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 Schedule 4). Prior to, and during, completion of this application form, please refer to Resource Consent Guidance Notes and Schedule of Fees and Charges — both available on the Council's web page.

1. Pre-Lodgement Meeting

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

2. Type of Consent being applied for

(more than one circle can be ticked):

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

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

3. Would you like to opt out of the Fast Track Process?

◯ **Yes** ✔ **No**

4. Consultation

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

If yes, which groups have you consulted with?	
Who else have you consulted with?	See attached application.

*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: Lionel Ward

Email: [redacted]

Phone number:

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

6. Address for Correspondence

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

Name/s: Williams & King, Attention: Natalie Watson

Email: [redacted]

Phone number:

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

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

7. Details of Property Owner/s and Occupier/s

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

Name/s: Michelle Anne Taylor and Nathan Stephen Ward

Property Address/ Location:
c/- 22 Taipa Heights Drive
Taipa

Postcode 0420

8. Application Site Details

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

Name/s:

Site Address/ Location:

22 Taipa Heights Drive

Taipa

Postcode 0420

Legal Description: Lot 2 DP 314261 **Val Number:** 00083-86405

Certificate of title: 56464

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

Site visit requirements:

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

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

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

9. Description of the Proposal:

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

Proposed dwelling (replacement) in the Coastal Living Zone. Consent sought under Visual Amenity and Stormwater Management Rule. Proposed cancellation of redundant consent notice.

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):

- [x] **Building Consent** EBC-2025-601/0
- [ ] **Regional Council Consent (ref # if known)** Ref # here (if known)
- [ ] **National Environmental Standard consent** Consent here (if known)
- [ ] **Other (please specify)** Specify 'other' here

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

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

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

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

- [ ] **Subdividing land**
- [ ] **Changing the use of a piece of land**
- [x] **Disturbing, removing or sampling soil**
- [ ] **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**

13. Draft Conditions:

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

If yes, do you agree to extend the processing timeframe pursuant to Section 37 of the Resource Management Act by 5 working days? ✔ **Yes** ◯ **No**

14. 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) Lionel Ward

Email: [redacted]

Phone number: [redacted]

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

Fees Information

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

Declaration concerning Payment of Fees

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

Name: (please write in full) Lionel Ward

Signature: [redacted] Date 4.02.25

(signature of bill payer) **MANDATORY**

15. 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.

15. Important information continued...

Declaration

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

Name: (please write in full) Lionel Ward

Signature: [redacted] Date 4.02.25

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

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.

Lionel Ward

Proposed Replacement Dwelling (Visual Amenity and Stormwater Management) & Consent Notice Cancellation

22 Taipā Heights Drive, Taipā

Williams & King, Kerikeri[1]
5 February 2025

1.0 Overview

Lionel Ward proposes to develop a property located at 22 Taipā Heights Drive in Taipā. The proposed development involves the construction of a new three bedroom home on an existing building platform remaining after the recent removal of a relocated dwelling. A deck will be installed along part of the northern face of the building. The new dwelling will be accessed by the existing vehicle crossing and driveway.

The subject site is legally described as Lot 2 DP 314261 and is held in the Record of Title 56464. An existing redundant Consent Notice is intended to be cancelled.

The subject site is zoned Coastal Living in the Operative Far North District Plan, and the proposed development requires resource consent under the 'Visual Amenity' and Stormwater Management Rules of the zone. It has been assessed as being a discretionary activity overall. Under the Proposed Far North District Plan, the size is zoned Rural Lifestyle, and is within the coastal environment.

This assessment accompanies the Resource Consent application made by the Applicant and is provided in accordance with Schedule 4 of the Resource Management Act 1991. It is intended to provide the necessary information, in sufficient detail, to provide an understanding of the proposal and any actual or potential effects the proposed activity may have on the environment.

[1] Williams & King - a Division of Survey & Planning Solutions (2010) Ltd
Surveyors, Planners, Resource Managers - Kerikeri and Kaitaia
PO Box 937 Kerikeri Phone (09) 407 6030 Email: nat@saps.co.nz

2.0 Description of Proposal

2.1 Proposed Dwelling

A single storey three bedroom dwelling is proposed, with a floor area of approximately 123m² and a roof area of 155m². The dwelling will be located generally upon the same building platform as the now removed dwelling, shifted slightly to the west and not extending as far north as the previous dwelling. As with the previous dwelling, the new dwelling will be orientated towards the north for sunlight and sea view, with the living/dining area and largest bedroom facing this direction. Refer to the G.J. Gardner Homes Site Location Plan, Site Plan, Floor Plan, Elevations in **Appendix 1**.

The dwelling will have a maximum height of approximately 5.2m, and will be constructed as a timber floor suspended upon a combination of ordinary, anchor and leading edge soil creep timber pile foundations of varying depth. Further details are available within the Wilton Joubert Limited Site-Specific Geotechnical Report, which is attached in **Appendix 2**.

Exterior materials are shown on the Elevation Plans as comprising Linea Weatherboard cladding, Selected metal tile roofing, and powder coated aluminium joinery. The final colour scheme has not been specified, however the applicant has specified that he does not wish to have a dark coloured roof in order to reduce heat transfer to the home's interior, to improve energy efficiency.

2.2 Impermeable Surface Coverage

The proposed Site Plan tables impermeable surface coverage as amounting to approximately 320m², comprising the existing metalled driveway areas, existing storage container, existing garage, and the proposed dwelling. All decks will be timber slatted decks and thus permeable. The proposed Site Plan shows no change to the existing hardstand areas (metalled driveway adjacent to house and to shed). Proposed stormwater mitigation is outlined in the Wilton Joubert Limited Stormwater Mitigation Report (see **Appendix 3**).

Lawfully established impermeable surface coverage on the site is considered to be as follows.

- The previous dwelling (now removed) was relocated to the site under Building Consent BP 34737 in 1988.
- The existing garage was approved under Land use Consent RC 2030850 and Building Consent BC-2003-1499-0 in 2003 (Code Compliance Issued 31 October 2005).
- At this time, District Plan Change 17 (Operative 11 February 2015) had not occurred, and metalled surfaces were not defined as being 'impermeable'. Therefore, existing metalled surfaces established prior to 11 February 2015 are also considered to be lawfully established.

Although it is considered that the proposed proportion of impermeable surfaces on the site has been lawfully established, there will be minor dissimilarities in the location of the impermeable coverage. Namely, the new dwelling, despite having smaller roof area, is located slightly further west of the previous dwelling, and also the storage container, which would not have required building consent, such that its impermeable surface coverage would not be lawfully established. As such, instead of obtaining an existing use certificate in terms of Section 10 of the Resource Management Act 1991, resource consent is sought for dispensation from the Stormwater Management rule for the Coastal Living Zone in the Operative District Plan.

2.3 Vehicle Access and Parking

Vehicle access to and within the property is provided via two existing crossings – the lower crossing is a sealed entrance providing access to a metalled hardstand area used for parking and maneuvering adjacent to the proposed dwelling. The upper crossing is a metalled entrance to the existing garage. Parking is available either within the garage, or upon the metalled hardstand areas.

2.4 Earthworks

Minor earthworks are required, involving sourcing approximately 10m³ of soil to be used to fill adjacent to the deck (filling up to approximately 0.4m), so that the deck height does not exceed 1m.

2.5 Utility Services

Existing water tanks will be used as dual purpose tanks for domestic water supply and stormwater mitigation.

The site has an existing connection to the Council's sanitary sewerage system.

2.6 Consent Notice Compliance & Cancellation

The Record of Title for the application site records three consent notices - D293102.2, D066108.3 and 5677702.2.

D293102.2

Consent notice D293102.2 is redundant, and approval is sought to cancel this in its entirety, as it relates to the application site (Lot 2 DP 314261 held in Record of Title 56464). The property owner may choose whether they want to implement this cancellation formally on the title. Nevertheless, the relevant conditions are commented on as follows.

(1)(a) prohibits the erection of any building without the consent of Council to a report and specific design by a registered engineer with geotechnical expertise defining safe building areas as defined on the plan attached hereto coloured yellow and as defined in accordance with the follow.

This condition is redundant. The referenced plan does not include the subject site.

1(b) prohibits the erection of any building whatsoever outside safe building areas defined under the foregoing condition.

As above.

1*(c) Prohibits the erection of any building unless the Council is first satisfied by a report and design from a registered engineer with geotechnical expertise or the foundations are at a level less than 900mm below ground level at the northern (lower) edge of the defined safe building areas*

A Site-Specific Geotechnical Report is attached.

1(d) All stormwater from any buildings erected on the land and tank overflows and paved areas are to be drained and piped to the stormwater system connection points

Current proposal complies – roof water from the dwelling will be collected in water tanks, overflow will be directed to the existing catch pit. The existing storage container does not appear to be connected to the water tanks (refer to the Site Plan in the Stormwater Mitigation Report).

1(e) no vegetation is to be cleared (other than noxious weeds) and no earthworks are to be undertaken on the allotments without the approval of the Council and the issue of an Earthworks Permit if deemed necessary and all such earthwork cuts are to be topsoiled grassed or otherwise planted to limit erosion

Complies – fill area to be re-grassed. Earthworks permit not considered necessary due to negligible volumes and boundary setback. An earthworks permit is not required.

D066108.3

The sole condition is commented on as follows:

No building shall be erected on any of Lots 1, 2 or 3 DP 173582 without the prior approval of the FNDC of specific designs for foundations and stormwater disposal, prepared by a registered engineer with geotechnical and hydrological expertise.

The current site was subdivided from part of Lot 1 DP 173582. A Stormwater Mitigation Report and Site-Specific Geotechnical Report is provided.

5677702.2

This is the most recent and relevant consent notice. In relation to the proposed activity on Lot 2 DP 314261, the following conditions are applicable:

To be registered on Lots 1 & 2

1….. Further, the foundations of any building on Lot 1 or 2 are to have specific design (in accordance with the geotechnical report which accompanies the aforementioned plan, or similar) by a registered engineer with appropriate expertise.

Specific foundation design is provided within the Site-Specific Geotechnical Report.

2. The consent holder, and subsequent owners of the land, should notify the New Zealand Historic Places Trust prior to commencing any work involving building, ground disturbance or tree planting, on or within 5 metres of the historic (archaeological) site registered on the property (site O04/645 indicated on the attached plan), and should comply with the requirements and provisions of the Historic Places Act 1993.

The referenced archaeological site as shown on the referenced approved scheme plan has been transcribed onto the current Site Plan. See Figure 3 in Section 3.4 below. This archaeological site appears to have been mapped in relation to an archaeological inspection written by Joan Maingay of the Department of Conservation (attached in **Appendix 4**). The building and fill area will be located more than 5m from the mapped site. Note that this does not preclude the need to comply with the Heritage NZ Pouhere Taonga Act 2014, and an Accidental Discovery Protocol condition is expected.

3. No significant earthworks (greater than 25 cubic metres, or with cut and/or fill faces exceeding 0.75 metres) shall be undertaken without the prior approval of the Council to specific designs for such work, prepared by a registered engineer with geotechnical expertise, and to be professionally supervised.

No significant earthworks exceeding 25m³ are proposed, and the fill will be less than 0.75m high.

3.0 Application Site Details and Description

3.1 Location

The property is located at 22 Taipā Heights Drive. Refer to the Location Map in **Figure 1**.

Taipā Heights Drive adjoins the eastern boundary. The property has views over Taipā River to the north. The application site is site amongst an existing coastal lifestyle area, which typically consists of low density residential development.

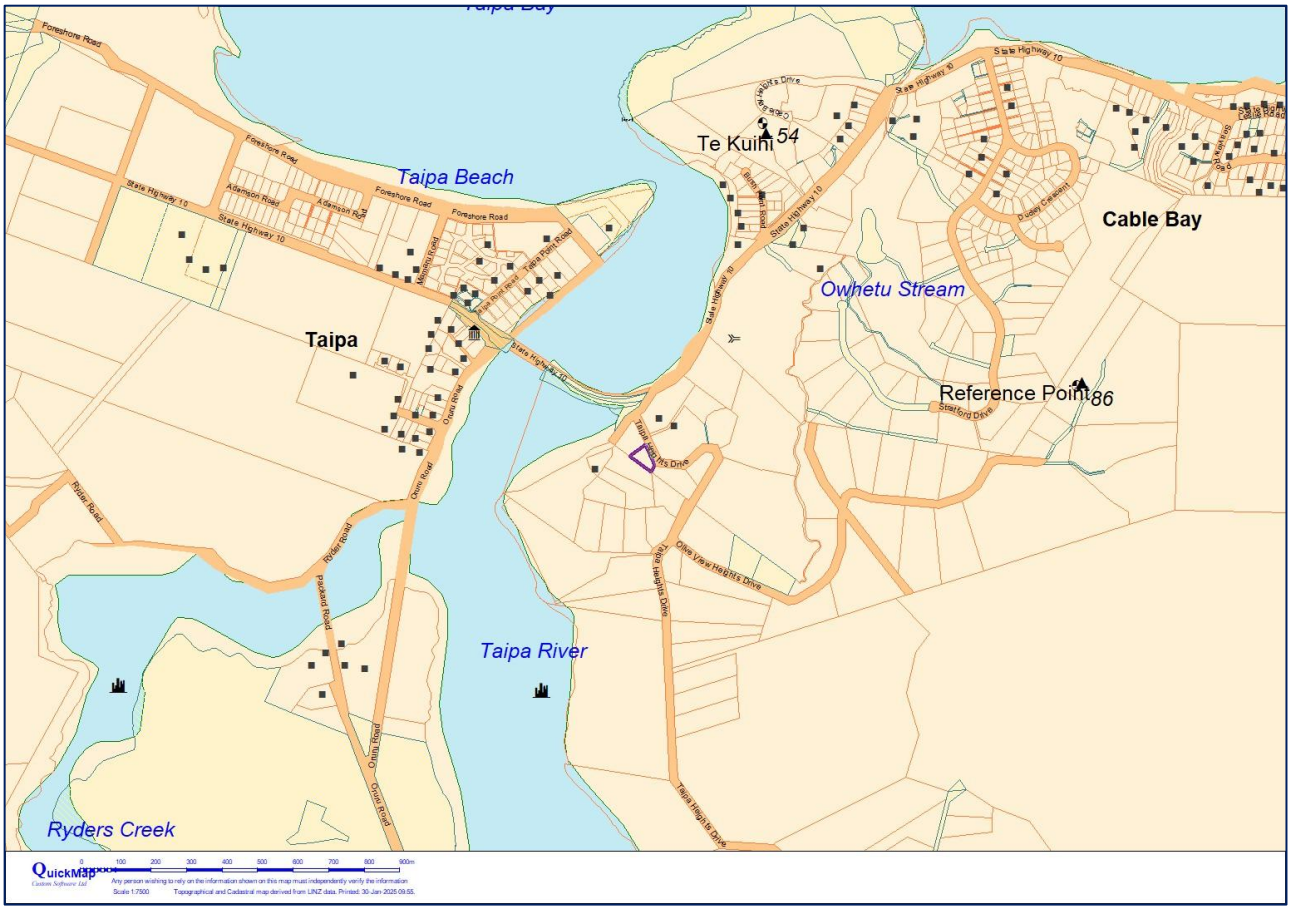

Figure 1: Location Map

3.2 Legal Details

Legal details of the application site are listed below. The Record of Title is attached in **Appendix 5**.

RECORD OF TITLE	APPELLATION	TITLE AREA	INTERESTS
56464	Lot 2 DP 314261	1889m² more or less	D066108.3 Consent Notice D293102.2 Consent Notice 5677702.2 Consent Notice Easement Instrument 5677702.4: Appurtenant electrical power supply. Subject to Section 243(a) RMA 1991.

3.3 Site Conditions

Existing buildings and structures on the site include an existing garage, which is accessed by a metalled entrance and driveway off Taipa Heights Drive. Below this, a block wall and timber landscape wall is positioned above the proposed dwelling location, where the footings and level platform of the previous dwelling remain. The metalled parking and manouevring area also remain between this area and Taipa Heights Drive. A shipping container is located near the southern corner of the property. Existing sewer, water and stormwater services are shown on the Site Plan.

The remainder of the site is in grass, with mature landscaping and garden plantings along the north-western and south western boundaries, surrounding the existing driveway and shed areas. There is also planting within the road reserve adjacent to the site's north eastern boundary.

Topographical conditions are described in the Stormwater Mitigation and Geotechnical Reports as follows.

"The site is positioned towards the toe of a northwest facing, long, moderate to steep ridge flank, falling from upslope Taipa Heights Drive some 120m to the southeast. The property is set around a central crest, transitioning into moderate to steep terrain that covers the northern end of the property and ultimately falling some 11m to the toe of the common flank, within the neighboring downslope allotment.
Slope grades across the proposed building platform vary due to the recent and past land modifications (see further below). The land in between the upslope block wall and the edge of the levelled platform generally displays a width of 18m and gentle grades of less than 5°. Grades across the steep northern flank generally range between 20° and 30°."

A cadastral map is provided in **Figure 2** below.

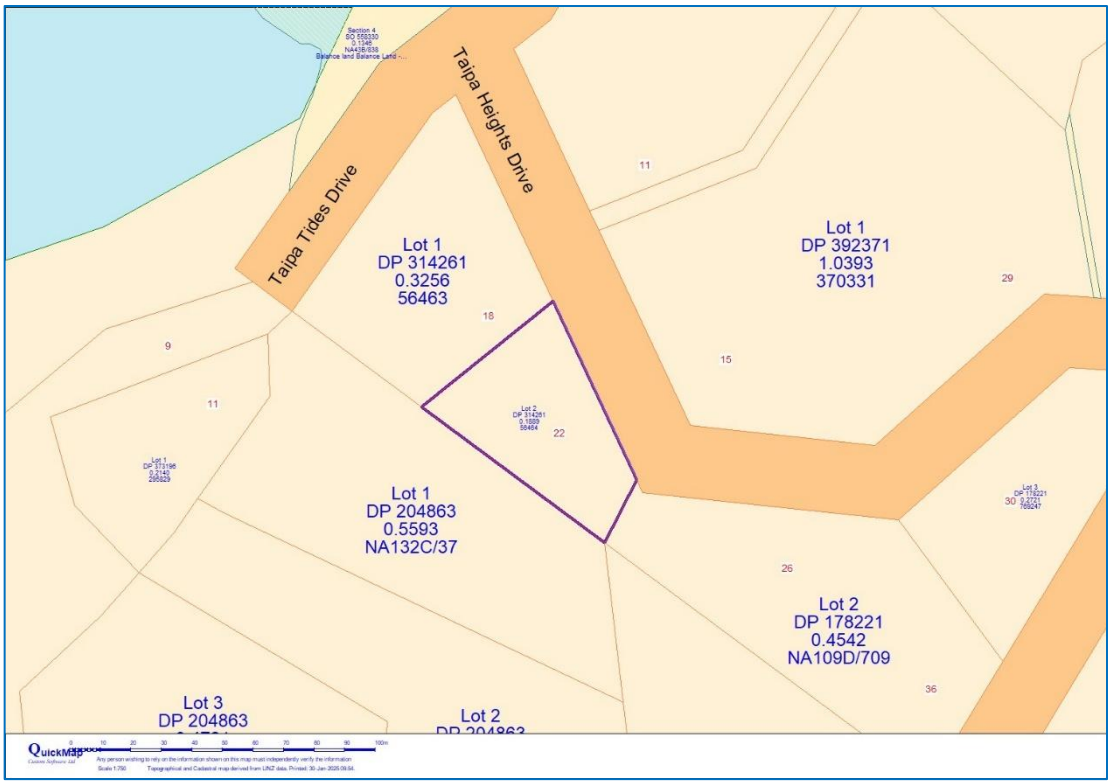

Figure 2: Cadastral Map

3.4 Archaeological Site O04/645

As part of the previous subdivision an archaeological inspection was undertaken in 1993, resulting in part of the archaeological site O04/645 being mapped in the north western corner of the site. The report and approved scheme plan referenced in consent notice 5677702.2 are attached in **Appendix 4**, and the archaeological site O04/645 has been transcribed onto the current site plan, copied in **Figure 3**.

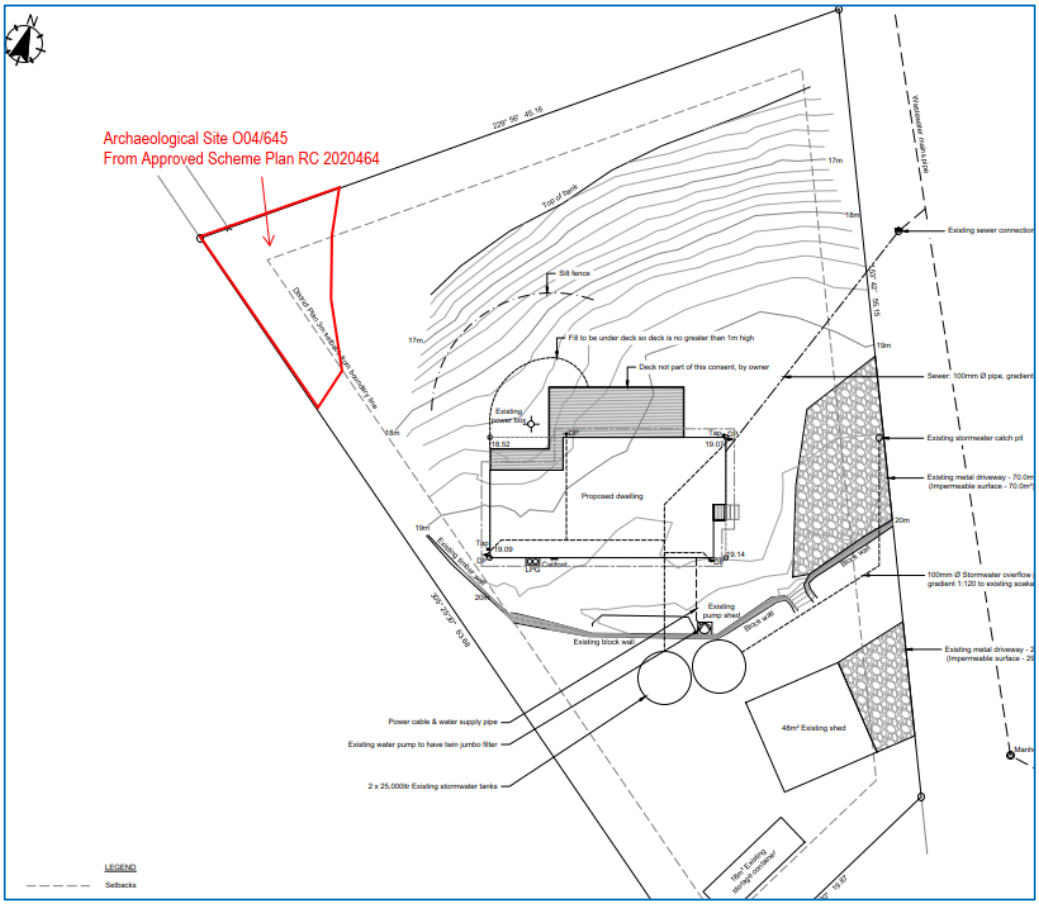

Figure 3: Site Plan with Archaeological Site O04/645 (from RC 2020464) Overlaid.

3.5 Recorded Natural Features

The Northland Regional Council Regional Policy Statement records the site as being within the coastal environment, but does not map any areas of high or outstanding natural character, outstanding natural features or outstanding natural landscapes.

The nearby “Lower Taipa River / Estuary” catchment is an area of high natural character. The area to the west of Taipa Tides Drive is a ‘Mangrove riparian complex.’

4.0 District Plan Assessment

4.1 Operative Far North District Plan

The application site is zoned Coastal Living and is not subject to any Resource Features. The proposal is assessed against the relevant rules of the District Plan as follows:

4.1.1 Coastal Living Zone

Rule	Discussion	Compliance
Permitted Activities		
10.7.5.1.1 Visual Amenity	Permitted activity Rule 10.7.5.1.1(c) allows replacement of any building so long as the replacement does not exceed the building envelope occupied by the previous building. There is no available survey data showing the exact location of the previous dwelling, but a comparison of the previous and proposed locations (see **Figure 4)** shows that the proposed building is positioned slightly west of the previous. Foundation Plans in **Appendix 1** shows that the proposed south western foundation will be located to the west of the south western existing foundation pile to be avoided of the previous building. As such, this standard is not met. The dwelling does not meet permitted standard (a) as the gross floor area exceeds 50m². The controlled activity standard (Rule 10.7.5.2.2) is not met as the building is not within an approved building envelope. As such, the activity is a restricted discretionary activity under Rule 10.7.5.3.1.	Does not comply- restricted discretionary activity.
10.7.5.1.2 Residential Intensity	The proposal is for a single residential unit, being the first on the site.	Complies.
10.7.5.1.3 Scale of Activities	The proposed dwelling will be used by people who normally reside on the site.	Complies.
10.7.5.1.4 Building Height	Building height does not exceed 8m.	Complies.
10.7.5.1.5 Sunlight	The proposed dwelling is sufficiently setback from the south western boundary to comply with the permitted activity sunlight standard – this is confirmed on the Site Plan.	Complies
10.7.5.1.6 Stormwater Management	Proposed impermeable surfaces exceed 10%, being the lesser area compared with 600m². The restricted discretionary activity standard of the lesser of 15% or 1,500m² is also exceeded.	Does not comply – discretionary activity.
10.7.5.1.7 Setback from Boundaries	The area of the application site is less than 5,000m², and the proposed buildings are at least 3m from all site boundaries.	Complies

4.1.2 District Wide Provisions

Natural & Physical Resources

Rule	Discussion	Compliance
Soils & Minerals		
12.3.6.1.2 Excavation and/or Filling …. In the … Coastal Living … Zones	Earthworks will be less than 300m³ / 1.5m.	Complies.

Natural Hazards		
12.4.6.1.2 Fire Risk to Residential Units	The dwelling is not located within 20m of any significant continuous vegetated areas.	Complies
Heritage		
12.5.6.1.3 Registered Archaeological Sites	The archaeological site on the property (O04/645) is not recorded in Appendix 1G of the District Plan resource maps and is not included on the specified register; nevertheless, the proposed development avoids the O04/645 as recorded by RC 2020464, and as such would not require an Archaeological Authority.	Complies.

Financial Contributions

The proposal has no implications in terms of Chapter 14.

Transportation

Rule	Discussion	Compliance
Traffic – Permitted Activities		
15.1.6A.2.1 Traffic Intensity	The first residential unit on a site is exempt from this rule.	Complies.
Parking – Permitted Activities		
15.1.6B.1.1 On-Site Car Parking Spaces	Two car parks will be either available within the existing garage, or otherwise stacked along the driveway.	Complies.
Access – Permitted Activities		
15.1.6C.1.1 Private Accessway in All Zones	The site has individual access from Taipa Heights Drive.	Complies.
15.1.6C.1.5 Vehicle Crossing Standards in Rural and Coastal Zones	The site has two existing entrances off Taipa Heights Drive – no new vehicle crossings are proposed. The house entrance is sealed while the garage entrance is metalled – this is an existing situation.	Complies.
15.1.6C.1.7 General Access Standards	Less than four parking spaces will be accessed from Taipa Heights Drive as per clause (a). Remaining clauses (b) – (d) will be met by the existing access design.	Complies

4.1.3 Summary of Activity Status

Overall, the proposal has been assessed as a discretionary activity, requiring consent under the Visual Amenity Rule 10.7.5.3.1 and Discretionary Activities Rule 10.7.5.4.

4.2 Proposed Far North District Plan

The subject site is zoned Rural Lifestyle and is within the Coastal Environment.

4.2.1 Rules with Immediate Legal Effect

Rules relating to earthworks and the discovery of suspected sensitive material, and earthworks and erosion and sediment control (EW-R12 and EW-R13) and associated standards EW-S3 and EW-S5 can be complied with through advice notes relating to the Heritage New Zealand Accidental Discovery Protocol and the requirement for erosion and sediment control to be implemented in accordance with the specified guideline document for the duration of earthworks. We are not aware of any other applicable rules with legal effect under the Proposed District Plan. Other relevant rules without legal effect are commented on below.

4.2.2 Rural Lifestyle Zone

Rule	Discussion	Compliance (no legal effect)
Permitted Activities		
RLZ-R1 New buildings	The proposed dwelling will accommodate a permitted activity (Residential Activity – RLZ-R3) in compliance with PER-1. The standards listed in PER-2 (RLZ-S1 – 5) are met, as specified below.	Complies
RLZ-R2 Impermeable Surface Coverage	More than 12.5% of impermeable surface coverage will result.	Does not comply – restricted discretionary activity
RLZ-R3 Residential activity	The proposal is for a single residential unit located on a site less than 2ha.	Complies
RLZ-S1 Maximum height	Building height does not exceed 8m.	Complies
RLZ-S2 Height in relation to boundary	The building will fit within the specified recession planes.	Complies
RLZ-S3 Setback	The proposed buildings are at least 3m from all site boundaries.	Complies
RLZ-S4 Setback from MHWS	A 30m setback from MHWS is achieved.	Complies
RLZ-S5 Building or Structure Coverage	Building / structure coverage is less than 12.5%.	Complies

4.2.3 Natural Hazards

Rule	Discussion	Compliance (no legal effect)
Permitted Activities		
NH-R5 Wild Fire - Buildings used for a vulnerable activity (excluding accessory buildings)	Onsite Water storage is used as per condition 2 of PER-1. The building will not be within 20m of vegetation and complies with PER-2.	Complies

4.2.4 Coastal Environment

Rule	Discussion	Compliance (no legal effect)
Permitted Activities		

CE-R1 – New buildings or structures	PER-2 is applicable as the site is not located within an urban zone. The proposed dwelling is not ancillary to farming activities and exceeds 25m², therefore does not comply with conditions 1 and 2. The building site is outside an outstanding natural character area, and as such is a discretionary activity. PER-4 requires compliance with CE-S1 and CE-S2, which limit the maximum height of any new building or structure to 5m above ground level and the nearest ridgeline, headland or peninsula, and require the use of materials / finishing with a reflectance value no greater than 30% and an exterior finish within Groups, A, B or C as defined within the BS5252 standard colour palette, respectively. CES-S1 is not met, as the apex height of the dwelling is 5.166m. Exterior colours have not been confirmed.	Discretionary activity
CE-R3 Earthworks …	As per PER-2, earthworks will not exceed 400m² in extent, or a cut height or fill depth of 1m.	Complies

4.2.5 Transport

Rule	**Discussion**	**Compliance (no legal effect)**
Permitted Activities		
TRAN-R1 Parking	Off street car parking is available.	Complies
TRAN-R2 Vehicle crossings and access, including private accessways	Access is for a single dwelling via an existing crossing.	Complies
Tran-R5 Trip Generation	Single residential unit proposed.	Complies.

5.0 Assessment of Environmental Effects

Section 104(1)(a) and (ab) require the consent authority, subject to Part 2 of the Act, to have regard to any actual and potential effects on the environment of allowing the activity and any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity.

Section 104(2) indicates that a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard of the plan permits an activity with that effect and Section 104(3)(a)(ii) requires a consent authority to not, when considering an application, have regard to any effect on a person who has given written approval to the application (unless that person has withdrawn the written approval before the date of a hearing or before the application is determined, as set out in 104(4)).

Clauses 6 and 7 of Schedule 4 of the RMA indicate the information requirements and matters that must be addressed in or by an assessment of environmental effects, both of which are subject to the provisions of any policy statement or plan. This assessment of environmental effect therefore addresses the relevant matters listed in Rule 10.7.5.3.1 and Assessment Criteria in 11.3 of the Operative District Plan.

The location of the building

The proposed dwelling is to be located on the existing building platform, which has historically been cut to a near level grade and push-over fill downslope. The proposed dwelling is located very slightly to the west of the previous building, which can be seen by review of the Foundation Plan in **Appendix 1** (showing existing pile foundations to be avoided, and proposed new pile foundations). The proposed building will not extend as far north as the previous dwelling. Given the previous and proposed building locations are nearly identical, it is considered that the building location is appropriate, has a low risk of instability subject to implementation of the recommendations of the Site-Specific Geotechnical Report, and avoids the need for building platform earthworks.

The size, bulk, and height of the building or utility services in relation to ridgelines and natural features

The dwelling is a single storey structure with an apex height of approximately 5.2m. The floor area of the proposed dwelling is smaller than that of the previous dwelling, which was removed less than 12 months ago - this can be seen by the comparison in **Figure 4** below, where the new building envelope has been overlaid onto an aerial photograph depicting the previous dwelling.

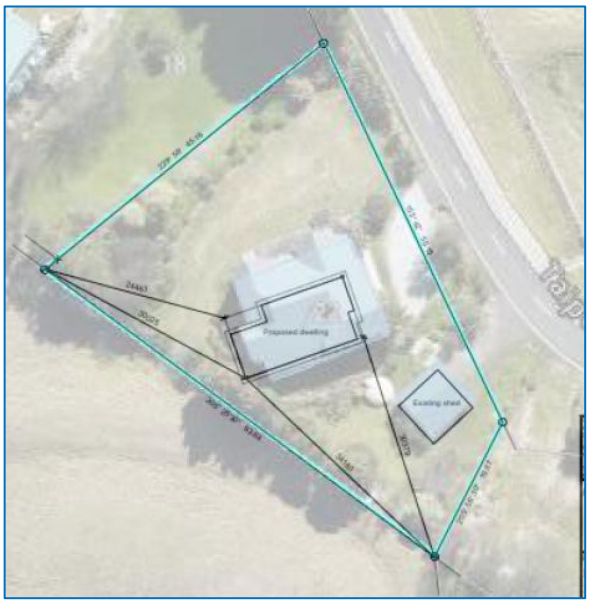

Figure 4: Proposed building envelope overlaid onto aerial photograph showing previous dwelling.

The building site is positioned towards the toe of a northwest facing, long ridge flank, falling from upslope Taipa Heights Drive some 120m to the southeast. Refer to the topographical description in the Site-Specific Geotechnical Report. The building site does not protrude above any ridgeline.

The subject site itself is not part of an outstanding natural landscape or outstanding natural feature, and does not have high or outstanding natural character. A nearby area of high natural character is the lower Taipa River / Estuary, which is located below Taipa Tides Drive and State Highway 10. The proposed development will not detract from the character of that area.

The colour and reflectivity of the building

Photograph 1 shows the exterior colour scheme of the previous dwelling, as being a mid-blue with white trims and a mid-grey roof.

Photograph 1: Previous Dwelling Colour Scheme

Existing buildings in the wider area around Taipa Heights Drive and Taipa Tides Drive exhibit a range of colour schemes, ranging from white through to dark charcoal cladding. These existing buildings form the existing environment within which the proposed dwelling will sit. Google Streetview imagery from 2019 shows the previous building in the context of this existing pattern, with the view being from Taipa Point Road near its intersection with Foreshore Road.

Figure 5: 2019 Google Streetview Image Showing Previous Dwelling and other properties on Taipa Heights Drive and Taipa Tides Drive.

The final colour scheme has not been specified, however the applicant has specified that he does not wish to have a very dark coloured roof in order to reduce heat transfer to the home's interior, to improve energy efficiency.

Taking into account the exterior colours of the previous dwelling and the surrounding environment, the potential adverse effects over and above those forming the permitted baseline had the proposed activity been prepared to meet permitted activity Visual Amenity Rule 10.7.5.1.1, are considered to be negligible, and no conditions are required.

The extent to which planting can mitigate visual effects

The site contains existing mature plantings, which enhanced privacy and amenity values for the previous dwelling and will do so for the proposed dwelling. These are located along the north-western and south western boundaries, surrounding the existing driveway and shed areas. There is also planting within the road reserve adjacent to the site's north eastern boundary. As they did with the previous dwelling, these existing plantings will soften the buildings as seen from various nearby public viewing points, including from nearby and adjacent legal roads and from the Taipa Point Road Recreation Reserve.

Any earthworks and/or vegetation clearance associated with the building

As the building platform is existing, the only earthworks required will be negligible in volume and extent, being those associated with filling in front of the deck to reduce its height above finished ground level. Volumes specified in the Site Plan will easily comply with the permitted activity Operative District Plan standards. No vegetation clearance is required.

The location and design of associated vehicle access, manoeuvring and parking areas

Vehicle access, manoeuvring and parking areas are all existing on the site. No changes to these are proposed.

The extent to which the building will be visually obtrusive

The new dwelling is low in profile, being a single storey building and will be set within an existing coastal lifestyle area, where existing dwellings and accessory buildings are already located. The proposed dwelling is generally positioned where the previous dwelling was situated since the late 1980s, forming part of the existing land use pattern until it was recently removed.

The proposal is an appropriate development in this location and on the application site. It will be unobtrusive and consistent with other existing built development found locally.

The cumulative visual effects of all the buildings on the site

The proposed dwelling together with the existing garage and container result in a reasonable extent of coverage on the site. Further, it is noted that the existing size of the application site (1,889m²) is small compared with the minimum lot sizes for subdivision in the Coastal Living Zone specified in the Operative District Plan (4ha, 8,000m² and 5,000m² as a controlled, restricted discretionary and discretionary activity) leading to impermeable surface coverage being unable to meet the permitted activity standard for the zone.

There is only one dwelling proposed, and this will replace the recently removed dwelling, with a smaller building footprint proposed. Existing vegetation softens the built form of the existing and proposed buildings and integrates them into the site. Cumulative visual effects are considered to be negligible.

The degree to which the landscape will retain the qualities that give it its naturalness, visual and amenity values

The application site is highly modified by way of existing buildings and utilities, the building platform of the previous dwelling, and earlier earthworks and retaining to form level platforms. The site has a low level of natural character, and is not part of an outstanding landscape.

The qualities of the site that contribute to the naturalness and visual amenity values of the area include the existing plantings along the site boundaries and remaining buildings, which can be retained. Furthermore, there will be no change to the overall site contours, which are part of a larger ridge flank falling from higher up Taipa Heights Drive.

The proposed development will be similar in nature to the existing surrounding development on the adjoining coastal lifestyle lots, and the overall landscape will retain its current level of natural and visual amenity.

The extent to which private open space can be provided for future uses

The site retains ample open grassed outdoor areas, which are more than adequate for the proposed residential use, and no less than was available with the previous dwelling.

The extent to which the siting, setback and design of building(s) avoid visual dominance on landscapes, adjacent sites and the surrounding environment

The site does not include any mapped outstanding natural features, outstanding landscape features, or areas of high or outstanding natural character as mapped by the Regional Policy Statement.

As described above, the building design, together with the setting of the site in an existing developed area, means that the proposed dwelling will not be a dominant or obtrusive feature of the landscape. The proposed development will be at a scale which blends in with current settlement patterns of the area. Permitted activity boundary setbacks and height and relation to boundary standards are achieved.

The proposed dwelling replicates the location and orientation of the recently removed dwelling. Dwellings on adjoining properties above and below are also orientated north towards the sea view, and as they are stepped up along the sloping hillside, will retain those views following the development.

The extent to which non-compliance affects the privacy, outlook and enjoyment of private open spaces on adjacent sites

The proposed dwelling will comply with all permitted activity setback, height and height in relation to boundary rules, such that the privacy, outlook and enjoyment of private open spaces on adjacent sites will not be affected beyond what can be considered as the permitted baseline.

Stormwater Effects

An assessment of stormwater effects is provided within the Stormwater Mitigation Report (Section 7). In summary, it is noted that less impermeable surfaces are proposed compared with the previous level of site development, nevertheless, water quality volume control will be provided for the 90th percentile of the 24-hour storm event for the total proposed roof area in the dual-purpose rainwater tanks in order to mitigate potential adverse stormwater effects.

Summary of effects and mitigation

The relevant effects of the proposed development are considered to be less than minor, or negligible compared with the permitted activity baseline of effects allowable under the replacement building rule set out in 10.7.5.1.1(c) of the Operative District Plan in terms of previous development on the site.

6.0 Statutory Assessment

6.1 Objectives and Policies

6.1.1 Far North Operative District Plan

The objectives and policies of the Coastal Environment and Coastal Living Zone Sections of the District Plan are relevant to this proposal. The relevant objectives and policies of the environment and zone are commented on below.

COASTAL ENVIRONMENT
10.3 OBJECTIVES
10.3.1 To manage coastal areas in a manner that avoids adverse effects from subdivision, use and development. Where it is not practicable to avoid adverse effects from subdivision use or development, but it is appropriate for the development to proceed, adverse effects of subdivision use or development should be remedied or mitigated.
10.3.2 To preserve and, where appropriate in relation to other objectives, to restore, rehabilitate protect, or enhance:
(a) the natural character of the coastline and coastal environment;
(d) the open space and amenity values of the coastal environment;
(e) water quality and soil conservation (insofar as it is within the jurisdiction of the Council).
10.3.3 To engage effectively with Maori to ensure that their relationship with their culture and traditions and taonga is identified, recognised, and provided for.
10.3.8 To ensure provision of sufficient water storage to meet the needs of coastal communities all year round.

Comment: Natural character of the coastal environment will be preserved. The proposal avoids disturbance to the recorded archaeological site. Water supply via the existing water tanks is established. Adverse effects from the proposed development are predominantly avoided or otherwise mitigated.

10.4 POLICIES
10.4.1 That the Council only allows appropriate subdivision, use and development in the coastal environment. Appropriate subdivision, use and development is that where the activity generally:
(a) recognises and provides for those features and elements that contribute to the natural character of an area that may require preservation, restoration or enhancement; and
(b) is in a location and of a scale and design that minimises adverse effects on the natural character of the coastal environment; and

(c) has adequate services provided in a manner that minimises adverse effects on the coastal environment and does not adversely affect the safety and efficiency of the roading network; and
(d) avoids, as far as is practicable, adverse effects which are more than minor on heritage features, outstanding landscapes, cultural values, significant indigenous vegetation and significant habitats of indigenous fauna, amenity values of public land and waters and the natural functions and systems of the coastal environment; and
(e) promotes the protection, and where appropriate restoration and enhancement, of areas of significant indigenous vegetation and significant habitats of indigenous fauna; and
(f) 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
(g) where appropriate, provides for and, where possible, enhances public access to and along the coastal marine area; and
(h) gives effect to the New Zealand Coastal Policy Statement and the Regional Policy Statement for Northland.
10.4.2 That sprawling or sporadic subdivision and development in the coastal environment be avoided through the consolidation of subdivision and development as far as practicable, within or adjoining built up areas, to the extent that this is consistent with the other objectives and policies of the Plan.
10.4.8 That development avoids, remedies or mitigates adverse effects on the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga.
10.4.9 That development avoids, where practicable, areas where natural hazards could adversely affect that development and/or could pose a risk to the health and safety of people.
10.4.10 To take into account the need for a year-round water supply, whether this involves reticulation or on-site storage, when considering applications for subdivision, use and development.
10.4.12 That the adverse effects of development on the natural character and amenity values of the coastal environment will be minimised through:
(a) the siting of buildings relative to the skyline, ridges, headlands and natural features;
(b) the number of buildings and intensity of development;
(c) the colour and reflectivity of buildings;
(d) the landscaping (including planting) of the site;
(e) the location and design of vehicle access, manoeuvring and parking areas.

