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

Office Use Only
Application Number:

Application for resource consent or fast-track resource consent

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

1. Pre-Lodgement Meeting

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

◯ **Yes** ✔ **No**

If yes, who have you spoken with?

2. Type of consent being applied for

(more than one circle can be ticked):

◯ **Land Use**
◯ **Fast Track Land Use***
✔ **Subdivision**
◯ **Consent under National Environmental Standard**
(e.g. Assessing and Managing Contaminants in Soil)
◯ **Other (please specify)**
◯ **Discharge**
◯ **Change of Consent Notice (s.221(3))**
◯ **Extension of time (s.125)**

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

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

◯ **Yes** ✔ **No**

4. Consultation

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

If yes, which groups have you consulted with? Kareponia Marae Trustees

Who else have you consulted with? Neighbours

*For any questions or information regarding iwi/hapū consultation, please contact Te Hono at Far North District Council, **tehonosupport@fndc.govt.nz***

5. Applicant details

Name/s: Clayton Matthews

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: Logiplan Limited C/- Nina Pivac

Email:

Phone number:

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

Postcode

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: Paula and Nigel Matthews

Property address/
location: 47 Pairatahi Road Kaingaroa

Postcode

8. Application site details

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

Name/s: As above

Site address/ location:

Postcode

Legal description: Lot 1 DP 161116 **Val Number:**

Certificate of title: NA96D/620

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.

Please contact applicant to arrange site visit

9. Description of the proposal

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

Proposed subdivision in RPZ to create one additional allotment.

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.

10. Would you like to request public notification?

☐ **Yes** ☑ **No**

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

(more than one circle can be ticked):

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

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

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

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

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

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

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

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

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

13. 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**

14. 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 for 5 working days as per s107G of the RMA to enable consideration for the draft conditions.

15. 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)**	As per applicant details
Email:	
Phone number:	Work / Home
Postal address: (or alternative method of service under section 352 of the act)	Postcode

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.

15. Billing details continued...

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) Clayton Matthews

Signature:
(signature of bill payer)

Date 19-Mar-2026

MANDATORY

16. 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.

17. Declaration

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

Name (please write in full) Nina Pivac

Signature

Date 19-Mar-2026

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

See overleaf for a checklist of your information...

Checklist

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.

Wilton Joubert Limited
185 Waipapa Road
Kerikeri 0230
Tel: (09) 527 0196

SITE	**47 Pairatahi Road, Kaingaroa**
LEGAL DESCRIPTION	**Lot 1 DP 42296 & Lot 1 DP 161116**
PROJECT	**Proposed 2-Lot Subdivision**
CLIENT	**Clayton Matthews**
REFERENCE NO.	**145217**
DOCUMENT	**Site Assessment Report**
STATUS/REVISION NO.	**FINAL – Issued for Resource Consent**
DATE OF ISSUE	**20 February 2026**

Report Prepared For	Attention	Email
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1. EXECUTIVE SUMMARY

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

Development Type:	2-Lot subdivision (Proposed Lot 1 for assessment).
Development Proposals Supplied:	Yes - Subdivision Scheme Plan.
Geology Encountered:	Awhitu Group Alluvium.
Surficial Topsoil Encountered:	Surficial layers were encountered to a depth of 0.20m below present ground level.
Overall Site Gradient in Proximity to Designated Building Platforms:	Near level to gently inclined.
Site Stability Risk:	Low risk of instability at the proposed Lot 1 Designated Building Platform (DBP).
Liquefaction Risk:	Negligible risk of liquefaction susceptibility.
Proposed Future Foundation Type(s):	Timber subfloor, suspended on bored, concrete encased, tanalised timber pile foundations.
Soil Bearing Capacity:	Yes – Competent Natural Ground Only. Geotechnical Ultimate Bearing Capacity= 300kPa.
NZBC B1 Expansive Soil Classification:	Class H – Highly Expansive (ys = 78mm).
NZS1170.5:2004 Site Subsoil Classification:	Class C – Shallow soil stratigraphy.
Minimum Footing Embedment Depth:	0.90m below finished ground levels and 0.30m into competent natural ground, whichever is deeper.
Earthworks:	We anticipate minimal earthworks will be undertaken in forming the future dwelling building site, essentially consisting of bored footing excavations.
Consent Application Report Suitable for:	**Resource Consent**. This report is not intended to support any Building Consent application unless a Geotechnical review of future, finalised development drawings for proposed Lot 1 has been undertaken by WJL.

2. INTRODUCTION

2.1. SCOPE OF WORK

Wilton Joubert Limited (WJL) was engaged by **Clayton Matthews** (the Client) to undertake a geotechnical assessment of the above site, where we understand, it is proposed to subdivide the existing property into two individual allotments.

The primary purpose of this report is to provide Geotechnical assessments, along with preliminary design recommendations, pertaining to future residential development within vacant proposed Lot 1. The existing residential development that covers the central northern portion of the property will be contained within proposed Lot 2.

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

2.2. SUPPLIED INFORMATION

At the time of preparing this report, we were supplied with a Subdivision Scheme Plan depicting the proposed development, dated February 2026 (Ref: 24766), prepared by Williams and King.

Any revision of the Subdivision Scheme Plan with geotechnical implications should be referred back to us for review. Additionally, this report is not intended to support any Building Consent application unless a Geotechnical review of future finalised development drawings for proposed Lot 1 has been undertaken by WJL.

3. SITE DESCRIPTION

The proposed development will be constructed within the following property (the site), which is located off the southern side of Pairatahi Road, accessed approximately 450m from the State Highway 1 intersection:

- 47 Pairatahi Road, Kaingaroa, legally described as Lot 1 DP 42296 and Lot 1 DP 161116.

The site is shown on our appended Site Plan (Ref: 145217-G600) and in Figure 1 below.

Figure 1: Aerial view with the subject property highlighted in cyan (from Northland Regional Council online GIS database).

The surface area of the subject site is approximately 2.4ha and is accessed near the middle of the northern boundary via a main aggregate driveway. An additional vehicle crossing and grassed driveway formation is located immediately to the east of the main driveway.

Built development on site comprises an existing dwelling and adjacent shed near the northern boundary, along with perimeter and internal fences. Vegetation comprises mainly pasture, with small trees and bush intermittently present along the northern and eastern boundaries. A small pond is located near the northeastern boundary corner.

Topographically speaking, the property is set in a broad, elevated plateau, and is essentially near level to very gently sloping.

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

4. DEVELOPMENT PROPOSALS

It is our understanding that the client intends to subdivide the existing property into two individual allotments, as depicted on the Subdivision Scheme Plan below.

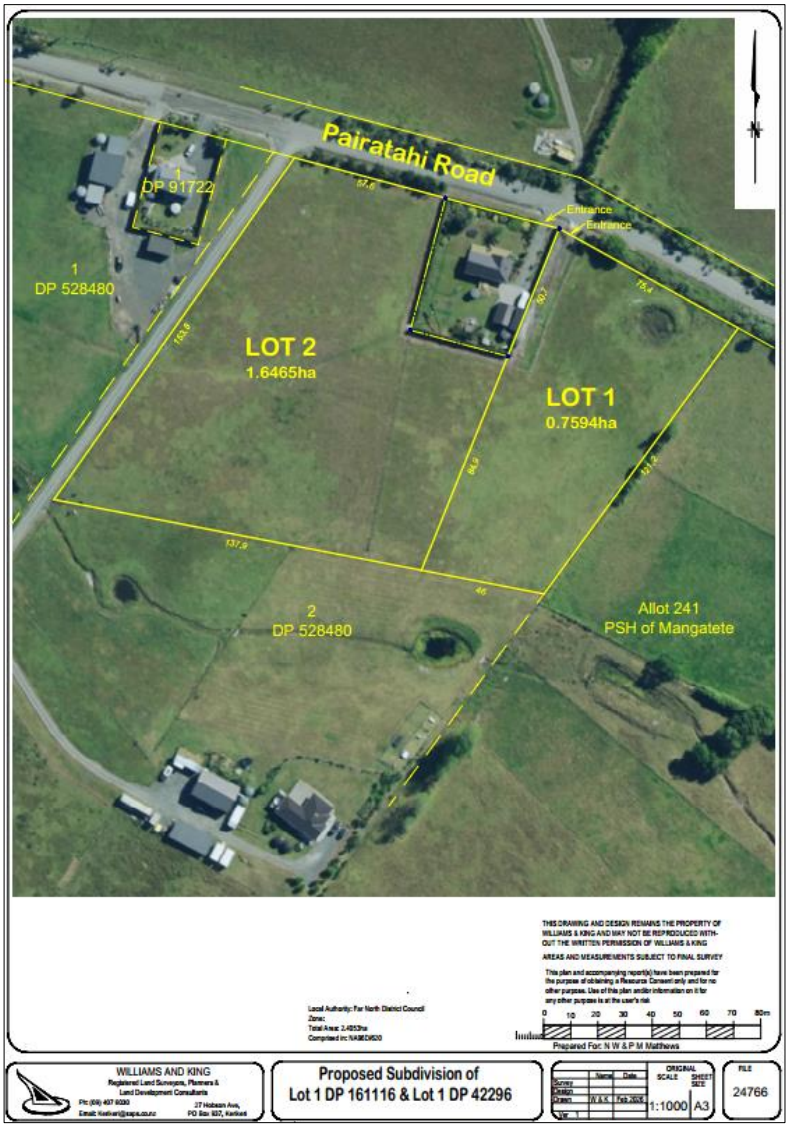

Figure 2: Subdivision Scheme Plan (from Williams and King).

Proposed Lot 1 will encompass a vacant 7,594m² area across the eastern portion of the property. The Lot will be accessed via the existing vehicle crossing and grassed driveway to the east of the main driveway.

Proposed Lot 2 will encompass the remaining 1.6465ha area of land and contain the existing dwelling and shed. The Lot will continue to use the existing main aggregate driveway for access.

WJL has been engaged to provide geotechnical assessments, along with preliminary design recommendations, pertaining to future residential development within proposed Lot 1. A 30m x 30m (900m²) designated building platform (DBP) has been identified by the client in the southern portion of the Lot for assessment, as depicted on our appended Site Plan.

Following approval of subdivision, it is our understanding that the client intends to construct a residential dwelling within the Lot 1 DBP. For the purposes of this report, we have generally assumed that the future dwelling will be designed and constructed in accordance with the requirements of NZS3604:2011 and is likely to be found on a timber subfloor, suspended on bored, concrete encased, tanalised timber pile foundations.

Figure 3: Site photograph looking southeast towards the proposed Lot 1 DBP.

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

5. PUBLISHED GEOLOGY

Reference to the New Zealand Geology Web Map hosted by GNS Science indicates that the subject site and wider surrounding influential land is underlain by **Awhitu Group Alluvium** deposits.

These deposits are approximately 4 to 1 million years in age and described as; "*Partly consolidated sandstone and mudstone of high terraces*' (Ref: GNS Science Website).

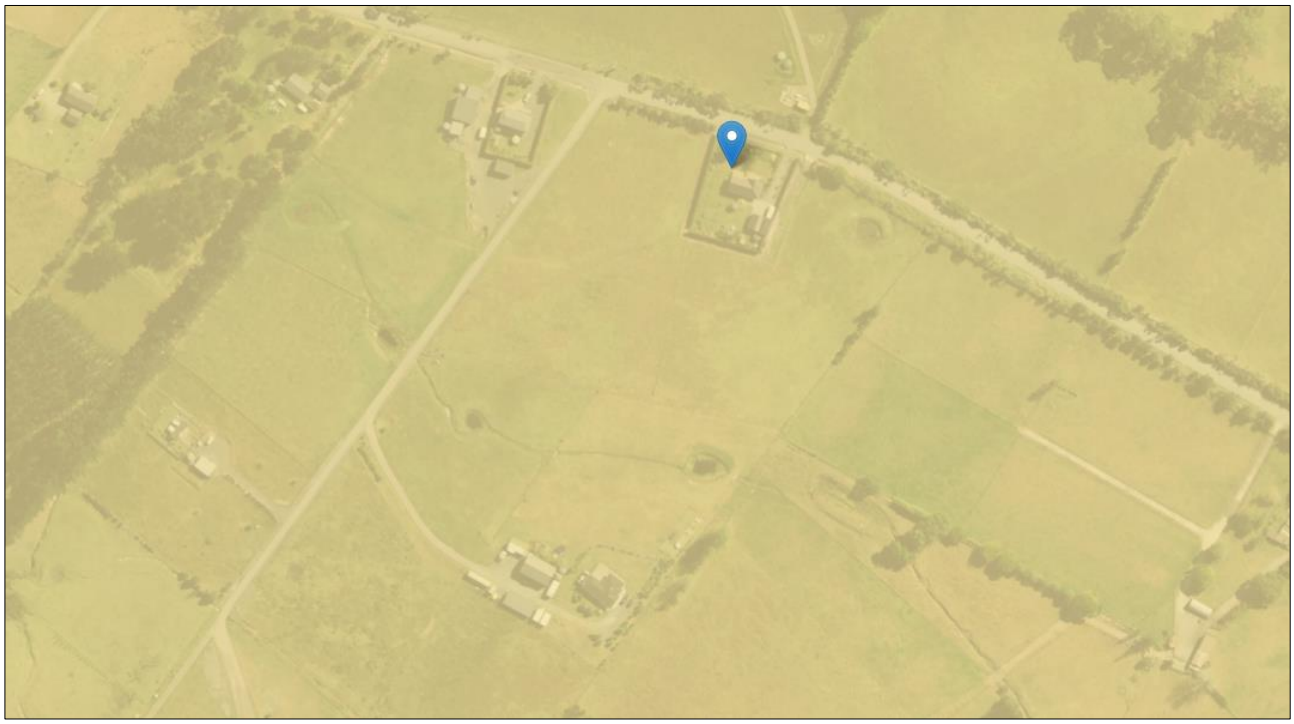

Figure 4: Screenshot from the New Zealand Geology Web Map hosted by GNS Science. Blue marker depicts property location.

6. GEOTECHNICAL INVESTIGATION

Our fieldwork, as depicted on our appended Site Plan, was undertaken on the 18 February 2026 and involved:

- Drilling 3 (no.) 50mm diameter hand auger boreholes (HA01 to HA03) to depths ranging between 0.30m and 3.0m below present ground level (bpgl), and
- A Dynamic Cone Penetrometer (DCP-Scala) test was undertaken at the base of HA02, immediately refusing at a depth of 0.40m bpgl.

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

7. GEOTECHNICAL FINDINGS

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

7.1. TOPSOIL

Topsoil was encountered in all boreholes to a depth of 0.20m bpgl.

7.2. NATURAL GROUND

The underlying natural deposits encountered were consistent with our expectations of Awhitu Group alluvial deposits, initially comprising a very stiff to hard veneer of sandy SILT and SILT to a depth of 0.60 to 0.65m, overlying very stiff clayey SILT, silty CLAY, and CLAY to a maximum explored depth of 3.0m bpgl. In HA02, the very stiff to hard veneer of SILT could not be penetrated and as such, the borehole required termination at a depth of 0.30m bpgl.

Measured in-situ, BS1377 adjusted peak Vane Shear Strengths ranged between 114kPa and greater than 195kPa, the latter being where soil strength was in excess of the shear vane capacity, or the vane could not penetrate the soil (UTP).

