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

Office Use Only
Application Number:

Application for resource consent or fast-track resource consent

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

1. Pre-Lodgement Meeting

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

2. Type of Consent being applied for

(more than one circle can be ticked):

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

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

3. Would you like to opt out of the Fast Track Process?

✔ **Yes** ◯ **No**

4. Consultation

Have you consulted with Iwi/Hapū? ✔ **Yes** ◯ **No**

If yes, which groups have you consulted with?	
Who else have you consulted with?	

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

5. Applicant Details

Name/s: Far North Holdings Limited

Email: [redacted]

Phone number:

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

6. Address for Correspondence

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

Name/s: Bay of Islands Planning Limited

Email: [redacted]

Phone number:

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

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

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

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

Name/s: Far North District Council

Property Address/ Location:
Private Bag 752
Kaikohe
Postcode 0440

8. Application Site Details

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

Name/s:

Site Address/ Location:

69 & 71 State Highway 12 (Broadway)

Kaikohe

Postcode 0405

Legal Description: Lot 1 DP114630 & Part Lot 13 DP 7

Val Number:

Certificate of title: NA65B/130 & NA1027/4 & NA1936/67

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

Site visit requirements:

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

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

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

9. Description of the Proposal:

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

Development of a library

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

10. Would you like to request Public Notification?

◯ **Yes** ✔ **No**

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

(more than one circle can be ticked):

- ◯ **Building Consent** Enter BC ref # here (if known)
- ◯ **Regional Council Consent (ref # if known)** Ref # here (if known)
- ◯ **National Environmental Standard consent** Consent here (if known)
- ◯ **Other (please specify)** Specify 'other' here

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

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

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

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

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

13. Assessment of Environmental Effects:

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

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

13. Draft Conditions:

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

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

14. Billing Details:

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

Name/s: (please write in full)

Email:

Phone number: Work | Home

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

Postcode

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

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

Name: (please write in full)

Signature:
(signature of bill payer

Date

MANDATORY

15. Important Information:

Note to applicant

You must include all information required by this form. The information must be specified in sufficient detail to satisfy the purpose for which it is required.
You may apply for 2 or more resource consents that are needed for the same activity on the same form.
You must pay the charge payable to the consent authority for the resource consent application under the Resource Management Act 1991.

Fast-track application

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

Privacy Information:

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

15. Important information continued...

Declaration

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

Name: **(please write in full)**

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)
- ◯ Details of your consultation with Iwi and hapū
- ◯ Copies of any listed encumbrances, easements and/or consent notices relevant to the application
- ◯ Applicant / Agent / Property Owner / Bill Payer details provided
- ◯ Location of property and description of proposal
- ◯ Assessment of Environmental Effects
- ◯ Written Approvals / correspondence from consulted parties
- ◯ Reports from technical experts (if required)
- ◯ Copies of other relevant consents associated with this application
- ◯ Location and Site plans (land use) AND/OR
- ◯ Location and Scheme Plan (subdivision)
- ◯ Elevations / Floor plans
- ◯ Topographical / contour plans

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

14. Billing Details:

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

Name/s: (please write in full) Far North Holdings Ltd

Email: [redacted]

Phone number:

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

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

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Name: (please write in full) Hori Tane

Signature: [redacted] Date 12/12/24
(signature of bill payer) **MANDATORY**

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

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BAY OF ISLANDS PLANNING (2022) LIMITED

Kerikeri House
Suite 3, 88 Kerikeri Road
Kerikeri

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

18 December 2024

Far North District Council
John Butler Centre
Kerikeri

Dear Team Leaders,

Re: Proposed Public Library, Corner of State Highway 12 (Broadway) and Raihara Street, Kaikohe – Far North Holdings Limited

Our client, Far North Holdings Limited (the Applicant) seeks resource consent to develop a public library over three sites totalling 3,932m^2, on the corner of State Highway 12 (Broadway) and Raihara Street, Kaikohe. The site is zoned Commercial within the Operative District Plan (**ODP**), and Mixed Use under the Proposed Far North District Plan (**PDP**).

The application is a Discretionary Activity and requires resource consent in respect of Visual Amenity and Environmental Protection, Setback from Boundaries and Traffic Intensity. We attach information required to be included in this application by the relevant statutory documents as follows:

- **Appendix A** – Record of Titles & Relevant Instruments
- **Appendix B** – Application Plans & Elevations (Ākau)
- **Appendix C** – Design Concept Report (Eclipse Architecture, GMC Architects and Ākau)
- **Appendix D** – Site Investigation, Remedial Action Plan and Site Management Plan (Haigh Workman)
- **Appendix E** – Traffic Impact Assessment (Haigh Workman)
- **Appendix F** – Landscape Plan (Ākau)
- **Appendix G** – Acoustic Report (Marshall Day Acoustics)
- **Appendix H** – Geotechnical Investigation Report (Haigh Workman)
- **Appendix I** – Parking Occupancy Study (Far North District Council)
- **Appendix J** – Services – Design Features Report (22 degrees)
- **Appendix K** – Structural – Design Features Report (Brown & Thomson Consulting Engineers)
- **Appendix L** – Civil Engineering Design (Vecta)

Overall, it is concluded that any potential adverse effects on the environment would be less than minor and that the proposal will achieve the objectives and policies for the Commercial zone.

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

Yours faithfully,

Andrew McPhee

Cosultant Planner

1.0 INTRODUCTION

The Applicant seeks resource consent to establish a new library over three sites, on the corner of State Highway 12 (Broadway) and Raihara Street, Kaikohe. The site is zoned Commercial within the ODP, and Mixed Use under the PDP. Under both district plans the sites are subject to Pedestrian Frontage controls.

The application area involves three existing sites being Lot 1 DP 114630 and Part Lot 13 DP 7437. Part Lot 13 DP 7437 consists of two titles being NA1027/4 and NA1936/67. A copy of the Records of Title are attached at **Appendix A.**

2.0 SITE AND LOCALITY DESCRIPTION

The application site is part of the Kaikohe 'commercial hub', located centrally within the town centre. The site has frontage and access to State Highway 12 otherwise known as Broadway, and also has frontage and access onto Raihara Street. No access is sought from State Highway 12 (Broadway), all access to the proposed development will be from Raihara Street.

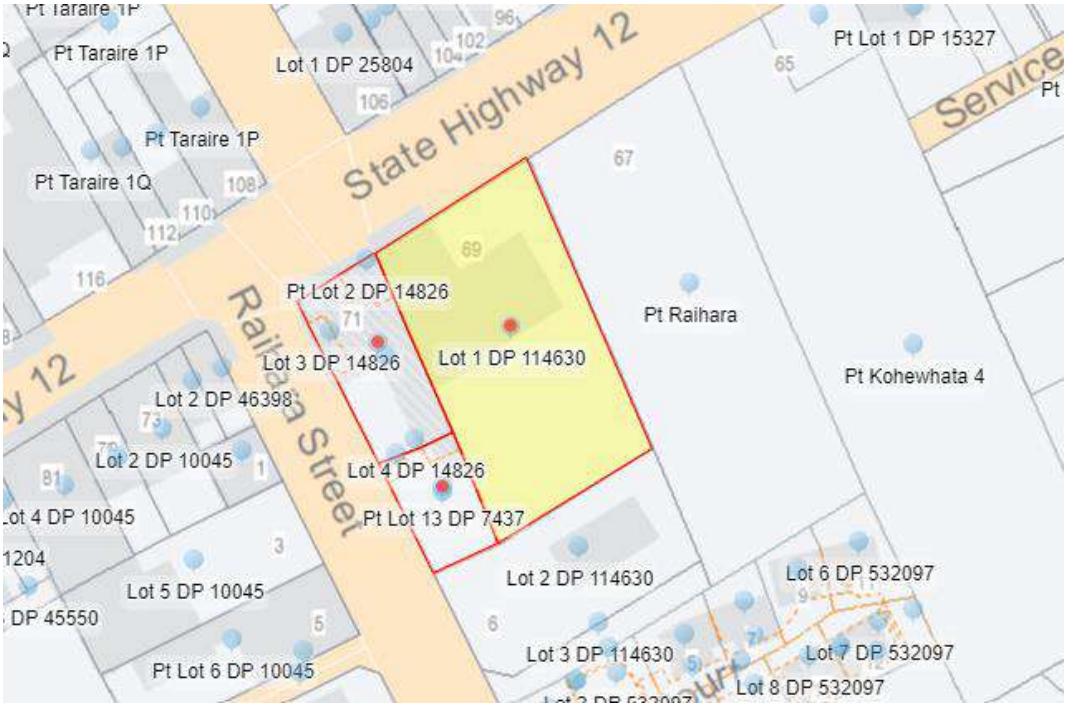

Figure 1 – Site (Source prover)

Figure 2 – Site aerial (Source Google Earth)

Despite the aerial showing a number of buildings over the site, these has recently been removed and the site is vacant. The adjacent site to the east on State Highway 12 (Broadway) is also vacant and is currently used for the Kaikohe markets. The building on the corner of State Highway 12 (Broadway) and Reihara Street opposite the site is currently untenanted.

The property has connection to all reticulated services.

Figure 3 – Site services (Source Far North Maps)

The site has been assessed in terms of National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (**NES-CS**). Haigh Workman has undertaken a Detailed Site Investigation Report, Remedial Action Plan and Site Management Plan, this is contained within **Appendix D**.

No consent notices of covenants apply to the sites.

3.0 DESCRIPTION OF THE PROPOSAL

This land use application seeks to establish a new library in Kaikohe, replacing the existing library in Kaikohe. The general layout provides for 1,001m^2 of library space, the proposed development is shown below:

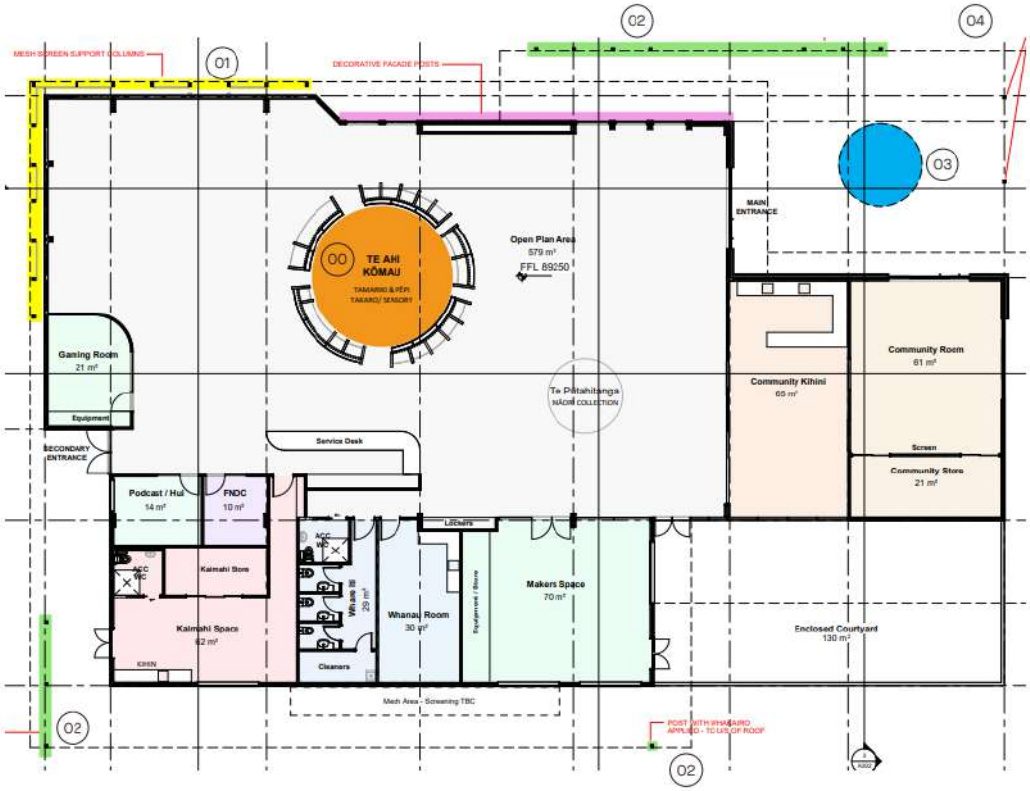

Figure 4 – Library layout (Source Ākau)

Figure 5 – Concept drawing (Source Ākau)

Carparking will be provided at the rear of the site with ingress and egress being accommodated from Raihara Street.

Figure 6 – Carparking (Source Ākau)

The full set of plans, elevations and renders for the public library are in **Appendix B**.

The development will connect into Councils existing reticulated services as detailed within the Civil Engineering Report (see **Appendix L**).

4.0 REASONS FOR CONSENT

Operative Far North District Plan (ODP)

Under the ODP, the site is zoned '**Commercial**'. The site is also subject to Pedestrian Frontage controls.

There are no other Resource Features that apply to this site.

Figure 7 – ODP zone Commercial (Source Far North Maps)

Figure 8 – PDP zone Mixed Use(Source PDP Maps)

69 State Highway 12 (Broadway) is recorded as a HAIL site under the Far North Maps. A detailed site investigation along with proposed remediation for this property is provided in **Appendix D**.

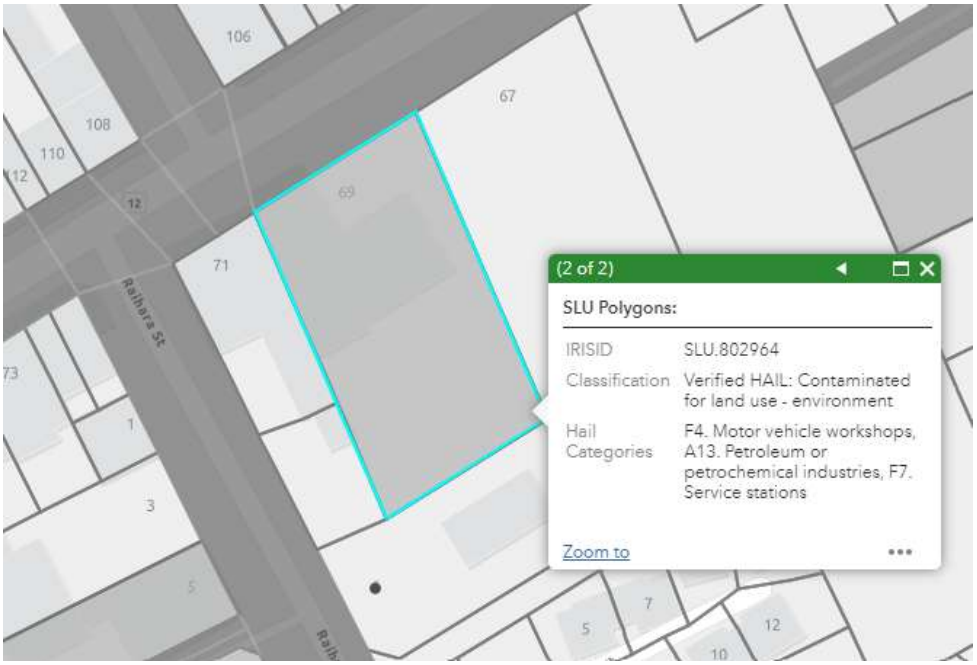

Figure 9 – HAIL map (Source Far North Maps)

An assessment of the proposal against the relevant land-use rules of the ODP is provided where it relates to the library development:

Table 1 – Commercial Zone Performance Standards

Performance Standard	Comment
Rule 7.7.5.5.1.1 Building Height	The maximum building height is approximately 7m. **Complies**
Rule 7.7.5.1.2 Sunlight	The site does not adjoin a Residential, Coastal Residential, Russell Township, Rural Living, or Coastal Living Zone site. Therefore, the rule is not relevant to the proposal. **Complies**
Rule 7.7.5.1.3 Visual Amenity and Environmental Protection	Clause (a) - requires screening along boundaries other than the Commercial or Industrial Zone. The site is surrounded by the Commercial Zone. **Complies** Clause (b) - requires that 50% of the part of the site between the road boundary and a parallel line 3m from that boundary, which are not occupied by buildings or driveways, be landscaped. The road boundary treatment is a mix of natural planting and paving. **Restricted discretionary** Clause (c) – requires landscaping to be on site in perpetuity. **Complies**

Rule 7.7.5.1.4 Setback from boundaries	The site includes a pedestrian frontage overlay. Therefore, a verandah covering the footpath is required. A verandah is not provided along the entire extent of the pedestrian frontage overlay. **Restricted discretionary**
Rule 7.7.5.1.5 Noise Mitigation for Residential Activities	No residential activities are proposed. **Complies**
Rule 7.7.5.1.6 Transportation	Traffic parking and access standards are assessed below.
Rule 7.7.5.1.7 Keeping of Animals	Not applicable **Complies**
Rule 7.7.5.1.8 Noise	Not applicable **Complies**
Rule 7.7.5.1.10 Roof Pitch	Not applicable **Complies**
Rule 7.7.5.1.11 Stormwater	The site is located within an existing consented urban stormwater management plan / discharge consent for Kaikohe. **Complies**
Rule 7.7.5.1.12 Helicopter Landing Area	Not applicable **Complies**

Table 2 – Natural and Physical Resources Performance Standards

Performance Standard	Comment
12.1 Landscape and Natural Features	The site is not implicated by 'outstanding' overlays. **Complies**
12.2 Indigenous Flora and Fauna	The proposal will not require substantial vegetation clearance that triggers relevant rules. **Complies**
12.3 Soils and Minerals	There are no earthworks provisions for the Commercial Zone except for that associated with fill for the site. **Complies**
12.4 Natural Hazards	No natural hazards are implicated. **Complies**
12.5 Heritage & 12.5A Heritage Precincts	Not applicable. There are no mapped heritage features / precincts that apply to the site. **Complies**
12.7 Lakes, Rivers, Wetlands and the Coastline	There are no localised waterways of concern.

	Complies
12.8 Hazardous Substances	Not applicable. **Complies**
12.9 Renewable Energy	Not applicable. **Complies**

Table 3 – Transportation Performance Standards

Performance Standard	Comment
Rule 15.1.6A.2.1 Traffic Intensity	The Haigh Workman report identifies the library is likely to have more than 200 traffic movements but less than 500. **Controlled Activity**
Rule 15.1.6B.1.1 On-site Car Parking Spaces	25 car parks are proposed as part of the library facility and 25 car parks is the permitted standard. **Complies**
Rule 15.1.6B.1.4 Accessible Car Parking Spaces	Two car parks are required to be accessible car parks. **Complies**
Rule 15.1.6B.1.5 Car Parking Space Standards	The carparking provided can meet the standards as set out in Appendix 3D. **Complies**
Rule 15.1.6B.1.6 Loading Spaces	The nature and scale of the development does not generate the need for loading spaces. Adequate space has been provided for bus and shuttle drop off. **Complies**
Rule 15.1.6C.1.1 Private Accessway in all Zones	The proposed accessway serves more than 8 household equivalents. **Discretionary Activity**
Rule 15.1.6C.1.2 Private Accessways in Urban Zones	The accessway is over 6m and less than 7m. **Complies**
Rule 15.1.6C.1.3 Passing Bays on Private Accessways in All Zones	No passing bays are required. **Complies**
Rule 15.1.6C.1.4 Access over footpaths	The vehicle crossings is 6m in width. **Complies**
Rule 15.1.6C.1.6 Vehicle Crossing Standards in Urban Zones	The crossings will be constructed to Council engineering standards. **Complies**
15.1.6C.1.7 General Access Standards	There is no need to reverse off site for this development.

	There are no bends and corners on the accessway. All accessway areas are linked to stormwater services. **Complies**
15.1.6C.1.8 Frontage to Existing Roads	The sites have frontage to both State Highway 12 and Raihara Street. There is not vehicular access off State Highway 12. Raihara Street is expected to meet the minimum standard. The proposal is not for a subdivision. **Complies**

The preceding assessment concludes consent is required for these rules –

- Visual Amenity and Environmental Protection;
- Setback from Boundaries;
- Traffic Intensity; and
- Private Accessway in all Zones.

The application is assessed as a **Discretionary Activity** under the ODP. It is concluded that any potential adverse effects arising from the activity would be less than minor and that the proposal reflects an activity ordinarily anticipated in the urban setting providing a valuable community asset.

In terms of the PDP, the following rules are assessed in Table 4 below.

Table 4 – PDP Standards

Proposed District Plan				
Matter	**Rule/Std Ref**	**Relevance**	**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	N/A	Yes	Not proposed **Permitted Activity**

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)	N/A	Yes	Not present **Permitted activity**
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	N/A	Yes	Not indicated on Far North Proposed District Plan. Not within 20m of a scheduled heritage resource **Permitted Activity**
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) Schedule 1 has immediate legal effect	N/A	Yes	Not indicated on Far North Proposed District Plan **Permitted Activity**

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	N/A	Yes	Not indicated on Far North Proposed District Plan **Permitted Activity**
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)	N/A	Yes	No proposed vegetation clearance. **Permitted Activity**
Activities on the Surface of Water	All rules have immediate legal effect (ASW-R1 to ASW-R4)	N/A	Yes	Not indicated on Far North Proposed District Plan **Permitted Activity**
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	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. **Permitted Activity**
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	N/A	Yes	Not indicated on Far North Proposed District Plan **Permitted Activity**
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	N/A	Yes	Not indicated on Far North Proposed District Plan

				Permitted Activity
Subdivision	SUB-R6, R13-R15, and R17	N/A	Yes	No subdivision is proposed. **Permitted Activity**
No consent is required under the PDP				

National Environmental Standard

The site is subject to the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (**NES-CS**) due to the change in use. The site has been subject to a previous assessment that identified the presence of asbestos containing material in the buildings onsite (69 Broadway). A detailed site investigation has been prepared by Haigh Workman in **Appendix D**. The report concludes that upon completion and validation of remedial works it is projected that the following can be achieved:

- The level of risk from arsenic ground contamination is reduced to 'low/negligible'; no preferential pathways should exist between pyrene and groundwater receptor.
- In accordance with NES Regulation 2011(4)(b), it can be concluded that 'It is highly unlikely that there will be a risk to human health if the activity is done to the piece of land'.

No consent is required under the NES-CS.

5.0 SECTION 104B ASSESSMENT

Section 104B of the Resource Management Act (**RMA**) governs the determination of applications for Discretionary activities:

104B Determination of applications for discretionary or non-complying activities

After considering an application for a resource consent for a discretionary activity or non-complying activity, a consent authority—

(a) may grant or refuse the application; and

(b) if it grants the application, may impose conditions under section 108.

With respect to discretionary activities, the Council has discretion to grant or refuse an application. Council may then impose conditions under Section 108.

When considering an application for resource consent, a consent authority must have regard to the matters under section 104 of the Resource Management Act 1991, including any matters relating to Part 2. References to Part 2 in applications are only required where Plans may be deficient in terms of giving effect to the purpose and principles of the RMA.

Section 104 specifies that consent authorities have regard to the following matters when considering whether to grant or refuse an application for resource consent.

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

(ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment that will or may result from allowing the activity; and;

(c) any relevant provisions of –

i. a national environmental standard:

ii. other regulations:

iii. a national policy statement:

iv. a New Zealand Coastal Policy Statement:

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

vi. a plan or proposed plan; and

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

In the case of the subject application those considerations include the actual and potential effects of an activity on the environment, the relevant provisions of the regional policy statement or other relevant statutory document, a district plan and any other matter the consent authority considers relevant and reasonably necessary to determine the application.

As the sites are not within the Coastal Environment the New Zealand Coastal Policy Statement is not relevant.

The following assessment addresses all relevant considerations under s104 of the RMA.

Section 104 (1)(a) Assessment of Effects on the Environment (AEE)

Section 104(1)(a) requires that consent authorities have regard to any actual or potential effects on the environment of allowing the activity. Section 2 of the RMA defines 'Environment' as follows:

environment includes—

(a) ecosystems and their constituent parts, including people and communities; and

(b) all natural and physical resources; and

(c) amenity values; and

(d) the social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) or which are affected by those matters

Section 3 defines the meaning of 'effect' to include:

3 Meaning of effect

In this Act, unless the context otherwise requires, the term **effect** includes—

(a) any positive or adverse effect; and

(b) any temporary or permanent effect; and

(c) any past, present, or future effect; and

(d) any cumulative effect which arises over time or in combination with other effects—

regardless of the scale, intensity, duration, or frequency of the effect, and also includes—

(e) any potential effect of high probability; and

(f) any potential effect of low probability which has a high potential impact.

Section 3: amended, on 7 July 1993, by section 3 of the Resource Management Amendment Act 1993 (1993 No 65).

Section 104(2) of the RMA states that:

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

This is referred to as the 'permitted baseline', which is based on the permitted performance standards and development controls that form part of a district plan. The bulk and location controls generally permit a building of this type and scale in this location save the proposed design treatment in terms of landscaping, not providing a pedestrian frontage and the traffic movement thresholds and access under the District Wide rules.

The focus of this AEE is on addressing those relevant matters for which resource consent is sought within the Commercial Zone along with the applicable District Wide rules. The matters of discretion within the Commercial zone chapter provide the appropriate basis for the evaluation along with relevant maters identified in Chapters 11 and 15 of the ODP.

An assessment of the degree to which this application achieves the objectives and policies of the ODP, PDP and Northland Regional Policy Statement is also undertaken.

Visual amenity and environmental protection

The design of the library was carefully considered in collaboration with schools, community groups, Local hapu and Iwi. Detail around the design concepts and the process are referenced in **Appendix C**.

The areas surrounding the carparking area at the southern end of the site are landscaped with garden varietals and specimen trees. Paving treatment has been preferred on the area between the carpark and the secondary entrance to the library on Raihara Street as well as on the State Highway 12 (Broadway) frontage. There is an additional area of vegetated landscaping wrapping around the corner of Raihara Steet and State Highway 12 (Broadway). A Landscape Plan is provided in **Appendix F** which details the vegetation, paving and furniture proposed for the development.

Figure 10 – Render of the proposed Library looking from State Highway 12 (Broadway) (Source Ākau)

The design concept for the library site was carefully considered coupled with appropriate landscaping solutions in cognisance of functionality, practicality and visibility of building, enabling it to tell its story (see **Appendix C**).

The library façade utilises three main materials: vertical timber cladding, volcanic stone, and glazing. At the main entrance, this corner geographically and symbolically points towards Pūtahi. The walls under the canopy are lined with local volcanic stone to reinforce this connection. The volcanic stone continues around the courtyard, its solid mass emphasising a sense of safety inside. Key landscaping approaches were:

- Creating a large basalt paving area for community gathering. Numerous bench seats are to be placed throughout this area.
- Raised circular planters made from volcanic stone break up the plaza space and contain a few native trees.

- Low maintenance, native planting in the carpark berms and around the Broadway/Raihara Street corner of the building.
- Bicycle rack underneath the canopy.

The result is a building and site that has applied landscape solutions to facilitate a high-quality aesthetic and community space. While the definition in the ODP for 'landscaping' is generally limited to the planting of trees, shrubs and plants, it is considered that the general concept of landscaping is much broader, encapsulating elements found in nature. By way of example, the use of basalt and granite paving on the Broadway façade.

It is considered that the landscaping proposed for the library is appropriate in the context of its place as an iconic community building in the middle of the urban fabric in Kaikohe. Any adverse effects are considered to be less than minor.

Figure 11 – Render of the proposed Library looking west along State Highway 12 (Broadway) (Source Ākau)

Figure 12 – Render of the proposed Library looking east along State Highway 12 (Broadway) at the corner of Raihara Street (Source Ākau)

Setback from Boundaries

The library is not proposing to provide a pedestrian frontage in accordance with the permitted activity standard. Pedestrian frontage along the southern side of State Highway 12 (Broadway), east of the proposed library, is sporadic. The neighbouring properties adjacent to the library site to the east (67 and 65 State Highway 12 (Broadway)) are free of development. These sites are large open spaces, currently utilised for the Kaikohe markets (see Figure 13).

Figure 13 – Sites at 65 and 67 State Highway 12 (Broadway) looking west towards the library site (Source Google Maps)

To the west on the opposite side of Raihara Street, the pedestrian frontage along State highway 12 (Broadway) is more consistent and in keeping with the pedestrian frontage controls in the ODP (see Figure 14).

Figure 14 – Broadway looking west on the opposite side of Raihara Street (Source Google Maps)

The character of the Commercial zone along the southern side of State Highway 12 (Broadway) east of Raihara Street is distinctively different to the character west of Raihara Street.

The character to the east is better described as a mix of commercial and light industrial land use, including the presence of two petrol stations and a tyre shop. As mentioned above, the presence of a pedestrian frontage along State Highway 12 (Broadway) to the east is sporadic.

To the west of the site land use is more akin to a traditional town centre with the presence of food outlets, cafes, hairdressers, butchers, banks etc. The pedestrian frontage is maintained along this stetch of State Highway 12 (Broadway).

To summarise it is considered that the character of the development east of Raihara Street is different to that west of Raihara street. The proposed library bookends this change of character and the design, in terms of a non-traditional pedestrian frontage, is in keeping with the character of the development of commercial blocks to the east of State Highway 12 (Broadway).

It is noted that while the library is not providing a pedestrian frontage in accordance with the ODP provisions, the main entrance of the building does provide significant cover and a place for the public to meet and retreat from the weather if necessary.

Traffic Intensity and Access

A comprehensive Traffic Impact Assessment has been prepared by Haigh Workman (see **Appendix E**). In terms of traffic intensity, the Traffic Impact Assessment identifies that the library will generate 256 vehicles movements per day and that the net generated effects on the intersection of State Highway 12 (Broadway) and Raihara Street are anticipated to be nil.

No access is being provided from State Highway 12 (Broadway) favouring exclusive access from Raihara Street. The access has been designed to cater for the proposed activity and vehicle numbers attributed to the activity.

The report suggests that the replacement of the existing library will incur minimal change in traffic patterns of the surrounding network and concludes that the possible traffic impacts from the proposed development are less than minor. A full assessment against the assessment criteria in the ODP is within section 7.1 of the Traffic Impact Assessment (**Appendix E**).

Section 104 (1)(ab) Any measures to achieve positive effects

Positive effects associated with this activity are many. They include but are not limited to:

- Providing access to educational resources and information;
- Providing a vehicle for the promotion of literacy and learning; and
- Providing a community hub for social interaction.

Additionally, the library will provide a modern community asset in an accessible location for the people of Kaikohe and surrounds. The library will be an immersive learning environment and sensory space, born directly from hapū kōrero and elevated through community discussions.

Section 104 (b)(i) and (ii) National Environmental Standards & Other Regulations

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (**NES-CS**). The site has been subject to a previous assessment that identified the presence of asbestos containing material in the buildings onsite (69 Broadway). A Detailed Site Investigation, Remedial Action Plan and Site Management Plan for 69 Broadway, Kaikohe has been prepared by Haigh Workman (see **Appendix D**). The report concludes upon completion and validation of remedial works it is projected that the following can be achieved:

- The level of risk from arsenic ground contamination is reduced to 'low/negligible'; no preferential pathways should exist between pyrene and groundwater receptor.
- In accordance with NES Regulation 2011(4)(b), it can be concluded that 'It is highly unlikely that there will be a risk to human health if the activity is done to the piece of land'.

The National Environmental Standard for Freshwater (**NES-FW**). A review of aerial images, including NRC's wetland maps, reveal no evidence to suggest that there are any wet areas that may be subject to the NES-FW provisions. Therefore, no further assessment is required under the NES-FW.

Section 104 (b)(iii) National Policy Statement(s)

There are no National Policy Statements considered to be relevant to this application for a library in Kaikohe.

Section 104 (b)(iv) New Zealand Coastal Policy Statement

The New Zealand Coastal Policy Statement is not relevant to this application.

Section 104 (b)(v) Regional Policy Statement or Proposed Regional Policy Statement

The subject site is within the Northland region and is subject to the objectives and policies of the operative Northland Regional Policy Statement (operative May 2016). The jurisdiction for land use activities is governed by the Far North District Council including the policy framework and the management of potential effects as set out in the ODP. This Plan is subject to the governing regional policy framework evolving from the Northland Regional Policy Statement. With respect to any identified features, the site is not within any area of 'High' or 'Outstanding' Natural Area, or the Coastal Environment boundary.

Of statutory relevance to this proposal are regional objectives and policies relating to sustainable management, enabling economic wellbeing and planned/coordinated development. The proposed development is considered to promote sustainable management through the provision of a community facility enabling that community to provide for their social and cultural wellbeing. The development seeks to replace the existing library in Kaikohe with a new building that has undergone extensive engagement with schools, community groups, local iwi and hapu to provide a fit for purpose community facility in the heart of Kaikohe.

Overall, it is considered that the proposal would not be inconsistent with the Northland Regional Policy Statement objectives and policies.

Section 104 (b)(vi) Plans or Proposed Plans

This application is subject to the provisions of the ODP and is subject to consideration (limited weight) of the PDP objectives and policies. The site is zoned Commercial in the ODP and Mixed Use in the PDP. In terms of the ODP it is to be assessed in terms of the objectives and policies for the Commercial Zone and the transport standards that apply district wide.

The District Plan Urban Environment is comprised of three urban sub-zones that includes the Residential Zone, the Commercial Zone and the Industrial Zone. These zones provide for distinctively different urban environments that together function as a community environment that enables living and employment opportunities. They are the parts of the district that have public infrastructure services that enable growth and intensification of land use activities. The Commercial Zone enables the development of this nature. The application site is located within an established commercial environment.

Table 5 – Commercial zone Objectives and Policies

OBJECTIVE OR POLICY		PERFORMANCE OF PROPOSAL
OBJECTIVES		
7.7.3.1	To achieve the development of commercial areas in the district accommodating a wide range of activities that avoid, remedy or mitigate the adverse effects of activities on other activities within the Commercial Zone and on the natural and physical resources of the District.	The establishment of a library is considered to have no adverse effect upon any activity within the adjoining Commercial Zone and has no effect upon the natural and physical resources.
POLICIES		

OBJECTIVE OR POLICY		PERFORMANCE OF PROPOSAL
7.7.4.1	That the Commercial Zone be applied to areas which are traditional commercial centres, and also to areas where the provision of commercial activity would not have adverse environmental effects, and would contribute to the needs and well being of the community.	The Commercial Zone has been created through the District Plan process with the effects generated by the activity being no different from those effects of other activities in the Zone.
7.7.4.2	That the range of activities provided for in the Commercial Zone be limited only by the needs for the effects generated by the particular activity to be consistent with other activities in the zone.	The proposal is replacing the existing library in Kaikohe in a similar location, and is a valuable community asset for the township.
7.7.4.3	That standards be applied that protect visual and environmental amenity within the Commercial Zone, and the amenity of adjacent zones.	Careful consideration has been given to the design of the building in the context of its surrounds. The overall form of the building is single level to ensure sightlines were kept across the whole interior, and the building was fully accessible. The material used for the façade and the layout, both internally and how it sits on the site, have been carefully considered to aid legibility and provide amenity both as it translates from the street and how it is used by the community.
7.7.4.4	That stormwater disposal systems do not result in suspended solids, industrial by-products, oil, or other contaminated substance or waste entering the stormwater collection system in concentrations that are likely to pose an immediate or long term hazard to human health or the environment.	The proposals stormwater system drainage will discharge via gravity where possible to the existing stormwater services. The system will be designed in accordance with AS/NZS 3500.3 Plumbing and drainage - Stormwater drainage and E1/AS1 of NZBC Clause E1 Surface Water. The specific drainage requirements of E2/AS1 of NZBC Clause E2 External Moisture will also be provided.

In summary, it is considered that the proposal would achieve the outcomes sought by the objectives and policies for the Commercial zone, particularly in this location in proximity to the library it is replacing. It is considered that the proposal would contribute positively to visual and environmental amenity within the Commercial Zone, and the amenity of adjacent zones in Kaikohe.

Table 6 – Traffic, Parking and Access Objectives and Policies

OBJECTIVE OR POLICY		PERFORMANCE OF PROPOSAL
OBJECTIVES		
15.1.3.1	To minimise the adverse effects of traffic on the natural and physical environment.	The traffic volumes have been considered in the Traffic Impact Assessment and are considered to generate no more than the existing library.
15.1.3.2	To provide sufficient parking spaces to meet seasonal demand in tourist destinations.	Sufficient carparking is being provided. This proposal provides more carparking than the existing library being replaced.
15.1.3.3	To ensure that appropriate provision is made for on-site car parking for all activities, while considering safe cycling and pedestrian access and use of the site.	All of these matters are addressed in the Traffic Impact Assessment (**Appendix E**). Appropriate provision is made for parking, including an area for shuttles and vans to park. A cycle rack is provided at the front of the building. In terms of pedestrian safety, access to the site is provided by adjoining footpaths on State Highway 12 (Broadway) and Raihara Street. There is pedestrian circulation around the building and to main entry at the front of the building.
15.1.3.4	To ensure that appropriate and efficient provision is made for loading and access for activities.	Vehicular access to the site is from the side road (Raihara Street). Loading bays are not considered relevant for a library.
15.1.3.5	To promote safe and efficient movement and circulation of vehicular, cycle and pedestrian traffic, including for those with disabilities.	Refer Objective 15.1.3.3. Disability parking is provided from Raihara Street.
POLICIES		
15.1.4.1	That the traffic effects of activities be evaluated in making decisions on resource consent applications.	A Traffic Impact Assessment has been assessed the effects of the application and is provided in **Appendix E**.
15.1.4.2	That the need to protect features of the natural and built environment be recognised in the provision of parking spaces.	There are no features considered affected through the provision of parking for the library.

OBJECTIVE OR POLICY		PERFORMANCE OF PROPOSAL
15.1.4.3	That parking spaces be provided at a location and scale which enables the efficient use of parking spaces and handling of traffic generation by the adjacent roading network.	The traffic generation is commensurate with the library that is being replaced by this application. Parking has been provided in general accordance with the standards in the ODP.
15.1.4.4	That existing parking spaces are retained or replaced with equal or better capacity where appropriate, so as to ensure the orderly movement and control of traffic.	Parking and access have been provided in general accordance with the standards in the ODP.
15.1.4.5	That appropriate loading spaces be provided for commercial and industrial activities to assist with the pick-up and delivery of goods.	Loading spaces are not considered necessary for this land use activity.
15.1.4.6	That the number, size, gradient and placement of vehicle access points be regulated to assist traffic safety and control, taking into consideration the requirements of both the New Zealand Transport Agency and the Far North District Council.	Parking and access have been provided in general accordance with the standards in the ODP. No vehicle access is being provided from State Highway 12 (Broadway).
15.1.4.7	That the needs and effects of cycle and pedestrian traffic be taken into account in assessing development proposals.	Refer Objective 15.1.3.3
15.1.4.8	That alternative options be considered to meeting parking requirements where this is deemed appropriate by the Far North District Council.	Parking has been provided in accordance with the standards in the ODP. A cycle rack is also provided as part of this application.

In summary, it is considered that the proposal would achieve the outcomes sought by the objectives and policies for Traffic, Parking and Access. The proposed design and layout for parking and access are the subject of a comprehensive Traffic Impact Assessment in **Appendix E**. Overall, it is considered that the proposal is consistent with the objective and policy framework.

Table 7 – PDP Mixed Use zone Objectives and Policies

OBJECTIVES	
MUZ-O1	The Mixed Use zone is the focal point for the district's commercial, community and civic activities, and provides for residential development where it complements and is not incompatible with these activities.
MUZ-O2	Development in the Mixed Use zone is of a form, scale, density and design quality that contributes positively to the vibrancy, safety and amenity of the zone.
MUZ-O3	Enable land use and subdivision in the Light Industrial zone where there is adequacy and capacity of available or programmed development infrastructure to support it.
MUZ-O4	The adverse environmental effects generated by activities within the zone are managed, in particular at zone boundaries.
MUZ-O5	Residential activity in the Mixed Use zone is located above commercial activities to ensure active street frontages, except where the interface is with the Open Space zone.
POLICIES	
MUZ-P1	Enable a range of commercial, community, civic and residential activities in the Mixed Use zone where: a. it supports the function, role, sense of place and amenity of the existing environment; and b. there is: i. existing infrastructure to support development and intensification, or ii. additional infrastructure capacity can be provided to service the development and intensification.
MUZ-P2	Require all subdivision in the Mixed Use zone to provide the following reticulated services to the boundary of each lot: a. telecommunications: i. fibre where it is available; ii. copper where fibre is not available; iii. copper where the area is identified for future fibre deployment. b. local electricity distribution network; and c. wastewater, potable water supply and stormwater where they are available.
MUZ-P3	Require development in the Mixed Use zone to contribute positively to: a. high quality streetscapes; b. pedestrian amenity; c. safe movement of people of all ages and abilities; d. community well-being, health and safety; and e. traffic, parking and access needs.
MUZ-P4	Require development in the Mixed Use zone that is adjacent to Residential and Open Space zones to maintain the amenity values of those areas, having specific regard to: a. visual dominance;

	b. privacy; c. shadowing; d. ambient noise; and e. light spill.
MUZ-P5	Restrict activities that are likely to have an adverse effect on the function, role, sense of place and amenity of the Mixed Use zone, including: a. residential activity, retirement facilities and visitor accommodation on the ground floor of buildings, except where a site adjoins an Open Space zone; b. light or heavy industrial activity; c. storage and warehousing; d. large format retail activity over 400 m^2; and e. waste management activity.
MUZ-P6	Promote energy efficient design and the use of renewable electricity generation in the construction of mixed use development.
MUZ-P7	Consider the following effects when assessing applications to establish residential, early childhood, retirement and education facilities: a. the level of ambient noise; b. reduced privacy; c. shadowing and visual domination; and d. light spill.
MUZ-P8	Manage land use and subdivision to address the effects of the activity requiring resource consent, including (but not limited to) consideration of the following matters where relevant to the application: a. consistency with the scale, density, design, amenity and character of the mixed use environment; b. the location, scale and design of buildings or structures, outdoor storage areas, parking and internal roading; c. at zone interfaces: i. any setbacks, fencing, screening or landscaping required to address potential conflicts; ii. any adverse effects on the character and amenity of adjacent zones; d. the adequacy and capacity of available or programmed development infrastructure to accommodate the proposed activity; including: i. opportunities for low impact design principles; ii. management of three waters infrastructure and trade waste; e. managing natural hazards; f. the adequacy of roading infrastructure to service the proposed activity; g. any adverse effects on historic heritage and cultural values, natural features and landscapes or indigenous biodiversity, and h. any historical, spiritual, or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.

The library will be a building within the Mixed use zone designed for civic activities. The Mixed Use zone or town centre is an appropriate location for a library.

The scale and design of the proposed library has been carefully considered and has been the subject to much community consultation. Appropriate provision of traffic, parking and access has been provided along with safe movement of people accessing the facility.

Council services are available and will be utilised to serve the proposed development.

The site is surrounded by the Mixed Use zone. The assessment of effects above has concluded that the effects on the environment form the development will be less than minor.

Overall, it is considered that the proposal is consistent with the PDP Mixed Use objective and policy framework.

Table 8 – PDP Transport Objectives and Policies

OBJECTIVES	
TRAN-O1	The State Highways, transport networks and cycleways of strategic significance are recognised and managed as regionally significant infrastructure to support the economic, cultural, environmental and social wellbeing of current and future generations.
TRAN-O2	The transport network is designed and located to minimise adverse effects on historical, cultural and natural values.
TRAN-O3	Land use and all modes of transport are integrated so that the transport network is safe, efficient and well-connected.
TRAN-O4	Parking, loading and access provisions support the needs of land use and subdivision activities, and ensure safe and efficient operation for users.
TRAN-O5	The safe and efficient movement of vehicular, cycle and pedestrian traffic that also meets the needs of persons with a disability or limited mobility.
TRAN-O6	The transport network is resilient to the likely current and future effects of climate change, and supports urban environments designed to reduce greenhouse gas emissions.
POLICIES	
TRAN -P1	Recognise the transport network as regionally significant infrastructure by having particular regard to the significant social, economic, and cultural benefits of transport projects when determining resource consent applications or making recommendations on notices of requirement.
TRAN -P2	Establish and maintain a transport network that: a. provides safe efficient linkages and connections; b. avoids and mitigates adverse effects on historical, cultural and natural environment values to the extent practicable; c. recognises the different functions and design requirements for each road classification under the most current National Transport Network classification system;

	d. supports reductions of greenhouse gases from vehicle movements; e. considers the likely current and future impacts of climate change when new sections of the network are proposed or existing sections upgraded; and f. provides for existing and future pedestrian and cycling pathways, including the Pou Herenga Tai Twin Coast Cycle Trail.
TRAN -P3	Ensure the safe, efficient and well connected operation of the transport network through the management of: a. the subdivision layout, and location of buildings, structures and other potential visual obstructions that may impact on sightlines and the integrity of the road carriageway; b. the design of access and parking; c. vehicular access to and from sites; d. the volume of traffic from land use activities; e. vehicular, pedestrian, and cyclist needs, including persons with a disability or limited mobility; f. the adverse cumulative effects of land use and subdivision on the transport network; and g. reverse sensitivity effects that may impact regionally significant infrastructure.
TRAN -P4	Manage the design, location and supply of parking to: a. achieve the safe, efficient and effective operation of the transport network; b. support the operational and functional requirements of activities; c. appropriately manage character and amenity effects on the local environment, including on the streetscape; d. minimise the impact of large parking areas on the stormwater network by encouraging low impact design; e. provide sufficient parking for persons with a disability or limited mobility; and f. comply with any relevant Parking Management Plans.
TRAN -P5	Encourage new land uses to support an integrated and diverse transport network by: a. promoting alternative transport modes; b. the provision of safe and secure parking facilities for bicycles and associated changing or showering facilities for staff; c. allocation of parking facilities for motorcycles, car share vehicles, pick/up/drop off areas for ride share services and charging stations for electric vehicles; and d. supporting the establishment and operation of accommodation and tourism related activities in close proximity to the Pou Herenga Tai Twin Coast Cycle Trail, provided reverse sensitivity effects can be avoided.
TRAN -P6	Provide flexibility for a reduction in on-site parking where it can be demonstrated that: a. there are no adverse effects on public parking or the transport network; or b. there is a lower parking demand; or c. alternative modes of transport are provided for, if appropriate; or d. the reduction will protect cultural or heritage values.

TRAN -P7	Only allow high traffic generating activities exceeding the thresholds in TRAN-Table 11 - Trip generation where these activities support the safe, efficient and effective use of transport infrastructure, as demonstrated through an integrated transport assessment (ITA). All ITAs should be completed by a suitably qualified and experienced transport professional.
TRAN -P8	Manage land use and subdivision to address the effects of the activity requiring resource consent, including (but not limited to) consideration of the following matters where relevant to the application: a. the type and level of traffic anticipated; b. the location of high traffic generating activities and their relationship to existing roads and their status under the National Transport Network classification system, and adjacent properties; c. low impact design principles, including green spaces; d. safety requirements and improvements; e. the management of stormwater; f. any natural hazards; g. any cumulative effects arising from lawfully established activities in the surrounding environment; h. current and future connectivity including pathways and parking, and open space networks; i. any traffic assessment prepared by a suitably qualified and experienced transport professional; j. impacts on any State Highway or Limited Access Road; and k. any historical, spiritual or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.

For the reasons already provided through this report and with reference to the Traffic Impact Assessment in **Appendix E**, the proposal is considered to be consistent with the objectives and policies for Transport under the PDP.

Section 104 (b)(vi) Plans or Proposed Plans

There are no other matters that are considered relevant.

6.0 NOTIFICATION (S95A-95D)

S95A of the RMA determines circumstances when public or limited notification of an application may be appropriate. Section 95A sets out a series of steps for determining public notification. These include:

- *Step 1* – Mandatory public notification in certain circumstances. The applicant is not seeking public notification, nor is it subject to a mandatory notification requirement.

- *Step 2* – Public notification precluded in certain circumstances. None of the circumstances in this step apply.
- *Step 3* – Public notification required in certain circumstances. In respect of clause 8(a) the application is not subject to a rule or national environmental standard that requires public notification. In respect of clause 8(b), this assessment of effects on the environment concludes that any adverse effects would be less than minor. For these reasons, it is considered that the application can be processed without public notification.
- *Step 4* – Public notification in special circumstances. 'Special circumstances' are those that are unusual or exceptional, but they may be less than extraordinary or unique. (Peninsula Watchdog Group Inc v Minister of Energy [1996] 2NZLR 5290). It is considered that there are no unusual or exceptional circumstances that would warrant notification of this application.

Section 95B sets out a series of steps for determining limited notification. These include:

- *Step 1* – certain affected groups and affected persons must be notified. These include affected customary rights groups or marine title groups (of which there are none relating to this application). Affected groups and persons may also include owners of adjacent land subject to statutory acknowledgement if that person is affected in accordance with s95E. There are no groups or affected persons that must be notified with this application.
- *Step 2* – limited notification precluded in certain circumstances. These include any rule or national environmental standard that precludes limited notification, or the activity is solely for a controlled activity or a prescribed activity. These circumstances do not apply to this application.
- *Step 3* – certain other persons must be notified. An affected person is determined in accordance with s95E. A person is affected if the consent authority decides that the activity's adverse effects on the person are minor or more than minor (but are not less than minor). Adverse effects on a person may be disregarded if a rule or a national environmental standard permits an activity with that effect or is a controlled or RDA with an adverse effect that does not relate to a matter over which a rule or standard reserves control or discretion. Those circumstances do not apply to this application. S95E(3) states that a person is not affected if the person has given, and not withdrawn their written approval for a proposed activity or a consent authority is satisfied that it is unreasonable in the circumstances for an applicant to seek a person's written approval.

The assessment of effects above has concluded that the effects on the environment will be less then minor. The library is considered appropriate in the proposed location within the commercial environment and contributes positively to the amenity of the Kaikohe town centre.

Section 95C relates to the public notification after a request for further information which does not apply to this application. Section 95D provides the basis for determining notification under Section 95A(8)(b) if adverse effects are likely to be more than minor. This assessment concludes that potential adverse effects arising from the application would be less than minor.

7.0 PART II CONSIDERATIONS

With regard to the purpose and principles of the Resource Management Act 1991, the following considerations are of relevance to this application.

Sustainable Management [Section 5]

The purpose of the RMA as stated in section 5 is the sustainable management of natural and physical resources through managing their use, development and protection in a way that enables people and communities to provide for their social, cultural and economic well-being while sustaining those resources for future generations, protecting the life supporting capacity of ecosystems, and avoiding, remedying or mitigating adverse effects on the environment.

The development attains a vision sought by the applicant and the community ensuring that the four wellbeing's can be provided for.

Matters of National Importance [Section 6]

With respect to section 6 matters, those of potential relevance are the relationships of Māori with land, as the development area does not contain any outstanding natural features or landscapes, significant vegetation or habitats.

Whilst only one matter is considered to apply, the relationship of Maori with the land is enhanced through the collaboration with local hapu and iwi in the design of the library building.

Other Matters [Section 7]

Many of the items in section 7 accord with values held by tangata whenua and hence underpin the philosophy behind the proposal. These include maintenance and enhancement of both amenity values and the quality of the environment which are embodied within the proposal. The earlier discussion demonstrated there will be no adverse effects on the environment and how amenity values will be maintained and improved.

Treaty of Waitangi [Section 8]

With respect to the principles of the Treaty of Waitangi, the project is not considered to be in conflict with these articles.

8.0 CONCLUSION

This application seeks discretionary resource consent for the development of a library on the corner of State Highway 12 (Broadway) and Raihara Street within the Commercial Zone. The proposal replaces the current library approximately 100 metres away. The building has been designed in consultation with the local community, hapu and iwi and creates an iconic building on Kaikohe's main street. Overall, any potential adverse effects are considered to be less than minor.

The proposal is consistent with the relevant objectives of policies of the ODP and the PDP. An assessment of Part II of the RMA has also been completed with the proposal generally able to satisfy this higher order document also.

On this basis, it is considered that the application is able to be processed on a non-notified basis.

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

Kind regards,

Andrew McPhee
Consultant Planner

Reviewed by

Steven Sanson
Consultant Planner

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R.W. Muir
Registrar-General of Land

Identifier **NA65B/130**

Land Registration District **North Auckland**

Date Issued 08 July 1987

Prior References

NA668/174 NA668/175

Estate Fee Simple

Area 2642 square metres more or less

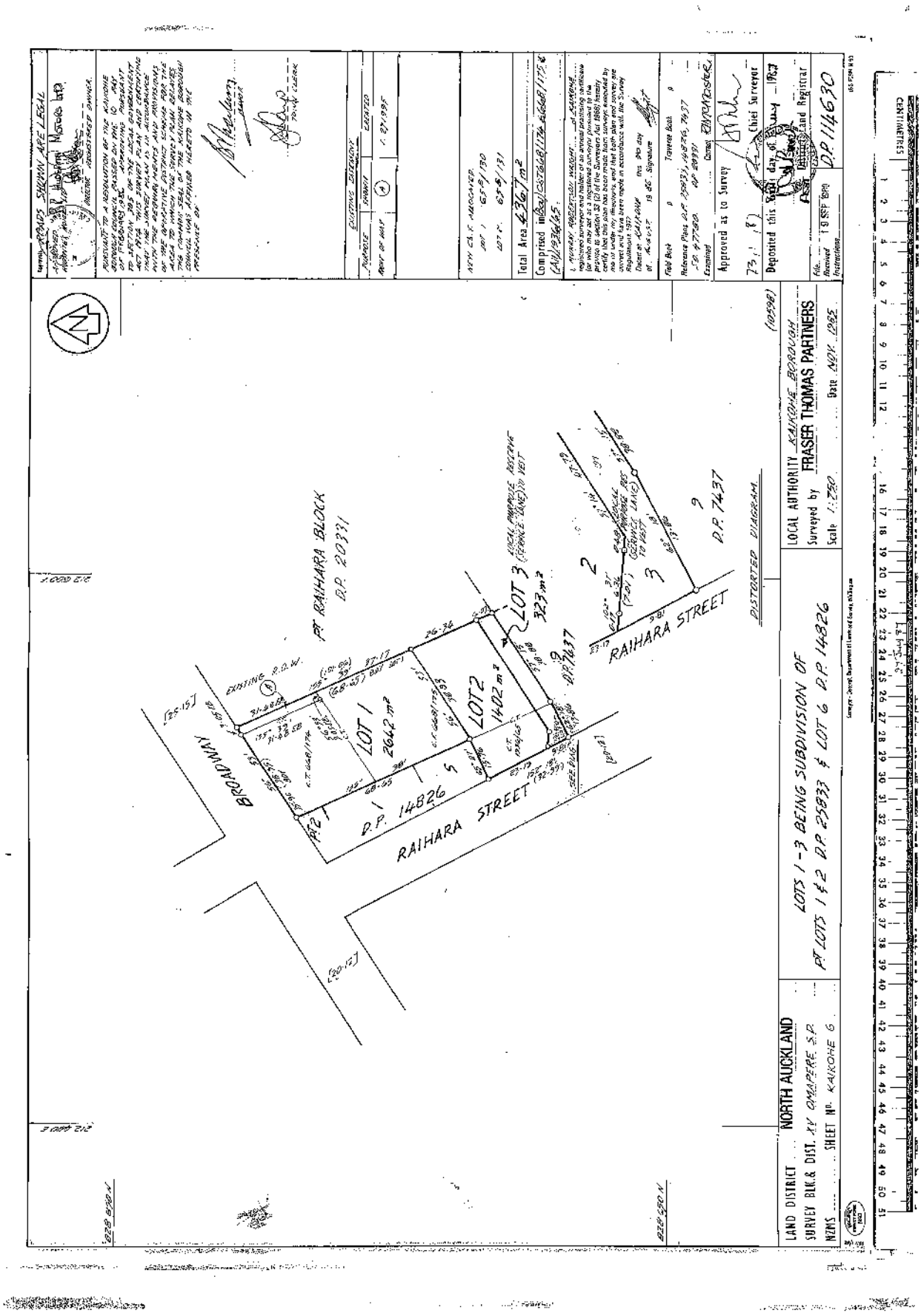
Legal Description Lot 1 Deposited Plan 114630

Registered Owners

Far North District Council

Interests

Fencing Agreement in Transfer 271995


LOTS 1-3 BEING SUBDIVISION OF
PT LOTS 1 & 2 DP 25833 & LOT 6 D.P. 14826
LOCAL AUTHORITY KAIKOHE BOROUGH
Surveyed by FRASER THOMAS PARTNERS
Scale 1:250
Date NOV. 1985
LAND DISTRICT NORTH AUCKLAND
SURVEY BLK & DIST. XV OMAPERE S.D.
NZMS SHEET NO. KAIKOHE 6
DISTORTED DIAGRAM
PT RAIHARA BLOCK
D.P. 20731
LOT 1
2642 m²
LOT 2
1402 m²
LOT 3
323 m²
D.P. 14826
D.P. 7437
BROADWAY
RAIHARA STREET
EXISTING R.O.W.
Approved as to Survey
Chief Surveyor
Deposited this
Land Registrar
D.P. 114630

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 **NA1027/4**

Part-Cancelled

Land Registration District **North Auckland**

Date Issued 05 March 1952

Prior References
NA235/283

Estate Fee Simple

Area 860 square metres more or less

Legal Description Part Lot 13 Deposited Plan 7437

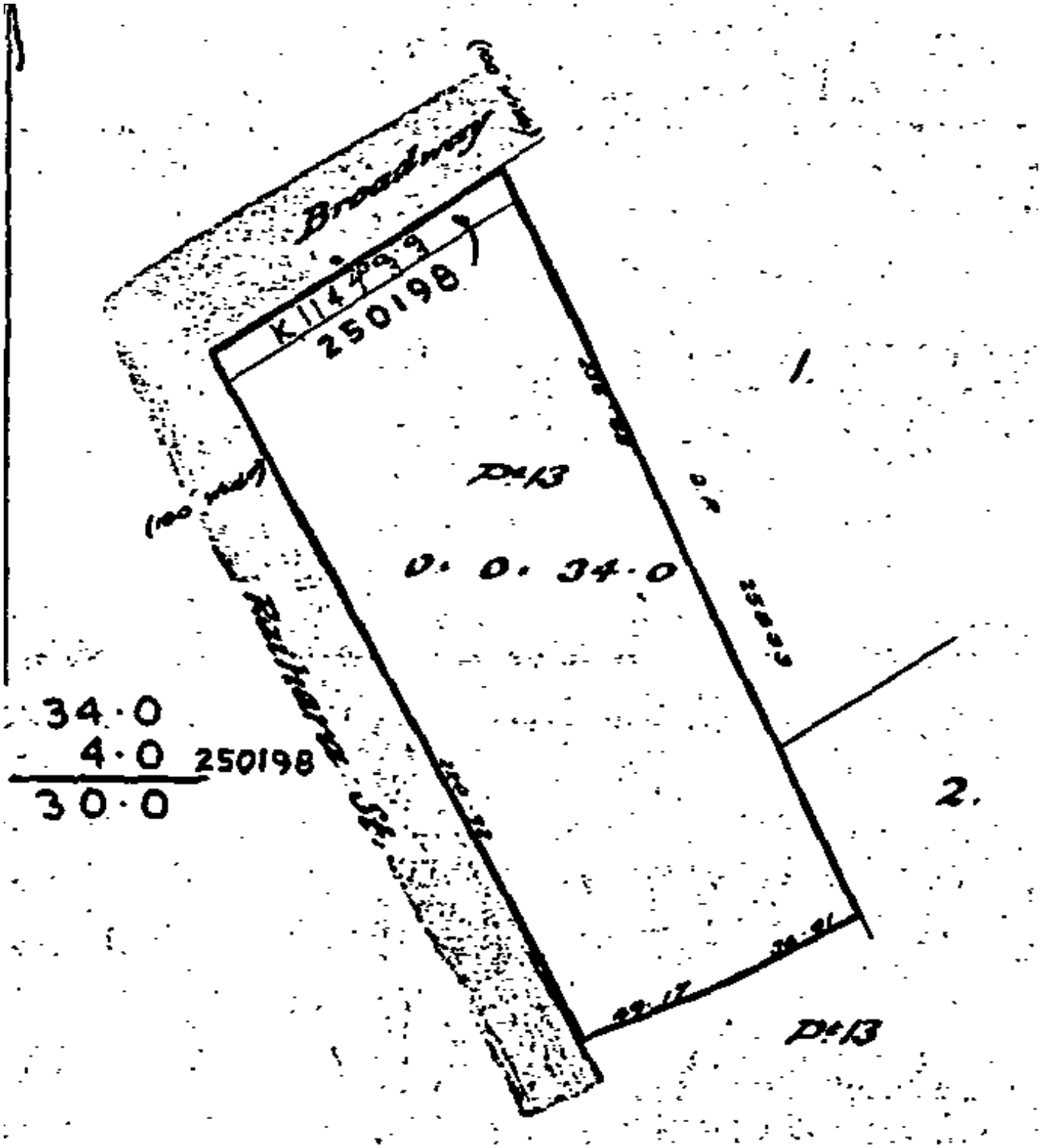
Registered Owners

Far North District Council

Interests

K114733 Building Line by law for Kaikohe Borough Council under Section 188 Municipal Corporations Act 1954 - 26.7.1963 at 9.01 am

250198.4 Gazette Notice taking part (4 perches) within land for street - 23.1.1974 at 9.03 am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250198
D413
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100 wide
Railway
34.0
4.0 250198
30.0
2.
D413

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	**NA1936/67**
Land Registration District	**North Auckland**
Date Issued	28 February 1961

Prior References
NA1052/180

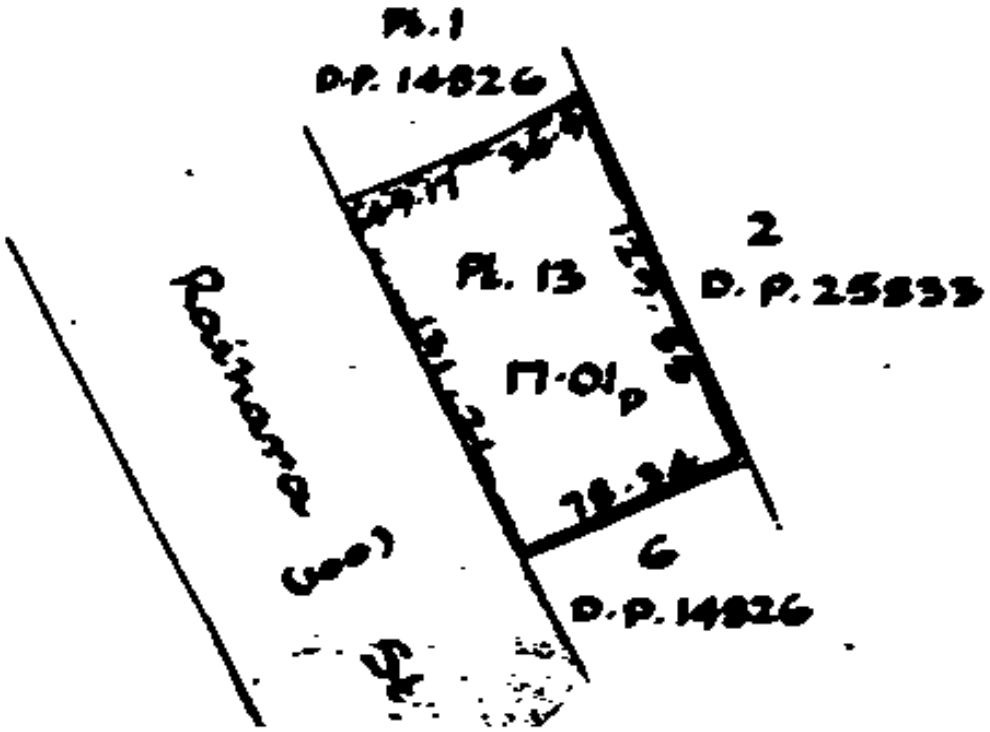
Estate	Fee Simple
Area	430 square metres more or less
Legal Description	Part Lot 13 Deposited Plan 7437
Registered Owners	

Far North District Council

Interests

EQUIVALENT METRIC
AREA IS 430m2
430M2

Kaikoura Borough



NORTH

SITE AREAS

SITE AREA	**3830m²**
BUILDING AREA	1001m²
PAVING AREA	1017m²
LANDSCAPING AREA	455m²
CARPARKS	31

1 Proposed Site Plan-1-200
1 : 200

CONFIDENTIAL

FOR INFORMATION
NOT FOR CONSTRUCTION

ORIGINAL DRAWING IN COLOUR

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rev	date	descriptions
1	14/11/2024	Prelim adjustments following council feedback

job no.	FNH0878.10
cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:13 pm

job title: KAIKOHE LIBRARY COMMUNITY HUB

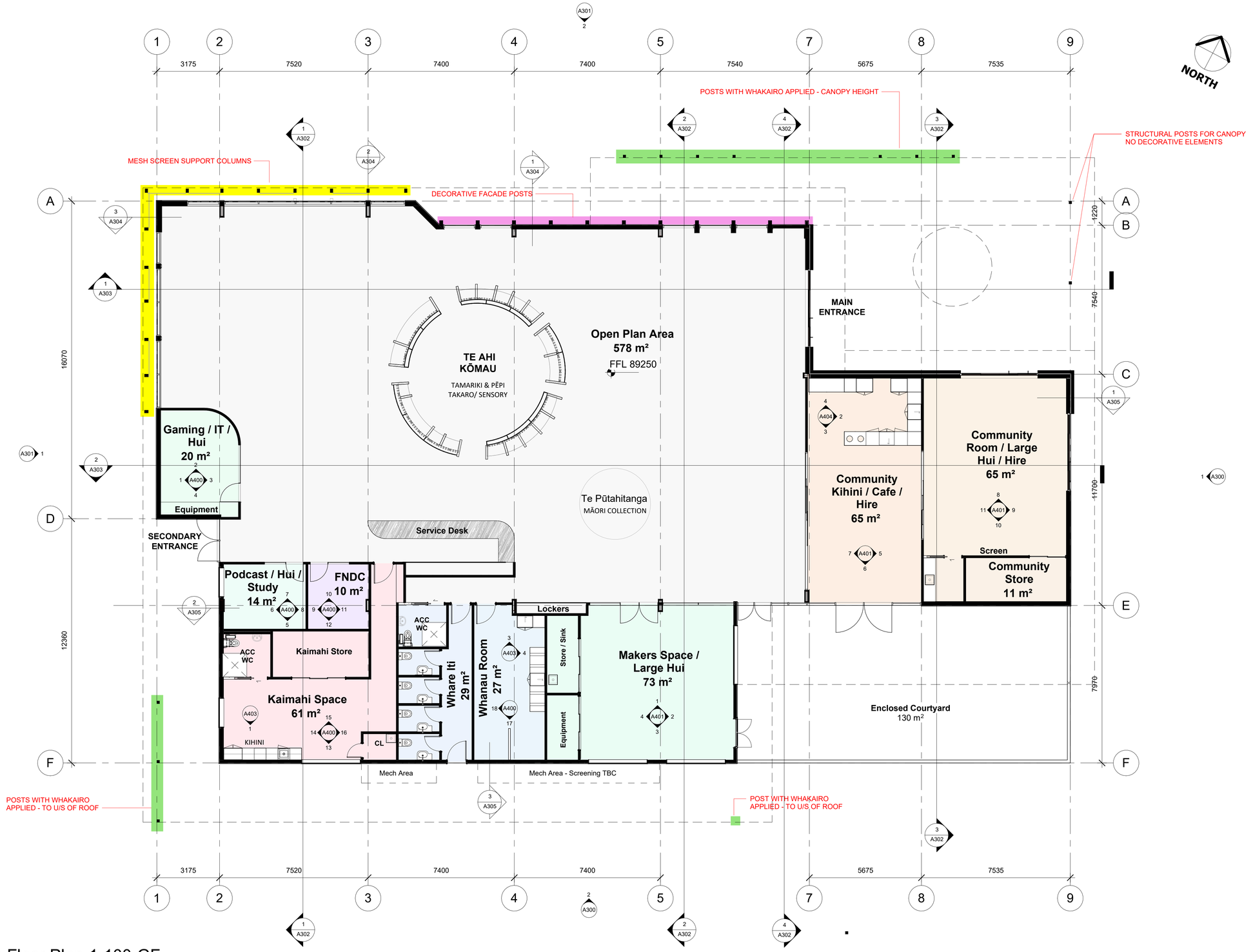
dwg title: SITE PLAN

status: Preliminary Design

scale: AS SHOWN@A1
HALF-SCALE@A3

rev: 1

dwg No: A100



1 Reference Floor Plan-1-100-GF

1 : 100

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rev	date	descriptions
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cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:17 pm

job title: KAIKOHE LIBRARY COMMUNITY HUB

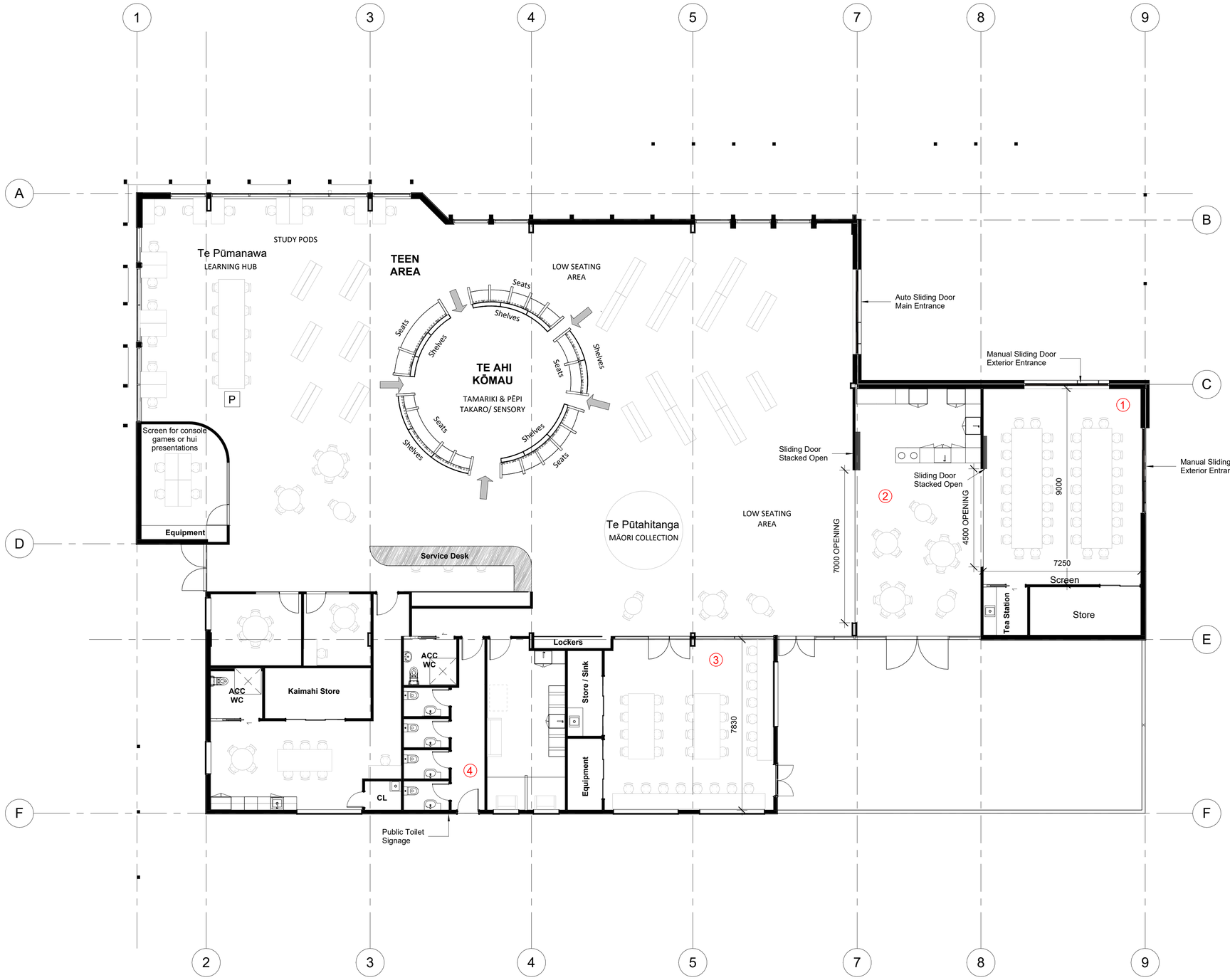
dwg title: REFERENCE FLOOR PLAN

status: Preliminary Design

scale: AS SHOWN@A1
HALF-SCALE@A3

rev: 1

dwg No: A200



1 Furniture Plan-1-100
1 : 100

NOTES:

① **Community Room / Large Hui / Event**
This room is set up to cater for a wide range of activites. A large interior sliding door can either open the space up to the rest of the library or separate it. Sliding door entrances open the space to the plaza and provide out-of-hours access for private hire. A large store allows furniture and equipment to be stacked away as needed. The T.V. screen could be used for meeting presentations, movie nights, and art screening. A tea station tucked away in the corner can cater to meetings or events, or be used by regulars to make a quiet cup of tea.

② **Community Kihini / Cafe / Event Catering**
As with the community room, large sliding doors can separate off this part of the building from the rest of the library for events and after hours access hire. The large kitchen could be community use, hired out as a cafe, or used for catering to out-of-hours events. Ample seating flows out to the courtyard.

③ **Maker's Space / Large Hui / Activities**
This space is set up to house a range of craft and making activities. An equipment cupboard can pack away things like paint, craft suppliers, sewing machines, 3D printer and other machinery, so that the room can also be used for other purposes, such as hui. A fully glazed internal wall visually connects the space to the rest of the library.

④ **Whare Iti**
The whare iti offers four, fully enclosed unisex bathrooms and an accessible bathroom with a shower. An exterior door will allow public access from the carpark, without having to enter the main library space. A sign placed on the building facade will signal the public toilet entry.

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rev	date	descriptions
1	14/11/2024	Prelim adjustments following council feedback

job no.	FNH0878.10
cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:24 pm

job title: KAIKOHE LIBRARY COMMUNITY HUB

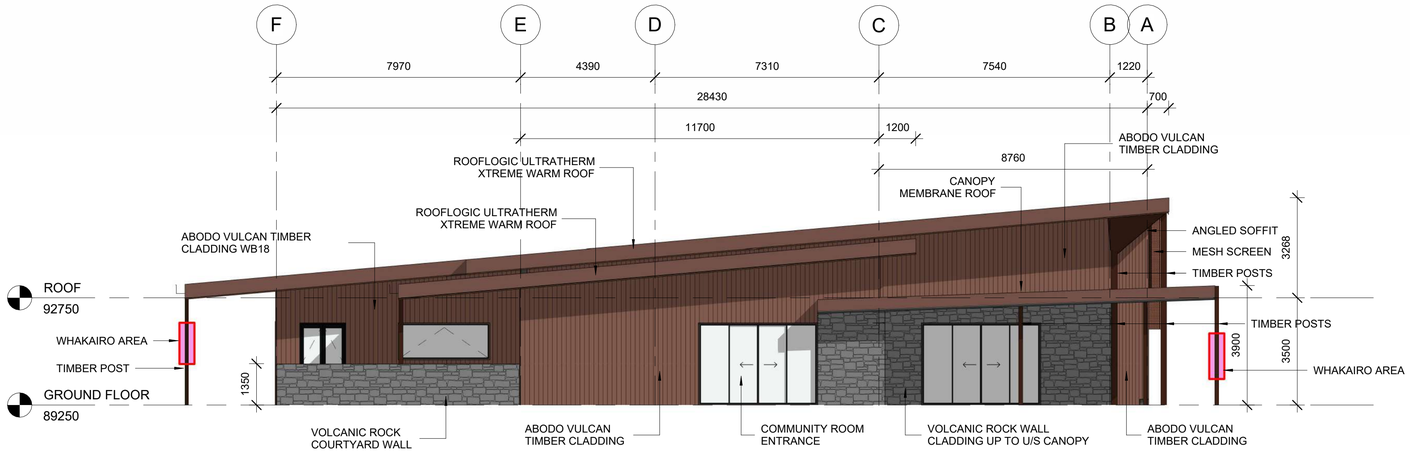
dwg title: FURNITURE PLAN

status: Preliminary Design

scale: AS SHOWN@A1
HALF-SCALE@A3

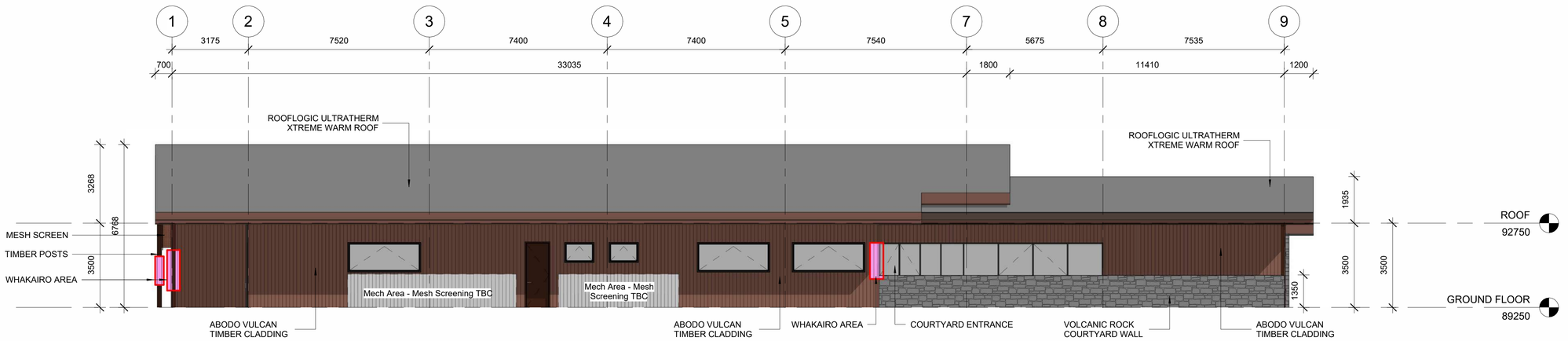
rev: 1

dwg No: A203



1 Elevation East

1 : 100



2 Elevation South

1 : 100

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rev	date	descriptions

job no.	FNH0878.10
cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:30 pm

job title: KAIKOHE LIBRARY COMMUNITY HUB

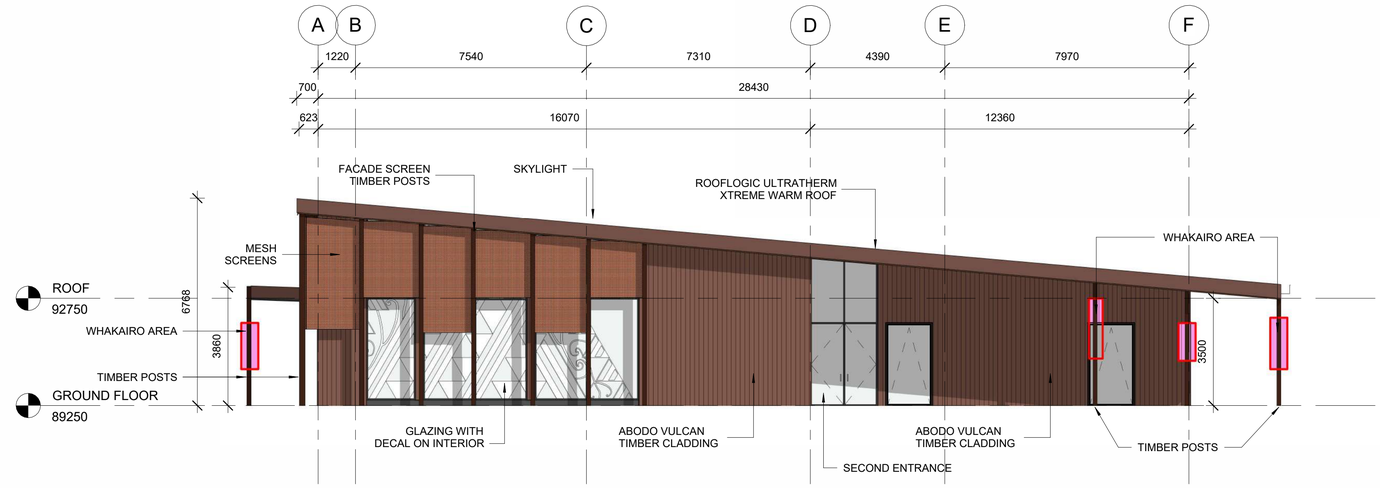
dwg title: ELEVATIONS

status: Preliminary Design

scale: AS SHOWN@A1
HALF-SCALE@A3

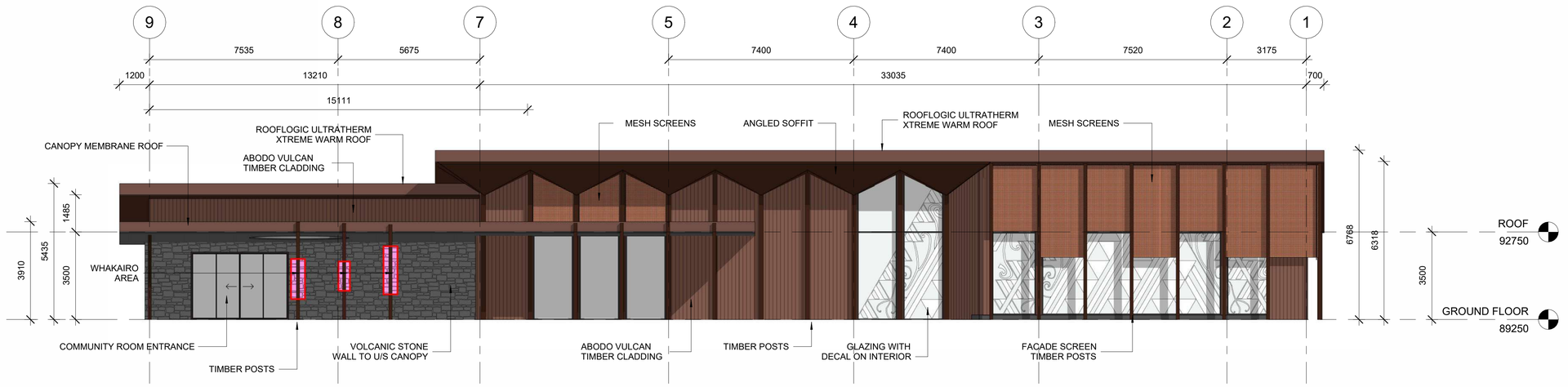
rev

dwg No: **A300**



1 Elevation West

1 : 100



2 Elevation North

1 : 100

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rev	date	descriptions

job no.	FNH0878.10
cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:36 pm

job title

KAIKOHE LIBRARY COMMUNITY HUB

dwg title

ELEVATIONS

status

Preliminary Design

scale

AS SHOWN@A1
HALF-SCALE@A3

rev

dwg No

A301

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rev	date	descriptions

job no.	FNH0878.10
cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:37 pm

job title
KAIKOHE LIBRARY COMMUNITY HUB

dwg title
BROADWAY VIEW 1

status
Preliminary Design

scale
AS SHOWN@A1
HALF-SCALE@A3

rev

dwg No
AXX0

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rev	date	descriptions

job no.	FNH0878.10
cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:38 pm

job title
KAIKOHE LIBRARY COMMUNITY HUB

dwg title
BROADWAY VIEW 2

status
Preliminary Design

scale
AS SHOWN@A1
HALF-SCALE@A3

rev

dwg No
AXX1

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rev	date	descriptions

job no.	FNH0878.10
cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:39 pm

job title
KAIKOHE LIBRARY COMMUNITY HUB

dwg title
BROADWAY VIEW 3

status
Preliminary Design

scale
AS SHOWN@A1
HALF-SCALE@A3

rev

dwg No
AXX2

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rev	date	descriptions

job no.	FNH0878.10
cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:40 pm

job title

KAIKOHE LIBRARY COMMUNITY HUB

dwg title

BUILDING SETBACK

status

Preliminary Design

scale

AS SHOWN@A1
HALF-SCALE@A3

rev

dwg No

AXX3

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rev	date	descriptions

job no.	FNH0878.10
cad file	
design	Designer
drawn	Author
checked	Checker
date	27/11/2024 4:13:40 pm

job title

KAIKOHE LIBRARY COMMUNITY HUB

dwg title

BUILDING SETBACK

status

Preliminary Design

scale

AS SHOWN@A1
HALF-SCALE@A3

rev

dwg No

AXX4

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Te Āta Haere

Concept Document

08 November, 2024

Design Concept

The concepts for this kaupapa are based upon kōrero shared generously by Te Uri-o-Hua. The design has been inspired by whakaaro developed by tamariki and hapori during the papamahi process and elevated by the valued contribution of Matua Allen Wihongi.

TE AHI KŌMAU | MAMARI WAKA

Central to the design is Te Ahi Kōmau, the beacon of light that radiates from the centre of the kaupapa. This light was brought on Te Mamari Waka, and also refers to the smouldering fire that is kept alight on the whenua, using coverings of ashes and earth.

Te Ahi Kōmau explains that every person has a burning fire, the same fire that our tupuna had burning a thousand years ago.

We are interconnected through the fire 'Te Ahi Kōmau' with our tupuna, just in a different time-frame. We are connected through whakapapa tracing back to our tupuna who lived on the land.

TE AHOTANGA

Wrapping around Te Ahi Kōmau is the concept of Te Ahotanga. Te Ahotanga highlights the sacred connections from Ngā Whetū, through the building to the Whenua. The transmission of knowledge between people through these threads is experienced throughout the building through the spatial forms and activities within. Vertical whenu wrap around the building, and become the kaupapa for "Te Kakahu O Te Uri O Hua".

BROADWAY ELEVATION

Mahi Toi

Opportunities for Mahi Toi have developed through the course of the design process. These elements are woven into the design and build upon the community design brief and papamahi process. Allen Wihongi has been a valued advisor through the process and has developed concepts which have been detailled on the following pages.

OBJECTIVES

- Expression of local/hapū kōrero, context and history are acknowledged as an integral element of the building fabric, narrative and aesthetic.
- Hapū voices lead conceptual development to ensure appropriate expression of hapū kōrero.
- Hapū practitioners guide practical aspects and fabrication where possible to ensure appropriate integration of te ao Māori, mātauranga Māori and craft.

