



Office Use Only
Application Number:

APPLICATION FOR RESOURCE CONSENT OR FAST-TRACK RESOURCE CONSENT

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

(If applying for a Resource Consent pursuant to Section 87AAC or 88 of the RMA, this form can be used to satisfy the requirements of 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 **No**

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

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

*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 **No**

4. Applicant Details:

Name/s: Katherine Gaye Noakes and Glenn Llewellyn Williams

Electronic Address for Service (E-mail): [Redacted]

Phone Numbers: [Redacted]

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

Post Code: [Redacted]

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

Name/s: [Redacted]

Electronic Address for Service (E-mail): [Redacted]

Phone Numbers: [Redacted] Home: [Redacted]

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

Post Code: [Redacted]

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: Katherine Gaye Noakes and Glenn Llewellyn Williams

Property Address/
Location: 132c Waipapa Road, Kerikeri

7. **Application Site Details:**
Location and/or Property Street Address of the proposed activity:

Site Address/
Location: 132c Waipapa Road, Kerikeri

Legal Description: Lot 1 DP 365914 Val Number: 00213-28404

Certificate of Title: 267139
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.

Proposal to build / erect a shed. Building Consent has been granted, please find attached:

1. Approved Form 5 BC Certificate

2. Stamped Approved Plans

3. Stamped Approved Geotech Report

4. Stamped Approved Stormwater mitigation report

(see Section 8 for Assessment of Environmental Effects)

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)
EBC-2024-448/0
- 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)

[Redacted Name]

Email:

[Redacted Email]

Postal Address:

[Redacted Address]

Post Code: [Redacted]

Phone Numbers:

Work: [Redacted] Home: [Redacted] Fax: -

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

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

Name: [Redacted] (please print)

Signature: [Redacted] (signature of bill payer – mandatory) Date: 22/12/23

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

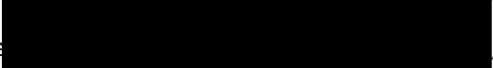
Under the fast-track resource consent process, notice of the decision must be given within 10 working days after the date the application was first lodged with the authority, unless the applicant opts out of that process at the time of lodgement. A fast-track application may cease to be a fast-track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

Signature:  (signature)

Date: 22/12/23

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

Checklist (please tick if information is provided)

- Payment (cheques payable to Far North District Council)
- A current Certificate of Title (Search Copy not more than 6 months old)
- 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



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




R. W. Muir
Registrar-General
of Land

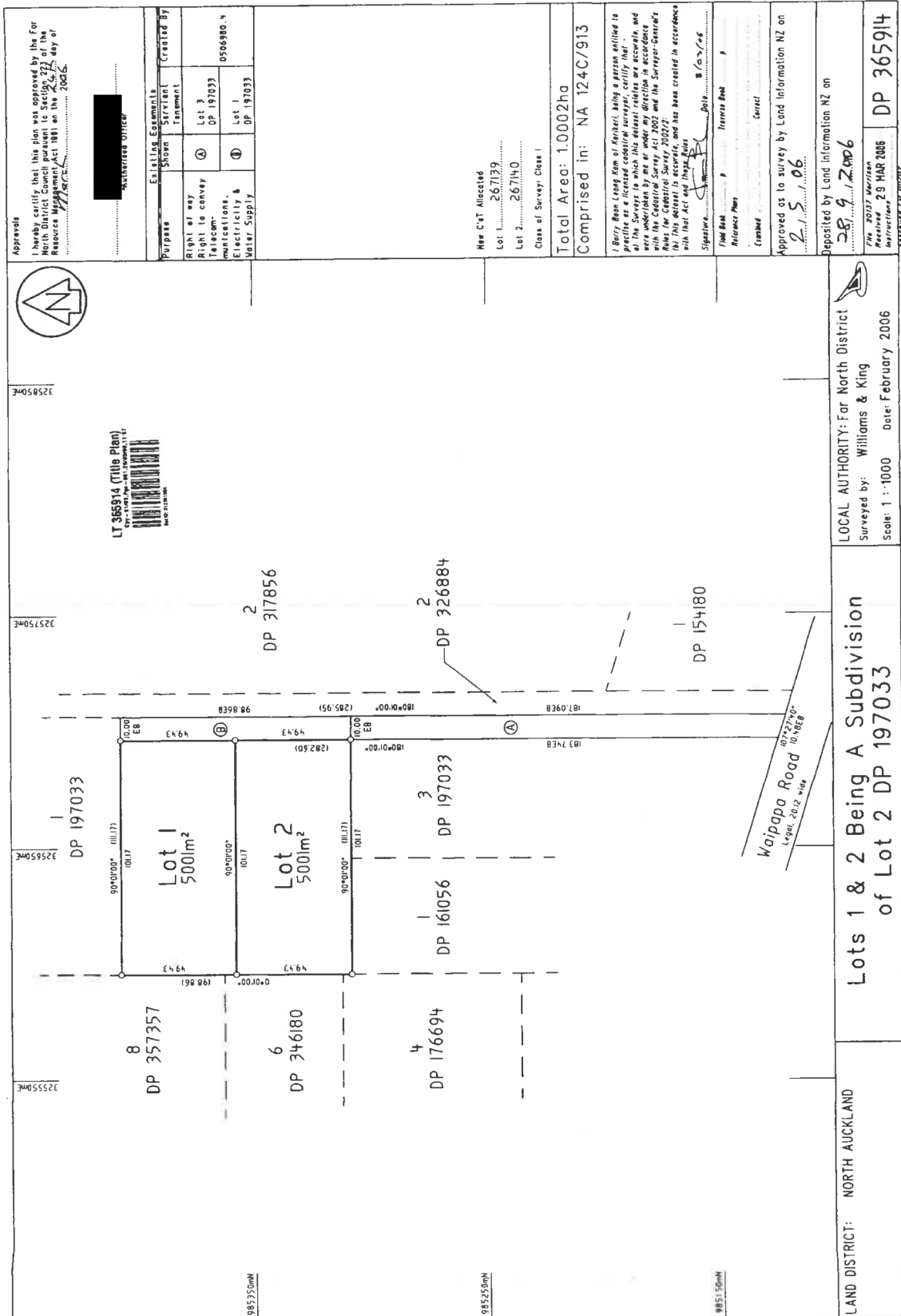
Identifier **267139**
Land Registration District **North Auckland**
Date Issued 28 September 2006

Prior References
NA124C/913

Estate Fee Simple
Area 5001 square metres more or less
Legal Description Lot 1 Deposited Plan 365914
Registered Owners
Glenn Llewellyn Williams and Katherine Gaye Noakes

Interests

D506980.2 Consent Notice pursuant to Section 221(1) Resource Management Act 1991 - 18.5.2000 at 2:44 pm
Appurtenant hereto are rights of way and electricity, telecommunications and water supply rights specified in Easement Certificate D506980.5 - 18.5.2000 at 2:44 pm
The easements specified in Easement Certificate D506980.5 are subject to Section 243 (a) Resource Management Act 1991
12866318.2 Mortgage to Kiwibank Limited - 2.11.2023 at 2:55 pm



Approvals
 I hereby certify that this plan was approved by the Far North District Council pursuant to Section 222 of the Resource Management Act 1991 on the 23rd day of February 2006.

Authorised Officer

Existing Easements		Created By	
Shown	Termination	Shown	Termination
Right of way	Lot 3	Lot 3	
Telecom	DP 197033	DP 197033	
Electricity & Water Supply	Lot 1	Lot 1	DP 197033
			DP 197033

New C/T Allocated
 Lot 1: 267139
 Lot 2: 267140
 Class of Survey: Class 1

Total Area: 1.0002ha
Comprised in: NA 124C/913

I Barry Ben Leong Kim of Kaitiaki, being a person entitled to practice as a licensed cadastral surveyor, certify that this plan was prepared by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor-General's Rules for Cadastral Survey 2002/2.
 In this regard I declare, and has been created in accordance with that Act and the Rules.

Signature: [Signature]
Date: 23/2/06

Field Book: [Blank]
Reference Plan: [Blank]
Created: [Blank]
Correct: [Blank]

Approved as to survey by Land Information NZ on 2/5/06

Deposited by Land Information NZ on 28/9/2006

File 20137 Marston
 Received 29 MAR 2006
 APPROVED FOR REGISTER

LOCAL AUTHORITY: Far North District
Surveyed by: Williams & King
Scale: 1 : 1000 **Date:** February 2006

Lots 1 & 2 Being A Subdivision of Lot 2 DP 197033

LAND DISTRICT: NORTH AUCKLAND



**FORM 5
BUILDING CONSENT**

Section 51, Building Act 2004

Building Consent Number: EBC-2024-448/0

THE BUILDING

Street Address of Building

132C Waipapa Road, Kerikeri
0295

Legal description of land where building is located:

Lot 1 DP 365914

Building Name:

Location of Building within site / block number:

Level/unit number:

THE OWNER

Name of Owner:

Katherine Gaye Noakes and Glen
Llewellyn Williams

Contact Person Name:

Glenn Williams

Mailing Address:

Street Address / Registered Office:

Phone Number:

Landline:

Mobile:

Daytime:

After Hours:

Facsimile Number:

Email Address:

Website

First point of contact for communications with the building consent authority:

BUILDING WORK

The following building work is authorised by this building consent:

New shed

This building consent is issued under section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or responsibility under any other Act relating to or affecting the building (or proposed building). This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.



THIS BUILDING CONSENT IS SUBJECT TO THE FOLLOWING CONDITION(S)

Section 90 Inspections by the Building Consent Authority (BCA) and Third Parties

Agents authorised by the BCA (Council) are entitled to inspect, at all times during normal working hours or while building work is being done. Inspection means the taking of all reasonable steps to ensure that building work is being carried out in accordance with this building consent.

Attached to this document are a list of the inspections that Council will undertake (refer attachments for details) and a list of inspections and supporting documentation required by third parties e.g. your engineer or accredited inspection body (refer attachments for details)

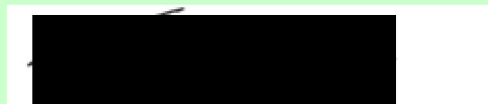
COMPLIANCE SCHEDULE

- A compliance schedule is not required for the building.

ATTACHMENTS

Copies of the following documents are attached to this building consent:

- Project information memorandum
- Development contribution notice
- Notification of requirement to obtain Resource Consent (Form 4)
- Schedule of Inspections required by the BCA and 3rd Parties. These schedules identify certificates and producer statements required during construction. Please ensure you read these documents carefully.



Trent Blakeman

Manager, Building Services, Delivery and Operations
Far North District Council (Building Consent Authority)

Position:

On behalf of:

Date:

13-Dec-2023



Part 1: Schedule of BCA (Council) Inspections required under s.90 of the Building Act

The following inspections are required to confirm compliance during construction. Where construction monitoring or certification is also required, refer to Part 2 for further detail.

209B

Bored Pile Foundation

A hole or series of holes are drilled in the ground. A timber pile or post is then placed in the hole before it is filled with concrete. The hole may also have reinforcing steel placed in it.

This inspection takes place prior to the concrete being placed.

The inspector will check the depth and width of the hole and its location.

Note: If you are unable to locate survey pegs a Registered Land Surveyor's certificate will be required and must be provided at time of inspection.

306F

Final Inspection – Accessory Buildings

The purpose of this inspection is to ensure all building work is completed.

Outbuildings are usually detached from the main building and include but are not limited to garage, carport, shed, deck, gazebo, greenhouse, bridge, sleep out, etc.

Note: Power must be connected and storm water drainage completed.



Part 2: Schedule of 3rd party inspections and documentation for general construction

The following 3rd party inspections, certificates, producer statements and documents are required to confirm compliance during construction. For information about inspection and documentation for specified systems, refer to Part 3 for further details.

Energy Works Certificate - Electrical

The electrician is required to submit an energy works certificate certifying that all electrical installations meet the requirements of Clause G9 (Electricity) of the New Zealand Building Code and the Electrical Regulations.



Part 3: Schedule of 3rd party inspections and documentation for Specified Systems

The following 3rd party inspections, certificates, producer statements and documents are required to confirm compliance for specified systems during construction.

N/A



RECORD OF INSPECTIONS FOR EBC-2024-448/0

Applicant Name: Glen Llewellyn Williams and Katherine Gaye Noakes
Project: New shed
Address: 132C Waipapa Road, Kerikeri 0295

- Please refer to the attached Form 5 document for a list of inspections required for this project.
This document will be collected at the final inspection and retained on Council files.

Building conditions, inspections, advice notes and documentation requirements have been discussed with the Owner / Agent / Builder / Other

Date:Print Name & Initial:
Role:

Table with 6 columns: Inspection Date, Inspection Code, Result, Inspection Sheet ID#, Comments, Inspectors Initials. The table contains 15 empty rows for recording inspection data.



CHRISTCHURCH

Ph: (03) 348 8691

Fax: (03) 348 0314

farmbuildings.mitek.nz.co.nz

AUCKLAND

Ph: (09) 274 7109

Fax: (09) 274 7100

email: fbuildings.mitek.nz@mii.com

Producer Statement - PS1 - Design

ISSUED BY: MiTek New Zealand Limited

TO BE SUPPLIED TO: Building Consent Authorities in New Zealand

IN RESPECT OF: Proposed Lean-To Farm Building - FB83008

AT: 132C Waipapa Road, Kerikeri

We have been engaged to provide engineering design services in respect of the requirements of Clause B1 of the New Zealand Building Code for

All Part only as specified: Purlins, Rafters, Girts, Poles, Columns, Trusses if applicable (including fixings as specified), Roof Bracing and Pole embedment

of the proposed building work.

The design carried out by us has been prepared in accordance with Compliance Documents issued by MBIE and Verification Method B1/VM1. The proposed building work covered by this producer statement is described on MiTek New Zealand Limited drawings numbered FB83008

On behalf of the Design Firm, and subject to:

1. Site verification of the following design assumptions:
 - i) Building Importance Level 1 with a 50 year working life (refer to AS/NZS 1170.0:2002)
 - ii) Light roof and no ceiling
 - iii) Modified High Wind Zone
 - iv) Snow Load $S_g = 0$ kPa
 - v) Foundations - undisturbed ground with a minimum ultimate bearing capacity of 300 kPa
 - vi) Refer attached Design Information for other assumptions
2. All proprietary products meeting their performance specification requirements.

I believe on reasonable grounds that:

- a) The building, if constructed in accordance with the drawings, specifications, and other documents provided, will comply with the relevant provisions of the Building Code.
- b) The persons who have undertaken the design have the necessary competency to do so.

I, In Ling Ng, am a Chartered Member of Engineering NZ and CPEng #146585 and hold the following qualifications BE Civil (Hons). The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than \$200,000*.

On behalf of MiTek New Zealand Limited

.....
In Ling Ng
BE (Hons), CMEngNZ, IntPE, CPEng (146585)
Engineering Manager New Zealand

Date: 25 / 10 / 23

NOTE: ANY SUBSTITUTION OR OMISSION OF ANY MITEK PRODUCT SPECIFIED ON THESE PLANS WILL INVALIDATE MITEK'S PS1 FOR THE ENTIRE PROJECT

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

This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.



CHRISTCHURCH

Ph: (03) 348 8691

Fax: (03) 348 0314

farmbuildings.mitek.nz.co.nz

AUCKLAND

Ph: (09) 274 7109

Fax: (09) 274 7100

email: fbbuildings.mitek.nz@mii.com

DESIGN INFORMATION - FARM BUILDING FB83008

TIMBER AND GRADES

- Poles : Poles, Outer Zone Density Normal 350 kg/m³ $f_b = 38$ MPa, Machine Shaved ($k_{20} = 0.85$)
- Purlins : Radiata Pine or Douglas Fir - SG8
- Girts : Radiata Pine or Douglas Fir - SG8
- Rafters : Radiata Pine or Douglas Fir - SG8
- Moisture content can be green. Our recommendation is 20% or less at time of installation.

DESIGN LOADS

- Dead loads for Light Roof - 0.25kPa (includes weight of purlins, associated framing and galvanized iron roof).
- Live loads - 1.1kN concentrated load, 0.25kPa uniform Load.
- The enclosed documentation has been designed for a Building Importance level 1, with 50 years working life. Refer to AS/NZS 1170.0:2002.
- Wind loads - building designed for a modified High Wind Zone.
- Snow Loads - building designed for $S_g = 0$ kPa (calculated specifically for the job site in this documentation)
- Seismic Zone - 1 (Annual Probability of Exceedance - 1/100)
- Soil conditions:
All foundations to be into natural undisturbed cohesive ground with a minimum ultimate bearing capacity of 300kPa and 18kPa skin friction.
Foundations on ground that has the potential for subsidence, lateral spread, expansive soils and soil instability are outside the scope of this design.
Effects of liquefaction have not been considered as part of this design.

DESIGN LOAD REFERENCES

Compliance Document for the New Zealand Building Code Clause B1 Structure	
NZS3603:1993 Amendment 4	Cited Verification Method
NZS3604 Amendment 2	Cited Acceptable Solution
NZS 1170 Part 0: 2002	Cited Verification Method
NZS 1170 Part 1: 2002	Cited Verification Method
NZS 1170 Part 2: 2011	Cited Verification Method
NZS 1170 Part 3: 2003	Cited Verification Method
NZS 1170 Part 5: 2004	Cited Verification Method
ANSI/TPI1 - 2002	Alternative Solution
Rutledge Method	Alternative Solution - Footing Design for Cantilever Poles.

BUILDING ERECTION

Proper bracing must be installed to hold the components true and plumb and in a safe condition until permanent bracing is fixed. All permanent bracing and fixings must be installed before applying any loads.

LOAD DETAILS

These drawings have been prepared using the above design loads. It is the responsibility of the user to ensure that the design data and loads are still correct at the time of construction.

PRODUCT SPECIFICATION

These details have been designed using specific MITEK®, LUMBERLOK® and BOWMAC® products and the performance of the building and validity of the Producer Statement is reliant on the correct choice of product.

