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

Office Use Only
Application Number:

Application for resource consent or fast-track resource consent

(Or Associated Consent Pursuant to the Resource Management Act 1991 (RMA)) (If applying for a Resource Consent pursuant to Section 87AAC or 88 of the RMA, this form can be used to satisfy the requirements of Schedule 4). Prior to, and during, completion of this application form, please refer to Resource Consent Guidance Notes and Schedule of Fees and Charges — both available on the Council's web page.

1. Pre-Lodgement Meeting

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

2. Type of Consent being applied for

(more than one circle can be ticked):

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

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: Robyn and Raymond Ferguson

Email: [redacted]

Phone number: [redacted]

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

6. Address for Correspondence

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

Name/s: MJD Environmental Ltd - Melanie Donaghy

Email: [redacted]

Phone number:

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

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

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

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

Name/s: Robyn and Raymond Ferguson

Property Address/ Location: 493 Hautapu Rd, RD 2, Kaikohe

Postcode 0472

8. Application Site Details

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

Name/s: Robyn and Raymond Ferguson

Site Address/ Location: 18 Worth Street, Kaitaia

Postcode

Legal Description: Lot 17 DP 3801 **Val Number:**

Certificate of title: NA5C/444

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

Site visit requirements:

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

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

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

Please contact the Applicants to arrange a site visit

9. Description of the Proposal:

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

To locate two separate dwellings onto a sewered site with a net site area of less than 1,200m2 within the Residential Zone of the Operative Far North District Plan.

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

10. Would you like to request Public Notification?

◯ **Yes** ☑ **No**

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

(more than one circle can be ticked):

- [x] **Building Consent** EBC-2025-664/0
- [ ] **Regional Council Consent (ref # if known)** Ref # here (if known)
- [ ] **National Environmental Standard consent** Consent here (if known)
- [ ] **Other (please specify)** Specify 'other' here

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

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

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

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

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

13. Assessment of Environmental Effects:

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

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

13. Draft Conditions:

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

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

14. Billing Details:

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

Name/s: (please write in full) Robyn and Raymond Ferguson

Email: [redacted]

Phone number: [redacted]

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

Fees Information

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

Declaration concerning Payment of Fees

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

Name: (please write in full) Robyn and Raymond Ferguson

Signature: (signature of bill payer) X [redacted] Date 19/03/2025

MANDATORY

15. Important Information:

Note to applicant

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

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

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

Fast-track application

Under the fast-track resource consent process, notice of the decision must be given within 10 working days after the date the application was first lodged with the authority, unless the applicant opts out of that process at the time of lodgement. A fast-track application may cease to be a fast-track application under section 87AAC(2) of the RMA.

Privacy Information:

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

15. Important information continued...

Declaration

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

Name: (please write in full) Melanie Donaghy (MJD Environmental Ltd)

Signature: [redacted] Date 19/03/2025

...d if the application is made by electronic means

Checklist (please tick if information is provided)

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

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

Land Use Resource Consent Application

Robyn & Raymond Ferguson
18 Worth Street, Kaitaia

Prepared by:

MJD Environmental
RESOURCE MANAGEMENT & PLANNING

Report Prepared For: Robyn & Raymond Ferguson

Authority: Far North District Council

Report Prepared By: _____

Melanie Donaghy
Senior Resource Management Consultant / Director

Report Reference: 120325MD

Date: 19th March 2025

MJD Environmental Limited / 5A Kākāriki Road / RD 3 / Whangārei / 0173 / New Zealand
*Ph: 021 230 2811 / Email: **melanie@mjdenvironmental.co.nz***

TABLE OF CONTENTS

APPENDICES

A. Certificate of Title
B. Proposed Building Plans
C. Relevant Planning Maps
D. Geotechnical Investigation Report
E. Stormwater Mitigation Report
F. Operative District Plan Rules Assessment

ABBREVIATIONS

RMA - Resource Management Act 1991
FNDP – Operative Far North District Plan
PFNDP- Proposed Far North District Plan
NRC - Northland Regional Council
RPS - Regional Policy Statement
NES - National Environmental Standards
RZ – Residential Zone
GRZ – General Residential Zone
AEE - Assessment of Environmental Effects
HAIL - Hazardous Activities and Industries List
FNDC – Far North District Council

1. INTRODUCTION

1.1 Report Basis

This Report has been prepared for Robyn and Raymond Ferguson in support of a resource consent application to locate two residential units onto a site located within the Operative Residential Zone. This land use application is specific to a property at 18 Worth Street, Kaitaia, legally described as Lot 17 DP 3801.

The Application has been prepared in accordance with Section 88 and the Fourth Schedule of the Resource Management Act, 1991 (RMA). Section 88 of the RMA requires that resource consent applications be accompanied by an Assessment of Environmental Effects (AEE) in accordance with the Fourth Schedule.

This Report also includes an analysis of the relevant provisions of the district, regional and national planning documents that are pertinent to the assessment, required under Section 104 of the RMA.

1.2 Further Information

Should Council require any additional information, or wish to clarify any matter raised by this proposal, please make contact via the address for service below:

1.3 Address for Service

All correspondence in respect to this Application should be addressed to:

MJD Environmental Ltd (5A Kākāriki Road, RD 3, Whangārei 0173)
Attention: Melanie Donaghy
Email: melanie@mjdenvironmental.co.nz
Telephone: 021 2302 811

1.4 Technical Advice

Specialist advice and design input was sought from the consultants listed in **Table 1.1** below.

Consultant	Service	Appendix
NZ Architectural Design Studio Ltd	Architectural Drawings	**B**
Wilton Joubert Consulting Engineers	Geotechnical Assessment Report	**D**
Wilton Joubert Consulting Engineers	Stormwater Mitigation Memorandum	**E**

Table 1.1 Specialist Technical Advice

1.5 Review of Draft Conditions

We kindly request that the processing planner email a copy of the draft consent conditions for our review prior to releasing the final decision for this Application.

1.6 Property Details

Applicant	Robyn & Raymond Ferguson
Site Location	18 Worth Street, Kaitaia
Legal Description	Lot 17 DP 3801
Certificate of Title	NA5C/444
Site Area	1145 square metres more or less
Consent Authority	Far North District Council (FNDC)
District Plan	Operative Far North District Plan (FNDP) Proposed Far North District Plan (PFNDP)
District Plan Zone	Residential Zone (FNDP) General Residential Zone (PFNDP)
District Wide Matters	NA
Reasons for Consent	Restricted Discretionary land use consent is required for the development, as two residential units will be located on a site with less than 600 m^2 available to serve each unit.

1.7 Relevant Title Memorials

There are no easements, consent notices, covenants or other relevant interests registered on the Certificate of Title. A copy of the Certificate of Title is attached at **Appendix A** for completeness.

1.8 Statutory Context

Section 104C of the RMA relates to the determination of applications for Restricted Discretionary Activities and states:

> **104C Determination of applications for restricted discretionary activities**
>
> (1) When considering an application for a resource consent for a restricted discretionary activity, a consent authority must consider only those matters over which—
>
> (a) a discretion is restricted in national environmental standards or other regulations:
>
> (b) it has restricted the exercise of its discretion in its plan or proposed plan.
>
> (2) The consent authority may grant or refuse the application.
>
> (3) However, if it grants the application, the consent authority may impose conditions under section 108 only for those matters over which—
>
> (a) a discretion is restricted in national environmental standards or other regulations:
>
> (b) it has restricted the exercise of its discretion in its plan or proposed plan.

Section 104(1) of the RMA sets out the matters that a consent authority must, subject to Part 2, have regard to when considering an application for resource consent. Section 104 states:

> **104 Consideration of applications**
>
> *(1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to–*
>
> *(a) any actual and potential effects on the environment of allowing the activity; and*
>
> *(ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and*

(b) any relevant provisions of—

1. a national environmental standard:

2. other regulations:

3. a national policy statement:

4. a New Zealand coastal policy statement:

5. a regional policy statement or proposed regional policy statement:

6. a plan or proposed plan; and

(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

(2) When forming an opinion for the purposes of subsection (1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect.

This Report focuses on the relevant matters in s104(1) and s104C and specifically:

- The actual and potential environmental effects (s104(1)(a);
- The relevant provisions of the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations (s104(1)(b)(i));
- The relevant provisions of the Northland Regional Policy Statement (s104(1)(b)(v);
- The relevant provisions of the Operative District Plan (s104(1)(b)(vi)); and
- The relevant provisions of the Proposed District Plan (s104(1)(b)(vi).

2. SITE DESCRIPTION AND SURROUNDING ENVIRONMENT

2.1 Subject Site and Surrounding Environment

Address and Location

The site is legally described as Lot 17 DP 38101 (NA5C/444) and is accessed from the south-eastern side of Worth Street, approximately 203 metres east of the intersection with Pukepoto Road, within the south-western outskirts of the Kaitaia urban District. The site comprises a rectangular shaped allotment with an area of approximately 1,145 m^2.

Illustration 2.1 Site Locality

SOURCE: FNDC GIS Maps, download date 12th March 2025

Planning Notations

The land is zoned Residential (RZ) within the Operative Far North District Plan (FNDP) and is located within the General Residential Zone (RRZ) within the Proposed Far North District Plan (PFNDP).

Topography, Vegetation and Existing Development

Topographically speaking, the site lies within a generally sloping, elevated plateau. The site is east facing and initially falls at gentle grades averaging less than 3˚, increasing slightly to grades averaging less than 5˚ across the south-eastern corner of the Lot. Existing ground levels across the site range between approximately 29.5m and 27m New Zealand Vertical Datum (NZVD). The land beyond the south-eastern boundary is encompassed by the Kaitaia Hospital environment and displays similar inclinations.

A residential unit once occupied the north-western end of the site. However this was burnt down, with remnants removed from the site. The site is currently vacant of any built development and covered in grass, with pockets of exposed surficial soil and debris. Aside from the south-eastern boundary of the site, large trees and bush bound much of the site boundaries.

Illustrations 2.2 & 2.3 Subject Site *SOURCE: www.raywhite.co.nz*

Existing Access

The site is currently accessed via an existing vehicle crossing and partial concrete driveway at the north-eastern corner of the site. A new compliant driveway, replacing the existing concrete driveway is proposed to service the two new dwellings.

Surrounding Environment / Development Patterns

The surrounding environment is a mix of medium and high density residential allotments, with some allotments, including two properties immediately adjacent to the site (11a and 11B Worth St) less than 400 m^2 in net site area. This can be noted via **Illustration 2.3** below. The residential properties fronting Worth Street are predominantly fenced off from the road and generally include single level bungalows with their original hip, shingle roofs and wooden joinery, developed in the 1950s / 1960s.

The larger property immediately adjoining the site to the south-east is occupied by the hospital.

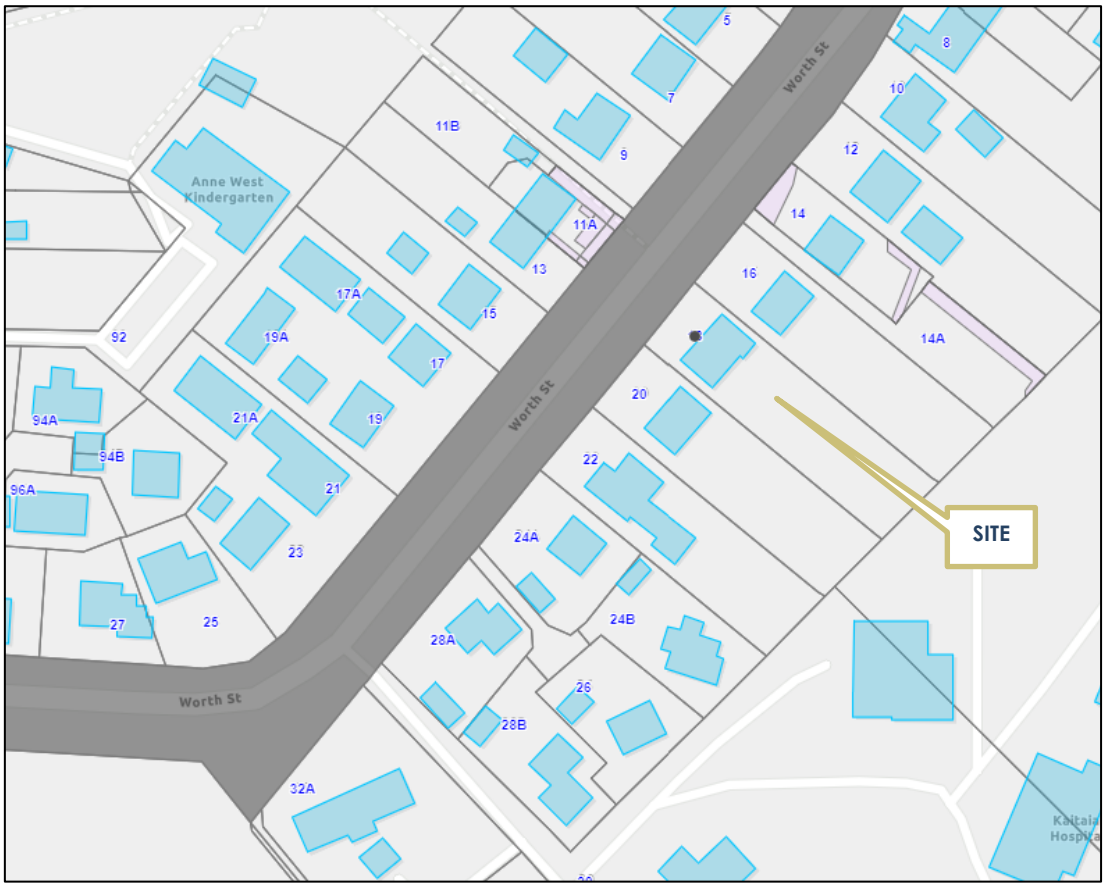


Illustration 2.3 *Surrounding Density SOURCE: FNDC GIS Maps, download date 12th March 2025*

3. DESCRIPTION OF THE PROPOSAL

3.1 General

The proposal seeks to locate two independent residential units with associated detached garaging onto the site which will serve as two new homes for future residents.

In consideration of the FNDP, the proposal will enable the location of two residential units onto a vacant residential site with less than 600 m² available to serve each independent unit. The site is some 1,145 m² in net site area. Two independent garages will also be constructed over the site, each to serve a residential unit. The site layout of the proposed development can be observed via **Illustration 3.1** below which includes an extract from the Site Plan provided at **Appendix B**.

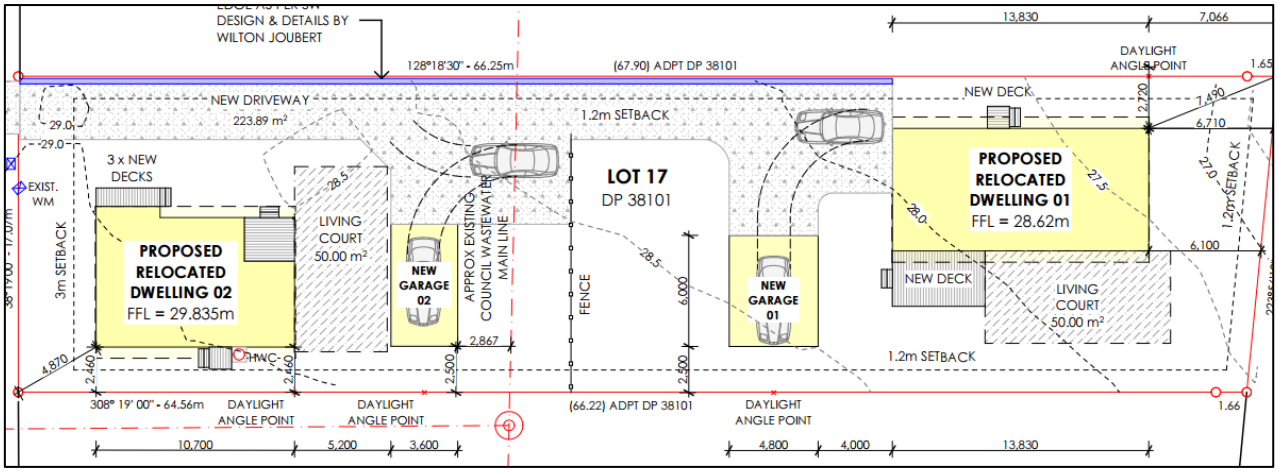


Illustration 3.1 ***Excerpt from the Site Plan*** *SOURCE: Site Plan – NZADS Ltd*

Proposed Development Details:

- 223.89 m² driveway (including manoeuvring areas) to serve both dwellings;
- Single level 3-bedroom relocated dwelling (1) – 91.55 m² building coverage with 15 m² front deck and 1.44 m² rear landing deck;
- Garage (1) – 28.88 m²;
- Single level 2-bedroom relocated dwelling (2) – 70.63 m² building coverage with 1.44 m² front landing deck, 6,35 m² rear living deck and 4.14 m² rear deck off the master bedroom;
- Garage (2) – 24.95 m²

3.2 Access

As already discussed within this Assessment, the site is accessed directly from Worth Street via an existing vehicle crossing. A new compliant replacement driveway, inclusive of two manoeuvring areas, for the residential units is proposed.

3.3 Building Site Suitability and Earthworks

A Geotechnical Assessment Report has been prepared in support of the proposal by Wilton Joubert Consulting Engineers (WJL), which can be found at **Appendix D**.

It is the expert opinion of WJL that the subject site is suitable for the proposed development provided the recommendations of the WJL Geotechnical Assessment Report are implemented.

No significant earthworks are required to enable the proposal. Excavations will be limited to minor surficial soil stripping and debris removal along with bored footing excavations and will be carried out in accordance with the WJL Geotechnical Assessment.

3.4 Three Waters Management

The site is serviced by reticulated wastewater and water systems, noting that a Council sewer line runs across the site (as shown on the Site Plan provided at **Appendix B**).

Stormwater run-off will be managed on site via detention tanks and a driveway silt trap, in accordance with the Stormwater Mitigation Assessment prepared by WJL, provided at **Appendix E**).

4. RESOURCE CONSENTS REQUIRED

4.1 Relevant Zoning and District Wide Matters

The subject site is located within the Residential Zone (RZ) of the FNDP and the General Residential Zone (GRZ) of the PFNDP. A copy of the relevant operative planning maps are attached at **Appendix C**.

4.2 District Plan Rule Assessment

A complete assessment of the FNDP rules is provided at **Appendix F**.

OPERATIVE FAR NORTH DISTRICT PLAN (FNDP)

Resource consent is required under the Urban Environment Chapter (Chapter 7) of the FNDP, within the Residential Zone (Section 6), as informed below:

Residential Zone (RZ)

- **Rule 7.6.5.1.2 – Residential Intensity** – The site is sewered and less than 600 m^2 net site area is available to serve each residential unit. Consent is therefore required as a **Restricted Discretionary Activity** in accordance with Rule 7.6.5.3.1 as more than 300 m^2 net site area is available to serve each residential unit.

PROPOSED FAR NORTH DISTRICT PLAN (PNDP)

The Proposed Far North District Plan (PFNDP) was notified on Wednesday 27 July 2022. Rules in a proposed plan have legal effect once the Council makes a decision on submissions relating to that rule and publicly notifies the decision, unless the rule has immediate legal effect in accordance with Section 86(3) of the RMA.

The further submission period closed on 4 September 2023. However, Council are yet to make a decision on submissions received and publicly notify the decision. Therefore, only rules within the PFNDP with immediate legal effect have weight at this time. These rules are identified with a 'hammer' in the Plan. Rules that do not have immediate legal effect do not trigger the need for a resource consent under the PFNDP.

An assessment of the proposal against the rules with immediate legal effect has been undertaken. In this case, there are no proposed rules with immediate legal effect relevant to the subject application.

While it is noted that the proposal infringes a General Residential Zone Rule within the Residential Zone Chapter of the PFNDP, no weight is given to this infringement as it currently has no legal effect. For completion, an assessment of the proposed rule is provided below:

General Residential Zone (GRZ)

- **'Proposed' Rule GRZ-R3 – Residential Activity (standalone residential units)** – The number of standalone residential units will exceed the permitted criteria of one. However, as discussed, this Rule currently has no legal effect given the status of the Proposed Plan and consent is therefore not currently required under the Proposed Far North District Plan.

4.3 Assessment of National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 (NES-CS)

All applications that involve subdivision, or an activity that changes the use of a piece of land, or earthworks are subject to the provisions of the NES-CS. The regulation sets out the requirements for considering the potential for soil contamination, based on the HAIL (Hazardous Activities and Industries List) and the risk that this may pose to human health as a result of the proposed land use.

Given the proposal includes the disturbance of soil, albeit minimal, the NES-CS has been considered in the context of this proposal.

Prior to the fire which burnt the residential unit down on the site, the site has been used for residential activity for at least 50 years. The proposed development will not result in a change of use to the site.

A review of Council records including the consent history has not uncovered any record of HAIL activities having been undertaken on the site and the site is not located on the NRC 'Selected Land-Use Register'.

In light of the above findings, no further consideration of this Standard is considered to be necessary.

4.4 Summary of Activity Assessment

On the basis of the above assessment, the proposal is assessed overall as a **Restricted Discretionary** Activity and is subject to the provisions of Sections 104, 104C and Part 2 of the Resource Management Act 1991.

4.5 Other Approvals Required

A building consent is required to give effect to this proposal. The building consent application has been lodged with Council, referenced: **EBC-2025-664/0**. No other approvals are required to give effect to the proposed development.

5. NOTIFICATION ASSESSMENT

5.1 Section 95A – Public Notification

Section 95A of the RMA specifies the standard tests for public notification. The steps that must be followed in determining whether to publicly notify a resource consent application are set out below.

Step 1 – *Council must publicly notify an application for resource consent if:*

a) *The applicant has requested that the application be publicly notified.*
b) *Public notification is required under section 95C.*
c) *The application is made jointly with an application to exchange recreation reserve land under section 15AA of the Reserves Act 1977.*

The Applicants do not request public notification and the Application is not made jointly with an application to exchange recreation reserve land. Public notification is not required.

Step 2 – *If not required by step 1, public notification is precluded in the following circumstances:*

a) *The application is for 1 or more activities, and each activity is subject to a rule or National Environmental Standard (NES) that precludes public notification.*
b) *The application is for a resource consent for a controlled activity or a boundary activity, but no other activities.*

The activity is not precluded from public notification by any rule or NES, and the proposal is not made solely for a controlled or for a boundary activity. Public notification is not precluded.

Step 3 – *If not precluded by step 2, public notification is required where:*

a) *The application is for 1 or more activities, and any of those activities are subject to a rule or NES that requires public notification.*
b) *The consent authority decides, in accordance with section 95D, that the activity will have or is likely to have adverse effects on the environment that are more than minor.*

No rule or NES requires the proposal to be publicly notified. An assessment pursuant to section 95A has been undertaken in **Sections 5.6 – 5.8** below, of which concludes adverse effects of the proposal are assessed as being less than minor on the environment. On this basis, public notification is not required.

Step 4 – *Notwithstanding the outcome of steps 3 and 4, an application must be publicly notified where special circumstances exist in relation to the application that warrant the application being publicly notified.*

In this instance, there is nothing particularly noteworthy about the proposal and it is therefore considered that the Application cannot be described as being out of the ordinary or giving rise to special circumstances.

5.2 Section 95D – Environmental Effects Assessment

The following sections set out an assessment of the actual and potential effects on the environment associated with the proposal in accordance with the requirements of section 95D.

5.3 Existing Environment

Section 104(1)(a) of the RMA requires a consideration of any actual and potential effects on the environment of allowing an activity. For the purposes of this consideration, it is necessary to establish the correct environment on which the effects are to be assessed.

The existing state of the environment has been described in **Section 2** of this AEE. This section described the site itself, the existing built development in the area, and also includes an assessment of development patterns in the surrounding environment.

These established uses should be considered as part of the existing environment and they form part of the basis upon which the effects of the proposed activity should be assessed against.

As far as we are aware, there are no known unimplemented resource consents near the site that would influence the existing environment.

Overall, the existing environmental context, including existing development patterns and other permitted activities in the surrounding environment, make up the 'existing environment' on which the effects of the proposal are to be assessed.

5.4 Permitted Baseline

Section 104(2) of the RMA allows a consent authority to disregard an adverse effect of an activity on the environment if a plan (the WDP in this instance) permits an activity with that effect. This is commonly referred to as the permitted baseline.

The permitted level of development is one residential unit per 600 m^2 net site area. The extent of adverse effects that extend beyond this permitted baseline in this instance, equates to a secondary residential unit to be located on the site, providing approx. 572.5 m^2 of net site area available for each unit. This is a shortfall of approx. 27.5 m^2 of net site area available for each of the two proposed residential units.

Only effects specific to the increased site density should be considered within any effects assessment for this proposal.

5.5 Effects to be Disregarded

For the purpose of the public notification assessment, adverse effects on persons who own or occupy the land within which the activity will occur, or any land adjacent to that land must be disregarded. Accordingly, land excluded from the public notification assessment is identified in **Illustration 5.1** below.

Illustration 5.1 Land to be excluded from the public notification assessment (identified with red markers)
Source: FNDC GIS Maps - Download Date 12th March 2025

The effects of trade competition and effects on any person who has provided written approval are also to be disregarded.

Trade competition is not a relevant concern in this instance and no persons have been approached to provide their written approval to the proposal.

The relevant matters as they relate to the proposal are assessed below.

5.6 Effects Assessment / Matters of Discretion

The matters of which Council shall restrict its discretion, as outlined within Rule 7.6.5.3.1 (Residential Intensity) of the Far North District Plan, are addressed below:

(a) The character and appearance of building(s) and the extent to which they will be compatible with the principal activity on the site and with other buildings in the surrounding area;

The proposed development seeks to locate two small scale dwellings onto the site which are not dissimilar in character and appearance from each other or to those in the existing environment.

(b) The siting of the building(s), decks and outdoor areas relative to adjacent properties in order to avoid visual domination and loss of privacy and sunlight to those properties;

The proposed single level dwellings will be located on the site so as to ensure full compliance with the Rules pertaining to boundary setbacks, height, building coverage, height in relation to boundary and impervious areas.

(c) The size, location and design of open space and the extent to which trees and garden plantings are utilised for mitigating adverse effects;

The proposed development is small in scale, covering only 21.3 % of the site with buildings and 41.4 % of the site with impervious areas (inclusive of the driveway and manoeuvring areas). Each of the proposed dwellings is able to provide a minimum 50 m^2 outdoor living court and the property boundaries are predominantly screened with existing mature vegetation.

(d) The ability of the immediate environment to cope with the effects of increased vehicular and pedestrian traffic;

Effects beyond the permitted baseline on vehicular and pedestrian traffic are limited to those associated with one additional small scale dwelling. One additional user to this suburban area is not considered to raise effects of a minor or more than minor nature to traffic infrastructure within the receiving environment.

(e) The location and design of vehicular and pedestrian access, on site vehicle manoeuvring and parking areas and the ability of those to mitigate the adverse effects of additional traffic;

As discussed above, effects on the existing traffic infrastructure are expected to be negligible. The proposed site layout provides for compliant on-site access, parking and manoeuvring.

(f) Location in respect of the roading network – sites on local roads are not generally considered appropriate for activities which generate high levels of pedestrian and vehicular activity;

The FNDP anticipates one user / dwelling within the subject site. Both of the proposed dwellings will share the existing vehicle crossing, avoiding the need for creating an additional

crossing off Worth Street. One additional user to the site is not considered to generate high levels of pedestrian and vehicular activity.

(g) Noise generation and the extent to which reduction measures are used;

The proposed residential development is expected to comply with the noise controls of the FNDP. Construction / vehicle noise associated with the placement of the dwellings onto the site and connection to infrastructure will be temporary and carried out within accordance of the noise controls of the FNDP.

(h) Any servicing requirements and/or constraints of the site – whether the site has adequate water supply and provision for disposal of waste products and stormwater;

Connections to Council reticulated wastewater and water are available to service the proposed development. Stormwater will be managed on-site by way of two detention tanks and a driveway silt trap, as discussed within the Stormwater Mitigation Memorandum attached at **Appendix E**.

(i) Whether the development is designed in a way that avoids, remedies or mitigates any adverse effects of stormwater discharge from the site into reticulated stormwater systems and/or natural water bodies.

As recommended within the appended Stormwater Mitigation Memorandum prepared by WJL, discharge from the proposed detention tanks and driveway silt trap will be directed via sealed pipes to an underground spreader pipe in a rock-filled dispersal trench. The area directly downslope of the proposed dispersal device will be planted out to provide additional erosion protection and evapotranspiration.

(j) The ability to provide adequate opportunity for landscaping and buildings and for all outdoor activities associated with the residential unit(s) permitted on the site;

As discussed, only 21.3 % of the site will be covered by buildings inclusive of two dwellings and two garages. Compliant outdoor living courts and on-site access and manoeuvring are available to serve each of the proposed dwellings. While the site boundaries already include mature vegetation, there will be ample space available for the provision of additional future landscaping associated with each of the proposed dwellings.

(k) The degree to which mitigation measures are proposed for loss of open space and vegetation.

Given the small scale / bulk of the proposed development, combined with the existing environment, the proposal is not considered to give rise to any adverse effect on open space and vegetation over and above the permitted baseline.

(l) Any adverse effects on the life supporting capacity of soils;

The site is zoned Residential and located within a residential settlement / built-up area and does not have soils deemed as being 'highly productive'. Residential development is anticipated at this locale.

(m) The suitability of sites for building and access;

A site specific Geotechnical Assessment has been undertaken by WJL and is provided at **Appendix D**. This assessment supports the proposal and gives recommendations in regard to foundations, earthworks and general site works.

(n) Visual effects of site layout on the natural character of the coastal environment;

Not applicable.

(o) The effect on indigenous vegetation and habitats of indigenous fauna.

The site does not contain any significant areas of indigenous vegetation or significant habitats of indigenous fauna. No vegetation clearance is required.

5.7 Positive Effects

The proposal will provide two warm and dry small scale dwellings for future residents to reside in, noting that the country is currently experiencing a shortage in housing. The proposed development will replace the previous dwelling which was burnt down in a fire.

5.8 Conclusion of Effects Assessment

Overall, the proposed development is considered to present less than minor adverse environmental effects in all respects.

Public notification is therefore not required.

5.9 Section 95B – Limited Notification

If the Application is not publicly notified under section 95A, Council must follow the steps set out in section 95B to determine whether limited notification is required. The steps that must be followed are set out below.

Step 1 – *Council must determine and notify any:*

a) Affected protected customary rights groups; or

b) Affected customary marine title groups (in the case of an application for a resource consent for an accommodated activity).

c) Council must then determine:

i. Whether the proposed activity is on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement; and

ii. Whether the person to whom the statutory acknowledgement is made is an affected person under section 95E.

No such circumstances apply. Therefore, limited notification is not required.

Step 2 – *If not required by step 1, limited notification is precluded in the following circumstances:*

a) The application is for a resource consent for 1 or more activities, and each activity is subject to a rule or National Environmental Standard that precludes limited notification.

b) *The application is for a resource consent for either or both of the following, but no other activities;*

i. A controlled activity that requires consent under a district plan;

ii. A prescribed activity (see Section 360H(1)(a)(ii).

The activity is not precluded from limited notification by any rule or NES, and the proposal is not made solely for a controlled activity. Therefore, limited notification is not precluded.

Step 3 – *If not precluded by step 2, affected persons must be notified. Limited notification is required where determines that:*

a) In the case of a boundary activity, determine in accordance section 95E, whether an owner of an allotment with an infringed boundary is an affected person.

b) *In the case of any other activity prescribed under Section 360H(1)(b), a prescribed person in respect of the proposed activity.*

Under Section 92B(8) of the RMA a determination of whether a person is an affected person in accordance with Section 95E must be made for any other activity.

The Application is not made for a boundary activity. Further, an assessment pursuant to section 95E has been undertaken in the following Section, which concludes there are no affected persons. On this basis, limited notification is not required.

Step 4 – *Council must determine whether special circumstances exist that warrants notification of the application to any other persons not already determined to be eligible for limited notification (excluding persons assessed under section 95E as not being affected persons).*

As stated previously, no special circumstances exist that would warrant the Application being notified to any other person.

5.10 Affected Party Assessment (Section 95E)

In undertaking an assessment of the effects of the proposal, due consideration has been given to the extent of actual and potential adverse effects on adjacent landowners.

Section 95E(2)((a) prescribes that a consent authority '….*may disregard an adverse effect of the activity on the person if a rule or a national environmental standard permits an activity with that effect;'*. A permitted baseline has been adopted as part of the effects assessment above. The permitted baseline provides for residential development on the subject site in the form of a compliant MRU and a principal residential unit. With this in mind, only adverse effects relating to the separation distance of the two dwellings (being greater than 15 m) should be considered when considering adverse effects of the proposal.

Section 95E(2)(b) does not apply to the proposal as the proposal is a Discretionary Activity.

In regard to Section 95E(2)(c), there are no relevant statutory acknowledgements.

Based on the environmental effects conclusion provided at **Section 5.8** of this AEE, it is considered that no persons will be adversely affected to a minor or more than minor extent by the proposal.

5.11 Notification Recommendation

Overall, the above assessments conclude that this Application can be processed without notification because:

- Notification is not precluded, nor is it required;
- The Applicants do not request public notification;
- The adverse effects of the activity on the environment will be less than minor and no person is considered to be adversely affected by the proposal; and
- There are no special circumstances to warrant notification.

6. SECTION 104 ASSESSMENT

6.1 Assessment of Effects

Section 104(1)(a) requires consideration of any actual and potential effects on the environment of allowing the activity. An assessment of effects carried out in accordance with Section 95D has been provided above. That assessment and the conclusion that any adverse effects arising from the proposal will be less than minor informs an assessment of effects under Section 104(1)(a).

Some positive effects will arise from the development being undertaken, whereby it will provide two warm and dry residential units for future residents to reside in.

Overall, the effects associated with the proposal are minimal and are therefore acceptable within the receiving environment.

6.2 National and Regional Planning Documents

As discussed in **Section 4.3** above, the proposal is permitted in terms of the relevant National Environmental Standard documents.

The Regional Policy Statement for Northland (RPS) is relevant to consider and is discussed and assessed below at **Section 6.2.1**.

6.2.1 Regional Policy Statement for Northland (RPS)

The Regional Policy Statement for Northland (RPS) provides a broad direction and framework for managing Northland's natural and physical resources. These include land, water, air, soil, minerals, plants, animals and all built structures.

We consider the proposal to be consistent with the RPS as it provides for development without compromising indigenous ecosystems and biodiversity, freshwater resources, natural character, landscapes, sites of cultural or historic significance or levels of amenity and infrastructure services.

6.3 District Plan Objectives and Policies

Section 104(1)(b)(vi) requires consideration of the relevant objectives and policies contained in any Operative or proposed District Plan.

6.3.1 Operative District Plan Assessment

The relevant Objectives and Policies contained in the Operative Far North District Plan addressing the proposal are contained within Section 7.6 (Residential Zone(RZ)) of the Urban Environment Chapter. These objectives and policies seek to control adverse effects from development that does not have a residential character, scale and intensity similar to that of existing residential development, seeking to provide for a range of activities that are compatible in terms of their effects with the predominant residential use and character of those areas.

The Objectives and Policies within the RZ which are relevant to the proposal are assessed below:

Objective 7.6.3.1 *– To achieve the development of new residential areas at similar densities to those prevailing at present.*

Comment: The surrounding environment is primarily characterised by low to medium density residential development, inclusive of sites which provide a higher residential density than that proposed under this application. The proposal will provide two small scale dwellings and associated garaging on a single site of some 1,145 m^2, providing approx. 572.5 m^2 of land for each of the two residential developments. The subject site is only 28.5 m^2 smaller than that anticipated for two

dwellings within the Residential Zone and this level of development is consistent with the existing environment.

Objective 7.6.3.2 *– To enable development of a wide range of activities within residential areas where the effects are compatible with the effects of residential activity.*

Comment: The proposal seeks to provide for residential activity within the Residential Zone.

Policy 7.6.4.4 *– That the Residential Zone provide for a range of housing types and forms of accommodation.*

Comment: The proposal will provide two small scale dwellings to be utilised for residential activity on a large, predominantly flat, residential site, not dissimilar to existing forms of accommodation in the immediate surrounds of the site.

Policy 7.6.4.6 *– That activities with net effects that exceed those of a typical single residential unit, be required to avoid, remedy or mitigate those effects with respect to the ecological and amenity values and general peaceful enjoyment of adjacent residential activities.*

Comment: While the proposal will provide for two dwellings on one site, the proposed density is consistent with the existing environment. In addition, the proposed scale and placement of the subject dwellings will ensure that the amenity and general peaceful enjoyment of adjacent residential activities will be maintained.

Policy 7.6.4.7 *– That residential activities have sufficient land associated with each household unit to provide for outdoor space, planting, parking and manoeuvring.*

Comment: As discussed within the Effects Assessment of this Report, only 21.3 % of the site will be covered by buildings inclusive of two dwellings and two garages. Compliant outdoor living courts and on-site access and manoeuvring areas will be provided to serve each of the proposed dwellings. While the site boundaries already include mature vegetation, there will be ample space available for the provision of additional future landscaping associated with each of the proposed dwellings.

Policy 6.6.4.8 *– That the portion of a site or of a development that is covered in buildings and other impermeable surfaces be limited so as to provide open space around buildings to enable planting, and to reduce adverse hydrological ecological and amenity effects.*

Comment: As provided within the attached Stormwater Mitigation Memorandum prepared by WJL, the proposed development will provide for on-site stormwater management, ensuring that any adverse hydrological and amenity effects will be minimal and therefore acceptable within the receiving environment.

Policy 7.6.4.9 *– That sites have adequate access to sunlight and daylight.*

Policy 7.6.4.10 *– That provision be made to ensure a reasonable level of privacy for inhabitants of buildings on a site.*

Comment: The site is currently vacant, but was previously in residential use prior to a fire destroyed the dwelling. The location of two small scale dwellings and associated curtilage will enable efficient use of the large site. The proposed siting of each of the subject dwellings will ensure full compliance with the building bulk and location requirements of the Residential Zone, ensuring a reasonable level of privacy for inhabitants of buildings on a site and adequate access to sunlight and daylight for residents.

Conclusion of Operative FNDP Objective and Policy Assessment

Overall, the proposal is consistent with the relevant Objectives and Policies of the Operative Far North District Plan.

6.3.2 Proposed District Plan Assessment

The further submission period on the PFNDP closed on Monday, 4th September 2023. However, Council is yet to make a decision on submissions made and publicly notify this decision. Therefore, the subject application shall only 'have regard to' the relevant Objectives and Policies of the PFNDP.

