Far North District Council

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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

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

4. Applicant Details:

Name/s: [redacted]

Electronic Address for Service (E-mail):

Phone Numbers: _____ Home: _____

Postal Address: (*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: Bay of Islands Planning (2022) Limited - Steve Sanson

Electronic Address for Service (E-mail): steve@bayplan.co.nz

Phone Numbers: Work: 0211606035 Home: _____

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

Po Box 318, Paihia, 0247

_____ Post Code: _____

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: Refer applicant details

Property Address/: Location 4 Titore Way, Russell

7. Application Site Details:

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

Site Address/ Location: 4 Titore Way, Russell

Legal Description: Lot 1 DP 65575 Val Number:

Certificate of Title: NA24A/1114

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.

New dwelling at 4 Titore Way, Russell

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):

O Building Consent (BC ref # if known)

O Regional Council Consent (ref # if known)

O National Environmental Standard consent

O 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)

O yes ☑ no O 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).

O yes ☑ no O don't know

O Subdividing land

O Changing the use of a piece of land

O Disturbing, removing or sampling soil

O 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]

Email:

Postal Address:

Post Code:

Phone Numbers: 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)

Signat signature of bill payer – **mandatory**) Date: 28/02/2024

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: _____

(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**

BAY OF ISLANDS PLANNING (2022) LIMITED

25 years serving Bay of Islands PLANNING LTD Northland

2 Cochrane Drive, Kerikeri
PO Box 318
Paihia
Phone [09] 407 5253; Email – office@bayplan.co.nz Website - www.bayplan.co.nz

29 February 2024

Re: Proposed residential development at 4 Titore Way, Russell, Northland

Our client, David MacDonald seeks a land use consent for a new dwelling at 4 Titore Way, Russell. We attach information required to be included in this application by the relevant statutory documents as follows:

- **Planning Report and Assessment of Environmental Effects**
- **Appendix 1 – Record of Title & Instruments;**
- **Appendix 2 – Architectural Drawings [Arcline];**
- **Appendix 3 – Engineering Drawings;**
- **Appendix 4 – FENZ Approval.**
- **Appendix 5 – Soldier Pile Retaining Wall Report; and**
- **Appendix 6 – Initial Consultation with the Department of Conservation**

Please do not hesitate to contact me should you require any further information.

[redacted]

Steven Sanson
Consultant Planner

1.0 APPLICANT AND PROPERTY DETAILS

Applicant	David Cameron MacDonald

Address for Service	Bay of Islands Planning [2022] Limited PO Box 318 PAIHIA 0247 C/O - Steven Sanson steve@bayplan.co.nz 021-160-6035
Legal Description	Lot 1 DP 65575
Certificate Of Title	NA24A/1114
Physical Address	4 Titore Way, Russell, Northland
Site Area	1661m^2
Owner of the Site	David Cameron MacDonald
District Plan Zone / Features	Russell Township Zone
Proposed Plan Features	Kororāreka Russell Township Zone Coastal Environment and High Natural Character Overlays
Archaeology	Nil
NRC Overlays	High Natural Character
Soils	6e 9
Protected Natural Area	Nil
HAIL	Nil

2.0 INTRODUCTION

This report has been prepared for David MacDonald in support of a land use consent application at 4 Titore Way, Russell.

The application has been prepared in accordance with the provisions of Section 88 and the Fourth Schedule of the Resource Management Act 1991.

This report serves as the Assessment of Environmental Effects required under both provisions.

The report also includes an analysis of the relevant provisions of the Far North District Plan, relevant Regional Planning documents, National Policy Statements and Environmental Standards, as well as Part 2 of the Resource Management Act 1991.

The report concludes that the proposal is acceptable subject to conditions of consent and that the proposal is consistent with the Resource Management Act 1991.

3.0 SITE AND LOCALITY DESCRIPTION

3.1 The Site

The site is located on the north-western edge of the Russell Township Zone. The site is regular in shape, measures a total area of 1,661m^2 and located on the south-eastern side of Titore Way.

The site is accessed via a shared vehicle crossing with 6 Titore Way. The site is undeveloped and largely in vegetation.

The site gradually slopes from north to south while according to Northland Regional Council, on site soils are described as mature greywacke soils, specifically, silty clay loams. The site has been recently cleared of shrub to allow for soil investigations.

The property is not subject to any HAIL activities, while mapping identifies that there are no sites of significance, notable trees, or archaeological sites.

Figure 1: Site aerial (Source: FNDC GIS)

3.2 The Surrounding Environment

The subject site is located within the outer edge of the Russell Township Zone. The immediate environment is residential in nature with large scale modern dwellings contained in parcels similar to the subject site.

Most parcels are developed with residential dwellings, all while maintaining the spacious residential nature of the surrounding area. The combination of the larger parcels and vegetation provides an environment which does not feel largely developed. Notwithstanding this, parcels have been developed and cleared to promote residential use.

The Flagstaff Hill Historic Reserve abuts the site to the east and south. Beyond this, to the north and east land is zoned General Coastal and held in much larger parcels.

The majority of this land has been identified as High Natural Character under the Northland Regional Policy Statement. This land is identified as kanuka dominant shrubland & forest; and kanuka-mixed broadleaved forest.

Whaihihi Bay is located 380m eastward while Russell township is approximately 620m south.

The site is not within a PNA / SNA as outlined in Figure 3.

Figure 2: Site Surrounds (Source: FNDC GIS)

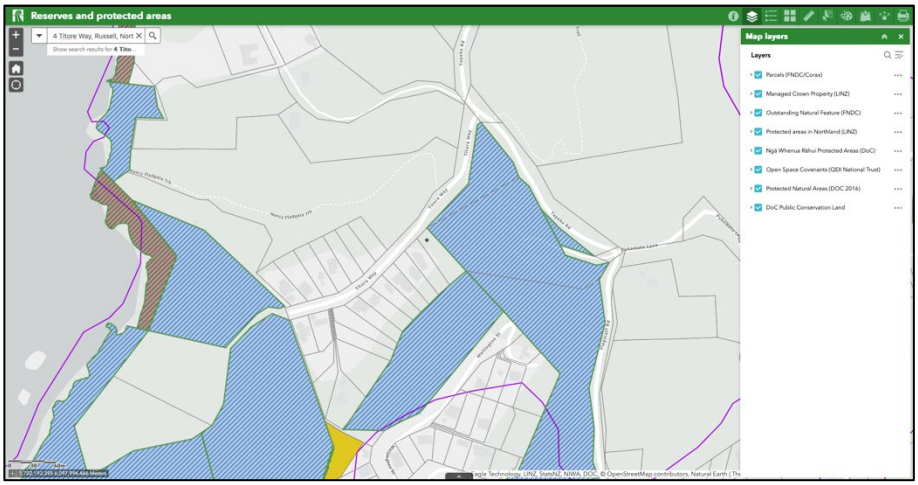


Figure 3: Reserve Maps

The certificate of title for the site is provided in **Appendix 1**. The site has an easement across Lot 2 DP *65575*. This instrument is also provided in the appendices, however there are no relevant other instruments on the title that impacts development.

3.3 The Immediate Environment

The immediate environment is residential in nature and contains the properties in Table 1 and depicted in Figure 4.

Table 1 - Immediate Environment

Legal Description	Address / Owners
Lot 2 DP 65575	6 Titore Way, Russell ; Julee & Mark Devoy
Lot 25 DP 65575	47 Wellington Street, Russell ; Her Majesty the Queen.
Lot 12 DP 200303	16 Tapeka Road, Russell ; Fladgates
Lot 13 DP 200303	44 Wellington Street, Russell ; Her Majesty the Queen
Section 51 Block I Russell SD	N/A ; Her Majesty the Queen
Section 52 Block I Russell SD	47 Wellington Street, Russell ; Her Majesty the Queen

Figure 4: Adjacent properties (Source: FNDC GIS)

4.0 DESCRIPTION OF THE PROPOSAL

Dwelling Specifics

Consent is sought for the construction of a two-storey residential dwelling as shown on the plans found in **Appendix 2**. The site plan for the proposal is outlined in Figure 5 below.

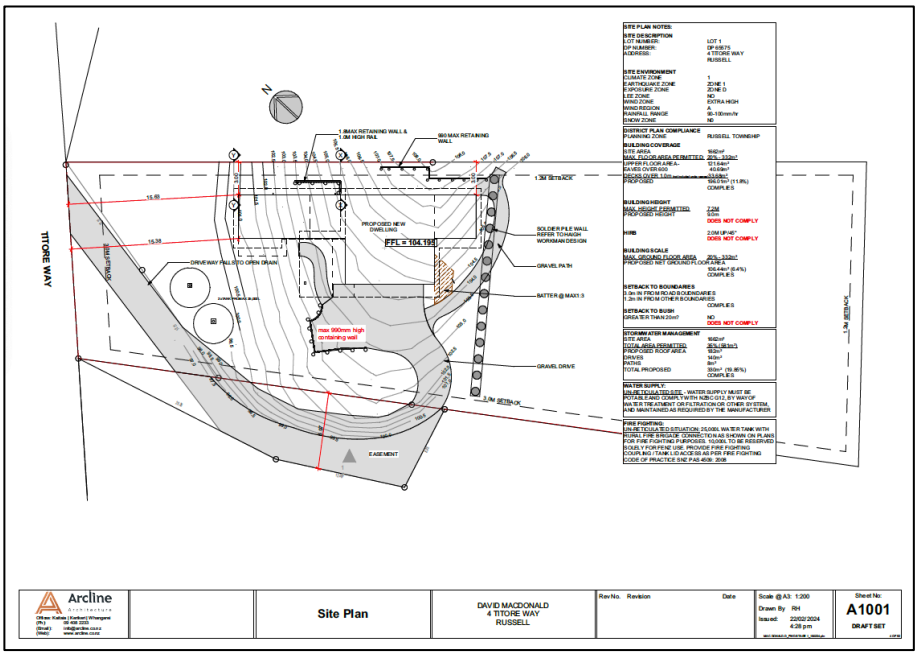


Figure 5: Proposed Dwelling

Access

Access is proposed across Lot 2 DP 65575 and an existing easement provides for this to be undertaken. A new vehicle crossing is to come of Titore Way, and the site is to be serviced internally by a manouvring area as shown on the architectural drawings.

The accessway and house is supported by retaining walls as outlined in **Appendix 3**.

Services

The site has access to FNDC wastewater, however water and stormwater needs to be managed on site.

Two x 25,000l water tanks are provided and stormwater will be via the water tanks with overflow going to a dish drain adjacent to the side of the drive / retaining wall before entering drains along Titore Way.

In terms of water for firefighting, this is provided for in **Appendix 2** and is approved by FENZ in **Appendix 4.**

Other Matters

The site has recently been cleared of scrub to allow for site investigations. These investigations (refer **Appendix 5**) have found that a soldier pile retaining wall is required to provide a stable building platform.

As is found in the plans, a range of retaining walls are also required to support the development.

Given the location of development relative to surrounding DoC owned landholdings, this application has been sent to DoC for their feedback and consideration of the proposal (refer **Appendix 6**).

5.0 REASONS FOR CONSENT

5.1 Operative Far North District Plan

Under the Operative Far North District Plan, the site is zoned **Russell Township Zone** with no additional features or overlays (Figure 6).

Figure 6: Site Zoning

Chapter 10 of the Coastal Environment, Section 9 contains rules and standards specific to the subject site. These are addressed in Table 2, below.

Table 2 – Consideration of Relevant Operative Rules

Chapter 10 – Residential Performance Standards	
Performance Standard	**Comment**
10.9.5.1.2 Residential Intensity Each residential unit for a single household shall have available to it a minimum net site area of 1000m^2 for sewered sites. Except that this rule shall not limit the use of an existing site for a single residential unit for a single household, provided that all other standards for permitted activities are complied with.	One dwelling is proposed for the 1,661m^2 site. The site is sewered. **Permitted**
10.9.5.1.4 Building Height Permitted Standard: Maximum Height = 7.2m Restricted Discretionary Activity	Parts of the dwelling have a proposed height of 9m which does not meet permitted standards. **Restricted Discretionary**

Maximum Height = 9m	
Rule 10.9.5.1.5 Building Scale The maximum net ground floor area of all the buildings on the site shall not exceed 20% of the net site area;	The final dwelling design will have a gross floor area of 196.01m² which equates to 11.8%. **Permitted**
10.9.5.1.6 Sunlight Permitted Standard: No part of any building to project beyond 45-degree recession plan as measured inwards from any point 2m vertically above the ground on any site boundary Restricted Discretionary Standard: No part of any building to project beyond 45-degree recession plan as measured inwards from any point 3m vertically above the ground on any site boundary for a length not exceeding 25% of the relevant boundary.	Refer to Architectural Drawings within **Appendix 2** which show non-compliance with the permitted standards. **Discretionary**
10.9.5.1.7 Stormwater Management Permitted Standard: Maximum proportion of the gross site area covered by impermeable surfaces is 35%.	The proposal will have a final impervious area of 330m² (19.85%) **Permitted**
10.9.5.1.8 Setback from Boundaries Permitted Standard: Minimum setback from road boundaries shall be 3m. The minimum setback from any boundary other than a road boundary shall be 1.2m, except that no setback is required for a maximum total length of 10m along any one such boundary; not less than 50% of that part of the site between the road boundary and a	The proposed dwelling will be located 3m from the nearest boundary. **Permitted**

parallel line 6m there-from shall be landscaped.	
10.9.5.1.13 Noise 0700 to 2200 hours 55 dBA L10 2200 to 0700 hours 45 dBA L10 70 dBA Lmax	The residential activity will meet these standards. **Permitted**
Chapter 12 - Natural and Physical Resources Performance Standards	
Section 12.2 Indigenous Flora and Fauna	
Matters	**Comment**
12.2.6.1.4 Indigenous vegetation clearance in other zones The clearance of indigenous vegetation is a permitted activity if the site meets the definition of an "urban environment" site as specified in Rule 12.2.6.1.1(p) above. On all other sites in other zones, the clearance of indigenous vegetation is a permitted activity, provided that the clearance does not increase the total area of cleared land on the site above 500m2.	Clearance is required to provide for the development on the site, however, given the scope of development this will be less than 500m^2. **Permitted**
Section 12.3 Soils and Minerals	
12.3.6.1.2 Permitted Standard (Russell Township Zone) Excavation, and/or filling, excluding mining and quarrying, on any site in the Residential, Industrial, Horticultural Processing, Coastal Residential, Russell Township Zones, is permitted, provided that: (a) Does not exceed 200m3 in any 12-month period per site; and (b) It does not involve a cut or filled face exceeding 1.5m in height	Consent is required for retaining walls which are above 1.5m in height. **Restricted Discretionary**

i.e. the maximum permitted cut and fill height may be 3m. 12.3.6.2.1Restricted Discretionary Excavation and/or filling, excluding mining and quarrying, on any site in the Residential, Industrial, Horticultural Processing, Coastal Residential or Russell Township Zones is a restricted discretionary activity provided that: (a) it does not exceed 500m3 in any 12 month period per site; and (b) it does not involve a cut or filled face exceeding 1.5m in height i.e. the maximum permitted cut and fill height may be 3m.	
Section 12.4 Natural Hazards	
<u>12.4.6.1.2 Fire Risk to Residential Units:</u> (a) Residential units shall be located at least 20m away from the drip line of any trees in a naturally occurring or deliberately planted area of scrub or shrubland, woodlot or forest. (b) Any trees in a deliberately planted woodlot or forest shall be planted at least 20m away from any urban environment zone, Russell Township or Coastal Residential Zone boundary, excluding replanting of plantation forests existing at July 2003.	The proposal is within 20m of vegetation. **<u>Discretionary Activity</u>**
Chapter 15 - Transportation	

Performance Standard	Comment
15.1.6A.2 Traffic Intensity Status: Daily one-way traffic movements Permitted: 20 Restricted discretionary: 21 – 40 Discretionary: 40 +	The single residential dwelling can readily meet this standard.
15.1.6B.1 Parking Two carparks are required for a residential	Two parks can be provided in the manovring area.
15.1.6C Access	The site contains an existing vehicle crossing and the accessway has been designed in accordance with FNDC standards.

5.2 Proposed Far North District Plan

Under the Proposed Far North District Plan, the site is zoned **Kororāreka Russell Township,** with **Coastal Environment** and **High Natural Character** overlays. There are several chapters of the proposed plan which have immediate legal effect and are relevant to the application site.

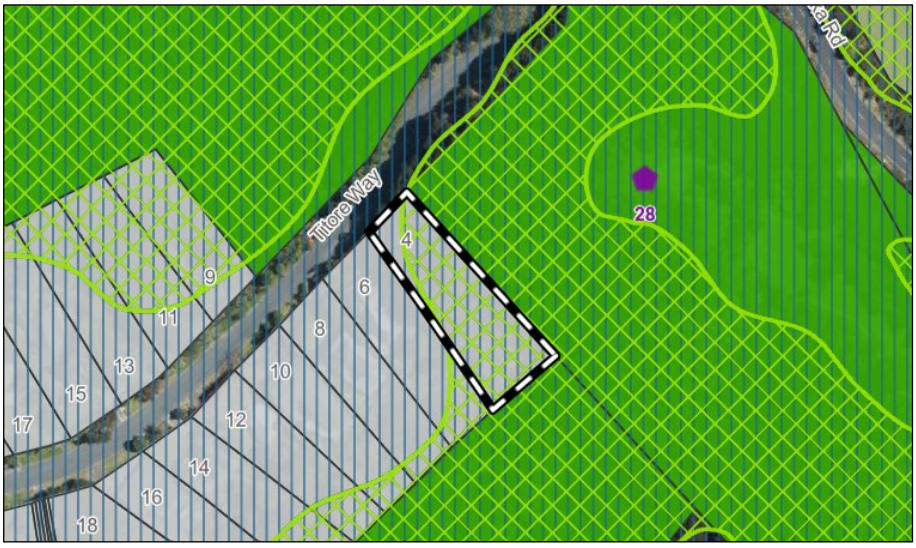


Figure 7: PDP Zoning

Table 3 – Consideration of Relevant Proposed Rules

Part 2 – District wide matters – Natural Environment Values	
Ecosystems and indigenous biodiversity	
Provision	**Assessment**
IB-R1 – Indigenous vegetation pruning, trimming and clearance and any associated land disturbance for specified activities within and outside a Significant Natural Area All zones Activity status permitted where: **PER-1** It is for any of the following: 1. To address an immediate risk to the health and safety of the public or damage to property; 2. To remove dead trees, provided that no more indigenous vegetation is cleared or trimmed than is necessary for safe removal; 3. The formation of walking tracks less than 1.2m wide using manual methods which do not require the removal of any tree over 300mm in girth; 4. Clearance for biosecurity reasons; 5. The sustainable non-commercial harvest of plant material for rongoā Māori (customary medicine); 6. To create or maintain a 20m setback from a building used for a vulnerable activity (excluding accessory buildings)	Clause 7 of PER-1 is promoted to be used.

to the edge of the indigenous vegetation area; 7. To allow for the construction of a single residential unit on a title and essential associated on-site infrastructure and access and it does not exceed 1,000m^2; 8. It is within an area subject to an Open Space Covenant under the Queen Elizabeth II National Trust Act 1977, a Ngā WhenuaRahui Kawenata, a Conservation Covenant under the Reserves Act 1977 or the Conservation Act 1987, or a Heritage covenant under the Heritage New Zealand Pouhere Taonga Act 2014 and the vegetation clearance is provided for in that covenant or order; 9. The construction of a new fence where the purpose of the new fence is to exclude stock and/or pests from the area of indigenous vegetation provided that the clearance does not exceed 3.5m in width either side of the fence line; 10. The removal or clearance from land which was previously cleared and the indigenous vegetation to be cleared is less than 10 years old; 11. Creation and maintenance of firebreaks to manage fire risk; 12. The harvesting of indigenous timber approved under the Forests Act 1949 via either a registered sustainable forest management plan, a registered sustainable forest management permit	

or a personal use approval for the harvesting and milling of indigenous timber from the Ministry of Primary Industries; 13. It is for the operation, repair and maintenance of the following activities where they have been lawfully established: i. Fences ii. infrastructure iii. buildings iv. driveways and access v. walking tracks vi. cycling tracks vii. farming tracks.	
IB-R2 – Indigenous vegetation clearance and any associated land disturbance within a Significant Natural Area for papakāinga Māori Purpose zone, Treaty Settlement Land overlay, Rural Production zone Activity status permitted where: **PER-1** It does not exceed: 1,500m^2 for a marae complex, including associated infrastructure and access; and 500m^2 per residential unit. ***Note:*** *Rules MPZ-R5 and RPROZ-R20 include specific land use rules that also apply to papakainga in the Māori Purpose zone, Treaty*	The property does not have any SNA.

Settlement Land overlay and Rural Production zones. Where compliance not achieved – discretionary	
IB-R3 – Indigenous vegetation clearance and any associated land disturbance within a Significant Natural Area All zones Activity status permitted where: **PER-1** It does not exceed 100m^2 per site in any calendar year. Where compliance not achieved – Discretionary	The property does not have any SNA.
IB-R4 – Indigenous vegetation clearance and any associated land disturbance outside a Significant Natural Area All Zones Activity status permitted where: **PER-1** 1. A report has been obtained from a suitably qualified and experienced ecologist confirming that the indigenous vegetation does not meet the criteria for a Significant Natural Area and it is submitted to Council 14 days in advance of the clearance being undertaken; and 2. It does not exceed the following amounts per site over a 5-year period: i. Rural Production zone, Horticulture zone, Māori Purpose zone and Treaty Settlement Land Overlay – 5,000m^2 if not in a remnant forest,	The rule will not be met. Whilst the site is not within a SNA , more than 100m^2 of clearance is likely required. **Discretionary Activity**

otherwise 500m² in a remnant forest; ii. All other zones – 500m². **PER-2** 1. A report has not been obtained from a suitably qualified and experienced ecologist confirming that the indigenous vegetation does not meet the criteria for a Significant Natural Area and a report has not been submitted to Council 14 days in advance of the clearance being undertaken; and 2. It does not exceed 100m² per site in any calendar year. ***Note:*** *This rule only has immediate legal effect for indigenous vegetation clearance where compliance is not achieved with PER-2 (i.e. in circumstances where a report confirming that the indigenous vegetation is not a Significant Natural Area has not been obtained).* Where compliance not achieved – discretionary	
IB-R5 – Plantation forestry and plantation forestry activities within a Significant Natural Area All zones Activity status – discretionary	The property does not have any SNA.

Table 4 – Consideration of Other Proposed Rules

Proposed District Plan			
Matter	**Rule/Std Ref**	**Compliance**	**Evidence**
Hazardous Substances Majority of rules relates to development within a site that has heritage or cultural items scheduled and mapped however Rule HS-R6 applies to any development within an SNA – which is not mapped	Rule HS-R2 has immediate legal effect but only for a new significant hazardous facility located within a scheduled site and area of significance to Māori, significant natural area or a scheduled heritage resource HS-R5, HS-R6, HS-R9	Yes	Not proposed.
Heritage Area Overlays (Property specific) This chapter applies only to properties within identified heritage area overlays (e.g. in the operative plan they are called precincts for example)	All rules have immediate legal effect (HA-R1 to HA-R14) All standards have immediate legal effect (HA-S1 to HA-S3)	Yes	Not indicated on Far North Proposed District Plan
Historic Heritage (Property specific and applies to adjoining sites (if the boundary is within 20m of an identified heritage item)). Rule HH-R5 Earthworks within 20m of a scheduled heritage resource. Heritage resources are shown as a historic item on the maps) This chapter applies to scheduled heritage resources – which are called heritage items in the map legend	All rules have immediate legal effect (HH-R1 to HH-R10) Schedule 2 has immediate legal effect	Yes	Not indicated on Far North Proposed District Plan
Notable Trees (Property specific) Applied when a property is showing a scheduled notable tree in the map	All rules have immediate legal effect (NT-R1 to NT-R9) All standards have legal effect (NT-S1 to NT-S2)	Yes	Not indicated on Far North Proposed District Plan

	Schedule 1 has immediate legal effect		
Sites and Areas of Significance to Māori (Property specific) Applied when a property is showing a site / area of significance to Maori in the map or within the Te Oneroa-a Tohe Beach Management Area (in the operative plan they are called site of cultural significance to Maori)	All rules have immediate legal effect (SASM-R1 to SASM-R7) Schedule 3 has immediate legal effect	Yes	Not indicated on Far North Proposed District Plan
Ecosystems and Indigenous Biodiversity SNA are not mapped – will need to determine if indigenous vegetation on the site for example	All rules have immediate legal effect (IB-R1 to IB-R5)	Yes	See assessment table above.
Activities on the Surface of Water	All rules have immediate legal effect (ASW-R1 to ASW-R4)	Yes	Not indicated on Far North Proposed District Plan
Earthworks all earthworks (refer to new definition) need to comply with this	The following rules have immediate legal effect: EW-R12, EW-R13 The following standards have immediate legal effect: EW-S3, EW-S5	Yes	With respect of EW-R12, this requires that the proposed earthworks comply with EW-S3. In effect, EW-S3 triggers the need for an ADP to be applied. It is confirmed that the proposed earthworks will comply with an ADP, and this is volunteered as a condition of consent. EW-R13 links to EW-S5. EW-S5 requires earthworks to be controlled in accordance with GD-05. It is confirmed here that

			the earthworks will be undertaken in accordance with GD-05.
Signs (Property specific) as rules only relate to situations where a sign is on a scheduled heritage resource (heritage item), or within the Kororareka Russell or Kerikeri Heritage Areas	The following rules have immediate legal effect: SIGN-R9, SIGN-R10 All standards have immediate legal effect but only for signs on or attached to a scheduled heritage resource or heritage area	Yes	Not indicated on Far North Proposed District Plan
Orongo Bay Zone (Property specific as rule relates to a zone only)	Rule OBZ-R14 has partial immediate legal effect because RD-1(5) relates to water	Yes	Not indicated on Far North Proposed District Plan
Comments:			
Consents are required under the PDP.			

5.3 Overall Activity Status

The proposed development fails to meet the following standards:

- 10.9.5.1.4 Building Height – The proposal is for building height at 9m which exceeds the permitted standards of 7.2m is as a restricted discretionary activity.
- 10.9.5.1.6 Sunlight – The standard of 3m, 45◦ recession plane is infringed along the eastern boundary which is as a restricted discretionary activity.
- 12.4.6.1.2 Fire Risk to Residential Units – The proposed dwelling cannot meet the required 20m setback to bush on account of the vegetation located on the adjacent reserve which cannot be removed. This is provided as a discretionary activity.
- IB-R4 – Indigenous vegetation clearance and any associated land disturbance outside a Significant Natural Area – The proposal requires more than 100m^2 of clearance and a report is not being provided to consider the status of vegetation of the site.

Overall, consent is required as a **Discretionary Activity**.

6.0 NOTIFICATION ASSESSMENT

6.1 Public Notification

The table below outlines the steps associated with public notification insofar as it relates to s95 of the Act.

Table 5 – Public Notification Assessment

Step 1	Mandatory public notification in certain circumstances	
S95A(3)(a)	Has the applicant requested that the application be publicly notified?	No
S95A(3)(b)	Is public notification required under section 95C?(after a request for further information)	TBC
S95A(3)(c)	Has the application been made jointly with an application to exchange recreation reserve land under section 15AA of the Reserves Act 1977.	No
Step 2	if not required by step 1, public notification precluded in certain circumstances	
S95A(5)(a)	Is the application for a resource consent for 1 or more activities and each activity is subject to a rule or national environmental standard that precludes public notification?	No
S95A(5)(b)	Is the application for a resource consent for 1 or more of the following, but no other, activities; (i) a controlled activity; (iii) a restricted discretionary, discretionary, or non-complying activity, but only if the activity is a boundary activity;	No

The proposed development does not meet the tests for mandatory public notification, nor does it meet the tests for precluding public notification.

Therefore, an assessment of the proposals effects on the environment is required to ascertain the effects of the development and whether public notification is required. The section below provides this assessment.

6.2 Effects That Must Be Disregarded

Adjacent Land

Effects on persons who are owners and occupiers of the land in, on, or over which the application relates, or of adjacent land must be disregarded when considering effects on the environment (s 95D(a)). Those properties / persons are as follows:

- Lot 2 DP 65575
- Lot 25 DP 65575
- Lot 12 DP 200303
- Lot 13 DP 200303
- Section 51 Block I Russell SD

- Section 52 Block I Russell SD

Written Approvals

FENZ have provided their written approval to the development. This is provided in **Appendix 4.**

6.3 Effects That May Be Disregarded

Permitted Baseline

Sections 95D(b) and 95E(2)(a) provide that when determining the extent of the adverse effects of an activity or the effects on a person respectively, a council 'may disregard an adverse effect if a rule or national environmental standard permits an activity with that effect'. This is known as the permitted activity baseline test.

The purpose of the permitted baseline test is to isolate and make effects of activities on the environment that are permitted by a plan or NES, irrelevant.

When applying the permitted baseline such effects cannot then be taken into account when assessing the effects of a particular resource consent application.

The baseline has been defined by case law as comprising non-fanciful (credible) activities that would be permitted as of right by the plan in question.

In relation to the rule breaches the consideration of the effects of the following will be undertaken:

- The effects of the additional 1.8m in height of the proposed dwelling at certain locations owing to underlying topography.
- The effects of sunlight to the adjoining allotment resulting from the 3m + 45 degree recession plane.
- The effects of vegetation clearance above 100m^2 but below 500m^2 on the site.

6.4 Existing Environment

The receiving environment beyond the subject site includes permitted activities under the relevant plans, lawfully established activities (via existing use rights or resource consent) and any unimplemented resource consents that are likely to be implemented. The effects of any unimplemented consents on the subject site that are likely to be implemented (and which are not being replaced by the current proposal) also form part of this reasonably foreseeable receiving environment. This is the environment within which the adverse effects of the application must be assessed.

In this case the receiving environment contains residential development which includes vegetated land parcels to the and east while land to the southwest is predominantly residential being defined by smaller allotments occupied by single residential dwellings.

6.5 Effects Assessment

Building Height

Rule 10.6.5.3.2 outlines the following matters to consider when the permitted building height rule is breached:

(a) the extent to which adjacent properties will be adversely affected in terms of visual domination, overshadowing, loss of privacy and loss of access to sunlight and daylight;

(b) the ability to mitigate any adverse effects by way of increased separation distances between buildings or the provision of landscaping and screening.

These are addressed as follows:

(a) Adjacent properties are not considered to be adversely affected in terms of visual domination, overshadowing, loss of privacy and loss of access to sunlight and daylight as the proposed dwelling is adjacent to a DoC Reserve (Flagstaff / Maiki Hill) which on the boundary is covered in vegetation ; and at 6 Titore Way – the proposed dwelling is sufficiently separated to incur any of the associated effects described within the assessment criteria. There are no tracks implicated by the proposal (see Figure 8).

Across Titore Way and to the south of the site, the building height infringement is sufficiently separated from existing development to cause no such effects as described.

Figure 8: DoC Tracks (DoC Maps)

(b) The primary mitigation measure in this instance are the separation distances proposed, in relation to the matters outlined in (a), between the proposed house and the adjacent sites and their relevant development. The eastern boundary site (Flagstaff / Maiki Hill) is the closest site, however there are no such uses on that site in the vicinity of the rule breach which results in minor or more than minor adverse effects.

Sunlight

Rule 10.6.5.3.3 outlines the following matters to consider when the permitted sunlight rule is breached:

(a) the extent to which adjacent properties will be adversely affected in terms of visual domination, overshadowing, loss of privacy and loss of access to sunlight and daylight;

(b) the location and proximity of adjacent residential units, and the outdoor space used by those units;

(c) the ability to mitigate any adverse effects of loss of sunlight.

These are addressed as follows:

(a) Similar to the rationale presented above in terms of building height, adjacent properties will not be implicated by a sunlight breach that results in minor or more than minor effects. Any relevant effects will be most felt at the DoC Reserve site to the east, which is covered in vegetation. As above, there are no DoC tracks implicated by the breach.

(b) The closest dwelling is located at 6 Titore Way. The proposed house is at least ~ 20m away from the dwelling on this site. The outdoor space immediately adjacent to (or in between each site) contains the shared access areas. Outdoor space is predominantly in vegetation.

(c) The location of the dwelling is the primary mitigation measure in this instance. To avoid effects on residential units, the dwelling has been located closer to the DoC Reserve, noting that the boudnary of the DoC Reserve is likely to remain in vegetation and undeveloped.

Please note for both aspects above – the written approval of DoC has been sought (refer **Appendix 6**). This will be provided on receipt.

Fire Risk to Residential Units

Rule 12.4.6.1.2 outlines the following matters to consider when the permitted sunlight rule is breached:

(a) the degree to which the activity may cause or exacerbate natural hazards or may be adversely affected by natural hazards, and therefore increase the risk to life, property and the environment;

(b) the extent to which the activity may adversely affect cultural and spiritual values;

(c) the degree to which any proposed activity is compatible with the maintenance of the natural character of the environment;

(d) the effects on amenity values, landscape values, heritage features and indigenous habitats and ecosystems, especially in the coastal environment and associated with rivers, lakes, wetlands and their margins;

(e) the effects on natural features, such as beaches, sand dunes, mangrove areas, wetlands and vegetation, which have the capacity to protect land and structures from natural hazards;

(f) any adverse effects on water quality;

(g) any adverse effects of the activity on any archaeological sites;

(h) any effect on the life supporting capacity of soil;

(i) the potential impact of sea level rise;

(j) in respect of fire risk to residential units:

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

(ii) any mitigation measures proposed to reduce the fire risk; and

(iii) the adequacy of the water supply; and

(iv) the accessibility of the water supply to fire service vehicles.

(k) any cumulative adverse effects on the environment arising from the activity;

(l) the potential need for ongoing maintenance and the potential effects of such maintenance;

(m) the effects of any proposed option to either avoid, remedy or mitigate the effects of identified natural hazards;

(n) the ability to monitor the effects of the activity and take remedial action (e.g. removal) if necessary;

(o) the extent to which any proposed activity or works intended to provide protection from natural hazards will result in the effects of the natural hazard being transferred to another location.

These are addressed as follows:

(a) The only relevant natural hazard risk associated with the development is fire risk. This risk is reduced through the written approval of FENZ and the provision of fire-fighting water on the site.

(b) There are no known cultural or spiritual effects resulting from the proposal.

(c) In terms of the maintenance of natural character of the coastal environment, the site whilst in the Coastal Environment also expects a form of development as per the Russell Township Zone.

The dwelling is considered to maintain the natural character by limiting clearance to that of the proposed development area. The development area is considered minimal and modest in size and conforms to the relevant stormwater, building coverage, and building scale rule of the Zone.

This ensures that built development is in keeping with the underlying character found by the vegetation present on the site, whilst enabling development that is expected on the site.

(d) The effects to these matters are minimal as many are not relevant to the site.

(e) Not relevant.

(f) No known effects to water quality.

(g) There are no known archaeological sites present.

(h) Soils are impacted to the extent allowed for under the Russel Township Zone. The soils are not considered as Class 1-3.

(i) Impacts of sea level rise are not relevant to the site.

(j) Fire risk is considered in (a) above.

(k) There are no known cumulative effects arising.

(l) Vegetation around the house may need to be cleared from time to time to further limit fire risk.

(m) The proposed mitigation measures are standard approaches to fire risk mitigation.

(n) No monitoring is considered required.

(o) The fire risk mitigation does not encourage the spreading of the fire risk to others.

Vegetation Clearance / Natural Character Effects

As outlined in Figure 9 below, the proposal is located within an area of High Natural Character. The proposal is also located in the Coastal Environment.

Firstly, vegetation clearance is likely to be between 100m^2 – 500m^2 , to promote the proposal. The figure is permitted within the ODP, but requires consent under the PDP, solely because the application is not supported by an ecological report claiming that the site is / is not SNA.

With reference to earlier figures, the site was not considered a SNA / PNA under current DoC mapping. The vegetation to be cleared will only be enough to provide for the development and to allow for appropriate fire management on the site. No clearance is to occur on other sites.

By limiting clearance, this allows the natural character of the site to be retained whilst enabling a development which is enabled through the ODP and PDP.

Given the underlying zoning of the site, and the High Natural Character mapping reflecting vacant use at the time, it is not unusual that the site has qualities and characteristics that result in High Natural Character. However, it is interesting to note that the majority of Titore Way is not included as it is mostly developed.
The proposal is considered to result in the right balance between promoting residential development as enabled by the ODP and PDP whilst retaining natural character on the site. To provide an appropriate balance between the development and natural character of the site, a Landscaping Plan following development is volunteered to assist in this regard.

With these factors in mind, the proposal does not result in significant adverse effects. Relevant effects associated with vegetation clearance and natural character are also appropriately mitigated. On this basis, effects are considered to be no more than minor.

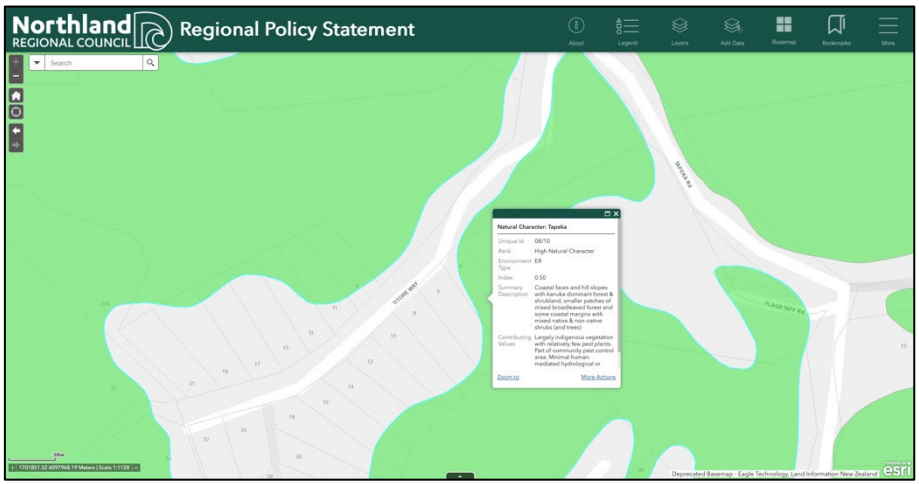


Figure 9: RPS Natural Character (NRC Maps)

Retaining Wall Effects

The relevance of the breach associated with the retaining walls are all associated with engineering stability and appropriateness which are outlined in **Appendix 3 and 5** of this application.

The walls are critical for the access to the house and to provide a stable building platform. No environmental effects arise from their allowance or construction provided the recommendations contained and associated with them are adhered to on an ongoing basis.

Summary

Overall, it has been demonstrated in the above assessment that adverse effects on the environment will be less than minor and therefore public notification is not required.

6.6 Limited Notification Assessment (Sections 95B, 95E)

As with the amendments to Section 95A, Section 95B also entails a number of steps that must be followed to determine whether an application should be subject to limited notification.

The table below outlines the steps associated with limited notification insofar as it relates to s95 of the Act.

Table 6 – Limited Notification Assessment

Step 1	certain affected groups and affected persons must be notified	
S95B(2)(a)	Are there any affected protected customary rights groups?	No

S95B(2)(b)	Are there any affected customary marine title groups (in the case of an application for a resource consent for an accommodated activity)?	No
S95B(3)(a)	Is the proposed activity on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement made in accordance with an Act specified in Schedule 11?	No
S95B(3)(b)	Is the person to whom the statutory acknowledgement is made is an affected person under section 95E?	No
Step 2	if not required by step 1, limited notification precluded in certain circumstances	
S95B(6)(a)	the application is for a resource consent for 1 or more activities, and each activity is subject to a rule or national environmental standard that precludes limited notification:	No
S95B(6)(b)	the application is for a controlled activity (but no other activities) that requires a resource consent under a district plan (other than a subdivision of land)	No

6.7 Affected Person Determination

As the proposed activity does not trigger mandatory limited notification, nor is it precluded, an assessment of potential affected persons must be undertaken.

The consent authority has discretion to determine whether a person is an affected person. A person is affected if an activity's adverse effects are minor or more than minor to them.

The potential effects of the proposal on adjacent landowners has been undertaken below in context of those parties outlined earlier.

6.8 Adversely Affected Persons Assessment

- As the proposed dwelling is located within 20m of the tree dripline Fire and Emergency are considered an affected party. Fire and Emergency New Zealand have reviewed the proposal and have not raised any concerns and have supplied their written approval, therefore are not considered affected.
- The proposed dwelling is to be located within an area which has predominantly residential activities of a similar bulk and scale to that which is proposed. Generous setbacks are provided towards all boundaries and adjacent persons Therefore, the character and amenity of the area is considered to remain unchanged. With respect to the sunlight breach, the surrounding uses are adequately setback / separated from the proposal or contain uses which are not affected to the same degree as residential activities (i.e DoC land).

- The applicant has contacted DoC whose response can be provided on receipt.

6.9 Notification Conclusion

Based on the information provided, it is reasonable to conclude that this application aligns with the relevant provisions of S95A, S95D, S95B, and S95E of the RMA. As such, it can be lawfully assessed without the need for public notification / limited notification or written approvals from affected parties.

7.0 SECTION 104 ASSESSMENT

7.1 Actual and Potential Effects Section – Section 104(1)(a)

In regard to section 104(1)(a) of the Act the actual and potential effects of the proposal will be acceptable as:

- The development is largely consistent with the outcomes anticipated under the zoning and provisions in terms of the built form, height, use, intensity and the overall visual appearance being one, two storey dwelling which is recessed into the site as far as possible and screened by dense, protected vegetation. The dwelling will also be constructed of recessive materials further receding the dwelling into the site. Overall, the dwelling is of an intensity and design which is beginning to emerge in the wider environment due to recent subdivisions.
- The development has been designed to provide acceptable on-site residential amenity for residents whilst minimising any adverse amenity effects such as shading, dominance, overlooking or privacy effects on adjoining sites and people to an acceptable level through the design of the buildings including materiality, form, and setbacks from boundaries.
- In cases where the dwelling does not fully meet the Sunlight standard along the eastern and southern boundaries, a condition requiring certification by a surveyor is expected to ensure compliance with approved plans. This minor infringement is deemed acceptable as it does not result in unreasonable shading or overlooking of adjacent properties or reserves.
- The proposal will also result in positive effects, including, providing for economic and social wellbeing for the current site owner through providing a residential dwelling on an underutilised site. The proposal also adds and additional dwelling to the local housing stock.

7.2 Relevant Statutory Documents – Section 104(1)(b)

New Zealand Coastal Policy Statement 2011

The New Zealand Coastal Policy Statement 2011 (NZCPS) serves as a national framework for managing the coastal environment and its resources. It outlines policies and objectives to ensure the sustainable management and protection of New Zealand's coastal areas.

The NZCPS emphasizes the importance of avoiding adverse effects on the coastal environment, protecting natural coastal processes, and ensuring that development in these areas is well-managed and sustainable. A coastal residential subdivision, when designed and executed responsibly, can align with the principles of the NZCPS.

In the context of the proposed residential dwelling, this site is located some 390m from the waters edge and is separated by several dwelling and roads. This ensures ample setback between the site and coastal area, maintaining any ecological processes within this area of bay and not detracting from the visual appeal of the coastal area. The dwelling has been designed to work with the existing topography, being of two levels to account for the steep topography. The proposal will utilise a natural recessive colour scheme to blend into the existing natural environment as well as only minimal vegetation clearance being required for a firebreak from the dwelling.

The development site is not overlain by any natural hazards, notwithstanding, being within the coastal environment can bring rise to hazards such as erosion and flooding. The site is well elevated as to prevent against flooding, while residential development is located within appropriate building areas to mitigate against any unseen flood risks.

It is considered the proposal will not adversely affect the natural aspects within the coastal environment nor will the proposal create any adverse effects on the natural character and amenity values within the area.

National Policy Statements

There are no National Policy Statements directly relevant to this application.

National Environmental Standards

The National Environment Standards (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health is of relevance to this site. The proposal is considered permitted in terms of this legislation.

This NES does not contain any policy or objectives, instead it has an overarching aim to ensure that development of contaminated land does not cause a risk to human health. Given the permitted activity status it is considered that the overarching aim to protect human health will be achieved. No contamination of the site is known according to NRC maps and available property file information.

NES for Freshwater

The site does not contain any wetlands or freshwater, nor does the application involve a dairy farm activity and therefore the NESFW is not relevant.

Northland Regional Policy Statement 2016

The Regional Policy Statement (RPS) for Northland sets the broad direction and framework for managing the region's natural and physical resources. It identifies significant resource management issues for the region and sets out how resources such as land, water, soil, minerals, plants, animals, and structures will be managed.

The RPS recognises that there are activities and land that should be protected from the negative impacts brought about through subdivision, as further development can result in incompatible land use, effects on receiving environments, reverse sensitivity issues and sterilisation of productive land.

The site does contain areas of high natural character which covers some of the bush on the site. Only minimal vegetation clearance is required to provide a fire break from the dwelling. The bulk of the proposal will occur within the existing cleared area on the site.

The proposal is considered to create less than minor effects on the character of the locality. The proposal will enable the construction of a dwelling while not compromising the sustainable management of natural and physical resources of the coastal environment. The proposal is considered to have negligible effects on the life supporting capacity of air, water, soil and ecosystems. As such, it is considered the proposal is compatible with the intent of the RPS.

The surrounding environment consists of existing built development in an area which is of high natural character and within the coastal environment. Built development in this area is not uncommon and can be seen from the CMA. The site has been previously subdivided for residential end use with the anticipation that most of the bush would be maintained. As such, the proposal will blend into the existing sense of place and is not objectionable in the surrounding environment.

The proposal is considered consistent with the RPS as it involves a coastal residential development in a coastal living area in an area of transiting development from larger parcels to smaller coastal living. There will be no reverse sensitivity implications as the proposed lots are anticipated for residential living being an activity that doesn't require large buildings, noisy machinery, or objectionable odour.

Northland Regional Plan 2019 (NRP)

All future buildings including discharges from the buildings will need to comply with the standards in the NRP at the time of building consent. For a single dwelling as proposed, no NRP consents are required.

Operative Far North District Plan (2009)

The following objectives and policies of the District Plan have been considered:

- Russell Township Zone ;
- Chapter 12.4 Natural Hazards.

In terms of the Russell Township Zone, there is nothing out of line with the proposal for a house / dwelling on a vacant section. Whilst there are amenity based development breaches, these result in minimal adverse effects as the potentially impacted site / persons being the DoC Reserve covered in vegetation is not affected to a minor or more than minor extent. Overall, the aims and intents of the Russell Township Zone are adhered to.

In terms of Chapter 12.4, the proposal rightly considered the potential fire risk and includes appropriate / standard mitigation measures for the fire risk. On this basis, the proposal also meets the requirements of Chapter 12.4

Proposed Far North District Plan

Section 88A(2) provides that "any plan or proposed plan which exists when the application is considered must be had regard to in accordance with section 104(1)(b)." This requires applications to be assessed under both the operative and proposed objective and policy frameworks from the date of notification of the proposed district plan.

In the event of differing directives between objective and policy frameworks, it is well established by case law that the weight to be given to a proposed district plan depends on what stage the relevant provisions have reached, the weight generally being greater as a proposed plan moves through the notification and hearing process. In Keystone Ridge Ltd v Auckland City Council, the High Court held that the extent to which the provisions of a proposed plan are relevant should be considered on a case by case basis and might include:

- The extent (if any) to which the proposed measure might have been exposed to testing and independent decision making;
- Circumstances of injustice; and
- The extent to which a new measure, or the absence of one, might implement a coherent pattern of objectives and policies in a plan.

In this instance, the proposed subdivision is consistent with the relevant objectives and policies of the Proposed District Plan.

Kororāreka Russell Township

- Objectives: Refer Zone
- Policies: Refer Zone

Coastal Environment

- Objectives: CE-O1, CE-O3
- Policies: CE-P5

The proposal is located within the cusp of the Russell residential area of the coastal environment. The site has previously been subdivided for residential end use. Development within this location is consistent with surrounding land use and reduces development sprawl into incompatible areas. The site can be suitably serviced internally with private & public infrastructure.

Overall, the proposed is appropriate for the site and surrounds and is in accordance with the proposed Coastal Environment objectives and policies.

Natural Hazards

- Objectives: NH-O1, NH-O2
- Policies:

The application is consistent with the above policies and objectives. Dedicated 25,000L tank will be located within the site and adjacent to the driveway for ready access in an emergency with at least 10,000L of water always available for firefighting purposes. All planting and landscaping will involve non-flammable species, and vegetation between the dwelling and the bush line will be regularly maintained. With these mitigation measures in place, it is concluded that the proposed dwelling complies with the Natural Hazard Chapter's Fire Risk policies and objectives, resulting in effects on the environment and neighbouring individuals that are considered less than minor.

Earthworks

- Objectives: *EW-O1, EW-O2, EW-O3*
- Policies: *EW-P2, EW-P4, EW-P5, EW-P6, EW-P8*

The area of works is commensurate to the proposal which has been located within the most suitable area of the site. Where cuts are proposed specifically designed retaining walls will be

erected to maintain site stability. The site is suitable from a stability perspective for the proposed development and the proposed works will be undertaken appropriately to ensure that the stability of neighbouring sites is maintained throughout the works. This be ensured through the works being undertaken in accordance with the recommendations of relevant reports.

While appropriate sediment and erosion control measures will be put in place to ensure the sediment does not get beyond the subject site. Conditions are anticipated to be imposed to this effect.

The site is not within a Mana Whenua overlay and no archaeological sites have been identified. Notwithstanding, should any site be inadvertently uncovered work will cease, and local iwi will be consulted immediately.

For this resource consent application, the relevant provisions of both an operative and any proposed plan must be considered. Weighting is relevant if different outcomes arise from assessments of objectives and policies under both the operative and proposed plans.

As the outcomes sought are the same under the operative and the proposed plan frameworks, no weighting is necessary.

8.0 PART 2 ASSESSMENT

8.1 Section 5 – Purpose of The Act

Section 5 in Part 2 of the Act identifies the purpose as being the sustainable management of natural and physical resources. This means managing the use of natural and physical resources in a way that enables people and communities to provide for their social, cultural and economic well-being which sustain those resources for future generations, protecting the life supporting capacity of ecosystems, and avoiding remedying or mitigating adverse effects on the environment.

It is considered that proposal represents a sustainable use of existing resources that allow people and the community to provide for its social and economic wellbeing in a manner that mitigates adverse effects on the environment.

8.2 Section 6 – Matters of National Importance

In achieving the purpose of the Act, a range of matters are required to be recognised and provided for. This includes:

a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:

c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:

d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:

e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

f) the protection of historic heritage from inappropriate subdivision, use, and development:

g) the protection of protected customary rights:

h) the management of significant risks from natural hazards.

In context, the relevant items to the proposal and have been recognised and provided for in the design of the residential development.

8.3 Section 7 – Other Matters

In achieving the purpose of the Act, a range of matters are to be given particular regard. This includes:

(a) kaitiakitanga:
(aa) the ethic of stewardship:
(b) the efficient use and development of natural and physical resources:
(ba) the efficiency of the end use of energy:
(c) the maintenance and enhancement of amenity values:
(d) intrinsic values of ecosystems:
(e) [Repealed]
(f) maintenance and enhancement of the quality of the environment:
(g) any finite characteristics of natural and physical resources:
(h) the protection of the habitat of trout and salmon:
(i) the effects of climate change:
(j) the benefits to be derived from the use and development of renewable energy.

These matters have been given particular regard through the design of the proposal.

8.4 Section 8 – Treaty of Waitangi

The Far North District Council is required to take into account the principles of the Treaty of Waitangi when processing this consent. This consent application may be sent to local iwi and hapū who may have an interest in this application.

8.5 Section 8 – Part 2 Conclusion

Given the above, it is considered that the proposal meets the purpose of the Act.

9.0 CONCLUSION

This application seeks a discretionary resource consent to undertake a residential dwelling within the Russell Township Zone. The assessment of effects on the environment concludes that for the reasons outlined in the application, the effects of undertaking this proposal will be no more than minor on the surrounding environment.

The proposal is not precluded from public notification and is considered to have less than minor effects on the wider environment. Through assessment, there are considered to be no affected persons.

The proposal is consistent with the objectives and policies of the Far North District Plan, the Regional Policy Statement for Northland, and achieves the purpose of the Act.

Given the assessment carried out in this report, it is considered that this proposal can be determined non-notified under the RMA 1991. We would appreciate the review of draft conditions when available.

Regards,

Steven Sanson

Consultant Planner

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Guaranteed Search Copy issued under Section 60 of the Land Transfer Act 2017

R.W. Muir
Registrar-General of Land

Identifier	**NA24A/1114**
Land Registration District	**North Auckland**
Date Issued	30 June 1972

Prior References
NA1060/112

Estate	Fee Simple
Area	1662 square metres more or less
Legal Description	Lot 1 Deposited Plan 65575
Registered Owners	

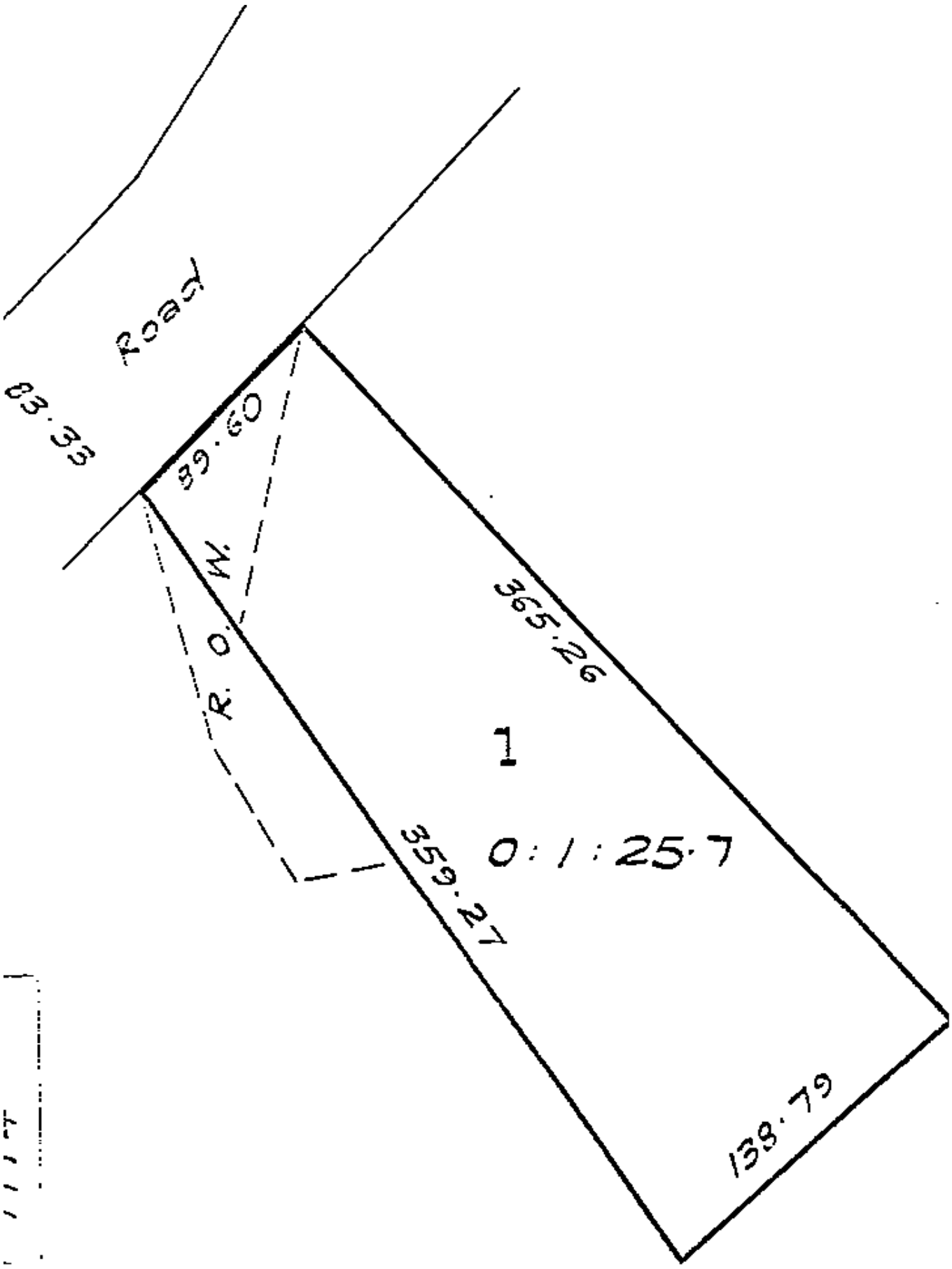
David Cameron MacDonald

Interests

Fencing Agreement in Transfer 517776

Subject to a right of way over part coloured yellow on DP 65575 specified in Easement Certificate 207409.1 - 30.6.1972 at 1.37 pm

Appurtenant hereto is a right of way specified in Easement Certificate 207409.1 - 30.6.1972 at 1.37 pm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EASEMENT CERTIFICATE

(IMPORTANT—Registration of this certificate does not of itself create any of the easements specified herein.)

I, NANCY LOUISE FLADGATE of Russell Married Woman

being the registered proprietor of the land described in the Schedule hereto hereby certify that the easements specified in that Schedule, the servient tenements in relation to which are shown on a plan of survey deposited in the Land Registry Office at Auckland on the 1st day of November 1971 under No. 65575 are the easements which it is intended shall be created by the operation of *section 90A* of the Land Transfer Act 1952.

SCHEDULE

DEPOSITED PLAN No. 65575

Nature of Easement (e.g., Right of Way, etc:)	Servient Tenement		Dominant Tenement Allotment No(s).	Title Reference
	Allotment No.	Colour, or Other Means of Identification, of Part Subject to Easement		
Right of Way	Pt. Lot 1	Yellow	Lot 2	Part Certificate of Title Volume 1060 Folio 112
Right of Way	Pt. Lot 2	Yellow	Lot 1	
Right of Way	Pt. Lot 9	Yellow	Lots 10, 11 12 and 13	
Right of Way	Pt. Lot 10	Yellow	Lots 11, 12 13 and 9	
Right of Way	Pt. Lot 11	Yellow	Lots 12, 13 9 and 10	
Right of Way	Pt. Lot 12	Yellow	Lots 13, 9 10 and 11	
Right of Way	Pt. Lot 13	Yellow	Lots 9, 10 11 and 12	

1. Rights and powers:

State whether any rights or powers set out here are in addition to or in substitution for those set out in the *Seventh* Schedule to the Land Transfer Act 1952.

2. Terms, conditions, covenants, or restrictions in respect of any of the above easements:

(i) The cost of constructing and maintaining the rights of way will be borne as follows :-

(a) As regards the parts of Lots 1 and 2 coloured yellow on Deposited Plan 65575 by the registered proprietors of the dominant tenements Lots 2 and 1 Deposited Plan 65575 respectively in the proportions of one equal part to each such tenement

(b) As regards the parts of Lots 9, 10, 11, 12 and 13 coloured yellow on Deposited Plan 65575 by the registered proprietors of the dominant Tenements Lots 10, 11, 12, 13 and 9 respectively in the proportions of 3/16ths to the said Lot 10, 4/16ths to the said Lot 11, 4/16ths to the said Lot 12, 3/16ths to the said Lot 13 and 2/16ths to the said Lot 9.

(ii) Where the need for maintenance is directly attributable to the actions of one or more of those registered proprietors the cost in that case shall be borne wholly by that proprietor or if more than one by those proprietors equally between them.

Dated this 10th day of May 1972

Signed by the abo [redacted] Nancy L. Fladgate
in the presence

[redacted]

Witness:

Occupation:

Address:

No.

EASEMENT CERTIFICATE

situated in Bay of Islands County

Particulars entered in the Register-book,

Vol. 1060, folio 112,

[redacted]

So
cr
37
19

203/1157

[redacted]

Correct for the purp [redacted] *ct.*

..... [redacted] *rietor.*

RIGHTS AND POWERS OF GRANTEES IMPLIED IN CERTAIN EASEMENTS BY SECTION 90D OF THE LAND TRANSFER ACT 1952

"1. RIGHT OF WAY

The full, free, uninterrupted, and unrestricted right, liberty, and privilege for the grantee, his servants, tenants, agents, workmen, licensees, and invitees (in common with the grantor, his tenants, and any other person lawfully entitled so to do) from time to time and at all times by day and by night to go pass and repass, with or without horses and domestic animals of any kind and with or without carriages, vehicles, motor vehicles, machinery, and implements of any kind, over and along the land over which the right of way is granted or created.

"2. RIGHT TO CONVEY WATER

The full, free, uninterrupted, and unrestricted right, liberty, and privilege for the grantee and his tenants (in common with the grantor, his tenants, and any other person lawfully entitled so to do) from time to time and at all times to take, convey, and lead water in a free and unimpeded flow (except when the flow is halted for any reasonable period necessary for essential repairs) and in any quantity, consistent with the rights of other persons having the same or similar rights, from the source of supply or point of entry, as the case may be, and following the stipulated course (where a course is stipulated) across the land over which the easement is granted or created, together with the additional rights incidental thereto set out in clause 5 of this Schedule.

"3. RIGHT TO DRAIN WATER

The full, free, uninterrupted, and unrestricted right, liberty, and privilege for the grantee and his tenants (in common with the grantor, his tenants, and any other person lawfully entitled so to do) from time to time and at all times to drain and discharge water (whether rain, tempest, spring, soakage, or seepage water) in any quantities along the stipulated course (where a course is stipulated) across the land over which the easement is granted or created, together with the additional rights incidental thereto set out in clause 5 of this Schedule (or, where open drains are provided for, similar rights in regard to those drains, with the necessary modifications as are provided for in respect of pipe lines in the additional rights so set out).

"4. RIGHT TO DRAIN SEWAGE

The full, free, uninterrupted, and unrestricted right, liberty, and privilege for the grantee and his tenants (in common with the grantor, his tenants, and any other person lawfully entitled so to do) from time to time and at all times to drain, discharge, or convey sewage and other waste material and fluid in any quantities along the stipulated course (where a course is stipulated) across the land over which the easement is granted or created, together with the additional rights incidental thereto set out in clause 5 of this Schedule.

"5. ADDITIONAL RIGHTS ATTACHING TO EASEMENTS OF RIGHT TO CONVEY WATER AND OF RIGHT TO DRAIN WATER AND OF RIGHT TO DRAIN SEWAGE

The full, free, uninterrupted, and unrestricted right, liberty, and privilege for the grantee and his tenants (in common with the grantor, his tenants, and any other person lawfully entitled so to do) for the purposes of the easement concerned—

(a) To use any line of pipes already laid on the stipulated course or any pipe or pipes in replacement or in substitution for all or any of those pipes:

(b) Where no such line of pipes exists, to lay, place, and maintain, or to have laid, placed, and maintained, a line of pipes of a sufficient internal diameter and of suitable material for the purpose under or over the surface (as the parties decide) of the land over which the easement is granted or created and along the line defined for the purpose where such a line has been so defined:

(c) In order to construct or maintain the efficiency of any such pipe line, the full, free, uninterrupted, and unrestricted right, liberty, and privilege for the grantee, his tenants, servants, agents, and workmen, with any tools, implements, machinery, vehicles, or equipment of whatsoever nature necessary for the purpose, to enter upon the land over which the easement is granted or created (or, where only the position of the pipe line is defined in the easement, upon such part of the land of the grantor and by such route as is reasonable in the circumstances) and to remain there for any reasonable time for the purpose of laying, inspecting, cleansing, repairing, maintaining, and renewing the pipe line or any part thereof [redacted] soil of that land to such extent as [redacted] reasonable in that regard, subject [redacted] as little disturbance as possible is c[redacted] the land of the grantor and that [redacted] as nearly as possible to its original c[redacted] damage done by reason of the a[redacted] repaired."

[redacted]

LAND TRANSFER ACT 1952

[redacted]

Land Transfer Office

Received 03375

Title Reference Part C's T. 1060/112 Ltd and 20B/1157 Ltd

Referred to L. T. Surveyor

Land and Deeds Plan

Firm Jackson Russell

Date 21.7.71 Fee 54-00

Time 130 Abstract No. 6994

Memorandum of Easements				
Easement	Land	Colour	Servient Tenement	Dominant Tenement
Right of Way	Pt. Lot 9	Yellow	Pt. Lot 9	Lots 10, 11, 12 & 13.
Right of Way	Pt. Lot 10	Yellow	Pt. Lot 10	Lots 11, 12, 13 & 9.
Right of Way	Pt. Lot 11	Yellow	Pt. Lot 11	Lots 12, 13, 9 & 10.
Right of Way	Pt. Lot 12	Yellow	Pt. Lot 12	Lots 13, 9, 10 & 11.
Right of Way	Pt. Lot 13	Yellow	Pt. Lot 13	Lots 9, 10, 11 & 12.

Proposed Easements				
Easement	Land	Colour	Servient Tenement	Dominant Tenement
Right of Way	Pt. Lot 1	Yellow	Pt. Lot 1	Lot 2.
Right of Way	Pt. Lot 2	Yellow	Pt. Lot 2	Lot 1.

Conditional Consent

65575

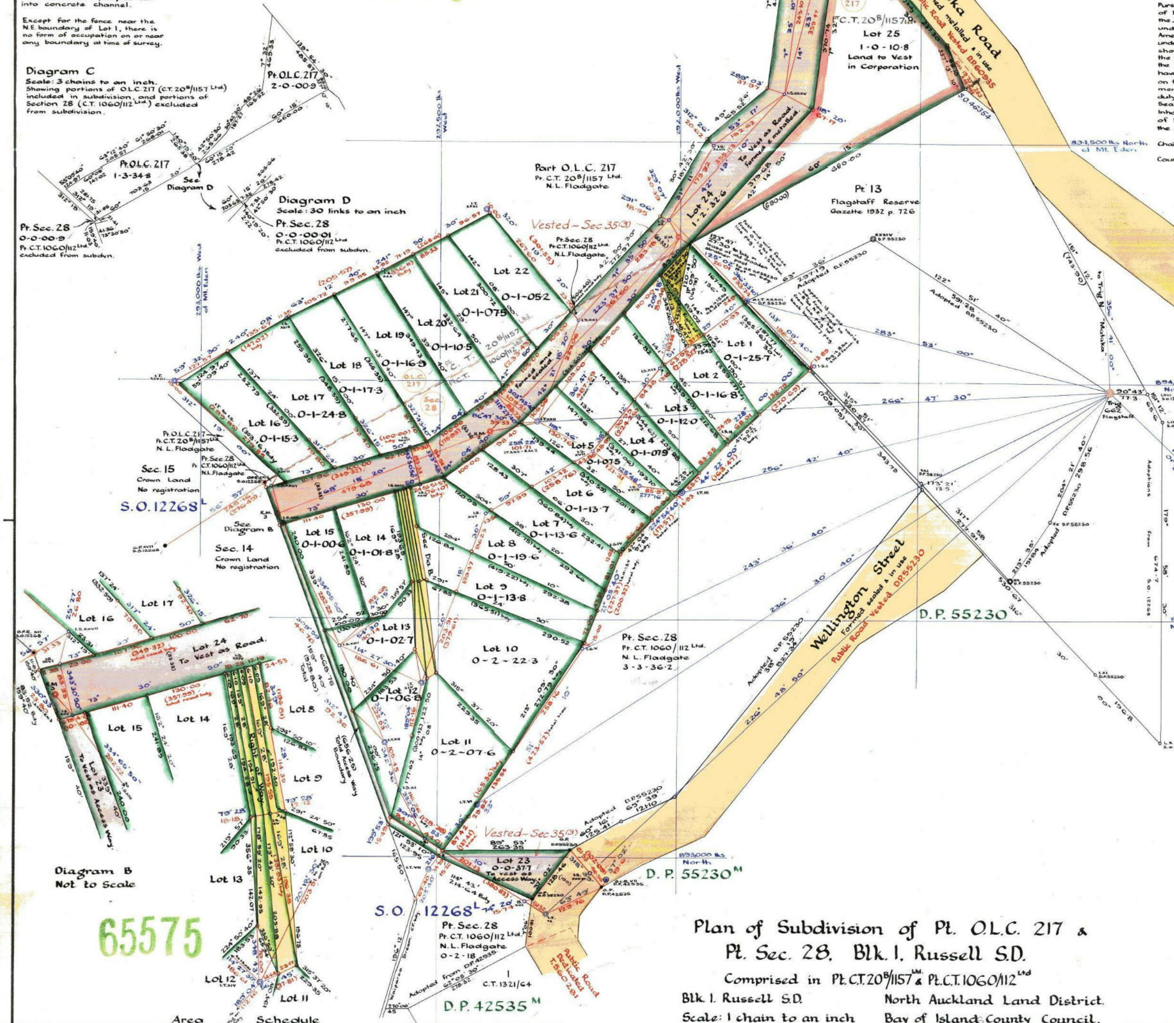
R.M.'s 1, 2 & 3 are plaques set into concrete channel.

Except for the fence near the N.E. boundary of Lot 1, there is no form of occupation on or near any boundary at time of survey.

Diagram C

Scale: 3 chains to an inch.

Showing portions of O.L.C. 217 (C.T. 20B/1157 Ltd.) included in subdivision, and portions of Section 28 (C.T. 1060/112 Ltd.) excluded from subdivision.



65575

Pursuant to a resolution of the Bay of Islands County Council passed on the 21st day of April 1971 approving under Section 34 of the Counties Amendment Act 1961 the Subdivision and under Section 40 the rights of way shown on this plan, and certifying that the requirements of Section 33 (4) of the Town and Country Planning Act 1953 have been complied with, and conditional on the easements shown in the memorandum endorsed hereon being duly granted or reserved, the Common Seal of the Chairman, Councillors and Inhabitants of the County of Bay of Islands was hereto affixed in the presence of :-

Chairman: [signature]

County Clerk: [signature]

THE COMMON SEAL OF THE CHAIRMAN, COUNCILLORS AND INHABITANTS OF THE BAY OF ISLANDS COUNTY

65575

Plan of Subdivision of Pt. O.L.C. 217 & Pt. Sec. 28, Blk. I, Russell S.D.

Comprised in Pt. C.T. 20B/1157 Ltd. & Pt. C.T. 1060/112 Ltd.

Blk. I. Russell S.D. — North Auckland Land District.

Scale: 1 chain to an inch — Bay of Island County Council.

Surveyed by Beca, Carter, Hollings & Ferner.

Registered Surveyors.

