

Application for resource consent or fast-track resource consent

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

1. Pre-Lodgement Meeting

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

Yes No

If yes, who have you spoken with?

2. Type of consent being applied for

(more than one circle can be ticked):

Land Use

Discharge

Fast Track Land Use*

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

Subdivision

Extension of time (s.125)

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

Other (please specify)

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

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

Yes No

4. Consultation

Have you consulted with Iwi/Hapū? Yes No

If yes, which groups have you consulted with?

Who else have you consulted with?

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

5. Applicant details

Name/s:

Wayne Olsen

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.

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6. Address for correspondence

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

Name/s:

Steven Sanson - Bay of Islands Planning

Email:

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.

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

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

Name/s:

Refer CT attached

**Property address/
location:**

1032B Wiroa Road, Okaihau 0475

Postcode

8. Application site details

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

Name/s:

Site address/
location:

 Postcode

Legal description:

Val Number:

Certificate of title:

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.

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

10. Would you like to request public notification?

Yes No

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

(more than one circle can be ticked):

Building Consent

Regional Council Consent (ref # if known)

National Environmental Standard Consent

Other (please specify)

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

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

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

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

Subdividing land

Disturbing, removing or sampling soil

Changing the use of a piece of land

Removing or replacing a fuel storage system

13. Assessment of environmental effects:

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

Your AEE is attached to this application Yes

14. Draft conditions:

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

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

15. Billing Details:

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

Name/s: (please write in full)

Email:

Phone number:

Postal address:

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

Fees Information

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

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

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Name/s: (please write in full)

WAYNE OLSEN

Email:

Phone number:

Postal address:

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

Fees Information

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15. Billing details continued...

Declaration concerning Payment of Fees

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

Name: (please write in full)

WAYNE OLSEN

Signature:

(signature of bill payer)

MANDATORY

16. Important Information:

Note to applicant

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

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

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

Fast-track application

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

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

Privacy Information:

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

17. Declaration

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

Name (please write in full)

Signature

Date

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

See overleaf for a checklist of your information...

Checklist

Please tick if information is provided

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

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

BAY OF ISLANDS PLANNING LIMITED

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

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

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23 March 2026

Dear Team Leaders,

Re: Proposed Second Residential Unit at 1032B Wiroa Road, Okaihau

Our client, Wayne Olsen seeks a resource consent for a second residential unit at 1032B Wiroad Road, Okaihau. The site is zoned Rural Production within the Far North District Council Operative District Plan (**ODP**), and Rural Production under the Proposed District Plan (**PDP**).

Resource Consent is required as the property already has an established principal residential unit and the proposed unit cannot strictly meet the Minor Residential Unit size and separation distance parameters.

Overall, the application is a **Non-complying Activity**. Please do not hesitate to contact me should you require any further information.



Steven Sanson
Consultant Planner

ASSESSMENT OF ENVIRONMENTAL EFFECTS

1.0 INTRODUCTION

1.1 Applicant & Property Details

- **Applicant:** Wayne Olsen
- **Owner:** William Francis Albert Foote and Beula Foote
- **Site Address:** 1032B Wiroa Road, Okaihau 0475
- **Legal Description:** Lot 3 DP 514318
- **Site Area:** 2.0138 hectares
- **Zoning (ODP):** Rural Production Zone
- **Zoning (PDP):** Rural Production Zone

1.2 Proposal Summary

The applicants seek Land Use Consent to establish a second residential unit on the site.

The proposal comprises:

- A transportable 2-bedroom minor dwelling. The unit has a floor area of approximately 70m².
- Installation of a new onsite wastewater treatment and disposal system (SEPD45C dual chamber septic tank fed through Evapo-Transpiration Seepage (ETS) Beds).
- Management of stormwater via existing water storage tanks and new dispersal devices (above-ground bar or in-ground trench).

Overall, the application falls to be considered as a **Non-Complying Activity** under the Operative District Plan (ODP) due to breaches of the Minor Residential Unit rule (separation distance and size being 5m² larger) and Residential Intensity standards.

No consents are needed under the Proposed District Plan (PDP), the Northland Regional Plan or any National Environmental Standard.

2.0 SITE DESCRIPTION & STATUTORY CONTEXT

2.1 Site Topography and Character

The subject site is located at 1032B Wiroa Road, Okaihau, and is a regular-shaped allotment of 2.0138 hectares. The site currently contains a principal existing dwelling (336m²) located near the south-eastern boundary, an existing shed (Shed 1 - 72m²), and a second shed under construction (Shed 2 - 40m²) in the western portion of the site. An established metalled driveway extends from the access at the south-western corner.

The topography consists of a broad volcanic flank that falls at gentle inclinations (averaging less than 5°) from the east down to the west. The Far North District Council (**FNDC**) online GIS indicates that public underground service connections are not available to the property. The site soils are noted as Class 4.

2.2 Record of Title and Consent Notice 10094951.3

The Record of Title (Identifier 797963) confirms William Francis Albert Foote and Beula Foote as the registered owners. The title is subject to standard interests including Section 206 of the Land Act 1924, Section 8 of the Coal Mines Amendment Act 1950, and various easements for electricity, telecommunications, and right of way.

Crucially, the title is subject to Consent Notice 10094951.3. Condition (vi) of this notice pertains specifically to the installation of wastewater systems. It dictates that any building requiring a wastewater disposal system must install the system detailed in the original report by Bay of Islands Plumbing and Drainage. However, the condition provides an alternative compliance pathway: *"Where wastewater treatment and effluent disposal system is proposed that differs from that detailed in the above mentioned report, a new TP 58 / Site and soil Evaluation Report will be required to be submitted, and Council's approval of a new system must be obtained, prior to its installation."*

The proposed minor dwelling incorporates a newly designed wastewater treatment system (SEPD45C) by Waterflow NZ Ltd, rather than the originally specified system. To fulfill the requirements of Consent Notice 10094951.3, a comprehensive site-specific wastewater design and producer statement (PS1) have been provided with this application. This directly satisfies the alternative provision within the Consent Notice, ensuring the proposal remains legally compliant with the title's restrictions upon Council's approval.

3.0 DESCRIPTION OF THE PROPOSAL

The proposal is to establish a transportable minor dwelling on the property. The primary purpose of establishing this minor residential unit is to assist with family living on the site, providing independent yet proximate accommodation for extended family members.

- **Nature of Unit:** The unit is a lightweight transportable building. It will be founded on a timber subfloor suspended on bored, concrete-encased, tanalised timber pile foundations.
- **Location:** The unit will be situated in the south-western portion of the site, offset approximately 8.0m north of the existing Shed 1. It is located greater than 30m from the principal dwelling.
- **Access:** The unit will utilize an extension of the existing metalled driveway.
- **Wastewater:** Connected to its own Waterflow NZ Ltd SEPD45C system discharging to 80m² of ETS beds.
- **Stormwater:** Roof runoff will be directed to the existing tanks or a dedicated dispersal device. Driveway runoff will be managed via a grassed V-channel to a silt trap and dispersal line, ensuring post-development flows are appropriately mitigated.

4.0 REASONS FOR CONSENT

4.1 Operative District Plan (ODP) Rules

Table 1 – Rural Production Zone - Performance Standards

Rule	Standards	Performance/Comments	Compliance
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Residential Intensity	Permitted – One unit per 12ha. Discretionary – One unit per 2ha. Units must have 3,000m ² exclusive use plus a minimum of 11.7ha elsewhere on the property.	The site is 2.0138ha. The addition of a second unit breaches the intensity threshold as it cannot achieve the 11.7ha requirement elsewhere on the property.	Non-complying
Sunlight	Permitted - No part of any building shall project beyond a 45-degree recession plane.	The single-storey dwelling is set back sufficiently from all boundaries.	Complies
Stormwater Management	Permitted - Max impermeable surface 15%.	Post-development impermeable coverage will be 1,772m ² or 8.8% of the site area.	Complies
Setback from Boundaries	Permitted - No building within 10m of any site boundary.	The dwelling is set back 17.02m from the western boundary and easily clears 10m on all other boundaries.	Complies
Building Height	Permitted - Maximum height 12m.	The proposed transportable dwelling is single-storey and well under 12m.	Complies
Building Coverage	Permitted - Maximum building coverage 12.5%.	Proposed building coverage is 479.06m ² (approx 2.3% of the site).	Complies
Minor Residential Unit	Controlled - Max 1 per site, minimum 5,000m ² , shares access, and is no greater than 30m from the principal dwelling.	The proposed dwelling is more than 30m from the principal dwelling, and slightly larger than the MRU requirement meaning it defaults to being assessed as a second residential unit under the Residential Intensity rules.	N/A

Table 2 – District Wide Performance Standards

Rule	Standard	Performance/Comments	Compliance
12.3 Earthworks	Permitted – Max 5,000m ³ within a 12-month period and max 1.5m cut or fill.	Earthworks are minimal and associated entirely with footing excavations for the piles.	Complies
12.7.6.1.4 Discharge of Human Sewage	Standards for onsite disposal.	The system has been designed by Waterflow NZ Ltd to safely	Complies

		accommodate the load within the property boundaries.	
Chapter 15 Transportation	Permitted – 60 one-way traffic movements.	The addition of one minor unit will generate negligible additional traffic well within the limits. Parking and access are considered to be appropriate and permitted.	Complies

4.2 Proposed District Plan (PDP) Rules

Under the PDP, the site is zoned Rural Production. There are no special features present or relevant.

It has been evaluated that no consents are required under the PDP as the proposal complies with all standards having immediate legal effect (e.g., earthworks, light, noise).

5.0 ASSESSMENT OF EFFECTS ON THE ENVIRONMENT

5.1 Character and Appearance & Residential Intensity

The proposed unit is a modest, single-storey transportable dwelling. Its scale is compatible with the rural-lifestyle nature of the site and surrounding lifestyle blocks. It is noted that the proposed minor dwelling maintains a significant separation distance from the Wiroa Road frontage, mitigating potential visual effects on the public realm. Furthermore, the existing principal house is partially screened by mature vegetation, allowing the site to readily absorb the additional modest built form without dominating the rural landscape.

While the Operative District Plan requires a Minor Residential Unit to be located within 30m of the principal dwelling to ensure it remains visually and functionally subservient, the proposed approach is to utilize the 2ha site area to separate the dwellings to provide a superior level of onsite amenity.

By locating the unit further away, it affords both households a high degree of acoustic privacy, independent outdoor living spaces, and visual separation. Despite this physical distance, the minor dwelling's modest 70m² footprint ensures it undeniably remains subservient in scale and nature to the expansive 336m² principal dwelling, fulfilling the underlying intent of the rule.

In regards to the breach of the residential intensity standard, it is highly relevant that the proposal comfortably complies with the Operative District Plan's building coverage and stormwater (impermeable surface) rules. Total building coverage across the site will be approximately 2.3% (well below the 12.5% permitted), and impermeable surfaces will be 8.8% (below the 15% permitted).

This demonstrates that the District Plan fundamentally anticipates and accepts the physical scale and level of built development proposed on a site of this size. The non-compliance is driven entirely by the use of the structure as a second independent dwelling, rather than its physical massing or bulk. Consequently, the visual and environmental footprint of the built form is entirely within the baseline expected by the Plan.

Furthermore, this spatial separation does not pre-empt an expectation of future subdivision. It is well understood that a 2ha block is highly unlikely to be subdivided any further, as doing so would directly conflict with current and future objectives and policies of both the ODP and PDP that specifically seek to avoid the fragmentation of rural land and the proliferation of undersized lots.

Specifically, any future subdivision would be highly contrary to ODP Chapter 13 Subdivision provisions (including Objectives 13.3.1 and 13.3.2, which seek to maintain the natural and physical environment of the rural area) and PDP strategic directions (such as SUB-O1, SUB-O2, and RPROZ-O3, which explicitly aim to avoid the subdivision and fragmentation of Rural Production land into unviable parcels).

Therefore, the layout optimizes the living environment for a single rural title without compromising the integrity of the Rural Production Zone or establishing a precedent for inappropriate subdivision.

5.2 Siting, Sunlight & Privacy

The residential unit fully complies with the 10m boundary setback rules, ensuring sunlight access to neighbouring properties is unaffected. The decision to locate the unit more than 30m from the principal dwelling represents a superior planning outcome, as it provides high levels of acoustic and visual privacy for the occupants of both dwellings.

5.3 Soils and Earthworks

The site's soils are noted as Class 4. Because these are not Class 1-3 soils, they are not considered Highly Productive Land under the NPS-HPL. The establishment of a transportable dwelling on timber piles requires minimal earthworks, thereby preserving the underlying soil structure and avoiding permanent alienation of versatile land. Geotechnical investigations confirm the site has a low risk of instability and foundations will be engineered for Class H (Highly Expansive) soils.

5.4 Servicing (Wastewater and Stormwater)

- **Stormwater:** The Wilton Joubert Stormwater Management Report confirms that the total impermeable area will be only 8.8% of the site. Roof and hardstand runoff will be captured and dispersed via purpose-built grassed V-channels, silt traps, and dispersal devices (bars/trenches) to prevent erosion and localized flooding.
- **Wastewater:** A site-specific wastewater design has been prepared by Waterflow NZ Ltd. The system (SEPD45C) easily caters to the 640L/day peak flow and utilizes 80m² of ETS beds for dispersal. The depth to the seasonal water table is >1.2m, and the site characteristics ensure no short-circuiting or runoff to surface waters. The effects on the receiving environment will be negligible.

5.5 Traffic & Access

The second residential unit does not create significant traffic effects. It will utilize the established metalled driveway, requiring no major upgrades. We consider that the existing vehicle crossing is suitable for the proposed use and can safely and efficiently accommodate

the minor increase in vehicle movements without adversely affecting the Wiroa Road network. Parking is provided on-site in accordance with the district plan requirements.

6.0 NATIONAL POLICY STATEMENTS AND ENVIRONMENTAL STANDARDS

6.1 National Policy Statement for Highly Productive Land (NPS-HPL)

The NPS-HPL seeks to protect highly productive land (Class 1-3 soils) for use in land-based primary production. As noted in Section 5.3, the subject site's soils are classified as Class 4, meaning the site does not meet the definition of Highly Productive Land. Therefore, the proposal to establish a minor residential unit does not result in the inappropriate loss of versatile soils and is entirely consistent with the NPS-HPL.

6.2 National Environmental Standards for Detached Minor Residential Units (NES-DMRU)

The NES-DMRU, which came into effect on 15 January 2026, establishes a national framework to make it easier to build 'granny flats' or detached minor residential units. The standard supports the establishment of one minor unit per site across rural and residential zones, provided certain physical standards are met, actively seeking to reduce the regulatory burden of restrictive District Plan rules.

While the proposal requires consent as a Non-Complying Activity due to the ODP's specific 30m maximum separation rule, 65m² floor area limit, and underlying 12ha residential intensity limit, it is functionally consistent with the standards and overarching intent of the new NES-DMRU:

- **Floor Area:** The proposed unit is approximately 70m², perfectly aligning with the maximum 70m² floor area permitted by the NES-DMRU for minor residential units.
- **Separation Distance:** The NES-DMRU requires a minimum setback of 2m from the principal dwelling, notably omitting any maximum separation distance. The proposed 30m+ separation safely exceeds the 2m minimum, aligning with the NES-DMRU framework which allows for flexibility in unit siting.
- **Boundary Setbacks:** The NES-DMRU requires a 10m front boundary setback and 5m side/rear boundary setbacks in rural zones. The proposed unit is set back 17.02m from the western boundary and comfortably exceeds 10m on all other boundaries, achieving these national baseline standards.
- **Building Coverage:** In rural zones, the NES-DMRU requires compliance with the District Plan's site coverage limits. The proposal's 2.3% building coverage easily complies with the ODP's 12.5% allowance.

Overall, the proposal directly reflects the type of secondary residential accommodation the government seeks to enable through the NES-DMRU. The District Plan's 30m maximum separation rule is a legacy constraint that the new national direction functionally moves past, demonstrating that the environmental footprint, scale, and spatial distribution of this unit are nationally anticipated and accepted.

7.0 ASSESSMENT OF OBJECTIVES AND POLICIES

7.1 Operative District Plan (ODP) – Rural Production Zone

- **Sustainable Management and Wellbeing (Objectives 8.6.3.1, 8.6.3.2 / Policy 8.6.4.1):** The proposal provides for a second residential unit on an existing 2.0138ha block. This allows the applicants to utilize their land efficiently for residential living in a manner that supports their social and economic wellbeing, without compromising the wider rural environment.
- **Rural Character and Reverse Sensitivity (Objectives 8.6.3.3, 8.6.3.6 / Policies 8.6.4.2, 8.6.4.3):** The addition of a modest 70m² transportable dwelling will not generate reverse sensitivity effects on legitimate rural production activities. The breach of the 30m separation rule ensures that the dwellings are not clustered, thereby preventing internal crowding and maintaining the spacious, open character anticipated in the rural environment.
- **Protection of Soils (Policy 8.6.4.6):** The site's soils are classified as Class 4 and do not hold 'highly productive' status. The use of a transportable dwelling on timber pile foundations requires minimal earthworks, ensuring the underlying soil structure is largely undisturbed.

7.2 Proposed District Plan (PDP) – Rural Production Zone (RPROZ)

- **Protecting Primary Production (RPROZ-O1, RPROZ-O3 / RPROZ-P1):** Given the site's limited size (2ha) and Class 4 soil profile, the property has negligible economic viability for traditional, large-scale primary production. The minor dwelling will not sterilise highly productive land.
- **Maintaining Rural Amenity and Density (RPROZ-O2 / RPROZ-P4):** The PDP seeks to maintain a predominant character of low-density development. Total building coverage across the site will remain exceptionally low at approximately 2.3%, and impermeable surfaces at only 8.8%.

8.0 SECTION 104D GATEWAY TEST ASSESSMENT

As the proposal is classified as a Non-Complying Activity under the ODP, it must be assessed against the restrictions on granting consent outlined in Section 104D of the RMA. A consent authority may only grant resource consent for a non-complying activity if it is satisfied that either (a) the adverse effects on the environment will be minor; or (b) the application is not contrary to the objectives and policies of the relevant plans.

8.1 Section 104D(1)(a) – Adverse Effects

As detailed in Section 5.0, the adverse effects of the proposal on the environment will be less than minor. The unit is modest, maintains substantial boundary setbacks, and is fully self-sufficient regarding onsite servicing.

The breach of the 30m MRU separation rule results in a positive effect on internal privacy, while the density breach does not tangibly alter the established rural-lifestyle character.

Furthermore, the building footprint and impermeable surfaces are well within permitted limits, ensuring the physical scale of the development matches what the Plan expects. The proposal successfully passes the first gateway.

8.2 Section 104D(1)(b) – Objectives and Policies

The proposal is broadly consistent with the outcomes sought by both the ODP and PDP. It avoids the sterilisation of versatile soils, prevents reverse sensitivity, and sustains a very low building coverage that preserves the open nature of the Rural Production Zone. Consequently, the proposal is not contrary to the relevant objectives and policies, and successfully passes the second gateway.

9.0 CONCLUSION

This application seeks resource consent to add a second dwelling to the site, which operates in nature as a Minor Residential Unit but technically breaches the 30m separation rule and the 2ha site residential intensity limit.

Placing the unit further than 30m away improves amenity for both households without generating external effects. The built form is well within permitted thresholds for site coverage and impermeable surfaces, demonstrating that the environmental footprint of the structure is anticipated by the District Plan.

It has also been demonstrated that the proposal is closely aligned with the recent national direction provided by the NES-DMRU. Appropriate servicing and geotechnical foundation designs have been provided, fulfilling all requirements set out on the Record of Title via Consent Notice 10094951.3.

It has been demonstrated that the adverse effects of the proposal on the environment will be less than minor, the proposal is not contrary to the objectives and policies of the Rural Production Zone, and successfully passes both limbs of the Section 104D Gateway Test.

Prepared by:

Steve Sanson

Consultant Planner

Bay of Islands Planning

APPENDICES

- **Appendix A** - Record of Title & Instrument (Identifier 797963 & CN 10094951.3)
- **Appendix B** - Architectural Drawings (Evolve Architecture, WD01)
- **Appendix C** - Wastewater Report (Waterflow NZ Ltd Design & PS1)
- **Appendix D** - Stormwater Report (Wilton Joubert Stormwater Management Report)
- **Appendix E** - Geotechnical Report (Wilton Joubert Site-Specific Report)



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **797963**
Land Registration District **North Auckland**
Date Issued 26 January 2018

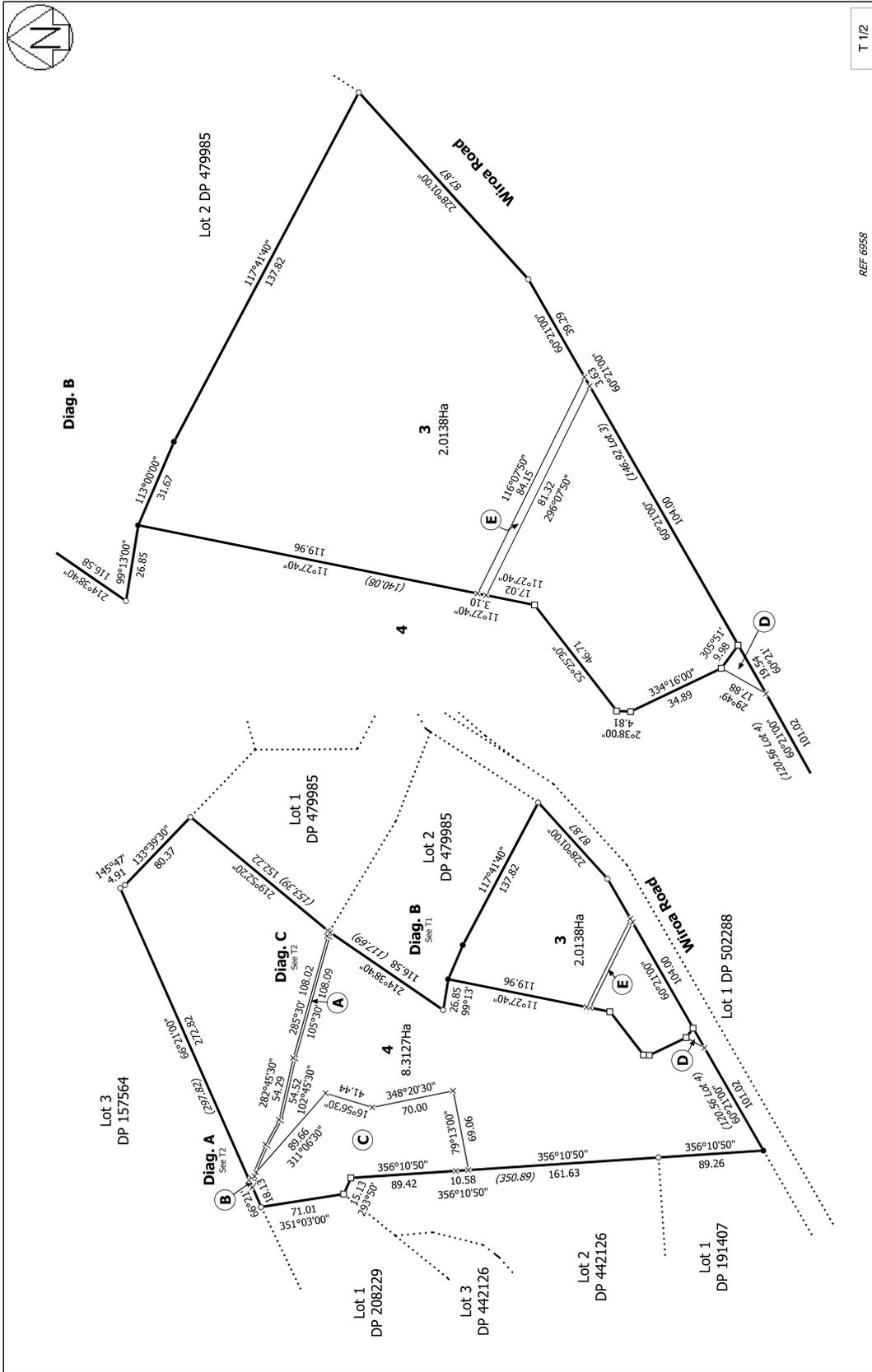
Prior References
669966

Estate Fee Simple
Area 2.0138 hectares more or less
Legal Description Lot 3 Deposited Plan 514318

Registered Owners
William Francis Albert Foote and Beula Foote

Interests

Subject to Section 206 Land Act 1924
Subject to Section 8 Coal Mines Amendment Act 1950
10094951.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 16.6.2015 at 1:00 pm
Subject to a right to convey electricity, telecommunications and computer media over part marked E on DP 514318 created by Easement Instrument 11012105.3 - 26.1.2018 at 12:01 pm
Appurtenant hereto is a right of way created by Easement Instrument 11012105.3 - 26.1.2018 at 12:01 pm
The easements created by Easement Instrument 11012105.3 are subject to Section 243(a) Resource Management Act 1991
13453741.3 Mortgage to ASB Bank Limited - 17.11.2025 at 2:46 pm



T 1/2

REF: 6959

Land District: North Auckland
 Digitally Generated Plan
 Generated on: 26/10/2017 08:16am Page 3 of 4

Surveyor: Aaron Robert Donaldson
 Firm: Donaldsons

Title Plan
 LT 514318
 Approved on: 26/10/2017

Lots 3 and 4 being a Subdivision of Lot 3 DP 479985

View Instrument Details



Instrument No 10094951.3
Status Registered
Date & Time Lodged 16 June 2015 13:00
Lodged By Kitchen, Carol Joy
Instrument Type Consent Notice under s221(4)(a) Resource Management Act 1991



Affected Computer Registers	Land District
669964	North Auckland
669965	North Auckland
669966	North Auckland

Annexure Schedule: Contains 2 Pages.

Signature

Signed by Clive Arthur Patterson as Territorial Authority Representative on 16/06/2015 11:51 AM

***** End of Report *****



Private Bag 752, Ahimairi Ave
Kirkcaldy 0440, New Zealand
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Phone (09) 401 5200
Fax: (09) 401 2137
Email: esk.us@fndc.govt.nz
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THE RESOURCE MANAGEMENT ACT 1991

SECTION 221: CONSENT NOTICE

REGARDING RC 2140308
Being the Subdivision of Lot 2 DP 208229
North Auckland Registry

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

SCHEDULE

Lots 1 & 2 – DP 479985

- i) No owners or occupiers of or visitors to any of the lots shall keep or introduce onto the land any carnivorous animal (such as cats, dogs, or mustelids) which have the potential to be Kiwi predators. This prohibition includes the bringing of any such animals onto the site by visitors and/ or contractors.

Lot 3 – DP 479985

- ii) No owners, or occupiers of, or visitors to the lot shall keep or introduce onto the land any carnivorous animal (such as cats, dogs, or mustelids) which have the potential to be Kiwi predators. This prohibition includes the bringing of any such animals onto the site by visitors and contractors but excludes an allowance for one farm working dog.
- iii) The owner shall preserve the living indigenous vegetation within the restricted covenanted area shown on the survey plan and shall not without the prior written approval of the Council and then in strict compliance with any condition imposed by Council, cut down, damage or destroy any such vegetation or suffer and permit the cutting down, damaging or destruction of any such trees or bush. The owner shall be deemed to be not in breach of this prohibition if any such trees or bush shall die of natural causes not attributable to any act or default by or on behalf of the owner for which the owner is responsible.



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Lots 2 & 3 – DP 479985

- iv) That upon construction of any habitable building the building shall have a roof water collection system with a minimum tank storage of 45,000 litres. The tank(s) shall be positioned so that they are accessible (safely) for fire fighting purposes and fitted with an outlet compatible with rural fire service equipment. Where more than one tank is utilised they shall be coupled together and at least one tank fitted with an outlet compatible with rural fire service equipment. Alternatively, the dwelling can be fitted with a sprinkler system approved by Council.
- v) It has not been a condition of consent to require that power or telecommunications be reticulated to the boundary of the lot. The lot owner is responsible for the provisions of a power supply to the site.
- vi) In conjunction with the erection of any building requiring a wastewater disposal system the lot owner shall obtain a Building Consent and install the wastewater treatment and effluent disposal system as detailed in the report prepared by Bay of Islands Plumbing and Drainage.

The installation shall include an agreement with the system supplier, or their authorised agent, for the ongoing operation and maintenance of the wastewater treatment plant and the effluent disposal system.

The estimated cost of the installed system as quoted by BOI Plumbing & Drainage dated 19/05/2015 is Option One - \$7,800 + GST and Option Two - \$16,400 + GST. The costing is valid for a period of 6 months from the date of issue of the Section 224(c) certificate.

Following 12 months of operation of the wastewater treatment and effluent disposal system the lot owner shall provide certification to Council that the system is operating in accordance with the design criteria.

Where wastewater treatment and effluent disposal system is proposed that differs from that detailed in the above mentioned report, a new TP 58 / Site and soil Evaluation Report will be required to be submitted, and Council's approval of a new system must be obtained , prior to its installation.

SIGNED:


Mr Patrick John Killalea
By the FAR NORTH DISTRICT COUNCIL
Under delegated authority:
PRINCIPAL PLANNER – RESOURCE MANAGEMENT

DATED at KERIKERI this 22nd day of May 2015

SP02 - 24.02.26
- APPROVED TO BUILDING CONSENT STAGE

WD01 - 05.03.26
- ISSUED FOR BUILDING CONSENT LODGEMENT

01	INDEX
02	PROJECT AND CONSTRUCTION NOTES
03	OVERALL SITE PLAN
04	SITE PLAN
05	COVERAGE CALCULATIONS
06	SITE SETOUT PLAN
07	PLUMBING & DRAINAGE PLAN
08	SUBFLOOR FRAMING PLAN
09	SUBFLOOR FOUNDATION DETAILS
10	SUBFLOOR FOUNDATION DETAILS
11	SUBFLOOR FOUNDATION DETAILS
12	STAIR AND HANDRAIL DETAILS
13	FLOOR PLAN
14	ELEVATIONS E01 & E02
15	ELEVATIONS E03 & E04
16	H1 PLAN
17	H1 INFORMATION
18	PLUMBING & SITE DETAILS

1032B WIROA ROAD, OKAIHAU PROPOSAL

BUILDING CONSENT DOCUMENTATION

CLIENT: WILLIAM FRANCIS ALBERT FOOTE AND BEULA FOOTE

SCOPE OF WORKS

- TRANSPORTABLE DWELLING RELOCATION ONLY
- DESIGNED TO THE PARAMETERS OF STATED SITE LOCATION IN EVOLVE ARCHITECTURE PLANS
- BELOW BEARERS ONLY

PROJECT NOTES

WIND ZONE: VERY HIGH
 EARTHQUAKE ZONE: 3 (BRANZ)
 DURABILITY ZONE: C (BRANZ)
 DURABILITY ZONE: 1 (BRANZ)

DURABILITY:
 REFER DURABILITY TABLE THIS SHEET
 EXPOSURE ZONE C (BRANZ) (AS DEFINED BY NZS3604:2011 4.2)
 "CLOSED" - DRY INTERNAL LOCATIONS, NOT SUBJECT TO AIRBORNE SALT OR RAIN WETTING.
 "SHELTERED": - OPEN TO AIRBORNE SALTS, BUT NOT RAIN WASHED. SHALL BE ABOVE 45° LINE DRAWN FROM LOWER EDGE OF A PROJECTING WEATHERTIGHT STRUCTURE SUCH AS A FLOOR, ROOF OR DECK.

CONTRACT SHALL BE NZS 3910 UNLESS OTHERWISE STATED.
 THE PROJECT CONTRACT AND ALL CONSTRUCTION SHALL COMPLY WITH:

- RELEVANT TRADE CODES/REFERENCE DOCUMENTS
- PROPRIETARY SPECIFICATION DETAILS AND INSTALLATION/MAINTENANCE
- PROJECT SPECIFICATION
- NZS 3604:2011
- THE FOLLOWING SECTIONS OF THE NEW ZEALAND BUILDING CODE:

B1	STRUCTURE	AS1
B2	DURABILITY	AS1
D1	ACCESS ROUTES	AS1
E1	SURFACE WATER	AS1
E2	EXTERNAL MOISTURE	AS1
F2	HAZARDOUS BUILDING MATERIALS	AS1
F5	CONSTRUCTION & DEMOLITION HAZARDS	AS1
G4	VENTILATION	AS1
G12	WATER SUPPLIES	AS1
G13	FOUL WATER	AS1
H1	ENERGY EFFICIENCY	AS1

NZBC B1/VM1 - AIR CONDITIONING UNITS (NZS 4219)
 AIR CONDITIONING UNITS SHALL BE ANCHORED TO 100mm THICK CONCRETE PAD ON SITE PRIOR TO APPLICATION FOR CCC. CONCRETE STRENGTH SHALL BE COMPATIBLE WITH SITE DURABILITY ZONE

NZBC D1/AS1 - ACCESS ROUTES:
 ALL SURFACES TO THE DWELLING MAIN ENTRY DOOR SHALL COMPLY WITH AS/NZS 3661.1 AND MEET A CO-EFFICIENT OF FRICTION OF NO LESS THAN 0.4 OR MATERIALS LISTED IN TABLE 2 AS ACCEPTABLE WET SLIP.

HANDRAILS:
 HANDRAILS SHALL COMPLY WITH NZBC D1/AS1 ACCESS ROUTES. PROVIDE HANDRAILS FOR STAIRS WITH THREE OR MORE TREADS. HANDRAILS SHALL BE PLACED 900mm ABOVE PITCHLINE. REFER TO FLOOR PLAN NOTES FOR DECKING REQUIREMENTS.

ONSITE AMENDMENTS TO PROJECT:
 ALL PLAN VARIATIONS OR PRODUCT CHANGES/ SYSTEMS/ AS BUILT DOCUMENTATION SHALL BE SUPPLIED TO THE MAIN CONTRACTOR AND BUILDING CONSENT AUTHORITY BEFORE A CODE OF COMPLIANCE CERTIFICATE CAN BE ISSUED.

OWNER BUILDING MAINTENANCE:
 REGULAR ONGOING MAINTENANCE SHALL BE CARRIED OUT BY OWNER TO ACHIEVE REQUIRED DURABILITY OF ALL MATERIALS, COMPONENTS AND JUNCTIONS.
 REFER TO SPECIFIC MANUFACTURERS LITERATURE FOR ALL MAINTENANCE SCHEDULES AND PROCEDURES.
 REGULAR MAINTENANCE INCLUDES:
 - INSPECTION OF /WASHING EXTERIOR SURFACES/ JUNCTIONS.
 - REPAIR OR REPLACEMENT OF ITEMS TO MAINTAIN WEATHER TIGHTNESS OF BUILDING ENVELOPE.
 - GUTTER SYSTEMS INSPECTED AND CLEANED OUT MONTHLY TO AVOID BLOCKING GUTTER SYSTEM.
 - FLASHINGS, CLADDINGS AND ROOF SYSTEMS INSPECTED EVERY QUARTER FOR SIGNS OF DETERIORATION. REPAIR ALL FAULTS WITHOUT DELAY AS SOON AS DISCOVERED.

ALL AMENDMENTS TO PRODUCTS / SYSTEMS SHALL REQUIRE AN ONSITE AMENDMENT WITH THE LOCAL AUTHORITY

B2/AS1 3.5.2 MODIFICATIONS TO NZS 4223.2
 5.3 MARKING
 INSULATING GLASS UNITS SHALL BE PERMANENTLY AND CLEARLY MARKED. AS A MINIMUM, MARKING SHALL INCLUDE THE FOLLOWING:
 (a) THE NAME OF REGISTERED TRADEMARK OF THE MANUFACTURE OR SUPPLIER;
 (b) THE DATE OF MANUFACTURE (USE THE YEAR AS THE MINIMUM), AND
 (c) COMPLIES WITH NZS 4223.2.2016.
 MARKING SHALL BE VISIBLE AFTER THE IGU HAS BEEN INSTALLED, AND MUST BE LEGIBLE AND DURABLE FOR THE LIFE OF THE UNIT.

NZBC F5 - CONSTRUCTION AND DEMOLITION HAZARDS:

F5.2 - FUNCTIONAL REQUIREMENT:
 CONSTRUCTION AND DEMOLITION WORK ON BUILDINGS SHALL BE PERFORMED IN A MANNER THAT AVOIDS THE LIKELIHOOD OF:
 (a) OBJECTS FALLING ON TO PEOPLE ON OR OFF THE SITE
 (b) OBJECTS FALLING ON PROPERTY OFF THE SITE
 (c) OTHER HAZARDS ARISING ON THE THE SITE AFFECTING PEOPLE OFF THE SITE AND OTHER PROPERTY
 (d) UNAUTHORISED ENTRY OF CHILDREN TO HAZARDS ON THE SITE

F5.3.1 - PERFORMANCE:
 SUITABLE CONSTRUCTION METHODS SHALL BE USED TO AVOID THE LIKELIHOOD OF TOOLS OR MATERIALS FALLING ONTO PLACES WHERE PEOPLE MIGHT BE PRESENT.

F5.3.2
 WHERE CONSTRUCTION OR DEMOLITION WORK PRESENTS A HAZARD IN PLACES TO WHICH THE PUBLIC HAS ACCESS, BARRIERS SHALL BE PROVIDED AND SHALL:
 (a) BE OF APPROPRIATE HEIGHT AND CONSTRUCTION TO PREVENT SITE HAZARDS FROM HARMING TRAFFIC OR PASSERSBY,
 (b) BE DIFFICULT TO CLIMB,
 (c) HAVE NO OPENINGS OTHER THAN THOSE APPROVED BY THE TERRITORIAL AUTHORITY FOR ACCESS AND VIEWING
 (d) HAVE NO GATES OR DOORS WHICH PROJECT BEYOND THE SITE WHEN OPENED. LIMITS ON THE APPLICATION FIRST SCHEDULE
 (e) CONTAIN NO PROJECTION THAT WOULD BE A HAZARD TO TRAFFIC OR PEOPLE.
 (f) BE CLEARLY MARKED WHERE THE BARRIER ITSELF MAY OTHERWISE PRESENT A HAZARD TO TRAFFIC OR PASSERS-BY.

F5.3.3
 WHERE A CONSTRUCTION OR DEMOLITION SITE CONTAINS ANY HAZARD WHICH MIGHT BE EXPECTED TO ATTRACT THE UNAUTHORISED ENTRY OF CHILDREN, THE HAZARD SHALL BE ENCLOSED TO RESTRICT ACCESS BY CHILDREN.

F5.3.4
 SUITABLE BARRIERS SHALL BE CONSTRUCTED TO PROVIDE A SAFE ROUTE FOR PEOPLE WHERE LIFTING EQUIPMENT CREATES A RISK OF ACCIDENT FROM OBJECTS FALLING ON A PLACE OF PUBLIC ACCESS, OR WHERE A SIMILAR RISK RESULTS FROM THE HEIGHT AT WHICH CONSTRUCTION OR DEMOLITION WORK IS BEING CARRIED OUT.

NZBC H1/AS1 - THERMAL INSULATION CONSTRUCTION R-VALUES:
 REFER TO SPECIFICATION APPENDIX FOR DESIGN WORKSHEET. REQUIREMENTS ARE IN ACCORDANCE WITH NZBC H1/AS1 CLIMATE ZONE 1 (BRANZ). CALCULATION METHOD. INSTALL MANUFACTURERS SPECIFICATION ALL WALL/ ROOF AND SUBFLOOR INSULATION.
 REFER TO H1 INFORMATION LAYOUT SHEET FOR FULL SPECIFICATIONS.

CONSTRUCTION NOTES

CONTRACTOR SHALL ESTABLISH AND CONFIRM SITE AND FINISHED LEVELS ON SITE BEFORE COMMENCING CONSTRUCTION.

ALL DIMENSIONS SHALL BE VERIFIED ON SITE BEFORE COMMENCING CONSTRUCTION.

WRITTEN DIMENSIONS SUPERSEDE SCALED DIMENSIONS.

ALL ARCHITECTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ENGINEERING DRAWINGS AND CALCULATIONS.

ALL CONTRACTORS ARE RESPONSIBLE FOR COMPLIANCE WITH BUILDING CONSENT DOCUMENTATION AND SITE SAFETY REQUIREMENTS DURING CONSTRUCTION.

SERVICES:
 STORMWATER & SEWER SYSTEMS AS SHOWN ON DRAINAGE PLAN.

CONTRACTOR SHALL LIAISE WITH AND ATTEND WHERE NECESSARY NETWORK UTILITY OPERATORS & COUNCIL AUTHORITIES FOR INSTALLATION OF SERVICES.

SERVICE CONNECTIONS AND DRAINAGE SHALL BE COMPLETED IN ACCORDANCE WITH RELEVANT NZ CODES AND TERRITORIAL AUTHORITY REQUIREMENTS.

CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS DURING EXCAVATION TO AVOID DISRUPTION TO EXISTING SERVICES INCLUDING REINSTATEMENT TO THEIR ORIGINAL CONDITION.

TIMBER NOTES:
 ALL TIMBER FRAMING SHALL COMPLY WITH NZS3604:2011.

ALL STRUCTURAL TIMBER FRAMING SHALL BE SG8 OR J-FRAME UNLESS OTHERWISE SPECIFIED. REFER TO PRODUCT SPECIFICATIONS ATTACHED.