Relevant Objectives and Policies within the PFNDP are contained within the General Residential Zone Chapter, seeking to provide a variety of densities, housing types and lot sizes, responding to housing needs, capacity of available or programmed development infrastructure, the amenity and character of the receiving environment while reducing urban sprawl. The proposal is considered to be largely consistent with the anticipated outcome of the relevant Objectives and Policies of the PFNDP.

6.4 Other Matters

Section 104(1)(c) provides for consideration of any other matters that may be relevant to the activity.

In this case, no other matters are considered relevant in the consideration of this Application.

6.5 Part 2 Assessment

Regard has been given to Part 2 of the Resource Management Act 1991, in particular the Purpose of the Act (Section 5) and Other Matters (Section 7). In considering the provisions in these sections in relation to this Application, it is considered that the activity will use and develop the physical resources of the site in a sustainable manner for the following reasons:

- The proposal enables the efficient use of resources by allowing land to be developed and utilised in general accordance with the intentions of the FNDP.
- Earthworks associated with the proposed development will be minimal, confined to establishing the proposed building foundations and trenching for utility services. All earthworks will be carried out in accordance with the recommendations provided within the WJL Geotechnical Assessment Report provided at **Appendix D**.
- The subject site is not located within the Coastal Environment or in close proximity to any waterways and there are no natural inland wetlands within or adjoining the site.
- Although the proposed residential density exceeds that permitted for the site, additional housing is anticipated at the locale under the FNDP and the proposed building bulk and location achieves full compliance with the Rules of the Residential Zoning.
- The proposed development will provide two small scale dry and warm homes for future residents to enjoy, being an efficient use of a large vacant residential site located within an existing built-up environment, thereby supporting the social, economic and cultural well-being and the health and safety of others.

The principles of the Treaty of Waitangi have been taken into account in accordance with Section 8 of the RMA. In this regard, it is noted that there are no known matters of National Importance relevant to the subject site nor is the site known to be of significance to Iwi or Hapū. The proposal does not create any additional allotments or involve any extensive earthworks or indigenous vegetation removal and the site was previously occupied by a dwelling and is located within a 'built-up' residential settlement. For these reasons, no consultation has been carried out with local Hapū.

The effects of the proposal are considered to be less than minor and the proposal accords with the relevant Objectives and Policies of the RPS and the Operative District Plan provisions.

Overall, the proposal enables sustainable use of land and does not compromise the purpose of the RMA or other matters specified in Part 2 of the said Act.

7. CONCLUSION

The site is located within the Residential Zone of the Operative Far North District Plan, whereby the proposal requires consent as a Restricted Discretionary Activity.

The proposal seeks land use consent to locate two residential units onto a site located at 18 Worth Street, Kaitaia (Lot 17 DP 38101) whereby it will not fully comply with the requirements of Rule 7.6.5.1.2 – Residential Intensity – as the site is sewered and less than 600 m^2 net site area is available to serve each residential unit.

The proposal will support the national housing shortage by providing two small scale homes and associated curtilage for families to reside in, on a vacant residential site.

From the foregoing assessment, the actual and potential effects on the environment are considered to be acceptable and appropriate. Any adverse effects on the environment can be adequately mitigated to an acceptable level within the receiving environment.

The proposal is considered to promote the sustainable management imperative as outlined in Part 2 of the RMA and is consistent with the policy framework found in the relative planning documents.

In terms of Section 95 of the RMA, the statutory tests for non-notification are fulfilled and it is concluded that the Application should proceed on a non-notified basis.

Having regard to all of the relevant matters in Sections 104(1) and 104C of the RMA, it is respectfully requested that the Far North District Council approve the Application.

As per **Section 1.5** of this AEE, we would appreciate the opportunity to comment on any draft conditions prior to the release of the decision.

Melanie Donaghy
Senior Resource Management Consultant / Director
MJD Environmental Ltd

APPENDIX A: Certificate of Title

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**NA5C/444**
Land Registration District	**North Auckland**
Date Issued	23 March 1965

Prior References
NA1561/24

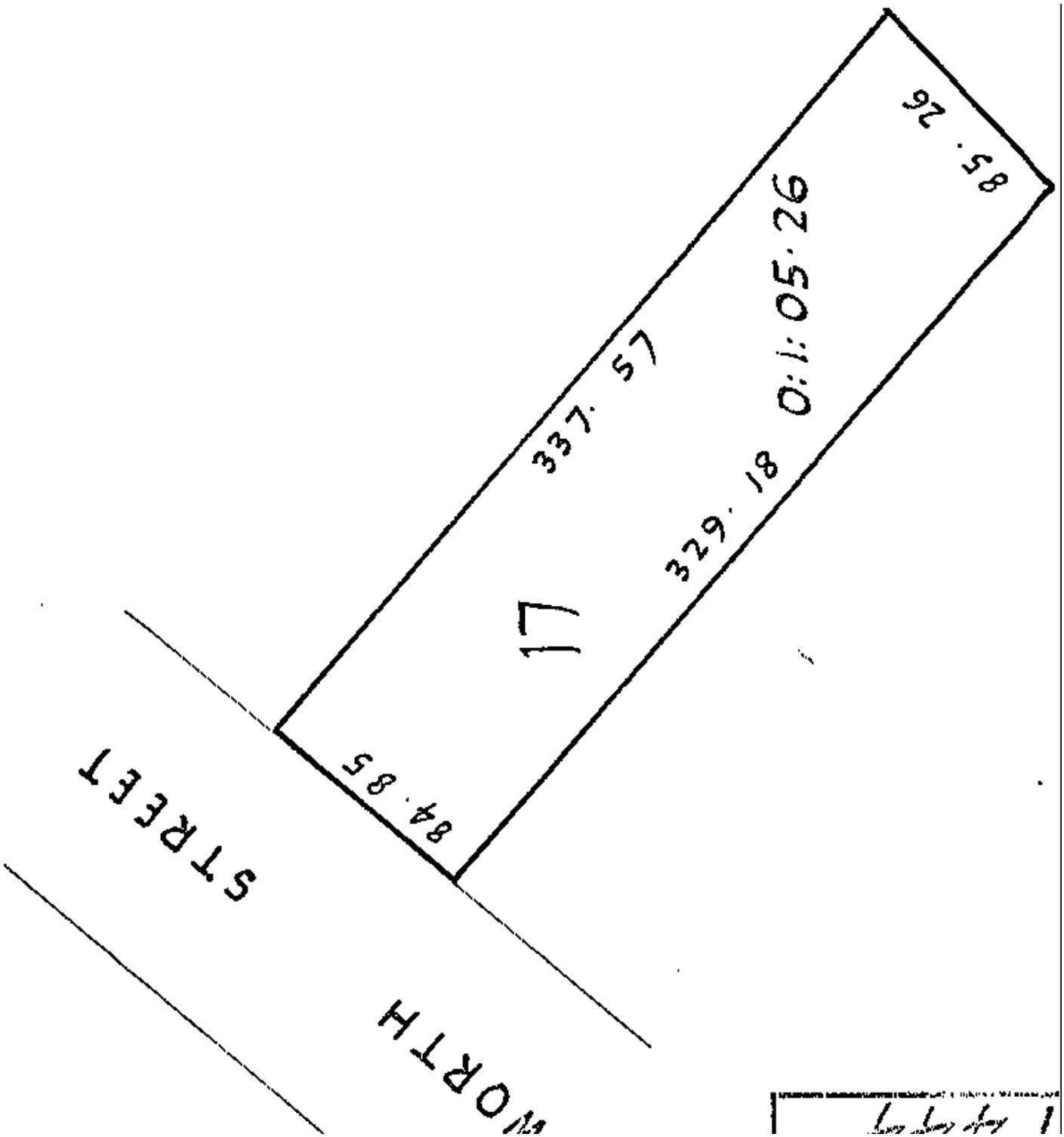
Estate	Fee Simple
Area	1145 square metres more or less
Legal Description	Lot 17 Deposited Plan 38101
Registered Owners	

Raymond Bruce Ferguson and Robyn Jennifer Ferguson

Interests

K61610 Certificate that a pipeline for the passage of sewage serves the within land - 31.5.1957 at 2.17 pm

Fencing Agreement in Transfer A65975 - 23.3.1965


85.26
337.57
329.18
0:1:05.26
17
84.85
STREET
NORTH

Appendix B: Proposed Building Plans

NZ ARCHITECTURAL

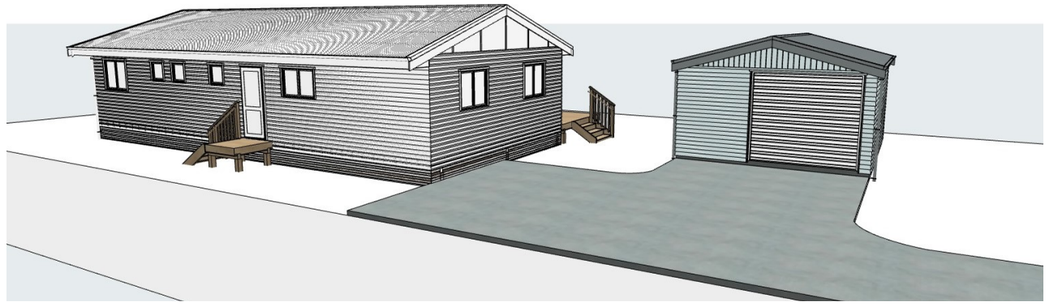
DESIGN STUDIO LTD

TWO PROPOSED RELOCATED DWELLINGS WITH NEW TIMBER DECKS & TWO NEW GARAGES FOR

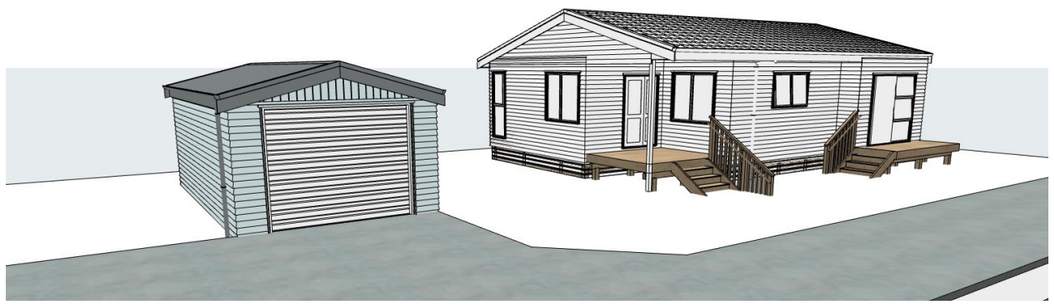
R & R FERGUSON

18 WORTH STREET,
KAITAIA, 0410

26/02/2025



RELOCATE DWELLING 01 & NEW VERSATILE GARAGE 01
- ARTIST'S IMPRESSION ONLY - WITHOUT SITE CONTOURS



RELOCATE DWELLING 02 & NEW VERSATILE GARAGE 02
- ARTIST'S IMPRESSION ONLY - WITHOUT SITE CONTOURS

SHEET INDEX

REVISIONS

26 FEBRUARY 2025 - BC 01
- WORKING DRAWINGS FOR BC

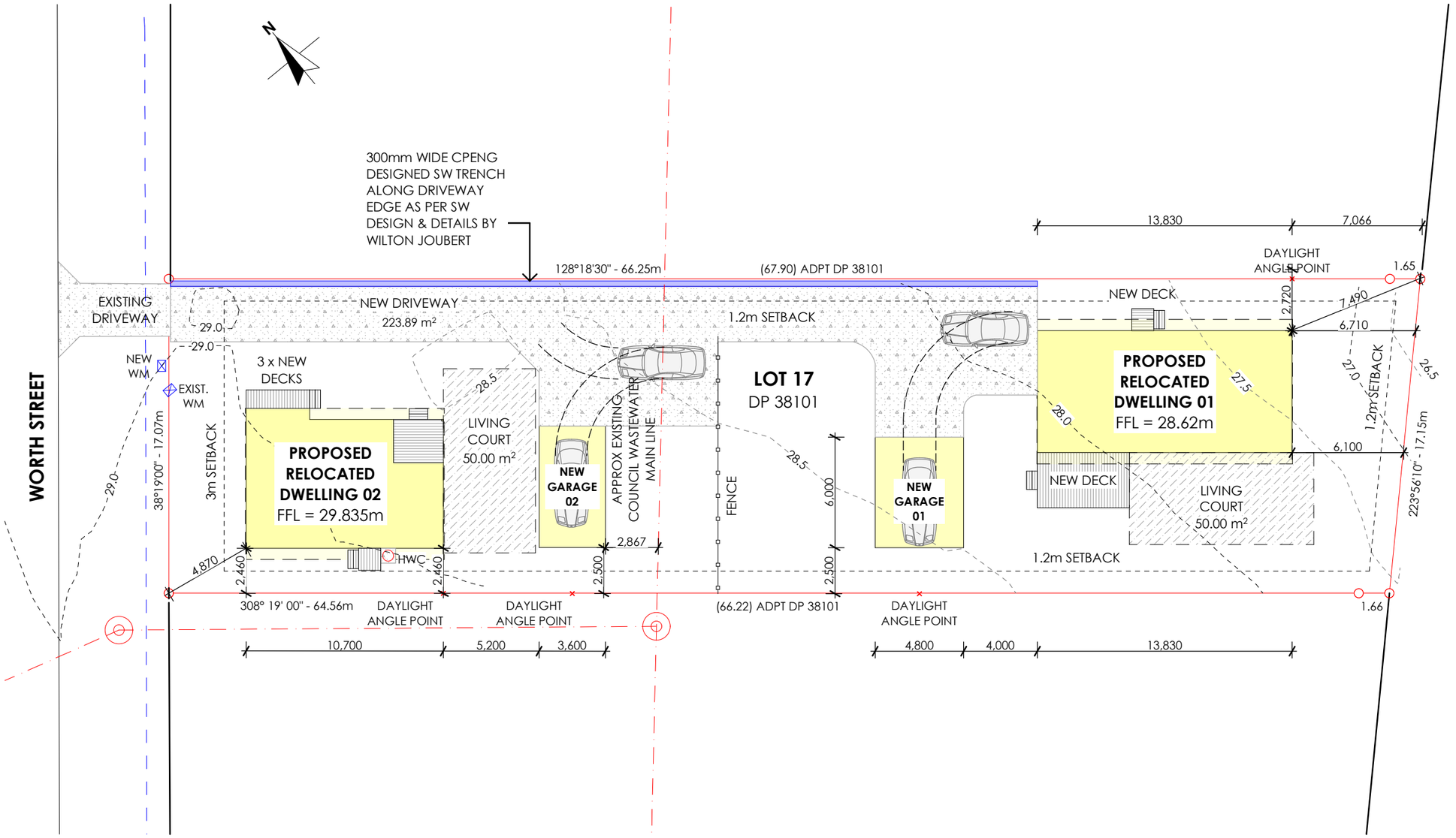
13 FEBRUARY 2025 - PRELIM 01
- PRELIMINARY DRAWINGS FOR CPENG SED FOUNDATION DESIGN

10 FEBRUARY 2025 - CONC 03
- CONCEPT 03 APPROVED

LBP ARCHITECTURAL DESIGNERS
PH: 0275 41 51 61
PO Box 530, Whangarei, 0140
info@nzadsltd.co.nz
www.nzarchitecturaldesign.co.nz

LICENSED BUILDING PRACTITIONER · www.dbh.govt.nz · BUILDING CONFIDENCE

WORKING DRAWINGS



SITE NOTES

LEGAL DESCRIPTION
LOT 17, DP 38101

PHYSICAL ADDRESS
18 WORTH STREET,
KAITAIA, 0410

SITE AREA: 0.1145 Ha (1,145m²)

SITE INFORMATION

WIND ZONE	MEDIUM
CORROSION ZONE	C
EARTHQUAKE ZONE	1
DISTRICT PLAN ZONE	RESIDENTIAL (GRZ)
RAINFALL INTENSITY	90mm/hr

BUILDING COVERAGE

2 x PROPOSED RELOCATED DWELLINGS: - FLOOR AREA OVER FRAME	= 162.18m²
2 x PROPOSED GARAGES: - FLOOR AREA OVER FRAME	= 53.75m²
NEW TIMBER DECK/LANDINGS:	= 28.37m²
TOTAL BUILDING COVERAGE	**= 244.3m² (APPROX.)**
(45% GROSS SITE AREA MAX.)	= 21.33%

IMPERVIOUS AREAS

PROPOSED ROOF AREA: (2 x RELOCATE DWELLINGS & 2 x NEW GARAGES)	= 196.57m² = 53.75m²
PROPOSED DRIVEWAY AREA:	= 223.89m²
TOTAL BUILDING IMPERMEABLE AREA	**= 474.21m² (APPROX.)**
(50% GROSS SITE AREA MAX.)	= 41.41%

WATER SUPPLY (COUNCIL MAIN WATER SUPPLY)
COUNCIL RETICULATED WATER SUPPLY TO CONNECT TO DWELLINGS & GARAGE 01 AS PER NZBC G12 VIA WATER METER CONNECTION/S.

SITE WORKS:

- ALL CONSTRUCTION CARRIED OUT ON SITE IS TO COMPLY WITH THE SITE SAFETY REQUIREMENTS OUTLINED IN F5/AS1.
- SITE BOUNDARIES & CONTOURS, SITE LEVELS, EXISTING SERVICES SHOWN ON PLAN IS AS PER SITE SURVEY CARRIED OUT BY BOUNDARY HUNTERS LTD (DATED 20/02/2025). SITE SURVEYOR HAS PEGGED OUT & SURVEYED WHERE THE DWELLINGS & GARAGES ARE TO GO ON SITE AS PER THE FINAL APPROVED BC PLANS.
- SURVEYOR IS TO CONFIRM ACTUAL LOCATIONS OF BOUNDARIES & BOUNDARY PEGS TO ENSURE RELOCATED DWELLING IS LOCATED AWAY FROM THE REQUIRED BOUNDARY SETBACKS FOR THE SITE & DISTRICT PLAN REQUIREMENTS.
- PLANS ARE TO BE READ IN CONJUNCTION WITH SUITABILITY/GEOTECH REPORT BY WILTON JOUBERT (REF# 138275, DATED 30/01/2025) PRIOR TO UNDERTAKING ANY SITE & FOUNDATION WORKS. ALL WORKS ARE TO COMPLY WITH RECOMMENDATIONS & CONCLUSIONS WITHIN REPORT.
- ENGINEER IS TO CARRY OUT SITE INVESTIGATION & FOUNDATION INSPECTIONS AS PER GEOTECH REPORT RECOMMENDATIONS. **NOTE:** IF PS4 IS REQUIRED, SITE INSPECTIONS SHOULD BE UNDERTAKEN BY A CHARTERED PROFESSIONAL ENGINEER OR THEIR AGENT, WHO IS FAMILIAR WITH BOTH THIS SITE & THE CONTENTS OF THE GEOTECH REPORT. CONTRACTOR MUST REFER TO THE ENGNEER'S SED DESIGN, PS1 & GEOTECH REPORT RECOMMENDATIONS & THE COUNCIL REQUIRED INSPECTIONS PRIOR TO POURING FOOTINGS.
- CONFIRM ALL SERVICE CONNECTION DEPTHS PRIOR TO COMMENCING ANY WORKS. ENSURE SUFFICIENT FALL FROM PROPOSED F.F.L. TO ALL CONNECTIONS.
- EXISTING VEHICLE CROSSING & NEW EXTENDED DRIVEWAY TO SITE.

SEDIMENT CONTROL / MANAGEMENT:
- PROVIDE SILT FENCE IF/WHERE REQUIRED TO PREVENT SEDIMENT RUN-OFF FROM LEAVING THE SITE.

NZ ARCHITECTURAL DESIGN STUDIO LTD
PH: 0275 41 51 61
PO Box 530, Whangarei, 0140
info@nzadsltd.co.nz
www.nzarchitecturaldesign.co.nz

R & R FERGUSON
18 WORTH STREET,
KAITAIA, 0410

DRAWING NAME: **SITE PLAN**			DRAWING SCALE:	**1:250**
			DATE DRAWN:	29/01/2025
DRAWN BY:	B.HANLEY	JOB No: 24067	Layout ID: **1.1**	Revision: **BC-01**
DESIGNED BY:	B.HANLEY			

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

ISSUE / REVISION

No.	DATE	BY	DESCRIPTION
A	FEB 2025	JWB	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY: JWB
DRAWN BY: JWB
CHECKED BY:
SURVEYED BY:

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

BUILDING CONSENT
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

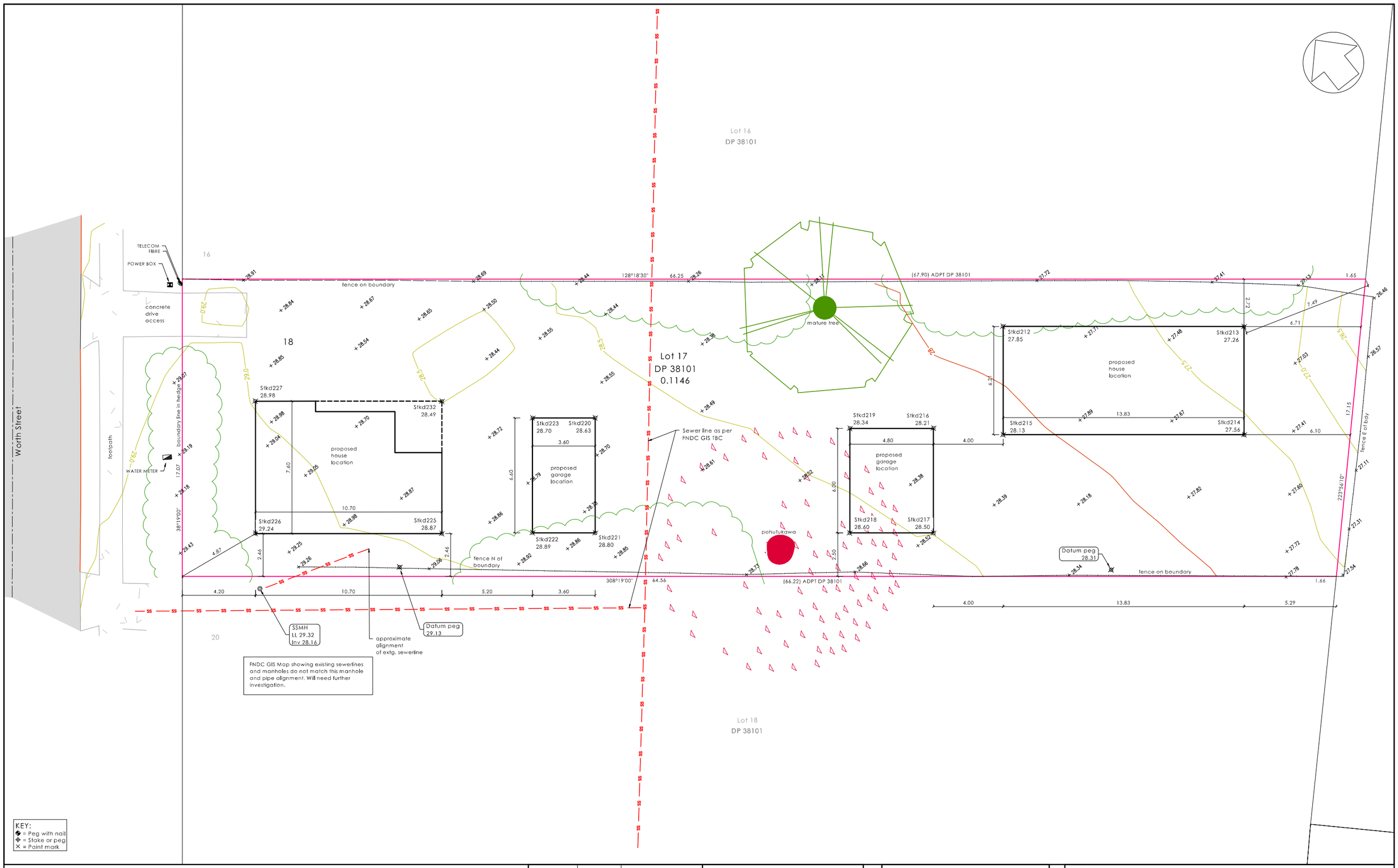
DRAWING TITLE:
SITE PLAN

PROJECT DESCRIPTION:
TWO RELOCATED DWELLING & TWO DETACHED GARAGES

PROJECT TITLE:
LOT 17 DP 38101
18 WORTH STREET
KAITAIA
NORTHLAND

ORIGINAL DRAWING SIZE:	OFFICE:
A3	KERIKERI
DRAWING SCALE:	CO-ORDINATE SYSTEM:
1:200	NOT COORDINATED

DRAWING NUMBER: 138275-G600
ISSUE: A



NOTES:

- Contours are at 0.5m intervals.
- Levels are in terms of LINZ Unahi Vertical Datum SM1203 SO 62891.
- All underground and above services may not be surveyed or shown on this plan. Please consult Service Providers before carrying out any excavation or construction.
- Boundary Hunter Ltd accepts no responsibility for services omitted by this survey.

0 3 6 Meters

	BY	DATE
SURVEY	B Kidd	17/02/25
DRAWN	B Kidd	19/02/25
REV.		
REV.		
CHECKED	B Smith	20/02/25

Prepared By:

BOUNDARY HUNTER LTD

Email. bruce@boundaryhunter.co.nz

Client: NZ Architectural Design Studio

C & R Ferguson
18 Worth St
Kaitaia

TITLE: Lot 17 D.P.38101

Proposed Building Setout and Existing Contour survey

JOB: 11924

SHEET: 1

SCALE: Hz. 1:100 @ A1

CAD FILE: 1000\11924.dwg

REVISION:

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.
5. IMPERVIOUS SURFACES FOR MITIGATION:
   SITE AREA = 1,145m²
   TOTAL ROOF COVER = 250.32m²
   DRIVEWAY = 223.89m²

MINIMUM 150mm DEEP x 300mm WIDE V-CHANNEL SWALE (@ >0.5% GRADE) DIRECTING RUNOFF TO SILT TRAP

SILT TRAP WITH SCRUFFY DOME OR GRATED INLET

DRAINAGE LINE FROM TANKS & SILT TRAP TO DISPERSAL DEVICE. 100Ø uPVC @ >1%

6m LONG TRENCH WITH NOVACOIL PIPE SNAKED IN TRENCH

PROPOSED DRIVEWAY TO BE SHAPED TO SHED RUNOFF TO GRASSED SWALE

PROPOSED DRIVEWAY 223.89m²

PROPOSED RELOCATED DWELLING 2 ROOF COVERAGE 87.7m²

PROPOSED GARAGE 2 26.87m²

PROPOSED GARAGE 1 26.88m²

PROPOSED RELOCATED DWELLING 1 ROOF COVERAGE 108.87m²

INDICATIVE DRAINAGE LINE FROM GUTTERS TO **TANK 2**

INDICATIVE DRAINAGE LINE FROM GUTTERS TO **TANK 1**

TANK 2:
1 x 5,000L RAINWATER TANK FOR DETENTION

TANK 1:
1 x 5,000L RAINWATER TANK FOR DETENTION

01 C201

02 C202

CP

SW DP SS W

28.0 27.0 29.0

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 '24	GMB	STORMWATER MITIGATION REPORT

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

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

BUILDING CONSENT
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **SITE PLAN**

PROJECT DESCRIPTION: **STORMWATER MITIGATION REPORT**

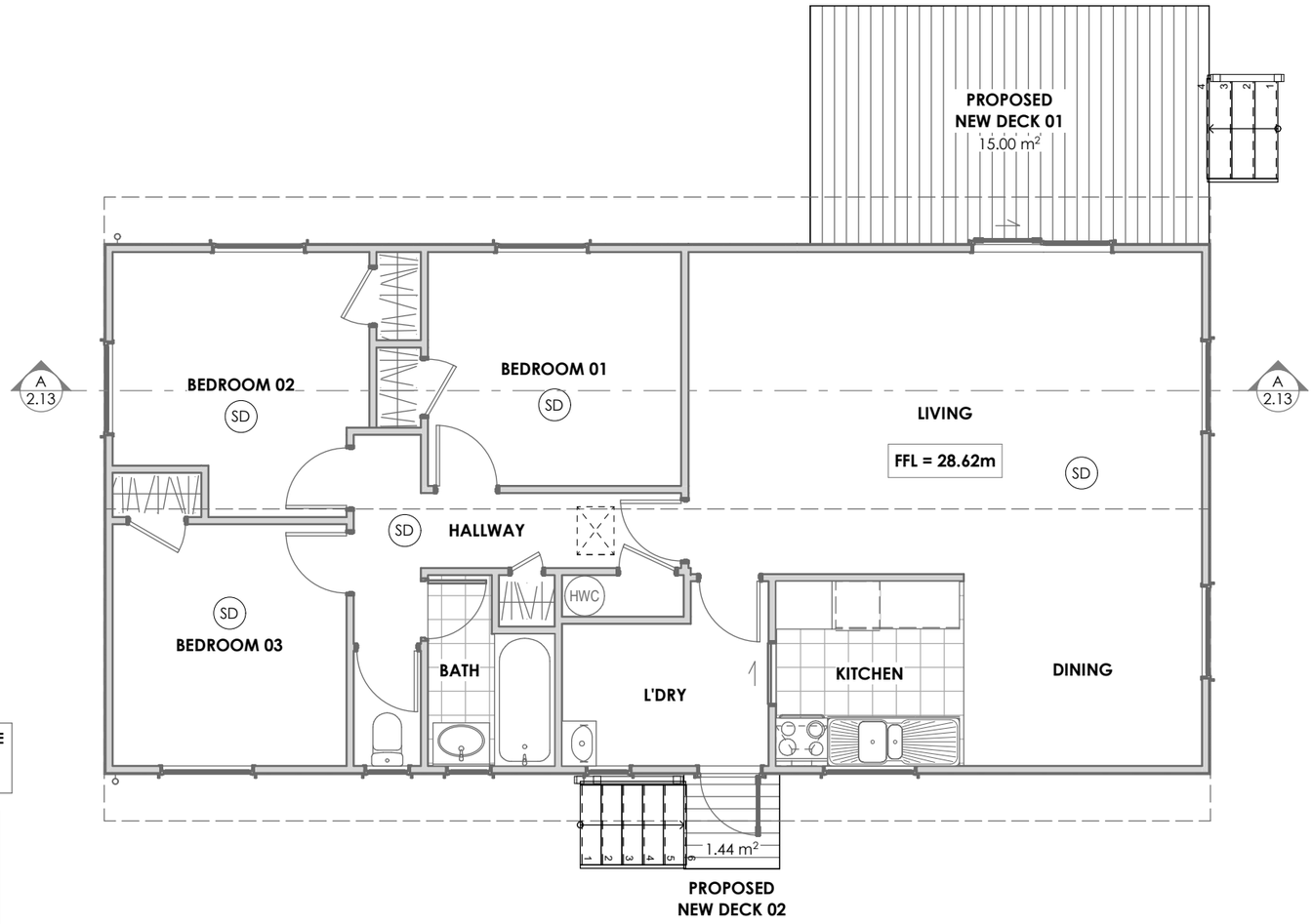
PROJECT TITLE:
LOT 17 DP 38101
18 WORTH STREET
KAITAIA
NORTHLAND

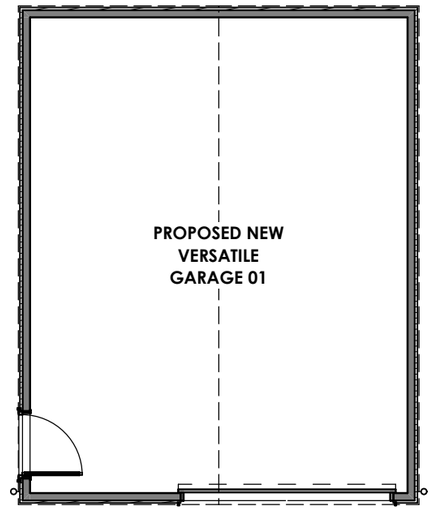
ORIGINAL DRAWING SIZE: A3
OFFICE: OREWA
DRAWING SCALE: 1:200
CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 138276-C200
ISSUE: 01

DAMAGED FRAMING REPAIRS

ANY DAMAGED FRAMING IS TO BE REPAIRED & REPLACED LIKE FOR LIKE & MADE GOOD, AS PER NZS 3604:2011 REQUIREMENTS. THESE REPAIRS CAN BE CARRIED OUT AS SCHEDULE 1 WORKS & IS TO BE AS PER NZS 3604: 2011. ANY DAMAGED CEILING LININGS & INSULATION ARE TO BE REPLACED AS PER NZS 3604:2011 & NZBC H1/AS1.

SMOKE ALARMS:
INSTALL INTERCONNECTED SMOKE ALARMS IN EVERY BEDROOM, LIVING SPACE & HALLWAY AS PER REQUIREMETNS OF NZS 4514:2021 & NZBC F7/AS1.





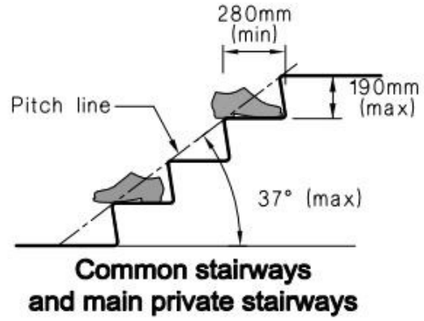
NOTE: ALL DWELLING MEASUREMENTS ARE INDICATIVE & APPROX ONLY & MUST BE CONFIRMED ON SITE BY CONTRACTORS.