ELEMENTS

00 Te Ahi Kōmau
Sensory Space

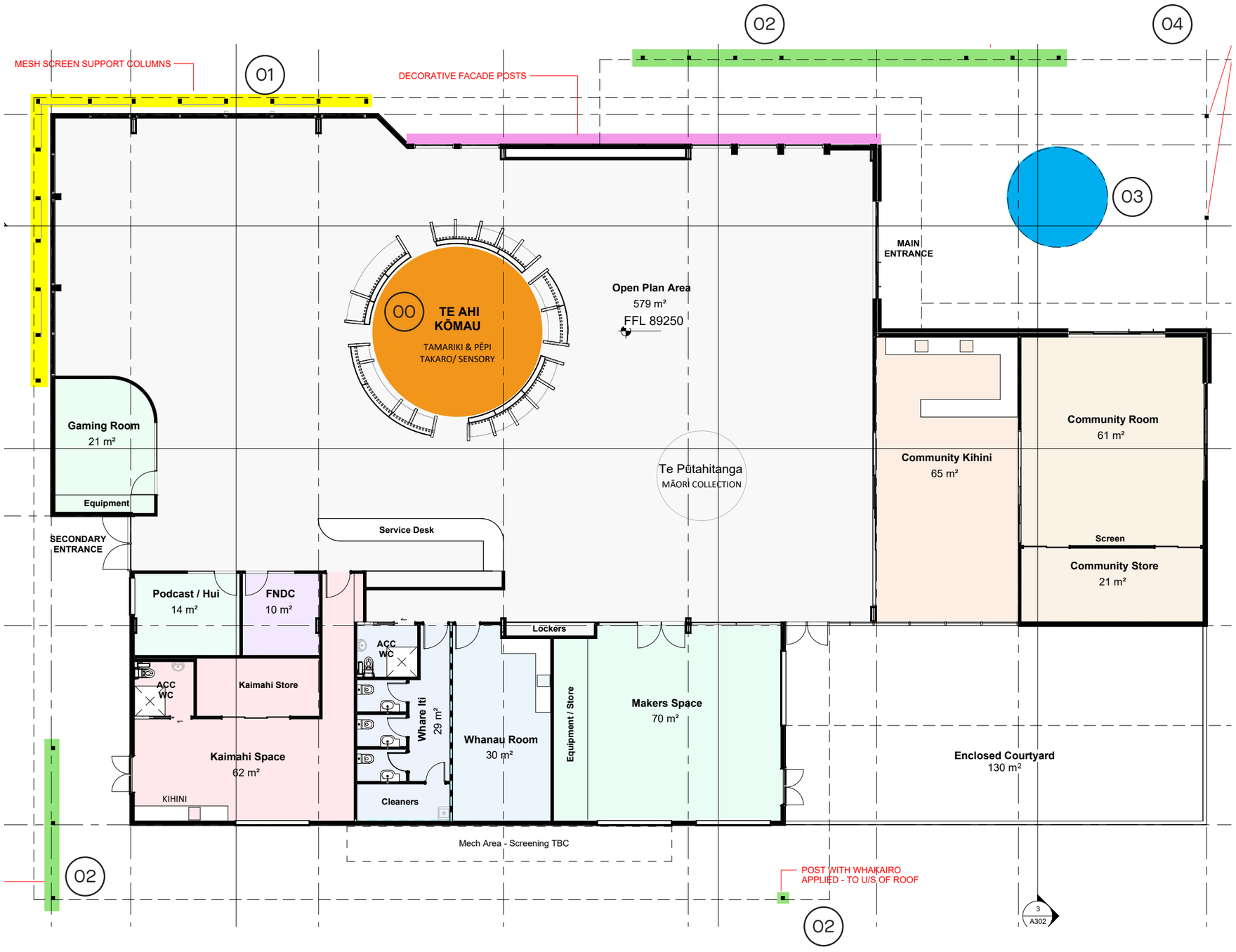
01 Connection to Atua
Facade Design

02 Connection through Whakapapa
Carved pou representing key tupuna

03 Connection through Whenua
Representation of Putahi, in canopy "Te Pū O Te Wheke".

04 Additional Elements
Etched Paving and Ceiling Detail

05 Branding
Whare Ingoa feature signage, external naming and internal wayfinding



Te Kakahu O Te Uri O Hua

Kōrero and Concepts provided by Allen Wihongi

A background to the artwork for the Kaikohekohe library.

The cultural elements are:

1. *Connection to Atua*
2. *Connection through whakapapa*
3. *Connection to whenua*
4. *Connection to purpose*

1. Connection to Atua:

- "Te Kakahu O Te Uri O Hua"

Cosmology plays an important part in Maori life

- Separation of Ranginui and Papatuanuku
- Tānemahuta, Rehua

A book most important to Te Uri o Hua is called "Te Kakahu o Te Uri o Hua", "The Precious Cloak of Te Uri O Hua". In it is contained a comprehensive amount of information regarding, Whakapapa, cosmological and historical events, rituals, karakia, etc that pertain to Te Uri o Hua.

The window design depicts a taniko pattern which is found on the borders kakahu. The major pattern will allude to "Te Kakahu o Te Uri O Hua".

Within the book there is a tauparapara and stories that refer to the deity Rehua.

So this book gives an account of that story of Rehua.

It begins with the separation of Ranginui and Papatuanuku – when Tane separates his parents, Rehua the eldest leaves to go live to be near Ranginui never to return to Papatuanuku.

He is said by some to be the eldest son of Ranginui and Papatuanuku. He lives in Te-Putahi-Nui-A-Rehua (known as the star constellation Scorpio) the 10th and highest heaven beneath Io. Rehua (Antares) is the brightest star in Te-Putahi-Nui-O-Rehua.

Because he lives in the highest heavens, Rehua is untouched by death, and has the power to heal all diseases. Hence him being known as the deity of health. He is the god of kindness. Rehua is always spoken of as a chief among stars. His innumerable hosts dwell in the heavens with him.

When Ranginui and Papatuanuku were separated by Tānemahuta he saw that his work was not yet complete as he could see that his mother Papatuanuku lay naked. He climbed up into the heavens and asked his brother Rehua for help. Rehua gave him birds such as the tui to bring down to this world, and showed him how to snare them. He also gave Tanemahuta trees in which the birds could live and feed from.

Rehua is the one associated with summer. After long cold winters, he disperses gloom and sorrow from the minds of men. There is a saying - 'The cicada and the cricket are the flying creatures of Rehua. These creatures sing when summer has begun.'

Other stories tell of pepe the moth, tatarakihi the cicada, pihareinga the grasshopper and kekerewai the beetle.

Puanga (Rigel in Orion) is the brightest star in the Orion constellation. She mated with Rehua. Puawānanga (Clematis) was said to be one of the many children of their union. Besides being a messenger that summer's approaching, Puawānanga also had a medicinal use. Thus the reason why it is said that he has the power to heal. The appearance of Puanga signalled winter and Rehua summer – puawānanga vine flowered in the months between them. Here we see a reference to the blossoming of certain plants, the children of Rehua, the forest.

The window design will allude to this story of Rehua. It will depict the birds and the small creatures associated with summer. It will be much more detailed than what these concepts show.

2. Connection through whakapapa:

Tupuna are memorialised by having hapu named after them. The tangatawhenua of this place are the following hapu. **Te Uri o Hua, Ngati Kura** and **Takotoke**

- The ancestor **Te Taniwha** named the hapu Te Uri o Hua after **Hua Takaroa** who married **Maikuku**
- **Kuraimaraewhiti** is Te Taniwha's wife. Ngati Kura is named after her
- **Te Kiore** is Te Taniwha's son. The hapu Takotoke was named by his **sisters** following his demise
- All Ngapuhi trace their whakapapa back to **Rahiri**
- **Te Ahi Ko Mau**, this was the fire brought to this land on the waka, Mamari. Whakapapa can be traced back to **Ruanui** and **Nukutawhiti** who captained this waka.
- It is what we understand today to be **ahi kaa** – to keep the home fires burning. When the fire is out you have lost the land.

"Te Kakahu O te Uri o Hua" contains whakapapa of the tangata whenua of Kaikohekohe with connections back to Rahiri and beyond as well as to other waka. It shows the connections to hapu within the region.

Up to eleven carved pou representing the key tupuna will feature around the building. They will acknowledge eponymous ancestor, tangatawhenua and hapu.

Te Ahi Ko Mau, the fire brought to this land on the waka, Mamari, from the perspective of tangata whenua will represent Te Ahi Ka. Ahi kā is one of the traditional means to establish mana whenua (authority over land). Ahi kā is a Māori principle that refers to the ongoing occupation of land as a way to establish authority over it. Ahi kā is a symbol of the hapu's continuous presence on the land and their connection to it through whakapapa. The hapu are be able to trace back to the land through whakapapa.

3. Connection to Whenua:

- Ko Putahi te maunga, ko Wairoro te awa. Putahi is the maunga, Wairoro is the river.
- Kaikohekohe was given its name by **Te Hotete** (father of **Hongi Hika**)
- Te Uri o Hua, Ngati Kura and Takotoke are the Tangatawhenua

Te Kakahu O Te Uri O Hua

Kōrero and Concepts provided by Allen Wihongi

Within the entrance way to the library is a circular opening beneath which everyone will pass as they enter. This will represent Putahi, “Te Pu O Te Wheke,” “The centre of the Octopus.” (with tentacles which reach out to the extremities of Ngapuhi)

Around the circumference of the hole will be a compass like arrangement which will show the placement of the library direction to the other maunga tapu o Ngapuhi. (Sacred mountains of Ngapuhi)

One of the carved pou will acknowledge the tupuna, Te Taniwha, Hongi Hika’s father, who renamed Opango, Kaikohekohe following the siege of Opango when the ancestors were forced onto what today is known as Kaikohe Hill (Tokareireia,) which at the time was then covered with kohekohe trees, and were forced to eat Kohekohe berries.

4. **Connection to purpose:**
   - Te Uri O Hua sees “Te Kakahu O Te Uri O Hua” as a tangible connection the library
   - They are both repositories of knowledge.

Te Uri O Hua sees “Te Kakahu O Te Uri O Hua” as a tangible connection to the library in the fact that their book is a very important book which contains the history of the hapu, a history if not recorded the hapu could well be lost without. The library is regarded in the same light by the hapu. It is a repository of knowledge and is there to be utilised as such.

The hapu of Kaikohekohe honours the above view by having “Te Kakahu O Te Uri O Hua” form the foundation to the art work within the library.

MAIN ENTRANCE
FROM BROADWAY

Connection through Whenua
Representation of Putahi at Entrance.

Connection through Whakapapa
Carved pou representing key tupuna

Connection to Atua
Facade Design

00 Te Ahi Kōmau

Ahi Kōmau is an immersive learning environment and sensory space, born directly from hapū kōrero and elevated through community discussions as a priority for design development. It is a storytelling hub where whānau can gather to share narratives of the past, reflect on the present, and dream boldly of the future.

KEY FEATURES

Form

The design draws inspiration from the idea of whānau gathering around an ahi, reinforcing the essence of te ahi kā. Its structure reflects the relationship between whenua and the atua above, creating a space grounded in cultural connection.

The form incorporates inviting nooks, offering individuals private, safe retreats while maintaining an overarching design that encourages communal gathering and shared experiences.

Immersive Experience

Community consultations emphasized the need for immersive learning environments that transform to enhance storytelling and the exchange of mātauranga. This space is designed to cater to diverse learning styles, including those of neuro-diverse members of the community.

At the heart of Te Ahi Kōmau is a round, void-like ceiling structure featuring a built-in circular screen that mimics a skylight, symbolizing a connection to Ranginui. This screen acts as a dynamic storytelling portal, capable of changing colors, projecting imagery, and displaying community-created content.

Integrated lighting within the structure can also be programmed for color-changing effects, amplifying the sensory and visual storytelling experience. Soundscapes and audio features will add another layer to the immersive environment, with creatives like Horomona Horo expressing interest in collaborating on this concept.

While further technical development is needed, these features lay the groundwork for a unique, sensory storytelling experience.

Programmed Flexibility and Transformation

Ahi Kōmau is designed to adapt to a variety of uses, from curated storytelling sessions and exhibitions to educational workshops and technology-driven programs. This space aligns with the community's vision for future-focused learning environments.

For instance, a storytelling animation program could be showcased across the building's screens, seamlessly integrating creative technology and storytelling. This flexibility ensures Ahi Kōmau remains a pivotal point for tamariki exploration, lifelong learning, and community engagement.

Future Generations

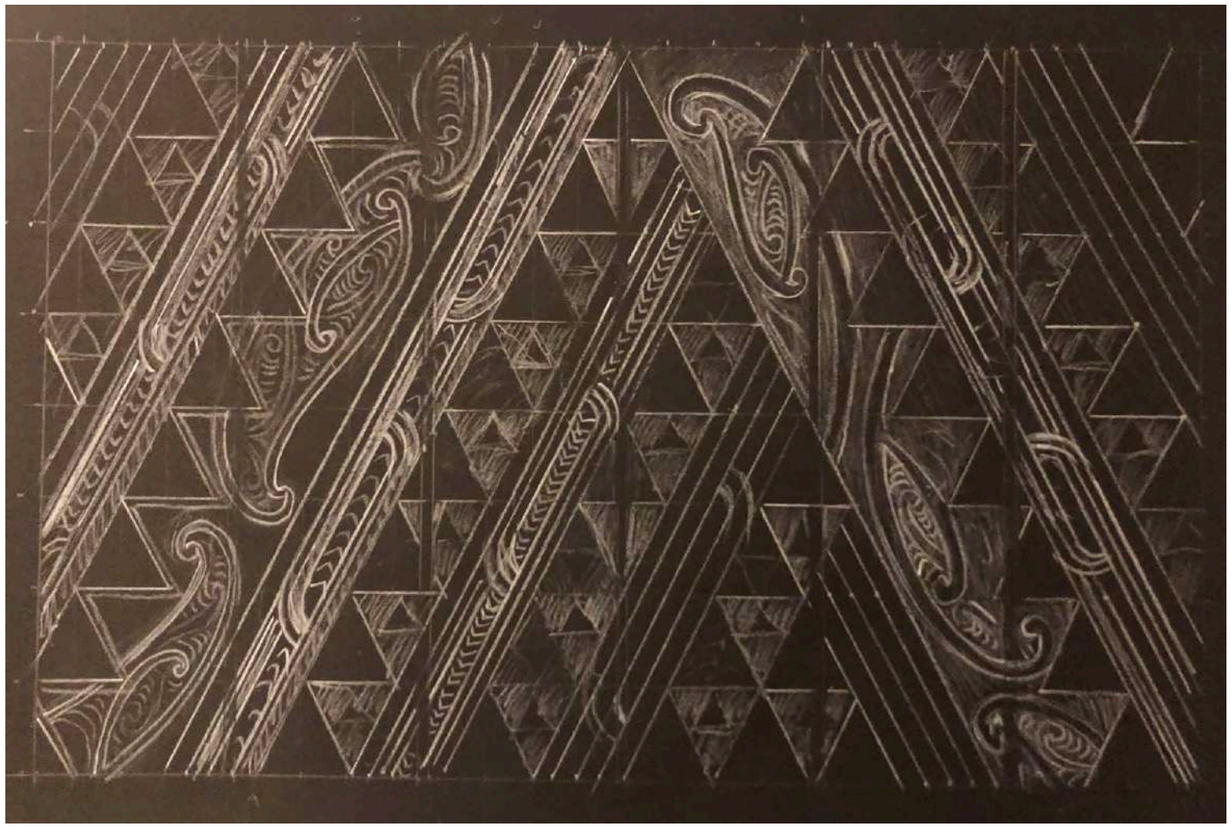
As part of a broader network of transformational technology spaces within the library, it serves as a functional storytelling platform, empowering whānau and tamariki to connect, learn, and innovate.

Te Ahi Kōmau
Immersive Learning and Storytelling Space

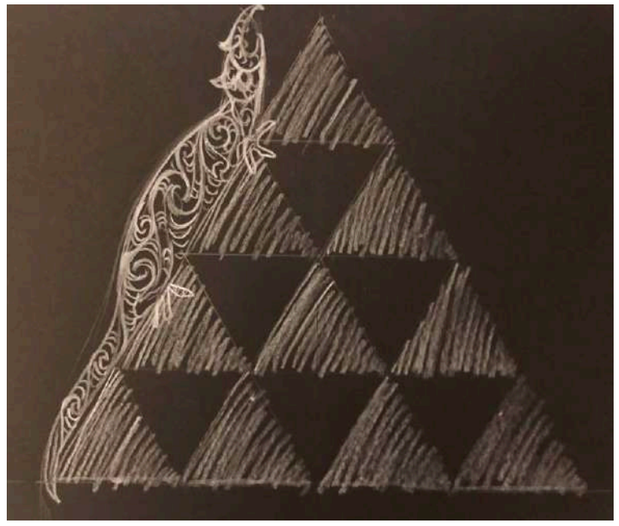
Interactive Storytelling Example

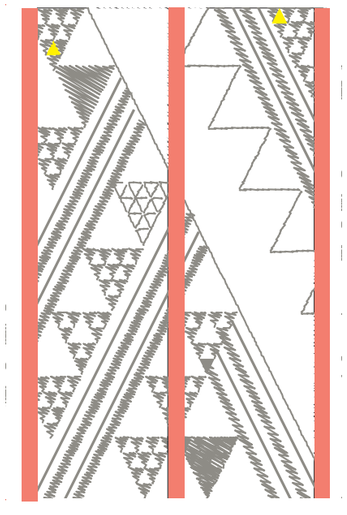
01 Connection to Atua

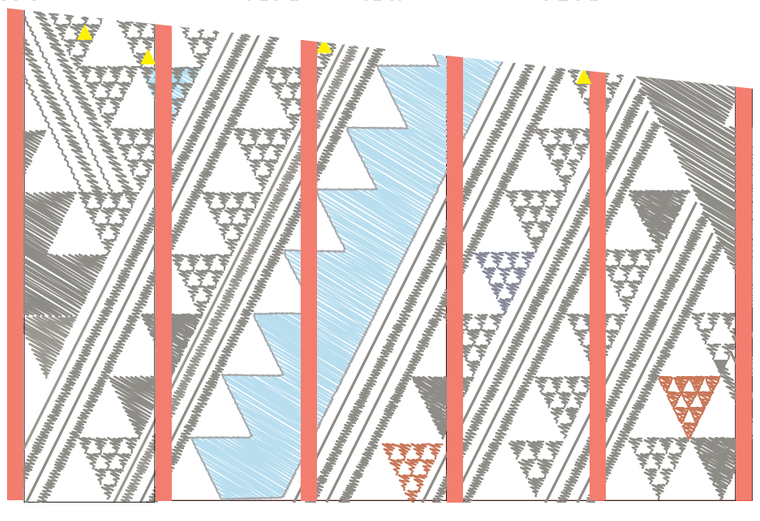
Facade Design
Concept Drawings by Allen Wihongi



This image will be created on the elevation of Broadway and Raihara St through imagery applied directly to the window elements and be reinforced by mesh sunscreening sitting in front of the windows. The mesh will take on elements of the image so that the final outcome will be a layered element visible from both the interior and exterior of the whare.

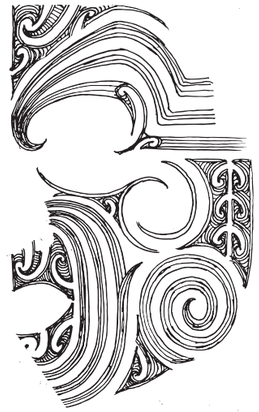


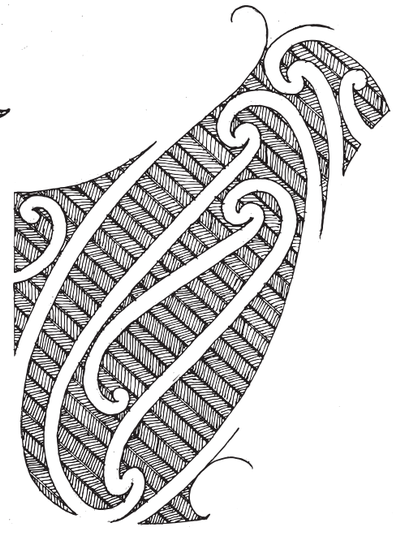




01 Connection to Atua

Facade Design & Ceiling Pattern
Concept Drawings by Allen Wihongi





04 Additional Elements

Enhancing the sensory experience within and around the space, and incorporating opportunities for discovery, additional design elements to be developed include:

Paving

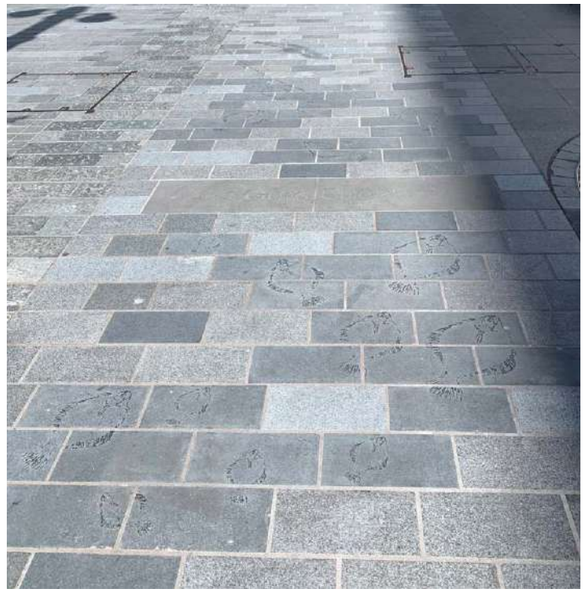
The plaza paving will feature a selection of pavers etched with custom motifs.

These motifs will be designed collaboratively with community members and tamariki, reflecting their unique stories and identity.

Ceiling

The faceted timber ceiling in the main space will include a subtle integration of etched elements.

These custom motifs will also be created in partnership with community members and tamariki, ensuring the design resonates with their aspirations and cultural narratives.



Example of Etched Pavers

Detailed Site Investigation (DSI), Remedial Action Plan (RAP) and Site Management Plan (SMP) for

69 Broadway, Kaikohe

for

Far North District Council

Haigh Workman reference 22 277

September 2022

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Revision History

Revision Nº	Issued By	Description	Date
A	Joshua Cuming	First Issue	13/09/2022

Prepared by	Approved by
Joshua Cuming **Environmental Geologist** BSc (Geol, Env Stu.) CEnvP, MEIANZ	John Papesch **Senior Civil Engineer / Director** BE (Civil Eng.), NZCE, CMEngNZ, CPEng

TABLE OF CONTENTS

TABLES

FIGURES

A5: DSI table of contents: restricted discretionary activities

Note: Regulation 8(2) outlines the requirements for soil sampling to be a permitted activity.

Content	Required	Required if relied on[17]	CLMG 5 section
1. Introduction			
• investigation objectives	☑		2.1
• site identification (site name, address, legal description, site boundaries, a map reference and geographic coordinates)	☑		3.3.1
• proposed site use.	☑		3.3.2
2. Site description			
• environmental setting	☑		3.3.3
• site layout	☑		3.3.4
• current site uses	☑		3.3.5
• surrounding land uses	☑		3.3.6
• geophysical surveys		☐	5.1
• site inspection.		☑	3.3.8
3. Historical site use (sufficient to plan investigation)			
• summary of site history gained from	☑		3.3.7
– review of existing investigation reports		☑	
– review of council information		☑	
– review of aerial photographs		☑	
– interviews		☑	
– review of other historical information		☑	
• preliminary sampling (if carried out)		☐	3.3.9
– description (including diagram)			
– results			
– comparison of results to guidelines.			
4. Sampling and analysis plan (could be appended if complex)	☑		4.2
• contaminants of potential concern and/or analyte selection	☑		4.2.1
• media to be sampled (link to CSM and objectives)	☑		3

[17] Any evidence relied upon to form an opinion and/or conclusion must be included in the report.

Content	Required	Required if relied on[17]	CLMG 5 section
• background concentration level (if relevant), contaminant standard and/or environmental guideline value calculation[18] or selection[19]	☑		4.2.2 & 4.2.7
• sampling design (eg, targeted or systematic sampling)	☑		4.2.3
• number of samples including justification for number selected and potential limitations of methodology adopted in the context of investigation objectives	☑		4.2.4
• sample depth	☑		4.2.5
• composite sampling including number of sub-samples per sample		☐	4.2.6
• background sampling methodology		☐	4.2.7
• sampling techniques	☑		4.2.8
• field screening techniques		☐	5.4
• quality assurance and quality control.	☑		4.3
5. Sampling results			
• summary of works undertaken with rationale for any departure from, or addition to, sampling and analysis plan	☑		
• field observations (eg, staining, odour, soil characteristics)	☑		5.2.1
• evaluation of analytical laboratory results with comparison to background concentration levels (if relevant), contaminant standards and/or environmental guideline values	☑		7
• evaluation of field screening results with comparison to background concentration levels (if relevant), contaminant standards and/or environmental guideline values		☐	
• results of field and laboratory sample quality assurance/quality control	☑		
• statistical analysis of results.		☐	
6. Disposal documentation			
• the transport, disposal and tracking of soil and other materials taken away in the course of the activity – regulation 10(3)(e).		☐	
7. Risk assessment			
• conceptual site model	☑		3
• evaluate the probability contamination exists on the site	☑		3.3.11
• characterise the source through adequate delineation of contamination horizontally and vertically and assessment of contaminant concentrations		☑	

18 Refer to *Methodology for deriving standards for contaminants in soil to protect human health* (Ministry for the Environment, 2011d).

19 Refer to *Contaminated land management guidelines No 2: Hierarchy and application in New Zealand of environmental guideline values* (Ministry for the Environment, 2011a).

Content	Required	Required if relied on[17]	CLMG 5 section
• identify and characterise potential pathways and receptors for each exposure area through relevant site properties (eg, assessment of geology, hydrogeology, building construction, site use)	☑		
• determine the likelihood the contamination poses a risk to identified receptors including potential receptors	☑		
• evaluate the magnitude of that risk	☑		
pursuant to regulation 10(2)(b): – *the report on the detailed site investigation must state that the soil contamination exceeds the applicable standard in regulation 7*			
pursuant to regulation 10(3)(b): – *recommendation on the suitability of the piece of land for the proposed activity, given the amount and kind of soil contamination*			
• describe any requirements for management methods to mitigate identified risks (as necessary)		☑	
• evaluate the magnitude of any identified risk to other receptors (eg, ecological)		☐	
• describe the limitations of the data collected and the assumptions and uncertainties inherent in the data and models used.	☑		
Note: If insufficient information exists to assess risk, then the DSI should not be accepted for the purposes of determining compliance with NESCS regulation 10(2). This would then result in the application defaulting to a discretionary consent.			
8. Discussion		☐	
9. Conclusions	☑		
10. Recommendations (if relevant to report purpose)		☑	
11. Report limitations	☑		
12. SQEP certification of report (refer appendix C)	☑		
13. References	☑		
Appendices: relevant supporting information	☑		

Supporting information	Required	Required if relied on[20]
Figures		☐
Conceptual site model (if not included in report body)	☐	

20 Any evidence relied upon to form an opinion/conclusion must be included in report.

Supporting information	Required	Required if relied on[20]
Land titles	☐	☑
Historical site information relied upon	☑	☐
Previous reports (or relevant sections thereof)	☐	☑
Site photographs	☐	☑
Geological logs	☐	☑
Field sheets	☐	☐
Sampling and analysis plan (if not included in body)	☑	☐
Summary tables of sampling results	☐	☑
Laboratory reports and chain of custody documentation	☑	☐
Calibration information for any field screening instruments used	☐	☐
Statistical calculations eg, ProUCL inputs and outputs	☐	☐
Soil cuttings and purge water disposal documentation	☐	☐
Remedial action plan (refer appendix A7) – regulation 10(3)(c)	☐	☑
Site validation report (refer appendix A8) – regulation 10(3)(d)	☐	☐
Ongoing site management plan (refer appendix A9) – regulation 10(3)(c)	☐	☐
Statement of qualification as an SQEP	☐	☐

A7: Remedial action plan table of contents

Content	Required	Required if relied on[23]
1. Introduction		
• description of the site, report purpose, regulatory context (including references to consents if already granted).	☑	
2. Site description		
• site layout	☑	
• summary of previous investigations.	☑	
3. Scope and purpose of remediation		
• summary of contamination	☑	
• remediation strategy, objectives and milestones	☑	
• summary of remedial options/ROR.	☑	
4. Remediation method(s)		
• proposed remediation method(s) to address the risk posed by the contaminants to the environment and/or human health	☑	
• proposed timing of the remediation (schedule of works)	☑	
• proposed mitigation methods and/or controls to address the risk posed by the contaminants to the environment and/or human health during the remedial works (including health and safety of workers, and environmental controls)	☑	
• proposed contamination management measures, including the frequency and location of monitoring of specified contaminants	☑	
• proposed remediation activity record keeping.	☑	
5. Standard of remediation		
• proposed standard of the remediation on completion	☑	
• proposed site validation strategy and methods to demonstrate the degree to which remedial objectives have been met.	☑	
6. Unexpected contamination discovery protocols	☑	
7. References	☑	
Appendices: relevant supporting information	☑	

Supporting information	Required	Required if relied on[24]
Figures	☑	
Conceptual site model (if not included in plan body)	☑	
Drawings of proposed work (eg, earthworks, containment cells, barrier systems and ventilation systems, as relevant)		☑
Subdivision plans		☐
Engineering specifications		☐
Previous reports (or relevant sections thereof)		☑
Consents or permits (if already granted)		☐
Examples of soil transport and disposal manifests		☐
Site management plan (refer appendix A6) – regulation 10(3)(d)		☐
Proposed ongoing site management plan (refer appendix A9) – regulation 10(3)(c)		☐
Statement(s) of qualification as an SQEP		☐
Assessment of remedial options (ARO)		☐

Executive Summary

Haigh Workman Ltd was commissioned by Far North District Council (the client) to undertake a Detailed Site Investigation Report (DSI), Remedial Action Plan (RAP) and Site Management Plan (SMP) for land at 69 Broadway, Kaikohe, for the proposed change in use to a community facility ie, a library.

The client is proposing to develop the site into a community facility such as a library. The piece of land for the intentions of this report is the entire site.

The land is zoned commercial and this report has adopted this as the final land.

This (DSI) Detailed Site Investigation identified one discrete area of pyrene impacted soil in exceedance of the adopted scenario concentration. The contamination is not in hydraulic continuity with the soil below as it is contained within a 'U' drain that is assumed to have been part of the former fuel dispensing infrastructure.

Targeted sampling was undertaken throughout the external areas of the site with particular focus on the locations of the removed tanks and former service station forecourt. It was not possible to undertake sampling in the footprint of the existing buildings. For this reason, daily site visits by a SQEP familiar with this document are recommended during the breakout of the floor slab of the former vehicle workshop area.

Through review of available information to Haigh Workman, the proposed site end-use and the results of laboratory analysis the following outcomes have been identified:

- Chemical analysis of samples retrieved during the site investigation has determined that pyrene contamination in excess of the adopted criteria is confined to the contents of the 'U' drain found in the location of TP3. It is considered likely that this 'U' drain will be present in elsewhere in the former service station forecourt area.
- The volume to be remediated is estimated to be $5m^3$.

Remediation will be achieved through excavation and disposal offsite. If further soils requiring remediation are identified during the remedial works they can be removed accordingly, up to the limits identified within this report.

The *piece of land* measures $2,642m^2$; this allows for 132 m^3 soil disturbance and 26 m^3 soil removal as a permitted activity under the NESCS. **Resource Consent is not required for the remedial works in isolation** as soil removal is estimated to be $<5m^3$.

Earthworks associated with the development may exceed the volumes stated in the NES-CS **which would result in resource consent being required.**

Upon completion and validation of remedial works it is projected that the following can be achieved:

- The level of risk from arsenic ground contamination is reduced to 'low/negligible'; no preferential pathways should exist between pyrene and groundwater receptor.

- In accordance with NES Regulation 2011 (4) (b), it can be concluded that '*It is highly unlikely that there will be a risk to human health if the activity is done to the piece of land'.*

1 Introduction

Haigh Workman Ltd (Haigh Workman) was commissioned by Far North District Council (FNDC) (the client) to undertake a Detailed Site Investigation, Remedial Action Plan and Site Management Plan of land at 69 Broadway, Kaikohe (the site). The site consists of an existing building currently being used as a community charity distribution hub. It has previously been used as an automotive garage, fuel station and vehicle show room dating to before WW2. The site is subject to the Hazardous Activities and Industries List (HAIL) under HAIL codes A13, F4 and F7.

It is understood the client intends to redevelop that site into a community facility. The *piece of land* for the intentions of this report is all of 69 Broadway, Kaikohe.

In accordance with the Resource Management National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NES-CS), contaminated land assessment is required with change of land use.

1.1 Site Identification

The site is located at 69 Broadway, Kaikohe. Refer to Table 1.

Figure 1 – Site Identification

The site is zoned **Commercial** on the Far North District Plan. It is understood that the client wishes to develop a community facility possibly a library on the site.

Table 1 Piece of land / Investigation area

Legal Description	Lot 1 DP 114630
Street Address	69 Broadway, Kaikohe
Certificate of Title	NA65B/130
FNDC Zoning	Commercial
Coordinates	-35.407163712701426, 173.80169568651337
Approx. Site Area (m^2)	2642 m^2
Piece of land under investigation **(m^2)**	2642 m^2

1.2 Previous Investigations

Asbestos Advice - Asbestos demolition survey 02/08/2022

- Assessed the presence of asbestos containing materials in the buildings onsite.

1.3 Proposed Development

It is understood that the client wishes to redevelop the site into a community facility possibly a library.

1.4 Objectives

Under the NESCS, a DSI is required:

1. to comply with regulation 3 of the NESCS
2. to establish whether or not the NESCS applies to land described in regulation 5(7)–(8) by demonstrating any contaminants in or on the piece of land are at, or below, background concentrations (regulation 5(9)), or
3. to establish if 'sampling soil', 'disturbing soil', and/ or 'changing use' can be undertaken as a controlled activity (regulation 9) or a restricted discretionary activity (regulation 10).

This Report has been carried out in accordance with Ministry for Environment (MfE) Contaminated Land Management Guidelines[1] (CLMG 1 to 5), *Methodology for Deriving Contaminants for the Protection of Human Health*[2] (*Methodology*) and the NESCS.

Soil chemical concentrations have also been compared to the *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand*[3].

[1] Ministry for the Environment, *Contaminated Land Management Guidelines Nos. 1 to 5*, Revised 2021 and 2011
[2] Ministry for the Environment, *Methodology for Deriving Contaminants for Protection of Human Health,* 2011
[3] Ministry for the Environment, *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, 1999.*

2 Site Description

2.1 Site and Surrounding Environment

The site is situated within Kaikohe township and comprises of a rectangular parcel of 'commercial' zoned land. A building is present onsite that is currently being used as a distribution for a local charity. Past uses of the site include automotive garage, vehicle showroom and petrol filling station.

Topographically the site is flat.

The site is bounded by State Highway 12 to the north and is largely surrounded by retail and food outlets. Exceptions are immediately to the south where a vehicle glass and windscreen replacement workshop is located and the site immediately to the east which is currently vacant having previously housed the Kaikohe Hotel which burnt down.

2.2 Mapped Geology

Sources of Information:

- Institute of Geological & Nuclear Sciences 1:250,000 Geological Map 2, 2009: "*Geology of the Whangarei area*".
- NZMS 290 Sheet P 04/05, 1: 100,000 scale, 1982: *"Rock type map of the Whangaroa-Kaikohe area",*
- NZMS 290 Sheet P 04/05, 1: 100,000 scale, 1980: *"Soil map of the Whangaroa-Kaikohe area".*

The site is within the bounds of the GNS Geological Map 2 "Geology of the Whangarei area", 1:250,000 scale. The published geology shows the site to be underlain by the Kerikeri Volcanic Group. An exert of the geological map is shown in Figure 1 below, with geological units presented in Table 2.

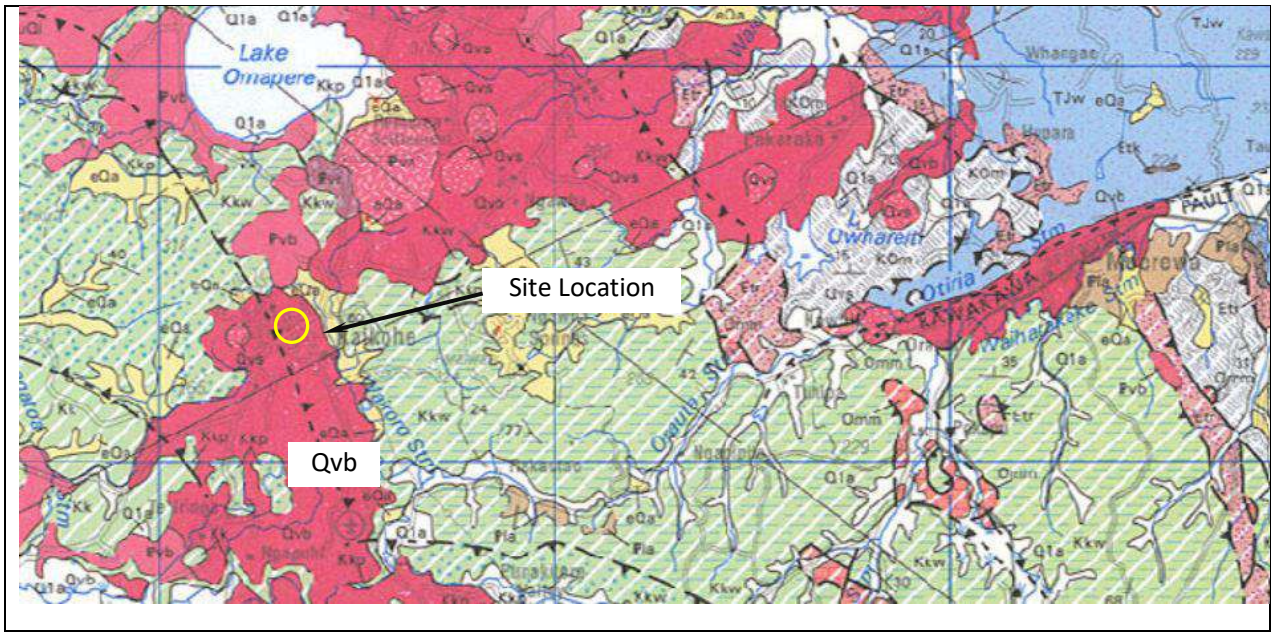


Figure 2 - Geological Map

Table 2 - Geological Legend

Symbol	Unit Name	Description
Qvb	Kerikeri Volcanic Group	Basalt lava flows. Early to late Pleistocene age.

Further reference to the published New Zealand land inventory maps (Whangaroa-Kaikohe 1980), indicates the site is underlain by *'soils of the rolling and hilly land, well to moderately well drained Kiripaka boulder silt loam (KB),* with underlying material comprising Basalt, '*weathered to soft red brown or dark grey, brown clay to depths of 20m with many rounded corestones*'.

2.3 Flooding and Hydrology

Table 3 Flooding and Hydrology

	Presence/Location	Comments
Watercourses & Water Features within 500 m (Ponds, lakes etc)	There are no watercourses with 500m of the site.	
Flood Risk	The site is shown on the NRC natural hazards map as land that is not subjected to flooding. No flooding is recorded within 20 m of the site boundaries.	NRC GIS databases indicate the site is unaffected by anticipated maximum flood levels for both 10- and 100-year storm events, including provisions for climate change.
Flood Susceptibility	Low. None recorded within or within 20 m of the site boundaries.	Flood susceptibility is considered to be low at the site, however due care needs to be taken with regards to surface water management.
Tsunami	The site is not within a Tsunami evacuation zone.	NRC GIS database.
Private wells within 500 m	The closest well is 100m northeast of site and is for monitoring purposes. Another well is located 130m northeast of site and is for commercial supply. A total of 10 wells are located within 500m of the site.	NRC GIS database.
Source Protection Zones within 500 m	Site is within the Kaikohe Aquifer.	The Kaikohe Aquifer underlies the site. Aquifers are generally protected water sources and as such no preferential contamination pathway (piling etc) should be opened up to aquifers.

2.4 Site visits

A photo log of the site inspection can be found in Appendix I.

2.4.1 Site inspection – 12 July 2022

A SQEP from Haigh Workman attended site to undertake a site inspection. This visit was scheduled to coincide with an asbestos survey of the buildings onsite and underground utility trace.

During the site inspection the following was observed:

- Dark staining in the former workshop area was observed.
- Manhole covers and drains were inspected, no visual or olfactory signs of contamination were observed.
- Concrete scaring was observed indicating the likely location of redundant fuel dispensing infrastructure in the former forecourt.
- Small quantities of materials such as corrugated iron, an oil drum, building materials were observed on the ground surface at the rear of the property. These materials were likely placed there for future use by the former occupants rather than being the result of fly tipping.
- Asbestos containing materials were identified with the buildings onsite. The details of this are included in the asbestos survey included in appendix G of this report.

2.4.2 Site investigation – 27th and 28th July 2022

Haigh Workman scoped the intrusive ground investigation using guidance presented in MFE Contaminated Land Management Guidelines and Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

A geotechnical site investigation was also undertaken during this mobilisation to site by a geotechnical engineer. The findings of this investigation are not included in this report.

The site investigation consisted of targeted sampling of shallow and deeper soils in the likely locations of removed tanks and fuel dispensing infrastructure and of madeground and shallow soils elsewhere onsite.

Trial pitting was undertaken utilising a digger with concrete breaker attachment. A hand auger was utilised to establish the depth to groundwater.

Visual and olfactory evidence of hydrocarbon contamination was observed in several locations. No gross contamination were observed.

52 samples were taken including duplicate samples. Samples were analysed for metals, PAHs, TPH and BTEX and asbestos.

Field work was undertaken by a Haigh Workman SQEP. Trial pit locations are shown on drawing 1 presented within Appendix A of this report. The locations of the sampling holes were measured using a tape measure from a known point.

2.5 Discharges and Waste Management

Table 4 Site Discharges, Landfilling and Waste Management

	Presence/Location	Comments
Materials and/ or Wastes Associated with the Site	The site was previously a petrol filling station and a motor vehicle workshop. Asbestos containing materials have been identified within the buildings onsite.	Details of asbestos containing materials found onsite can be found within the asbestos survey carried out by Asbestos Advice included with in Appendix G
Landfilling/ Tipping on or within 250 m	None recorded.	
Above & Underground Storage Tanks (AST & UST) (On-site and within 250 m)	Onsite tanks were removed in 1996. Fuel tanks are recorded as being present / previously present at 5 locations within 250m of the site. The closest of these is approximately 130m to the east of the site.	
Product Spill/ Loss History within 250m	Several spill incidents are recorded as occurring within 250m of the site. Exact street locations are not included in the information received from NRC. Spill incidents within 250m of the site include 'chemical smells' and discharge of hydrocarbons. The most recent incident related to the discharge of waste oil to stormwater network in 2018 on Clifford Street. The next most recent incident was the discharge of hydrocarbons at an address on Broadway in 2009.	
Recorded Discharges to Land, Air and Water	Several discharges have been recorded as occurring within 250m of site. These include smoke nuisance, discharge of hydrocarbons to stormwater, fly tipping of floor sandings, sewage overflows, spray drift, burning of prohibited materials and chemical smells. The precise locations of these discharges are not listed.	
Waste Management Facilities within 1 km	A former landfill is located 450m south of the site.	This landfill is unlikely to have caused contamination to the *piece of land*.

2.6 HAIL Activities

Table 5 identify HAIL and commonly associated contaminants (CLMG Schedule B[4]) relevant to the site and surrounding land (up to 1 km) sourced from NRC Selected Land Use GIS Register.

[4] Ministry for Environment, *Contaminated Land Management Guidelines Schedule B: Hazardous Activities and Industries List (HAIL) with Hazardous Substances,* 2004

Table 5 NRC Recorded HAIL on surrounding sites

HAIL Code	Definition	Commonly Associated Contaminants	Location
Recorded (within 250m)			
A5	*Dry cleaning premises*	*Volatile hydrocarbons including trichloroethylene 1,1,1-trichloroethane tetrachlorothene (also known as PCE), and carbon tetrachloride*	100m north-east
A9	*Paint manufacture or formulation (excluding retail paint stores)*	*Solvents, resins, metals including arsenic, cadmium, copper, nickel, lead, zinc, and mercury*	210m east
B4	*Power substation*	*PCBs, asbestos, metals including boron, arsenic (in fly ash), water treatment chemicals (thermal stations), and hydrocarbons (eg, diesel in generators)*	250m south-west
F4	*Motor vehicle workshops*	*Hydrocarbons including PAHs, solvents, and metals contained in waste oil.*	Numerous, closest is 35m to the west.
F7	*Service stations*	*Petroleum hydrocarbons (BTEX, PAHs) and lead*	40m north, 180m northeast and 200m east.
F8	*Transport depot*	*Wide variety of chemicals, dependent on products being transported*	100m east.

Surrounding HAIL activities have been assessed in the Preliminary CSM[5].

The site is subject to the HAIL under HAIL codes A13 and F4, due to the historic use as a service station and motor vehicle workshop.

[5] HAIL Code H: *Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment.*

3 Historical Site Use

3.1 Historic Photography

Images are enclosed as Appendix B and summarised in Tables 5 and 6 below.

Table 6 Onsite aerial photography review

Date	Review
1950	A forecourt and building are present on the front half of the property. A house is present on the rear half of the property. The forecourt and building in the front portion of the property are assumed to be the vehicle workshop and petrol filling station.
1969	The house on the rear portion of the property is no longer present. Property is now also being used as a vehicle showroom.
1977	No significant visible changes to the site.
1981	
1982	
1987	
1993	
2004	Cars are now parked on what was the petrol filling station forecourt. The underground storage tanks onsite were removed in 1996.
2007	No significant visible changes to the site.
2011	
2013	
2016	
2018	
2019	
2020	
2022	There are no longer cars parked on the site. This is due to the garage and car dealership no longer being operational.

Table 7 Surrounding land aerial photography review

Dates	Surrounding Land
1950	Broadway has several commercial businesses present. Beyond this there is residential dwellings present on the side roads.
1969	Significant development has occurred offsite, with additional residential, commercial and industrial land use being shown.
1977	No significant visible changes offsite.
1981	
1982	
1987	
1993	
2004	
2007	
2011	A building has been built on the property directly to the south of the site. This build currently houses a glass and windscreen repair workshop.
2013	No significant visible changes offsite.
2016	The Kaikohe Hotel situated on the bordering property to the east has been demolished.
2018	No significant visible changes offsite.
2019	
2020	
2022	

Due to the activities undertaken onsite and the distances between the site and recorded HAIL land uses on nearby sites it is not anticipated that offsite activities will apply an additional environmental risk to the site.

3.2 Certificate of Titles - Ownership

A review of the Certificate of Title documents concurs with other evidence that the site has been used as a vehicle workshop since prior to WWII. The Certificate of Title Documents for the site are included as Appendix C.

3.3 Consents and Permits

A property file search was undertaken. This revealed that there are no active resource consents granted for the site.

Table 8 Relevant Permits / Licences / Consents

Date(s)	Details	Compliance Record
26.02.1938	Ref: 24/379 Mr S H Holly Construction of buildings	Unknown
26.04.1962	BP62 Hudspith's Garage Limited Erect a showroom and garages. Alterations and additions to existing garage.	Permission granted.
28.09.2962	BP88 Hudspith's Garage Limited Partial demolition and removal of partitions from old house.	Permission granted.
30.09.1962	BP75 Hudspith's Garage Limited Plumbing and drain laying.	Permission granted.
10.02.1968	BP30 Hudspith's Garage Limited Small building to house compressor and air tank.	Permission granted.
30.10.1969	BP654 Hudspith's Garage Limited Installation of car wash system	Permission granted.
14.01.1971	BP180 Hudspith's Garage Limited Erection of new sign.	Unknown
13.12.1979	Motor Spirits Licensing Authority - Ref: 23/147/8 Hudspith's Garage Limited Relocation of fuel pumps.	Permission granted.
08.07.1987	BPP2923 Hudspith's Garage Limited Installation of a pot belly stove.	Permission granted.

3.4 Supporting Documents

The following supporting documents were viewed and provide key information as to the history of this site. They can be found in appendix H.

3.4.1 **NZ Herald Article dated 20.08.2020**

Includes an interview with former owner of the property Peter Peterson. The site has been used as a car dealership since just after WW2. Over time the dealership has been a franchise for Morris, Austin, Triumph, Hyundai, Lada, Toyota and most recently second-hand cars. The dealership and car garages ceased to be operational onsite at the end of August 2020.

3.4.2 NRC "Potentially Contaminated Site Survey" 12.01.2001

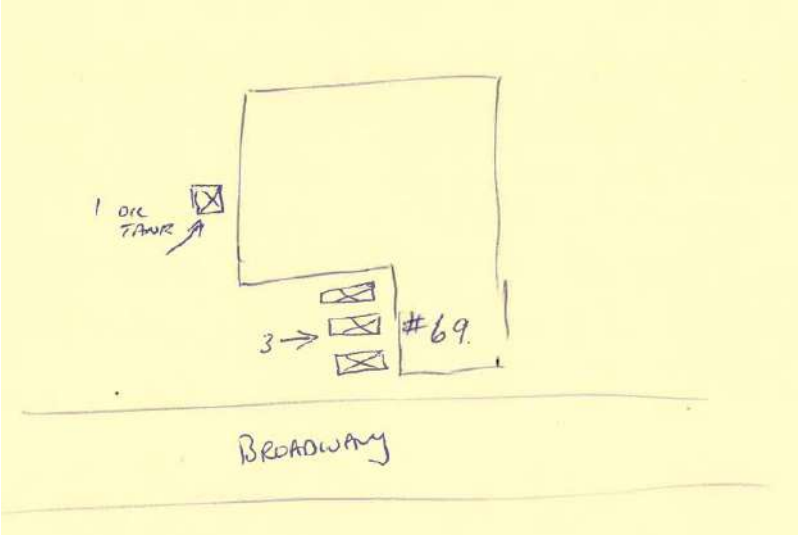
During this inspection 4 nr 300 litre above ground oil tanks were observed. It is noted that "site has been a garage of some sort since before WW2. Used to have petrol tanks these were dug up and removed 15 years ago." It is likely that the tanks being removed 15 years prior is incorrect as NRC were able to provide records of the tanks being removed in 1996.

3.4.3 NRC File Note – Tank Removal – Peterson Toyota Kaikohe 01.07.1996

The file note states that a site visit was undertaken by Gary Young of NRC. 4 tanks were removed by Fuelquip. An inspector was onsite, and samples were taken by NIWA. Regarding the removal of tanks, it was noted "All OK".

The below hand drawing from the file note shows the locations of the tanks.

Figure 3 Hand sketch of location of removed tanks, from NRC file note



3.5 Desk Study Overview

The following has been concluded for the site:

- The site is subject to HAIL activities A13, F4 and F7
- It is unlikely that offsite historical activities will apply an additional environmental risk to the site.

3.6 Preliminary CSM

The assessment provided in table 9 below expands on the potential sources of contamination identified within the area of the proposed development and exposure pathways. It is based on the potentials effects of the proposed land use and soil disturbance activities on human health and the environment associated with the proposed development of a community facility possibly a library.

Table 9 Preliminary conceptual site model

Potential Source	Potential Pathways	Potential Receptors	Assessment
Contaminated Soil	Dermal contact with contaminated soils	Human health – commercial outdoor worker. Human health – maintenance / excavation workers	Potentially complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
	Ingestion of contaminated soils	Human health – commercial outdoor worker. Human health – maintenance / excavation workers	Potentially complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
	Inhalation of vapours / fibres	Human health – commercial outdoor worker. Human health – maintenance / excavation workers	Potentially complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
	Protection of groundwater quality	Groundwater	Potentially complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.

4 Soil Sampling

4.1 Site Investigation

Investigations were undertaken on **27th and 28th of July 2022** and comprised a site walkover and soil sampling by a SQEP. Visual inspection notes and soil descriptions are detailed in the sampling logs included in Appendix D.

During the fieldwork access was made available to Haigh Workman across the whole investigation area. The only limiting factor was being unable to investigate under the footprint of the existing building.

4.1.1 Sampling Locations and Soil Characteristics

Sampling locations are presented on drawing 1 and sampling logs are included in Appendix D.

- Topsoil was not present onsite, it had likely been stripped to enable the prior development of the site.
- Groundwater was encountered at 3.7 mbgl.
- Placed aggregate was encountered site wide on the surface / under hardstanding. This material appeared to be quarried material rather than recycled aggregate.
- Encountered sub soils were typically silty clay and clayey silt.
- Deeper fill was observed in the locations where historic underground tanks were recorded. This made ground was placed natural material and did not contain any anthropogenic material.
- Isolated thin pockets of lightly hydrocarbon impacted material was encountered. The majority of this was within 0.3m of the surface. In TP9 lightly hydrocarbon impacted material was encountered. This was adjacent to the recorded location of a removed underground tank.

4.2 Objective

Soil sample activities followed appropriate sampling methods, procedures and quality assurance procedures described in CLMG 5.

The objectives of the sampling plan were to:

- Identify contamination through targeted sampling.
- Undertake representative sampling.
- Determine suitability of end-use for excavated soils and associated risks.
- Determine the accuracy and reliability of the sampling and laboratory analysis techniques through duplicate sampling.

Minor ground disturbance for sampling activities was conducted as a permitted activity under NESCS regulation 8(2), where soil sampling is defined within regulation 5(3).

4.3 Potential Contaminants of Concern

The contaminants of concern identified in the desk study from the historical site use of vehicle workshop and service station are hydrocarbons (TPH, PAH and BTEX) and metals. Asbestos was also considered a contaminant of concern due to asbestos containing materials having historically being used in automotive components.

4.4 Sampling design

4.4.1 Sampling Number

Site visit 27-28/07/2022:

- 16 trial pit locations were advanced. Trial pits were named TP1-16. Samples were taken from madeground materials and from the underlying subsoil.
    - 50 samples were retrieved including duplicates.

Site visit 30/08/2022:

- Samples were retrieved from two of the above trial pit locations to be analysed for asbestos fibres.
    - 2 samples were retrieved.

This sampling regime is considered appropriate.

4.4.2 Targeted Sampling

Targeted sampling makes use of a judgemental technique and involves selecting sampling locations based on expert knowledge or professional judgement, informed by a well-developed CSM and site-specific knowledge. Targeted sampling design can be used in combination with other sampling designs to produce effective sampling for defensible decision-making. The sampling undertaken can be considered targeted as the investigation focused on the locations of historic activities undertaken onsite this included fuel storage and dispensing infrastructure and the area at the rear of the property where vehicles to be serviced were parked.

4.4.3 Sample depth

The concentration and distribution of contaminants can vary significantly at different depths in the soil or groundwater at a site. It is influenced by numerous factors including the nature of the contaminant source (point source, diffuse source, surface, subsurface, single or multiple releases etc.) and the nature of the breakdown products of primary contaminants.

The exposure scenarios for the priority contaminants listed in the Methodology include soil ingestion, dermal exposure, inhalation as well as protection of groundwater quality:

- When assessing soil ingestion or dermal exposure pathways, samples are typically collected from between 0 and 150 mm below the ground surface to represent soil that receptors (mainly people) are exposed to.
- Deeper samples were also taken of encountered madeground, any soil showing olfactory or visual evidence of contamination and of the top of the natural formation.

4.4.4 Sampling Design

Based on the preliminary conceptual site model, a targeted soil sampling regime was undertaken to assess the identified extents of HAIL activities. Potential impacts from previous land uses were identified and soil samples located in these areas.

As a large proportion of the site is covered in hardstanding and compacted aggregate an excavator with breaker attachment was required to undertake the sampling.

Sampling locations are shown on Drawing 1.

4.4.5 Individual Testing

All samples scheduled for analysis were tested on an individual basis.

4.4.6 Composite Testing

No composite sampling was undertaken.

4.4.7 Quality Assurance and Quality Control (QA/QC)

Quality assurance (QA) and quality control (QC) are essential elements for site investigation. QA relates to the planned activities implemented so that quality requirements will be met, and QC relates to the observation techniques and activities used to demonstrate the quality requirements have been met.

4.4.8 Laboratory QA/QC

Any laboratory analysing samples of contaminated media must be able to show it has in-house quality assurance procedures and quality control checks (QA/QC) to ensure accurate testing and reporting of analyses. IANZ, or equivalent overseas accreditation, is a good indication a laboratory has appropriate QA/QC in place. Eurofins Laboratories[6] is IANZ and NZS/ISO/IEC 17025:2018 accredited, and was the laboratory elected for testing.

Following receipt of the samples by Eurofins Laboratories, the samples were scheduled for analysis of the identified contaminants of concern. Records of laboratory QA/QC and the results of chemical testing including methodologies as received from the laboratory, are presented in Appendix E and F.

4.4.9 Field QA/QC

Adequate QA is achieved when QC results demonstrate that agreed quality objectives – such as freedom from sample cross contamination, sampling method accuracy and precision – can be reliably achieved. In the field, this involves practices such as checking sampling equipment cleanliness and analysing duplicate samples.

Soils were inspected for visual and olfactory indicators of contamination and logged (Appendix D).

[6] R J Hill Laboratories Limited, an IANZ[6] and NZS/ISO/IEC 17025:2018[6] accredited laboratory incorporating the aspects of ISO 9000:2015[6] relevant to testing laboratories. International Accreditation New Zealand which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). New Zealand Standard, General Requirements for the Competence of Testing and Calibration Laboratories, 2018. ISO9000: Quality Management Systems.

Between samples equipment was decontaminated by brushing, spraying with clean potable water and rinsing with high purity de-ionised water. To reduce the potential for cross-contamination, each sample was taken using disposable nitrile gloves that were discarded following the collection of each sample.

Appropriate Personal Protective Equipment (PPE) was used by Haigh Workman staff including disposable nitrile gloves, highly visible vest and steel toe capped boots.

All disposable PPE was treated as contaminated and disposed of appropriately.

Soil samples were placed in glass jars supplied by Hill Laboratories, which were then capped, labelled with a unique identifier and placed in a chilly bin prior to transport to the laboratory in Hamilton by Courier. Standard chain of custody documentation is enclosed in Appendix E.

4.4.10 **Duplicate samples**

A duplicate sample involves collecting two separate samples from a single sample location, storing these in separate containers, and submitting them for analysis to the laboratory as two separate samples. Samples are given separate sample numbers so the laboratory does not know the sample is a duplicate.

A duplicate sample measures the contaminant concentration difference between the two samples because of soil heterogeneity, the variability or error within the laboratory analysis and the variability or error related to field sampling technique. The results of duplicate variance analysis are presented in Section 5.4. One duplicate for every 10 results was adopted.

5 Results of Chemical Testing

5.1 Data Evaluation Quality Assurance & Quality Control (QA/QC)

The results were evaluated against the relevant exposure scenario Soil Contaminant Value (SCS) and processed by Evalu8[7]. The software is applicable for Contaminated Site Assessments (soil and ground water) and consents monitoring.

5.2 Basis for Guideline Values

The results can be compared directly to published SCS values for the adopted exposure scenario:

- The adopted exposure scenario being **Industrial / Commercial.**

The results were also compared directly with the published values for human health and groundwater protection in *'Guidelines for assessing and managing petroleum hydrocarbon contaminated sites in New Zealand, 1999'*.

Where the adopted criteria for a contaminant was below the limit of recording, the criteria was adjusted to become the limit of recording.

5.3 Results

Samples presented have been processed via Evalu8, presented in Appendix F.

[7] Evalu8 has been designed by environmental consultants and developed by the award-winning software company Entuitive.

5.4 Laboratory QA/QC

5.4.1 Duplicate Analysis

Four duplicate samples were analysed for the purpose of quality assurance and control.

Each of the samples had analytes which had a relative difference greater than 50%. This was likely caused by the heterogeneous nature of the relevant samples (being madeground) and the testing methodology where only a small amount of the sample is used for analysis.

The results of the duplicate analysis can be found in table 10 below.

Table 10 Duplicate Analysis

	TP2 0.2 - TP21 0.2		% Difference
	Result 1	Result 2 Duplicate	
Arsenic	6.1	5.6	8.55
Boron	10	10	0.00
Cadmium	0.07	0.05	33.33
Total Recoverable Chromium	42	35	18.18
Copper	32	22	37.04
Lead	39	23	51.61
Mercury	0.19	0.24	-23.26
Nickel	16	7.9	67.78
Zinc	74	48	42.62
Benzene	0.1	0.1	0.00
Toulene	0.1	0.1	0.00
Ethylbenzene	0.1	0.1	0.00
Xylene Total	0.3	0.3	0.00
4-Bromofluorobenzene (surr.)	119	146	-20.38
TPH-SG C7-C9	5	5	0.00
TPH-SG C10-C14	10	10	0.00
TPH-SG C15-C36	20	20	0.00

	TP10 0.15 - TP19 0.2		% Difference
	Result 1	Result 2 Duplicate	
Arsenic	11	7.1	43.09
Boron	10	10	0.00
Cadmium	0.79	0.27	98.11
Total Recoverable Chromium	25	39	-43.75
Copper	68	57	17.60
Lead	570	360	45.16
Mercury	0.08	0.41	-134.69
Nickel	18	12	40.00
Zinc	300	160	60.87
Benzene	0.1	0.1	0.00
Toulene	0.1	0.1	0.00
Ethylbenzene	0.1	0.1	0.00
Xylene Total	0.3	0.3	0.00
4-Bromofluorobenzene (surr.)	106	122	-14.04
TPH-SG C7-C9	5	5	0.00
TPH-SG C10-C14	10	10	0.00
TPH-SG C15-C36	420	220	62.50

	TP6 0.2 - TP20 0.2		% Difference
	Result 1	Result 2 Duplicate	
Arsenic	2.7	2.1	25.00
Boron	10	10	0.00
Cadmium	0.04	0.68	-177.78
Total Recoverable Chromium	42	11	116.98
Copper	29	47	-47.37
Lead	18	130	-151.35
Mercury	0.22	0.08	93.33
Nickel	8.5	11	-25.64
Zinc	46	93	-67.63
Benzene	0.1	0.1	0.00
Toulene	0.1	0.1	0.00
Ethylbenzene	0.1	0.1	0.00
Xylene Total	0.3	0.3	0.00
4-Bromofluorobenzene (surr.)	116	130	-11.38
TPH-SG C7-C9	5	5	0.00
TPH-SG C10-C14	10	10	0.00
TPH-SG C15-C36	170	240	-34.15

	TP14 0.15 - TP19 0.15		% Difference
	Result 1	Result 2 Duplicate	
Arsenic	6.4	7.6	-17.14
Boron	10	10	0.00
Cadmium	0.43	0.77	-56.67
Total Recoverable Chromium	18	16	11.76
Copper	45	86	-62.60
Lead	200	180	10.53
Mercury	0.12	0.13	-8.00
Nickel	7.3	12	-48.70
Zinc	130	150	-14.29
Benzene	0.1	0.1	0.00
Toulene	0.1	0.1	0.00
Ethylbenzene	0.1	0.1	0.00
Xylene Total	0.3	0.3	0.00
4-Bromofluorobenzene (surr.)	106	NA	
TPH-SG C7-C9	5	5	0.00
TPH-SG C10-C14	37	10	114.89
TPH-SG C15-C36	2600	880	98.85

5.5 Leachability Testing (TCLP)

Leachability testing will be undertaken during the remedial works to determine the disposal pathway for soils to be removed from site.

5.6 Statistical Analysis

Statistical analysis has not been conducted as the majority of samples were retrieved in a targeted manner.

5.7 Site Characterisation

The characterisation below considers sampling undertaken during the DSI. The scenario adopted for this site is **industrial / commercial**. This criteria is deemed the most applicable for the proposed use of the site as a community facility such as a library. Analysis was also compared against the criteria for protection of groundwater quality in the *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand*.

5.7.1 Metals

No samples analysed for metals exceeded the adopted criteria.

5.7.2 PAHs (Polycyclic Aromatic Hydrocarbons)

One sample analysed exceeded the adopted criteria for groundwater protection for pyrene.

5.7.3 TPH (Total Petroleum Hydrocarbons)

No samples analysed for TPH exceeded the adopted criteria.

5.7.4 Asbestos fibres

All samples analysed for asbestos fibres had concentrations below the limit of detection.

5.7.5 BTEX

No samples analysed for BTEX exceeded the adopted criteria.

5.7.6 Background Concentrations

As the NES-CS does not apply to a piece of land which has a DSI demonstrating contaminants are at, or below, background concentrations, the soil test results were also compared to background levels (sourced from Auckland Council TP153:2001 Table 3[8]).

[8] Auckland Regional Council, *Technical Publication No. 153: Background Concentrations of Inorganic Elements in Soils from the Auckland Region*. April 2002.

14 Samples () recorded lead in exceedance of the upper values in TP153. The highest value recorded was 1600 mg/kg.

7 Samples () recorded mercury in exceedance of the upper values in TP153. The highest value recorded was 4.4 mg/kg.

5 Samples () recorded cadmium in exceedance of the upper values in TP153. The highest value recorded was 0.89 mg/kg.

2 Samples () recorded copper in exceedance of the upper values in TP153. The highest value recorded was 880 mg/kg.

As contaminant concentrations onsite are above background concentrations set out in TP153 the NES-CS applies to this site.

5.7.7 **Overview**

It is important to note that the SCS are intended to be protective of human health only, and do not apply to other environmental receptors. The SCS considers predicted daily exposure rates for the allocated land use/ exposure scenario. Analysis was also compared against the relevant protection of groundwater quality criteria, considering the geology and depth to groundwater.

Following review of Laboratory Results, the following has been concluded:

- One sample **(TP3 0.15m)** had concentrations in exceedance of the ground water criteria for pyrene. This sample was located in a 'U' shaped drain in the location of the former service station forecourt. The soil in this drain was not in hydraulic continuity with the soil below due to the 'U' drain. A photo of the excavated 'U' drains can be found in figure 4 below.

Figure 4 Excavated 'U' drains.

The sampling undertaken in the area accessible during the site investigation is appropriate and sufficient, therefore no further sampling is required for characterisation of these areas.

6 Risk Assessment

The preliminary CSM has been revised from the desk study in this report in light of the ground investigation.

The revised conceptual site model has been developed for a proposed future land use of industrial / commercial and summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors.

Of the potential contaminant linkages identified in the preliminary CSM only the criteria for the protection of groundwater quality was exceeded in one sample. Sample TP3 0.15m had a concentration of pyrene of 20 mg/kg which is in exceedance of the groundwater criteria for the site considering the site geology and groundwater depth.

The exceeding material was contained within a concrete 'U' drain which is not in hydraulic continuity with the soils below it. Due to the drain restricting the continuity with the soils below there is currently not a risk to groundwater. However during the developments earthworks it is likely that this 'U' drain will need to be removed. This will lead to soil disturbance which could result in an unacceptable risk (classified as greater than 'low') in the proposed end-use if left unmitigated.

7 Regulatory Requirements

7.1 NESCS

7.1.1 Subdividing or changing use

Pursuant to regulation 10(3)(b), given the amount and kind of soil contamination being low and isolated, it is recommended that the *piece of land* is suitable for Commercial use subject to the further works detailed in Section 8.

7.1.2 Disturbing Soil

It is considered that the proposed soil removal associated with the remedial works detailed in section 8 is a **Permitted Activity (8)** under the NES-CS:2011 as this detailed site investigation states the soil contamination exceeds the applicable standard in regulation 7.

The NESCS describes a '*piece of land*' as the area that has had, currently has, or most likely has had activities listed on the HAIL:

> ***8(3) Disturbing Soil***
> *8(3)(c) The volume of the disturbance of the soil of the piece of land must be no more than 25 m^3 per 500 m^2.*
> *8(3)(d)(ii) Soil must not be taken away in the course of the activity, except that for all other purposes combined, a maximum of 5 m^3 per 500 m^2 of soil may be taken away per year.*

The *piece of land* measures 2,642m^2; this allows for 132 m^3 soil disturbance and 26 m^3 soil removal as a permitted activity under the NESCS. **Resource Consent is not required for the remedial works in isolation.**

Earthworks associated with the development may exceed the volumes stated in the NES-CS **which would result in resource consent being required.**

7.2 NRC

As per Rule C.6.8.1 of the Proposed Regional Plan for Northland, copies of site investigation reports must be provided to the regional council within three months of completion of the investigation (reports can be sent to: contamination@nrc.govt.nz).

8 Site Remediation Action Plan

The results of analytical laboratory testing and findings of the revised conceptual site model have highlighted 1 location with localised elevated pyrene concentrations, which may pose an unacceptable risk to groundwater following site development if remediation does not take place.

It is recommended that remediation is conducted on site by a professional, suitably experienced contractor overseen and validated by a SQEP familiar with recommendations set out in this report. The remediation works, outlined methodologies and validation processes should be accepted by FNDC prior to conducting works.

8.1 Remediation Goals

In view of the elevated pyrene, remedial action is considered necessary to protect groundwater. Upon completion and validation of remedial works it is projected that the following can be achieved:

- The level of risk from pyrene contamination is reduced to 'low/negligible'; no preferential pathways should exist between pyrene contamination and groundwater.
- In accordance with NES Regulation 2011 (4) (b), it can be concluded that for the proposed activities (use as a community facility such as a library) '*It is highly unlikely that there will be a risk to human health if the activity is done to the piece of land*'. As a result, no additional work relating to contaminated land will need to take place following remediation.

8.2 Remediation Area

Chemical analysis of samples retrieved during the site investigation has determined that pyrene contamination in excess of the adopted criteria is confined to the contents of the 'U' drain found in the location of TP3. It is considered likely that this 'U' drain will be present in elsewhere in the former service station forecourt area. The former service station forecourt area is shown in drawing 2.

The volume to be remediated is estimated to be $5m^3$.

If further soils requiring remediation are identified during the remedial works they can be removed accordingly, up to the limits identified within Section 7.1.2 of this report - Regulatory Requirements.

8.3 Remediation Options

It is considered that the most suitable remedial option for the site is to remove contaminated soil from site and dispose via approved disposal routes. This is considered the most appropriate option due to the small volume of material requiring remediation (likely to be $<5m^3$). The concrete 'U' drain is likely to be present around the former service station forecourt area. The drain should be systematically 'chased out'.

8.4 Remediation Methodology

The disturbance of ground and capping of contaminated material within the containment cell at the site should be conducted as follows:

1) Site management to be inducted by Haigh Workman and principal contractor prior to starting works;
2) Provide and install temporary fencing as a physical barrier between third parties and remediation works/ excavations (if contractor deems this is necessary);
3) Mobilise construction equipment and materials and engineer to accurately mark out excavation areas as per proposed development plans;
4) Install erosion and sediment control measures (if required);
5) Excavate designated areas of contaminated soil for offsite disposal;
6) Excavated contaminated material should be placed on an impermeable polythene textile whilst chemical analysis is awaited;
7) Wash equipment;
8) Visual inspection of excavation of 'U' drains. If impacted material is confined to drains no validation sampling will be required. However, if visual or olfactory evidence of contamination is observed outside of the drains sampling will be undertaken;
9) Excavated soil for offsite disposal will be stockpiled and sampled. Once lab analysis has been returned then the material will be sent to a suitably licenced disposal facility;
10) A landfill manifest or weighbridge dockets of all material disposed of will be kept;
11) Geo-environmental engineer to inspect all remediation construction works undertaken;
12) Validation report undertaken by SQEP, submitted to FNDC.

8.5 Extent of Remediation Required

The sample which was in exceedance of the site criteria was in TP3 at a depth of 0.15m. It is likely that the 'U' drain is present across the former service station forecourt.

8.6 Further remedial recommendations

The following actions are recommended during earthworks onsite:

- **SQEP to attend site daily during the excavation and obstruction removal of the former service station forecourt area**;
- **SQEP to attend site daily during the slab breakout of the former workshop area**;
- Erosion and sediment controls will be implemented prior to earthworks commencing;
- Should unexpected material be encountered the discovery strategy outlined in section 8.12 should be enacted.

Should visual or olfactory evidence of gross contamination be observed during the above sampling will be undertaken and material will remain insitu or placed on an impermeable bunded surface until the chemical analysis has been returned.

8.7 Regulatory Requirements

It is considered that the proposed remediation works fall within the jurisdiction of Far North District Council (FNDC), Northland Regional Council (NRC) and of the National Environmental Standard for Assessing and Managing Contaminants is Soil to Protect Human Health Regulations 2011 (NES).

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, activity rules 8(3) (c), 8(3) (d) and 8(3) (e), state that an activity is permitted as follows;

8(3) (c) The volume of the disturbance of the soil of the piece of land must be no more than 25 m^3 per 500 m^2;

8(3) (d)(ii) Soil must not be taken away in the course of the activity, except that for all other purposes combined, a maximum of 5 m^3 per 500 m^2 of soil may be taken away per year.

8(3) (d) (iii) *a maximum of 5 m^3 per 500 m^2 of soil may be taken away per year.*

8(3) (e) Soil taken away in the course of the activity must be disposed of at a facility authorised to receive soil of the kind.

In addition, remediation works must abide by NES requirements within activity rule 8(3) (a), that soil disturbance meets the following requirements;

8(3) (a) Controls to minimise the exposure of humans to mobilised contaminants must -

- *(i) Be in place when the activity begins;*
- *(ii) Be effective while the activity is done;*
- *(iii) Be effective until the soil is reinstated to an erosion-resistant state.*

The *piece of land* measures 2,642m^2; this allows for 132 m^3 soil disturbance and 26 m^3 soil removal as a permitted activity under the NESCS. **Resource Consent is not required for the remedial works in isolation** as soil removal is estimated to be <5m^3.

Earthworks associated with the development may exceed the volumes stated in the NES-CS **which would result in resource consent being required.**

8.8 Remediation Personnel

The hierarchy of personnel proposed to be involved with site remediation works and subject to health and safety requirements of the project are presented in Table 14.

Table 11 Site Remediation Personnel Contact Details

Title	Company	Name	Contact Number
Local Authority	FNDC	TBC	0800 920 029
Client	FNDC	Darren James	027 239 3871
SQEP	Haigh Workman Ltd	Joshua Cuming	028 8516 0190
Contractor	TBC	TBC	TBC

8.9 Remediation Schedule

Remediation works are anticipated to be completed within a timely manner by adopting standard site hours of operation. Remediation works are proposed to be conducted Monday to Friday between the hours of 08:00 and 18:00, subject to approval by FNDC.

A schedule of proposed works within the aforementioned hours of operation will be provided to FNDC upon the appointment of a suitably experienced contractor.

8.10 Validation Testing

Validation works will be crucial to the successful remediation of the site. All validation works and reporting should be conducted by a SQEP familiar with the requirements of this report, NES Regulations 2011 and MfE Contaminated Land Management Guidelines 2021.

It is recommended that upon completion of proposed remediation works that the built environment is inspected by a professional engineer familiar with this report to confirm:

- Depth and location of remedial excavation;
- Validation sampling is not proposed due to the confined nature of the material being excavated.

A 'Site Validation Report' will be compiled by a SQEP and submitted to FNDC upon completion of all remediation works.

8.11 Contingency Plan

Remediation methodologies are highlighted within Section 8 of this report. Appropriate health and safety measures are proposed including the restriction of personnel and third-party access and the provision of appropriate PPE. Provided the methodology for remediation works are conducted in accordance with Section 8.5 of this report it is considered a high degree of confidence can be assumed that remediation methods will not cause the further spread of pyrene contamination as contaminated soils will be removed from site.

As a result, it is also concluded that a specific contingency plan is not required. The remediation strategy proposed is conservative and it is considered extremely unlikely to fail to achieve goals as set out in Section 8.1 of this report.

8.12 Discovery Strategy

Should visual and/or olfactory evidence of gross contamination be identified during remediation works and/ or development works outside of the area of proposed remediation it is recommended that works cease in that area and a SQEP familiar with the site attends to inspect the impacted soils. If required, the SQEP will undertake sampling to confirm the level and scope of contamination.

The discovery strategy should also be enacted if any underground fuel storage tanks are encountered.

9 Site Management Plan

Methodology for the remediation of the site considering the following is presented in Section 9.1:

- Noise and odour control;
- Vapour control;
- Dust control.

9.1 Air Quality Monitoring

Some remediation procedures, in particular excavating have the potential to generate significant quantities of dust; inhalation of contaminated dust is a potential risk to human health during remediation works. In terms of the site and the nature of remediation works it is considered that dust generation will be minimal. It is recognised that dust associated with proposed remediation works of this report can be generated from, but not limited to the following sources:

- Vehicle movements.
- Excavation of dry soils.

9.1.1 **Dust Management Plan (DMP)**

The following DMP is designed to minimise dust as part of remediation works.

Control Measures

Remediation is proposed through excavation and offsite disposal. It is recommended that simple control measures are adopted to minimise the risk of dust during excavations, including:

- Minimising access to contaminated areas, especially by vehicles, and;
- Stop works during times of high wind.

Should excessive dust be generated during the construction process, works should be stopped until further mitigation measures such as dampening of the working area have been agreed and implemented.

Personnel Protection and Training

Methodology 1 of the site management plan identifies that all staff/visitors will be inducted either prior to works commencing or as/ when necessary. The site induction will include as a minimum:

- Appropriate Personal Protective Equipment (PPE);
- Methodologies of works;
- Acceptable vehicle movements;
- Hours of works;

- Qualitative monitoring procedures and control measures for dust;
- Key project contacts/ personnel roles, and;
- Procedure for limiting third party access, i.e., fencing if required.

PPE will be adopted within the proposed works to act as effective personnel protection. Minimal PPE for any person entering the site (and conducting construction works) will include:

- Steel toe-capped boots;
- Highly visible vest;
- Hard hat when near or operating machinery, and;
- Single use disposable nitrile gloves to prevent dermal contact with contaminated soils.

All single-use PPE should be classed as contaminated following works involving the interaction with soils and disposed of via appropriate routes for contaminated materials.

Action Levels and Responses

The threshold for airborne dust shall be visible signs in the absence of dust monitors. At any point should the threshold be exceeded all works shall cease and the control measures considered, changed or expanded as necessary. Consultation as to the adequacy/ deficiency of control measures shall be made in co-operation between the engineer and contractor.

9.1.2 Hydrocarbon Vapours

The concentrations of hydrocarbons detected during the DSI are not anticipated to be sufficient to generate vapour in concentrations which would pose a risk to site workers. However, as a precaution the following precautions should be undertaken:

- Undertaking excavation works in a staged manner to limit the exposed surface area of potentially odorous material;
- Wetting down excavations;
- Application of odour suppressants (if necessary)
- Covering any portion of the site that is generating odour when not being remediated;
- Covering odorous stockpiled material with sheeting; and / or,
- Routinely backfilling excavations.

9.2 Proposed Long-term Site Management

Due to the nature of ground contamination at the site and remediation techniques proposed (offsite disposal of material which exceeds the site criteria) long-term site management and monitoring is not considered necessary.

Should produce for consumption be grown onsite it should be grown in raised planters with no continuity to site soils. The planters should be filled with imported clean material.

9.3 Occupational Health and Safety

All works will be carried out in strict accordance with the Health and Safety at Work Act 2015 and Health and Safety at Work Regulations.

Personal Protective Equipment (PPE) must be worn by all personnel and/or visitors to the site who enter the fenced remediation works area. Minimum PPE requirements are identified in Section 9.2.1.

10 Conclusions and Recommendations

This Detailed Site Investigation (DSI), Remediation Action Plan (RAP) and Site Management Plan (SMP) has been completed for land at 69 Broadway, Kaikohe.

It is understood that the client is proposing to develop the site into a community facility possible a library.

This report has given consideration to a final land use of industrial / commercial.

If any of these assumptions are incorrect, then amendments to the recommendations made in this report may be required.

10.1 Summary of Findings

Through review of available information to Haigh Workman, the proposed site end-use and the results of analytical laboratory testing, the following outcomes have been identified at the site:

- One sample **(TP3 0.15m)** had concentrations in exceedance of the ground water criteria for pyrene. This sample was located in a 'U' shaped drain in the location of the former service station forecourt. The soil in this drain was not in hydraulic continuity with the soil below due to the 'U' drain.
- Site remediation is required for the soil contained within this 'U' drain. It is possible that this 'U' drain is present throughout the former service station forecourt area. Remediation will be achieved via offsite disposal. Remediation, personnel qualifications, methodologies of works and site health and safety must conform to parameters as set out in Section 8 and 9 of this report. All remediation recommendations of this report have been made in line with MfE Guidelines 2021.
- The piece of land defined by FNDC equates to the entire site area of 2,462 m2, this allows for 132 m^3 soil disturbance and 26 m^3 soil removal as a permitted activity under the NESCS. **Resource Consent is not required for the remedial works in isolation** as soil removal is estimated to be <5m^3.
- Although resource consent will not be required for the remediation works in isolation it is likely to be required for the soil disturbance associated with the redevelopment works.
- Validation sampling is not proposed due to the confined nature of the material being excavated. SQEP to attend site daily during the excavation works in the former service station forecourt area and the footprint of the former workshop.
- Should unexpected contaminated material be encountered during the development works onsite the discovery strategy detailed in section 8.12 should be enacted.

10.2 Soil Contamination

10.2.1 Risk Evaluation for the Proposed End Use (Industrial Commercial)

The revised conceptual model confirms that should development works occur without remedial works being undertaken, significant pollutant linkages exist to protection of ground water quality.

10.2.2 Protection of Groundwater Quality

Sample TP3 0.15m had a concentration of pyrene of 20 mg/kg which is in exceedance of the groundwater criteria for the site considering the site geology and groundwater depth.

The exceeding material was contained within a concrete 'U' drain which is not in continuity with the soils below it. Due to the drain restricting the continuity with the soils below there is currently not a risk to groundwater. However during the developments earthworks it is likely that this 'U' drain will need to be removed. This will lead to soil disturbance which could result in an unacceptable risk (classified as greater than 'low') in the proposed end-use if left unmitigated.

10.2.3 Construction and Maintenance Workers

Contamination may pose a short-term (acute) or long-term (chronic) risk to workers during remediation works only. Provided health and safety guidance and methodologies are followed, and only suitably trained and inducted personnel are granted access to the site, there is considered a **low** risk posed to construction and maintenance workers.

Site practices must conform to the specific legislative requirements and follow appropriate guidance for works on a contaminated site with heavy metals. In particular it is recommended that provisions are put in place to provide dust suppression should events arise which cause significant volumes of contaminated dust.

10.2.4 Adjacent Site Users

The presence and interaction (during remedial works) with contaminated soils as part of land development is unlikely to expose adjacent land users to risk. However, it is still important that all measures are taken to reduce the risk of creating airborne dust when remediating localised contamination. Precautions may include (but are not limited to) restricting traffic movements to the affected area and/ or lightly wetting the exposed materials. Works should be monitored daily by a suitable earthworks contractor and periodically by construction monitoring conducted by a SQEP.

10.3 Outline Remediation Requirements

10.3.1 Remediation Requirements

In view of the elevated pyrene, remedial action is considered necessary to protect groundwater. Upon completion and validation of remedial works it is projected that the following can be achieved:

- The level of risk from pyrene contamination is reduced to 'low/negligible'; no preferential pathways should exist between pyrene contamination and groundwater.

The above can be achieved by the offsite disposal of soil contained within the 'U' drain in the former service station forecourt area.

10.4 Further Works

Remedial methods outlined in this report should be agreed with the regulatory authorities prior to commencement of remediation/ground preparatory works.

During and upon completion of remediation the following further works have been identified:

- Upon completion of excavation visual inspection by a SQEP should be undertaken.
- Daily site visits by a SQEP during the excavation of the former service station forecourt and vehicle workshop areas.
- If unforeseen contamination is encountered the discovery strategy should be enacted.
- A site validation report completed by a SQEP. This document should be produced in accordance with MFE Contaminated Land Guideline No. 1: (Revised 2021) and confirm successful remediation has taken place on site, i.e., the likelihood of significant pollutant linkage to receptors identified on the revised conceptual site model is low/negligible. The site validation report should include laboratory analysis results obtained during the remediation works and photos of the works undertaken.

10.5 Report Limitations

Limitations of the report have been discussed in the relevant sections. This desk study has been collated from information provided by historic title documents, informal interviews, the property file held by FNDC, available online GIS databases, aerial mapping, site photography and Haigh Workman archives. These sources provide a high level of confidence in the desk study and CSM at this stage.

A field inspection and sampling investigation were devised to determine whether the risks identified in the CSM are present on-site, to determine the correct application of the NESCS, and to support the findings of the desk study.

A Land Information Memorandum (LIM) report has not been included within the scope of works and is not subject to this review.

10.6 Disclaimer

This report has been prepared for the use of FNDC with respect to the particular brief outlined to us. This report is to be used by our Client and their consultants and may be relied upon when considering contaminated land advice. The information and opinions contained within this report shall not be used in any other context for any other purpose without prior review and agreement by Haigh Workman Ltd.

If any of the assumptions outlined are incorrect, then amendments to the recommendations made in this report may be required. The comments and opinions presented in this report are based on the findings of the desk study, ground conditions encountered during an intrusive sampling visit performed by Haigh Workman and the results of tests carried out within one or more laboratories. There may be other conditions prevailing on the site which have not been revealed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for any conditions not revealed by this investigation.

Any diagram or opinion on the possible configuration of strata, contamination or other spatially variable features between or beyond investigation positions is conjectural and given for guidance only. Confirmation of ground conditions between sampling points should be undertaken if deemed necessary.

It should be noted that ground gas and groundwater levels may vary due to seasonal fluctuations, tidal flows and/or other effects.

Appendix A - Drawings

Drawing No.	Title
E01	Detailed Site Investigation Plan
Drawing 2	Area requiring watching brief during breakout / excavation

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	29/07/2022	FIRST ISSUE

DWG: Site Features & Investigation Plan

Scale 1:300 @A3 | Date 29 July 2022

Drawn CN | Checked JC | Approved JP

File C:\USERS\CRAIGNELDER\HAIGH WORKMAN LIMITED\SUITEFILES - CLIENTS\FNDC\JOBS\22 277 - 69 BROADWAY, KAIKOHE (LOT 1 DP 114630)\ENGINEERING\2. GEOTECH\DRAWINGS\22 277 GEOTECH DRAWINGS.DWG

HAIGH WORKMAN LTD
Civil & Structural Engineers
6 Fairway Drive
Kerikeri, BOI
T: 09 407 8327
F: 09 407 8378
E: info@haighworkman.co.nz

Project: Detailed Site Investigation Plan
69 Broadway, Kaikohe

Client: FNDC

Project No. 22 277 | RC no. N/A

DWG No. **E01**

Sheet No.