January 1971

Area Schedule

Lots 1 - 22	7-2-29·9	
Lot 23 to vest as Access Way	0-0-37·7	Vested
Lot 24 to vest as Road	1-2-32·6	Vested
Lot 25 to vest in Corporation	1-0-10·8	
Total Area	10-2-31·0	

Approved as to Survey

[signature] Chief Surveyor 16.8.71

Received

Reference plans D.P. 20409, 42535, 55230, 60935, 62951, S.O. 12268

Field book 516 p. 63-71

Traverse book p. 8

Examined by 11-8-71

Recorded R 1553

Correct 13.8.71 L. T. Surveyor

I, Alan James Kinnear of Auckland Registered Surveyor and holder of an annual practising certificate, solemnly and sincerely declare that this plan has been made from surveys executed by me; that both plan and survey are correct; and have been made in accordance with the Regulations under the Surveyors Act 1938. And I make this solemn declaration, conscientiously believing the same to be true and by virtue of the Oaths and Declarations Act 1957.

Declared at Helford this 7th day of April 1971 before me— [signature]

Solicitor ~~Justice of the Peace~~, (or other person authorised to take a statutory declaration.)

[signature] Registered Surveyor

Approved

[signature] Nancy L. Fladgate

Applicant or Registered Owner

This space reserved for plan numbers

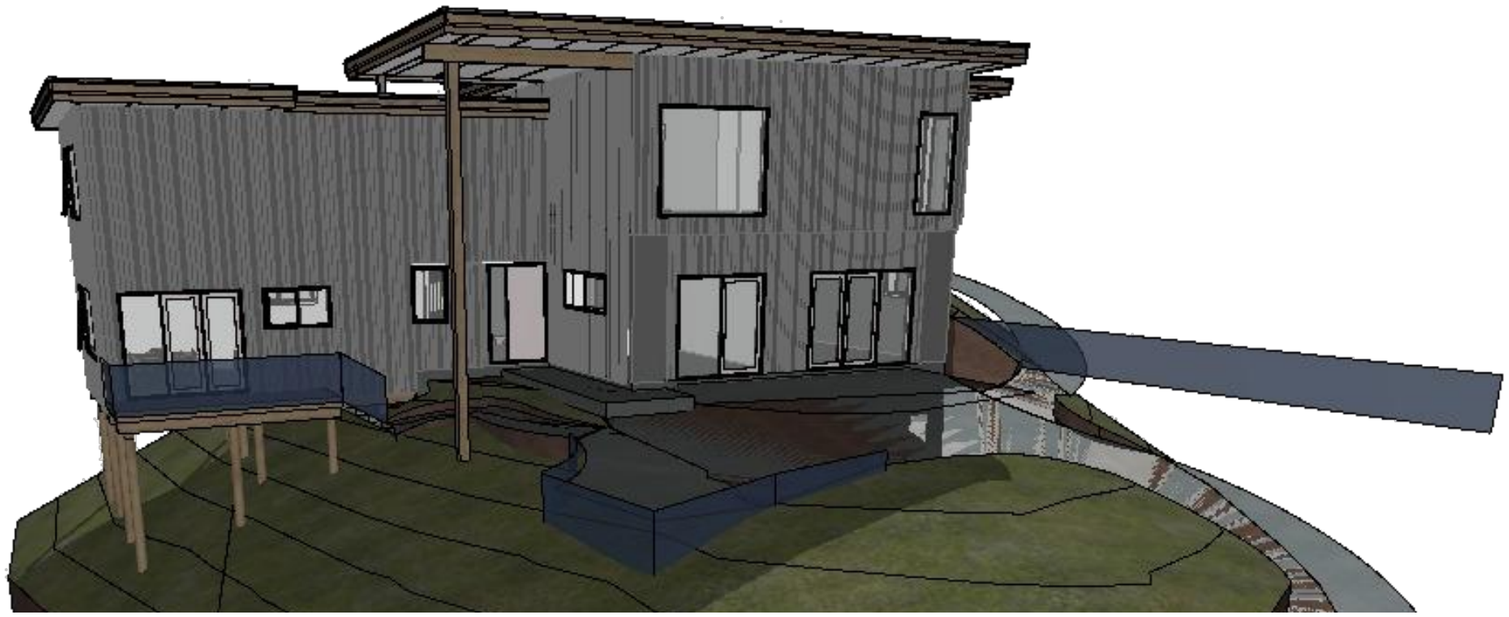
65575

Supplied by Sterling Imports (Auck.) Ltd. P.O. Box 8752 Auckland

NEW RESIDENTIAL DWELLING FOR

DAVID MACDONALD

	SHEET INDEX
A0001	Cover Page
A0002	Presentation
A1001	Site Plan
A1501	Ground Floor Plan
A1502	First Floor Plan
A1511	Ground Floor Wall Framing Plan
A1512	First Floor Wall Framing Plan
A2001	Elevations
A2002	Elevations



LOT 1 DP 65575
4 TITORE WAY RUSSELL

Arcline Architecture

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(Ph): 09 408 2233
(Email): info@arcline.co.nz
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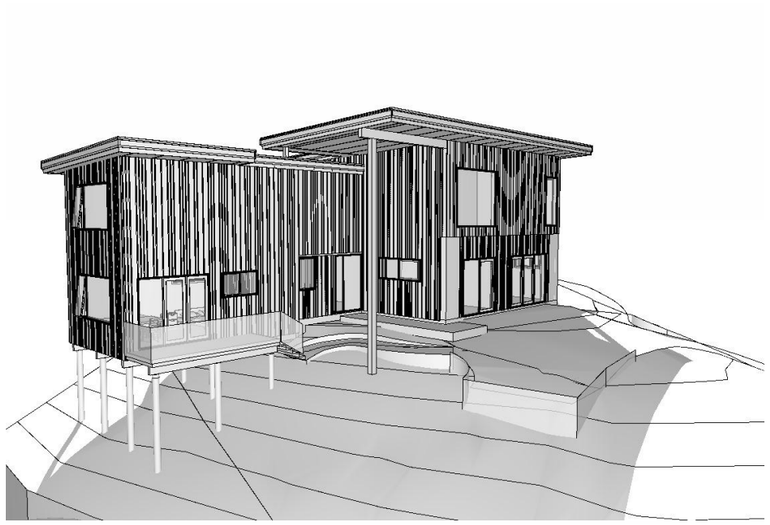
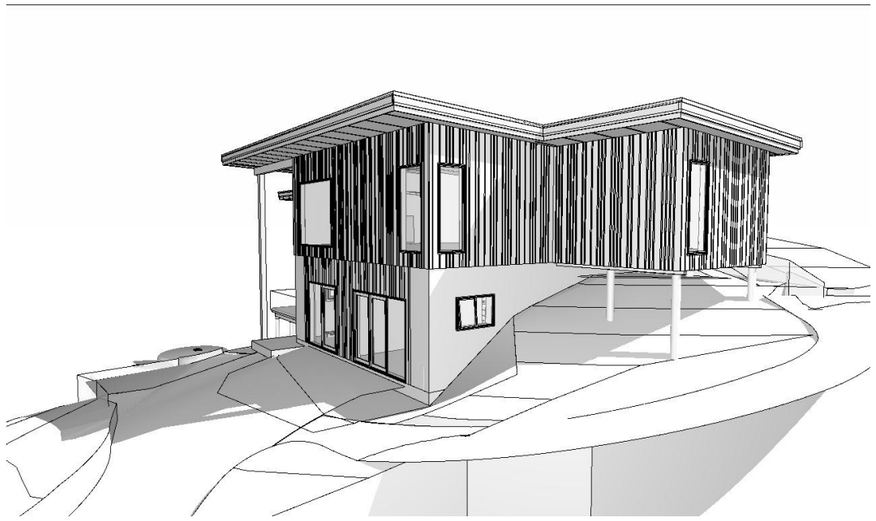
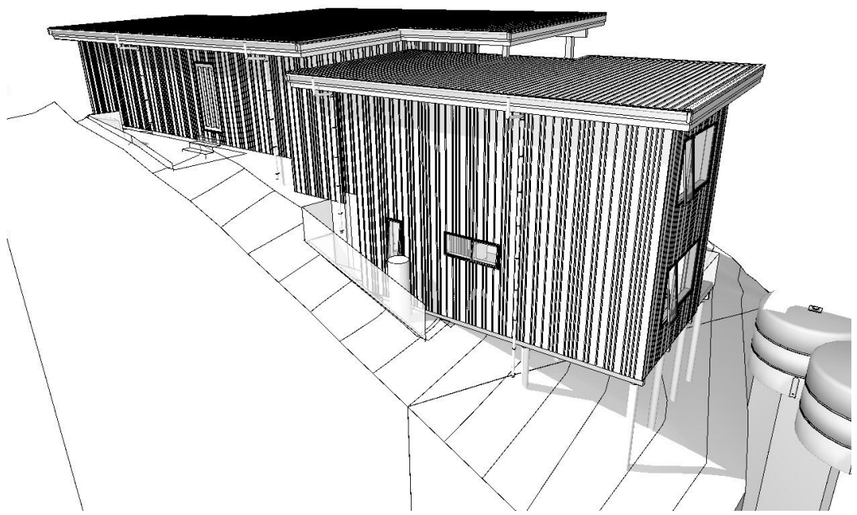
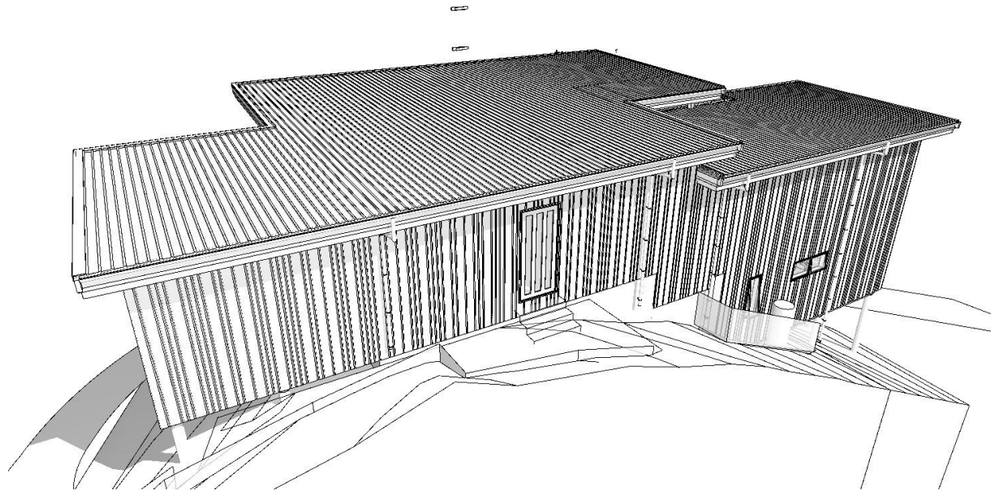
DRAFT SET
22/02/2024 4:28 pm

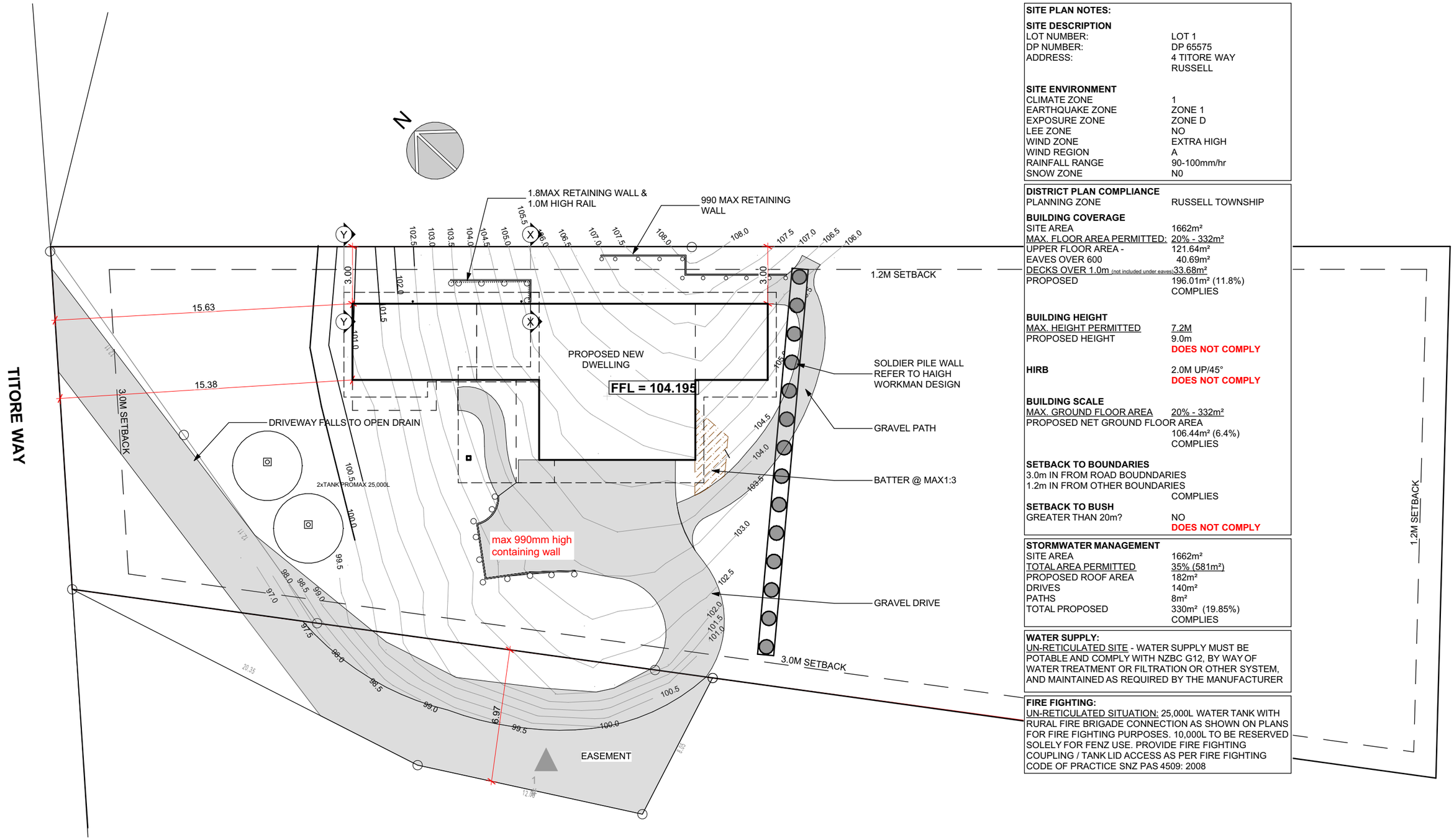








Arcline Architecture Offices: Kaitaia | Kerikeri | Whangarei (Ph): 09 408 2233 (Email): info@arcline.co.nz (Web): www.arcline.co.nz		**Presentation**	DAVID MACDONALD 4 TITORE WAY RUSSELL	Rev No. Revision Date	Scale @ A3: 1:161.2903 Drawn By RH Issued: 22/02/2024 4:28 pm MAC DONALD.D_FWD STAGE 1_190224.pln	Sheet No: **A0002** **DRAFT SET** 3 OF 52



SITE PLAN NOTES:

SITE DESCRIPTION

LOT NUMBER:	LOT 1
DP NUMBER:	DP 65575
ADDRESS:	4 TITORE WAY RUSSELL

SITE ENVIRONMENT

CLIMATE ZONE	1
EARTHQUAKE ZONE	ZONE 1
EXPOSURE ZONE	ZONE D
LEE ZONE	NO
WIND ZONE	EXTRA HIGH
WIND REGION	A
RAINFALL RANGE	90-100mm/hr
SNOW ZONE	N0

DISTRICT PLAN COMPLIANCE

PLANNING ZONE	RUSSELL TOWNSHIP

BUILDING COVERAGE

SITE AREA	1662m²
MAX. FLOOR AREA PERMITTED:	20% - 332m²
UPPER FLOOR AREA -	121.64m²
EAVES OVER 600	40.69m²
DECKS OVER 1.0m (not included under eaves)	33.68m²
PROPOSED	196.01m² (11.8%) COMPLIES

BUILDING HEIGHT

MAX. HEIGHT PERMITTED	7.2M
PROPOSED HEIGHT	9.0m **DOES NOT COMPLY**
HIRB	2.0M UP/45° **DOES NOT COMPLY**

BUILDING SCALE

MAX. GROUND FLOOR AREA	20% - 332m²
PROPOSED NET GROUND FLOOR AREA	106.44m² (6.4%) COMPLIES

SETBACK TO BOUNDARIES

3.0m IN FROM ROAD BOUDNDARIES
1.2m IN FROM OTHER BOUNDARIES
COMPLIES

SETBACK TO BUSH

GREATER THAN 20m?	NO **DOES NOT COMPLY**

STORMWATER MANAGEMENT

SITE AREA	1662m²
TOTAL AREA PERMITTED	35% (581m²)
PROPOSED ROOF AREA	182m²
DRIVES	140m²
PATHS	8m²
TOTAL PROPOSED	330m² (19.85%) COMPLIES

WATER SUPPLY:

UN-RETICULATED SITE - WATER SUPPLY MUST BE POTABLE AND COMPLY WITH NZBC G12, BY WAY OF WATER TREATMENT OR FILTRATION OR OTHER SYSTEM, AND MAINTAINED AS REQUIRED BY THE MANUFACTURER

FIRE FIGHTING:

UN-RETICULATED SITUATION: 25,000L WATER TANK WITH RURAL FIRE BRIGADE CONNECTION AS SHOWN ON PLANS FOR FIRE FIGHTING PURPOSES. 10,000L TO BE RESERVED SOLELY FOR FENZ USE. PROVIDE FIRE FIGHTING COUPLING / TANK LID ACCESS AS PER FIRE FIGHTING CODE OF PRACTICE SNZ PAS 4509: 2008

Arcline Architecture
Offices: Kaitaia | Kerikeri | Whangarei
(Ph): 09 408 2233
(Email): info@arcline.co.nz
(Web): www.arcline.co.nz

Site Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

Scale @ A3: 1:200
Drawn By RH
Issued: 22/02/2024 4:28 pm
MAC DONALD.D_FWD STAGE 1_190224.pln

Sheet No:
A1001
DRAFT SET

ACCESS
SLIP RESISTANCE SHALL BE PROVIDED TO EXTERIOR ACCESS ROUTES AS BELOW OR BY OTHER MEANS IN ACCORDANCE WITH TABLE 2 / SECTION 2 NZBC D1/AS1:
LEVEL SURFACE FINISH
CONCRETE DRY - SMOOTH TROWEL FINISH
CONCRETE WET - BROOMED OR WOOD FLOAT
TIMBER DRY - UNCOATED SMOOTH
TIMBER WET - GROOVED ACROSS PROFILE
TIMBER WET - COATED AND SAND/GRIT
RAMPS OR STAIRS FINISH
TIMBER WET - GROOVED ACROSS PROFILE
TIMBER WET - COATED AND SAND/GRIT

STAIRS / STEPS
ALL STAIRS TO BE AS PER MAIN PRIVATE TO NZBC D1 FIG. 11
MAX. RISE: 190mm (ENSURE EQUAL RISE)
MIN. TREAD: 280mm
ENSURE HAND RAIL TO AT LEAST ONE SIDE OF STAIR WITH 3 OR MORE STEPS

INSULATION
DWELLING:
SKILLION ROOF - 265mm MAX, R6.0
EG. PINK BATTS SKILLION SUPERBATTS ROOF R6.0 230mm

WALL INSULATION - 90mm MIN R2.8
EG. PINK BATTS ULTRA R2.8 90mm WALL
(STAIRWELL INSULATED)

MIDFLOOR & SUBFLOOR INSULATION R2.5
EG. EXPOL UNDERFLOOR R2.5 100mm

R2.4 INSULATION TO BE INSTALLED AROUND/BETWEEN BATHROOMS AND BEDROOMS.

STAIRWELL SLAB

CONCRETE MASONRY:
(STRAP AND LINE - CHECK)

FLOOR AREAS

GROUND FLOOR AREA:	106.43m²
TOP FLOOR AREA:	121.64m²
TOTAL FLOOR AREA:	**228.07m²**

INTERIOR FINISHES
WALL LININGS
10mm GIB.
GIB AQUALINE TO WET AREAS.
VILLABOARD IN TILED SHOWERS.

INTERNAL DOORS
2.2m TYPICAL INTERNAL DOOR HEIGHT.
BLACK MDF WITH ROUTED GROOVES

TRIMS
60x10 FJ PINE, SINGLE BEVEL SKIRTING.
40x10 FJ PINE ARCHITRAVE.
SQUARE STOP (40x18 IN CUPBOARDS) SCOTIA.

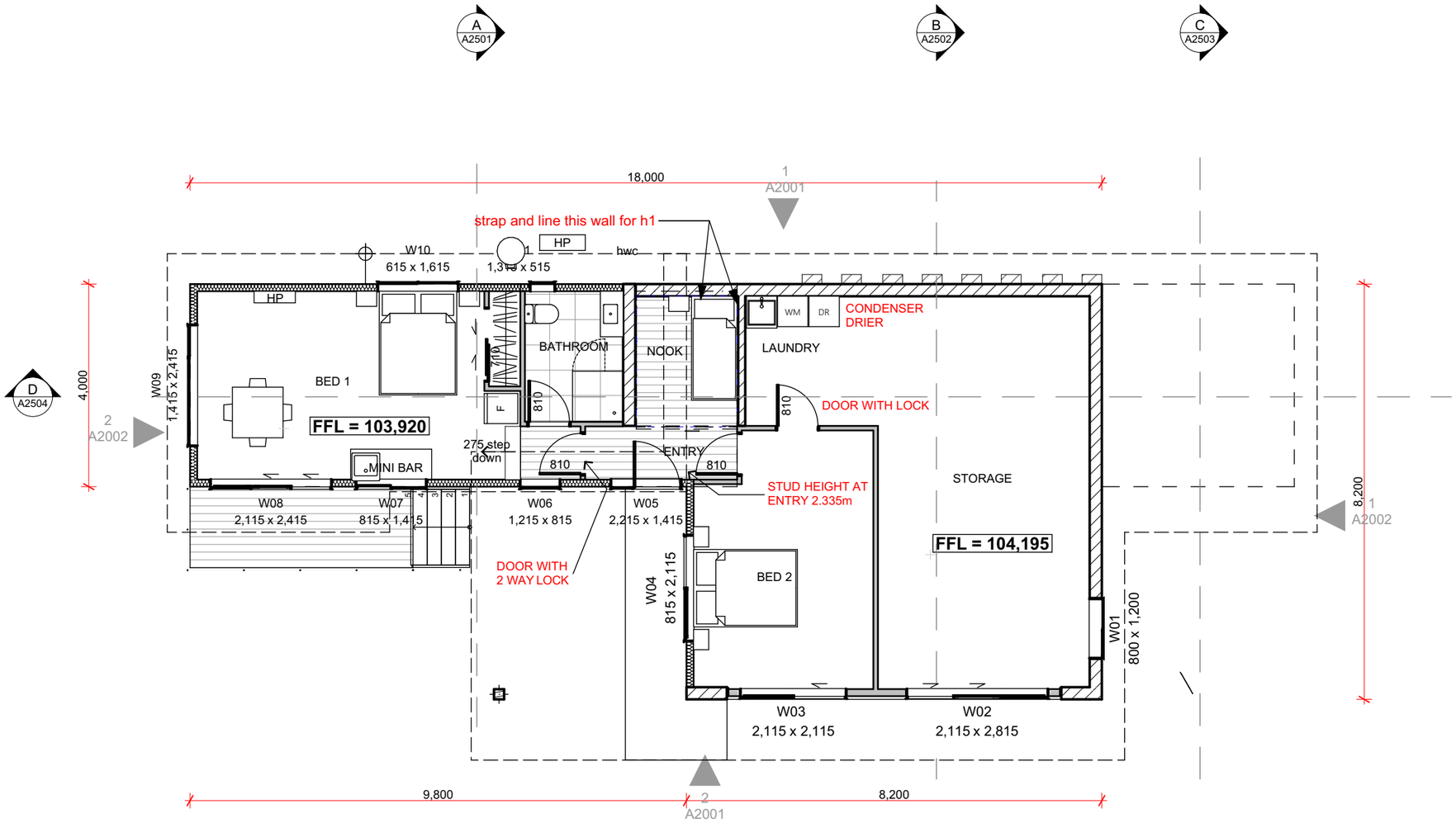
KEY:
RAKING CEILING
WARDROBE
ST. STORAGE CUPBOARD
SMART METER BOX
FLOORING: TILE
FLOORING: OVERLAY
INSULATION TO INTERNAL WALLS
MECHANICAL VENT DUCTED TO EXTERIOR
EXTERIOR WATER TAP
HP HEAT PUMP
SD SMOKE DETECTOR

WET AREAS
ALL DETAILS TO COMPLY WITH NZBC E3 INTERNAL MOISTURE AND MANUFACTURER'S PRODUCT DETAILS. PROVIDE AN IMPERVIOUS AND EASILY CLEANABLE SURFACE TO ALL WALL AREAS LIKELY TO BE SPLASHED. USE GIB AQUALINE ON WET AREA WALLS AND CEILINGS. JOINTS BETWEEN FIXTURES & WALL LININGS; WHERE BATHS, BASINS, TUBS OR SINKS ABUTT IMPERVIOUS LININGS THE JOINT BETWEEN FIXTURE & LINING SHALL BE SEALED TO PREVENT WATER PENETRATION TO CONCEALED SPACES OR BEHIND LININGS.

SHOWERS TO HAVE 6MM SAFETY GLASS DOOR PANEL UNLESS SPECIFIED
ALL GLAZING TO WET AREAS TO BE GRADE A TOUGHENED SAFETY GLASS
ALL ACCESS ROUTES, BOTH EXTERANL AND INTERNAL, PROVIDE ANTI-SLIP SURFACES COMPLYING WITH NZBC CLAUSE D1/AS1 (2.1 SLIP RESISTANCE)

WATER HEATING
GAS CALIFONT AS SHOWN ON THE ELECTRICAL PLAN.
2X45KG BOTTLES AS SHOWN ON FLOOR PLAN. (WITH SEISMIC RESTRAINTS)

SMOKE ALARMS TO BE INSTALLED TO AS1670.6 REQUIREMENTS. EQUIPMENT TO COMPLY WITH AS3786.



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Ground Floor Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

Scale @ A3: 1:100
Drawn By RH
Issued: 22/02/2024 4:28 pm
MAC DONALD.D_FWD STAGE 1_190224.pln

Sheet No:
A1501
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ACCESS
SLIP RESISTANCE SHALL BE PROVIDED TO EXTERIOR ACCESS ROUTES AS BELOW OR BY OTHER MEANS IN ACCORDANCE WITH TABLE 2 / SECTION 2 NZBC D1/AS1:
LEVEL SURFACE FINISH
CONCRETE DRY - SMOOTH TROWEL FINISH
CONCRETE WET - BROOMED OR WOOD FLOAT
TIMBER DRY - UNCOATED SMOOTH
TIMBER WET - GROOVED ACROSS PROFILE
TIMBER WET - COATED AND SAND/GRIT
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EG. PINK BATTS ULTRA R2.8 90mm WALL
(STAIRWELL INSULATED)

MIDFLOOR & SUBFLOOR INSULATION R2.5
EG. EXPOL UNDERFLOOR R2.5 100mm

R2.4 INSULATION TO BE INSTALLED AROUND/BETWEEN BATHROOMS AND BEDROOMS.

STAIRWELL SLAB

CONCRETE MASONRY:
(STRAP AND LINE - CHECK)

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TOP FLOOR AREA:	121.64m²
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VILLABOARD IN TILED SHOWERS.

INTERNAL DOORS
2.2m TYPICAL INTERNAL DOOR HEIGHT.
BLACK MDF WITH ROUTED GROOVES

TRIMS
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40x10 FJ PINE ARCHITRAVE.
SQUARE STOP (40x18 IN CUPBOARDS) SCOTIA.

KEY:
- RAKING CEILING
- WARDROBE
- ST. STORAGE CUPBOARD
- SMART METER BOX
- FLOORING: TILE
- FLOORING: OVERLAY
- INSULATION TO INTERNAL WALLS
- MECHANICAL VENT DUCTED TO EXTERIOR
- EXTERIOR WATER TAP
- HP HEAT PUMP
- SD SMOKE DETECTOR

WET AREAS
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PROVIDE AN IMPERVIOUS AND EASILY CLEANABLE SURFACE TO ALL WALL AREAS LIKELY TO BE SPLASHED.
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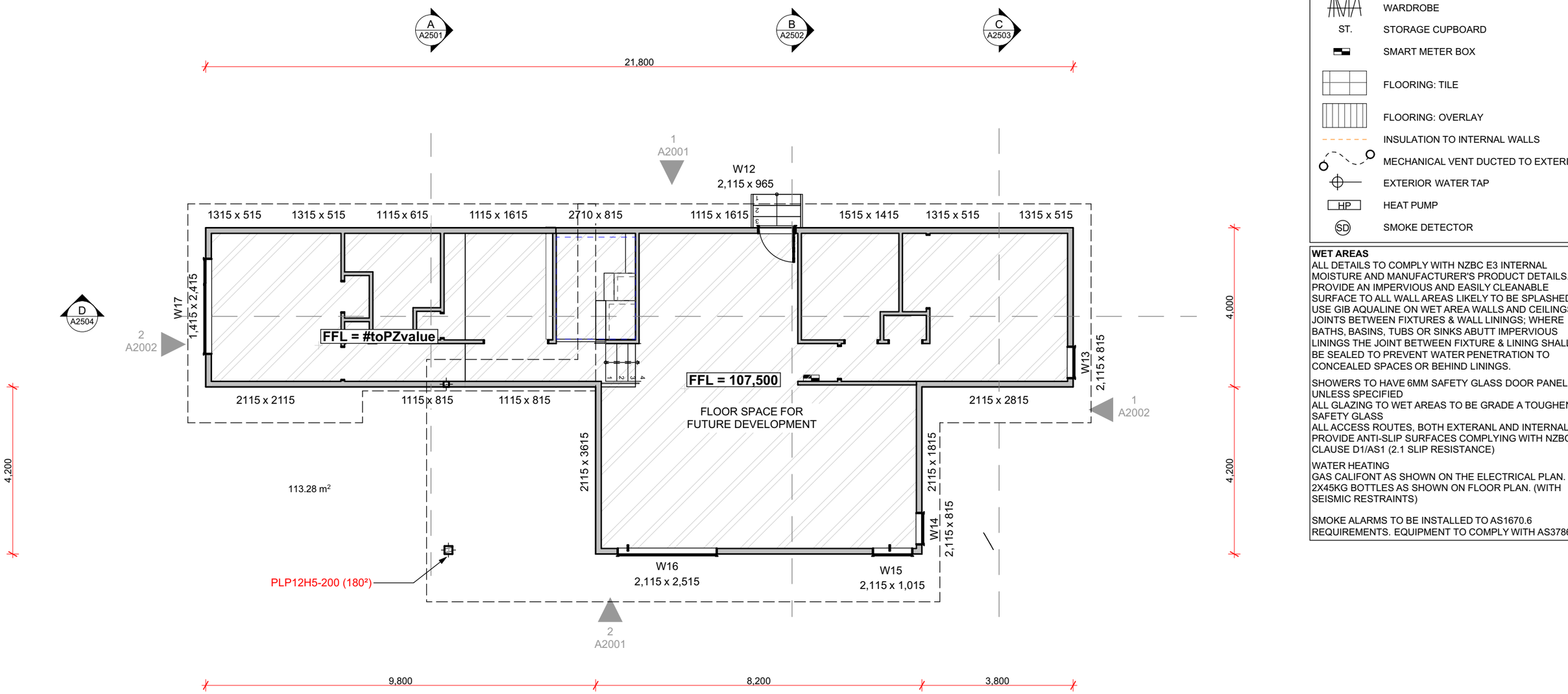

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First Floor Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

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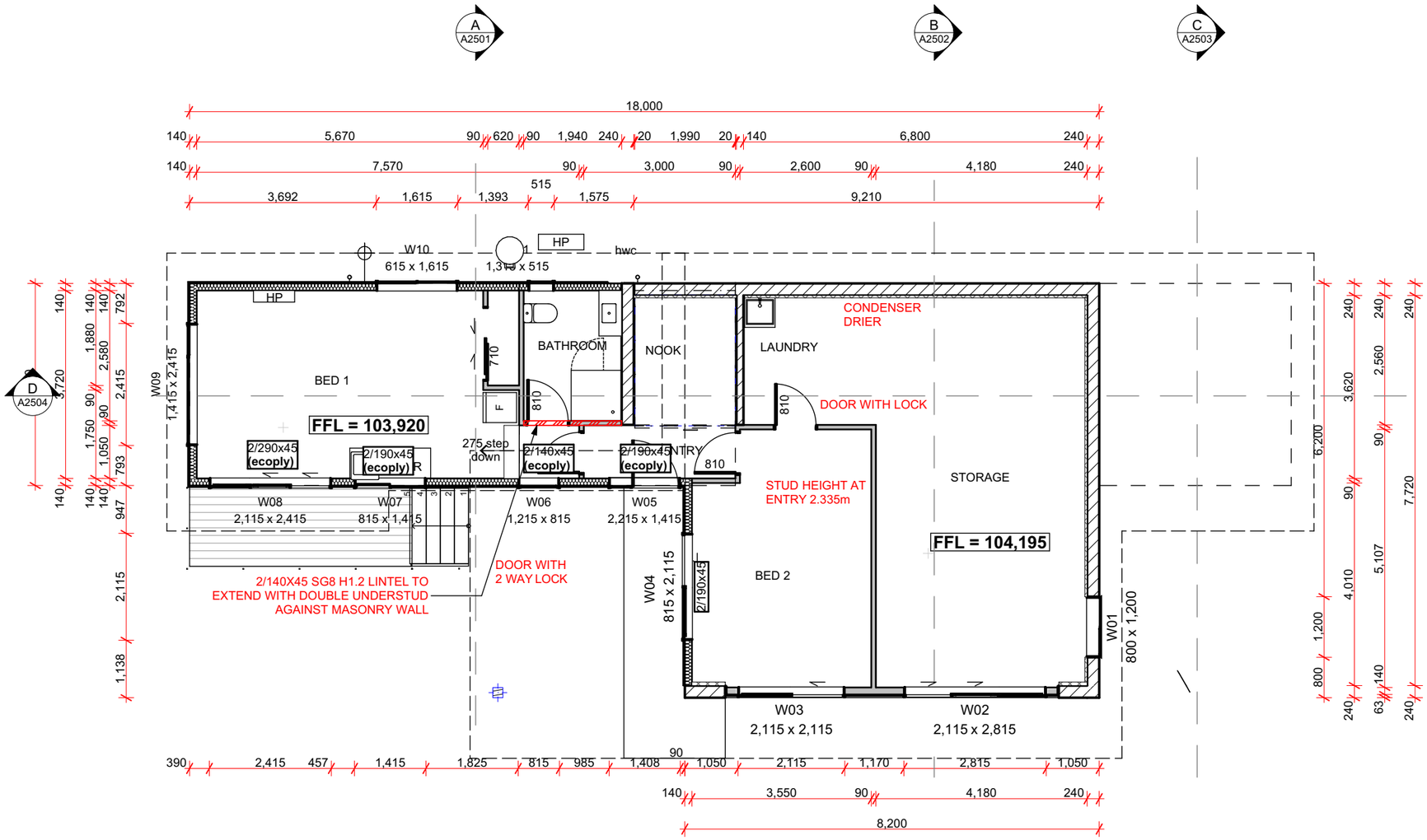
A1502
DRAFT SET



WALL FRAMING
GENERAL WALL FRAMING NOTES
ALL DIMENSIONS TO TIMBER FRAMING NOT FINISHED ROOM SIZES

ALL JOINERY SIZES ARE TO TRIM / OPENING SIZE

ALL FRAMING & BOTTOM PLATES TO BE H1.2 TREATED UNLESS SPECIFIED OTHERWISE

INTERIOR DOORS - 2.2m TYPICAL INTERNAL DOOR HEIGHT.
BLACK MDF WITH ROUTED GROOVES

STUD HEIGHT
2.610m RAKING UP TO 3.035m UPPER FLOOR
3.045m - GARAGE
2.385m - ENTRY
2.610m - BED 1

STUD SIZES: (UNLESS NOTED ON THE PLAN)

EXTERNAL WALLS: (TO EXTRA HIGH WIND ZONE)
UP TO 2,460 WALL
90 x 45mm H1.2 SG8 STUDS @ 400mm CRS.

UP TO 2,760 WALL
140 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

UP TO 3,060 WALL
140 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

INTERIOR WALLS:
UP TO 3.0 STUD
90 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

NOGS :
EXTERIOR: ALL NOGS @ 600mm MAX. CRS.

INTERIOR: ALL @ 800mm MAX. CRS.

EXTRA NOGS:
WALL NOGGING FOR HAND RAILS BY TOILETS AND SHOWERS

LINTELS:
ALL LINTELS TO BE H1.2 SG8 UNLESS STATED OTHERWISE.
WARDROBE SLIDER AND BIFOLD LINTELS TO BE 20mm HIGHER THAN STANDARD LINTELS.
MOUNT SLIDING DOOR TRACK FLUSH WITH OUTSIDE OF JAMB WITH 130mm TOP ARCHITRAVE DROPPED TO HIDE TRACK.
FIXINGS:
AS PER LUMBERLOK STUDLOK LINTEL FIXING TABLES (E = 1.4kN, F = 4.0kN, G = 7.5kN, H = 13.5kN).
LINTEL FIXINGS UP TO 7.5kN CAN BE SUBSITUTED FOR ECOPLY BARRIER LINTEL CONNECTION DETAIL.
ALLOW TO PACK OUT ALL LINTELS TO SUIT 140mm STUDS

TOP PLATES:
DOUBLE TOP PLATE. 2/90x45 SG8 H1.2 or 2/140x45 SG8 H1.2 TOP PLATE TYPICAL
FIXINGS:
EXTERIOR WALLS - ECOPLY BARRIER TOP PLATE FIXINGS,
INTERIOR LOAD BEARING WALLS - STUDLOK **SL**.
INTERIOR NON-LOAD BEARING WALLS STUDLOK **2N**. SEE DETAILS ON SHEET A4701.

BOTTOM PLATES
H1.2 BOTTOM PLATES ON DPC TO CONCRETE FLOORS
RIGID AIR BARRIER 6mm BOTTOM PLATE OVERHANG
FIX TO STUDS VIA 2/100x3.75mm END NAILS OR 4/75x3.75mm SKEW NAILS

BOTTOM PLATE FIXING
TIMBER FLOOR: 2/90x3.15mm NAILS @ 600 CRS.
CONC. SLAB EDGE: M12 TRUBOLTS @ 900 CRS. MAX. 150mm FROM ENDS OF PLATE & CORNERS

LEGEND
INTERNAL LOAD BEARING WALL

Arcline Architecture
Offices: Kaitaia | Kerikeri | Whangarei
(Ph): 09 408 2233
(Email): info@arcline.co.nz
(Web): www.arcline.co.nz

Ground Floor Wall Framing Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

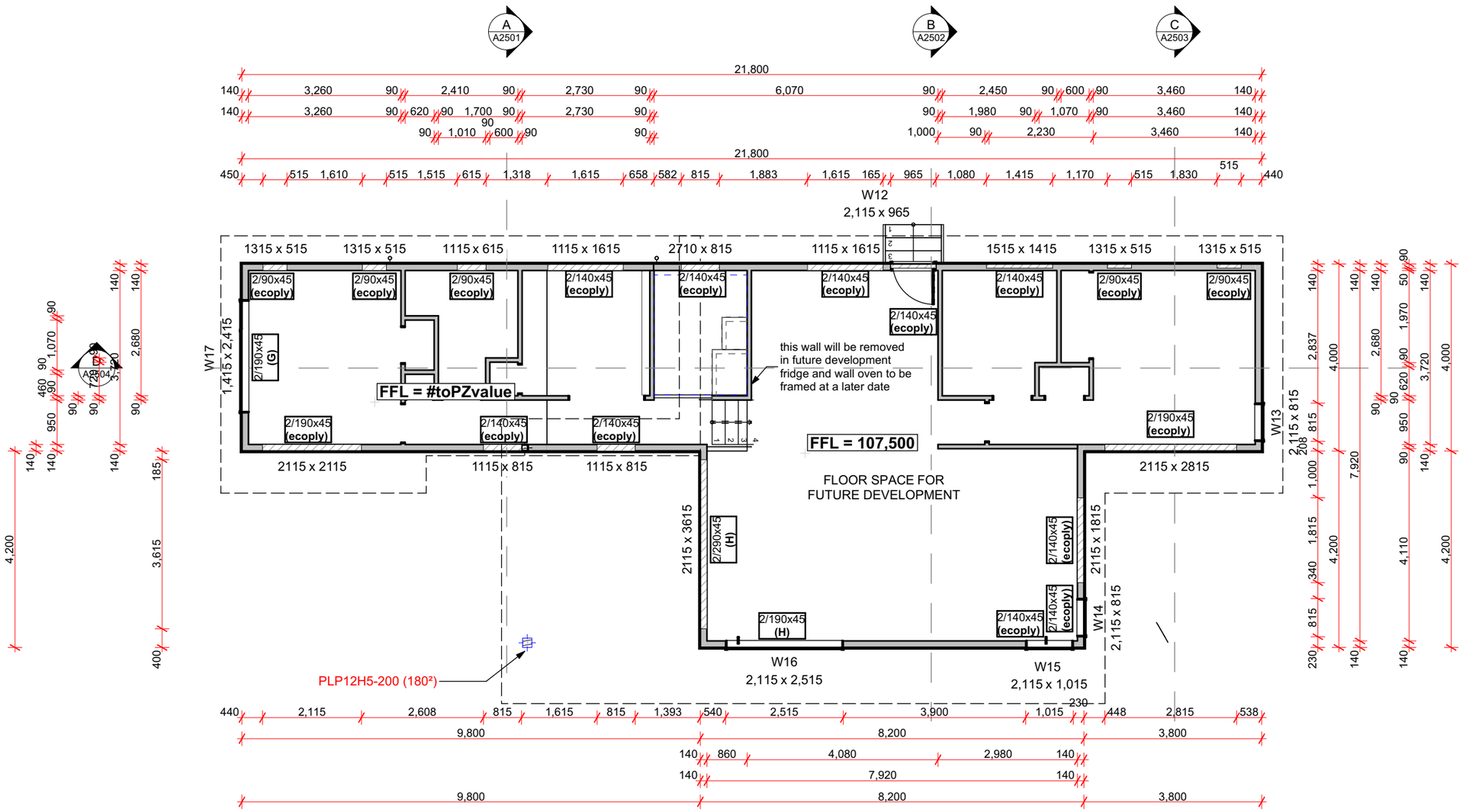
Rev No.	Revision	Date

Scale @ A3: 1:100
Drawn By RH
Issued: 22/02/2024 4:28 pm
MAC DONALD.D_FWD STAGE 1_190224.pln

Sheet No:
A1511
DRAFT SET

EXTERIOR FRAMING TO ALLOW FOR FUTURE DEVELOPMENT
FRAME AS PER STANDARD FRAMING WITH OPENINGS AS SHOWN
HEAD HEIGHT 2115 TO UNDERSIDE OF LINTEL
TEMPORARY FRAMING INSIDE OPENINGS TO BE 90X45 SG8 H1.2 STUDS @ 400 CRS WITH 90X45 SG8 H1.2 NOGS @ 600 CRS SCREW FIXED CPC80'S TOP AND BOTTOM

WALL BRACING
REFER TO ENGINEERS DESIGN



WALL FRAMING
GENERAL WALL FRAMING NOTES
ALL DIMENSIONS TO TIMBER FRAMING NOT FINISHED ROOM SIZES

ALL JOINERY SIZES ARE TO TRIM / OPENING SIZE

ALL FRAMING & BOTTOM PLATES TO BE H1.2 TREATED UNLESS SPECIFIED OTHERWISE

INTERIOR DOORS - 2.2m TYPICAL INTERNAL DOOR HEIGHT.
BLACK MDF WITH ROUTED GROOVES

STUD HEIGHT
2.610m RAKING UP TO 3.035m UPPER FLOOR
3.045m - GARAGE
2.385m - ENTRY
2.610m - BED 1

STUD SIZES: (UNLESS NOTED ON THE PLAN)

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90 x 45mm H1.2 SG8 STUDS @ 400mm CRS.

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140 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

UP TO 3,060 WALL
140 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

INTERIOR WALLS:
UP TO 3.0 STUD
90 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

NOGS :
EXTERIOR: ALL NOGS @ 600mm MAX. CRS.

INTERIOR: ALL @ 800mm MAX. CRS.

EXTRA NOGS:
WALL NOGGING FOR HAND RAILS BY TOILETS AND SHOWERS

LINTELS:
ALL LINTELS TO BE H1.2 SG8 UNLESS STATED OTHERWISE.
WARDROBE SLIDER AND BIFOLD LINTELS TO BE 20mm HIGHER THAN STANDARD LINTELS.
MOUNT SLIDING DOOR TRACK FLUSH WITH OUTSIDE OF JAMB WITH 130mm TOP ARCHITRAVE DROPPED TO HIDE TRACK.
FIXINGS:
AS PER LUMBERLOK STUDLOK LINTEL FIXING TABLES (E = 1.4kN, F = 4.0kN, G = 7.5kN, H = 13.5kN).
LINTEL FIXINGS UP TO 7.5kN CAN BE SUBSITUTED FOR ECOPLY BARRIER LINTEL CONNECTION DETAIL.
ALLOW TO PACK OUT ALL LINTELS TO SUIT 140mm STUDS

TOP PLATES:
DOUBLE TOP PLATE. 2/90x45 SG8 H1.2 or 2/140x45 SG8 H1.2 TOP PLATE TYPICAL
FIXINGS:
EXTERIOR WALLS - ECOPLY BARRIER TOP PLATE FIXINGS,
INTERIOR LOAD BEARING WALLS - STUDLOK **SL**.
INTERIOR NON-LOAD BEARING WALLS STUDLOK **2N**. SEE DETAILS ON SHEET A4701.

BOTTOM PLATES
H1.2 BOTTOM PLATES ON DPC TO CONCRETE FLOORS
RIGID AIR BARRIER 6mm BOTTOM PLATE OVERHANG
FIX TO STUDS VIA 2/100x3.75mm END NAILS OR 4/75x3.75mm SKEW NAILS

BOTTOM PLATE FIXING
TIMBER FLOOR: 2/90x3.15mm NAILS @ 600 CRS.
CONC. SLAB EDGE: M12 TRUBOLTS @ 900 CRS. MAX.
150mm FROM ENDS OF PLATE & CORNERS

LEGEND
INTERNAL LOAD BEARING WALL

Arcline Architecture
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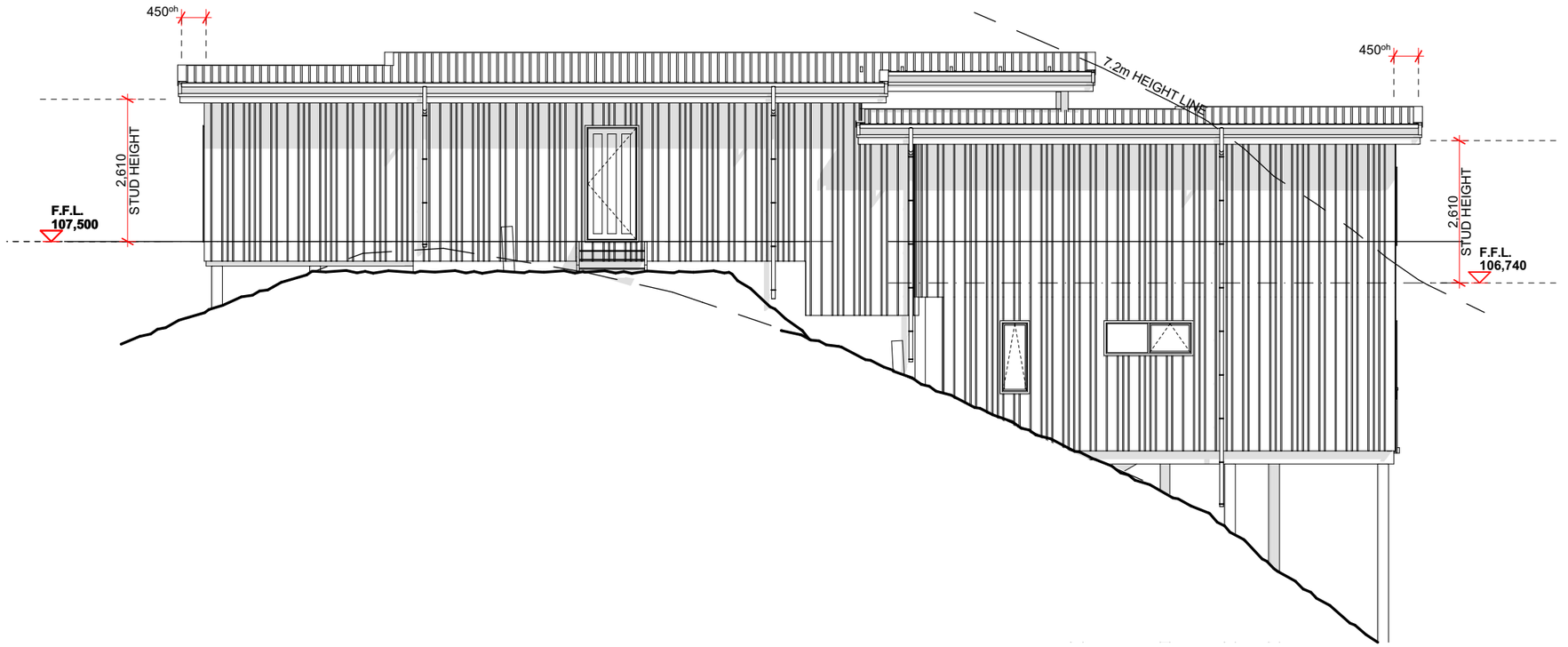
First Floor Wall Framing Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

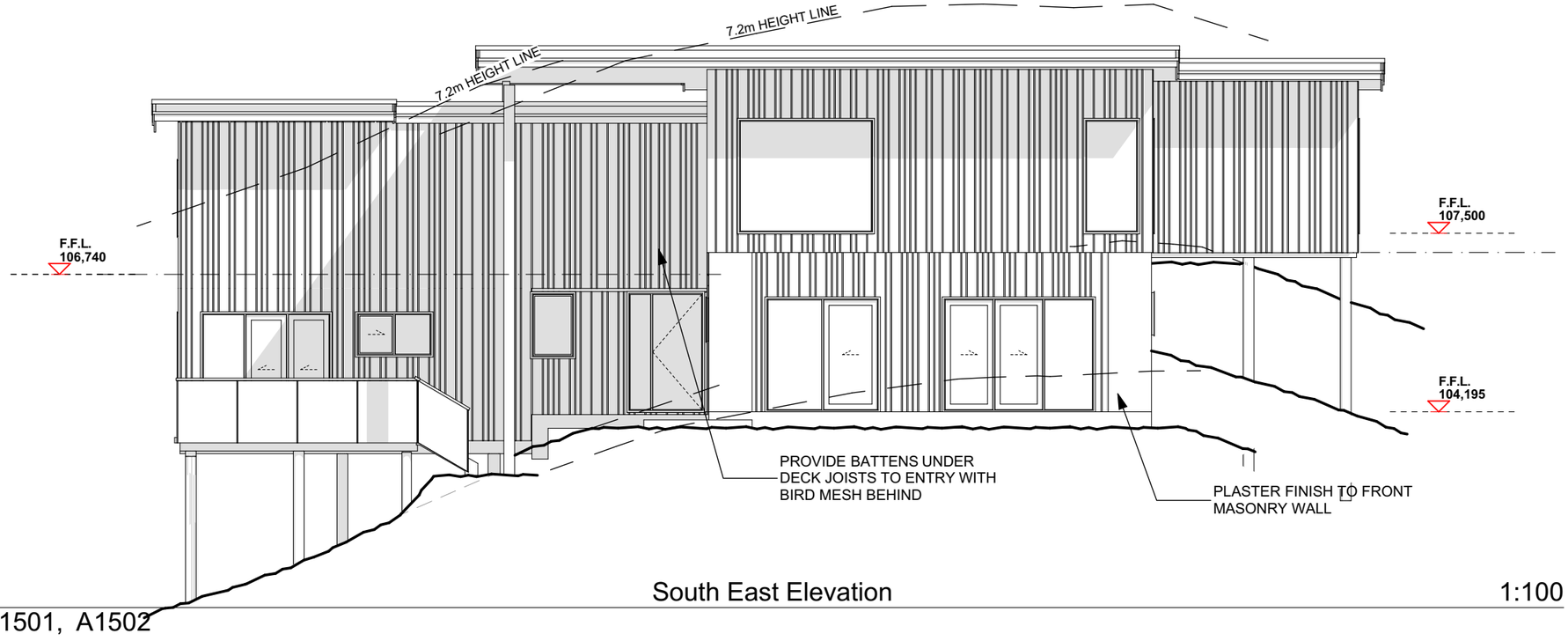
Scale @ A3: 1:100
Drawn By RH
Issued: 22/02/2024 4:28 pm
MAC DONALD.D_FWD STAGE 1_190224.pln

Sheet No:
A1512
DRAFT SET



1 North West Elevation 1:100

A1501, A1502



2 South East Elevation 1:100

A1501, A1502

Arcline Architecture
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Elevations

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

Scale @ A3: 1:100, 1:1
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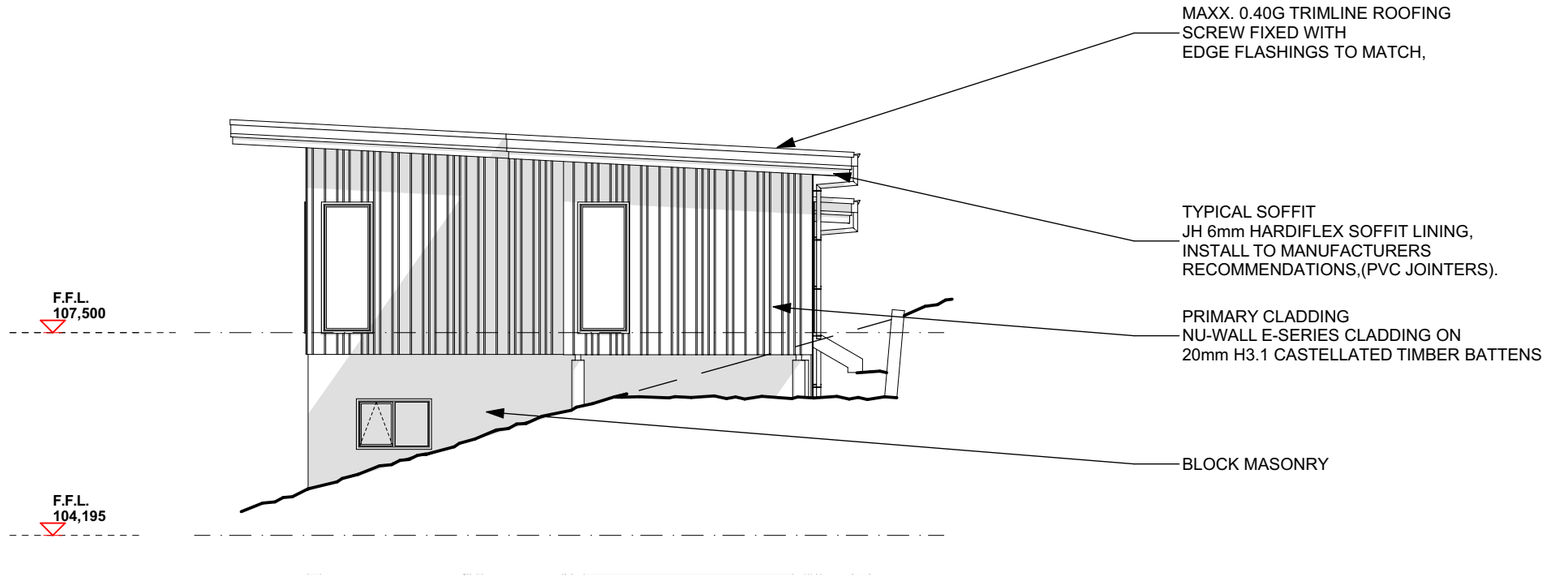
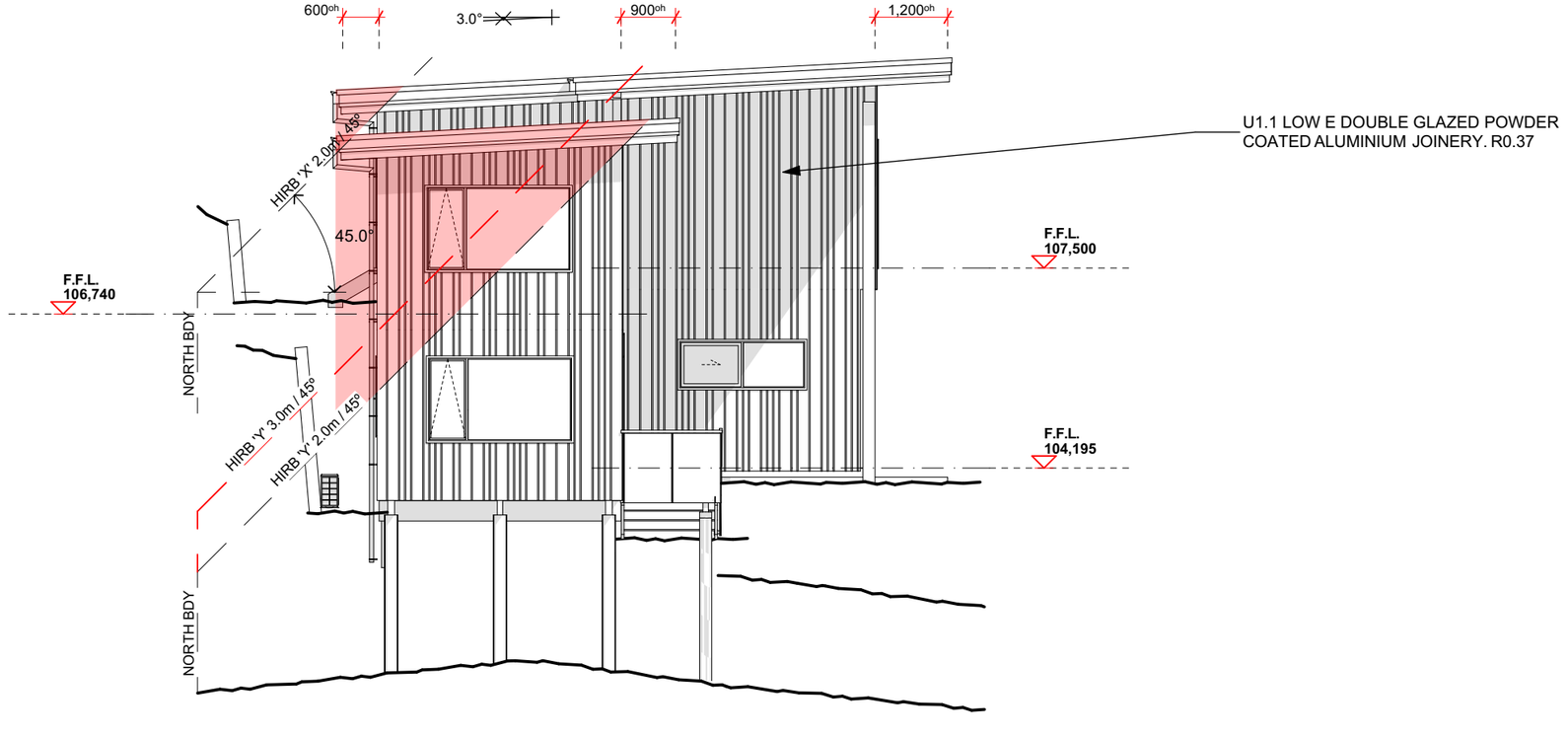
Issued: 22/02/2024 4:28 pm
MAC DONALD.D_FWD STAGE 1_190224.pln

Sheet No: **A2001**
DRAFT SET
17 OF 52



1 North East Elevation 1:100

A1501, A1502



2 South West Elevation 1:100

A1501, A1502

Arcline Architecture
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Elevations

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

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MAC DONALD.D_FWD STAGE 1_190224.pln

Sheet No:
A2002
DRAFT SET

GENERAL

1. Do not scale from drawings. These drawings are to be read in conjunction with the architectural drawings and all other related documents. Refer to architectural drawings for dimensions, rebates & recesses.

2. Contact the architect/engineer if any discrepancies are found.

3. Under no circumstances shall polystyrene spacers be used. Use recommended spacers as per details provided.

4. DPM shall be in accordance with NZS3604 (polyethylene sheet, min. 0.25mm). Do not use multiple layers. All penetrations through the DPM shall be sealed.

5. A layer of sand blinding or granular fines (GAP7) shall be placed, screeded and compacted over the building platform. The maximum thickness of this layer shall be no more than 50mm.

6. Polystyrene pods shall be 1100 x 1100 x 220mm or 1200 x 1200 x 220mm.

7. Edge beams and/or thickenings may be wider than shown (as necessary to accommodate off-cuts/wastage etc.). Add an additional HD12 in the bottom for every 100mm of additional concrete width.

CONCRETE

1. All concrete work and materials shall conform to NZS3109 and applicable building consent authority regulations.

2. Cuts shall be made to the floor where shown on the drawings.

3. Additional supplementary sawcuts no deeper than 15mm may be placed at 5m bays. Each bay length to width ratio shall be limited to 1.5:1.

4. Where concrete polishing are made to the floor, the floor thickness shall be increased such that the final topping depth is no less than that specified on the plans after all polishing. Highly recommended for supplementary sawcuts on polished or exposed concrete to be placed in 3m bays to reduce cracking, locations TBC by architect/ agent. Highly recommended to engage concrete specialist for advice on concrete placement, curing, and polishing, in order to achieve desirable finish with minimal cracking.

5. Where underfloor heating is installed, floor topping shall be increased to 110mm. Close attention and careful planning shall be taken to ensure no damage to underfloor heating (e.g. layout avoiding load bearing wall, sawcuts, etc.).

6. Unless otherwise noted, concrete shall be:
Raftfloor: Raftmix 25MPa minimum
Other concrete: 25MPa minimum

REINFORCEMENT

1. Unless otherwise specified, all reinforcement shall be Ductility Class E, in accordance with NZS 4671.

2. All bend diameters shall comply with NZS 3109. Re-bending of reinforcement is not permitted. 'Spot' welding of reinforcement is not permitted.

3. All mesh reinforcement shall be Ductility Class E as per NZS4671

4. Unless otherwise specified by proprietary product specifications, mesh shall be lapped a minimum of 250mm or by a grid plus 50mm, whichever is greater.

5. Unless otherwise specified on plans, minimum covers are:
exposed to earth: 75mm
exposed to edge: 50mm
protected by damp proofing: 50mm

6. Unless otherwise specified, reinforcement laps are:

Reinforcement Grade	Nomination	min. lap when less than 300mm of concrete below steel	min. lap when more than 300mm of concrete below steel	concrete strength (MPa)
300	'D'	40Ø or min. 600mm (whichever is greater)	52Ø or min. 600mm (whichever is greater)	all blockfill, 20 and 25
500	'HD'	70Ø	91Ø	all blockfill
500	'HD'	56Ø	73Ø	20
500	'HD'	50Ø	65Ø	25

*Note: for lap of vertical bars, use values for "when less than 300mm of concrete below steel"

SITE CONDITIONS

1. Design based on soils report/assessment
By: Haigh Workman Ref: 23187 Dated: Sep/2023
Specifically: Design based on all unsuitable material removed and uniform class 'M' expansive soils across building platform with a minimum allowable bearing capacity of 100kPa, subject to engineer's confirmation. For pile design, assume the following design parameters:
- Undrained shear strength (Cu) of 50kPa
- Side adhesion = 30kPa
- Soil density of 18kN/m³

2. In the absence of any other recommendation, a minimum of 100mm of compacted granular/hardfill layer extended min. 200mm beyond the building footprint (or as per notes 3 & 4 below) shall be placed under the slab to level the site and provide a durable working surface for temporary works.

3. Building platform, where filled above natural Existing Ground Level (EGL), shall be extended min. 1000mm beyond the building footprint. Fill shall be placed and compacted in accordance to NZS 4431:1989. Fill exceeding 600mm deep above EGL shall be reviewed by author of geotechnical report or suitably qualified geotechnical engineer.

4. Where compacted fill (to replace excavated material) is required to form building platform, the excavation and backfill shall be extended past the building edge by at least the same depth that is being excavated or as per note 2 above, whichever is greater. Backfill shall be placed and compacted in accordance to NZS 4431:1989.

5. Confirm position & depth of all public pipes on the site, prior to any works. If different to the site plan then Wilton Joubert Ltd. shall be contacted.

6. Building foundation shall be outside of 45° influence line from the bottom of any public pipes, unless otherwise allowed for and shown in WJL Foundation Plan.

7. Building foundation shall be outside of 1V:1.5H influence line from the bottom of any retaining wall, unless otherwise allowed for and shown in WJL Foundation Plan.

8. Building foundation shall be outside of 1V:1.5H influence line from the bottom of any private underground tank and pumps, unless otherwise allowed for and shown in WJL Foundation Plan.

9. Any excavation done for private drainage trenches MUST be backfilled and recompacted strictly as per NZBC Acceptable Solution G13/AS2.

INSPECTIONS

1. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).

2. If BCA requires PS4 to be issued for inspections, a local engineer may be engaged to carry out such inspections and issue a PS4 accordingly.

2. It is increasingly common for building consent authorities to require a "PS4" for specifically designed structures. For Wilton Joubert Ltd. to issue this, we need to carry out inspections as per the building consent requirements. Ring Wilton Joubert Ltd. local office to arrange a booking.
NO INSPECTION EQUALS NO PS4 ISSUED.

3. Recommended Inspections:

- Piles holes geotechnical parameter *(This may be carried out by Wilton Joubert Ltd. or by the author of the geotechnical report *)*.

- Piles dimensions, depth, and reinforcements *(This may be carried out by Wilton Joubert Ltd.)* .

- Site cut to suitable subgrade *(This may be carried out by Wilton Joubert Ltd. or by the author of the geotechnical report *)*.

- Compaction and depth of fill *(This may be carried out by Wilton Joubert Ltd. or by the author of the geotechnical report *)*.

- Concrete pre-pour of blockwall and foundations/footings (& any other structural elements).

If geotechnical report was written by others, Wilton Joubert Ltd. shall be given the opportunity to review all available geotechnical reports and reserve the right to pass on any geotechnical inspections to author of geotechnical report.

It is the building consent applicant's (or authorised agent) responsibility to ensure that Wilton Joubert Ltd. is notified in advance of the required inspection. We cannot issue PS4 for items we did not inspect. Bookings should be made 48 hours prior to the desired time of inspection. The following are required at the time of booking:

- Building consent number MUST be provided at time of booking.

- Building consent documentation and consent conditions MAY be requested for review prior to inspection, particularly for geotechnical inspection requests where geotechnical report was written by others.

- Building consent documentation and consent conditions MUST be available on site for inspection.

- Do not scale from Drawings.
- All structural drawings are to be read in conjunction with architectural and all other relevant documentation. Any discrepancies shall be notified prior to any construction or fabrication.
- Prior to any works, the position & depth of all public pipes on the site shall be confirmed by authorized/qualified personnel. If different to the plans provided, Wilton Joubert Ltd. shall be contacted for possible redesigns.

No.	DESCRIPTION	DATE
2	Deepened edge beam	02-02-24
1	Detailed Design	18-12-23

REVISION

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

SITE ADDRESS:

**Proposed Residence
4 Titore Way
Russell**

SHEET TITLE:

Cover Page

DESIGNED BY: AZA	DRAWN BY: MH
CHECKED BY: DL	CHECKED BY: MH
DATE: 18-12-2023	OFFICE: Lunn Ave
DRAWING SCALE: 1:100	ORIGINAL DRAWING SIZE: A3

Original Job #: **Job # 129628**
Revision Job #: **Rev.2 #131807**
Sheet #: **S0.1**

MASONRY

1. Unless otherwise stated on drawings, all masonry shall be constructed in strict accordance with the revisions of:

- NZS 4229 Concrete masonry buildings not requiring specific design
- NZS 4210 Masonry construction: Materials and workmanship
- AS/NZS 4455.1 Masonry units, pavers, flags and segmental retaining wall units - Masonry units
- NZS 3109 Concrete construction
- AS/NZS 4671 Steel reinforcing materials

2. All masonry blockwall shall be Observation Type B.

3. All masonry blockwall shall be laid by a registered mason and inspected by an engineer or by a nominated representative
.

4. All blocks shall comply with AS/NZS 4455.1 and shall be dense, hard, sound and true to size and shape. Any necessary cutting shall be by saw, neat and true to lines.

5. Cement shall comply with NZS 3122, be stored off the ground and kept protected from weather. Sand for mortar shall comply with NZS 3103. Sand and aggregate for grout shall comply with NZS 3121.

6. Mortar shall comply with NZS 4210 and attain a minimum 28 day compressive strength of 12.5MPa.

7. Coarse grout in accordance with NZS 4210 shall be used to fill blockwork cavities. Spread as explained in CCANZ IB50 shall be between 450 - 530mm. Aggregate shall be between 4.5 and 13mm.

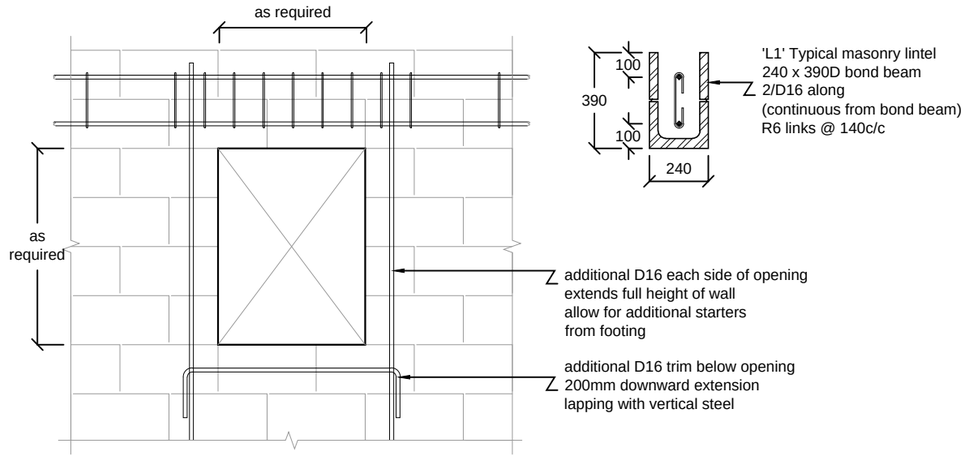
8. Blockfill shall have a minimum 28 day compressive strength of 20MPa or 25MPa within 'exposure zone D' (if in doubt, confirm with local BCA).