TIMBER TREATMENTSHALL COMPLY WITH NZBC B2/AS1 REFER TO DRAWINGS / SPECIFICATIONS AS TREATMENT VARIES ACCORDING TO LOCATION & DETAIL

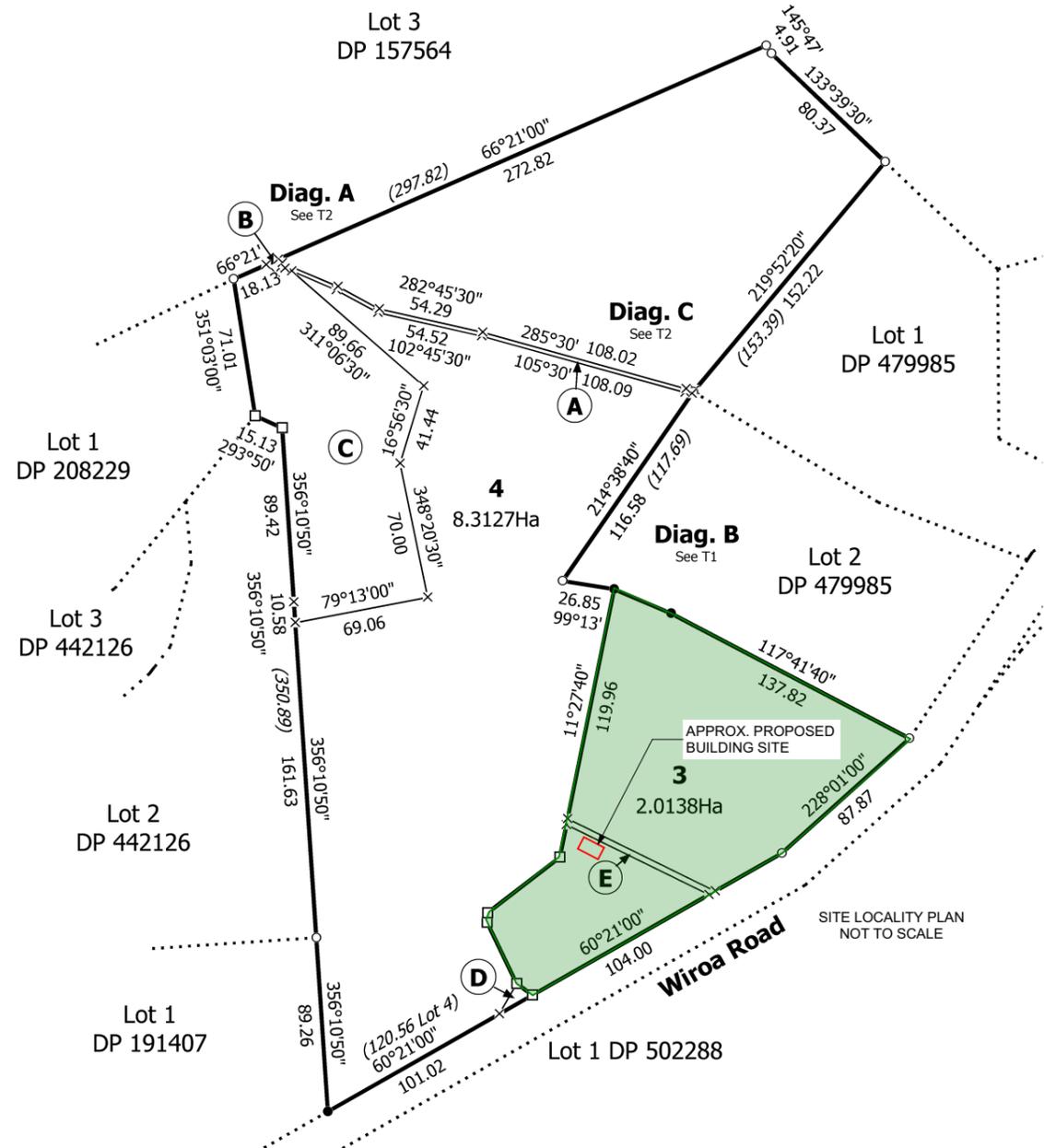
ALL INTERNAL ENCLOSED FRAMING H1.2
 ALL EXTERNAL EXPOSED FRAMING H3.2
 ALL TIMBER IN CONTACT WITH GROUND H5

INSTALL DPC UNDER ALL BOTTOM PLATES/ TIMBER IN CONTACT WITH CONCRETE.

DURABILITY OF NAILS & SCREWS - ZONE C	
NZS 3604:2011 TABLE 4.2 - STEEL ITEMS SUCH AS NAILS/SCREWS USED FOR FRAMING/CLADDING -NOTE: MANUFACTURERS SPECIFICATION REQUIREMENTS TAKE PRECEDENCE	
LOCATION OF NAIL OR SCREW IN BUILDING	
CLADDING THAT ACTS AS BRACING - 50 YEAR DURABILITY	GALVANISED STEEL ⁽⁴⁾
NON-STRUCTURAL CLADDING (15-YEAR DURABILITY)	GALVANISED STEEL ⁽⁴⁾
FRAMING IN "CLOSED" AREAS ⁽¹⁾ INCLUDING ROOF SPACES	MILD STEEL ⁽⁵⁾
FRAMING IN "SHELTERED AREAS" ⁽¹⁾	GALVANISED STEEL ⁽⁵⁾
FRAMING IN "EXPOSED" AREAS ⁽¹⁾	GALVANISED STEEL ⁽⁵⁾

ABBREVIATIONS:

C.O.S.	CONFIRM ON SITE
FFL	FINISHED FLOOR LEVEL
FGL	FINISHED GROUND LEVEL
FPL	FINISHED PAVED LEVEL
EX GL	EXISTING GROUND LEVEL
EX	EXISTING
GALV	HOT DIP FULLY COATED GALVANISED
SS	STAINLESS STEEL:
	TYPE 304 - INTERNAL APPLICATIONS
	TYPE 316 - EXTERNAL APPLICATIONS



IMPORTANT NOTES:
 THE CONTRACTOR SHALL VERIFY ALL DATUM SOURCES AND DIMENSIONS INCLUDING SITING SETOUT BEFORE COMMENCING CONSTRUCTION. WRITTEN DIMENSIONS SUPERSEDE SCALED DIMENSIONS. REFER TO SPECIFICATIONS THAT FORM A PART OF THIS CONTRACT. SURVEY PLANS / ENGINEERING DESIGN TAKE PRECEDENCE IN ALL CASES



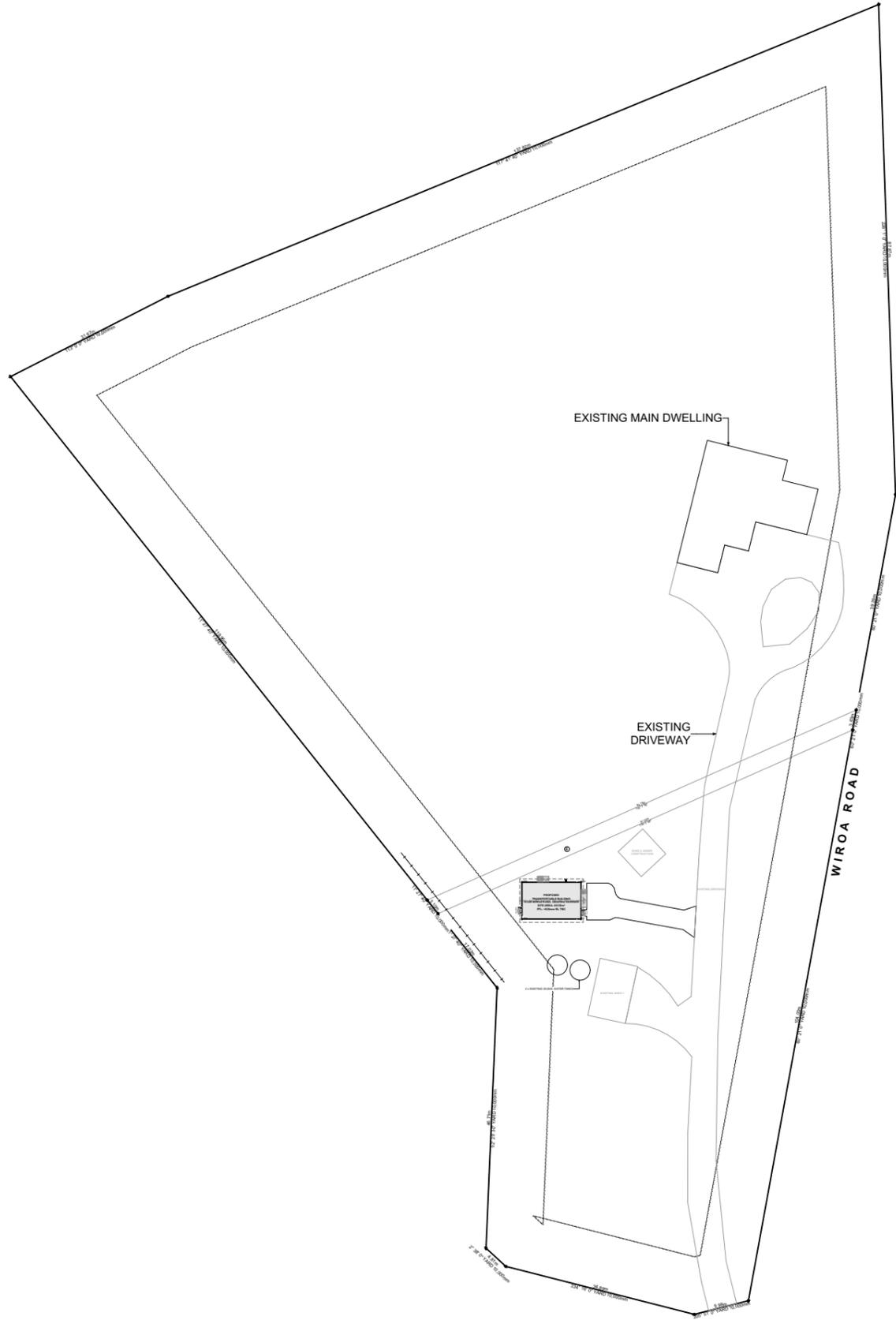
For Customer:
WILLIAM FRANCIS ALBERT FOOTE AND BEULA FOOTE
 Location:
1032B WIROA ROAD, OKAIHAU, KERIKERI

Project No:
25 4805
 Legal Description:
LOT 3 DP 514318

Drawing Name:
PROJECT AND CONSTRUCTION NOTES

Current Issue:
WD01
 Plot Date:
5/03/2026

Issue:	Revision:	Date:	Sheet No.
			02
			Scale @ A3:



SITE NOTES



DESIGN SITE PARAMETERS

LEGAL DESCRIPTION: LOT 3 DP 514318
 SITE AREA: 20138m²
 COUNCIL: FAR NORTH DISTRICT COUNCIL
 PLANNING ZONE: RURAL PRODUCTION
 WIND ZONE: VERY HIGH
 EARTHQUAKE ZONE: 3 (BRANZ)
 DURABILITY ZONE: C (BRANZ)
 CLIMATE ZONE: 1 (BRANZ)

MAX. BUILDING HEIGHT: COMPLIES
 RULE RPROZ - S1: 12.0m
 (SEE ELEVATIONS FOR COMPLIANCE)

MAX. ALLOWED IMPERMEABLE AREA: COMPLIES
 RULE RPROZ-R2: THE IMPERMEABLE SURFACE OF ANY SITE IS NO MORE THAN 15%
 (SEE COVERAGE PAGE FOR COMPLIANCE)

MAX. ALLOWED SITE AREA: COMPLIES
 RULE RPROZ - S5: THE BUILDING OR STRUCTURE COVERAGE OF ANY SITE IS NO MORE THAN 12.5%
 (SEE COVERAGE PAGE FOR COMPLIANCE)

HEIGHT IN RELATION TO BOUNDARY: COMPLIES
 RULE RPROZ - S2:
 - NORTH 2.0m + 55°
 - EAST & WEST 2.0m + 45°
 - SOUTH 2.0m + 35°
 (SEE ELEVATIONS FOR COMPLIANCE)

YARDS: COMPLIES
 RULE RPROZ - S3: ROAD / SIDE / REAR 10.0m

BOUNDARIES:
 RECORD OF TITLE 7367370 DATED 17.11.25

SITE LEVELS:
 CLIENT SUPPLIED

FFL:
 SHALL BE CONFIRMED WITH TERRITORIAL AUTHORITY BEFORE COMMENCING CONSTRUCTION

SITE PLAN KEY

- CONVEY ELECTRICITY, TELECOMMUNICATIONS, AND COMPUTER MEDIA EASEMENT
- SEDIMENT CONTROL FENCE
- SPOT LEVEL

IMPORTANT NOTES:
 THE CONTRACTOR SHALL VERIFY ALL DATUM SOURCES AND DIMENSIONS INCLUDING SITING SETOUT BEFORE COMMENCING CONSTRUCTION. WRITTEN DIMENSIONS SUPERSEDE SCALED DIMENSIONS. REFER TO SPECIFICATIONS THAT FORM A PART OF THIS CONTRACT. SURVEY PLANS / ENGINEERING DESIGN TAKE PRECEDENCE IN ALL CASES



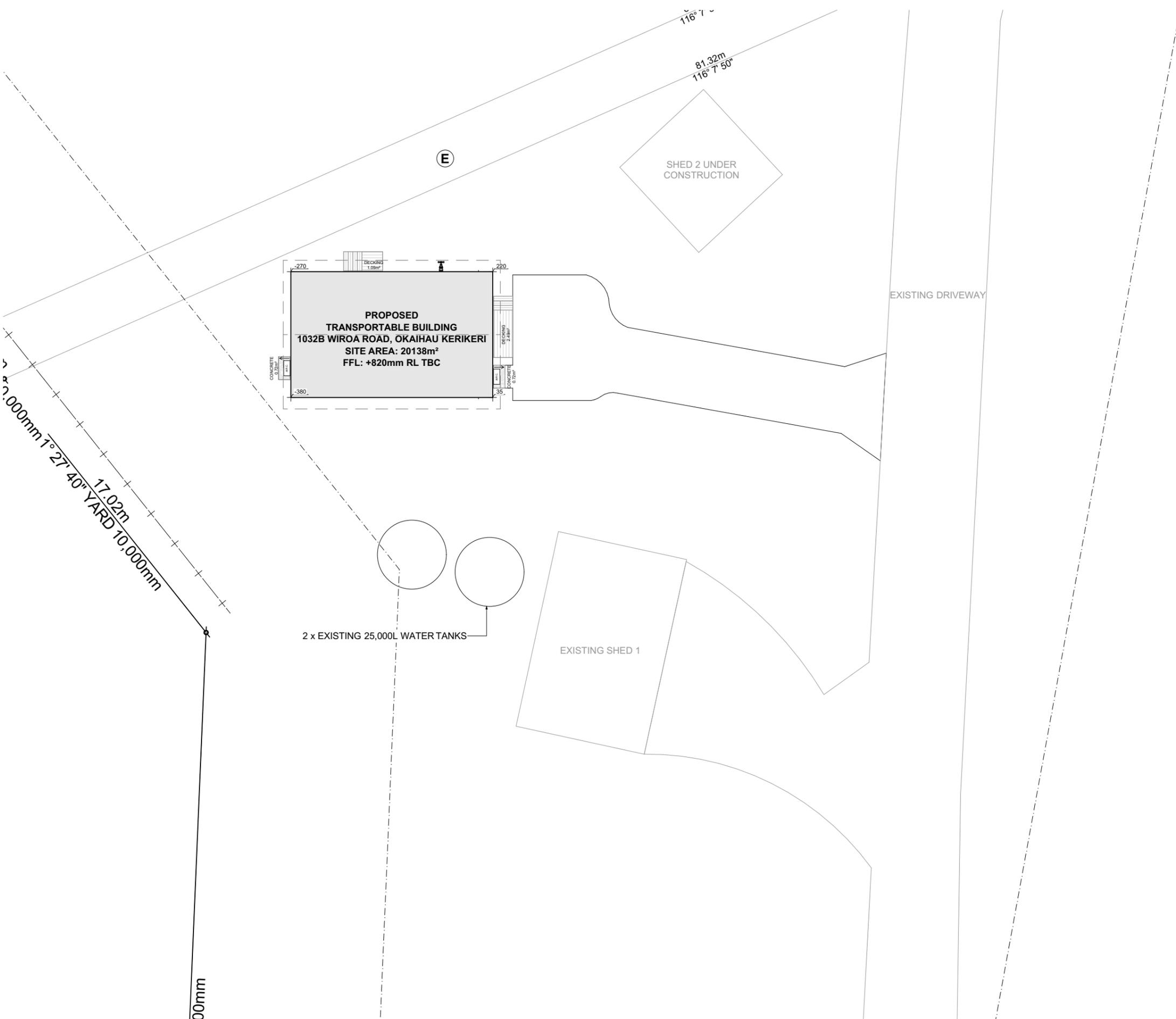
For Customer:
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 Location:
1032B WIROA ROAD, OKAIHAU, KERIKERI

Project No:
25 4805
 Legal Description:
LOT 3 DP 514318

Drawing Name:
OVERALL SITE PLAN

Current Issue:
WD01
 Plot Date:
5/03/2026

Issue:	Revision:	Date:	Sheet No.
			03
			Scale @ A3: 1:1000



SITE NOTES

DESIGN SITE PARAMETERS
LEGAL DESCRIPTION: LOT 3 DP 514318
SITE AREA: 20138m²
COUNCIL: FAR NORTH DISTRICT COUNCIL
PLANNING ZONE: RURAL PRODUCTION
WIND ZONE: VERY HIGH
EARTHQUAKE ZONE: 3 (BRANZ)
DURABILITY ZONE: C (BRANZ)
CLIMATE ZONE: 1 (BRANZ)

MAX. BUILDING HEIGHT: **COMPLIES**
RULE RPROZ - S1: 12.0m
 (SEE ELEVATIONS FOR COMPLIANCE)

MAX. ALLOWED IMPERMEABLE AREA: **COMPLIES**
RULE RPROZ - R2: THE IMPERMEABLE SURFACE OF ANY SITE IS NO MORE THAN 15%
 (SEE COVERAGE PAGE FOR COMPLIANCE)

MAX. ALLOWED SITE AREA: **COMPLIES**
RULE RPROZ - S5: THE BUILDING OR STRUCTURE COVERAGE OF ANY SITE IS NO MORE THAN 12.5%
 (SEE COVERAGE PAGE FOR COMPLIANCE)

HEIGHT IN RELATION TO BOUNDARY: **COMPLIES**
RULE RPROZ - S2:
 - NORTH 2.0m + 55°
 - EAST & WEST 2.0m + 45°
 - SOUTH 2.0m + 35°
 (SEE ELEVATIONS FOR COMPLIANCE)

YARDS: **COMPLIES**
RULE RPROZ - S3: ROAD / SIDE / REAR 10.0m

BOUNDARIES:
 RECORD OF TITLE 7367370 DATED 17.11.25
SITE LEVELS:
 CLIENT SUPPLIED
FFL:
 SHALL BE CONFIRMED WITH TERRITORIAL AUTHORITY BEFORE COMMENCING CONSTRUCTION

SITE PLAN KEY

- (E) CONVEY ELECTRICITY, TELECOMMUNICATIONS, AND COMPUTER MEDIA EASEMENT
- +— SEDIMENT CONTROL FENCE
- +123 SPOT LEVEL

IMPORTANT NOTES:
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Drawing Name:
SITE PLAN

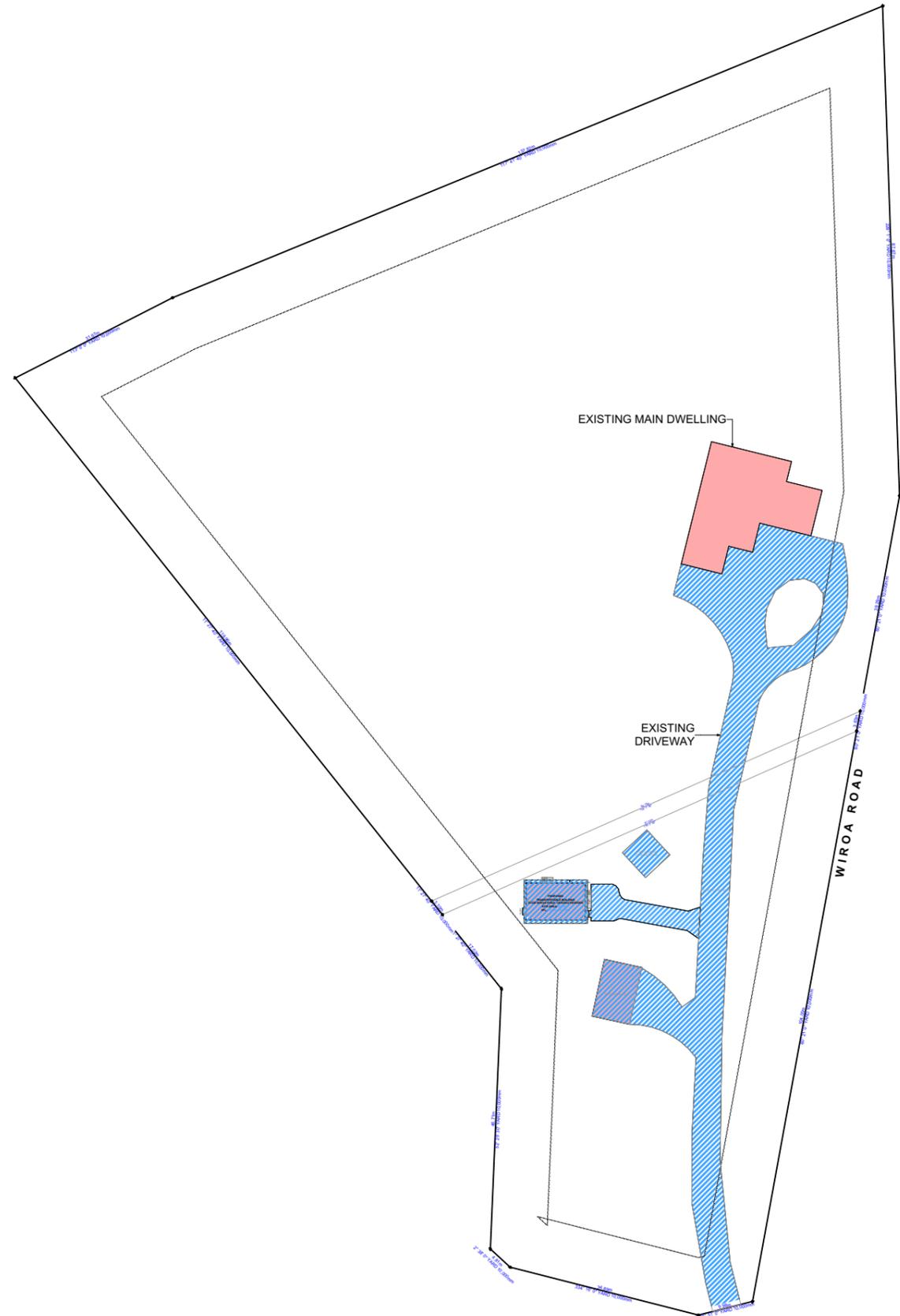
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WD01
 Plot Date:
5/03/2026

Issue:	Revision:	Date:

Sheet No.
04
 Scale @ A3:
1:200

COVERAGE NOTES

	MAX SITE COVERAGE (m2)	2517.25	
	SITE COVERAGE	479.06	COMPLIES
	MAX IMPERMEABLE AREA (m2)	3020.7	
	IMPERMEABLE AREA	1,431.13	COMPLIES



IMPORTANT NOTES:
 THE CONTRACTOR SHALL VERIFY ALL DATUM SOURCES AND DIMENSIONS INCLUDING SITING SETOUT BEFORE COMMENCING CONSTRUCTION. WRITTEN DIMENSIONS SUPERSEDE SCALED DIMENSIONS. REFER TO SPECIFICATIONS THAT FORM A PART OF THIS CONTRACT. SURVEY PLANS / ENGINEERING DESIGN TAKE PRECEDENCE IN ALL CASES



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25 4805
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LOT 3 DP 514318

Drawing Name:
COVERAGE CALCULATIONS

Current Issue:
WD01
 Plot Date:
5/03/2026

Issue:	Revision:	Date:

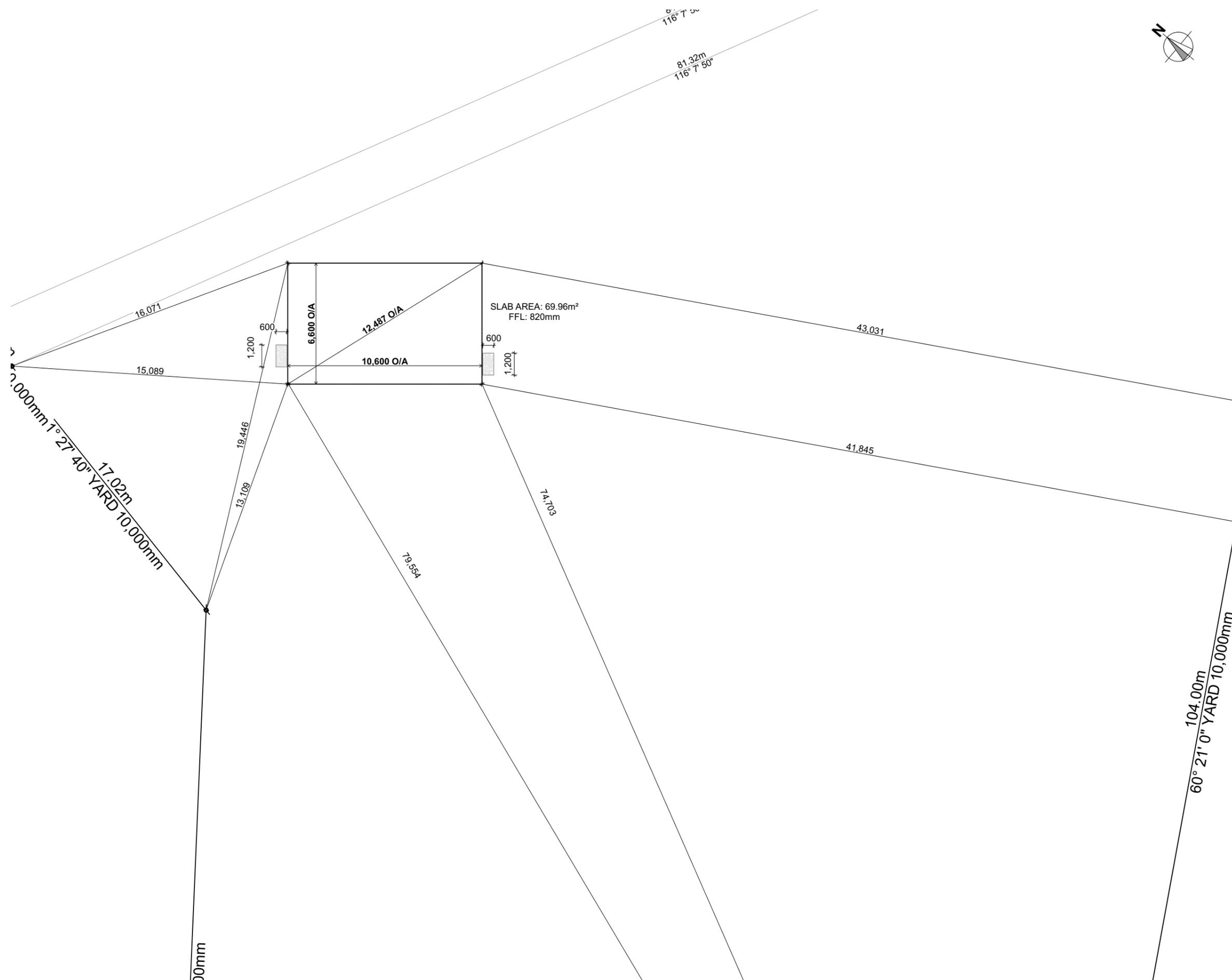
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SITE SETOUT NOTES

1. GROUND TO BE EXCAVATED AS REQUIRED WHEN A PERIOD OF PROLONGED FINE WEATHER IS FORECAST.
2. WORK TO BE COMPLETED IN A TIMELY MANNER.
3. POLES AND CONCRETE FOR POLES AND PALINGS MUST BE WITHIN THE BOUNDARY.
4. STRUCTURAL ENGINEER TO BE CALLED OUT TO SITE TO CHECK THE CUT HEIGHT AND HOLE DEPTH AND SPACINGS.
5. GEOTECHNICAL ENGINEER TO BE CALLED OUT TO SITE TO CHECK SOIL IN THE BORED HOLES IS IN LINE WITH GEOTECHNICAL COMPLETION REPORT ASSUMPTIONS.

SURVEYOR SETOUT - ALL BUILDING POSITIONS SHALL BE VERIFIED TO PROPERTY BOUNDARIES ONSITE BY A LICENCED CADASTRAL SURVEYOR BEFORE COMMENCING CONSTRUCTION.



IMPORTANT NOTES:
 THE CONTRACTOR SHALL VERIFY ALL DATUM SOURCES AND DIMENSIONS INCLUDING SITING SETOUT BEFORE COMMENCING CONSTRUCTION. WRITTEN DIMENSIONS SUPERSEDE SCALED DIMENSIONS. REFER TO SPECIFICATIONS THAT FORM A PART OF THIS CONTRACT. SURVEY PLANS / ENGINEERING DESIGN TAKE PRECEDENCE IN ALL CASES



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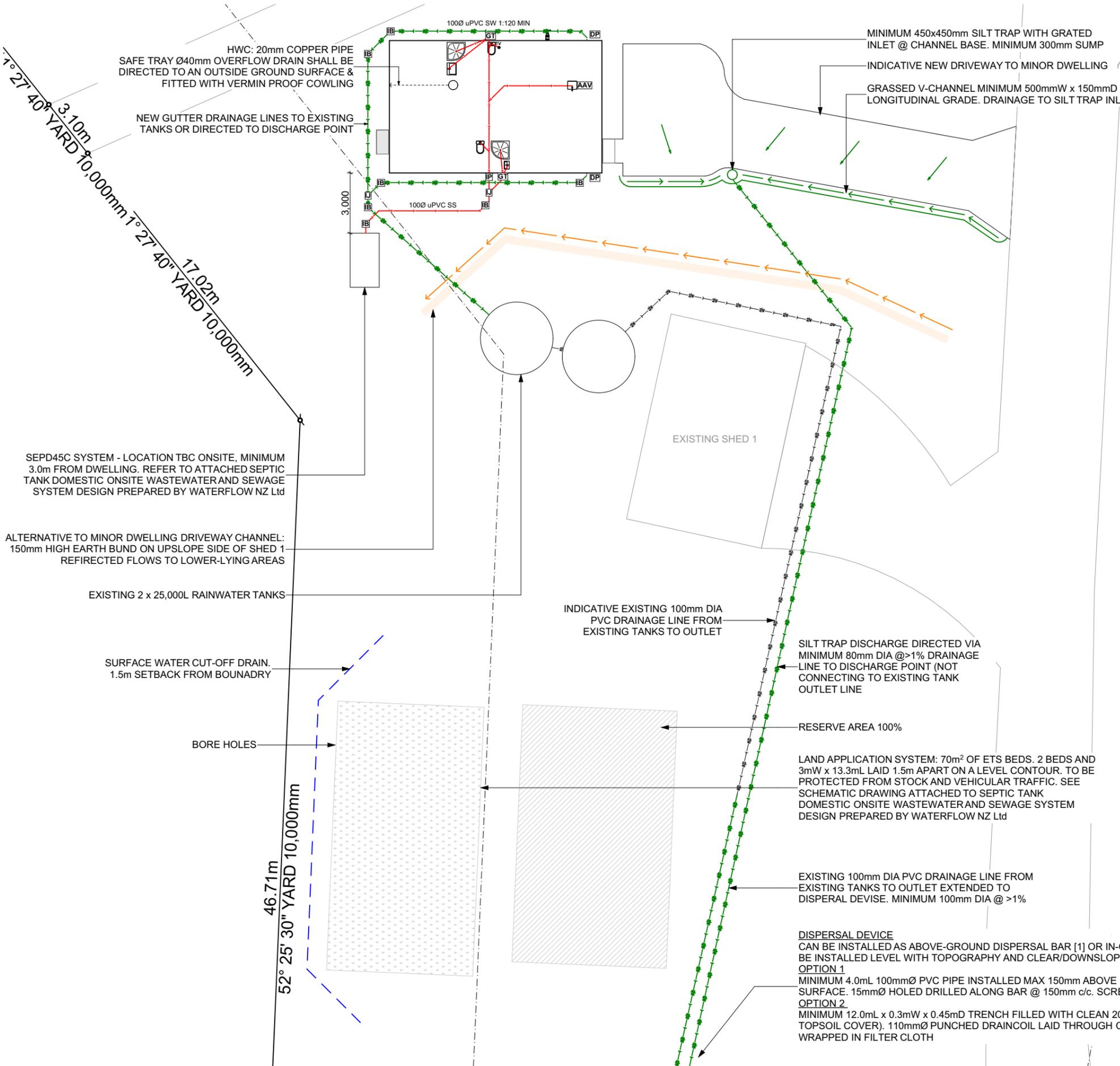
Project No:
25 4805
 Legal Description:
LOT 3 DP 514318

Drawing Name:
SITE SETOUT PLAN

Current Issue:
WD01
 Plot Date:
5/03/2026

Issue:	Revision:	Date:

Sheet No.
06
 Scale @ A3:
1:200



SANITARY PLUMBING NOTES

PIPE SIZES & FALLS TO NZBC G12/AS1 & G13/AS1:

- KITCHEN SINK	Ø40	1:40 (3 DU)
- SHOWER	Ø40	1:40 (2 DU)
- BATH	Ø40	1:40 (4 DU)
- BASIN	Ø32	1:20 (1 DU)
- WC	Ø100	1:60 (4 DU)
- LAUNDRY TUB	Ø40	1:40 (5 DU)
- CL WASHER	Ø40	1:40 (5 DU)
- DISHWASHER	Ø40	1:40 (3 DU)

MAX. 6.0m WC UNVENTED DRAIN LENGTH

- SANITARY SEWER LINES	Ø100	1:60
- STORMWATER LINES	Ø100	1:100

- Ø40 FLOOR WASTES SHALL
- DISCHARGE DIRECTLY TO A GULLY TRAP
 - HAVE A REMOVEABLE GRATING FLUSH WITH THE ADJACENT FINISHED FLOOR SURFACE

- ALL Ø40 WASTE PIPES OVER 3.5m IN LENGTH SHALL BE VENTED.
- DRAIN VENT Ø65
 - TERMINAL VENT TO OPEN AIR Ø80

- BRANCH/RELIEF VENTS:
- Ø40 UP TO 15 DISCHARGE UNITS
 - Ø50 UP TO 65 DISCHARGE UNITS

- AIR ADMITTANCE VALVES (AAV) MUST**
- HAVE MIN 100mm MIN VERTICAL HEIGHT
 - BE USED ON A STACK VENT NOT ACTING AS A DRAIN VENT
 - BE ACCESSIBLE AND VENTILATED

HOT WATER PIPES SHALL BE INSULATED TO NZS4305 AS MODIFIED BY H1/AS1 5.0

PIPE MATERIALS FOR HOT & COLD WATER:

- HOT SUPPLY TO NZS 3501
- COPPER
- COLD SUPPLY TO AS/NZS 1477
- UPVC
- POLYETHYLENE:
- NZS 7601-PRESSURE UP TO 0.9Mpa (TYPE 3)
 - NZS 7602-PRESSURE UP TO 1.2Mpa (TYPE 5)
 - NZS 7610-PRESSURE UP TO 1.2Mpa
- AS 1460:
- PART 1- MECHANICAL JOINTING FITTINGS
 - PART 2- ELECTROFUSION FITTINGS AS/NZS4130 FOR PRESSURES UP TO 1.5 Mpa

GULLY TRAPS
GULLY TRAPS SHALL HAVE OVERFLOW RIMS MIN 150mm ABOVE OVERFLOW LEVEL AND BELOW FIXTURE SERVED.

- MINIMUM OVERFLOW LEVEL OF GULLY TRAP:
- 25mm ABOVE PAVED SURFACES
 - 100mm ABOVE UNPAVED GROUND

GULLY TRAPS, ORG AND ALL INSPECTION OPENINGS WHERE RAISED TO FINISHED SURFACE LEVEL SHALL BE PROTECTED FROM DAMAGE (E.G. BY MEANS OF A CONCRETE SURROUND).

THERMOSTAT SHALL BE SET TO NOT LESS THAN 60°C TO PREVENT GROWTH OF HARMFUL BACTERIA INCLUDING LEGIONELLA IN ACCORDANCE WITH G12/AS1 6.14.3

REFERENCED REPORTS:

WASTEWATER REPORT: WATERFLOW NEW LTD ON-SITE WASTEWATER DESIGN REPORT REF. #WF24937

STORMWATER REPORT: WILTON JOUBERT LIMITED STORMWATER MANAGEMENT REPORT REF #145144

NON-POTABLE WATER:
BACKFLOW PREVENTION SHALL COMPLY WITH G12/AS1 3.6.4 AND FIGURE 2.
IN ACCORDANCE WITH G12/AS1 4.3.1 ALL NON-POTABLE WATER SUPPLY SHALL BE IDENTIFIED BY COLOURED PIPES. IN ACCORDANCE WITH G12/AS1 4.2.1 ALL OUTLETS FOR NON POTABLE WATER SHALL BE IDENTIFIED BY DISPLAYING SAFETY SIGN SHOWN IN FIGURE 3.

DRAINAGE KEY:

- IB** - INSPECTION BEND
- IJ** - INSPECTION JUNCTION
- IP** - INSPECTION POINT
- GT** - GULLY TRAP
- TV** - TERMINAL VENT
- AAV** - AIR ADMISION VALVE
- DP** - DOWNPIPE



IMPORTANT NOTES:
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Location:
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Project No:
25 4805
Legal Description:
LOT 3 DP 514318

Drawing Name:
PLUMBING & DRAINAGE PLAN

Current Issue:
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Plot Date:
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GROUND FLOOR PLAN NOTES

-  **FJ** 140x45 SG8 H1.2 FLOOR JOISTS @450mm CRS TO MAX. 2.6m SPAN, IN ACCORDANCE TO NZS3604:2011 TABLE 7.1(a).
-  **H3.1 LAMINEX STRANDFLOOR FLOORING FOR WET AREAS.**
-  **BEARER** 2/140x45 H3.2 SG8 BEARER TO MAX. 1.65m SPAN AND MAX. 2.8m LOADED DIMENSION, IN ACCORDANCE TO NZS3604:2011 TABLE 6.4(a)
-  125x125MM SQ H5 ORDINARY PILES
-  **BP** 125x125MM H5 BRACED PILES ONTO 400SQ X450MM DEEP CONCRETE FOOTING TO NZS3604:2011.
-  **DIAGONAL BRACE TO NZS3604:2011 WITH M12 BOLT EACH END.**
-  **AP** 125x125MM H5 ANCHOR PILES ONTO 400DIA X 900MM DEEP CONCRETE FOOTING TO NZS3604:2011. (120BUs FOR EARTHQUAKE AND 160BUs FOR WIND)

DECK FRAMING KEY

-  **DJ** 90x45 H3.2 SG8 DECK JOISTS @450mm CRS TO MAX. 1.50m SPAN, IN ACCORDANCE TO NZS3604:2011 TABLE 7.1(b).
-  **BEARER** 2/90x45 H3.2 SG8 BEARER TO MAX. 1.3m SPAN AND 1.2m LOADED DIMENSION, IN ACCORDANCE TO NZS3604:2011 TABLE 6.4 (b)
-  125X125MM H5 ORDINARY PILES ONTO 400SQ x 200mm THICK (MIN 450mm DEEP) CONCRETE FOOTING TO NZS3604:2011.

SUBFLOOR BRACING

IN ACCORDANCE TO NZS3604:2011 5.5.1.