Plotted By Craig Nelder at 12/09/2022 4:56:30 PM

Legend

- Base Group
- Site Boundary
- Former service station forecourt area
- Former vehicle workshop area

0 5 m 10 m

HAIGH WORKMAN Ltd
Civil & Structural Engineers

Produced by **Datanest.earth**

Title: Areas requiring watching brief from SQEP during breakout / excavation

Client: FNDC		Drawing No: 2 Size: A4
Project: 69 Broadway Kaikohe	Drawn: JCum	
Date: 06-09-2022	Checked: JP	
Proj No: 22 277	Scale: 1:500	Version: REV1

Appendix B – Historic Aerial Photographs

NOTE: Site boundaries indicative only

Figure 5 – Aerial Photograph – 1950 (Source: Retro Lens)

Figure 6 - Aerial Photograph – 1969 (Source: Retro Lens)

Figure 7 – Aerial Photograph – 1977 (Source: Retro Lens)

Figure 8 - Aerial Photograph – 1981 (Source: Haigh Workman archives)

Figure 9 – Aerial Photograph – 1982 (Source: Retrolens)

Figure 10 - Aerial Photograph – 1987 (Source: Retrolens)

Figure 11 - Aerial Photograph – 1993 (Source: Retrolens)

Figure 12 - Aerial Photograph – 2004 (Source: Google Earth)

Figure 13 - Aerial Photograph – 2007 (Source: Google Earth)

Figure 14 - Aerial Photograph – 2011 (Source: Google Earth)

Figure 15 - Aerial Photograph – 2013 (Source: Google Earth)

Figure 16 Aerial Photograph – 2016 (Source: Google Earth)

Figure 17 Aerial Photograph – 2018 (Source: Google Earth)

Figure 18 – Aerial Photograph – 2019 (Source: Google Earth)

Figure 19 – Aerial Photograph –2020 (Source: Google Earth)

Figure 20 – Aerial Photograph – 2022 (Source: Google Earth)

Appendix C - Certificate of Title Documents

REGISTER

(Land and Deeds—4.
[Form B.

NEW ZEALAND.

CANCELLED

Reference: Vol. 582, Folio 104
Transfer No.
Application No.
Order for N/C No. C.14860

Register-book, Vol. 668, folio 125

66/899

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.

This Certificate, dated the twentieth day of September, one thousand nine hundred and thirty five under the hand and seal of the District Land Registrar of the Land Registration District of AUCKLAND **Witnesseth** that A D A G R A C E W R I G H T of Kaikohe, widow

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written or endorsed hereon, subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered green, be the several admeasurements a little more or less, that is to say: All that parcel of land containing two roods and thirty perches more or less situated in the Kaikohe Town District being Lot Two (2) on a plan deposited in the Land Registry Office at Auckland as No. 25833 and being portion of the Raihara block.

Plan 114630 Lodged 19/9/86 2785m²

METRIC AREA IS 2783m²
Conversion Factors:
1 Acre = 4046m²
1 Perch = 25.29m²
1 Link = .2012 metres

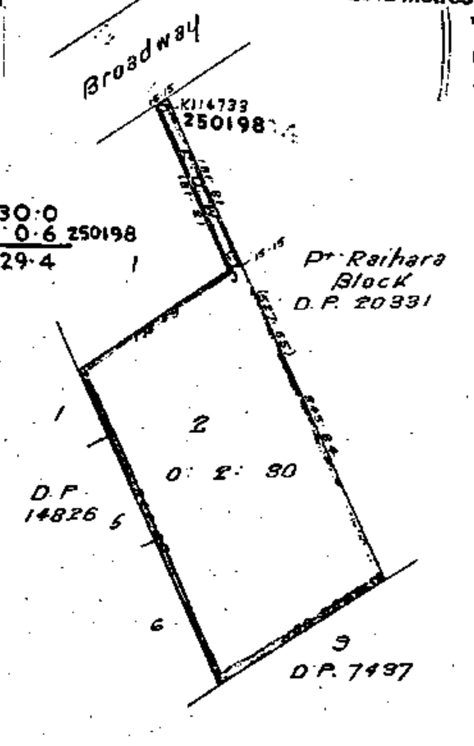
W. Williams
Assistant ~~District~~ Land Registrar.

This Certificate of Title is issued subject to a right of way over the part coloured [illegible] on the plan hereon and marked Right of Way appurtenant to the land in Certificate of Title Volume 668 Folio 174 created in and by Transfer No. 271995

CANCELLED ~~SEE~~ ... 1987

W. Williams
Asst. Land Regr.

0 - 2 - 30.0
0.6 250198
0 - 2 - 29.4



Scale: 1 Chain to an inch

~~Z 74339 Transmission to Alfred Victor Wright of Kaikohe tomanaker and Henry Gifford Wright of Wellington civil servant as executors entered 17/12/1953 @ 11.47 W Benjamin~~

~~Transfer 534688 the registered proprietors to Hudspith Garage Limited produced 17/12/1953 @ 11.52 o'c. W Benjamin~~

~~Mortgage 516713 to Bank of New South Wales Produced 15 ... 2.47~~ DISCHARGED 19 JUL 1973 ... J. Matthewson A.L.R.

K114733 Building line by-law by Kaikohe Borough Council under Section 168 Municipal Corporations Act 1954. Entered 26.7.1963 at 9.01 o'c. W Williams A.L.R.

THIS REPRODUCTION (ON A REDUCED SCALE) CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL REGISTER FOR THE PURPOSES OF SECTION 215A LAND TRANSFER ACT 1952.
L. Otterman
D.L.R.

043329.3 Transfer to Hudspith's Motors Limited at Auckland - 19.7.1973 at 9.33 oc.

for A.L.R.

043329.4 Mortgage to Cyril Donald William Hudspith and to Norman Charles Hudspith (in shares) - 19.7.1973 at 9.33 oc.

for A.L.R.

250198 Gazette Notice taking part (.6p) within land for street. - 23.1.1974 at 9.030 c.

A-L.R.

292182.1 Transfer of Mortgage 043329.4 to Hudspith's Garage Limited - 30.10.1974 at 12.18 o'c

for A.L.R.

292182.2 Mortgage to The Bank of New South Wales - 30.10.1974 at 12.18 o'c

for A.L.R.

194491.1 Caveat by Bridgelands Finance Limited - 28.10.1977 at 9.17 o'c

for A.L.R.

582274.1 Transfer of Mortgage 043329.4 to Cyril Donald William Hudspith and Norman Charles Hudspith as tenants in common in equal shares - 19.6.1979 at 10.51 o'c

A.L.R.

948340.3 Mortgage to The National Bank of New Zealand Limited - 17.9.1981 at 2.06 o'c

A.L.R.

B.203725.1 Transfer of the share of Norman Charles Hudspith in Mortgage 043329.4 to Barbara Eveline Hudspith - 10.8.1983 at 11.34 o'c

A.L.R.

B.694697.1 Certificate of Compliance under Section 306(1)(f)(i) Local Government Act 1974 (affects Plan 114630) - 8.7.1987 at 9.20 o'c

A.L.R.

Pursuant to Section 306(4) of the Local Government Act 1974 Lot 3 Plan 114630 is vested in the Kaikohe Borough Council as a Local Purpose Reserve (service lane) subject to the Reserves Act 1977

A.L.R.

B.694697.2) Cancelled as to Lots 1 &
O.N.C.T.) 2 Plan 114630 and new CsT
8.7.1987) issued: 65B/130 & 65B/131

A.L.R.

CANCELLED
DUPLICATE DESTROYED

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Historical Search Copy

R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **NA65B/130**

Land Registration District **North Auckland**

Date Issued 08 July 1987

Prior References
NA968/174 NA968/175

Estate Fee Simple

Area 2642 square metres more or less

Legal Description Lot 1 Deposited Plan 114630

Original Registered Owners

George Peter Petersen and Margaret Kay Petersen as to a 1/2 share

Margaret Kay Petersen and George Peter Petersen as to a 1/2 share

---

Interests

Fencing Agreement in Transfer 271995

948340.3 Mortgage to The National Bank of New Zealand Limited - 17.9.1981 at 2.06 pm

B831194.1 Mortgage to ASB Bank Limited - 25.5.1988 at 2.25 pm

B831194.2 Memorandum of Priority making Mortgage B831192.1 a first mortgage and Mortgage 948340.3 a second mortgage - 25.5.1988 at 2.25 pm

D489319.2 Mortgage to ASB Bank Limited - 21.3.2000 at 10.43 am

5308064.1 Discharge of Mortgage 948340.3 - 7.8.2002 at 2:55 pm

8095976.1 Variation of Mortgage D489319.2 - 17.3.2009 at 12:21 pm

11642425.1 Discharge of Mortgage B831194.1 - 20.12.2019 at 10:28 am

11642425.2 Discharge of Mortgage D489319.2 - 20.12.2019 at 10:28 am

11642425.3 Transfer to Far North Holdings Limited - 20.12.2019 at 10:28 am

12417077.1 Transfer to Far North District Council - 14.4.2022 at 12:14 pm

References
Prior C/T 968/175 & 968/174

Transfer No.
N/C. Order No. B.694697.2

Land and Deeds 69

REGISTER

No. 65B/130

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of July one thousand nine hundred and eighty seven under the seal of the District Land Registrar of the Land Registration District of NORTH AUCKLAND

WITNESSETH that HUDSPITH'S MOTORS LIMITED at Auckland

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 2642 square metres more or less being Lot 1 Deposited Plan 114630 and being part Raihara Block

DISTRICT LAND REGISTRAR NORTH AUCKLAND

Assistant Land Registrar

Interests at date of issue:

Fencing agreement in Transfer 271995

043329.4 Mortgage to Cyril Donald William Hudspith and Barbara Eveline Hudspith as tenants in common in equal shares - 19.7.1973 at 9.33 o'c

948340.3 Mortgage to The National Bank of New Zealand Limited - 17.9.1981 at 2.06 o'c

A.L.R.

B.778696.1 Transfer an undivided one-half share of Cyril Donald William Hudspith in Mortgage 043329.4 to Barbara Eveline Hudspith of Kaikohe married woman - 4.2.1988 at 2.46 o'c

A.L.R.

B.831194.1 Mortgage to ASB Bank - 25.5.1988 at 2.25 oc.

A.L.R.

B.831194.2 Memorandum of Priority making Mortgage B.831192.1 a first mortgage and Mortgage 948340.3 a second mortgage - 25.5.1988 at 2.25 oc.

A.L.R.

D489319.1 Transfer to George Peter Petersen and Margaret Kay Petersen (1/2 share) Margaret Kay Petersen and George Peter Petersen (1/2 share)

D489319.2 Mortgage to ASB Bank Limited

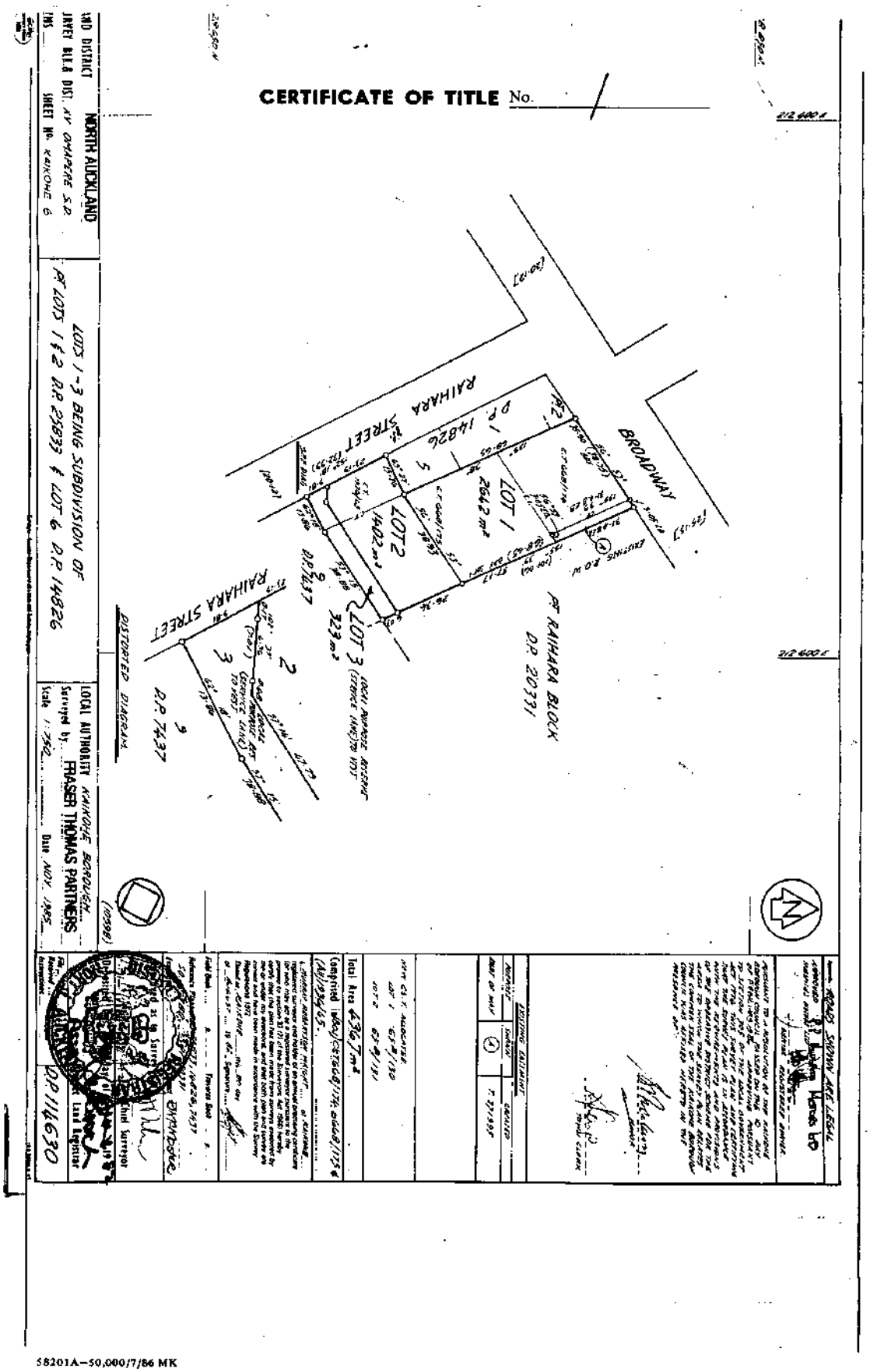
All 21.3.2000 at 10.43

for RGL

tol

No. 658/130

Measurements are Metric



58201A—50,000/7/86 MK

REGISTER

(Land and Deeds—4. [Form B.

NEW ZEALAND.

Reference: Vol. 582, Folio 104; Transfer No. 271995; Application No.; Order for N/C No.

Register-book, Vol. 668, folio 174

668/174

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.

This Certificate, dated the twentieth day of September, one thousand nine hundred and thirty five under the hand and seal of the District Land Registrar of the Land Registration District of AUCKLAND Witnesseth that

SYDNEY HERBERT JOLLY of Kaikohe, Retired Farmer

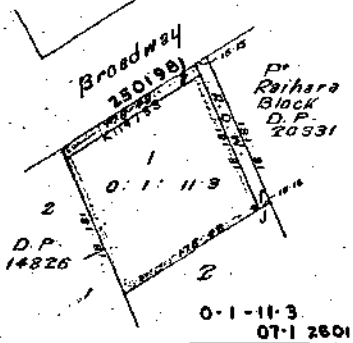
is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written or endorsed hereon, subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered green, be the several admeasurements a little more or less, that is to say: All that parcel of land containing one rood eleven perches and three tenths of a perch more or less situated in the Kaikohe Town District being Lot One (1) on a plan deposited in the Land Registry Office at Auckland as No. 25833 and being portion of the Raihara block.

Plan 14630 lodged 19/9/86

1297m²

METRIC AREA IS 1297m²

Conversion Factors:
1 Acre = 4046m²
1 Perch = 25.29m²
1 Link = .2012 metres



0·1·11·3
07·1 250198
0·1·04·2

Scale: 1 Chain to an inch.

AUCKLAND DISTRICT LAND REGISTRY NEW ZEALAND

W. Luccioni
Assistant District Land Registrar.

Appurtenant to the land in this Certificate of Title is a right of way over Lot 2 on plan 25833 coloured blue on the plan hereunder marked "Grant of Easement" (Part Certificate of Title Volume 668 Folio 175) created in and by Transfer No. 271995.
Luccioni
Asst. Land Regr.

Agreement as to fencing contained in Transfer No. 271995.
Luccioni
Asst. Land Regr.

Mortgage No. 231494 Sydney Herbert Jolly to the Bank of New Zealand Produced 20th September 1935 at 2.30 p.m.
PRODUCED 20 SEP 1935
W. Luccioni
Asst. Land Regr.

Transfer 403528 Sydney Herbert Jolly to Henry Argent Jackson of Kaikohe Garage Proprietor Produced 5.6.1946 at 2.35 p.m. Cancelled A.L.R.

Mortgage 305269 Henry Argent Jackson to The Bank of New South Wales Produced 5.6.1946 at 2.35 p.m. Cancelled A.L.R.

Transfer 479832 Henry Argent Jackson to Kaikohe Garage Limited Produced 14.9.50 at 2.35 p.m. Cancelled

Over . .

REGISTER

668/174

Mortgage 369062 Discharge ... to the Bank of ... Produced ... 19 ... at ... o'c ... A.L.R.

Kaikohe Zoning Use by-law by Kaikohe Borough Council under Section 152 Municipal Corporations Act 1954 affecting within land - Entered 26.7.1963 at 9.01 o'c ... A.L.R.

THIS REPRODUCTION (ON A REDUCED SCALE) CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL REGISTER FOR THE PURPOSES OF SECTION 215A LAND TRANSFER ACT 1952
L.G. Stoman D.L.R.

043329.3 Transfer to Hudspith's Motors Limited at Auckland - 19.7.1973 at 9.33 oc.

for A.L.R.

043329.4 Mortgage to Cyril Donald William Hudspith and to Norman Charles Hudspith (in shares) - 19.7.1973 at 9.33 oc.

for A.L.R.

250198 Gazette Notice taking part (7.1.p) within land for street - 23.1.1974 at 9.03 oc. A.L.R.

292182.1 Transfer of Mortgage 043329.4 to Hudspith's Garage Limited - 30.10.1974 at 12.18 o'c

for A.L.R.

292182.2 Mortgage to The Bank of New South Wales - 30.10.1974 at 12.18 o'c

for A.L.R.

194491.1 Caveat by Broadlands Finance Limited - 28.10.1975 at 9.17 o'c

for A.L.R.

582274.1 Transfer of Mortgage 043329.4 to Cyril Donald William Hudspith and Norman Charles Hudspith as tenants in common in equal shares - 19.6.1979 at 10.51 o'c

A.L.R.

948340.3 Mortgage to The National Bank of New Zealand Limited - 17.9.1981 at 2.06 o'c

A.L.R.

948340.1

B.203725.1 Transfer of the share of Norman Charles Hudspith in Mortgage 043329.4 to Barbara Eveline Hudspith - 10.8.1983 at 11.34 o'c

A.L.R.

668/174

B.694697.1 Certificate of Compliance under Section 306(1)(f)(i) Local Government Act 1974 (affects Plan 114630) - 8.7.1987 at 9.20 o'c

A.L.R.

B.694697.2) Cancelled as to Lot 1 Plan
O N C T) 114630 and new CT issued:
8.7.1987) 65B/130

A.L.R.

CANCELLED

DUPLICATE DESTROYED

Appendix D - Sampling Logs

PO Box 89, 0245
6 Fairway Drive
Kerikeri, 0230
New Zealand

HAIGH WORKMAN LTD
Civil & Structural Engineers

Phone 09 407 8327
Fax 09 407 8378
www.haighworkman.co.nz
info@haighworkman.co.nz

Trial pit Log - TP1

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Reinforced Concrete	0.0					
0.13m Madeground Silty CLAY, brown, moist, no odour.					0.3m ES	
	0.5	Madeground				
	1.0				1.2m ES	
Silt CLAY, brown, moist, trace corase gravel and occaisional cobbles, no odour	1.5	Kerikeri Volcanic		Groundwater not encountered	1.6m ES	
	2.0					
2.1m EOH Natural ground proven.						
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP2

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Reinforced Concrete	0.0	MG		Groundwater not encountered		
Silty CLAY, brown, moist, occaisional fine to medium scoria gravel no odour.		Kerikeri Volcanics			0.2m ES	TP21 0.2m
	0.5					
Slight darkening in colour	1.0				1.0m ES	
1.5m EOH Natural ground proven.	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP3

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Reinforced Concrete	0.0	MG		Groundwatr not encountered		
Silty CLAY, brown, moist. 'U' drain present with dark stained silty clay material with moderate hydrocarbon odour.		Kerikeri Volcanics			0.15m ES	
Brown, Silty CLAY, moist wirh occasional coarse gravel and cobbles.					0.25m ES	
	0.5				0.5m ES	
0.9m EOH Natural ground proven.	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP4

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Reinforced Concrete over tarmac	0.0	MG		Groundwatr not encountered		
Madeground, Fine to medium GRAVEL, grey, moist, with some medium to coarse sand.					0.25m ES	
Madeground, Silty CLAY, brown, moist, occasional fine gravel, oyster shells and rootlets.	0.5				0.4m ES	
COBBLES and GRAVEL with some clay. Cobbles and gravel are well weatherd volcanics.	1.0	Kerikeri Volcanics				
	1.5					
	2.0					
2.3m EOH Natural ground proven.	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP5

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Tarmac	0.0	MG		Groundwater not encountered	0.2m ES	
Madeground, Fine to medium GRAVEL, grey, moist, with some medium to coarse sand.						
Silty CLAY, brown, moist.		Kerikeri Volcanic			0.4m ES	
	0.5					
Trace coarse gravel						
0.9m EOH Natural ground proven.	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP6

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Tarmac	0.0	MG		Groundwater not encountered	0.2m ES	TP20 0.2m
0.06m Madeground, Fine to medium GRAVEL, grey, moist, with some medium to coarse sand. Colouration indicates lime stabilisation						
Silty CLAY, brown, moist.	0.5	KK Volcan			0.4m ES	
0.7m EOH Natural ground proven.	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP7

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Tarmac	0.0	MG		Groundwater not encountered	0.2m ES	
0.07m Madeground, Fine to medium GRAVEL, grey, moist, with some medium to coarse sand.						
0.2m Madeground, Silty CLAY, brown, moist, occasional gravel and cobble sized concrete. Polythene pipe at 0.2m, pipe not live.					0.4m ES	
Concrete absent	0.5					
	1.0					
Silty CLAY, brown, moist, with some coarse gravel and cobbles.		KK Volca.			1.3m ES	
1.6m EOH Natural ground proven.	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP8

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Tarmac	0.0	MG		Groundwater not encountered		
0.07m Madeground, Fine to medium GRAVEL, grey, moist, with some medium to coarse sand.					0.1m ES	
Madeground, Silty CLAY, brown, moist.					0.3m ES	
Madeground, Scoria boulders and cobbles, occasional scrap metal. Cast iron pipe in side of trial pit at 0.4m, pipe is already damaged and not in use.	0.5					
	1.0					
	1.5					
	2.0					
2.35m Silty CLAY brown, moist.		KK V			2.4m ES	
2.5m EOH Natural ground proven.	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP9

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Tarmac	0.0					
0.07m Madeground, Fine to medium GRAVEL, grey, moist, with some medium to coarse sand. Moderate hydrocarbon odour.		MG			0.15m ES	
0.25m Madeground, Fine to medium GRAVEL, red brown, moist, with some medium to coarse sand.					0.3m ES	
0.55m Silty CLAY, brown, moist.	0.5				0.6m ES	
Advanced with hand auger						
Clayey SILT; brown. Very stiff, moist, low to medium plasticity.	1.0					
At 1.3m: Mottled pinkish red.	1.5					
At 1.8m: Trace coarse sand; mottled grey to light grey.	2.0					
At 2.3m: Trace fine gravel; mottled orange.						
From 2.5m: Becomes mottled grey and orange. Firm to stiff.	2.5	Kerikeri Volcanics				
From 2.7 to 3.0m: Slight hydrocarbon odour.					2.8m ES	
From 2.9m: Trace medium to coarse sand. Very stiff.						
At 3.1m: Trace medium gravel. Gravel; vesicular, weakly cemented.	3.0				3.2m ES	
SILT, minor clay, trace medium sand to fine gravel; brownish orange, mottled brown. Firm, moist to wet, low plasticity.	3.5			▽		
From 3.7m: Becomes wet.						
From 4.0m: Becomes greyish brown and orange. Stiff.	4.0					
At 4.2m: Trace fine to medium gravel.						
From 4.3m; Becomes brownish grey to dark grey.						
SILT, minor fine to medium sand; brown, orange and black. Firm, wet, no plasticity.	4.5					
Sandy SILT; orange. Stiff, saturated, no plasticity. Sand: medium to coarse.	5.0					
Sandy SILT, trace fine to medium gravel; greyish brown. Medium dense, saturated, no plasticity. Sand: coarse.						
5.3m EOH (No Sample Recovery - Gravel)						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

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Trial pit Log - TP10

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Concrete	0.0	MG		Groundwater not encountered	0.15m ES	ES19 0.2m
Madeground, Silty CLAY, brown, moist. Occasional oyster shells and ceramics. Frequent black stained material, burnt wood, no evidence of inorganic material.					0.4m ES	
Silty CLAY, brown, moist.	0.5	KK Volc.			0.6m ES	
0.85m EOH Natural ground proven	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP11

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Concrete	0.0	MG		Groundwater not encountered	0.2m ES	
Silty CLAY, brown, moist. Occasional shell fragments						
Shell fragments absent.					0.4m ES	
	0.5	KK Volc.				
0.85m EOH Natural ground proven						
	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP12

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Madeground, fine to medium GRAVEL, grey, minor fine to medium sand.	0.0	MG		Groundwater not encountered	0.05m ES 0.15m ES	
0.25m Madeground, Fine to medium GRAVEL, redish brown, moist, with some medium to coarse Black staining, no odour.					0.4m ES	
Silty CLAY, brown, moist.	0.5	KK Volc.			0.5m ES	
0.85m EOH Natural ground proven	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP13

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Madeground, fine to medium GRAVEL, grey, occasional concrete cobbles.	0.0	MG		Groundwater not encountered	0.15m ES	
Madeground, Fine to medium GRAVEL, redish brown, moist, with some medium to coarse sand.						
Silty CLAY, brown, moist. Minor fine to medium gravel.	0.5	KK Volcanics			0.4m ES	
0.85m EOH Natural ground proven	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP14

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Madeground, fine to medium GRAVEL, brown, moist, some fine sand. Thin red and white layers.	0.0	MG		Groundwater not encountered	0.15m ES	TP19 0.15
0.25m Silty CLAY, brown, moist.	0.5	Kerikeri Volcanics			0.3m ES	
0.9m EOH Natural ground proven	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP15

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Madeground, fine GRAVEL, grey, moist, some fine sand. Occasional rootlets At 0.2m 5cm think layer of dark materail with slight hydrocarbon odour.	0.0	MG		Groundwater not encountered	0.15m ES 0.2m ES 0.35m ES	
Gravelly CLAY, gravel is fine to coarse, orange brown, moist, occasional shells						
Silty CLAY, orange brown, moist,minor fine to medium gravel.	0.5	KK Void				
0.7m EOH Natural ground proven	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

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Trial pit Log - TP16

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Excavator	**LOGGED BY:**	JCum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	NZ	**CHECKED BY:**	JP

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sampling Details	Duplicate Sample name (if relevant)
Madeground, fine GRAVEL, grey, moist, some fine sand. Occasional rootlets 0.15m Madeground, Fine to medium GRAVEL, redish brown, moist, with some medium to coarse sand.	0.0	MG		Groundwater not encountered	0.1m ES 0.2m ES 0.3m ES	
0.25m Silty CLAY, brown, moist.	0.5	KK Volc.				
0.8m EOH Natural ground proven	1.0					
	1.5					
	2.0					
	2.5					
	3.0					
	3.5					
	4.0					
	4.5					

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Note: UTP = Unable To Penetrate. T.S. = Topsoil. ES = Environmental Sample

Appendix E - Quality Assurance and Quality Control

eurofins | Environment Testing

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IANZ# 1327

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Rolleston,
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IANZ# 1290

Eurofins Environment Testing Australia Pty Ltd
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Tel: +61 2 4968 8448
NATA# 1261 Site# 25079

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ABN: 91 05 0159 898

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46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Sample Receipt Advice

Company name:	Haigh Workman Limited
Contact name:	Josh Cuming
Project name:	69 BROADWAY KAIKOHE
Project ID:	22277
Turnaround time:	3 Day
Date/Time received	Sep 5, 2022 9:00 AM
Eurofins reference	920306

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Karishma Patel on phone : or by email: KarishmaPatel@eurofins.com

Results will be delivered electronically via email to Josh Cuming - joshcuming@haighworkman.co.nz.

Note: A copy of these results will also be delivered to the general Haigh Workman Limited email address.

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing A6N 50 005 085 521

☐ **Sydney Laboratory** 179 Magowan Road Gatswein NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** 46-48 Banksia Road Welshpool WA 6106 08 6253 4444 Samples@ARLgroup.com.au

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Haigh Workman Limited	Project №	22 277	Project Manager	Joshua Cuming
Address	6 Fairway Drive, Kerikeri, 0230	Project Name	69 Broadway, Kaikohe	EDD Format (Excel, EQuIS etc)	Facility Code
Contact Name	Joshua Cuming				
Phone №	028 8516 0190				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Joshua Cuming	
Handed over by		
Email for Invoice	debra@haighworkman.co.nz	
Email for Results	joshcuming@haighworkman.co.nz	

Analyses: Where metals are requested, please specify mode of "Filtered". SUITE code must be used to assist SUITE pricing.

Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Soil (S) Water (W)	HOLD	Moisture Set	Total Petroleum Hydrocarbons (NZ ME 1999)	Metals M8 (NZ ME)	Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ ME)	Asbestos - AS4964	Asbestos in Soils (NZ GAMAS)	Asbestos Absence /Presence	Organochlorine Pesticides (NZ ME)	Polycyclic Aromatic Hydrocarbons (NZ ME)	BTEX	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)
TP12 0.1	30.08.2022	Soil							AKL									1			
TP15 0.1	30.08.2022	Soil							AKL									1			

Required Turnaround Time (TAT) Default will be 5 days if not ticked

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦
- ☐ 1 day♦
- ☐ 2 days♦
- ☑ 3 days♦
- ☐ 5 days (Standard)
- ☐ Other(

Sample Comments / Dangerous Goods Hazard Warning

Date/Time: 6/9/22 9.00AM

Chilled: Yes / No N/A

Temp:

Correction:

Final Temp:

#920623

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

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IANZ# 1327

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Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

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ABN: 50 005 085 521

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NATA# 1261 Site# 1254

Geelong
19/8 Lewalan Street
Grovedale
VIC 3216
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Sydney
179 Magowar Road
Girraween
NSW 2145
Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

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ACT 2911
Tel: +61 2 6113 8091

Brisbane
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NATA# 1261 Site# 25079

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Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Sample Receipt Advice

Company name:	Haigh Workman Limited
Contact name:	Josh Cuming
Project name:	69 BROADWAY KAIKOHE
Project ID:	22 277
Turnaround time:	3 Day
Date/Time received	Sep 6, 2022 9:00 AM
Eurofins reference	920623

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
N/A	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✓	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Karishma Patel on phone : or by email: KarishmaPatel@eurofins.com

Results will be delivered electronically via email to Josh Cuming - joshcuming@haighworkman.co.nz.

Note: A copy of these results will also be delivered to the general Haigh Workman Limited email address.

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ **Sydney Laboratory** 179 Magowar Road Girraween NSW 2145 02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** 46-48 Banksia Road Welshpool WA 6106 08 6253 4444 Samples@ARLgroup.com.au

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Haigh Workman Limited
Address	6 Fairway Drive, Kerikeri, 0230
Contact Name	Joshua Cuming
Phone №	028 8516 0190
Special Directions	
Purchase Order	
Quote ID №	
Project №	22 277
Project Name	69 Broadway, Kaikohe
Project Manager	Joshua Cuming
EDD Format (ESdat, EQuIS, etc)	
Facility Code	
Sampler(s)	Joshua Cuming
Handed over by	
Email for Invoice	debra@haighworkman.co.nz
Email for Results	josh.cuming@haighworkman.co.nz

Required Turnaround Time (TAT) Default will be 5 days if not ticked

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦
- ☐ 1 day♦
- ☐ 2 days♦
- ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other(

Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	HOLD	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Metals M8 (NZ MfE)	Eurofins Suite M10.NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)	Asbestos - AS4964	Asbestos in Soils (NZ GAMAS)	Asbestos Absence /Presence	Organochlorine Pesticides (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)						500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
TP1 0.3	27/08/22	Soil			AKL		AKL					AKL												1		
TP1 1.2	27/08/22	Soil			AKL		AKL					AKL												1		
TP1 1.6	27/08/22	Soil			AKL		AKL					AKL												1		
TP2 0.2	28/8/22	Soil			AKL		AKL					AKL												1		
TP2 1.0	28/8/22	Soil			AKL		AKL					AKL												1		
TP3 0.15	28/8/22	Soil			AKL		AKL					AKL												1		
TP3 0.25	28/8/22	Soil			AKL		AKL					AKL												1		
TP3 0.5	28/8/22	Soil	AKL																					1		
TP4 0.25	28/8/22	Soil			AKL		AKL					AKL												1		
TP4 0.4	28/8/22	Soil			AKL		AKL					AKL												1		
TP5 0.2	27/08/22	Soil			AKL		AKL					AKL												1		
TP5 0.4	27/08/22	Soil	AKL																					1		
TP6 0.2	28/8/22	Soil			AKL		AKL					AKL												1		
TP6 0.4	28/8/22	Soil			AKL		AKL					AKL												1		
TP7 0.2	27/08/22	Soil					AKL																	1		
TP7 0.4	27/08/22	Soil			AKL		AKL					AKL												1		
TP7 1.3	27/08/22	Soil	AKL																					1		
TP8 0.1	27/08/22	Soil					AKL					AKL												1		
TP8 0.3	27/08/22	Soil					AKL					AKL												1		
TP8 2.4	27/08/22	Soil			AKL		AKL					AKL												1		
TP9 0.15	28/8/22	Soil			AKL		AKL					AKL												1		
TP9 0.3	28/8/22	Soil	AKL																					1		
TP9 0.6	28/8/22	Soil	AKL																					1		
TP9 2.8	28/8/22	Soil			AKL		AKL					AKL												1		
TP9 3.2	28/8/22	Soil	AKL																					1		
TP10 0.15	28/8/22	Soil			AKL		AKL					AKL												1		
TP10 0.4	28/8/22	Soil			AKL		AKL					AKL												1		
TP10 0.6	28/8/22	Soil	AKL																					1		
TP11 0.2	28/8/22	Soil			AKL		AKL					AKL												1		
TP11 0.4	28/8/22	Soil	AKL																					1		
TP12 0.05	27/08/22	Soil			AKL		AKL					AKL												1		
TP12 0.15	27/08/22	Soil	AKL																					1		
TP12 0.4	27/08/22	Soil			AKL		AKL					AKL												1		
TP12 0.5	27/08/22	Soil	AKL																					1		
TP13 0.15	27/08/22	Soil			AKL		AKL					AKL												1		
TP13 0.4	27/08/22	Soil	AKL																					1		
TP14 0.15	27/08/22	Soil					AKL					AKL												1		

TP14 0.3	27/08/22	Soil	AKL																	1	
TP15 0.15	27/08/22	Soil			AKL		AKL					AKL								1	
TP15 0.2	27/08/22	Soil			AKL		AKL					AKL								1	
TP15 0.35	27/08/22	Soil			AKL		AKL					AKL								1	
TP16 0.1	27/08/22	Soil			AKL		AKL					AKL								1	
TP16 0.2	27/08/22	Soil			AKL		AKL					AKL								1	
TP16 0.3	27/08/22	Soil	AKL																	1	
TP19 0.15	27/08/22	Soil			AKL		AKL					AKL									
TP19 0.2	28/8/22	Soil			AKL		AKL					AKL									
TP19 0.9	27/08/22	Soil			AKL		AKL					AKL									
TP20 0.2	28/8/22	Soil	AKL																		
TP21 0.2	28/8/22	Soil	AKL																		
TP22 0.25	28/8/22	Soil	AKL																		
10		Total Counts																		44	

Method of Shipment	☐ Courier #	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Laboratory Use Only	Received By: Kyla Alan	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By:	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

#910568

Date/Time: 2/8/22 9:00AM

Chilled: (Yes) No

Temp: 14.9

Correction: +0.1

Final Temp: 15.0

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

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Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261 Site# 1254

Geelong
19/8 Lewalan Street
Grovedale
VIC 3216
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Sydney
179 Magowar Road
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NSW 2145
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NATA# 1261 Site# 18217

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Tel: +61 2 6113 8091

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Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Sample Receipt Advice

Company name:	Haigh Workman Limited
Contact name:	Josh Cuming
Project name:	69 BROADWAY KAIKOHE
Project ID:	22277
Turnaround time:	5 Day
Date/Time received	Aug 2, 2022 9:00 AM
Eurofins reference	910568

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Samples TP12 0.15 and TP19 0.9 broken in transit - removed. Used sampling dates as per labels on jars.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Swati Oberoi on phone : or by email: SwatiOberoi@eurofins.com

Results will be delivered electronically via email to Josh Cuming - joshcuming@haighworkman.co.nz.

Note: A copy of these results will also be delivered to the general Haigh Workman Limited email address.

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ **Sydney Laboratory**
179 Magowar Road Girraween NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
46-48 Banksia Road Welshpool WA 6106
08 6253 4444 Samples@ARLgroup.com.au

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Haigh Workman Limited	**Project №**	22 277	**Project Manager**	Joshua Cuming	**Sampler(s)**	Joshua Cuming
Address	6 Fairway Drive, Kerikeri, 0230	**Project Name**	69 Broadway, Kaikohe	**EDD Format** ESdat, EQuIS etc		**Facility Code**	**Handed over by**
Contact Name	Joshua Cuming						**Email for Invoice** debra@haighworkman.co.nz
Phone №	028 8516 0190						**Email for Results** joshcuming@haighworkman.co.nz
Special Directions							
Purchase Order							
Quote ID №							

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers Change container type & size if necessary.

Required Turnaround Time (TAT) Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	HOLD	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Metals M8 (NZ MfE)	Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)	Asbestos - AS4964	Asbestos in Soils (NZ GAMAS)	Asbestos Absence /Presence	Organochlorine Pesticides (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	BTEX					500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	TP1 0.3	27/08/22	Soil											AKL											1		
2	TP1 1.2	27/08/22	Soil											AKL											1		
3	TP1 1.6	27/08/22	Soil											AKL											1		
4	TP2 0.2	28/8/22	Soil											AKL											1		
5	TP2 1.0	28/8/22	Soil											AKL											1		
6	TP3 0.15	28/8/22	Soil											AKL											1		
7	TP3 0.25	28/8/22	Soil											AKL											1		
8	TP3 0.5	28/8/22	Soil																						1		
9	TP4 0.25	28/8/22	Soil											AKL											1		
10	TP4 0.4	28/8/22	Soil											AKL											1		
11	TP5 0.2	27/08/22	Soil											AKL											1		
12	TP5 0.4	27/08/22	Soil																						1		
13	TP6 0.2	28/8/22	Soil											AKL											1		
14	TP6 0.4	28/8/22	Soil											AKL											1		
15	TP7 0.2	27/08/22	Soil																						1		

QS3009_R9 Modified by: F. Sanjaya Approved by: Dr. R Symons Approved on: 10 December 2018

16	TP7 0.4	27/08/22	Soil											AKL										1	
17	TP7 1.3	27/08/22	Soil																					1	
18	TP8 0.1	27/08/22	Soil																					1	
19	TP8 0.3	27/08/22	Soil																					1	
20	TP8 2.4	27/08/22	Soil											AKL										1	
21	TP9 0.15	28/8/22	Soil											AKL										1	
22	TP9 0.3	28/8/22	Soil																					1	
23	TP9 0.6	28/8/22	Soil																					1	
24	TP9 2.8	28/8/22	Soil											AKL										1	
25	TP9 3.2	28/8/22	Soil																					1	
26	TP10 0.15	28/8/22	Soil											AKL										1	
27	TP10 0.4	28/8/22	Soil											AKL										1	
28	TP10 0.6	28/8/22	Soil																					1	
29	TP11 0.2	28/8/22	Soil											AKL										1	
30	TP11 0.4	28/8/22	Soil																					1	
31	TP12 0.05	27/08/22	Soil											AKL										1	
32	TP12 0.15	27/08/22	Soil																					1	
33	TP12 0.4	27/08/22	Soil											AKL										1	
34	TP12 0.5	27/08/22	Soil																					1	
35	TP13 0.15	27/08/22	Soil											AKL										1	
36	TP13 0.4	27/08/22	Soil																					1	
37	TP14 0.15	27/08/22	Soil																					1	
38	TP14 0.3	27/08/22	Soil																					1	
39	TP15 0.15	27/08/22	Soil											AKL										1	
40	TP15 0.2	27/08/22	Soil											AKL										1	

41	TP15 0.35	27/08/22	Soil											AKL											1		
42	TP16 0.1	27/08/22	Soil											AKL											1		
43	TP16 0.2	27/08/22	Soil											AKL											1		
44	TP16 0.3	27/08/22	Soil																						1		
45	TP19 0.15	27/08/22	Soil											AKL													
46	TP19 0.2	28/8/22	Soil											AKL													
47	TP19 0.9	27/08/22	Soil											AKL													
48	TP20 0.2	28/8/22	Soil			AKL		AKL					AKL	AKL													
49	TP21 0.2	28/8/22	Soil			AKL		AKL					AKL	AKL													
50	TP22 0.25	28/8/22	Soil																								
51																											
52																											
10		Total Counts																							44		

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	

Laboratory Use Only	Received By	Kyla Alan	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	22/08/22	Time	4:30pm	Temperature	4.5
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	916598

eurofins | Environment Testing

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NATA# 1261 Site# 1254

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Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

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Murarrie
QLD 4172
Tel: +61 7 3902 4600
NATA# 1261 Site# 20794

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Mayfield East NSW 2304
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Tel: +61 2 4968 8448
NATA# 1261 Site# 25079

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ABN: 91 05 0159 898

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46-48 Banksia Road
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Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Sample Receipt Advice

Company name:	Haigh Workman Limited
Contact name:	Josh Cuming
Project name:	69 BROADWAY KAIKOHE
Project ID:	22277
Turnaround time:	5 Day
Date/Time received	Aug 22, 2022 4:30 PM
Eurofins reference	916598

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

TP19 0.9 broken in transit from original job - analysis removed.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Karishma Patel on phone : or by email: KarishmaPatel@eurofins.com

Results will be delivered electronically via email to Josh Cuming - joshcuming@haighworkman.co.nz.

Note: A copy of these results will also be delivered to the general Haigh Workman Limited email address.

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ **Sydney Laboratory**
179 Magowar Road Girraween NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
46-48 Banksia Road Welshpool WA 6106
08 6253 4444 Samples@ARLgroup.com.au

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Haigh Workman Limited	**Project №**	22 277	**Project Manager**	Joshua Cuming
Address	6 Fairway Drive, Kerikeri, 0230	**Project Name**	69 Broadway, Kaikohe	**EDD Format** ESdat, EQuIS etc	**Facility Code**
Contact Name	Joshua Cuming				
Phone №	028 8516 0190				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Joshua Cuming
Handed over by	
Email for Invoice	debra@haighworkman.co.nz
Email for Results	joshcuming@haighworkman.co.nz

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers Change container type & size if necessary.

Required Turnaround Time (TAT) Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☑ 3 days♦
☐ 5 days (Standard)
☐ Other( )

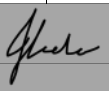
№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	HOLD	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Metals M8 (NZ MfE)	Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)	Asbestos - AS4964	Asbestos in Soils (NZ GAMAS)	Asbestos Absence /Presence	Organochlorine Pesticides (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	BTEX					500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	TP1 0.3	27/08/22	Soil																					1		
2	TP1 1.2	27/08/22	Soil																					1		
3	TP1 1.6	27/08/22	Soil																					1		
4	TP2 0.2	28/8/22	Soil																					1		
5	TP2 1.0	28/8/22	Soil																					1		
6	TP3 0.15	28/8/22	Soil																					1		
7	TP3 0.25	28/8/22	Soil																					1		
8	TP3 0.5	28/8/22	Soil																					1		
9	TP4 0.25	28/8/22	Soil																					1		
10	TP4 0.4	28/8/22	Soil																					1		
11	TP5 0.2	27/08/22	Soil																					1		
12	TP5 0.4	27/08/22	Soil																					1		
13	TP6 0.2	28/8/22	Soil																					1		
14	TP6 0.4	28/8/22	Soil																					1		
15	TP7 0.2	27/08/22	Soil																					1		

QS3009_R9 Modified by: F. Sanjaya Approved by: Dr. R Symons Approved on: 10 December 2018

16	TP7 0.4	27/08/22	Soil																						1	
17	TP7 1.3	27/08/22	Soil																						1	
18	TP8 0.1	27/08/22	Soil																						1	
19	TP8 0.3	27/08/22	Soil																						1	
20	TP8 2.4	27/08/22	Soil																						1	
21	TP9 0.15	28/8/22	Soil																						1	
22	TP9 0.3	28/8/22	Soil																						1	
23	TP9 0.6	28/8/22	Soil																						1	
24	TP9 2.8	28/8/22	Soil																						1	
25	TP9 3.2	28/8/22	Soil																						1	
26	TP10 0.15	28/8/22	Soil																						1	
27	TP10 0.4	28/8/22	Soil																						1	
28	TP10 0.6	28/8/22	Soil																						1	
29	TP11 0.2	28/8/22	Soil																						1	
30	TP11 0.4	28/8/22	Soil																						1	
31	TP12 0.05	27/08/22	Soil																						1	
32	TP12 0.15	27/08/22	Soil																						1	
33	TP12 0.4	27/08/22	Soil																						1	
34	TP12 0.5	27/08/22	Soil																						1	
35	TP13 0.15	27/08/22	Soil																						1	
36	TP13 0.4	27/08/22	Soil																						1	
37	TP14 0.15	27/08/22	Soil			AKL										AKL									1	
38	TP14 0.3	27/08/22	Soil																						1	
39	TP15 0.15	27/08/22	Soil																						1	
40	TP15 0.2	27/08/22	Soil																						1	

41	TP15 0.35	27/08/22	Soil																						1		
42	TP16 0.1	27/08/22	Soil																						1		
43	TP16 0.2	27/08/22	Soil																						1		
44	TP16 0.3	27/08/22	Soil																						1		
45	TP19 0.15	27/08/22	Soil																								
46	TP19 0.2	28/8/22	Soil																								
47	TP19 0.9	27/08/22	Soil																								
48	TP20 0.2	28/8/22	Soil																								
49	TP21 0.2	28/8/22	Soil																								
50	TP22 0.25	28/8/22	Soil																								
51																											
52																											
10		Total Counts																						44			

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	

Laboratory Use Only											
	Received By	Kyla Alan	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	5/09/22	Time	9:00 a.m.	Temperature	4.6
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	920306

Appendix F - Results of Chemical Testing

Evalu8 Data for TPH 69 Broadway, Kaikohe

Analyte	Units	EQL	TP1	TP1	TP1	TP10	TP10	TP11	TP12	TP12	TP13	TP14
Depth			1.6m	1.2m	0.3m	0.15m	0.4m	0.2m	0.05m	0.4m	0.15m	0.15m
Sampled Date			27-07-2022	27-07-2022	27-07-2022	28-07-2022	28-07-2022	28-07-2022	27-07-2022	27-07-2022	27-07-2022	27-08-2022
Soil Type			Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay		Sand	Clay	Sand	Sand
Soil Depth			1m - 4m	1m - 4m	< 1m	< 1m	< 1m		< 1m	< 1m	< 1m	< 1m
C10-C14	mg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	37
C15-C36	mg/kg	20	< 20	< 20	< 20	420	< 20	< 20	< 20	< 20	< 20	2,500
C7-C9	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5

Analyte	Units	EQL	TP15	TP15	TP15	TP16	TP16	TP2	TP2	TP3	TP3
Depth			0.2m	0.15m	0.35m	0.1m	0.2m	0.2m	1m	0.15m	0.25m
Sampled Date			27-07-2022	27-07-2022	27-07-2022	27-07-2022	27-07-2022	28-07-2022	28-07-2022	28-07-2022	28-07-2022
Soil Type			Sand	Sand		Sand	Sand	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Soil Depth			< 1m	< 1m		< 1m	< 1m	1m - 4m	1m - 4m	< 1m	< 1m
C10-C14	mg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
C15-C36	mg/kg	20	570	74	< 20	< 20	< 20	< 20	< 20	130	< 20
C7-C9	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5

Analyte	Units	EQL	TP4	TP4	TP5	TP6	TP6	TP7	TP8	TP9	TP9
Depth			0.25m	0.4m	0.2m	0.2m	0.4m	0.4m	2.4m	0.15m	2.8m
Sampled Date			28-07-2022	28-07-2022	27-07-2022	28-07-2022	28-07-2022	27-07-2022	27-07-2022	28-07-2022	28-07-2022
Soil Type			Sand	Silty Clay	Sand	Sand	Silty Clay	Silty Clay	Silty Clay	Sand	Silty Clay
Soil Depth			< 1m	1m - 4m	< 1m	< 1m	< 1m	< 1m	1m - 4m	< 1m	1m - 4m
C10-C14	mg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
C15-C36	mg/kg	20	< 20	< 20	58	170	21	< 20	< 20	230	340
C7-C9	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5

Adopted Criteria

Analyte	Units	EQL	Groundwater Protection		
			Depth To Groundwater: 2m		
			Silty Clay	Sand	Clay
Depth			< 1m	< 1m	< 1m
Sampled Date					
Soil Type					
Soil Depth					
C10-C14	mg/kg	10	1,500[1]	1,500[1]	1,500[1]
C15-C36	mg/kg	20	-[1]	-[1]	-[1]
C7-C9	mg/kg	5	710[1]	710[1]	710[1]

Analyte	Units	EQL	Commercial / Industrial																	
			All Pathways						inhalation of indoor air						inhalation of outdoor air					
			Silty Clay	Sand	Clay	Silty Clay	Sand	Clay	Silty Clay	Sand	Clay									
Depth			< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m
Sampled Date																				
Soil Type																				
Soil Depth																				
C10-C14	mg/kg	10	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]	1,900[1]
C15-C36	mg/kg	20	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]	20,000[1]
C7-C9	mg/kg	5	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]	8,800[1]

Scenarios:

Shaded	indicates concentrations exceed Groundwater Protection landuse
Shaded	indicates concentrations exceed Commercial / Industrial landuse
Bold	indicates concentrations exceed Background Concentrations

Criteria adopted from the following guidelines:

[1]Petroleum Hydrocarbon Guidelines MfE 1999

[2]MfE NES, 2011

Notes:

This table does not represent the full analytical results, please refer to the laboratory results for full details.

Assumes soil pH of 5 for Chromium VI.

Criteria for Chromium VI were conservatively selected.

Evalu8 data for BTEX 69 Broadway , Kaikohe

Analyte	Units	EQL	TP1	TP1	TP1	TP10	TP10	TP11	TP12	TP12	TP13	TP14
Depth			0.3m	1.2m	1.6m	0.4m	0.15m	0.2m	0.05m	0.4m	0.15m	0.15m
Sampled Date			27-08-2022	27-08-2022	27-08-2022	28-08-2022	28-08-2022	28-08-2022	27-08-2022	27-08-2022	27-08-2022	27-08-2022
Soil Type			Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Sand	Clay	Sand	Sand
Soil Depth			< 1m	1m - 4m	1m - 4m	< 1m	< 1m	< 1m	< 1m	< 1m	< 1m	< 1m
BTEX												
Benzene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Analyte	Units	EQL	TP15	TP15	TP15	TP16	TP16	TP2	TP2	TP3	TP3	TP4
Depth			0.15m	0.2m	0.35m	0.1m	0.2m	0.2m	1m	0.15m	0.25m	0.25m
Sampled Date			27-08-2022	27-08-2022	27-08-2022	27-08-2022	27-08-2022	28-08-2022	28-08-2022	28-08-2022	28-08-2022	28-08-2022
Soil Type			Sand		Clay	Sand	Sand	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Sand
Soil Depth			< 1m		< 1m	< 1m	< 1m	< 1m	1m - 4m	< 1m	< 1m	< 1m
BTEX												
Benzene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Analyte	Units	EQL	TP4	TP5	TP6	TP6	TP7	TP8	TP9	TP9
Depth			0.4m	0.2m	0.4m	0.2m	0.4m	2.4m	0.15m	2.8m
Sampled Date			28-08-2022	27-08-2022	28-08-2022	28-08-2022	27-08-2022	27-08-2022	28-08-2022	28-08-2022
Soil Type				Sand	Silty Clay	Sand	Silty Clay	Silty Clay	Sand	Silty Clay
Soil Depth				< 1m	< 1m	< 1m	< 1m	1m - 4m	< 1m	1m - 4m
BTEX										
Benzene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Adopted Criteria

Analyte	Units	EQL	Groundwater Protection		
			Depth To Groundwater: 2m		
			Silty Clay	Sand	Clay
Depth			< 1m	< 1m	< 1m
Sampled Date					
Soil Type					
Soil Depth					
BTEX					
Benzene	mg/kg	0.1	0.0057[1]	0.0057[1]	0.0057[1]
Ethylbenzene	mg/kg	0.1	1.2[1]	1.2[1]	1.2[1]
Toluene	mg/kg	0.1	1.1[1]	1.1[1]	1.1[1]

Analyte	Units	EQL	Commercial / Industrial																	
			All Pathways			inhalation of indoor air						inhalation of outdoor air								
			Silty Clay	Sand	Clay	Silty Clay	Sand	Clay	Silty Clay	Sand	Clay									
Depth			< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m
Sampled Date																				
Soil Type																				
Soil Depth																				
BTEX																				
Benzene	mg/kg	0.1	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]	7.2[1]
Ethylbenzene	mg/kg	0.1	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]	350[1]
Toluene	mg/kg	0.1	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]	670[1]

Scenarios:

Shaded	indicates concentrations exceed Groundwater Protection landuse
Shaded	indicates concentrations exceed Commercial / Industrial landuse
Bold	indicates concentrations exceed Background Concentrations

Criteria adopted from the following guidelines:

[1]Petroleum Hydrocarbon Guidelines MfE 1999

[2]MfE NES, 2011

Notes:

This table does not represent the full analytical results, please refer to the laboratory results for full details.

Assumes soil pH of 5 for Chromium VI.

Criteria for Chromium VI were conservatively selected.

Evalu8 data for Heavy Metals 69 Broadway, Kaikohe

Analyte	Units	EQL	TP1	TP1	TP1	TP10	TP10	TP11	TP12	TP12	TP13	TP14	TP15
Depth			1.6m	1.2m	0.3m	0.15m	0.4m	0.2m	0.05m	0.4m	0.15m	0.15m	0.2m
Sampled Date			27-07-2022	27-07-2022	27-07-2022	28-07-2022	28-07-2022	28-07-2022	27-07-2022	27-07-2022	27-07-2022	27-07-2022	27-07-2022
Soil Type			Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay		Sand	Clay	Sand	Sand	Sand
Soil Depth			1m - 4m	1m - 4m	< 1m	< 1m	< 1m		< 1m	< 1m	< 1m	< 1m	< 1m
Heavy Metals													
Cadmium	mg/kg	0.01	0.04	0.07	0.05	0.28	0.35	**0.78**	0.09	**0.79**	0.04	0.43	0.25
Copper	mg/kg	0.1	29	80	31	41	**880**	41	21	**120**	15	45	17
Lead	mg/kg	0.1	20	15	41	**440**	**400**	**570**	19	**1,600**	7.7	**200**	**130**
Arsenic	mg/kg	0.1	7.1	6.5	5.9	6.3	4.3	7.8	5.8	10	4.4	6.4	9.3
Chromium	mg/kg	0.1	42	37	39	38	49	49	12	39	6.5	18	6.2
Nickel	mg/kg	0.1	12	20	11	12	15	12	19	12	12	7.3	4.4
Zinc	mg/kg	5	50	68	66	200	220	440	63	460	35	130	140

Analyte	Units	EQL	TP15	TP15	TP16	TP16	TP2	TP2	TP3	TP3	TP4	TP4
Depth			0.15m	0.35m	0.1m	0.2m	0.2m	1m	0.15m	0.25m	0.25m	0.4m
Sampled Date			27-07-2022	27-07-2022	27-07-2022	27-07-2022	28-07-2022	28-07-2022	28-07-2022	28-07-2022	28-07-2022	28-07-2022
Soil Type			Sand		Sand	Sand	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Sand	Silty Clay
Soil Depth			< 1m		< 1m	< 1m	1m - 4m	1m - 4m	< 1m	< 1m	< 1m	1m - 4m
Heavy Metals												
Cadmium	mg/kg	0.01	0.15	0.02	0.1	0.46	0.07	0.06	0.43	0.2	0.08	0.1
Copper	mg/kg	0.1	18	27	23	44	32	30	42	32	9.2	33
Lead	mg/kg	0.1	**220**	19	24	**120**	39	23	**400**	**86**	9.6	10
Arsenic	mg/kg	0.1	6.5	7	6.7	5.2	6.1	8.8	4.5	5.5	1.7	6.1
Chromium	mg/kg	0.1	9.6	43	9.9	9.1	42	39	32	40	3.6	28
Nickel	mg/kg	0.1	13	9.3	15	11	16	15	24	15	5.8	24
Zinc	mg/kg	5	98	45	64	110	74	53	140	120	29	67

Analyte	Units	EQL	TP5	TP6	TP6	TP7	TP7	TP8	TP8	TP8	TP9	TP9
Depth			0.2m	0.2m	0.4m	0.2m	0.4m	0.1m	0.3m	2.4m	0.15m	2.8m
Sampled Date			27-07-2022	28-07-2022	28-07-2022	27-07-2022	27-07-2022	27-07-2022	27-07-2022	27-07-2022	28-07-2022	28-07-2022
Soil Type			Sand	Sand	Silty Clay	Silty Clay	Silty Clay	Sand	Silty Clay	Silty Clay	Sand	Silty Clay
Soil Depth			< 1m	< 1m	< 1m	< 1m	< 1m	< 1m	< 1m	1m - 4m	< 1m	1m - 4m
Heavy Metals												
Cadmium	mg/kg	0.01	0.29	**0.89**	0.04	0.19	0.16	0.12	0.28	0.08	**0.79**	0.1
Copper	mg/kg	0.1	35	48	29	33	32	9.1	32	41	68	23
Lead	mg/kg	0.1	62	**150**	18	**200**	**98**	19	28	19	**570**	27
Arsenic	mg/kg	0.1	3.4	2.7	6.6	4.6	5.5	5	4.9	6	11	5.1
Chromium	mg/kg	0.1	18	12	42	32	33	3.9	33	31	24	29
Nickel	mg/kg	0.1	7.1	16	8.5	29	18	4.4	31	43	18	10
Zinc	mg/kg	5	100	110	46	88	110	67	180	71	300	73

Scenarios:

Shaded	indicates concentrations exceed Groundwater Protection landuse
Shaded	indicates concentrations exceed Commercial / Industrial landuse
Bold	indicates concentrations exceed Background Concentrations

Criteria adopted from the following guidelines:

[1]Petroleum Hydrocarbon Guidelines MfE 1999

[2]MfE NES, 2011

Notes:

This table does not represent the full analytical results, please refer to the laboratory results for full details.

Assumes soil pH of 5 for Chromium VI.

Criteria for Chromium VI were conservatively selected.

Adopted Criteria

		Groundwater Protection	Commercial / Industrial	Background Concentrations
Cadmium	mg/kg	-	1,300[2]	**0.1-0.65**
Copper	mg/kg	-	10,000[2]	**20-90**
Lead	mg/kg	-	3,300[2]	**5-65**
Arsenic	mg/kg	-	70[2]	**0.4-12**
Chromium	mg/kg	-	6,300[2]	**3-125**
Nickel	mg/kg	-	-	**4-320**
Zinc	mg/kg	-	-	**54-1,160**

Evalu8 Data for PAHs 69 Broadway, Kaikohe

Analyte	Units	EQL	TP1	TP1	TP1	TP10	TP10	TP10	TP11	TP12	TP12	TP13	TP14
Depth			1.6m	1.2m	0.3m	0.15m	0.4m	0.15m	0.2m	0.05m	0.4m	0.15m	0.15m
Sampled Date			27-07-2022	27-07-2022	27-07-2022	28-07-2022	28-07-2022	28-08-2022	28-07-2022	27-07-2022	27-07-2022	27-07-2022	27-07-2022
Soil Type			Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay		Sand	Clay	Sand	Sand
Soil Depth			1m - 4m	1m - 4m	< 1m	< 1m	< 1m	< 1m		< 1m	< 1m	< 1m	< 1m
Polycyclic Aromatic Hydrocarbons													
Naphthalene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	0.05	< 0.03	< 0.03

Analyte	Units	EQL	TP15	TP15	TP15	TP16	TP16	TP19	TP2	TP2	TP3	TP3
Depth			0.2m	0.15m	0.35m	0.1m	0.2m	0.15m	0.2m	1m	0.15m	0.25m
Sampled Date			27-07-2022	27-07-2022	27-07-2022	27-07-2022	27-07-2022	27-07-2022	28-07-2022	28-07-2022	28-07-2022	28-07-2022
Soil Type			Sand	Sand		Sand	Sand	Unspecified	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Soil Depth			< 1m	< 1m		< 1m	< 1m	< 1m	1m - 4m	1m - 4m	< 1m	< 1m
Polycyclic Aromatic Hydrocarbons												
Naphthalene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.3	< 0.1
Pyrene	mg/kg	0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.07	< 0.03	< 0.03	< 0.03	20	0.23

Analyte	Units	EQL	TP4	TP5	TP6	TP6	TP7	TP8	TP8	TP8	TP9	TP9
Depth			0.4m	0.2m	0.2m	0.4m	0.4m	0.1m	0.3m	2.4m	0.15m	2.8m
Sampled Date			28-07-2022	27-07-2022	28-07-2022	28-07-2022	27-07-2022	27-07-2022	27-07-2022	27-07-2022	28-07-2022	28-07-2022
Soil Type			Silty Clay	Sand	Sand	Silty Clay	Silty Clay	Sand	Silty Clay	Silty Clay	Sand	Silty Clay
Soil Depth			1m - 4m	< 1m	< 1m	< 1m	< 1m	< 1m	< 1m	1m - 4m	< 1m	1m - 4m
Polycyclic Aromatic Hydrocarbons												
Naphthalene	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	0.03	0.05	2.5	< 0.03	< 0.03	0.18	< 0.3	0.07	< 0.03	0.17	< 0.03

Adopted Criteria

Analyte	Units	EQL	Groundwater Protection		
			Depth To Groundwater: 2m		
			Silty Clay	Sand	Clay
Depth			< 1m	< 1m	< 1m
Sampled Date					
Soil Type					
Soil Depth					
Polycyclic Aromatic Hydrocarbons					
Naphthalene	mg/kg	0.1	0.047[1]	0.047[1]	0.047[1]
Pyrene	mg/kg	0.03	1.3[1]	1.3[1]	1.3[1]

Analyte	Units	EQL	Commercial / Industrial																	
			All Pathways			inhalation of indoor air						inhalation of outdoor air								
			Silty Clay	Sand	Clay	Silty Clay	Sand	Clay	Silty Clay	Sand	Clay									
Depth			< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m	< 1m	1m - 4m
Sampled Date																				
Soil Type																				
Soil Depth																				
Polycyclic Aromatic Hydrocarbons																				
Naphthalene	mg/kg	0.1	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]	230[1]
Pyrene	mg/kg	0.03	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]

Scenarios:

Shaded	indicates concentrations exceed Groundwater Protection landuse
Shaded	indicates concentrations exceed Commercial / Industrial landuse
Bold	indicates concentrations exceed Background Concentrations

Criteria adopted from the following guidelines:

[1]Petroleum Hydrocarbon Guidelines MfE 1999

[2]MfE NES, 2011

Notes:

This table does not represent the full analytical results, please refer to the laboratory results for full details.

Assumes soil pH of 5 for Chromium VI.

Criteria for Chromium VI were conservatively selected.

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Haigh Workman Limited
6 Fairway Drive
Kerikeri
NZ 0230

Attention: **Josh Cuming**

Report **920306-S**
Project name 69 BROADWAY KAIKOHE
Project ID 22277
Received Date Sep 05, 2022

Client Sample ID			**TP14 0.15**
Sample Matrix			**Soil**
Eurofins Sample No.			**K22-Se0006373**
Date Sampled			**Aug 27, 2022**
Test/Reference	LOR	Unit	
BTEX (NZ MfE)			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	136
Total Petroleum Hydrocarbons (NZ MfE 1999)			
TPH-SG C7-C9	5	mg/kg	< 5
TPH-SG C10-C14	10	mg/kg	37
TPH-SG C15-C36	20	mg/kg	2500
TPH-SG C7-C36 (Total)	35	mg/kg	2600
% Moisture	1	%	11

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX (NZ MfE)	Auckland	Sep 05, 2022	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
Total Petroleum Hydrocarbons (NZ MfE 1999)	Auckland	Sep 09, 2022	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
% Moisture	Auckland	Sep 05, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

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IANZ# 1327

Christchurch
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Eurofins Environment Testing Australia Pty Ltd
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NATA# 2377 Site# 2370

Company Name: Haigh Workman Limited
Address: 6 Fairway Drive
Kerikeri
NZ 0230

Project Name: 69 BROADWAY KAIKOHE
Project ID: 22277

Order No.:
Report #: 920306
Phone: 09 4078 327
Fax:

Received: Sep 5, 2022 9:00 AM
Due: Sep 8, 2022
Priority: 3 Day
Contact Name: Josh Cuming

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Moisture Set	BTEX (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X
Christchurch Laboratory - IANZ# 1290							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TP14 0.15	Aug 27, 2022		Soil	K22-Se0006373	X	X
Test Counts						1	1

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX (NZ MfE)							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	mg/kg	< 5			5	Pass	
TPH-SG C10-C14	mg/kg	< 10			10	Pass	
TPH-SG C15-C36	mg/kg	< 20			20	Pass	
TPH-SG C7-C36 (Total)	mg/kg	< 35			35	Pass	
LCS - % Recovery							
BTEX (NZ MfE)							
Benzene	%	76			70-130	Pass	
Toluene	%	91			70-130	Pass	
Ethylbenzene	%	99			70-130	Pass	
m&p-Xylenes	%	102			70-130	Pass	
o-Xylene	%	103			70-130	Pass	
Xylenes - Total	%	102			70-130	Pass	
LCS - % Recovery							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C36 (Total)	%	84			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX (NZ MfE)				Result 1					
Benzene	K22-Au0066994	NCP	%	71			70-130	Pass	
Toluene	K22-Se0002279	NCP	%	70			70-130	Pass	
Ethylbenzene	K22-Se0002279	NCP	%	81			70-130	Pass	
m&p-Xylenes	K22-Se0002279	NCP	%	85			70-130	Pass	
o-Xylene	K22-Se0002279	NCP	%	86			70-130	Pass	
Xylenes - Total	K22-Se0002279	NCP	%	85			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
BTEX (NZ MfE)				Result 1	Result 2	RPD			
Benzene	K22-Se0000579	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	K22-Se0000579	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	K22-Se0000579	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	K22-Se0000579	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	K22-Se0000579	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	K22-Se0000579	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Se0002283	NCP	%	42	32	27	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Karishma Patel	Analytical Services Manager
Daren Yang	Senior Analyst-Organic

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Haigh Workman Limited
6 Fairway Drive
Kerikeri
NZ 0230

Attention:	Josh Cuming
Report	920623-AIS-NZ
Project Name	69 BROADWAY KAIKOHE
Project ID	22 277
Received Date	Sep 06, 2022
Date Reported	Sep 09, 2022

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Client Sample ID			TP12 0.1
Sample Matrix			**Soil**
Eurofins Sample No.			**22-Se0009432**
Date Sampled			**Aug 30, 2022**
Test/Reference	LOR	Unit	
Asbestos in Soils (AS 4964-2004)			
Sample Description	-	Comment	Fine grained soil and rocks
Received Weight	0.1	g	1093
Total Dry Mass	0.1	g	1054
Total Analytical Fraction	0.1	g	1054
Asbestos Detected	-	Yes/No	No
Materials Identified	-	Comment	N/A
Fibres Identified and estimated Asbestos Content (%)	-	Comment	Synthetic mineral fibre detected. Organic fibre detected.
Asbestos Content (as asbestos)	0.01	% w/w	< 0.01
Trace Analysis	0.1	g/kg	No trace asbestos detected.
Asbestos in Soils (NZ GAMAS)			
Weight (>10 mm)	0.1	g	307.69
Weight (<10 mm >2 mm)	0.1	g	476.86
Weight (<2 mm)	0.1	g	269.62
Asbestos Containing Materials (ACM) >10 mm			
Total ACM (> 10mm)	0.1	g	< 0.1
ACM % asbestos (weighted average)	-	%	N/A
ACM in Soil (as asbestos)	0.01	% w/w	< 0.01
Fibrous Asbestos (FA) >10 mm			
Total FA	0.00001	g	< 0.00001
FA % asbestos (weighted average)	-	%	N/A
FA Asbestos in Soil	0.001	% w/w	< 0.001
Fibrous Asbestos (FA) <10 mm			
Total FA	0.00001	g	< 0.00001
FA % asbestos (weighted average)	-	%	N/A
FA Asbestos in Soil	0.001	% w/w	< 0.001
Asbestos Fines (AF) < 10 mm			
Total AF	0.00001	g	< 0.00001
AF % asbestos (weighted average)	-	%	N/A
AF Asbestos in Soil	0.001	% w/w	< 0.001
Combined AF+FA	0.001	% w/w	< 0.001

Client Sample ID			TP15 0.1
Sample Matrix			**Soil**
Eurofins Sample No.			**22-Se0009433**
Date Sampled			**Aug 30, 2022**
Test/Reference	LOR	Unit	
Asbestos in Soils (AS 4964-2004)			
Sample Description	-	Comment	Fine grained soil and rocks
Received Weight	0.1	g	1093
Total Dry Mass	0.1	g	1040
Total Analytical Fraction	0.1	g	1040
Asbestos Detected	-	Yes/No	No
Materials Identified	-	Comment	N/A
Fibres Identified and estimated Asbestos Content (%)	-	Comment	Synthetic mineral fibre detected. Organic fibre detected.
Asbestos Content (as asbestos)	0.01	% w/w	< 0.01
Trace Analysis	0.1	g/kg	No trace asbestos detected.
Asbestos in Soils (NZ GAMAS)			
Weight (>10 mm)	0.1	g	143.25
Weight (<10 mm >2 mm)	0.1	g	573.49
Weight (<2 mm)	0.1	g	323.61
Asbestos Containing Materials (ACM) >10 mm			
Total ACM (> 10mm)	0.1	g	< 0.1
ACM % asbestos (weighted average)	-	%	N/A
ACM in Soil (as asbestos)	0.01	% w/w	< 0.01
Fibrous Asbestos (FA) >10 mm			
Total FA	0.00001	g	< 0.00001
FA % asbestos (weighted average)	-	%	N/A
FA Asbestos in Soil	0.001	% w/w	< 0.001
Fibrous Asbestos (FA) <10 mm			
Total FA	0.00001	g	< 0.00001
FA % asbestos (weighted average)	-	%	N/A
FA Asbestos in Soil	0.001	% w/w	< 0.001
Asbestos Fines (AF) < 10 mm			
Total AF	0.00001	g	< 0.00001
AF % asbestos (weighted average)	-	%	N/A
AF Asbestos in Soil	0.001	% w/w	< 0.001
Combined AF+FA	0.001	% w/w	< 0.001

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
LTM-ASB-8020 Method for the Qualitative Identification of Asbestos in Bulk Samples	Christchurch	Sep 06, 2022	Indefinite

eurofins

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NATA# 2377 Site# 2370

Company Name: Haigh Workman Limited
Address: 6 Fairway Drive
Kerikeri
NZ 0230

Project Name: 69 BROADWAY KAIKOHE
Project ID: 22 277

Order No.:
Report #: 920623
Phone: 09 4078 327
Fax:

Received: Sep 6, 2022 9:00 AM
Due: Sep 9, 2022
Priority: 3 Day
Contact Name: Josh Cuming

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Asbestos in Soils (NZ GAMAS)
Auckland Laboratory - IANZ# 1327						
Christchurch Laboratory - IANZ# 1290						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	TP12 0.1	Aug 30, 2022		Soil	K22-Se0009432	X
2	TP15 0.1	Aug 30, 2022		Soil	K22-Se0009433	X
Test Counts						2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
NZ GAMAS	New Zealand Guideline for Assessing and Managing Asbestos in Soil, BRANZ (2017)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. ACM is generally restricted to those materials that do not pass a 10mm x 10mm sieve.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. FA is generally restricted to those materials that do not pass a 10mm x 10mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Asbestos Counter/Identifier:

Kate Stuart	Senior Analyst-Asbestos

Authorised by:

Sophie Bush	Senior Analyst-Asbestos

Sophie Bush
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Haigh Workman Limited
6 Fairway Drive
Kerikeri
NZ 0230

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Attention: **Josh Cuming**

Report **910568-S**
Project name 69 BROADWAY KAIKOHE
Project ID 22277
Received Date Aug 02, 2022

Client Sample ID			**TP1 0.3**	**TP1 1.2**	**TP1 1.6**	**TP2 0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**K22-Au0003285**	**K22-Au0003286**	**K22-Au0003287**	**K22-Au0003288**
Date Sampled			**Jul 27, 2022**	**Jul 27, 2022**	**Jul 27, 2022**	**Jul 28, 2022**
Test/Reference	LOR	Unit				
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	< 5	< 5	< 5
TPH-SG C10-C14	10	mg/kg	< 10	< 10	< 10	< 10
TPH-SG C15-C36	20	mg/kg	< 20	< 20	< 20	< 20
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	< 35	< 35	< 35
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.04	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	0.08	0.08	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	96	110	100	102
2-Fluorobiphenyl (surr.)	1	%	72	94	78	74
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Arsenic	0.1	mg/kg	5.9	6.5	7.1	6.1
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.01	mg/kg	0.05	0.07	0.04	0.07
Chromium	0.1	mg/kg	39	37	42	42
Copper	0.1	mg/kg	31	80	29	32
Lead	0.1	mg/kg	41	15	20	39
Manganese	0.1	mg/kg	1500	760	320	1600
Mercury	0.01	mg/kg	0.64	0.29	0.19	0.19

Client Sample ID			TP1 0.3	TP1 1.2	TP1 1.6	TP2 0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003285	K22-Au0003286	K22-Au0003287	K22-Au0003288
Date Sampled			Jul 27, 2022	Jul 27, 2022	Jul 27, 2022	Jul 28, 2022
Test/Reference	LOR	Unit				
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Nickel	0.1	mg/kg	11	20	12	16
Zinc	5	mg/kg	66	68	50	74
% Moisture	1	%	24	30	27	29

Client Sample ID			TP2 1.0	TP3 0.15	TP3 0.25	TP4 0.25
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003289	K22-Au0003290	K22-Au0003291	K22-Au0003292
Date Sampled			Jul 28, 2022	Jul 28, 2022	Jul 28, 2022	Jul 28, 2022
Test/Reference	LOR	Unit				
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	< 5	< 5	< 5
TPH-SG C10-C14	10	mg/kg	< 10	< 10	< 10	< 10
TPH-SG C15-C36	20	mg/kg	< 20	130	< 20	< 20
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	130	< 35	< 35
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Comments				G01		
Acenaphthene	0.03	mg/kg	< 0.03	< 0.3	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.3	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	2.0	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	11	0.15	0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03	21	0.19	0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	27	0.23	0.04
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	27	0.25	0.06
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	27	0.26	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	6.4	0.11	0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	5.1	0.08	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	6.0	0.07	< 0.03
Chrysene	0.03	mg/kg	< 0.03	7.6	0.12	0.04
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	2.5	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	15	0.13	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.3	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	5.6	0.05	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.3	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	4.9	< 0.03	< 0.03
Pyrene	0.03	mg/kg	< 0.03	20	0.23	0.06
p-Terphenyl-d14 (surr.)	1	%	107	123	88	107
2-Fluorobiphenyl (surr.)	1	%	74	61	70	102
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Arsenic	0.1	mg/kg	8.8	4.5	5.5	1.7
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.01	mg/kg	0.06	0.43	0.20	0.08
Chromium	0.1	mg/kg	39	32	40	3.6
Copper	0.1	mg/kg	30	42	32	9.2
Lead	0.1	mg/kg	23	400	86	9.6
Manganese	0.1	mg/kg	670	590	720	95
Mercury	0.01	mg/kg	0.12	0.70	4.4	0.15

Client Sample ID			TP2 1.0	TP3 0.15	TP3 0.25	TP4 0.25
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003289	K22-Au0003290	K22-Au0003291	K22-Au0003292
Date Sampled			Jul 28, 2022	Jul 28, 2022	Jul 28, 2022	Jul 28, 2022
Test/Reference	LOR	Unit				
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Nickel	0.1	mg/kg	15	24	15	5.8
Zinc	5	mg/kg	53	140	120	29
% Moisture	1	%	33	18	25	9.7

Client Sample ID			TP4 0.4	TP5 0.2	TP6 0.2	TP6 0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003293	K22-Au0003294	K22-Au0003295	K22-Au0003296
Date Sampled			Jul 28, 2022	Jul 27, 2022	Jul 28, 2022	Jul 28, 2022
Test/Reference	LOR	Unit				
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	< 5	< 5	< 5
TPH-SG C10-C14	10	mg/kg	< 10	< 10	< 10	< 10
TPH-SG C15-C36	20	mg/kg	< 20	58	170	21
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	59	170	< 35
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	0.07	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	0.03	2.1	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03	3.2	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	5.1	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	5.1	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.07	5.1	0.08	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	0.03	1.7	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	2.4	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	2.1	< 0.03	< 0.03
Chrysene	0.03	mg/kg	0.03	1.7	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	1.1	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	0.06	1.2	< 0.03	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	2.0	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	0.05	0.10	< 0.03	< 0.03
Pyrene	0.03	mg/kg	0.05	2.5	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	98	106	102	99
2-Fluorobiphenyl (surr.)	1	%	97	109	96	97
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Arsenic	0.1	mg/kg	6.1	3.4	2.7	6.6
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.01	mg/kg	0.10	0.29	0.89	0.04
Chromium	0.1	mg/kg	28	18	12	42
Copper	0.1	mg/kg	33	35	48	29
Lead	0.1	mg/kg	10	62	150	18
Manganese	0.1	mg/kg	1000	580	310	960
Mercury	0.01	mg/kg	0.17	0.13	0.11	0.22
Nickel	0.1	mg/kg	24	7.1	16	8.5
Zinc	5	mg/kg	67	100	110	46

Client Sample ID			TP4 0.4	TP5 0.2	TP6 0.2	TP6 0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003293	K22-Au0003294	K22-Au0003295	K22-Au0003296
Date Sampled			Jul 28, 2022	Jul 27, 2022	Jul 28, 2022	Jul 28, 2022
Test/Reference	LOR	Unit				
% Moisture	1	%	35	23	11	27

Client Sample ID			TP7 0.2	TP7 0.4	TP8 0.1	TP8 0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003297	K22-Au0003298	K22-Au0003299	K22-Au0003300
Date Sampled			Jul 27, 2022	Jul 27, 2022	Jul 27, 2022	Jul 27, 2022
Test/Reference	LOR	Unit				
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	-	< 5	-	-
TPH-SG C10-C14	10	mg/kg	-	< 10	-	-
TPH-SG C15-C36	20	mg/kg	-	< 20	-	-
TPH-SG C7-C36 (Total)	35	mg/kg	-	< 35	-	-
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Comments					G01	
Acenaphthene	0.03	mg/kg	-	< 0.03	< 0.3	< 0.03
Acenaphthylene	0.03	mg/kg	-	< 0.03	< 0.3	< 0.03
Anthracene	0.03	mg/kg	-	< 0.03	< 0.3	< 0.03
Benz(a)anthracene	0.03	mg/kg	-	0.18	< 0.3	< 0.03
Benzo(a)pyrene	0.03	mg/kg	-	0.23	< 0.3	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	-	0.36	< 0.3	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	-	0.36	0.4	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	-	0.36	0.8	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	-	0.19	< 0.3	0.04
Benzo(g.h.i)perylene	0.03	mg/kg	-	0.18	< 0.3	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	-	0.13	< 0.3	< 0.03
Chrysene	0.03	mg/kg	-	0.16	< 0.3	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	-	0.06	< 0.3	< 0.03
Fluoranthene	0.03	mg/kg	-	0.10	< 0.3	< 0.03
Fluorene	0.03	mg/kg	-	< 0.03	< 0.3	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	-	0.16	< 0.3	< 0.03
Naphthalene	0.1	mg/kg	-	< 0.1	< 0.3	< 0.1
Phenanthrene	0.03	mg/kg	-	< 0.03	< 0.3	< 0.03
Pyrene	0.03	mg/kg	-	0.18	< 0.3	0.07
p-Terphenyl-d14 (surr.)	1	%	-	101	127	INT
2-Fluorobiphenyl (surr.)	1	%	-	98	90	130
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Arsenic	0.1	mg/kg	4.6	5.5	5.0	4.9
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.01	mg/kg	0.19	0.16	0.12	0.28
Chromium	0.1	mg/kg	32	33	3.9	33
Copper	0.1	mg/kg	33	32	9.1	32
Lead	0.1	mg/kg	200	98	19	28
Manganese	0.1	mg/kg	650	820	150	800
Mercury	0.01	mg/kg	0.17	0.25	0.01	0.15
Nickel	0.1	mg/kg	29	18	4.4	31
Zinc	5	mg/kg	88	110	67	180
% Moisture	1	%	18	20	1.5	27

Client Sample ID			TP8 2.4	TP9 0.15	TP9 2.8	TP10 0.15
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003301	K22-Au0003302	K22-Au0003303	K22-Au0003304
Date Sampled			Jul 27, 2022	Jul 28, 2022	Jul 28, 2022	Jul 28, 2022
Test/Reference	LOR	Unit				
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	< 5	< 5	< 5
TPH-SG C10-C14	10	mg/kg	< 10	< 10	< 10	< 10
TPH-SG C15-C36	20	mg/kg	< 20	230	340	420
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	240	340	430
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03	0.28	0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	0.28	0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.30	0.05	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	0.33	0.08	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	0.03	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	0.03	mg/kg	< 0.03	0.17	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	112	143	124	141
2-Fluorobiphenyl (surr.)	1	%	83	93	75	78
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Arsenic	0.1	mg/kg	6.0	11	5.1	6.3
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.01	mg/kg	0.08	0.79	0.10	0.28
Chromium	0.1	mg/kg	31	24	29	38
Copper	0.1	mg/kg	41	68	23	41
Lead	0.1	mg/kg	19	570	27	440
Manganese	0.1	mg/kg	620	230	1100	790
Mercury	0.01	mg/kg	0.14	0.08	0.49	0.39
Nickel	0.1	mg/kg	43	18	10	12
Zinc	5	mg/kg	71	300	73	200
% Moisture	1	%	29	13	34	24

Client Sample ID			TP10 0.4	TP11 0.2	TP12 0.05	TP12 0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003305	K22-Au0003306	K22-Au0003307	K22-Au0003308
Date Sampled			Jul 28, 2022	Jul 28, 2022	Jul 27, 2022	Jul 27, 2022
Test/Reference	LOR	Unit				
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	< 5	< 5	< 5
TPH-SG C10-C14	10	mg/kg	< 10	< 10	< 10	< 10
TPH-SG C15-C36	20	mg/kg	< 20	< 20	< 20	< 20
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	< 35	< 35	< 35
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	0.03	< 0.03	0.04
Benzo(a)pyrene	0.03	mg/kg	< 0.03	0.03	< 0.03	0.07
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	0.03	< 0.03	0.08
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.05	0.04	0.10
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	0.08	0.08	0.12
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.08
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.05
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.05
p-Terphenyl-d14 (surr.)	1	%	INT	145	117	144
2-Fluorobiphenyl (surr.)	1	%	81	82	72	81
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Arsenic	0.1	mg/kg	4.3	7.8	5.8	10
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.01	mg/kg	0.35	0.78	0.09	0.79
Chromium	0.1	mg/kg	49	49	12	39
Copper	0.1	mg/kg	880	41	21	120
Lead	0.1	mg/kg	400	570	19	1600
Manganese	0.1	mg/kg	1200	870	380	1000
Mercury	0.01	mg/kg	0.02	1.6	0.02	1.2
Nickel	0.1	mg/kg	15	12	19	12
Zinc	5	mg/kg	220	440	63	460
% Moisture	1	%	38	37	5.0	25

Client Sample ID			TP13 0.15	TP14 0.15	TP15 0.15	TP15 0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003309	K22-Au0003310	K22-Au0003311	K22-Au0003312
Date Sampled			Jul 27, 2022	Jul 27, 2022	Jul 27, 2022	Jul 27, 2022
Test/Reference	LOR	Unit				
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	-	< 5	< 5
TPH-SG C10-C14	10	mg/kg	< 10	-	< 10	< 10
TPH-SG C15-C36	20	mg/kg	< 20	-	74	570
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	-	75	570
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	0.05	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03	0.07	< 0.03	0.10
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	0.08	< 0.03	0.10
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.10	0.04	0.12
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	0.12	0.08	0.15
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	< 0.03	0.04	0.07
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	INT	117	123	125
2-Fluorobiphenyl (surr.)	1	%	86	81	69	68
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Arsenic	0.1	mg/kg	4.4	6.4	6.5	9.3
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.01	mg/kg	0.04	0.43	0.15	0.25
Chromium	0.1	mg/kg	6.5	18	9.6	6.2
Copper	0.1	mg/kg	15	45	18	17
Lead	0.1	mg/kg	7.7	200	220	130
Manganese	0.1	mg/kg	230	290	300	240
Mercury	0.01	mg/kg	0.01	0.12	0.02	0.03
Nickel	0.1	mg/kg	12	7.3	13	4.4
Zinc	5	mg/kg	35	130	98	140
% Moisture	1	%	1.7	19	3.5	11