COPYRIGHT

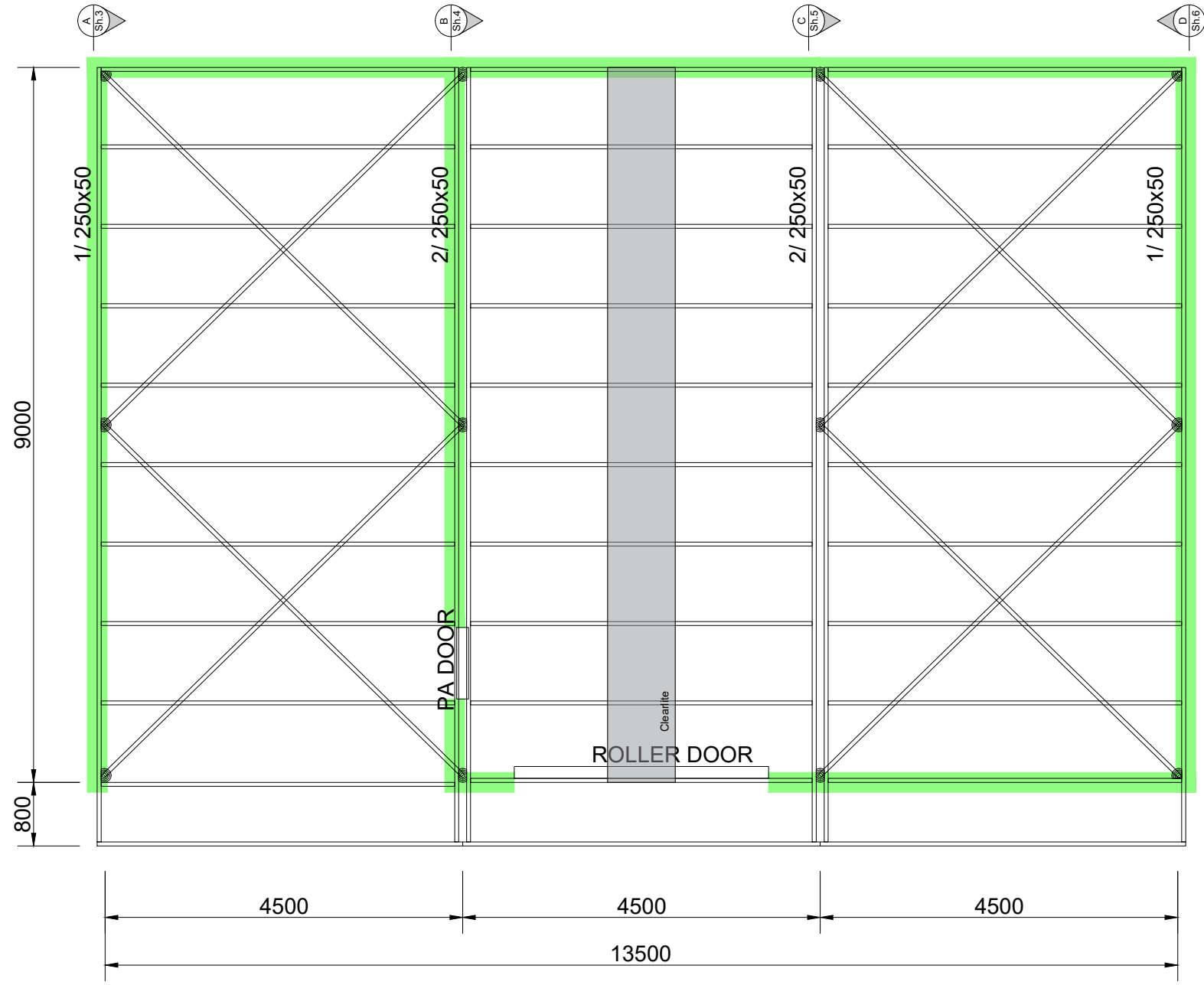
These drawings are the property of MiTek New Zealand Limited and must not be copied or reproduced without permission.

Building Information:

Roof Pitch: 4.4 deg.
 Wind Load: High
 Snow Load: Sg = 0 kPa
 Earthquake Zone: 1
 Timber Grade: SG8
 Bay Spacing: 4500mm
 Column Size: 200x50
 Column Centres: 1000mm
 Girder Size: 200x50, 200x50 (Rear)
 Girder Centres: 1100mm
 Wind Column Size: NA
 Pole Size: 175 LSR
 Pole Embedment: 1000mm
 Rafter Size: 250x50, 250x50 (Internal)
 Rafter Span: 4500mm
 Props Required: NA
 Max Pole Height: 3600mm
 Gov Pole Height: 2900mm
 Floor Type: Earth
 Front Overhang: 800mm Canopy
 Rear Overhang: None

- Legend:**
- = Clad Walls
 - = Column
 - = Pole
 - = Single Row of Tensioned Multibrace

Notes: Order #: G Williams



FNDC - Approved Building Consent Document - EBC-2024-448/0 - Pg 3 of 7 - 6/12/2023

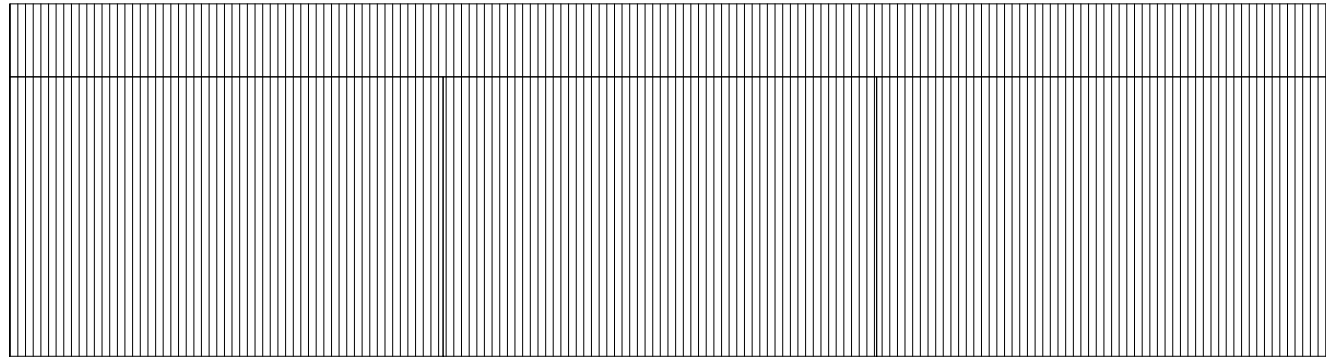


Job Name: Glenn Williams		Plan		Drawing Number: FB83008
Job Site: 132C Waipapa Road, Kerikeri		Date: 25 / 10 / 23		Scale: drawings to scale
Client Name: Richard Duley	Drawn by: Chris Richards	Sheet Number: 1		

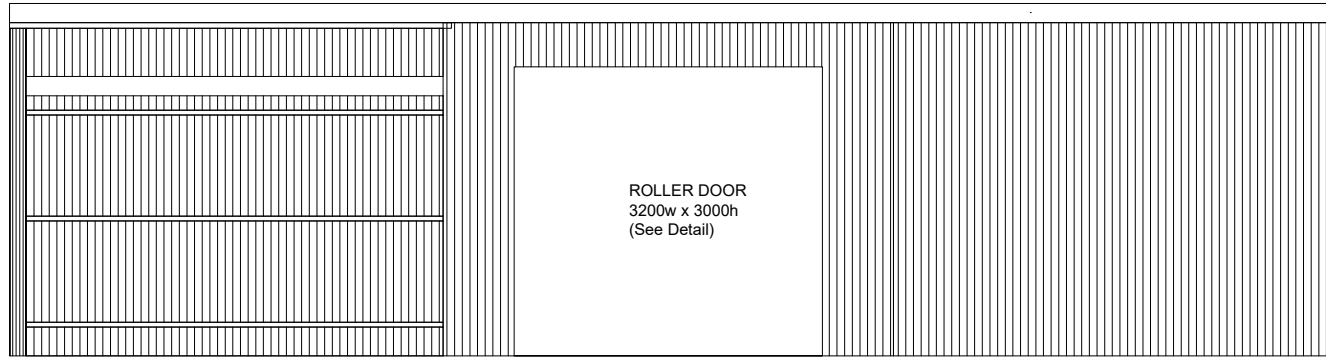
Notes:

NB. This design does not include any design or detail for flashing and/or drainage requirements.

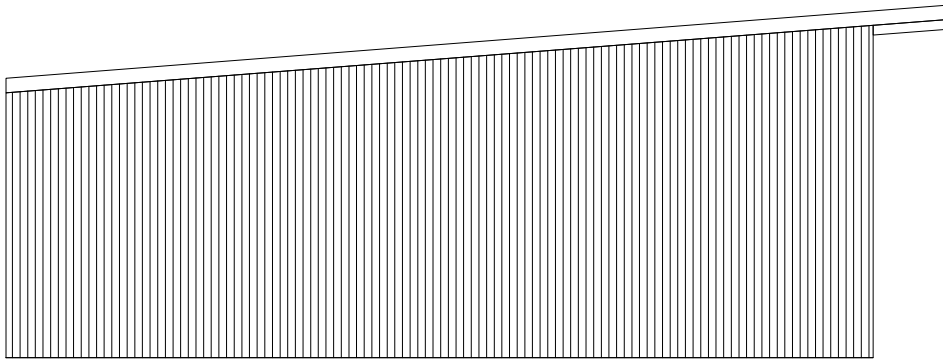
Any Concrete Floor shown is indicative only and not required as part of the structural integrity of the Building.



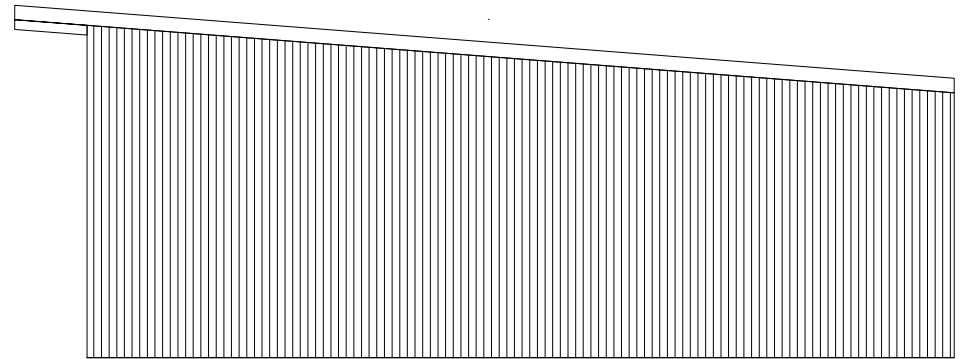
REAR ELEVATION



FRONT ELEVATION



LEFT END ELEVATION



RIGHT END ELEVATION



Job Name: Glenn Williams

Job Site: 132C Waipapa Road, Kerikeri

Client Name:
Richard Duley

Drawn by:
Chris Richards

Date:
25 / 10 / 23

Scale:
drawings to scale

Drawing Number:

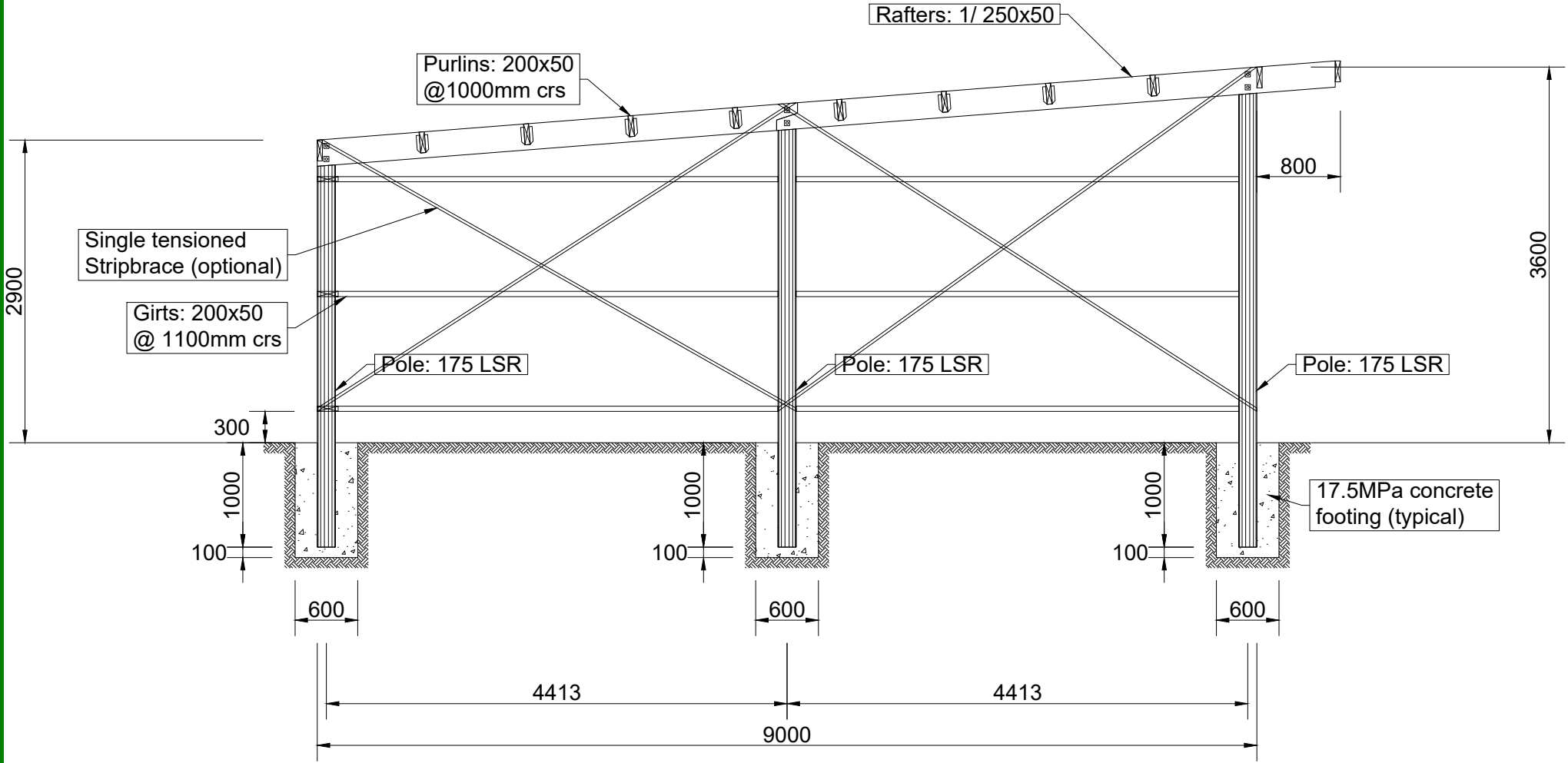
FB83008

Sheet Number:

2

Elevations

Note: Girt pattern may vary, as long as spacings do not exceed 1100mm.

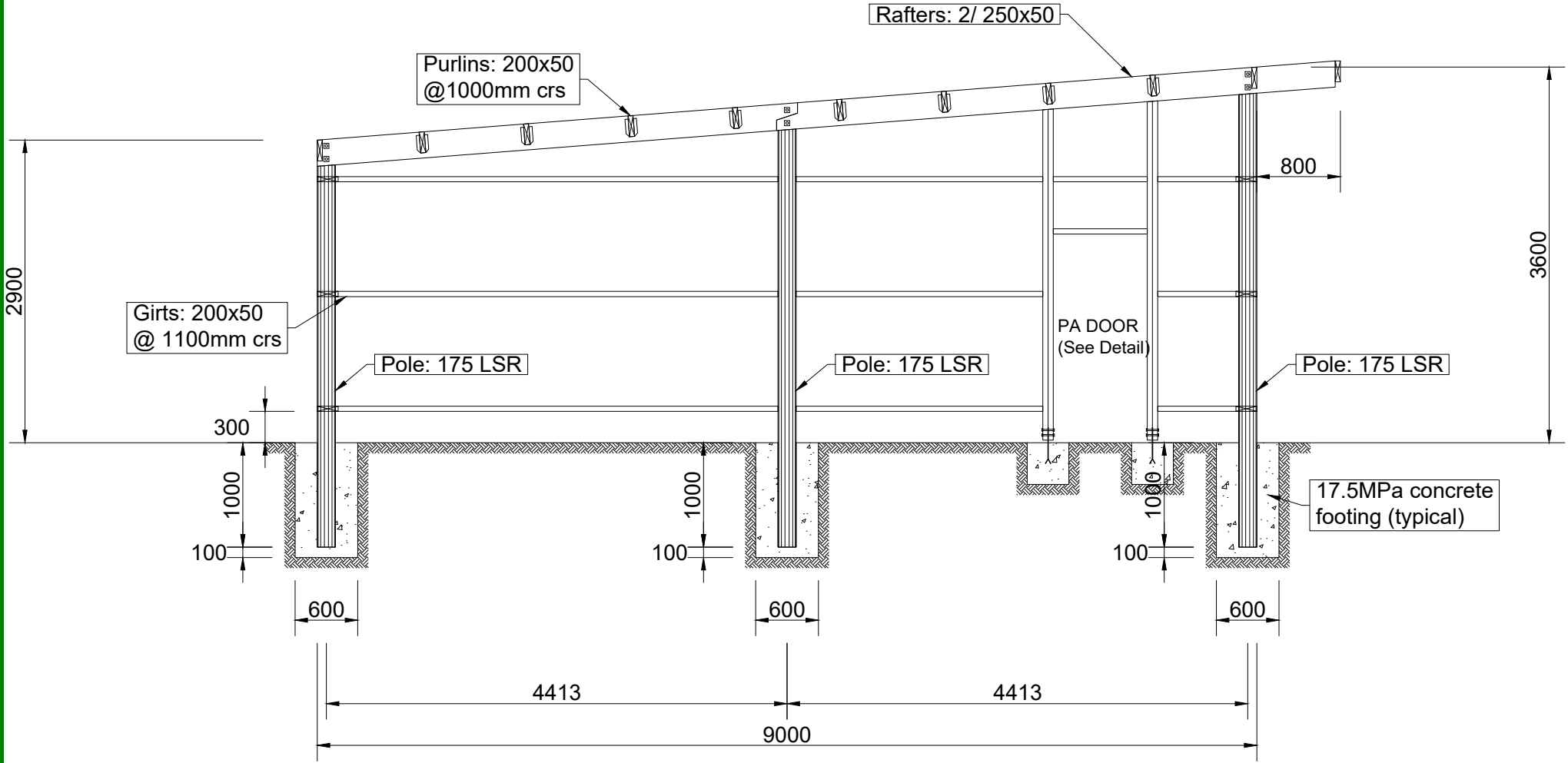


Pitch: 4.4 deg.



Job Name: Glenn Williams		Section A		Drawing Number: FB83008	
Job Site: 132C Waipapa Road, Kerikeri				Sheet Number: 3	
Client Name: Richard Duley	Drawn by: Chris Richards	Date: 25 / 10 / 23	Scale: drawings to scale		

Note: Girt pattern may vary, as long as spacings do not exceed 1100mm.



Pitch: 4.4 deg.



Job Name: Glenn Williams

Job Site: 132C Waipapa Road, Kerikeri

Client Name:
Richard Duley

Drawn by:
Chris Richards

Date:
25 / 10 / 23

Scale:
drawings to scale

Section B

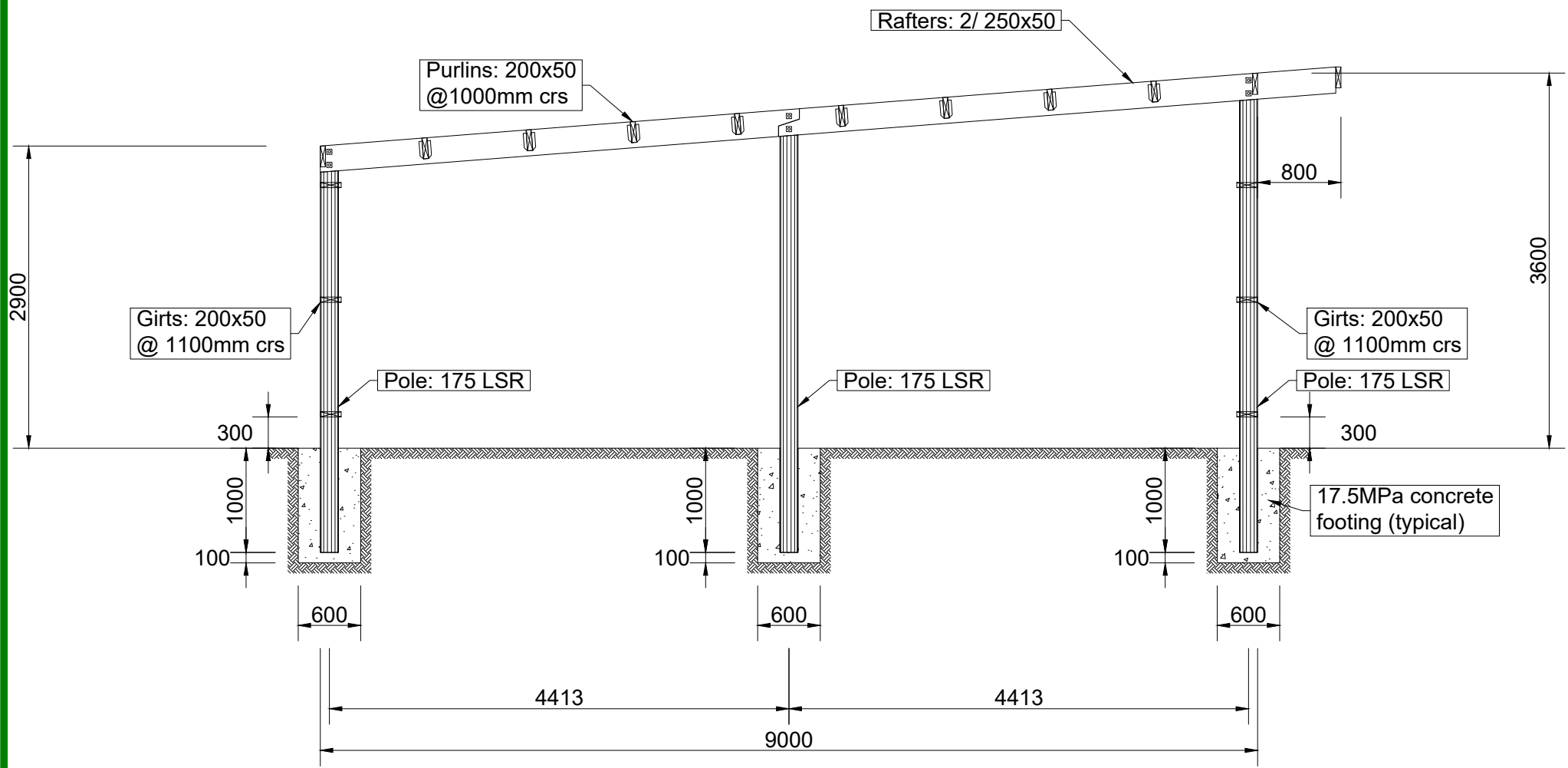
Drawing Number:

FB83008

Sheet Number:

4

Note: Girt pattern may vary, as long as spacings do not exceed 1100mm.