The DCP-Scala test at the base of HA02 immediately refused on a blow count of greater than 20 per 100mm penetration, indicating very dense stratum below the borehole.

The ratio of peak to remoulded vane shear strength values measured within boreholes ranged between 1.5 and 2.6, indicating the underlying subsoils are 'Insensitive' to 'Moderately Sensitive' subgrade.

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

7.3. GROUNDWATER

Groundwater was not encountered in any of the boreholes on the day of our investigation.

7.4. SUMMARY TABLE

The following table summarises our inferred stratigraphic profiling:

Table 1: Stratigraphic Summary Table

Investigation Hole ID	Termination Depth (m)	Depth to Base of Surficial Topsoil (m)	Vane Shear Strength Range within Cohesive Natural Ground (kPa)	DCP-Scala Blow Count Range Per 100mm Ground Penetration	DCP-Scala Refusal (20+ Blows) from the base of selected HAs Depth (m)	Standing Groundwater Depth (m)
HA01	3.0	0.20	120 – 195+	NT	NT	NE
HA02	0.30 (1)	0.20	UTP	20+	0.40	NE
HA03	3.0	0.20	114 - 195+	NT	NT	NE

Table Note: (1) Too hard to auger. NT Not tested. NE Not encountered.

7.5. EXPANSIVE SOILS

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

In this instance, in the absence of laboratory testing, but instead adopting the visual-tactile method as per AS2870, considering that the site is only overlain by a thin veneer of non-cohesive deposits, which in turn is underlain by plastic clay deposits, this gives rise to the concern of differential settlement due to the likelihood of differing non-cohesive and cohesive soils at foundation levels. As such, we have adopted a conservative primary classification estimate of the soils underlying the site as follows:

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

Effects of expansive soils for the construction type proposed here, will require mitigation by way of a specific engineering design (SED) deepened bored footings. Foundation design recommendations are given in the appropriate Conclusion and Recommendation sections below.

8. GEOTECHNICAL ASSESSMENTS

As appropriate to the site conditions, we have carried out the following geotechnical analyses for the proposed Lot 1 DBP:

- Qualitative slope stability, and
- Liquefaction susceptibility.

8.1. QUALITATIVE SLOPE STABILITY

Due to the near level to gentle topography of the proposed Lot 1 DBP and surrounding influential area, land instability is not considered to be a constraint or risk to the proposed development.

8.2. LIQUEFACTION ASSESSMENT

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:

- The FNDC online GIS Hazard Map categorises the site as an '*Unlikely*' Liquefaction Vulnerability area,
- Very stiff to hard Awhitu Group Alluvium deposits – mostly cohesive - encountered during our investigations,
- Groundwater was not encountered in any of the boreholes on the day of our investigation,
- The site is situated on a broad, elevated plateau, with good water-shedding characteristics,
- There are no known active faults traversing through or close to the site, and
- Soils of the Awhitu Group Alluvium underlie the site (geological age +1My).

8.3. LIQUEFACTION ASSESSMENT CONCLUSION

Based on our 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.

9. CONCLUSIONS AND RECOMMENDATIONS

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

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

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

Therefore, we are satisfied that the proposed Lot 1 DBP should be generally suitable for future residential construction in terms of NZS3604:2011, subject to a Geotechnical development review of finalized development drawings prior to submission for a Building Consent application.

9.1. PRELIMINARY FOUNDATION DESIGN

The client intends to construct a residential dwelling with the Lot 1 DBP, likely found on a timber subfloor, suspended on bored, concrete encased, tanalised timber pile foundations.

Shallow foundations are suitable to support the future dwelling provided they are designed to accommodate vertical movement of soil associated with Soil Reactivity **Class H – Highly Reactive.**

9.1.1. SHALLOW FOUNDATION BEARING CAPACITY

The following bearing capacity values are considered to be appropriate for the design of shallow foundations, subject to founding directly within competent natural ground, for which careful future Geo-Professional inspections during bored footing excavations should be undertaken to check that the underlying conditions are in keeping with our expectations:

Table 2: Shallow Bearing Capacity Values

Parameters	Awhitu Group Alluvium
Geotechnical Ultimate Bearing Capacity	300 kPa
ULS Dependable Bearing Capacity (Φ=0.5)	150 kPa

When finalising development proposals, it should be checked that all foundations lie outside 45° envelopes rising from 0.50m below the invert of service trenches, unless such foundation details are found by SED to be satisfactory. Deeper foundation embedment or bridging piles may be required for any surcharging foundations.

9.1.2. SHALLOW FOUNDATIONS ON EXPANSIVE SOILS

As described earlier in this report, we have estimated the classification of the site subsoils as follows:

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

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 all proposed foundations.

All bored footings should be embedded at a minimum of 0.90m below finished ground levels and 0.30m into competent natural ground, whichever is deeper.

9.2. NZS1170.5:2004 SITE SUBSOIL CLASSIFICATION

We consider the proposed Lot 1 DBP to be underlain with a Class C – Shallow Soil stratigraphy.

9.3. SITE EARTHWORKS

We anticipate minimal earthworks will be undertaken in forming the future dwelling building site, essentially consisting of bored footing excavations.

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

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

9.4. SITE CLEARANCE & PREPARATION

The competency of the exposed subgrade at the invert of all bored footings should be confirmed by a Geo-Professional, to confirm that the underlying natural subgrade conditions are in keeping with the expectations of this report. Without such inspections being undertaken, a Chartered Professional Geotechnical Engineer is unable to issue a Producer Statement - PS4 – Design Review which could result in the failure to meet Building Consent requirements as set by Council as conditions of consent.

9.5. SUBGRADE PROTECTION

All bored footing inverts should be poured as soon as possible once inspected by a Geo-Professional or covered with a protective layer of site concrete.

9.6. GENERAL SITE WORKS

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

Furthermore:

- All works must be undertaken in accordance with the Health and Safety at Work Act 2015,
- Any open excavations should be fenced off or covered, and/or access restricted as appropriate,
- 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.

9.7. 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, and
- Foundation construction too soon after their removal can result in soil swelling and raising foundations as the soil rehydrates.

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.

All stormwater runoff from new roofs and paved areas should be collected in sealed pipes and be discharged to a FNDC approved stormwater system.

Under no circumstances should concentrated overflows from any source discharge into or onto the ground in an uncontrolled fashion.

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 the future development.

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

12. UNDERGROUND SERVICES

Underground services, public or private, mapped, or unmapped, of any type may be present, hence we recommend staying on the side of caution during the commencement of any work within the proposed development area.

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

Once future development plans for proposed Lot 1 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.

14. FUTURE CONSTRUCTION MONITORING

The foregoing statements are Professional Opinion, based on a limited collection of information, some of which is factual, and some of which is inferred. Because soils are not a homogeneous, manufactured building component, there always exists a level of risk that inferences about soil conditions across the greater site, which have been drawn from isolated "pinprick" locations, may be subject to localized variations. Generally, any investigation is deemed less complete until the applicability of its inferences and the Professional Opinions arising out of those are checked and confirmed during the construction phase, to an appropriate level.

It is increasingly common for the Building Consent Authorities (BCA) to require a Producer Statement – Construction (PS4) which is an important document. The purpose of the PS4 is to confirm the Engineers' Professional Opinion to the BCA that specific elements of construction, such as the verification of design assumptions and soil parameters (NZBC clause B1/VM4 2.0.8), are in accordance with the approved Building Consent and its related documents, which should include the subject Geotechnical Report. Where site works will involve the placement of fill, the PS4 should reference NZBC clause B1/VM1 10.1.

For WJL to issue a PS4 to meet the above clauses of the NZBC, we will need to carry out the site inspections as per the Building Consent and Council requirements. We require at least 48 hours' notice for site inspections.

Site inspections should be undertaken by a Chartered Professional Geotechnical Engineer or their Agent, who is familiar with both this site and the contents of this Geotechnical Report.

Prior to works commencement, the above Engineer should be contacted to confirm the construction methodologies, inspection, and testing frequency.

The primary purpose of the site inspections is to check that the conditions encountered are consistent with those expected from the investigations and adopted for the design as discussed herein. If anomalies or uncertainties are identified, then further Professional advice should be sought from the Geo-Professional, which will allow the timely provision of solutions and recommendations should any engineering problems arise.

Upon satisfactory completion of the above work aspects, WJL would then be in a position to issue the PS4 as required by Council.

At this time, the following Geotechnical Site Inspections and Testing should include, but are not limited to:

- Pre-pour bored footing excavations.

15. LIMITATIONS

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

This report has been commissioned solely for the benefit of our Client, **Clayton Matthews**, in relation to the project 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 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.

The recommendations provided in this geotechnical report are in accordance with the findings from our shallow investigation. However, it is important to acknowledge that additional refinement of the investigation and analysis may be necessary to meet the specific requirements set by the local council.

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

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

Yours faithfully,

WILTON JOUBERT LIMITED

Appendices:

WJL Site Plan (1 sheet)

Hand Auger Borehole Records (3 sheets)

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

WJL's Construction Monitoring Information (1 sheet)

SITE LOCATION

IMAGE SOURCE:
FAR NORTH DISTRICT COUNCIL LOCALMAPS

SYMBOL KEY	
HA	HAND AUGER LOCATIONS

GENERAL NOTES

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

WILTON JOUBERT
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ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
A	FEB 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

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

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

GEOTECHNICAL
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **SITE PLAN**

PROJECT DESCRIPTION: **PROPOSED SUBDIVISION**

PROJECT TITLE:
LOT 1 DP 42296 &
LOT 1 DP 161116
47 PAIRATAHI ROAD
KAINGAROA
NORTHLAND

ORIGINAL DRAWING SIZE:	OFFICE:
A3	WHANGAREI
DRAWING SCALE:	CO-ORDINATE SYSTEM:
1:500	NOT COORDINATED
DRAWING NUMBER:	ISSUE:
145217-G600	A

HAND AUGER : HA01

CLIENT: Clayton Matthews
PROJECT: 2-Lot Subdivision
SITE LOCATION: 47 Pairatahi Road, Kaingaroa

JOB NO.: 145217 **SHEET:** 1 OF 1
START DATE: 18/02/2026 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: DR4802 **ELEVATION:** Ground
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 / mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, dry to moist.	TS	0.2						
Awhitu Group Alluvium	NATURAL: Fine Sandy SILT, white with some brown, very stiff, dry to moist, no plasticity. 0.3m: Brown, hard.		0.4						
	SILT, trace sand and clay, dark brown, very stiff, moist, no plasticity.		0.6		195+	-	-		
	Clayey SILT, brown with occasional dark brown seams and clasts, very stiff, dry to moist, low plasticity. 0.9m: Greyish brown.		0.8		195+	-	-		
			1.0						
	Silty CLAY, brownish grey, very stiff, dry to moist, moderate plasticity.		1.2	Groundwater Not Encountered	195+	-	-		
			1.4						
			1.6		195+	-	-		
			1.8						
	2.0m: Trace to minor sand, grey, moist.		2.0		175	81	2.2		
			2.2						
			2.4						
	CLAY, trace to minor silt and sand, grey, very stiff, moist, high plasticity.		2.6		120	78	1.5		
			2.8						
	EOH: 3.00m - Target Depth		3.0		125	64	2.0		
			3.2						
			3.4						

REMARKS
End of borehole @ 3.00m (Target Depth: 3.00m)

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 : HA02

CLIENT: Clayton Matthews
PROJECT: 2-Lot Subdivision
SITE LOCATION: 47 Pairatahi Road, Kaingaroa

JOB NO.: 145217 **SHEET:** 1 OF 1
START DATE: 18/02/2026 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: DR4802 **ELEVATION:** Ground
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	TOPSOIL, dark brown, dry to moist.	TS	0.2	Groundwater Not Encountered					
Group	NATURAL: Fine Sandy SILT, white with some brown, very stiff, dry to moist, no plasticity.				UTP	-	-	20+	
	EOH: 0.30m - Too Hard To Auger		0.4						
			0.6						
			0.8						
			1.0						
			1.2						
			1.4						
			1.6						
			1.8						
			2.0						
			2.2						
			2.4						
			2.6						
			2.8						
			3.0						
			3.2						
			3.4						

SOIL DESCRIPTION
TOPSOIL CLAY SAND PEAT
FILL SILT GRAVEL ROCK

REMARKS
End of borehole @ 0.30m (Target Depth: 3.00m)

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

CLIENT: Clayton Matthews
PROJECT: 2-Lot Subdivision
SITE LOCATION: 47 Pairatahi Road, Kaingaroa

JOB NO.: 145217 **SHEET:** 1 OF 1
START DATE: 18/02/2026 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: DR4802 **ELEVATION:** Ground
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 / mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, dry to moist.	TS	0.2						
Awhitu Group Alluvium	NATURAL: Fine Sandy SILT, white with some brown, very stiff, dry to moist, no plasticity.		0.4		195+	-	-		
	SILT, trace to minor organic material, brown and dark brown, dry to moist, very stiff, no plasticity.		0.6						
	Clayey SILT, brown with occasional dark brown organic inclusions, very stiff, dry to moist, low plasticity.		0.8		195+	-	-		
	Silty CLAY, brownish grey, very stiff, dry to moist, moderate plasticity.		1.0						
			1.2		195+	-	-		
	1.6m: Brownish grey.		1.4						
			1.6		195+	-	-		
			1.8						
			2.0		195+	-	-		
			2.2						
	2.4m: Grey, moist.		2.4						
			2.6		161	70	2.3		
	2.8m: Trace to minor sand.		2.8						
	EOH: 3.00m - Target Depth		3.0		114	44	2.6		
			3.2						
			3.4						

Groundwater Not Encountered

REMARKS
End of borehole @ 3.00m (Target Depth: 3.00m)

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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FOUNDATION MAINTENANCE AND FOOTING PERFORMANCE

Preventing soil-related building movement

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

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

SOIL TYPES

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

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

CAUSES OF MOVEMENT

SETTLEMENT DUE TO CONSTRUCTION

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

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

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

EROSION

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

SATURATION

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

SEASONAL SWELLING AND SHRINKAGE OF SOIL

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

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

SHEAR FAILURE

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

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

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

TREE ROOT GROWTH

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

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

TABLE 1. GENERAL DEFINITIONS OF SITE CLASSES.

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

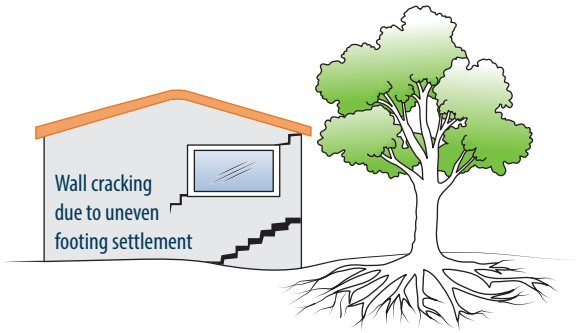

FIGURE 1 Trees can cause shrinkage and damage.