Client Sample ID			TP15 0.35	TP16 0.1	TP16 0.2	TP19 0.15
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0003313	K22-Au0003314	K22-Au0003315	K22-Au0003316
Date Sampled			Jul 27, 2022	Jul 27, 2022	Jul 27, 2022	Jul 27, 2022
Test/Reference	LOR	Unit				
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	< 5	< 5	< 5
TPH-SG C10-C14	10	mg/kg	< 10	< 10	< 10	< 10
TPH-SG C15-C36	20	mg/kg	< 20	< 20	< 20	880
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	< 35	< 35	880
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03	< 0.03	0.05	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	< 0.03	0.06	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.04	0.08	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	0.08	0.10	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	< 0.03	0.04	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	< 0.03	0.04	< 0.03
Chrysene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	0.03	mg/kg	< 0.03	< 0.03	0.07	< 0.03
p-Terphenyl-d14 (surr.)	1	%	INT	119	135	132
2-Fluorobiphenyl (surr.)	1	%	70	73	80	88
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals						
Arsenic	0.1	mg/kg	7.0	6.7	5.2	7.6
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.01	mg/kg	0.02	0.10	0.46	0.77
Chromium	0.1	mg/kg	43	9.9	9.1	16
Copper	0.1	mg/kg	27	23	44	86
Lead	0.1	mg/kg	19	24	120	180
Manganese	0.1	mg/kg	430	350	520	400
Mercury	0.01	mg/kg	0.29	0.02	2.4	0.13
Nickel	0.1	mg/kg	9.3	15	11	14
Zinc	5	mg/kg	45	64	110	150
% Moisture	1	%	28	9.9	19	11

Client Sample ID			TP19 0.2
Sample Matrix			Soil
Eurofins Sample No.			K22-Au0003317
Date Sampled			Jul 28, 2022
Test/Reference	LOR	Unit	
Total Petroleum Hydrocarbons (NZ MfE 1999)			
TPH-SG C7-C9	5	mg/kg	< 5
TPH-SG C10-C14	10	mg/kg	< 10
TPH-SG C15-C36	20	mg/kg	220
TPH-SG C7-C36 (Total)	35	mg/kg	220
Polycyclic Aromatic Hydrocarbons (NZ MfE)			
Acenaphthene	0.03	mg/kg	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03
Anthracene	0.03	mg/kg	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03
Chrysene	0.03	mg/kg	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03
Fluorene	0.03	mg/kg	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03
Naphthalene	0.1	mg/kg	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03
Pyrene	0.03	mg/kg	< 0.03
p-Terphenyl-d14 (surr.)	1	%	128
2-Fluorobiphenyl (surr.)	1	%	65
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals			
Arsenic	0.1	mg/kg	7.1
Boron	10	mg/kg	< 10
Cadmium	0.01	mg/kg	0.27
Chromium	0.1	mg/kg	39
Copper	0.1	mg/kg	57
Lead	0.1	mg/kg	360
Manganese	0.1	mg/kg	710
Mercury	0.01	mg/kg	0.41
Nickel	0.1	mg/kg	12
Zinc	5	mg/kg	160
% Moisture	1	%	28

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Petroleum Hydrocarbons (NZ MfE 1999)	Auckland	Aug 02, 2022	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
Polycyclic Aromatic Hydrocarbons (NZ MfE)	Auckland	Aug 02, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water by GC MSMS			
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)	Auckland	Aug 02, 2022	28 Days
- Method:			
% Moisture	Auckland	Aug 02, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

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Project Name: 69 BROADWAY KAIKOHE
Project ID: 22277

Order No.:
Report #: 910568
Phone: 09 4078 327
Fax:

Received: Aug 2, 2022 9:00 AM
Due: Aug 5, 2022
Priority: 3 Day
Contact Name: Josh Cuming

Eurofins Analytical Services Manager : Swati Oberoi

Sample Detail						HOLD	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals
Auckland Laboratory - IANZ# 1327						X	X	X	X	X
Christchurch Laboratory - IANZ# 1290										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	TP1 0.3	Jul 27, 2022		Soil	K22-Au0003285		X	X	X	X
2	TP1 1.2	Jul 27, 2022		Soil	K22-Au0003286		X	X	X	X
3	TP1 1.6	Jul 27, 2022		Soil	K22-Au0003287		X	X	X	X
4	TP2 0.2	Jul 28, 2022		Soil	K22-Au0003288		X	X	X	X
5	TP2 1.0	Jul 28, 2022		Soil	K22-Au0003289		X	X	X	X
6	TP3 0.15	Jul 28, 2022		Soil	K22-Au0003290		X	X	X	X
7	TP3 0.25	Jul 28, 2022		Soil	K22-Au0003291		X	X	X	X
8	TP4 0.25	Jul 28, 2022		Soil	K22-Au0003292		X	X	X	X
9	TP4 0.4	Jul 28, 2022		Soil	K22-Au0003293		X	X	X	X
10	TP5 0.2	Jul 27, 2022		Soil	K22-Au0003294		X	X	X	X
11	TP6 0.2	Jul 28, 2022		Soil	K22-Au0003295		X	X	X	X
12	TP6 0.4	Jul 28, 2022		Soil	K22-Au0003296		X	X	X	X

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Address: 6 Fairway Drive
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Contact Name: Josh Cuming

Eurofins Analytical Services Manager : Swati Oberoi

Sample Detail						HOLD	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals
Auckland Laboratory - IANZ# 1327						X	X	X	X	X
Christchurch Laboratory - IANZ# 1290										
External Laboratory										
13	TP7 0.2	Jul 27, 2022		Soil	K22-Au0003297		X			X
14	TP7 0.4	Jul 27, 2022		Soil	K22-Au0003298		X	X	X	X
15	TP8 0.1	Jul 27, 2022		Soil	K22-Au0003299		X		X	X
16	TP8 0.3	Jul 27, 2022		Soil	K22-Au0003300		X		X	X
17	TP8 2.4	Jul 27, 2022		Soil	K22-Au0003301		X	X	X	X
18	TP9 0.15	Jul 28, 2022		Soil	K22-Au0003302		X	X	X	X
19	TP9 2.8	Jul 28, 2022		Soil	K22-Au0003303		X	X	X	X
20	TP10 0.15	Jul 28, 2022		Soil	K22-Au0003304		X	X	X	X
21	TP10 0.4	Jul 28, 2022		Soil	K22-Au0003305		X	X	X	X
22	TP11 0.2	Jul 28, 2022		Soil	K22-Au0003306		X	X	X	X
23	TP12 0.05	Jul 27, 2022		Soil	K22-Au0003307		X	X	X	X
24	TP12 0.4	Jul 27, 2022		Soil	K22-Au0003308		X	X	X	X
25	TP13 0.15	Jul 27, 2022		Soil	K22-Au0003309		X	X	X	X
26	TP14 0.15	Jul 27, 2022		Soil	K22-Au0003310		X		X	X

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Company Name: Haigh Workman Limited
Address: 6 Fairway Drive
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NZ 0230

Project Name: 69 BROADWAY KAIKOHE
Project ID: 22277

Order No.:
Report #: 910568
Phone: 09 4078 327
Fax:

Received: Aug 2, 2022 9:00 AM
Due: Aug 5, 2022
Priority: 3 Day
Contact Name: Josh Cuming

Eurofins Analytical Services Manager : Swati Oberoi

Sample Detail						HOLD	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals
Auckland Laboratory - IANZ# 1327						X	X	X	X	X
Christchurch Laboratory - IANZ# 1290										
External Laboratory										
27	TP15 0.15	Jul 27, 2022		Soil	K22-Au0003311		X	X	X	X
28	TP15 0.2	Jul 27, 2022		Soil	K22-Au0003312		X	X	X	X
29	TP15 0.35	Jul 27, 2022		Soil	K22-Au0003313		X	X	X	X
30	TP16 0.1	Jul 27, 2022		Soil	K22-Au0003314		X	X	X	X
31	TP16 0.2	Jul 27, 2022		Soil	K22-Au0003315		X	X	X	X
32	TP19 0.15	Jul 27, 2022		Soil	K22-Au0003316		X	X	X	X
33	TP19 0.2	Jul 28, 2022		Soil	K22-Au0003317		X	X	X	X
34	TP3 0.5	Jul 28, 2022		Soil	K22-Au0003319	X				
35	TP5 0.4	Jul 27, 2022		Soil	K22-Au0003320	X				
36	TP7 1.3	Jul 27, 2022		Soil	K22-Au0003321	X				
37	TP9 0.3	Jul 28, 2022		Soil	K22-Au0003322	X				
38	TP9 0.6	Jul 28, 2022		Soil	K22-Au0003323	X				
39	TP9 3.2	Jul 28, 2022		Soil	K22-Au0003324	X				
40	TP10 0.6	Jul 28, 2022		Soil	K22-Au0003325	X				

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Sample Detail						HOLD	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals
Auckland Laboratory - IANZ# 1327						X	X	X	X	X
Christchurch Laboratory - IANZ# 1290										
External Laboratory										
41	TP11 0.4	Jul 28, 2022		Soil	K22-Au0003326	X				
42	TP12 0.5	Jul 27, 2022		Soil	K22-Au0003328	X				
43	TP13 0.4	Jul 27, 2022		Soil	K22-Au0003329	X				
44	TP14 0.3	Jul 27, 2022		Soil	K22-Au0003330	X				
45	TP16 0.3	Jul 27, 2022		Soil	K22-Au0003331	X				
46	TP20 0.2	Jul 28, 2022		Soil	K22-Au0003332	X				
47	TP21 0.2	Jul 28, 2022		Soil	K22-Au0003333	X				
48	TP22 0.25	Jul 28, 2022		Soil	K22-Au0003334	X				
Test Counts						15	33	29	32	33

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	mg/kg	< 5			5	Pass	
TPH-SG C10-C14	mg/kg	< 10			10	Pass	
TPH-SG C15-C36	mg/kg	< 20			20	Pass	
TPH-SG C7-C36 (Total)	mg/kg	< 35			35	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	mg/kg	< 0.03			0.03	Pass	
Acenaphthylene	mg/kg	< 0.03			0.03	Pass	
Anthracene	mg/kg	< 0.03			0.03	Pass	
Benz(a)anthracene	mg/kg	< 0.03			0.03	Pass	
Benzo(a)pyrene	mg/kg	< 0.03			0.03	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.03			0.03	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Chrysene	mg/kg	< 0.03			0.03	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.03			0.03	Pass	
Fluoranthene	mg/kg	< 0.03			0.03	Pass	
Fluorene	mg/kg	< 0.03			0.03	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.03			0.03	Pass	
Naphthalene	mg/kg	< 0.1			0.1	Pass	
Phenanthrene	mg/kg	< 0.03			0.03	Pass	
Pyrene	mg/kg	< 0.03			0.03	Pass	
Method Blank							
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Manganese	mg/kg	< 0.1			0.1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C36 (Total)	%	82			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	%	101			70-130	Pass	
Acenaphthylene	%	98			70-130	Pass	
Anthracene	%	101			70-130	Pass	
Benz(a)anthracene	%	90			70-130	Pass	
Benzo(a)pyrene	%	100			70-130	Pass	
Benzo(b&j)fluoranthene	%	94			70-130	Pass	
Benzo(g.h.i)perylene	%	75			70-130	Pass	
Benzo(k)fluoranthene	%	85			70-130	Pass	
Chrysene	%	89			70-130	Pass	
Dibenz(a.h)anthracene	%	87			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluoranthene	%	93			70-130	Pass	
Fluorene	%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	70			70-130	Pass	
Naphthalene	%	98			70-130	Pass	
Phenanthrene	%	93			70-130	Pass	
Pyrene	%	99			70-130	Pass	
LCS - % Recovery							
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)							
Arsenic	%	112			80-120	Pass	
Cadmium	%	98			80-120	Pass	
Chromium	%	88			80-120	Pass	
Copper	%	83			80-120	Pass	
Lead	%	91			80-120	Pass	
Manganese	%	95			80-120	Pass	
Mercury	%	92			80-120	Pass	
Nickel	%	90			80-120	Pass	
Zinc	%	91			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Indeno(1.2.3-cd)pyrene	K22-Jl0060192	NCP	%	116			70-130	Pass	
Spike - % Recovery									
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)				Result 1					
Copper	K22-Au0003864	NCP	%	102			75-125	Pass	
Manganese	K22-Jl0059492	NCP	%	101			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Acenaphthene	K22-Au0003286	CP	%	71			70-130	Pass	
Anthracene	K22-Au0003286	CP	%	84			70-130	Pass	
Benz(a)anthracene	K22-Au0003286	CP	%	76			70-130	Pass	
Benzo(a)pyrene	K22-Au0003286	CP	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	K22-Au0003286	CP	%	82			70-130	Pass	
Chrysene	K22-Au0003286	CP	%	78			70-130	Pass	
Dibenz(a.h)anthracene	K22-Au0003286	CP	%	83			70-130	Pass	
Fluoranthene	K22-Au0003286	CP	%	79			70-130	Pass	
Fluorene	K22-Au0003286	CP	%	70			70-130	Pass	
Naphthalene	K22-Au0003286	CP	%	77			70-130	Pass	
Phenanthrene	K22-Au0003286	CP	%	81			70-130	Pass	
Pyrene	K22-Au0003286	CP	%	79			70-130	Pass	
Spike - % Recovery									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1					
TPH-SG C7-C36 (Total)	K22-Au0003294	CP	%	83			70-130	Pass	
Spike - % Recovery									
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)				Result 1					
Arsenic	K22-Au0003294	CP	%	99			75-125	Pass	
Cadmium	K22-Au0003294	CP	%	95			75-125	Pass	
Lead	K22-Au0003294	CP	%	90			75-125	Pass	
Mercury	K22-Au0003294	CP	%	90			75-125	Pass	
Nickel	K22-Au0003294	CP	%	81			75-125	Pass	
Zinc	K22-Au0003294	CP	%	87			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	K22-Au0003303	CP	%	103			70-130	Pass	
Acenaphthylene	K22-Au0003303	CP	%	127			70-130	Pass	
Anthracene	K22-Au0003303	CP	%	121			70-130	Pass	
Benz(a)anthracene	K22-Au0003303	CP	%	100			70-130	Pass	
Benzo(a)pyrene	K22-Au0003303	CP	%	109			70-130	Pass	
Benzo(g.h.i)perylene	K22-Au0003303	CP	%	71			70-130	Pass	
Benzo(k)fluoranthene	K22-Au0003303	CP	%	81			70-130	Pass	
Chrysene	K22-Au0003303	CP	%	86			70-130	Pass	
Fluoranthene	K22-Au0003303	CP	%	121			70-130	Pass	
Fluorene	K22-Au0003303	CP	%	99			70-130	Pass	
Naphthalene	K22-Au0003303	CP	%	101			70-130	Pass	
Phenanthrene	K22-Au0003303	CP	%	106			70-130	Pass	
Pyrene	K22-Au0003303	CP	%	117			70-130	Pass	
Spike - % Recovery									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1					
TPH-SG C7-C36 (Total)	K22-Au0003313	CP	%	81			70-130	Pass	
Spike - % Recovery									
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)				Result 1					
Arsenic	K22-Au0003314	CP	%	110			75-125	Pass	
Cadmium	K22-Au0003314	CP	%	97			75-125	Pass	
Chromium	K22-Au0003314	CP	%	83			75-125	Pass	
Mercury	K22-Au0003314	CP	%	91			75-125	Pass	
Nickel	K22-Au0003314	CP	%	86			75-125	Pass	
Spike - % Recovery									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1					
TPH-SG C7-C36 (Total)	K22-Au0003315	CP	%	78			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Acenaphthene	K22-Au0003317	CP	%	96			70-130	Pass	
Acenaphthylene	K22-Au0003317	CP	%	105			70-130	Pass	
Anthracene	K22-Au0003317	CP	%	112			70-130	Pass	
Benz(a)anthracene	K22-Au0003317	CP	%	102			70-130	Pass	
Benzo(a)pyrene	K22-Au0003317	CP	%	116			70-130	Pass	
Benzo(b&j)fluoranthene	K22-Au0003317	CP	%	92			70-130	Pass	
Benzo(k)fluoranthene	K22-Au0003317	CP	%	90			70-130	Pass	
Chrysene	K22-Au0003317	CP	%	86			70-130	Pass	
Fluoranthene	K22-Au0003317	CP	%	94			70-130	Pass	
Fluorene	K22-Au0003317	CP	%	91			70-130	Pass	
Naphthalene	K22-Au0003317	CP	%	100			70-130	Pass	
Phenanthrene	K22-Au0003317	CP	%	95			70-130	Pass	
Pyrene	K22-Au0003317	CP	%	106			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Au0003285	CP	%	24	29	19	30%	Pass	
Duplicate									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1	Result 2	RPD			
TPH-SG C7-C9	K22-Au0003293	CP	mg/kg	< 5	< 5	<1	30%	Pass	
TPH-SG C10-C14	K22-Au0003293	CP	mg/kg	< 10	< 10	<1	30%	Pass	
TPH-SG C15-C36	K22-Au0003293	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TPH-SG C7-C36 (Total)	K22-Au0003293	CP	mg/kg	< 35	< 35	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K22-Au0003293	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K22-Au0003293	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K22-Au0003293	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K22-Au0003293	CP	mg/kg	0.03	< 0.03	56	30%	Fail	Q15
Benzo(a)pyrene	K22-Au0003293	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(b&j)fluoranthene	K22-Au0003293	CP	mg/kg	0.03	< 0.03	190	30%	Fail	Q15
Benzo(g.h.i)perylene	K22-Au0003293	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K22-Au0003293	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K22-Au0003293	CP	mg/kg	0.03	< 0.03	82	30%	Fail	Q15
Dibenz(a.h)anthracene	K22-Au0003293	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K22-Au0003293	CP	mg/kg	0.06	< 0.03	200	30%	Fail	Q15
Fluorene	K22-Au0003293	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K22-Au0003293	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K22-Au0003293	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K22-Au0003293	CP	mg/kg	0.05	< 0.03	190	30%	Fail	Q15
Pyrene	K22-Au0003293	CP	mg/kg	0.05	< 0.03	200	30%	Fail	Q15
Duplicate									
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Au0003293	CP	mg/kg	6.1	5.8	5.1	30%	Pass	
Boron	K22-Au0003293	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	K22-Au0003293	CP	mg/kg	0.10	0.10	3.3	30%	Pass	
Chromium	K22-Au0003293	CP	mg/kg	28	27	4.3	30%	Pass	
Copper	K22-Au0003293	CP	mg/kg	33	32	1.1	30%	Pass	
Lead	K22-Au0003293	CP	mg/kg	10	10	3.3	30%	Pass	
Manganese	K22-Au0003293	CP	mg/kg	1000	1300	26	30%	Pass	
Mercury	K22-Au0003293	CP	mg/kg	0.17	0.17	<1	30%	Pass	
Nickel	K22-Au0003293	CP	mg/kg	24	23	2.3	30%	Pass	
Zinc	K22-Au0003293	CP	mg/kg	67	62	7.6	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Au0003293	CP	%	35	35	1.2	30%	Pass	
Duplicate									
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Au0003301	CP	mg/kg	6.0	5.7	5.1	30%	Pass	
Boron	K22-Au0003301	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Chromium	K22-Au0003301	CP	mg/kg	31	31	1.8	30%	Pass	
Copper	K22-Au0003301	CP	mg/kg	41	39	4.2	30%	Pass	
Lead	K22-Au0003301	CP	mg/kg	19	21	12	30%	Pass	
Manganese	K22-Au0003301	CP	mg/kg	620	710	15	30%	Pass	
Mercury	K22-Au0003301	CP	mg/kg	0.14	0.11	19	30%	Pass	
Nickel	K22-Au0003301	CP	mg/kg	43	42	2.8	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Au0003301	CP	%	29	28	3.4	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(a)pyrene	K22-Au0003302	CP	mg/kg	0.28	0.25	8.4	30%	Pass	
Benzo(b&j)fluoranthene	K22-Au0003302	CP	mg/kg	0.03	< 0.03	49	30%	Fail	Q15
Benzo(g.h.i)perylene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Benzo(k)fluoranthene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Dibenz(a.h)anthracene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluorene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K22-Au0003302	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K22-Au0003302	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K22-Au0003302	CP	mg/kg	0.17	0.09	56	30%	Fail	Q15
Duplicate									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1	Result 2	RPD			
TPH-SG C7-C9	K22-Au0003311	CP	mg/kg	< 5	< 5	<1	30%	Pass	
TPH-SG C10-C14	K22-Au0003311	CP	mg/kg	< 10	< 10	<1	30%	Pass	
TPH-SG C15-C36	K22-Au0003311	CP	mg/kg	74	68	8.6	30%	Pass	
TPH-SG C7-C36 (Total)	K22-Au0003311	CP	mg/kg	75	69	7.8	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Au0003312	CP	%	11	11	4.1	30%	Pass	
Duplicate									
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Au0003313	CP	mg/kg	7.0	7.0	<1	30%	Pass	
Boron	K22-Au0003313	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	K22-Au0003313	CP	mg/kg	0.02	0.03	15	30%	Pass	
Chromium	K22-Au0003313	CP	mg/kg	43	44	2.7	30%	Pass	
Copper	K22-Au0003313	CP	mg/kg	27	29	4.4	30%	Pass	
Lead	K22-Au0003313	CP	mg/kg	19	20	4.1	30%	Pass	
Manganese	K22-Au0003313	CP	mg/kg	430	440	2.9	30%	Pass	
Mercury	K22-Au0003313	CP	mg/kg	0.29	0.27	7.9	30%	Pass	
Nickel	K22-Au0003313	CP	mg/kg	9.3	9.9	6.0	30%	Pass	
Zinc	K22-Au0003313	CP	mg/kg	45	47	4.4	30%	Pass	
Duplicate									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1	Result 2	RPD			
TPH-SG C7-C9	K22-Au0003314	CP	mg/kg	< 5	< 5	<1	30%	Pass	
TPH-SG C10-C14	K22-Au0003314	CP	mg/kg	< 10	< 10	<1	30%	Pass	
TPH-SG C15-C36	K22-Au0003314	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TPH-SG C7-C36 (Total)	K22-Au0003314	CP	mg/kg	< 35	< 35	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(a)pyrene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(b&j)fluoranthene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(g.h.i)perylene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Dibenz(a.h)anthracene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluorene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K22-Au0003316	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K22-Au0003316	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Karishma Patel	Analytical Services Manager
Michael Ritchie	Senior Analyst-Metal

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Haigh Workman Limited
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Kerikeri
NZ 0230

Attention: **Josh Cuming**

Report **916598-S**
Project name 69 BROADWAY KAIKOHE
Project ID 22277
Received Date Aug 22, 2022

Client Sample ID			**TP1 0.3**	**TP1 1.2**	**TP1 1.6**	**TP2 0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**K22-Au0051375**	**K22-Au0051376**	**K22-Au0051377**	**K22-Au0051378**
Date Sampled			**Aug 27, 2022**	**Aug 27, 2022**	**Aug 27, 2022**	**Aug 28, 2022**
Test/Reference	LOR	Unit				
BTEX (NZ MfE)						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	77	77	121	119
% Moisture	1	%	30	29	27	27

Client Sample ID			**TP2 1.0**	**TP3 0.15**	**TP3 0.25**	**TP4 0.25**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**K22-Au0051379**	**K22-Au0051380**	**K22-Au0051381**	**K22-Au0051382**
Date Sampled			**Aug 28, 2022**	**Aug 28, 2022**	**Aug 28, 2022**	**Aug 28, 2022**
Test/Reference	LOR	Unit				
BTEX (NZ MfE)						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	63	75	133	190
% Moisture	1	%	33	18	24	9.9

Client Sample ID			TP4 0.4	TP5 0.2	TP6 0.2	TP6 0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0051383	K22-Au0051384	K22-Au0051385	K22-Au0051386
Date Sampled			Aug 28, 2022	Aug 27, 2022	Aug 28, 2022	Aug 28, 2022
Test/Reference	LOR	Unit				
BTEX (NZ MfE)						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	87	87	116	124
% Moisture	1	%	37	23	13	29

Client Sample ID			TP7 0.4	TP8 2.4	TP9 0.15	TP9 2.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0051387	K22-Au0051388	K22-Au0051389	K22-Au0051390
Date Sampled			Aug 27, 2022	Aug 27, 2022	Aug 28, 2022	Aug 28, 2022
Test/Reference	LOR	Unit				
BTEX (NZ MfE)						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	124	97	INT	144
% Moisture	1	%	23	28	12	34

Client Sample ID			TP10 0.15	TP10 0.4	TP11 0.2	TP12 0.05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0051391	K22-Au0051392	K22-Au0051393	K22-Au0051394
Date Sampled			Aug 28, 2022	Aug 28, 2022	Aug 28, 2022	Aug 27, 2022
Test/Reference	LOR	Unit				
BTEX (NZ MfE)						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	106	95	INT	145
% Moisture	1	%	30	41	33	-

Client Sample ID			TP12 0.4	TP13 0.15	TP15 0.15	TP15 0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0051395	K22-Au0051396	K22-Au0051397	K22-Au0051398
Date Sampled			Aug 27, 2022	Aug 27, 2022	Aug 27, 2022	Aug 27, 2022
Test/Reference	LOR	Unit				
BTEX (NZ MfE)						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	122	106	INT	83
% Moisture	1	%	24	6.4	5.2	11

Client Sample ID			TP15 0.35	TP16 0.1	TP16 0.2	TP19 0.15
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Au0051399	K22-Au0051400	K22-Au0051401	K22-Au0051402
Date Sampled			Aug 27, 2022	Aug 27, 2022	Aug 27, 2022	Aug 27, 2022
Test/Reference	LOR	Unit				
BTEX (NZ MfE)						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	INT	140	127	INT
% Moisture	1	%	29	10	19	11

Client Sample ID			TP19 0.2	TP20 0.2	TP21 0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			K22-Au0051403	K22-Au0051404	K22-Au0051405
Date Sampled			Aug 28, 2022	Aug 28, 2022	Aug 28, 2022
Test/Reference	LOR	Unit			
BTEX (NZ MfE)					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	122	130	146
% Moisture	1	%	29	13	28
Total Petroleum Hydrocarbons (NZ MfE 1999)					
TPH-SG C7-C9	5	mg/kg	-	< 5	< 5
TPH-SG C10-C14	10	mg/kg	-	< 10	< 10
TPH-SG C15-C36	20	mg/kg	-	240	< 20
TPH-SG C7-C36 (Total)	35	mg/kg	-	240	< 35

Client Sample ID			TP19 0.2	TP20 0.2	TP21 0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			K22-Au0051403	K22-Au0051404	K22-Au0051405
Date Sampled			Aug 28, 2022	Aug 28, 2022	Aug 28, 2022
Test/Reference	LOR	Unit			
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals					
Arsenic	0.1	mg/kg	-	2.1	5.6
Boron	10	mg/kg	-	< 10	< 10
Cadmium	0.01	mg/kg	-	0.68	0.05
Chromium	0.1	mg/kg	-	11	35
Copper	0.1	mg/kg	-	47	22
Lead	0.1	mg/kg	-	130	23
Manganese	0.1	mg/kg	-	220	1400
Mercury	0.01	mg/kg	-	0.08	0.24
Nickel	0.1	mg/kg	-	11	7.9
Zinc	5	mg/kg	-	93	48

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX (NZ MfE)	Auckland	Aug 23, 2022	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
Total Petroleum Hydrocarbons (NZ MfE 1999)	Auckland	Aug 23, 2022	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)	Auckland	Aug 23, 2022	28 Days
- Method:			
% Moisture	Auckland	Aug 23, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

eurofins

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NZ 0230

Project Name: 69 BROADWAY KAIKOHE
Project ID: 22277

Order No.:
Report #: 916598
Phone: 09 4078 327
Fax:

Received: Aug 22, 2022 4:30 PM
Due: Aug 29, 2022
Priority: 5 Day
Contact Name: Josh Cuming

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals	BTEX (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X
Christchurch Laboratory - IANZ# 1290									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	TP1 0.3	Aug 27, 2022		Soil	K22-Au0051375	X			X
2	TP1 1.2	Aug 27, 2022		Soil	K22-Au0051376	X			X
3	TP1 1.6	Aug 27, 2022		Soil	K22-Au0051377	X			X
4	TP2 0.2	Aug 28, 2022		Soil	K22-Au0051378	X			X
5	TP2 1.0	Aug 28, 2022		Soil	K22-Au0051379	X			X
6	TP3 0.15	Aug 28, 2022		Soil	K22-Au0051380	X			X
7	TP3 0.25	Aug 28, 2022		Soil	K22-Au0051381	X			X
8	TP4 0.25	Aug 28, 2022		Soil	K22-Au0051382	X			X
9	TP4 0.4	Aug 28, 2022		Soil	K22-Au0051383	X			X
10	TP5 0.2	Aug 27, 2022		Soil	K22-Au0051384	X			X
11	TP6 0.2	Aug 28, 2022		Soil	K22-Au0051385	X			X
12	TP6 0.4	Aug 28, 2022		Soil	K22-Au0051386	X			X

eurofins

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NATA# 2377 Site# 2370

Company Name: Haigh Workman Limited
Address: 6 Fairway Drive
Kerikeri
NZ 0230

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Auckland Laboratory - IANZ# 1327						X	X	X	X
Christchurch Laboratory - IANZ# 1290									
External Laboratory									
13	TP7 0.4	Aug 27, 2022		Soil	K22-Au0051387	X			X
14	TP8 2.4	Aug 27, 2022		Soil	K22-Au0051388	X			X
15	TP9 0.15	Aug 28, 2022		Soil	K22-Au0051389	X			X
16	TP9 2.8	Aug 28, 2022		Soil	K22-Au0051390	X			X
17	TP10 0.15	Aug 28, 2022		Soil	K22-Au0051391	X			X
18	TP10 0.4	Aug 28, 2022		Soil	K22-Au0051392	X			X
19	TP11 0.2	Aug 28, 2022		Soil	K22-Au0051393	X			X
20	TP12 0.05	Aug 27, 2022		Soil	K22-Au0051394				X
21	TP12 0.4	Aug 27, 2022		Soil	K22-Au0051395	X			X
22	TP13 0.15	Aug 27, 2022		Soil	K22-Au0051396	X			X
23	TP15 0.15	Aug 27, 2022		Soil	K22-Au0051397	X			X
24	TP15 0.2	Aug 27, 2022		Soil	K22-Au0051398	X			X
25	TP15 0.35	Aug 27, 2022		Soil	K22-Au0051399	X			X
26	TP16 0.1	Aug 27, 2022		Soil	K22-Au0051400	X			X

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Auckland Laboratory - IANZ# 1327						X	X	X	X
Christchurch Laboratory - IANZ# 1290									
External Laboratory									
27	TP16 0.2	Aug 27, 2022		Soil	K22-Au0051401	X			X
28	TP19 0.15	Aug 27, 2022		Soil	K22-Au0051402	X			X
29	TP19 0.2	Aug 28, 2022		Soil	K22-Au0051403	X			X
30	TP20 0.2	Aug 28, 2022		Soil	K22-Au0051404	X	X	X	X
31	TP21 0.2	Aug 28, 2022		Soil	K22-Au0051405	X	X	X	X
Test Counts						30	2	2	31

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX (NZ MfE)							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	mg/kg	< 5			5	Pass	
TPH-SG C10-C14	mg/kg	< 10			10	Pass	
TPH-SG C15-C36	mg/kg	< 20			20	Pass	
TPH-SG C7-C36 (Total)	mg/kg	< 35			35	Pass	
Method Blank							
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Manganese	mg/kg	0.1			0.1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
BTEX (NZ MfE)							
Benzene	%	105			70-130	Pass	
Toluene	%	120			70-130	Pass	
Ethylbenzene	%	112			70-130	Pass	
m&p-Xylenes	%	119			70-130	Pass	
o-Xylene	%	122			70-130	Pass	
Xylenes - Total	%	120			70-130	Pass	
LCS - % Recovery							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C36 (Total)	%	74			70-130	Pass	
LCS - % Recovery							
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)							
Arsenic	%	85			80-120	Pass	
Cadmium	%	80			80-120	Pass	
Chromium	%	86			80-120	Pass	
Copper	%	82			80-120	Pass	
Lead	%	84			80-120	Pass	
Manganese	%	82			80-120	Pass	
Mercury	%	91			80-120	Pass	
Nickel	%	85			80-120	Pass	
Zinc	%	86			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX (NZ MfE)				Result 1					
o-Xylene	K22-Au0042339	NCP	%	100			70-130	Pass	
Spike - % Recovery									
BTEX (NZ MfE)				Result 1					
Benzene	K22-Au0051376	CP	%	84			70-130	Pass	
Toluene	K22-Au0051376	CP	%	113			70-130	Pass	
Ethylbenzene	K22-Au0051376	CP	%	121			70-130	Pass	
m&p-Xylenes	K22-Au0051376	CP	%	122			70-130	Pass	
Xylenes - Total	K22-Au0051376	CP	%	125			70-130	Pass	
Spike - % Recovery									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1					
TPH-SG C7-C36 (Total)	K22-Au0052354	NCP	%	80			70-130	Pass	
Spike - % Recovery									
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)				Result 1					
Arsenic	Z22-Au0051571	NCP	%	89			75-125	Pass	
Cadmium	K22-Au0041376	NCP	%	80			75-125	Pass	
Chromium	K22-Au0054294	NCP	%	80			75-125	Pass	
Copper	K22-Au0041376	NCP	%	82			75-125	Pass	
Lead	K22-Au0042339	NCP	%	81			75-125	Pass	
Manganese	Z22-Au0051571	NCP	%	82			75-125	Pass	
Mercury	K22-Au0042339	NCP	%	98			75-125	Pass	
Nickel	K22-Au0041376	NCP	%	84			75-125	Pass	
Zinc	K22-Au0054294	NCP	%	85			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
BTEX (NZ MfE)				Result 1	Result 2	RPD			
Benzene	K22-Au0051375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	K22-Au0051375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	K22-Au0051375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	K22-Au0051375	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	K22-Au0051375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	K22-Au0051375	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Au0051381	CP	%	24	24	3.3	30%	Pass	
Duplicate									
BTEX (NZ MfE)				Result 1	Result 2	RPD			
Benzene	K22-Au0051386	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	K22-Au0051386	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	K22-Au0051386	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	K22-Au0051386	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	K22-Au0051386	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	K22-Au0051386	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Au0051391	CP	%	30	26	15	30%	Pass	
Duplicate									
BTEX (NZ MfE)				Result 1	Result 2	RPD			
Benzene	K22-Au0051395	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	K22-Au0051395	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	K22-Au0051395	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	K22-Au0051395	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
BTEX (NZ MfE)				Result 1	Result 2	RPD			
o-Xylene	K22-Au0051395	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	K22-Au0051395	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Au0051401	CP	%	19	19	1.9	30%	Pass	
Duplicate									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1	Result 2	RPD			
TPH-SG C7-C9	K22-Au0052323	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
TPH-SG C10-C14	K22-Au0052323	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
TPH-SG C15-C36	K22-Au0052323	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TPH-SG C7-C36 (Total)	K22-Au0052323	NCP	mg/kg	< 35	< 35	<1	30%	Pass	
Duplicate									
Eurofins Suite M10-NZ: Canterbury Soil Addendum Metals (As,B,Cd,Cr,Cu,Mn,Ni,Pb,Zn,Hg) (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Au0042348	NCP	mg/kg	4.8	5.2	8.7	30%	Pass	
Boron	K22-Au0042348	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	K22-Au0042348	NCP	mg/kg	0.23	0.25	8.4	30%	Pass	
Chromium	K22-Au0042348	NCP	mg/kg	28	30	8.4	30%	Pass	
Copper	K22-Au0042348	NCP	mg/kg	14	15	6.5	30%	Pass	
Lead	K22-Au0042348	NCP	mg/kg	13	15	13	30%	Pass	
Manganese	K22-Au0042348	NCP	mg/kg	380	400	5.4	30%	Pass	
Mercury	K22-Au0042348	NCP	mg/kg	0.19	0.19	<1	30%	Pass	
Nickel	K22-Au0042348	NCP	mg/kg	20	22	9.9	30%	Pass	
Zinc	K22-Au0042348	NCP	mg/kg	50	58	15	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Karishma Patel	Analytical Services Manager
Michael Ritchie	Senior Analyst-Metal

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Appendix G– Building Asbestos Survey

Asbestos Advice
NORTHERN REGION

Asbestos Demolition Survey

SITE LOCATION: 69 Broadway, Kaikohe

ISSUED ON: 2 Aug 2022

JOB NUMBER: 70

PREPARED FOR: Haigh Workman

Asbestos Advice Northern Region - A Division of Onederus Ltd - PO Box 3185, Onerahi, 0142
Phone: - 021 899 206 - info@asbestosadvice.co.nz

Table of Contents

Report Details

Report By	Asbestos Advice Northern Region
Client	Haigh Workman
Project	Commercial Property Demolition
Site Address	69 Broadway, Kaikohe
Site Location	
Site Description	Former toyota dealership. Medium sized commercial building including showroom, offices, parts storage rooms, workshop and grooming bays.
Scope of Work	Demolition Survey required
Purpose of Survey	To identify any asbestos material that needs to be removed prior to demolition.
Other Notes	Particular attention was drawn to dust in the workshop and mezzanine areas. This is due to asbestos linings that were present in old car parts. No contamination was located though.
Surveyors	Greg Fallon
Survey Dates	12 Jul 2022
QC Date	2 Aug 2022
Issue Date	2 Aug 2022

Totals

An overview of the data collected on site, during the survey

Total Records	Suspect ACM	NAD	Low	Medium	High
30	11	5	6	0	0

Introduction

This survey was conducted in accordance with **WorkSafe Guidelines**. Asbestos Advice Northern Region cannot accept any liability for loss, injury, damage or penalty issues that arise for reasons of survey scope limitations. Asbestos Advice Northern Region cannot be held responsible for asbestos potentially present in areas of the building not explicitly specified within the client instruction, not indicated on provided site plans or not physically possible to access. Asbestos Advice Northern Region cannot be held responsible for any damage caused as part of this survey carried out on your behalf. Due to the nature and necessity of sampling for asbestos some damage is unavoidable and will be limited to that necessary for taking of the samples.

Executive Summary

Variations to Scope

Where necessary, the surveyor may deviate from the defined scope - see below for additional information.

Notes	Photo
n/a	

Summary of Asbestos-Containing Materials

These suspected materials were assessed as **asbestos-containing**.

Building / Level / Location	Item	Material	Material Score	Recommendation	Page
Main Building / 0 / 001 - Showroom exterior	Cladding above windows	Cement Sheet	3 Low	Remove prior to demolition	10
Main Building / 0 / 001 - Showroom exterior	Lining on parapet	Cement Sheet	3 Low	Remove prior to demolition	11
Main Building / 0 / 001 - Showroom exterior	Soffit	Cement Sheet	3 Low	Remove prior to demolition	13
Main Building / 0 / 006 - Grooming Bay interior	Switches & light fittings	Bakerlite Composite	1 Low	Remove prior to demolition	15
Main Building / 0 / 007 - Electrical Board Room Interior	Fuse board	Bakerlite	2 Low	Remove prior to demolition	16
Main Building / 0 / 008 - Workshop Interior	Electrical Switches	Bakerlite Composite	1 Low	Remove prior to demolition	17

Summary of Non-Asbestos-Containing Materials

These suspected materials were assessed as **non-asbestos-containing**.

Building / Level / Location	Item	Material	Page
Main Building / 0 / 001 - Showroom exterior	Rendered plaster below windows	Cement Rendered Plaster	12
Main Building / 0 / 006 - Grooming Bay interior	Floor Covering	Paint/Vinyl Remnants	14
Main Building / 0 / 009 - Workshop Mezzanine Interior	Horizontal Surfaces	Loose Dust	18
Main Building / 0 / 010 - Service Managers Office Interior	Floor & Covering	Vinyl on timber floor	19
Main Building / 0 / 011 - Workshop Store Room Interior	Floor & Covering	Vinyl on timber floor	20

Summary of Areas or Items of Limited Access or No Access

These areas or items could not be fully accessed during survey. Asbestos should be presumed to be present until a further assessment can be undertaken. Note that the survey scope may exclude other areas - see **Report Details (p. 3)** and **Variations to Scope (p. 4)**.

Building / Level / Location	Item	Access / Notes	Photo 1	Photo 2	Page
Main Building / 0 / 001 - Showroom exterior	Lining on parapet	No Access / Due to height and wet roof making it too dangerous to access.			11

Register

The register contains priority scoring, please see **Priority Assessment Scores (p. 28)** and **Risk Assessment Scores (p. 0)** for further information.

Building / Level / Location	Item	Material	Strategy / Sample Id	Extent	Fibre Type	Product Type	Extent of Damage	Surface Treatment	Material Score	Priority Score	Recommendation	Page
Main Building / 0 / 001 - Showroom exterior	Cladding above windows	Cement Sheet	Sample 02	Approx 19 sq m	Grunerite (Amosite), Chrysotile	1	1	1	3 Low		Remove prior to demolition	10
Main Building / 0 / 001 - Showroom exterior	Lining on parapet	Cement Sheet	Strongly Presume	Approx 15sq m	Crocidolite	1	1	1	3 Low		Remove prior to demolition	11
Main Building / 0 / 001 - Showroom exterior	Soffit	Cement Sheet	Sample 01	Approx 60 sq m including canopy over footpath	Grunerite (Amosite), Chrysotile	1	1	1	3 Low		Remove prior to demolition	13
Main Building / 0 / 006 - Grooming Bay interior	Switches & light fittings	Bakerlite Composite	Strongly Presume	Unquantified at the time of inspection	Crocidolite	1	0	0	1 Low		Remove prior to demolition	15
Main Building / 0 / 007 - Electrical Board Room Interior	Fuse board	Bakerlite	Strongly Presume	Approx 0.25sq m	Crocidolite	1	1	0	2 Low		Remove prior to demolition	16
Main Building / 0 / 008 - Workshop Interior	Electrical Switches	Bakerlite Composite	Strongly Presume	Unquantifiable at the time of inspection	Crocidolite	1	0	0	1 Low		Remove prior to demolition	17

Survey Inspection Detail

A summary of all items and materials inspected during the survey, including ACMs, non-ACMs, items and areas that could not be fully accessed.

Building / Level / Location	Item	Material	Access / Notes	Material Score	Priority Score	Recommendation	Page
Front & Side Yards / 0 / 001 - All	Gravel, concrete & sub surface level	No asbestos located, but care must be taken during excavation incase of discovery of asbestos material.					
Main Building / 0 / 001 - Showroom exterior	Cladding above windows	Cement Sheet		3 Low		Remove prior to demolition	10
Main Building / 0 / 001 - Showroom exterior	Lining on parapet	Cement Sheet	No Access / Due to height and wet roof making it too dangerous to access.	3 Low		Remove prior to demolition	11
Main Building / 0 / 001 - Showroom exterior	Rendered plaster below windows	Cement Rendered Plaster		0 None			12
Main Building / 0 / 001 - Showroom exterior	Soffit	Cement Sheet		3 Low		Remove prior to demolition	13
Main Building / 0 / 002 - Showroom Interior	All	Painted concrete floor, mixture of plasterboard & timber panelling on walls, acoustic tiles & plasterboard ceiling					
Main Building / 0 / 002 - Showroom Interior	Beams Inside Bulkheads	Steel, framed in timber & limited in plasterboard. So Asbestos located within.					
Main Building / 0 / 003 - Sales Offices Interior	All	Carpet on concrete floor, plasterboard walls & ceilings					
Main Building / 0 / 004 - Showroom Toilet Interior	All	Modern vinyl on concrete floor, plasterboard walls & ceilings					
Main Building / 0 / 005 - Parts Room & Office Interior	All	Concrete floor, plasterboard & timber walls & ceilings					
Main Building / 0 / 006 - Grooming Bay interior	Floor Covering	Paint/Vinyl Remnants		0 None			14

table continued from previous page...

Building / Level / Location	Item	Material	Access / Notes	Material Score	Priority Score	Recommendation	Page
Main Building / 0 / 006 - Grooming Bay interior	Switches & light fittings	Bakerlite Composite		1 Low		Remove prior to demolition	15
Main Building / 0 / 006 - Grooming Bay interior	Walls & Ceiling	Hardboard or similar wall lining.					
Main Building / 0 / 007 - Electrical Board Room Interior	Fuse board	Bakerlite		2 Low		Remove prior to demolition	16
Main Building / 0 / 007 - Electrical Board Room Interior	Walls & Ceiling	Hardboard or similar wall lining.					
Main Building / 0 / 008 - Workshop Interior	All	Concrete floors, hardboard or similar wall lining, exposed timber framing.					
Main Building / 0 / 008 - Workshop Interior	Electrical Switches	Bakerlite Composite		1 Low		Remove prior to demolition	17
Main Building / 0 / 009 - Workshop Mezzanine Interior	All	Timber floor, hardboard or similar wall lining, exposed timber framing.					
Main Building / 0 / 009 - Workshop Mezzanine Interior	Horizontal Surfaces	Loose Dust		0 None			18
Main Building / 0 / 010 - Service Managers Office Interior	Floor & Covering	Vinyl on timber floor		0 None			19
Main Building / 0 / 010 - Service Managers Office Interior	Walls & Ceiling	Hardboard & Plasterboard or similar wall lining.					
Main Building / 0 / 011 - Workshop Store Room Interior	Floor & Covering	Vinyl on timber floor		0 None			20
Main Building / 0 / 011 - Workshop Store Room Interior	Walls & Ceiling	Hardboard & Plasterboard or similar wall lining.					
Main Building / 0 / 012 - Workshop Kitchen Interior	Floor & Covering	Concrete floor, carpeted in part					
Main Building / 0 / 012 - Workshop Kitchen Interior	Walls & Ceiling	Hardboard & Plasterboard or similar wall lining.					

table continued from previous page...

Building / Level / Location	Item	Material	Access / Notes	Material Score	Priority Score	Recommendation	Page
Main Building / 0 / 013 - Workshop Exterior	Cladding	Corrugated Iron & Timber Soffits					
Main Building / 0 / 014 - Lean-To Exterior	Cladding	Corrugated Iron					
Main Building / 0 / 015 - Lean-To Toilet Interior	Floor	Concrete floor					
Main Building / 0 / 015 - Lean-To Toilet Interior	Walls & Ceiling	Hardboard wet wall or similar wall lining.					
Rear Yard / 0 / 001 - All	Gravel & Sub Surface Level	No asbestos located, but care must be taken during excavation incase of discovery of asbestos material.					

Material and Priority Assessments

Building	Main Building	**Level**	0
Location	001 - Showroom exterior	**Item**	Cladding above windows
Material	Cement Sheet	**Extent**	Approx 19 sq m

Strategy / Sample Id	Sample / 02	**Fibre Type**	Grunerite (Amosite), Chrysotile
Recommendation	Remove prior to demolition		
General Comments	Must be removed by a suitably licensed and experienced asbestos removal contractor under Class B asbestos controls.		

Material Assessment

Product Type (or Debris from Product)	1	**Extent of Damage / Deterioration**	1
Surface Type / Treatment	1	**Material Score / Category**	3 / Low

No Priority Assessment was carried out for this item

Building	Main Building	**Level**	0
Location	001 - Showroom exterior	**Item**	Lining on parapet
Material	Cement Sheet	**Extent**	Approx 15sq m

Access / Notes	No Access / Due to height and wet roof making it too dangerous to access.		
Strategy / Sample Id	Strongly Presume	**Presumed Fibre Type**	Crocidolite
Recommendation	Remove prior to demolition		
General Comments	Is visible on the inside face. It is likely that it is on the 'roadside' or outer face under the signage too. Must be removed by a suitably licensed and experienced asbestos removal contractor under Class B asbestos controls.		

Material Assessment

Product Type (or Debris from Product)	1	**Extent of Damage / Deterioration**	1
Surface Type / Treatment	1	**Material Score / Category**	3 / Low

No Priority Assessment was carried out for this item

Building	Main Building	**Level**	0
Location	001 - Showroom exterior	**Item**	Rendered plaster below windows
Material	Cement Rendered Plaster	**Extent**	Approx 5 sq m
			
Strategy / Sample Id	Sample / 03	**Fibre Type**	NADIS
General Comments	No asbestos detected.		

No Asbestos Detected in Sample

Building	Main Building	**Level**	0
Location	001 - Showroom exterior	**Item**	Soffit
Material	Cement Sheet	**Extent**	Approx 60 sq m including canopy over footpath
			
Strategy / Sample Id	Sample / 01	**Fibre Type**	Grunerite (Amosite), Chrysotile
Recommendation	Remove prior to demolition		
General Comments	Must be removed by a suitably licensed and experienced asbestos removal contractor under Class B asbestos controls.		

Material Assessment

Product Type (or Debris from Product)	1	**Extent of Damage / Deterioration**	1
Surface Type / Treatment	1	**Material Score / Category**	3 / Low

No Priority Assessment was carried out for this item

Building	Main Building	**Level**	0
Location	006 - Grooming Bay interior	**Item**	Floor Covering
Material	Paint/Vinyl Remnants	**Extent**	Approx 42 sq m
			
Strategy / Sample Id	Sample / 04	**Fibre Type**	NADIS
General Comments	No asbestos detected		

No Asbestos Detected in Sample

Building	Main Building	**Level**	0
Location	006 - Grooming Bay interior	**Item**	Switches & light fittings
Material	Bakerlite Composite	**Extent**	Unquantified at the time of inspection

Strategy / Sample Id	Strongly Presume	**Presumed Fibre Type**	Crocidolite
Recommendation	Remove prior to demolition		
General Comments	The exact number of switches was not accurately quantified. They must all be located and removed by a suitably licensed and experienced asbestos removal contractor under Class B asbestos controls.		

Material Assessment

Product Type (or Debris from Product)	1	**Extent of Damage / Deterioration**	0
Surface Type / Treatment	0	**Material Score / Category**	1 / Low

No Priority Assessment was carried out for this item

Building	Main Building	**Level**	0
Location	007 - Electrical Board Room Interior	**Item**	Fuse board
Material	Bakerlite	**Extent**	Approx 0.25sq m

Strategy / Sample Id	Strongly Presume	**Presumed Fibre Type**	Crocidolite
Recommendation	Remove prior to demolition		
General Comments	Must be removed by a suitably licensed and experienced asbestos removal contractor under Class B asbestos controls.		

Material Assessment

Product Type (or Debris from Product)	1	**Extent of Damage / Deterioration**	1
Surface Type / Treatment	0	**Material Score / Category**	2 / Low

No Priority Assessment was carried out for this item

Building	Main Building	**Level**	0
Location	008 - Workshop Interior	**Item**	Electrical Switches
Material	Bakerlite Composite	**Extent**	Unquantifiable at the time of inspection

Strategy / Sample Id	Strongly Presume	**Presumed Fibre Type**	Crocidolite
Recommendation	Remove prior to demolition		
General Comments	The exact number was not determined at the time of inspection, but it is not expected to be a high number. They must all be located and removed by a suitably licensed and experienced asbestos removal contractor under Class B asbestos controls prior to demolition.		

Material Assessment

Product Type (or Debris from Product)	1	**Extent of Damage / Deterioration**	0
Surface Type / Treatment	0	**Material Score / Category**	1 / Low

No Priority Assessment was carried out for this item

Building	Main Building	**Level**	0
Location	009 - Workshop Mezzanine Interior	**Item**	Horizontal Surfaces
Material	Loose Dust	**Extent**	Entire high level surfaces
			
Strategy / Sample Id	Sample / 06	**Fibre Type**	NADIS
General Comments	A very thick coating of dust was on horizontal framing members and soffit interior. Due to the potential of asbestos dust in old car parts, and unknown original roof material, the dust was tested by composite sample (from numerous different locations but submitted as one sample). No asbestos was detected.		

No Asbestos Detected in Sample

Building	Main Building	**Level**	0
Location	010 - Service Managers Office Interior	**Item**	Floor & Covering
Material	Vinyl on timber floor	**Extent**	Approx 15sq m
			
Strategy / Sample Id	Sample / 05	**Fibre Type**	NADIS
General Comments	No asbestos detected.		

No Asbestos Detected in Sample

Building	Main Building	**Level**	0
Location	011 - Workshop Store Room Interior	**Item**	Floor & Covering
Material	Vinyl on timber floor	**Extent**	Approx 8sq m
			
Strategy / Sample Id	Cross Reference / 05	**Fibre Type**	NADIS
General Comments	Identical to the vinyl in the managers office. No asbestos detected.		

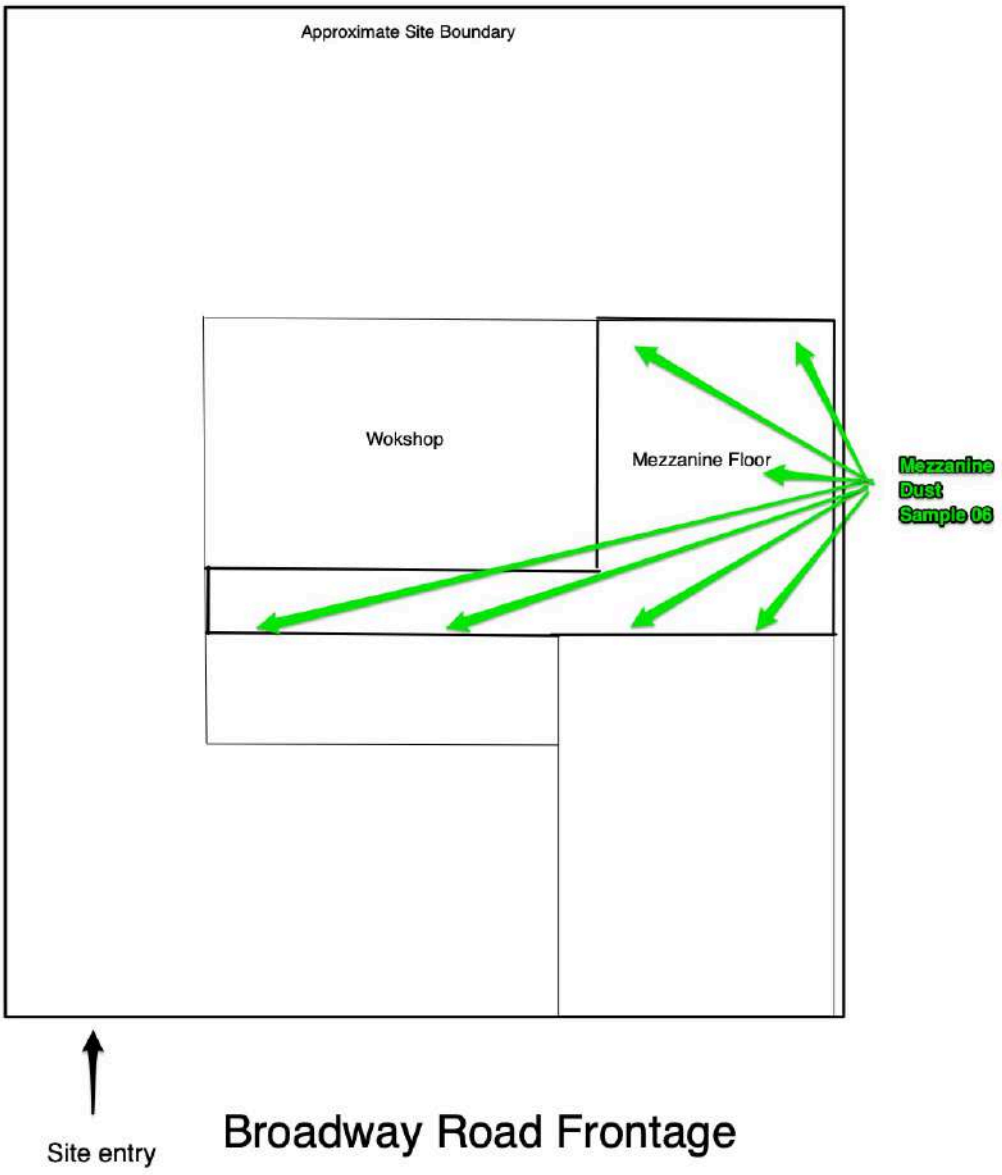
No Asbestos Detected in Sample

Appendices

Floor Plans

See following pages...

First Floor - Asbestos / Sample Locations

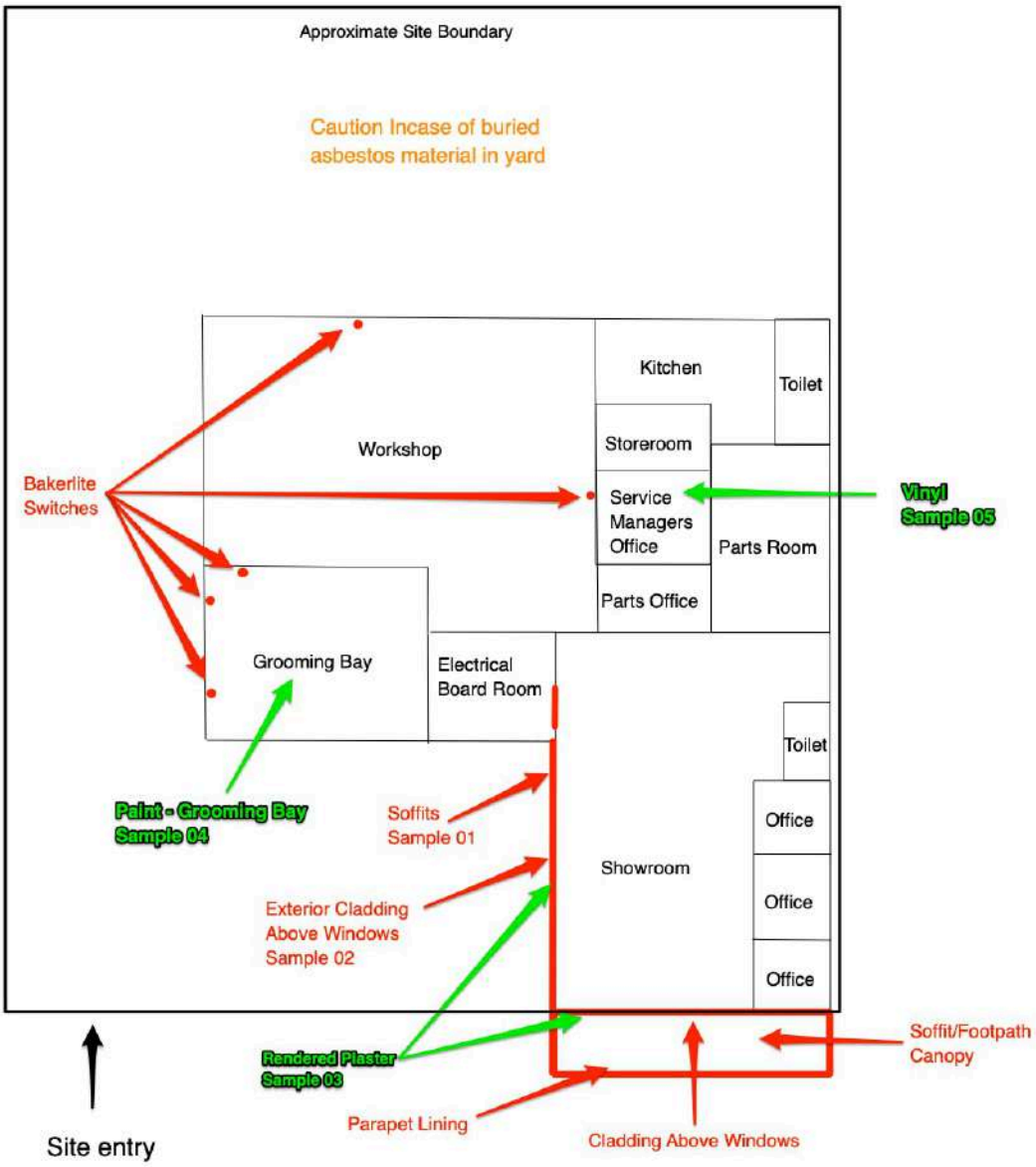


Key:

No Asbestos Detected

Not To Scale

Ground Floor - Asbestos / Sample Locations



Broadway Road Frontage

Key:

No Asbestos Detected

Asbestos Material

Not To Scale

Lab Results, Certificates & Evidence

See following pages...

PROLABS

PO Box 11156
Ellerslie, Auckland, 1542
New Zealand

CERTIFICATE OF ANALYSIS

Asbestos Identification

Certificate No: 22-4352

Client:	Onederus Ltd	**Date Sampled:**	12/07/2022
Client Contact:	Greg Fallon	**Date Received:**	15/07/2022
Telephone:	021 899 206	**Date Analysed:**	15/07/2022
Email:	info@asbestosadvice.co.nz	**Date Issued:**	15/07/2022
Address:	23 Woodlands Heights Drive, Parua Bay	**Order No.:**	69 Broadway
Site:	69 Broadway, Kaikohe	**Sampled By:**	As Received

Test Method:
Qualitative identification of asbestos types in bulk samples at PROLABS Laboratory by polarised light microscopy, including dispersion staining techniques using PROLABS in-house method ID-1, AS4964 (2004).

Lab ID	Sample ID	Sample Details	Sample Type	Size / Weight cm/g	Fibres Identified	Asbestos Present
001	01	Showroom soffit - Cement sheet	Fibre Cement	2 x 2	CHR, AMO	Yes
002	02	Showroom cladding - Cement sheet	Fibre Cement	1 x 1	CHR, AMO	Yes
003	03	Showroom cladding - Rendered plaster	Render	3 x 4	NAD, ORF	No
004	04	Grooming bay vinyl remnants / paint from floor	Debris	2 x 3	NAD, ORF	No
005	05	Vinyl floor covering - service managers office	Vinyl Sheet	5 x 4	NAD, ORF	No
006	06	Composite sample dust on trusses & workshop mezanine	Dust / Debris	N/A	NAD, ORF, SMF	No

Fibre Identification Legend

CHR	Chrysotile (white asbestos)	ORF	Organic Fibre
AMO	Amosite (Brown/Grey asbestos)	SMF	Synthetic Mineral Fibre
CRO	Crocidolite (Blue asbestos)	NAD	No Asbestos Detected
UMF	Unknown Mineral Fibre	hpd	Handpicked

All samples submitted by clients for laboratory testing are retained by the laboratory for a period of 3 months.

Approved Identifier
Name: Stefanie Zhou

Approved Signatory
Name: Philip Torley

PROLABS accepts no responsibility for the initial collection, packaging or transportation of samples submitted by external persons.
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IANZ Accredited Laboratory - IANZ No. 9447

NZBN: 9429045881237

Page 1 of 1

Types of Asbestos Survey

WorkSafe describes three types of survey:

Management Surveys

A management survey is the standard survey. Its purpose is to locate, as far as reasonably practicable, the presence and extent of any suspect ACMs in the building which could be damaged or disturbed during normal occupancy, including foreseeable maintenance and installation, and to assess their condition. Management surveys can involve a combination of sampling to confirm asbestos is present or presuming asbestos to be present.

Refurbishment and Demolition Surveys

A refurbishment or demolition survey is needed before any refurbishment or demolition work is carried out. These types of survey are used to locate and describe, as far as reasonably practicable, all ACMs in the area where the refurbishment work will take place or in the whole building if demolition is planned. The survey will be fully intrusive and involve destructive inspection, as necessary, to gain access to all areas, including those that may be difficult to reach. A refurbishment or demolition survey may also be required in other circumstances, eg when more intrusive maintenance and repair work will be carried out or for plant removal or dismantling.

Material Assessment Scores

Where ACMs have been identified or presumed, a material score is calculated in accordance with WorkSafe Guidelines. The value assigned to each of the sample variables is added together to give a total material score between 1 and 9.

Sample Variable	Score	Examples of Score
Product Type (or Debris from Product)	1	Asbestos reinforced composites (plastics, resins, mastics, roofing felts, vinyl floor tiles, semi-rigid paints or decorative finishes, asbestos cement etc)
	2	Asbestos insulating board, mill boards, other low density insulation boards, asbestos textiles, gaskets, ropes and woven textiles, asbestos paper and felt
	3	Thermal insulation (eg pipe and boiler lagging), sprayed asbestos, loose asbestos, asbestos mattresses and packing
Extent of Damage / Deterioration	0	Good condition: no visible damage
	1	Low damage: a few scratches or surface marks; broken edges on board, tiles etc.
	2	Medium damage: significant breakage of materials or several small areas where material has been damaged revealing loose asbestos fibres
	3	High damage or delamination of materials, sprays and thermal insulation. Visible asbestos debris.
Surface Treatment	0	Composite materials containing asbestos: reinforced plastics, resins, vinyl tiles
	1	Enclosed sprays and lagging, asbestos insulating board (with exposed face painted or encapsulated), asbestos cement sheets etc.
	2	Unsealed asbestos insulating board, or encapsulated lagging and sprays
	3	Unsealed laggings and sprays

The material score determines the potential for a material to release asbestos fibres when disturbed. This score is then categorised to describe the potential:

Material Score	1	2	3	4	5	6	7	8	9
Category	Low			Medium			High		

Priority Assessment Scores

The priority assessment is determined by carrying out an assessment of the likelihood of the ACM being disturbed through: **Normal Occupant Activity**, **Likelihood of Disturbance**, **Human Exposure Potential** and **Maintenance Activity**. Guidance on Priority Assessments is provided in HSG 227 (A Comprehensive Guide to Managing Asbestos in Premises) and WorkSafe Guidelines.

The value assigned to each of the four categories is added together to give a total priority score between 0 and 12.

The surveyor has carried out a priority risk assessment on your behalf. This is based on the activities witnessed by the surveyor on the day of the survey. This information can contribute to the risk assessment, however **it is the duty holder's responsibility to complete the Risk Assessments using the Survey report and his / her own detailed knowledge of the activities carried out within the premises**.

Assessment Parameter	Score	Examples of Score
Normal Occupant Activity		
Main Type of Activity in Area	0	Rare disturbance activity (eg little used store room)
	1	Low disturbance activities (eg office type activity)
	2	Periodic disturbance (eg industrial or vehicular activity which may cause contact with ACMs)
	3	High levels of disturbance, (eg fire door with asbestos insulating board sheet in constant use)
Likelihood of Disturbance		
Location	0	Outdoors
	1	Large Rooms or well-ventilated areas
	2	Rooms up to 100 sq metres in area
	3	Restricted or confined areas
Accessibility	0	Usually inaccessible or unlikely to be disturbed
	1	Occasionally likely to be disturbed
	2	Easily disturbed
	3	Routinely disturbed
Extent / Amount	0	Small amounts or single items (eg strings, gaskets)
	1	Less than 10 sq metres area, or 10 metre pipe run
	2	10 to 50 sq metres area or 10 to 50 metres pipe run
	3	More than 50 sq metres, or 50 metres pipe run
Average Score		Average of scores for **Location**, **Accessibility** and **Extent / Amount** *Maximum score of 3*
Human Exposure Potential		
Number of Occupants	0	None
	1	1 to 3
	2	4 to 10
	3	More than 10
Frequency of Use of Area	0	Infrequent

table continued from previous page...

Assessment Parameter	Score	Examples of Score
	1	Monthly
	2	Weekly
	3	Daily
Average Time Area is in Use	0	Less than 1 hour
	1	1 to less than 3 hours
	2	3 to less than 6 hours
	3	More than 6 hours
Average Score		Average of scores for **Number of Occupants**, **Frequency of Use of Area**, and **Average Time Area is in Use** *Maximum score of 3*
Maintenance Activity		
Type of Maintenance Activity	0	Minor disturbance (eg possibility of contact when gaining access)
	1	Low disturbance (eg changing light bulbs in asbestos insulating board ceiling)
	2	Medium disturbance (eg lifting one or two asbestos insulating board ceiling tiles to access a valve)
	3	High levels of disturbance (eg removing a number of asbestos insulating board ceiling tiles to replace a valve or for recabling)
Frequency of Maintenance Activity	0	Unlikely - almost never
	1	Less than once a year
	2	Less than once a month
	3	More often than once a month
Average Score		Average of scores for **Type of Maintenance Activity** and **Frequency of Maintenance Activity** *Maximum score of 3*
Total Score		

Asbestos Materials

Asbestos is a naturally occurring mineral composed of soft and flexible fibers that are resistant to heat, electricity and corrosion. These qualities make the mineral useful, but they also make asbestos exposure highly toxic.

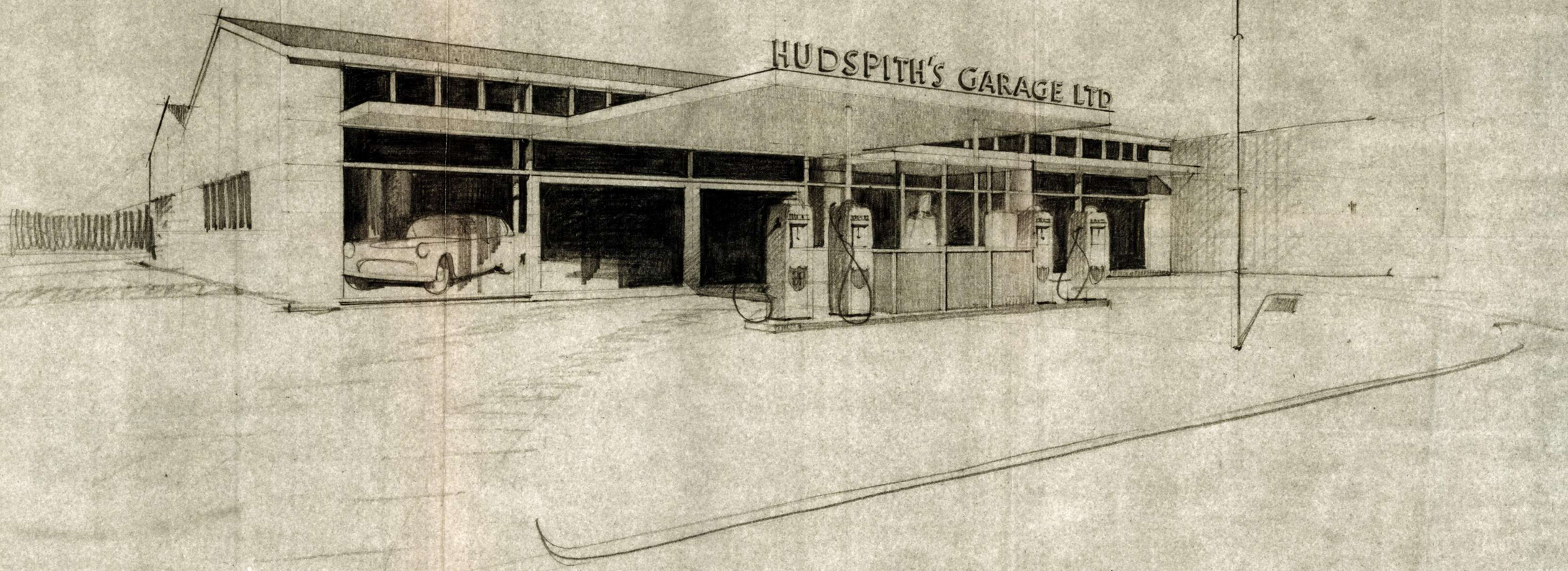
Asbestos is a group of six naturally occurring fibrous minerals composed of thin, needle-like fibers. Exposure to asbestos causes several cancers and diseases, including mesothelioma and asbestosis.

Asbestos Morphology

Mineral Group	Fibre Type	Common Name
Serpentine	Chrysotile	White
Amphibole	Amosite	Brown
	Crocidolite	Blue
	Anthophyllite	n/a
	Tremolite	n/a
	Actinolite	n/a

Note: *Anthophyllite was used in limited quantities for insulation products and construction materials. It also occurs as a contaminant in chrysotile asbestos, vermiculite and talc. Tremolite and actinolite are not used commercially, but they can be found as contaminants in chrysotile asbestos, vermiculite and talc.*

Appendix H– Supporting Documents



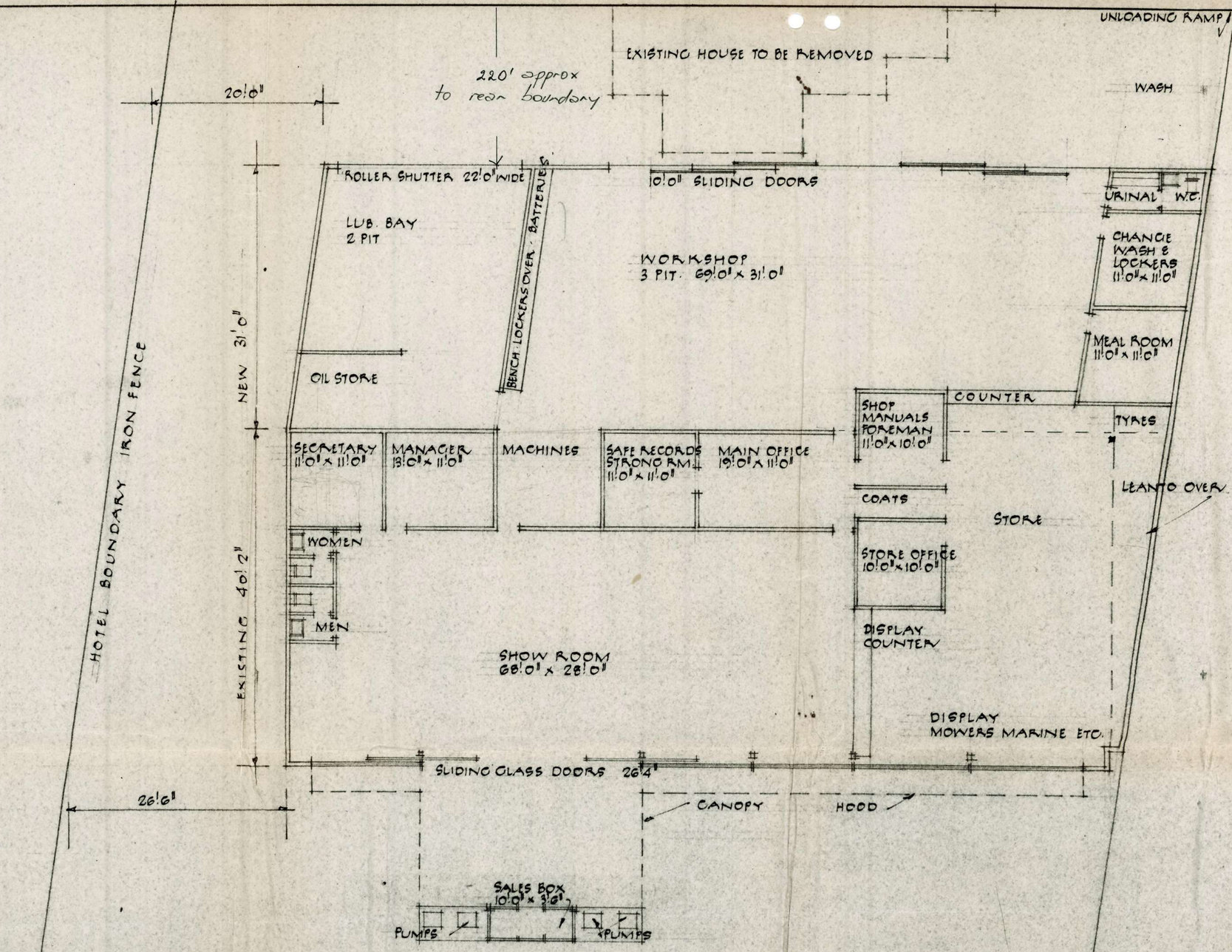
SARGENT and SMITH and PARTNERS
REGD. ARCHITECTS - A.N.Z.I.A. - R.I.V.A. - A.N.Z.I.
CHARTERED and CHARTERED ARCHITECTS
AUCKLAND ROTORUA TAKAPUNA TAUPO

85 BROADWAY, NEWMARKET
PHONE 544-199 & 52-198
P.O. BOX 9181
AUCKLAND

ALTERATIONS & ADDITIONS TO HUDSPITH'S GARAGE LTD. KAIKOHE

PERSPECTIVE

P5
829.



SARGENT AND SMITH AND PARTNERS

REGISTERED AND CHARTERED ARCHITECTS

AUCKLAND } GEORGE ROGER SARGENT DIP ARCH. ARIBA. ANZIA.
TAKAPUNA }
ROTORUA TRAVIS JARVIE SMITH DIP ARCH. ARIBA. ANZIA. DIP UVAL. ANZIV.
RODERICK ANDREW WILLIAMSON DIP ARCH. ARIBA. ANZIA. DIP UVAL.
TAUPO EWEN MAXWELL CHRISTIE ARIBA. ANZIA.

P.O. BOX 9181, PHONES 548-189 & 52-196
52 BROADWAY, NEWMARKET, AUCKLAND

ALTERATIONS & ADDITIONS TO HUDSPITH'S GARAGE LTD KAIKOHE

AMENDMENTS

FLOOR PLAN.

DATE	October '60
SCALES	1/8" = 1'0"
DRAWN	K.P.M.
TRACED	
CHECKED	

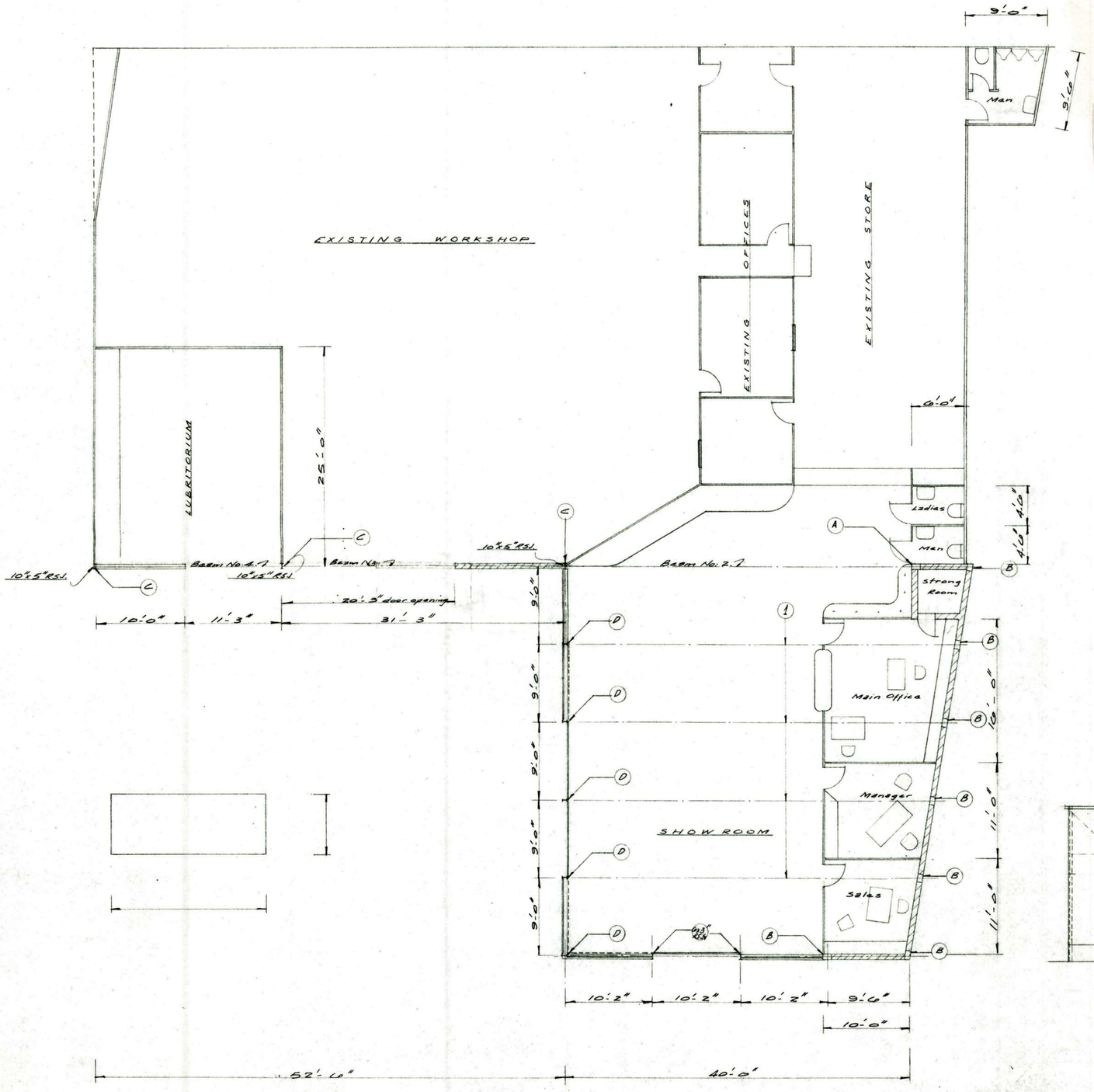
SET No. | JOB No. 829

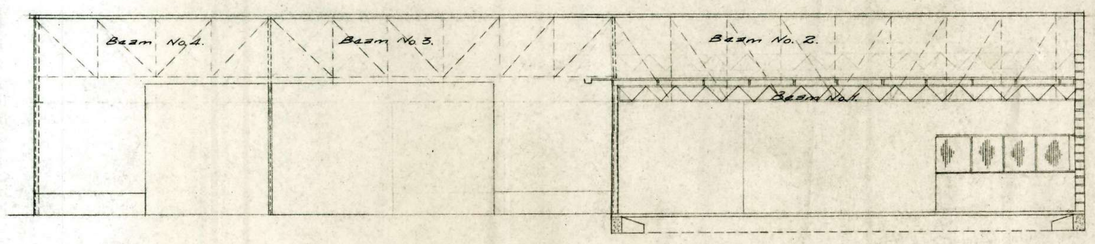
SHEET No. P4

IN SET OF 2 SHEETS

ABP 62

23/11/62.





SCALES
1/8" to a foot.
APPROVED

TAPPER AND DE VITT
REGISTERED ENGINEERS
A.M.P. BLDG., BANK STREET
WHANGAREI - PH. 3661

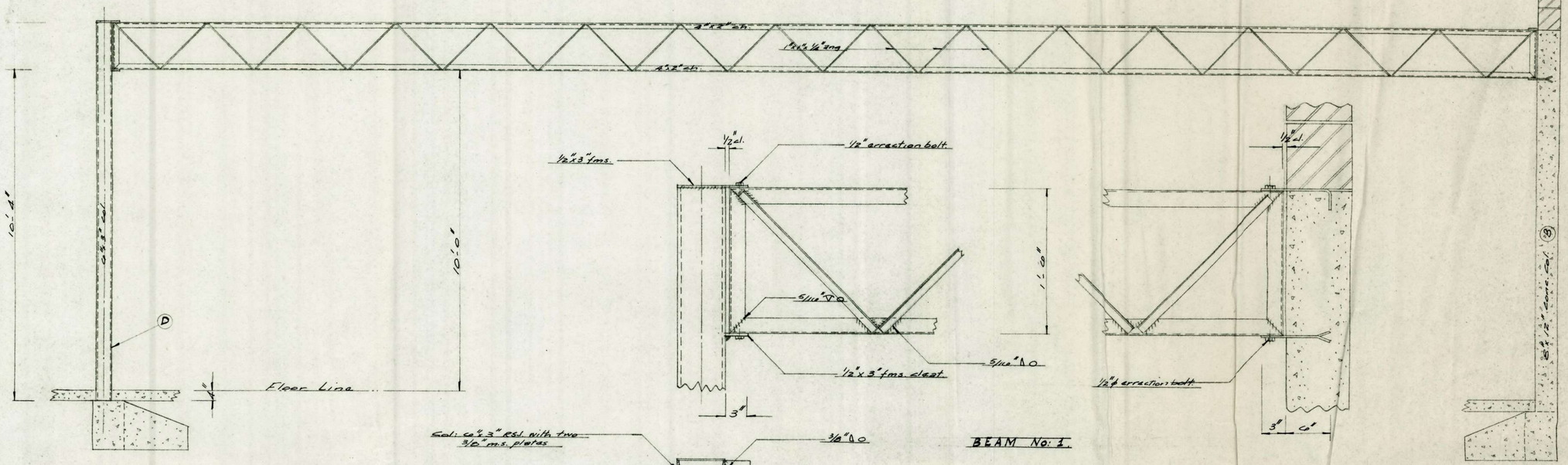
HUDSPITH'S GARAGE - KAIKOHE.

DESIGN:
DRAWN: D.N.W. Knight
TRACED:
CHECKED:

SHEETS 1.
DRAWING No. 374

SCALES 1/4" & 1" to a foot. APPROVED	TAPPER AND DE WIT REGISTERED ENGINEERS A.M.P. BLDG., BANK STREET WHANGAREI - Ph. 3661	HUDSPITH'S GARAGE - KAIKOHE.	DESIGN: DRAWN: D.N.W. Knight. TRACED: CHECKED:
			FIELD BK. CALC. BK. SHEET No. 2 OF SHEETS DRAWING No. 374

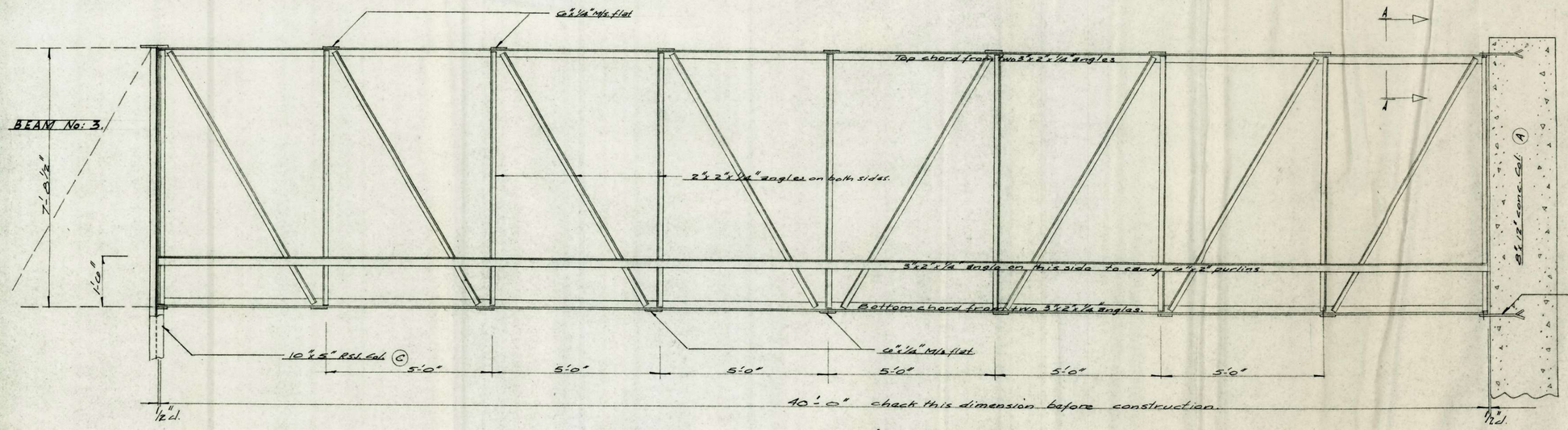
One off each at 40'-6", 42'-6", 43'-6", & 45'-0" all dimensions to be checked on site.