Comment: The proposal is an appropriate development in this location and on this application site, which avoids adverse effects on areas of high natural character, archaeological sites and other heritage features, outstanding landscapes, significant ecological values, amenity values and traffic safety. It is neither sprawling nor sporadic, with the site being located within an existing coastal lifestyle settlement. Visual amenity matters have been previously addressed in terms of building location, cumulative visual effects, colour and reflectivity, planting, and vehicle access, manoeuvring and parking areas, and it is considered that the potential adverse effects are less than minor and in accordance with the relevant policies.

Site specific geotechnical investigation has been made to ensure suitable foundations which avoid the effects of natural hazards.

Water supply and a sanitary sewer connection are established.

COASTAL LIVING ZONE
10.7.3 OBJECTIVES
These objectives supplement those set out in Section 10.3.
10.7.3.1 To provide for the well being of people by enabling low density residential development to locate in coastal areas where any adverse effects on the environment of such development are able to be avoided, remedied or mitigated.
10.7.3.2 To preserve the overall natural character of the coastal environment by providing for an appropriate level of subdivision and development in this zone.

Comment: As detailed previously, the proposal is a low density residential development on an existing site, with negligible adverse effects, and resultantly the overall natural character of the coastal environment can be preserved.

10.7.4 POLICIES
These policies supplement those set out in Section 10.4.
10.7.4.1 That the adverse effects of subdivision, use, and development on the coastal environment are avoided, remedied or mitigated.
10.7.4.2 That standards be set to ensure that subdivision, use or development provides adequate infrastructure and services and maintains and enhances amenity values and the quality of the environment.
10.7.4.3 Subdivision, use and development shall preserve and where possible enhance, restore and rehabilitate the character of the zone in regards to s6 matters, and shall avoid adverse effects as far as practicable by using techniques including:
(a) clustering or grouping development within areas where there is the least impact on natural character and its elements such as indigenous vegetation, landforms, rivers, streams and wetlands, and coherent natural patterns;
(b) minimising the visual impact of buildings, development, and associated vegetation clearance and earthworks, particularly as seen from public land and the coastal marine area;
(f) protecting historic heritage through the siting of buildings and development and design of subdivisions.

Comment: Infrastructure for residential use is already established. The proposal will not reduce amenity values or the quality of the environment. The natural character of the Coastal Living Zone will be preserved, with the subject site being highly modified, and situated within an existing coastal lifestyle settlement. By utilising the existing building platform, the recorded archaeological site is protected and the need for earthworks and vegetation clearance is avoided.

6.1.2 Far North Proposed District Plan

Rural Lifestyle Zone and Coastal Environment objectives and polies are commented on below. It is considered to be consistent with the relevant strategies of the Proposed District Plan.

Rural Lifestyle Zone
Objectives
RLZ-O1 The Rural Lifestyle Zone is used for predominantly low density residential activities and small scale farming activities that are compatible with the rural character and amenity of the zone.
RLZ-O2 The predominant character and amenity of the Rural Lifestyle Zone is characterised by:
a. Low density residential activities;

Comment: The proposed development is for a single residential dwelling on an existing site, is of a density that replaces the previous dwelling, and is consistent with the above objective.

Policies
RLZ-P1 Enable activities that will not compromise the role, function and predominant character and amenity of the Rural Lifestyle Zone, while ensuring their design, scale and intensity is appropriate to manage adverse effects in the zone, including:
a. low density residential activities;
RLZ-P2 Avoid activities that are incompatible with the role, function and predominant character and amenity of the Rural Lifestyle Zone because they are:
a. contrary to the density anticipated for the Rural Lifestyle zone;
b. predominately of an urban form or character;
c. primary production activities, such as intensive indoor primary production, that generate adverse amenity effects that are incompatible with rural lifestyle living; or
d. commercial, rural industry or industrial activities that are more appropriately located in a Settlement Zone or an urban zone.
RLZ-P4 Manage land use and subdivision to address the effects of the activity requiring resource consent, including (but not limited to) consideration of the following matters where relevant to the application:
a. consistency with the scale and character of the rural lifestyle environment;

Comment: As above, low density residential use is proposed, and is not an activity of the type to be avoided as per RLZ-P2. The proposal is for a single residential dwelling on the property, and is consistent with the scale and character of the existing local environment.

Coastal Environment

Objectives
CE-O1 The natural character of the coastal environment is identified and managed to ensure its long-term preservation and protection for current and future generations.
CE-O2 Land use and subdivision in the coastal environment:
a. preserves the characteristics and qualities of the natural character of the coastal environment
b. is consistent with the surrounding land use;
c. does not result in urban sprawl occurring outside of urban zones;
d. promotes restoration and enhancement of the natural character of the coastal environment; …

The proposed building site is not located within an area of high or outstanding natural character. Natural character of the coastal environment can be protected, as the proposal does not affect the qualities of the site and surrounding environment that contribute to the overall level of natural character. In particular, the site will retain existing vegetation, and the proposed building is generally located on the building envelope remaining after removal of the previous dwelling. It fits within the existing settlement pattern in this part of the coastal environment, and at a scale which does not contribute to urban sprawl.

Policies
CE-P1 Identify the extent of the coastal environment as well as areas of high and outstanding natural character using the assessment criteria in APP1-Mapping methods and criteria.
CE-P3 Avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of land use and subdivision on the characteristics and qualities of the coastal environment not identified as:
a. outstanding natural character;
b. ONL;
c. ONF.
CE-P4 Preserve the visual qualities, character and integrity of the coastal environment by:
a. consolidating land use and subdivision around existing urban centres and rural settlements; and
b. avoiding sprawl or sporadic patterns of development.
CE-P8 Encourage the restoration and enhancement of the natural character of the coastal environment.
CE-P10 Manage land use and subdivision to preserve and protect the natural character of the coastal environment, and 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. the presence or absence of buildings, structures or infrastructure;
b. the temporary or permanent nature of any adverse effects;
c. the location, scale and design of any proposed development;
d. any means of integrating the building, structure or activity; e. the ability of the environment to absorb change;
f. the need for and location of earthworks or vegetation clearance;
h. any viable alternative locations for the activity or development;
i. any historical, spiritual or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6;
j. the likelihood of the activity exacerbating natural hazards;
k. the opportunity to enhance public access and recreation;
l. the ability to improve the overall quality of coastal waters; and
m. any positive contribution the development has on the characteristics and qualities

The site is within the coastal environment but not an area of high or outstanding natural character.

The proposal will not result in significant adverse effects, and other effects on the characteristics and qualities of the coastal environment will be avoided and mitigated through location and design of the building. A single house site on a site of this size is neither sprawling nor sporadic.

Retention of existing vegetation, together with the reasonable scale of the building, will mean that existing amenity values and the current level of natural character in the wider area are maintained.

6.1.3 Regional Policy Statement for Northland ("RPS")

The relevant policies from the Regional Policy Statement is commented on under the relevant heading below.

4.6.1 Policy – Managing effects on the characteristics and qualities natural character, natural features and landscapes
(1) In the coastal environment:
a) Avoid adverse effects of subdivision use, and development on the characteristics and qualities which make up the outstanding values of areas of outstanding natural character, outstanding natural features and outstanding natural landscapes.
b) Where (a) does not apply, avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of subdivision, use and development on natural character, natural features and natural landscapes. Methods which may achieve this include:
(i) Ensuring the location, intensity, scale and form of subdivision and built development is appropriate having regard to natural elements, landforms and processes, including vegetation patterns, ridgelines, headlands, peninsulas, dune systems, reefs and freshwater bodies and their margins; and
(iii) Encouraging any new subdivision and built development to consolidate within and around existing settlements or where natural character and landscape has already been compromised.

The property is located within the Coastal Environment. The site has no identified Outstanding Natural Features or Outstanding Natural Character areas and is not part of a high or outstanding natural character overlay. The building site differs only slightly from the previous dwelling. The existing driveway is in place. There will be minimal earthworks and clearance of indigenous vegetation is not required for the development. Natural character values are protected.

5.1.1 Policy – Planned and coordinated development.
Subdivision, use and development should be located, designed and built in a planned and co-ordinated manner which:
(a) Is guided by the 'Regional Form and Development Guidelines' in Appendix 2;
(b) Is guided by the 'Regional Urban Design Guidelines' in Appendix 2 when it is urban in nature;
(c) Recognises and addresses potential cumulative effects of subdivision, use, and development, and is based on sufficient information to allow assessment of the potential long-term effects;
(d) Is integrated with the development, funding, implementation, and operation of transport, energy, water, waste, and other infrastructure;
(e) Should not result in incompatible land uses in close proximity and avoids the potential for reverse sensitivity;
(g) Maintains or enhances the sense of place and character of the surrounding environment except where changes are anticipated by approved regional or district council growth strategies and / or district or regional plan provisions.
(h) Is or will be serviced by necessary infrastructure.
Note: in determining the appropriateness of subdivision, use and development (including development in the coastal environment – see next policy), all policies and methods in the Regional Policy Statement must be considered, particularly policies relating to natural character, features and landscapes, heritage, natural hazards, indigenous ecosystems and fresh and coastal water quality.

The proposed use and development comply with all permitted activity Coastal Living Zone standards with the exception of the Visual Amenity Rule and Stormwater Management Rule, however taking into account the previous dwelling and associated impermeable surfaces, the potential adverse effects of these infringements are negligible. Development of an existing site for a single dwelling and accessory buildings is an anticipated land use in this zone, and the re-development of the site for this purpose will be compatible with other existing activities in the area so as to maintain the character of the surrounding environment.

6.1.4 New Zealand Coastal Policy Statement

The Regional Policy Statement gives effect to the New Zealand Coastal Policy Statement, and the relevant policies have been taken into account in the above assessment. In particular, Policies 13.1 (b) – (d) and 15(a) – (c) have been implemented through Northland Regional Council mapping, which shows that the site does not have high or outstanding natural character and is not part of an outstanding natural landscape or feature.

Relevant parts of Policy 6 are supported, as the site is within an existing coastal lifestyle area, the development will maintain the character of the existing built environment, and adverse visual effects are avoided and mitigated.

6.2 Part 2 of the Resource Management Act 1991

An assessment of the proposal in relation to Part 2 of the Act is given below.

PART 2 PURPOSE AND PRINCIPLES

5 Purpose

(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.

(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while-

(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

(b)Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

(c)Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

6 Matters of national importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

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

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

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

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

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

(h) The management of significant risks from natural hazards.

7 Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development and protection of natural and physical resources, shall have particular regard to-

(b) The efficient use and development of natural and physical resources;

(c) The maintenance and enhancement of amenity values;

(f) Maintenance and enhancement of the quality of the environment;

8 Treaty of Waitangi

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

The nature of development is similar to surrounding properties and represents a smaller building scale than the previous dwelling which is being replaced. The proposed building is of a modest height and floor area, and together with the retention of established planting, will ensure that adverse visual amenity effects are appropriately avoided and mitigated, to ensure that the existing character of the site and its surrounding can be retained.

The site is within a modified part of the coastal environment, where there is no high or outstanding degree of natural character. The existing natural character values of the area can be retained.

The proposal does not generate any adverse effects in terms of public access to water bodies, or on ecological values.

The proposed development avoids the recorded archaeological site, and is not within a 5m buffer of this site as referred to in Consent Notice 5677702.2. The proposal uses an existing building platform, and avoids disruption to previously undisturbed parts of the site. Nevertheless, an Accidental Discovery Protocol advisory note can be included in the consent.

The proposal has regard to Section 7 Matters and represents an efficient and anticipated use of the land, which will retain existing amenity values and maintain the quality of the environment.

The proposal has no known implications in terms of the Treaty of Waitangi principles.

Overall, the proposal is considered to be consistent with the purpose and principles of the Resource Management Act 1991.

6.3 National Environmental Standards

6.3.1 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The proposal has been considered in terms of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011. The subject site is not recorded on Northland Regional Council's Selected Landuse Register.[2] The land is not known to be currently, or historically, used for any activity or industry on the Hazardous Activities and Industries List, and the activity is not subject to the above regulations.

6.3.2 National Environmental Standards for Freshwater & Amendments

The proposed activity does not involve any earthworks or vegetation disturbance within 10m of a wetland. The area to the west of Taipa Tides Drive is a 'Mangrove riparian complex' and is within 100m of the proposed buildings, although this area is within the coastal marine area and not covered by the amended regulations. As such, the proposal is not considered to have any implications in terms of the above national environmental standard, in particular, regulation 54.

6.4 Proposed Regional Plan – February 2024

No consents are required under the Proposed Regional Plan.

7.0 Consultation & Notification Assessment

7.1 Consultation

The following consultation has been undertaken.

Heritage New Zealand
Comments from Heritage New Zealand Pouhere Taonga have been invited. Any responses received will be forwarded to Council.

7.2 Public Notification Assessment

Step 1: Public notification is not requested. Section 95A(3)(b) and (c) do not apply.

Step 2: Public notification is not precluded.

Step 3: There are no rules that require public notification in terms of section 95A8(a). An assessment has been made in accordance with section 95D, and it is considered that the adverse effects of the activity are not more than minor. Refer to Section 5.0 of this report.

Step 4: No special circumstances exist to warrant public notification.

[2] Northland Regional Council. Retrieved 25 January 2023 from https://localmaps.nrc.govt.nz/localmapsviewer/?map=65b660a9454142d88f0c77b258a05f21

7.3 Limited Notification Assessment

Step 1: The site is not in the marine and coastal area or common marine and coastal area. There are no affected protected customary rights groups or affected customary marine title groups, the land is not the subject to a statutory acknowledgement.

Step 2: Limited notification is not precluded.

Step 3: In terms of 95B(8), an assessment has been undertaken in accordance with section 95E. Section 95E(1) specifies that a person is an affected person if the consent authority decides that the activity's adverse effects on the person are minor or more than minor (but are not less than minor).

Section 95E(2) provides guidance as to how a consent authority should assess an activity's adverse effects on a person for the purposes of Section 95E, including clause (a), where they may disregard an adverse effect of the activity on a person if a rule or national environmental standard permits an activity with that effect and clause (b), where they must, if the activity is a controlled activity or a restricted discretionary activity, disregard an adverse effect of the activity on the person if the effect does not relate to a matter for which a rule or a national environmental standard reserves control or restricts discretion.

Section 95E(3) specifies that a person is not an affected person in relation to an application for a resource consent for an activity if (a) the person has given, and not withdrawn, approval for the proposed activity in a written notice received by the consent authority before the authority has decided whether there are any affected persons.

The anticipated adverse effects of the proposed development are expected to be less than minor, in particular given that the proposal is for a replacement building, with an insignificant alteration of the building platform compared with the building that has recently been removed. All access and services are in place. Additionally, there is a minimal amount of earthworks and avoidance of vegetation clearance, and the building will not be visually obtrusive or a dominant feature of the environment, and will not result in effects that are minor or greater on any person. It is noted that the proposed buildings comply with all permitted activity setback, height and height in relation to boundary rules, such that the privacy, outlook and enjoyment of private open spaces on adjacent sites will not be affected. As such, it is considered that there are no affected persons in terms of the proposed activity.

Step 4: There are no special circumstances to warrant notification to any other person.

7.4 Summary of Notification Assessment

As outlined above we are of the opinion that the proposal satisfies the statutory requirements for non-notification, and we respectfully request that it be processed on that basis.

8.0 Conclusion

In terms of section 104 and 104B of the Resource Management Act 1991, we consider that:

- The actual and potential adverse effects of the proposal can be avoided and mitigated so as to be less than minor.
- The proposal is considered to be consistent with the relevant objectives and policies of the Operative District Plan, Proposed District Plan, Regional Policy Statement and New Zealand Coastal Policy Statement.

- The proposal is in accordance with the Purpose and Principles of the Resource Management Act 1991.

We also note that:

- It has been assessed that the proposal meets the statutory criteria to be processed as non-notified.

For these reasons it is requested this application be considered to be a non-notified application, and that the Council grant consent to the proposal, under delegated authority, as detailed in the application and supporting information.

Signed ..... Date ..... *5 February 2025* .....
Natalie Watson, WILLIAMS & KING
Resource Planner Kerikeri

9.0 Appendices

Appendix 1: G.J. Gardner Homes Site Location Plan, Site Plan, Floor Plan, Elevations
Appendix 2: Wilton Joubert Limited Site-Specific Geotechnical Report
Appendix 3: Wilton Joubert Limited Stormwater Mitigation Report
Appendix 4: Archaeological Inspection Report
Appendix 5: Record of Title

Proposed Dwelling

Lionel Ward
22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Index		
Sheet No.	Sheet Title	Rev
A01a	Site Location Plan	BC-S-2
A01b	Site Plan	BC-S-2
A02	Floor Plan	BC-S-2
A03	Elevations	BC-S-2
A04	Electrical Plan	BC-S-2
A05	Drainage Plan	BC-S-2
A06	Foundation Plan	BC-S-2
A07	Subfloor Plan	BC-S-2
A08	Roof Plan	BC-S-2
A09	Framing & Lintel Plan	BC-S-2
A10	Bracing Plan	BC-S-2
A11	Section A	BC-S-2
A12	Subfloor Details	BC-S-2
A13	Threshold Details	BC-S-2
A14	Hold Down Details	BC-S-2
A15	Hold Down Details	BC-S-2
A16	Cladding Details	BC-S-2
A17	Roof Details	BC-S-2
A18	Drainage Details	BC-S-2
Revisions		
-	-	-

Engineers Index		
Sheet No.	Sheet Title	Rev
A06	Foundation Plan	Q

Construction Plans

Date: 21 January 2025

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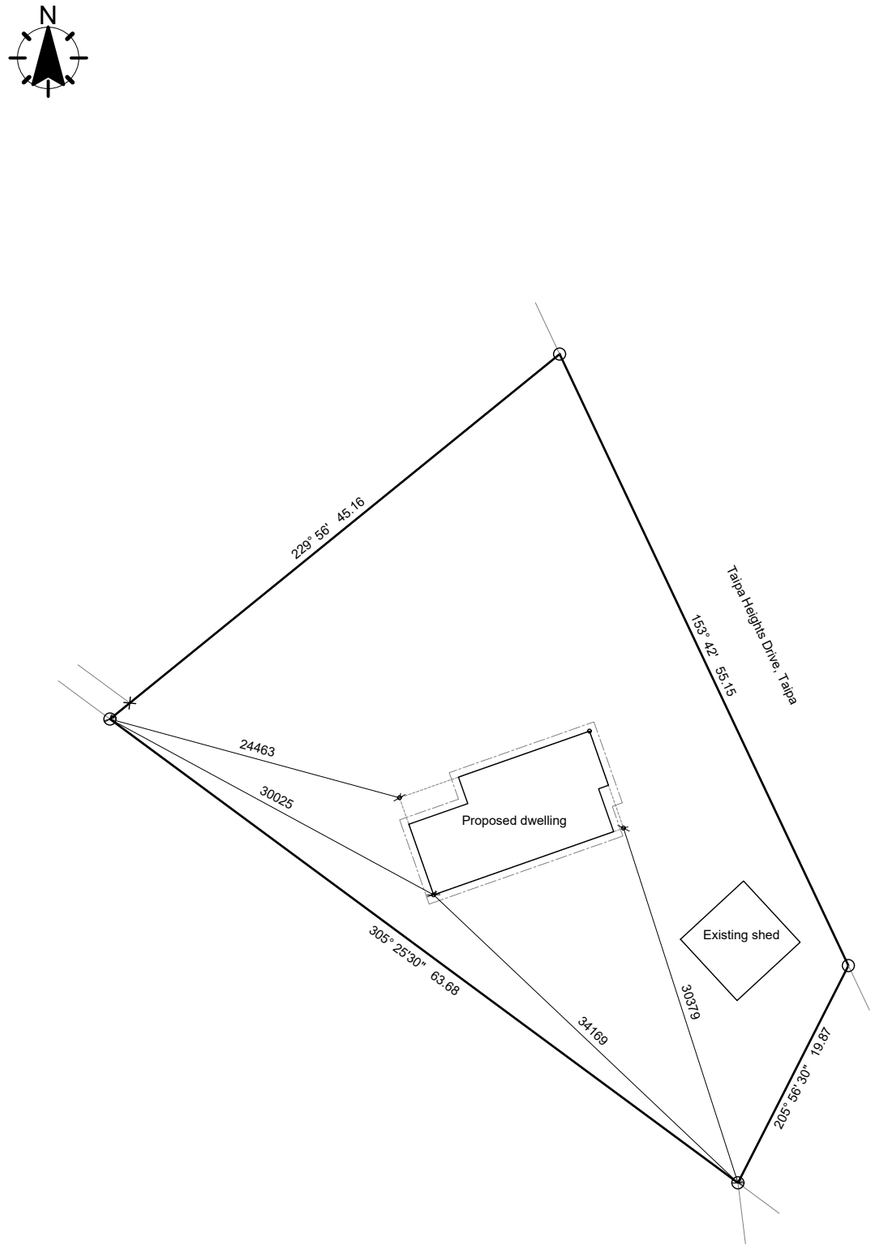

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Project Title
Lionel Ward
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Taipa
Lot 2 DP 314261

Sheet Title
Site Location Plan

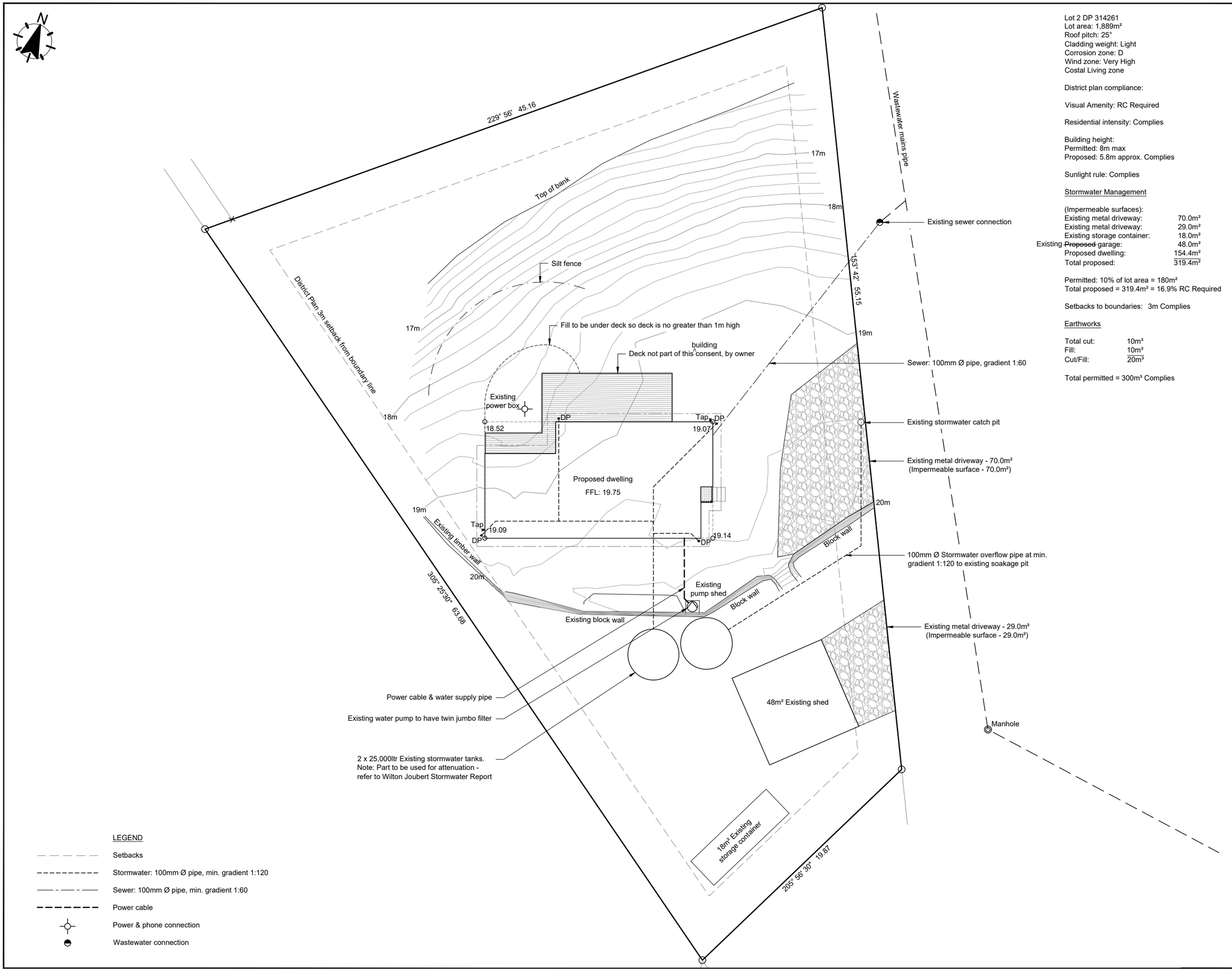
Drawn 21 January 2025

Project No 5296

Rev	Sheet
BC-S-2	A01a

Scale (A3 Original) 1: 500

5 2.5 0 5 10 m



Lot 2 DP 314261
Lot area: 1,889m²
Roof pitch: 25°
Cladding weight: Light
Corrosion zone: D
Wind zone: Very High
Costal Living zone

District plan compliance:

Visual Amenity: RC Required

Residential intensity: Complies

Building height:
Permitted: 8m max
Proposed: 5.8m approx. Complies

Sunlight rule: Complies

Stormwater Management

(Impermeable surfaces):

Existing metal driveway:	70.0m²
Existing metal driveway:	29.0m²
Existing storage container:	18.0m²
Existing ~~Proposed~~ garage:	48.0m²
Proposed dwelling:	154.4m²
Total proposed:	319.4m²

Permitted: 10% of lot area = 180m²
Total proposed = 319.4m² = 16.9% RC Required

Setbacks to boundaries: 3m Complies

Earthworks

Total cut:	10m³
Fill:	10m³
Cut/Fill:	20m³

Total permitted = 300m³ Complies

NOTES

1. All heights shown are existing ground heights.
2. Contour lines at 0.2m increments, sourced from surveyor .
3. All drainage to comply with AS/NZS3500 & NZBC G13/AS1. All drainage is diagrammatical, drainlayer to determine on site drainage layout and provide asbuilt plan when complete.
4. The works which are being proposed will comply with Earthworks EW-S3 Accidental Discovery Protocol and Earthworks EW-S5 Erosion and Sediment Control - Auckland Council Guideline Document GD005 GD05 Erosion and Sediment Control.pdf (aucklanddesignmanual.co.nz)

LEGEND

- Setbacks
- Stormwater: 100mm Ø pipe, min. gradient 1:120
- Sewer: 100mm Ø pipe, min. gradient 1:60
- Power cable
- Power & phone connection
- Wastewater connection

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Project Title
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Lot 2 DP 314261

Sheet Title
Site Plan

Drawn 21 January 2025

Project No 5296

Rev BC-S-2

Sheet A01b

Scale (A3 Original) 1: 250

2.5 1.25 0 2.5 5 m

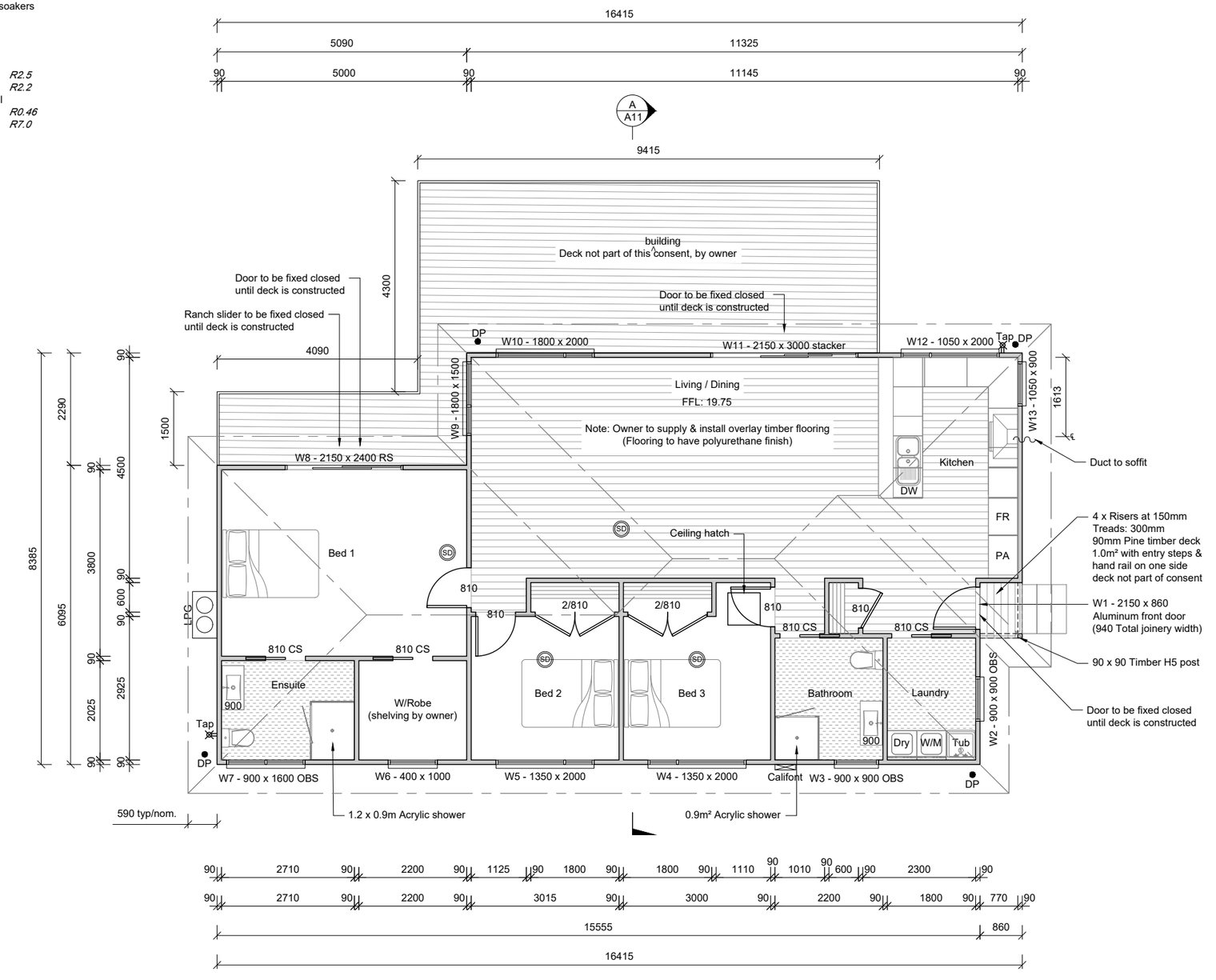
C
B D
A

SPECIFICATION:

- Very high wind zone
- Stud height - 2440 *(2400 Nominal)*
- Linea weatherboard with soakers
- Gerard metal tile roofing

H1 SPECIFICATION:

-	Subfloor: Expol	*R2.5*
-	Walls: Pink batts	*R2.2*
-	Double glazing low E Xcel	
-	with thermal break	*R0.46*
-	Ceiling: Pink batts	*R7.0*



NOTE:

1. All dimensions taken from the outside of pre-cut, please check all dimensions before construction commences.
2. Refer to Framing & Lintel Plan for lintel dimensions, stud spacing & external door offsets.
2. Refer to Eave detail for stud, lintel and soffit framing heights.
3. Additional nogs to be installed at framing stage to allow for towel rails, wardrobe & fixed shelves, WC cistern, toilet roll holders, wall mounted extractors, heat pump, A/C units & garage door components where required.
4. Refer to attached sheet for cladding & roofing notes & details.
5. All wet areas to be provided with impervious linings as per NZBC E3/AS1.
6. Smoke alarms to be installed to NZS 4514:2021.
7. All wall framing typically H1.2 treated unless specifically stated.
8. All external linings to be installed to manufacturers instructions, refer to separate detail sheet for cladding details & notes.

BUILDING AREA:

Floor Area (Framing):	122.8m²
Roof Area:	154.4m²

FIXINGS:

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

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Lot 2 DP 314261

Sheet Title
Floor Plan

Drawn 21 January 2025

Project No 5296

Rev BC-S-2

Sheet A02

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m

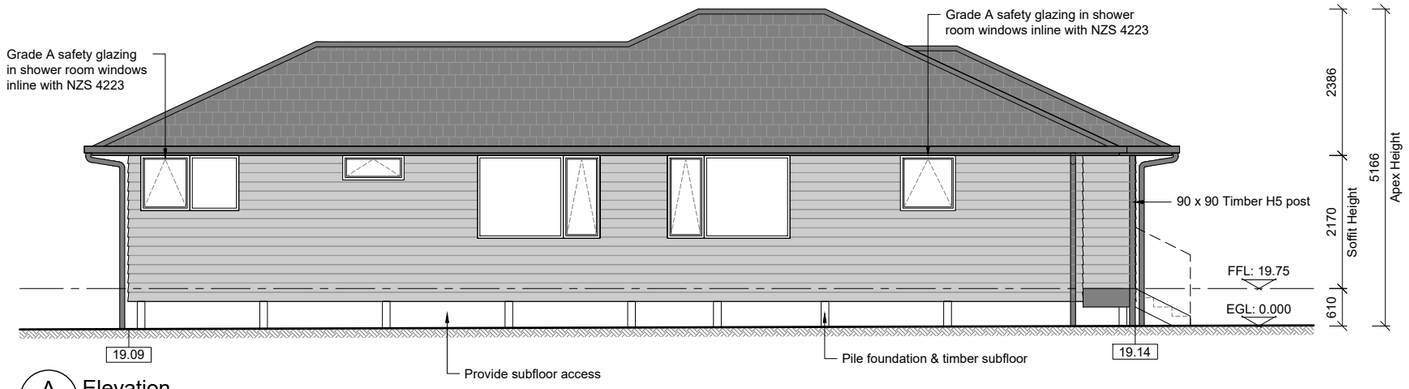
LEGEND

- Smoke Detector
- Roof Line
- 90 x 45 SG8 H1.2 Timber framing walls
- Sheet vinyl flooring manufacturers specifications
- KD Engineered hardwood flooring supplied & installed by owner to manufacturers specifications
- Rinnai Infinity VT26 water heater installed to manufacturers instructions
- 45KG LPG Bottles, top of bottle to be 500mm min. from ignition source refer to LPG Association Code of Practice for clearances and seismic restraints.

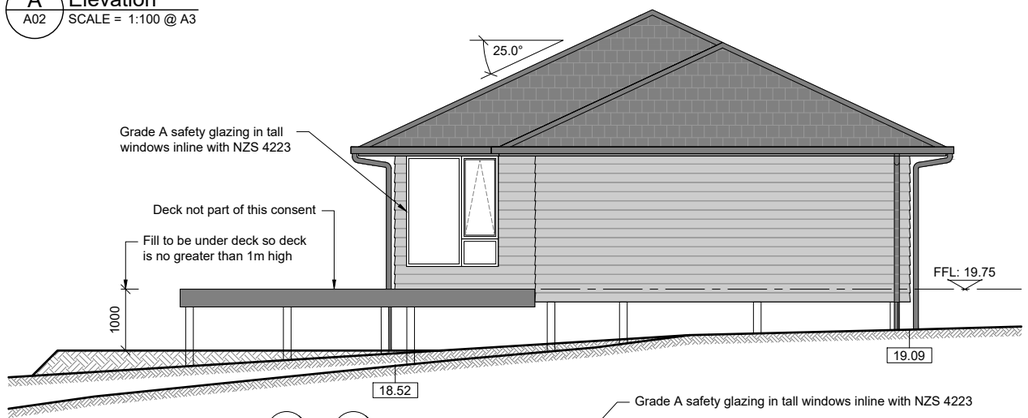
FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

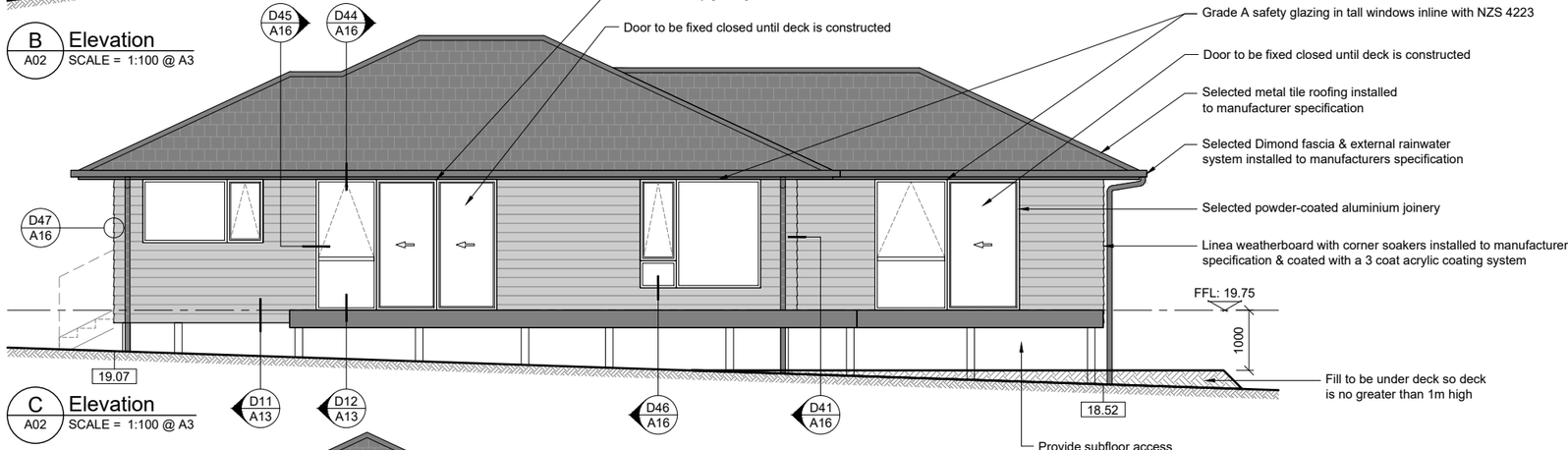
Fixings within 600mm of finished ground level to be 304 stainless steel.
Exposed fixings to be type 304 stainless steel.
Sheltered fixings to be type 304 stainless steel.
Closed in nail plates in roof space to be continuous coated galvanized steel.
Closed in wire dogs and bolts to be hot dipped galvanized steel.
All other closed structural fixings to be mild steel (uncoated non galvanized)



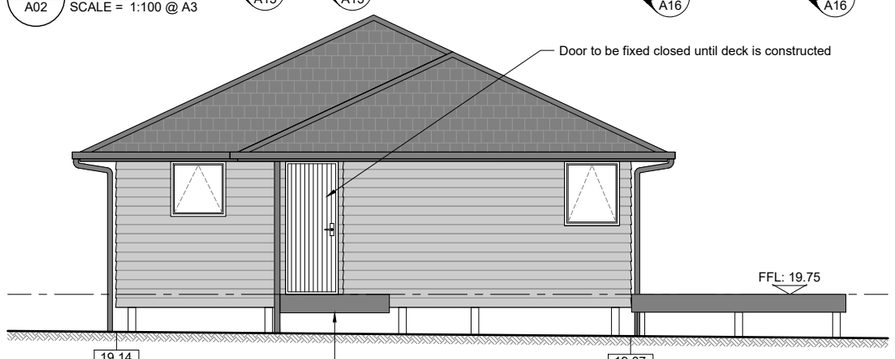
A02 **A Elevation**
SCALE = 1:100 @ A3



B02 **B Elevation**
SCALE = 1:100 @ A3



C02 **C Elevation**
SCALE = 1:100 @ A3



D02 **D Elevation**
SCALE = 1:100 @ A3

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.

Exposed fixings to be type 304 stainless steel.

Sheltered fixings to be type 304 stainless steel.

Closed in nail plates in roof space to be continuous coated galvanized steel.

Closed in wire dogs and bolts to be hot dipped galvanized steel.

All other closed structural fixings to be mild steel (uncoated non galvanized)

SPECIFICATIONS	
Cladding Type	Linea Weatherboard
Stud Height	2.4m
Roofing Type	Steel Tile
Roof Pitch	25°
Joinery	Aluminium
Wind Zone	Very high
Earth Quake Zone	1

RISK MATRIX					
Risk Factor	L	M	H	VH/EH	Score
A. Wind Zone	0	0	1	2	2
B. Number of Storeys	0	1	2	4	0
C. Roof / Wall Intersection	0	1	3	5	0
D. Eave Width	0	1	2	5	1
E. Envelope Complexity	0	1	3	6	0
F. Deck Design	0	2	4	6	0
	Total				3

NOTE:

1. All heights shown are existing ground heights.
2. All external linings to be installed to manufacturers instructions, refer to separate detail sheet for cladding details & notes.
3. All windows and doors double glazing low E Xcel with thermal break.
4. Grade A safety glazing in bathrooms & tall windows and sliders inline with NZS 4223.

