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

HE ARA TĀMATA
CREATING GREAT PLACES
Supporting our people

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fndc.govt.nz

Application for resource consent

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

1. Pre-Lodgement discussion

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

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

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

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

2. Type of consent being applied for

(more than one circle can be ticked):

☑ **Land Use**
◯ **Fast Track (Land Use - Controlled Activity)**
◯ **Change of Consent Notice (s.221(3))**
◯ **Certificate of Compliance (s.139)**
◯ **Extension of time (s.125)**
◯ **Discharge:** Total voume = _____ m³
Note; volumes >3m³ requires NRC Consent 3m³
◯ **Subdivision**
◯ **Existing Use Certificate (s.139A)**
◯ **Consent under National Environmental Standard**
(e.g. Assessing and Managing Contaminants in Soil)
◯ **Other (please specify)** _____

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

☑ **Yes** ◯ **No**

4. Consultation

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

If yes, which groups have you consulted with?

Who else have you consulted with?

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

5. Applicant details

Name/s: Connie and Dean Noble

Email:

Phone number:

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

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

If yes, please provide details:

6. Address for correspondence

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

Name/s: Gareth Moran

Email:

Phone number:

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

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

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

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

Name/s: Connie and Dean Noble

Property address/ location: 2 Taylors Road, Te Kao

Postcode

8. Application site details

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

Name/s: 3 Taylors Road

Site address/ location:

Postcode

Legal description: Lot 2 SP 105514 – NA58 **Val Number:**

Certificate of title: NA58A/1065

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.

Non-Compliance with boundary setback and impermeable surface.

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

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

◯ **2009** ◯ **2023**

10. Would you like to request public notification?

◯ **Yes** ☑ **No**

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

(more than one circle can be ticked):

- [x] **Building Consent** Enter BC ref # here (if known)
- [ ] **Regional Council Consent (ref # if known)** Ref # here (if known)
- [ ] **National Environmental Standard Consent** Consent here (if known)
- [ ] **Other (please specify)** Specify 'other' here

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

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

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

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

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

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

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

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

- [ ] **Flooding**
- [ ] **Active Faults**
- [ ] **Landslips**
- [ ] **Liquefaction**
- [ ] **Coastal Erosion**
- [ ] **Tsunami**
- [ ] **Coastal Inundation**

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

14. Assessment of environmental effects:

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

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

15. Draft conditions:

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

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

16. Billing Details:

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

Name/s: (please write in full) Connie and Dean Noble

Email:

Phone number:

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

e

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) Connie Noble

Signature:
(signature of bill payer)

Date 2 /11/26

MANDATORY

17. Important Information:

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

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

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

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

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

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

18. Declaration

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

Name (please write in full) Gareth Moran

Signature

Date

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

See overleaf for a checklist of your information...

Checklist of your information

Please tick if information is provided

- ◯ Payment (cheques payable to Far North District Council)
- ◯ A current Certificate of Title (Search Copy not more than 6 months old)
- ◯ Details of your consultation with Iwi and hapū
- ◯ Copies of any listed encumbrances, easements and/or consent notices relevant to the application
- ◯ Applicant / agent / property owner / bill payer details provided
- ◯ Location of property and description of proposal
- ◯ Assessment of Environmental Effects
- ◯ Written approvals / correspondence from consulted parties
- ◯ Reports from technical experts (if required)
- ◯ Copies of other relevant consents associated with this application
- ◯ Location and site plans (land use) AND/OR
- ◯ Location and scheme plan (subdivision)
- ◯ Elevations / floor plans
- ◯ Topographical / contour plans

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

NICKLIN CE
SURVEYING PLANNING ENGINEERING



Assessment of Environmental Effects

AEE Report

Nicklin CE Reference:

60473

Status:

Final

Date:

2 November 2026

Prepared by:

Gareth Moran

Senior Planner, Nicklin CE

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Appendix 4	Record of Title and Interests
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1.0 Applicant and Property Details

To	Far North District Council
Site Address	3 Taylors Road, Te Kao
Applicant Name	Connie and Dean Noble
Agent	Gareth Moran
Address for Service	Nicklin CE, 6 Wilson Street, Cambridge
Legal Description	Lot 2 SP 105514 – NA58A/1065
Site Area	1,171 m²
Site Owner	Connie and Dean Noble
District Plan	Far North District Plan
Zoning	Rural Production under the Operative District Plan and Rural Production under the Proposed District Plan — Appeals Version
Overlays and Controls	Treaty Settlement Area of Interest
Designations	None
Brief Description of Proposal	Relocation of dwelling
Summary of Reasons for Consent	Resource consent is required as a **Discretionary Activity**

2.0 Executive Summary

This application seeks land use consent for a relocated dwelling at Lot 2 DP 105517, Taylors Road, Te Kao. Given the site's uncharacteristically small size, the proposal has generated unavoidable non-compliances with the required boundary setback and impermeable surface requirements.

The proposal has been assessed as a Discretionary Activity under the Operative Far North District Plan and as a Restricted Discretionary Activity under the Proposed (Appeals Version) of the Far North District Plan.

In our view, the proposal will not generate any adverse effects on the surrounding properties, wider environment and is not contrary to the relevant objectives and policies. As a result the proposal is deemed to represent an acceptable outcome for the site and surrounding area, and resource consent can be granted.

This Assessment of Environmental Effects (AEE) has been prepared in accordance with the requirements of Section 88 and Schedule 4 of the Resource Management Act 1991 (the Act) and is intended to provide the information necessary for a full understanding of the activity for which consent is sought and any actual or potential effects the proposal may have on the environment

3.0 Site Context

3.1 Site Description

The subject site (Figure 10 is situated near the intersection of Taylors Road and Far North Road / State Highway 1, south of Te Kao in the Far North District. This site is currently vacant of any development and has access to Taylors Road, via an existing right of way. The site is surround by large rural landholdings which consist of pastural grazing and forestry/native bush.



Figure 1: Locality plan.

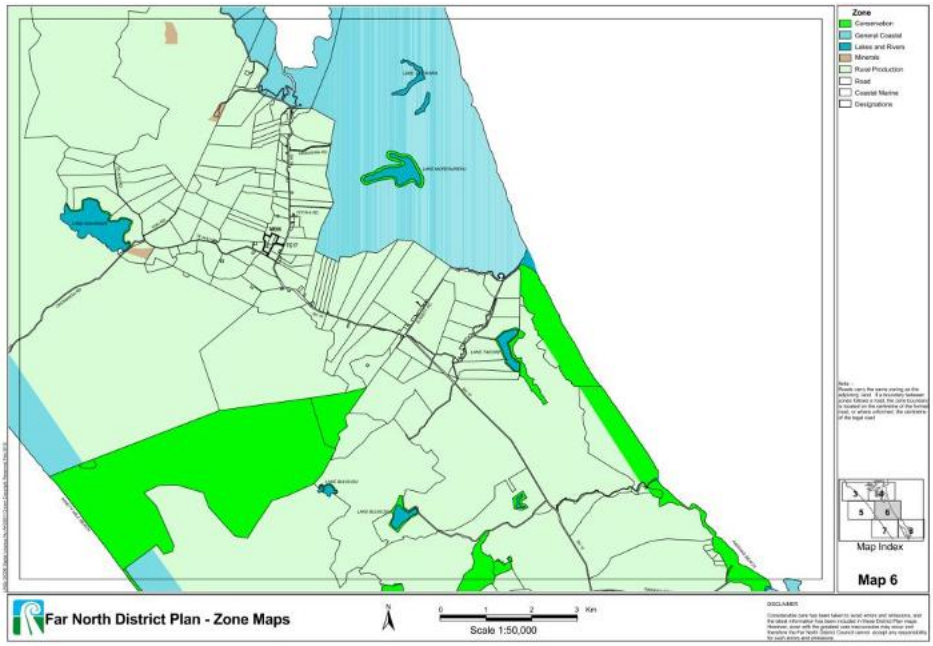


Figure 2: Operative Far North District Plan – Rural Production Zone

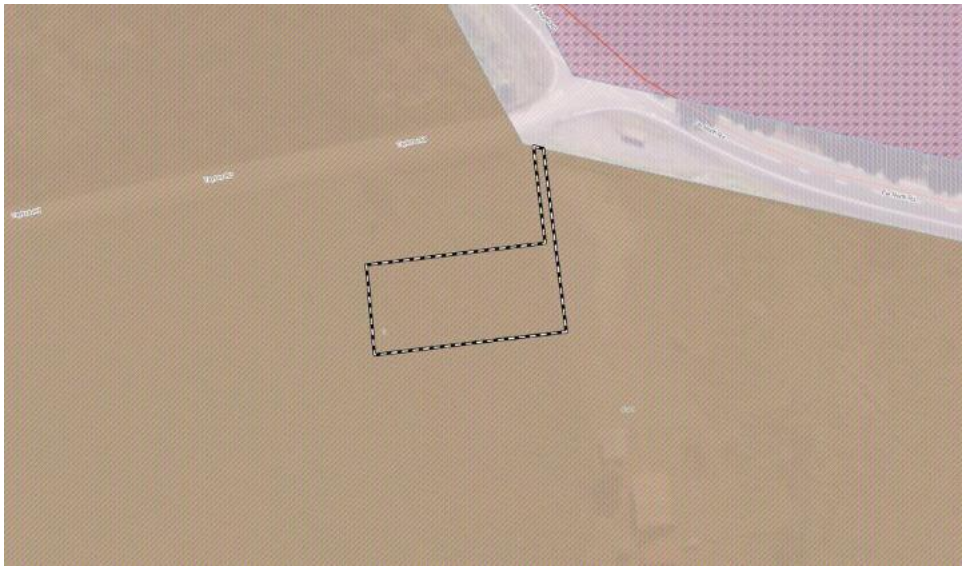


Figure 3 – Proposed District Plan (Appeals Version) – Rural Production Zone – Treaty Settlement Area of Interest

3.2 Surrounding Locality

The site is surrounded by standard rural related activity.

4.0 Proposal

The application seeks land use consent to establish a relocated dwelling at Taylors Road, as identified in Figure 4 (below).

The dwelling will be set back:

- 3.7 m from the southern boundary;

- 11.7 m from the northern boundary;
- 16.05 m from the western boundary; and
- 13.78 m from the eastern boundary.

The zone requires a minimum boundary setback of 10 m. The proposal therefore infringes the southern boundary setback only.

The dwelling and driveway area will equate to a total impermeable area of 28%.

Two 25,000-litre water tanks, each less than 2.7 m high, will be positioned in the south-western corner of the site. Vehicle access will be retained via the existing right of way.



Figure 4: Site Plans

Stormwater

A Stormwater Management Report was prepared by FNR Ltd Consulting, which is attached in **Appendix 1**. The proposed stormwater management system has been designed to keep peak stormwater runoff at pre-development levels during the 10% annual-probability design storm. Roof water will be collected in two 25,000-litre rainwater tanks, providing 50,000 litres of on-site water storage. Approximately 1,600 litres of temporary storage within the tanks will hold back stormwater and release it slowly at no more than 1.93 litres per second. This keeps the total site peak discharge at the pre-development rate of 21.8 litres per second for that design event.

Wastewater

Household wastewater will be collected and treated on the property, then distributed into a dedicated disposal field in the soil. In this instance, a TechTreat CP2 system is proposed which treats wastewater in three main steps:

- Solids settle in the first tank and are retained for periodic removal.
- Wastewater passes into an aerated chamber, where bacteria break down the waste. It then passes through clarification and filtration stages.
- A pump distributes the treated wastewater to the land-application field, where the soil provides further treatment. A separate reserve area is kept available if a replacement field is needed.

The intricate details associated with the system will be confirmed at building consent stage. Refer to **Appendix 3**, for more detailed information.

Fire fighting

The two 25,000-litre tanks provide 50,000 litres of total water storage, intended to support household supply, stormwater control and firefighting. The intricate details associated with firefighting will be confirmed at building consent stage.

5.0 Reasons for Consent

Far North District Plan

Operative District Plan

Rule: 8.6.5.1.3 - Stormwater Management

The total proposed impermeable surfaces area is 28% which exceeds the permitted 15% threshold.

Rule: 8.6.5.1.4 - Setback Fom Boundaries

The dwelling is located 3.7m from the Southern Boundary.

Proposed District Plan (Appeals Version)

Rule: RPROZ- S3 - Setback (excluding from MHWS or wetland, lake and river margins)

The dwelling is located 3.7m from the Southern Boundary.

Rule: RPROZ-R2 PER- Impermeable surface coverage

The total proposed impermeable surfaces area is 28% which exceeds the permitted 10% threshold.

5.1 Activity Status

Operative District Plan – Discretionary Activity

Proposed District Plan – Restricted Discretionary

6.0 Public Notification Assessment (Sections 95A, 95C and 95D)

This section assesses whether public notification is required in accordance with the statutory steps in section 95A of the RMA.

6.1 Section 95A Statutory Steps (Steps 1 to 4)

Step	Statutory test	Assessment
Step 1	Public notification is mandatory if the applicant requests public notification, or the application involves an exchange of recreation reserve land under section 15AA of the Reserves Act 1977.	The applicant has not requested public notification. The application does not involve an exchange of recreation reserve land. This does not apply to the proposal.

Step 2	Public notification is precluded if the relevant rules or national environmental standards preclude notification, or if the application is for a controlled activity or prescribed boundary activity.	In this case, the applicable rules do not preclude public notification, and the proposal is not a controlled activity or boundary activity. Therefore, public notification is not precluded
Step 3	Public notification is required if the relevant rules require it, or if the activity is likely to have adverse effects on the environment that are more than minor.	As noted under Step 2 above, public notification is not precluded, and an assessment in accordance with section 95A is required, which is set out in the sections below. As described below, it is considered that any adverse effects will be less than minor.
Step 4	If public notification is not required under the preceding steps, Council must consider whether special circumstances exist. Special circumstances are those that are: • Exceptional or unusual, but something less than extraordinary; or • Outside of the common run of applications of this nature; or • Circumstances which make notification desirable, notwithstanding the conclusion that the adverse effects will be no more than minor.	It is considered that there is nothing unique about the proposal. It is therefore considered that the application cannot be described as being out of the ordinary or giving rise to special circumstances.

6.2 Section 95D Statutory Matters

In determining whether to publicly notify an application, section 95D specifies a council must decide whether an activity will have, or is likely to have, adverse effects on the environment that are more than minor.

Section 95D Matter	Assessment
Adverse effects on persons who own or occupy the land within which the activity will occur, or any land adjacent to that land, must be disregarded	In assessing public notification under section 95D, any adverse effects on persons who own or occupy the application site or adjacent land must be disregarded.
Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded.	There is no relevant 'permitted baseline' applicable to this application.
Trade competition must be disregarded.	Trade competition is not relevant to this application.

The adverse effects on those persons who have provided their written approval must be disregarded.	No written approvals have been provided at this stage

The sections below set out an assessment in accordance with section 95D, including identification of adjacent properties, and an assessment of adverse effects.

6.3 Land Excluded from the Assessment

In terms of the tests for public notification (but not for the purposes of limited notification or service of notice), the adjacent properties to be excluded from the assessment are shown in **Figure 5 (**below).



Figure 5: Adjacent properties in relation to subject site.

6.4 Assessment of Effects on the Wider Environment

Residential use of existing titles is anticipated in the Rural Production Zone. Although the circumstances of the subdivision in the late 1980s are unknown, it is reasonable to expect that the site's ability to accommodate a dwelling would have been considered at that time. The non-compliances with the District Plan arise primarily from the site's uncharacteristically small size, rather than from development that is unsuitable for, or disproportionately large in relation to, the site.

The supporting stormwater assessment identifies a site-specific system designed to maintain pre-development peak runoff rates for the assessed 10% annual exceedance probability (AEP) storm event. An on-site wastewater system is also proposed, with its suitability to be confirmed through detailed design.

Given the nature and scale of the development, the proposal is not expected to generate adverse effects on the wider environment beyond those anticipated from residential development on the existing title.

6.5 Public Notification Conclusion

Having undertaken the section 95A public notification tests, the following conclusions are reached:

Section 95A	Step	Conclusion Reached
Step 1		Under step 1, public notification is not mandatory.
Step 2		Under step 2, public notification is not precluded.
Step 3		Under step 3, public notification is not required as it is considered that the activity will result in less than minor adverse effects.
Step 4		Under step 4, there are no special circumstances.

Therefore, based on the conclusions reached under steps 3 and 4, it is recommended that this application be processed without public notification.

7.0 Limited Notification Assessment (Sections 95B, 95E to 95G)

7.1 Assessment of Steps 1 to 4 (Sections 95B)

If the application is not publicly notified under section 95A, the council must follow the steps set out in section 95B to determine whether to limited notify the application. These steps are addressed in the statutory order below.

Step	Statutory test	Assessment
Step 1	Limited notification is required where there are any affected protected customary rights groups or customary marine title groups; or affected persons under a statutory acknowledgement affecting the land (being on land, or adjacent to land, that is subject to a statutory acknowledgement area).	This does not apply to this proposal.
Step 2	Limited notification is precluded if all applicable rules and national environmental standards preclude limited notification, or if the application is for a controlled activity (other than the subdivision of land).	In this case, the applicable rules do not preclude limited notification and the proposal is not a controlled activity. Therefore, limited notification is not precluded.
Step 3	Step 3 requires that, where limited notification is not precluded under step 2 above, a determination must be made as to whether any of the following persons are affected persons: • In the case of a boundary activity, an owner of an allotment with an infringed boundary;	In this case, the application is not for a boundary activity, and therefore an assessment in accordance with section 95E is required and is set out below Overall, it is considered that any adverse effects on persons will be less than minor, and accordingly, that no persons are adversely affected.

	• In the case of any other activity, a person affected in accordance with s95E.	
Step 4	If limited notification is not required under the preceding steps, Council must determine whether special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined as eligible for limited notification.	In this instance, having regard to the assessment in section 8.1 Step 4 above, it is considered that special circumstances do not apply.

7.2 Section 95E Statutory Matters

If the application is not publicly notified, a council must decide if there are any affected persons and give limited notification to those persons. A person is affected if the effects of the activity on that person are minor or more than minor (but not less than minor).

In deciding who is an affected person under section 95E:

- Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded;
- Only those effects that relate to a matter of control or discretion can be considered (in the case of controlled or restricted discretionary activities); and
- The adverse effects on those persons who have provided their written approval must be disregarded.

These matters were addressed in section 8.4 above. Having regard to the above provisions, an assessment is provided below.

7.3 Assessment of Effects on Persons

The adjoining properties on the southern side of Taylors Road form part of a wider landholding owned by members of the Noble family. Based on the assessment below, written approvals are not considered necessary. However, if Council reaches a different conclusion, the relevant written approvals can be provided.

The proposed dwelling will establish residential use on an existing vacant lot. The boundary setback and impermeable coverage infringements arise primarily from the lot's small size and dimensions and are largely unavoidable if a modestly sized dwelling is to be established on the site.

The reduced setbacks will not result in adverse amenity effects on adjoining properties beyond those reasonably anticipated by the original subdivision.

The site-specific stormwater system is designed to maintain pre-development peak runoff rates for the assessed 10% annual exceedance probability (AEP) storm event. An on-site wastewater system is also proposed, subject to detailed design confirming suitable treatment and disposal capacity. These servicing measures will avoid adverse effects on adjoining properties.

The properties north of Taylors Road are bush-covered. The proposed dwelling will not be visible from existing habitable buildings or from areas reasonably likely to accommodate future dwellings on those properties.

On this basis, adverse effects on adjoining owners and occupiers are assessed as less than minor.

7.4 Limited Notification Conclusion

Having undertaken the section 95B limited notification tests, the following conclusions are reached:

Section 95B Step	Conclusion Reached
Step 1	Under step 1, limited notification is not mandatory.
Step 2	Under step 2, limited notification is not precluded.
Step 3	Under step 3, limited notification is not required as it is considered that the activity will not result in any adversely affected persons; and
Step 4	Under step 4, there are no special circumstances.

Therefore, it is recommended that this application be processed without limited notification.

8.0 Consideration of Applications (Section 104)

8.1.1 Section 104 matters

Subject to Part 2 of the Act, when considering an application for resource consent and any submissions received, a council must, in accordance with section 104(1) of the Act have regard to:

- Any actual and potential effects on the environment of allowing the activity (refer to Section 11 below);
- Any relevant provisions of a national environmental standard, other regulations, national policy statement, a New Zealand coastal policy statement, a regional policy statement or proposed regional policy statement; a plan or proposed plan (refer to Section 12 below); and
- Any other matter a council considers relevant and reasonably necessary to determine the application.

As a discretionary activity, section 104B of the Act states that a council:

- may grant or refuse the application; and
- if it grants the application, may impose conditions under section 108.

9.0 Effects on the Environment (Section 104(1)(A))

As established in the preceding sections of this report, the proposal will have less than minor adverse effects on the wider environment and surrounding properties. The establishment of a new dwelling on the undeveloped site will result in effects that are anticipated within the zone, rather than any notable positive or adverse effects. The proposal is therefore considered an acceptable outcome for the site and surrounding area.

10.0 District Plan and Statutory Documents (Section 104(1)(B))

10.1.1 Operative Far North District Plan – Objectives and Policies

The proposal is considered to be consistent with the relevant objectives and policies of the Rural Production Zone, read alongside the broader rural environment provisions in Sections 8.3 and 8.4. These provisions enable a range of activities while requiring development to maintain rural amenity, safeguard natural and physical resources, and avoid compromising rural production through incompatible land uses or reverse sensitivity effects.

The establishment of one relocated dwelling on an existing 1,171 m² vacant allotment represents a modest use of an existing land resource, consistent with Objectives 8.6.3.1 and 8.6.3.2 and Policy 8.6.4.5. The proposal does not involve further subdivision or fragmentation of the surrounding rural landholdings and will utilise the existing right-of-way access. The setback and impermeable surface infringements arise primarily from the site's uncharacteristically small size and are largely unavoidable when accommodating a standard sized dwelling.

Objective 8.6.3.3 and Policy 8.6.4.4 seek to maintain rural amenity at a level consistent with the productive intent of the zone. Although the dwelling will be located 3.7 m from the southern boundary, the remaining boundary setbacks exceed 10 m. As assessed in the preceding sections, the reduced southern setback will not result in material adverse effects on the amenity of adjoining properties. The scale and intensity of a single dwelling on the existing allotment will not materially alter the character of the wider rural environment.

The proposal is consistent with the effects-management approach of Objective 8.6.3.7 and Policies 8.6.4.2 and 8.6.4.3. Although impermeable surfaces exceed the permitted threshold, the supporting stormwater design provides attenuation to maintain pre-development peak runoff rates for the assessed 10% AEP storm event. On-site wastewater treatment and disposal are also proposed. Subject to confirmation of suitable wastewater treatment and disposal capacity through detailed design, adverse effects on adjoining land and natural and physical resources can be appropriately avoided/mitigated.

Objective 8.6.3.6 and Policies 8.6.4.1 and 8.6.4.7–8.6.4.9 seek to protect existing lawful rural activities from incompatible development and reverse sensitivity effects. The surrounding area supports grazing and forestry activities, and the proposed residential use must be considered within this productive rural context. The site was created through subdivision in 1989. Given its small size, residential use was its only realistic development outcome. Although the circumstances of the previous subdivision are unknown, residential use and any associated reverse sensitivity effects should have been considered at that time. The proposal is therefore not expected to generate reverse sensitivity effects beyond those reasonably anticipated when the lot was created. Furthermore, the land to the south forms part of the wider Noble landholding, and written approvals can be provided if required.

Overall, the proposal is concluded to be consistent with the relevant objectives and policies of the Operative Far North District Plan.

10.1.2 Proposed Far North District Plan – Appeals Version – Objectives and Policies

The relevant objectives and policies seek to retain the Rural Production Zone for primary production, protect rural activities from reverse sensitivity effects, maintain the character of a rural working environment, and ensure development can be appropriately serviced. These outcomes are expressed in Objectives RPROZ-O1–O4 and Policies RPROZ-P3–P5 and RPROZ-P7.

The proposal will not further subdivide, or fragment surrounding rural landholdings or alter the wider rural character. Residential development of the site could reasonably have been anticipated when it was subdivided in the late 1980s. As assessed in this report, the reduced southern boundary setback of 3.7 m will not generate additional adverse effects on adjoining properties.

Consistent with Objective RPROZ-O4 and Policy RPROZ-P4, the dwelling must be considered within a working rural environment where effects associated with lawful grazing and forestry activities are anticipated. As mentioned above, the permitted use of the site for residential purposes was essentially authorised as part of the underlaying subdivision, as a result any potential reverse sensitive effects needed to have been contemplated at time of subdivision, rather than at the future development phase.

The proposed stormwater attenuation and on-site wastewater treatment and disposal respond to the servicing outcomes sought by Objective RPROZ-O3 and Policies RPROZ-P5 and RPROZ-P7. As concluded within the specialist reports submitted as part of this application the proposal can be serviced without generating any material increase in effects on adjoining properties. The stormwater system is designed to maintain pre-development peak runoff rates for the assessed 10% AEP event.

While the proposal does not itself support primary production or demonstrate a functional need for a rural location, its establishment on an existing small allotment distinguishes it from development involving further rural subdivision. This creates some tension with Objective RPROZ-O2 and Policy RPROZ-P5. While the intent of these objectives and polices is clear, every site must be assessed on its merits, and the simple fact is that the subject site is too small to support rural production activities. With this use largely restricted to that of residential purposes.

Overall, the proposal is not concluded to be contrary with the relevant objectives and policies.

10.2 Summary

It is considered that the proposed development is generally in accordance with the objectives and policies of the both versions of the Far North District Plan.

11.0 Part 2 Matters

While it is not necessary to take recourse to Part 2 given that it has already been incorporated into the Far North District Plan, this section is included for completeness.

Section 5 of Part 2 identifies the purpose of the RMA as being the sustainable management of natural and physical resources. This means managing the use, development and protection of natural and physical resources in a way that enables people and communities to provide for their social, cultural and economic

well-being and health and safety while sustaining those resources for future generations, protecting the life supporting capacity of ecosystems, and avoiding, remedying or mitigating adverse effects on the environment.

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

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

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

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

12.0 Other Matters (Section 104(1)(C))

12.1 Record of Title Interests

The Record of Title for the site are subject to a number of interests (refer **Appendix 4**). None of these will affect the resource consent application.

12.2 Section 106A Natural Hazards

Under section 106A of the Act, a consent authority may refuse to grant a land use consent, or may grant the consent subject to conditions, if it considers that there is a significant risk from natural hazards. Based on the findings of a Site Investigation Report, prepared by FNR Consulting **(Appendix 5),** the site is not identified as being subject to any mapped natural hazard overlays, and the minor nature of the development will not exacerbate any Natural Hazards. The site will continue to utilise its existing vehicle access.

13.0 Conclusion

This application seeks land use consent for a relocated dwelling at Lot 2 DP 105517, Taylors Road, Te Kao. Given the site's uncharacteristically small size, the boundary setback and impermeable surface non-compliances are largely unavoidable when establishing a standard-sized dwelling. The application has been assessed as a Discretionary Activity, with potential adverse effects on adjoining properties and the wider environment concluded to be less than minor. The proposal is not contrary to the relevant objectives and policies of the Operative and Proposed District Plans. The proposal therefore represents an acceptable outcome for the site and surrounding area, and resource consent can be granted.

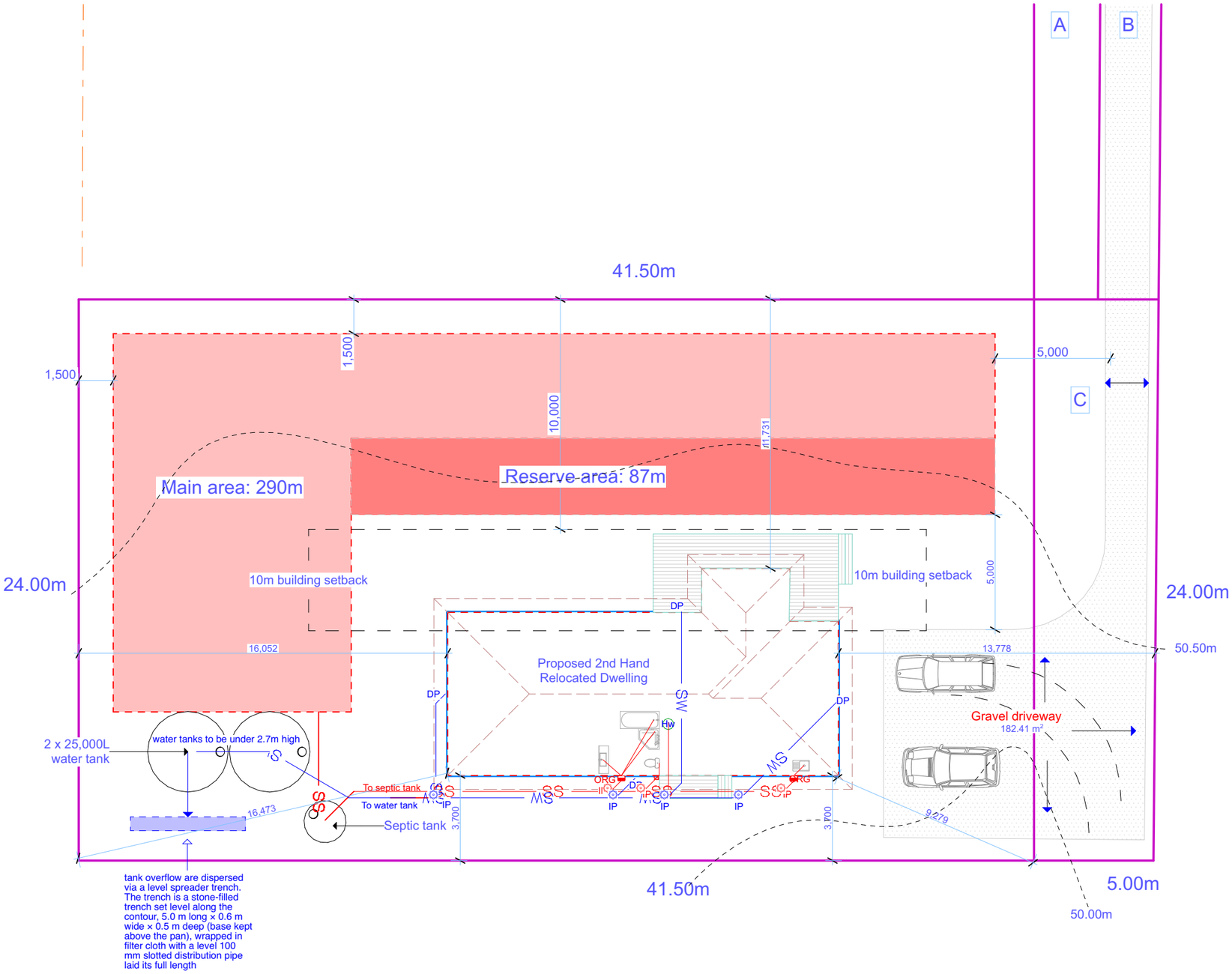
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Proposed 2nd Hand Relocated Dwelling
for
Dean & Connie Noble
To be located to …
Lot 2 Taylors Road Te Kao Northland 0484 New Zealand



	SHEET NAME
0	Cover Page
1	Site Plan
1a	Site Plan a
3	Floor Plan
4	Foundation Plan
5	Elevations
6	Sections
7	Anchor & Normal Pile Details
8	Deck Details



KEY

- Existing plumbing fixtures
- Stormwater line
- Sanitary sewer line

N

Sediment and Erosion Control Notes

1. Stabilised Site Access
A stabilised entry/exit point must be installed (e.g., compacted basecourse or aggregate over geotextile) to prevent sediment tracking onto public roads. All vehicles and equipment must use this access only.

2. Silt Control Fencing
Install silt fences or approved alternatives (e.g., super silt fence or silt sock) downslope of disturbed areas. Ensure fencing is trenched in, securely staked, and maintained throughout the project.

3. Soil and Stockpile Protection
Stockpiles must be located away from waterways and drains. Cover all stockpiles with tarpaulins or temporary vegetation and surround with sediment controls.

4. Stormwater Inlet Protection
Protect all stormwater drains on and near the site using sandbags, silt socks, or appropriate inlet filters. Maintain these after rainfall and replace if damaged.

5. Site Stabilisation and Revegetation
Disturbed areas must be stabilised as early as possible via seeding, hydroseeding, straw mulching, or turfing. Final landscaping or vegetative cover must be applied promptly upon completion.

6. Sediment Retention Devices
For larger or sloped sites, install devices such as sediment retention pits, check dams, or bunds as needed. Ensure sizing and location suit the site and maintain regularly.

7. Maintenance and Monitoring
Inspect all erosion and sediment controls weekly and after heavy rainfall. Promptly repair or replace any damaged or ineffective controls. Keep records of inspections if requested by Council.

General Notes

• Plumbing layout is indicative only. Contractors must verify all details on-site prior to commencing work.
Water Supply Notes (Rural)
• Rainwater must be collected from roof catchments and directed to an approved storage tank.
• Install leaf guards to all gutters to prevent debris ingress.
• Provide debris strainers or first-flush diverters on all downpipes.
• Install a potable water filtration system post-tank, compliant with AS/NZS 4020.
• Include a UV filtration system (e.g., Bug Buster Pro Series Platinum or approved equivalent).
• Water system must supply safe drinking water in compliance with NZBC G12.
• All installations must follow manufacturer specifications and be carried out by a licensed plumber.

Reference Reports Before Construction
All relevant reports must be reviewed before commencing any work. These include:
– Geotechnical Report
– Wastewater Report
– Stormwater Report
– Survey Plan and any other related documentation

If discrepancies or uncertainties arise, STOP work and consult with the designer or relevant authority before proceeding.

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NOTES:
House floor area: 127m²
Site area:1,171m²
Water tanks: 20m²
Site coverage = 12.63%
Grade site to a gentle 1% fall, following existing contours and natural drainage direction as closely as practicable.

Impermeable driveway area: 182m²
House floor area: 127m²
Site area:1,171m²
Water tanks: 20m²
Impermeable area = 28%

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SITE AREA:	1,171 m²
WIND ZONE:	High
EXPOSURE ZONE:	C
EARTHQUAKE ZONE:	1
STATUS:	BC

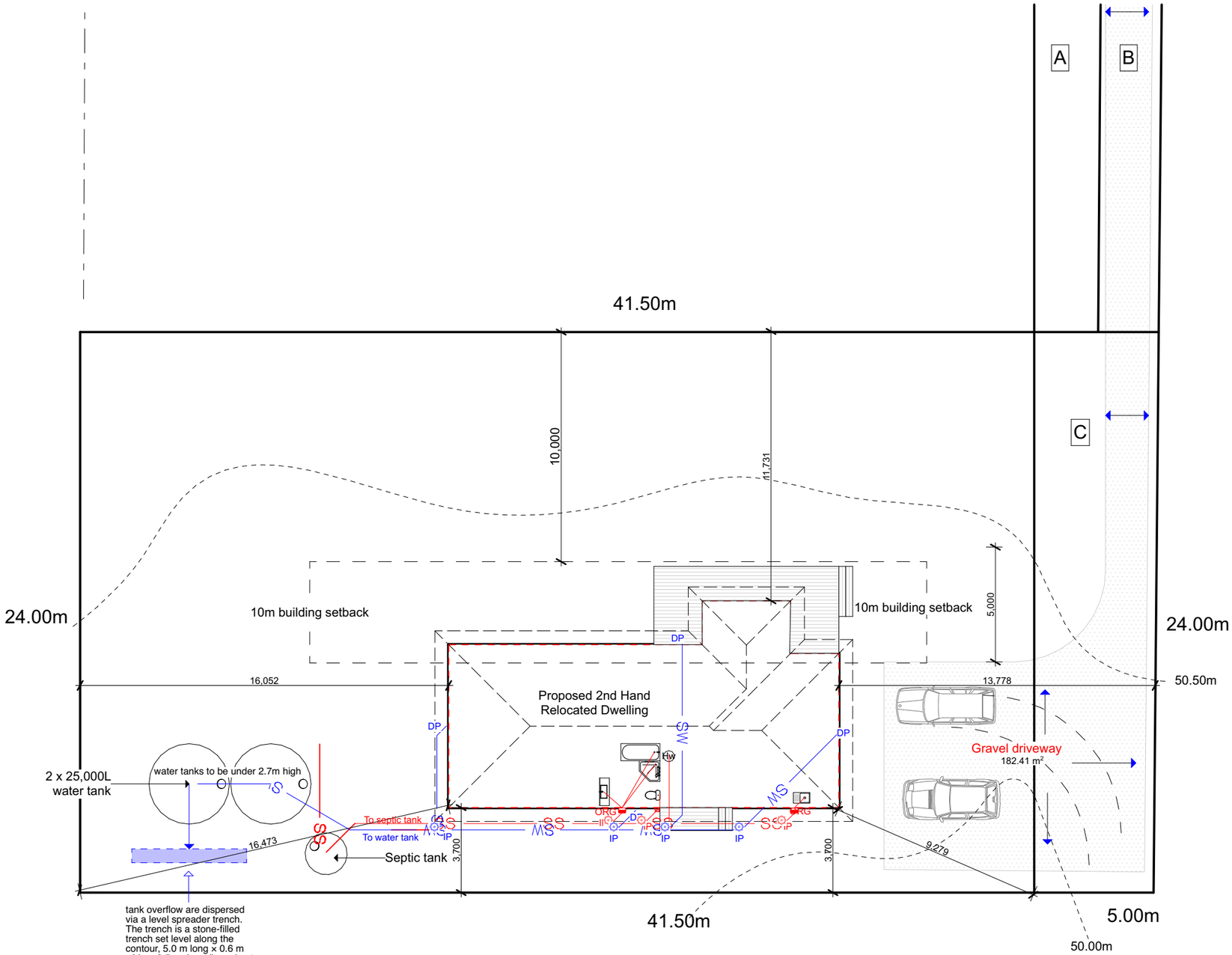
JOB: Proposed 2nd Hand Relocated Dwelling
Lot 2 Taylors Road Te Kao Northland 0484 New Zealand

ISSUE: 29/10/2026
REV: A - WIP

SCALE: 1:200 @ A3

DRAWING TITLE: Site Plan

PAGE: 1



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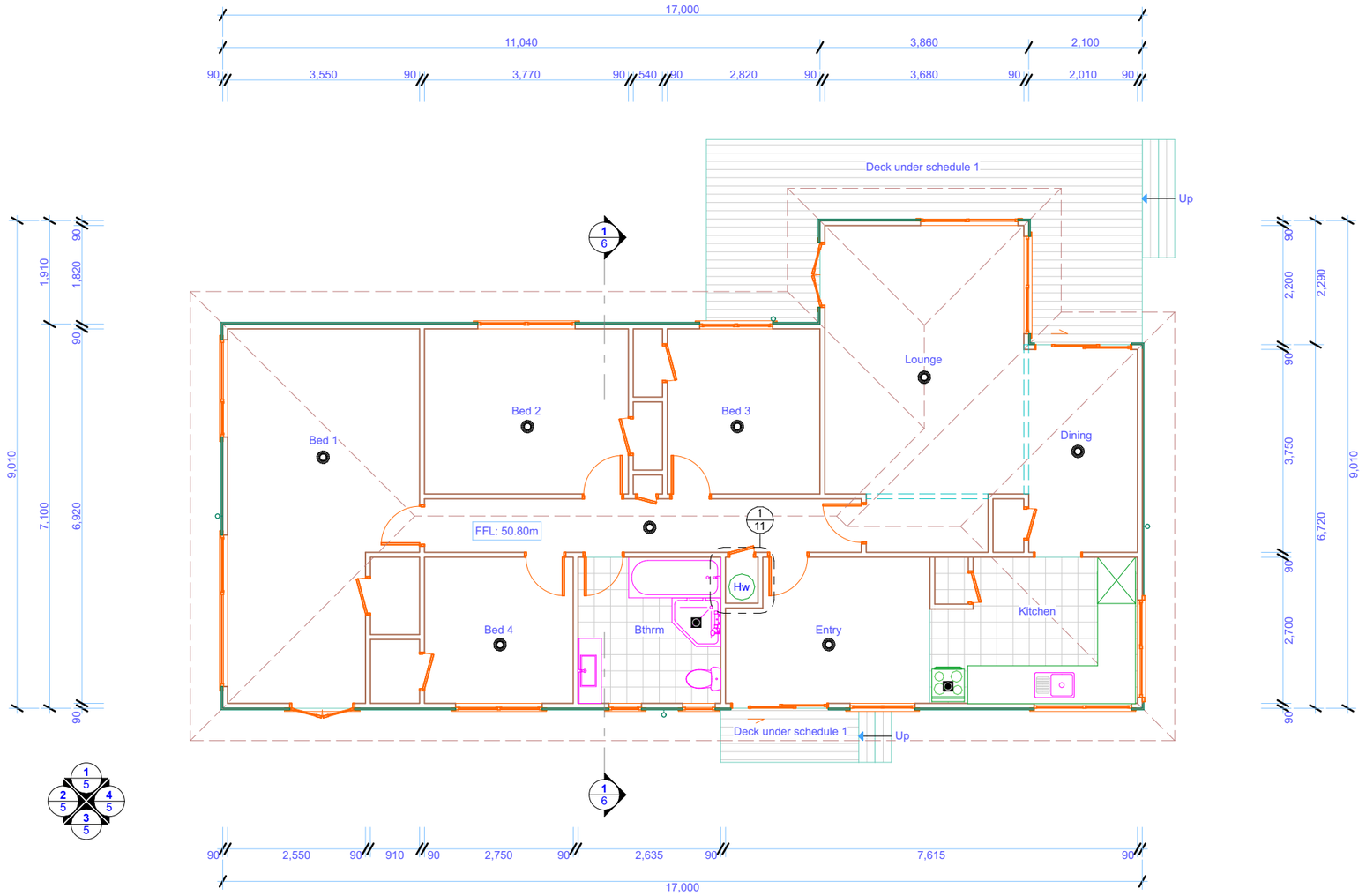
SCALE: 1:200 @ A3

DRAWING TITLE: Site Plan a

PAGE: 1a

KEY

- Existing plumbing fixtures
- Existing 90x45mm timber framing
- SA — Inter connected smoke alarms 10 year min battery life
- Extractor fan



Where possible
1. Add single Z nail to Purlin/Rafter connection in periphery areas.
2. Add "L" Bracket between rafter and plate, nailed (4) and screwed (2) in place.

General Notes

- Contractor is responsible for verifying all dimensions, angles, levels, and site conditions before commencing any work.
- Drawings are for construction purposes only and must be used in accordance with the project status noted.
- All drawings must be read in conjunction with architectural specifications, structural documents, manufacturer installation guides, and all relevant consultant reports.
- All construction must comply with the latest New Zealand Building Code and relevant standards.
- Ensure all proprietary products are installed strictly per the manufacturer's instructions.
- Do not scale drawings. Use figured dimensions only. Contact the designer or contractor if in doubt.
- Report any discrepancies or inconsistencies to the drafter immediately.
- Site boundaries, floor levels, and profiles must be pegged and confirmed by a registered surveyor prior to construction.
- Contractor is solely responsible for identifying and protecting all underground services prior to commencement of any excavation or groundwork.

Construction & Demolition Safety
- F5.3.3: Where construction or demolition sites pose potential hazards (e.g., attraction to children), the site must be enclosed to restrict unauthorized access.
- F5.3.4: Adequate barriers must be erected to protect the public and ensure safe passage when equipment or work areas pose fall or injury risks.
- Ensure all workers comply with appropriate site safety protocols, PPE standards, and WorkSafe NZ guidelines.

Stair Requirements
- Maximum riser height: 190mm
- Minimum tread length: 280mm
- Deck landing to dwelling clearance (including cladding and decking): Minimum 12mm
- All stairs to comply with D1 Building Code and NZS 4121 for accessibility if applicable
- Handrails required where stairs exceed 1m in height or as specified

Mechanical Ventilation / Extractor Fans
Mechanical ventilation systems must comply with NZBC Clause G4.
Minimum flow rate for extract fans:
– 25 L/s for showers and baths
– 50 L/s for kitchen cooktops
Extractor fans must be vented directly to the exterior, not into ceiling cavities or roof spaces.

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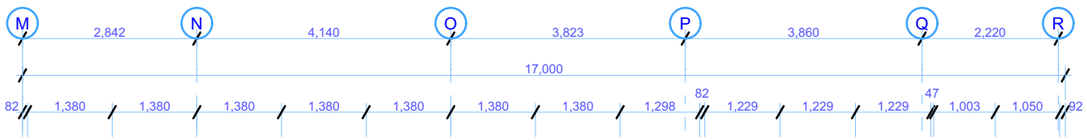
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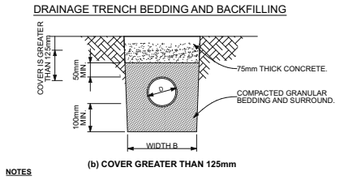
DRAWING TITLE: Floor Plan
PAGE: 3

7.4.2.2 Deck Bracing

Decks which project more than 2 m from the building shall have *subfloor bracing* provided by anchor and/or *braced piles*, at half the *bracing demand* required by table 5.8 for "light/light/light" *cladding*, for 0° *roof* slope and for "subfloor structures".

15 BU's divided by 2x
7.5bus per sqaure metre for deck

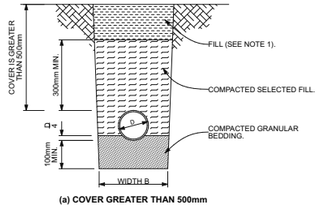


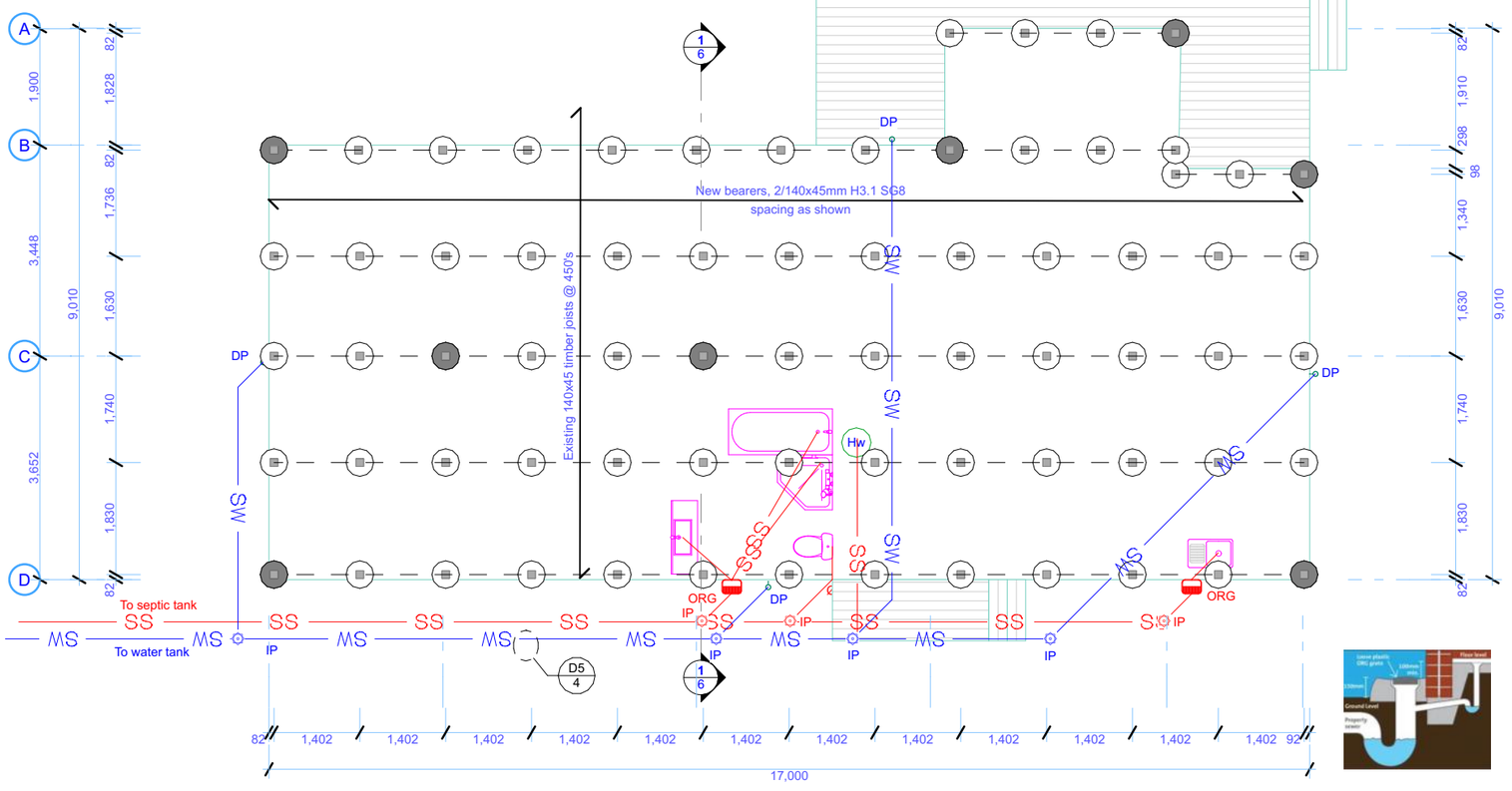


NOTES

1. 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 SUBJECTED TO LIGHT TRAFFIC.