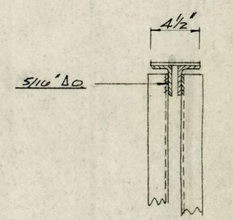


Col: 6"x3" RSJ with two 3/8" m.s. plates

3/8" Δ o

BEAM No: 1.





PART SECTION AA

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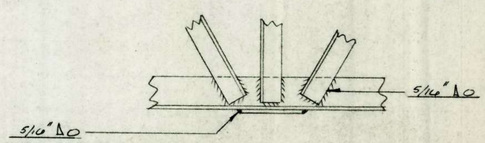


SCALES
¼" & 1½" to a foot.
APPROVED

TAPPER AND DE WIT
REGISTERED ENGINEERS
A.M.P. BLDG., BANK STREET
WHANGAREI - Ph. 3651

HUDSPITH'S GARAGE - KAIKOHE.

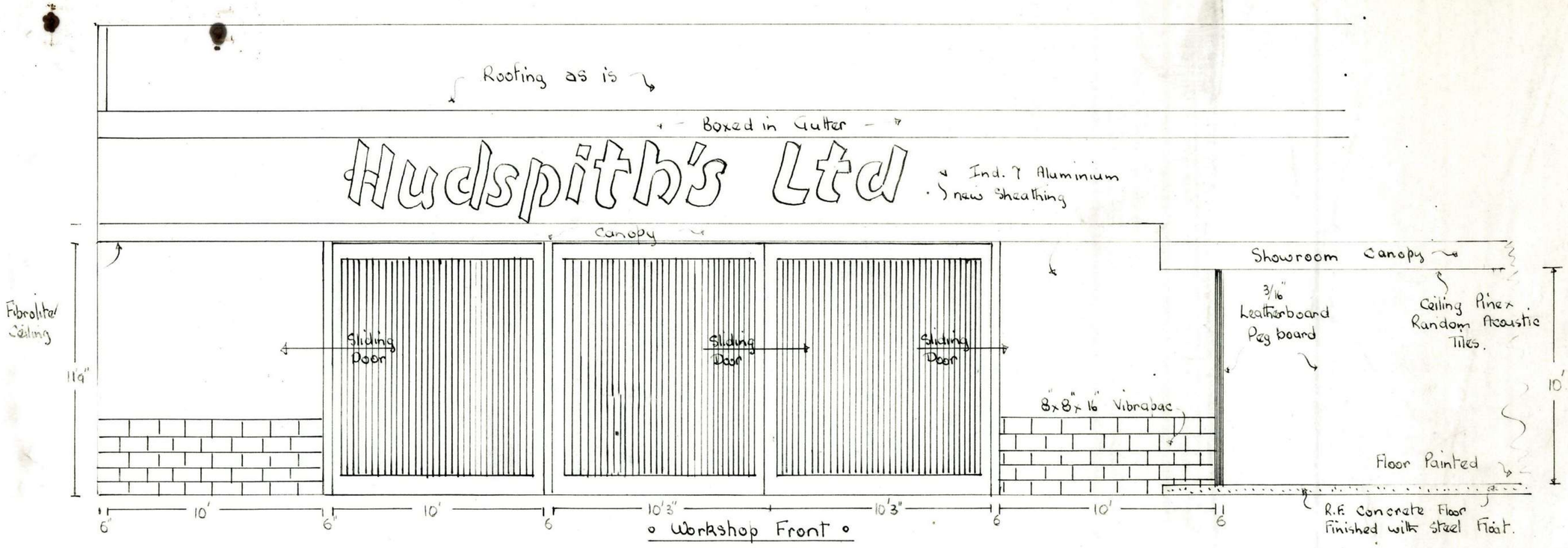
DESIGN:
DRAWN: D.W.W. Knight
TRACED:
CHECKED:

FIELD BK.
SHEET No. 3. CALC. BK.
OF SHEETS
DRAWING No 374

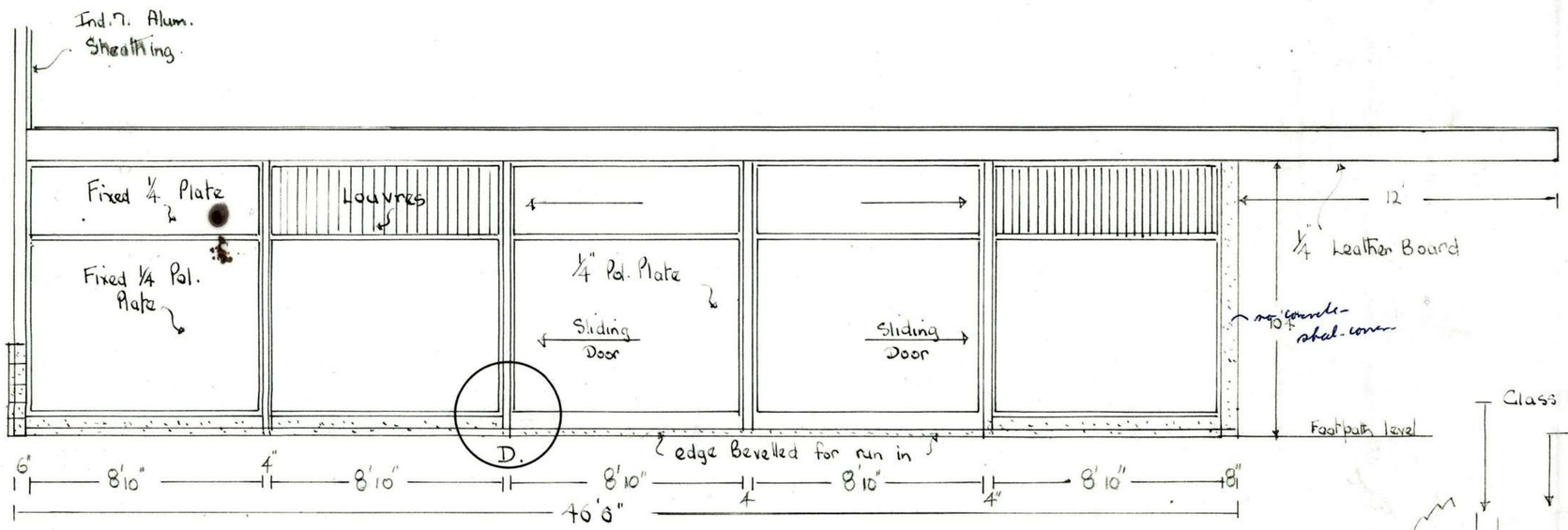
SCALES 1/2" to a foot APPROVED	TAPPER AND DE WIT REGISTERED ENGINEERS A.M.P. BLDG. BANK STREET WHANGAREI - Ph. 3661	HUDSPITH'S GARAGE - KAIKOHE.	DESIGN: DRAWN: D.N.W. Knight TRACED: CHECKED:	FIELD BK. CALC. BK. SHEET No. 4. OF SHEETS DRAWING No. 374

BUILDING
HUDSPITH MOTORS
KAIKOHE

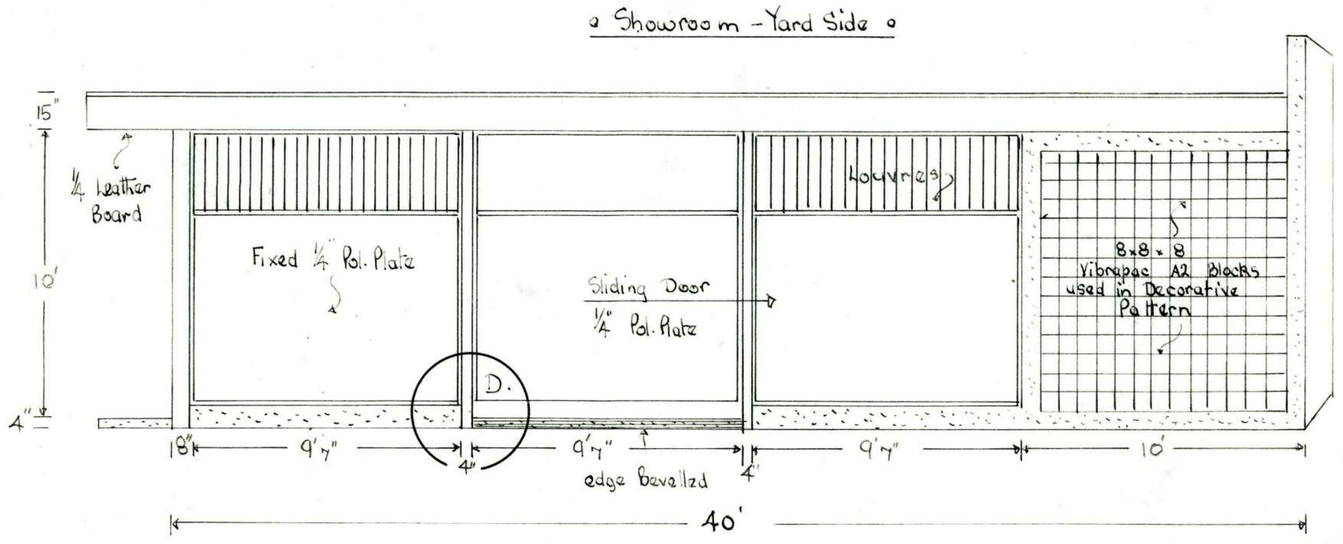
HUDSPATH MOTORS LTD
24/379



Workshop Front

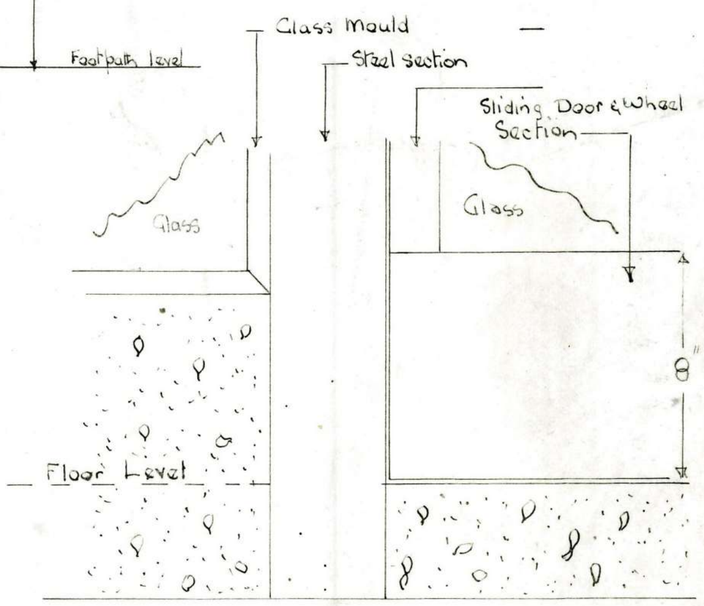


Showroom - Yard Side



Showroom - Street Side

Scale ¼" = 1'



Section D

Scale ¼ F.S.

Elevations of Showroom	Scales - ¼" = 1'0" ¼ F.S.	Drawing No.

10' Sliding Corr. Iron Sheathed Door in position to be specified later

3 Door

3' Door

Corr. Iron.

9'6"

S.S. Urinal

Brs. Quarries

Block Wall

Boundary Wall

Existing corner Removed.

Replaced by this wall

As is

As is

W.B.

Toilet

2' Louvres.

Corr. Iron.

Ceiling & Walls H.B. Lined

Present workshop as is for this contract

New Pit

Repair Floor

Passage

Lift up Flap

Existing Wall as is.

New Sheathing up to window level. Old windows replaced with clear sheets Novalite for full width of Cable Section

H.B. walls & Ceiling

4" Partition wall

21'

3' Sliding Door

SHELVES 12" & 6" WIDE (SEE DETAIL).

Store Area as is

Cupboard, Shelves etc, for Oil Plant & Units

Resurface Lube Floor

25'

New Wall

3' Glass Slide

2'8" Door

6" Glass above waist from old wall

Lino covered

Flap.

4" Partition wall

Counter

Pegboard

3' Dias

Glass Partition

Lino

Men

Ladies

Present wall out

Concrete Apron

Water & air

Diesel

Lub.

Sliding

Sliding

Sliding

26'6"

Concrete finishes here

3' wide Hood

Block Walls

Strong Room

SQUAB

Zip Unit

S.S. Sheet Top

Lino

10' Ceiling - Pinex Random Acoustic Tiles.

Canopy Outline

27'

Windows & Doors ¼" Pol. Plate

Floor Finished Steel Float for Painting

76"x2'

46"

MAIN OFFICE

46"

13'

11'6"

18" Top

Concrete

19'

oil Bar

Bench

Sales office 56 x 98"

0.9 x 2.0

19'

Concrete

MANAGER

Top cupboards above

5'

2'6"

11'6"

18" Top

63'8"

Lino covered.

11'

SHOWROOM

Sliding Doors

12'

3' Hood

¼" Pol. Plate Sliding Glass Doors

SALES.

46" x 26"

11'

18" Top - Lino

New Building Line

52'6"

30'

10'

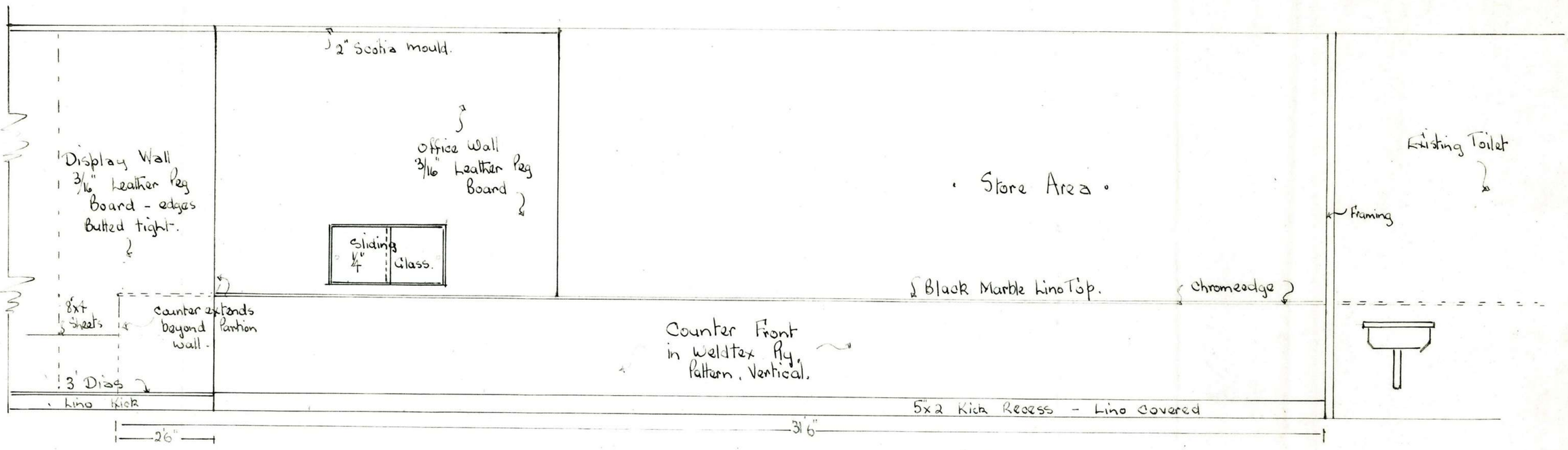
40'

Decorative Block Wall

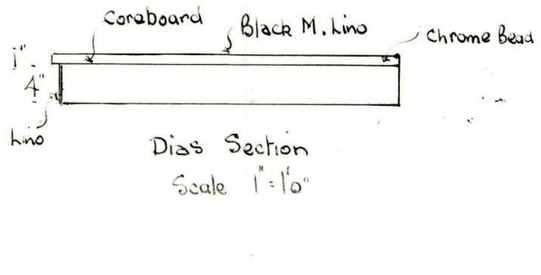
12' canopy

Old Building Line

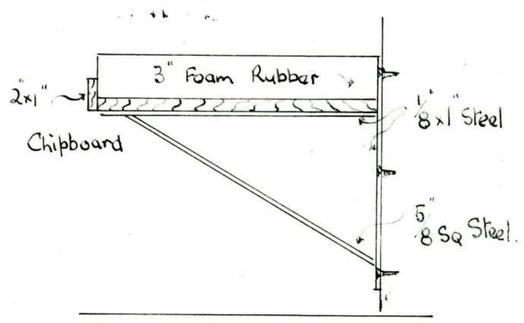
° Ground Plan °	Scale :- 1/8" = 1'0"	Drawing No:-



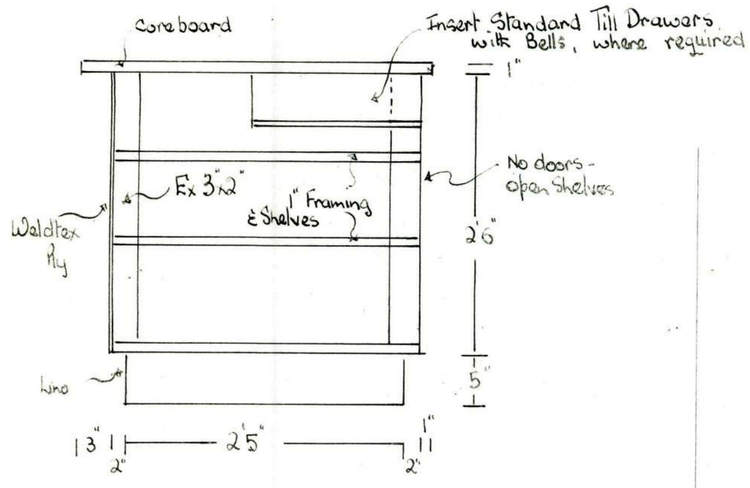
Display Wall & Store Counter - Section "CC"
Scale ½" = 1'0"



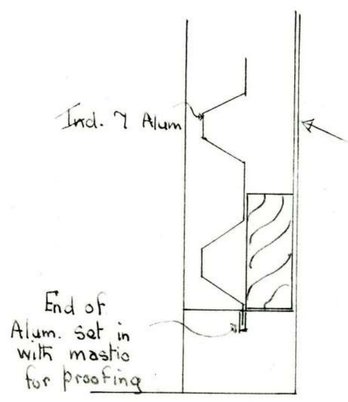
Dias Section
Scale 1" = 1'0"



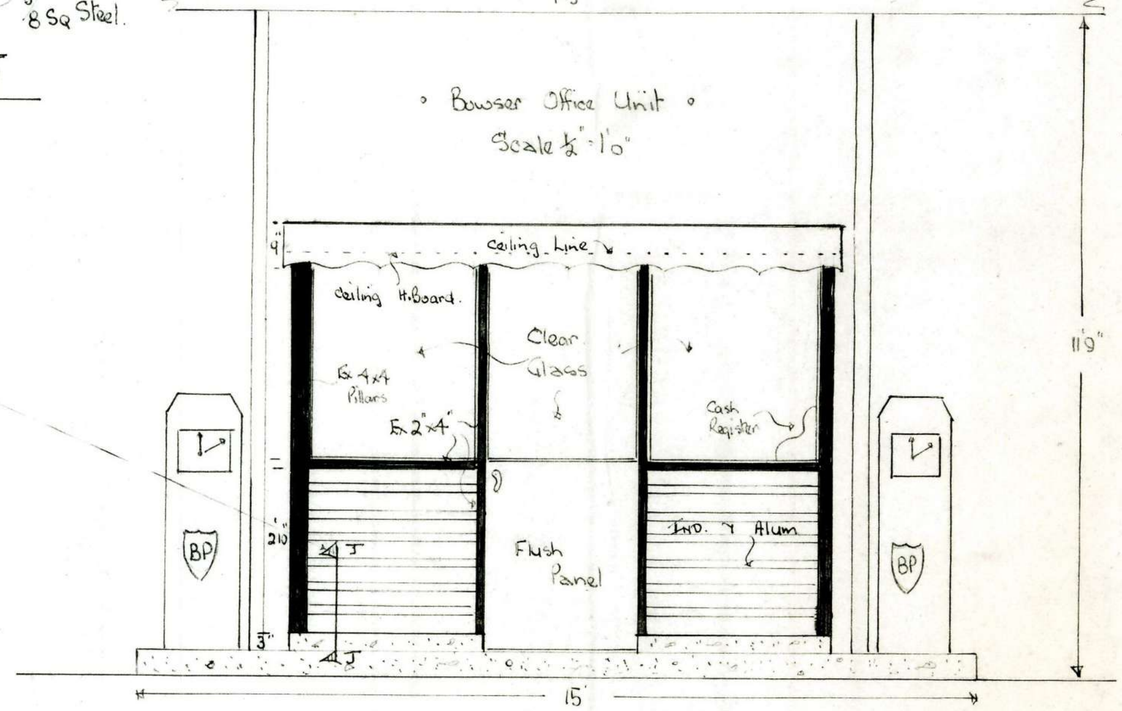
Seat Section
Scale ⅛" = 1'0"



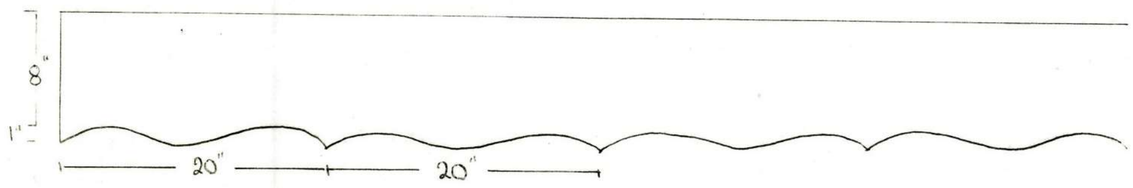
Store Counter Section
Scale 1" = 1'0"



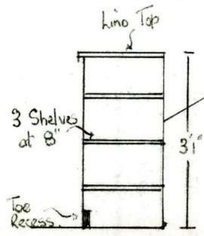
Section "J"
Scale ¼" = 1'

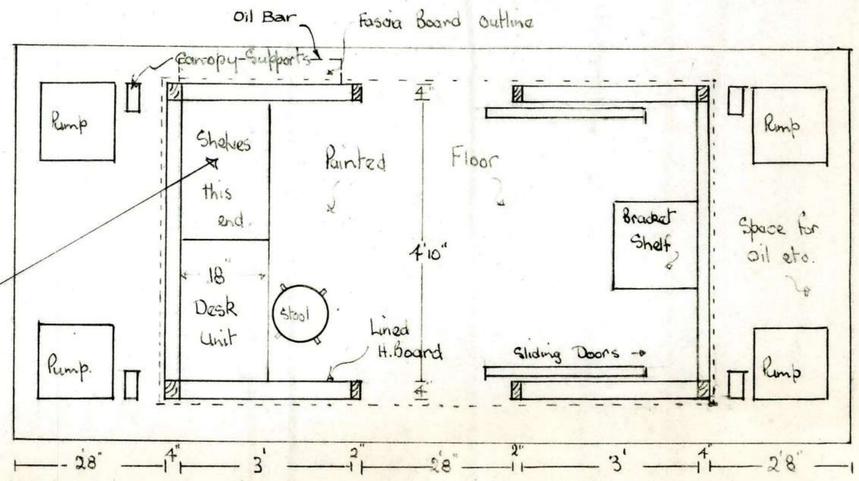


Bowser Office Unit
Scale ½" = 1'0"

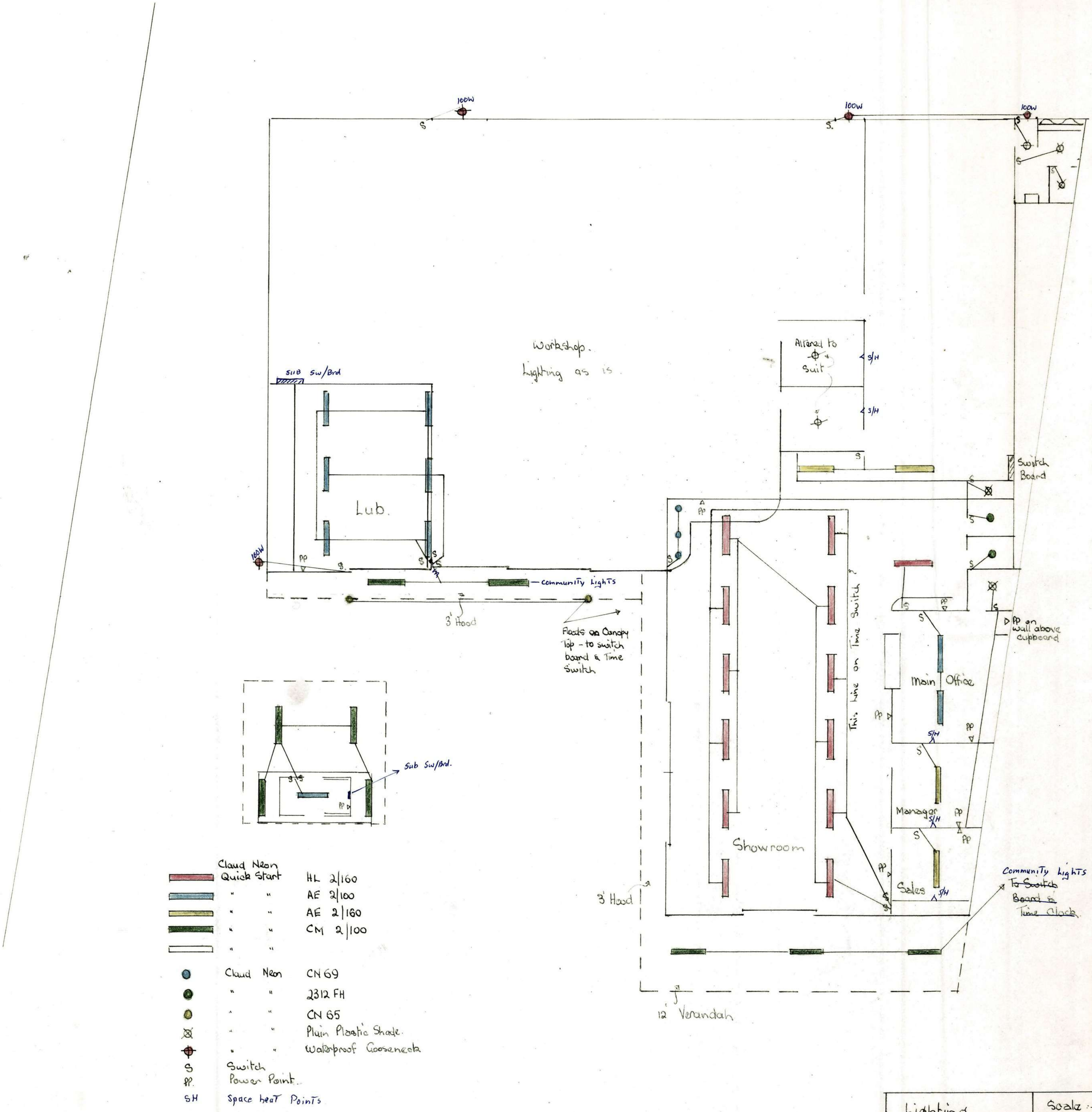


Fascia Board Pattern
Scale ⅛" = 1"



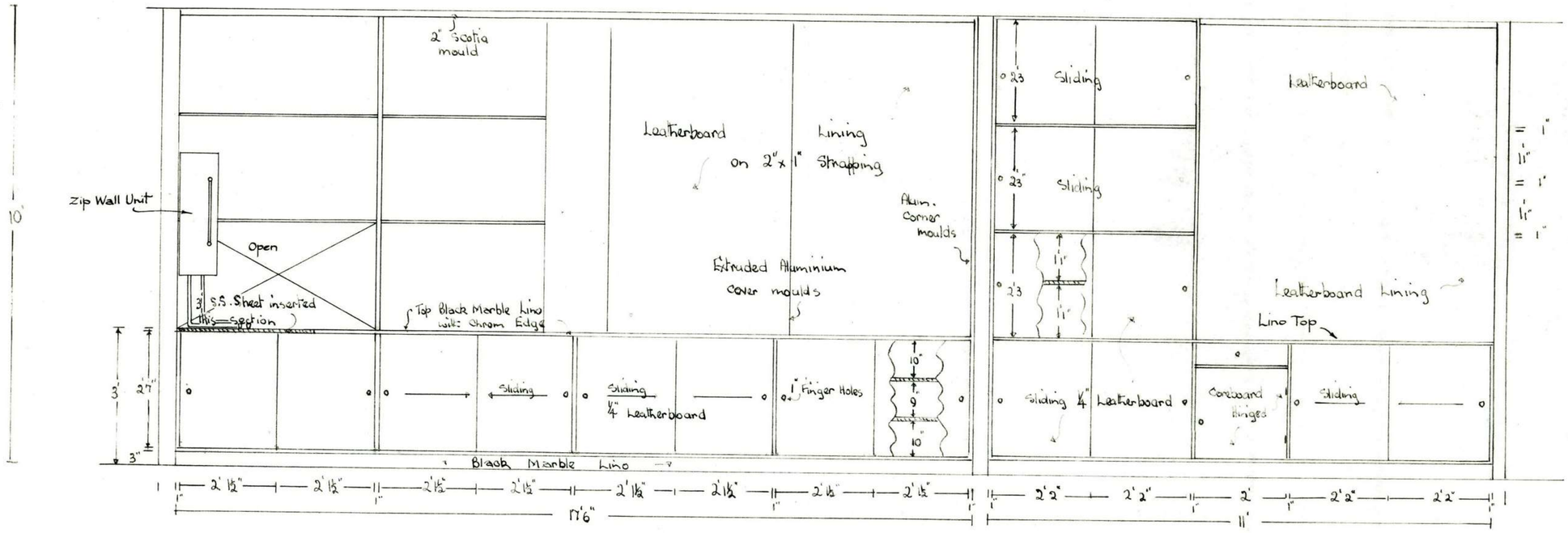


Details	Scales:- Varying	Drawing No.



Lighting Plan	Scale :- 1/8 = 1'0"	Drawing No.

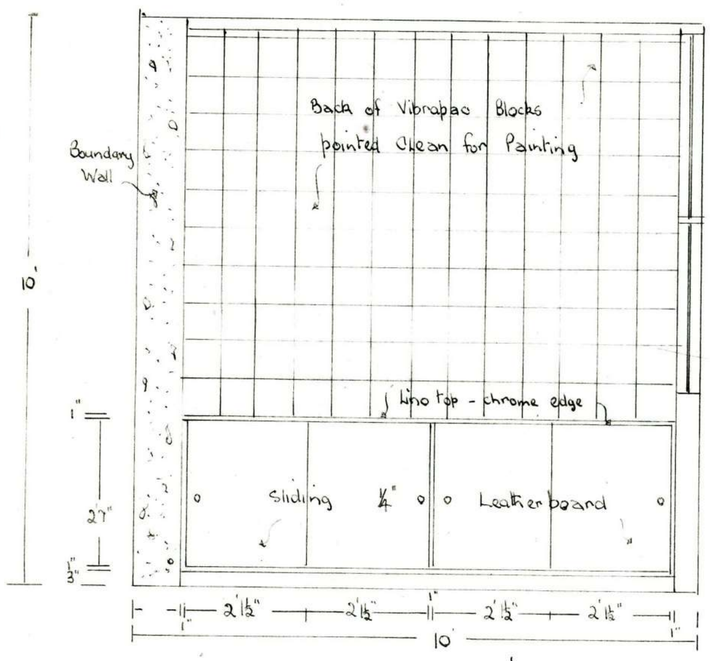
44
46
269
176
2024



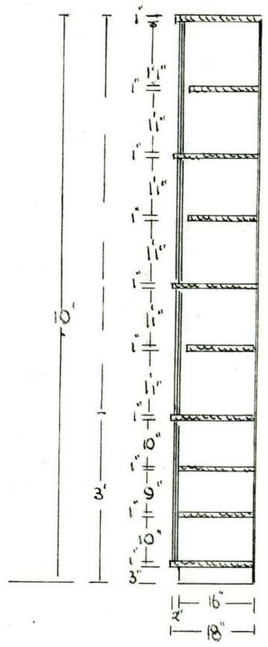
° Cupboards, Main Office °

° Cupboards, Managers Office °

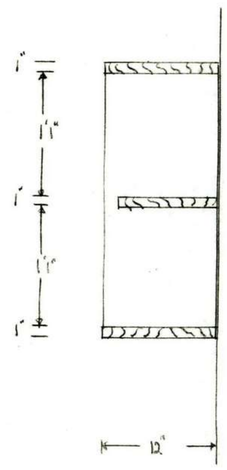
Scale ½" = 1'0"



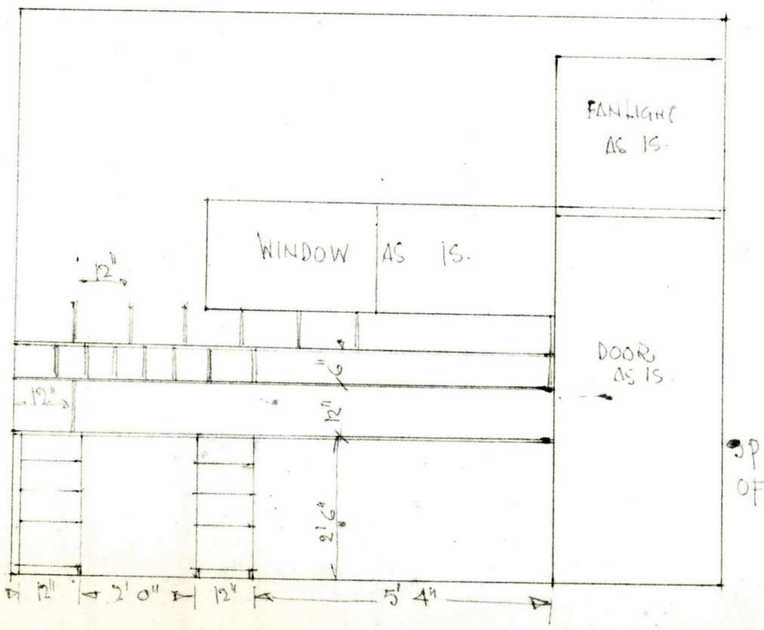
° Cupboards, Salesmans Office °



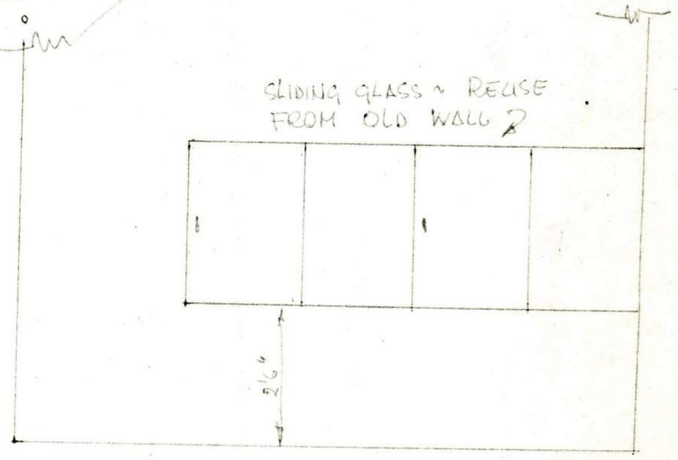
° Section thru' Cupboards °
° managers Office °



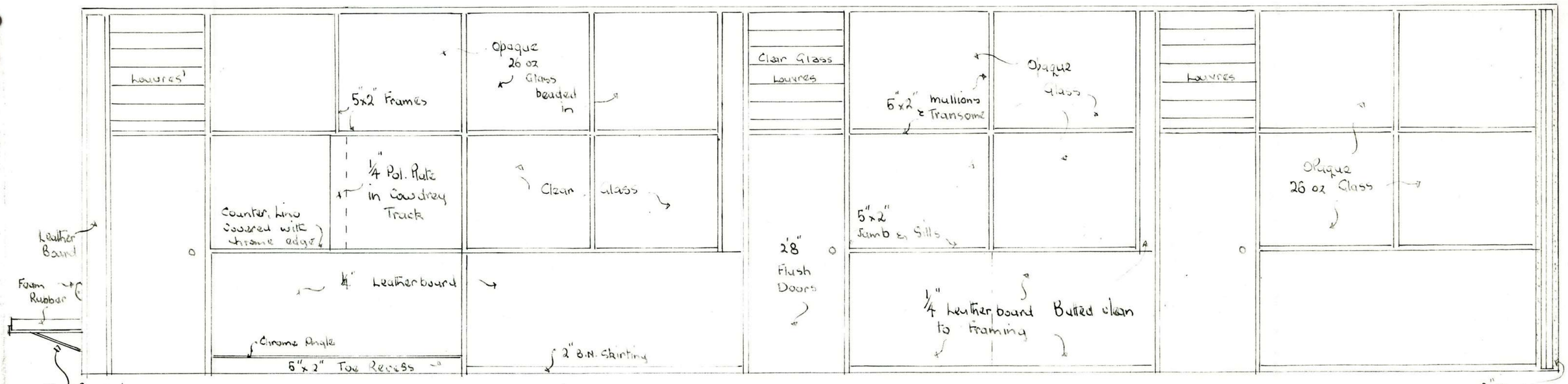
° Section thru' Bookcase °
Scale 1" = 1'



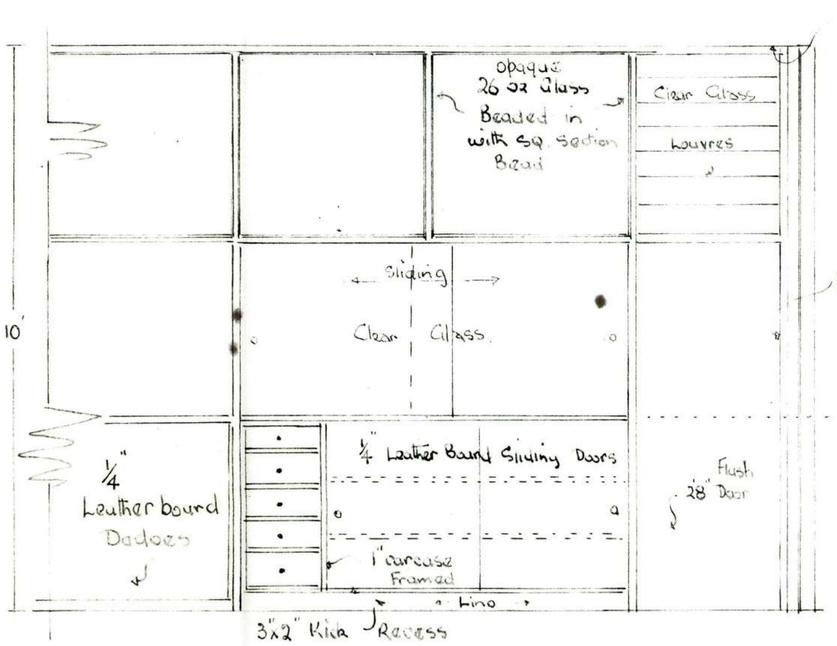
° SPARE PARTS OFFICE ~ SIDE WALL °



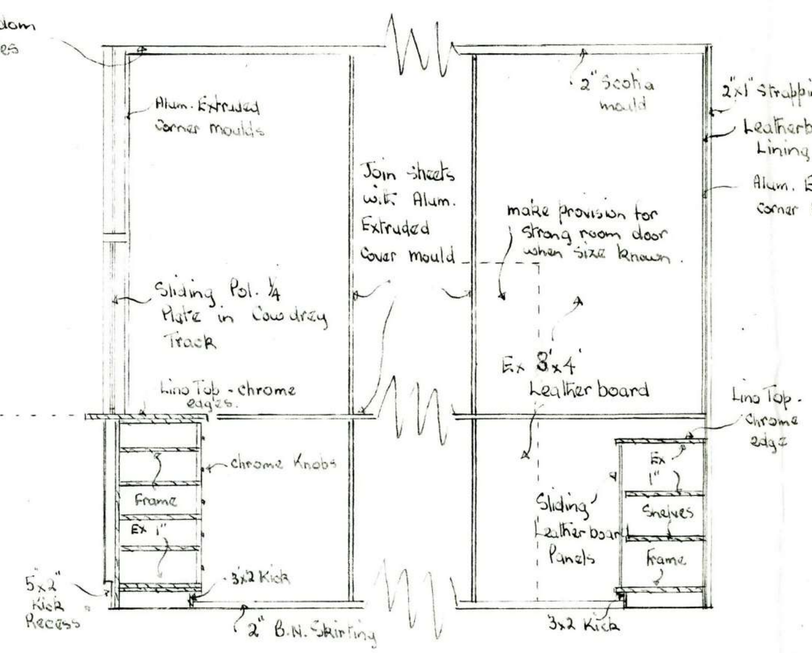
° Details °	Scales:- ½" = 1'0" 1" = 1'0"	Drawing No:-



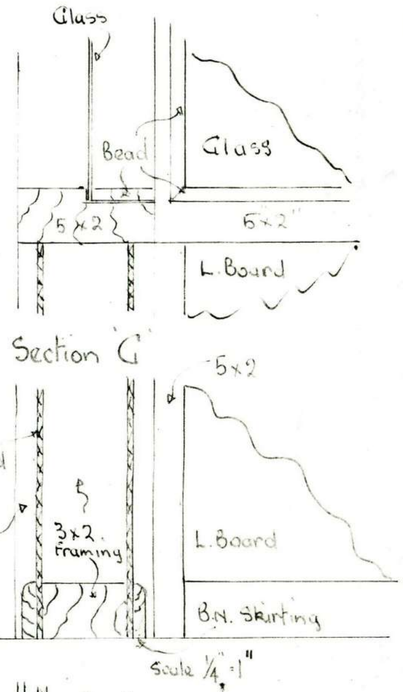
Office Wall Elevation - Section AA
Scale ½" : 1'

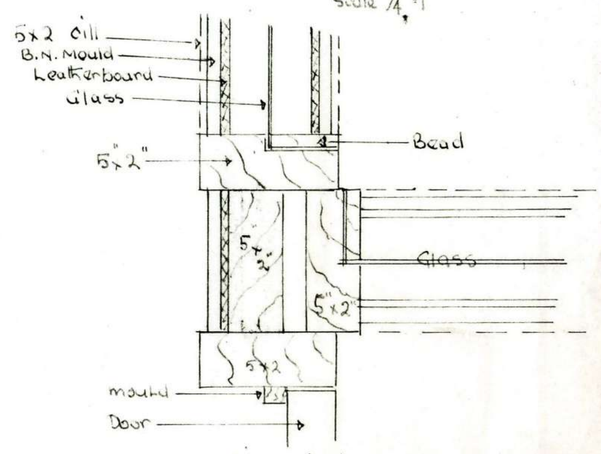


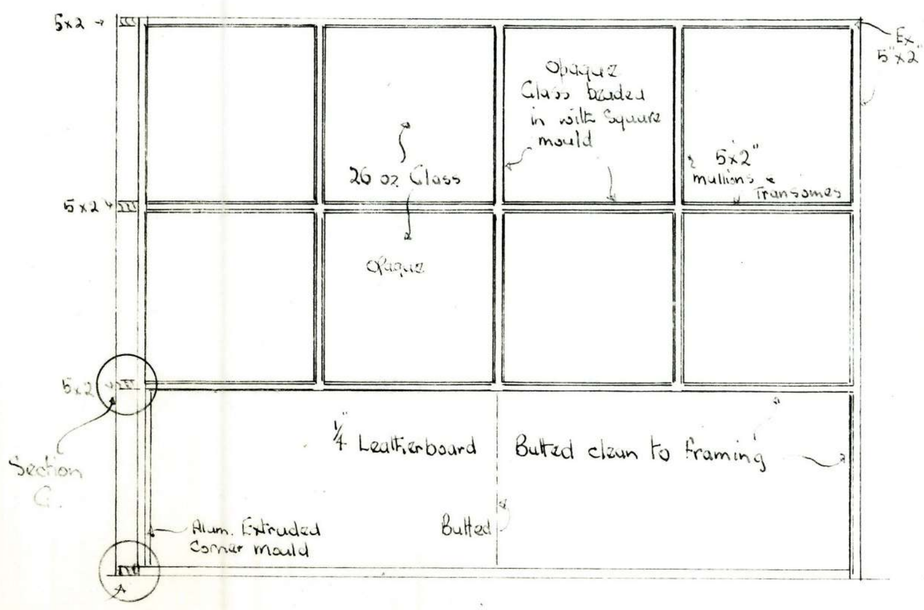
Main Office - Section EE



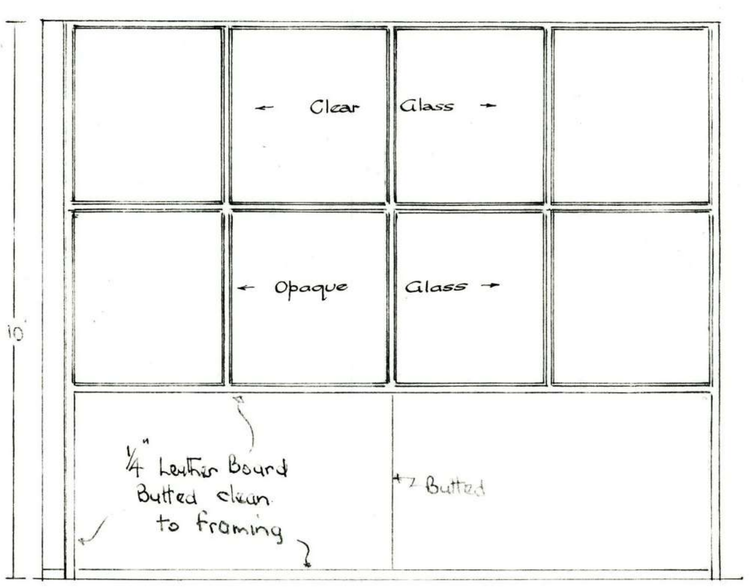
Main Office - Section FF





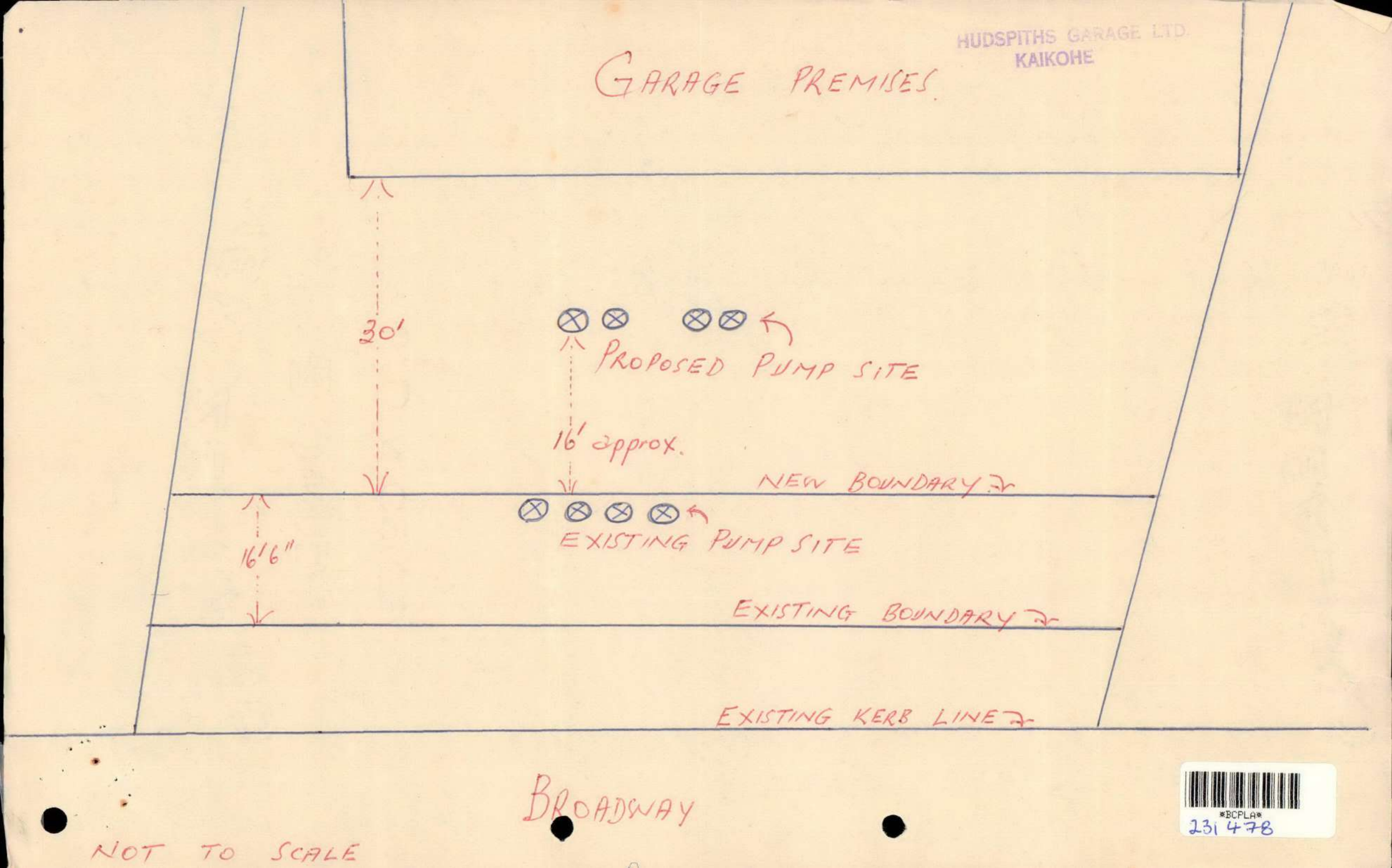


Partition Wall between Manager & Main Office



Partition between Sales & managers Office

Scales:- ½" = 1'0"
¼" = 1"



NORTHLAND REGIONAL COUNCIL

FILE NOTE

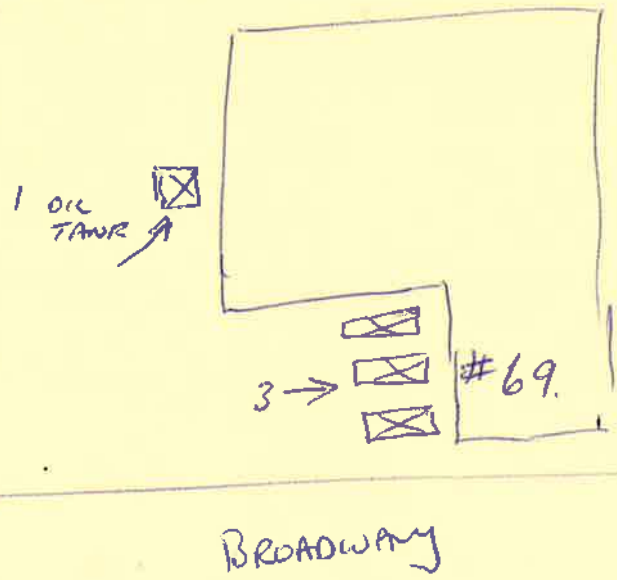
Date: 1ST JULY 1996

File Number:
Action Number:

Correspondence From: GARY YOUNG.

Subject: TANK REMOVAL - PETERSON TOYOTA KAIKOHE.

Action Taken: SITE VISIT, 4 x TANKS REMOVED BY FUELQUIP. DG INSPECTOR AT SCENE AND SAMPLES TAKEN BY NIWA. ALL OK.



Signed: .....

Title: Waste Monitoring

NORTHLAND AGE

Peter Petersen is calling it a day

Northland Age
By Sandy Myhre

20 Aug, 2020 09:36 AM 2 mins to read

Peter Petersen is bringing the curtain down on 47 years in business. Photo / Supplied

There has been a car dealership on Kaikohe's Broadway for 75 years, but not for much longer.

Petersen Motors is closing at the end of the month. Staff have bought the parts and service departments, which will move to Raiharo St, while the car sales department will cease operating altogether.

The first dealership on the site opened just after World War I, selling Morris, Austin, Triumph and Leyland cars, and in 1973 Peter Petersen bought the business as a Morris dealership, under the Motorcorp banner.

A few years later Motorcorp relinquished some of the smaller dealers within its network, and Kaikohe's was one of them. Petersen was left without a franchise, so he began selling Hyundais and Ladas, which were new to New Zealand and considerably cheaper than most other new cars on offer at the time.

Both were somewhat Spartan, but price drove their popularity. What eventually affected sales was the introduction of used imports from Japan, which, although second-hand, boasted greater comfort levels. Hyundai has gone from strength to strength, but Ladas are now virtually extinct outside Russia.

Meanwhile, for 25 years, from the early 1960s, Kaikohe was very much the commercial centre of the Far North, days that Petersen remembers well.

"Kaikohe was a bustling little town back then," he said.

"In my time there have been some significant changes to rural areas, starting in the mid- to late-80s, when the economy began to change."

In 1989 he was offered a Toyota franchise, and the dealership changed brands. He continued with Toyota until 2003, when, in a déjà vu moment, Toyota chopped small dealerships around the country and Petersen Motors was again left in the lurch. Since then it has successfully concentrated on second-hand cars selling for less than $10,000, but now even that is coming to an end.

Petersen said he was well past the "normal time" for retirement, and would even be looking at selling his collection of increasingly rare car manuals to collectors.

The land where Petersen Motors stands, and next door to where once stood a second-hand clothing shop, is believed to have been bought by the Far North District Council.

Land on the eastern side, where once stood the Kaikohe Hotel, is owned by Te Rūnanga ā Iwi o Ngāpuhi.

Potentially Contaminated Sites Survey *Contam id #* 167

- Site Name Peterson Toyota Location 69 Broadway Kaikohe
- Owner Peter Peterson Phone Number 4010388
- Legal Description of Property

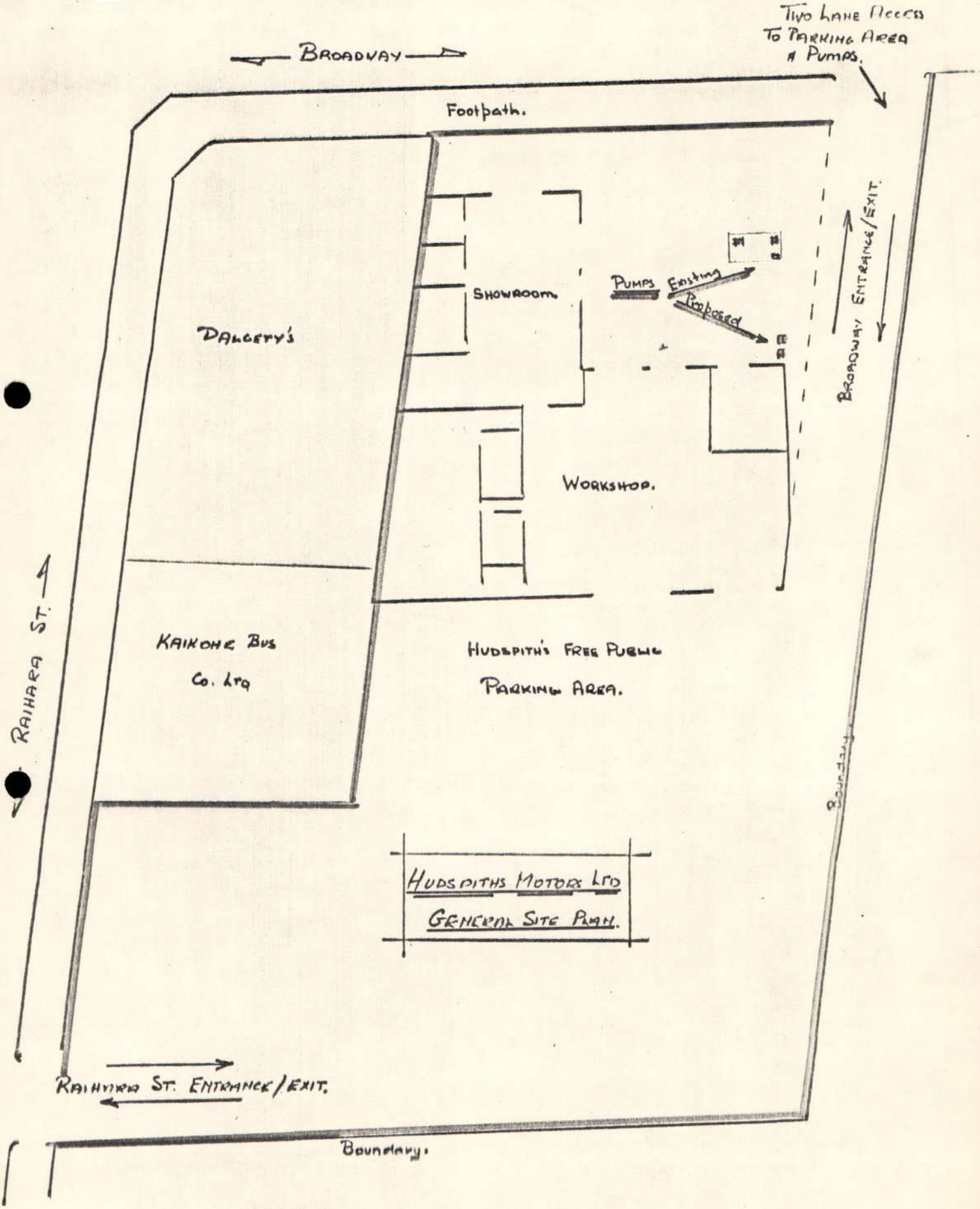
Map Ref E -
N –

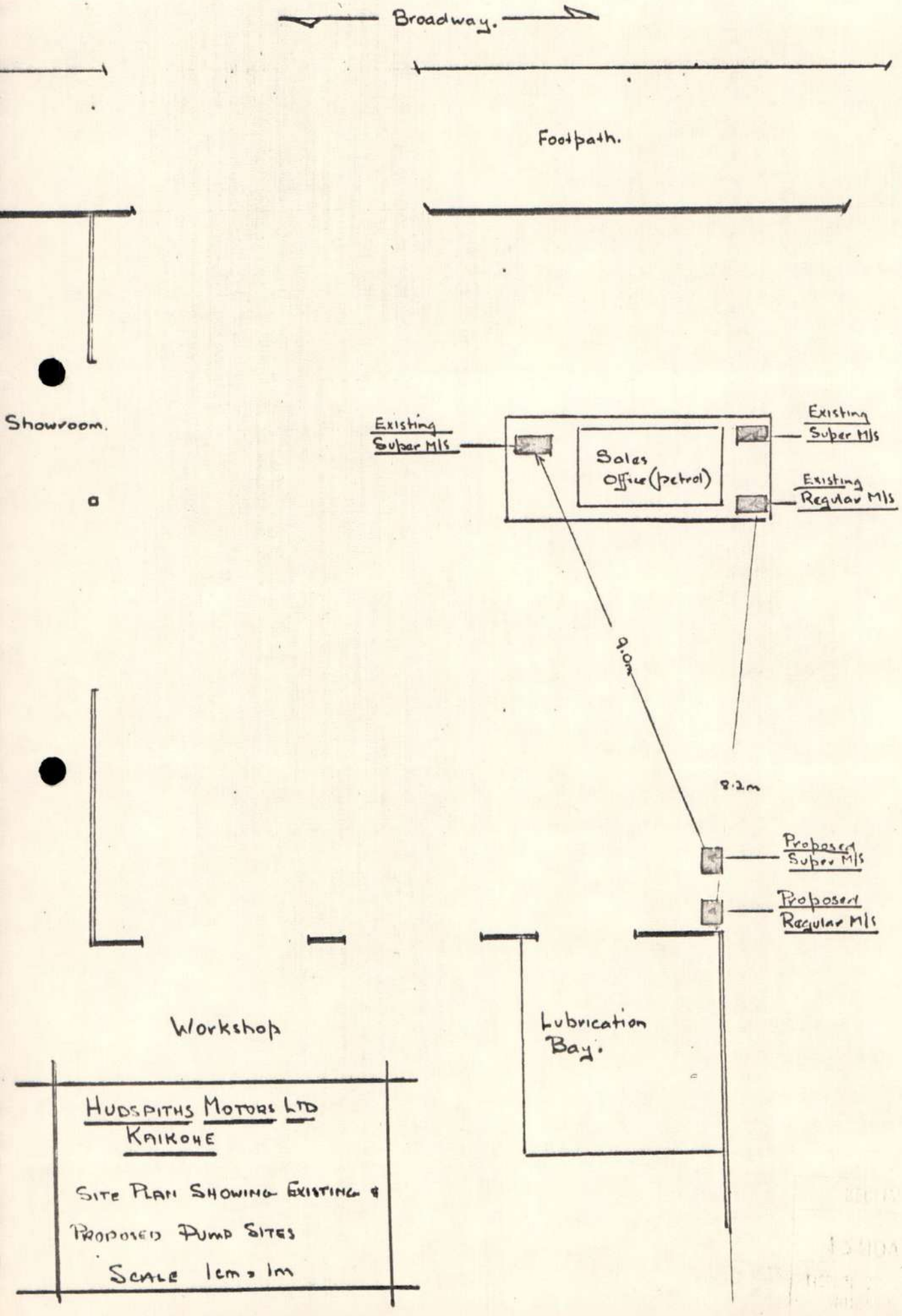
- Nature of Processes and Operations Auto Sales Service
- Dangerous Goods License Yes ☐ No ☑
- Chemicals Held 0.1 Gx 300L AG Tank
- Waste Types 0.1
- Disposal Method Collected by Salters
- Discharges
- Site History 60yrs

Comments Site has been a garage of some sort since before WWII. Used to have petrol tanks. Has undergone a renovation 15yrs ago.

NRC Officer SM

Date 12/01/01


Two Lane Access To Parking Area & Pumps.
Broadway
Footpath.
Showroom.
Pumps Existing
Proposed
Broadway Entrance/Exit.
Dalgety's
Workshop.
Kaikohe Bus Co. Ltd
Hudspith's Free Public Parking Area.
Raihara St.
Boundary
Hudspiths Motors Ltd
General Site Plan.
Raihara St. Entrance/Exit.
Boundary



HUDSPITHS MOTORS LTD
KAIKOHE

SITE PLAN SHOWING EXISTING & PROPOSED PUMP SITES

SCALE 1cm = 1m

Appendix I– Photolog

Photolog

Photo 1. Front of site, outside of former vehicle showroom.

Photo 2. Accessway to rear of site.

Photo 1. Front of site.

Photo 4. Rear of site

Photo 5. Former vehicle show room.

Photo 6. Rear of site.

Photo 7. Rear of site, former automotive workshop to right.

Photo 8. Possible former washdown area.

Photo 9. Drain at southeast corner of building inspected with no evidence of hydrocarbons.

Photo 10. Drain at northeast corner of building inspected with no evidence of hydrocarbons.

Photo 11. Drain adjacent to suspected washdown bay. Inspected with no evidence of hydrocarbons.

Photo 12. Corregated iron and pipe on ground at rear of building.

Photo 13. Sump adjacent to washdown area inspected, with no evidence of hydrocarbons.

Photo 14. Inspection pits inside garage.

Photo 15. Inside of inspection pit 1.

Photo 16. Inside of inspection pit 2.

Photo 17. Dark staining in former workshop.

Photo 18. Dark staining in former workshop.

Photo 19. Former workshop with stockpiled charity supplies. Unable to fully inspect area underneath pallets..

Photo 20. Former vehicle showroom.

Photo 21. TP1

Photo 22. TP2

Photo 23. TP3

Photo 24. TP4

Photo 25. TP5

Photo 26. TP6

Photo 27. TP7

Photo 28. TP8

Photo 29. TP9

Photo 30. TP10

Photo 31. TP11

Photo 32. TP12

Photo 33. TP13

Photo 34. TP14

Photo 35. TP15

Photo 36. TP16

Photo 37. Excavator breaking out hardstanding

Traffic Impact Assessment
Kaikohe Public Library
for the
Far North District Council

Haigh Workman reference 24 122

November 2024

Phone: 0800 424 447 • info@haighworkman.co.nz • www.haighworkman.co.nz

Kerikeri • Whangarei • Warkworth

TABLE OF CONTENTS

Figures

Revision History

Revision №	Issued By	Description	Date
A	John McLaren	Draft for Circulation	1 November 2024

Prepared by:	Reviewed by:	Approved by:
John McLaren Transportation Engineer BE (Civil), CMEng, CPEng	**Tom Adcock** Senior Civil Engineer BE (Civil) MEng	**John Papesch** Senior Civil Engineer CMEng CPEng

Executive Summary

Haigh Workman Ltd was commissioned by the Far North District Council to undertake a Traffic Impact Assessment to support a land use consent application for development and construction of a municipal public library and associated car parking located on the corner of Broadway Road and Raihara Street, Kaikohe. The proposed development effectively relocates the current library 100m from its current location to the subject site. As such, minimal change in traffic patterns of the surrounding network are anticipated.

This report has provided all traffic related assessments for the proposed development with respect to the following:

- Existing road network;
- Traffic movements and connectivity; and
- Pedestrian safety within the area.

The development has complied with all of the Far North Operative District Plan relating to traffic and transportation. Discussion of layout, intersection selection and pedestrian safety has been provided in the report. Further safety improvement measures below are recommended as part of the development.

- No parking road marking is proposed along the frontage of Raihara Street (to improve safety and visibility at the vehicle crossing).
- The existing crossing at 69 Broadway Road (SH12) is to be stopped (subject to NZTA approval)
- Accessible parking is to be marked at the stopped crossing located adjacent to the front entrance of the library (subject to NZTA approval).
- Detailed design of the internal carpark and layout will occur following issue of the land use consent (Engineering Plan Approval).

This report addresses the effects of the development on local roading network, and egress to the local township. Internal pedestrian linkages are proposed, and provision for internal parking has been improved.

This transport assessment concludes that the possible traffic impacts from the proposed development are less than minor. Therefore, the development proposal is supported from a traffic engineering perspective, and there is no traffic related reason why resource consent should not be granted. In conclusion, the proposal is supported and acceptable from a traffic perspective.

1 Introduction

1.1 Project Brief and Scope

Haigh Workman Ltd was commissioned by the Far North District Council to undertake a Traffic Impact Assessment to support a land use consent application for development and construction of a municipal public library and associated car parking located on the corner of Broadway Road and Raihara Street, Kaikohe.

The library is to replace the existing library located at a central block location between the Kaikohe New World on Memorial Ave, Reclaim Fitness on Raihara Street, Tony's Butcher on Broadway, and the central public ablution block. The physical distance between the old library and the proposed location is approximately 100m by foot.

Figure 1 Location of new library, Kaikohe

This report addresses the effects of the development on local roading network and egress to the local township. It includes an assessment of traffic flows, car parking on site for the purpose of resource consent applications.

Separate reports prepared by Haigh Workman address civil engineering and geotechnical engineering.

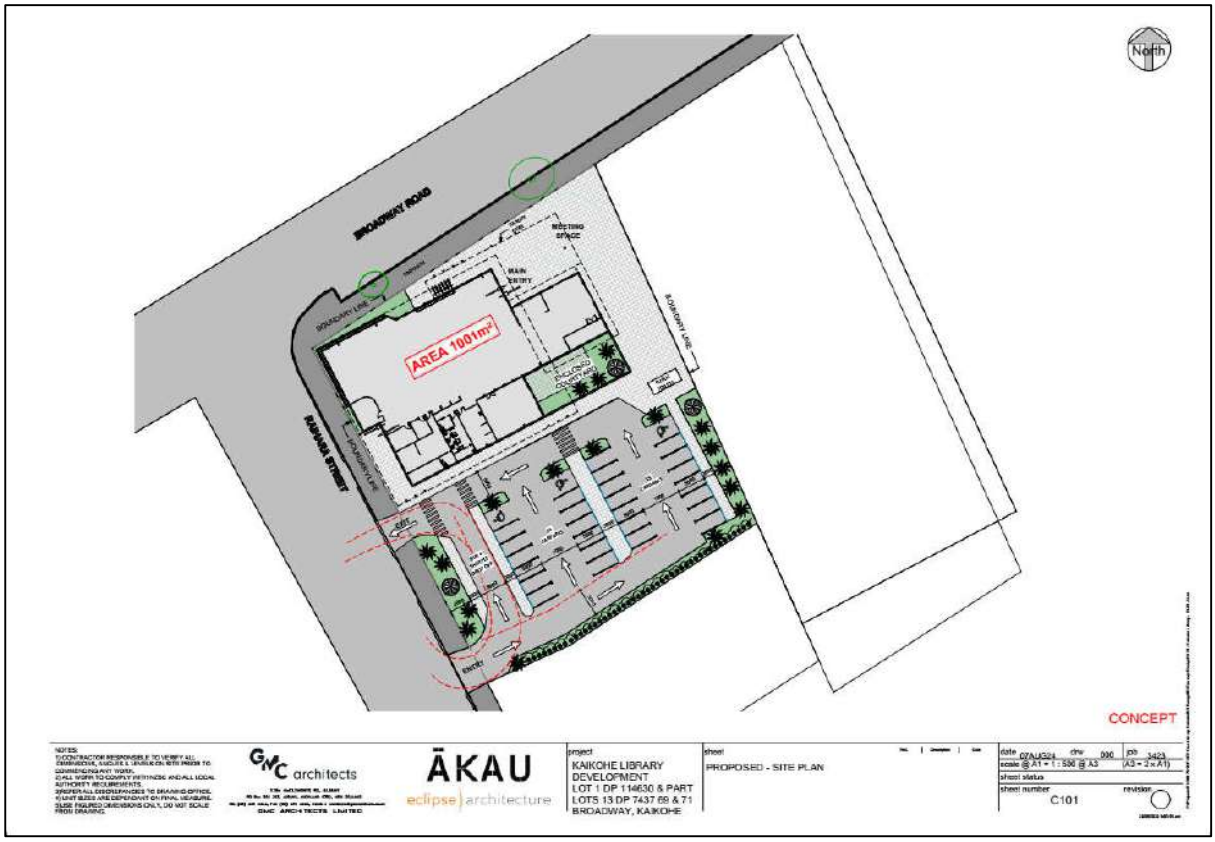


Figure 2 Concept Plan – Eclipse Architecture

A copy of the concept plan is included in Appendix A.

1.2 Disclaimer

This report has been prepared for our Client, Far North District Council, with respect to the particular brief given to us. The information and opinions contained within this report shall not be used in any other context for any other purpose without prior review and agreement by Haigh Workman Ltd. This report may not be read or reproduced except in its entirety.

2 Site Description

2.1 Identification

Address: 69 and 71 Broadway, Kaikohe, 0405

Legal Description: LOT 1 DP 114630 & PART LOTS 13 DP 7437 & Lot 5 DP 14826

Site Area: 3,864 m^2

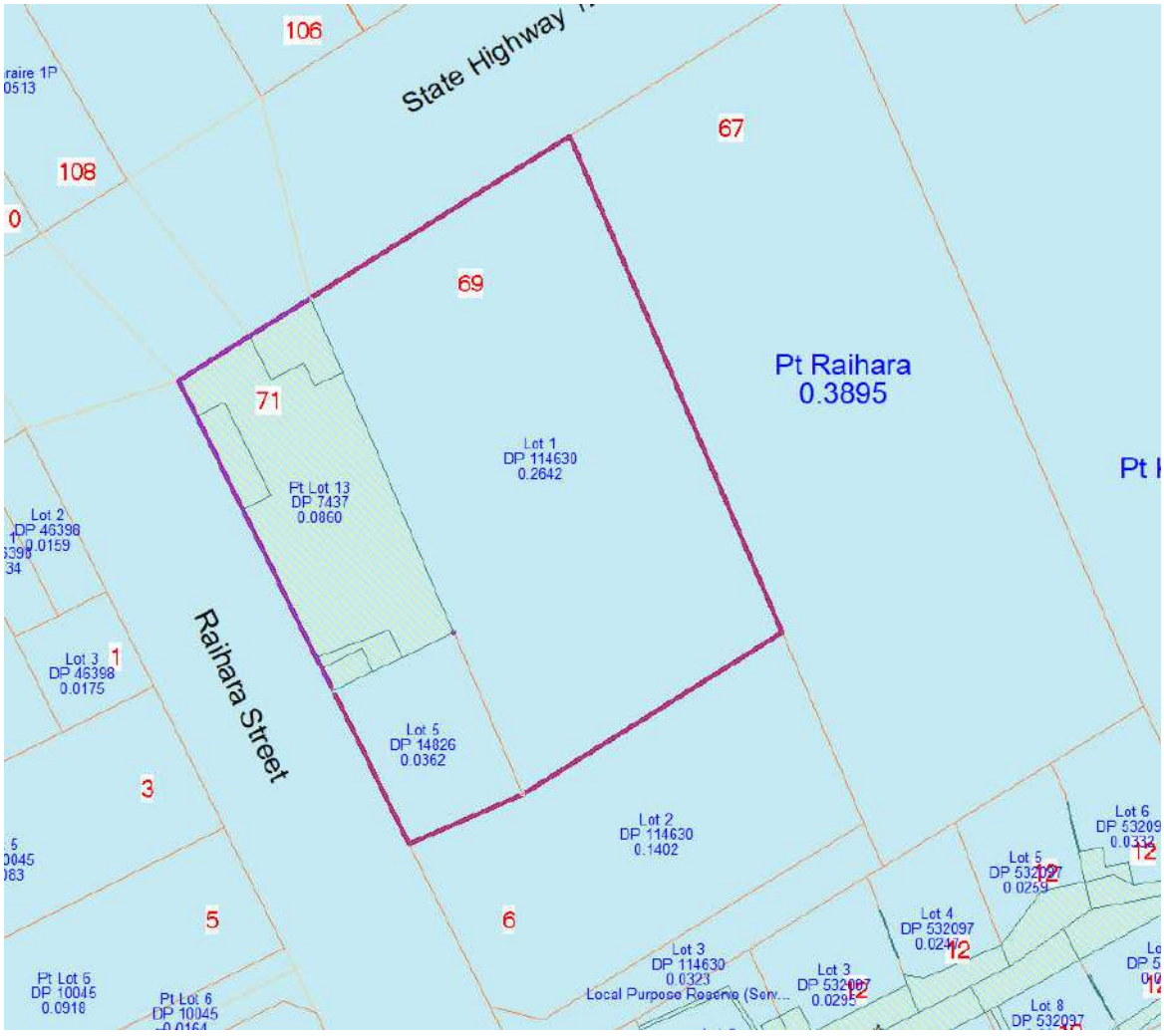


Figure 3 Quickmap Information

2.2 District Plan Zoning

The current District Planning Zoning in the Operative District Plan is:

- Commercial; (orange) overlaid with
- Pedestrian Frontage (red)

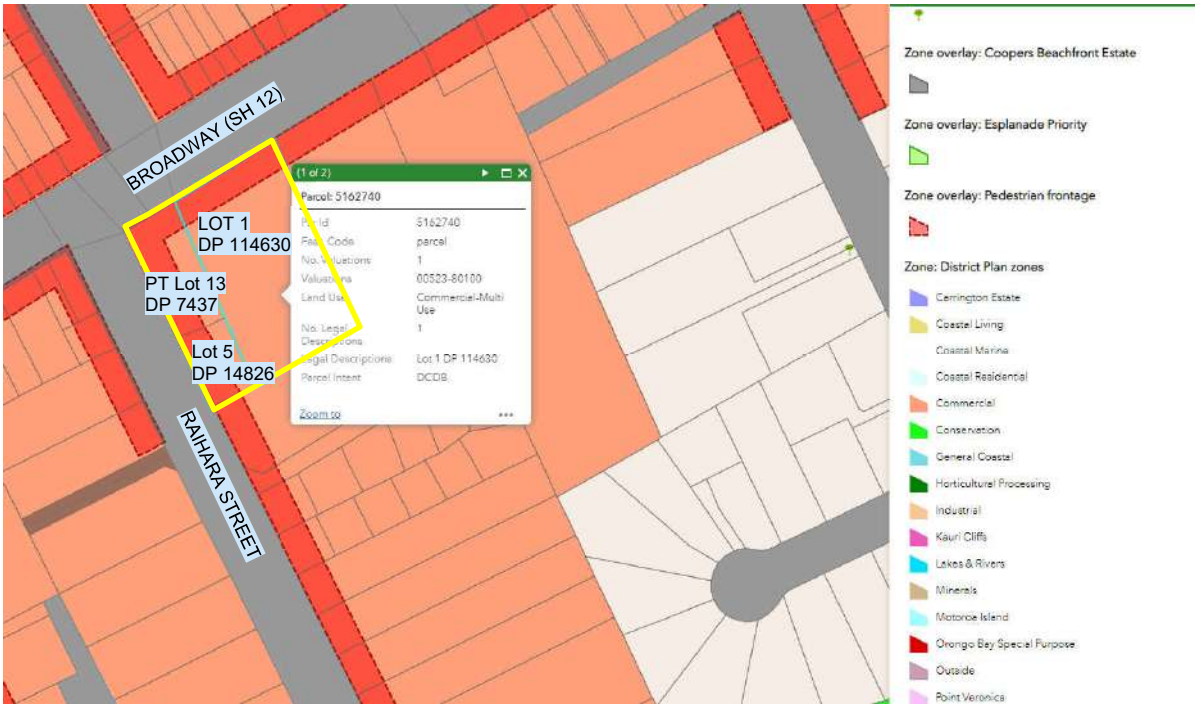


Figure 4 – Current Operative District Plan Zoning

2.3 Site Description

The site is situated on the eastern corner of Raihara Street and Broadway (SH 12). The subject site has an area of 3,864 m² and having recently been cleared, is brownfields undeveloped.

Broadway (State Highway 12) forms a gently ridge with land gently sloping towards the south and southeast.

Figure 5 Subject site – cleared and brownfields

2.4 Proposed Development

The concept plan shows a 1001m2 building, a small ablution block, 29 carparks (including 3 accessible carparks), and a bus/shuttle drop off with egress from Raihara Street.

3 Existing Traffic Volumes

Prior to clearing, the subject used to accommodate a “SaveMart” retail store and a “Toyota” franchise.

Figure 6 "SaveMart"

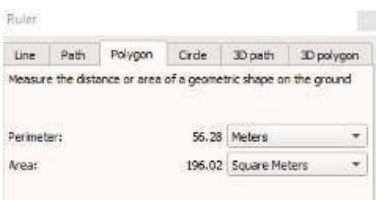
Figure 7 Toyota Franchise

Traffic intensity factors in Appendix 3a, while providing a test for planning status, these also provide a guide on historic traffic volumes.

Retail – Shops	50 per 100m^2 GBA	625 x 50/100	= 312 vehicles per day
Retail – Vehicle Sales	1 per 100m^2 GBA	= 196 x 1/100	= 2 vehicles per day
Retail – Vehicle Repair/Service	30 per 100m^2 GBA	= 30 x 531/100	= 159 vehicles per day
TOTAL			**473 vehicles per day**

Where Gross Building Area (GBA) has been defined as the building's footprint, enclosed floors, and rentable mezzanine. This includes the area of stairways, elevator shafts, and vertical duct shafts on each floor.

While approximate, the TIF calculation indicates recent historic volumes from the subject site could be around 473 vehicles per day.



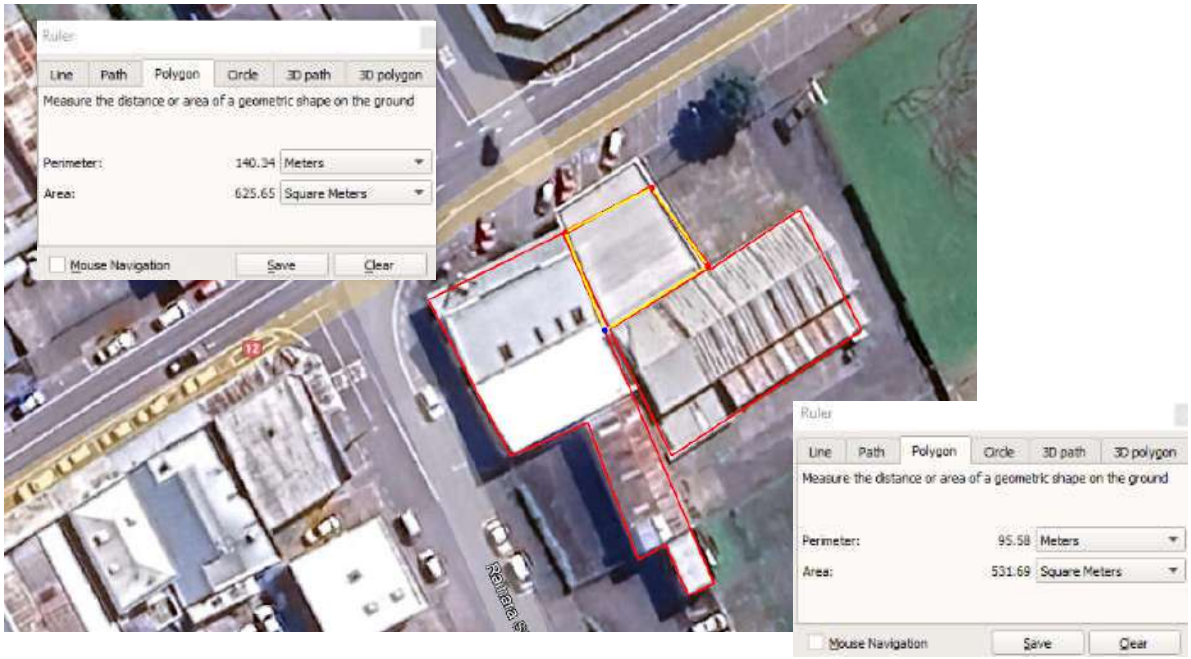


Figure 8 Approximated Gross Building Area

4 Trip Generation

For the purpose of this report, vehicles per day (VPD) is the total number of one way movements during a 24 hour period. A trip is defined as a one way traffic movement. The land use as a library has been estimated from first principles as follows:

No. carparks x 4 park occupation per day x 2 trips per carpark = 29 x 4 x 2 = 232 vehicles per day

Bus / Shuttle drop off x 12 drop off per day x 2 trips per drop off = 12 x 2 = 24 vehicles per day

TOTAL **256 vehicles per day**

As it can be seen above, trip generation is likely be to similar or less than historic trip generation from the subject site. In addition, relocation of the library premises approximately 100m from its current site is likely to have minimal change in traffic patterns at the intersection.

As traffic volumes may exceed 200 one way traffic movements, the development is a **controlled activity** (Table 15.1.6A.1 Maximum Daily One Way Traffic Movements of the Operative District Plan).

4.1 Broadway Road (SH12) / Raihara Street Intersection

With the current library relocation 100m from its current site, net generated effects on the intersection are anticipated to be nil.

The operating speed of vehicles on Broadway (SH12) approaching from the west was observed to be lower than 50km/hr, estimated to be 40km/hr. There is a pedestrian crossing 65m to the west of the intersection that helps to platoon traffic from the west.

Visibility to the west is often impeded by parked vehicles along Broadway that restricts visibility to around 40m. Removal of parking to improve sight distance is not expected to be received well by local business, so is not recommended.

Figure 9 Sight distance of approximately 40m to the west

Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections, Table 3.2 shows the SISD as 67m that corresponds to a 40km/hr design speed with a 1.5 second reaction time. The intersection does not meet safe intersection sight distance (SISD) standards while there are parked vehicles along Broadway Road (SH12).

The intersection achieves approach sight distance of 34m that corresponds to a 40km/hr design speed with a 1.5 second reaction time (Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections, Table 3.1). For the reasons above, no changes are recommended for visibility towards the east. To summarise the reasoning for recommending no change, these are:

- Platooning of traffic from the pedestrian crossing;
- Approach sight distance (40km/hr) being achieved; and
- Anticipated resistance for removal of parking in front of retail.

Figure 10 Sight distance to the east

Figure 11 Sight distance of around 90m to the east.

Safe intersection sight distance of 90m that corresponds to 50km/hr with 1.5s reaction time, can be achieved to the east.

5 Access and Parking

5.1 Access

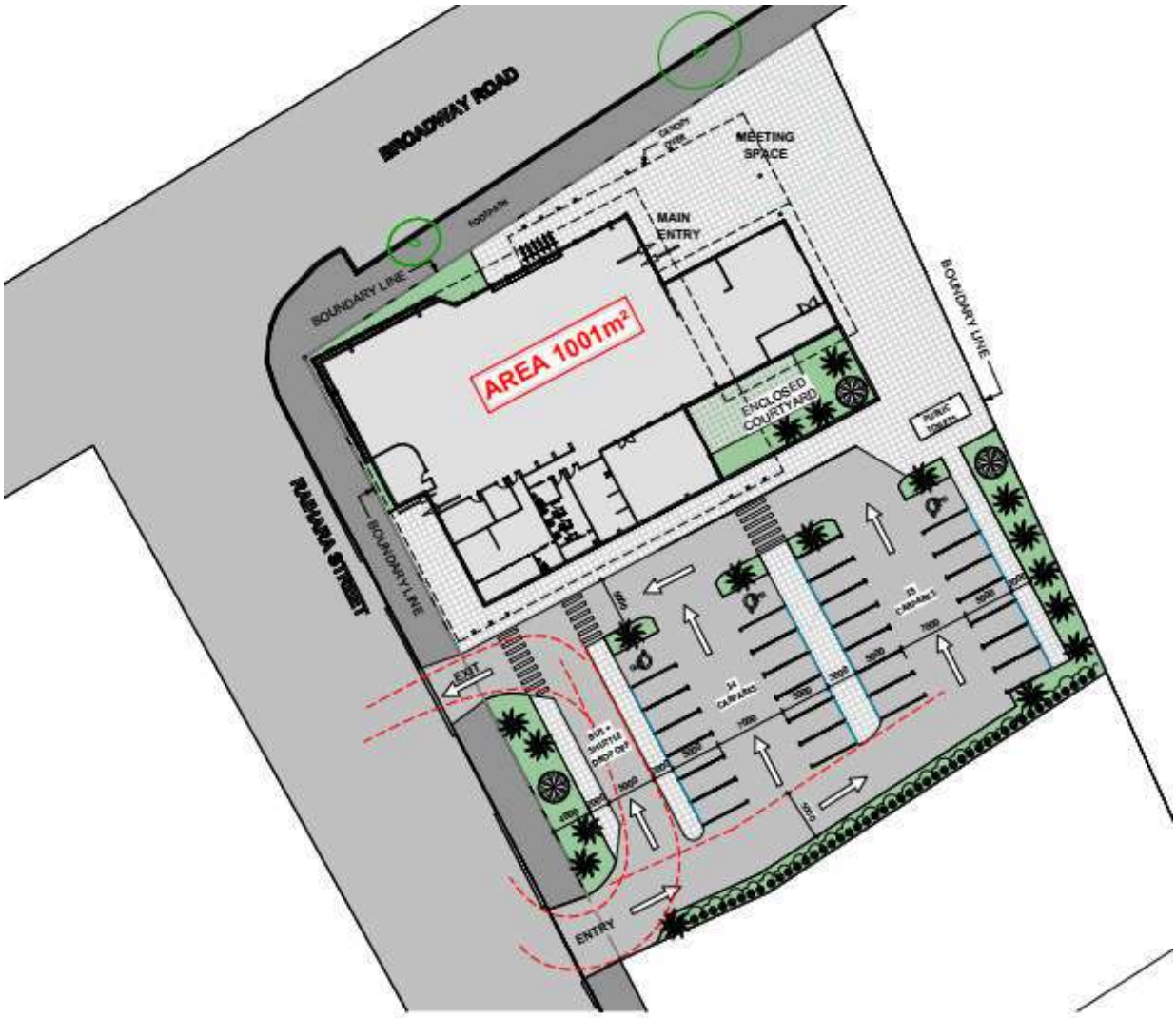


Figure 12 Access and parking

The exit is located approximately 31m from the Broadway (SH12) boundary. Subject to FNDC approval, it is recommended to extend the No Stopping broken yellow line from corner of Broadway intersection to the entry. This will ensure visibility for vehicles exiting the subject site is not impeded by parked vehicles. The No Stopping marking will involve removal of eight parallel car parks along the frontage of the property along Raihara Street.