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

UNEVENNESS OF MOVEMENT

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

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

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

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

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

EFFECTS OF UNEVEN SOIL MOVEMENT ON STRUCTURES

EROSION AND SATURATION

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

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

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

SEASONAL SWELLING/SHRINKAGE IN CLAY

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

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

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

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

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

MOVEMENT CAUSED BY TREE ROOTS

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

COMPLICATIONS CAUSED BY THE STRUCTURE ITSELF

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

EFFECTS ON FULL MASONRY STRUCTURES

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

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

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

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

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

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

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

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

EFFECTS ON FRAMED STRUCTURES

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

EFFECTS ON BRICK VENEER STRUCTURES

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

WATER SERVICE AND DRAINAGE

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

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

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

SERIOUSNESS OF CRACKING

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

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

PREVENTION AND CURE

PLUMBING

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

GROUND DRAINAGE

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

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

PROTECTION OF THE BUILDING PERIMETER

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

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

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

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

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

CONDENSATION

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

TABLE 2. CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS.

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

Source: Reproduced with the permission of Standards Australia Limited © 2011. Copyright in AS 2870-2011 Residential slabs and footings vests in Standards Australia Limited.

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.

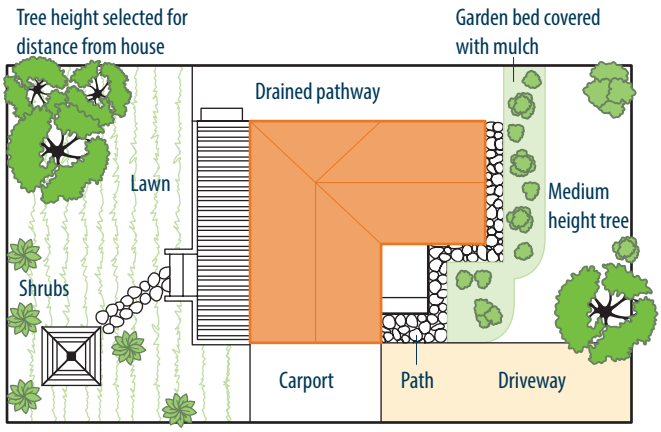

FIGURE 2 Gardens for a reactive site.

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.

WILTON JOUBERT
Consulting Engineers

Construction Monitoring Services

Northland, Auckland-Waikato, Canterbury, Southern Lakes

Need a PS4?

- Please read the conditions of your Building Consent to determine which section of the works Council wants an engineer to sign off on.
- Book an inspection with Wilton Joubert Ltd or with a suitable qualified engineer.
- Have the Consent documents on site at the time of the inspection
- Be sure to verify both the grounding conditions (soil parameters) as well as the structural elements of works in question
- If in doubt what to get inspected please clarify with Council.

Producer Statements 4 - Construction Review Documents (PS4's) relates to Building Consents (BC) only, not Resource Consents (RC), unless there is an element of the RC which requires a BC, e.g. a retaining wall needed to develop a subdivision.
In soils, RC's are usually verified with a "Statement of Professional Opinion as to Suitability for Building Development", or variations on that title.

CONSTRUCTION MONITORING SERVICES

Construction monitoring refers to the physical inspection of selective components of the design or works as required by Council and as specified in the Consented documents. It is up to the Consent holder to read the special conditions set out by Council and arrange for the required inspections to be done. No PS4 can be issued without the physical inspection of works and sighting of Consented plans either by the design engineer, his representative, or another qualified engineer. (download PDF with more info via our website)

It is also important to note that, more often than not, there are two physical components that needs verification:

1. Geotechnical or grounding Conditions –referring to the strength or bearing capacity of the soil
2. Structural Components – verify that works are done as per design and in accordance with the consented plans.

To complicate matters there can be multiple engineers that might be engaged on the same site:

- Civil Engineer – To do storm water and wastewater designs
- Geotechnical Engineer – to do a Geotech report and specificity soil parameters as required
- Structural Engineer – to design structural components such as retaining walls, raft floors, beams and so on.

In cases where engineers from different companies are appointed it is important to make sure all the required boxes are ticked as not to complicate matters when it comes to the issuing of all the relevant PS4's.
Note: sites in the Auckland area might requires multiple PS4's for the same component (e.g. a raft floor requires a Geotechnical Engineer to verify the bearing capacity of the platform and a Structural engineer needs to verify the structural components are according to the design.
Not to mention a Council inspection is also required on the same floor to verify position, plumbing and so on.

In Summary:

- Read the conditions as laid out in the Consent documents to which elements of the design requires a PS4's from the design engineer.
- Have Consented plans on site during inspection time
- Book inspections ahead of time (a minimum of 48 hours in advanced)
- Ensure both grounding conditions as well as structural components are inspected. In some cases, this might mean two separate inspections if different engineers are involved.
- If you have any further questions, feel free to contact us at any time during business hours.

Construction Monitoring Enquiries
Email: *jobs@wjl.co.nz*
or scan QR code to visit our website

Measured in-situ, BS1377 adjusted peak Vane Shear Strengths ranged between 114kPa and greater than 195kPa, the latter being where soil strength was in excess of the shear vane capacity, or the vane could not penetrate the soil (UTP).

The DCP-Scala test at the base of HA02 immediately refused on a blow count of greater than 20 per 100mm penetration, indicating very dense stratum below the borehole.

The ratio of peak to remoulded vane shear strength values measured within boreholes ranged between 1.5 and 2.6, indicating the underlying subsoils are 'Insensitive' to 'Moderately Sensitive' subgrade.

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

7.3. GROUNDWATER

Groundwater was not encountered in any of the boreholes on the day of our investigation.

7.4. SUMMARY TABLE

The following table summarises our inferred stratigraphic profiling:

Table 1: Stratigraphic Summary Table

Investigation Hole ID	Termination Depth (m)	Depth to Base of Surficial Topsoil (m)	Vane Shear Strength Range within Cohesive Natural Ground (kPa)	DCP-Scala Blow Count Range Per 100mm Ground Penetration	DCP-Scala Refusal (20+ Blows) from the base of selected HAs Depth (m)	Standing Groundwater Depth (m)
HA01	3.0	0.20	120 – 195+	NT	NT	NE
HA02	0.30 (1)	0.20	UTP	20+	0.40	NE
HA03	3.0	0.20	114 - 195+	NT	NT	NE

Table Note: (1) Too hard to auger. NT Not tested. NE Not encountered.

7.5. EXPANSIVE SOILS

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

In this instance, in the absence of laboratory testing, but instead adopting the visual-tactile method as per AS2870, considering that the site is only overlain by a thin veneer of non-cohesive deposits, which in turn is underlain by plastic clay deposits, this gives rise to the concern of differential settlement due to the likelihood of differing non-cohesive and cohesive soils at foundation levels. As such, we have adopted a conservative primary classification estimate of the soils underlying the site as follows:

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

Effects of expansive soils for the construction type proposed here, will require mitigation by way of a specific engineering design (SED) deepened bored footings. Foundation design recommendations are given in the appropriate Conclusion and Recommendation sections below.

8. GEOTECHNICAL ASSESSMENTS

As appropriate to the site conditions, we have carried out the following geotechnical analyses for the proposed Lot 1 DBP:

- Qualitative slope stability, and
- Liquefaction susceptibility.

8.1. QUALITATIVE SLOPE STABILITY

Due to the near level to gentle topography of the proposed Lot 1 DBP and surrounding influential area, land instability is not considered to be a constraint or risk to the proposed development.

8.2. LIQUEFACTION ASSESSMENT

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:

- The FNDC online GIS Hazard Map categorises the site as an '*Unlikely*' Liquefaction Vulnerability area,
- Very stiff to hard Awhitu Group Alluvium deposits – mostly cohesive - encountered during our investigations,
- Groundwater was not encountered in any of the boreholes on the day of our investigation,
- The site is situated on a broad, elevated plateau, with good water-shedding characteristics,
- There are no known active faults traversing through or close to the site, and
- Soils of the Awhitu Group Alluvium underlie the site (geological age +1My).

8.3. LIQUEFACTION ASSESSMENT CONCLUSION

Based on our 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.

9. CONCLUSIONS AND RECOMMENDATIONS

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

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

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

Therefore, we are satisfied that the proposed Lot 1 DBP should be generally suitable for future residential construction in terms of NZS3604:2011, subject to a Geotechnical development review of finalized development drawings prior to submission for a Building Consent application.

9.1. PRELIMINARY FOUNDATION DESIGN

The client intends to construct a residential dwelling with the Lot 1 DBP, likely found on a timber subfloor, suspended on bored, concrete encased, tanalised timber pile foundations.

Shallow foundations are suitable to support the future dwelling provided they are designed to accommodate vertical movement of soil associated with Soil Reactivity **Class H – Highly Reactive.**

9.1.1. SHALLOW FOUNDATION BEARING CAPACITY

The following bearing capacity values are considered to be appropriate for the design of shallow foundations, subject to founding directly within competent natural ground, for which careful future Geo-Professional inspections during bored footing excavations should be undertaken to check that the underlying conditions are in keeping with our expectations:

Table 2: Shallow Bearing Capacity Values

Parameters	Awhitu Group Alluvium
Geotechnical Ultimate Bearing Capacity	300 kPa
ULS Dependable Bearing Capacity (Φ=0.5)	150 kPa

When finalising development proposals, it should be checked that all foundations lie outside 45° envelopes rising from 0.50m below the invert of service trenches, unless such foundation details are found by SED to be satisfactory. Deeper foundation embedment or bridging piles may be required for any surcharging foundations.

9.1.2. SHALLOW FOUNDATIONS ON EXPANSIVE SOILS

As described earlier in this report, we have estimated the classification of the site subsoils as follows:

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

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 all proposed foundations.

All bored footings should be embedded at a minimum of 0.90m below finished ground levels and 0.30m into competent natural ground, whichever is deeper.

9.2. NZS1170.5:2004 SITE SUBSOIL CLASSIFICATION

We consider the proposed Lot 1 DBP to be underlain with a Class C – Shallow Soil stratigraphy.

9.3. SITE EARTHWORKS

We anticipate minimal earthworks will be undertaken in forming the future dwelling building site, essentially consisting of bored footing excavations.

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

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

9.4. SITE CLEARANCE & PREPARATION

The competency of the exposed subgrade at the invert of all bored footings should be confirmed by a Geo-Professional, to confirm that the underlying natural subgrade conditions are in keeping with the expectations of this report. Without such inspections being undertaken, a Chartered Professional Geotechnical Engineer is unable to issue a Producer Statement - PS4 – Design Review which could result in the failure to meet Building Consent requirements as set by Council as conditions of consent.

9.5. SUBGRADE PROTECTION

All bored footing inverts should be poured as soon as possible once inspected by a Geo-Professional or covered with a protective layer of site concrete.

9.6. GENERAL SITE WORKS

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

Furthermore:

- All works must be undertaken in accordance with the Health and Safety at Work Act 2015,
- Any open excavations should be fenced off or covered, and/or access restricted as appropriate,
- 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.

9.7. 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, and
- Foundation construction too soon after their removal can result in soil swelling and raising foundations as the soil rehydrates.

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.

All stormwater runoff from new roofs and paved areas should be collected in sealed pipes and be discharged to a FNDC approved stormwater system.

Under no circumstances should concentrated overflows from any source discharge into or onto the ground in an uncontrolled fashion.

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 the future development.

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

12. UNDERGROUND SERVICES

Underground services, public or private, mapped, or unmapped, of any type may be present, hence we recommend staying on the side of caution during the commencement of any work within the proposed development area.

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

Once future development plans for proposed Lot 1 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.

14. FUTURE CONSTRUCTION MONITORING

The foregoing statements are Professional Opinion, based on a limited collection of information, some of which is factual, and some of which is inferred. Because soils are not a homogeneous, manufactured building component, there always exists a level of risk that inferences about soil conditions across the greater site, which have been drawn from isolated "pinprick" locations, may be subject to localized variations. Generally, any investigation is deemed less complete until the applicability of its inferences and the Professional Opinions arising out of those are checked and confirmed during the construction phase, to an appropriate level.

It is increasingly common for the Building Consent Authorities (BCA) to require a Producer Statement – Construction (PS4) which is an important document. The purpose of the PS4 is to confirm the Engineers' Professional Opinion to the BCA that specific elements of construction, such as the verification of design assumptions and soil parameters (NZBC clause B1/VM4 2.0.8), are in accordance with the approved Building Consent and its related documents, which should include the subject Geotechnical Report. Where site works will involve the placement of fill, the PS4 should reference NZBC clause B1/VM1 10.1.

For WJL to issue a PS4 to meet the above clauses of the NZBC, we will need to carry out the site inspections as per the Building Consent and Council requirements. We require at least 48 hours' notice for site inspections.

Site inspections should be undertaken by a Chartered Professional Geotechnical Engineer or their Agent, who is familiar with both this site and the contents of this Geotechnical Report.

Prior to works commencement, the above Engineer should be contacted to confirm the construction methodologies, inspection, and testing frequency.

The primary purpose of the site inspections is to check that the conditions encountered are consistent with those expected from the investigations and adopted for the design as discussed herein. If anomalies or uncertainties are identified, then further Professional advice should be sought from the Geo-Professional, which will allow the timely provision of solutions and recommendations should any engineering problems arise.

Upon satisfactory completion of the above work aspects, WJL would then be in a position to issue the PS4 as required by Council.

At this time, the following Geotechnical Site Inspections and Testing should include, but are not limited to:

- Pre-pour bored footing excavations.

15. LIMITATIONS

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

This report has been commissioned solely for the benefit of our Client, **Clayton Matthews**, in relation to the project 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 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.

The recommendations provided in this geotechnical report are in accordance with the findings from our shallow investigation. However, it is important to acknowledge that additional refinement of the investigation and analysis may be necessary to meet the specific requirements set by the local council.