ACCEPTABLE FLOW RATES TO SANITARY FIXTURES

Sanitary fixture	Flow rate and temperature (l/s and °C)
Sink	0.2 @ 60°C* (hot) and 0.2 (cold) Flow rates required at both hot and cold taps, but not simultaneously
Laundry tub	0.2 @ 60°C* (hot) and 0.2 (cold) Flow rates required at both hot and cold taps, but not simultaneously
Basin	0.1 @ 45°C Mix hot and cold water to achieve 45°C
Shower	0.1 @ 42°C Mix hot and cold water to achieve 42°C

MINIMAL PIPE SIZES AND FALLS

Fixture/Drain Type	Minimum Size	Minimum Grade
uPVC Stormwater Drain	100 mm	1:100
uPVC Sewer Drain	100 mm	1:60
Sink & Dishwasher Waste	65 mm	1:40
Laundry Tub & WM Waste	50 mm	1:40
Wash Hand Basin Waste	40 mm	1:40
Shower Waste	65 mm	1:40
WC Waste	100 mm	1:60
Floor Waste	65 mm	1:40

KEY

- Existing plumbing fixtures
- Stormwater line
- Sanitary sewer line
- ORG — New Overflow Relief Gully
- IP — Inspection point
- DP — Existing downpipes
- TV Ø — Existing 80mm Terminal Vent
- Normal piles: New 450mmØ by 450mm deep 25mpa conc footing 450mm below ground level with 125mm² H5 sg8 timber posts
- Anchor piles: New 450Ø by 0.9m deep 25mpa conc footing 0.9m below ground level with 125mm² H5 sg8 timber posts
- Existing 100x70 timber bearers

Overall, the site is considered suitable for the proposed dwelling, subject to foundation design in accordance with NZS 3604:2011 and the recommendations contained within this report. "Good Ground" was encountered at shallow depths, ranging from approximately 0.25 m to 0.6 m below existing ground level, with refusal (>10 blows per 50 mm) subsequently encountered at all test locations across the site. This refusal is interpreted to represent a dense sand or hardpan layer, laterally continuous beneath the proposed building platform. Given the consistent shallow refusal encountered at all test and retest locations, it is recommended that standard pile foundations bearing on Good Ground be adopted, founded at the depth of refusal, in accordance with NZS 3604:2011. Piles should achieve a minimum embedment of 300 mm into the dense layer where practicable. Given the shallow refusal depths encountered (as little as 0.25 m below existing ground level in places), full embedment may not be achievable at every pile location.
NOTE:
Add bridge pile or standard pile under all bearer joins. Provide additional normal piles where required to support any point loads or bearer joins.

Notes:

- Plumbing shown is indicative only. Contractors must verify all plumbing details and dimensions on site prior to commencing work.
- Pile sizes, depths, footing dimensions, timber treatment, and connections are to match NZS 3604 requirements and the structural details in this drawing set. Unless SED design and refer engineers details
- All anchor piles, braced piles, and bracing lines are to be installed as shown and fixed in accordance with NZS 3604 unless stated otherwise
- Plumbing layout shown is indicative only. All dimensions, locations, and heights to be verified on site before commencing work.
- All works shall comply with the New Zealand Building Code clauses G12 (Water Supplies) and G13 (Foul Water), using G12/AS1 and G13/AS3 as the Acceptable Solutions.
- Water supply pipework shall comply with NZBC Clause G12 and be installed to G12/AS1 requirements.
- All cold-water supply pipework shall be medium or high-density polyethylene (MDPE/HDPE), installed so all joints are free from stress or tension.
- Provide conveniently located isolating valves for each group of fixtures and an isolating valve at each toilet cistern (if not integrally fitted).
- All pipe materials to be uPVC for foul water and stormwater systems, unless noted otherwise.

Contractor Requirements

- Inspect existing house/site prior to commencement to confirm pile layouts, site conditions, and services match the structural and plumbing drawings.
- Refer to the structural engineer's drawings, geotechnical report, septic design, and stormwater design reports as applicable.
- Contact the designer immediately if any discrepancies or questions arise.

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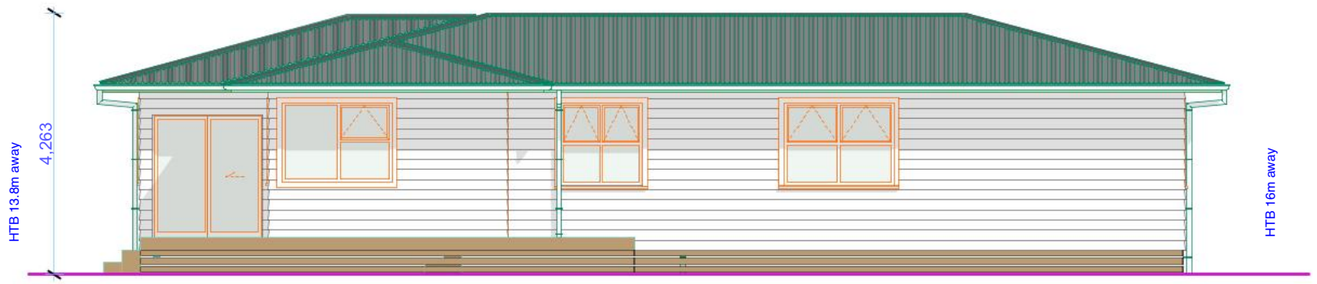
NOTES:
Normal piles: = 4.509m³
Anchor piles: = 1.145m³
Total pile excavations = 5.65m³

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DRAWING TITLE:	Foundation Plan
PAGE:	4



1 North Elevation 1:100



4 East Elevation 1:100



3 South Elevation 1:100



2 West Elevation 1:100

General Notes

- All elevations are indicative only. Verify materials, finishes, and heights on-site prior to construction.
- Finished floor levels (FFLs) and roof heights to be confirmed with site survey and architectural plans.
- Downpipes and spouting must align with stormwater design and be clearly coordinated on-site.
- All penetrations through external cladding must be flashed and sealed as per NZBC requirements.
- Elevations to be read in conjunction with plans, sections, specifications, and product literature.

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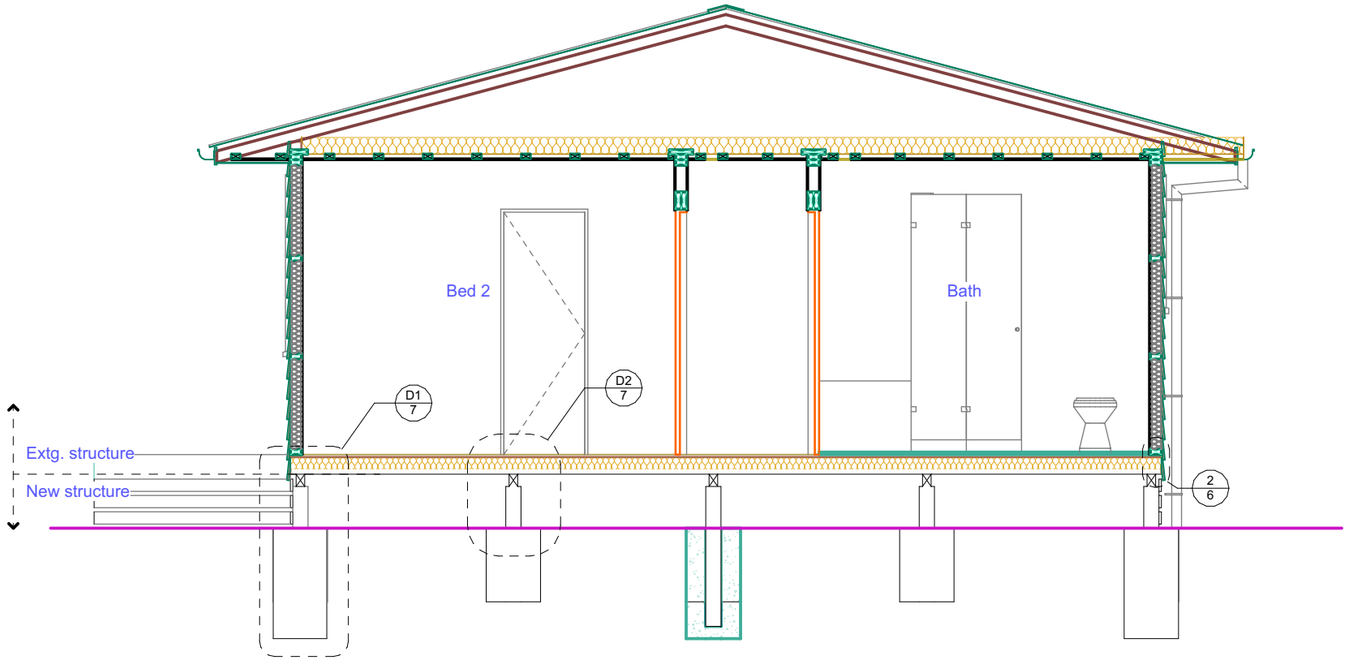
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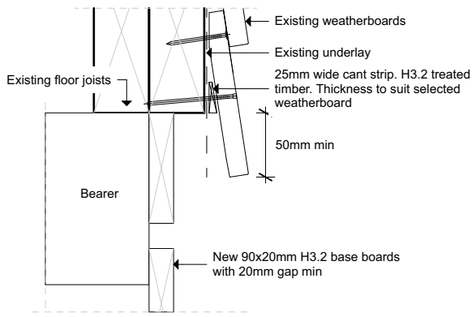
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SCALE: 1:100 @ A3

DRAWING TITLE: Elevations

PAGE: 5



1 Section A 1:50



2 Base Board Details 1:5

General Notes

- Cross sections are indicative only. Contractor must verify all dimensions, levels, and conditions on site before construction.
- Sections must be read in conjunction with floor plans, elevations, foundation layouts, and engineer's documentation.
- All materials and construction methods must meet durability requirements per NZS 3604 and NZBC Clause B2.
- Ensure compliance with Clause E2 for external moisture at all wall/roof junctions, penetrations, and openings.
- Confirm all finished floor levels (FFLs), ground clearances, and roof heights on site prior to ordering or building components.
- Floor build-ups, damp-proof membranes, insulation, and ventilation to comply with Clause E3 (Internal Moisture)
- Coordinate all underfloor services, drainage runs, and pile penetrations with plumbing documentation.

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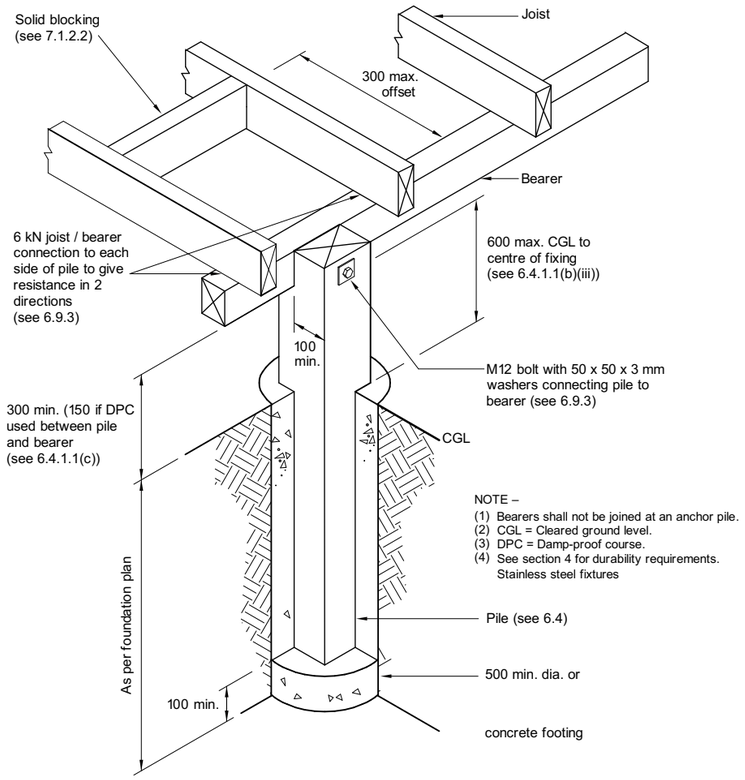
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DRAWING TITLE: Sections

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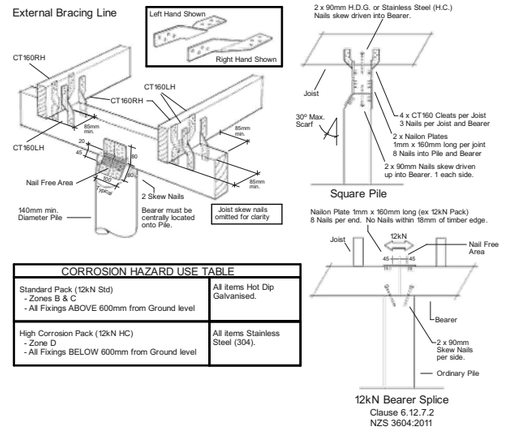
12kN PILE FIXING



NOTE –
(1) Bearers shall not be joined at an anchor pile.
(2) CGL = Cleared ground level.
(3) DPC = Damp-proof course.
(4) See section 4 for durability requirements. Stainless steel fixtures

Bracing units	
Wind	160
Earthquake	120

12KN PILE FIXING



CORROSION HAZARD USE TABLE	
Standard Pack (12kN Std) - Zones B & C - All Fixings ABOVE 600mm from Ground level	All items Hot Dip Galvanised.
High Corrosion Pack (12kN HC) - Zone D - All Fixings BELOW 600mm from Ground level	All items Stainless Steel (304).

12kN Pile Set Contents Each set represents 1 x 12kN Pile Fixing

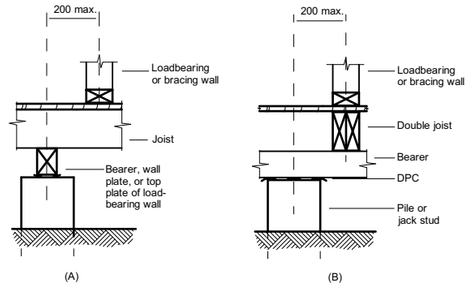
(packed 4 sets per carton)
2 x Nailon Plates 160mm long
8 x CT160 Cleats
80 x 45mm x 3.55 dia. Spiral Nails
90mm x 4 dia. St. Steel Angular Groove
6 - H.C. Pack

Refer front page for Product Finish Options

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

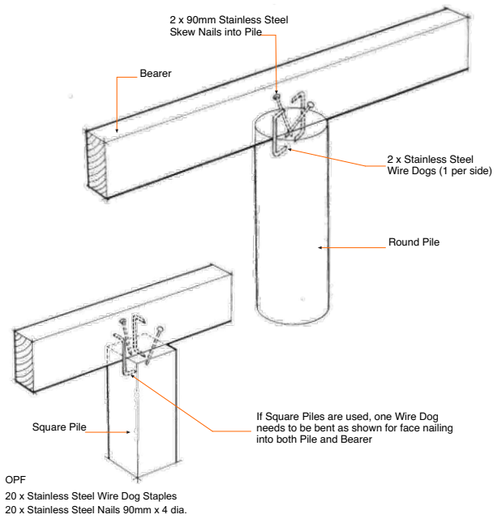
12kN Joint Fixing Schedule

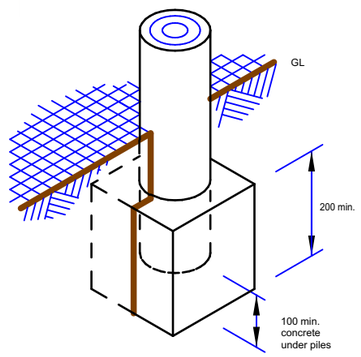
PILE TO BEARER	- Nailon Plate (2 per joint) 1mm x 100mm (Typical) x 160mm long - 8 Nails per Plate into Pile - 8 Nails per Plate into Bearer - 2 Skew Nails 90mm (1 per face)
JOIST TO BEARER	- CT160 Cleats (4 per Joist) 160mm long - 3 Nails per Cleat into Joist - 3 Nails per Cleat into Bearer - 2 Skew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



ORDINARY PILE FIXING

★ Complies with NZS 3604:2011
★ All Fixings Stainless Steel
★ For all Ordinary Piles (Refer Figure 6.3 NZS 3604:2011)

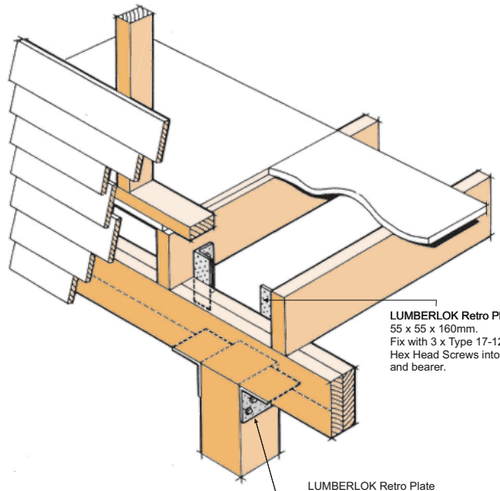


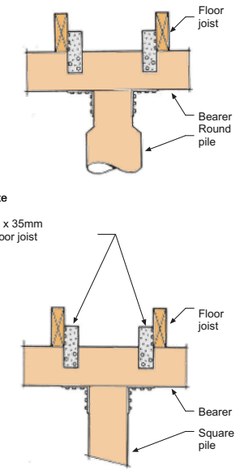


12kN RETRO SUBFLOOR FIXING

★ Fixing to be used when the outside face of the bearer is not accessible e.g. fixing relocatable houses to piles.

★ Hot Dip Galvanised or Stainless Steel options available for required corrosive zone.





Code: 12KNRF
Material: 0.91mm G300 Z275 (Hot Dip Galvanised Steel)
Code: 12KNRFH
Material: 0.9mm Stainless Steel 304-2B
Packed: 8 x Retro Plate 55 x 55 x 160mm
8 x Retro Plate 100 x 100 x 120mm
100 x Type 17-12g x 35mm Hex Head Screws

General Notes

- All piles and subfloor fixings must comply with NZS 3604, unless specified otherwise by a structural engineer.
- Pile type, size, embedment depth, and fixings must match structural or architectural details shown on drawings.
- (Refer to NZS 3604 Table 6.1 unless otherwise engineer-designed.)
- Durability: All timber to be H5 treated below ground and H3.2 treated above ground
unless noted otherwise.
- Steel subfloor fixings and brackets must be hot-dip galvanized or stainless steel for coastal or high-corrosion zones.
- Ensure bracing piles, anchor piles, and bearer fixings match the bracing schedule and engineering details.
- All piles must be founded in firm natural ground — not fill. If soft or fill conditions are encountered, notify engineer immediately.
- All subfloor fixings to be installed per manufacturer's instructions, using correct washers, edge clearances, and fasteners.
- Contractor must verify pile layout on site against the approved plan and check all levels before installing bearers.
- Final pile layout and fixings must be inspected by anyone mentioned in reports.

ArchX

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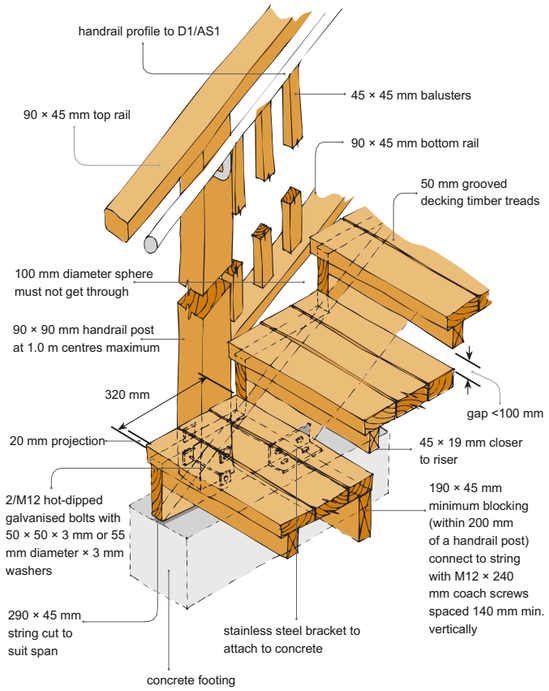
FLOOR AREA:	127m²
LOT & DP:	Lot 2 Dp 105517
SITE AREA:	1,171 m²
WIND ZONE:	High
EXPOSURE ZONE:	C
EARTHQUAKE ZONE:	1
STATUS:	BC

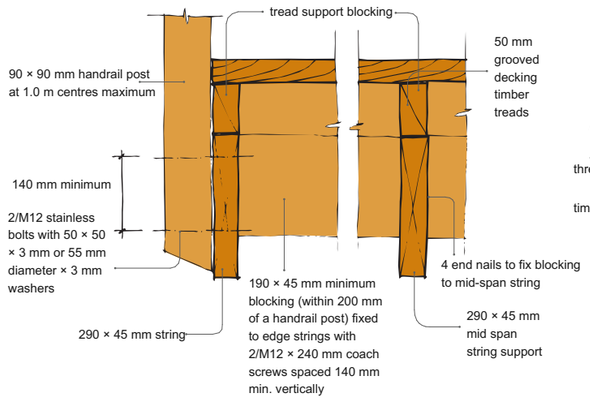
JOB: Proposed 2nd Hand Relocated Dwelling
Lot 2 Taylors Road Te Kao Northland 0484 New Zealand

ISSUE: 29/10/2026
REV: A - WIP
SCALE: @ A3

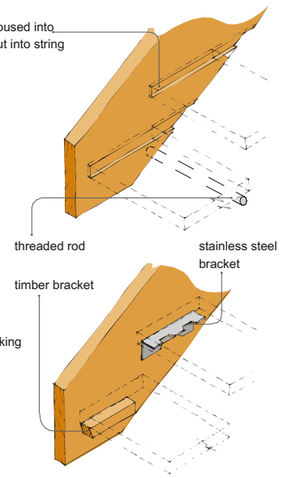
DRAWING TITLE: Anchor & Normal Pile Details

PAGE: 7





Handrail post fixing to stair string and mid-span string for wider stairs.

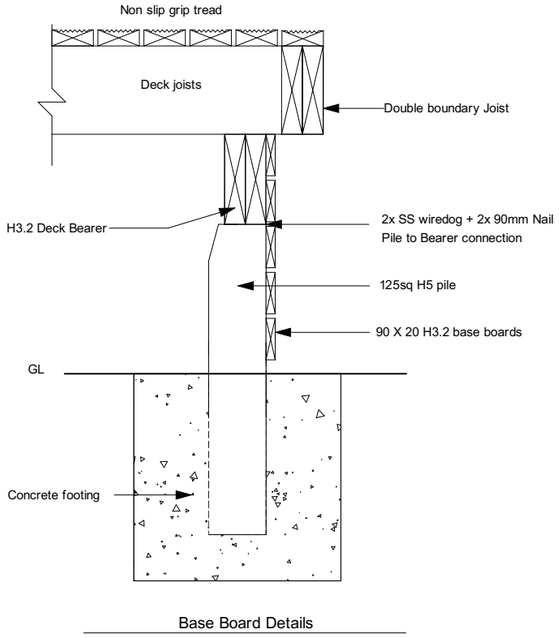


Alternate tread fixings.

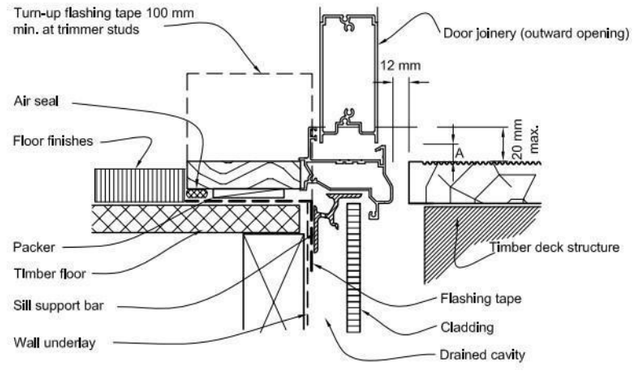
BRANZ MAXIMUM SPAN FOR SG8 (H3.2) STRING SIZES.

STRING SIZE	MAXIMUM SPAN
290× 45 mm	4.0 m
240× 45 mm	3.3 m
190× 45 mm	2.6 m
140× 45 mm	1.9 m

D4 Stair Details



Base Board Details



(b) TIMBER FLOOR

NOTE: 'A' to be the minimum dimension to maintain clearance from the bottom of the door to finished floor or deck, to manufacturer's requirements, and to keep sill upstand height to less than 20 mm

General Notes

- All details are diagrammatic and indicative only. Contractor must verify all dimensions and integrate with actual site conditions.
- Drawings must be read in conjunction with:
  – Structural engineer's documentation
  – Product manufacturer installation guides
  – Architectural floor plans, elevations, and sections
- Subfloor and foundation details must comply with NZS 3604 unless otherwise noted by engineer.
- All cladding and joinery junctions must meet NZBC Clause E2 (External Moisture) performance standards.
- Door sill and deck transitions must maintain drainage cavity, air seal, and minimum threshold clearance as detailed.
- Membranes, flashing tapes, air seals, and packers to be installed per supplier's installation instructions.
- Timber floor systems must include proper joist spacing, stringer support, and underfloor ventilation.
- Ensure support bar and packer configuration matches detail and engineering intent.
- All fasteners, brackets, and support fixings must be stainless steel or hot-dip galvanized in moisture or corrosion-prone areas.
- Where stairs or stringers are shown, confirm timber grades (e.g., SG8 H3.2) and maximum spans using BRANZ tables.
- All timber treatment levels must comply with durability standards as per NZS 3602.
- If any discrepancy exists between drawings and supplier instructions, contact the designer prior to installation.

ArchX

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NOTES:
Deck details are shown for reference only and do not form part of this building consent application

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ISSUE: 29/10/2026
REV: A - WIP

SCALE: @ A3

DRAWING TITLE: Deck Details

PAGE: 8

Stormwater Management report

Lot 2 DP 105517 Taylors Road, Te Kao

30/07/2026



Job No.	FNR010, Rev A
Report Author	Tess Allen
Report Reviewer	Manu Burkhardt
Date	30/07/2026

Document Approval				
Action	Name	Qualification	Signed	Date
Author	Tess Allen	BE (Hons) Civil Engineering		30/07/2026
Approver	Manu Burkhardt Macrae	BE Environmental Engineering, CPENG NZ, 253797		5/08/2026

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Executive Summary

FNR Consulting has been engaged to undertake a stormwater assessment, design and management plan for a proposed relocated dwelling off State Highway 1 and Taylors Road, Te Kao, in the Far North District. The property is legally described as Lot 2 DP105517 (approximately 1,228 m^2) and this report is prepared for Connie and Dean Noble. The Record of Title has been reviewed and carries no consent notice or covenant governing stormwater, rainwater tanks, attenuation, soakage or firefighting supply; the design has therefore been prepared in general accordance with Auckland Regional Council Technical Publication 10 (TP10), NZBC Clause E1/VM1 and the FNDC Engineering Standards.

The stormwater system is designed on the principle of hydrological neutrality — limiting the post-development peak flow to the pre-development peak so the development does not increase runoff from the site. Roof runoff is captured by two 25,000 litre rainwater tanks and released through a controlled orifice (approximately 48 mm) at no more than 1.93 L/s, which holds the total site discharge at its pre-development peak of 21.8 L/s for the 10% AEP storm. This requires only about 1.6 m^3 of temporary attenuation storage within the tanks.

Site investigation using a Scala penetrometer reached refusal at approximately 600 mm depth at all test locations, indicating an impenetrable pan. As this prevents vertical infiltration, conventional soak pit disposal is not feasible, and there is no reticulated network or legal discharge point available on the subject site.

In addition to stormwater management, the dwelling will be provided with 50,000 litres of on-site water storage across the two tanks. A review of the Northland Regional Council flood hazard maps confirms the site lies outside any identified river or coastal flood hazard extent, so no flood-related floor level or freeboard constraint applies.

This integrated plan provides a robust, compliant solution that mitigates runoff effects, manages the site's conditions, protects surrounding properties and the receiving environment, and satisfies stormwater requirements for rural residential development in the Far North District

Consent Notices and Resource Consents

The Record of Title for the property has been reviewed. There are no consent notices or covenants registered against the title that govern on-site stormwater management, rainwater tank storage, attenuation, soakage, or firefighting water supply.

In the absence of a prescribed consent-notice standard, the stormwater system has been designed in general accordance with Auckland Regional Council Technical Publication 10 (TP10), NZBC Clause E1/VM1 and the FNDC Engineering Standards. The attenuation system is designed to limit the post-development peak flow to the pre-development peak flow consistent with the FNDC Engineering Standards.

The above relates to consent notices and covenants registered on the title. Assessment of the proposal against the Far North District Plan and any land-use resource consent requirement is a planning matter outside the scope of this report.

Two matters relating specifically to the stormwater discharge are noted for confirmation:

- Discharging stormwater to the ground should be confirmed with the Northland Regional Council as something their regional plan allows.
- The overland flow path runs south toward a wetland (Appendix C). Wetlands can carry extra rules under the national freshwater regulations (the NES-Freshwater), so this should also be confirmed with the Northland Regional Council before construction.

Site Description and Details

The subject site is located off Taylors Road and State Highway 1, Te Kao, within the Far North District. The property is legally described as Lot 2 DP105517 and has an area of approximately 1,228 m^2. This report is prepared for Connie and Dean Noble as the property owners.

The proposal is for a second-hand relocated dwelling with a roof area of approximately 130 m^2.

Flood Hazard Assessment

A review of the Northland Regional Council (NRC) flood hazard maps was undertaken for the site; the relevant mapping is provided in Appendix B. The NRC mapping confirms that the site does not fall within any identified river or coastal flood hazard extent, and no modelled flood levels affect the property.

Methodology

The impervious areas on the site have been assessed using the architectural plans prepared by ArchX (Site Plan and Floor Plan, Rev A, dated 01/07/2026), which identify the proposed dwelling, rainwater tanks and septic tank. The new impervious surfaces contributing to runoff are the dwelling roof (approximately 130 m^2, which drains to the rainwater tanks) and the tank footprint (approximately 21 m^2), giving a total impervious area of approximately 151 m^2; no sealed driveway, garage or paved area is proposed.

Roof runoff is captured by the two 25,000 litre rainwater tanks, which provide the household water supply, some reserved firefighting storage, and the temporary attenuation storage. The tank outlet is designed in accordance with Auckland Regional Council's Technical Publication 10 (TP10) so that the post-development peak flow is limited to the pre-development peak flow, or lower, consistent with the FNDC Engineering Standards. This ensures the development does not increase runoff from the site.

Site investigation was undertaken using a Scala penetrometer at representative locations across the proposed disposal area. All tests reached refusal at approximately 600 mm depth, indicating a hard, impenetrable pan layer. As this pan prevents vertical infiltration, soakage (soak pit) disposal is not feasible, and a soakage test was therefore not warranted. The Scala penetrometer results are provided in Appendix F. There is no reticulated stormwater network, and no legal discharge point available adjacent to the site. The existing stormwater manhole and pipework shown on the topographic survey (Appendix C) are located on the adjacent property and are not available to serve this site.

As the surface water impacting the site is only from direct rainfall, the verification method set out in NZBC Clause E1/VM1 can be used.

The attenuated tank overflow is disposed of by controlled discharge to a level spreader trench, which distributes the flow evenly as low-velocity sheet flow across a grassed dispersal area. Minimal residual flow follows the natural overland flow path across the property to the site's low point and discharges onto the adjoining property to the south, consistent with the pre-development overland flow pattern.

The level spreader trench will be constructed as a stone-filled trench set level along the contour, wrapped in filter cloth, with a level slotted distribution pipe laid its full length so the flow spills uniformly over the level downstream edge onto the grassed dispersal area.

Design

The stormwater management design for the site is based on the parameters below to ensure compliance with NZBC Clause E1, Auckland Regional Council's Technical Publication 10 (TP10) and the FNDC Engineering Standards. No consent notice applies to the site.

For stormwater attenuation, the system has been designed to manage runoff from a 10% AEP storm event in accordance with TP10, so that the post-development peak flow is limited to the pre-development peak flow, or lower. Although TP10 nominates the 1-in-2-year (2-year ARI) storm for peak-flow attenuation where runoff discharges to ground rather than a reticulated network, the 10% AEP (1-in-10-year) event has been adopted here as a more conservative basis.

Rainfall depths and intensities are taken from the NIWA High Intensity Rainfall Design System version 4 (HIRDSv4), using RCP8.5 for the 2081–2100 period to account for climate change, in general accordance with NZBC Clause E1/VM1. The time of concentration for stormwater flow across the site is estimated to be less than 10 minutes.

Surface water runoff is calculated using the rational method, $Q = C\ i\ A / 360$ (NZBC E1). The runoff coefficients adopted are C = 0.45 for the existing pervious (pasture) surfaces and C = 0.90 for impervious (roof and tank) surfaces, taken from the FNDC Engineering Standards (Table 4-3), which derive coefficients from $C = CN / (200 - CN)$ using TP108 / USDA TR-55 curve numbers, adopted in preference to the lower NZBC E1 values as more representative of Northland conditions. The site's sandy soils are classified as hydrologic soil Group B (coastal wind-blown sands).

The new impervious surfaces contributing to a change in stormwater runoff post-construction are the dwelling roof (approximately 130 m^2, which drains to the rainwater tanks) and the tank footprint (approximately 21 m^2), giving a total impervious area of approximately 151 m^2. No sealed driveway, garage or paved area is proposed; site access is via an existing unsealed accessway (pervious) and is excluded from the impervious catchment.

Deep infiltration is precluded by the impermeable pan encountered at approximately 600 mm depth, so no soak pit could be proposed. The attenuated tank overflow is instead dispersed via a level spreader trench to the grassed dispersal area and the natural overland flow path.

Table: Design Parameters

Category	Parameter
Design storm	10% AEP
Attenuation basis	Post-development peak ≤ pre-development peak (TP10 / FNDC ES)
Rainfall data	HIRDSv4 (RCP8.5, 2081–2100)
Time of concentration	< 10 minutes
Roof area (drains to tanks)	~130 m^2
Total impervious area	~151 m^2 (roof 130 + tank footprint 21)
Driveway / paved area	None proposed
Disposal device	Level spreader trench (stone-filled, slotted pipe)
Spreader trench size	5.0 m long × 0.6 m wide × 0.5 m deep (base above pan)
Dispersal area	Grassed, grade ≤5% (max 10%), ≥10 m flow length

The orifice is sized from the orifice equation $Q = Cd \cdot A \cdot \sqrt{(2gH)}$ to limit the release to the pre-development peak flow, at the calculated attenuation head, as set out in the stormwater calculations (Appendix E). The orifice provides controlled release of the attenuation storage, with its edges strengthened to prevent fraying of the material. The pipe from the orifice, together with the tank overflow, discharges into the level spreader trench, which distributes the flow evenly across the grassed dispersal area to the overland flow path.

While TP10 is fundamentally a treatment-devices manual, no Water Quality Volume or dedicated treatment device is required for this site. The only catchment draining to the system is the dwelling roof — a low-contaminant surface, with no roads, vehicle areas or other high-contaminant surfaces. Roof runoff is captured in the rainwater tanks for domestic reuse, which itself provides the volume-reduction and quality benefit TP10 recognises, and the residual attenuated overflow passes through the stone-filled, geotextile-wrapped level spreader trench, which provides filtration and sediment removal prior to dispersal. Water quality is therefore adequately addressed.

Results

Category	Parameter
Attenuation	
Pre-development peak flow	21.8 L/s
Post-development peak (uncontrolled)	24.5 L/s
Allowable release (hold site at pre-development)	1.93 L/s
Attenuation storage required	1,609 L (1.61 m^3)
Attenuation depth (head) in tank	~0.15 m
Orifice size	~48 mm
Controlled site peak (post-attenuation)	21.8 L/s (no net increase)
Disposal — Level Spreader Trench	
Design (controlled) release	1.93 L/s
1% AEP roof overflow (governs length)	7.05 L/s
Spreader trench (L × W × D)	5.0 × 0.6 × 0.5 m
Trench void storage	~525 L
Dispersal area	Grassed, grade ≤5% (max 10%), ≥10 m flow length

This stormwater management design has been prepared in accordance with Clause E1 of the New Zealand Building Code (NZBC), which requires that surface water resulting from rainfall be managed in a way that avoids damage to property, reduces flooding risk, and ensures safe conveyance or disposal from the site. The proposed system combines attenuation (rainwater tanks with a controlled orifice) with even surface dispersal (a level spreader trench), reflecting good engineering practice and FNDC Engineering Standards expectations.

Attenuation Design

The attenuation system is designed to temporarily detain roof runoff generated during the 10% AEP design storm, reducing the peak discharge so that the site does not exceed its pre-development peak flow. The pre-development peak from the site is 21.8 L/s; without control the post-development peak would rise to 24.5 L/s. The dwelling roof (approximately 130 m^2) drains to the two 25,000 litre rainwater tanks, where the runoff is

temporarily stored and released through a controlled orifice at no more than 1.93 L/s — the rate that holds the total site discharge at the pre-development value of 21.8 L/s.

This release rate gives a required attenuation storage of 1,609 litres (1.61 m^3), which is a depth of approximately 0.15 metres within the tank. Discharge is controlled through an orifice of approximately 48 mm diameter, sized to release 1.93 L/s at this head using $Q = Cd \cdot A \cdot \sqrt{(2gH)}$ as set out in the stormwater calculations (Appendix E). This ensures stormwater is retained on site during peak flows and discharged gradually, in accordance with E1.3.1 and E1.3.2, which require that surface water is disposed of in a manner that avoids nuisance or damage to other property.

Overflow Disposal — Level Spreader Trench

Because vertical infiltration is precluded by the pan, and no reticulated network or legal discharge point is available, the controlled release and any tank overflow are dispersed via a level spreader trench. The trench is a stone-filled trench set level along the contour, 5.0 m long × 0.6 m wide × 0.5 m deep (base kept above the pan), wrapped in filter cloth with a level 100 mm slotted distribution pipe laid its full length. Its purpose is to diffuse the concentrated tank discharge into low-velocity, non-erosive sheet flow across the grassed dispersal area.

Disposal is therefore achieved by spreading and conveyance rather than infiltration. The attenuated flow spreads across the grassed dispersal area (grade ≤5%, minimum 10 m flow length) and follows the natural overland flow path, discharging in a manner consistent with the pre-development overland drainage pattern. Because the same impermeable pan limits infiltration both before and after development, the site's runoff volume and flow path are essentially unchanged by the development: the tanks and spreader simply return the roof's concentrated flow to the diffuse overland condition that existed pre-development, while the orifice holds the peak discharge at the pre-development rate.

The attenuation is designed for the 10% AEP event. In rarer events the tank storage is exceeded and the excess passes through the tank overflow to the level spreader and the natural overland flow path, which together form the secondary (overland) flow path required under NZBC Clause E1. The 1% AEP event has been checked using the HIRDSv4 RCP8.5 (2081–2100) intensities, which already incorporate the climate-change allowance: the pre-development 1% AEP peak is approximately 33.3 L/s and the post-development peak approximately 37.4 L/s, the approximate 4 L/s increase being the roof's contribution. This is passed to the level spreader and dispersed as diffuse, low-velocity sheet flow. The overland flow path identified on the topographic survey (Appendix C) conveys it south to the low point at non-erosive velocity. This is conveyed to the south to the low point at non-erosive velocity. The trench length is governed by the 1% AEP roof overflow of approximately 7.05 L/s spread at 1.5 litres per second per

lineal metre — a conservative value adopted to maintain diffuse, non-erosive sheet flow — satisfied by the 5.0 m length. The incremental increase over the pre-development natural flow is therefore minor and diffuse, so the secondary flow path disposes of surface water without causing damage or nuisance to other property.

Effects on Other Property (NZBC E1.3.2)

The subject site falls to the south, from approximately RL 51.5 at Taylors Road to approximately RL 48.5 (NZVD 2016, per the topographic survey in Appendix C) and the natural overland flow path discharges onto the adjoining property to the south, consistent with the pre-development condition. The design has been assessed against NZBC E1.3.2, which requires surface water to be disposed of to avoid the likelihood of damage or nuisance to other property.
The development does not increase the surface-water burden on the adjoining property beyond the pre-existing natural condition:

- The attenuation limits the post-development peak flow to the pre-development peak of 21.8 L/s, so the rate reaching the boundary is not increased.
- Because the impermeable pan limits infiltration both before and after development, the total volume is essentially unchanged.
- The level spreader returns the flow to diffuse, low-velocity sheet flow (≤1.5 L/s per lineal metre) at the same location as the natural flow, avoiding any concentrated or erosive discharge onto the neighbouring land. On this basis the development does not create additional damage or nuisance to other property, consistent with E1.3.2 and the natural drainage that already crosses the boundary.

Wetland Effects

Any surface water reaching the adjoining wetland from the developed area is expected to be very minimal. The only catchment is the dwelling roof (approximately 130 m^2), which is attenuated to the pre-development peak flow and passed through the stone-filled, geotextile-wrapped level spreader trench providing filtration and sediment removal before being released as diffuse, low-velocity sheet flow across the grassed dispersal area. In frequent events this small flow is largely absorbed and dispersed within the dispersal area, so measurable surface water only reaches the wetland during extreme (1% AEP) events. Even then the discharge is clean, filtered roof rainwater only with no roads, vehicle areas or other high-contaminant surfaces contributing — at no greater rate or volume than the pre-development natural condition, so the effect on the wetland is considered negligible.

Site Drainage

The subject site was not observed to be saturated at the time of inspection, although neighbouring properties have experienced drainage and waterlogging issues consistent with this pan. As a precaution, the building platform should be raised on engineered fill with a granular drainage blanket beneath the floor, to keep habitable levels clear of any perched water that may develop above the pan. Should waterlogging be encountered during construction or in service, a subsoil drainage system (for example 100 mm Novacoil in geotextile-wrapped aggregate trenches) may be installed to intercept and lower the perched water table.



Figure 1- Existing Swale drain

Monitoring, operation and maintenance

This management plan outlines the approach for operating and maintaining the stormwater attenuation and dispersal system proposed for the site. The system is designed to control runoff from impervious areas, limit the post-development peak flow to the pre-development peak flow, and disperse the attenuated flow evenly across the site, in accordance with the Far North District Plan, NZBC Clause E1 and Technical Publication 10 (TP10) by the former Auckland Regional Council.

1. Management Objectives

- Ensure the system performs as intended and meets regulatory requirements.
- Prevent ponding, nuisance discharges, or damage to neighbouring properties.
- Maintain system components to prevent blockages or failure.
- Maintain even, non-erosive dispersal across the grassed area.

2. Operation & Maintenance Responsibilities

The property owners (or nominated agent) are responsible for system upkeep. Regular inspections and maintenance tasks include:

Rainwater Tanks

Task	**Frequency**
Inspect inlets and outlets	Quarterly
Clear debris and sediment	Quarterly
Check for damage or leaks	Annually
Clear screens after storms	After major events

Level Spreader Trench

Task	**Frequency**
Check inlet / slotted pipe and clear sediment or debris	Every 6 months
Confirm downstream edge remains level; check for erosion or channelling	After major storms
Check aggregate surface for clogging; rake or replace as needed	Annually

Dispersal Area & Overland Flow Path

Task	**Frequency**
Maintain dense grass cover; mow and re-seed bare patches	Bi-annually
Remove obstructions; repair rilling or scour	After major storms
Confirm flow remains as sheet flow	Annually

3. Record Keeping

A simple logbook should be maintained to track:

- Inspection dates and outcomes
- Maintenance actions taken
- Any repairs or modifications
- Supporting photographs (where useful)

Records may be requested by the Far North District Council to verify ongoing compliance.

4. Contingency Measures

In the event of system failure (e.g. blocked spreader trench, channelling, or tank overflow), the following actions should be taken:

1. Identify and isolate the issue.
2. Clear blockages, re-level the trench edge, or engage a licensed drainage contractor.
3. Notify council if stormwater discharges off-site or affects public areas.

5. Review of Plan

This management plan should be reviewed every five years, or earlier if the site layout changes, the stormwater system is upgraded, or additional impervious surfaces are introduced.

Firefighting Water Supply

Firefighting water supply is outside the scope of this stormwater report. The on-site rainwater tanks may also serve as a firefighting water source; any firefighting water supply requirement under SNZ PAS 4509:2008 and the FNDC Engineering Standards is to be confirmed separately with Fire and Emergency New Zealand (FENZ) as part of the building consent process.

Appendices

Appendix A –Architectural Site Plan

Appendix B – NRC Flood Map report

Appendix C – FNR Topography Plan

Appendix D – Stormwater Drawings

Appendix E – Stormwater Calculations

Appendix F – Site investigation (Scala penetrometer) results and photos

Appendix A: Site Plan and Test Location



Site Aerial
Scale 1:5000



KEY

- Existing plumbing fixtures
- Stormwater line
- Sanitary sewer line

N

Sediment and Erosion Control Notes

1. Stabilised Site Access
A stabilised entry/exit point must be installed (e.g., compacted basecourse or aggregate over geotextile) to prevent sediment tracking onto public roads. All vehicles and equipment must use this access only.

2. Silt Control Fencing
Install silt fences or approved alternatives (e.g., super silt fence or silt sock) downslope of disturbed areas. Ensure fencing is trenched in, securely staked, and maintained throughout the project.

3. Soil and Stockpile Protection
Stockpiles must be located away from waterways and drains. Cover all stockpiles with tarpaulins or temporary vegetation and surround with sediment controls.

4. Stormwater Inlet Protection
Protect all stormwater drains on and near the site using sandbags, silt socks, or appropriate inlet filters. Maintain these after rainfall and replace if damaged.

5. Site Stabilisation and Revegetation
Disturbed areas must be stabilised as early as possible via seeding, hydroseeding, straw mulching, or turfing. Final landscaping or vegetative cover must be applied promptly upon completion.

6. Sediment Retention Devices
For larger or sloped sites, install devices such as sediment retention pits, check dams, or bunds as needed. Ensure sizing and location suit the site and maintain regularly.

7. Maintenance and Monitoring
Inspect all erosion and sediment controls weekly and after heavy rainfall. Promptly repair or replace any damaged or ineffective controls. Keep records of inspections if requested by Council.

General Notes

- Plumbing layout is indicative only. Contractors must verify all details on-site prior to commencing work.

Water Supply Notes (Rural)
- Rainwater must be collected from roof catchments and directed to an approved storage tank.
- Install leaf guards to all gutters to prevent debris ingress.
- Provide debris strainers or first-flush diverters on all downpipes.
- Install a potable water filtration system post-tank, compliant with AS/NZS 4020.
- Include a UV filtration system (e.g., Bug Buster Pro Series Platinum or approved equivalent).
- Water system must supply safe drinking water in compliance with NZBC G12.
- All installations must follow manufacturer specifications and be carried out by a licensed plumber.

Reference Reports Before Construction
All relevant reports must be reviewed before commencing any work. These include:
– Geotechnical Report
– Wastewater Report
– Stormwater Report
– Survey Plan and any other related documentation

If discrepancies or uncertainties arise, STOP work and consult with the designer or relevant authority before proceeding.

ArchX

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NOTES:
House floor area: 99m²
Site area: 97942m²
Water tanks: 20m²
Site coverage = 0.121%

Date	Rev
Work in Progress	A - WIP

Work in Progress

ARCHX DETAILS:
Timmy Nator
021 872 870
info@archx.co.nz

CLIENT DETAILS:
Dean and Connie Noble
-
conniefnoble@gmail.com

FLOOR AREA:	105m²
LOT & DP:	Lot 11 DP 183286
SITE AREA:	1,228 m2
WIND ZONE:	High
EXPOSURE ZONE:	C
EARTHQUAKE ZONE:	1
STATUS:	BC

JOB: Proposed 2nd Hand Relocated Dwelling
3 Taylors Road Te Kao Northland 0484 New Zealand

ISSUE: 01/07/2026
REV: A - WIP

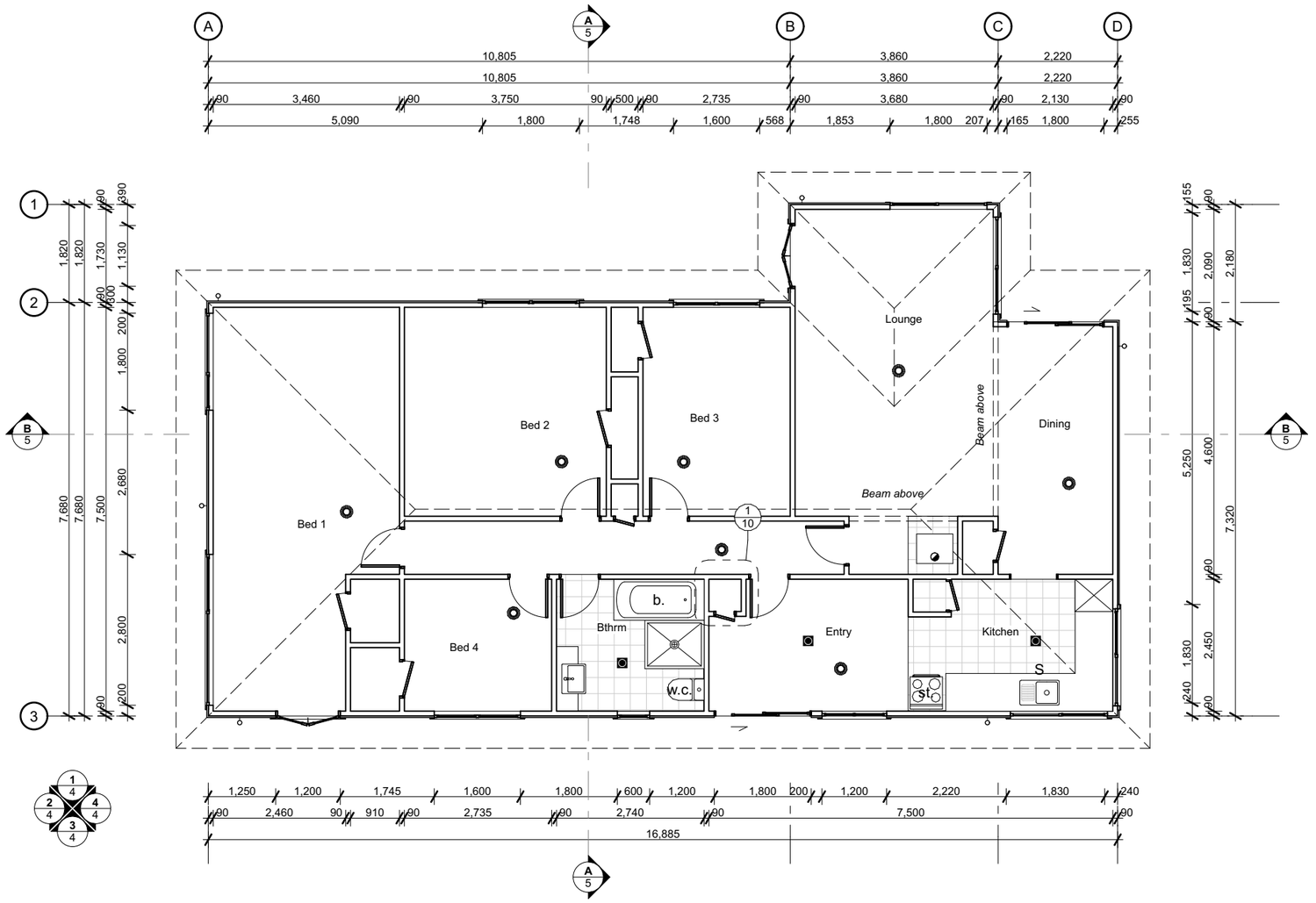
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DRAWING TITLE: Site Plan

PAGE: 1

KEY

- Existing plumbing fixtures
- Existing 90x45mm timber framing
- SA — Inter connected smoke alarms 10 year min battery life
- Extractor fan



Where possible
1. Add single Z nail to Purlin/Rafter connection in periphery areas.
2. Add "L" Bracket between rafter and plate, nailed (4) and screwed (2) in place.

