



<b>Office Use Only</b> Application Number:
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**APPLICATION FOR RESOURCE CONSENT OR FAST-TRACK RESOURCE CONSENT**

**(Or Associated Consent Pursuant to the Resource Management Act 1991 (RMA))**

**(If applying for a Resource Consent pursuant to Section 87AAC or 88 of the RMA, this form can be used to satisfy the requirements of Form 9)**

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

**1. Pre-Lodgement Meeting**

Have you met with a Council Resource Consent representative to discuss this application prior to lodgement? Yes / No

**2. Type of Consent being applied for (more than one circle can be ticked):**

- Land Use
- Extension of time (s.125)
- Consent under National Environmental Standard (e.g. Assessing and Managing Contaminants in Soil)
- Other (please specify) Building Coverage & Stormwater Management
- Fast Track Land Use\*
- Change of conditions (s.127)
- Subdivision
- Change of Consent Notice (s.221(3))
- Discharge

**\*The fast track for simple land use consents is restricted to consents with a controlled activity status and requires you provide an electronic address for service.**

**3. Would you like to opt out of the Fast Track Process? Yes / No**

**4. Applicant Details:**

Name/s:

Libby Wycherley

Electronic Address for Service (E-mail):

Phone Numbers:

Postal Address:  
(or alternative method of service under section 352 of the Act)

**5. Address for Correspondence: Name and address for service and correspondence (if using an Agent write their details here).**

Name/s:

Nicola @ Martin O'Brien

Electronic Address for Service (E-mail):

Phone Numbers:

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.**

**6. 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: Libby Wycherley

Property Address/  
Location \_\_\_\_\_

**7. Application Site Details:**

Location and/or Property Street Address of the proposed activity:

Site Address/  
Location: 60 Landing Road,

Kerikeri

Legal Description: Lot 2 DP 541418 Val Number: \_\_\_\_\_

Certificate of Title: 909919

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.**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**8. Description of the Proposal:**

Please enter a brief description of the proposal here. Attach a detailed description of the proposed activity and drawings (to a recognized scale, e.g. 1:100) to illustrate your proposal. Please refer to Chapter 4 of the District Plan, and Guidance Notes, for further details of information requirements.

Application for Building Coverage as a Discretionary Activity is due to building coverage being a total of 18.3% (373.8m<sup>2</sup>) of the total lot area. Resulting in 169.6m<sup>2</sup> over the 10% (204.2m<sup>2</sup>) permitted allowance outlined in the Far North District Plan, Section 8.7.5.1.13.

Application for Stormwater Management as a Discretionary activity is due to impermeable surfaces being a total of 28.1% (574m<sup>2</sup>) of the total lot area. Breaching Permitted Activity rule

(8.7.5.1.5) Application for Fire Risk to Residential Unit as a Discretionary Activity due to a breach of the Far North District Plan Section 12.4.6.1.2, Fire Risk to Residential Units  
If this is an application for an Extension of Time (s.125); Change of Consent Conditions (s.127) or 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) or extension being sought, with reasons for requesting them.

**9. Would you like to request Public Notification**

**Yes/No**

**10. Other Consent required/being applied for under different legislation (more than one circle can be ticked):**

- Building Consent (BC ref # if known)                       Regional Council Consent (ref # if known)
- National Environmental Standard consent                       Other (please specify)

**11. 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 (further information in regard to this NES is available on the Council's planning web pages):

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? (If the activity is any of the activities listed below, then you need to tick the 'yes' circle).  yes  no  don't know

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

**12. 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.

**Please attach your AEE to this application.**

**13. 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 all names in full)

Libby Wycherley

Email:


Postal Address:

Phone Numbers:

**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 20<sup>th</sup> 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: Libby Wycherley (please print)

Signature:  (signature of bill payer – **mandatory**) Date: 24/7/24

## 14. 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](http://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.

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

Name: Libby Wycherley (please print)

Signature:  (signature)

Date: 22nd July 2024

(A signature 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)
- 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.*

**Only one copy of an application is required, but please note for copying and scanning purposes, documentation should be:**

**UNBOUND**

**SINGLE SIDED**

**NO LARGER THAN A3 in SIZE**

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# ASSESSMENT OF ENVIRONMENTAL EFFECTS

## Building Coverage, Stormwater Management & Fire Risk to Residential Unit

Libby Wycherley  
60 Landing Road  
Kerikeri  
Lot 2 DP 541418

Written by: Nicola O'Brien  
Reviewed by: Martin O'Brien

Rev: B  
Date: 16<sup>th</sup> August 2024  
Job No: 4075

Ph: (09) 407 5208 | Mob: 027 407 5208  
E-mail: martin@obrienconsulting.co.nz  
E-mail: nicola@obrienconsulting.co.nz

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## Form 9 Application for Resource Consent under Sections 127 Resource Management Act 1991

### To Far North District Council

1. *Libby Wycherley, from 60 Landing Road, Kerikeri, Lot 2 DP 541418, applies for Resource Consent due to the following rule breaches in a Rural Living Zone:*

- Application for Building Coverage as a Discretionary Activity is due to building coverage being a total of 18.3% (373.8m<sup>2</sup>) of the total lot area. Resulting in 169.6m<sup>2</sup> over the 10% (204.2m<sup>2</sup>) permitted allowance outlined in the Far North District Plan, Section 8.7.5.1.13.

The activity is Discretionary because it does not comply with Permitted Activities rule 8.7.5.1.13, building coverage is not listed in Controlled Activities (8.7.5.2) and total building coverage exceeds the 15% allowed for a Restricted Discretionary activity as per rule 8.7.5.3.4.

- Application for Stormwater Management as a Discretionary activity is due to impermeable surfaces being a total of 28.1% (574m<sup>2</sup>) of the total lot area.

The total proposed impermeable area exceeds 20% of the site area and does not comply with Permitted Activity rule (8.7.5.1.5) nor Controlled Activity rule (8.7.5.2.2). Stormwater Management is not listed as a Restricted Discretionary Activity. Discretionary Activity rule 8.7.5.4 (c) states a Discretionary activity “does not comply with one or more of the other standards for permitted controlled or restricted discretionary activities in this zone as set out under Rules 8.7.5.1, 8.7.5.2 and 8.7.5.3. Therefore, the activity is Discretionary.

- Application for Fire Risk to Residential Unit as a Discretionary Activity due to a breach of the Far North District Plan Section 12.4.6.1.2, Fire Risk to Residential Units:

Application for fire risk to residential unit due to the proposed dwelling being ~13m from vegetation located on neighbouring properties breaching the 20m permitted, Section 12.4.6.1.2. The activity is not Controlled as 12.4.6.2 (b) states an activity is Controlled “if it complies with Rule 12.4.6.1.2 Fire Risk to Residential Units” which it does not therefore the activity is Discretionary.

The applicant opts out of the fast-track consent process as the breaches are Discretionary.

2. *The activity to which the application relates (the proposed activity) is as follows:*

A new 3-bedroom dwelling with a building coverage of 373.8m<sup>2</sup> is to be constructed on a currently bare section at 60 Landing Road, Kerikeri. A concrete driveway, concrete path and patio are proposed. The development exceeds permitted building coverage and requires stormwater management. The building is less than 20m from vegetation located on neighboring properties. Architectural Plans, Appendix II provides further details of the development.

This report addresses relevant criteria in the existing and proposed Far North District Plan and Resource Management Act (1991).

3. *The location of the proposed activity:*

Lot 2 DP 541418 is located at 60 Landing Road, Kerikeri. The property is zoned Rural Living in the Far North District Plan. Refer to the Site Location Plan, Appendix II, Sheet A01a, showing the location of Lot 2 DP 541418 and the surrounding area.

4. The owner listed is the only owner/occupier of the site to which this application relates.
5. There are no other activities that are part of the proposal to which this application relates.
6. No additional resource consents are required for the proposal to which this application relates.
7. Attached is an assessment of the proposed activity’s effect on the environment that:
  - a. Includes the information required by clause 6 of Schedule 4 of the Resource Management Act 1991; and
  - b. Addresses the matters specified in clause 7 of Schedule 4 of the Resource Management Act 1991; and
  - c. includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

8. Attached is an assessment of the proposed activity against the matters set out in Part 2 of the Resource Management Act 1991.

9. Attached is an assessment of the proposed activity against any relevant provisions of a document referred to in section 104(1)(b) of the Resource Management Act 1991, including the information required by clause 2(2) of Schedule 4 of that Act.

10-13 Not applicable.

14. Attached is further information required to be included in this application by the District Plan, the Regional Plan, the Resource Management Act 1991, or any regulations made under that Act.

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## 1.0 Introduction

Lot 2 DP 541418 is currently a bare 2,042m<sup>2</sup> section located at 60 Landing Road, Kerikeri. The Certificate of Title and Consent Notices for the property are attached as Appendix I.

A new 3-bedroom dwelling with a floor area of 328.8m<sup>2</sup> is proposed. Total building coverage will be 373.8m<sup>2</sup>. A Resource Consent as a Discretionary Activity is required. It is not unusual for a modern dwelling in Kerikeri to have a similar building coverage of 373.8m<sup>2</sup>. The single, modern, architecturally designed dwelling is in keeping with Landing Road, nearby Waipapa Road and the general Kerikeri area. Existing and proposed plantings along the northern and southern boundary will screen the development from adjacent properties to the north and south. Proposed planting considers the necessity to reduce fire risk.

A concrete driveway, concrete path and patio are proposed. Total impermeable surfaces are above permitted requiring a Resource Consent with stormwater management. A Stormwater Management Report, written by Wilton Joubert, Consulting Engineers, 20<sup>th</sup> June 2023 is attached. Stormwater management can be achieved onsite with a detention tank and shaped hardstand areas directed to the roadside drain and catch pits directed to the available stormwater connection via sealed pipes.

There is available area on the property for required infrastructure such as onsite wastewater, water tanks, and stormwater management along with lawn and garden areas for recreational residential use.

The proposed dwelling is not surrounded by vegetation but is within 20m of vegetation located on neighbouring properties to the south. Residential housing with lawn and gardens are located to the north and west whilst Landing Road runs along the eastern boundary. The dwelling is clad primarily in fire resistant brick with a metal longrun roof reducing flammability of the exterior. The landscape design incorporates low flammable plants avoiding species with high flammability. A fire hydrant is located approximately 13.6m to the east of the dwelling near Landing Road. The close and accessible fire hydrant provides a preferred water supply for firefighters if required.

### 1.1 Scope

O'Brien Design Consulting were engaged by Libby Wycherley to prepare an Assessment of Environmental Effects Report to accompany an application to for Resource Consent addressing the requirements of Section 88.2 and Schedule 4 of the Resource Management Act 1991. The application is to be submitted to the Far North District Council. This application has been prepared in accordance with Form 9 and Schedule 4, Sections 2, 6 and 7 of the Resource Management Act.

Relevant District Plan rules and proposed District Plan rules have been assessed along with objectives and policies, for each plan. District Plan Criterion for building coverage are addressed in this report. A Stormwater Mitigation Report by Wilton Joubert Engineers addresses criterion for stormwater management and is attached as Appendix III.

This report focuses on mitigation for building coverage and fire risk to residential unit as stormwater is covered in the report by Wilton Joubert attached.

### 1.2 Description of Activities

#### Building Coverage:

Proposed dwelling: 373.8m<sup>2</sup>

Total permitted = 10% of gross site area = 204.2m<sup>2</sup>

Total proposed = 373.8m<sup>2</sup> = 18.3%

Application for Building Coverage as a Discretionary activity is due to building coverage being a total of 18.3% (373.8m<sup>2</sup>) of the total lot area. Resulting in 169.6m<sup>2</sup> over the 10% (204.2m<sup>2</sup>) permitted allowance outlined in the Far North District Plan, Section 8.7.5.1.13.

The activity is Discretionary because it does not comply with Permitted Activities rule 8.7.5.1.13, building coverage is not listed in Controlled Activities (8.7.5.2) and total building coverage exceeds the 15% allowed for a Restricted Discretionary activity as per rule 8.7.5.3.4.

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## Stormwater Management:

### Impermeable surfaces

Proposed concrete driveway:	157.1m <sup>2</sup>
Proposed concrete path:	18.6m <sup>2</sup>
Proposed concrete patio:	32.4m <sup>2</sup>
Proposed dwelling:	<u>365.9m<sup>2</sup></u>
Total:	574.0m <sup>2</sup>

Application for Stormwater Management as a Discretionary activity is due to impermeable surfaces being a total of 28.1% (574m<sup>2</sup>) of the total lot area.

The total proposed impermeable area exceeds 20% of the site area and does not comply with Permitted Activity rule (8.7.5.1.5) nor Controlled Activity rule (8.7.5.2.2). Stormwater Management is not listed as a Restricted Discretionary Activity. Discretionary Activity rule 8.7.5.4 (c) states a Discretionary activity "does not comply with one or more of the other standards for permitted controlled or restricted discretionary activities in this zone as set out under Rules 8.7.5.1, 8.7.5.2 and 8.7.5.3. Therefore, the activity is Discretionary.

A Stormwater Mitigation Report has been written by Wilton Joubert Consulting Engineers, 20<sup>th</sup> June 2023. Refer to Appendix III. The low impact design principles utilised will mitigate runoff from impermeable areas exceeding permitted threshold to that of predevelopment levels (10% and 1% AEP storm events with climate change). With mitigation stormwater effects are considered to have less than minor impact on the receiving environment.

### Fire Risk to Residential Unit

Application for fire risk to residential unit due to the proposed dwelling being within 20m of vegetation located on neighbouring properties breaching the 20m permitted, Section 12.4.6.1.2. Lot 1 and 2 DP 453506 to the south have vegetation likely to include native bush. The activity is described as Discretionary.

## 2.0 Site Description

Lot 2 DP 541418 is a 2,042m<sup>2</sup>, irregular square shaped, slightly sloping residential section located at 60 Landing Road, Kerikeri. The property is slightly elevated above Landing Road. Earthworks have occurred over the site creating a flat building platform. The property is currently bare. Grass has recently been sprayed. The beginning of a concrete drive currently provides access to the property. The property is in a residential area. The Parrot Place is located opposite to the property on the other side of Landing Road. The Far North District Council Map on the Site Location Plan, Sheet A01a, Appendix II shows the location of the property in relation to Landing Road and the proposed dwelling on the site.

A bottle brush hedge runs along the southern property boundary along Easement Y. Consent Notice (ii) states the easement is for hedge protection and requires a minimum mature hedge height of 2 meters. The existing hedge provides screening of the proposed development from the south.

Lot 2 is currently open to neighbouring residential properties to the north and west and to Landing Road and an associated roadside drain which runs along the eastern property boundary. Refer to Photograph 1 showing Lot 2 and neighbouring properties on 9<sup>th</sup> July 2024 during a site visit.

Earthworks over the site have created primarily flat to slightly sloping topography with a cut building platform.

Proposed building coverage will be 373.8m<sup>2</sup>. There are numerous properties in the area with a building coverage greater than this for example the existing dwelling and shed on Lot 1 DP 93649. The development of a single residential dwelling with a larger than usual building coverage is in keeping with the local area.

Vegetation within 20m of the proposed dwelling is located on neighbouring Lot 1 and 2 DP 453506 to the south. Some of the vegetation is visible in Photograph 1.





Photograph 1: Showing existing Lot 2 DP 541418, currently a bare site. A bottle brush hedge runs along the southern boundary. The lot is currently open to neighbouring residential properties and Landing Road. Mature vegetation on neighboring properties to the left of the photograph.

### **3.0 Far North District Plan Review**

#### **3.1 Operative Far North District Plan**

Application for Building Coverage as a Discretionary activity is due to building coverage being a total of 18.3% (373.8m<sup>2</sup>) of the total lot area. Resulting in 169.6m<sup>2</sup> over the 10% (204.2m<sup>2</sup>) permitted allowance outlined in the Far North District Plan, Section 8.7.5.1.13.

Application for Stormwater Management as a Discretionary activity is due to impermeable surfaces being a total of 28.1% (574m<sup>2</sup>) of the total lot area.

Application for Fire Risk to Residential Unit as a Discretionary activity due to the proposed dwelling being less than 20m from the “dripline of any trees in a naturally occurring or deliberately planted area of scrub or shrubland, woodlot or forest” as per Section 12.4.6.1.2.

#### **3.2 Operative Far North District Plan Other Rule Assessment:**

The following District Plan rules comply:

8.6.5.1.1 Residential Intensity: Complies.

8.6.5.1.2 Sunlight: Complies.

8.6.5.1.4 Setback from Boundaries: 3m minimum, Complies.

8.6.5.1.8 Building Height: Permitted 9m proposed 6.1m: Complies.

12.3.6.1: Earthworks:

Driveway cut: 16m<sup>3</sup>

Main cut: 130m<sup>3</sup>

Total cut: 146m<sup>3</sup>

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Fill: 146m<sup>3</sup>

Cut/fill: 292m<sup>3</sup>

Total permitted = 300m<sup>3</sup>. Complies.

### **3.3 Operative Far North District Plan Objectives & Policies**

#### **3.3.1 Rural Living Zone, Section 8.7, Operative Far North District Plan**

The following has been taken from the Operative Far North District Plan, Section 8.7, p. 1 and 2.

##### **Objectives**

***8.7.3.1 To achieve a style of development on the urban periphery where the effects of the different types of development are compatible.***

The development of a single residential dwelling is compatible with residential development along Landing Road, nearby Waipapa Road and the general Kerikeri area.

***8.7.3.2 To provide for low density residential development on the urban periphery, where more intense development would result in adverse effects on the rural and natural environment.***

The development is in keeping with low density development and is not considered intense development that would result in adverse effects on the rural and natural environment. A single dwelling is proposed. Low impact design principles are to be used to reduce run off volumes and to protect receiving environments from the adverse effects of stormwater discharge.

***8.7.3.3 To protect the special amenity values of the frontage to Kerikeri Road between SH10 and the urban edge of Kerikeri.***

Not applicable.

##### **Policies**

***8.7.4.1 That a transition between residential and rural zones is achieved where the effects of activities in the different areas are managed to ensure compatibility.***

The development is in keeping with surrounding residential properties.

***8.7.4.2 That the Rural Living Zone be applied to areas where existing subdivision patterns have led to a semi-urban character but where more intensive subdivision would result in adverse effects on the rural and natural environment.***

Not applicable. Subdivision has created a semi urban character.

***8.7.4.3 That residential activities have sufficient land associated with each household unit to provide for outdoor space, and where a reticulated sewerage system is not provided, sufficient land for onsite effluent disposal.***

The 2,042m<sup>2</sup> property has sufficient land available for onsite wastewater which includes an aeration treatment system with dripper lines. A 50% reserve area is available. Stormwater can be managed onsite. Refer to Sheet A01b, Appendix II showing the onsite wastewater and stormwater design including the location of the aeration treatment system and dripper lines, the detention tank, channel drain and catch pits. The dwelling is serviced by town water supply.

***8.7.4.4 That no limits be placed on the types of housing and forms of accommodation in the Rural Living Zone, in recognition of the diverse needs of the community.***

The style of housing is in keeping with modern, Kerikeri dwellings.

***8.7.4.5 That non-residential activities can be established within the Rural Living Zone subject to compatibility with the existing character of the environment.***

Not applicable the development is residential.

**8.7.4.6 That home-based employment opportunities be allowed in the Rural Living Zone.**

Not applicable.

**8.7.4.7 That provision be made for ensuring that sites, and the buildings and activities which may locate on those sites, have adequate access to sunlight and daylight.**

The dwelling complies with building height and the sunlight rule.

**8.7.4.8 That the scale and intensity of activities other than a single residential unit be commensurate with that which could be expected of a single residential unit.**

A single residential dwelling is proposed. Building coverage exceeds permitted but is compatible with existing development in the area.

**8.7.4.9 That activities with effects on amenity values greater than a single residential unit could be expected to have, be controlled so as to avoid, remedy or mitigate those adverse effects on adjacent activities.**

The development is a single residential unit in keeping with modern dwellings in the Kerikeri area.

**8.7.4.10 That provision be made to ensure a reasonable level of privacy for inhabitants of buildings on adjoining sites.**

The Landscape Plan, Sheet A01d, Appendix II shows existing hedge along the southern boundary and proposed hedge along the northern. This will ensure a reasonable level of privacy for inhabitants of buildings on adjoining southern and northern properties.

The owner's son owns neighbouring, adjacent Lot 1 DP 541418 to the west. Limited planting is proposed along the boundary between the properties so that the families can come and go between the dwellings. The property is open to Landing Road, some plantings are proposed to the front of the house and along the driveway. Numerous properties in the local area are open to the roadside. Reduced plantings where possible lowers the risk of fire spread.

The dwelling is architecturally designed and aesthetically appealing as shown by the bottom drawing, Sheet A04 Elevations, Architectural Plans, Appendix II.

**8.7.4.11 That the built form of development allowed on sites with frontage to Kerikeri Road between its intersection with SH10 and Cannon Drive be maintained as small in scale, set back from the road, relatively inconspicuous and in harmony with landscape plantings and shelter belts.**

Not applicable as not on a site with frontage to Kerikeri Road.

**8.7.4.12 That the Council maintains discretion over new connections to a sewerage system to ensure treatment plant discharge quality standards are not compromised.**

Not applicable. A secondary treatment system with dripper line will service the dwelling.

**Summary**

A single dwelling with a concrete driveway, path and patio are proposed. The design is aesthetically pleasing. There is available area on the property for onsite wastewater and stormwater management. Proposed and existing plantings will provide privacy for buildings on adjoining sites to the north and south. The dwelling is located in a residential area where visual effects on neighbouring sites are expected to be less than minor.

Stormwater will be managed so that flow rates are that of predeveloped. The low impact design principles utilised will mitigate runoff from impermeable areas exceeding permitted threshold to that of predevelopment levels (10% and 1% AEP). Mitigation includes the use of a concrete water tank for stormwater attenuation and hardstands shaped to direct stormwater to catchpits. With mitigation stormwater effects are considered to be less than minor on the receiving environment. The Stormwater Mitigation Report by Wilton Joubert, Appendix III provides further details of stormwater management.

The proposed development is in keeping with the objectives and policies in the Operative Far North District Plan for a Rural Living zone.

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### 3.3.2 Proposed Far North District Plan Objectives & Policies

In the proposed District Plan the property will become Rural Residential. The Rural Residential zone has been applied to areas that were formerly zoned Rural Living and are contiguous with an urban area. The site will also be within Kerikeri Heritage Area Overlay – Part B.

#### The Rural Residential Zone

##### Objectives

***RRZ-01 The Rural Residential zone is used predominantly for rural residential activities and small-scale farming activities that are compatible with the rural character and amenity of the zone.***

The proposed development is considered a residential activity which complies with the character and amenity of the zone, surrounding properties and local area.

***RRZ-02 The predominant character and amenity of the Rural Residential Zone is maintained and enhanced, which includes:***

***a. Peri-urban scale residential activities.***

The property is peri-urban scale residential. The development is in keeping with neighboring properties and the local area.

***b. Small scale farming activities with limited buildings and structures.***

Not applicable. No farming activities proposed.

***c. Smaller lot sizes than anticipated in the Rural Production or Rural Lifestyles zones:***

The 2,042m<sup>2</sup> in keeping with residential activity.

***d. A diverse range of rural residential environments reflecting the character and amenity of the adjacent urban area.***

Applicable. In keeping with the character and amenity of adjacent sites and the local area.