WIND ZONE: VERY HIGH
 EARTHQUAKE ZONE: 3 (BRANZ)
 FLOOR AREA: 69.96m²
 SOIL CLASS: C (GEOREPORT)

WIND BRACING DEMAND

IN ACCORDANCE TO NZS3604:2011 5.2.6 AND TABLE 5.5

ACROSS DEMAND: 10.6 m x 97.5 = 1033.5 BUs REQUIRED
 ALONG DEMAND: 6.6 m x 104 = 686.4 BUs

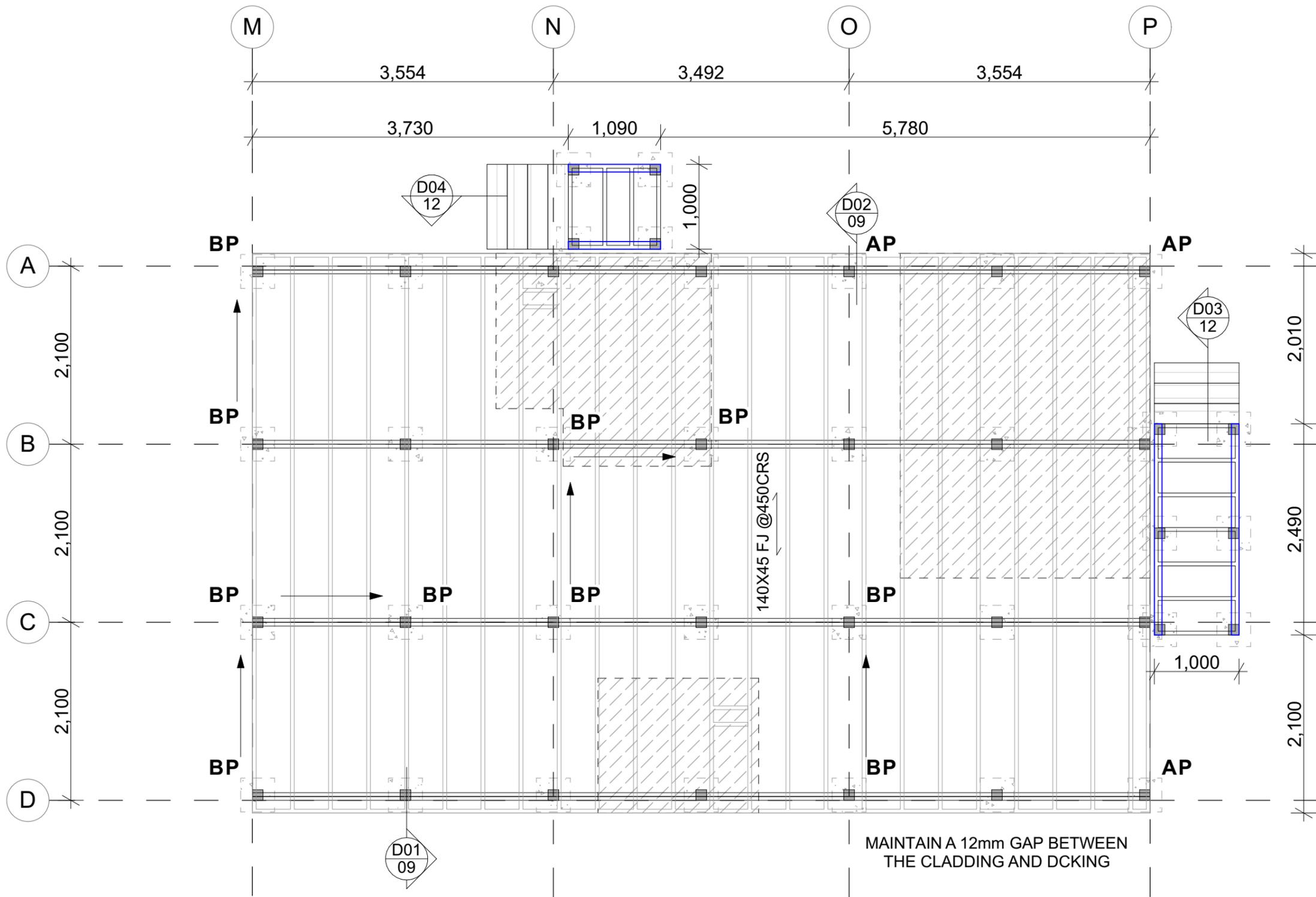
REQUIRED MIN. 7 PILES ACROSS
 REQUIRED MIN. 5 PILES ALONG

EARTHQUAKE BRACING DEMAND

IN ACCORDANCE TO NZS3604:2011 5.3.1. AND TABLE 5.8

SUBFLOOR DEMAND: 69.96 m² x 10.7 = 734.58 BUs REQUIRED
 REQUIRED TOTAL 7 ANCHOR/BRACED PILES

NOTE:
 ANCHOR/BRACED PILES
 120BU EQ
 160BU WIND



NOTE:
 THIS BUILDING CONSENT IS FOR BELOW BEARERS ONLY

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SUBFLOOR FRAMING PLAN

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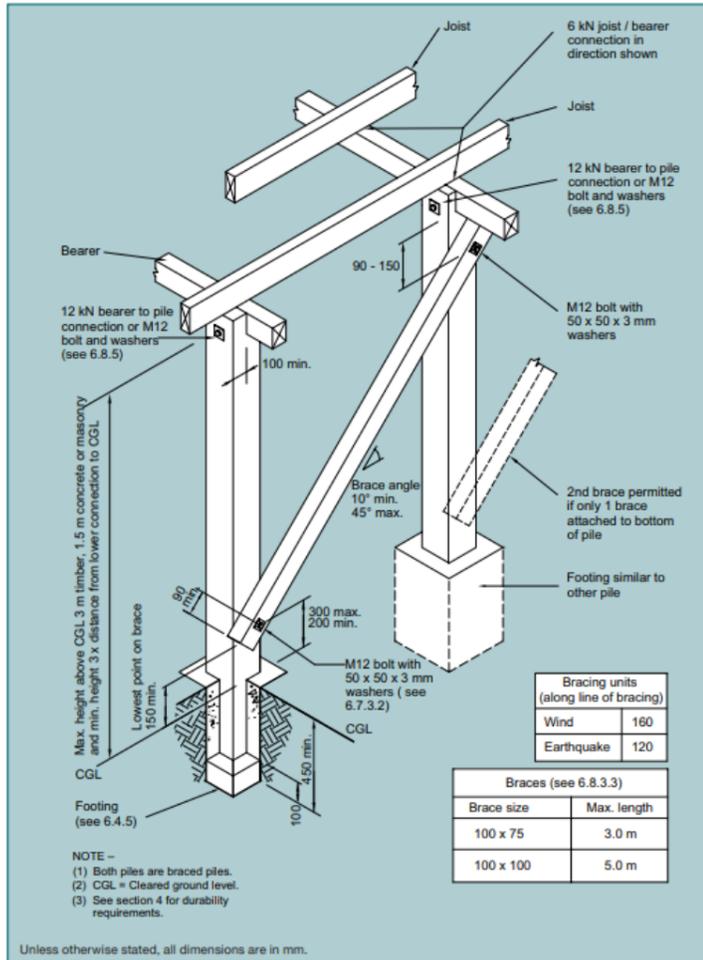


Figure 6.6 – Braced pile system – Brace connected to pile (see 6.8)

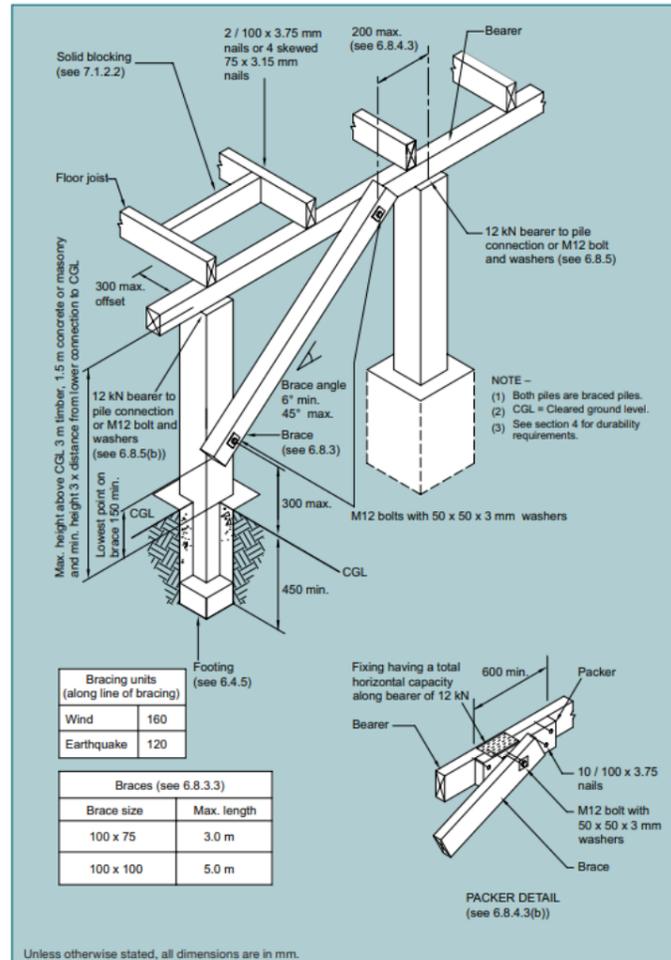


Figure 6.7 – Braced pile system – Brace connected to bearer (see 6.8)

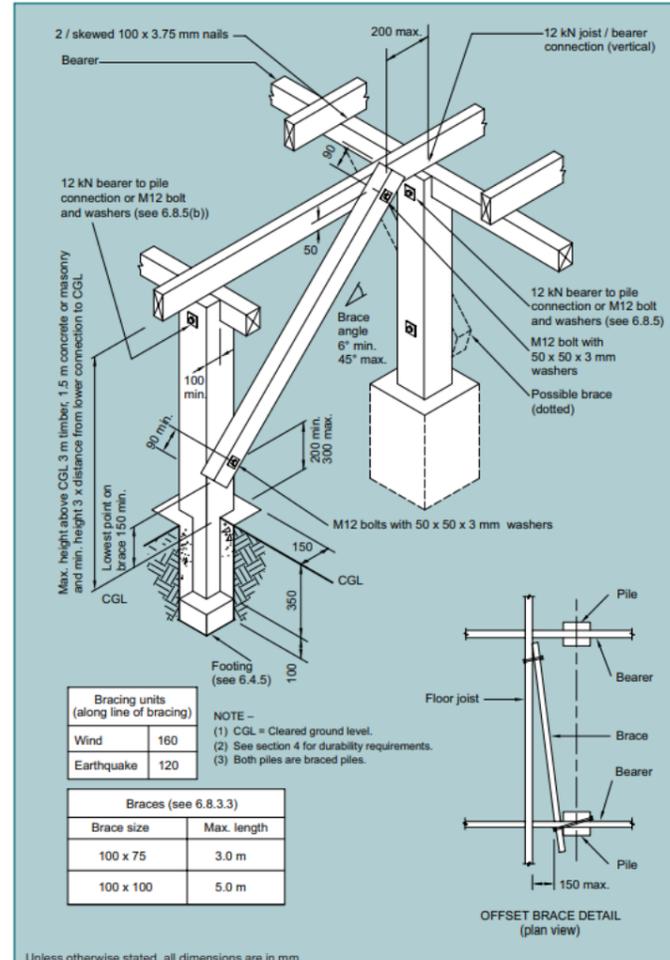


Figure 6.8 – Braced pile system – Brace connected to joist (see 6.8)

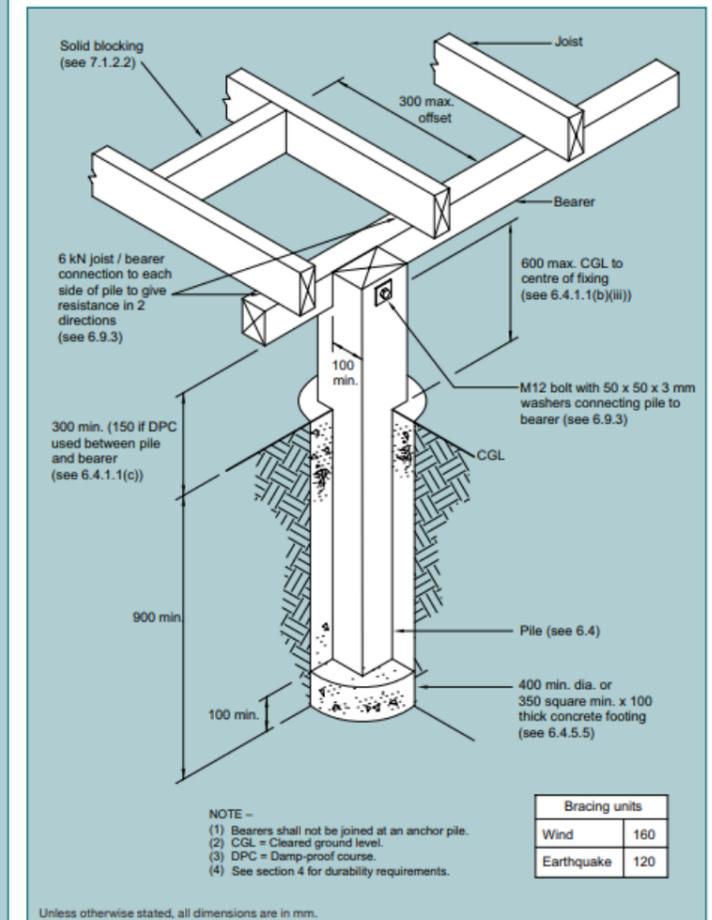
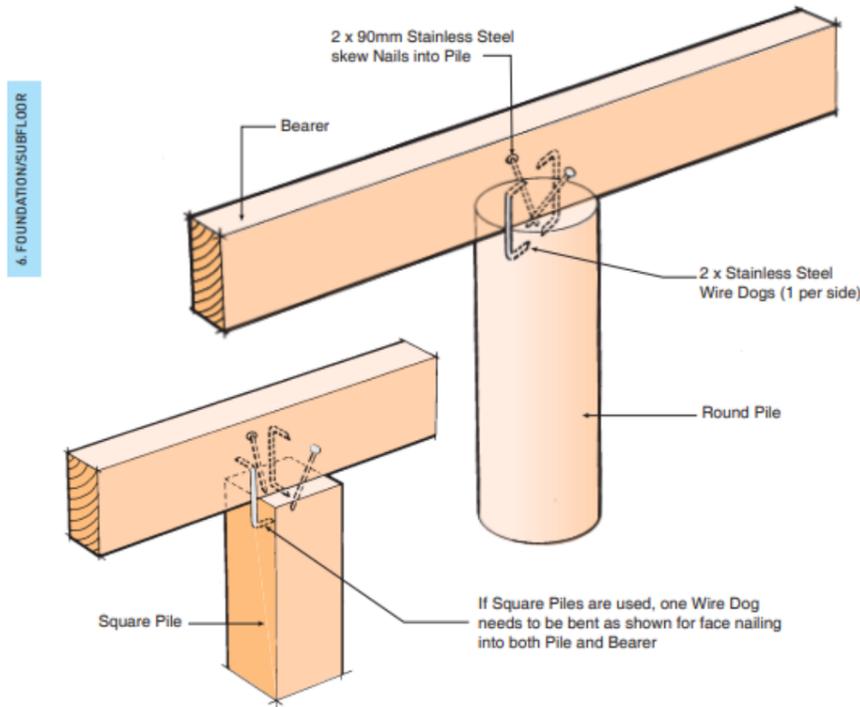


Figure 6.10 – Anchor pile directly connected to bearer only (see 6.9)

ORDINARY PILE FIXING

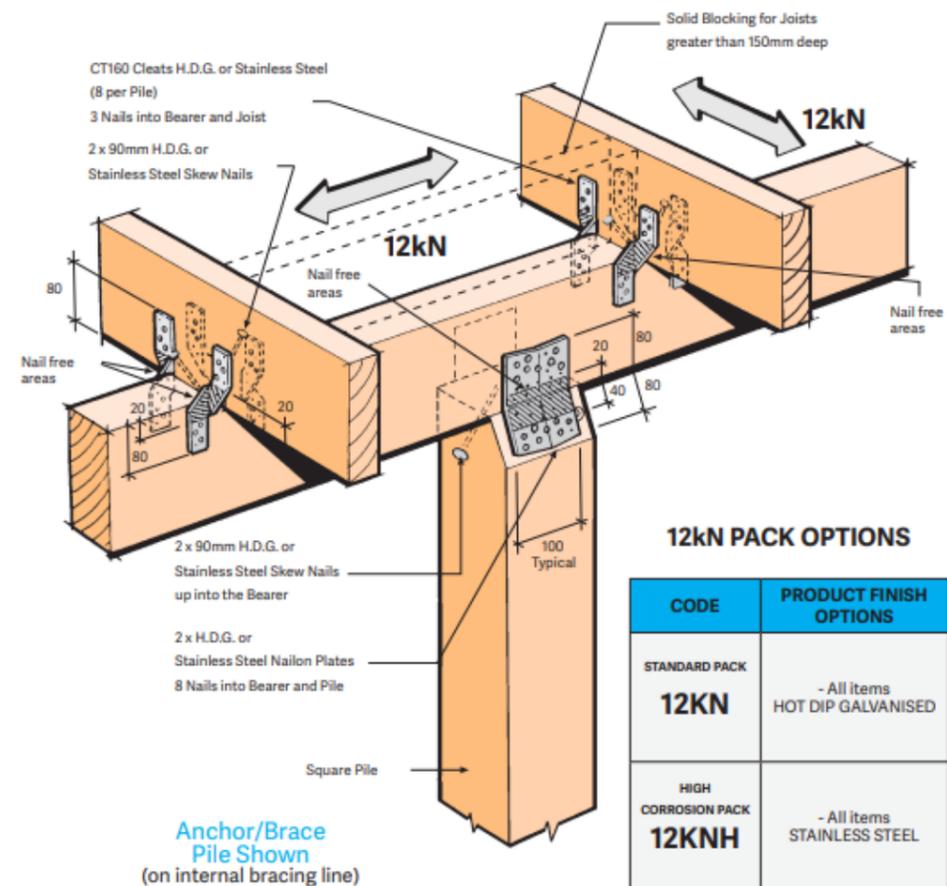
- Complies with NZS 3604:2011
- All Fixings Stainless Steel
- For all Ordinary Piles (Refer Figure 6.3 NZS 3604:2011)



Code: OPF
Packed: 20 x Stainless Steel Wire Dog Staples
20 x Stainless Steel Nails 90mm x 4 dia.

12kN PILE FIXING FOR BRACED PILES OR ANCHOR PILES

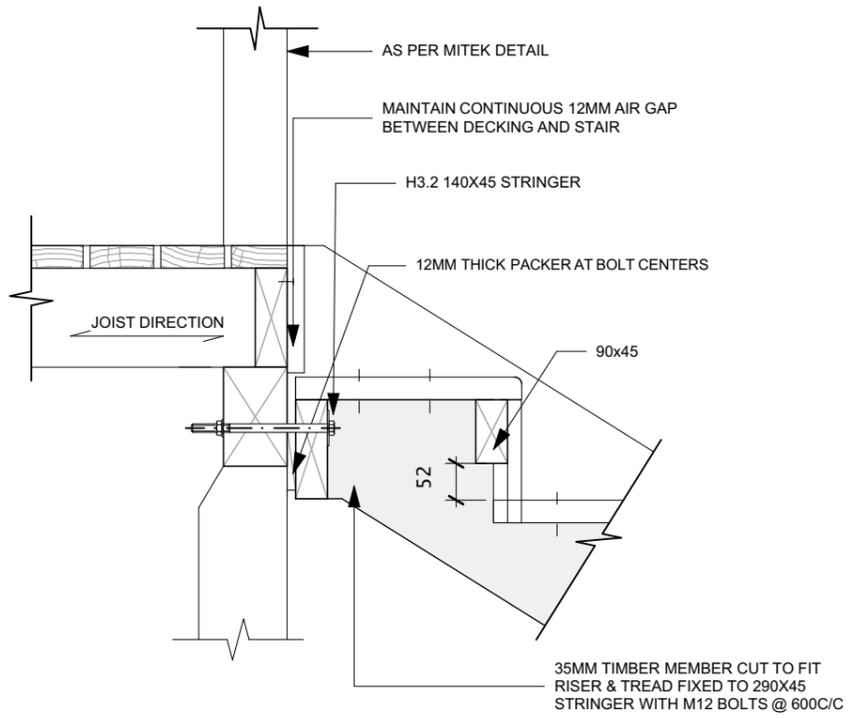
- The 12kN Pile Fixing must be installed in accordance with this brochure
- Auckland University Tested. Test Ref. 4613
- All subfloor construction must be in accordance with NZS 3604:2011
- NZS 3604 requires lines of lateral support to floor joists within 300mm of bearer or bracing lines, refer to Clause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



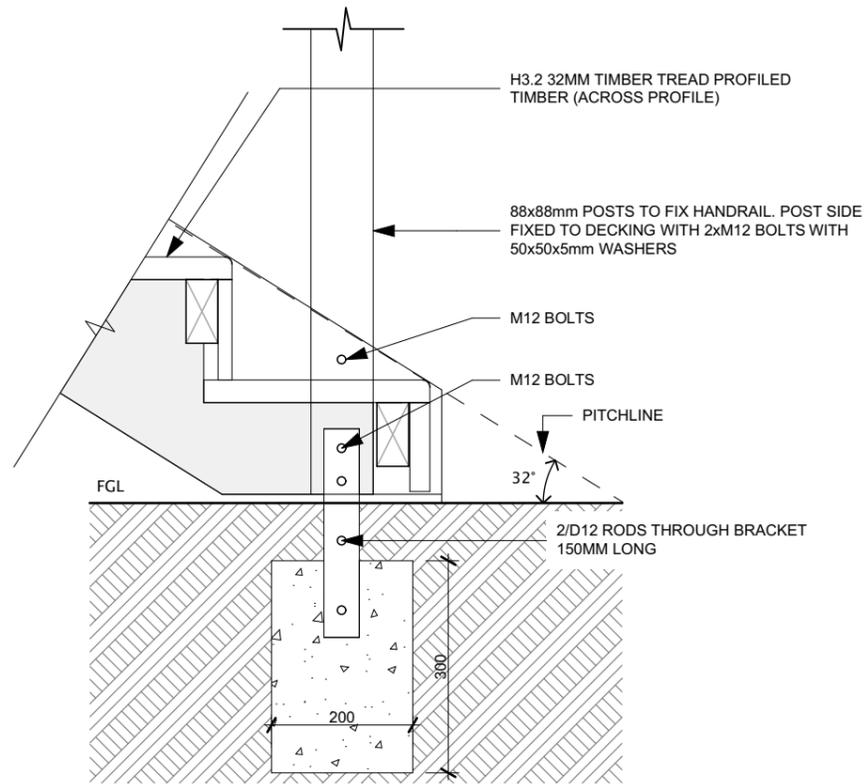
12kN PACK OPTIONS

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

→ See next page for Corrosion Table



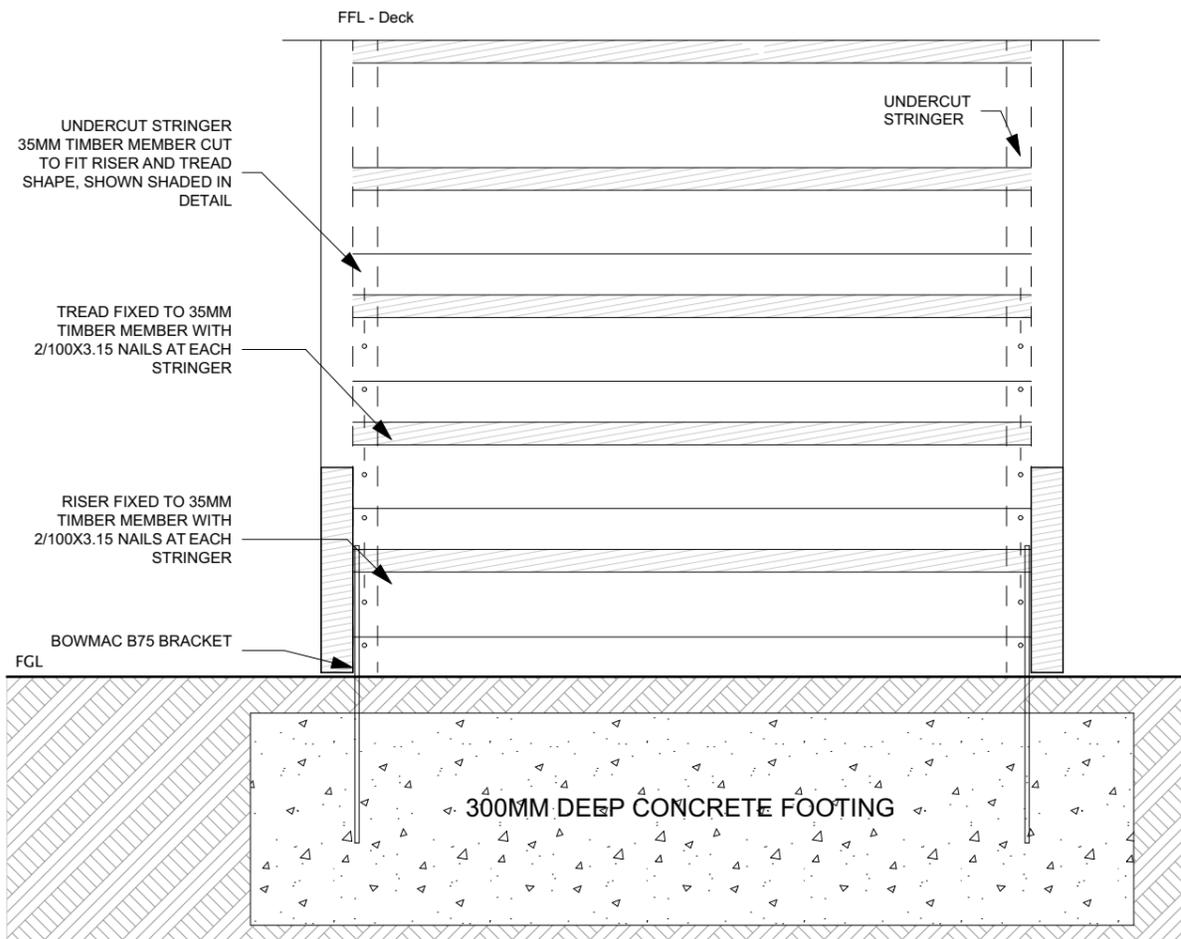
D03 - TAIRS DETAIL



D04 - STAIRS DETAIL

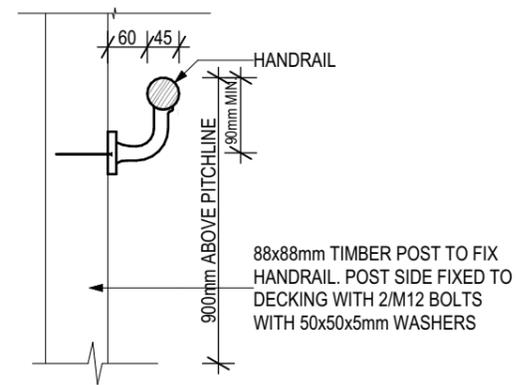
RESIDENTIAL COMMON STAIRWAYS AND MAIN PRIVATE STAIRWAYS

STAIRS:
 MIN. TREAD = 280mm (INCL. 25mm MAX. TREAD PROJECTION)
 MAX. RISER = 190mm
 MAX. PITCH = 37°



D05 - DECK ACCESS STAIRS

HANDRAILS:
 HANDRAILS SHALL COMPLY WITH NZBC D1/AS1 ACCESS ROUTES. PROVIDE HANDRAILS FOR STAIRS WITH THREE OR MORE TREADS. HANDRAILS SHALL BE PLACED 900mm ABOVE PITCHLINE.



D06 - HANDRAIL DETAIL

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Drawing Name:
STAIR AND HANDRAIL DETAILS

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GROUND FLOOR PLAN NOTES

FLOOR AREA OA FRAME 69.96 m²



HANDRAILS:
HANDRAILS SHALL COMPLY WITH NZBC D1/AS1 ACCESS ROUTES. PROVIDE HANDRAILS FOR STAIRS WITH THREE OR MORE TREADS. HANDRAILS SHALL BE PLACED 900mm ABOVE PITCHLINE.

STAIRS:
MIN. TREAD = 280mm (INCL. 25mm MAX. TREAD PROJECTION)
MAX. RISER = 190mm

CONFIRM FLOOR FINISHES ON SITE IN COMPLIANCE WITH MAX. 190mm RISER BEFORE FABRICATION OF STAIRCASE.

MIN. 2.0m HEAD CLEARANCE. CONFIRM ON SITE BEFORE INSTALLATION OF STAIRCASE.

DECKING:
140x20mm HARDWOOD PLANTATION GROWN DECKING WEATHER GROOVED PROFILED UNCOATED SURFACE FINISH COMPLIANT WITH D1/AS1 TABLE 2 CO EFFICIENT OF FRICTION:
- ACROSS PROFILE 0.35 - 0.6
- ALONG PROFILE 0.15 - 0.2
ENSURE DECKING RUN IS 90 DEGREE ANGLE TO MAIN ENTRY DOOR DECK APPROACH. STAINLESS STEEL SCREW FIXED.

NOTE: ALL MEASUREMENTS SHALL BE CONFIRMED ON SITE BEFORE COMMENCING CONSTRUCTION.



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FLOOR PLAN

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ELEVATION NOTES

ROOF PITCH: 18° UNLESS OTHERWISE LABE

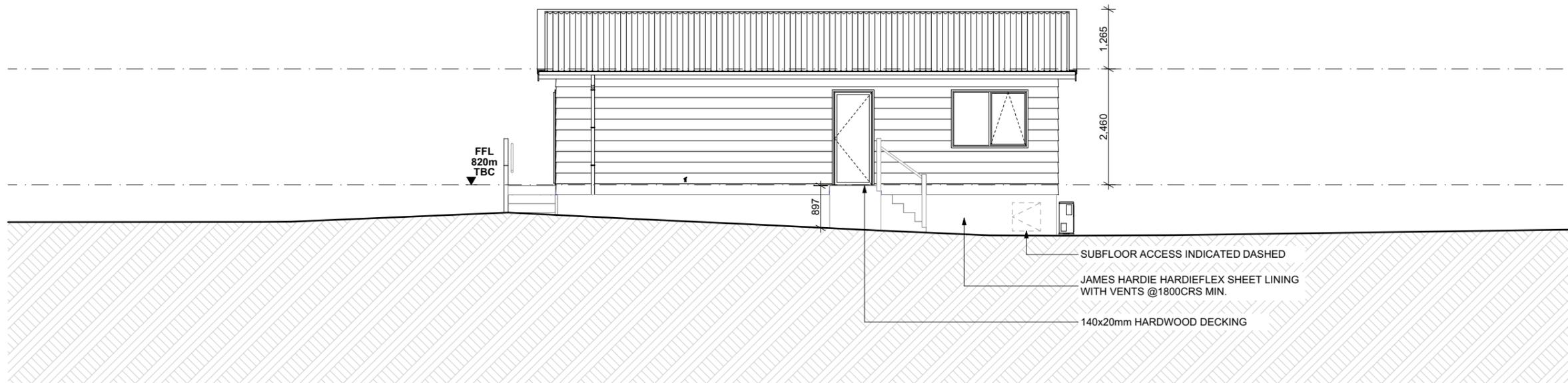
ELEVATION KEY



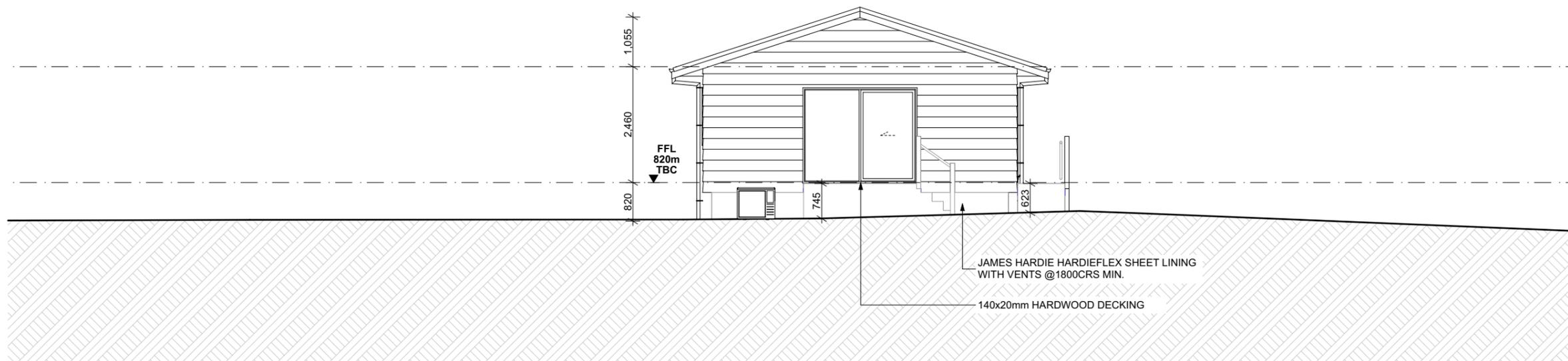
ROOF CLADDING:
 COLORSTEEL MAXAM 0.4 BMT
 CORRUGATE PROFILE LONGRUN



CLADDING 1:
 INNOVA DURAPLANK WEATHERBOARD
 230x7.5mm ON 20mm DRAINED CAVITY



E01 ELEVATION



E02 ELEVATION

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Drawing Name:
ELEVATIONS E01 & E02

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ELEVATION NOTES
 ROOF PITCH: 18° UNLESS OTHERWISE LABE

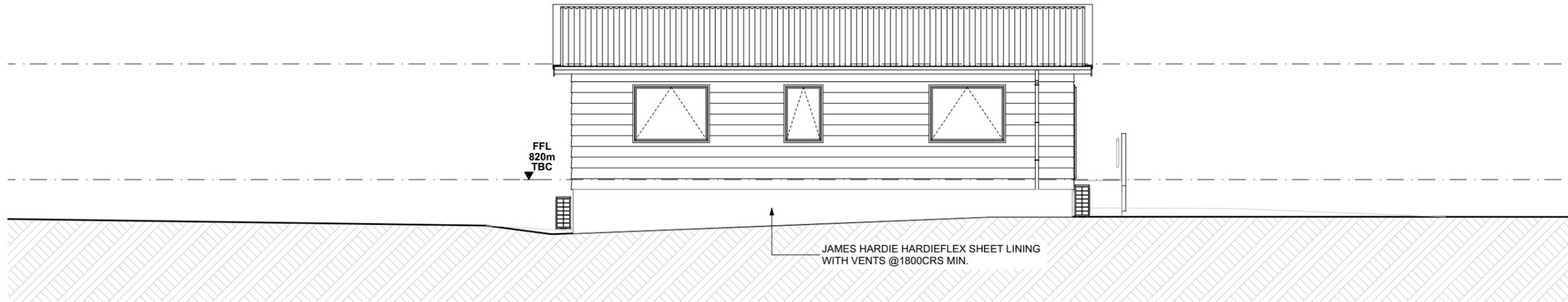
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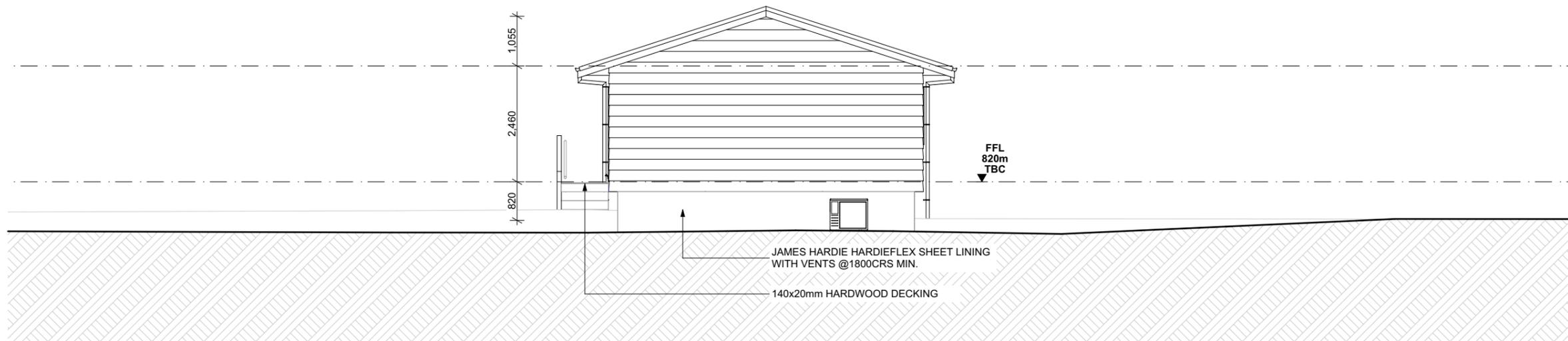
ROOF CLADDING:
 COLORSTEEL MAXAM 0.4 BMT
 CORRUGATE PROFILE LONGRUN



CLADDING 1:
 INNOVA DURAPLANK WEATHERBOARD
 230x7.5mm ON 20mm DRAINED CAVITY



E03 ELEVATION



E04 ELEVATION

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ELEVATIONS E03 & E04

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GROUND FLOOR PLAN NOTES



FLOOR

SUBFLOOR FRAMING: EXPOL R2.8 UNDERFLOOR INSULATION

WALLS

90mm R2.2 BRADFORD GOLD WALL INSTULATION

AREA (m ²)	PERIMETER (mm)	AREA/PERIMETER RATIO
66.90	33,680 ⁰	1.97

GLAZING

R0.37 THERMALLY IMPROVED LOW-E ARGON FILLED DOUBLE GLAZED ALUMINIUM JOINERY

GLAZING AREA / TOTAL WALL AREA = 16%

NOTE: JOINERY SUPPLIER TO PROVIDE PRODUCER STATEMENT - REQUIRED BY COUNCIL DURING CONSTRUCTION INSPECTIONS.

NOTE: JOINERY SUPPLIER TO PROVIDE PERFORMANCE STATEMENT - REQUIRED BY COUNCIL BEFORE APPLYING FOR CERTIFICATE CODE OF COMPLIANCE.

OPAQUE DOORS

R0.34 INTERNAL DOOR

R0.18 FRONT DOOR

R0.18 OPAQUE ELEMENTS GENERALLY, IN ACCORDANCE TO NZBC H1/AS1 2.1.3.9.

ROOF

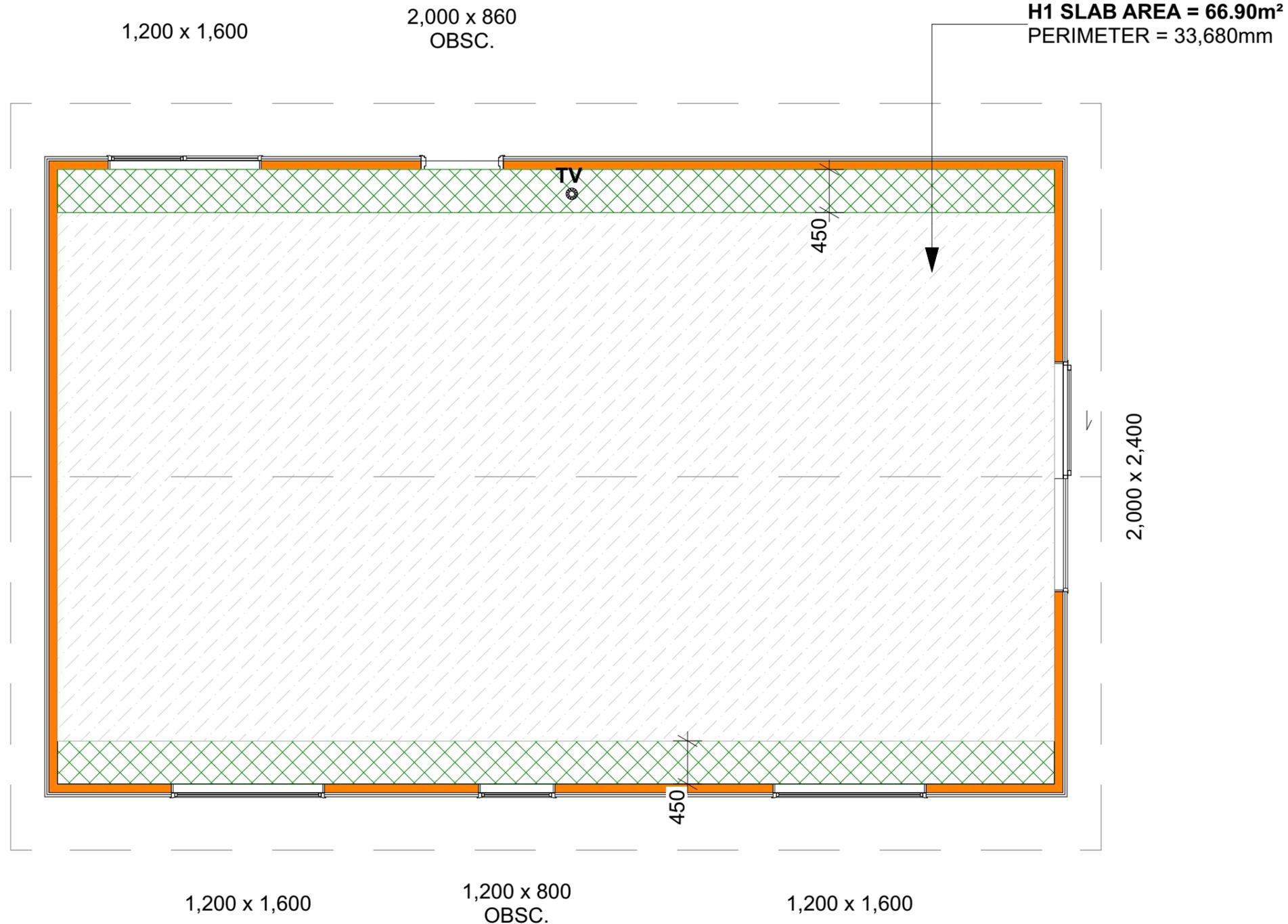
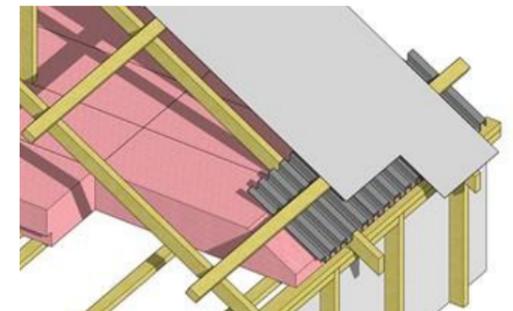
ROOF CORE INSULATION:

1 LAYER BRADFORD GOLD R7.3 (290mm) CEILING INSULATION

ROOF EDGE INSULATION:

R7.3 BRADFORD GOLD CEILING COMPRESSED TO 115mm (R3.44)

-USE 650mm LONG INSULATION GUARD TO ENSURE 25mm AIR GAP BETWEEN INSULATION AND UNDERSIDE OF ROOFING



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Drawing Name:
H1 PLAN

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TIMBER FLOOR 2.71 m²C/W

Type: Floor: Suspended Floor (no Lining) ▼
 Suspended Floor (no Lining) view detail

internal surface 0.09

Flooring : generic - Particle Board 20mm ▼
R-value: 0.17

Timber Frame & Cavity : 140mm joists @ 450mm ▼
 Floor Frame Area: 10.0% Cavity Area: 90.0%

Framing : Expol Underfloor R-2.8 Wooden Floor (Dbl Layer)
R-value: 1.16 (120mm) 2.8

Insulation value of the subfloor space

Suspended floor area [m²]: 66.90
 Perimeter length [m]: 33.68
 Perimeter height [m]: 0.6
 Perimeter type: Exposed floor (pole house) ▼

Construction R-value calculated by DesignNavigator ©

ROOF CORE 3.37 m²C/W

Type: Roof: Timber framed truss Roof, flat Ceiling ▼
 Timber framed truss Roof, direct fixed or battened flat Ceiling view detail

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper ▼
R-value: 0.01

Insulation : ▼

Timber Frame & Cavity : 90mm rafters or joists @ 900mm, battens covered with insulation ▼
 Roof Frame Area: 5.0% Cavity Area: 95.0%

Roof space (still air) 0.11 Roof space (still air) 0.11
 Framing : Bradford Gold Ceiling 3.6 3.6
R-value: 0.75 Insulation covering bottom chord

Ceiling Lining : generic - gypsum Plasterboard 13mm ▼
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: Number of downlights: Clearance from lamp holder side [m]: i

Construction R-value calculated by DesignNavigator ©

ROOF EDGE 3.44 m²C/W

Type: Roof: Timber framed truss Roof, flat Ceiling Perimeter (compressed Insulation) ▼
 Timber framed truss Roof, direct fixed or battened flat Ceiling, compressed Perimeter Insulation

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper ▼
R-value: 0.01

Timber Frame & Cavity : 90mm rafters or joists @ 900mm, battens covered with insulation ▼
 Roof Frame Area: 5.0% Cavity Area: 95.0%

Framing : Bradford Gold Ceiling 7.3 7.3
R-value: 0.75

Compressed Insulation Details

Roof Slope: 19° Perimeter Width: 460 mm
 Wall Stud Width: 90 mm Offset: 45 mm
 Top Chord Lift: 115 mm Top Chord Depth: 90 mm
 Compression Constant: 1
 Is a ventilation gap present? Is insulation inside chord base?