General Notes

- Contractor is responsible for verifying all dimensions, angles, levels, and site conditions before commencing any work.
- Drawings are for construction purposes only and must be used in accordance with the project status noted.
- All drawings must be read in conjunction with architectural specifications, structural documents, manufacturer installation guides, and all relevant consultant reports.
- All construction must comply with the latest New Zealand Building Code and relevant standards.
- Ensure all proprietary products are installed strictly per the manufacturer's instructions.
- Do not scale drawings. Use figured dimensions only. Contact the designer or contractor if in doubt.
- Report any discrepancies or inconsistencies to the drafter immediately.
- Site boundaries, floor levels, and profiles must be pegged and confirmed by a registered surveyor prior to construction.
- Contractor is solely responsible for identifying and protecting all underground services prior to commencement of any excavation or groundwork.

Construction & Demolition Safety
- F5.3.3: Where construction or demolition sites pose potential hazards (e.g., attraction to children), the site must be enclosed to restrict unauthorized access.
- F5.3.4: Adequate barriers must be erected to protect the public and ensure safe passage when equipment or work areas pose fall or injury risks.
- Ensure all workers comply with appropriate site safety protocols, PPE standards, and WorkSafe NZ guidelines.

Stair Requirements
- Maximum riser height: 190mm
- Minimum tread length: 280mm
- Deck landing to dwelling clearance (including cladding and decking): Minimum 12mm
- All stairs to comply with D1 Building Code and NZS 4121 for accessibility if applicable
- Handrails required where stairs exceed 1m in height or as specified

Mechanical Ventilation / Extractor Fans
Mechanical ventilation systems must comply with NZBC Clause G4.
Minimum flow rate for extract fans:
– 25 L/s for showers and baths
– 50 L/s for kitchen cooktops
Extractor fans must be vented directly to the exterior, not into ceiling cavities or roof spaces.

ArchX

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NOTES:

Work in Progress

Date	Rev
	A - WIP

ARCHX DETAILS:
Timmy Nator
021 872 870
info@archx.co.nz

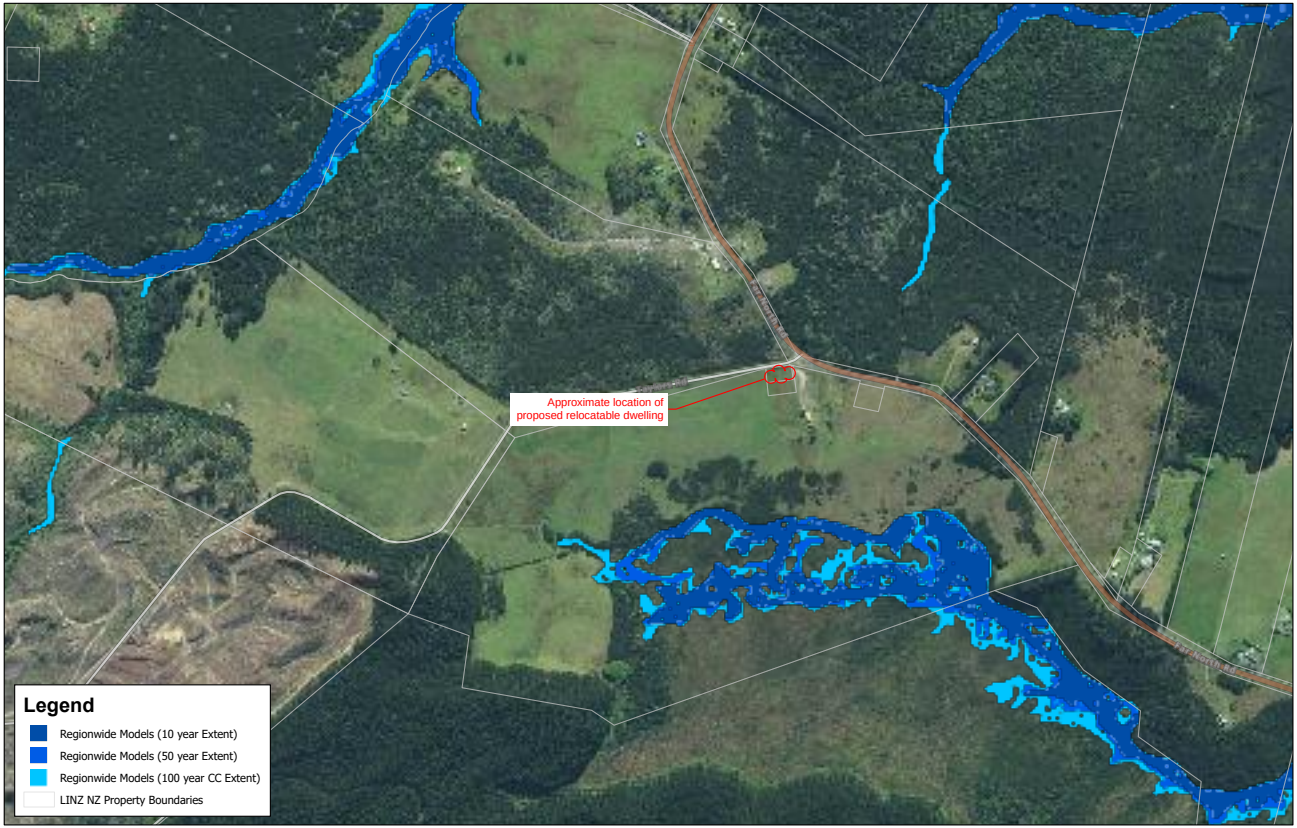
CLIENT DETAILS:
Dean and Connie Noble
-
conniefnoble@gmail.com

FLOOR AREA:	105m²
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JOB: Proposed 2nd Hand Relocated Dwelling
3 Taylors Road Te Kao Northland 0484 New Zealand

ISSUE: 01/07/2026
REV: A - WIP
SCALE: 1:100 @ A3

DRAWING TITLE: Floor Plan
PAGE: 2



Northland Regional Council

Natural Hazards

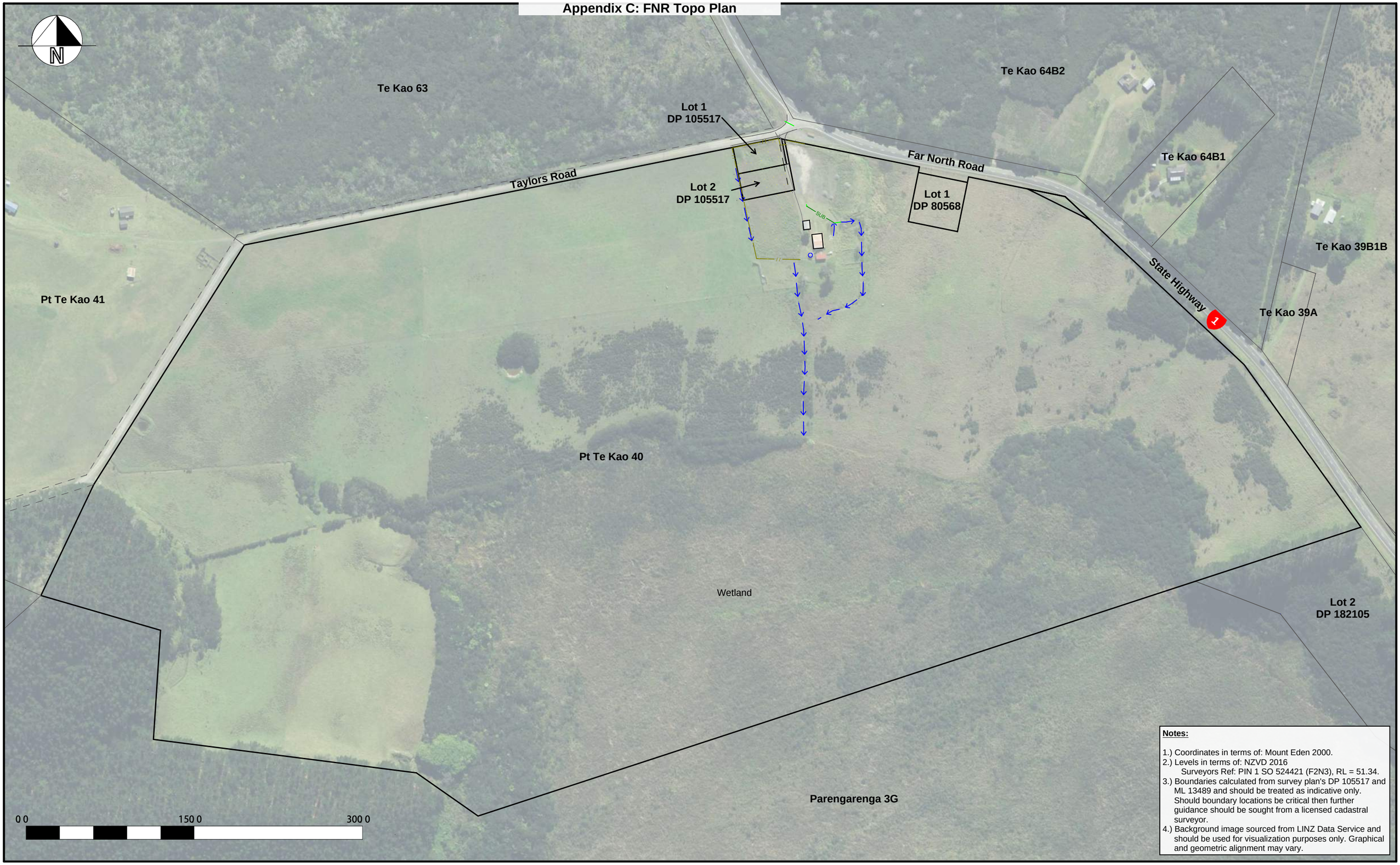
Crown Copyright Reserved
Projection NZTM. Datum NZTM2000.
DISCLAIMER:
The Northland Regional Council cannot guarantee that the information shown is accurate and should not be reused in any manner without proper consultation with its owner.

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0 40 80 160 240 320 400
m

July 27 2026

Appendix C: FNR Topo Plan



Notes:

1.) Coordinates in terms of: Mount Eden 2000.
2.) Levels in terms of: NZVD 2016
Surveyors Ref: PIN 1 SO 524421 (F2N3), RL = 51.34.
3.) Boundaries calculated from survey plan's DP 105517 and ML 13489 and should be treated as indicative only. Should boundary locations be critical then further guidance should be sought from a licensed cadastral surveyor.
4.) Background image sourced from LINZ Data Service and should be used for visualization purposes only. Graphical and geometric alignment may vary.

FNR LTD CONSULTING

Title:

Site Overview

1:3000 @ A3

Client: **Connie & Dean Noble**			
Location: **Lot 2 DP 105517 Taylors Road, Te Kao**			
Project Name: **Stormwater Report**		Project Number: **FNR010**	
Drawn: **Andrew van der Linden**	Date: **01/08/2026**	Sheet: **1 of 2**	Version: **V1**



Notes:

1.) Coordinates in terms of: Mount Eden 2000.
2.) Levels in terms of: NZVD 2016
Surveyors Ref: PIN 1 SO 524421 (F2N3), RL = 51.34.
3.) Boundaries calculated from survey plan's DP 105517 and ML 13489 and should be treated as indicative only. Should boundary locations be critical then further guidance should be sought from a licensed cadastral surveyor.
4.) Background image sourced from LINZ Data Service and should be used for visualization purposes only. Graphical and geometric alignment may vary.

FNR LTD CONSULTING

Title:

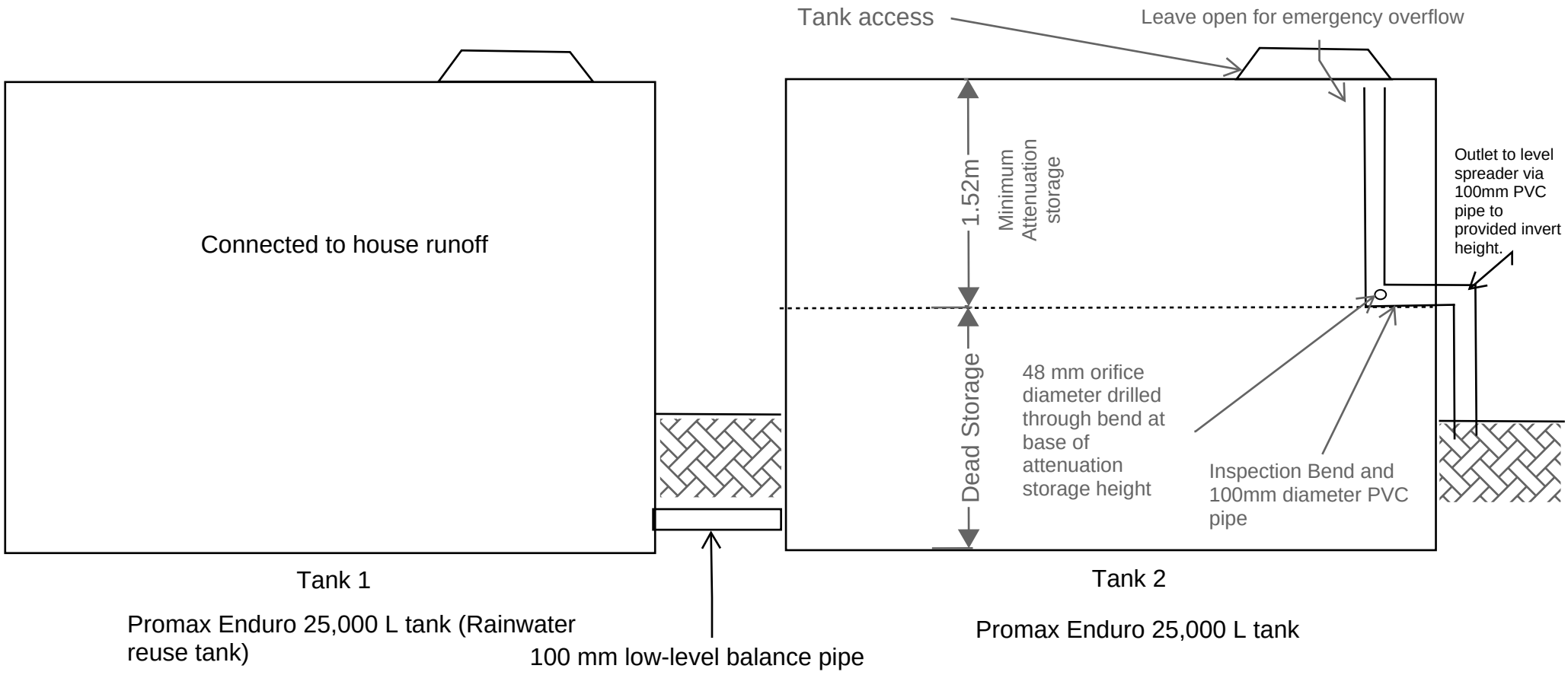
Topo Plan

1:700 @ A3

Client: **Connie & Dean Noble**			
Location: **Lot 2 DP 105517 Taylors Road, Te Kao**			
Project Name: **Stormwater Report**		Project Number: **FNR010**	
Drawn: **Andrew van der Linden**	Date: **01/08/2026**	Sheet: **2 of 2**	Version: **V1**

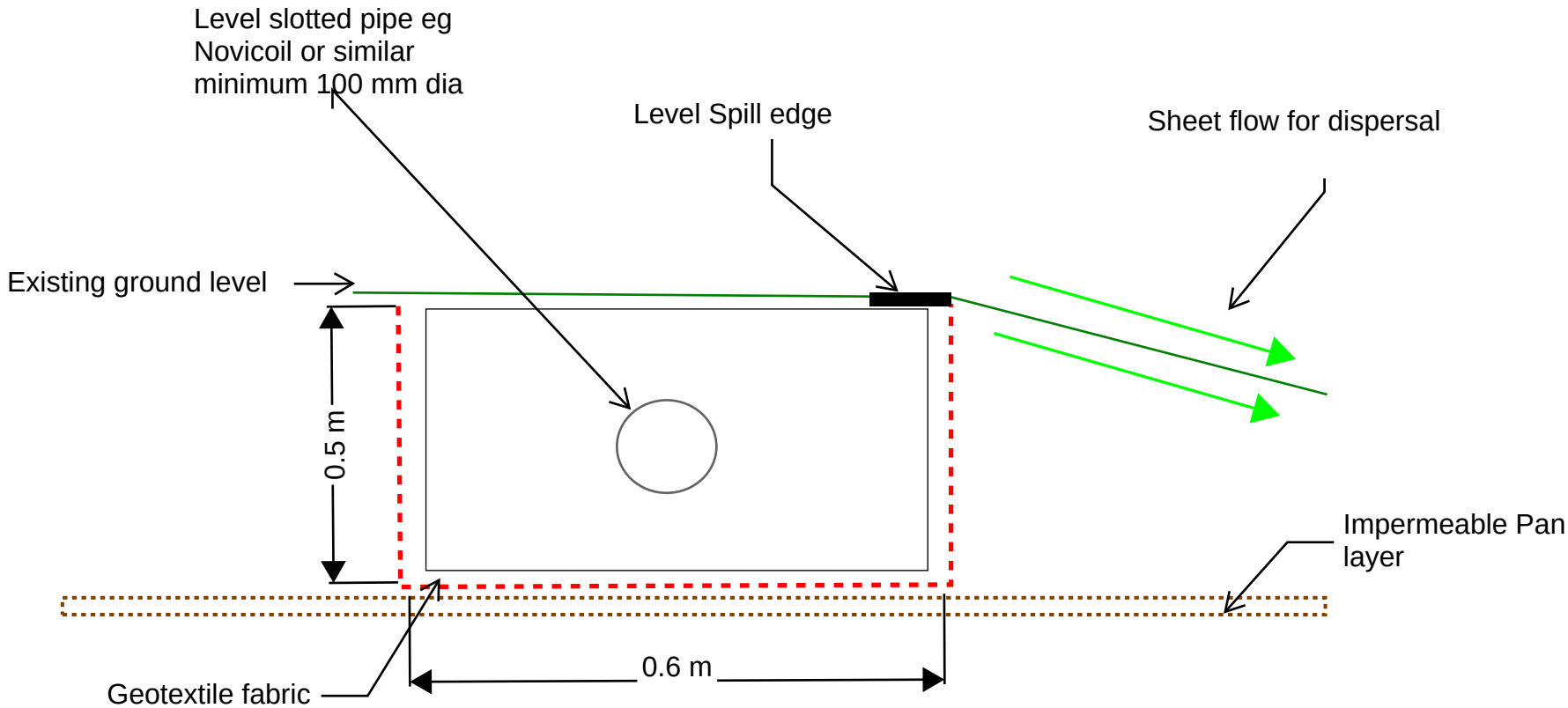
Appendix D: Stormwater Construction Drawings

Construction Notes:
- All tank, attenuation and orifice sizing to be as per FNR Consulting Drawings and Stormwater report.
- Tank foundations and base pads to be as per manufacturers specifications.
- Tanks are installed above ground. Tank base levels are to be set by the installation contractor to ensure the orifice outlet achieves minimum 1% grade to the kerb invert.
- Install debris and leaf protection on roof drainage to minimize contamination in water tanks.
- Holes drilled in the tank need to be as per manufactures specification.
- Installation contractor needs to ensure tank foundation height is adequate to ensure the height of the orifice outlet is elevated to prevent backflow from the kerb level.



Not to Scale

FNR LTD CONSULTING	Title: **Stormwater Tank and Attenuation Detail**	Client: Connie and Dean Noble Location: Taylors Road, Te Kao Project Name: **Stormwater Management design** Project Number: **FNR010** Drawn: **TA** Date: 30/07/2026 Sheet: **1 OF 2** Version: **V0**



Not to Scale

FNR LTD CONSULTING

Title: **Level spreader bar detail**

Client: Connie and Dean Noble			
Location: Taylors Road, Te Kao			
Project Name: **Stormwater Management design**		Project Number: **FNR010**	
Drawn: **TA**	Date: 30/07/2026	Sheet: **2 OF 2**	Version: **V0**

10% AEP (1 in 10 Yr)

Full Area Catchment - Taylors Road Te Kao
Date 27-Jul-26
Calc's By Tess Allen

Impervious Catchment Area (m^2)	1228	m^2
Run-off coefficient	0.45	pasture
Total effective C x A	**553**	

Storage Calculation **Design Storm=** **10** **yr. ARI**

Rainfall intensities (mm/hr) :: RCP8.5 for the period 2081-2100

Time (min)	Rainfall Intensity (mm/hr)	Runoff (L)	Runoff (L/min)	Runoff (L/sec)
10	142.00	13,078	1,308	21.8
20	97.90	18,033	902	15.0
30	78.00	21,551	718	12.0
60	52.30	28,901	482	8.0
120	34.10	37,687	314	5.2
360	16.40	54,376	151	2.5
720	10.00	66,312	92	1.5
1440	6.03	79,972	56	0.9
2880	3.57	94,694	33	0.5
4320	2.61	103,845	24	0.4

Rainfall intensities (mm/hr) :: RCP8.5 for the period 2081-2100

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	84.5	58	46.2	30.8	20	9.54	5.81	3.51	2.06	1.5	1.2	1
2	0.5	92.9	63.7	50.8	33.9	22.1	10.5	6.44	3.86	2.28	1.66	1.32	1.11
5	0.2	121	83.3	66.4	44.4	29	13.9	8.5	5.1	3.02	2.21	1.75	1.47
10	0.1	142	97.9	78	52.3	34.1	16.4	10	6.03	3.57	2.61	2.08	1.74
20	0.05	164	113	90	60.4	39.4	19	11.6	6.98	4.15	3.03	2.42	2.02
30	0.033	177	122	97.3	65.3	42.7	20.6	12.6	7.56	4.5	3.29	2.62	2.19
40	0.025	186	128	102	68.7	44.9	21.7	13.3	7.99	4.74	3.48	2.77	2.32
50	0.02	194	134	107	71.6	46.8	22.6	13.9	8.32	4.95	3.62	2.89	2.41
60	0.017	200	138	110	73.8	48.3	23.4	14.3	8.61	5.11	3.75	2.98	2.49
80	0.013	209	144	115	77.5	50.7	24.5	15	9.04	5.38	3.94	3.14	2.63
100	0.01	217	150	119	80.3	52.6	25.5	15.6	9.39	5.58	4.09	3.26	2.73
250	0.004	247	171	137	91.9	60.2	29.2	18	10.8	6.43	4.71	3.76	3.14

10% AEP (1 in 10 Yr)

Full Area Catchment - Taylors Road Te Kao

Date 27-Jul-26

Calc's By Tess Allen Catchment Size 0.1228 Ha 1228 m2

Impervious Catchment Area (m^2)	151	m^2	
House	130	m^2	
Driveway	0	m^2	
Future Garage	0	m^2	
Tanks	21	m^2	2x 3.66 meter tanks (25,000 litres Promax enduro)
Run-off coefficient	0.9		
Total effective	135.936		

Impervious Catchment Area (m^2)	1077
Run-off coefficient	0.45
Total effective	484.632

Total effective C x A	**621**
Roof Efective only	**117**

Storage Calculation **Design Storm=** **10** **yr. ARI**

Rainfall intensities (mm/hr) :: RCP8.5 for the period 2081-2100

Time (min)	Rainfall Intensity (mm/hr)	Runoff (L)	Runoff (L/min)	Runoff (L/sec)	Vin L
10	142.00	2,769	277	4.6	2,769
20	97.90	3,818	191	3.2	3,818
30	78.00	4,563	152	2.5	4,563
60	52.30	6,119	102	1.7	6,119
120	34.10	7,979	66	1.1	7,979
360	16.40	11,513	32	0.5	11,513
720	10.00	14,040	20	0.3	14,040
1440	6.03	16,932	12	0.2	16,932
2880	3.57	20,049	7	0.1	20,049
4320	2.61	21,987	5	0.1	21,987

Rainfall intensities (mm/hr) :: RCP8.5 for the period 2081-2100

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	84.5	58	46.2	30.8	20	9.54	5.81	3.51	2.06	1.5	1.2	1
2	0.5	92.9	63.7	50.8	33.9	22.1	10.5	6.44	3.86	2.28	1.66	1.32	1.11
5	0.2	121	83.3	66.4	44.4	29	13.9	8.5	5.1	3.02	2.21	1.75	1.47
10	0.1	142	97.9	78	52.3	34.1	16.4	10	6.03	3.57	2.61	2.08	1.74
20	0.05	164	113	90	60.4	39.4	19	11.6	6.98	4.15	3.03	2.42	2.02
30	0.033	177	122	97.3	65.3	42.7	20.6	12.6	7.56	4.5	3.29	2.62	2.19
40	0.025	186	128	102	68.7	44.9	21.7	13.3	7.99	4.74	3.48	2.77	2.32
50	0.02	194	134	107	71.6	46.8	22.6	13.9	8.32	4.95	3.62	2.89	2.41
60	0.017	200	138	110	73.8	48.3	23.4	14.3	8.61	5.11	3.75	2.98	2.49
80	0.013	209	144	115	77.5	50.7	24.5	15	9.04	5.38	3.94	3.14	2.63
100	0.01	217	150	119	80.3	52.6	25.5	15.6	9.39	5.58	4.09	3.26	2.73
250	0.004	247	171	137	91.9	60.2	29.2	18	10.8	6.43	4.71	3.76	3.14

FNR LTD CONSULTING

Attenuation and Orifice Calculations - Taylors Road , Te Kao

Calcs by: Tess Allen 30/07/2026

DESIGN INPUTS			
Design intensity i (10 yr, tc = 10 min)	142	*mm/hr*	*HIRDS RCP8.5 2081–2100*
1% AEP intensity i (100 yr, 10 min)	217	*mm/hr*	*HIRDS – for overflow check*
Spreader unit loading q	1.5	*L/s per m*	*conservative, grassed*
Tank internal diameter	3.675	*m*	
Tank capacity (each)	25000	*L*	
Tank capacity (total)	50000	*L*	*2 × 25,000 L Promax ENDURO*
Tank cross-sectional area (π/4·d²)	10.607	*m²*	
Discharge coefficient (Cd)	0.6	*–*	*TP10 Ch.11 – sharp-edged orifice*
Gravitational accel. (g)	9.81	*m/s²*	
Design head (H)	0.152	*m*	

Pre and post development flows

Pre-development peak Q10 = C·A·i / 3600	21.80	*L/s*	
Post-development peak Q10 = C·A·i / 3600	24.48	*L/s*	
Non-roof peak (paddock + non-roof impervious)	19.86		
Allowable roof release Q_allow = Qpre − non-roof	1.93		
Allowable release Q_allow	0.00193		

Orifice Sizing

Q = Cd × A × √(2gH) → A = Q ÷ (Cd × √(2gH))

Adopted controlled discharge rate:	1.93	*L/s*	
Step	**Formula**	**Result**	**Unit**
Calculate 2gH	*2 × g × H = 2 × 9.81 × H*	2.975	m²/s²
Calculate √(2gH)	*√(2gH)*	1.725	m/s
Orifice area (A)	*Q ÷ (Cd × √(2gH))*	0.001869	m²
Orifice diameter (d)	*√(4A ÷ π)*	0.0488	m
Diameter (mm)	*d × 1000*	48.8	mm
Diameter (mm) choosen	*d × 1000*	48.0	mm
→ **Calculated diameter = 48.8 mm** → **ADOPT 48 mm diameter orifice**			
Check – release at adopted d & H	1.87	*L/s*	
Check	**OK ≤ allowable**		

Attenuation size

V in(L)	Outflow (L)	Vin-Vout
2,769	1160	1,609
3,818	2321	1,497
4,563	3481	1,082
6,119	6963	-843
7,979	13925	-5,946
11,513	41775	-30,262
14,040	83551	-69,511
16,932	167101	-150,169
20,049	334202	-314,153
21,987	501303	-479,317

CRITICAL STORAGE VOLUME & ATTENUATION DEPTH (1 Attenuation Tank)			
Critical storage volume	*MAX of net storage col*	1,609	L
Critical storage volume	*vol / 1000*	1.609	m³

LEVEL SPREADER / SPREADER TRENCH			
Allowable unit loading q	1.5	*L/s per m*	
Design (controlled) release	1.93	*L/s*	
1% AEP roof overflow (tank full)	7.05	*L/s*	*governs length*
Length for controlled release	1.3	*m*	
Length for 1% AEP overflow	4.7	*m*	
Choosen spreader trench length	5.0	*m*	*≥ overflow length*
Choosen Trench width	0.6	*m*	
Choosen Trench depth (base above 600 mm pan)	0.5	*m*	
Aggregate void ratio	0.35	*–*	
Void storage in trench	525	*L*	

Appendix F: Site Investigation testing results

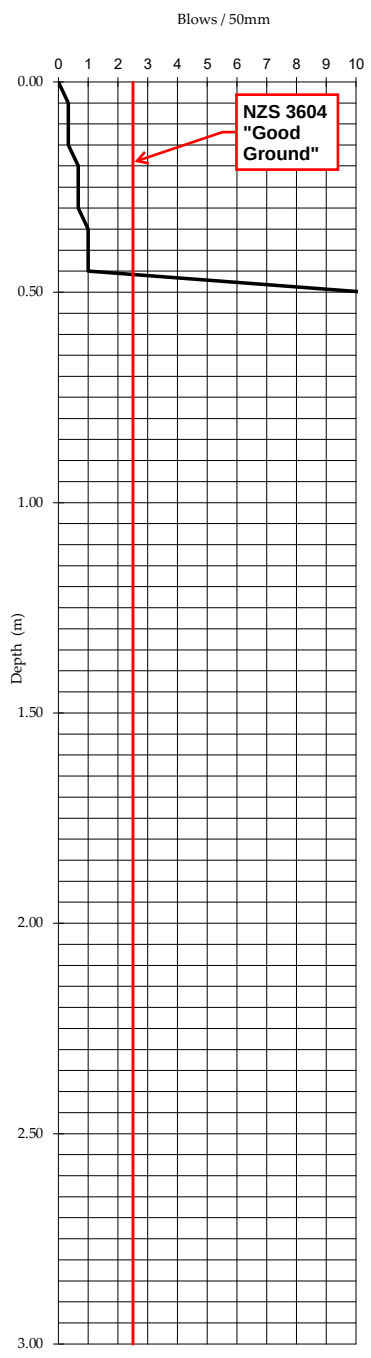
FNR LTD CONSULTING

SCALA PENETROMETER
TEST REPORT

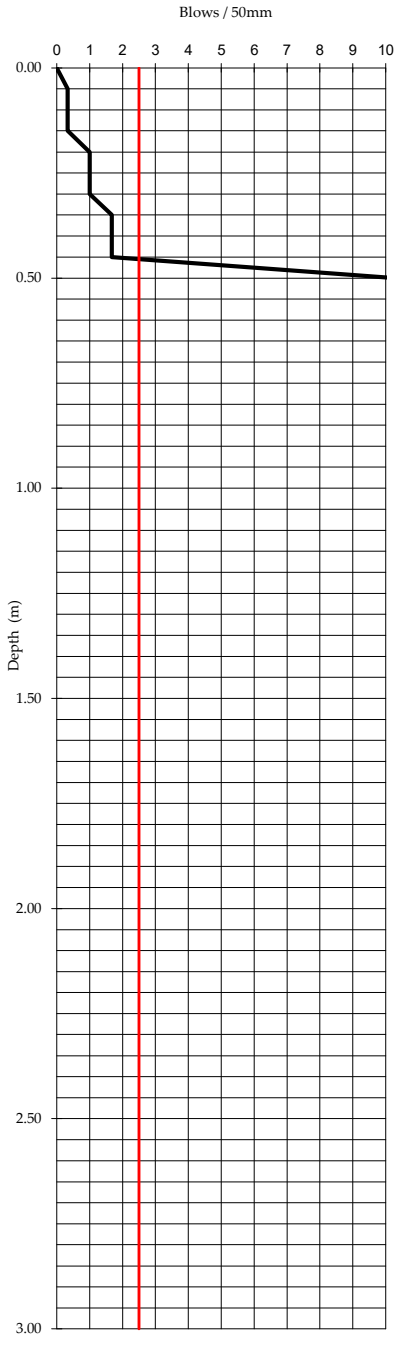
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Location :	2 Taylors Road Te Kao
Client :	Connie Noble
Contractor :	N/A

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Reduced level :	Ex. GL	Reduced level :	Ex. GL	Reduced level :	Ex. GL

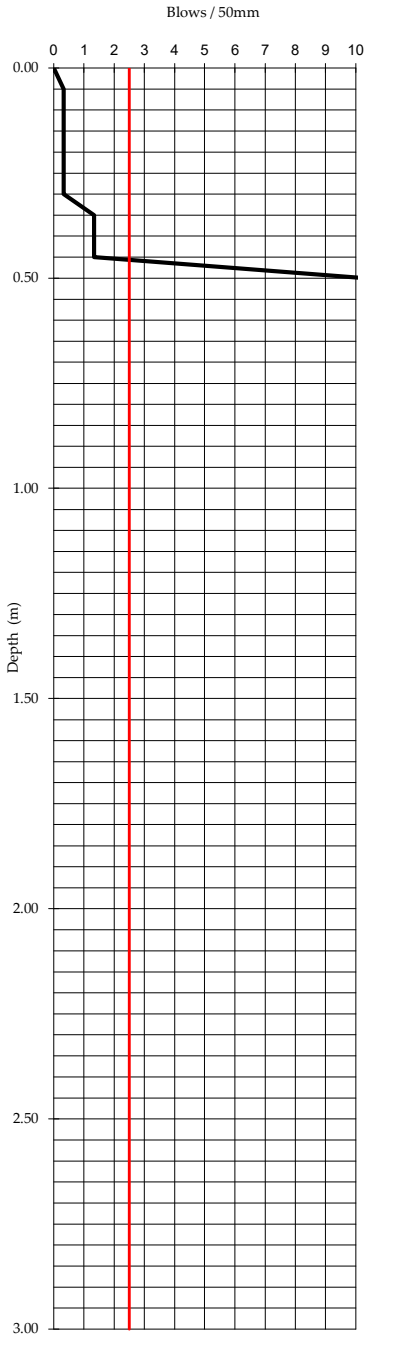
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

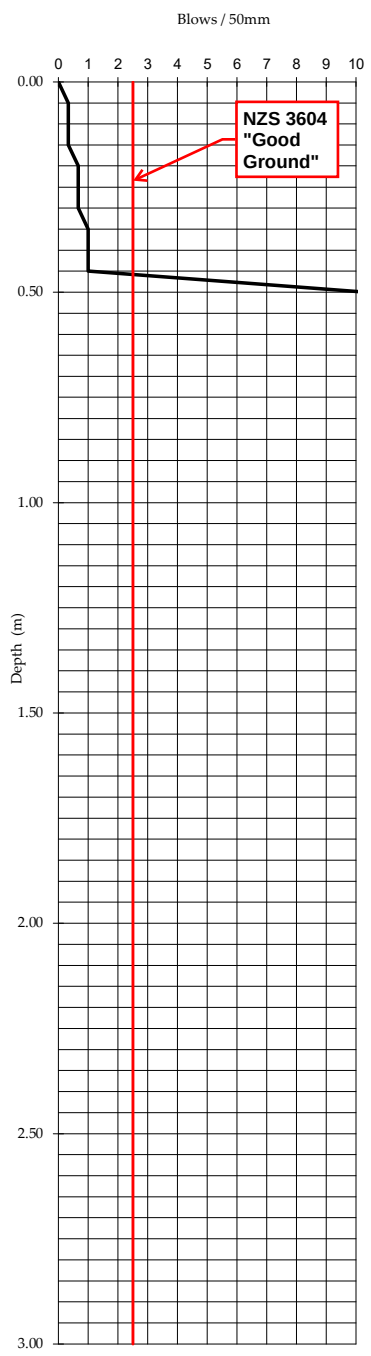
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Date reported :	27/07/26	Reported by:	TA

FNR LTD CONSULTING

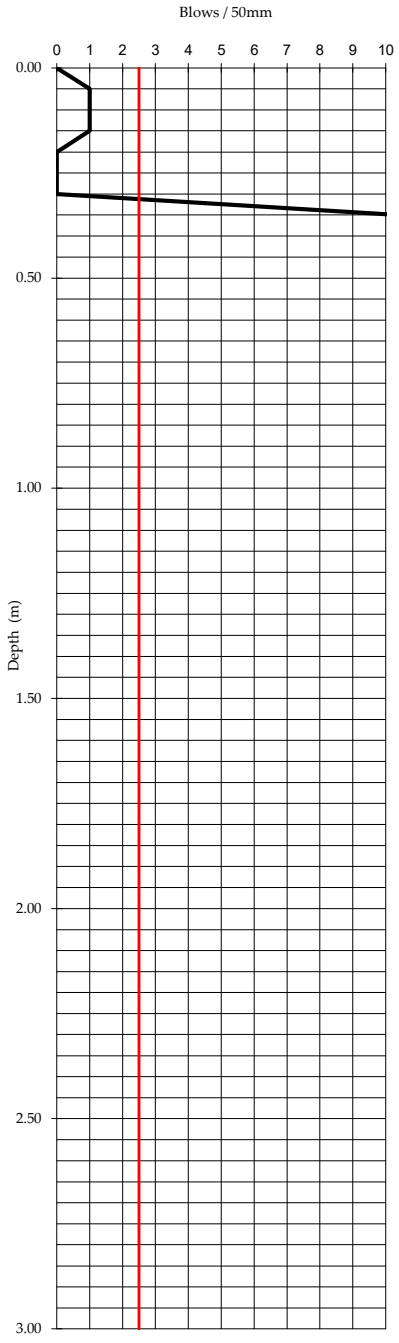
SCALA PENETROMETER
TEST REPORT

Project :	FNR1070 - Site Investigation Report				
Location :	2 Taylors Road Te Kao				
Client :	Connie Noble				
Contractor :	N/A				
Test number :	SP2A	Test number :	SP3	Test number :	SP3A
Water level :	N/A	Water level :	N/A	Water level :	N/A
Reduced level :	Ex. GL	Reduced level :	Ex. GL	Reduced level :	Ex. GL

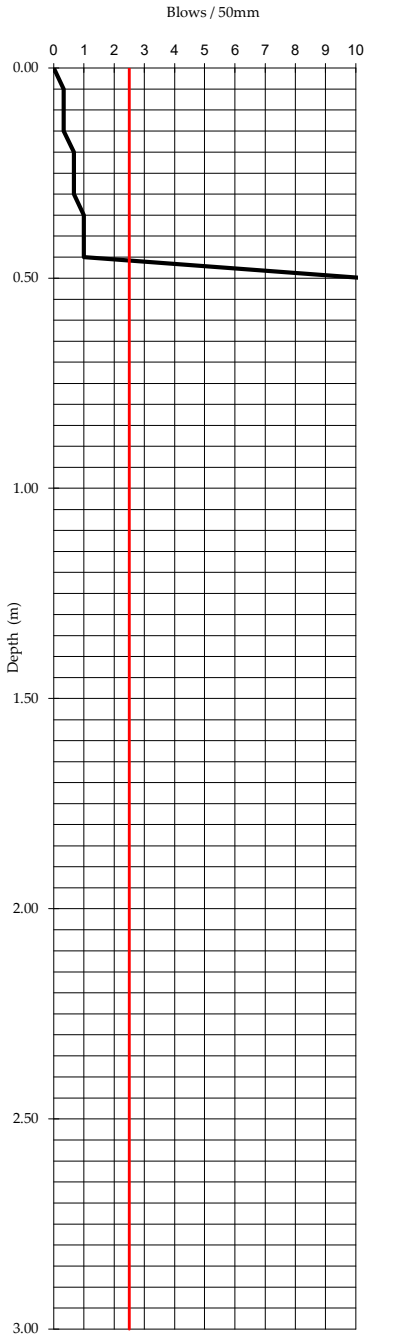
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

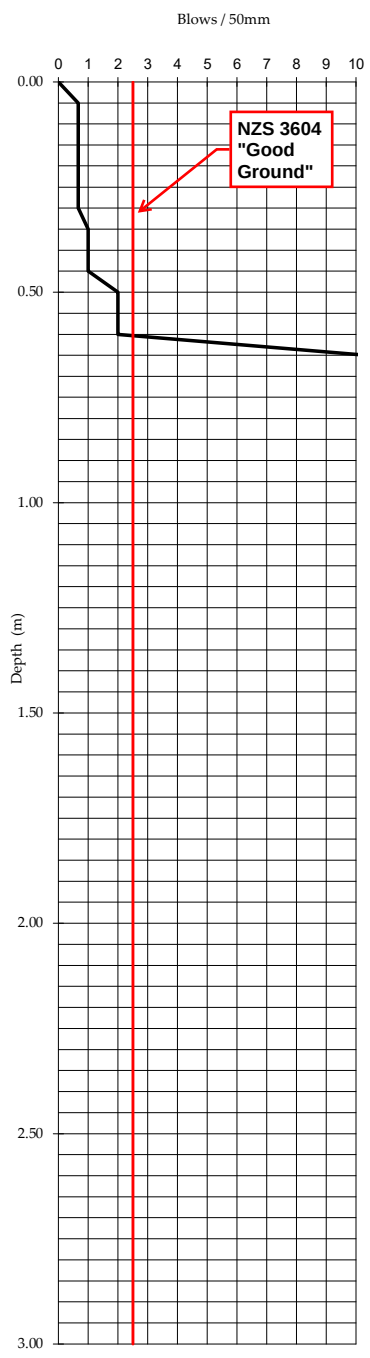
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Date reported :	27/07/26	Reported by:	TA

FNR LTD CONSULTING

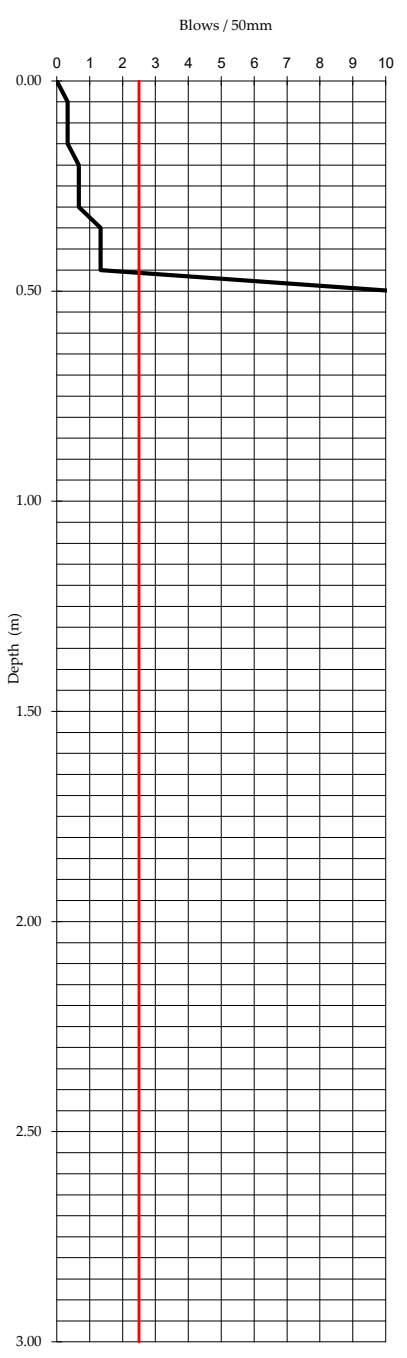
SCALA PENETROMETER
TEST REPORT

Project :	FNR1070 - Site Investigation Report				
Location :	2 Taylors Road Te Kao				
Client :	Connie Noble				
Contractor :	N/A				
Test number :	SP4	Test number :	SP4A	Test number :	SP5
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Reduced level :	Ex. GL	Reduced level :	Ex. GL	Reduced level :	Ex. GL

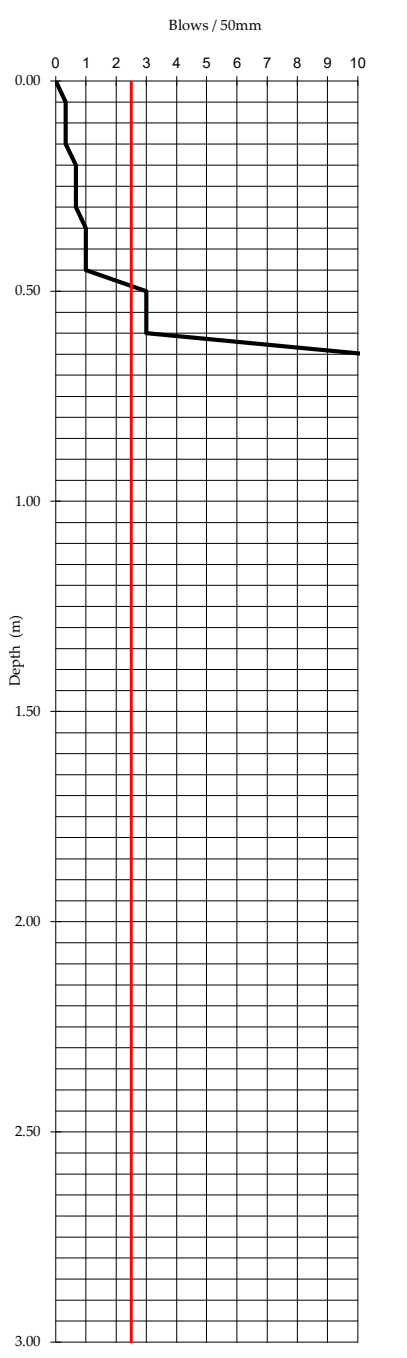
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

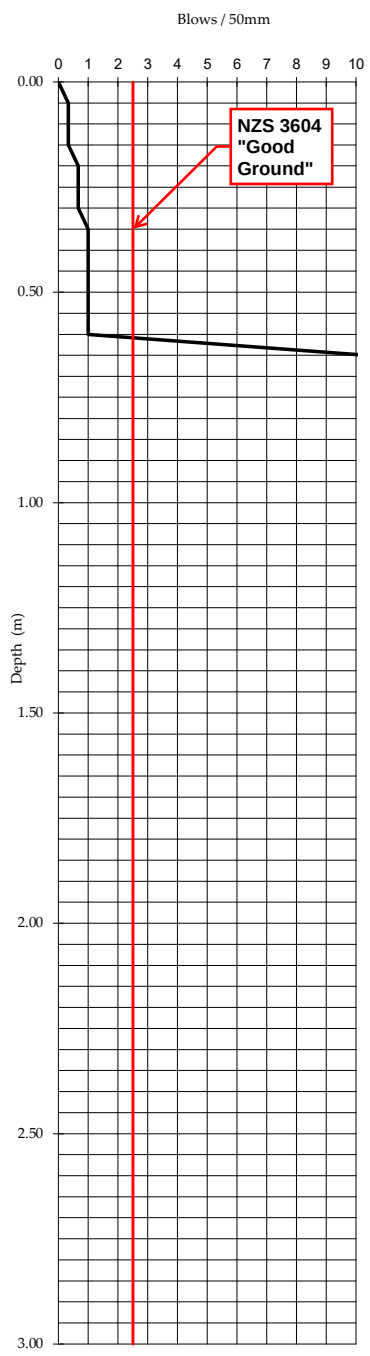
Date tested :	15/07/2026	Tested by:	TR
Date reported :	27/07/26	Reported by:	TA