***RRZ-03 The Rural Residential zone helps meet the demand for growth around urban centers while ensuring the ability of the land to be rezoned for urban development in the future is not compromised.***

Not applicable to this application. The 2,042m<sup>2</sup> property is suitable for residential use.

***RRZ-04 Land use and subdivision in the Rural Residential zone:***

***a. Maintains rural residential character and amenity values.***

The residential land use maintains the existing character and amenity values of the surrounding area.

***b. Supports a range of rural residential and small-scale farming activities.***

Not applicable as residential use with no farming activities.

***c. Is managed to control any reverse sensitivity issues that may occur within the zone or at the zone interface.***

Not applicable.

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## **Policies**

***Enable activities that will not compromise the role, function and predominant character and amenity of the Rural Residential Zone, while ensuring their design, scale and intensity is appropriate, including:***

- a. *rural residential activities;***

The design, scale and intensity are appropriate for the neighbourhood and surrounding area. The development does not compromise the role, function, or character of the Rural Residential Zone. The dwelling is modern and stylish enhancing the amenity and financial value of the neighbourhood.

- b. *small-scale farming activities;*** Not applicable.

- c. *home business activities;*** Not applicable.

- d. *visitor accommodation;*** Not applicable.

- e. *small-scale education facilities;*** Not applicable.

### **RRZ-P2**

***Avoid activities that are incompatible with the role, function and predominant character and amenity of the Rural Residential Zone including:***

- a. *activities that are contrary to the density anticipated for the Rural Residential Zone;***

Not applicable. A single dwelling is proposed.

- b. *primary production activities, such as intensive indoor primary production or rural industry, that generate adverse amenity effects that are incompatible with rural residential activities;***

Not applicable as primary production activities not proposed.

- c. *commercial or industrial activities that are more appropriately located in an urban zone or a Settlement Zone.***

Not applicable as commercial or industrial activities not proposed.

### **RRZ-P3**

***Avoid where possible, or otherwise mitigate, reverse sensitivity effects from sensitive and other non-productive activities on primary production activities in adjacent Rural Production Zones and Horticulture Zones.***

Not applicable. Reverse sensitivity effects from sensitive and other non-productive activities on primary production activities not anticipated as the lot is located in a residential area.

### **RRZ-P4**

***Require all subdivision in the Rural Residential zone to provide the following reticulated services to the boundary:***

- a. *telecommunications:***

**i. *fibre where it is available;***

**ii. *copper where fibre is not available;***

**iii. *copper where the area is identified for future fibre deployment.***

- b. *local electricity distribution network.***

Not applicable.

**Manage land use and subdivision to address the effects of the activity requiring resource consent, including (but not limited to) consideration of the following matters where relevant to the application:**

**a. consistency with the scale and character of the rural residential environment;**

Although building coverage exceeds permitted the scale and character of the development is consistent with the local area.

**b. location, scale and design of buildings or structures;**

The dwelling is to be located centrally on the lot. The exterior is to be clad primarily in brick with some vertical timber shiplap cladding. The colour scheme will be within the heritage colours required. The design is modern TRS 450mm Superseam trough style roofing which is the same as adjacent Lot 1 DP 541418 to the west. The dwelling consists of multiply gables with vertical shiplap chimney as a feature. Refer to Architectural Plans, Appendix II.

**at zone interfaces:**

- i. any setbacks, fencing, screening or landscaping required to address potential conflicts;**
- ii. the extent to which adverse effects on adjoining or surrounding sites are mitigated and internalised within the site as far as practicable;**

Stormwater is to be managed onsite and should not affect neighbouring properties. Setback from boundaries has been achieved. Existing ~2m hedge along the southern boundary, proposed ~2m hedge along the northern boundary will provide privacy to adjoining sites to the north and south.

**c. the capacity of the site to cater for on-site infrastructure associated with the proposed activity;**

The property has the capacity for onsite wastewater including an aeration treatment system, wastewater disposal field and 50% reserve. A detention tank, catchpits and drains will manage stormwater. Plantings along boundaries will provide privacy. The site is serviced by town water supply.

**d. the adequacy of roading infrastructure to service the proposed activity;**

The roading infrastructure is adequate to service the single dwelling.

**e. managing natural hazards;**

No natural hazards known. Northland Regional Council Hazard Maps do not show potential flooding or erosion prone land.

Rainfall intensity as a result of climate change is considered for stormwater calculations.

**f. any adverse effects on historic heritage and cultural values, natural features and landscapes or indigenous biodiversity;**

Identified within a Kerikeri Heritage Area 'Part B'. The exterior of the dwelling will be in accordance with the colour scheme outlined in Section HA-S2, Heritage Colours. Refer to Kerikeri Heritage Section below.

**g. any historical, spiritual, or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.**

The property is located within Kerikeri Heritage Area Overlay, Part B. The development is in keeping with housing in the near vicinity and wider Kerikeri area. The exterior colours will be within Heritage Colours listed.

## Rules

### **RRZ-R2 Impermeable Surface Coverage**

Application for Stormwater Management as a Discretionary activity is due to impermeable surfaces being a total of 28.1% (574m<sup>2</sup>) of the total lot area. The activity is Discretionary.

A Stormwater Mitigation Report written by Wilton Joubert Consulting Engineers attached as Appendix III outlines mitigation measures and includes a District Plan Assessment in Section 8, p. 8 and 9. With mitigation stormwater effects are considered to have less than minor impact on the receiving environment.

### **RRZ-S5 Building Structure or Coverage**

Application for Building Coverage as a Discretionary activity is due to building coverage being a total of 18.3% (373.8m<sup>2</sup>) of the total lot area.

***Where the standard is not met, matters of discretion are restricted to:***

- a. the character and amenity of the surrounding area;***
- b. any landscaping, planting and screening to mitigate any adverse effects;***
- c. the extent to which private open space can be provided for future uses;***
- d. the extent to which the sitting, setback and design mitigate visual dominance on adjacent sites and surrounding environment; and***
- e. natural hazard mitigation and site constraints.***

a-e above are addressed in Section 5 of this report. The assessment criteria of the current plan are similar to the above an exception being the inclusion of e. natural hazard mitigation and site constraints in the proposed plan. No natural hazards are identified. Increased rainfall intensity as a result of climate change is considered for stormwater calculations.

## **Kerikeri Heritage Area**

60 Landing Road, Kerikeri is located in Heritage Area Overlay Part B. A significant area of Kerikeri is within this overlay. Heritage Area Overlay Part B. Part B “covers the archaeologically sensitive slopes surrounding Kororipo Pā and the Church Missionary Settlement (CMS). The north and east ridge line also provide the sight lines from Kororipo Pā. There still remains a legacy of early horticultural subdivision pattern which supports the identity of Kerikeri, predominantly located along the Kerikeri Inlet Road ridgeline” extract taken from the Far North Proposed District Plan, Part 2/District-Wide Matters/Heritage Area Overlays.

Heritage Colours from section HA-S2 of the Heritage overlay will be used. Therefore, the activity is permitted.

### **HA-S2 Heritage Colours**

***The exterior facades of all buildings or structures are finished in accordance with the colour scheme from the following paint ranges or equivalent:***

***Resene heritage colours;***

***Resene whites and neutrals; and***

***Resene colour range BS5252 (A01-C40 range).***

The TRS Superseam roof of the dwelling will be coloursteel Ebony which is similar to Bokara Grey within the BS5252 (A01-C40 range). A black, heritage barn with vertical steel cladding is located on adjacent Lot 2 DP 544492 to the north. The Vertical timber shiplap cladding will be Burnt Cedar colour similar to Resene Charade. The series brick veneer will be a neutral colour within the BS5252 (A01-C40 range).

The colour range will be within heritage colours listed and the design in keeping with modern Kerikeri dwellings.

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### 3.3.3 Natural Hazards, Section 12.4, Operative Far North District Plan

**Issue:** 12.4.1.4 *The risk of fire causing loss of life, severe damage to property and loss of indigenous vegetation and habitats of indigenous fauna is increasing due to the practice of building homes within or close to flammable vegetation and/or in isolated areas remote from firefighting services.*

#### **Objectives**

**12.4.3.1** *To reduce the threat of natural hazards to life, property, and the environment, thereby to promote the wellbeing of the community.*

Lot 2 DP 541418 is located in a residential area. Mitigation measures are outlined in Section 5.3 to reduce the threat of fire to life, property and the environment.

**12.4.3.2** *To ensure that development does not induce natural hazards or exacerbate the effects of natural hazards.*

Mitigation measures such as the exterior cladding primarily in brick with a metal roof reduces the likelihood the development will induce or exacerbate fire risk.

**12.4.3.3** *To ensure that natural hazard protection works do not have adverse effects on the environment.*

Not applicable.

**12.4.3.4** *To ensure that the role in hazard mitigation played by natural features is recognised and protected.*

Not applicable. Kerikeri River acts as a natural hazard mitigation feature creating a physical fire barrier to reduce the risk of fire spread.

**12.4.3.5** *To improve public awareness of natural hazards as a means of helping people to avoid them.*

The owners will maintain the property to reduce risk of fire and fire spread for example clearing and removing dead plant material, clearing gutters, keeping lawns short and well maintained.

**12.4.3.6** *To take into account reasonably foreseeable changes in the nature and location of natural hazards.*

Community involvement such as property owners reducing fire risk with mitigation assists in managing overall effects of natural hazards.

**12.4.4.1** *That earthworks and the erection of structures not be undertaken in areas where there is a significant potential for natural hazards unless they can be carried out in such a way so as to avoid being adversely affected by the natural hazards, and can avoid exacerbating natural hazards.*

Not applicable. A Site-Specific Geotechnical Report was written for the site by Wilton Joubert, Consulting Engineers, June 2023.



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**12.4.4.2 That the natural character of features, such as beaches, sand dunes, mangrove areas, wetlands and vegetation, which have the capacity to protect land values and assets from natural coastal hazards, is protected and enhanced.**

Not applicable.

**12.4.4.3 That protection works for existing development be allowed only where they are the best practicable option compatible with sustainable management of the environment.**

Not applicable.

**12.4.4.4 That the sea level rise, as predicted by the Intergovernmental Panel of Climate Change or Royal Society of NZ, be taken into account when assessing development in areas potentially affected.**

Not applicable.

**12.4.4.5 That information on known natural hazards be made available in order that the public can make informed resource management decisions.**

Not applicable.

**12.4.4.6 That the adverse effects on people, property and the environment from coastal hazards in Coastal Hazard Areas, as identified by the Northland Regional Council, are avoided.**

Not applicable.

**12.4.4.7 That the risk to adjoining vegetation and properties arising from fires be avoided.**

The property is near vegetation but not surrounded by it. The landscape design required for visual amenity for building coverage considers fire risk. This includes reducing plantings where possible and low flammable plant species chosen whilst highly flammable species avoided. The exterior cladding of the building primarily brick with metal roofing and ongoing maintenance by the property owners will reduce flammability and the risk of fire spread. The close and accessible fire hydrant provides a preferred water supply for firefighters if required.

**12.4.4.8 That the location, intensity, design and type of new coastal subdivision, use and development be controlled so that the need for hazard protection works is avoided or minimised.**

Not applicable.

**12.4.4.9 That the role of riparian margins in the mitigation of the effects of natural hazards is recognised and that the continuing ability of riparian margins to perform this role be assured.**

Not applicable.

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### 3.3.4 Natural Hazards, Section NH-P9, Proposed Far North District Plan

#### Objectives

***NH-O1 The risks from natural hazards to people, infrastructure and property are managed, including taking into account the likely long-term effects of climate change, to ensure the health, safety, and resilience of communities.***

It is the intent of the owners to reduce the risk of fire and fire spread.

***NH-O2 Land use and subdivision does not increase the risk from natural hazards or risks are mitigated, and existing risks are reduced where there are practicable opportunities to do so.***

Risks are mitigated and reduced where possible.

***NH-O3 New infrastructure is located outside of identified natural hazard areas unless:***

- a. it has a functional or operational need to be located in that area;***
- b. it is designed to maintain its integrity and function, as far as practicable during a natural hazard event; and***
- c. adverse effects resulting from that location on other people, property and the environment are mitigated.***

Lot 2 DP 541418 is a new, bare residential section. The vegetated area is not located on the property. Mitigation measures are outlined in Section 5.3 including exterior of the dwelling in brick with a metal longrun roof. A fire hydrant is easily accessible.

***NH-O4 Natural defences, such as natural systems and features, and existing structural mitigation assets are protected to maintain their functionality and integrity and used in preference to new structural mitigation assets to manage natural hazard risk.***

Not applicable.

#### Policies

Policies NH-P1 to NH-P14 from the Natural Hazards section of the proposed Far North District Plan were reviewed. The relevant policy to this consent is listed below.

***NH-P9 Manage land use and subdivision that may be susceptible to wildfire risk by requiring:***

- a. setbacks from any contiguous scrub or shrubland, woodlot or forestry;***
- b. access for emergency vehicles; and***
- c. sufficient accessible water supply for firefighting purposes.***

The 2,042m<sup>2</sup> property limits the location of the dwelling so that it cannot be setback further from the vegetation located on neighbouring properties. Access for emergency vehicles is excellent. The fire hydrant is close (13.6m from the dwelling), easily accessible and a preferred firefighting water supply.

## 4.0 Proposed Far North District Plan Rules with Immediate Legal Effect

The proposal is also subject to the Proposed District Plan process. Within the Proposed District Plan, the site is zoned Rural Production with a Coastal Environment overlay. Assessment of the matters relating to the Proposed District Plan that have immediate legal effect, has been undertaken below:

Chapter	Rule Reference	Compliance of Proposal
<i>Hazardous Substances</i>	<i>The following rules have immediate legal effect: Rule HS-R2 has immediate legal effect but only for a new significant hazardous facility. HS -R5 relates to a hazardous facility within a scheduled site and area of significance to Maori. HS-R6 relates to a hazardous facility within an SNA. HS-R9 relates to a hazardous facility within a scheduled heritage resource.</i>	Not applicable.  The site does not contain any hazardous substances to which these rules would apply.
<i>Heritage Area Overlays</i>	<i>All rules have immediate legal effect (HAR1 to HA-R14) All standards have immediate legal effect (HA-S1 to HA-S3)</i>	The site is within Kerikeri Heritage Area Overlay, Part B. The exterior of the dwelling will be within the heritage colours listed in Section HA-S2 of the proposed Far North District Plan and is Permitted.
<i>Historic Heritage</i>	<i>All rules have immediate legal effect (HHR1 to HH-R10)  Schedule 2 has immediate legal effect</i>	Not applicable.  The site is not located within a Heritage Area Overlay.
<i>Notable Trees</i>	<i>All rules have immediate legal effect (NTR1 to NT-R9) All standards have legal effect (NT-S1 to NT-S2) Schedule 1 has immediate legal effect</i>	Not applicable.  The site does not contain any notable trees.
<i>Sites and Areas of Significance to Māori</i>	<i>All rules have immediate legal effect (SASM-R1 to SASM-R7)  Schedule 3 has immediate legal effect</i>	The site is located within Kerikeri Heritage Area Overlay, Part B an area with significance to Māori. The development meets permitted standards as it will be within the colour range required.
<i>Ecosystems and Indigenous Biodiversity</i>	<i>All rules have immediate legal effect (IB-R1 to IB-R5)</i>	Not applicable. The proposal does not include any indigenous vegetation pruning trimming, clearance, or associated land disturbance. No plantation forestry activities are proposed. Therefore, the proposal is not in breach of rules IB-R1 to IB-R5.
<i>Subdivision</i>	<i>The following rules have immediate legal effect:  SUB-R6, SUB-R13, SUB-R14, SUB-R15, SUB-R17</i>	Not applicable.  The proposal is not a subdivision
<i>Activities on the Surface of Water</i>	<i>All rules have immediate legal effect (ASWR1 to ASW-R4)</i>	Not applicable.  The proposal does not involve activities on the surface of water.
<i>Earthworks</i>	<i>The following rules have immediate legal effect: EW-R12, EW-R13  The following standards have immediate legal effect: EW-S3, EW-S5</i>	Earthworks addressed in Section 5.2
<i>Signs</i>	<i>The following rules have immediate legal effect: SIGN-R9, SIGN-R10  All standards have immediate legal effect but only for signs on or attached to a scheduled heritage resource or heritage area</i>	Not applicable.  No signs are proposed as part of this application.
<i>Orongo Bay Zone</i>	<i>Rule OBZ-R14 has partial immediate legal effect because RD-1(5) relates to water</i>	Not applicable. The site is not located in the Orongo Bay Zone.

The assessment above indicates that the proposal is determined to be a Permitted Activity in regard to the Proposed District Plan. Therefore, no further assessment of these rules will be undertaken.

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## 5.0 Assessment of Environmental Effects

### 5.1 Building Coverage – *Far North District Plan Assessment Criteria Section 8.7.5.3.4*

***In considering whether or not to grant consent or impose conditions, the Council shall also have regard to the following assessment matters:***

In assessing an application under this provision, the Council will restrict the exercise of its discretion to:

**(a) *The ability to provide adequate landscaping for all activities associated with the site;***

Policy 8.7.4.10 states “*That provision be made to ensure a reasonable level of privacy for inhabitants of buildings on adjoining sites*”. An existing Bottle Brush hedge runs along the southern boundary within easement Y. The hedge is to be kept at a minimum height of 2m as per Consent Notice (ii) attached as Appendix 1. The hedge is thick providing full screening from ground level. Refer to Photograph 2 showing the existing hedge.

A *Fiscus tuffi* hedge at a height of ~2m is proposed along the northern boundary. *Fiscus tuffi* is a common evergreen, fast growing hedge plant with emerald, green leaves which once established will provide full screening at ground level. The existing and proposed hedge provide at least a reasonable level of privacy and screening from buildings on adjoining sites to the north and south.

The owner’s son owns neighbouring, adjacent Lot 1 DP 541418 to the west. Limited planting is proposed along the boundary between the properties so that the families can come and go between the dwellings.

Plantings including flowering Cherry or Bay trees and tussock grasses are proposed in front of the house and box hedge along the driveway. Refer to the Landscape Plan, Sheet A01D, Appendix II.

**(b) *The extent to which building(s) are consistent with the character and scale of the existing buildings in the surrounding environment;***

The proposed single dwelling is consistent with the character and scale of existing buildings in the surrounding environment. For example, it is of a similar design and scale to the existing house on adjacent Lot 1 DP 541418 to the west. The black heritage barn to the north (Lot 2 DP 544492) is not consistent with the character of existing buildings in the surrounding area.

**(c) *The scale and bulk of the building in relation to the site;***

The scale and bulk of the proposed dwelling on the 2,042m<sup>2</sup> property is typical of modern development in Kerikeri. The property will have available area for required infrastructure such as onsite wastewater and outdoor recreational activities. The Site Plan, A01A and B show the scale of the building in relation to the site.

**(d) *The extent to which private open space can be provided for future uses;***

Lawn will surround the dwelling providing open space for residential use.

**(e) *The extent to which the cumulative visual effects of all the buildings impact on landscapes, adjacent sites and the surrounding environment;***

A single dwelling only is proposed.

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

The proposed dwelling is located roughly centrally onsite. The section is 2,042m<sup>2</sup> therefore the location of the dwelling is determined by the size of the lot. The dwelling meets setback requirements from boundaries and complies with building height and sunlight rules. The aesthetically pleasing, modern design is in keeping with the local area.

**(g) The extent to which landscaping and other visual mitigation measures may reduce adverse effects;**

Refer to (a) above. The dwelling is architecturally designed likely to increase property values in the neighbourhood.

Proposed and existing hedging reduce visibility of the development from the north and south. Proposed plantings will assist in blending the development with the environment.

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

Non-compliance is not expected to affect the privacy, outlook, and enjoyment of private open spaces on adjacent sites. The property is located in a residential area.

## **5.2 Stormwater Management – Far North District Plan Assessment Criteria Section 8.7.5.2.2**

The assessment criteria for stormwater management are addressed in Section 8, p. 8 and 9 of the Stormwater Mitigation Report by Wilton Joubert, 20<sup>th</sup> June 2023 attached as Appendix III.

Stormwater will be managed so that flow rates are that of predeveloped. The low impact design principles utilised will mitigate runoff from impermeable areas exceeding permitted threshold to that of predevelopment levels. Mitigation includes the use of a detention tank for roof attenuation. The proposed driveway will shed run off to a v channel swale drain along the proposed driveway. The swale will direct run off to the existing roadside drain along Landing Road. The remaining hard stand areas will direct run off to catch pits. The catchpits are required to drain directly to the available stormwater connection via sealed pipes.

## **5.3 Fire Risk to Residential Unit – Far North District Plan Assessment Criteria Section 12.4.7**

Application for Fire Risk to Residential Unit as a Discretionary Activity due to the proposed dwelling being less than 20m from vegetation located on neighbouring Lot 1 and 2 DP 453506 to the southwest and southeast.

In assessing an application under this provision, the Council will restrict the exercise of its discretion to:

**(j) In respect of fire risk to residential units:**

**(i) The degree of fire risk to dwellings arising from the proximity of the woodlot or forest and vice versa:**

A vegetated area including native bush defined as 'Kerikeri River Reserve' is located to the north of Kerikeri river. Some residential properties to the north off the reserve include vegetation likely to have originated from the reserve. Further north where Lot 2 DP 541418 is located properties become residential with home gardens. It is a relatively common occurrence for a building to be located within 20m of a naturally occurring or deliberately planted area of scrub or shrubland, woodlot or forest.

Lot 2 DP 541418 is currently a bare, grassed residential section with no vegetation. Residential housing with minimal gardens are located to the west and north whilst Landing Road runs along the eastern boundary. The property is not surrounded by vegetation reducing risk.

Section (ii) below discusses mitigation measures proposed to reduce fire risk. This includes low fire risk exterior cladding primarily brick with a metal roof. Minimal planting onsite with fire resistant or low risk plants (some planting is needed for visual amenity purposes). Smoke alarm detectors meeting regulations. A fire hydrant close by and easily accessible.

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**(ii) Any mitigation measures proposed to reduce the fire risk:**

The following materials will be used for cladding and roofing:

- The dwelling is primarily clad in brick veneer which is fire resistant with a small amount of timber cladding.
- Metal Longrun roofing also fire resistant.
- Hardie board Fascia (fibre cement)
- HardieFlex soffit lining:  
“HardieFlex Sheet clad walls using direct fix or cavity construction method can achieve fire ratings up to 60/60/60 when the walls are constructed in accordance with this literature and include the fire rated system requirements as specified in James Hardie ‘Fire and Acoustic’ Design Manual. Refer to ‘Fire and Acoustic’ Design Manual for further information about fire rated systems”  
(James Hardie HardieFlex Sheet Technical Specification)
- All eaves will be enclosed, and vents screened.

Refer to the Architectural Plans for further information specifically sheet A03 and 4. Note that the dwelling is primarily clad in fire resistant brick with a metal longrun roof.

The existing Bottle Brush hedge provides privacy between the properties and cannot be removed as per Consent Notice (ii). Plantings are proposed for visual amenity purposes however they are kept to a minimum to reduce the risk of fire spread.

Fire Emergency New Zealand website <https://www.checkitalright.nz/reduce-your-risk/low-flammability-plants> provides information on the flammability of plants.