Subject to NZTA approval, the existing crossing 69 Broadway Road (SH12) is to be stopped. Subject to NZTA approval 2 x accessible carparks are to be marked at the current crossing location near the library front entrance on Broadway Road (SH12).

The orientation of the entry and exit from the site (exist being located closest to SH 12), maximizes the sight distance from the exit. The exit location reduces conflict between roadside car parking adjoining the neighbouring site reducing visibility at the exit.

Figure 13 New Roadside Marking

For vehicle sweep paths and vehicle tracking curves, a 9.3m minibus was checked the tracking worked. Car parks were checked using the 85th percentile car. Some changes are recommended during the design phase to optimise the carpark and vehicle tracking.

Figure 14 Snip of vehicle tracking for the car park using the 85th percentile vehicle.

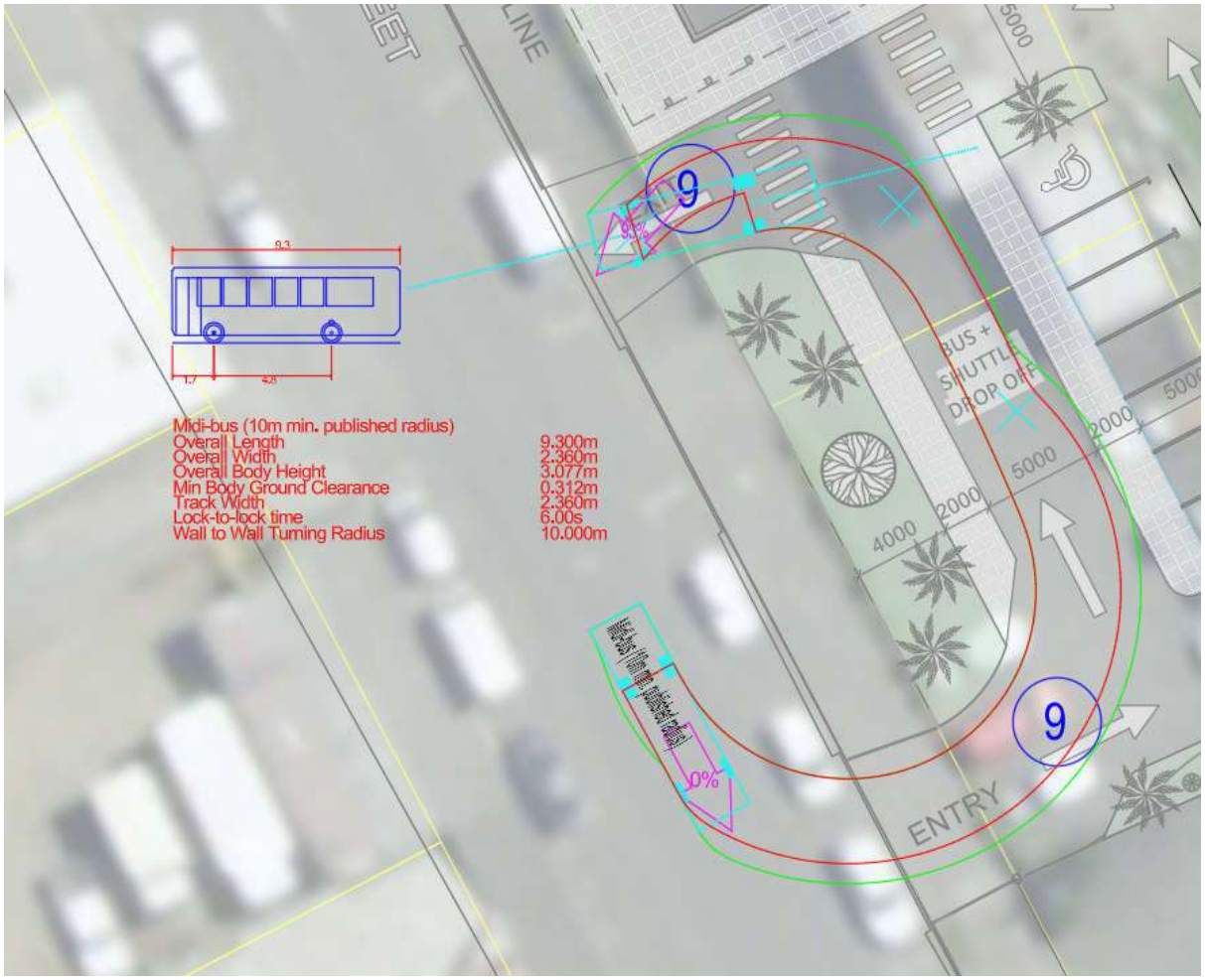


Figure 15 Snip of the shuttle / minibus using a 9.3m bus

5.2 Parking

There are 29 internal carparks shown on the concept drawing. The proposed library activity does not neatly fit into a category in Appendix 3c of the Operative District Plan. The proposed library is shown as 1001 m^2. Working on 1 person per 10m^2 the library could cater for 100 persons.

Possible categories under the Operative District Plan are

- Tertiary Education facility 1 per 3 persons facility is designed for
- Places of Entertainment 1 per every 4 persons designed to be accommodated
- Places of Assembly 1 per every 5 persons facility is designed for….

Working on 1 car park per 4 persons, a total of 25 car parks should be provided.

Under section 15.1.6B.1.4 Accessible Car Parking Spaces of the Operative District Plan, 2 accessible car parks are required.

A total of 29 car parks including 3 accessible carparks are shown on the concept plan. An additional 2 accessible car parks are recommended on Broadway Road (SH12) subject to NZTA approval.

Consultation was carried out with library staff. Library staff are supportive of the proposed layout and have requested 3 staff carparks of the 29 proposed carparks. A copy of the feedback is included in Appendix B.

A check of parking was made as a comparison against carparking at the existing library. There are approximately 19 car parking including 1 accessible car park.

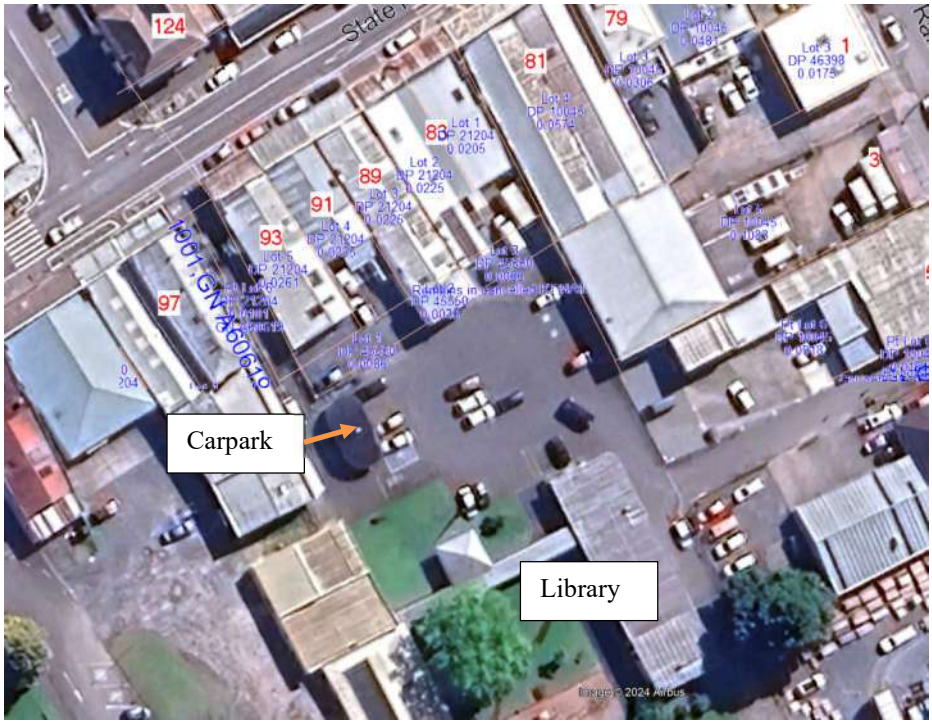


Figure 16 Current library and carpark.

Feedback from staff is that the existing carpark gets very busy as the same parking is utilised by the adjoining shops on Broadway (SH12).

In conclusion it is recommended that a minimum of 25 car parks be provided for the development as per the calculation above. It is recommended that two of these car parks should be accessible parking. It is considered that the new carpark will be sufficient for the needs of the proposed development.

5.3 Pedestrian Access

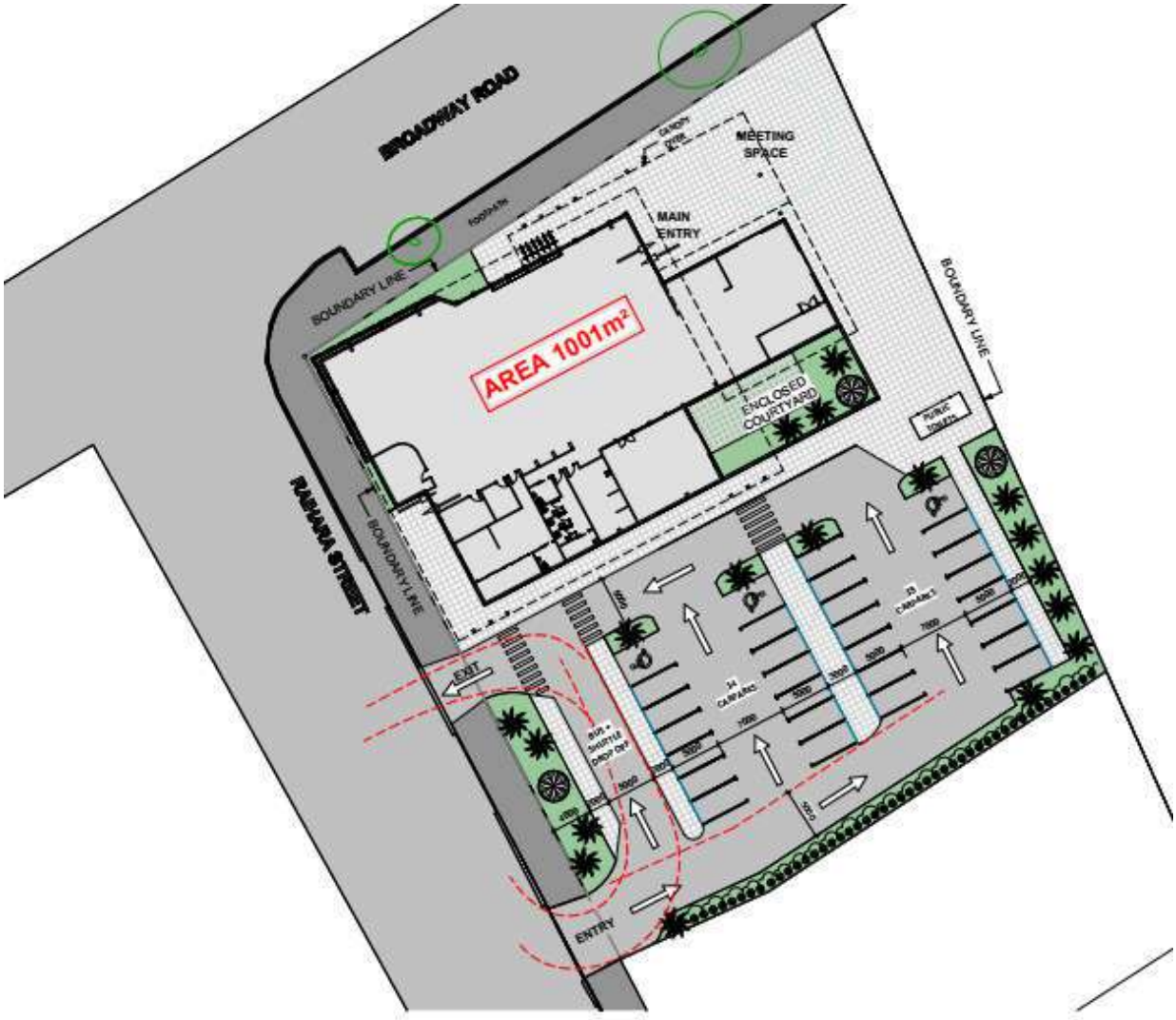


Figure 17 Access and parking

Under Objectives, Section 15.1.3.3 is "To ensure that appropriate provision is made for on-site car parking for all activities, while considering safe cycling and pedestrian access and use of the site".

It is considered that that the concept plan meets those objectives. The central 3.0m footpath is approximate. The minimum with of 1.5m should be provided for secondary footpaths. The width of 2.0m is shown on the concept plan that meets that recommendation.

Pedestrian access to the site is provided by adjoining footpaths on Broadway (SH12) and Raihara Street. There appears to be pedestrian circulation around the building and to main entry at the front of the building. There appears to be a cycle rack at the front of the building.

6 Safety

The NZTA Crash Analysis System (CAS) was checked near the subject site for the years 2019 – 2023 inclusive (5 years). There were five non-injury crashes, and three minor injury crashes recorded during the period. All of the crashes occurred on Broadway Road (SH 12).

Five of the crashes involved a motor vehicle striking an unmanned parked vehicle and/or a stationary object. One crash involved the driver falling asleep. One crash involved reversing into the vehicle behind while queued at Raihara Intersection. One of the crashes involved an overtaking vehicle.

Figure 18 Collision diagram 2019 - 2023 inclusive

While the crash record is very poor, (e.g. collision with stationary objects) there were no crashes that would suggest that the proposed development will degrade safety or make the local roading network unsafe. The CAS printout is included in Appendix C.

7 Assessment Criteria

7.1 FNDP Assessment Criteria

Activities may be granted consent when appropriately assessed under the assessment criteria described in the Far North District Plan. The following numbering refers to that of the Operative District Plan.

11.12 TRAFFIC INTENSITY

Criterion	Comment	Acceptable
(a) The extent by which the expected traffic intensity exceeds the threshold set by the Traffic Intensity Factor contained in Appendix 3A in Part 4 of the Plan.	*The threshold from Section 3A could not be determined. Estimated traffic volumes from the subject site are expected to be a reduction from historic traffic volumes from the subject site.* *Further to this, relocated traffic movements from the current library site to the subject site, are expected to result in nil change to the surrounding network.*	*Yes*
(b) The time of day when the extra vehicle movements will occur.	*No adverse effects expected from the time of day that vehicle movements are expected to occur.*	*Yes*
(c) The distance between the location where the vehicle movements take place and any adjacent properties.	*Entry to the site adjoins an existing vehicle crossing. The exit to the site has been nominated to maximise visibility from vehicles exiting the site around adjoining parallel parking.*	*Yes*
(d) The width and capability of any street to be able to cope safely with the extra vehicle movements.	*Geometry of Raihara Street is suitable to accommodate the expected traffic movements. Relocation of the current library by only 100m will result in minimal changes to the current traffic patterns. The current vehicle crossing at 69 Broadway (SH12) is to be stopped.*	*Yes*
(e) The location of any footpaths and the volume of pedestrian traffic on them.	*Adjoining footpaths has sufficient width to accommodate generated pedestrian traffic. Internal footpaths are to be constructed to accommodate internal pedestrian traffic movements.*	*Yes*

Criterion	Comment	Acceptable
(f) The sight distances associated with the vehicle access onto the street.	*Sight distances at the entry and exit are adequate. The exit is located 30m from SH12 to maximise visibility and safety for vehicles exiting the subject site.* *Removing the crossing at 69 Broadway is a positive for State Highway traffic.*	*Yes*
(g) The existing volume of traffic on the streets affected.	*There is likely to be a slight reduction in traffic volumes from the subject site. Relocation from the existing library to the subject site will have negligible change to traffic patterns in the local vicinity.*	*Yes*
(h) Any existing congestion or safety problems on the streets affected.	*There is poor driver behaviour on Broadway (SH 12) in vicinity of the site. The proposed development is not expected to change driver behaviour for better or worse.*	*Yes*
(i) With respect to effects in local neighbourhoods, the ability to mitigate any adverse effects through the design of the access, or the screening of vehicle movements, or limiting the times when vehicle movements occur.	*There is no material change in traffic patterns anticipated from relocation of the library 100m from the current site to the subject site.* *Relocation of access from 69 Broadway (SH12) to the side road is a positive.*	*Yes*
(j) With respect to the effects on through traffic on arterial roads, strategic roads and State Highways, any measures such as right-turn bays, flush medians, left turn deceleration tapers, etc. proposed to be installed on the road as part of the development to accommodate traffic turning into and out of the site.	*There is no material change in traffic patterns on State Highway 12 or arterial roads that would be anticipated from relocation of the library 100m from the current site to the subject site.*	*Yes*
(k) The extent 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.	*The additional traffic is not expected to exacerbate effects from natural hazards that would increase risk to life, property or the environment.*	*Yes*
(l) The extent to which the activity may result in adverse effects on the safety and efficiency of the State Highway system and its connections to the local roading network.	*No adverse effects on the safety or efficiency of State Highway 12. Relocation of access from 69 Broadway (SH12) to the side road is a positive.*	*Yes*

Criterion	Comment	Acceptable
(m) the effects on the safety and/or efficiency on any State Highways, its connections to the local road network and the provision of written approval from the NZ Transport Agency.	*No adverse effects on the safety or efficiency of State Highway 12 or its connections to the local roading network.* *Relocation of access from 69 Broadway (SH12) to the side road is a positive. Approval is required to stop the existing crossing at 69 Broadway (SH12).*	*Yes*
(n) The effects of the activity where it is located within 500m of reserve land administered by the Department of Conservation upon the ability of the Department to manage and administer that land.	*No adverse effects on DOC land.*	*Yes*

15.1.6B.5 PARKING

Criterion	Comment	Acceptable
(a) Whether it is physically practicable to provide the required car parks on site.	A minimum number of 25 car parks is recommended. The number of car parks currently proposed (29) are adequate for the requirements of the proposed land use. It is recommended that the number of carparks, layout and ramps be optimised during design.	Yes
(b) Whether there is an adequate alternative supply of parking in the vicinity, such as a public car park or angled road parking.	Not required.	Yes
(c) Whether there is another site nearby where a legal agreement could be entered into with the owner of that site to allow it to be used for the parking required for the application.	Not required.	Yes
(d) Whether it can be shown that the actual parking demand will not be as high as that indicated in Appendix 3C.	The site already has adequate parking for the proposed land use. An endorsement from library staff is contained in Appendix B.	Yes
(e) Adequacy of the layout and design of the car parking areas in terms of other recognised standards, including the provision made to mitigate the effects of stormwater runoff, and any impact of roading and access on waterways, ecosystems, drainage patterns or the amenities of adjoining properties.	Engineering standards will be complied with and layout optimised during the design phase.	Yes
(f) Degree of user familiarity with the car park and length of stay of most vehicles.	Car parking will be used by staff familiar with the site and the public not familiar with the site.	Yes
(g) Total number of spaces in the car park.	Number of car parks provided is sufficient to accommodate the needs of the development.	Yes.
(h) Clear space for car doors to be opened even if columns, walls and other obstructions intrude into a car parking space.	The carpark will comply in this regard.	Yes
For sites with a frontage with Kerikeri Road between its intersection with SH10 and Cannon Drive: (i) the visual impact of hard surfaces and vehicles on the natural environment; (ii) the effectiveness of any landscape plantings in screening hard surfaces and vehicles associated with parking areas.	No frontage onto Kerikeri Road – Not applicable.	Yes

Criterion	Comment	Acceptable
(j) Whether cycling facilities or open green space have been considered or are appropriate as an alternative to car parking.	A cycle rack is proposed.	Yes
(k) Whether adequate consideration has been given to providing accessible car parking spaces for those with disabilities, the location of these spaces and regulating inappropriate use of the spaces.	A minimum 2 accessible car parks will be provided (3 shown on the concept drawings).	Yes
(l) The extent to which the site can be accessed by alterative transport means such as buses, cycling or walking.	Provision for a mini-bus has been provided for.	Yes
(m) The extent to which the reduced number of car parking spaces may increase congestion along arterial and strategic roads.	No spill-over parking from the site is anticipated.	Yes
(n) The degree to which provision of on-site car parking spaces may have resulted in adverse visual effects or fragmented pedestrian links.	Not applicable.	Yes
(o) Whether a financial contribution in lieu of car parking spaces is appropriate.	Not required – adequate car parking for the land use is to be provided.	Yes
(p) Consideration given to shared parking options between adjacent sites and activities that have varying peak parking demands.	Not required.	Yes
(q) The varying parking requirements for staff and customers.	A minimum of 3 staff parks are required. Adequate parking will be provided for staff and visitors.	Yes

15.1.7.2 VEHICLE ACCESS

Criterion	Comment	Acceptable
(a) Adequacy of sight distances available at the access location.	Sight distances comply with the relevant FNDC 2023 Engineering standards. FNDC approval to remove adjacent vehicle parking on Raihara Street is required.	Yes
(b) Any current traffic safety or congestion problems in the area.	The CAS database was reviewed. The proposed development is not expected to have a negative impact on safety.	Yes
(c) Any foreseeable future changes in traffic patterns in the area.	State Highway 1 is anticipated to reopen following closure in August 2022 for slip repairs at Mangamuka Gorge. No changes in the local traffic patterns are anticipated.	Yes

Criterion	Comment	Acceptable
(d) Possible measures or restrictions on vehicle movements in and out of the access.	No restrictions are required on vehicle movements.	Yes
(e) The adequacy of the engineering standards proposed and the ease of access to and from, and within, the site.	No changes are required to improve access.	Yes
(f) The provision of access for all persons and vehicles likely to need access to the site, including pedestrian, cycle, disabled, vehicular.	A minimum 2 accessible carparks will be provided. Three accessible carparks are shown on the concept drawings.	Yes
(g) The provision made to mitigate the effects of stormwater runoff, and any impact of roading and access on waterways, ecosystems, drainage patterns or the amenities of adjoining properties.	Covered in the engineering report prepared by Haigh Workman.	Yes
(h) For sites with a road frontage with Kerikeri Road between its intersection with SH10 and Cannon Drive: the visual impact of hard surfaces and vehicles on the natural character; the cumulative effects of additional vehicle access onto Kerikeri Road and the potential vehicle conflicts that could occur; possible use of right of way access and private roads to minimise the number of additional access points onto Kerikeri Road; (iv) the vehicle speed limit on Kerikeri Road at the additional access point and the potential vehicle conflicts that could occur.	No frontage to Kerikeri Road. Not applicable.	Yes
(i) The provisions of the roading hierarchy, and any development plans of the roading network.	The current vehicle crossing at 69 Broadway (SH12) is to be stopped that will result in a minor improvement to the function of Broadway (SH12).	Yes
(j) The need to provide alternative access for car parking and vehicle loading in business zones by way of vested service lanes at the rear of properties, having regard to alternative means of access and performance standards for activities within such zones.	Access to the site is proposed from the side road (Raihara Street).	Yes

Criterion	Comment	Acceptable
(k) Any need to require provision to be made in a subdivision for the vesting of reserves for the purpose of facilitating connections to future roading extensions to serve surrounding land; future connection of pedestrian accessways from street to street; future provision of service lanes; or planned road links that may need to pass through the subdivision; and the practicality of creating such easements at the time of subdivision application in order to facilitate later development.	Not applicable.	Yes
(l) Enter into agreements that will enable the Council to require the future owners to form and vest roads when other land becomes available (consent notices shall be registered on such Certificates of Title pursuant to Rule 13.6.7)	None required.	Yes
(m) With respect to access to a State Highway that is a Limited Access Road, the effects on the safety and/or efficiency on any SH and its connection to the local road network and the provision of written approval from the New Zealand Transport Agency.	The current vehicle crossing at 69 Broadway (SH12) is to be stopped that will result in a minor improvement to the function of Broadway (SH12). Carparking (accessible parking) at the current vehicle crossing is recommended subject to NZTA approval. The parking will be located close to the front entrance of the library.	Yes

15.1.6A.7 TRAFFIC INTENSITY

Refer Assessment Criteria 11.12.

Appendix A – Concept Plan

CONCEPT

NOTES:
1) CONTRACTOR RESPONSIBLE TO VERIFY ALL DIMENSIONS, ANGLES & LEVELS ON SITE PRIOR TO COMMENCING ANY WORK.
2) ALL WORK TO COMPLY WITH NZBC AND ALL LOCAL AUTHORITY REQUIREMENTS.
3)REFER ALL DISCREPANCIES TO DRAWING OFFICE.
4) UNIT SIZES ARE DEPENDANT ON FINAL MEASURE.
5)USE FIGURED DIMENSIONS ONLY, DO NOT SCALE FROM DRAWING.

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TEL (09) 476 4244, FAX (09) 476 4246, EMAIL : architects@gmcarchitects.co.nz
GMC ARCHITECTS LIMITED

ÄKAU
eclipse architecture

project
KAIKOHE LIBRARY DEVELOPMENT
LOT 1 DP 114630 & PART LOTS 13 DP 7437 69 & 71
BROADWAY, KAIKOHE

sheet
PROPOSED - SITE PLAN

Ref.	Description	Date

date 07AUG24 drw 000 job 3423
scale @ A1 = 1 : 500 @ A3 (A3 = 2 x A1)
sheet status
sheet number C101 revision

24/09/2024 9:57:10 am

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Appendix B – Feedback from Library

John McLaren

From: Nicola Smith <Nicola.Smith@fndc.govt.nz>
Sent: Wednesday, 23 October 2024 2:43 PM
To: John McLaren
Subject: FW: Car parking space at new build KH Library
Attachments: 18102024132331-0001.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

> You don't often get email from nicola.smith@fndc.govt.nz. Learn why this is important

Kia ora John

Apologies for the delayed response.

We have reviewed the attached and happy to proceed, noting we will need 3 of the carparks allocated for staff.

Happy to discuss if you need more info, my number is 0210591177 😊

Nic

Nicola Smith She/her Mon-Fri 8:00-17:00
Manager - Libraries & Customer Service
M 64210591177 | **P** 6494015373 | Nicola.Smith@fndc.govt.nz
Te Kaunihera o Te Hiku o te Ika | Far North District Council

Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029
fndc.govt.nz

From: Jacqueline Vance <Jacqueline.Vance@fndc.govt.nz>
Sent: Friday, October 18, 2024 1:36 PM
To: Nicola Smith <Nicola.Smith@fndc.govt.nz>; Tiffany Papuni-Moa <Tiffany.Papuni-Moa@fndc.govt.nz>
Subject: Car parking space at new build KH Library

Kia ora
Just had a Civil Engineer in wanting some feedback on the car parking space needed for the new build.
If someone can get in touch about that as soon as possible that would be great. He wants as much info as poss because once it is set it is set in stone ! Have scanned the doc and his card. Hard copy in KH Library.
😊

Jacqueline Vance
Customer Service Officer - Multiskilled - Kaikohe and Kawakawa Libraries
P 6494012416 | Jacqueline.Vance@fndc.govt.nz
Te Kaunihera o Te Hiku o te Ika | Far North District Council

Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029
fndc.govt.nz

Appendix C - Crash Analysis Output

Crash road	Distance	Direction	Side road	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor
012-0010	44	E	CLIFFORD STREET	201968217	21/05/2019	Tue	12:10	Unknown1 DIRN on 012-0010 hit rear end of Car/Wagon2 stop/slow for PEDESTRIAN	UNKNOWN1, failed to notice car slowing, stopping/stationary, speed on straight	Dry	Bright sun	Fine	Nil (Default)	Unknown	0	0	0
BROADWAY	39	N	CLIFFORD STREET	2022213517	14/02/2022	Mon	19:15	Car/Wagon1 WDB on Broadway hit Pedestrian2 (Age 27) crossing road from right side	CAR/WAGON1, alcohol test below limit, driver dazzled, driver over-reacted, failed to give way to a pedestrian, wrong pedal/foot slipped, ENV: dazzling sun	Dry	Bright sun	Fine	Nil (Default)	Nil	0	0	1
BROADWAY	40	N	CLIFFORD STREET	2022239893	19/10/2022	Wed	17:35	Ute1 NDB on Broadway hit rear end of Car/Wagon2 stopped/moving slowly, Ute1 hit boulder, parked (unattended) vehicle	UTE1, alcohol suspected, fatigue due to lack of sleep, speed on straight	Dry	Bright sun	Fine	Nil (Default)	Nil	0	0	1
BROADWAY	38	W	RAIHARA STREET	2021181492	16/03/2021	Tue	10:00	Car/Wagon1 EDB on BROADWAY hit Ute2 manoeuvring, Car/Wagon1 hit parked (occupied) vehicle	CAR/WAGON1, alcohol test below limit, other vehicle controls UTE2, alcohol test below limit	Dry	Overcast	Fine	Nil (Default)	Nil	0	0	0
BROADWAY		I	RAIHARA STREET	201979929	4/09/2019	Wed	20:20	Car/Wagon1 NDB on RAIHARA STREET lost control turning right; went off road to left	CAR/WAGON1, alcohol test below limit, other inattentive	Wet	Dark	Light rain	T Junction	Stop	0	0	0
RAIHARA STREET		I	BROADWAY	2020192928	27/11/2020	Fri	17:40	Left scene1 SDB on RAIHARA STREET hit Car/Wagon2 manoeuvring	LEFT SCENE1, did not check/notice another party behind	Dry	Bright sun	Fine	T Junction	Stop	0	0	0
BROADWAY	25	N	ROUTLEY AVENUE	2020156880	1/05/2020	Fri	17:25	Car/Wagon1 NDB on BROADWAY hit parked veh, Car/Wagon1 hit parked (unattended) vehicle	CAR/WAGON1, too far left	Dry	Overcast	Null	Nil (Default)	Nil	0	0	0
BROADWAY	25	N	ROUTLEY AVENUE	2020152686	24/05/2020	Sun	9:28	Car/Wagon1 WDB on Broadway hit Car/Wagon2 manoeuvring, Car/Wagon1 hit parked (unattended) vehicle	CAR/WAGON1, alcohol test below limit, wrong pedal/foot slipped	Wet	Overcast	Light rain	Nil (Default)	Unknown	0	0	0
BROADWAY	42	E	ROUTLEY AVENUE	2021206755	28/11/2021	Sun	14:00	Car/Wagon1 EDB on BROADWAY overtaking hit Car/Wagon2 head on	CAR/WAGON1, alcohol suspected, overtaking in the face of oncoming traffic, speed on straight CAR/WAGON2, alcohol test below limit SUV3, alcohol test below limit	Dry	Overcast	Fine	Nil (Default)	Nil	0	0	3

LEGEND

- Kaitā bench 3m with backrest
- Kaitā bench 3m
- Kaitā bench 2m
- Type D Cycle Stand
- Webber Bin
- Apollo 280 Drinking Fountain
- Basalt/granite paving, mixed colours
- Textured granite setts
- Conrete, exposed aggregate finish
- Volcanic stone wall
- Planting - garden mix 1
- Planting - garden mix 2
- Planting - garden mix 3
- +Ds Specimen tree - Kohekohe
- +Sm Specimen tree - Kowhai
- +Ae Specimen tree - Titoki

No.	Date	Revision
1.11	26.10.24	1

ĀKAU

Job:

Kaikohe Library and Civic Hub Landscape

Scale:

1:100@ A1
1:200@ A3

Drawing Title:

GA Plan north: plaza

Drawing Number: 1.11

Revision: 1

Issued for:

Preliminary Design

No.	Date	Revision
1.12	26.10.24	1

ÄKAU

Job:

Kaikohe Library and Civic Hub Landscape

Scale:

1:100@ A1
1:200@ A3

Drawing Title:

GA Plan south: car parking

Drawing Number: 1.12

Revision: 1

Issued for:

Preliminary Design

Furniture - seating

6no. Kaitā bench 3m WITH backrest

4no. Kaitā bench 3m WITHOUT backrest

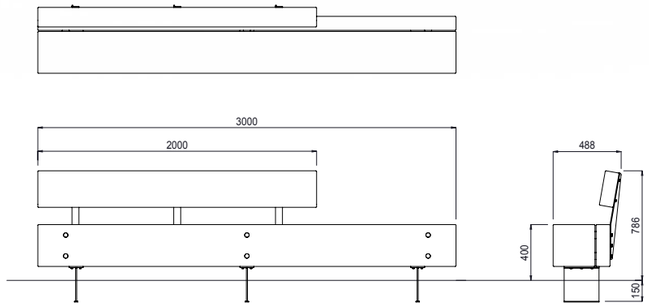
4no. Kaitā bench 2m WITHOUT backrest

1no. Kaitā bench, custom dimensions: 3m long x 600m wide

Kaitā Seat 3000L

fel. STREET FURNITURE NZ

Colours / finishes shown are indicative only and may differ in reality.



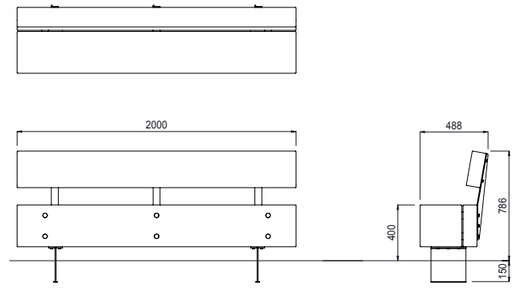
	MATERIALS	FINISHES	FINISH OPTIONS
Timber (Hardwood)	• Purple Heart as standard Other species available on request	• Un-sealed (Natural) as standard	• Penetrating oil / Graffiti guard / Clear sealant
Steelwork	• Mild steel as standard	• Hot dip galvanised powdercoated	• Custom paint options
Hardware / Fasteners	• Stainless steel		
	OPTIONS	**DIMENSIONS**	**WEIGHT**
	• Plant mounted • Skate deterrents	• 3000L x 786H x 488D as standard	• 496Kg

- Made to order and can be customised to suit clients requirements.
- Furniture is not supplied with installation instructions, install fastenings or footing details. These are to be specified and determined by the installing contractor for the specific requirements of each site.

Kaitā Seat 2000L

fel. STREET FURNITURE NZ

Colours / finishes shown are indicative only and may differ in reality.



	MATERIALS	FINISHES	FINISH OPTIONS
Timber (Hardwood)	• Purple Heart as standard Other species available on request	• Un-sealed (Natural) as standard	• Penetrating oil / Graffiti guard / Clear sealant
Steelwork	• Mild steel as standard	• Hot dip galvanised powdercoated	• Custom paint options
Hardware / Fasteners	• Stainless steel		
	OPTIONS	**DIMENSIONS**	**WEIGHT**
	• Plant mounted • Skate deterrents	• 2000L x 786H x 488D as standard	• 354Kg

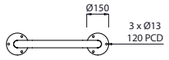
- Made to order and can be customised to suit clients requirements.
- Furniture is not supplied with installation instructions, install fastenings or footing details. These are to be specified and determined by the installing contractor for the specific requirements of each site.

Furniture - other

Type D Cycle Stand
600W x 1000H

5no. Type D Cycle Stand, inground mounted

Colours / finishes shown are indicative only and may differ in reality.



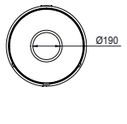
MATERIALS		FINISHES	FINISH OPTIONS
Steelwork	• Mild steel • 304 Stainless steel • 316 Stainless steel	• Hot dip galvanised only or Hot dip galvanised and powdercoated • Electropolished as standard • Electropolished or Bead blasted	• Custom paint options
OPTIONS		**DIMENSIONS**	**WEIGHT**
• Plant or Surface Mounted		475L x 1000H x Ø50.8 • 600L x 1000H x Ø50.8 800L x 1000H x Ø50.8 1000L x 1000H x Ø50.8	• 7Kg • 7.5Kg • 8Kg • 8.5Kg

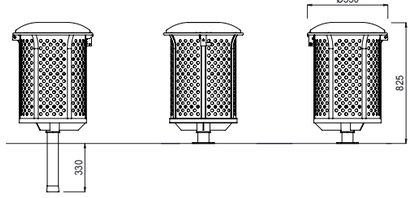
• Made to order and can be customised to suit clients requirements.
• Furniture is not supplied with installation instructions, install fastenings or footing details. These are to be specified and determined by the installing contractor for the specific requirements of each site.

Mayfair Bin

1no. Mayfair Bin, inground mounted

Colours / finishes shown are indicative only and may differ in reality.





MATERIALS		FINISHES	FINISH OPTIONS
Steelwork	• Stainless steel 304 or 316 grade • Stainless steel or mild steel • Galvanised liner as standard - 60L • Mild steel mounting base	• Electropolished as standard • Powdercoated as standard • Hot dip galvanised as standard	• Electropolished lid, frame, wrap • Electropolished lid, frame and powdercoated wrap • Electropolished lid, powdercoated frame and wrap
Hardware / Fasteners	• Stainless steel		
OPTIONS		**DIMENSIONS**	**WEIGHT**
• Plant or Surface mounted • Ashtray lid option		• Ø550 x 825H as standard	• 35Kg

• Made to order and can be customised to suit clients requirements.
• Furniture is not supplied with installation instructions, install fastenings or footing details. These are to be specified and determined by the installing contractor for the specific requirements of each site.

1no. Apollo 280 Drinking Fountain, with bottle filler, powdercoat colour TBC

Apollo 280 Drinking Fountain

Colourful architectural style drinking fountain

Material
Welded heavy steel fountain, powder coated finish

Mount
304 Stainless steel basin with bubbler, 1 x bottle filler

Length
900mm (H)

Clear all selections above

POA

SKU: DFA280

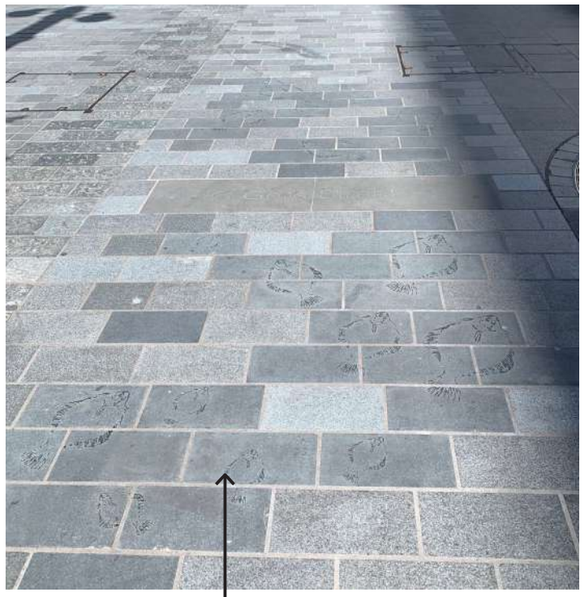
Paving palette

Plaza paving: 801m2 granite and basalt pavers, mix of colours. 2% of pavers to be etched with custom motif (to be designed).

Courtyard paving, 59m2. Same type and pattern as as plaza paving.

Paving under canopy opening: 18m2 textured granite setts.

All example images from Design Source - www.designsource.co.nz



Textured granite setts

Etched pavers

Granite and basalt pavers, mix of colours

Etched pavers

Planting palette

GARDEN MIX 1: 99m2. Plaza planters and courtyard

- Carex comans
- Elatostema rugosa
- Fuschia procumbens
- Hebe stricta
- Phormium cookianum

GARDEN MIX 2: 56m2. building edge at street

- Aceana inermus ‘Purpurea’
- Carex comans
- Fuschia procumbens
- Phormium cookianum

GARDEN MIX 3: 303m2. Car park edges

- Carex comans
- Hebe stricta
- Muehlenbeckia complexa
- Phormium cookianum

Specimen trees

- Titoki/Alectyron exelsus
- Kohekohe/Dysoxylum spectabile
- Kowhai/Sophora Microphylla

Planting schedule

Job Number J2539
Job Name **Kaikohe Library and Civic Hub**
Revision A - Preliminary
Date 27.10.24

Plaza and building exterior			(size, m2)				
Mix	**Area**	**Botanical name**	**Comon name**	**Size**	**Spacing (m)**	**% of mix**	**Total no.**
		Carex comans	Carex	2L	0.3	10%	33
		Elatostema rugosa	Parataniwha	2L	0.2	20%	99
		Fuchsia procumbens	Creeping Fuchsia	2L	0.2	20%	99
		Hebe stricta	Koromiko/Hebe	2L	0.3	30%	99
Garden mix 1	99	Phormium cookianum	Korari/Flax	2L	0.3	20%	66
		Acaena inermus 'Purpurea	Purple Hakea	2L	0.2	30%	84
		Carex Comans	Carex	2L	0.3	10%	19
		Fuchsia procumbens	Creeping Fuchsia	2L	0.2	40%	112
Garden mix 2	56	Phormium cookianum	Korari/Flax	2L	0.3	20%	37
							648

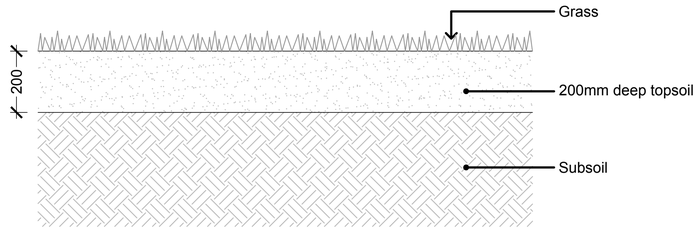
Car park			(size, m2)				
Mix	**Area**	**Botanical name**	**Comon name**	**Size**	**Spacing (m)**	**% of mix**	**Total no.**
		Carex Comans	Carex	2L	0.2	10%	152
		Hebe stricta	Koromiko/Hebe	2L	0.3	30%	303
		Muehlenbeckia complexa	Pōhuehue	2L	0.3	20%	202
Garden mix 3	303	Phormium cookianum	Korari/Flax	2L	0.3	40%	404
							1061

Large trees							
		Alectyron excelsus	Titoki	45L	As shown	n/a	5
		Dysoxylum spectabile	Kohekohe	45L	As shown	n/a	1
		Sophora microphylla	Kōwhai	30L	As shown	n/a	2

RE-GRASS ARE/ 4224m2

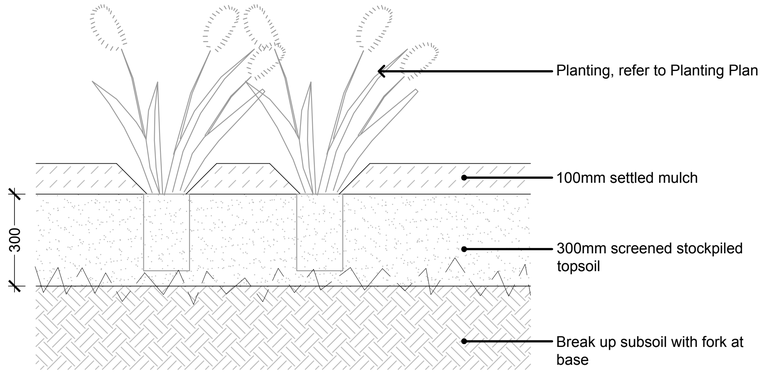
TOTAL BY SPECIES

Elatostema rugosa	Parataniwha	2L			99
Carex comans	Carex	2L			203
Fuchsia procumbens	Creeping Fuchsia	2L			211
Hebe stricta	Koromiko/Hebe	2L			402
Phormium cookianum	Korari/Flax	2L			507
Muehlenbeckia complexa	Pōhuehue	2L			202
Alectyron excelsus	Karaka	45L			5
Dysoxylum spectabile	Kohekohe	45L			1
Sophora microphylla	Kōwhai	30L			2
					1633



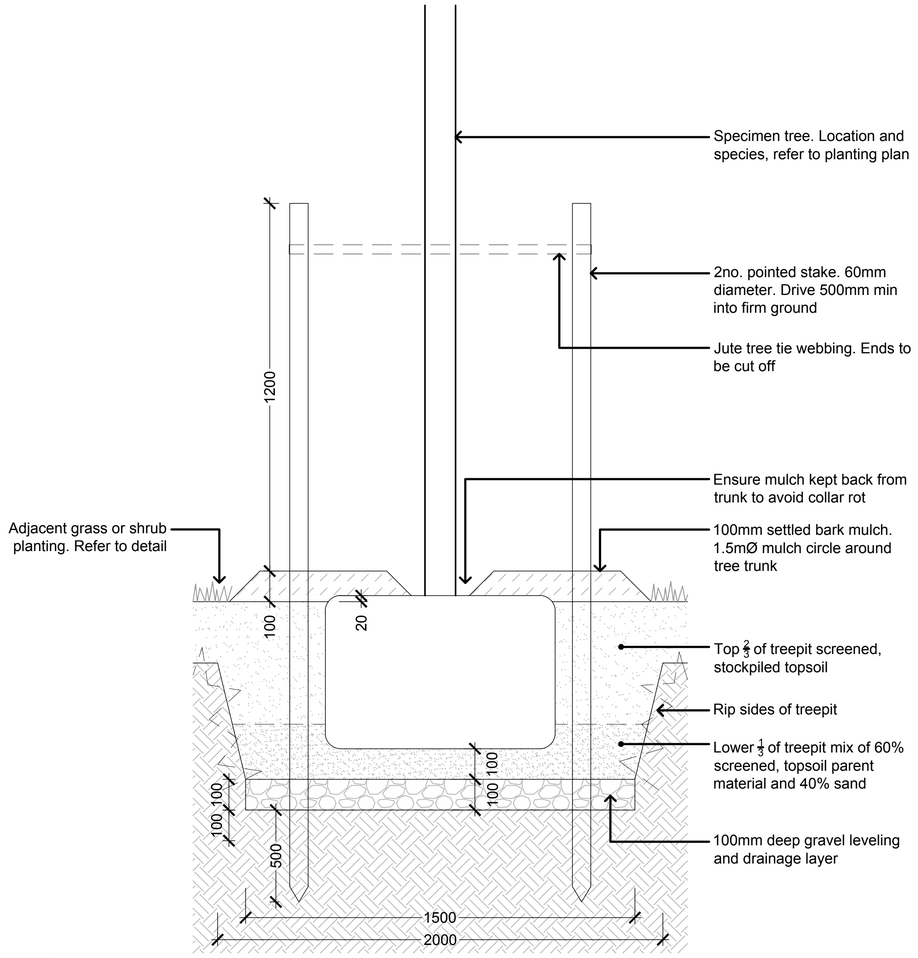
1 **Typical grass detail**

Scale: 1:10 @ A1, 1:20 @ A3



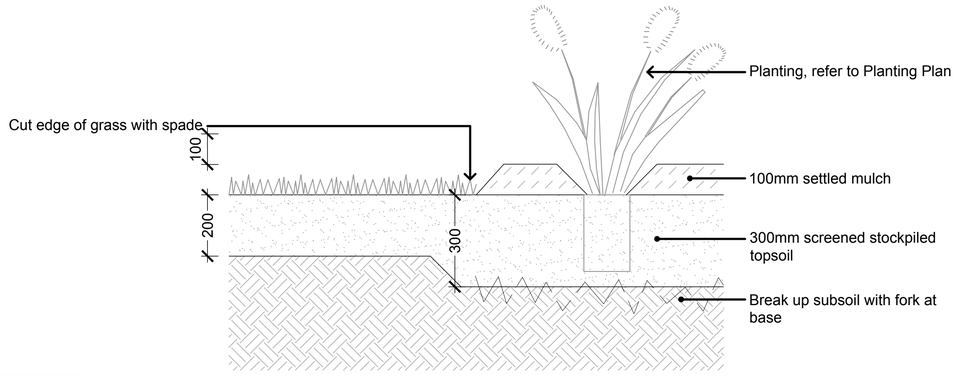
2 **Typical planting detail**

Scale: 1:10 @ A1, 1:20 @ A3



3 **Typical tree planting detail**

Scale: 1:10 @ A1, 1:20 @ A3



4 **Typical planting to grass edge**

Scale: 1:10 @ A1, 1:20 @ A3

Rev	Date	Details	Initials
B	07.03.2022	Construction	MH
A	01.02.2022	Detailed Design	MH

ÄKAU

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Project

Multisport Complex Lindvart Park, Kaikohe

Drawing

Typical planting details

Scale
as noted

Drawn
MH

Plot date
07.03.2022

Job number
AS20.13

Dwg number
3.41

Issue
C

MARSHALL DAY Acoustics

KAIKOHE PUBLIC LIBRARY
PRELIMINARY (DETAIL) DESIGN (UPDATED FOR FNDC SUBMISSION)

Rp 001 20231000 | 8 November 2024

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Project: **KAIKOHE PUBLIC LIBRARY**

Prepared for: **Far North District Council**
c/- Eclipse Architecture Limited
PO Box 7539
Victoria Street West
Auckland 1142

Attention: **Maurice Langdon**

Report No.: **Rp 001 20231000**

Document control

Status:	Rev:	Comments	Date:	Author:	Reviewer:
Approved	-	-	1 Nov 2024	Carlos Medina Panta	Peter Ibotson
Approved	1	Updated for FNDC Submission	8 Nov 2024	Carlos Medina Panta Peter Ibbotson	Peter Ibotson

TABLE OF CONTENTS

1.0 INTRODUCTION

Marshall Day Acoustics (MDA) has been engaged by Far North District Council to provide acoustic design advice for the Kaikohe library project. It is located in central Kaikohe at 71 Broadway Road.

The project consists of a one-level library building with a Gaming Room, Open Space Library Area, Community Kai, Community Room, Hui/Podcast Room, FNDC Meeting Room, Kaimahi Room, Whanau Room and Maker Space.

In this report, we detail our proposed acoustic design criteria, highlight important acoustical design elements and provide advice to enable compliance with the design criteria where necessary. Our report is based on the *FNDC FNH Kaikohe Library – Design Team Files + Correspondence – Design Documentation – 00_Preliminary Design* documentation.

Appendix A explains acoustic terminology used throughout this report.

2.0 PRIMARY ACOUSTIC CONSIDERATIONS

There are several key acoustic aspects which are important for achieving successful acoustic outcomes. These aspects are as follows:

- *Reverberation control*

  Absorptive finishes are needed to reduce reverberation within rooms, which improves comfort and reduces noise build-up. This is important because noise build-up in active areas can impede communication. The ability to interpret speech with people can be affected in noisy environments.

- *Sound insulation design*

  It is important that sufficient levels of airborne and impact sound insulation are achieved between adjacent enclosed spaces in order to prevent disturbance and privacy.

  Adequate external sound insulation is also important to control noise ingress into sensitive spaces.

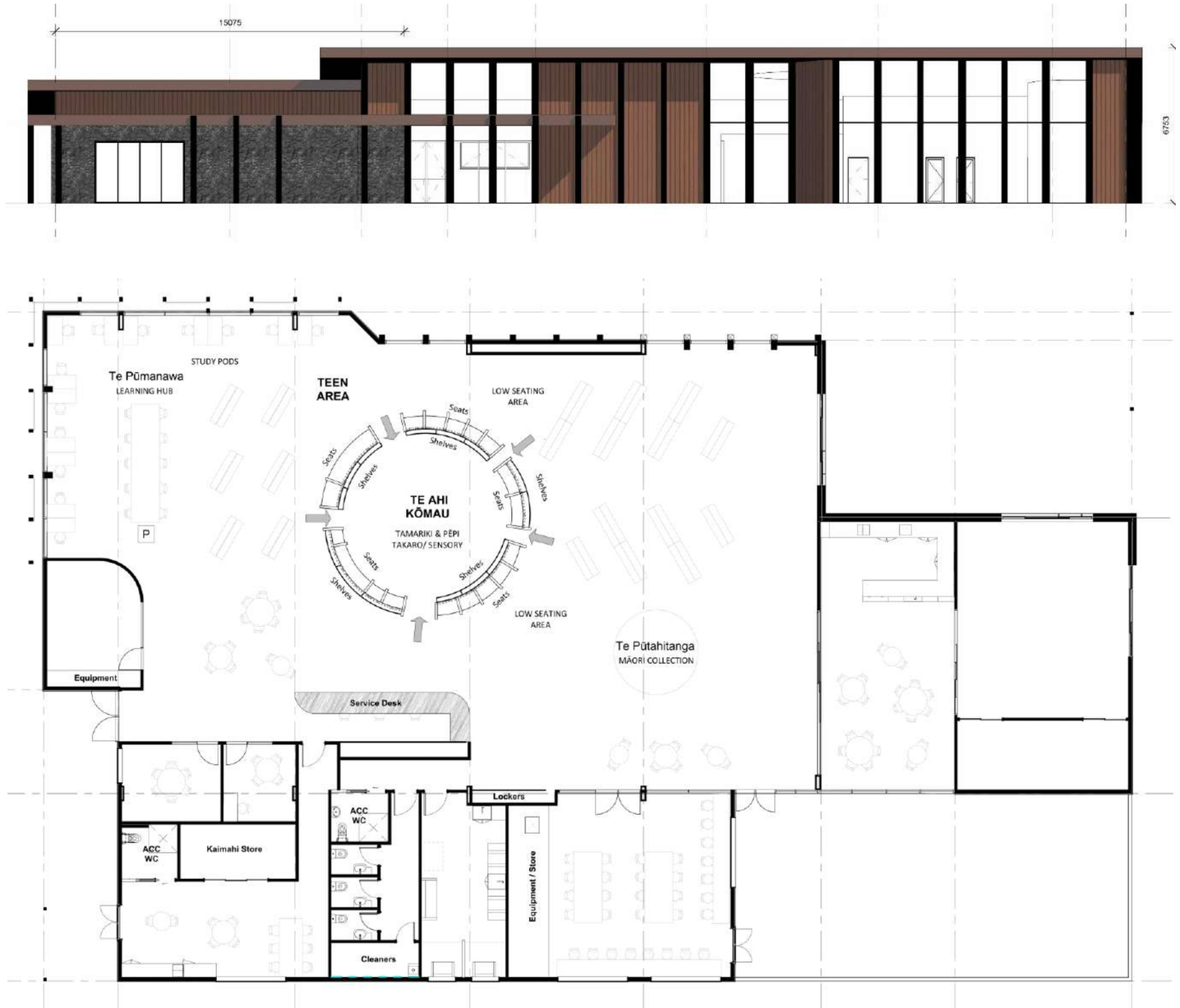
- *Mechanical services noise design*

  It is important that background noise levels generated by mechanical services are not too high or too low. Background noise levels that are too high can be disturbing, effect concentration, speech intelligibility and sleep quality. Background noise levels that are too low will reduce the acoustic privacy between spaces making it easier to hear adjacent activities.

3.0 FLOOR PLAN

For context, the following is the reference elevation floor plan from the Architectural Drawing Package dated 1 November 2024. Refer to the Architectural Drawing Package for any required detail.

Figure 1: Concept North Elevation and Furniture Floor Plan (from Architects Drawings, not to scale)



4.0 DESIGN CRITERIA

The acoustic design criteria and our recommendations for the library and spaces are discussed in this section for each of the following:

- Reverberation
- Internal Noise Levels
- Acoustic Separation

These are discussed in further detail below.

4.1 Reverberation

Table 1 summarises the recommended reverberation criteria for this development, taking into consideration the guidelines outlined in AS/NZS 2107:2016.

4.2 Internal noise levels

AS/NZS 2107:2016 also recommends a design sound level range of internal ambient noise of spaces in buildings.

We recommend that the internal ambient noise must account for all internal and external noise including noise arising from building services equipment, noise emission from outdoor sources such as traffic. Occupancy noise is excluded.

The relevant mechanical services noise criteria from AS/NZS 2107 are provided in Based on the above noise rules, we recommend that noise emissions from the library are limited to no greater than 60 dB L_{Aeq} during the daytime. The main external noise emission is likely to be air conditioning condensers (or packaged plant) and extract fans associated with the mechanical services. While this requires consideration in the design, location and selection of plant, we do not expect compliance to be challenging.

The daytime noise limit would not require the carparking area to be screened by a noise barrier.

Note that possible changes to the District Plan noise rules NOISE-S5 may require the library to achieve an internal noise limit of 45 dB L_{Aeq}. These changes could potentially be required as a result of a submission to the District Plan by NZTA Waka Kotahi. This is an appropriate noise level for a library and should ideally form the general basis for design. However, the potential Proposed District Plan changes would make this a statutory requirement, rather than a design/cost decision. We recommend this is discussed with FNDC in any pre application process.

4.3 General Acoustical Design Criteria Specification

The following are our recommended noise levels and reverberation time for each time for each proposed space. Table 1

4.4 Internal Sound Insulation

The recommended design approach is to establish the level of acoustic separation between spaces and then determine the level of sound insulation and background noise required to achieve these criteria.

4.4.1 STC ratings

Our recommended STC ratings are provided in mark-ups in Section 8.3.2. An on-site relaxation of 5 decibels should be allowed.

Wall constructions are discussed in Section 8.1.

4.5 Rain noise

We recommend that rain noise in the library building not exceed 55 dB L_{Aeq}.

The rain noise levels are based on a rainfall rate of 45 mm/h occurring for an average of 5 min/month in Kaikohe.

4.6 Environmental noise emissions

4.6.1 Operative District Plan

The site is zoned *Commercial* in the Far North Operative District Plan. The properties to the north, east, west and south are also zoned *Commercial*.

Rule 7.7.5.1.8 of the Far North Operative District Plan sets out the following noise limits.

0700 to 2200 hours *65 dB L_{A10}*

2200 to 0700 hours *55 dB L_{A10} and 80 dB L_{AFmax}*

The noise limits above apply at any point beyond the site boundary. The District Plan Sound levels shall be measured in accordance with NZS 6801:1991 “Measurement of Sound” and assessed in accordance with NZS 6802:1991 “Assessment of Environmental Sound”.

4.6.2 Proposed District Plan

The Proposed District Plan is currently being heard by independent commissioners. In the Proposed District Plan, the site would be zoned *Mixed Use.* The properties to the north, east, west and south would also be zoned *Mixed Use*.

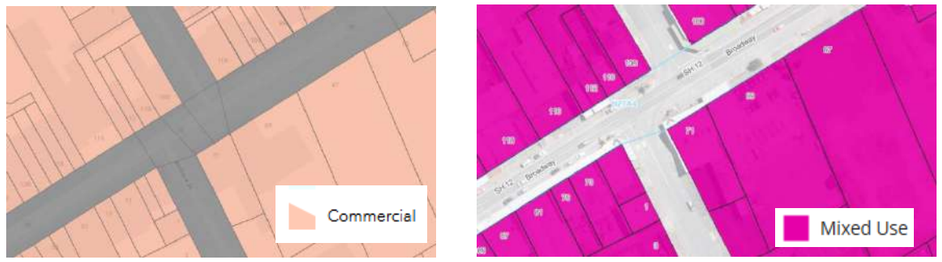
Proposed NOISE-S1 sets out the following noise limits. Note that these may be subject to change but are considered the most likely noise limits based on the current hearing process.

0700 to 2200 hours *60 dB L_{Aeq}*

2200 to 0700 hours *55 dB L_{Aeq} and 80 dB L_{AFmax}*

The daytime is extended to midnight on Friday and Saturday. The noise limits above apply at any point within the receiving property boundary. The District Plan Sound levels shall be measured in accordance with *NZS 6801:2008 “Acoustics - Measurement of Environmental Sound”* and assessed in accordance with *NZS 6802:2008 “Acoustics - Environmental Noise”.*

Figure 2: Zoning (Operative Plan Left, Proposed Plan, Right



4.6.3 Overall Environmental Design Criteria

For FNDC building or resource consent, the requirement will be to ensure that the building meets operative District Plan daytime noise limit of 65 dB L_{A10} at the nearest site boundary. This is not expected to be a significant constraint on the design. Air-conditioning condensers can readily meet this noise limit, especially where well located on a large site (refer mechanical services section). Traffic noise to the carpark would also readily comply with this limit.

We recommend the building be designed to meet the Proposed District Plan noise limit of 60 dB L_{Aeq} during the daytime, as this should be practicable.

The building is not expected to operate at night. Any plant operating at night (e.g. ventilation) will need to meet 55 dB $L_{A10.}$

4.7 General Acoustical Design Criteria Specification

The following are our recommended noise levels and reverberation time for each proposed space.

Table 1: Acoustic Design Criteria

Space	AS/NZS 2107 Space	Overall Noise dB L_{Aeq}	Building Services Sound ($NC_{63\text{-}4k}$)	Reverberation Time Seconds
Hui / Podcast*	Office buildings – Meeting room	35 - 40	30 - 35	<0.6
FNDC Office	Office buildings – Meeting room	35 - 40	30 - 35	<0.6
Community Room	Office Buildings – Video/audio conference rooms	30 – 40	30 – 35	< 0.9
Library	Libraries – Reading areas	40 – 45	33 - 38	0.4 – 0.6
Community Kai	Restaurants and cafeterias – coffee shops	40 – 45	33 – 38	< 1.0
Kaimahi Room	Office buildings – Meeting room	35 – 40	30 – 35	< 0.6
Whanau	Office buildings – Meeting room	35 – 40	30 – 35	< 0.6
Maker Space	Libraries – Workshop areas	45 – 50	38 - 43	0.4 - 0.6
Gaming	Libraries – Workshop areas	45 – 50	38 - 43	0.4 – 0.6

* We understand that the space will be used for meetings and for voice recordings at times.

5.0 SURROUNDING NOISE ENVIRONMENT

We performed an existing noise environment measurement at the corner of Broadway and Raihara Street on the 26 September 2024 between midday and 12:15pm. The location of the measurement position was intended to approximate the position of the building façade.

The measurement location was around 10 metres from the nearside carriageway of Broadway / State Highway 12. Meteorological conditions were suitable for noise measurements with few clouds, no rain and light air (0.3 to 1.5m/s wind speed) conditions.

The results of our noise measurements are summarised in the following table:

Table 2: Summary of existing Noise Levels

Measurement Position and Location	Measured Noise Levels (dB)				Noise Sources and Comments
	L_{Aeq}	L_{A10}	LA95	L_{AFmax}	
Corner of Broadway, and Raihara Street, 10m from nearside Carriageway of SH12	**65**	**66**	**57**	**82**	Few gaps in traffic. Generally best described as a fairly noise urban environment: traffic rolls by continuously. A busker in the distance (outside bakery) plays fairly loud amplified music (around 52 to 58 dB L_{AF}) at times, so less than background but still clearly audible wen traffic is not dominant. Note noise level of 82 dB L_{AFmax} is possibly set by loud noise from passing car, but also possibly from passerby near microphone.

Noise levels on-site are broadly controlled by traffic along Broadway Road (SH12), however other noise sources in the environment occasionally dominated the soundscape.

6.0 REVERBERATION CONTROL

6.1 Library open space

We recommend the main library has a ceiling with an average performance of NRC 0.7 across the full ceiling area.

The concept design shows a Sawtooth Feature ceiling treatment across the main library area.

Figure 3: Main Ceiling Concept

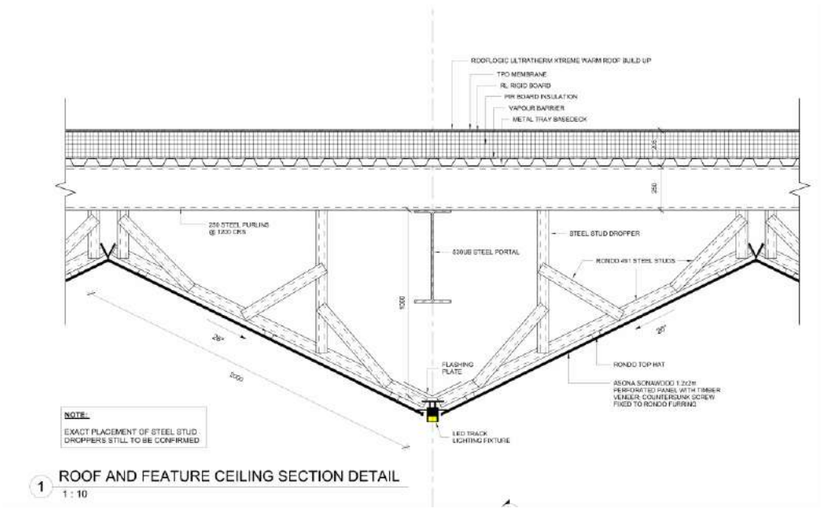
The following broad specification is recommended for the ceiling treatment,

- **Perforated timber with a minimum open area of 15%, NRC prfomance for min. 200mm cavity backed with a 50mm thick high density absorptive blanket (min density of 48 kg/m^3).**

Table 3 shows examples of acoustic perforated panels for ceiling.

The concept design drawings have already implemented a specification and drawing detail for the acoustic treatment. This shows Asona Sonawood Perforated Panel with Timber Veneer as the ceiling to the space.

Figure 4: Asona Sonawood and Rooflogic Membrane Roof Solution Detail



The Asona Sonawood Range includes many perforation options, several of which will have a % open area of greater than 15%. This appears to be a suitable acoustic solution for the ceiling, provided the final solution specified has the right % open area.

Figure 5: Sonawood options

Of critical importance to the success of this treatment is **the provision of a suitable sound absorbing material behind the perforated facing.** We recommend at **50mm thick high density absorptive blanket (48kg/m^2).** Asona may have proprietary products available that can be used, however regardless the drawings should be updated to show this absorber backed onto the perforated ceiling.

6.2 Hui/Podcast room

Concept recommendations:

We understand that this space is not proposed to be used as a professional quality recording studio, however the room will be used to record and, presumably, conduct video conferences as well as host meetings.

While the room is not intended to be used for a recording studio, a low, balanced reverberation time is still ideal. To achieve this, at this stage we recommend the ceiling be covered with 100mm absorptive panels (e.g. Autex Quietspace 100) or an absorptive ceiling tile with NRC 0.9+ performance.

We recommend allowing for wall finishes covering 65% of the wall area. We will review this as the design progresses. Suitable products are provided in Table 5 and we are happy to review alternatives.

Concept drawings:

The concept drawings show:

- A suspended ceiling tile in a grid to the podcast room.

If a ceiling tile solution is kept through detailed design, **we recommend this ceiling tile is specified to be highly absorptive (NRC 0.9+).** This may mean that the podcast room has an alternative specification to other areas.

The room is proposed to have carpet tiles. These will not be highly absorptive and will not service to create an ideal environment by themselves. However they will work well with the other treatments recommended.

6.3 FNDC office

Concept recommendations:

The FNDC office is understood to be a typical office. These rooms are typically carpeted.

The office will benefit from an absorptive ceiling (e.g. ceiling tiles, or plasterboard with absorptive panels) together with acoustically absorptive pinboard along one to two walls.

Concept drawings:

The drawings show:

- **Flooring:** Carpet tiles
- **Ceiling:** Ceiling tiles in grid

This will result in a suitable acoustic environment. However it will be further improved with acoustically absorptive pinboard along one to two walls.

6.4 Community Kai and Community room

Concept recommendations:

We recommended theses spaces have a ceiling with an average performance of NRC 0.7 across the ceiling Solutions can be drawn from Tables 3, 4 or 5. It may be architecturally appropriate to extend the main space absorptive treatment through the community kai area. We assumed some carpet would be utilised.

Note that for hygiene reasons, we expect that the area above the kitchen preparation area will need to be a solid cleanable surface. Our recommendations would apply to the area outside this zone.

Ideally this space would also contain absorptive wall treatment – however this may not be practical in a kitchen and dining space for hygiene reasons. Consider treating the rear (south) wall if possible, as well as any other areas that are available. Hygienic acoustical solutions are available for commercial kitchens (e.g. Asona Triton Hygiene).

We understand glazed doors or sliding doors may be used between the main space, Community Kihini and the Community Room. Acoustic curtains may be suitable between these spaces. With an acoustic curtain no other acoustic wall finishes would be needed. A range of suitable acoustic curtains are provided in Table 5. Note these may not be a hygienic option for the use within the Community Kitchen.

Concept drawings:

The drawings show:

- **Flooring:** Flooring tiles (hard tiles, e.g. terracotta or basalt)
- **Ceiling:** ceiling tiles in grid.

This solution will result in generally acceptable acoustics for these spaces. Noise levels may become high at times if the community kai room is used for many people dining together. Without carpet and wall treatment there would be few options for control of this noise.

If hard flooring tiles are to be used in the community room, consideration to providing for a higher quality ceiling treatment to the (than the ceiling tiles) could be considered. This would allow the room to function well as a meeting room, especially for meetings involving audiovisual. An example of a suitable treatment for this meeting room space would be:

- **A highly absorbent ceiling to 70% of the ceiling (the perimeter).** An example of a suitable solution would be the Asona treatment used to the mani space.
- **A central (30%) reflective area.**
- **A suitably absorptive wall treatment to one or two walls.**

We can provide more information on this solution through developed design. Consideration to the potential use of the space (regularity of meetings where ideal acoustics are required) and the cost of treatment should be given.

6.5 Kaimahi Room (Staffroom) and Whanau Room

Concept recommendations:

We recommend these spaces have a ceiling with an average performance of NRC 0.7 across the full ceiling area. Solutions can be drawn from Tables 3, 4 or 5.

These spaces often have hard floor treatments (e.g. linoleum, laminate or tiles) and there would be benefit in treating available wall areas. There appears to be limited space available for treatment (perhaps 10-15m^2) in the Kaimahi Room and perhaps half that in the Whanau Room. Areas would benefit from the use of an acoustic pinboard or semi-rigid panel such as Autex Cube or Martini dECO. A somewhat better outcome would be achieved using a higher performance (higher NRC) product from Table 5, however this may not be practical.

Concept drawings:

The drawings show:

Kaimahi Room:

- **Flooring:** Mostly carpet tiles
- **Ceiling:** ceiling tiles in grid.

Whanau Room:

- **Flooring:** Vinyl
- **Ceiling:** Plasterboard

The Kaimahi Room broadly accords with our recommendations, however no absorption is shown to the Whanau Room. We recommend consideration be given to introducing absorption to the Whanau Room, ideally to the ceiling or possibly to walls where hygiene permits. However we do note that the room is relatively small, and may not be a critical speech intelligibility area. The provision of soft furnishings (couches with material that is permeable to sound) may provide some control of reverberation time and the exceedance of our recommended reverberation time criteria may not be regularly problematic.

6.6 Makers Space

Concept recommendations:

We recommend these spaces have a ceiling with an average performance of NRC 0.7 across the full ceiling area. Solutions can be drawn from Tables 3, 4 or 5.

As with the Kaimahi Room, the Maker Space would benefit from the use of an acoustic pinboard or semi-rigid panel such as Autex Cube or Martini dECO to all available wall areas.

Concept drawings:

The drawings show:

- **Flooring:** Flooring tiles (hard tiles, e.g. terracotta or basalt)
- **Ceiling:** Ceiling tiles in grid.

This will likely be acceptable, however the hard floor tiles mean that there will be a greater need to utilise wall treatment (e.g. pinboard) to control noise and reverberation in the Makers Space. We recommend that the developed design drawings consider where this could be implemented.

6.7 Gaming Space

Concept recommendations:

We recommend this space have a ceiling with an average performance of NRC 0.7 across the full ceiling area. Solutions can be drawn from Tables 3, 4 or 5.

As with the Makers Space, the Gaming Space would benefit from the use of an acoustic pinboard or semi-rigid panel such as Autex Cube or Martini dECO to all available wall areas.

Concept drawings:

The drawings show:

- **Flooring:** carpet tiles
- **Ceiling:** reflective plasterboard ceiling

We recommend consideration be given to an absorptive ceiling in this space (this could be affixed to the ceiling and continued across the walls). The provision of the plasterboard ceiling will provide a good level of sound insulation and should be retained if possible.

6.8 Recommended Products

Table 3: Ceiling Tiles

Manufacturer	Product	NRC*	CAC	Distributor
Armstrong	Ultima	0.7	35	forman.co.nz
	Fine Fissured High Acoustics	0.7	40	
	Cirrus Square	0.7	40	
AMF	Thermatex Acoustic	0.7	38	potters.co.nz
	Thermatex Silence	0.9	44	
USG	Mars ClimaPlus	0.7	35	potters.co.nz
	Radar ClimaPlus High-CAC, High-NRC	0.7	40	
Asona	Triton Duo 35	0.75	40+	asona.co.nz
	Triton Duo 60	0.9	40+	
EcoPlus	Dual Bloc 35mm	0.7	40+	ecoplus-systems.com
	Dual Bloc 60mm	0.9	40+	
C-MAX	Combo 50mm	0.9	40+	tr-interiorsystems.co.nz
Rockfon	Sonar dB 50 mm	0.85	43	cbsltd.net.nz
	Sonar dB 40	0.9	40	
	Sonar dB 44	0.9	44	
*	NRC performance for tiles on 200 mm cavity			

Table 4: Direct Fix Ceiling/Wall Products– NRC 0.85+

Manufacturer	Product	NRC[1]	Distributor
Asona	Triton 25/50	0.95	asona.co.nz
	Fabwall 25/50	0.85/1.0	
Autex	Quietspace Panel 25/50 mm	0.85/1.0	autexindustries.com
	AAB 35-25, 20-50[2]	0.7/0.95	
	3D Tiles	0.9	
Armstrong	Soundsoak Custom 50mm	1.0	forman.co.nz
	Optima with 20 mm airgap	0.9	
Fabri Trak	Acoustic (25/50 mm thick)	0.8-0.9	forman.co.nz
Rockfon	Wall Absorbers (40 mm thick)	0.9	cbsltd.net.nz
Heradesign	25 mm Superfine/Fine on 60 mm cavity with 30 mm, 60kg/m^3 mineral wool in cavity	0.85	potters.co.nz
C Max	Silence Cloud Sound Panel	0.9/1.0	tr-interiorsystems.co.nz
OROQI	3D Sound Panel	0.9	tr-interiorsystems.co.nz
[1]	NRC performance for direct fix products		
[2]	These products could be faced with either timber battens spaced to achieve 30% open area or perforated aluminium of minimum 20% open area		

Table 5: Acoustic curtains

Brand	Product(s)	Manufacturer stated performances *
Annette Douglas Textiles	Streamer pro Streamer classic Sound dimmer Liquid classic	a_w 0.50 – 0.80
Gerriets	Absorber CS Absorber Light etc.	a_w 0.55 – 0.90
Materialised	Hush Light Reduction Drapery Hush Sheer Drapery Hush Sheer Blinds	NRC 0.55 – 0.70
Vescom	Formoza Corisca Ellis Elara	a_w 0.50 – 0.80

* Two measurement metrics are shown, NRC and a_w. These are determined by the testing standard used by the manufacturer. You can generally think of NRC and a_w being the same. The higher the number, the more absorption with 1 being the highest.

7.0 FAÇADE CONSTRUCTION

7.1 External noise ingress

The most significant concerns acoustically are rain noise and external noise intrusion via the building envelope (glazed façade and roof).

The proposed building is in a commercial zone and ambient noise is dominated by traffic. We have allowed for a future noise level of 67 dB L_{Aeq} in our construction recommendations.

7.2 Roof / rain noise

We calculate rain noise based on heavy rainfall rates that might occur for 5 minutes per month on average. In the Far North this rainfall rate is around 45 mm/hr. For a library, in heavy rainfall, a good result is around "NC 50" (around 55 dB L_{Aeq}). At that level of rain noise, people can talk and communicate, take phone calls, and generally communicate.

To adequately control rain noise a roof with a solid barrier and a ceiling will be required. We summarise our recommendations below:

7.2.1 Roof to include an additional barrier

If a profiled metal roofing system was used, an additional mass layer would be required to control external noise. This might have considered of 12mm plywood sarking or plywood layer under purlins.

However the concept drawings show that it is now proposed to use a warm roof system (e.g. Rooflogic Ultratherm Xtreme). This system will have the potential to adequately control noise. We will address this further through developed design.

7.2.2 Ceiling

We recommend the ceilings to have the following sound insulation performance:

- Main library area: a perforated timber/plasterboard ceiling backed with a 50mm thick high-density blanket (min 48 kg/m^3) is recommended. This does not have any inherent sound insulation performance.
- Community and office area: Absorptive ceiling tile with CAC 30+
- Podcast room: 13mm Noiseline plasterboard with directly fixed absorption or plasterboard backed absorptive ceiling tile (CAC 44+)

7.3 Façade

Glazing to the main space and associated northern facing rooms will require a double-glazed aluminium joinery consisting of at least 6.38mm thick laminated glass pane, 14mm air gap and, and a 4mm thick glass pane specification. An alternative specification is 8mm thick float glass pane, 12mm air gap and, and a 4mm thick glass pane specification.

We recommend the thermal and cost requirements of these solutions are reviewed and the glazing considered through development design.

Note we have recommended solutions based on a 24mm aluminium framing rebate. If larger rebates are required (or are available in the commercial suite that will be used), we can provide alternative specifications.

8.0 INTERNAL SOUND INSULATION

8.1 Walls

Our recommended STC ratings are shown in the mark-ups in Section 8.1.4. Our recommended wall constructions are provided in Tables 7 to 10. The STC ratings are round values based on typical wall constructions and materials. The STC ratings of specific wall systems may therefore vary slightly from those listed below.

8.1.1 Wall heights

We recommend that all acoustically rated walls are constructed full height. For the Gaming space a 'lid' construction would be a sui table alternative to full height walls. We recommend that the lid be constructed as follows:

- 2x13mm high-density plasterboard or 2x17mm Plywood
- Minimum 90mm ceiling cavity with fibrous insulation blanket
- plasterboard ceiling

Table 6: STC 40 Wall Construction Options

Lining[2]	Studwork + Cavity Absorption[1]	Lining[2]
Timber Stud		
2x13 mm standard plasterboard	90 mm timber stud	1x13 mm standard plasterboard
1x13 mm high-density plasterboard	90 mm timber stud	1x13 mm high-density plasterboard
Glazing (STC 38)		
10.76 mm Acoustic Laminate	(single glazing)	
13 mm Metroglass Soundstop CIP	(single glazing)	
12.5 mm Viridian Vlam Hush	(single glazing)	

1 All constructions to have absorptive blanket within the cavity (fibreglass or polyester)

2 Refer to Appendix B for range of suitable plasterboard products

Table 7:STC 45 Wall Construction Options

Lining[2]	Studwork + Cavity Absorption[1]	Lining[2]
Timber Stud		
2x13 mm high-density plasterboard	90 mm timber stud	1x13 mm high-density plasterboard
2x13 mm standard plasterboard	90 mm timber stud	2x13 mm standard plasterboard
1x13 mm standard plasterboard	Double timber studs forming a minimum 205 mm cavity with a minimum 25 mm gap between	1x13 mm standard plasterboard
Glazing (STC 45)		
8.38mm laminated glass	50mm airspace	8.38mm laminated glass

1 All constructions to have minimum 90 mm thick absorptive blanket within the cavity (fibreglass or polyester)

2 Refer to Appendix B for range of suitable plasterboard products

Table 8: STC 50 Wall Construction Options

Lining[2]	Studwork + Cavity Absorption[1]	Lining[2]
Timber Stud		
2x13 mm high-density plasterboard	90 mm timber stud	2x13 mm high-density plasterboard
1x13 mm standard plasterboard	Double timber studs forming a minimum 205 mm cavity with a minimum 25 mm gap between	1x13 mm standard plasterboard

1 All constructions to have minimum 90 mm thick absorptive blanket within the cavity (fibreglass or polyester)

2 Refer to Appendix B for range of suitable plasterboard products

Table 9: STC 55 Wall Construction Options

Lining[2]	Studwork + Cavity Absorption[1]	Lining[2]
Timber Stud		
2x13 mm high-density plasterboard	Double timber studs forming a minimum 205 mm cavity with a minimum 25 mm gap between	1x13 mm high-density plasterboard
2x13 mm high-density plasterboard	Staggered timber studs forming a minimum 140 mm cavity with	2x13 mm high-density plasterboard

1 All constructions to have minimum 90 mm thick absorptive blanket within the cavity (fibreglass or polyester)

2 Refer to Appendix B for range of suitable plasterboard products

8.1.2 Electrical fittings

Back to back electrical fittings are not recommended in walls ≥ STC 45. We recommend one of the following:

- Install boxes on opposite sides of the wall a minimum of 550mm apart (centre to centre) and the cavity must have an absorptive blanket.
- Ensure that there is a stud between boxes on opposites sides of the wall and both sides of the cavity must be acoustically lined.

Figure 6: Acceptable placement of power or GPO boxes

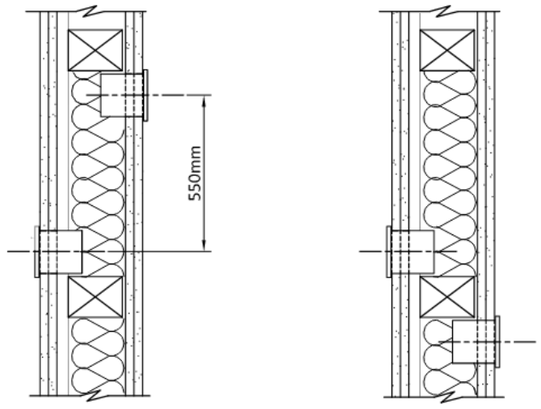
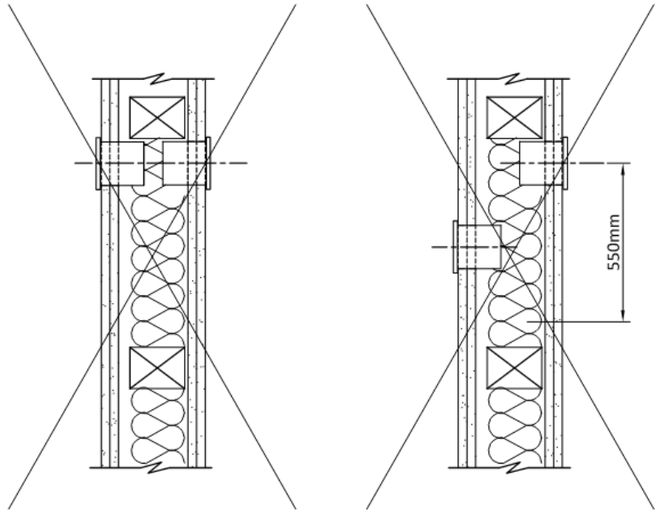


Figure 7: Unacceptable placement of power or GPO boxes



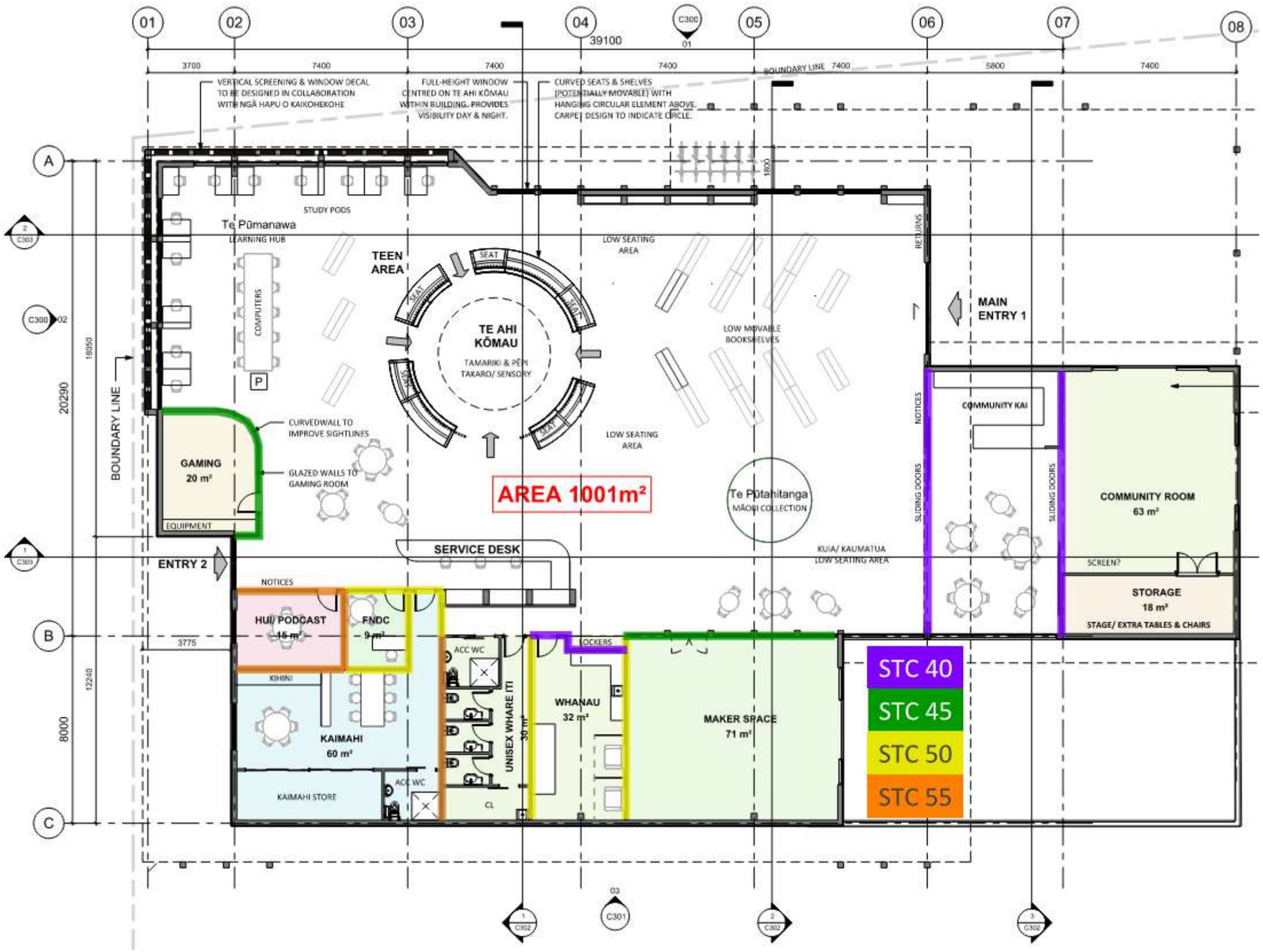
8.1.3 Studwork spacing in single stud walls

Studwork spacing of minimum 600 mm centres are required to achieve the noted acoustic performance. Smaller stud spacings will significantly reduce the sound insulation performance. If stud centres below 600mm is required, the following options should be explored to retain desired acoustic ratings.