FNR LTD CONSULTING

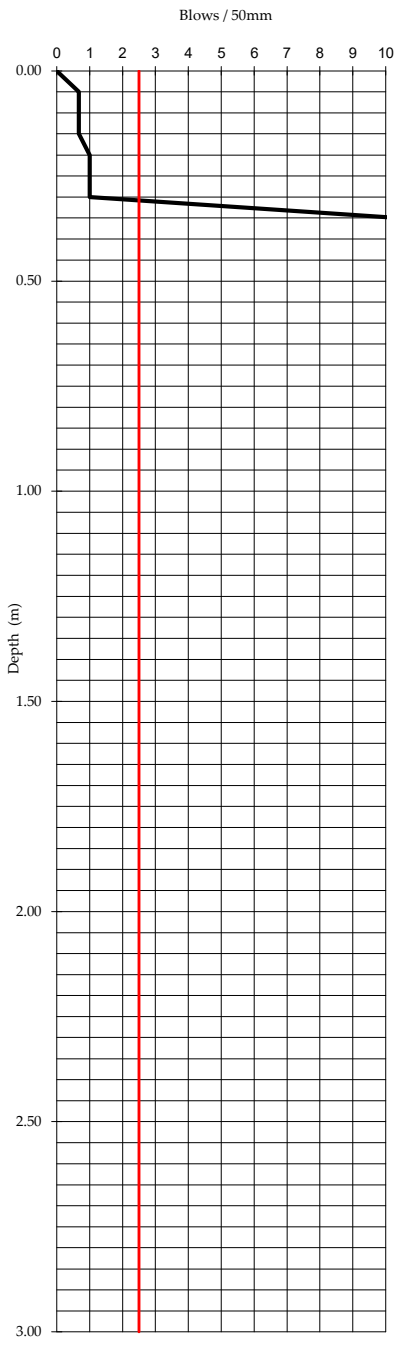
SCALA PENETROMETER TEST REPORT

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Location :	2 Taylors Road Te Kao				
Client :	Connie Noble				
Contractor :	N/A				
Test number :	SP5A	Test number :	SP6	Test number :	SP7
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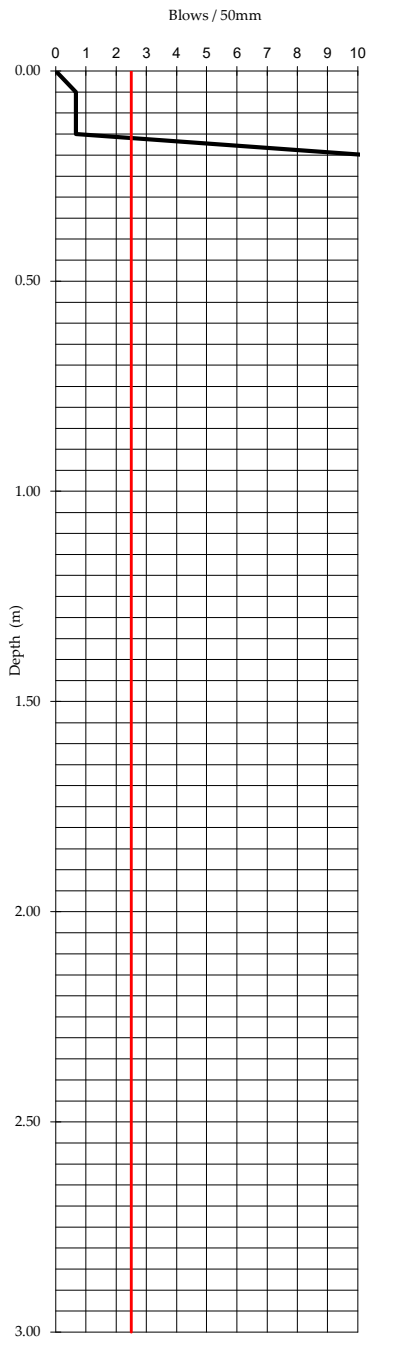
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

Date tested :	15/07/2026	Tested by:	TR
Date reported :	27/07/26	Reported by:	TA

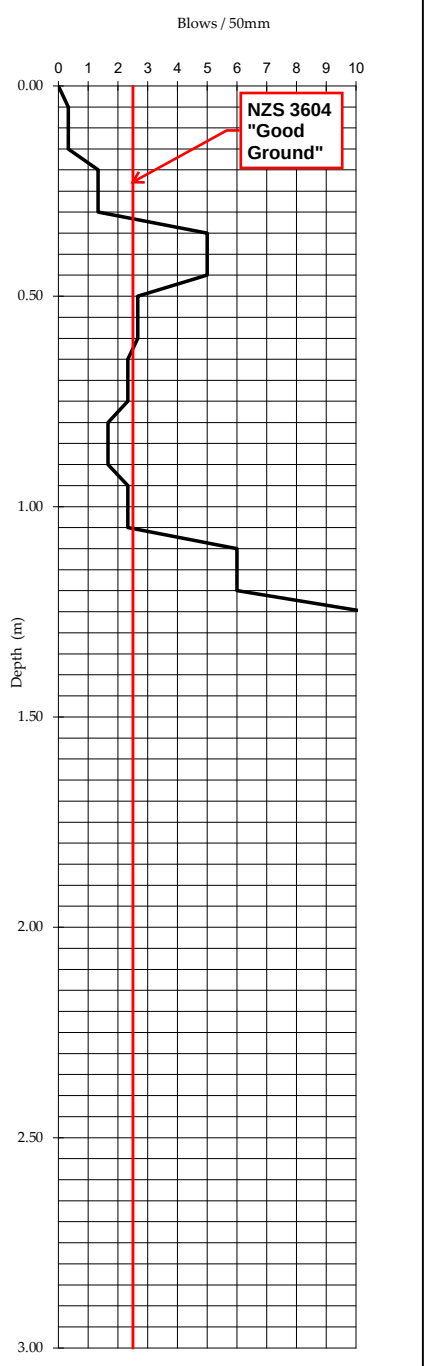
FNR LTD CONSULTING

SCALA PENETROMETER TEST REPORT

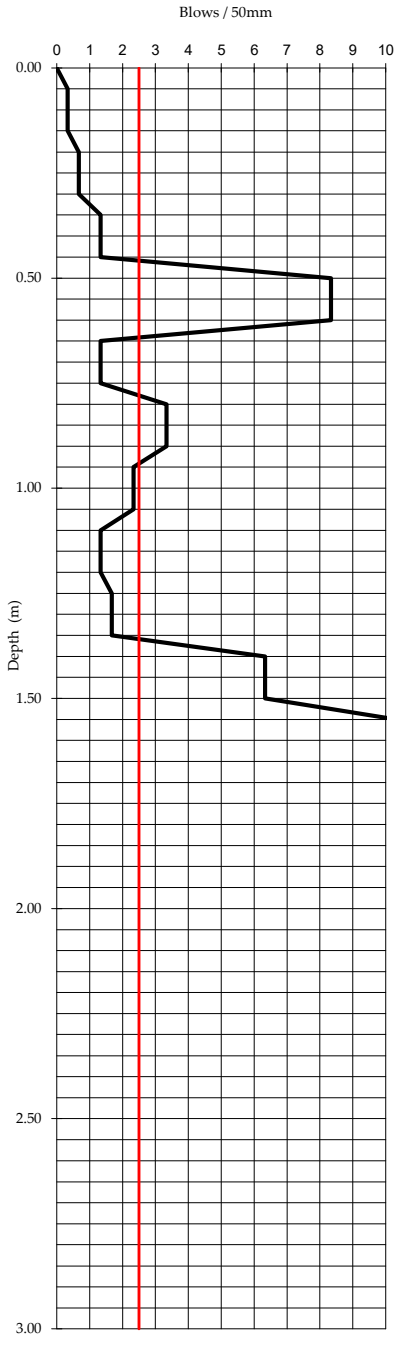
Project :	FNR1070 - Site Investigation Report
Location :	2 Taylors Road Te Kao
Client :	Connie Noble
Contractor :	N/A

Test number :	SP8	Test number :	SP9	Test number :	SP10
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Reduced level :	Ex. GL	Reduced level :	Ex. GL	Reduced level :	Ex. GL

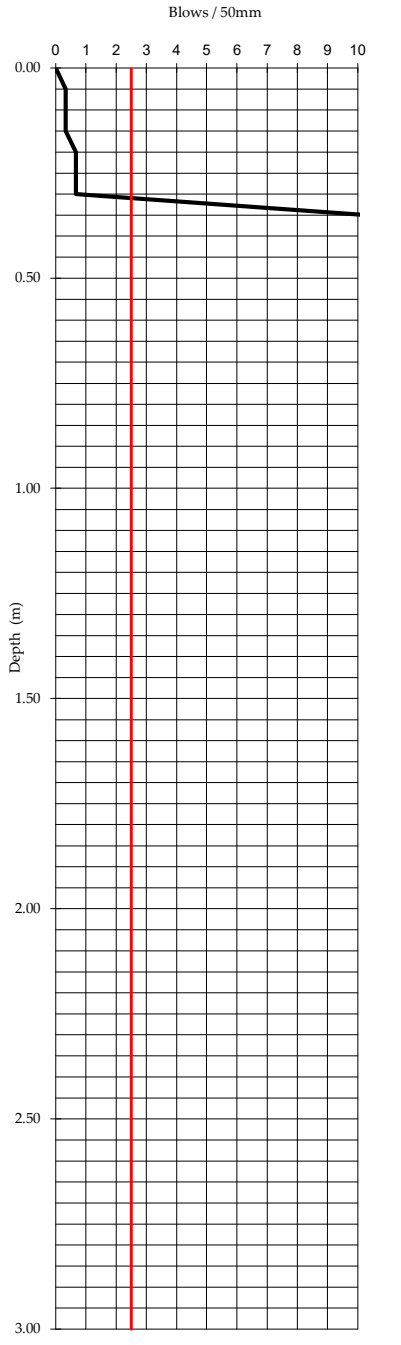
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

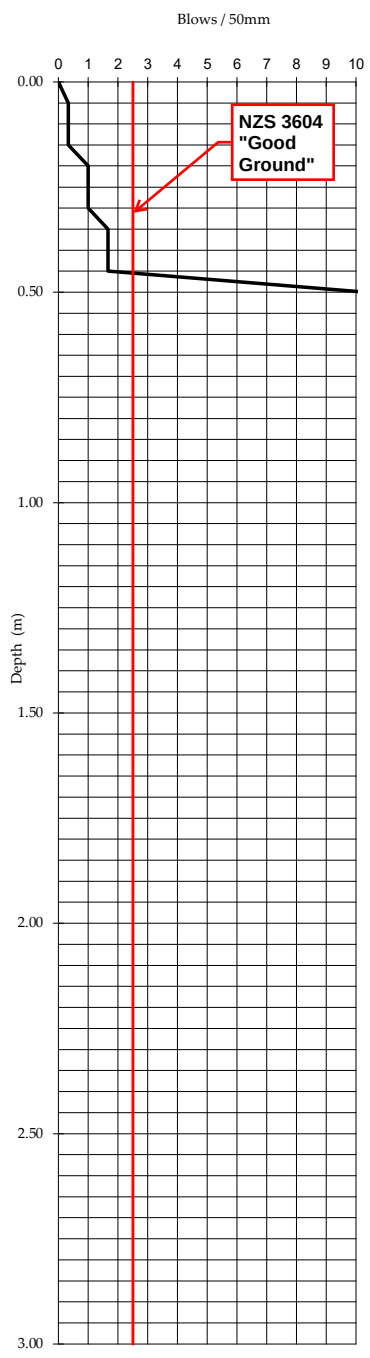
Date tested :	15/07/2026	Tested by:	TR
Date reported :	27/07/26	Reported by:	TA

FNR LTD CONSULTING

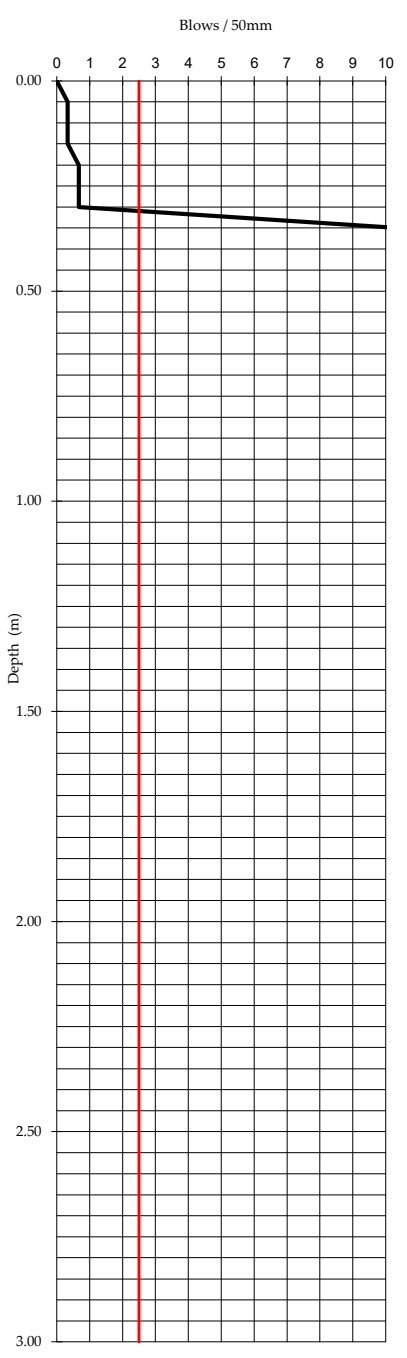
SCALA PENETROMETER
TEST REPORT

Project :	FNR1070 - Site Investigation Report				
Location :	2 Taylors Road Te Kao				
Client :	Connie Noble				
Contractor :	N/A				
Test number :	SP11	Test number :	SP12	Test number :	
Water level :	N/A	Water level :	N/A	Water level :	N/A
Reduced level :	Ex. GL	Reduced level :	Ex. GL	Reduced level :	Ex. GL

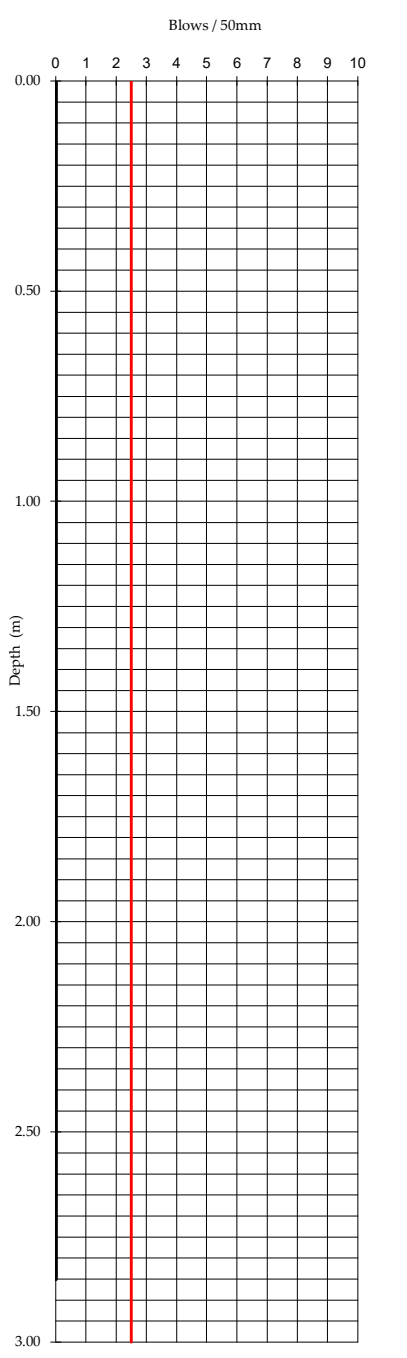
Scala Penetrometer



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Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

Date tested :	15/07/2026	Tested by:	TR
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Section 1

Wastewater Treatment System

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Biological Media
System Specifications
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Introduction

The TechTreat CP2 system has been developed over a number of years to provide years of reliable, trouble free operation using new and innovative technology. We wanted to design a reliable cost effective system made in New Zealand by qualified technicians who are involved from manufacture to servicing aftercare. Simple to install and maintain whilst remaining highly effective. The system has been tested in the Rotorua Testing Facility and has met NZ Performance Standards.

The team at TechTreat have wide experience in the wastewater treatment industry, particularly with the design, installation and servicing of aerated treatment systems, and are dedicated to achieving and maintaining the highest standard of product quality, performance and service.

The TechTreat CP2 uses new technology in our aim to provide a simple and cost effective Aerated Wastewater Treatment System.

The system will treat sewage and wastewater from household and light commercial facilities, producing clean effluent for reuse, irrigating trees, shelterbelts, shrubbery and landscape gardens.

The CP2 System Has These Features:

- TechTreat Limited is a New Zealand company, manufacturing lightweight Wastewater Treatment Systems for New Zealand conditions.
- We quarantee depending on the inflow waste water that the CP2 will effectively recycle all household sewage and wastewater as clear odourless water to irrigate your gardens
- The CP2 uses Polymer RELN 3200L septic tanks and is unique in its simplistic design concepts. Compliant with AS/NZS 1546:2008
- RELN offer a 15 year warranty on their septic tanks
- There are six significant features of the TechTreat CP2 aeration and activated sludge treatment system:

1. **Large capacity to provide retention time for better treatment**
   The CP2 is a multi chambered system with 5260L (approx) of treatment capacity, plus additional emergency storage of 1000L without cross contamination of chambers
2. **Primary filtration**
   The CP2 is fitted with a biological effluent filter on the outlet of the primary chamber reducing suspended solids by up to 93%
3. **Flow balance, high usage and shock loadings**
   The CP2 is fitted with a flow balance surge control to avoid solid waste carry over, ensuring full treatment of the wastewater
4. **Efficient air supply for extended aeration and activated sludge process**
   The CP2 uses a large piston air blower to supply air for the extended aeration process, and for the return of activated sludge and the recirculation of waste water to the aeration chambers
5. **Hydraulic flow pattern**
   The CP2 has 2 completely sealed treatment chambers to ensure the best possible treatment of wastewater as it passes through the system. This prevents short circuiting of the liquid known as cross flow contamination

6. Biological and filtration media (purpose made)

The CP2 has 90 sheets of submersed fixed film media in the aeration media chamber to encourage the growth of aerobic bacteria for suspended solid digestion

- The design and injection moulding technology of the RELN tanks is so strong that the system can be filled from the sewer inlet directly from the house immediately after installation
- The weight of the CP2 is just 300kg making it very easy to transport on utility vehicles or trailers
- Once on site, a small excavator can simply lower the system from a trailer to the hole
- There is no need for large diggers, heavy trucks transporters, hi-ab lifting gear
- TechTreat Limited can also offer systems specifically designed for larger households, maraes and light commercial operations

7. Biological Treatment

- The TechTreat CP2 is fitted with a purpose made media which ideally positioned within the aeration chamber to achieve rapid stabilisation of the organic matter.

- The media is made of polyethylene and is strongly constructed. The large surface area is designed to promote fast biological accumulation. However, the design and orientation of the media does not allow the build up of excess biological film. Consequently the biological process remains at optimum efficiency.

- The diffused air is directed to circulate freely through the media creating an ideal aerobic environmental for biological activity

Specifications Of TechTreat CP2 Sewage Treatment System

The specifications of the TechTreat CP2 system are as follows:

Tank Chambers	Dual RELN plastic septic tanks –complying with standard AS/NZS 1546.1:2008
Anaerobic Chamber Filter	Proprietary effluent filter/3mm max screening
Air Blower	Nitto LA80b
Diffusers	2 x venturi diffusers
Air System	Supplies air to the diffusers and sludge return systems(anaerobic & aerobic).The air system is controlled by valves enabling the air supply to be regulated and fine tuned to achieve the most effective and efficient use of air in the treatment system
Media	Purpose made polyethylene biological treatment and filtration media
Disinfection(optional)	1. Chlorinator 2.Electronic Treatment
Effluent Pump	Jet 0.5HP/1hp
Tertiary Filter	Proprietary disc filter/ 130 micron
Alarm System	Control Unit – Alarm Plate 1. Connected to a high level float switch mounted in the pump chamber- audio -visual alarm activated when effluent reaches high level in the pump chamber 2. Connected to air pump reticulation – audio-visual alarm activated if the air pump stops or there is insufficient air pressure in the system 3. Fitted with an alarm activator – audio-visual alarm which will alert householders in the event of a power failure

TechTreat CP2 System Specifications

System name / model	CP2
NZ supplier/manufacturer Postal address Email Phone number	TechTreat ltd Po box 970 kerikeri northland techtreat@hotmail.com 09 4071967/ 0274472322
Operating Humidity Range	15 to 100 % Humidity
Operating Temperature Range	-10 to 50 Degrees Celsius
Technology Description e.g. submerged biological, aerobic suspended growth	Fixed film submerged media
Tank construction material	Reln polymer Septic Tanks
Volumes (litres) • Number of chambers / tanks • Total operating volume / Capacity • Additional emergency storage • Normal operating level (internal – mm) • Primary chamber / septic tank	 Two 6420L 1000L without cross contamination 1400 L max 1350mm 3200L

• Aeration chamber • • Clarification chamber • • Pump out chamber	2700L 200L 160L
Filter • Make / model • Location	 zabel 1800 Septic tank outlet
Air Blower • Make / model • Location • kW • Runtime	 Nitto LA80b/Thomas AP-80 Top of aeration tank 86w/51W 18hrs
Irrigation Pump • Make / model / impellor • kW	 Self priming pump 0.37kw
Growth media • Description / type • Amount (e.g. surface area / sheets)	 Fixed film 90 sheets
Electrical controls / alarms	yes
Internal tank fixings sealed with holdfast fix all HG used to form gasket only-sandwich between 2 flanges External fittings use PVC Plumbers Glue as set out in RELN installation Manual (section 4) Treatment capacity	 2000L per day

Septic Tanks

The TechTreat CP2 comprises of two 3200L RELN Septic Tanks

RELN Septic Tanks are approved to the requirements of the Australian/ New Zealand Standard AS/NZS1546.1:2008 On-site domestic wastewater treatments units –Septic tanks Lic SMK1651

Tank Lids and Manhole Covers are secured by stainless steel lid screws (10g 316) washers and nuts as set out in the RELN Septic Tank Installation Instructions –Supplied with tank
(see section 4)

Wastewater Treatment System

The Design, System Specifications and Performance Criteria of the TechTreat CP2 meet the requirements of the Australian/ New Zealand Standard AS/NZS 1547:2012 as laid out in this manual

Marking Of TechTreat CP2 System

Marking is to be carried out with the use of a stencil. The marking will be permanent and legible and will be positioned in a prominent position that is readily visible after installation (located on electrical control box or system lid as applicable)

The marking shall include:

- Manufacturers Name: TechTreat Limited
- Model number
- Month and Year of Manufacture
- The Design hydraulic capacity in litres/day: 2000L/day
- Top Load Limitations: 500kg

Positioned adjacent to the lifting points shall be a marker specifying:

- Weight of tank: 139kg
- Lifting Instructions

Service Requirements for TechTreat CP2

The System must be serviced at least every 12 months (annually) by a TechTreat Limited approved Technician

Servicing Chart

Function	3 monthly	9monthly	Annually
Anaerobic Chamber/Check			Qualified Person
Bio Filter/clean filter			Qualified Person
Air Blower/clean filter/pressure test			Qualified Person
Air Flow Path/Check			Qualified Person
Chlorinator if installed			Qualified Person
Pump Chamber/pressure test			Qualified Person
Outlet Filter/clean If Relevant	Owner	Owner	Qualified Person
Alarm System/check			Qualified Person
Irrigation field/			Qualified Person

Note: The desludging of the anaerobic chamber is the responsibility of the owner and should be carried out at least every 5 years or sooner if required (monitor yearly)

Service Contract / Renewal Advice

This agreement is made between (Owner/Occupier).....

of (Address).....

and the Authorised Distributor or their duly appointed agent

Business Name.....

Business Address.....

Business Phone Number & email.....

The duration of the agreement is from..... to .....

The Authorised Distributor/Agent agrees for the period to the following:

- A factory- trained technician will make annual field service inspections during the service period
  Inspections to include
  1. Any adjustment, cleaning and field service of the unit necessary for proper operation
  2. Inspection of the control panel and alarm plate, aeration blower, bio-mass sludge return, clarifier, filter, effluent quality, irrigation pump, and float alarm
- Both labour and materials will be charged for emergency service calls outside the call specified above
- In the event of any repairs being necessary on the purifier or electrical equipment during the first year because of damage which has occurred outside the warranty, then these repairs will be charged to include both labour and materials
- Complete a written report at the time of each annual inspection/service, providing a service report copy to the Customer and a copy to the Local Council
- This agreement does not bind TechTreat Limited or appointed agents to be responsible for the quality of effluent, However, it will at all times whenever possible, recommend how the effluent quality can be maintained at its maximum and alter/adjust the system during service calls in order to obtain the best possible effluent standard

In completing this agreement, the customer acknowledges that this Agreement is binding while they are the owner/occupier of the premises. There is an obligation by the Distributor/Agent and the homeowner to transfer this Contract to any new Owner/Occupier to comply with the relevant By-Law requirements.

Owner/Occupier Signature.....

Signature Authorised Distributor/Appointed Agent.....

Commissioning Sheet

Serial Number: **Date:**
(located on outside of electrical box)

Owners Name:
Owners Address:
Council:
System Model CP2

System filled with water and backfilled	Yes □ No □
Inlet invert less than 700mm	Yes □ No □
Pump working and in correct position	Yes □ No □
Float switches pump and High water free from obstruction	Yes □ No □
Blower working	Yes □ No □
Alarm working	Yes □ No □
Sludge Return set	Yes □ No □
Even air Distribution (Diffusers)	Yes □ No □
Irrigation installed/operating as per design	Yes □ No □
Home owners pack and system explanation given to home owner	Yes □ No □
Service contract entered into?	Yes □ No □

Installers Name.....

Signature.....

WARRANTY

Your 'TechTreat CP2' Sewage Treatment System is guaranteed to be free of any defects in materials or workmanship at the time of installation.

During the twelve months following installation, a cost free maintenance program is provided which includes your first annual service.

Should any mechanical or manufactured part/s fail as a result of defect within twelve months of installation, the part/s will be replaced free of charge.

Pumps supplied with your system come with a two year warranty.

The RELN septic tanks supplied with your system come with a manufacturers fifteen year warranty.

The aeration tank of your system is guaranteed to remain free from sludge for a period of five years from the date of installation.

This warranty is governed in total by the "Conditions of Sale"

Design Compliance

The design of the TechTreat CP2 Sewage Treatment System has been developed in accordance with sound and widely accepted engineering principles and technologies. The system has been assessed for a typical single home domestic wastewater loading.

Benchmark Ratings

The TechTreat system achieved the following effluent quality ratings for the 16 benchmarking results in weeks 23 to 35 of OSET NTP Trial 8.(On-site Effluent Treatment National Testing Programme)

Indicator Parameters	Median	Std Dev	Rating	Rating System				
				A+	A	B	C	D
BOD_5 (mg/L)	5.5	3.5	A	<5	<10	<20	<30	≥30
TSS (mg/L)	12.5	11	B	<5	<10	<20	<30	≥30
Total Nitrogen (mg/L)	23.5	5.8	B	<5	<15	<25	<30	≥30
NH_4- Nitrogen (mg/L)	11.2	5.9	C	<1	<5	<10	<20	≥20
Total phosphorus (mg/L)	3.6	0.6	B	<1	<2	<5	<7	≥7
Faecal Coliforms (cfu/100mL)	63,000	67,000	C	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)	2.00	0.1	C	0	<1	<2	<5	≥5

(See Performance Certificate Section 6 for full details)

Section 2

Pumps and Electrical Installation

Electrical Specifications

The complete electrical system has been designed to ensure minimum connection time and maximum reliability.

There are 2 components 1 = Main Control Panel 2 = Alarm Panel

Once power is connected and mains turned on, the neon switch is lit. Blower starts and run time is factory set. The blower unit has a current monitoring protection relay that alarms when the blower fails to operate within the factory set limits. The supply for the submersible pump is a continuous supply and is controlled by integral float switches and is isolated by the main switch.

Connection: Mains 230v AC 16RCBO RCD type MCBA Dedicated supply

All electrical work must be carried out by a Registered Electrician

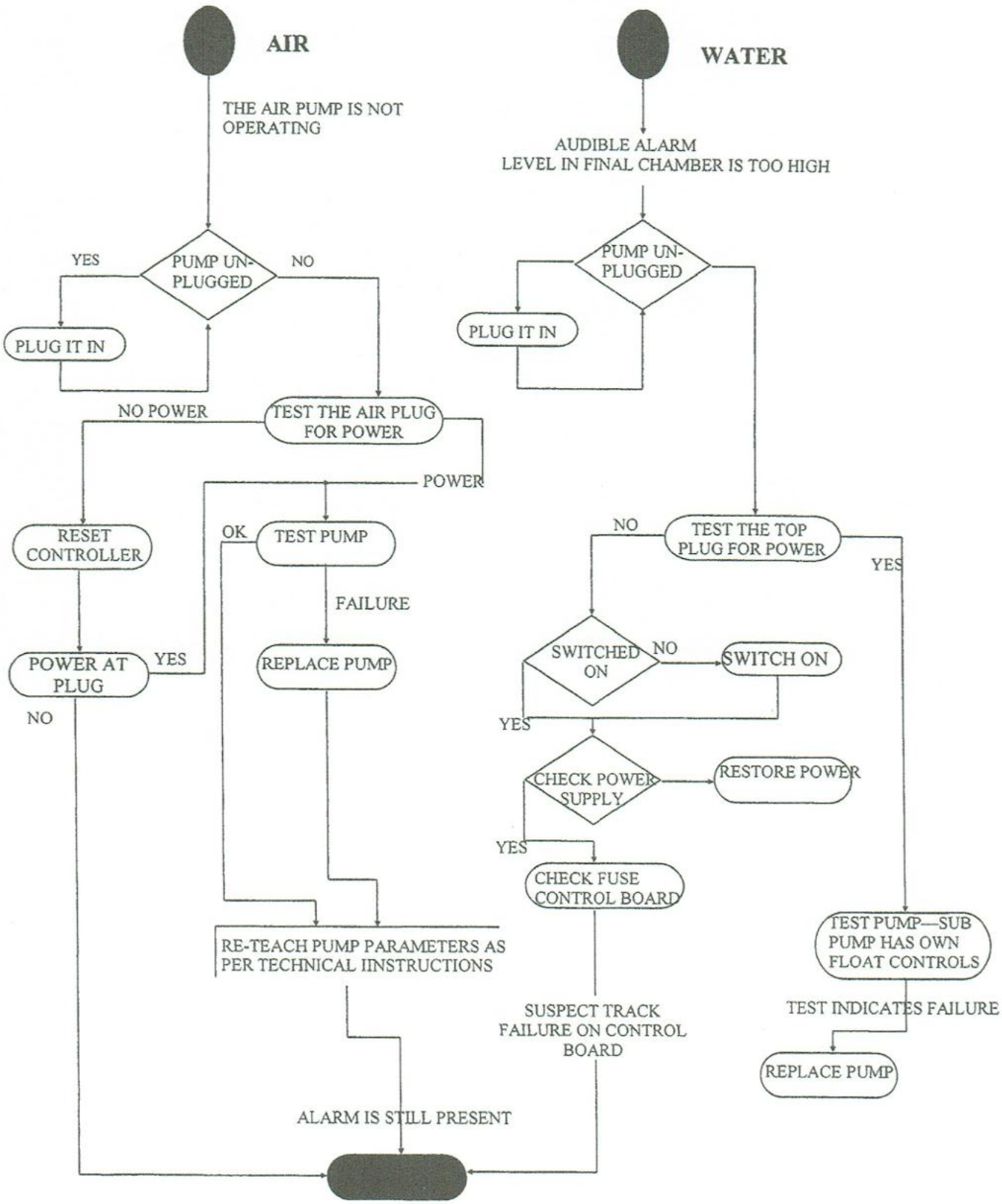
Main Control Panel

The Control Panel is manufactured under strict guidance by a qualified electrician and made to TechTreat's Specifications. Each Control Panel is issued with an Electrical Compliance Certificate

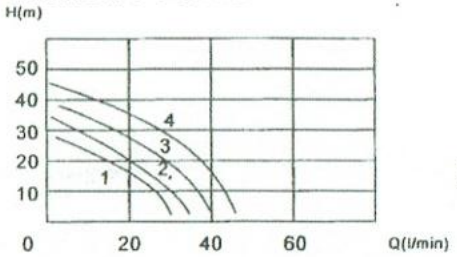
Alarm Panel

The alarm panel is a visual unit that is mounted in the premises where it is most functional. The alarm sounds on pump/ blower failure or on high level alarm. Red light on panel turns on.

ALARM TEST PROCEDURE ALL ANALOGUE VERSIONS



TOTAL HEAD-CAPACITY CURVE



1. JETP-40, 2. JETP-60
3. JETP-80, 4. JETP-100

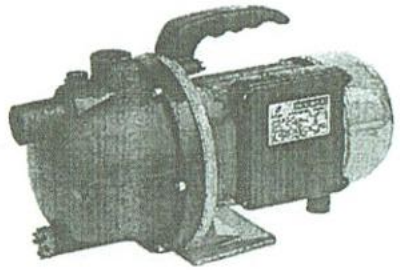
SPECIFICATIONS

Model	Max. Capacity (l/min)	Max. Head (m)	Max. Suct. L (m)	Power (W)	Pump Dia. (Mm)	Net Weight (Kg)
JETP-40	30	30	9	330	25x25	5.8
JETP-60	40	35	9	370	25x25	7.8
JETP-80	45	40	9	550	25x25	8.8
JETP-100	50	45	9	750	25x25	9.8

TROUBLES AND COUNTER-MEASURES

Troubles	Causes	Counter-Measures (The indication can be done by user.)
Motor does not start	Thermal protector.	If the motor is overheated, it does not operate. Then, wait till getting cold(20~30 minutes)
	Faulty cord connection.	Insert the plug securely.
	Cord disconnected.	Replace the new cord.
	Trouble in motor.	Repair or replace the motor.
	Tool low power supply voltage.	Consult with the power supplies compare.
Water in not pumped out although motor runs	Water level of well is lower than standard level.	Check the water level of well.
	Trouble in foot-valve.	Clean the foot-valve, the foot-valve seat and the foot-valve hole.
	Air drawn into suction pipe.	After checking the joints of piping, shut them perfectly
	Air drawn into pump from mechanical seal.	Replace the new mechanical seal.
Thermal protector for motor works too often.	Too low or high power supply voltage.	Consult with the power supplies compare.
	Impeller is in contact with another part.	Repair the defects.
	Short or open circuit of the capacitor.	Replace the capacitor.
Water does not come out at the first few minutes after switch on.	Air drawn into suction pipe.	Repair the defects of pipe. (To prevent air leaking.)
Pump starts though no water is being used.	Water leaks at pipe or pump.	Repair pipe, pump parts and faucets etc
Water does not come out immediately after switch on.	Water leaks at mechanical seal	Repair the mechanical seal.
	Foot-valve does not shut perfectly	Clean the foot-valve.
	Air drawn into suction pipe.	Repair the defects.

Jet Centrifugal Pump Operation Manual



JETP Series Pump

CE TÜV GS

Read over this operation manual before the first operation of your pump for the sake of its optimum efficiency

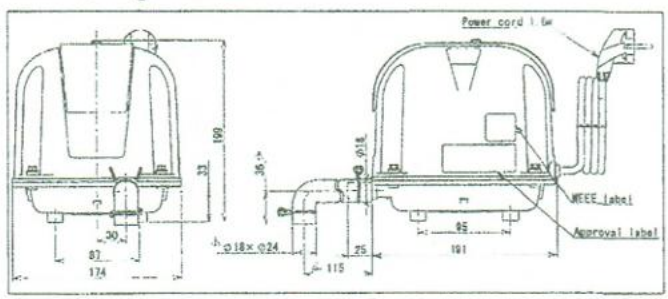
Linear Diaphragm pumps
Comparison LP-80HN, AP-80

THOMAS
A Gardner Denver Product

Flow at rated pressure **85 to 90 l/min**





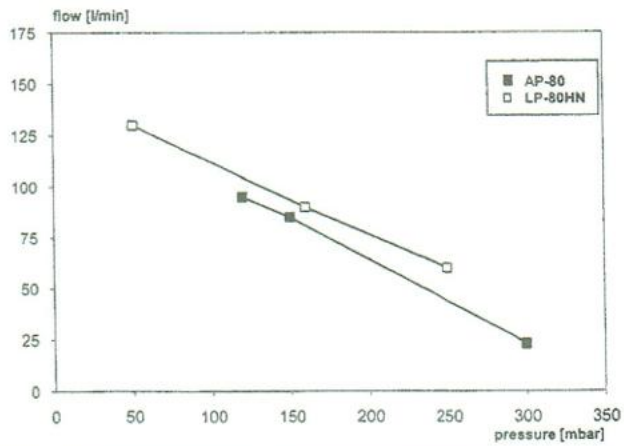


			remarks:
Pneumatic Data			
Description	LP-80HN	AP-80	"A..." = advanced
Part number	52500403	52500455	
Flow at rated pressure	90 l/min	85 l/min	approx. 7% less flow[1]
Rated pressure	160 mbar	150 mbar	rated pressure is lower
Operating range	50 to 250 mbar	120 to 300 mbar	higher MIN and MAX
Electrical Data			
Motor type	Linear drive	Linear drive	unchanged
Nominal voltage	230 V 50/60 Hz	230 V 50/60 Hz	unchanged
Consumption at rated pressure	0,9 A / 80 W	0,29 A/ 51 W	68% less current, 36% less power cons. [1]
Power consumption per liter at 150 mbar	0,87 W/l	0,60 W/l	31% less Watt per Liter at 150 mbar [1]
General Data			
Ambient temperature	-10 to 40 °C	-10 to 40 °C	unchanged
Weight	8,3 kg	4,7 kg	lighter (43%)
Outlet diameter	18 mm	18 mm	unchanged
air connector: diameter (free end)	18 mm	18 mm	unchanged
air connector: form	angled	angled	unchanged
Average noise level	35 dB(A)	38 dB(A)	3 dB (A) higher
size (H x W x L)	218x179x250mm	199x174x216mm	significantly smaller
diaphragm protection switch	integrated detecting axial overstroke	integrated (new design) detecting ax. overstroke + shuttle offset	additional detection of shuttle offset

[1] Values for LP-80HN are based on 150 mbar (identical basis for comparison)

All listed values are measured at standard atmospheric conditions and at 50Hz.

Flow curves



Gardner Denver Thomas GmbH
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The information presented in this material is based on technical data and test results of nominal units. It is believed to be accurate and reliable and is offered as an aid to help in the selection of Thomas products. It is the responsibility of the user to determine the suitability of the product for the intended use and the user assumes all risk and liability whatsoever in connection therewith. Thomas does not warrant, guarantee or assume any obligation or liability in connection with this information.

PRECAUTION BEFORE USING THE PUMP

1 Connect the earth wire before use.
This enable you to prevent an accident caused by electric shock when the electric insulation is not in order
For your safety from the danger of electric shock, please be careful not to get power plug stained with water

CAUTION IN CONNECTING THE EARTH WIRE

- Connect the earth wire after turning off the electric power.
- Never connect with gas pipes, other wire it can be the cause of explosion.

2 Avoid operating under the condition of dry running and delivering no water.
For it will shorten the service life of pump and also cause the trouble of motor

3 Never wrap the motor or the pump head in a blanket or a cloth for preventing freezing in the cold weather.

4 Avoid using the pump under the condition of ambient temperature over 40℃ and below 0℃, and also with hot water over 40℃.
For it will shorten the service life of pump.

5 Be careful not to use the pump with other liquids except for water.
When this used for solvent such as benzol, acid, in flammable liquids such as gasoline and high-viscous liquid, there is a risk of the fire and it will cause the trouble of the pump and also shorten the service life of it

6 Avoid using the pump under the condition exposed to the direct rays or rain because it will be the reason of shortening the service life of the pump and also of the danger of electric shock.

7 When this pump is set up in the well, which is easy to suck in sand, above all, sand filter is needed
For it will prevent the defacement of the impeller in the pump head for a short time, the decline of pressure and the decrease of pumping water.

8 The permitted voltage of this pump is 10% of the rated voltage. Otherwise it will be the reason of shortening the service life of the pump.

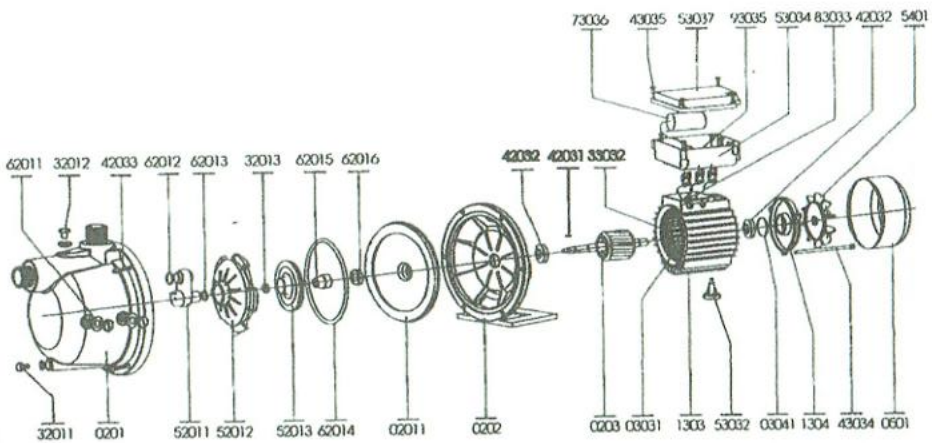
9 Never operation the pump without priming waters, for it will damage the mechanical-seal and the impeller and shorten the service life of the pump.

- Before setting the power on, confirm no abnormality by manual operation (exam by driver) of the truly operating act 2-3 times in checking of dust or sand is put into the pump and also adhesion of impeller or mechanical-seal.

WHEN THE PUMP IS REUSED AFTER A LONG TIME

There is possibility for the motor not to be operation in the condition of switching on the electric power, because of the sticking and solidification of the dirt and filth in the water of the pump head
In that case, turn off the electric power, and then turn the shaft in the back of the motor a few times with driver or something like that. After that, you can operation the pump as usual.

APPEARANCE AND NAME OF PARTS



0201.Pump body
32011.Coper Screw
32012.Flit plug Screw
62011.Seal
52011.Fluidic Device
62012 Jet Seal
62013 Jet Seal
52012.Diffusor
32013.Locking nut
52013.Impeller
62014.O Ring
62015 Mechanical seal
62016 Mechanical sea
02011 Pump cover board
0202.Motor front cover
42033.Screw
42032.Ball bearing
0203.Motor Rotor
42031 Shaft Key
1303 Motor Body
03031 Stator
33032.Stator Coil
53032.Motor Foot
03041.Spring Washer
1304 Motor End Cover
43034 Tie bolt
5401 Fan
0501.Fan cover
53034.Terminal Box
53037.Terminal cover
93035.Terminal block
73036 Capacitor
83033.Connection wire
43035 Screw

CHECKING POINTS BEFORE INSTALLATION

- Install the pump just over the well as possible as you can.
- But when the pump must be installed away from the well because of the circumstances, the maximum distance of the pipe from the well to the pump is limited according to the suction lift
- Decide the suction lift con idering the dry seas

GUIDE FOR INSTALLATION

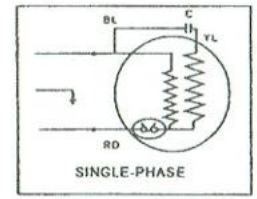
- Concrete the foundation with cement that the pump may not lean or slant even after many years.
- Select the place where the pump can be conveniently checked or repaired after installation.
- Install the stop valve on the discharg side of the pump and it will be very convenient for checking and repairing the pump
- Minimise the number of the elbows to prevent the water leaking in the piping or to lessen the resistance of water.

HOW TO OPERATION THE PUMP

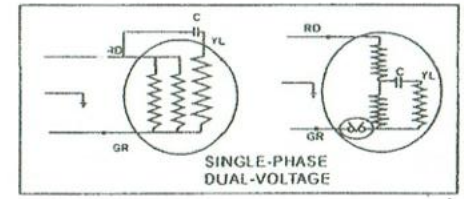
- This pump is not self-priming type, should be installed foot-valve to the bottom of suction pipe.
- Measure the depth from the ground surface to that of the well. The suction head is standardized at 8 m (max. 9m).
- Be sure to use pipe of standard diameter for normal.

CONNECTION METHODS FROM POWER

- When the pump is sending out from the manufacture, it is set for single phase, please according to the name plate on the pump. Check the voltage of the electric power before operating the pump.
- Warranty does not include accidents due to incorrect installation. See your electrician for advice. It is recommended to have a protected motor circuit breaker near the pump. It will cut power in case of surcharge, blocking or missed.
- Take terminal box cover off.
- Drive the 3 wires(or 4 wires) electric cable through opening (minimum section 1,5 mm^2).
- Connect 2 wires(or 3 wires) to terminals N and L. Connect earth wire (green/yellow) to terminal located under terminal block, marked with symbol. On figure.
- Put cover back.



SINGLE-PHASE



SINGLE-PHASE
DUAL-VOLTAGE

Note:
YL: Yellow
GR: Green
RD: Red

ELECTRIC PRINCIPLE DIAGRAMS

WHEN THE PUMP IS REUSED AFTER A LONG TIME

- There is a possibility for the motor not to be operated in spite of switching on the electric power because of the sticking and solidification of the dirt and filth in the water of the pump head
- In that case turn off the electric power, and then turn the shaft in the back of the motor a few times with driver or something like that. After that, you can operate the pump as usual.

HOW TO START THE PUMP

Since this pump has no self-priming system, at the start of operation, make priming by the following sequence:

- Remove the plug and pour water into the pump and replace the plug. The air in the suction pipe shall be pulled out with the water.
- Before the power switch on, the water cock of the discharge side should be opened
- After the power switch on, start priming procedure immediately.
- When the priming is not successful, air may be remained in the suction pipe Then to remove air in the suction pipe, pour water and power on and off repeatedly.
- Because the pump has no switch, use power switch on the wall or plug in and out from the receptacle.

AIR BLOWER

Specifications

Model	LA-28B	LA-45B	LA-60A	LA-80A	LA-100	LA-120
Rated Voltage: V AC	220/230/240*					
Rated Frequency: Hz	50					
Rated Pressure: MPa(kgf/cm²)	0.011(0.11)		0.015(0.15)		0.018(0.18)	
Operating Pressure Range: MPa(kgf/cm²)	0.005～0.02(0.05～0.2)		0.005～0.02(0.05～0.2)		0.005～0.025(0.05～0.25)	
Rated Airflow: L/min	28	45	60	80	100	120
Power Consumption: W	29	47	64	86	100	130
External Dimension(L×W×H): mm	207(L)×162(W)×205(H)		307(L)×190(W)×208(H)		407.5(L)×210(W)×232(H)	
Outlet Outside Diameter(D): mm	18				26	
Weight: kg	2.9	3.0	5.0	5.3	9.4	

*This unit must be operate only at the voltage indicated on the Name Plate.

1. For Safe Operation

Various symbols are used in this manual and on the product itself which are aimed at proper and safe operation in order to prevent injury to yourself or others or damage to property. The meanings of these symbols are explained below. Please be sure you understand their meanings before you read this manual.

Explanation of Diagrammatic Expressions (terms and symbols)

The term "Attention" used in this manual is to alert you to dangers such as the following.

Term	Degree of Danger Indicated by The Term
 Attention	This term indicates the possibility that continuing to work while ignoring this Attention, or working incorrectly without full understanding, may cause personal injury or physical damage.

The following symbols are used in this manual.

Symbol	Meaning
	This symbol advises you of an item which should be Noted (including Danger and Warning). The symbol on the left is the general note but specific details to be noted will be shown by a picture, word or explanatory text inside or near to the triangle.
	This symbol advises you of an action which must not be taken (is prohibited) in order to avoid danger. The symbol on the left is a general prohibition but specific details of the action which must not be taken will be shown by a picture or explanatory text inside or near to the symbol.
	This symbol advises you of an action which must be taken (is mandatory) in order to avoid danger. The symbol on the left is a general emphasis but specific details of the action which must be taken will be shown by a picture or explanatory text inside or near to the symbol.

Nitto Kohki's

Cat.NO. Lk04

MEDO Brand Air Blower

For aerobic sewage treatment system and aquatics



Model

Compact Type
LA-28B & LA-45B

Medium Type
LA-60B & LA-80B

Large Type
LA-100 & LA-120

Extra Large Type
LAM-200

Benefits include:

- Low Noise
- Low Power Consumption
- Easy Maintenance
- Unrivaled Lifetime
- Weatherproof Case IP55

Features

- **Low Power Consumption**
  Highly efficient blower saves energy.
- **Quiet Technology**
  High performance sound proofing gives quiet operation.
- **Easy Maintenance**
  Only one screwdriver is needed for filter replacement.
- **Oilless Design Offering Both Dry and Clean Air**
- **Low Running Temperature**
  Energy saving design greatly reduces heating effect.
- **Long Service Life with Linear Piston Technology**
  The rated specifications enable continuous operation for over 20,000 hours.
- **Light, Compact**
  Compact and ready-to-use design.
- **Easy Installation**
  No earthing/grounding work is required.