DWELLING 01 BUILDING AREA (APPROX.):

GROUND FLOOR AREA: (OVER FRAME)	91.55m²
ROOF AREA:	108.41m²
NEW TIMBER DECK & LANDINGS	16.44m²

GARAGE 01 BUILDING AREA (APPROX.):

GROUND FLOOR AREA: (OVER FRAME)	28.80m²
ROOF AREA:	28.80m²



Common stairways and main private stairways

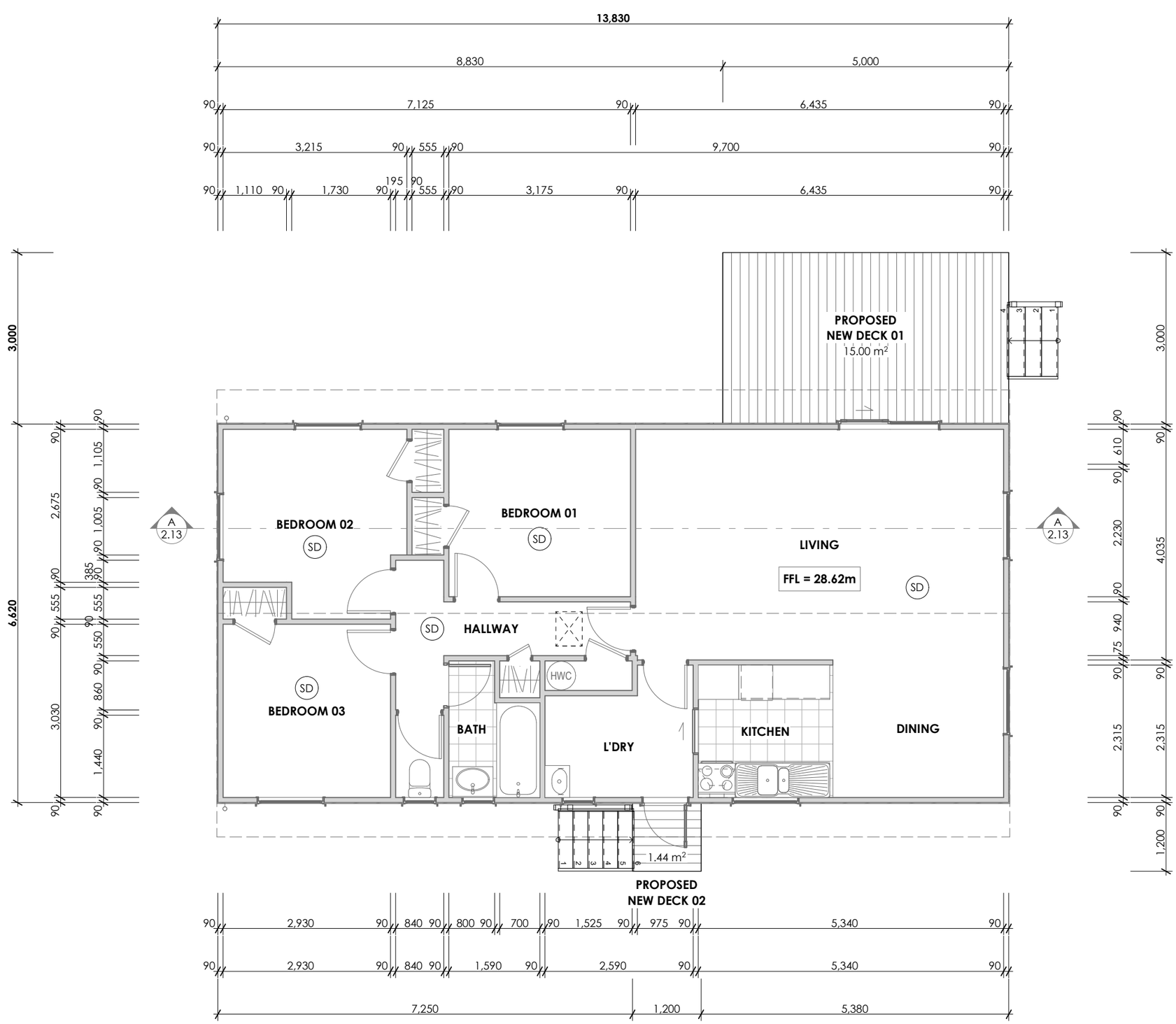
DWELLING 01 & GARAGE 01

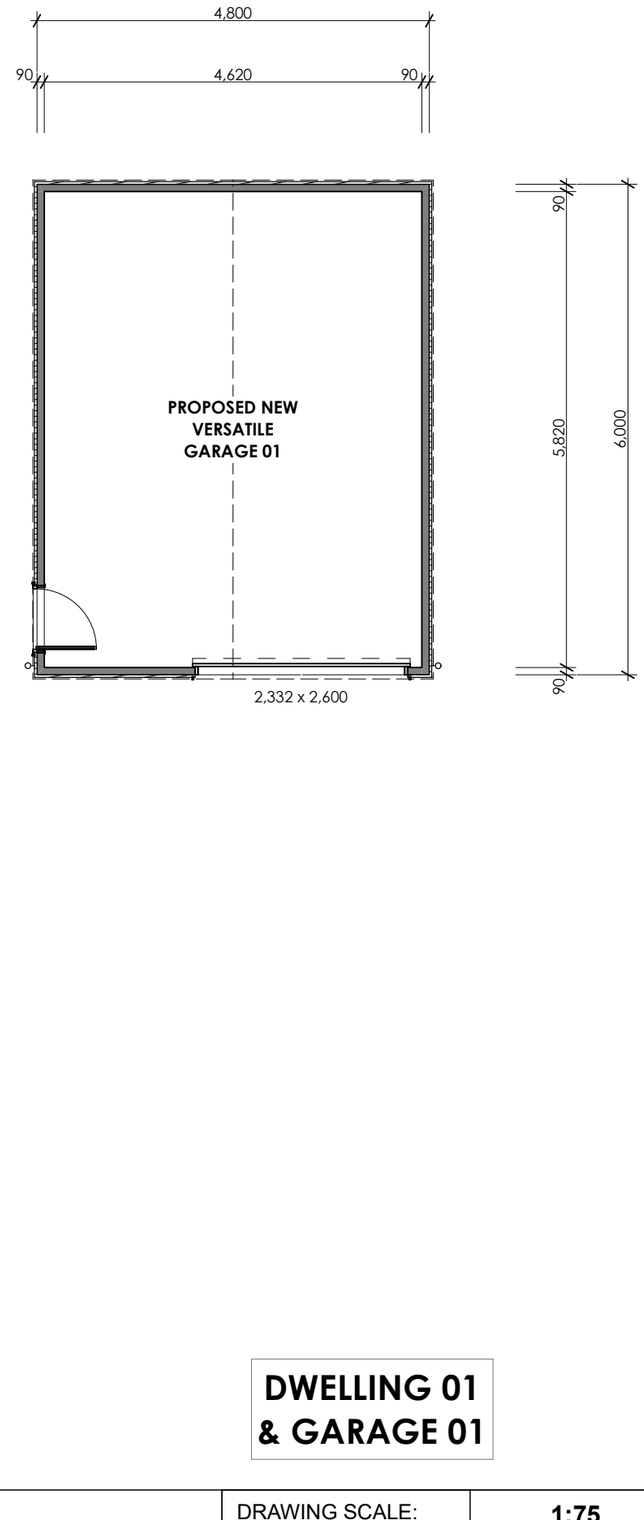
NZ ARCHITECTURAL
DESIGN STUDIO LTD

PH: 0275 41 51 61
PO Box 530, Whangarei, 0140
info@nzadsltd.co.nz
www.nzarchitecturaldesign.co.nz

R & R FERGUSON
18 WORTH STREET,
KAITAIA, 0410

DRAWING NAME: **FLOOR PLAN - DWELLING 01**			DRAWING SCALE:	**1:75**
			DATE DRAWN:	29/01/2025
DRAWN BY:	B.HANLEY	JOB No: 24067	Layout ID: **2.1**	Revision: **BC-01**
DESIGNED BY:	B.HANLEY			





DWELLING 01 & GARAGE 01

NZ ARCHITECTURAL
DESIGN STUDIO LTD

PH: 0275 41 51 61
PO Box 530, Whangarei, 0140
info@nzadsltd.co.nz
www.nzarchitecturaldesign.co.nz

R & R FERGUSON
18 WORTH STREET,
KAITAIA, 0410

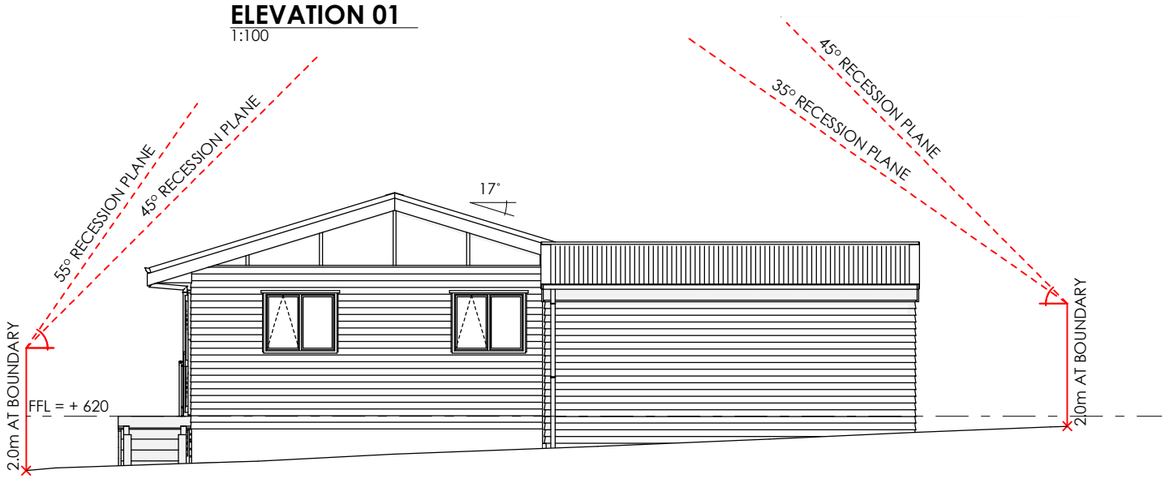
DRAWING NAME: **DIMENSION PLAN - DWELLING 01**			DRAWING SCALE:	**1:75**
			DATE DRAWN:	29/01/2025
DRAWN BY:	B.HANLEY	JOB No: 24067	Layout ID: **2.2**	Revision: **BC-01**
DESIGNED BY:	B.HANLEY			

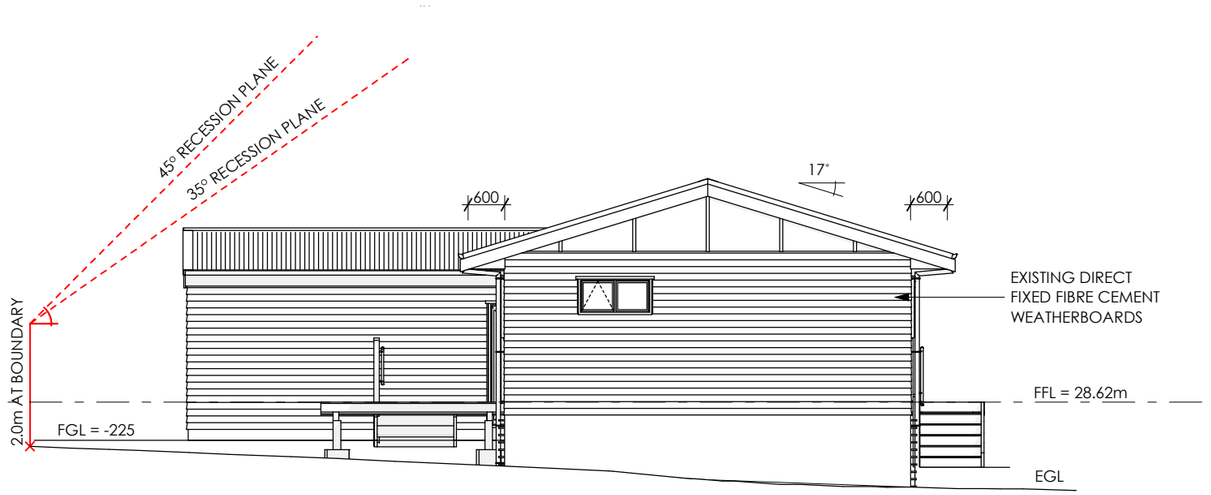
NOTE:
- HAND RAILS REQUIRED FOR STAIRS AS PER NZBC D1/AS1.
- 1.0m HIGH BARRIER FOR DECK ONLY REQUIRED WHERE DECK FFL HEIGHT IS GREATER THAN 1.0m FROM FGL, AS PER NZBC F4/AS1.
- 45x45 H3.2 VERTICAL BALUSTERS WITH 100mm MAX GAPS BETWEEN.
- INSTALL SUBFLOOR VENTS TO BASE CLADDING AS PER NZS 3604:2011.

GLAZING:
SAFETY GLAZING IS TO BE INSTALLED FOR ANY NEW JOINERY AS PER NZS 4223.3 & NZBC F2/AS1.

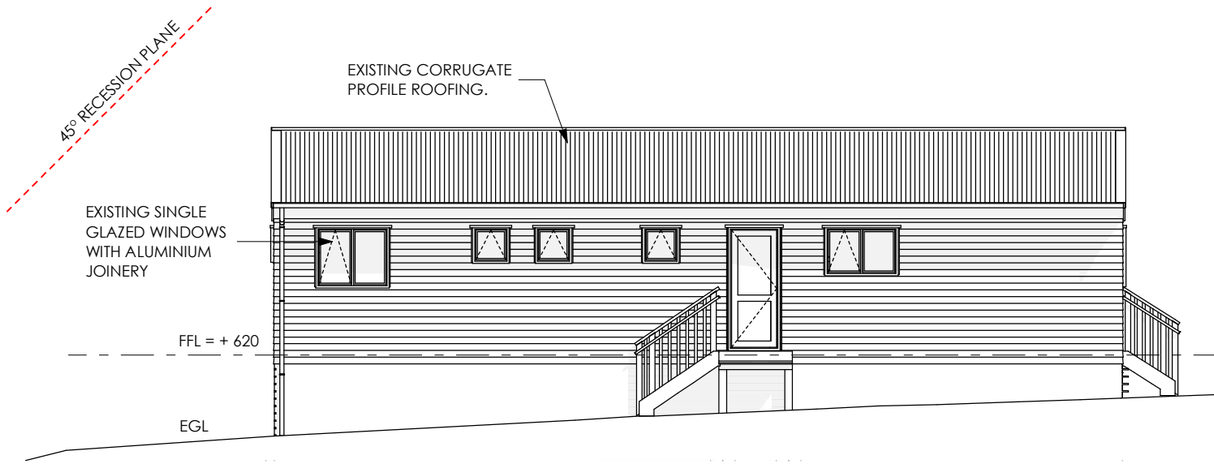
MAIN PRIVATE STAIRS:
RISER: 190mm MAX.
TREAD: 280mm MIN.

ELEVATION 01
1:100

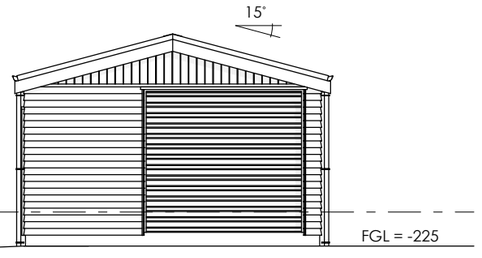




ELEVATION 02
1:100



ELEVATION 04
1:100



ELEVATION 03
1:100

RELOCATE DWELLING 01 - RISK MATRIX

BUILDING ENVELOPE RISK MATRIX		
DWELLING 01 WORST CASE SCENARIO ELEVATIONS		
Risk Factor	Risk Severity	Risk Score
Wind zone (per NZS 3604)	Medium risk	0
Number of storeys	Low risk	0
Roof/wall intersection design	Medium risk	1
Eaves width	Very high risk	5
Envelope complexity	Low risk	0
Deck design	Low risk	0
Total Risk Score:		6

GARAGE RISK MATRIX

BUILDING ENVELOPE RISK MATRIX		
GARAGE 01 WORST CASE SCENARIO ELEVATIONS		
Risk Factor	Risk Severity	Risk Score
Wind zone (per NZS 3604)	Medium risk	0
Number of storeys	Low risk	0
Roof/wall intersection design	Low risk	0
Eaves width	High risk	2
Envelope complexity	Low risk	0
Deck design	Low risk	0
Total Risk Score:		2

DWELLING 01 & GARAGE 01

NZ ARCHITECTURAL DESIGN STUDIO LTD
PH: 0275 41 51 61
PO Box 530, Whangarei, 0140
info@nzadsltd.co.nz
www.nzarchitecturaldesign.co.nz

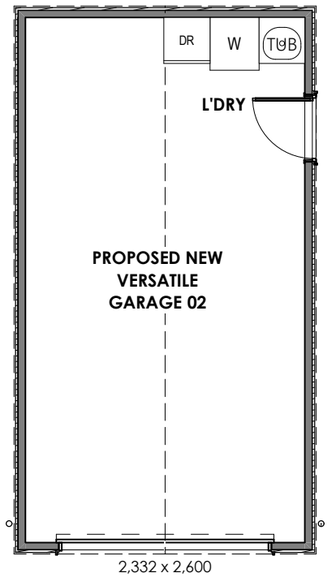
R & R FERGUSON
18 WORTH STREET,
KAITAIA, 0410

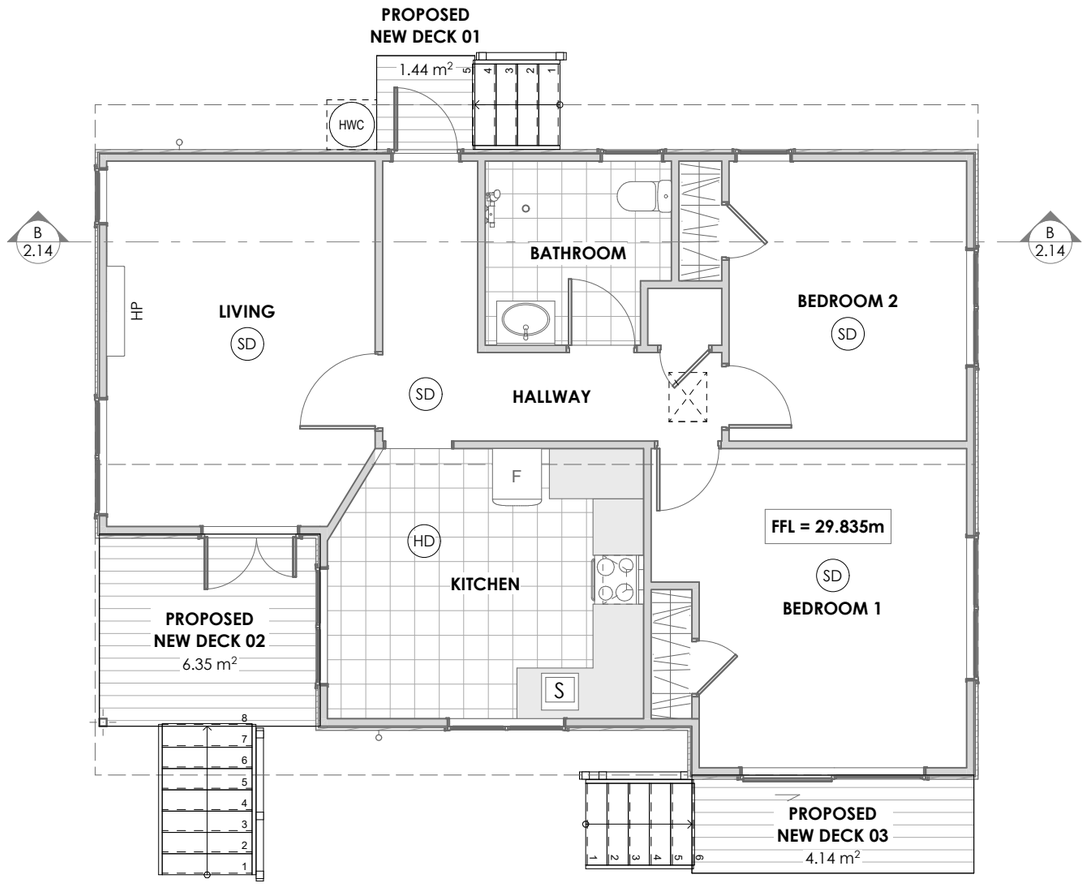
DRAWING NAME: **ELEVATIONS - DWELLING 01**
DRAWN BY: B.HANLEY
DESIGNED BY: B.HANLEY
JOB No: 24067
DRAWING SCALE: 1:100
DATE DRAWN: 29/01/2025
Layout ID: 2.3
Revision: BC-01

DAMAGED FRAMING REPAIRS

ANY DAMAGED FRAMING IS TO BE REPAIRED & REPLACED LIKE FOR LIKE & MADE GOOD, AS PER NZS 3604:2011 REQUIREMENTS. THESE REPAIRS CAN BE CARRIED OUT AS SCHEDULE 1 WORKS & IS TO BE AS PER NZS 3604: 2011. ANY DAMAGED CEILING LININGS & INSULATION ARE TO BE REPLACED AS PER NZS 3604:2011 & NZBC H1/AS1.

SMOKE ALARMS:
INSTALL INTERCONNECTED SMOKE ALARMS IN EVERY BEDROOM, LIVING SPACE & HALLWAY AS PER REQUIREMETNS OF NZS 4514:2021 & NZBC F7/AS1.





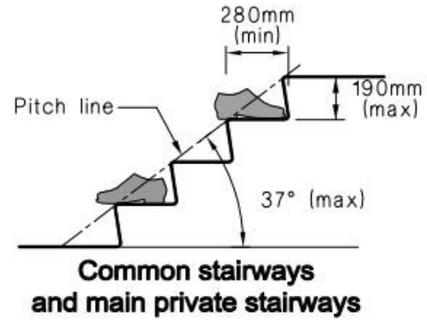
NOTE: ALL DWELLING MEASUREMENTS ARE INDICATIVE & APPROX ONLY & MUST BE CONFIRMED ON SITE BY CONTRACTORS.

DWELLING 02 BUILDING AREA (APPROX.):

GROUND FLOOR AREA: (OVER FRAME)	70.63m²
ROOF AREA:	88.16m²
NEW TIMBER DECK & LANDINGS	11.93m²

GARAGE 02 BUILDING AREA (APPROX.):

GROUND FLOOR AREA: (OVER FRAME)	24.95m²
ROOF AREA:	24.95m²



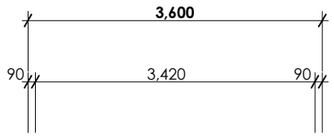
Common stairways and main private stairways

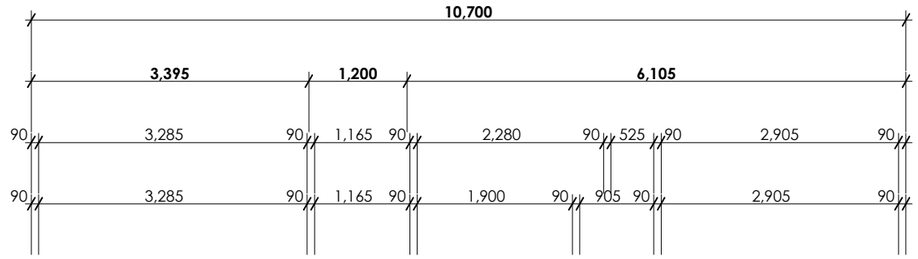
DWELLING 02 & GARAGE 02

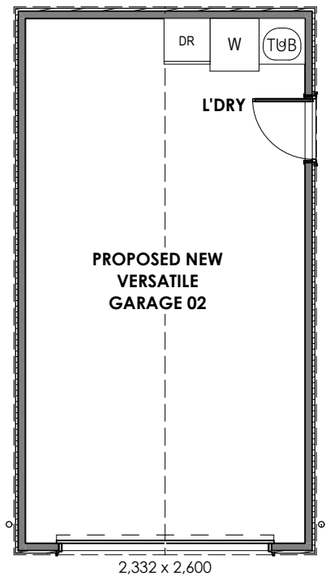
NZ ARCHITECTURAL DESIGN STUDIO LTD
PH: 0275 41 51 61
PO Box 530, Whangarei, 0140
info@nzadsltd.co.nz
www.nzarchitecturaldesign.co.nz

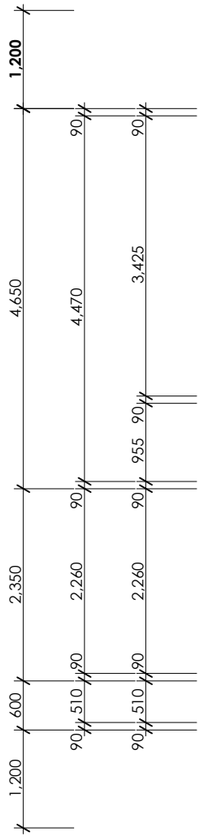
R & R FERGUSON
18 WORTH STREET,
KAITAIA, 0410

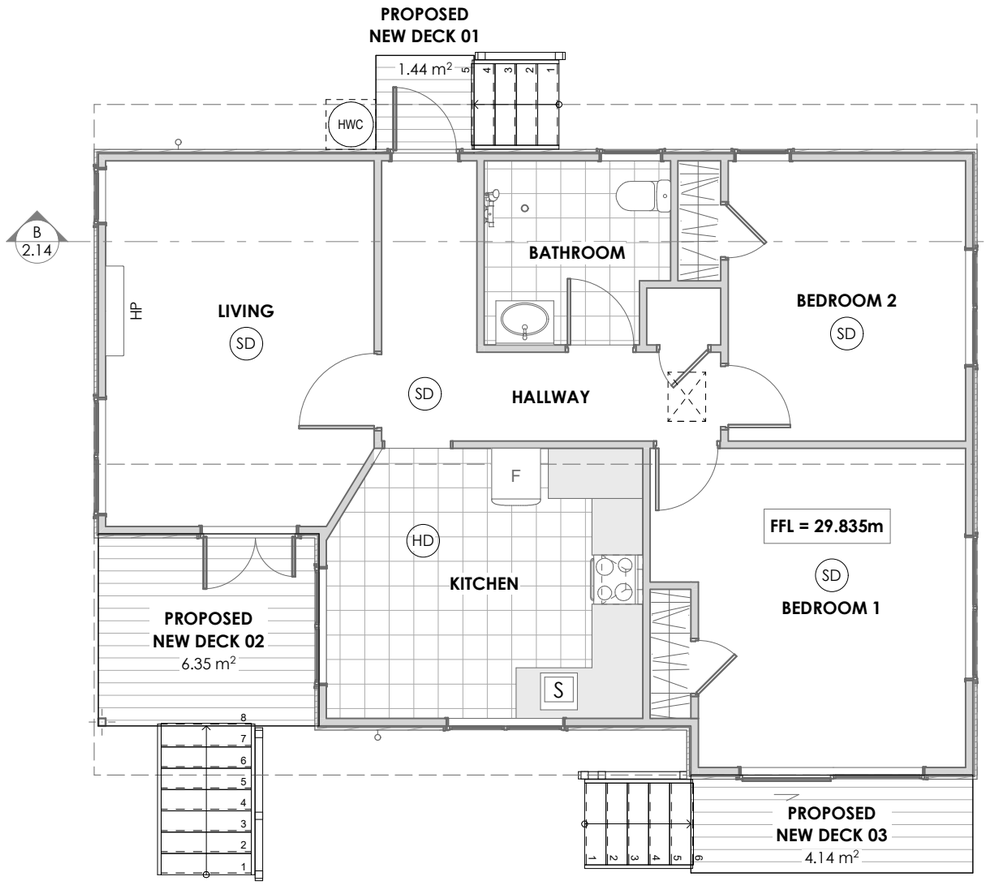
DRAWING NAME: **FLOOR PLAN - DWELLING 02**			DRAWING SCALE:	**1:75**
			DATE DRAWN:	29/01/2025
DRAWN BY:	B.HANLEY	JOB No: 24067	Layout ID: **2.4**	Revision: **BC-01**
DESIGNED BY:	B.HANLEY			

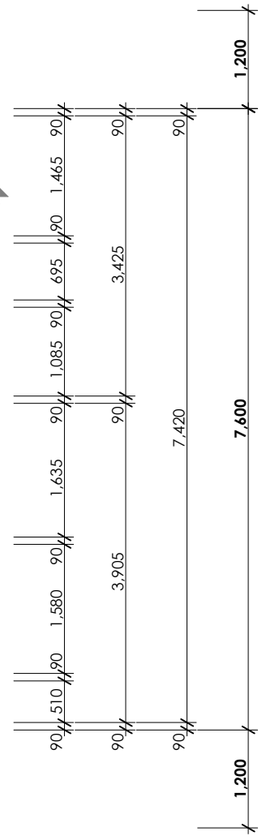


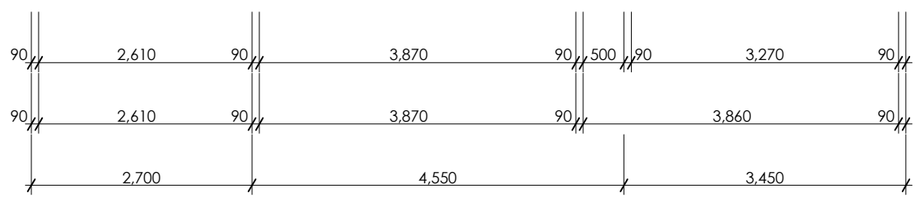










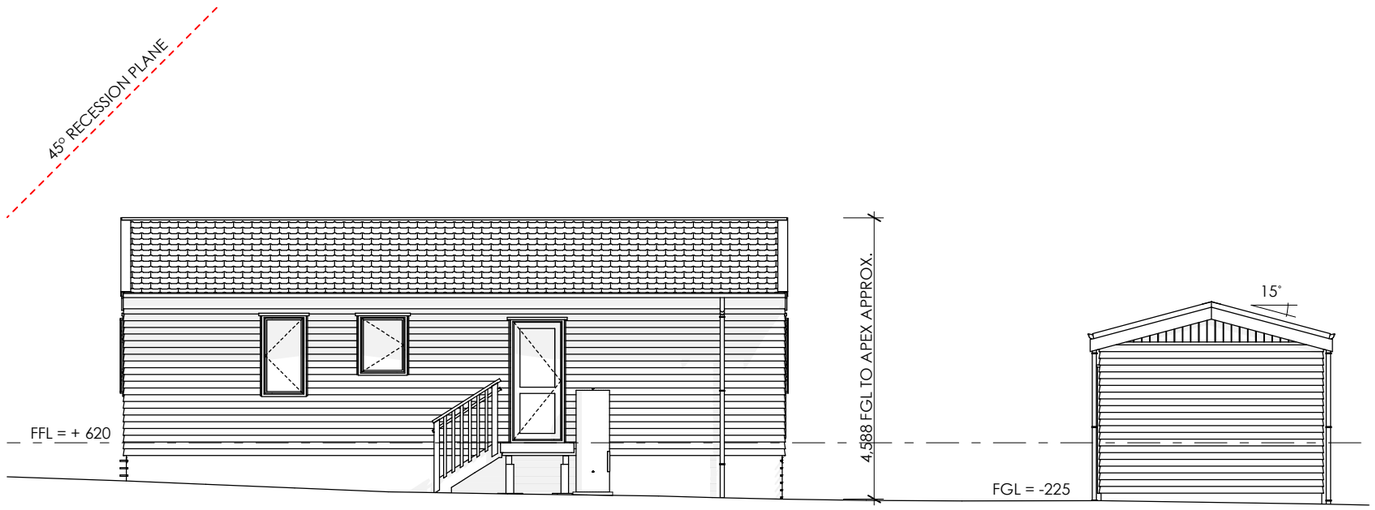


DWELLING 02
& GARAGE 02

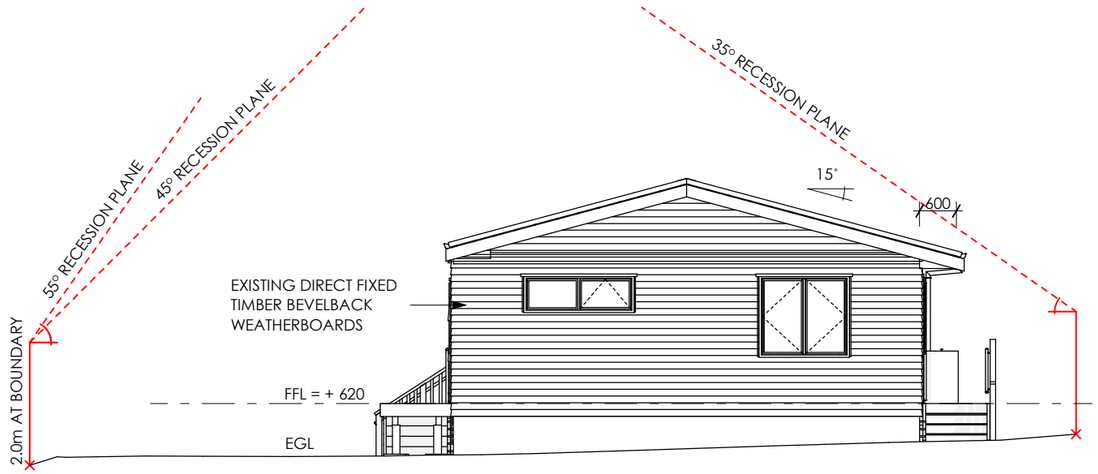
NZ ARCHITECTURAL
DESIGN STUDIO LTD
PH: 0275 41 51 61
PO Box 530, Whangarei, 0140
info@nzadsltd.co.nz
www.nzarchitecturaldesign.co.nz

R & R FERGUSON
18 WORTH STREET,
KAITAIA, 0410

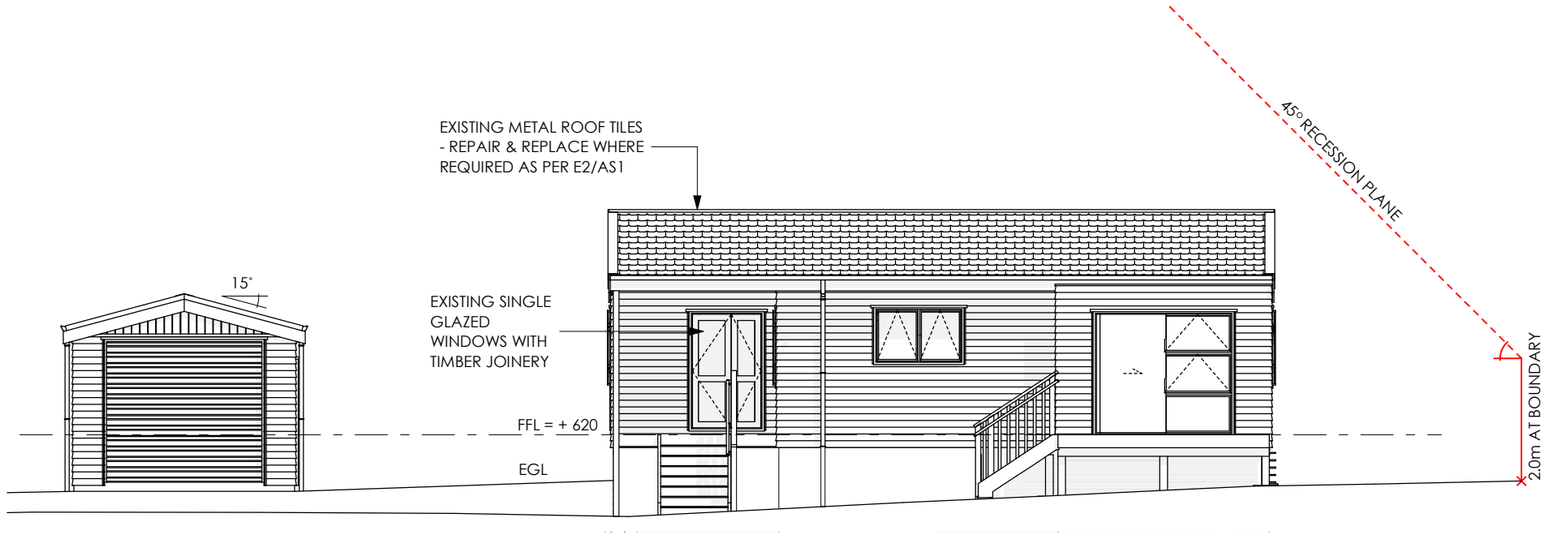
DRAWING NAME: **DIMENSION PLAN - DWELLING 02**			DRAWING SCALE: **1:75**
			DATE DRAWN: 29/01/2025
DRAWN BY:	B.HANLEY	JOB No: 24067	Layout ID: **2.5**
DESIGNED BY:	B.HANLEY		Revision: **BC-01**



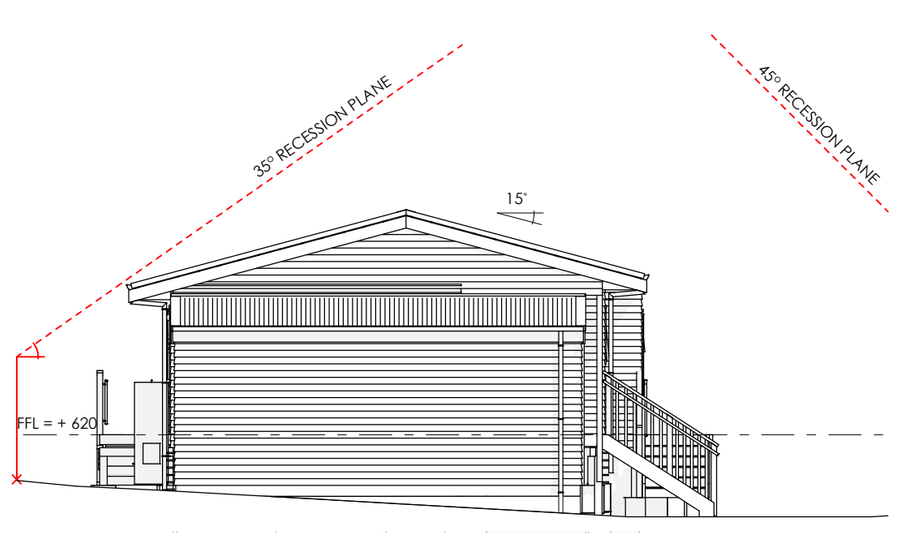
ELEVATION 05
1:100



ELEVATION 06
1:100



ELEVATION 07
1:100



ELEVATION 08
1:100

NOTE:
- HAND RAILS REQUIRED FOR STAIRS AS PER NZBC D1/AS1.
- 1.0m HIGH BARRIER FOR DECK ONLY REQUIRED WHERE DECK FFL HEIGHT IS GREATER THAN 1.0m FROM FGL, AS PER NZBC F4/AS1.
- 45x45 H3.2 VERTICAL BALUSTERS WITH 100mm MAX GAPS BETWEEN.
- INSTALL SUBFLOOR VENTS TO BASE CLADDING AS PER NZS 3604:2011.

GLAZING:
SAFETY GLAZING IS TO BE INSTALLED FOR ANY NEW JOINERY AS PER NZS 4223.3 & NZBC F2/AS1.

MAIN PRIVATE STAIRS:
RISER: 190mm MAX.
TREAD: 280mm MIN.

RELOCATE DWELLING 02 - RISK MATRIX

BUILDING ENVELOPE RISK MATRIX		
DWELLING 02 WORST CASE SCENARIO ELEVATIONS		
Risk Factor	Risk Severity	Risk Score
Wind zone (per NZS 3604)	Medium risk	0
Number of storeys	Low risk	0
Roof/wall intersection design	Medium risk	1
Eaves width	Very high risk	5
Envelope complexity	Low risk	0
Deck design	Low risk	0
Total Risk Score:		6

GARAGE 02 - RISK MATRIX

BUILDING ENVELOPE RISK MATRIX		
GARAGE 02 WORST CASE SCENARIO ELEVATIONS		
Risk Factor	Risk Severity	Risk Score
Wind zone (per NZS 3604)	Medium risk	0
Number of storeys	Low risk	0
Roof/wall intersection design	Low risk	0
Eaves width	High risk	2
Envelope complexity	Low risk	0
Deck design	Low risk	0
Total Risk Score:		2

DWELLING 02 & GARAGE 02

NZ ARCHITECTURAL
DESIGN STUDIO LTD

PH: 0275 41 51 61
PO Box 530, Whangarei, 0140
info@nzadsltd.co.nz
www.nzarchitecturaldesign.co.nz

R & R FERGUSON
18 WORTH STREET,
KAITAIA, 0410

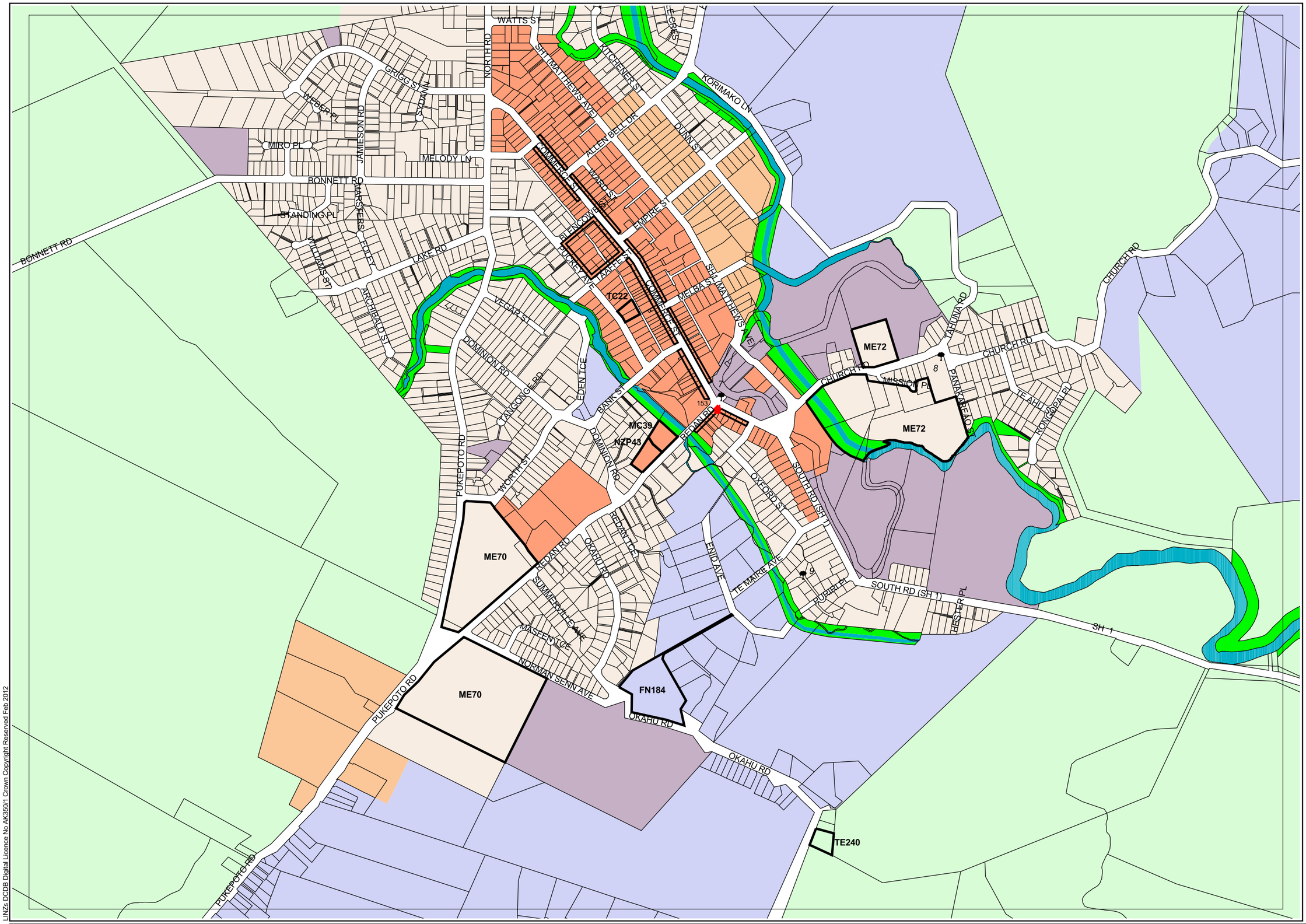
DRAWING NAME:
ELEVATIONS - DWELLING 02

DRAWN BY: B.HANLEY
DESIGNED BY: B.HANLEY

JOB No: 24067

DRAWING SCALE: **1:100**
DATE DRAWN: 29/01/2025
Layout ID: **2.6**
Revision: **BC-01**

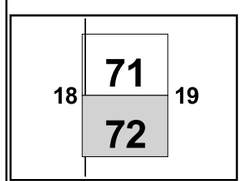
Appendix C: Relevant Planning Maps



Zone

- Conservation
- Commercial
- Industrial
- Lakes and Rivers
- Residential
- Recreational Activities
- Rural Living
- Rural Production
- Road
- Designations
- Pedestrian Frontage
- Historic Site
- Notable Tree

Note :-
Roads carry the same zoning as the adjoining land. If a boundary between zones follows a road, the zone boundary is located on the centreline of the formed road, or where unformed, the centreline of the legal road



Map Index

Map 72

KAITAIA SOUTH

Far North District Plan - Zone Maps

N

0 200 400 600 m

Scale 1:10,000

DISCLAIMER

Considerable care has been taken to avoid errors and omissions, and the latest information has been included in these District Plan maps. However, even with the greatest care inaccuracies may occur and therefore the Far North District Council cannot accept any responsibility for such errors and omissions.