9. The contractor shall be responsible for providing adequate temporary bracing to all masonry to resist any lateral loads (wind and other environmental, construction works).

10. Unless otherwise specified, drainage backfill behind masonry blockwall shall be:

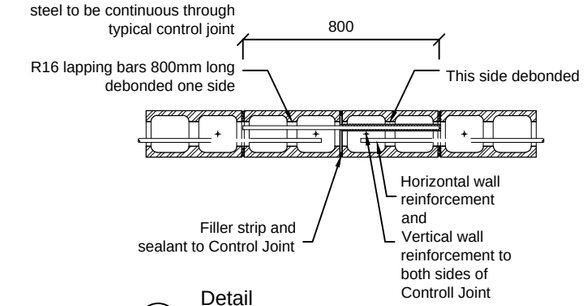
Type of Blockwall	Retained Height Range (mm)	min. Width of Drainage Backfill (mm)	max. Width of Drainage Backfill (mm)
Foundation Wall Tied to Structural Slab at Top	0 to 800	N/A	N/A
	800 to 1800	300	600
	1800 and higher	500	1000
Freestanding Wall	all height	300	600

Drainage fill shall be carefully placed in layers not exceeding 150mm in height, ensuring complete coverage and placement about the structure. Care should be taken to avoid unnecessary air pockets and voids. The placed material shall be lightly compacted with care to ensure appropriate settlement of the fill into the void only, but not overly as to risk damage to the DPM and structure. Due to size, working constraints and these compaction requirements a vibratory plate type compactor/ tamper would most likely be the most appropriate equipment.



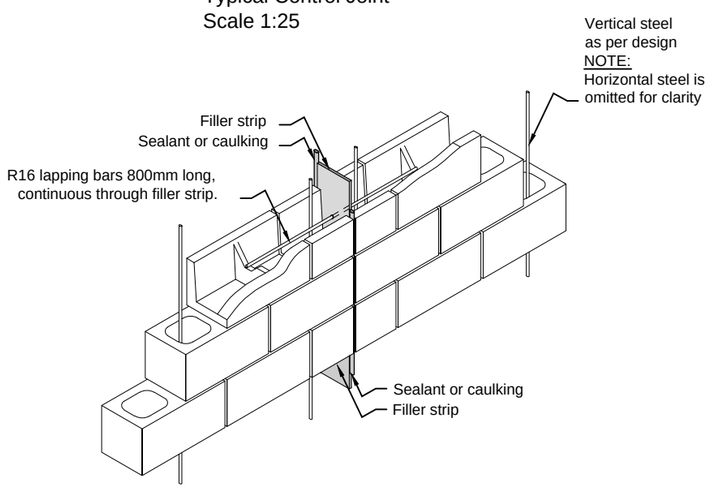
Detail - L1 -

Typical Opening
- use as required -
Scale 1:25



Detail

Typical Control Joint
Scale 1:25



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No.	DESCRIPTION	DATE
2	Deepened edge beam	02-02-24
1	Detailed Design	18-12-23

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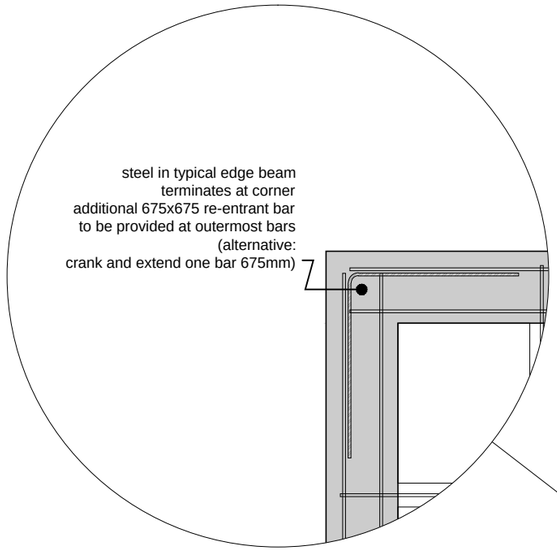
SITE ADDRESS:

Proposed Residence
4 Titore Way
Russell

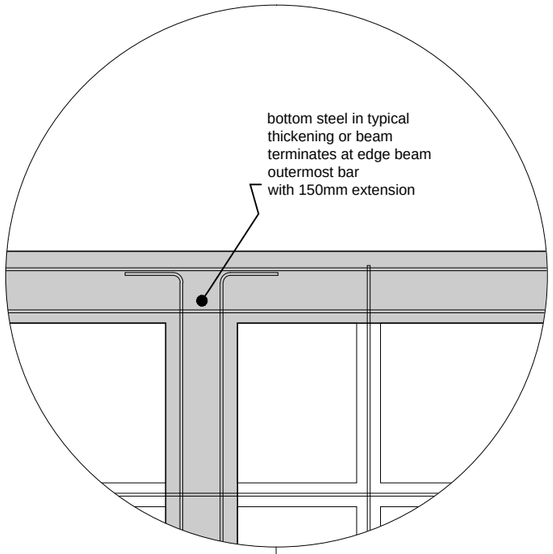
SHEET TITLE:

Masonry Notes & Indicative Detailing

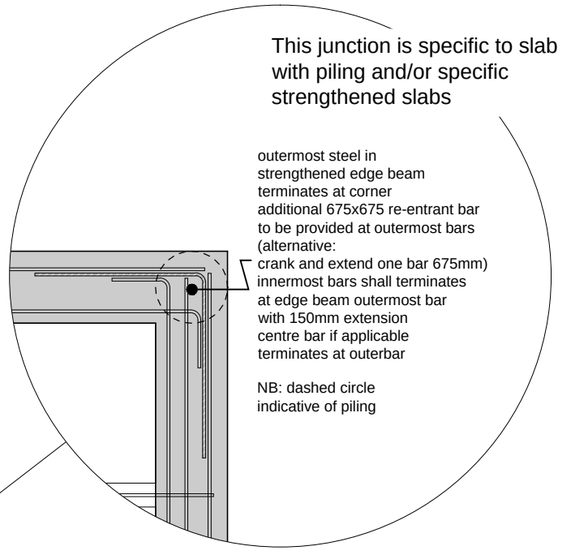
DESIGNED BY:	AZA	DRAWN BY:	MH
CHECKED BY:	DL	CHECKED BY:	MH
DATE:	18-12-2023	OFFICE:	Lunn Ave
DRAWING SCALE:	1:25	ORIGINAL DRAWING SIZE:	A3
Original Job #:	Job # 129628	Sheet #:	S0.2
Revision Job #:	Rev.2 #131807		



steel in typical edge beam
terminates at corner
additional 675x675 re-entrant bar
to be provided at outermost bars
(alternative:
crank and extend one bar 675mm)



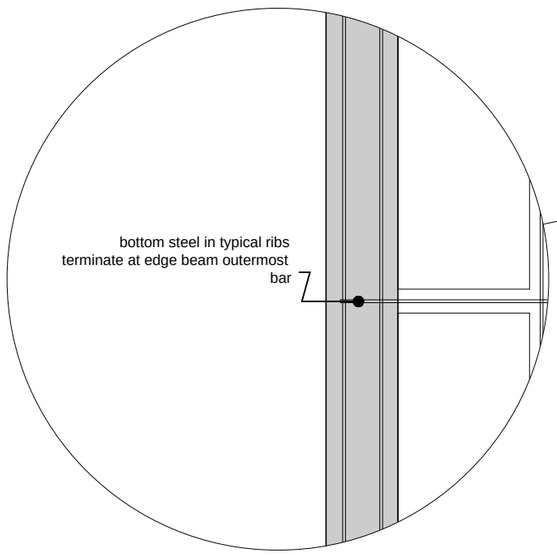
bottom steel in typical
thickening or beam
terminates at edge beam
outermost bar
with 150mm extension



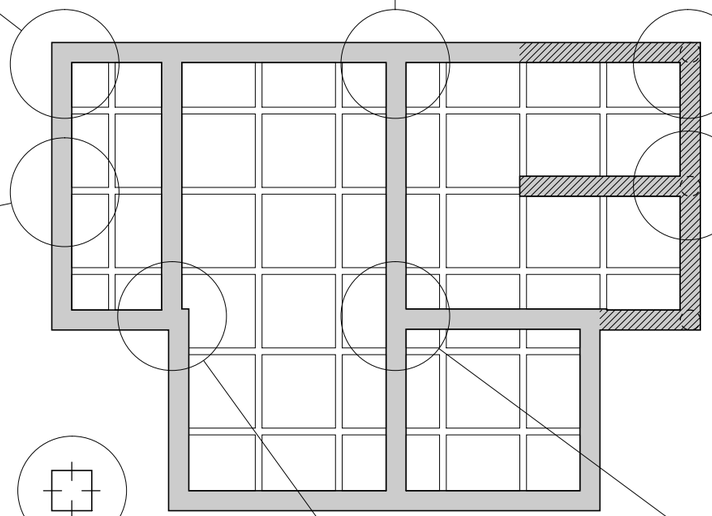
This junction is specific to slab
with piling and/or specific
strengthened slabs

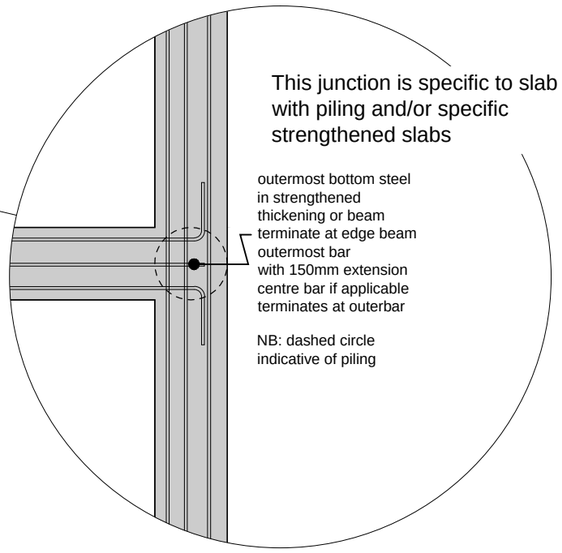
outermost steel in
strengthened edge beam
terminates at corner
additional 675x675 re-entrant bar
to be provided at outermost bars
(alternative:
crank and extend one bar 675mm)
innermost bars shall terminates
at edge beam outermost bar
with 150mm extension
centre bar if applicable
terminates at outerbar

NB: dashed circle
indicative of piling



bottom steel in typical ribs
terminate at edge beam outermost
bar

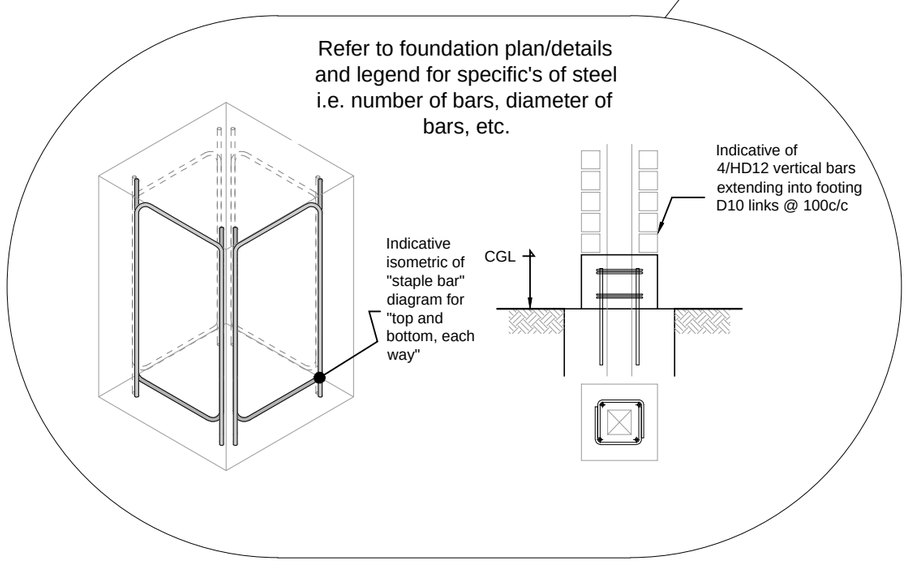




This junction is specific to slab
with piling and/or specific
strengthened slabs

outermost bottom steel
in strengthened
thickening or beam
terminate at edge beam
outermost bar
with 150mm extension
centre bar if applicable
terminates at outerbar

NB: dashed circle
indicative of piling

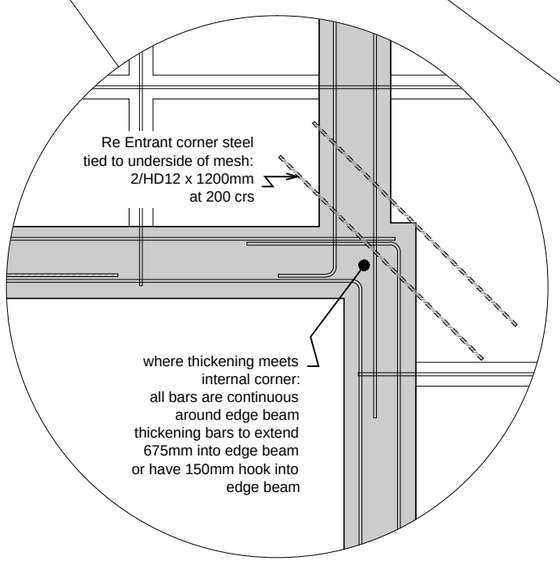


Refer to foundation plan/details
and legend for specific's of steel
i.e. number of bars, diameter of
bars, etc.

Indicative of
4/HD12 vertical bars
extending into footing
D10 links @ 100c/c

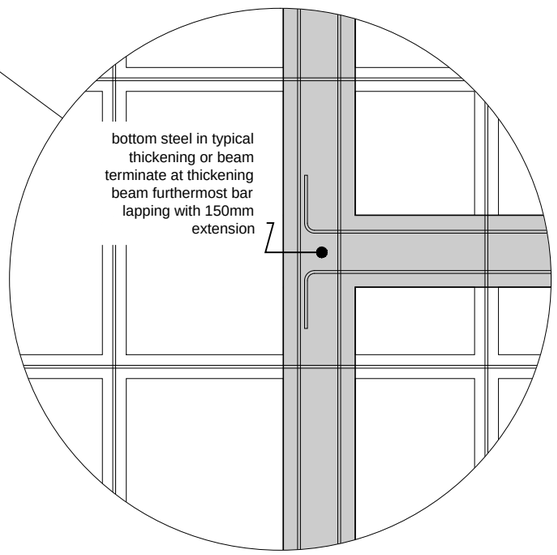
CGL

Indicative
isometric of
"staple bar"
diagram for
"top and
bottom, each
way"



Re Entrant corner steel
tied to underside of mesh:
2/HD12 x 1200mm
at 200 crs

where thickening meets
internal corner:
all bars are continuous
around edge beam
thickening bars to extend
675mm into edge beam
or have 150mm hook into
edge beam



bottom steel in typical
thickening or beam
terminate at thickening
beam furthermost bar
lapping with 150mm
extension

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No.	DESCRIPTION	DATE
2	Deepened edge beam	02-02-24
1	Detailed Design	18-12-23

REVISION

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

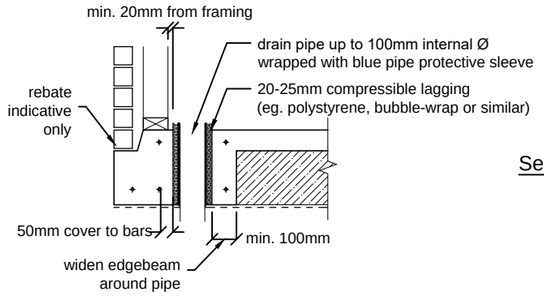
SITE ADDRESS:

Proposed Residence
4 Titore Way
Russell

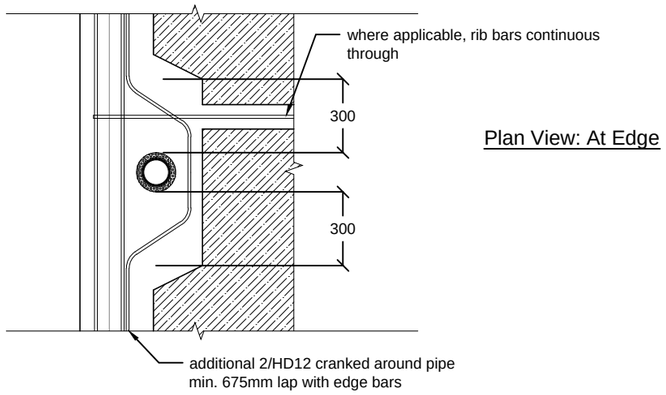
SHEET TITLE:

Typical Steel Detailing

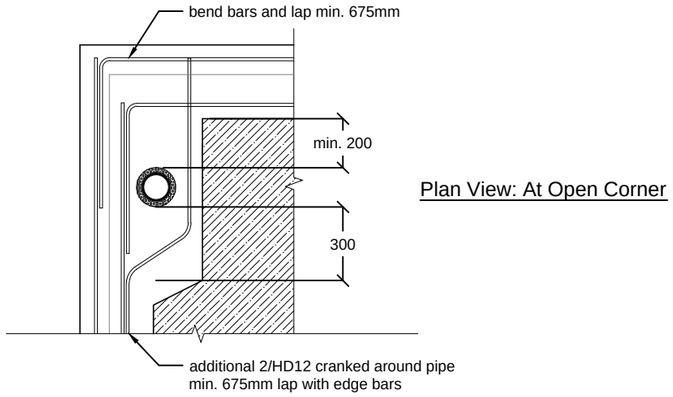
DESIGNED BY:	AZA	DRAWN BY:	MH
CHECKED BY:	DL	CHECKED BY:	MH
DATE:	18-12-2023	OFFICE:	Lunn Ave
DRAWING SCALE:	1:100 & 1:25	ORIGINAL DRAWING SIZE:	A3
Original Job #:	**Job # 129628**	Sheet #:	**S0.3**
Revision Job #:	**Rev.2 #131807**		



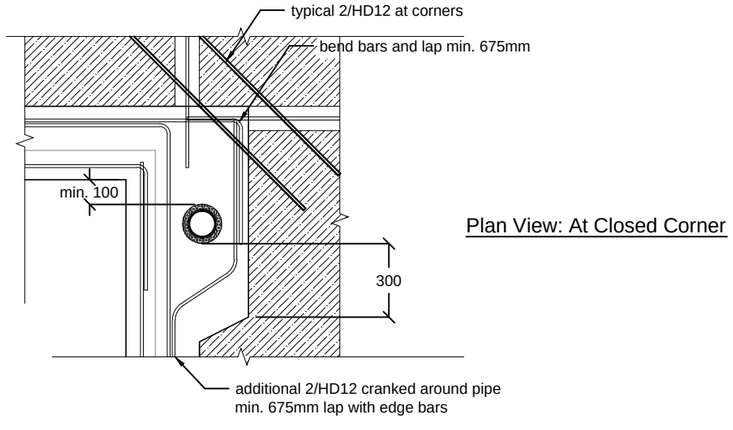
Section View: At Edge



Plan View: At Edge



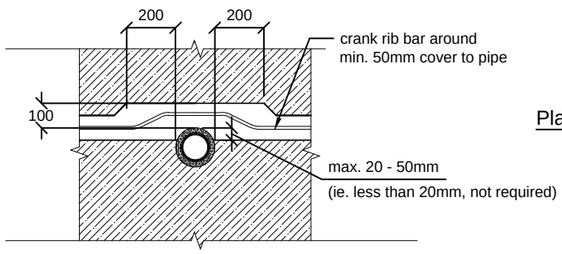
Plan View: At Open Corner



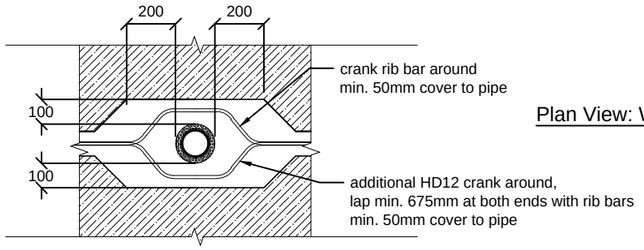
Plan View: At Closed Corner

Typical Detail Around Pipes

Raftfloor Edge Beam



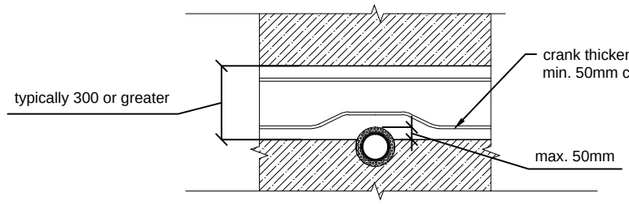
Plan View: At Rib Edge



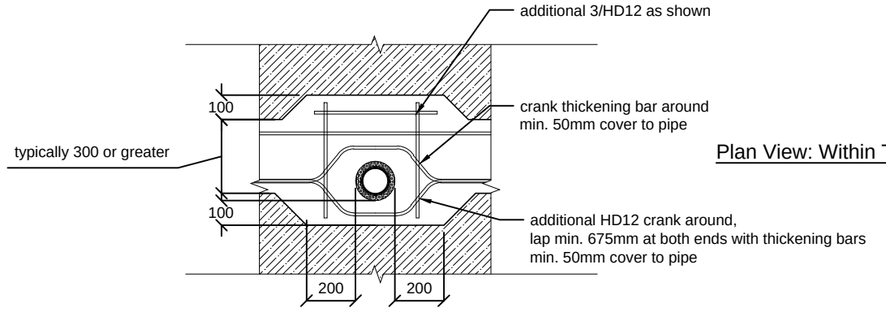
Plan View: Within Rib

Typical Detail Around Pipes

Raftfloor Internal Ribs



Plan View: At Thickening Edge



Plan View: Within Thickening

Typical Detail Around Pipes

Raftfloor Internal Thickenings

NOTES:

These details are applicable where plumbing/services are conveyed underground.
Services are to be taken through polystyrene pods as much as possible. If this is unavoidable, it may be taken through ribs/thickenings, provided the details (or similar in principle) on this sheet are used.

All service trench backfill shall be properly compacted.

Member sizes and reinforcing shown are indicative only, details shown on raftslab plan & details shall take precedence over the details shown here.

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No.	DESCRIPTION	DATE
2	Deepened edge beam	02-02-24
1	Detailed Design	18-12-23

REVISION

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www.wiltonjoubert.co.nz

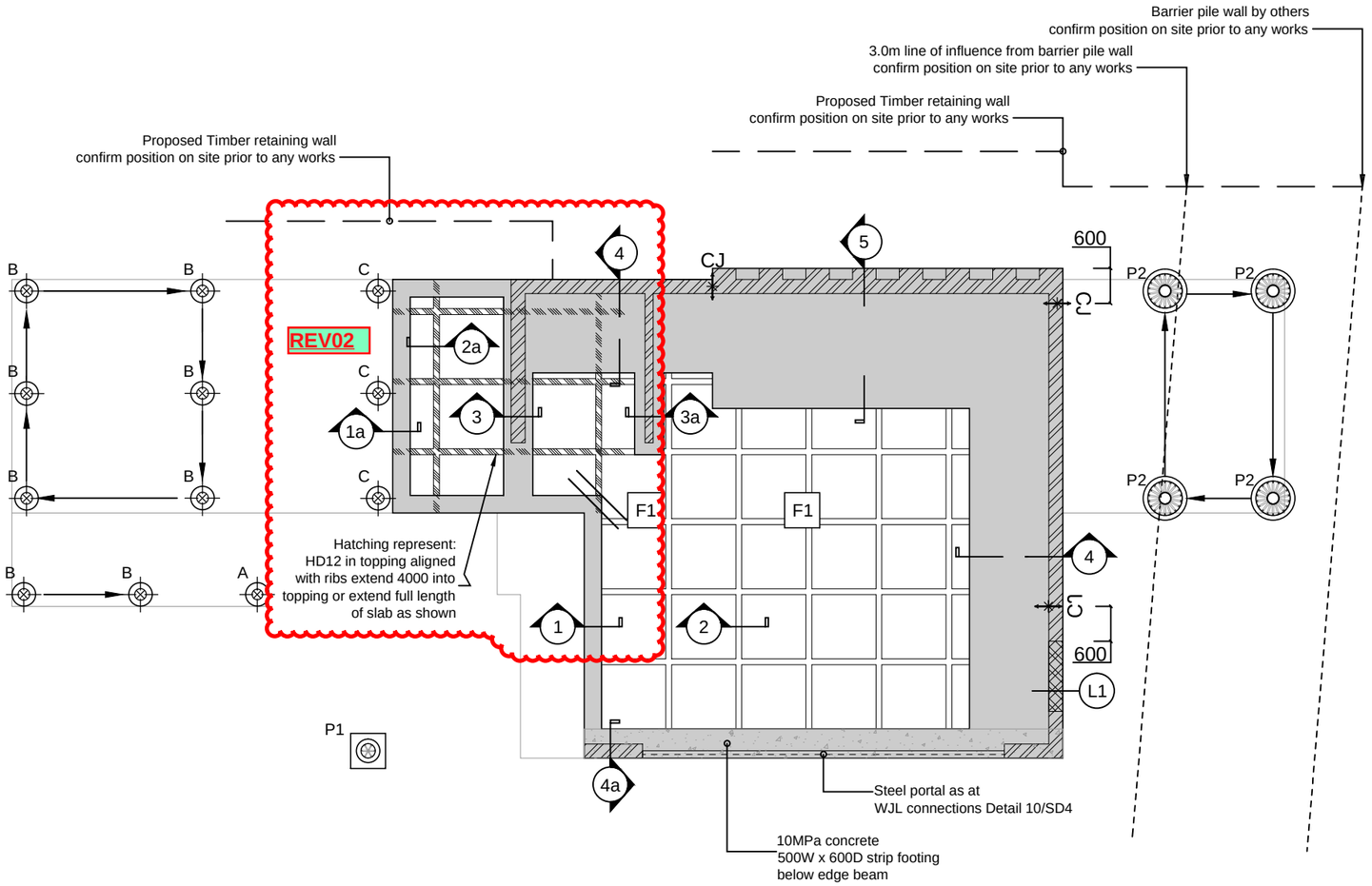
SITE ADDRESS:

Proposed Residence
4 Titore Way
Russell

SHEET TITLE:

Typical Pipe Penetration Details

DESIGNED BY: AZA	DRAWN BY: MH
CHECKED BY: DL	CHECKED BY: MH
DATE: 18-12-2023	OFFICE: Lunn Ave
DRAWING SCALE: 1:100 & 1:25	ORIGINAL DRAWING SIZE: A3
Original Job #: **Job # 129628**	Sheet #: **S0.4**
Revision Job #: **Rev.2 #131807**	



Raft Floor Plan

Scale 1:100

Legend:

Re Entrant corner steel
2/HD12 x 1200mm
at 200 crs

F1 — 600x600x305
Pad with
3/HD12 each way

A ← pile designation

Post footing 'A' - Ordinary Piles
400Ø Bored concrete footing (BCP)
set 3000 below existing ground (EGL)
with 175Ø SED ND H5 Pole
cast in with 100mm bottom cover
Ordinary Lumberlok fixings at top

Post footing 'B' - Braced Piles
400Ø BCP
set 3000 below EGL
with 200Ø SED ND H5 Pole
cast in with 100mm bottom cover
(small Ø end at top)
12.0kN Lumberlok fixings at top

Post footing 'C' - Anchor Piles
400Ø BCP
set 3000 below EGL
with 225Ø SED ND H5 Pole
cast in with 100mm bottom cover
(small Ø end at top)
12.0kN Lumberlok fixings at top
Max. 1000mm clearance between
top of pile to ground level

Typical Pile Brace
as per NZS 3604:2011
- arrow head depicts top of brace

P1 — P1 - 600² footing
with 400Ø BCP below
Refer to details

P2 — P2 - 800Ø BCP
with 200SED ND pole
Refer to details

CJ — Masonry control joint
as per detail on sheet
S0.2

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1	Detailed Design	18-12-23

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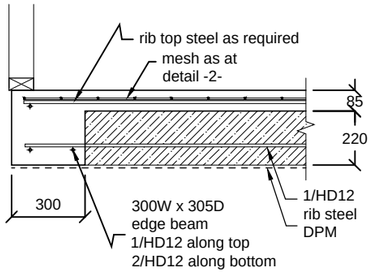
SITE ADDRESS:

Proposed Residence
4 Titore Way
Russell

SHEET TITLE:

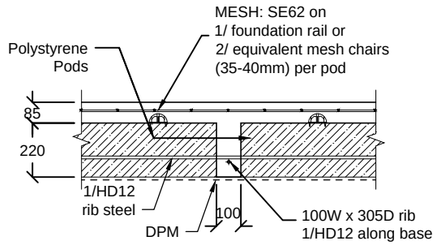
Raftfloor Plan

DESIGNED BY:	AZA	DRAWN BY:	MH
CHECKED BY:	DL	CHECKED BY:	MH
DATE:	18-12-2023	OFFICE:	Lunn Ave
DRAWING SCALE:	1:100	ORIGINAL DRAWING SIZE:	A3
Original Job #:	Job # 129628	Sheet #:	S1.1
Revision Job #:	Rev.2 #131807		



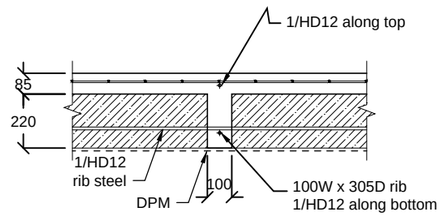
4 Detail

Raftfloor Edge Beam - 300
Scale 1:25



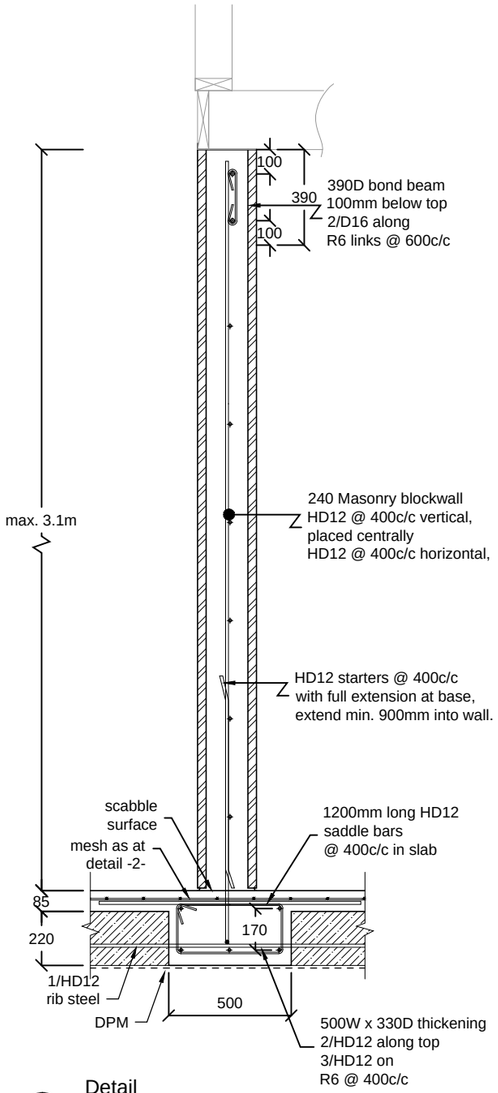
2 Detail

Raftfloor Internal Rib - 100
Scale 1:25



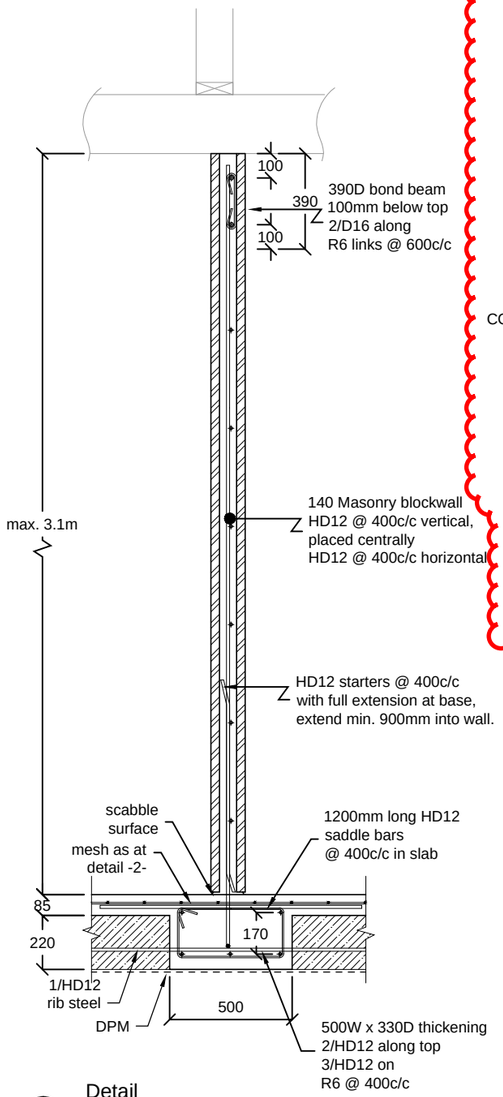
2a Detail

Raftfloor Internal Rib - 100
Scale 1:25



3 Detail

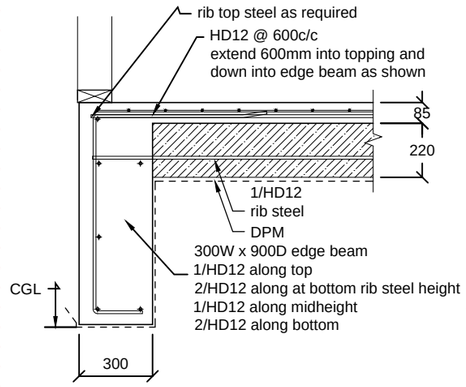
Raftfloor Internal Rib - 500
Scale 1:25



3a Detail

Raftfloor Internal Rib - 500
Scale 1:25

REV02



NOTE:
Detail -1a- may be used where,
FFL is greater than 300mm above CGL
but less than 900mm above CGL

1a Detail

Deepened Edge Beam - 300
Scale 1:25

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No.	DESCRIPTION	DATE
2	Deepened edge beam	02-02-24
1	Detailed Design	18-12-23

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Auckland: 09 527 0196 Southern Lakes: 03 443 6209
www.wiltonjoubert.co.nz

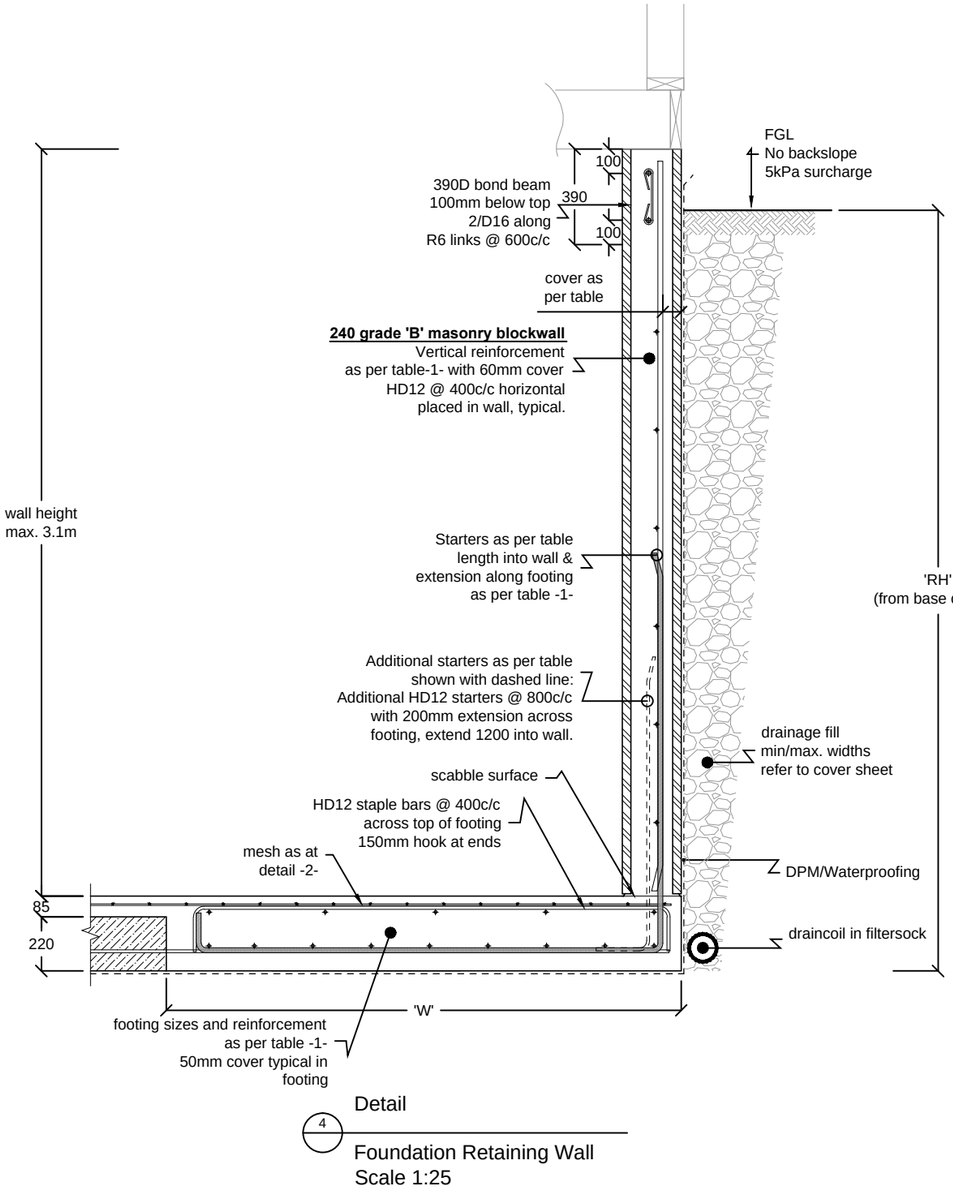
SITE ADDRESS:

Proposed Residence
4 Titore Way
Russell

SHEET TITLE:

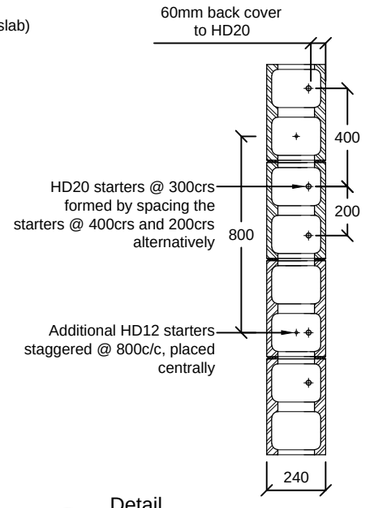
Raftfloor Details

DESIGNED BY: AZA	DRAWN BY: MH
CHECKED BY: DL	CHECKED BY: MH
DATE: 18-12-2023	OFFICE: Lunn Ave
DRAWING SCALE: 1:25	ORIGINAL DRAWING SIZE: A3
Original Job #: **Job # 129628**	Sheet #: **S2.1**
Revision Job #: **Rev.2 #131807**	



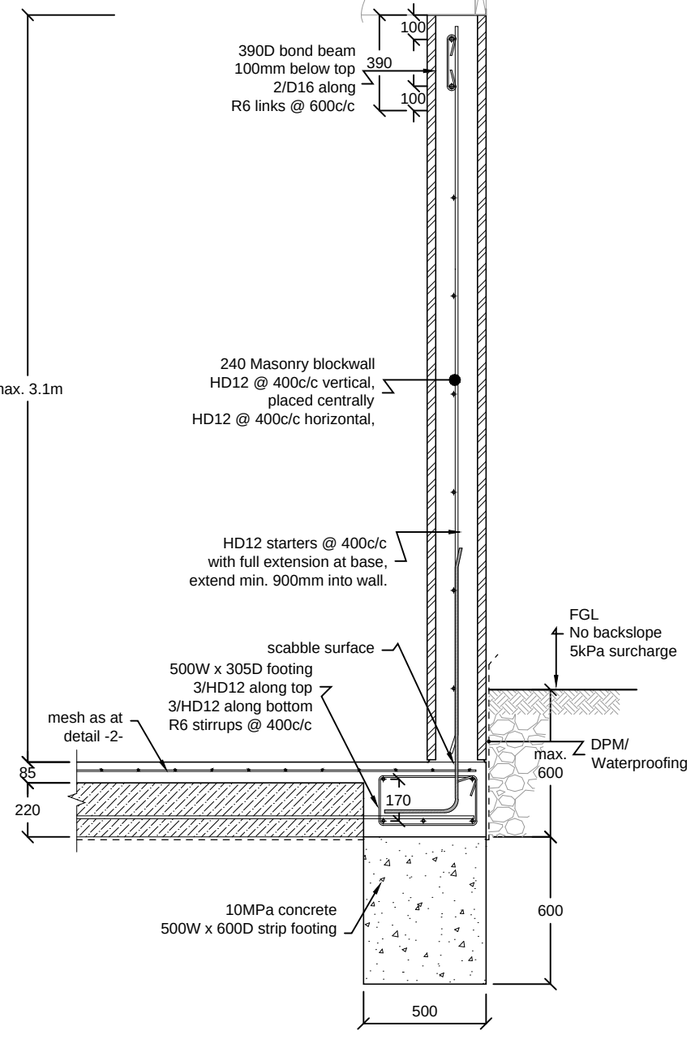
4 Detail

Foundation Retaining Wall
Scale 1:25



Detail

Cross Sectional View
Footing Starter Bar Layout
Scale 1:25



4a Detail

Raftfloor Edge beam - 500
Scale 1:25

Table -1- to Detail -4- Masonry Retaining Wall

'RH' Maximum Retained Height	Vertical Reinforcement	Vert. Steel Back Cover	Horizontal Reinforcement	Footing Dimensions 'W' (width) x 'T' (thickness) mm	Footing Reinforcement 75mm cover typical	Starters	Additional Starters
3.1m	HD20 @ 300c/c (refer to cross section)	60mm	HD12 @ 400c/c	2100W x 305T	5/HD12 along top 9/HD12 along bottom	HD20 @ 300c/c 1500 into wall full extension across footing with 150mm hook up at end	HD12 starters @ 800c/c with 200mm extension across footing, extend 1200 into wall.
2.6m	HD20 @ 400c/c	60mm	HD12 @ 400c/c	1600W x 305T	4/HD12 along top 7/HD12 along bottom	HD20 @ 400c/c 1500 into wall full extension across footing with 150mm hook up at end	N/A
2.1m	HD16 @ 400c/c	placed centrally	HD12 @ 400c/c	1100W x 305T	3/HD12 along top 5/HD12 along bottom	HD16 @ 400c/c 1200 into wall full extension across footing with 150mm hook up at end	N/A
0-1.6m	HD12 @ 400c/c	placed centrally	HD12 @ 400c/c	700W x 305T	2/HD12 along top 3/HD12 along bottom	HD12 @ 400c/c 900 into wall full extension across footing with 150mm hook up at end	N/A

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No.	DESCRIPTION	DATE
2	Deepened edge beam	02-02-24
1	Detailed Design	18-12-23

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www.wiltonjoubert.co.nz

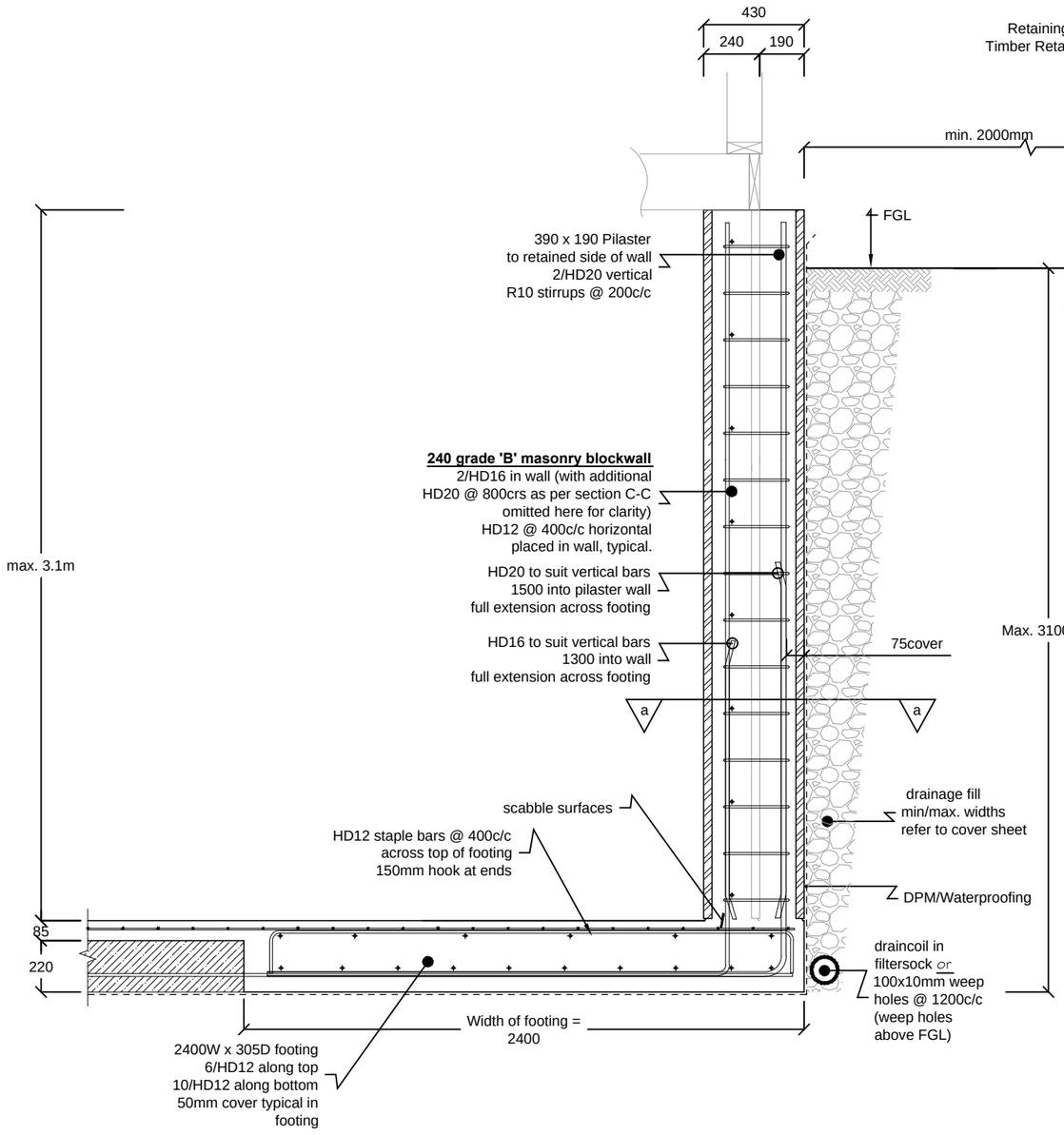
SITE ADDRESS:

Proposed Residence
4 Titore Way
Russell

SHEET TITLE:

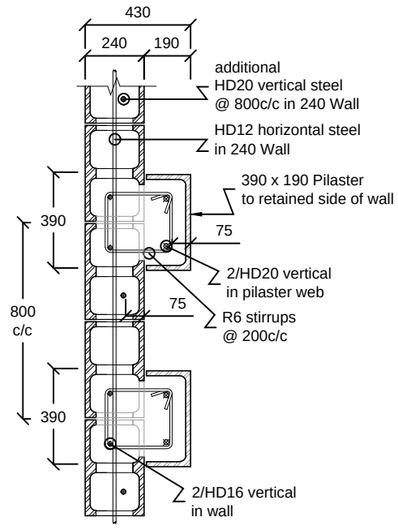
Raftfloor Details

DESIGNED BY: AZA	DRAWN BY: MH
CHECKED BY: DL	CHECKED BY: MH
DATE: 18-12-2023	OFFICE: Lunn Ave
DRAWING SCALE: 1:25	ORIGINAL DRAWING SIZE: A3
Original Job #: **Job # 129628**	Sheet #: **S2.2**
Revision Job #: **Rev.2 #131807**	



5 Detail

Masonry Pilaster Wall
Scale 1:25



5aa Detail

Pilaster Section
Scale 1:25

- Do not scale from Drawings.
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No.	DESCRIPTION	DATE
2	Deepened edge beam	02-02-24
1	Detailed Design	18-12-23

REVISION

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Consulting Engineers
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Auckland: 09 527 0196 Southern Lakes: 03 443 6209
www.wiltonjoubert.co.nz

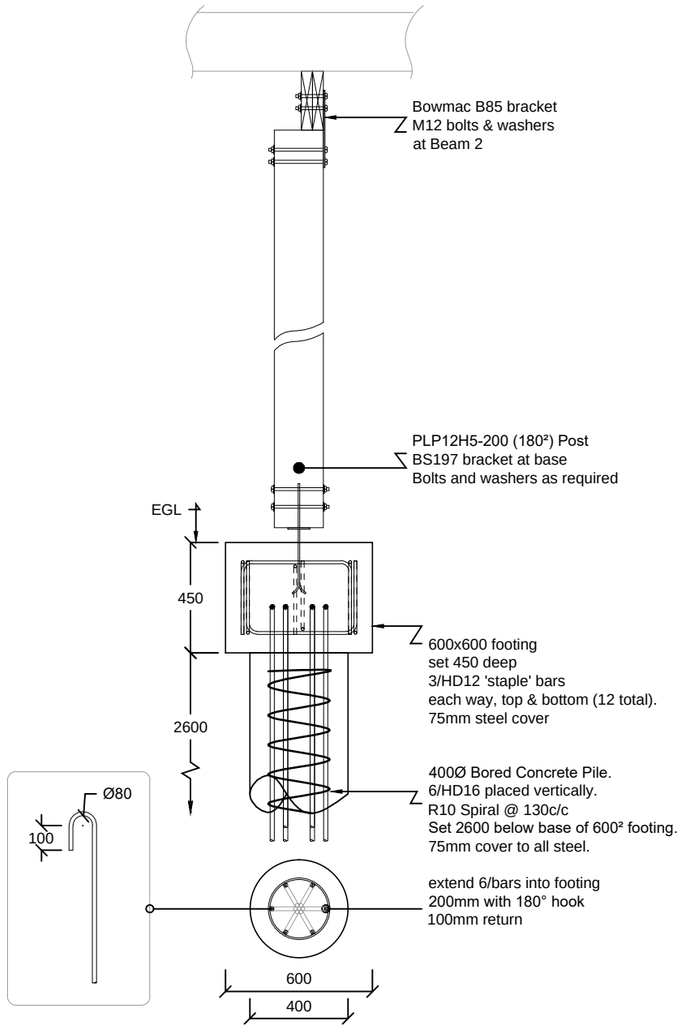
SITE ADDRESS:

Proposed Residence
4 Titore Way
Russell

SHEET TITLE:

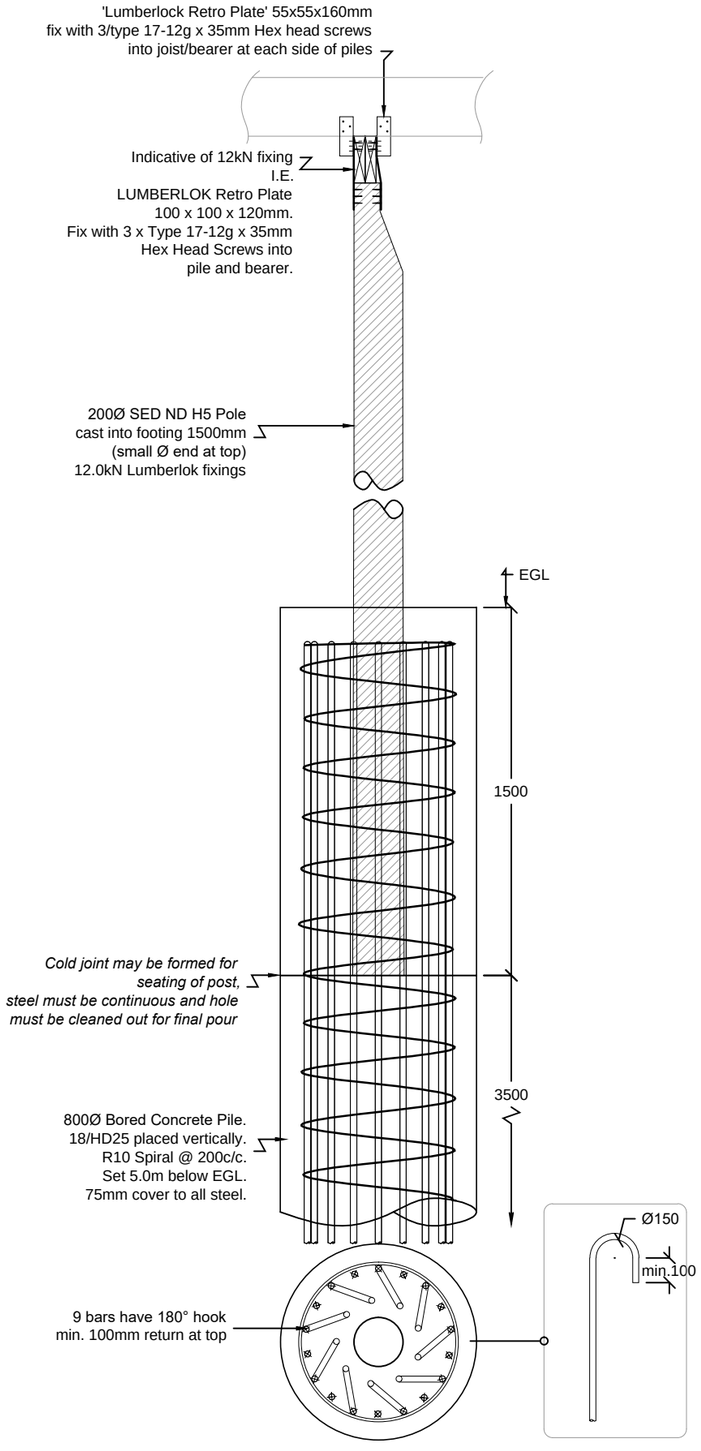
Raftfloor Details

DESIGNED BY: AZA	DRAWN BY: MH
CHECKED BY: DL	CHECKED BY: MH
DATE: 18-12-2023	OFFICE: Lunn Ave
DRAWING SCALE: 1:25	ORIGINAL DRAWING SIZE: A3
Original Job #: **Job # 129628**	Sheet #: **S2.3**
Revision Job #: **Rev.2 #131807**	



P1 Detail

P1 - Post Footing
Scale 1:25



P2 Detail

P2 - Subfloor Pile
Scale 1:25

- Do not scale from Drawings.
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No.	DESCRIPTION	DATE
2	Deepened edge beam	02-02-24
1	Detailed Design	18-12-23

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SITE ADDRESS:

Proposed Residence
4 Titore Way
Russell

SHEET TITLE:

Footing Details

DESIGNED BY: AZA	DRAWN BY: MH
CHECKED BY: DL	CHECKED BY: MH
DATE: 18-12-2023	OFFICE: Lunn Ave
DRAWING SCALE: 1:25	ORIGINAL DRAWING SIZE: A3
Original Job #: **Job # 129628**	Sheet #: **S2.4**
Revision Job #: **Rev.2 #131807**	

NOTE:
1. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).
2. It is increasingly common for building consent authorities to require a "PS4" for specifically designed structures. For Wilton Joubert Ltd. to issue this, we need to carry out inspections as per the building consent requirements. Ring Wilton Joubert Ltd. local office to arrange a booking.
NO INSPECTION EQUALS NO PS4 ISSUED.

3. Design based on soils report/assessment:
By: Haigh Workman Ltd.
Ref: 23_187 Date: Sep 2023
- Cu = 50kPa subject to Engineer's confirmation.
- Unit soil weight (W) of 18kN/m3
- Effective soil friction angle of 30degrees
- No stability issue

4. To mitigate soil failure close to the neighbouring boundary, minimise cut distance behind retaining wall. Highly recommend not to carry out earthworks in wet conditions or with impending wet weather.

5. All retaining wall loading conditions (eg. retained heights, boundary conditions, surcharges, backslope, frontslope, etc.) shall be checked prior to any construction. Wilton Joubert Ltd. shall be contacted if there are any discrepancies/deviations from the design.

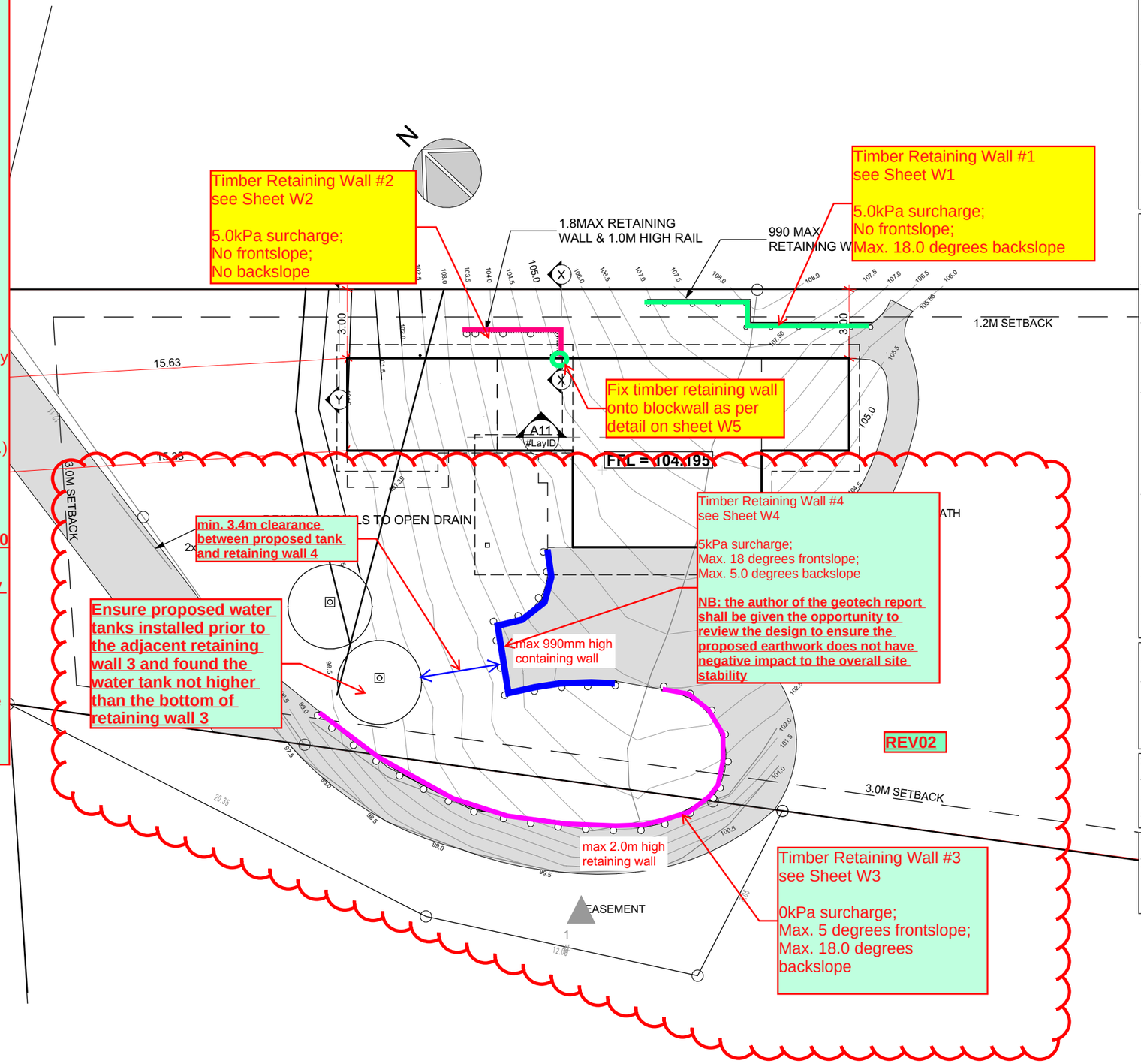
6. All existing or future structures shall be outside the 30 degrees influence line from bottom of timber retaining wall. Wilton Joubert Ltd. shall be consulted immediately if this changes on site.

7. Location and depth of all public pipes shall be confirmed on site prior to any works.

8. Loose fill over any proposed/existing public pipes shall be replaced with compacted engineering fill prior to retaining wall construction.

Mark-up
WJL #: 129628rev02

4 Titore Way
Russell



SITE PLAN NOTES:

SITE DESCRIPTION

LOT NUMBER:	LOT 1
DP NUMBER:	DP 65575
ADDRESS:	4 TITORE WAY RUSSELL

SITE ENVIRONMENT

CLIMATE ZONE	1
EARTHQUAKE ZONE	ZONE 1
EXPOSURE ZONE	ZONE D
LEE ZONE	NO
WIND ZONE	EXTRA HIGH
WIND REGION	A
RAINFALL RANGE	90-100mm/hr
SNOW ZONE	N0

DISTRICT PLAN COMPLIANCE

PLANNING ZONE	RUSSELL TOWNSHIP

BUILDING COVERAGE

SITE AREA	1662m²
MAX. FLOOR AREA PERMITTED:	20% - 332m²
UPPER FLOOR AREA -	121.64m²
EAVES OVER 600	40.69m²
DECKS OVER 1.0m (not included under eaves)	33.68m²
PROPOSED	196.01m² (11.8%) COMPLIES

BUILDING HEIGHT

MAX. HEIGHT PERMITTED	7.2M
PROPOSED HEIGHT	9.0m **DOES NOT COMPLY**
HIRB	2.0M UP/45° **DOES NOT COMPLY**

BUILDING SCALE

MAX. GROUND FLOOR AREA	20% - 332m²
PROPOSED NET GROUND FLOOR AREA	106.44m² (6.4%) COMPLIES

SETBACK TO BOUNDARIES
3.0m IN FROM ROAD BOUDNDARIES
1.2m IN FROM OTHER BOUNDARIES
COMPLIES

SETBACK TO BUSH

GREATER THAN 20m?	NO **DOES NOT COMPLY**

STORMWATER MANAGEMENT

SITE AREA	1662m²
TOTAL AREA PERMITTED	35% (581m²)
PROPOSED ROOF AREA	182m²
DRIVES	140m²
PATHS	8m²
TOTAL PROPOSED	330m² (19.85%) COMPLIES

WATER SUPPLY:
UN-RETICULATED SITE - WATER SUPPLY MUST BE POTABLE AND COMPLY WITH NZBC G12, BY WAY OF WATER TREATMENT OR FILTRATION OR OTHER SYSTEM, AND MAINTAINED AS REQUIRED BY THE MANUFACTURER

FIRE FIGHTING:
UN-RETICULATED SITUATION: NEW 25,000L WATER TANK WITH RURAL FIRE BRIGADE CONNECTION AS SHOWN ON PLANS FOR FIRE FIGHTING PURPOSES. PROVIDE FIRE FIGHTING COUPLING / TANK LID ACCESS AS PER FIRE FIGHTING CODE OF PRACTICE SNZ PAS 4509: 2008

Arcline Architecture
Offices: Kaitaia | Kerikeri | Whangarei
(Ph): 09 408 2233
(Email): info@arcline.co.nz
(Web): www.arcline.co.nz

Site Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No. Revision Date

Scale @ A3: 1:200
Drawn By RH
Issued: 22/01/2024 2:17 pm
MAC DONALD.D_FWD STAGE 1_13-11-23.pln

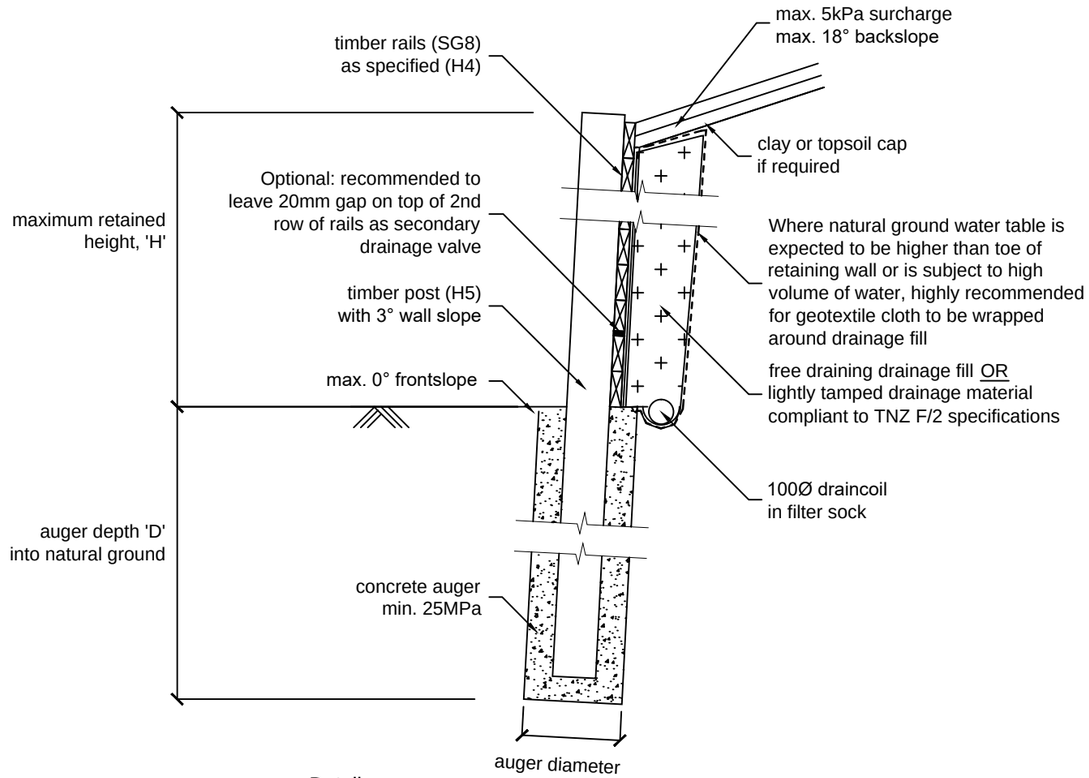
Sheet No:
A1002
DRAFT SET

Timber Retaining Wall #1

Notes:
Quality of poles shall conform to the requirements of NZS3605.
'ND' Poles are normal density with min. outer zone density of 350kg/m3.
'HD' Poles are high density with min. outer zone density of 450kg/m3.

Confirm site conditions matches design details prior to construction.

H, max. retained height (m)	Post spacing (mm)	SED Post diameter (mm)	D, auger depth (mm)	auger diameter (mm)	Rails
0.3	1000	150ND	850	350	150x50 SG8
0.6	1000	150ND	1050	350	150x50 SG8
0.9	1000	150ND	1350	350	150x50 SG8
0.99	1000	175ND	1450	350	150x50 SG8



Detail

Typical timber retaining wall

NOTES:
1. Contact the architect/engineer if any discrepancies are found.
2. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).
3. It is increasingly common for building consent authorities to require a "PS4" for specifically designed structures. For Wilton Joubert to issue this, we need to carry out inspections as per the building consent requirements. Ring Wilton Joubert local office to arrange a booking. NO INSPECTION EQUALS NO PS4 ISSUED. Where Wilton Joubert is unable to conduct inspection due to geographical reason, a local engineer may be engaged to carry out such inspections and issue a PS4 accordingly.
4. Location of all public pipes shall be confirmed on site.
5. All retaining wall loading conditions (eg. retained heights, boundary conditions, surcharges, backslope, frontslope, etc.) shall be check prior to any construction. Wilton Joubert shall be contacted if there are any discrepancies/deviations from the design.

No.	DESCRIPTION	DATE
2	Additional retaining walls	02-02-24
1	Detailed design	18-12-23
	REVISION	

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

SITE ADDRESS:

Proposed Residence:
4 Titore Way
Russell

SHEET TITLE:

Retaining Wall

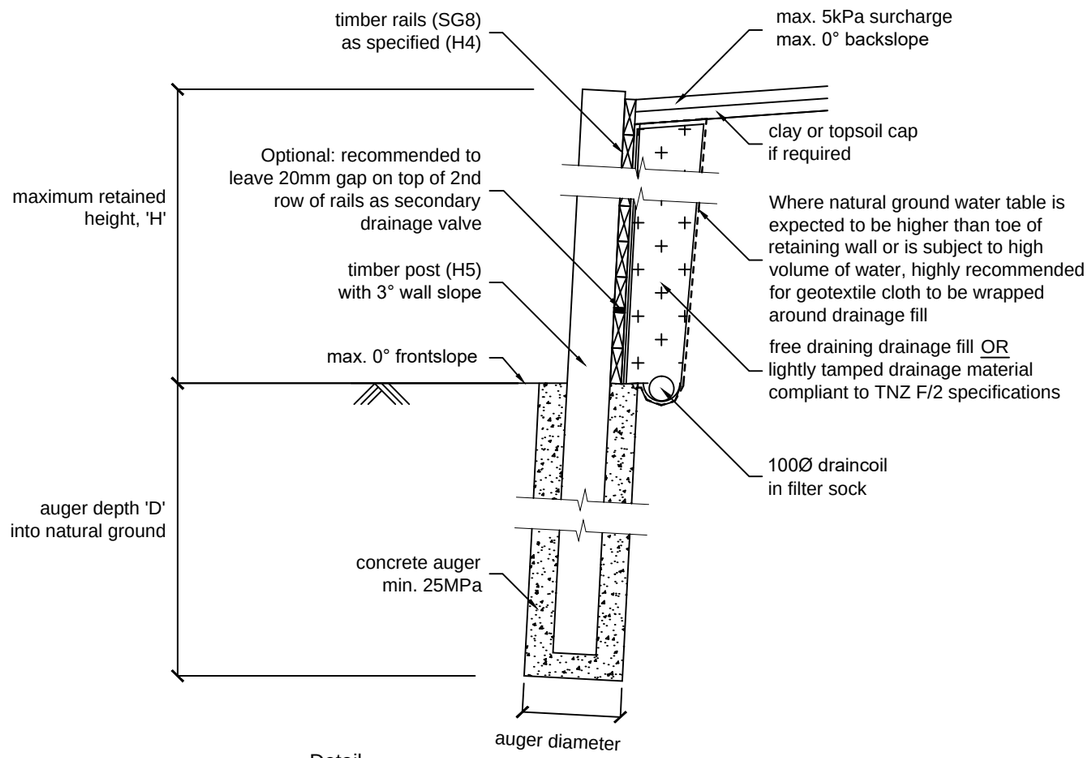
DESIGNED BY: AZA	DRAWN BY: AZA
CHECKED BY: DL	APPROVED BY: Wilton Joubert Ltd
DATE: 24-10-2023	OFFICE: Lunn Avenue
DRAWING SCALE: N.T.S	ORIGINAL DRAWING SIZE: A3
Original Job #: **Job # 129628**	Sheet #: **W1**
Revision Job #: **Job # 131807**	

Timber Retaining Wall #2

Notes:
Quality of poles shall conform to the requirements of NZS3605.
'ND' Poles are normal density with min. outer zone density of 350kg/m3.
'HD' Poles are high density with min. outer zone density of 450kg/m3.