Specifications

Model	LA-28B	LA-45B	LA-60B	LA-80B	LA-100	LA-120	LAM-200
Power Supply	120 V, 220 V, 230 V, 240 V AC						
Rated Frequency	50 Hz, 60 Hz						
Rated Pressure	0.11 bar (1.56 psig)		0.15 bar (2.13 psig)		0.18 bar (2.56 psig)		0.20 bar (2.84 psig)
Operating Pressure Range	0.05 – 0.2 bar (0.71 – 2.84 psig)				0.05 – 0.25 bar (0.71 – 3.56 psig)		0.05 – 0.3 bar (0.71 – 4.27 psig)
Rated Airflow	28 LPM	45 LPM	60 LPM	80 LPM	100 LPM	120 LPM	200 LPM
Power Consumption	29 W / 50 Hz	47 W / 50 Hz	64 W / 50 Hz	86 W / 50 Hz	100 W / 50 Hz	130 W / 50 Hz	215 W / 50 Hz
	25.5 W / 60 Hz	45 W / 60 Hz	60 W / 60 Hz	80 W / 60 Hz	95 W / 60 Hz	118 W / 60 Hz	
Weight	2.8 kg	3.0 kg	5.0 kg	5.3 kg	9.4 kg	9.4 kg	12.3 kg

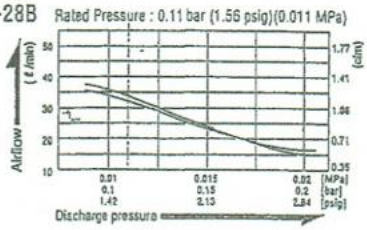
NITTO KOHKI CO., LTD.

MEDO Brand Air Blower

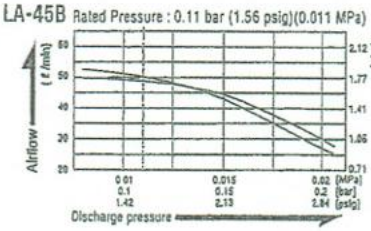
Air Flow Characteristics

50Hz
60Hz

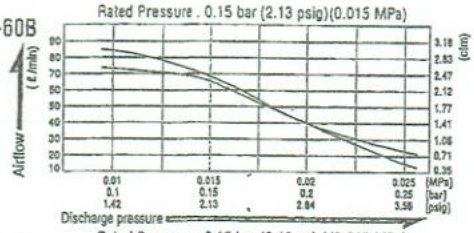
LA-28B
Rated Pressure : 0.11 bar (1.56 psig)(0.011 MPa)



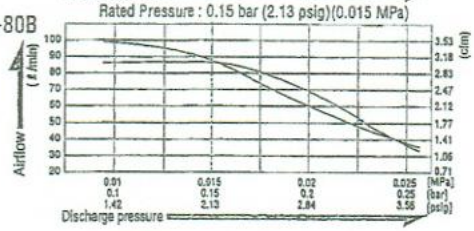
LA-45B
Rated Pressure : 0.11 bar (1.56 psig)(0.011 MPa)



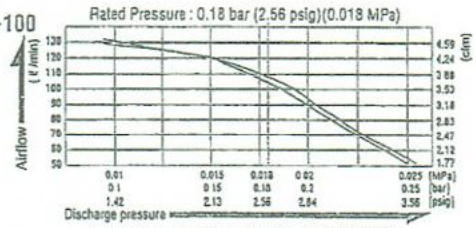
LA-60B
Rated Pressure . 0.15 bar (2.13 psig)(0.015 MPa)



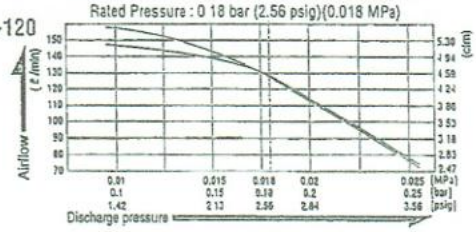
LA-80B
Rated Pressure : 0.15 bar (2.13 psig)(0.015 MPa)



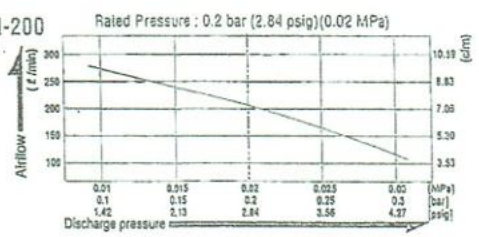
LA-100
Rated Pressure : 0.18 bar (2.56 psig)(0.018 MPa)



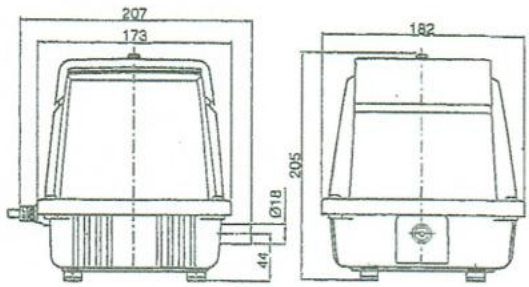
LA-120
Rated Pressure : 0 18 bar (2.56 psig)(0.018 MPa)

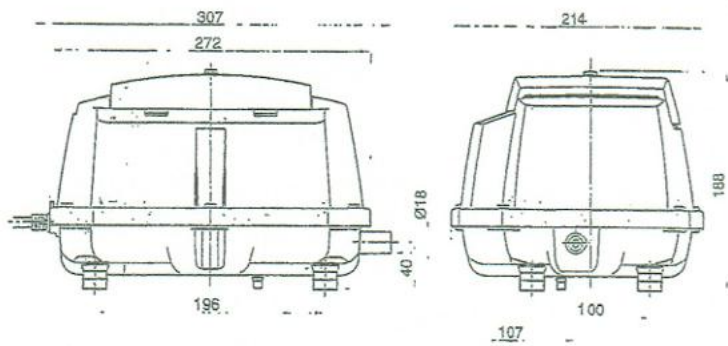


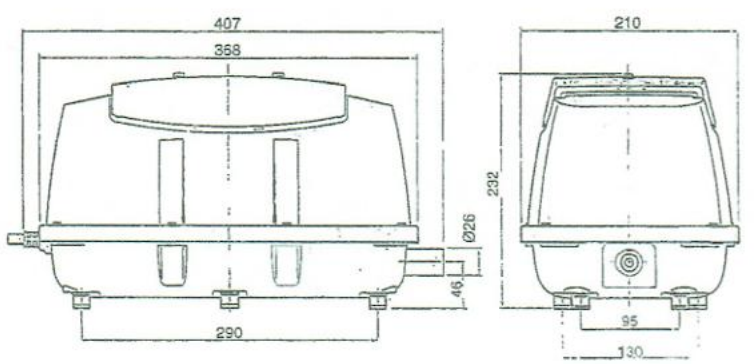
LAM-200
Rated Pressure : 0.2 bar (2.84 psig)(0.02 MPa)

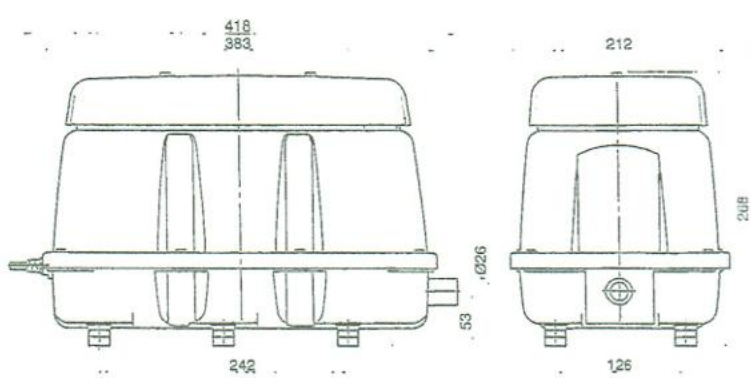


Sketch Drawing and Dimensions Diagram (mm)









★If the unit is to be run outside the operating pressure range, consult with your supplier for advice.
★Specifications and designs are subject to change at any time without notice.

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Section 3

Irrigation Systems

EFFLUENT DISPOSAL - IRRIGATION SYSTEM

The TechTreat CP2i will achieve a very high effluent quality that can be disbursed through a pump delivery line to the disposal area.

The most accepted method for effluent disposal is through a shallow sub surface irrigation system.

Method: Plastro hydropc Drip line/Geoflow wasteflow Compensating Drip Line

DRIPLINE SPECIFICATIONS		
	Plastro	**Geoflow**
Pipe Diameter	15.7 0D	15.7 OD
Wall thickness (mm)	0.9mm	1.10
Emitter flow rates available	2.2	2.3
Spacing	0.6m	0.6m
Pressure Range (m)*	5 - 35	5 - 40
Emitter spacing available (m)**	0.3, 0.4, 0.5, 0.6, 0.75, 0.9, 1.0**	
Note:		
*1m = 0.1 bar = 10 kPa = 1.45 psi		
** Non-standard emitter spacing available upon request		

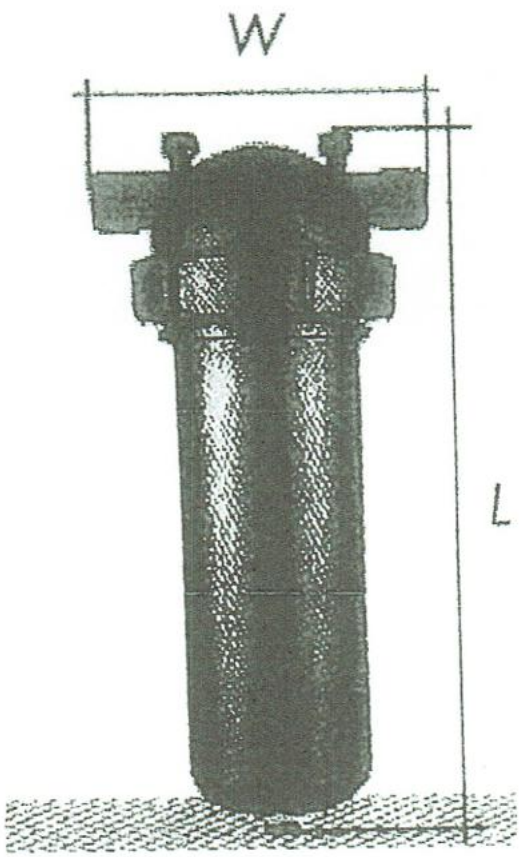
IRRIGATION ARKAL FILTER

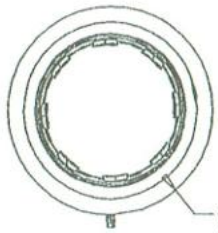
Final filtration of effluent before discharging through a irrigation system is achieved with an Arkal 25mm LB red disc super filter. This filter has a filtration performance of 120 mesh - 130 micron, and a total surface area of 50/2sq cm.

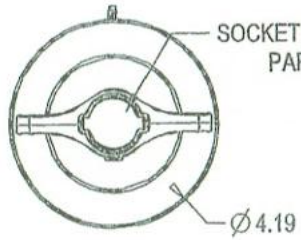
Any suspended solids that may be present in the effluent prior to the filter, will be prevented from entering the Plastro/wasteflow emitters, allowing long term performance of the irrigation system.

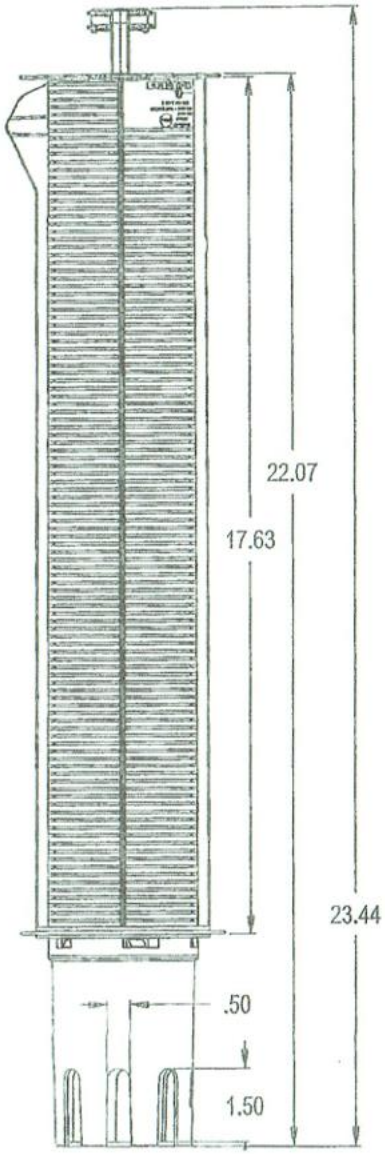
The removable Arkal filter discs should be cleaned every 3 months. Turn the pump power switch off before cleaning filter.

ARKAL SUPER FILTER



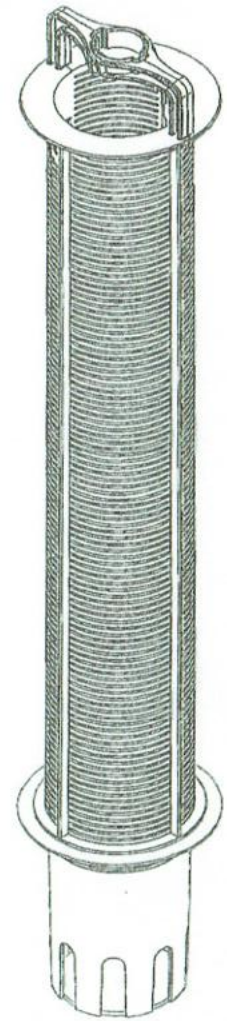












POLYLOK
Zabel A Division of Polylok Inc.

A1801-4X22 FILTER CARTRIDGE
COLOR - GREY
MATERIAL - POLYPROPYLENE
FILTER SIZE - 80 FT. OF 1/16" SLOT
FILTER AREA - 175 SQ.IN.

e-cogent
ENVIRONMENTAL ENGINEERING SOLUTIONS

wasteflow®

Dripline for Subsurface Wastewater Disposal

The only dripline manufactured with a herbicide to protect against root intrusion and a bactericide lining to inhibit slime growth.

INTRODUCTION

wasteflow® is a flexible and easy to install polyethylene dripline with pressure compensating turbulent flow emitters which distribute effluent slowly and uniformly even in difficult soils and hilly terrain.

ADVANTAGES

wasteflow® has two key advantages that no other dripline offers:

1. Emitters are protected by Rootguard® technology which uses Treflan® herbicide to prevent roots growing into the emitter. The herbicide is released at a uniform rate, maintaining sufficient concentration in the soil immediately surrounding the drip outlet which stops root intrusion.
2. wasteflow® is protected against slime growth on the inside walls by the use of Ultra Fresh®. Ultra Fresh is the green inner lining of the wasteflow® tube which is extruded with a bactericide that inhibits organic growth inside the dripline.



These features allow wasteflow® to be safely installed subsurface which has the following consequential advantages:

- Minimises health risk. As effluent is disposed of under the ground the potential for human contact is minimised compared to above ground irrigation.
- Provides environmentally superior disposal. as the soil is the ultimate system for wastewater treatment providing protection of surface water and ground water
- Subsurface disposal allows microorganisms present in the soil to complete the wastewater treatment process started by the preceding treatment system.
- The low application rate and the immense bacterial activity in the soil (which is far greater than can be achieved in a treatment plant) means that within a short distance of a typical dripper outlet the effluent has been treated to a level where bacterial contamination is difficult to detect.
- Solves limited area and soil problems as in most cases the disposal area can be utilised for other purposes such as golf courses, gardens, lawns, forestry and amenity areas.



Figures 1 and 2 show typical layouts and components.

System Components

Pumps, pump tanks / chambers and control systems.
WASTEFLOW dripfields depend on pumps to dose effluent under pressure to the field. These must be sized according to flow and pressure requirements. Look for submersible effluent pumps from a dependable source. Pumps should be capable of providing at least 15 psi or 1 Bar of head at the furthest (or highest dripper) including allowances for both static headloss and dynamic headloss through pipework, filters, meters etc. Control systems can generally consist of float switches or timers that ensure disposal is distributed over the field and throughout the day.

Filter
A filter with a maximum mesh size of screen mesh / 100 micron must be installed upstream of the disposal field (generally at the pump tank/chamber). Regular cleaning and inspection of the filter element is recommended to ensure that it is functioning correctly at all times.

Supply Manifold
This conveys the water from the pump tank to the dispersal area. Rigid PVC or PE is usually used. In areas were there is a possibility of lines freezing these must be designed to slope back to the pump tank. The pipe should be sized so that the velocity in the manifold is between 0.5 and 1.5ms^{-1}.

Return or Flush Manifold
In order to help clean the system, the ends of the drip lines are connected to a common return or flush line, again this is typically PE or PVC. This line helps to equalise the pressure within the system.

Flushing should be done frequently during the installation period. Periodic flushing will help to keep the manifolds clean. The return manifold should be installed to self-drain back to the pump or pretreatment tank in areas where freezing is possible. The return or flush manifold will generally discharge back to the septic tank or a dedicated disposal area as specified by the system designer.

Air Vacuum Breaker
Air vacuum breakers should be installed at the high points. These prevent soil from being sucked into the emitters due to back siphoning or backpressure. These are an absolute necessity with underground drip systems. They are also used for proper draining of the supply and return manifolds in freezing conditions. One should be installed at the high point of the supply manifold and one on the high point of the return manifold. Additional air vents may be required in undulating terrain. Freezing conditions require the air vacuum breaker be protected with insulation.

Filter Flush Valves
Used to flush debris from the filter cleanout port back to the pretreatment tank, this can be an electronically activated solenoid valve or a manual valve. If manual, it should be opened for a full flushing at least every six months and left cracked open slightly to flush continuously. Cracking open a manual valve may be used to increase flow through the system to be within the efficient flow rate of the filter and/or pump, if necessary.

Field Flush Valves
These valves are used to flush out fine particles that have passed through the filter and accumulated on the bottom of the tube at the end of each lateral, the field flush valve can be manual or electronic. If manual, it should be opened for full flushing at least every six months.

Depth and Spacing
WASTEFLOW systems typically have emitter lines placed at 600-1000 mm centers with a 600 mm emitter spacing such that each emitter supplies an area of approximately 0.36 m2. The lines should be placed at depths of 50 - 150 mm below the surface. This is a typical design for systems in sandy and loamy soils with a cover crop of lawn grass. Closer line and/or emitter spacing of 300mm are used on heavy clay soils or very coarse sands where lateral movement of water is restricted. Using closer spacing should not reduce the size of the field.

A minimum radius of bends of 300mm should be used otherwise there is a risk of kinking the WASTEFLOW. Angles and bends should be used in situations where tighter radii are necessary.

The length of dripline between supply and flush manifolds should not exceed 50m. This ensures the system can be flushed effectively.

Soil Layers and Types

The shallow depth of installation is an advantage of the subsurface dripfield since the topsoil or surface soil is generally the most biologically active and permeable soil for accepting water. The topsoil also dries the fastest after a rainfall event and will maintain the highest water absorption rate.

The quality and homogeneity of the soil may present a problem. If the soil was not properly prepared and there are pieces of construction debris, rocks and non-uniform soils, it is very difficult to obtain uniform water spread. In many cases, particularly if the soil is compacted, soil properties can be greatly improved by ripping and disking.

Adding Fill to the Dispersal Field

Some dispersal sites require additional soil be brought in for agronomic reasons or to increase separation distances from the restrictive layer. Restrictive layers stop or greatly reduce the rate of downward water movement, as a result surfacing may occur during part of the year. In soils with high water tables treatment is minimized due to a lack of oxygen.

Placing drip lines in selected fill material above the natural soil provides an aerated zone for treatment. Dispersal however still occurs in the natural soil and the field size must be based on the hydraulic capability of the natural soil to prevent hydraulic overload. Any time fill material is to be used, the area to receive the fill should have all organic material removed or it must be incorporated into the natural soil to prevent an organic layer from forming and restricting downward water movement. The fill material should be applied in shallow layers with the first 100 to 150 mm incorporated into the natural soil to prevent an abrupt textural interface. Continue this process until all fill has been incorporated. The fill area should be left crowned to shed surface water and may need diversion ditches or some other devices to prevent surface water from infiltrating. It is essential that the soil that the dripline lies within has an adequate structure so that voids are present to allow air to permeate into the soil and facilitate aerobic processes. If necessary soils should be blended with materials such as pumice or sand to provide a suitable soil medium. The entire fill area should have a vegetative cover to prevent erosion. If possible allow the fill to set at least seven to ten days before installing WASTEFLOW dripline. It is generally recommended that fill should not be used on slopes greater than 20%.

HIGH POINTS, SIPHONING AND SLOPES

A potential problem with buried drip lines is siphoning dirt into the emitters when the pump is switched off. For this reason:

- Drip lines should be installed on a fairly even gradient (i.e. Run dripline along a contour.)
- At least one vacuum breaker should be installed at the highest point in each zone.
- Avoid installing lines along rolling hills where you have high and low points along the same line. If this is the case, connect all the high points together and install a vacuum breaker on the connecting line.
- Drip lines should be connected at the end to a common return line with a flush valve.

EXCESSIVE ELEVATION DIFFERENCES

WASTEFLOW PC can tolerate very large height variations provided the pressure remains within the 7 to 60 psi range, and preferably within 10 to 45 psi.
At the end of each dosing cycle, water in the dripline will flow down to the bottom lines within the drip zone. This is called "lowhead drainage". On a slope site it is recommended that short manifolds with fewer lines and longer dripline runs are installed.

HILLY SITE

Concentrate drip lines at the top of the hill with wider spacing towards the bottom. In the case of compound slopes consult a professional irrigation designer or engineer.

MULTIPLE ZONES

Drip dispersal fields can be divided into multiple zones or subzones with solenoid, manual or index valves for the following reasons:

- Steep slopes with a risk of lowhead drainage can be subdivided to distribute the water at system shut-down more uniformly in the field.
- Smaller zones reduce the required flow per minute which consequently reduces the size of the pump, valves, filters, supply and return lines.
- If the dispersal field is located in multiple areas on the property.
- To accommodate varying soils or vegetation on a single site.

Note. On multiple zones, a single 'Headworks' can be used for filtration and flushing by placing zone valves downstream of the Headworks box. All zones would require a non return valve on the individual flush lines upstream of each line joining a common flush line to keep flush water from one zone entering any other zone during the flush cycle. If the effluent has not been through secondary treatment, then each zone should have a dedicated filter or Wasteflow Headworks.

REUSE FOR IRRIGATION

A good vegetative cover is an advantage to prevent erosion from the field and utilise water applied to the rooting zone. Sites should be planted or seeded immediately after installation.

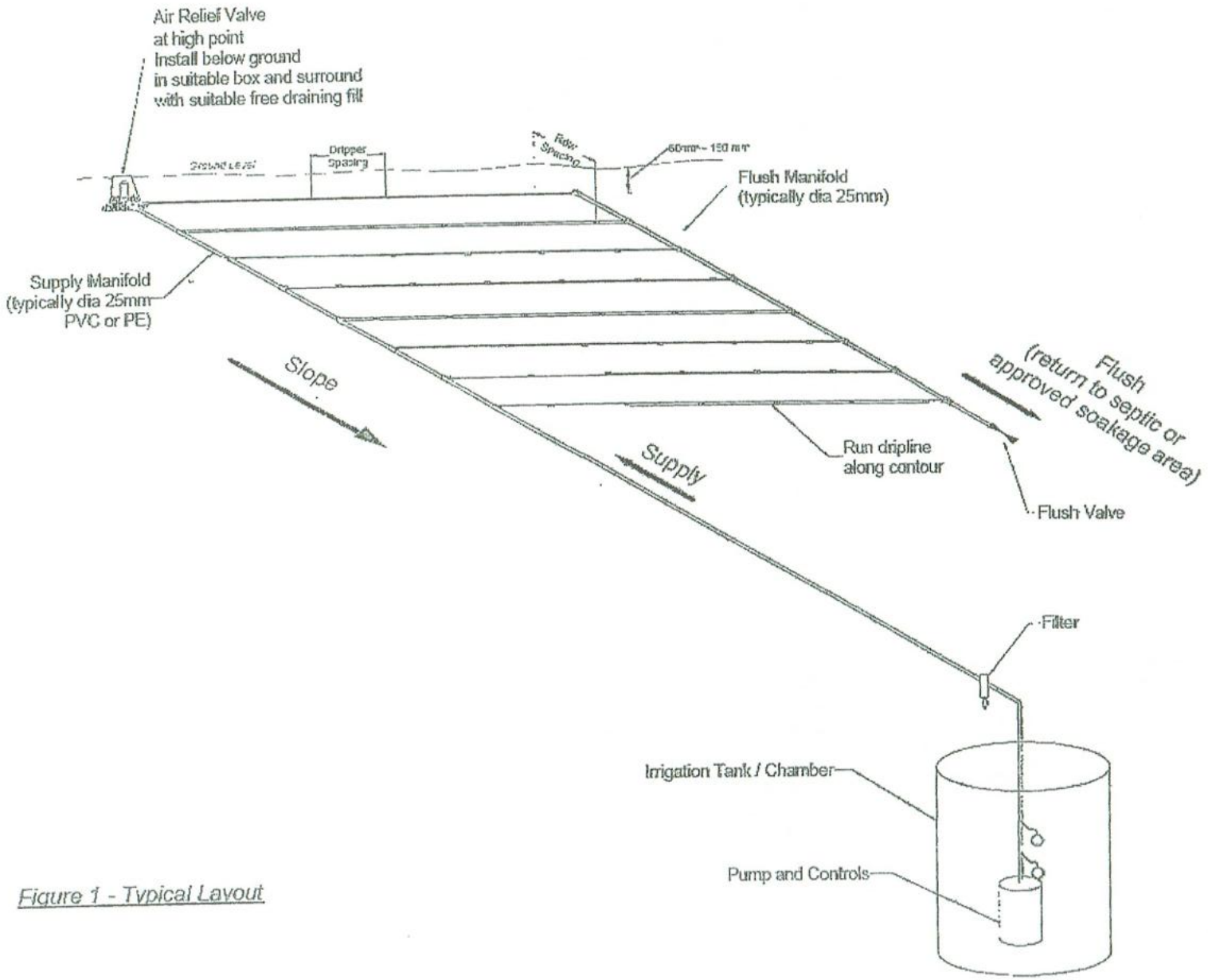


Figure 1 - Typical Layout

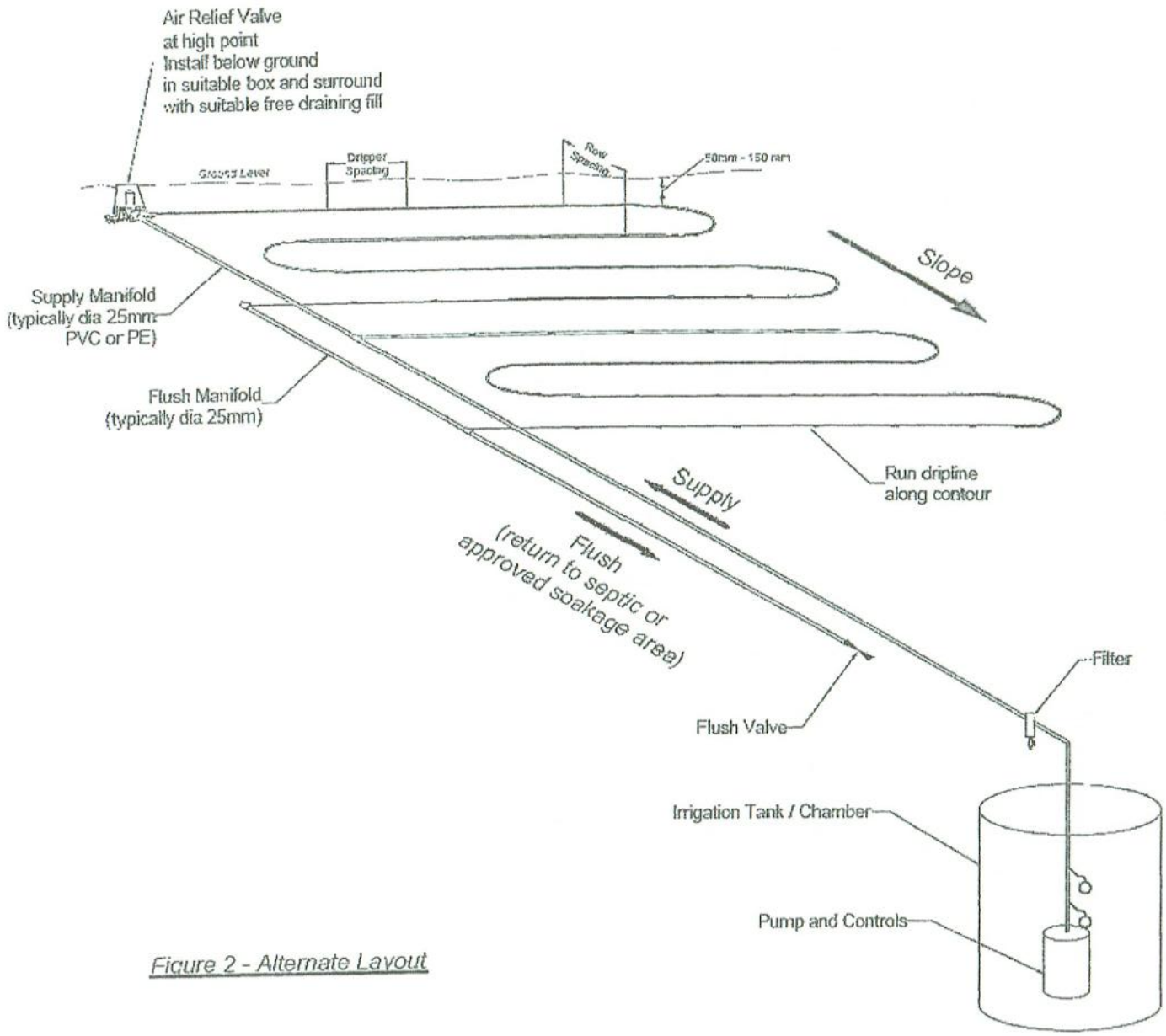


Figure 2 - Alternate Layout

Tube Non Leakage TNL

Brown	TNL-06-10 -THR	0.6-bar	1.6-bar	0.5-bar

Color	Netafim NZ Code	**Closing Pressure** Maximum sustained static head (inlet)	**Operating Pressure** Minimal required pressure for full opening	**Check Valve** Maximum sustained back pressure (*)
Red	TNL-02-03	0.2-bar	0.5-bar	0.15-bar
Black	TNL-04-06	0.4-bar	1.0-bar	0.3-bar
Brown	TNL-06-10	0.6-bar	1.6-bar	0.5-bar

Feature: self-locking at pressure drop, is used to avoid drainage of manifolds through the laterals.

(*) - - flow direction is backward.

1. Conversion of any drip system into a non-leakage version (by TNL installation) would prevent drainage of manifolds through the laterals, as well as avoid constant wetting of lower areas.
2. In the Uniram dripper the CNL feature improves laterals' water holding capacity in sloping areas (planning instructions were defined for such combination).
3. Installation of TNL at inlet and dripper line end of subsurface drip irrigation system will prevent backflow from flushing manifold into the laterals.

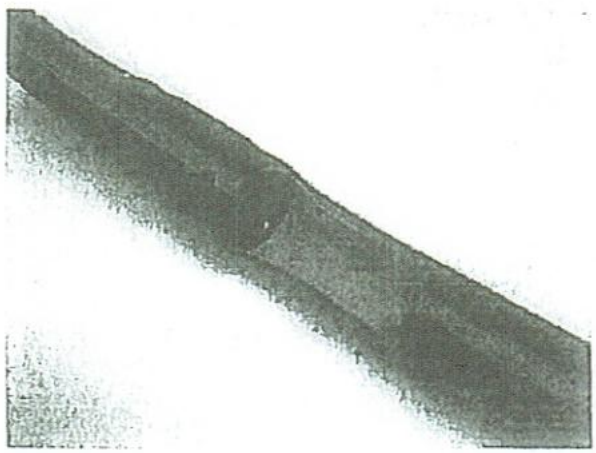


NETAFIM
IRRIGATION EQUIPMENT & DRIP SYSTEMS

e-cogent

ENVIRONMENTAL ENGINEERING SOLUTIONS

Wasteflow Drip Irrigation Line Installation and Maintenance Guidelines



October 2005

Introduction

Ecogent are the N.Z. supplier for Wasteflow. Wasteflow is a subsurface drip irrigation pipeline and is manufactured in the US by Geoflow Inc. Wasteflow drip line is suitable for use for the disposal of wastewater treated to secondary standards.

This guideline is intended to provide drainlayers and installers of irrigation fields with sufficient information so that the product can be installed in a manner that complies with the manufacturers specifications and will work effectively in most situations. The guide is intended for domestic situations where the total length of dripline installed is less than 400m. It is recommended that in situations where there are steep slopes, areas of fill, drainage lines, channels or watercourses in the vicinity of a proposed disposal area that a suitably qualified person design the disposal field. This document is not intended as a design guideline for the purposes of calculating the size of disposal areas etc.

Please note that the Wasteflow product supplied will, unless otherwise requested, be Wasteflow PC (pressure compensating).

Wasteflow (or equivalent product)

The main advantages of Wasteflow subsurface drip system for effluent dispersal are:

- Human and animal contact with effluent is minimized, reducing health risks.
- Correctly designed systems will not cause ponding or runoff.
- It can be used under difficult circumstances of high water tables, tight soils, rocky terrain, steep slopes, around existing buildings, trees or other vegetation, and on windy sites.
- Disposal of water is maximized by means of evapotranspiration.
- The system requires no gravel. It is easy to install directly into indigenous soils and the natural landscape can be maintained.
- Minimizes deep percolation.
- Consumption of nitrates by the plant material is increased.
- Invisible and vandal proof installations.
- Ten-year warranty for root intrusion, workmanship and materials. Systems are durable with a long expected life.
- Non intrusive. It allows use of the space while operating.
- Easily automated.
- Effluent can be re-used for irrigation.

WASTEFLOW dripline features: (or equivalent product)

ROOTGUARD®2

The risk of root intrusion with an emitter slowly releasing nutrient rich effluent directly into the soil is well known to anyone who has observed a leaking sewer pipe. All Geoflow drip emitters are guaranteed to be protected against root intrusion with ROOTGUARD. This patented process fuses the root-growth inhibitor, TREFLAN® into each drip emitter during manufacturing. Treflan is registered with the United States EPA for this application. The ROOTGUARD technology slowly releases Treflan in minute quantities to prevent root cells from dividing and growing into the barrier zone. It is chemically degradable, non-systemic, and virtually insoluble in water (0.3 ppm). ROOTGUARD carries a 10 year warranty against root intrusion.

Bactericide protection

Geoflow's WASTEFLOW has an inner lining impregnated with a bactericide, Ultra Fresh DM-50, to inhibit bacterial growth on the walls of the tube and in the emitter. This minimises the velocity required to flush WASTEFLOW dripline. The velocity only needs to move out the fine particles that pass through the 100 micron filter that, if not flushed, will ultimately accumulate at the distal end of each lateral. It is not necessary to scour growth off the inside wall of WASTEFLOW tubing. Since all pumps deliver more volume given less resistance to flow, just opening the flush valve will usually achieve this degree of flushing. When a minimum flushing velocity is requested, 0.2 ms-1 is used with Wasteflow dripline to get the settled particles at the bottom of the pipe back into suspension. This equates to 1.5 lpm per dripline.

Turbulent Flow Path

WASTEFLOW drip emitters are pre-inserted in the tube at 600mm spacings (300mm 450mm and 900mm also available) Angles in the emitter flow path are designed to cause turbulence in order to equalise flow between emitters and keep the emitters clean. Geoflow emitters boast large flow paths, which, coupled with turbulent flow, have proven over the years to be extremely reliable and dependable.

Root Intrusion in New Zealand

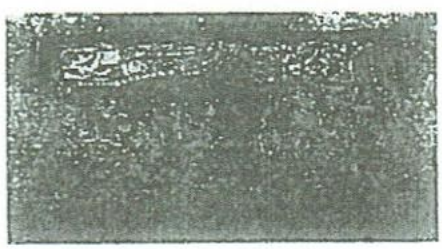
New Zealand experience confirms international research that root intrusion takes place in a variety of climates and soils. Roots will seek out the moisture within wastewater disposal dripline and actually enter the dripline through emitters. Once in the emitters the roots can reduce or even block flows through the emitters. This often results in increased flow volumes though other drippers in the subsurface disposal field that may result in effluent outbreaks or ponding.

This can be a health hazard and prolonged ponding may destroy the soil structure rendering the area unsuitable for wastewater disposal. As the emitters in a disposal field start to block, the irrigation pumps in the wastewater treatment plant are at increased risk of burning out due to reduced flows.

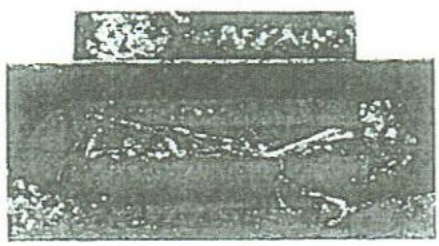
The following photographs are taken from a New Zealand university evaluation of root intrusion. The photos are of emitters from a subsurface dripline receiving treated wastewater from a recirculating sand filter. The scheme had been operating on a New Zealand property for three years.

wasteflow® is the only subsurface dripline manufactured with a herbicide to protect against root intrusion and a bactericide to inhibit slime growth, saving you costly repairs or replacements!

Root intrusion into the emitters of other brands not using Rootguard®



Root blockage inside drip emitter top chamber (With outlet hole removed)



Root intrusion into labyrinth chamber of the emitter (Diaphragm has been removed)

FURTHER WASTEWATER ADVICE

Clients with more complex wastewater problems requiring further design should contact their agent or ecogent Ltd.

ecogent engineers can provide solutions for septic tank or treatment plant filtration for flows up to several hundred cubic metres per day.

Ask us about the ecotube septic tank effluent filter.

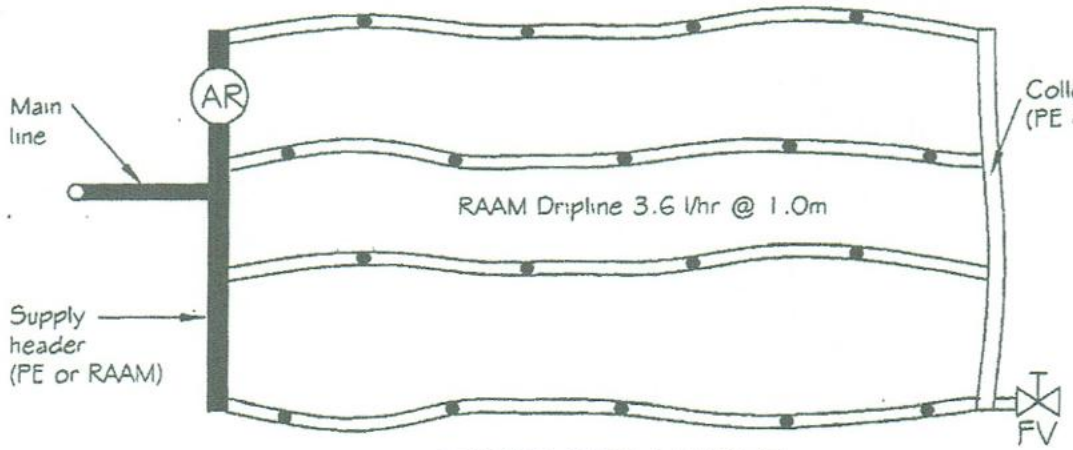
YOUR LOCAL AGENT

www.ecogent.co.nz
Ph: (09) 579 1080 / Fax: (09) 579 1090

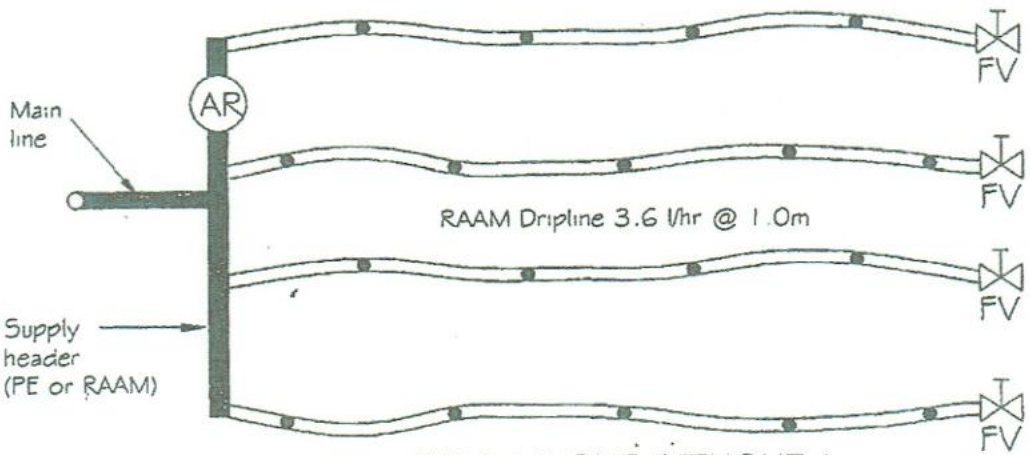
DISCLAIMER: Buyers and users must make their own assessment of our products under their own conditions for their own use. All queries regarding product suitability of purpose or installation should be directed to ecogent for advice and assistance. Availability of product may differ slightly from that available in your area.

TechTreat Limited
Sewage Treatment Systems





BASIC GRID LAYOUT



FIELD LAYOUT WITHOUT A COLLECTION HEADER PIPE

AR — Air / Vacuum Release Valve

FV — Flushing Valve

ON-SITE EFFLUENT DISPOSAL
TYPICAL FIELD LAYOUTS
Trickle Irrigation

PO Box 970 Kerikeri
Phone 09 407 1967 Mobile: 0274472622 email: techtreat@hotmail.com

Section 4

Septic Tanks

Blackwater Products

STRENGTH BY DESIGN
SEPTIC TANKS

Septic Tank & Holding Tank Installation guide



3200L Septic Tank
3200L Holding Tank
3200L Septic Tank with Riser
3200L Holding Tank with Riser
4000L Septic Tank
4000L Holding Tank



TANK BASE ASSEMBLY – INLET/OUTLET JUNCTIONS

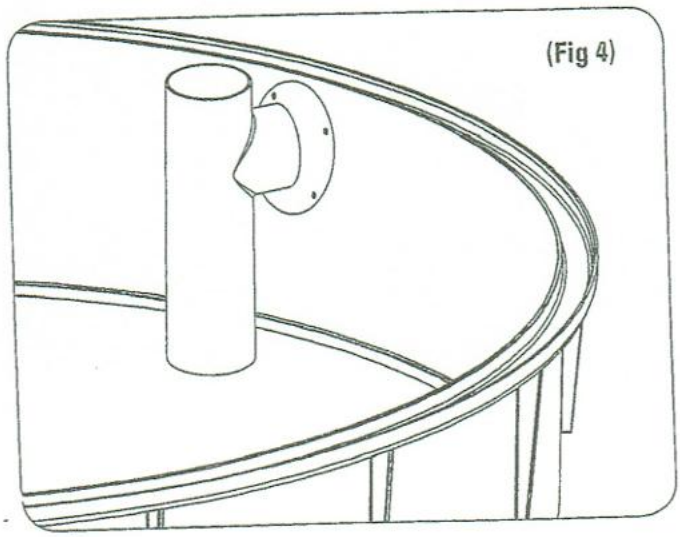
1. On inlet side of tank base fit Inlet T-Junction. Apply silicone sealer to the flange of the T-Junction and secure with supplied four (4) stainless steel self-tapping screws. **(Fig 4 – shown for 3200L)**
2. On outlet side of tank base fit Outlet T-Junction. Apply silicone sealer to the flange of the T-Junction and secure with supplied four (4) stainless steel self-tapping screws. **(Fig 5 – shown for 4000L)**

PIPE CONNECTION

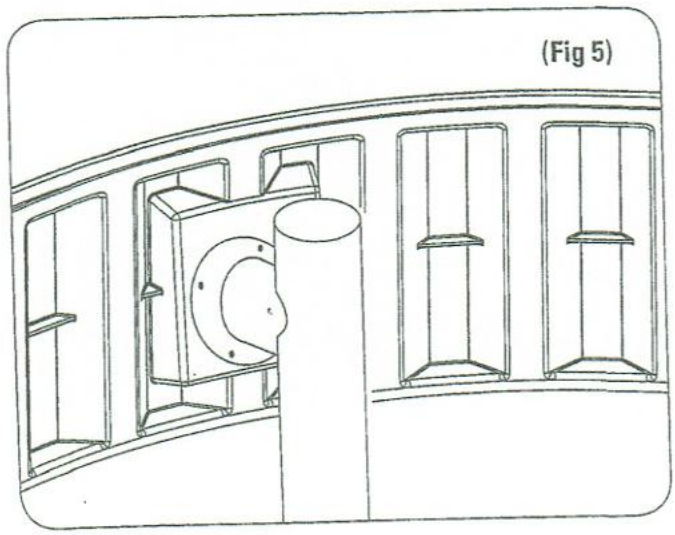
1. Connect 100mm PVC sewer pipe into Inlet T-Junction. Glue inlet pipe to T-Junction with PVC plumbers glue.
2. Connect 100mm PVC sewer pipe into Outlet T-Junction. Glue outlet pipe to T-Junction with PVC plumbers glue.

TANK ANCHORING

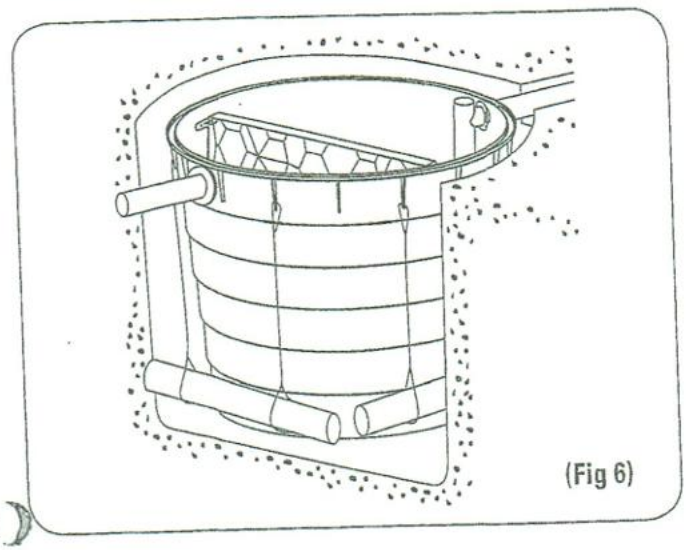
1. Tie anchoring ropes (8) to the pre-drilled lugs in the rim of the tank. Leave the looped end to hang free.
2. Place four durable anchoring beams (not included) through the looped ends of the ropes.
3. Anchor beams can be made from 100mm PVC sewer pipe (plumber to supply) and should be 2 metres long and positioned to exceed the tank's extremities. **(Fig 6 & 7)**



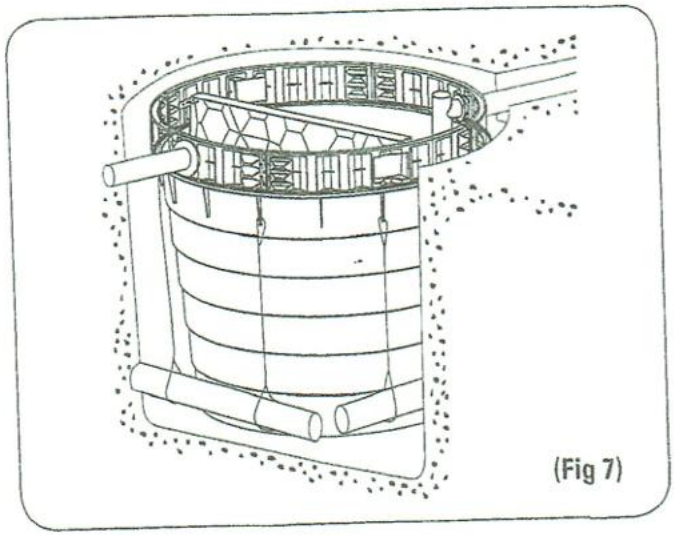
(Fig 4)



(Fig 5)



(Fig 6)



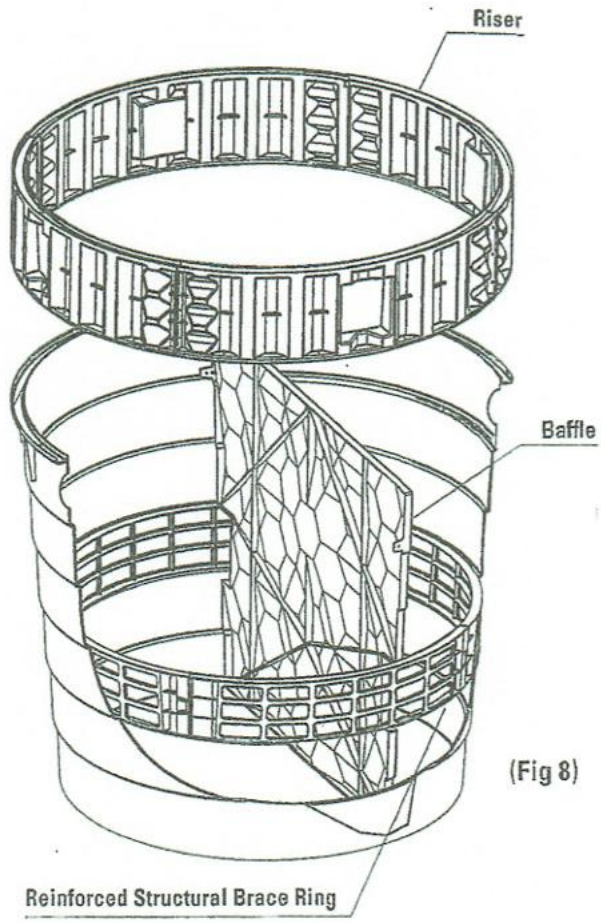
(Fig 7)

RELN 3200L SEPTIC/HOLDING TANKS COMPLETE WITH RISER

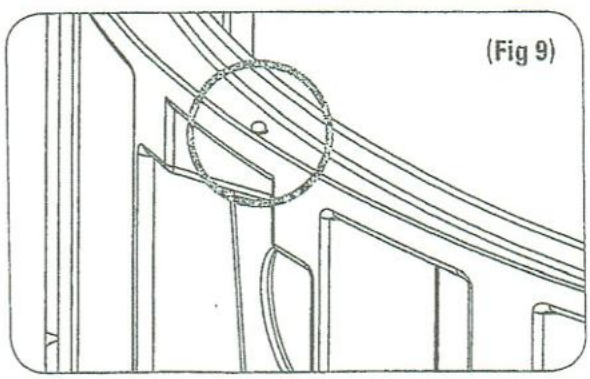
In sites where more fall is required from the exit point of the sewer line from the house to the septic tank, a riser can be used on a 3200L septic tank and holding tank. This tank must be ordered complete with riser and will be supplied with a factory installed reinforced structural brace ring **(Fig 8)**. The plumber installing the septic tank is to assemble the riser ring onto the tank base. Only one riser ring can be used. Riser rings must not be assembled to tank bases that do not have a factory fitted reinforced structural brace ring.