Far North Maps legend for Operative District Plan 2009

- Airport Noise Buffer
- Archaeological Sites
- Cemetery
- Coopers Beachfront Estate
- Designations
- Esplanade Priority
- Historic Sites
- Maritime Exemption Area
- Notable Trees
- NRC flood susceptible land
- NZ Railways Corporation Designation
- Outstanding Landscape
- Outstanding Natural Feature
- Outstanding Landscape Feature
- Paihia Commercial Zones
- Pedestrian frontage
- Sites of Cultural Significance to Maori

Coastal Hazard (NRC)

- Coastal hazard 1
- Coastal hazard 2

Heritage Area

- Kerikeri Visual Buffer
- Russell Township Basin and Gateway Area
- Rangihoua Historic Area
- Paihia Mission Area
- Heritage Precinct

Power lines

- National Grid Line
- Top Energy High Voltage Power Lines
- Power poles

District Plan Zones

- Carrington Estate
- Coastal Living
- Coastal Marine
- Coastal Residential
- Commercial
- Conservation
- General Coastal
- Horticultural Processing
- Industrial
- Kauri Cliffs
- Lakes & Rivers
- Minerals
- Motoroa Island
- Orongo Bay Special Purpose
- Outside
- Point Veronica
- Quail Ridge Country Club
- Rail
- Recreational Activities
- Residential
- Road
- Rural Living
- Rural Production
- Russell Township
- South Kerikeri Inlet Zone
- South Kerikeri Inlet Zone Sensitive Area
- Waimate North
- Undefined

updated: 21/05/2021


Worth St
1
2
2A
3
4
4A
5
6
7
8
9
10
11A
11B
12
13
14
14A
15
16
17
17A
18
19
19A
20
21
21A
22
23
24A
24B
25
26
28A
28B
30
32
MEDU70
Esri, Maxar, Earthstar Geographics, and the GIS User Community

Map Legend

Zones

- Airport
- Carrington Estate
- General Residential
- Heavy Industrial
- Horticulture
- Horticulture Processing Facilities
- Hospital
- Kauri Cliffs
- Kororāreka Russell Township
- Light Industrial
- Mixed Use
- Moturoa Island
- Māori Purpose - Rural
- Māori Purpose - Urban
- Natural Open Space
- Ngawha Innovation And Enterprise Park
- Open Space
- Orongo Bay
- Quail Ridge
- Rural Lifestyle
- Rural Production
- Rural Residential
- Settlement
- Sport And Active Recreation

Kauri Cliffs Special Areas

- Golf Living Environment
- Golf Playing Environment
- Lodge Environment
- Natural Heritage Environment

Variation 1 - Zones

- Airport
- General Residential
- Kororāreka Russell Township
- Light Industrial
- Natural Open Space
- Open Space
- Rural Production

Notable Tree

Heritage Item

Heritage Area

Sites & Areas of Significance to Māori

Te Oneroa-a-Tōhe Beach Management Area

Te Oneroa-a-Tōhē

Treaty Settlement Land

Pedestrian Frontage

Building Height Control

Area A

Area B

Mineral Extraction

Coastal Environment

Outer Control Boundary (55 dB Ldn)

Air Noise Boundary (65 db Ldn)

National Grid Line

National Grid Line

Critical Electricity Line

Airport Protection Surfaces

Precincts

Innovation and Enterprise Precinct

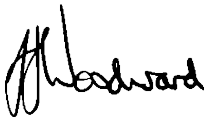
Designations

Appendix D: Geotechnical Assessment Report

Wilton Joubert Limited
09 945 4188
185 Waipapa Road,
Kerikeri

SITE	**18 Worth Street, Kaitaia**
LEGAL DESCRIPTION	**Lot 17 DP 38101**
PROJECT	**Two Relocated Dwellings and Two Detached Garages**
CLIENT	**Robyn & Charlie Ferguson**
REFERENCE NO.	**138275.Rev1**
DOCUMENT	**Geotechnical Assessment Report**
STATUS/REVISION NO.	**Revision 1 - Minor Scheme Change to Proposal.**
DATE OF ISSUE	**14 February 2025**

Report Prepared For	Email
Robyn & Charlie Ferguson	fergusonspropertycare@gmail.com

Authored by	**S. Page** *Pt NZDE (Civil)*	Engineering Technician	shaun@wjl.co.nz	
Reviewed by	**J. Mitchell** *Pt NZDE (Civil)*	Engineering Technician	justin@wjl.co.nz	
Approved by	**S.J. Woodward** *MEng, CPEng, CMEngNZ*	Principal Geotechnical Engineer	simonwoodward@wjl.co.nz	

1. EXECUTIVE SUMMARY

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

Development Type:	Two relocated residential dwellings and two detached garages.
Development Proposals Supplied:	Yes – Concept architectural drawings (4 sheets).
NZS3604 Type Structure/s:	Yes.
Geology Encountered:	Older, Late Pleistocene Estuary, River, and Swamp Deposits.
Surficial Topsoil / Non-Engineered Fill Encountered:	Yes –0.20m to 0.30m thick. No fill encountered at both garage building platforms.
Overall Site Gradient in Proximity to Development:	Property is gently sloping, averaging less than 5°.
Site Stability Risk:	Overall no Perceivable Risk of deep-seated global instability.
Liquefaction Risk:	Negligible risk of liquefaction susceptibility.
Suitable Foundation Type(s):	**Dwellings & Decking:** Bored, concrete encased tanalised timber pile foundations. **Garages:** Slab-on-Grade with deepened perimeter strip footings, or reinforced, stiffened raft slab foundation system.
Soil Bearing Capacity:	Yes – Comptent Natural Ground and Engineered Hardfill Only Geotechnical Ultimate Bearing Capacity = 300kPa.
NZBC B1 Expansive Soils Classification:	Class H – Moderately Expansive (y_s = 78mm). Refer report text for design guidance.
Minimum Bored & Strip Footing Embedment :	0.90m below finished ground levels and 0.30m into competent natural ground, whichever is deeper.
NZS1170.5:2004 Site Subsoil Classification:	Class C – Shallow soil stratigraphy.
Earthworks:	It is generally assumed earthworks for both dwelling building sites will comprise of minor surficial soil stripping and debris removal, along with bored footing excavations. No significant cut-fill earthworks are envisaged. Due to the level nature of both garage building sites, only minor cut-fill earthwork operations will be required to create level building platforms. Crossfalls of less than approximately 0.30m are expected across both areas. Refer report text for design guidance.
Consent Application Report Suitable for:	Building Consent. However, any revision of the supplied architectural drawings or overall proposal with Geotechnical implications should be referred to WJL for review.

2. INTRODUCTION

2.1. SCOPE OF WORK

Wilton Joubert Limited (WJL) was engaged by **Robyn and Charlie Ferguson** (the clients), to undertake a geotechnical assessment of ground conditions at the above site, where we understand, it is proposed to construct two new relocated dwellings and two detached garages.

For the purposes of this report, we have assumed all four structures will comprise lightweight, timber framed structures, designed and constructed generally in keeping with the requirements of NZS3604:2011.

2.2. SUPPLIED INFORMATION

At the time of preparing this report, we have been supplied with a set of preliminary architectural drawings (13sheets), titled; '*Two Proposed Relocated Dwellings with New Timber Decks & Two New Garages for R & R Ferguson, 18 Worth Street, Kaitaia,* 0410', dated 13 February 2025 (ref: 24067), prepared by NZ Architectural Design Studio Ltd. The drawing set includes Site, Floor, Dimension, Foundation, and Elevation Plans of both dwellings.

No development drawings have been provided pertaining to the two proposed garages. It is our understanding that both are to be Versatile in design.

Any revision of the supplied architectural drawings or overall proposal with Geotechnical implications should be referred to WJL for review.

3. SITE DESCRIPTION

The subject 1,145m² Residential zoned property is located off the south-eastern side of Worth Street, accessed 170m south-west of the Dominion Road intersection, in the south-western outskirts of the Kaitaia urban district. An existing vehicle crossing formation and partial concrete driveway are present at the north-eastern corner of the site. The property is depicted on our appended Site Plan (ref: 138275-G600) and below.

Figure 1: Screenshot aerial view of the subject site from the Far North District Council (FNDC) on-line GIS Property and Land Map. Property boundary is highlighted in cyan. 1.0m LiDAR contours are overlaid. Dwelling at north-western has been demolished.

Topographically speaking, the property lies within a gently sloping, elevated plateau. The site is east facing and initially falls at gentle grades averaging less than 3°, increasing slightly to grades averaging less than 5° across the south-eastern corner of the Lot. Existing ground levels across the site range between approximately 29.5m and 27m New Zealand Vertical Datum (NZVD). The land beyond the south-eastern boundary is encompassed by the Kaitaia Hospital environment and displays similar inclinations.

A residential dwelling used to occupy the north-western end of the site but based on Google Earth Aerial Imagery, appears to have been demolished at some point after October 2024, leaving the site now vacant and covered in overgrown lawn, but with pockets of exposed surficial soil, debris and rubbish, including glass. Except for the south-eastern boundary, large trees and bush bound much of the boundaries.

Figure 2: Site photograph looking north-westerly towards the roadside.

Figure 3: Site photograph looking south-easterly towards Kaitaia Hospital.

At the time of preparing this report, we note that the FNDC on-line GIS Water Services Map indicates the following services:

- A water supply line borders the north-western roadside boundary, and
- A gravity main wastewater line traverses through the approximate north-western third of the site. The line is aligned parallel to the north-western roadside boundary and offset approximately 27m.

Figure 4: Screenshot aerial view of the subject site from the FNDC on-line GIS Water Services Map. Property boundary is highlighted in cyan. Blue line is water, red line is wastewater.

4. DEVELOPMENT PROPOSALS

Based on our review of the supplied preliminary architectural drawings, it is our understanding that the client proposes to introduce two new relocatable dwellings and two detached garages.

Dwelling 01 is to encompass an area of 92m² and will be re-sited at the south-eastern end of the property. A 15m² deck is to be constructed off the north-western end of the dwelling, whilst a minor entry deck of less than 2m² is to be constructed off the eastern side. A 29m² garage will be positioned to the west of the house.

Dwelling 02 is to encompass an area of 71m² and will be re-sited at the north-western end of the property. Three minor timber decks of less than 7m² are to be constructed off the north-western, south-western, and eastern sides of the dwelling. A 25m² garage will be positioned to the south-east of the house.

Both dwellings are to consist of timber subfloors, suspended on bored, concrete encased, tanalised timber pile foundations. The finished floor levels (FFL) for both dwellings are currently unknown, but the drawings indicate the use of four risers of no higher than 190mm for the steps up onto the decks. It is inferred that no significant cut-fill earthworks will be undertaken for either dwelling other than perhaps minor surficial soil stripping and debris removal, along with bored footing excavations.

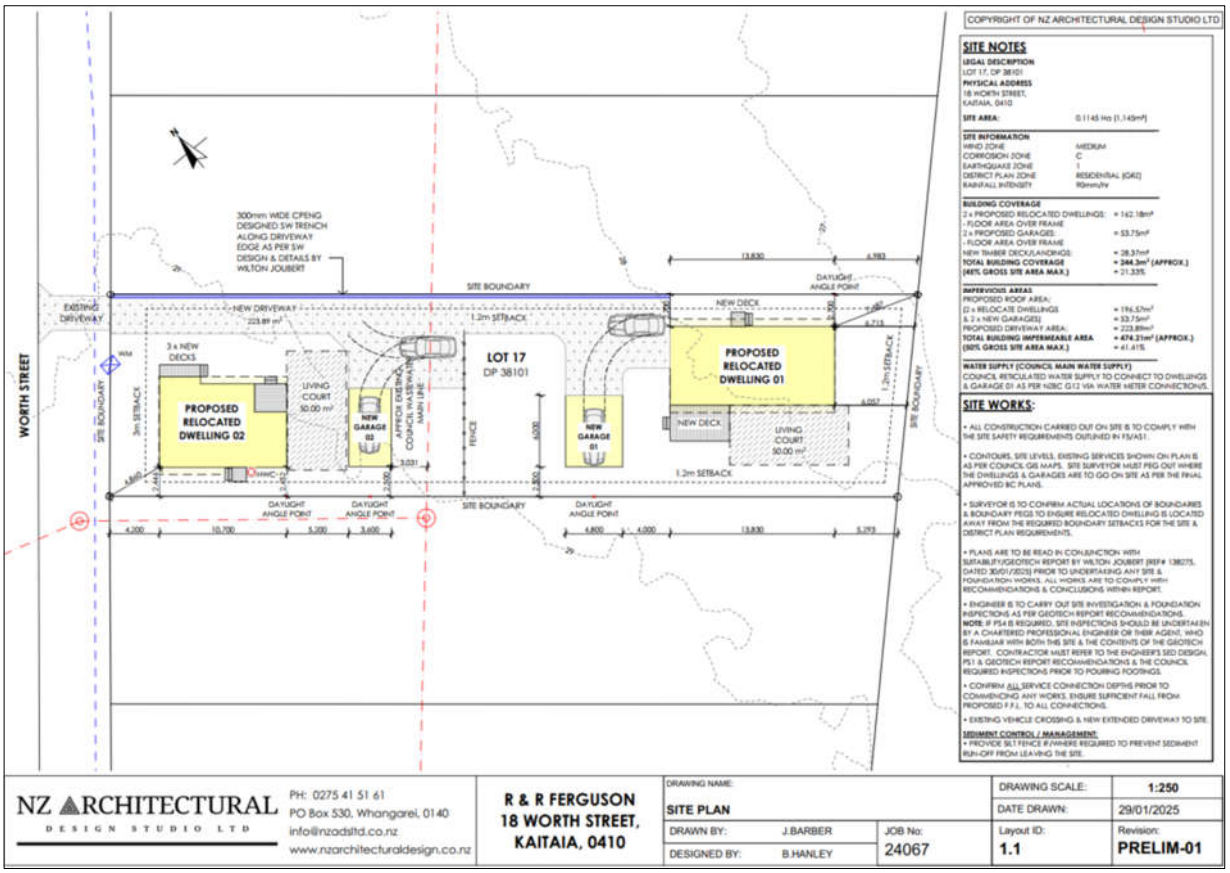


Figure 5: Screenshot of the Site Plan from the supplied preliminary architectural drawings.

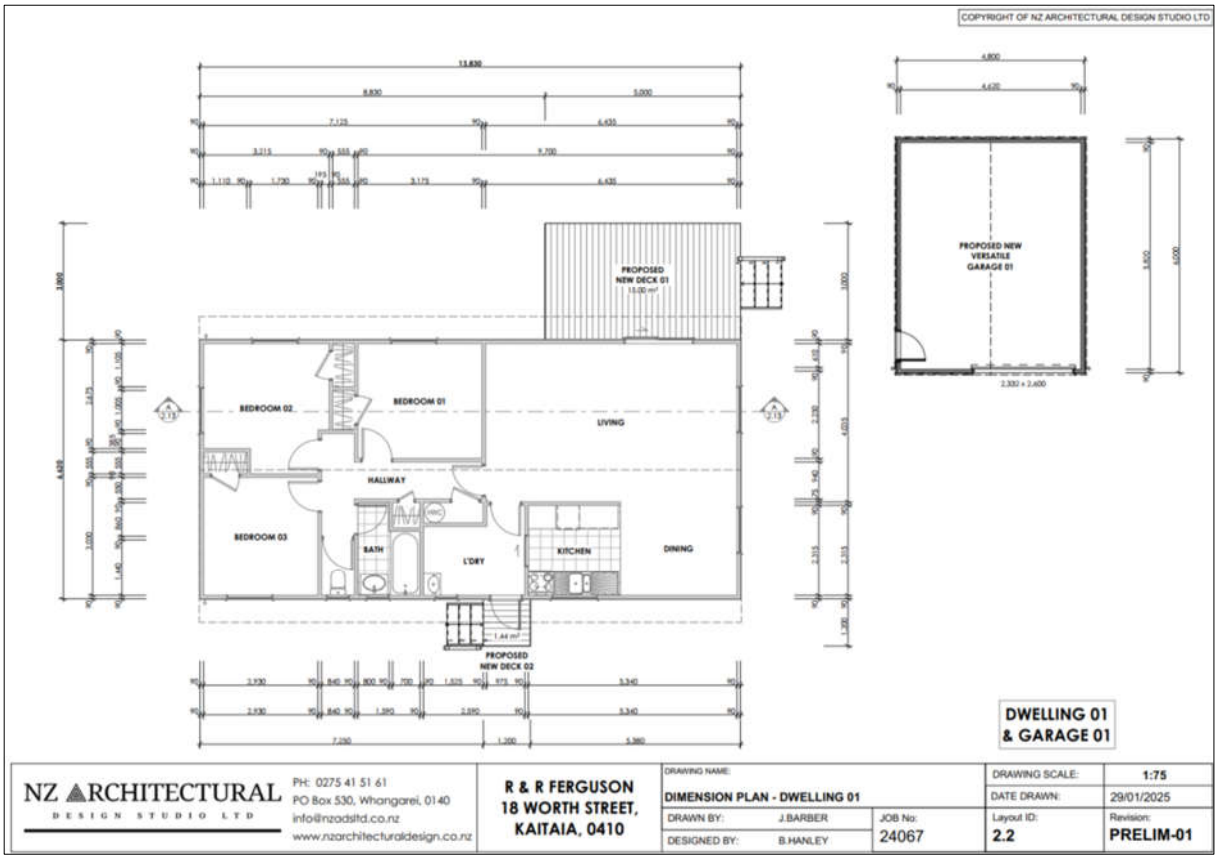


Figure 6: Screenshot of the Dwelling 01 Dimension Plan from the supplied preliminary architectural drawings.

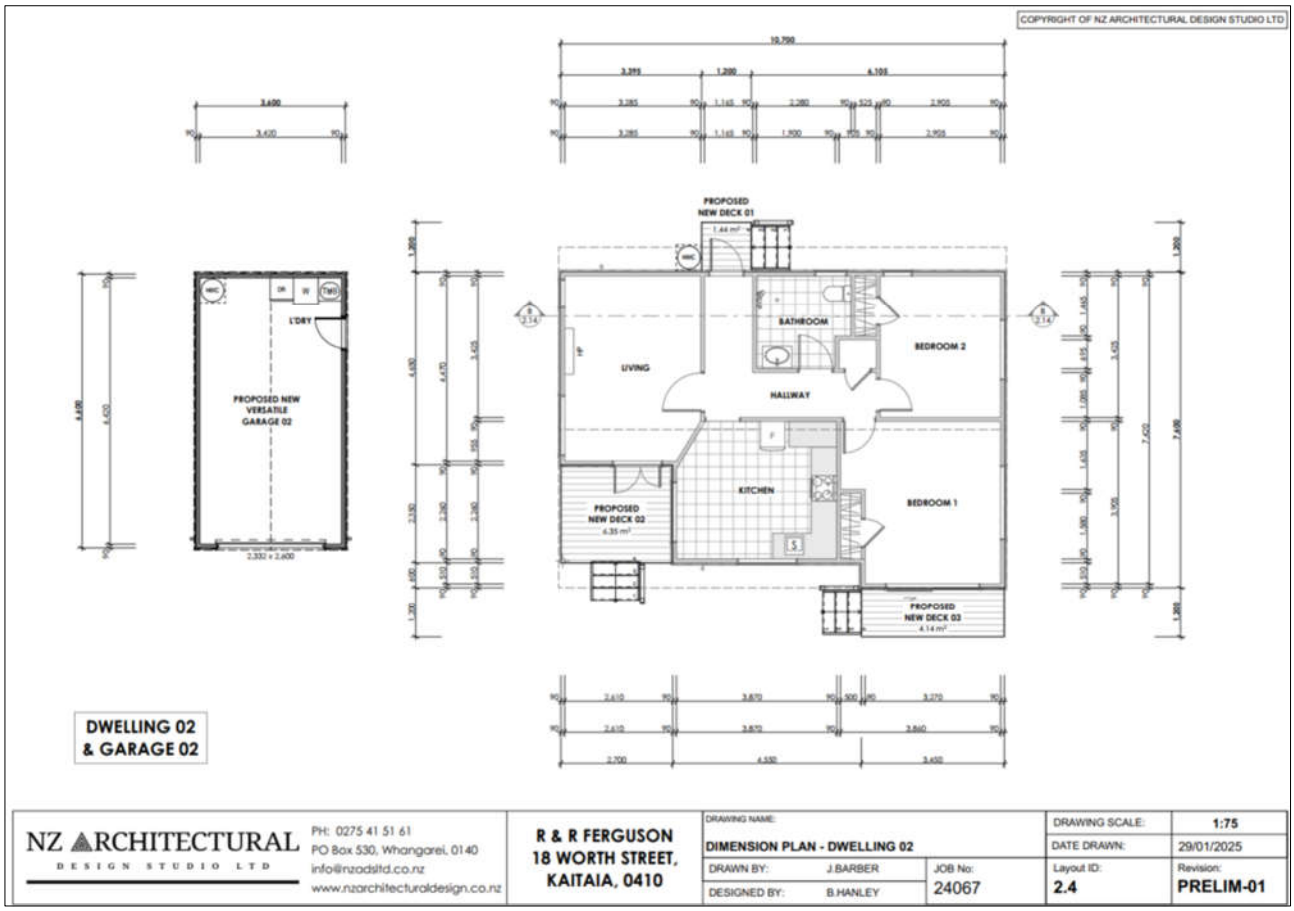


Figure 7: Screenshot of the Dwelling 02 Dimension Plan from the supplied preliminary architectural drawings.

The drawings indicate that both garages will be Versatile in design and founded on concrete slabs with perimeter strip foundations. Due to the level nature of both areas, only minor cut-fill earthwork operations are envisaged being required to create level building platforms.

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

5. GEOLOGY

Local geology across the property and wider surrounding land is noted on the GNS Science New Zealand Geology Web Map, Scale 1:250,000, as; **OIS4 – OIS1 (Late Pleistocene to Holocene) Estuary, River, and Swamp Deposits**. These deposits are described as being up to approximately 71,000 years in age and consisting of; "*Unconsolidated to poorly consolidated sand, peat, mud, and shell deposits (estuarine, lacustrine, swamp, alluvial, and colluvial*" (ref: GNS Science Website).

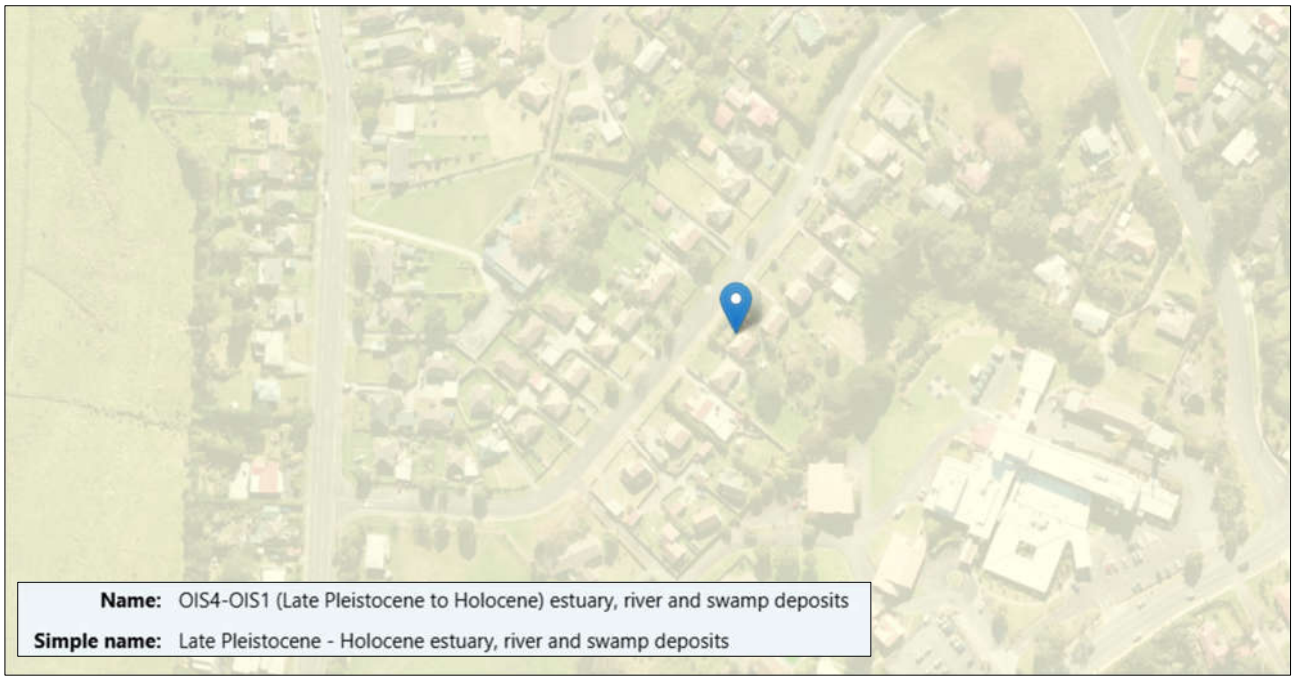


Figure 8: Screenshot aerial view of the subject site and wider surrounding land from the New Zealand Geology Web Map. Blue marker depicts property location.

6. GEOTECHNICAL INVESTIGATION

We undertook a Geotechnical investigation of the site on 22 January 2025, comprising of drilling 6 (no.) 50mm diameter hand auger boreholes (HA01 to HA06 inclusive) to depths ranging between 2.0m and 5.0m below existing ground level (BEGL).

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

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

The HA locations are depicted on our appended Site Plan (ref: 138275-G600) and the logged results are appended to this report.

7. GEOTECHNICAL FINDINGS

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 / NON-ENGINEERED FILL

Aside from HA02, surficial TOPSOIL layers of 0.20m to 0.30m thickness were overlying all HA's.

HA02 was overlain by a 0.20m thick surficial layer of NON-ENGINEERED FILL, comprising of stiff Slightly Clayey SILT intermixed with TOPSOIL.

7.2. NATURAL GROUND

The underlying natural deposits encountered on-site appeared to be only remotely consistent with, and generally better than, our expectations of older, Late Pleistocene Estuary, River, and Swamp Deposits. They comprised a 1.4m to 2.6m thick cap of very stiff Clayey SILT, generally overlying stiff to very stiff, Silty CLAY and Slightly Silty CLAY until termination, with no indications of any near surface weak materials, nor at any depth, any organic content. Subsoils did become firm in nature at a depth of 4.8m BEGL in the upslope HA01 however, were not evident at the downslope HA02.

In HA's 02-06 and above a depth of 4.0m BEGL in HA01, measured in-situ, BS1377 adjusted peak Shear Vane Strengths ranged between 72kPa and greater than 220kPa, the latter being where soil strength was in excess of the shear vane capacity. It was only below a depth of 4.0m BEGL in HA01, a depth considered to be beyond the depth of stress increases imposed by the proposed building loads, that strengths diminished, becoming in the range of between 47kPa and 57kPa.

Where able to be determined, peak to remould Vane Shear Strength ratios ranged between 1.3 and 3.0, indicating the underlying subsoils range between 'Insensitive, Normal' and 'Moderately Sensitive.'

Figure 9: Site photograph of the HA01 soil arisings (0.0m to 5.0m).

Figure 10: Site photograph of the HA06 soil arisings (0.0m to 5.0m).

7.3. GROUNDWATER

Groundwater was not encountered within any of the six HA's which were excavated to a maximum depth of 5.0m BEGL, which is notable, given that our testing followed a significant rainfall period of greater than 50mm that occurred over the three days prior to our investigation.

Based on the above, together with the topography of the general area and our subsoil findings, it is generally envisaged that groundwater levels will not be significantly elevated beneath proposed building sites or surrounding influential land.

7.4. SUMMARY TABLE

The following table summarises our inferred stratigraphic profiling:

Investigation Hole ID	Termination Depth (m)	Depth to Base of Surficial Topsoil / Non-Engineered Fill (m)	Vane Shear Strength Range (kPa) within Natural Ground	Standing Groundwater Depth (m)
HA01	5.0	0.20	47 - 220	NE
HA02	3.0	0.20	75 - 160	NE
HA03	2.0	0.20	220+	NE
HA04	2.0	0.20	155 – 197+	NE
HA05	3.0	0.20	102 – 197+	NE
HA06	5.0	0.20	90 – 197+	NE

Note: UTP = Unable to Penetrate, NE = Not Encountered

8. GEOTECHNICAL ASSESSMENTS

8.1. SITE STABILITY

On the basis of:

- No obvious evidence of deep-seated instability within the immediate vicinity of the property and surrounding influential land,
- Gently sloping nature of the property which averages less than 5°,
- The generally stiff to very stiff, measured in-situ Vane Shear Strengths recorded during our investigation within the upper 4.0m of subsoil stratum, and
- Lack of groundwater evidence within our HA's,

we perceive no apparent risk of deep-seated global slope instability impacting the proposed development.

In the long-term, provided that all of 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 proposed development.

8.2. LIQUEFACTION ASSESSMENT

Liquefaction is a natural phenomenon whereby prolonged seismic shaking induces an increase in pore water pressure, which in turn decreases the effective stress of silt/fine sand-like soil deposits. Excess pore water pressure (EPWP) can build to such an extent that the effective stress of the underlying soil is reduced to near zero, whereby the soils no longer carry shear strength and behave as a semi solid/fluid. In such a scenario, excess pore water pressures will follow the path of least resistance to eventual dissipation, which can lead to the migration of liquefied soils towards the surface, or laterally towards a free-face (edge of slope, riverbank, etc.) or layers that have not yet undergone liquefaction. Examples of these phenomena were experienced in Christchurch and the greater Canterbury Region during the Canterbury Earthquake Sequence between 2010-2011.

At the time of preparing this report, we note that the FNDC on-line GIS Liquefaction Vulnerability Map indicates that the property and wider surrounding land lies within an '*Undetermined*' zone.

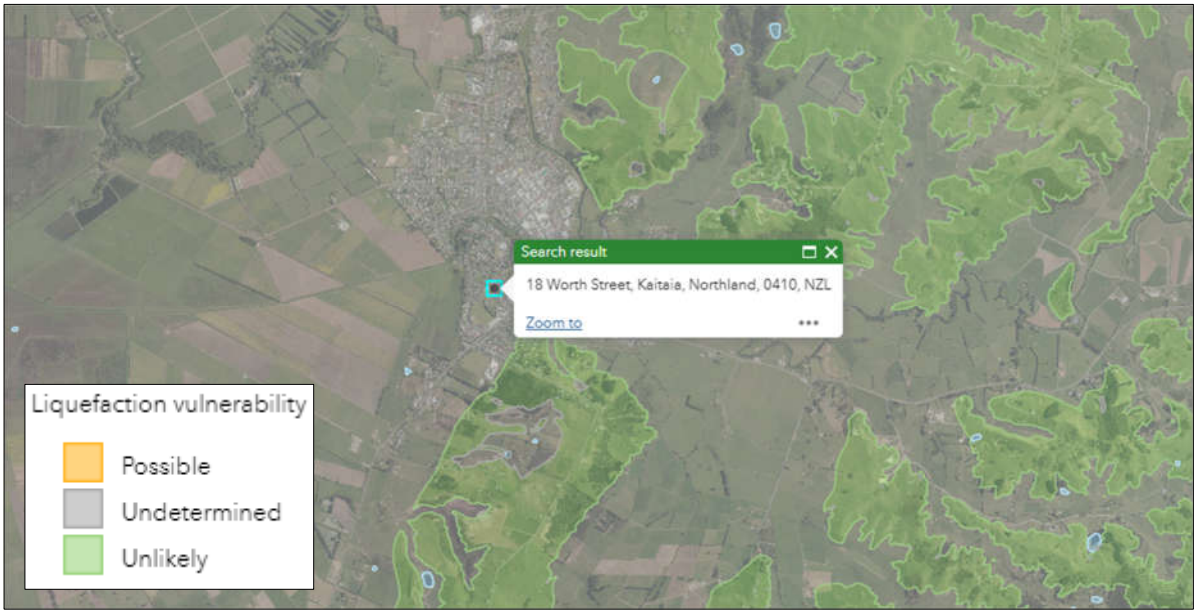


Figure 12: Screenshot aerial view of the from the FNDC on-line GIS Liquefaction Vulnerability Map. Black dot and cyan square depict property location.

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

- There are no known active faults traversing through the property or wider surrounding land,
- There is no historical evidence of liquefaction at the property,
- The property is situated in an elevated location, set no less than approximately 27m NZVD, with good water shedding characteristics,
- Stiff to very stiff, in-situ measured Vane Shear Strength were recorded during our investigation within the upper 4.0m of subsoil stratum,
- There was a lack of groundwater evidence within our HA's,
- The underlying natural soil deposits comprise of cohesive soils that are not generally considered susceptible to liquefaction, and
- The subsoils beneath the development areas are considered to be underlain by Estuary, River, and Swamp Deposits of older, Late Pleistocene Era, which allows for adequate consolidation in comparison to younger, Holocene age material (10,000 years).

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

9. CONCLUSIONS AND RECOMMENDATIONS

On the basis of the above analyses, we consider the risk of moderate to deep-seated slope instability impacting on the proposed development to be non-apparent, provided all recommendations contained within our report are implemented in design and construction.

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

i. The currently proposed site development and associated building work within the relayed building platforms 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 footprints and surrounding immediate amenity areas of the relayed building platforms are neither subject nor likely to be subject to slippage or subsidence, provided the development is undertaken in accordance with the recommendations and guidance of this report.

9.1. FOUNDATIONS

Both relocated dwellings are to consist of timber subfloors, suspended on bored, concrete encased, tanalised timber pile foundations. Additionally, various minor timber decks of less than 15m² and founded on similar foundations are to be constructed off both dwellings.

The drawings indicate that both garages will be Versatile in design and founded on concrete slabs with perimeter strip foundations. Due to the level nature of both areas, only minor cut-fill earthwork operations are envisaged being required to create level building platforms.

9.1.1. SHALLOW FOUNDATION BEARING CAPACITY

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

Geotechnical Ultimate Bearing Capacity	300 kPa
ULS Dependable Bearing Capacity (Φ=0.5)	150 kPa

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

Most notably, the northern-most garage near proposed Dwelling 02 appears to be offset approximately 3.4m from the gravity main wastewater line that traverses through the north-western third of the site. The location and depth of this service line must be verified prior to the finalisation of architectural drawings and commencement of construction works.

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

9.1.2. SHALLOW FOUNDATIONS ON EXPANSIVE SOILS

In the absence of site-specific laboratory testing, considering the alluvial nature of the underlying subsoils, we recommend a primary conservative classification of Class H (Highly) expansive soils, as defined in clause 7.5.13.1.2, and introduced to NZS3604 by Amendment 19 of NZBC Structure B1/AS1.

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

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

Soil expansiveness can be mitigated as follows:

- For Both Relocated Dwellings and All Timber Decks:
  - Bored, concrete encased, tanalised timber pile foundations embedded a minimum of 0.90m below finished ground levels (BFGL) and 0.30m into competent natural ground, whichever is deeper.

- For Both Garages:
  - Slab-on-Grade with deepened perimeter strip footings embedded a minimum of 0.90m BFGL and 0.30m into competent natural ground, whichever is deeper, or
  - Specifically designed reinforced, stiffened raft slab, designed for a Ys value of 44mm and founded on a minimum of 0.45m of engineered hardfill that extends a minimum of 1.0m beyond the building footprint.

9.1.3. NZS1170.5:2004 SITE SUBSOIL CLASSIFICATION

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

9.2. SITE EARTHWORKS

It is generally assumed earthworks for both dwelling building sites will comprise of minor surficial soil stripping and debris removal, along with bored footing excavations. No significant cut-fill earthworks are envisaged.

Due to the level nature of both garage building sites, only minor cut-fill earthwork operations will be required to create level building platforms. Crossfalls of less than approximately 0.30m are expected across both areas.

Generally, and as directed by a suitably experienced engineer, all earthworks should be undertaken in accordance with the following standards:

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

9.3. SITE PREPARATION

The competency of the exposed subgrade at the invert of all bored timber pile footings, as well as underlying both garage slabs, should be confirmed by a Geo-Professional. At both garage building sites, we recommend the stripping of all vegetation topsoil, and any non-engineered fill deposits encountered, prior to requesting Geo-Professional inspection(s) of the stripped ground to confirm that the underlying natural subgrade conditions are in keeping with the expectations of this report.

Without such inspections being undertaken, a Chartered Professional Geotechnical Engineer is unable to issue a Producer Statement - Construction Review (PS4) – which could result in the failure to meet Building Consent requirements as set by Council as conditions of consent.