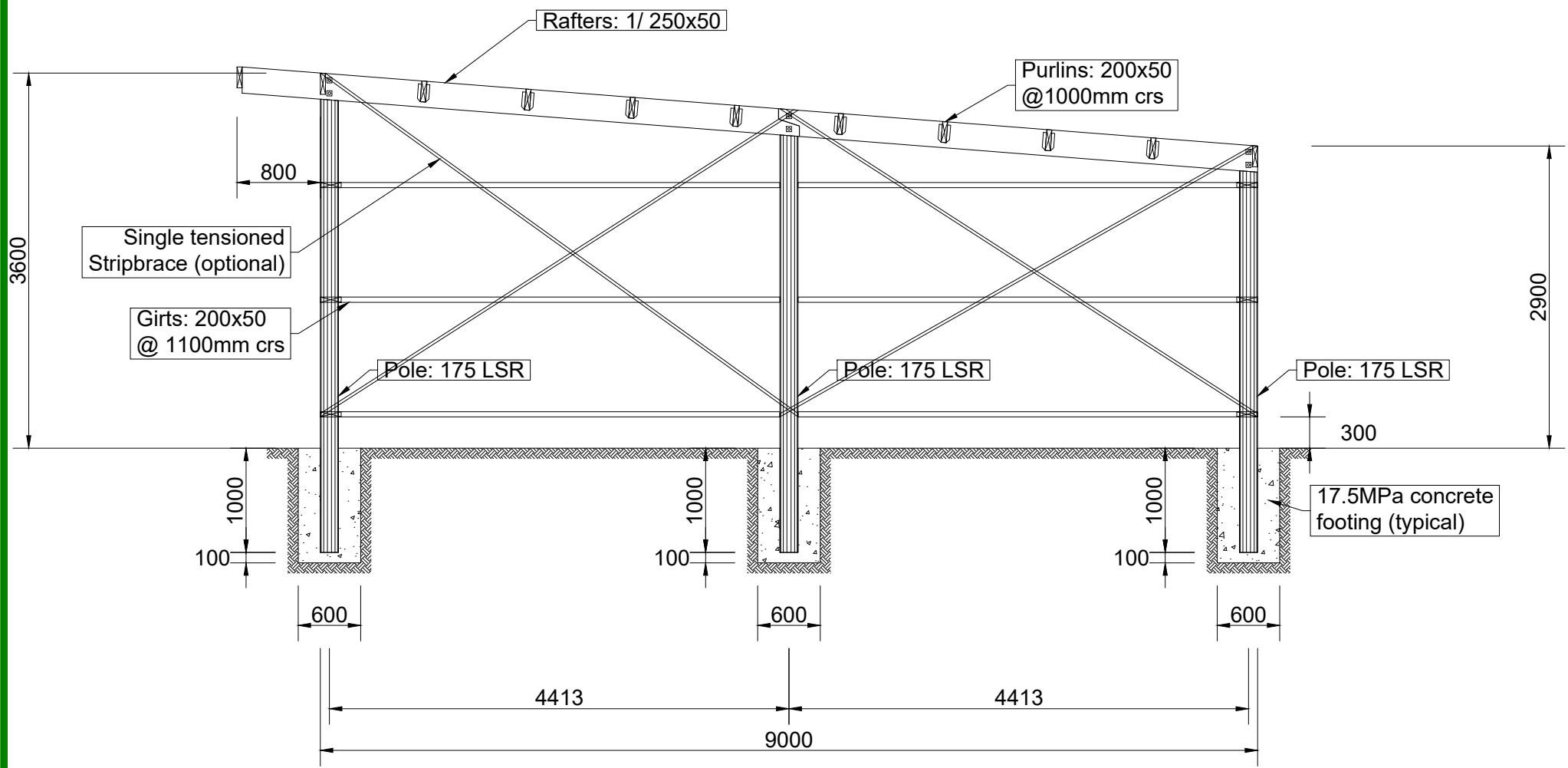


Pitch: 4.4 deg.



Job Name: Glenn Williams		Section C		Drawing Number: FB83008	
Job Site: 132C Waipapa Road, Kerikeri				Sheet Number: 5	
Client Name: Richard Duley	Drawn by: Chris Richards	Date: 25 / 10 / 23	Scale: drawings to scale		

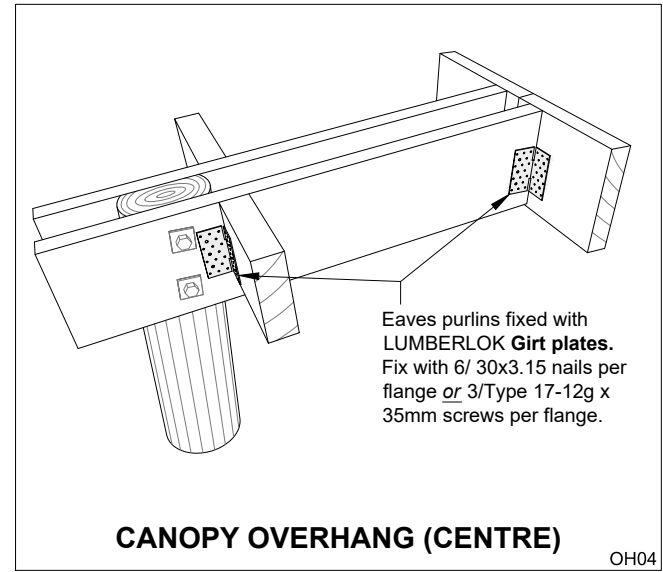
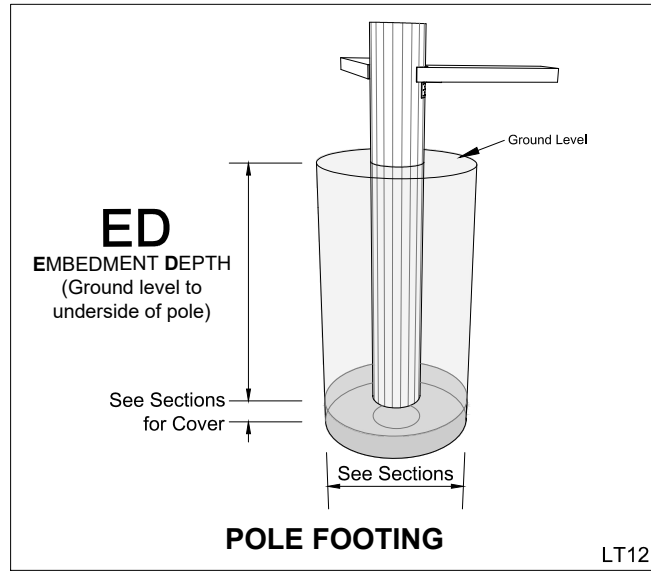
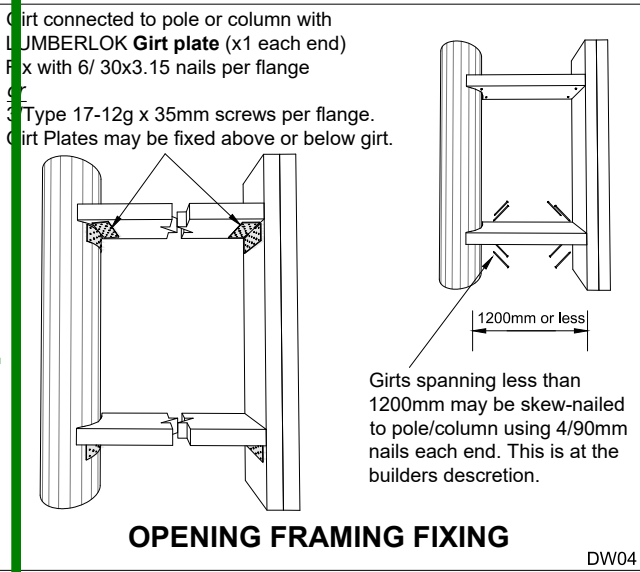
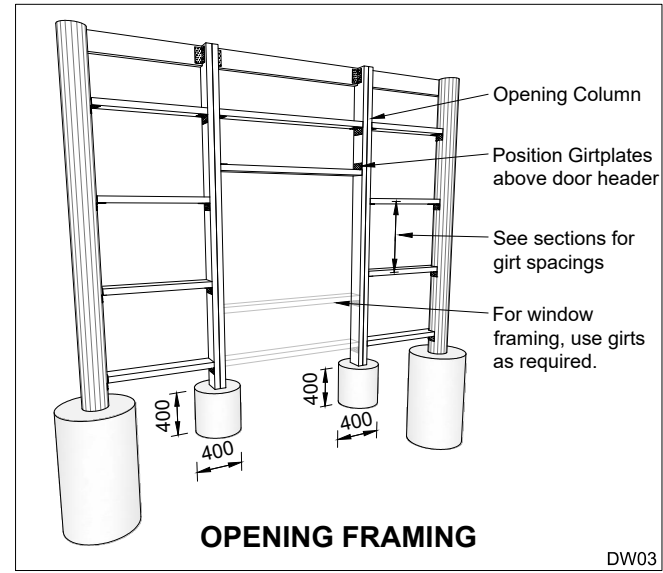
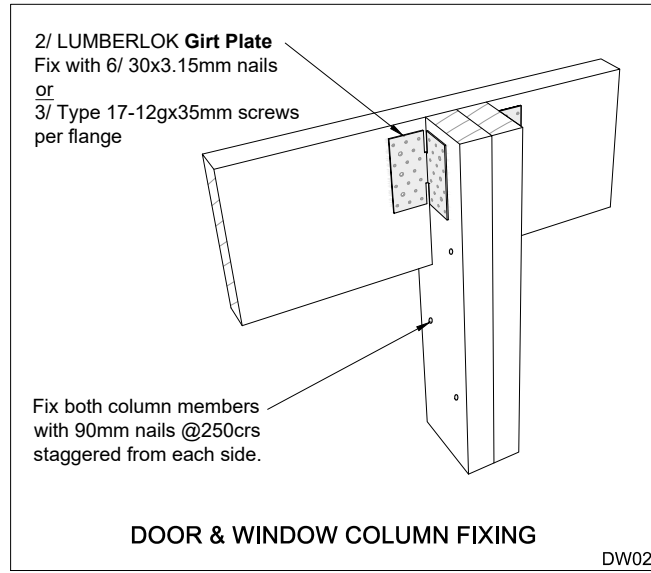
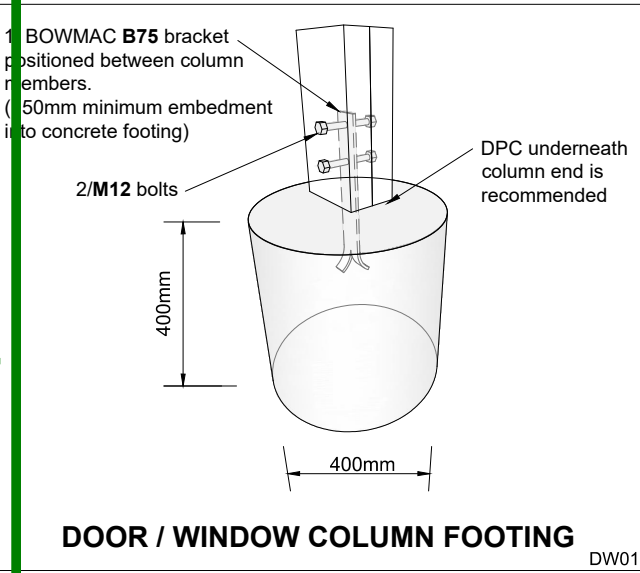
Note: Girt pattern may vary, as long as spacings do not exceed 1100mm.



Pitch: 4.4 deg.



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Job Site: 132C Waipapa Road, Kerikeri				FB83008	
Client Name:	Drawn by:	Date:	Scale:	Sheet Number:	
Richard Duley	Chris Richards	25 / 10 / 23	drawings to scale	6	



Job Name: Glenn Williams

Job Site: 132C Waipapa Road, Kerikeri

Client Name:
Richard Duley

Drawn by:
Chris Richards

Date:
25 / 10 / 23

Scale:
drawings to scale

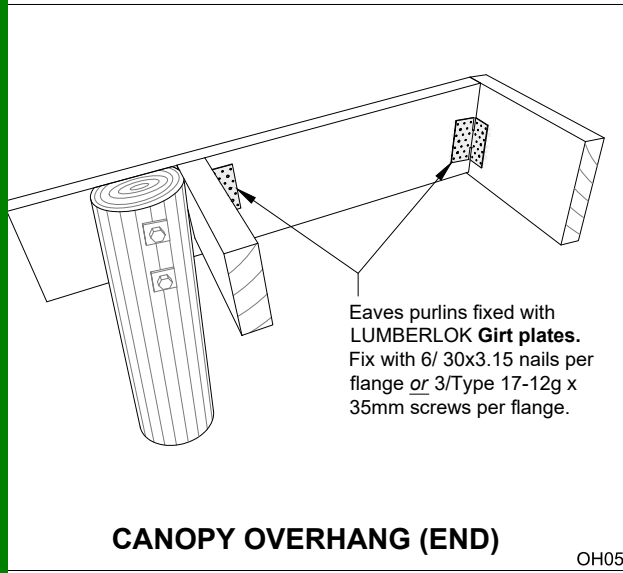
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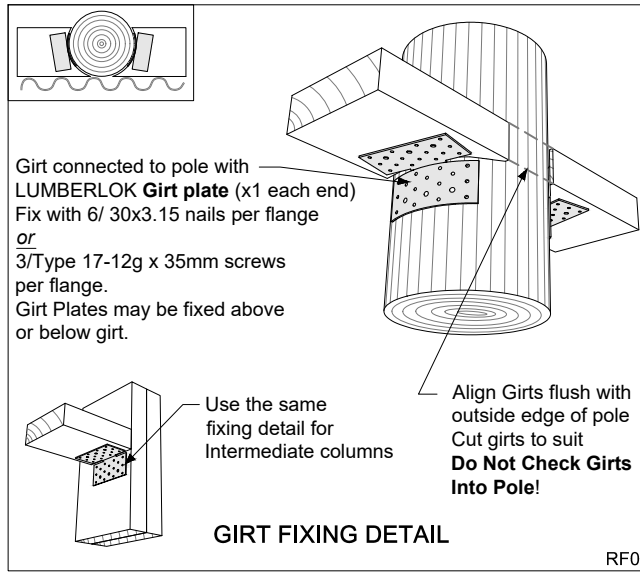
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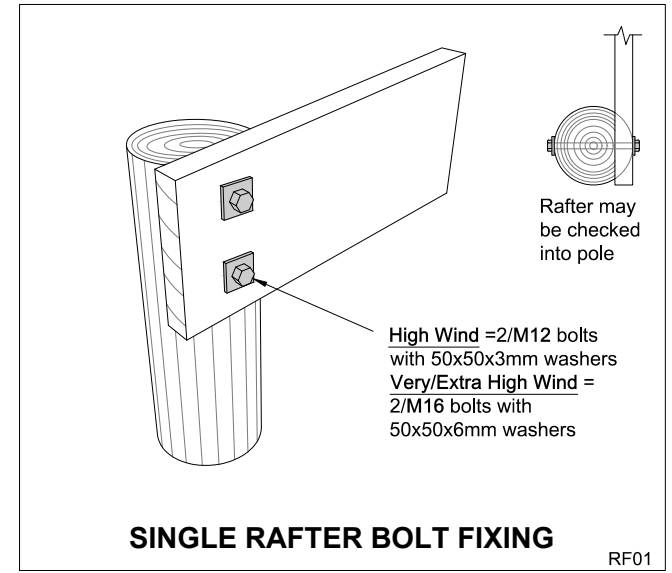
CANOPY OVERHANG (END)