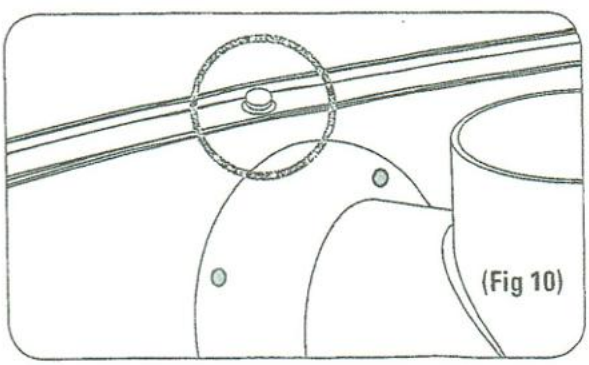
ASSEMBLING RISER RING

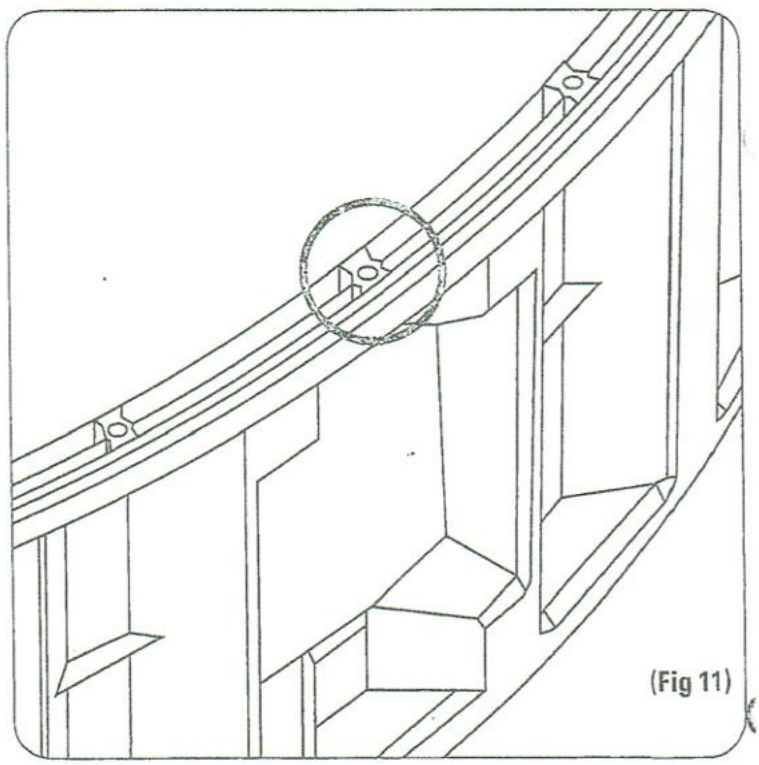
1. Seal the riser ring to the tank with the provided black mastic sealing strip.
2. Cut four (4) strips 390mm long for the vertical sealing faces of the riser ring.
3. Apply a sealing strip to the vertical face ensure sealing strips cover the full length of the vertical faces to provide a seal between each riser segment face. Remove paper strip. Ensure a small protrusion of the seal at the bottom edge of the ring (3mm).
4. Bolt each riser segment panel together with the 12 supplied M8x40 stainless steel bolt, washer and nuts. Use a washer on each side of the bolt. Securely tighten bolts. This completes assembly of the ring segments.
5. On the tank base roll the remaining sealing strip into the channel lip rim of the tank base, ensuring even coverage. Remove paper strip.
6. The sealing strip is mouldable. Mould the ends of the sealing strip together to create a single complete circular seal.
7. Identify the riser segment panel with the location lug. **(Fig 9)**
8. This riser segment and lug is positioned directly above the inlet pipe and aligns with the lug in the tank base **(Fig 10)** and the inlet inspection point in the lid.
9. Place and align the assembled riser ring on top of the tank base.
10. Ensure correct positioning of riser ring dowel hole on the tank base location dowel. **(Fig 11)**
11. With an M8 bit, drill and fix riser ring in position with 16 provided M8x50 stainless steel bolts, washers and nuts. Use a washer on each side of the bolt. Securely tighten bolts. Do not use self tapping screws!



(Fig 8)

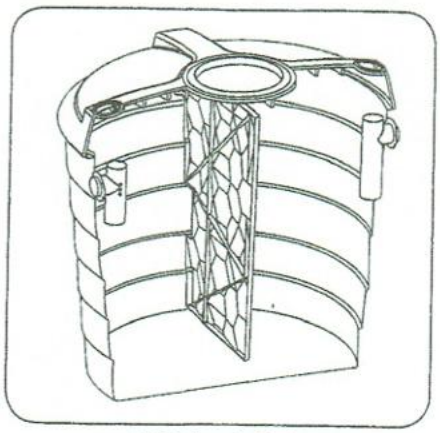

(Fig 9)


(Fig 10)

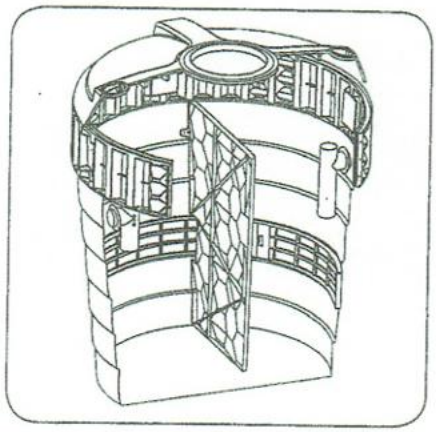

(Fig 11)

COMPLETION

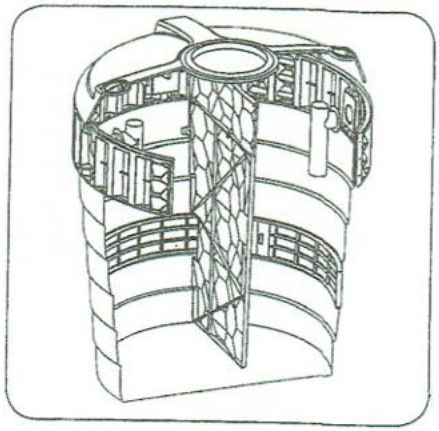
1. Secure the manhole cover then fill tank with water to outlet level.
2. After completely filling the tank with water, backfill around the tank with clean fill and compact thoroughly. Thorough compaction is required to secure anchors and to ensure the backfill has the same density as the surrounding ground.
3. **Compaction is important** – ensure there are no large or sharp objects in backfill material.
4. Ensure surface water run-off is directed away from pipe trenches and tank installation.



3200L Septic Tank



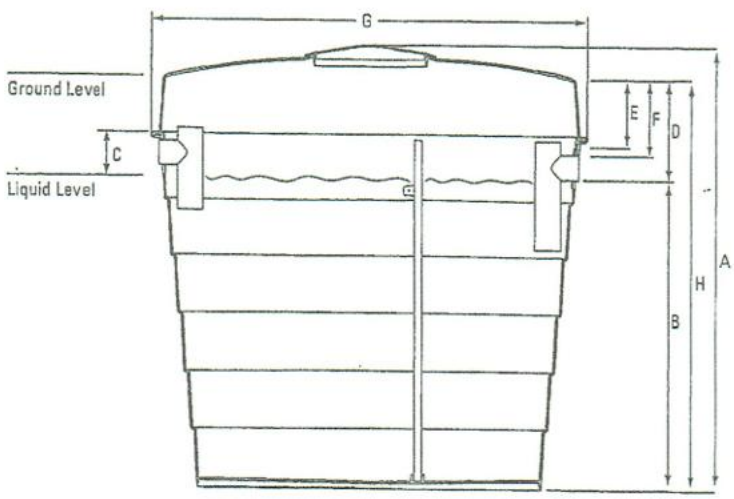
3200L Septic Tank w/Riser



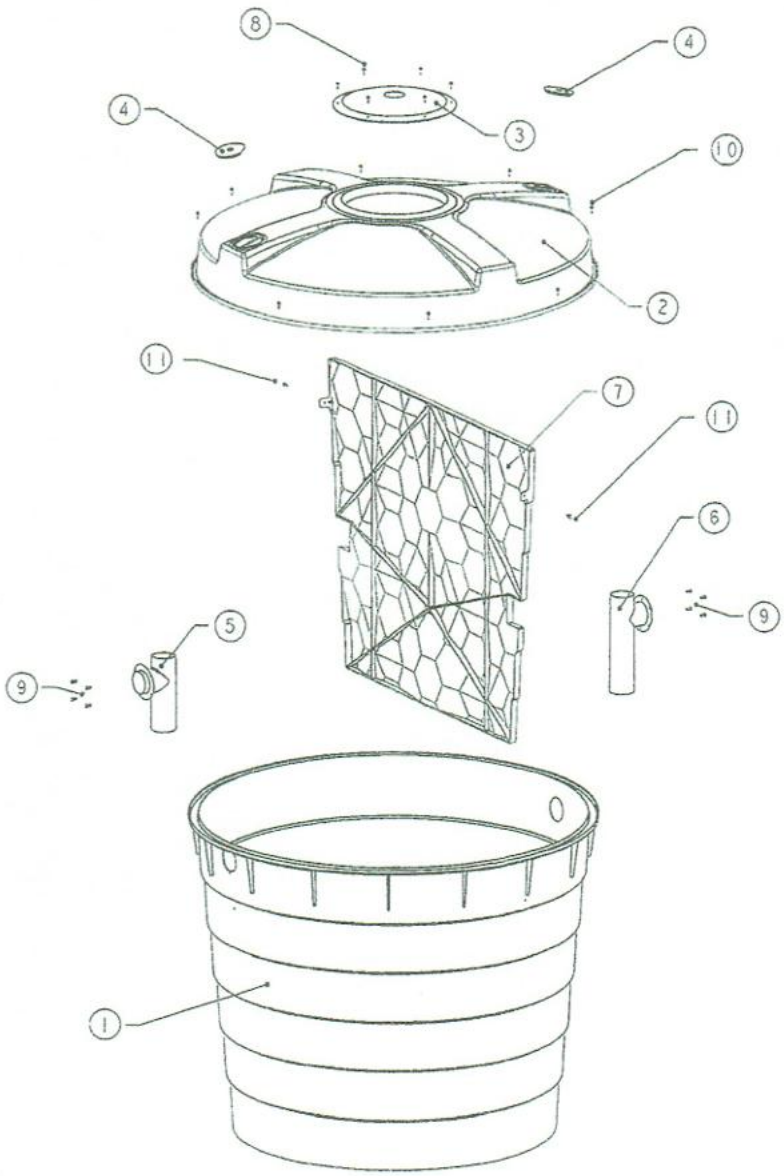
4000L Septic Tank

TECHNICAL DETAILS SUMMARY

	All Dimensions (mm), Capacities and Weights Nominal	3200L	3200L / Riser	4000L
A	Overall tank height	2038	2410	2410
B	Liquid depth level	1427	1427	1732
C	Tank rim to invert of outlet	200	585	385
D	Under roof to liquid level	460	845	540
E	Maximum cover to inlet pipe	300	685	380
F	Maximum cover to outlet pipe	350	735	430
G	Overall diameter	1998	1998	1998
H	Tank base to ground level	1887	2272	2272
	Capacity	3200L	3200L	4000L
	Weight	122kg	159kg	159kg
	Weight including baffle	139kg	177kg	181kg



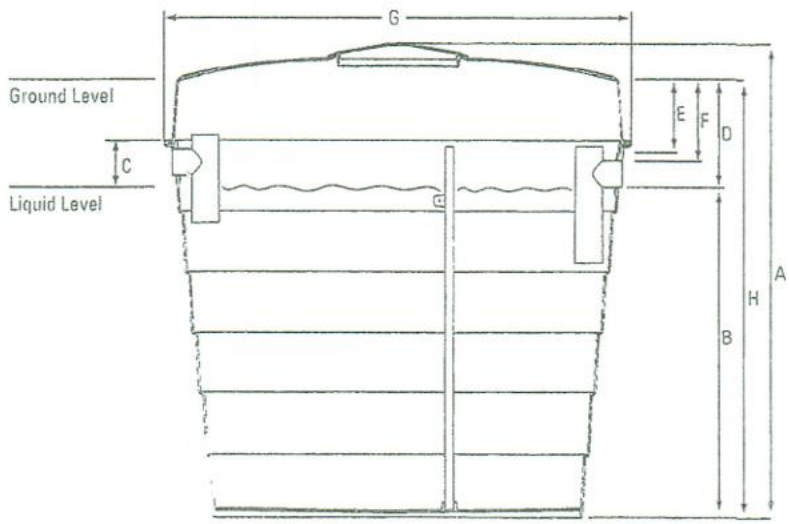
3200L SEPTIC TANK



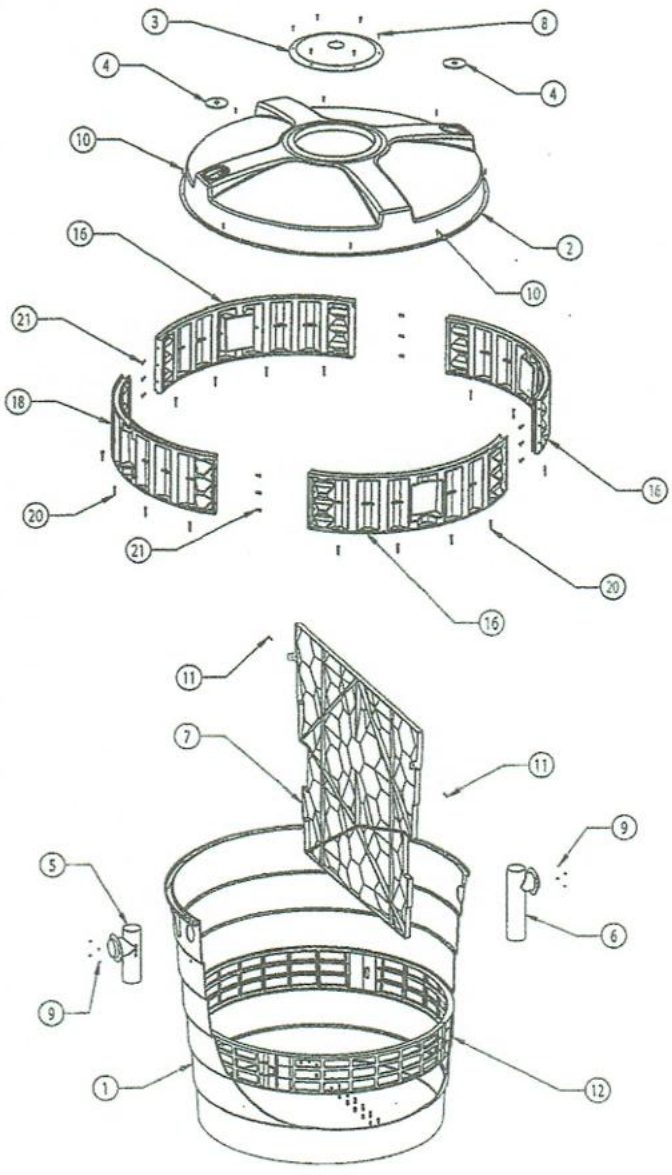
Item no.	Qty	Description
1	1	Tank Base - factory predrilled to nominal capacity of 3200L
2	1	Tank Lid
3	1	Manhole Cover
4	2	Inspection Cover
7	Optional	Baffle - Optional at extra cost. Please refer your local authority requirements
Accessory Kit Contents		
5	1	Inlet T-Junction
6	1	Outlet T-Junction
8	6	Manhole Self Tapping Screws, 10g 316 Stainless Steel
9	8	T-Junction Self Tapping Screws, 10g 316 Stainless Steel
10	8	Lid Bolt, Washer, Nut, M6 316 Stainless Steel
11	2	Baffle Bolt, Washer, Nut, M6 316 Stainless Steel
22	8	Anchor Rope
23	1	Installation Instructions

All Dimensions (mm), Capacities and Weights Nominal

A	Overall tank height	2038
B	Liquid depth level	1427
C	Tank rim to invert of outlet	200
D	Under roof to liquid level	460
E	Maximum cover to inlet pipe	300
F	Maximum cover to outlet pipe	350
G	Overall diameter	1998
H	Tank base to ground level	1887
	Capacity	3200L
	Weight	122kg
	Weight including baffle	139kg



3200L SEPTIC TANK WITH RISER



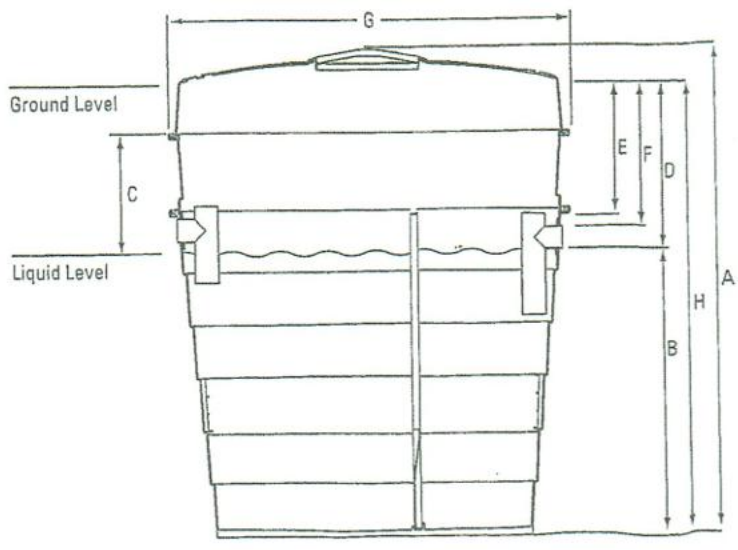
Item no.	Qty	Description
1	1	Septic Tank Base – factory predrilled to nominal capacity of 3200L including factory fitted reinforcing ring (item 12)
2	1	Tank Lid
3	1	Manhole Cover
4	2	Inspection Cover
7	Optional	Baffle – Optional at extra cost. Please refer to your local authority requirements
Riser Ring Contents		
16	3	Riser Side Panels
18	1	Riser Side Panel – Keyed
Accessory Kit Contents		
5	1	Inlet T-Junction
6	1	Outlet T-Junction
8	6	Manhole – Self Tapping Screws 10g 316 Stainless Steel
9	8	T-Junction Self Tapping Screws 10g 316 Stainless Steel
10	8	Lid – Bolt,Washer,Nut M6 316 Stainless Steel
11	2	Baffle – Bolt,Washer,Nut M6 316 Stainless Steel
20	16	Riser/Tank – Bolt, Washer, Nut M8x50 316Stainless Steel
21	12	Riser Ring Bolt, Washer, Nut M8x25 316 Stainless Steel
22	8	Anchor Rope
23	1	Installation Instructions

Note:

- *Only one riser can be used*
- *Riser may only be fitted to tank with factory fitted reinforced structural brace ring*

All Dimensions (mm), Capacities and Weights Nominal

A	Overall tank height	2410
B	Liquid depth level	1427
C	Tank rim to invert of outlet	585
D	Under roof to liquid level	845
E	Maximum cover to inlet pipe	685
F	Maximum cover to outlet pipe	735
G	Overall diameter	1998
H	Tank base to ground level	2272
	Capacity	3200L
	Weight	159kg
	Weight including baffle	177kg



RELN Septic & Holding Tank WARRANTY



RELN

Congratulations! You have made an excellent choice of this quality product. Our commitment to quality also includes our service. Should you, contrary to expectations, experience defects due to manufacturing faults, Reln will provide you with a warranty against defects as follows:

Warranty

The Reln Septic / Holding Tank is manufactured to the requirements of AS/NZS1546.1 and is guaranteed to be free from defects in workmanship and parts for a period of 15 years from the date of purchase. Defects that occur within this warranty period, under normal use and care, will be repaired, replaced or refunded at our discretion. The benefits conferred by this warranty are in addition to all rights and remedies in respect of the product that the consumer has under the Competition and Consumer Act 2010 and similar state and territory laws.
Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Proof of Purchase

This warranty is valid for the original purchase item and is not transferable. Please keep your purchase docket, tax invoice or receipt as the best proof of purchase, and as proof of date on which the purchase was made.

Extent of Warranty

This warranty is limited to defects in workmanship or parts. Your warranty does not cover installation. Reln Septic Tanks and Holding Tanks must be installed strictly in accordance to installation instructions by a qualified licensed plumber and must conform to all state and local regulation requirements.

Normal Wear and Tear

This warranty does not cover normal wear and tear to the products or parts.

Register Your Product

To further assist you with your warranty, Reln recommend registering your product. Please complete the separate warranty card enclosed with the particulars of your purchase and installation and return to Reln within one month of purchase / installation to:
Reln Pty Ltd, Attention: Customer Service, PO Box 5182 Minto BC NSW 2566.

Exclusions

This warranty does not cover:

- The installation of Septic Tanks and Holding Tanks. Installation must be conducted by a qualified licensed plumber.
- Any defects caused by an accident, transportation, misuse, abuse, improper installation or operation, lack of reasonable care, unauthorised modification, loss of parts, tampering or attempted repair by a person not authorised by Reln.
- Any product that has not been installed, operated or maintained in accordance with the manufacturer's installation instructions provided with the product.
- Any product, system or component that is supplied in addition to the Reln Septic / Holding Tank.
- Any product that has been used for purposes other than domestic use.
- The cost of transportation of the product from customer to distributor or from distributor to the customer.

To Make a Claim

To obtain service under this warranty or to have the product repaired please contact the Reln Customer Service Helpline on 1300 137 356 with your dated sales receipt (proof of purchase) and the completed Warranty Details certificate. If you require assistance regarding the warranty conditions or have technical enquiries about your product, please contact our Customer Service Helpline. phone: 1300 137 356 email: sales@reln.com.au website: www.reln.com.au



Reln Septic / Holding Tank - Warranty Details
15 Year Warranty - Reln Pty Ltd
Complete this Warranty Record and keep with your proof of purchase

Product Type: Septic Tank ☐ Holding Tank ☐

Capacity: 3200L ☐ 3200L with Riser ☐ 4000L ☐

Home Owners Name: _____

Home Owners Address: _____

State: _____ Postcode: _____

Date of Purchase: _____ Receipt Date & Number: _____

Store where tank was purchased: _____

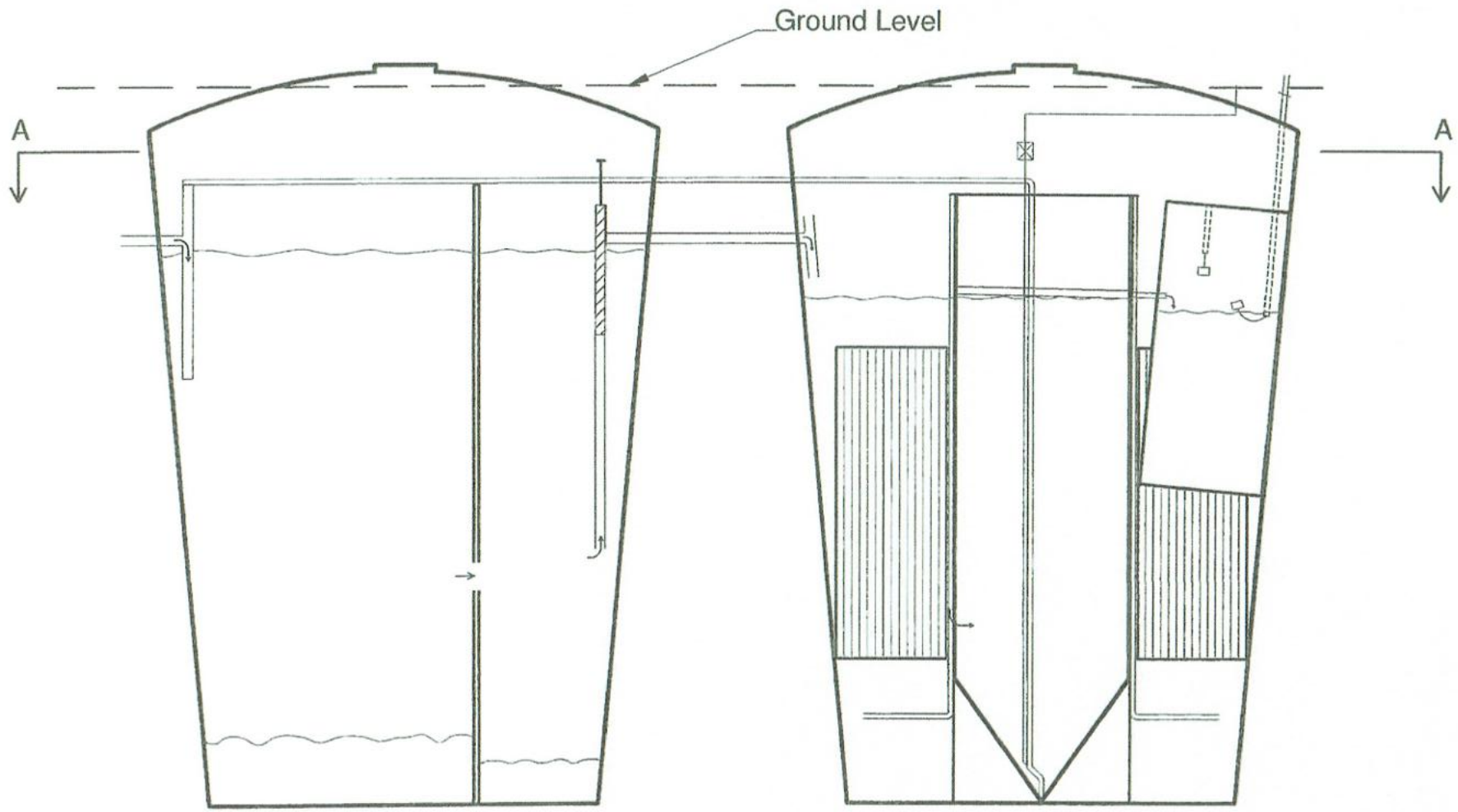
Installer's (Company Name): _____

Date of Installation: _____

RELN

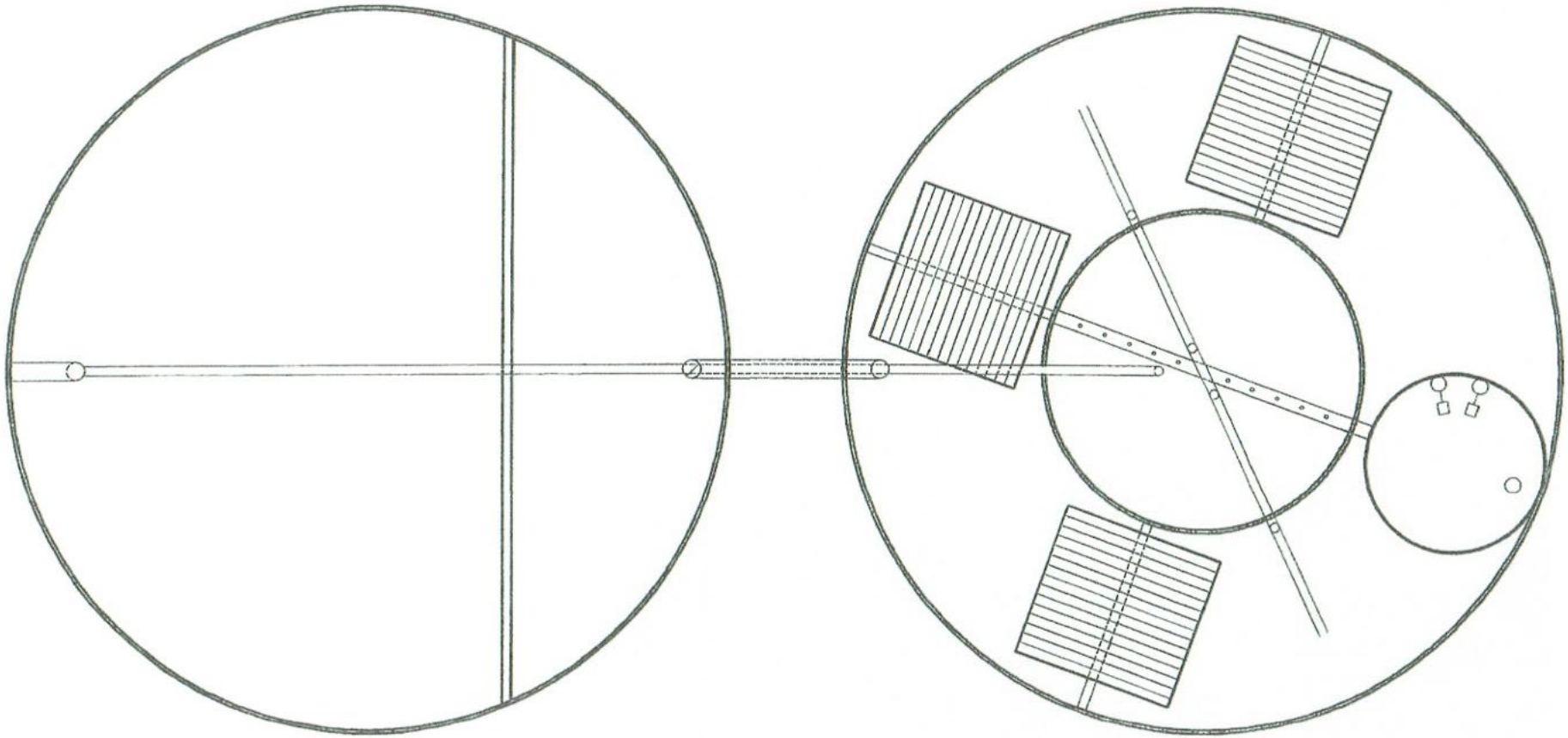
Section 5

System Schematic View

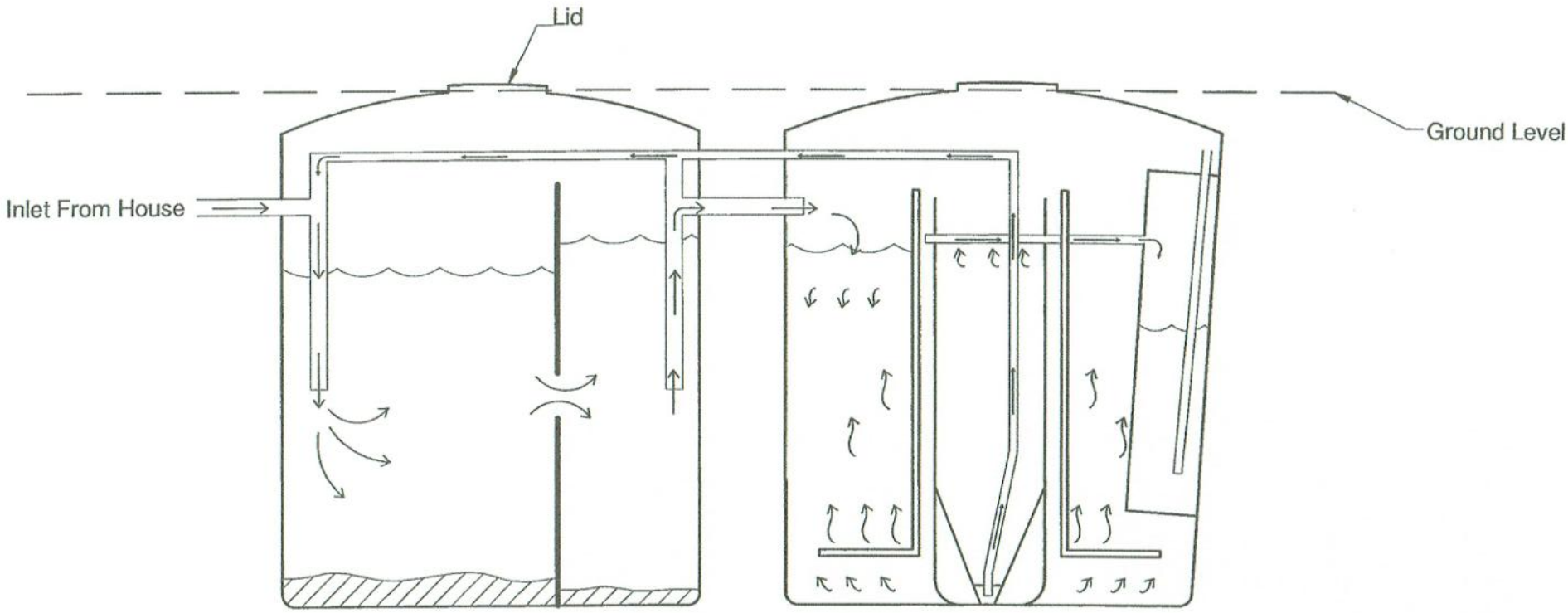


Revision notes:		
Rev:	Date:	Notes:

Client:	Description: Tank Elevation	Date: 4 May 2013	Tech Treat Limited	
Drawn by: CM		Scale @ A4: NTS		
		Revision: A		



Revision notes:						
Rev:	Date:	Notes:	Client:	Description: Cross Section A-A	Date: 4 May 2013	Tech Treat Limited
			Drawn by: CM		Scale @ A4: NTS	
					Revision: B	



Revision notes:		
Rev:	Date:	Notes:

Client:	Description: Flow Diagram	Date: 21 April 2013	Tech Treat Limited	
Drawn by: CM		Scale @ A4: NTS		
		Revision: B		

Section 6

OSET NTP Testing Procedures

OSET NTP TESTING PROCEDURES

COMPARISON – AS/NZS 1546.3:2008 versus OSET NTP AS/NZS 1547 SECONDARY EFFLUENT QUALITY ASSESSMENT

A: Testing Protocol Comparison

Section 9.3.2 of the Trial 8 (2012-2013) OSET NTP Testing Procedures sets out the difference between the AS/NZS 1546.3 testing protocol and the use of the OSET test results in evaluating the secondary treatment effluent quality performance under the Trials. The two procedures are compared in the table below.

Key comparison points are summarised in **B** below, with evaluation criteria for each testing programme set out in **C** below.

<table>
<tr><th rowspan="2">Week
No.</th><th colspan="2">OSET NTP Secondary Effluent Quality Performance Evaluation to AS/NZS 1547</th><th colspan="2">AS/NZS 1546.3 Testing Protocol</th></tr>
<tr><th>Testing</th><th>Period</th><th>Testing</th><th>Period</th></tr>
<tr><td>1</td><td rowspan="7">(a) Test Flow 1,000L/d at 5 persons commences in Week 1
(b) Five Profile A samples at 6 day intervals
(c) Adjustment of unit settings permitted</td><td rowspan="7">(a) Media Development (and settling in) Phase
(b) Samples are for information of the participating company</td><td rowspan="7">Test Flow 1,200L/d at 8 persons commences Week 1</td><td rowspan="7">Media Development (and settling in) Phase</td></tr>
<tr><td>2</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td></tr>
<tr><td>5</td></tr>
<tr><td>6</td></tr>
<tr><td>7</td></tr>
<tr><td>8</td><td></td><td>Sampling Period 1</td><td rowspan="4">16 samples in Week 8 (4 samples per day over 4 consecutive days)</td></tr>
<tr><td>9</td><td rowspan="14">19 samples at six day intervals (10 Profile A, 9 Profile B) of which five are over consecutive days in Week 17 [Routine maintenance permitted]</td><td rowspan="14">Pre-benchmarking Phase

The 19 samples count for AS/NZS 1547 performance evaluation</td><td rowspan="3"></td></tr>
<tr><td>10</td></tr>
<tr><td>11</td></tr>
<tr><td>12</td><td>Maintenance service</td></tr>
<tr><td>13</td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>14</td></tr>
<tr><td>15</td></tr>
<tr><td>16</td><td>Sampling Period 2</td><td rowspan="5">16 samples in Week 16 (4 samples per day over 4 consecutive days)</td></tr>
<tr><td>17</td><td>Sludge loading event</td></tr>
<tr><td>18</td><td rowspan="5"></td></tr>
<tr><td>19</td></tr>
<tr><td>20</td></tr>
<tr><td>21</td></tr>
<tr><td>22</td></tr>
<tr><td>23</td><td rowspan="13">19 samples at six day intervals (10 Profile A, 9 Profile B) of which five are over consecutive days in Week 29 [No maintenance permitted]</td><td rowspan="13">Benchmarking Phase
(a) 19 samples count for AS/NZS 1547 performance
(b) 16 samples count for Benchmarking performance</td><td rowspan="2"></td></tr>
<tr><td>24</td><td>Maintenance service</td></tr>
<tr><td>25</td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>26</td><td>Sampling Period 3</td><td rowspan="12">16 samples in Week 12 (4 samples per day over 4 consecutive days)

[Note: Weeks 8, 16 and 26 flow rate increased to 120% normal. Sampling flow rate increased to 160% normal 30 min before sampling.]</td></tr>
<tr><td>27</td><td rowspan="11"></td></tr>
<tr><td>28</td></tr>
<tr><td>20</td></tr>
<tr><td>30</td></tr>
<tr><td>31</td></tr>
<tr><td>32</td></tr>
<tr><td>33</td></tr>
<tr><td>34</td></tr>
<tr><td>35</td></tr>
<tr><td>36</td><td>2,000L/d over five days</td><td rowspan="4">High Load Phase</td></tr>
<tr><td>37</td><td>1,000L/d high load recovery period (3 samples)</td></tr>
<tr><td>38</td><td></td></tr>
<tr><td>39</td><td></td></tr>
</table>

B: **Key Comparison Points**

OSET NTP Secondary Effluent Quality Performance Evaluation to AS/NZS 1547	AS/NZS 1546.3 Testing Protocol
• The 39 weeks of the OSET Trials run through a fixed annual period incorporating summer, autumn and early winter (cold weather)	• The 26 weeks of AS/NZS 1546 testing is not to any fixed seasonal period
• A total of 38 samples used for AS/NZS 1547 secondary effluent quality assessment	• A total of 48 samples used for AS/NZS 1546.3 assessment against test criteria
• Daily sampling at 6-day intervals throughout 27 continuous weeks includes weekends and all week days (total of 38 separate sampling days).	• Five sampling days in 3 separate weeks (total of 15 separate sampling days).
• Assessment criteria for BOD and TSS identical	• Assessment criteria for BOD and TSS identical
• Testing Profile A includes BOD, TSS, TN , NH_4-N, TKN, TOXN, NO_3-N, NO_2-N, TP, Alk, pH, and Temp. • Testing Profile B includes all of profile A plus FC. • For treatment units incorporating disinfection processes the Profile B testing can be extended as required by the participating company.	• Testing includes BOD, TSS and *E.coli* (plus DO and Cl_2 residual)
• No sludge pre-loading is provided for. The 35 week testing period with continuous weekly samples from Week 9 onwards provides ample indication of treatment unit performance during an 8-month period. Field sampling (Strand 2) is intended to assess performance under long-term loading during which sludge accumulation will have progressed steadily over time.	• The sludge loading period in Week 17 involves shutting down the inflow, replacing 800L of primary chamber contents with 800L of septic sludge sourced off-site, and allowing the sludge to settle for 24 hours before reinstating flow.
• Routine maintenance (but no settings adjustment) is permitted during the 19 sample pre-benchmarking period Weeks 9 to 22. No maintenance permitted during the 19 sample benchmarking period Weeks 23 to 35.	• Maintenance allowed twice during testing programme, at Weeks 12 and 24 (being four weeks and then two weeks prior to sampling).
• The 90% exceedence requirement in meeting the secondary effluent quality performance requirements is gauged on 38 samples over 27 weeks.	• The 90% exceedence requirement in meeting the secondary effluent quality performance requirements is gauged on 48 samples over 3 weeks.
• Field testing is to be undertaken as Strand 2 of the OSET NTP performance evaluations. • Strand 2 field performance assessment will consist of 4 seasonal samples from each of 10 different treatment units for each Strand 1 tested system, with the 40 results used to rate the specific unit. • Field testing of any individual installation will require a minimum of 10 samples over a time frame of at least 6 months (the period between normal maintenance events) to assess performance in meeting the 90% exceedence requirement.	• Field testing is not covered by AS/NZS 1546.3, and AS/NZS 1547 requirements apply.

C: Evaluation Criteria

OSET NTP Secondary Effluent Quality Performance Evaluation to AS/NZS 1547	AS/NZS 1546.3 Testing Protocol
(a) When sampled and tested for biochemical oxygen demand (BOD_5) 90% of samples taken in weeks 9 to 35 shall have a BOD_5 of less than or equal to 20 g/m^3 with no sample greater than 30 g/m^3. (b) When sampled and tested for total suspended solids (TSS) 90% of samples taken in weeks 9 to 35 shall have a TSS of less than or equal to 30 g/m^3 with no sample greater than 45g/m^3.	(a) When sampled and tested for biochemical oxygen demand (BOD_5) 90% of samples over the three test periods shall have a BOD_5 of less than or equal to 20 g/m^3 with no sample greater than 30 g/m^3. (b) When sampled and tested for total suspended solids (TSS) 90% of samples over the three test periods shall have a TSS of less than or equal to 30 g/m^3 with no sample greater than 45g/m^3. (c) Where disinfection is provided, the samples on each occasion shall have an *E. coli* count not exceeding a median value of 10 organisms (cfu) per 100 mL with 80% of the samples containing fewer than 20 cfu per 100 mL and no sample exceeding 100 cfu per 100 mL.

D: An Assessment of the Comparison

It is submitted that the OSET NTP test procedures and performance evaluation of test results in meeting the secondary effluent quality requirements of AS/NZS 1457 are more rigorous than that undertaken under the AS/NZS 1546.3 testing protocols. When coupled with the benchmarking of 7 test parameters (BOD, TSS, NH_4-N, TN, TP and FC) and average energy consumption, the OSET test programme provides a far more comprehensive evaluation of system performance than the limited testing results from the AS/NZS 1546.3 procedures.

Ian Gunn
OSET NTP Technical Manager
10 October 2012

On-site Effluent Treatment National Testing Programme (OSET NTP)

PERFORMANCE CERTIFICATE
TechTreat SS10 On-site Domestic Wastewater Treatment System, OSET NTP Trial 8, 2012/2013

System Tested
The **TechTreat SS10** on-site wastewater treatment system is a submerged aerated filter treatment unit. Rated design capacity is 2,000 litres/day. Total liquid volume is 6,420 litres (primary treatment 3,200 litres; secondary treatment aeration chamber 2,700 litres; recirculation chamber 160 litres; clarification: 200 litres; pump chamber 160 litres) with aeration blower airflow 80 litres/minute 18 hours/day). Emergency storage is 1,000 litres. No tertiary treatment (such as UV disinfection) is incorporated. It is a two tank system with primary treatment in the first tank and secondary treatment in the second tank, incorporating a submerged aerated filter media (90 sheets) with clarifier and recirculation.

Test Flow Rate
The **TechTreat SS10** system was tested at 1,000 litres/day (equivalent to servicing a 3-bedroom 5 to 6 person household) over an 8 month (35 week) period November 2012 to June 2013 followed by a 1 month (4 week) high load effects test in July 2013 involving 5 days at 2,000 litres per day then 1,000 litres/day over the following 3 weeks.

Testing and Evaluation Procedures
A total of 37 treated effluent samples of organic matter (BOD_5) and suspended solids (TSS) at generally six day intervals during weeks 9 to 35 were tested and evaluated against the secondary effluent quality requirements of the joint Australia/NZ standard AS/NZS 1547:2012. During this period an internal airline came loose and impacted performance until repaired, compromising three sets of results in weeks 14-16. With SWANS-MAG approval these three sets of results were excluded and the evaluation undertaken using 34 results.

A total of 16 treated effluent samples of organic matter (BOD_5), total suspended solids (TSS), total nitrogen (TN), ammonia nitrogen (NH_4-N), total phosphorus (TP) and faecal coliforms (FC) at generally six day intervals during weeks 23 through 35 were benchmarked and rated on their median values. In addition, the energy used by the treatment system was assessed on the mean of consumption levels over the 16 sample days.

AS/NZS 1547:2012 Secondary Effluent Quality Requirements
These requirements are that 90% of all test samples must achieve a BOD_5 of $\leq$ 20 g/m^3 and TSS of $\leq$ 30 g/m^3 with no one result for BOD_5 being >30 g/m^3 and no one result for TSS being >45 g/m^3. The **TechTreat SS10 system** achieved a performance level of **100%** for BOD_5 and **91%** for TSS based on the full set of 37 test results in weeks 9 to 35, with no results exceeding the maximums. The **TechTreat SS10 system** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2012.

Benchmark Ratings
The TechTreat SS10 system achieved the following effluent quality ratings for the sixteen benchmarking results in weeks 23 to 35.

Indicator Parameters	Median	Std Dev	Rating	Rating System				
				A+	A	B	C	D
BOD_5 (mg/L)	5.5	3.5	A	<5	<10	<20	<30	≥30
TSS (mg/L)	12.5	11	B	<5	<10	<20	<30	≥30
Total nitrogen (mg/L)	23.5	5.8	B	<5	<15	<25	<30	≥30
NH_4- Nitrogen (mg/L)	11.2	5.9	C	<1	<5	<10	<20	≥20
Total phosphorus (mg/L)	3.6	0.6	B	<1	<2	<5	<7	≥7
Faecal Coliforms (cfu/100mL)	63,000	67,000	C	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)**	2.0	0.1	C	0	<1	<2	<5	≥5

** **Note:** Overall energy rating reflects conditions at the test facility – power consumption for effluent pumping under field conditions will be specific to the distribution system as installed.

This Performance Certificate is specific to the **TechTreat SS10 system** model as specified above when operated at a flow rate of 1,000 litres/day, and is valid for 5 years from the date below. For the full OSET NTP report on the performance of the **TechTreat SS10 system** contact TechTreat Ltd, KeriKeri, Northland. Phone: (09) 407 1967 Mob: 027 447 2322

Authorised By:
Ray Hedgland, Technical Manager, OSET NTP
23 March 2014

On-site Effluent Treatment National Testing Programme, c/- Technical Manager, 10/20 Selwyn Rd, Howick AUCKLAND 2014 Ph: (09) 534 9247 Mob: 021 626 772 E-mail: ray@hedgland.co.nz

TechTreat Limited

SS10/CP2 System

Homeowner's Manual

Aerated Wastewater Treatment System

TechTreat Ltd
Dave Snowden
Technician
09 4071967
0274472322
techtreat@hotmail.com



On-site Effluent Treatment National Testing Programme (OSET NTP)

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Faecal Coliforms (cfu/100mL)	63,000	67,000	C	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)**	2.0	0.1	C	0	<1	<2	<5	≥5

** **Note:** Overall energy rating reflects conditions at the test facility – power consumption for effluent pumping under field conditions will be specific to the distribution system as installed.

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Authorised By:
Ray Hedgland, Technical Manager, OSET NTP
23 March 2014

On-site Effluent Treatment National Testing Programme, c/- Technical Manager, 10/20 Selwyn Rd, Howick AUCKLAND 2014 Ph: (09) 534 9247 Mob: 021 626 772 E-mail: ray@hedgland.co.nz



Thank you for installing a TechTreat Aerated Wastewater Treatment System. This booklet gives you all the information and instructions required to understand and manage your new system

The TechTreat CP2 has been developed over a number of years to provide years of reliable, trouble free operation. We wanted to design a reliable cost effective system made in New Zealand by qualified technicians who are involved from manufacture to servicing aftercare. Simple to install and maintain yet highly effective

The TechTreat CP2 has no electrical parts inside the sewage chamber. This enables easy trouble free access to all areas of the system

How Does Your New System Work?