1. Double up studs (i.e. 90x45x2) and keep 600mm centre spacing, or
2. Use a Rondo 310 or 45x45mm timber batten at 600mm vertical spacing on one side of the wall, or
3. Use larger stud sizes (e.g. 140mm) if this enables 600mm centre stud spacing

8.1.4 STC mark-ups

Figure 8: Library ground floor STC ratings



8.2 Doors

Generally, we recommend a minimum STC 30 rating for all doors in acoustic partitions. A STC 30 door is:

- Solid core construction
  - minimum 24 kg/m^2 (timber, MDF, etc.), or
  - 10.38 mm laminate glass
- With compression seals to the head, threshold and jambs

Higher performance doors STC 40+ will be required to HUI/Podcast.

Ventilation grilles (for mechanical services) in doors undermines the sound insulation performance of the door. So acoustically rated doors (STC 30+) cannot have grilles.

Frameless glass doors do not seal and lead to acoustic issues. We recommend that these are avoided.

Table 10 summarises our recommended seals. We have divided our recommendations into typical and high quality. Our “high quality” systems have fully adjustable seals which for greater flexibility on site. The “typical” systems are not adjustable so rely on correct installation.

The location of doors is also important to preserve sound insulation. We recommend that you locate doors as far away as possible (Figure 9).In the left diagram of Figure 9 the doors are close together, leading to sound transfer between rooms. We recommend that you separate doors like either the centre or right arrangement.

Figure 9: Door Arrangements

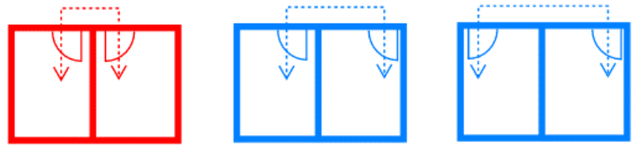


Table 10: Door Seals

	Head and Jambs seals	Threshold Seals	Meeting Stile Seals (double leaf doors)	
High Quality	Kilargo IS7095si Raven RP24	Kilargo IS8020si Raven RP38, RP70 Lorient LA S8006 si, LAS8007 si, or LAS8009 si	Rebated	Kilargo IS7071si (double row) or IS7060si Raven RP71Si (double row) or RP16Si
			Magnetic	Kilargo IS6020 Raven RP65
Typical	Kilargo IS1212, or IS1515 Lorient LA S1212, or LA S1515 Raven RP10, RP47si, RP120 or RP150 Schlegel Aquamac AQ 21, AQ 124, or AQ 836	Kilargo IS8020si Raven RP38, RP70 Lorient LA S8006 si, LAS8007 si, or LAS8009 si	Butted	Kilargo IS7071si (double row) or IS7060si Lorient LA S7004 si Raven RP71Si (double row) or RP16Si

Table 11: Sliding Door Seals

Head and Jambs seals	Threshold Seals	Meeting Stile Seals	
2 lines of fin seals or brush seals incorporating a silicone or rubber fin Raven RP73	Kilargo IS3022si Raven RP129si 2 lines of Kilargo IS3080si 2 lines of Raven RP51F, RP17 B. RP56, or RP71Si	Magnetic	Kilargo IS6020 Raven RP65
		Friction	Kilargo IS7071si (double row) Raven RP73 or RP71Si (double row)

8.3 Junctions and penetrations

8.3.1 Sealant

All partitioning junctions should be well sealed to the abutting structure with a non-hardening flexible sealant. An approved sealant list is contained in Appendix C.

8.3.2 Sealing penetrations

All penetrations through building elements with an STC rating must not degrade the acoustic performance.

All pipe and duct penetrations through floors, walls, ceilings and roofs must be treated so that there is no direct physical connection between the pipes or ducts and the surrounding structure.

Penetrations shall be oversized to allow a small amount of movement, and the surrounding gap between the service and the structure sealed airtight with an approved flexible, non-setting sealant. Table 12 provides methods of sealing depending on the wall type and clearance between the penetration and service.

Where foam backing rods are used they shall be closed cell polyethylene suitable for use as a backing rod for non-setting sealant. Refer Appendix D for acoustic penetration details.

Table 12: Sealing penetrations

Penetration clearance	Wall type	Method of sealing
< 5 mm	Masonry or framed plasterboard	Seal completely across gap with non-setting sealant
5 mm – 10 mm	Masonry	Place a foam backing rod in gap between wall and service and seal across gap up to rod with non-setting sealant
	Framed plasterboard	Reduce the gap to 5 mm using a 20 mm thick timber beading strip and seal the remaining 5 mm gap using a non-setting sealant (the timber beading strip should be sealed to the wall either by gluing or smearing a bead of sealant before nailing)
10 mm – 20 mm	Masonry	Pack gap between service and penetration tightly with thermal grade fibreglass and fit a 20 mm thick timber beading strip leaving a 5 mm gap to be sealed with a non-setting sealant
	Framed plasterboard	Reduce the gap to 5 mm using a 20 mm thick timber beading strip and seal this remaining gap using a non-setting sealant (the timber beading strip should be sealed to the wall either by gluing or laying a bead of sealant before fixing)
> 20 mm	Masonry (flexibility required)	Grout penetration to within 20 mm of service, pack remaining gap tightly with thermal grade fibreglass and fit a 20 mm thick timber beading strip leaving a 5 mm gap to be sealed with a non-setting sealant
	Masonry (flexibility not required)	Completely grout the penetration
	Framed plasterboard	Reduce the gap to 5 mm using a collar of plasterboard of the same thickness as the wall and seal this remaining gap with a non-setting sealant

9.0 MECHANICAL SERVICES NOISE

The following sections provide our general recommendations on mechanical design. These are the guidelines necessary to ensure that appropriate acoustical design criteria can be achieved within the building. The recommendations in section 9.1 to 9.6 are general design recommendations.

We have provided an initial review of the mechanical concept drawings in Section 9..7

9.1 Fans

It is recommended that 2 pole fans are avoided as our experience would indicate that these fans can be particularly tonal. There is a high risk of structure borne noise transmission which may cause issues in other locations.

We recommend allowing for attenuation on the high level exhaust fans. We will confirm the exact mitigation required once selections have been provided, but at this stage we recommend allowing for a 1D circular attenuator (fan attached).

9.2 FCUs

We recommend the following treatment be allowed for on the FCUs.

- 25mm internal insulation on the supply (metal or flexible duct)
- 50mm internally lined return plenums with a side intake
- 8 kg/m^2 mass loaded vinyl lagging

Supply and return attenuators might be required in some units depending on the duty of the FCU and location.

We will review this mitigation as the design progresses.

9.3 AHUs

The preliminary design for the library shows attenuators on the supply, return, intake and exhaust of the AHUs. This is considered appropriate, and we will review and provide an attenuator selection once the AHU selection has been made.

The AHU for the Chambers doesn't show attenuators. It is likely that this AHU will require attenuators due to the acoustically sensitive nature of the Chambers building.

9.4 Flexible Duct

Where specified for noise control purposes, flexible duct must be of the perforated acoustic type such as:

- Westaflex Greenduct (Perforated, Acoustic RM 1.25 insulation)
- UNILOK FR1 Acoustic Duct
- Holyoake perforated Spiroset
- or similar

9.5 Duct Air Velocities

Noise generated by air movement in ducts and through duct fittings is a major contributor to the mechanical system noise level. The acceptable level of flow generated noise is dependent on the design criterion of the space being served by the mechanical system.

To control turbulence and airflow generated noise to sensitive spaces, the duct velocities detailed in should not be exceeded.

Table 13: Duct velocity limits, m/s

Design Criteria	Run-Out Duct: Duct within 5 duct diameters of a grille/diffuser		Branch Duct: Ducts connected directly to Run-Out Ducting	Main Duct: Ducts preceding a Branch Duct within the air-conditioned space	Main Riser: Ducts not in the air-conditioned space
	Flexible Duct[1]	Metal Duct			
55 dB L_{Aeq}	4.5	6.0	7.5	10.0	15.0
50 dB L_{Aeq}	3.5	5.0	6.5	8.5	13.0
45 dB L_{Aeq}	3.0	4.0	5.5	7.5	11.0
40 dB L_{Aeq}	2.5	3.5	4.5	6.0	9.5
35 dB L_{Aeq}	2.0	2.5	4.0	5.0	8.0
30 dB L_{Aeq}	1.6	2.0	3.0	4.0	7.0

1 Caution must be exercised when installing flexible duct to ensure that airflow generated noise does not occur due to airflow restrictions.

9.6 Vibration Isolation

Any rotating item of equipment and **any connected pipework** within the plantroom will require suitable vibration isolation mounts or hangers, most likely in the form of springs.

A flexible duct connection must be provided between each fan or AHU and any connected ductwork.

Note that depending on the location of certain equipment, concrete or steel frame inertia bases would be required. The structural engineering should consider the additional load these bases would place on the building structure to ensure that slab design incorporates these additional loads.

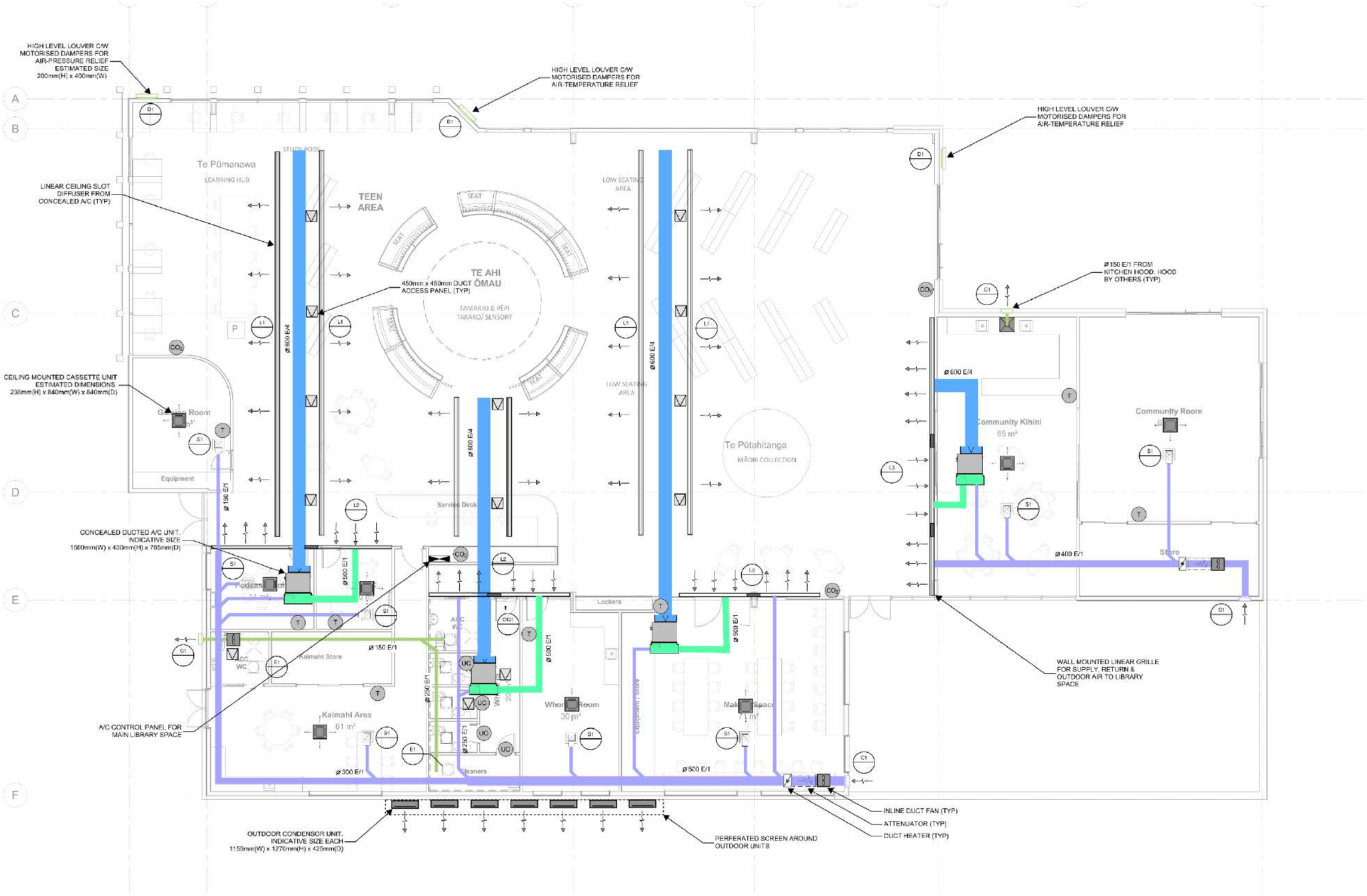
9.7 Initial Review of Concept Design Drawings

The proposed mechanical design shows several DX fan coil units with a set of seven external condenser units on the south side of the building. A screen around the units is proposed. The units would be around 40 metres from the site boundary.

No mechanical services selections have been made yet, however we note the following initial conclusions:

- External condenser units would be expected to readily comply with the District Plan noise limit. There is no appreciable risk that that daytime noise limits would be exceeded.
- Outdoor air fans are shown with attenuators. These will require selection and specification, but will be a reliable way to readily comply with the external noise limit.
- Internal noise levels (fan coil units downduct noise) may potentially require lined duct to ensure internal noise recommendations are met (see Table 1 for specification). This will be reviewed during detailed design.
- Breakout noise from fan coil units to the space below (e.g. Podcast/ Hui, Maker Space) may require consideration. Options are available to reduce noise breakout from units.

Figure 10: Proposed Mechanical Design Drawings



APPENDIX A GLOSSARY OF TERMINOLOGY

A-weighting	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
$L_{Aeq\ (t)}$	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level. The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.
PR	Privacy Rating An indicator of the privacy expected between two spaces based on the sound insulation of the intermediate partition and the background noise level in the receiving space.
RT or T_{60}	Reverberation Time The time (in seconds) taken for the sound pressure level generated by a particular noise incident to decay by 60 decibels following the conclusion of the noise event (hence T_{60} abbreviation). Reverberation Time is used for assessing the acoustic qualities of a space, describing how quickly sound decays within a space. The reverberation time is related to the room volume and total absorption.
STC	Sound Transmission Class A single number system for quantifying the transmission loss through a building element. STC is based upon typical speech and domestic noises, and thus is most applicable to these areas. STC of a building element is measured in approved testing laboratories under ideal conditions.
IIC	Impact Insulation Class A single number system for quantifying the transmission loss due to impact noise produced by a standard “Tapper Machine” through a building element.
NRC	Noise Reduction Coefficient A single number rating between 0 and 1 of the ability of a material to absorb sound. It is the average of the absorption coefficients in the 250-2000Hz octave bands rounded to the nearest 0.05. The larger the number, the more absorptive the material.
CAC	Ceiling Attenuation Class A measure for rating the airborne sound insulation performance of a ceiling system between adjacent enclosed spaces, such as offices where the dividing wall does not penetrate the ceiling cavity.
PPV	Peak Particle Velocity For Peak Particle Velocity (PPV) is the measure of the vibration aptitude, zero to maximum. Used for building structural damage assessment.

APPENDIX B SUITABLE PLASTERBOARD OPTIONS

Plasterboard Descriptor	Suitable Products by Manufacturer			
	GIB	USG Boral	Elephant	Gyprock
10 mm standard > 630 kg/m^3	10 mm Standard 10 mm Fyreline 10 mm Aqualine 10 mm Ultraline	10 mm Sheetrock 10 mm Wetstop	10 mm Standard-Plus	2 x 6.5 mm Flexible 10 mm Aquachek
13 mm standard > 630 kg/m^3	13 mm Standard 13 mm Fyreline 13 mm Aqualine 13 mm Superline 13 mm Toughline 13 mm Ultraline 10 mm Noiseline	13 mm Sheetrock 13 mm Firestop 13 mm Wetstop 13 mm Multistop 10 mm Fibrerock 10 mm Soundstop	13 mm Standard-Plus 10 mm Multiboard 13 mm Multiboard 10 mm Aquaboard 13 mm Aquaboard	2 x 6.5 mm Flexible 13 mm Standard 13 mm Aquachek 13 mm Impactchek 13 mm Fyrchek 13 mm Fyrchek MR 10 mm Soundchek 10 mm Superchek
13 mm high-density > 920 kg/m^3	13 mm Noiseline 16 mm Fyreline	13 mm Soundstop 16 mm Firestop 13 mm Fibrerock	16 mm Multiboard	3 x 6.5 mm Flexible 13 mm Soundchek 16 mm Fyrchek 16 mm Fyrchek MR

Note: The Plasterboard Descriptor nominates a minimum thickness and density. However, different thicknesses/densities of plasterboard would be suitable, as indicated above.

- Thinner boards would have a higher density than the minimum requirement.
- Thicker boards would have a lower density than the minimum requirement.

APPENDIX C ACOUSTIC SEALANTS

C1 Sealant Selection

Where sealants are used for acoustic purposes, it is essential that they retain adequate flexibility over the reasonable life of the building, to ensure that cracking and delamination does not occur, which will compromise the acoustic performance of the seal.

If the contractor wishes to use a sealant that is not on these lists, it must first be approved by the acoustic consultant.

When selecting a sealant, consider the following:

- It should not be porous
- It should not set rigidly and should allow joint movement of at least 25 % for high movement joints and 15 % for low movement joints when cured
- It should not shrink by more than 10 – 15% when it dries
- It will easily flow into gaps of 3 – 10 mm width
- For wider gaps, it may need a backing rod
- Its density should be similar to the lining materials
- It will adhere to a damp substrate, preferably without needing a primer

C2 High Movement Joints Sealants

Sealants used for high movement joints, such as seismic joints, window glazing, curtain walling and active services penetrations – mechanical ducts, plumbing, etc – must have a joint movement capability of either:

- ± 25 % of the original joint width or
- a Hardness Shore A of 30 or less

Sealants that would be suitable for all movement joints are listed Table 14.

Table 14: Suitable Sealants for all movement joints

Supplier	Sealant	Movement (%)	Hardness Shore A	Materials to be sealed
Bostick	Fireban One	± 25	30	Masonry, metal, ceramics, wood, most plastics, FC sheet, plasterboard
	Fire Tech Firecaulk	± 25		Concrete, precast panels, block and brick work, drywall systems, electrical cables and pipe penetrations
	Seal-N-Flex 1	± 50	30	Masonry, metal, ceramics, wood, most plastics, FC sheet, plasterboard
Selleys	Glass	± 25	-	Glass, aluminium, stainless steel, many plastics including polystyrene, most woods
	Roof and gutter	± 25	-	Metals, inc galvanised
	Brick and concrete	± 25	-	Masonry, plasterboard
Dow Corning	Dowsil 732	-	30	Most metals (ungalvanised), glass, most woods, ceramic, fibre, most plastics
	Dowsil 739	-	25	Most metals (ungalvanised), glass, most woods, ceramic, most plastics, masonry
Fosroc	Flamex PU	± 25	-	Concrete, brick, masonry, pre-cast panels, plasterboard, fibre cement, windows, doors
	Hilastic 88	± 25	-	Roof and wall sheets, guttering and downpipes, sheet metal
Gib	Fire Soundseal	± 25	-	Plasterboard, painted surfaces, timber, architraves and ceramic tiles
FirePro	M708 Fireban	± 25	-	Concrete, brick, plasterboard, glass, most woods, most plastics, most metals
Sika	Sikaflex-400 Fire	± 25	-	Porous and non-porous substrates
	Sikaflex Construction AP	± 25	-	Concrete and masonry

C3 Low Movement Joint Sealants

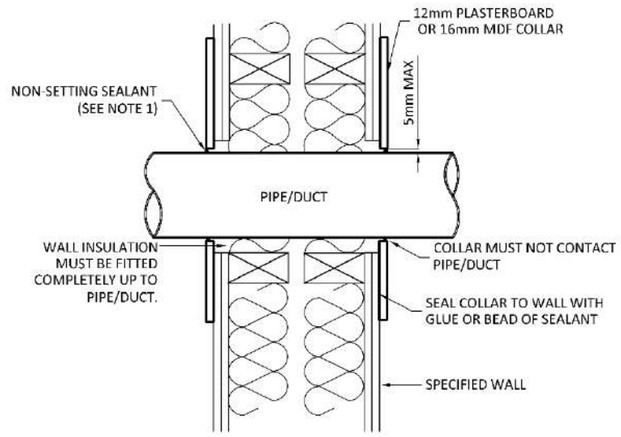
For low movement joints, such as perimeter sealing of masonry/plasterboard partitions or passive services penetrations – electrical cabling, fire sprinklers, etc a lower joint movement capability of ±15 % of the original joint width would be acceptable.

Table 15 provides additional sealants that would be suitable for low movement joints.

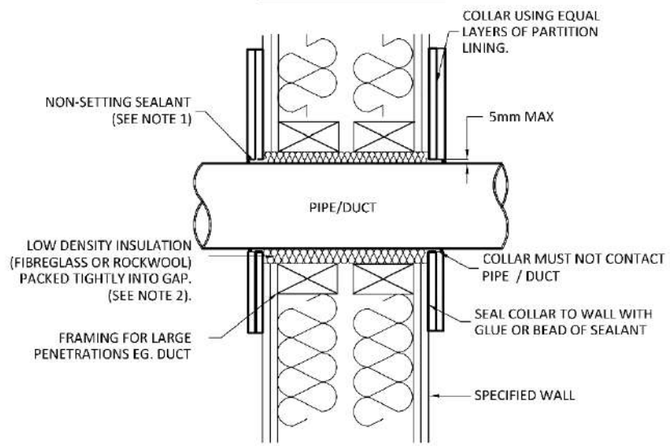
Table 15: Suitable sealants for low movement joints

Supplier	Sealant	Movement (%)	Hardness Shore A	Materials to be sealed
FirePro	M706	± 20	25 - 35	Concrete floors and concrete block walls, plasterboard, Hebel walls and brickwork. Also for sealing gaps around cables, metal pipes, conduits, busways and ducts that penetrate fire rated walls.
	M707	± 20		Concrete, brick, plasterboard, glass, most woods, most plastics, most metals
	M752 Aquathane	± 20		Concrete precast panels, blockwork, brickwork, and timber / steel joints
Firetherm	Intumastic	± 15		
Fosroc	Flamex XT	± 20	31	Concrete, timber, masonry, aluminium, metal and ceramics
	Nitroseal MS400	± 20	42	Concrete, timber, masonry, aluminium, metal and ceramics
H.B. Fuller	FireSound	±20		Pre-cast concrete panels, block work and brickwork. Also suitable for filling gaps around cables, metal pipes, conduits, busways and ducts that penetrate walls, floors and ceilings
Hilti	CP 606	± 16.5		Masonry, concrete, drywall and metal
Holdfast	Soudaseal 270HS	± 20	68 ± 5	Metals and plastics
Promat	Promaseal-A Acrylic Sealant	± 15	50	
Sika	Firerate	± 20		Porous and non-porous substrates

APPENDIX D PENETRATION AND SEALING DETAILS



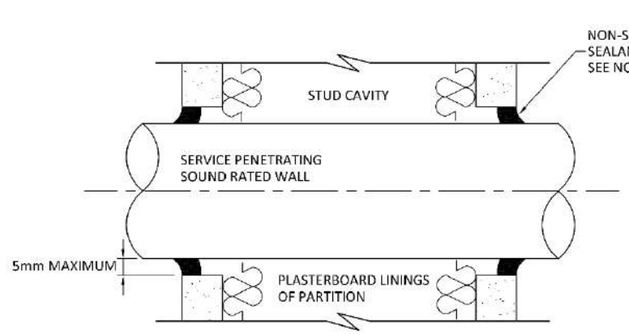
SERVICES CLEARANCE 5-20mm



SERVICES CLEARANCE >20mm

1. "NON-SETTING SEALANT" MEANS AN APPROVED NON HARDENING FLEXIBLE SEALANT, OR OTHER PRODUCTS SPECIFICALLY APPROVED BY THE ACOUSTIC CONSULTANT.
2. "LOW DENSITY INSULATION" MEANS 32kg/m3 MINERAL FIBRE, 16kg/m3 FIBREGLASS OR APPROVED EQUIVALENT.

MARSHALL DAY Acoustics	PENETRATION SEALING - LIGHT WEIGHT PARTITIONS	MDA-MEC-PEN-001 REVISION: C



1. "NON - SETTING SEALANT" MEANS AN APPROVED NON HARDENING FLEXIBLE SEALANT, OR OTHER PRODUCT SPECIFICALLY APPROVED BY THE ACOUSTIC CONSULTANT.

FIG 1a SEALING PENETRATIONS THROUGH MASONRY OR LIGHTWEIGHT WALLS (<5mm CLEARANCE)

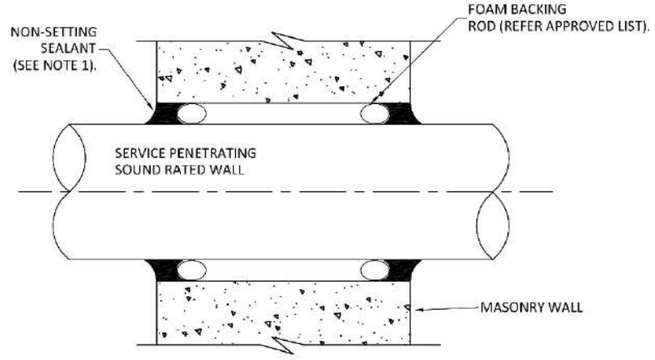
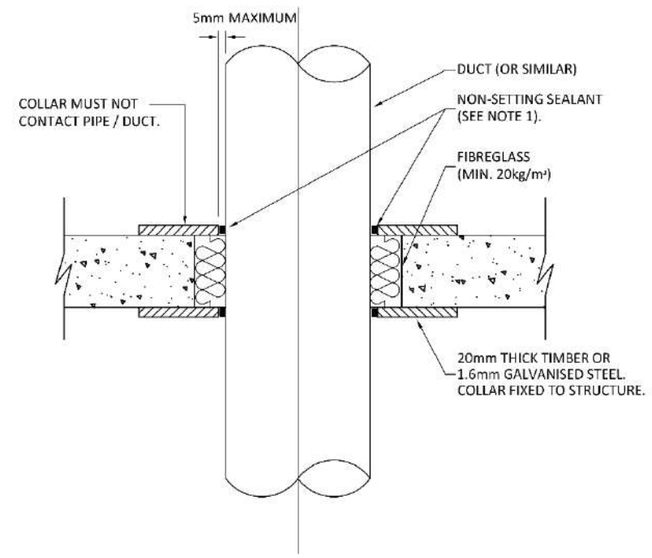
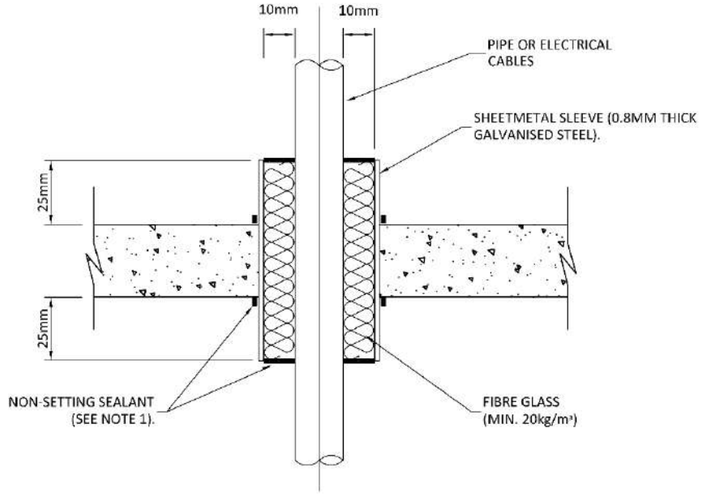


FIG 1b SEALING PENETRATIONS THROUGH MASONRY WALLS (5-10mm CLEARANCE)

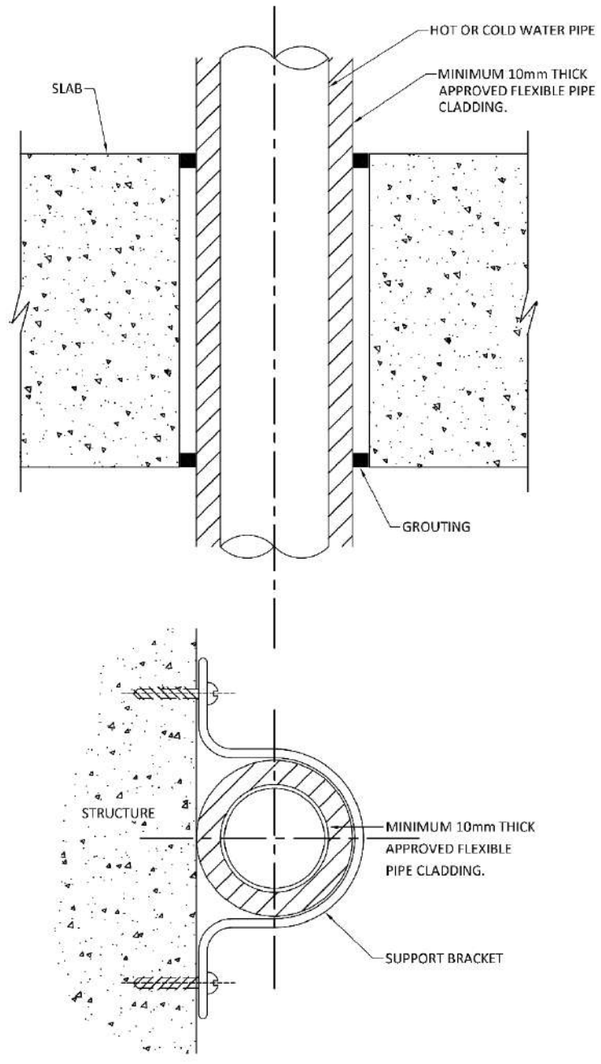
MARSHALL DAY Acoustics	SEALING PENETRATIONS	MDA-MEC-PEN-002 REVISION: D



1. "NON- SETTING SEALANT" MEANS AN APPROVED NON HARDENING FLEXIBLE SEALANT, OR OTHER PRODUCT SPECIFICALLY APPROVED BY THE ACOUSTIC CONSULTANT.
2. ANY GAP LARGER THAN 40mm MUST BE REDUCED USING CONCRETE OR PLASTER PRIOR TO APPLYING TREATMENT.

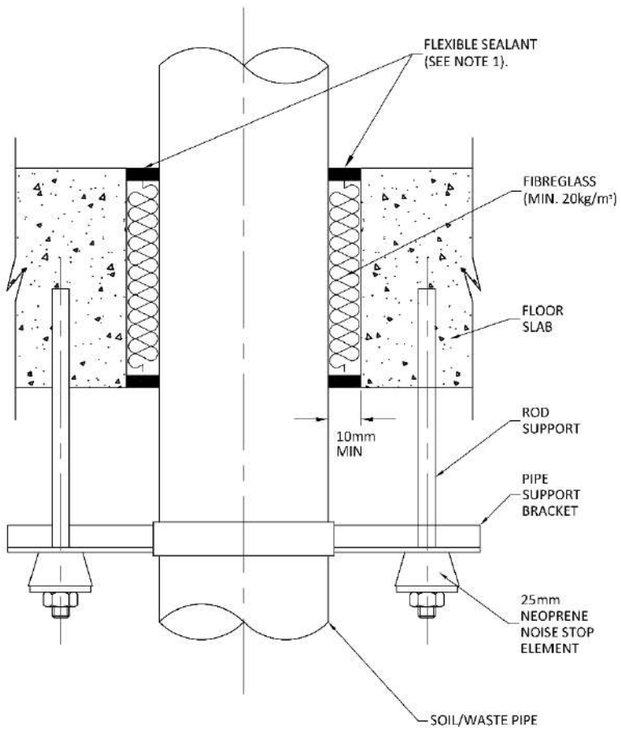


MARSHALL DAY Acoustics	SEALING PENETRATIONS - MASONRY	MDA-MEC-PEN-003 REVISION: C

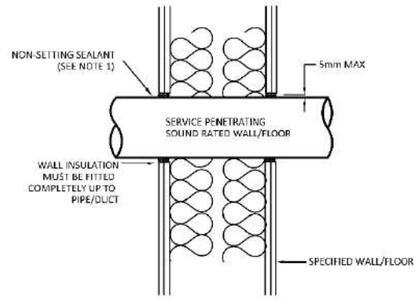


MARSHALL DAY Acoustics	HOT AND COLD WATER PIPE ISOLATION DETAILS	MDA-MEC-VIB-006 REVISION: B

1. "FLEXIBLE SEALANT" MEANS AN APPROVED NON HARDENING SEALANT, OR OTHER PRODUCT SPECIFICALLY APPROVED BY THE ACOUSTIC CONSULTANT.

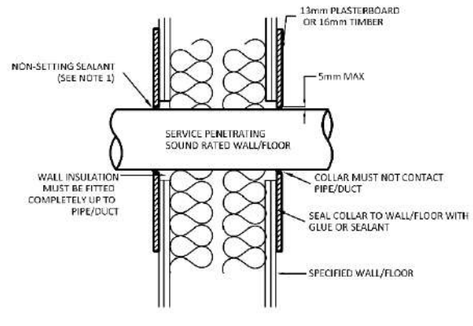


MARSHALL DAY Acoustics	WATER PIPE PENETRATION THROUGH SLAB	MDA-MEC-PEN-005 REVISION: C



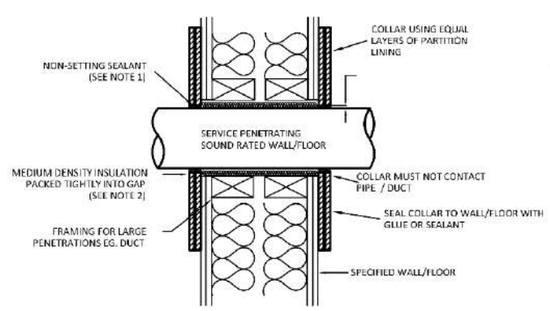
SERVICES CLEARANCE <5mm

SEAL COMPLETELY ACROSS THE GAP USING A NON-SETTING SEALANT (SEE NOTE 1)



SERVICES CLEARANCE 5-20mm

REDUCE THE GAP TO 5mm USING 13mm PLASTERBOARD OR 16mm TIMBER AND SEAL THIS REMAINING GAP USING A NON-SETTING SEALANT (SEE NOTE 1)



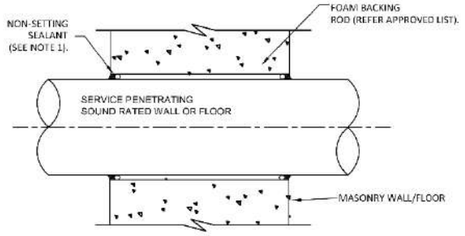
SERVICES CLEARANCE >20mm

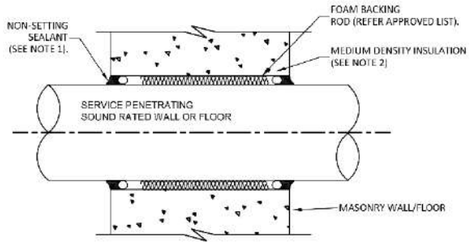
REDUCE THE GAP TO 5MM USING A COLLAR OF THE SAME CONSTRUCTION AS THE WALL/FLOOR AND SEAL THIS REMAINING GAP WITH A NON-SETTING SEALANT (SEE NOTE 1)

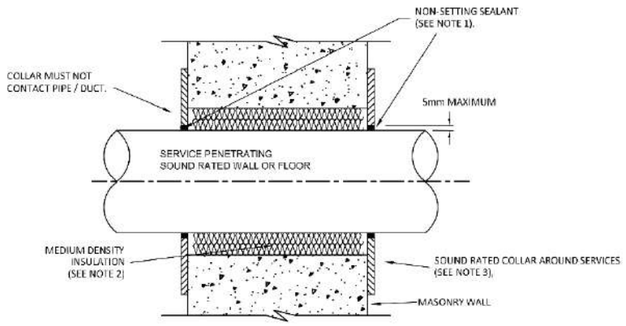
NOTE1. NON - SETTING SEALANT MEANS A POLYURETHANE OR SILICONE BASED "CLASS A" SEALANT WITH A JOINT MOVEMENT CAPABILITY OF +/- 25% OF THE ORIGINAL JOINT WIDTH.

NOTE 2. MEDIUM DENSITY INSULATION MEANS 32kg/m³ ROCKWOOL, 16kg/m³ FIBREGLASS, 20kg/m³ POLYESTER, OR APPROVED EQUIVALENT.

MARSHALL DAY Acoustics	SEALING PENETRATIONS - LIGHTWEIGHT WALL / FLOOR	MDA-MEC-PEN-008 REVISION: B







NOTE1. NON - SETTING SEALANT MEANS A POLYURETHANE OR SILICONE BASED "CLASS A" SEALANT WITH A JOINT MOVEMENT CAPABILITY OF +/- 25% OF THE ORIGINAL JOINT WIDTH.

NOTE 2. MEDIUM DENSITY INSULATION MEANS 32kg/m³ ROCKWOOL, 16kg/m³ FIBREGLASS, 20kg/m³ POLYESTER, OR APPROVED EQUIVALENT.

NOTE 3. COLLAR TO HAVE A MINIMUM MASS OF 12kg/m², SUCH AS: 16mm FR PLASTERBOARD, 25mm PLYWOOD, 1.6mm SHEET STEEL, OR APPROVED EQUIVALENT.

MARSHALL DAY Acoustics	SEALING PENETRATIONS - MASONRY WALL / FLOOR	MDA-MEC-PEN-009 REVISION: B

Geotechnical Investigation Report
Proposed Library & Community Hub
69 & 71 Broadway, Kaikohe
For
Eclipse Architecture

Haigh Workman reference 24 122

November 2024

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Revision History

Revision №	Issued By	Description	Date
A	Craig Nelder	First Issue	1 November 2024

Prepared By	Reviewed By	Approved By
Craig Nelder	Josh Curreen	John Papesch
Geotechnical Engineer BE(Hons)	Senior Geotechnical Engineer MEngNZ	Director CPEng, CMEngNZ

TABLE OF CONTENTS

Executive Summary

Haigh Workman Ltd. (Haigh Workman) has been commissioned by Eclipse Architecture Limited (the Client) to undertake a geotechnical investigation for a proposed new library and Community Hub at 69 & 71 Broadway, Kaikohe. The proposed development will comprise a single-storey Library and Community Hub with an approximate ground floor area of 1001m² and an additional outside canopy area.

Haigh Workman previously undertook geotechnical investigations as part of a preliminary suitability assessment in June 2022. Haigh workman undertook additional testing following the demolition of an old two-building complex, formerly Peterson Motors and Save Mart. Geotechnical monitoring works throughout the demolition process of the buildings have also been undertaken, with site records included in Appendix E. The area beneath the buildings were found to contain some deep pits and subsoil drains / a trench network which had been backfilled at some point and were determined unsuitable for supporting building loads.

The additional investigations comprised the drilling of eight hand auger boreholes (HA01 to HA08) across the proposed library footprint. Six Cone Penetrometer Tests (CPTs) were also undertaken by Underground Investigation Limited. Investigation data is presented in Appendix D.

Geotechnical risk has been evaluated and is considered minor, provided the recommendations detailed within this report are followed. A summary of the geotechnical risks and controls are as follows:

- Earthworks - Undercuts across the site will be required to remove uncertified fill material. Uncertified fill material has been mapped across the site and included within Drawing G02 (Appendix A). Other areas of unsuitable material may exist across the site that has not been included within our drawings.
- Shallow foundations will be subject to specific engineered design by a Chartered Professional Engineer (CPEng – Structural), adopted the design parameters included within this report. Shallow foundations may comprise rafts, strip footings or pads / pile foundations.
- Bearing capacity has been assessed in accordance with the methods presented in the New Zealand Building Code (B1/VM4). Recommended ultimate bearing capacity is 150 kPa for shallow foundations. The bearing capacity value is appropriate for vertical loads only, and do not allow for any imposed horizontal shear or moment actions and will require confirmation during specific design. A geotechnical strength reduction factor of 0.5 can be adopted for limit state design.
- Expansivity – The subsoils at this site are considered moderately expansive. The effects of tree roots for any proposed vegetation shall be considered. Refer Section 6.5.
- Seismic Site Subsoil Category - The site subsoil conditions have been assessed to be consistent with seismic subsoil class C (Shallow site soils) in accordance with NZS1170.5.
- Settlement – Section 4.3 presents settlement estimates based on 30 kPa UDL. Settlement has also been checked based on a concentrated footing load of 150 kPa embedded 0.6m below the surface. Estimated

total settlements were less than 25mm and were within the tolerable limits as outlined in B1 VM4. Haigh Workman can provide spring values as part of the detailed design process.

- Filling - Any fill placed beneath or within 1.0 m of the proposed structure and exceeding 1.0m in depth (above natural ground level) will need confirmation by the engineer that settlement caused by filling will not cause adverse effects to the building. Fill material shall be imported granular hardfill, GAP40 or GAP65, compacted to an engineered standard.
- Liquefaction – the material encountered is considered too plastic to liquefy. Based on our assessment we consider liquefaction damage is unlikely in accordance with 'Planning and engineering guidance for potentially liquefaction-prone land', MBIE, September 2017.
- Where it is not economical to remove unsuitable material, then piles can be incorporated into the foundation design to bridge the footings. We envisage this would only be required along the southern edge of the building where there is a deep (>3.0m depth) pit measuring approximately 2.0m in width. We recommend piled foundations are taken into the very stiff to hard competent material encountered from 5.0mbgl across this area. Haigh Workman can provide geotechnical design parameters for piled foundations as part of the detailed design process.

1 Introduction

1.1 Project Brief and Scope

Haigh Workman Ltd. (Haigh Workman) has been commissioned by Eclipse Architecture Limited (the Client) to undertake a geotechnical investigation for a proposed new library and Community Hub at 69 & 71 Broadway, Kaikohe. This report presents the information gathered during the site investigation, interpretation of data obtained and site-specific geotechnical recommendations relevant to the site. This report includes a site-specific geotechnical assessment in relation to the proposed Library and also presents a summary of Haigh Workman's initial 'Geotechnical Assessment Report', dated September 2022, Ref. 22 277.

The scope of this report encompasses the geotechnical suitability in the context of the proposed development as defined in Haigh Workman's offer (dated 12 April 2024) and sub consultant agreement (dated 06 June 2024). This appraisal has been designed to assess the subsoil conditions for foundation design and identify geotechnical constraints for the proposed development.

This report provides the following:

- A summary of the published geology with reference to the geotechnical investigations undertaken;
- analysis of the data obtained from site investigations and a geological ground model;
- foundation recommendations;
- provide comment on ground stability, and;
- identification of any additional geotechnical risks and/or hazards.

1.2 Proposed Development

We understand that FNDC intends to develop the site with the construction of a single-storey Library and Community Hub with an approximate ground floor area of 1001m² and an additional outside canopy area. The proposed development will be situated within the northern half of the property, with the southern half comprising paved carpark and entrance areas. The proposed development plans are included in Appendix B.

This geotechnical investigation and report consider the geotechnical aspects of the proposed development and the suitability of the ground for the proposed library with reference to the proposed development location. The concept plans, prepared by Eclipse Architecture (dated 07 August 2024) indicate that the exterior of the building will comprise variable cladding types including volcanic stone cladding, timber cladding and patterned precast. Refer Appendix B.

Should the proposed development vary from the proposals described above and/or be relocated outside of the investigated area, further investigation and/or amendments to the recommendations made in this report may be required.

1.3 Site Description

The proposed development is located across three titles bound south and east of Broadway (State Highway 12) and Raihara Street, respectively. Pt Lot 13 DP 7437 and Lot 5 DP14826 are located directly east of Raihara Street, with the larger Lot 1 DP 114630 located directly east of these lots. The total site area encompasses approximately 3864m^2. Recent demolition works of a 2-building complex, formerly Petersons Motors and Save Mart, had been undertaken across the site. The ground contours across the proposed development location are generally flat.

As part of Haigh Workman's initial assessment (prior to the demolition of the old buildings), it was discovered that areas outside of the buildings comprised a washpit, lubitorium tank, and several oil tanks, to which had been removed and backfilled some 25 years ago. Evidence of some of these areas were encountered through trial pits undertaken as part of Haigh Workman's initial Geotechnical and Environmental Assessments. An old, decommissioned steel pipe and trench was also encountered in the 2022 investigations at the southwestern corner of the old building.

Haigh Workman undertook geotechnical monitoring works throughout the demolition process of the buildings. The area beneath the buildings were found to contain some deep pits and subsoil drains / trench network which had been backfilled at some point and were determined unsuitable for supporting building loads. These areas were typically excavated to expose natural ground, however they were backfilled with site-sourced non-engineered material due to the extent of the excavations. High-quality drone photographs were captured of the site prior to backfilling – refer Figure 1 below. See also Appendix E for Haigh Workman's site records.

Figure 1 - Drone Photograph Prior to Backfilling

2 Geology

2.1 Published Geology

Sources of Information:

- Institute of Geological & Nuclear Sciences 1:250,000 Geological Map 2, 2009: "*Geology of the Whangarei area*";
- NZMS 290 Sheet P04/05, 1: 100,000 scale, 1982: *"Rock types map of the Whangaroa - Kaikohe area",*
- NZMS 290 Sheet P04/05, 1: 100,000 scale, 1980: *"Soil map of the Whangaroa - Kaikohe area".*

The site is within the bounds of the GNS Geological Map 2 "Geology of the Whangarei area", 1:250,000 scale*. The published geology shows the site to be underlain by the Kerikeri Volcanic Group (Pvb). An extract of the geological map is shown in Figure 2 below, with geological units presented in Table 1.

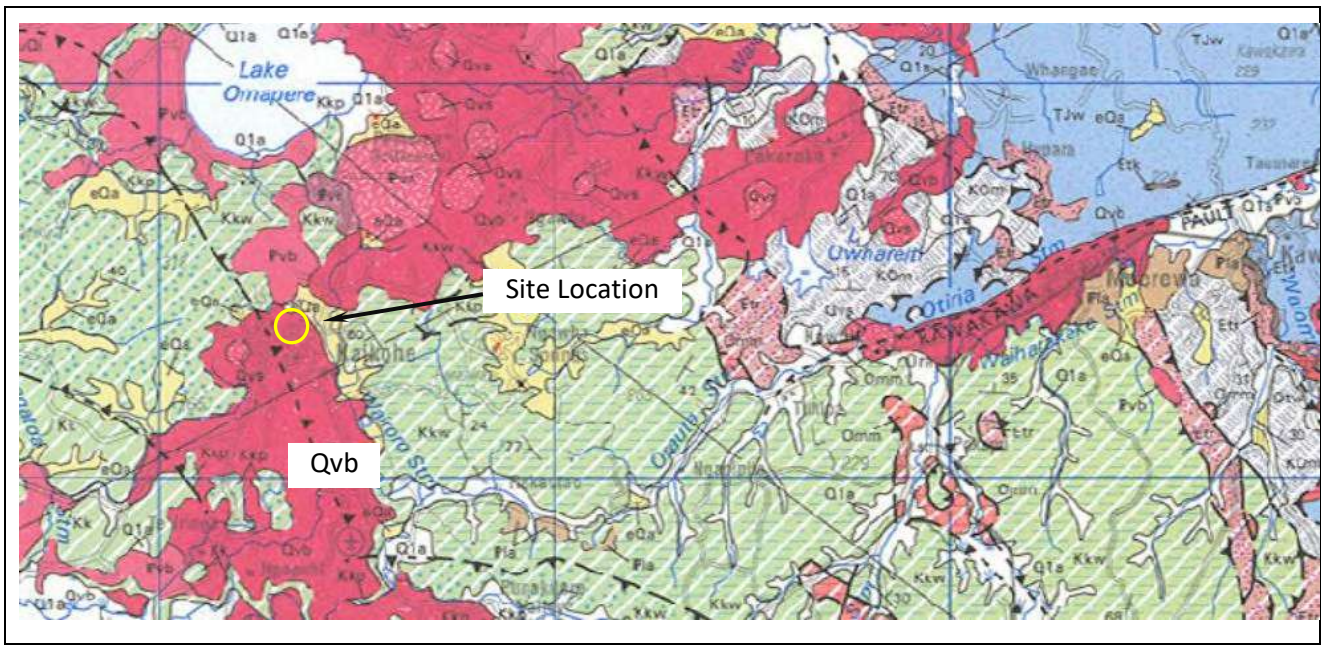

Figure 2 - Geological Map

* Edbrooke, S.W; Brook, F.J. (compilers) 2009. Geology of the Whangarei area.

Table 1 - Geological Legend

Symbol	Unit Name	Description
Qvb	Kerikeri Volcanic Group	Basalt lava flows. Early to late Pleistocene age.

Based on the results of our site investigation, the property is underlain by the Kerikeri Volcanic Group.

Further reference to the published New Zealand land inventory maps (Whangaroa-Kaikohe 1980), indicates the site is underlain by *'soils of the rolling and hilly land, well to moderately well drained Kiripaka boulder silt loam (KB), w*ith underlying material comprising Basalt, '*weathered to soft red brown or dark grey brown clay to depths of 20m with many rounded corestones*'.

3 Subsurface Geotechnical Investigations

3.1 Previous Investigations – Haigh workman (2022)

Haigh Workman undertook geotechnical investigations on 07 June and 16 June 2022. The investigations comprised the drilling of ten hand augered boreholes drilled by Haigh Workman Limited, and the excavation of seventeen test pits undertaken by a subcontractor. Boreholes BH04 to BH10 were paired with Scala Penetrometer tests.

All test locations were undertaken outside of the building footprint due to the locations of the old buildings. The investigations were undertaken as part of the preliminary geotechnical suitability assessment for the site.

3.2 Haigh Workman Investigations (2024)

Haigh Workman visited the property and undertook additional geotechnical investigations on 10 October 2024. The investigations comprised the drilling of eight hand auger boreholes (HA01 to HA08) across the proposed library footprint. Six Cone Penetrometer Tests (CPTs) were also undertaken by Underground Investigation Limited on 16 October 2024.

Hand augers were advanced to a maximum depth of 4.0 metres below ground level (mbgl). Handheld vane shear tests were undertaken at regular intervals during the advancement of the hand auger, with Scala Penetrometer testing undertaken within the hand augered boreholes HA01 and HA05 to HA07.

Investigations were logged in accordance with The New Zealand Geotechnical Society, "Guidelines for the Field Classification and Description of Soil and Rock for Engineering Purposes" (2005). Investigation locations are shown on the drawings in Appendix A and investigation hand auger logs are included in Appendix D.

CPTs were undertaken to refusal (high tip pressure). A maximum depth of 13.42mbgl was achieved at CPT03 location. CPT soundings are also presented in Appendix D.

3.3 Summary of Ground Conditions

Based on the results of the geotechnical investigation conducted by Haigh Workman and review of published geological maps, it is considered that the surface soils directly underlying the proposed development site comprise the natural soils of the Kerikeri Volcanic Group. Some surficial fill material had been placed as part of the construction works and site clearing, as covered in Section 1.3. The majority of the fill encountered in our 2022 investigations had been removed during the demolition works, which typically comprised hardfill and concrete / tarmac.

For the purposes of this report, subsoil conditions on the site have been interpolated between the boreholes and some variation between borehole positions are likely. Detailed logs are presented within Appendix D. Table 3 below summarises the materials encountered for the investigations undertaken in June 2022 and October 2024, respectively. Geological ground models have been developed based on the investigation and are presented in Appendix A.

Table 2 - Summary of subsurface investigations (2022)

Investigation ID	Fill and/or concrete (mbgl)	Kerikeri Volcanic Group (mbgl)	Groundwater and Soil Moisture Observations
BH01 / TP02	0.0 to 0.3	0.3 to > 3.55	Moist at surface, becoming moist to wet from 1.9m. Groundwater not encountered.
BH02 / TP04	0.0 to 0.6	0.6 to > 3.4	Moist throughout. Groundwater not encountered.
BH03 / TP06	0.0 to 0.4	0.4 to > 3.7	Moist at surface, becoming moist to wet from 2.3m. Groundwater not encountered.
BH04 / TP09	0.0 to 0.4	0.4 to > 5.3	Moist at surface, becoming wet from 3.7m. Groundwater encountered at 3.7m.
BH05 / TP10	0.0 to 0.5	0.5 to > 2.65	Moist throughout. Groundwater not encountered.
BH06 / TP12	0.0 to 0.4*	0.4 to > 3.5	Moist throughout. Groundwater not encountered.
BH07 / TP17	0.0 to 0.4	0.4 to > 2.3	Moist throughout. Groundwater not encountered.
BH08 / TP15	0.0 to 0.4	0.4 to > 2.6	Moist at surface, becoming moist to wet from 2.1m. Groundwater not encountered.
BH09 / TP16	0.0 to 0.4	0.4 to > 1.55	Moist at surface, becoming moist to wet from 0.8m. Groundwater not encountered.
BH10 / TP14	0.0 to 0.3	0.3 to > 4.1	Moist at surface, becoming moist to wet from 2.5m. Groundwater not encountered.
TP01	0.0 to 1.5	1.5 to > 2.1	Moist throughout. Groundwater not encountered.
TP03	0.0 to 0.1	0.1 to > 0.9	Soil moisture not recorded. Groundwater not encountered.
TP05	0.0 to 0.3	0.3 to > 0.9	Moist throughout. Groundwater not encountered.

TP07	0.0 to 1.2	1.2 to > 1.6	Moist throughout. Groundwater not encountered.
TP08	0.0 to 2.35	2.35 to > 2.5	Moist throughout. Groundwater not encountered.
TP11	0.0 to 0.5	0.5 to > 0.85	Moist throughout. Groundwater not encountered.
TP13	0.0 to 0.3	0.3 to > 0.85	Moist throughout. Groundwater not encountered.

Measurements taken from the existing ground surface level. NE = Not Encountered.

** Buried topsoil encountered from 0.3 to 0.4mbgl*

Table 3 - Summary of subsurface Investigations (2024)

Investigation ID	Fill (mbgl)	Kerikeri Volcanic Group (mbgl)	Groundwater and Soil Moisture Observations
HA01	NE	0.0 to > 2.7 (refusal)	Moist soils throughout Groundwater not encountered.
HA02	NE	0.0 to > 3.5 (refusal)	Dry to moist, becoming moist to wet at 1.4m Groundwater not encountered.
HA03	NE	0.0 to > 2.1	Moist soils throughout Groundwater not encountered.
HA04	NE	0.0 to > 3.2	Moist soils throughout. Groundwater not encountered.
HA05	NE	0.0 to > 4.0	Moist at surface, becoming moist to wet from 1.4m and wet from 2.2m. Groundwater not encountered.
HA06	NE	0.0 to > 2.2 (refusal)	Dry to moist soils throughout. Groundwater not encountered.
HA07	NE	0.0 to > 1.1 (refusal)	Dry soils throughout. Groundwater not encountered.
HA08	NE	0.0 to > 3.0	Dry to moist at surface, becoming moist from 0.4m and wet from 2.4m. Groundwater not encountered.
CPT1	NT	0.0 to > 7.502	Groundwater measured at 7.1m at completion of testing.
CPT2	NT	0.0 to > 11.280	Groundwater measured at 6.8m at completion of testing.
CPT3	NT	0.0 to > 13.427	Groundwater measured at 7.25m at completion of testing.
CPT4	NT	0.0 to > 11.470	Groundwater measured at 6.2m at completion of testing.
CPT5	NT	0.0 to > 11.897	Groundwater measured at 6.2m at completion of testing.
CPT6	NT	0.0 to > 5.065	Groundwater not encountered at completion of testing.

Measurements taken from the existing ground surface level. NE = Not Encountered. NT = Not Traceable.

3.3.1 *Topsoil*

No topsoil or buried topsoil was encountered beneath the proposed building.

Buried topsoil was encountered BH06 / TP12 as part of the preliminary geotechnical investigations and reporting and which is located outside of the proposed building footprint. The buried topsoil layer was 100mm in thickness, overlaid by 300mm of fill material and was located within / at the edge of the proposed car park area near the eastern boundary of the site.

3.3.2 *Non-certified Fill Material*

Non-certified fill material was encountered across localised areas and typically comprised fine-grained volcanic material, rubbish, concrete and/or boulders.

Areas of non-certified fill material are typically easily distinguishable from the natural ground. Although the material was removed during demolition works, the excavations were re-filled with the same material with the intention that the material will be removed and replaced at the time of construction works once the final building platform is known.

3.3.3 *Kerikeri Volcanic Group*

All test locations were found to comprise natural soils of the Kerikeri Volcanic Group. The natural ground conditions were variable across the site. However, near surface soils generally comprising brown clayey silt or silty clay, with areas of lower plasticity silt.

The deeper soil profile comprised predominantly silt with varying amounts of clay, from none to some, and was described as being greyish brown, reddish brown, brownish orange or purplish brown in colour. Coarse material (sand, gravel and cobbles) generally increased with increasing depth. Pockets of gravel, cobbles and/or boulders were encountered within test pits TP01, TP04 & TP07, and were generally vesicular and brittle in nature.

Firm lenses were encountered across the site with a maximum thickness of up to 1.5m, and at depths ranging between 1.3mbgl to 4.5mbgl.

3.3.4 *Groundwater*

Groundwater seepage was encountered at 3.7mbgl within BH04 during the 2022 geotechnical investigations.

During the 2024 investigations, groundwater was not encountered within any hand auger boreholes. Cone penetrometer tests were tested for groundwater at the completion of each test using a weighted tape measure. Groundwater was measured at depths ranging between 6.2mbgl to 7.25m within CPT01 to CPT05. CPT06 encountered refusal at 5.065m and no groundwater was encountered.

Groundwater standpipes were not installed in the hand augured boreholes or CPT's. Groundwater levels can and do fluctuate and higher groundwater levels may be encountered following prolonged or heavy rainfall.

4 Geotechnical Assessment

4.1 Liquefaction Potential

Liquefaction potential has been assessed using MBIE guidance: *planning and engineering guidance for potentially liquefaction prone ground*. The published geology and investigation data indicates the site is underlain by residual Kerikeri Volcanic Group soils of Late Miocene to Pliocene age and is not part of a landform that is commonly susceptible to liquefaction. Furthermore, subsoil investigations encountered fine-grained, clayey soils with a measured plasticity index greater than 12 (PI > 12).

Coupled with the age of the deposits, liquefaction can be assessed based on plasticity index, where PI > 12 is not susceptible to liquefaction[†]. We consider the soils beneath the site too plastic to liquefy. No further assessment is required.

4.2 CPT Estimates

The undrained shear strength has been assessed using the in-situ CPT data and vane shear strength, with adjacent vane shear strength plotted for CPT03, CPT04 & CPT05. The hand auger and shear vane locations typically offset the CPT locations by between 1.0m to 3.0m across the site and hence some vertical variations can be observed within the shear vane plot overlays in Figure 3 below. Furthermore, the firm lenses encountered across locations CPT03 & CPT04 were high in sand / gravel content which is also likely to affect the vane shear strengths.

HA01 encountered refusal at 2.7mbgl (adjacent CPT05). Ground conditions varied across the site, and early refusal within the hand auger boreholes is likely a result of completely weathered to highly weathered basalt boulders and cobbles.

[†] ((MBIE), November 2021) Module 3: *Identification, assessment and mitigation of liquefaction hazards*.

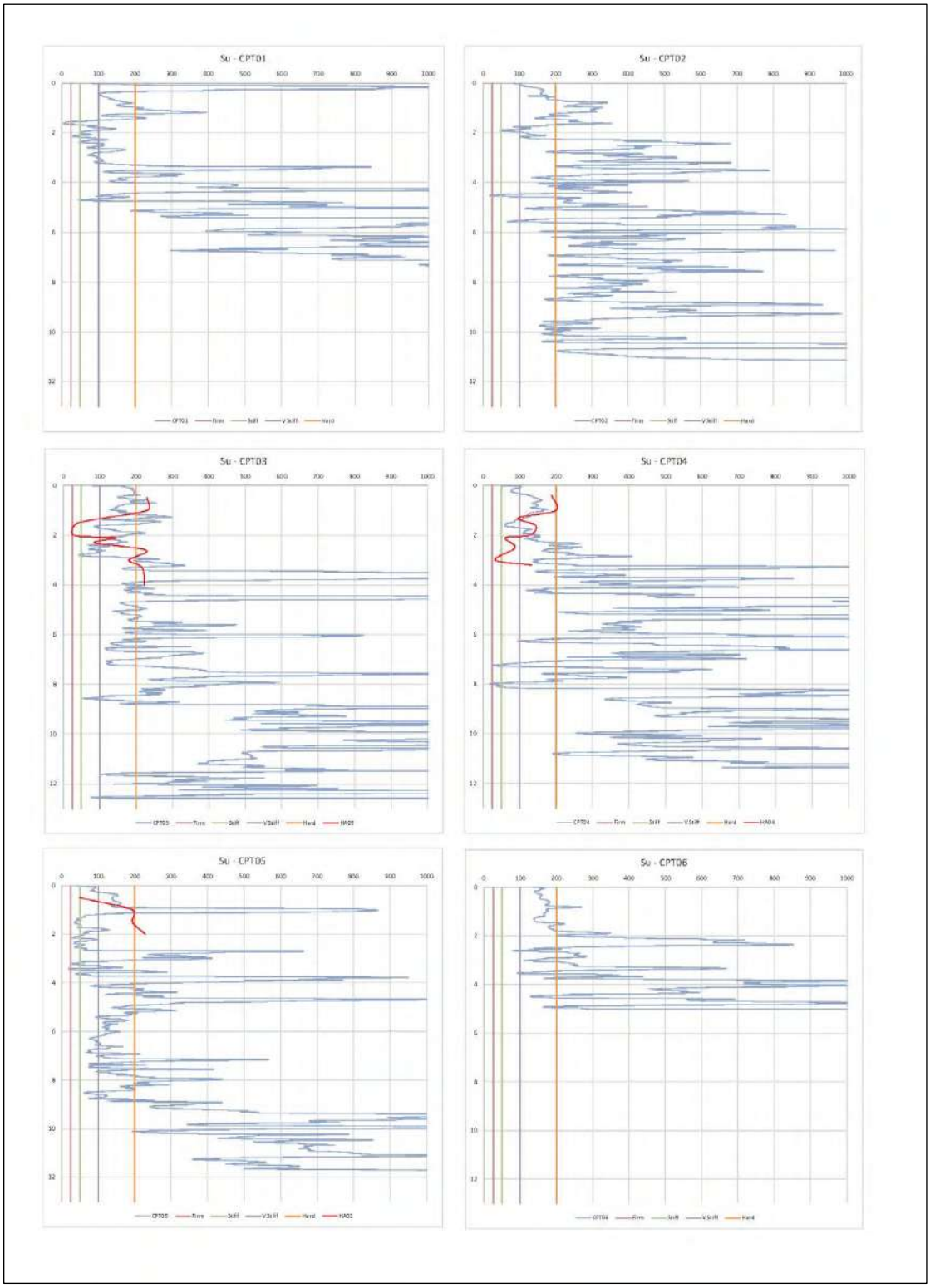

Figure 3 - Estimated Undrained Shear Strength Plot with Shear Vane plot overlay

4.3 Settlement

A preliminary settlement analysis has been undertaken using the CPT data. A uniformly distributed load (UDL) of 30kPa across the proposed building platform and a concentrated 0.5m wide footing load of 150 kPa embedded 0.6m below the surface was trialed. Results indicated settlement will be less than 25mm and differential settlement across the building.

Our preliminary assessment has been conducted in accordance with the New Zealand Building Code B1/VM4, allowing angular distortion as a result of consolidation settlement of up to 1:240 (approximately 25mm over a 6.0m length). We recommend a review of the building loads and coordinate with the structural engineer to ensure that our recommendations regarding settlement and foundations remain valid, and that angular distortions are within the acceptable limits given the nature of the construction. Haigh Workman can provide spring values as part of the detailed design process.

It is recommended that fill depths across and within vicinity of the building platform are limited to 1.0m above existing ground level. All fill material must be compacted to an engineered standard (Refer Section 6.2) and all unsuitable material is removed below any areas of intended fill. where unsuitable material is unable to be removed, or hardfill unable to be placed and compacted to an engineered level, then bridging foundations over such areas may be required.

4.4 Shrink Swell Soil Characteristics

The New Zealand Building Code stipulates expansive soils are those with a liquid limit greater than 50% and a linear shrinkage greater than 15%. Atterberg limits test results on the samples collected during the site investigation are presented in Table 4 below, and plotted on the Casagrande Chart in Figure 4 below. See also Appendix F.

Table 4 - Atterberg Limits and Linear Shrinkage Test Results

Sample I.D.	Depth (m)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage (%)
BH03	0.6 – 1.0	37.2	64	33	31	18
HA05	0.2-0.7	43.6	81	42	39	23

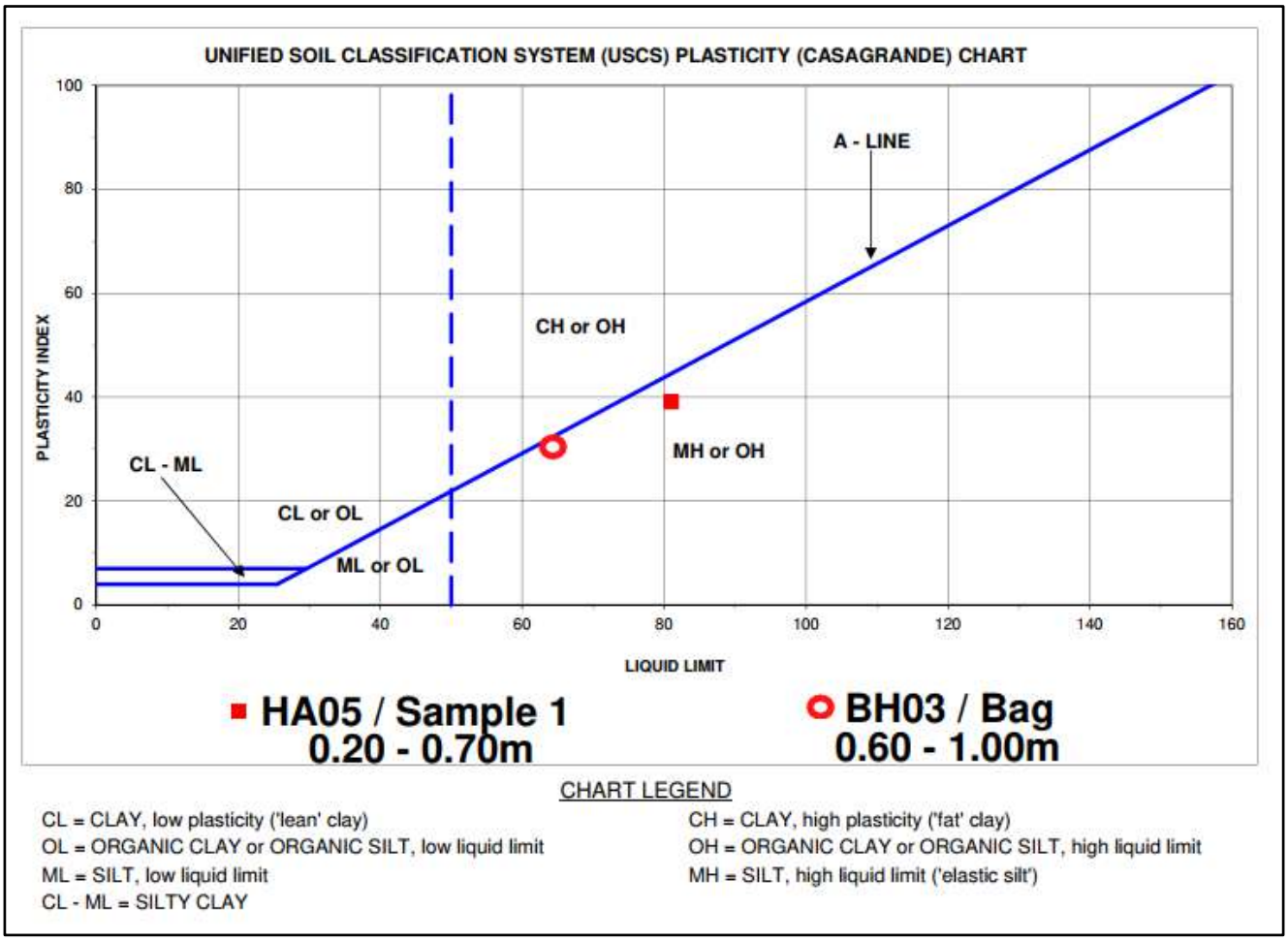

Figure 4 - Casagrande Chart

Both samples plot below the A-Line. The plot is typical for a residual volcanic soil containing Halloysite (Tropical Red Clays), which are described to typically have good engineering properties[‡].

Based on our local knowledge of the behaviour of these soils, and our on-site observations, we considered the soils to be no more than moderately expansive in accordance with the New Zealand Building Code, B1/AS1. Provided the foundations are designed to withstand volumetric changes to the soil under seasonal variations of water content for a class M soil (e.g. shrinkage during dry summer months), potential volume change effects are anticipated to be avoided.

[‡] Laurence D. Wesley, 2010: *Geotechnical Engineering in Residual Soils*

5 Foundation Recommendations

5.1 General

Concept drawings show the proposed library will comprise a building footprint of approximately 1000m^2. Earthworks volumes are unknown at this stage; however, we have been provided with a preliminary cut and fill plan which indicates up to 0.8m of fill may be placed within the north-eastern extent of the property. Earthworks recommendations are included in section 6.1.

Areas across the building platform are expected to comprise up to 1.5m of soft to firm lenses from depths ranging between 1.3mbgl to 4.5mbgl. Foundations shall consider the depth to such material.

5.2 Seismic Site Subsoil Category

The site subsoil conditions have been assessed to be consistent with seismic subsoil class C (Shallow site soils) in accordance with NZS1170.5.

5.3 Shallow Foundations

Investigations across the proposed development area identified variable soils, with some test locations identifying firm soils up to 1.3m from surface. Conditions across the proposed development area are suitable for shallow foundations, provided a lower ultimate bearing capacity is adopted in design.

Shallow foundations may comprise rafts, strip footings or pad / pile foundations, and will be subject to specific engineered design by a Chartered Professional Engineer (CPEng). Shallow foundations may be designed as follows:

- Ultimate bearing capacity – 150 kPa;
- Geotechnical strength reduction factor – 0.5;
- Seismic class – Site Class C (shallow soil site).
- Soil expansivity class – Site Class M (moderately reactive soils).
- Minimum embedment depth – 0.6m for spread foundations.
- Minimum embedment depth – 0.8m for post / piled foundations (e.g. for the canopy areas).

Bearing capacity values included in this report are for vertical loads only and do not take into account horizontal shear or moment.

Spread foundations will be subject to specific engineered design (SED) by a Chartered Professional Engineer (CPEng) – Structural, with an allowance for Class M soils, taking into account the revised return period and

surface movement in accordance with B1/AS1 for expansive soils. A minimum embedment depth of 600mm below finished ground level shall be adopted.

Where post / pile foundations are proposed (e.g. for the canopy areas), we recommend a minimum embedment for all foundations of 800mm below finished ground level to take into consideration the moderately expansive nature of the foundation soils.

Confirmation of the stripped subgrade is recommended prior to preparing foundations and prior to placing imported any fill to ensure all unsuitable material, e.g., topsoil, has been removed. A geotechnical drawing review is recommended to confirm the foundation and filling recommendations have been followed.

5.4 Bridging Piled Foundations (Deep Foundations)

If pile foundations are adopted to span across the pit along the southern edge of the building, then we recommend piled foundations are taken into the very stiff to hard competent material encountered from 5.0mbgl across this area.

Haigh Workman will be available to provide geotechnical design parameters if piled foundations are considered necessary.

5.5 Geotechnical Review

We recommend that the consent drawings are submitted for review to either ourselves, or another professional geotechnical engineer who is familiar with the contents of this report, once they are ready for submission to Council for approval. We recommend this review is carried out in order to check the compatibility of the design with the recommendations given within this report.

6 Construction

6.1 Earthworks

The site is flat and sits at an elevation of approximately 196.8mRL to 197.4mRL. Floor levels and finished ground levels have not been provided to us at the time of writing this report, however preliminary earthworks cut and fill plan was given to us which indicated up to 0.8m of fill across the building platform.

The site contains numerous historic pits, trench networks and removed tanks that had been backfilled with loose, non-engineered material. This material is considered not suitable for supporting building loads and shall be removed and replaced with imported granular hardfill. Refer Section 6.2. these areas can be seen in the drone photograph included in Figure 1 (Section 1.3) and the drawings attached (Appendix A).

Where it is not economical to remove unsuitable material, then piles can be incorporated into the foundation design to bridge the footings. We envisage this would only be required along the southern edge of the building

where there is a deep (>3.0m depth) pit measuring approximately 2.0m in width. The pit contained loose clay backfill intermixed with buried rubbish.

Pit and trench locations that are within 3.0m from the edge of the building are considered to be within the building's bearing zone of influence (i.e., the removed underground north of the building). Unsuitable material should be removed until natural ground is observed and replaced with engineered hardfill.

The south-western extent of the building platform was largely untouched during demolition works, however, buried concrete was observed. Property files indicate that petrol pumps and an underground tank were located here, and further excavation is likely required. The remaining areas of the building platform have been mapped out using high quality drone footage of the trench and pit locations.

Due to the nature of the site, subgrade preparation for the proposed building will need to be monitored by an appropriately qualified engineer who is familiar with the contents of this report prior to filling.

6.2 Filling

All grass coverings, topsoil, uncertified fill material and loose material must be removed below any proposed areas of intended fill placement. Any fill placed beneath or within 1.0 m of the proposed structure and exceeding 1.0m in depth (above natural ground level) will need confirmation by the engineer that settlement caused by filling will not cause adverse effects to the building.

Prior to commencing filling, a pre-fill inspection of the subgrade should be undertaken by a professional engineer. The fill material shall be imported granular hardfill, GAP40 or GAP65 and verification of compaction should be undertaken by a professional engineer at regular lifts. i.e., inspection at pre-placement and every 250mm thereafter. A minimum Clegg Impact Value (CIV) of 25 is recommended or 95% of the material's maximum dry density (MDD[§]).

6.3 Retaining Walls

Hard filling is expected to be minor and there will be sufficient room to batter the fill, thus retaining walls are not envisaged.

Should retaining be required, then Haigh Workman Limited should be engaged to provide further design recommendations. All retaining walls will be subject to specific engineered design by a Chartered Professional Engineer (CPEng).

[§] The MDD for the granular hardfill must be known prior to commencment of filling, we recommend requesting compaction curve test result information from the aggregate supplier before choosing the material to be used.

6.4 Wetting of Floor Slab

With potentially expansive soils, it is important that the soils at slab subgrade are not permitted to dry out as they may be susceptible to re-swell on wetting (in the months after pouring the slab), exerting significant swelling pressures and potentially causing damage to the floor slab. We therefore recommend that any prepared pad be inspected by a geotechnical engineer and promptly covered with at least 100mm of GAP20 type material or periodically wet down for at least one week prior to slab placement. All excavations should be left open for the shortest possible time prior to pour and should be protected by covering/lining with polythene or similar within 24 hours of excavation. These measures will reduce the risk of 'hogging' and cracking of the slab.

6.5 Planned and Existing Vegetation

The foundation designer and architect must take into account the proximity of trees when preparing designs as trees can exacerbate the normal seasonal variation of soil moisture levels and associated with that, the vertical and horizontal movement of the founding soils. Further, mechanical interference with foundations by tree roots should be considered.

We are aware that some landscaping is proposed. Due to the nature of the residual Kerikeri Volcanic Soils, influence on the founding soils is unlikely to exacerbate soil shrink/swell effects provided small shrub and/or plant species are located within 3.0m of the foundations. If larger tree species are proposed, then foundations within the zone of influence of the trees shall be designed for Class H (Highly Expansive) soils to account for exacerbated horizontal movement of the founding soils.

6.6 Unexpected Ground Conditions

Shallow refusal and difficult drilling were encountered during our geotechnical investigations. The depth to the hard stratum may vary across the site and weathered rock, cobbles and/or boulders can be expected during foundation excavations and service trenches.

Trenches and other larger areas of fill were accurately identified during the demolition stage of the former Save Mart and Peterson's motors buildings prior to backfilling. However, the eastern extent of the proposed building platform remained largely untouched and more unsuitable fill material / service trenches may be encountered at this extent during subgrade preparation. All unsuitable material must be removed and replaced with engineered fill. Refer Section 6.2.

6.7 Services

Existing underground services were predominantly removed during the demolition works. At the time of writing, no other known services cross beneath the proposed development platform, other than those identified on drawing G02 appended.

We recommend that any new services are accurately located on site and the depth to invert be determined prior to the commencement of foundation excavations. Services should be located outside the zone of influence of the building foundations, that is 0.5m below the pipe invert, extending to the surface at 45°, or otherwise foundations be designed to bridge over the services.

6.8 Stormwater Disposal

All stormwater is to be diverted away from any proposed building platform to avoid over saturation of the subsoils and to maintain stability across the site. All stormwater should be piped away from the development platform and managed appropriately.

6.9 Construction Observations

Specific engineering inspections of building platform preparation and/or foundation construction with certification by a Producer Statement, PS4, are often required by Council and outlined in the Building Consent documents. These observations are generally required to ensure that the foundation soils exposed at the time of construction are consistent with the assumptions made in this geotechnical report.

We consider the following specific items, but not limited to will need to be addressed prior to and at the time of construction to ensure the foundation soils are consistent with the assumptions made in this geotechnical report:

- Geotechnical drawing review prior to undertaking construction observations;
- Observe building platform excavations (subgrade), removal of unsuitable material, and confirm location of the building are in accordance with our recommendations.
- Observe any fill being placed with testing undertaken prior to preparing foundations.
- Observe all foundation excavations for the building prior to foundations being poured.

Provision should be allowed for modifying the foundation solution at this time should unforeseen ground conditions be encountered.

7 Limitations

This report has been prepared for the use of Eclipse Architecture with respect to the particular 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. 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
24 122/G01	Site Location
24 122/G02	Site Features & Investigation Plan
24 122/G03	Geological Cross Section A – A’
24 122/G04	Geological Cross Section B –B’

NOTES:

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

Issue	Date	Revision
A	30/10/2024	FIRST ISSUE

DWG: Site Location Plan

Scale 1:2500 @A3 | Date October 2024

Drawn CN | Checked JMC | Approved JP

File T:\CLIENTS\ECLIPSE ARCHITECTURE\JOBS\24 122 - 69 AND 71 BROADWAY, KAIKOHE\ENGINEERING\GEOTECH\DRAWINGS\24 122_GEO PLANS.DWG

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Client: ECLIPSE ARCHITECTURE

Project No. 24 122 | RC no. N/A

DWG No. **G01**

Sheet No. **1** of **4**

Plotted By Craig Nelder at 30/10/2024 3:25:30 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.

KEY:

- HAND AUGER BOREHOLE LOCATION (2024)
- HAND AUGER BOREHOLE LOCATION (2022)
- TEST PIT LOCATION
- CONE PENETROMETER TEST LOCATION
- PROPOSED BUILDING OUTLINE

OLD PUMPS & SALES OFFICE (REMOVED) (APPROX.)

OLD UNDERGROUND TANKS (REMOVED) (APPROX.)

SHALLOW FILL / CONTAMINATION AREA (REMOVED) (APPROX.)

OLD OIL TANK (REMOVED) (APPROX.)

DECOMISSIONED STEEL PIPE & TRENCH (APPROX.)

VEHICLE SERVICE BAYS FROM OLD BUILDING (1.0m APPROX.)

TRENCH NETWORK (0.5m TO 1.2m APPROX.)

BURIED CONCRETE, POSSIBLE DEEPER UNSUITABLE MATERIAL

DEEP PIT >3m DEEP (APPROX. 2m WIDE)

LOCATION OF OLD PUMPS AND TANK APPROX. (NOT IDENTIFIED DURING DEMOLITION WORKS - POSSIBLE UNSUITABLE MATERIAL)

TP01, TP02, TP03, TP04, BH02, TP05, TP06, BH03, BH01, CPT4, HA04, CPT5, HA01, TP07, TP08, HA02, CPT2, HA06, CPT3, HA05, TP09, BH04, HA07, CPT6, HA03, TP12, BH06, TP11, HA08, TP13, CPT1, TP10, BH05, TP14, BH10, TP16, BH09, TP17, BH07, TP15, BH08

A G03 · B G04 · B' G04

Issue	Date	Revision
A	30/10/2024	FIRST ISSUE

DWG: Site Features & Investigation Plan

Scale 1:300 @A3 | Date October 2024

Drawn CN | Checked JMC | Approved JP

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Project No. 24 122 | RC no. N/A

DWG No. G02

Sheet No. 2 of 4

Plotted By Craig Nelder at 1/11/2024 11:05:14 AM

NOTES:

1. THIS DRAWING IS BASED ON MEASUREMENTS BY TAPE AND CLINOMETER AND IS APPROXIMATE ONLY.
2. THE GROUND MODEL HAS BEEN INFERRED FROM THE DATA OBTAINED ON SITE. INFERENCES ABOUT THE SOILS CONDITIONS BETWEEN TEST LOCATIONS HAVE BEEN MADE BUT CANNOT BE GUARANTEED.
3. DRAWING NOT TO BE USED FOR CONSTRUCTION PURPOSES.
4. UNDRAINED SHEAR STRENGTHS / REMOULDED SHEAR STRENGTHS ARE BASED OFF IN-SITU VANE SHEAR STRENGTH READINGS.