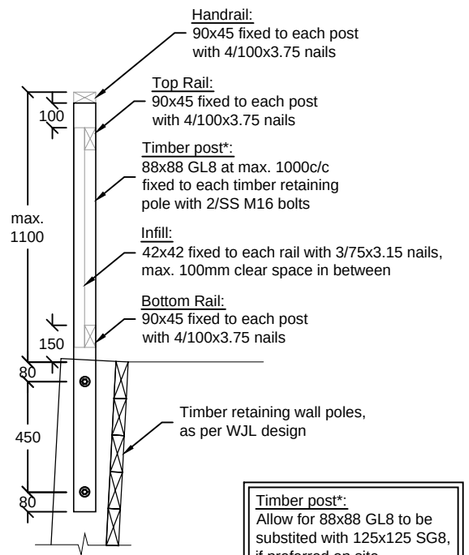
Confirm site conditions matches design details prior to construction.

H, max. retained height (m)	Post spacing (mm)	SED Post diameter (mm)	D, auger depth (mm)	auger diameter (mm)	Rails
0.6	1000	150ND	1000	350	150x50 SG8
0.9	1000	150ND	1250	350	150x50 SG8
1.2	1000	175ND	1500	350	150x50 SG8
1.5	1000	**200HD**	1800	350	150x50 SG8
1.8	1000	**200HD**	2100	350	150x50 SG8



Detail

Typical timber retaining wall



Timber post*:
Allow for 88x88 GL8 to be substited with 125x125 SG8, if preferred on site

Detail

Timber retaining wall barrier
(*use as required)

NOTES:
1. Contact the architect/engineer if any discrepancies are found.
2. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).
3. It is increasingly common for building consent authorities to require a "PS4" for specifically designed structures. For Wilton Joubert to issue this, we need to carry out inspections as per the building consent requirements. Ring Wilton Joubert local office to arrange a booking. NO INSPECTION EQUALS NO PS4 ISSUED. Where Wilton Joubert is unable to conduct inspection due to geographical reason, a local engineer may be engaged to carry out such inspections and issue a PS4 accordingly.
4. Location of all public pipes shall be confirmed on site.
5. All retaining wall loading conditions (eg. retained heights, boundary conditions, surcharges, backslope, frontslope, etc.) shall be check prior to any construction. Wilton Joubert shall be contacted if there are any discrepancies/deviations from the design.

No.	DESCRIPTION	DATE
2	Additional retaining walls	02-02-24
1	Detailed design	18-12-23
	REVISION	

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

SITE ADDRESS:

Proposed Residence:
4 Titore Way
Russell

SHEET TITLE:

Retaining Wall

DESIGNED BY: AZA	DRAWN BY: AZA
CHECKED BY: DL	APPROVED BY: Wilton Joubert Ltd
DATE: 24-10-2023	OFFICE: Lunn Avenue
DRAWING SCALE: N.T.S	ORIGINAL DRAWING SIZE: A3
Original Job #: **Job # 129628**	Sheet #: **W2**
Revision Job #: **Job # 131807**	

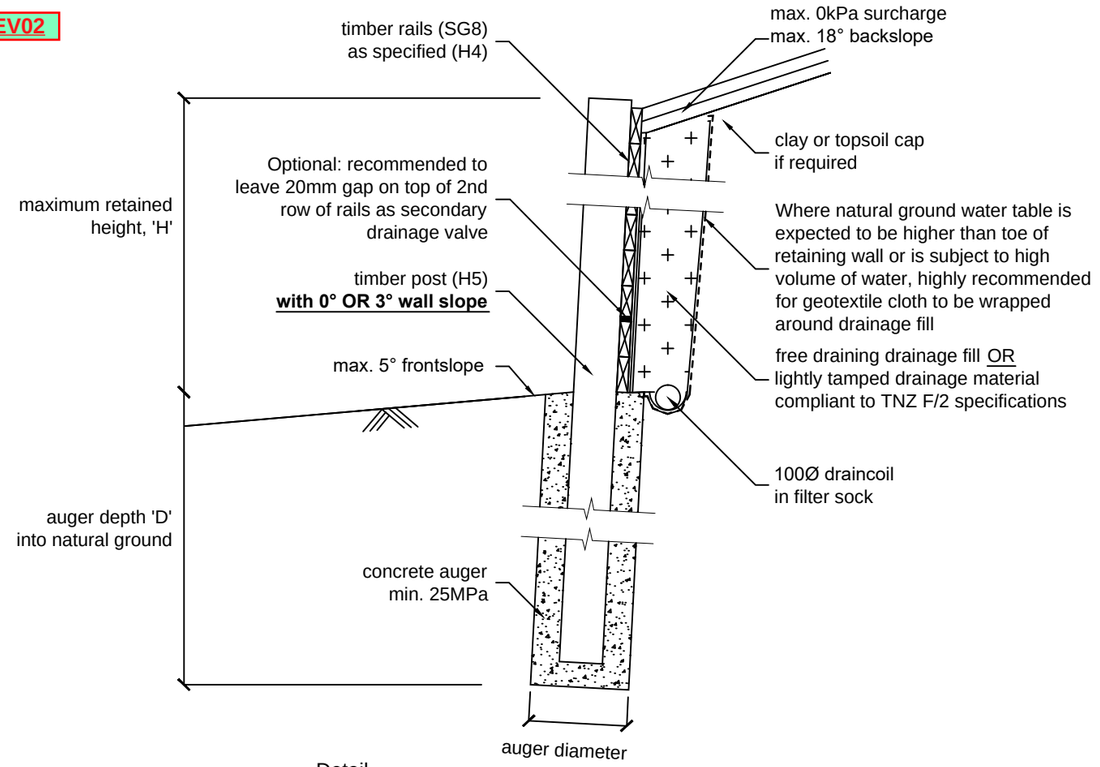
Timber Retaining Wall #3

Notes:
Quality of poles shall conform to the requirements of NZS3605.
'ND' Poles are normal density with min. outer zone density of 350kg/m3.
'HD' Poles are high density with min. outer zone density of 450kg/m3.

Confirm site conditions matches design details prior to construction.

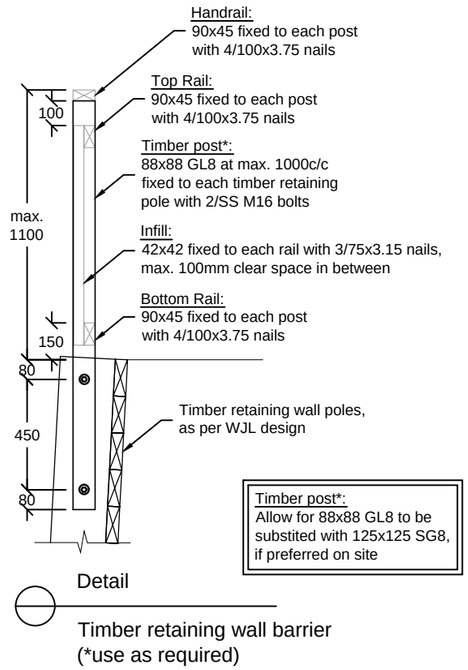
H, max. retained height (m)	Post spacing (mm)	SED Post diameter (mm)	D, auger depth (mm)	auger diameter (mm)	Rails
0.6	1000	150ND	1050	350	150x50 SG8
0.9	1000	150ND	1300	350	150x50 SG8
1.2	1000	175ND	1600	350	150x50 SG8
1.5	1000	**200ND**	1950	350	150x50 SG8
1.8	1000	**225HD**	2450	400	150x50 SG8
2.0	1000	**225HD**	2700	400	2/150x50 SG8 below top 1.8m

REV02



Detail

Typical timber retaining wall



Timber post*:
Allow for 88x88 GL8 to be substited with 125x125 SG8, if preferred on site

Detail

Timber retaining wall barrier
(*use as required)

NOTES:
1. Contact the architect/engineer if any discrepancies are found.
2. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).
3. It is increasingly common for building consent authorities to require a "PS4" for specifically designed structures. For Wilton Joubert to issue this, we need to carry out inspections as per the building consent requirements. Ring Wilton Joubert local office to arrange a booking. NO INSPECTION EQUALS NO PS4 ISSUED. Where Wilton Joubert is unable to conduct inspection due to geographical reason, a local engineer may be engaged to carry out such inspections and issue a PS4 accordingly.
4. Location of all public pipes shall be confirmed on site.
5. All retaining wall loading conditions (eg. retained heights, boundary conditions, surcharges, backslope, frontslope, etc.) shall be check prior to any construction. Wilton Joubert shall be contacted if there are any discrepancies/deviations from the design.

No.	DESCRIPTION	DATE
2	Additional retaining walls	02-02-24
1	Detailed design	18-12-23
	REVISION	

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

SITE ADDRESS:

Proposed Residence:
4 Titore Way
Russell

SHEET TITLE:

Retaining Wall

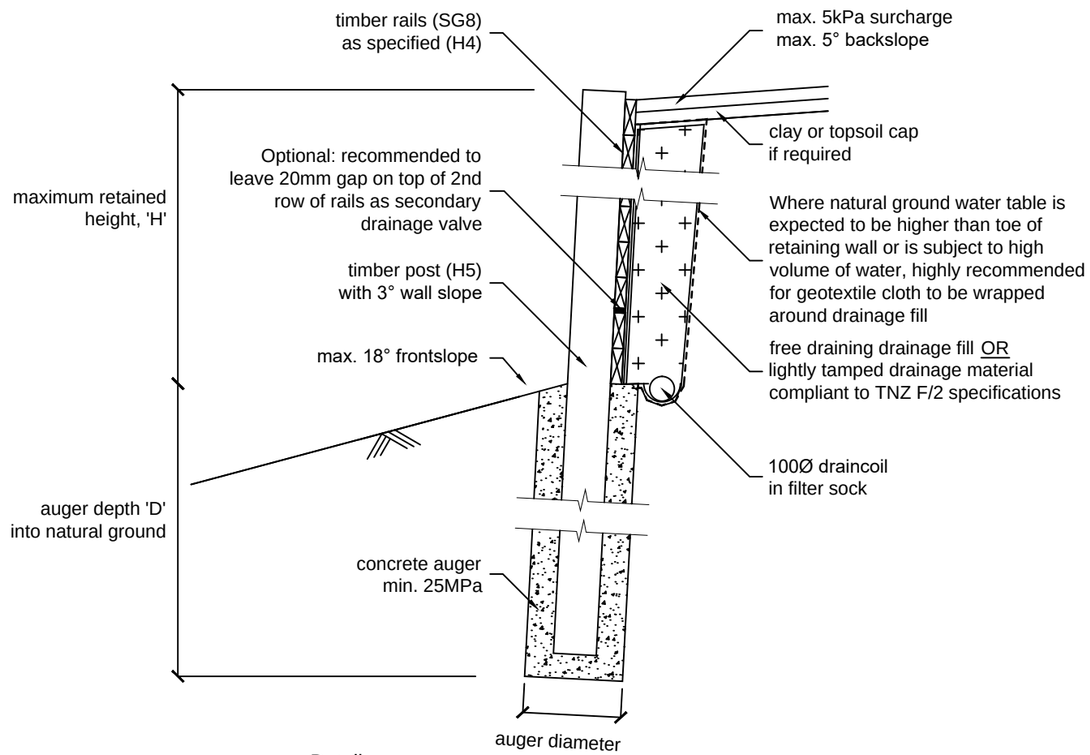
DESIGNED BY: AZA	DRAWN BY: AZA
CHECKED BY: DL	APPROVED BY: Wilton Joubert Ltd
DATE: 24-10-2023	OFFICE: Lunn Avenue
DRAWING SCALE: N.T.S	ORIGINAL DRAWING SIZE: A3
Original Job #: **Job # 129628**	Sheet #: **W3**
Revision Job #: **Job # 131807**	

Timber Retaining Wall #4

Notes:
Quality of poles shall conform to the requirements of NZS3605.
'ND' Poles are normal density with min. outer zone density of 350kg/m3.
'HD' Poles are high density with min. outer zone density of 450kg/m3.

Confirm site conditions matches design details prior to construction.

H, max. retained height (m)	Post spacing (mm)	SED Post diameter (mm)	D, auger depth (mm)	auger diameter (mm)	Rails
0.3	1000	150ND	1400	350	150x50 SG8
0.6	1000	150ND	1650	350	150x50 SG8
0.9	1000	175ND	1900	350	150x50 SG8
0.99	1000	175ND	2000	350	150x50 SG8



Detail

Typical timber retaining wall

REV02

NOTES:
1. Contact the architect/engineer if any discrepancies are found.
2. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).
3. It is increasingly common for building consent authorities to require a "PS4" for specifically designed structures. For Wilton Joubert to issue this, we need to carry out inspections as per the building consent requirements. Ring Wilton Joubert local office to arrange a booking. NO INSPECTION EQUALS NO PS4 ISSUED. Where Wilton Joubert is unable to conduct inspection due to geographical reason, a local engineer may be engaged to carry out such inspections and issue a PS4 accordingly.
4. Location of all public pipes shall be confirmed on site.
5. All retaining wall loading conditions (eg. retained heights, boundary conditions, surcharges, backslope, frontslope, etc.) shall be check prior to any construction. Wilton Joubert shall be contacted if there are any discrepancies/deviations from the design.

No.	DESCRIPTION	DATE
2	Additional retaining walls	02-02-24
1	Detailed design	18-12-23

REVISION

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

SITE ADDRESS:

Proposed Residence:
4 Titore Way
Russell

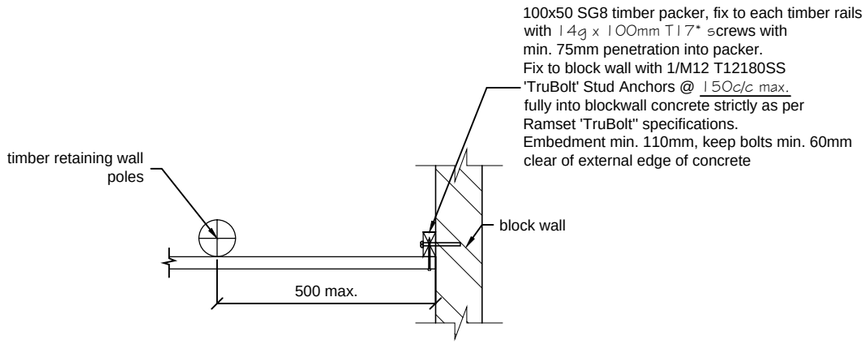
SHEET TITLE:

Retaining Wall

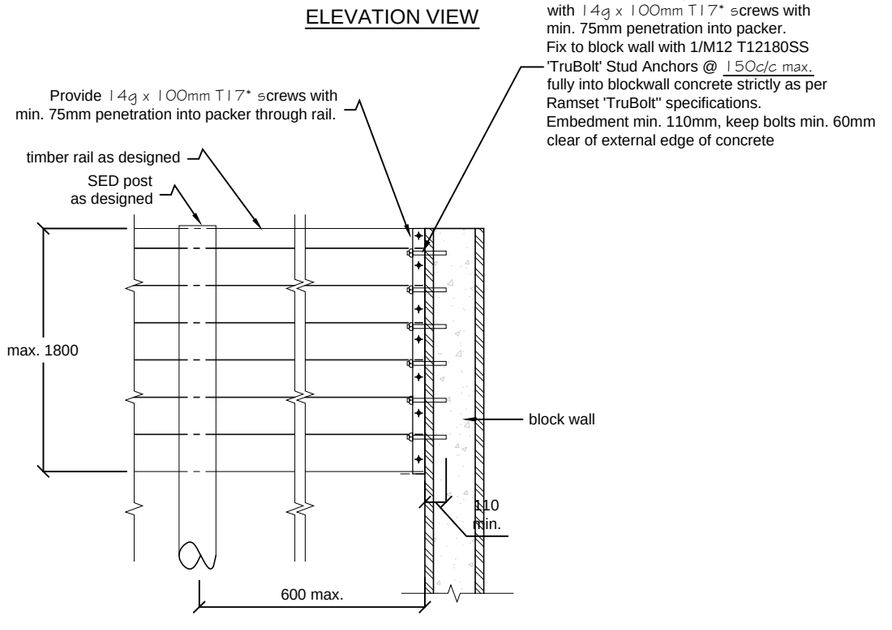
DESIGNED BY: AZA	DRAWN BY: AZA
CHECKED BY: DL	APPROVED BY: Wilton Joubert Ltd
DATE: 24-10-2023	OFFICE: Lunn Avenue
DRAWING SCALE: N.T.S	ORIGINAL DRAWING SIZE: A3

Original Job #: **Job # 129628**
Revision Job #: **Job # 131807**
Sheet #: **W4**

PLAN VIEW



ELEVATION VIEW



Detail

Timber retaining wall to block wall connection

NOTES:

1. Contact the architect/engineer if any discrepancies are found.
2. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).
3. It is increasingly common for building consent authorities to require a "PS4" for specifically designed structures. For Wilton Joubert to issue this, we need to carry out inspections as per the building consent requirements. Ring Wilton Joubert local office to arrange a booking. NO INSPECTION EQUALS NO PS4 ISSUED. Where Wilton Joubert is unable to conduct inspection due to geographical reason, a local engineer may be engaged to carry out such inspections and issue a PS4 accordingly.
4. Location of all public pipes shall be confirmed on site.
5. All retaining wall loading conditions (eg. retained heights, boundary conditions, surcharges, backslope, frontslope, etc.) shall be check prior to any construction. Wilton Joubert shall be contacted if there are any discrepancies/deviations from the design.

No.	DESCRIPTION	DATE
2	Additional retaining walls	02-02-24
1	Detailed design	18-12-23

REVISION

WILTON JOUBERT

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

SITE ADDRESS:

Proposed Residence:
4 Titore Way
Russell

SHEET TITLE:

Retaining Wall Fixings

DESIGNED BY: AZA	DRAWN BY: AZA
CHECKED BY: DL	APPROVED BY: Wilton Joubert Ltd
DATE: 24-10-2023	OFFICE: Lunn Avenue
DRAWING SCALE: N.T.S	ORIGINAL DRAWING SIZE: A3
Original Job #: Job # 129628	Sheet #: W5
Revision Job #: Job # 131807	

Non-Reticulated Firefighting Water Supplies, Vehicular Access & Vegetation Risk Reduction Application for New and Existing Residential Dwellings and Sub-Divisions

Contents

Section A - Firefighting Water Supplies and Vegetation Risk Reduction Waiver

"Fire and Emergency New Zealand strongly recommends the installation of automatic fire detection system devices such as smoke alarms for early warning of a fire and fire suppression systems such as sprinklers in buildings (irrespective of the water supply) to provide maximum protection to life and property".

Waiver Explanation Intent

Fire and Emergency New Zealand [FENZ] use the New Zealand Fire Service [NZFS] Code of Practice for firefighting water supplies (SNZ PAS 5409:2008) (The Code) as a tool to establish the quantity of water required for firefighting purposes in relation to a specific hazard (Dwelling, Building) based on its fire hazard classification regardless if they are located within urban fire districts with a reticulated water supply or a non-reticulated water supply in rural areas. The code has been adopted by the Territorial Authorities and Water Supply Authorities. The code can be used by developers and property owners to assess the adequacy of the firefighting water supply for new or existing buildings.

The Area Manager under the delegated authority of the Fire Region Manager is responsible for approving applications in relation to firefighting water supplies. The Area Manager may accept a variation or reduction in the amount of water required for firefighting for example; a single level dwelling measuring 200^{m2} requires 45,000L of firefighter water under the code, however the Area Managers in Northland have excepted a reduction to 10,000L.

This application form is used for the assessment of proposed water supplies for firefighting in non-reticulated areas only and is referenced from (Appendix B – Alternative Firefighting Water Sources) of the code. This application also provides fire risk reduction guidance in relation to vegetation and the 20-metre dripline rule under the Territorial Authority's District Plan. Fire and Emergency New Zealand are not a consenting authority and the final determination rests with the Territorial Authority.

For more information in relation to the code of practice for Firefighting Water supplies, Emergency Vehicle Access requirements, Home Fire Safety advice and Vegetation Risk Reduction Strategies visit www.fireandemergency.nz

Section B – Applicant Information

Applicants Information	
Name:	David MacDonald
Address:	
Contact Details:	c/- Bay of Islands Planning Limited
Return Email Address:	kenton@bayplan.co.nz

Section C – Property Details

Property Details	
Address of Property:	4 Titore Way, Russell
Lot Number/s:	Lot 1 DP 65575
Dwelling Size: (Area = Length & Width)	180m2
Number of levels: (Single / Multiple)	2

1. Fire Appliance Access to alternative firefighting water sources - Expected Parking Place & Turning circle

Fire and Emergency have specific requirements for fire appliance access to buildings and the firefighting water supply. This area is termed the hard stand. The roading gradient should not exceed 16%. The roading surface should be sealed, able to take the weight of a 14 to 20-tonne truck and trafficable at all times. The minimum roading width should not be less than 4 m and the property entrance no less 3.5 metres wide. The height clearance along access ways must exceed 4 metres with no obstructions for example; trees, hanging cables, and overhanging eaves.

1 (a) Fire Appliance Access / Right of Way	
Is there at least 4 metres clearance overhead free from obstructions?	☒YES ☐NO
Is the access at least 4 metres wide?	☒YES ☐NO
Is the surface designed to support a 20-tonne truck?	☒YES ☐NO
Are the gradients less than 16%	☒YES ☐NO
Fire Appliance parking distance from the proposed water supply is approximately 20 metres	

If access to the proposed firefighting water supply is not achievable using a fire appliance, firefighters will need to use portable fire pumps. Firefighters will require at least a one-metre wide clear path / walkway to carry equipment to the water supply, and a working area of two metres by two metres for firefighting equipment to be set up and operated.

1 (b) Restricted access to firefighting water supply, portable pumps required
Has suitable access been provided? ☒YES ☐ NO
Comments:

Internal FENZ Risk Reduction comments only:

Click or tap here to enter text.

2. Firefighting Water Supplies (FFWS)

What are you proposing to use as your firefighting water supply?

2 (a) Water Supply Single Dwelling	
Tank	☒ Concrete Tank ☐ Plastic Tank ☐ Above Ground (Fire Service coupling is required - 100mm screw thread suction coupling) ☒ Part Buried (max exposed 1.500 mm above ground) ☐ Fully Buried (access through filler spout) Volume of dedicated firefighting water 10,000 litres

2 (b) Water Supply Multi-Title Subdivision Lots / Communal Supply	
Tank Farm	☐ Concrete Tank ☐ Plastic Tank ☐ Above Ground (Fire Service coupling is required - 100mm screw thread suction coupling) ☐ Part Buried (max exposed 1.500mm above ground) ☐ Fully Buried (access through filler spout) Number of tanks provided Click or tap here to enter text. Number of Tank Farms provided Click or tap here to enter text. Water volume at each Tank Farm Click or tap here to enter text. Litres Volume of dedicated firefighting water Click or tap here to enter text. litres

2 (c) Alternative Water Supply	
Pond:	Volume of water: Click or tap here to enter text.
Pool:	Volume of water: l
Other:	Specify: Click or tap here to enter text.
	Volume of water: Click or tap here to enter text.

Internal FENZ Risk Reduction comments only:

Click or tap here to enter text.

3. Water Supply Location

The code requires the available water supply to be at least 6 metres from a building for firefighter safety, with a maximum distance of 90 metres from any building. This is the same for a single dwelling or a Multi-Lot residential subdivision. Is the proposed water supply within these requirements?

3 (a) Water Supply Location	
Minimum Distance:	*Is your water supply at least 6 metres from the building?* ☒YES ☐ NO
Maximum Distance	*Is your water supply no more than 90 metres from the building?* ☒YES ☐ NO

3 (b) Visibility
How will the water supply be readily identifiable to responding firefighters? E.g.: tank is visible to arriving firefighters or, there are signs / markers posts visible from the parking place directing them to the tank etc.
Comments: Tanks will be visible from the driveway

3 (c) Security
How will the FFWS be reasonably protected from tampering? E.g.: light chain and padlock or, cable tie on the valve etc.
Explain how this will be achieved: Tanks are located on private site situated away from road.

Internal FENZ Risk Reduction comments only: Click or tap here to enter text.

4. Adequacy of Supply

The volume of storage that is reserved for firefighting purposes must not be used for normal operational requirements. Additional storage must be provided to balance diurnal peak demand, seasonal peak demand and normal system failures, for instance power outages. The intent is that there should always be sufficient volumes of water available for firefighting, except during Civil Défense emergencies or by prior arrangement with the Fire Region Manager.

4 (a) Adequacy of Water supply
Note: *The owner must maintain the firefighting water supply all year round. How will the usable capacity proposed be reliably maintained? E.g. automatically keep the tank topped up, drip feed, rain water, ballcock system, or manual refilling after use etc.*
Comments: Roof water supply with top up when necessary.

Internal FENZ Risk Reduction comments only:

Click or tap here to enter text.

5. Alternative Method using Appendix's H & J

If Table 1 + 2 from the Code of Practice is not being used for the calculation of the Firefighting Water Supply, a competent person using appendix H and J from the Code of Practice can propose an alternative method to determine firefighting water supply adequacy.

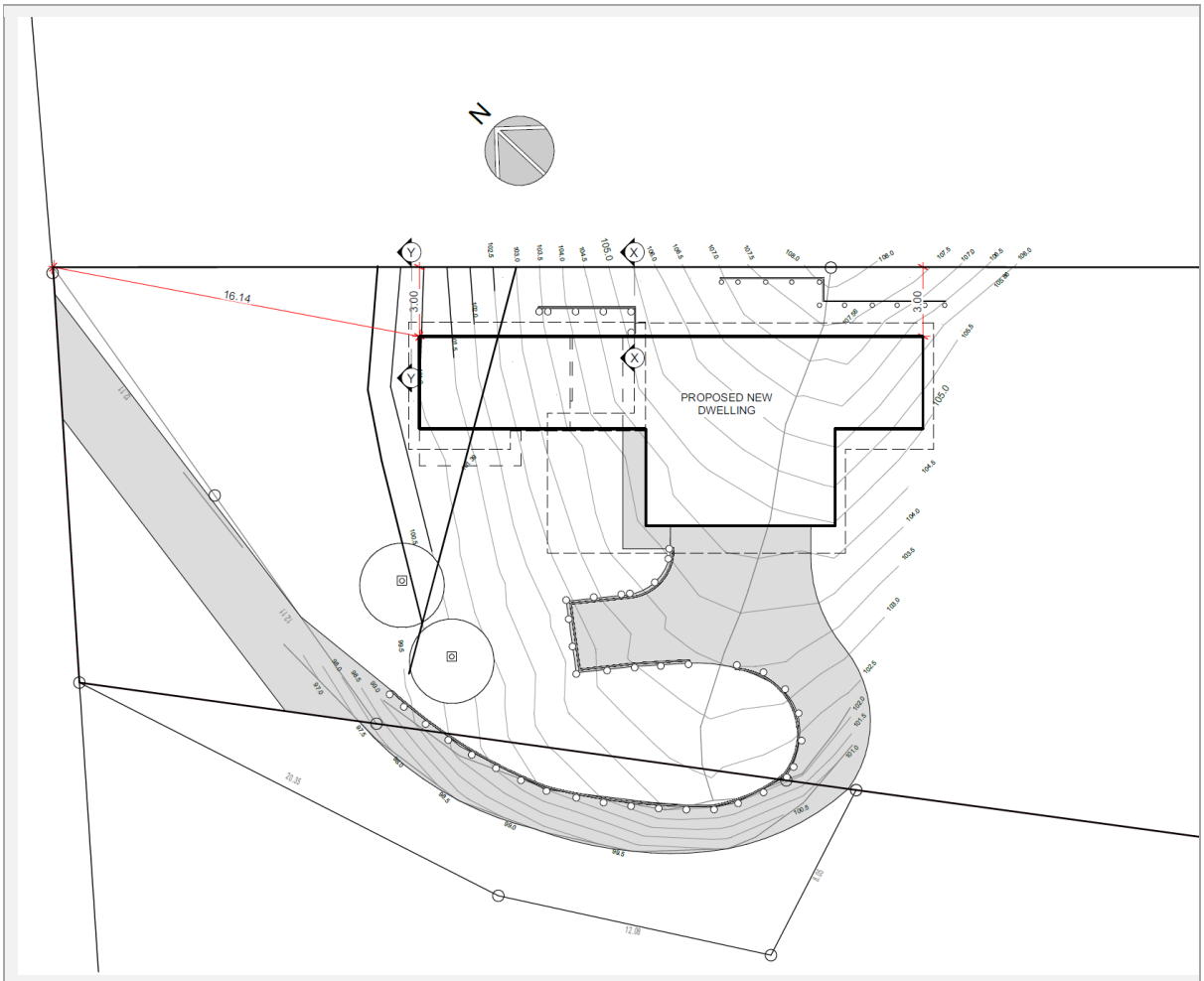
Appendix H describes a method for determining the maximum fire size in a structure. Appendix J describes a method for assessing the adequacy of the firefighting water supply to the premises.

5 (a) Alternative Method Appendix H & J	
If an alternative method of determining the FFWS has been proposed, who proposed it? Name: Click or tap here to enter text.	
Contact Details: Click or tap here to enter text.	
Proposed volume of storage?	Litres: Click or tap here to enter text.
Comments: Click or tap here to enter text. ** Please provide a copy of the calculations for consideration.*	

Internal FENZ Risk Reduction comments only: Click or tap here to enter text.

6. Diagram

Please provide a diagram identifying the location of the dwelling/s, the proposed firefighting water supply and the attendance point of the fire appliance to support your application.



Internal FENZ Risk Reduction comments only:

Click or tap here to enter text.

7. Vegetation Risk Reduction - Fire + Fuel = Why Homes Burn

Properties that are residential, industrial or agricultural, are on the urban–rural interface if they are next to vegetation, whether it is forest, scrubland, or in a rural setting. Properties in these areas are at greater risk of wildfire due to the increased presence of nearby vegetation.

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

I. *Fire safe construction*

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

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

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

II. *Establish Safety Zones around your home.*

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

a) *Mow lawn and plant low-growing fire-resistant plants; and*
b) *Thin and prune trees and shrubs; and*
c) *Avoid tall trees close to the house; and*
d) *Use gravel or decorative crushed rock instead of bark or wood chip mulch; and*
e) *Remove flammable debris like twigs, pine needles and dead leaves from the roof and around and under the house and decks; and*
f) *Remove dead plant material along the fence lines and keep the grass short; and*
g) *Remove over hanging branches near powerlines in both Zone 1 and 2.*

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

a) *Remove scrub and dead or dying plants and trees; and*
b) *Thin excess trees; and*
c) *Evenly space remaining trees so the crowns are separated by 3-6 metres; and*
d) *Avoid planting clusters of highly flammable trees and shrubs*
e) *Prune tree branches to a height of 2 metres from the ground.*

IV. *Choose Fire Resistant Plants*

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

For more information please go to https://www.fireandemergency.nz/at-home/the-threat-of-rural-fire/

If your building or dwelling is next to vegetation, whether it is forest, scrubland, or in a rural setting, please detail below what Risk Reduction measures you will take to mitigate the risk of fire development and spread involving vegetation?

7 (a) Vegetation Risk Reduction Strategy
Above mitigation strategies will be implemented where possible.

Internal FENZ Risk Reduction comments only:

Click or tap here to enter text.

8. Applicant

Checklist	
☒	Site plan (scale drawing) – including; where to park a fire appliance, water supply, any other relevant information.
☒	Any other supporting documentation (diagrams, consent).

I submit this proposal for assessment.

Name: Kenton Baxter Dated: 20/09/2023

Contact No.: 09 407 5253

Email: kenton@bayplan.co.nz

Signature: Kenton Baxter

9. Approval

In reviewing the information that you have provided in relation to your application being approximately a Click or tap here to enter text. *square metre,* Choose an item. *dwelling/sub division, and non-sprinkler protected.*

The Area Manager of Fire and Emergency New Zealand under delegated authority from the Fire Region Manager, Te Hiku, has assessed the proposal in relation to firefighting water supplies and the vegetation risk strategy. The Manager Choose an item. *agree with the proposed alternate method of Fire Fighting Water Supplies. Furthermore; the Manager agrees with the Vegetation Risk Reduction strategies proposed by the applicant.*

Name: Click or tap here to enter text.

Signature: Click or tap here to enter text. Dated: Click or tap to enter a date.

P.P on behalf of the Area Manager

Fire and Emergency New Zealand
Te Tai Tokerau / Northland District

APPROVED
By GoffinJ at 8:14 am, Sep 22, 2023

Jason Goffin- Advisor Risk Reduction

Ground Stabilisation Design Report

4 Titore Way, Russell

for

Arcline Architecture

Haigh Workman reference 23 187

November 2023

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PO Box 89 • 6 Fairway Drive • Kerikeri 0245 • New Zealand

Revision History

Revision №	Issued By	Description	Date
A	Wayne Thorburn	Design Report	27 November 2023

Prepared by

[redacted]

Senior Geotechnical Engineer

CMEngNZ, CPEng

Approved by

[redacted]

Senior Civil Engineer / Director

CMEngNZ, CPEng

https://haighworkman2020.sharepoint.com/sites/suitefiles/shared documents/clients/arcline architecture/jobs/23 187 - 4 titore way, russell (lot 1 dp 65575)/engineering/design report/23 187_soldier pile wall design report.docx

TABLE OF CONTENTS

TABLES

1 Introduction

1.1 General

Haigh Workman Limited (Haigh Workman) were engaged by Arcline Architecture (the Client) to undertake design of a soldier pile retaining wall to stabilise the site and provide a safe building platform, located along the south-eastern side of the proposed dwelling at 4 Titore Way, Russell. This report should be read in conjunction with the geotechnical assessment report prepared by Haigh Workman Limited*.

Based on the recommendations made within the geotechnical report and liaison with the Client, the preferred remedial option to stabilise the site was to construct a barrier soldier pile wall. This report contains the design for the barrier pile wall proposed to stabilise the property, and includes:

- Identification of the extent and geometry of the proposed barrier wall.
- Assessment of the geological and geotechnical issues.
- Design and construction recommendations of the proposed barrier pile wall.

1.2 Site Description

The site is legally described as Lot 1, DP 65575, and occupies an area of approximately 1661 m^2. The subject site is approximately rectangular in plan shape, elongated north-west to south-east and is currently a bare parcel of land, recently cleared of shrub to allow access into the site for site investigations. Excluding the development area, the north-western portion of the site (building platform area) is covered in mature Manuka trees and regenerative shrub. The south-eastern portion is moderately steep to steep, with slope angles up to 45 degrees based on the 2018-2020 LiDAR dataset†, and is densely vegetated with native and exotic species.

The property is bordered with Titore Way along the north-western boundary and shares an accessway with 6 Titore Way along the western boundary. The south-eastern boundary is located at the base of the steep gully, with approximately half the property located within the gully. The north-eastern boundary is shared with a scenic and historic reserve (Flagstaff Hill Historic reserve).

* 23 187, Geotechnical Assessment Report at 4 Titore Way, Russell. Dated September 2023.

† Northland LiDAR 1m DEM (2018-2020). Toitu Te Whenua, Land Information New Zealand.

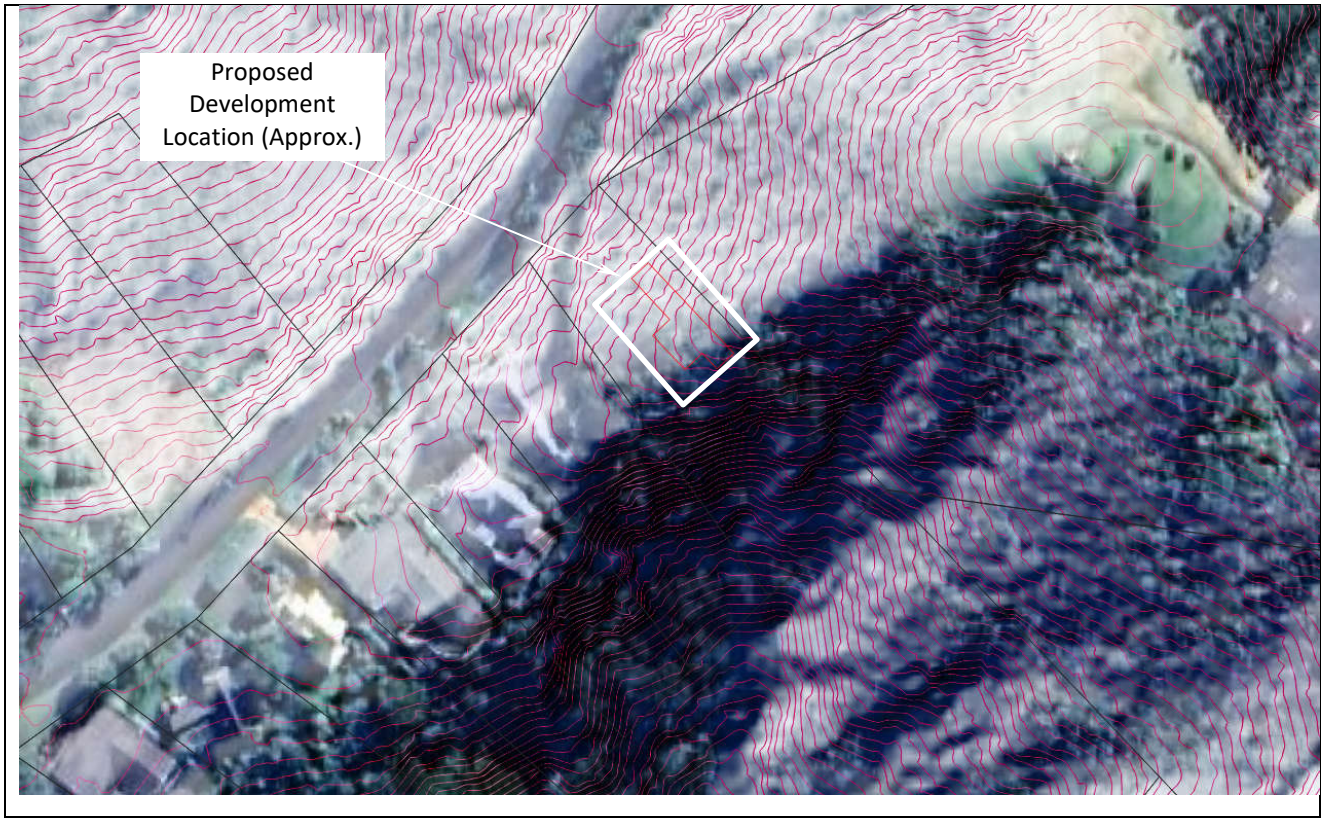


Figure 1 - Site Location (4 Titore Way, Russell)

1.3 Proposed Development

It is proposed to construct a solider pile retaining wall to stabilise the proposed building platform prior to building a new dwelling, refer Appendix A – Drawings, for location. The wall will be constructed to maintain stability of the site and mitigate the effects of any potential land movement adjacent to the new dwelling.

Concept drawings are included within Appendix A. Should the proposed development vary from the concept drawings and/or be relocated outside the investigated area, further investigation and/or amendments to the recommendations made in this report may be required.

2 Subsurface Conditions

2.1 Haigh Workman Geotechnical Investigations, 2023

Subsurface investigations were undertaken on 24 August 2023. The investigation comprised 5x CPTs (CPT01 to CPT05) and 6x hand augered boreholes (HA01 to HA06). Subsurface conditions encountered at the test locations are summarised in Table 1.

Table 1 - Summary of subsoil investigations

Test I.D.	Topsoil (mbgl)	Very stiff residual Waipapa Group (mbgl)	Hard / completely weathered Waipapa Group (mbgl)	Highly weathered Waipapa Group (mbgl)	Groundwater and Soil Moisture Observations (mbgl)
HA01	0.02	>3.0	NE	NE	Wet at 2.2
HA02	0.025	>3.0	NE	NE	Wet at 2.6
HA03	0.05	>3.0	NE	NE	Wet at 2.5
HA04	NE	>2.0	NE	NE	Wet at 0.5
HA05	0.3	>3.0	NE	NE	Wet at 1.5
HA06	0.3	>2.0	NE	NE	Moist to wet 1.1m
CPT01	NE	5.5	15.0	>17.81	NE
CPT02	NE	5.0	13.5	>23.33	NE
CPT03	NE	2.5	5.0	>9.77	NE
CPT04	NE	2.0	6.0	>16.07	NE
CPT05	NE	3.5	6.5	>11.78	NE

* NE = Not Encountered

3 Soldier Pile Wall Design

3.1 Geotechnical Design Parameters

Table 2 below presents the material parameters adopted for the stability analyses. The parameters have been adopted based on our preliminary ground model, observations from subsoil investigation data, experience within similar materials and back analysis of the observed site features.

Table 2 – Soil/rock design parameters

Soil Unit	Bulk Unit Weight γ (kN/m^3)	Undrained Shear Strength S_u (kPa)	Effective Cohesion c' (kPa)	Effective Friction Angle φ' (degrees)	Groundwater Ru[1]
Very stiff residual (Melange)	18	100	5	30	0.2 (0.35)
Very stiff residual (Hunua facies)	18	100	7	32	0.1 (0.2)
Hard / Completely weathered (Melange)	18	200	7	32	0 (0.1)
Hard / Completely weathered (Hunua facies)	18	200	20	32	0 (0.05)
Highly weathered Waipapa Group (Hunua facies)	20	>500	50	32	0

Notes: 1 Values are for design groundwater. Parenthesis values represent elevated groundwater conditions.

3.2 Geotechnical Ground Model and Stability Analysis

The solider pile wall design is based on the ground model and stability analyses presented in the geotechnical assessment report. The results show ground stabilisation is required to provide a long-term safe building platform. This has been modelled as an in-ground retaining wall (barrier pile wall) along the crest of the steep escarpment (south-eastern side of dwelling). The proposed ground stabilisation system is predominantly designed to stabilise the land behind the wall and provide a safe building platform. Further downslope evacuation may occur, and this has been taken into consideration in design by allowing an evacuation height of 5.5 m, i.e., the downslope soils do not provide any buttress / passive support. The inground solider pile wall location is shown on the attached site plan G02.

Seismic Coefficient

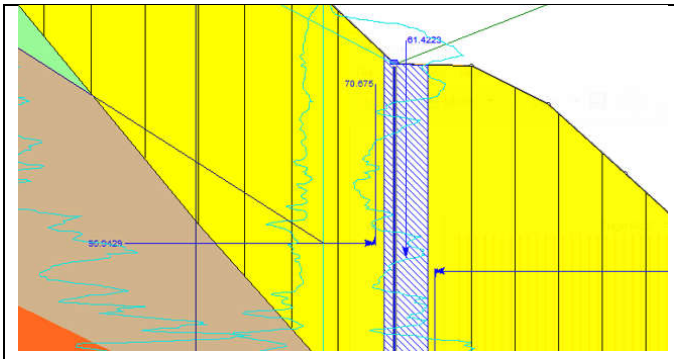
Anticipated peak ground acceleration for the Paihia/Russell area has been taken from Module 1: Overview of the guidelines – Earthquake geotechnical engineering practice, adopting the mean hazard value of 0.13 g as the principal parameter for pseudo-static analysis (500-year return period). Step-change behaviour response has been assessed adopting the 'lower-bound' value of 0.19 g.

Solider Pile Wall Analysis

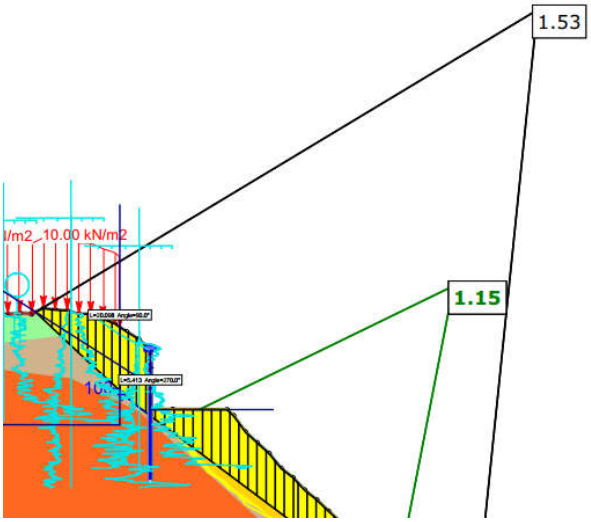
The design concept is to provide protection to the property from future instability by construction of an in-ground reinforced concrete barrier pile wall. Design of the wall was carried out with the following steps:

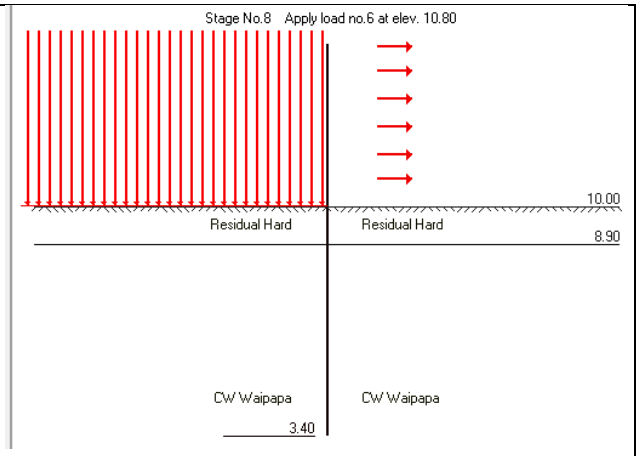
1. Slope stability analyses, with computer program 'SLIDE', to determine the location and minimum length of the pile to obtain an adequate FOS.
2. Carried out slope stability analyses and forced the slip surface to pass through the pile to determine the depth of the failure plane and the minimum capacity of the pile required to resist the shearing forces. The forces from the soil mass acting on the pile were also obtained.
3. Carried out slope stability analyses to determine the depth of soil which could be evacuated if slip failure occurred in front of the wall. These results were used as the basis for the sacrificial depth of the passive pressure of the wall.
4. Design actions, deflections and length of embedment can be derived using computation software (Wallap). Wall stiffness to be 50% of its short-term uncracked modulus for long term behaviour. Moment actions and shear forces were used for structural design.

A summary of the design approach and values are provided in Figure 2 and. The conceptual analysis was undertaken in Wallap, staging included removal of soil on both sides of the wall, applying a surcharge on the active side of the wall that is representative of the existing soil condition and horizontal loads from the slope stability analysis (this was undertaken to not double up active earth pressure). Figure 2 shows how the loads were computed and applied under static conditions.



Slide forces – driving active force = 96 kN (adopt 100 kN/m for concept design purposes).





Horizontal loads added into Wallap – evenly distributed. 100 kN/m applied in 6 evenly distributed horizontal loads (16.7 kN steps)

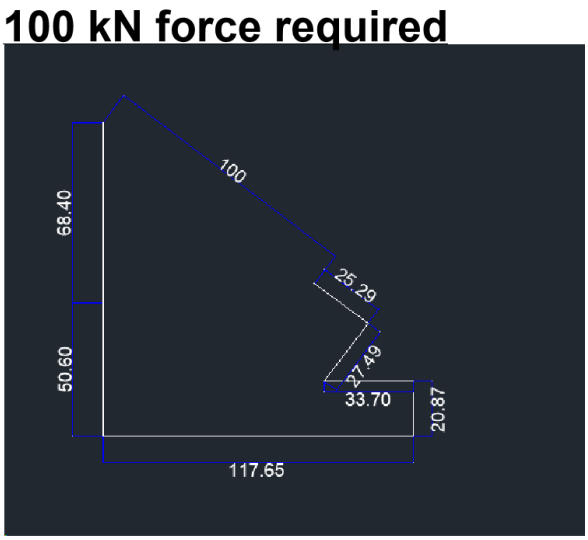


Figure 2 – Free body diagram and staging (Static, normal groundwater conditions)

Design Criteria

The inground solider pile wall has been designed considering the following failure modes:

- Kick-out (factor of safety of 1.5).
- Yielding of structural elements.
- Deflection limit = 50 mm.

The design criteria adopted is shown in Table 3.

Table 3 - Retaining wall design criteria.

Retaining Wall No.	Design Height (m)	Surcharge
SP01 – Soldier Pile Wall	In-ground (5.5m evacuation height)	Dwelling behind wall – 10 kPa

Wallap Analysis Results

Moment actions and shear forces have been taken from the analysis. The design is for a fully buried soldier pile wall, with a minimum concrete strength of 35 MPa. A summary of the results is presented in Table 4. Refer Appendix A for the location of the soldier pile wall.

Table 4 - Wallap Analysis Results

Details	In-ground palisade retaining wall – 750 mm reinforced concrete piles with capping beam
Pile spacing (m)	1.5
Concrete Strength (MPa)	35
Young's Modulus – E (GPa)	27.8
Cracked Modulus Value (%)	30
Bending Stiffness, EI (kN.m^2/m)	86373
Pile Bending moment (kNm)	307.5 kNm x 1.5 m spacing = 461.3
Pile Shear Force (kN)	100 kN x 1.5 m spacing = 150
Finished embedment length (m)	12

Notes: Bending and shear force values take into consideration the pile spacings and design load factors. Horizontal forces applied taken from stability software and have been sized to provide adequate safety factors

Structural Design Parameters

Structural design of the reinforcing steel component has been carried out using the bending the moments and shear forces given by the WALLAP and SLIDE analysis. The barrier pile wall is designed to be fully buried when constructed. A concrete strength of 35MPa with a cover of 75mm has been adopted for pile design, and 50mm cover for the capping beam design.

- One pile type has been developed for design:
  - 750mm outside diameter
  - fc'=35MPa (Concrete strength)
  - 8 no. HD25 longitudinal reinforcement equally spaced in the pile
  - D12 spiral at 150mm c/c confinement
  - Pile spacing centre to centre = 1.5m
  - 12.0m minimum depth
- Capping Beam for designed 750mm diameter Pile
  - Outside dimensions 450mm deep x 850mm wide
  - fc'=35MPa
  - External steel cage – longitudinal, 10 x HD20

- External steel cage confining steel D12 @150mm c/c

3.3 Foundations with zone of influence of wall

Th design of the soldier pile wall was to limit the deflection to 50 mm under the critical design case. Foundations located with 3.0 m of the wall shall be piled and consider interaction effects with the in-ground solider pile wall and designed to cope with the structural actions in Table 7. We recommend the foundations are designed as follows:

- Minimum embedment depth = 5.0 m
- Factored design bending moment = 307.5 kNm/m
- Factored design shear force = 100 kN/m
- Soil arching effect = 3x diameter.

4 Observation of Construction

Site observations for the retaining wall shall be carried out by a geotechnical engineer familiar with the findings of this report, to confirm soil and foundation conditions are consistent with those adopted within this report. Site observations cannot be undertaken during construction (temporary or permanent) that do not have a valid Consent. The Client is required to investigate which types of Consents are required prior to construction of the wall. We require a minimum 48 hours' notice for inspections. All works undertaken prior to our first inspection will be excluded from the Producer Statement (PS4).

Groundwater may accumulate in the pile holes during construction and must be pumped out prior to concreting. The Contractor is expected to have a sump pump onsite if water is encountered to keep the pile holes free of water before concrete pour. Alternatively, the concrete may be poured using tremie pouring techniques. Provided the construction methodology is continuous and the pile holes are not left open for extended periods, the holes are not expected to require casing. If the ground conditions vary outside those assumed in this report, then the design may need to be changed or altered to ensure adequate performance.

Construction monitoring of the retaining wall construction is recommended to ensure the walls are built to the design. Construction observations will be required at the following points:

- Bored holes prior to steel cages being put into the bored pile hole and concrete poured. Steel cages can be inspected prior to coming to site, i.e., in the yard where they are being built.
- Confirmation of cover around the steel cages prior to concrete pour. Engineer to observe concrete pour. Concrete dockets to be provided to Engineer and confirmation of concrete strength and slump.

All holes must be clear of water prior to pouring concrete. The Contractor should have a pump onsite and be ready to pump the holes dry.

4.1 Safety in Design

A tabulated Safety in Design register is provided in Table 5. This safety in design risk register should be updated and kept live during construction.

Table 5 - Safety in design risk register

Issue	Risk	Proposed mitigation measure
Excavations	Collapse of material and potential to strike people	Earthworks to be staged where possible and cuts to remain open for the smallest possible duration. No one to work immediately adjacent to the cut or during poor weather conditions.
Open auger holes	Falling from height	No holes to remain open overnight. No one allowed to walk around the construction site, other than those who understand site hazards. Holes should be backfilled with concrete as soon as possible.
Lifting steel cages	Heavy object falling	Lifting gear (straps and chains) to be in good condition. All chains and lifting hooks to be certified. Correct machinery to lift.
Pouring concrete	Steep ground	Concrete pump may be required to safely pour concrete into several of the holes due to location.
Groundwater	If encountered, groundwater will make constructability difficult.	We expect holes to remain free of groundwater in the short term. Holes not to remain open overnight and should be backfilled as soon as possible with concrete. Pumping may be required.

5 Limitations

This report has been prepared for the use of Arcline Architecture with respect to the brief outlined to us. This report is to be used by our Client and their Consultants and may be relied upon when considering geotechnical advice. Furthermore, this report may be utilised in the preparation of building and/or resource consent applications with local authorities. The information and opinions contained within this report shall not be used in other context for any other purpose without prior review and agreement by Haigh Workman Ltd.

The recommendations given in this report are based on site data from discrete locations and prepared specifically for the structures shown on the attached drawings. If any changes are made, we must be allowed to review the new development proposal to ensure that the recommendations of this report remain valid. Inferences about the subsoil conditions away from the test locations have been made but cannot be guaranteed. We have inferred an appropriate geotechnical model that can be applied for our analyses. However, variations in ground conditions from those described in this report could exist across the site. Should conditions encountered differ to those outlined in this report we ask that we be given the opportunity to review the continued applicability of our recommendations.

Appendix A – Drawings

Drawing No.	Title
23 187/G01	Site location plan
23 187/G02	Site Investigation plan
23 187/G03	Retaining wall elevation
23 187/G04	Geological section A-A
23 187/G05	Geological Cross Section B-B
23 187/STD-01	Standard Details and Specifications
23 187/S-01	Soldier Pile Details
	Arcline Architecture Drawings

NOTES:

1. LOT BOUNDARIES AND AERIAL PHOTO INFORMATION TAKEN FROM LAND INFORMATION NEW ZEALAND (LINZ).

Issue	Date	Revision
A	18/09/2023	FIRST ISSUE
B	27/11/2023	SOLDIER PILE WALL DESIGN

DWG: SITE LOCATION PLAN

Scale 1:2000 @A3 | Date 27/11/2023

Drawn WT | Checked JP | Approved JP

File C:\USERS\WAYNETHORBURN\HAIGH WORKMAN LIMITED\SUITEFILES - ARCLINE ARCHITECTURE\JOBS\23 187 - 4 TITORE WAY, RUSSELL (LOT 1 DP 65575)\ENGINEERING\DRAWINGS\23 187 GEO PLANS_A.DWG

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Project: GEOTECHNICAL INVESTIGATION
4 TITORE WAY, RUSSELL

Client: ARCLINE ARCHITECTURE

Project No. 23 187 | RC no. N/A

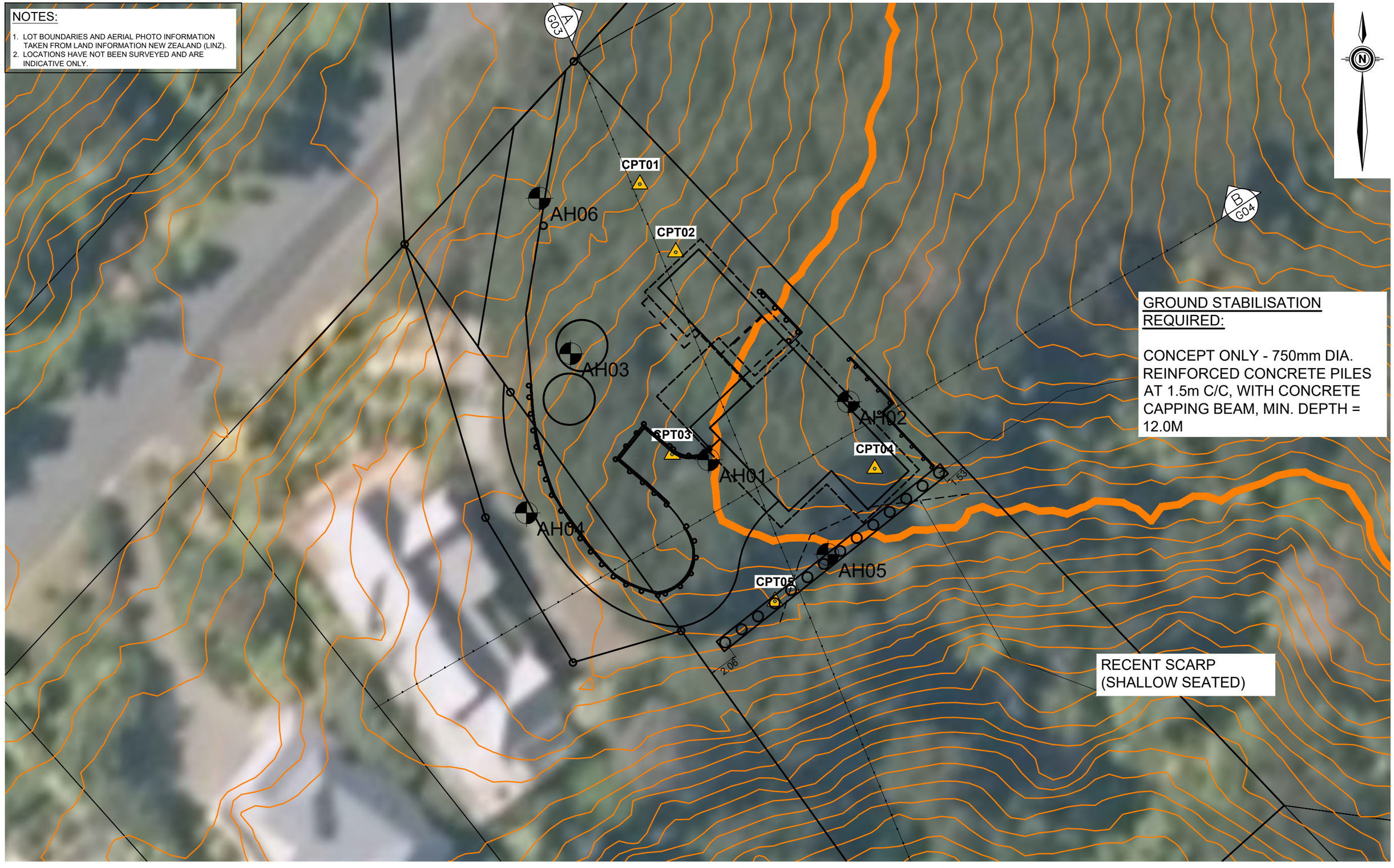
DWG No. **G01**

Sheet No. **1** of **5**

Plotted By Wayne Thorburn at 27/11/2023 2:08:58 pm

NOTES:

1. LOT BOUNDARIES AND AERIAL PHOTO INFORMATION TAKEN FROM LAND INFORMATION NEW ZEALAND (LINZ).
2. LOCATIONS HAVE NOT BEEN SURVEYED AND ARE INDICATIVE ONLY.



Issue	Date	Revision
A	18/09/2023	FIRST ISSUE
B	27/11/2023	SOLDIER PILE WALL DESIGN

DWG: SITE INVESTIGATION PLAN

Scale 1:250 @A3 | Date 27/11/2023

Drawn WT | Checked JP | Approved JP

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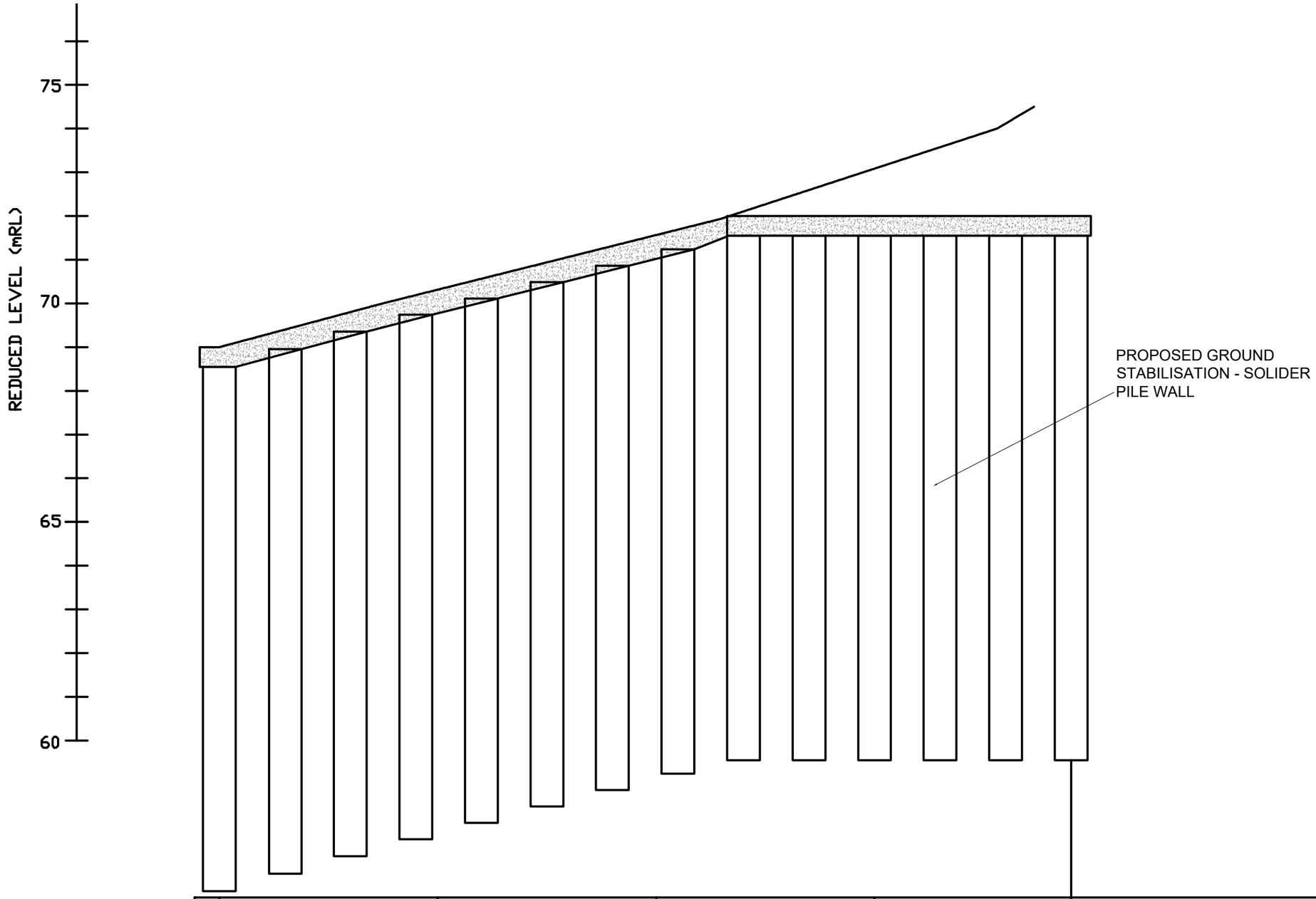
Project No. 23 187 | RC no. N/A

DWG No. **G02**

Sheet No. **2** of **5**

Plotted By Wayne Thorburn at 27/11/2023 2:08:59 pm



WALL CHAINAGE (m)	0	5	10	15	19.5
EXISTING GROUND ELEVATION (mRL)	69.0	70.3	71.56	73.08	75.0
FINISHED GROUND ELEVATION (mRL)	69.0			72.0	72.0

RETAINING WALL ELEVATION - RW03

Issue	Date	Revision
A	18/09/2023	FIRST ISSUE
B	27/11/2023	SOLDIER PILE WALL DESIGN

DWG: RETAINING WALL ELEVATION

Scale 1:100 @A3 | Date 27/11/2023

Drawn WT | Checked JP | Approved JP

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Project No. 23 187 | RC no. N/A

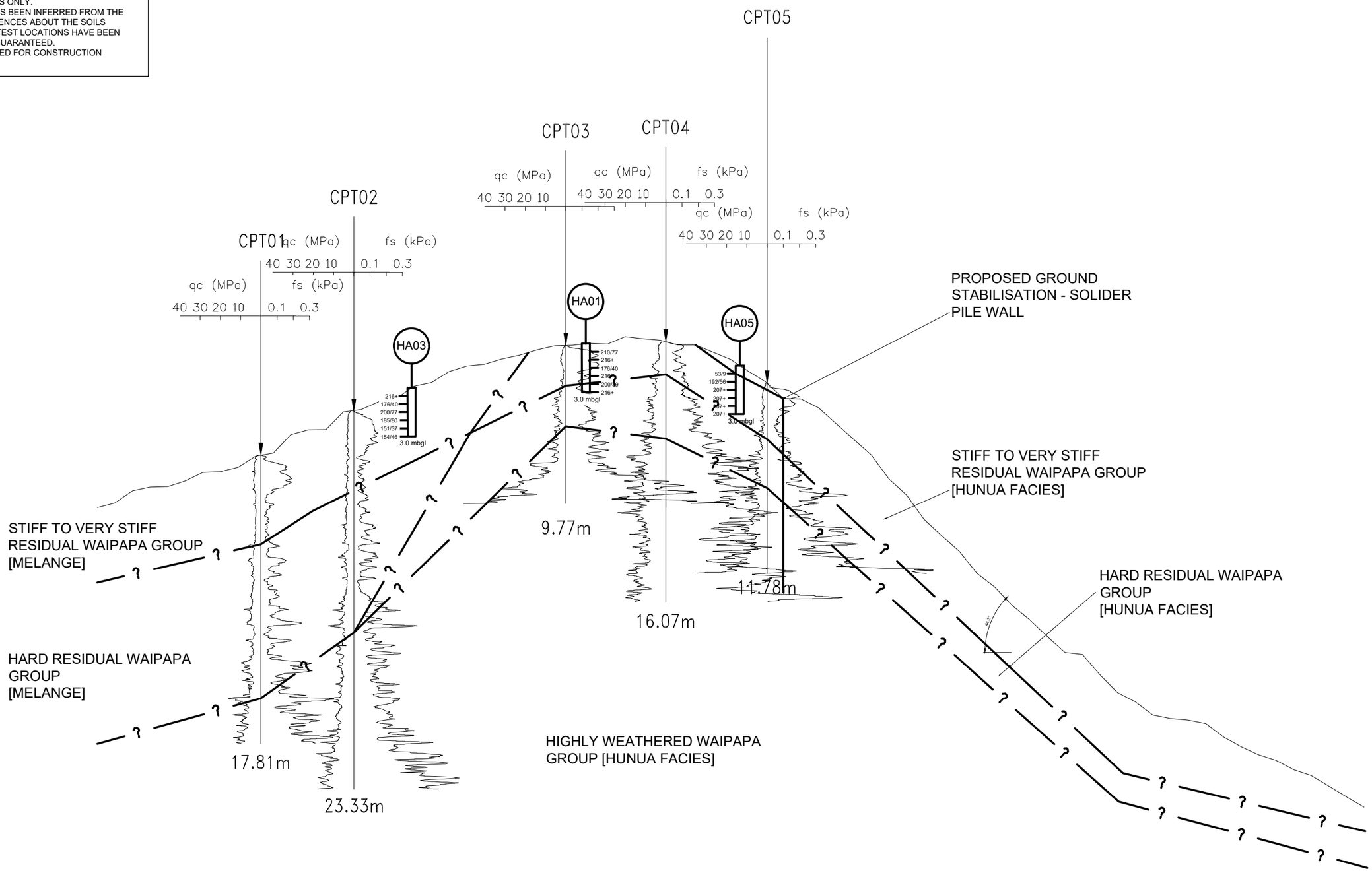
DWG No. G03

Sheet No. 3 of 5

Plotted By Wayne Thorburn at 27/11/2023 2:08:59 pm

NOTES:

1. THIS DRAWING IS BASED ON LIDAR SURVEY (2018-2020) AND SITE OBSERVATIONS ONLY.
2. THE GROUND MODEL HAS BEEN INFERRED FROM THE BOREHOLE DATA. INFERENCES ABOUT THE SOILS CONDITIONS BETWEEN TEST LOCATIONS HAVE BEEN MADE BUT CANNOT BE GUARANTEED.
3. DRAWING NOT TO BE USED FOR CONSTRUCTION PURPOSES.