OH05



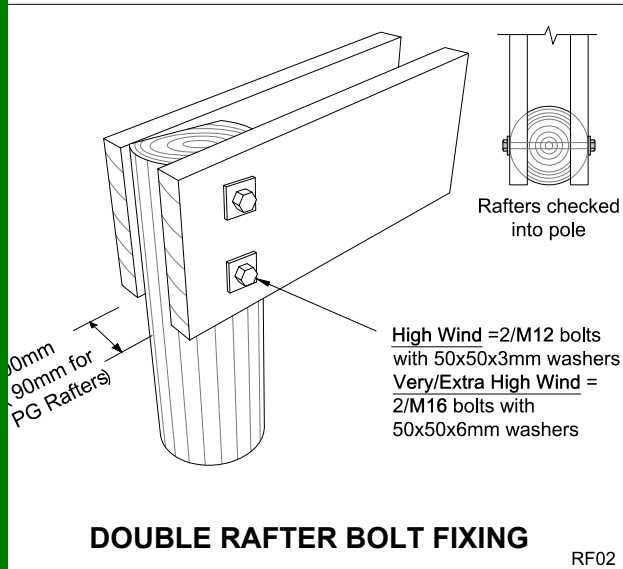
GIRT FIXING DETAIL

RF09



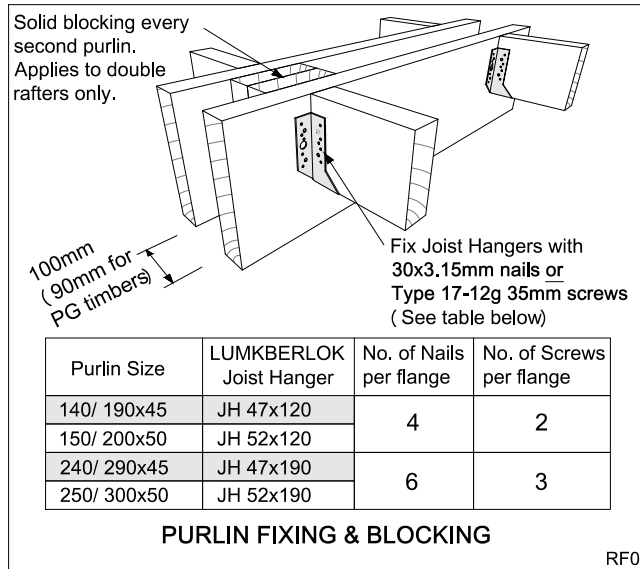
SINGLE RAFTER BOLT FIXING

RF01



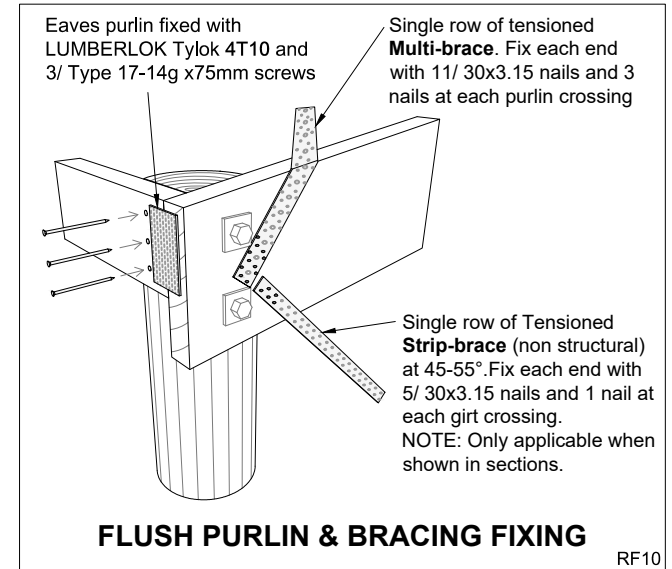
DOUBLE RAFTER BOLT FIXING

RF02



PURLIN FIXING & BLOCKING

RF08



FLUSH PURLIN & BRACING FIXING

RF10



Job Name: Glenn Williams

Job Site: 132C Waipapa Road, Kerikeri

Client Name:
Richard Duley

Drawn by:
Chris Richards

Date:
25 / 10 / 23

Scale:
drawings to scale

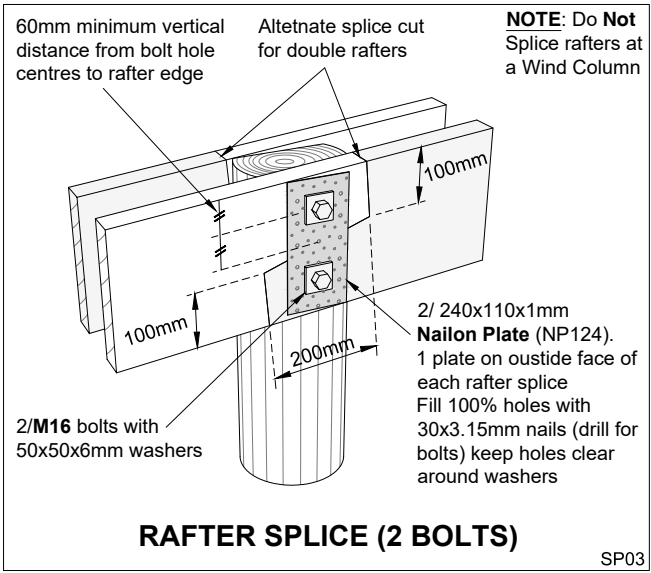
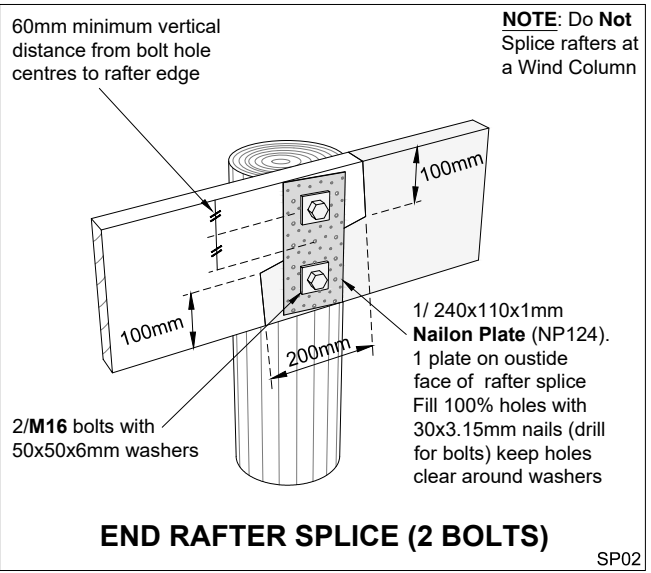
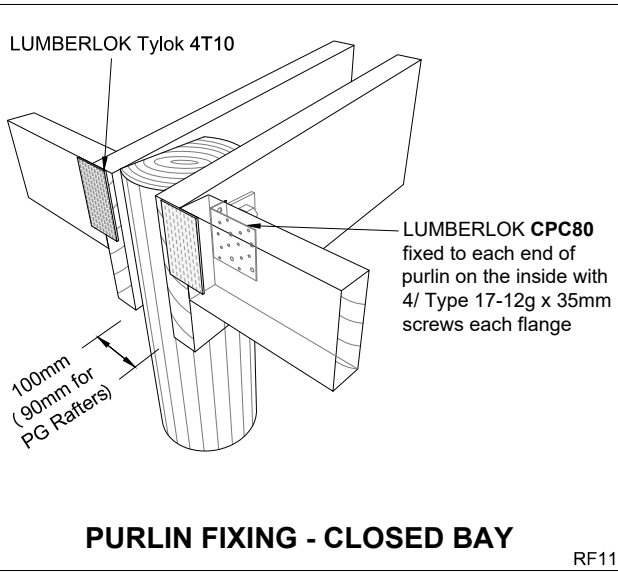
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Details



Job Name: Glenn Williams

Job Site: 132C Waipapa Road, Kerikeri

Client Name:
Richard Duley

Drawn by:
Chris Richards

Date:
25 / 10 / 23

Scale:
drawings to scale

Details

Drawing Number:

FB83008

Sheet Number:

9



— Shed (13.5 x 9 = 121.5m²)



— Gravel Driveway and concrete turning pad



— Distance from back boundary - 7m



— Distance from side boundary - 4.5m

● — Down pipes x2 = 80mm

● — Water tank

— Overflow water to discharge point

Address of property - 132c Waipapa Road, Kerikeri
 Legal Description = Lot 1 on DP 365914 (Title included in application documents)
 Registered owners - Glenn Llewellyn Williams and Katherine Gaye Noakes

Specifications for Pole Sheds supplied by Farm & BuildLink Kawakawa

- All Timber for Rafters, Purlins & Girts – SG8 Grade treated to H3.2
- Where LVLs Used within an enclosed building, treated to H1.2
- All Poles treated to H5
- Fastenings supplied as per detail in Mitek Plans
- Roofing & Cladding supplied in .4mm NZ Steel Colour Steel Endura or Zinalume, (unless specified)
- Flashings the same, in.55mm.
- Profile used either Trim rib (less than 8' pitch) or Corrugate.
- Fixings - 65mm Timbertek Screws in Trim rib Profile, 55mm in Corrugate (Walls pan fastened with 25mm)
- Spouting is not a requirement for a Farm Shed, but when requested by client shall be PVC Marley Classic or 125mm Steel Box Gutter with 80mm Downpipe, (1 per 100sqm as per Marley specification)

METALCRAFT T-RIB

PURPOSE

Metalcraft Roofing supplies Metalcraft T-Rib for use as a roof and horizontally and vertically laid wall cladding.

EXPLANATION

Metalcraft T-Rib is an asymmetrical trapezoidal, long-run steel sheet. Fabricated from steel manufactured by NZ Steel, the sheets come in various protective coatings to ensure they withstand NZ's exposure zones. They are available in the full range of Colorsteel® colours.

Metalcraft T-Rib sheets are available in the following New Zealand (NZ) Steel branded products:

- › Colorsteel® Endura®
 - › Galvsteel®
 - › Colorsteel® Maxx®
 - › Zinalume®
- The sheets are available in the following sizes:
- › Thickness (mm): 0.40 and 0.55
 - › Width (mm): Cover – 760, Sheet – 810.



Figure 1: Profile Dimension (nominal)

SCOPE AND LIMITATIONS OF USE

Scope	Limitations
Location	
› In all wind zones as defined in NZS 3604:2011 and in all calculated design loads.	› Metalcraft T-Rib load spans apply in wind zones up to and including extra high. › Where the calculated design loads exceed 2.5kPa the engineer must satisfy themselves that the product, pitch and fixings will meet the conditions.
› In all exposure zones as defined by NZS 3604:2011.	› In exposure Zone D only Colorsteel® Endura® or Colorsteel® Maxx® may be used. › For use in microclimatic considerations (as defined in paragraph 4.2.4) refer to Metalcraft Roofing for technical advice. › For more information on the specific exposure zones refer to www.colorsteel.co.nz .
› On buildings located any proximity to a relevant boundary.	› Metalcraft T-Rib is non-combustible.
Building	
› On timber or steel structural framing.	› Where Metalcraft T-Rib is used in an insulated building and in conjunction with steel framing, a thermal break is required.
› In conjunction with a primary structure that complies with the NZ Building Code or where the designer has established that the existing structure is suitable for the intended building work.	› Building height is limited by the Metalcraft T-Rib design load span tables (refer to: www.metalcraftgroup.co.nz) or specific engineering, where applicable.
› As a wall cladding.	› A drained and ventilated cavity is always required unless the building is unlined or importance level 1, in which case the Metalcraft T-Rib may be direct fixed. › Flashings, flexible and rigid building underlays and Metalcraft T-Rib fixings must be in accordance with E2/AS1 and/or the NZMRM Code of Practice (V3.0). › Contact with other materials must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0).
› As a roof cladding.	› Metalcraft T-Rib lengths ≤40 m must be installed on a roof with a minimum pitch of 3°. › Metalcraft T-Rib lengths >40 m and <60 m must be installed on a roof with a minimum pitch of 4°. › A potable water collection system may be installed. › Flashings, flexible and rigid building underlays and Metalcraft T-Rib fixings must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0). › Contact with other materials must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0).

NZ STEEL ASSURANCE

- › Australasian registered Environmental Protection Declaration (EPD); compliant with EN 15804.
- › ISO 9001:2015. Telarc No.82
- › ISO 14001:2015. Telarc No. 63.

PERFORMANCE CLAIMS

If designed, installed and maintained in accordance with all Metalcraft Roofing requirements, Metalcraft T-Rib will comply with or contribute to compliance with the following performance claims:

VERSION: 3.1

PERFORMANCE CLAIMS CONTINUED

NZ Building Code clauses	BASIS OF COMPLIANCE	
	Compliance pathway	Demonstrated by
B1 Structure B1.3.1, B1.3.2, B1.3.3 (a, b, c, d, g, i)	ACCEPTABLE SOLUTION B1/AS1	<ul style="list-style-type: none"> Steel in accordance with AS 1397:2021, which is equivalent to AS 1397:2011 for the NZ Steel steel. AS 1397 is cited in NASH Standard Part 1:2016 and NASH Standard Part 2:2019 (BlueScope, 2016). Metalcraft span tables in accordance with AS/NZS 1170.
B2 Durability B2.3.1 (b), B2.3.2 (b)	VERIFICATION METHOD B2/VM1	<ul style="list-style-type: none"> Steel in accordance with AS 1397:2021, which is equivalent to AS 1397:2011 for the NZ Steel steel. AS 1397 is cited in NASH Standard Part 1:2016 and NASH Standard Part 2:2019 (BlueScope, 2016). Coating to AS 2728, which is cited in E2/AS1. (BlueScope, 2013) NZ Steel and their parent company BlueScope provides assurance that when correctly installed and maintained, their products will meet or exceed NZ Building Code B2: Durability.
B3 Fire Affecting Areas beyond the Fire Source B3.4 (a), C3.7 (a)	ACCEPTABLE SOLUTION C/AS1 C/AS2	<ul style="list-style-type: none"> Steel is defined in C/AS1 and C/AS2 as non-combustible. Non-combustible products achieve a material group number 1.
B2 External Moisture E2.3.1, E2.3.2, E2.3.7 (a, b, c)	ALTERNATIVE SOLUTION	<ul style="list-style-type: none"> E2 comparison (TBB, 2022). Largely in accordance with E2/AS1
B2 Hazardous Building Materials B2.3.1	ALTERNATIVE SOLUTION	<ul style="list-style-type: none"> Steel in accordance with AS 1397:2021, which is equivalent to AS 1397:2011 for the NZ Steel steel. (BlueScope, 2016). Use in accordance with manufacturer's safety requirements.

Other performance statement	BASIS OF STATEMENT	
	Performance statement	Demonstrated by
Metalcraft T-Rib will not contaminate potable water.	AS/NZS 4020:2005	<ul style="list-style-type: none"> Claimed by manufacturer: NZ Steel. BRANZ statement that metal roof suitable refer to www.level.org.nz/water/water-supply/mains-or-rainwater/harvesting-rainwater.

SOURCES OF INFORMATION

- BlueScope (2016). *Specification clauses for steel to ensure compliance with relevant Australian standards/regulations*. Refer <http://www.steel.com.au/library>. [Accessed 27/02/2022].
- BlueScope (2013). *New Colorbond® steel*. Refer <http://www.steel.com.au/articles/article-44--new-colorbond-steel>. [Accessed 27/02/2022].
- BRANZ. (20/05/2020). *Harvesting rainwater*. Refer <https://www.level.org.nz/water/water-supply/mains-or-rainwater/harvesting-rainwater/>. [Accessed 27/02/2022].
- EPD Australasia. (23/10/2018). *Colorsteel®, Endure®, Colorsteel Maxx® Environmental Product Declaration*. Refer <https://epd-australasia.com/epd/colorsteel-endura-and-colorsteel-maxx/>. [Accessed 27/02/2022].
- NZ Steel. (10/2018). *Maintenance recommendations brochure V4.0*. Refer <https://www.colorsteel.co.nz/resources/downloads-and-brochures/>. [Accessed 27/02/2022].
- NZ Steel. (2022). *Zincalume® steel features*. Refer <https://www.nzsteel.co.nz/products/zincalume/features/>. [Accessed 27/02/2022].
- NZ Metal Roof Manufacturer's (NZMRM) (06/2018, Amend 12/2021). *Code of Practice V3.0*. Refer <https://www.metalroofing.org.nz/codeonline>. [Accessed 27/02/2022].
- Telarc (14/08/2019). *ISO 9001:2015 The design, manufacture and supply of hot and cold rolled steel plate, sheet and strip, and coated, steel coil and flat sheet. No 82*. Refer <https://www.nzsteel.co.nz/new-zealand-steel/responsibilities/certificates-and-memberships/> [Accessed 28/02/2022].
- Telarc (24/07/2003). *ISO 14001:2015 The management of environmental aspects associated with the operation of: the Glenbrook Mill Site; the Waikato North Head Iron Sand Quarry; Pacific Steel NZ Ltd – Wire Mill; Pacific Steel NZ Ltd – Rolling Mill. No. 63*. Refer <https://www.nzsteel.co.nz/new-zealand-steel/responsibilities/certificates-and-memberships/> [Accessed 28/02/2022].
- TBB (02/2022). *E2 comparison V1.0*.

- Where a standard is referenced it is to be read as amended by the acceptable solution or verification method as applicable.
- Sources of information also include the Building Act 2004 and its regulations, including the Building Code (Schedule 1 of the Building Regulations 1992), Acceptable Solutions and Verification Methods, and relevant cited standards.
- The quality and assurance that the supplied products meet the performance claims stated in this pass™ are the responsibility of the company that is the holder of this pass™
- Where E2/AS1 is referenced it is to be read as including E2/AS4.

Scan or click this QR code for a full download of Compliance Documentation for this pass™.

www.metalcraftgroup.co.nz



Metalcraft Roofing confirms that if Metalcraft T-Rib is used in accordance with the requirements of this pass™ the product will comply with the NZ Building Code and other performance claims set out in this pass™ and the company has met all of its obligations under s14 G of the Building Act.

Date of first issue: 28/03/2019

Date of current issue: 16/03/2022

NZBN: 9429032461152

Kevin Brunton

Kevin Brunton, Technical Director, TBB confirms that this pass has been prepared on behalf of Metalcraft Roofing and in accordance with MBIE PTS guidelines and in accordance with the TBB pass™ process which is within the scope of TBB's ISO 9001 certification.

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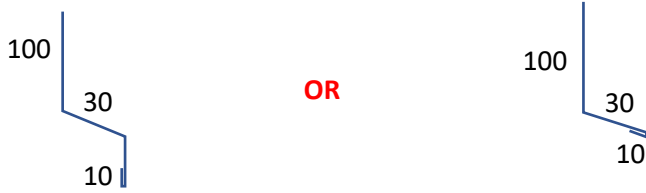
For more information visit www.metalcraftgroup.co.nz.

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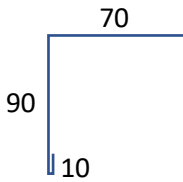
FNDC - Approved Building Consent Document - EBC-2024-44810 - Pg 15 of 17 - 6/12/2023 - J.O

Shed Flashings

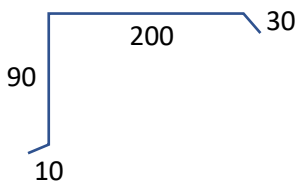
Vermin (Base)



Gutter (to fix gutter to rear wall)



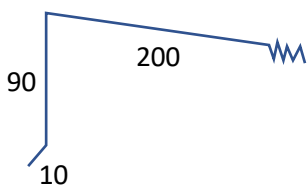
Starter Barge (side)



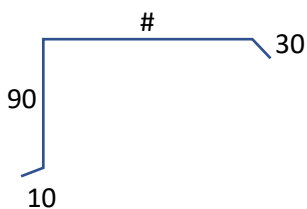
Corner Flashings (to measure)



Head Barge (apex)

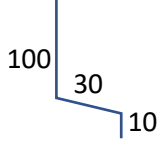


Finishing Barge (to measure)

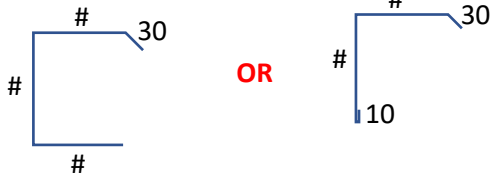


PA Door Flashings

Head

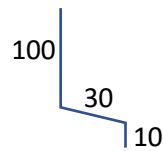


Door Jamb

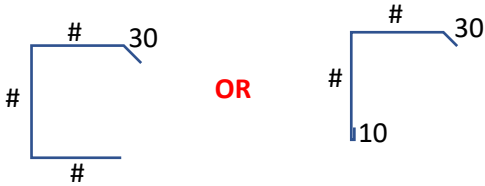


Roller Door Flashings

Head



Roller Door Jambs



Geotechnical Memorandum

To: Glenn Williams Date: 12 September 2023

Care of: Katherine Noakes Ref: 129003

Site: Lot 1 DP 365914, 132C Waipapa Road, Kerikeri

Re: Geotechnical Investigation for Proposed Timber Pole Shed

INTRODUCTION

Wilton Joubert Limited (WJL) was engaged to undertake a geotechnical assessment of ground conditions at the above site to support a Building Consent application for a Proposed Timber Pole Shed at 132C Waipapa Road, Kerikeri.

The subject site is located at 132C Waipapa Road, Kerikeri and is legally described as Lot 1 DP 365914. The proposed development will be constructed on level ground in the southwestern corner of the property, approximately 40m west of the existing dwelling and garage. Refer Figure 1. We understand that access to the proposed timber shed will be from the existing gravel driveway as indicated on our site plan attached to this memorandum.

The purpose of this geotechnical memorandum is to review the supplied development proposals as communicated by our client, against our on-site assessment and provide geotechnical foundation parameters to support the building consent application of a proposed new shed. WJL have been supplied with a plan set, including a Floor Plan and Elevations, detailing the proposed new shed on site, prepared by Versatile®, dated: 07/07/2023, although, we understand the client will be using Farm & BuildLink Kawakawa for the construction of this development.



Figure 1: Site Photo Overlooking Proposed Shed Platform. Orange Cones are Indicative of Field-Testing Locations.