A low flammability plant isn't fireproof but are less flammable. They generally have moist, supple leaves, low levels of sap or resin and watery sap without much smell. They have little dead material. Examples provided include *Coprosma robusta* a broad leaf shrub or small tree and *Griselinia littoralis* commonly used as a hedge. The plants chosen for landscaping include *Buxus sempervirens*, *Fiscus tuffi* and *Magnolia sp.* These species can be considered low flammability plants.

High flammability plants tend to contain volatile waxes or oils, contain twigs, needles, leaves or other dead material and may have loose bark, aromatic leaves and strong-smelling sap. Examples include eucalyptus, pine, lavender, manuka. Highly flammable plants have been avoided. Bay Laurel, *Laurus nobilis* was considered by the owners for landscaping but removed from the plan due to potential flammability.

Smoke detectors to current regulations are shown on sheet A02a. A fire extinguisher will be located at all times within the dwelling.

A fire hydrant 13.6m from the dwelling near Kerikeri road provides an easily accessible water supply for fire fighting purposes if required. Refer to Sheet A01b showing the location of the fire hydrant.

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## Recommendations from Fire Emergency NZ

The following recommendations taken from Firefighting NZ reduce the risk of fire from the dwelling to the vegetation and vice versa.

*In order to mitigate the risk of fire spread from surrounding vegetation to the proposed building and vice-versa, Fire Emergency New Zealand recommends the following;*

*I. Fire safe construction*

*Spouting and gutters – Clear regularly and consider screening with metal mesh. Embers can easily ignite dry material that collects in gutters.*

*Roof – Use fire resistant material such as steel or tile. Avoid butanol and rubber compounds.*

*Cladding – Stucco, metal sidings, brick, concrete, and fibre cement cladding are more fire resistant than wood or vinyl cladding.*

The spouting and gutters will be regularly cleared and screened with metal mesh. Corrugate metal roofing and brick cladding is proposed.

*II. Establish Safety Zones around your home.*

*Safety Zone 1 is your most important line of defence and requires the most consideration. Safety Zone 1 extends to 10 metres from your home, you should;*

*a) Mow lawn and plant low-growing fire-resistant plants; and*

*b) Thin and prune trees and shrubs; and*

*c) Avoid tall trees close to the house; and*

*d) Use gravel or decorative crushed rock instead of bark or wood chip mulch; and*

*e) Remove flammable debris like twigs, pine needles and dead leaves from the roof and around and under the house and decks; and*

*f) Remove dead plant material along the fence lines and keep the grass short; and*

*g) Remove over hanging branches near powerlines in both Zone 1 and 2.*

Trees and shrubs will be thinned and pruned, flammable debris and dead plant material is to be removed, grass will be well maintained and mown.

*III. Safety Zone 2 extends from 10 – 30 metres of your home.*

*a) Remove scrub and dead or dying plants and trees; and*

*b) Thin excess trees; and*

*c) Evenly space remaining trees so the crowns are separated by 3-6 metres; and*

*d) Avoid planting clusters of highly flammable trees and shrubs*

*e) Prune tree branches to a height of 2 metres from the ground.*

Any dead or dying plants are to be removed. Flammable plants are not proposed.

IV. *Choose Fire Resistant Plants*

*Fire resistant plants aren't fireproof, but they do not readily ignite. Most deciduous trees and shrubs are fire resistant. Some of these include: poplar, maple, ash, birch and willow. Install domestic sprinklers on the exterior of the sides of the building that are less 20 metres from the vegetation. Examples of highly flammable plants are: pine, cypress, cedar, fir, larch, redwood, spruce, kanuka, manuka.*

Low flammable plants are proposed. Highly flammable plants will not be planted.

**(iii) *The adequacy of the water supply:***

The fire hydrant near Landing Road is a preferred water supply for firefighters.

**(iv) *The accessibility of the water supply to fire service vehicles:***

Site Plan, A01b shows the location of the fire hydrant near Landing Road, 13.6m from the dwelling. The New Zealand Fire Service Code requires the available water supply to be at least 6m from the building for fire fighter safety with a maximum distance of 90 metres from any building. The location has excellent accessibility for fire service vehicles. There is at least 4 metres clearance overhead free from obstructions, the driveway access is a minimum of 4m wide, the gradient is less than 16% and the surface is designed to support a 20-tonne truck.

## **6.0 Notification Assessment, Section 95, RMA 1991**

### **6.1 Section 95A-G, RMA 1991**

Section 95A-G, Public Notification and Limited Notification of Applications, of the Resource Management Act (1991) were reviewed against the breach discussed.

#### **95A Public Notification of Consent Applications**

- (1) *A consent authority must follow the steps set out in this section, in the order given, to determine whether to publicly notify an application for a resource consent.*

#### **Step 1: Mandatory public notification in certain circumstances**

- (2) *Determine whether the application meets any of the criteria set out in subsection (3) and,—*  
(a) *if the answer is yes, publicly notify the application; and*  
(b) *if the answer is no, go to step 2.*

- (3) *The criteria for step 1 are as follows:*

- (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 applicant has not requested public notification nor is it required under section 95C. The application is not made jointly with an application to exchange recreation reserve land. Step 1 does not apply.

#### **Step 2: If not required by step 1, public notification precluded in certain circumstances**

- (4) *Determine whether the application meets either of the criteria set out in subsection (5) and,—*  
(a) *if the answer is yes, go to step 4 (step 3 does not apply); and*  
(b) *if the answer is no, go to step 3.*

- (5) *The criteria for step 2 are as follows:*

- (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 public notification;*  
(b) *the application is for a resource consent for 1 or more of the following, but no other, activities:*



- (i) a controlled activity;
- (ii) [Repealed]
- (iii) a restricted discretionary, discretionary, or non-complying activity, but only if the activity is a boundary activity.
- (iv) [Repealed]

(6) [Repealed]

Step 2 does not apply to the activity.

**Step 3: If not precluded by Step 2, public notification required in certain circumstances**

- (7) Determine whether the application meets either of the criteria set out in subsection (8) and,
  - (a) if the answer is yes, publicly notify the application; and
  - (b) if the answer is no, go to step 4.
- (8) The criteria for step 3 are as follows:
  - (a) the application is for a resource consent for 1 or more activities, and any of those activities is subject to a rule or national environmental standard 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.

The application does not require public notification. The activity will have a less than minor effect on the environment.

**Step 4; Public notification in special circumstances**

- (9) Determine whether special circumstances exist in relation to the application that warrant the application being publicly notified and,
  - (a) if the answer is yes, publicly notify the application; and
  - (b) if the answer is no, do not publicly notify the application, but determine whether to give limited notification of the application under section 95B.

No special circumstances exist in this application which justify public notification.  
From the assessment above it is considered that the application does not require public notification.

**95B Limited notification of consent applications**

- (1) A consent authority must follow the steps set out in this section, in the order given, to determine whether to give limited notification of an application for a resource consent, if the application is not publicly notified under section 95A.

**Step 1: certain affected groups and affected persons must be notified**

- (2) Determine whether there are 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).

There are no protected customary rights groups or affected customary marine title groups.

- (3) Determine—
  - (a) whether the proposed activity is on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement made in accordance with an Act specified in Schedule 11; and
  - (b) whether the person to whom the statutory acknowledgement is made is an affected person under section 95E.

Not applicable to this application.

- (4) Notify the application to each affected group identified under subsection (2) and each affected person identified under subsection (3).

**Step 2: if not required by step 1, limited notification precluded in certain circumstances**

- (5) Determine whether the application meets either of the criteria set out in subsection (6) and,—
  - (a) if the answer is yes, go to step 4 (step 3 does not apply); and
  - (b) if the answer is no, go to step 3.

No, go to step 3.

- (6) The criteria for step 2 are as follows:
  - (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 controlled activity (but no other activities) that requires a resource consent under a district plan (other than a subdivision of land).*

**Step 3: if not precluded by step 2, certain other affected persons must be notified**

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

*(8) In the case of any other activity, determine whether a person is an affected person in accordance with section 95E.*

*(9) Notify each affected person identified under subsections (7) and (8) of the application.*

The activity is not a boundary activity. Section 6.2 provides information determining that neighbours and the public are unlikely to be affected by the activity.

**Step 4: further notification in special circumstances**

*(10) Determine whether special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined to be eligible for limited notification under this section (excluding persons assessed under section 95E as not being affected persons), and,-*

*(a) if the answer is yes, notify those persons; and*

*(b) if the answer is no, do not notify anyone else.*

No special circumstances exist in relation to the application that warrant notification of other persons.

95C-E – Are not applicable as the activity has been assessed as being less than minor effect to neighbouring properties.

95F and G are not applicable as there are no affected customary rights groups involved or is it a customary marine title group.

It is considered that the application does not require public notification.

## **6.2 Neighboring Properties**

The design of the building as shown on Architectural Plans, Sheet A03 and A04 is modern and aesthetically pleasing assisting in increasing the value of houses in the neighbourhood. The development is located in a residential area where new development has occurred. The design is in keeping with new housing in the local and wider Kerikeri area.

Proposed and existing hedging along the northern and southern boundaries will provide screening for adjacent Lot 2 DP 544492 to the north and Lot 2 DP 453506 to the south. As the owners of Lot 1 DP 541418 are family plantings are not proposed to provide access between the dwellings. Reduced planting where possible assists in lowering the risk of flammability and fire spread. Fire risk was considered with the landscape design.

The landscape design, exterior of the building primarily in brick with metal roofing reduces flammability and fire spread. The hydrant provides an excellent water supply for fire fighters reducing the risk to neighbouring properties.

Once implemented and maintained stormwater mitigation outlined in the report by Wilton Joubert will ensure neighbouring properties are not affected by stormwater runoff from Lot 2.

---

## 7.0 Resource Management Act Section 104 Assessment

### 7.1 Section 104 Assessment

*(1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2 and section 77M, have regard to:*

*(a) any actual and potential effects on the environment of allowing the activity; and*

Section 104(1)(a) requires assessment of any actual and potential effects on the environment as a result of the proposed activity. Section 4, 5 and 6.2 discusses actual and potential effects. The conclusion reached is that the adverse effects of granting consent to the proposal are less than minor, and therefore acceptable in the receiving environment.

*(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;*

Section 104(1)(ab) requires that the consent authority consider 'any measure proposed or agreed to by the applicant for the purposes 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'. It is considered the proposal is not of a scale or nature that would require specific offsetting or environmental compensation measures to ensure positive effects on the environment. Mitigation measures are proposed and have been discussed.

*(b) any relevant provisions of:*

*(i) a national environmental standard:*

*(ii) other regulations:*

*(iii) a national policy statement:*

*(iv) a New Zealand coastal policy statement:*

*(v) a regional policy statement or proposed regional policy statement:*

*(vi) a plan or proposed plan; and*

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

The Regional Plan has been reviewed and there are no documents that are relevant to the proposal.

Any earthworks will proceed under the guidance of an ADP and will be in accordance with the Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region 2016, in accordance with Rules EW-12, EW-R13, EW-S3 and EW-S5.

### 8.2 Part 2 of the Resource Management Act

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

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

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

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

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

The application will have less than minor effect on the items in Part 2 of the Resource Management Act.

---

## 8.0 Schedule 4

### Information required in assessment of environmental effects.

(1) An assessment of the activity's effects on the environment must include the following information:

(a) if it is likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity:

Refer to Section 4, 5 and 6.2 which discuss the activity, potential effects, and mitigation methods. The activity will not result in any significant adverse effects on the environment.

(b) an assessment of the actual or potential effect on the environment of the activity:

Section 4, 5 and 6.2 discuss potential effects. The potential effects with mitigation are expected to be less than minor.

(c) if the activity includes the use of hazardous installations, an assessment of any risks to the environment that are likely to arise from such use:

There are no hazardous installations proposed.

(d) if the activity includes the discharge of any contaminant, a description of—

(i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and

(ii) any possible alternative methods of discharge, including discharge into any other receiving environment:

No contaminants are proposed.

(e) a description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect:

Mitigation measures are discussed in this report. Refer to Section 5 for mitigation measures and recommendations.

(f) identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted:

Refer to Section 6.1, Notification Assessment, Section 95, RMA 1991 and Section 6.2 Neighbouring Properties. Consultation and response not applicable.

(g) if the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved:

No monitoring is required for this activity.

(h) if the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group).

The activity will not have a more than minor effect on protected customary rights groups.

(2) A requirement to include information in the assessment of environmental effects is subject to the provisions of any policy statement or plan.

Refer to Section 4 and 5 for the assessment against the operative and proposed Far North District Plan and the Far North District Plan Assessment Criterion.

(3) To avoid doubt, subclause (1)(f) obliges an applicant to report as to the persons identified as being affected by the proposal, but does not—

(a) oblige the applicant to consult any person; or

(b) create any ground for expecting that the applicant will consult any person.

Refer to Section 6.0 Notification Assessment, Section 95, RMA 1991.

---

## Matters that must be addressed by assessment of environmental effects.

*(1) An assessment of the activity's effects on the environment must address the following matters:*

- (a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects:*
  - (b) any physical effect on the locality, including any landscape and visual effects:*
  - (c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity:*
  - (d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations:*
  - (e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants:*
  - (f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or hazardous installations.*
- (2) The requirement to address a matter in the assessment of environmental effects is subject to the provisions of any policy statement or plan.*

Refer to Section 4.0 - 7.0 which address the items required as per Schedule 4, Section 7.

## 9.0 Conclusion

At the completion of the project a single dwelling with a building coverage of 373.8m<sup>2</sup> will be located on the 2,042m<sup>2</sup> property. The development will be modern, stylish, well maintained and visually appealing. Although building coverage exceeds permitted there are numerous dwellings located in the area of a similar size. The development is in keeping with that of the local area and compatible with existing and proposed zoning. There is available area on the property for required infrastructure such as onsite wastewater, water tanks, and stormwater management along with lawn and garden areas for recreational residential use. The existing and proposed plantings on and along the northern and southern boundaries provide a reasonable level of privacy and screening of the development from properties to the north and south. The exterior of the dwelling will be in line with Heritage Colours. Potential visual effects of building coverage are considered to be less than minor.

Stormwater will be managed so that flow rates are that of predeveloped. The low impact design principles utilised will mitigate runoff from impermeable areas exceeding permitted threshold to that of predevelopment levels. Mitigation includes the use of a detention tank for roof attenuation. The proposed driveway will shed run off to a v channel swale drain along the proposed driveway. The swale will direct run off to the existing roadside drain along Landing Road. The remaining hard stand areas will direct run off to catch pits. The catchpits are required to drain directly to the available stormwater connection via sealed pipes. With mitigation implemented and maintained stormwater effects are expected to be less than minor on the receiving environment.

The property is near vegetation but not surrounded by it. The landscape design, exterior cladding of the building and ongoing maintenance by the property owners will reduce flammability and the risk of fire spread. The close and accessible fire hydrant provides a preferred water supply for firefighters if required.



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



  
R.W. Muir  
Registrar-General  
of Land

**Identifier** 909919  
**Land Registration District** North Auckland  
**Date Issued** 13 February 2024

**Prior References**  
NA101A/395

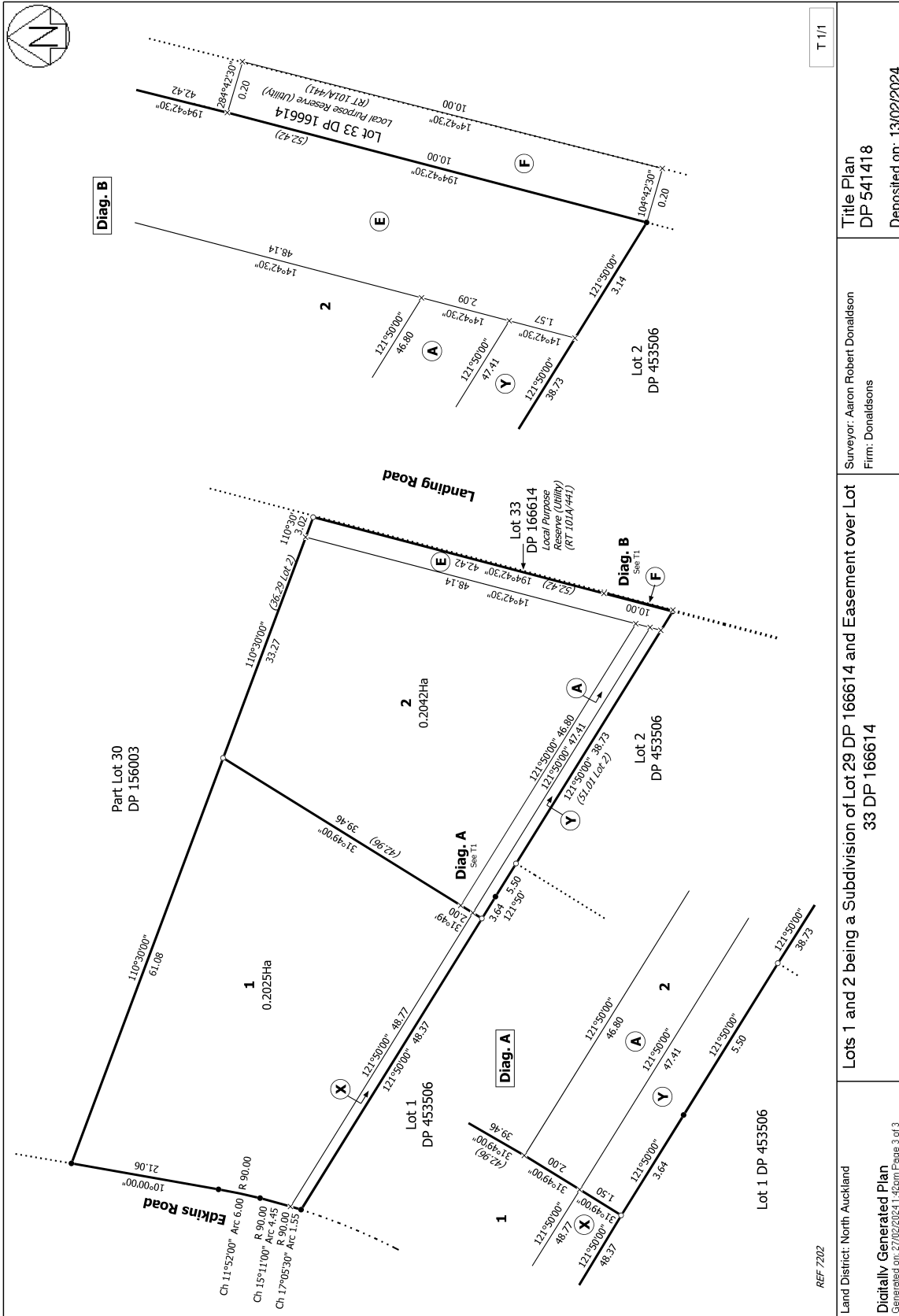
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**Estate** Fee Simple  
**Area** 2042 square metres more or less  
**Legal Description** Lot 2 Deposited Plan 541418  
**Registered Owners**  
Matthew Robert Wycherley and Charlotte Anne Wycherley

---

**Interests**

Appurtenant hereto are water rights created by Transfer 752251.3 - 5.9.1979 at 1:35 pm  
Appurtenant hereto is a water right created by Transfer 594061.66 - 16.1.1980 at 1:44 pm  
The easements created by Transfer 594061.6 are subject to Section 309 (1) (a) Local Government Act 1974  
Subject to a water drainage right (in gross) over part marked E on DP 541418 in favour of The Far North District Council created by Transfer C903356.5 - 4.10.1995 at 9.09 am  
The easements created by Transfer C903356.5 are subject to Section 243 (a) Resource Management Act 1991  
Fencing Covenant in Transfer D516017.2 - 19.6.2000 at 3.21 pm  
Land Covenant in Transfer 6696321.1 - 19.12.2005 at 9:00 am  
11972318.2 Mortgage to ASB Bank Limited - 22.1.2021 at 9:28 am  
Subject to a right to drain water over part marked A on DP 541418 created by Easement Instrument 12918181.2 - 13.2.2024 at 8:36 am  
The easements created by Easement Instrument 12918181.2 are subject to Section 243 (a) Resource Management Act 1991  
Appurtenant hereto is a right of way, right to convey electricity, telecommunications and water created by Easement Instrument 12918181.3 - 13.2.2024 at 8:36 am  
The easements created by Easement Instrument 12918181.3 are subject to Section 243 (a) Resource Management Act 1991  
12918181.4 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 13.2.2024 at 8:36 am



# Proposed Dwelling

Libby Wycherley  
Landing Road  
Kerikeri  
Lot 2 DP 541418

Construction Drawings

Date: 2 August 2024

Job Number: 4075

Drawn by:



T 09 407 5208 | martinatobrienconsulting.co.nz

## Engineer Sheet Index

Sheet No.	Sheet Title	Rev
S0.1	Cover Page	-
S0.2	Typical Steel Detailing	-
S0.3	Typical Pipe Penetration Details	-
S1.1	Raft Floor Plan	-
S2.1	Raft Floor Details	-
S2.2	Raft Floor Details	-
S2.3	Raft Floor Details	-
A08	Framing & Lintel Mark Up	-
A07	Roof Plan mark Up	-
ED1	Roof Details Mark Up	-
SD0	Connections	-
SD1	Connections Detail	-
SD2	Connections Detail	-
SD3	Connections Detail	-
SD4	Connections Detail	-
SD5	Connections Detail	-
A01b	Site Plan Mark Up	-
W1	Retaining Wall	-
Revisions		
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A01c	Wastewater Disposal Field Details	S
A02a	Floor Plan without Dimensions	S
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A03	Elevations A & B	S
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A05	Drainage Plan	S
A06	Foundation Plan	S
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A19	Portal Frame 2 Section	S
A20	Portal Frame 3 Section	S
A21	Portal Frame 4 Section	S
A22	Foundation Edge Details	S
A23	Threshold Details	S
A24	Hold Down Details	S
A25	Cladding Details	S
A26	Cladding Details	S
A27a	Window Flashing Detail	S
A27b	Window Flashing Detail	S
A27c	Joinery Details	S
A27d	Joinery Details	S
A27e	Joinery Details	S
A27f	Joinery Details	S
A28	Roof Details	S
A29	Roof Details	S
A30	Chimney Details	S
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A32	Step-Out Details	S
A33	Membrane Details	S
A34	Drainage Details	S
A36	Seismic Restraint Details	S
Revisions		
-	-	-