Ceiling Lining : generic - gypsum Plasterboard 13mm ▼
R-value: 0.06

internal surface 0.09

Construction R-value calculated by DesignNavigator ©

DURAPLANK 1.94 m²C/W

Type: Wall: Timber Frame with vented Cavity ▼
 Timber Frame with vented Cavity view detail

external surface 0.03

Cladding : generic - Fibre cement board 7.5mm ▼
R-value: 0.03

Air Barrier : generic - fibre cement RAB Board 4mm ▼
R-value: 0.02

Timber Frame & Cavity : 90mm, studs @ 450mm, dwangs @ 800mm ▼
 Wall Frame Area: 16.7% Cavity Area: 83.3%

15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08 15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08

Framing : Bradford Gold Wall 2.2 2.2
R-value: 0.75

still Airgap: none ▼
R-value: 0.00

Wall Lining : generic - gypsum Plasterboard 10mm ▼
R-value: 0.04

internal surface 0.09

Construction R-value calculated by DesignNavigator ©

4.03 H1 INFORMATION SCHEDULE

DESCRIPTION	HEIGHT	LENGTH	WIDTH	TOTAL WALL AREA	DOORS	WINDOWS	OPENING AREA	WALL AREA EXCLUDING OPENINGS
H1 DURAPLANK	2,460	6,420 ⁰	90	16.24	0	0	0.00	16.24
	2,460	6,420 ⁰	90	16.24	1	0	4.80	11.44
	2,460	10,420 ⁰	90	26.08	0	3	4.80	21.28
	2,460	10,420 ⁰	90	26.08	1	1	3.64	22.44
				84.64 m²			13.24 m²	71.40 m²

INSULATED ROOF SCHEDULE OF AREAS	
INSULATION SPEC	AREA
ROOF CORE AREA INSULATION	57.52
ROOF EDGE AREA INSULATION	9.38

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 Location:
1032B WIROA ROAD, OKAIHAU, KERIKERI

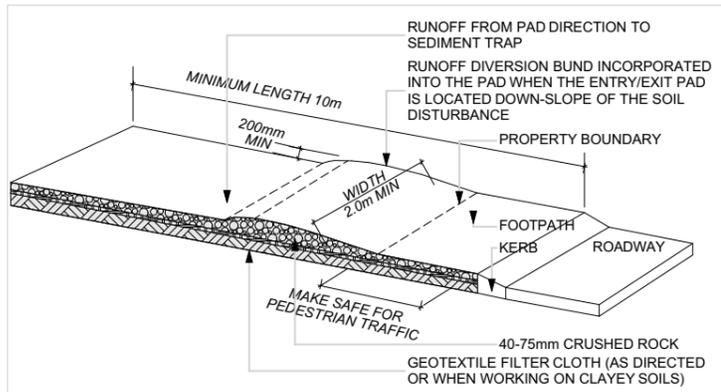
Project No:
25 4805
 Legal Description:
LOT 3 DP 514318

Drawing Name:
H1 INFORMATION

Current Issue:
WD01
 Plot Date:
5/03/2026

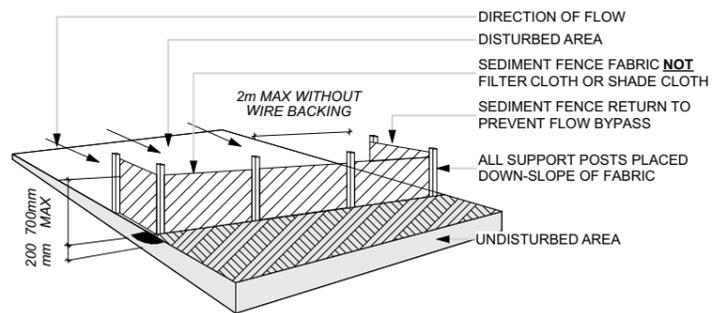
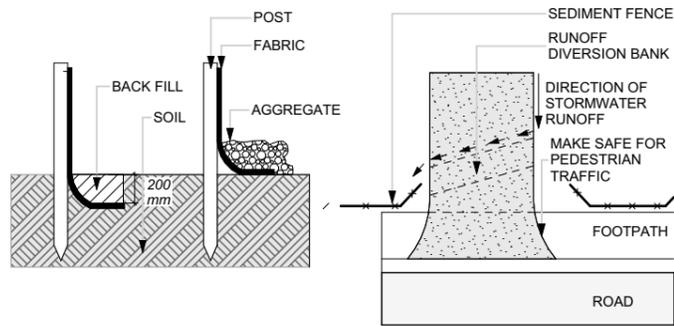
Issue:	Revision:	Date:

Sheet No.
17
 Scale @ A3:



STABILISED ENTRY/EXIT PAD - BUILDING SITES

ENTRY/EXIT PAD EXTENDS FROM KERB TO BUILDING SLAB WHERE PRACTICAL



SILT & SEDIMENT CONTROL

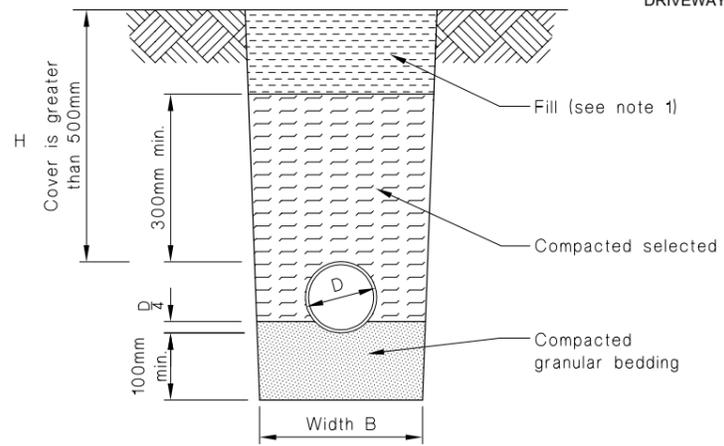
SEDIMENT CONTROL

SEDIMENT AND EROSION CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE MAIN CONTRACTOR AND SHALL BE REGULARLY CHECKED AND MAINTAINED AS REQUIRED DURING CONSTRUCTION - REFER SITE PLAN KEY FOR ALL CUT/FILL ZONES.

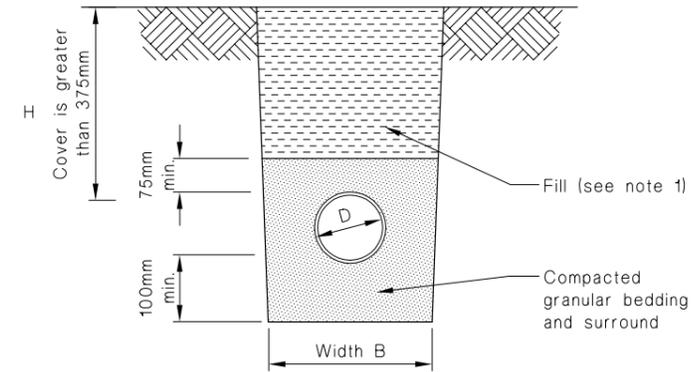
SEDIMENT AND RUNOFF CONTROL SHALL BE DESIGNED AND INSTALLED BY THE SITE LICENCED BUILDING PRACTITIONER PRIOR TO OR DURING PROJECT EARTHWORKS.

FIGURE 7 - BEDDING & BACKFILLING
ACCEPTABLE SOLUTION G13/AS2

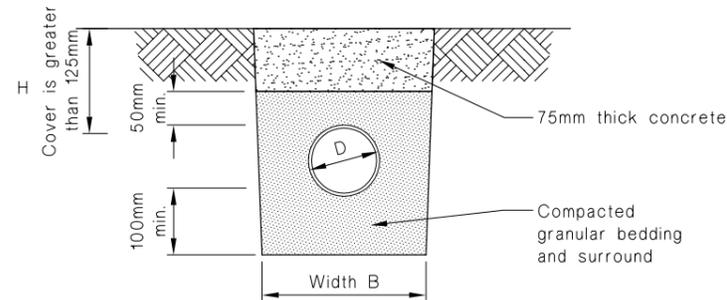
NOTE:
1. FILL SHALL BE:
-ORDINARY FILL WHERE DRAINS ARE LOCATED BELOW GARDENS & OPEN COUNTRY
-COMPACTED SELECTED FILL WHERE THE DRAINS ARE LOCATED BELOW RESIDENTIAL DRIVEWAYS AND SIMILAR AREAS SUBJECT TO LIGHT TRAFFIC



(a) Cover greater than 500 mm



(b) Cover greater than 375 mm



(c) Cover greater than 125 mm

IMPORTANT NOTES:
THE CONTRACTOR SHALL VERIFY ALL DATUM SOURCES AND DIMENSIONS INCLUDING SITING SETOUT BEFORE COMMENCING CONSTRUCTION. WRITTEN DIMENSIONS SUPERSEDE SCALED DIMENSIONS. REFER TO SPECIFICATIONS THAT FORM A PART OF THIS CONTRACT. SURVEY PLANS / ENGINEERING DESIGN TAKE PRECEDENCE IN ALL CASES

STATEMENT OF DESIGN - PS1

Issued by: Matt Riddell

To: William and Beula Foote

Copy to be supplied to: Far North District Council

In Respect of: Septic Tank Domestic Onsite Wastewater and Sewage System Design

At: 1032B Wiroa Road, Kerikeri

Legal Description: Lot 3 DP 51431

Waterflow NZ Ltd has been engaged by William and Beula Foote to provide the technical design services and details in respect of the requirements of G13/VM4 and B2 Durability of the Building Code 2004, for an Onsite Wastewater and Sewage System for their building at the above location.

The Design has been carried out in accordance with Auckland Council TP-58 Guidelines and Clause B2, G13 and G14 of the Building Regulations 2004.

The proposed building work covered by this producer statement is described on the drawings titled: William and Beula Foote Onsite Wastewater Design Report, and numbered 1-42 together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

- (i) Site verification of the following design assumptions: correct installation of the system and drainage fields
- (ii) All proprietary products meeting their performance specification requirements;

As an independent design professional covered by a current policy for Professional Indemnity Insurance, no less than \$200,000*, I **believe on reasonable grounds** the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code.

Signed by: Matt Riddell - PS Author '2384' Auckland Council, NZQA Onsite Wastewater Training/Opus, Approved Designer

Date: 28/11/2025

Signature:



Waterflow NZ Ltd
4/525 Great South Road
Penrose, Auckland 1061

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000.*



WaterFlow
Bringing Clarity to Wastewater

2025

Waterflow NZ Ltd
Certified Designer



William and Beula Foote
1032B Wiroa Road
Kerikeri
Lot 3 DP 51431

Reference Number: WF24937

Issued 28/11/2025

ONSITE WASTEWATER DESIGN REPORT



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Attachments

- PS1
- Land Application System Schematics
- Assessment of Environmental Effects
- System & Installation Specifications
- Home Owners Care Guide

**Disclaimer**

The design presented herein is based on the information available at the time of preparation and reflects the conditions known at that time.

If additional information comes to light or if there are significant changes in site conditions or circumstances, the design may no longer be valid. In such cases, the design must be reassessed and potentially revised by the designer to ensure its continued suitability.

The designer(s) disclaim any responsibility for the design's applicability or effectiveness under new or altered conditions and recommend a review before implementation if any such changes occur.

**PART A: CONTACT AND PROPERTY DETAILS****A 1. Consultant / Evaluator**

Name:	Xandir Fatialofa
Company/Agency:	Waterflow New Zealand Ltd
Address:	4/525 Great South Road, Penrose, Auckland 1061
Phone:	09 431 0042
Fax:	
Email Address:	xandir@waterflow.co.nz

A 2: Applicant Details

Applicant Name:	William and Beula Foote
Company Name:	
Property Owner:	William and Beula Foote
Owner Address:	1032B Wiroa Road, Kerikeri
Phone:	
Mobile:	0272 741472
Email Address:	doorman69r@hotmail.com

A 3: Site Information

Sited Visited by:	Ken Hoyle	Date:	Tuesday, 25 November 2025
Physical Address:	1032B Wiroa Road, Kerikeri		
Territorial Authority:	Far North District Council		
Regional Council:	Northland Regional Council		
Regional Rule	C.6.1.3		
Legal Status of Activity:	Permitted:	<input checked="" type="checkbox"/>	Controlled: <input type="checkbox"/> Discretionary: <input type="checkbox"/>
Total Property Area (m²):	20138m ²		
Map Grid Reference:			
Legal Description of Land (as on Certificate of Title):			
Lot No:	3		
DP No:	51431		
CT No:	797963		



A 4: Are there any previous existing discharge consents relating to this proposal or other waste discharge/disposal on the site?

Yes:	<input type="checkbox"/>	No:	<input checked="" type="checkbox"/>
------	--------------------------	-----	-------------------------------------

If yes, give reference No's and description:

--

A 5: Dwelling(s) for which on-site wastewater service is to be provided

Status of dwelling(s) to be serviced:	New	<input type="checkbox"/>	Existing	<input checked="" type="checkbox"/>	Multiple	<input type="checkbox"/>
How many dwellings on the property?	1					
Capacity of dwellings:	Dwelling 1	2				
(or number of bedrooms)	Dwelling 2					
	Dwelling 3					
	Other:					
Notes:						

**PART B: SITE ASSESSMENT - SURFACE EVALUATION****B 1: Site Characteristics**

Performance of adjacent systems:	(Unknown)		
Estimated annual rainfall (mm):	1250 - 1500 (as per NIWA statistics)		
Seasonal variation (mm):	300-400mm		
Vegetation cover:	Grass		
Slope shape:	Linear Planar		
Slope angle:	3°		
Surface water drainage characteristics:	Overland to southern boundary		
Flooding potential?	Yes:	No:	x
If Yes, specify relevant flood levels relative to disposal area:			
Site characteristics:	1032B Wiroa Road is a large rural property with a legal description of Lot 3 DP 514318. The property is about 12km southwest of Kerikeri and has an area of just over 2 hectares. The property is relatively flat with a slight southerly aspect. It is grass covered with some areas of trees and there are no nearby overland flow paths, surface waters or flood plains. A new two bedroom minor dwelling is proposed which will require its own onsite wastewater management system.		

B 2: Slope Stability

Has a slope stability assessment been carried out on the site?

Yes:		No:	x
------	--	-----	---

If no, why not?

Low slope:	x	No signs of instability:	x	Other:
------------	---	--------------------------	---	--------

If yes, give brief details of report:

Details:	
Author:	
Company/Agency:	
Date of report:	

B 3: Site Geology

--

**B 4: Slope Direction**

What aspect does the proposed disposal system face?

North		West	
North-West		South-West	
North-East		South-East	
East		South	x

B 5: Site Clearances if applicable (also on site plan)

	Treatment Separation Distance (m)	Disposal Field Separation Distance (m)
Boundaries:	>1.5	>1.5
Surface Water:	>20	>20
Ground Water:	>1.2	>1.2
Stands of Trees / Shrubs:	n/a	n/a
Wells/Water Bores:	>20	>20
Embankments / Retaining Walls:	>3	>3
Buildings:	>3	>3
Other:		

B 6: Please identify any site constraints applicable for this property, and indicate how the design process is to deal with these.

Constraints	Explain how constraints are being dealt with
1 Site constraints: (a) (b)	n/a

**PART C: SITE ASSESSMENT - SOIL INVESTIGATION****C 1: Soil Profile Determination Method**

Test pit:		Depth (mm):		No. of Test pits:	
Bore hole:	x	Depth (mm):	1200	No. of Bore holes:	2
Other:					

C 2: Fill Material

Was fill material intercepted during the subsoil investigation?

Yes:		No:	x
------	--	-----	---

If yes, please specify the effect of the fill on wastewater disposal:

C 3: Permeability Testing

Has constant head Permeability Testing (Ksat) been carried out?

Yes:		No:	x
------	--	-----	---

If yes, please indicate the details (test procedure, number of tests):

Test report attached?

Yes:		No:	x
------	--	-----	---

C 4: SURFACE WATER CUT OFF DRAINS

Are surface water interception/diversion drains required?

Yes:	x	No:	
------	---	-----	--

C 5: DEPTH OF SEASONAL WATER TABLE:

Winter (m):	>1.2
Summer (m):	>1.2

Was this:

Measured:	✓ no sign of ground water or mottling in bore holes
Estimated:	

C 6: SHORT CIRCUITS

Are there any potential short circuit paths?

Yes:		No:	x
------	--	-----	---

If yes, how have these been addressed?

**C 7: SOIL CATEGORY**

Is topsoil present?

Yes:	<input checked="" type="checkbox"/>	No:	<input type="checkbox"/>
------	-------------------------------------	-----	--------------------------

If yes, what is the topsoil depth & soil description?

250m silty loam topsoil over clay loam
--

Indicate the disposal field soil category (as per AC TP-58, Table 5.1)

Category	Description	Drainage	(x)
1	Gravel, coarse sand	Rapid draining	
2	Coarse to medium sand	Free draining	
3	Medium-fine & loamy sand	Good draining	
4	Sandy loam, loam & silt loam	Moderate draining	
5	Sandy clay-loam, clay loam & silty clay-loam	Moderate to slow draining	x
6	Sandy clay, non-swelling clay & silty clay	Slow draining	
7	Swelling clay, grey clay & hardpan	Poorly or non-draining	

Reason for placing in stated category:

Result of bore hole/test pit sample	<input checked="" type="checkbox"/>
Profile from excavation	<input type="checkbox"/>
Geotech report	<input type="checkbox"/>
Other:	<input type="checkbox"/>

C 8: SOIL STRUCTURE

Based on results of the in-situ soil profile investigation above (C7) please indicate the disposal (land application) field soil structure:

Massive	<input type="checkbox"/>
Single grained	<input type="checkbox"/>
Weak	<input type="checkbox"/>
Moderate	<input checked="" type="checkbox"/>
Strong	<input type="checkbox"/>

C 9: As necessary, provide qualifying notes on the relationship of Soil Category (C7) to Soil Structure (C8) and the effect this relationship will have on design loading rate selection:

--



PART D: DISCHARGE DETAILS

D 1: Water supply source for the property:

Rain water (roof collection)	x
Bore/well	
Public supply	

D 2: Are water reduction fixtures being used?

Yes:	<input type="checkbox"/>	No:	x	(according to our knowledge at time of design report)
------	--------------------------	-----	---	---

If 'yes' Please state:

Standard Fixtures include dual flush 11/5.5 or 6/3 litre toilet cisterns, and includes standard automatic washing machine, but a low water use dishwasher, no garbage grinder.
--

D 3: Daily volume of wastewater to be discharged:

No. of bedrooms/people:	1: 2 Bedroom 2: 3:
Design occupance (people): (as per AC TP-58, Table 6.1)	1: 4 People 2: 3:
	Black / Grey water
Per capita wastewater production (litres/person/day): (as per ARC TP-58, Table 6.2)	1: 160 L/day 2: 3:
Total daily wastewater production (litres per day):	640 L/day
Notes:	

D 4: Is daily wastewater discharge volume more than 2000 litres?

Yes:	<input type="checkbox"/>	No:	x
------	--------------------------	-----	---

D 5: Gross lot area to discharge ratio:

Gross lot area:	20138 m ²
Total daily wastewater production (litres/day):	640 L
Lot area to discharge ratio:	31.47

D 6: Net Lot Area

Area of lot available for installation of the disposal (land application) field and reserve area:

Net lot area (m ²):	19138 m ²
Reserve area (m ²):	100% 80m ²

**PART E: LAND DISPOSAL METHOD****E 1: Indicate the proposed loading method:**

	Black / Grey Water
Trickle Fed:	x
Dosing Siphon:	
Pump:	

E 2: If a pump is being used please provide following information:

Total Design Head (m):	
Pump Chamber Volume (litres):	
Emergency Storage Volume (litres):	

Is a high water level alarm being installed in pump chambers?

Yes:		No:	x
------	--	-----	---

E 3: Identify the type(s) of Land Disposal method proposed for this site:

	Black / Grey Water
P.C.D.I. Dripper Irrigation:	
L.P.E.D. System:	
Evapo-Transpiration Beds:	ETS Beds
Other:	
(as per Schematics attached)	

E 4: Identify the Loading Rate proposed for option selected in E3:

as per ARC TP-58, Table 9.2 & Table 10.3	Black / Grey Water
Loading Rate (litres/m ² /day):	8
Disposal Area Basal (m ²):	80
Areal (m ²):	#VALUE!

E 6: Details and dimensions of the disposal (land application) field:

Length (m):	13.3	No. ETS Beds	2	Hole Size:	16.0
Width (m):	3.0	Spacing (m):	1.5	Hole Spacing:	500.0
Notes:	Conventional ETS beds laid on level contour. To be protected from stock and vehicle movements, as per schematic drawing attached. See schematic drawing attached.				



PART F: PROPOSED WASTEWATER TREATMENT SYSTEM

A Septic Tank SEPD45C System, fed through ETS Beds is suitable for this site. The SEPD45C System has enough capacity to accommodate 2000ltr per day, so will be well within its capacity. The land application system is designed to discharge a maximum volume of 640ltrs per day and if this is exceeded it could cause failure resulting in environmental and public harm.

PART G: OPERATION AND MAINTENANCE OF SYSTEM

The operation of this complete system will be explained verbally to the owner by the Installer or Agent on Completion of Installation; also provided with Waterflow's Home Owner's Manual.

Waterflow NZ Ltd encourages the Home Owner to monitor and care for your Septic Tank system yourself, with our backing and support, and by doing so you will learn how your system works and operates and how to keep it in top working order.

It is also recommended that a Maintenance Program contract is in place at all times to ensure this system is maintained at top performance at all times.

All on site wastewater systems require regular maintenance; in this case once annually is suffice and may be specified within the consent process by the Building Department of Far North District Council. This Maintenance will be recorded on hard copy and supplied to both the Owner and Far North District Council Compliance Officer if requested.

NOTE TO OWNER: All written records pertaining to the wastewater system should be retained in a safe place. When a change of ownership occurs, a full and complete history is able to be passed to the new owners.

Animals are to be physically excluded from the installed effluent field to avoid damage, and to reduce the risk of soil compaction in the vicinity of the bed.

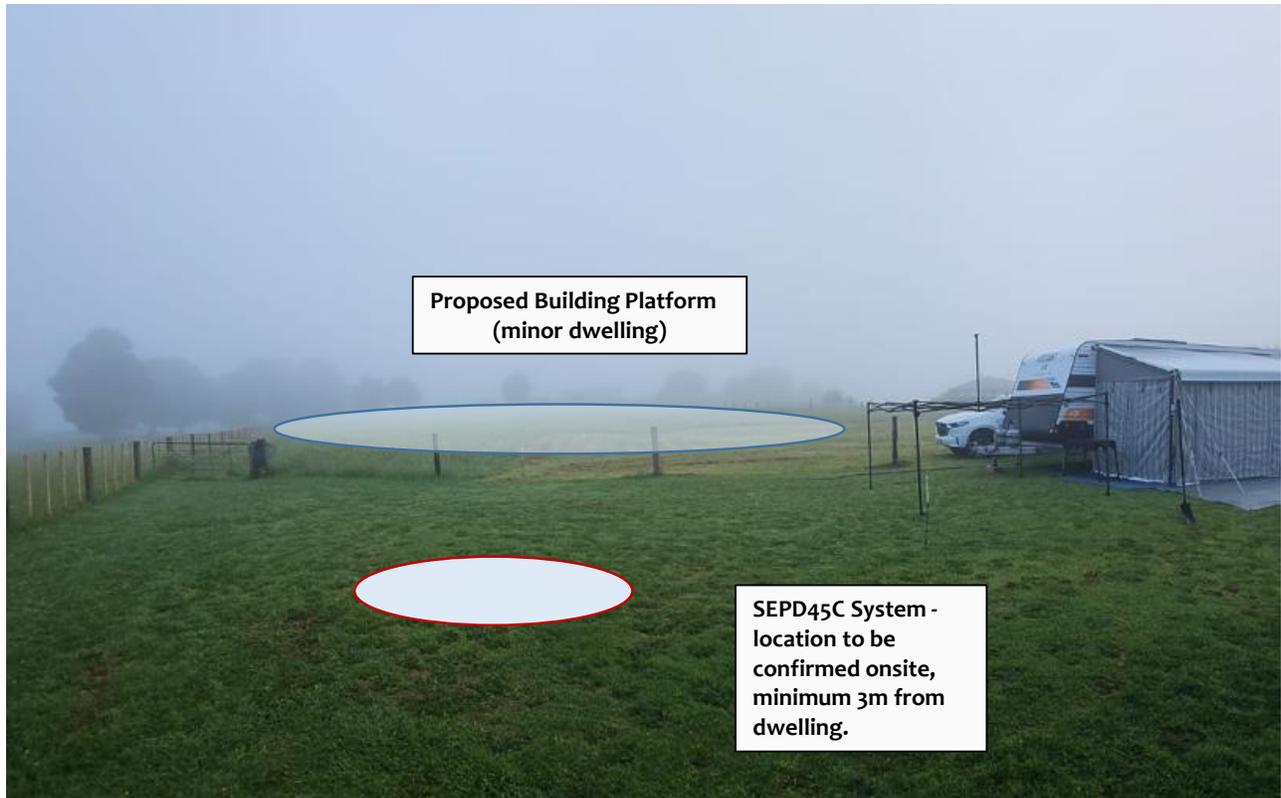
Planting within this area is encouraged to assist with evapotranspiration by plants.

PART H: SOIL LOG PROFILE



250m silty loam topsoil over clay loam. Soil Category 5, (as per AC TP-58, Table 5.1)

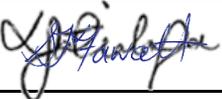
PART I: SITE IMAGES





DECLARATION

I, hereby certify that, to the best of my knowledge and belief, the information given in this application is true and complete.

Prepared By:	
Name:	Xandir Fatialofa - Design Technician
Signature:	
Date:	28/11/2025

Designed By:	
Name:	Matt Riddell - PS Author '2384' Auckland Council, NZQA Onsite Wastewater Training/Opus, Approved Designer
Signature:	
Date:	28/11/2025

NOTE: The Waterflow Systems are to be installed by a registered drainlayer to the designs supplied by Waterflow NZ Ltd. All work to comply with Regional Council Water and Soil Plans.

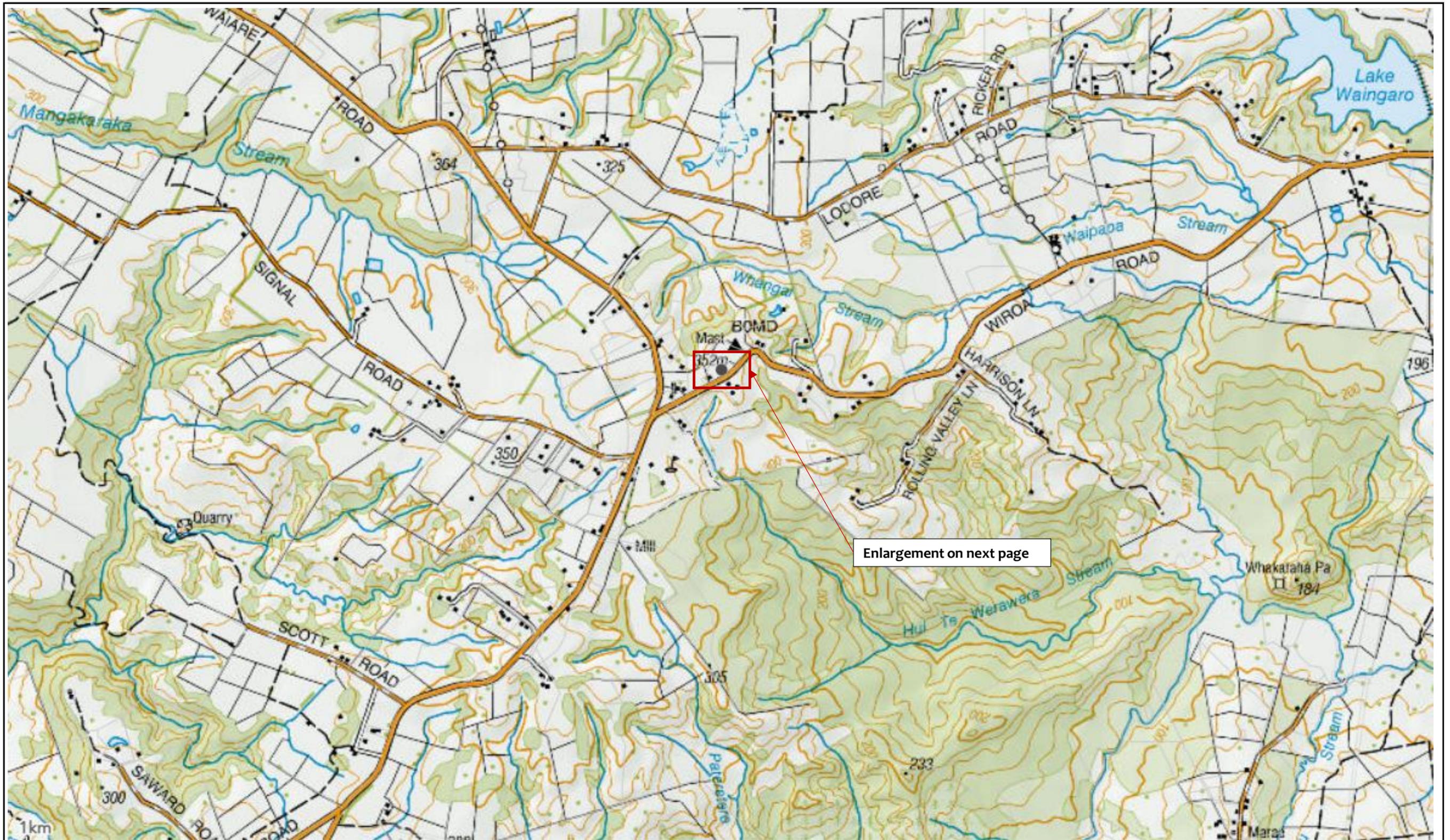
Comments/Summary:

The disposal field will need to be protected from traffic and animal grazing. Planting this area is recommended to increase Evapotranspiration.

Suitable plants for the disposal field can be found on our website www.naturalflow.co.nz

Waterflow Treatment systems to be installed by accredited installer unless other arrangements have been made by Waterflow NZ Ltd

For more information do not hesitate to contact the team at Waterflow NZ Ltd on 0800 628 356



SITE LOCATION PLAN:

William and Beula Foote
 1032B Wiroa Road
 Kerikeri
 Lot 3DP 51431
 2.0138HA

SCALE:

1 : 25561

@ A3



DATE DRAW: 28/11/2025
 PREPARED BY: Xandir Fatialofa
 REVISED: Matt Riddell

SITE LAYOUT PLAN:

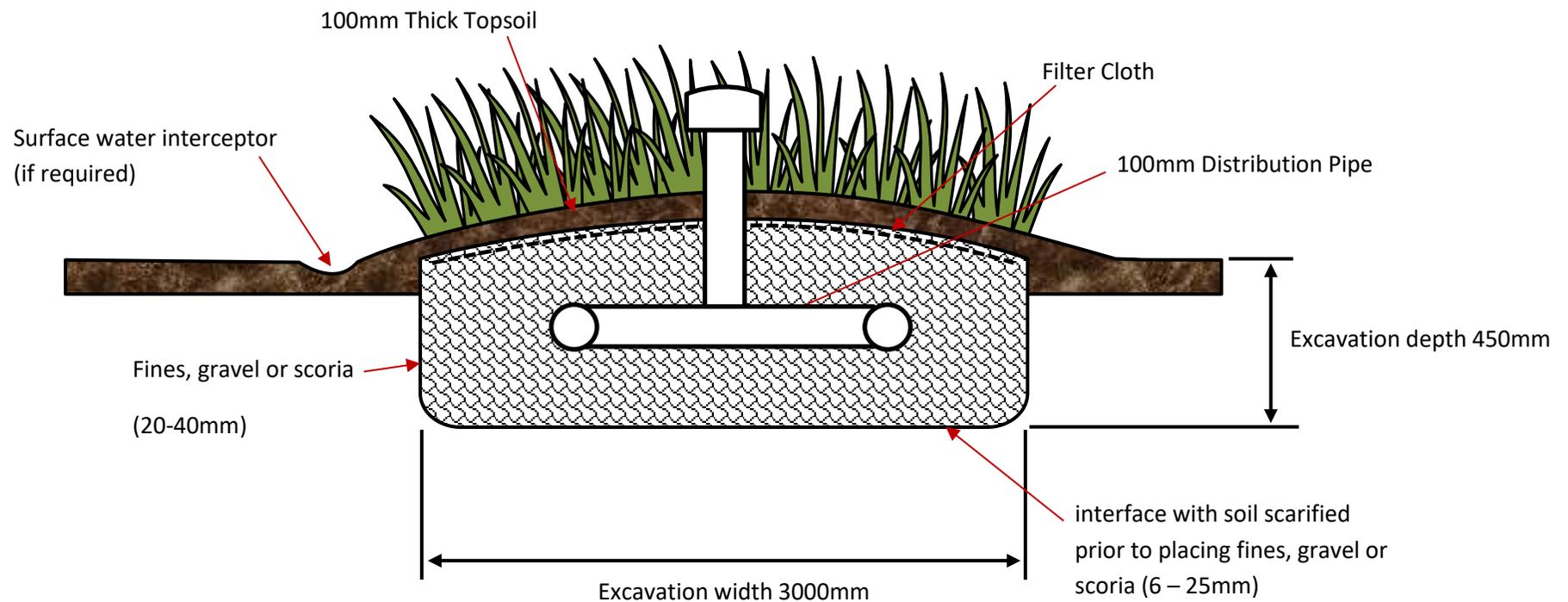
William and Beula Foote
 1032B Wiroa Road
 Kerikeri
 Lot 3 DP 51431
 2.0138HA

SCALE:

1 : 827

@ A3

ETS (EVAPOTRANSPIRATION SEEPAGE) CONTOUR BEDS

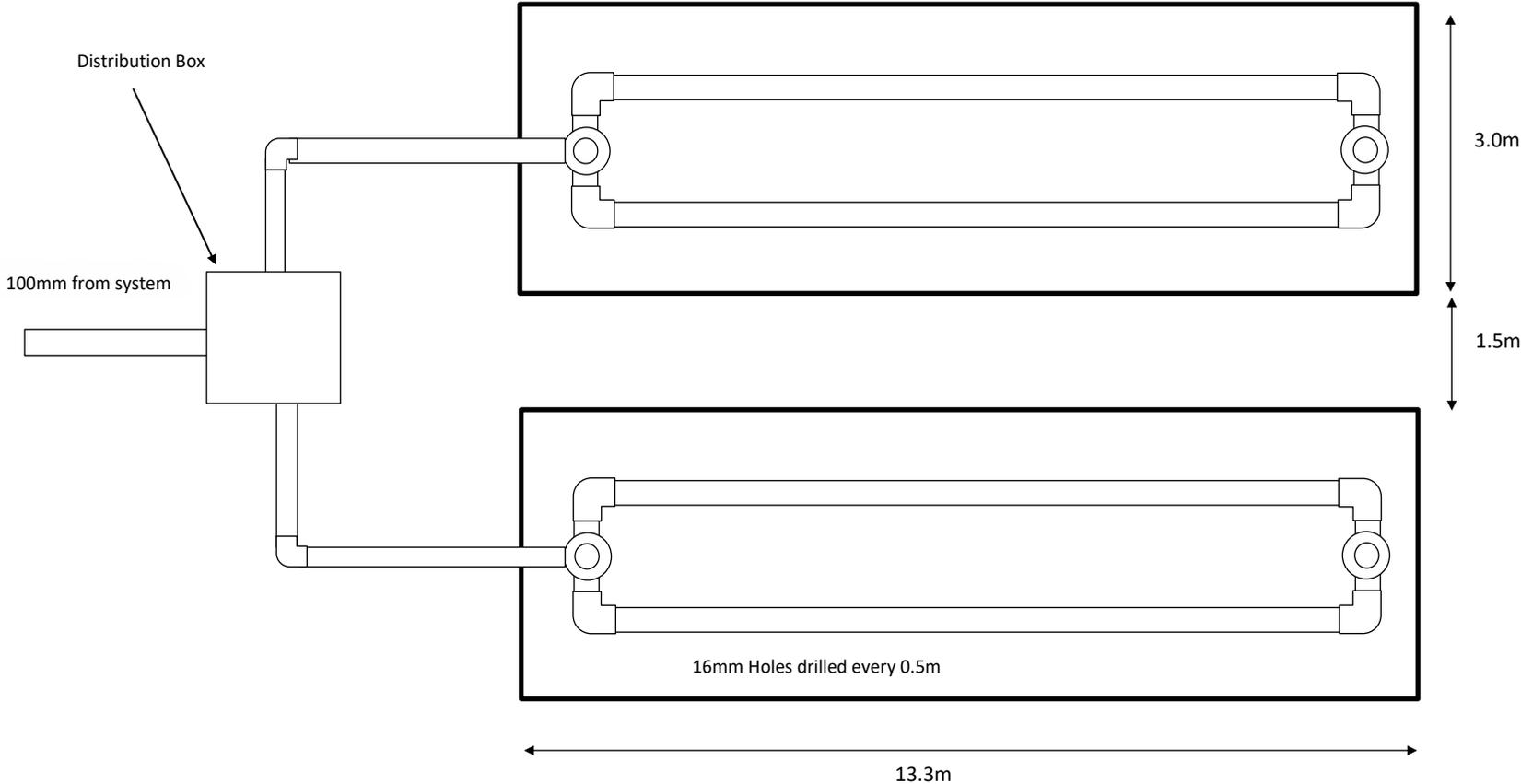


The standard width for ETS beds is from 750 – 1500mm, but 1800mm up to 3000mm maximum can be utilised provided crowing to shed rainfall is increased accordingly. Contour ETS beds of 450mm to 750mm width can be used on sloping sites.

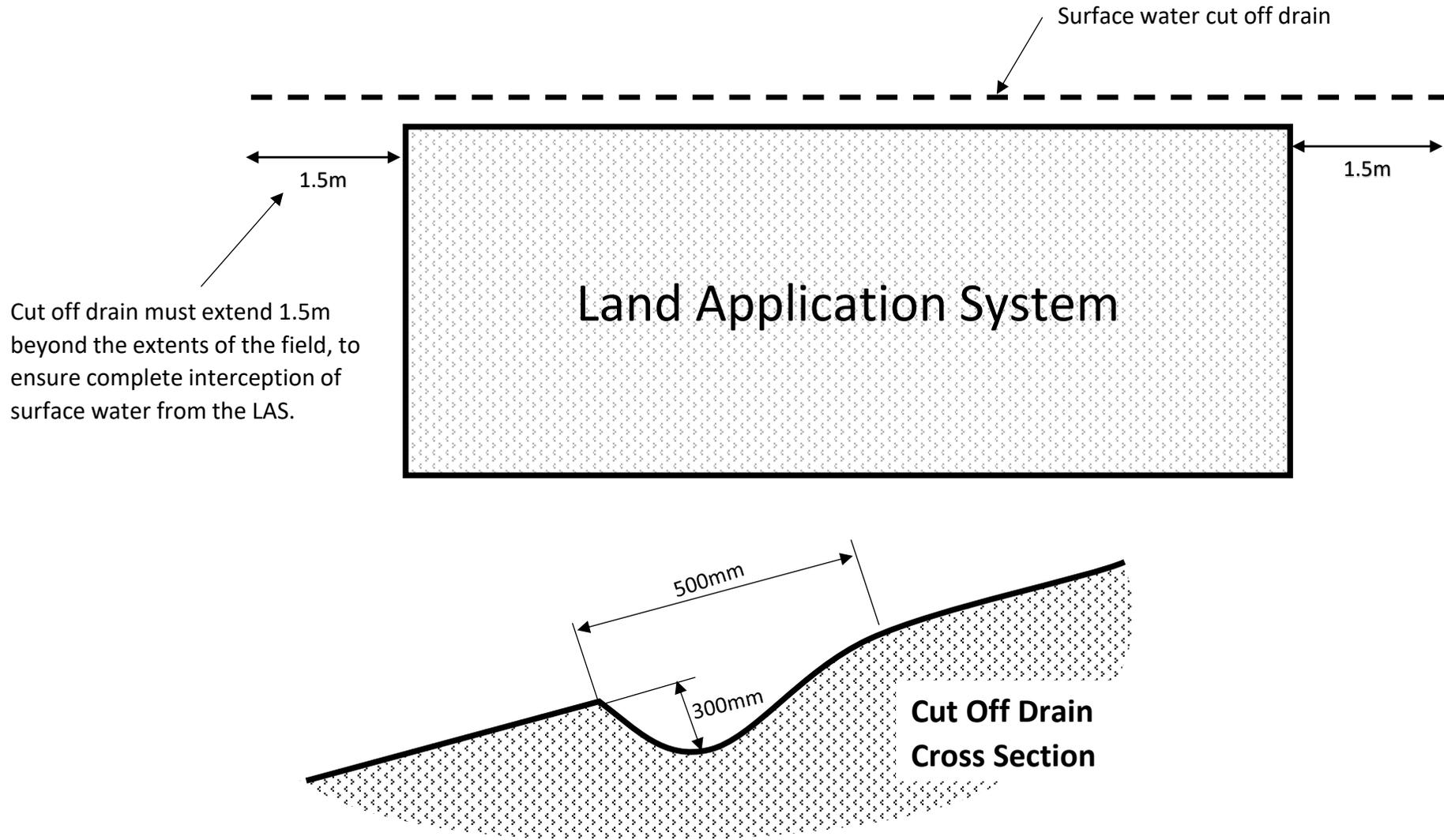
ETS (EVAPOTRANSPIRATION SEEPAGE) CONTOUR BEDS



Top Elevation



Surface Water Cut Off Drain Schematic



Assessment of Environmental Effects

William and Beula Foote of 1032B Wiroa Road, Kerikeri Lot 3 DP 51431

1.1 Description of Proposal

The owners of this property propose the construction of a new 2 bedroom dwelling. This is a minor dwelling separate from the main dwelling on the property and will require a separate onsite wastewater management system.