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

PROPOSED DEVELOPMENT

It is proposed to construct a ~120m² timber-pole shed in the southwestern corner of the property. The superstructure will primarily be supported by timber poles, bored into the ground and encased with concrete while the floor is to comprise a concrete slab. Due to the level nature of the site, only minor earthworks are expected to prepare a level building platform prior to excavating foundations.

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Figure 2: Excerpt of Supplied Development Drawings showing Proposed Elevations of the Shed.

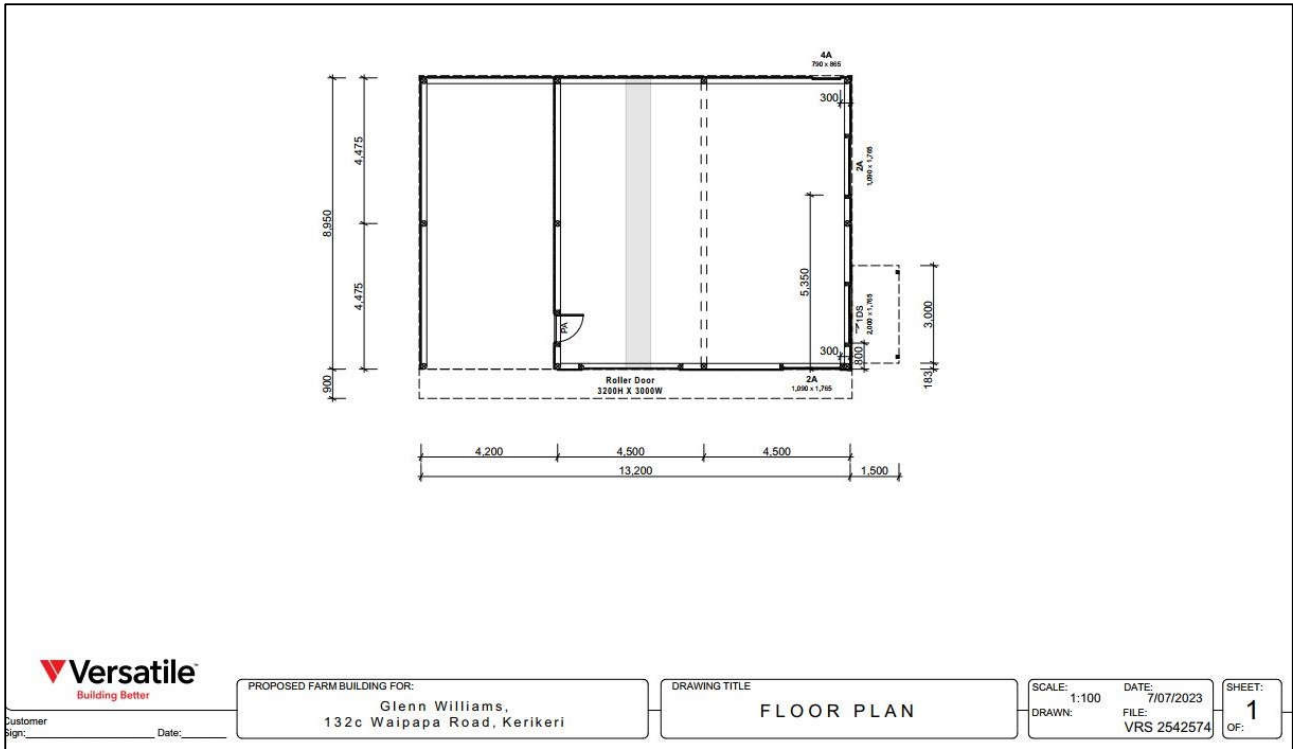


Figure 3: Excerpt of Supplied Development Drawings showing Proposed Floor Plans for Shed.

GEOTECHNICAL REVIEW

Two hand auger boreholes (HA) were undertaken within the proposed building platform which encountered between 0.15m-0.20m of TOPSOIL overlying Kerikeri Volcanic material comprising very stiff, fine to coarse gravelly and clayey SILTs. This material was classified as Moderately Expansive ($\gamma_s=44\text{mm}$) based on the above geology and our experience within these subsoils.



Figure 4: Photo of HA01. 0.0m-1.0m Depth.

Considering the small size of the subject site, along with the low plasticity subsoils encountered specifically within our investigated boreholes (HA01-HA02), for the purposes of this development, we consider these boreholes to be representative of the soil conditions expected to be found across the overall building platform. Refer Figure 4 above.

SHALLOW FOUNDATION BEARING

Subject to confirmation by careful geo-professional inspections of exposed ground conditions prior to the placement of any construction materials, we consider that the natural inorganic soils and/or any engineer certified fill should be capable of providing the following foundation bearing characteristics in keeping with NZS3604:2011 and its prevailing amendments:

Geotechnical Ultimate Bearing Capacity	300 kPa
ULS Dependable Bearing Capacity ($\Phi=0.5$)	150 kPa

SHALLOW FOUNDATION SOIL EXPANSIVITY

Given that the soils are considered to lie outside the shrink-swell characteristics of “good ground” as per NZS3604 and the changes introduced to the NZ Building Act by amendment 19, the design of shallow foundations is no longer covered by that standard, and care must be taken to mitigate against the potential seasonal shrinkage and swelling effects of expansive foundation soils on both superstructures and the floor. The proposed use of concreted poles bored to sufficient embedment depth to generate cantilever action is expected to overcome any adverse shrink swell effects on the pole foundations, but design of shallower slab thickenings and the slab itself should be consideration with respect to the effects of Class M soil expansivity.

The attached calculations indicate that Class M expansive soil effects can be ameliorated to those of “Good Ground” by undercutting the Class M soils to a depth of 0.37m, and replacing those soils with non expansive compacted hardfill.

LIQUEFACTION ASSESSMENT

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

A commonly accepted definition is: “Areas susceptible to liquefaction generally correspond with geologically young deposits (less than 10,000 years) located in relatively flat areas close to active or abandoned waterways, in coastal or estuarine areas, and/or areas of uncompacted or poorly compacted fill”.

A screening procedure based on geological criteria was adopted to examine whether the subject site might be susceptible to liquefaction, as follows:

- There are no known active faults traversing through the property,
- There is no historical evidence of liquefaction at this location,
- The proposed building platform is elevated above ponding and natural drainage features,
- High in-situ measured vane shear strength readings recorded during our investigation,
- The subsoils at the building site are part of Kerikeri Volcanic Group soils being ~9.7-1.8 million years of age, allowing for adequate consolidation in comparison to Holocene age material (10,000 years), this corroborates with the high shear vane and DCP readings at the refusal depths of around 1.3m-1.4m recorded during our investigation, and
- The surficial soil comprising gravelly silts and clayey silts (i.e. cohesive soils), which are not generally considered susceptible to liquefaction.

Based on the above, we conclude that the soils at the building site have a negligible risk of liquefaction susceptibility and liquefaction damage is therefore unlikely.

CONCLUSIONS

Based on our review of the provided drawings, it is our Professional Opinion that the current development proposals as described above are generally commensurate with the ground conditions assessed on-site with and with respect to the geotechnical aspects of the proposed development, and provided they satisfy our recommendations provided herein, we consider that they should not be exposed to unsatisfactory geotechnical risk.

To address issues associated with moderately expansive soils, our recommendations for foundation solutions for this structure are as follows:

- **For a Raft Slab Foundation System:**
 - A specifically designed reinforced concrete stiffened raft designed for a Class M Ys value of 44mm founded on 0.10m of engineered hardfill, or
 - A specifically designed reinforced concrete stiffened raft designed for a Class S Ys value of 22mm founded on 0.60m of engineered hardfill
- **For a less robust conventional Slab-on-Grade with Strip and/or Pad Footings:**
 - A minimum foundation embedment of 0.45m below finished ground level with the slab sitting on hardfill undercut to 0.45m below underside of slab.

If any uncontrolled fill is encountered within the building platform, it is unable to be used to support foundation loads.

Piled foundations will need to be taken below any fill material and embedded at least 0.30m into stiff natural ground, or a minimum of 0.6m below final cleared ground level, whichever is deeper.

Seismic Sub-Soil Class

In accordance with New Zealand Standard 1170.5 Section 3.1.1, the site subsoil site classification is determined to be Category C – Shallow soil sites.

Foundation Care & Maintenance

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

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

- their presence can induce differential consolidation settlements beneath foundations through localised soil water deprivation, or conversely.
- foundation construction too soon after their removal can result in soil swelling and raising foundations as the soils rehydrate.
- To this end, care should be taken to avoid having significant trees positioned where their roots could migrate beneath the house foundations, and
- constructing foundations on soils that have been differentially excessively desiccated by nearby trees, whether still existing, or recently removed.

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

STORMWATER AND SURFACE WATER CONTROL

Stormwater run-off from the development should be appropriately controlled and managed on-site in accordance with the New Zealand Building Code and where applicable as per Council requirements. The Development Designer should confirm compliance with all the above.

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

Runoff from any higher ground should be intercepted by means of shallow surface drains or small bunds to protect the building platforms from both saturation and erosion. Water collected in interceptor drains should be diverted away from the building site to a disposal point as appropriate.

All stormwater run-off from roofed and paved areas as well as tank overflows, must be collected and discharged in a controlled manner to an appropriate outfall point clear of obstruction.

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

LIMITATIONS

This memorandum is intended to serve as a development review of the plans provided and is anticipated to be submitted to Council in support of a Building Consent application. Should proposals change from those supplied, these should be submitted to WJL for further review.

This report has been prepared solely for the use of our Client, Glenn Williams, with respect to both the particular brief and specific purpose provided to Wilton Joubert Ltd. (WJL), with regard to the specific project described herein. Both no liability or any duty of care is acknowledged or accepted for the use of any part of this report in any other context or for any other purpose, or by any other person, other party or entity.

This document is both the property and copyright © of WJL. Any unauthorised employment or reproduction, in full or part is forbidden. This report may not be read or reproduced other than in its entirety. This report does not address matters relating to the National Environmental Standard for Contaminated Sites. The opinions, recommendations and comments given in this report are the result from the application of accepted industry methods of site investigation.

As factual evidence has been obtained solely from boreholes, shear vane tests and Scala penetrometer tests which by their nature only provide information about a relatively small volume of subsoils at that exact location, there may be special conditions pertaining to this site which have not been disclosed by the investigation and which have not been taken into account in our report. Inferences are made about the nature and continuity of subsoils away from and beyond the testing locations but cannot be guaranteed. The descriptions detailed on the exploratory bore logs are based on the field descriptions of the soils encountered. In determination of expansive soils, WJL has based this on visual inspection, should local council or client require specific testing, this can be undertaken on request.

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 in the subsoil occur which differ from that described or assumed to exist, and then the matter should be referred back to WJL immediately.

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

outside the limits given in this report. All future owners of this property should seek professional geotechnical advice to satisfy themselves as to its ongoing suitability for their intended use.

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

Prepared By:



Nikora Ngaropo
Engineering Geologist
(BSc (Geol))

Reviewed By:



Nick Anson
Geotechnical Engineer
(BE(Civil), MEngNZ)

Reviewed & Approved by:



Simon Woodward
Senior Geotechnical Engineer
(ME (Civil), CPEng, CMEngNZ)

Encl:

Site plan 129003-C200 (1 sheet)

Hand auger Borehole Records (2 sheets)

Dynamic Cone Penetrometer Records (1 sheet)



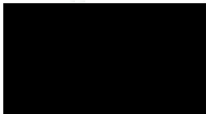
Expansive Soil Modulation Calculations (1 sheet)

CSIRO Foundation Maintenance and Footing Performance (4 sheets)

Engineering NZ Construction Monitoring Matrices (1 sheet)

SITE Lot 1 DP 365914, 132c Waipapa Road, Kerikeri
PROJECT Proposed Shed Addition
CLIENT Glenn Williams
REFERENCE NO. 128040
DOCUMENT Stormwater Mitigation Report
STATUS/REVISION No. A
DATE OF ISSUE 10th August 2023

Report Prepared For	Email
Glenn Williams	Glenn@starke.co.nz

Authored by	K. Mitchell <i>(BSc Geol, PGDipSci Env Mgmt)</i>	Engineering Geologist	keavy@wjl.co.nz	
Reviewed by	P. McSweeney <i>(BE(Hons) Civil)</i>	Civil Engineer	patrick@wjl.co.nz	
Approved by	B. Steenkamp <i>(CPEng, BEng Civil, BSc Geology)</i>	Civil Group Manager	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 1 DP 365914	
Site Area:	5,001m ²	
Development Proposals Supplied:	Proposed to build a new shed in the south-western corner of the property	
District Plan Zone:	Rural Living	
Permitted Activity Coverage:	<u>12.5% or 3,000m²</u>	
Impermeable Coverage:	Existing Dwelling Roof Area	222 m ²
	Existing Garage Roof Area	57m ²
	Existing Driveway	269 m ²
	Proposed Shed Roof Area	130m ²
	Proposed Driveway Area	180m ²
	Total impermeable area = 858m ² or 17.1% of the site area.	
Activity Status:	<u>Controlled Activity</u>	
Attenuation:	Attenuation is to be provided in accordance with the requirements outlined in Section 4 via proposed flow attenuated outlets in a new stormwater tank, next to the proposed shed.	
	Proposed Tank – 1 x 25,000 Rainwater Tank	
	Dimensions - 3600mmØ x 2600mm high	
	10% AEP Control Orifice – 27mmØ orifice; located <u>1100mm below the overflow outlet</u>	
	1% AEP Control Orifice – 18mmØ orifice; located <u>700mm above the 10% AEP Control Orifice</u>	
	<u>100mm overflow</u> – at the top of the tank	
Discharge Point:	To existing stormwater line that discharges to R.O.W swale	
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, Glenn Williams, 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:

- Versatile Shed Plans, 2 Pages, dated 7th July 2023

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

3. SITE DESCRIPTION

Situated on the northern side of Waipapa Road in Kerikeri, the subject site spans an area of 5,001m² and is officially designated as Lot 1 DP 365914. At present, the site contains an existing residential dwelling along with a detached garage, both of which can be accessed via an established gravel driveway. This driveway, connected to a right of way driveway branching from Waipapa Road, serves as the primary entry point. The site itself is of near-level terrain, with a small declination towards the north-east. Notably, an open stormwater swale runs along the northern portion of the eastern boundary. This open stormwater channel conveys flows from the wider area, north, toward a natural drainage path via a 300Ø concrete culvert located beneath the driveway entrance. This culvert serves as a conduit for channelling stormwater flows from a piped stormwater line south of the site's driveway into the open swale situated north of the driveway entrance. While the site lacks direct connections to public potable water, wastewater, and stormwater systems, public potable water infrastructure is available near the south-eastern corner of the lot.

Currently, rainwater runoff from the existing residential dwelling and garage roofing is managed through an on-site stormwater tank. The collected rainwater is utilised as a potable water supply within the residential dwelling. In terms of stormwater overflow management, any excess from the on-site tank is directed through an existing 100Ø uPVC stormwater pipeline that is directed towards a soak pit, west of the dwelling.



Figure 1: Aerial view of existing Lot 1 DP 365914, highlighted in cyan (FNDC GIS Maps).

4. DEVELOPMENT PROPOSALS

The development proposals consist of constructing a new 130m² shed in the south-western corner of the lot, along with a new gravel driveway of approximately 180m², to serve as an accessway and parking facility for the shed. The development proposals have been provided verbally, and as per the concept plans from Versatile.

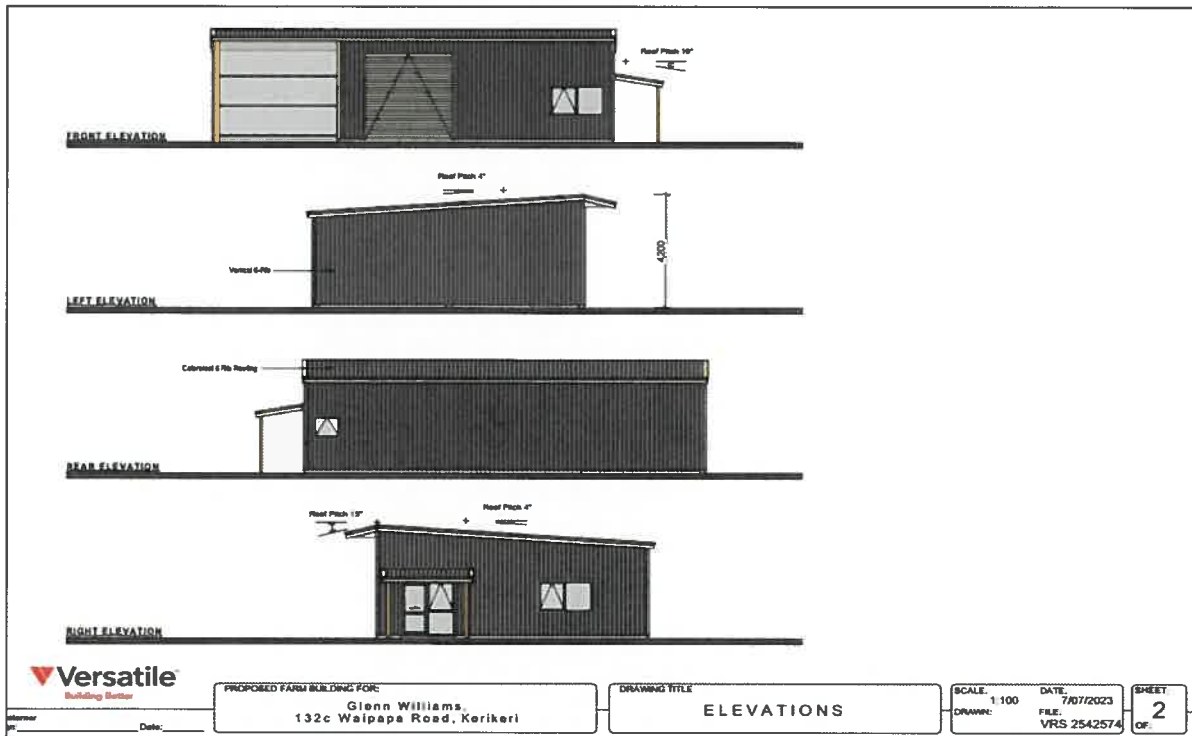


Figure 2: Snip of proposed shed from the Versatile plan set (dated 07/07/2023).

As outlined in below, the impermeable coverage within the Lot, post development, will be 19.2% of the total proposed lot's area and is thus considered a Controlled Activity under the FNDC District Plan. The principal objective of this assessment is to provide an indicative stormwater attenuation design to manage stormwater flows from the proposed additional impervious surfaces.

5. ASSESSMENT CRITERIA

Impermeable Areas

The calculation for the stormwater system for the development is based on a gross site area of 5,001m² and the below areas extracted from the supplied plans:

Existing Dwelling Roof Area	222 m ²
Existing Garage Roof Area	57m ²
Existing Driveway	269 m ²
Proposed Shed Roof Area	130m ²
Proposed New Driveway Area	180m ²
Total	858 m²

The total amount of impermeable area on site, post-development will be 858m² or 17.1% of the site area. Should any changes be made to the current proposal, the on-site stormwater mitigation design must be reviewed.

District Plan Rules

The site is zoned Rural 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 3,000m², 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 3300m², whichever is the lesser.

The total proposed impervious area for the development exceeds 12.5% of the site area and does not comply with Permitted Activity rules under the FNDC District Plan Cl 8.7.5.1.5. Therefore, the proposals are considered to be a Controlled Activity. Additional considerations for stormwater management as outlined in the FNDC District Plan Cl 8.7.5.2.2 are required. An Assessment of Environmental Effects has been included in Section 7 of this report.