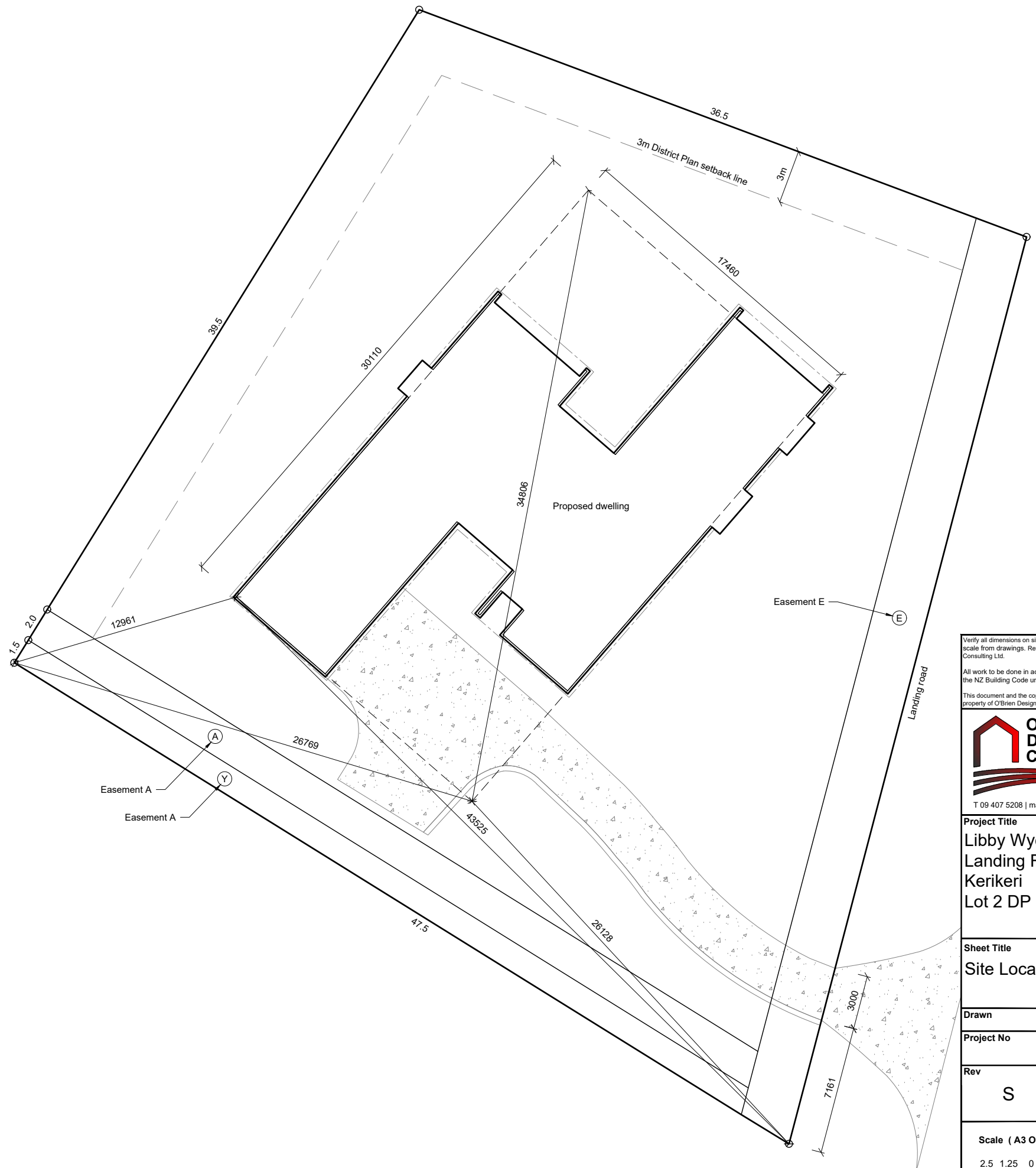
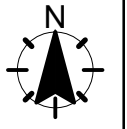


**Far North District Council**  
Te Kaitiaki o Te Tai Tokerau ki te Rauki

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Projection NZTM2000, Datum NZGD2000, Scale: 1:1,500

Created: 14/04/2023



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**Project Title**  
Libby Wycherley  
Landing Road  
Kerikeri  
Lot 2 DP 541418

**Sheet Title**  
Site Location Plan

**Drawn** 2 August 2024

**Project No** 4075

Rev	Sheet
S	A01a

**Scale (A3 Original) 1: 250**  
2.5 1.25 0 2.5 5 m



Lot 2 DP 541418  
 Lot area: 2,042m<sup>2</sup>  
 Corrosion zone: C  
 Wind zone: High

Rural Living Zone

District plan compliance:

Residential intensity: Complies

Sunlight rule: Complies

**Stormwater Management**

(Impermeable surfaces):  
 Proposed concrete driveway: 157.1m<sup>2</sup>  
 Proposed concrete path: 18.6m<sup>2</sup>  
 Proposed concrete patio: 32.4m<sup>2</sup>  
 Proposed dwelling: 365.9m<sup>2</sup>  
 Total proposed: 574.0m<sup>2</sup>

Total permitted = 12.5% of gross site area = 255.25m<sup>2</sup>  
 Total proposed = 574.0m<sup>2</sup> = 28.1%  
**Does not Comply, RC Required**

Setbacks to boundaries: 3m min. Complies

Building height:  
 Permitted: 9m max  
 Proposed: 6.1m approx. Complies

**Building Coverage:**

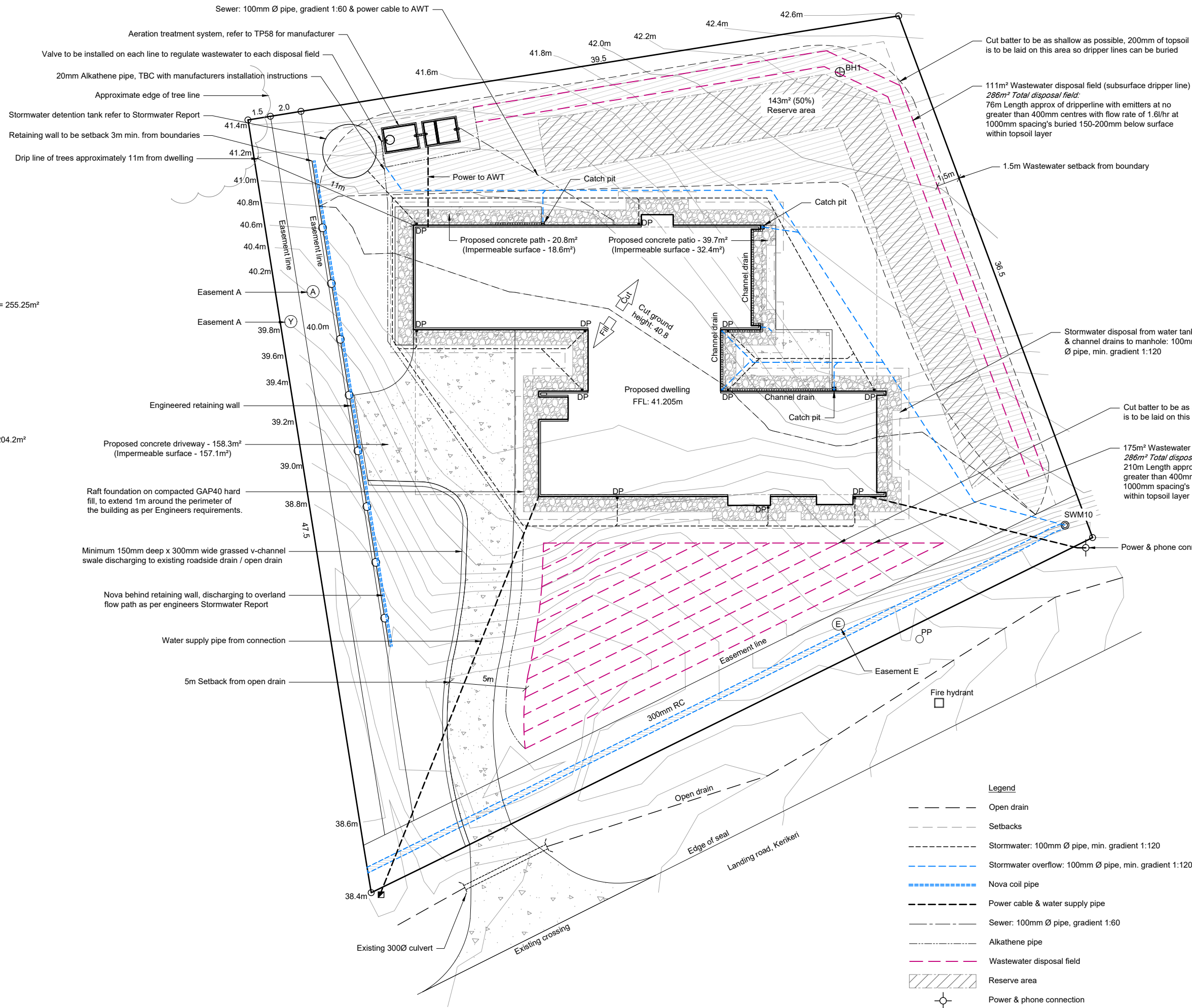
Proposed dwelling: 373.8m<sup>2</sup>

Total permitted = 10% of gross site area = 204.2m<sup>2</sup>  
 Total Proposed = 373.8 = 18.3%  
**Does not Comply, RC Required**

**Earthworks**

Driveway cut: 16m<sup>3</sup>  
 Main cut: 130m<sup>3</sup>  
 Total cut: 146m<sup>3</sup>  
 Fill: 146m<sup>3</sup>  
 Cut/Fill: 292m<sup>3</sup>

Total permitted = 300m<sup>3</sup>



- NOTES**
- All heights shown are existing ground heights.
  - All drainage to comply with AS/NZS3500 & NZBC G13/AS1. All drainage is diagrammatical, drainlayer to determine on site drainage layout and provide asbuilt plan when complete.
  - Length of dripper lines to be no more than 100m between feed points.
  - Dripper lines to follow contour lines
  - Dripper lines to be setback:
    - 1.5m from buildings
    - 1.5m from property boundaries
  - 5m from any intermittent storm water flow path such as a drain or overland flow path down slope of the field
  - The works which are being proposed will comply with Earthworks EW-S3 Accidental Discovery Protocol and Earthworks EW-S5 Erosion and Sediment Control - Auckland Council Guideline Document GD005 GD05 Erosion and Sediment Control.pdf (aucklanddesignmanual.co.nz)

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**Project Title**  
 Libby Wycherley  
 Landing Road  
 Kerikeri  
 Lot 2 DP 541418

**Sheet Title**  
 Site Plan

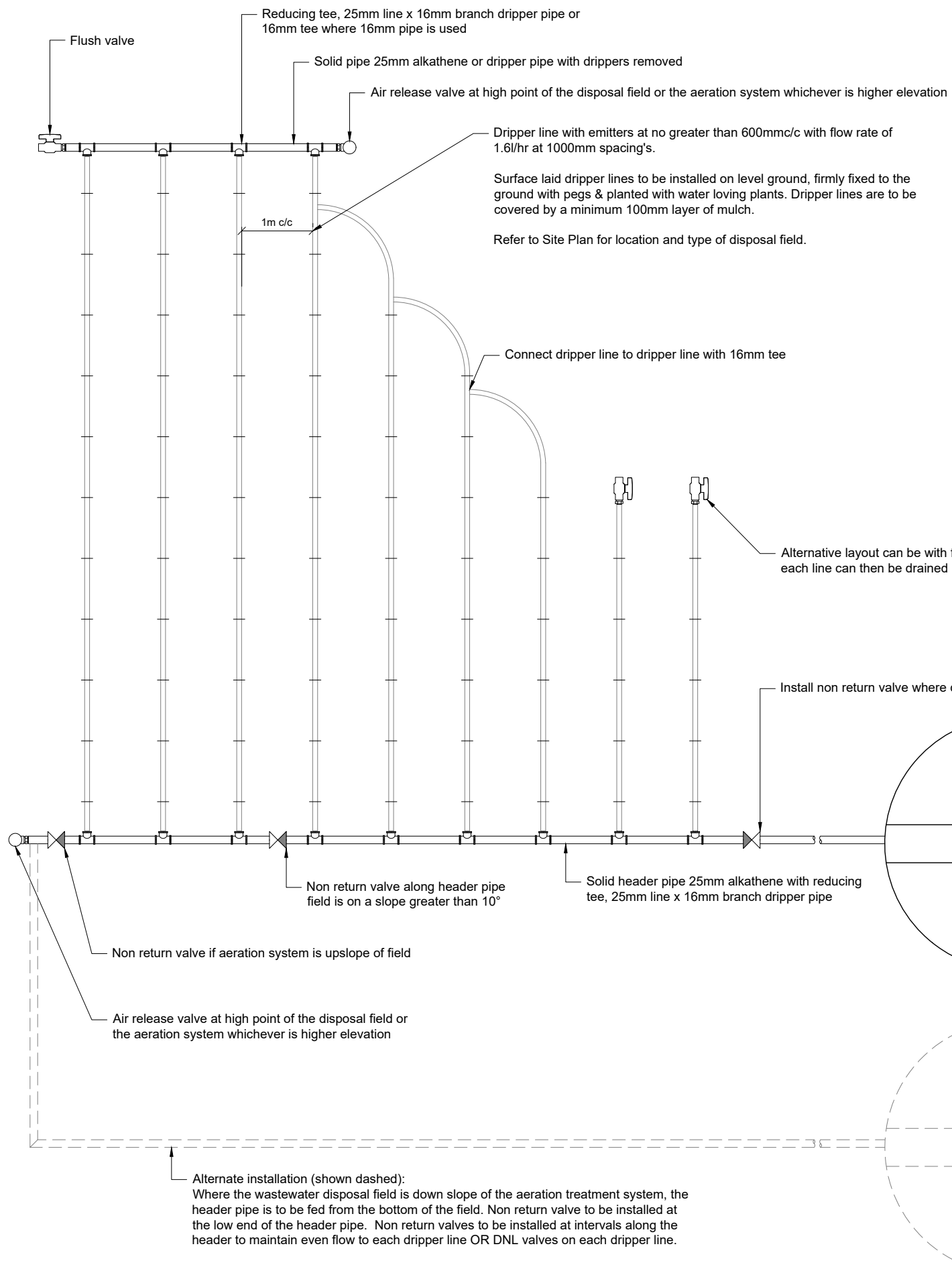
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**Project No** 4075

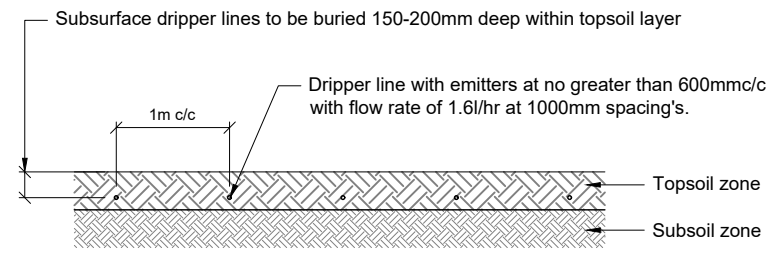
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S	A01b

**Scale (A3 Original) 1: 250**  
 2.5 1.25 0 2.5 5 m

- Legend**
- Open drain
  - Setbacks
  - Stormwater: 100mm Ø pipe, min. gradient 1:120
  - Stormwater overflow: 100mm Ø pipe, min. gradient 1:120
  - Nova coil pipe
  - Power cable & water supply pipe
  - Sewer: 100mm Ø pipe, gradient 1:60
  - Alkathene pipe
  - Wastewater disposal field
  - Reserve area
  - Power & phone connection
  - ⊙ Manhole
  - Water connection



**W01 Typical Wastewater Disposal Field Plan**  
SCALE = 1:20



**W02 Typical Subsurface Drinker Line Detail**  
SCALE = 1:20

**NOTES**

1. All drainage is diagrammatical, do not scale from drawing.
2. Length of dripper lines to be no more than 100m between feed points.
3. Drinker lines to follow contour lines.
4. Drinker lines to be laid on even ground, laying dripper lines on gully's or humps in the ground can cause ponding.
5. Air release valve to be at the high point in the disposal field or at the system if that is a higher elevation, locations shown on detail are indicative.
6. The works which are being proposed will comply with Earthworks EW-S3 Accidental Discovery Protocol and Earthworks EW-S5 Erosion and Sediment Control - Auckland Council Guideline Document GD005 GD05 Erosion and Sediment Control.pdf (aucklanddesignmanual.co.nz)

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**Project Title**  
Libby Wycherley  
Landing Road  
Kerikeri  
Lot 2 DP 541418

**Sheet Title**  
Wastewater Disposal  
Field Details

**Drawn** 2 August 2024

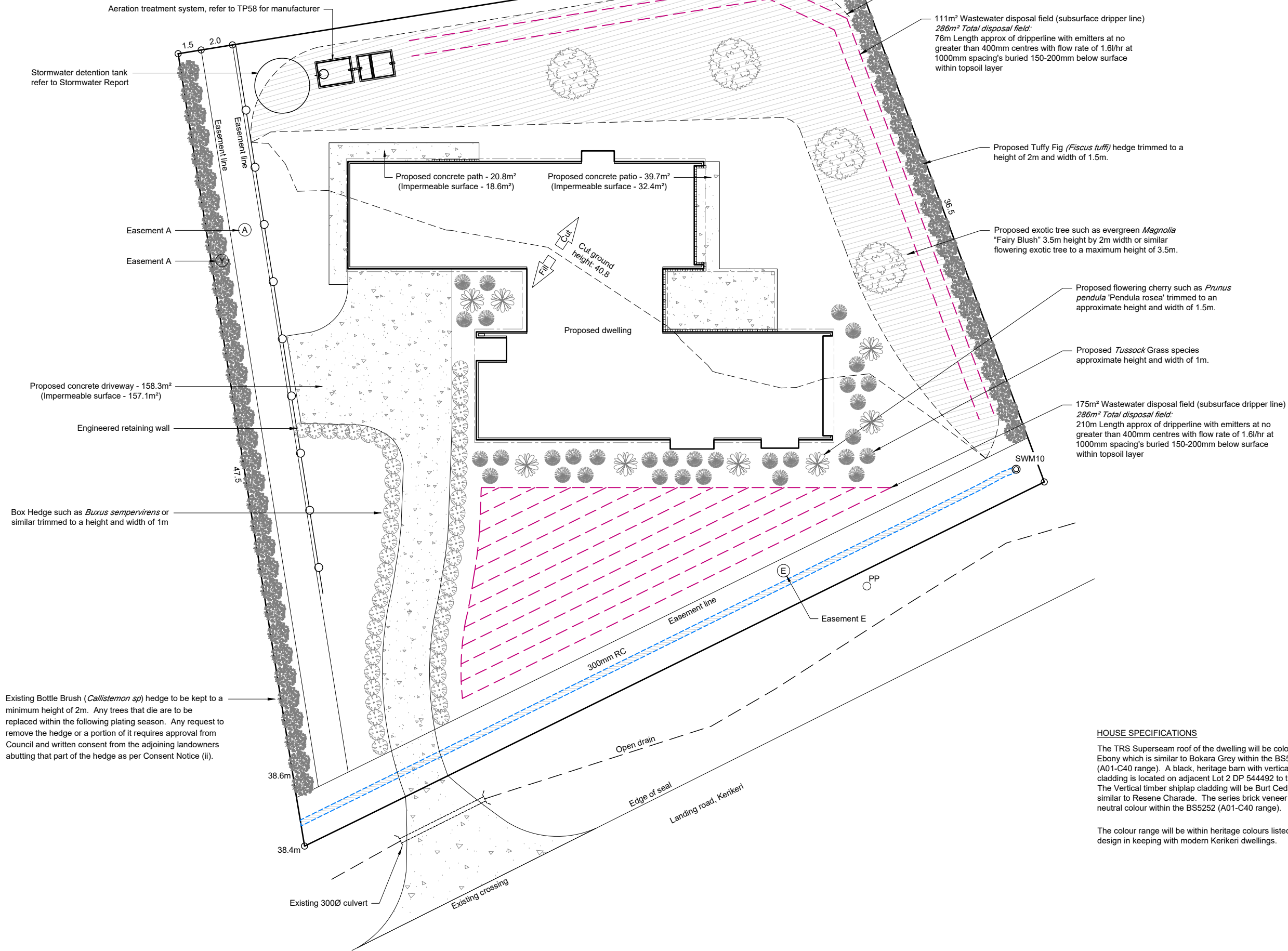
**Project No** 4075

Rev	Sheet
S	A01c

**Scale (A3 Original) 1: 20**  
0.2 0.1 0 0.2 0.4 m



Boundary to remain open as family own adjacent Lot 1 DP 541418.  
The owners of Lot 1 and 2 DP 541418 wish to keep the boundary open so that family members can come and go between the 2 houses.



**Planting Method:**

1. Spray areas to be planted with weed killer 3 weeks prior to planting.
2. If possible plan planting for autumn (most favorable), winter and spring. Avoid planting during hot summer months.
3. Excavate a hole 250mm deep x 250mm wide.
4. Remove plastic pb3 bag from the plant and place the plants roots in the hole.
5. Use the soil from hole excavation to refill around the root ball of the plant making sure that the original potting mix of the plant is level to the surrounding ground.
6. Water the plant well.
7. In order to suppress weed growth and for moisture retention, it is recommended a layer of approximately 700mm of mulch is placed around each plant.

**Maintenance Schedule:**

1. Remove weed species from around the plants regularly.
2. A small handful of all-purpose garden fertilizer may be sprinkled around each plant annually to encourage growth and plant health.
3. Re apply mulch when needed.
4. Water over the summer months in the first year. However, once plants are established they will cope well with dry conditions.
5. Plants requiring removal due to damage, disease or other cause shall be replaced with a similar specimen before the end of the next following planting season (1st May to 30th September).

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All work to be done in accordance with NZS 3604:2011 and the NZ Building Code unless specifically designed.

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**Project Title**  
Libby Wycherley  
Landing Road  
Kerikeri  
Lot 2 DP 541418

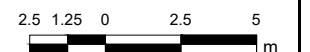
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Landscape Design

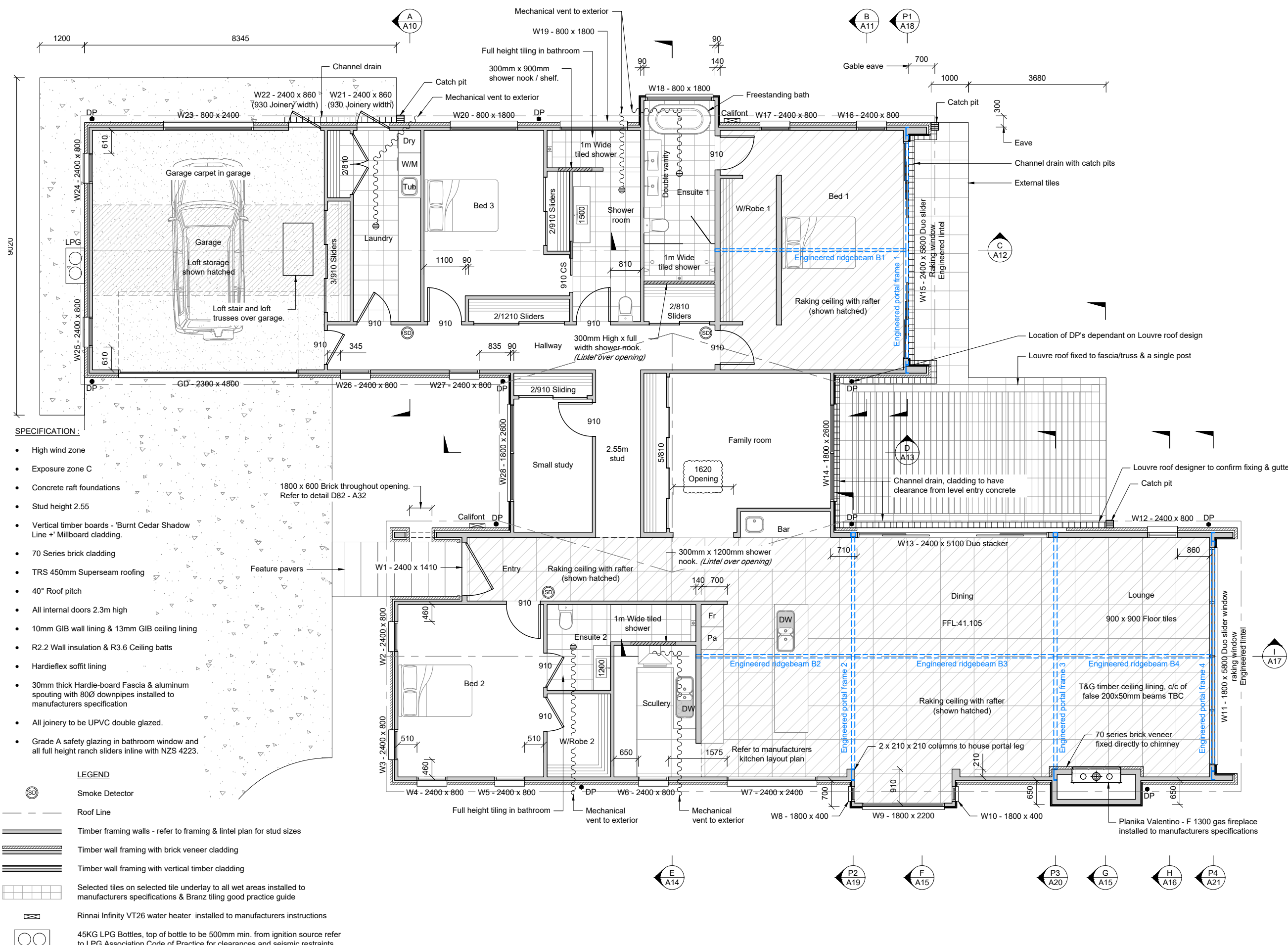
**Drawn** 2 August 2024

**Project No** 4075

**Rev** S **Sheet** A01d

**Scale (A3 Original) 1: 250**





- SPECIFICATION :**
- High wind zone
  - Exposure zone C
  - Concrete raft foundations
  - Stud height 2.55
  - Vertical timber boards - 'Burnt Cedar Shadow Line + Millboard cladding.
  - 70 Series brick cladding
  - TRS 450mm Superseam roofing
  - 40° Roof pitch
  - All internal doors 2.3m high
  - 10mm GIB wall lining & 13mm GIB ceiling lining
  - R2.2 Wall insulation & R3.6 Ceiling batts
  - Hardiflex soffit lining
  - 30mm thick Hardie-board Fascia & aluminum spouting with 80Ø downpipes installed to manufacturers specification
  - All joinery to be UPVC double glazed.
  - Grade A safety glazing in bathroom window and all full height ranch sliders inline with NZS 4223.