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

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

Yours faithfully,

WILTON JOUBERT LIMITED

Appendices:

WJL Site Plan (1 sheet)

Hand Auger Borehole Records (3 sheets)

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

WJL's Construction Monitoring Information (1 sheet)

SITE LOCATION

IMAGE SOURCE:
FAR NORTH DISTRICT COUNCIL LOCALMAPS

SYMBOL KEY	
HA	HAND AUGER LOCATIONS

GENERAL NOTES

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

WILTON JOUBERT
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ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
A	FEB 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

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

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

GEOTECHNICAL
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **SITE PLAN**

PROJECT DESCRIPTION: **PROPOSED SUBDIVISION**

PROJECT TITLE:
LOT 1 DP 42296 &
LOT 1 DP 161116
47 PAIRATAHI ROAD
KAINGAROA
NORTHLAND

ORIGINAL DRAWING SIZE:	OFFICE:
A3	WHANGAREI
DRAWING SCALE:	CO-ORDINATE SYSTEM:
1:500	NOT COORDINATED
DRAWING NUMBER:	ISSUE:
145217-G600	A

HAND AUGER : HA01

CLIENT: Clayton Matthews
PROJECT: 2-Lot Subdivision
SITE LOCATION: 47 Pairatahi Road, Kaingaroa

JOB NO.: 145217 **SHEET:** 1 OF 1
START DATE: 18/02/2026 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: DR4802 **ELEVATION:** Ground
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 / mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, dry to moist.	TS	0.2						
Awhitu Group Alluvium	NATURAL: Fine Sandy SILT, white with some brown, very stiff, dry to moist, no plasticity. 0.3m: Brown, hard.		0.4						
	SILT, trace sand and clay, dark brown, very stiff, moist, no plasticity.		0.6		195+	-	-		
	Clayey SILT, brown with occasional dark brown seams and clasts, very stiff, dry to moist, low plasticity. 0.9m: Greyish brown.		0.8		195+	-	-		
			1.0						
	Silty CLAY, brownish grey, very stiff, dry to moist, moderate plasticity.		1.2	Groundwater Not Encountered	195+	-	-		
			1.4						
			1.6		195+	-	-		
			1.8						
	2.0m: Trace to minor sand, grey, moist.		2.0		175	81	2.2		
			2.2						
			2.4						
	CLAY, trace to minor silt and sand, grey, very stiff, moist, high plasticity.		2.6		120	78	1.5		
			2.8						
	EOH: 3.00m - Target Depth		3.0		125	64	2.0		
			3.2						
			3.4						

REMARKS
End of borehole @ 3.00m (Target Depth: 3.00m)

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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Website: www.wiltonjoubert.co.nz

HAND AUGER : HA02

CLIENT: Clayton Matthews
PROJECT: 2-Lot Subdivision
SITE LOCATION: 47 Pairatahi Road, Kaingaroa

JOB NO.: 145217 **SHEET:** 1 OF 1
START DATE: 18/02/2026 **NORTHING:** **GRID:**
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STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, dry to moist.	TS	0.2	Groundwater Not Encountered					
Group	NATURAL: Fine Sandy SILT, white with some brown, very stiff, dry to moist, no plasticity.				UTP	-	-	20+	
	EOH: 0.30m - Too Hard To Auger		0.4						
			0.6						
			0.8						
			1.0						
			1.2						
			1.4						
			1.6						
			1.8						
			2.0						
			2.2						
			2.4						
			2.6						
			2.8						
			3.0						
			3.2						
			3.4						

SOIL DESCRIPTION
TOPSOIL CLAY SAND PEAT
FILL SILT GRAVEL ROCK

REMARKS
End of borehole @ 0.30m (Target Depth: 3.00m)

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

CLIENT: Clayton Matthews
PROJECT: 2-Lot Subdivision
SITE LOCATION: 47 Pairatahi Road, Kaingaroa

JOB NO.: 145217 **SHEET:** 1 OF 1
START DATE: 18/02/2026 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: DR4802 **ELEVATION:** Ground
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STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, dry to moist.	TS	0.2						
Awhitu Group Alluvium	NATURAL: Fine Sandy SILT, white with some brown, very stiff, dry to moist, no plasticity.		0.4		195+	-	-		
	SILT, trace to minor organic material, brown and dark brown, dry to moist, very stiff, no plasticity.		0.6						
	Clayey SILT, brown with occasional dark brown organic inclusions, very stiff, dry to moist, low plasticity.		0.8		195+	-	-		
	Silty CLAY, brownish grey, very stiff, dry to moist, moderate plasticity.		1.0						
			1.2		195+	-	-		
	1.6m: Brownish grey.		1.4						
			1.6		195+	-	-		
			1.8						
			2.0		195+	-	-		
			2.2						
	2.4m: Grey, moist.		2.4						
			2.6		161	70	2.3		
	2.8m: Trace to minor sand.		2.8						
	EOH: 3.00m - Target Depth		3.0		114	44	2.6		
			3.2						
			3.4						

Groundwater Not Encountered

REMARKS
End of borehole @ 3.00m (Target Depth: 3.00m)

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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FOUNDATION MAINTENANCE AND FOOTING PERFORMANCE

Preventing soil-related building movement

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

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

SOIL TYPES

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

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

CAUSES OF MOVEMENT

SETTLEMENT DUE TO CONSTRUCTION

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

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

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

EROSION

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

SATURATION

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

SEASONAL SWELLING AND SHRINKAGE OF SOIL

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

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

SHEAR FAILURE

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

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

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

TREE ROOT GROWTH

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

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

TABLE 1. GENERAL DEFINITIONS OF SITE CLASSES.

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

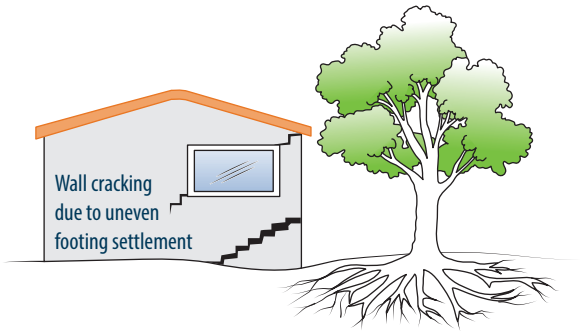

FIGURE 1 Trees can cause shrinkage and damage.

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

UNEVENNESS OF MOVEMENT

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

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

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

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

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

EFFECTS OF UNEVEN SOIL MOVEMENT ON STRUCTURES

EROSION AND SATURATION

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

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

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

SEASONAL SWELLING/SHRINKAGE IN CLAY

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

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

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

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

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

MOVEMENT CAUSED BY TREE ROOTS

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

COMPLICATIONS CAUSED BY THE STRUCTURE ITSELF

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

EFFECTS ON FULL MASONRY STRUCTURES

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

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

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

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

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

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

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

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

EFFECTS ON FRAMED STRUCTURES

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

EFFECTS ON BRICK VENEER STRUCTURES

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

WATER SERVICE AND DRAINAGE

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

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

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

SERIOUSNESS OF CRACKING

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

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

PREVENTION AND CURE

PLUMBING

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

GROUND DRAINAGE

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

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

PROTECTION OF THE BUILDING PERIMETER

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

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

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

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

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

CONDENSATION

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

TABLE 2. CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS.

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

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

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

THE GARDEN

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

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

EXISTING TREES

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

INFORMATION ON TREES, PLANTS AND SHRUBS

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

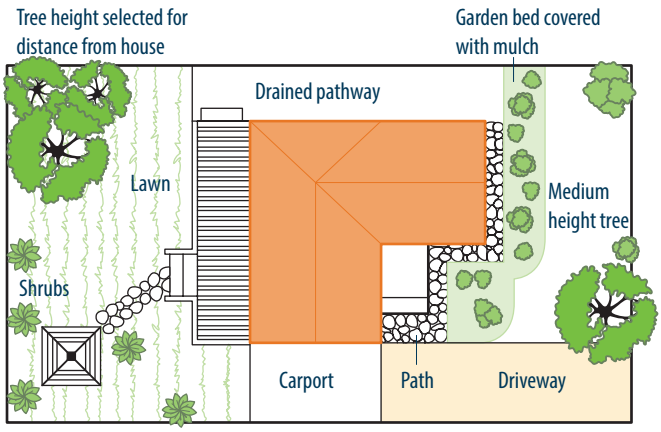


FIGURE 2 Gardens for a reactive site.

EXCAVATION

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

REMEDIATION

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

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

WILTON JOUBERT
Consulting Engineers

Construction Monitoring Services

Northland, Auckland-Waikato, Canterbury, Southern Lakes

Need a PS4?

- Please read the conditions of your Building Consent to determine which section of the works Council wants an engineer to sign off on.
- Book an inspection with Wilton Joubert Ltd or with a suitable qualified engineer.
- Have the Consent documents on site at the time of the inspection
- Be sure to verify both the grounding conditions (soil parameters) as well as the structural elements of works in question
- If in doubt what to get inspected please clarify with Council.

Producer Statements 4 - Construction Review Documents (PS4's) relates to Building Consents (BC) only, not Resource Consents (RC), unless there is an element of the RC which requires a BC, e.g. a retaining wall needed to develop a subdivision.
In soils, RC's are usually verified with a "Statement of Professional Opinion as to Suitability for Building Development", or variations on that title.

CONSTRUCTION MONITORING SERVICES

Construction monitoring refers to the physical inspection of selective components of the design or works as required by Council and as specified in the Consented documents. It is up to the Consent holder to read the special conditions set out by Council and arrange for the required inspections to be done. No PS4 can be issued without the physical inspection of works and sighting of Consented plans either by the design engineer, his representative, or another qualified engineer. (download PDF with more info via our website)

It is also important to note that, more often than not, there are two physical components that needs verification:

1. Geotechnical or grounding Conditions –referring to the strength or bearing capacity of the soil
2. Structural Components – verify that works are done as per design and in accordance with the consented plans.

To complicate matters there can be multiple engineers that might be engaged on the same site:

- Civil Engineer – To do storm water and wastewater designs
- Geotechnical Engineer – to do a Geotech report and specificity soil parameters as required
- Structural Engineer – to design structural components such as retaining walls, raft floors, beams and so on.

In cases where engineers from different companies are appointed it is important to make sure all the required boxes are ticked as not to complicate matters when it comes to the issuing of all the relevant PS4's.
Note: sites in the Auckland area might requires multiple PS4's for the same component (e.g. a raft floor requires a Geotechnical Engineer to verify the bearing capacity of the platform and a Structural engineer needs to verify the structural components are according to the design.
Not to mention a Council inspection is also required on the same floor to verify position, plumbing and so on.

In Summary:

- Read the conditions as laid out in the Consent documents to which elements of the design requires a PS4's from the design engineer.
- Have Consented plans on site during inspection time
- Book inspections ahead of time (a minimum of 48 hours in advanced)
- Ensure both grounding conditions as well as structural components are inspected. In some cases, this might mean two separate inspections if different engineers are involved.
- If you have any further questions, feel free to contact us at any time during business hours.

Construction Monitoring Enquiries
Email: *jobs@wjl.co.nz*
or scan QR code to visit our website

Rural Production Zone - Policies	
Policy	**Comment**
8.6.4.1 That the Rural Production Zone enables farming and rural production activities, as well as a wide range of activities, subject to the need to ensure that any adverse effects on the environment, including any reverse sensitivity effects, resulting from these activities are avoided, remedied or mitigated and are not to the detriment of rural productivity.	The subdivision will result in no adverse effects on the environment, as open space will be maintained by continuing using the land for residential and productive purposes.
8.6.4.2 That standards be imposed to ensure that the off site effects of activities in the Rural Production Zone are avoided, remedied or mitigated.	As per the AEE, the proposed development has been designed to be consistent with existing surrounding development patterns.
8.6.4.3 That land management practices that avoid, remedy or mitigate adverse effects on natural and physical resources be encouraged.	As above.
8.6.4.4 That the type, scale and intensity of development allowed shall have regard to the maintenance and enhancement of the amenity values of the Rural Production Zone to a level that is consistent with the productive intent of the zone.	The proposed development will not adversely affect those adjoining properties that are zoned Rural Production.
8.6.4.5 That the efficient use and development of physical and natural resources be taken into account in the implementation of the Plan.	As above.
8.6.4.6 That the built form of development allowed on sites with frontage to Kerikeri Road between its intersection with SH10 and Cannon Drive be maintained as small in scale, set back from the road, relatively inconspicuous and in harmony with landscape plantings and shelter belts.	Not applicable
8.6.4.7 That although a wide range of activities that promote rural productivity are appropriate in the Rural Production Zone, an underlying goal is to avoid the actual and potential adverse effects of conflicting land use activities.	As concluded in the assessment of effects above, the proposal will not result in any reverse sensitivity effects.
8.6.4.8 That activities whose adverse effects, including reverse sensitivity effects, cannot be avoided remedied or mitigated are given separation from other activities.	As concluded in the assessment of effects above, the proposal will not result in any reverse sensitivity effects.
8.6.4.9 That activities be discouraged from locating where they are sensitive to the effects of or may compromise the continued operation of lawfully established existing activities in the Rural Production zone and in neighbouring zones	As concluded in the assessment of effects above, the proposal will not result in any reverse sensitivity effects.

Subdivision Chapter - Objectives	
Objective	**Comment**
13.3.1 To provide for the subdivision of land in such a way as will be consistent with the purpose of the various zones in the Plan, and will promote the sustainable management of the natural and physical resources of the District, including airports and roads and the social, economic and cultural well being of people and communities.	As concluded in the assessment of effects, the proposed subdivision will be keeping in character with the surrounding environment. The subdivision will provide for the social and economic well-being of current and future owners of the site.
13.3.2 To ensure that subdivision of land is appropriate and is carried out in a manner that does not compromise the life-supporting capacity of air, water, soil or ecosystems, and that any actual or potential adverse effects on the environment which result directly from subdivision, including reverse sensitivity effects and the creation or acceleration of natural hazards, are avoided, remedied or mitigated	The life-supporting capacity of natural resources will not be affected by the subdivision, nor will the proposal give rise to reverse sensitivity effects or exacerbate natural hazards.
13.3.3 To ensure that the subdivision of land does not jeopardise the protection of outstanding landscapes or natural features in the coastal environment.	No such landscapes of features will be affected.
13.3.4 To ensure that subdivision does not adversely affect scheduled heritage resources through alienation of the resource from its immediate setting/context.	No such resources will be affected.
13.3.5 To ensure that all new subdivisions provide a reticulated water supply and/or on-site water storage and include storm water management sufficient to meet the needs of the activities that will establish all year round.	As concluded in the Site Suitability Report, proposed Lots 1 and 2 have the ability to accommodate suitable building platforms and adequate services.
13.3.6 To encourage innovative development and integrated management of effects between subdivision and land use which results in superior outcomes to more traditional forms of subdivision, use and development, for example the protection, enhancement and restoration of areas and features which have particular value or may have been compromised by past land management practices.	N/a
13.3.7 To ensure the relationship between Maori and their ancestral lands, water, sites, wahi tapu and other taonga is recognised and provided for.	There are no recorded archaeological sites or registered Sites of Cultural Significance within, or in proximity to, the subject site. It is therefore considered that the proposed subdivision will not result in any adverse cultural effects.
13.3.8 To ensure that all new subdivision provides an electricity supply sufficient to meet the needs of the activities that will establish on the new lots created.	Electricity supply is not a requirement in the RPZ. However, connections are available.
13.3.9 To ensure, to the greatest extent possible, that all new subdivision supports energy efficient design through appropriate site layout and orientation in order to maximise the ability to provide light, heating, ventilation and cooling	Owing to the topography, the site has the ability to accommodate future dwellings with a northerly aspect.

Subdivision Chapter - Objectives	
Objective	**Comment**
through passive design strategies for any buildings developed on the site(s).	
13.3.10 To ensure that the design of all new subdivision promotes efficient provision of infrastructure, including access to alternative transport options, communications and local services.	There are no alternative transport options available to the site.
13.3.11 To ensure that the operation, maintenance, development and upgrading of the existing National Grid is not compromised by incompatible subdivision and land use activities	Not applicable.