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Project Title
Lionel Ward
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Taipa
Lot 2 DP 314261

Sheet Title
Elevations

Drawn 21 January 2025

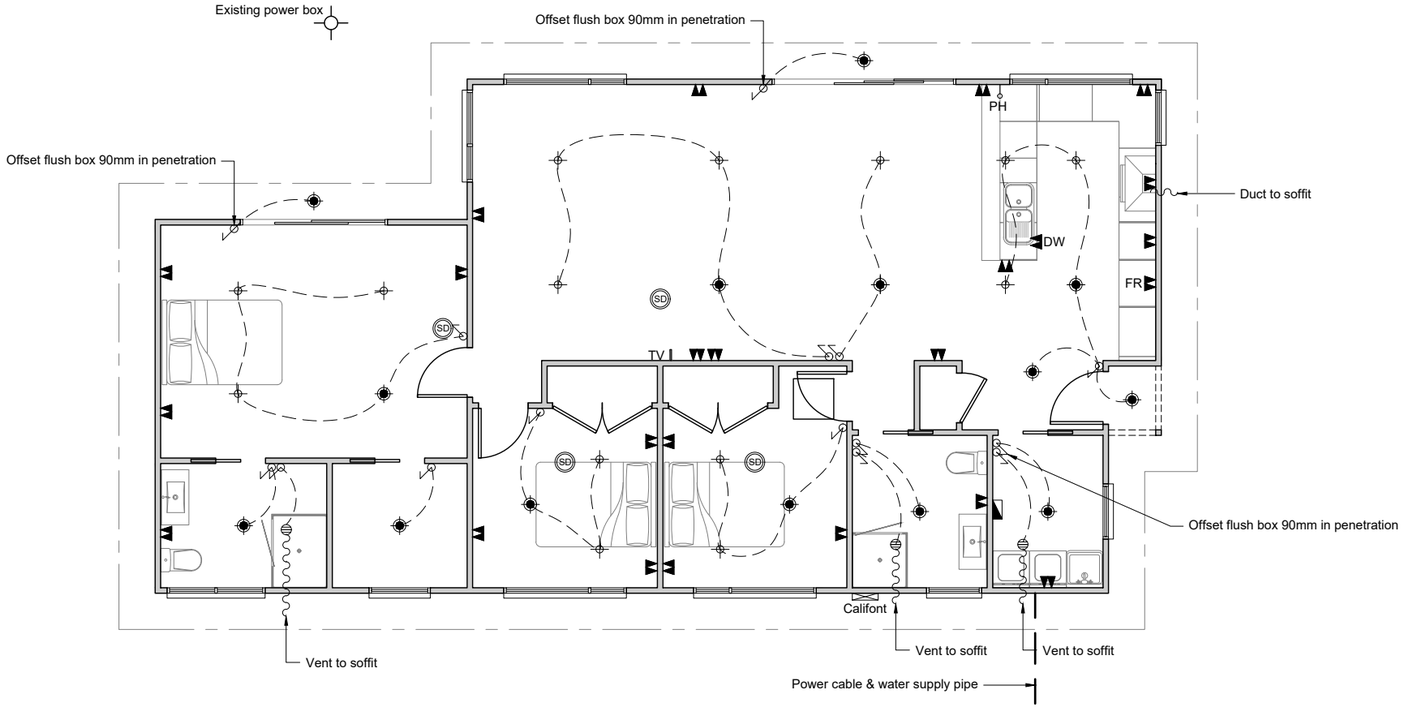
Project No 5296

Rev BC-S-2

Sheet A03

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m



NOTE:

1. All electrical work to by a registered Electrician to comply with Electricity regulations, NZ Standards & NZBC.
2. Electrician to supply electrical "Certificate of Compliance" on completion.
3. Electrical layout schematic only. All electrical & lighting fixtures & fittings are shown indicative - not to scale. To be confirmed on site with owner prior to installation.
4. All power points to be 350mm above FFL and 200mm above bench top and fixed horizontally unless specified.
5. All switches to be 1200mm above FFL and fixed vertically (up/down).
6. Power point for rangehood to be in ceiling space
7. Electrician to check bracing plan and offset flush boxes 90mm if penetration occurs.
8. External power points and electrical Fittings to be IP rated to provide dust and weather protection to comply with NZ Standards.
9. "Type 1" Smoke Detectors to be installed within 3m of bedrooms on escape paths to comply with NZBC C/AS1 & F7/AS1.
10. All recessed light fixtures to be CA rated to comply with AS/NZS 605982.2 (Insulation to comply with AS/NZS 60695.11.5)

LEGEND

SD	4	Smoke detector
	14	Primary LED down Light
	14	Secondary LED down light
	3	Mechanical vent, vented to exterior
	24	double point
TV	1	TV outlet
PH	1	Phone outlet
	1	Meter board/Distribution board

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Project Title
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Lot 2 DP 314261

Sheet Title
Electrical Plan

Drawn 21 January 2025

Project No 5296

Rev BC-S-2

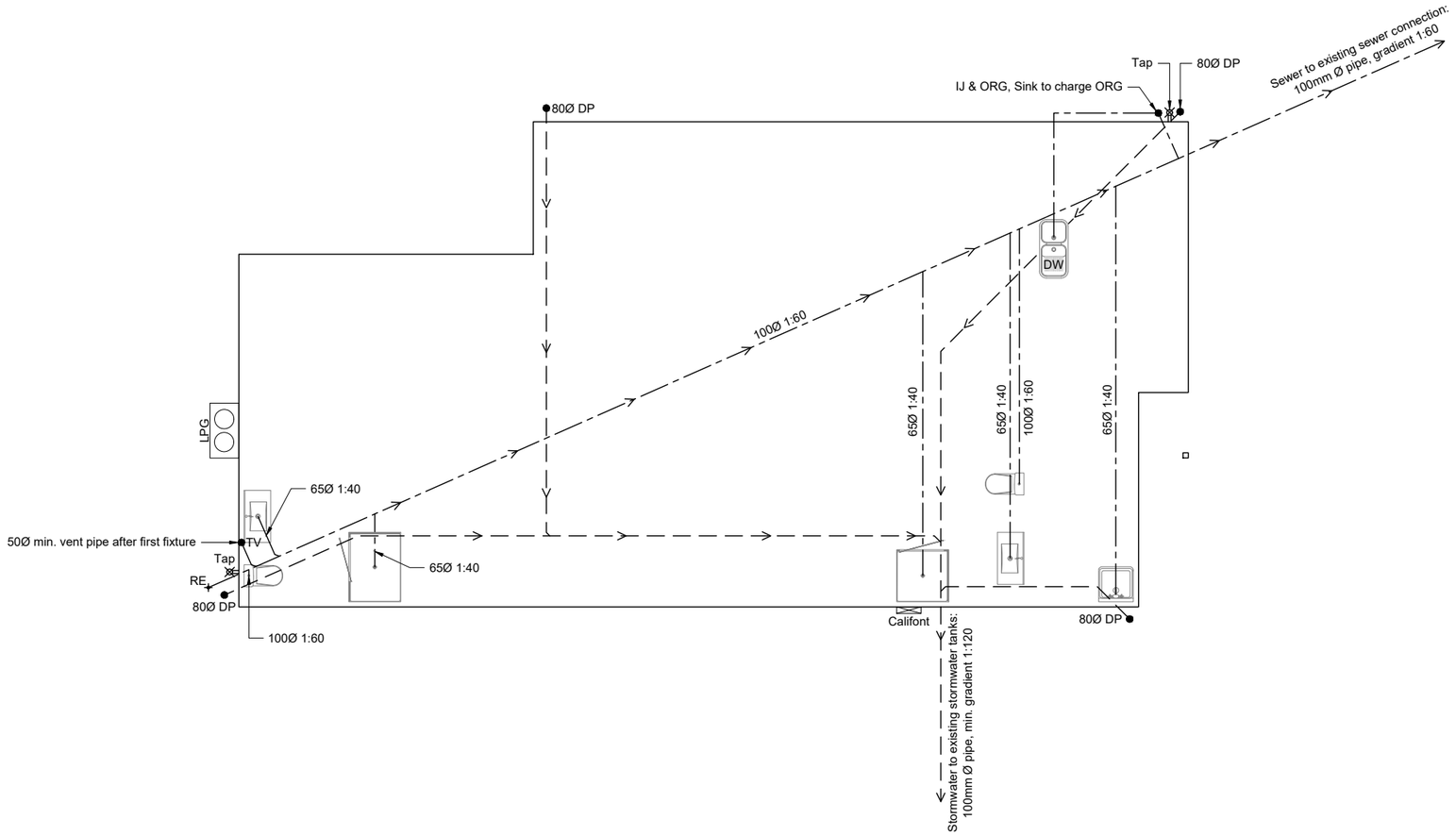
Sheet A04

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m

NOTE:

1. All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.
2. All drainage is diagrammatical, drainlayer to determine on site drainage layout and provide asbuilt plan when complete.
3. Number of downpipes required as per NZBC E1/AS1 1 x 74mmØ downpipe per 70m² roof plan area.
4. Stormwater: 100mm Ø UPVC pipe, minimum gradient 1:120.
5. All drainage to comply with AS/NZS 3500 & NZBC G13/AS1.
6. Provide seismic restraints & temperature valve to hot water cylinder as per NZBC G12/AS1. Refer to separate sheet for details.



Waste Pipe Gradients (min)		
40Ø	1:40 Minimum Gradient	4DU
65Ø	1:40 Minimum Gradient	21DU
100Ø	1:60 Minimum Gradient	115DU
Waste Pipe & Discharge Units		
40Ø	Hand basin	1DU
40Ø	Kitchen Sink	3DU
40Ø	Dishwasher	3DU
40Ø	Laundry Tub	3DU
40Ø	Washing Machine	5DU
40Ø	Shower	2DU
40Ø	Bath	4DU
100Ø	WC Pan	4DU
Drainage Pipe Gradient		
65Ø	1:40 Minimum Gradient	25DU
85Ø	1:60 Minimum Gradient	61DU
100Ø	1:60 Minimum Gradient	205DU
150Ø	1:60 Minimum Gradient	1310DU
● TV	Terminal Vent	
● ORG	Overflow Relief Gully	
+ RE	Rodding Eye	
— – ——— – —	Drainage - Waste Pipe	
– — — — — –	100mm Ø Stormwater Pipe	

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Project Title
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Sheet Title
Drainage Plan

Drawn 21 January 2025

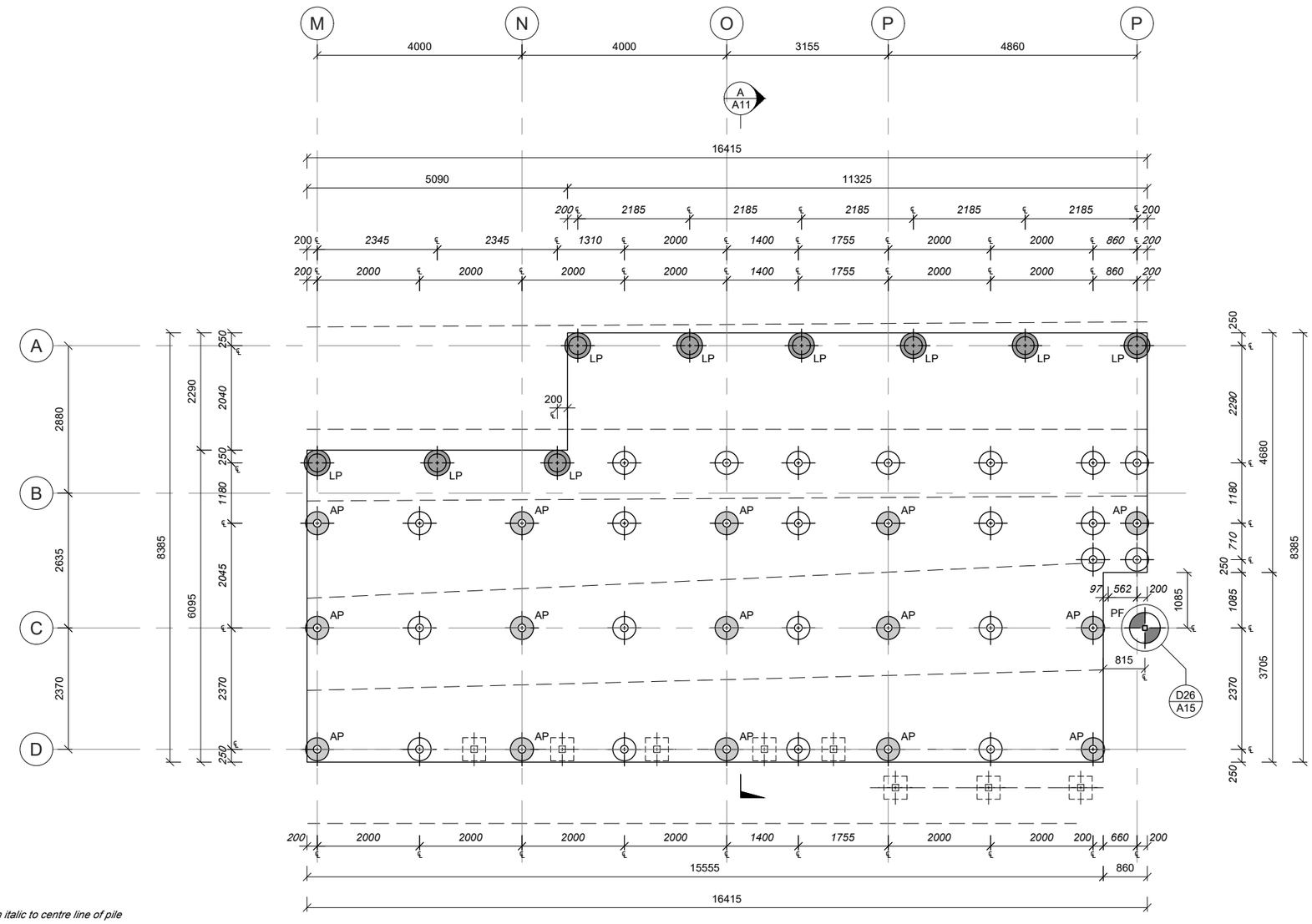
Project No 5296

Rev BC-S-2

Sheet A05

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m



DIMENSION NOTE:

All dimensions shown in italic to centre line of pile

LEGEND

Existing concrete pile foundations from previous house to be avoided

Ordinary Piles:
150 ND Poles cast in 450 diameter bored concrete pile set minimum 0.9m below FGL and min. 0.3m into very stiff natural ground, which ever is deeper.

AP Anchor Piles:
150 ND Poles cast in 450 diameter bored concrete pile set minimum 2.0m below FGL and min. 0.3m into very stiff natural ground, which ever is deeper.

LP Leading Edge Soil Creep Piles:
350 HD Poles cast in 500 diameter bored concrete pile set minimum 4.5m below FGL

PF 90 x 90 H3.2 SG8 Timber post cast in 600 diameter bored concrete pile set minimum 9.0m below FGL and min. 0.3m into very stiff natural ground, which ever is deeper.

ENGINEERED FOUNDATIONS

Plans to be read in conjunction with engineers mark up plans & calculations

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.
Exposed fixings to be type 304 stainless steel.
Sheltered fixings to be type 304 stainless steel.
Closed in nail plates in roof space to be continuous coated galvanized steel.
Closed in wire dogs and bolts to be hot dipped galvanized steel.
All other closed structural fixings to be mild steel (uncoated non galvanized)

FOUNDATION PLAN NOTES:

1. All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.
2. Check all existing drain locations and all dimensions on site before construction.
3. Concrete to be a minimum of 20MPa at 28 days unless specifically stated.
4. Local Authority should inspect the earthworks, building platform construction and foundation, prior to the concrete being poured to ensure that the design criteria has been met.

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Project Title
Lionel Ward
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Lot 2 DP 314261

Sheet Title
Foundation Plan

Drawn 21 January 2025

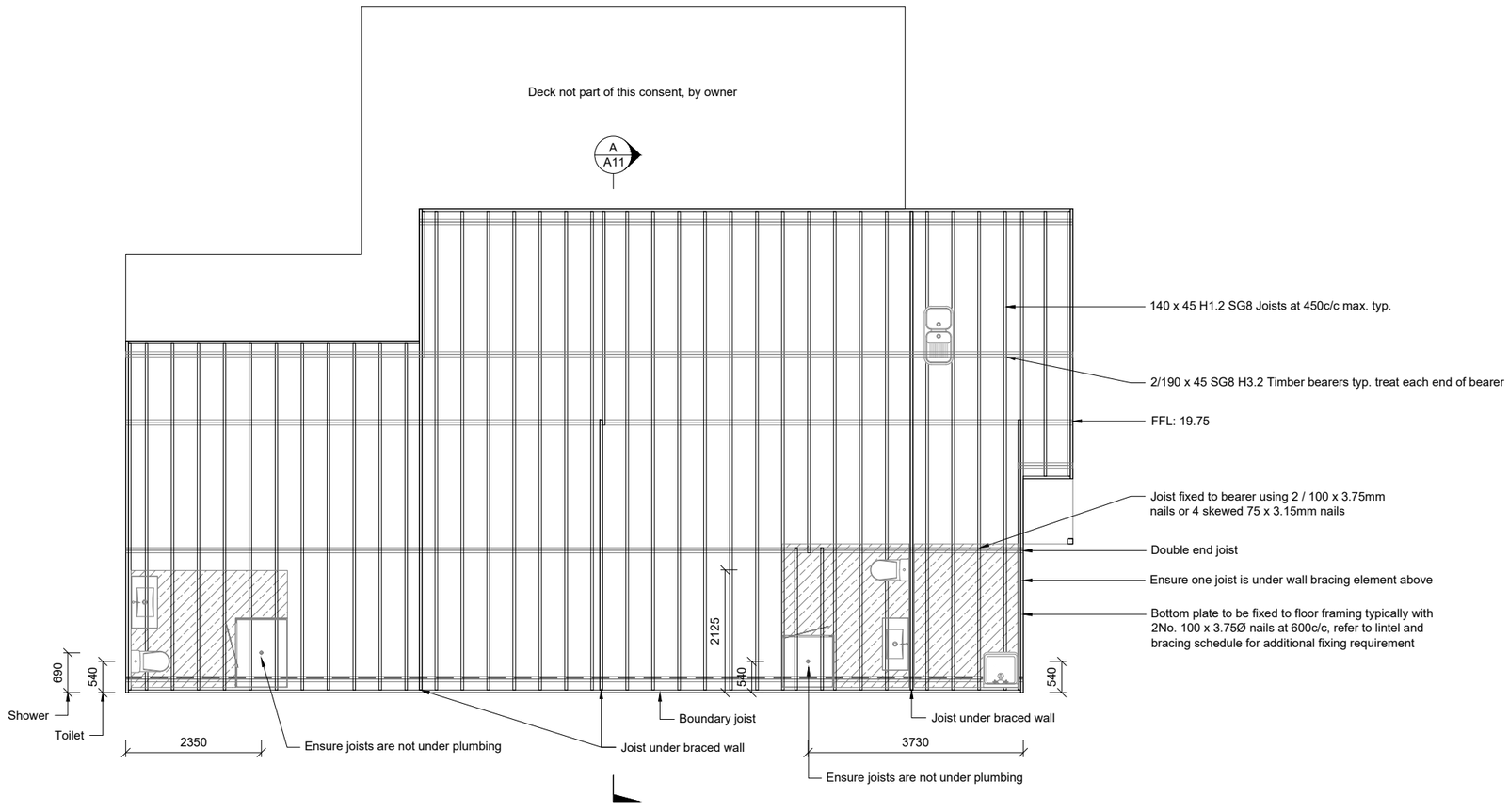
Project No 5296

Rev BC-S-2

Sheet A06

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m



JOIST LAYOUT PLAN NOTES:

1. Double joist to be used under all load bearing walls. A single joist to be located under Non-loadbearing walls containing bracing elements. Non-loadbearing walls without bracing elements to be located no more than 150mm from a single joist.
2. Solid blocking between joists over supports at 1.8m c/c max. & through mid span where spans are greater than 2.5m c/c.
3. 20mm Particle board or Plywood flooring to all non-wet areas nail or screw fixed.
4. Hardies Secura or H3.2 ply flooring installed to manufacturers instructions with H1.2 Joists.
5. Expol R2.5 insulation between each joist.
6. Provide subfloor access, refer to elevations.

LEGEND

Hardies Secura interior flooring with H1.2 Joists

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

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Project Title
Lionel Ward
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Lot 2 DP 314261

Sheet Title
Subfloor Plan

Drawn 21 January 2025

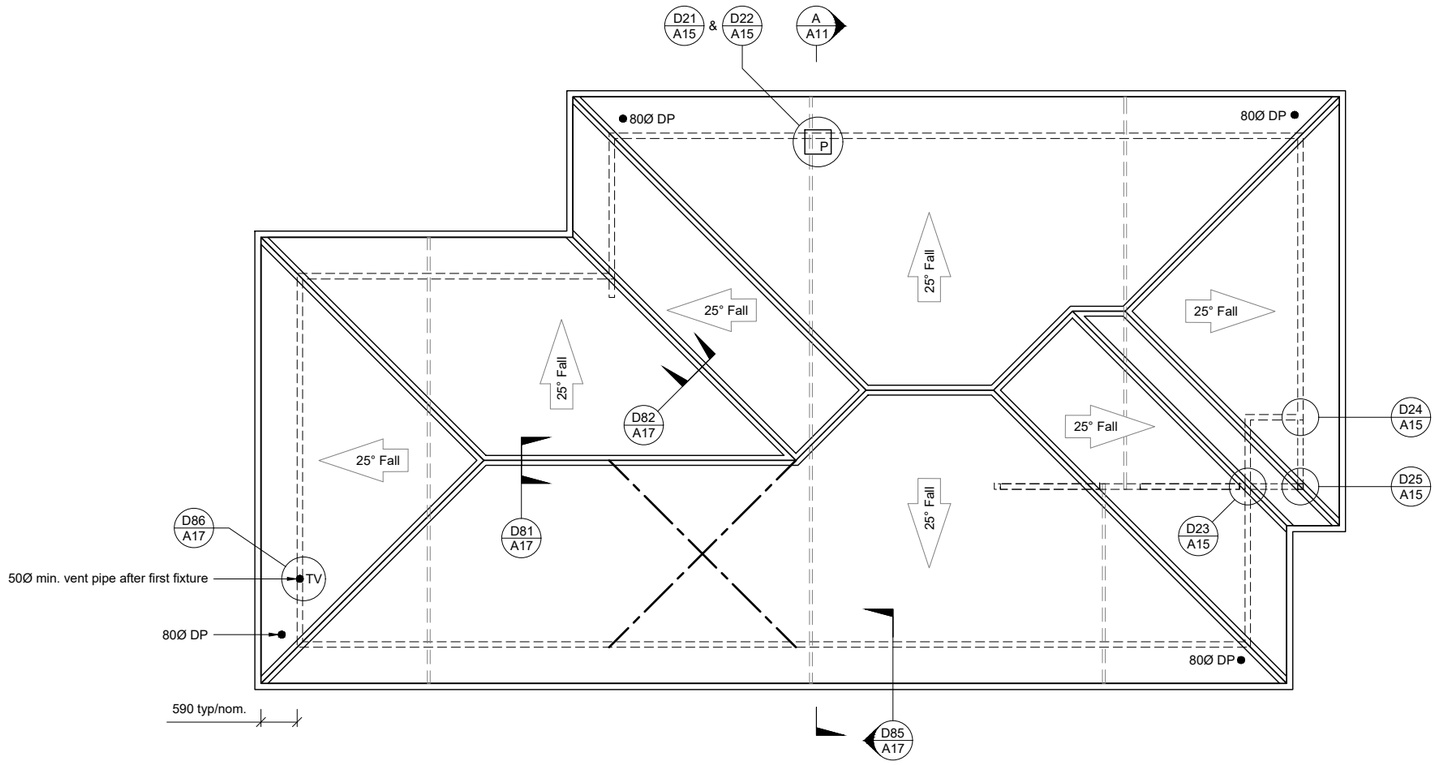
Project No 5296

Rev BC-S-2

Sheet A07

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m



NOTE:

Unless specifically noted all internal loadbearing walls less than 10KN, so no thickening required

NOTE:

1. All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.
2. Kitchen extractor hood to be vented to exterior.
3. Roofing to be installed to New Zealand Metal Roofing Code of Practice and in accordance with manufacturers installation instructions.
4. Refer to Eave detail for stud, lintel and soffit framing heights.
5. Precut manufacturer to provide truss and lintel fixings and Producer Statement.
6. All drainage is diagrammatical, drainlayer to determine on site drainage layout and provide asbuilt plan when complete.
7. Number of downpipes required as per NZBC E1/AS1 1 x 74mmØ downpipe per 70m² roof plan area.
8. Stormwater: 100mm Ø UPVC pipe, minimum gradient 1:120.
9. Selected Dimond Fascia & Continuous Spouting with 80Ø PVC downpipe installed to manufactures specifications

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.
Exposed fixings to be type 304 stainless steel.
Sheltered fixings to be type 304 stainless steel.
Closed in nail plates in roof space to be continuous coated galvanized steel.
Closed in wire dogs and bolts to be hot dipped galvanized steel.
All other closed structural fixings to be mild steel (uncoated non galvanized)

LEGEND

- Roof Line
- Load bearing stud
- Girder truss
- TV● Terminal vent
- Lumberlok strip brace both ways in roof plane fixed using 5No. 30 x 3.15mm nails each end and 1No. 30 x 3.15mm nails where brace crosses truss
- P Fixings under truss point load as follows:

Stud to bottom plate connection use GIB HandiBrac fixed using 8 Tek screws & 1 Bowmac screw bolt.

Stud to top plate connection to Mitek internal loadbearing 16kN connection: Lumberlok CPC 80 each side (16kN pair) with Type 17 - 14g x 35 mm screws + 8Ø product nails

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Project Title
Lionel Ward
22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Title
Roof Plan

Drawn 21 January 2025

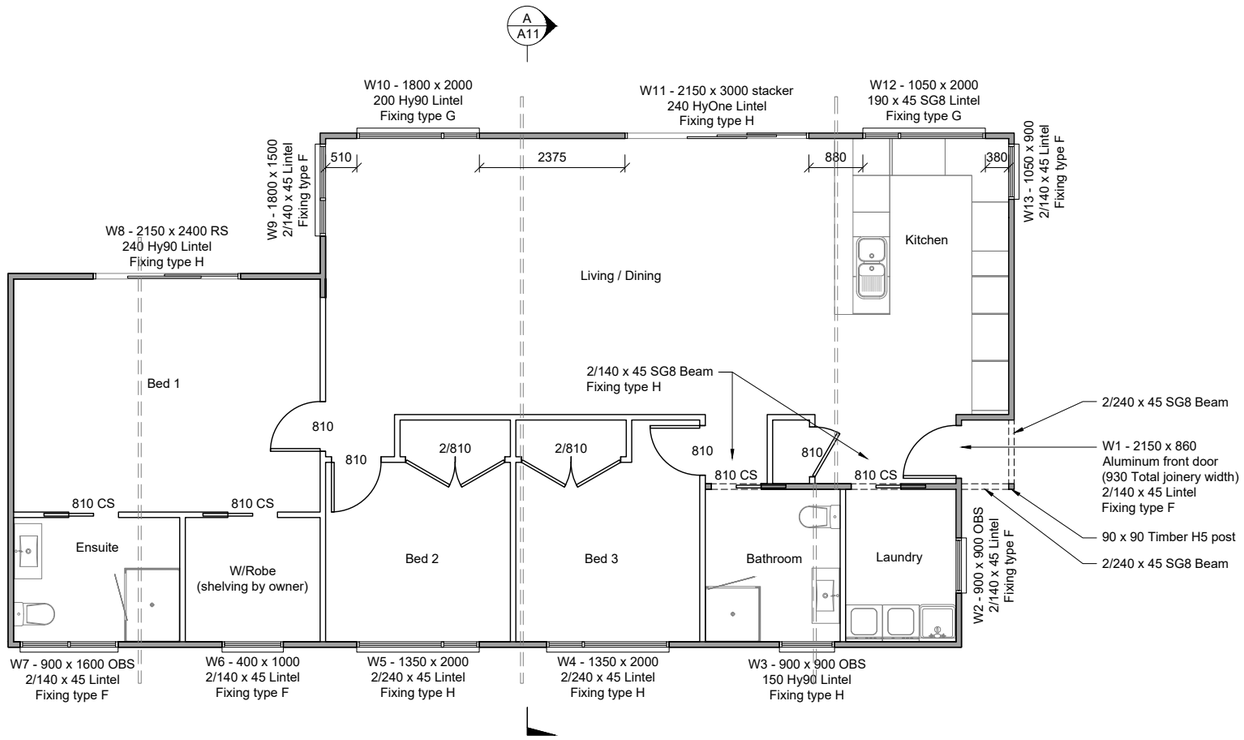
Project No 5296

Rev BC-S-2

Sheet A08

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m



NOTE:

1. All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.
2. Refer to NZS3604:2011 Section 4 for durability requirements.
2. Do not scale from drawings.
3. Check all dimensions before construction commences.
4. Refer to Eave detail for stud, lintel and soffit framing heights.
5. Precut manufacturer to provide truss and lintel fixings and Producer Statement.
6. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC clause E2/AS1.
7. Building underlay must comply with acceptable solution NZBC clause E2/AS1 and NZS 3604.
8. Sill support bars conforming to BRANZ evaluation method EM6 to be installed to all windows.
9. Flashing tape must have proven compatibility with the selected building underlay and other materials with which it comes into contact as per Table 21 of NZBC clause E2/AS1.
10. As per NZBC 9.1.10.8: Install windows & doors using pairs of min 75x3.15 jolt head nails through reveals into surrounding frame at
    a) 450mm max c/c along sills, jambs & heads
    b) 150mm max from ends of reveal Install packer between reveals & framing at all fixing points, except between head reveals & lintels.
11. All window joinery to comply with NZS 4211:2008
12. All glazing to comply with NZS 4223
13. All window and door openings to be checked on site prior to manufacture, any discrepancies to be reported to GJ Gardner Homes Ltd.
14. All internal doors to be offset from return walls by 90mm minimum.
15. Where studs exceed 450mm c/c install polypropylene tape horizontally at 300mm c/c over building wrap.

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.
Exposed fixings to be type 304 stainless steel.
Sheltered fixings to be type 304 stainless steel.
Closed in nail plates in roof space to be continuous coated galvanized steel.
Closed in wire dogs and bolts to be hot dipped galvanized steel.
All other closed structural fixings to be mild steel (uncoated non galvanized)

LEGEND

90 x 45 SG8 H1.2 Timber framing to external load bearing walls at 400 c/c
90 x 45 SG8 H1.2 Timber framing to internal load bearing walls at 600 c/c

90 x 45 SG8 H1.2 Timber Framing non-load bearing walls at 600 c/c

Girder truss

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Project Title
Lionel Ward
22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Title
Framing & Lintel Plan

Drawn 21 January 2025

Project No 5296

Rev BC-S-2

Sheet A09

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m

NOTE:

1. All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.
2. All bracing elements to be installed to manufacturers specifications.
3. Aqualine GIB to all bathroom walls.

WALL BRACING

GS1-N: 10mm GIB one face Min. 0.4m long, no hold downs.

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Lionel Ward
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Taipa
Lot 2 DP 314261

Sheet Title
Bracing Plan

Drawn 21 January 2025

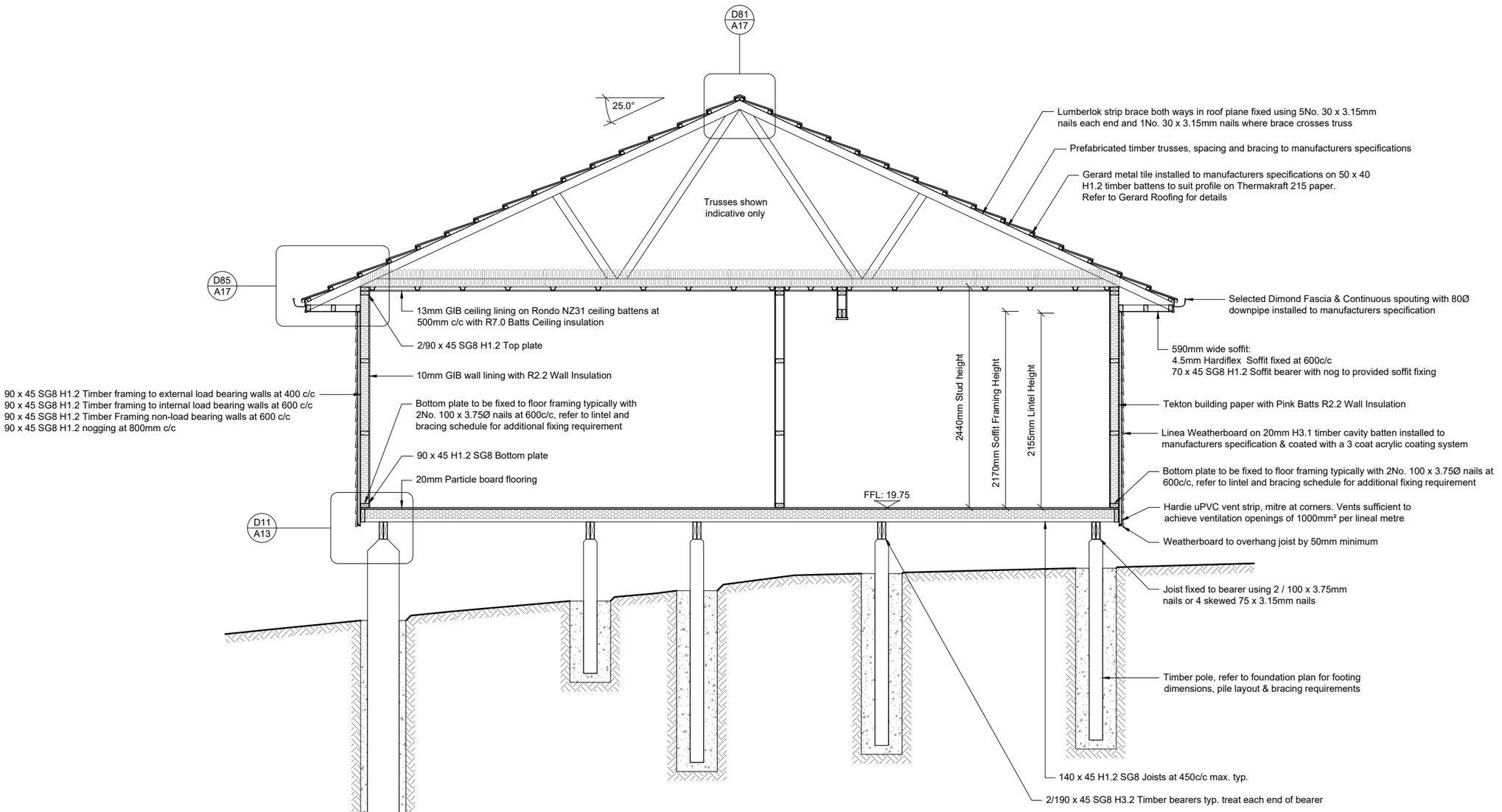
Project No 5296

Rev BC-S-2

Sheet A10

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m



FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.

Exposed fixings to be type 304 stainless steel.

Sheltered fixings to be type 304 stainless steel.

Closed in nail plates in roof space to be continuous coated galvanized steel.

Closed in wire dogs and bolts to be hot dipped galvanized steel.

All other closed structural fixings to be mild steel (uncoated non galvanized)

SECTION NOTES:

1. Do not scale from drawings.
2. Refer to Engineers notes for concrete MPa & other details.
3. Plans to be read in conjunction with Engineers foundation design & PS1.
4. Local Authority should inspect the earthworks, building platform construction and foundation, prior to the concrete being poured to ensure that the design criteria has been met.
5. Fill to be compacted at 150mm intervals. Do not build on uncertified fill. All wet areas to be provided with impervious linings as per NZBC E3/AS1.
6. All wall framing typically H1.2 treated unless specifically stated.
7. Refer to Eave detail for stud, lintel and soffit framing heights.
8. Additional nogs to be installed at framing stage to allow for towel rails, wardrobe & fixed shelves, WC cistern, toilet roll holders & wall mounted extractors.
9. Refer to Framing & Lintel Plan for lintel dimensions.
10. All wet areas to be provided with impervious linings as per NZBC E3/AS1.
11. Aqualine GIB to all bathroom walls.
12. Precut manufacturer to provide truss and producer statement.
13. Where studs exceed 450mm c/c install polypropylene tape horizontally at 300mm c/c over building wrap.
14. Domestic smoke detectors to be installed in accordance with C AS1 & F7 ensure placement within 3m of bedroom doors.

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Project Title
Lionel Ward
22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Title
Section A

Drawn 21 January 2025

Project No 5296

Rev BC-S-2

Sheet A11

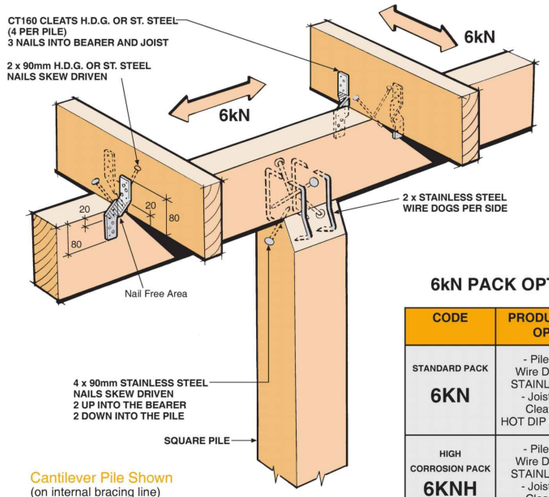
Scale (A3 Original) 1: 50

0.5 0.25 0 0.5 1 m

6kN PILE FIXING

FOR CANTILEVER PILES

- ★ The 6kN Pile Fixing must be installed in accordance with this brochure
- ★ Auckland University Tested. Test Ref. 4613
- ★ All subfloor construction must be in accordance with NZS 3604:2011
- ★ NZS 3604 requires lines of lateral support to floor joists within 300mm of bearer or bracing lines, refer to Clause 7.1.2
- ★ Joists deeper than 150mm require solid nogging over cantilever pile

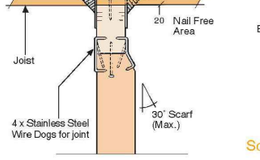


Cantilever Pile Shown
(on internal bracing line)

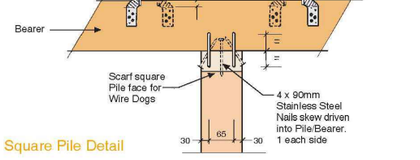
6kN PACK OPTIONS

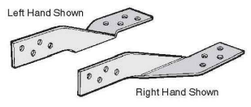
CODE	PRODUCT FINISH OPTIONS
STANDARD PACK **6KN**	- Pile to Bearer Wire Dogs & Nails STAINLESS STEEL - Joist to Bearer Cleats & Nails HOT DIP GALVANISED
HIGH CORROSION PACK **6KNH**	- Pile to Bearer Wire Dogs & Nails STAINLESS STEEL - Joist to Bearer Cleats & Nails STAINLESS STEEL

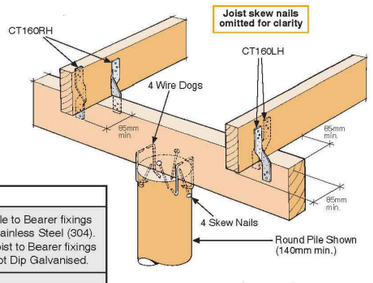
★ See Over For Corrosion Table.



Square Pile Detail







CORROSION HAZARD USE TABLE

Standard Pack (6KN) - Zones B & C - If Joist to Bearer Fixings ABOVE 600mm from Ground level	Pile to Bearer fixings Stainless Steel (304). Joist to Bearer fixings Hot Dip Galvanised.
High Corrosion Pack (6KNH) - Zone D - All Fixings BELOW 600mm from Ground level	All items Stainless Steel (304).

6kN Joint Fixing Schedule

PILE TO BEARER	- Wire Dog Staples (4 per joint) Stainless Steel - 4 x 90mm Skew Nails (1 per face) Stainless Steel
JOIST TO BEARER	- CT160 Cleats (4 per pile) 160mm long - 3 Nails per Cleat into Joist - 3 Nails per Cleat into Bearer - 2 Skew Nails 90mm (1 per side)
NAILS	- 24 x 45mm x 3.55 dia. Spiral Nails (for Joist to Bearer fixings) - 4 x 90mm x 4 dia. St. Steel Nails (6KN Pack only) - 8 x 90mm x 4 dia. St. Steel Nails (6KNH Pack only)

6kN Pile Set Contents

Each set represents 1 x 6kN Pile Fixing
(packed 10 sets per carton)
4 x Wire Dog Staples Stainless Steel
4 x CT160 Cleats
24 x 45mm x 3.55 dia. Spiral Nails
90mm St. Steel Nails to suit 4 - 6KN pack
8 - 6KNH pack

Refer front page for Product Finish Options

External Bracing Line

Bearer located centrally on Pile

Pile

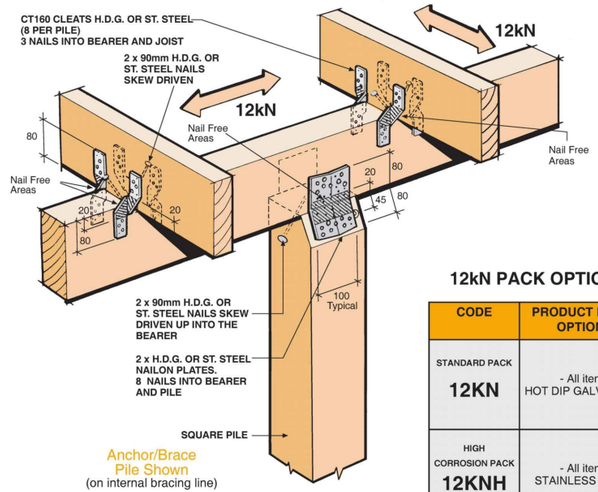
90mm H.D.G. Nails not included.

Wire Dog leg to be bent on site to allow each prong to enter each timber surface at 90°

12kN PILE FIXING

FOR BRACED PILES OR ANCHOR PILES

- ★ The 12kN Pile Fixing must be installed in accordance with this brochure
- ★ Auckland University Tested. Test Ref. 4613
- ★ All subfloor construction must be in accordance with NZS 3604:2011
- ★ NZS 3604 requires lines of lateral support to floor joists within 300mm of bearer or bracing lines, refer to Clause 7.1.2
- ★ Joists deeper than 150mm require solid nogging over braced or anchor pile



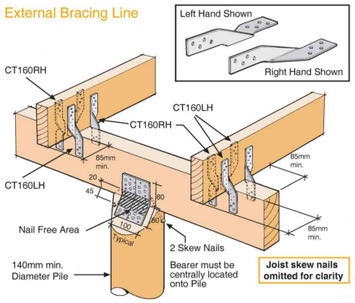
Anchor/Brace
Pile Shown
(on internal bracing line)

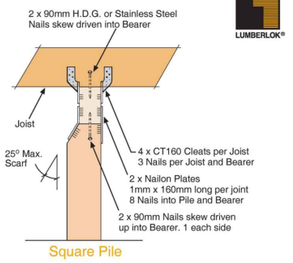
12kN PACK OPTIONS

CODE	PRODUCT FINISH OPTIONS
STANDARD PACK **12KN**	- All items HOT DIP GALVANISED
HIGH CORROSION PACK **12KNH**	- All items STAINLESS STEEL

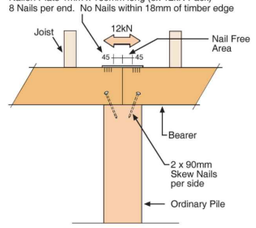
★ See Over For Corrosion Table.

External Bracing Line





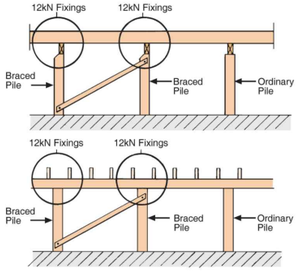
Square Pile



12kN Bearer Splice
Clause 6.12.7.2
NZS 3604:2011

CORROSION HAZARD USE TABLE

Standard Pack (12KN) - Zones B & C - All Fixings ABOVE 600mm from Ground level	All items Hot Dip Galvanised.
High Corrosion Pack (12KNH) - Zone D - All Fixings BELOW 600mm from Ground level	All items Stainless Steel (304).