- LEGEND**
- ⊙ Smoke Detector
  - Roof Line
  - ▬ Timber framing walls - refer to framing & lintel plan for stud sizes
  - ▬ Timber wall framing with brick veneer cladding
  - ▬ Timber wall framing with vertical timber cladding
  - Selected tiles on selected tile underlay to all wet areas installed to manufacturers specifications & Branz tiling good practice guide
  - ☑ Rinnai Infinity VT26 water heater installed to manufacturers instructions
  - ⊙ 45KG LPG Bottles, top of bottle to be 500mm min. from ignition source refer to LPG Association Code of Practice for clearances and seismic restraints.

- NOTE:**
1. All dimensions taken from the outside of pre-cut, please check all dimensions before construction commences.
  2. Refer to Framing & Lintel Plan for lintel dimensions, stud spacing & external door offsets.
  2. Refer to Section for stud, lintel and soffit framing heights.
  3. Additional nogs to be installed at framing stage to allow for fixed shelves, wall mounted extractors, heat pump, A/C units & garage door components where required.
  4. Refer to attached sheet for cladding & roofing notes & details.
  5. All wall framing typically H1.2 treated unless specifically stated.
  6. All external linings to be installed to manufacturers instructions, refer to separate detail sheet for cladding details & notes.

**BUILDING AREA:**

Floor Area (Framing): 328.8m<sup>2</sup>  
 Floor Area (Brickline): 338.7m<sup>2</sup>  
 Roof Area: 365.9m<sup>2</sup>

**FIXINGS:**

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

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**Project Title**  
 Libby Wycherley  
 Landing Road  
 Kerikeri  
 Lot 2 DP 541418

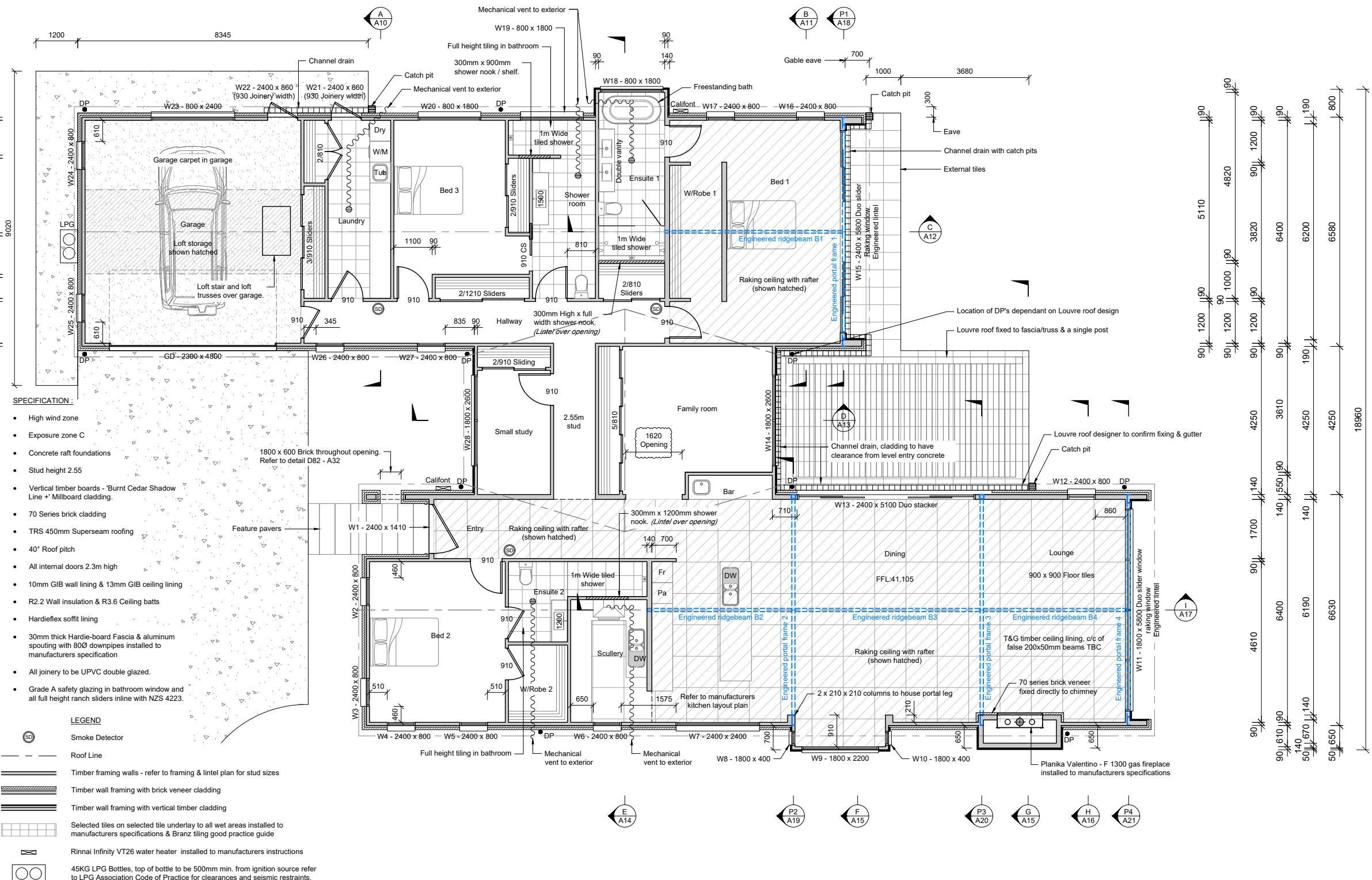
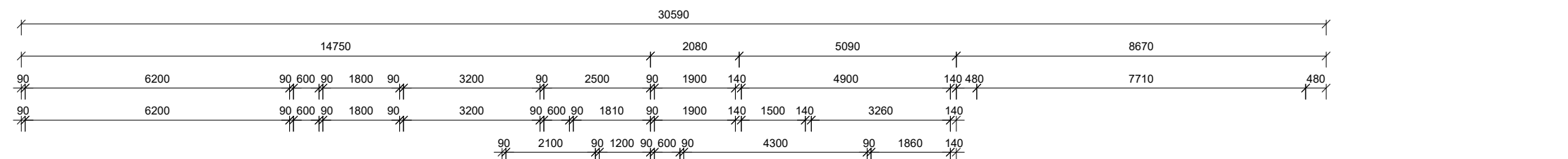
**Sheet Title**  
 Floor Plan without  
 Dimensions

**Drawn** 2 August 2024

**Project No** 4075

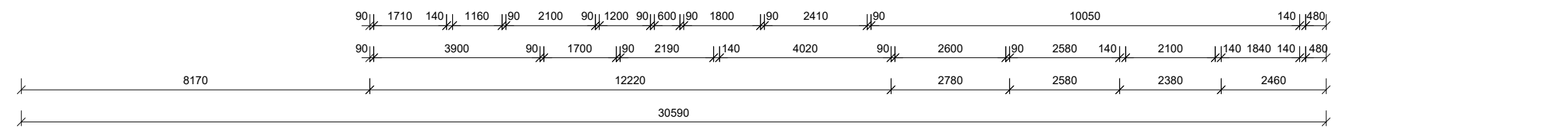
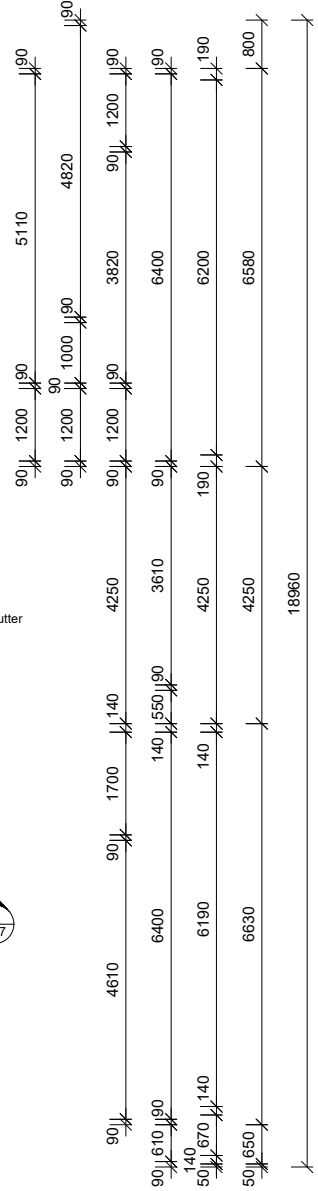
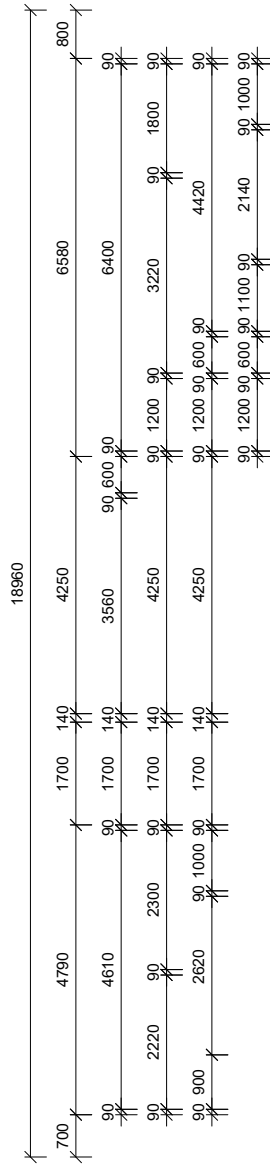
**Rev** s **Sheet** A02a

**Scale (A3 Original) 1: 100**



- SPECIFICATION :**
- High wind zone
  - Exposure zone C
  - Concrete raft foundations
  - Stud height 2.55
  - Vertical timber boards - 'Burnt Cedar Shadow Line + Millboard cladding.
  - 70 Series brick cladding
  - TRS 450mm Superseam roofing
  - 40° Roof pitch
  - All internal doors 2.3m high
  - 10mm GIB wall lining & 13mm GIB ceiling lining
  - R2.2 Wall insulation & R3.6 Ceiling batts
  - Hardieflex soffit lining
  - 30mm thick Hardie-board Fascia & aluminum spouting with 80Z downpipes installed to manufacturers specification
  - All joinery to be UPVC double glazed.
  - Grade A safety glazing in bathroom window and all full height ranch sliders inline with NZS 4223.

- LEGEND**
- ☉ Smoke Detector
  - Roof Line
  - Timber framing walls - refer to framing & lintel plan for stud sizes
  - Timber wall framing with brick veneer cladding
  - Timber wall framing with vertical timber cladding
  - Selected tiles on selected tile underlay to all wet areas installed to manufacturers specifications & Branz tiling good practice guide
  - Rinnai Infinity VT26 water heater installed to manufacturers instructions
  - 45KG LPG Bottles, top of bottle to be 500mm min. from ignition source refer to LPG Association Code of Practice for clearances and seismic restraints.



- NOTE:**
1. All dimensions taken from the outside of pre-cut, please check all dimensions before construction commences.
  2. Refer to Framing & Lintel Plan for lintel dimensions, stud spacing & external door offsets.
  2. Refer to Section for stud, lintel and soffit framing heights.
  3. Additional nogs to be installed at framing stage to allow for fixed shelves, wall mounted extractors, heat pump, A/C units & garage door components where required.
  4. Refer to attached sheet for cladding & roofing notes & details.
  5. All wall framing typically H1.2 treated unless specifically stated.
  6. All external linings to be installed to manufacturers instructions, refer to separate detail sheet for cladding details & notes.

**BUILDING AREA:**

Floor Area (Framing): 328.8m<sup>2</sup>  
 Floor Area (Brickline): 338.7m<sup>2</sup>  
 Roof Area: 365.9m<sup>2</sup>

**FIXINGS:**

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

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**Project Title**

Libby Wycherley  
 Landing Road  
 Kerikeri  
 Lot 2 DP 541418

**Sheet Title**

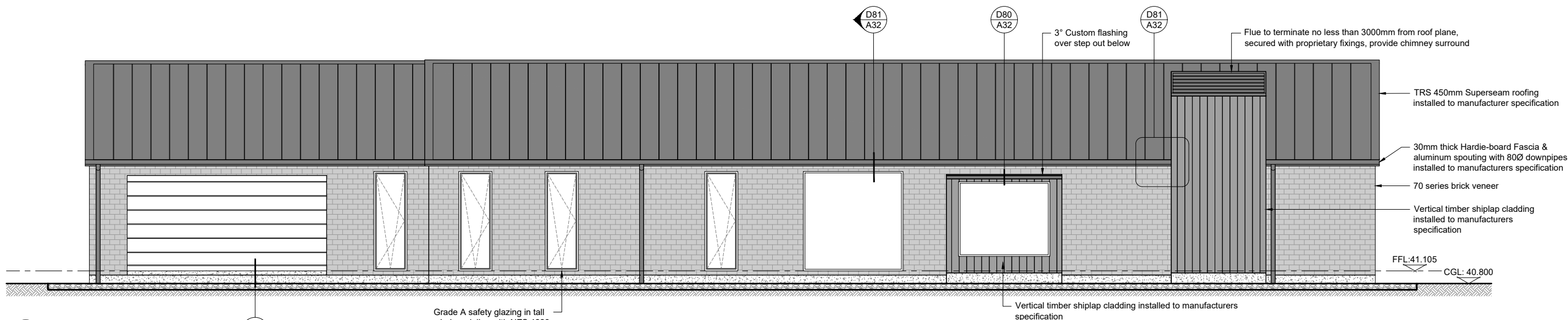
Floor Plan with  
 Dimensions

Drawn 2 August 2024

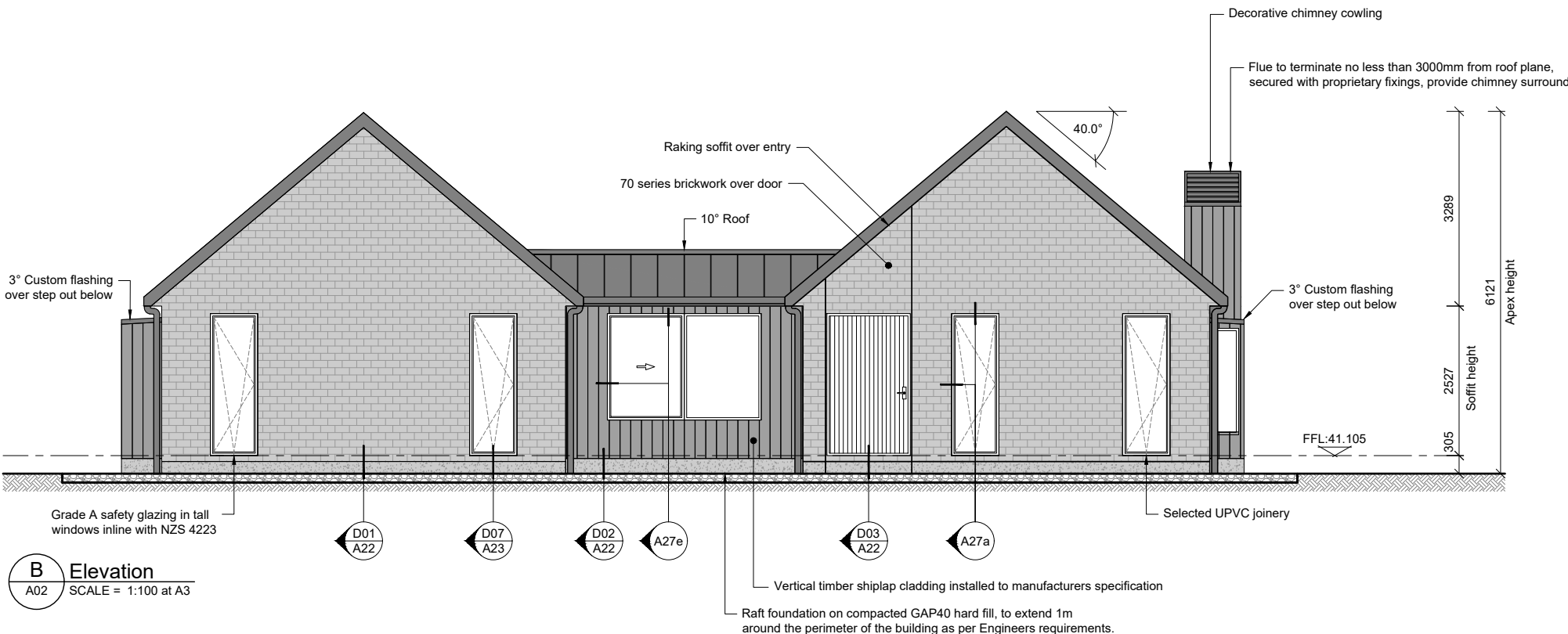
Project No 4075

Rev S Sheet A02b

Scale (A3 Original) 1: 125



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



**B Elevation**  
A02 SCALE = 1:100 at A3

**FIXINGS:**  
Exposure Zone: C  
Durability of fixings to comply with NZS 3604:2011 Section 4 & NZBC B2/AS1

**H1 SPECIFICATION:**  
- Foundation: Raft R1.3  
- Walls: Pink batts R2.2  
- PVC Joinery R0.74  
- Ceiling: Pink batts R3.6

**H1 NOTE:**  
H1 calculations included in BC information.

- NOTES:**
- All heights shown are existing ground heights.
  - All external linings to be installed to manufacturers instructions, refer to separate detail sheet for cladding details & notes.
  - All windows and doors double glazed.
  - Grade A safety glazing in bathrooms & tall windows and sliders inline with NZS 4223.

SPECIFICATIONS	
Cladding Type	70 Series brick & vertical shiplap
Stud Height	2550 (2610mm)
Roofing Type	TRS Superstream
Roof Pitch	40° & 10°
Joinery	uPVC
Wind Zone	High
Earth Quake Zone	1

RISK MATRIX					
Risk Factor	L	M	H	VH	Score
A. Wind Zone	0	0	1	2	1
B. Number of Storeys	0	1	2	4	0
C. Roof / Wall Intersection	0	1	3	5	5
D. Eave Width	0	1	2	5	5
E. Envelope Complexity	0	1	3	6	1
F. Deck Design	0	2	4	6	0
Total					12

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**Project Title**  
Libby Wycherley  
Landing Road  
Kerikeri  
Lot 2 DP 541418

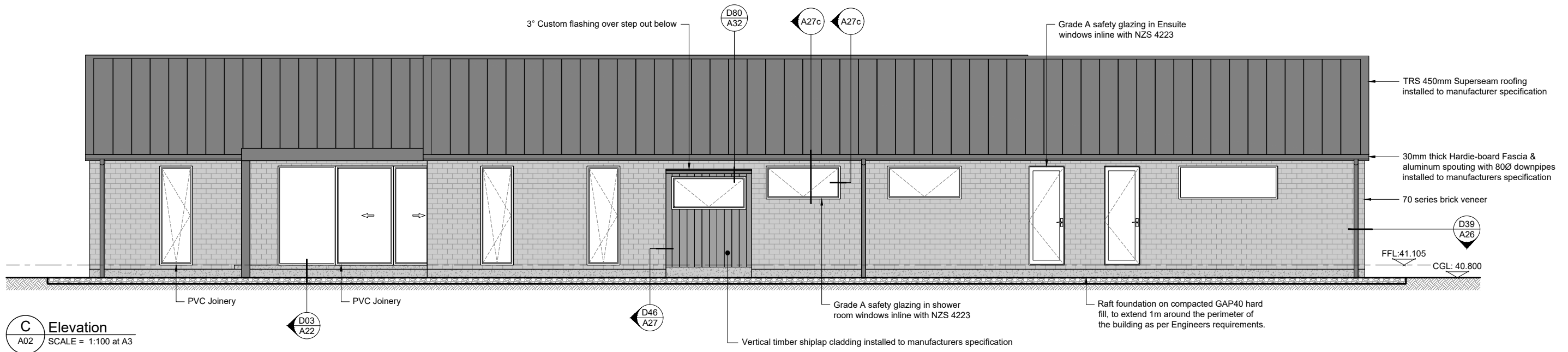
**Sheet Title**  
Elevations A & B

**Drawn** 2 August 2024

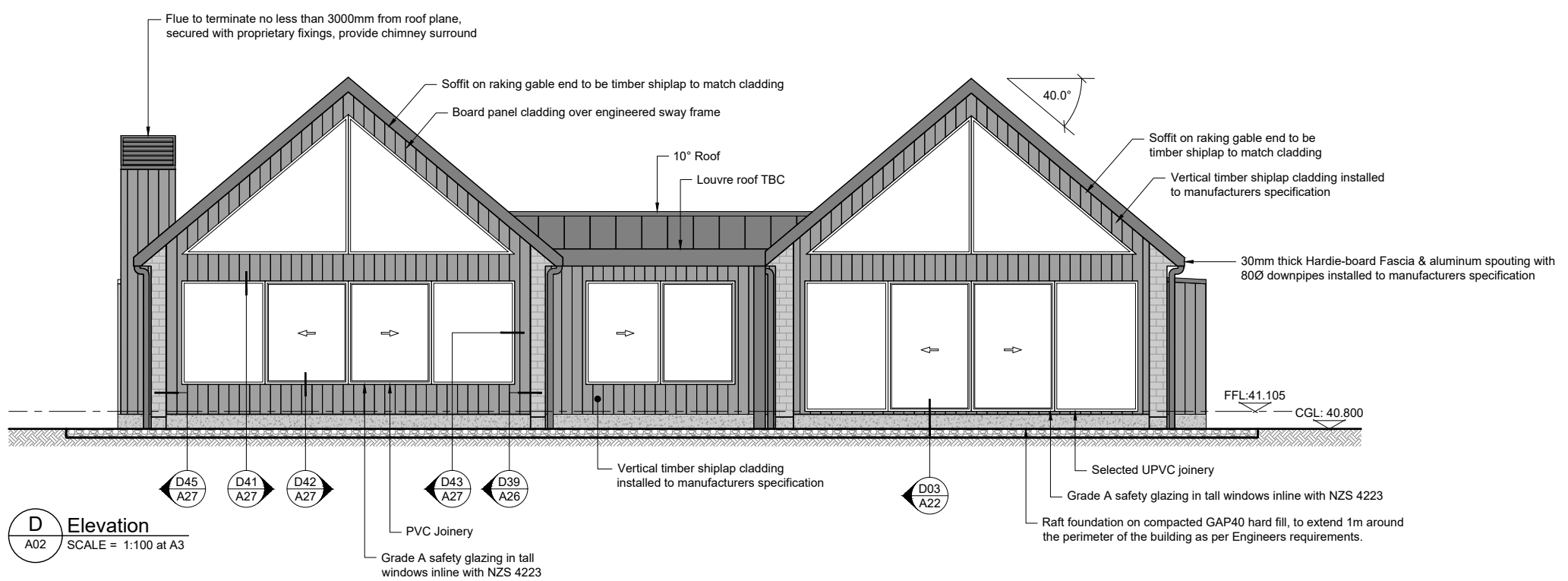
**Project No** 4075

**Rev** S **Sheet** A03

**Scale (A3 Original) 1: 100**  
1 0.5 0 1 2 m



**C Elevation**  
A02 SCALE = 1:100 at A3



**D Elevation**  
A02 SCALE = 1:100 at A3

**H1 SPECIFICATION:**

- Foundation: Raft *R1.3*
- Walls: Pink batts *R2.2*
- PVC Joinery *R0.74*
- Ceiling: Pink batts *R3.6*

**H1 NOTE:**

H1 calculations included in BC information.