Subdivision Chapter - Policies	
Objective	**Comment**
13.4.1 That the sizes, dimensions and distribution of allotments created through the subdivision process be determined with regard to the potential effects including cumulative effects, of the use of those allotments on: (a) natural character, particularly of the coastal environment; (b) ecological values; (c) landscape values; (d) amenity values; (e) cultural values; (f) heritage values; and (g) existing land uses.	As concluded in the assessment of effects, the proposed subdivision will not result in such adverse effects.
13.4.2 That standards be imposed upon the subdivision of land to require safe and effective vehicular and pedestrian access to new properties.	All vehicle crossings will be constructed/upgraded in accordance with Council's Engineering Standards.
13.4.3 That natural and other hazards be taken into account in the design and location of any subdivision.	As concluded in the Site Suitability Report, the proposed development will not exacerbate any natural hazards.
13.4.4 That in any subdivision where provision is made for connection to utility services, the potential adverse visual impacts of these services are avoided.	The site has existing connections to electricity and telecommunications. No additional connections are required as part of the subdivision given the Rural Production zoning.
13.4.5 That access to, and servicing of, the new allotments be provided for in such a way as will avoid, remedy or mitigate any adverse effects on neighbouring property, public roads (including State Highways), and the natural and physical resources of the site caused by silt runoff, traffic, excavation and filling and removal of vegetation.	Minimal earthworks are required. No vegetation clearance is required.
13.4.6 That any subdivision proposal provides for the protection, restoration and enhancement of heritage resources, areas of significant indigenous vegetation and significant habitats of indigenous fauna, threatened species, the natural character of	No such resources will be affected.

Subdivision Chapter - Policies	
Objective	**Comment**
the coastal environment and riparian margins, and outstanding landscapes and natural features where appropriate.	
13.4.7 That the need for a financial contribution be considered only where the subdivision would: (a) result in increased demands on car parking associated with non-residential activities; or (b) result in increased demand for esplanade areas; or (c) involve adverse effects on riparian areas; or (d) depend on the assimilative capacity of the environment external to the site	Not applicable.
13.4.8 That the provision of water storage be taken into account in the design of any subdivision.	The sites are able to accommodate adequate on-site water supply.
13.4.9 That bonus development donor and recipient areas be provided for so as to minimise the adverse effects of subdivision on Outstanding Landscapes and areas of significant indigenous flora and significant habitats of fauna.	Not applicable.
13.4.10 The Council will recognise that subdivision within the Conservation Zone that results in a net conservation gain is generally appropriate.	Not applicable.
13.4.11 That subdivision recognises and provides for the relationship of Maori and their culture and traditions, with their ancestral lands, water, sites, waahi tapu and other taonga and shall take into account the principles of the Treaty of Waitangi.	There are no recorded archaeological sites or registered Sites of Cultural Significance within, or in proximity to, the subject site. It is therefore considered that the proposed subdivision will not result in any adverse cultural effects.
13.4.12 That more intensive, innovative development and subdivision which recognises specific site characteristics is provided for through the management plan rule where this will result in superior environmental outcomes.	Not applicable.
13.4.13 Subdivision, use and development shall preserve and where possible enhance, restore and rehabilitate the character of the applicable zone in regards to s6 matters. In addition subdivision, use and development shall avoid adverse effects as far as practicable by using techniques including: (a) clustering or grouping development within areas where there is the least impact on natural character and its elements such as indigenous vegetation, landforms, rivers, streams and wetlands, and coherent natural patterns; (b) minimising the visual impact of buildings, development, and associated vegetation clearance and earthworks, particularly as seen from public land and the coastal marine area;	As concluded in the assessment of effects, the subdivision is able to achieve this policy.

Subdivision Chapter - Policies	
Objective	**Comment**
(c) providing for, through siting of buildings and development and design of subdivisions, legal public right of access to and use of the foreshore and any esplanade areas; (d) through siting of buildings and development, design of subdivisions, and provision of access that recognise and provide for the relationship of Maori with their culture, traditions and taonga including concepts of mauri, tapu, mana, wehi and karakia and the important contribution Maori culture makes to the character of the District (refer Chapter 2 and in particular Section 2.5 and Council's "Tangata Whenua Values and Perspectives" (2004); (e) providing planting of indigenous vegetation in a way that links existing habitats of indigenous fauna and provides the opportunity for the extension, enhancement or creation of habitats for indigenous fauna, including mechanisms to exclude pests; (f) protecting historic heritage through the siting of buildings and development and design of subdivisions. (g) achieving hydraulic neutrality and ensuring that natural hazards will not be exacerbated or induced through the siting and design of buildings and development.	
13.4.14 That the objectives and policies of the applicable environment and zone and relevant parts of Part 3 of the Plan will be taken into account when considering the intensity, design and layout of any subdivision.	This assessment concludes that the subdivision is consistent with the relevant objectives and policies of the District Plan.
13.4.15 That conditions be imposed upon the design of subdivision of land to require that the layout and orientation of all new lots and building platforms created include, as appropriate, provisions for achieving the following: (a) development of energy efficient buildings and structures; (b) reduced travel distances and private car usage; (c) encouragement of pedestrian and cycle use; (d) access to alternative transport facilities; (e) domestic or community renewable electricity generation and renewable energy use.	It is anticipated that a number of conditions will be imposed including those relating to servicing, foundation design and general accordance conditions.
13.4.16 When considering proposals for subdivision and development within an existing National Grid Corridor the following will be taken into account: (a) the extent to which the proposal may restrict or inhibit the operation, access, maintenance, upgrading of transmission lines or support structures; (b) any potential cumulative effects that may restrict the operation, access, maintenance, upgrade of transmission lines or support structures; and	Not applicable.

Subdivision Chapter - Policies	
Objective	**Comment**
(c) whether the proposal involves the establishment or intensification of a sensitive activity in the vicinity of an existing National Grid line.	

Proposed Far North District Plan – Objectives and Policies

The relevant provisions of the Proposed District Plan are contained in the following chapters:

- Subdivision
- Rural Production

Subdivision – PDP Objectives	
Objective	**Comment**
SUB-O1 Subdivision results in the efficient use of land, which: achieves the objectives of each relevant zone, overlays and district wide provisions; contributes to the local character and sense of place; avoids reverse sensitivity issues that would prevent or adversely affect activities already established on land from continuing to operate; avoids land use patterns which would prevent land from achieving the objectives and policies of the zone in which it is located; does not increase risk from natural hazards or risks are mitigates and existing risks reduced; and manages adverse effects on the environment.	As discussed earlier, the subject site is located in a well-defined cluster of rural-residential development on the outskirts of the Kaitaia township. With a large land area of over 4ha, in amongst adjoining propeties which are less than 1ha in area, some would consider the existing site to be out of character in the contect of the surrounding environment. The proposed subdivision will therefore enhance the character of the local environment, by creating sites that are more similar sized to adjoining properties but still maintaining ample open space for small-scale production activities to occur.
SUB-O2 Subdivision provides for the: Protection of highly productive land; and Protection, restoration or enhancement of Outstanding Natural Features, Outstanding Natural Landscapes, Natural Character of the Coastal Environment, Areas of High Natural Character, Outstanding Natural Character, wetland, lake and river margins, Significant Natural Areas, Sites and Areas of Significance to Māori, and Historic Heritage.	The site does not contain highly productive soils, heritage or archaeological sites, or any significant areas of indigenous vegetation or habitats of indigenous fauna.
SUB-O3 Infrastructure is planned to service the proposed subdivision and development where: a. there is existing infrastructure connection, infrastructure should provided in an integrated, efficient, coordinated and future-proofed manner at the time of subdivision; and b. where no existing connection is available infrastructure should be planned and	As per the site suitability report, existing services within Lot 1 are operating adequately. Proposed Lot 2 has the ability to accommodate adequate services and infrastructure.

Subdivision – PDP Objectives	
Objective	**Comment**
consideration be given to connections with the wider infrastructure network.	
SUB-O4 Subdivision is accessible, connected, and integrated with the surrounding environment and provides for: a. public open spaces; b. esplanade where land adjoins the coastal marine area; and c. esplanade where land adjoins other qualifying waterbodies.	Not applicable.

Subdivision – PDP Policies	
Objective	**Comment**
SUB-P1 Enable boundary adjustments that: a. do not alter: i. the degree of non compliance with District Plan rules and standards; ii. the number and location of any access; and iii. the number of certificates of title; and b. are in accordance with the minimum lot sizes of the zone and comply with access, infrastructure and esplanade provisions.	Not applicable.
SUB-P2 Enable subdivision for the purpose of public works, infrastructure, reserves or access.	Not applicable.
SUB-P3 Provide for subdivision where it results in allotments that: a. are consistent with the purpose, characteristics and qualities of the zone; b. comply with the minimum allotment sizes for each zone;	As per the AEE, the proposed development is considered to be consistent with the immediate surrounding environment. Lot 2 contains existing built development which will remain compliant with all relevant bulk and location standards. Lot 1 has ample area to accommodate a suitable building platform and adequate services. Legal and physical access to each lot has been provided for.

Subdivision – PDP Policies	
Objective	**Comment**
c. have an adequate size and appropriate shape to contain a building platform; and d. have legal and physical access.	
SUB-P4 Manage subdivision of land as detailed in the district wide, natural environment values, historical an cultural values and hazard and risks sections of the plan	The site does not contain any significant natural, historical or cultural values, nor is the site subject to any natural hazards.
SUB-P5 Manage subdivision design and layout in the General Residential, Mixed Use and Settlement zone to provide for safe, connected and accessible environments by: a. minimising vehicle crossings that could affect the safety and efficiency of the current and future transport network; b. avoid cul-de-sac development unless the site or the topography prevents future public access and connections; c. providing for development that encourages social interaction, neighbourhood cohesion, a sense of place and is well connected to public spaces; d. contributing to a well connected transport network that safeguards future roading connections; and e. maximising accessibility, connectivity by creating walkways, cycleways and an interconnected transport network.	Not applicable.
SUB-P6 Require infrastructure to be provided in an integrated and comprehensive manner by: a. demonstrating that the subdivision will be appropriately serviced and integrated with existing and planned infrastructure if available; and b. ensuring that the infrastructure is provided is in accordance the purpose, characteristics and qualities of the zone.	As discussed earlier in the report, all necessary infrastructure will be provided for.
SUB- P7 Require the vesting of esplanade reserves when subdividing land adjoining the coast or other qualifying waterbodies.	Not applicable.
SUB-P8 Avoid rural lifestyle subdivision in the Rural Production zone unless the subdivision:	Not applicable.

Subdivision – PDP Policies	
Objective	**Comment**
a. will protect a qualifying SNA in perpetuity and result in the SNA being added to the District Plan SNA schedule; and b. will not result in the loss of versatile soils for primary production activities.	
SUB-P9 Avoid subdivision rural lifestyle subdivision in the Rural Production zone and Rural residential subdivision in the Rural Lifestyle zone unless the development achieves the environmental outcomes required in the management plan subdivision rule.	Not applicable.
SUB-P10 To protect amenity and character by avoiding the subdivision of minor residential units from principal residential units where resultant allotments do not comply with minimum allotment size and residential density.	Not applicable.
SUB-P11 Manage subdivision to address the effects of the activity requiring resource consent including (but not limited to) consideration of the following matters where relevant to the application: a. consistency with the scale, density, design and character of the environment and purpose of the zone; b. the location, scale and design of buildings and structures; c. the adequacy and capacity of available or programmed development infrastructure to accommodate the proposed activity; or the capacity of the site to cater for on-site infrastructure associated with the proposed activity; d. managing natural hazards; e. Any adverse effects on areas with historic heritage and cultural values, natural features and landscapes, natural character or indigenous biodiversity values; and f. any historical, spiritual, or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.	As above.

Rural Production – PDP Objectives	
Objective	**Comment**
RPROZ-O1 The Rural Production zone is managed to ensure its availability for primary production activities and its long-term protection for current and future generations.	Proposed Lot 2 is in residential use with small rural-lifestyle activities occuring on site. The use of this site will remain unchanged. Proposed Lot 1 has ample area so as to accommodate future residential development whilst also enabling small-scale production activities to occur.
RPROZ-O2 The Rural Production zone is used for primary production activities, ancillary activities that support primary production and other compatible activities that have a functional need to be in a rural environment.	As above.
RPROZ-O3 Land use and subdivision in the Rural Production zone: protects highly productive land from sterilisation and enables it to be used for more productive forms of primary production; protects primary production activities from reverse sensitivity effects that may constrain their effective and efficient operation; does not compromise the use of land for farming activities, particularly on highly productive land; does not exacerbate any natural hazards; and is able to be serviced by on-site infrastructure.	The site does not contain highly productive soils. The subdivision will occur in a defined cluster of rural-residential development. The proposal is therefore considered to be consistent with adjacent land-uses. Production activities will not be affected by the proposal.
RPROZ-O4 The rural character and amenity associated with a rural working environment is maintained.	The proposed lot sizes are large enough so as to accommodate future residential development whilst maintaining ample open space and therefore rural amenity.

Rural Production – PDP Policies	
Objective	**Comment**
RPROZ-P1Enable primary production activities, provided they internalise adverse effects onsite where practicable, while recognising that typical adverse effects associated with primary production should be anticipated and accepted within the Rural Production zone.	Not applicable.
RPROZ-P2 Ensure the Rural Production zone provides for activities that require a rural location by: enabling primary production activities as the predominant land use;	Not applicable.

Rural Production – PDP Policies	
Objective	**Comment**
enabling a range of compatible activities that support primary production activities, including ancillary activities, rural produce manufacturing, rural produce retail, visitor accommodation and home businesses.	
RPROZ-P3 Manage the establishment, design and location of new sensitive activities and other non-productive activities in the Rural Production Zone to avoid where possible, or otherwise mitigate, reverse sensitivity effects on primary production activities.	As per the AEE, the proposed development has been designed to be consistent with existing surrounding development patterns.
RPROZ-P4 Land use and subdivision activities are undertaken in a manner that maintains or enhances the rural character and amenity of the Rural Production zone, which includes: a predominance of primary production activities; low density development with generally low site coverage of buildings or structures; typical adverse effects such as odour, noise and dust associated with a rural working environment; and a diverse range of rural environments, rural character and amenity values throughout the District.	As above.
RPROZ-P5 Avoid land use that: is incompatible with the purpose, character and amenity of the Rural Production zone; does not have a functional need to locate in the Rural Production zone and is more appropriately located in another zone; would result in the loss of productive capacity of highly productive land; would exacerbate natural hazards; and cannot provide appropriate on-site infrastructure.	As above.
RPROZ-P6 Avoid subdivision that: results in the loss of highly productive land for use by farming activities; fragments land into parcel sizes that are no longer able to support farming activities, taking into account: the type of farming proposed; and whether smaller land parcels can support more productive forms of farming due to the presence of highly productive land. provides for rural lifestyle living unless there is an environmental benefit.	The subject site does not contain highly productive soils.

Rural Production – PDP Policies	
Objective	**Comment**
RPROZ-P7 Manage land use and subdivision to address the effects of the activity requiring resource consent, including (but not limited to) consideration of the following matters where relevant to the application: whether the proposal will increase production potential in the zone; whether the activity relies on the productive nature of the soil; consistency with the scale and character of the rural environment; location, scale and design of buildings or structures; for subdivision or non-primary production activities: scale and compatibility with rural activities; potential reverse sensitivity effects on primary production activities and existing infrastructure; the potential for loss of highly productive land, land sterilisation or fragmentation at zone interfaces: any setbacks, fencing, screening or landscaping required to address potential conflicts; the extent to which adverse effects on adjoining or surrounding sites are mitigated and internalised within the site as far as practicable; the capacity of the site to cater for on-site infrastructure associated with the proposed activity, including whether the site has access to a water source such as an irrigation network supply, dam or aquifer; the adequacy of roading infrastructure to service the proposed activity; Any adverse effects on historic heritage and cultural values, natural features and landscapes or indigenous biodiversity; Any historical, spiritual, or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.	As above.