9.4. SUBGRADE PROTECTION

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

In the absence of penultimate garage details, the following comments pertaining to the garage are intended as general preliminary guidance. The subgrade beneath the future garage slab should not be left exposed for any prolonged period and should be covered with a 0.10m thick layer of granular fill. such as GAP40 basecourse, as soon as possible.

If subgrade degradation occurs by:

- Excessive drying out resulting in desiccation shrinkage cracking, it will be necessary to either re-hydrate the subgrade or undercut the degraded material and replace with compacted hardfill, or
- Excessive subgrade softening after a period of wet weather resulting in weakened soils, it will be necessary to undercut the degraded material and replacement with compacted hardfill.

9.5. HARDFILL COMPACTION

Engineered, compacted hardfill should be utilised for all fills beneath both garage slabs. The compaction of hardfill should be undertaken using either a heavy plate compactor or a steel wheeled roller with low frequency dynamic compaction. Hardfill layers should not exceed 0.15m at a time, and where the total depths exceed 0.60m, there is likely to be a Building Consent condition for observation/testing of the hardfill by a Geo-Professional. We recommend achieving the following compacted target values, with equivalence testing using either a Clegg Impact Hammer or DCP-Scala Penetrometer.

Foundation Support Type	CBR	Equivalent Clegg Impact Value (CIV)	Equivalent DCP-Scala Penetrometer Blows
Foundation Footings & Beams (Over a depth of no less than twice the foundation width)	≥ 10%	Minimum 20 Average 25	≥5 blows/100mm (NZS3604)
Floor Slabs	≥ 7%	Minimum 18 Average 20	≥3.5 blows/100mm (NZS3604)

9.6. TEMPORARY & LONG-TERM EARTHWORK BATTERS

We recommend that earthworks only be undertaken during prolonged forecasted periods of dry weather conditions.

During times of inclement weather, earthwork sites should be shaped to assist in stormwater run-off, as saturating site soils could result in a reduction of bearing capacities.

All cuts and fills up to 0.60m should be respectively battered no steeper than 1V:3H (18°) and 1V:4H (14°). All proposed cuts and fills outside these imposed limits must be referred to WJL.

All exposed batters and soils should be re-grassed and/or planted as soon as practicable.

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

9.7. GENERAL SITE WORKS

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

Furthermore:

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

9.8. LONG-TERM FOUNDATION CARE & MAINTENANCE

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

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

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

To this end, care should be taken to avoid:

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

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

10. STORMWATER CONTROL

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

All stormwater runoff from roof and paved areas should be collected in sealed pipes and be discharged to a stable disposal point that is well clear of all four building sites.

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

11. UNDERGROUND SERVICES

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

12. FUTURE CONSTRUCTION MONITORING

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

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

For WJL to issue a PS4 to meet the above clauses of the NZBC, we will need to carry out the site inspections as per the Building Consent and Council requirements.

We require at least 48 hours' notice for site inspections.

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

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

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

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

At this time, the following Geotechnical site inspections and testing should include, but are not limited to:

- Site cut (both garages),
- Hardfill compaction (both garages),
- Deepened perimeter strip footings (both garages, if applicable), and
- Pre-pour bored timber pile footings (both dwellings).

13. LIMITATIONS

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

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

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

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

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

Yours faithfully,

WILTON JOUBERT LIMITED

Enclosures:

Site Plan (1 sheet)
Hand Auger Borehole Records (6 sheets)
'Foundation Maintenance & Footing Performance' sheet BTF18: A Homeowner's Guide, published by CSIRO (4 sheets)
Construction Monitoring (1 sheet)

SITE LOCATION

IMAGE SOURCE:
FAR NORTH DISTRICT COUNCIL LOCAL MAPS

13,830

6,983

2,700

2,700

7,487

HA 05

HA 02

WM

PROPOSED DRIVEWAY 228.24m²

LOT 17
D P 38101

PROPOSED RELOCATED DWELLING ROOF COVERAGE 108.87m²

4,800

4,000

HA 06

SITE BOUNDARY

3m SETBACK

PROPOSED RELOCATED DWELLING ROOF COVERAGE

PROPOSED GARAGE 26.87m²

HA 03

PROPOSED GARAGE 26.88m²

HA 04

NEW DECK

HA 01

6,000

1.2m SETBACK

1.2m SETBACK

SITE BOUNDARY

1,297

1,297

4,100

3,200

0m 2m 10m 20m

SCALE 1:200

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

GENERAL NOTES

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

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

ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
A	FEB 2025	JWB	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY: JWB
DRAWN BY: JWB
CHECKED BY:
SURVEYED BY:

SERVICES NOTE

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

BUILDING CONSENT

DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **SITE PLAN**

PROJECT DESCRIPTION: **TWO RELOCATED DWELLING & TWO DETACHED GARAGES**

PROJECT TITLE: **LOT 17 DP 38101 18 WORTH STREET KAITAIA NORTHLAND**

ORIGINAL DRAWING SIZE:	OFFICE:
A3	KERIKERI
DRAWING SCALE:	CO-ORDINATE SYSTEM:
1:200	NOT COORDINATED
DRAWING NUMBER:	ISSUE:
138275-G600	A

HAND AUGER : HA01

JOB NO.: 138275 **SHEET:** 1 OF 1

START DATE: 22/01/2025 **NORTHING:** **GRID:**

CLIENT: Robyn & Charlie Ferguson **DIAMETER:** 50mm **EASTING:**

PROJECT: Two Relocated Dwellings & Two Detached Garages **SV DIAL:** DR4802 **ELEVATION:** Ground

SITE LOCATION: 18 Worth St, Kaitaia **FACTOR:** 1.57 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / mm)	COMMENTS, SAMPLES, OTHER TESTS
	TOPSOIL, dark brown, moist.	TS	0.2						
OIS4-OIS1 (Late Pleistocene to Holocene) Estuary, River, and Swamp Deposits	NATURAL: Clayey SILT, light brown with grey and brown streaks, very stiff to hard, moist, low to moderate plasticity.		0.4						
	0.4m: Becoming very stiff.				176	75	2.3		
	0.6m: Becoming yellowish brown with whitish grey mottles, low plasticity.		0.6						
	0.8m: Becoming hard.		0.8		220+	-	-		
			1.0						
	1.1m: Becoming whitish grey with yellow and brown mottles.		1.2		220+	-	-		
	1.3m: Becoming low to moderate plasticity, frequent red mottles.		1.4						
			1.6						
	Silty CLAY, yellowish brown and whitish grey with occasional red mottles, stiff to very stiff, moist, moderate plasticity.		1.8		154	78	2.0		
			2.0		154	78	2.0		
	2.2m: Becoming light grey with orange and red mottles, moderate to high plasticity.		2.2						
			2.4		126	72	1.8		
			2.6						
	2.8m: Becoming stiff		2.8		91	57	1.6		
			3.0						
	3.1m: Becoming light grey with orange mottles.		3.2		94	53	1.8		
			3.4						
	Slightly Silty CLAY, light grey with orange and grey mottles, stiff, moist, high plasticity.		3.6		75	41	1.8		
			3.8						
			4.0		72	38	1.9		
			4.2						
	4.4m: Becoming red with light grey & yellow mottles.		4.4		57	44	1.3		
			4.6						
	4.8m: Becoming firm.		4.8		47	31	1.5		
			5.0						
	EOH: 5.00m - Target depth.		5.2						
			5.4						

Groundwater Not Encountered

REMARKS

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

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

LOGGED BY: SJP

CHECKED BY: SJW

▼ Standing groundwater level

▽ GW while drilling

WILTON JOUBERT Consulting Engineers
185 Waipapa Road, Kerikeri 0295
Phone: 09-945 4188
Email: jobs@wjl.co.nz
Website: www.wiltonjoubert.co.nz

HAND AUGER : HA02

JOB NO.: 138275 **SHEET:** 1 OF 1

START DATE: 22/01/2025 **NORTHING:** **GRID:**

CLIENT: Robyn & Charlie Ferguson **DIAMETER:** 50mm **EASTING:**

PROJECT: Two Relocated Dwellings & Two Detached Garages **SV DIAL:** DR4802 **ELEVATION:** Ground

SITE LOCATION: 18 Worth St, Kaitaia **FACTOR:** 1.57 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / mm)	COMMENTS, SAMPLES, OTHER TESTS
	FILL: Slightly Clayey SILT intermixed with TOPSOIL, dark brown with white and red mottles, stiff, moist, low plasticity.		0.2	Groundwater Not Encountered					
OIS4-OIS1 (Late Pleistocene to Holocene) Estuary, River, and Swamp Deposits	NATURAL: Clayey SILT, light brown with grey and brown streaks, very stiff, moist, low to moderate plasticity.		0.4		160	72	2.2		
	0.6m: Becoming yellowish brown with grey and brown streaks.		0.6						
	0.8m: Becoming yellowish brown with white mottles.		0.8		135	66	2.0		
			1.0						
			1.2		126	66	1.9		
	1.3m: Becoming whitish grey with orange mottles, moderate plasticity.		1.4						
			1.6		110	66	1.7		
			1.8						
	1.9m: Becoming yellowish brown with grey and red mottles.		2.0						
	2.0m: Becoming stiff.				94	63	1.5		
	Silty CLAY, yellowish brown and whitish grey with occasional red mottles, stiff, moist, moderate plasticity.		2.2						
			2.4		85	50	1.7		
			2.6						
	2.7m: Becoming light grey with orange and red mottles, moderate to high plasticity.		2.8		75	47	1.6		
			3.0						
	EOH: 3.00m - Target depth.		3.2						
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						
			4.4						
			4.6						
			4.8						
			5.0						
			5.2						
			5.4						

REMARKS

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

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

LOGGED BY: SJP

CHECKED BY: SJW

▼ Standing groundwater level

▽ GW while drilling

WILTON JOUBERT Consulting Engineers
185 Waipapa Road, Kerikeri 0295
Phone: 09-945 4188
Email: jobs@wjl.co.nz
Website: www.wiltonjoubert.co.nz

HAND AUGER : HA03

JOB NO.: 138275 **SHEET:** 1 OF 1

START DATE: 22/01/2025 **NORTHING:** **GRID:**

CLIENT: Robyn & Charlie Ferguson **DIAMETER:** 50mm **EASTING:**

PROJECT: Two Relocated Dwellings & Two Detached Garages **SV DIAL:** DR4802 **ELEVATION:** Ground

SITE LOCATION: 18 Worth St, Kaitaia **FACTOR:** 1.57 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE: PEAK STRENGTH (kPa)	SHEAR VANE: REMOULD STRENGTH (kPa)	SHEAR VANE: SENSITIVITY	DCP - SCALA (Blows / mm)	COMMENTS, SAMPLES, OTHER TESTS
	TOPSOIL, dark brown, moist.	TS	0.2	Groundwater Not Encountered					
OIS4-OIS1 (Late Pleistocene to Holocene) Estuary, River, and Swamp Deposits	NATURAL: Clayey SILT, light brown, hard, moist, low to moderate plasticity.		0.4		220+	-	-		
	0.5m: Becoming yellowish brown with white mottles, low plasticity.		0.6						
			0.8		220+	-	-		
			1.0						
			1.2		220+	-	-		
	1.4m: Becoming low to moderate plasticity, occasional red mottles.		1.4						
			1.6		220+	-	-		
	1.7m: Becoming yellowish brown with white and grey mottles.		1.8						
			2.0						
	EOH: 2.00m - Target depth.		2.2		220+	-	-		
			2.4						
			2.6						
			2.8						
			3.0						
			3.2						
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						
			4.4						
			4.6						
			4.8						
			5.0						
			5.2						
			5.4						

REMARKS

End of borehole @ 2.00m (Target Depth: 2.00m)

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: SJW

▼ Standing groundwater level

▽ GW while drilling

WILTON JOUBERT Consulting Engineers
185 Waipapa Road, Kerikeri 0295
Phone: 09-945 4188
Email: jobs@wjl.co.nz
Website: www.wiltonjoubert.co.nz

HAND AUGER : HA04

CLIENT: Robyn & Charlie Ferguson
PROJECT: Two Relocated Dwellings & Two Detached Garages
SITE LOCATION: 18 Worth St, Kaitaia

JOB NO.: 138275 **SHEET:** 1 OF 1
START DATE: 22/01/2025 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: 1994 **ELEVATION:** Ground
FACTOR: 1.41 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / mm)	COMMENTS, SAMPLES, OTHER TESTS
	TOPSOIL, dark brown, moist.	TS	0.2	Groundwater Not Encountered					
	NATURAL: Clayey SILT, yellowish brown, very stiff, moist, low to moderate plasticity, frequent rootlets.		0.4		197+	-	-		
			0.6						
			0.8		197+	-	-		
			1.0						
	1.2m: Becoming yellowish brown with red and white mottles.		1.2		197+	-	-		
			1.4						
			1.6		197+	-	-		
			1.8						
	EOH: 2.00m - Target depth.		2.0		155	65	2.4		
			2.2						
			2.4						
			2.6						
			2.8						
			3.0						
			3.2						
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						
			4.4						
			4.6						
			4.8						
			5.0						
			5.2						
			5.4						

REMARKS
End of borehole @ 2.00m (Target Depth: 2.00m)

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

LOGGED BY: JEM
CHECKED BY: SJW

▼ Standing groundwater level
▽ GW while drilling

WILTON JOUBERT Consulting Engineers
185 Waipapa Road, Kerikeri 0295
Phone: 09-945 4188
Email: jobs@wjl.co.nz
Website: www.wiltonjoubert.co.nz

HAND AUGER : HA05

JOB NO.: 138275 **SHEET:** 1 OF 1

START DATE: 22/01/2025 **NORTHING:** **GRID:**

CLIENT: Robyn & Charlie Ferguson **DIAMETER:** 50mm **EASTING:**

PROJECT: Two Relocated Dwellings & Two Detached Garages **SV DIAL:** 1994 **ELEVATION:** Ground

SITE LOCATION: 18 Worth St, Kaitaia **FACTOR:** 1.41 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / mm)	COMMENTS, SAMPLES, OTHER TESTS
	TOPSOIL, dark brown, moist.	TS	0.2						
OIS4-OIS1 (Late Pleistocene to Holocene) Estuary, River, and Swamp Deposits	NATURAL: Clayey SILT, yellowish brown, very stiff, moist, low to moderate plasticity.		0.4	Groundwater Not Encountered	197+	-	-		
	0.8m: Becoming yellowish brown with red and brown mottles.		0.6						
			0.8		197+	-	-		
			1.0						
			1.2		197+	-	-		
			1.4						
			1.6		158	73	2.2		
			1.8						
			2.0		102	48	2.1		
			2.2						
	Silty CLAY, reddish brown, very stiff, moist, moderate plasticity.		2.4		121	68	1.8		
			2.6						
			2.8		113	65	1.7		
	EOH: 3.00m - Target depth.		3.0						
			3.2						
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						
			4.4						
			4.6						
			4.8						
			5.0						
			5.2						
			5.4						

REMARKS

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

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

LOGGED BY: JEM

CHECKED BY: SJW

▼ Standing groundwater level

▽ GW while drilling

WILTON JOUBERT Consulting Engineers
185 Waipapa Road, Kerikeri 0295
Phone: 09-945 4188
Email: jobs@wjl.co.nz
Website: www.wiltonjoubert.co.nz

HAND AUGER : HA06

CLIENT: Robyn & Charlie Ferguson
PROJECT: Two Relocated Dwellings & Two Detached Garages
SITE LOCATION: 18 Worth St, Kaitaia

JOB NO.: 138275 **SHEET:** 1 OF 1
START DATE: 22/01/2025 **NORTHING:** **GRID:**
DIAMETER: 50mm **EASTING:**
SV DIAL: 1994 **ELEVATION:** Ground
FACTOR: 1.41 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / mm)	COMMENTS, SAMPLES, OTHER TESTS
	TOPSOIL, dark brown, moist.	TS	0.2						
OIS4-OIS1 (Late Pleistocene to Holocene) Estuary, River, and Swamp Deposits	NATURAL: Clayey SILT, yellowish brown, very stiff, moist, low to moderate plasticity.		0.4	Groundwater Not Encountered	197+	-	-		
			0.6						
			0.8		197+	-	-		
	1.1m: Becoming yellowish brown with white and grey mottles.		1.0						
			1.2		197+	-	-		
			1.4						
			1.6		197+	-	-		
			1.8						
			2.0		197+	-	-		
			2.2						
			2.4		147	54	2.7		
			2.6						
			2.8						
	Silty CLAY, yellowish brown with red and grey mottles, very stiff, moist, moderate plasticity.		3.0		135	45	3.0		
			3.2						
			3.4		124	51	2.4		
	3.6m: Becoming moderate to high plasticity.		3.6		149	82	1.8		
	4.0m: Becoming stiff.		3.8						
			4.0		90	62	1.5		
	4.4m: Becoming moist to wet.		4.2						
			4.4		93	62	1.5		
	4.8m: Becoming very stiff.		4.6						
			4.8		124	85	1.5		
	EOH: 5.00m - Target depth.		5.0						
			5.2						
			5.4						

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

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

LOGGED BY: JEM
CHECKED BY: SJW

▼ Standing groundwater level
▽ GW while drilling

WILTON JOUBERT Consulting Engineers
185 Waipapa Road, Kerikeri 0295
Phone: 09-945 4188
Email: jobs@wjl.co.nz
Website: www.wiltonjoubert.co.nz

Foundation Maintenance and Footing Performance:
A Homeowner's Guide

PUBLISHING

BTF 18-2011 replaces Information Sheet 10/91

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

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

Soil Types

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

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. The table below is Table 2.1 from AS 2870-2011, the Residential Slab and Footing Code.

Causes of Movement

Settlement due to construction

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

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

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

Erosion

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

Saturation

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

Seasonal swelling and shrinkage of soil

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

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

Shear failure

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

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

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

GENERAL DEFINITIONS OF SITE CLASSES

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

Notes

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

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

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.
- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

Unevenness of Movement

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

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

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

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

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

Effects of Uneven Soil Movement on Structures

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

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

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

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

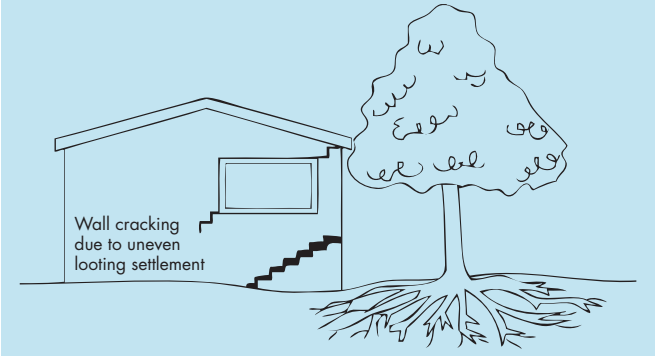
The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally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

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

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

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

Trees can cause shrinkage and damage



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

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

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

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

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

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

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

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

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

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

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

Water Service and Drainage

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

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

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

Seriousness of Cracking

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

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

Prevention/Cure

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

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

It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

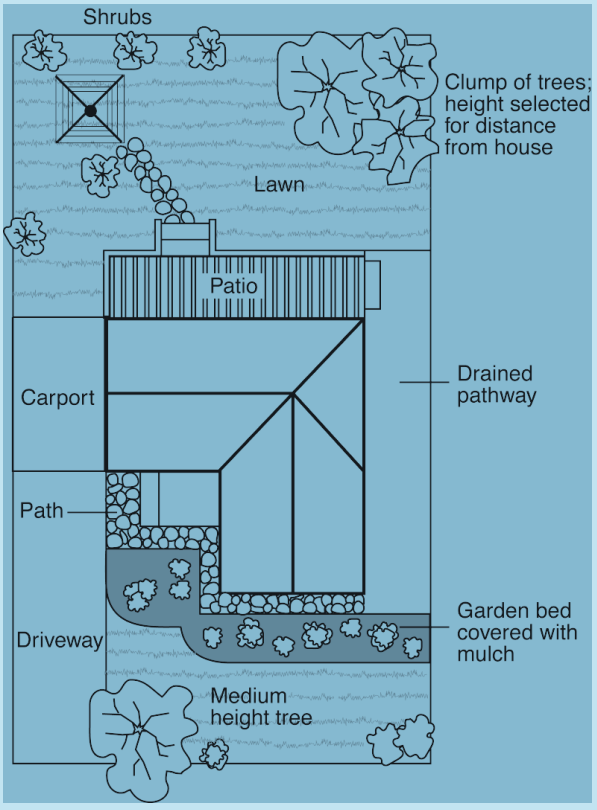
Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving should

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

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

Gardens for a reactive site



extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

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

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill from it (see BTF 19).

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

Condensation

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

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

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

The garden

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

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

Existing trees

Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, if the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

Information on trees, plants and shrubs

State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information. For information on plant roots and drains, see Building Technology File 17.

Excavation

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

Remediation

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

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

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

Distributed by

CSIRO PUBLISHING PO Box 1139, Collingwood 3066, Australia

Tel (03) 9662 7666 Fax (03) 9662 7555 www.publish.csiro.au

Email: publishing.sales@csiro.au

WILTON JOUBERT
Consulting Engineers

Construction Monitoring Services

Northland, Auckland-Waikato, Canterbury, Southern Lakes

Need a PS4?

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

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

CONSTRUCTION MONITORING SERVICES

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

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

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

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

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

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

In Summary:

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

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

Appendix E: Stormwater Mitigation Memorandum

Wilton Joubert Limited
09 527 0196
PO BOX 11-381
Ellerslie
Auckland 1524

SITE	18 Worth Street, Kaitaia
LEGAL DESCRIPTION	Lot 17 DP 38101
PROJECT	Two Relocated Dwellings & Two Detached Garages
CLIENT	Robyn & Charlie Ferguson
REFERENCE NO.	138276
DOCUMENT	Stormwater Mitigation Memorandum
STATUS/REVISION No.	01
DATE OF ISSUE	13th February 2025

Report Prepared For	Email
Robyn & Charlie Ferguson	fergusonspropertycare@gmail.com

Authored by	**G.Brant** *(BE(Hons) Civil)*	Civil Engineer	Gustavo@wjl.co.nz	
Reviewed and Approved by	**B. Steenkamp** *(CPEng, BEng Civil, CMEngNZ, BSc (Geology))*	Senior Civil Engineer	BenS@wjl.co.nz	

1. SCOPE OF WORK

Wilton Joubert Ltd. (WJL) was engaged by the clients, **Robyn & Charlie Ferguson**, to produce an on-site stormwater mitigation assessment for the proposed development at 18 Worth Street, Kaitaia.

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

- Plan Set provided by NZ Architectural Design Studio Ltd, including site plan, floor plans, and elevations (Ref No: 24067, dated: 29.01.2025)

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

2. ASSESSMENT CRITERIA

Impermeable Areas

The calculations for the stormwater system for the development are based on a gross site area of 1,145m² and the below areas *extracted from the supplied plans*:

	Pre-Development	Post-Development	Total Change
Total Roof Area	**104.31 m²**	**250.32 m²**	250.32 m²
Total Driveway	**50 m²**	**223.89 m²**	223.89 m²
Pervious	990.69 m²	670.79 m²	-319.9 m²

The total amount of impermeable area on site, post-development, equates to 474.21m² or 41.41% of the site area. Should any changes be made to the current proposal, the on-site stormwater mitigation design must be reviewed.

Given the above, the proposed development is compliant with Permitted Activity Rule (7.6.5.1.6) and a District Plan Assessment is not required.

Design Requirements

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

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

It is recommended to provide stormwater neutrality for the 20% AEP and 1% AEP storm events for the proposed impermeable areas. Providing stormwater neutrality for the proposed development will mitigate potential risks to neighbouring properties by ensuring that there is no increase in peak flows directed to downstream neighbours.

The Type IA storm profile was utilised for stormwater management calculations in accordance with TR-55. HydroCAD® software has been utilised in design for a 20% AEP rainfall value of 139mm with a 24-hour duration and a 1% AEP rainfall value of 254mm with a 24-hour duration. Rainfall data was obtained from HIRDS and increased by 20% to account for climate change.

Provided that the recommendations within this report are adhered to, the effects of stormwater runoff resulting from the proposed impermeable areas are considered to have less than minor effects on the receiving environment.

3. STORMWATER MITIGATION ASSESSMENT

To meet the requirements outlined in Section 2, the following must be provided:

Stormwater Mitigation – Roof

Two detention tanks are required to be installed for the mitigation of runoff resulting from the proposed roof.

A proprietary guttering system is required to collect roof runoff from proposed **relocated dwelling 1** and proposed **garage 1** and direct runoff to proposed **tank 1**. A proprietary guttering system is required to collect roof runoff from **relocated dwelling 2** and proposed **garage 2** and direct runoff to proposed **tank 2.** Refer to the appended Site Plan (138276-C200) for clarification. Leaf guards can be installed to minimise blockage of the attenuation tanks. Other adequate protection measures may also be installed in the roof gutters and the tanks' inlet. Any in-line protection systems must be installed at least 600mm above the tank inlets.

As per the attached design calculations, **Tank 1** and **Tank 2** are to have the following specifications:

Proposed Tank	1 x 5,000 litre Promax Rainwater Tank (or similar)
Tank dimensions	1600mm Ø (or greater) x 2690mm high (or greater)
Outlet orifice (20% AEP Control)	**14mm diameter orifice**; located >2200mm below the overflow outlet
Outlet orifice (1% AEP Control)	**23mm diameter orifice**; located 1380mm above the 20% AEP Control orifice
Overflow Outlet	**100mm diameter**; located at the top of the tank

Refer to the appended calculation set, Site Plan (138276-C200) and Tank Detail (138276-C201) for clarification. Discharge from the detention tanks must be transported via sealed pipes to the dispersal device specified below.

Levels are to be confirmed on-site by the contractors prior to construction. The tank locations and burial depths must allow for a minimum drainage line (>1%) from the tank outlets to the discharge point. If this is not achievable, WJL is to be contacted for review of the design.

Stormwater Mitigation – Hardstand

It is recommended to shape the proposed driveway to shed runoff to a minimum 150mm deep x 300mm wide grassed v-channel swale along the northern side of the proposed driveway. The proposed swale is to have a silt trap with a scruffy dome or grated inlet located at a low point. The silt trap is to be fitted with a 100mmØ outlet pipe discharging to the dispersal device specified below. Refer to the appended Site Plan (138276-C200) for clarification.

Stormwater catchpits and drainage piping should be in accordance with E1 Surface Water of the NZBC. The catchpit(s) must have a suitable sump to serve as a pre-treatment device prior to discharging to the discharge point.

Stormwater Mitigation – Discharge Point

It is recommended that discharge from the detention tanks and driveway silt trap be directed via sealed pipes to an underground spreader pipe in a rock-filled dispersal trench. The trench is recommended to be 6m long, with novacoil snaked inside the trench to provide a total 12m long underground spreader pipe. The dispersal device must be installed parallel to the topography. Refer to the appended Site Plan (138276-C200) and Dispersal Device Detail (138276-C202) for clarification.

It is recommended to plant out the area directly downslope of the proposed dispersal device to provide additional erosion protection and evapotranspiration.

4. 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. An indicative system detail has been provided in the appendices of this report (138276-C200 & 138276-C201).

Care should be taken when constructing the discharge point to avoid any siphon or backflow effect within the stormwater system. During construction, if it is found that drainage levels do not work, then WJL must be contacted for review of the design and/or advice.

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.

5. 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 for the dwelling. Any hardstand, secondary stormwater system, Overland Flow Paths (OLFP), vehicular access and the consideration of road/street water flooding is all assumed to be undertaken by a third party.

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

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

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

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

Wilton Joubert Ltd.

Gustavo Brant
Civil Engineer
BE(Hons)

REPORT ATTACHMENTS

- Site Plan – C200 (1 sheet)
- Tank Detail – C201 (1 sheet)
- Dispersal Device Detail – C202 (1 sheet)
- 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.
5. IMPERVIOUS SURFACES FOR MITIGATION:
   SITE AREA = 1,145m²
   TOTAL ROOF COVER = 250.32m²
   DRIVEWAY = 223.89m²

MINIMUM 150mm DEEP x 300mm WIDE V-CHANNEL SWALE (@ >0.5% GRADE) DIRECTING RUNOFF TO SILT TRAP

SILT TRAP WITH SCRUFFY DOME OR GRATED INLET

DRAINAGE LINE FROM TANKS & SILT TRAP TO DISPERSAL DEVICE. 100Ø uPVC @ >1%

6m LONG TRENCH WITH NOVACOIL PIPE SNAKED IN TRENCH

PROPOSED DRIVEWAY TO BE SHAPED TO SHED RUNOFF TO GRASSED SWALE

PROPOSED DRIVEWAY 223.89m²

PROPOSED RELOCATED DWELLING 1 ROOF COVERAGE 108.87m²

PROPOSED RELOCATED DWELLING 2 ROOF COVERAGE 87.7m²

PROPOSED GARAGE 2 26.87m²

PROPOSED GARAGE 1 26.88m²

INDICATIVE DRAINAGE LINE FROM GUTTERS TO **TANK 2**

INDICATIVE DRAINAGE LINE FROM GUTTERS TO **TANK 1**

TANK 2:
1 x 5,000L RAINWATER TANK FOR DETENTION

TANK 1:
1 x 5,000L RAINWATER TANK FOR DETENTION

01 C201

02 C202

CP

SW DP SS W

26.0 27.0 28.0 29.0

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 '24	GMB	STORMWATER MITIGATION REPORT

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

SERVICES NOTE

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

BUILDING CONSENT

DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **SITE PLAN**

PROJECT DESCRIPTION: **STORMWATER MITIGATION REPORT**

PROJECT TITLE:
LOT 17 DP 38101
18 WORTH STREET
KAITAIA
NORTHLAND

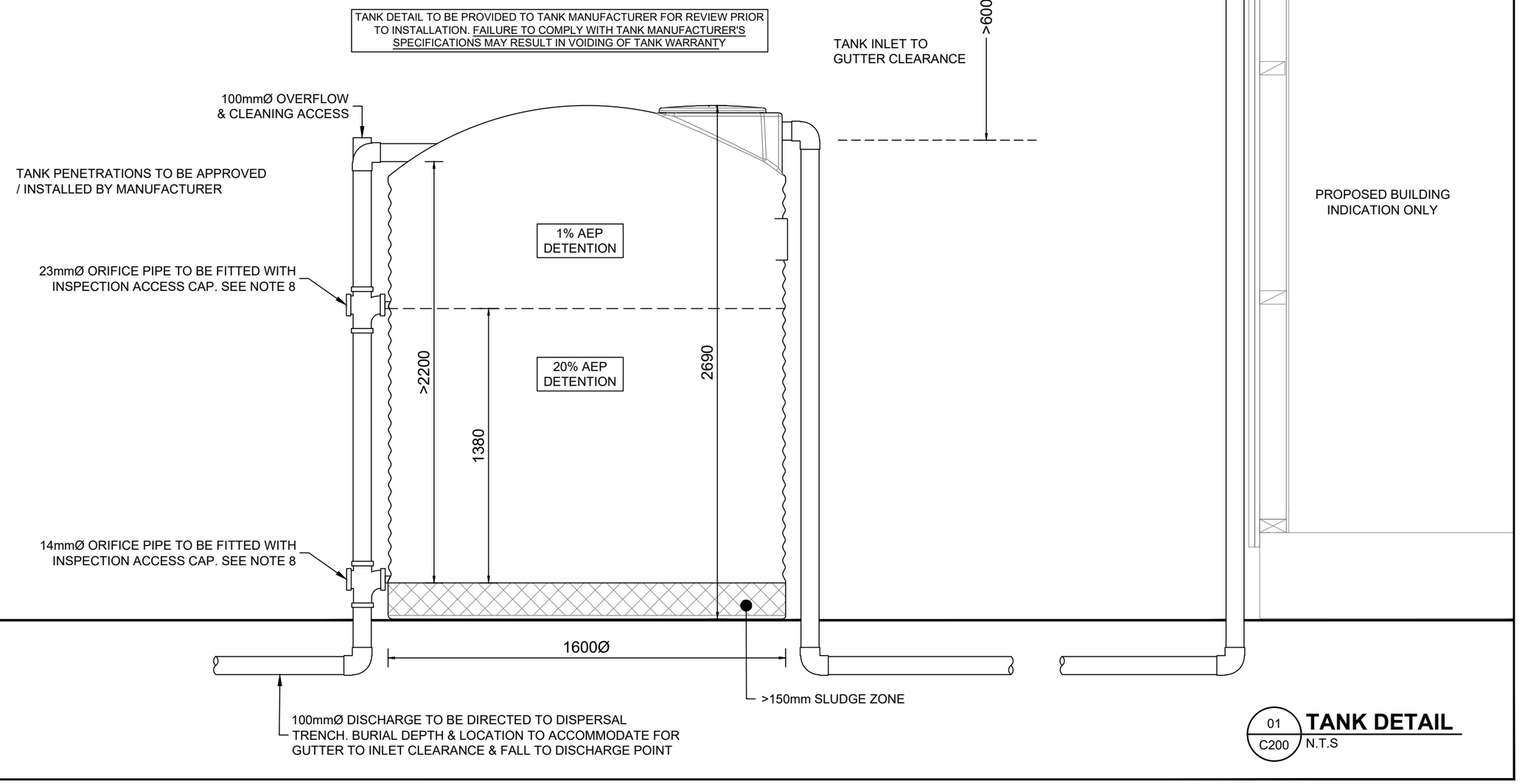
ORIGINAL DRAWING SIZE: A3
OFFICE: **OREWA**
DRAWING SCALE: **1:200**
CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: **138276-C200**
ISSUE: **01**

NOTES:

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

PLASTIC TANK NOTES:

8. ALL OUTLETS / PENETRATIONS INTO TANK (UNDER PRESSURE) TO BE INSTALLED BY MANUFACTURER.
9. TANK PENETRATIONS FOR ORIFICE TEES TO HAVE A MINIMUM SEPARATION COMPLYING WITH MANUFACTURER SPECIFICATIONS.