**NOTES:**

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

SPECIFICATIONS	
Cladding Type	70 Series brick & vertical shiplap
Stud Height	2550 (2610mm)
Roofing Type	TRS Superstream
Roof Pitch	40° & 10°
Joinery	uPVC
Wind Zone	High
Earth Quake Zone	1

RISK MATRIX					
Risk Factor	L	M	H	VH	Score
A. Wind Zone	0	0	1	2	1
B. Number of Storeys	0	1	2	4	0
C. Roof / Wall Intersection	0	1	3	5	5
D. Eave Width	0	1	2	5	5
E. Envelope Complexity	0	1	3	6	1
F. Deck Design	0	2	4	6	0
Total					12

**FIXINGS:**

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

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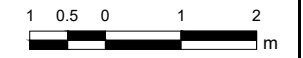
**Sheet Title**  
Elevations C & D

**Drawn** 2 August 2024

**Project No** 4075

**Rev** S **Sheet** A04

**Scale (A3 Original)** 1: 100





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

SITE Lot 2 DP 541418, 60 Landing Road, Kerikeri

PROJECT Proposed Residential Dwelling

CLIENT Matthew Wycherley




REFERENCE NO. 127280

DOCUMENT Stormwater Mitigation Report

STATUS/REVISION No. A

DATE OF ISSUE 20<sup>th</sup> June 2023

Attention	Email
Matthew Wycherley	matthew@starke.co.nz

<b>Authored by</b>	<b>G. Brant</b> (BE(Hons) Civil)	Civil Design Engineer	Gustavo@wjl.co.nz	
<b>Reviewed by</b>	<b>P. McSweeney</b> (BE(Hons) Civil)	Civil Design Engineer	Patrick@wjl.co.nz	
<b>Approved by</b>	<b>B. Steenkamp</b> (CPEng, BEng Civil, CMEngNZ, BSc (Geology))	Senior Civil Engineer	BenS@wjl.co.nz	

## 1. EXECUTIVE SUMMARY

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

Legal Description:	Lot 2 DP 541418	
Site Area:	2,042 m <sup>2</sup>	
Development Proposals Supplied:	Preliminary Concept Plans Provided	
Development Type:	Proposed Residential Dwelling	
District Plan Zone:	Rural Living	
Permitted Activity Coverage:	<u>12.5%</u> or <u>3,000m<sup>2</sup></u>	
	<b>Post-development Impermeable Areas</b>	
Impermeable Coverage:	Total Proposed Roof Area	365.9 m <sup>2</sup>
	Total Uncovered Hardstand Area	208.1 m <sup>2</sup>
	Post-Development Total = 574 m <sup>2</sup> or 28.1% of the site area	
Activity Status:	<b><u>Discretionary Activity</u></b>	
	Attenuation is to be provided in accordance with the consent conditions outlined in Section 5 via a flow attenuated outlet in a detention tank.	
Roof Attenuation:	<b>Recommended Tank</b> – 1 x 15,000L Promax Xpress Rainwater Tank <b>Dimensions</b> - 3000mmØ (or greater) x 2500mm high (or greater) <b>10% AEP Control Orifice</b> – 24mmØ orifice; located <u>100mm above the base of the tank</u> <b>Overflow</b> – 100mmØ; located <u>at the top of the tank</u>	
Driveway Mitigation:	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 southern side of the proposed driveway. The proposed swale is to direct runoff to the existing roadside drain along Landing Road.  It is recommended to shape the remaining hardstand areas to direct runoff to catchpits. The catchpits are required to drain directly to the available stormwater connection via sealed pipes.	
Discharge Point:	To available stormwater connection.	
Further Review of Development Proposals Required:	Not anticipated unless development proposals/impermeable areas are revised.	

## 2. SCOPE OF WORK

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

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

- Plan Set by O'Brien Design Consulting including site plan, floor plan and elevations (Ref No: 4075, dated: 06.06.2023)
- Onsite Wastewater Feasibility Report by Vision Consulting (Ref No: J13956, dated: 02.04.2019)

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

## 3. SITE DESCRIPTION

The subject property is legally described as Lot 2 DP 541418 and is located off the western side of Landing Road, Kerikeri. Access to the lot is to be directly off Landing Road, approximately 100m southwest of the Landing Road – Waipapa Road roundabout.

The subject site has had cut earthworks as part of forming a level building site and fill earthworks located to the east and south boundary to extend this platform. The ground surface at the site is near level to gently sloping from the northwest of the lot to the southeast (up to approximately 4°) with a short moderate slope (up to 8°) 15m south from the northern boundary and becomes near level to gently sloping again. Very steep short slopes (up to 33°) are located along the edge of the eastern and southern boundary.

The Far North District Council GIS maps indicates that the property is serviced by public stormwater and potable water reticulation.



Figure 1: Aerial Snip from FNDC Maps Showing Site Boundaries (red), Public Stormwater Line (green) and Public Potable Water Line (blue)

**4. DEVELOPMENT PROPOSALS**

The development proposal obtained from the client is to construct a residential dwelling, a concrete driveway, a concrete path, and concrete patio on-site as depicted in the plan set by O'Brien Design Consulting (Ref No: 4075, dated: 06.06.2023).

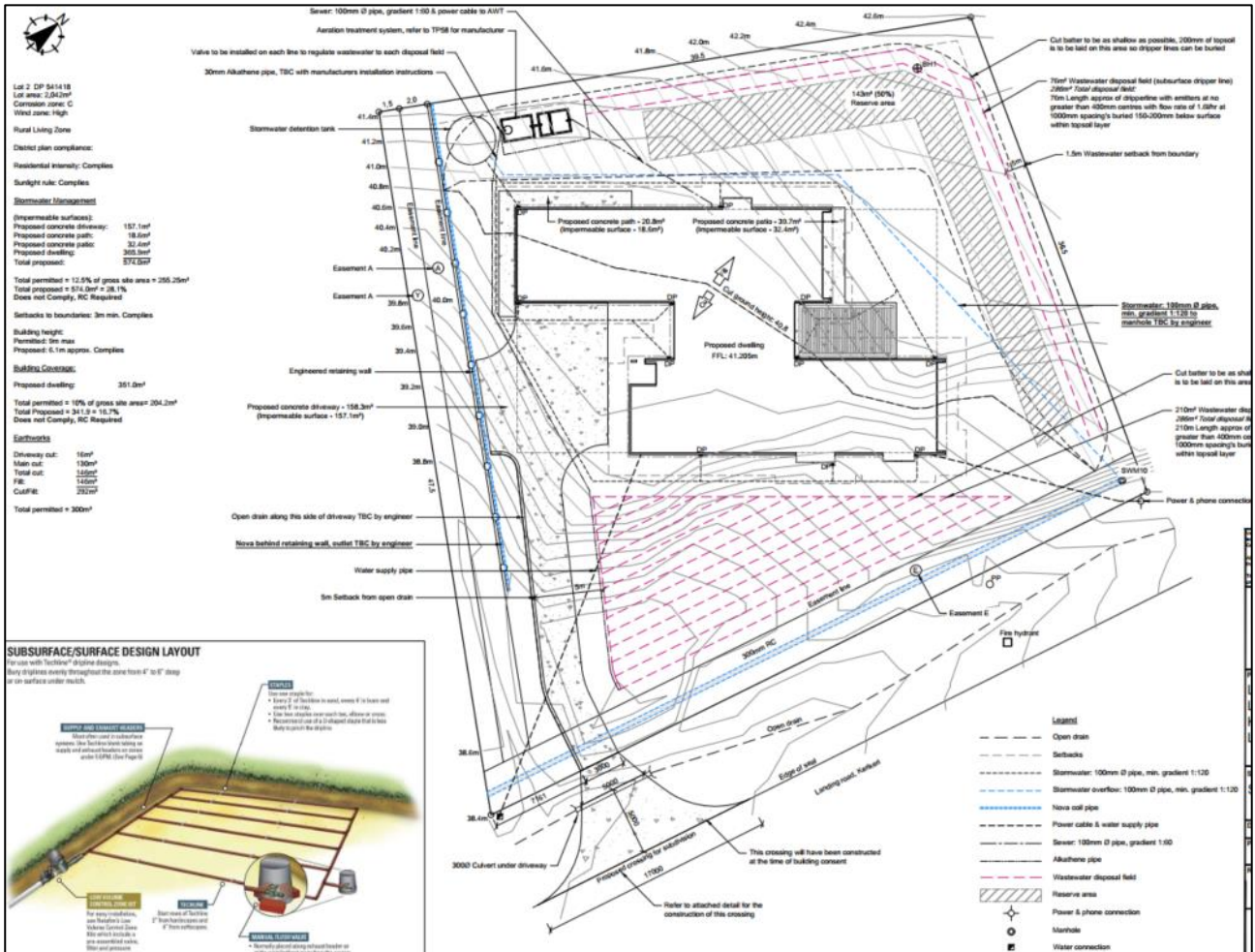


Figure 2: Snip of Proposed Site Plan by O'Brien Design Consulting (Ref No: 4075, dated: 06.06.2023)

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

## 5. ASSESSMENT CRITERIA

### *Impermeable Areas*

The calculations for the on-site primary stormwater management system for the proposed development are based on a gross site area of 2,042m<sup>2</sup> and the below areas *extracted from the supplied plans*:

	Pre-Development	Post-Development	Total Change
Roof Area	0 m <sup>2</sup>	365.9 m <sup>2</sup>	365.9 m <sup>2</sup>
Total Uncovered Hardstand	0 m <sup>2</sup>	208.1 m <sup>2</sup>	208.1 m <sup>2</sup>
Concrete Driveway	0 m <sup>2</sup>	157.1 m <sup>2</sup>	
Concrete Path	0 m <sup>2</sup>	18.6 m <sup>2</sup>	
Concrete Patio	0 m <sup>2</sup>	32.4 m <sup>2</sup>	
Pervious	2,042 m <sup>2</sup>	1,468 m <sup>2</sup>	-574 m <sup>2</sup>

The total amount of impermeable area on site, post-development will be 574m<sup>2</sup> or 28.1% of the site area. Should any changes be made to the current proposal, the on-site stormwater mitigation design must be reviewed.

### *Consent Conditions*

The site is under the jurisdiction of the Far North District Council. This design has been completed in accordance with the recommendations and requirements contained within the Far North District Engineering Standards, the Far North District Council District Plan, Clause E1 of the New Zealand Building Code, and the following specific design guidelines provided within RC 2190583-RMASUB:

(iii) Prior to the construction of any impermeable surface, the lot owner shall install a stormwater management system that is designed to ensure that peak stormwater runoff from the increase in impermeable surfaces does not exceed flows anticipated for the predevelopment for a 10% AEP storm event plus an allowance for climate change. Overland and secondary flowpaths are to be unobstructed by the new dwellings, other structures or landscaping.

*Figure 3: FNDC RC 2190583-RMASUB Extract*

The development is subject to the above conditions. This report is intended to provide recommendations for the management of stormwater and mitigation of increased runoff resulting from the proposed development in accordance with these conditions. Therefore, the stormwater management design will provide recommendations to achieve hydrological neutrality across the proposed impermeable areas for the 10% AEP storm event.

### *District Plan Rules*

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

8.7.5.1.5 – **Permitted Activities – Stormwater Management** - The maximum proportion or amount of the gross site area covered by buildings and other impermeable surfaces shall be 12.5% or 3,000m<sup>2</sup>, whichever is the lesser.

8.7.5.2.2 – **Controlled Activities – Stormwater Management** - The maximum proportion or amount of the gross site area covered by buildings and other Impermeable Surfaces shall be 20% or 3300m<sup>2</sup>, whichever is the lesser.

The total proposed impermeable area for the development exceeds 12.5% of the site area and does not comply with Permitted Activity rules under the FNDC District Plan CI 8.7.5.1.5. Therefore, the proposals are considered to be a Discretionary Activity. Additional considerations for stormwater management as outlined in the FNDC District Plan Section 11.3 are required. A District Plan Assessment has been included in Section 8 of this report.

### Stormwater Modelling Method

The attenuation calculations have been computed using HydroCAD modelling software. The model has been configured utilising the Rational Method (NZ Building Code E1). The rainfall intensity values for the 10% AEP storm event adjusted for climate change are as follows:

Rainfall Intensity Values (RCP6.0 2081-2100)								
Time	10m	20m	30m	1h	2h	6h	12h	24h
10% AEP	121	87.4	72.2	51.7	36.3	19.5	12.6	7.81

The NIWA RCP6.0 rainfall data scenario for 2081-2100 has been used to account for climate change.

Local geology at the property is noted on the GNS Science New Zealand Geology Web Map Scale 1:250,000, as; Kerikeri Volcanic Group, refer; 'GNS Science Website'. Kerikeri Volcanic Group soils are typically considered Type C in terms of the Draft Far North District Council Engineering Standards. Therefore, in accordance with Table 4-3 of the standards, a pre-development runoff coefficient of 0.59 has been adopted.

## 6. STORMWATER MITIGATION ASSESSMENT

### Stormwater Mitigation – Roof

A detention tank system is 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 the proposed dwelling. Leaf guards can be installed to minimise blockage of the attenuation tank. Other adequate protection measures may also be used in the roof gutters and the tank's inlet. Any in-line systems must be installed at least 600mm above the tank inlet.

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

Proposed Tank	1 x 15,000 litre Promax Xpress Rainwater Tank
Tank dimensions	3000mm Ø x 2500mm high (or greater)
Outlet Orifice (10% AEP control)	<b>24mm diameter orifice</b> ; located <u>100mm above the base of the tank</u> <ul style="list-style-type: none"> <li>- 2086mm water elevation</li> <li>- 14.7m<sup>3</sup> storage</li> </ul>
Overflow Outlet	<b>100mm diameter</b> ; located at the top of the tank

Refer to the appended calculation set, Site Plan (127280-C200) and Roof Tank Detail (127280-C201) for clarification. Discharge from the roof detention tank must be transported via sealed pipes to the available stormwater connection.

Levels are to be confirmed on-site by the contractors prior to construction. The tank location must allow for a minimum drainage line grade (>1%) from the tank outlet to the available stormwater connection. If this is not achievable, WJL is to be contacted for review of the design.

### ***Hardstand Areas***

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 southern side of the proposed driveway. The proposed swale is to direct runoff to the existing roadside drain along Landing Road. Refer to the appended Site Plan (127280-C200) and calculation set for clarification.

It is recommended to shape the remaining hardstand areas to direct runoff to catchpits. The catchpits are required to drain directly to the available stormwater connection via sealed pipes. Refer to the appended Site Plan (127280-C200) for clarification.

Stormwater catchpit(s) 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 available stormwater connection.

The outlet orifice fitted to the detention tank has been conservatively sized to allow for the unattenuated hardstand areas. Runoff resulting from the impermeable areas on-site has still been attenuated back to pre-development flow rates for the 10% AEP design storm, with rainfall values adjusted for climate change.

### ***Retaining Walls***

Discharge from the drainage portion of the retaining walls must be directed to the available stormwater connection or to the existing overland flow path in Easement E.

## **7. STORMWATER RUNOFF SUMMARY**

Refer to the appended HydroCAD Calculation output.

### *Pre-Development Scenario – 10% AEP Storm Event + CCF*

<b>Surface</b>	<b>Area</b>	<b>Runoff C</b>	<b>10% AEP Flow Rate</b>
Greenfields Roof Area	365.9 m <sup>2</sup>	0.59	2.68ℓ/s
Greenfields Uncovered Hardstand Areas	208.1 m <sup>2</sup>	0.59	1.52ℓ/s
			4.20ℓ/s

### *Post-Development Scenario – 10% AEP Storm Event + CCF*

<b>Surface</b>	<b>Area</b>	<b>Runoff C</b>	<b>10% AEP Flow Rate</b>
Post-Development Roof Area via Detention Tank	365.9 m <sup>2</sup>	0.96	1.73ℓ/s
Post-Development Uncovered Hardstand Areas	208.1 m <sup>2</sup>	0.96	2.48ℓ/s
			4.18ℓ/s

Given the design parameters, stormwater neutrality has been achieved for the 10% AEP storm event across the proposed impermeable surfaces.

## 8. DISTRICT PLAN ASSESSMENT

As the proposed development is not compliant with Permitted Activity Rule 8.7.5.1.5, nor Controlled Activity Rule 8.7.5.2.2, and is therefore regarded as a Discretionary Activity.

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

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

(a) the extent to which building site coverage and Impermeable Surfaces contribute to total catchment impermeability and the provisions of any catchment or drainage plan for that catchment;	Impermeable surfaces resulting from the development increase site impermeability. Through tank attenuation, runoff is to be attenuated to pre-development conditions.
(b) the extent to which Low Impact Design principles have been used to reduce site impermeability;	The dwelling roof and paved areas have been accounted for in the attenuation system proposed, supplying outflow control for the 10% AEP storm event as per the Resource Consent condition. Given this, hydrologic neutrality will be achieved for the proposed development.
(c) any cumulative effects on total catchment impermeability;	Impervious coverage will increase by 574 m <sup>2</sup> .
(d) the extent to which building site coverage and Impermeable Surfaces will alter the natural contour or drainage patterns of the site or disturb the ground and alter its ability to absorb water;	Runoff from the proposed roof area and hardstand areas is to be collected and directed to the available stormwater connection via sealed pipes, mitigating the potential for runoff to pass over / saturate the surrounding soils.  Ponding is not anticipated to occur provided the recommendations within this report are adhered to, mitigating interference with natural water absorption.
(e) the physical qualities of the soil type;	Kerikeri Volcanic Group. Moderate drainage.
(f) any adverse effects on the life supporting capacity of soils;	Stormwater runoff from roof and hardstand areas will be captured and conveyed to the available stormwater connection via sealed pipes. Stormwater runoff from the proposed driveway to be managed via a grassed channel, which discharges to the existing roadside drain.  Runoff flows resulting from the proposed impermeable areas will be contained within the specified stormwater management devices for storm events up to the 10% AEP event and will not be discharged in-ground. Therefore, no adverse effects on the life supporting capacity of the soils due to contaminants are anticipated from the proposed development given that the recommendations herein are adhered to.
(g) the availability of land for the disposal of effluent and stormwater on the site without adverse effects on the water quantity and water quality of water bodies (including groundwater and aquifers) or on adjacent sites;	Runoff flows resulting from the proposed impermeable areas will be directed via stormwater management devices to the public stormwater network.



	<p>The site is large enough for on-site stormwater and effluent disposal (i.e setbacks between water sources and effluent disposal comply with Table 9 of the PRPN).</p> <p>A review of NRC Bore location maps shows no ground water bores in close proximity to the site (i.e. within 20m to the proposed wastewater field).</p>
(h) the extent to which paved, Impermeable Surfaces are necessary for the proposed activity;	The proposed driveway provides vehicle and pedestrian access to the dwelling. We do not deem the proposed paved areas to be excessive for the site.
(i) the extent to which land scaping and vegetation may reduce adverse effects of run-off;	Any plantings introduced by the homeowner during occupancy will aid in reducing surface water velocity and providing treatment. No specific landscaping scheme is proposed as part of the stormwater management system described herein.
(j) any recognised standards promulgated by industry groups;	Not applicable
k) the means and effectiveness of mitigating stormwater runoff to that expected by permitted activity threshold;	The dwelling roof and hardstand areas have been accounted for in the attenuation system proposed, supplying outflow control for the 10% AEP storm event. Given this, hydrologic neutrality will be achieved for the proposed development, in accordance with the consent conditions, mitigating the effects of stormwater runoff from the proposed impermeable areas to below permitted activity levels.
(l) the extent to which the proposal has considered and provided for climate change;	NIWA RCP6.0 rainfall data scenario for 2081-2100 has been used for the post-development flow scenario.
(m) the extent to which stormwater detention ponds and other engineering solutions are used to mitigate any adverse effects.	The dwelling roof and hardstand areas have been accounted for in the attenuation system proposed, supplying outflow control for the 10% AEP storm event. Given this, hydrologic neutrality will be achieved for the proposed development.

## 9. NOTES

If any of the design specifications mentioned in the previous sections are altered or found to be different than what is described in this report, Wilton Joubert Ltd will be required to review this report. Indicative system details have been provided in the appendices of this report (127280-C200 & 127280-C201)

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.