The TechTreat Wastewater Treatment System is made up of 2 tanks. The first is a standard septic tank and the second is an aeration tank which contains the treatment components

Household waste receives primary treatment in the septic tank and then passes into the aeration tank for secondary treatment

The treated water produced has no smell and is completely safe for normal garden use

What To Do If Your Alarm Sounds

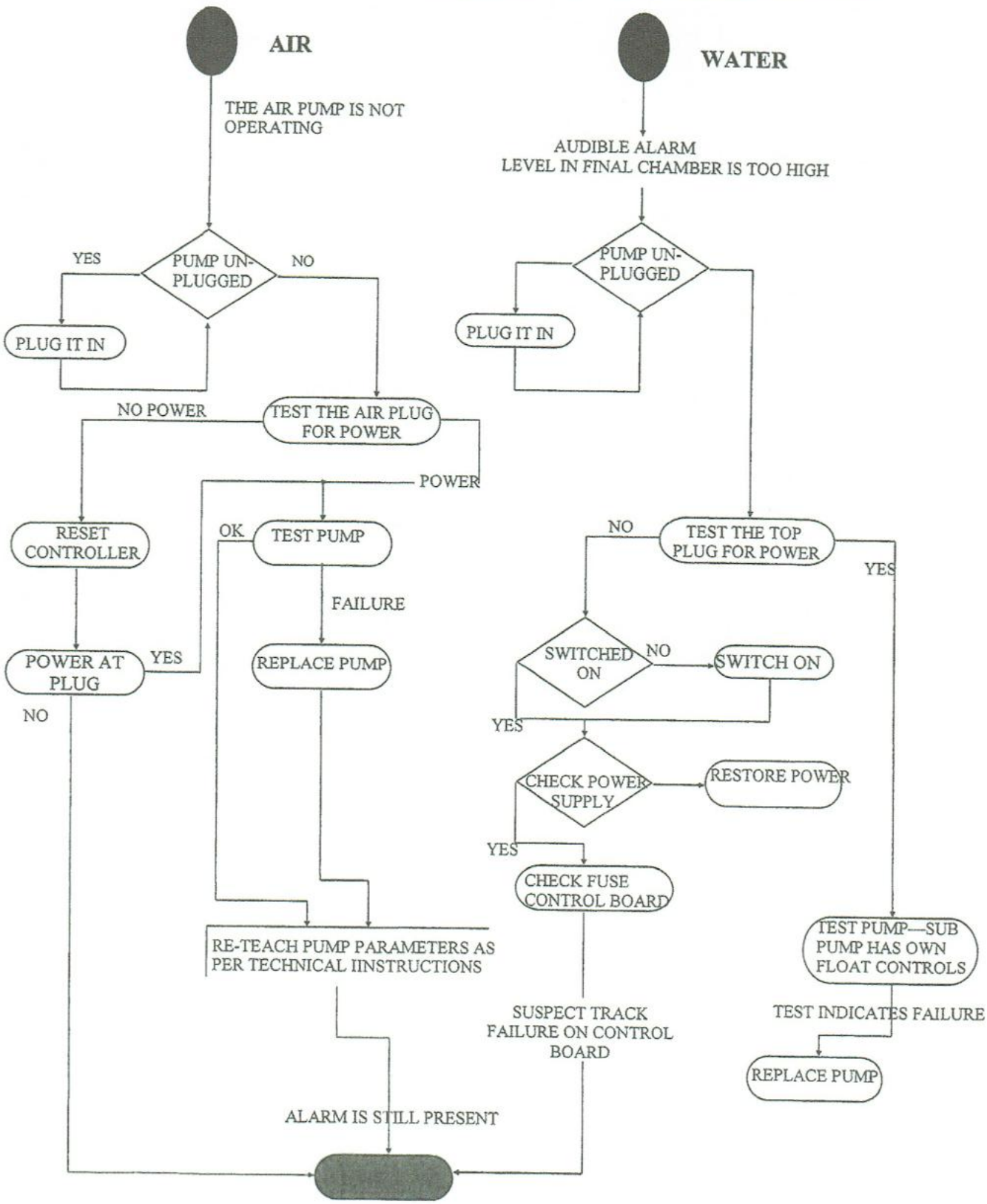
Your Wastewater Treatment System is fitted with an alarm that, if activated, will sound and the red light will come on (light located near control panel)

You can silence the audible alarm by flicking the alarm switch provided, however, do not ignore the red light – you must contact your service provider

In all cases - If your alarm is activated – call your service provider
A qualified technician will assist you in diagnosing your system condition.

Please see Alarm Test Procedure on following page

ALARM TEST PROCEDURE ALL ANALOGUE VERSIONS



A Practical Guide for TechTreat CP2 Treatment System

Your new home now has a modern septic tank/ treatment system. This system treats your household waste water and it needs Bacteria "Bugs" to operate correctly

General Do's and Don'ts

Don't flush dangerous and damaging substances into your wastewater treatment System, this includes:

- **No Bleaches or Chlorine**
  These products are designed to kill bugs and will kill off the "bugs" in the tank causing smells and blocked filters
- **No Fats or Oils down drains**
  Fats and olis may block the tank filters and kill "bugs" in the tank
- **No Tea Leaves or Coffee Grounds down drains**
  May block the filters
- **No Washing Paint Brushed or Disposing of Paints down drains**
  Kill "bugs" in the tank and also residue is difficult and costly to remove
- **No Disposable Nappies, Sanitary Pads, Tampons or Condoms**
  Kill 'bugs" and Difficult to break down and can block filters
- **Do not Turn The Power Off to the Septic System as There are Electrical Parts that Need Power to Operate the System**

Do :

1. Call your service agent when you encounter problems
2. Only use gentle biodegradable cleaning products
3. Try to avoid using washing machines, dishwashers, showers at the same time

Service Contract / Renewal Advice

This agreement is made between (Owner/Occupier).....

of (Address).....

and the Authorised Distributor or their duly appointed agent

Business Name.....

Business Address.....

Business Phone Number & email.....

The duration of the agreement is from..... to .....

The Authorised Distributor/Agent agrees for the period to the following:

- A factory- trained technician will make annual field service inspections during the service period

  Inspections to include

  1. Any adjustment, cleaning and field service of the unit necessary for proper operation
  2. Inspection of the control panel and alarm plate, aeration blower, bio-mass sludge return, clarifier, filter, effluent quality, irrigation pump, and float alarm
- Both labour and materials will be charged for emergency service calls outside the call specified above
- In the event of any repairs being necessary on the purifier or electrical equipment during the first year because of damage which has occurred outside the warranty, then these repairs will be charged to include both labour and materials
- Complete a written report at the time of each annual inspection/service, providing a service report copy to the Customer and a copy to the Local Council
- This agreement does not bind TechTreat Limited or appointed agents to be responsible for the quality of effluent, However, it will at all times whenever possible, recommend how the effluent quality can be maintained at its maximum and alter/adjust the system during service calls in order to obtain the best possible effluent standard

In completing this agreement, the customer acknowledges that this Agreement is binding while they are the owner/occupier of the premises. There is an obligation by the Distributor/Agent and the homeowner to transfer this Contract to any new Owner/Occupier to comply with the relevant By-Law requirements.

Owner/Occupier Signature.....

Signature Authorised Distributor/Appointed Agent.....

Service Requirements for TechTreat CP2

The System must be serviced at least every 12 months (annually) by a TechTreat Limited approved Technician

Servicing Chart

Function	3 monthly	9monthly	Annually
Anaerobic Chamber/Check			Qualified Person
Bio Filter/clean filter			Qualified Person
Air Blower/clean filter/pressure test			Qualified Person
Air Flow Path/Check			Qualified Person
Chlorinator if installed			Qualified Person
Pump Chamber/pressure test			Qualified Person
Outlet Filter/clean If Relevant	Owner	Owner	Qualified Person
Alarm System/check			Qualified Person
Irrigation field/			Qualified Person

Note: The desludging of the anaerobic chamber is the responsibility of the owner and should be carried out at least every 5 years or sooner if required (monitor yearly)

WARRANTY

Your 'TechTreat CP2' Sewage Treatment System is guaranteed to be free of any defects in materials or workmanship at the time of installation.

During the twelve months following installation, a cost free maintenance program is provided which includes your first annual service.

Should any mechanical or manufactured part/s fail as a result of defect within twelve months of installation, the part/s will be replaced free of charge.

Pumps supplied with your system come with a two year warranty.

The RELN septic tanks supplied with your system come with a manufacturers fifteen year warranty.

The aeration tank of your system is guaranteed to remain free from sludge for a period of five years from the date of installation.

This warranty is governed in total by the "Conditions of Sale"

CONDITIONS OF SALE

This quotation as submitted is subject to the terms and conditions as listed below and should be read and understood clearly as they constitute part of the Quotation.

1. The Quotation remains open for acceptance for a period of thirty days after which the price is subject to confirmation.
2. The quoted price will be subject to revision if the site conditions are altered in any way between the date of acceptance of this Quotation and the commencement of work.
3. The quoted price is based on the completion of the whole of the work at the one time unless otherwise agreed.
4. The customer warrants that they are the sole owner of the job site. If this is not the case, the customer will produce written approval from the site owner for the installation of the system.
5. The nominated "TechTreat" Agent or Supplier will apply for all the necessary local Council and Health Authority approvals for the installation of the system unless the Customer chooses to undertake this responsibility. The customer will do all things reasonably necessary to obtain such approvals including the signing of all necessary documents and forms and the payment of all necessary fees to enable approvals to be obtained from the relevant authorities for the installation of the system. If all such approvals are not obtained within 6 weeks from the date of this agreement, or if any approval is given upon a condition with which either party is, on reasonable grounds, dissatisfied, then either party may, providing it has complied with its obligations under this condition, rescind this agreement whereupon half the deposit monies will be refunded to the customer and half retained by the Supplier/Agent and thereafter neither party shall have any further claim against the other.
6. Once all the necessary Statutory Approvals have been obtained, the customer will:
    a. In the case of a conversion from either septic tank/absorption trench/transpiration bed or pump out system, arrange and pay for the proper desludging of the existing system to the satisfaction of the Agent/Supplier.

OR b. In the case of a new installation, immediately ensure the area where the TechTreat CP2" system and tanks (if applicable) are to be installed, is free and clear so as to allow any and all machinery associated with the installation to enter the site and complete such work without hindrance. Should it be necessary to hire or use cranes or other heavy equipment to facilitate installation, then the customer agrees to pay for the additional costs arising from the presence of rock or other obstruction underground will be borne by the customer.

7. Upon advice from the Customer that the site is ready for the installation of the 'TechTreat CP2' system, the Agent/Supplier will proceed with that installation in accordance with the layout as approved by the relevant Statutory Authorities, provided that this may be altered if it is found to be impractical to adhere to that layout. In all cases the responsibility for the burial of the irrigation lines and/or any additional landscaping within the irrigation area will lie with the customer unless previously agreed with the Agent. With the installation of a conversion system, the Agent/Supplier will disconnect the evacuation line but will not be responsible for its removal from the site. As little disturbance as possible will be caused to any established lawns or gardens, but no responsibility will be accepted for the replacement of lawns, plants or trees so disturbed. Should it be required to remove or dismantle any fences or parts of buildings in order to gain proper access, the costs of such work will be the responsibility of the customer. Removal of any spoil arising from excavation or drainage work will be the responsibility of the customer.

8. Should the Agent/Supplier agree to perform any additional work or to supply any additional materials other than those specified in this quotation, then the customer agrees to pay for such work or materials.
9. TechTreat Limited as manufacturers of these AWTS or the Agent/Supplier on behalf of TechTreat Limited provides an unconditional warranty on the installed system for a period of twelve months from the date of the actual commissioning of the system, it being understood that any failure of the system being caused by the customer with the Operating instructions or actual interference with the system or any of its parts will render such warranty null and void.
10. Included within the Quotation is a Maintenance Contract covering a period of 12 months dating from the actual commissioning date of the 'TechTreat' system, the provisions of which are:
    a. Full maintenance service every 12 months including the supply of any necessary chlorine tablets. A copy of the Service Report will be provided to the Customer at the time of each service.
    b. The establishment of a Service Report Record for the system and provision of full details of all service results to pertinent Statutory Authorities as required by them.
    c. Responding to all emergency service requirements as or when such service may be required, providing that any fault or defect in the operation of the system caused by Customer non compliance to Operating Instructions or actual interference with the system or any of its parts will incur a charge for the rectification of such faults or defects.

11. Local Councils require that all domestic waste treatment systems be maintained during their lifetime by the systems supplier or a suitably qualified maintenance contractor and to this end, the Customer agrees to enter into a Maintenance Contract upon the expiry of the warranty period for the ensuing 12 months and each year thereafter with such a contractor and to pay the annual fees applicable to that time.
12. In the event of the sale of a property at which 'TechTreat system is installed, the customer agrees to:
    a. Advise the Agent/Supplier or TechTreat Limited of the change in ownership of the system and:
    b. Advise the new owner of the Statutory requirements as expressed in Clause 11 above.
    c. It is understood that any residual portion of the current Maintenance Contract will be honoured in respect of the new owner.

13. Any fault or defect in the system requiring service, parts or materials where such is required due to the wilfully damaging actions of any person or the Customer's failure to comply with the Agent/Suppliers or TechTreat Limited's suggestions or recommendations for the system or if due to the system being required to bear a work load for which it is not certified or is extraordinary for the size of the dwelling on the site, or if due to earthquake, fire, flood, storm, lightening or tempest, or if due to unauthorised persons interfering with the system in any way, or if due to the Customer's failure to comply with any of the conditions of this agreement will result in such service, parts or materials being charged to the customer and the said customer, as party to this agreement, agrees to accept such charges as their responsibility.
14. TechTreat Limited and or its Agents/Suppliers obligations under the warranty expressed in Clause 10 above and all maintenance provisions referred to throughout this agreement are conditional on the full price having been paid for the installation and provision of the "TechTreat" system. With respect to any particular defect or malfunction of the system, such obligations are also conditional on the customer

giving notice of such malfunction or defect within 7 days of the customer becoming aware of it.

15. If through the Customers default in any of his obligations as expressed in this agreement, the system cannot be installed, then this agreement is at an end and any deposits paid by the customer will not be refunded.
16. The Customer acknowledges that this document comprises the whole agreement between the parties and that, in entering into this agreement, he is not relying on any representation, statement or warranty that is not set out in this document.
17. Where herein used, words importing the singular number or plural number shall include the plural number and singular number respectively and words importing one gender shall include any other gender. If there is more than one customer, such Customers shall be jointly and severally liable here under.
18. TechTreat Limited manufacturer of the Aerated Waste Treatment System and I/we .....Appointed distributor, will ensure that the AWTS system which is the subject of this sale, will be installed in accordance with the specifications on which the system has been approved by the Rotorua Testing Facility and the Local Council in terms of the adherence and compliance with New Zealand Standards.

Certificate of Compliance



TechTreat Limited
Waste Water Treatment Systems
Model CP2

The RELN Septic Tanks used in this system are approved to the requirements of AS/NZS 1546.1:2008
The Design, System Specifications and Performance Criteria of this system meet the requirements of AS/NZS 1547.1:2012
Issued:

Dave Snowden Company Director

On-Site Wastewater Systems

List of Water Tolerant Plants Suitable for on-site Wastewater Disposal Systems

(from Auckland Council)

General Matters to Consider When Planting a Land Disposal Area:

Plants that are suitable for planting in moist conditions, such as those associated with wastewater land disposal fields need to be selected on the basis of both their tolerance for such moist conditions and for their potential for high level of growth/high transpiration of moisture in such conditions.

Standard lawn grass is a proven effective high transpiration plant species in such conditions, as are a large number of other plant species seen in typical domestic gardens.

Consideration need to be given to effects of roots from plants and from trees in particular on wastewater distribution pipe networks/emitter lines in land application systems. Potential for root intrusion/disruption to the pipe system must be considered prior to selection and planting of a plant or tree species.

Advise on such matters can be obtained from garden centre specialists and landscaping consultants.

Native Plants Suitable for Moist Conditions in the Auckland/Northland Region:

The following list covers native plant species which are considered to be suitable for planting in moist conditions, such as those associated with wastewater disposal fields in Auckland/Northland situations. They are all tolerant or fond of moist conditions and are all native to the region.

Grasses, ground covers, and other plants

Astelia grandis (swamp astelia)

Large clump forming plant with bright green, flax-like foliage. Female plants produce upright panicles of orange berries in the centre of the plant. This endemic species will not tolerate eutrophic conditions and prefers peat soils.

Blechnum novaezealandiae (kiokio)

Large, robust fern growing to 1 or even 2m, hardy species that tolerates most conditions, but does best in well drained, shady areas.

Carex

There are many members of this genus which grow naturally in damp to wet areas. They all have quite fine drooping foliage and are vigorous in moist conditions. Most prefer very light shade. The following species have been identified for their suitability:

Carex Dissita

Endemic species with dull green to reddish tufts often 0.5m tall (although this can vary). Tolerates a range of swampy habitats, but is also noted to grow on drier soils under forest cover.

Carex flagellifera

Endemic species with dense spreading reddish-brown tufts to 0.5m tall. Prefers damp soil and full sun, but is noted to thrive in a variety of habitats including boggy pasture.

Carex geminate

Robust and vigorous endemic species that grows to 1.5m tall. Thrives in a range of wet habitats. Suitable for a larger area.

Carex Lessoniana
Robust and vigorous endemic species that grows to 1.5m tall. Similar to C.geminata in that the species is spreading and suitable for a large wet area.

Carex secta (purei, makura)
Endemic species that exhibits tall spreading tussocks. Has been noted to grow to 3m tall, widespread in swampy areas. Useful in the creation of bird habitat.

Carex virgata
Endemic species that forms dense, light green tussocks up to 1m tall. Thrives in a variety of habitats including swamps, drain margins, seepages and wet pastures. Useful in the creation of bird habitat.

Cortaderia fulvida (toetoe)
Branching from the base and forming a clump to 4m high. Long strap-shaped leaves with red-orange coloured veins, flower heads cream yellow. New shoots exhibit pale waxy cover on lower parts (unlike pampas grass). Prefers good drainage and semi-shade. Will struggle to compete if dried out in summer.

Cyperus ustulatus (toetoe upoko-tangata, giant umbrella sedge)
Vigorous leafy sedge growing to 1m in open damp places. Tolerates immersion in standing water within a range of habitats from seepages to wetlands.

Dicksonia squarrosa (wheka, tree fern)
Tree fern up to 7m tall that exhibits tolerance of wet open ground and floods. Found to shelter and accumulate with other native plants. The base of the fern attracts biodiversity. Useful application to streambank and seepage habitats.

Elastostema rugosum (parataniwha)
Herbaceous plant up to 0.5m tall that spreads by rhizomes. Bronze coloured foliage with serrated edge. Grows on moist sites in light to heavy shade. Intolerant of dry habitats.

Hypolepis dicksonioldes
Large fern that prefers fertile moist, but well-drained ground, grows vigorously and spores into planted areas with abundance. Does however, die back during winter.

Phormium tenax (harakeke, flax)
Fast growing clump-forming flax with large stiff leaves to 3m. Full exposure and sun. Moist to wet conditions. Does not have deep or wide roots. Easily propagated from split fans or grown from seed. Attracts birds, especially Tui.

Trees and Shrubs

Consideration needs to be given to the effects of roots on wastewater distribution pipe networks.This problem can be more significant for large tree species.

Carpodetus serratus (putaputaweta, marbleleaf)
Lowland forest tree up to 7m tall. Large bunches of cream coloured flowers appear in spring followed by black berries.

Coprosma areolata
Species that grows to 4m tall. Low tolerance to drought, with medium to high fertility.

Coprosman robusta (karamu, shining karamu)
Shrubs or small trees growing to 3m+, with glossy green leaves. Masses of orange-red fruit in autumn are attractive to birds. Hardy plant.

Coprosma tenuicaulis (swamp coprosma)
Endemic species that grows to 3m tall. Leaves pale green with slender branches. Will tolerate a range of swampy to boggy habitats including standing water.

Cordyline australis (ti kouka, cabbage tree)
Palm-like in appearance with large heads of linear leaves and panicles of scented flowers. Sun to semi-shade. Prefers damp to moist soil. Grows eventually to 12m+ height.

Dacrycarpus dacrydioides (kahikatea, white pine)
Tree that grows to 40m. Moderately growing species, which prefers wetland and boggy environments. Application of this species must consider the possible impact of its root systems on the wastewater disposal field.

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**NA58A/1065**
Land Registration District	**North Auckland**
Date Issued	16 June 1989

Prior References
NA35C/444

Estate	Fee Simple
Area	1171 square metres more or less
Legal Description	Lot 2 Deposited Plan 105517
Registered Owners	

Dean Mark Noble and Connie Frances Noble

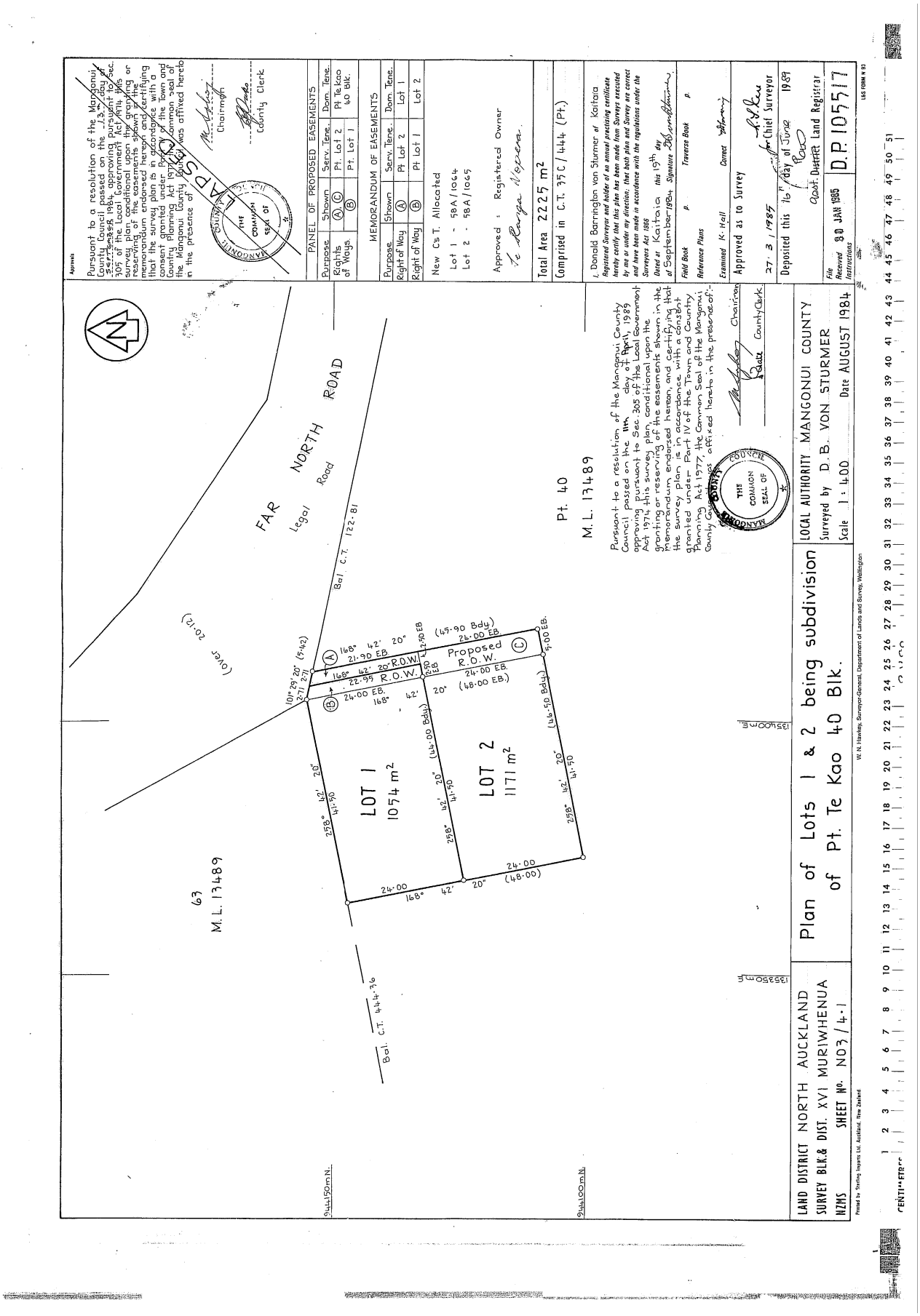
Interests

Subject to Section 10 Maori Affairs Amendment Act 1967

Appurtenant hereto is a right of way specified in Easement Certificate C005188.4 - 16.6.1989 at 1.40 pm

Subject to a right of way over parts marked A and C on DP 105517 specified in Easement Certificate C005188.4 - 16.6.1989 at 1.40 pm

Some of the easements specified in Easement Certificate C005188.4 are subject to Section 309 (1) (a) Local Government Act 1974 (See DP 105517)


Approvals
Pursuant to a resolution of the Mangonui County Council passed on the 13th day of September 1984, approving pursuant to sec. 305 of the Local Government Act 1974 this survey plan subject to the conditions therein and reserving of the easements shown on the memorandum endorsed hereon and certifying that the survey plan is in accordance with a consent granted under Part IV of the Town and Country Planning Act 1977, the Common Seal of the Mangonui County Council was affixed hereto in the presence of
Chairman
County Clerk
THE COMMON SEAL OF MANGONUI COUNTY
PANEL OF PROPOSED EASEMENTS
Purpose | Shown | Serv. Tene. | Dom. Tene.
Rights of Ways | A C | Pt. Lot 2 | Pt Te Kao 40 Blk.
B | Pt. Lot 1
MEMORANDUM OF EASEMENTS
Purpose | Shown | Serv. Tene. | Dom. Tene.
Right of Way | A | Pt Lot 2 | Lot 1
Right of Way | B | Pt Lot 1 | Lot 2
New Cs T. Allocated
Lot 1 - 58A/1064
Lot 2 - 58A/1065
Approved : Registered Owner
Te Aroha Nikora
Total Area 2225 m²
Comprised in C.T. 357C/444 (Pt.)
I, Donald Barrington van Sturmer of Kaitaia
Registered Surveyor and holder of an annual practising certificate hereby certify that this plan has been made from Surveys executed by me or under my direction, that both plan and Surveys are correct and have been made in accordance with the regulations under the Surveyors Act 1966
Dated at Kaitaia this 19th day of September 1984 Signature
Pursuant to a resolution of the Mangonui County Council passed on the 11th day of April 1985 approving pursuant to Sec 305 of the Local Government Act 1974 this survey plan conditional upon the granting or reserving of the easements shown in the memorandum endorsed hereon, and certifying that the survey plan is in accordance with a consent granted under Part IV of the Town and Country Planning Act 1977, the Common Seal of the Mangonui County Council was affixed hereto in the presence of
Chairman
County Clerk
THE COMMON SEAL OF MANGONUI COUNTY
Field Book p Traverse Book p
Reference Plans
Examined K. Hall Correct
Approved as to Survey
27-3-1985
Chief Surveyor
Deposited this 16th day of June 1989
Asst. District Land Registrar
File Received 30 JAN 1985
Instructions
D.P. 105717
FAR NORTH ROAD
Legal Road
Bal. C.T. 122-81
Pt. 40
M.L. 13489
63
M.L. 13489
Bal. C.T. 444-36
(Over 20-12)
LOT 1
1054 m²
LOT 2
1171 m²
Proposed R.O.W.
22-99 R.O.W.
24-00 EB.
(45-90 Bdy)
(48-00 Bdy)
(44-50 Bdy)
168° 42' 20"
258° 42' 41-90
24-00
(48-00)
LAND DISTRICT NORTH AUCKLAND
SURVEY BLK. & DIST. XVI MURIWHENUA
NZMS SHEET No. N03/4-1
Plan of Lots 1 & 2 being subdivision of Pt. Te Kao 40 Blk.
LOCAL AUTHORITY MANGONUI COUNTY
Surveyed by D.B. VON STURMER
Scale 1:400 Date AUGUST 1984
W. N. Hawkey, Surveyor-General, Department of Lands and Survey, Wellington
Printed by Sterling Imprints Ltd. Auckland, New Zealand.
LAS FORM N 93
CENTIMETRES

FNR LTD CONSULTING

2 Te Paia Lane, Kaitaia
Phone (09) 408 0979
PO Box 62, Awanui 0451

Lot 2 DP105517 Taylors Road, Te Kao

Site Investigation Report

Prepared for Connie Noble



Job No.	FNR1070, Rev A
Report Author	Tess Allen
Report Approver	Manu Burkhardt Macrae
Date	06/08/2026

Document Approval				
Action	Name	Qualification	Signed	Date
Author	Tess Allen	BE (Hons) Civil Engineering		28/07/2026
Reviewer	Andrew van der Linden	BE (Hons) Civil Engineering		06/08/2026
Approver	Manu Burkhardt Macrae	BE Environmental Engineering, CPENG NZ, 253797		06/08/2026

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Executive Summary

FNR Consulting was engaged to complete a site investigation report for the property at Lot 2 DP105517 Taylors Road, Te Kao. The site is a rural residential property characterised by sloping, open pasture with no surrounding bush. The site is currently vacant, with no existing structures. No erosion, or ground instability was observed at the time of inspection. However, localised ponding was observed in low lying area caused by livestock.

FNR Consulting undertook geotechnical testing across the proposed building site, comprising twelve scala penetrometer tests (with retests undertaken at five locations to confirm the results) and one hand auger borehole, in accordance with NZS 4402:1988 and NZS 3604:2011.

Scala penetrometer testing confirmed that the in-situ soils achieve "Good Ground" criteria (as defined by NZS 3604:2011) at shallow depths of approximately 0.25 m to 0.6 m below existing ground level. Refusal (>10 blows per 50 mm) was encountered at all test and retest locations, interpreted to represent a laterally continuous dense sand or hardpan layer beneath the building platform. The hand auger (HA1) encountered only a thin layer of moist topsoil before being unable to penetrate at approximately 0.5 m depth; no groundwater was encountered.

A review of regional liquefaction hazard mapping indicates the site falls entirely within the "Unlikely" liquefaction vulnerability category. A review of FNDC and NRC hazard mapping also confirms the site is not located within any mapped coastal or river flood hazard zone for the 10, 50, or 100-year events, or the 100-year climate change scenario.

On the basis of the testing undertaken, the site is considered suitable for the proposed dwelling, subject to standard pile foundations founded on Good Ground/at the depth of refusal, in accordance with NZS 3604:2011. If the foundations break through this pan layer, it is recommended that the underlying material is inspected by a suitably qualified engineer at the time of construction. Site drainage in the vicinity of the proposed dwelling should be specifically addressed to manage the moisture observed on site.

Site Description

The site at on Taylors Road is a rural property located south of Te Kao, in the Far North District. The property is close to the intersection of Taylors Road and Far North Road (State Highway 1), bounded on all four sides by neighbouring rural/rural residential properties, with access to Taylors Road via two right of ways (ROW) (refer to Figure 1). The property is open grass pasture with no surrounding bush, with the ground generally sloping across the proposed building platform to the southern boundary.

The subject property has an area of approximately 1,171 m^2 and is legally described as Lot 2 DP 105517.

At the time of inspection, the site was vacant with no existing structures. There were no obvious issues with erosion, or ground instability observed within the inspected area. However, water was observed to be ponding in low spots across the site in rutting caused by livestock.

Vehicle access to the property is proposed directly from Taylors Road via a metalled accessway.

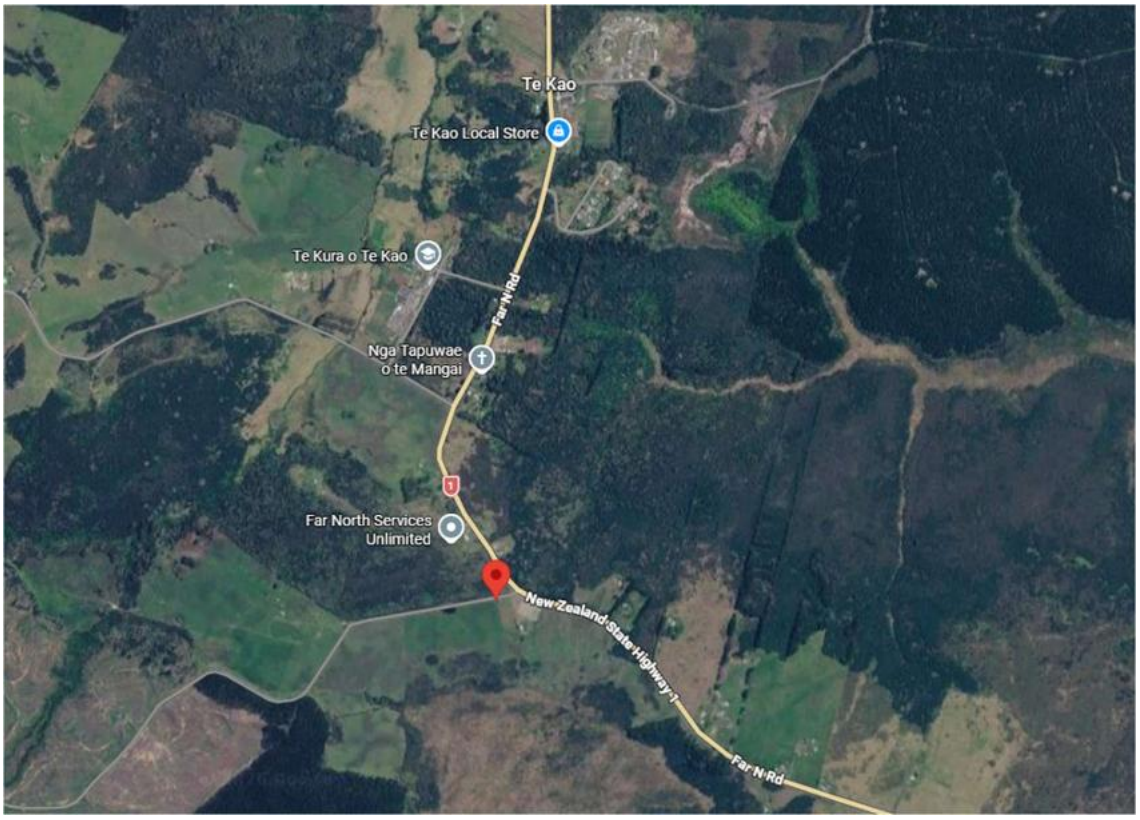


Figure 1 – Location Plan (Google Maps)

Published Geology

The New Zealand Land Inventory soil map “Soil Types North Cape - Houhora” 1:100,000 scale describes the soils at this site as**: Te Kopuru Sand (TEK) and Ohia Sand (OE)** belonging to the Soils of the Coastal Sand dunes Complex and are categorised as both excessively to somewhat excessively drained and imperfectly to poorly drained.

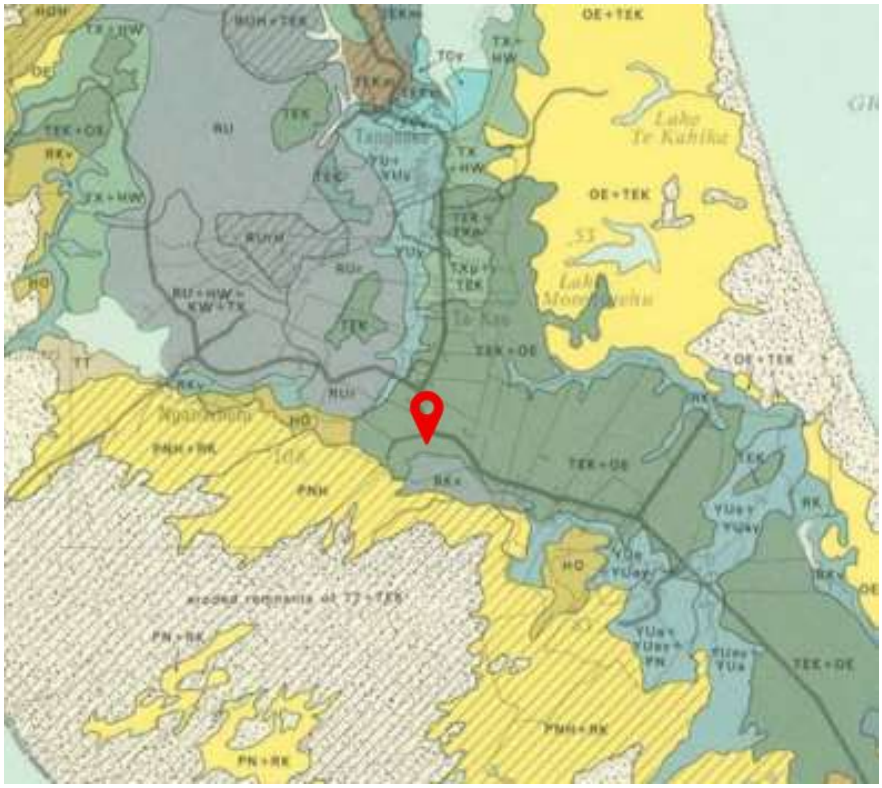


Figure 2 – New Zealand Land Inventory Soil Map

The GNS Geological Map “Geology of the Kaitaia” 1:250,000 scale shows the site is underlain by Pliocene aged parabolic dunes consisting of “Cemented dune sand and associated facies (Pad)” of the Awhitu Group.



Figure 3 – Institute of Geological & Nuclear Sciences Geological Map

Subsurface Testing

FNR Consulting carried out a geotechnical investigation to assess the in-situ ground conditions at the proposed new relocatable building site. A site plan was provided prior to the site visit, and the test locations were selected based on the proposed building footprint shown in the plans. Based on the building footprint, the proposed dwelling has an approximate floor area of 130 m^2.

A total of 17 scala penetrometer tests and one hand auger borehole were undertaken within the proposed building footprint and around the subject site.

Scala penetrometer testing was undertaken in general accordance with NZS 4402:1988, to assess the in-situ soil's compliance with NZS 3604:2011. Soil descriptions from the hand auger logs are in general accordance with the New Zealand Geotechnical Society's (NZGS) "Field Description of Soil and Rock". The test locations are shown in Appendix A, with the corresponding scala test results, borehole logs, and photographs included in Appendix B.

Test Results

The scala penetrometer testing (refer to Appendix B) indicated that the in-situ soils beneath the proposed building footprint consistently achieved "Good Ground" (as defined by NZS 3604:2011) at consistent shallow depths, ranging from approximately 0.25 m to 0.6 m below existing ground level, at all test locations within and immediately surrounding the proposed house location. Refusal (>10 blows per 50 mm) was encountered at all of these test locations. Additional scala penetrometer

tests were undertaken adjacent to each test following refusal, to confirm the subsurface conditions were representative of the proposed building footprint; refusal was similarly encountered again at all retest locations, confirming that the shallow refusal was representative of the subsurface conditions beneath the dwelling.

Two tests, SP8 and SP9, were undertaken in the southeastern corner of the lot, outside the proposed building footprint, to assess the broader site conditions. These locations encountered refusal at a greater depth of approximately 1.4 m to 1.6 m below existing ground level. This variation is considered to reflect natural lateral variability in the depth of the dense sand/hardpan layer away from the building platform, and does not affect the foundation design for the proposed dwelling, which is based on the shallower refusal depths confirmed at and around the footprint.

Refusal encountered within the building footprint is interpreted to represent a dense sand or hardpan layer beneath the proposed building platform. This interpretation is supported by sandstone exposed in the metalled area to the northeast of the subject lot. The thickness of this layer and the characteristics of the underlying materials could not be confirmed, as refusal prevented further investigation at any test location.

Site Observations & Soil Description

The proposed building site is located on moderately sloping ground (less than 5%), which generally falls towards the south. Based on visual observations, the proposed dwelling appears to be positioned within undisturbed natural ground rather than fill material.

The site soils were investigated by hand auger (HA1), which encountered a thin layer of very moist, fine, black topsoil with some signs of organic matter. The auger was unable to penetrate (UTP) at approximately 0.5 m depth, and no further soil profile was obtained below this point. Water inflow was observed into the test pit upon reaching the dense sand/hardpan layer; this is not considered to represent the groundwater level, but may indicate localised moisture sitting above the pan layer. Refer to the hand auger borehole log in Appendix B for the full record.

Slope Stability Assessment

There were no visual signs of slope instability in the vicinity of the proposed building site. However, the site soils were observed to be moist at the time of inspection, with moisture noted in the topsoil at the hand auger location. Elevated soil moisture should be considered in the design of foundations and site drainage, with appropriate measures taken to manage surface and subsurface water across the site.

Expansive Soil Classification

The site reactivity classification, in accordance with AS2870:2011 Table 2.1, has been assessed as Class A – sand and rock sites, with little to no ground movement

from moisture changes. This assessment is based on published geology mapping indicating a predominantly sandy soil profile at the site, together with the dense sand/hardpan layer encountered during scala penetrometer testing, visual site observations, and our knowledge and experience with similar soils in the area. As the hand auger did not progress beyond the topsoil layer, this classification has not been confirmed by direct field observation of the underlying soil profile and, in the absence of laboratory testing and quantified ground movement data, should be considered indicative only.

Environmental Constraints

Liquefaction Risk

A desk-top assessment of liquefaction vulnerability has been undertaken for the site. Liquefaction occurs when saturated sands and non-plastic silts temporarily lose strength and behave like a fluid when subjected to rapid loading, such as earthquake shaking. Far North District Council has undertaken a liquefaction vulnerability assessment for the Far North District, which provides guidance on the potential liquefaction susceptibility in the district.

"The area of Northland is identified to be at low risk of seismic hazard. There are no active faults known in the Far North. Small earthquakes will give short duration shaking that may not have enough cycles to cause liquefaction. Microzoning studies are probably not required as the hazard is low (GNS 2004)" - Regional Liquefaction Vulnerability Assessment – Far North District, prepared by Vision Consulting for FNDC 20/01/2023.

According to the above referenced report and associated mapping, the Liquefaction Vulnerability Category for this site is "Unlikely", indicating a low likelihood of liquefaction-induced ground damage. The approximate site location relative to the liquefaction vulnerability mapping is shown in Appendix C.

Several site-specific factors act to reduce the potential for liquefaction at this site. Liquefaction requires the presence of loose, saturated, non-plastic soils to occur. Scala penetrometer testing indicates a dense sand or hardpan layer at shallow depth, with refusal (>10 blows per 50 mm) encountered at all test locations between approximately 0.25 m and 0.6 m below existing ground level. This dense, shallow layer is not consistent with the loose, saturated soil conditions required for liquefaction to occur.

Based on the above assessment, the liquefaction vulnerability of the site is considered to be low. However, no site-specific liquefaction assessment has been undertaken for this area.

Flood Risk

A review of the Far North District Council (FNDC) Hazard Map and Northland Regional Council (NRC) Hazard Map indicates that the subject property is not located within any mapped River Flood Hazard Zone or Coastal Flood Hazard Zone, for the 10 year, 50 year, or 100 year flood events, or the 100 year climate change scenario (refer to Appendix C). On this basis, no site-specific flood risk has been identified for the property.

Foundation Recommendations

Overall, the site is considered suitable for the proposed dwelling, subject to foundation design in accordance with NZS 3604:2011 and the recommendations contained within this report. "Good Ground" was encountered at shallow depths, ranging from approximately 0.25 m to 0.6 m below existing ground level, with refusal (>10 blows per 50 mm) subsequently encountered at all test locations across the site. This refusal is interpreted to represent a dense sand or hardpan layer, laterally continuous beneath the proposed building platform.

Given the consistent shallow refusal encountered at all test and retest locations, it is recommended that standard pile foundations bearing on Good Ground be adopted, founded at the depth of refusal, in accordance with NZS 3604:2011. Piles should achieve a minimum embedment of 300 mm into the dense layer where practicable. Given the shallow refusal depths encountered (as little as 0.25 m below existing ground level in places), full embedment may not be achievable at every pile location.

If fill is required to level the site, all topsoil and any soft or unsuitable material should be undercut and replaced with suitable engineered hardfill, such as GAP40 or GAP65, compacted in layers not exceeding 150 mm. Where hardfill exceeds 600 mm in depth, compaction testing shall be carried out, with certification provided in the form of a Producer Statement – Construction Review (PS4).

As the nature and thickness of the material underlying the refusal layer could not be confirmed testing was prevented by refusal, and the hand auger (HA1) was similarly unable to penetrate beyond approximately 0.5 m foundation excavations should be inspected by a suitably qualified engineer at the time of construction to confirm the bearing material is consistent with the assumptions made in this report.

Three Waters

Based on a review of the Water Services layer within the Far North Atlas Map, the site is not connected to the Far North District Council reticulated wastewater, stormwater, or water supply network. As the site is currently vacant, all services required to comply with the Building Code will need to be provided as part of the proposed development.

Uncontrolled stormwater may result in erosion, potential ground instability, and adversely affect foundation performance. Accordingly, all stormwater from roofed and paved areas, together with any subsoil drainage, should be collected and discharged to a suitable on-site stormwater disposal system in accordance with the relevant FNDC requirements. Given the moisture observed on site, drainage in the immediate vicinity of the proposed dwelling should be specifically addressed to direct surface and subsurface water away from the building platform.

Any site-specific stormwater management and/or wastewater disposal system design is outside of the scope of this report.

Limitations

This report has been prepared for the use of Connie Noble with respect to the brief outlined to us. This report may be utilised in the preparation of resource consent and building consent applications with the relevant local authorities. The information and opinions contained in this report shall not be used for any other purpose without prior review and agreement by FNR Consulting Limited.

Recommendations in this report are based on visual observations and subsoil testing at discrete locations. Actual soil conditions between these points may vary. If the in-situ soil encountered during construction differs from those outlined in the report, or the foundations break through the pan layer, it is recommended that FNR Consulting is engaged to confirm the in-situ soils meet the design requirements.

The proposed dwelling footprint had not been marked with survey pegs at the time of the site inspection. Accordingly, the test locations were selected based on the site plan provided by ArchX Rev A(WIP) 01/07/2026. Should the proposed dwelling location be relocated prior to construction, additional geotechnical investigation is recommended to confirm that the subsurface soil conditions and bearing capacity at the revised location are consistent with those encountered during this investigation.

Appendix A – Site Plan and Test Locations

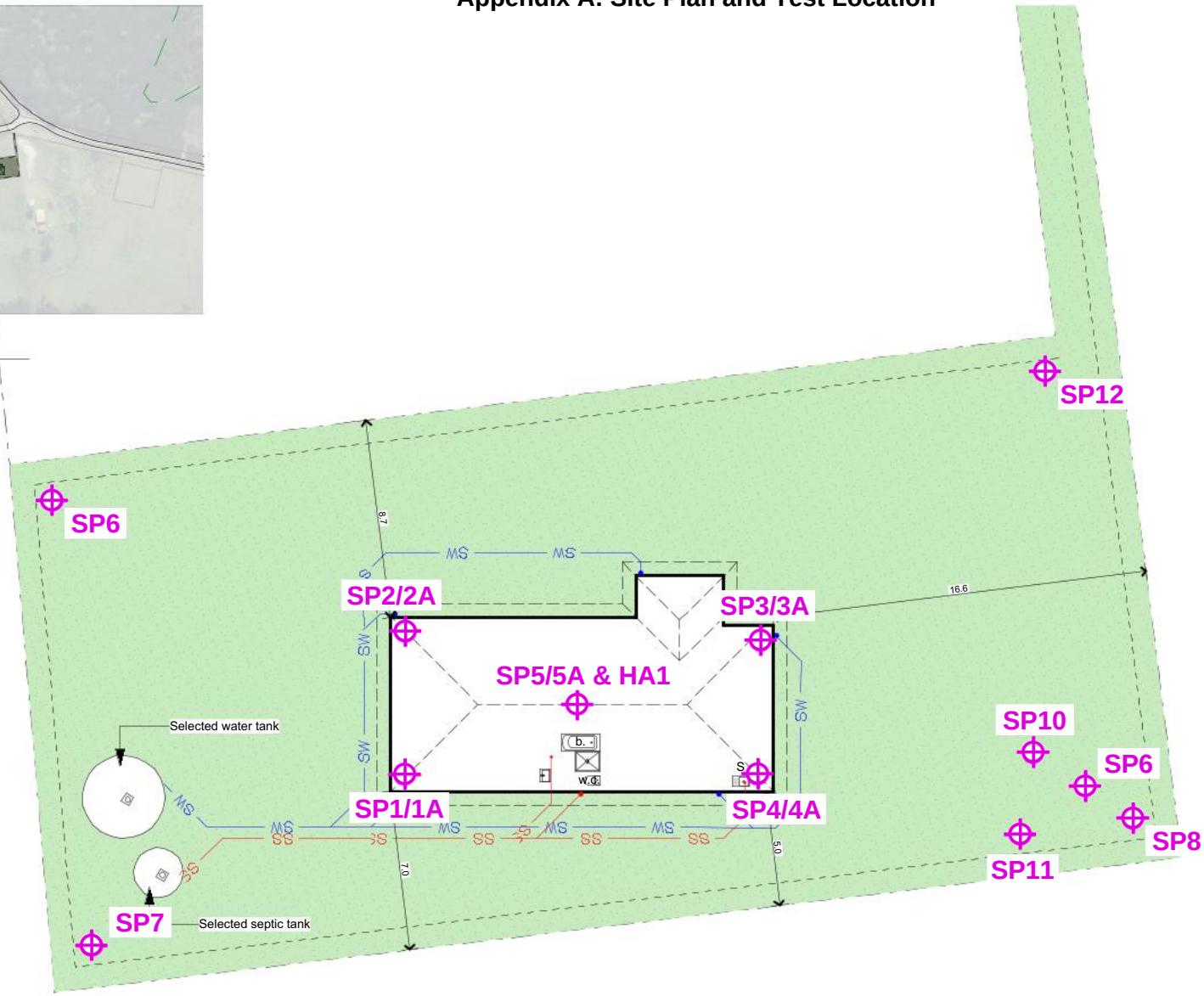
Appendix B – Testing Results

Appendix C – FNDC Hazard Maps

Appendix A: Site Plan and Test Location



Site Aerial
Scale 1:5000



ARCHICAD EDUCATION VERSION

KEY

- Existing plumbing fixtures
- Stormwater line
- Sanitary sewer line

N

Sediment and Erosion Control Notes

1. Stabilised Site Access
A stabilised entry/exit point must be installed (e.g., compacted basecourse or aggregate over geotextile) to prevent sediment tracking onto public roads. All vehicles and equipment must use this access only.