1.2 Site Description

1032B Wiroa Road is a large rural property with a legal description of Lot 3 DP 514318. The property is about 12km southwest of Kerikeri and has an area of just over 2 hectares. The property is relatively flat with a slight southerly aspect. It is grass covered with some areas of trees and there are no nearby overland flow paths, surface waters or flood plains. A new two bedroom minor dwelling is proposed which will require its own onsite wastewater management system.

1.3 Wastewater Volume

In calculating the wastewater flows we have allowed for a maximum occupancy of 4 persons, based on the proposed 2 bedroom dwelling (as per AC TP-58, Table 6.1). Total wastewater production is based on an allowance of 160 litres per person per day (as per ARC TP-58, Table 6.2), which is conservative given that water supply is roof collected rain water and standard water fixtures will be used throughout the house.

1.4 Wastewater Volume

The SEPD45C system that is proposed will treat the wastewater to a high standard prior to dispersal using a LPED dispersal system into a purpose-designed ETS bed system, where the removal of nutrient will continue, both in the receiving soils and by plant uptake.

The system will be capable of producing reductions in Biochemical Oxygen Demand, Total Suspended Solids, Nitrogen, and Coliforms to a standard that meets the requirements (see details below). The system will cater for the wastewater requirements of the private dwellings (domestic wastewater) and will not service any commercial or trade waste sources. Risk Minor to Nil.

1.5 Proposed Treatment System

The objective of the treatment system is to reduce and remove much of the contaminants from the wastewater prior to discharge into the receiving soil. This will improve the long-term performance of the disposal field as well as reducing the risk to the receiving environment. The system will consist of:

- SEPD45C
- ReIn Outlet Filter
- Land Application System

The system is constructed using concrete tank. The system produces treated effluent with BOD <150mg/l, Suspended solids <40mg/l.

1.6 Land Application System

The proposed land application system uses a LPED dispersal system into ETS beds, to disperse the treated wastewater into the receiving soils and dense planting is required to enhance evapo-transpiration. This land application system will be installed in conjunction with existing and proposed landscaping as detailed on the site plan.

1.7 Surface & Ground Water

It is proposed to treat the water to a high standard prior to discharge and the proposed irrigation system will introduce the water into the topsoil horizon using ETS Beds. A low application rate of treated effluent into the topsoil will significantly reduce the likelihood of, any breakout or runoff or any risk of surface water contamination. With the ground water levels being >1.2m this conservative DLR also means the risk of ground water contamination is virtually nil. A majority of the undeveloped areas of this site are suitable for a ETS Beds when the necessary setbacks are observed. Risk Minor to Nil.

1.8 Air Quality

The proposed SEPD45C system will produce no noticeable odour when functioning correctly. Any odour will be contained within the tanks. The land application system will load the soil at a rate that should not cause ponding, spraying or aerosol of the effluent that could potentially cause odours. Risk Minor to Nil.

1.9 Visual Impact

The tanks are installed wholly below ground level with only the lids being visible. The lids will protrude approximately 100mm to prevent egress of storm water into the system. The disposal field will be located in a purpose designed mulched and intensively planted disposal area. Warning signs may be installed to indicate the presence of the disposal area, although probably not necessary in a domestic situation, also the area may be fenced to restrict access.

1.10 Environmental Risks

Risks associated with this proposal are minor. The treatment system will be automated, and the Home Owner will be given a 'Home Owners Care Guide' which explains the necessary visual checks to ensure no issues arise with the system, specifically – solids build-up - high water level – discharge failure – filter blockage.

Peak flow into the system are not expected to be significant and the system includes a large emergency storage volume.

1.11 Maintenance Requirements

The maintenance requirement of this system is minimal, with the system fully automated. The system requires little input from the operator apart from the regular visual checks of the treatment system and land application system. All other maintenance interventions must be carried out by service persons familiar with the operation of the system and approved by the manufacturer. Maintenance may include checking of the dissolved oxygen levels, cleaning of effluent outlet filter, removal of excess sludge volume, checking of control panel function, etc....

The owners will be verbally informed at the commissioning of this system of all maintenance requirements and strongly advised to have a service contract in place prior to final sign off of the system installation.



WaterFlow

Bringing Clarity to Wastewater

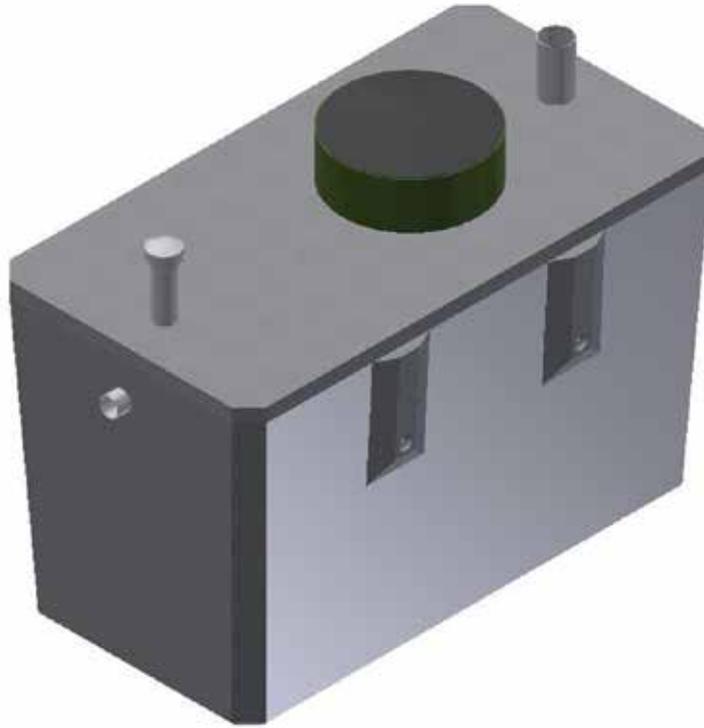
SEPD45C Dual Chamber Septic Tank



**System Specifications &
Installation Instructions**

SEPD45C

System Specifications & Installation Instructions



Compliance Requirements

All Waterflow Septic Tanks and Treatment Modules meet the requirements of the New Zealand Building Code G13-VM4, Clause B1 - Structure, and Clause B2 Durability. As stated in the AS/NZS 1546.1:2008 Standard, 1.5.2.1, all septic tanks constructed to this Standard meet the requirements of the New Zealand Building Code for Clause B1 - Structure and Clause B2 Durability.

The design and specifications of the septic tank are fully compliant with the AS/NZS1546.1:2008 Standard, including but not limited to:

Structural Integrity: The tank is designed using Polymer suitable for the manufacturing method as per 9.4.1 AS/NZS1546.1:2008, with all exposed lids being UV protected, with appropriate foot anchors and reinforcement, ensuring it meets the structural requirements specified in the standard.

Material Specifications: All materials used, including the Polymer composition, comply with the necessary standards for durability and suitability in septic tank applications.

Capacity and Dimensions: The tank's dimensions and baffle placements align with the standard's guidelines, ensuring proper functionality and waste management.

Access and Maintenance Provisions: The design includes provisions for easy access, necessary for regular inspection, cleaning, and maintenance in accordance with the standard.

Please feel free to ask for a copy of this complete document, if required.

SEPD45C

System Specifications & Installation Instructions

Treatment Process

The Dual Chamber Septic Tank comprises of a 2700mm long by 1500mm wide concrete tank, standing 1685mm high. Following the septic tank is a Dose Chamber that controls the discharge; both gravity dose and pump dose options are available.

The wastewater is directed into the first chamber. Here the solids are separated from the liquid through settling and floatation; long term testing has shown this to remove 60-80% of solids, which are then stored in the tank. The liquid from the clear zone then flows into the second chamber where further settling and floatation takes place. Anaerobic digestion further processes the waste producing odoriferous gases and humus, reducing the BOD. This finally passed through an outlet filter as per AS/NZS 1546 1:2008 Clause D3.3.1; which screens the effluent, reducing TSS.

It is then disposed of via a gravity or pump dose into the receiving environment, in accordance with AS/NZS 1547:2012 and the relevant local authority's requirements. The size and extent of the disposal system is determined by the receiving environment and the expected flow volumes. Factors such as soil types, slope and the proximity of potentially sensitive environments such as creeks, wells, bores and other water ways determine the extent, location and type of disposal system chosen.

The Dual Chamber Septic Tank has a 2000ltr reserve capacity to allow for 24hrs emergency storage should a pump fail. The operating capacity of the Dual Chamber Septic Tank is 2000ltrs per day. Reserve capacity is not required for gravity discharge systems.

The Dual Chamber Septic Tank will accumulate solids require regular desludging. Septic tank capacities are calculated up to a 5 year pump out cycle, as per AS/NZS 1547:2012 5.4.2.2.1 as to desludging requirements. It is recommended to service at no longer than 3 years from previous inspection.

SEPD45C

System Specifications & Installation Instructions

Dual Chamber Septic Tank Specifications

Tanks are made of Concrete which is suitable material for wastewater treatment containment meeting all the requirements of Section 4.3.3 of AS/NZS 1547:2012 which cross references the structural performance requirements of its section 2.4.2.3 back to the relevant provisions of AS/NZS 1546.1, which for concrete septic tanks are set out in Section 9 of that Standard. These tanks have an expected lifespan of 50 years.

Dual Chamber Septic Tank

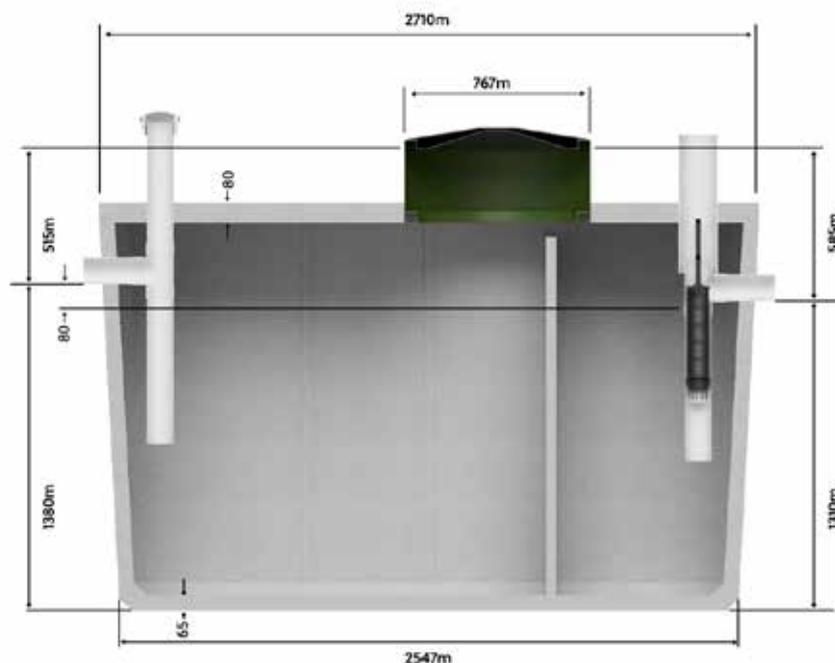
4500ltrs Nominal capacity
2700mm Length
1450mm Width
1895mm O/A height

Gravity Dose Chamber option

500ltrs Nominal capacity
750mm Diameter
1100mm O/A height

Pump Dose Chamber option

1600ltrs Nominal capacity
1300mm Diameter
2100mm O/A height

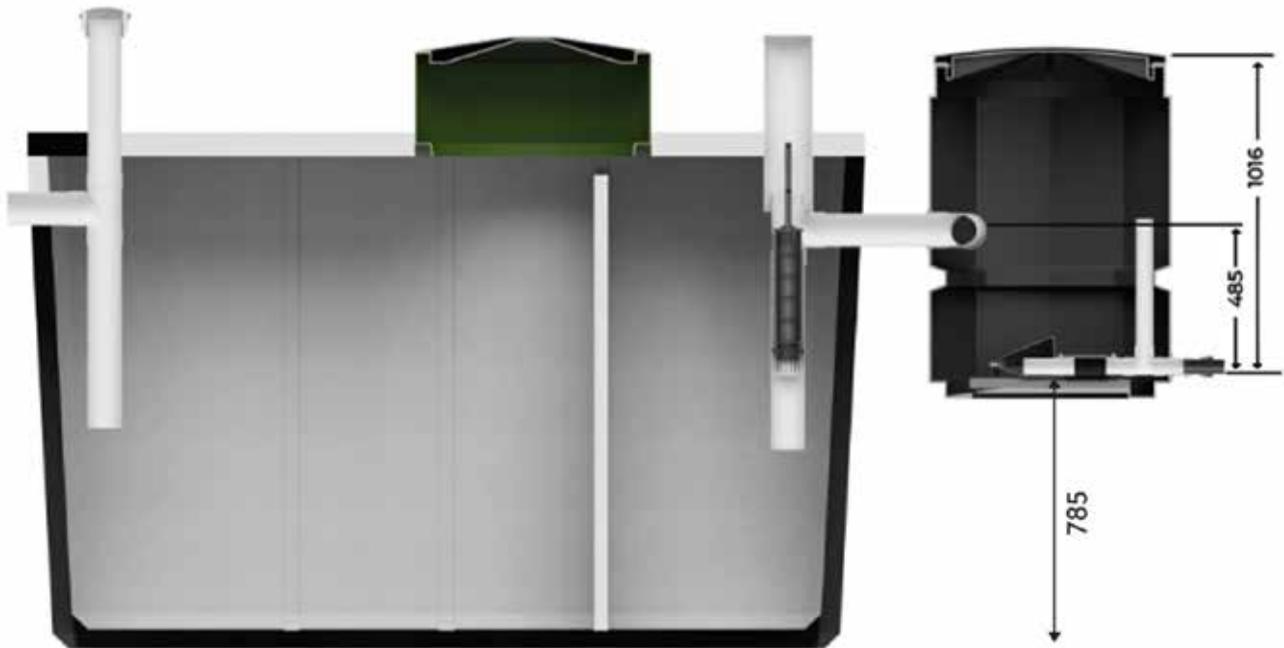


weight: 3200kg

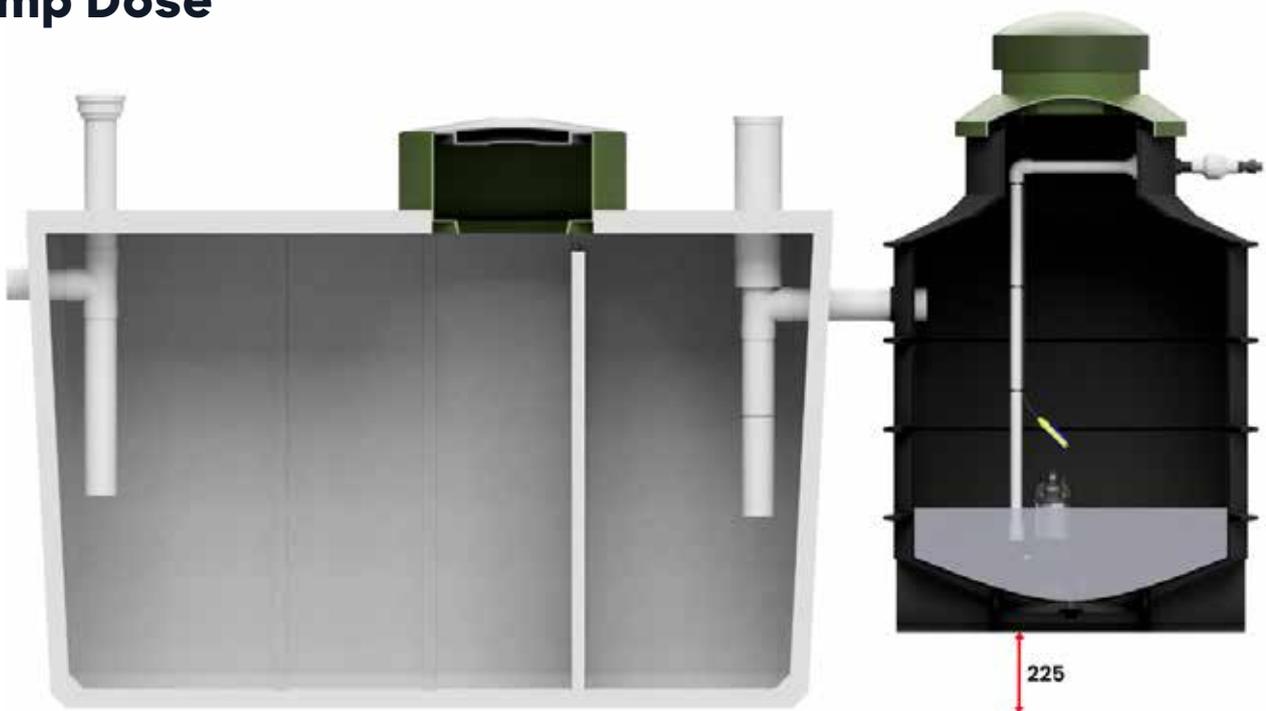
SEPD45C

Instructions for Installation

Gravity Dose



Pump Dose



Instructions for Installation

The Dual Chamber Septic Tank is to be installed or signed off by a registered Drain layer to the design specified by Waterflow NZ Ltd. The following installation instructions and procedures followed correctly will ensure System performance is not compromised in any way.

1. Excavate a 3m x 1.5m level platform for the tank at the appropriate depth to ensure adequate fall for inlet pipe from the source. This has to be installed in stable soil conditions.
2. Lay 100mm of bedding metal on platform and place Septic Tank.
3. Trench from septic tank outlet to disposal field (if gravity discharge, ensure there is a constant fall from outlet to disposal field).
4. Where possible excavate a trench away from System and lay drain coil and drainage metal at the base of the system to drain away any surface or ground water. On a flat or high water table site System must be bedded in as per appendix A below.
5. Take a minimum of 3 photos at this point to showing connections and back fill, to ensure correct installation for sign off.
6. Back fill around tanks with the excavated soil (be aware this will settle over time - to avoid settlement, backfill with aggregate).

Caution: System must be protected from excessive super imposed loads both lateral and top loads. E.g. loads from vehicular traffic. There needs to be at least 2m of clearance maintained around system.

Appendix A | High Water Table

For installation in high water table areas, make sure you have a pump to pump away ground water whilst installing. Excavate a pump cavity to one side of the platform and pump ground water away during entire installation process. Fill Septic Tank with water during installation, this will help with resisting the hydraulic uplift.

SEPD45C

System Specifications & Installation Instructions

Installation Location and Certification

These tanks are not designed for vehicle loads and shall be located no closer than 1.50m to a driveway, road frontage or a building. If for any reason the tank is located where vehicle traffic may drive over the tank or approach closer than 1.50m, or where it may be trampled on by farm stock then the tank should be protected by a concrete slab designed to support these loads. Surface water must also be diverted from flowing into the installation.

Installation must be in accord with AS/NZS 1547:2012 Standard and G13 of Building Code. Final producer statement certificate to be issued and held by the regulatory authority.

High Water Table Installations

All tanks have been engineered and constructed from injection molded plastic for maximum strength, in accordance with the NZC 3604. Clauses B1 and B2 for structure and durability, to withstand any hydraulic pressures, both lateral and uplift, created by high water table conditions.

Plumbing Pipes and Fittings

All internal plumbing is done with PVC pipes with appropriate connections according to AS/NZS 1260 and AS/NZS 4130.

Backfilling and Bedding

Place and bed to NZBC G13/AS2, using compacted granular material, in layers not exceeding 100mm. Backfill with soil excavated from the hole.

Electrical

Where a pump is required to dose the Land Application System, all electrical connections must be installed according to AS/NZS 3000. The electrical connections are housed in an enclosure on the top of the tank. Please see separate Electrical Guide for more details.

SEPD45C

System Specifications & Installation Instructions



Warranty

WATERFLOW NZ LTD warrants that all Treatment Systems manufactured by WaterFlow NZ Ltd will be free from defects in materials and workmanship for the following periods from the date of installation, under the following conditions:

1. Plastic-Moulded tanks: 15 years
2. Concrete Tanks: 15 years
3. Filter Media: 5 years
4. Dosing float: 2 years
5. Electrical Components and Pump: 2 years

WATERFLOW NZ LTD will, at its discretion, repair or replace any defective components with the same or equivalent part at no charge to the consumer, in accordance with the following terms and conditions laid out in the WaterFlow NZ's Warranty Certificate. Full text warranty available on request.

1st June 2025
Dean Hoyle
Managing Director



WaterFlow

Bringing Clarity to Wastewater

Our team of wastewater experts are here to help.
Let's see if DCST- 4500L could be right for your backyard.

*Smarter wastewater and sewage systems, for a
cleaner New Zealand.*

0800 628 356

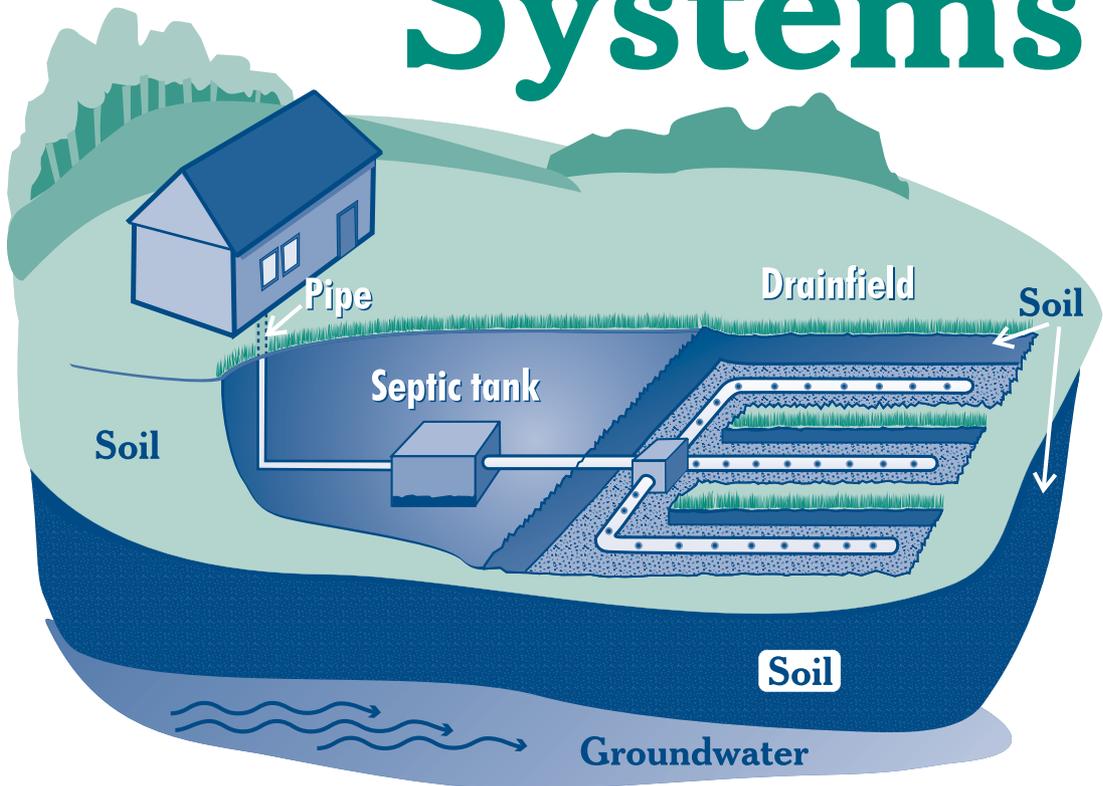
www.waterflow.co.nz

sales@waterflow.co.nz

SEP-45C-SpecInstall-250516



A Homeowner's Guide to Septic Systems



What's Inside

Your septic system is your responsibility	1
How does it work?	1
Why should I maintain my septic system?	4
How do I maintain my septic system?	5
What can make my system fail?	9
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Your Septic System is your responsibility!

Did you know that as a homeowner you're responsible for maintaining your septic system? Did you know that maintaining your septic system protects your investment in your home? Did you know that you should periodically inspect your system and pump out your septic tank?

If properly designed, constructed and maintained, your septic system can provide long-term, effective treatment of household wastewater. If your septic system isn't maintained, you might need to replace it, costing you thousands of dollars. A malfunctioning system can contaminate groundwater that might be a source of drinking water. And if you sell your home, your septic system must be in good working order.

This guide will help you care for your septic system. It will help you understand how your system works and what steps you can take as a homeowner to ensure your system will work properly. To help you learn more, consult the resources listed at the back of this booklet.

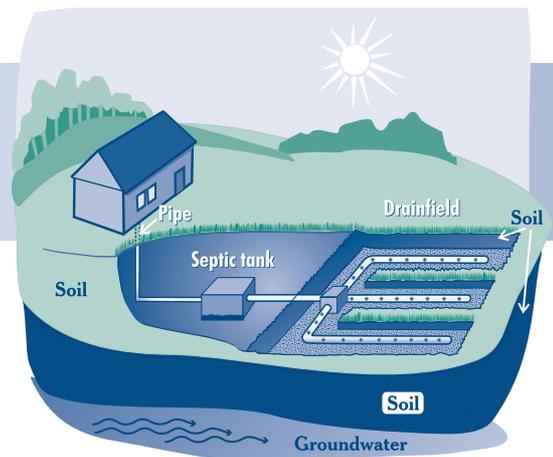
Top Four Things You Can Do to Protect Your Septic System

1. Regularly inspect your system and pump your tank as necessary.
2. Use water efficiently.
3. Don't dispose of household hazardous wastes in sinks or toilets.
4. Care for your drainfield.

How does it work?

Components

A typical septic system has four main components: a pipe from the home, a septic tank, a drainfield, and the soil. Microbes in the soil digest or remove most contaminants from wastewater before it eventually reaches groundwater.



Typical septic system

Septic system aliases:

- On-lot system
- Onsite system
- Individual sewage disposal system
- Onsite sewage disposal system
- Onsite wastewater treatment system

Pipe from the home

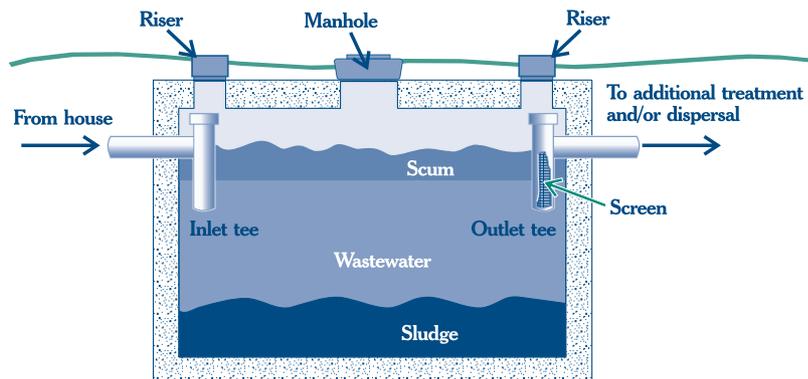
All of your household wastewater exits your home through a pipe to the septic tank.

Septic tank

The septic tank is a buried, watertight container typically made of concrete, fiberglass, or polyethylene. It holds the wastewater long enough to allow solids to settle out (forming sludge) and oil and grease to float to the surface (as scum). It also allows partial decomposition of the solid materials. Compartments and a T-shaped outlet in the septic tank prevent the sludge and scum from leaving the tank and traveling into the drainfield area. Screens are also recommended to keep solids from entering the drainfield.

Newer tanks generally have risers with lids at the ground surface to allow easy location, inspection, and pumping of the tank.

Typical single-compartment septic tank with ground-level inspection risers and screen

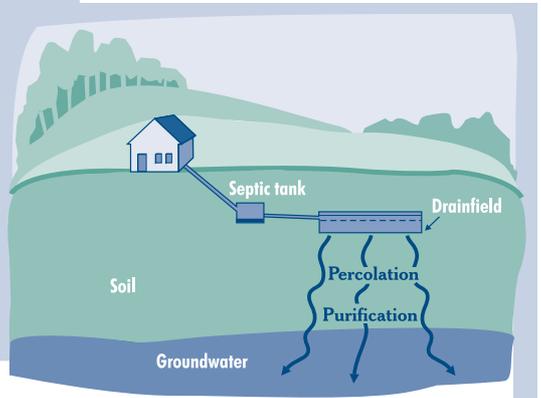


Tip

To prevent buildup, sludge and floating scum need to be removed through periodic pumping of the septic tank. Regular inspections and pumping are the best and cheapest way to keep your septic system in good working order.

Finding Your System

Your septic tank, drainfield, and reserve drainfield should be clearly designated on the “as-built” drawing for your home. (An “as-built” drawing is a line drawing that accurately portrays the buildings on your property and is usually filed in your local land records.) You might also see lids or manhole covers for your septic tank. Older tanks are often hard to find because there are no visible parts. An inspector/pumper can help you locate your septic system if your septic tank has no risers.



Drainfield

The wastewater exits the septic tank and is discharged into the drainfield for further treatment by the soil. The partially treated wastewater is pushed along into the drainfield for further treatment every time new wastewater enters the tank.

If the drainfield is overloaded with too much liquid, it will flood, causing sewage to flow to the ground surface or create backups in plumbing fixtures and prevent treatment of all wastewater.

A reserve drainfield, required by many states, is an area on your property suitable for a new drainfield system if your current drainfield fails. Treat this area with the same care as your septic system.

Soil

Septic tank wastewater flows to the drainfield, where it percolates into the soil, which provides final treatment by removing harmful bacteria, viruses, and nutrients. Suitable soil is necessary for successful wastewater treatment.

Alternative systems

Because many areas don't have soils suitable for typical septic systems, you might have or need an alternative system. You might also have or need an alternative system if there are too many typical septic systems in one area or the systems are too close to groundwater or surface waters. Alternative septic

systems use new technology to improve treatment processes and might need special care and maintenance. Some alternative systems use sand, peat, or plastic media instead of soil to promote wastewater treatment. Other systems might use wetlands, lagoons, aerators, or disinfection devices. Float switches, pumps, and other electrical or mechanical components are often used in alternative systems. Alternative systems should be inspected annually. Check with your local health department or installer for more information on operation and maintenance needs if you have or need an alternative system.

Why should I maintain my septic system?

When septic systems are properly designed, constructed, and maintained, they effectively reduce or eliminate most human health or environmental threats posed by pollutants in household wastewater. However, they require regular maintenance or they can fail. Septic systems need to be monitored to ensure that they work properly throughout their service lives.

Saving money

A key reason to maintain your septic system is to save money! Failing septic systems are expensive to repair or replace, and poor maintenance is often the culprit. Having your septic system inspected regularly is a bargain when you consider the cost of replacing the entire system. Your system will need pumping depending on how many people live in the house and the size of the system. An unusable septic system or one in disrepair will lower your property value and could pose a legal liability.

Protecting health and the environment

Other good reasons for safe treatment of sewage include preventing the spread of infection and disease and protecting water resources. Typical pollutants in household wastewater are nitrogen, phosphorus, and disease-

causing bacteria and viruses. If a septic system is working properly, it will effectively remove most of these pollutants.

With one-fourth of U.S. homes using septic systems, more than 4 billion gallons of wastewater per day is dispersed below the ground's surface. Inadequately treated sewage from septic systems can be a cause of groundwater contamination. It poses a significant threat to drinking water and human health because it can contaminate drinking water wells and cause diseases and infections in people and animals. Improperly treated sewage that contaminates nearby surface waters also increases the chance of swimmers contracting a variety of infectious diseases. These range from eye and ear infections to acute gastrointestinal illness and diseases like hepatitis.

How do I maintain my septic system?

Inspect and pump frequently

You should have a typical septic system inspected at least every 3 years by a professional and your tank pumped as recommended by the inspector (generally every 3 to 5 years). Alternative systems with electrical float switches, pumps, or mechanical components need to be inspected more often, generally once a year. Your service provider should inspect for leaks and look at the scum and sludge layers in your septic tank. If the bottom of the scum layer is within 6 inches of the bottom of the outlet tee or the top of the sludge layer is within 12 inches of the outlet tee, your tank needs to be pumped. Remember to note the sludge and scum levels determined by your service provider in your operation and maintenance records. This information will help you decide how often pumping is necessary.

What Does an Inspection Include?

- Locating the system.
- Uncovering access holes.
- Flushing the toilets.
- Checking for signs of back up.
- Measuring scum and sludge layers.
- Identifying any leaks.
- Inspecting mechanical components.
- Pumping the tank if necessary.

Four major factors influence the frequency of pumping: the number of people in your household, the amount of wastewater generated (based on the number of people in the household and the amount of water used), the volume of solids in the wastewater (for example, using a garbage disposal increases the amount of solids), and septic tank size.

Some makers of septic tank additives claim that their products break down the sludge in septic tanks so the tanks never need to be pumped. Not everyone agrees on the effectiveness of additives. In fact, septic tanks already contain the microbes they need for effective treatment. Periodic pumping is a much better way to ensure that septic systems work properly and provide many years of service. Regardless, every septic tank requires periodic pumping.

In the service report, the pumper should note any repairs completed and whether the tank is in good condition. If the pumper recommends additional repairs he or she can't perform, hire someone to make the repairs as soon as possible.

Use water efficiently

Average indoor water use in the typical single-family home is almost 70 gallons per person per day. Leaky toilets can waste as much as 200 gallons each day. The more water a household conserves, the less water enters the septic system. Efficient water use can improve the operation of the septic system and reduce the risk of failure.

High-efficiency toilets

Toilet use accounts for 25 to 30 percent of household water use. Do you know how many gallons of water your toilet uses to empty the bowl? Most older homes have toilets with 3.5- to 5-gallon reservoirs, while newer high-efficiency toilets use 1.6 gallons of water or less per flush. If you have problems with your septic system being flooded with household water, consider reducing the volume of water in the toilet tank if you don't have a high-efficiency model or replacing your existing toilets with high-efficiency models.



Faucet aerators and high-efficiency showerheads

Faucet aerators help reduce water use and the volume of water entering your septic system. High-efficiency showerheads or shower flow restrictors also reduce water use.

Water fixtures

Check to make sure your toilet's reservoir isn't leaking into the bowl. Add five drops of liquid food coloring to the reservoir before bed. If the dye is in the bowl the next morning, the reservoir is leaking and repairs are needed.

A small drip from a faucet adds many gallons of unnecessary water to your system every day. To see how much a leak adds to your water usage, place a cup under the drip for 10 minutes. Multiply the amount of water in the cup by 144 (the number of minutes in 24 hours, divided by 10). This is the total amount of clean water traveling to your septic system each day from that little leak.



Use Water Efficiently!

- **Install high-efficiency showerheads**
- **Fill the bathtub with only as much water as you need**
- **Turn off faucets while shaving or brushing your teeth**
- **Run the dishwasher and clothes washer only when they're full**
- **Use toilets to flush sanitary waste only (not kitty litter, diapers, or other trash)**
- **Make sure all faucets are completely turned off when not in use**
- **Maintain your plumbing to eliminate leaks**
- **Install aerators in the faucets in your kitchen and bathroom**
- **Replace old dishwashers, toilets, and clothes washers with new, high-efficiency models.**

For more information on water conservation, please visit www.epa.gov/owm/water-efficiency/index.htm

Watch your drains

What goes down the drain can have a major impact on how well your septic system works.

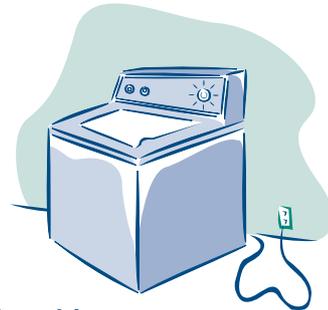
Waste disposal

What shouldn't you flush down your toilet? Dental floss, feminine hygiene products, condoms, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, and other kitchen and bathroom items that can clog and potentially damage septic system components if they become trapped. Flushing household chemicals, gasoline, oil, pesticides, antifreeze, and paint can stress or destroy the biological treatment taking place in the system or might contaminate surface waters and groundwater. If your septic tank pumper is concerned about quickly accumulating scum layers, reduce the flow of floatable materials like fats, oils, and grease into your tank or be prepared to pay for more frequent inspections and pumping.

Washing machines

By selecting the proper load size, you'll reduce water waste. Washing small loads of laundry on the large-load cycle wastes precious water and energy. If you can't select load size, run only full loads of laundry.

Doing all the household laundry in one day might seem like a time-saver, but it could be harmful to your septic system. Doing load after load does not allow your septic tank time to adequately treat wastes. You could be flooding your drainfield without allowing sufficient recovery time. Try to spread water usage throughout the week. A new Energy Star clothes washer uses 35 percent less energy and 50 percent less water than a standard model.



Care for your drainfield

Your drainfield is an important part of your septic system. Here are a few things you should do to maintain it:

- Plant only grass over and near your septic system. Roots from nearby trees or shrubs might clog and damage the drainfield.
- Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.
- Keep roof drains, basement sump pump drains, and other rainwater or surface water drainage systems away from the drainfield. Flooding the drainfield with excessive water slows down or stops treatment processes and can cause plumbing fixtures to back up.

What can make my system fail?

If the amount of wastewater entering the system is more than the system can handle, the wastewater backs up into the house or yard and creates a health hazard.

You can suspect a system failure not only when a foul odor is emitted but also when partially treated wastewater flows up to the ground surface. By the time you can smell or see a problem, however, the damage might already be done.

By limiting your water use, you can reduce the amount of wastewater your system must treat. When you have your system inspected and pumped as needed, you reduce the chance of system failure.

A system installed in unsuitable soils can also fail. Other failure risks include tanks that are inaccessible for maintenance, drainfields that are paved or parked on, and tree roots or defective components that interfere with the treatment process.

Failure symptoms

The most obvious septic system failures are easy to spot. Check for pooling water or muddy soil around your septic system or in your basement. Notice whether your toilet or sink backs up when you flush or do laundry. You might also notice strips of bright green grass over the drainfield. Septic systems also fail when partially treated wastewater comes into contact with

groundwater. This type of failure is not easy to detect, but it can result in the pollution of wells, nearby streams, or other bodies of water. Check with a septic system professional and the local health department if you suspect such a failure.

Stop, look, and smell!

Failure causes

Household toxics

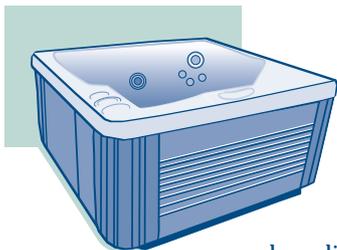
Does someone in your house use the utility sink to clean out paint rollers or flush toxic cleaners? Oil-based paints, solvents, and large volumes of toxic cleaners should not enter your septic system. Even latex paint cleanup waste should be minimized. Squeeze all excess paint and stain from brushes and rollers on several layers of newspaper before rinsing. Leftover paints and wood stains should be taken to your local household hazardous waste collection center. Remember that your septic system contains a living collection of organisms that digest and treat waste.

Household cleaners

For the most part, your septic system's bacteria should recover quickly after small amounts of household cleaning products have entered the system. Of course, some cleaning products are less toxic to your system than others. Labels can help key you into the potential toxicity of various products. The word "Danger" or "Poison" on a label indicates that the product is highly hazardous. "Warning" tells you the product is moderately hazardous. "Caution" means the product is slightly hazardous. ("Nontoxic" and "Septic Safe"



are terms created by advertisers to sell products.) Regardless of the type of product, use it only in the amounts shown on the label instructions and minimize the amount discharged into your septic system.



Hot tubs

Hot tubs are a great way to relax. Unfortunately, your septic system was not designed to handle large quantities of water from your hot tub. Emptying hot tub water into your septic system stirs the solids in the tank and pushes them out into the drainfield, causing it to clog and fail. Draining your hot tub into a septic system or over the drainfield can overload the system. Instead, drain cooled hot tub water onto turf or landscaped areas well away from the septic tank and drainfield, and in accordance with local regulations. Use the same caution when draining your swimming pool.

Water Purification Systems

Some freshwater purification systems, including water softeners, unnecessarily pump water into the septic system. This can contribute hundreds of gallons of water to the septic tank, causing agitation of solids and excess flow to the drainfield. Check with your licensed plumbing professional about alternative routing for such freshwater treatment systems.

Garbage disposals

Eliminating the use of a garbage disposal can reduce the amount of grease and solids entering the septic tank and possibly clogging the drainfield. A garbage disposal grinds up kitchen scraps, suspends them in water, and sends the mixture to the septic tank. Once in the septic tank, some of the materials are broken down by bacterial action, but most of the grindings have to be pumped out of the tank. Using a garbage disposal frequently can significantly increase the accumulation of sludge and scum in your septic tank, resulting in the need for more frequent pumping.



Improper design or installation

Some soils provide excellent wastewater treatment; others don't. For this reason, the design of the drainfield of a septic system is based on the results of soil analysis. Homeowners and system designers sometimes underestimate the significance of good soils or believe soils can handle any volume of wastewater applied to them. Many failures can be attributed to having an undersized drainfield or high seasonal groundwater table. Undersized septic tanks—another design failure—allow solids to clog the drainfield and result in system failure.

If a septic tank isn't watertight, water can leak into and out of the system. Usually, water from the environment leaking into the system causes hydraulic overloading, taxing the system beyond its capabilities and causing inadequate treatment and sometimes sewage to flow up to the ground surface. Water leaking out of the septic tank is a significant health hazard because the leaking wastewater has not yet been treated.

Even when systems are properly designed, failures due to poor installation practices can occur. If the drainfield is not properly leveled, wastewater can overload the system. Heavy equipment can damage the drainfield during installation which can lead to soil compaction and reduce the wastewater infiltration rate. And if surface drainage isn't diverted away from the field, it can flow into and saturate the drainfield.