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

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 '24	GMB	STORMWATER MITIGATION REPORT

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

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

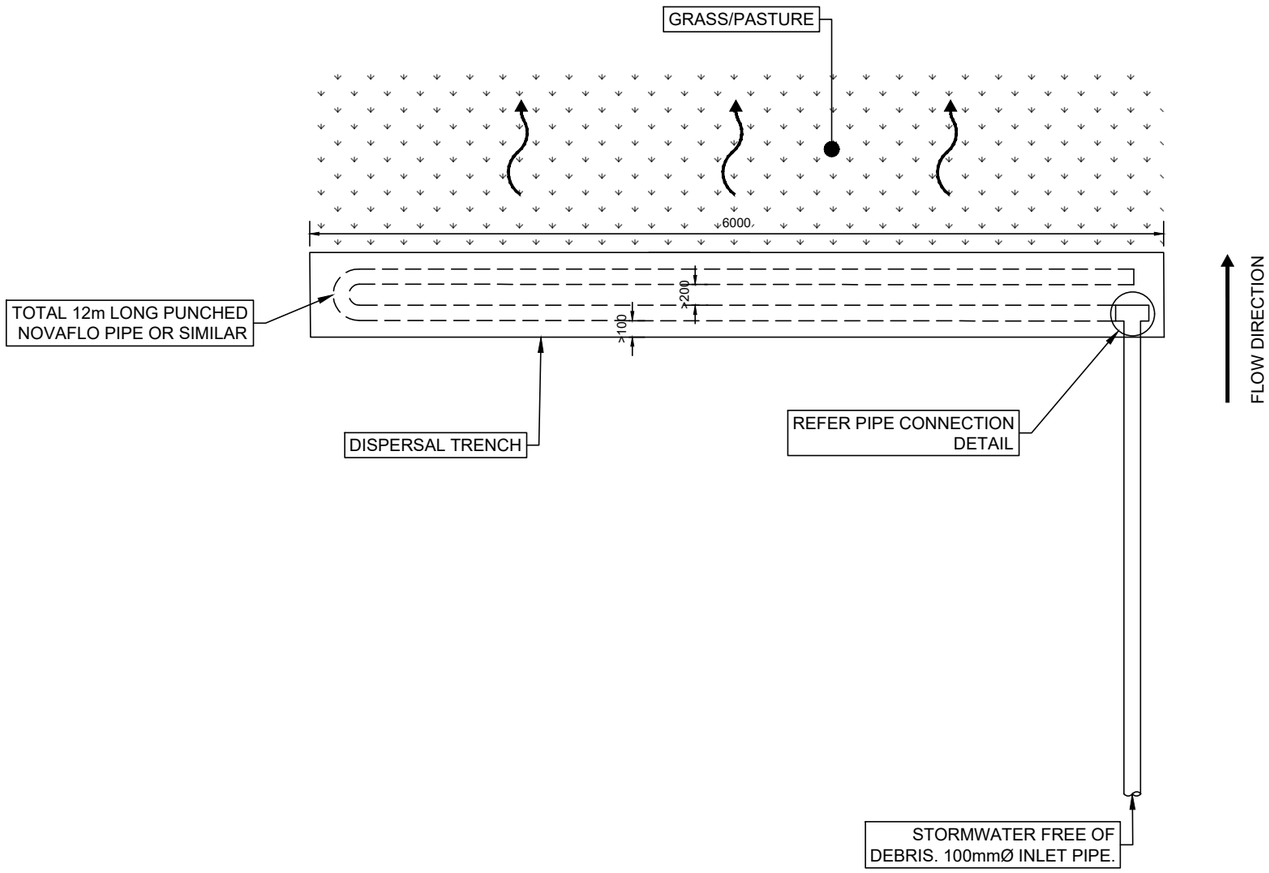
BUILDING CONSENT
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

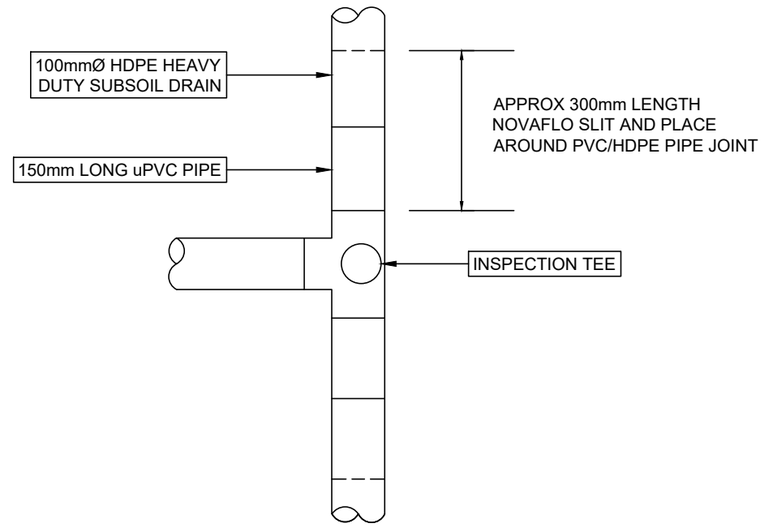
DRAWING TITLE: **TANK DETAIL**

PROJECT DESCRIPTION: **STORMWATER MITIGATION REPORT**

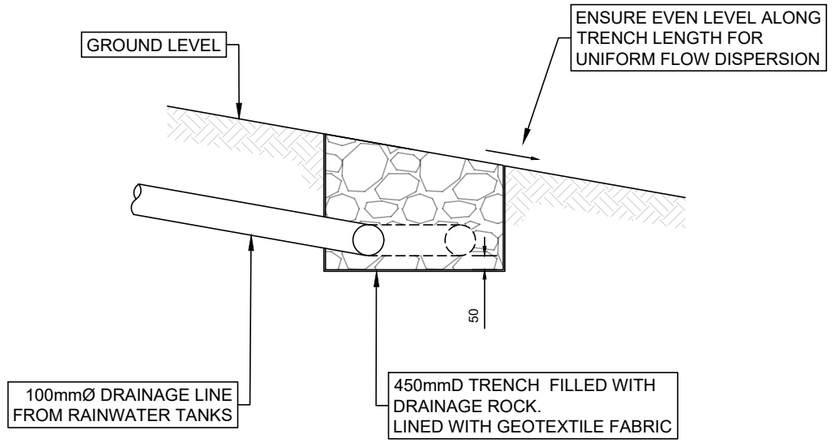
PROJECT TITLE: **LOT 17 DP 38101 18 WORTH STREET KAITAIA NORTHLAND**

ORIGINAL DRAWING SIZE: A3
OFFICE: **OREWA**
DRAWING SCALE: **N.T.S**
CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: **138276-C201**
ISSUE: **01**





PIPE CONNECTION DETAIL



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 '24	GMB	STORMWATER MITIGATION REPORT

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

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

BUILDING CONSENT
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

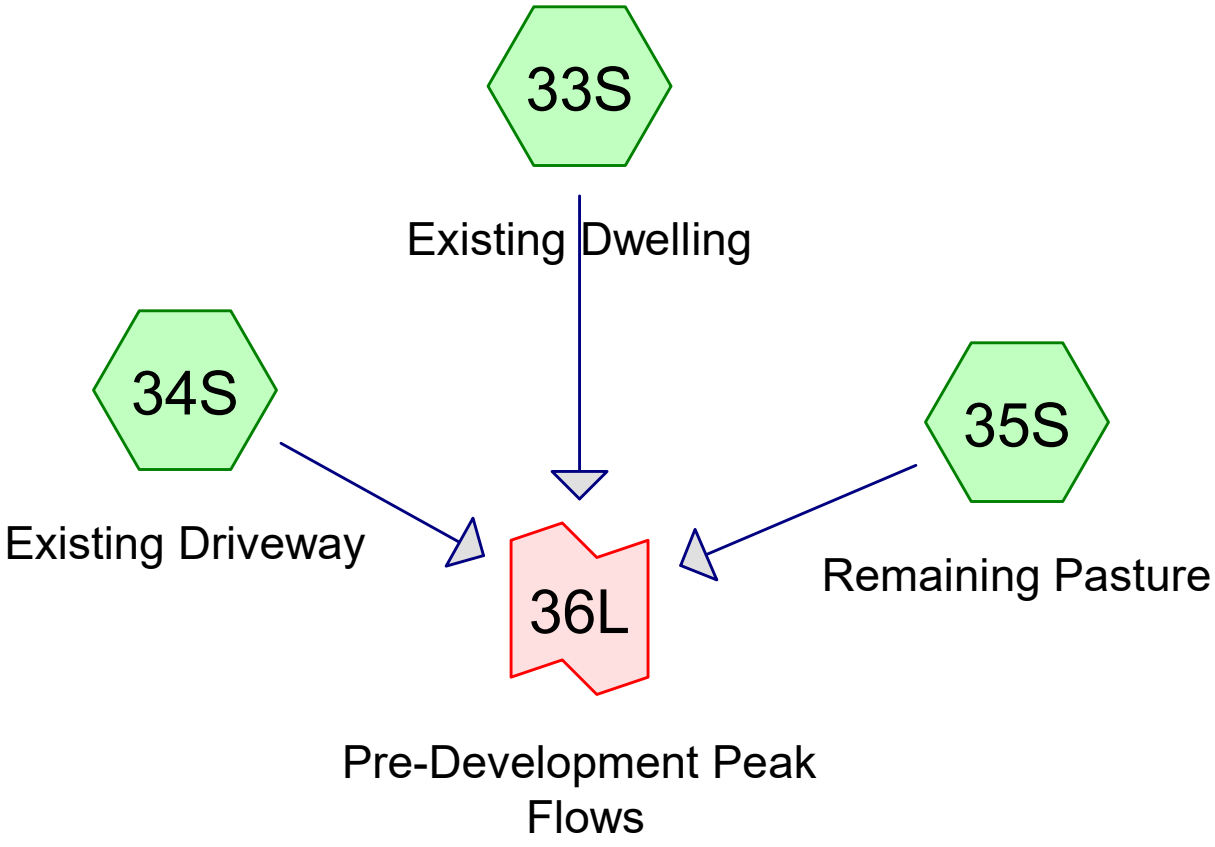
DRAWING TITLE: **DISPERSAL DEVICE DETAIL**

PROJECT DESCRIPTION: **STORMWATER MITIGATION REPORT**

PROJECT TITLE: **LOT 17 DP 38101 18 WORTH STREET KAITAIA NORTHLAND**

ORIGINAL DRAWING SIZE: A3
OFFICE: **OREWA**
DRAWING SCALE: **N.T.S**
CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: **138276-C202**
ISSUE: **01**

Pre-Development



Subcat Reach Pond Link

Routing Diagram for 138276
Prepared by Wilton Joubert Limited, Printed 13/02/2025

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 33S: Existing Dwelling Runoff Area=104.3 m² 100.00% Impervious Runoff Depth>247 mm
Tc=10.0 min CN=98 Runoff=1.75 L/s 25.8 m³

Subcatchment 34S: Existing Driveway Runoff Area=50.0 m² 100.00% Impervious Runoff Depth>247 mm
Tc=10.0 min CN=98 Runoff=0.84 L/s 12.4 m³

Subcatchment 35S: Remaining Pasture Runoff Area=990.7 m² 0.00% Impervious Runoff Depth>171 mm
Tc=10.0 min CN=74 Runoff=11.95 L/s 169.2 m³

Link 36L: Pre-Development Peak Flows Inflow=14.52 L/s 207.4 m³
Primary=14.52 L/s 207.4 m³

Summary for Subcatchment 33S: Existing Dwelling

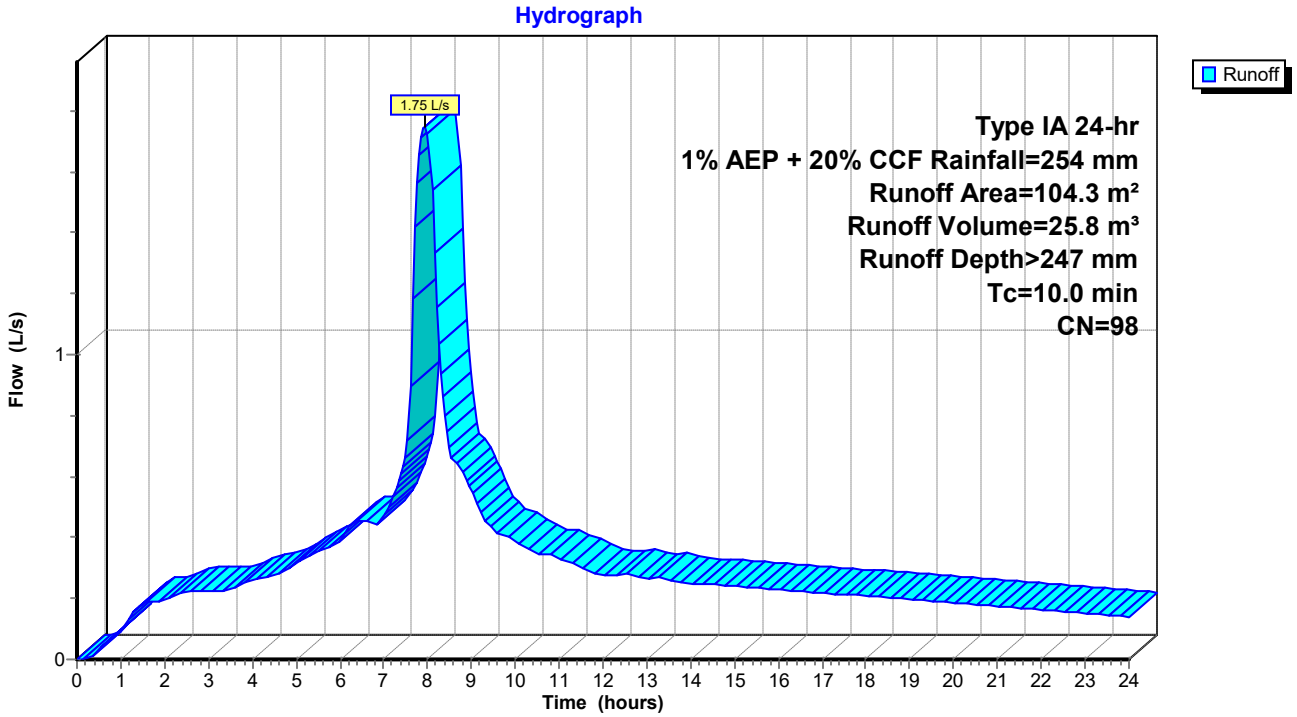
Runoff = 1.75 L/s @ 7.94 hrs, Volume= 25.8 m³, Depth> 247 mm

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% CCF Rainfall=254 mm

Area (m²)	CN	Description
104.3	98	Roofs, HSG C
104.3		100.00% Impervious Area

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

Subcatchment 33S: Existing Dwelling



Summary for Subcatchment 34S: Existing Driveway

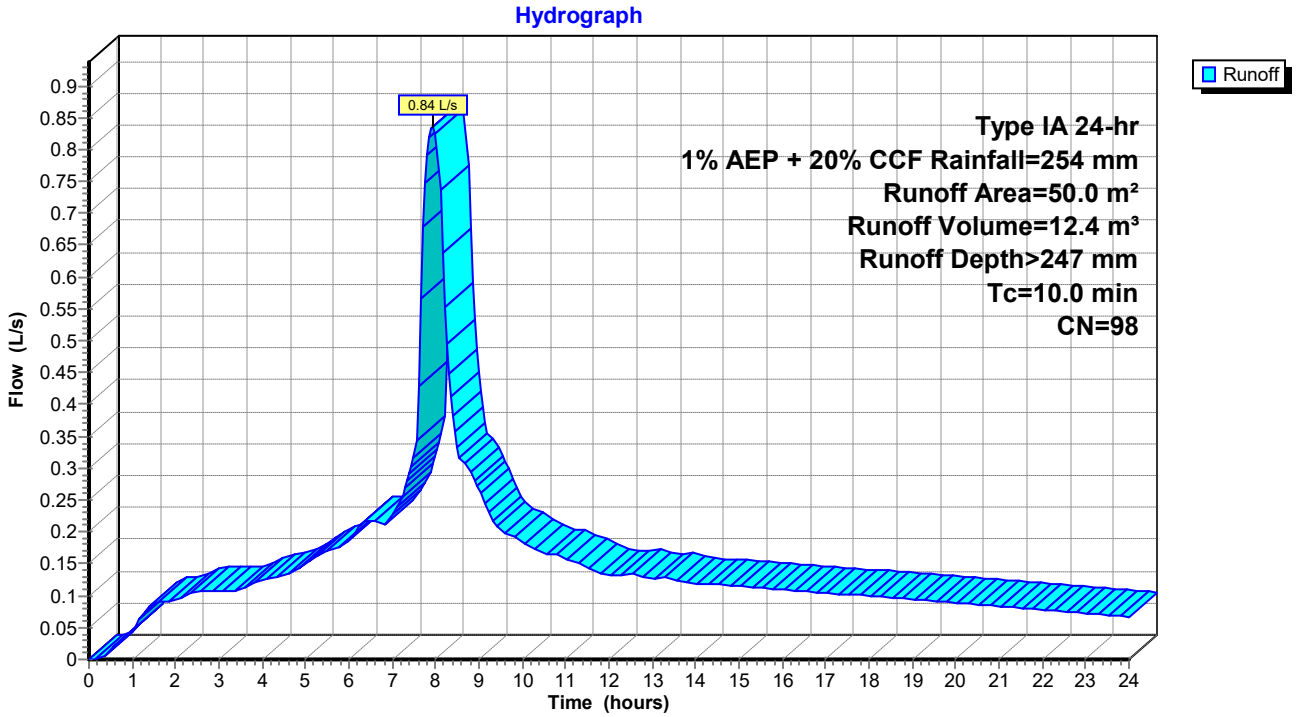
Runoff = 0.84 L/s @ 7.94 hrs, Volume= 12.4 m³, Depth> 247 mm

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% CCF Rainfall=254 mm

Area (m²)	CN	Description
50.0	98	Roofs, HSG C
50.0		100.00% Impervious Area

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

Subcatchment 34S: Existing Driveway



Summary for Subcatchment 35S: Remaining Pasture

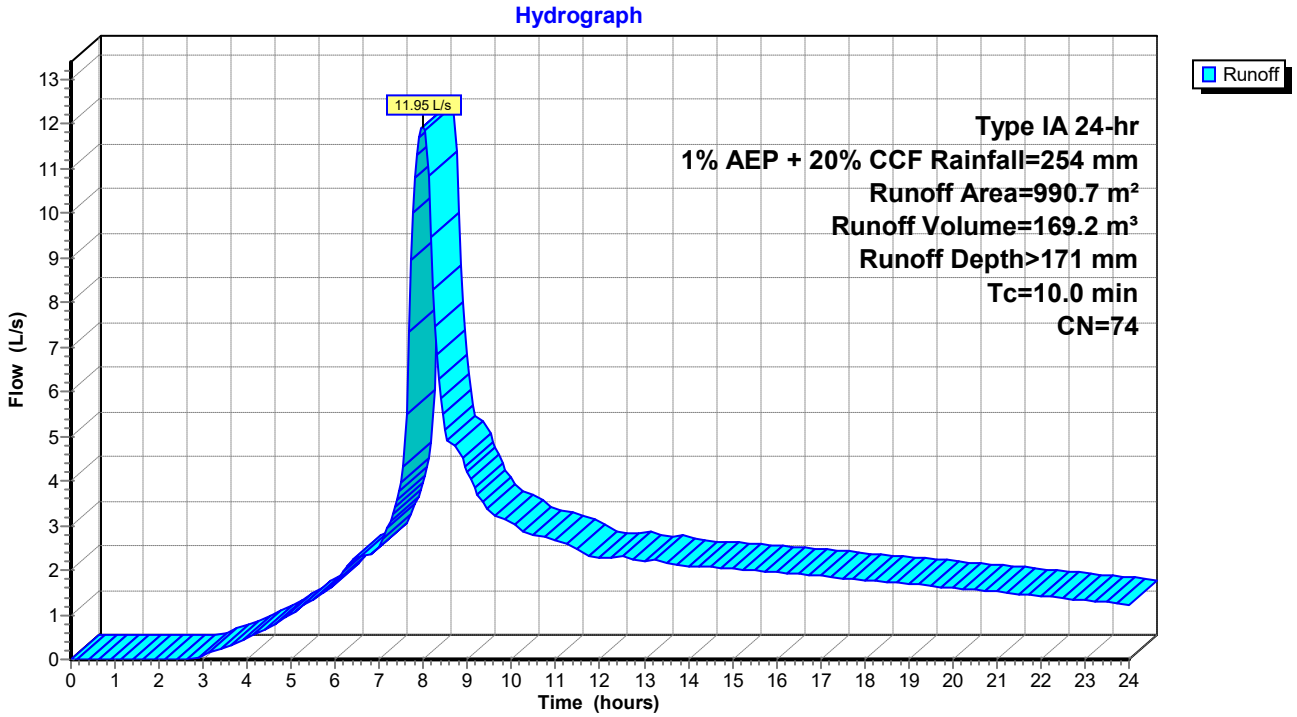
Runoff = 11.95 L/s @ 7.98 hrs, Volume= 169.2 m³, Depth> 171 mm

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% CCF Rainfall=254 mm

Area (m²)	CN	Description
990.7	74	>75% Grass cover, Good, HSG C
990.7		100.00% Pervious Area

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

Subcatchment 35S: Remaining Pasture

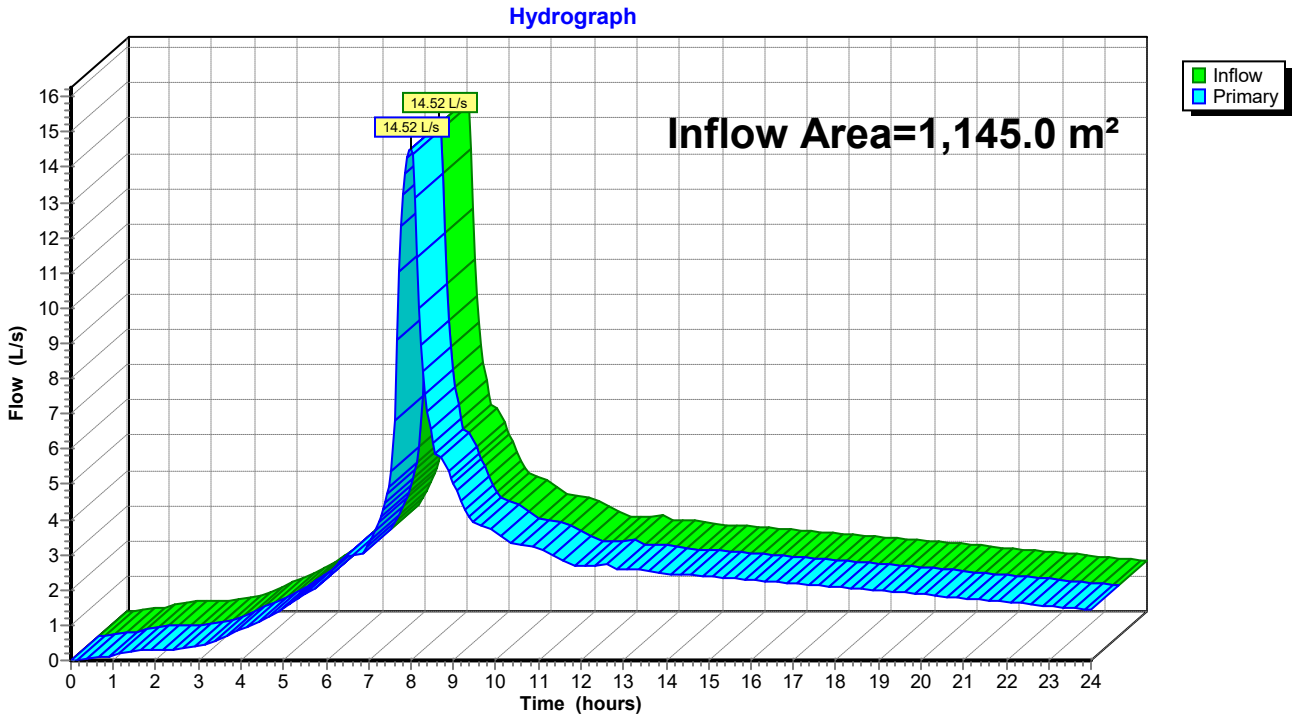


Summary for Link 36L: Pre-Development Peak Flows

Inflow Area = 1,145.0 m², 13.48% Impervious, Inflow Depth > 181 mm for 1% AEP + 20% CCF event
Inflow = 14.52 L/s @ 7.98 hrs, Volume= 207.4 m³
Primary = 14.52 L/s @ 7.98 hrs, Volume= 207.4 m³, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 36L: Pre-Development Peak Flows



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 33S: Existing Dwelling Runoff Area=104.3 m² 100.00% Impervious Runoff Depth>133 mm
Tc=10.0 min CN=98 Runoff=0.95 L/s 13.8 m³

Subcatchment 34S: Existing Driveway Runoff Area=50.0 m² 100.00% Impervious Runoff Depth>133 mm
Tc=10.0 min CN=98 Runoff=0.46 L/s 6.6 m³

Subcatchment 35S: Remaining Pasture Runoff Area=990.7 m² 0.00% Impervious Runoff Depth>69 mm
Tc=10.0 min CN=74 Runoff=4.45 L/s 68.8 m³

Link 36L: Pre-Development Peak Flows Inflow=5.84 L/s 89.3 m³
Primary=5.84 L/s 89.3 m³

Summary for Subcatchment 33S: Existing Dwelling

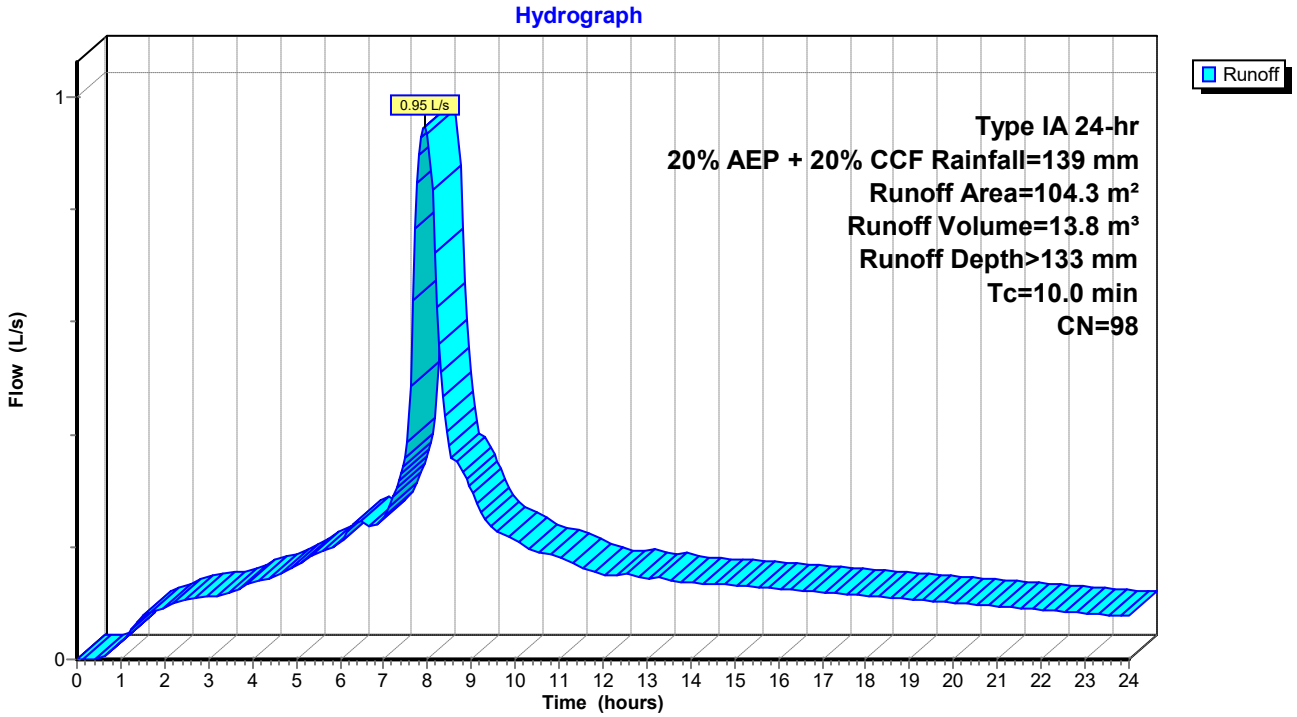
Runoff = 0.95 L/s @ 7.94 hrs, Volume= 13.8 m³, Depth> 133 mm

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% CCF Rainfall=139 mm

Area (m²)	CN	Description
104.3	98	Roofs, HSG C
104.3		100.00% Impervious Area

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

Subcatchment 33S: Existing Dwelling



Summary for Subcatchment 34S: Existing Driveway

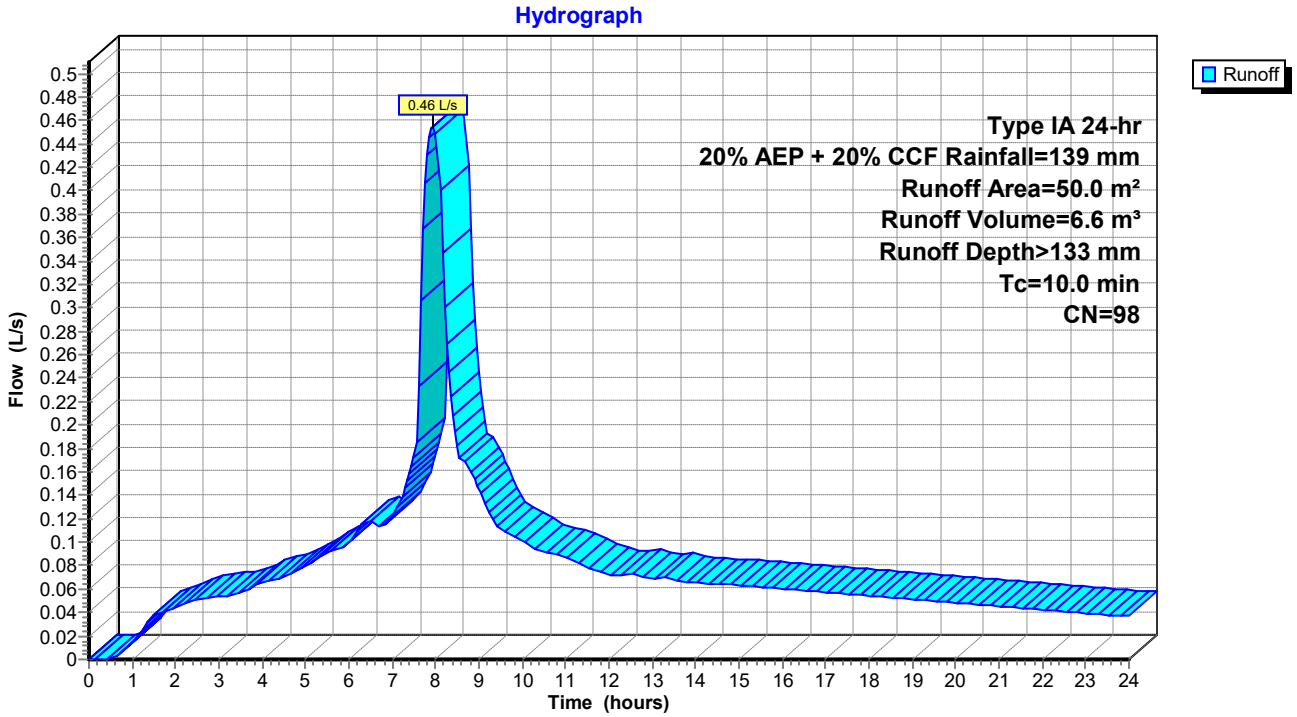
Runoff = 0.46 L/s @ 7.94 hrs, Volume= 6.6 m³, Depth> 133 mm

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% CCF Rainfall=139 mm

Area (m²)	CN	Description
50.0	98	Roofs, HSG C
50.0		100.00% Impervious Area

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

Subcatchment 34S: Existing Driveway



Summary for Subcatchment 35S: Remaining Pasture

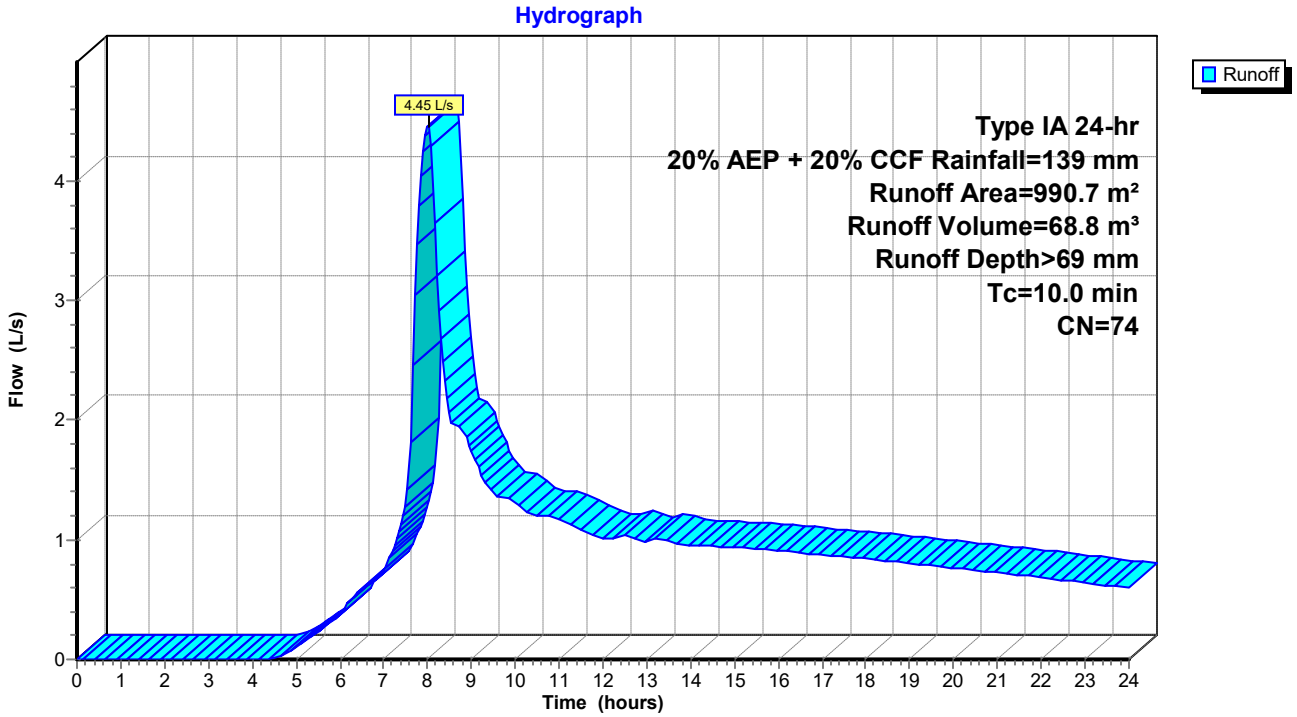
Runoff = 4.45 L/s @ 8.01 hrs, Volume= 68.8 m³, Depth> 69 mm

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% CCF Rainfall=139 mm

Area (m²)	CN	Description
990.7	74	>75% Grass cover, Good, HSG C
990.7		100.00% Pervious Area

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

Subcatchment 35S: Remaining Pasture

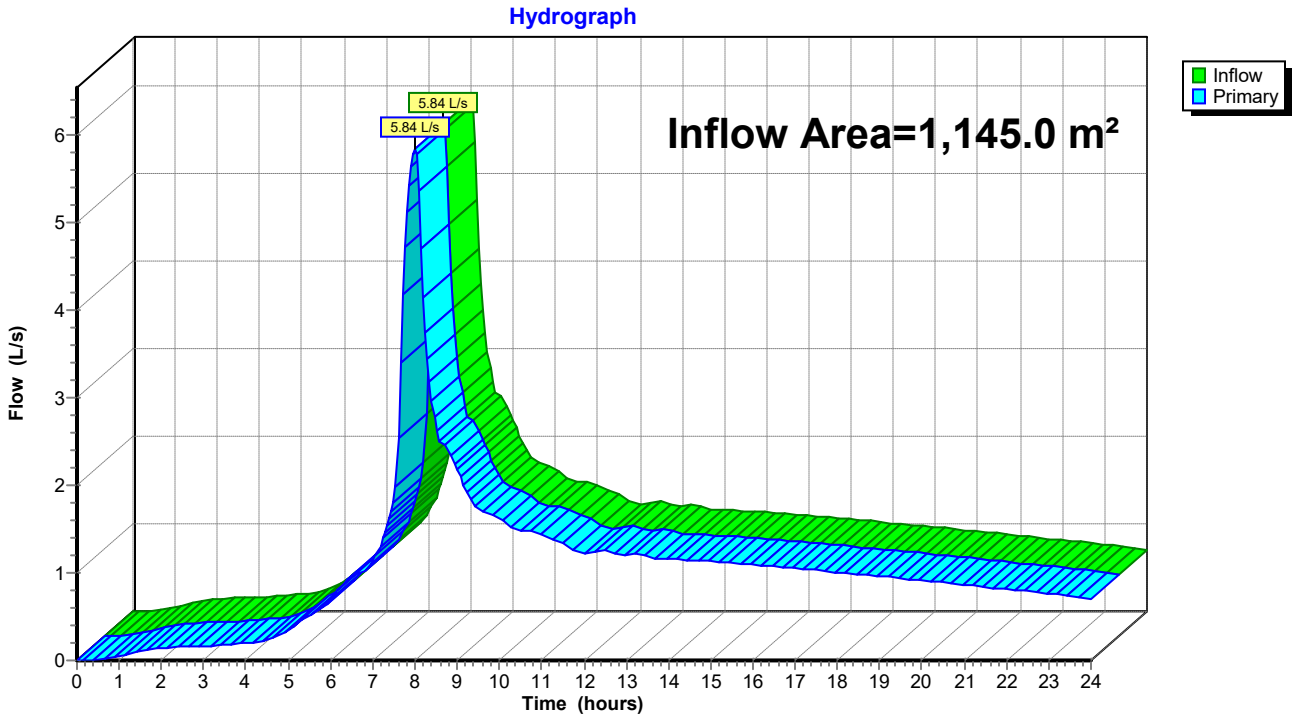


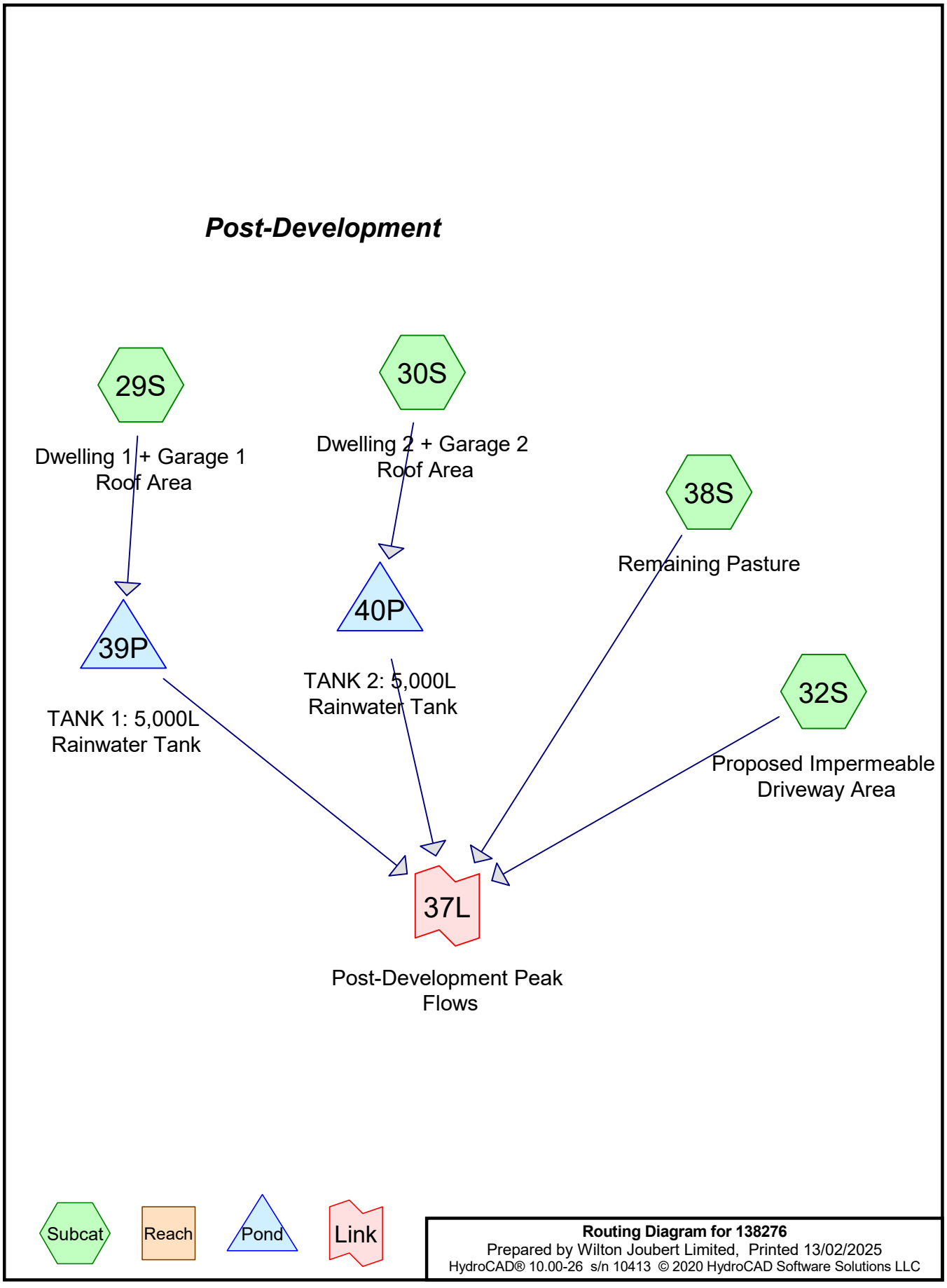
Summary for Link 36L: Pre-Development Peak Flows

Inflow Area = 1,145.0 m², 13.48% Impervious, Inflow Depth > 78 mm for 20% AEP + 20% CCF event
Inflow = 5.84 L/s @ 8.00 hrs, Volume= 89.3 m³
Primary = 5.84 L/s @ 8.00 hrs, Volume= 89.3 m³, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 36L: Pre-Development Peak Flows




Post-Development
29S
Dwelling 1 + Garage 1 Roof Area
30S
Dwelling 2 + Garage 2 Roof Area
38S
Remaining Pasture
40P
39P
TANK 2: 5,000L Rainwater Tank
TANK 1: 5,000L Rainwater Tank
32S
Proposed Impermeable Driveway Area
37L
Post-Development Peak Flows
Subcat
Reach
Pond
Link
Routing Diagram for 138276
Prepared by Wilton Joubert Limited, Printed 13/02/2025
HydroCAD® 10.00-26 s/n 10413 © 2020 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 29S: Dwelling 1 + Runoff Area=135.8 m² 100.00% Impervious Runoff Depth>247 mm
Tc=10.0 min CN=98 Runoff=2.27 L/s 33.6 m³