Issue	Date	Revision
A	18/09/2023	FIRST ISSUE
B	27/11/2023	SOLDIER PILE WALL DESIGN

DWG: Geological Cross Section A-A'

Scale 1:250 @A3 | Date 27/11/2023

Drawn WT | Checked JP | Approved JP

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Project No. 23 187 | RC no. N/A

DWG No. **G04**

Sheet No. **4** of **5**

Plotted By Wayne Thorburn at 27/11/2023 2:08:59 pm

NOTES:

1. THIS DRAWING IS BASED ON LIDAR SURVEY (2018-2020) AND SITE OBSERVATIONS ONLY.
2. THE GROUND MODEL HAS BEEN INFERRED FROM THE BOREHOLE DATA. INFERENCES ABOUT THE SOILS CONDITIONS BETWEEN TEST LOCATIONS HAVE BEEN MADE BUT CANNOT BE GUARANTEED.
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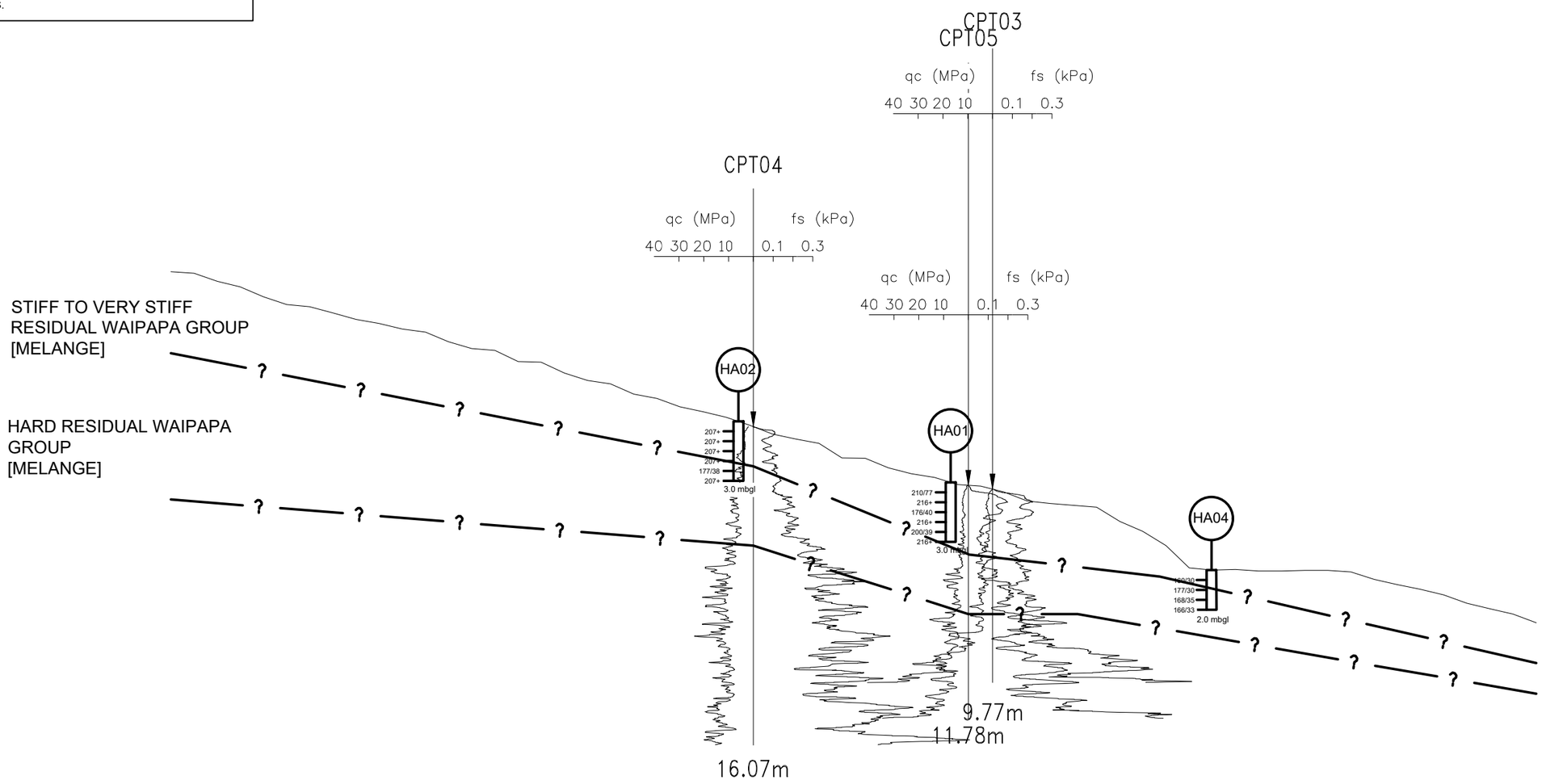

Issue	Date	Revision
A	18/09/2023	FIRST ISSUE
A	27/11/2023	SOLDIER PILE WALL DESIGN

DWG: Geological Cross Section B-B'

Scale 1:250 @A3 | Date 27/11/2023

Drawn WT | Checked JP | Approved JP

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Client: ARCLINE ARCHITECTURE

Project No. 23 187 | RC no. N/A

DWG No. **G05**

Sheet No. **5** of **5**

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GENERAL

- THE STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL, SERVICES, CIVIL AND OTHER PROJECT DRAWINGS. ANY DISCREPANCIES SHALL BE REFERRED TO THE ARCHITECT & DESIGNER FOR RESOLUTION.
- THE PRESENCE, LOCATION AND DETAILS OF NIBS, UPSTANDS, RECESSES, PLINTHS, PENETRATIONS, INSERTS, SLEEVES, CHASES, REBATES, CAST-IN FIXINGS, BRACKETS, HOLES, FLASHINGS, FIRE PROOFING, DAMP-PROOFING & WATERPROOFING etc ARE NOT NECESSARILY SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL, SERVICES, CIVIL, & OTHER PROJECT DRAWINGS FOR THESE ITEMS.
- THE LOCATION, SIZE AND DETAILS OF ALL PENETRATIONS, RECESSES, SLEEVES, HOLES, etc. IN STRUCTURAL MEMBERS, MUST BE APPROVED BY THE DESIGNER PRIOR TO CONSTRUCTION UNLESS SHOWN ON THE STRUCTURAL DRAWINGS. THESE ITEMS SHALL BE CAST-IN, FORMED, OR SHOP FABRICATED AND SHALL NOT BE CUT OR CORED ON SITE, UNLESS NOTED OTHERWISE OR APPROVED BY THE DESIGNER.
- SUBSTITUTION FOR OR AMENDMENT OF SPECIFIED DETAILS OR MATERIALS SHALL NOT BE CARRIED OUT WITHOUT APPROVAL OF THE DESIGNER.
- STANDARDS LISTED REFER TO THEIR LATEST ISSUE INCLUDING AMENDMENTS THAT ARE CURRENT AT THE TIME OF PREPARING THESE DRAWINGS.

DIMENSIONS

- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, SERVICES, CIVIL & ALL OTHER PROJECT DRAWINGS PRIOR TO CONSTRUCTION COMMENCING. ANY DISCREPANCIES SHALL BE REFERRED TO THE DESIGNER FOR RESOLUTION.
- DO NOT SCALE THE DRAWINGS.
- ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
- ALL DIMENSIONS TO EXISTING WORK SHALL BE VERIFIED BY SITE MEASUREMENT PRIOR TO FABRICATION.

CONCRETE

- CONCRETE STRENGTHS:
  CONCRETE STRENGTHS ARE 'SPECIFIED 28 DAY COMPRESSIVE STRENGTHS' AS DEFINED IN NZS 3109.
  FLOOR SLABS & FOOTINGS STRENGTHS SHALL BE 30MPa MINIMUM U.N.O.
  WALL FOOTING MASS & SITE CONCRETE STRENGTHS SHALL BE 20 MPa MINIMUM
- CONCRETE SURFACE FINISHES:
  SURFACE FINISHES ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS. WHERE NOT SPECIFIED, & NOT SHOWN ON ARCHITECTURAL DRAWINGS, SURFACE FINISHES SHALL BE AS FOLLOWING (REFER NZS 3114 FOR DEFINITIONS)

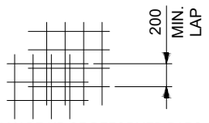
FORMED FOUNDATION SURFACES :	F1
CONCEALED FORMED SURFACES OF :	
BEAMS, COLUMNS, WALLS, PANELS AND SLAB EDGES	F3
EXPOSED FORMED SURFACES OF :	
BEAMS, COLUMNS, WALLS, PANELS AND SLAB EDGES	F5
EXTERIOR SLAB FINISHES :	U5
INTERNAL FLOORS :	U3

- REINFORCEMENT CLASS & MANUFACTURE PROCESS:
  ALL REINFORCEMENT BARS SHALL BE CLASS E TO AS/NZS 4671 U.N.O.
  ALL GRADE 500 REINFORCEMENT BARS SHALL BE MANUFACTURED USING THE MICRO-ALLOY PROCESS, UNLESS SPECIFICALLY APPROVED OTHERWISE BY THE DESIGNER.
- CONCRETE COVER TO REINFORCEMENT:
  MINIMUM CONCRETE COVER SHALL BE MEASURED TO THE EDGE OF CHAMFERS, RECESSES, REBATES, ETC. WHERE APPLICABLE.
  MINIMUM CONCRETE COVERS ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS. WHERE NOT SPECIFIED, MINIMUM CONCRETE COVERS SHALL BE AS FOLLOWS:

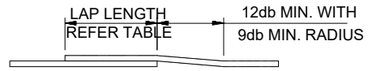
EXPOSURE SITUATION	FOUNDATIONS	BEAMS AND COLUMNS		RIBS, SLABS, WALLS	
		MAIN BARS	STIRRUPS, TIES, SPIRALS	20mm DIA. & UNDER	25mm DIA. & OVER
CAST AGAINST & EXPOSED TO EARTH	75	75	75	75	75
EXPOSED TO EARTH OR WEATHER					
CAST-IN PLACE	50	50	45	45	45
PRECAST	45	45	45	40	40
NOT EXPOSED TO EARTH OR WEATHER					
CAST-IN PLACE	-	40	25	30	35
PRECAST	-	35	25	30	30

NOTES:
- TOLERANCES ON COVERS SHALL BE:
  FOR 20mm BAR DIAMETER & UNDER: +10, -0
  FOR BAR DIAMETER LARGER THAN 20mm: +15, -0
- PRECAST IN THE CONTEXT OF THIS TABLE MEANS CONCRETE CAST UNDER PLANT CONTROL CONDITIONS, UTILISING RIGID FORMWORK & INTENSE COMPACTION
- COVER VARIES DUE TO EXPOSURE CLASSIFICATION & CONCRETE STRENGTH. REFER TO NZS 3101 : PART 1

- PLACING & SPACING OF REINFORCEMENT - GENERAL
  - SPLICING OF REINFORCEMENT, WHETHER BY LAPPING, WELDING OR MECHANICAL SPLICE, SHALL ONLY BE CARRIED OUT AS SHOWN ON THE DRAWINGS OR AS SPECIFICALLY APPROVED BY THE DESIGNER, EXCEPT AS NOTED BELOW:
    WELDED WIRE MESH SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS
    REINFORCEMENT IN SLABS ON GRADE AND IN TOPPINGS SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS.
  - LAYERS OF BEAM REINFORCEMENT SHALL BE SEPARATED WITH R40 BARS AT 1500mm CENTRES
  - ALL HOOKS ON STIRRUPS & TIES MUST FIT CLOSELY AROUND MAIN BARS U.N.O. FIRST STIRRUP TO BE PLACED NOT FURTHER THAN THE LESSER OF HALF THE STIRRUP SPACING OR 50mm FROM SUPPORT FACE
- LAP SPLICES IN REINFORCEMENT
  - WELDED WIRE MESH MADE UP OF SMOOTH WIRES SHALL BE LAP SPLICED WITH A MINIMUM 200mm OVERLAP BETWEEN OUTERMOST CROSS WIRES THUS :



  - WELDED MESH MADE UP OF DEFORMED BARS SHALL BE LAP SPLICED
  - LAP LENGTHS FOR DEFORMED BARS SHALL BE AS SHOWN IN THE FOLLOWING TABLES WHERE SPACING OF ADJACENT BARS ARE EQUAL TO OR GREATER THAN 2.5 db
  - LAP LENGTHS FOR PLAIN ROUND BARS SHALL BE TWICE THOSE SHOWN IN THE FOLLOWING TABLES
  - ALL BEAM AND COLUMN MAIN REINFORCEMENT LAP SPLICES SHALL HAVE CRANKED LAPS UNLESS NOTED OTHERWISE
  - CRANKED LAPS SHALL BE AS FOLLOWS:

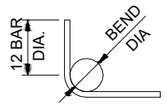


  - LAP LENGTHS ARE IN ACCORDANCE WITH NZS 3101

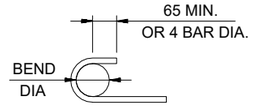
  NOTE: USE OF FOLLOWING TABLES
  TOP BAR FACTOR IS 1.0 FOR ALL VERTICAL BARS (COLUMNS, WALLS) AND FOR HORIZONTAL BARS WITH LESS THAN 300mm OF FRESH CONCRETE CAST BENEATH BAR (TYPICALLY BEAM BOTTOM BARS AND SLAB BARS).
  TOP BAR FACTOR IS 1.3 FOR ALL HORIZONTAL BARS WITH MORE THAN 300mm OF FRESH CONCRETE CAST BENEATH THE BAR (TYPICALLY BEAM TOP BARS AND HORIZONTAL WALL BARS).

		BAR DIAMETER		
		10	12	16
CONCRETE 30 MPa STEEL GRADE 300 MPa	TOP BAR FACTOR = 1.3	390	470	630
	TOP BAR FACTOR = 1	300	360	480
CONCRETE 30 MPa STEEL GRADE 500 MPa	TOP BAR FACTOR = 1.3	650	780	1040
	TOP BAR FACTOR = 1	500	600	800

- SPIRAL, SPLICES AND TERMINATIONS
  - SPLICING OF ADJACENT LENGTHS OF SPIRAL SHALL BE EITHER BY PROVIDING 135° STIRRUP HOOKS AS FOR CIRCULAR HOOPS, OR BY WELDED LAP SPLICES. ANCHORAGE OF A SPIRAL BAR AT THE TERMINATION OF THE LENGTH OF SPIRAL SHALL BE PROVIDED BY AN EXTRA ONE-HALF TURN OF THE SPIRAL PLUS EITHER A 135° STIRRUP HOOK OR A WELDED LAP SPLICE TO THE PREVIOUS TURN. WELDED SPLICES IN SPIRALS SHALL COMPLY WITH AS/NZS 1554.3 ALL WELDS SHALL BE CLASS SP
- BENDING OF REINFORCEMENT
  - BENDS FOR ALL BARS EXCEPT STIRRUPS AND TIES



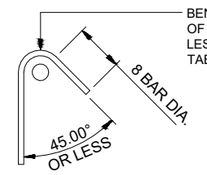
STANDARD HOOK



STANDARD 180° HOOK

STEEL GRADE	BAR DIAMETER	MINIMUM BEND DIAMETER
GRADE 300 & 500	6 TO 20	5 BAR DIAMETERS
	25 TO 40	6 BAR DIAMETERS
GRADE 300 & 500 GALVANISED BEFORE OR AFTER WELDING	6 TO 16	5 BAR DIAMETERS
	20 TO 40	8 BAR DIAMETERS

  - BENDS FOR STIRRUPS AND TIES



STANDARD STIRRUP & TIE HOOK

STEEL GRADE	BAR DIAMETER	MINIMUM BEND DIAMETER	
		PLAIN BARS	DEFORMED BARS
GRADE 300 & 500	6 TO 20	2 BAR DIAMETERS	4 BAR DIAMETERS
	25 TO 32	3 BAR DIAMETERS	6 BAR DIAMETERS
GRADE 300 & 500 GALVANISED BEFORE OR AFTER WELDING	6 TO 16	2 BAR DIAMETERS	5 BAR DIAMETERS
	20 TO 32	3 BAR DIAMETERS	8 BAR DIAMETERS

  - BARS PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE SITE BENT UNLESS SHOWN ON THE PROJECT DRAWINGS OR SPECIFICALLY APPROVED BY THE DESIGNER.
- HOLD DOWN BOLTS LOCATION TO BE CONFIRMED PRIOR CONCRETE POURING, THE USE OF TEMPLATES IS RECOMMENDED
- ALL GROUTING TO BE RAMMABLE SHRINKAGE COMPENSATED HIGH STRENGTH CEMENTITIOUS GROUT

Issue	Date	Revision
0	11/2023	ISSUE FOR BUILDING CONSENT

DWG STANDARD DETAILS AND SPECIFICATIONS

Scale AS SHOWN | Date 11/2023

Drawn PL | Checked SK | Approved JP

File

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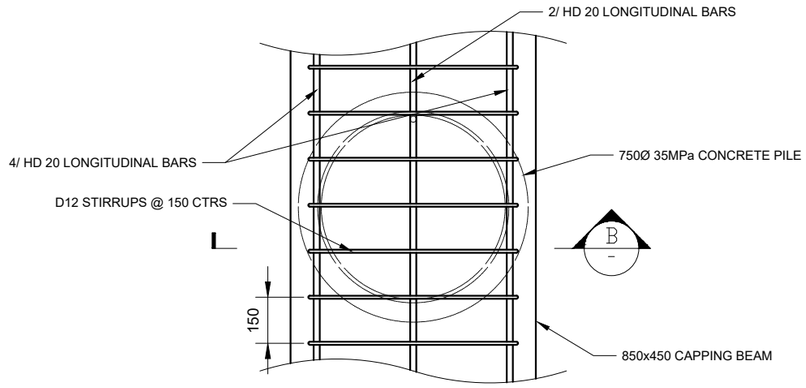
Project: PROPOSED NEW DWELLING
4 TITORE WAY, RUSSELL (LOT 1 DP 65575)

Client: ARCLINE ARCHITECTURE

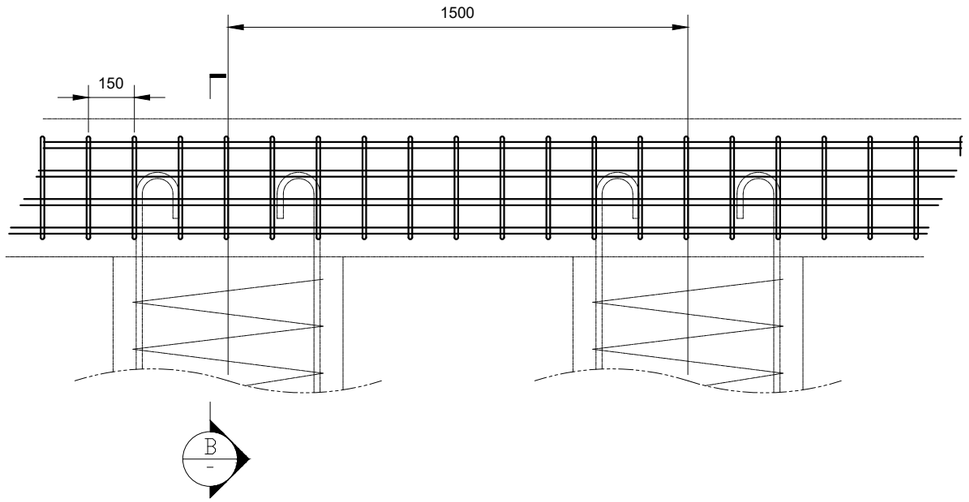
Project No. 23 187 | BC no. -

DWG No. **STD-01**

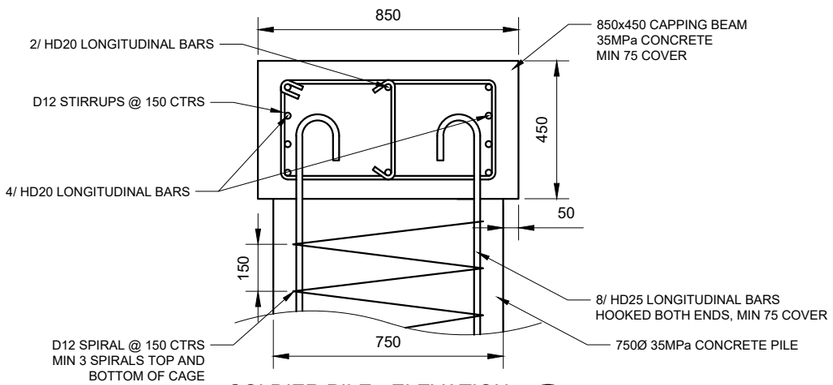
Sheet No. 1 of 2



SOLDIER PILE - PLAN A -
SCALE 1:20



SOLDIER PILE - ELEVATION C -
SCALE 1:20



SOLDIER PILE - ELEVATION B -
SCALE 1:20

TO BE READ IN CONJUNCTION WITH ARCHITECTURAL PLANS

Issue	Date	Revision
0	11/2023	ISSUE FOR BUILDING CONSENT

DWG SOLDIER PILE DETAILS

Scale AS SHOWN | Date 11/2023

Drawn PL | Checked SK | Approved JP

File

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Project PROPOSED NEW DWELLING
4 TITORE WAY, RUSSELL (LOT 1 DP 65575)

Client ARCLINE ARCHITECTURE

Project No. 23 187 | BC no. -

DWG No. **S-01**

Sheet No. 2 of 2

NEW RESIDENTIAL DWELLING FOR

DAVID MACDONALD

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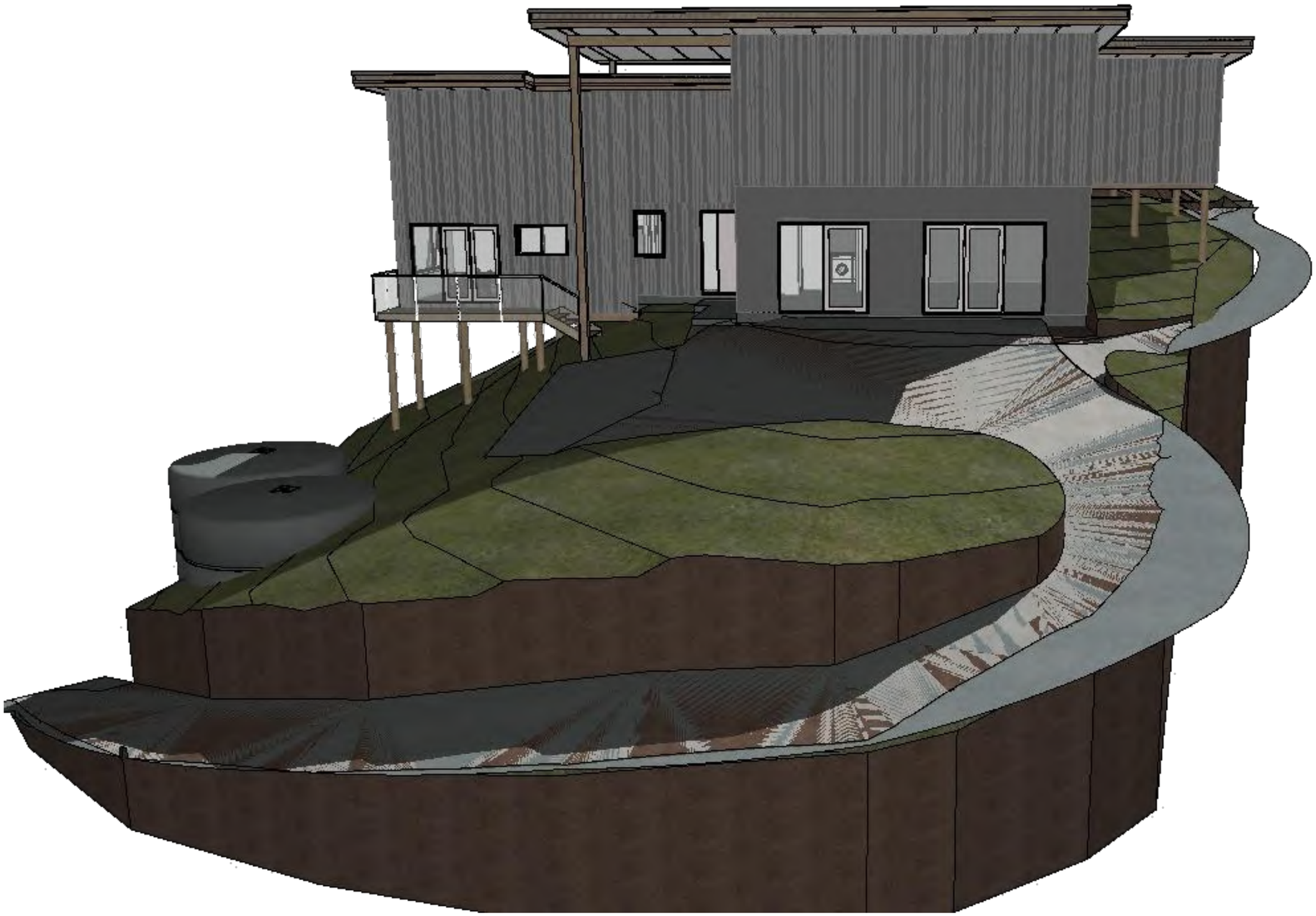
A0001	Cover Page
A0002	Presentation
A1002	Site Plan
A1501	Floor Plan
A1502	Upper Floor Plan
A1511	Wall Framing Plan
A1512	Upper Wall Framing Plan
A2001	Elevations
A2002	Elevations



LOT 1 DP 65575
4 TITORE WAY RUSSELL

Arcline
Architecture

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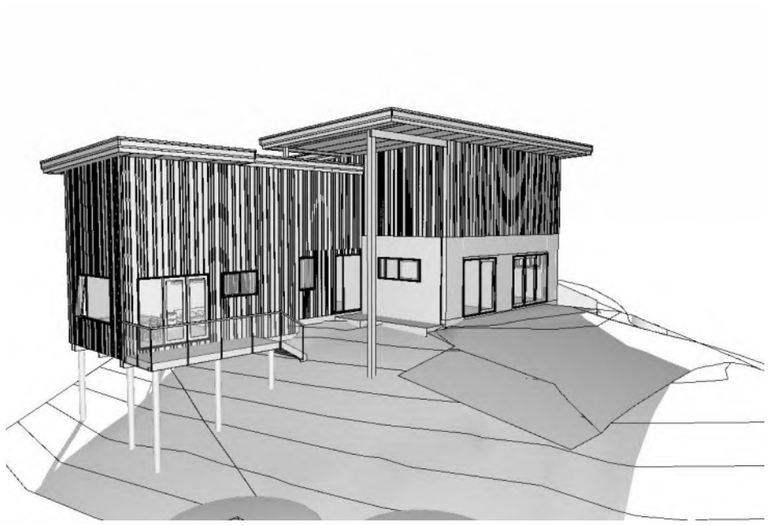

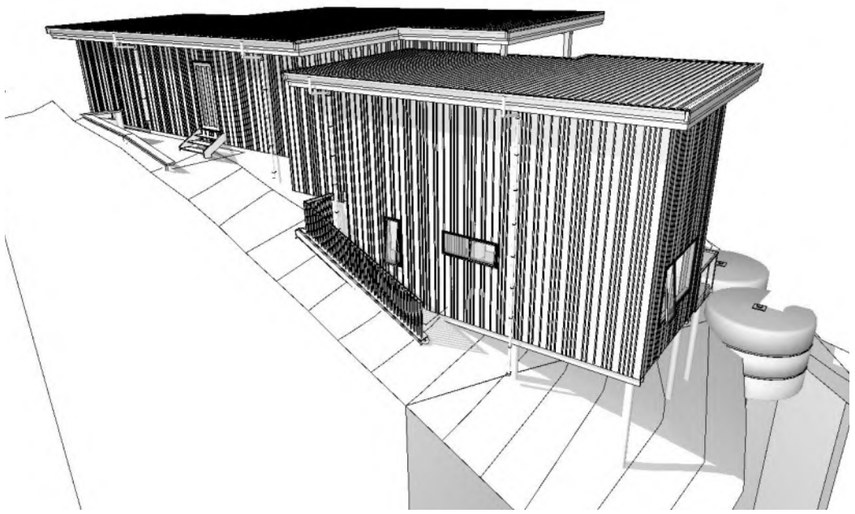

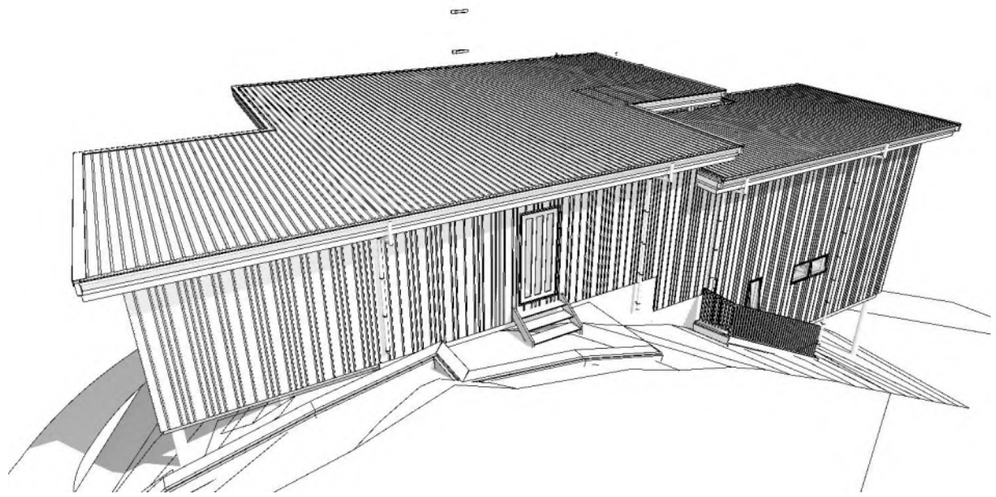

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Presentation

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

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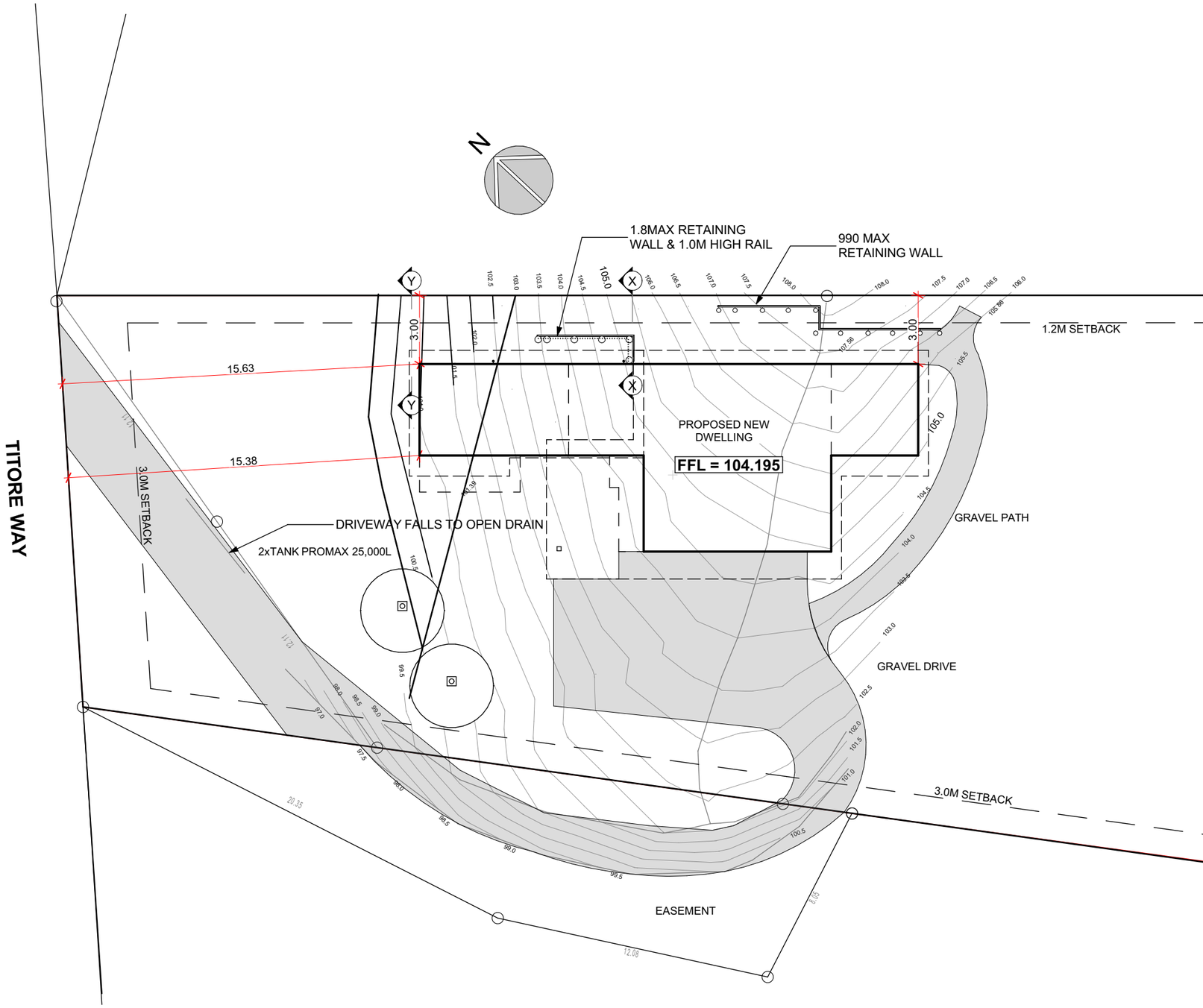

SITE PLAN NOTES:

SITE DESCRIPTION

LOT NUMBER:	LOT 1
DP NUMBER:	DP 65575
ADDRESS:	4 TITORE WAY RUSSELL

SITE ENVIRONMENT

CLIMATE ZONE	1
EARTHQUAKE ZONE	ZONE 1
EXPOSURE ZONE	ZONE D
LEE ZONE	NO
WIND ZONE	EXTRA HIGH
WIND REGION	A
RAINFALL RANGE	90-100mm/hr
SNOW ZONE	N0

DISTRICT PLAN COMPLIANCE

PLANNING ZONE	RUSSELL TOWNSHIP

BUILDING COVERAGE

SITE AREA	1662m²
MAX. FLOOR AREA PERMITTED:	20% - 332m²
UPPER FLOOR AREA -	121.64m²
EAVES OVER 600	40.69m²
DECKS OVER 1.0m (not included under eaves)	33.68m²
PROPOSED	196.01m² (11.8%) COMPLIES

BUILDING HEIGHT

MAX. HEIGHT PERMITTED	7.2M
PROPOSED HEIGHT	9.0m **DOES NOT COMPLY**
HIRB	2.0M UP/45° **DOES NOT COMPLY**

BUILDING SCALE

MAX. GROUND FLOOR AREA	20% - 332m²
PROPOSED NET GROUND FLOOR AREA	106.44m² (6.4%) COMPLIES

SETBACK TO BOUNDARIES

3.0m IN FROM ROAD BOUDNDARIES
1.2m IN FROM OTHER BOUNDARIES
COMPLIES

SETBACK TO BUSH

GREATER THAN 20m?	NO **DOES NOT COMPLY**

STORMWATER MANAGEMENT

SITE AREA	1662m²
TOTAL AREA PERMITTED	35% (581m²)
PROPOSED ROOF AREA	182m²
DRIVES	140m²
PATHS	8m²
TOTAL PROPOSED	330m² (19.85%) COMPLIES

WATER SUPPLY:

UN-RETICULATED SITE - WATER SUPPLY MUST BE POTABLE AND COMPLY WITH NZBC G12, BY WAY OF WATER TREATMENT OR FILTRATION OR OTHER SYSTEM, AND MAINTAINED AS REQUIRED BY THE MANUFACTURER

FIRE FIGHTING:

UN-RETICULATED SITUATION: NEW 25,000L WATER TANK WITH RURAL FIRE BRIGADE CONNECTION AS SHOWN ON PLANS FOR FIRE FIGHTING PURPOSES. PROVIDE FIRE FIGHTING COUPLING / TANK LID ACCESS AS PER FIRE FIGHTING CODE OF PRACTICE SNZ PAS 4509: 2008

Arcline Architecture
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Site Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

Scale @ A3: 1:200
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Issued: 14/11/2023 2:38 pm
MAC DONALD.D_FWD STAGE 1_13-11-23.pln

Sheet No:
A1002
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ACCESS
SLIP RESISTANCE SHALL BE PROVIDED TO EXTERIOR ACCESS ROUTES AS BELOW OR BY OTHER MEANS IN ACCORDANCE WITH TABLE 2 / SECTION 2 NZBC D1/AS1:
LEVEL SURFACE FINISH
CONCRETE DRY - SMOOTH TROWEL FINISH
CONCRETE WET - BROOMED OR WOOD FLOAT
TIMBER DRY - UNCOATED SMOOTH
TIMBER WET - GROOVED ACROSS PROFILE
TIMBER WET - COATED AND SAND/GRIT
RAMPS OR STAIRS FINISH
TIMBER WET - GROOVED ACROSS PROFILE
TIMBER WET - COATED AND SAND/GRIT

STAIRS / STEPS
ALL STAIRS TO BE AS PER MAIN PRIVATE TO NZBC D1 FIG. 11
MAX. RISE: 190mm (ENSURE EQUAL RISE)
MIN. TREAD: 280mm
ENSURE HAND RAIL TO AT LEAST ONE SIDE OF STAIR WITH 3 OR MORE STEPS

INSULATION
DWELLING:
SKILLION ROOF - 265mm MAX, R6.0
EG. PINK BATTS SKILLION SUPERBATTS ROOF R6.0 230mm

WALL INSULATION - 90mm MIN R2.8
EG. PINK BATTS ULTRA R2.8 90mm WALL (STAIRWELL INSULATED)

MIDFLOOR & SUBFLOOR INSULATION R2.5
EG. EXPOL UNDERFLOOR R2.5 100mm

R2.4 INSULATION TO BE INSTALLED AROUND/BETWEEN BATHROOMS AND BEDROOMS.

STAIRWELL SLAB

GARAGE:

GARAGE/ GARAGE DOOR NOT/INSULATED

GARAGE NOT/INSULATED (STRAP AND LINE??)

FLOOR AREAS

GROUND FLOOR AREA:	106.43m²
TOP FLOOR AREA:	121.64m²
TOTAL FLOOR AREA:	**228.07m²**

INTERIOR FINISHES
WALL LININGS
10mm GIB.
GIB AQUALINE TO WET AREAS.
VILLABOARD IN TILED SHOWERS.

INTERNAL DOORS
2.2m TYPICAL INTERNAL DOOR HEIGHT.

TRIMS
60x10 FJ PINE, SINGLE BEVEL SKIRTING.
40x10 FJ PINE ARCHITRAVE.
SQUARE STOP (40x18 IN CUPBOARDS) SCOTIA.

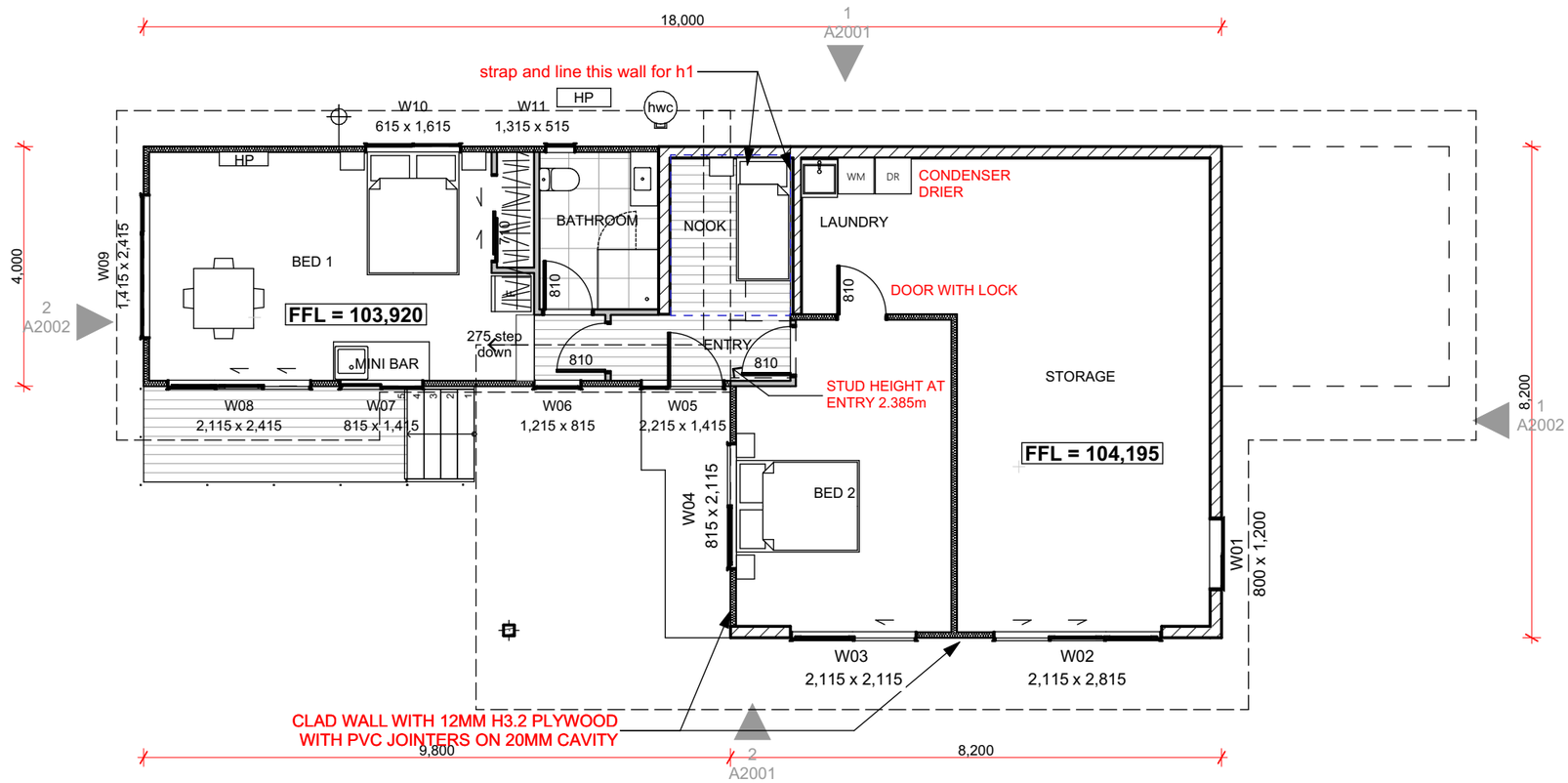
KEY:
RAKING CEILING
WARDROBE
ST. STORAGE CUPBOARD
SMART METER BOX
FLOORING: TILE
FLOORING: OVERLAY
INSULATION TO INTERNAL WALLS
MECHANICAL VENT DUCTED TO EXTERIOR
EXTERIOR WATER TAP
HP HEAT PUMP
SD SMOKE DETECTOR

WET AREAS
ALL DETAILS TO COMPLY WITH NZBC E3 INTERNAL MOISTURE AND MANUFACTURER'S PRODUCT DETAILS.
PROVIDE AN IMPERVIOUS AND EASILY CLEANABLE SURFACE TO ALL WALL AREAS LIKELY TO BE SPLASHED.
USE GIB AQUALINE ON WET AREA WALLS AND CEILINGS.
JOINTS BETWEEN FIXTURES & WALL LININGS; WHERE BATHS, BASINS, TUBS OR SINKS ABUTT IMPERVIOUS LININGS THE JOINT BETWEEN FIXTURE & LINING SHALL BE SEALED TO PREVENT WATER PENETRATION TO CONCEALED SPACES OR BEHIND LININGS.

SHOWERS TO HAVE 6MM SAFETY GLASS DOOR PANEL UNLESS SPECIFIED
ALL GLAZING TO WET AREAS TO BE GRADE A TOUGHENED SAFETY GLASS
ALL ACCESS ROUTES, BOTH EXTERANL AND INTERNAL, PROVIDE ANTI-SLIP SURFACES COMPLYING WITH NZBC CLAUSE D1/AS1 (2.1 SLIP RESISTANCE)

WATER HEATING
GAS CALIFONT AS SHOWN ON THE ELECTRICAL PLAN.
2X45KG BOTTLES AS SHOWN ON FLOOR PLAN. (WITH SEISMIC RESTRAINTS)

SMOKE ALARMS TO BE INSTALLED TO AS1670.6 REQUIREMENTS. EQUIPMENT TO COMPLY WITH AS3786.



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Floor Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

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A1501
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ACCESS
SLIP RESISTANCE SHALL BE PROVIDED TO EXTERIOR ACCESS ROUTES AS BELOW OR BY OTHER MEANS IN ACCORDANCE WITH TABLE 2 / SECTION 2 NZBC D1/AS1:
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CONCRETE WET - BROOMED OR WOOD FLOAT
TIMBER DRY - UNCOATED SMOOTH
TIMBER WET - GROOVED ACROSS PROFILE
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EG. PINK BATTS ULTRA R2.8 90mm WALL (STAIRWELL INSULATED)

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EG. EXPOL UNDERFLOOR R2.5 100mm

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STAIRWELL SLAB

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GARAGE NOT/INSULATED (STRAP AND LINE??)

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TOP FLOOR AREA:	121.64m²
TOTAL FLOOR AREA:	**228.07m²**

INTERIOR FINISHES
WALL LININGS
10mm GIB.
GIB AQUALINE TO WET AREAS.
VILLABOARD IN TILED SHOWERS.

INTERNAL DOORS
2.2m TYPICAL INTERNAL DOOR HEIGHT.

TRIMS
60x10 FJ PINE, SINGLE BEVEL SKIRTING.
40x10 FJ PINE ARCHITRAVE.
SQUARE STOP (40x18 IN CUPBOARDS) SCOTIA.

KEY:
- RAKING CEILING
- WARDROBE
- ST. STORAGE CUPBOARD
- SMART METER BOX
- FLOORING: TILE
- FLOORING: OVERLAY
- INSULATION TO INTERNAL WALLS
- MECHANICAL VENT DUCTED TO EXTERIOR
- EXTERIOR WATER TAP
- HP HEAT PUMP
- SD SMOKE DETECTOR

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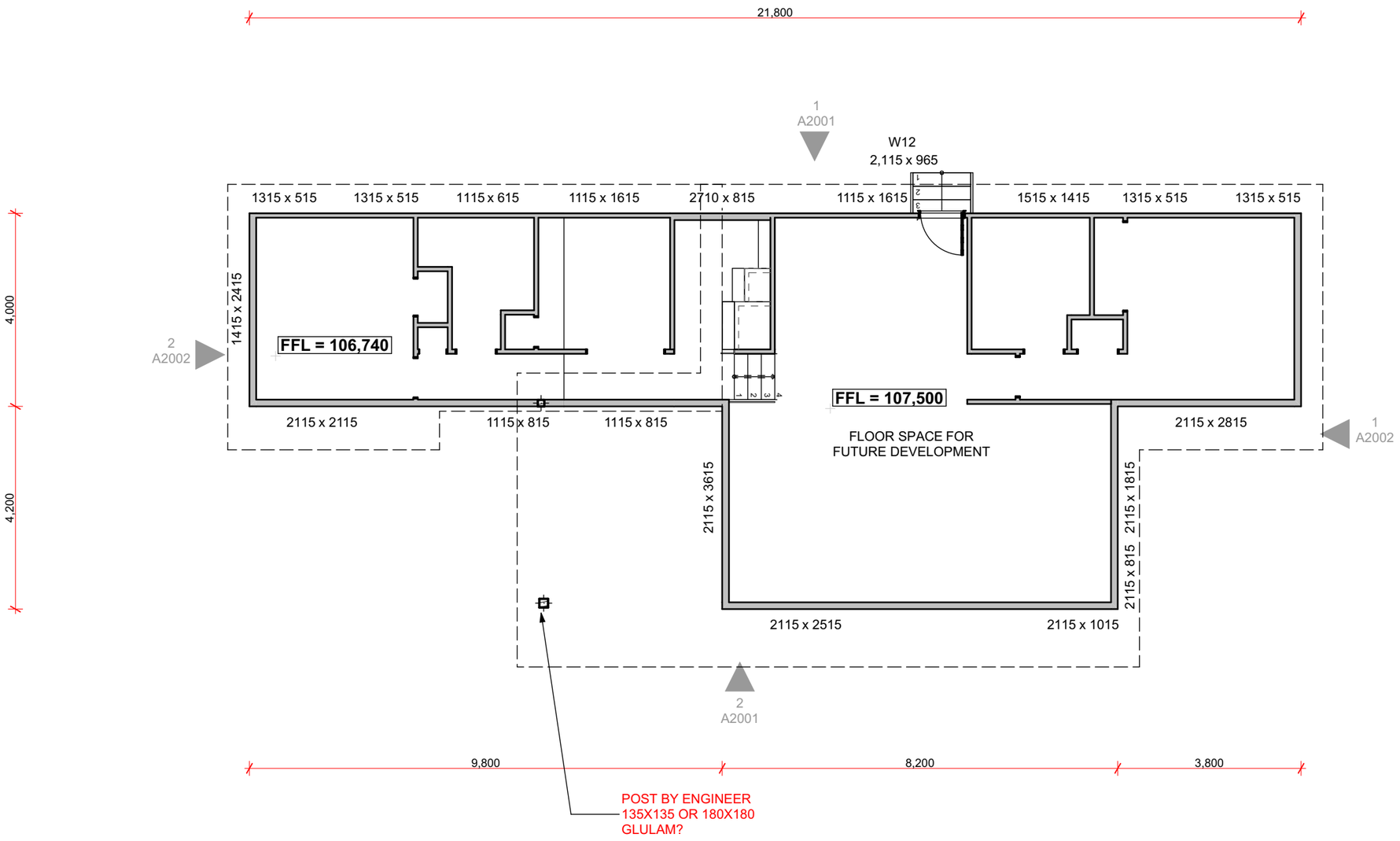
2X45KG BOTTLES AS SHOWN ON FLOOR PLAN. (WITH SEISMIC RESTRAINTS)

SMOKE ALARMS TO BE INSTALLED TO AS1670.6 REQUIREMENTS. EQUIPMENT TO COMPLY WITH AS3786.



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Upper Floor Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

Scale @ A3: 1:100
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Sheet No:
A1502
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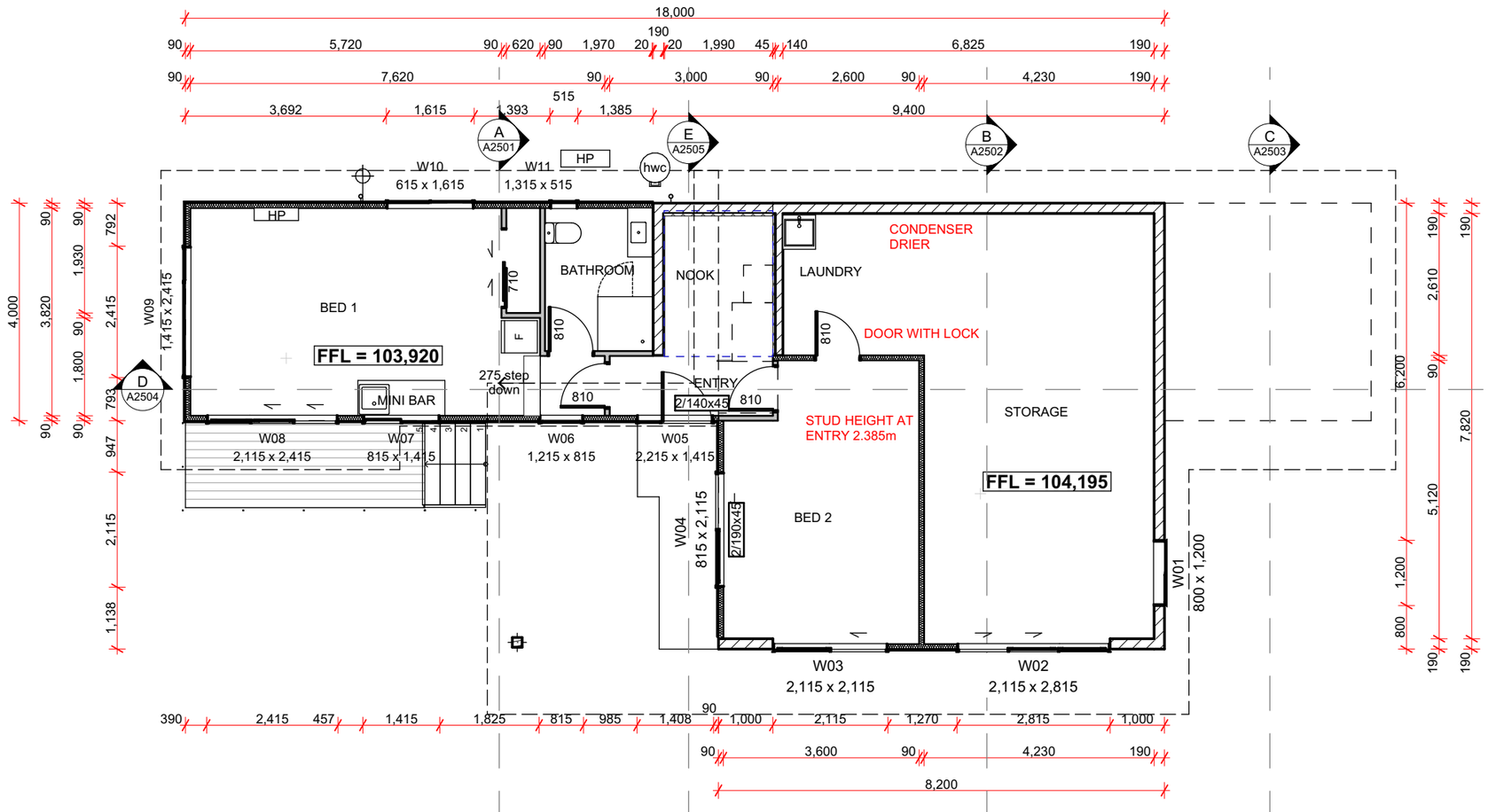

WALL FRAMING
GENERAL WALL FRAMING NOTES
ALL DIMENSIONS TO TIMBER FRAMING NOT FINISHED ROOM SIZES

ALL JOINERY SIZES ARE TO TRIM / OPENING SIZE

ALL FRAMING & BOTTOM PLATES TO BE H1.2 TREATED UNLESS SPECIFIED OTHERWISE

INTERIOR DOORS - 2.2m TYPICAL INTERNAL DOOR HEIGHT.

STUD HEIGHT
2.610m RAKING UP TO 3.035m UPPER FLOOR
3.045m - GARAGE
2.385m - ENTRY

STUD SIZES: (UNLESS NOTED ON THE PLAN)

EXTERNAL WALLS: (TO EXTRA HIGH WIND ZONE)
UP TO 2,460 WALL
90 x 45mm H1.2 SG8 STUDS @ 400mm CRS.

UP TO 2,760 WALL
140 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

UP TO 3,060 WALL
140 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

INTERIOR WALLS:
UP TO 3.0 STUD
90 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

NOGS :
EXTERIOR: ALL NOGS @ 600mm MAX. CRS.

INTERIOR: ALL @ 800mm MAX. CRS.

EXTRA NOGS:
WALL NOGGING FOR HAND RAILS BY TOILETS AND SHOWERS

LINTELS:
ALL LINTELS TO BE H1.2 SG8 UNLESS STATED OTHERWISE.
WARDROBE SLIDER AND BIFOLD LINTELS TO BE 20mm HIGHER THAN STANDARD LINTELS.
MOUNT SLIDING DOOR TRACK FLUSH WITH OUTSIDE OF JAMB WITH 130mm TOP ARCHITRAVE DROPPED TO HIDE TRACK.
FIXINGS:
AS PER LUMBERLOK STUDLOK LINTEL FIXING TABLES (E = 1.4kN, F = 4.0kN, G = 7.5kN, H = 13.5kN).
LINTEL FIXINGS UP TO 7.5kN CAN BE SUBSITUTED FOR ECOPLY BARRIER LINTEL CONNECTION DETAIL.
ALLOW TO PACK OUT ALL LINTELS TO SUIT 140mm STUDS

TOP PLATES:
DOUBLE TOP PLATE. 2/90x45 SG8 H1.2 or 2/140x45 SG8 H1.2 TOP PLATE TYPICAL
FIXINGS:
EXTERIOR WALLS - ECOPLY BARRIER TOP PLATE FIXINGS, INTERIOR LOAD BEARING WALLS - STUDLOK **SL**.
INTERIOR NON-LOAD BEARING WALLS STUDLOK **2N**. SEE DETAILS ON SHEET A4701.

BOTTOM PLATES
H1.2 BOTTOM PLATES ON DPC TO CONCRETE FLOORS
RIGID AIR BARRIER 6mm BOTTOM PLATE OVERHANG
FIX TO STUDS VIA 2/100x3.75mm END NAILS OR 4/75x3.75mm SKEW NAILS

BOTTOM PLATE FIXING
TIMBER FLOOR: 2/90x3.15mm NAILS @ 600 CRS.
CONC. SLAB EDGE: M12 TRUBOLTS @ 900 CRS. MAX. 150mm FROM ENDS OF PLATE & CORNERS
CONC. MASONRY EDGE: M12 TRUBOLTS @ 600 CRS. MAX. 150mm FROM ENDS OF PLATE & CORNERS

LEGEND

INTERNAL LOAD BEARING WALL

Arcline Architecture
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Wall Framing Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

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A1511
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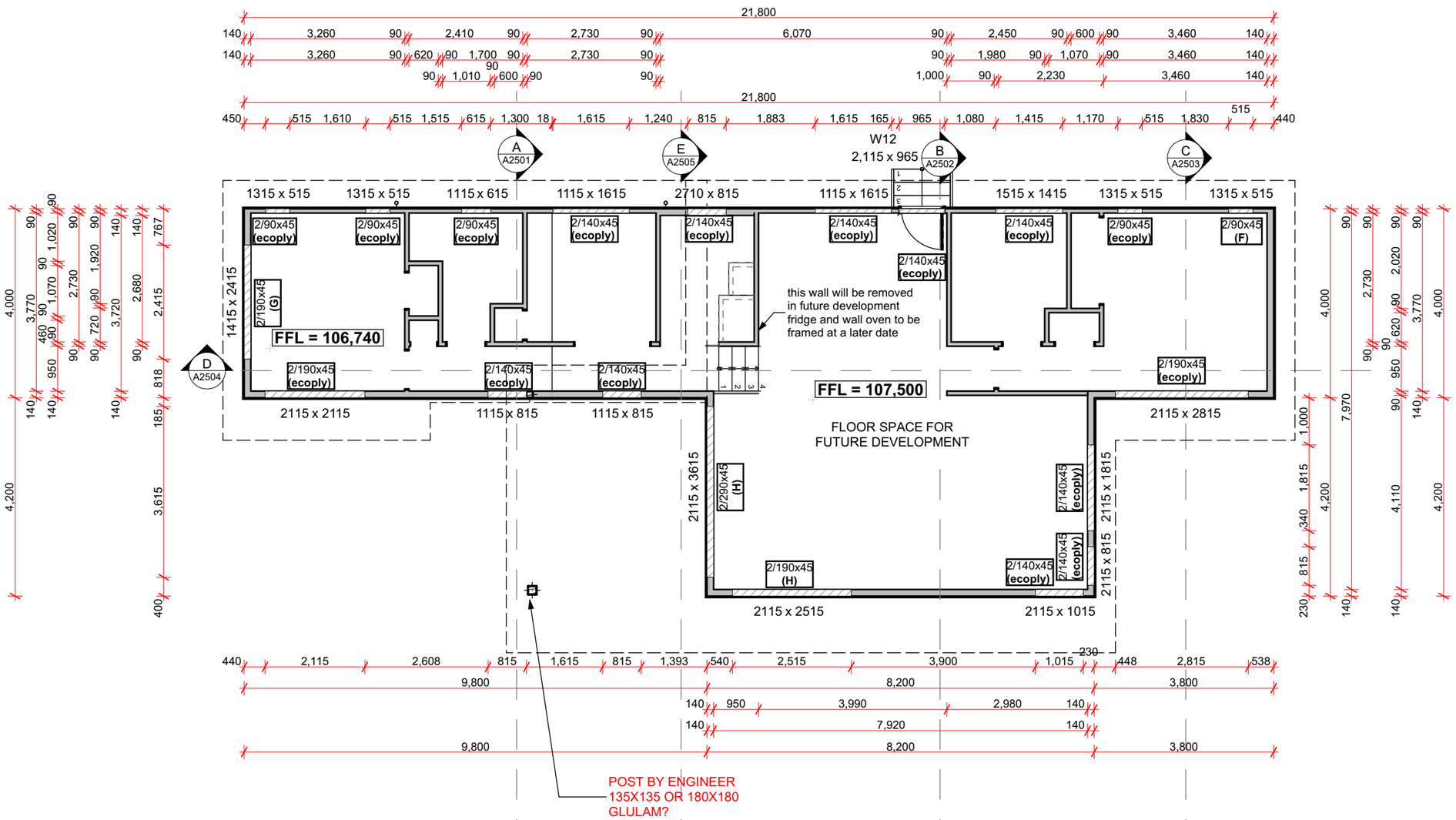
EXTERIOR FRAMING TO ALLOW FOR FUTURE DEVELOPMENT
FRAME AS PER STANDARD FRAMING WITH OPENINGS AS SHOWN
HEAD HEIGHT 2115 TO UNDERSIDE OF LINTEL
TEMPORARY FRAMING INSIDE OPENINGS TO BE 90X45 SG8 H1.2 STUDS @ 400 CRS WITH 90X45 SG8 H1.2 NOGS @ 600 CRS SCREW FIXED CPC80'S TOP AND BOTTOM



WALL FRAMING
GENERAL WALL FRAMING NOTES
ALL DIMENSIONS TO TIMBER FRAMING NOT FINISHED ROOM SIZES

ALL JOINERY SIZES ARE TO TRIM / OPENING SIZE

ALL FRAMING & BOTTOM PLATES TO BE H1.2 TREATED UNLESS SPECIFIED OTHERWISE

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2.610m RAKING UP TO 3.035m UPPER FLOOR
3.045m - GARAGE
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UP TO 2,760 WALL
140 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

UP TO 3,060 WALL
140 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

INTERIOR WALLS:
UP TO 3.0 STUD
90 x 45mm H1.2 SG8 STUDS @ 600mm CRS.

NOGS :
EXTERIOR: ALL NOGS @ 600mm MAX. CRS.

INTERIOR: ALL @ 800mm MAX. CRS.

EXTRA NOGS:
WALL NOGGING FOR HAND RAILS BY TOILETS AND SHOWERS

LINTELS:
ALL LINTELS TO BE H1.2 SG8 UNLESS STATED OTHERWISE.
WARDROBE SLIDER AND BIFOLD LINTELS TO BE 20mm HIGHER THAN STANDARD LINTELS.
MOUNT SLIDING DOOR TRACK FLUSH WITH OUTSIDE OF JAMB WITH 130mm TOP ARCHITRAVE DROPPED TO HIDE TRACK.
FIXINGS:
AS PER LUMBERLOK STUDLOK LINTEL FIXING TABLES (E = 1.4kN, F = 4.0kN, G = 7.5kN, H = 13.5kN).
LINTEL FIXINGS UP TO 7.5kN CAN BE SUBSITUTED FOR ECOPLY BARRIER LINTEL CONNECTION DETAIL.
ALLOW TO PACK OUT ALL LINTELS TO SUIT 140mm STUDS

TOP PLATES:
DOUBLE TOP PLATE. 2/90x45 SG8 H1.2 or 2/140x45 SG8 H1.2 TOP PLATE TYPICAL
FIXINGS:
EXTERIOR WALLS - ECOPLY BARRIER TOP PLATE FIXINGS,
INTERIOR LOAD BEARING WALLS - STUDLOK **SL**.
INTERIOR NON-LOAD BEARING WALLS STUDLOK **2N**. SEE DETAILS ON SHEET A4701.