Sample Subfloor Elevations
12kN Fixing - Pile to Bearer
- Joists to Bearer

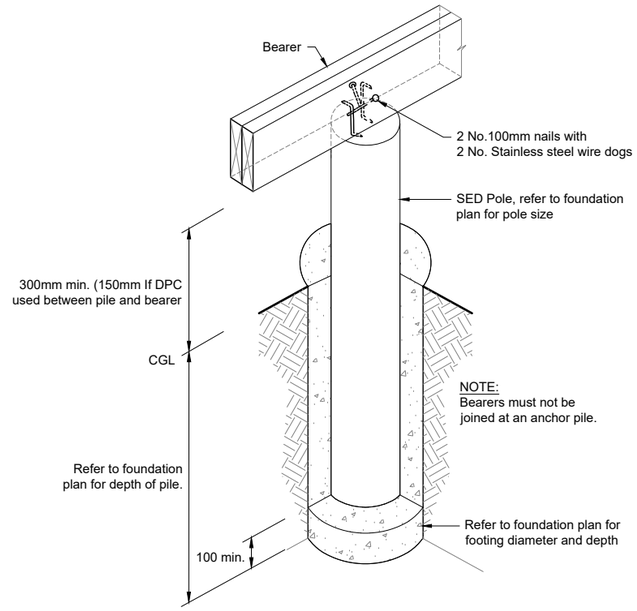
12kN Joint Fixing Schedule

PILE TO BEARER	- Nailon Plate (2 per joint) 1mm x 100mm (Typical) x 160mm long - 8 Nails per Plate into Pile - 8 Nails per Plate into Bearer - 2 Skew Nails 90mm (1 per face)
JOIST TO BEARER	- CT160 Cleats (4 per Joist) 160mm long - 3 Nails per Cleat into Joist - 3 Nails per Cleat into Bearer - 2 Skew Nails 90mm (1 per side)
NAILS	- 80 x 45mm x 3.55 dia. Spiral Nails - 6 x 90mm x 4 dia. St. Steel Nails (12KNH Pack only)

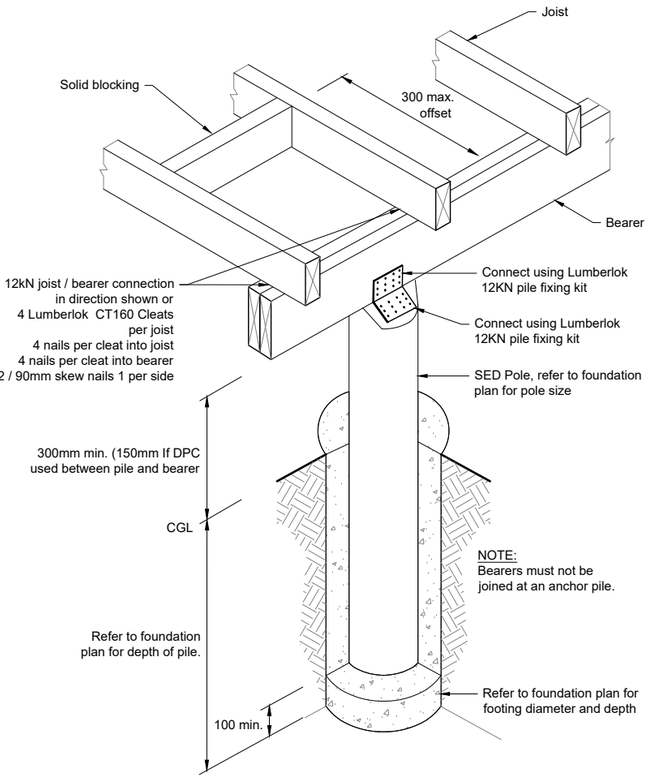
12kN Pile Set Contents

Each set represents 1 x 12kN Pile Fixing
(packed 4 sets per carton)
2 x Nailon Plates 160mm long
8 x CT160 Cleats
80 x 45mm x 3.55 dia. Spiral Nails
90mm x 4 dia. St. Steel Angular Groove 6 - 12KNH Pack

Refer front page for Product Finish Options



D01 - Ordinary Pile Detail
SCALE = NTS



D02 - Anchor Pile Detail
SCALE = NTS

NOTE:

1. Check all existing drain locations and all dimensions on site before construction.
2. Concrete to be a minimum of 20MPa at 28 days unless specifically stated.
3. Local Authority should inspect the earthworks, building platform construction and foundation, prior to the concrete being poured to ensure that the design criteria has been met.
4. All exposed fixing or fixings within 600mm of finished ground level to be stainless steel.
5. Solid blocking between joists through mid span and at 1.8m max c/c over joist support.

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.
Exposed fixings to be type 304 stainless steel.
Sheltered fixings to be type 304 stainless steel.
Closed in nail plates in roof space to be continuous coated galvanized steel.
Closed in wire dogs and bolts to be hot dipped galvanized steel.
All other closed structural fixings to be mild steel (uncoated non galvanized)

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Lionel Ward
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Taipa
Lot 2 DP 314261

Sheet Title
Subfloor Details

Drawn 21 January 2025

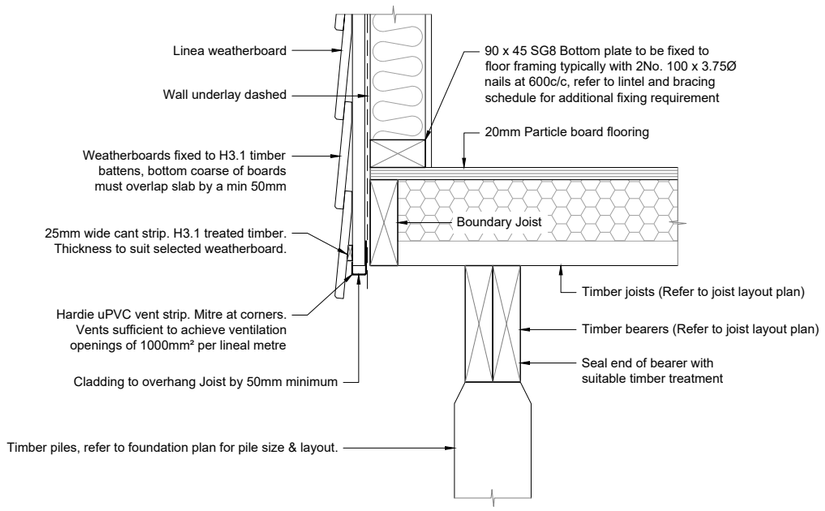
Project No 5296

Rev BC-S-2

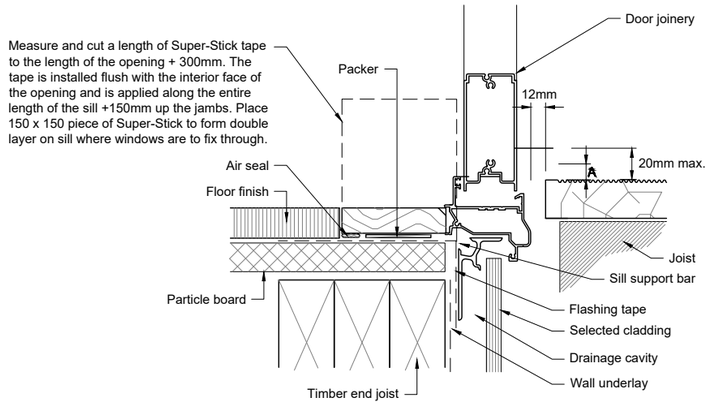
Sheet A12

Scale (A3 Original) 1: 20

0.2 0.1 0 0.2 0.4 m



D11 A03 Linea Weatherboard to Subfloor Detail
SCALE = 1:10 @ A3



D12 A03 Door Sill at Timber Deck Detail
SCALE = 1:5 @ A3

NOTE:

1. All window joinery to comply with NZS 4211:2008. All glazing to comply with NZS 4223.3:2016.
2. Flashing materials must be selected based on environmental exposure, refer to NZS 3604:2012 & NZBC E2/AS1 Table 20.
3. Building underlay must comply with acceptable solution NZS 3604:2012 & NZBC E2/AS1.
4. Sill support bars conforming to BRANZ evaluation method EM6 to be installed to all windows.
5. Flashing tape must have proven compatibility with the selected building underlay and other materials with which it comes into contact as per NZBC E2/AS1 Table 21.
6. As per NZBC E2/AS1 Section 9.1.10.8: Install windows & doors using pairs of min 75x3.15 jolt head nails through reveals into surrounding frame at:
   a) Maximum 450mm max c/c along sills, jambs & heads.
   b) Maximum 150mm max from ends of reveal Install packers between reveals & framing at all fixing points, except between head reveals & lintels.
7. All window and door openings to be checked on site prior to manufacture, any discrepancies to be reported to Designer.
8. All external linings to be installed to manufacturers instructions, refer to separate detail sheet for cladding details & notes.
9. Details to be read in conjunction with manufacturers specifications and installation requirements.

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.
Exposed fixings to be type 304 stainless steel.
Sheltered fixings to be type 304 stainless steel.
Closed in nail plates in roof space to be continuous coated galvanized steel.
Closed in wire dogs and bolts to be hot dipped galvanized steel.
All other closed structural fixings to be mild steel (uncoated non galvanized)

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22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Title
Threshold Details

Drawn 21 January 2025

Project No 5296

Rev BC-S-2

Sheet A13

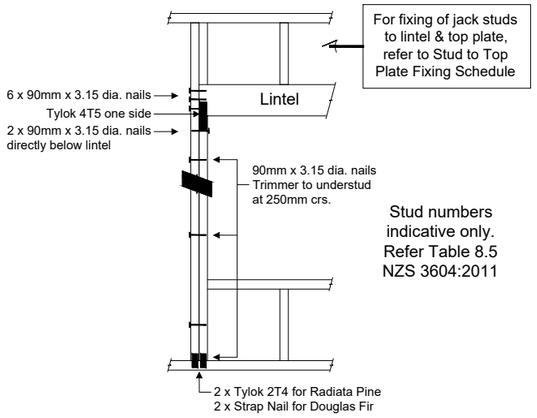
Scale (A3 Original) 1: 10

0.1 0.05 0 0.1 0.2 m

LINTEL FIXING OPTIONS

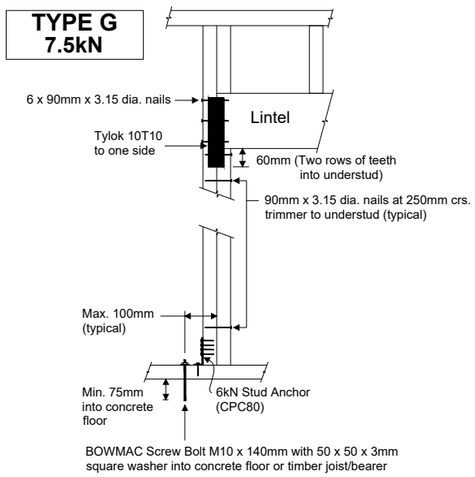
LUMBERLOK

TYPE F 4.0kN

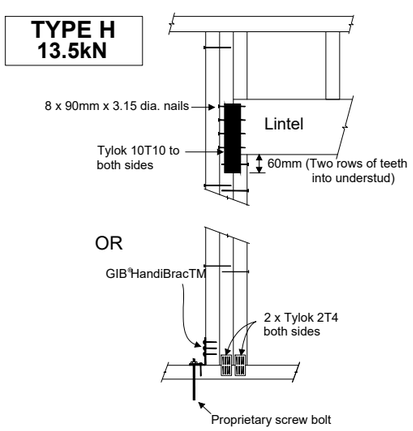


Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

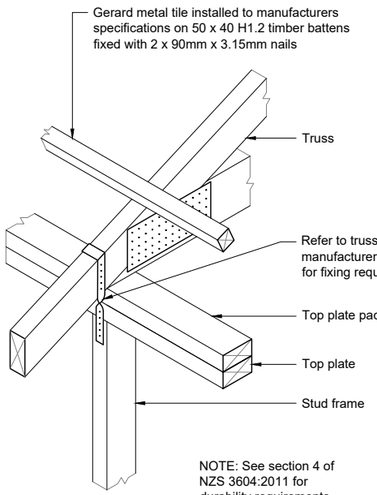
TYPE G 7.5kN



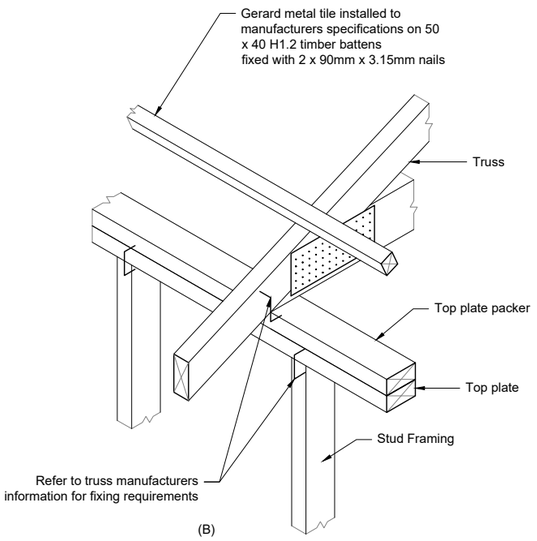
TYPE H 13.5kN



D15 - Lintel Fixing Details
SCALE = NTS



(A)

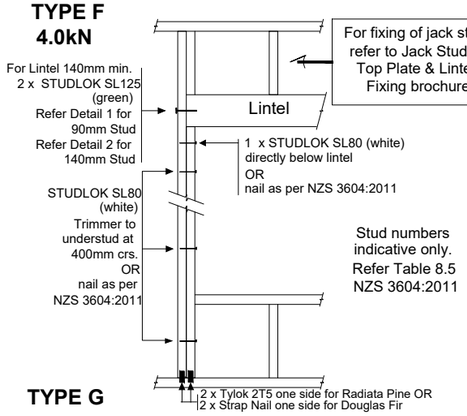


(B)

D16 - Truss Top Plate Connection
SCALE = NTS

STUDLOK LINTEL FIXING OPTIONS FOR ON-SITE

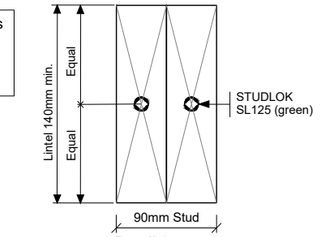
TYPE F 4.0kN



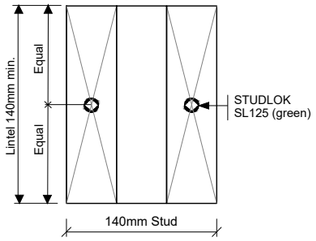
Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

TYPE G

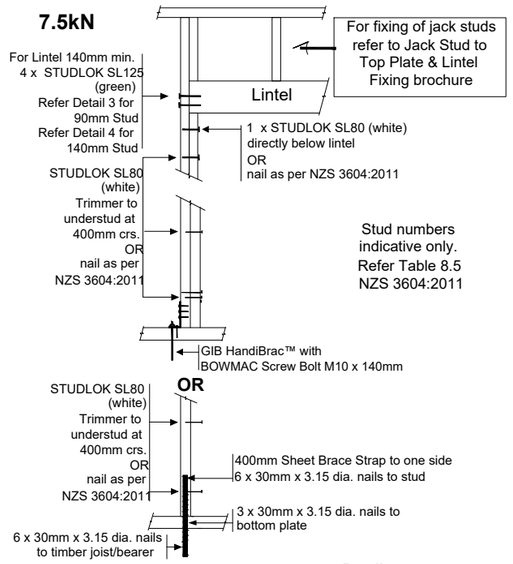
Detail 1



Detail 2

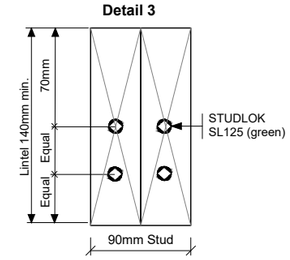


7.5kN

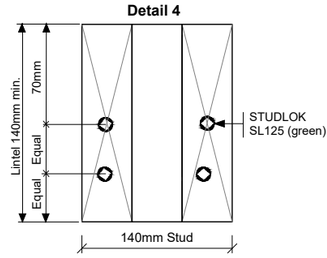


Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

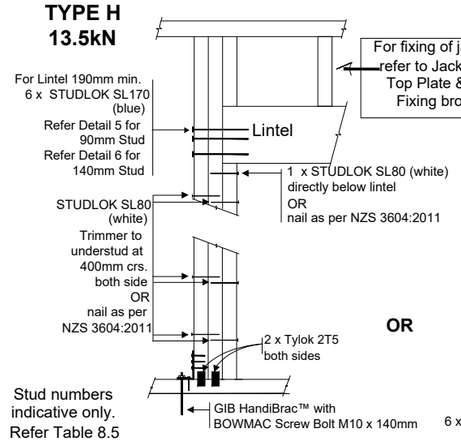
Detail 3



Detail 4

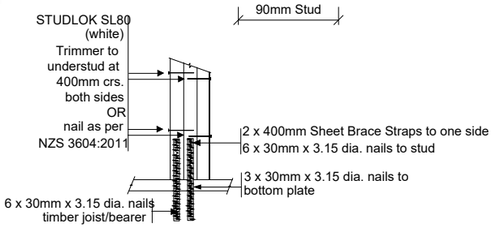


TYPE H 13.5kN

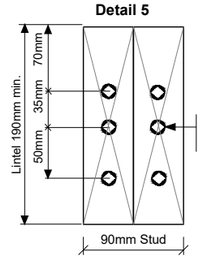


Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

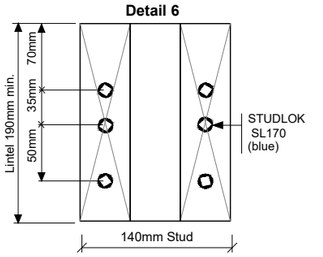
OR



Detail 5



Detail 6

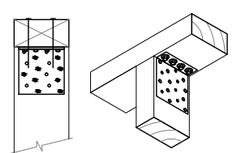
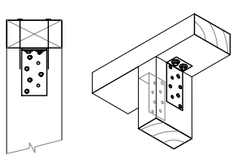
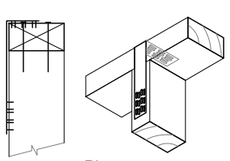


TOP PLATE CONNECTION OPTIONS:
Choose from the three connections below or refer to manufacturers information in specifications for Bowmac Stud-lok fixing

NOTE:

To calculate the number of B type fixings required, divide the wall length by the stud centres, add 1 to this figure and locate this number of fixings as evenly as possible along the wall length. This figure includes the start and end studs in each wall length.

FIXING TYPE B: 4.7KN — CHOOSE ANY OF THE 3 OPTIONS BELOW

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.	2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.	2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.
		
Plus LUMBERLOK 6kN Stud Anchor (CPC80)	Plus 2 x LUMBERLOK CPC40	Plus LUMBERLOK Stud Strap (one face only)

Recommended for internal wall options to avoid lining issues

G.J. Gardner. HOMES
"We're Great Together"
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Project Title
Lionel Ward
22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Title
Hhold Down Details

Drawn 21 January 2025

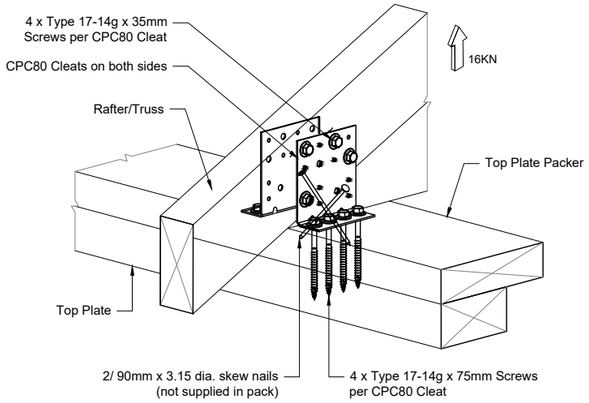
Project No 5296

Rev BC-S-2

Sheet A14

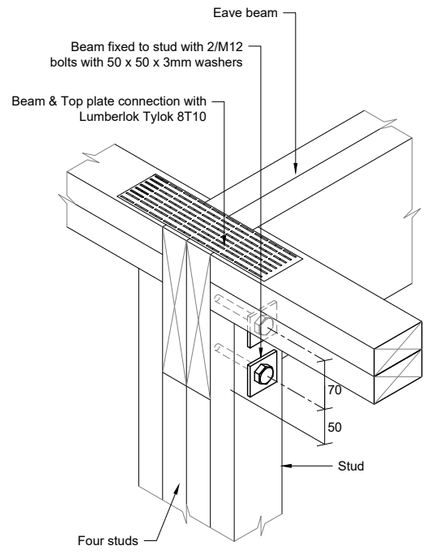
Scale (A3 Original) 1: 10

0.1 0.05 0 0.1 0.2 m

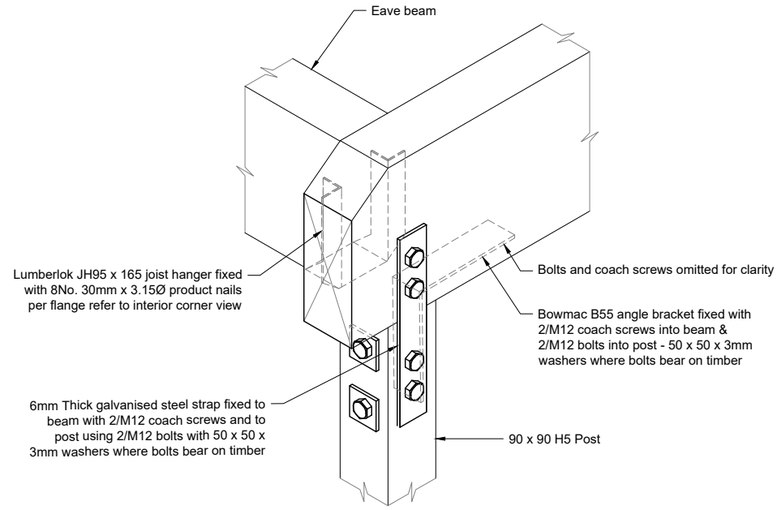


Code: 16KNTTP
Material: CPC80 1.55mm G300 Z275 Galvanised Steel
Packed: 8 x Type 17-14g x 35mm Hex Head Galvanised Screws
8 x Type 17-14g x 75mm Hex Head Galvanised Screws

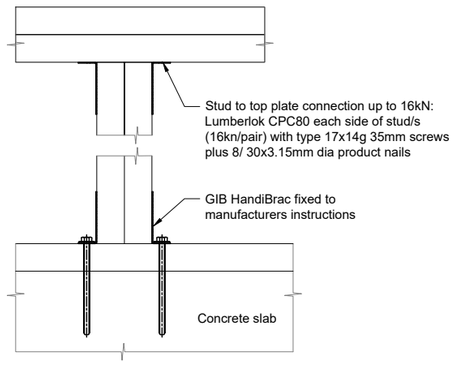
D21 P - 16KN Truss to Top Plate Connection
A08 SCALE = NTS



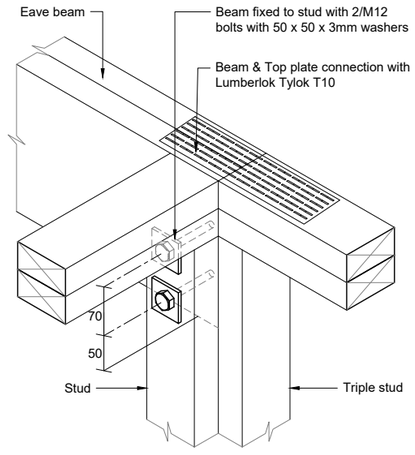
D23 Beam to Stud Detail
A08 SCALE = 1:10 @ A3



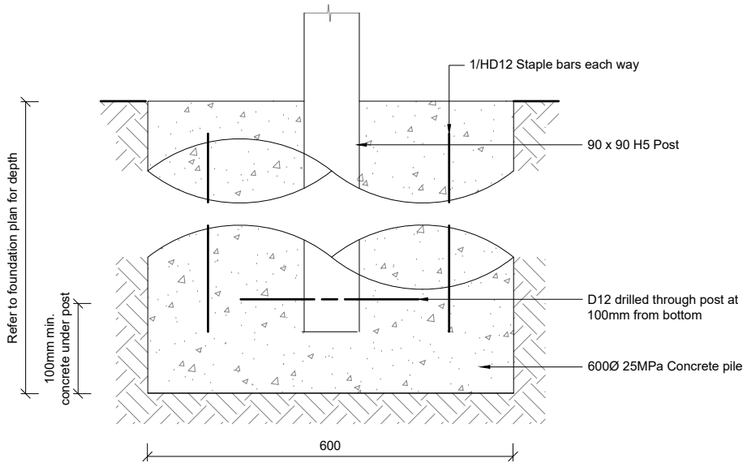
D25 Post Detail Exterior Corner View
A08 SCALE = NTS



D22 P - 16KN Stud to Top & Bottom Plate Detail
A08 SCALE = 1:10 @ A3



D24 Beam to Corner Stud Detail
A08 SCALE = 1:10 @ A3



D26 Porch Post Footing Detail
A06 SCALE = 1:10 @ A3

NOTE:

1. All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.
2. Refer to NZS3604:2011 Section 4 for durability requirements.
3. Do not scale from drawings.
4. All wall framing typically H1.2 treated unless specifically stated.
5. Designers connection details to be followed unless specifically design by precut manufacturer.
6. Refer to Eave detail for stud, lintel and soffit framing heights.
7. Precut manufacturer to provide truss fixings and Producer Statement.
8. Refer to Framing & Lintel Plan for lintel to stud fixings.

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.
Exposed fixings to be type 304 stainless steel.
Sheltered fixings to be type 304 stainless steel.
Closed in nail plates in roof space to be continuous coated galvanized steel.
Closed in wire dogs and bolts to be hot dipped galvanized steel.
All other closed structural fixings to be mild steel (uncoated non galvanized)

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Project Title
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Taipa
Lot 2 DP 314261

Sheet Title
Hold Down Details

Drawn 21 January 2025

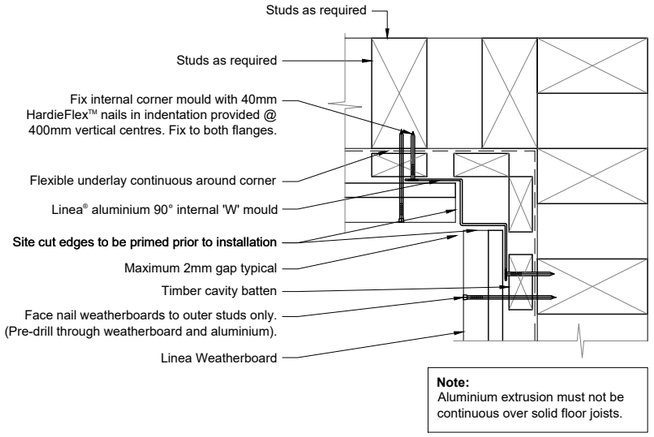
Project No 5296

Rev BC-S-2

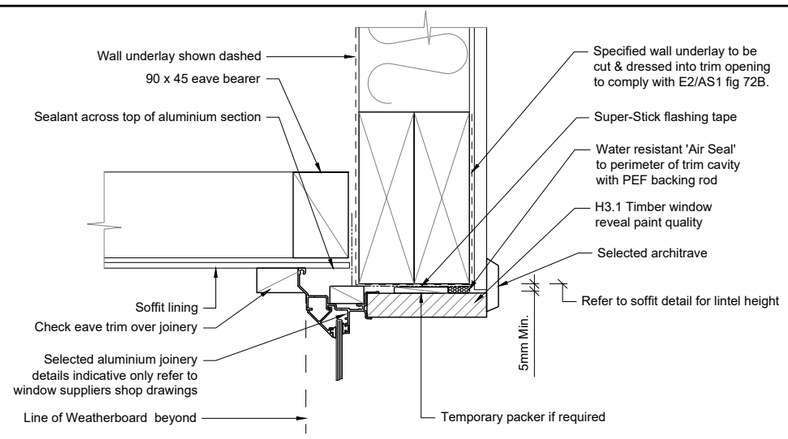
Sheet A15

Scale (A3 Original) 1: 10

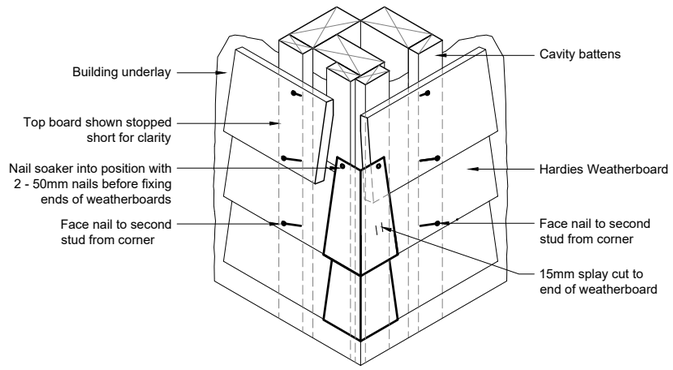
0.1 0.05 0 0.1 0.2 m



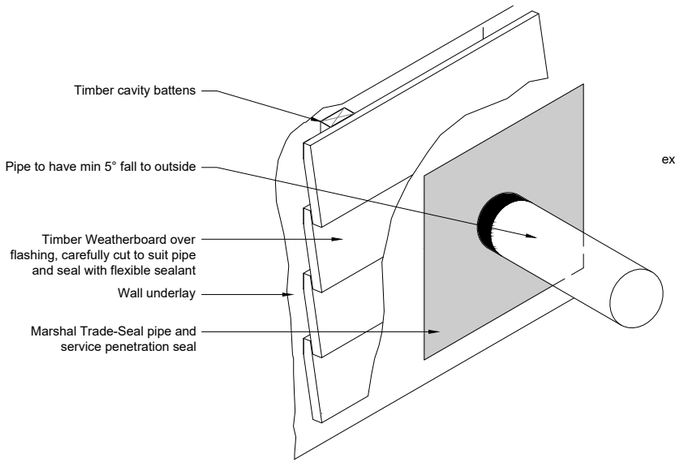
D41 A03 Linea Weatherboard Internal Corner Detail
SCALE = 1:5 @ A3



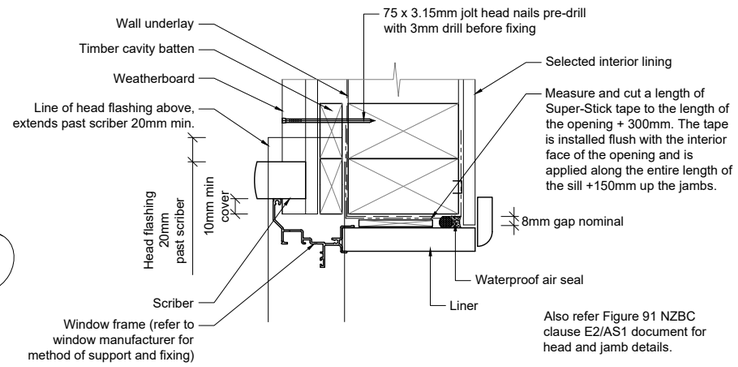
D44 A03 Linea Weatherboard Window Head Detail
SCALE = 1:5 @ A3



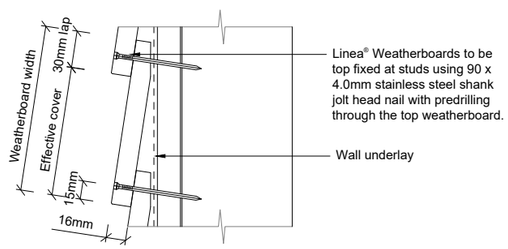
D47 A03 Linea Weatherboard Corner Soakers Detail
SCALE = 1:5 @ A3



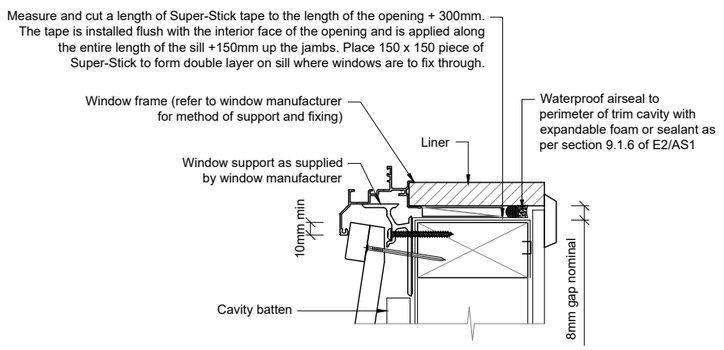
D42 - Linea Weatherboard Plank Joint Detail
SCALE = NTS @ A3



D45 A03 Linea Weatherboard Window Jamb Detail
SCALE = 1:5 @ A3



D43 - Linea Weatherboard to Nail Fixing
SCALE = 1:5 @ A3



D46 A03 Linea Weatherboard Window Sill Detail
SCALE = 1:5 @ A3

NOTE:

1. Refer to NZS3604:2011 Section 4 for durability requirements.
2. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC clause E2/AS1.
3. Building underlay must comply with acceptable solution NZBC clause E2/AS1 and NZS 3604.
4. Flashing tape must have proven compatibility with the selected building underlay and other materials with which it comes into contact as per Table 21 of NZBC clause E2/AS1.
5. As per NZBC 9.1.10.8: Install windows & doors using pairs of min 75x3.15 jolt head nails through reveals into surrounding frame at
   a) 450mm max c/c along sills, jambs & heads
   b) 150mm max from ends of reveal
   Install packers between reveals & framing at all fixing points, except between head reveals & lintels.
6. All window joinery to comply with NZS 4211:2008
7. All glazing to comply with NZS 4223
8. All window and door openings to be checked on site prior to manufacture, any discrepancies to be reported to the Designer.
9. Details to be read in conjunction with manufacturers installation instruction.
10. Weatherboard cladding to be installed to manufacturers installation instructions.

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

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Lionel Ward
22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Title
Cladding Details

Drawn 21 January 2025

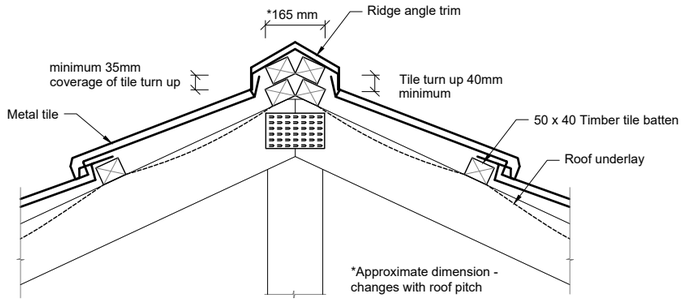
Project No 5296

Rev BC-S-2

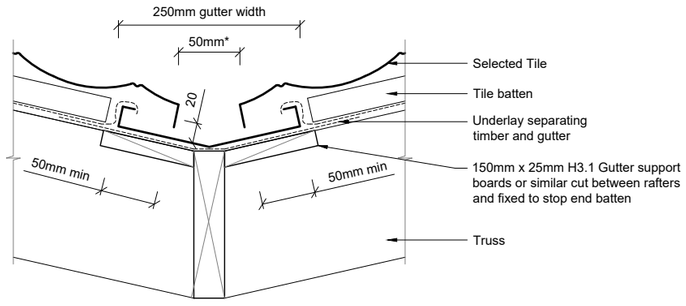
Sheet A16

Scale (A3 Original) 1: 5

0.05 0.03 0 0.05 0.1 m

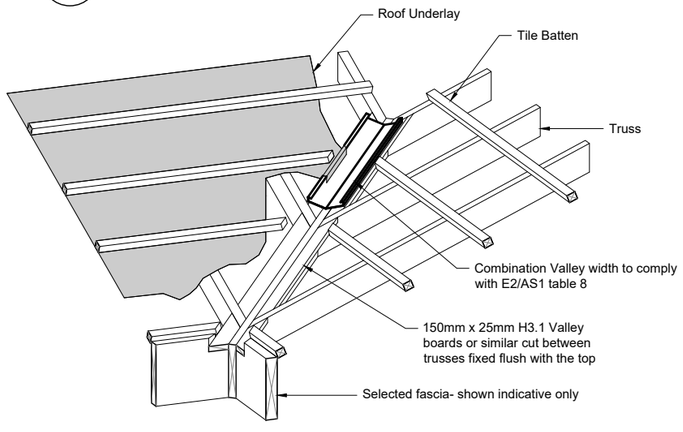


D81 Ridge Flashing Detail
A08 SCALE = 1:10 @ A3

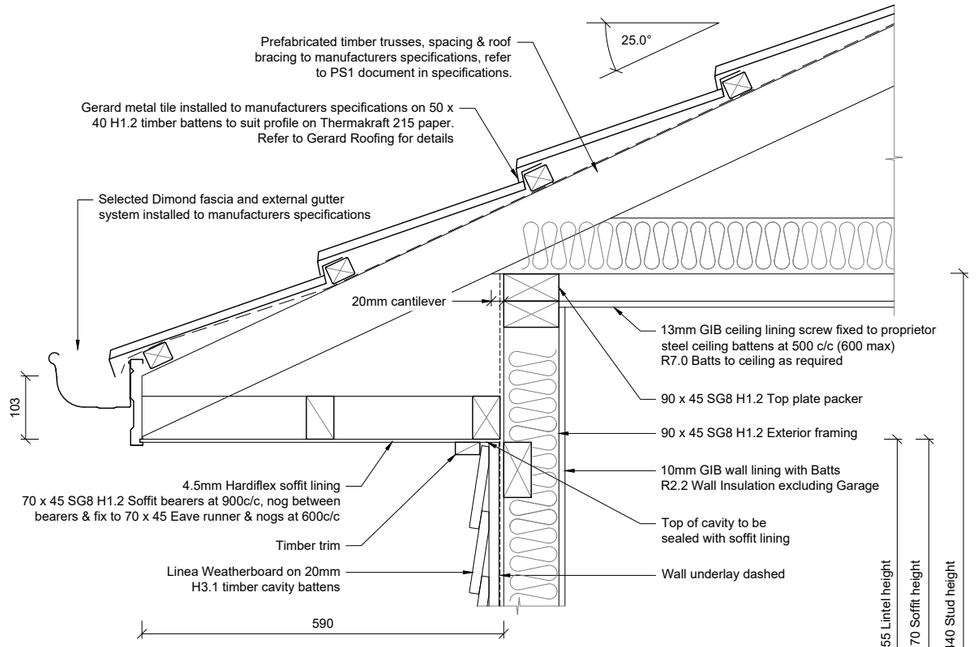


*Minimum clearance between tiles

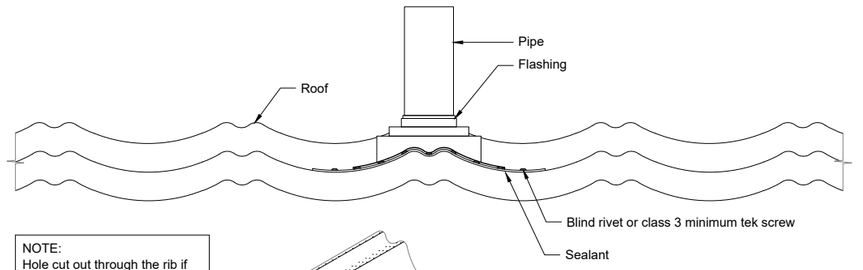
D82 Gutter Valley Detail
A08 SCALE = 1:10 @ A3



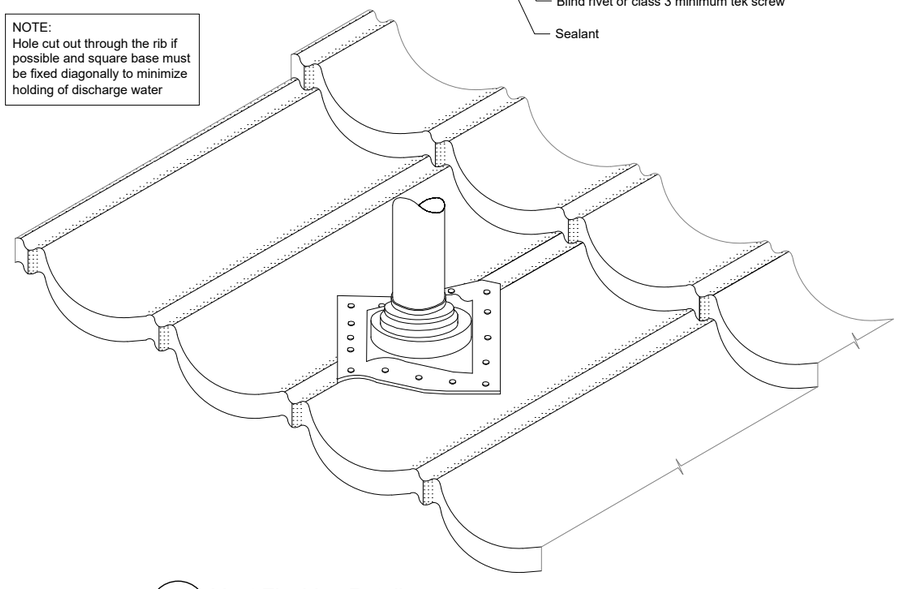
D83 Gutter Valley Flashing Detail
- SCALE = NTS



D85 Linea Weatherboard - 590mm Eave Detail
A08 SCALE = 1:10 @ A3



NOTE:
Hole cut out through the rib if possible and square base must be fixed diagonally to minimize holding of discharge water



D86 Vent Flashing Detail
A08 SCALE = 1:10 @ A3

NOTE:

1. Refer to Section for specific product selection.
2. All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.
3. Refer to NZS3604:2011 Section 4 for durability requirements.
4. Do not scale from drawings.
5. All wall framing typically H1.2 treated unless specifically stated.
6. Designers connection details to be followed unless specifically design by precut manufacturer.
7. Refer to Eave detail for stud, lintel and soffit framing heights.
8. Precut manufacturer to provide truss fixings and Producer Statement.
9. Refer to Framing & Lintel Plan for lintel to stud fixings.
10. Details to be read in conjunction with manufacturers specifications and installation requirements.