Conclusion

For the reasons outlined above, it is considered that the proposal is consistent with the relevant objectives and policies of the RPS and Operative District Plan.

12.0 PART 2 MATTERS

Section 5 of Part 2 identifies the purpose of the RMA as being the sustainable management of natural and physical resources. This means managing the use, development and protection of natural and physical resources in a way that enables people and communities to provide for their social, cultural and economic well-being and health and safety while sustaining those resources for future generations, protecting the life supporting capacity of ecosystems, and avoiding, remedying or mitigating adverse effects on the environment.

Section 6 of the Act sets out a number of matters of national importance including (but not limited to) the protection of outstanding natural features and landscapes and historic heritage from inappropriate subdivision, use and development.

Section 7 identifies a number of "other matters" to be given particular regard by Council and includes (but is not limited to) Kaitiakitanga, the efficient use of natural and physical resources, the maintenance and enhancement of amenity values, and maintenance and enhancement of the quality of the environment.

Section 8 requires Council to take into account the principles of the Treaty of Waitangi.

Overall, as the effects of the proposal are considered to be less than minor, and the proposal accords with the relevant objectives and policies of the RPS, and the Operative District Plan provisions. Accordingly, it is considered that the proposal will not offend the general resource management principles set out in Part 2 of the Act.

13.0 OTHER MATTERS (SECTION 104(1)(C)

There are no other matters considered relevant to this proposal.

14.0 CONCLUSION

The proposal involves the subdivision of NA96D/620 to create one additional allotment in the Rural Production Zone.

Based on the assessment of effects above, it is concluded that any potential adverse effects on the existing environment would be no more than minor and can be managed in terms of appropriate conditions of consent.

It is therefore concluded that the proposal satisfies all matters the consent authority is required to assess, and that the application for resource consent can be granted on a non-notified basis.

AUTHOR

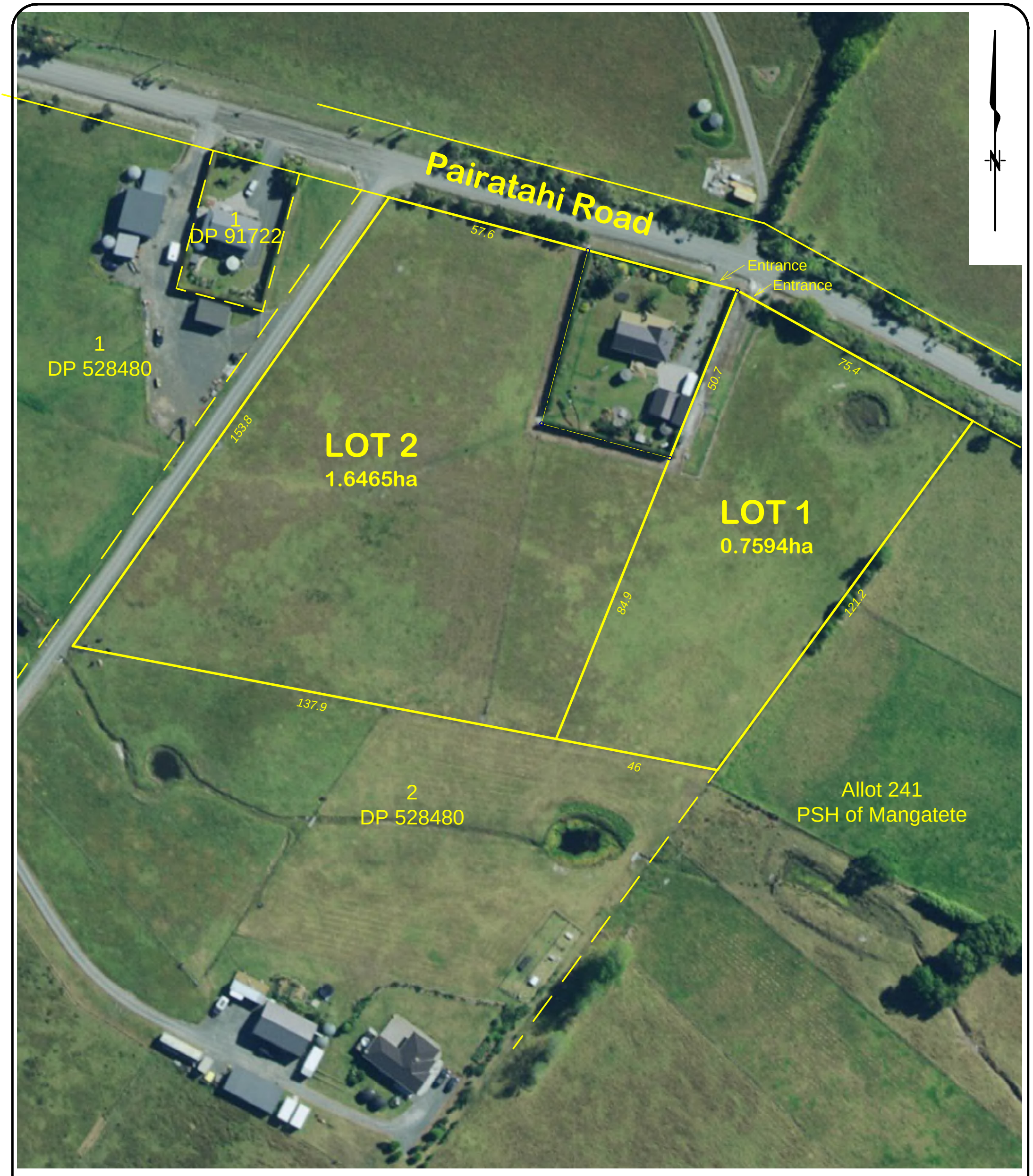
Nina Pivac
Director l BAppSC l PGDipPlan l Assoc. NZPI

Date: 23 March 2026

Appendices:

Appendix A – Scheme Plan
Appendix B – Certificate of Title
Appendix C – Site Suitability Report
Appendix D – Iwi Consultation
Appendix E – Written Approvals

Appendix A – Scheme Plan



Local Authority: Far North District Council
Zone:
Total Area: 2.4053ha
Comprised in: NA96D/620

AREAS AND MEASUREMENTS SUBJECT TO FINAL SURVEY

This plan and accompanying report(s) have been prepared for the purpose of obtaining a Resource Consent only and for no other purpose. Use of this plan and/or information on it for any other purpose is at the user's risk

0 10 20 30 40 50 60 70 80m

Prepared For: N W & P M Matthews

WILLIAMS AND KING
Registered Land Surveyors, Planners &
Land Development Consultants
Ph: (09) 407 6030
Email: Kerikeri@saps.co.nz
27 Hobson Ave,
PO Box 937, Kerikeri

Proposed Subdivision of Lot 1 DP 161116 & Lot 1 DP 42296

	Name	Date
Survey		
Design		
Drawn	W & K	Feb 2026
Ver 1		

ORIGINAL
SCALE 1:1000
SHEET SIZE A3

FILE 24766

Appendix B – Certificate of Title

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 **NA96D/620**

Land Registration District **North Auckland**

Date Issued 09 September 1996

Prior References

NA45A/788 NA66C/520

Estate Fee Simple

Area 2.4053 hectares more or less

Legal Description Lot 1 Deposited Plan 42296 and Lot 1 Deposited Plan 161116

Registered Owners

Nigel Walter Matthews and Paula Maisie Matthews

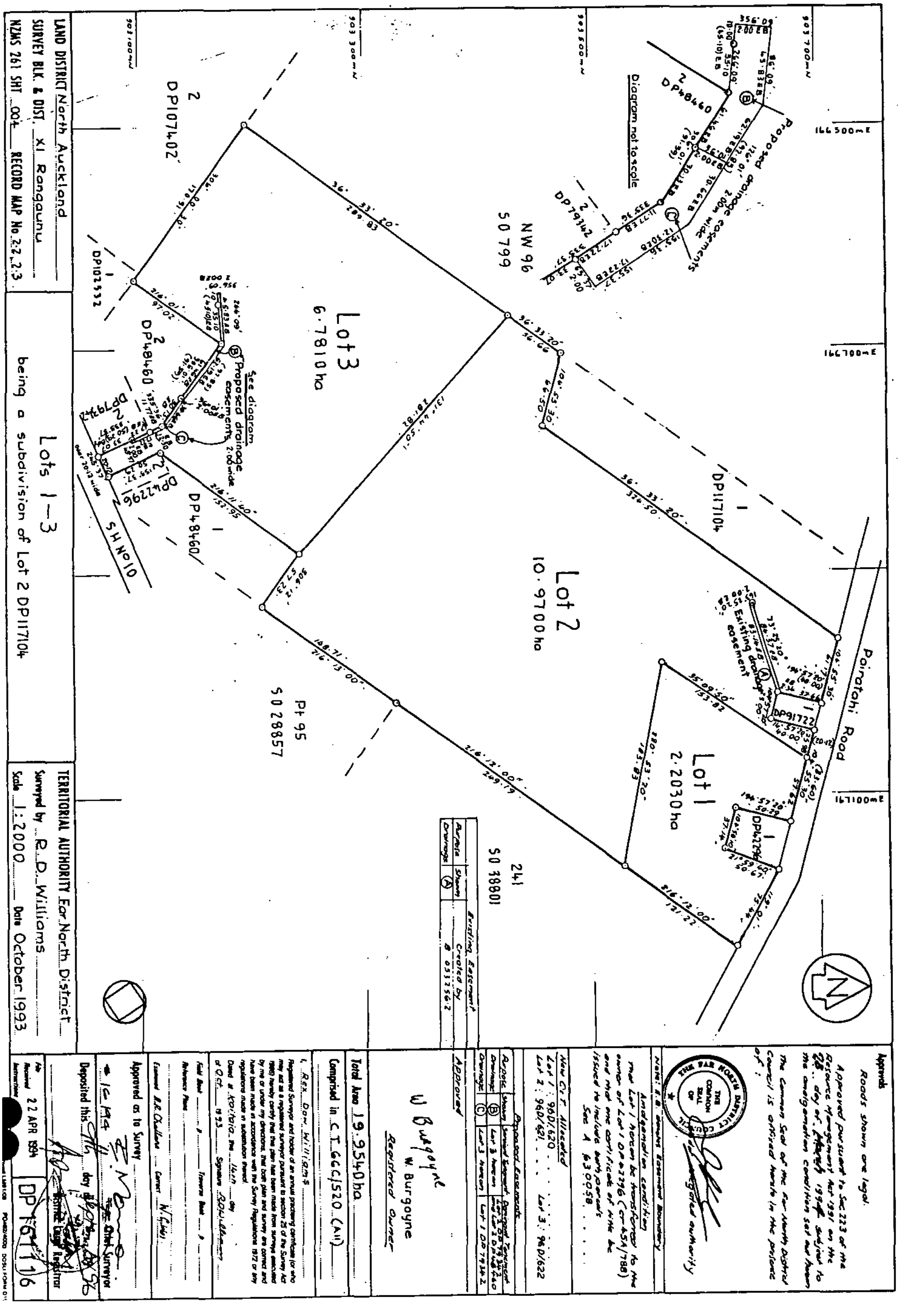
Interests

Subject to Section 241(2) and Sections 242(1) Resource Management Act 1991

Settled under the Joint Family Homes Act 1964 on Nigel Walter Matthews and Paula Maisie Matthews on 8.10.1979 at 11.54 am as to Lot 1 DP 42296 and on 9.9.1996 at 1.27 pm as to Lot 1 DP 161116 See Applications 754133.2 & D042863.6

C580693.1 Mortgage to The National Bank of New Zealand Limited - 22.3.1994 at 1.37 pm (affects Lot 1 DP 42296)

5290489.1 Variation of Mortgage C580693.1 - 19.7.2002 at 3:54 pm


LAND DISTRICT North Auckland
SURVEY BLK. & DIST. XI Rangaunu
Lots 1—3
being a subdivision of Lot 2 DP117104
TERRITORIAL AUTHORITY Far North District
Surveyed by R.D. Williams
Scale 1:2000 Date October 1993
Lot 1 2.2030ha
Lot 2 10.9700ha
Lot 3 6.7810ha
Pairatahi Road
SH No10
Diagram not to scale
Proposed drainage easements 2.00m wide
Existing drainage easement
Total Area 19.9540ha
Comprised in C.T. 66C/520 (All)
W. Burgoyne
Registered Owner
Received 22 APR 1994
DP161116

Appendix C – Site Suitability Report

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

SITE	**47 Pairatahi Road, Kaingaroa**
LEGAL DESCRIPTION	**Lot 1 DP 42296 & Lot 1 DP 161116**
PROJECT	**Proposed 2-Lot Subdivision**
CLIENT	**Clayton Matthews**
REFERENCE NO.	**145218**
DOCUMENT	**Civil Site Suitability Report**
STATUS/REVISION NO.	**01– Resource Consent**
DATE OF ISSUE	**27 February 2026**

Report Prepared For	Attention	Email
Clayton Matthews	Nina Pivac	tmacn96@gmail.com nina@logiplan.co.nz

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

1 EXECUTIVE SUMMARY

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

Legal Description:	Lot 1 DP 42296 & Lot 1 DP 161116
Lot Sizes:	Proposed Lot 1 – 7,594m² Proposed Lot 2 – 1.6465ha
Scope:	Civil Site Suitability Investigation: - Wastewater Assessment - Stormwater Assessment - Access
Development Proposals Supplied:	Subdivision Scheme Plan supplied by Williams and King (Ref No: 24766, dated: Feb 2026)
District Plan Zone:	Rural Production Zone
Wastewater:	The following is an indicative PCDI wastewater design for a 4-bedroom dwelling – given the subsoils encountered we recommend Secondary Level Treatment or higher: Daily Wastewater Production: 1,080L/day Daily Application Rate: 3.5mm/day Disposal Area: 309m² Reserve Area: 93m² (30%) Recommendations for wastewater are provided in Section 6.
Stormwater Management – District Plan Rules:	Permitted Activity: 8.6.5.1.3 STORMWATER MANAGEMENT – The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 15%. Controlled Activity: 8.6.5.2.1 STORMWATER MANAGEMENT – The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 20%.
Stormwater Management:	To comply with the parameters of the Permitted Activity Rule (8.6.5.1.3), Lots 1 & 2 must not exceed an impermeable area of 1,139m² and 2,470m². Future development of Lot 1 is expected to fall within the Permitted / Controlled Activity range. A stormwater attenuation report including a District Plan Assessment will be required for any future development within Lot 1 that does not comply with Permitted Activity Rule (8.6.5.1.3) at Building Consent stage. The existing development within Lot 2 does not exceed 15% of the site area and therefore falls within the Permitted Activity range. Attenuation for the 1% AEP storm event should be provided for runoff resulting from existing / future proposed impermeable areas exceeding the Permitted Activity threshold to mitigate adverse effects of runoff on the downstream receiving environment.

Stormwater mitigation recommendations are provided in Section 7.

Access:

Access to Lot 1 is proposed to be provided via the existing vehicle crossing located near the northwestern corner of the lot. Access to Lot 2 will continue to be provided via the existing vehicle crossing located near the northeastern corner of the lot which currently provides access to the existing dwelling located in Lot 2.