BOTTOM PLATES
H1.2 BOTTOM PLATES ON DPC TO CONCRETE FLOORS
RIGID AIR BARRIER 6mm BOTTOM PLATE OVERHANG
FIX TO STUDS VIA 2/100x3.75mm END NAILS OR 4/75x3.75mm SKEW NAILS

BOTTOM PLATE FIXING
TIMBER FLOOR: 2/90x3.15mm NAILS @ 600 CRS.
CONC. SLAB EDGE: M12 TRUBOLTS @ 900 CRS. MAX.
150mm FROM ENDS OF PLATE & CORNERS
CONC. MASONRY EDGE: M12 TRUBOLTS @ 600 CRS. MAX.
150mm FROM ENDS OF PLATE & CORNERS

LEGEND

INTERNAL LOAD BEARING WALL

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Upper Wall Framing Plan

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

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Sheet No:
A1512
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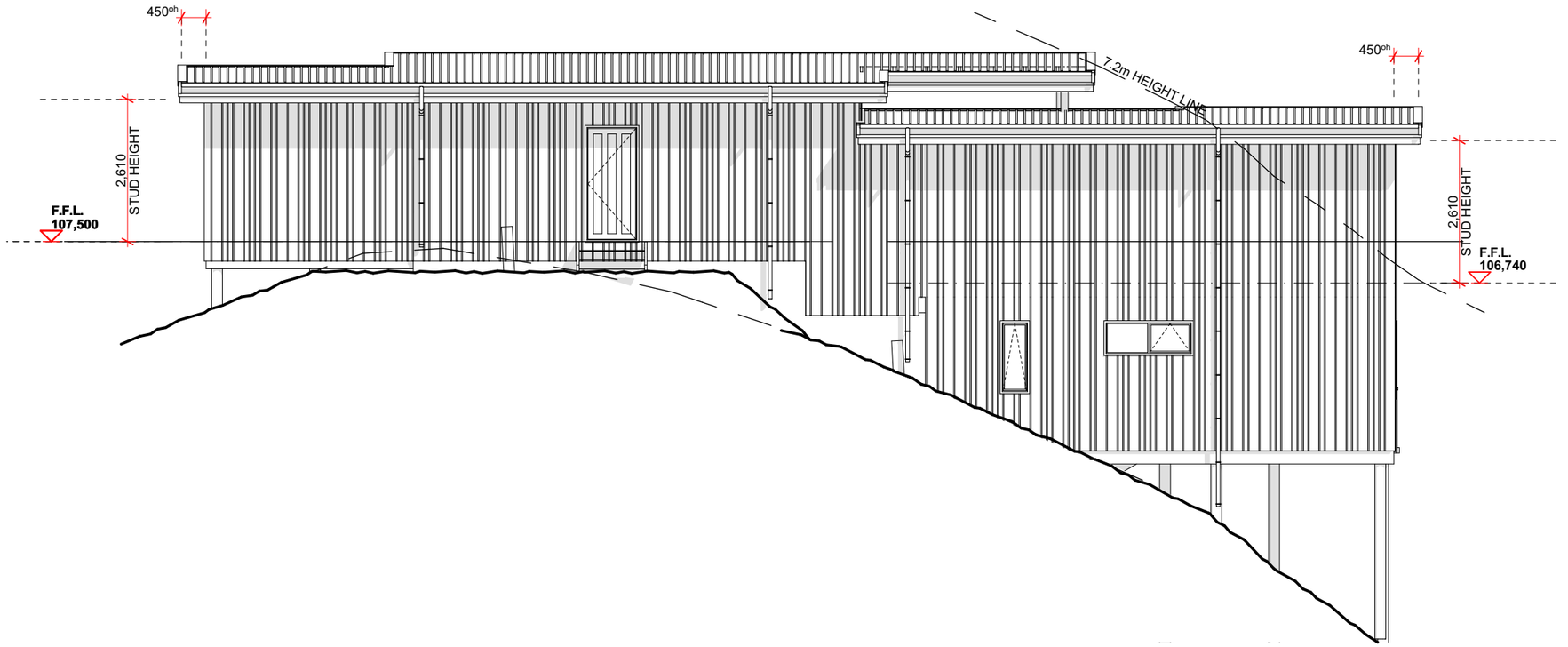
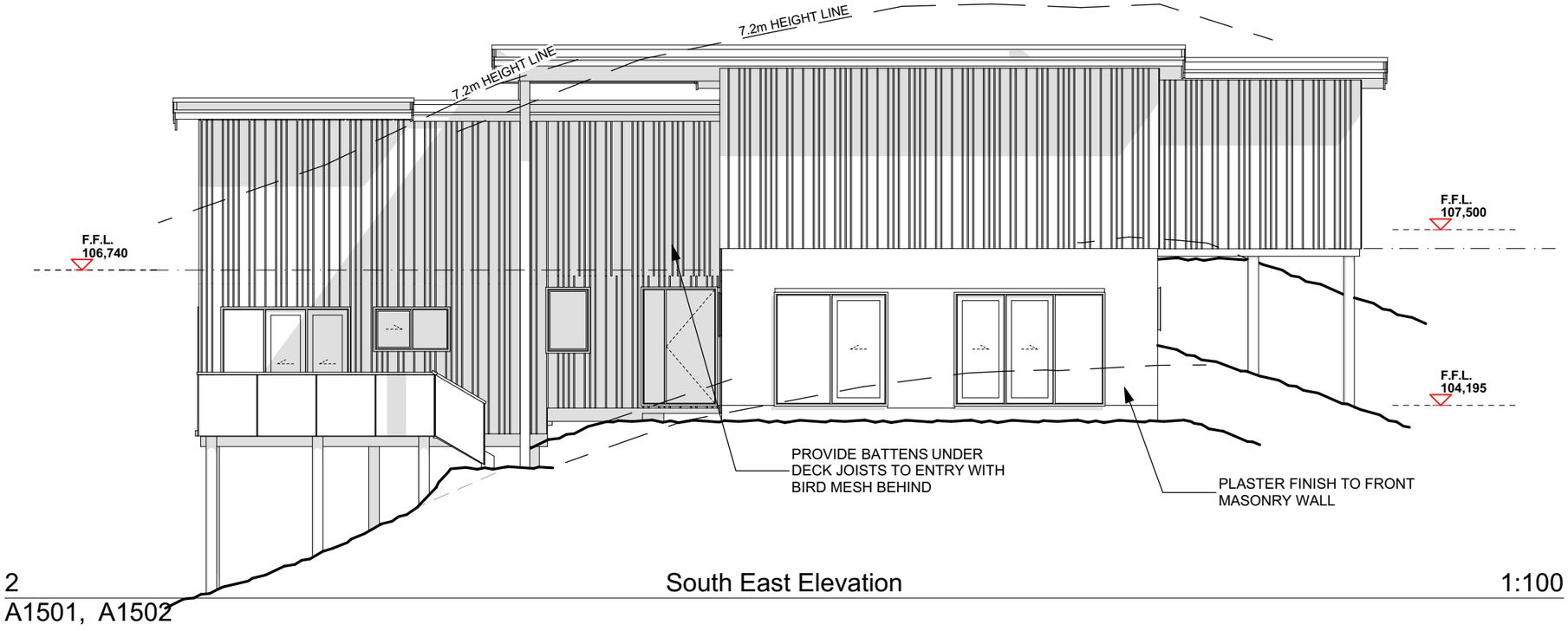


1 North West Elevation 1:100

A1501, A1502



2 South East Elevation 1:100

A1501, A1502

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Elevations

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

Scale @ A3: 1:100, 1:1
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Sheet No: **A2001**
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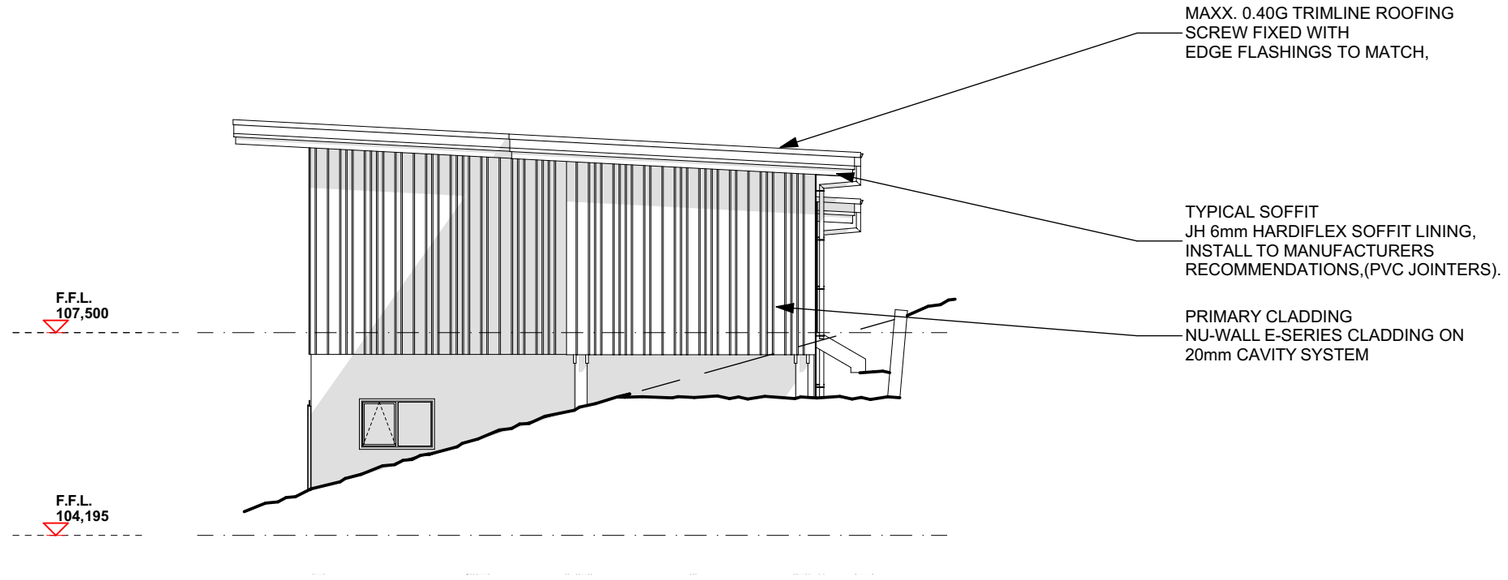
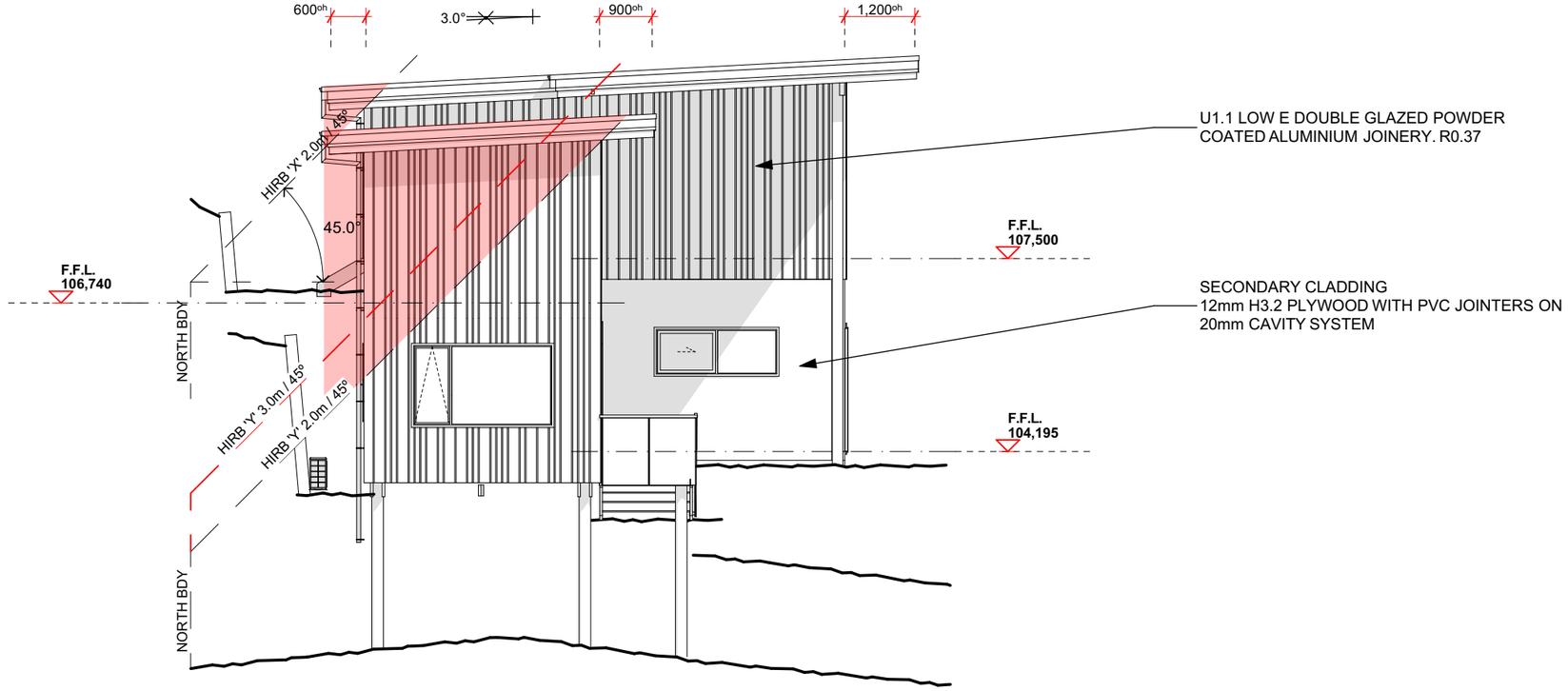


1 North East Elevation 1:100

A1501, A1502



2 South West Elevation 1:100

A1501, A1502

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Elevations

DAVID MACDONALD
4 TITORE WAY
RUSSELL

Rev No.	Revision	Date

Scale @ A3: 1:100
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Sheet No:
A2002
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Appendix B –Design Calculations

Structural

Geotechnical

Units: kN,m

INPUT DATA

SOIL PROFILE

Stratum no.	Elevation of top of stratum	Soil types Left side	Soil types Right side
1	10.00	2 Residual Hard	2 Residual Hard
2	8.90	3 CW Waipapa	3 CW Waipapa

SOIL PROPERTIES

-- Soil type -- No.	Description (Datum elev.)	Bulk density kN/m3	Young's Modulus Eh,kN/m2 (dEh/dy)	At rest coeff. Ko (dKo/dy)	Consol state. NC/OC (Nu)	Active limit Ka (Kac)	Passive limit Kp (Kpc)	Cohesion kN/m2 (dc/dy)
1	Residual	18.00	25000	0.470	OC (0.350)	0.258 (1.188)	4.845 (6.154)	7.000d
2	Residual Hard	18.00	50000	0.470	OC (0.300)	0.258 (1.188)	4.845 (6.154)	20.00d
3	CW Waipapa	20.00	75000	0.470	OC (0.350)	0.258 (1.188)	3.404 (4.929)	50.00d

Additional soil parameters associated with Ka and Kp

------- Soil type ------- No.	Description	--- parameters for Ka --- Soil friction angle	Wall adhesion coeff.	Back-fill angle	--- parameters for Kp --- Soil friction angle	Wall adhesion coeff.	Back-fill angle
1	Residual	32.00	0.713	0.00	32.00	0.459	0.00
2	Residual Hard	32.00	0.713	0.00	32.00	0.459	0.00
3	CW Waipapa	32.00	0.713	0.00	26.00	0.473	0.00

GROUND WATER CONDITIONS

Density of water = 9.810 kN/m3

	Left side	Right side
Initial water table elevation	0.00	0.00

Automatic water pressure balancing at toe of wall : No

WALL PROPERTIES

Type of structure = Soldier Pile Wall
Soldier Pile width = 0.75 m
Soldier Pile spacing = 1.50 m
Passive mobilisation factor = 3.00
Elevation of toe of wall = 3.40
Maximum finite element length = 0.60 m
Youngs modulus of wall E = 2.7806E+07 kN/m2
Moment of inertia of wall I = 3.1063E-03 m4/m run
= 4.6594E-03 m4 per pile
E.I = 86374 kN.m2/m run
Yield Moment of wall = Not defined

HORIZONTAL and MOMENT LOADS/RESTRAINTS

Load no.	Elevation	Horizontal load kN/m run	Moment load kN.m/m run	Moment restraint kN.m/m/rad	Partial factor (Category)
1	14.60	16.66	0	0	N/A
2	13.90	16.66	0	0	N/A
3	13.10	16.66	0	0	N/A
4	12.30	16.66	0	0	N/A
5	11.50	16.66	0	0	N/A
6	10.80	16.66	0	0	N/A

SURCHARGE LOADS

Surch-arge no.	Elev.	Distance from wall	Length parallel to wall	Width perpend. to wall	Surcharge kN/m2 Near edge	Surcharge kN/m2 Far edge	Equiv. soil type	Partial factor/ Category
1	10.00	0.00(L)	20.00	20.00	100.50	=	N/A	N/A
2	10.00	-0.00(R)	20.00	4.00	54.00	0.00	N/A	N/A

Note: L = Left side, R = Right side
A trapezoidal surcharge is defined by two values:
N = at edge near to wall, F = at edge far from wall

CONSTRUCTION STAGES

Construction stage no.	Stage description
1	Apply surcharge no.1 at elevation 10.00
	No analysis at this stage
2	Change EI of wall to 143957 kN.m2/m run
	Yield moment not defined
	Reset wall displacements to zero at this stage
3	Apply load no.1 at elevation 14.60
4	Apply load no.2 at elevation 13.90
5	Apply load no.3 at elevation 13.10
6	Apply load no.4 at elevation 12.30
7	Apply load no.5 at elevation 11.50
8	Apply load no.6 at elevation 10.80

FACTORS OF SAFETY and ANALYSIS OPTIONS

Stability analysis:
Method of analysis - Strength Factor method
Factor on soil strength for calculating wall depth = 1.50

Parameters for undrained strata:
Minimum equivalent fluid density = 5.00 kN/m3
Maximum depth of water filled tension crack = 0.00 m

Bending moment and displacement calculation:
Method - Subgrade reaction model using Influence Coefficients
Open Tension Crack analysis? - No
Non-linear Modulus Parameter (L) = 0 m

Boundary conditions:
Length of wall (normal to plane of analysis) = 20.00 m

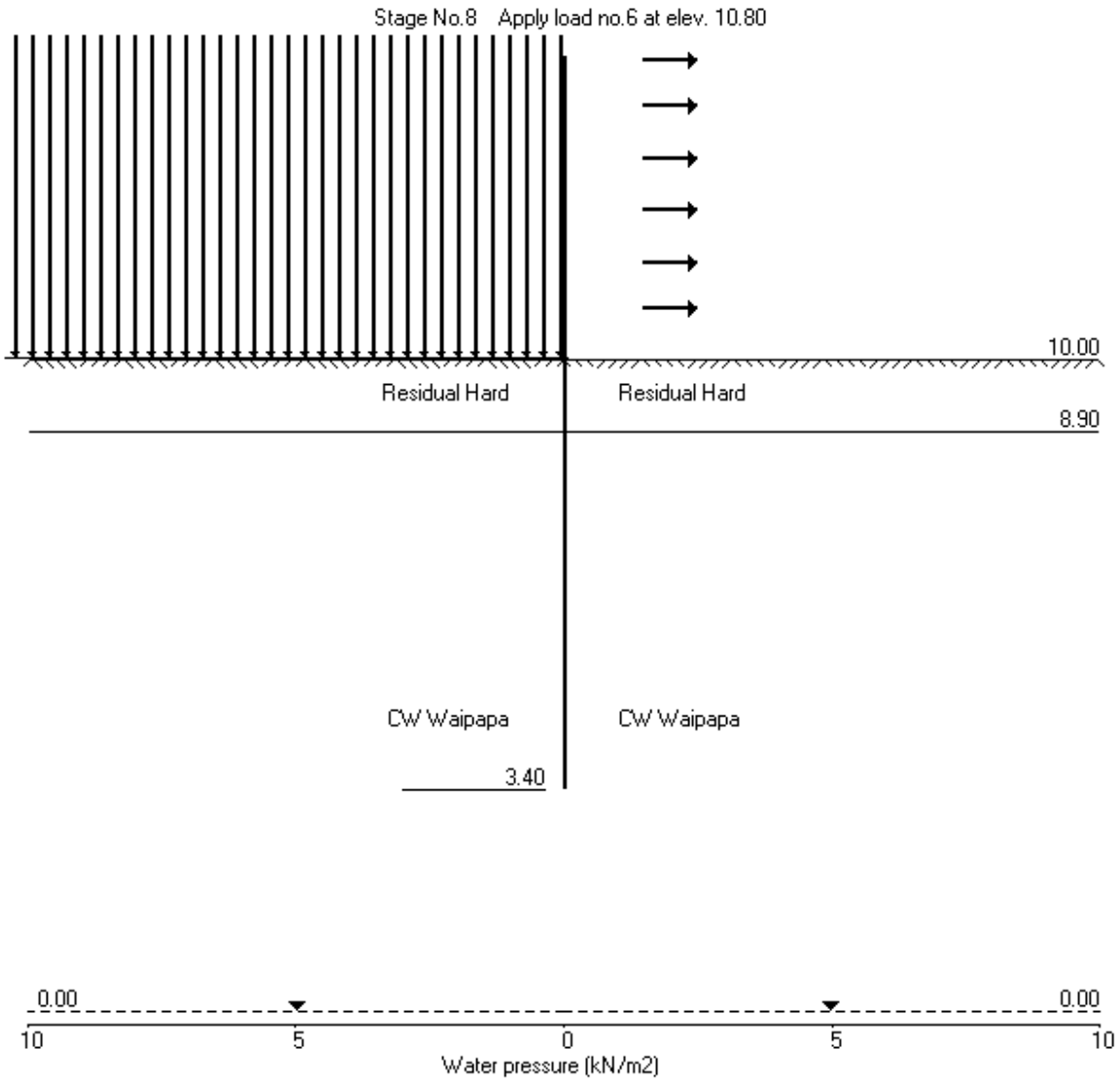
Width of excavation on Left side of wall = 70.00 m
Width of excavation on Right side of wall = 70.00 m

Distance to rigid boundary on Left side = 200.00 m
Distance to rigid boundary on Right side = 200.00 m

OUTPUT OPTIONS

Stage no.	Stage description	Output options: Displacement, Bending mom., Shear force	Active, Passive pressures	Graph. output
1	Apply surcharge no.1 at elev. 10.00	No	No	No
2	Change EI of wall to 143957kN.m2/m run	No	No	No
3	Apply load no.1 at elev. 14.60	No	No	No
4	Apply load no.2 at elev. 13.90	No	No	No
5	Apply load no.3 at elev. 13.10	No	No	No
6	Apply load no.4 at elev. 12.30	No	No	No
7	Apply load no.5 at elev. 11.50	No	No	No
8	Apply load no.6 at elev. 10.80	No	No	No
*	Summary output	Yes	-	Yes

Units: kN,m


Stage No.8 Apply load no.6 at elev. 10.80
10.00
Residual Hard
Residual Hard
8.90
CW Waipapa
CW Waipapa
3.40

0.00
0.00
10
5
0
5
10
Water pressure (kN/m2)

Units: kN,m

Stage No. 8 Apply load no.6 at elevation 10.80

STABILITY ANALYSIS of Soldier Pile Wall according to Strength Factor method

Factor of safety on soil strength

Stage No.	Ground level Act.	Ground level Pass.	Prop Elev.	**FoS for toe elev. = 3.40** Factor of Safety	Moment equilib. at elev.	**Toe elev. for FoS = 1.500** Toe elev.	Wall Penetr -ation	Direction of failure
8	10.00	10.00	Cant.	2.657	4.37	6.11	3.89	L to R

BENDING MOMENT and DISPLACEMENT ANALYSIS of Soldier Pile Wall

Analysis options

Soldier Pile width = 0.75m; spacing = 1.50m
Passive mobilisation factor = 3.000
Length of wall perpendicular to section = 20.00m
Subgrade reaction model - Boussinesq Influence coefficients
Soil deformations are elastic until the active or passive limit is reached

Rigid boundaries: Left side 200.00 from wall
Right side 200.00 from wall

*** Wall displacements reset to zero at stage 2

Node no.	Y coord	Nett pressure kN/m2	Wall disp. m	Wall rotation rad.	Shear force kN/m	Bending moment kN.m/m	Prop forces kN/m	EI of wall kN.m2/m
1	14.60	0.00	0.045	9.02E-03	16.7	-0.0	16.7	143957
2	14.25	0.00	0.042	9.02E-03	16.7	5.8		143957
3	13.90	0.00	0.039	8.99E-03	16.7	11.7	16.7	143957
		0.00	0.039	8.99E-03	33.3	11.7		
4	13.50	0.00	0.036	8.94E-03	33.3	25.0		143957
5	13.10	0.00	0.032	8.86E-03	33.3	38.3	16.7	143957
		0.00	0.032	8.86E-03	50.0	38.3		
6	12.70	0.00	0.028	8.72E-03	50.0	58.3		143957
7	12.30	0.00	0.025	8.53E-03	50.0	78.3	16.7	143957
		0.00	0.025	8.53E-03	66.6	78.3		
8	11.90	0.00	0.022	8.28E-03	66.6	105.0		143957
9	11.50	0.00	0.018	7.95E-03	66.6	131.6	16.7	143957
		0.00	0.018	7.95E-03	83.3	131.6		
10	11.15	0.00	0.016	7.59E-03	83.3	160.8		143957
11	10.80	0.00	0.013	7.17E-03	83.3	189.9	16.7	143957
		0.00	0.013	7.17E-03	100.0	189.9		
12	10.40	0.00	0.010	6.58E-03	100.0	229.9		143957
13	10.00	0.00	0.008	5.89E-03	100.0	269.9		143957
		-120.93	0.008	5.89E-03	100.0	269.9		
14	9.45	-129.90	0.005	4.79E-03	31.0	307.5		143957
15	8.90	-77.63	0.003	3.62E-03	-26.1	305.0		143957
		-126.90	0.003	3.62E-03	-26.1	305.0		
16	8.35	-64.10	0.001	2.53E-03	-78.6	272.0		143957
17	7.80	-5.34	-0.000	1.61E-03	-97.7	219.1		143957
18	7.20	20.93	-0.001	8.37E-04	-93.0	159.5		143957
19	6.60	29.14	-0.001	2.94E-04	-78.0	107.4		143957
20	6.00	31.09	-0.001	-5.62E-05	-59.9	65.8		143957
21	5.40	29.05	-0.001	-2.60E-04	-41.9	35.4		143957
22	4.80	24.78	-0.001	-3.62E-04	-25.8	15.5		143957
23	4.20	19.44	-0.001	-4.02E-04	-12.5	4.4		143957
24	3.80	15.63	-0.001	-4.09E-04	-5.5	1.0		143957

(continued)

Stage No.8 Apply load no.6 at elevation 10.80

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
25	3.40	11.75	-0.001	-4.11E-04	0.0	0.0		---

LEFT side

Node no.	Y coord	Water press.	Effective stresses: Vertic-al	Active limit	Passive limit	Earth pressure	Total earth pressure	Coeff. of subgrade reaction
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m3
1	14.60	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	14.25	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	13.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	13.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	13.10	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	12.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	12.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	11.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	11.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	11.15	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	10.80	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	10.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
13	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	100.50	2.14	610.01	2.14	2.14a	18848
14	9.45	0.00	110.39	4.69	657.92	4.69	4.69a	18848
15	8.90	0.00	120.24	7.23	705.64	7.23	7.23a	18848
		0.00	120.24	0.00	655.77	0.00	0.00a	29337
16	8.35	0.00	131.10	0.00	692.75	9.43	9.43	29337
17	7.80	0.00	141.84	0.00	729.31	43.91	43.91	29337
18	7.20	0.00	153.39	0.00	768.62	62.56	62.56	14265
19	6.60	0.00	164.73	0.00	807.23	72.13	72.13	11814
20	6.00	0.00	175.86	0.00	845.10	78.51	78.51	11814
21	5.40	0.00	186.77	0.00	882.25	82.84	82.84	11814
22	4.80	0.00	197.47	0.00	918.68	85.99	85.99	11814
23	4.20	0.00	207.98	0.00	954.47	88.56	88.56	11814
24	3.80	0.00	214.90	0.00	978.00	90.12	90.12	11814
25	3.40	0.00	221.74	0.00	1001.30	91.63	91.63	11814

RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic-al	Active limit	Passive limit	Earth pressure	Total earth pressure	Coeff. of subgrade reaction
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m3
1	14.60	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	14.25	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	13.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	13.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	13.10	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	12.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	12.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	11.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	11.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	11.15	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	10.80	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	10.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
13	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	0.00	0.00	123.07	123.07	123.07p	18848
14	9.45	0.00	9.90	0.00	171.04	134.59	134.59	18848
15	8.90	0.00	19.80	0.00	219.00	84.85	84.85	18848
		0.00	19.80	0.00	313.86	126.90	126.90	29337

(continued)

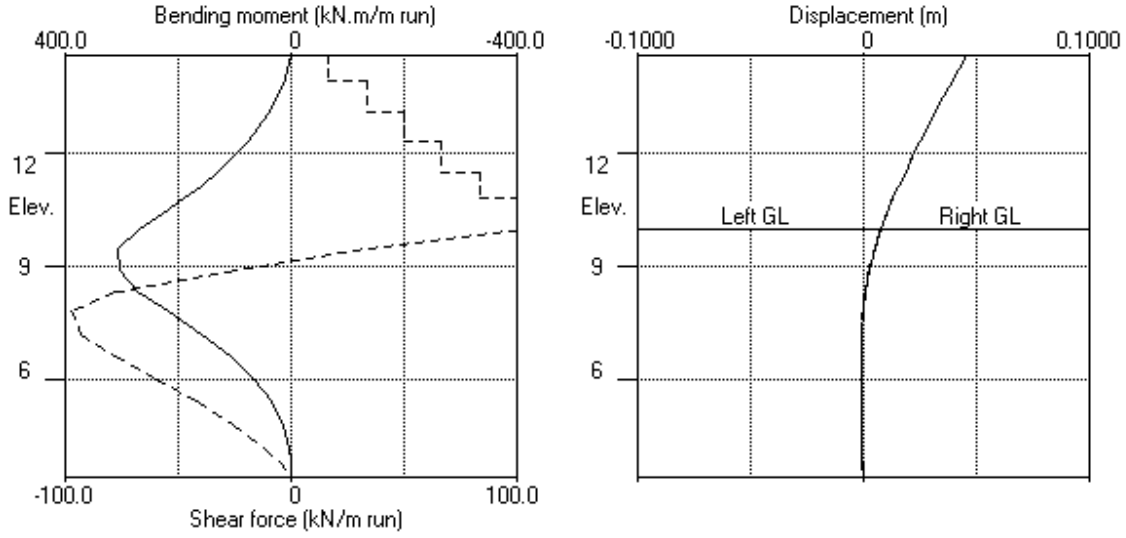
Stage No.8 Apply load no.6 at elevation 10.80

		RIGHT side						
			Effective stresses				Total	Coeff. of
Node no.	Y coord	Water press.	Vertic -al	Active limit	Passive limit	Earth pressure	earth pressure	subgrade reaction
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m3
16	8.35	0.00	30.80	0.00	351.31	73.53	73.53	29337
17	7.80	0.00	41.80	0.00	388.76	49.25	49.25	29337
18	7.20	0.00	53.80	0.00	429.61	41.63	41.63	14265
19	6.60	0.00	65.80	0.00	470.45	42.99	42.99	11814
20	6.00	0.00	77.80	0.00	511.30	47.42	47.42	11814
21	5.40	0.00	89.80	0.00	552.15	53.79	53.79	11814
22	4.80	0.00	101.80	0.00	593.00	61.21	61.21	11814
23	4.20	0.00	113.80	0.00	633.85	69.13	69.13	11814
24	3.80	0.00	121.80	0.00	661.09	74.50	74.50	11814
25	3.40	0.00	129.80	0.00	688.32	79.88	79.88	11814

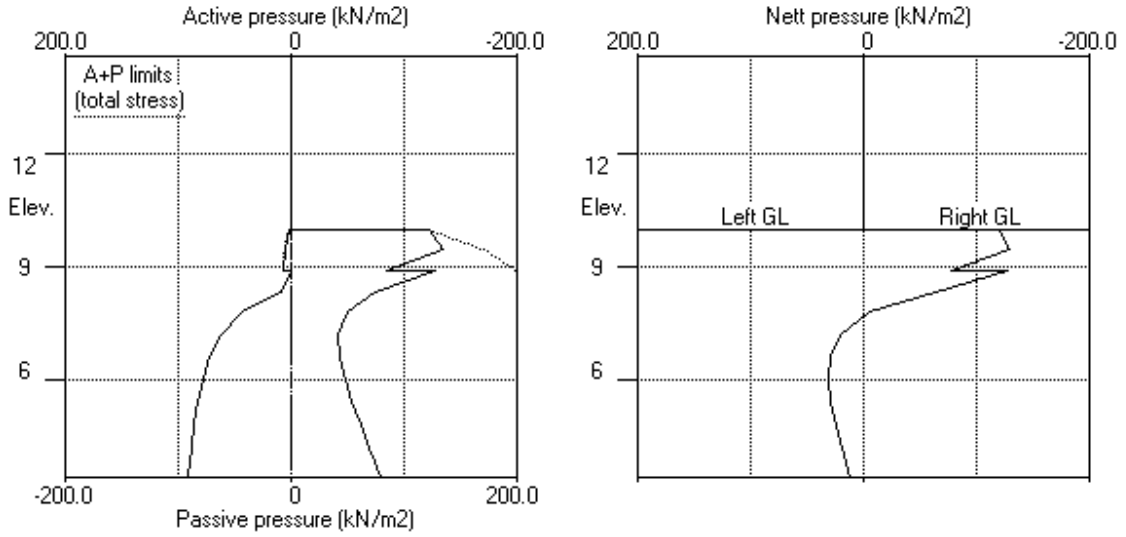
Note: 0.00a Soil pressure at active limit
  123.07p Soil pressure at passive limit

Units: kN,m

Stage No.8 Apply load no.6 at elev. 10.80



Stage No.8 Apply load no.6 at elev. 10.80



Units: kN,m

Summary of results

STABILITY ANALYSIS of Soldier Pile Wall according to Strength Factor method
Factor of safety on soil strength

Stage No.	Ground level Act.	Pass.	Prop Elev.	**FoS for toe elev. = 3.40** Factor of Safety	Moment equilib. at elev.	**Toe elev. for FoS = 1.500** Toe elev.	Wall Penetr -ation	Direction of failure
1	10.00	10.00	Cant.	Conditions not suitable for FoS calc.				
2	10.00	10.00		No analysis at this stage				
3	10.00	10.00	Cant.	3.847	3.99	7.96	2.04	L to R
4	10.00	10.00	Cant.	3.489	4.11	7.31	2.69	L to R
5	10.00	10.00	Cant.	3.202	4.21	6.91	3.09	L to R
6	10.00	10.00	Cant.	2.979	4.28	6.54	3.46	L to R
7	10.00	10.00	Cant.	2.801	4.33	6.31	3.69	L to R
8	10.00	10.00	Cant.	2.657	4.37	6.11	3.89	L to R

Units: kN,m

Summary of results

BENDING MOMENT and DISPLACEMENT ANALYSIS of Soldier Pile Wall

Analysis options

Soldier Pile width = 0.75m; spacing = 1.50m
Passive mobilisation factor = 3.000
Length of wall perpendicular to section = 20.00m
Subgrade reaction model - Boussinesq Influence coefficients
Soil deformations are elastic until the active or passive limit is reached

Rigid boundaries: Left side 200.00 from wall
Right side 200.00 from wall

Bending moment, shear force and displacement envelopes

Node no.	Y coord	Displacement maximum	Displacement minimum	Bending moment maximum	Bending moment minimum	Shear force maximum	Shear force minimum
		m	m	kN.m/m	kN.m/m	kN/m	kN/m
1	14.60	0.045	0.000	0.0	-0.0	16.7	0.0
2	14.25	0.042	0.000	5.8	-0.0	16.7	0.0
3	13.90	0.039	0.000	11.7	0.0	33.3	0.0
4	13.50	0.036	0.000	25.0	0.0	33.3	0.0
5	13.10	0.032	0.000	38.3	0.0	50.0	0.0
6	12.70	0.028	0.000	58.3	-0.0	50.0	0.0
7	12.30	0.025	0.000	78.3	-0.0	66.6	0.0
8	11.90	0.022	0.000	105.0	-0.0	66.6	0.0
9	11.50	0.018	0.000	131.6	-0.0	83.3	0.0
10	11.15	0.016	0.000	160.8	-0.0	83.3	0.0
11	10.80	0.013	0.000	189.9	-0.0	100.0	0.0
12	10.40	0.010	0.000	229.9	-0.0	100.0	0.0
13	10.00	0.008	0.000	269.9	-0.0	100.0	0.0
14	9.45	0.005	0.000	307.5	0.0	31.0	-6.7
15	8.90	0.003	0.000	305.0	0.0	4.2	-36.7
16	8.35	0.001	-0.000	272.0	0.0	1.8	-78.6
17	7.80	0.000	-0.000	219.1	0.0	0.2	-97.7
18	7.20	0.000	-0.001	159.5	0.0	0.0	-93.0
19	6.60	0.000	-0.001	107.4	0.0	0.0	-78.0
20	6.00	0.000	-0.001	65.8	0.0	0.0	-59.9
21	5.40	0.000	-0.001	35.4	0.0	0.0	-41.9
22	4.80	0.000	-0.001	15.5	0.0	0.0	-25.8
23	4.20	0.000	-0.001	4.4	0.0	0.0	-12.5
24	3.80	0.000	-0.001	1.0	0.0	0.0	-5.5
25	3.40	0.000	-0.001	0.0	-0.0	0.0	0.0

Maximum and minimum bending moment and shear force at each stage

Stage no.	Bending moment maximum	Bending moment elev.	Bending moment minimum	Bending moment elev.	Shear force maximum	Shear force elev.	Shear force minimum	Shear force elev.
	kN.m/m		kN.m/m		kN/m		kN/m	
1	3.9	7.80	-0.0	10.00	4.2	8.90	-1.3	6.00
2	No calculation at this stage							
3	78.9	9.45	-0.0	3.40	16.7	14.60	-23.9	8.35
4	147.4	9.45	-0.0	14.60	33.3	13.90	-45.1	8.35
5	203.5	9.45	-0.0	14.60	50.0	13.10	-63.2	7.80
6	250.8	9.45	-0.0	14.60	66.6	12.30	-78.6	7.80
7	285.0	9.45	-0.0	14.60	83.3	11.50	-89.9	7.80
8	307.5	9.45	-0.0	14.60	100.0	10.80	-97.7	7.80

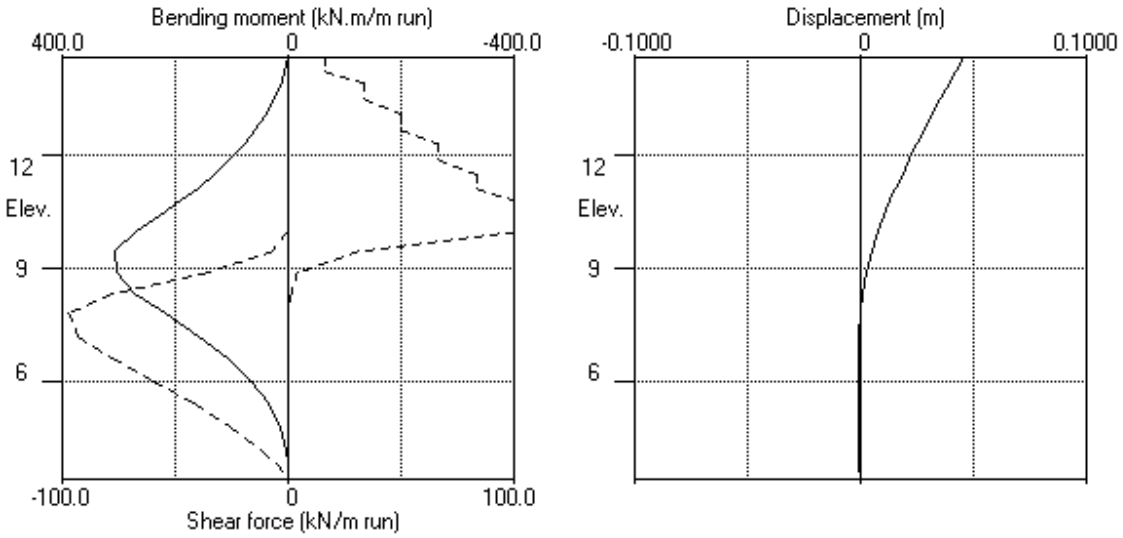
Summary of results (continued)

Maximum and minimum displacement at each stage

Stage no.	Displacement maximum (m)	elev.	minimum (m)	elev.	Stage description
1	0.005	14.60	0.000	14.60	Apply surcharge no.1 at elev. 10.00
2	Wall displacements reset to zero				Change EI of wall to 143957kN.m2/m run
3	0.010	14.60	-0.000	6.60	Apply load no.1 at elev. 14.60
4	0.020	14.60	-0.001	6.60	Apply load no.2 at elev. 13.90
5	0.028	14.60	-0.001	6.60	Apply load no.3 at elev. 13.10
6	0.036	14.60	-0.001	6.60	Apply load no.4 at elev. 12.30
7	0.041	14.60	-0.001	6.00	Apply load no.5 at elev. 11.50
8	0.045	14.60	-0.001	6.00	Apply load no.6 at elev. 10.80

Units: kN,m

Bending moment, shear force, displacement envelopes



Project Name:

4 Titore Way

Job No.: 23 187

Doc No.:

Subject:

Retaining Pole Option - WALLAP Runs

By: W. Thorburn Date:

Verified By: J. Papesch Date:

Material Properties for Concrete Pile

2.78E+07

$E_{concrete}$ = 27.806 GPa (Young Modulus) = 4700*(f'_{cu}[MPa])^0.5 f'_{cu} = 35 MPa

$g_{concrete}$ = 24.5 kN/m^3 (Unit Weight) 0.750 m ϕ

S = 1.5 m c/c (Spacing between piles)

A = 0.442 m^2 (Sectional Area)

I = 1.553E-02 m^4 (Area Moment of Inertia)

EA =	**8.189E+06**	kN/m = [kN/m^2][m^2]/[m]
EI =	**2.879E+05**	kNm^2/m = [kN/m^2][m^4]/[m]
w =	**7.216**	kN/m/m = [kN/m^3][m^2]/[m]

I = 1.035E-02 kNm^4/m

$E_{concrete}$ = 2.78E+07 kPa

30% Cracked EI = 86372.77 kNm^2/m

I = 3.1063E-03 m^4

57581.84

WALLAP Structures Input Parameters (35 MPa design checks)

Loading Calculations

Loads

Soil pressure (Refer HW Geo report) $N_{soil} := 150\ \frac{kN}{m}$

Beam length $L_{beam} := 3\ m$

Beam Reinforcement Required

Thickness of beam $d_1 := 850\ mm$

Width of rib beam $b_w := 450\ mm$

Density of concrete $\gamma_{con} := 25\ \frac{kN}{m^3}$

Diameter of additional reinforcement $D_{bar} := 20\ mm$ $n_{top} := 4$ $D_{bar.bottom} := 20\ mm$ $n_{bottom} := 4$

Effective depth of steel $d'_{top} := 75\ mm + \frac{D_{bar}}{2} = 85\ mm$ Top of slab to centre of top reinforcement

$d'_{bottom} := 75\ mm + \frac{D_{bar}}{2} = 85\ mm$ Bottom of slab to centre of bottom reinforcement

Concrete strength $f'_c := 35\ MPa$

Steel strength $f_y := 500\ MPa$

$f_{yt} := 500\ MPa$

Effective depth of steel $d_{2.top} := d_1 - d'_{top} = 765\ mm$ $d_{2.bottom} := d_1 - d'_{bottom} = 765\ mm$

Max moment for ultimate limit state

Point Load applied to cantileaver beam due to wall loads $M_{max} := \frac{N_{soil} \cdot {L_{beam}}^2}{8} = 168.75\ m \cdot kN$

Check for minimum reinforcement

Check 1 (NZS3101:Part 1:2006 9.3.8.2.1, 9.3.8.2.2)

$b_w = 0.45\ m$ $f'_{c.units} := \frac{f'_c}{MPa}$

$A_{s1} := \frac{\sqrt{f'_{c.units}} \cdot MPa}{4 \cdot f_y} \cdot b_w \cdot d_{2.top} = 1018.31\ mm^2$

$A_{s2} := 1.4 \cdot \frac{b_w \cdot d_1}{\frac{f_y}{MPa}} = 1071\ mm^2$

$A_{s.min1} := \text{if}\left(A_{s1} \le A_{s2}, A_{s2}, A_{s1}\right) = 1071\ mm^2$

Check 2 (NZS3101:Part 1:2006 strength design)

Concrete factors - 2.3.2, 7.4.2.7 $\alpha_1 := 0.85 \quad \beta_1 := 0.85 \quad \phi := 0.85$

Minimum requirement required for strength combination $M_{max} = 168.75\ m \cdot kN$

$$\mu_{positive} := \frac{M_{max}}{\left(f'_c \cdot b_w \cdot d_{2.bottom}{}^2\right)} = 0.0183$$

$$q_{positive} := \beta_1 \cdot \frac{\alpha_1}{2 \cdot 0.42} \cdot \left(1 - \left(\left(1 - \left(4 \cdot 0.42 \cdot \frac{\mu_{positive}}{\alpha_1 \cdot \beta_1 \cdot \phi}\right)\right)\right)^{0.5}\right) = 0.0218$$

$$j_{positive} := 1 - \frac{0.42}{(\alpha_1 \cdot \beta_1)} \cdot q_{positive} = 0.9873$$

$$A_{s.min2} := \frac{\left(\frac{M_{max}}{\phi}\right)}{f_y \cdot j_{positive} \cdot d_{2.bottom}} = 525.7\ mm^2$$

$$A_{s.min2} := 1.3 \cdot A_{s.min2} = 683.41\ mm^2$$

Minimum area of steel required $A_{s.min1} := \max\left(A_{s.min1}, A_{s.min2}\right) = 1071\ mm^2$

$$A_{s.min} := A_{s.min1} = 1071\ mm^2$$

Reinforcement Requirements

Reinforcement given by bar $A_{s.prov.bar} := n_{top} \cdot \frac{\left(\pi \cdot D_{bar}{}^2\right)}{4} = 1256.64\ mm^2$

$$\text{if}\left(A_{s.min} \le A_{s.prov.bar}, \text{“OK”}, \text{“ADDITIONAL BAR REQ”}\right) = \text{“OK”}$$

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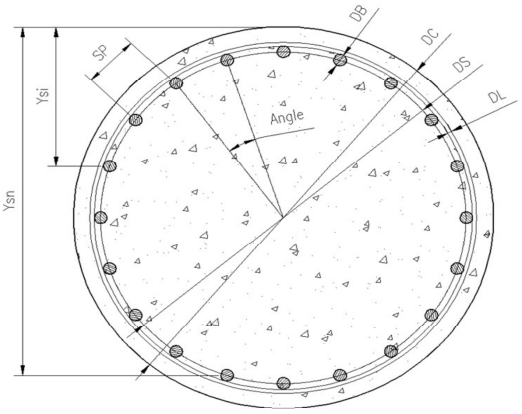
Circular Concrete Columns NZS 3101:2006

Project Number	23 187		
Project Name	4 Titore Way, Russell		
Client	Arcline Architecture		
Author	PL	Checked:	SK
Date	21/11/23	Revision	A

Geometry

Ly length of column along Y axe	12000	mm
Lz length of column along Z axe	12000	mm
DC Diameter of column or pile	750	mm
DS Diameter of steel circle	600	mm
DB Size diameter of bars	25	mm
Number of bars	8	See Commentary
Angle of bars	45.0	degrees °
SP spacing of bars	236	mm Arch
Clear cover to main bars	62.5	mm
DL diameter of links	12	mm
Max Aggregate size	20	mm
k of column along Y direction	1.0	
k of column along Z	1.0	
Ast Area of longitudinal steel	3927	mm²
ρ % of reinforcement	0.89	See Commentary



Materials

f'c at 28 days	35	MPa
fy of main bars	500	MPa
fy of links	300	MPa
E steel Elastic modulus	200000	MPa
E concrete Elastic modulus	26541	MPa

Loads

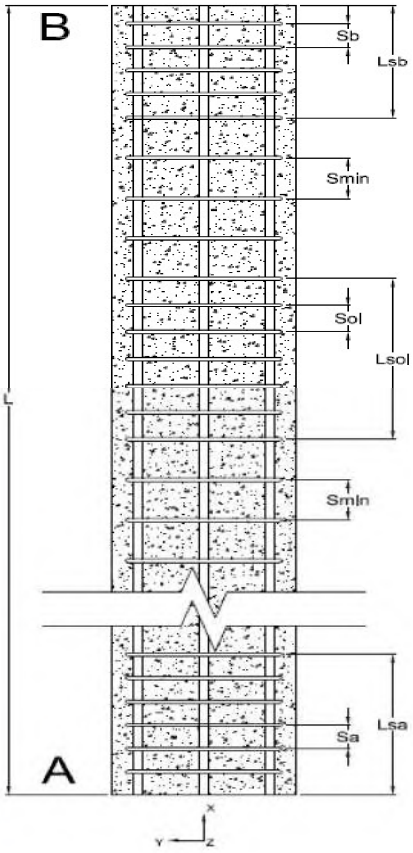
Bd= 0.15 ratio N*dead/N*live

Node A

Combination	Fx	Fy	Fz	Mx	My	MZ	Note	Cond.
Combination	*0*	*150*	*0*	*0*	*0*	*470*	1A	SC
Combination							2A	SC
Combination							3A	SC
Combination							4A	SC
Combination							5A	SC
Combination							6A	SC

Node B uy

Combination	Fx	Fy	Fz	Mx	My	MZ	Note	Cond.
Combination							1B	SC
Combination							2B	SC
Combination							3B	SC
Combination							4B	SC
Combination							5B	SC
Combination							6B	SC



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Date	21/11/23	Revision	A

Calculations Combination number 1A See notes Condition= Single curvature

N=*	*0*	*KN*	*Vy*=*	*150*	*KN*	*Vz*=*	*0*	*KN*	*Vn=*	*150*	*KN*
T=*	*0*	*KN.m*	*My*=*	*0*	*KN.m*	*Mz*=*	*470*	*KN.m*	*Mn=*	*470*	*KN.m*

N ϒ ≤ 0.05 V* LuY* 0.0E+00 ≤ 90000000 OK Slenderness check NZS3101.2006 Cl. 10.3.2.3
N ϒ ≤ 0.05 V* LuZ* 0.0E+00 ≤ 0 All cases OK

Where:

rY=	*187.5*	*mm*	C.10.3.2.3.3	*NcY=*	*9827384*	*N*	*M1/M2=*	*0.00*	*ϒY=*	*1.00*	
rZ=	*187.5*	*mm*	C.10.3.2.3.3	*NcZ=*	*9827384*	*N*	*Cm=*	*0.60*	*ϒZ=*	*1.00*	

M2Y,min=	*0*	*KN.m*	*Nn,max=*	*14989.8*	*KN*	*OK, N*<Nn,max*	NZS3101.2006 Cl. 10.3.4.2
M2Z,min=	*0*	*KN.m*	*α1=*	0.85		All cases OK	

Design forces:

N=*	*0*	*KN*	*Vy*=*	*150*	*KN*	*Vz*=*	*0*	*KN*
T=*	*0*	*KN.m*	*Mcy*=*	*0*	*KN.m*	*Mcz*=*	*470*	*KN.m*

Min amount of longitudinal Reinforcing bars= *8* *Bars*
Max permissible spacing of bars= *187.5* *mm*

	Cm	Ncy	Ncz	ϒY	ϒZ	M2Y	M2Z	Nmax	Load KN	McY KN.m	McZ KN.m	Combined bending
Node A	0.6	3128	3128	1.0	1.0	0.0	0.0	14990	0.0	0.0	470.0	470
Node B												

Notes:
1. the table above summarises the minimal design actions for biaxial bending check
2. Biaxial moments are treated separately to account for diferent column braced lengths per axis
3. Axial load must not be considered nule
4. The tabe above assumed the column's inercia of the uncracked section

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Revision	A

ULS strength calculation

Geometry

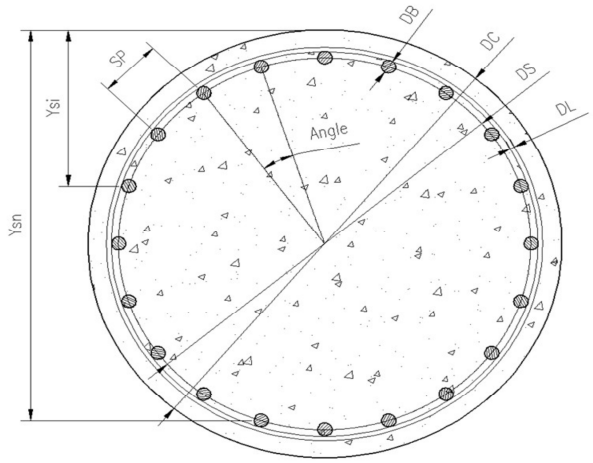
DC Diameter of column or pile	*750*	*mm*
DS Diameter of steel circle	*600*	*mm*
DB Size diameter of bars	*25*	*mm*
Number of bars	*8*	
Angle of bars	*45*	*°*
SP spacing of bars	*235.6*	*mm*
Clear cover to main bars	*62.5*	*mm*

Materials

f'c at 28 days	*35*	*Mpa*
fy of main bars	*500*	*MPa*
fy of links	*300*	*MPa*
E steel Elastic modulus	*200000*	*MPa*
E concrete Elastic modulus	*26541*	*MPa*

Steel total reinforcement ρ	*0.89*	*%*

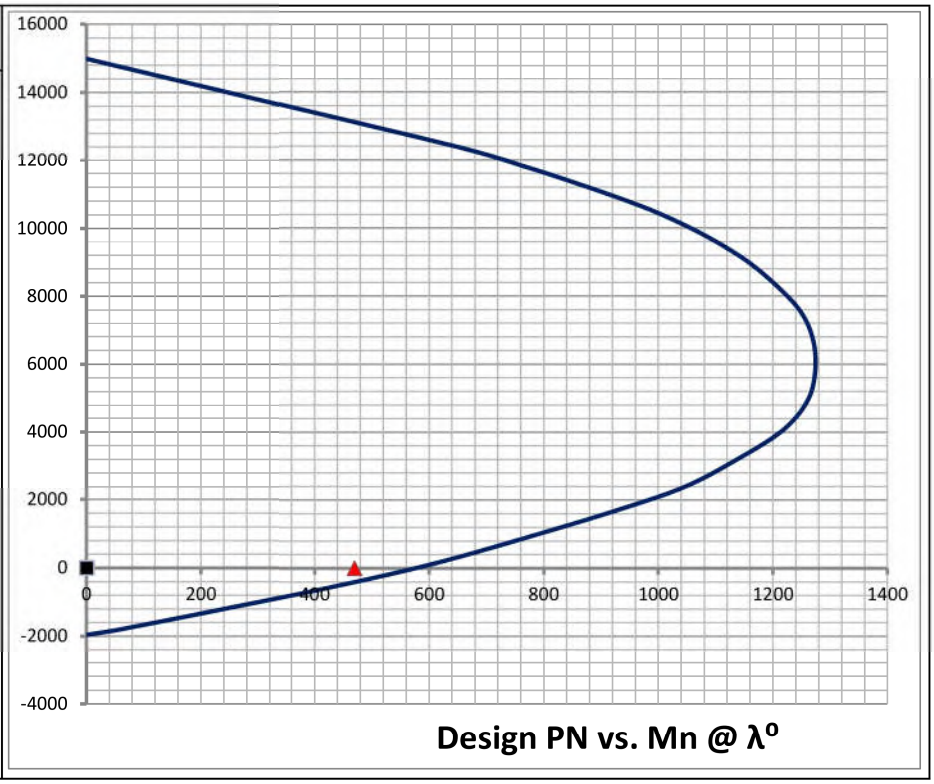
Note: Minimum steel for columns 0.8%, more than 6% is not buildable. Minimum steel for piles should be as per Sec.413.6.5



A	N*	Mcn*
*	0	470
*		
*		
*		
*		
*		
	KN	KN.m

B	N*	Mcn*
*		
*		
*		
*		
*		
*		
	KN	KN.m

Pn (KN)	Mn (KN.m)
-1963	0
-1784	64
-1150	256
-515	440
143	609
947	779
1698	926
2400	1047
3241	1142
4070	1218
4933	1261
5817	1274
6672	1271
7500	1250
8275	1208
9054	1153
9805	1079
10524	988
11183	880
11834	762
12444	635
14990	0



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Shear Design

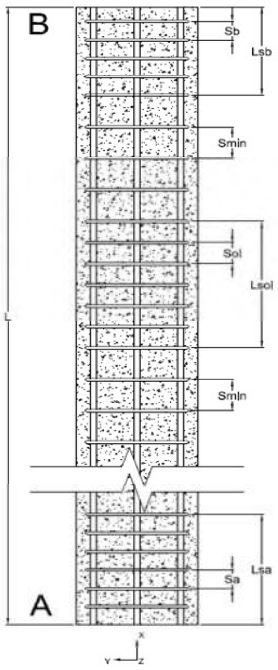
V*< øVn

NZS3101:2006 sec.10.3.10.5.1

Sa= 75 mm Core strength check Ag/Ac: 1.335 OK
Sb= 75 mm Pt= 0.89 m= 16.81 Ptm= 0.149

$Vc = Ka\ Kn\ Vb\ Acv;$ Vb= (0.07 + 10 Pw)$\sqrt{f'c}$.; $0.08\sqrt{f'c} < Vb < 0.2\sqrt{f'c}$. NZS3101:2006 sec.10.3.2.2

Ka= 1.000 Vb Mpa= 0.664 0.473 < 0.664 < 1.183 OK
Pw= 0.004 Acv mm²= 306796 Ac mm²= 330810
f'c= 35 Mpa Vn Mpa= 7 Ag mm²= 441786



Design case: Max shear

Case	1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	5B	6B
V*i-n	150	0	0	0	0	0	0	0	0	0	0	0
N*i-n	0	0	0	0	0	0	0	0	0	0	0	0
Torq*	0	0	0	0	0	0	0	0	0	0	0	0
Kn	1	1	1	1	1	1	1	1	1	1	1	1
vtn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vc	153	153	153	153	153	153	153	153	153	153	153	153
Vs*	35	0	0	0	0	0	0	0	0	0	0	0
7.6.2.1												
SoptY	300	300	300	300	300	300	300	300	300	300	300	300

Calculated min SA= 300 mm Calculated min SB= 300 mm

Max spacing NZS3101 Part1:2006 Sec.10.3.10.4.3= 300 mm (Smin)
Av tirrup min= 69 mm² < 226 mm² OK Tirrup area sufficient
Torsion design 0.00 < 0.61 OK NZS3101:2006 Sec.7.6.2.1

Notes

1. Needs reinforcement for shear
2. Please detail shear links as specified above
3. Beam-to-column connection must be design as per NZS3101:2006
4. Links must have bending radious of 3xDiameter of link bars
5. More checks needs to be done acording to section 7 and 8 regarding the minimum steel and spacings.

Comments:

GENERAL

- THE STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL, SERVICES, CIVIL AND OTHER PROJECT DRAWINGS. ANY DISCREPANCIES SHALL BE REFERRED TO THE ARCHITECT & DESIGNER FOR RESOLUTION.
- THE PRESENCE, LOCATION AND DETAILS OF NIBS, UPSTANDS, RECESSES, PLINTHS, PENETRATIONS, INSERTS, SLEEVES, CHASES, REBATES, CAST-IN FIXINGS, BRACKETS, HOLES, FLASHINGS, FIRE PROOFING, DAMP-PROOFING & WATERPROOFING etc ARE NOT NECESSARILY SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL, SERVICES, CIVIL, & OTHER PROJECT DRAWINGS FOR THESE ITEMS.
- THE LOCATION, SIZE AND DETAILS OF ALL PENETRATIONS, RECESSES, SLEEVES, HOLES, etc. IN STRUCTURAL MEMBERS, MUST BE APPROVED BY THE DESIGNER PRIOR TO CONSTRUCTION UNLESS SHOWN ON THE STRUCTURAL DRAWINGS. THESE ITEMS SHALL BE CAST-IN, FORMED, OR SHOP FABRICATED AND SHALL NOT BE CUT OR CORED ON SITE, UNLESS NOTED OTHERWISE OR APPROVED BY THE DESIGNER.
- SUBSTITUTION FOR OR AMENDMENT OF SPECIFIED DETAILS OR MATERIALS SHALL NOT BE CARRIED OUT WITHOUT APPROVAL OF THE DESIGNER.
- STANDARDS LISTED REFER TO THEIR LATEST ISSUE INCLUDING AMENDMENTS THAT ARE CURRENT AT THE TIME OF PREPARING THESE DRAWINGS.

DIMENSIONS

- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, SERVICES, CIVIL & ALL OTHER PROJECT DRAWINGS PRIOR TO CONSTRUCTION COMMENCING. ANY DISCREPANCIES SHALL BE REFERRED TO THE DESIGNER FOR RESOLUTION.
- DO NOT SCALE THE DRAWINGS.
- ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
- ALL DIMENSIONS TO EXISTING WORK SHALL BE VERIFIED BY SITE MEASUREMENT PRIOR TO FABRICATION.

CONCRETE

- CONCRETE STRENGTHS:
  CONCRETE STRENGTHS ARE 'SPECIFIED 28 DAY COMPRESSIVE STRENGTHS' AS DEFINED IN NZS 3109.
  FLOOR SLABS & FOOTINGS STRENGTHS SHALL BE 30MPa MINIMUM U.N.O.
  WALL FOOTING MASS & SITE CONCRETE STRENGTHS SHALL BE 20 MPa MINIMUM
- CONCRETE SURFACE FINISHES:
  SURFACE FINISHES ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS. WHERE NOT SPECIFIED, & NOT SHOWN ON ARCHITECTURAL DRAWINGS, SURFACE FINISHES SHALL BE AS FOLLOWING (REFER NZS 3114 FOR DEFINITIONS)

FORMED FOUNDATION SURFACES :	F1
CONCEALED FORMED SURFACES OF :	
BEAMS, COLUMNS, WALLS, PANELS AND SLAB EDGES	F3
EXPOSED FORMED SURFACES OF :	
BEAMS, COLUMNS, WALLS, PANELS AND SLAB EDGES	F5
EXTERIOR SLAB FINISHES :	U5
INTERNAL FLOORS :	U3

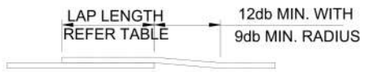
- REINFORCEMENT CLASS & MANUFACTURE PROCESS:
  ALL REINFORCEMENT BARS SHALL BE CLASS E TO AS/NZS 4671 U.N.O.
  ALL GRADE 500 REINFORCEMENT BARS SHALL BE MANUFACTURED USING THE MICRO-ALLOY PROCESS, UNLESS SPECIFICALLY APPROVED OTHERWISE BY THE DESIGNER.
- CONCRETE COVER TO REINFORCEMENT:
  MINIMUM CONCRETE COVER SHALL BE MEASURED TO THE EDGE OF CHAMFERS, RECESSES, REBATES, ETC. WHERE APPLICABLE.
  MINIMUM CONCRETE COVERS ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS. WHERE NOT SPECIFIED, MINIMUM CONCRETE COVERS SHALL BE AS FOLLOWS:

EXPOSURE SITUATION	FOUNDATIONS	BEAMS AND COLUMNS		RIBS, SLABS, WALLS	
		MAIN BARS	STIRRUPS, TIES, SPIRALS	20mm DIA. & UNDER	25mm DIA. & OVER
CAST AGAINST & EXPOSED TO EARTH	75	75	75	75	75
EXPOSED TO EARTH OR WEATHER					
CAST-IN PLACE	50	50	45	45	45
PRECAST	45	45	45	40	40
NOT EXPOSED TO EARTH OR WEATHER					
CAST-IN PLACE	-	40	25	30	35
PRECAST	-	35	25	30	30

NOTES:
- TOLERANCES ON COVERS SHALL BE:
  FOR 20mm BAR DIAMETER & UNDER: +10, -0
  FOR BAR DIAMETER LARGER THAN 20mm: +15, -0
- PRECAST IN THE CONTEXT OF THIS TABLE MEANS CONCRETE CAST UNDER PLANT CONTROL CONDITIONS, UTILISING RIGID FORMWORK & INTENSE COMPACTION
- COVER VARIES DUE TO EXPOSURE CLASSIFICATION & CONCRETE STRENGTH. REFER TO NZS 3101 : PART 1

- PLACING & SPACING OF REINFORCEMENT - GENERAL
  - SPLICING OF REINFORCEMENT, WHETHER BY LAPPING, WELDING OR MECHANICAL SPLICE, SHALL ONLY BE CARRIED OUT AS SHOWN ON THE DRAWINGS OR AS SPECIFICALLY APPROVED BY THE DESIGNER, EXCEPT AS NOTED BELOW:
    WELDED WIRE MESH SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS
    REINFORCEMENT IN SLABS ON GRADE AND IN TOPPINGS SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS.
  - LAYERS OF BEAM REINFORCEMENT SHALL BE SEPARATED WITH R40 BARS AT 1500mm CENTRES
  - ALL HOOKS ON STIRRUPS & TIES MUST FIT CLOSELY AROUND MAIN BARS U.N.O. FIRST STIRRUP TO BE PLACED NOT FURTHER THAN THE LESSER OF HALF THE STIRRUP SPACING OR 50mm FROM SUPPORT FACE
- LAP SPLICES IN REINFORCEMENT
  - WELDED WIRE MESH MADE UP OF SMOOTH WIRES SHALL BE LAP SPLICED WITH A MINIMUM 200mm OVERLAP BETWEEN OUTERMOST CROSS WIRES THUS :

  - WELDED MESH MADE UP OF DEFORMED BARS SHALL BE LAP SPLICED
  - LAP LENGTHS FOR DEFORMED BARS SHALL BE AS SHOWN IN THE FOLLOWING TABLES WHERE SPACING OF ADJACENT BARS ARE EQUAL TO OR GREATER THAN 2.5 db
  - LAP LENGTHS FOR PLAIN ROUND BARS SHALL BE TWICE THOSE SHOWN IN THE FOLLOWING TABLES
  - ALL BEAM AND COLUMN MAIN REINFORCEMENT LAP SPLICES SHALL HAVE CRANKED LAPS UNLESS NOTED OTHERWISE
  - CRANKED LAPS SHALL BE AS FOLLOWS:

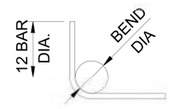


  - LAP LENGTHS ARE IN ACCORDANCE WITH NZS 3101

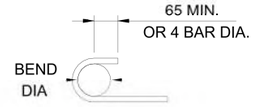
NOTE: USE OF FOLLOWING TABLES
TOP BAR FACTOR IS 1.0 FOR ALL VERTICAL BARS (COLUMNS, WALLS) AND FOR HORIZONTAL BARS WITH LESS THAN 300mm OF FRESH CONCRETE CAST BENEATH BAR (TYPICALLY BEAM BOTTOM BARS AND SLAB BARS).
TOP BAR FACTOR IS 1.3 FOR ALL HORIZONTAL BARS WITH MORE THAN 300mm OF FRESH CONCRETE CAST BENEATH THE BAR (TYPICALLY BEAM TOP BARS AND HORIZONTAL WALL BARS).

		BAR DIAMETER		
		10	12	16
CONCRETE 30 MPa STEEL GRADE 300 MPa	TOP BAR FACTOR = 1.3	390	470	630
	TOP BAR FACTOR = 1	300	360	480
CONCRETE 30 MPa STEEL GRADE 500 MPa	TOP BAR FACTOR = 1.3	650	780	1040
	TOP BAR FACTOR = 1	500	600	800

- SPIRAL, SPLICES AND TERMINATIONS
  - SPLICING OF ADJACENT LENGTHS OF SPIRAL SHALL BE EITHER BY PROVIDING 135° STIRRUP HOOKS AS FOR CIRCULAR HOOPS, OR BY WELDED LAP SPLICES. ANCHORAGE OF A SPIRAL BAR AT THE TERMINATION OF THE LENGTH OF SPIRAL SHALL BE PROVIDED BY AN EXTRA ONE-HALF TURN OF THE SPIRAL PLUS EITHER A 135° STIRRUP HOOK OR A WELDED LAP SPLICE TO THE PREVIOUS TURN. WELDED SPLICES IN SPIRALS SHALL COMPLY WITH AS/NZS 1554.3 ALL WELDS SHALL BE CLASS SP
- BENDING OF REINFORCEMENT
  - BENDS FOR ALL BARS EXCEPT STIRRUPS AND TIES



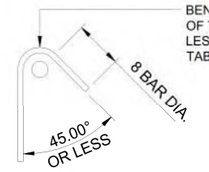
STANDARD HOOK



STANDARD 180° HOOK

STEEL GRADE	BAR DIAMETER	MINIMUM BEND DIAMETER
GRADE 300 & 500	6 TO 20	5 BAR DIAMETERS
	25 TO 40	6 BAR DIAMETERS
GRADE 300 & 500 GALVANISED BEFORE OR AFTER WELDING	6 TO 16	5 BAR DIAMETERS
	20 TO 32	8 BAR DIAMETERS

  - BENDS FOR STIRRUPS AND TIES



STANDARD STIRRUP & TIE HOOK

STEEL GRADE	BAR DIAMETER	MINIMUM BEND DIAMETER	
		PLAIN BARS	DEFORMED BARS
GRADE 300 & 500	6 TO 20	2 BAR DIAMETERS	4 BAR DIAMETERS
	25 TO 32	3 BAR DIAMETERS	6 BAR DIAMETERS
GRADE 300 & 500 GALVANISED BEFORE OR AFTER WELDING	6 TO 16	2 BAR DIAMETERS	5 BAR DIAMETERS
	20 TO 32	3 BAR DIAMETERS	8 BAR DIAMETERS

  - BARS PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE SITE BENT UNLESS SHOWN ON THE PROJECT DRAWINGS OR SPECIFICALLY APPROVED BY THE DESIGNER.
- HOLD DOWN BOLTS LOCATION TO BE CONFIRMED PRIOR CONCRETE POURING, THE USE OF TEMPLATES IS RECOMMENDED
- ALL GROUTING TO BE RAMMABLE SHRINKAGE COMPENSATED HIGH STRENGTH CEMENTITIOUS GROUT

Issue	Date	Revision
0	11/2023	ISSUE FOR BUILDING CONSENT

DWG STANDARD DETAILS AND SPECIFICATIONS

Scale AS SHOWN | Date 11/2023

Drawn PL | Checked SK | Approved JP

File

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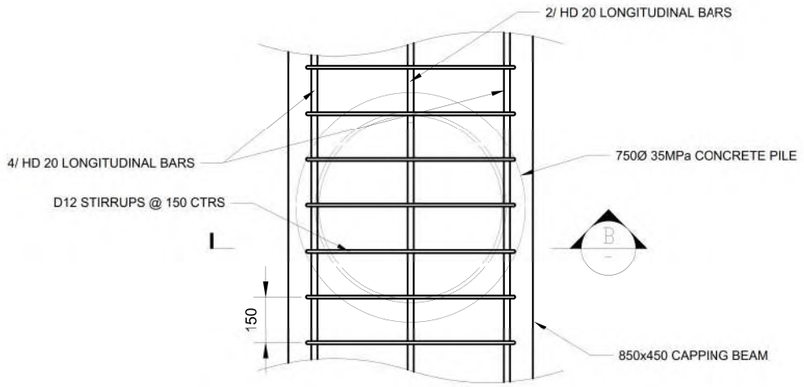
Project: PROPOSED NEW DWELLING
4 TITORE WAY, RUSSELL (LOT 1 DP 65575)

Client: ARCLINE ARCHITECTURE

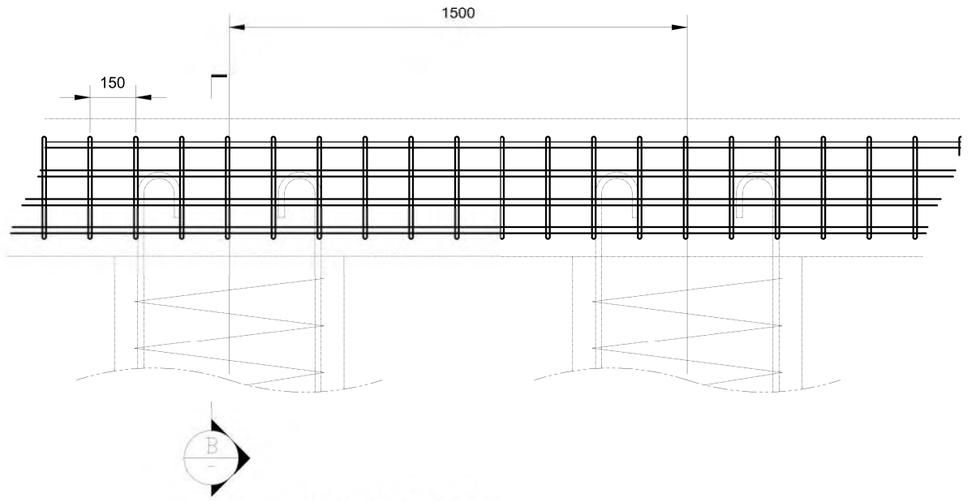
Project No. 23 187 | BC no. -

DWG No. **STD-01**

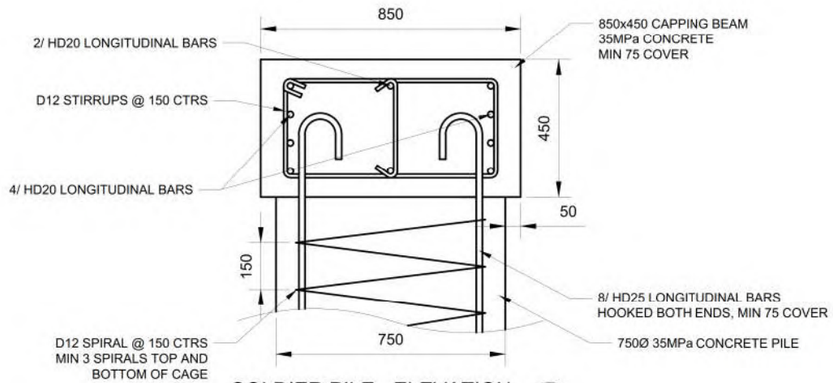
Sheet No. 1 of 2



SOLDIER PILE - PLAN (A -)
SCALE 1:20



SOLDIER PILE - ELEVATION (C -)
SCALE 1:20



SOLDIER PILE - ELEVATION (B -)
SCALE 1:20

TO BE READ IN CONJUNCTION WITH ARCHITECTURAL PLANS

Issue	Date	Revision
0	11/2023	ISSUE FOR BUILDING CONSENT

DWG SOLDIER PILE DETAILS

Scale AS SHOWN | Date 11/2023

Drawn PL | Checked SK | Approved JP

File

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4 TITORE WAY, RUSSELL (LOT 1 DP 65575)

Client: ARCLINE ARCHITECTURE

Project No. 23 187 | BC no. -

DWG No. **S-01**

Sheet No. 2 of 2

Appendix C –Specifications

GROUND STABILISATION
4TITORE WAY, RUSSELL

SPECIFICATION FOR REINFORCED CONCRETE SOLDIER PILE WALL
PREPARED FOR ARCLINE ARCHITECTURE

Scope

The work specified in this section covers the supply of all labour, materials, plant, equipment and testing necessary for the boring, reinforcing and concreting of bored piles in accordance with this Specification and the drawings/reports prepared by Haigh Workman Limited and Ruamoko Solutions.

Nature of Ground

Site investigations have been carried out and a copy of the report is available for inspection. The report is made available without guarantee as to the completeness of the data and the Contractor shall make their own deductions as to the nature of the sub-soil conditions. The Contractor shall be deemed to have inspected the site, examined the design documents and any other information supplied in writing and to have satisfied himself, as far as is practicable for an experienced contractor, before tendering, as to the correctness and sufficiency of his tender for the work.

The Contractor accepts full responsibility for the method of working, for the sinking and sealing of any casing against the entry of water and the positioning of the completed pile within the required tolerances and to the anticipated founding depth indicated on the drawings. Where, during drilling operations, material and/or obstacles are encountered which the Contractor considers could not have been inferred from the information available at the time of tender, he shall refer to the Engineer for a decision as to whether a variation to the contract can exist.

Pile Location

The positions of all piles shall be set out by a Registered Surveyor. After construction, the actual pile locations shall be shown on a fully dimensioned, "as built" drawing certified by a Registered Surveyor.

Pile Geometry

All piles shall be the straight shaft type. Pile diameters and dimensions shall be as shown on the drawings.

Capping Beam

The dimensions of the capping beam shall be as shown on the drawings. The top of the capping beam shall be 100mm below final ground level and sloped (not stepped) to match the final ground contour. The RL's of the top of capping beam shall be determined by the designer.

Pile Lengths

Pile lengths shall be measured from the top of the pile which shall be taken as the soffit of the pile cap. Payment will be made for the actual pile lengths; such payment being based on the schedule rates for the anticipated lengths. The Contractor shall include in his rates for the provision of all equipment, safety equipment and attendance personnel necessary for the Engineer to carry out inspections and/or observation of pile cuttings.

Founding Level

Founding levels shall be established by inspection of pile cuttings at each pile location or by written instruction provided by the Engineer

Excavation for Piles

a) The pile dimensions shown on the drawings are the net structural dimensions. The Contractor shall allow in his rates for any extra excavation, oversize drilling and materials required for his method of construction of the piles.

b) To effectively transmit horizontal loads into the surrounding ground will require each pile to be in intimate contact with the ground, over its full length. In consequence, any space between permanent casing and its surrounding ground shall be completely filled with cement grout or other approved material.

c) The Contractor shall allow in his rates for all permanent or temporary ground support required for the excavation of the piles and for all over-break and consequent extra concrete required to fill the pile.

d) The use of explosives during the excavation for piles is forbidden without the written approval of the Engineer and the Territorial Authority. If approved, explosives shall be used strictly in accordance with the requirements of the Engineer and all relevant authorities.

e) The bases of all piles shall be clean and free from loose excavated material before the reinforcing cage is introduced into the pile excavation.

f) Prior to pouring concrete each pile shaft and base shall be approved by the Engineer. Notice of when an inspection is required shall be given by the Contractor at least one working day in advance.

g) All excavated material shall become the property of the Contractor and shall be removed from site and disposed of at regular intervals. The accumulation of excavated material on site shall not interfere with the operations of any other Contractor or sub-contractor engaged on the site.