Subcatchment 30S: Dwelling 2 + Runoff Area=114.6 m² 100.00% Impervious Runoff Depth>247 mm
Tc=10.0 min CN=98 Runoff=1.92 L/s 28.3 m³

Subcatchment 32S: Proposed Runoff Area=223.9 m² 100.00% Impervious Runoff Depth>247 mm
Tc=10.0 min CN=98 Runoff=3.75 L/s 55.4 m³

Subcatchment 38S: Remaining Pasture Runoff Area=670.8 m² 0.00% Impervious Runoff Depth>171 mm
Tc=10.0 min CN=74 Runoff=8.09 L/s 114.6 m³

Pond 39P: TANK 1: 5,000L Rainwater Tank Peak Elev=2.188 m Storage=4.4 m³ Inflow=2.27 L/s 33.6 m³
Outflow=1.59 L/s 33.1 m³

Pond 40P: TANK 2: 5,000L Rainwater Tank Peak Elev=1.892 m Storage=3.8 m³ Inflow=1.92 L/s 28.3 m³
Outflow=1.34 L/s 28.0 m³

Link 37L: Post-Development Peak Flows Inflow=14.49 L/s 231.0 m³
Primary=14.49 L/s 231.0 m³

Summary for Subcatchment 29S: Dwelling 1 + Garage 1 Roof Area

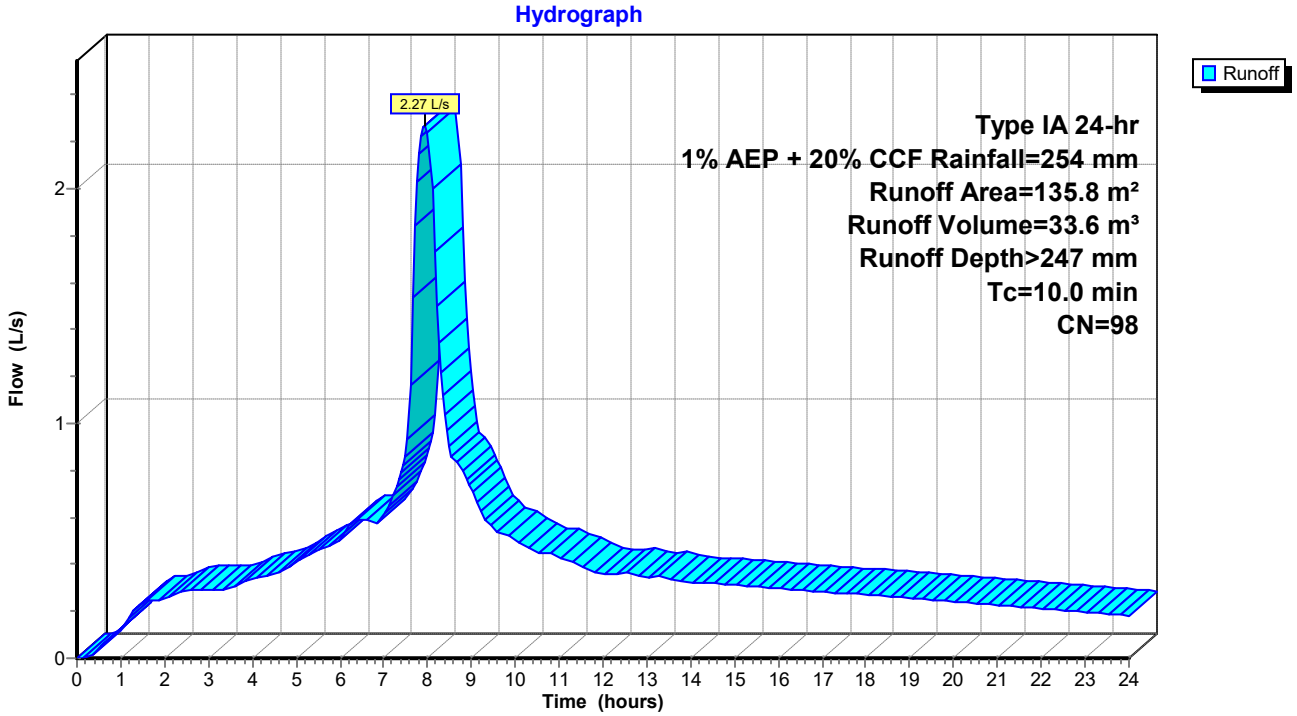
Runoff = 2.27 L/s @ 7.94 hrs, Volume= 33.6 m³, Depth> 247 mm

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% CCF Rainfall=254 mm

Area (m²)	CN	Description
108.9	98	Roofs, HSG C
26.9	98	Roofs, HSG C
135.8	98	Weighted Average
135.8		100.00% Impervious Area

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

Subcatchment 29S: Dwelling 1 + Garage 1 Roof Area



Summary for Subcatchment 30S: Dwelling 2 + Garage 2 Roof Area

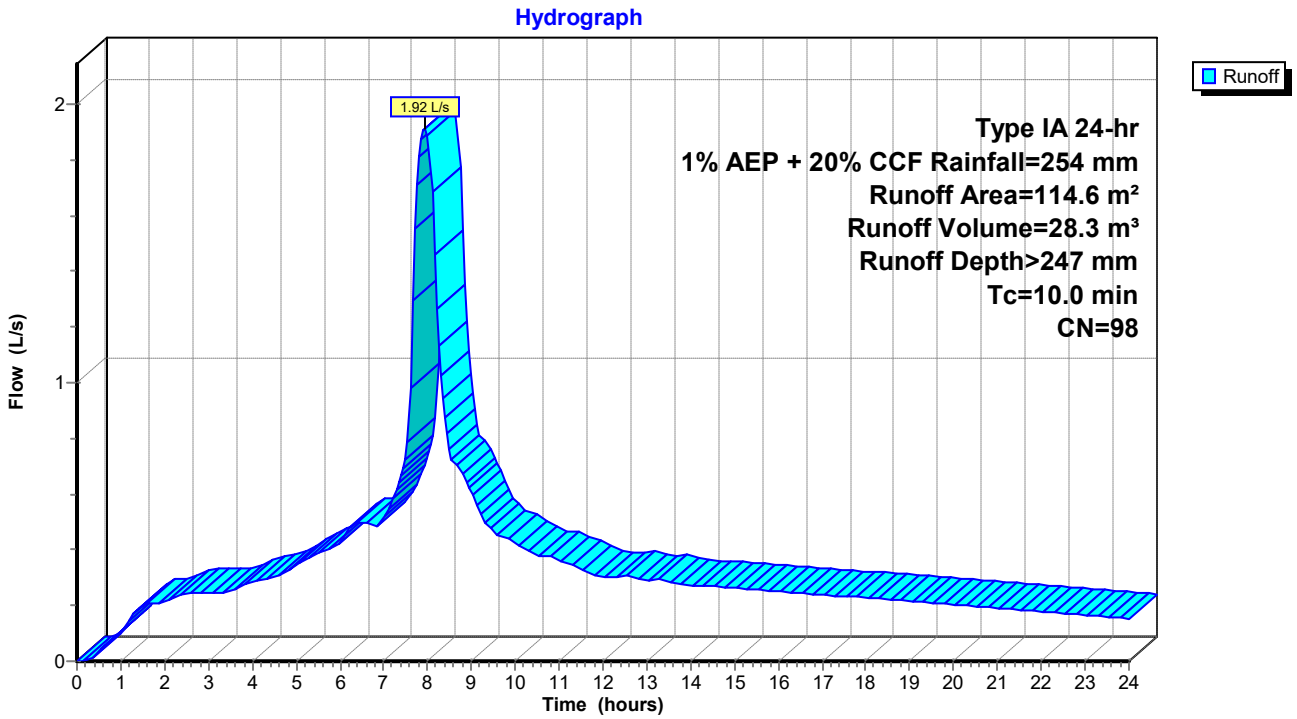
Runoff = 1.92 L/s @ 7.94 hrs, Volume= 28.3 m³, Depth> 247 mm

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% CCF Rainfall=254 mm

Area (m²)	CN	Description
87.7	98	Roofs, HSG C
26.9	98	Roofs, HSG C
114.6	98	Weighted Average
114.6		100.00% Impervious Area

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

Subcatchment 30S: Dwelling 2 + Garage 2 Roof Area



Summary for Subcatchment 32S: Proposed Impermeable Driveway Area

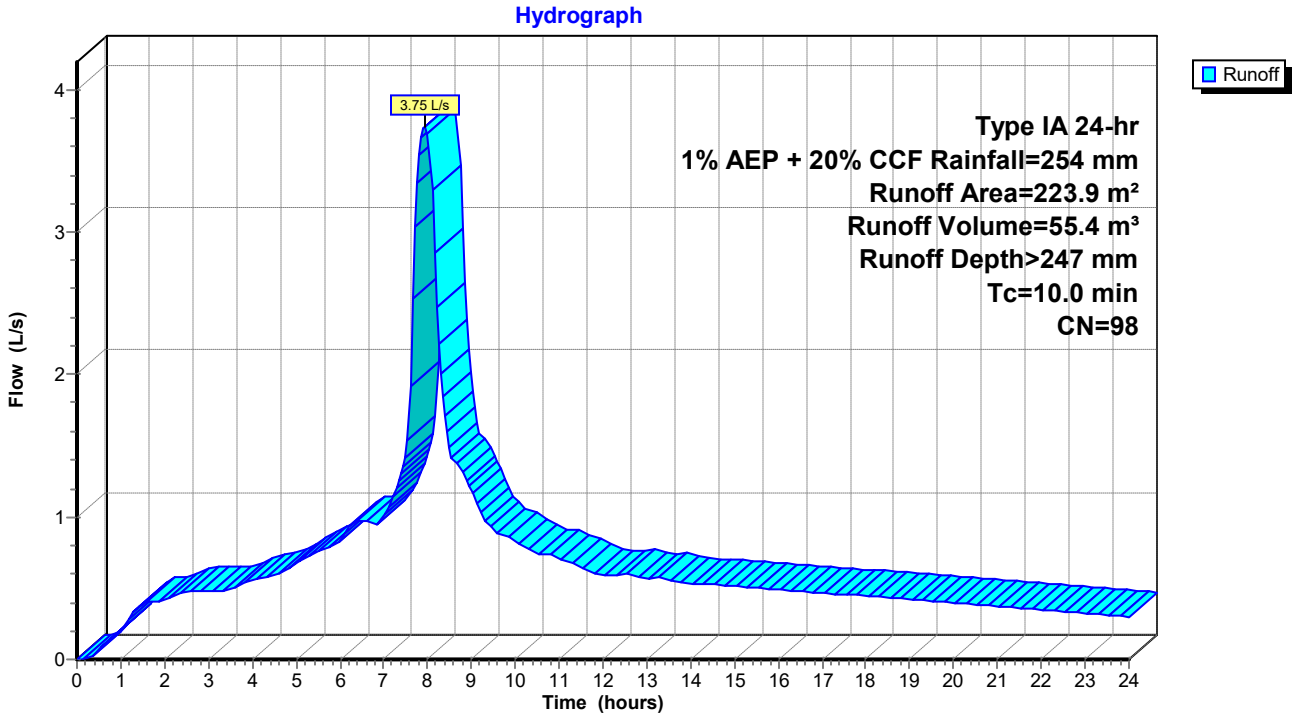
Runoff = 3.75 L/s @ 7.94 hrs, Volume= 55.4 m³, Depth> 247 mm

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% CCF Rainfall=254 mm

Area (m²)	CN	Description
223.9	98	Paved roads w/curbs & sewers, HSG C
223.9		100.00% Impervious Area

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

Subcatchment 32S: Proposed Impermeable Driveway Area



Summary for Subcatchment 38S: Remaining Pasture

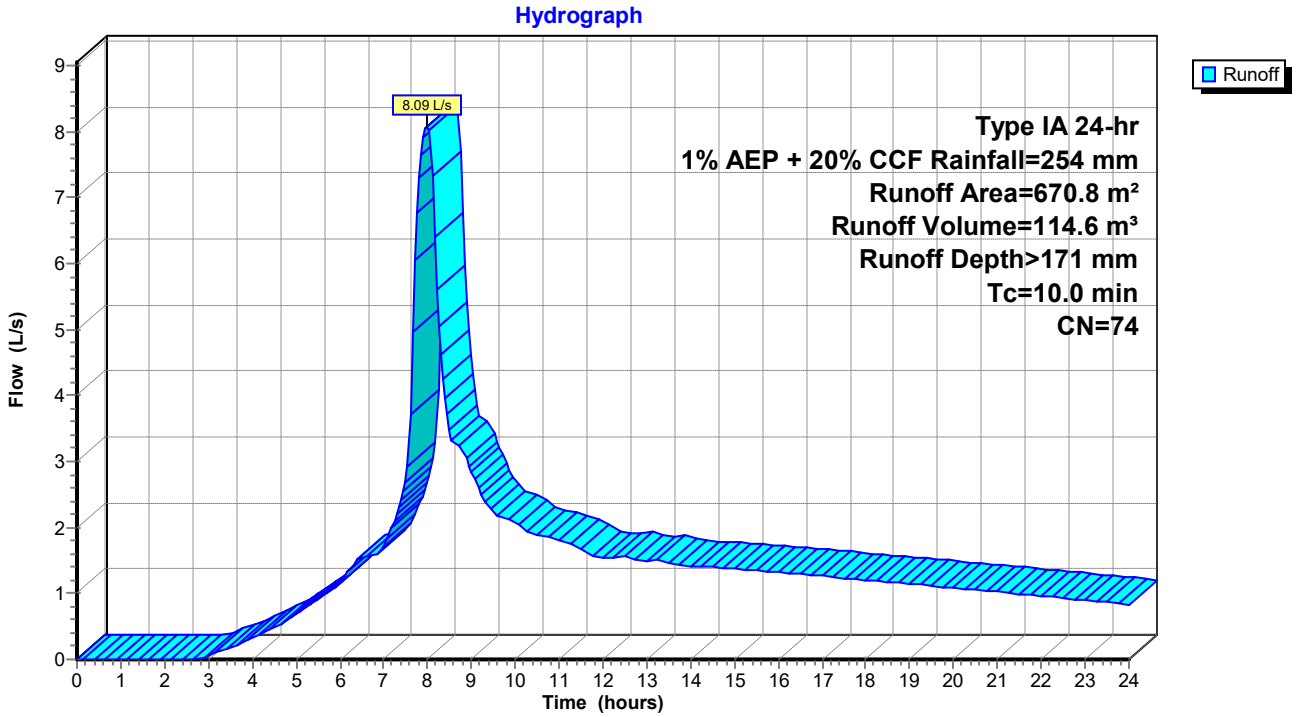
Runoff = 8.09 L/s @ 7.98 hrs, Volume= 114.6 m³, Depth> 171 mm

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% CCF Rainfall=254 mm

Area (m²)	CN	Description
670.8	74	>75% Grass cover, Good, HSG C
670.8		100.00% Pervious Area

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

Subcatchment 38S: Remaining Pasture



Summary for Pond 39P: TANK 1: 5,000L Rainwater Tank

Inflow Area = 135.8 m²,100.00% Impervious, Inflow Depth > 247 mm for 1% AEP + 20% CCF event
Inflow = 2.27 L/s @ 7.94 hrs, Volume= 33.6 m³
Outflow = 1.59 L/s @ 8.18 hrs, Volume= 33.1 m³, Atten= 30%, Lag= 14.7 min
Primary = 1.59 L/s @ 8.18 hrs, Volume= 33.1 m³

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 2.188 m @ 8.18 hrs Surf.Area= 2.0 m² Storage= 4.4 m³

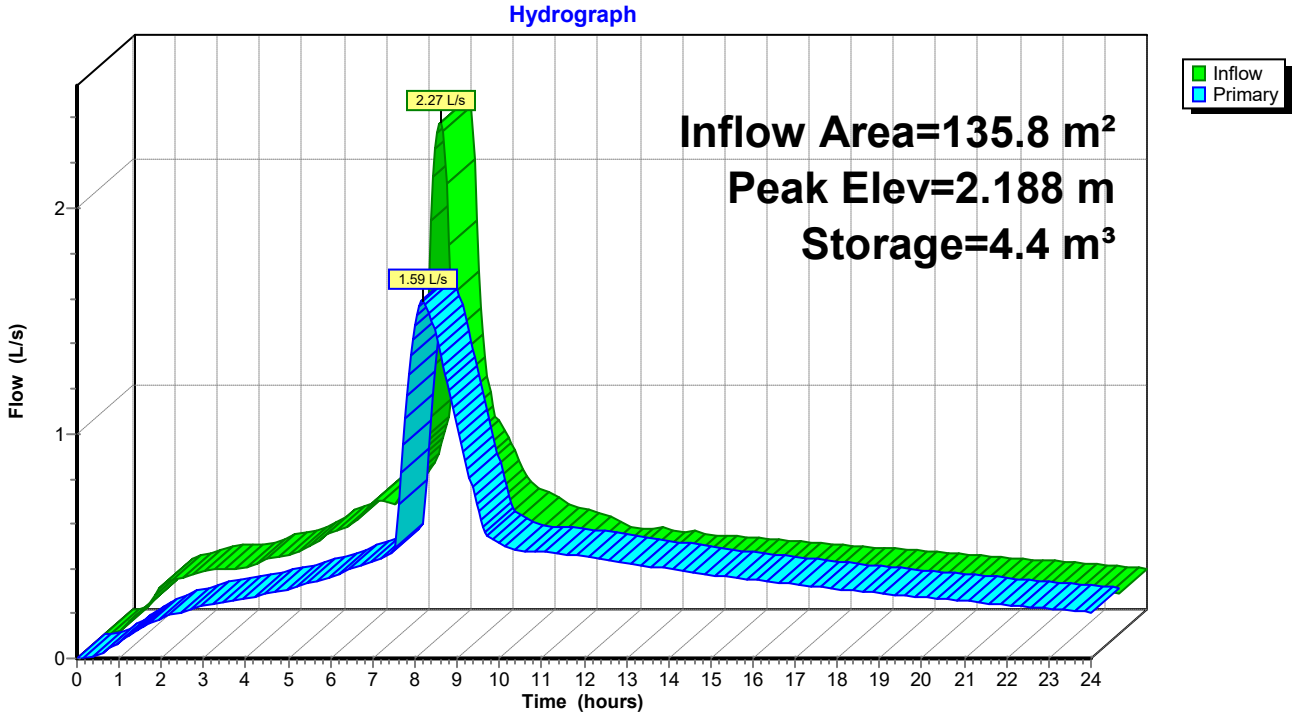
Plug-Flow detention time= 65.2 min calculated for 33.1 m³ (98% of inflow)
Center-of-Mass det. time= 53.1 min (699.1 - 646.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	4.7 m³	**1.60 mD x 2.35 mH Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices	
#1	Primary	0.000 m	**14 mm Vert. Orifice/Grate**	C= 0.600
#2	Primary	1.380 m	**23 mm Vert. Orifice/Grate**	C= 0.600

Primary OutFlow Max=1.59 L/s @ 8.18 hrs HW=2.186 m (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.60 L/s @ 3.92 m/s)
└**2=Orifice/Grate** (Orifice Controls 0.98 L/s @ 2.37 m/s)

Pond 39P: TANK 1: 5,000L Rainwater Tank



Summary for Pond 40P: TANK 2: 5,000L Rainwater Tank

Inflow Area = 114.6 m²,100.00% Impervious, Inflow Depth > 247 mm for 1% AEP + 20% CCF event
Inflow = 1.92 L/s @ 7.94 hrs, Volume= 28.3 m³
Outflow = 1.34 L/s @ 8.18 hrs, Volume= 28.0 m³, Atten= 30%, Lag= 14.6 min
Primary = 1.34 L/s @ 8.18 hrs, Volume= 28.0 m³

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1.892 m @ 8.18 hrs Surf.Area= 2.0 m² Storage= 3.8 m³

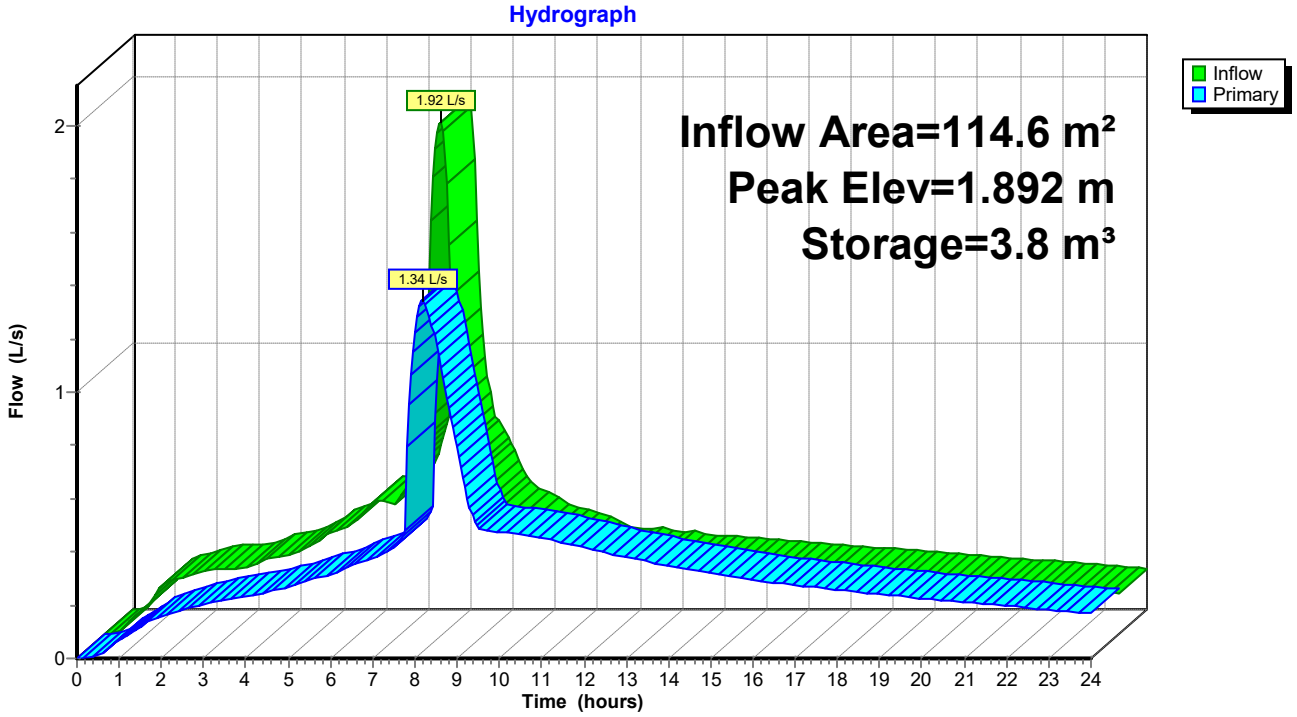
Plug-Flow detention time= 62.2 min calculated for 28.0 m³ (99% of inflow)
Center-of-Mass det. time= 52.3 min (698.3 - 646.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	4.7 m³	**1.60 mD x 2.35 mH Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices	
#1	Primary	0.000 m	**14 mm Vert. Orifice/Grate**	C= 0.600
#2	Primary	1.380 m	**23 mm Vert. Orifice/Grate**	C= 0.600

Primary OutFlow Max=1.34 L/s @ 8.18 hrs HW=1.890 m (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.56 L/s @ 3.65 m/s)
└**2=Orifice/Grate** (Orifice Controls 0.78 L/s @ 1.88 m/s)

Pond 40P: TANK 2: 5,000L Rainwater Tank

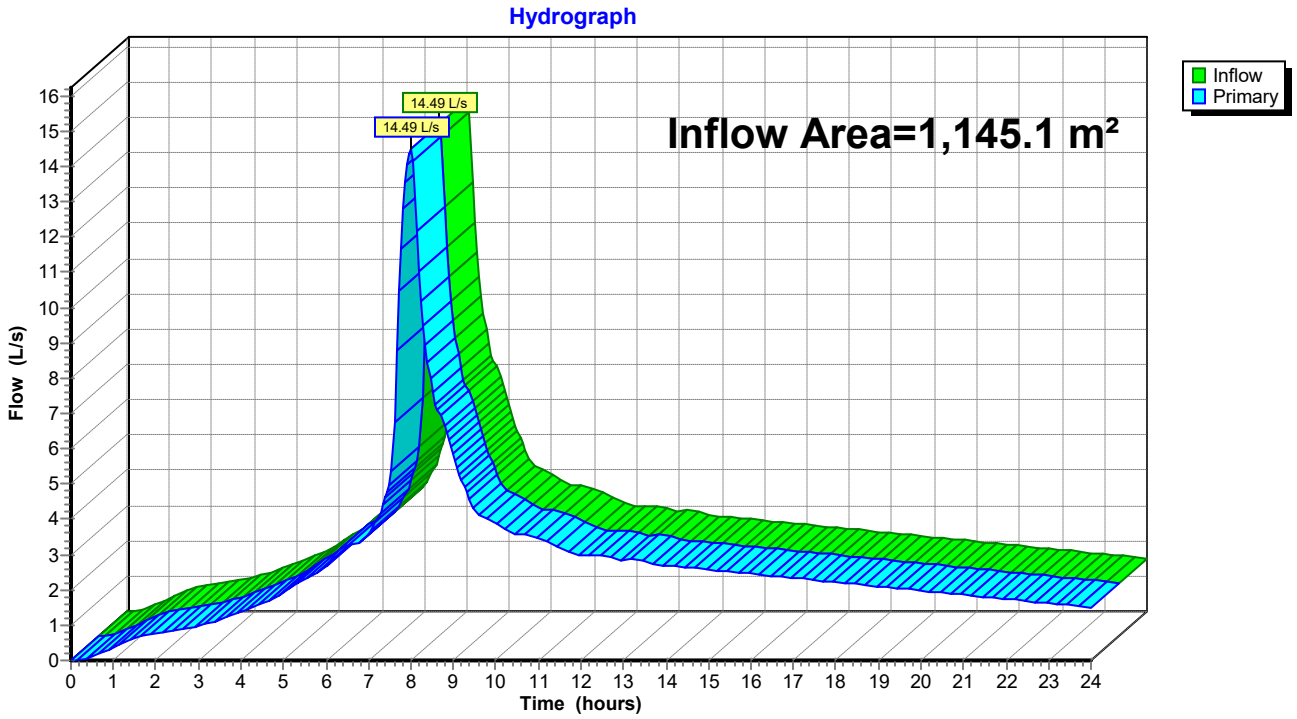


Summary for Link 37L: Post-Development Peak Flows

Inflow Area = 1,145.1 m², 41.42% Impervious, Inflow Depth > 202 mm for 1% AEP + 20% CCF event
Inflow = 14.49 L/s @ 8.00 hrs, Volume= 231.0 m³
Primary = 14.49 L/s @ 8.00 hrs, Volume= 231.0 m³, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 37L: Post-Development Peak Flows



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 29S: Dwelling 1 + Runoff Area=135.8 m² 100.00% Impervious Runoff Depth>133 mm
Tc=10.0 min CN=98 Runoff=1.24 L/s 18.0 m³

Subcatchment 30S: Dwelling 2 + Runoff Area=114.6 m² 100.00% Impervious Runoff Depth>133 mm
Tc=10.0 min CN=98 Runoff=1.04 L/s 15.2 m³

Subcatchment 32S: Proposed Runoff Area=223.9 m² 100.00% Impervious Runoff Depth>133 mm
Tc=10.0 min CN=98 Runoff=2.04 L/s 29.7 m³

Subcatchment 38S: Remaining Pasture Runoff Area=670.8 m² 0.00% Impervious Runoff Depth>69 mm
Tc=10.0 min CN=74 Runoff=3.02 L/s 46.6 m³

Pond 39P: TANK 1: 5,000L Rainwater Tank Peak Elev=1.377 m Storage=2.8 m³ Inflow=1.24 L/s 18.0 m³
Outflow=0.48 L/s 17.9 m³

Pond 40P: TANK 2: 5,000L Rainwater Tank Peak Elev=1.089 m Storage=2.2 m³ Inflow=1.04 L/s 15.2 m³
Outflow=0.43 L/s 15.1 m³

Link 37L: Post-Development Peak Flows Inflow=5.83 L/s 109.3 m³
Primary=5.83 L/s 109.3 m³

Summary for Subcatchment 29S: Dwelling 1 + Garage 1 Roof Area

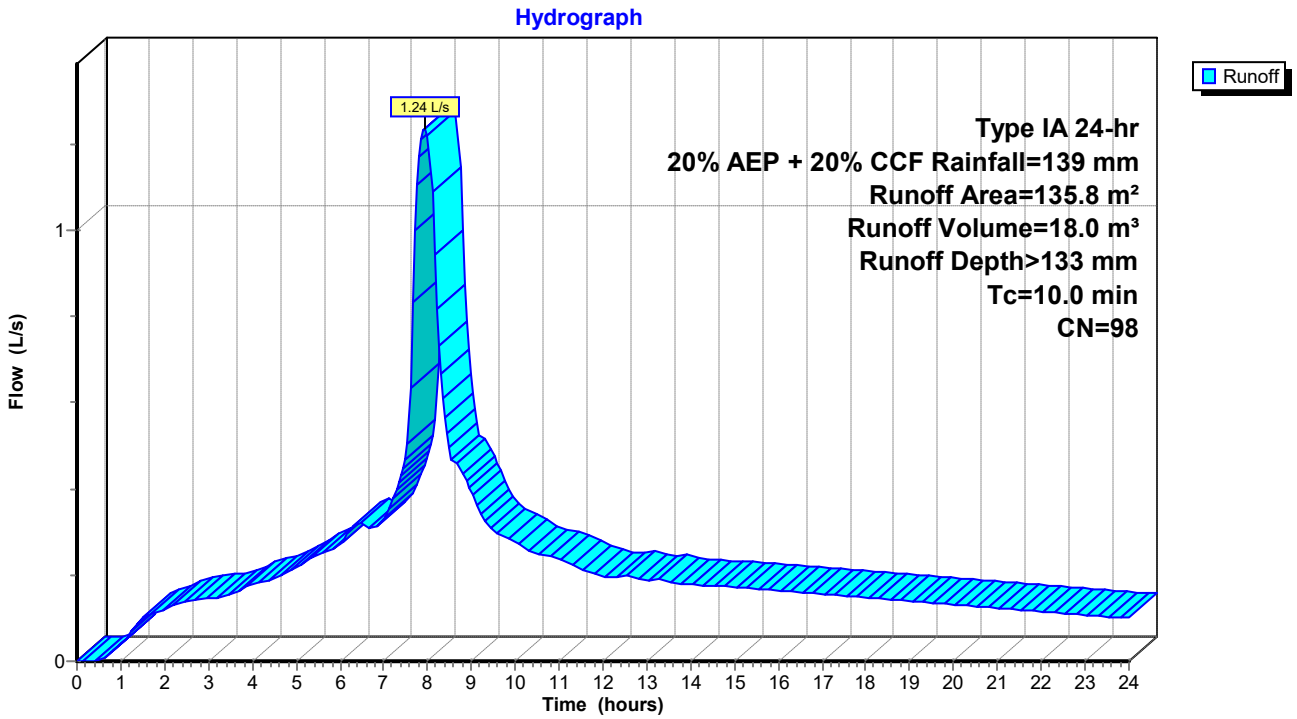
Runoff = 1.24 L/s @ 7.94 hrs, Volume= 18.0 m³, Depth> 133 mm

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% CCF Rainfall=139 mm

Area (m²)	CN	Description
108.9	98	Roofs, HSG C
26.9	98	Roofs, HSG C
135.8	98	Weighted Average
135.8		100.00% Impervious Area

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

Subcatchment 29S: Dwelling 1 + Garage 1 Roof Area



Summary for Subcatchment 30S: Dwelling 2 + Garage 2 Roof Area

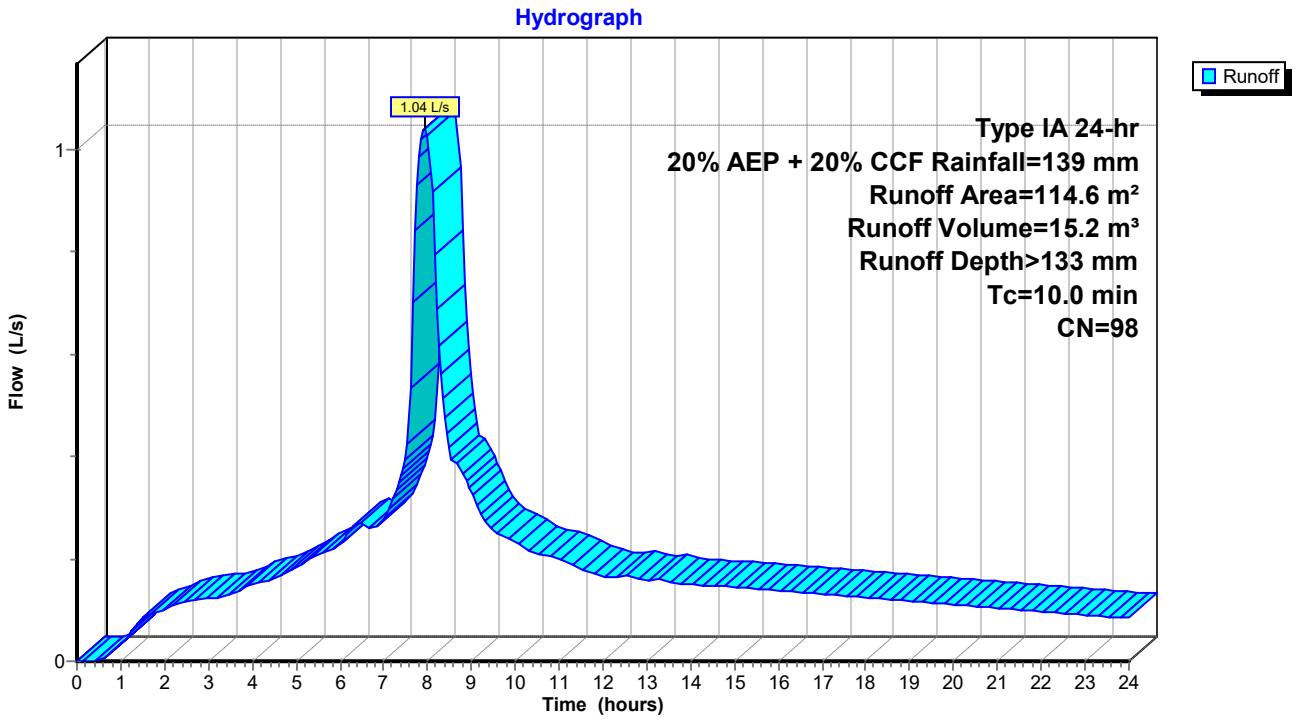
Runoff = 1.04 L/s @ 7.94 hrs, Volume= 15.2 m³, Depth> 133 mm

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% CCF Rainfall=139 mm

Area (m²)	CN	Description
87.7	98	Roofs, HSG C
26.9	98	Roofs, HSG C
114.6	98	Weighted Average
114.6		100.00% Impervious Area

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

Subcatchment 30S: Dwelling 2 + Garage 2 Roof Area



Summary for Subcatchment 32S: Proposed Impermeable Driveway Area

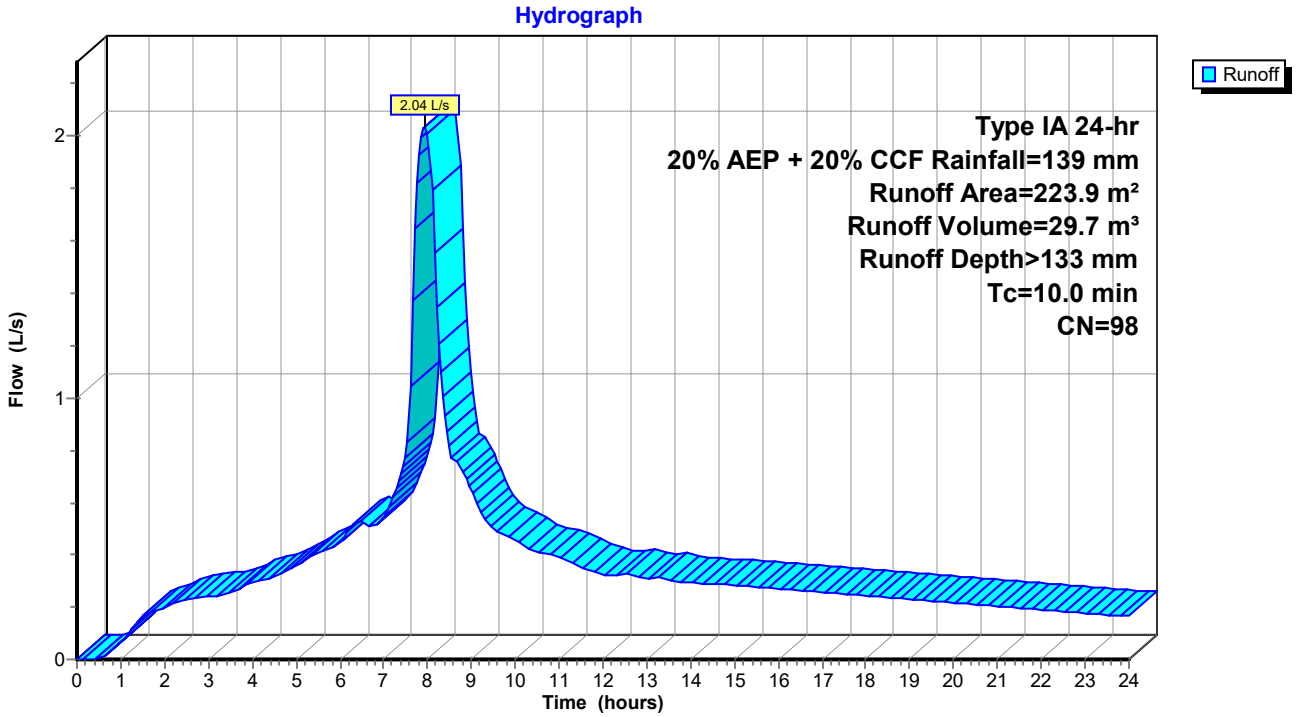
Runoff = 2.04 L/s @ 7.94 hrs, Volume= 29.7 m³, Depth> 133 mm

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% CCF Rainfall=139 mm

Area (m²)	CN	Description
223.9	98	Paved roads w/curbs & sewers, HSG C
223.9		100.00% Impervious Area