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.
Exposed fixings to be type 304 stainless steel.
Sheltered fixings to be type 304 stainless steel.
Closed in nail plates in roof space to be continuous coated galvanized steel.
Closed in wire dogs and bolts to be hot dipped galvanized steel.
All other closed structural fixings to be mild steel (uncoated non galvanized)

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Project Title
Lionel Ward
22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Title
Roof Details

Drawn 21 January 2025

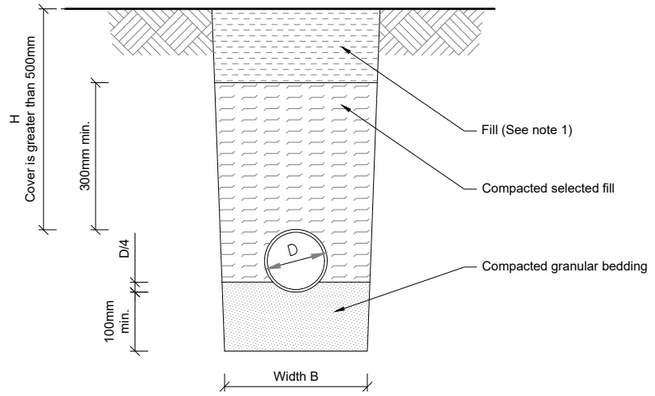
Project No 5296

Rev BC-S-2

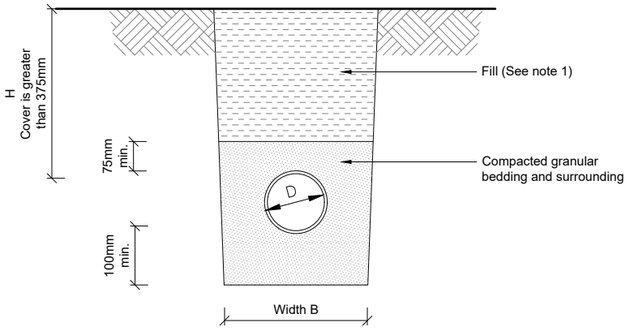
Sheet A17

Scale (A3 Original) 1: 10
0.1 0.05 0 0.1 0.2 m

Figure 7: Bedding and backfilling
Paragraphs 5.2.1, 5.3.1 and 5.4.1



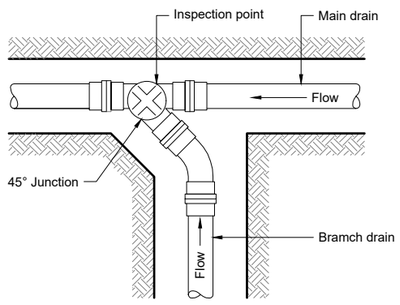
(a) Bedding type 'B' of NZS 7643
Cover greater than 500mm



(b) Bedding type 'D' of NZS 7643
Cover greater than 375mm

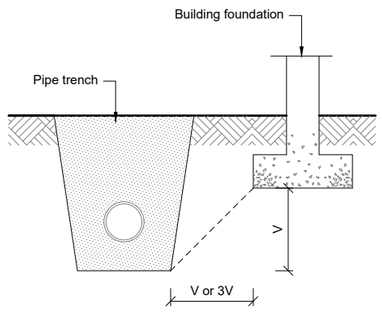
NOTE:
Fill shall be:
Ordinary fill where drains are located below gardens and open country.
Compacted selected fill where the drains are located below residential driveways and similar areas subject to light traffic.

Figure 9: Inspection points
Paragraph 5.7.3

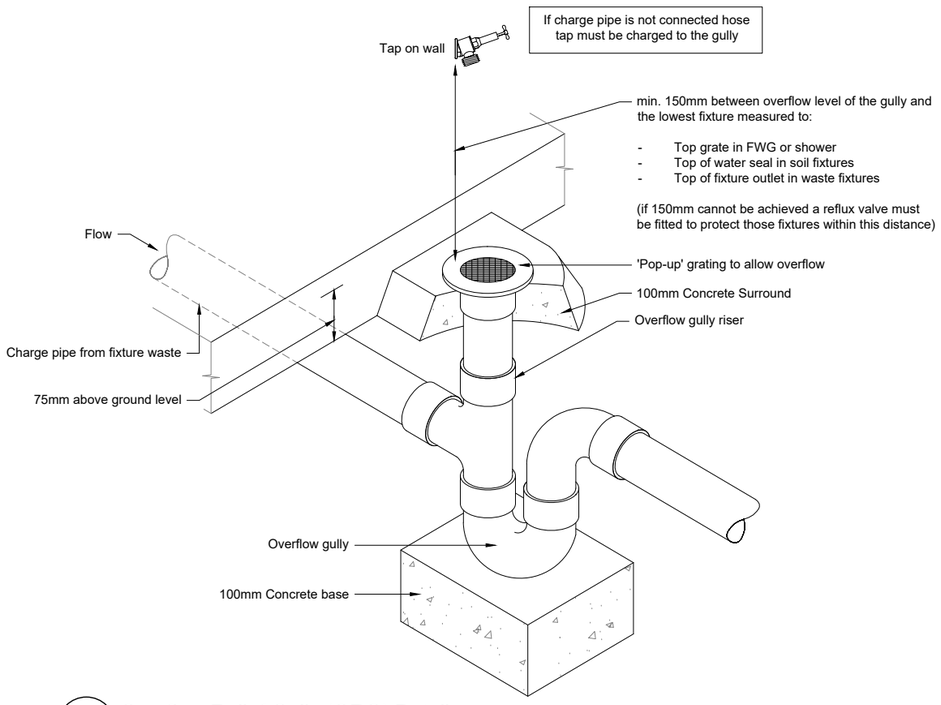


101 - Trench & Inspection Joint Details
SCALE = NTS

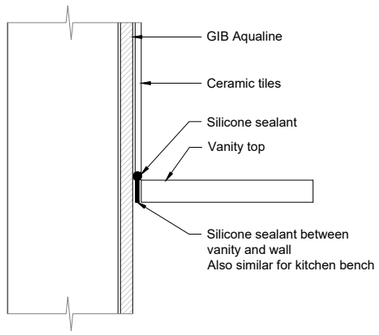
Figure 8: Relationship of pipe trench to building foundation
Paragraph 5.6.1



Minimum horizontal separation shall be
V or 3V depending on length of time
trench open, see paragraph 5.6.1



102 - Overflow Relief Gully (ORG) Detail
SCALE = NTS



103 - Tile Upstand Detail
SCALE = 1:5 @ A3

NOTE:

1. All drainage is diagrammatical, drainlayer to determine on site drainage layout and provide asbuilt plan when complete.
2. Number of downpipes required as per NZBC E1/AS1 1 x 74mmØ downpipe per 70m² roof plan area.
3. Stormwater: 100mm Ø UPVC pipe, minimum gradient 1:120.
4. All drainage to comply with AS/NZS 3500 & NZBC G13/AS1.
5.
6. All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.
7. All construction materials fixings & fastenings to comply with NZS 3604:2011 Section 4 & NZBC B2.
8. Plumbing to be installed by resigtered Plumber.
9. Refer to Gib aqualine Wet Area Systems for manufacturers installation required for GIB lining to typical fixtures & installations.
10. Tiled showers to have membrane applied under tiling.
11. All wet areas to be provided with impervious linings as per NZBC E3/AS1.
12. Builder to refer to fixture manufacturers requirements for framing /nogging required for installations of all fixtures & fixings.
13. "Watersplash" Areas to E3/ AS1

- Seal around all penetrations and at junctions of wall/floor tiles with approved mould resistant silicone sealant.
- Watersplash areas & surfaces adjacent to sanitary & laundering facilities to be impervious to compl.y with NZBC E3.
- Kitchen bench/ work surfaces 3.0 to comply with G3/ AS1.
- Membrane used behind all sealant joints.

Tiles to be installed in accordance with BRANZ Good Practice Guide

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Project Title
Lionel Ward
22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Title
Drainage Details

Drawn 21 January 2025

Project No 5296

Rev BC-S-2

Sheet A18

Scale (A3 Original) 1: 10

0.1 0.05 0 0.1 0.2 m

LEGEND:

LP

LP - SED Leading Edge Soil Creep Piles
350HD H5 Poles cast into 500mm diameter Bored Concrete Pile with 100 base cover
4.5m below finished ground level
Top of pile shall be no more than 1.0m above finished ground level
12kN pile fixings at top

AP

AP - SED Anchor Piles
150ND H5 Poles cast into 450mm diameter Bored Concrete Pile with 100 base cover
1.9m below FGL OR 0.3m into stiff natural ground, whichever is deeper
Top of pile shall be no more than 1.0m above finished ground level
12kN pile fixings at top

Unmarked - SED Ordinary Piles
150ND H5 Poles cast into 450mm diameter Bored Concrete Pile with 100 base cover
0.9m below FGL OR 0.3m into stiff natural ground, whichever is deeper
Top of pile shall be no more than 1.0m above finished ground level
Ordinary pile fixings at top

PF

PF - SED Post Footing
600mm diameter Bored Concrete Pile
0.9m below ground level OR 0.3m into stiff natural ground, whichever is deeper
1/HD12 'staple bars' each way, top and bottom (4 total)
Refer to architectural dwg for plinth, post and fixings

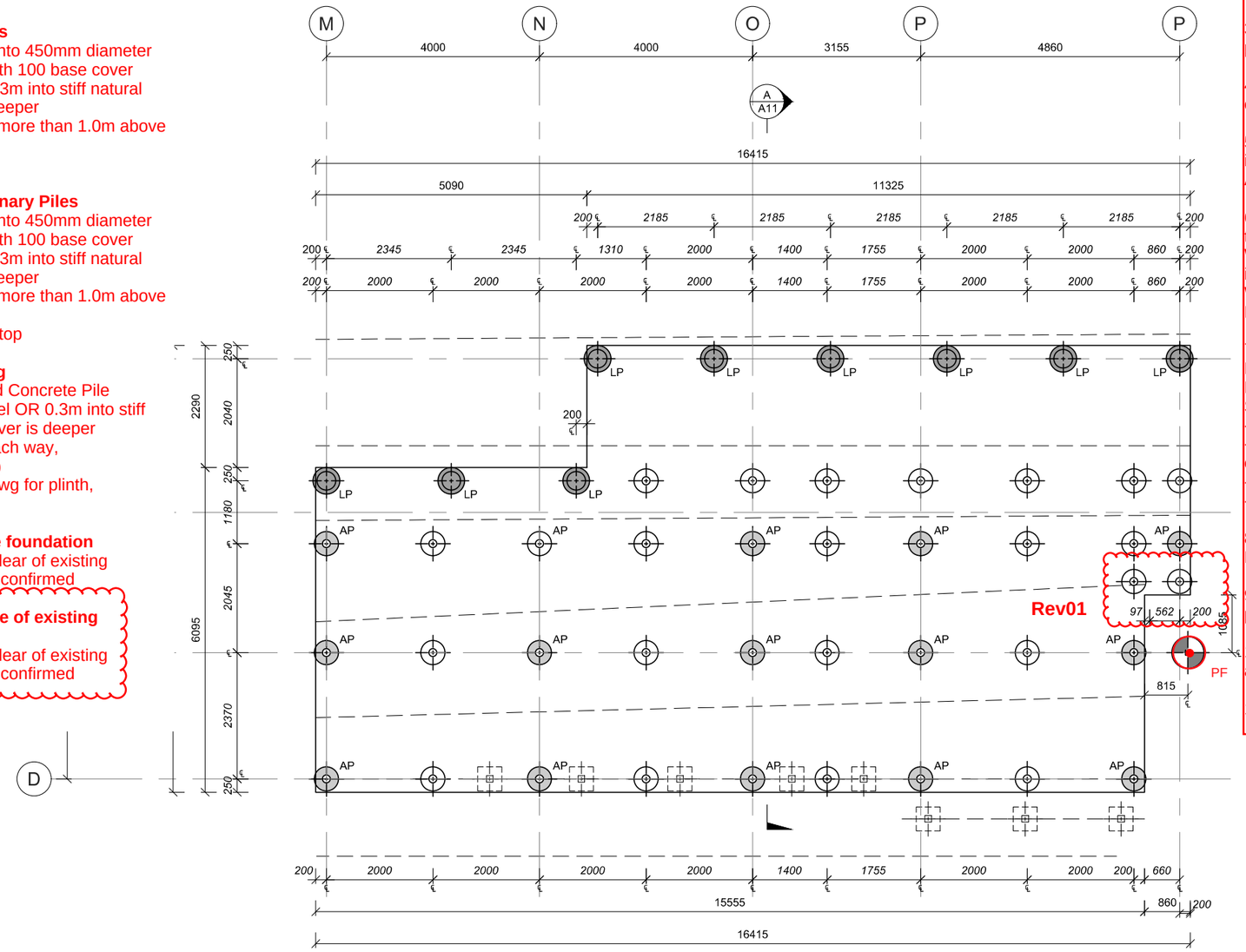
Existing concrete pile foundation
All new piles must be clear of existing footings, location to be confirmed

Dash lines - Centreline of existing row of piles
All new piles must be clear of existing footings, location to be confirmed

Rev01

Subfloor and Foundation Mark-up
WJL #: 136246

22 Taipa Heights Drive
Taipa, Northland



NOTES:

1. These mark-ups are to be read in conjunction with the architectural drawings and all other related documents. Refer to architectural drawings for dimensions.

2. Contact the architect/engineer if any discrepancies are found.

3. Check all structural beams, components and dimensions prior to fabrication and installation.

4. Durability requirements as per NZS 3604 or proprietary coatings (solutions) to comply with SNZ TS 3404:2018.

5. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).

6. It is increasingly common for building consent authorities to require a "PS4" for specifically designed structures. For Wilton Joubert Ltd. to issue this, we need to carry out inspections as per the building consent requirements. Ring Wilton Joubert Ltd. local office to arrange a booking.
NO INSPECTION EQUALS NO PS4 ISSUED.

7. Design based on report
By: Wilton Joubert Ltd
Ref: 135230 Dated: 25-07-2024
Specifically:
- Class H expansive soil
- Ultimate end bearing capacity ot 300kPa, subject to engineers confirmation
- Soil friction angle of 28 degrees
- Undrained shear strength of 50kPa

8. House subfloor piles shall be no more than 1.0m above FGL.

9. Foundation shall be outside of 45deg influence line of any public pipes.

10. Foundation shall be outside of 1V:1.5H influence line of any buried pumps and tanks.

11. Concrete to be minimum 20MPa.

FOUNDATION PLAN NOTES:

1. All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.
2. Check all existing drain locations and all dimensions on site before construction.
3. Concrete to be a minimum of 20MPa at 28 days unless specifically stated.
4. Local Authority should inspect the earthworks, building platform construction and foundation, prior to the concrete being poured to ensure that the design criteria has been met.

Note: For specific items as defined in Producer Statement - Design

signed by: David B.N. Lau
B.E. (Hons), Ph.D., MIPENZ, CPEng

WILTON JOUBERT Consulting Engineers

FIXINGS

Exposure zone: D
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

Fixings within 600mm of finished ground level to be 304 stainless steel.
Exposed fixings to be type 304 stainless steel.
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Project Title
Lionel Ward
22 Taipa Heights Road
Taipa
Lot 2 DP 314261

Sheet Title
Foundation Plan

Drawn 10 October 2024

Project No 5296

Rev Q

Sheet A06

Scale (A3 Original) 1: 100

1 0.5 0 1 2 m

Wilton Joubert Limited
09 945 4188
185 Waipapa Road,
Kerikeri

SITE	**22 Taipa Heights Drive, Taipa**
LEGAL DESCRIPTION	**Lot 2 DP 314261**
PROJECT	**Proposed Dwelling**
CLIENT	**G.J Gardner Homes Far North (2K Construction Ltd)**
REFERENCE NO.	**135230**
DOCUMENT	**Site-Specific Geotechnical Report**
STATUS/REVISION NO.	**FINAL – Building Consent**
DATE OF ISSUE	**25 July 2024**

Report Prepared For	Attention	Email
G.J Gardner Homes Far North (2K Construction Ltd)	**Shane Anderson**	shane.anderson@gjgardner.co.nz

Authored by	**N. Ngaropo** *BSc (Geology)*	Engineering Geologist	nikora@wjl.co.nz	
Reviewed by	**S. Page** *Part Dip. (Civil)*	Engineering Technician	shaun@wjl.co.nz	
Approved by	**D. Soric** *(BE, CMEngNZ, CPEng)*	Senior Geotechnical Engineer	damir@wjl.co.nz	

1. EXECUTIVE SUMMARY

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

Development Type:	Proposed Dwelling
Development Proposals Supplied:	Concept architectural drawings (6 sheets)
NZS3604 Type Structure/s:	Yes
Geology Encountered:	Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon
Surficial Topsoil/Non-engineered Fill/Buried Topsoil Encountered:	Yes - 0.10m to 0.40m thick layers of surficial NON-ENGINEERD FILL was overlying the building site area. Additionally, soft to stiff, NON-ENGINEERED FILL was encountered on the leading-edge of the historically formed platform and ranged in depths between 0.90m to 1.50m. Underlying the fill were 0.20m to 0.30m thick layers of BURIED TOPSOIL.
Overall Site Gradient in Proximity to Development:	Level within the proposed building platform with steep slopes to the north-west.
Site Stability Risk:	Our stability assessment indicated a low risk of global instability at the site. The localized effects of placing non-engineered fill on sloping ground below (north of) the building footprint should be mitigated with the installation of leading-edge soil creep piles along the northern edge of the proposed dwelling (refer Section 9.1.1).
Liquefaction Risk:	Negligible risk of liquefaction susceptibility.
Suitable Foundation Type(s):	**Leading-edge of Dwelling:** SED soil creep piles designed resist a loss of lateral soil support to a minimum depth of 2.0m bpgl. The minimum pile embedment bpgl is recommended to be 4.5m. **All other Dwelling Foundations:** Bored, concrete encased, tanalised timber pile foundations.
Shallow Soil Bearing Capacity:	Yes – Natural Soils Only. Geotechnical Ultimate Bearing Capacity = 300kPa.
NZBC B1 Expansive Soils Classification:	Class H – Highly Expansive (refer Section 9.1.4).
Minimal Footing Depth :	0.90m below finished ground level and 0.30m into natural ground, whichever is deeper.
NZS1170.5:2004 Site Subsoil Classification:	Class C – Shallow Soil stratigraphy.
Earthworks:	Apart from footing excavations and minor landscape fill below the proposed deck, no significant earthworks are proposed for the development. Any proposed landscape fills that exceed a height of 0.40m must be referred to a Geo-Professional. A cut-off drain should also be installed above the development area to aid in surficial water ponding and alleviating perched groundwater levels.
Further Review required:	Not anticipated unless development proposals are revised.

2. INTRODUCTION

2.1. SCOPE OF WORK

Wilton Joubert Limited (WJL) was engaged by G.J Gardner Homes (2K Construction Ltd), the Client, to undertake a Geotechnical assessment of ground conditions at the above site where it is proposed for a new single-level residential dwelling to be constructed in the location of the recently removed former dwelling that used to occupy the southern portion of the site.

For the purposes of this report, we have assumed the dwelling will comprise a lightweight, timber-framed structure, designed and constructed generally in keeping with the requirements of NZS3604:2011.

2.2. SUPPLIED INFORMATION

We have been supplied with a set of concept architectural drawings (6 sheets, dated 10/07/2024), prepared by the client. The drawing set includes Site, Elevation, Floor and Electrical Plans of the proposed development.

Our Geotechnical assessment is based on the abovementioned supplied drawings and correspondence with the client.

We understand that this report will be used to support a Building Consent application. Please note, if development proposals are revised, WJL should be contacted for review prior to our report being used to support a consent application.

3. SITE DESCRIPTION

The subject 1,889m² irregular shaped property is legally described as Lot 2 DP 314261 and physically addressed as 22 Taipa Heights Drive, Taipa. Access to the section is via an existing gravel driveway off the western side of Taipa Heights Drive.

An existing dwelling has recently been relocated away from the southern end of the site, with the former timber footings for the structure still present across the proposed building site. An existing gravity block wall has been erected accompanying part of the driveway and the immediate southern perimeter of the old dwelling. The wall is offset approximately 3-5m to the south of the proposed dwelling location. The wall is erected up to a height of 1.4m and appears to have an additional timber landscape wall extending some 3m from the southernmost end. An auxiliary shed is situated directly upslope, some 9m to the southeast of the proposed dwelling platform, with two adjacent water tanks directly below.

The site is depicted on our appended Site Plan (ref: 135230-G600) and in Figure 1 below.

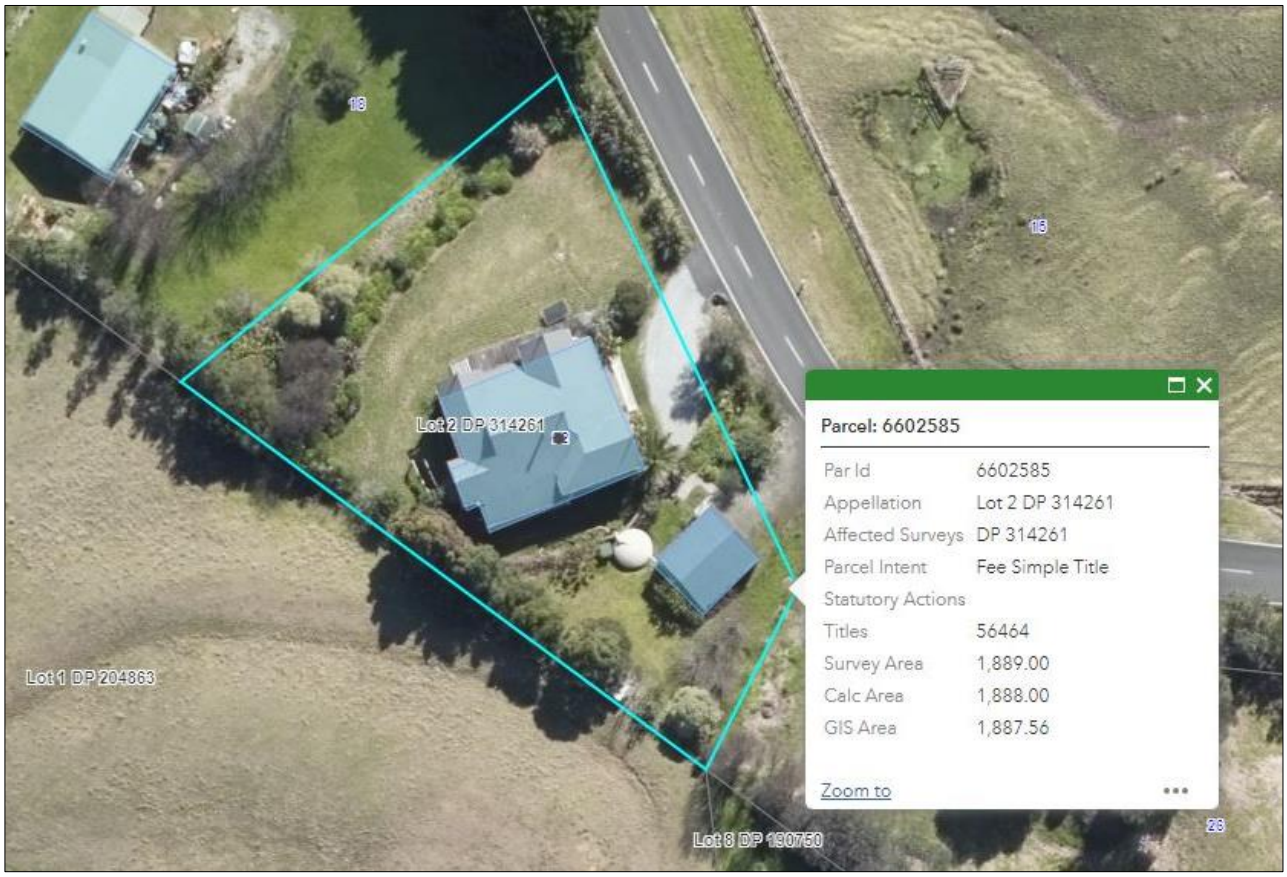


Figure 1: Screenshot aerial view of the subject site from the Far North District Council (FNDC) on-line GIS Property and Land Map. Subject property is highlighted in cyan.

Topographically speaking, the site is positioned towards the toe of a northwest facing, long, moderate to steep ridge flank, falling from upslope Taipa Heights Drive some 120m to the southeast. The property is set around a central crest, transitioning into moderate to steep terrain that covers the northern end of the property and ultimately falling some 11m to the toe of the common flank, within the neighboring downslope allotment.

Slope grades across the proposed building platform vary due to the recent and past land modifications (see further below). The land in between the upslope block wall and the edge of the levelled platform generally displays a width of 18m and gentle grades of less than 5°. Grades across the steep northern flank generally range between 20° and 30°.

Historical earthworks have been carried out within the proposed building platform and in proximity to the leading edge of the pre-existing dwelling. As a result, the building platform has been cut to a near level nature and what appears to be “push-over” fill, ranging from 0.4m-1.5m in depth, placed across the downslope northern portion of the property (refer Figures 3-5).

Apart from the small clearing within the pre-existing dwelling platform and impermeable areas related to the auxiliary shed and driveway areas, vegetation across the site comprises of pasture with intermittent trees throughout.

Although the FNDC on-line GIS Water Services Map indicates that a reticulated wastewater connection is available to the property, water and stormwater connections do not appear to be available.

Figure 2: Screenshot aerial view of the subject site from the FNDC on-line GIS Water Services Map. Subject property is highlighted in cyan.

Figure 3: Site photograph overlooking Proposed Building Platform (south direction).

Figure 4: Site photograph (Northwest direction) overlooking Proposed Building Platform.

Figure 5: Site photograph of the leading-edge slopes (northwest direction).

4. DEVELOPMENT PROPOSALS

Based on our review of the supplied architectural plans, it is our understanding that the client proposes to construct a new 122.1m², single-level residential dwelling in place of the previous dwelling that has recently been removed from the site. The existing building platform is essentially the land targeted for development (ref Figure 6-8).

The dwelling will comprise of a timber floor suspended on bored, concrete encased, tanalised timber pile foundations. The structure will consist of lightweight timber framing, cladding, and roofing. A timber deck, not part of the building consent, is also proposed to be constructed off the north-western end of the dwelling.

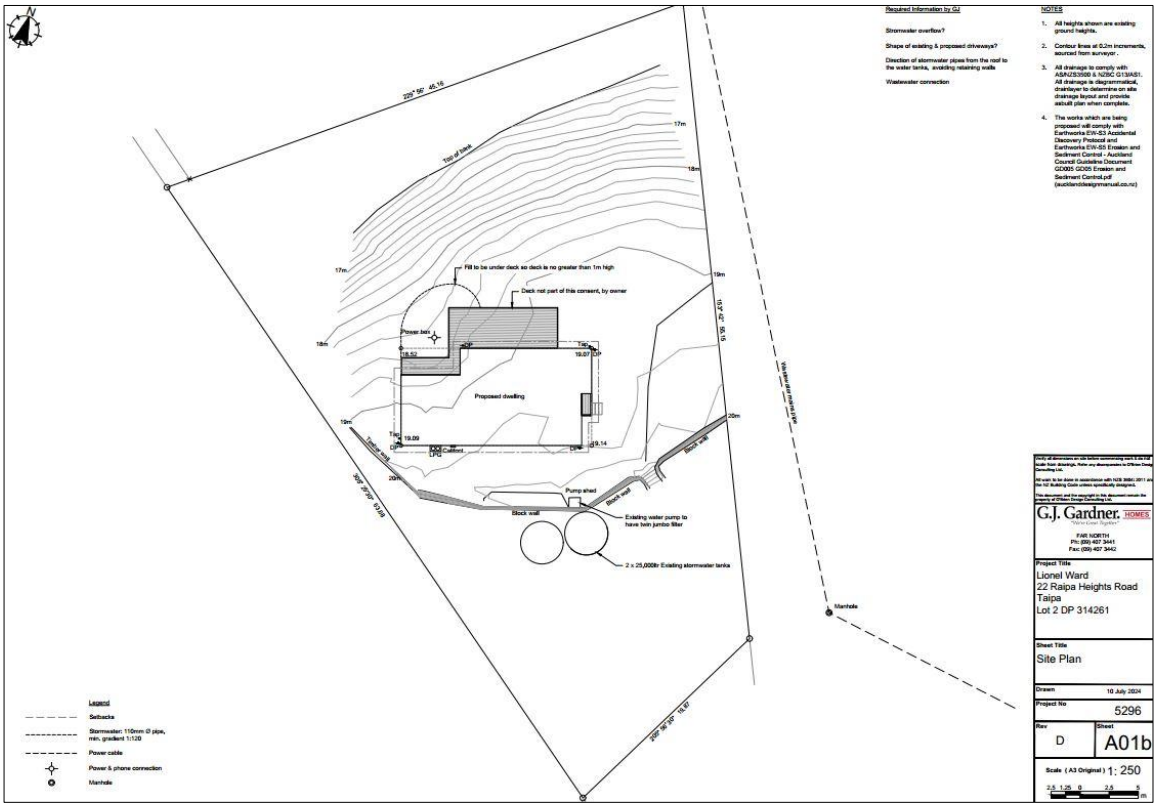


Figure 6: Screenshot of the supplied Site Plan Prepared by the Client.

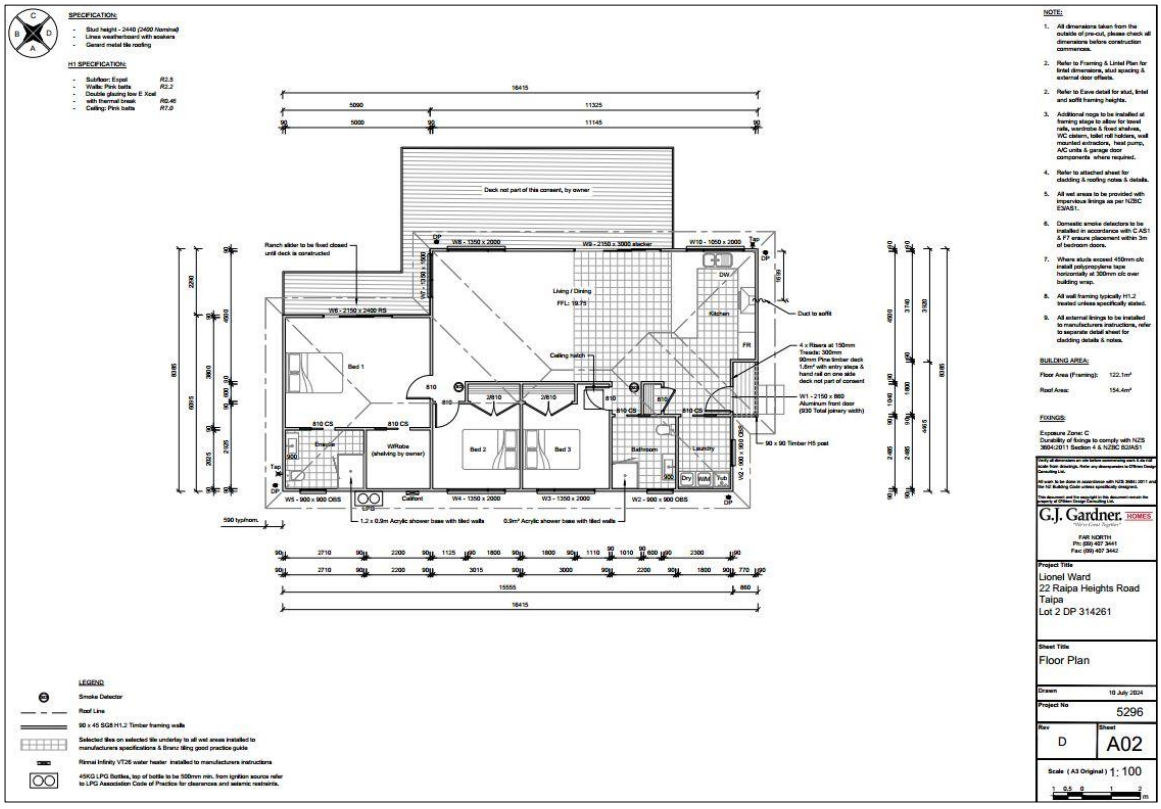


Figure 7: Screenshot of the supplied Floor Plan Prepared by the Client.

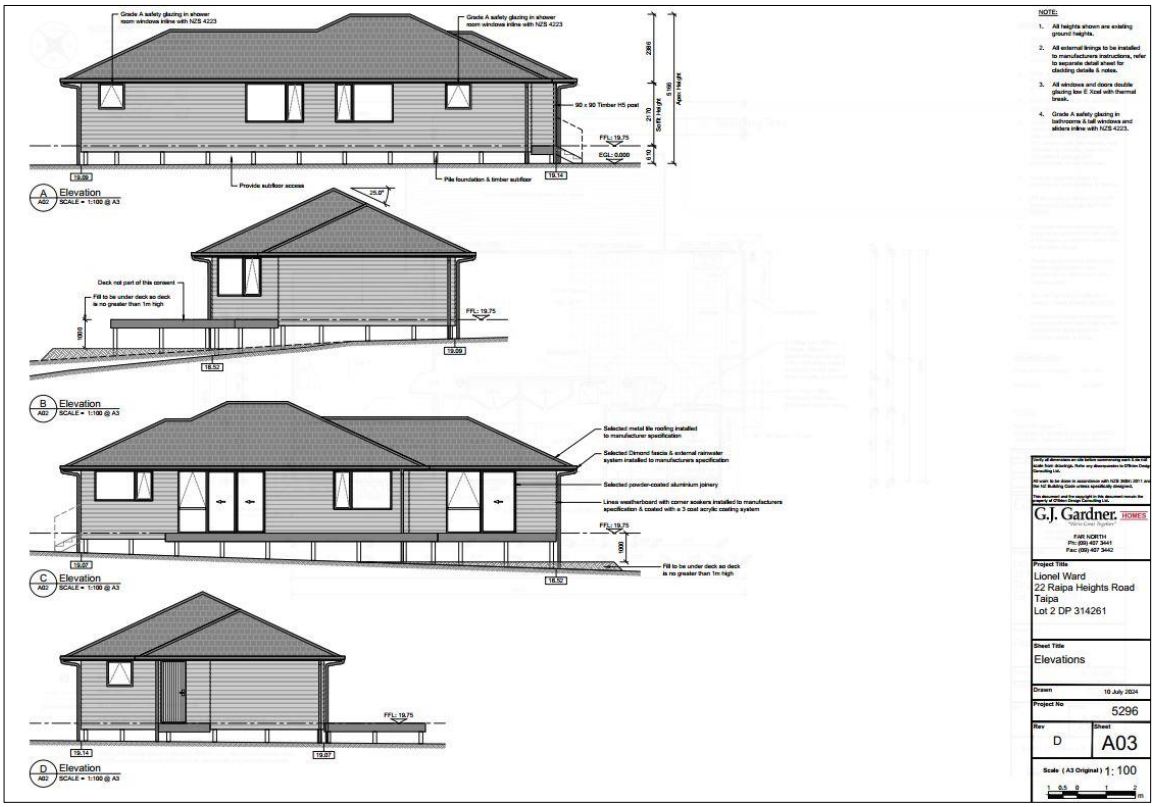


Figure 8: Screenshot of the supplied Elevation Plan Prepared by the Client.

The finished floor level (FFL) for the dwelling is proposed at RL19.75. In facilitating the above FFL, apart from footing excavations and minor landscape fill below the proposed deck, up to approximately 0.40m, in ensuring it is no higher than 1.0m above the finished ground level, no significant earthworks are proposed for the development.

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

5. DESKTOP STUDY

5.1. GEOLOGY

Local geology across the property and greater surrounding area is noted on the GNS Science New Zealand Geology Web Map, Scale 1:250,000, as; ***Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon***. These deposits are approximately 75 to 95 million years in age and described as; "*Weakly indurated metre-bedded quartzose, micaceous sandstone, with minor conglomerate, and interbeds of blue-grey mudstone*" (refer: GNS Science Website).

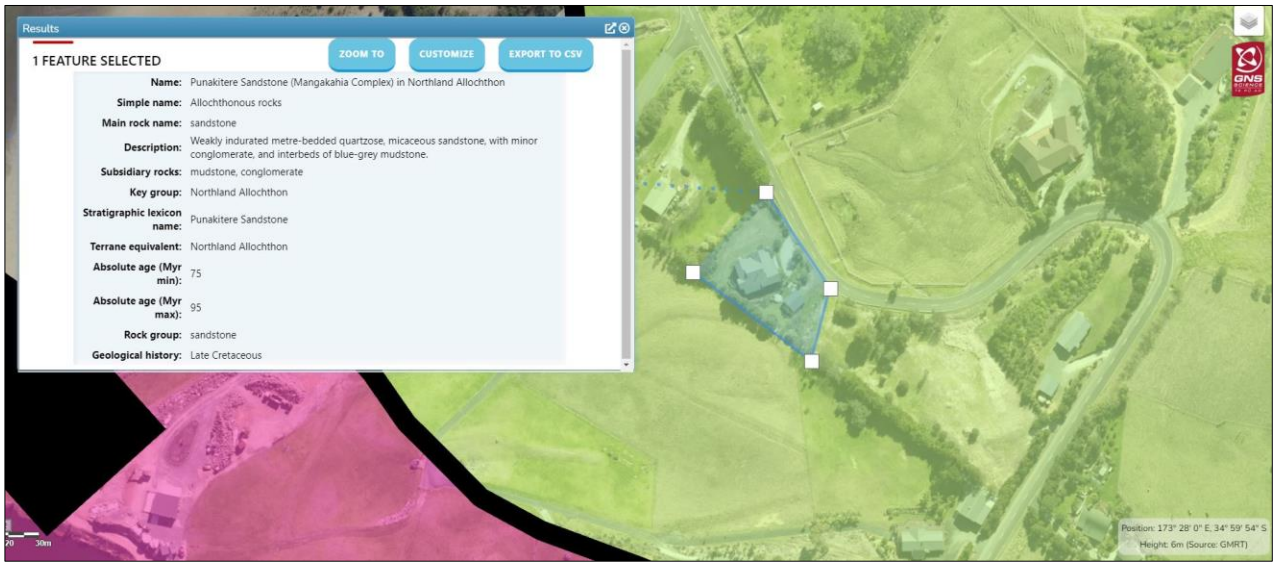


Figure 9: Screenshot aerial view of the subject site from the New Zealand Geology Web Map hosted by GNS Science.

5.2. HISTORICAL AERIAL PHOTOGRAPHY REVIEW

A historical aerial photography review has been undertaken to evaluate any slope instability features or changes in landform across the property and surrounding influential land. Aerial images from 1948 have been reviewed and compared to the present-day conditions (refer Figures 10-14 below).

There were no visible significant geomorphological changes in the landscape, indicating a period of stable ground conditions between 1948 and 2024.

The property and surrounding influential land have been covered in pasture, with some intermittent areas of bush nearby since at least 1948. Continued clearing evident from the formation of Taipa Heights Drive has occurred between 1981 and 2003. The pre-existing residential development appears to have been constructed circa 2003 and the dwelling removed sometime after 2023.

Figure 10: Historical aerial photograph from 1948 (Retrolens). Approximate property location is depicted by red circle.

Figure 11: Historical aerial photograph from 1966 (Retrolens). Approximate property location is depicted by red circle.

Figure 12: Historical aerial photograph from 1977 (Retrolens). Approximate property location is depicted by red circle.

Figure 13: Historical aerial photograph from April 2003 (Google Earth). Approximate property location is depicted by red circle.

Figure 14: Aerial photograph from December 2024 (Google Earth). Approximate property location is depicted by red circle.

6. GEOTECHNICAL INVESTIGATION

Our fieldwork, as depicted on our appended Site Plan (ref: 135230-G600), was undertaken on 18th July 2024, and involved:

- Drilling 3 (no.) 50mm diameter hand auger boreholes (HA01 to HA03 inclusive) to a maximum depth of 4.6m below present ground level (bpgl),
- DCP-Scala penetrometer tests (DCP) were undertaken at the base of each HA to a maximum depth of 5.5m bpgl,
- The measurement of an electronic Zip Level and tape cross-section A-A' through the proposed development and surrounding influential slopes (ref: 135230-G610), and
- Additional 'Fill-Check' boreholes were drilled to a maximum depth of 1.8m bpgl on the leading-edge of the historically formed platform.

The soil sample arisings from the boreholes were logged in accordance with the "Field Description of Soil and Rock", NZGS, December 2005.

In-situ undrained Vane Shear Strengths were measured at intervals of depth adjusted in accordance with the New Zealand Geotechnical Society (NZGS); Guidelines for Handheld Shear Vane Testing, August 2001, with strengths classified in accordance with the NZGS Field Classification Guidelines; Table 2.10, December 2005. The materials identified are described in detail on the appended records, together with the results of the various tests undertaken, plus the groundwater conditions as determined during time on site.

7. GEOTECHNICAL FINDINGS

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

7.1. TOPSOIL

Upon our arrival at the site, surficial TOPSOIL was cleared of the proposed development area.

7.2. NON-ENGINEERED FILL & BURIED TOPSOIL

Soft to stiff, NON-ENGINEERED FILL was encountered on the leading-edge of the historically formed platform and ranged in depths between 0.90m to 1.50m. It is inferred that the fill is made-up of "push-over" material from historical earthworks carried out in relation to the formation of the platform for the original dwelling that was on site. Underlying the fill were 0.20m to 0.30m thick layers of BURIED TOPSOIL.

Additionally, 0.10m to 0.40m thick layers of surficial NON-ENGINEERD FILL was overlying HA's 01-03.

7.3. NATURAL GROUND

The underlying natural deposits encountered on-site were consistent with our expectations of Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon soils. The residual soils comprised of Clayey, Slightly Gravelly and Sandy SILTs, overlying very stiff to hard, completely weathered sandstone and/or mudstone derived SILTs.

Measured in-situ, BS1377 adjusted peak shear strengths in the natural soils ranged from 96kPa (11kPa remould) and/or greater than 224kPa, where soil strength was excess of the shear vane capacity, or the vane was 'Unable to Penetrate' into the soil (UTP).

Where able to, the ratio of peak to remoulded vane shear strength values determined within the natural soils ranged between 1.6 to 3.1, indicating 'Insensitive, Normal – Moderately Sensitive' underlying subsoils.

However, HA01 encountered a potential interbed of blue-grey mudstone and overlying ratios of peak to remould vane shear strengths of the subsoils ranging from 5.0 to 8.7. These soils are determined to be more indicative of 'Sensitive – Extra Sensitive' subsoils.

DCP's were carried out at the base of all three HA's (HA01-HA03). Blow counts per 0.10m of penetration generally ranged between 4 and 19, ultimately refusing on greater than 20 blows at depths between 0.2m-0.9m below the base of all three HA's, indicating very dense material and/or inferred rock at depth.

Figure 15: Site photograph of the HA01 soil arisings (0.0m – 2.0m).

Figure 16: Site photograph of the HA02 soil arisings (0.0m – 4.6).

Figure 17: Site photograph of the HA03 soil arisings (0.0m – 0.8m).

7.4. GROUNDWATER

Groundwater was not encountered within HA02-03. However, HA01 did encounter a perched level of 0.8m bpgl. This is likely due to surface stormwater run-off becoming trapped between the surficial, soft non-engineered fill layer and shallow completely weathered mudstone which is impermeable in nature. The site will benefit from better contouring and proper stormwater control.

7.5. SUMMARY TABLE

The following table summarises our inferred stratigraphic profiling:

Table 1: Stratigraphic Profiling Table.

Investigation Hole ID	Termination Depth (m)	Depth to Base of Fill (m)	Vane Shear Strength Average (kPa) within Natural Ground	Perched/Encountered Groundwater Depth (m)
HA01	2.0	0.3	130 / UTP	NE
HA02	4.6	0.4	158 / UTP	NE
HA03	0.8	0.1	217+ / UTP	NE

UTP = Unable to Penetrate, NE = Not Encountered

8. GEOTECHNICAL ASSESSMENTS

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

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

8.1. QUALITATIVE SLOPE STABILITY

The site is positioned towards the toe of a northwest facing, long, moderate to steep ridge flank, falling from upslope Taipa Heights Drive some 120m to the southeast. The property is set around a central crest, transitioning into moderate to steep terrain that covers the northern end of the property and ultimately falling some 11m to the toe of the common flank, within the neighbouring downslope allotment.