Below Ground Casing

Casing shall be used for the construction of pile, solely at the discretion of the Contractor, and the choice of casing thickness shall be the Contractor's responsibility. The Contractor will not be required to sink any casing deeper than the level at which he can achieve a seal against the ingress of water or that required by the Department of Labour, whichever is the greater.

Stability of Excavations

The Contractor shall be responsible for the stability of each excavation and the safety of his own workmen and other persons who may have to enter the excavations and shall comply with the requirements of all the relevant authorities.

Reinforcement

All the requirements of the REINFORCEMENT section of the main construction specification shall apply, as appropriate, or as detailed on the drawings.

Longitudinal bars in cages shall, wherever possible, be made from single lengths of bar. Should the Contractor wish to lap such bars then the positions and lengths of lap shall be approved by the Structural Engineer, prior to manufacture of the reinforcing cages. Shop drawings of the reinforcing cages shall be submitted for the Engineers approval prior to commencement of manufacture.

Temporary internal braces incorporated in piles to maintain their shape during handling shall not prevent the passage of pumps or other equipment required to maintain dry conditions at the base of pile shafts.

All reinforcing cages shall be manufactured, handled, transported and store in a manner which does not result in a loss of shape or positioning of reinforcing in the cages. Cages which the Engineer determines are distorted or have incorrectly positioned bars or spirals shall be removed from site for repair or reconstruction.

Concreting

All the requirements of the CONCRETE section of the main construction specification shall apply, as appropriate.

The concrete used in pile shafts shall be High Grade with a minimum compression strength at 28 days of 35MPa.

Each pile shall be concreted as soon as possible, but not more than 2 hours, after inspection and approval by the Engineer.

Concrete shall be placed in dry conditions where possible. If the ingress of water into the pile shaft is such that its depth in the bottom of the excavation cannot be maintained at less than 75 mm at the time of concreting, then concrete shall be placed by tremie.

During concreting the withdrawal of casing (if required) may be carried out progressively provided a sufficient head of concrete is maintained to prevent the ingress of water at all times but, in no case, shall such head be less than 2.0 m.

The concrete in each pile shall be compacted over its full depth with internal vibrators used for at least the upper-most 2.0 m. A vibrator, in full working order, must be available for each pile being concreted.

Pile Records

Records for each pile constructed are to be kept by the Contractor and submitted to the Engineer, weekly, and a complete set shall be provided after piling completion. Each record shall include the following:

a) Pile number or reference, type and size,

b) The nature of the materials (including obstructions) encountered during drilling and their depths, all recorded to provide a ground profile for the hole,

c) Concrete mix properties and slump shall be based on supply of certified concrete with periodic samples taken as per the supplier's certification standards,

d) Method, date and time of boring,

e) Method, date and time of concreting and whether any break occurred in the filling process,

f) Water level, if any, at the time of concreting, and any use of a tremie

g) The levels and lengths of any casing left in the excavations,

h) The reinforcement placed, and

i) The founding level of the base of the pile and the finished level of the top of the pile.

The Contractor shall prepare these records independently of any records that are maintained by the Engineer, or a Quantity Surveyor employed by the Principal. A Producer Statement PS3 (Construction) shall be issued by the Contractor within two weeks of completion of construction.

Tolerances

a) At the level of each pile cap soffit the top of the pile should not vary from the plan position on the drawings by more than 4 percent of the shaft diameter or 75 mm, whichever is the lesser amount.

b) The bottom of each pile should not vary from the plan position on the drawings by more than 1 percent of the pile length, 12.5 percent of the shaft diameter or 400 mm. whichever is the lesser.

c) The tops of each pile shall not be less than 25 mm above or 75mm below the "finished top of pile level" i.e., the pile cap soffit level given on the drawings.

d) Should the above criteria not be met, the Engineer reserves the right to order such works as he may consider necessary to rectify the faults, at no cost to the Principal.

Haigh Workman

SPECIFICATION
of work to be done and materials to be used in carrying out the works shown on the accompanying drawings

Titore Way, Russell

Project Specification

4 Titore Way , Russell, New Zealand
Project Ref: 23 187

Printed: 27 November 2023

DRAFT

masterspec

Specification built using Masterspec software
Project ID: 294013

TABLE OF CONTENTS

1013 DOCUMENT CONTROL

1 DOCUMENT CONTROL

Document Control

1.1 PREPARED BY

Company:	Haigh Workman Limited
Postal Address:	6 Fairway Drive, Kerikeri
Street Address:	
City:	
Telephone:	
Email:	wayne@haighworkman.co.nz

1.2 DOCUMENT DETAILS

Project Name:	4 Titore Way, Russell
Project Number:	23 187
File Reference:	~
Client:	~
Client Contact:	~
Version:	~

1.3 REVISION CONTROL

Issue:	Building Consent
Revision:	A
Amendment Details:	~
Issued to:	~FNDC
Date of Issue:	~22/11/2023
Reviewed by:	~WT
Approved by:	~JP

1.4 AUDIT CONTROL

Date:	~
Author:	~
Approved by:	~

1220 PROJECT

1 GENERAL

This general section describes the project including:

- A description of the work
- Design construction safety
- Principal's Health & Safety matters
- Site description, features and restrictions
- Design parameters for design by contractor
- Archaeological discovery

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

1.2 DESCRIPTION OF THE WORK

~

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Design Construction Safety

1.4 DESIGN CONSTRUCTION SAFETY MATTERS

The project has the following unusual or atypical features, which a reasonably experienced contractor may not be aware of, that may present an unexpected hazard or risk during a typical construction process.

ITEM	COMMENT
EARTHWORKS	SITE SPECIFIC H&S PLAN
HEAVY LIFTS	TAGGED CHAINS ON LIFTING GEAR

Provide particular health and safety procedures and methods to mitigate these hazards or risks, and specifically include them as well as any other health and safety matters in the site Health and Safety Plan (refer to section 1260 PROJECT MANAGEMENT for Plan requirements). The Contractor is still required to undertake its own assessment, to determine if they consider there are further safety matters and provide for these in carrying out the construction of the work.

Principal's Health & Safety Matters

1.5 PRINCIPAL'S KNOWN SITE HAZARDS

Site hazards known to the principal are:
~

1.6 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN

Obtain a copy of the principal's site health and safety plan.

Site

1.7 SITE

The site consists of: ~
As shown on drawing: ~

1.8 LEGAL DESCRIPTION

The site of the works, the street address and the legal description are shown on the drawings.

1.9 SITE FEATURES

~

Site environment - Durability

1.10 EXPOSURE ZONE

The exposure zone is to NZS 3604, Section 4 Durability, 4.2 Exposure zones and NZBC E2/AS1.
The site zone is: ~

Site environment - Seismic

1.11 EARTHQUAKE - SPECIFIC DESIGN

The earthquake design is to NZS 1170.5, in particular the intent of NZS 1170.5, 1.2 **Determination of earthquake actions**.

~	Building type, importance level (to AS/NZS 1170.0, table 3.2)

Archaeological discovery

1.12 REPORT FINDING ANY ANTIQUITIES AND ITEMS OF VALUE

Report the finding of any fossils, antiquities and other items of value, to the Contract Administrator. All to remain undisturbed until approval is given for removal.

Pre-1900, items or evidence of human activity on the site, come under the Heritage New Zealand Pouhere Taonga Act 2014. If such items or evidence is discovered work must stop immediately and the Contract Administrator must be notified immediately. The site may be classified as an Archaeological Site under the Act, and the Contract Administrator or Owner must contact the Heritage New Zealand for authority to proceed.

Post-1900 items remain the property of the owner, pre-1900 items may remain the property of the owner or the Crown subject to what is found.
Known archaeological information relating to this site includes the following: -
~

1233 REFERENCED DOCUMENTS

1 GENERAL

1.1 REFERENCED DOCUMENTS

Throughout this specification, reference is made to various New Zealand Building Code Compliance Documents (NZBC), acceptable solutions and verification methods. For criteria and/or methods used to establish compliance with the New Zealand Building Code.

Reference is also made to various standards produced by Standards New Zealand (NZS, AS/NZS, NZS/AS), overseas standards and to listed Acts, Regulations and various industry codes of practice and practice guides. The latest edition (including amendments and provisional editions) at the date of this specification applies unless stated otherwise.

It is the responsibility of the contractor to be familiar with the materials and expert in the techniques quoted in these publications.

Documents cited both directly and within other cited publications are deemed to form part of this specification. However, this specification takes precedence in the event of it being at variance with the cited documents.

1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

NZBC F5/AS1	Construction and demolition hazards
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 3012	Electrical installations - Construction and demolition sites
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 4781	Code of Practice for Safety in Welding and Cutting
AS/NZS 5131	Structural steelwork - Fabrication and erection
NZS 6803	Acoustics - Construction Noise

Building Act 2004
Building Regulations 1992
Health and Safety at Work Act 2015
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
Health and Safety at Work (Hazardous Substances) Regulations 2017
Health and Safety in Employment Regulations 1995
New Zealand Building Code
Heritage New Zealand Pouhere Taonga Act 2014
Resource Management Act 1991
Smoke-free Environments Act 1990

WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe	Good Practice Guidelines - Excavation Safety
WorkSafe	Scaffolding in New Zealand - Good Practice Guidelines
WorkSafe	Managing Work Site Traffic - Good Practice Guidelines

1240 ESTABLISHMENT

1 GENERAL

This general section relates to site establishment including:

- Notices and approvals
- Inspections
- Site preparation
- Temporary construction

Notices and approvals

1.1 STATUTORY OBLIGATIONS

Comply with all statutory obligations and regulations of regulatory bodies controlling the execution of the works.

1.2 BUILDING CONSENT AUTHORITY AND NETWORK UTILITY APPROVALS

Attend on building consent authority officers, statutory and network utility inspectors, as necessary to obtain approvals, including those required for the completion of the works.

1.3 NOTIFY NETWORK UTILITY OPERATORS

Notify all network utility operators of proposed works before commencing site operations. Ascertain location of services or confirm that none exist in the vicinity of the works. Take all necessary precautions to avoid damage to existing services.

Inspections

1.4 CARRY OUT INSPECTIONS

AS PER GEOTECHNICAL REPORT

Site preparation

1.5 SITE ACCESS

Access to the site is limited to: NO LIMIT

1.6 WORKING AREA

Limited to the following designated working areas on the site:
NO LIMIT

1.7 SITE AND SOIL SURVEYS

Carry out all investigations necessary and peruse all information available to determine ground conditions and likely ground performance both on the site and adjacent to it. Also refer to the territorial authority project information memorandum (PIM).

1.8 GROUND CONDITIONS

Refer to the geotechnical / soils report included with this specification.

Temporary construction

1.9 TEMPORARY BUILDINGS

Provide as necessary temporary sheds, offices, lunch rooms, sanitary accommodation and other temporary buildings required for storage, management of the works, for the use of workers while on site and as required by Acts and Regulations.

1.10 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

First aid

1.11 FIRST AID EQUIPMENT

Provide first aid equipment.

1250 TEMPORARY WORKS & SERVICES

1 GENERAL

This general section relates to temporary works and services required for the construction of the contract works. It includes

- Temporary works and services including temporary fencing and hoardings
- Scaffolding
- General care and protection
- Rubbish removal

Temporary works

1.1 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.2 MAINTENANCE OF TEMPORARY WORKS

Maintain alter, adapt and move temporary works and services as necessary. Clear away when no longer required and make good.

1.3 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

Take reasonable precautions to prevent unauthorised access, including access outside working hours, to the site, the works and adjoining property. Safeguard the site, the works, materials and plant from damage and theft.

1.4 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

Provide appropriate measures to prevent or minimise sediment generation and silt run off. Comply with territorial and other authority requirements relating to carrying out earthworks.
Prevent silt run off by:

- exposing only as much ground as required at any time
- providing run off channels, contour drains or earth bunds to divert clean water away from the site on to stable sealed or grassed ground
- capture silt by the use of silt fences, vegetation buffer strips, sediment ponds or earth bunds.

Provide sediment control by:

- earth bunds constructed across the slope to control and detain run off
- silt fences constructed using filter fabric stretched between posts at a maximum of 1 metre spacing.

Pump water from trenches and other areas of the site using methods to prevent sediment entering any drain or watercourse. Filter dirty water before discharging into drainage system.

1.5 PROVIDE CONCRETE WASHWATER RUN OFF PROTECTION

Provide appropriate measures to prevent cement/concrete washwater or slurry run off to; drains or waterways, landscaped areas new or remaining and adjoining public or private properties. Comply with territorial and other authority requirements relating to cement/concrete washwater.

Control run off from:

- Cement/concrete based material production, placing and finishing.
- Hosing down and cleaning of, tools and equipment, fresh material, and spilt or surplus material, pumps and mixers etc.
- Wet cutting or grinding.
- Slab watering etc.
- Water cleaning of new concrete elements, fresh used formwork etc.

Small project with relatively large exposed ground areas - prevent run off by:

- directing small amounts of washwater onto the area of ground closest to the work.
- for larger amounts provide run off channels, and small soak pits
- very small amounts of washwater with no aggregate and only a small amount of sand may be spread over existing lawns.

Large project and those without suitable ground area - prevent run off by:

- plan and implement washwater control measures based on the expected volumes, allow for the timely removal and safe disposal of liquids and solids.

- Limit the volume of water used for washing down to the extent required.
- Control the flow of washwater so that it is directed to proper catchments.
- providing watertight bunds, pits or tanks, filtered washwater is not to be discharged to drains.

Spilt or surplus material:

- if possible allow to set and either use or dispose of as hardfill.
- pre-made concrete items, either use or dispose of as hardfill.

Pump washwater away from drains, waterways and adjoining property.

1.6 EXCAVATION SAFETY

To the Health and Safety at Work Act 2015.
Carry out excavation to WorkSafe, Good Practice Guidelines - Excavation Safety. This may include deep excavation, trenching, and areas behind unfilled retaining walls.
Carry out excavation using plant and equipment suitable for the purpose.

Temporary services

1.7 WATER

Provide clean, fresh water for the works and make arrangements for distributing about the site.

1.8 ELECTRICITY

To AS/NZS 3012.
Nominate the person to install and be responsible for the complete temporary electrical installation. The name and designation of the person responsible is to be displayed prominently and close to the main switch or circuit breaker.

Inspect and overhaul the installation at such intervals as are prescribed by the network utility operator but not more than three monthly intervals.

1.9 TELEPHONE

Provide on-site temporary telephone facilities.

1.10 COMPUTER FACILITIES

Provide on-site temporary computer facilities complete with an email and internet connection capable of sending, receiving and printing site communications.

1.11 PRINTER

Provide on-site temporary printing facilities capable of printing A4 and A3 colour prints.

1.12 IMAGING

Keep available devices able to take and send quality printable digital photographs.

Care and protection - Site

1.13 LOCATE AND PROTECT SURVEY MARKS

Review information provided relating to survey marks. Physically locate and protect survey marks. Where required use a licensed cadastral surveyor to reinstate survey marks disturbed during construction.

1.14 LOCATE EXISTING SERVICES

Review information provided relating to underground and above ground services. Physically locate the position of all such services. Arrange with the network utility operator for all necessary exploratory work, location, protection, isolation, off-setting, reinstatement or alterations required. Record any alterations made to such utilities.

1.15 PROTECT EXISTING SERVICES

Protect existing services and parts of service systems, whether indicated or not, that are to remain in place during the execution of the works. Provide temporary caps or covers to prevent the ingress of dust and other contaminants into the systems, ducts, pipes etc. Reinstate where required and repair any damage resulting from carrying out the contract works.

1.16 PROTECT EXISTING LANDSCAPE ELEMENTS

Protect existing trees, fences, gates, walls, gardens and other designated landscape features which are to remain in position during the execution of the works. Construct a temporary fence at the outer edge of the drip line of trees to be protected. Comply with territorial authority requirements.

1.17 MAKE GOOD - SITE

Make good all damage to existing roads, footpaths, grounds, services, landscape elements and site features caused in carrying out the contract works.

Care and protection - Project

1.18 TEMPORARY PROTECTION

Provide and maintain temporary protection as required to protect products during transport, storage and handling. Provide temporary protection as required to protect the work in progress and the finished work. Refer to 1270 CONSTRUCTION for removal of protection.

1.19 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

1.20 SPECIAL PROTECTION PROJECT

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Care and protection - miscellaneous

1.21 CONSTRUCTION KEYING AND SECURITY

Provide locksets with temporary keying, or install with the cylinders removed.

1.22 TEMPORARY STORAGE

Provide temporary storage areas and protective covers and screens to meet the requirements of the products to be stored.

Rubbish removal

1.23 PERIODIC RUBBISH REMOVAL

Maintain on site appropriate means for the storage and removal of construction waste material. Where required or appropriate provide for the separate storage of recyclable waste and other materials requiring special disposal.

1260 PROJECT MANAGEMENT

1 GENERAL

This general section relates to project management requirements including:

- Meetings
- Reporting
- Cost control
- Communicating and records
- Confidentiality
- Programming
- Hold points and notification points
- Working hours
- Health and safety

Site Meetings TO BE AGREED

1.1 PURPOSE OF SITE MEETINGS

The purpose of site meetings is to:

- Ensure that the Contractor has all information required to construct the work
- To address and clarify aspects of construction of the work including quality
- To address issues relating to project delivery including, site progress and cost.

1.2 SITE MEETING ATTENDANCE

The following persons to attend:

- TO BE AGREED (MIN. ENGINEER AND CONTRACTOR)

1.3 REPORTING

The following reports are required to be presented at site meetings:
Contractor: A detailed status report

1.4 SITE MEETING MINUTES

The contract administrator is to keep full minutes of all site meetings and arrange distribution to all those involved within 3 working days.

The minutes are to record

- Documentation and information issued and required
- Directions and variations issued
- Confirmation of contract insurances
- Programme items
- General business
- Site health and safety
- Payment claim processing including costing variations

Design meetings

1.5 PURPOSE OF DESIGN MEETINGS

The purpose of design meetings is to:

- consider matters arising from design by the contractor in relation to parts of the work being carried out on a design build or performance specification basis by the contractor.
- review and assess design aspects of such work on other designed parts of the work.
- provide value engineering advice on parts of the work where design changes are required or are being considered to meet the project financial performance requirements.

1.6 DESIGN MEETING ATTENDANCE

The following persons to attend:

- Principal
- Contract administrator
- Project manager
- Contractor
- Architect
- Designer
- Engineer

- Quantity surveyor
- Other consultants

1.7 DESIGN MEETING MINUTES

The designated design manager is to keep full minutes of all design meetings and arrange distribution to all those involved within 5 working days.

Reporting

1.8 CONTRACTORS DETAILED STATUS REPORT

A contractor's detailed status report is to address the following:

- Progress performance, addressing actual progress against the programme and any variance from the programme.
- Procurement progress on parts of the work being undertaken under a monetary allowance including the time by which direction must be given on monetary allowances to conform to the programme.
- Details of measures being taken to get work back on programme where there has been a delay and details of any future events that will or are likely to affect compliance with the programme.
- Compliance with the issued Building Consent and notification of any work or inspections that have not been passed by the BCA inspector.
- Compliance with the issued Resource Consent and any compliance issues.
- Site health and safety including any notifiable incidents.
- Details of any discrepancies in the contract documents that require clarification or determination
- A list of information requests by the contractor, the date when they were made, the person who they were directed to and the date by which a response is required.
- A variation report including progress on agreed variations, variations to be agreed and anticipated variations and the time implication of variations.
- Variation costing and the adjusted contract price including an assessment of the cost of known and potential variations.
- Review of sums not yet directed for expenditure.

Cash flow estimates

1.9 CASH FLOW ESTIMATES

The contractor is required to submit to the contract administrator a detailed cash flow estimate of all payments to which the contractor considers they will be entitled to under the contract. Where no time is stated in the conditions of contract, provide the cash flow estimate within 20 working days of the date of award of the contract. The contractor shall subsequently submit such revised cash flow estimates at 3 month intervals.

Cost control

1.10 MEASUREMENT

Give reasonable notice to the contract administrator before covering up work which requires to be measured.

1.11 DAYWORK VOUCHERS

To be signed by the contractor's representative as confirming the labour, times and materials used, before being supplied to the contract administrator.

Communicating and records

1.12 MEANS OF COMMUNICATION

Communications between the parties shall be as follows: -

Directions:	In writing delivered by email with a copy by post or hand
Meeting minutes:	In writing delivered by email
RFI's:	(Requests for information) by email or in writing to the contract administrator

1.13 DELIVERY OF COMMUNICATIONS

Deliver communications to the addresses listed in the contract agreement by means as allowed. Where such addresses are not included in the contract agreement:

- deliver to the addressee by hand; or

- post to the postal address stated in the project directory; or
- deliver to the street address as stated in the Project Directory; or
- send by email to the email address stated in the Project Directory; or
- where agreed, deliver via a file hosting service or an electronic project management system.

1.14 SERVICE OF NOTICES

Serve notices to the addresses listed in the contract agreement by means as allowed.

1.15 CHANGE OF ADDRESS

The principal, contractor and the contract administrator must notify the others if they change their address for delivery or transmission of communications.

1.16 RECORDS

Ensure all records specified are kept, held and collated on site in a form that makes the information easily accessible when it is needed. Distribute copies as and when necessary to those persons entitled under the contract to that information.

1.17 PROGRESS PHOTOGRAPHS

Take digital photographs recording progress. Refer to SELECTIONS.

Confidentiality

1.18 CONFIDENTIALITY - PUBLICITY

Unless specifically agreed photographs and other images of the work are not to be used by the contractor, subcontractors, material suppliers and others involved in the construction of the works.

Photographs taken for record purposes may be kept but must not be passed to other persons.

1.19 CONFIDENTIALITY AGREEMENT

Where required as a condition of the contract arrange for workers to provide a confidentially agreement. Workers who have not provided such an agreement shall be excluded from the site.

Programming

1.20 PROGRAMME

Include the proposed sequence of all significant on-site and off-site activities, including any intermediate key dates mentioned in the contract. Identify the critical path. Provide a tabulated schedule of information for each activity in order of:

- brief description
- duration in suitable time unit
- earliest start and latest finish time
- total float
- key dates for the supply of information or materials by others.

Identify the dates by which particular information, material or plant need to be supplied or arranged by the contract administrator. Also identify any constraints which may have been imposed by the programme.

Supply copies of the programme to the following:

Contract administrator	1
Architect	1
Designer	1
Principal	1
Quantity surveyor	1
Site supervisor	1

Monitor the programme by:

- recording progress regularly on the site chart
- informing the contract administrator promptly of any circumstances affecting any part of the programme structure and timing
- reviewing the programme once a month making alterations as needed and agreed to and re-issuing the required copies.

Hold Points and Notification Points

Refer to section 1232 INTERPRETATION & DEFINITIONS for definition of hold points and notification points.

1.21 HOLD POINTS

The following hold points are in addition to hold points nominated in work sections. Notify of hold point work/item, do not to proceed further with work/item until advised to continue.

Notify: Contract administrator
Notification: 2 working days prior to work/item being carried out.

Hold Point Schedule

Location	Hold Point	Requirement
SITE	EXCAVATIONS	TO BE CHECKED BY GEOTECHNICAL ENGINEER
SITE	PILING	BEFORE COMMENCEMENT TO APPROVE LOCATION

1.22 NOTIFICATION POINTS

The following notification points are in addition to notification points nominated in work sections. Notify of notification point work/item, continue with the work/item and subsequent work unless advised otherwise.

Notify: Contract administrator
Notification: 2 working days prior to work/item being carried out.

Notification Point Schedule

Location	Notification Point	Requirement
SITE	BEFORE WORK STARTS	DAILY
~	~	~

Working hours

1.23 WORKING HOURS

Work on site is not restricted. Comply with territorial authority consent conditions and noise and nuisance controls.

Health and safety

1.24 HEALTH AND SAFETY LEGISLATION

Refer to the requirements of the Health and Safety at Work Act 2015. Comply also with all other relevant New Zealand safety legislation.

The Contractor will ensure, so far as is reasonably practicable, that, each subcontractor they engage and each separate contractor is aware of and complies with its obligations under health and safety-related law.

For the purpose of health and safety-related law, the contract administrator and others involved in contract administration and observation and construction monitoring will not at any time have management or control of the Workplace.

1.25 HEALTH AND SAFETY REGULATIONS, CODES AND GUIDES

Comply with:

- Relevant New Zealand safety legislation including, Health and Safety at Work (General Risk and Workplace Management) Regulations 2016, also Health and Safety in Employment Regulations 1995 as amended by that Regulation and the appropriate Health and Safety at Work Regulations.
- WorkSafe publications including "Guidelines for the provision of facilities for general safety in the construction industry".
- Relevant codes of practice, guides, guidelines and standards.

Until further regulations are made under the Health and Safety at Work Act 2015 to cover them, the transitional provisions of the Act continue in force until revoked or amended.

1.26 HEALTH AND SAFETY IMPLEMENTATION

Take all practical steps to make the site and the contract works safe and to provide and maintain a safe working environment. Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards and risks.

Co-operate, consult and co-ordinate health and safety matters with each PCBU including all subcontractors, suppliers, separate contractors, others engaged on the project and others who may be affected by the construction of the works.

Identify any significant hazards and risks.

Maintain proper procedures for dealing with any emergencies that may arise. Immediately investigate accidents, identify their cause and maintain a register of accidents and serious harm. Provide a copy of any report which the contractor is required to make to a public authority on any accident which is associated with carrying out the contract works and results in serious harm to any person.

Refer to individual work sections for detailed requirements on this project.

1.27 SUSPENSION OF HAZARDOUS WORK

On the request of the contract administrator, acting on reasonable grounds, suspend any identified hazardous activities and proceed to eliminate, isolate or minimise them in order to comply with the Act, without prejudice to any other rights of the principal under the contract.

1.28 SITE SAFETY PERSON

Appoint a suitably qualified site safety person to co-ordinate site safety and to attend all site meetings.

1.29 HEALTH AND SAFETY PLAN

Prepare and submit a health and safety plan to the contract administrator before commencing work on site. Include in that plan all people on site and the general public, as well as the following items and any other necessary items:

- identification of existing and potential construction hazards and risks
- Any design construction safety matters identified in section 1220 PROJECT and/or any separate project design construction safety report.
- safety procedures to eliminate, isolate or minimise construction hazards and risks
- the equipment to be used to minimise the hazards and risks
- the maintenance of a register of hazards and risks for the site
- the name and qualifications of the site safety person
- emergency procedures
- first aid facilities and safety equipment
- the methodology for notifying, recording and investigating accidents and injuries.

Advise the contract administrator of unusual or atypical features in the Plan in addition to any features already identified in section 1220 PROJECT and/or any separate project design construction safety report. Keep a copy of the plan in the site office.

1.30 MAINTAIN HEALTH AND SAFETY PLAN

Maintain health and safety plan and alter to accommodate changing situations and /or substitutions. Advise contract administrator of changes.

1.31 COMPLY WITH SITE SAFETY PLAN

Carry out all construction operations in accordance with the submitted health and safety plan.

1.32 INFORM WORKERS OF HAZARDS AND RISKS

Inform workers and others on the site of:

- hazards and risks they may be exposed to while working or other legitimate activities
- hazards and risks they may create while working which could harm others
- how these hazards and risks may be minimised
- emergency procedures
- the location of first aid facilities and safety equipment.

1.33 EXPLOSIVES

Do not use explosives except with the written approval of the territorial authority/WorkSafe. Comply with their safety requirements and use construction blasters holding a current, appropriate Approved Handler Certificate and Controlled Substance Licence issued by WorkSafe, to the Health and Safety at Work (Hazardous Substances) Regulations.

1.34 POWDER-ACTUATED FASTENING TOOLS

Comply with the requirements of WorkSafe and the Health and Safety at Work Act 2015. Powder-actuated fastening tool operators to have the appropriate current Certificate and/or Licence and tools to have the appropriate certificate of fitness if necessary.

2 SELECTIONS

Meetings

2.1 SITE MEETINGS

Frequency:	WHEN REQUIRED
Start date:	TBA
Time:	TBA
Venue:	SITE
Convener:	TBA

2.2 DESIGN MEETINGS

Frequency:	WHEN REQUIRED
Start date:	TBA
Time:	TBA
Venue:	TBA
Convener:	TBA

Photographs

2.3 PROGRESS PHOTOGRAPHS

Position:	~
Frequency:	~
Copies required:	~
Recipient:	~

1270 CONSTRUCTION

1 GENERAL

This GENERAL section relates to common requirements for construction issues including:

- Quality control and assurance
- Noise and nuisance
- Set-out and tolerances
- Common execution requirements
- Qualifications
- Common product requirements
- Common requirements for samples and prototypes
- Common requirements for spare and maintenance products
- Cleaning during the works
- Removal of protection
- Completion requirements
- Commissioning
- Practical completion submission
- Defects period submissions
- Completion submissions

1.1 SCHEDULE SECTION

Refer to 1270S1 SCHEDULE OF SAMPLES & PROTOTYPES for work sections contained in this specification that have requirements for samples and prototypes.

Refer to 1270S2 SCHEDULE OF SPARES & MAINTENANCE PRODUCTS for work sections contained in this specification that have requirements for spares and maintenance products.

Quality control and assurance

1.2 QUALITY ASSURANCE

Carry out and record regular checks of material quality and accuracy, including:

- Concrete quality and finish.
- Dimensional accuracy of structural column locations (following completion of foundations).
- All perimeter columns and frames for plumb.
- Levels of all floors relative to the site datum.
- Framing timber moisture content.

Where any material, quality or dimension falls outside specified or required tolerances, obtain written direction from the contract administrator. Where building consent approval is affected, confirm remedial action with the Building Consent Authority.

Provide all materials, plant, attendances, supervision, inspections and programming to ensure the required quality standards are met by all project personnel.

1.3 PROVIDE QUALITY PLAN

Prepare a quality plan for the execution of the contract works and submit a copy of the quality plan to the Contract Administrator within 10 Working Days of the date of award of the contract. The quality plan shall describe the procedures for meeting the requirements of the contract in respect of:

- Materials and workmanship
- Monitoring and maintaining subcontractors' performance
- Record keeping
- The level of documentation for signing off the contract works as complete
- Procedures to ensure that all persons engaged in undertaking the contract works are qualified, experienced and trained for the work they are undertaking
- Inspection and testing required by the contract
- Auditing the quality plan

1.4 REVIEW OF QUALITY PLAN

Within 5 working days of the contractor submitting a quality plan to the contract administrator for review, the contract administrator may advise that:

- they have completed their final review, or
- that they have undertaken a review and require resubmission of the quality plan.

Review by the contract administrator of the quality plan does not make the quality plan a contract document. The contractor at all times remains responsible for the construction of the Works. If resubmission of a quality plan is required, the contract administrator will give their reasons. The contractor shall take account of the reasons and resubmit a revised quality plan within a period of 5 working days.

1.5 COMMENCEMENT OF WORK

Do not commence any part of the contract works, other than establishment, setting out and site preparation until the contract administrator has completed their final review of the quality plan.

1.6 NOTICE

Give notice to the contract administrator and any other nominated person of hold points and notification points. Refer to work sections and 1260 PROJECT MANAGEMENT for hold points and notification points required.

1.7 NOTIFIABLE WORK

Lodge notice of the intention to commence any notifiable work and any work that will at any time include any notifiable work, in accordance with Health and Safety in Employment Regulations 1995.

Noise and nuisance

1.8 LIMIT CONSTRUCTION NOISE

Minimise the effects of noise generation by including in the planning of the work such factors as placing of plant, programming the sequence of operations and other management functions. Limit construction noise to comply with the requirements of NZS 6803, the requirements of the Resource Management Act sections 326, 327 and 328 and the Health and Safety in Employment Regulations 1995 clause 11.

1.9 ACCEPTABLE NOISE LEVELS

Refer to NZS 6803 Tables 2 and 3 for the upper limits of construction work noise received in residential zones, dwellings in rural areas, industrial areas and commercial areas, note also the allowed adjustments. Do not exceed these limits or any limits imposed by regional councils or territorial authorities.

1.10 PROVIDE INFORMATION TO NEIGHBOURS

Provide information to neighbours of any noise generation from the site liable to constitute a problem. Explain to them the means being used to minimise excessive noise and establish with them the timings most suitable for the noise generating work to be carried on.

Discuss with any complainant the measures being used to minimise noise. Where possible modify these measures to accommodate particular circumstances. Finally, determine the sound level at the location under discussion using methods and observation reporting as laid down in NZS 6803. If the noise level is above the upper limits of NZS 6803, table 2 and table 3, cease the noise generating operation and remedy the problem.

1.11 ROADWAY AND FOOTPATH

Keep the adjacent footpath and road clear at all times. Where work must be carried out in the roadway or footpath, obtain required consents from the territorial authority. Where temporary use is made of the footpath or roadway for deliveries and the like ensure that public safety is protected and the goods and materials moved as soon as practicable. Sweep, wash and otherwise clean the roadway/footpath and restore it to its previous condition.

1.12 VEHICLE CROSSING

Make good damage that has occurred as a result of carrying out the contract works. Where there has been significant damage, contact the territorial authority and obtain instructions for making good. Pay the territorial authority costs associated with making good.

1.13 TRAFFIC SAFETY

The management of traffic safety on-site and related traffic off-site, to WorkSafe Managing Work Site Traffic - Good Practice Guidelines. Movement on- and off-site also to territorial authority and/or NZTA requirements.

1.14 DIRT AND DROPPINGS

Remove dirt and droppings deposited on public or private thoroughfares from vehicles servicing the site to the satisfaction of the appropriate authorities and the contract administrator.

1.15 DAMAGE AND NUISANCE

Take precautions to prevent damage and nuisance from water, fire, smoke, dust, rubbish and all other causes resulting from the construction works.

1.16 SMOKE FREE REQUIREMENTS

In accordance with the Smoke Free Environments Act 1990 smoking is not allowed on site.

1.17 RESTRICTIONS

Do not:

- light rubbish fires on the site.
- bring dogs on to or near the site.
- bring radios/audio players on to the site.

Set-out and tolerances

1.18 SURVEY INFORMATION

Locate and verify survey marks and datum points required to set out the works. Where these do not exist or cannot be located advise the contract administrator who will arrange for the required points to be established.

Record and maintain their position. Re-establish and replace disturbed or obliterated marks.

1.19 DATUM

Establish a permanent site datum to confirm the proposed levels and their relationship to all other existing and new levels.

1.20 SET-OUT

Set out the work to conform with the drawings.

1.21 SET-OUT BY LICENSED CADASTRAL SURVEYOR

Before commencing construction provide the contract administrator with a certificate prepared by a licensed cadastral surveyor that the set-out is complete and that the building is accurately placed on the site.

During construction provide the contract administrator with a certificate, prepared by the same licensed cadastral surveyor confirming the set-out of the foundations and grid lines. Necessary adjustments are to be determined and agreed to by the contract administrator before proceeding further.

1.22 USE OF SET-OUT INSTRUMENTS

Permit without charge, the use of instruments already on site for checking, setting out and levels.

1.23 CHECK DIMENSIONS

Check all dimensions both on drawings and site, particularly the correlation between components and work in place. Take all dimensions on drawings to be between structural elements before linings or finishes, unless clearly stated otherwise.

1.24 TOLERANCES

All work to be level, plumb, and true to line and face. Unless otherwise specified in specific work sections of this specification, tolerances for structural work shall comply with the following:

Concrete construction:	To NZS 3109 Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To NZS 3114 Concrete surface finishes
Masonry construction:	To NZS 4210 Masonry construction: Materials and workmanship Clause 2.6.5 Tolerances Table 2.2 Maximum tolerances
Structural steelwork:	To NZS 3404.1 Steel structures standard Section 14.4 Tolerances (after fabrication) Section 15.3 Tolerances (erection)

Timber framing:	To NZS 3604 Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances

Refer to work sections for tolerance requirements for finishes.

Execution

1.25 EXAMINE PREVIOUS WORK

Before commencing any part of the work carefully examine the previous work on which it depends, to ensure it is of the required standard.

1.26 REPORT DEFECTIVE PREVIOUS WORK

Refer defects to the contractor to be remedied, if the remedy is outside the scope of the contract documents the contractor shall obtain direction from the contract administrator. Do not carry out work over previous work that is defective and will affect the required standard.

1.27 EXECUTION GENERALLY

Construct the work in accordance with the documents issued for construction including any direction that may have been given by the contract administrator that varies the construction document.

1.28 EXECUTION - NO DETAIL IS PROVIDED

The documents issued for construction will not include all details relating to every material, junction and interface with other materials.

Where the detail provided is of a general nature, or where no detail is provided, refer to the manufacturer's documents for information relating to installation and execution of that part of the work.

Where there is more than one method or detail appropriate to the part of the work in question, refer the options to the Contract Administrator for direction as to which detail or method to use.

1.29 EXECUTION - ACCEPTABLE SOLUTION IS REFERRED TO

Where a NZBC Acceptable Solution is referred to in the specification but not shown on the plans, obtain a copy of that Acceptable Solution and make it available to the workers carrying out that part of the work.

1.30 MINIMISE DELAYS DUE TO WEATHER

Use appropriate techniques and methods to prevent damage and minimise delays due to weather.

Defective or damaged work

1.31 DEFECTIVE OR DAMAGED WORK

Repair defective, damaged and marked elements, or replace them where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Refer to individual work sections for any special requirements.

Hot work - fire safety

1.32 HOT WORK

Generally, to NZS 4781 Code of Practice for Safety in Welding and Cutting, includes but not limited to: Welding; flame cutting; disc cutting; grinding; bitumen blowers; blow lamps; brazing; burning off; soldering; use of hot air guns.
Note - where the standard refers to the use of asbestos, alternative fire-resistant materials are to be used.

1.33 COMBUSTIBLE MATERIAL

Manage fire risk to adjacent combustible materials by isolating hot work at a safe distance away, or store combustible materials away from fire hazards. Additional precautions may be necessary if combustible material cannot be separated from hot work, refer to NZS 4781, 6.1.4.

1.34 HOT WORK PERMIT

A hot work permit, issued by the main contractor, is required when it is not possible to isolate hot work from adjacent fire hazards. Refer to example in NZS 4781, Appendix A.

1.35 FIRE SYSTEMS

Fire systems should remain operational where possible while welding or cutting work is performed. Where required, shield fire systems to NZS 4781 clause 6.4.

1.36 DURING SUSPENDED WORK

Maintain a fire watch at least 30-minutes after hot works are suspended e.g. during lunch breaks or overnight, to NZS 4781, clause 6.2.7.
For hot works in confined spaces, prevent potential ignition of flammable gases, to NZS 4781 clause 6.5.

Qualifications

1.37 QUALIFICATIONS GENERALLY

The work is to be carried out by workers and / or supervisors who are experienced, competent and familiar with the materials and the techniques specified. Workers must also be familiar with the manufacturers' and suppliers' installation and application instructions and standard details provided by them in relation to the use of the products for this project. If requested provide evidence of qualification / experience.

1.38 QUALIFICATIONS WORKERS – RESTRICTED BUILDING WORK

Where restricted building work (RBW) forms part of the contract works, workers, or supervisors of that work must be licensed building practitioners (LBP) holding current licenses for the particular restricted building work.
For rare instances where non-RBW also requires an LBP refer to individual work sections for details.

1.39 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Where required by a manufacturer or supplier, workers must be specifically trained /approved / accredited / registered / licensed / certified by them. Refer to individual work sections for details.

1.40 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Where workers and / or supervisors of work are required to be licensed, registered or similar under legislation, they must have a current license before they start the work and maintain currency until their part of the work has been completed and all documentation that is required has been provided.

1.41 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

Where workers and / or supervisors of work are required to be trained / licensed / certified or similar under industry rules or contractual requirements, they must have a current qualification before they start the work and maintain currency until their part of the work has been completed. Refer to individual work sections for details.

1.42 QUALIFICATIONS – PRODUCER STATEMENTS

Where producer statements are required for parts of the work, ensure that person is suitably qualified and authorized to issue such producer statements.

1.43 REPLACEMENT OF PERSON

Should it be necessary to replace a person, ensure that records of work, producer statements, warranties and the like required for the part of the work they have carried out are obtained.

Ensure that the replacement person takes responsibility for the work they carry out and that they are able to provide such records of work, producer statements, warranties and the like required as a condition of the contract and the building consent.

Products

1.44 NEW PRODUCTS

Products to be new unless stated otherwise, of the specified standard, and complying with all cited documents.

1.45 COMPATIBILITY OF PRODUCTS

Ensure all parts of a construction or finish are compatible and their individual use approved by the manufacturers and suppliers of other parts of the system. Source all parts of a system from a single manufacturer or supplier.

1.46 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Protect products during transit and delivery on site and / or off site. Reject and replace goods that are defective or damaged or will not provide the required finish.

Handle products carefully to avoid damage and distortion and in accordance with codes of practice and the manufacturer's or supplier's requirements. Avoid any contact with potentially damaging surfaces or conditions.

Store products to avoid visual damage, environmental damage, mechanical damage and distortion. Store in accordance with codes of practice and the product manufacturer's or supplier's requirements. Maintain the proper condition of any protective packaging, wrapping and support.

Refer to individual work sections for any special requirements.

1.47 SUBSTRATE CONDITIONS

Ensure substrate conditions are within the manufacturer's or supplier's stated guidelines both before and during the installation of any material, product or system. Obtain written instructions on the necessary action to rectify unsatisfactory conditions.

1.48 INSTALLING PRODUCTS

Install in accordance with the manufacturer's or supplier's technical literature. Ensure that all installers are familiar with the required substrate conditions and the manufacturer's or supplier's specified preparation, fixing and finishing techniques.

1.49 COMPLY WITH STANDARDS

Comply with the relevant and/or cited Standard for any material or component. Obtain certificates of compliance when requested by the contract administrator.

1.50 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.51 INCOMPATIBLE PRODUCTS

Separate incompatible materials and metals with separation layers, sleeves or gaskets of plastic film, bituminous felt or mastic or paint coatings, installed so that none are visible on exposed surfaces.

Samples

1.52 SAMPLES FOR REVIEW

Where specified in the work sections submit samples and any nominated supporting documentation to the named reviewer and notify the contract administrator of the submission. Where no person is named as the reviewer, submit to the contract administrator.

Samples for review may be described as a portable sample for review, portable control sample, fixed sample for review or fixed control sample. A portable sample refers to a sample that is easily movable, convenient for carrying. A fixed sample refers to a sample that is not portable. If the location of a fixed sample is not defined in the work section, obtain direction from the contract administrator.

For samples that are located on site, or by agreement with the contract administrator are located off site, notify the reviewer and contract administrator of their location and availability for review.

Timing for the provision and review of samples is to be included in the contract programme. Where no time is stated in a work section allow 10 working days for each review. Allow for such resubmission and further review as may be required. No extension of time will be allowed for resubmission and further review.

Obtain written instructions in relation to the samples from the contract administrator. Do not proceed further with related work items until advised to continue.

Samples may be incorporated in the finished work if confirmed in writing by the contract administrator, otherwise allow to completely remove any fixed samples. Remove from the site any rejected samples.

Refer to SAMPLES clauses in work sections for further detail.

1.53 CONTROL SAMPLES

Samples become control samples if an instruction is given by the contract administrator to that effect. Control samples will be used for comparison purposes throughout the contract. Control samples may be portable or fixed in place, refer to SAMPLES clauses in work sections for further detail.

Control samples that are to remain on site, or otherwise in the care of the contractor, are to be maintained in original condition.

If confirmed by the contract administrator, fixed control samples may be incorporated in the finished work, otherwise allow to remove fixed control samples from site when instructed by the contract administrator.

1.54 OTHER SAMPLE REQUIREMENTS

Where specified in the work sections obtain samples for the purposes described.

Prototypes

1.55 PROTOTYPES - TESTING

Where specified in the work sections provide and test prototypes. Timing for the provision, testing, disassembling, re-assembling, retesting and review of prototypes and test results is to be included in the contract programme. Where no time is stated in a work section allow 10 working days for each review of test results. Submit test results to the named reviewer and to the contract administrator. Where no person is named as the reviewer submit test results to the contract administrator.

Obtain written instructions in relation to the prototype from the contract administrator. Do not proceed further with related work items until advised to continue.

Refer to PROTOTYPES - TESTING clauses in work sections for further detail.

1.56 PROTOTYPES - REVIEW

Where specified in the work sections provide prototypes for review. Timing for the provision, disassembling, re-assembling and review of prototypes is to be included in the contract programme. Where no time is stated in a work section allow 10 working days for review by the named reviewer. Where no person is named as the reviewer notify the contract administrator for direction.

Obtain written instructions in relation to the prototype from the contract administrator. Do not proceed further with related work items until advised to continue.

Refer to PROTOTYPES - REVIEW clauses in work sections for further detail.

1.57 PROTOTYPES - GENERAL

Refer to the PROTOTYPES - TESTING and PROTOTYPES - REVIEW clauses in work section for details on what is to happen after the review and or testing of the prototype is complete. Where no information is provided refer to the contract administrator for direction.

Prototypes may become control samples if an instruction is given by the contract administrator to that effect.

Spares & maintenance products

1.58 SPARES & MAINTENANCE PRODUCTS

Collect, protect, package, label and store safely all spares and maintenance products specified in the work sections. Give the contract administrator an inventory of all spares and maintenance products.

If no instruction is given within a work section for the location of spares and maintenance products, then deliver to the owner ~.

If no instruction is given within a work section for timing in relation to the provision of spares and maintenance products, then provide at practical completion.

Refer to SPARES & MAINTENANCE PRODUCTS clauses in work sections for further detail.

Cleaning during the works

1.59 PERIODIC SITE CLEANING

Carry out periodic site cleaning during the contract period. Place waste material in appropriate storage pending removal from the site. Keep food waste separate from construction waste.

1.60 TRADE CLEANING

Keep the work area clean, remove of all debris, unused and temporary materials and elements from the site as work progresses and on completion. Refer to individual work sections for any specific requirements.

1.61 SPECIAL SITE CLEANING

~

Remove protection

1.62 REMOVE PROTECTION

Remove all temporary markings, labels, packaging and coverings to products unless instructed otherwise, or where they are required for protection.

Maintain temporary protection until removal is required by the manufacturer/supplier, the execution of the work or the requirements of individual work sections. Re-establish protection as necessary.

Remove temporary protection and special protection immediately prior to practical completion or before when there is no further risk of damage.

Refer to individual work sections for any special removal requirements.

Completion

1.63 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.64 LEAVE WORK

Leave work to the standard required for the following procedures.

1.65 COMPLETION - TESTS & CERTIFICATION

Carry out tests as detailed in the work sections. If testing identifies a failure to meet performance requirements, notify the contract administrator and any nominated recipient, identify and correct the cause of failure and repeat the test. Submit test results and certification documentation to the contract administrator and any nominated recipient.

1.66 REMOVE CONSTRUCTION WASTE

Remove all debris, unused materials and the like from the site. Arrange for material to be recycled to be collected or delivered to the recycler.

1.67 COMPLETE ALL SERVICES

Ensure all services are complete and operational, with all temporary labelling removed, required labelling fixed and service instructions provided.

1.68 CLEANING BY CONTRACTOR

Clear the contract works of all construction materials, waste, dirt and debris. Clean the contract works including:

- Wipe all surfaces to remove construction dust.
- Clean out service ducts and accessible concealed spaces.
- Clean out all gutters and rainwater heads.
- Wipe dust from both sides of glass. Take particular care when removing paint or cementitious materials to not damage the glass. Do not use metal scrappers that may damage the glass.
- Remove adhesive residue left by labels and other temporary protection/markings.
- Clean out the interior of all cabinetry.
- Wash down external concrete including driveways and concrete masonry. Take care when waterblasting to not cause damage to the surface or allow water to enter the building.
- Remove rubbish and building material from the area immediately adjacent to the contract works.

Commissioning

1.69 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.70 MOVING PARTS

Adjust, ease and lubricate all doors, windows, drawers, hardware, appliances, controls and all moving parts to give easy and efficient operation.

1.71 COMMISSIONING - TESTS & CERTIFICATION

Carry out tests as detailed in the work sections. If testing identifies a failure to meet performance requirements, notify the contract administrator and any nominated recipient, identify and correct the cause of failure and repeat the test. Submit test results and certification documentation to the contract administrator and any nominated recipient.

1.72 INSTRUCTION AND DEMONSTRATION

Provide instruction and demonstration to the owner/occupier to the extent that is listed below and as required for them to reasonably occupy and use the building. This is to include at least the following:

- Location and isolation of all services connections.
- Operation of all emergency systems.
- Locking and security arrangements.
- Operation of basic building services including lighting, heating, mechanical ventilation, air conditioning and security.
- Special cleaning requirements and procedures.
- Any other features that the owner/occupier needs to know about.

1.73 SECURITY AT COMPLETION

Remove any temporary lock cylinders and complete final keying prior to handing over keys to the principal on completion of the works. Leave the works secure with all accesses locked. Account for all keys/cards/codes and hand to the principal along with an itemised schedule, retaining a duplicate schedule signed by the principal as a receipt.

Practical completion submission

1.74 ADDITIONAL PRACTICAL COMPLETION INFORMATION

In addition to requirements in the contract and contained elsewhere in the specification provide the following information submissions for practical completion:

- All documents which the contractor has obtained on behalf of the owner/occupier.
- Information required by the owner/occupier to be able to use the building.
- Advice that NUO accounts in the contractor's name have been closed and as appropriate changed to be in the name of the owner/occupier.
- A list of persons to be contacted to carry out any emergency or remedial work including 24 hour/7 day contact details.

1.75 ADDITIONAL PRACTICAL COMPLETION REQUIREMENTS

Refer to the conditions of contract for the definition of practical completion and the conditions relating to practical completion.

In addition to the requirements in the contract, the following conditions also apply:

- ~

Defects period submissions

1.76 DEFECTS REMEDIATION - SUBMISSIONS

Provide the following at periods required by the contract administrator, where no period is stated, provide this information monthly:

- A copy of the contractor's check list identifying remaining defects and omissions to be completed recording progress made in completing and correcting the items.
- A copy of lists issued by the principal/employer identifying omissions and defects recording progress made in completing and correcting the items.
- A copy of lists issued by the contract administrator identifying omissions and minor defects recording progress made in completing and correcting the items.

Completion submissions

1.77 FINAL COMPLETION - SUBMISSIONS

In addition to requirements in the contract and contained elsewhere in the specification provide:

- Contractors advice that all defects have been corrected and omissions and deferred work

completed.
- All documents which the contractor has obtained on behalf of the owner/occupier.

2221 REMOVING VEGETATION

1 GENERAL

This section relates to the removal of vegetation, trees and shrubs in whole or in part, to the extent necessary to carry out the contract works.

Related work

1.1 RELATED SECTIONS

Refer to ~ for ~.

2 EXECUTION

Conditions

2.1 FIRES

Do not light rubbish fires on site.

2.2 REPORT

Report any survey pegs, bench marks and the like on any features, leaving them undisturbed until approval is given for removal.

Application

2.3 CUT DOWN AND REMOVE

Except for identified retained vegetation or features, cut down all growth, grub up all major roots and remove from the site. Identify perennial weeds to be removed. Where regrowth can occur from residual plant material, ensure all plant material (including roots) is completely removed. Dispose of safely at authorised refuse transfer station.

Completion

2.4 LEAVE

Leave work to the standard required by following procedures.

2.5 TAKE AWAY

Take away from the site all material resulting from clearance of the site, leaving it clear and tidy.

3 SELECTIONS

2241 EXCAVATION

1 GENERAL

This section relates to the excavating required for the building works, removing surface soils and the disposal of excavated material.

Related work

1.1 RELATED SECTIONS

Refer to ~ for ~.

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZS 4402	Methods of testing soils for civil engineering purposes
WorkSafe	Good Practice Guidelines - Excavation Safety

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

Requirements

1.3 ARCHAEOLOGICAL DISCOVERY

If fossils, antiquities and other items of value are found refer to the general section 1220 PROJECT for actions to be taken with archaeological discovery.

Performance

1.4 GROUND CONDITIONS

Foundation investigations and drilling have been carried out. Place your own interpretation on this information as no warranty is implied that the information is truly representative or complete. Make such extra investigations as considered necessary.

Copies of bore logs are ~.GEOTECHNICAL REPORT

1.5 PROOF DRILLING

Site bores already carried out indicate underlying layers of unsuitable material in certain areas. For the foundations designated on the plan, hand augered proof holes may be required to determine the extent of such material. Include for this work in programming and adjust against provisional quantities scheduled.

1.6 ACCESS FOR MACHINES

Determine working conditions and access for machines. Take into account the time of year, the nature of the ground and subsoil to be excavated, the ground water table and all matters influencing the carrying out of the work.

1.7 SAFE WORKING CONDITIONS

Provide safe working conditions and adequate support to excavations at all times to WorkSafe, Good Practice Guidelines - Excavation Safety. Cover holes and fence off trenches and banks.

1.8 FOUNDATION BEARING

Request written instructions if a natural bearing is:

- reached at a lesser depth or
- not reached at the depth shown on the drawings.

In made-up ground excavate down to a natural bearing. Remove unsuitable material that is exposed and replace with compacted backfill.

1.9 INSPECTION

Arrange for inspections and before placing any new work.

1.10 SITE MEASUREMENT, ROCK

Where rock is shown to be part of the site condition by the bore logs, all rock removed to be solid measured and the quantity recorded and agreed to in writing as the excavation proceeds.

1.11 SITE MEASUREMENT, OTHER FORMATIONS

If for any reason the excavations have to vary from the drawings, those affected to be solid measured and the quantity recorded and agreed to in writing as the excavation proceeds.

2 PRODUCTS

Materials

2.1 TOPSOIL

Weathered soil, with organic inclusions capable of supporting the growth of vegetation.

2.2 CUT MATERIAL

Consisting of sands, gravels, sedimentary materials, clays, scoria and similar deposits.

2.3 ROCK

Defined as material encountered in excavations which because of its size or position can be removed only by breaking up by explosives or mechanical plant such as jack hammers or percussion drills.

2.4 UNCONTROLLED FILL

Variable fill material placed with little or no compaction control.

2.5 EXCAVATED FILL

Material from other formations in the excavation which may be selected and approved as suitable for filling and complying with NZS 4402 by having grading and moisture content properties that will allow compaction to 95% of maximum density.

3 EXECUTION

Conditions

3.1 REPORT

Report any survey pegs, bench marks, and the like on any features, leaving them undisturbed until approval is given for removal.

3.2 COMPLY

Comply with the requirements of WorkSafe, Good Practice Guidelines - Excavation Safety.

3.3 WORK BY OTHERS

Before taking over work done on the site by others check all levels and conditions and report any discrepancies affecting further work.

3.4 EXISTING SERVICES AND FOUNDATIONS

Locate underground services and foundations before work is started. Any information provided regarding the location of these services and foundations is given from available records but with no guarantee of accuracy as regards alignment or depth. Furthermore no guarantee is given or implied that the information provided covers all existing services and foundations. Make good at no extra cost damage to existing services to the satisfaction of the appropriate network utility operator. Protect existing roads, footpaths, gutters, crossings etc from damage during work.

3.5 KEEP FREE OF WATER

Keep excavations free from water and keep water from excavations clear of other construction work.

3.6 TERRITORIAL AUTHORITY REQUIREMENTS

Obtain from the territorial authority requirements for the method of discharging water from the site.

3.7 FORM SUMPS

Form sumps outside the line of foundations and deep enough to drain excavations. Pump from sumps without disturbing excavations or any material in place.

3.8 SILT CONTROL

Undertake silt control measures required by territorial authorities and network utility operators in relation to design, location and discharge into the drainage system. REFER EARTHWORKS REPORT BY HAIGH WORKMAN LTD

Application

3.9 STRIP TOPSOIL

Strip topsoil carefully over the whole site and stockpile where directed on the site, on the prepared subgrade, for re-spreading at the completion of the contract.

3.10 STRIP TO SUBGRADE

Strip the soil over the whole site to form a subgrade generally, but at a minimum of 200mm below the original ground level. Leave the subgrade level, clear of all loose material and with no impediment for the excavation work.

3.11 DIVERT WATERWAYS

Temporarily divert as necessary all ditches, field drains and other waterways encountered during the excavations and reinstate to approval on completion.

3.12 DIVERT DRAINS AND SERVICE LINES

Divert services, drains and field drains encountered in the excavations to new routes clear of the building and reconnect to the requirements of the network utility operator.

3.13 BREAK OUT

Break out and remove old foundations, floor slabs, drains, manholes and septic tanks, seal up connections and remove contaminated soil. Grub out roots in excess of 75mm diameter to a minimum of 500mm below the bottom level of footings or paving. Backfill with selected excavated material, well rammed in layers.

Take special care when working close to retained trees and shrubs.

3.14 EXCAVATION GENERALLY

Excavate for pads, strip foundations and tie beams to the profiles and levels shown on the drawings. Allow clearance for working space and formwork as necessary. Trim to required profiles, falls and levels. If pouring against natural ground excavate an extra 25mm that side to provide 75mm minimum cover to reinforcement horizontally. Bench surface of sloping ground to receive filling. Use plant and equipment suitable for the purpose.

3.15 OVER EXCAVATION

Make good with well compacted backfill.

3.16 EXCAVATED BACKFILL

Stockpile selected excavated backfill on site where directed so that it does not impede continuing works until it is required.

Finishing

3.17 BATTERS, TEMPORARY PROTECTION

Protect batters with a change of level between crest and toe of more than 1.5 metres from weather erosion with a waterproof covering of either hessian and tar, or heavy duty black polythene sheet. Seal at joints and securely fix down at crest and toe. Maintain coverings in good condition until the ground is secured by permanent construction.

Completion

3.18 LEAVE

Leave work to the standard required by following procedures.

3.19 SURPLUS TOPSOIL

Remove unwanted stripped soil from the site continually as the work proceeds. Clean up continually any soil if dropped on footpaths or roads.

3.20 SURPLUS MATERIAL

Remove surplus excavated material from the site continually as the excavation proceeds. Clean up continually any excavated material dropped on footpaths or roads.

4 SELECTIONS

4.1 BORE LOGS

Copies of bore logs are ~. GEOTECHNICAL REPORT

2311 CAST IN PLACE CONCRETE PILING

1 GENERAL

This section relates to the casings for bored in situ concrete piling, including the use of withdrawn casings where necessary.

Related work

1.1 RELATED SECTIONS

Refer to 3112 REINFORCEMENT FOR CONCRETE for reinforcing.
Refer to 3121 CONCRETE PLACEMENT for concrete placement.
Refer to 3129 CONCRETE PRODUCTION for concrete production.

1.2 MANUFACTURE.R'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:
n/a
Copies of the above literature are available from ~
Web: ~
Email: ~
Telephone: ~
Facsimile: ~

2 PRODUCTS

Components

3 EXECUTION

Conditions

3.1 RECORDS

Maintain accurate records of all pile depths, founding conditions and concrete quantities used for piling.

3.2 ACCESS FOR MACHINES

Determine ease of access for machines, facilities and all matters influencing construction.

3.3 GROUND CONDITIONS

Foundation investigations and drilling have been carried out. Copies of bore logs are available for perusal and interpretation. As no guarantee is implied that the information is truly representative or complete, make such extra investigations as considered necessary.

3.4 DEPTH OF PILES

Arrange for inspections of each pile when founding depth has been reached.

3.5 ADJUSTMENT IN DEPTH

If ground conditions do not meet the design requirements, change the planned depth of piling to suit, as directed by the Engineer.

Application

3.6 EXCAVATED MATERIALS

Remove from the site material excavated from pile shafts.

3.7 PILE EXCAVATION

Remove loose material from the base of piles, and keep hole dry prior to concrete pour.

3.8 OVERBREAK

Fill overbreak in shafts with concrete.

3.9 POSITIONAL TOLERANCES FOR PILES

Construct piles to within a vertical tolerance of 1% of their length from true rake or plumb. Tolerances are non-cumulative.

3.10 TOLERANCES FOR RETAINING WALLS

Position piles in the plane of the wall as close as possible and cast to within 75mm of the dredge level. Construct piles to within a vertical tolerance of 1% of their length from true rake or plumb. Tolerances are non-cumulative.

3.11 NON-COMPLIANCE

Where non-compliance with tolerance requirements results in gaps between piles in the wall of greater than 75mm, infill between piles with mass concrete.

3.12 PUMPING

Provide sufficient pumping equipment to ensure dry excavations during inspection and concreting operations.

3.13 DISPOSAL OF WATER

Provide silt traps as necessary. Flush out drains used for water disposal on completion to ensure no silt build up occurs.

3.14 REINFORCEMENT GENERALLY

Comply with the EXECUTION clauses in 3112 REINFORCEMENT FOR CONCRETE.

3.15 REINFORCEMENT FABRICATION

Make up pile cages in one length with sufficient tying to prevent distortion during pitching. Provide additional stiffening rings welded to the main reinforcement if required for handling purposes.

3.16 REINFORCEMENT COVER

Maintain required cover for steel in bored piles. Use approved spacers to maintain cover during concreting.

3.17 PLACE CONCRETE

Comply with the EXECUTION clauses in 3121 CONCRETE PLACEMENT. Place concrete in one continuous operation. Pour this into a chute projecting down the centre of the pile to ensure concrete is placed without segregation. Vibrate concrete with immersion vibrators.

3.18 CUT OFF LEVEL

Finish concrete at 20mm above nominated cut off to provide for trimming back to remove laitance and any weak, poorly compacted concrete.

Completion

3.19 LEAVE

Leave work to the standard required by following procedures.

3.20 REMOVE

Remove all debris, unused materials and elements from the site.

4 SELECTIONS

3101 CONCRETE WORK - BASIC

1 GENERAL

This section relates to formwork, reinforcement, concrete mixes and the placing of concrete.

1.1 RELATED WORK

Refer to ~ for ~

1.2 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

ACRS	Australian Certification Authority for Reinforcing Steels - An independent certification scheme for reinforcing steel and structural steel, by product and manufacturer/processor. Certifies compliance with Australia/New Zealand Standards.

ACRS web site - www.steelcertification.com

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B1/AS1	Structure
NZBC E2/AS3	External moisture
AS 1366.3	Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 3101.1	Concrete structures standard
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
CCANZ CP 01	Code of practice for weathertight concrete and concrete masonry construction

Requirements

1.4 QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

1.5 STEEL REINFORCING COMPLIANCE

Steel reinforcing materials for concrete to AS/NZS 4671. Steel to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid (or equivalent) NZ S Mark or ACRS certificate for that type of steel. Confirm compliance and provide evidence if requested.

2 PRODUCTS

2.1 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.2 SPACERS AND CHAIRS

Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.

3 EXECUTION

3.1 HANDLE AND STORE

Handle and store reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat.

Ensure reinforcement is clean and remains clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.

3.2 FALSEWORK AND FORMWORK

Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Ensure timber or plywood used for formwork is non-staining to the set concrete.

Securely fix and brace formwork sufficiently to support loads and with joints and linings tight enough to prevent water loss. Do not use tie wires or rods unless approved in writing by the Contract Administrator. Unless detailed otherwise, provide a 19mm chamfer or fillet strip at all interior and exterior angles of beam and column forms. Mitre at intersections.

Water blast to clean formwork. Keep formwork wet before concrete is placed.

Unless detailed otherwise, set up soffit boxing for beams and slabs to provide a camber when forms are stripped, of 3mm rise for every 3 metres of total clear span.

3.3 CUT AND BEND REINFORCEMENT

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109: 3.3 Hooks and bends. Minimum radii of reinforcement bends to NZS 3109, table 3.1, Minimum radii of reinforcement bends. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.

3.4 ADJUSTMENTS

Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.

3.5 TOLERANCES, BENDING

To NZS 3109, 3.9, Tolerances for reinforcement.

3.6 SECURE REINFORCEMENT

Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums in NZS 3109, 3.6, Spacing of reinforcement.

3.7 LAPPED SPLICES

Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked.
Wire mesh laps to NZS 3101.1, lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).

3.8 EQUIPOTENTIAL BONDING REINFORCING

If it is a project requirement, ensure that reinforcing is electrically equipotential bonded (or at least conductor cable attached) before the concrete is poured. For bonded reinforcing ensure all reinforcing is interconnected with good contact at joints and tight conductive ties.

3.9 CASTING IN

Build in all grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required by all trades and as shown on the drawings, prior to pouring the concrete.

Do not use grounds exceeding 100mm in length. Location and form of conduits to be approved in writing by the Contract Administrator. Minimum cover 40mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar.

Form all pockets, chases and flashing grooves as required by all trades and as shown on the drawings.

Wrap all pipes embedded in concrete with tape to break the bond and to accommodate expansion. Do not embed pipes for conveying liquids exceeding a temperature of 50°C in concrete.

3.10 PRE-PLACEMENT INSPECTION

Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the Building Consent Authority.

3.11 SURFACE FINISHES

To NZS 3114, 105, Specification of finishes, as scheduled or as denoted on the drawings.

3.12 CONCRETE SURFACE TOLERANCES

To NZS 3114, 104, Surface tolerances and NZS 3114, 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

3.13 PUMPING CONCRETE

Set up and supervise pump operation, placing and compaction of the mix to NZS 3109, 7.4, Handling and placing and NZS 3109, 7.6, Compaction Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.

3.14 COMPACTION

Use power operated vibrators on foundations, vertical constructions and beams.

3.15 SURFACE DEFECTS

Make good surface defects immediately after forms are stripped. Make good hollows or bony areas with 1:2 mortar or plaster, finished to the same tolerances as the parent concrete. Fill any tie rod holes with 1:2 mortar.

3.16 CURING OF CONCRETE

Keep damp for not less than seven days. Ensure curing of slabs commences as soon as possible after final finishing, by the use of continuous water sprays, or ponding. Alternately, apply a curing membrane. Ensure any membrane used will not affect subsequent applied finishes.

3.17 STRIKE FORMWORK

Strike formwork without damaging or overloading structure. Do not remove formwork before the following minimum periods:

12 hours:	Sides of beams, walls and columns
4 days:	Slabs in beam and slab construction (leave props under slab spans over 2 metres)
10 days:	Props from under slab spans over 2 metres
18 days:	Beams, soffits and slab spans over 5 metres

3.18 REMOVE

Remove all unused materials and all concrete and reinforcing debris from the site.

4 SELECTIONS

4.1 REINFORCEMENT LAPS

Where reinforcement laps are not shown on the drawings, lap as follows:

Bar diameter	Grade 300E deformed
10mm	400mm
12mm	500mm
16mm	650mm

3105 CONCRETE - COMMON REQUIREMENTS

1 GENERAL

This section deals with general matters relating to all aspects of concrete work.

1.1 RELATED WORK

Refer to 3111 FORMWORK FOR CONCRETE for formwork
Refer to 3112 REINFORCEMENT FOR CONCRETE for reinforcement
Refer to 3121 CONCRETE PLACEMENT for concrete placing
Refer to 3124 FINISHES TO WET CONCRETE for concrete finishing
Refer to 3129 CONCRETE PRODUCTION for concrete production

1.2 ABBREVIATIONS AND DEFINITIONS

The following abbreviation and definition apply specifically to this section:

ACRS:	Australasian Certification Authority for Reinforcing and Structural Steels - An independent certification scheme for reinforcing steel and structural steel. Certifies compliance with Australia/New Zealand Standards. Web site: www.steelcertification.com.
CNZ PAS	Concrete New Zealand Plant Audit Scheme - an independent audit scheme for the production of concrete which certifies compliance with NZS 3104 Specification of Concrete Production. Web site: http://rmcplantaudit.org.nz.

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B1/VM1	Structure
AS 1478.1	Chemical admixtures for concrete, mortar and grout - Admixtures for concrete
AS/NZS 1554.3	Structural steel welding - Welding of reinforcing steel
AS/NZS 2269.0	Plywood - Structural - Specifications
AS/NZS 3000	Electrical installations
NZS 3101.1	Concrete Structures Standard
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3111	Methods of test for water and aggregate for concrete
NZS 3112.1	Methods of test for concrete - Tests relating to fresh concrete
NZS 3114	Specification for concrete surface finishes
NZS 3121	Water and aggregate for concrete
NZS 3122	Specification for Portland and blended cements (General and special purpose)
NZS 3125	Specification for Portland-limestone filler cement
NZS 3604	Timber-framed buildings
NZS 3631	New Zealand timber grading rules
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4672.1	Steel prestressing materials - General requirements
AS/NZS 4672.2	Steel prestressing materials - Testing requirements
AS/NZS ISO 9001	Quality management systems - Requirements
Concrete NZ TR3	Alkali silicate reaction

Requirements

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 RECORDS

Retain the following records and make available to the contract administrator upon request:

- Mixing records
- Concrete delivery docket
- Reinforcing steel batch certificate
- Time, date, location and weather condition of each pour.

1.6 PRODUCER STATEMENTS

Provide Producer Statements where required by the Building Consent Authority and where required by this specification.

Performance

1.7 CONCRETE PRODUCTION COMPLIANCE

Concrete production and testing to comply with NZS 3104. Concrete to be supplied from a concrete batching plant holding a current quality Certificate of Audit provided by CNZ PAS Concrete NZ Plant Audit Scheme or an auditing engineer with credentials nominated in NZS 3104.

1.8 STEEL REINFORCING COMPLIANCE

Steel reinforcing and steel prestressing materials for concrete to AS/NZS 4671 or AS/NZS 4672.1, respectively. Steel reinforcing to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid (or equivalent) NZ S Mark or ACRS certificate for that type of steel.

Supplier to provide certification upon delivery that reinforcing steel complies with the grades specified on the drawings.

Steel that fails to meet these requirements is not to be used (or ordered) without the contract administrators written approval, further proof and/or testing may be required.

1.9 EQUIPOTENTIAL BONDING REINFORCING

If required by AS/NZS 3000 clause 5.6, ensure that reinforcing is electrically equipotential bonded (or at least conductor cable attached) before the concrete is poured. For bonded reinforcing ensure all reinforcing is interconnected with good contact at joints and tight conductive ties.

Quality control and assurance

1.10 CONCRETE ASSESSMENT - ON SITE

Where the quality of concrete supplied is in doubt, carry out concrete assessment during construction to NZS 3109: section 9, Concrete Assessment and NZS 3104 section 2.15 Control Tests and their Evaluation. Make all test records available.

1.11 CONSTRUCTION REVIEWER

Refer to 1222 PROJECT PERSONNEL for Construction Reviewer contact details or if not listed obtain from the Contract Administrator.