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

Subcatchment 32S: Proposed Impermeable Driveway Area



Summary for Subcatchment 38S: Remaining Pasture

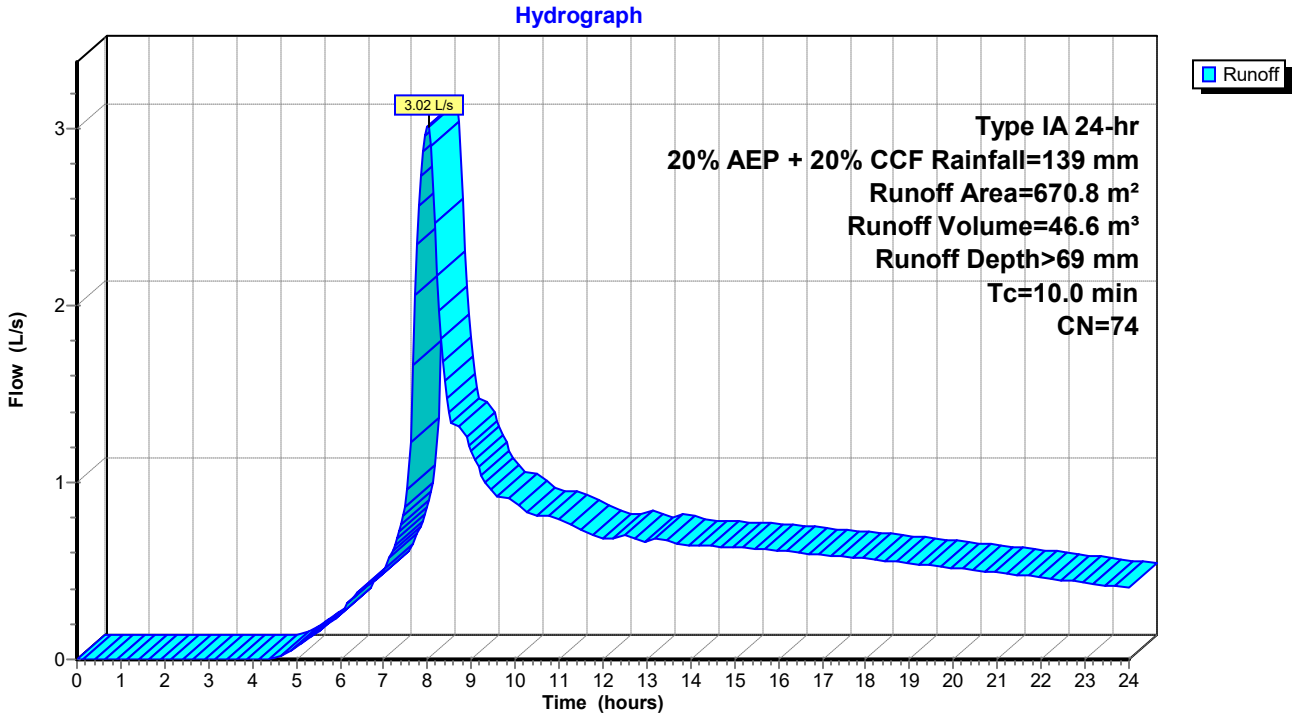
Runoff = 3.02 L/s @ 8.01 hrs, Volume= 46.6 m³, Depth> 69 mm

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% CCF Rainfall=139 mm

Area (m²)	CN	Description
670.8	74	>75% Grass cover, Good, HSG C
670.8		100.00% Pervious Area

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

Subcatchment 38S: Remaining Pasture



Summary for Pond 39P: TANK 1: 5,000L Rainwater Tank

Inflow Area = 135.8 m²,100.00% Impervious, Inflow Depth > 133 mm for 20% AEP + 20% CCF event
Inflow = 1.24 L/s @ 7.94 hrs, Volume= 18.0 m³
Outflow = 0.48 L/s @ 8.53 hrs, Volume= 17.9 m³, Atten= 61%, Lag= 35.5 min
Primary = 0.48 L/s @ 8.53 hrs, Volume= 17.9 m³

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1.377 m @ 8.53 hrs Surf.Area= 2.0 m² Storage= 2.8 m³

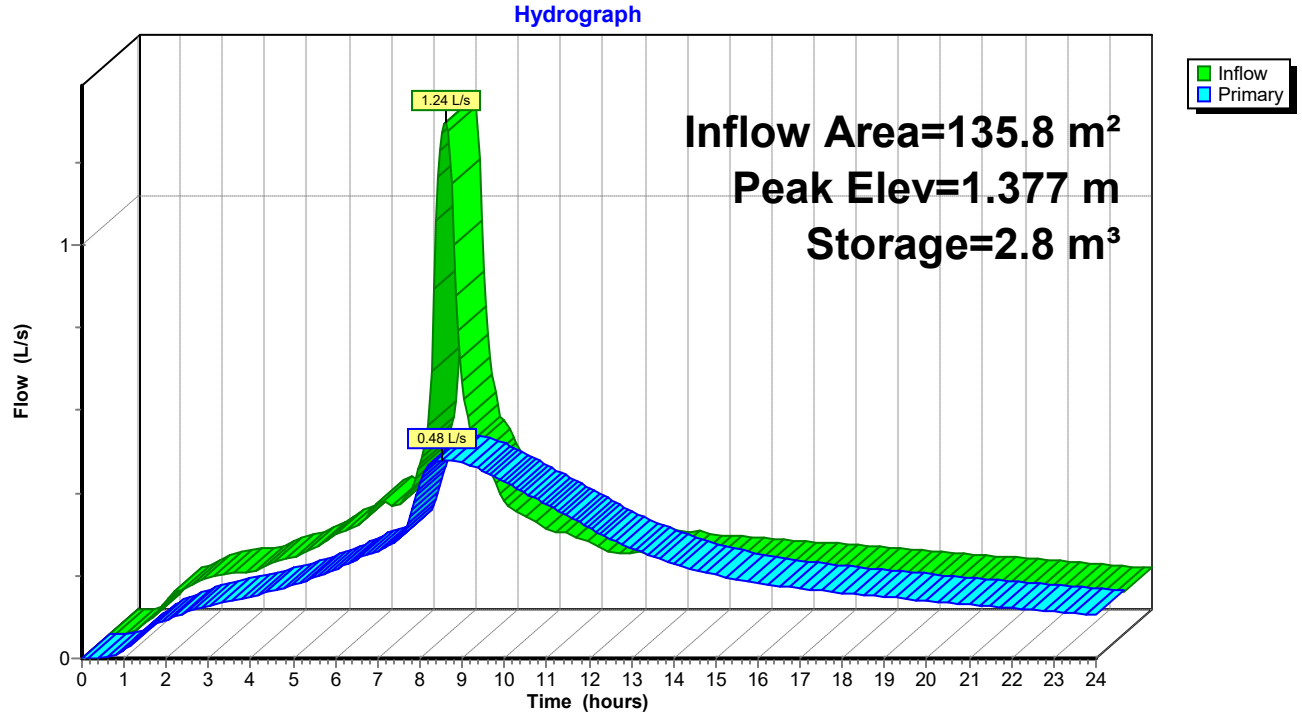
Plug-Flow detention time= 55.6 min calculated for 17.8 m³ (99% of inflow)
Center-of-Mass det. time= 49.2 min (704.1 - 654.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	4.7 m³	**1.60 mD x 2.35 mH Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices	
#1	Primary	0.000 m	**14 mm Vert. Orifice/Grate**	C= 0.600
#2	Primary	1.380 m	**23 mm Vert. Orifice/Grate**	C= 0.600

Primary OutFlow Max=0.48 L/s @ 8.53 hrs HW=1.377 m (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.48 L/s @ 3.11 m/s)
└**2=Orifice/Grate** (Controls 0.00 L/s)

Pond 39P: TANK 1: 5,000L Rainwater Tank



Summary for Pond 40P: TANK 2: 5,000L Rainwater Tank

Inflow Area = 114.6 m²,100.00% Impervious, Inflow Depth > 133 mm for 20% AEP + 20% CCF event
Inflow = 1.04 L/s @ 7.94 hrs, Volume= 15.2 m³
Outflow = 0.43 L/s @ 8.49 hrs, Volume= 15.1 m³, Atten= 59%, Lag= 32.8 min
Primary = 0.43 L/s @ 8.49 hrs, Volume= 15.1 m³

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1.089 m @ 8.49 hrs Surf.Area= 2.0 m² Storage= 2.2 m³

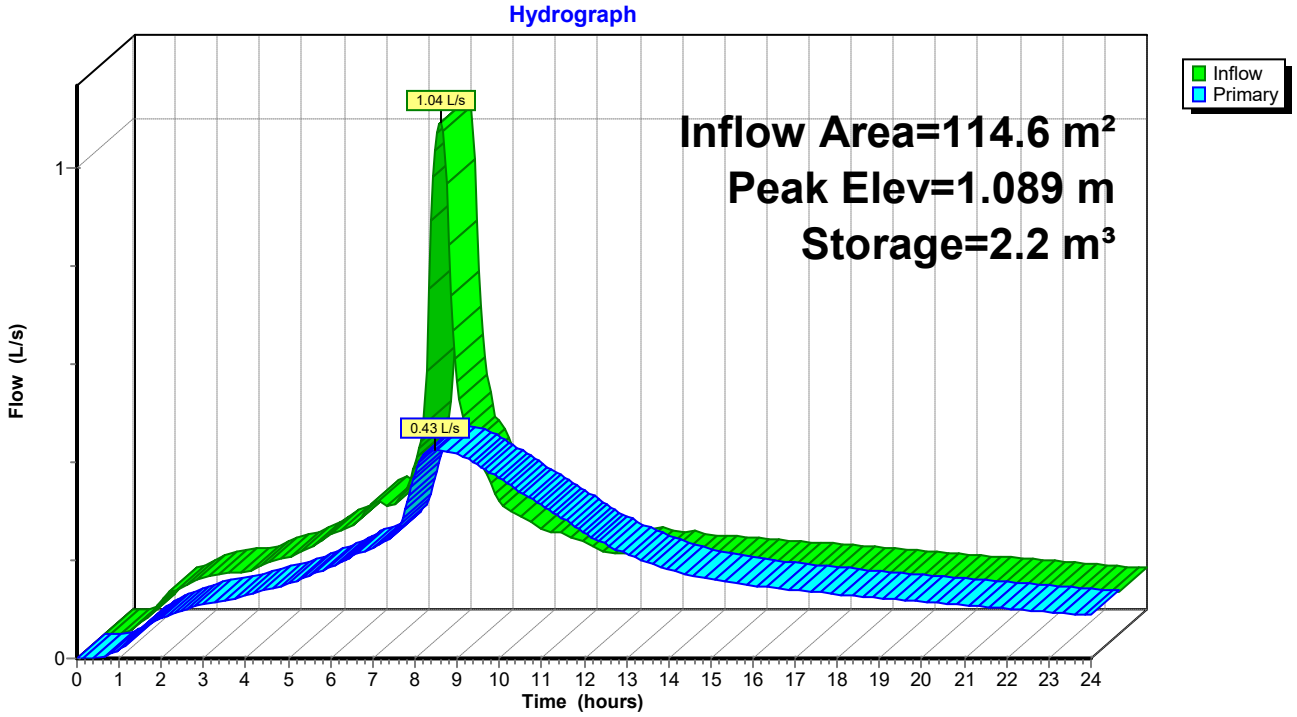
Plug-Flow detention time= 48.0 min calculated for 15.1 m³ (99% of inflow)
Center-of-Mass det. time= 42.5 min (697.4 - 654.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	4.7 m³	**1.60 mD x 2.35 mH Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices	
#1	Primary	0.000 m	**14 mm Vert. Orifice/Grate**	C= 0.600
#2	Primary	1.380 m	**23 mm Vert. Orifice/Grate**	C= 0.600

Primary OutFlow Max=0.43 L/s @ 8.49 hrs HW=1.089 m (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.43 L/s @ 2.76 m/s)
└**2=Orifice/Grate** (Controls 0.00 L/s)

Pond 40P: TANK 2: 5,000L Rainwater Tank

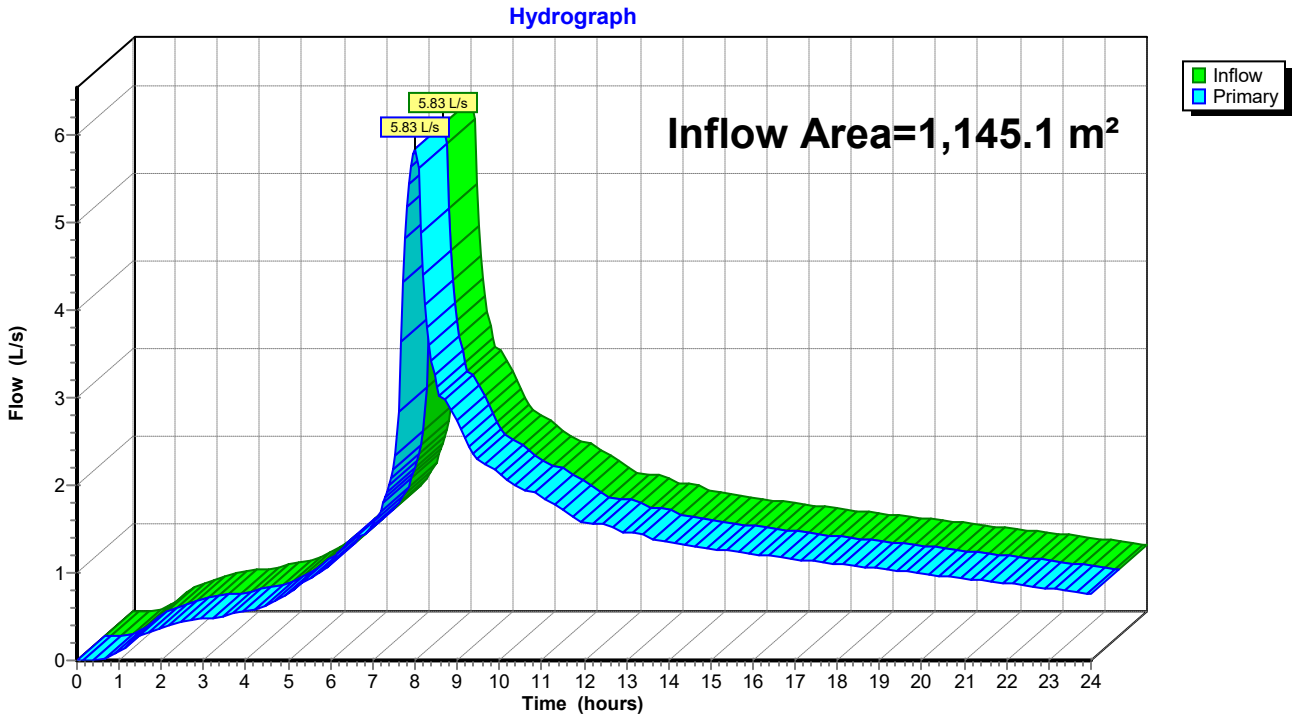


Summary for Link 37L: Post-Development Peak Flows

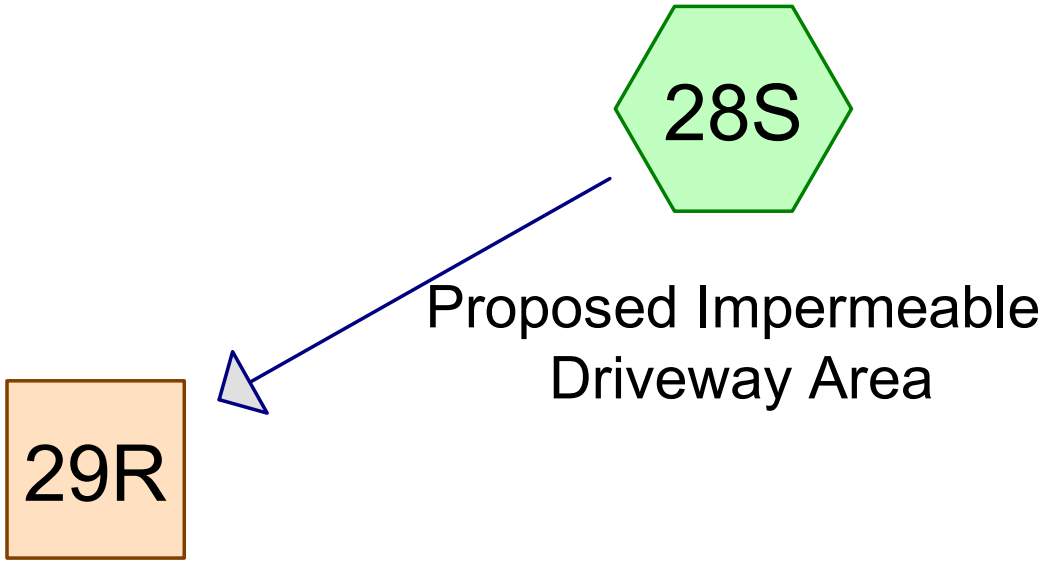
Inflow Area = 1,145.1 m², 41.42% Impervious, Inflow Depth > 95 mm for 20% AEP + 20% CCF event
Inflow = 5.83 L/s @ 8.00 hrs, Volume= 109.3 m³
Primary = 5.83 L/s @ 8.00 hrs, Volume= 109.3 m³, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 37L: Post-Development Peak Flows



Swale Sizing



Swale Capacity Check

Subcat Reach Pond Link

Routing Diagram for 138276
Prepared by Wilton Joubert Limited, Printed 13/02/2025

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 28S: Proposed Runoff Area=223.9 m² 100.00% Impervious Runoff Depth>247 mm
Tc=10.0 min CN=98 Runoff=3.75 L/s 55.4 m³

Reach 29R: Swale Capacity Check Avg. Flow Depth=0.11 m Max Vel=0.32 m/s Inflow=3.75 L/s 55.4 m³
n=0.025 L=10.00 m S=0.0050 m/m Capacity=8.98 L/s Outflow=3.75 L/s 55.3 m³

Summary for Subcatchment 28S: Proposed Impermeable Driveway Area

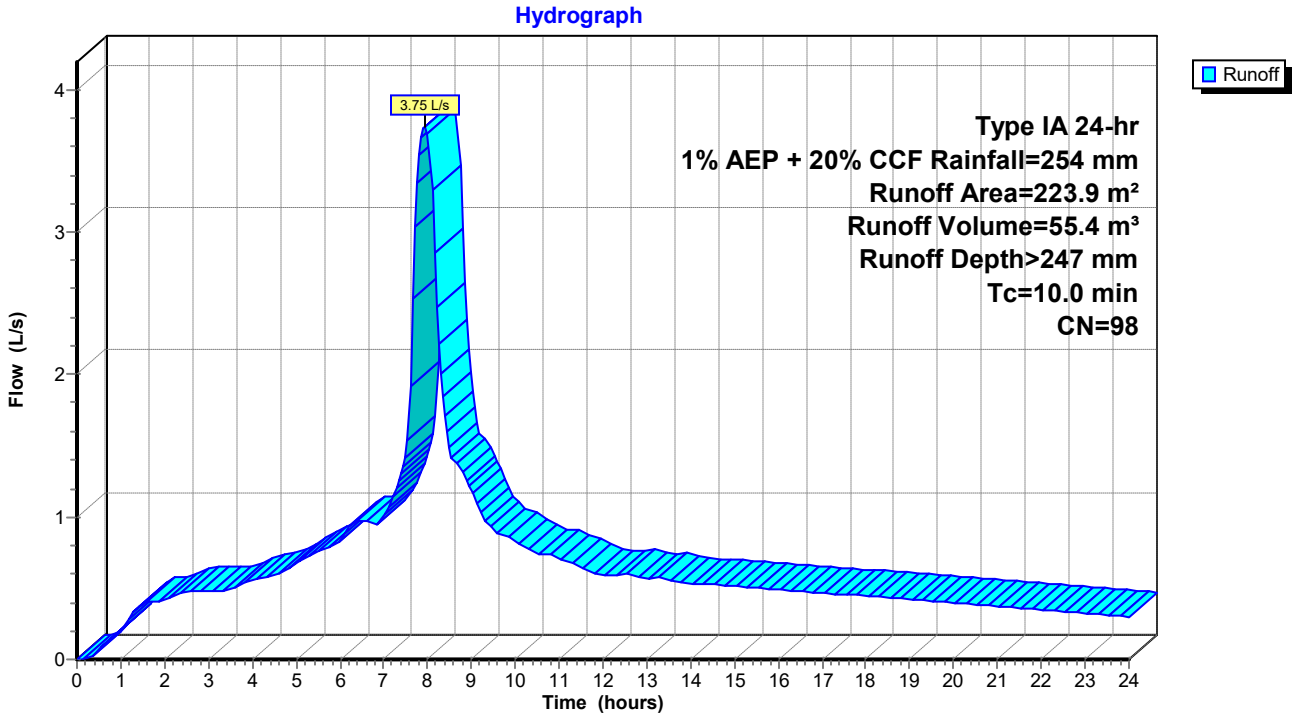
Runoff = 3.75 L/s @ 7.94 hrs, Volume= 55.4 m³, Depth> 247 mm

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% CCF Rainfall=254 mm

Area (m²)	CN	Description
223.9	98	Paved roads w/curbs & sewers, HSG C
223.9		100.00% Impervious Area

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

Subcatchment 28S: Proposed Impermeable Driveway Area



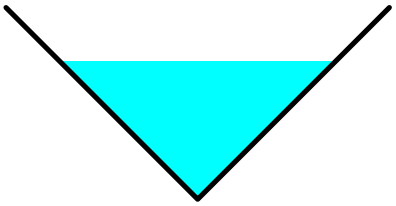
Summary for Reach 29R: Swale Capacity Check

Inflow Area = 223.9 m²,100.00% Impervious, Inflow Depth > 247 mm for 1% AEP + 20% CCF event
Inflow = 3.75 L/s @ 7.94 hrs, Volume= 55.4 m³
Outflow = 3.75 L/s @ 7.94 hrs, Volume= 55.3 m³, Atten= 0%, Lag= 0.4 min

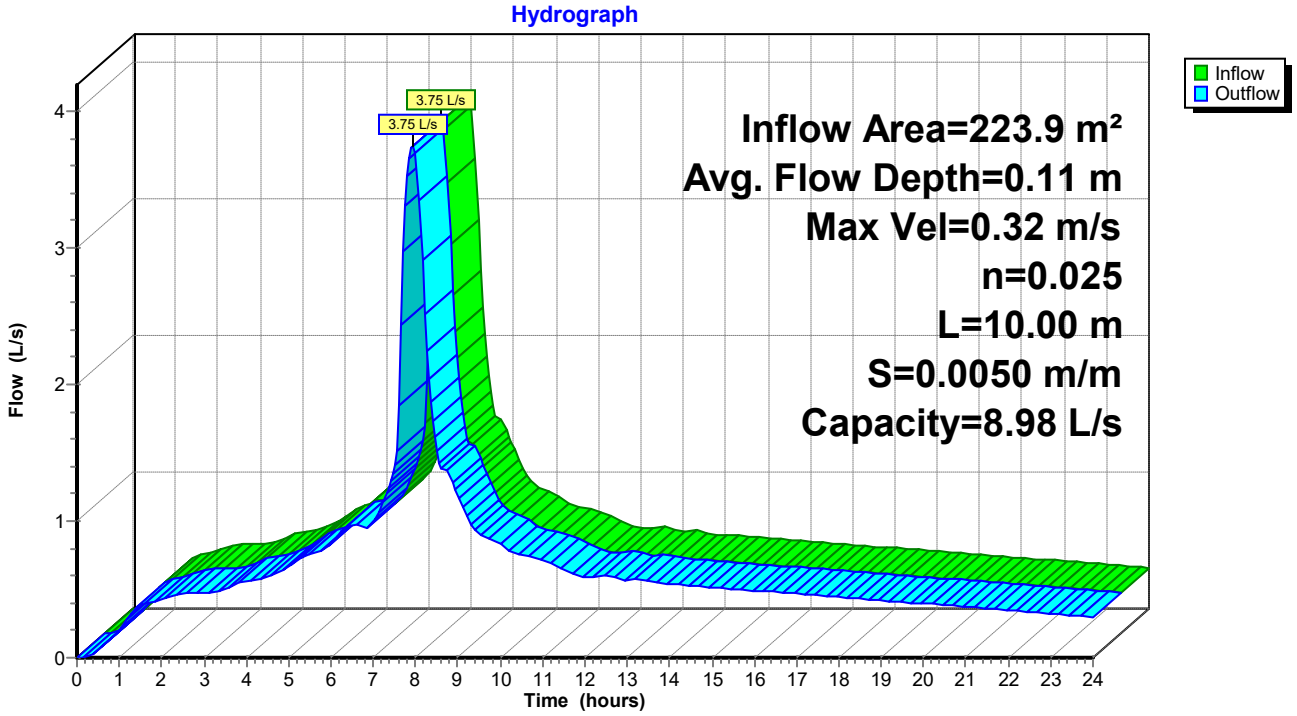
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.32 m/s, Min. Travel Time= 0.5 min
Avg. Velocity = 0.20 m/s, Avg. Travel Time= 0.8 min

Peak Storage= 0.1 m³ @ 7.94 hrs
Average Depth at Peak Storage= 0.11 m
Bank-Full Depth= 0.15 m Flow Area= 0.02 m², Capacity= 8.98 L/s

0.00 m x 0.15 m deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 1.0 m/m Top Width= 0.30 m
Length= 10.00 m Slope= 0.0050 m/m
Inlet Invert= 0.000 m, Outlet Invert= -0.050 m



Reach 29R: Swale Capacity Check



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 28S: Proposed Runoff Area=223.9 m² 100.00% Impervious Runoff Depth>133 mm
Tc=10.0 min CN=98 Runoff=2.04 L/s 29.7 m³

Reach 29R: Swale Capacity Check Avg. Flow Depth=0.09 m Max Vel=0.28 m/s Inflow=2.04 L/s 29.7 m³
n=0.025 L=10.00 m S=0.0050 m/m Capacity=8.98 L/s Outflow=2.04 L/s 29.7 m³

Summary for Subcatchment 28S: Proposed Impermeable Driveway Area

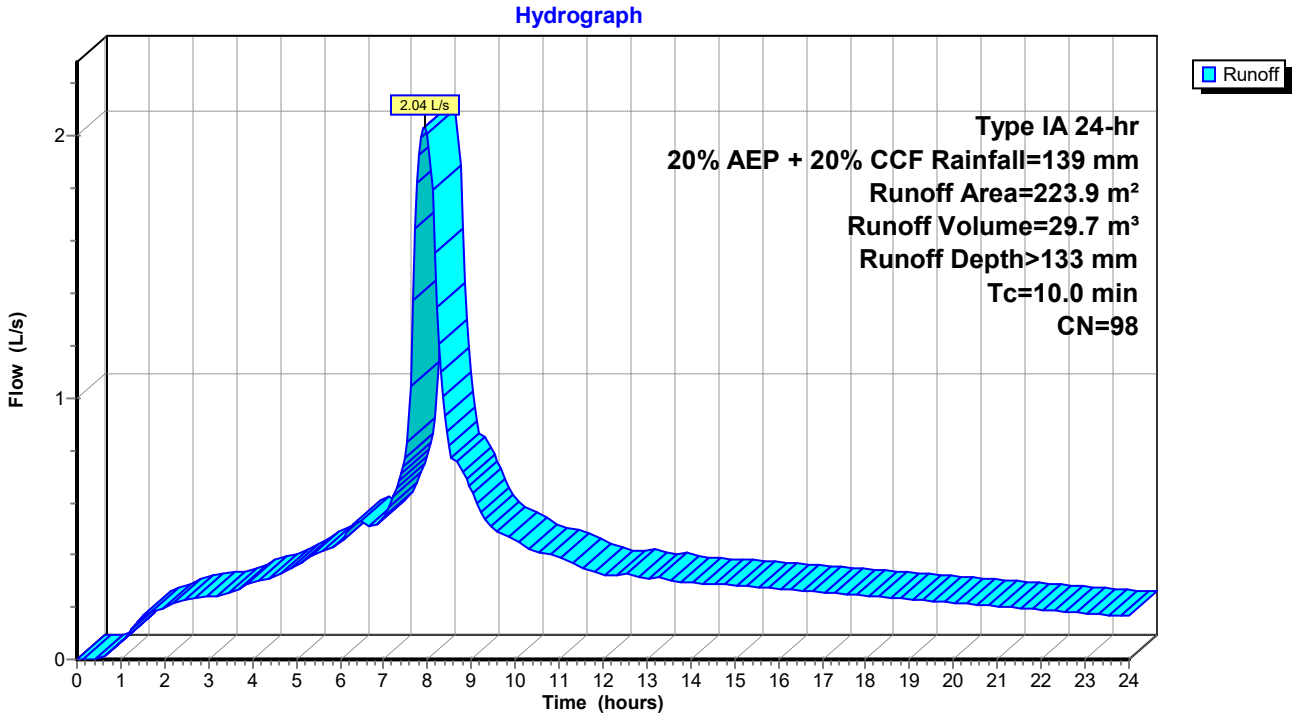
Runoff = 2.04 L/s @ 7.94 hrs, Volume= 29.7 m³, Depth> 133 mm

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% CCF Rainfall=139 mm

Area (m²)	CN	Description
223.9	98	Paved roads w/curbs & sewers, HSG C
223.9		100.00% Impervious Area

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

Subcatchment 28S: Proposed Impermeable Driveway Area



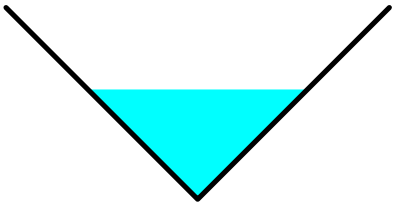
Summary for Reach 29R: Swale Capacity Check

Inflow Area = 223.9 m²,100.00% Impervious, Inflow Depth > 133 mm for 20% AEP + 20% CCF event
Inflow = 2.04 L/s @ 7.94 hrs, Volume= 29.7 m³
Outflow = 2.04 L/s @ 7.95 hrs, Volume= 29.7 m³, Atten= 0%, Lag= 0.5 min

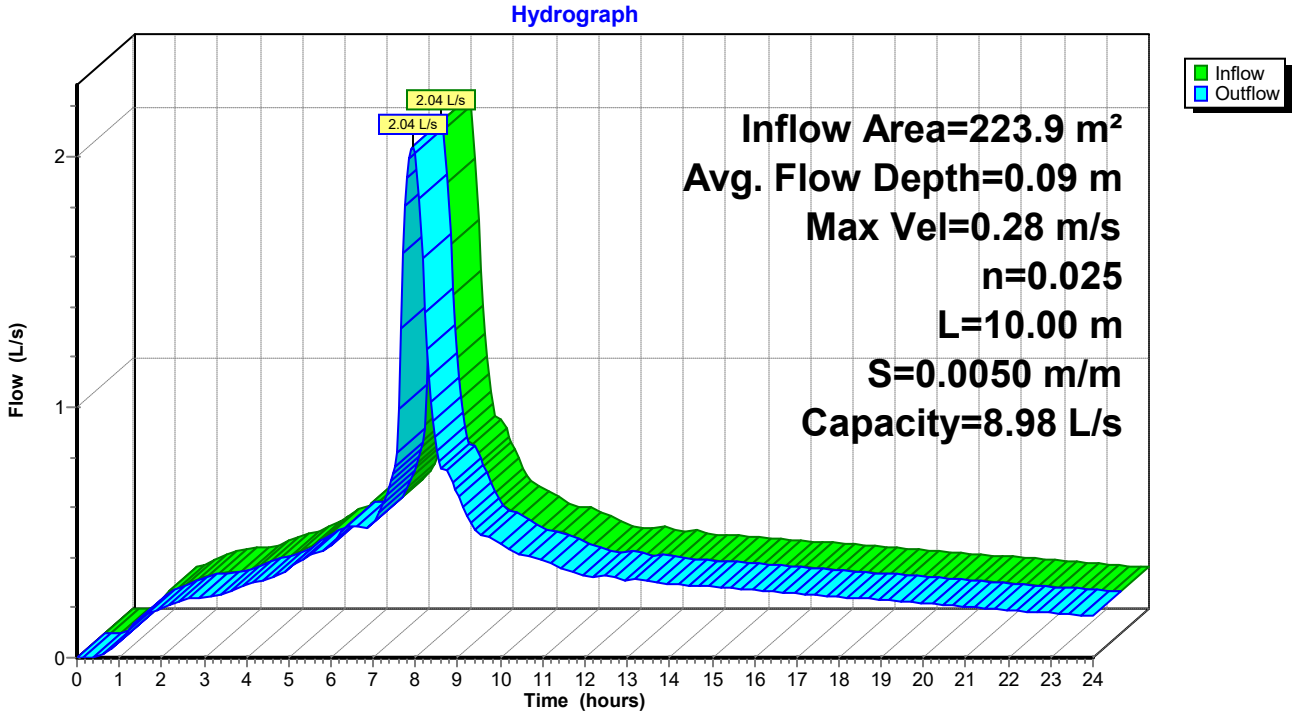
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.28 m/s, Min. Travel Time= 0.6 min
Avg. Velocity = 0.17 m/s, Avg. Travel Time= 1.0 min

Peak Storage= 0.1 m³ @ 7.95 hrs
Average Depth at Peak Storage= 0.09 m
Bank-Full Depth= 0.15 m Flow Area= 0.02 m², Capacity= 8.98 L/s

0.00 m x 0.15 m deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 1.0 m/m Top Width= 0.30 m
Length= 10.00 m Slope= 0.0050 m/m
Inlet Invert= 0.000 m, Outlet Invert= -0.050 m



Reach 29R: Swale Capacity Check



Appendix F: District Plan Rules Assessment

APPENDIX F – COMPLIANCE WITH DISTRICT PLAN PROVISIONS

Operative Far North District Plan Rule Assessment

An assessment of the applicable Operative District Plan rules is provided below. The specific Chapters of the District Plan which are referred to in the following assessment are:

- Urban Environment (Chapter 7)
- Transportation Chapter (Chapter 15)

District Plan Assessment – Urban Environment (7)

Urban Environment (Residential Zone)			
RULE No.	**RULE**	**COMPLIANCE**	**NON COMPLIANCE**
7.6.5.1.1	RELOCATED BUILDINGS	Reinstatement works associated with the two proposed dwellings will be completed within six months of the building being delivered to the site. **Compliant**	
7.6.5.1.2	RESIDENTIAL INTENSITY	There will be two residential units on a sewered site with less than 1,200 m2 in net site area. The proposal can comply with the other residential intensity standards of this Rule. **Not Fully Compliant**	**Restricted Discretionary (7.6.5.3.1)**
7.6.5.1.3	SCALE OF ACTIVITIES	No commercial activity is proposed. **Not Applicable**	
7.6.5.1.4	BUILDING HEIGHT	The maximum height of the proposed buildings is less than 8 m. **Compliant**	
7.6.5.1.4	SUNLIGHT	The proposed buildings will not project beyond a 45 degree recession plane as measured inwards from any point 2m vertically above ground level on the site boundary. **Compliant**	
7.6.5.1.6	STORMWATER MANAGEMENT	As provided within the notes on the Site Plan, the total building area and other impermeable surfaces over the site cover less than 50% of the gross site area. **Compliant**	

Urban Environment (Residential Zone)			
7.6.5.1.7	SETBACK FROM BOUNDARIES	The proposed buildings are setback more than 3 m from a road boundary and more than 1.2 m from other boundaries. **Compliant**	
7.6.5.1.8	SCREENING FOR NEIGHBOURS – NON RESIDENTIAL ACTIVITIES	Only residential activity is proposed. **Not Applicable**	
7.6.5.1.9	OUTDOOR ACTIVITIES	Only residential activity is proposed. **Not Applicable**	
7.6.5.1.10	VISUAL AMENITY	The site is not located with the locations referenced within this Rule, **Not Applicable**	
7.6.5.1.12	SITE INTENSITY – NON RESIDENTIAL ACTIVITIES	Only residential activity is proposed. **Not Applicable**	
7.6.5.1.13	HOURS OF OPERATION – NON RESIDENTIAL ACTIVITIES	Only residential activity is proposed. **Not Applicable**	
7.6.5.1.13	KEEPING OF ANIMALS	The site will not be used for factory farming, a boarding or breeding kennel or a cattery. **Not Applicable**	
7.6.5.1.15	NOISE	The proposal is expected to comply with the Noise limits as the proposed activity is residential. Construction noise will be temporary and given the proposal involves relocatable dwellings, any construction noise is expected to comply with the construction noise limits under this Rule. **Compliant**	
7.6.5.1.16	HELICOPTER LANDING AREA	No helicopter landing area is proposed. **Not Applicable**	
7.6.5.1.17	BUILDING COVERAGE	As provided within the notes section of the Site Plan, the total building coverage of the proposal is well less than 45 % of the gross site area. **Compliant**	

Transportation (15)			
RULE No.	**RULE**	**COMPLIANCE**	**NON-COMPLIANCE**
15.1.6A.1	MAXIMUM DAILY ONE WAY TRAFFIC MOVEMENTS	Two small scale dwellings are proposed to be located on the site. Daily traffic movements generated from the site will be within the permitted standard (up to 20 movements) **Permitted**	
15.1.6A.2	TRAFFIC INTENSITY	The proposal is not a new activity nor is it changing the activity on the site as there was previously a residential unit located on the site. **Not Applicable**	
15.1.6B.1.1	PARKING	There is adequate space to provide for on-site parking spaces associated with both residential units. **Compliant**	
15.1.6B.1.1	CAR PARKING SPACE STANDARDS	Carparking, access and manoeuvring areas will meet the required standards of this Rule **Compliant**	
15.1.6C.1.1	PRIVATE ACCESSWAY IN ALL ZONES	The proposed replacement driveway will be compliant with the required standards of this Rule. **Compliant**	
15.1.6C.1.2	PRIVATE ACCESSWAYS IN URBAN ZONES	The proposed replacement driveway will be compliant with the required standards of this Rule. **Compliant**	
15.1.6C.1.4	ACCESS OVER FOOTPATHS	Only one crossing will be provided to access the site which is existing and legally established. **Compliant**	
15.1.6C.1.6	VEHICLE CROSSING STANDARDS IN URBAN ZONES	(a) The vehicle crossing is existing and was legally established.	

Transportation (15)			
		(b) The crossing serves one property only. **Compliant**	
15.1.6C.1.7	GENERAL ACCESS STANDARDS	(a) Provision is made such that there is no need for vehicles to reverse off the site. (b) There are no bends or corners on the accessway. (c) The access does not exceed formation requirements. (d) A Stormwater Mitigation Memorandum is provided with recommendations (which are adopted) to ensure that stormwater is managed appropriately on-site **Compliant**	