Slope grades across the proposed building platform vary due to the recent and past land modifications (see further below). The land in between the upslope block wall and the edge of the levelled platform generally displays a width of 18m and gentle grades of less than 5°. Grades across the steep northern flank generally range between 20° and 30°.

Our assessment also considered the following:

- Stiff to hard natural soils encountered during our investigation,
- Aside from a perched level which can be alleviated, groundwater was not encountered within our HA's,
- The development area is situated on elevated terrain with good water-shedding characteristics,
- There are no known active faults traversing through or close to the site, and
- No visual signs of natural ground instability were observed at the time of our investigation.

8.2. QUANTITATIVE SLOPE STABILITY

Cross Section A-A' was measured using tape and Zip-level measurements to represent the topography of the site and surrounding influential land, as depicted in our appended Site and Cross-section Plans (ref: 135230-G600 and 135230-G610). Where ground inclination could not be measured due to private and public service properties, contours from available LiDAR data were implemented to represent the ground profile of subject areas.

Slope stability analyses were undertaken using computer program Slide 2 by Rocscience Limited. Theoretical non-circular (composite) surfaces were assessed using the Spencer method.

An assumed Uniformly Distributed Load (UDL) of 10kPa was applied to represent the surcharge load of the proposed dwelling and the existing neighboring dwelling downslope. An additional 5kPa was applied to represent the surcharge load of the public road downslope before crossing over to the Oruru River.

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

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

Effective shear stress (shear strength) parameters were used for our assessment, based on experience of the geology and back analysis of an assumed failure under normal and extreme groundwater conditions. Undrained soil strength parameters (no friction angle) were used to model the extreme conditions of a seismic event.

Back Analysis:

We have carried out a 'back analyses' to establish effective shear stress parameters for the stability assessment. An existing ground profile was modelled with fully saturated ground conditions to achieve a Factor of Safety ≈1.0 to demonstrate a possible scenario when ground movement could occur based on land topography prior to recent land modifications (ref Figure 18). The soil strength parameters used for the back analyses were then applied for the moderate and elevated scenarios of our slope stability assessment. Undrained soil strength parameters (no friction angle) were used to model the extreme conditions of a seismic event.

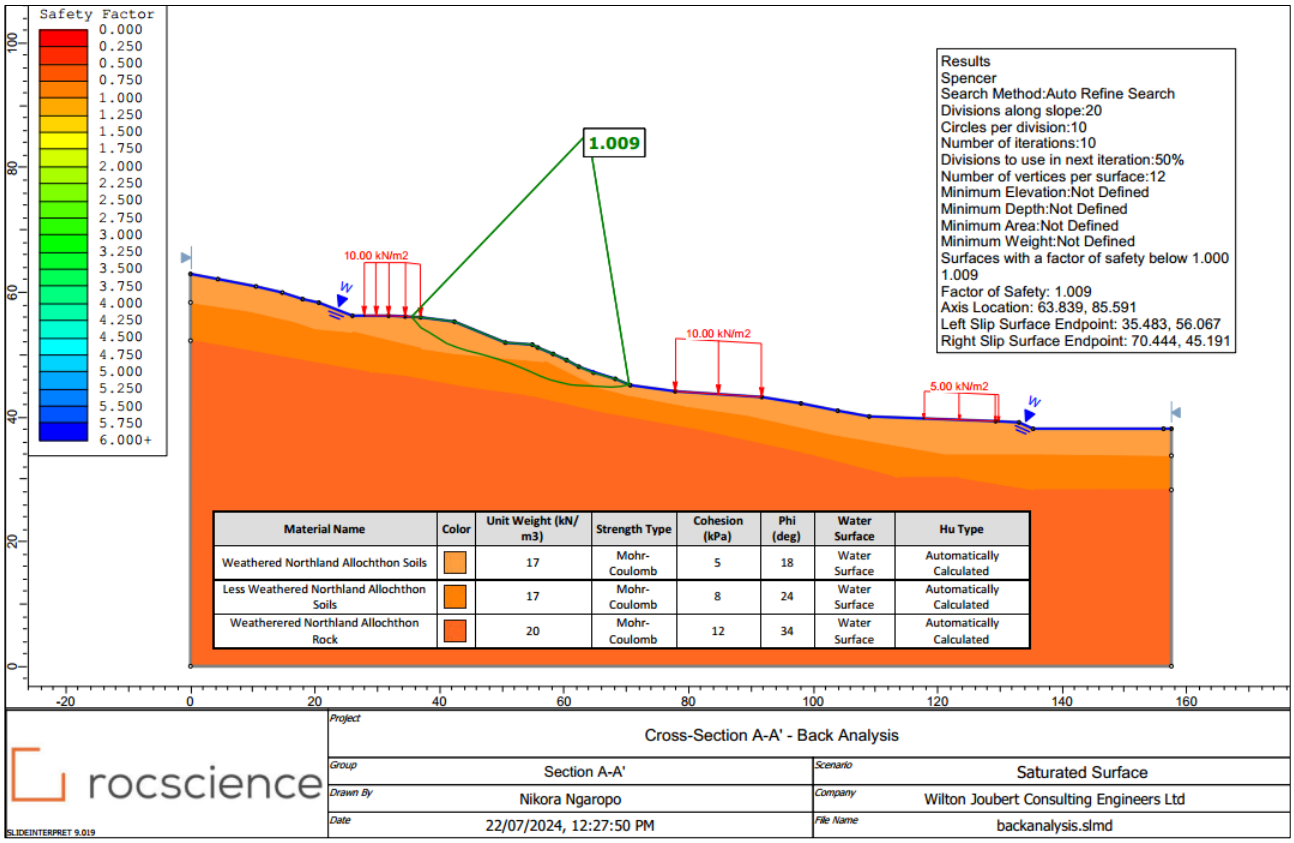


Figure 18: Original ground surface profile modelled from SLIDE 2 during back analysis.

The soil strength parameters used in the stability assessment are shown in the following table:

Table 2: Effective Shear Stress (Shear Strength) Parameters.

Soil Parameters	Non-Engineered Fill	Weathered Northland Allochthon Soils	Less Weathered Northland Allochthon Soils	Weathered Northland Allochthon Rock
Unit Weight, γ (kN/m3)	18.5	17	17	20
Effective Cohesion c' (kPa)	5	5	8	12
Friction Angle, ϕ' (°)	20	18	24	34
Undrained (no ϕ') Su	30	30	80	200

We commenced our assessment with a number of sensitivity analyses (not presented here), using more conservative parameters for the soil stratum, and groundwater day-lighting positions which confirmed that the slope is slightly sensitive to fluctuations in groundwater level near the surficial soil layers, and furthermore, that elevated groundwater (if present) would be the result of rapid infiltration of rainfall (wetting occurs from top down) rather than gradual rise in groundwater levels from depth. Based on the above, we have assumed the following groundwater scenarios:

1. **Moderate Groundwater Level.** Long-term stability when modelling the existing ground conditions and assumed a groundwater level at a depth of approximately 2.5m to 3.5m below the building site.

   FoS required >1.5.

2. **Elevated Groundwater Level.** Transient (medium-term) stability when modelling the worst-case scenario and assumed a raised groundwater level at a depth of approximately 1.3m to 2.3m below the building site.

   FoS required >1.3.

3. **Seismic Loading**. Short-term stability when modelling extreme ground conditions under a 500-year seismic event and assumed an elevated groundwater level at a depth of approximately 2.5m to 3.5m below the building site.

   FoS required >1.1.

A summary of the calculated minimum FoS against failure across the proposed development area for each of the above scenarios is shown in the following table:

Table 3: Stability Analysis Results – Back Analysis

Section	Design Conditions	Factor of Safety (FoS) within the Proposed Building Platform		Pass / Fail
		Required	Calculated	
A-A'	Back Analysis (Completely Saturated Ground)	≈1.0	1.009	N/A

Table 4: Stability Analysis Results – Post-Development

Section	Design Conditions	Factor of Safety (FoS) within the Proposed Building Platform		Pass / Fail
		Required	Calculated	
A-A'	Moderate Groundwater	≥1.5	>1.5	Pass
	Elevated Groundwater	≥1.3	>1.3	Pass
	Elevated Groundwater, plus Seismic Load	≥1.1	>1.1	Pass

8.3. SLOPE STABILITY CONCLUSIONS

The analyses indicate that a satisfactory FoS is available for the proposed building site under all conditions (see Table 4 above).

However, our analyses indicate that unsatisfactory FoS are apparent across the northern flank and existing non-engineered fill deposits during moderate and extreme groundwater scenario's (ref: appended Slope Stability Assessment Outputs). The analyses indicate that the mechanism of failure comprises a series of shallow (progressively getting deeper) slippage that starts at the toe of the northern flank and retrogressively encroaches upslope near the leading-edge of the building platform. The risk of shallow translational ground movement is expected to increase during times of extreme rainfall and following periods of intense rainfall that results in saturation of the weathered soil overburden and slippage along the contact with the underlying weathered rock.

In Section 9.1 below, we provide detailed recommendations for the design of leading-edge soil creep piles, such that risk of shallow soil creep and/or movement in the filled area is mitigated. The proposed deck is to be less than 1.0m in height off the finished ground level and is not part of this consent.

It is also recommended that:

- The northern flank and non-engineered fill deposits are planted systematically with low trees and shrubs to reduce the rate of failure through root-binding effects and prevention of ground surface cracking, and
- All stormwater run-off from the new development is appropriately managed and controlled on-site, so that no uncontrolled concentrated discharge occurs onto the steep northern flank. A cut-off drain should also be installed above the development area to aid in surficial water ponding and alleviating perched groundwater levels.

Any future construction on-site, not covered by this report, should be subject to further Geotechnical investigation and comprehensive stability assessment.

8.4. LIQUEFACTION ASSESSMENT

At the time of preparing this report, we note that the FNDC on-line GIS Liquefaction Vulnerability Map indicates that the designated building site is within an '*Undetermined*' zone.

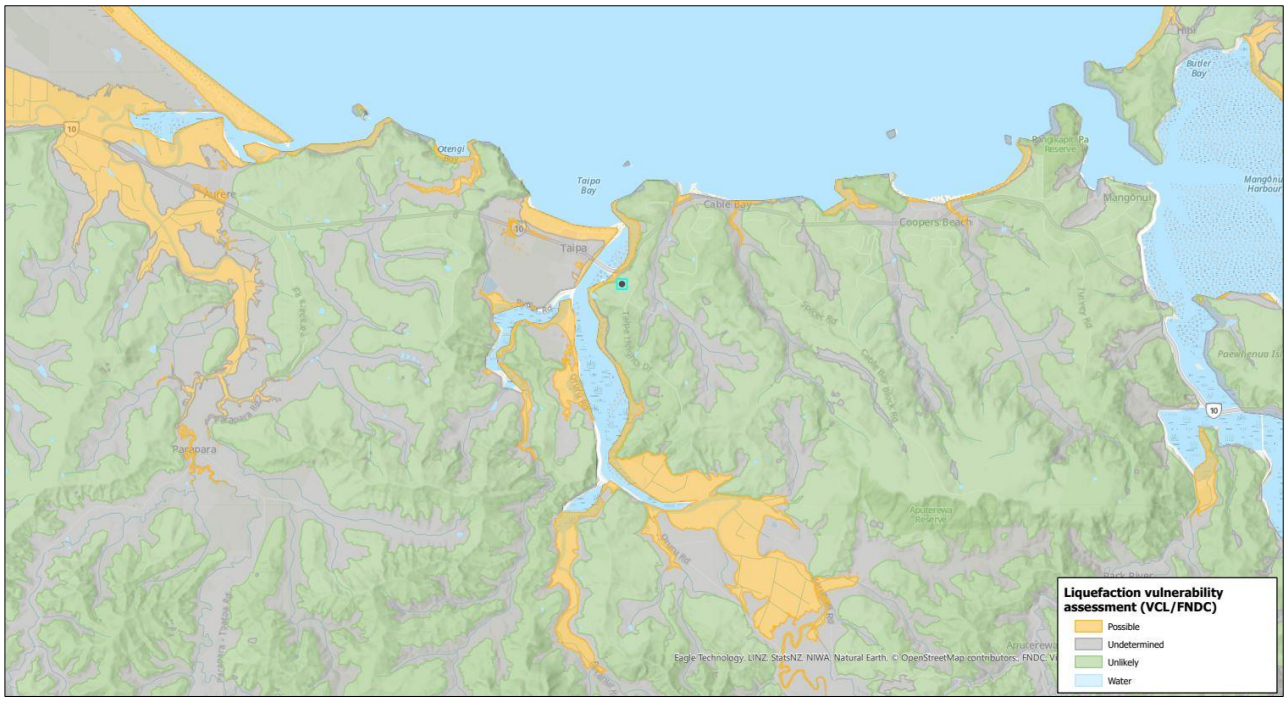


Figure 19: Screenshot of the subject site from the FNDC on-line GIS Liquefaction Vulnerability Map. Grey circle depicts property.

Liquefaction is a natural phenomenon where a loss of strength of sand-like soils is experienced following cyclic induced stress, which is typically a result of prolonged seismic shaking and the resultant increase in pore water pressure of saturated soils. Recent examples of this were experienced in Christchurch and the greater Canterbury Region during the Canterbury Earthquake Sequence between 2010-2011.

Cyclic loading during prolonged seismic shaking induces an increase in pore water pressure, which in turn decreases the effective stress of a sand-like deposit of soil. Excess pore water pressure (EPWP) can build to such an extent that the effective stress of the underlying soils is reduced to near zero, whereby the soils no longer carry shear strength and behave as a semi solid/fluid. In such a scenario, excess pore water pressures will follow the path of least resistance to eventual dissipation, which can lead to the migration of liquefied soils towards the surface, or laterally towards a free-face (edge of slope, riverbank, etc.) or layers that have not yet undergone liquefaction.

A screening procedure based on geological criteria was adopted to examine whether the proposed development might be susceptible to liquefaction, with observations as follows:

- There are no known active faults traversing through the property or immediate surrounding land,
- There is no historical evidence of liquefaction at the property,
- The site is situated on an elevated location with good water-shedding characteristics,
- Very high in-situ measured Vane Shear Strength readings recorded within natural ground during our investigation,
- Apart from a perched groundwater level, no groundwater was recorded in any of our HA's,
- The underlying natural soil deposits comprise of stiff to hard, cohesive soils that are not generally considered susceptible to liquefaction, and
- The subsoils of the site are underlain by Punakitere Sandstone (Mangakahia Complex) within Northland Allochthon soil deposits that are approximately 75 to 95 million years of age, allowing for adequate consolidation in comparison to Holocene age material (10,000 years). This also corroborates with the high Vane Shear Strengths and DCP readings at depth, recorded during our investigation.

Based on the above, we conclude that the subsoils across the designated building site have a negligible risk of liquefaction susceptibility and liquefaction damage is therefore considered to be unlikely.

9. CONCLUSIONS AND RECOMMENDATIONS

On the basis of the above analyses, we consider that the risk of moderate to deep-seated slope instability impacting on the designated building site to be satisfactorily low, provided all recommendations contained within our report are implemented in design and construction.

With regard to the Building Act 2004; Sections 71-72, we believe on reasonable grounds that:

i. The current proposed site development and associated building work within the relayed building platform should not accelerate, worsen, or result in slippage or subsidence on the land on which the building work is to be carried out or any other property, and

ii. The land beneath the building footprint and surrounding immediate amenity areas of the relayed building platform are neither subject nor likely to be subject to slippage or subsidence, provided the development is undertaken in accordance with the recommendations and guidance of this report.

9.1. FOUNDATIONS

9.1.1. LEADING EDGE SOIL CREEP PILES

We recommend all leading-edge dwelling foundations are designed to resist a loss of lateral soil support to a minimum depth of 2.0m bpgl. The minimum pile embedment bpgl is recommended to be 4.5m, unless deeper embedment is calculated by the structural designer based on Broms theory.

The approximate extent of the piles is depicted in our appended Site Plan (ref: 135230-G600) and will need verification by a Chartered Structural Engineer at the time of SED. At rest (Ko) Earth pressures, should be calculated assuming ø' = 28°, plus any upslope surcharges from sloping ground or applied surface loads to minimise pile/pole deflections.

The lateral creep forces loading foundations should be calculated from the "equivalent fluid pressure" of: Po =Ko.γ.Dc, plus distributed surcharge loads, (again for piles, applied over an equivalent width of 3 pile diameters), where:

- Ko = (1-sinø').(1+sinß),
- ø'= soil angle of shearing resistance,
- ß = up-slope angle,
- Soil density γ= 17kN/m3, and
- Dc = Soil creep depth = 2.0m.

For calculating embedment using Brom's theory, we recommended assuming an undrained shear strength (Su) value of no more than 50kPa.

For the design of axial capacity of piles, we recommend assuming the following design parameters, subject to confirmatory pile inspections during construction:

Table 5: Soil Parameters for In-ground Soldier Pile Wall Design

Minimum Pile Embedment Depth	Geotechnical Ultimate End Bearing Capacity (GUBC)	Geotechnical Dependable End Bearing Capacity (GDBC)	Geotechnical Ultimate Soil/Concrete Adhesion	Geotechnical Dependable Soil/Concrete Adhesion
No less than 3.0m below existing ground level (structural designer to confirm).	900 kPa	450 kPa (SRF 0.5 to GUBC)	25 kPa	12.5 kPa (SRF 0.5 to GUBC)

Please note, for SLS calculation, an appropriate factor of safety such as 3 applied to the GUBC should be adopted to calculate the Allowable Load Capacity for SLS Design. If both shaft resistance and end bearing resistance are combined when designing piles in excess of 0.60m diameter for SLS design loads, the Structural Engineer should give consideration to the relative levels of tolerable settlement, as the magnitude of pile movement required to mobilise shaft resistance may be significantly less than the movement required to mobilise end bearing resistance.

9.1.2. SHALLOW FOUNDATION BEARING CAPACITY

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

Table 6 Bearing Capacity Values

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 up from:

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

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

During inspections, it is important to exercise caution to verify that the natural ground meets the recommended bearing capacity mentioned in this report. This is crucial for preserving stability and structural integrity.

9.1.3. SHALLOW FOUNDATIONS ON EXPANSIVE SOILS

In the absence of specific lab-testing, we recommend a primary classification of Class H (Highly) expansive soils as defined in clause 7.5.13.1.2, as introduced to NZS3604 by Amendment 19 of NZBC Structure B1/AS1.

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

For shallow foundations, possessing sufficient lateral stability is crucial. Adequate lateral stability is essential to protect the foundation's integrity and prevent any potential damage to the structure and adjacent elements. It is also essential to ensure that the load from a foundation does not impose any additional stress or load on the surrounding features.

Soil expansiveness can be mitigated for shallow foundations as follows:

- Dwelling & Deck Foundations:
  - Bored, concrete-encased, tanalised timber pile foundations with a minimum embedment of 0.90m below finished ground level and 0.30m into very stiff, natural ground, whichever is deeper.

9.1.4. NZS1170.5:2004 SITE SUBSOIL CLASSIFICATION

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

9.2. SITE EARTHWORKS

Apart from footing excavations and minor landscape fill below the proposed deck, up to approximately 0.40m, in ensuring it is no higher than 1.0m above the finished ground level, no significant earthworks are proposed for the development.

The former timber footings for the previous dwelling that are present across the proposed building site can remain, however, may need to be cut or removed where required during foundation construction.

Furthermore, any future earthworks should be undertaken in accordance with the following standards:

- NZS4431:2022 “Code of Practice for Earth Fill Residential Development”,
- Section 2 “Earthworks & Geotechnical Requirements” of NZS4404:2010 “Land Development and Subdivision Infrastructure”, and
- Chapter 2 “Site Development Suitability (Geotechnical and Natural Hazards” of the Far North District Council Engineering Standards, (Version 0.6 issued May 2023).

9.3. TEMPORARY & LONG-TERM EARTHWORK BATTERS

We recommend that any earthworks only be undertaken during the summer period of the year or prolonged dry forecast weather conditions.

During times of inclement weather, earthwork sites should be shaped to assist in stormwater run-off. The toe of batter excavations should be shaped so as to avoid ponded water, as saturating site soils could result in a reduction of bearing capacities.

Any additional cuts and fills outside the proposed limits of this report should be discussed with a Geo-Professional.

All landscape fills should be battered no steeper than 1V:4H or if this is unable to be achieved, advice should be sought from a Geo-Professional. Likewise, any proposed landscape fills that exceed a height of 0.40m must be referred to a Geo-Professional.

The structural designer and building contractor should ensure that a satisfactory FoS against ground instability is available at all stages of the development.

9.4. GENERAL SITE WORKS

We stress that any and all works should be undertaken in a careful and safe manner so that Health & Safety is not compromised, and that suitable Erosion & 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.

9.5. LONG-TERM FOUNDATION CARE & MAINTENANCE

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

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

- Their presence can induce differential consolidation settlements beneath foundations through localised soil water deprivation, or conversely, 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 CONTROL

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

Overland flows and similar runoff such as from any higher ground should be intercepted by means of a cut-off drain and be directed away from the building site to protect the platform from both saturation and erosion. Water collected in interceptor drains should be diverted away from the building site to a stable disposal point and not to the steep northern flank. All stormwater runoff from roof areas should be collected in sealed pipes and be discharged in accordance with the above.

At no stage should run-off be directed to slopes below the proposed development area and under no circumstances should concentrated overflows from any source discharge into or onto the ground in an uncontrolled fashion.

11. UNDERGROUND SERVICES

The FNDC on-line GIS Water Services Map does not indicate any underground services to be present within the property. However, considering the pre-existing residential development on-site, it is generally envisaged that underground services, public or private, mapped, or unmapped, of any type will be present, hence we recommend staying on the side of caution during the commencement of any work within the proposed development area.

12. 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 "pin-prick" 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 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 soil creep pile footing excavations, and
- Pre-pour dwelling footings.

13. LIMITATIONS

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

This report has been commissioned solely for the benefit of our clients, GJ Gardner Homes Far North (2K Construction Ltd), in relation to the project as described herein, and to the limits of our engagement, with the exception that the local Territorial Authority may rely on it to the extent of its appropriateness, conditions and limitations, when issuing the subject consent. Any variations from the development proposals as described herein as forming the basis of our appraisal should be referred to us for further evaluation. Copyright of Intellectual Property remains with WJL, and this report may NOT be used by any other entity, or for any other proposals, without our written consent. Therefore, no liability is accepted by this firm or any of its directors, servants, or agents, in respect of any other geotechnical aspects of this site, nor for its use by any other person or entity, and any other person or entity who relies upon any information contained herein does so entirely at their own risk. Where other parties may wish to rely on it, whether for the same or different proposals, this permission may be extended, subject to our satisfactory review of their interpretation of the report.

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.

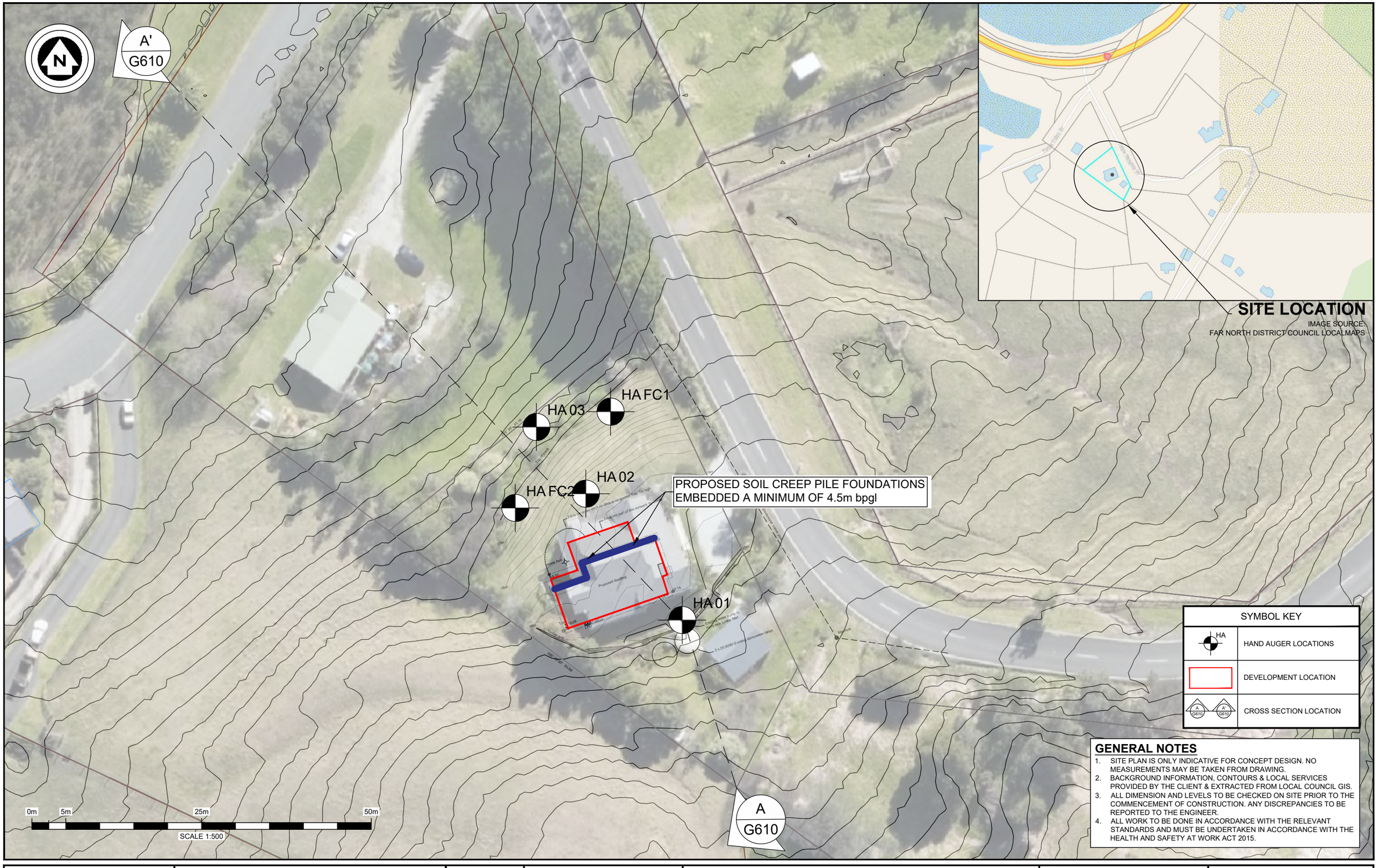
Thank you for the opportunity to provide our service on this project, and if we can be of further assistance, please do not hesitate to contact us.

Yours faithfully,

WILTON JOUBERT LIMITED

Enclosures:

Site Plan (1 sheet)
Cross-Section A-A' (1 sheet)
Hand Auger Borehole Records (5 sheets)
Slope Stability Assessment Outputs (4 sheets)
'Foundation Maintenance & Footing Performance' sheet BTF18: A Homeowner's Guide, published by CSIRO (4 sheets)
Construction Monitoring (1 sheet)



SITE LOCATION

IMAGE SOURCE:
FAR NORTH DISTRICT COUNCIL LOCALMAPS

SYMBOL KEY	
HA	HAND AUGER LOCATIONS
	DEVELOPMENT LOCATION
A G610 / A' G610	CROSS SECTION LOCATION

GENERAL NOTES

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

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Wanaka: 03 443 6209
www.wiltonjoubert.co.nz

ISSUE / REVISION

No.	DATE	BY	DESCRIPTION
A	JULY 2024	NPN	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY:
DRAWN BY: NPN
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.

BUILDING CONSENT

DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **SITE PLAN**

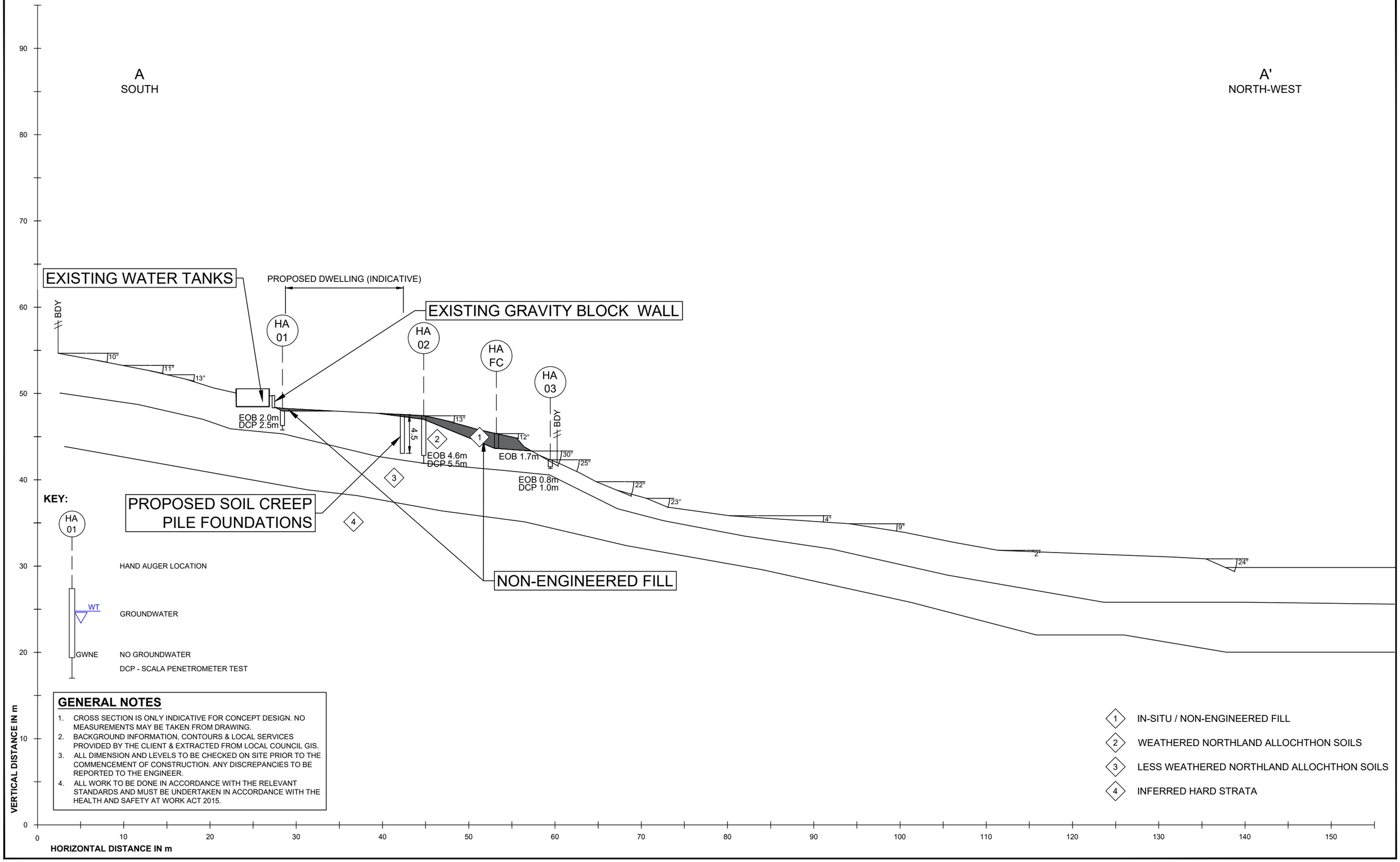
PROJECT DESCRIPTION: **PROPOSED DWELLING**

PROJECT TITLE:
LOT 2 DP 314261
22 TAIPA HEIGHTS DRIVE
TAIPA
NORTHLAND

ORIGINAL DRAWING SIZE:	OFFICE:
A3	KERIKERI
DRAWING SCALE: 1:500	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 135230-G600	ISSUE: A

A
SOUTH

A'
NORTH-WEST



GENERAL NOTES

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

1. IN-SITU / NON-ENGINEERED FILL
2. WEATHERED NORTHLAND ALLOCHTHON SOILS
3. LESS WEATHERED NORTHLAND ALLOCHTHON SOILS
4. INFERRED HARD STRATA

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ISSUE / REVISION

No.	DATE	BY	DESCRIPTION
A	JULY 2024	NPN	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY:
DRAWN BY: NPN
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.

BUILDING CONSENT
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE:
CROSS SECTION A-A'

PROJECT DESCRIPTION:
PROPOSED DWELLING

PROJECT TITLE:
LOT 2 DP 314261
22 TAIPA HEIGHTS DRIVE
TAIPA
NORTHLAND

ORIGINAL DRAWING SIZE:	OFFICE:
A3	KERIKERI
DRAWING SCALE:	CO-ORDINATE SYSTEM:
1:400	NOT COORDINATED
DRAWING NUMBER:	ISSUE:
135230-G610	A

HAND AUGER : HA01

CLIENT: G.J. Gardner Homes Far North (2K Construction Ltd)
PROJECT: New Dwelling
SITE LOCATION: 22 Taipa Heights Drive, Taipa

JOB NO.: 135230 **SHEET:** 1 OF 5
START DATE: 18/07/2024 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: 1994 **ELEVATION:** Ground
FACTOR: 1.41 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE: PEAK STRENGTH (kPa)	SHEAR VANE: REMOULD STRENGTH (kPa)	SHEAR VANE: SENSITIVITY	DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
FILL	NON-ENGINEERED FILL, yellow with brown TOSPOIL intermixed, wet		0.2						
Punakitere Sandstone in Northland Allochthon	NATURAL: Clayey SILT, yellow, stiff, moist to wet, low plasticity, occasional clast inclusions		0.4		99	20	5.0		
	0.7m: Frequent weakly cemented clast inclusions		0.6						
			0.8	▽					
	Slightly Gravelly SILT (COMPLETELY WEATHERED MUDSTONE), trace sand & clay, bluey grey, very stiff to hard, moist, no plasticity, perched groundwater encountered		1.0		96	11	8.7		
			1.2					19	
			1.4		UTP	-	-	9	
			1.6					9	
			2.0		197+	-	-	6	
								9	
								5	
	EOH: 2.00m - Too Hard To Auger				UTP	-	-	12	
			2.2					8	
			2.4					7	
			2.6					8	
			2.8					20+	
			3.0						
			3.2						
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						
			4.4						
			4.6						
			4.8						
			5.0						
			5.2						
			5.4						
			5.6						
			5.8						

REMARKS
End of borehole @ 2.00m (Target Depth: 5.00m)
Groundwater encountered @ 0.80m during drilling.

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

LOGGED BY: JEM
CHECKED BY: DXS

▼ Standing groundwater level
▽ GW while drilling

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HAND AUGER : HA02

JOB NO.: 135230 **SHEET:** 2 OF 5

CLIENT: G.J. Gardner Homes Far North (2K Construction Ltd)

PROJECT: New Dwelling

SITE LOCATION: 22 Taipa Heights Drive, Taipa

START DATE: 18/07/2024 **NORTHING:** **GRID:**

DIAMETER: 50mm **EASTING:**

SV DIAL: 772 **ELEVATION:** Ground

FACTOR: 1.6 **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
FILL	NON-ENGINEERED FILL (TOPSOIL intermixed with Clayey SILT), brown with occasional orange mottles, stiff, moist, low plasticity		0.2 0.4						
Punakitere Sandstone in Northland Allochthon	NATURAL: Clayey SILT, light brown streaked orange & grey, very stiff, moist, moderate plasticity		0.4	Groundwater Not Encountered	58	19	3.1		
			0.6 0.8						
			0.8		141	58	2.4		
			1.0 1.2						
	1.2m: 100mm lense of orange silt inclusions		1.2		109	61	1.8		
	1.3m: Becoming greyish light brown with light orange & grey streaks, low to moderate plasticity		1.4 1.6						
			1.6		179	99	1.8		
			1.8 2.0						
	2.1m: Becoming orange with white streaks, moderate plasticity		2.0		176	96	1.8		
	2.3m: Becoming light orange with white streaks, low to moderate plasticity		2.2 2.4		141	74	1.9		
			2.6						
	2.8m: Becoming orange with white streaks, moderate plasticity		2.8		144	90	1.6		
			3.0 3.2		154	86	1.8		
	3.3m: Becoming light orange with white streaks, low to moderate plasticity		3.4						
			3.6		154	77	2.0		
	3.7m: Becoming grey with orange streaks		3.8						
	Sandy SILT (COMPLETELY WEATHERED SANDSTONE), brown & grey, very stiff to hard, dry to moist, no plasticity, friable		4.0						
	4.0m: Becoming brown		4.0		UTP	-	-		
	4.3m: Becoming brown & orange		4.2 4.4						
			4.6		224+	-	-		
	EOH: 4.60m - Too Hard To Auger				UTP	-	-	11	
			4.8					6	
			5.0					6 4	
			5.2					7 6	
			5.4					7 12	
			5.6					20+	
			5.8						

REMARKS

End of borehole @ 4.60m (Target Depth: 5.00m)

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

LOGGED BY: SJP

CHECKED BY: DXS

▼ Standing groundwater level

▽ GW while drilling

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HAND AUGER : HA03

CLIENT: G.J. Gardner Homes Far North (2K Construction Ltd)
PROJECT: New Dwelling
SITE LOCATION: 22 Taipa Heights Drive, Taipa

JOB NO.: 135230 **SHEET:** 3 OF 5
START DATE: 18/07/2024 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: DR4802 **ELEVATION:** Ground
FACTOR: 1.55 **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
FILL	NON-ENGINEERED FILL/TOPSOIL		0.0	Groundwater Not Encountered					
Punakitere Sandstone in Northland Allochthon	NATURAL: SILT with minor Fine Sand (COMPLETELY WEATHERED SANDSTONE), brownish orange with occasional grey streaks, very stiff, dry to moist, no to low plasticity		0.2						
			0.4		217+	-	-		
	0.6m: Becoming hard to drill		0.6						
			0.8		UTP	-	-	20	
	EOH: 0.80m - Too Hard To Auger		1.0					20+	Bouncing
			1.2						
			1.4						
			1.6						
			1.8						
			2.0						
			2.2						
			2.4						
			2.6						
			2.8						
			3.0						
			3.2						
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						
			4.4						
			4.6						
			4.8						
			5.0						
			5.2						
			5.4						
			5.6						
			5.8						

REMARKS
End of borehole @ 0.80m (Target Depth: 5.00m)

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

LOGGED BY: NPN
CHECKED BY: DXS

▼ Standing groundwater level
▽ GW while drilling

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HAND AUGER : FC01

JOB NO.: 135230 **SHEET:** 4 OF 5

START DATE: 18/07/2024 **NORTHING:** **GRID:**

CLIENT: G.J. Gardner Homes Far North (2K Construction Ltd)

DIAMETER: 50mm **EASTING:**

PROJECT: New Dwelling

SV DIAL: **ELEVATION:** Ground

SITE LOCATION: 22 Taipa Heights Drive, Taipa

FACTOR: **DATUM:**

SOIL DESCRIPTION: TOPSOIL, CLAY, SAND, PEAT, FILL, SILT, GRAVEL, ROCK

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE: PEAK STRENGTH (kPa)	SHEAR VANE: REMOULD STRENGTH (kPa)	SHEAR VANE: SENSITIVITY	DCP - SCALA (Blows / mm)	COMMENTS, SAMPLES, OTHER TESTS
FILL	NON-ENGINEERED FILL		0.0	Groundwater Not Encountered					
Topsoil	BURIED TOPSOIL	TS	1.6						
Natural	NATURAL GROUND		1.8						
	EOH: 1.80m - Target Depth		2.0						

REMARKS

End of borehole @ 1.80m (Target Depth: 1.80m)

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

LOGGED BY: JEM

CHECKED BY: DXS

▼ Standing groundwater level

▽ GW while drilling

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HAND AUGER : FC02

CLIENT: G.J. Gardner Homes Far North (2K Construction Ltd)
PROJECT: New Dwelling
SITE LOCATION: 22 Taipa Heights Drive, Taipa

JOB NO.: 135230 **SHEET:** 5 OF 5
START DATE: 18/07/2024 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: **ELEVATION:** Ground
FACTOR: **DATUM:**

SOIL DESCRIPTION: TOPSOIL, CLAY, SAND, PEAT, FILL, SILT, GRAVEL, ROCK

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE: PEAK STRENGTH (kPa)	SHEAR VANE: REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / mm)	COMMENTS, SAMPLES, OTHER TESTS
FILL	NON-ENGINEERED FILL, some rubbish inclusions		0.2, 0.4, 0.6, 0.8	Groundwater Not Encountered					
Topsoil	BURIED TOPSOIL	TS	1.0, 1.2						
Natural in Nature	NATURAL GROUND								
	EOH: 1.30m - Target Depth		1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.6, 2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.0, 4.2, 4.4, 4.6, 4.8, 5.0, 5.2, 5.4, 5.6, 5.8						

REMARKS
End of borehole @ 1.30m (Target Depth: 1.30m)