For more information

Local Health Department

EPA Onsite/Decentralized Management Homepage

www.epa.gov/owm/septic

EPA developed this Web site to provide tools for communities investigating and implementing onsite/decentralized management programs. The Web site contains fact sheets, program summaries, case studies, links to design and other manuals, and a list of state health department contacts that can put you in touch with your local health department.

National Small Flows Clearinghouse

www.nesc.wvu.edu

Funded by grants from EPA, the NSFC helps America's small communities and individuals solve their wastewater problems. Its activities include a Web site, online discussion groups, a toll-free assistance line (800-624-8301), informative publications, and a free quarterly newsletter and magazine.

Rural Community Assistance Program

www.rcap.org

RCAP is a resource for community leaders and others looking for technical assistance services and training related to rural drinking water supply and wastewater treatment needs, rural solid waste programs, housing, economic development, comprehensive community assessment and planning, and environmental regulations.

National Onsite Wastewater Recycling Association, Inc.

www.nowra.org

NOWRA is a national professional organization to advance and promote the onsite wastewater industry. The association promotes the need for regular service and educates the public on the need for properly designed and maintained septic systems.

Septic Yellow Pages

www.septicyellowpages.com

The Septic Yellow Pages provides listings by state for professional septic pumpers, installers, inspectors, and tank manufacturers throughout the United States. This Web site is designed to answer simple septic system questions and put homeowners in contact with local septic system professionals.

National Association of Wastewater Transporters

www.nawt.org

NAWT offers a forum for the wastewater industry to exchange ideas and concerns. The NAWT Web site lists state associations and local inspectors and pumpers.



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December 2002
Revised March 2005

Additional copies can be obtained from:
U.S. EPA Publications Clearinghouse
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Cincinnati, OH 45241

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Office of Water
U.S. Environmental Protection Agency

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Septic System Dos and Don'ts

(adapted from National Small Flows Clearinghouse)

Dos

- Check with the local regulatory agency or inspector/pumper if you have a garbage disposal unit to make sure that your septic system can handle this additional waste.
- Check with your local health department before using additives. Commercial septic tank additives do not eliminate the need for periodic pumping and can be harmful to the system.
- Use water efficiently to avoid overloading the septic system. Be sure to repair leaky faucets or toilets. Use high-efficiency fixtures.
- Use commercial bathroom cleaners and laundry detergents in moderation. Many people prefer to clean their toilets, sinks, showers, and tubs with a mild detergent or baking soda.
- Check with your local regulatory agency or inspector/pumper before allowing water softener backwash to enter your septic tank.
- Keep records of repairs, pumpings, inspections, permits issued, and other system maintenance activities.
- Learn the location of your septic system. Keep a sketch of it with your maintenance record for service visits.
- Have your septic system inspected and pumped as necessary by a licensed inspector/contractor.
- Plant only grass over and near your septic system. Roots from nearby trees or shrubs might clog and damage the drainfield.

Don'ts

- Your septic system is not a trash can. Don't put dental floss, feminine hygiene products, condoms, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, latex paint, pesticides, or other hazardous chemicals into your system.
- Don't use caustic drain openers for a clogged drain. Instead, use boiling water or a drain snake to open clogs.
- Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.



Office of Water
Washington, DC 20460

Official Business
Penalty for Private Use
\$300
EPA-832-B-02-005

SITE 1032B Wiroa Road, Okaihau
 LEGAL DESCRIPTION Lot 3 DP 514318
 PROJECT Transportable Minor Dwelling
 CLIENT William & Beula Foote
 REFERENCE NO. 145144
 DOCUMENT Stormwater Management Report
 STATUS/REVISION No. 01
 DATE OF ISSUE 19 February 2026

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1. EXECUTIVE SUMMARY

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

Legal Description:	Lot 3 DP 514318	
Site Area:	20,138 m ²	
Development Proposals Supplied:	Plan Set by Evolve Architecture Proj No. 25 4805 dated 14.01.2026.	
Development Type:	Proposed Residential Dwelling	
District Plan Zone:	Rural Production	
Permitted Activity Coverage:	<u>15%</u>	
Impermeable Coverage:	Existing	
	Dwelling Roof Area	336 m ²
	Shed 1 Roof Area	72 m ²
	Shed 2 Roof Area (assumed)	40 m ²
	Metal Driveway Area	1,145 m ²
	Proposed	
Total Roof Area	89 m ²	
Total Hardstand Area (assumed)	90 m ²	
	Post-Development Total = 1,772 m ² or 8.8% of the site area	
Activity Status:	<u>Permitted</u>	
Roof Runoff Management:	<ul style="list-style-type: none"> The proposed minor dwelling's guttering system is to direct runoff to the existing water storage tanks behind Shed 1 or directly to the proposed dispersal outlet via minimum 80mmØ sealed pipes at a minimum grade of 1%. Drainage lines from the guttering system may join to the existing drainage line conveying runoff to the existing discharge point if this line is confirmed as being installed at a minimum grade of 1%. 	
	<ul style="list-style-type: none"> The future driveway (depicted indicatively in the appended Site Plan C200) from the existing metalled driveway to the minor dwelling should be shaped to shed runoff to a grassed channel with minimum dimensions of 500mm wide x 150mm deep with a longitudinal grade of at least 1%. The channel should direct flows to a silt trap with a grated inlet for runoff collection. Runoff collected via the silt trap should be directed to the proposed dispersal outlet specified below via minimum 80mmØ sealed pipes at a minimum grade of 1%. Alternatively, a 150mm high earth bund may be established on the upslope side of Shed 1 to divert flows resulting from the new driveway around the structure to lower-lying grassed areas. 	
Hardstand Runoff Management:	<p>The existing discharge point located southwest of Shed 1 is to be retrofitted with an above-ground dispersal bar or an in-ground dispersal trench with the below specifications:</p> <p>Above-ground</p> <ul style="list-style-type: none"> Minimum 4.0m dispersal bar length and 100mm bar diameter, Dispersal bar to be installed parallel to property's topography, The dispersal bar is to be installed well clear and downslope of wastewater effluent fields, Dispersal bar installed maximum 150mm above ground level via waratah standards & stainless wire or plastic clips, 15mmØ outlet holes drilled at 150mm centres along the bar, 	
Discharge Point:		

- Riprap installed beneath and extending up to 500 mm around the spreader bar where bare soil is present, to provide localised erosion protection,
- Both ends of the spreader bar fitted with screw caps to allow for inspection, flushing, and maintenance,

In-ground

- Min. 12.0mL x 0.3mW x 0.45mD trench filled with clean 20-7 scoria or equivalent
 - 100mmØ PVC pipe laid level through trench
 - Filled with drainage metal to ground level (no topsoil cover). Spillover edge to be level with topography
 - Filter fabric wrapped
-

2. SCOPE OF WORK

Wilton Joubert Ltd. (WJL) was engaged by the client, William & Beula Foote, to produce a stormwater mitigation assessment at the above site.

At the time of report writing, the following documents were referred to for background data and details of the proposed development:

- Plan Set by Evolve Architecture Proj No. 25 4805 dated 14.01.2026.

Any revision of these drawings and/or development proposals with stormwater management implications should be referred back to us for review.

3. SITE DESCRIPTION

The ~2ha subject site, legally described as Lot 3 DP 514318, is located off the northern side of Wiroa Road, towards the eastern outskirts of the Okaihau District.

Built development at the property consists of a main residential dwelling adjacent to the midpoint of the south-eastern boundary with a metalled driveway extending to the dwelling from the site access at the south-western corner of the property, and a shed (Shed 1 in Figure 1) in the western portion of the site off the northern side of the metalled driveway. A small shed (Shed 2 in Figure 1) is also under construction to the east of the existing Shed 1. The fenced site is covered in pasture, with a small pocket of trees bounding the southwest side of existing Shed 1.

Topographically speaking, the property lies on a west facing, broad volcanic flank that falls at gentle inclinations from the east down to the west, averaging less than 5°.

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



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

Observations during a site visit conducted by WJL on 16.02.2026 noted that two existing water tanks are located behind Shed 1, with an outgoing 100mmØ PVC line conveying flows from the tank outlet to a daylighting surface outlet to the southwest of the shed structure.



Figure 2: Site Photo 16.02.2026 – Existing tank outlet to ground surface, located southwest of Shed 1.



Figure 3: Site Photo 16.02.2026 – View of existing Shed 1 (left) from metalled driveway, facing northwest.



Figure 4: Site Photo 16.02.2026 – View of proposed building area (between vehicles and campervan in centre-left of image) and floor of Shed 2 currently under construction (centre-right of image) from metallised driveway, facing north.

4. DEVELOPMENT PROPOSALS

It is our understanding that a 10.6m x 6.6m minor dwelling is to be transported to and established on the site, offset approximately 8.0m north of the existing Shed 1 north-eastern corner.

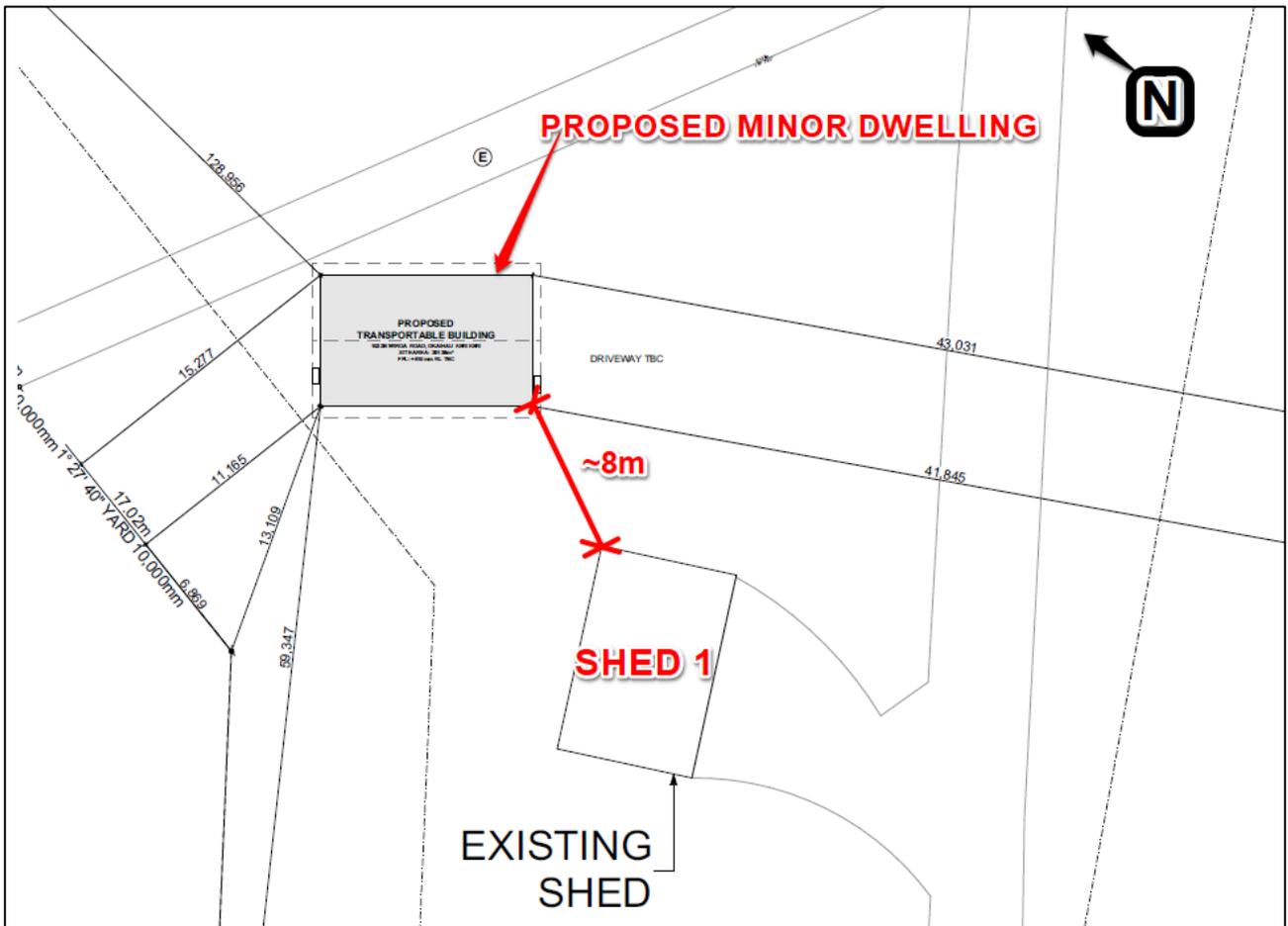


Figure 5: Snip of development proposals from supplied plan set with markups for proposed dwelling position relative to existing shed.

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

5. ASSESSMENT CRITERIA

Impermeable Areas

The calculation for the stormwater system for the development is based on a gross site area of 20,138m² and the below areas *extracted from the supplied plans*:

	Pre-Development	Post-Development	Total Change
Roof Area	448 m²	537 m²	89 m²
Primary Dwelling Roof	336 m ²	336 m ²	
Shed 1 Roof	72 m ²	72 m ²	
Shed 2 Roof (assumed)	40 m ²	40 m ²	
Proposed Minor Dwelling Roof	-	89 m ²	
Hardstand	1,145 m²	~1,235 m²	~90 m²
Existing Metalled Driveway	1,145 m ²	1,145 m ²	
Metal Driveway to Minor Dwelling (assumed)	-	~90 m ²	
Pervious	18,545 m²	18,366 m²	-179 m²

The total amount of impermeable area on site, post-development will be 1,772m² or 8.8% of the site area. Should any changes be made to the current proposal, the on-site stormwater mitigation design must be reviewed.

District Plan Rules

The site is zoned Rural Production. The following rules apply under the FNDC District Plan:

8.6.5.1.3 – **Permitted Activities – Stormwater Management** - The maximum proportion or amount of the gross site area covered by buildings and other impermeable surfaces shall be 15%.

8.6.5.2.1 – **Controlled Activities – Stormwater Management** - The maximum proportion or amount of the gross site area covered by buildings and other impermeable surfaces shall be 20%.

The total proposed impermeable development area does not exceed 15% of the site area and therefore complies with Permitted Activity rules under the FNDC District Plan CI 8.6.5.1.3.

Design Requirements

The site is under the jurisdiction of the Far North District Council. This design has been completed in general accordance with the recommendations and requirements contained within the Far North District Engineering Standards and the Far North District Council District Plan as well as Clause E1 of the New Zealand Building Code.

Provided that the recommendations within this report are adhered to, we anticipate that the effects of stormwater runoff on the receiving environment resulting from the unattenuated proposed impermeable surfaces will be less than minor.

Existing impermeable areas on the site have not been reassessed as part of this report, as they are assumed to be adequately managed via the established stormwater system; accordingly, this assessment and associated modelling relate only to the proposed development and any existing areas directly affected by those works.

Stormwater Modelling Method

Runoff calculations have been computed using the HydroCAD hydrologic and hydraulic modelling software. In accordance with the standards, the Type IA storm profile was utilised for runoff calculations. Rainfall data was obtained from HIRDS and increased by 20% to account for climate change, with resulting 24-hour rainfall depths of 217mm and 389mm for the 20% AEP & 1% AEP storm events respectively. CN values for pervious and impervious surfaces have been taken as 74 and 98 respectively.

6. STORMWATER MITIGATION ASSESSMENT

Roof Runoff Management

It is recommended that a proprietary guttering system be installed to collect roof runoff from the proposed minor dwelling. Litter filters may be installed in-line between the roof and the inlet of the tanks to improve system performance over time. The tank inlet level should be at least 600mm below the gutter inlet and any in-line litter filters.

Runoff should be directed from the gutters to the existing tanks on the northern side of existing Shed 1 or directly to the discharge point specified below.

Hardstand Runoff Management

At the time of report writing, no future driveway access to the minor dwelling has been depicted in the supplied plan set. For the purposes of this assessment, we have assumed a future driveway area of approximately 90m², with an indicative layout as shown on the appended Site Plan C200. While the final driveway configuration may vary from that illustrated on C200, the recommendations set out below are expected to remain applicable, provided the ultimate layout is of a comparable scale, extent of impervious area, and general geometric arrangement.

The future driveway providing access from the existing metalled driveway to the minor dwelling should be shaped to shed runoff to a grassed channel with minimum dimensions of 500mm wide x 150mm deep with a longitudinal grade of at least 1%. The channel should direct flows to a minimum 450x450mm silt trap with a grated inlet for runoff collection. The inlet of the silt trap should be flush with the grassed channel base, and the chamber should have a minimum 300mm sump for debris settlement.

Runoff collected via the silt trap should be directed to the proposed dispersal outlet specified below via >80mmØ sealed pipes at a minimum grade of 1%. Due to backflow risks and capacity constraints, drainage lines from the silt trap should not join to the existing 100mmØ PVC line from the tank outlet to surface outlet.

Alternative to the grassed drainage channel, a 150mm earth bund may be established on the upslope side of Shed 1 to divert flows resulting from the driveway around the structure and effluent field to lower-lying grassed areas.

Discharge Point - Dispersal Device

It is recommended that the existing PVC outlet line currently discharging from the water storage tanks to the ground surface be extended further downslope and connected to a new dispersal device for the long-term mitigation of erosion. The dispersal device must be installed well clear and downslope of any effluent disposal systems and structures. The dispersal device may be installed as an above-ground bar or in-ground trench with the following specifications:

Above-Ground Dispersal Bar

- Minimum 4.0mm long PVC pipe of 100mm diameter,
- Dispersal bar to be installed level with topography,
- Dispersal bar installed maximum 150mm above ground level via waratah standards & stainless wire or plastic clips,
- 15mm \varnothing outlet holes drilled at 150mm centres along the bar,
- Riprap installed beneath and extending up to 500 mm around the spreader bar where bare soil is present, to provide localised erosion protection,
- Both ends of the spreader bar fitted with screw caps to allow for inspection, flushing, and maintenance,

In-Ground Dispersal Trench

- Min. 12.0mL x 0.30mW x 0.45mD trench filled with clean 20-7 scoria or equivalent,
- 100mm \varnothing punched draincoil pipe laid level through trench,
- Filled with drainage metal to ground level (no topsoil cover). Spillover edge to be level with topography,
- Drainage metal to be wrapped with filter fabric.

7. NOTES

If any of the design specifications mentioned in the previous sections are altered or found to be different than what is described in this report, Wilton Joubert Ltd will be required to review this report. Indicative system details have been provided in the appendices of this report (145144-C200, 145144-C210 & 145144-C211). Care should be taken when constructing the discharge point to avoid any siphon or backflow effect within the stormwater system.

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

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

8. LIMITATIONS

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

This assignment only considers the primary stormwater system. The secondary stormwater system, Overland Flow Paths (OLFP), vehicular access and the consideration of road/street water flooding is excluded from this assessment.

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

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

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

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

Wilton Joubert Ltd.



Patrick McSweeney
BE(Hons)

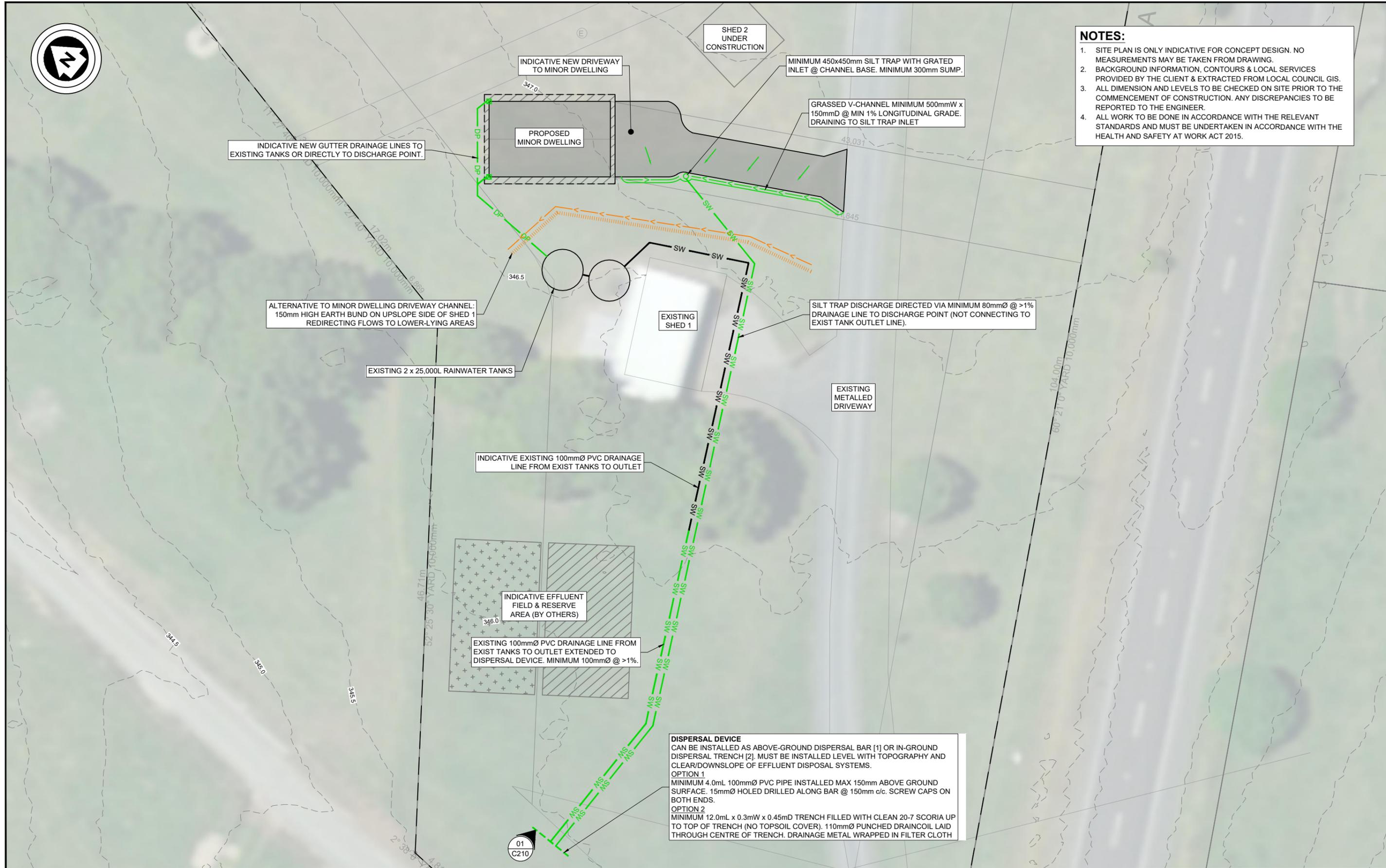
REPORT ATTACHMENTS

1. Site Plan - C200 (1 sheet)
2. Above-Ground Dispersal Device Detail - C210 (1 sheet)
3. In-Ground Dispersal Device Detail - C210 (1 sheet)
4. Calculation Set



NOTES:

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



WILTON JOUBERT
Consulting Engineers

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

ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
01	FEB '26	PM	STORMWATER REPORT

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

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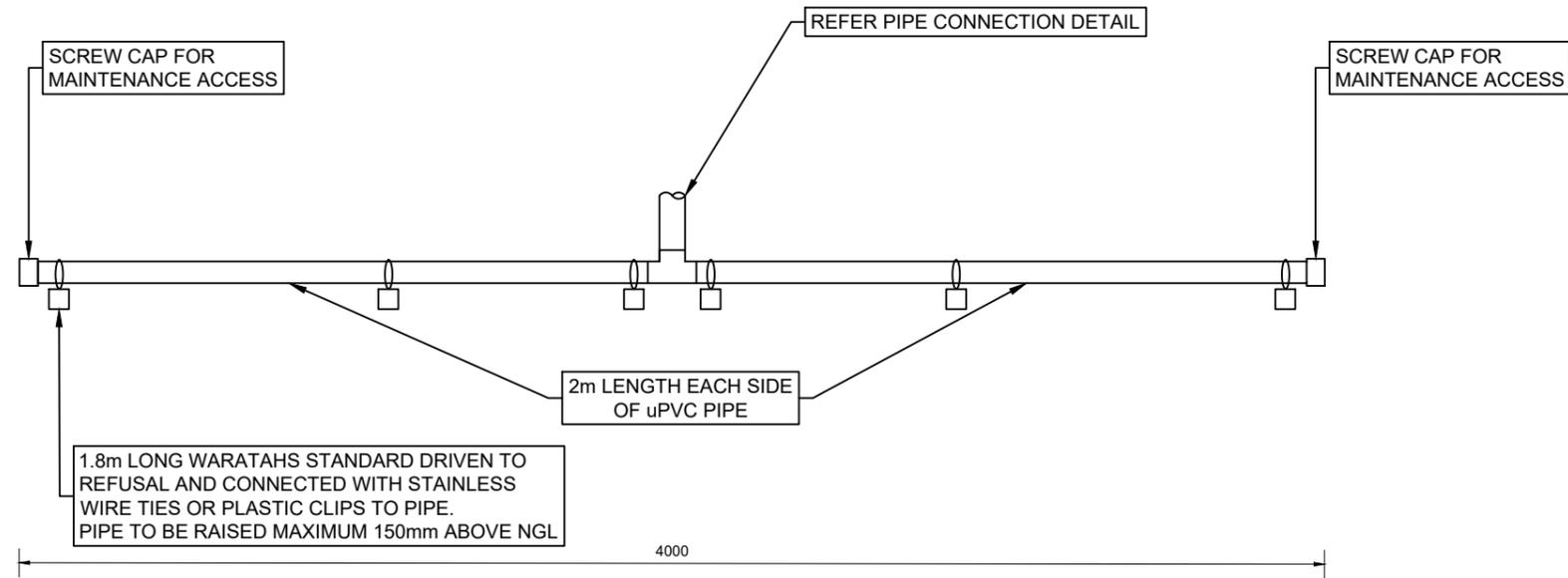
FOR INFORMATION
DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

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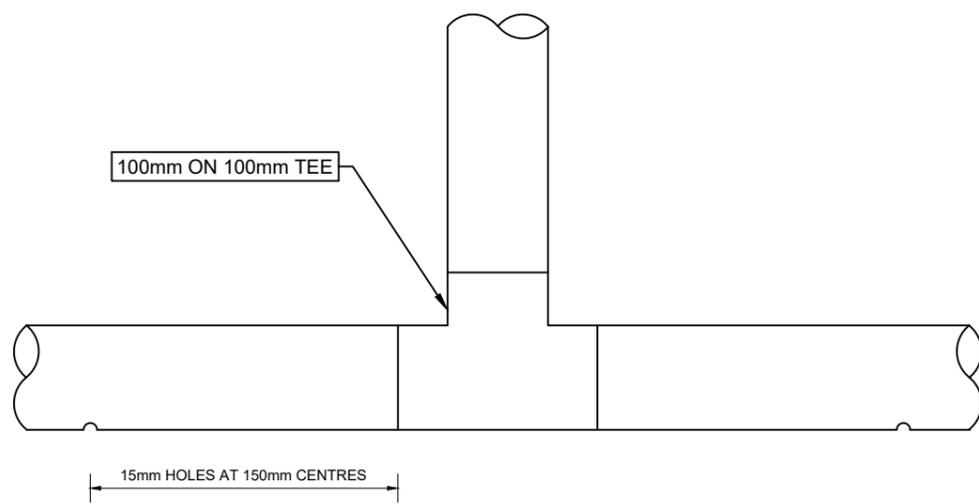
PROJECT DESCRIPTION: **STORMWATER MITIGATION REPORT**

PROJECT TITLE: **LOT 3 DP 514318
1032B WIROA ROAD
OKAIHAU
NORTHLAND**

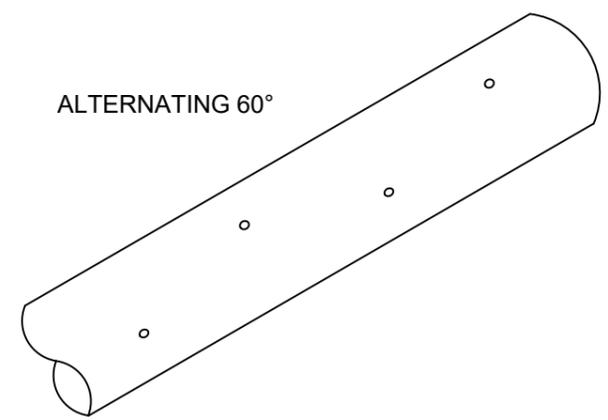
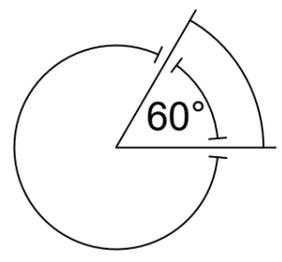
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DRAWING SCALE: 1:300	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 145144-C200	ISSUE: 01
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PLAN



PIPE CONNECTION DETAIL



PIPE OUTLET HOLE ARRANGEMENT DETAIL

01 ABOVE-GROUND DISPERSAL DEVICE DETAIL
C200 N.T.S

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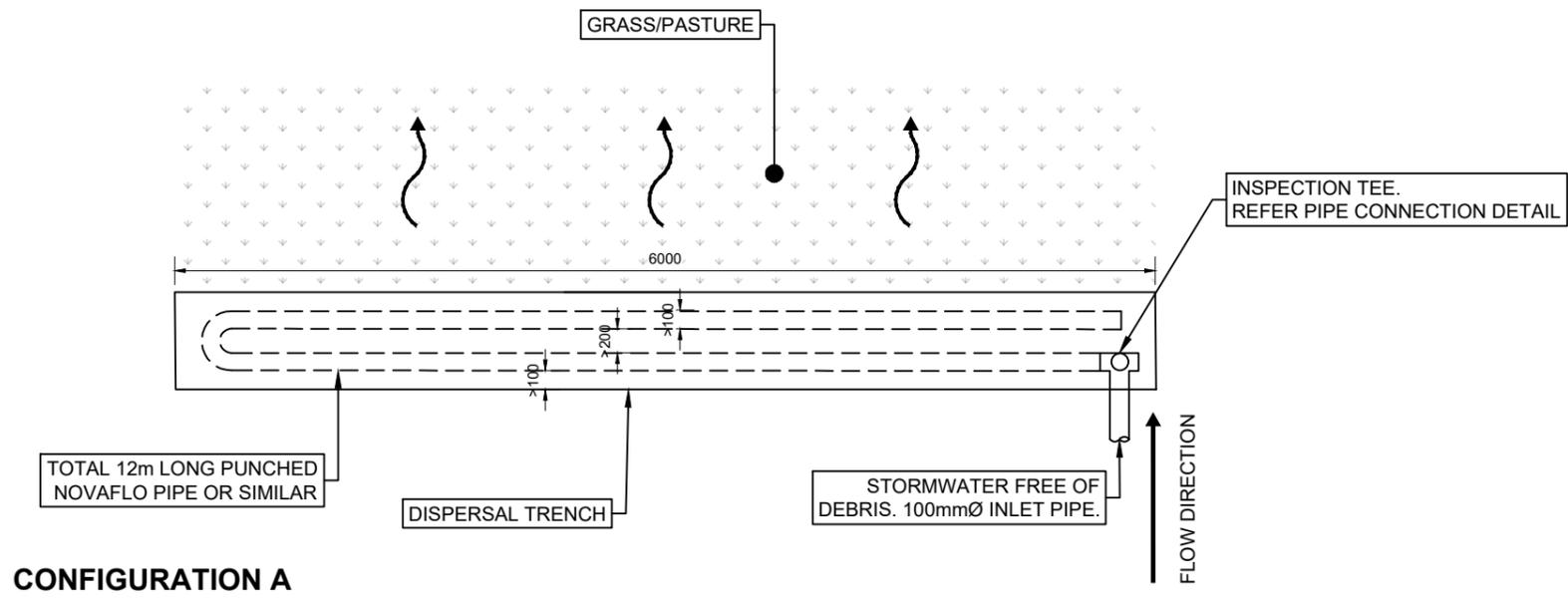
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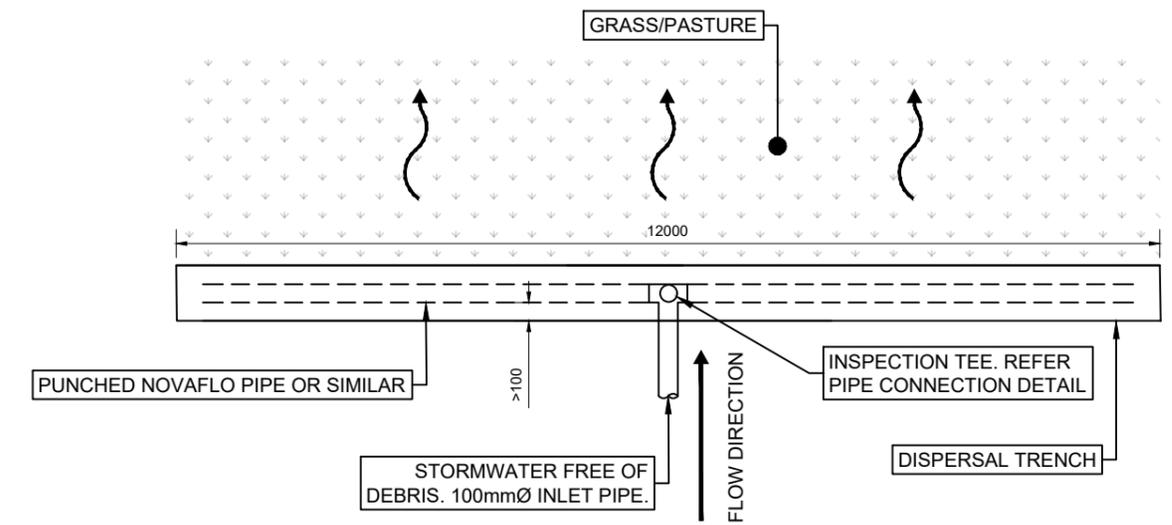
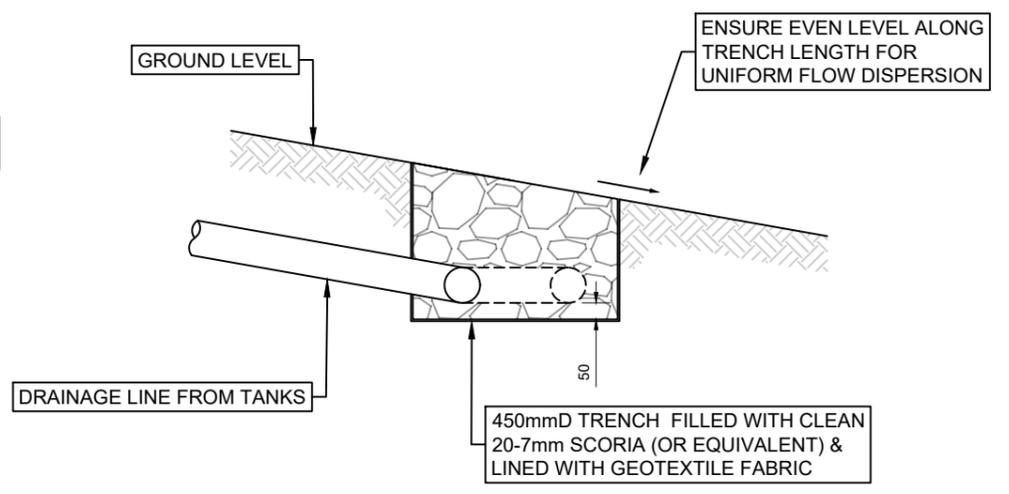
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STORMWATER MITIGATION REPORT

PROJECT TITLE:
**LOT 3 DP 514318
1032B WIROA ROAD
OKAIHAU
NORTHLAND**

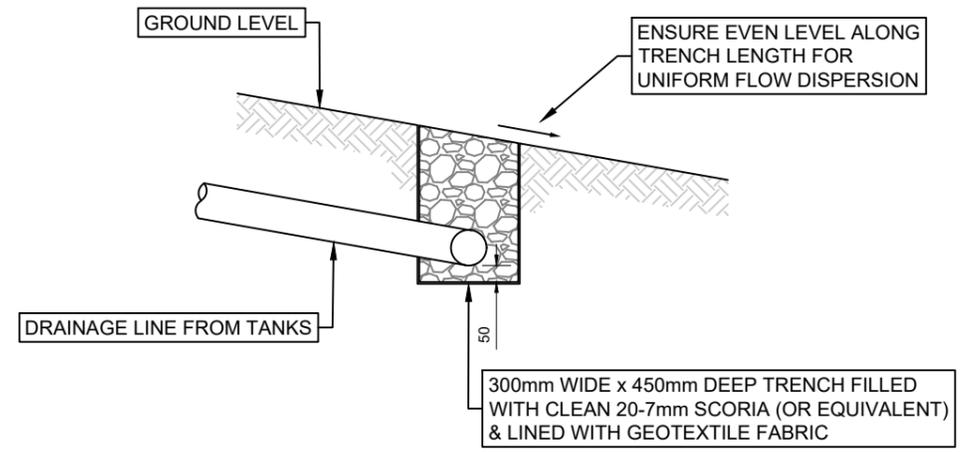
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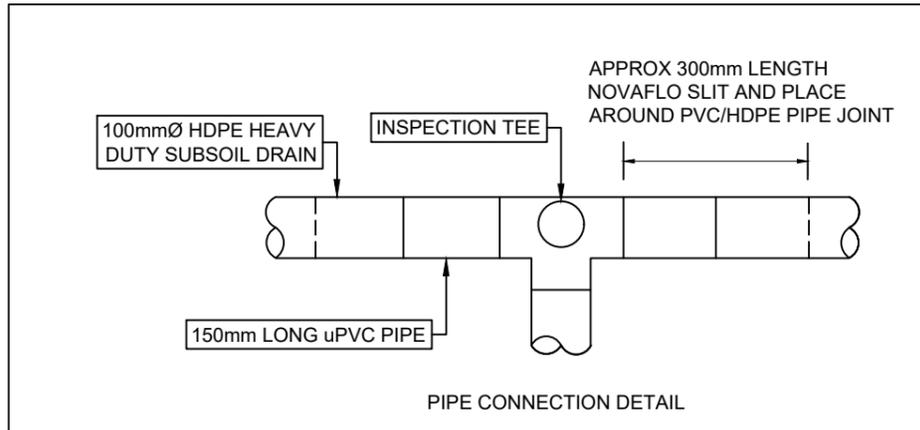
CONFIGURATION A



CONFIGURATION B



01 IN-GROUND DISPERSAL DEVICE DETAIL
C200 N.T.S



PIPE CONNECTION DETAIL



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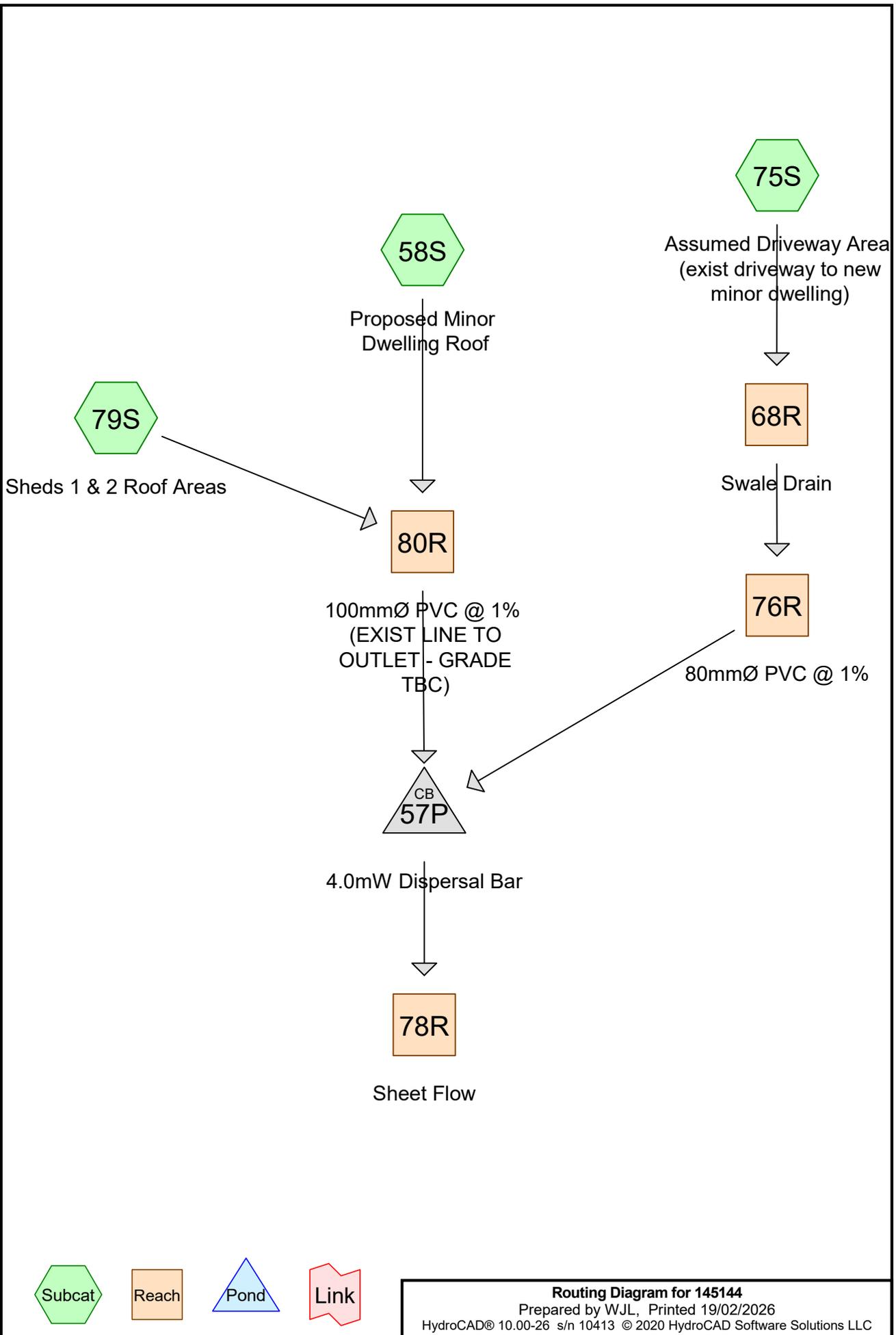
FOR INFORMATION
DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
IN-GROUND DISPERSAL DEVICE DETAIL