Design Approach

The site is under the jurisdiction of the Far North District Council. This design has been completed in general accordance with the recommendations and requirements contained within the Far North District Engineering Standards and the Far North District Council District Plan as well as Clause E1 of the New Zealand Building Code. Attenuation will be provided for the 10% and 1% AEP events for all impermeable areas exceeding the 12.5% Permitted Activity Threshold. This equates to 233m². Provided that the recommendations within this report are adhered to, the effects of stormwater runoff resulting from the developed areas within the allotment are considered to have less than minor effects on the receiving environment.

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 and 1% AEP storm events 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	120	84	68	48.5	34.2	19.1	12.7	8.1
1% AEP	178.8	124.8	102.1	72.6	51.5	28.8	19.3	12.4

The post-development flow scenarios for the storm events must be increased to account for climate change. For this, the NIWA RCP6.0 rainfall data scenario for 2081-2100 has been used. In accordance with Table 4-3 of the FNDC Engineering standards, a pre-development weighted runoff coefficient of 0.59 has been adopted.

6. STORMWATER MITIGATION ASSESSMENT

Rainwater Tank – New Dual-Purpose 25,000L Tank

It is recommended that a 25,000L tank is installed adjacent to the proposed shed, in accordance with manufacturer's installation specifications. The upper section of the rainwater tank will provide a permanent detention volume for the 10% and 1% AEP events for the proposed impermeable area exceeding the Permitted Activity Threshold. The rainwater tank overflow riser is to be fitted with flow attenuated outlets as specified below.

Rainwater Tanks – Detention Volume

As per the attached design calculations, the design elements of the rainwater tank's detention volume are as follows:

Tank Setup	1 x 25,000 litre Rainwater Tank
Tank dimensions	3600mm \varnothing (or greater) x 2600mm high (or greater)
Outlet orifice (10% AEP control)	27mm diameter orifice ; located <u>1100mm below the overflow outlet</u> <ul style="list-style-type: none">- 700mm water elevation- 7.1m³ storage
Outlet orifice (1% AEP control)	18mm diameter orifice ; located <u>700mm above the 10% AEP control orifice</u> <ul style="list-style-type: none">- 1100mm total water elevation- 11.0m³ total storage

Tank detail, 128040-C201, is appended to this report. Please refer to the appended calculation set for clarification.

Discharge Point

Discharge and overflow from the shed's detention tank must drain via sealed pipes to the roadside swale on the eastern side of the site. To achieve adequate fall (minimum 1% grade) from the tank's outlet to the discharge point it is required to install 3 x 450mm \varnothing bubble-up chambers in-line between the tank's outlet and the R.O.W. swale. The drainage line from the easternmost bubble-up chamber is to daylight in the existing roadside swale. Each bubble-up chamber is to provide a minimum 200mm settlement zone below the inlet pipe for debris and sediment settlement. See the appended Site Plan (128040-C200) for clarification.

The roof area of the existing dwelling and garage is currently being conveyed to a 25,000l potable water tank that discharges to a existing soak pit, west of the dwelling. It is recommended that the overflow from the existing tank be re-routed to a new stormwater line, to transport stormwater to the swale, along with overflows from the new detention tank servicing the proposed shed.

The existing accessway to the dwelling and garage is narrow and will remain unsealed. Due to the near level contour of the site, peak stormwater flows are evenly dispersed to the surrounding pastured areas where no scouring or major concentration of surface water will occur. Therefore, the accessways effect on soil permeability and overall peak runoff flows is considered to be less than minor. Rainfall on either side of the accessway is currently infiltrating into the underlying soils, providing infiltration rates similar to pre-development conditions.

7. STORMWATER RUNOFF SUMMARY

Please refer to the appended HydroCAD Calculation output.

Pre-Development Scenario – 10% AEP and 1% AEP Storm Events

Surface	Area	Runoff C	10% AEP Flow Rate	1% AEP Flow Rate
Shed / Mitigated portion of driveway	233 m ²	0.59	1.33ℓ/s	2.00ℓ/s

Post-Development Scenario – 10% AEP and 1% AEP Storm Events + CCF

Surface	Area	Runoff C	10% AEP Flow Rate	1% AEP Flow Rate
Shed / Mitigated portion of driveway	233 m ²	0.96	1.26ℓ/s	1.99ℓ/s

Given the design parameters, stormwater neutrality will be achieved for any areas in excess of the Permitted Activity Threshold, for the 10% AEP and 1% AEP storm events.

8. DISTRICT PLAN ASSESSMENT

This report has been prepared to demonstrate the likely effects of increased stormwater run-off arising from the proposed development and the means of mitigating run-off to no more than the levels that would result from the permitted threshold under Stormwater Management Rule 8.7.5.1.5.

In assessing an application under this provision, the Council will exercise its discretion to review the following matters below, (a) through (i) of FNDCDP Cl 8.7.5.2.2.

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

<i>(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;</i>	Impermeable surfaces resulting from the development increase site impermeability. Through tank attenuation and low impact design principles employed in drainage plans, runoff for the areas exceeding the Permitted Activity allowance will be attenuated to pre-development conditions and discharged to the open swale located along the right of way.
<i>(b) the extent to which Low Impact Design principles have been used to reduce site impermeability;</i>	Existing established vegetation aids in diminishing stormwater runoff from the site. Additionally, sheet flow of runoff from the proposed driveway area to the open lawn areas will assist in treatment of runoff from the new driveway area.
<i>(c) any cumulative effects on total catchment impermeability;</i>	Impervious coverage will increase by 310m ² .

<p><i>(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;</i></p>	<p>Runoff from the proposed roof area is to be collected and directed to stormwater management devices via sealed pipes, mitigating the potential for runoff to pass over / saturate the surrounding soils. Runoff from the proposed driveway is to be shed to the surrounding lawn area via sheet flow, following the natural drainage pattern of the site.</p> <p>Ponding is not anticipated to occur provided the recommendations within this report are adhered to, mitigating interference with natural water absorption.</p>
<p><i>(e) the physical qualities of the soil type;</i></p>	<p>Kerikeri Volcanic Group. Stiff clayey silts.</p>
<p><i>(f) 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;</i></p>	<p>Stormwater runoff from all impermeable surfaces will be captured and conveyed to the specified discharge point.</p> <p>The site is large enough for on-site stormwater and effluent disposal (i.e set backs 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>
<p><i>(g) the extent to which paved, Impermeable Surfaces are necessary for the proposed activity;</i></p>	<p>The proposed driveway and pathway provide vehicle and pedestrian access to the dwelling and shed. We do not deem the proposed gravelled areas to be excessive for the size of the site.</p>
<p><i>(h) the extent to which land scaping and vegetation may reduce adverse effects of run-off;</i></p>	<p>Existing established vegetation aids in diminishing stormwater runoff from the site. No specific planting regime is recommended as part of the stormwater management design herein.</p>
<p><i>i) the means and effectiveness of mitigating stormwater runoff to that expected by permitted activity threshold.</i></p>	<p>The proposed shed roof and a portion of the new driveway area have been accounted for in the attenuation system proposed, supplying outflow control for the 10% AEP and 1% AEP storm event. Given this, hydrological neutrality will be achieved for areas exceeding the Permitted Activity threshold.</p>

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 (128040-C200 & 128040-C201). Care should be taken when constructing the discharge point to avoid any siphon or backflow effect within the stormwater system.

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

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

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.

Yours Faithfully,

Wilton Joubert Ltd.

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.
- MEASUREMENTS PROVIDED ARE APPROXIMATE ONLY.
- BACKGROUND INFORMATION, CONTOURS & LOCAL SERVICES PROVIDED BY THE CLIENT & EXTRACTED FROM LOCAL COUNCIL GIS DATA. THE ENGINEER HAS CONDUCTED VISUAL VERIFICATION 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

ORIGINAL DRAWING REF	A3	OFFICE	KERIKERI
DRAWING SCALE	1:400	COORDINATED BY	NOT COORDINATED
DRAWING NUMBER	128040-C200	ISSUE	A
DRAWN BY			BGS
CHECKED BY			N.A.

PROJECT TITLE
LOT 1 DP 365914
132C WAIPAPA ROAD
WAIPAPA
FAR NORTH

ISSUE / REVISION

No.	DATE	BY	DESCRIPTION
A	AUG 23	KEM	STORMWATER REPORT FOR BUILDING CONSENT

DESIGNED BY KEM
DRAWN BY KEM
CHECKED BY BGS
APPROVED BY N.A.

SITE PLAN
STORMWATER REPORT

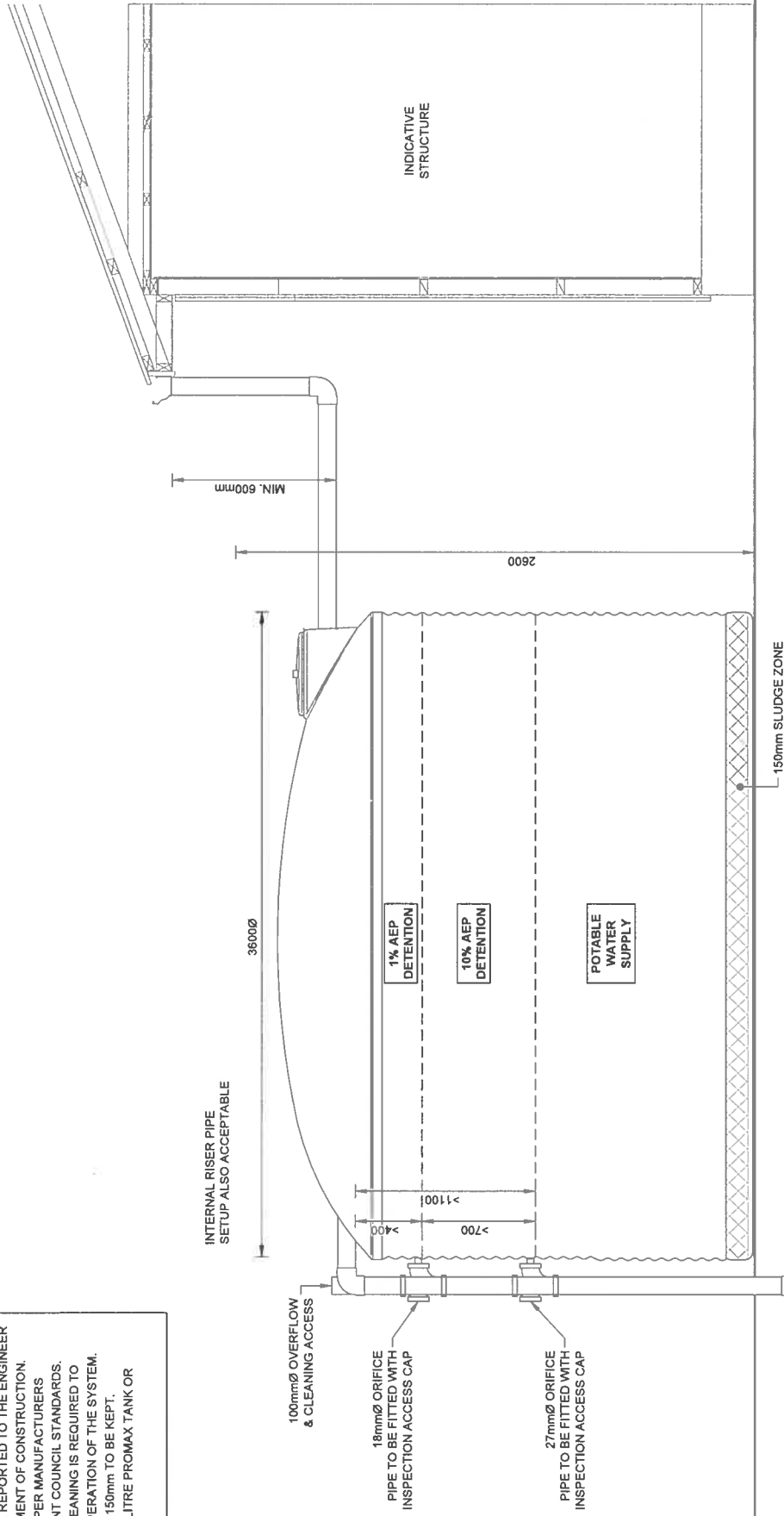
SERVICES NOTE
 THE SERVICES NOTED ARE INDICATIVE FOR A CONCEPT DESIGN. THE SERVICES ARE SUBJECT TO THE APPROVAL OF THE LOCAL COUNCIL AND THE CLIENT. THE SERVICES ARE SUBJECT TO THE APPROVAL OF THE LOCAL COUNCIL AND THE CLIENT. THE SERVICES ARE SUBJECT TO THE APPROVAL OF THE LOCAL COUNCIL AND THE CLIENT.

BUILDING CONSENT

WILTON JOUBERT
 Consulting Engineers
 1001 WILSON ROAD, WILSON ROAD, WILSON ROAD
 CHRISTCHURCH 8013
 Phone: 03 378 1000
 Fax: 03 378 1001
 www.wiltonjoubert.co.nz

NOTES:

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



01 TANK DETAIL
C200 N.T.S

PREPARED BY	DATE	OFFICE
DESIGNED BY		
CHECKED BY		
DRAWING NUMBER		
128040-C201		
A		
COPYRIGHT - WILTON JOUBERT LIMITED		

PROJECT TITLE
**LOT 1 DP 366914
 132C WAIPAPA ROAD
 WAIPAPA
 FAR NORTH**

TANK DETAIL
STORMWATER REPORT

PROJECT DESCRIPTION

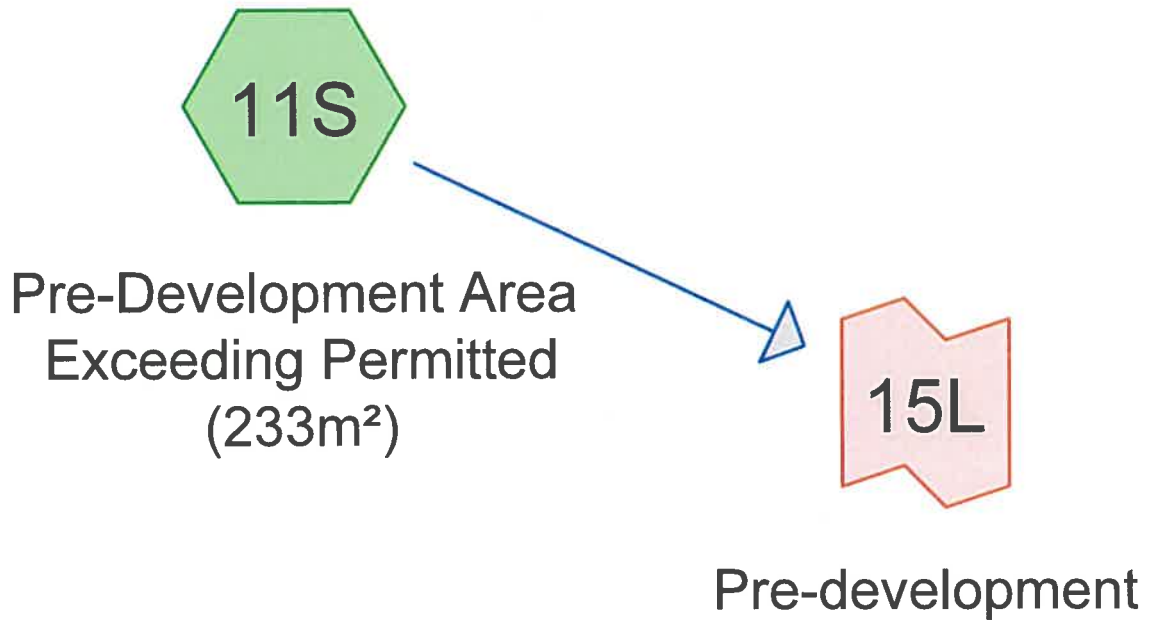
BUILDING CONSENT

DESIGNED BY	KEM
CHECKED BY	KEM
REPORTED BY	BGS
DATE	N/A

ISSUE / REVISION	DATE	BY	DESCRIPTION
A	AUG 23	KEM	STORMWATER REPORT FOR BUILDING CONSENT

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 Cambridge Road
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Pre-Development Scenario



132c Waipapa Road_Final_4Aug23

Prepared by Wilton Joubert Ltd

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Page 2

Area Listing (selected nodes)

Area (sq-meters)	C	Description (subcatchment-numbers)
233.0	0.59	Grass, short (11S)
233.0	0.59	TOTAL AREA

132c Waipapa Road_Final_4Aug23

Prepared by Wilton Joubert Ltd

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Page 3

Soil Listing (selected nodes)

Area (sq-meters)	Soil Group	Subcatchment Numbers
0.0	HSG A	
0.0	HSG B	
0.0	HSG C	
0.0	HSG D	
233.0	Other	11S
233.0		TOTAL AREA

132c Waipapa Road_Final_4Aug23

Prepared by Wilton Joubert Ltd

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Page 4

Ground Covers (selected nodes)

HSG-A (sq-meters)	HSG-B (sq-meters)	HSG-C (sq-meters)	HSG-D (sq-meters)	Other (sq-meters)	Total (sq-meters)	Ground Cover	Subca Numbr
0.0	0.0	0.0	0.0	233.0	233.0	Grass, short	
0.0	0.0	0.0	0.0	233.0	233.0	TOTAL AREA	

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 11S: Pre-Development Runoff Area=233.0 m² 0.00% Impervious Runoff Depth=27 mm
Tc=10.0 min C=0.59 Runoff=1.33 L/s 6.4 m³

Link 15L: Pre-development

Inflow=1.33 L/s 6.4 m³
Primary=1.33 L/s 6.4 m³

**Total Runoff Area = 233.0 m² Runoff Volume = 6.4 m³ Average Runoff Depth = 27 mm
100.00% Pervious = 233.0 m² 0.00% Impervious = 0.0 m²**

Summary for Subcatchment 11S: Pre-Development Area Exceeding Permitted (233m²)

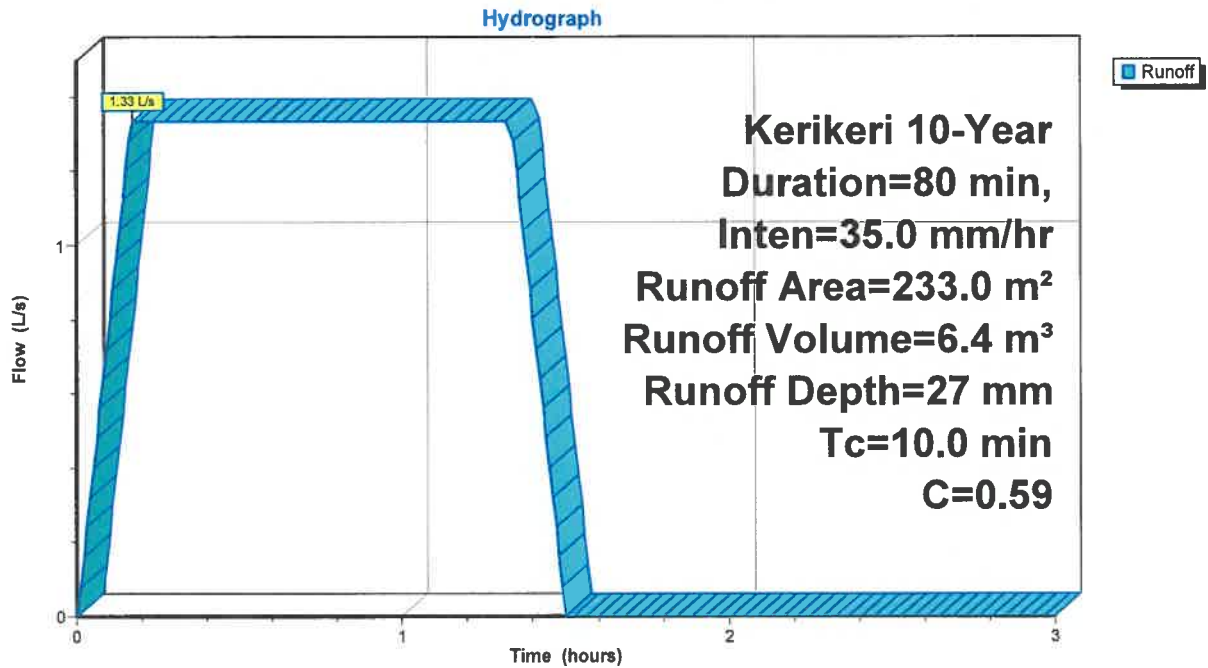
Runoff = 1.33 L/s @ 0.17 hrs, Volume= 6.4 m³, Depth= 27 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Kerikeri 10-Year Duration=80 min, Inten=35.0 mm/hr