## **10. LIMITATIONS**

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

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

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

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

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

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

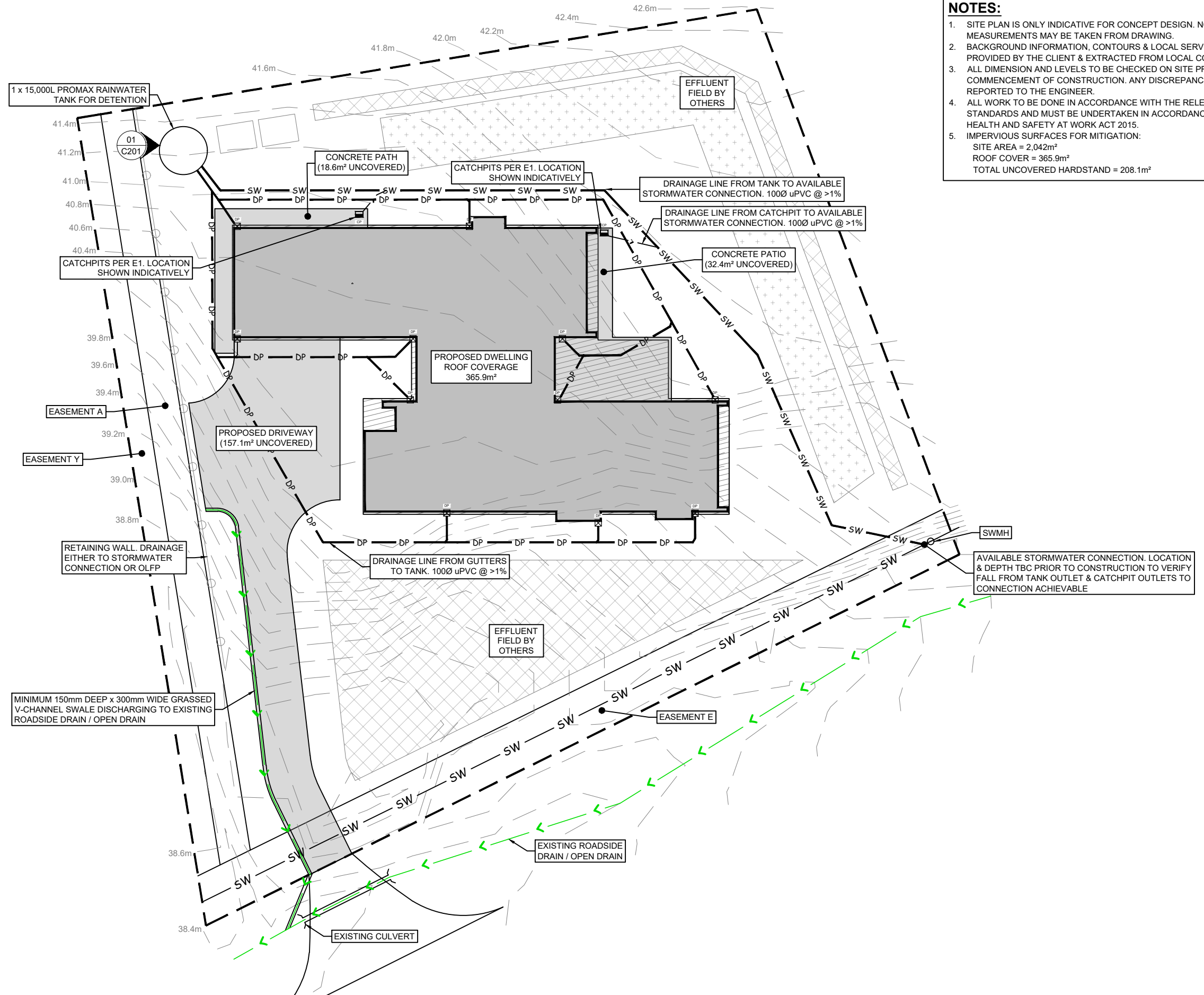
Wilton Joubert Ltd.



Gustavo Medina Brant  
BE(Hons)

## **REPORT ATTACHMENTS**

1. Site Plan - C200 (1 sheet)
2. Tank Detail - C201 (1 sheet)
3. Calculation Set



- NOTES:**
- SITE PLAN IS ONLY INDICATIVE FOR CONCEPT DESIGN. NO MEASUREMENTS MAY BE TAKEN FROM DRAWING.
  - BACKGROUND INFORMATION, CONTOURS & LOCAL SERVICES PROVIDED BY THE CLIENT & EXTRACTED FROM LOCAL COUNCIL GIS.
  - ALL DIMENSION AND LEVELS TO BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
  - 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.
  - IMPERVIOUS SURFACES FOR MITIGATION:  
 SITE AREA = 2,042m<sup>2</sup>  
 ROOF COVER = 365.9m<sup>2</sup>  
 TOTAL UNCOVERED HARDSTAND = 208.1m<sup>2</sup>

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	JUN '23	GB	STORMWATER MITIGATION REPORT

DESIGNED BY: GB  
 DRAWN BY: GB  
 CHECKED BY: BGS  
 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 ENGINEERS APPROVAL

DRAWING TITLE: **SITE PLAN**

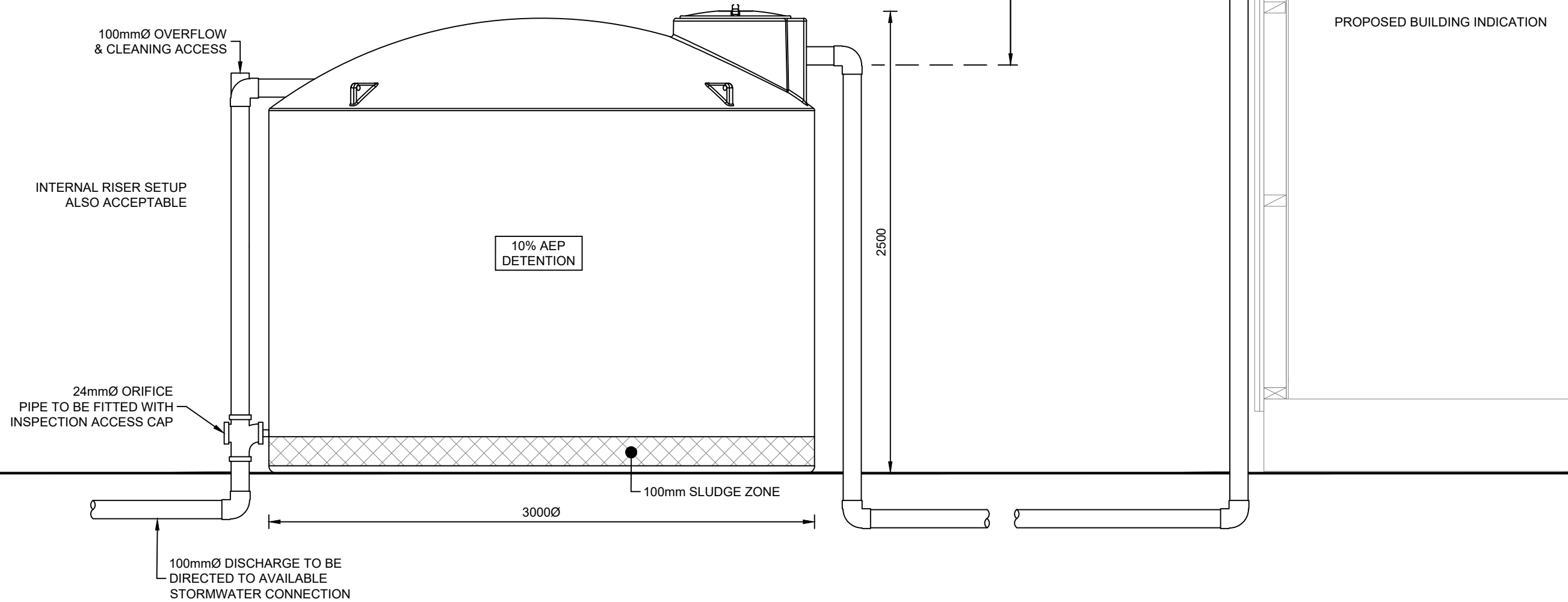
PROJECT DESCRIPTION: **STORMWATER MITIGATION REPORT**

PROJECT TITLE: **LOT 2 DP 541418  
 60 LANDING ROAD  
 KERIKERI  
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: OREWA
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 127280-C200	ISSUE: A
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**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 100mm TO BE KEPT.
6. ALL ORIFICE OUTLETS TO BE COVERED WITH STAINLESS STEEL OR NYLON MESH.
7. ASSUMED USE OF A 1 x 15,000 LITRE PROMAX XPRESS TANK OR SIMILARLY APPROVED.



01 **TANK DETAIL**  
C200 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
A	JUN '23	GB	STORMWATER MITIGATION REPORT

DESIGNED BY: GB  
DRAWN BY: GB  
CHECKED BY: BGS  
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 ENGINEERS APPROVAL

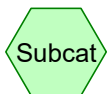
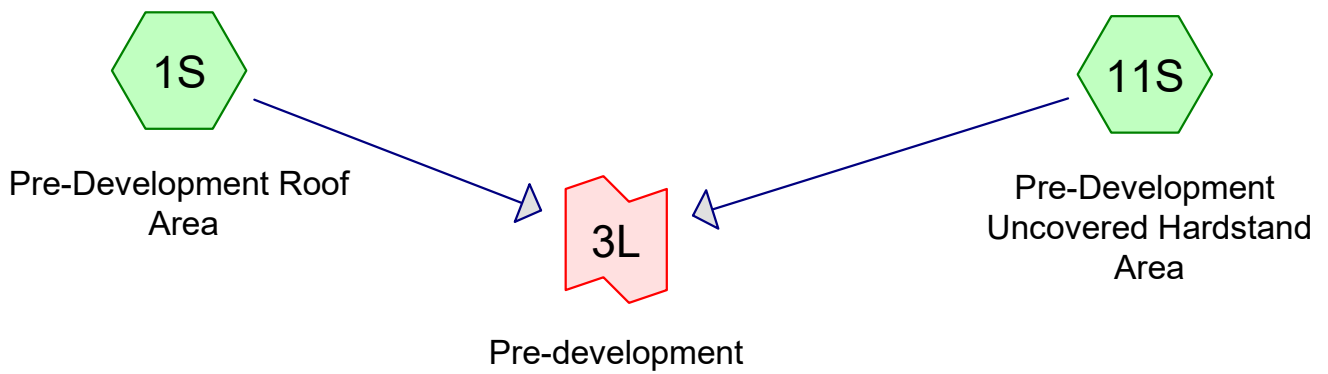
DRAWING TITLE:  
**ROOF TANK DETAIL**

PROJECT DESCRIPTION:  
**STORMWATER MITIGATION REPORT**

PROJECT TITLE:  
**LOT 2 DP 541418  
60 LANDING ROAD  
KERIKERI  
NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: OREWA
DRAWING SCALE: NTS	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: <b>127280-C201</b>	ISSUE: <b>A</b>
COPYRIGHT - WILTON JOUBERT LIMITED	

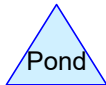
**Pre-Development Scenario**



Subcat



Reach



Pond



Link

**Routing Diagram for 127280**

Prepared by Wilton Joubert Ltd, Printed 19/06/2023  
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**127280**

*60 Landing Road 10-Year + CCF Duration=80 min, Inten=44.6 mm/hr*

Prepared by Wilton Joubert Ltd

Printed 19/06/2023

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Page 2

Time span=0.00-3.00 hrs, dt=0.01 hrs, 301 points

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Pre-Development Roof** Runoff Area=365.9 m<sup>2</sup> 0.00% Impervious Runoff Depth=35 mm  
Tc=10.0 min C=0.59 Runoff=2.68 L/s 12.8 m<sup>3</sup>

**Subcatchment 11S: Pre-Development** Runoff Area=208.1 m<sup>2</sup> 0.00% Impervious Runoff Depth=35 mm  
Tc=10.0 min C=0.59 Runoff=1.52 L/s 7.3 m<sup>3</sup>

**Link 3L: Pre-development**

Inflow=4.20 L/s 20.2 m<sup>3</sup>  
Primary=4.20 L/s 20.2 m<sup>3</sup>

**Summary for Subcatchment 1S: Pre-Development Roof Area**

Runoff = 2.68 L/s @ 0.17 hrs, Volume= 12.8 m<sup>3</sup>, Depth= 35 mm

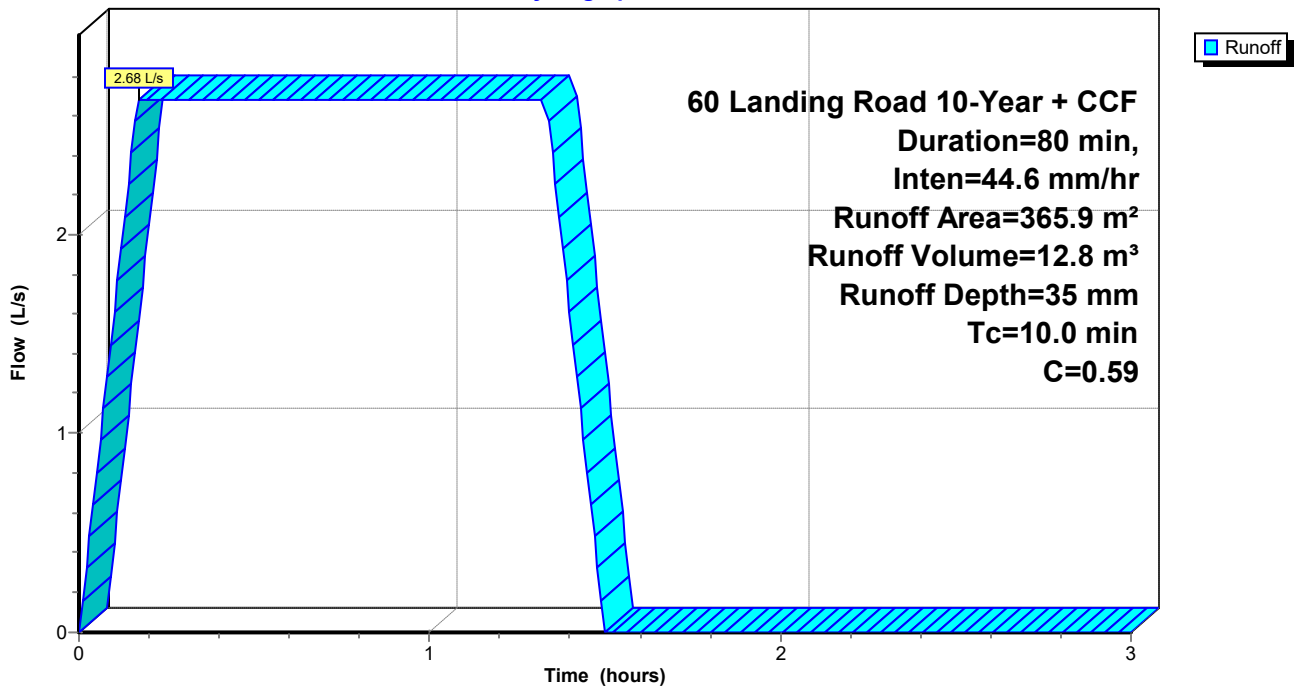
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs  
 60 Landing Road 10-Year + CCF Duration=80 min, Inten=44.6 mm/hr

Area (m <sup>2</sup> )	C	Description
365.9	0.59	Grass, short
365.9		100.00% Pervious Area

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

**Subcatchment 1S: Pre-Development Roof Area**

Hydrograph



**Summary for Subcatchment 11S: Pre-Development Uncovered Hardstand Area**

Runoff = 1.52 L/s @ 0.17 hrs, Volume= 7.3 m<sup>3</sup>, Depth= 35 mm

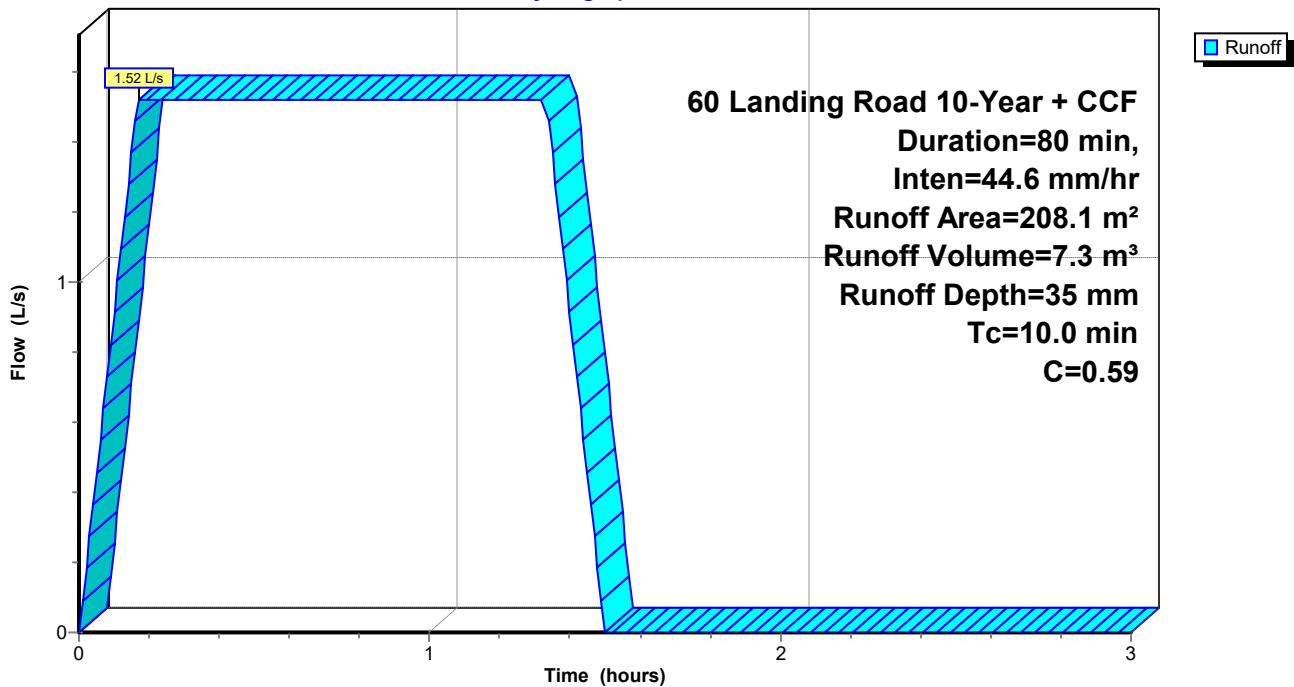
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs  
 60 Landing Road 10-Year + CCF Duration=80 min, Inten=44.6 mm/hr

Area (m <sup>2</sup> )	C	Description
208.1	0.59	Grass, short
208.1		100.00% Pervious Area

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

**Subcatchment 11S: Pre-Development Uncovered Hardstand Area**

Hydrograph





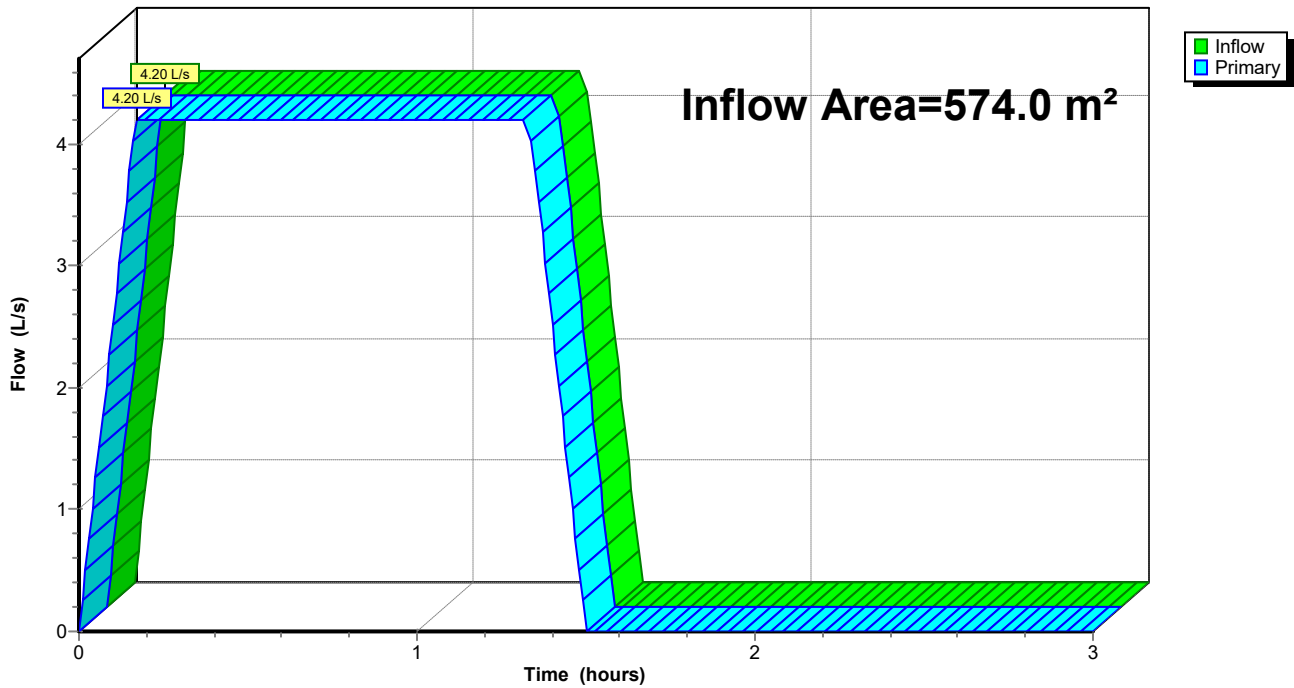
### Summary for Link 3L: Pre-development

Inflow Area = 574.0 m<sup>2</sup>, 0.00% Impervious, Inflow Depth = 35 mm for 10-Year + CCF event  
Inflow = 4.20 L/s @ 0.17 hrs, Volume= 20.2 m<sup>3</sup>  
Primary = 4.20 L/s @ 0.17 hrs, Volume= 20.2 m<sup>3</sup>, Atten= 0%, Lag= 0.0 min

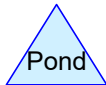
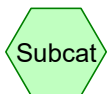
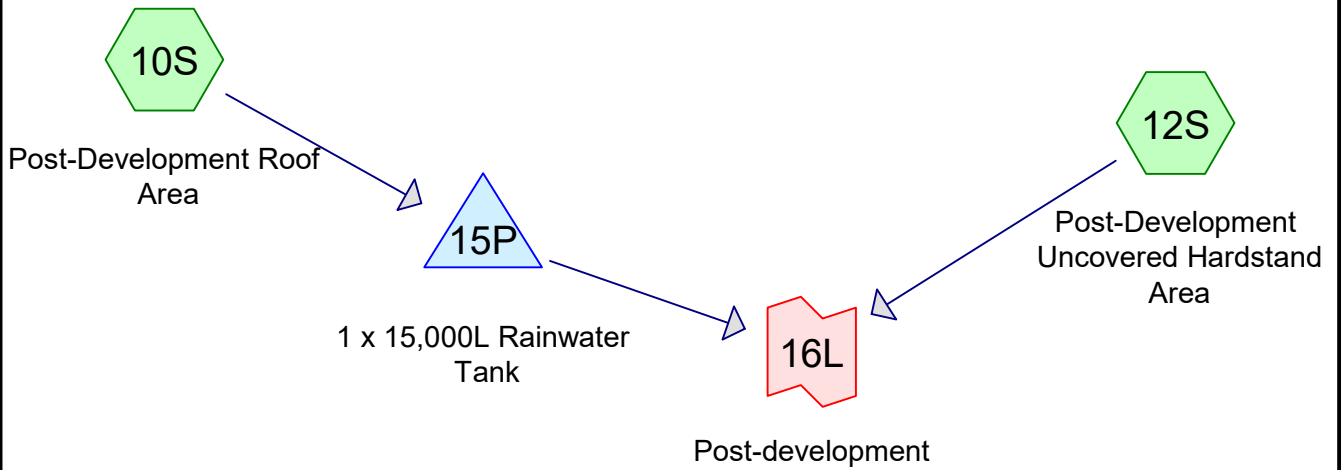
Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