The existing vehicle crossings are generally in accordance with the Far North District Council's requirements and are in reasonable physical condition. Accordingly, the existing crossings are considered sufficient to service the proposed lots.

Access recommendations are provided in Section 8.

2 SITE DESCRIPTION

The site is located off the southern side of Pairatahi Road, accessed approximately 450m from the State Highway 1 intersection:

- 47 Pairatahi Road, Kaingaroa, legally described as Lot 1 DP 42296 and Lot 1 DP 161116.

Figure 1: Snip from The Far North District Council (FNDC) on-line GIS Water Services Map showing site boundaries (cyan)

The surface area of the subject site is approximately 2.4ha and is accessed near the middle of the northern boundary via a main aggregate driveway. An additional vehicle crossing and grassed driveway formation is located immediately to the east of the main driveway.

Built development on site comprises an existing dwelling and adjacent shed near the northern boundary, along with perimeter and internal fences. Vegetation comprises mainly pasture, with small trees and bush intermittently present along the northern and eastern boundaries. A small pond is located near the northeastern boundary corner.

Topographically speaking, the property is set in a broad, elevated plateau, and is essentially near level to very gently sloping.

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

3 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 two-lot subdivision of Lot 1 DP 42296 & Lot 1 DP 161116 as per the supplied Scheme Plan prepared by Williams and King (Ref No: 24766, dated: Feb 2026).

It is our understanding that the client intends to subdivide the existing property into two individual allotments, as depicted on the Scheme Plan below.

Proposed Lot 1 will encompass a vacant 7,594m² area across the eastern portion of the property. The lot will be accessed via the existing vehicle crossing and grassed driveway to the east of the main driveway.

Proposed Lot 2 will encompass the remaining 1.6465ha area of land and contain the existing dwelling and shed. The lot will continue to use the existing main aggregate driveway for access.

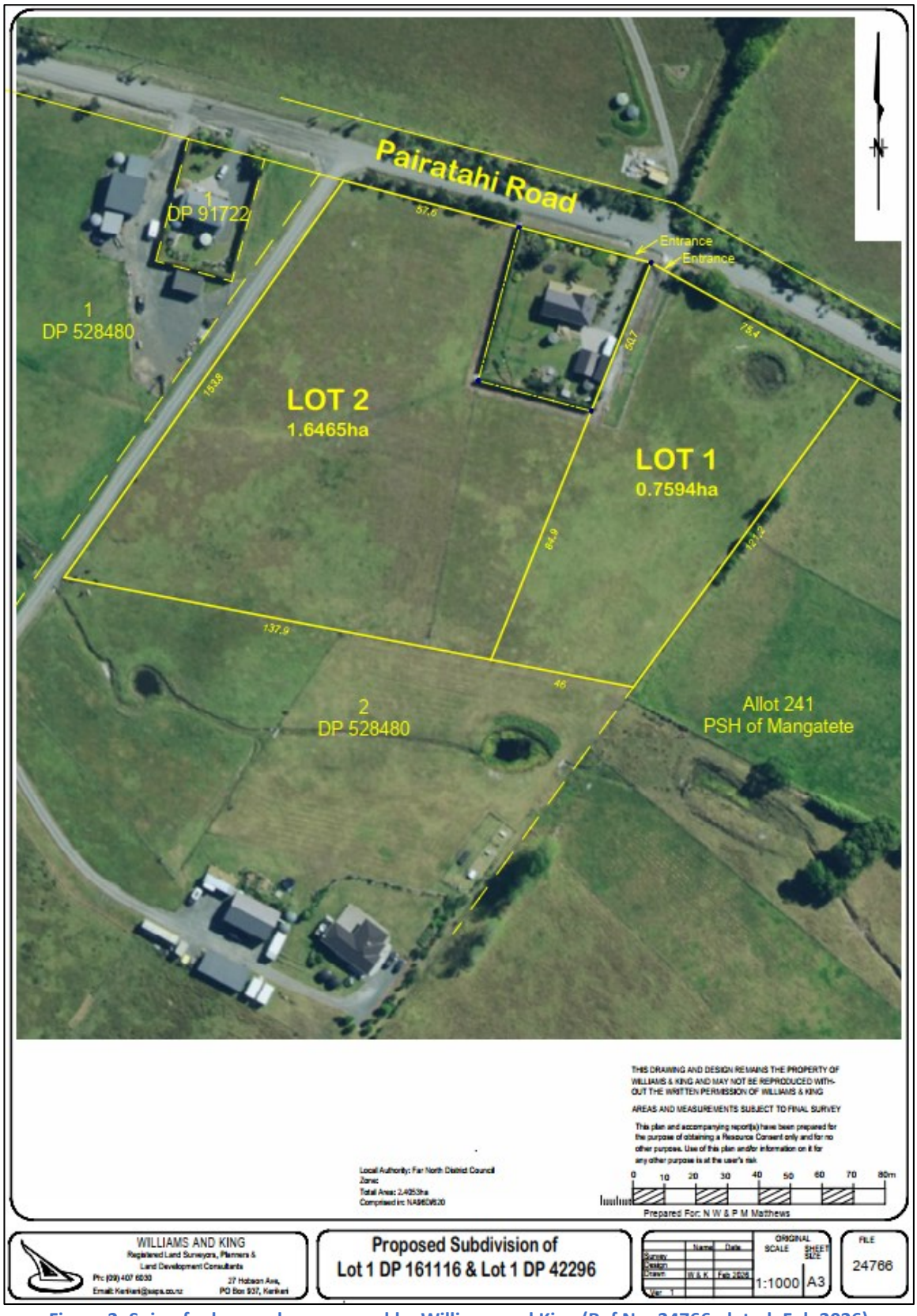


Figure 2: Snip of scheme plan prepared by Williams and King (Ref No: 24766, dated: Feb 2026)

Any revision of the supplied drawings and/or development proposals with wastewater, stormwater and/or access implications should be referred back to us for review. This report is not intended to support Building Consent applications for the future proposed lots, and any revision of supplied drawings and/or development proposals including those for Building Consent, which might rely on wastewater, stormwater and/or access assessments herein, should be referred to us for review.

4 PUBLISHED GEOLOGY

Local geology at the subject site is noted on the GNS Science New Zealand Geology Web Map, Scale 1:250,000 as; **Awhitu Group Alluvium**, described as; "*Partly consolidated sandstone and mudstone of high terraces.*". Refer to GNS Science Website.

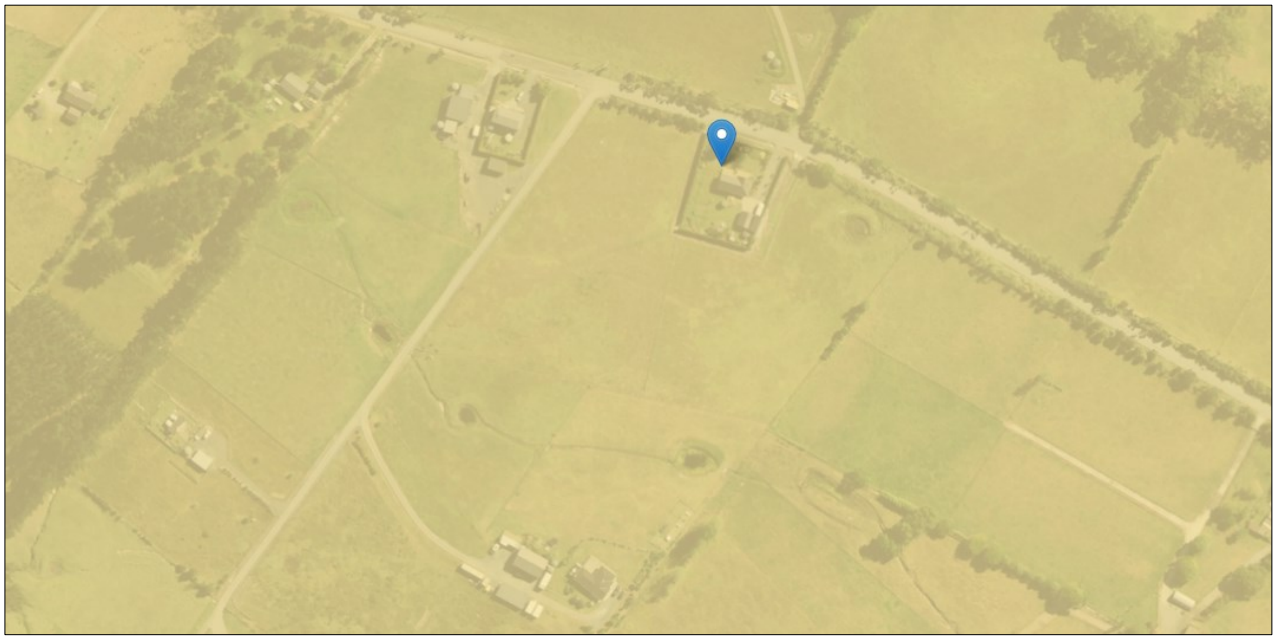


Figure 3: Screenshot aerial view from the New Zealand Geology Web Map

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 SILT, Clayey SILT and Silty CLAY. Approximately 200mm of TOPSOIL was overlying the investigated area. Groundwater was not observed to a tested depth of 3.0m below natural ground level. Refer to the appended 'BH Logs'.

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

5 POTABLE WATER SUPPLY

It is recommended that Lot 1's 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. The type of tank and volume is for the client to confirm.

6 WASTEWATER

Lot 1

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.

Lot 2

An existing on-site wastewater treatment system currently services Lot 2's residential dwelling.

If the existing on-site wastewater treatment system is functional, fit for the existing dwelling and located within Lot 2's proposed boundaries it may continue to operate.

If any part of the wastewater system, including any trenches or disposal fields are not located within proposed Lot 2, the system can either be relocated to a suitable location and/or upgraded, or it can be decommissioned and replaced with a new on-site wastewater treatment system in accordance with the recommendations in Section 6.1 below.

6.1 DESIGN PARAMETERS

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

The below wastewater design has been completed to show feasibility of on-site wastewater management within the proposed Lots. As no development proposals are available at this stage for the eventual residential development within the Lots, 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 the Lots.

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

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

Development Type:	Residential Dwellings
Effluent Treatment Level:	Secondary (<BOD5 20 mg/L, TSS 30 mg/L)
Fill Encountered in Disposal Areas:	Not encountered
Water Source:	Rainwater Collection Tanks
Site Soil Category (AS/NZS 1547:2012):	Category 4 – SILT – Moderate Drainage
Estimate House Occupancy:	6 Persons
Loading Rate:	PCDI System – 3.5mm/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:	309m²
Required Min. Reserve Area:	30%
Buffer Zone:	Not anticipated to be required
Cut-off Drain:	Not anticipated to be required

6.2 REQUIRED SETBACK DISTANCES

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

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

6.3 NORTHLAND REGIONAL PLAN ASSESSMENT

The existing wastewater disposal system servicing Lot 2 should meet the compliance points below, stipulated within Section C.6.1.1 of the Proposed Regional Plan for Northland:

C.6.1.1 Existing on-site domestic type wastewater discharge – permitted activity	
The discharge of domestic type wastewater into or onto land from an on-site system that was a permitted activity at the notification date of this Plan, and the associated discharge of any odour into air from the onsite system, are permitted activities, provided:	
#	Rule
1	the discharge volume does not exceed:
	a) three cubic metres per day, averaged over the month of greatest discharge, and
	b) six cubic metres per day over any 24-hour period, and
2	the following reserve disposal areas are available at all times:

	a) one hundred percent of the existing effluent disposal area where the wastewater has received primary treatment or is only comprised of greywater, or
	b) thirty percent of the existing effluent disposal area where the wastewater has received at least secondary treatment, and
3	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
4	wastewater irrigation lines are at all times either installed at least 50 millimetres beneath the surface of the disposal area or are covered by a minimum of 50 millimetres of topsoil, mulch, or bark, and
5	the discharge does not contaminate any groundwater supply or surface water, and
6	there is no surface runoff or ponding of wastewater, and
7	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 as outlined above.

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

C.6.1.3 Other on-site treated domestic wastewater discharge– permitted activity	
The discharge of domestic type wastewater into or onto land from an on-site system and the associated discharge of odour into air from the on-site system are permitted activities, provided:	
#	Rule
1	The on-site system is designed and constructed in accordance with the Australian/New Zealand Standard. On-site Domestic Wastewater Management (AS/NZS 1547:2012), and
2	The volume of wastewater discharged does not exceed two cubic metres per day, and
3	The discharge is not via a spray irrigation system or deep soakage system, and
4	The slope of the disposal area is not greater than 25 degrees, and
5	The wastewater has received secondary or tertiary treatment and is discharged via a trench or bed in soil categories 3 to 5 that is designed in accordance with Appendix L of Australian/New Zealand Standard. On-site Domestic Wastewater Management (AS/NZS 1547:2012); or is via an irrigation line system that is:
	a) dose loaded, and
	b) covered by a minimum of 50 millimetres of topsoil, mulch, or bark, and
6	For the discharge of wastewater onto the surface of slopes greater than 10 degrees:
	a) the wastewater, excluding greywater, has received at least secondary treatment, and
	b) the irrigation lines are firmly attached to the disposal area, and
	c) where there is an up-slope catchment that generates stormwater runoff, a diversion system is installed and maintained to divert surface water runoff from the up-slope catchment away from the disposal area, and

	d) a minimum 10 metre buffer area down-slope of the lowest irrigation line is included as part of the disposal area, and
	e) the disposal area is located within existing established vegetation that has at least 80 percent canopy cover, or
	f) the irrigation lines are covered by a minimum of 100 millimetres of topsoil, mulch, or bark, and
7	the disposal area and reserve disposal area are situated outside the relevant exclusion areas and setbacks in Table 9: Exclusion areas and setback distances for on-site domestic wastewater systems, and
8	for septic tank treatment systems, a filter that retains solids greater than 3.5 millimetres in size is fitted on the outlet, and
9	the following reserve disposal areas are available at all times:
	a) 100 percent of the existing effluent disposal area where the wastewater has received primary treatment or is only comprised of greywater, or
	b) 30 percent of the existing effluent disposal area where the wastewater has received secondary treatment or tertiary treatment, and
10	the on-site system is maintained so that it operates effectively at all times and maintenance is undertaken in accordance with the manufacturer's specifications, and
11	the discharge does not contaminate any groundwater water supply or surface water, and
12	there is no surface runoff or ponding of wastewater, and
13	there is no offensive or objectionable odour beyond the property boundary.

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

Based on current observations and topography, the lots contains sufficient undeveloped natural ground to accommodate both the primary and reserve wastewater disposal areas in accordance with AS/NZS1547. Final sizing and positioning will be confirmed at Building Consent stage.

7 STORMWATER MANAGEMENT

7.1 ASSESSMENT CRITERIA

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

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

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

The following Stormwater Management Rules Apply:

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

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

To comply with the parameters of the Permitted Activity Rule (8.6.5.1.3), Lots 1 & 2 must not exceed an impermeable area of 1,139m² and 2,470m².

Future development of Lot 1 is expected to fall within the Permitted / Controlled Activity range. A stormwater attenuation report including a District Plan Assessment will be required for any future development within Lot 1 that does not comply with Permitted Activity Rule (8.6.5.1.3) at Building Consent stage.