Area (m ²)	C	Description
233.0	0.59	Grass, short
233.0		100.00% Pervious Area

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

Subcatchment 11S: Pre-Development Area Exceeding Permitted (233m²)

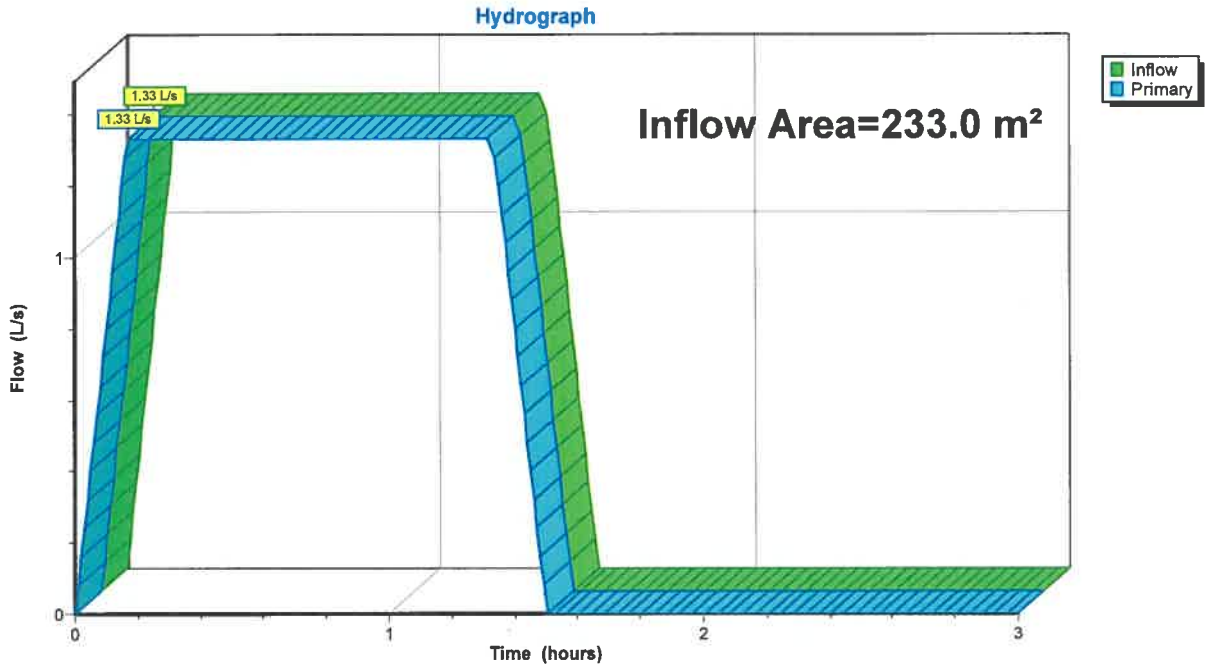


Summary for Link 15L: Pre-development

Inflow Area = 233.0 m², 0.00% Impervious, Inflow Depth = 27 mm for 10-Year event
Inflow = 1.33 L/s @ 0.17 hrs, Volume= 6.4 m³
Primary = 1.33 L/s @ 0.17 hrs, Volume= 6.4 m³, Atten= 0%, Lag= 0.0 min

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

Link 15L: Pre-development



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 11S: Pre-Development Runoff Area=233.0 m² 0.00% Impervious Runoff Depth=41 mm
Tc=10.0 min C=0.59 Runoff=2.00 L/s 9.6 m³

Link 15L: Pre-development Inflow=2.00 L/s 9.6 m³
Primary=2.00 L/s 9.6 m³

Total Runoff Area = 233.0 m² Runoff Volume = 9.6 m³ Average Runoff Depth = 41 mm
100.00% Pervious = 233.0 m² 0.00% Impervious = 0.0 m²

Summary for Subcatchment 11S: Pre-Development Area Exceeding Permitted (233m²)

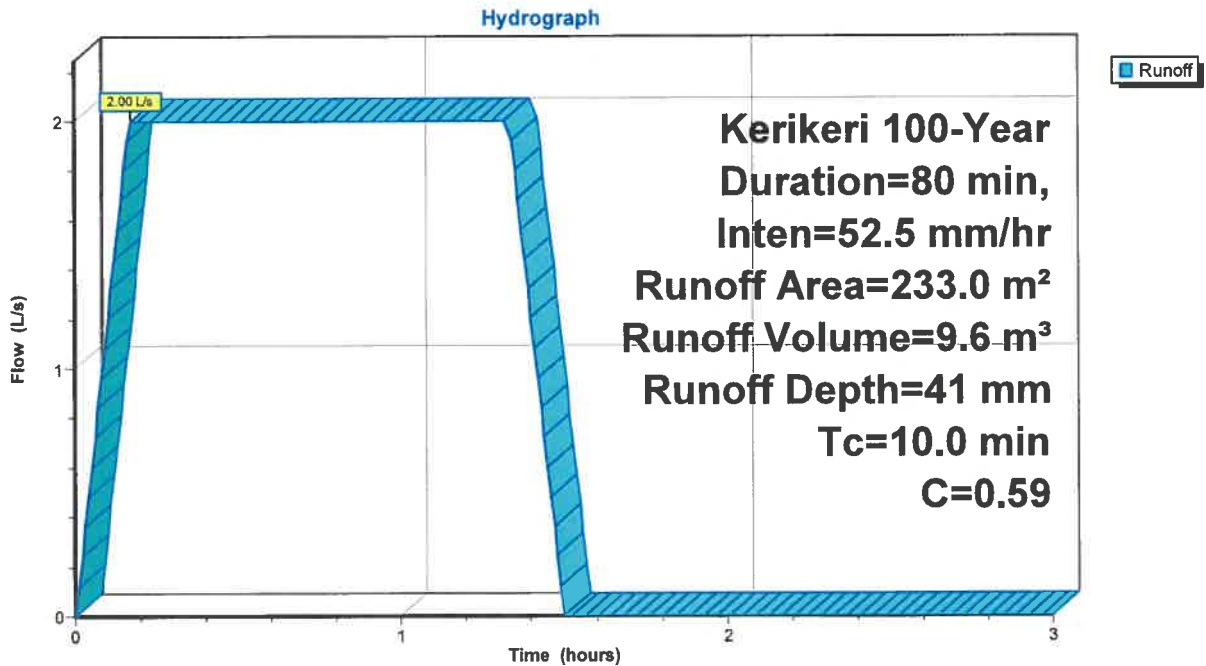
Runoff = 2.00 L/s @ 0.17 hrs, Volume= 9.6 m³, Depth= 41 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Kerikeri 100-Year Duration=80 min, Inten=52.5 mm/hr

Area (m ²)	C	Description
233.0	0.59	Grass, short
233.0		100.00% Pervious Area

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

Subcatchment 11S: Pre-Development Area Exceeding Permitted (233m²)

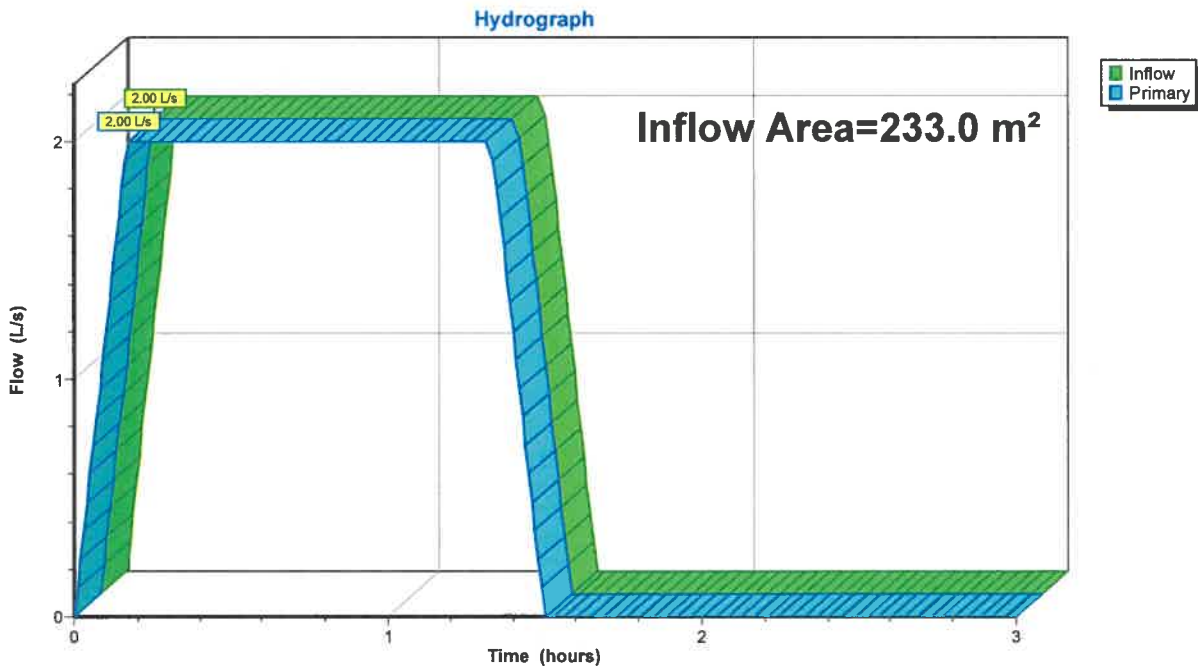


Summary for Link 15L: Pre-development

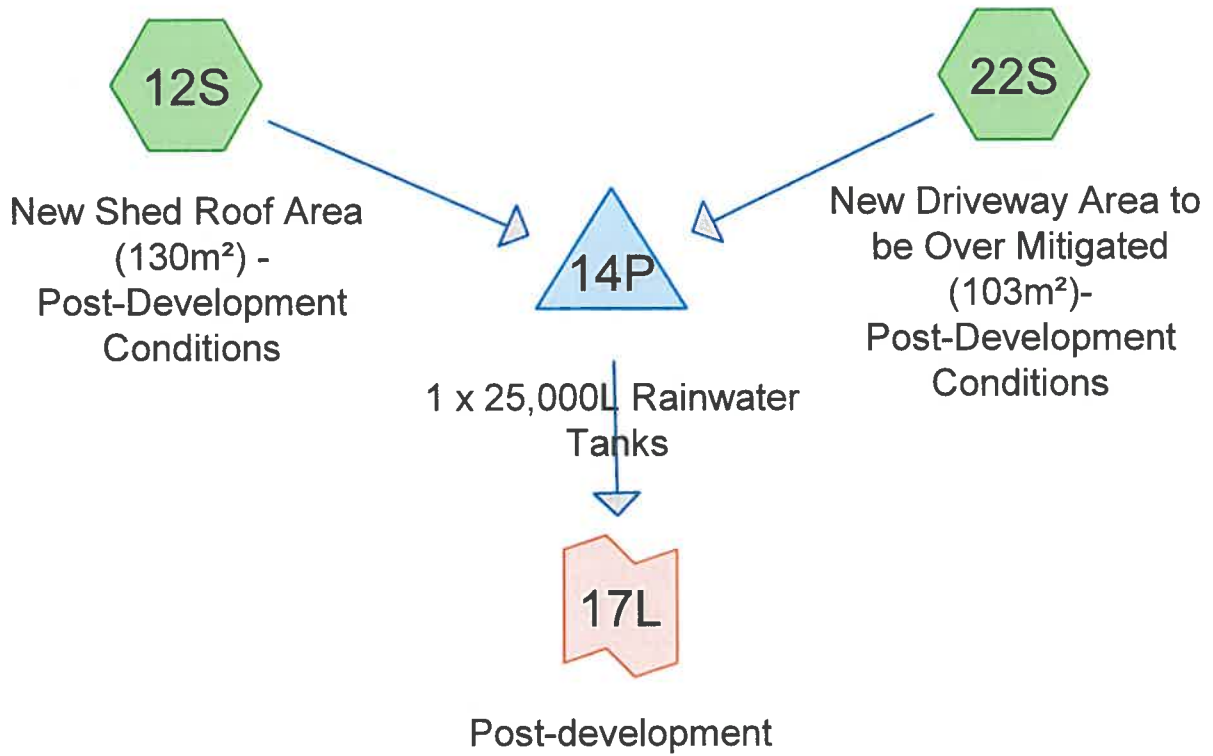
Inflow Area = 233.0 m², 0.00% Impervious, Inflow Depth = 41 mm for 100-Year event
Inflow = 2.00 L/s @ 0.17 hrs, Volume= 9.6 m³
Primary = 2.00 L/s @ 0.17 hrs, Volume= 9.6 m³, Atten= 0%, Lag= 0.0 min

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

Link 15L: Pre-development



Post-Development Scenario



132c Waipapa Road_Final_4Aug23

Prepared by Wilton Joubert Ltd

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Printed 10/08/2023

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Area Listing (selected nodes)

Area (sq-meters)	C	Description (subcatchment-numbers)
103.0	0.80	Driveway (22S)
130.0	0.96	Roof (12S)
233.0	0.89	TOTAL AREA

Soil Listing (selected nodes)

Area (sq-meters)	Soil Group	Subcatchment Numbers
0.0	HSG A	
0.0	HSG B	
0.0	HSG C	
0.0	HSG D	
233.0	Other	12S, 22S
233.0		TOTAL AREA

Ground Covers (selected nodes)

HSG-A (sq-meters)	HSG-B (sq-meters)	HSG-C (sq-meters)	HSG-D (sq-meters)	Other (sq-meters)	Total (sq-meters)	Ground Cover	Subca Numbr
0.0	0.0	0.0	0.0	103.0	103.0	Driveway	
0.0	0.0	0.0	0.0	130.0	130.0	Roof	
0.0	0.0	0.0	0.0	233.0	233.0	TOTAL AREA	

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 12S: New Shed Roof Runoff Area=130.0 m² 100.00% Impervious Runoff Depth=54 mm
Tc=10.0 min C=0.96 Runoff=1.45 L/s 7.0 m³

Subcatchment 22S: New Driveway Runoff Area=103.0 m² 0.00% Impervious Runoff Depth=45 mm
Tc=10.0 min C=0.80 Runoff=0.96 L/s 4.6 m³

Pond 14P: 1 x 25,000L Rainwater Tanks Peak Elev=0.698 m Storage=7.1 m³ Inflow=2.41 L/s 11.6 m³
Outflow=1.26 L/s 9.7 m³

Link 17L: Post-development Inflow=1.26 L/s 9.7 m³
Primary=1.26 L/s 9.7 m³

**Total Runoff Area = 233.0 m² Runoff Volume = 11.6 m³ Average Runoff Depth = 50 mm
44.21% Pervious = 103.0 m² 55.79% Impervious = 130.0 m²**

Summary for Subcatchment 12S: New Shed Roof Area (130m²) - Post-Development Conditions

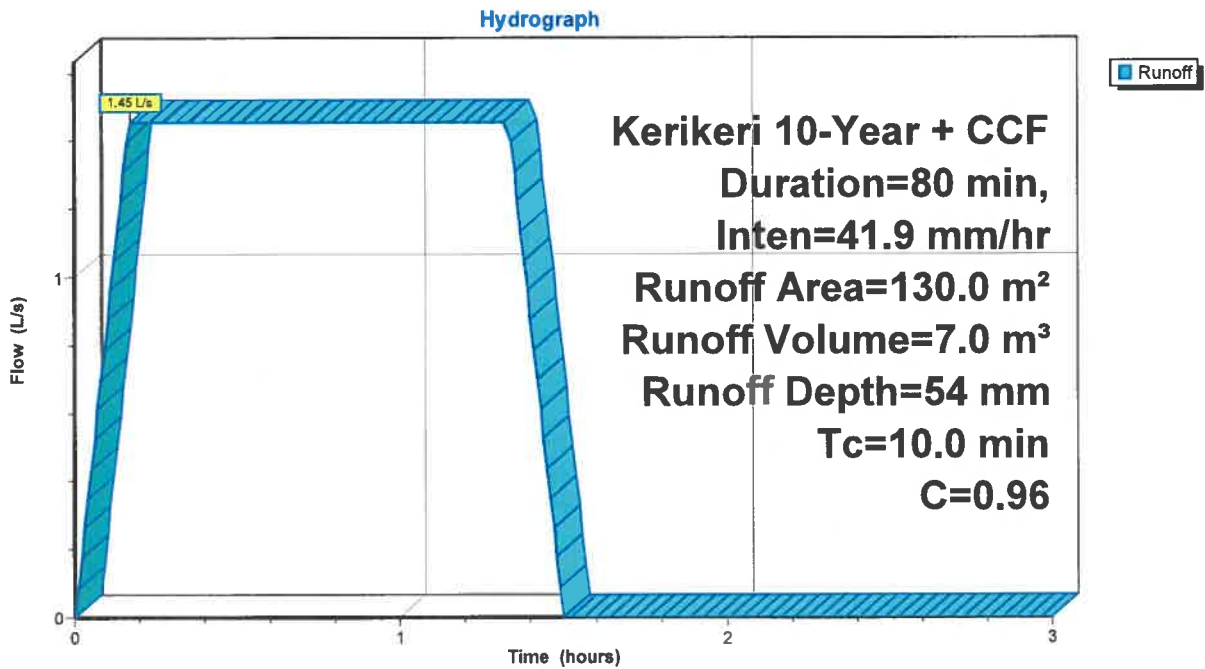
Runoff = 1.45 L/s @ 0.17 hrs, Volume= 7.0 m³, Depth= 54 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Kerikeri 10-Year + CCF Duration=80 min, Inten=41.9 mm/hr

Area (m ²)	C	Description
130.0	0.96	Roof
130.0		100.00% Impervious Area

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

Subcatchment 12S: New Shed Roof Area (130m²) - Post-Development Conditions



Summary for Subcatchment 22S: New Driveway Area to be Over Mitigated (103m²)- Post-Development Conditions