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

LOGGED BY: NPN
CHECKED BY: DXS

▼ Standing groundwater level
▽ GW while drilling

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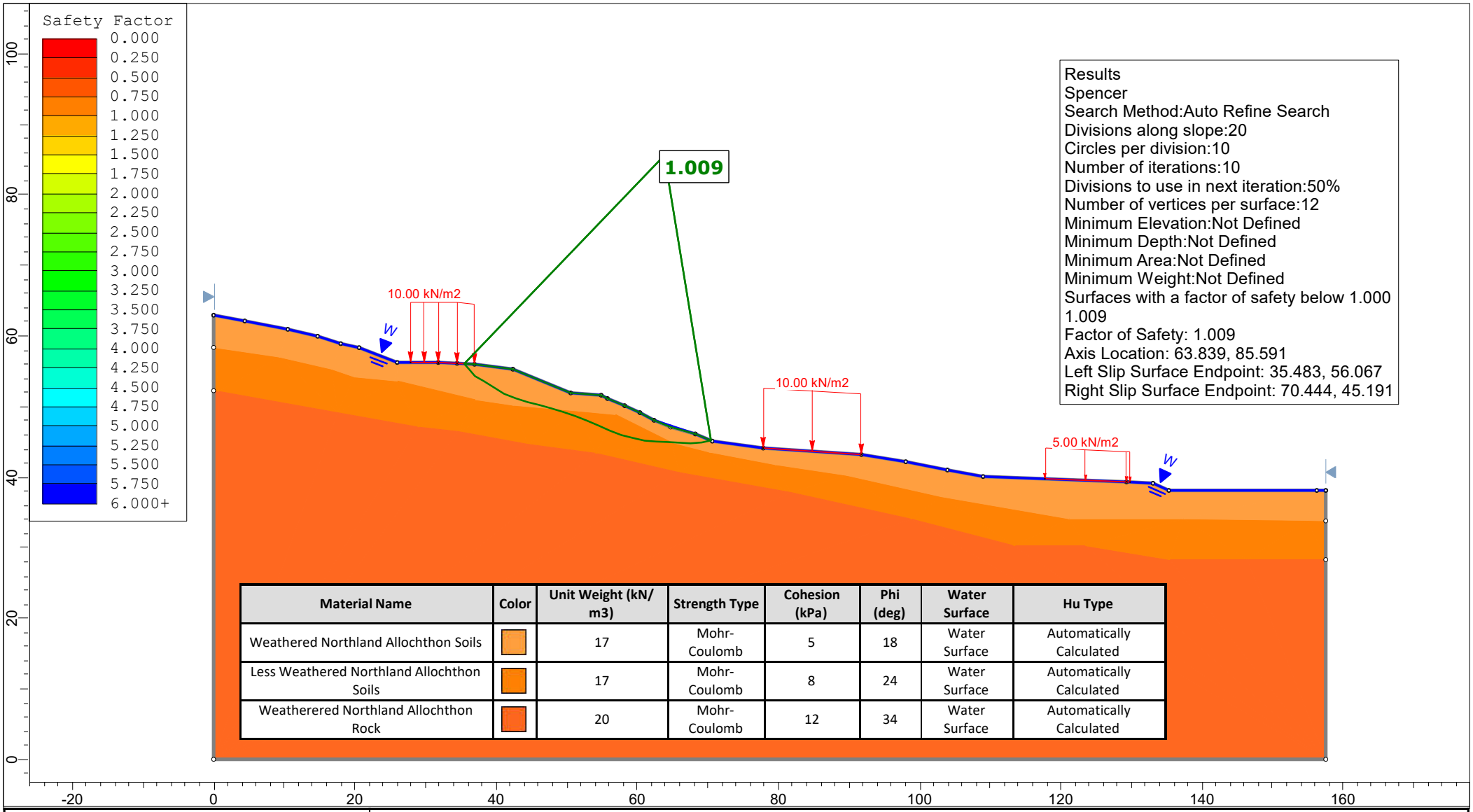
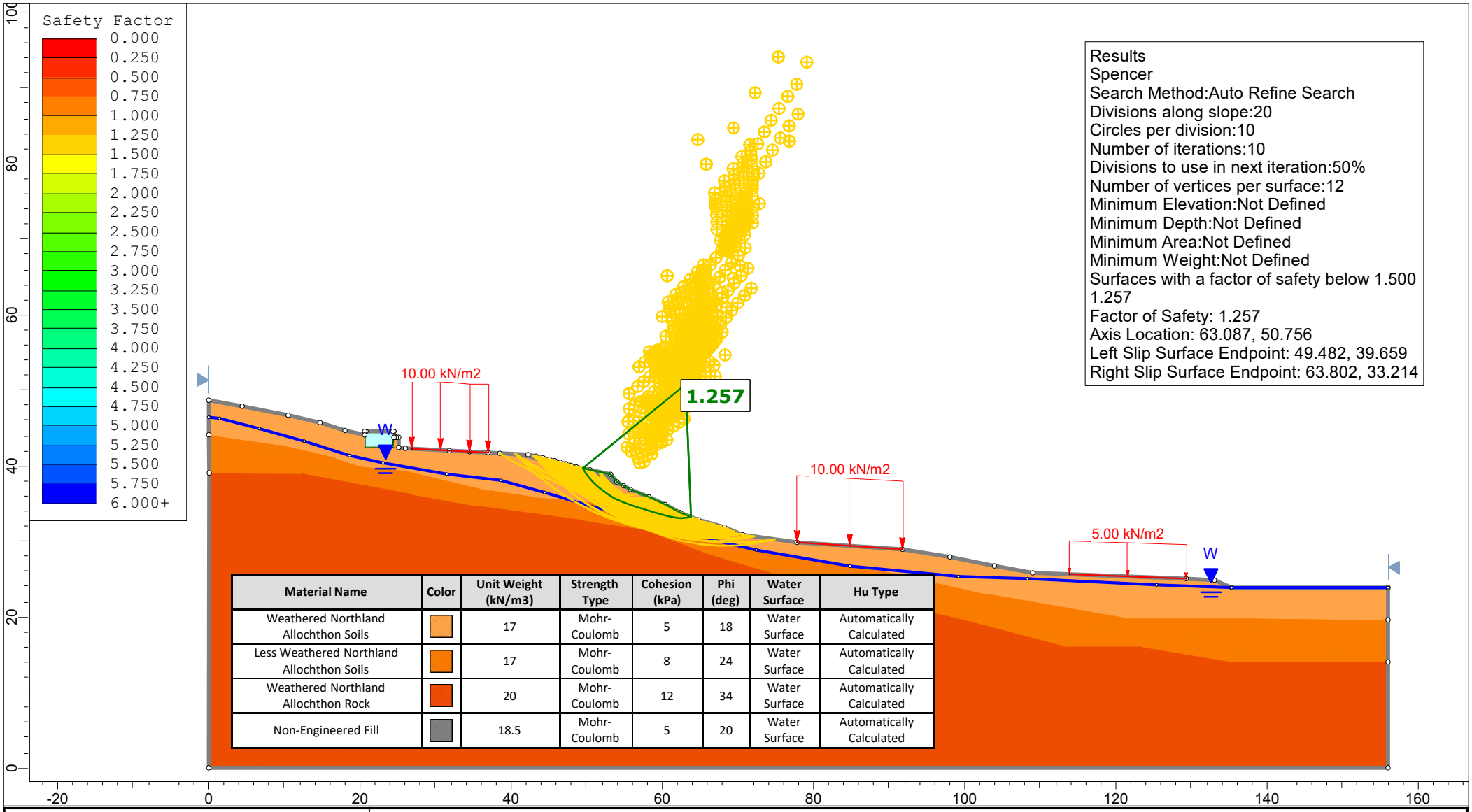


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Hu Type
Weathered Northland Allochthon Soils		17	Mohr-Coulomb	5	18	Water Surface	Automatically Calculated
Less Weathered Northland Allochthon Soils		17	Mohr-Coulomb	8	24	Water Surface	Automatically Calculated
Weatherered Northland Allochthon Rock		20	Mohr-Coulomb	12	34	Water Surface	Automatically Calculated

rocscience

SLIDEINTERPRET 9.019

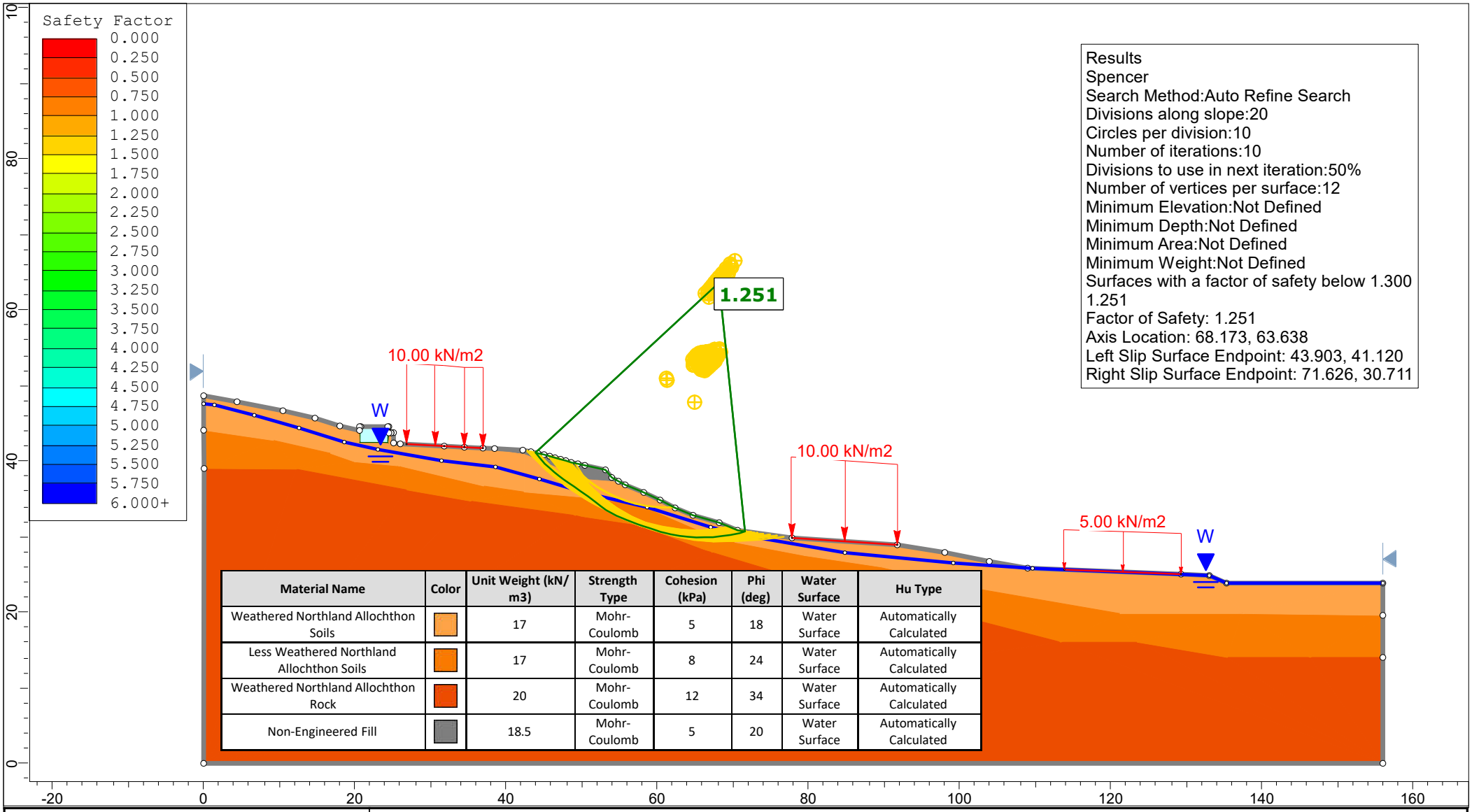
Project	Cross-Section A-A' - Back Analysis		
Group	Section A-A'	*Scenario*	Saturated Surface
Drawn By	Nikora Ngaropo	*Company*	Wilton Joubert Consulting Engineers Ltd
Date	22/07/2024, 12:27:50 PM	*File Name*	backanalysis.slmd



rocscience

SLIDEINTERPRET 9.019

Project	Cross-Section A-A'		
Group	Section A-A'	*Scenario*	Moderate Groundwater
Drawn By	Nikora Ngaropo	*Company*	Wilton Joubert Consulting Engineers
Date	22/07/2024, 1:49:51 PM	*File Name*	Section A-A'.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Hu Type
Weathered Northland Allochthon Soils		17	Mohr-Coulomb	5	18	Water Surface	Automatically Calculated
Less Weathered Northland Allochthon Soils		17	Mohr-Coulomb	8	24	Water Surface	Automatically Calculated
Weathered Northland Allochthon Rock		20	Mohr-Coulomb	12	34	Water Surface	Automatically Calculated
Non-Engineered Fill		18.5	Mohr-Coulomb	5	20	Water Surface	Automatically Calculated

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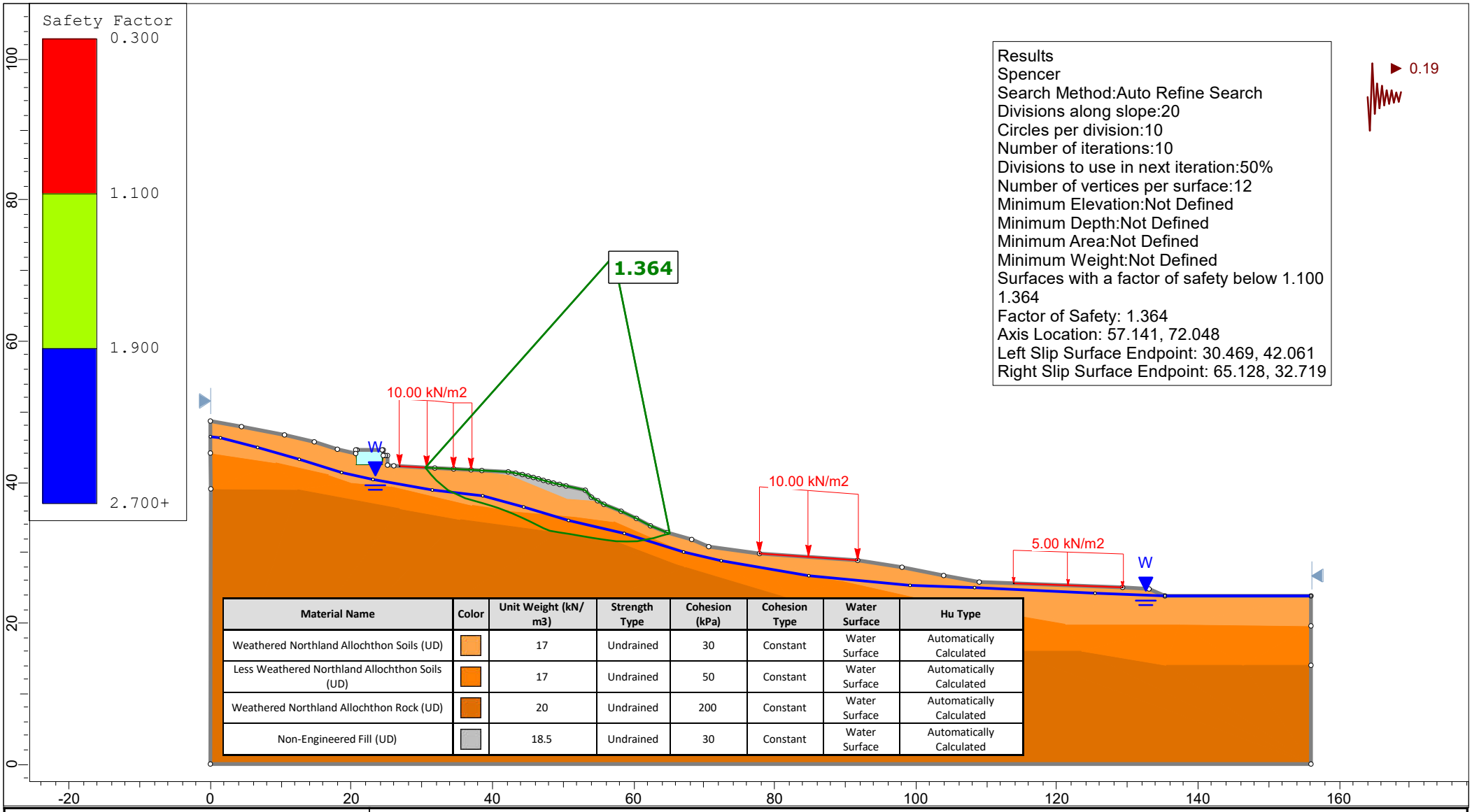
SLIDEINTERPRET 9.019

Project	Cross-Section A-A'		
Group	Section A-A'	*Scenario*	Extreme Groundwater
Drawn By	Nikora Ngaropo	*Company*	Wilton Joubert Consulting Engineers
Date	22/07/2024, 1:49:51 PM	*File Name*	Section A-A'.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Cohesion Type	Water Surface	Hu Type
Weathered Northland Allochthon Soils (UD)		17	Undrained	30	Constant	Water Surface	Automatically Calculated
Less Weathered Northland Allochthon Soils (UD)		17	Undrained	50	Constant	Water Surface	Automatically Calculated
Weathered Northland Allochthon Rock (UD)		20	Undrained	200	Constant	Water Surface	Automatically Calculated
Non-Engineered Fill (UD)		18.5	Undrained	30	Constant	Water Surface	Automatically Calculated

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SLIDEINTERPRET 9.019

Project	Cross-Section A-A'		
Group	Section A-A'	*Scenario*	Seismic
Drawn By	Nikora Ngaropo	*Company*	Wilton Joubert Consulting Engineers
Date	22/07/2024, 1:49:51 PM	*File Name*	Section A-A'.slmd

Foundation Maintenance and Footing Performance:
A Homeowner's Guide

PUBLISHING

BTF 18-2011 replaces Information Sheet 10/91

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 homeowner 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.

This Building Technology File is designed to identify causes of soil-related building movement, and to suggest methods of prevention of resultant cracking in buildings.

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.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. 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. The table below is Table 2.1 from AS 2870-2011, the Residential Slab and Footing Code.

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 are the province of the builder and should be taken into consideration as part of the preparation of the site for construction. Building Technology File 19 (BTF 19) deals with these problems.

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). 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.

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

Notes

1. Where controlled fill has been used, the site may be classified A to E according to the type of fill used.
2. Filled sites. Class P is used for sites which include soft fills, such as clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soil subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise.
3. Where deep-seated moisture changes exist on sites at depths of 3 m or greater, further classification is needed for Classes M to E (M-D, H1-D, H2-D and E-D).

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.
- 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. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins 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.

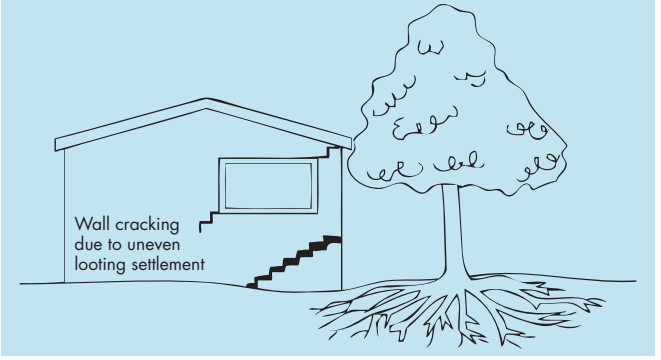
The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally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

Trees can cause shrinkage and damage



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. The table 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/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 is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

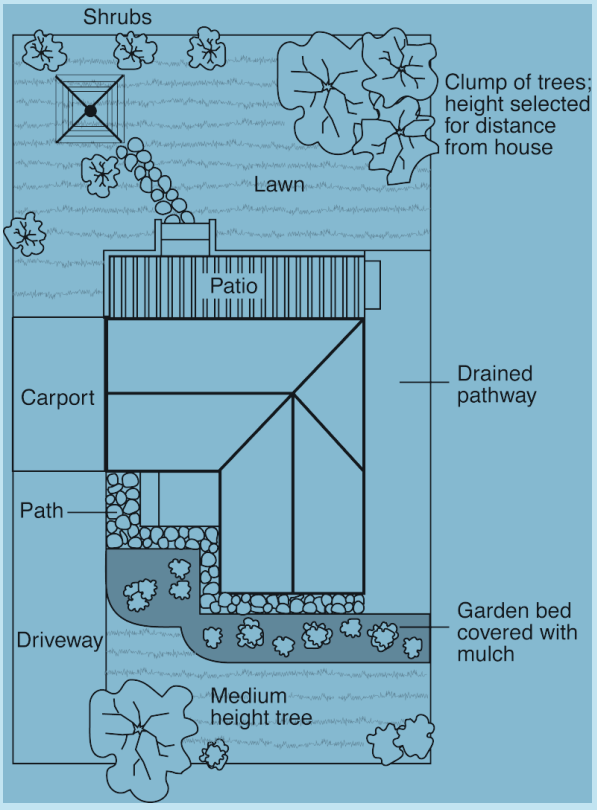
Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

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

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly.	<5 mm	2
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
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

Gardens for a reactive site



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 from it (see BTF 19).

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.

Warning: Although this Building Technology File 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.
- 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

Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, 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. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

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. For information on plant roots and drains, see Building Technology File 17.

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 homeowner 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.

This BTF was prepared by John Lewer FAIB, MIAMA, Partner, Construction Diagnosis.

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CONSTRUCTION MONITORING SERVICES

Construction monitoring is a service, which provides the client with independent verification (to the extent of the consultant's engagement) that the works have been completed in accordance with specified requirements. Most construction projects are unique, and construction works are often complex in detail and skilled professional involvement is necessary for the successful execution of such projects.

The decision as to which level is appropriate will be project dependent, but factors influencing the level of construction monitoring for a project are the size and importance of the project, the complexity of the construction works, and the experience and demonstrated skill in quality management of the constructor. The primary responsibility for completing the contract works in accordance with the requirements of the plans and specifications is the constructor's.

The involvement of the consultants is important during the construction phase to ensure that the design is being correctly interpreted, the construction techniques are appropriate and do not reduce the effectiveness of the design and the work is completed generally in accordance with the plans and specifications. The risk of non-compliance can be reduced by increasing the involvement of the consultant.

Table 1 sets out the five levels of construction monitoring, describes the types of review and indicates where a particular level of monitoring is appropriate. Tables 2 and 3 provide rating values for various aspects of a project to enable an assessment of an appropriate monitoring level to be made.

Table 1

LEVEL	REVIEW	COMMENT
CM1	Monitor the outputs from another party's quality assurance programme against the requirements of the plans and specifications. Visit the works at a frequency agreed with the client to review important materials of construction critical work procedures and/or completed plant or components. Be available to advise the constructor on the technical interpretation of the plans and specifications.	This level is only a secondary service. It may be appropriate where:- For the design consultant when another party is engaged to provide a higher level of construction monitoring or review during the period of construction or:- When the project works are the subject of a performance based specification and performance testing is undertaken and monitored by others.
CM2	Review, preferable at the earliest opportunity, a sample of each important work procedure, material of construction and component for compliance with the requirements of the plans and specifications and review a representative sample of each important completed work prior to enclosure or completion s appropriate. Be available to provide the constructor with technical interpretation of the plans and specification.	This level of service is appropriate for smaller projects of a routine nature being undertaken by an experienced and competent constructor and where a higher than normal risk of non-compliance is acceptable. It provides for the review of a representative sample of work procedures and materials of construction. The assurance of compliance of the finished work is dependent upon the constructor completing the work to at least the same standard as the representative sample reviewed.
CM3	Review, to an extent agreed with the client, random samples of important work procedures, for compliance with the requirements of the plans and specifications and review important completed work prior to enclosure or on completion as appropriate. Be available to provide the constructor with technical interpretation of the plans and specifications.	This level of service is appropriate for medium sized projects of a routine nature being undertaken by an experienced constructor when a normal risk of non-compliance is acceptable.
CM4	Review, at a frequency agreed with the client, regular samples of work procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review the majority of completed work prior to the enclosure or on completion as appropriate.	This level of service is appropriate for projects where a lower than normal risk of non-compliance is required.
CM5	Maintain personnel on site to constantly review work procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review completed work prior to enclosure or on completion as appropriate.	This level of service is appropriate for Major projects -Projects where the consequences of failure are critical -Projects involving innovative or complex construction procedures. The level of service provides the client with the greatest assurance that the completed work complies with the requirements of the plans and specifications.

Source www.ipenz.org.nz/ipenz/practicesupport/endorsedinfo/codes

Table 2

CRITERIA	K	ASSESSMENT				SELECTED VALUE
Project Status		Small	Medium	Large	Major	
	KA	1	2	3	4	
Complexity of work procedures		Routine	Difficult	Complex		
	KB	2	4	6		
Constructor's relevant experience		Inexperienced	Experienced	Certified ISO 9000		
	KC	6	2	1		
Consequences of non-compliance		Minor	Moderate	Serious	Critical	
	KD	1	4	6	12	
					KTOTAL = KA + KB + KC + KD ->	

Table 3

	LEVEL OF CONSTRUCTION MONITORING				
KTOTAL	CM1	CM2	CM3	CM4	
5-6	-	Sampling only	-	-	-
7-8	-	N/A	Weekly	-	-
9-10	A	N/A	Twice Weekly	-	-
11-12	Secondary	N/A	N/A	Twice Weekly	-
13-14	Service	N/A	N/A	Every second day	-
15-16	-	N/A	N/A	Daily	-
17-	-	N/A	N/A	N/A	Constant

N/A = Not Appropriate

- Secondary Service - This level of service is only appropriate when another party is responsible for undertaking the primary review of construction standards.
- Table 3 indicates the frequency of review considered to be appropriate for the project concerned. Not indicated is the time input requirement at each review. The time on each occasion will increase with the increased size and complexity of the construction works and should be agreed with the consultant at the time of engagement.
- Frequency of inspection is intended to be indicative of involvement with actual frequency dependent on the rate of progress of the works.

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SITE	22 Taipa Heights Drive, Taipa
LEGAL DESCRIPTION	Lot 2 DP 314261
PROJECT	Proposed Dwelling
CLIENT	G.J Gardner Homes Far North (2K Construction Ltd.)
REFERENCE NO.	136259
DOCUMENT	Stormwater Mitigation Report
STATUS/REVISION No.	C
DATE OF ISSUE	14th October 2024

Report Prepared For	Attention	Email
G.J Gardner Homes Far North (2K Construction Ltd.)	Shane Anderson	shane.anderson@gjgardner.co.nz

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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.

Legal Description:	Lot 2 DP 314261
Site Area:	1,889m²
Development Type:	Proposed Dwelling
Development Proposals Supplied:	Plan Set supplied by G.J Gardner Homes (Ref No: 5296, dated: 11.10.2024)
District Plan Zone:	Coastal Living
Permitted Activity Coverage:	10%
Impermeable Coverage:	Post-Development Impermeable Areas Total Roof Area 202.4m² Total Hardstand 117m² Total impermeable area = 319.4m² or 16.9% of the site area
Activity Status:	Discretionary Activity
Roof Attenuation:	Stormwater mitigation is to be provided in accordance with the requirements outlined in Section 5 in the existing/proposed dual-purpose rainwater tanks. **Proposed Tank** – 2 x 25,000 litre Rainwater Tanks **Dimensions** – 3600mmØ (or greater) x 2600mm high (or greater) **WQV Control Orifice** – 15mmØ orifice; located >220mm below the overflow outlet **Overflow** – 100mmØ at the top of the tank
Point of Discharge:	To existing catchpit.

2. SCOPE OF WORK

Wilton Joubert Ltd. (WJL) was engaged by the client, **G.J Gardner Homes Far North (2K Construction Ltd.)**, to produce an on-site stormwater mitigation assessment at the above site.

At the time of report writing, we have been supplied the following documents:

- Plan Set supplied by G.J Gardner Homes including site plan, floor plan and elevations (Ref No: 5296, dated: 11.10.2024)

Should any changes be made to the provided plans with stormwater management implications, WJL must be contacted for review.

3. SITE DESCRIPTION

The subject 1,889m² irregular shaped property is legally described as Lot 2 DP 314261 and physically addressed as 22 Taipa Heights Drive, Taipa. Access to the section is via an existing gravel driveway off the western side of Taipa Heights Drive.

An existing dwelling has recently been relocated away from the site, with the former timber footings for the structure still present across the proposed building site. An existing gravity block wall has been erected accompanying part of the driveway and the immediate southern perimeter of the old dwelling. The wall is offset approximately 3-5m to the south of the proposed dwelling location. An auxiliary garage is situated directly upslope, some 9m to the southeast of the proposed dwelling platform, with two adjacent water tanks directly below.

Figure 1: Aerial Snip (outdated satellite imagery) from FNDC Maps Showing Site Boundaries (cyan), Public Wastewater (red) & 1m Contours (yellow)

Topographically speaking, the site is positioned towards the toe of a northwest facing, long, moderate to steep ridge flank, falling from upslope Taipa Heights Drive some 120m to the southeast. The property is set around a central crest, transitioning into moderate to steep terrain that covers the northern end of the property and ultimately falling some 11m to the toe of the common flank, within the neighbouring downslope allotment.

Slope grades across the proposed building platform vary due to the recent and past land modifications. The land in between the upslope block wall and the edge of the levelled platform generally displays a width of 18m and gentle grades of less than 5°. Grades across the steep northern flank generally range between 20° and 30°.

Historical earthworks have been carried out within the proposed building platform and in proximity to the leading edge of the pre-existing dwelling. As a result, the building platform has been cut to a near level nature and what appears to be "push-over" fill, ranging from 0.4m-1.5m in depth, placed across the downslope northern portion of the property (refer Figures 3-5).

Apart from the small clearing within the pre-existing dwelling platform and impermeable areas related to the auxiliary garage and driveway areas, vegetation across the site comprises of pasture with intermittent trees throughout.

The Far North District Council (FNDC) GIS Water Services Map indicates that the property is serviced by public wastewater services. The property is not serviced by public stormwater or potable water reticulation.

4. DEVELOPMENT PROPOSALS

The development proposal, obtained from the client, is to construct a residential dwelling on-site, as depicted in the plan set provided by G.J Gardner Homes (Ref No: 5296, dated: 02.10.2024).

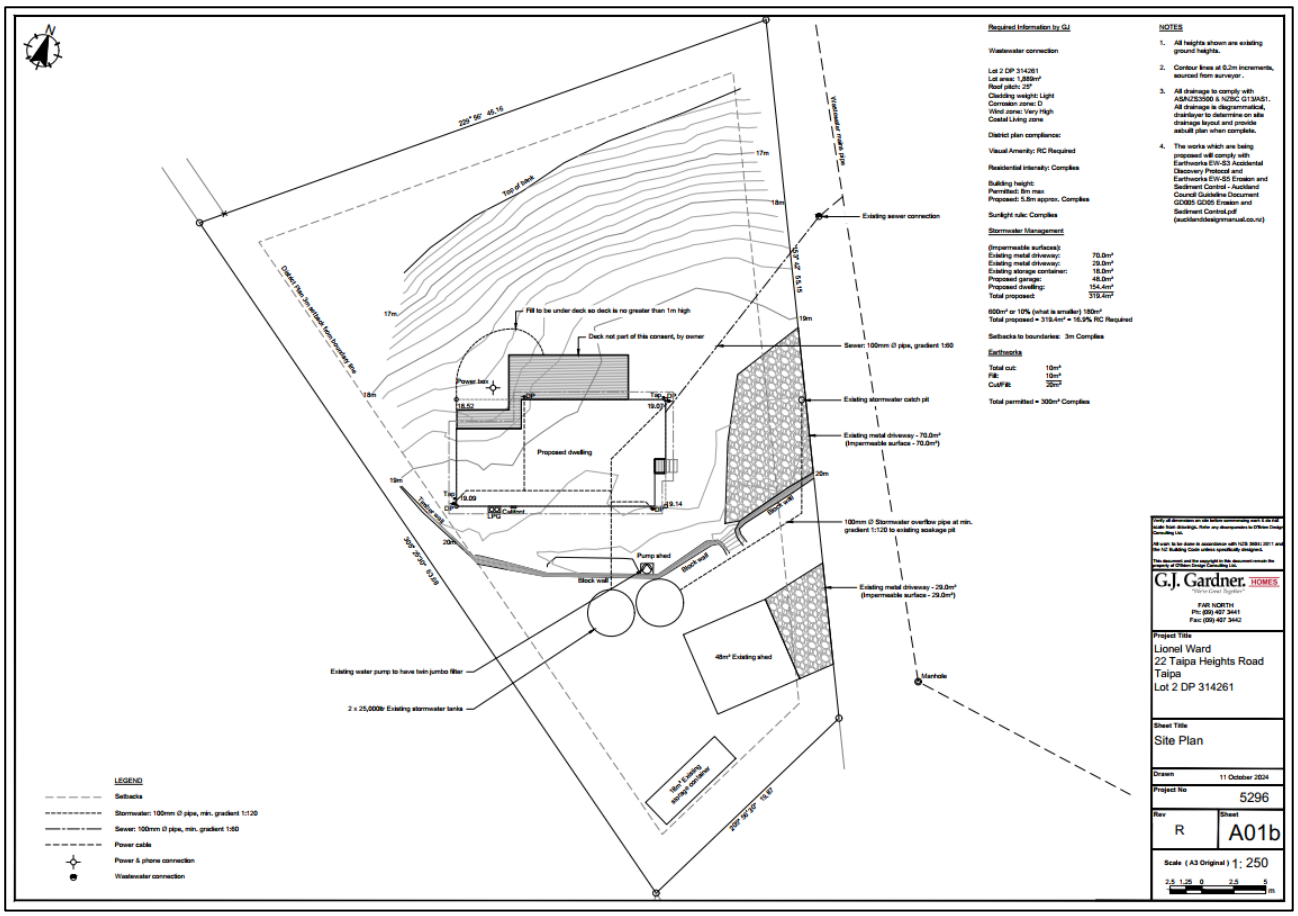


Figure 2: Snip of Proposed Site Plan Provided by G.J Gardner Homes (Ref No: 5296, dated: 11.10.2024)

The principal objective of this assessment is to provide an indicative stormwater disposal design which will manage runoff generated from the proposed impermeable areas resulting from the proposed development.

5. ASSESSMENT CRITERIA

Impermeable Areas

The calculations for the stormwater system for the development are based on a gross site area of 1,889m² and the below areas *extracted from the supplied plans*:

	Pre-Development	Post-Development	Total Change
Total Roof Area	**300m²**	**202.4m²**	-97.6 m²
Existing Dwelling*	252 m²	0 m²	
Existing Garage	48 m²	48 m²	
Proposed Dwelling	0 m²	154.4 m²	
Total Hardstand	**117 m²**	**117 m²**	0 m²
Existing Metal Driveways	99 m²	99 m²	
Existing Storage Container	18 m²	18 m²	
Pervious	1,472 m²	1,569.6 m²	97.6 m²

**Existing impermeable area estimated from FNDC's GIS Maps.*

The total amount of impermeable area on site, post-development, equates to 319.4m² or 16.9% of the site area. Should any changes be made to the current proposal, the on-site stormwater mitigation design must be reviewed.

District Plan Rules

The site is zoned Coastal Living. The following rules apply under the FNDC District Plan:

10.7.5.1.6 – **Permitted Activities – Stormwater Management** - The maximum proportion or amount of the gross site area which may be covered by buildings and other impermeable surfaces shall be 10% or 600m² whichever is the lesser.

10.7.5.3.8 – **Restricted Discretionary Activities – Stormwater Management** - The maximum proportion or amount of the gross site area covered by buildings and other impermeable surfaces shall be 15% or 1,500m², whichever is the lesser.

The total proposed impermeable area exceeds 15% of the site area and does not comply with Permitted Activity Rule (10.7.5.1.6) nor Restricted Discretionary Activity Rule (10.7.5.3.8). Therefore, the proposal is considered to be a Discretionary Activity. Additional considerations for stormwater management as outlined in the FNDC District Plan Section 11.3 are required. A District Plan Assessment has been included in Section 7 of this report.

Design Requirements

The stormwater design has been completed in accordance with the following documents:

- The Far North District Council Engineering Standards 2023
- The operative Far North District Council District Plan

The total impermeable area in exceedance of Permitted Activity Rule 10.7.5.1.6 is **130.5m²**. Stormwater mitigation must therefore be provided for this excess impermeable area.

In accordance with Table 4-1 of the FNDC Engineering Standards, water quality volume (WQV) control will be provided for the 90th percentile of the 24-hour storm event for the total existing / proposed roof area.

For WQV Control calculations, a pre-development 90th percentile rainfall value of 25mm was adopted in accordance with Table 4-1 of the Far North District Council Engineering Standards. TP108 methodology has been utilised to calculate the WQV Control as discussed above.

Provided that the recommendations within this report are adhered to, the effects of stormwater runoff resulting from the unattenuated proposed / existing impermeable surfaces (188.9m^2 total) are considered to have less than minor effects on the receiving environment, equivalent to conditions that would result from development proposals falling within the Permitted Activity coverage threshold.

6. STORMWATER MITIGATION ASSESSMENT

To meet the requirements outlined in Section 5, the following must be provided:

Potable Water Supply

It is recommended that the existing rainwater tanks are utilised to provide the proposed dwelling with a potable water supply. A proprietary guttering system is required to collect roof runoff from the existing garage and proposed dwelling. A first flush diverter and/or leaf filters may be installed in-line between the gutters and the tank inlet. The tank inlet level should be at least 600mm below the gutter inlet and any in-line filters. Any filters will require regular inspection and cleaning to ensure the effective operation of the system. The frequency of cleaning will depend on current and future plantings around the existing garage and proposed dwelling. Provision should be made by the homeowner for top-up of the tanks via water tankers in periods of low rainfall.

All potable tanks must be constructed level and fitted with balancing pipes at the top and near the base of each tank to connect all potable water tanks to each other. Due to inadequate water quality concerns, runoff from hardstand areas should not be allowed to drain to the potable water tanks.

The upper section of the potable water tanks is to act as a detention volume to achieve WQV Control for the total proposed impermeable roof area. One of the tanks is to be retrofitted with a 100mmØ overflow outlet with a flow attenuation outlet as specified below.

Potable Tanks Detention Volume

As per the attached design calculations, the design elements of the detention volume are as follows:

Existing Tanks	2 x 25,000 litre Rainwater Tanks
Tank dimensions	3600mmØ x 2600mm high
Outlet orifice (Volume Control)	**15mm diameter orifice**; located >220mm below the overflow outlet - 4.44m^3 Storage
Overflow Outlet	**100mm diameter**; located at the top of the tank

Discharge from the potable water / detention tanks must be transported via sealed pipes to an outlet in the existing catchpit. Refer to the appended Site Plan (136259-C200), Tank Detail (136259-C201) and calculation set for clarification.

Levels are to be confirmed by the contractor on-site prior to construction. Adequate fall (minimum 1% grade) from the tank's outlet to the discharge point is required. If this is not achievable, WJL must be contacted for review of the design.

7. DISTRICT PLAN ASSESSMENT

As the proposed development is not compliant with Permitted Activity Rule 10.7.5.1.6, nor Restricted Discretionary Activity Rule 10.7.5.3.8, it is therefore regarded as a Discretionary Activity.

In assessing an application under this provision, the Council will exercise its discretion to review the following matters below, (a) through (m) of FNDCDP Section 11.3.

In respect of matters (a) through (m), we provide the following comments:

(a) the extent to which building site coverage and Impermeable Surfaces contribute to total catchment impermeability and the provisions of any catchment or drainage plan for that catchment;	Impermeable surfaces resulting from the development decreases site impermeability by 97.6m². Water quality volume (WQV) control will be provided for the 90th percentile of the 24-hour storm event for the total proposed roof area via a detention volume in the dual-purpose rainwater tanks.
(b) the extent to which Low Impact Design principles have been used to reduce site impermeability;	Impermeable surfaces resulting from the development decreases site impermeability by 97.6m². Water quality volume (WQV) control will be provided for the 90th percentile of the 24-hour storm event for the total proposed roof area via a detention volume in the dual-purpose rainwater tanks.
(c) any cumulative effects on total catchment impermeability;	Impervious coverage will decrease by 97.6m².
(d) the extent to which building site coverage and Impermeable Surfaces will alter the natural contour or drainage patterns of the site or disturb the ground and alter its ability to absorb water;	Runoff from the existing / proposed impermeable roof areas is to be collected and directed to the discharge point via sealed pipes. Ponding is not anticipated to occur provided the recommendations within this report are adhered to, mitigating interference with natural water absorption.
(e) the physical qualities of the soil type;	Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon; Refer 'GNS Science Website'.
(f) any adverse effects on the life supporting capacity of soils;	Stormwater runoff from the existing / proposed impermeable roof areas is to be collected and directed to stormwater management devices via sealed pipes, mitigating the potential for contamination of surrounding soils and harm to life supporting capacity of soils.
(g) the availability of land for the disposal of effluent and stormwater on the site without adverse effects on the water quantity and water quality of water bodies (including groundwater and aquifers) or on adjacent sites;	Runoff resulting from the existing / proposed roof areas is to be collected and directed to the discharge point via sealed pipes, mitigating the potential for runoff to pass over / saturate surrounding soils. Public wastewater services are available to service the property.
(h) the extent to which paved, Impermeable Surfaces are necessary for the proposed activity;	The existing driveway is necessary to provide the dwelling with access and is not considered to be excessive.

(i) the extent to which land scaping and vegetation may reduce adverse effects of run-off;	Existing vegetation and any plantings introduced by the homeowner during occupancy will aid in reducing surface water velocity and providing treatment. No specific landscaping scheme is proposed as part of the stormwater management system described herein.
(j) any recognised standards promulgated by industry groups;	Not applicable.
k) the means and effectiveness of mitigating stormwater runoff to that expected by permitted activity threshold;	Water quality volume (WQV) control will be provided for the 90th percentile of the 24-hour storm event for the total proposed roof area (greater than the proposed impermeable area exceeding the permitted activity threshold) in the dual-purpose rainwater tanks.
(l) the extent to which the proposal has considered and provided for climate change;	Post-Development rainfall values increased by 20% to account for climate change.
(m) the extent to which stormwater detention ponds and other engineering solutions are used to mitigate any adverse effects.	Water quality volume (WQV) control will be provided for the 90th percentile of the 24-hour storm event for the total proposed roof area (greater than the proposed impermeable area exceeding the permitted activity threshold) in the dual-purpose rainwater tanks.

8. NOTES

If any of the design specifications mentioned in the previous sections are altered or found to be different than what is described in this report, Wilton Joubert Ltd will be required to review this report. Indicative system details have been provided in the appendices of this report (136259-C200 & 136259-C201).

Care should be taken when constructing the discharge point to avoid any siphon or backflow effect within the stormwater system.

Subsequent to construction, a programme of regular inspection / maintenance of the system should be initiated by the Owner to ensure the continuance of effective function, and if necessary, the instigation of any maintenance required.

Wilton Joubert Ltd recommends that all contractors keep a photographic record of their work.

9. LIMITATIONS

The recommendations and opinions contained in this report are based on information received and available from the client at the time of report writing.

This assignment only considers the primary stormwater system. The secondary stormwater system, Overland Flow Paths (OLFP), vehicular access and the consideration of road/street water flooding is all assumed to be undertaken by a third party.

All drainage design is up to the connection point for each building face of any new structures/slabs; no internal building plumbing or layouts have been undertaken.

During construction, an engineer competent to judge whether the conditions are compatible with the assumptions made in this report should examine the site. In all circumstances, if variations occur which differ from that described or that are assumed to exist, then the matter should be referred to a suitably qualified and experienced engineer.

The performance behaviour outlined by this report is dependent on the construction activity and actions of the builder/contractor. Inappropriate actions during the construction phase may cause behaviour outside the limits given in this report.