The existing development within Lot 2 does not exceed 15% of the site area and therefore falls within the Permitted Activity range.

Attenuation for the 1% AEP storm event should be provided for runoff resulting from existing / future proposed impermeable areas exceeding the Permitted Activity threshold to mitigate adverse effects of runoff on the downstream receiving environment.

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

Stormwater management recommendations are provided below.

7.2 PRIMARY STORMWATER

7.2.1 Stormwater Runoff from Roof Areas

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

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

7.2.2 Stormwater Runoff from Hardstand Areas

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

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

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

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

7.2.3 Stormwater Runoff Discharge Point

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

7.3 SECONDARY STORMWATER

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

7.4 DISTRICT PLAN ASSESSMENT

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

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

13.10.4 – Stormwater Disposal

(a) Whether the application complies with any regional rules relating to any water or discharge permits required under the Act, and with any resource consent issued to the District Council in relation to any urban drainage area stormwater management plan or similar plan.	No discharge permits are required. No resource consent issued documents stipulating specific requirements are known for the subject site or are anticipated to exist.
(b) Whether the application complies with the provisions of the Council's "Engineering Standards and Guidelines" (2004) - Revised March 2009 (to be used in conjunction with NZS 4404:2004).	The application is deemed compliant with the provisions of the Council's "Engineering Standards and Guidelines" (2004) - Revised March 2009

(c) Whether the application complies with the Far North District Council Strategic Plan - Drainage.	The application is deemed compliant with the Far North District Council Strategic Plan - Drainage
(d) The degree to which Low Impact Design principles have been used to reduce site impermeability and to retain natural permeable areas.	Stormwater management should be provided for the subject lot by utilising Low Impact Design Methods. Guidance for design should be taken from 'The Countryside Living Toolbox' design document, and where necessary, *"Technical Publication 10, Stormwater Management Devices – Design Guidelines Manual" Auckland Regional Council (2003).* All roof runoff will be collected by rainwater tanks for conveyance to a safe outlet point. Hardstand areas should be shaped to shed to swales/catchpits for runoff conveyance to a safe outlet location.
(e) The adequacy of the proposed means of disposing of collected stormwater from the roof of all potential or existing buildings and from all impervious surfaces.	As above. Runoff from roof areas will be collected, directed to rainwater tanks and discharged in a controlled manner to a designated outlet, reducing scour and erosion. Hardstand areas should be shaped to shed runoff to lower-lying lawn areas as passive mitigation, or to swales/catchpits for runoff conveyance to a safe outlet location.
(f) The adequacy of any proposed means for screening out litter, the capture of chemical spillages, the containment of contamination from roads and paved areas, and of siltation.	Runoff from roof areas is free of litter, chemical spillages, or contaminants from roads. Hardstand areas should be shaped to shed runoff to lower-lying lawn areas as passive mitigation, or to swales/catchpits for runoff conveyance to a safe outlet location. Large downslope pasture areas and swales act as bio-filter strips to filter out entrained pollutants and catchpits/silt traps allow for the settlement of sediment.
(g) The practicality of retaining open natural waterway systems for stormwater disposal in preference to piped or canal systems and adverse effects on existing waterways.	No alteration to waterways is proposed.
(h) Whether there is sufficient capacity available in the Council's outfall stormwater system to cater for increased run-off from the proposed allotments.	Not applicable.
(i) Where an existing outfall is not capable of accepting increased run-off, the adequacy of proposals and solutions for disposing of run-off.	Not applicable.
(j) The necessity to provide on-site retention basins to contain surface run-off where the capacity of the outfall is incapable of accepting flows, and where the outfall has limited capacity, any need to restrict the rate of discharge from the subdivision to the same rate of	Not applicable.

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

8 ACCESS

8.1 GENERAL

A basic access and vehicle crossing assessment has been completed for the proposed subdivision.

Access to Lot 1 is proposed to be provided via the existing vehicle crossing located near the northwestern corner of the lot. Access to Lot 2 will continue to be provided via the existing vehicle crossing located near the northeastern corner of the lot which currently provides access to the existing dwelling located in Lot 2. The vehicle crossings are assessed under the Far North District Council Engineering Standards (2023).

8.2 VEHICLE CROSSINGS

The existing vehicle crossings are generally in accordance with the Far North District Council Engineering Standards (2023), Sheet 21 – Type 1A (Light Vehicles). The crossing surfacing is in reasonable condition, with no significant defects or areas of disrepair observed. Accordingly, the existing crossings are considered sufficient to service the proposed lots.

Figure 5: Photo showing existing vehicle crossing to service Lot 1

Figure 6: Photo showing existing vehicle crossing to service Lot 2

8.3 SIGHT DISTANCES

Pairatahi Road has a general operating speed of 100km/hr (NZTA National Speed Limits Register) and is considered a Primary and Secondary Collector road. The Far North District Council Engineering Standards (2023) – Sheet 4 notes that the minimum required sight distance is 210m.

Both existing vehicle crossings allows for >210m of sight distance to the northwest and ~140m of sight distance to the southeast. While the sight distance to the southeast falls below the minimum sight distance specified in Sheet 4, the operating speed of vehicles coming from the southeast is expected to be lower than the posted speed limit given that Pairatahi Road is unsealed. The available sight distance is therefore likely to be acceptable subject to confirmation from the Far North District Council.

Figure 7: Annotated photo showing available sight distance to the northwest

Figure 8: Annotated photo showing available sight distance to the southeast

9 LIMITATIONS

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

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

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

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

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

Yours faithfully,

WILTON JOUBERT LIMITED

Enclosures:

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

WILTON JOUBERT
Consulting Engineers
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
01	FEB '26	GMB	CIVIL SITE SUITABILITY REPORT

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

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

RESOURCE CONSENT
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE:
SITE PLAN

PROJECT DESCRIPTION:
CIVIL SITE SUITABILITY REPORT

PROJECT TITLE:
LOT 1 DP 42296 & LOT 1 DP 161116
47 PAIRATAHI ROAD
KAINGAROA
NORTHLAND

ORIGINAL DRAWING SIZE:	OFFICE:
A3	OREWA
DRAWING SCALE:	CO-ORDINATE SYSTEM:
1:750	NOT COORDINATED
DRAWING NUMBER:	ISSUE:
145218-C001	01

HAND AUGER : HA01

CLIENT: Clayton Matthews
PROJECT: 2-Lot Subdivision
SITE LOCATION: 47 Pairatahi Road, Kaingaroa

JOB NO.: 145217 **SHEET:** 1 OF 1
START DATE: 18/02/2026 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: DR4802 **ELEVATION:** Ground
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 / mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, dry to moist.	TS	0.2						
Awhitu Group Alluvium	NATURAL: Fine Sandy SILT, white with some brown, very stiff, dry to moist, no plasticity. 0.3m: Brown, hard.		0.4						
	SILT, trace sand and clay, dark brown, very stiff, moist, no plasticity.		0.6		195+	-	-		
	Clayey SILT, brown with occasional dark brown seams and clasts, very stiff, dry to moist, low plasticity. 0.9m: Greyish brown.		0.8		195+	-	-		
			1.0						
	Silty CLAY, brownish grey, very stiff, dry to moist, moderate plasticity.		1.2	Groundwater Not Encountered	195+	-	-		
			1.4						
			1.6		195+	-	-		
			1.8						
	2.0m: Trace to minor sand, grey, moist.		2.0		175	81	2.2		
			2.2						
			2.4						
	CLAY, trace to minor silt and sand, grey, very stiff, moist, high plasticity.		2.6		120	78	1.5		
			2.8						
	EOH: 3.00m - Target Depth		3.0		125	64	2.0		
			3.2						
			3.4						

REMARKS
End of borehole @ 3.00m (Target Depth: 3.00m)

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 : HA02

CLIENT: Clayton Matthews
PROJECT: 2-Lot Subdivision
SITE LOCATION: 47 Pairatahi Road, Kaingaroa

JOB NO.: 145217 **SHEET:** 1 OF 1
START DATE: 18/02/2026 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: DR4802 **ELEVATION:** Ground
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	TOPSOIL, dark brown, dry to moist.	TS	0.2	Groundwater Not Encountered					
Group	NATURAL: Fine Sandy SILT, white with some brown, very stiff, dry to moist, no plasticity.				UTP	-	-	20+	
	EOH: 0.30m - Too Hard To Auger		0.4						
			0.6						
			0.8						
			1.0						
			1.2						
			1.4						
			1.6						
			1.8						
			2.0						
			2.2						
			2.4						
			2.6						
			2.8						
			3.0						
			3.2						
			3.4						

SOIL DESCRIPTION
TOPSOIL CLAY SAND PEAT
FILL SILT GRAVEL ROCK

REMARKS
End of borehole @ 0.30m (Target Depth: 3.00m)

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

CLIENT: Clayton Matthews
PROJECT: 2-Lot Subdivision
SITE LOCATION: 47 Pairatahi Road, Kaingaroa

JOB NO.: 145217 **SHEET:** 1 OF 1
START DATE: 18/02/2026 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: DR4802 **ELEVATION:** Ground
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 / mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, dry to moist.	TS	0.2						
Awhitu Group Alluvium	NATURAL: Fine Sandy SILT, white with some brown, very stiff, dry to moist, no plasticity.		0.4		195+	-	-		
	SILT, trace to minor organic material, brown and dark brown, dry to moist, very stiff, no plasticity.		0.6						
	Clayey SILT, brown with occasional dark brown organic inclusions, very stiff, dry to moist, low plasticity.		0.8		195+	-	-		
	Silty CLAY, brownish grey, very stiff, dry to moist, moderate plasticity.		1.0						
			1.2		195+	-	-		
	1.6m: Brownish grey.		1.4						
			1.6		195+	-	-		
			1.8						
			2.0		195+	-	-		
			2.2						
	2.4m: Grey, moist.		2.4						
			2.6		161	70	2.3		
	2.8m: Trace to minor sand.		2.8						
	EOH: 3.00m - Target Depth		3.0		114	44	2.6		
			3.2						
			3.4						

Groundwater Not Encountered

REMARKS
End of borehole @ 3.00m (Target Depth: 3.00m)

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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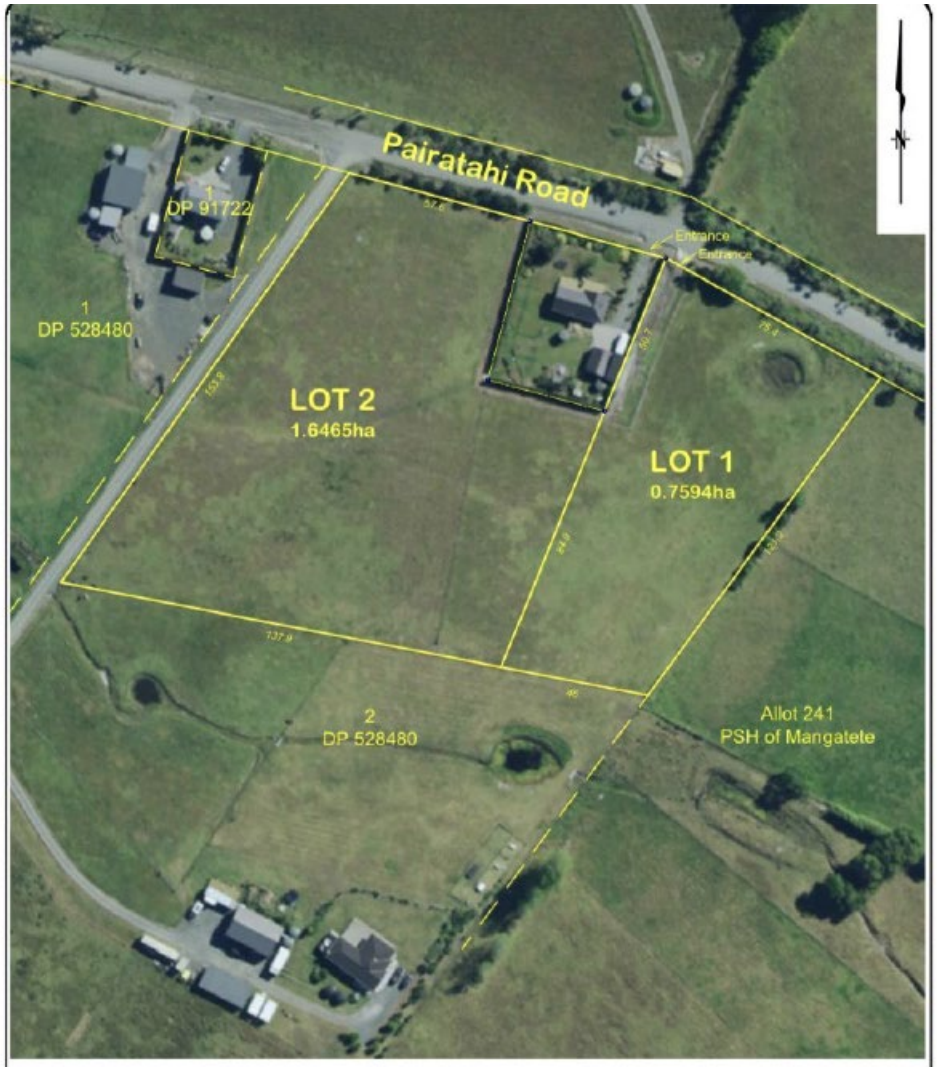
Appendix D – Iwi Consultation

From: Clayton Matthews
To: Nina Pivac
Subject: Fwd: Subdivision proposal
Date: Thursday, 19 March 2026 8:30:01 am

---------- Forwarded message ---------
From: **Clayton Matthews** <tmacn96@gmail.com>
Date: Wed, 18 Mar 2026 at 12:57 pm
Subject: Subdivision proposal
To: kareponia.trustees@gmail.com <kareponia.trustees@gmail.com>

Hi Trina Vela. My name is Clayton Matthews I'm wanting to build my first home on my parents land at 47 pairatahi rd kaingaroa. They own a 5 and a half acre block and they are happy to gift me some. So I want to subdivide the block to get my own title to lend against. My proposed boundary line will cut off 2 acres. One of the council requirements is that I get support from the local iwi. I grew up in that house. I left to go to Australia for 15 years and now I'm back home to settle with friends and family. To build next to my parents, the land I grew up on would mean the world to me. I would really appreciate your support and look forward to hearing from you.



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AREAS AND MEASUREMENTS SUBJECT TO FINAL SURVEY

This plan and accompanying report(s) have been prepared for the purpose of obtaining a Resource Consent only and for no other purpose. Use of this plan and/or information on it for any other purpose is at the user's risk.

0 10 20 30 40 50 60 70 80m

Local Authority: Far North District Council
Zone:
Total Area: 2.4059ha
Comprised in: RA6B/430

Prepared For: N W & P M Matthews

WILLIAMS AND KING
Registered Land Surveyors, Planners & Land Development Consultants
Ph: (09) 407 6030
Email: Kerikeri@waps.co.nz
27 Hobson Ave, PO Box 937, Kerikeri

Proposed Subdivision of
Lot 1 DP 161116 & Lot 1 DP 42296

	Name	Date
Survey		
Design		
Drawn	W & K	Feb 2025
Chkd		

ORIGINAL SCALE 1:1000 | DRGT SIZE A3

FILE 24766

Appendix E – Written Approvals