PROJECT DESCRIPTION:
STORMWATER MITIGATION REPORT

PROJECT TITLE:
**LOT 3 DP 514318
1032B WIROA ROAD
OKAIHAU
NORTHLAND**

ORIGINAL DRAWING SIZE:	OFFICE:
A3	OREWA
DRAWING SCALE:	CO-ORDINATE SYSTEM:
N.T.S	NOT COORDINATED
DRAWING NUMBER:	ISSUE:
145144-C211	01
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Summary for Subcatchment 58S: Proposed Minor Dwelling Roof

Runoff = 2.28 L/s @ 7.94 hrs, Volume= 34.0 m³, Depth> 382 mm

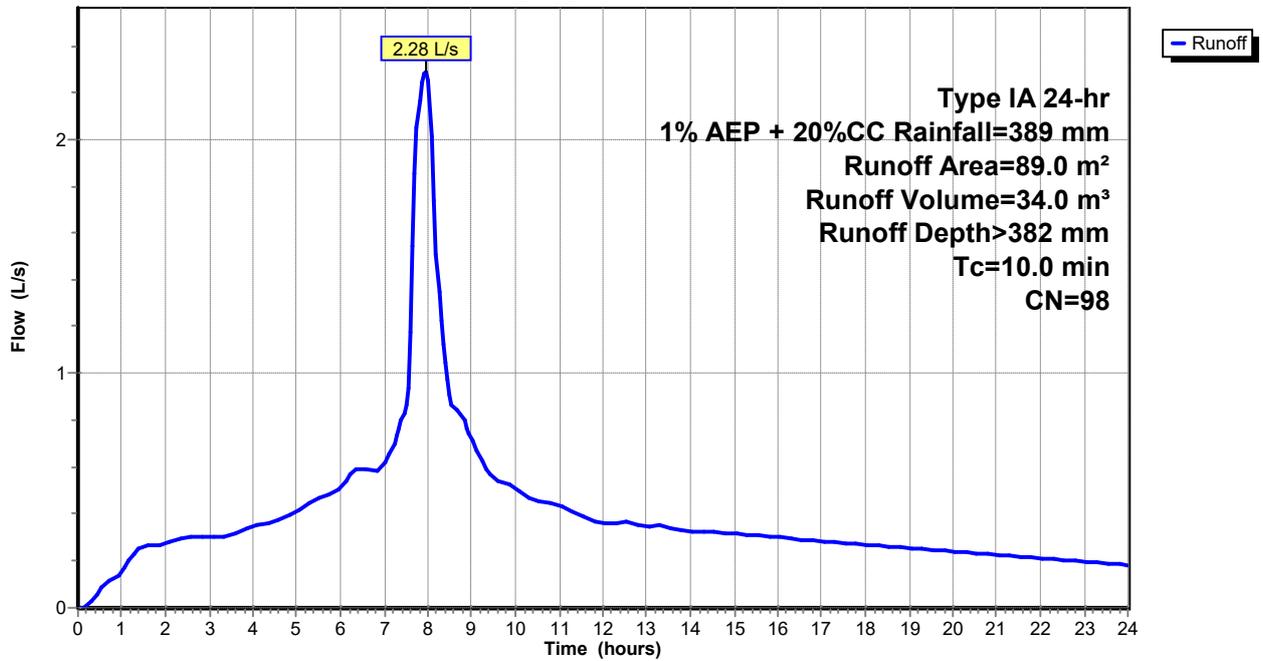
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 1% AEP + 20%CC Rainfall=389 mm

Area (m ²)	CN	Description
* 89.0	98	100% Impervious
89.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
10.0					Direct Entry,

Subcatchment 58S: Proposed Minor Dwelling Roof

Hydrograph



Summary for Subcatchment 75S: Assumed Driveway Area (exist driveway to new minor dwelling)

Runoff = 2.31 L/s @ 7.94 hrs, Volume= 34.4 m³, Depth> 382 mm

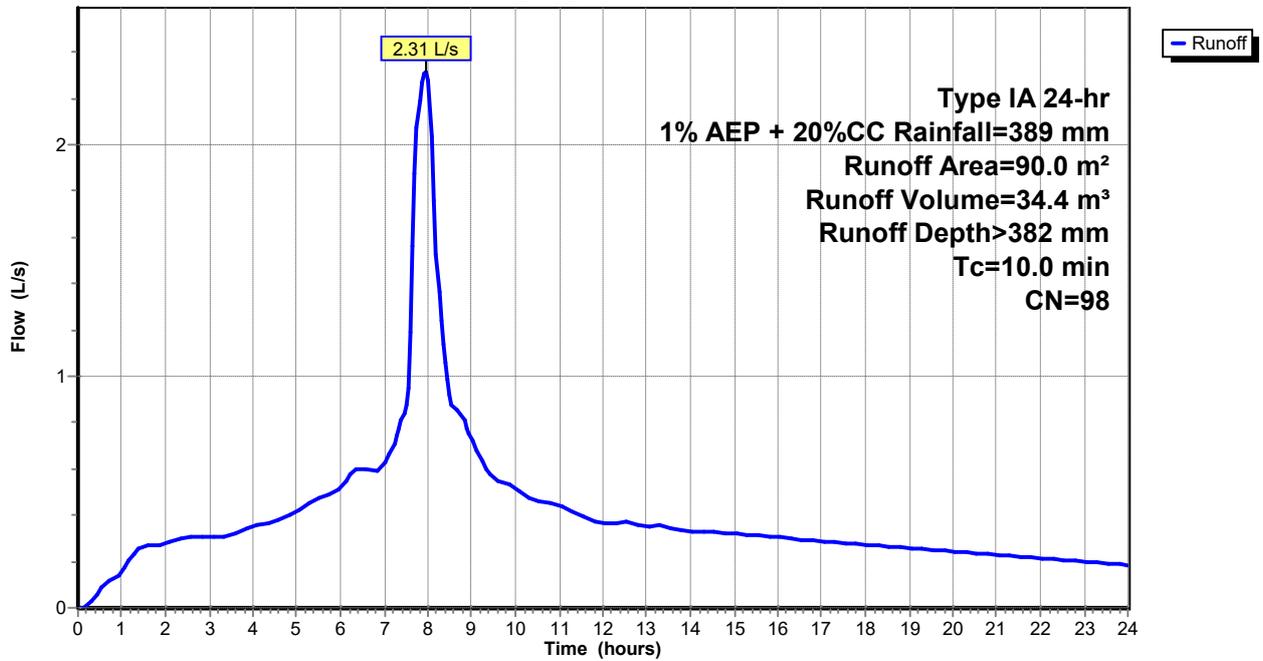
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 1% AEP + 20%CC Rainfall=389 mm

Area (m ²)	CN	Description
* 90.0	98	100% Impervious
90.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
10.0					Direct Entry,

Subcatchment 75S: Assumed Driveway Area (exist driveway to new minor dwelling)

Hydrograph



Summary for Subcatchment 79S: Sheds 1 & 2 Roof Areas

Runoff = 2.87 L/s @ 7.94 hrs, Volume= 42.8 m³, Depth> 382 mm

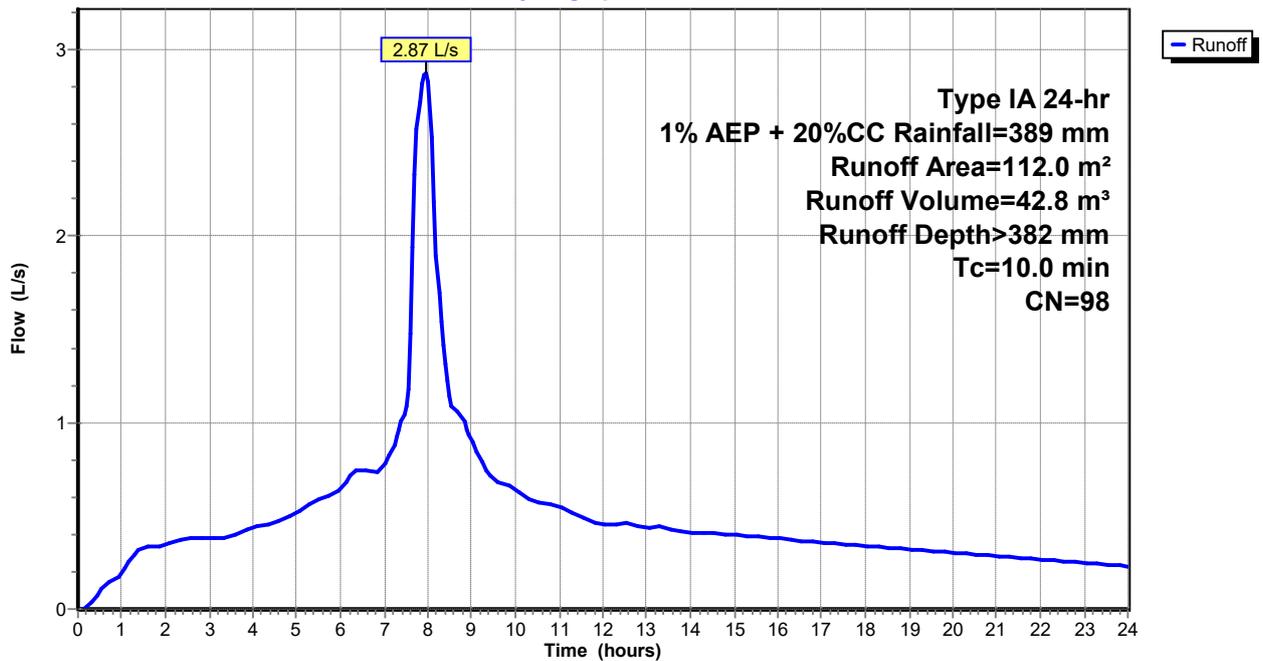
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 1% AEP + 20%CC Rainfall=389 mm

	Area (m²)	CN	Description
*	72.0	98	100% Impervious
*	40.0	98	100% Impervious
	112.0	98	Weighted Average
	112.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
10.0					Direct Entry,

Subcatchment 79S: Sheds 1 & 2 Roof Areas

Hydrograph



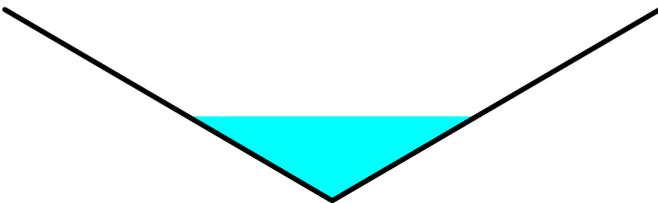
Summary for Reach 68R: Swale Drain

Inflow Area = 90.0 m², 100.00% Impervious, Inflow Depth > 382 mm for 1% AEP + 20%CC event
 Inflow = 2.31 L/s @ 7.94 hrs, Volume= 34.4 m³
 Outflow = 2.31 L/s @ 7.94 hrs, Volume= 34.4 m³, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.31 m/s, Min. Travel Time= 0.5 min
 Avg. Velocity = 0.19 m/s, Avg. Travel Time= 0.9 min

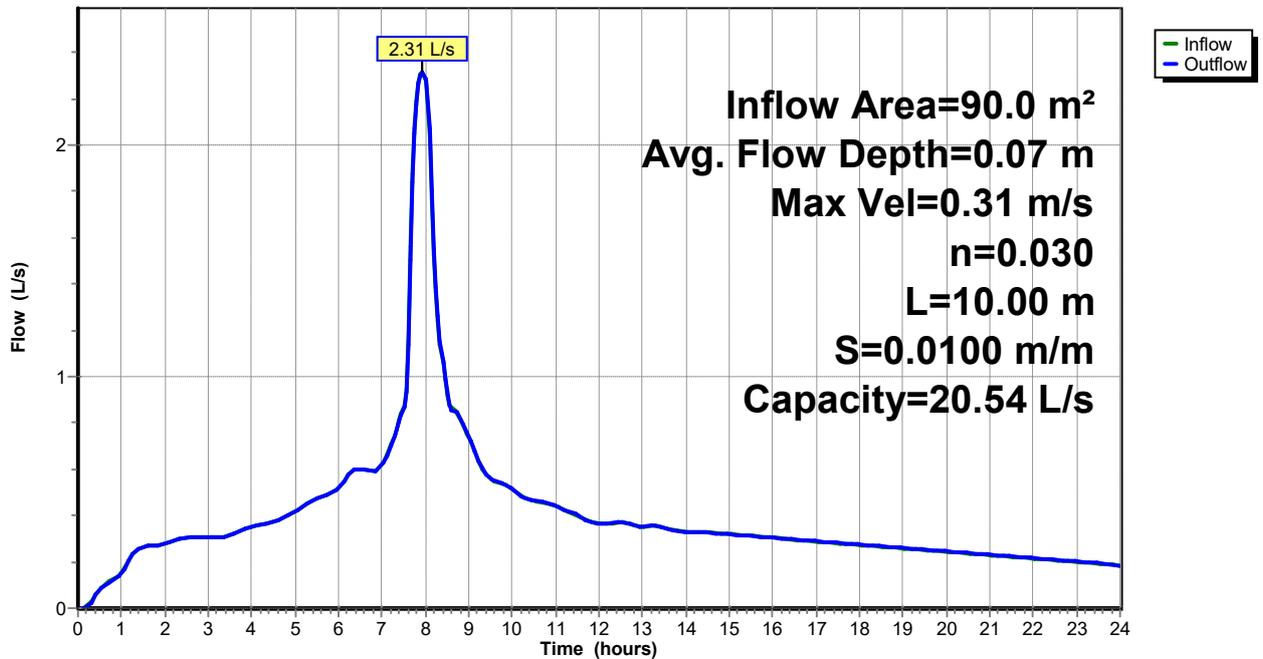
Peak Storage= 0.1 m³ @ 7.94 hrs
 Average Depth at Peak Storage= 0.07 m
 Bank-Full Depth= 0.15 m Flow Area= 0.04 m², Capacity= 20.54 L/s

0.00 m x 0.15 m deep channel, n= 0.030
 Side Slope Z-value= 1.7 m/m Top Width= 0.51 m
 Length= 10.00 m Slope= 0.0100 m/m
 Inlet Invert= 10.000 m, Outlet Invert= 9.900 m



Reach 68R: Swale Drain

Hydrograph



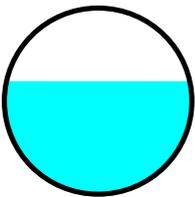
Summary for Reach 76R: 80mmØ PVC @ 1%

Inflow Area = 90.0 m², 100.00% Impervious, Inflow Depth > 382 mm for 1% AEP + 20%CC event
Inflow = 2.31 L/s @ 7.94 hrs, Volume= 34.4 m³
Outflow = 2.31 L/s @ 7.95 hrs, Volume= 34.4 m³, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.72 m/s, Min. Travel Time= 0.2 min
Avg. Velocity = 0.43 m/s, Avg. Travel Time= 0.4 min

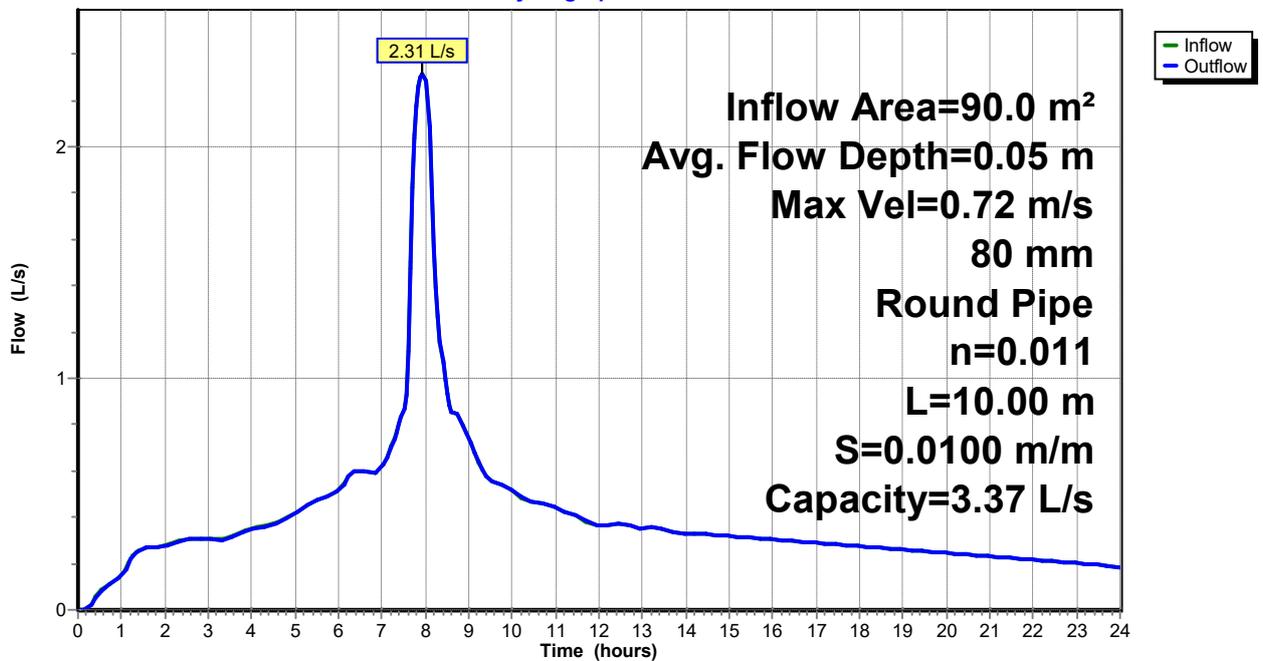
Peak Storage= 0.0 m³ @ 7.95 hrs
Average Depth at Peak Storage= 0.05 m
Bank-Full Depth= 0.08 m Flow Area= 0.01 m², Capacity= 3.37 L/s

80 mm Round Pipe
n= 0.011
Length= 10.00 m Slope= 0.0100 m/m
Inlet Invert= 5.000 m, Outlet Invert= 4.900 m



Reach 76R: 80mmØ PVC @ 1%

Hydrograph



Summary for Reach 78R: Sheet Flow

Inflow Area = 291.0 m², 100.00% Impervious, Inflow Depth > 382 mm for 1% AEP + 20%CC event
 Inflow = 7.47 L/s @ 7.94 hrs, Volume= 111.1 m³
 Outflow = 7.46 L/s @ 7.97 hrs, Volume= 110.9 m³, Atten= 0%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.07 m/s, Min. Travel Time= 2.3 min
 Avg. Velocity = 0.03 m/s, Avg. Travel Time= 4.9 min

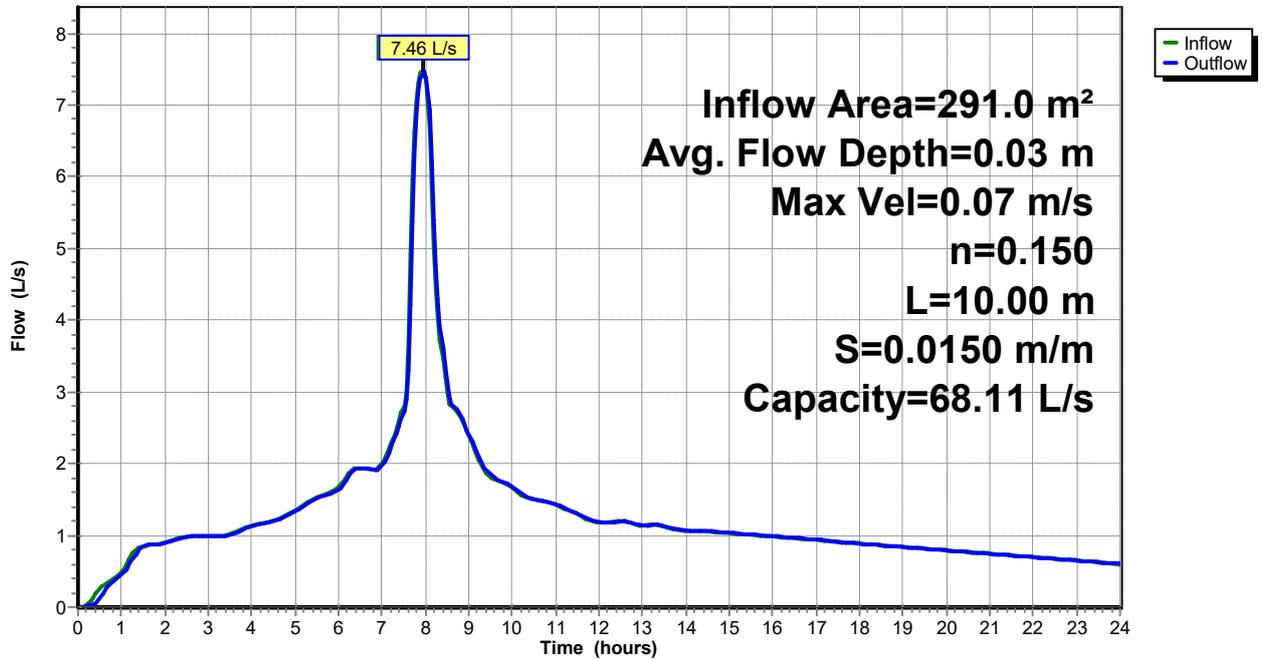
Peak Storage= 1.0 m³ @ 7.97 hrs
 Average Depth at Peak Storage= 0.03 m
 Bank-Full Depth= 0.10 m Flow Area= 0.40 m², Capacity= 68.11 L/s

4.00 m x 0.10 m deep channel, n= 0.150
 Length= 10.00 m Slope= 0.0150 m/m
 Inlet Invert= 1.000 m, Outlet Invert= 0.850 m



Reach 78R: Sheet Flow

Hydrograph



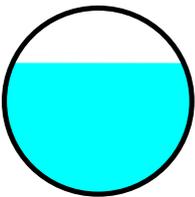
Summary for Reach 80R: 100mmØ PVC @ 1% (EXIST LINE TO OUTLET - GRADE TBC)

Inflow Area = 201.0 m², 100.00% Impervious, Inflow Depth > 382 mm for 1% AEP + 20%CC event
 Inflow = 5.16 L/s @ 7.94 hrs, Volume= 76.8 m³
 Outflow = 5.16 L/s @ 7.94 hrs, Volume= 76.8 m³, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.87 m/s, Min. Travel Time= 0.2 min
 Avg. Velocity = 0.53 m/s, Avg. Travel Time= 0.3 min

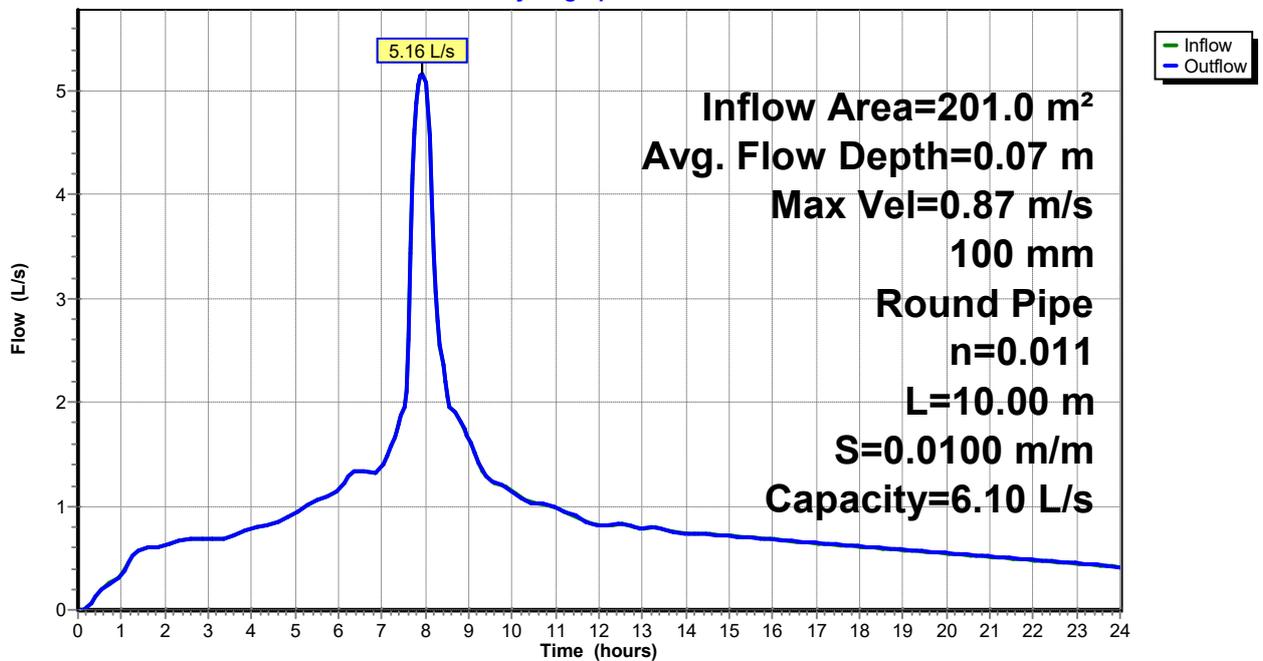
Peak Storage= 0.1 m³ @ 7.94 hrs
 Average Depth at Peak Storage= 0.07 m
 Bank-Full Depth= 0.10 m Flow Area= 0.01 m², Capacity= 6.10 L/s

100 mm Round Pipe
 n= 0.011
 Length= 10.00 m Slope= 0.0100 m/m
 Inlet Invert= 2.000 m, Outlet Invert= 1.900 m



Reach 80R: 100mmØ PVC @ 1% (EXIST LINE TO OUTLET - GRADE TBC)

Hydrograph



Summary for Pond 57P: 4.0mW Dispersal Bar

Inflow Area = 291.0 m², 100.00% Impervious, Inflow Depth > 382 mm for 1% AEP + 20%CC event
 Inflow = 7.47 L/s @ 7.94 hrs, Volume= 111.1 m³
 Outflow = 7.47 L/s @ 7.94 hrs, Volume= 111.1 m³, Atten= 0%, Lag= 0.0 min
 Primary = 7.47 L/s @ 7.94 hrs, Volume= 111.1 m³

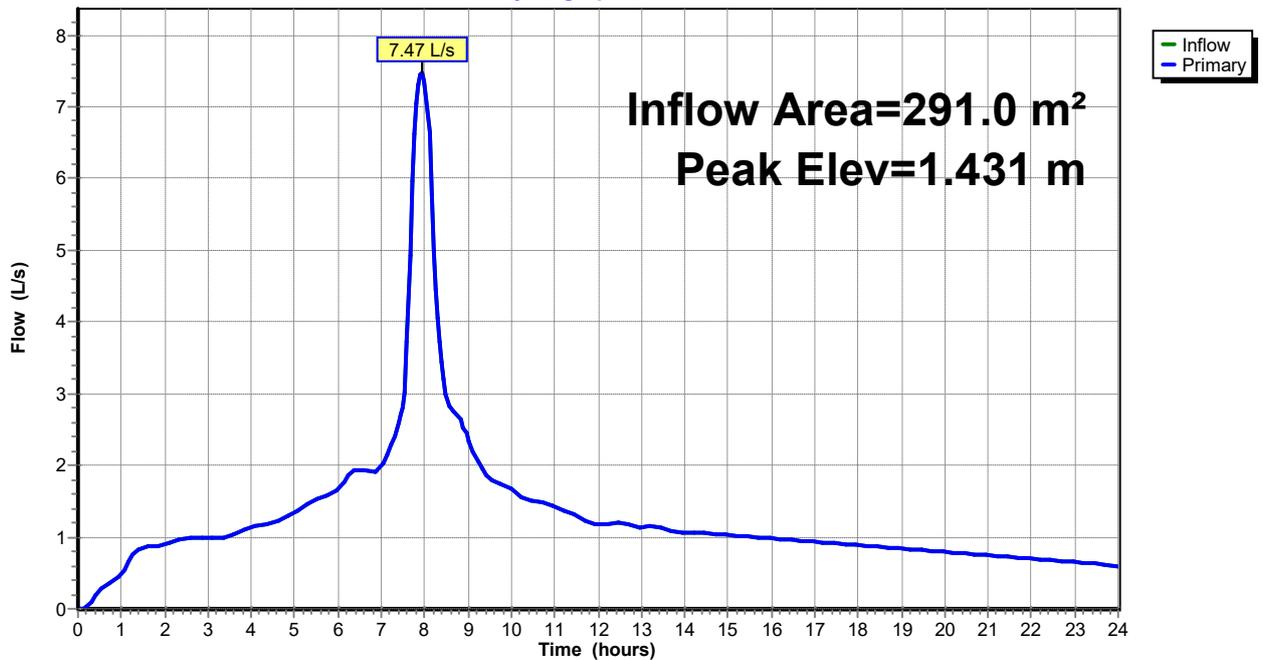
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 1.431 m @ 7.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1.000 m	15 mm Vert. Orifice/Grate X 25.00 C= 0.600

Primary OutFlow Max=7.46 L/s @ 7.94 hrs HW=1.430 m TW=1.026 m (Dynamic Tailwater)
 ←1=Orifice/Grate (Orifice Controls 7.46 L/s @ 1.69 m/s)

Pond 57P: 4.0mW Dispersal Bar

Hydrograph



Summary for Subcatchment 58S: Proposed Minor Dwelling Roof

Runoff = 1.27 L/s @ 7.94 hrs, Volume= 18.7 m³, Depth> 210 mm

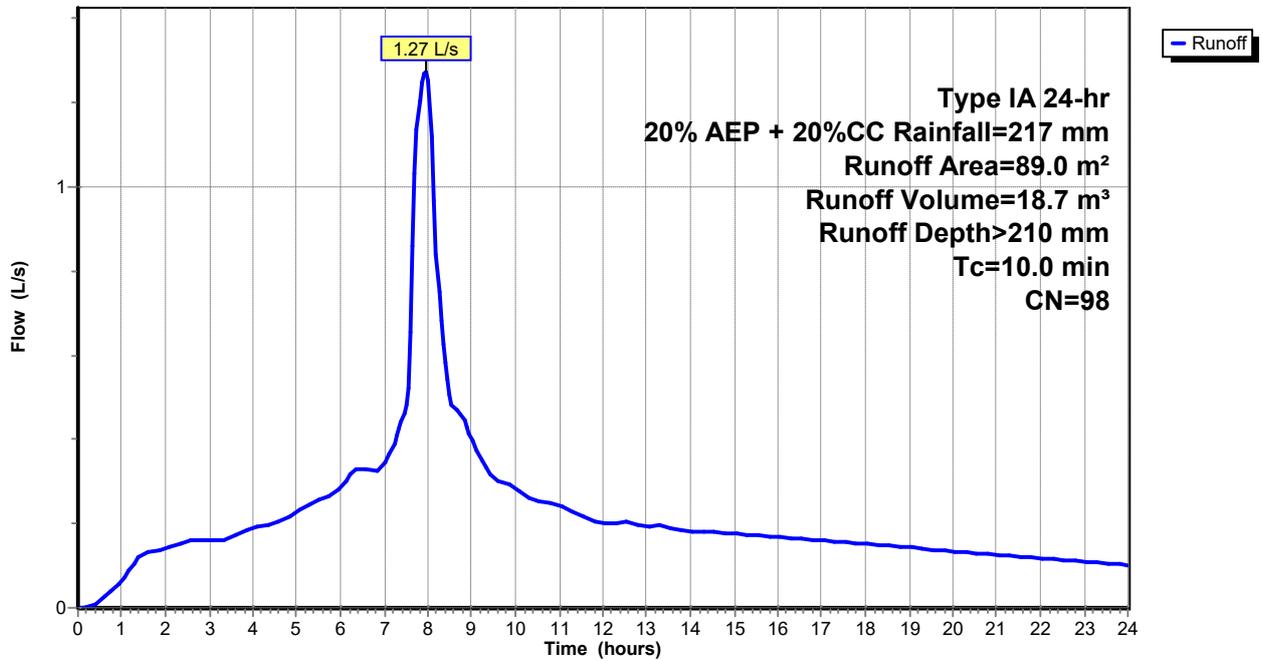
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 20% AEP + 20%CC Rainfall=217 mm

Area (m ²)	CN	Description
* 89.0	98	100% Impervious
89.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
10.0					Direct Entry,

Subcatchment 58S: Proposed Minor Dwelling Roof

Hydrograph



Summary for Subcatchment 75S: Assumed Driveway Area (exist driveway to new minor dwelling)

Runoff = 1.29 L/s @ 7.94 hrs, Volume= 18.9 m³, Depth> 210 mm

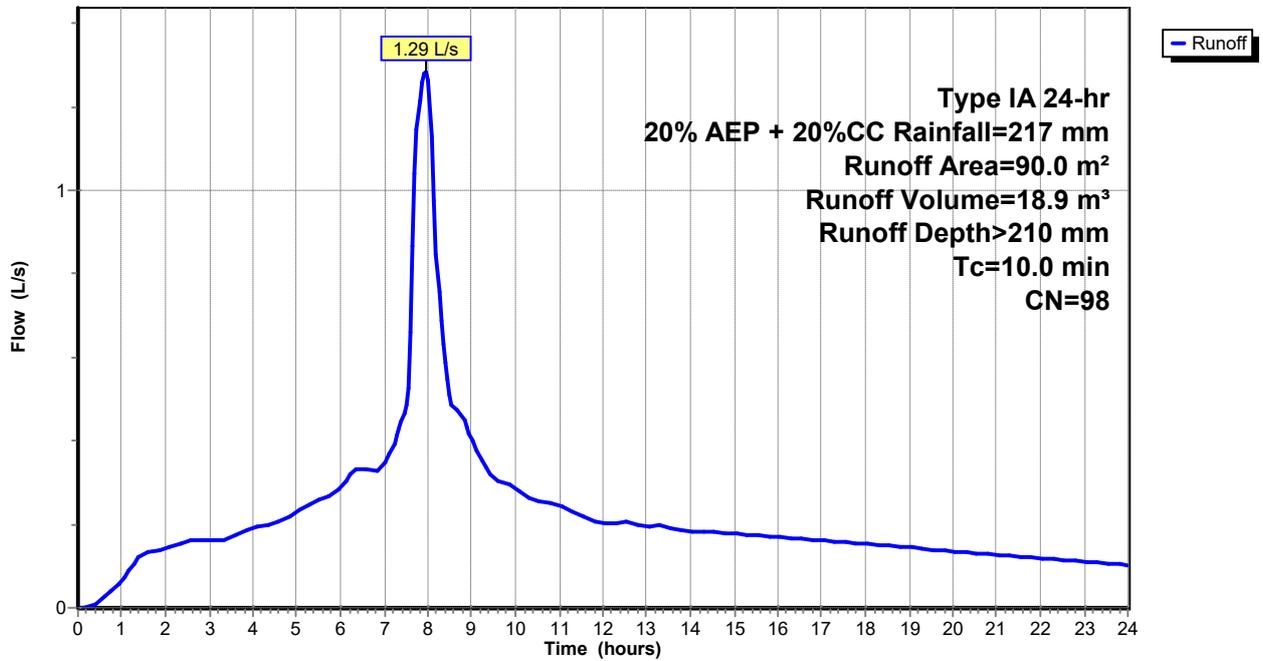
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 20% AEP + 20%CC Rainfall=217 mm

Area (m ²)	CN	Description
* 90.0	98	100% Impervious
90.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
10.0					Direct Entry,

Subcatchment 75S: Assumed Driveway Area (exist driveway to new minor dwelling)

Hydrograph



Summary for Subcatchment 79S: Sheds 1 & 2 Roof Areas

Runoff = 1.60 L/s @ 7.94 hrs, Volume= 23.6 m³, Depth> 210 mm

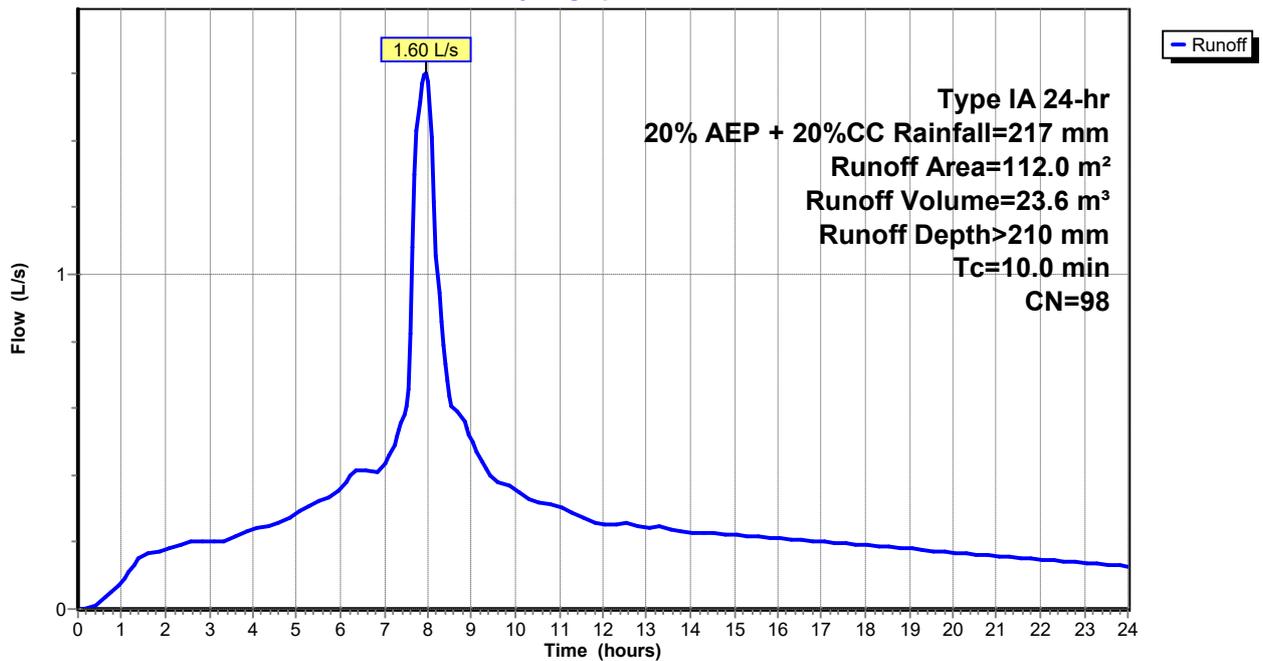
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 20% AEP + 20%CC Rainfall=217 mm

	Area (m²)	CN	Description
*	72.0	98	100% Impervious
*	40.0	98	100% Impervious
	112.0	98	Weighted Average
	112.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
10.0					Direct Entry,

Subcatchment 79S: Sheds 1 & 2 Roof Areas

Hydrograph



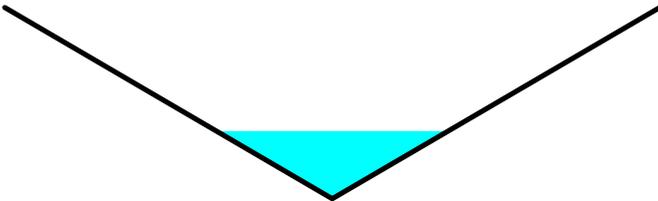
Summary for Reach 68R: Swale Drain

Inflow Area = 90.0 m², 100.00% Impervious, Inflow Depth > 210 mm for 20% AEP + 20%CC event
 Inflow = 1.29 L/s @ 7.94 hrs, Volume= 18.9 m³
 Outflow = 1.29 L/s @ 7.95 hrs, Volume= 18.9 m³, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.27 m/s, Min. Travel Time= 0.6 min
 Avg. Velocity = 0.17 m/s, Avg. Travel Time= 1.0 min

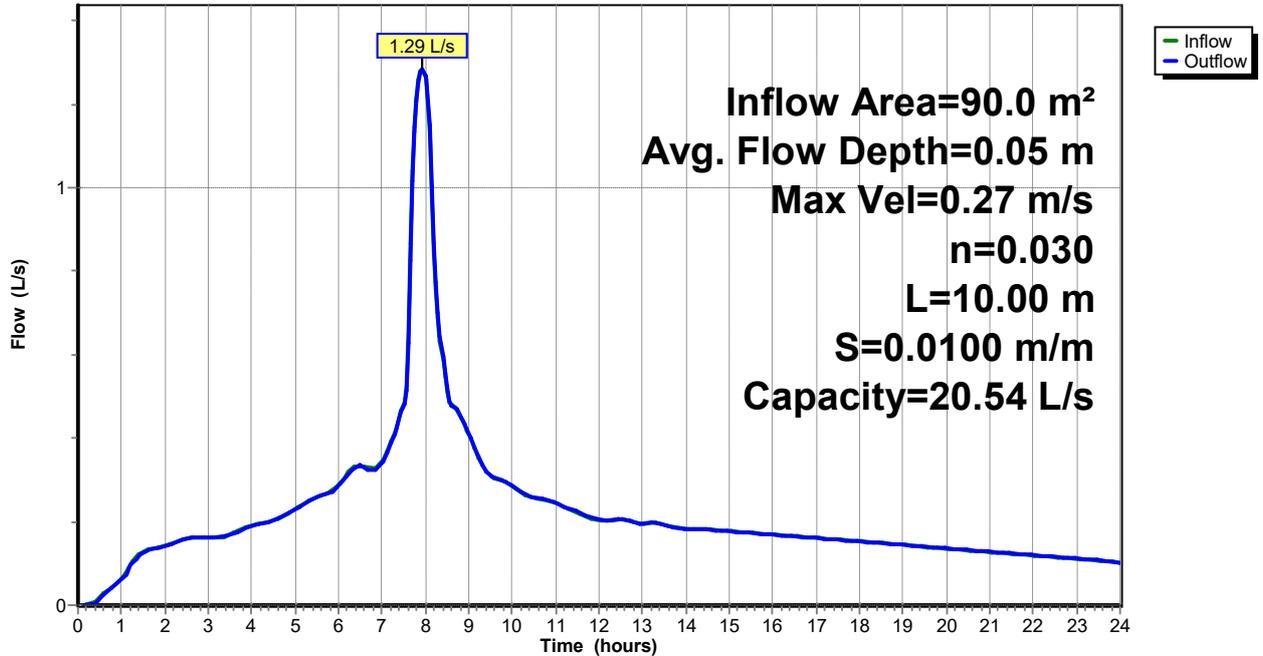
Peak Storage= 0.0 m³ @ 7.95 hrs
 Average Depth at Peak Storage= 0.05 m
 Bank-Full Depth= 0.15 m Flow Area= 0.04 m², Capacity= 20.54 L/s