### Link 3L: Pre-development

Hydrograph



**Post-Development Scenario**



Time span=0.00-3.00 hrs, dt=0.01 hrs, 301 points

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 10S: Post-Development** Runoff Area=365.9 m<sup>2</sup> 100.00% Impervious Runoff Depth=57 mm  
Tc=10.0 min C=0.96 Runoff=4.36 L/s 20.9 m<sup>3</sup>

**Subcatchment 12S: Post-Development** Runoff Area=208.1 m<sup>2</sup> 100.00% Impervious Runoff Depth=57 mm  
Tc=10.0 min C=0.96 Runoff=2.48 L/s 11.9 m<sup>3</sup>

**Pond 15P: 1 x 15,000L Rainwater Tank** Peak Elev=2.086 m Storage=14.7 m<sup>3</sup> Inflow=4.36 L/s 20.9 m<sup>3</sup>  
Outflow=1.73 L/s 14.2 m<sup>3</sup>

**Link 16L: Post-development** Inflow=4.18 L/s 26.1 m<sup>3</sup>  
Primary=4.18 L/s 26.1 m<sup>3</sup>

**Summary for Subcatchment 10S: Post-Development Roof Area**

Runoff = 4.36 L/s @ 0.17 hrs, Volume= 20.9 m<sup>3</sup>, Depth= 57 mm

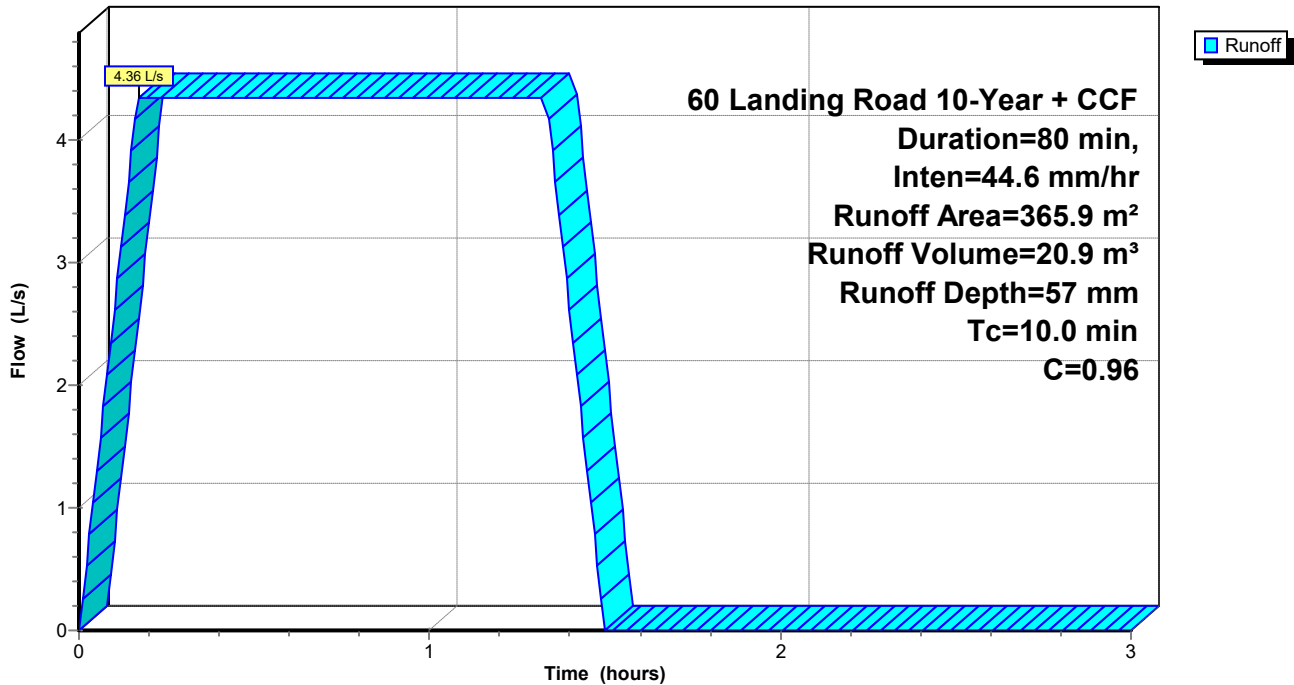
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs  
 60 Landing Road 10-Year + CCF Duration=80 min, Inten=44.6 mm/hr

Area (m <sup>2</sup> )	C	Description
365.9	0.96	Roof
365.9		100.00% Impervious Area

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

**Subcatchment 10S: Post-Development Roof Area**

Hydrograph



**Summary for Subcatchment 12S: Post-Development Uncovered Hardstand Area**

Runoff = 2.48 L/s @ 0.17 hrs, Volume= 11.9 m<sup>3</sup>, Depth= 57 mm

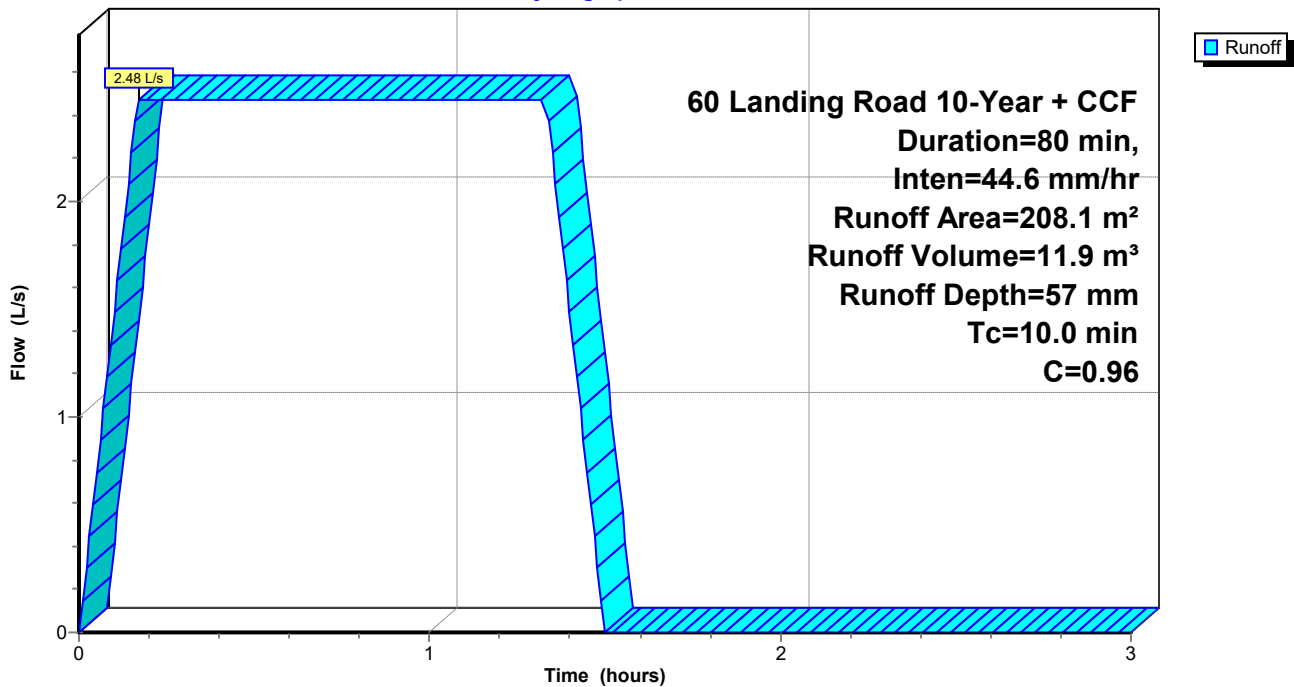
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs  
 60 Landing Road 10-Year + CCF Duration=80 min, Inten=44.6 mm/hr

Area (m <sup>2</sup> )	C	Description
208.1	0.96	Roof
208.1		100.00% Impervious Area

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

**Subcatchment 12S: Post-Development Uncovered Hardstand Area**

Hydrograph



### Summary for Pond 15P: 1 x 15,000L Rainwater Tank

Inflow Area = 365.9 m<sup>2</sup>, 100.00% Impervious, Inflow Depth = 57 mm for 10-Year + CCF event  
 Inflow = 4.36 L/s @ 0.17 hrs, Volume= 20.9 m<sup>3</sup>  
 Outflow = 1.73 L/s @ 1.43 hrs, Volume= 14.2 m<sup>3</sup>, Atten= 60%, Lag= 75.8 min  
 Primary = 1.73 L/s @ 1.43 hrs, Volume= 14.2 m<sup>3</sup>

Routing by Stor-Ind method, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs  
 Peak Elev= 2.086 m @ 1.43 hrs Surf.Area= 7.1 m<sup>2</sup> Storage= 14.7 m<sup>3</sup>

Plug-Flow detention time= 65.6 min calculated for 14.2 m<sup>3</sup> (68% of inflow)  
 Center-of-Mass det. time= 52.6 min ( 97.6 - 45.0 )

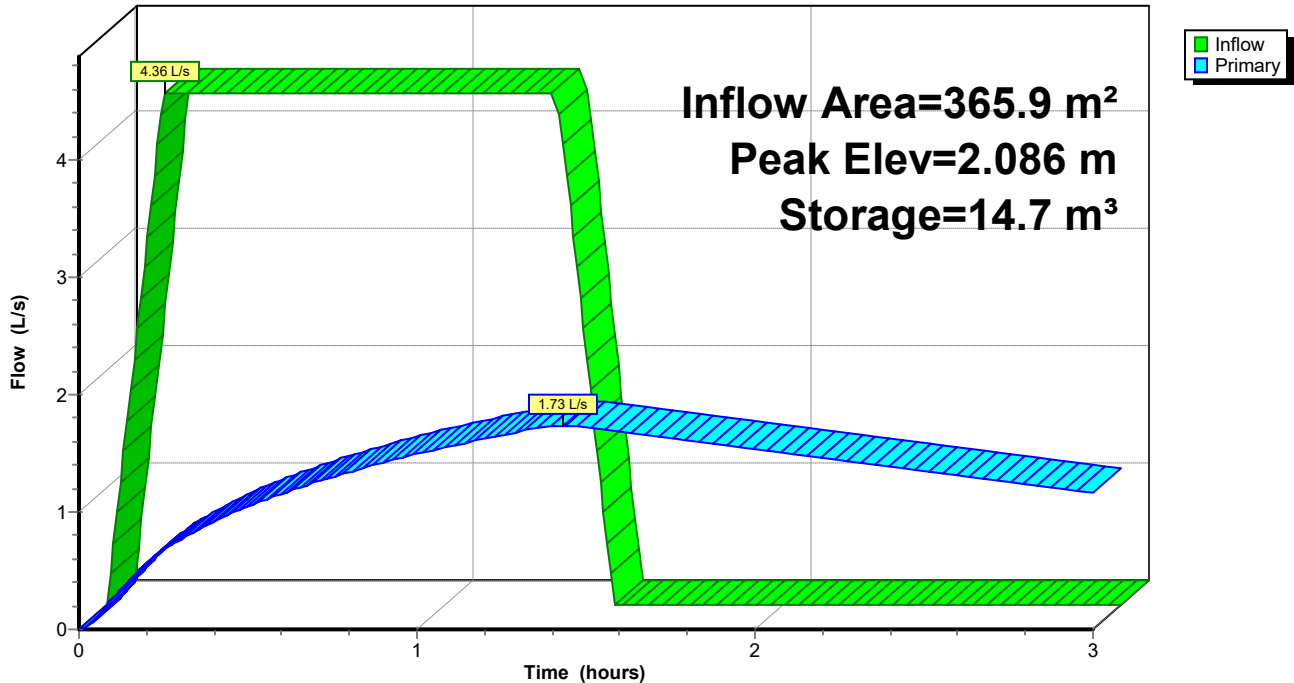
Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	17.7 m <sup>3</sup>	<b>3.00 mD x 2.50 mH Vertical Cone/Cylinder</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	<b>24 mm Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=1.73 L/s @ 1.43 hrs HW=2.086 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 1.73 L/s @ 3.83 m/s)

### Pond 15P: 1 x 15,000L Rainwater Tank

Hydrograph



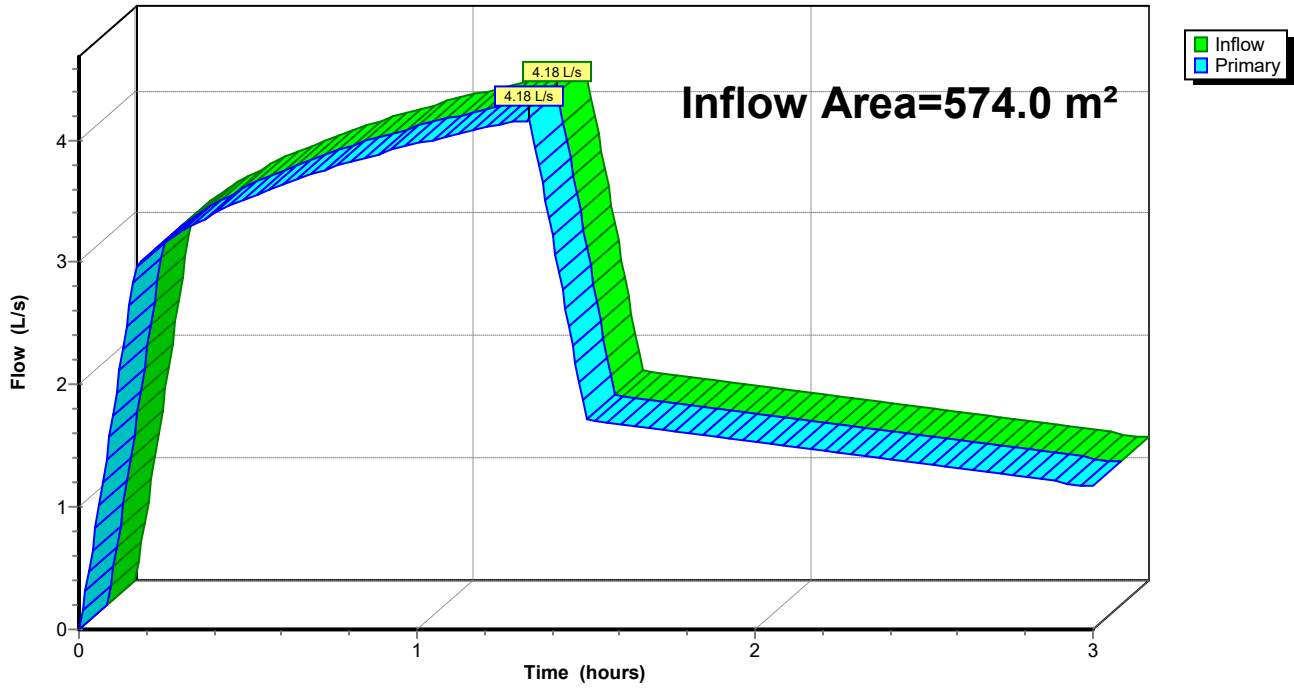
### Summary for Link 16L: Post-development

Inflow Area = 574.0 m<sup>2</sup>, 100.00% Impervious, Inflow Depth > 45 mm for 10-Year + CCF event  
Inflow = 4.18 L/s @ 1.33 hrs, Volume= 26.1 m<sup>3</sup>  
Primary = 4.18 L/s @ 1.33 hrs, Volume= 26.1 m<sup>3</sup>, Atten= 0%, Lag= 0.0 min

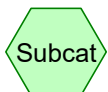
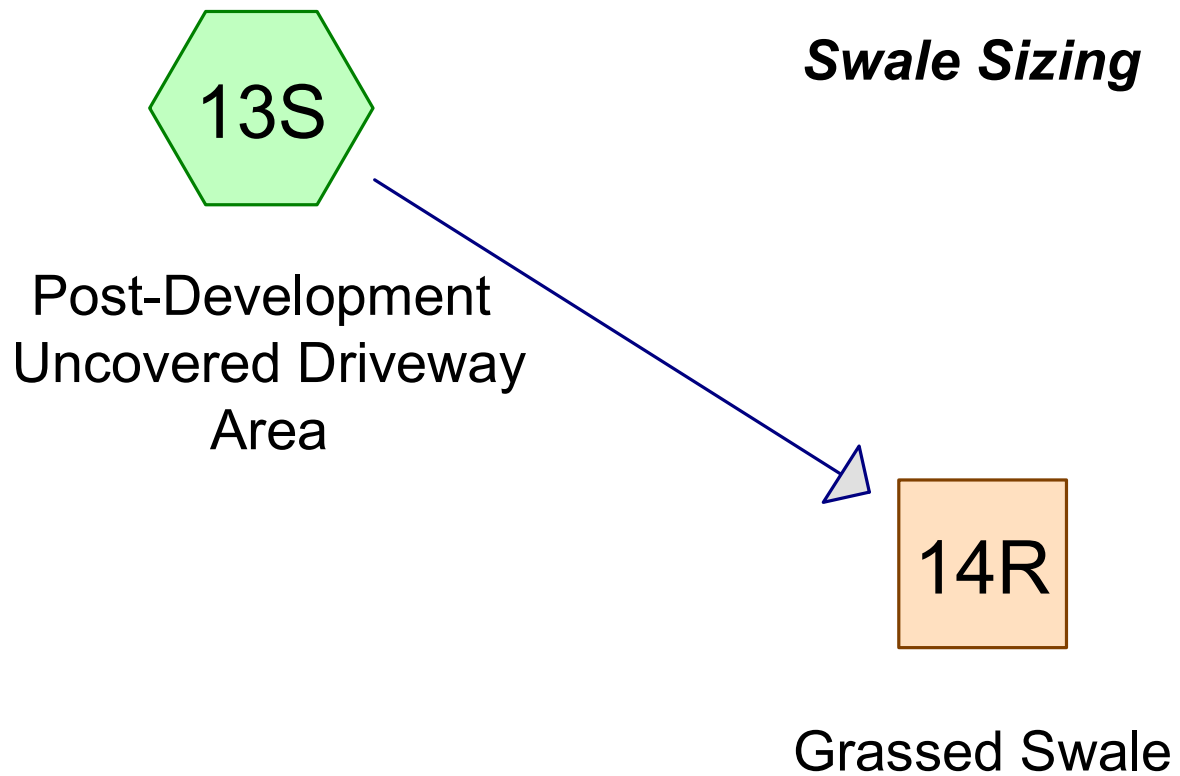
Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

### Link 16L: Post-development

Hydrograph



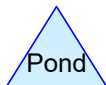
## Swale Sizing



Subcat



Reach



Pond



Link

Routing Diagram for 127280

Prepared by Wilton Joubert Ltd, Printed 20/06/2023

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**Summary for Subcatchment 13S: Post-Development Uncovered Driveway Area**

Runoff = 1.87 L/s @ 0.17 hrs, Volume= 9.0 m<sup>3</sup>, Depth= 57 mm

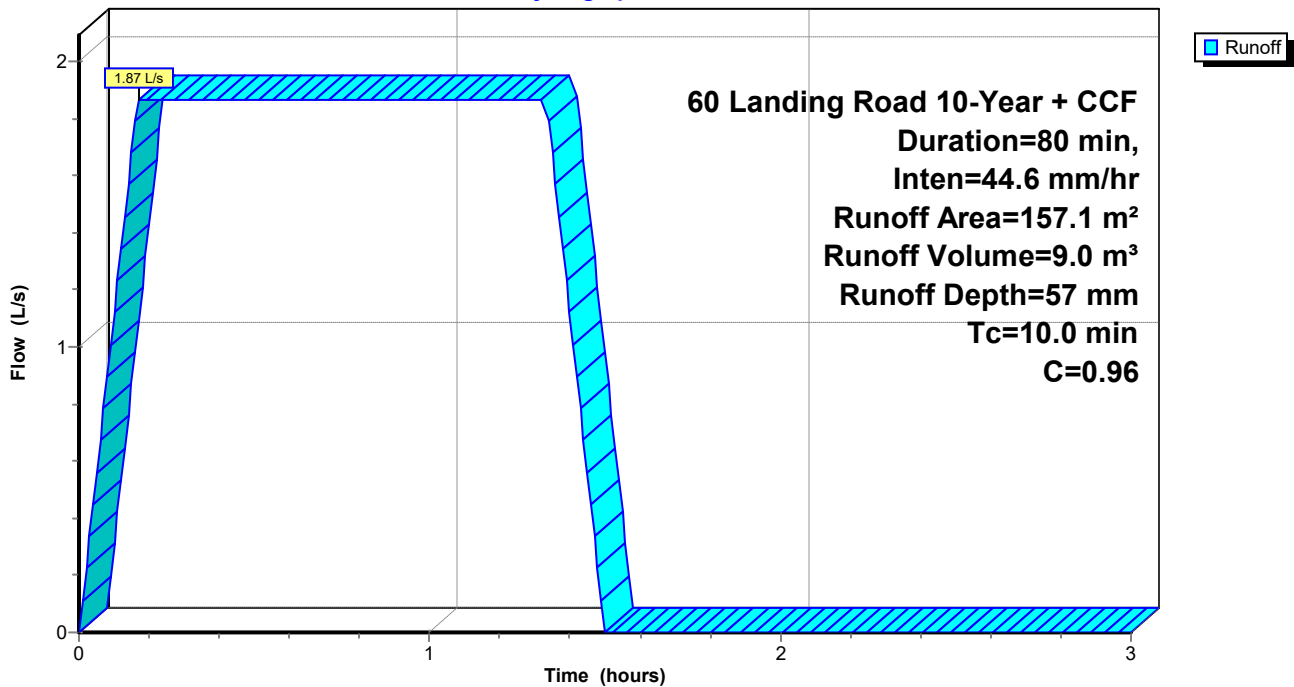
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs  
 60 Landing Road 10-Year + CCF Duration=80 min, Inten=44.6 mm/hr

Area (m <sup>2</sup> )	C	Description
157.1	0.96	Roof
157.1		100.00% Impervious Area

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

**Subcatchment 13S: Post-Development Uncovered Driveway Area**

Hydrograph



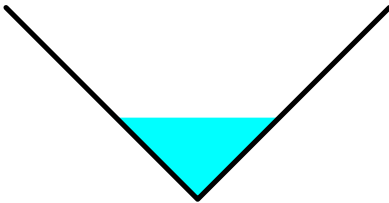
**Summary for Reach 14R: Grassed Swale**

Inflow Area = 157.1 m<sup>2</sup>, 100.00% Impervious, Inflow Depth = 57 mm for 10-Year + CCF event  
 Inflow = 1.87 L/s @ 0.17 hrs, Volume= 9.0 m<sup>3</sup>  
 Outflow = 1.87 L/s @ 0.55 hrs, Volume= 9.0 m<sup>3</sup>, Atten= 0%, Lag= 22.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 0.46 m/s, Min. Travel Time= 0.9 min  
 Avg. Velocity = 0.43 m/s, Avg. Travel Time= 1.0 min

Peak Storage= 0.1 m<sup>3</sup> @ 0.53 hrs  
 Average Depth at Peak Storage= 0.06 m  
 Bank-Full Depth= 0.15 m Flow Area= 0.02 m<sup>2</sup>, Capacity= 18.26 L/s

0.00 m x 0.15 m deep channel, n= 0.022 Earth, clean & straight  
 Side Slope Z-value= 1.0 m/m Top Width= 0.30 m  
 Length= 25.00 m Slope= 0.0160 m/m  
 Inlet Invert= 39.000 m, Outlet Invert= 38.600 m



**Reach 14R: Grassed Swale**

Hydrograph