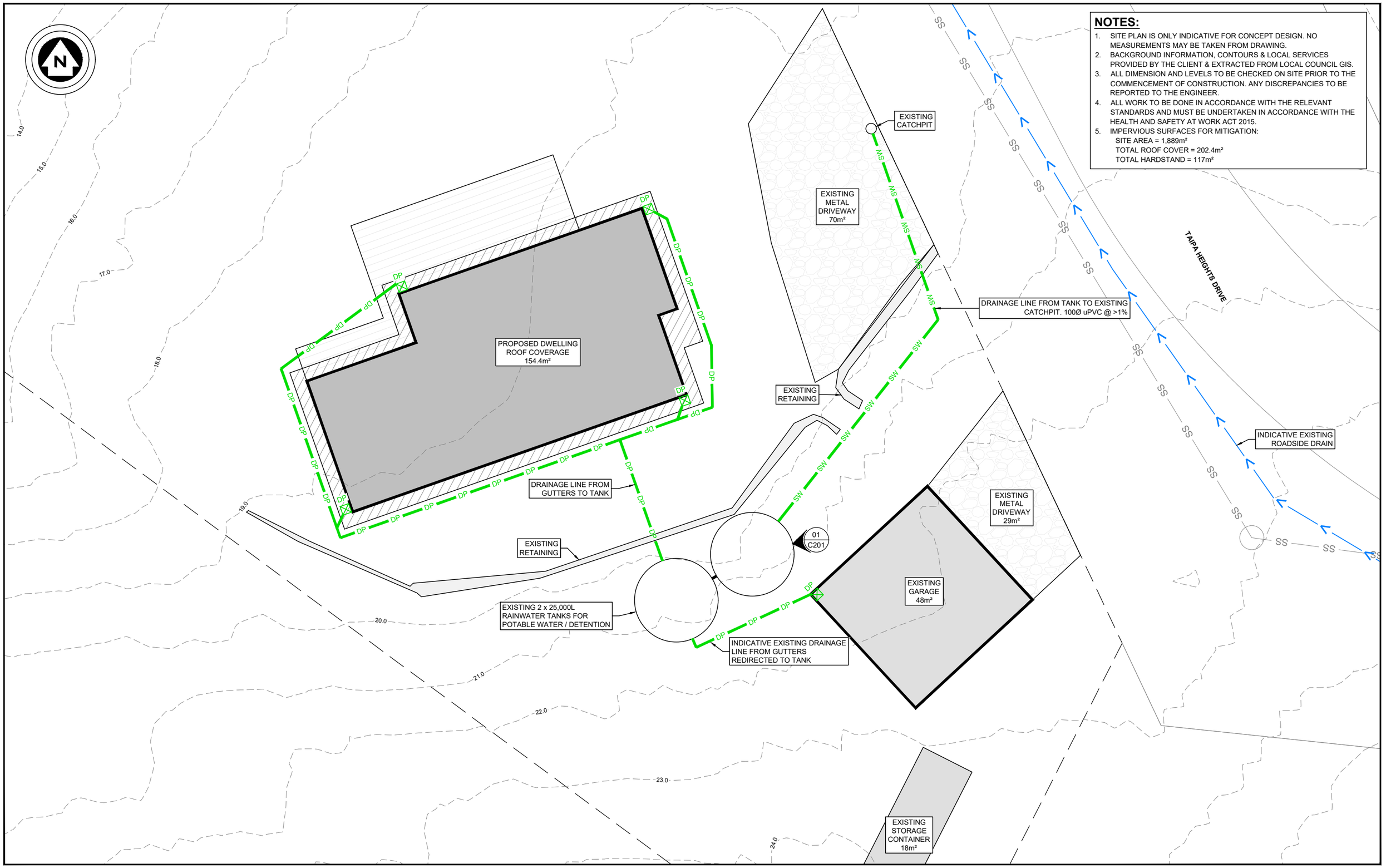
This report has been prepared for the particular project described to us and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

Wilton Joubert Ltd.

Gustavo Brant
Civil Engineer
BE(Hons)

REPORT ATTACHMENTS

- Site Plan - C200 (1 sheet)
- Tank Detail – C201 (1 sheet)
- Calculation Set



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
A	SEP '24	GMB	STORMWATER MITIGATION REPORT
B	OCT '24	GMB	STORMWATER MITIGATION REPORT REV B
C	OCT '24	GMB	STORMWATER MITIGATION REPORT REV C

DESIGNED BY: GMB
DRAWN BY: GMB
CHECKED BY: BGS
SURVEYED BY: OTHER

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.

BUILDING CONSENT
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE:
SITE PLAN

PROJECT DESCRIPTION:
STORMWATER MITIGATION REPORT

PROJECT TITLE:
LOT 2 DP 314261
22 TAIPA HEIGHTS DRIVE
TAIPA
NORTHLAND

ORIGINAL DRAWING SIZE: A3	OFFICE: OREWA
DRAWING SCALE: 1:150	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 136259-C200	ISSUE: A

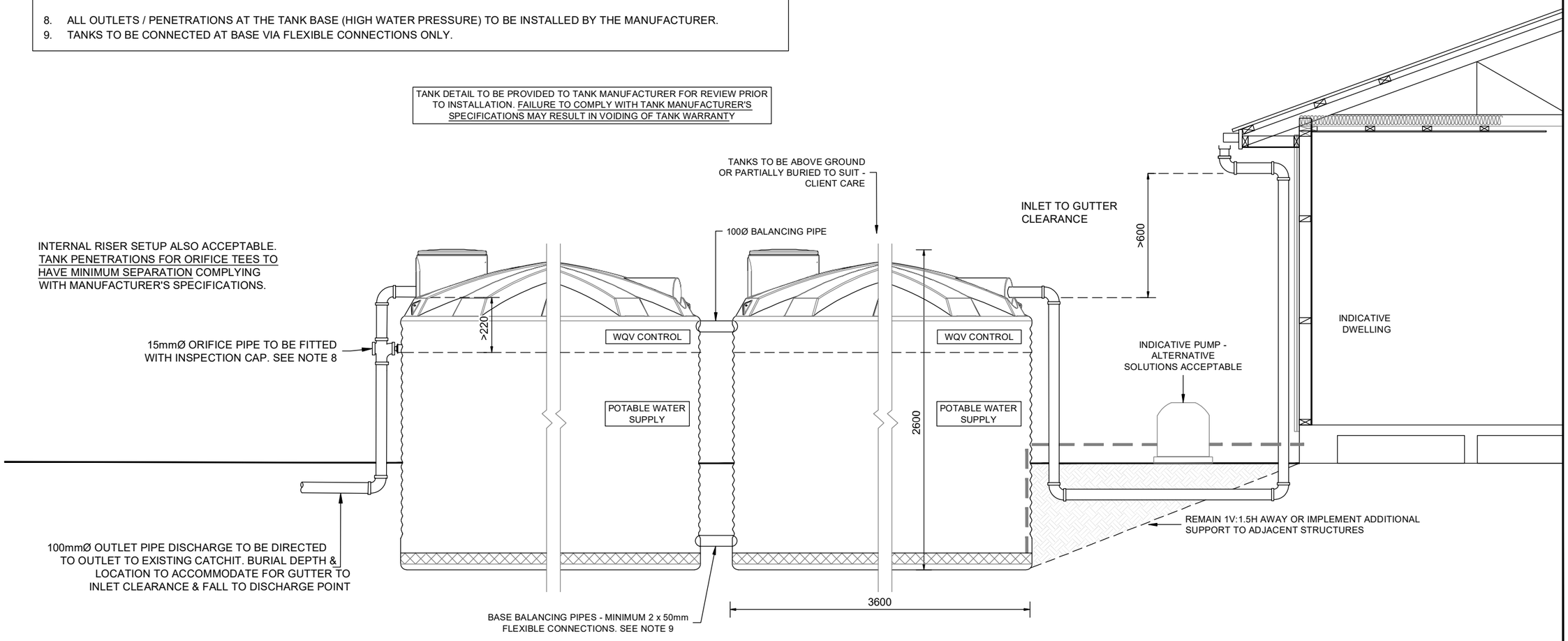
NOTES:

1. NOT TO SCALE. DRAWN INDICATIVELY ONLY.
2. ALL LEVELS & DIMENSIONS TO BE CONFIRMED ON SITE & ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. TANK TO BE INSTALLED AS PER MANUFACTURERS SPECIFICATIONS & RELEVANT COUNCIL STANDARDS.
4. REGULAR INSPECTION & CLEANING IS REQUIRED TO ENSURE THE EFFECTIVE OPERATION OF THE SYSTEM.
5. MINIMUM SLUDGE ZONE OF 150mm TO BE KEPT.
6. ALL ORIFICE OUTLETS TO BE COVERED WITH STAINLESS STEEL OR NYLON MESH.
7. ASSUMED USE OF A 2 x 25,000 LITRE PLASTIC PROMAX WATER TANKS OR SIMILARLY APPROVED.

PLASTIC TANKS NOTES:

8. ALL OUTLETS / PENETRATIONS AT THE TANK BASE (HIGH WATER PRESSURE) TO BE INSTALLED BY THE MANUFACTURER.
9. TANKS TO BE CONNECTED AT BASE VIA FLEXIBLE CONNECTIONS ONLY.

TANK DETAIL TO BE PROVIDED TO TANK MANUFACTURER FOR REVIEW PRIOR TO INSTALLATION. FAILURE TO COMPLY WITH TANK MANUFACTURER'S SPECIFICATIONS MAY RESULT IN VOIDING OF TANK WARRANTY



01 C200 **TANK DETAIL**
N.T.S

WILTON JOUBERT
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www.wiltonjoubert.co.nz

ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
A	SEP '24	GMB	STORMWATER MITIGATION REPORT
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DESIGNED BY: GMB
DRAWN BY: GMB
CHECKED BY: BGS
SURVEYED BY: OTHER

SERVICES NOTE
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BUILDING CONSENT
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **TANK DETAIL**

PROJECT DESCRIPTION: **STORMWATER MITIGATION REPORT**

PROJECT TITLE: **LOT 2 DP 314261 22 TAIPA HEIGHTS DRIVE TAIPA NORTHLAND**

ORIGINAL DRAWING SIZE: A3
OFFICE: **OREWA**
DRAWING SCALE: **N.T.S**
CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: **136259-C201**
ISSUE: C

WILTON JOUBERT
Consulting Engineers

Volume Control Calculations

Job Number	136259	Date:	14.10.2024
Address	22 Taipa Heights Drive	Initials:	GMB
	Taipa	Revision	A

Catchment Information For Pre-Development Conditions

202.4	m²	0.0002024	km^2	
Group C	soil type		see TP108 page 8 section 3.2 for soil designations	
25.00	P_{24}		90th Percentile Rainfall - Table 4-1 FNDC EES	
		CN		
202.4	m²	74	Pervious	
0	m²	98	Sealed roof(s)	
0	m²	98	Sealed conrete	
0	m²	0		
202.4	m² tot	74.00	CN -mean	TP108 Eq3.4

5.00	Ia (mm)	Weighted initial abstraction - Ia (mm)
0.03	Tc (hrs)	TP108 Eq 4.3 - pg 12
0.02	Tp (hrs)	Time to peak
89.24	S (mm)	Soil Storage parameter see TP108 eq 3.2 pg 6
3.662	Q_{24} (mm)	Run-Off Depth
0.74	m^3	Volume

Catchment Information For Post-Development Conditions

202.4	m²	0.0002024	km^2	
Group C	soil type		see page 8 section 3.2 for soil designations	
30.00	P_{24}		90th Percentile + 20% CCF - Table 4-1 FNDC EES	
		CN		
0	m²	74	Pervious	
202.4	m²	98	Sealed roof(s)	
0	m²	98	Sealed conrete	
0	m²	89	Metal/Gravel	
202.4	m² tot	98.00	CN -mean	TP108 Eq3.4

0.00	Ia (mm)	Weighted initial abstraction - Ia (mm)
0.02	Tc (hrs)	TP108 Eq 4.3 - pg 12
0.01	Tp (hrs)	Time to peak
5.18	S (mm)	Soil Storage parameter see TP108 eq 3.2 pg 6
25.580	Q_{24} (mm)	Run-Off Depth
5.18	m^3	Volume

Total Detention Volume Required: **4.44** m^3

WILTON JOUBERT
Consulting Engineers

ADDRESS	22 Taipa Heights Drive, Taipa
REFERENCE	Volume Control

JOB NO	136259
DATE	14.10.2024
DESIGNER	GMB
CHECKER	BGS

Outlet Orifice: 24-hour release

Q=(C)(A)(2gh)^0.5	Q = orifice discharge capacity (m3/s)
	C = orifice constant (0.9), value considered conservative
	A = orifice area (m2)
	g = acceleration due to gravity9.8m/s2
	h = head on orifice (m)

Select orifice size (D)	**0.005000**			
Orifice Area (A)	**0.000020**			
Select hydraulic height	**0.220000**			
Flow from tank	**0.037**	*l/s*	**0.13**	m^3/h

Flow Required

Tank Size	**4.44**	m^3		
24-hr release	**0.051**	*l/s*	**0.19**	m^3/h

Orifice Check

Orifice sized correctly Check if the flows are met

ARCHAEOLOGICAL INSPECTION OF A PROPOSED SUBDIVISION AT TAIPA

A proposed subdivision overlooking Taipa Estuary was inspected for archaeological evidence by Joan Maingay on 21 June 1993. The owners, G Phelps and N Page, wish to subdivide the present Lot 2 DP 123824 into 5 separate titles. They will retain the new Lot 2 (see attached map and plan).

An archaeological site, N7/253, was recorded in this area in 1978. It consisted of 3 pits and several patches of exposed midden. Further midden and terraces, O04/634, were recorded in 1992 on adjacent land owned by D Stratford.

The Recent Inspection

Three midden sites were recorded during the recent visit. Their locations are marked on the attached plan.

N7/253 - Shell midden is eroding from the road-cutting near the north-eastern corner of the property. It is about 3 m in length and composed of estuarine shell, mainly pipi (*Paphies australis*) with some cockle (*Austrovenus stutchburyi*). The deposit appears to be a disturbed remnant of site N7/253. There is no evidence that it continues into Lot 5 of the subdivision.

O04/634 - A small area of midden is located 5 m inside the south-west boundary fence and about 45 m south-east of the house. It consists of 2 m of very sparse cockle eroding from slumped topsoil. This is close to a midden on adjacent land owned by Mr Stratford and has therefore been recorded under the same number.

O04/645 - An extensive area of midden is visible intermittently across the whole width of Lot 1 near the base of a slope that runs down from the existing house to the garage. It also continues into the north-west corner of Lot 2. The midden is exposed in slumped areas of ground. It is relatively sparse on the north-east and more concentrated near the south-western side of the property where deposits consist of dense crushed shell up to 20 cm thick. Again it is comprised of pipi, cockle and charcoal. A few large hangi stones are lying on the surface.

Discussion

Most of the land to be subdivided is steeply sloping. Proposed building sites for Lts 3, 4 and 5 are on a ridgeline on the eastern side of the property. This has been considerably modified in recent years by road formation and by the removal of soil for fill. There is no visible evidence to suggest that house construction will disturb archaeological features.

The only site likely to be affected by development is the extensive midden O04/645 in Lot 1. This may once have been associated with an area of occupation further up the slope but there is no longer any obvious sign of terracing. Like other similar sites near the mouth of the river the midden contents indicate that Taipa was a favoured area for the collection and consumption of estuarine shellfish.

The site has been disturbed by slumping and by stock. Although it covers a large area it does not appear to contain features or artefacts that would justify long-term preservation.

Recommendations

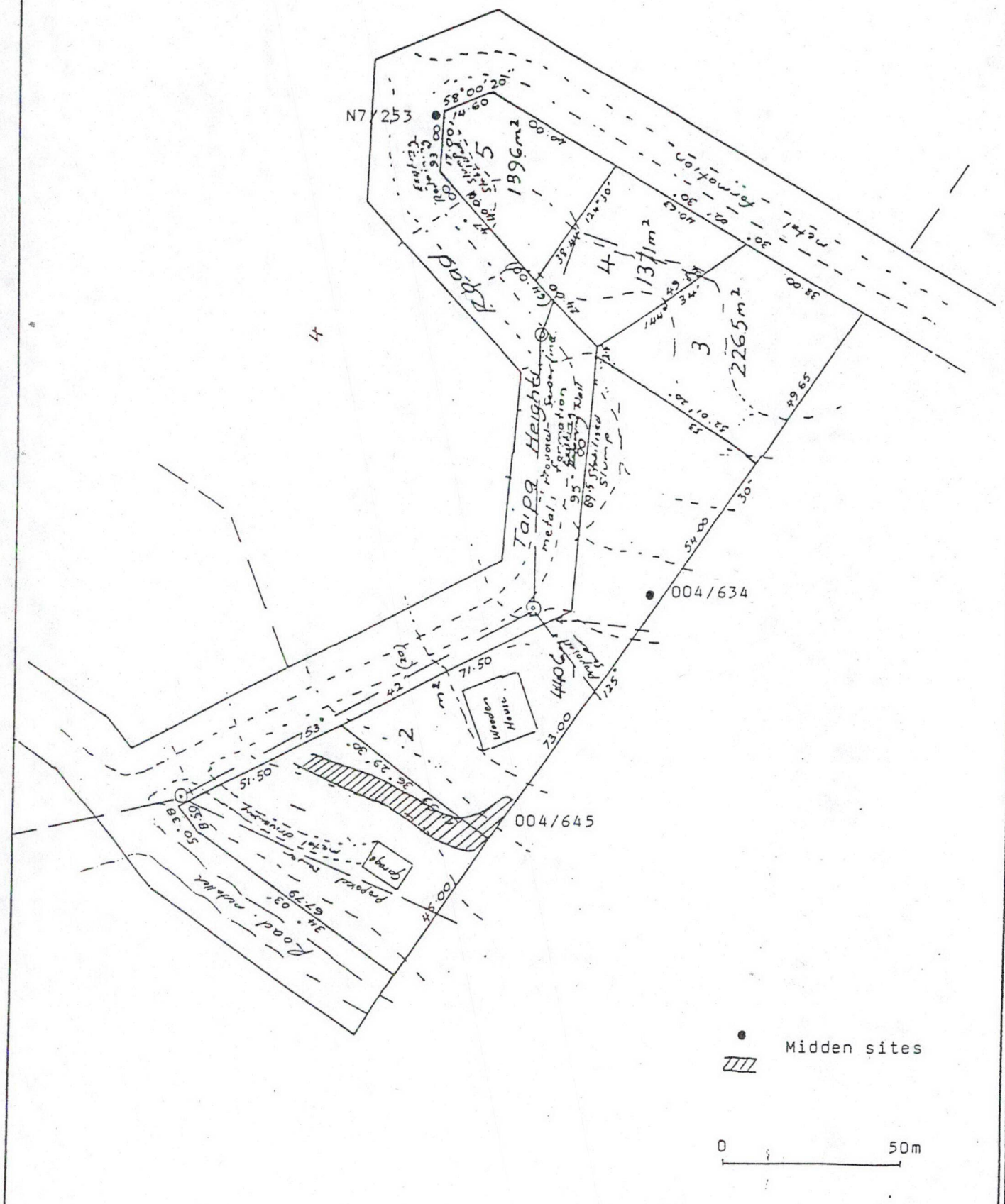
1. The subdivision should be allowed with the condition that an authority to modify site O04/645 is acquired from the Historic Places Trust before development of Lot 1 takes place.

2. Unless there are objections from the tangata whenua the Trust should authorise modification of the site with the condition that an archaeologist is present to monitor sub-surface disturbance.

Joan Maingay
Archaeologist

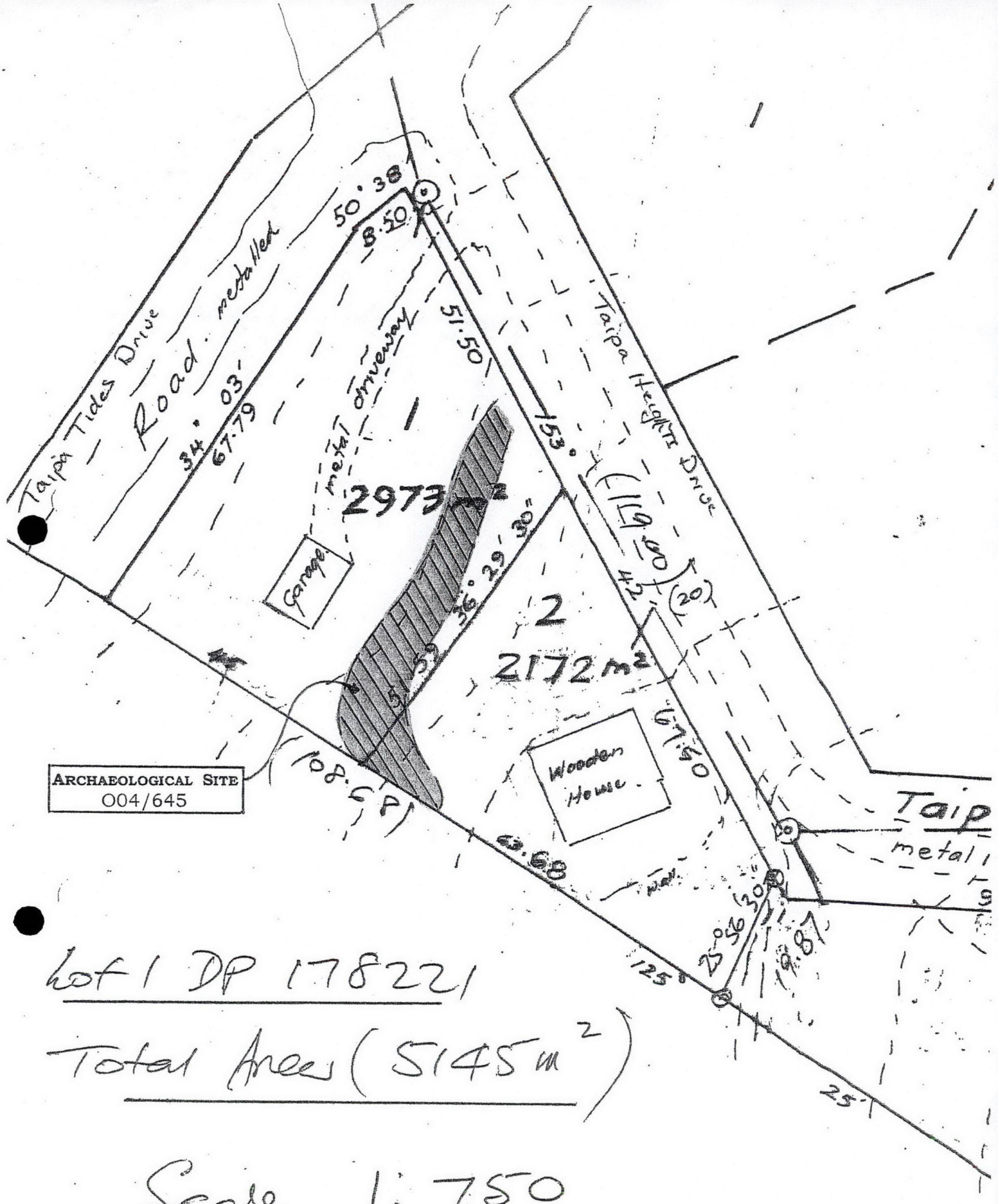
Department of Conservation
June 1993

PLAN SHOWING ARCHAEOLOGICAL SITES ON PROPOSED SUBDIVISION



Proposed Subdn. of Lot 2 DP 122021

Bk IV Mangonui S.D.
Far North District



lot 1 DP 178221

Total Area (5145 m²)

Scale 1:750

APPROVED PLAN

PLANNER..Greg Phillips

RC..2020464. Date..22/4/02

★ subdivision plan

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **56464**
Land Registration District **North Auckland**
Date Issued 01 August 2003

Prior References
NA109D/708

Estate Fee Simple
Area 1889 square metres more or less
Legal Description Lot 2 Deposited Plan 314261
Registered Owners
Michelle Anne Taylor and Nathan Stephen Ward

Interests

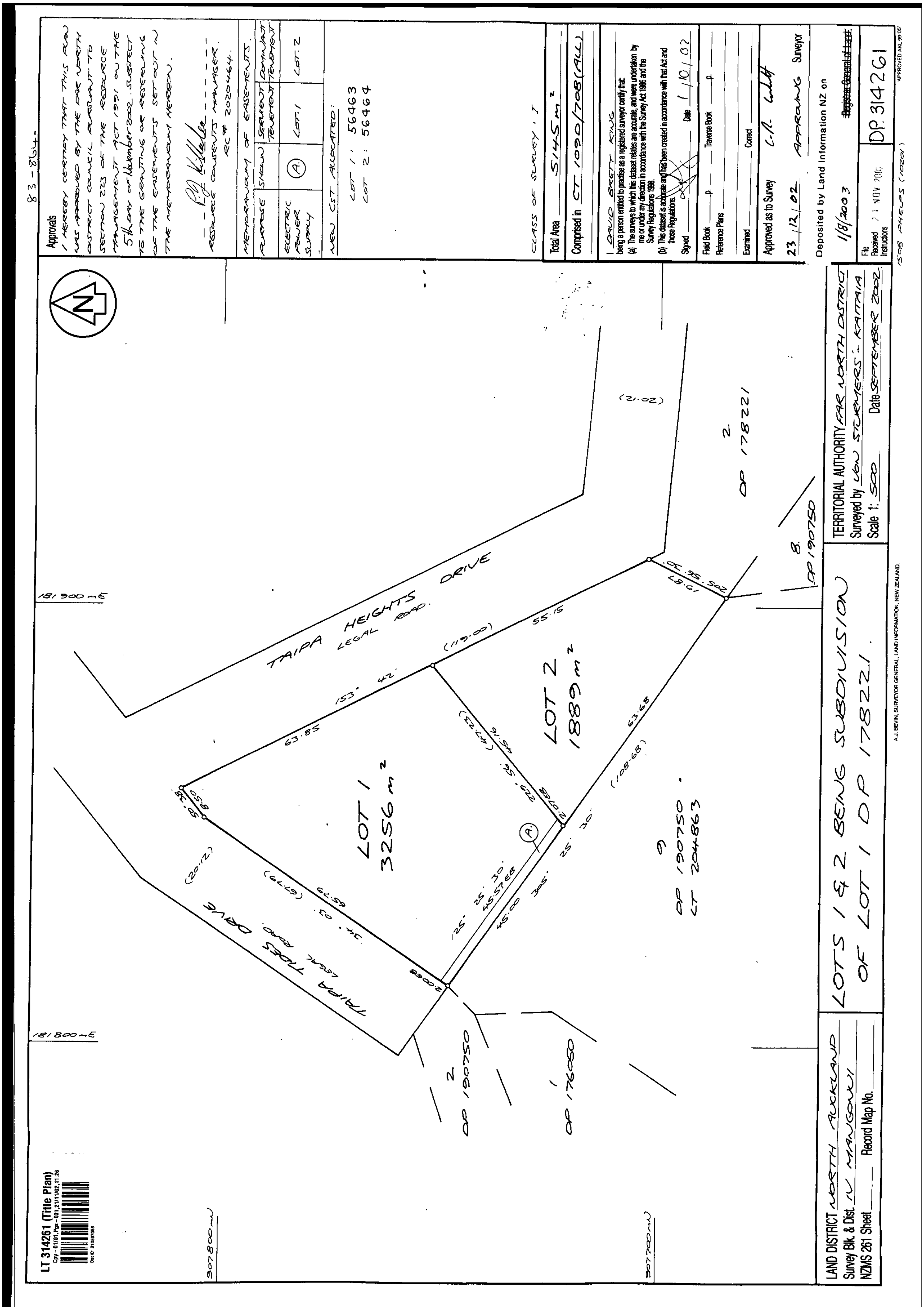
D066108.3 Consent Notice pursuant to Section 221(1) Resource Management Act 1991 - 11.11.1996 at 1.37 pm

D293102.2 Consent Notice pursuant to Section 221(1) Resource Management Act 1991 - 17.7.1998 at 3.37 pm

5677702.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 1.8.2003 at 9:00 am

Appurtenant hereto is an electric power supply easement created by Easement Instrument 5677702.4 - 1.8.2003 at 9:00 am

The easement created by Easement Instrument 5677702.4 is subject to Section 243 (a) Resource Management Act 1991


LT 314261 (Title Plan)
Approvals
I HEREBY CERTIFY THAT THIS PLAN WAS APPROVED BY THE FAR NORTH DISTRICT COUNCIL PURSUANT TO SECTION 223 OF THE RESOURCE MANAGEMENT ACT 1991 ON THE 5th DAY OF November 2002. SUBJECT TO THE GRANTING OR RESERVING OF THE EASEMENTS SET OUT IN THE MEMORANDUM HEREON.
RESOURCE CONSENTS MANAGER. RC# 2020464.
MEMORANDUM OF EASEMENTS
PURPOSE
SHOWN
SERVIENT TENEMENT
DOMINANT TENEMENT
ELECTRIC POWER SUPPLY
A
LOT 1
LOT 2
NEW CST ALLOCATED:
LOT 1: 56463
LOT 2: 56464
CLASS OF SURVEY: I
Total Area 5145 m²
Comprised in CT 109D/708(ALL)
I DAVID BRETT KING
being a person entitled to practise as a registered surveyor certify that:
(a) The surveys to which this dataset relates are accurate, and were undertaken by me or under my direction in accordance with the Survey Act 1986 and the Survey Regulations 1998.
(b) This dataset is accurate and has been created in accordance with that Act and those Regulations.
Signed
Date 1.10.02
Field Book
Reference Plans
Traverse Book
Examined
Correct
Approved as to Survey
23.12.02
APPROVING Surveyor
Deposited by Land Information NZ on
1/8/2003
Registrar General of Land
DP 314261
TERRITORIAL AUTHORITY FAR NORTH DISTRICT
Surveyed by VON STURMERS - KAITAIA
Scale 1: 500
Date SEPTEMBER 2002
LOTS 1 & 2 BEING SUBDIVISION OF LOT 1 DP 178221
LAND DISTRICT NORTH AUCKLAND
Survey Blk. & Dist. IV MANGONUI
NZMS 261 Sheet
Record Map No.
TAIPA HEIGHTS DRIVE
LEGAL ROAD
TAIPA TIDES DRIVE
LEGAL ROAD
LOT 1
3256 m²
LOT 2
1889 m²
2
DP 178221
8
DP 190750
9
DP 190750
CT 204863
2
DP 190750
1
DP 176050
181 900 mE
181 800 mE
307 800 mN
307 700 mN

D066108.3 CONO

THE RESOURCE MANAGEMENT ACT 1991

SECTION 221 : CONSENT NOTICE

IN THE MATTER of The subdivision of Lot 1 Deposited Plan 171151 and Lot 2 Deposited Plan 123824 North Auckland Registry

PURSUANT to Section 221 and for the purposes of Section 224 of the Resource Management Act 1991, this Consent Notice is issued by THE FAR NORTH DISTRICT COUNCIL to the effect that the conditions described in the schedule below are to be complied with on a continuing basis by the subdividing owners and any subsequent owners after the deposit of the survey plan, and is to be registered on the appropriate new titles.

SCHEDULE

No building shall be erected on any of Lots 1, 2 or 3 Deposited Plan 173582 without the prior approval of The Far North District Council of specific designs for foundations and stormwater disposal, prepared by a registered engineer with geotechnical and hydrological expertise.

SIGNED: _____

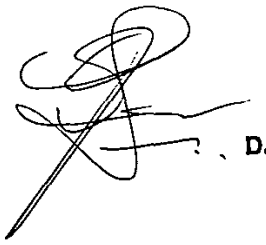
by the FAR NORTH DISTRICT COUNCIL pursuant to Section 252 of the Local Government Act 1974

DATE: 21st October 1996

N.P.

SIGNED by the registered)
proprietors in the presence of:)

Nancy Page
G A Page



D. R. FOUNTAIN
SOLICITOR
KAITAIA

1.37 11.NOV96 D 066108 ·3

PARTICULARS ENTERED IN REGISTER
LAND REGISTRY NORTH AUCKLAND
ASS'T LAND REGISTRAR

DISTRICT LAND REGISTRAR
NORTH AUCKLAND NEW ZEALAND

02A/587

102A/587

3 CONO /20

D293102.2 CONO

THE RESOURCE MANAGEMENT ACT 1991

SECTION 221 : CONSENT NOTICE

IN THE MATTER of Plan 178221

PURSUANT to Section 221 and for the purposes of Section 224 of the Resource Management Act 1991, this Consent Notice is issued by the **FAR NORTH DISTRICT COUNCIL** to the effect that the conditions described in the schedule below are to be complied with on a continuing basis by the subdividing owner and any subsequent owners after the deposit of the survey plan, and is to be registered on the appropriate titles.

SCHEDULE

(1) That a restriction be registered against the undermentioned parcels of land THAT:

a) prohibits the erection of any building without the consent of the Council to a report and specific design by a registered engineer with geotechnical expertise defining safe building areas as defined on the plan attached hereto coloured yellow and as defined in accordance with the following.

b) probibits the erection of any building whatsoever outside safe building areas defined under the foregoing condition;

c) prohibits the erection of any building unless the Council is first satisfied by a report and design from a registered engineer with geotechnical expertise or the foundations are at a level less than 900mm below ground level at the northern (lower) edge of the defined safe building areas;

d) all stormwater from any buildings erected on the land and tank overflows and paved areas are to be drained and piped to the stormwater system connection points;

e) no vegetation is to be cleared (other than noxious weeds) and no earthworks are to be undertaken on the allotments without the approval of the Council and the issue of an Earthworks Permit if deemed necessary and all such earthwork cuts are to be topsoiled grassed or otherwise planted to limit erosion;

f) in respect of Lot 2 on Deposited Plan 178221 the said Lot 2 may not be transferred leased or otherwise disposed of until such time as The Far North District Council (by way at least of an approved development plan and a statutory declaration that the prospective purchaser intends to carry out such development) is satisfied that a prospective purchaser for the said lot has a bona fide proposal to establish a permitted controlled or discretionary Rural A Zone activity as required by Rule 6.1.6 of the Mangonui County Section of the Operative Far North District Council Plan;

g) in respect of Lot 2 on Deposited Plan 178221 or Lot 2 on Deposited Plan 173582 no subdivision is to be undertaken for a period of two (2) years from the date of deposit of Deposited Plan 178221;

h) that in respect of the land to be described hereunder no separate title (either by subdivision or revocation of the amalgamation condition) may be issued for Lot 3 on Deposited Plan 178221 until the following conditions have been complied with:

i) sewerage and stormwater connections to the allotment to the Urban Code Standard and to the satisfaction of The Far North District Council shall first be provided and

ii) the uppermost 2.5 - 3.0 metres of topsoil material from the ridge top of Lot 3 as required in the

March 1993 Geotechnical Report with authorisations and supervisions (as may be required) as specified under the relevant Council by-laws and the District Plan Rules shall be completed.

iii) a sewerage upgrading contribution of $291.00 plus GST shall be paid;

(2) That the said pieces of land affected by the foregoing restrictions are:

FIRST. 5145m² more or less being Lot 1 on Deposited Plan 178221 being part of the land formerly comprised and described in Certificate of Title Volume 106B Folio 924 (North Auckland Registry) being now the whole of the land comprised and described in Certificate of Title Volume 109D Folio 708 (North Auckland Registry);

SECONDLY. 4542m² more or less being the Lot 2 on Deposited Plan 178221 being part of the land formerly comprised and described in Certificate of Title Volume 106B Folio 924 (North Auckland Registry) being now the whole of the land comprised and described in Certificate of Title Volume 109D Folio 709 (North Auckland Registry);

THIRDLY. 3.1521 Hectares more or less being Lot 3 on Deposited Plan 178221 and Lot 2 on Deposited Plan 173582 being the residue of the land formerly comprised and described in Certificate of Title Volume 106B Folio 924 (North Auckland Registry) and being the whole of the land formerly comprised and described in Certificate of Title Volume 106B Folio 925 (North Auckland Registry) being now the whole of the land comprised and described in

Certificate of Title Volume 109D Folio 710 (North Auckland Registry).

SIGNED: _____

by the FAR NORTH DISTRICT COUNCIL pursuant to Section 252 of the Local Government Act 1974

DATE: 25/11/97

SIGNED by)
GORDON ASHLEY PHELPS)
in the presence of:)

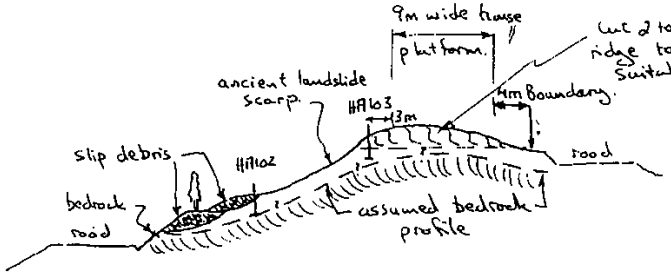
G.A.P. Phelps.

D. R. FOUNTAIN
SOLICITOR
KAITAIA

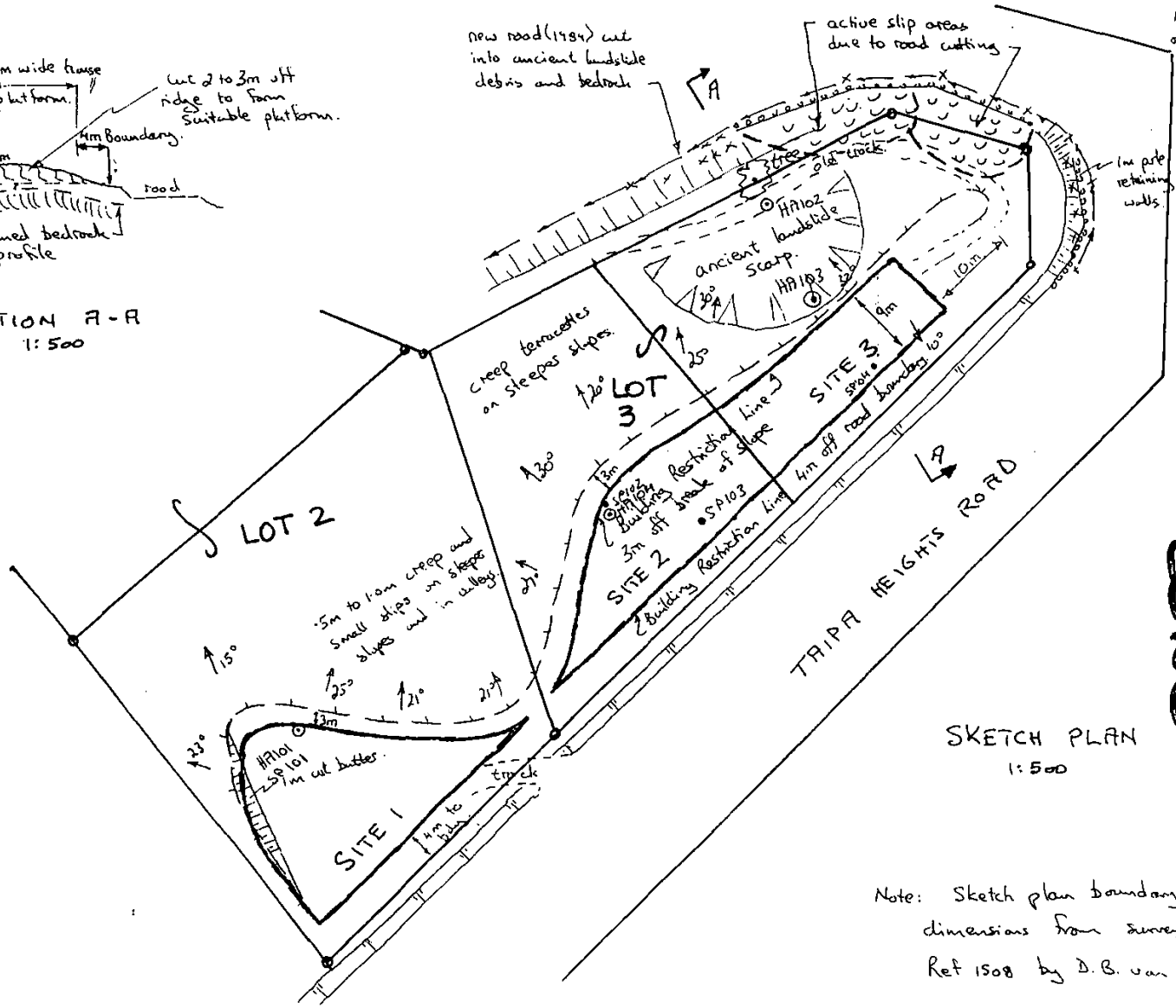
SIGNED by)
NANCY ELAINE PAGE)
in the presence of:)

Nancy Page

D. R. FOUNTAIN
SOLICITOR
KAITAIA



SECTION A-A
1:500



Key:

- HA 101 Hand Auger Borehole
- SP 102 Scala Penetrometer Profile.
- 22° Slope angle to horizontal
- Break of slope
- landslip debris
- Building Restriction line

SKETCH PLAN
1:500

Note: Sketch plan boundary dimensions from survey plan Ref 1508 by D.B. van Sturmer

D29302.2
CONO

EARTHTECH CONSULTING LTD
P.O. Box 791 Pukekohe Tel (09) 239 8500

Geotechnical Constraints Plan
Lots 1 and 3, D.P. 123824, Taipa

Sketch Plan and Section			SHEET Fig 1
DRAWN AHN	CHECKED PS	SCALES 1:500 (A3)	SERIES OF REF 2108
TRACED	DATE 24-7-98		

NO.

RESOURCE MANAGEMENT ACT 1991
SECTION 221 : CONSENT NOTICE

IN THE MATTER of Plan 178221

109D/708 - 710

106B/924

(2) Cons 150 -

PARTICULARS ENTERED
LAND REGISTRY NORTH
ASST LAND REGISTRAR

DISTRICT LAND REGISTRAR NORTH AUCKLAND

FOUNTAIN MANNING & Co.
SOLICITORS
KAITAIA.

ENZ COPY
3.37 17.JUL98 D 293102.2

FAR NORTH DISTRICT COUNCIL

THE RESOURCE MANAGEMENT ACT 1991

SECTION 221 : CONSENT NOTICE

REGARDING RC 2020464
The subdivision of
Lot 1 DP 178221
North Auckland Registry.

PURSUANT to Section 221 for the purposes of Section 224 of the Resource Management Act 1991, this Consent Notice is issued by the FAR NORTH DISTRICT COUNCIL to the effect that conditions described in the schedule below are to be complied with on a continuing basis by the subdividing owner and the subsequent owners after the deposit of the survey plan, and is to be registered on the appropriate titles of DP 314261

SCHEDULE

To be registered on Lot 1 only

1. The application for construction of a dwelling is also to be accompanied by specific engineering design by the foundations (soils) engineer to construct the subsoil buttress drains and retaining wall specified in the aforementioned geotechnical report. This work is to be undertaken as part of the house construction.

2. The application for construction of a dwelling is also to be accompanied by an indication of stormwater management such that all concentrated runoff (including water tank overflow) is directed to the reticulated stormwater connection and outfall provided for as part of this subdivision.

To be registered on Lots 1 & 2

1. The construction of a dwelling on Lot 1 is to be confined to the "Proposed Building Envelope" indicated on the Hawthorn Geddes geotechnical assessment plan, numbered 3921 and dated 23.11.01. Further, the foundations of any building on Lot 1 or 2 are to have specific design (in accordance with the geotechnical report which accompanies the aforementioned plan, or similar) by a registered engineer with appropriate expertise.

2. The consent holder, and subsequent owners of the land, should notify the New Zealand Historic Places Trust prior to commencing any work involving building, ground disturbance or tree planting, on or within 5 metres of the historic (archaeological) site registered on the property (site O04/645 indicated on the attached plan), and should comply with the requirements and provisions of the Historic Places Act 1993.

3. No significant earthworks (greater than 25 cubic metres, or with cut and/or fill faces exceeding 0.75 metres) shall be undertaken without the prior approval of the Council to specific designs for such work, prepared by a registered engineer with geotechnical expertise, and to be professionally supervised.

SIGNED: _____

by the FAR NORTH DISTRICT COUNCIL
under delegated authority:
RESOURCE CONSENTS MANAGER

DATED at **KAIKOHE** this 27th day of June 2003.

RC 2020464
SRM\CERT\3page221