2. Silt Control Fencing
Install silt fences or approved alternatives (e.g., super silt fence or silt sock) downslope of disturbed areas. Ensure fencing is trenched in, securely staked, and maintained throughout the project.

3. Soil and Stockpile Protection
Stockpiles must be located away from waterways and drains. Cover all stockpiles with tarpaulins or temporary vegetation and surround with sediment controls.

4. Stormwater Inlet Protection
Protect all stormwater drains on and near the site using sandbags, silt socks, or appropriate inlet filters. Maintain these after rainfall and replace if damaged.

5. Site Stabilisation and Revegetation
Disturbed areas must be stabilised as early as possible via seeding, hydroseeding, straw mulching, or turfing. Final landscaping or vegetative cover must be applied promptly upon completion.

6. Sediment Retention Devices
For larger or sloped sites, install devices such as sediment retention pits, check dams, or bunds as needed. Ensure sizing and location suit the site and maintain regularly.

7. Maintenance and Monitoring
Inspect all erosion and sediment controls weekly and after heavy rainfall. Promptly repair or replace any damaged or ineffective controls. Keep records of inspections if requested by Council.

General Notes

- Plumbing layout is indicative only. Contractors must verify all details on-site prior to commencing work.
Water Supply Notes (Rural)
- Rainwater must be collected from roof catchments and directed to an approved storage tank.
- Install leaf guards to all gutters to prevent debris ingress.
- Provide debris strainers or first-flush diverters on all downpipes.
- Install a potable water filtration system post-tank, compliant with AS/NZS 4020.
- Include a UV filtration system (e.g., Bug Buster Pro Series Platinum or approved equivalent).
- Water system must supply safe drinking water in compliance with NZBC G12.
- All installations must follow manufacturer specifications and be carried out by a licensed plumber.

Reference Reports Before Construction
All relevant reports must be reviewed before commencing any work. These include:
– Geotechnical Report
– Wastewater Report
– Stormwater Report
– Survey Plan and any other related documentation

If discrepancies or uncertainties arise, STOP work and consult with the designer or relevant authority before proceeding.

ArchX

These drawings are subject to copyright and remain the property of ArchX. Duplication of these drawings will result in legal action ©

NOTES:
House floor area: 99m²
Site area: 97942m²
Water tanks: 20m²
Site coverage = 0.121%

Date	Rev
Work in Progress	A - WIP

ARCHX DETAILS:
Timmy Nator
021 872 870
info@archx.co.nz

CLIENT DETAILS:
Dean and Connie Noble
-
conniefnoble@gmail.com

FLOOR AREA:	105m²
LOT & DP:	Lot 11 DP 183286
SITE AREA:	1,228 m2
WIND ZONE:	High
EXPOSURE ZONE:	C
EARTHQUAKE ZONE:	1
STATUS:	BC

JOB: Proposed 2nd Hand Relocated Dwelling
3 Taylors Road Te Kao Northland 0484 New Zealand

ISSUE: 01/07/2026
REV: A - WIP

SCALE: 1:200 @ A3

DRAWING TITLE: Site Plan

PAGE: 1

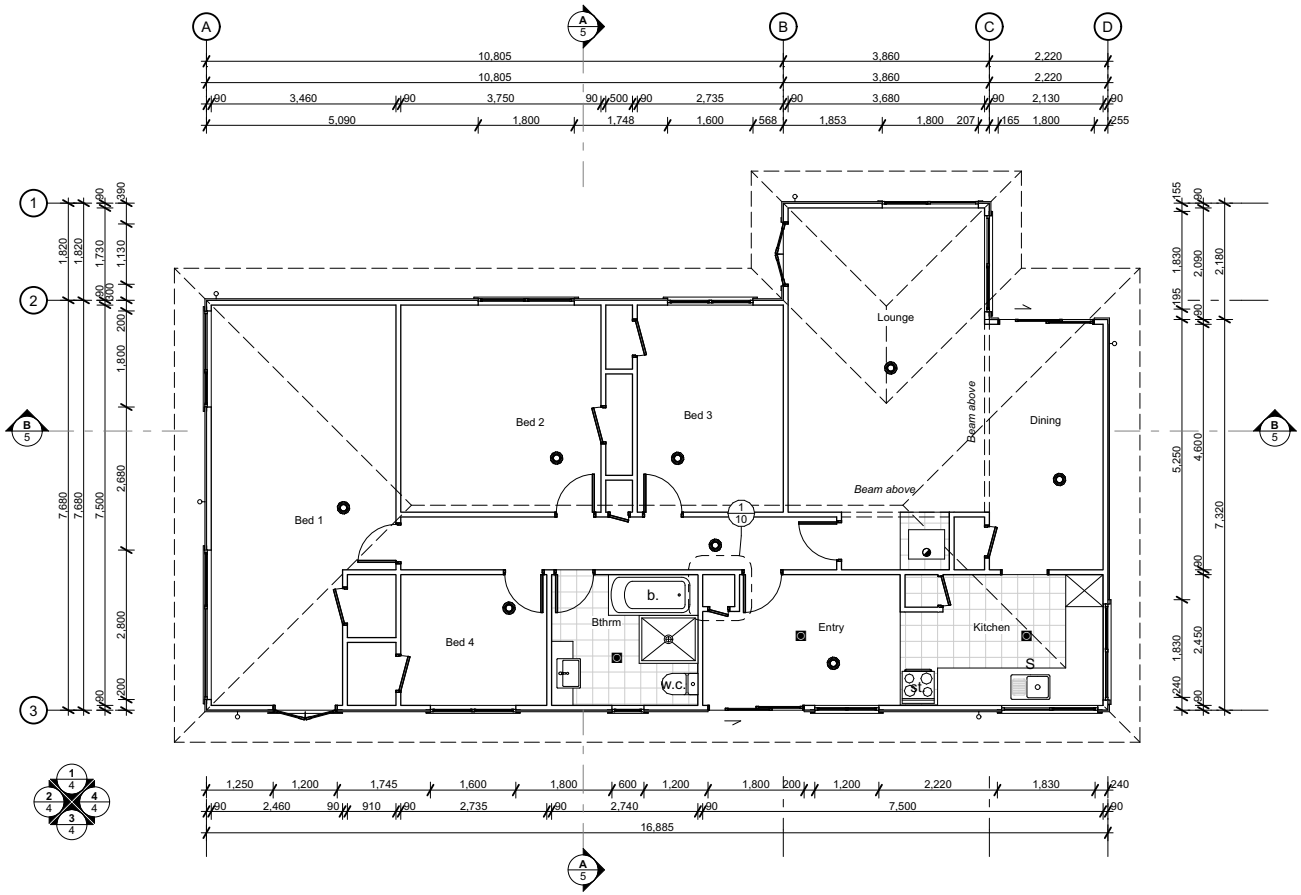
Work in Progress

Building Layout

ARCHICAD EDUCATION VERSION

KEY

- Existing plumbing fixtures
- Existing 90x45mm timber framing
- SA — Inter connected smoke alarms 10 year min battery life
- Extractor fan



Where possible
1. Add single Z nail to Purlin/Rafter connection in periphery areas.
2. Add "L" Bracket between rafter and plate, nailed (4) and screwed (2) in place.

General Notes

- Contractor is responsible for verifying all dimensions, angles, levels, and site conditions before commencing any work.
- Drawings are for construction purposes only and must be used in accordance with the project status noted.
- All drawings must be read in conjunction with architectural specifications, structural documents, manufacturer installation guides, and all relevant consultant reports.
- All construction must comply with the latest New Zealand Building Code and relevant standards.
- Ensure all proprietary products are installed strictly per the manufacturer's instructions.
- Do not scale drawings. Use figured dimensions only. Contact the designer or contractor if in doubt.
- Report any discrepancies or inconsistencies to the drafter immediately.
- Site boundaries, floor levels, and profiles must be pegged and confirmed by a registered surveyor prior to construction.
- Contractor is solely responsible for identifying and protecting all underground services prior to commencement of any excavation or groundwork.
Construction & Demolition Safety
- F5.3.3: Where construction or demolition sites pose potential hazards (e.g., attraction to children), the site must be enclosed to restrict unauthorized access.
- F5.3.4: Adequate barriers must be erected to protect the public and ensure safe passage when equipment or work areas pose fall or injury risks.
- Ensure all workers comply with appropriate site safety protocols, PPE standards, and WorkSafe NZ guidelines.

Stair Requirements
- Maximum riser height: 190mm
- Minimum tread length: 280mm
- Deck landing to dwelling clearance (including cladding and decking): Minimum 12mm
- All stairs to comply with D1 Building Code and NZS 4121 for accessibility if applicable
- Handrails required where stairs exceed 1m in height or as specified

Mechanical Ventilation / Extractor Fans
Mechanical ventilation systems must comply with NZBC Clause G4.
Minimum flow rate for extract fans:
– 25 L/s for showers and baths
– 50 L/s for kitchen cooktops
Extractor fans must be vented directly to the exterior, not into ceiling cavities or roof spaces.

Work in Progress

ArchX

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NOTES:

Date	Rev
Work in Progress	A - WIP

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Timmy Nator
021 872 870
info@archx.co.nz

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STATUS:	BC

JOB: Proposed 2nd Hand Relocated Dwelling
3 Taylors Road Te Kao Northland 0484 New Zealand

ISSUE: 01/07/2026
REV: A - WIP

SCALE: 1:100 @ A3

DRAWING TITLE: Floor Plan

PAGE: 2

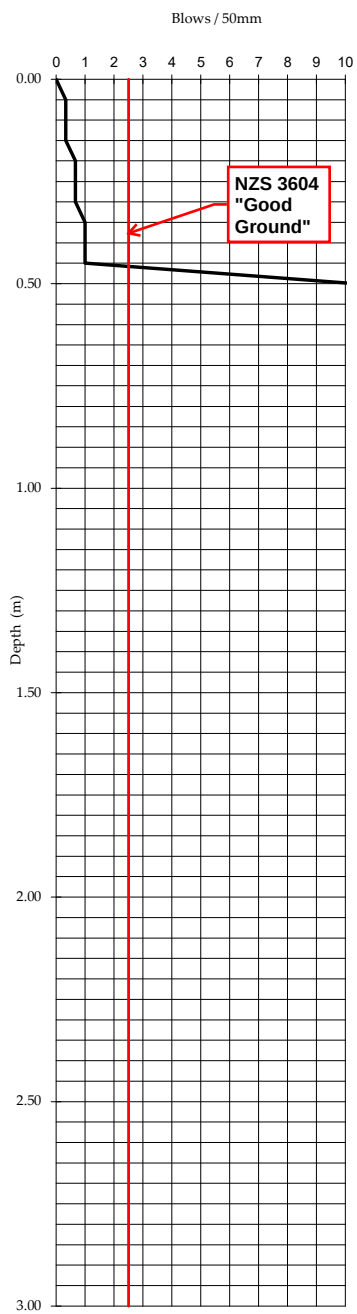
Appendix B: Testing Results

FNR LTD CONSULTING

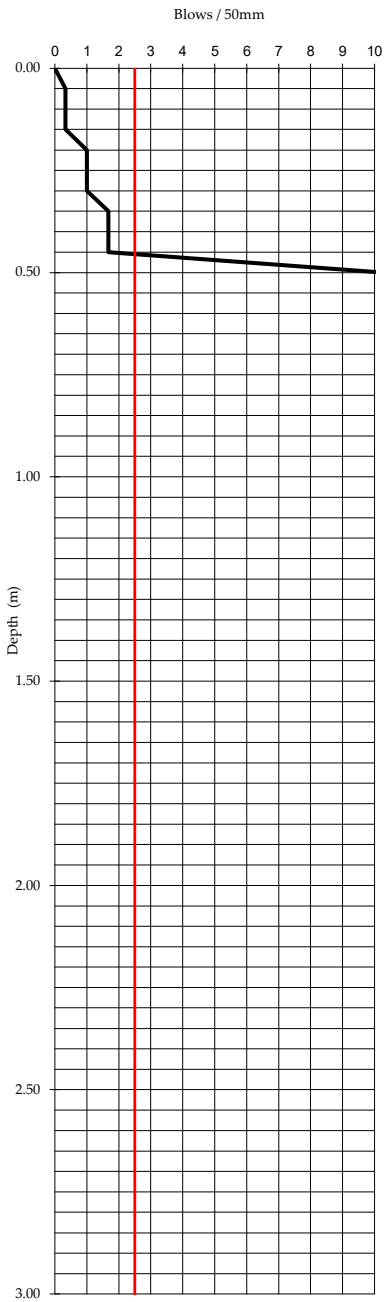
SCALA PENETROMETER TEST REPORT

Project :	FNR1070 - Site Investigation Report				
Location :	2 Taylors Road Te Kao				
Client :	Connie Noble				
Contractor :	N/A				
Test number :	SP1	Test number :	SP1A	Test number :	SP2
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Reduced level :	Ex. GL	Reduced level :	Ex. GL	Reduced level :	Ex. GL

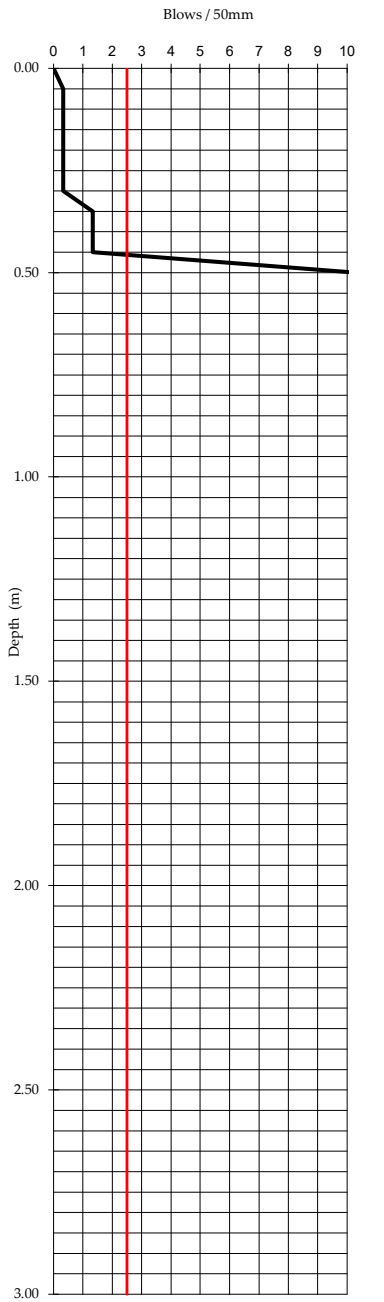
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

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Date reported :	27/07/26	Reported by:	TA

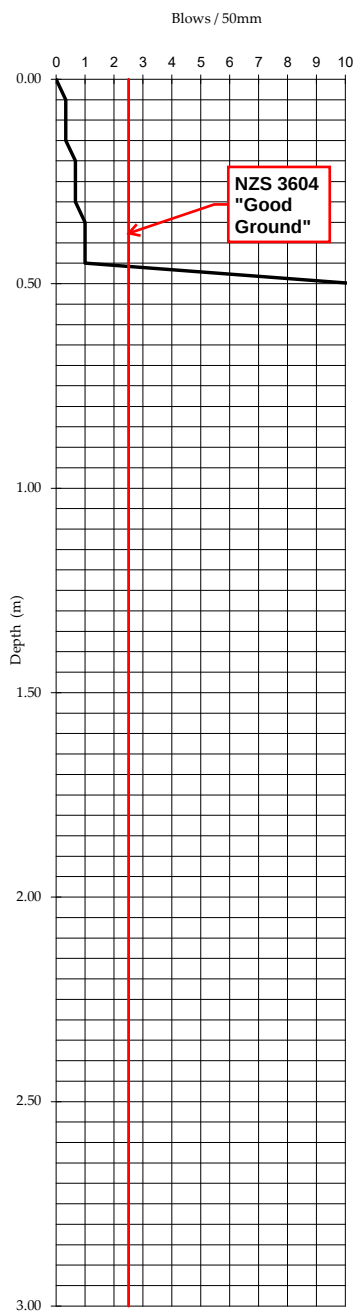
FNR LTD CONSULTING

SCALA PENETROMETER TEST REPORT

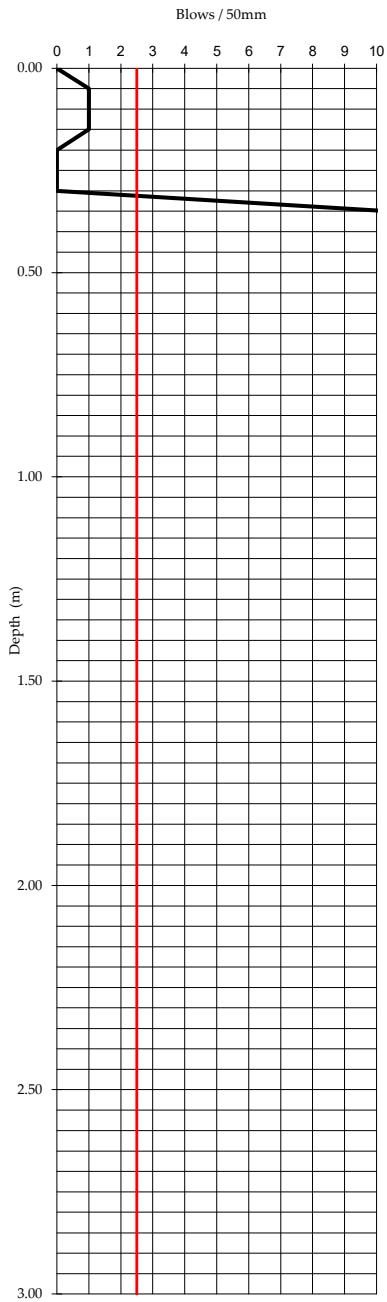
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Location :	2 Taylors Road Te Kao
Client :	Connie Noble
Contractor :	N/A

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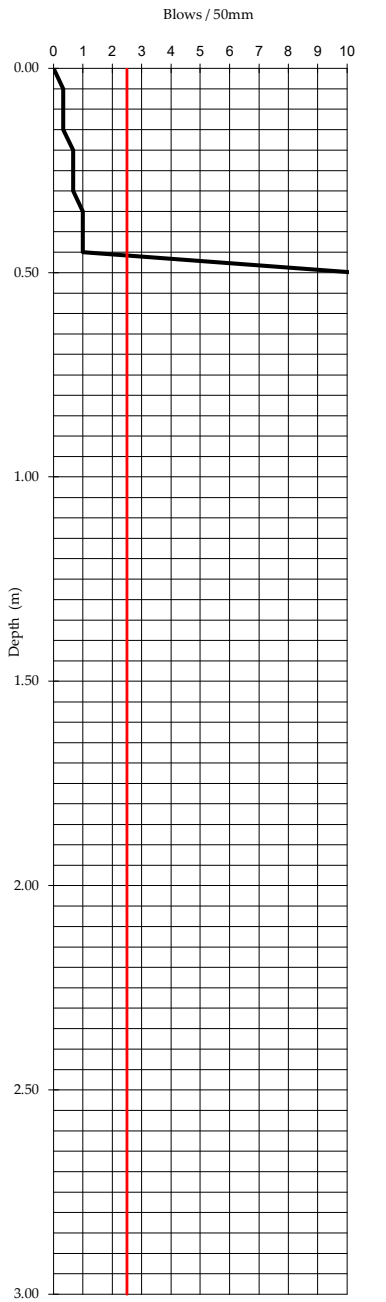
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

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Date reported :	27/07/26	Reported by:	TA

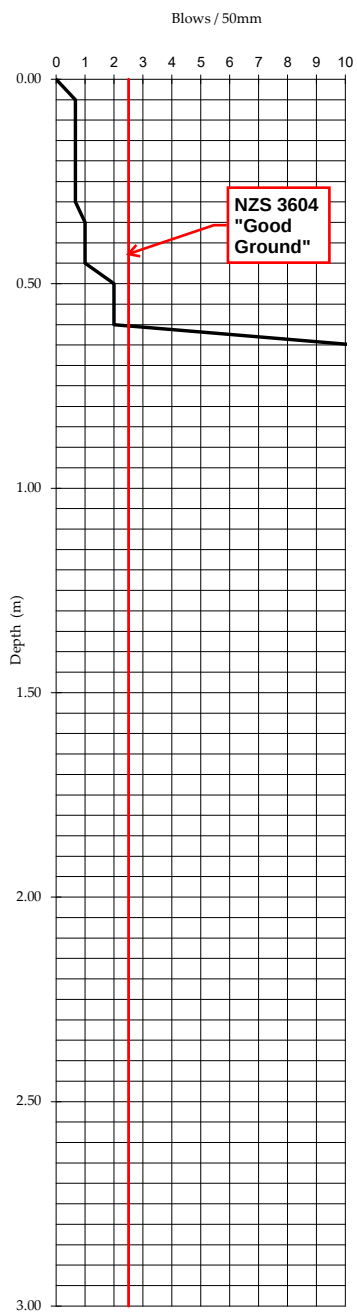
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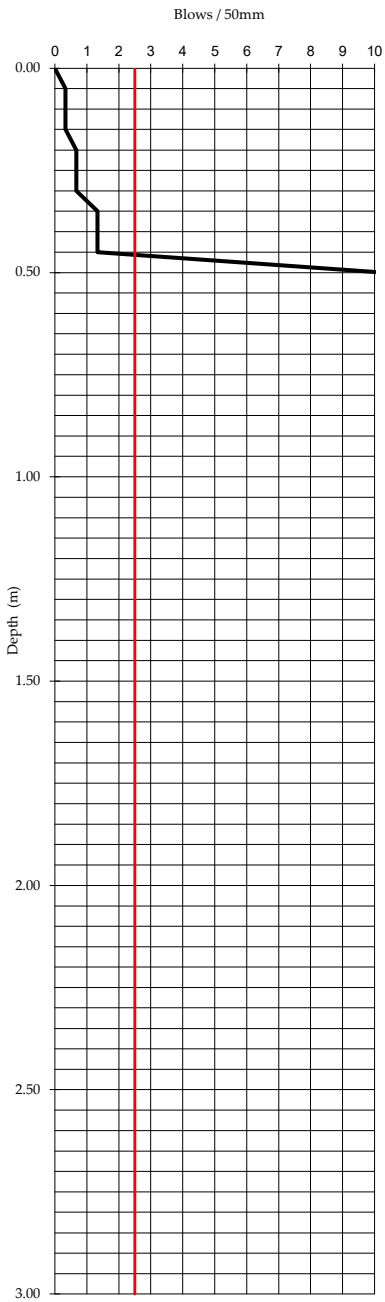
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Location :	2 Taylors Road Te Kao
Client :	Connie Noble
Contractor :	N/A

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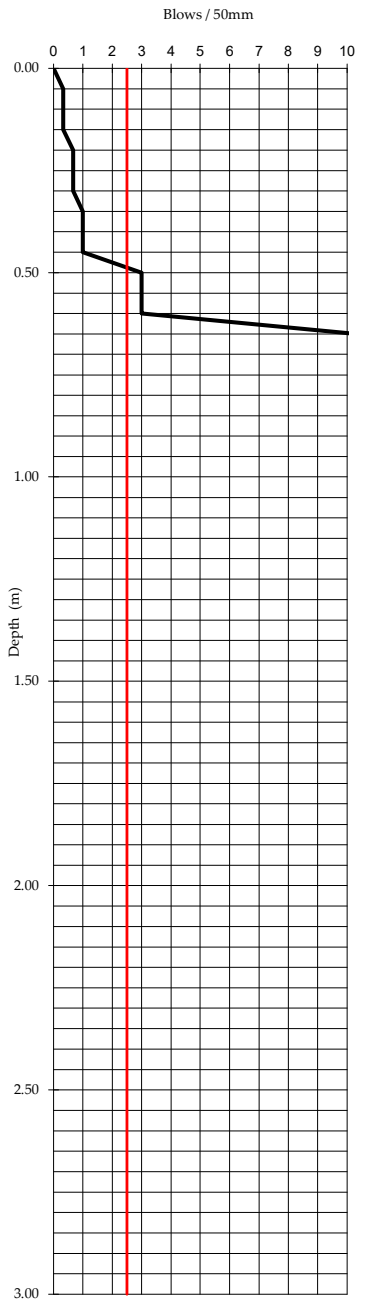
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

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Date reported :	27/07/26	Reported by:	TA

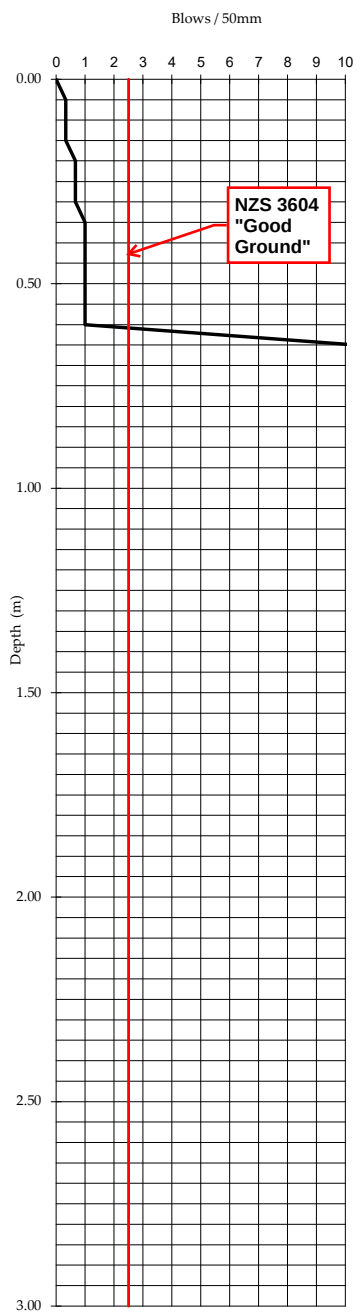
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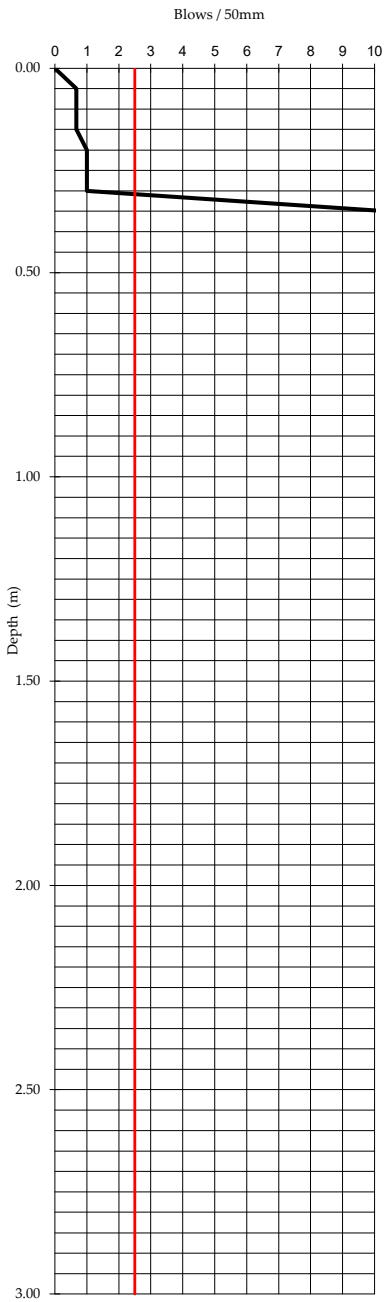
Project :	FNR1070 - Site Investigation Report
Location :	2 Taylors Road Te Kao
Client :	Connie Noble
Contractor :	N/A

Test number :	SP5A	Test number :	SP6	Test number :	SP7
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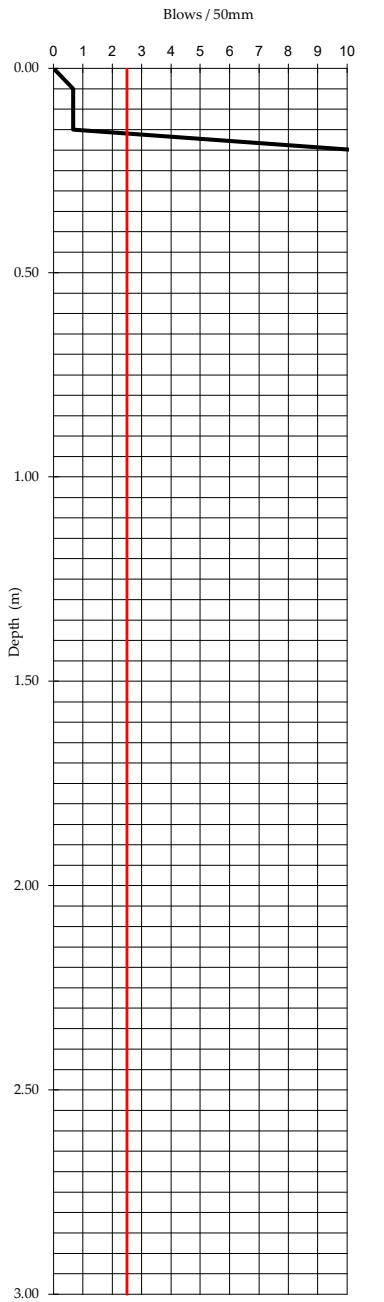
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

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Date reported :	27/07/26	Reported by:	TA

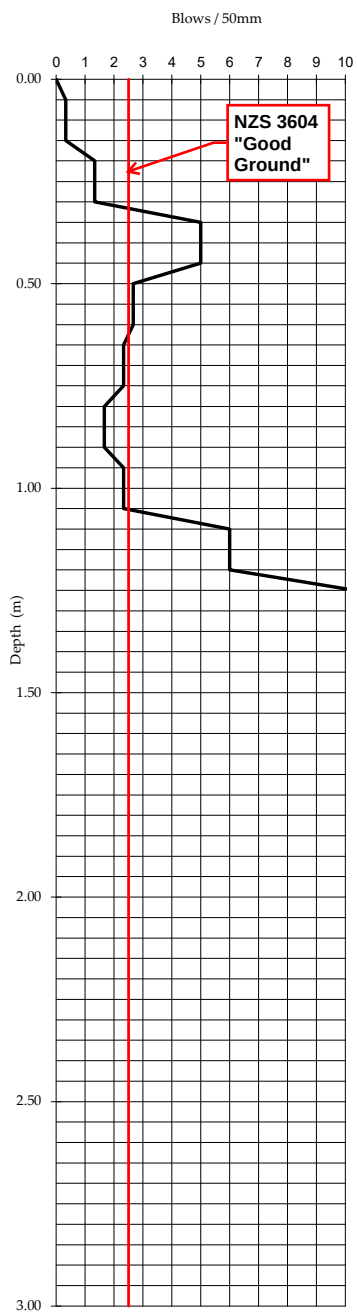
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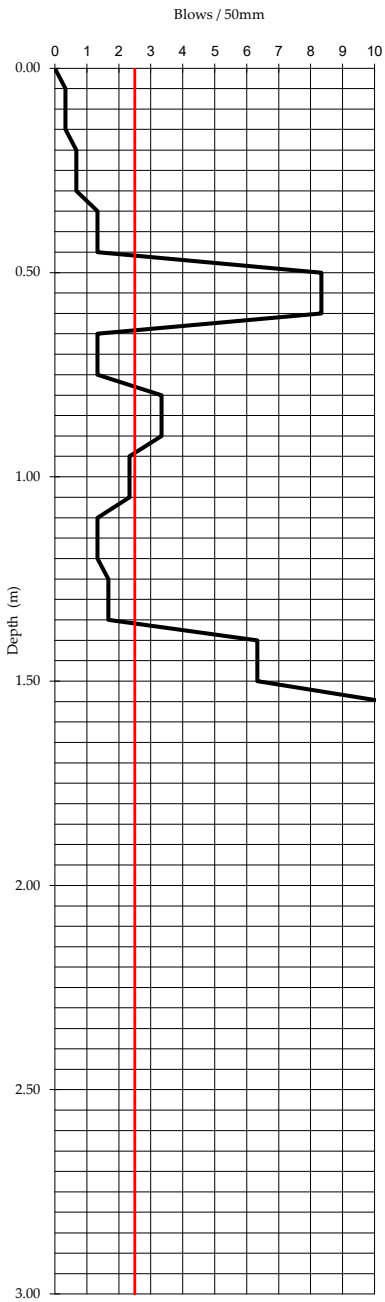
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Location :	2 Taylors Road Te Kao
Client :	Connie Noble
Contractor :	N/A

Test number :	SP8	Test number :	SP9	Test number :	SP10
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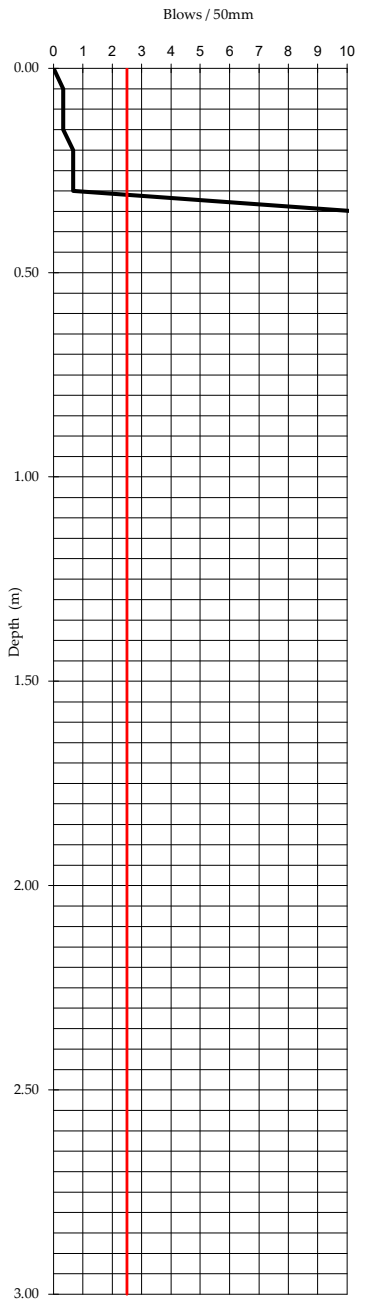
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

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Date reported :	27/07/26	Reported by:	TA

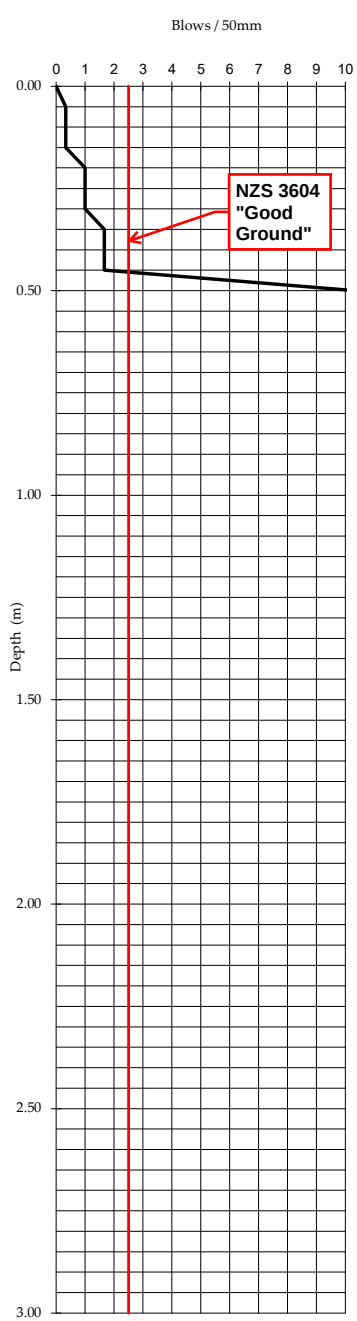
FNR LTD CONSULTING

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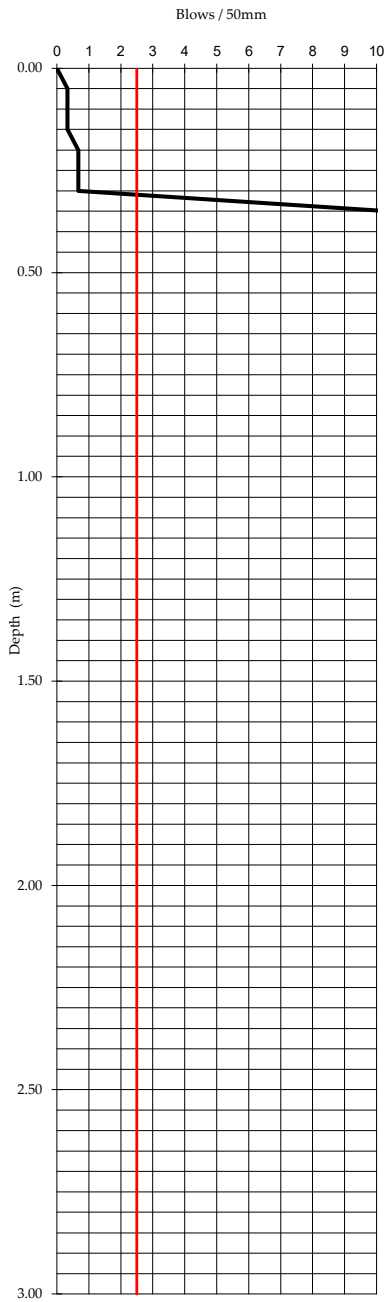
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Location :	2 Taylors Road Te Kao
Client :	Connie Noble
Contractor :	N/A

Test number :	SP11	Test number :	SP12	Test number :	
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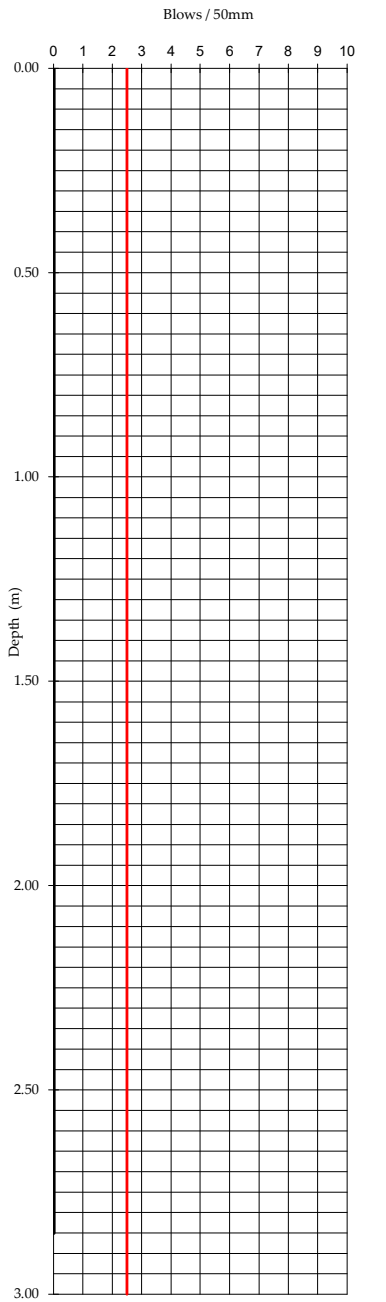
Scala Penetrometer



Scala Penetrometer



Scala Penetrometer



Test Methods

Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2

Date tested :	15/07/2026	Tested by:	TR
Date reported :	27/07/26	Reported by:	TA

Scala Photos













Hand Auger Borehole Log

Test No:	**HA1**
Job No:	FNR 1070
Sheet:	1 of 1

Project:	FNR1070- Site Investigation Report	**Vane ID:**	2712
Client:	Connie Noble	**Coordinates:**	N/A
Location:	2 Taylors Road Te Kao	**Reduced Level:**	Existing Ground Level
Tested By:	Tarn Richards	**Test Date:**	15/07/2026

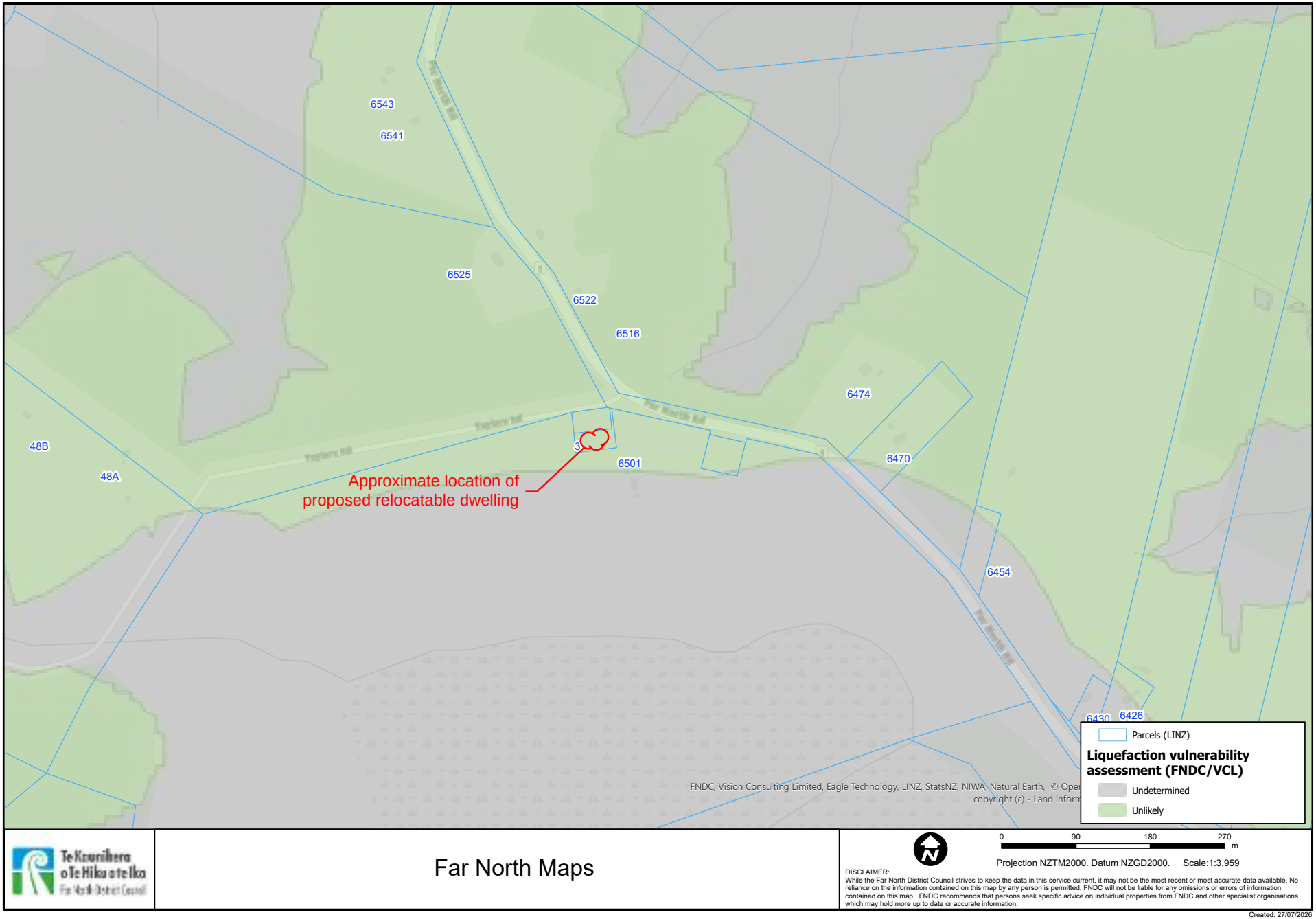
Depth (m)	Graphic Log	Material Description	Geology	G.W.L	Scala Penetrometer (blows / 50mm) 0 1 2 3 4 5 6 7 8 9 10	Shear Vane Strength (kPa) Peak/Residual
0.5		Very moist fine TOPSOIL, black some signs of organic matter Dense SAND hardpan layer	Karioitahi and Awhitu Group			
		Auger termined - UTP				
1.0						
1.5						
2.0						
2.5						
3.0						
3.5						
4.0						

Remarks:

1) The subsurface data described above has been determined at this specific test location (refer to site plan). The data will not identify any variations away from this location.
2) Material described in general accordance with NZGS Field Description of Soil and Rock (2005).
3) Drill Method 50mm hand auger.
4.) UTP - Unable to penetrate

- Standing Water Level
- Inflow
- Outflow
- Scala Results
- NZS 3604 Good Ground

Appendix C: FNDC Natural Hazard Maps





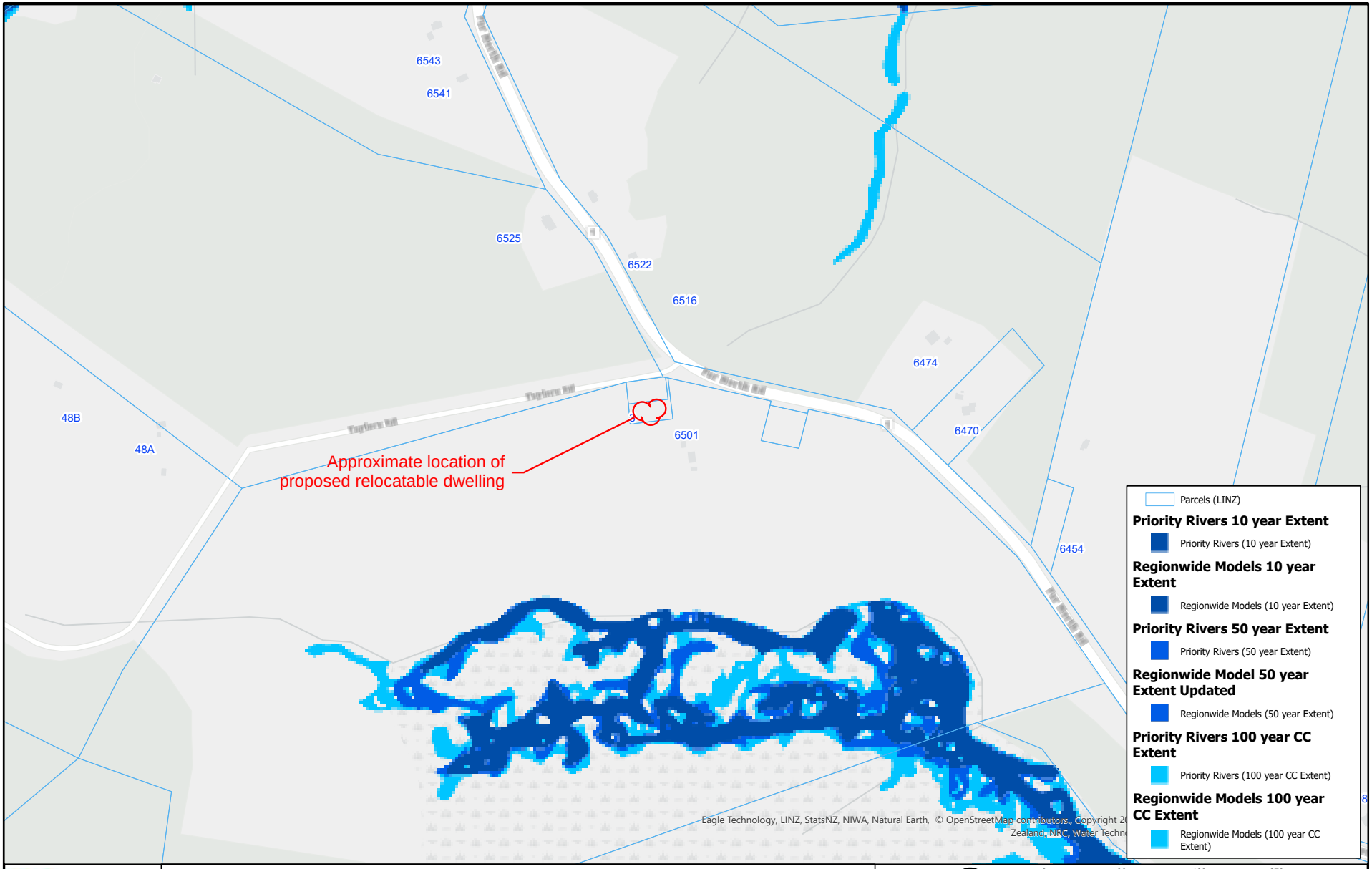
Far North Maps

0 30 60 90 m

Projection NZTM2000. Datum NZGD2000. Scale:1:1,425

DISCLAIMER:
While the Far North District Council strives to keep the data in this service current, it may not be the most recent or most accurate data available. No reliance on the information contained on this map by any person is permitted. FNDC will not be liable for any omissions or errors of information contained on this map. FNDC recommends that persons seek specific advice on individual properties from FNDC and other specialist organisations which may hold more up to date or accurate information.

Created: 27/07/2026



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

Far North Maps

0 90 180 270 m

Projection NZTM2000. Datum NZGD2000. Scale:1:3,959

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Created: 27/07/2026