0.00 m x 0.15 m deep channel, n= 0.030
 Side Slope Z-value= 1.7 m/m Top Width= 0.51 m
 Length= 10.00 m Slope= 0.0100 m/m
 Inlet Invert= 10.000 m, Outlet Invert= 9.900 m



Reach 68R: Swale Drain

Hydrograph



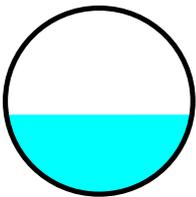
Summary for Reach 76R: 80mmØ PVC @ 1%

Inflow Area = 90.0 m², 100.00% Impervious, Inflow Depth > 210 mm for 20% AEP + 20%CC event
 Inflow = 1.29 L/s @ 7.95 hrs, Volume= 18.9 m³
 Outflow = 1.29 L/s @ 7.95 hrs, Volume= 18.9 m³, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.62 m/s, Min. Travel Time= 0.3 min
 Avg. Velocity = 0.37 m/s, Avg. Travel Time= 0.5 min

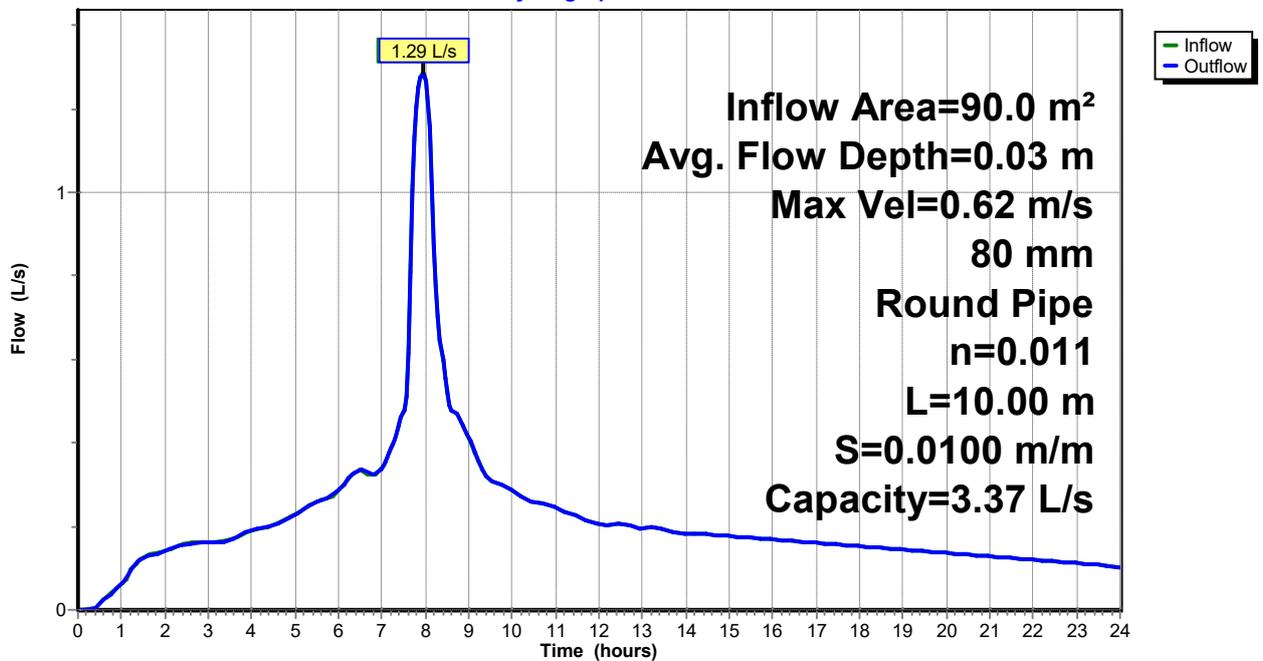
Peak Storage= 0.0 m³ @ 7.95 hrs
 Average Depth at Peak Storage= 0.03 m
 Bank-Full Depth= 0.08 m Flow Area= 0.01 m², Capacity= 3.37 L/s

80 mm Round Pipe
 n= 0.011
 Length= 10.00 m Slope= 0.0100 m/m
 Inlet Invert= 5.000 m, Outlet Invert= 4.900 m



Reach 76R: 80mmØ PVC @ 1%

Hydrograph



Summary for Reach 78R: Sheet Flow

Inflow Area = 291.0 m², 100.00% Impervious, Inflow Depth > 210 mm for 20% AEP + 20%CC event
 Inflow = 4.16 L/s @ 7.94 hrs, Volume= 61.2 m³
 Outflow = 4.15 L/s @ 7.97 hrs, Volume= 61.0 m³, Atten= 0%, Lag= 1.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.06 m/s, Min. Travel Time= 3.0 min
 Avg. Velocity = 0.03 m/s, Avg. Travel Time= 6.2 min

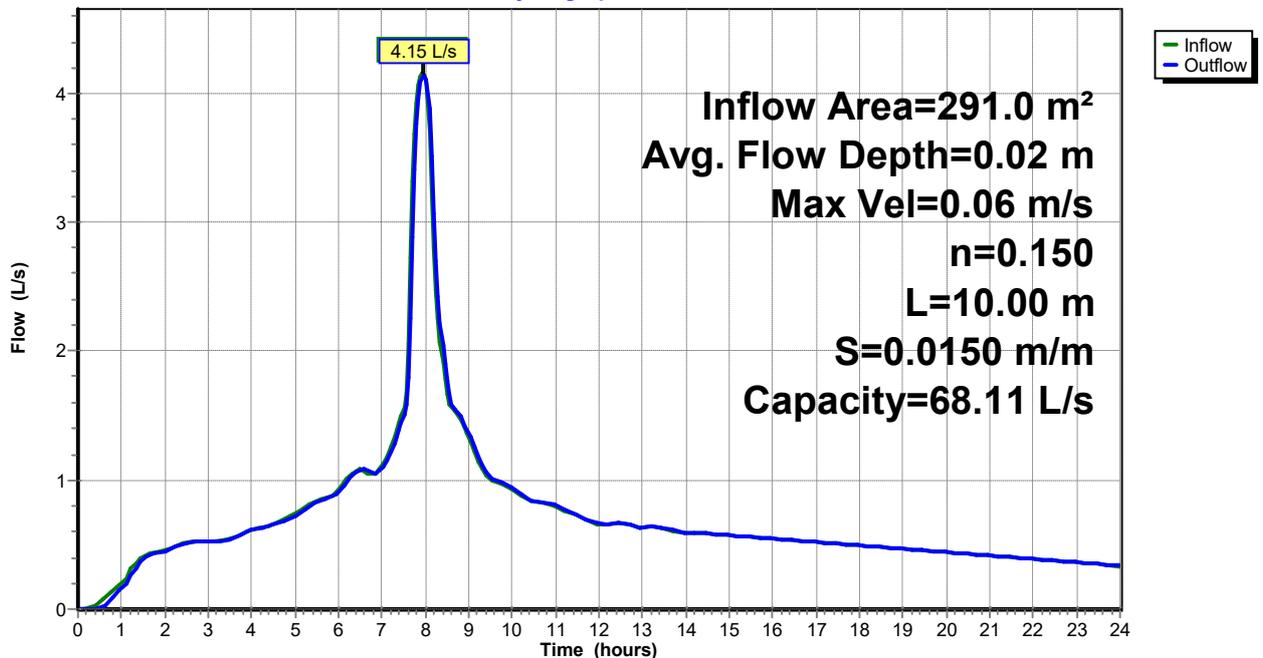
Peak Storage= 0.7 m³ @ 7.97 hrs
 Average Depth at Peak Storage= 0.02 m
 Bank-Full Depth= 0.10 m Flow Area= 0.40 m², Capacity= 68.11 L/s

4.00 m x 0.10 m deep channel, n= 0.150
 Length= 10.00 m Slope= 0.0150 m/m
 Inlet Invert= 1.000 m, Outlet Invert= 0.850 m



Reach 78R: Sheet Flow

Hydrograph



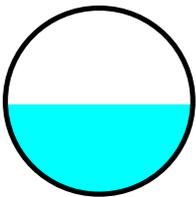
Summary for Reach 80R: 100mmØ PVC @ 1% (EXIST LINE TO OUTLET - GRADE TBC)

Inflow Area = 201.0 m², 100.00% Impervious, Inflow Depth > 210 mm for 20% AEP + 20%CC event
 Inflow = 2.87 L/s @ 7.94 hrs, Volume= 42.3 m³
 Outflow = 2.87 L/s @ 7.94 hrs, Volume= 42.3 m³, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.77 m/s, Min. Travel Time= 0.2 min
 Avg. Velocity = 0.45 m/s, Avg. Travel Time= 0.4 min

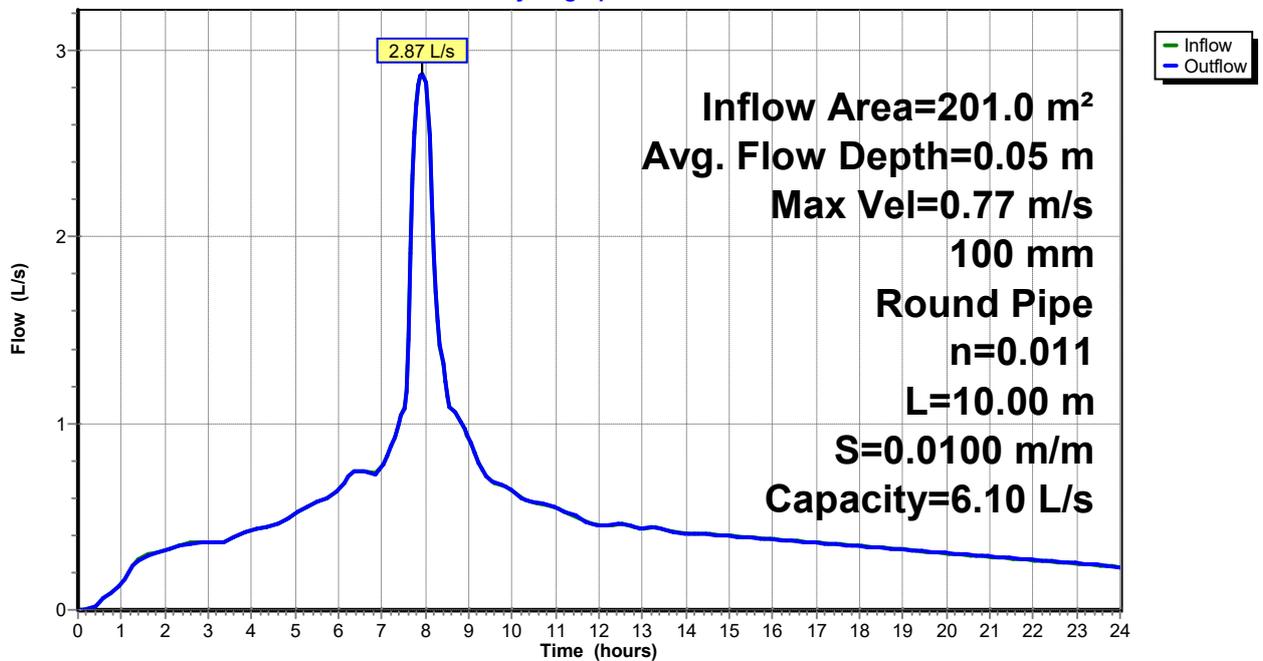
Peak Storage= 0.0 m³ @ 7.94 hrs
 Average Depth at Peak Storage= 0.05 m
 Bank-Full Depth= 0.10 m Flow Area= 0.01 m², Capacity= 6.10 L/s

100 mm Round Pipe
 n= 0.011
 Length= 10.00 m Slope= 0.0100 m/m
 Inlet Invert= 2.000 m, Outlet Invert= 1.900 m



Reach 80R: 100mmØ PVC @ 1% (EXIST LINE TO OUTLET - GRADE TBC)

Hydrograph



Summary for Pond 57P: 4.0mW Dispersal Bar

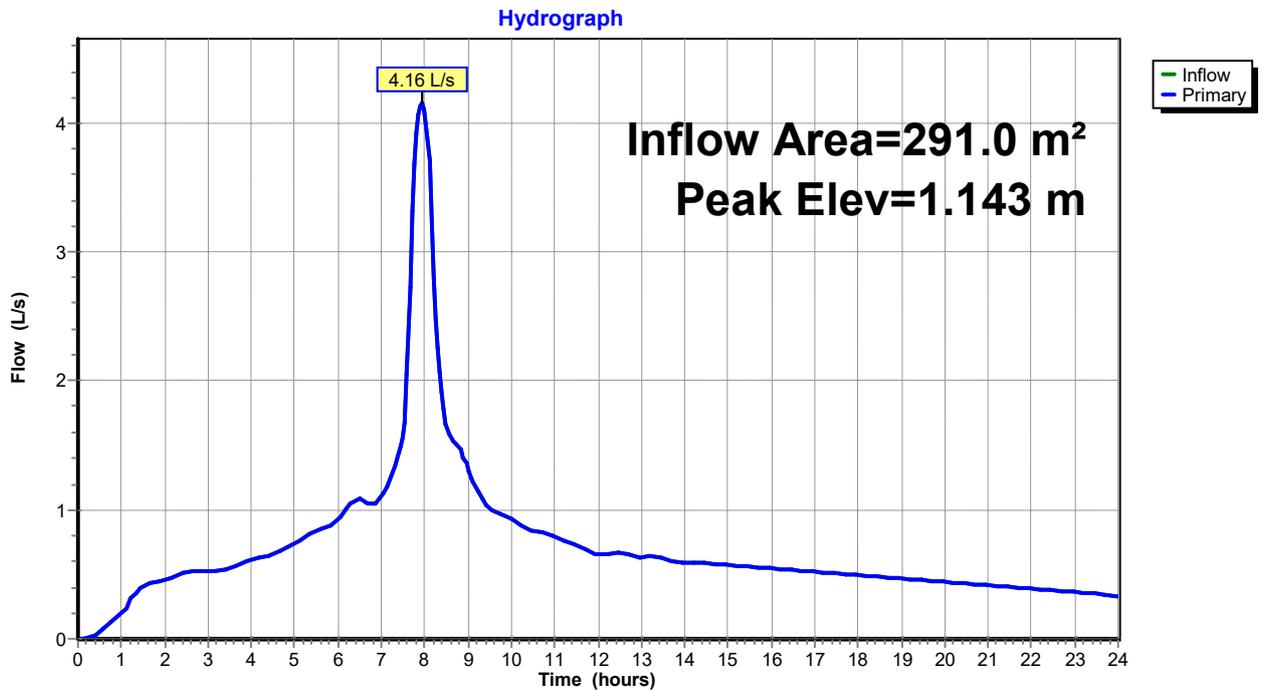
Inflow Area = 291.0 m², 100.00% Impervious, Inflow Depth > 210 mm for 20% AEP + 20%CC event
 Inflow = 4.16 L/s @ 7.94 hrs, Volume= 61.2 m³
 Outflow = 4.16 L/s @ 7.94 hrs, Volume= 61.2 m³, Atten= 0%, Lag= 0.0 min
 Primary = 4.16 L/s @ 7.94 hrs, Volume= 61.2 m³

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 1.143 m @ 7.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1.000 m	15 mm Vert. Orifice/Grate X 25.00 C= 0.600

Primary OutFlow Max=4.15 L/s @ 7.94 hrs HW=1.143 m TW=1.018 m (Dynamic Tailwater)
 ←1=Orifice/Grate (Orifice Controls 4.15 L/s @ 0.94 m/s)

Pond 57P: 4.0mW Dispersal Bar



SITE	1032B Wiroa Road, Okaihau
LEGAL DESCRIPTION	Lot 3 DP 514318
PROJECT	Proposed Minor Dwelling
CLIENTS	William & Beula Foote
REFERENCE NO.	145142
DOCUMENT	Site-Specific Report
STATUS/REVISION NO.	FINAL – Issued for Building Consent
DATE OF ISSUE	17 February 2026

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1. EXECUTIVE SUMMARY

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

Development Type:	Residential transportable minor dwelling.
Development Proposals Supplied:	Yes – Concept architectural drawings (7 sheets).
NZS3604 Type Structure(s):	Yes.
Earthworks:	We anticipate minimal earthworks will be undertaken in forming the building site, essentially associated with footing excavations for the proposed dwelling.
Geology Encountered:	Kerikeri Volcanic Group.
Topsoil Encountered:	Surficial layers of topsoil were encountered to a maximum depth of 0.30m below present ground level.
Overall Site Gradient in Proximity to Development:	Gently inclined (averages less than 5°).
Site Stability Risk:	Low risk of instability at the site.
Liquefaction Risk:	Negligible risk of liquefaction susceptibility.
Suitable Shallow Foundation Type(s):	Bored, concrete encased, tanalised timber pile foundations.
Shallow Soil Bearing Capacity:	Yes – Natural Soils Only. Geotechnical Ultimate Bearing Capacity = 300kPa.
NZBC B1 Expansive Soil Classification:	Class H – Highly Expansive ($\gamma_s = 78\text{mm}$).
NZS1170.5:2004 Site Subsoil Classification:	Class C – Shallow Soil stratigraphy.
Minimum Footing Embedment Depth:	0.90m below finished ground levels and 0.30m into competent natural ground, whichever is deeper.
Consent Application Report Suitable for:	Building Consent.

2. INTRODUCTION

2.1. SCOPE OF WORK

Wilton Joubert Limited (WJL) was engaged by **William and Beula Foote** (the Clients) to undertake a geotechnical assessment of ground conditions at the above property where, we understand, it is proposed to place a transportable minor dwelling on to the site.

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

2.2. SUPPLIED INFORMATION

Our assessment is based on the following development proposals supplied:

- Preliminary architectural drawings (7 sheets) dated 14 January 2026 (Ref: 25 4805), prepared by Evolve Architecture. The drawing set includes Site, Floor and Elevation Plans.

Any revision of drawings supplied and/or development proposals with Geotechnical implications should be referred back to us for review.

3. SITE DESCRIPTION

The proposed development will be constructed within the following property (the site), which is located off the northern side of Wiroa Road, towards the eastern outskirts of the Okaihau District:

- 1032B Wiroa Road, Okaihau, legally described as Lot 3 DP 514318.

The site is shown on our appended Site Plan (Drawing No. 145142-G600) and in Figure 1 below.



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

The surface area of the subject site is approximately 2ha and is accessed at the southwestern boundary corner via an aggregate driveway that traverses towards an existing residential development near the middle of the southern boundary. An existing shed is also positioned in the southwestern portion of the block.

The fenced site is covered in pasture, with a small pocket of trees bounding the existing shed to the west.

Topographically speaking, the property lies on a west facing, broad volcanic flank that falls at gentle inclinations from the east down to the west, averaging less than 5°.

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

4. DEVELOPMENT PROPOSALS

Based on our review of the drawings supplied, it is our understanding that the client proposes to place a 70m² transportable minor dwelling on to the southwestern portion of the site, offset slightly to the northeast of the existing shed.

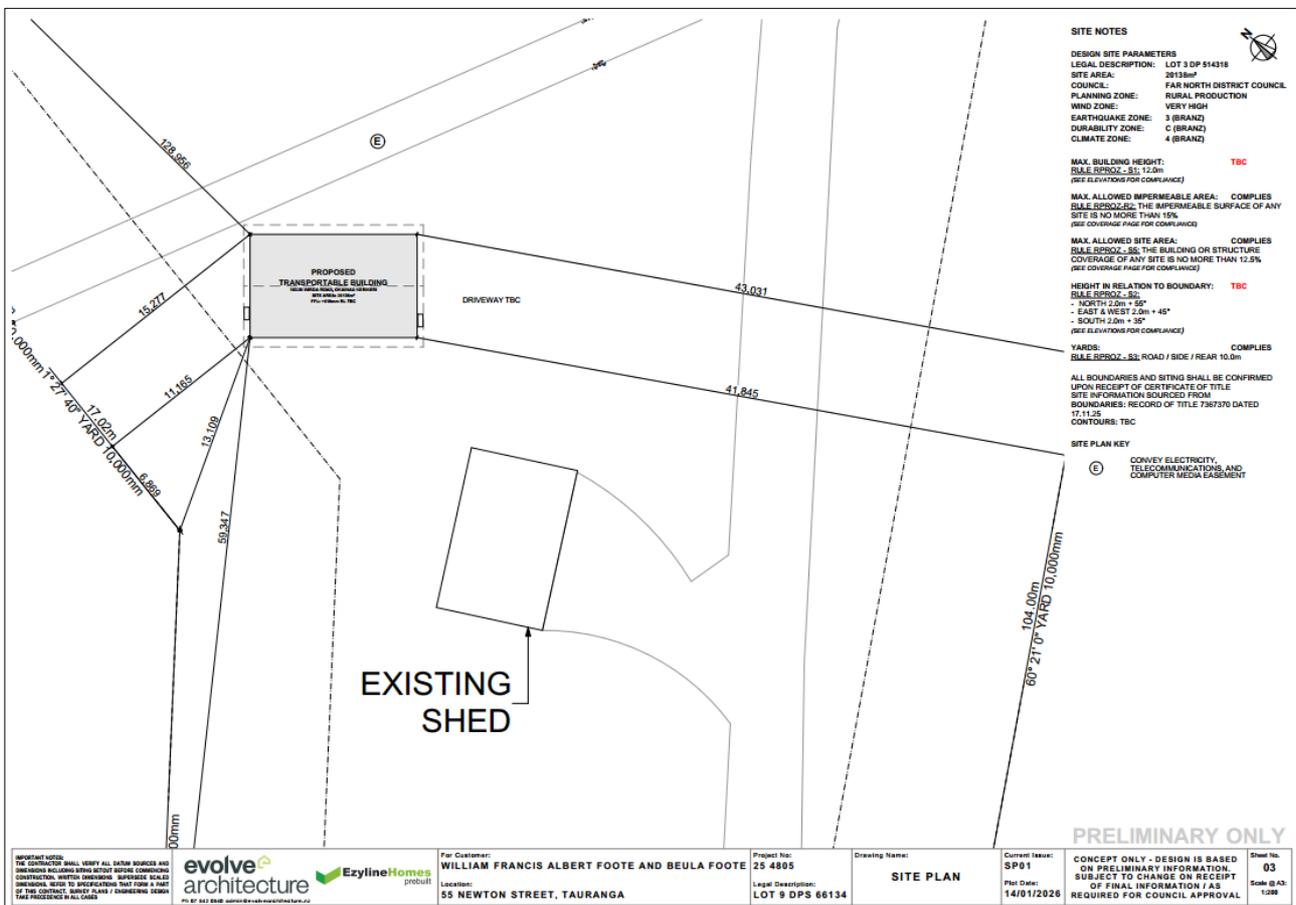


Figure 2: Architectural Site Plan depicting the proposed development (from Evolve Architecture).

The dwelling will be single-level and founded on a timber subfloor, suspended on bored, concrete encased, tanalised timber pile foundations, supporting lightweight timber framing, weatherboard cladding and a longrun steel roof.

We anticipate minimal earthworks will be undertaken in forming the building site, essentially associated with footing excavations for the proposed dwelling.

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

5. PUBLISHED GEOLOGY

Reference to the New Zealand Geology Web Map hosted by GNS Science indicates that the subject site and wider surrounding land are underlain by deposits of the **Kerikeri Volcanic Group Late Miocene Basalt of Kaikohe – Bay of Islands Volcanic Field**.

These deposits are approximately 9.7 to 1.8 million years in age and described as; *“Basalt lava, volcanic plugs and minor tuff.”*



Figure 3: Screenshot from New Zealand Geology Web Map hosted by GNS Science.

6. GEOTECHNICAL INVESTIGATION

6.1. FIELDWORK

Our fieldwork, as shown on our appended Site Plan, was undertaken on 16 February 2026 and involved:

- Drilling 2 (no.) 50mm diameter hand auger boreholes (HA01 & HA02) to refusal depths ranging between 1.1m and 1.6m below present ground level (bpgl), and
- Dynamic Cone Penetrometer (DCP-Scala) tests were undertaken from the base of each borehole to refusal depths ranging between 2.7m and 2.9m bpgl.

7. GEOTECHNICAL FINDINGS

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

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

7.1. TOPSOIL

Surficial topsoil was encountered in both boreholes to depths ranging between 0.20m and 0.30m bpgl.

7.2. NATURAL GROUND

The underlying natural deposits encountered were consistent with our expectations of Kerikeri Volcanic Group deposits, comprising of a low to moderate plasticity, very stiff clayey SILT, overlying no to low plasticity, very stiff to hard SILT and gravelly SILT from depths ranging between 0.60m to 0.90m bpgl.

Measured in-situ BS1377 adjusted peak Vane Shear Strengths ranged between 136kPa and 195kPa and/or 197kPa, the latter two being where soil strengths were in excess of the shear vane capacity, or the vane could not penetrate the soil (UTP).

DCP-Scala testing below the base of each borehole returned blow counts that ranged from 4 to greater than 20 blows per 100mm penetration, indicating medium dense to very dense stratum at depth.

The ratio of peak to remoulded vane shear strength values measured within the boreholes ranged between 2.0 and 2.7, indicating that the underlying subsoils are 'Moderately Sensitive' subgrade.

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

7.3. GROUNDWATER

Groundwater was not encountered in either borehole on the day of our investigation.

7.4. SUMMARY TABLE

The following table summarises our inferred stratigraphic profiling.

Table 1: Stratigraphic Summary Table

Investigation Hole ID	Termination Depth (m)	Depth to Base of Surficial Topsoil (m)	Vane Shear Strength Range within Natural Ground (kPa)	DCP-Scala Blow Count Range Below Borehole Base	DCP-Scala Refusal Depth Below Borehole Base (m)	Groundwater Depth (m)
HA01	1.6 ⁽¹⁾	0.30	158 – 197+ / UTP	6 – 20+	2.7	NE
HA02	1.1 ⁽¹⁾	0.20	136 - 195+ / UTP	4 - 16	NE	NE

Table Note: (1) Too Hard to Auger, NE= Not encountered

7.5. EXPANSIVE SOILS

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

In this instance, in the absence of laboratory testing, but instead adopting the visual-tactile method as per AS2870, considering the high clay content and low to moderate plasticity nature of the clayey silt crust present at foundation levels, we have adopted a conservative primary classification estimate of the soils underlying the site as follows:

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

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

8. GEOTECHNICAL ASSESSMENTS

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

- Qualitative slope stability, and
- Liquefaction susceptibility assessments.

8.1. QUALITATIVE SLOPE STABILITY

Due to the gentle topography of the property and surrounding influential land which averages less than 5°, land instability is not considered to be a constraint or risk to the proposed development.

8.2. LIQUEFACTION SUSCEPTIBILITY

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

A commonly accepted definition is: "Areas susceptible to liquefaction generally correspond with geologically young deposits (less than 10,000 years) located in relatively flat areas close to active or abandoned waterways, in coastal or estuarine areas, and/or areas of uncompacted or poorly compacted fill." None of these characteristics apply to this site.

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

- The FNDC on-line GIS Hazard Map categorises the site as an '*Unlikely*' Liquefaction Vulnerability area,
- Very stiff to hard soils of the Kerikeri Volcanic Group encountered during our investigations,
- DCP-Scala testing indicating medium dense to very dense stratum at depth below the boreholes,
- Groundwater was not present within either borehole on the day of our investigation,
- The site is situated on an elevated, broad volcanic flank, set no less than approximately RL346m New Zealand Vertical Datum (NZVD), with good water-shedding characteristics down to the west,
- There are no known active faults traversing through or close to the site, and
- Soils of the Kerikeri Volcanic Group underlie the site (geological age +1.8My).

8.3. LIQUEFACTION ASSESSMENT CONCLUSION

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

8.4. ANALYSIS CONCLUSIONS

Based on our observations, site survey, record research, hand auger borehole investigation and in-situ testing as described herein, we confirm that we have considered both foundation and ground stability risks, and are of the Professional Opinion that the subject development as described above should not be exposed to unsatisfactory Geotechnical Risk, subject to the following requirements:

In the long-term, given that all the recommendations within this report, or subsequent revisions, are adhered to then we do not anticipate any significant risk of instability either within or immediately beyond the property boundaries.

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

- i. The current proposed site development and associated building work to which an application of Building Consent (BC) must be made to FNDC should not accelerate, worsen, or result in slippage or subsidence on the land on which the building work is to be carried out or any other property; and
- ii. The land beneath the building footprint and surrounding immediate amenity area is neither subject nor likely to be subject to slippage or subsidence, provided the development is undertaken in accordance with the recommendations and guidance of this report.

9. CONCLUSIONS AND RECOMMENDATIONS

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

9.1. FOUNDATION DESIGN

The transportable minor dwelling will be founded on a timber subfloor, suspended on bored, concrete encased, tanalised timber pile foundations.

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

9.1.1. SHALLOW FOUNDATIONS BEARING CAPACITY

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

Table 2: Bearing Capacity Values

Parameters	Kerikeri Volcanic Group Soils
Geotechnical Ultimate Bearing Capacity	300 kPa
ULS Dependable Bearing Capacity ($\Phi=0.5$)	150 kPa

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

9.1.2. SHALLOW FOUNDATIONS ON EXPANSIVE SOILS

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

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

Given that the soils are not considered to lie within the definition of “good ground” as per NZS3604:2011, the design of shallow foundations is no longer covered by NZS3604:2011. Care must be taken to mitigate against the potential seasonal shrinkage and swelling effects of expansive foundation soils on both superstructures and floors. We therefore recommend SED should be undertaken by a qualified engineer for the design of all proposed foundations.

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

9.2. NZS1170.5:2004 SITE SUBSOIL CLASSIFICATION

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

9.3. SITE EARTHWORKS

We anticipate minimal earthworks will be undertaken in forming the building site, essentially associated with footing excavations for the proposed dwelling.

Earthworks should be undertaken in accordance with the following standards:

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

9.4. SITE CLEARANCE & PREPARATION

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

9.5. SUBGRADE PROTECTION

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

9.6. GENERAL SITE WORKS

We stress that any and all works should be undertaken in a careful and safe manner so that health and safety is not compromised, and that suitable erosion and sediment control measures should be put in place. Any stockpiles placed should be done so in an appropriate manner so that land stability and/or adjacent structures are not compromised.

Furthermore:

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

9.7. LONG-TERM FOUNDATION CARE & MAINTENANCE

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

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

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

To this end, care should be taken to avoid:

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

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

10. STORMWATER & SURFACE WATER CONTROL

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

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

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

11. ON-SITE WASTEWATER DISPOSAL

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

We recommend that all designs for on-site wastewater systems should be carried out by a suitably qualified professional experienced in on-site wastewater disposal.

12. UNDERGROUND SERVICES

The FNDC online GIS Water Services Map indicates that public underground service connections are not available to the property. Considering the existing developed nature of the site, other underground services, public or private, mapped, or unmapped, may be present.

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

13. FUTURE CONSTRUCTION MONITORING

The foregoing statements are Professional Opinion, based on a limited collection of information, some of which is factual, and some of which is inferred. Because soils are not a homogeneous, manufactured building component, there always exists a level of risk that inferences about soil conditions across the greater site, which have been drawn from isolated “pinprick” locations, may be subject to localized variations.

Generally, any investigation is deemed less complete until the applicability of its inferences and the Professional Opinions arising out of those are checked and confirmed during the construction phase, to an appropriate level.

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

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

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

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

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

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

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

- Pre-pour bored footing excavations.

14. LIMITATIONS

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

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

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

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

Yours faithfully,

WILTON JOUBERT LIMITED

Appendices:

Site Plan (1 sheet)

Hand Auger Borehole Records (2 sheets)

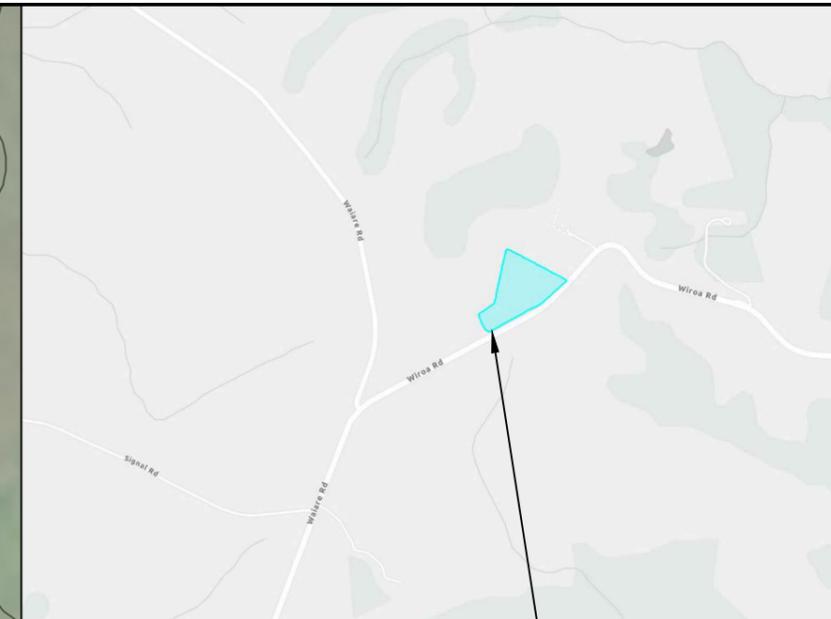
'Foundation Maintenance and Footing Performance' homeowner's guide, published by CSIRO (4 sheets)

WJL's Construction Monitoring Information (1 sheet)



340.0

345.0



SITE LOCATION

IMAGE SOURCE:
FAR NORTH DISTRICT COUNCIL LOCALMAPS

HA 01

HA 02

PROPOSED MINOR DWELLING

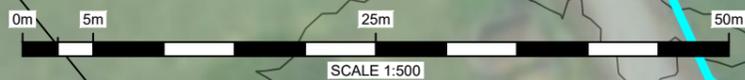
SYMBOL KEY



HAND AUGER LOCATIONS

GENERAL NOTES

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



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

DESIGNED BY:

DRAWN BY:
A.B

CHECKED BY:

SURVEYED BY:

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

GEOTECHNICAL

DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
SITE PLAN

PROJECT DESCRIPTION:
PROPOSED MINOR DWELLING

PROJECT TITLE:
**LOT 3 DP 514318
1032B WIROA ROAD
OKAIHAU
NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:500	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 145142-G600	ISSUE: A
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HAND AUGER : HA01

JOB NO.: 145142 SHEET: 1 OF 1

START DATE: 16/02/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: 1994 ELEVATION: Ground

FACTOR: 1.41 DATUM:

CLIENT: William & Beula Foote

PROJECT: New Minor Dwelling

SITE LOCATION: 1032B Wiroa Road, Okaihau

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Topsoil	TOPSOIL, dark brown, moist.		0.0 - 0.2						
	Kerikeri Volcanic Group	NATURAL: Clayey SILT, brown with occasional orange clast mottles, very stiff, moist, low to moderate plasticity.	0.2 - 0.8			158	59	2.7	
0.8m: Moist to wet.		0.8 - 1.0			197+	-	-		
SILT, minor clay, trace to minor clasts, brown with orange brown mottles and occasional black streaks, very stiff, moist to wet, no to low plasticity.		1.0 - 1.6			197+	-	-		
EOH: 1.60m - Too Hard To Auger		1.6 - 3.0			UTP	-	-	11	
			1.8					8	
			2.0					7	
			2.2					6	
			2.4					9	
			2.6					8	
			2.8					7	
			3.0					6	
			3.2					11	
			3.4					16	
			3.6					20+	

REMARKS

End of borehole @ 1.60m (Target Depth: 3.00m)

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

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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 Email: jobs@wjl.co.nz
 Website: www.wiltonjoubert.co.nz

HAND AUGER : HA02

JOB NO.: 145142 SHEET: 1 OF 1

START DATE: 16/02/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: DR4802 ELEVATION: Ground

FACTOR: 1.39 DATUM:

CLIENT: William & Beula Foote
 PROJECT: New Minor Dwelling
 SITE LOCATION: 1032B Wiroa Road, Okaihau

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Topsoil	TOPSOIL, dark brown, moist.		0.0 - 0.2						
Kerikeri Volcanic Group	NATURAL: Clayey SILT, dark brown with occasional red clast mottles, very stiff, moist, low to moderate plasticity.		0.2 - 0.4	Groundwater Not Encountered					
	0.4m: Light brown.		0.4 - 0.6		136	67	2.0		
	SILT, minor clay and clasts, light brown with orange mottles, very stiff, moist, no to low plasticity.		0.6 - 0.8						
	0.85m: 100mm lense of minor to some clay, low plasticity.		0.8 - 1.0						
	Gravelly/Clast SILT, light brown and purplish brown with orange mottles, very stiff to hard, no plasticity.		1.0 - 1.1						
	EOH: 1.10m - Too Hard To Auger		1.1 - 1.2						
			1.2 - 1.4						
			1.4 - 1.6						
			1.6 - 1.8						
			1.8 - 2.0						
			2.0 - 2.2						
			2.2 - 2.4						
			2.4 - 2.6						
			2.6 - 2.8						
			2.8 - 3.0						

REMARKS
 End of borehole @ 1.10m (Target Depth: 3.00m)

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

LOGGED BY: SJP
 CHECKED BY: CSH

▼ Standing groundwater level
 ▽ GW while drilling



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FOUNDATION MAINTENANCE AND FOOTING PERFORMANCE

Preventing soil-related building movement

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

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

SOIL TYPES

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

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

CAUSES OF MOVEMENT

SETTLEMENT DUE TO CONSTRUCTION

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

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

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

EROSION

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

SATURATION

This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume,

particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

SEASONAL SWELLING AND SHRINKAGE OF SOIL

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

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

SHEAR FAILURE

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

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

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

TREE ROOT GROWTH

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

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

TABLE 1. GENERAL DEFINITIONS OF SITE CLASSES.

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

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

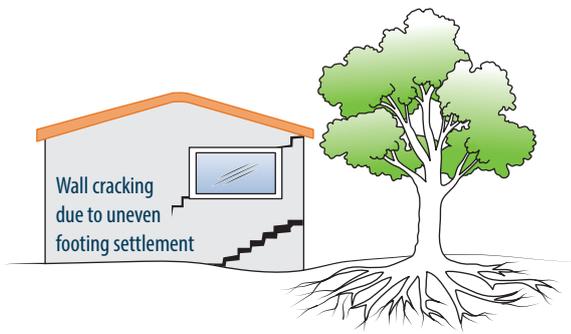


FIGURE 1 Trees can cause shrinkage and damage.

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

UNEVENNESS OF MOVEMENT

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

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

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

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

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

EFFECTS OF UNEVEN SOIL MOVEMENT ON STRUCTURES

EROSION AND SATURATION

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

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

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

SEASONAL SWELLING/SHRINKAGE IN CLAY

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

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

and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

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

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

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

MOVEMENT CAUSED BY TREE ROOTS

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

COMPLICATIONS CAUSED BY THE STRUCTURE ITSELF

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

EFFECTS ON FULL MASONRY STRUCTURES

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

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

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

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

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

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

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

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

EFFECTS ON FRAMED STRUCTURES

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

EFFECTS ON BRICK VENEER STRUCTURES

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

WATER SERVICE AND DRAINAGE

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

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

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

SERIOUSNESS OF CRACKING

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

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

PREVENTION AND CURE

PLUMBING

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

GROUND DRAINAGE

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

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

PROTECTION OF THE BUILDING PERIMETER

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

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

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

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

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

CONDENSATION

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

TABLE 2. CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS.

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

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

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

THE GARDEN

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

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

EXISTING TREES

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

INFORMATION ON TREES, PLANTS AND SHRUBS

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

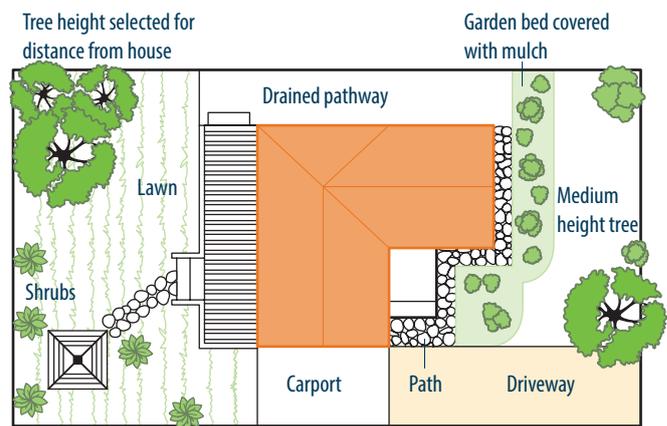


FIGURE 2 Gardens for a reactive site.

EXCAVATION

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

REMEDICATION

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

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

Construction Monitoring Services

Northland, Auckland-Waikato, Canterbury, Southern Lakes

Need a PS4?

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

Producer Statements 4 - Construction Review Documents (PS4's) relates to Building Consents (BC) only, not Resource Consents (RC), unless there is an element of the RC which requires a BC, e.g. a retaining wall needed to develop a subdivision.

In soils, RC's are usually verified with a "Statement of Professional Opinion as to Suitability for Building Development", or variations on that title.

CONSTRUCTION MONITORING SERVICES

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

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

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

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

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

In cases where engineers from different companies are appointed it is important to make sure all the required boxes are ticked as not to complicate matters when it comes to the issuing of all the relevant PS4's.

Note: sites in the Auckland area might requires multiple PS4's for the same component (e.g. a raft floor requires a Geotechnical Engineer to verify the bearing capacity of the platform and a Structural engineer needs to verify the structural components are according to the design.

Not to mention a Council inspection is also required on the same floor to verify position, plumbing and so on.

In Summary:

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



Construction Monitoring Enquiries

Email: jobs@wjl.co.nz

or scan QR code to visit our website