1.12 INSPECTIONS

Reviewer:	**Stage:**	**Hold/Notification Point:**
Construction reviewer	TBA	TBC with CONTRACTOR
~	~	~

1.13 QUALITY ASSURANCE

Carry out the whole of this work to the requirements of NZS 3109 and undertake quality assurance in accordance with requirements of AS/NZS ISO 9000 quality management system

Quality assurance procedures apply to all aspects of concrete construction including:

- Formwork construction
- Reinforcing steel placing
- Cast in items
- Concrete supply
- Concrete placing and compaction
- Concrete finishes
- Construction tolerances

3112 REINFORCEMENT FOR CONCRETE

1 GENERAL

This section relates to the supply, cutting, bending and fixing of steel bar and steel welded reinforcement for concrete.

1.1 RELATED WORK

Refer to 3105 CONCRETE COMMON REQUIREMENTS for general matters
Refer to 3111 FORMWORK FOR CONCRETE for formwork
Refer to 3121 CONCRETE PLACEMENT for concrete placing
Refer to 3129 CONCRETE PRODUCTION for concrete production

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are listed in 3105 CONCRETE COMMON REQUIREMENTS.

Requirements

1.3 SELECTIONS AND DIAGRAMS

Provide schedules and diagrams of bars and bar bending.

2 PRODUCTS

Materials

2.1 GRADE 500E STEEL

To AS/NZS 4671. Round bars shown by symbol "HR" and deformed bars by symbol "HD" followed by diameter in millimetres.

2.2 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

Components

2.3 SPACERS AND CHAIRS

Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

Handle and store all reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat.

3.2 DELIVER ALL BUNDLES

Deliver all bundles of steel to the site clearly marked or tagged with numbers relating them to the bending schedule and drawings.

3.3 CLEANLINESS

Keep reinforcement clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.

3.4 PROJECTING REINFORCEMENT

Protect projecting reinforcement from the weather where rust staining of exposed concrete surfaces may occur.
Protect and/or mark any projecting reinforcement where it provides a potential hazard to site personnel.

Assembly

3.5 CUT AND BEND

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3101.1, 8 and NZS 3109: 3.3 Hooks and bends. Minimum radii of reinforcement bends to NZS 3101.1, 8 and NZS 3109: table 3.1, Minimum radii of reinforcement bends. Do not rebend grade 500E bars. Where rebending is necessary for grade 300E bars, use a purpose built tool, proper preparation and preheating.

3.6 ADJUSTMENTS

Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.

3.7 TOLERANCES, BENDING

To NZS 3109: clause, 3.9 Tolerances for reinforcement.

Application

3.8 SECURE REINFORCEMENT

Secure reinforcement adequately with tying wire and place accurately, supported adequately and secured against displacement when concreting. Bend tying wire back well clear of the formwork.

3.9 SPACING

Spacing as dimensioned on the drawings but if not shown then the clear distance between parallel bars in a layer, or the distance between layers, or the spacing of other steel to the minimums laid down in NZS 3109: clause 3.6, Spacing of reinforcement.

3.10 TOLERANCES, SPACING

To NZS 3109: clause 3.9, Tolerances for reinforcement.

3.11 LAPPED SPLICES

Length of laps where not dimensioned on the drawings in accordance with NZS 3101.1, 8.7 **Splices in reinforcement**, refer SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked.

3.12 WELDED SPLICES

No Quench and Tempered (QT) reinforcing bar shall be welded or preheated. For Microalloy reinforcing bars, carry out only if either specified on the drawings or after written approval from the Construction reviewer and then to the requirements of AS/NZS 1554.3 and NZS 3109: clause 3.7.2, Welded splices, in respect of developed strength and location. Welds shall not be permitted at bends in bars, and welding shall be carried out so that no undercutting of bar sizes occur.

3.13 MECHANICAL SPLICES

Use only where shown on drawings. Use the appropriate sleeve size and length, swaged onto the bars using correct die and hydraulic press all to the manufacturer's requirements. Notify when ready for inspection and carry out tests if required.

3.14 STEEL SPACERS

Fix spacers between layers of wall reinforcement at 1.0 metre centres minimum.

3.15 REINFORCEMENT COVER TO NZS 3101.1

Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on drawings. Where cover is not shown on drawings provide minimum cover to NZS 3101.1, table 3.6, **Minimum required cover for a specified intended life of 50 years**. Sub-soil cover to NZS 3101.1, to suit soil and groundwater conditions. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to NZS 3109, 3.9, Tolerances for reinforcement.

3.16 TOLERANCES, COVER

Tolerances on cover relative to the values in NZS 3109: clause 3.9 Tolerances for reinforcement. Tolerances shall be +5mm all positions, but in no case shall cover be less than that shown on the drawings.

3.17 FIX CHAIRS

Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support.

3.18 CONCRETE SPACER BLOCKS

Where required in exposed concrete work, make from same materials and mix as the surrounding concrete.

3.19 WELDED WIRE FABRIC GENERALLY - LAPS

Laps to NZS 3101.1, lap one mesh square plus 50mm minimum (do not count bar extensions beyond the outermost wire). Tie all mesh sheets together at the laps.

Completion

3.20 REMOVE

Remove all debris, unused materials and elements from the site.

4 SELECTIONS

4.1 REINFORCEMENT LAPS

Where reinforcement laps are not shown on the drawings, lap as follows:

Bar Diameter	Grade 300E deformed	Grade 500E deformed
10mm	400mm	650mm
12mm	500mm	750mm
16mm	650mm	1000mm
20mm	800mm	1250mm
25mm	1000mm	1600mm
32mm	1200mm	2000mm

3121 CONCRETE PLACEMENT

1 GENERAL

This section relates to the handling, placing, finishing and curing of concrete.

1.1 RELATED SECTIONS

Refer to 3105 CONCRETE COMMON REQUIREMENTS for general matters
Refer to 3111 FORMWORK FOR CONCRETE for formwork
Refer to 3112 REINFORCEMENT FOR CONCRETE for reinforcement
Refer to 3124 FINISHES TO WET CONCRETE for concrete finishing
Refer to 3129 CONCRETE PRODUCTION for concrete production

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are listed in 3105 CONCRETE COMMON REQUIREMENTS.

2 PRODUCTS

Materials

2.1 CONCRETE MIXES

Refer to 3129 CONCRETE PRODUCTION.

Accessories

2.2 CEMENT GROUTS

Cement mixed with the minimum quantity of water to obtain a suitable consistency. Grout cement to NZS 3122. Use grout within 30 minutes of preparation.

Equipment

2.3 VIBRATION EQUIPMENT

Provide vibration equipment that meets requirements of NZS 3109.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.

3.4 INSPECTIONS BY BUILDING CONSENT AUTHORITY

Notify for inspection sufficiently in advance before placing concrete to allow for any necessary rectification of formwork, reinforcement and construction joints.

3.5 INSPECTIONS BY CONSTRUCTION REVIEWER

Submit Concrete pour schedule to the construction reviewer and re-submit amendments as necessary. Notify for inspection sufficiently in advance before placing concrete to allow for any necessary rectification of formwork, reinforcement and construction joints. Refer to 3105 CONCRETE COMMON REQUIREMENTS.

3.6 UNFAVOURABLE CONDITIONS

Do not place concrete in unfavourable conditions in accordance with NZS 3109: 7.2 Unfavourable conditions.

3.7 EXISTING WORK

Protect existing work from damage and make junctions to existing work as detailed.

3.8 PREPARATORY WORK

Ensure at the time of placing, that surfaces to receive the concrete are clean, free of debris and with no free water present. Ensure reinforcement, cast-in items and hardened concrete against which fresh concrete is laid are free from any release agent or other deleterious surface deposit.

3.9 WETTING OF TIMBER FORMWORK

Wet inside of timber forms with clean water immediately prior to placing concrete. Remove surplus water before concrete placement.

3.10 DEFECTS

Reject concrete with structural defects. Immediately after stripping formwork, identify all defects and obtain direction. Do not carry out any repair work until directed and then only in accordance with the direction. Repair defects by cutting out, making good and replacing, or otherwise as directed.

Application

3.11 CONSTRUCTION JOINTS

To NZS 3109: clause 5.6, Construction joints, Type B, unless directed otherwise for particular minor areas. Prepare joints to produce the required Type B roughened surface.

3.12 PROTECT CONCRETE WORK

Protect formwork, reinforcement, 'cast-in' items and fresh concrete from damage, as the concrete is placed, making good any damage if it occurs.

3.13 TRANSPORT CONCRETE

Transport concrete from agitator to final placement as quickly as possible using means that avoid segregation.

3.14 PLACE CONCRETE

Place concrete to NZS 3109: clause 7.4, Handling and placing. Place in layers not more than 500mm deep, compacted and vibrated. When placing concrete on steel form decks ensure that free water is displaced rather than trapped.

3.15 COMPACT CONCRETE

To NZS 3109: clause 7.6, Compaction. Compact by vibration of the concrete to expel entrapped air and until settlement of the concrete is visibly evident over all areas of the surface. Maintain vibration until settlement ceases and coarse aggregate at the surface is embedded. Do not continue vibration beyond reaching this condition.

Note: compaction by vibration is not required when using Self Compacting Concrete (SCC).

3.16 RE-VIBRATION OF CONCRETE

Where plastic cracking becomes evident before the concrete has taken its initial set, re-vibrate the concrete over the full depth of the cracks.

Note: compaction by vibration is not required when using Self Compacting Concrete (SCC).

Finishing

3.17 SCREED THE SURFACE

Screed the concrete surface by straight edge or vibrating screed immediately after compaction and to tolerances in NZS 3109: table 5.2, Tolerances for in situ construction.

3.18 SAW CUTS

Cut slabs where indicated on the drawings and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring.

3.19 SURFACE FINISH

Refer to 3124 FINISHES TO WET CONCRETE

Curing

3.20 CURING METHOD NOMINATED BY CONTRACTOR

Provide in writing the curing method to be used for this work for review.

3.21 PONDING CURING METHOD

Build a temporary retaining lip around the concrete slab and pond with water, keeping the depth constant over the curing period.

3.22 SPRINKLING CURING METHOD

Apply a fine spray of water continuously over the curing period through a system of nozzles placed to cover the whole of the concrete work being cured.

3.23 WET COVERINGS CURING METHOD

Cover the whole of the concrete work being cured, including edges with hessian, or similar, and keep continuously moist so that a film of water remains on the concrete surface throughout the curing period. Do not use wet coverings at times of freezing weather.

3.24 PLASTIC SHEETS CURING METHOD

Cover the whole of the concrete being cured with polyethylene or other waterproof sheet material for the whole of the curing period. Fit closely, carry down over edges and tape as necessary to contain moisture.

3.25 CURING COMPOUNDS CURING METHOD

Cover the whole of the concrete according to the manufacturer's recommendations, including edges being cured, with a liquid, white pigmented membrane, which hardens to form a waterproofing coating. Apply as soon as the surface has been finished, using spray equipment at the rate and using the method required by the manufacturer. Allow to remove the compound completely before applying subsequent finishes and coatings. Additives shall be mixed prior to concrete placement as per manufacturer's specification.

3.26 CURING PERIOD

Cure all concrete for a minimum of 7 days. Keep time between placing of concrete and the start of curing to an absolute minimum. Ensure curing is continuous.

3.27 KEEP ABSORBENT FORMWORK MOIST

Keep formwork left in place continuously moist by sprinkling with water over the curing period. Continue sprinkling the exposed surface if the formwork is removed before the end of the curing period.

3.28 SECURE COVERINGS

When covering with sheet materials, ensure that edges are well secured throughout the specified curing period, to prevent draughts passing over the surfaces of the concrete.

Completion

3.29 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

3129 CONCRETE PRODUCTION

1 GENERAL

This section relates to the production of ready-mixed and/or prescribed mix concrete, as designated in NZS 3104. Ready-mixed, normal concrete (N) and special concrete(S) to be supplied by a ready-mix plant with a current Certificate of Audit.

1.1 RELATED SECTIONS

Refer to 3105 CONCRETE - COMMON REQUIREMENTS for general matters
Refer to 3121 CONCRETE PLACEMENT for concrete placing
Refer to 3124 FINISHES TO WET CONCRETE for concrete finishing

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are listed in 3105 CONCRETE - COMMON REQUIREMENTS.

Performance

1.3 CONCRETE PRODUCTION COMPLIANCE

Ready-mixed concrete production and testing to comply with NZS 3104. Concrete to be supplied from a concrete batching plant holding a current quality Certificate of Audit provided by CNZ PAS Concrete NZ Plant Audit Scheme or an Auditing Engineer with credentials nominated in NZS 3104.

2 PRODUCTS

Materials

2.1 CEMENT

General purpose Portland cement (Type GP) and general purpose blended cement (Type GB) to NZS 3122.

2.2 CEMENT, FILLER

Portland-limestone filler cement to NZS 3125.

2.3 SAND

Sand to NZS 3121 and NZS 3104 clause 2.5.4. The provisions of Concrete NZ TR3 apply when the sand is potentially reactive.

2.4 COARSE AGGREGATE

Coarse aggregate to NZS 3121, except as modified by NZS 3104: clause 2.5.3, Coarse aggregate. The provisions of Concrete NZ TR3 apply when the aggregate is potentially reactive.

Accessories

2.5 WATER

To NZS 3121.

2.6 ADMIXTURES, SITE/PLANT

To AS 1478.1.
For concrete defined as Normal Concrete(N) to NZS 3104, admixtures may be added at the plant engineer's discretion as required by concrete producers mix design, subject to the following requirements:

- The quantity of admixture used and the method of mixing to be in accordance with manufacturers recommendations.
- Admixtures containing calcium chloride will not be permitted.
- Concrete must comply with the entrained air requirements of NZS 3101 when the surface is subject to freeze-thaw cycles.
- Additional admixtures may be added to concrete at the contractor's request to control the set, in response to weather or environmental factors, subject to approval by engineer.

For concrete defined as Special Concrete (S) to NZS 3104, admixtures to be used are subject to approval by the engineer in respect of the special performance properties required of the concrete. Refer to SELECTIONS.

Admixtures containing calcium chloride will not be permitted where steel reinforcing is present.

2.7 PIGMENT, SITE/PLANT

As agreed before manufacture or placing. Refer to SELECTIONS.

3 EXECUTION

Conditions - Ready-Mix Concrete

3.1 MATERIAL STANDARDS

To comply with respective standards. Store and test coarse aggregate and sand and store cement and admixtures all separately and to NZS 3104 clause 2.5, Materials

3.2 MEASUREMENT

Weigh aggregates and cement separately, to NZS 3104 by a plant holding a current Certificate of Audit. Measurement tolerances of materials, measurement methods and equipment calibration and accuracy to NZS 3104.

3.3 MIXING

Mix and transport to NZS 3104 by a plant holding a current Certificate of Audit.

4 SELECTIONS

4.1 READY-MIXED - NORMAL CONCRETE (N)

Location:	~
28 day strength:	35 MPa
Aggregate size:	19 mm maximum
Pigments:	~

Appendix D –PS1 Design

PRODUCER STATEMENT – PS1
DESIGN

Building Code Clause(s):	B1,	Job number: 23 187
ISSUED BY: *(Engineering Design Firm)*	Haigh Workman Ltd	
TO: *(Client)*	Arcline Architecture	
TO BE SUPPLIED TO: *(Building Consent Authority)*	Far North District Council	
IN RESPECT OF: *(Description of building work))*	New build - Soldier Pile	
AT: *(Address)*	4 Titore Way, , Russell	
LEGAL DESCRIPTION	Lot 1 DP 65575	

We have been engaged by Arcline Architecture to provide:

SED Foundations - Soldier Pile

in respect of the requirements of the Clause(s) of the Building Code specified above for part only, as specified in the attached Schedule, of the proposed building work.

In this document SED means "Specific Engineering Design".

The design carried out by Haigh Workman Ltd has been prepared in accordance with:

✓ compliance documents issued by the Ministry of Business, Innovation & Employment (Verification method /acceptable solution): VM1/VM4

The proposed building work covered by this producer statement is described in the drawings specified in the attached Schedule, together with the specification, and other documents set out in the attached Schedule.

On behalf of Haigh Workman Ltd, and subject to:

- all proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that:

- the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached Schedule, will comply with the relevant provisions of the Building Code specified above; and that
- the persons who have undertaken the design have the necessary competence to do so.

I recommend the CM3 level of construction monitoring.

I, Sushil Kharche, am:

- CPEng number 1162311
- and hold the following qualifications: M.E.

Haigh Workman Ltd holds a current policy of Professional Indemnity Insurance no less than $200,000.

✓ Haigh Workman Ltd is a member of ACE New Zealand.

SIGNED BY:

(Signature): [redacted] Date:27/01/2023

ON BEHALF OF: Haigh Workman Ltd

Note: This statement has been prepared solely for Far North District Council and shall not be relied upon by any other person or entity. Any liability in relation to this statement accrues to Haigh Workman Ltd only. As a condition of reliance on this statement, Far North District Council accepts that the total maximum amount of liability of any kind arising from this statement and all other statements provided to Far North District Council in relation to this building work, whether in tort or otherwise, 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.

SCHEDULE TO PS1

Please include an itemised list of all referenced documents, drawings, or other supporting materials in relation to this producer statement below:

- Certificate of Design Work, Construction Monitoring Schedule, Structural Maintenance Schedule, B2 Letter in Lieu - Design
- Engineering Drawing Set: STD-01, S-01
- Engineering Calculations: Soldier Pile Calculations

Limited Scope of Engagement

We have been engaged by Arcline Architecture to provide services in respect of the requirements of the Clause(s) of the Building Code specified above for the following parts of the proposed building work:

SED Foundations - Soldier Pile

GUIDANCE ON USE OF PRODUCER STATEMENTS

Information on the use of Producer Statements and Construction Monitoring Guidelines can be found on either the ACE New Zealand or Engineering New Zealand websites.

Producer statements were first introduced with the Building Act 1991. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects (NZIA), Institution of Professional Engineers New Zealand (now Engineering New Zealand), Association of Consulting and Engineering New Zealand (ACE NZ) in consultation with the Building Officials Institute of New Zealand (BOINZ). The original suite of producer statements has been revised at the date of this form to ensure standard use within the industry.

The producer statement system is intended to provide Building Consent Authorities (BCAs) with part of the reasonable grounds necessary for the issue of a Building Consent or a Code Compliance Certificate, without necessarily having to duplicate review of design or construction monitoring undertaken by others.

PS1 DESIGN: Intended for use by a suitably qualified independent engineering design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;
PS2 DESIGN REVIEW: Intended for use by a suitably qualified independent engineering design review professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;
PS3 CONSTRUCTION: Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013 or Schedules E1/E2 of NZIA's SCC 20112
PS4 CONSTRUCTION REVIEW: Intended for use by a suitably qualified independent engineering construction monitoring professional who either undertakes or supervises construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate.
This must be accompanied by a statement of completion of building work (Schedule 6).
The following guidelines are provided by ACE New Zealand and Engineering New Zealand to interpret the Producer Statement.

Competence of Engineering Professional

This statement is made by an engineering firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its personnel.
The person signing the Producer Statement on behalf of the engineering firm will have a professional qualification and proven current competence through registration on a national competence-based register such as a Chartered Professional Engineer (CPEng).
Membership of a professional body, such as Engineering New Zealand provides additional assurance of the designer's standing within the profession. If the engineering firm is a member of ACE New Zealand, this provides additional assurance about the standing of the firm.
Persons or firms meeting these criteria satisfy the term "suitably qualified independent engineering professional".

Professional Indemnity Insurance

As part of membership requirements, ACE New Zealand requires all member firms to hold Professional Indemnity Insurance to a minimum level.
The PI Insurance minimum stated on the front of this form reflects standard practice for the relationship between the BCA and the engineering firm.

Professional Services during Construction Phase

There are several levels of service that an engineering firm may provide during the construction phase of a project (CM1-CM5 for engineers3).
The BCA is encouraged to require that the service to be provided by the engineering firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

BCAs should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued. No design professional should be expected to provide a producer statement unless such a requirement forms part of Haigh Workman Ltd's engagement.

Refer Also:

1 Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013
2 NZIA Standard Conditions of Contract SCC 2011
3 Guideline on the Briefing & Engagement for Consulting Engineering Services (ACE New Zealand/Engineering New Zealand 2004)
4 PN01 Guidelines on Producer Statements

www.acenz.org.nz
www.engineeringnz.org

CONSTRUCTION MONITORING SCHEDULE

SCHEDULE OF MONITORING FOR

Address: 4 Titore Way, , Russell

Job number: 23 187

We propose that at least the following site monitoring is undertaken to Engineering New Zealand/ACENZ CM3:

No.	Item of monitoring	Timeframe	To be monitored by
1.	Augered concrete piles	Pre-pour but reinforcing to be put in place	Engineer
2.	Foundation beams	Pre pour	Engineer

Notes:

a) The above items of monitoring are the minimum required to enable Haigh Workman Ltd to issue a PS4 – Producer Statement Construction Review for the specific engineering design items.

b) The above items of monitoring do not cover work constructed in accordance with NZS 3604:2011, for which monitoring is to be undertaken by the Building Consent Authority.

c) The Contractor/Builder is to provide Haigh Workman Ltd at least 24 hours' notice of the requirement for monitoring. The above timeframes are indicative, the Engineer and Contractor are to agree the timing of monitoring prior to work commencing on site.

d) A copy of this monitoring schedule is to be held on site during the works, and the Contractor/Builder is to provide reasonable and safe access to enable works to be monitored according to the schedule.

e) The above schedule does not necessarily represent the actual number of monitorings to be undertaken. The number of monitorings will depend on the construction method, sequence of the works and whether or not unforeseen conditions or difficulties are encountered on site.

CERTIFICATE OF DESIGN WORK MEMORANDUM FROM LICENSED BUILDING PRACTITIONER

SECTION 30C AND SECTION 45, BUILDING ACT 2004

THE BUILDING			
Street Address	4 Titore Way		
Suburb		Town/City	Russell
Postcode			

THE OWNER			
Name(s)	Arcline Architecture		
Email	trent@arcline.co.nz	Phone	0212208373
Address	49 Matthews Ave, Kaitaia		

BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the specialist designer who carried out or supervised specific Primary structure elements of restricted building work (RBW) design work as described in this memorandum. Other designers will provide memoranda covering the remaining RBW design work. Refer also to the attached PS1.

IDENTIFICATION OF RESTRICTED BUILDING WORK (RBW) DESIGN WORK

I, Sushil Kharche carried out or supervised the following RBW design work:

PRIMARY STRUCTURE: B1

Design work that is RBW		Description (as required) and reference to plans and specifications	Carried out or supervised
Foundations	✓	SED Soldier Pile as per foundation plan	Supervised
Subfloor framing	×	Not applicable	Not applicable
Retaining walls	×	Not applicable	Not applicable
Beams	×	Not applicable	Not applicable
Portal	×	Not applicable	Not applicable
Bracing	×	Not applicable	Not applicable

Other (primary)	✗	Not applicable	Not applicable

Note: SED = Elements subject to Specific Engineering Design outside of the scope of NZS3604:2011, unless otherwise noted.

WAIVERS AND MODIFICATIONS

Are waivers or modifications of the Building Code required? No

If yes, please provide details of the waivers or modifications:

ISSUED BY

Name	Sushil Kharche	**Design entity/company**	Haigh Workman Ltd
Chartered status	Chartered Professional Engineer	**Chartered no.**	1162311
Email	sushil@haighworkman.co.nz	**Website**	
Phone (daytime)	094078327	**Phone (after hours)**	094078327
Mobile	094078327		
Postal address	6 Fairway Drive, Kerikeri		
Physical address	6 Fairway Drive, Kerikeri		

DECLARATION

I, Sushil Kharche, LBP state that I have applied the skills and care reasonably required of a competent design professional in carrying out or supervising the RBW described in this memorandum and that based on this, I certify that the RBW described in this memorandum:

- complies with the Building Code
- ~~complies with the Building Code subject to any waiver or modification of the Building Code described in this memorandum.~~

Signat[redacted] Date 27/01/2023

STRUCTURAL MAINTENANCE SCHEDULE

NEW BUILD AT 4 TITORE WAY, , RUSSELL

This schedule of ongoing inspection and maintenance of structural elements shall be included with the Operations and Maintenance manuals and provided to the Owner/Body Corporate and building managers.

Inspection/maintenance timeframe and item	
(a) Half-yearly	Not applicable.
(b) 5 yearly	Not applicable.
(c) 10 yearly	Not applicable.
(d) 25 yearly	• Inspect all exposed, external reinforced concrete for signs of spalling or cracking. Repair as required.
(e) Following fit-out or alterations	Not applicable.
(f) Following seismic shaking > SLS1 event	• Inspections and repair as per sections above

LETTER IN LIEU – DESIGN

To the Building Official,
Far North District Council
New build at 4 Titore Way, , Russell

COMPLIANCE WITH BUILDING CODE CLAUSE B2 – DURABILITY

The purpose of this letter is to demonstrate how compliance with Clause B2 (Durability) of the Building Code will be achieved for the above project. We can confirm that for specifically designed structural elements that are included within our design documentation:

Material	Means of Compliance	Details
Reinforced concrete	B2/AS1	Concrete cover to reinforcing has been selected in accordance with NZS3101, Part 1, Section 3

Yours faithfully,

For and on behalf of

Haigh Workman Ltd

HAIGH WORKMAN Ltd
Civil & Structural Engineers

JOB NO: 23 187 November 2023

Specific Engineering Design

Soldier Pile & Capping Beam

4 Titore Way, Russell

Lot 1 DP 65575

For Arcline Architecture

Haigh workman Reference: 23 187

pp [redacted]
Prepared by
Peter Land, BE(Cons.), MEngNZ
Structural Engineer

Checked by
Sushil K[redacted]
CMEngNZ, CPEng
Senior Structural Engineer

Approved by:
John Papesch BE(Civil)
CPEng, CMEngNZ;
Director

HAIGH WORKMAN LTD
Civil & Structural Engineers

Contents

1. INTRODUCTION

1.1.Project Brief and Scope

Haigh Workman Ltd (Haigh Workman) has been commissioned by Arcline Architecture (the 'Client') to perform specific engineering design for Soldier pile and capping beam for a new dwelling at 4 Titore Way, Russell. The scope of work is as follows,

- Structural Design of Soldier Pile and Capping Beam: Soldier wall / Barrier wall are designed in this report based on the forces provided in the geotechnical report.
- As identified in the geotechnical report, the objective of solder pile wall is to provide slope stability.

1.2.Reference

- Geotechnical report prepared by Haigh Workman Ltd
- Architectural drawings supplied by the Architect / Owner

1.3. Codes and Standards

(Applicable standards are marked with ☒)

☒ B1-structure-1st-edition-amendment-19 (B1/VM1, B1/VM4)

☒ NZS 3101: Concrete Structures

☐ NZS 4230: Masonry Structures

☐ NZS 3603: Timber Structures

☐ NZS 3404: Steel Structures

☒ NZS 1170: Loading

☐ NZS 3604

☐ AS 2870

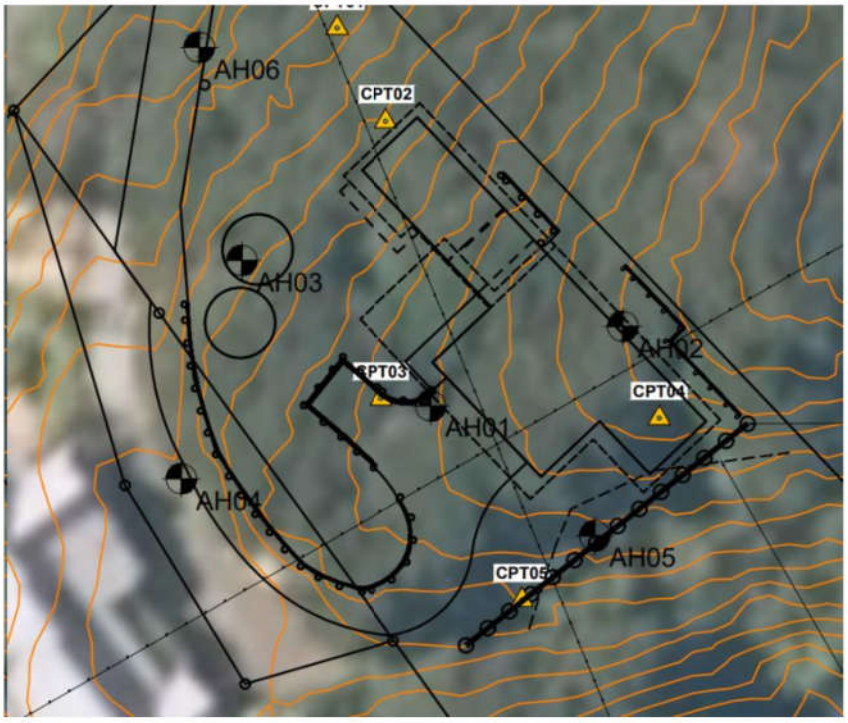
1.4.Structural Description and Load Path

- The capping beam is designed to transfer the lateral load evenly between the piles.

- The piles are designed to resist lateral earth pressures by transferring lateral loads into competent ground materials.

1.5. Geotechnical Recommendation

The following geotechnical recommendations are noted from Geotechnical report by Haigh Workman Ltd



4.3.3 ***Solider Pile Wall Analysis***

Design of the barrier pile wall is not within the scope of this report. A summary of the recommended design procedure is as follows (Poulos 1995 and Day 1999):

- Slope stability analyses to determine the location and minimum length of the pile to obtain an adequate factor of safety.
- Slip surface pass through the pile to determine the depth of the failure plane and the minimum shear capacity of the pile. Forces from the soil mass acting on the pile can be obtained.
- Design actions, deflections and length of embedment can be derived using computation software, e.g., Wallap or Plaxis. Wall stiffness to be 50% of its short-term uncracked modulus for long term behaviour. Moment actions and shear forces to be provided to structural engineer for design.

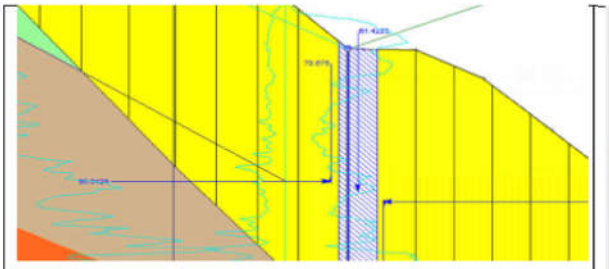
A conceptual analysis has been undertaken to provide some basic framework, however the values provided in Figure 5 and Table 7 are not intended for design and will require further analysis once the final concepts are provided. The conceptual analysis was undertaken in Wallap, staging included removal of soil on both sides of the wall, applying a surcharge on the active side of the wall that is representative of the existing soil condition

Table 7 - Wallap Analysis Results

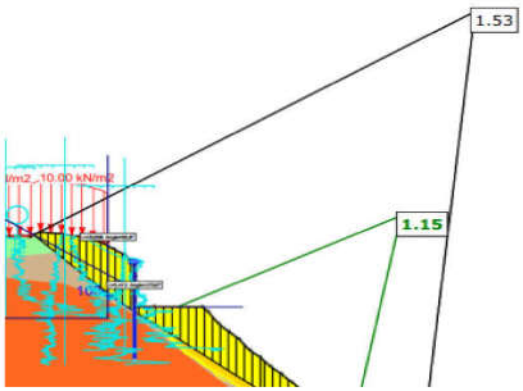
Details	In-ground palisade retaining wall – 750 mm reinforced concrete piles with capping beam
Pile spacing (m)	1.5
Finished retained height of pile (m)	Fully buried (capping beam to tie together and connect piles)
Finished embedment length (m)	12
Pile Bending moment (kNm)	307.5 kNm x 1.5 m spacing = 461.3
Pile Shear Force (kN)	100 kN x 1.5 m spacing = 150

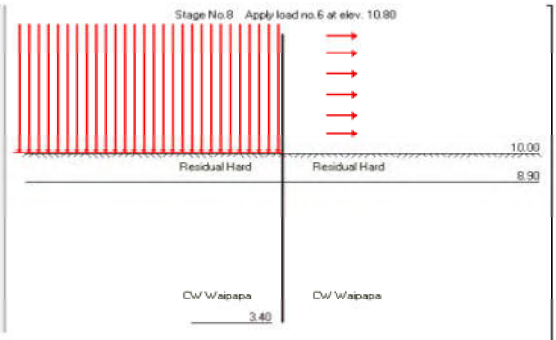
Notes: Bending and shear force values take into consideration the pile spacings and design load factors. Horizontal forces applied taken from stability software and have been sized to provide adequate safety factors.

and horizontal loads from the slope stability analysis (this was undertaken to not double up active earth pressure). Figure 5 shows how the loads were computed and applied under static conditions.



Slide forces – driving active force = 96 kN (adopt 100 kN/m for concept design purposes).





Horizontal loads added into Wallap – evenly distributed. 100 kN/m applied in 6 evenly distributed horizontal loads (16.7 kN steps)

Figure 5 – Free body diagram and staging (Static, normal groundwater conditions)

1.6.Assumptions / Consideration

1. The extent and location of wall is as per geotechnical report 23 187 prepared by Haigh Workman limited. Any discrepancies or inconsistencies should be promptly communicated to both the design engineer and the architect for further clarification and resolution. The soldier pile extent and length also to be verified with geotechnical design engineers prior to construction.
2. The unit weights, dead loads, live loads, wind load, and seismic load values and calculations referenced in this document can be found in the calculation sheets included within this document. These calculation sheets provide detailed information and calculations related to the specific loads and their corresponding magnitudes.
3. Based on our foundation design considerations, it is necessary to prepare the ground /pile holes for the foundation under the observation of Chartered Professional Engineers. The ground conditions must be verified in accordance with the geotechnical report and structural report.

2. ATTACHMENTS

- Calculation- Attachment-1
- Drawings-Attachment-2
- Information Supplied by Client / Vendor / Architect

Loading Calculations

Loads

Soil pressure (Refer HW Geo report) $N_{soil} := 150\ \frac{kN}{m}$

Beam length $L_{beam} := 3\ m$

Beam Reinforcement Required

Thickness of beam $d_1 := 850\ mm$

Width of rib beam $b_w := 450\ mm$

Density of concrete $\gamma_{con} := 25\ \frac{kN}{m^3}$

Diameter of additional reinforcement $D_{bar} := 20\ mm$ $n_{top} := 4$ $D_{bar.bottom} := 20\ mm$ $n_{bottom} := 4$

Effective depth of steel $d'_{top} := 75\ mm + \frac{D_{bar}}{2} = 85\ mm$ Top of slab to centre of top reinforcement

$d'_{bottom} := 75\ mm + \frac{D_{bar}}{2} = 85\ mm$ Bottom of slab to centre of bottom reinforcement

Concrete strength $f'_c := 35\ MPa$

Steel strength $f_y := 500\ MPa$

$f_{yt} := 500\ MPa$

Effective depth of steel $d_{2.top} := d_1 - d'_{top} = 765\ mm$ $d_{2.bottom} := d_1 - d'_{bottom} = 765\ mm$

Max moment for ultimate limit state

Point Load applied to cantileaver beam due to wall loads $M_{max} := \frac{N_{soil} \cdot {L_{beam}}^2}{8} = 168.75\ m \cdot kN$

Check for minimum reinforcement

Check 1 (NZS3101:Part 1:2006 9.3.8.2.1, 9.3.8.2.2)

$b_w = 0.45\ m$ $f'_{c.units} := \frac{f'_c}{MPa}$

$A_{s1} := \frac{\sqrt{f'_{c.units}} \cdot MPa}{4 \cdot f_y} \cdot b_w \cdot d_{2.top} = 1018.31\ mm^2$

$A_{s2} := 1.4 \cdot \frac{b_w \cdot d_1}{\frac{f_y}{MPa}} = 1071\ mm^2$

$A_{s.min1} := \text{if}\left(A_{s1} \le A_{s2}, A_{s2}, A_{s1}\right) = 1071\ mm^2$

Check 2 (NZS3101:Part 1:2006 strength design)

Concrete factors - 2.3.2, 7.4.2.7 $\alpha_1 := 0.85 \quad \beta_1 := 0.85 \quad \phi := 0.85$

Minimum requirement required for strength combination $M_{max} = 168.75\ m \cdot kN$

$$\mu_{positive} := \frac{M_{max}}{\left(f'_c \cdot b_w \cdot d_{2.bottom}{}^2\right)} = 0.0183$$

$$q_{positive} := \beta_1 \cdot \frac{\alpha_1}{2 \cdot 0.42} \cdot \left(1 - \left(\left(1 - \left(4 \cdot 0.42 \cdot \frac{\mu_{positive}}{\alpha_1 \cdot \beta_1 \cdot \phi}\right)\right)\right)^{0.5}\right) = 0.0218$$

$$j_{positive} := 1 - \frac{0.42}{(\alpha_1 \cdot \beta_1)} \cdot q_{positive} = 0.9873$$

$$A_{s.min2} := \frac{\left(\frac{M_{max}}{\phi}\right)}{f_y \cdot j_{positive} \cdot d_{2.bottom}} = 525.7\ mm^2$$

$$A_{s.min2} := 1.3 \cdot A_{s.min2} = 683.41\ mm^2$$

Minimum area of steel required $A_{s.min1} := \max\left(A_{s.min1}, A_{s.min2}\right) = 1071\ mm^2$

$$A_{s.min} := A_{s.min1} = 1071\ mm^2$$

Reinforcement Requirements

Reinforcement given by bar $A_{s.prov.bar} := n_{top} \cdot \frac{\left(\pi \cdot D_{bar}{}^2\right)}{4} = 1256.64\ mm^2$

$$\text{if}\left(A_{s.min} \le A_{s.prov.bar}, \text{“OK”}, \text{“ADDITIONAL BAR REQ”}\right) = \text{“OK”}$$

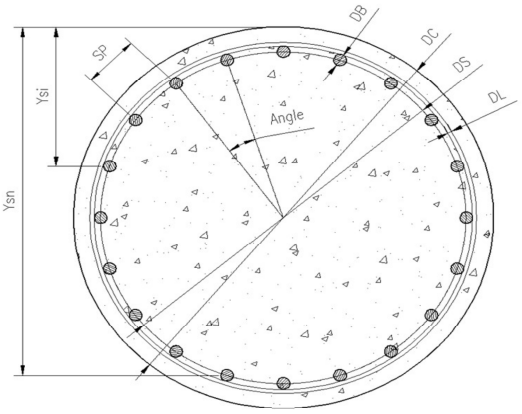
HAIGH WORKMAN LTD
Civil & Structural Engineers

Circular Concrete Columns NZS 3101:2006

Project Number	23 187		
Project Name	4 Titore Way, Russell		
Client	Arcline Architecture		
Author	PL	Checked:	SK
Date	21/11/23	Revision	A

Geometry

Ly length of column along Y axe	12000	mm
Lz length of column along Z axe	12000	mm
DC Diameter of column or pile	750	mm
DS Diameter of steel circle	600	mm
DB Size diameter of bars	25	mm
Number of bars	8	See Commentary
Angle of bars	45.0	degrees °
SP spacing of bars	236	mm Arch
Clear cover to main bars	62.5	mm
DL diameter of links	12	mm
Max Aggregate size	20	mm
k of column along Y direction	1.0	
k of column along Z	1.0	
Ast Area of longitudinal steel	3927	mm²
ρ % of reinforcement	0.89	See Commentary



Materials

f'c at 28 days	35	MPa
fy of main bars	500	MPa
fy of links	300	MPa
E steel Elastic modulus	200000	MPa
E concrete Elastic modulus	26541	MPa

Loads

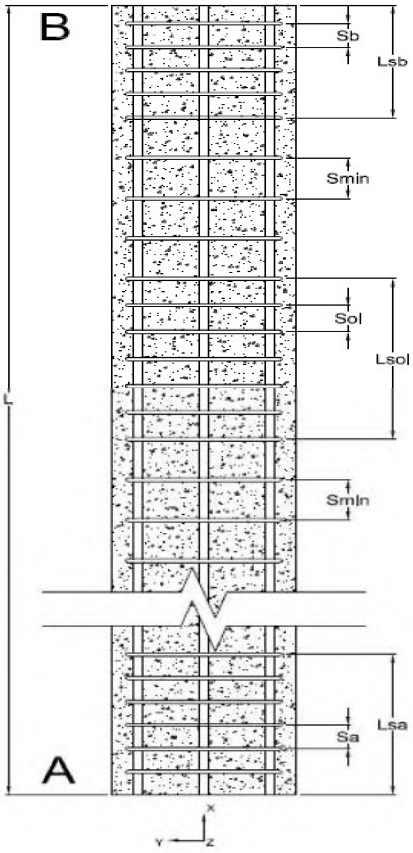
Bd= 0.15 ratio N*dead/N*live

Node A

Combination	Fx	Fy	Fz	Mx	My	MZ	Note	Cond.
Combination	*0*	*150*	*0*	*0*	*0*	*470*	1A	SC
Combination							2A	SC
Combination							3A	SC
Combination							4A	SC
Combination							5A	SC
Combination							6A	SC

Node B uy

Combination	Fx	Fy	Fz	Mx	My	MZ	Note	Cond.
Combination							1B	SC
Combination							2B	SC
Combination							3B	SC
Combination							4B	SC
Combination							5B	SC
Combination							6B	SC



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Project Number	23 187		
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Calculations Combination number 1A See notes Condition= Single curvature

N=*	*0*	*KN*	*Vy*=*	*150*	*KN*	*Vz*=*	*0*	*KN*	*Vn=*	*150*	*KN*
T=*	*0*	*KN.m*	*My*=*	*0*	*KN.m*	*Mz*=*	*470*	*KN.m*	*Mn=*	*470*	*KN.m*

N ϒ ≤ 0.05 V* LuY* 0.0E+00 ≤ 90000000 OK Slenderness check NZS3101.2006 Cl. 10.3.2.3
N ϒ ≤ 0.05 V* LuZ* 0.0E+00 ≤ 0 All cases OK

Where:

rY=	*187.5*	*mm*	C.10.3.2.3.3	*NcY=*	*9827384*	*N*	*M1/M2=*	*0.00*	*ϒY=*	*1.00*	
rZ=	*187.5*	*mm*	C.10.3.2.3.3	*NcZ=*	*9827384*	*N*	*Cm=*	*0.60*	*ϒZ=*	*1.00*	

M2Y,min=	*0*	*KN.m*	*Nn,max=*	*14989.8*	*KN*	*OK, N*<Nn,max*	NZS3101.2006 Cl. 10.3.4.2
M2Z,min=	*0*	*KN.m*	*α1=*	0.85		All cases OK	

Design forces:

N=*	*0*	*KN*	*Vy*=*	*150*	*KN*	*Vz*=*	*0*	*KN*
T=*	*0*	*KN.m*	*Mcy*=*	*0*	*KN.m*	*Mcz*=*	*470*	*KN.m*

Min amount of longitudinal Reinforcing bars= *8* *Bars*
Max permissible spacing of bars= *187.5* *mm*

	Cm	Ncy	Ncz	ϒY	ϒZ	M2Y	M2Z	Nmax	Load KN	McY KN.m	McZ KN.m	Combined bending
Node A	0.6	3128	3128	1.0	1.0	0.0	0.0	14990	0.0	0.0	470.0	470
Node B												

Notes:
1. the table above summarises the minimal design actions for biaxial bending check
2. Biaxial moments are treated separately to account for diferent column braced lengths per axis
3. Axial load must not be considered nule
4. The tabe above assumed the column's inercia of the uncracked section

HAIGH WORKMAN LTD
Civil & Structural Engineers

Circular Concrete Columns NZS 3101:2006

Project Number	23 187
Project Name	4 Titore Way, Russell
Client	Arcline Architecture
Author	PL
Date	21/11/23

Checked:	SK
Revision	A

ULS strength calculation

Geometry

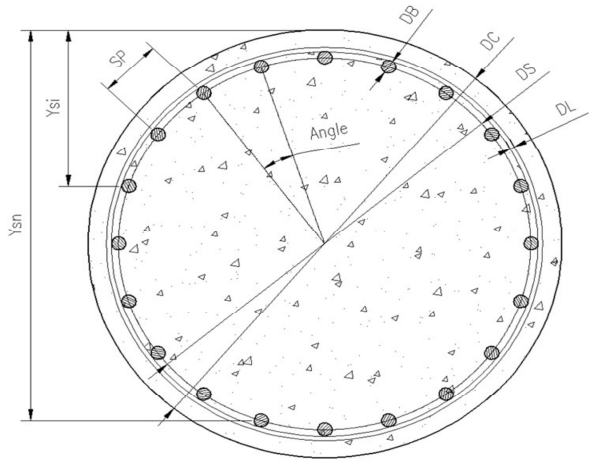
DC Diameter of column or pile	*750*	*mm*
DS Diameter of steel circle	*600*	*mm*
DB Size diameter of bars	*25*	*mm*
Number of bars	*8*	
Angle of bars	*45*	*°*
SP spacing of bars	*235.6*	*mm*
Clear cover to main bars	*62.5*	*mm*

Materials

f'c at 28 days	*35*	*Mpa*
fy of main bars	*500*	*MPa*
fy of links	*300*	*MPa*
E steel Elastic modulus	*200000*	*MPa*
E concrete Elastic modulus	*26541*	*MPa*

Steel total reinforcement ρ	*0.89*	*%*

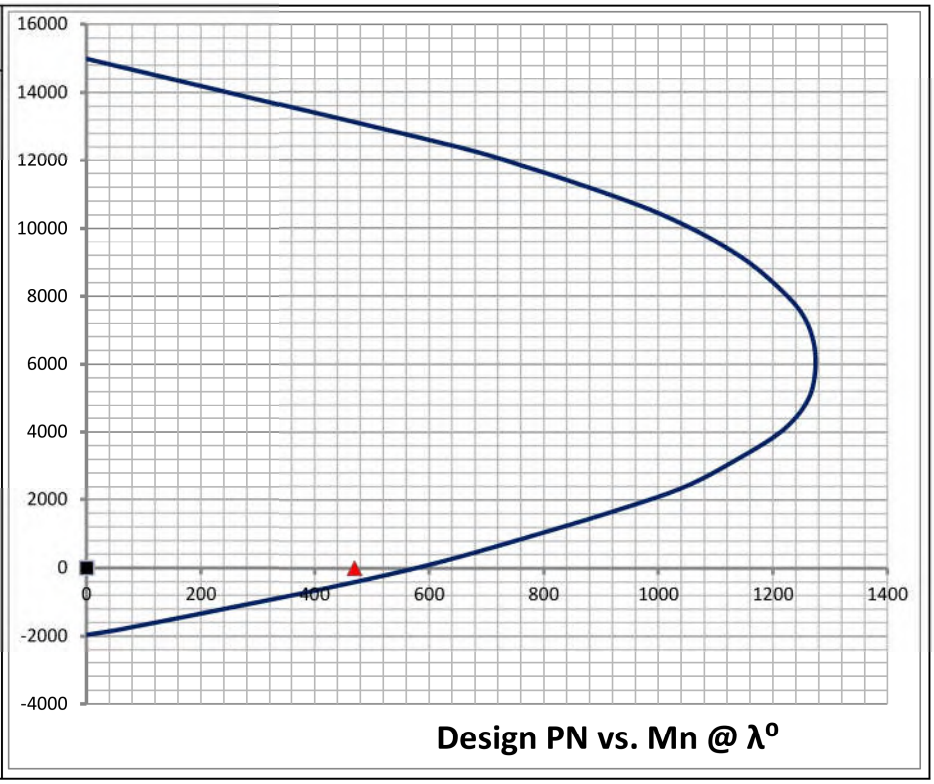
Note: Minimum steel for columns 0.8%, more than 6% is not buildable. Minimum steel for piles should be as per Sec.413.6.5



A	N*	Mcn*
*	0	470
*		
*		
*		
*		
*		
	KN	KN.m

B	N*	Mcn*
*		
*		
*		
*		
*		
*		
	KN	KN.m

Pn (KN)	Mn (KN.m)
-1963	0
-1784	64
-1150	256
-515	440
143	609
947	779
1698	926
2400	1047
3241	1142
4070	1218
4933	1261
5817	1274
6672	1271
7500	1250
8275	1208
9054	1153
9805	1079
10524	988
11183	880
11834	762
12444	635
14990	0



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Circular Concrete Columns NZS 3101:2006

Project Number	23 187		
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Date	21/11/23	Revision	A

Shear Design

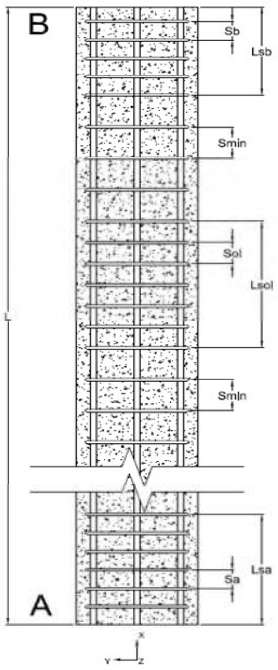
V*< øVn

NZS3101:2006 sec.10.3.10.5.1

Sa= 75 mm Core strength check Ag/Ac: 1.335 OK
Sb= 75 mm Pt= 0.89 m= 16.81 Ptm= 0.149

$Vc = Ka\ Kn\ Vb\ Acv;$ Vb= (0.07 + 10 Pw)$\sqrt{f'c}$.; $0.08\sqrt{f'c} < Vb < 0.2\sqrt{f'c}$. NZS3101:2006 sec.10.3.2.2

Ka= 1.000 Vb Mpa= 0.664 0.473 < 0.664 < 1.183 OK
Pw= 0.004 Acv mm²= 306796 Ac mm²= 330810
f'c= 35 Mpa Vn Mpa= 7 Ag mm²= 441786



Design case: Max shear

Case	1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	5B	6B
V*i-n	150	0	0	0	0	0	0	0	0	0	0	0
N*i-n	0	0	0	0	0	0	0	0	0	0	0	0
Torq*	0	0	0	0	0	0	0	0	0	0	0	0
Kn	1	1	1	1	1	1	1	1	1	1	1	1
vtn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vc	153	153	153	153	153	153	153	153	153	153	153	153
Vs*	35	0	0	0	0	0	0	0	0	0	0	0
7.6.2.1												
SoptY	300	300	300	300	300	300	300	300	300	300	300	300

Calculated min SA= 300 mm Calculated min SB= 300 mm

Max spacing NZS3101 Part1:2006 Sec.10.3.10.4.3= 300 mm (Smin)
Av tirrup min= 69 mm² < 226 mm² OK Tirrup area sufficient
Torsion design 0.00 < 0.61 OK NZS3101:2006 Sec.7.6.2.1

Notes

1. Needs reinforcement for shear
2. Please detail shear links as specified above
3. Beam-to-column connection must be design as per NZS3101:2006
4. Links must have bending radious of 3xDiameter of link bars
5. More checks needs to be done acording to section 7 and 8 regarding the minimum steel and spacings.

Comments:

GENERAL

- THE STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL, SERVICES, CIVIL AND OTHER PROJECT DRAWINGS. ANY DISCREPANCIES SHALL BE REFERRED TO THE ARCHITECT & DESIGNER FOR RESOLUTION.
- THE PRESENCE, LOCATION AND DETAILS OF NIBS, UPSTANDS, RECESSES, PLINTHS, PENETRATIONS, INSERTS, SLEEVES, CHASES, REBATES, CAST-IN FIXINGS, BRACKETS, HOLES, FLASHINGS, FIRE PROOFING, DAMP-PROOFING & WATERPROOFING etc ARE NOT NECESSARILY SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL, SERVICES, CIVIL, & OTHER PROJECT DRAWINGS FOR THESE ITEMS.
- THE LOCATION, SIZE AND DETAILS OF ALL PENETRATIONS, RECESSES, SLEEVES, HOLES, etc. IN STRUCTURAL MEMBERS, MUST BE APPROVED BY THE DESIGNER PRIOR TO CONSTRUCTION UNLESS SHOWN ON THE STRUCTURAL DRAWINGS. THESE ITEMS SHALL BE CAST-IN, FORMED, OR SHOP FABRICATED AND SHALL NOT BE CUT OR CORED ON SITE, UNLESS NOTED OTHERWISE OR APPROVED BY THE DESIGNER.
- SUBSTITUTION FOR OR AMENDMENT OF SPECIFIED DETAILS OR MATERIALS SHALL NOT BE CARRIED OUT WITHOUT APPROVAL OF THE DESIGNER.
- STANDARDS LISTED REFER TO THEIR LATEST ISSUE INCLUDING AMENDMENTS THAT ARE CURRENT AT THE TIME OF PREPARING THESE DRAWINGS.

DIMENSIONS

- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, SERVICES, CIVIL & ALL OTHER PROJECT DRAWINGS PRIOR TO CONSTRUCTION COMMENCING. ANY DISCREPANCIES SHALL BE REFERRED TO THE DESIGNER FOR RESOLUTION.
- DO NOT SCALE THE DRAWINGS.
- ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
- ALL DIMENSIONS TO EXISTING WORK SHALL BE VERIFIED BY SITE MEASUREMENT PRIOR TO FABRICATION.

CONCRETE

- CONCRETE STRENGTHS:
  CONCRETE STRENGTHS ARE 'SPECIFIED 28 DAY COMPRESSIVE STRENGTHS' AS DEFINED IN NZS 3109.
  FLOOR SLABS & FOOTINGS STRENGTHS SHALL BE 30MPa MINIMUM U.N.O.
  WALL FOOTING MASS & SITE CONCRETE STRENGTHS SHALL BE 20 MPa MINIMUM
- CONCRETE SURFACE FINISHES:
  SURFACE FINISHES ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS. WHERE NOT SPECIFIED, & NOT SHOWN ON ARCHITECTURAL DRAWINGS, SURFACE FINISHES SHALL BE AS FOLLOWING (REFER NZS 3114 FOR DEFINITIONS)

FORMED FOUNDATION SURFACES :	F1
CONCEALED FORMED SURFACES OF :	
BEAMS, COLUMNS, WALLS, PANELS AND SLAB EDGES	F3
EXPOSED FORMED SURFACES OF :	
BEAMS, COLUMNS, WALLS, PANELS AND SLAB EDGES	F5
EXTERIOR SLAB FINISHES :	U5
INTERNAL FLOORS :	U3

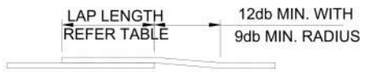
- REINFORCEMENT CLASS & MANUFACTURE PROCESS:
  ALL REINFORCEMENT BARS SHALL BE CLASS E TO AS/NZS 4671 U.N.O.
  ALL GRADE 500 REINFORCEMENT BARS SHALL BE MANUFACTURED USING THE MICRO-ALLOY PROCESS, UNLESS SPECIFICALLY APPROVED OTHERWISE BY THE DESIGNER.
- CONCRETE COVER TO REINFORCEMENT:
  MINIMUM CONCRETE COVER SHALL BE MEASURED TO THE EDGE OF CHAMFERS, RECESSES, REBATES, ETC. WHERE APPLICABLE.
  MINIMUM CONCRETE COVERS ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS. WHERE NOT SPECIFIED, MINIMUM CONCRETE COVERS SHALL BE AS FOLLOWS:

EXPOSURE SITUATION	FOUNDATIONS	BEAMS AND COLUMNS		RIBS, SLABS, WALLS	
		MAIN BARS	STIRRUPS, TIES, SPIRALS	20mm DIA. & UNDER	25mm DIA. & OVER
CAST AGAINST & EXPOSED TO EARTH	75	75	75	75	75
EXPOSED TO EARTH OR WEATHER					
CAST-IN PLACE	50	50	45	45	45
PRECAST	45	45	45	40	40
NOT EXPOSED TO EARTH OR WEATHER					
CAST-IN PLACE	-	40	25	30	35
PRECAST	-	35	25	30	30

NOTES:
- TOLERANCES ON COVERS SHALL BE:
  FOR 20mm BAR DIAMETER & UNDER: +10, -0
  FOR BAR DIAMETER LARGER THAN 20mm: +15, -0
- PRECAST IN THE CONTEXT OF THIS TABLE MEANS CONCRETE CAST UNDER PLANT CONTROL CONDITIONS, UTILISING RIGID FORMWORK & INTENSE COMPACTION
- COVER VARIES DUE TO EXPOSURE CLASSIFICATION & CONCRETE STRENGTH. REFER TO NZS 3101 : PART 1

- PLACING & SPACING OF REINFORCEMENT - GENERAL
  - SPLICING OF REINFORCEMENT, WHETHER BY LAPPING, WELDING OR MECHANICAL SPLICE, SHALL ONLY BE CARRIED OUT AS SHOWN ON THE DRAWINGS OR AS SPECIFICALLY APPROVED BY THE DESIGNER, EXCEPT AS NOTED BELOW:
    WELDED WIRE MESH SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS
    REINFORCEMENT IN SLABS ON GRADE AND IN TOPPINGS SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS.
  - LAYERS OF BEAM REINFORCEMENT SHALL BE SEPARATED WITH R40 BARS AT 1500mm CENTRES
  - ALL HOOKS ON STIRRUPS & TIES MUST FIT CLOSELY AROUND MAIN BARS U.N.O. FIRST STIRRUP TO BE PLACED NOT FURTHER THAN THE LESSER OF HALF THE STIRRUP SPACING OR 50mm FROM SUPPORT FACE
- LAP SPLICES IN REINFORCEMENT
  - WELDED WIRE MESH MADE UP OF SMOOTH WIRES SHALL BE LAP SPLICED WITH A MINIMUM 200mm OVERLAP BETWEEN OUTERMOST CROSS WIRES THUS :

  - WELDED MESH MADE UP OF DEFORMED BARS SHALL BE LAP SPLICED
  - LAP LENGTHS FOR DEFORMED BARS SHALL BE AS SHOWN IN THE FOLLOWING TABLES WHERE SPACING OF ADJACENT BARS ARE EQUAL TO OR GREATER THAN 2.5 db
  - LAP LENGTHS FOR PLAIN ROUND BARS SHALL BE TWICE THOSE SHOWN IN THE FOLLOWING TABLES
  - ALL BEAM AND COLUMN MAIN REINFORCEMENT LAP SPLICES SHALL HAVE CRANKED LAPS UNLESS NOTED OTHERWISE
  - CRANKED LAPS SHALL BE AS FOLLOWS:

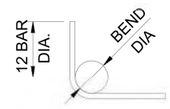


  - LAP LENGTHS ARE IN ACCORDANCE WITH NZS 3101

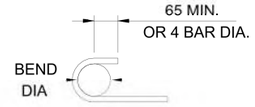
NOTE: USE OF FOLLOWING TABLES
TOP BAR FACTOR IS 1.0 FOR ALL VERTICAL BARS (COLUMNS, WALLS) AND FOR HORIZONTAL BARS WITH LESS THAN 300mm OF FRESH CONCRETE CAST BENEATH BAR (TYPICALLY BEAM BOTTOM BARS AND SLAB BARS).
TOP BAR FACTOR IS 1.3 FOR ALL HORIZONTAL BARS WITH MORE THAN 300mm OF FRESH CONCRETE CAST BENEATH THE BAR (TYPICALLY BEAM TOP BARS AND HORIZONTAL WALL BARS).

		BAR DIAMETER		
		10	12	16
CONCRETE 30 MPa STEEL GRADE 300 MPa	TOP BAR FACTOR = 1.3	390	470	630
	TOP BAR FACTOR = 1	300	360	480
CONCRETE 30 MPa STEEL GRADE 500 MPa	TOP BAR FACTOR = 1.3	650	780	1040
	TOP BAR FACTOR = 1	500	600	800

- SPIRAL, SPLICES AND TERMINATIONS
  - SPLICING OF ADJACENT LENGTHS OF SPIRAL SHALL BE EITHER BY PROVIDING 135° STIRRUP HOOKS AS FOR CIRCULAR HOOPS, OR BY WELDED LAP SPLICES. ANCHORAGE OF A SPIRAL BAR AT THE TERMINATION OF THE LENGTH OF SPIRAL SHALL BE PROVIDED BY AN EXTRA ONE-HALF TURN OF THE SPIRAL PLUS EITHER A 135° STIRRUP HOOK OR A WELDED LAP SPLICE TO THE PREVIOUS TURN. WELDED SPLICES IN SPIRALS SHALL COMPLY WITH AS/NZS 1554.3 ALL WELDS SHALL BE CLASS SP
- BENDING OF REINFORCEMENT
  - BENDS FOR ALL BARS EXCEPT STIRRUPS AND TIES



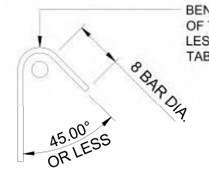
STANDARD HOOK



STANDARD 180° HOOK

STEEL GRADE	BAR DIAMETER	MINIMUM BEND DIAMETER
GRADE 300 & 500	6 TO 20	5 BAR DIAMETERS
	25 TO 40	6 BAR DIAMETERS
GRADE 300 & 500 GALVANISED BEFORE OR AFTER WELDING	6 TO 16	5 BAR DIAMETERS
	20 TO 32	8 BAR DIAMETERS

  - BENDS FOR STIRRUPS AND TIES



STANDARD STIRRUP & TIE HOOK

STEEL GRADE	BAR DIAMETER	MINIMUM BEND DIAMETER	
		PLAIN BARS	DEFORMED BARS
GRADE 300 & 500	6 TO 20	2 BAR DIAMETERS	4 BAR DIAMETERS
	25 TO 32	3 BAR DIAMETERS	6 BAR DIAMETERS
GRADE 300 & 500 GALVANISED BEFORE OR AFTER WELDING	6 TO 16	2 BAR DIAMETERS	5 BAR DIAMETERS
	20 TO 32	3 BAR DIAMETERS	8 BAR DIAMETERS

  - BARS PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE SITE BENT UNLESS SHOWN ON THE PROJECT DRAWINGS OR SPECIFICALLY APPROVED BY THE DESIGNER.
- HOLD DOWN BOLTS LOCATION TO BE CONFIRMED PRIOR CONCRETE POURING, THE USE OF TEMPLATES IS RECOMMENDED
- ALL GROUTING TO BE RAMMABLE SHRINKAGE COMPENSATED HIGH STRENGTH CEMENTITIOUS GROUT

Issue	Date	Revision
0	11/2023	ISSUE FOR BUILDING CONSENT

DWG STANDARD DETAILS AND SPECIFICATIONS

Scale AS SHOWN | Date 11/2023

Drawn PL | Checked SK | Approved JP

File

HAIGH WORKMAN LTD
Civil & Structural Engineers
6 Fairway Drive
Kerikeri, BOI.
T: 09 407 8327
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E: info@haighworkman.co.nz

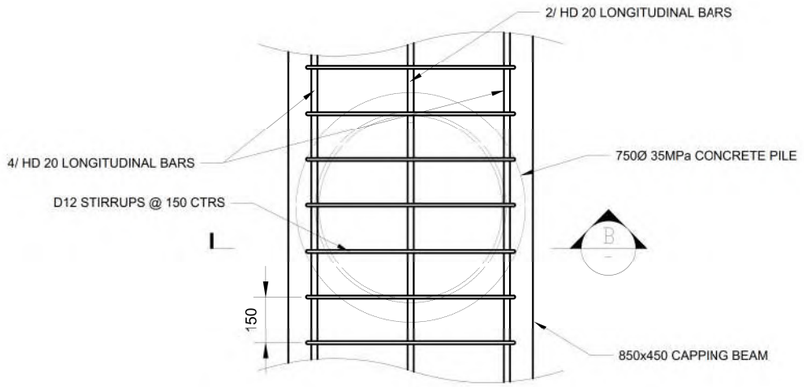
Project: PROPOSED NEW DWELLING
4 TITORE WAY, RUSSELL (LOT 1 DP 65575)

Client: ARCLINE ARCHITECTURE

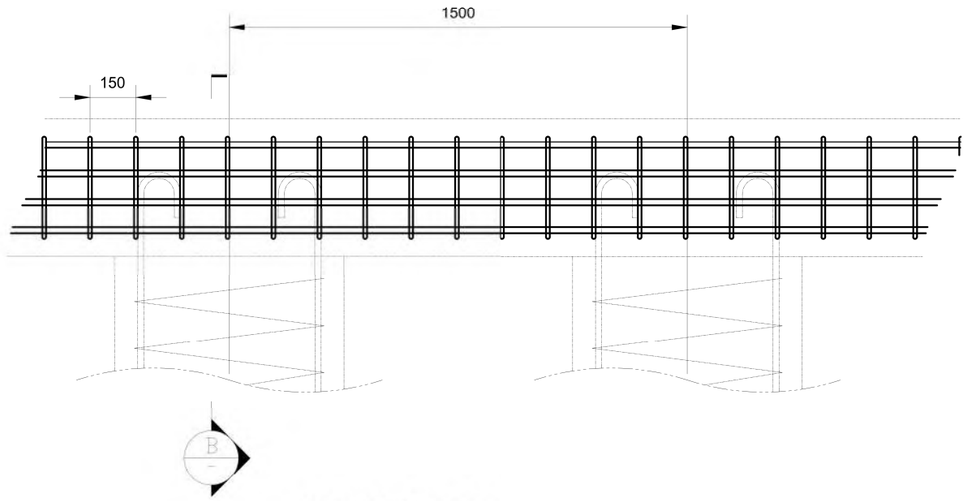
Project No. 23 187 | BC no. -

DWG No. **STD-01**

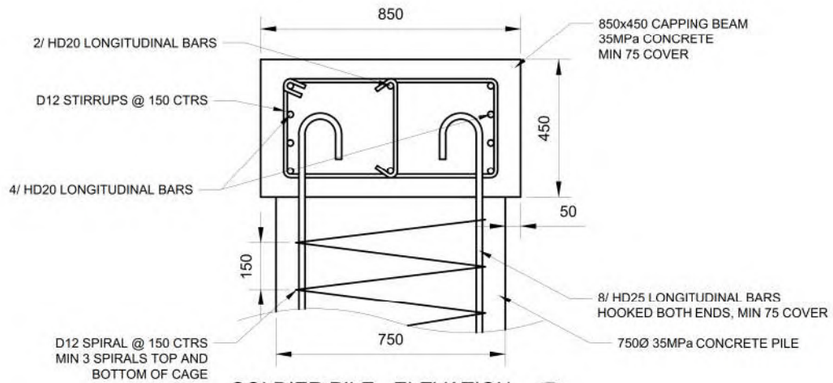
Sheet No. 1 of 2



SOLDIER PILE - PLAN (A -)
SCALE 1:20



SOLDIER PILE - ELEVATION (C -)
SCALE 1:20



SOLDIER PILE - ELEVATION (B -)
SCALE 1:20

TO BE READ IN CONJUNCTION WITH ARCHITECTURAL PLANS

Issue	Date	Revision
0	11/2023	ISSUE FOR BUILDING CONSENT

DWG SOLDIER PILE DETAILS

Scale AS SHOWN | Date 11/2023

Drawn PL | Checked SK | Approved JP

File

HAIGH WORKMAN Ltd
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T: 09 407 8327
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Project: PROPOSED NEW DWELLING
4 TITORE WAY, RUSSELL (LOT 1 DP 65575)

Client: ARCLINE ARCHITECTURE

Project No. 23 187 | BC no. -

DWG No. **S-01**

Sheet No. 2 of 2

Thursday, February 29, 2024 at 10:08:48 New Zealand Daylight Time

---

Subject:	Re: Resource consent application - 4 Titore Way, Russell
Date:	Thursday, 29 February 2024 at 10:08:43 AM New Zealand Daylight Time
From:	Steve Sanson
To:	RMA@doc.govt.nz
Attachments:	image001.png, image002.jpg, image003.png, image004.jpg, image005.png, image006.png, image007.png, image008.png, image009.png

Hello,

We have now prepared and completed the AEE associated with this.

Please find this attached in the link below.

2. Application Information

Regards

Steve Sanson
Director | Consultant Planner
Bay of Islands Planning (2022) Ltd

09 407 5253 | 021 160 6035
steve@bayplan.co.nz
https://www.bayplan.co.nz
2 Cochrane Drive, Kerikeri, 0295

From: Kenton Baxter <Kenton@bayplan.co.nz>
Date: Thursday, 29 February 2024 at 10:07 AM
To: Steve Sanson <Steve@bayplan.co.nz>
Subject: FW: Resource consent application - 4 Titore Way, Russell

---

From: Kenton Baxter <Kenton@bayplan.co.nz>
Date: Wednesday, 20 September 2023 at 10:43 AM
To: RMA <RMA@doc.govt.nz>
Cc: Office - Bay of Islands Planning <Office@bayplan.co.nz>
Subject: RE: Resource consent application - 4 Titore Way, Russell

Kia ora Trix,

We are seeking written approval.

We will forward on the AEE once completed.

If you have any other comments on the proposal in the meantime, please let us know.

Kind Regards,

Kenton Baxter
Consultant Planner
Bay of Islands Planning [2022] Limited
T: 09 4075253 **M:** 0210312948
E: kenton@bayplan.co.nz OR office@bayplan.co.nz
W: www.bayplan.co.nz

Bay of Islands PLANNING LTD
25 years serving Northland
SITEWISE GOLD 2023/24

From: RMA <RMA@doc.govt.nz>
Sent: Wednesday, September 20, 2023 10:39 AM
To: Kenton Baxter <Kenton@bayplan.co.nz>
Cc: Office - Bay of Islands Planning <Office@bayplan.co.nz>
Subject: RE: Resource consent application - 4 Titore Way, Russell

Kia ora Kenton,

Thank you for your email.

I am making sure before I capture the application, you are seeking comment, and/or written approval?

Do you have a AEE (Assessment of Environmental Effects) as well. We will not be able to do a full assessment without the AEE, thus written approval will not be possible at this time.

Ngā mihi

Trix Heigan
Statutory Process Team - RMA
Department of Conservation | Te Papa Atawhai

www.doc.govt.nz

Department of Conservation
Te Papa Atawhai

From: Kenton Baxter <Kenton@bayplan.co.nz>

Sent: Wednesday, September 20, 2023 9:51 AM
To: RMA <RMA@doc.govt.nz>
Cc: Office - Bay of Islands Planning <Office@bayplan.co.nz>
Subject: Resource consent application - 4 Titore Way, Russell

Hi there,

Our client is proposing to build a new dwelling on their property at 4 Titore Way, Russell.

The proposed building will breach the sunlight recession plane in relation to the northeastern boundary which is land administered by the DOC.

Can you please review the proposal and provide comments/approval.

Please see attached plans and let us know if you require any additional information.

Kind Regards,

Kenton Baxter
Consultant Planner
Bay of Islands Planning [2022] Limited
T: 09 4075253 **M:** 0210312948
E: kenton@bayplan.co.nz OR office@bayplan.co.nz
W: www.bayplan.co.nz

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