Runoff = 0.96 L/s @ 0.17 hrs, Volume= 4.6 m³, Depth= 45 mm

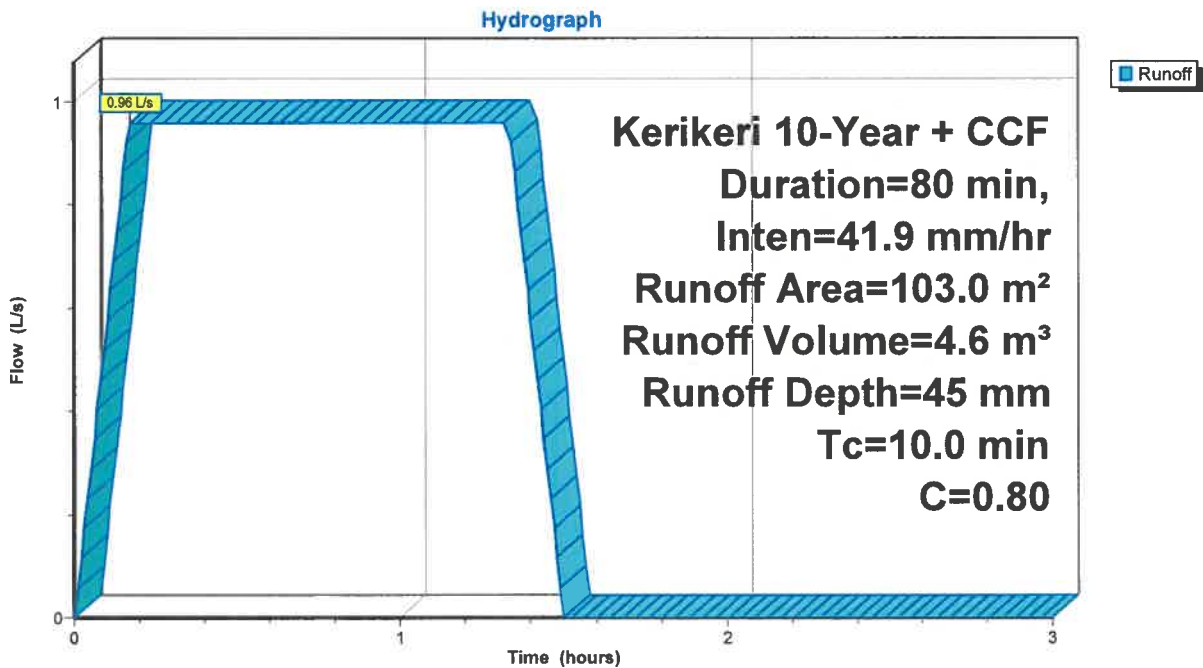
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Kerikeri 10-Year + CCF Duration=80 min, Inten=41.9 mm/hr

Area (m ²)	C	Description
103.0	0.80	Driveway
103.0		100.00% Pervious Area

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

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Subcatchment 22S: New Driveway Area to be Over Mitigated (103m²)- Post-Development Conditions



Summary for Pond 14P: 1 x 25,000L Rainwater Tanks

Inflow Area = 233.0 m², 55.79% Impervious, Inflow Depth = 50 mm for 10-Year + CCF event
 Inflow = 2.41 L/s @ 0.17 hrs, Volume= 11.6 m³
 Outflow = 1.26 L/s @ 1.41 hrs, Volume= 9.7 m³, Atten= 48%, Lag= 74.6 min
 Primary = 1.26 L/s @ 1.41 hrs, Volume= 9.7 m³

Routing by Stor-Ind method, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Peak Elev= 0.698 m @ 1.41 hrs Surf.Area= 10.2 m² Storage= 7.1 m³

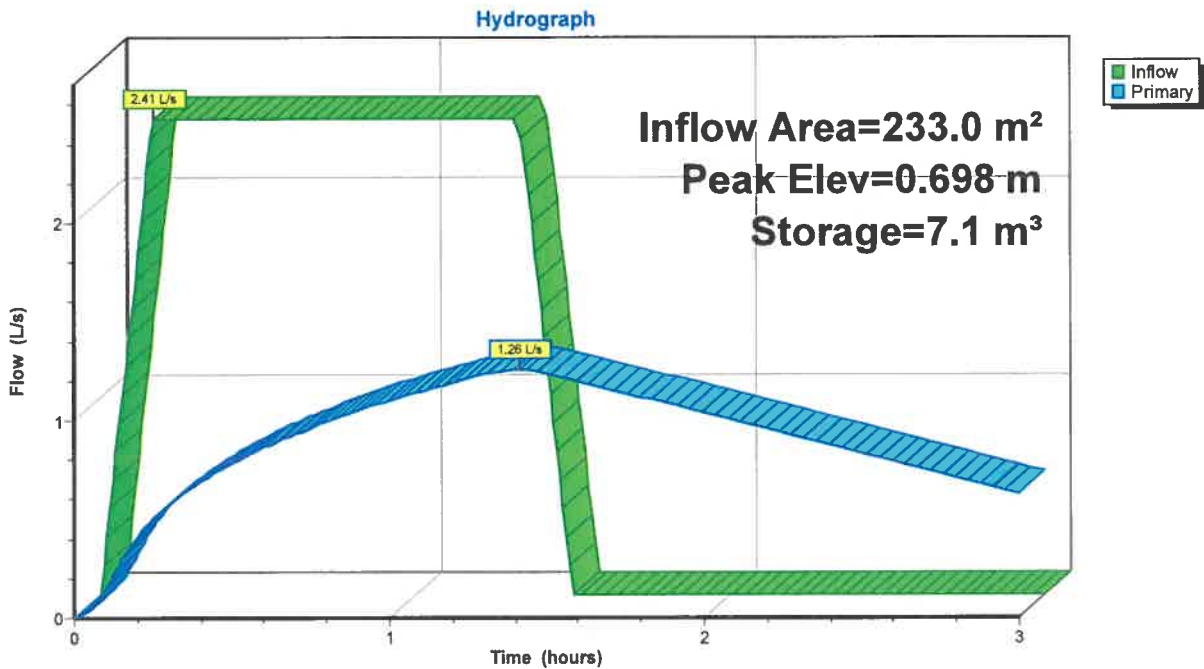
Plug-Flow detention time= 55.5 min calculated for 9.7 m³ (84% of inflow)
 Center-of-Mass det. time= 49.1 min (94.1 - 45.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	26.5 m ³	3.60 mD x 2.60 mH Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	27 mm Vert. Orifice/Grate C= 0.600
#2	Primary	0.698 m	18 mm Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.26 L/s @ 1.41 hrs HW=0.698 m (Free Discharge)
 1=Orifice/Grate (Orifice Controls 1.26 L/s @ 2.20 m/s)
 2=Orifice/Grate (Controls 0.00 L/s)

Pond 14P: 1 x 25,000L Rainwater Tanks

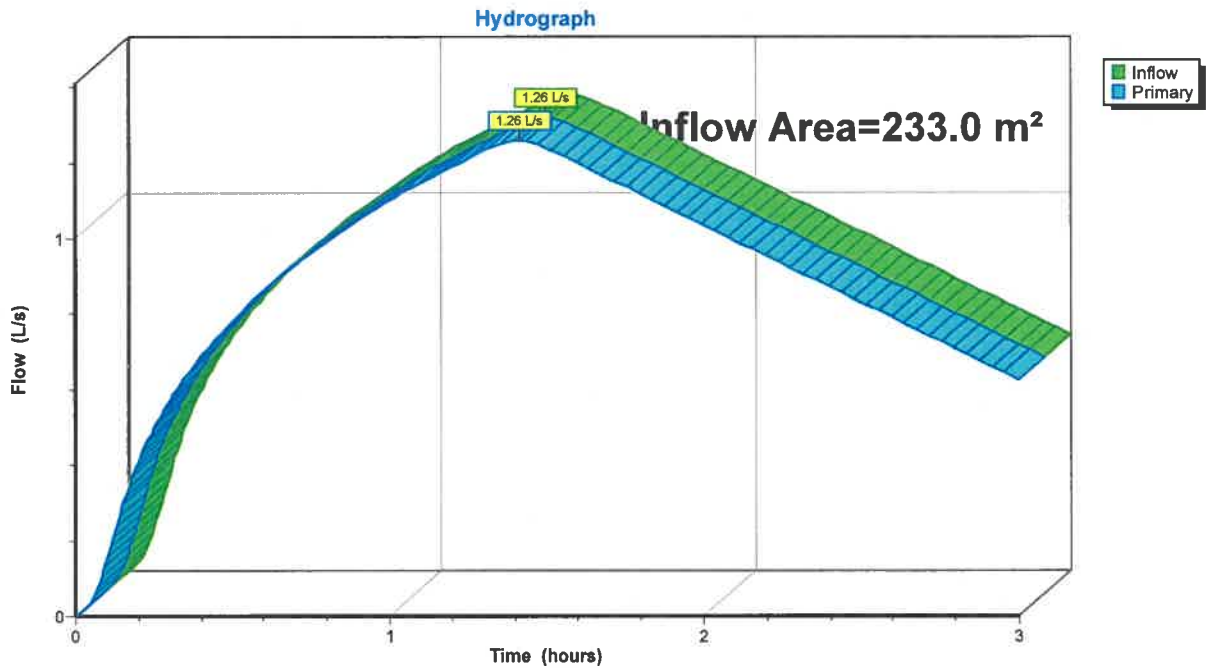


Summary for Link 17L: Post-development

Inflow Area = 233.0 m², 55.79% Impervious, Inflow Depth > 42 mm for 10-Year + CCF event
 Inflow = 1.26 L/s @ 1.41 hrs, Volume= 9.7 m³
 Primary = 1.26 L/s @ 1.41 hrs, Volume= 9.7 m³, Atten= 0%, Lag= 0.0 min

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

Link 17L: Post-development



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 12S: New Shed Roof Runoff Area=130.0 m² 100.00% Impervious Runoff Depth=81 mm
Tc=10.0 min C=0.96 Runoff=2.18 L/s 10.5 m³

Subcatchment 22S: New Driveway Runoff Area=103.0 m² 0.00% Impervious Runoff Depth=67 mm
Tc=10.0 min C=0.80 Runoff=1.44 L/s 6.9 m³

Pond 14P: 1 x 25,000L Rainwater Tanks Peak Elev=1.084 m Storage=11.0 m³ Inflow=3.62 L/s 17.4 m³
Outflow=1.99 L/s 13.8 m³

Link 17L: Post-development Inflow=1.99 L/s 13.8 m³
Primary=1.99 L/s 13.8 m³

Total Runoff Area = 233.0 m² Runoff Volume = 17.4 m³ Average Runoff Depth = 75 mm
44.21% Pervious = 103.0 m² 55.79% Impervious = 130.0 m²

Summary for Subcatchment 12S: New Shed Roof Area (130m²) - Post-Development Conditions

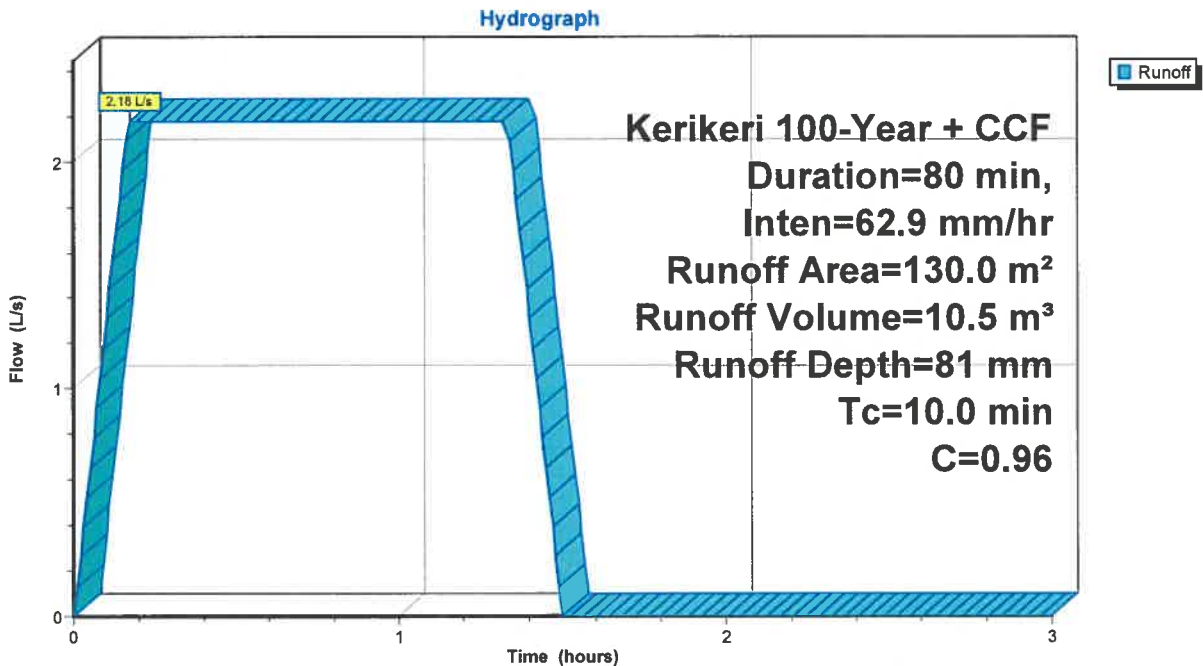
Runoff = 2.18 L/s @ 0.17 hrs, Volume= 10.5 m³, Depth= 81 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Kerikeri 100-Year + CCF Duration=80 min, Inten=62.9 mm/hr

Area (m ²)	C	Description
130.0	0.96	Roof
130.0		100.00% Impervious Area

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

Subcatchment 12S: New Shed Roof Area (130m²) - Post-Development Conditions



Summary for Subcatchment 22S: New Driveway Area to be Over Mitigated (103m²)- Post-Development Conditions

Runoff = 1.44 L/s @ 0.17 hrs, Volume= 6.9 m³, Depth= 67 mm

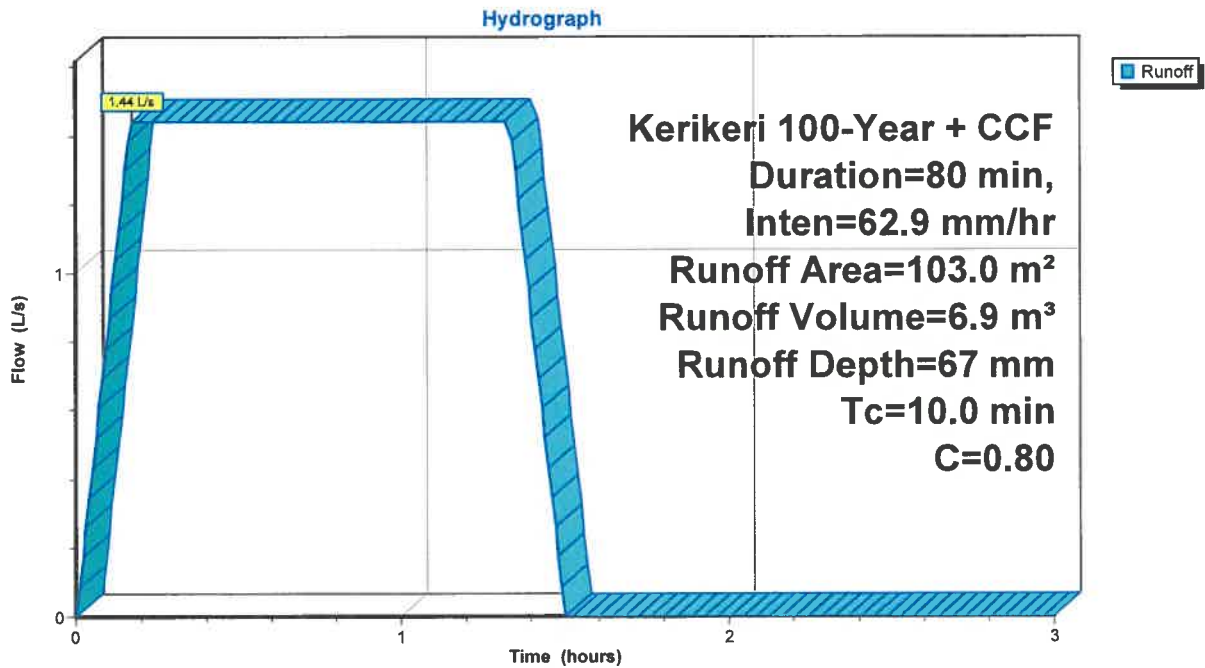
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Kerikeri 100-Year + CCF Duration=80 min, Inten=62.9 mm/hr

Area (m ²)	C	Description
103.0	0.80	Driveway
103.0		100.00% Pervious Area

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

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Subcatchment 22S: New Driveway Area to be Over Mitigated (103m²)- Post-Development Conditions



Summary for Pond 14P: 1 x 25,000L Rainwater Tanks

Inflow Area = 233.0 m², 55.79% Impervious, Inflow Depth = 75 mm for 100-Year + CCF event
 Inflow = 3.62 L/s @ 0.17 hrs, Volume= 17.4 m³
 Outflow = 1.99 L/s @ 1.41 hrs, Volume= 13.8 m³, Atten= 45%, Lag= 74.3 min
 Primary = 1.99 L/s @ 1.41 hrs, Volume= 13.8 m³

Routing by Stor-Ind method, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Peak Elev= 1.084 m @ 1.41 hrs Surf.Area= 10.2 m² Storage= 11.0 m³

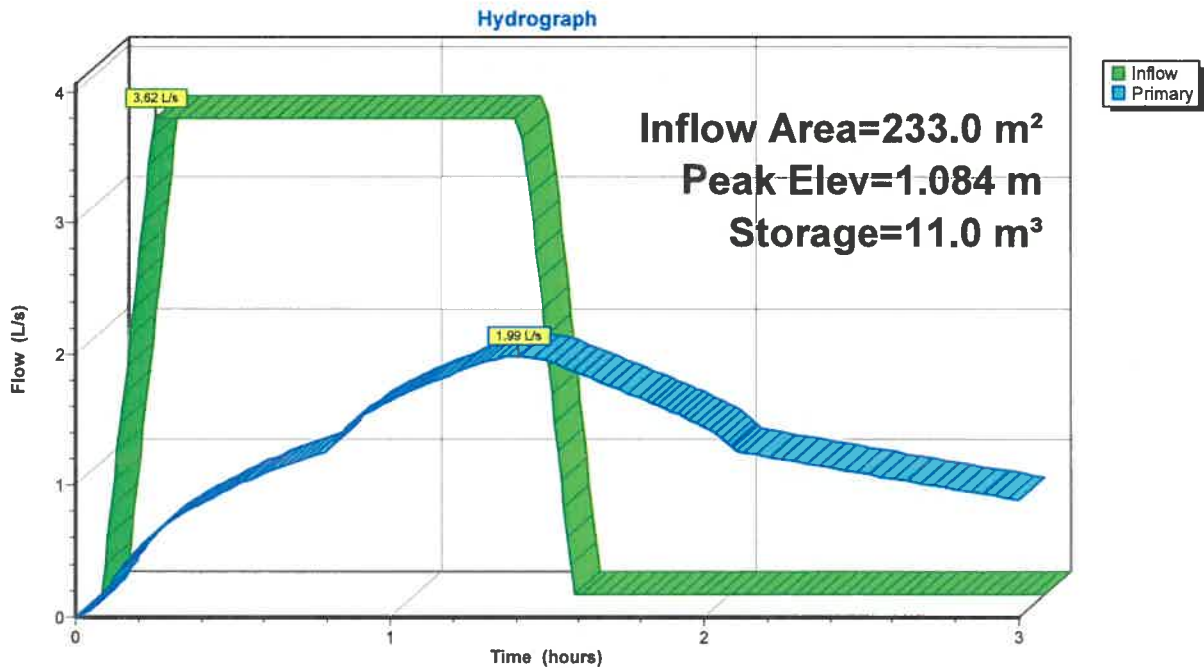
Plug-Flow detention time= 57.5 min calculated for 13.8 m³ (79% of inflow)
 Center-of-Mass det. time= 49.1 min (94.1 - 45.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	26.5 m ³	3.60 mD x 2.60 mH Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	27 mm Vert. Orifice/Grate C= 0.600
#2	Primary	0.698 m	18 mm Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.99 L/s @ 1.41 hrs HW=1.084 m (Free Discharge)
 1=Orifice/Grate (Orifice Controls 1.57 L/s @ 2.75 m/s)
 2=Orifice/Grate (Orifice Controls 0.42 L/s @ 1.63 m/s)

Pond 14P: 1 x 25,000L Rainwater Tanks



Summary for Link 17L: Post-development

Inflow Area = 233.0 m², 55.79% Impervious, Inflow Depth > 59 mm for 100-Year + CCF event
 Inflow = 1.99 L/s @ 1.41 hrs, Volume= 13.8 m³
 Primary = 1.99 L/s @ 1.41 hrs, Volume= 13.8 m³, Atten= 0%, Lag= 0.0 min

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

Link 17L: Post-development