KEY:

NON-ENGINEERED FILL, PAVEMENT AND/OR REINFORCED CONCRETE

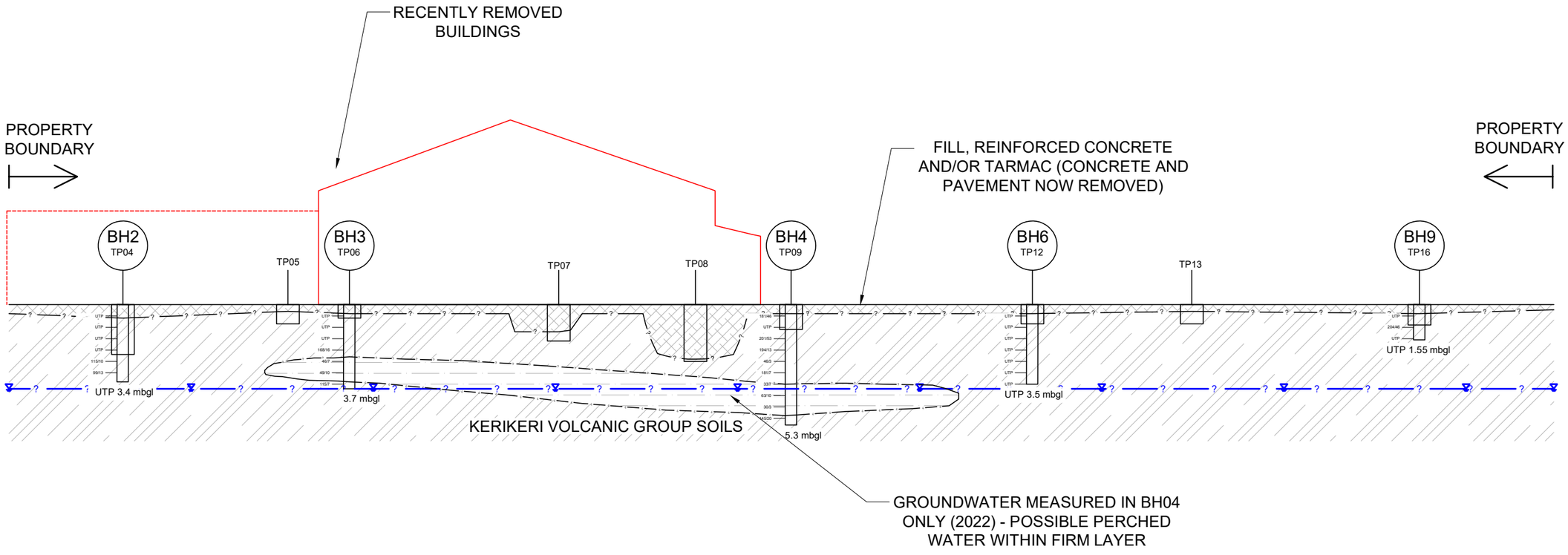
VERY STIFF SOILS
[KERIKERI VOLCANIC GROUP]

FIRM SOILS
[KERIKERI VOLCANIC GROUP]

CROSS SECTION & GROUND WATER BASED ON 2022 INVESTIGATION DATA

A — NORTHWEST

A' — SOUTHEAST



Issue	Date	Revision
A	30/10/2024	FIRST ISSUE

DWG: Geological Cross Section A-A'

Scale 1:200 @A3 | Date October 2024

Drawn CN | Checked JMC | Approved JP

File T:\CLIENTS\ECLIPSE ARCHITECTURE\JOBS\24 122 - 69 AND 71 BROADWAY, KAIKOHE\ENGINEERING\GEOTECH\DRAWINGS\24 122_GEO PLANS.DWG

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Project No. 24 122 | RC no. N/A

DWG No. **G03**

Sheet No. **3** of **4**

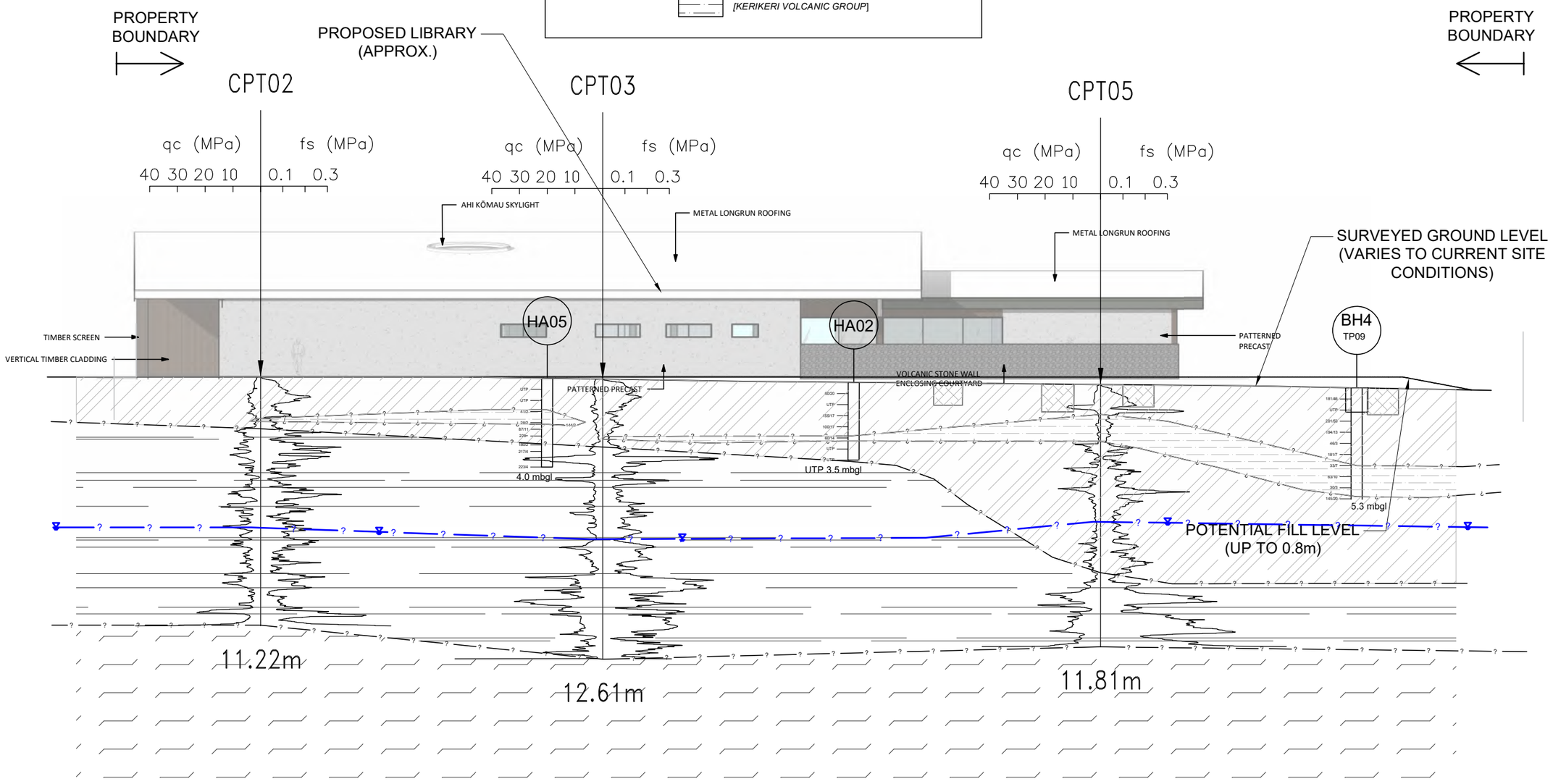
Plotted By Craig Nelder at 30/10/2024 3:29:28 PM

NOTES:

1. THE GROUND MODEL HAS BEEN INFERRED FROM THE DATA OBTAINED ON SITE. INFERENCES ABOUT THE SOILS CONDITIONS BETWEEN TEST LOCATIONS HAVE BEEN MADE BUT CANNOT BE GUARANTEED.
2. DRAWING NOT TO BE USED FOR CONSTRUCTION PURPOSES.
3. UNDRAINED SHEAR STRENGTHS / REMOULDED SHEAR STRENGTHS ARE BASED OFF IN-SITU VANE SHEAR STRENGTH READINGS.

KEY:

- **NON-ENGINEERED FILL AND/OR REINFORCED CONCRETE**
- **VERY STIFF & HARD** SOILS *[KERIKERI VOLCANIC GROUP]*
- **STIFF / VERY STIFF** SOILS *[KERIKERI VOLCANIC GROUP]*
- **WEATHERED ROCK** *[KERIKERI VOLCANIC GROUP]*
- **FIRM** SOILS *[KERIKERI VOLCANIC GROUP]*



Issue	Date	Revision
A	30/10/2024	FIRST ISSUE

DWG: Geological Cross Section B-B'

Scale 1:200 @A3 | Date October 2024

Drawn CN | Checked JMC | Approved JP

File T:\CLIENTS\ECLIPSE ARCHITECTURE\JOBS\24 122 - 69 AND 71 BROADWAY, KAIKOHE\ENGINEERING\GEOTECH\DRAWINGS\24 122_GEO PLANS.DWG

HAIGH WORKMAN LTD Civil & Structural Engineers

6 Fairway Drive
Kerikeri, BOI

T: 09 407 8327
F: 09 407 8378
E: info@haighworkman.co.nz

Project: Geotechnical Investigation
69 Broadway, Kaikohe

Client: ECLIPSE ARCHITECTURE

Project No. 24 122 | RC no. N/A

DWG No. **G04**

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

Plotted By Craig Nelder at 1/11/2024 11:02:47 AM

Appendix B – Provided Development Plans

Drawing No.	Title
24041-T001	Topographical Survey (Vecta)
Drawing Set	Kaikohe Library Development

ROUTLEY AVENUE
Legal Road

BROADWAY (SH 12)
Legal Road

MH SW Kerb Outlet

Concrete Rotary

Concrete Rotary

Seat

Removed Tree Pit

Toyota Sign

SW SUMP
LL = 197.22
OUT IL = 196.31

Concrete Rotary

SW Kerb Outlet

WMr

SS MH
LL = 196.51

SS MH
LL = 196.49

EX SS

Concrete Rotary

Phonebox

WMr

BROADWAY (SH 12)
Legal Road

Pt Lot 13
DP 7437

Lot 1
DP 114630

Part Raihara Block

2x SW Kerb Outlet

Lot 1 DP 46398

Lot 2 DP 46398

Lot 2
DP 10045

Lot 3
DP 46398

Lot 3
DP 10045

Sealed Area

SW Kerb Outlet

SS MH
LL = 197.11
OUT IL = 195.67

Metalled Area

RAIHARA STREET
Legal Road

Pt Lot 13
DP 7437

Sealed Area

KERB OUTLET

SS MH
LL = 197.46
OUT IL = 196.03

Lot 4
DP 10045

Lot 5
DP 10045

Ex SW

Lot 2
DP 114630

SS MH
LL = 197.03
OUT IL = 195.20

2x SW Kerb Outlet

SW MH
LL = 197.29
OUT IL = 196.51

Lot 3
DP 114630

Lot 4
DP 532097

Lot 3
DP 532097

Pt Lot 6
DP 10045

SW Kerb Outlet

SCALE 1:500

0 10 20

N

NOTES:
THIS SURVEY HAS BEEN COMPLETED UNDER INSTRUCTION BY THE CLIENT FOR ITS INTENDED PURPOSE. THIS DATA MAY NOT BE SUITABLE FOR OTHER PURPOSES AND THEREFORE WRITTEN AUTHORITY IS NEEDED FROM VECTA FOR ANY OTHER USE OR REPRODUCTION.

MAJOR CONTOURS ARE AT 1.0m INTERVALS
MINOR CONTOURS ARE AT 0.2m INTERVALS
LOCAL AUTHORITY: FAR NORTH DISTRICT COUNCIL
COORDINATE SYSTEM: NZGD MT EDEN 2000
LEVELS DATUM: NZ VERTICAL DATUM 2016
ORIGIN OF LEVELS: SM 1085 SO 61964 (C8BP)
RL= 195.51m

SURVEY DATE: 3RD JULY 2024

DRAINAGE FEATURES DENOTED "INDICATIVE PIPE POSITION FROM FNDC GIS" HAVE BEEN SCALED/TAKEN FROM COUNCIL GIS RECORDS AND MUST BE CHECKED PRIOR TO DESIGN AND CONSTRUCTION AS A RESULT, VECTA ACCEPTS NO LIABILITY FOR THE SERVICES AND THEIR POSITIONS SHOWN OR OMITTED FROM THIS PLAN LIABILITY

VECTA
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REV.	REVISION DETAILS	DRAWN	APP.
C			
B			
A	1ST ISSUE	16-07-24 HC	--

PROJECT DETAILS
KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437
69 & 71 BROADWAY, KAIKOHE

TITLE
TOPOGRAPHICAL SURVEY

DATE CREATED	DRAWN	DESIGNED	APPROVED
16/07/24	HC	--	--
VECTA REF NO	SCALE	STATUS	
24041	1:500 @ A3	ISSUED	
DWG NUMBER		REVISION	
24041-T001		A	

DATE PLOTTED: Tuesday, 16 July 2024 8:24:18 pm FILE PATH: V:\PROJECT\2024\24041 Kaikohe Library\CAD\Topo Survey\24041-Topo Survey-Kaikohe Library.dwg

KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437 69 & 71 BROADWAY, KAIKOHE

CONCEPT

NOTES:
1) CONTRACTOR RESPONSIBLE TO VERIFY ALL DIMENSIONS, ANGLES & LEVELS ON SITE PRIOR TO COMMENCING ANY WORK.
2) ALL WORK TO COMPLY WITH NZBC AND ALL LOCAL AUTHORITY REQUIREMENTS.
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GMC architects
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LOT 1 DP 114630 & PART LOTS 13 DP 7437 69 & 71 BROADWAY, KAIKOHE

sheet
INDEX

Ref.	Description	Date

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sheet status
sheet number C000 revision

24/09/2024 9:57:08 am

P:\Projects\FNH0878.10 FNDC New Library Kaikohe\03 Design\02 Concept Design\3423 - Kaikohe Library - 03.09.24.rvt

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BROADWAY, KAIKOHE

sheet
PROPOSED - SITE PLAN

Ref.	Description	Date

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sheet number C101 revision

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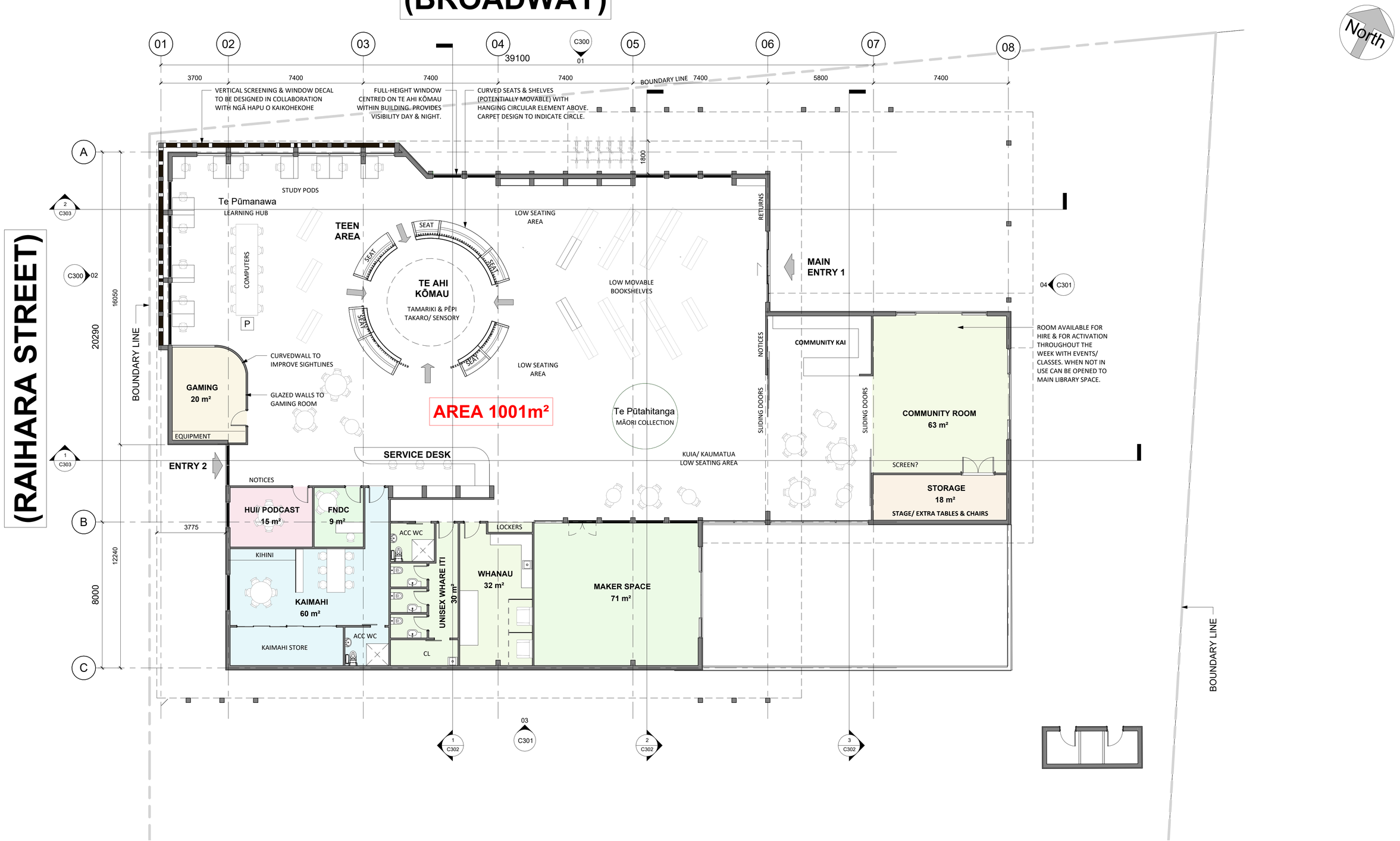

1 GROUND

A1 Scale: 1 : 100

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sheet
PROPOSED - GROUND - FLOOR PLAN

Ref.	Description	Date

date 07AUG24 drw 000 job 3423
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sheet status
sheet number C200 revision

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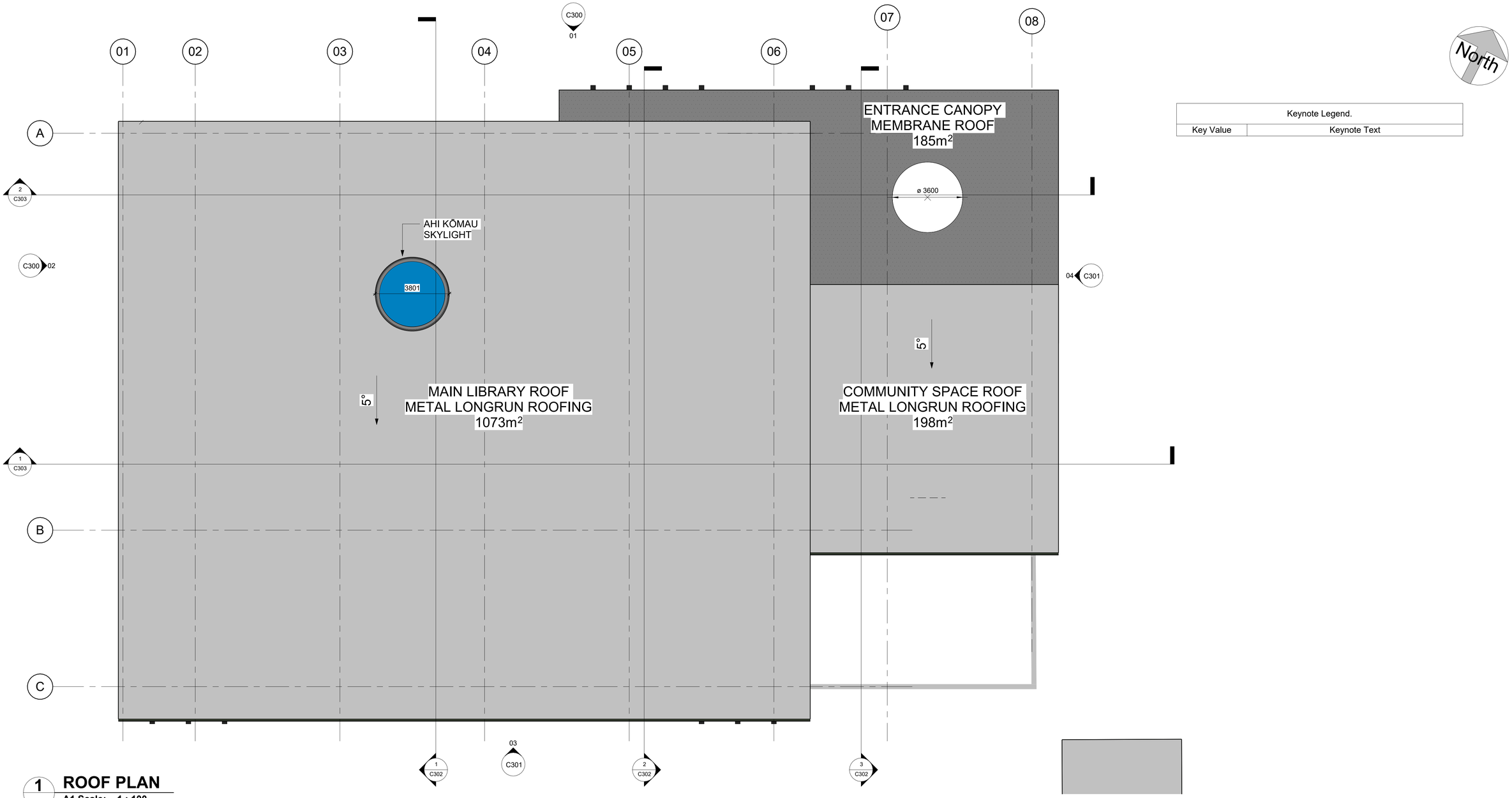

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Key Value	Keynote Text

1 **ROOF PLAN**
A1 Scale: 1 : 100

CONCEPT

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sheet
PROPOSED - ROOF PLAN

Ref.	Description	Date

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sheet number C206 revision

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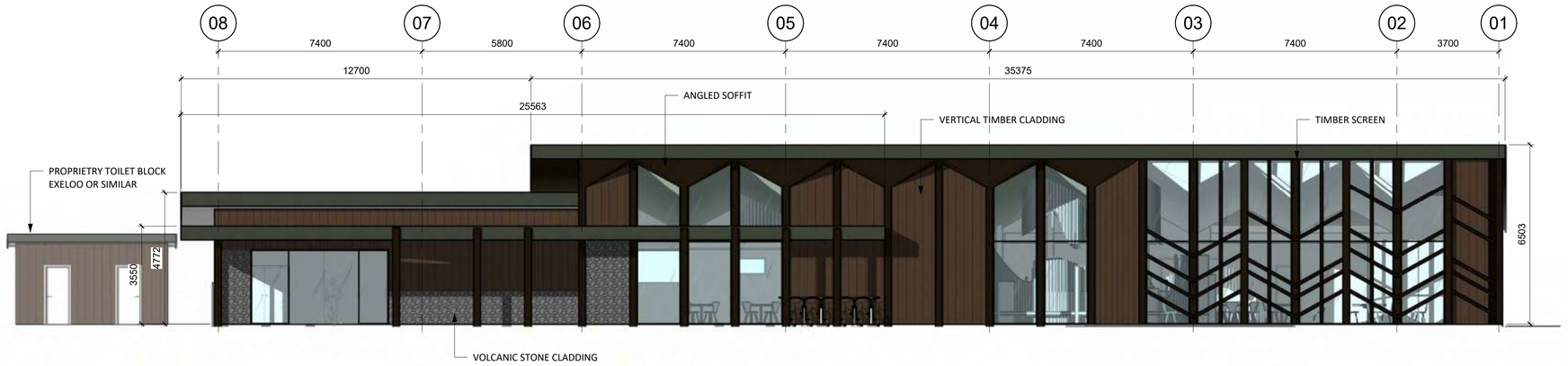
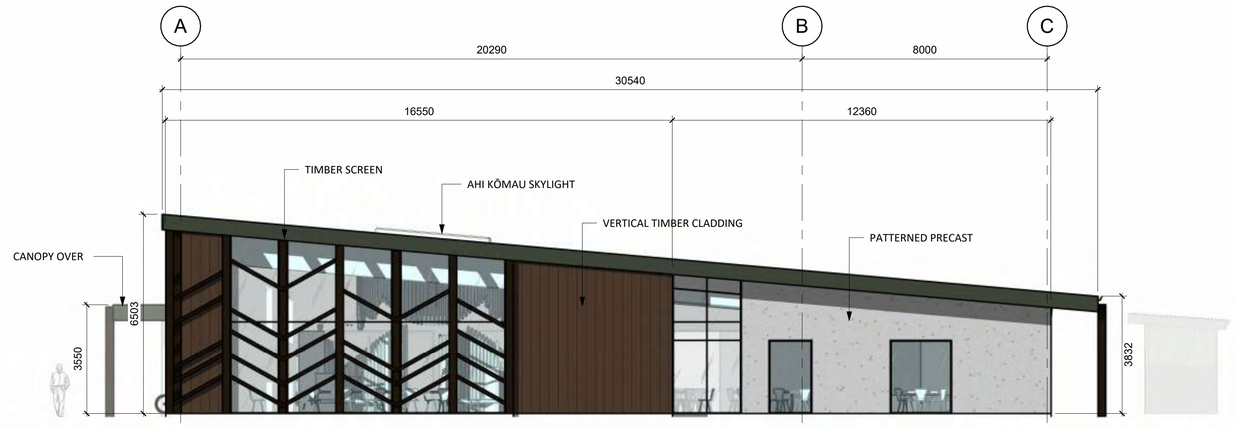


01 C200 NORTH - STREET VIEW **(BROADWAY)**
A1 Scale: 1 : 100



02 C200 WEST STREET VIEW **(RAIHARA STREET)**
A1 Scale: 1 : 100

CONCEPT

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sheet
PROPOSED - ELEVATIONS - NORTH & EAST

Ref.	Description	Date

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sheet number C300 revision

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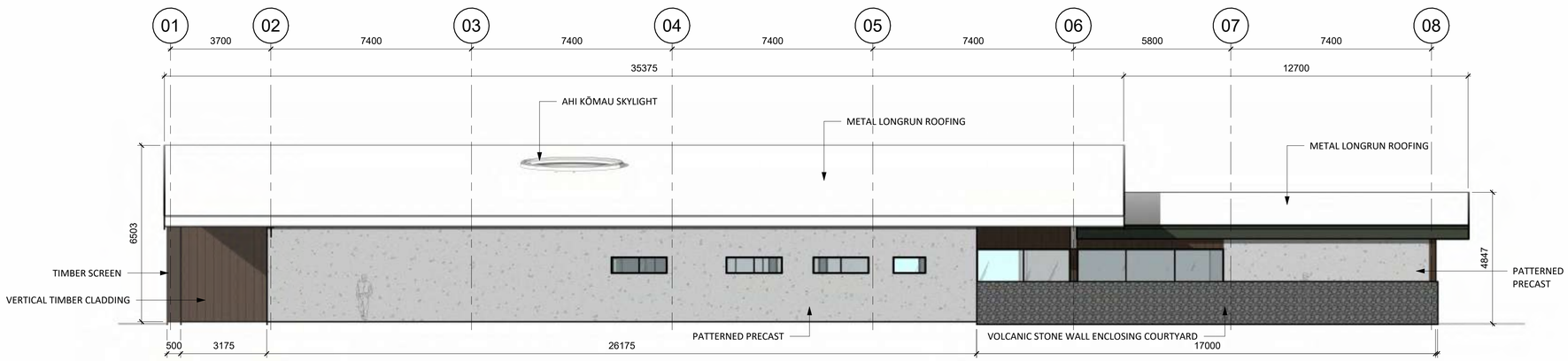
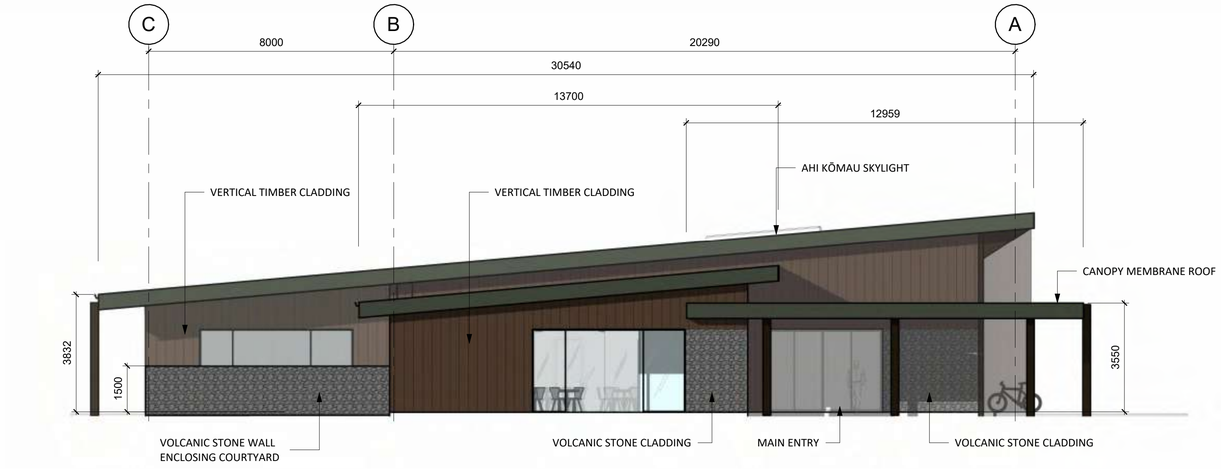


03 SOUTH
C200 A1 Scale: 1 : 100



04 EAST
C200 A1 Scale: 1 : 100

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sheet
PROPOSED - ELEVATIONS - SOUTH & WEST

Ref.	Description	Date

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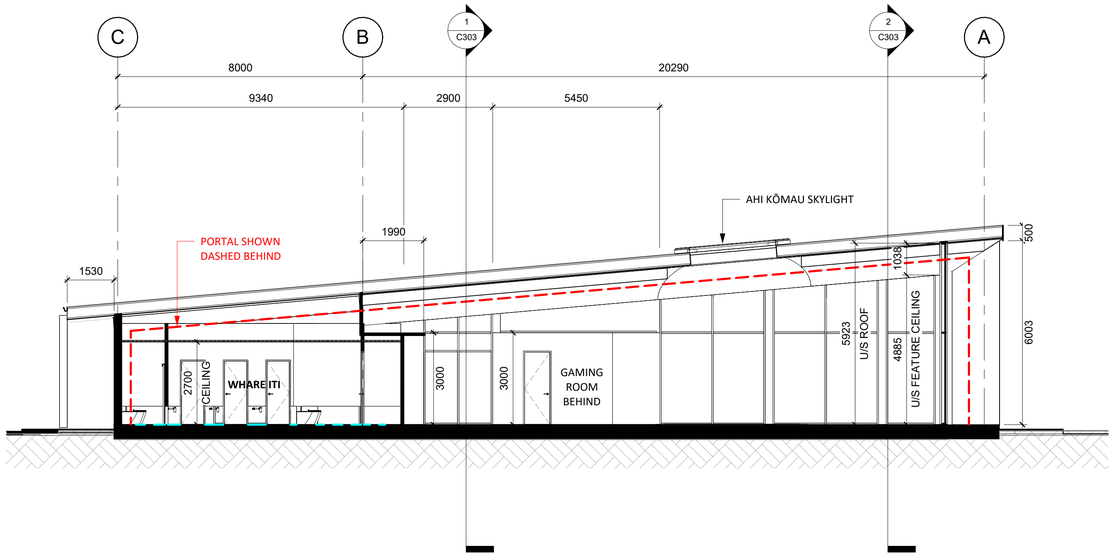

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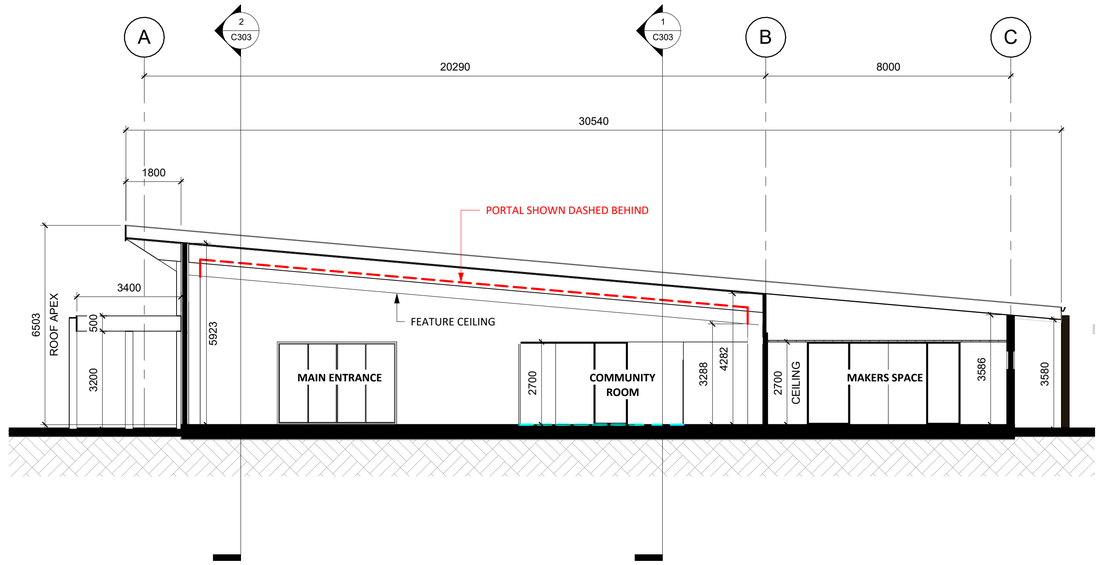

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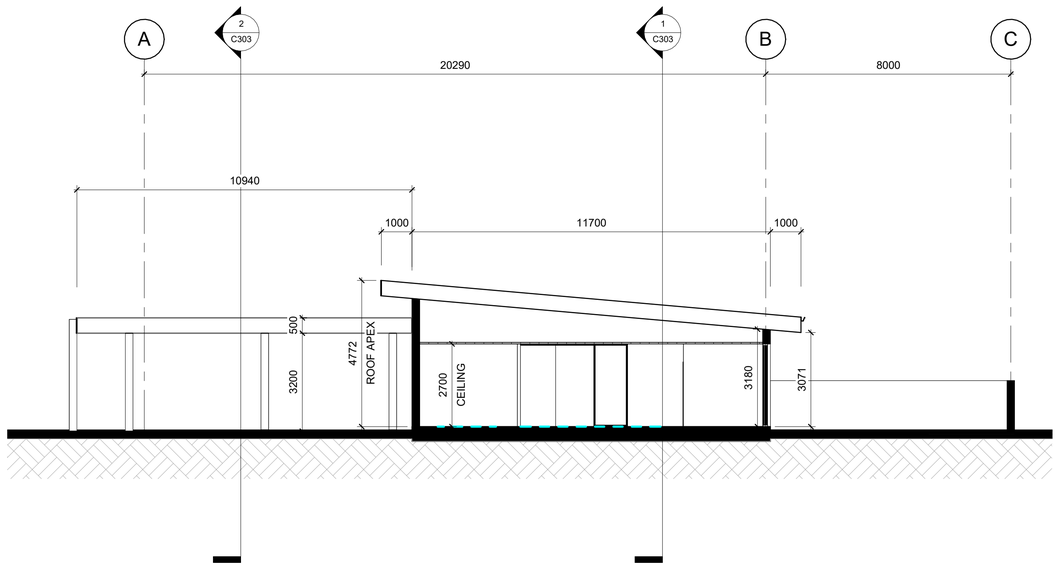

3 Section 3
1 : 100

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sheet
PROPOSED - CROSS SECTIONS

Ref.	Description	Date

date 07AUG24 drw Author job 3423
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sheet status
sheet number C302 revision

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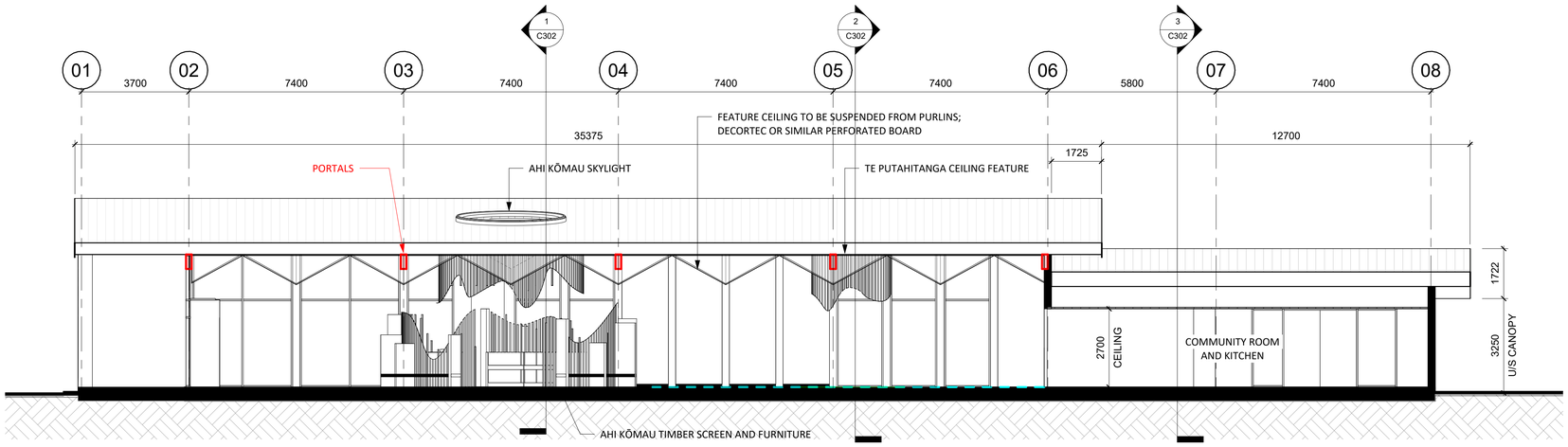

1 Section 1

1 : 100

2 Section 2

1 : 100

CONCEPT

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BROADWAY, KAIKOHE

sheet
PROPOSED - LONG SECTIONS

Ref.	Description	Date

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LOT 1 DP 114630 & PART LOTS 13 DP 7437 69 & 71
BROADWAY, KAIKOHE

sheet
PROPOSED - 3D VIEW

Ref.	Description	Date

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sheet status
sheet number C800 revision

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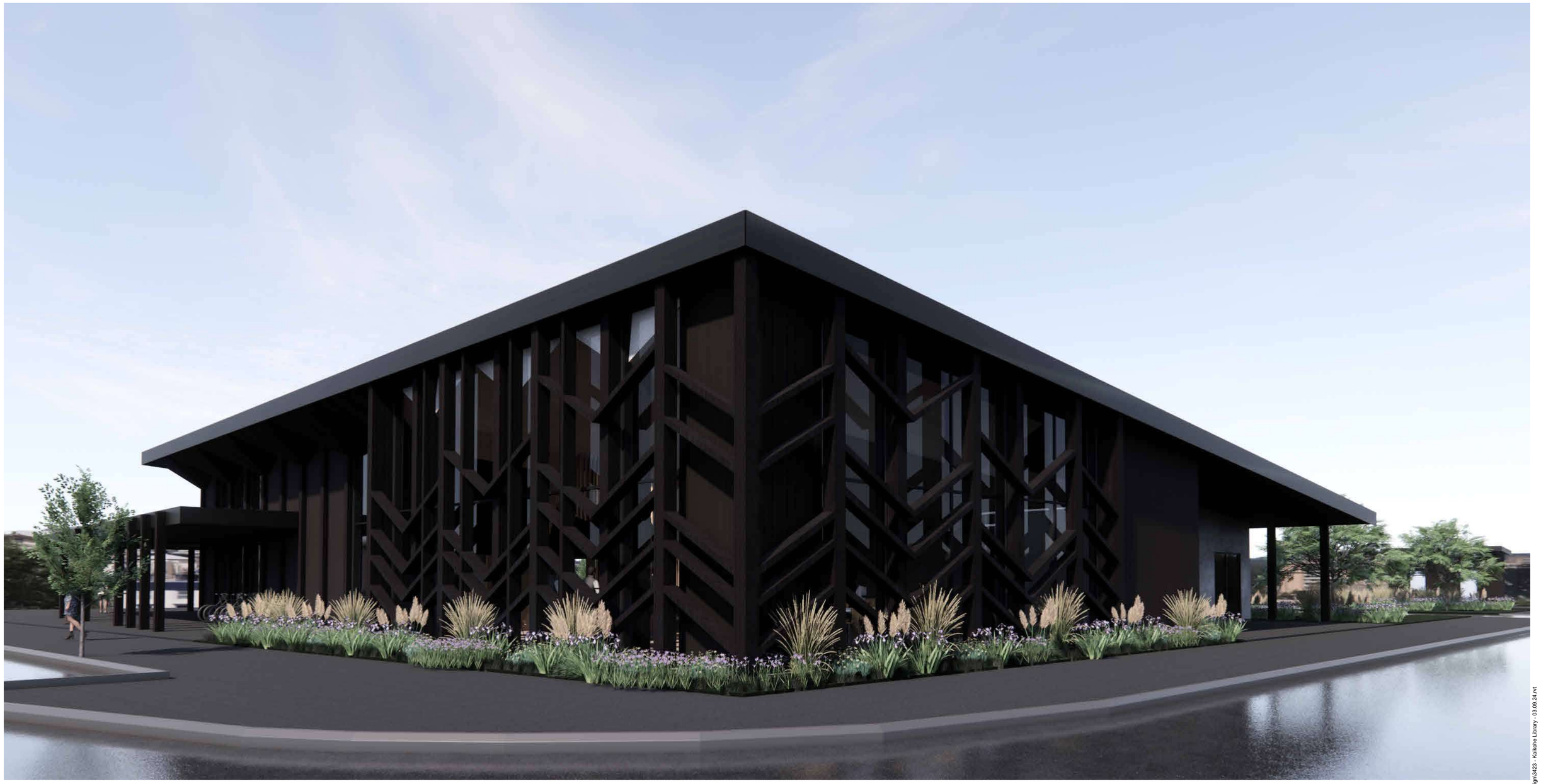

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BROADWAY, KAIKOHE

sheet
PROPOSED - 3D VIEW

Ref.	Description	Date

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sheet status
sheet number C801 revision

24/09/2024 9:57:37 am

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sheet
PROPOSED - 3D VIEW

Ref.	Description	Date

date 07AUG24 drw Author job 3423
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sheet status
sheet number C802 revision

24/09/2024 9:57:37 am

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LOT 1 DP 114630 & PART LOTS 13 DP 7437 69 & 71 BROADWAY, KAIKOHE

sheet
PROPOSED - 3D VIEW

Ref.	Description	Date

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project
KAIKOHE LIBRARY DEVELOPMENT
LOT 1 DP 114630 & PART LOTS 13 DP 7437 69 & 71
BROADWAY, KAIKOHE

sheet
PROPOSED - 3D VIEW

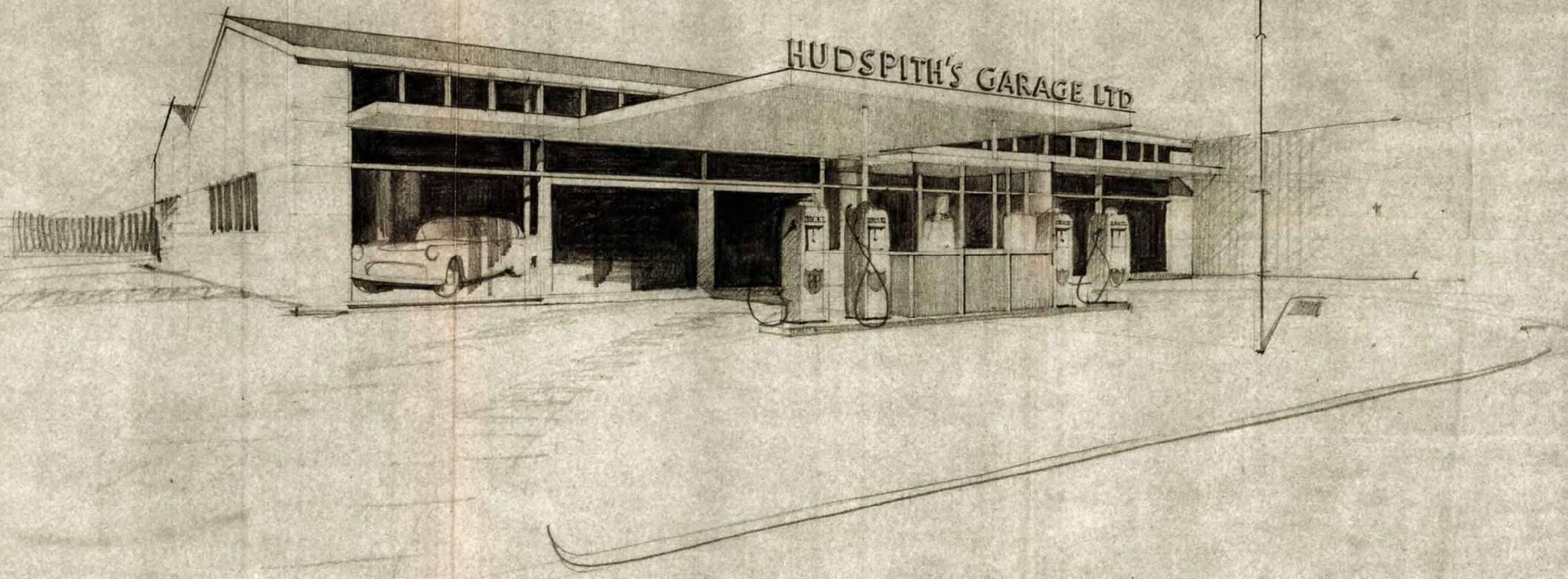
Ref.	Description	Date

date 07AUG24 drw Author job 3423
scale @ A1 = (A3 = 2 x A1)
sheet status
sheet number C804 revision

24/09/2024 9:57:38 am

P:\Projects\FNH0878.10 FNDC New Library Kaikohe\03 Design\02 Concept Design\3423 - Kaikohe Library - 03.09.24.rvt

Appendix C – Relevant Property Files



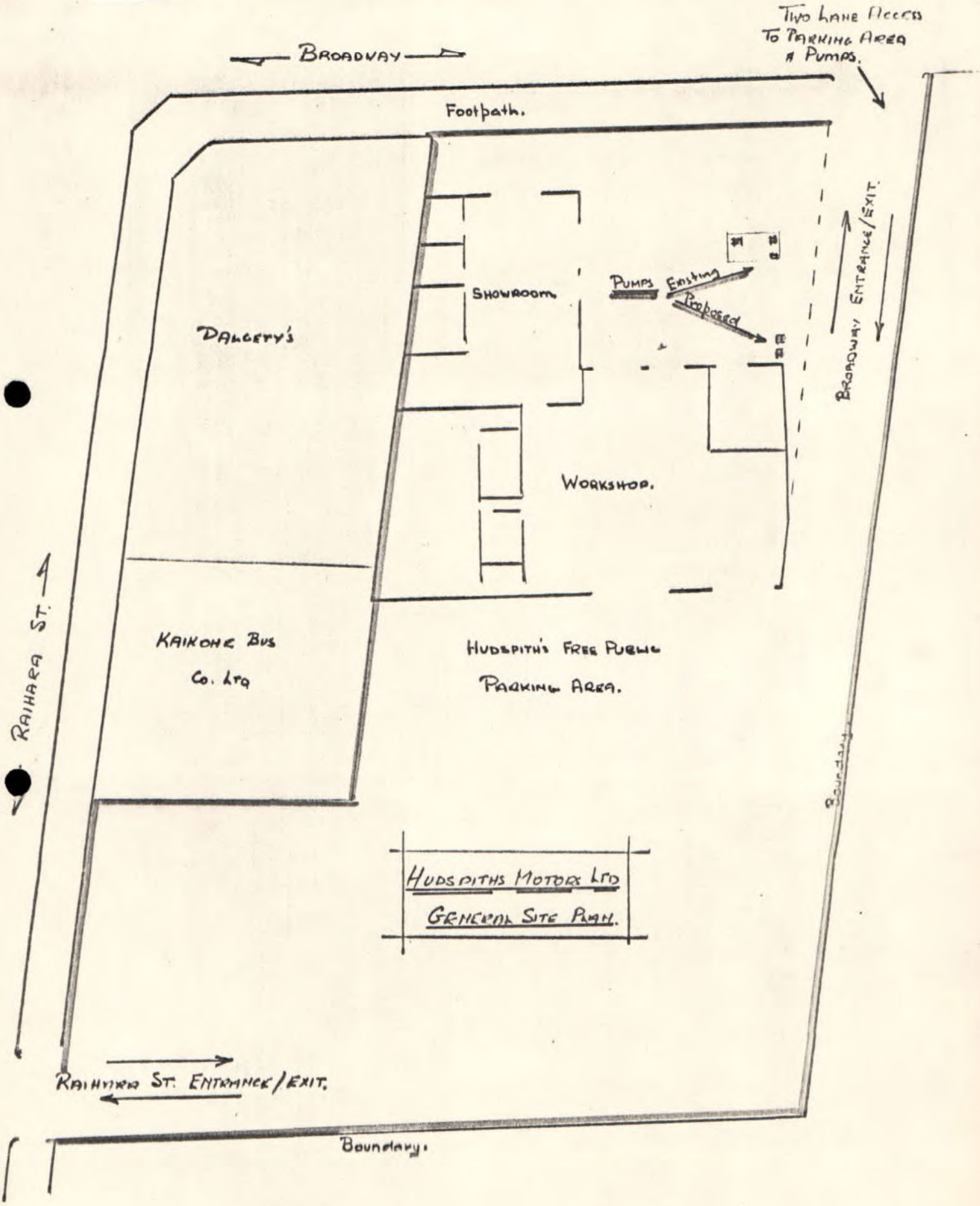
SARGENT and SMITH and PARTNERS
ARCHITECTS and CHARTERED ARCHITECTS
AUCKLAND ROTORUA TAKAPUNA TAUPO

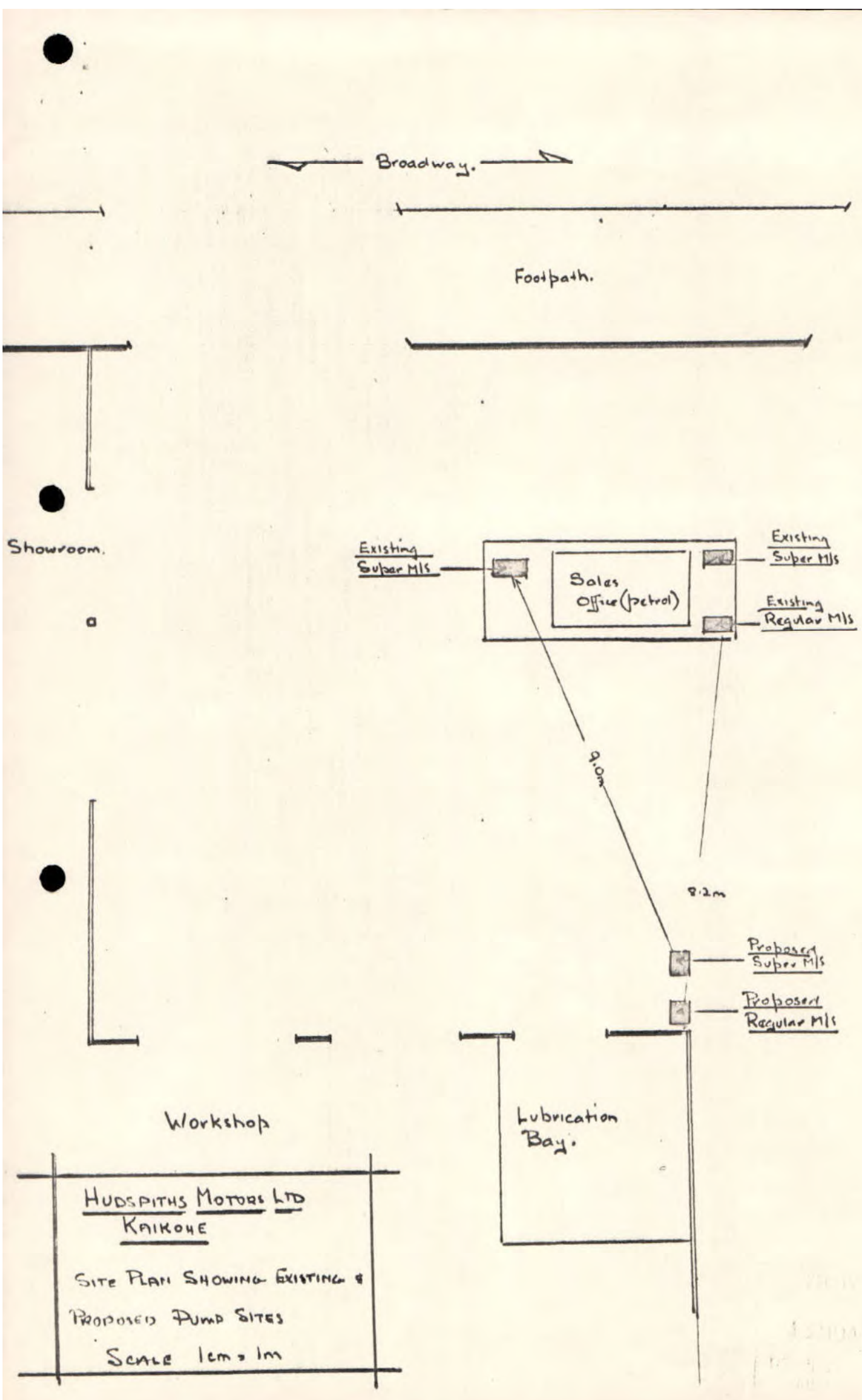
BROADWAY, NEWMARKET
PHONE 544169 & 52180
P.O. BOX 8181
AUCKLAND

ALTERATIONS & ADDITIONS TO HUDSPITH'S GARAGE LTD. KAIKOHE

PERSPECTIVE

P5
829.


Two Lane Access To Parking Area & Pumps.
Broadway
Footpath.
Showroom.
Pumps Existing
Proposed
Dalgety's
Broadway Entrance/Exit.
Workshop.
Kaikohe Bus Co. Ltd
Hudspith's Free Public Parking Area.
Raihara St.
Boundary
Hudspiths Motors Ltd
General Site Plan.
Raihara St. Entrance/Exit.
Boundary.



HUDSPITHS MOTORS LTD
KAIKOHE

SITE PLAN SHOWING EXISTING & PROPOSED PUMP SITES

SCALE 1cm = 1m

NORTHLAND REGIONAL COUNCIL

FILE NOTE

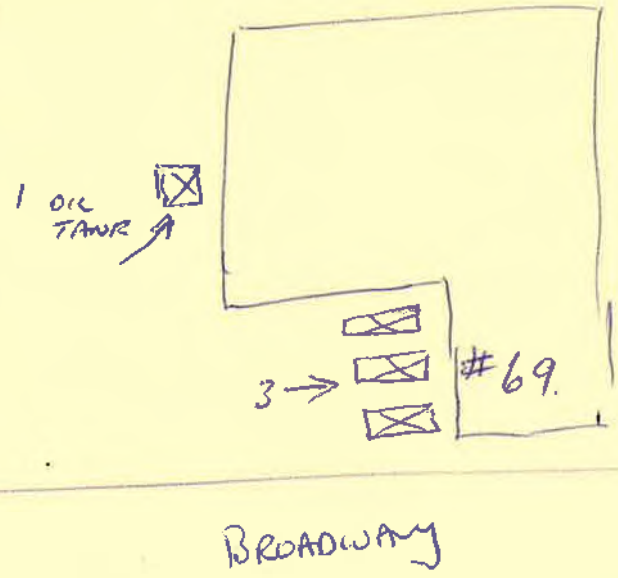
Date: 1ST JULY 1996

File Number:
Action Number:

Correspondence From: GARY YOUNG.

Subject: TANK REMOVAL - PETERSON TOYOTA KAIKOHE.

Action Taken: SITE VISIT, 4 x TANKS REMOVED BY FUELQUIP. DG INSPECTOR AT SCENE AND SAMPLES TAKEN BY NIWA. ALL OK.

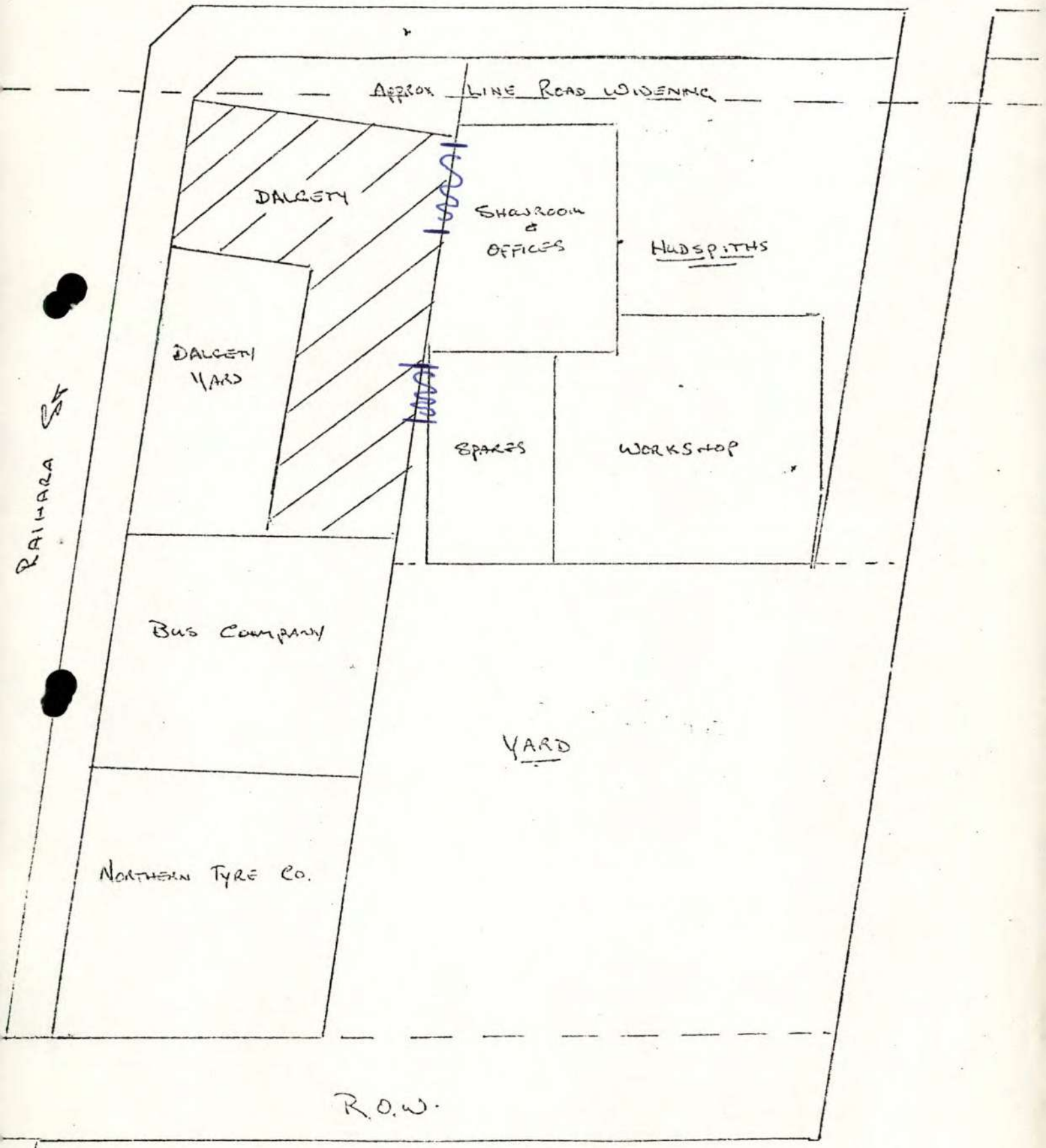


Signed: .....

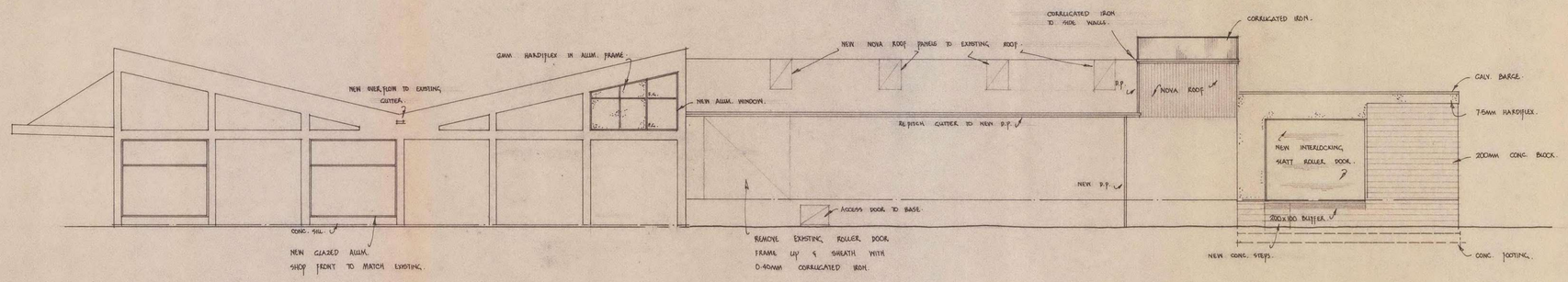
Title: Waste Monitoring

KAIKOHE

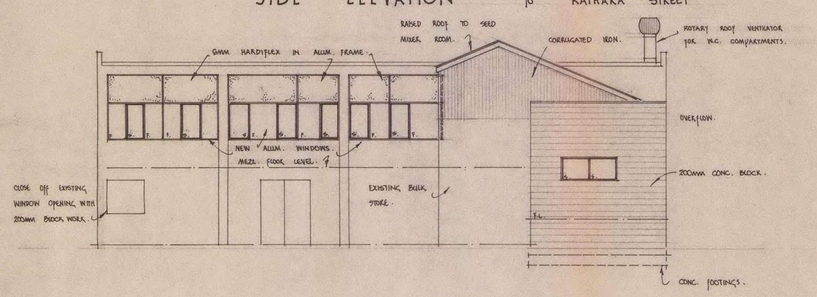
BROADWAY



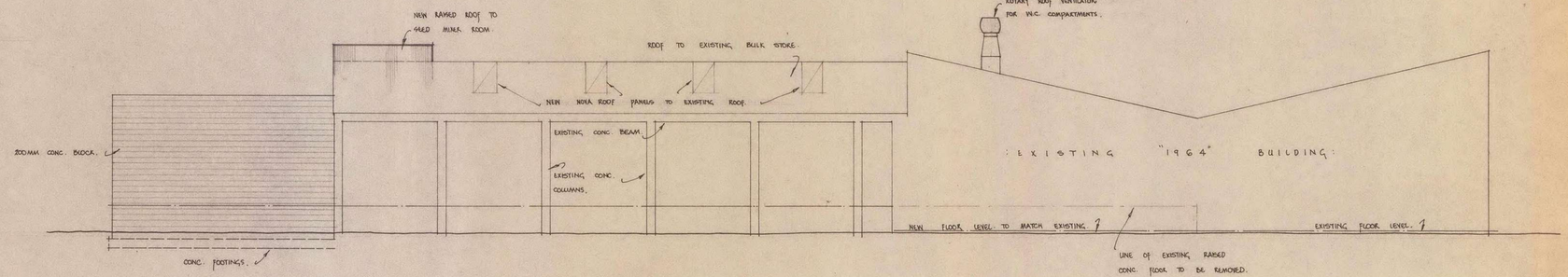
Proposed points where the two buildings will be opened up to give access.



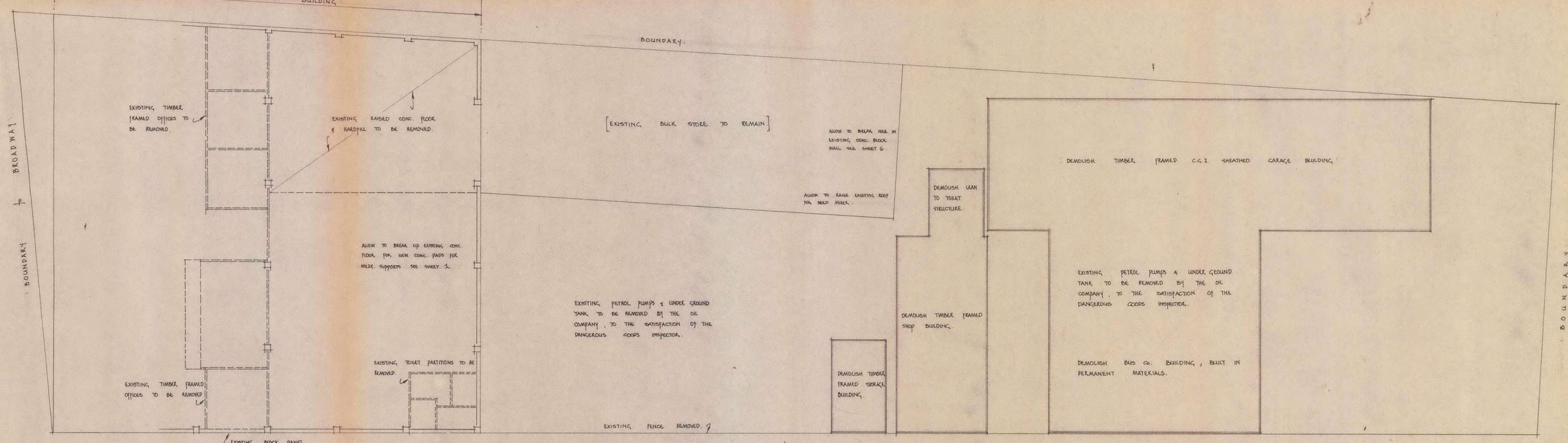
SIDE ELEVATION to RAIHARA STREET



REAR ELEVATION SCALE 1:100. WINDOWS - S = SASH. F = FIXED.



SIDE ELEVATION to HUDSPITH MOTORS LTD.



PLAN SHOWING EXTENT of DEMOLITION SCALE 1:100

DALGETY KAIKOHE

K. L. Mac DONALD Dip. ARCH.
BOX 4010 KAMO PHONE 84 080.

SHEET 2 OF 6

Appendix D – Site Investigation Data (Hand Augers & CPT's)

PO Box 89, 0245
6 Fairway Drive
Kerikeri, 0230
New Zealand

HAIGH WORKMAN LTD
Civil & Structural Engineers

Phone 09 407 8327
Fax 09 407 8378
www.haighworkman.co.nz
info@haighworkman.co.nz

Borehole Log - BH01

Hole Location: Within TP02 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

Reinforced Concrete.

Clayey **SILT**; brown to dark brown. Very stiff, moist, low plasticity. [Fill]

Clayey **SILT**; brown. Very stiff, moist, low plasticity. [Kerikeri Volcanic Group]

At 1.1m: Singular cobble; greyish brown, vesicular.

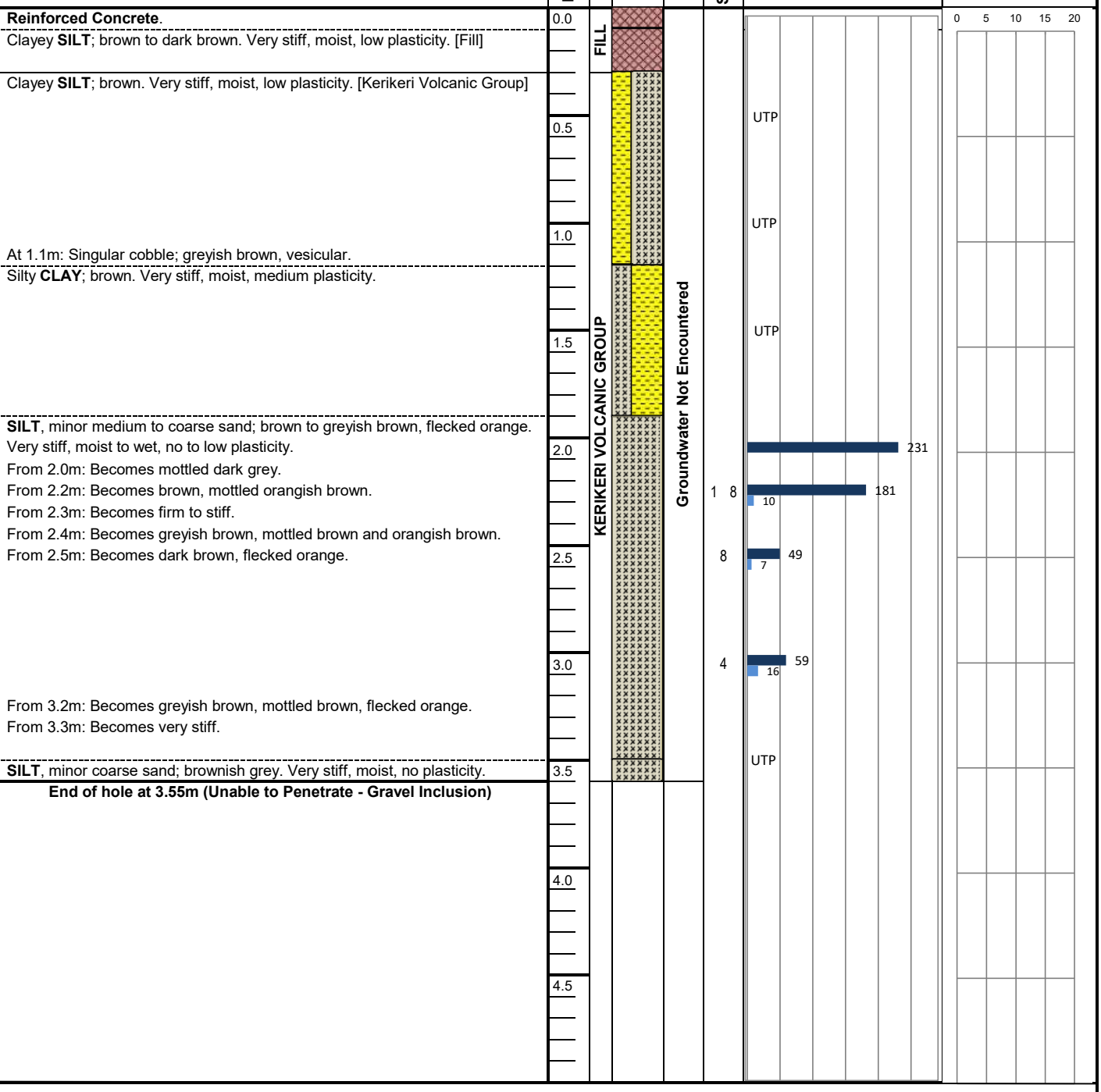
Silty **CLAY**; brown. Very stiff, moist, medium plasticity.

SILT, minor medium to coarse sand; brown to greyish brown, flecked orange. Very stiff, moist to wet, no to low plasticity.
From 2.0m: Becomes mottled dark grey.
From 2.2m: Becomes brown, mottled orangish brown.
From 2.3m: Becomes firm to stiff.
From 2.4m: Becomes greyish brown, mottled brown and orangish brown.
From 2.5m: Becomes dark brown, flecked orange.

From 3.2m: Becomes greyish brown, mottled brown, flecked orange.
From 3.3m: Becomes very stiff.

SILT, minor coarse sand; brownish grey. Very stiff, moist, no plasticity.

End of hole at 3.55m (Unable to Penetrate - Gravel Inclusion)



LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 1.4m.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Borehole Log - BH02

Hole Location: Within TP04 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

Reinforced Concrete.

Tarmac; black.

0.15m: Silty **GRAVEL**; light brownish grey. Dense, moist. [Fill]

0.25m: Clayey **SILT**; brown. Very stiff, moist, low plasticity.
At 0.4m: Trace shells.

Silty **CLAY**; brown. Very stiff, moist, medium to high plasticity. [Kerikeri Volcanic Group]

SILT, some clay, trace coarse sand to fine gravel; brown to dark brown. Very stiff, moist, low plasticity.

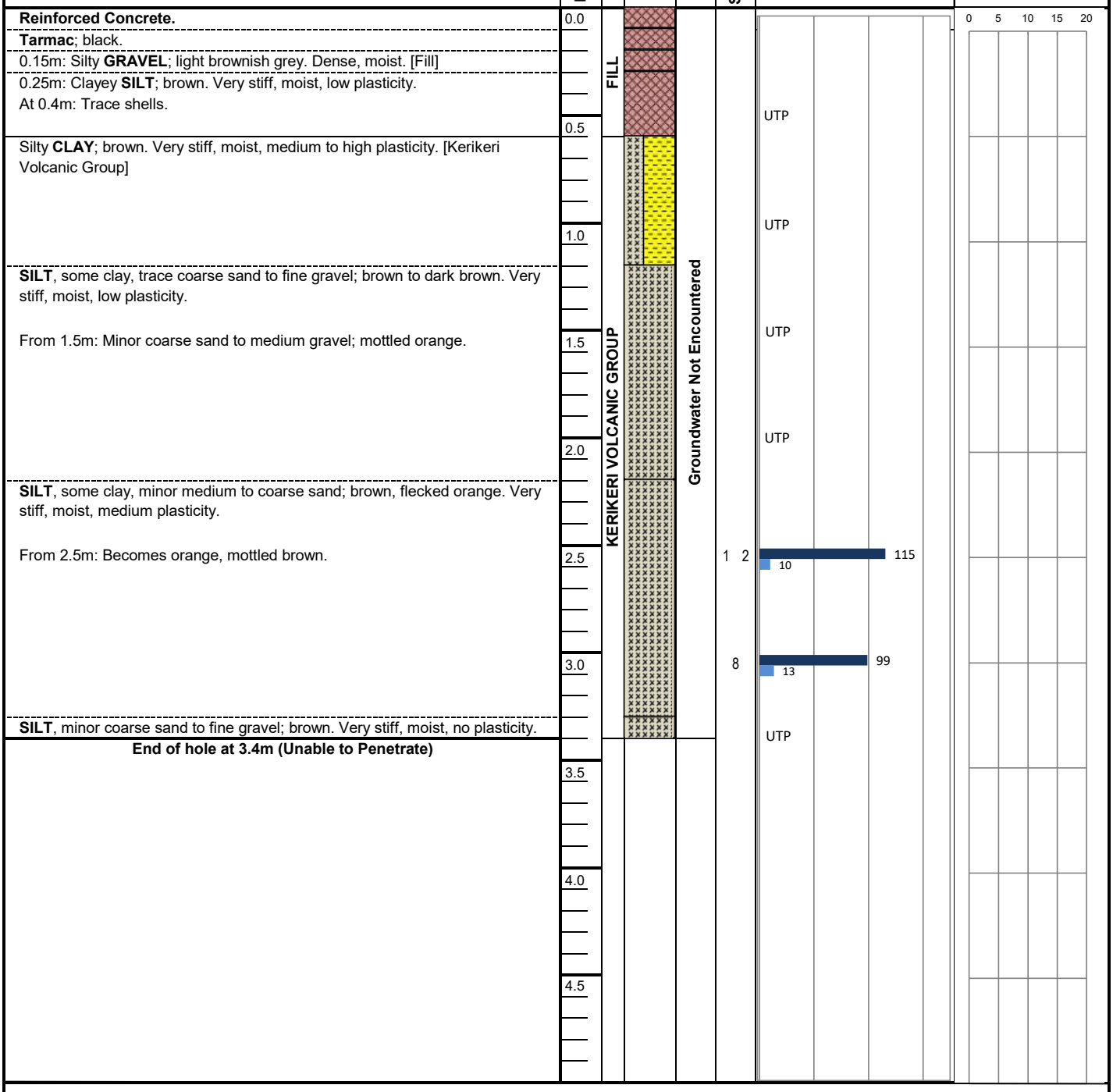
From 1.5m: Minor coarse sand to medium gravel; mottled orange.

SILT, some clay, minor medium to coarse sand; brown, flecked orange. Very stiff, moist, medium plasticity.

From 2.5m: Becomes orange, mottled brown.

SILT, minor coarse sand to fine gravel; brown. Very stiff, moist, no plasticity.

End of hole at 3.4m (Unable to Penetrate)



LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 2.2m.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered. From 1.2 to 2.0mbgl within testpit, adjacant hole: some cobbles and boulders; completely weathered & vesicular.

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Borehole Log - BH03

Hole Location: Within TP06 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Tarmac; black.	0.0	FILL		Groundwater Not Encountered			
0.05m: Silty **GRAVEL**; brown. Dense, moist. Gravel; Medium to coarse. [Fill]							
From 0.25m: Becomes orange.							
From 0.3m: Scoria; reddish pink to reddish brown.							
0.35m: Clayey **SILT**; brown. Very stiff, moist, low to medium plasticity. [Kerikeri Volcanic Group]	0.5	KERIKERI VOLCANIC GROUP				UTP	
SILT, some clay; greyish brown. Very stiff, moist, low plasticity.	1.0					UTP	
At 1.5m: Trace fine to medium gravel.	1.5					UTP	
From 2.0m: Trace coarse sand to fine gravel; brown, mottled orangish brown and grey.	2.0				1 0	168 / 16	
From 2.1m: Minor medium to coarse sand.					1 7	109 / 7	
From 2.3m: Becomes mottled black. Firm to stiff, moist to wet.	2.5				7	46 / 7	
From 3.0m: Becomes brown to purplish brown, mottled orange and dark grey.	3.0				5	49 / 10	
From 3.5m: Becomes brown to purplish brown, mottled reddish brown. Very stiff.	3.5				1 8	115 / 7	
End of hole at 3.7m (Target Depth)	4.0						
	4.5						

Vane Shear and Remoulded Vane Shear Strengths (kPa): 0 5 10 15 20

Scala Penetrometer (blows/100mm): 0 5 10 15 20

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.6m.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered.

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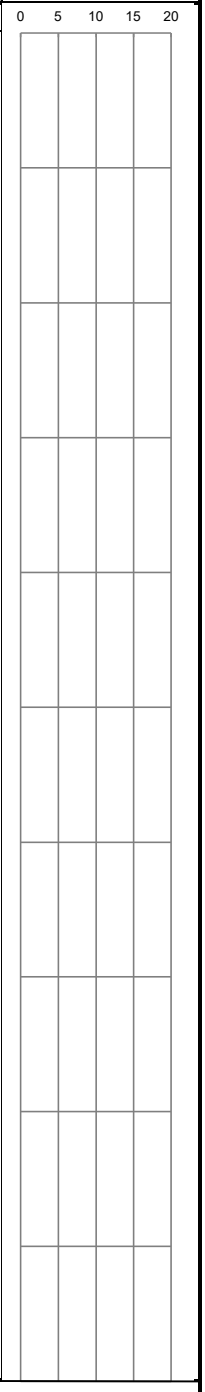
Borehole Log - BH04 (1)

Hole Location: Within TP09 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Tarmac; black.	0.0	FILL					
Silty **GRAVEL**, some sand. Dense, moist. Gravel; fine to coarse. [Fill]							
Silty **GRAVEL**; reddish pink. Dense, moist. Gravel; scoria subbase.							
SILT, trace clay; brown to greyish brown. Very stiff, moist, low plasticity. [Kerikeri Volcanic Group]	0.5	KERIKERI VOLCANIC GROUP			4	181 / 46	
SILT, some clay; brown. Very stiff, moist, low plasticity.						UTP	
Clayey **SILT**; brown. Very stiff, moist, low to medium plasticity.	1.0						
At 1.3m: Mottled pinkish red.	1.5				4	201 / 53	
At 1.8m: Trace coarse sand; mottled grey to light grey.	2.0				1 5	194 / 13	
					2 6	86 / 3	
At 2.3m: Trace fine gravel; mottled orange.							
From 2.5m: Becomes mottled grey and orange. Firm to stiff.	2.5				1 4	46 / 3	
From 2.7 to 3.0m: Slight hydrocarbon odour.							
From 2.9m: Trace medium to coarse sand. Very stiff.							
At 3.1m: Trace medium gravel. Gravel; vesicular, weakly cemented.	3.0				2 8	181 / 7	
SILT, minor clay, trace medium sand to fine gravel; brownish orange, mottled brown. Firm, moist to wet, low plasticity.	3.5			Groundwater encountered at 3.7 mbgl.	5	33 / 7	
From 3.7m: Becomes wet.							
From 4.0m: Becomes greyish brown and orange. Stiff.	4.0				6	63 / 10	
At 4.2m: Trace fine to medium gravel.							
From 4.3m; Becomes brownish grey to dark grey.							
SILT, minor fine to medium sand; brown, orange and black. Firm, wet, no plasticity.	4.5				9	30 / 3	
					7	145 / 20	



LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 1.1m.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered. From 2.7m to 3.0m: trace contamination - located near removed lubritorium tank.

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Borehole Log - BH04 (2)

Hole Location: Within TP09 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

Sandy **SILT**; orange. Stiff, saturated, no plasticity. Sand: medium to coarse.

Sandy **SILT**, trace fine to medium gravel; greyish brown. Medium dense, saturated, no plasticity. Sand: coarse.

End of hole at 5.3m (No Sample Recovery - Gravel)

Depth (m): 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5

Geology: KVG

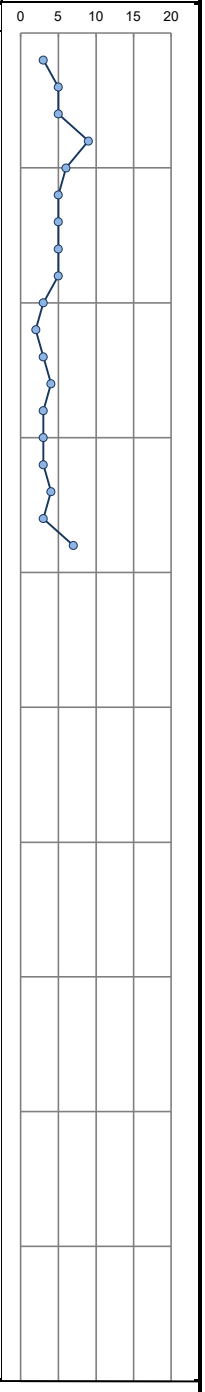
Graphic Log

Water Level

Sensitivity

Vane Shear and Remoulded Vane Shear Strengths (kPa)

Scala Penetrometer (blows/100mm)



LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 1.1m. KVG = Kerikeri Volcanic Group.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered.

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info@haighworkman.co.nz

Borehole Log - BH05

Hole Location: Within TP10 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

Reinforced concrete.

Clayey **SILT**, ash and cobbles combined; black and brown. Firm, moist to wet, no plasticity. [Fill]

Silty **CLAY**; brown. Very stiff, moist, medium to high plasticity. [Kerikeri Volcanic Group]

Clayey **SILT**; brown. Very stiff, moist, medium plasticity.

SILT, some clay, minor medium to coarse sand; brown to greyish brown, flecked light orange and orange. Very stiff, moist, medium plasticity.

At 1.7m: Gravel inclusion.

SILT, trace clay, trace medium to coarse sand, trace fine gravel; greyish brown. Very stiff, moist, low plasticity.

At 2.25m: Mottled white and black.

From 2.3m: Becomes flecked orange.

SILT, minor coarse sand; grey. Very stiff to hard, moist, no plasticity.

End of hole at 2.65m (Unable to Penetrate)

Depth (m): 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

Geology: FILL; KERIKERI VOLCANIC GROUP

Graphic Log

Water Level: Groundwater Not Encountered

Sensitivity: 1 1

Vane Shear and Remoulded Vane Shear Strengths (kPa): UTP; UTP; UTP; UTP; 73; 7

Scala Penetrometer (blows/100mm): 0 5 10 15 20

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.6m.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Borehole Log - BH06

Hole Location: Within TP12 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Silty **GRAVEL**, some sand; dark grey to bluish grey. Dense, moist to wet. Gravel; fine. [Fill]	0.0	FILL		Groundwater Not Encountered		UTP	0 5 10 15 20 25
Gravelly **SILT**; reddish pink. Very stiff, moist. Gravel; scoria subbase.							
SILT; black, flecked white. Very stiff, moist, no plasticity. [Buried Topsoil]		bt					
SILT, some clay; brown. Very stiff, moist, low plasticity. [Kerikeri Volcanic Group]	0.5	KERIKERI VOLCANIC GROUP				UTP	
Clayey **SILT**; brown. Very stiff, moist, low to medium plasticity.	1.0					UTP	
SILT, some clay, trace medium to coarse sand; brown, flecked white. Very stiff, moist, low plasticity.	1.5					UTP	
At 1.9m: Trace medium gravel; mottled grey.	2.0					UTP	
At 2.3m: Mottled grey.	2.5					UTP	
At 2.7m: Trace fine gravel.							
SILT, minor clay, trace coarse sand to fine gravel; brown. Very stiff, moist, low plasticity.	3.0					UTP	
At 3.4m: Mottled orange and white.							
End of hole at 3.5m (Unable to Penetrate)	3.5					UTP	
	4.0						
	4.5						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.85m. bt = turied topsoil.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered.

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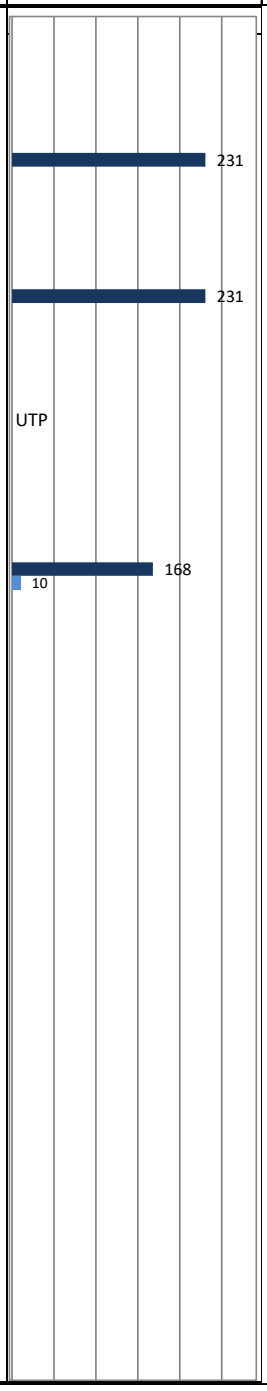
Borehole Log - BH07

Hole Location: Within TP17 (Refer to Site Plan)

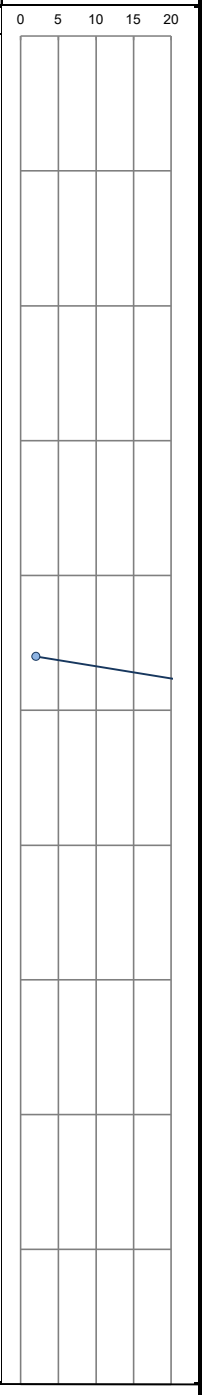
JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity
Sandy **GRAVEL**, some silt; bluish grey. Dense, wet. Gravel: GAP20. [Fill] From 0.1m: Gravel: GAP65.	0.0	FILL		Groundwater Not Encountered	
Sandy **SILT**, some gravel, trace cobbles; reddish pink. Dense, moist. Scoria.					
Silty **CLAY**; brown. Very stiff, moist, medium plasticity. [Kerikeri Volcanic Group]	0.5	KERIKERI VOLCANIC GROUP			
Clayey **SILT**; brown. Very stiff, moist, medium plasticity. From 1.2m: Trace medium to coarse sand; mottled greyish brown.	1.0				
SILT, some clay, trace medium to coarse sand; brown to reddish brown, mottled brownish grey. Very stiff, moist, low plasticity. From 1.9m: Becomes brown, mottled brownish grey.	1.5				
	2.0				1 7
End of hole at 2.3m (Unable to Penetrate)	2.5				
	3.0				
	3.5				
	4.0				
	4.5				



Vane Shear and Remoulded Vane Shear Strengths (kPa)



Scala Penetrometer (blows/100mm)

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.4m.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Borehole Log - BH08

Hole Location: Within TP15 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Silty **GRAVEL**, some sand; bluish grey, Dense, wet. Gravel; GAP20. [Fill]	0.0	FILL		Groundwater Not Encountered			
From 0.1m: Becomes black.							
Silty **GRAVEL**; grey, Dense, wet.							
Gravelly **SILT**, some sand; reddish pink. Dense, moist to wet. Scoria.							
Silty **CLAY**; brown. Very stiff, moist, medium to high plasticity. [Kerikeri Volcanic Group]	0.5	KERIKERI VOLCANIC GROUP				UTP	
	1.0					UTP	
Clayey **SILT**; brown to reddish brown. Very stiff, moist to wet, medium plasticity.							
SILT, trace fine to coarse sand; greyish brown. Very stiff, moist, no to low plasticity.	1.5					UTP	
From 1.9m: Some clay.	2.0					231	
Clayey **SILT**; reddish brown. Very stiff, moist to wet, medium plasticity							
SILT, minor clay, trace fine to medium sand; brownish grey. Very stiff, moist, no to low plasticity.	2.5				1 4	135 10 UTP	
End of hole at 2.6m (Unable to Penetrate)	3.0						
	3.5						
	4.0						
	4.5						

0 5 10 15 20 25

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.7m.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Borehole Log - BH09

Hole Location: Within TP16 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

Silty **GRAVEL**, some sand; bluish grey to dark grey. Dense, wet. Gravel; GAP20. [Fill]

0.25m: **SILT**, some coarse sand to fine gravel; reddish brown. Dense, moist to wet, no plasticity. Gravel; Scoria.

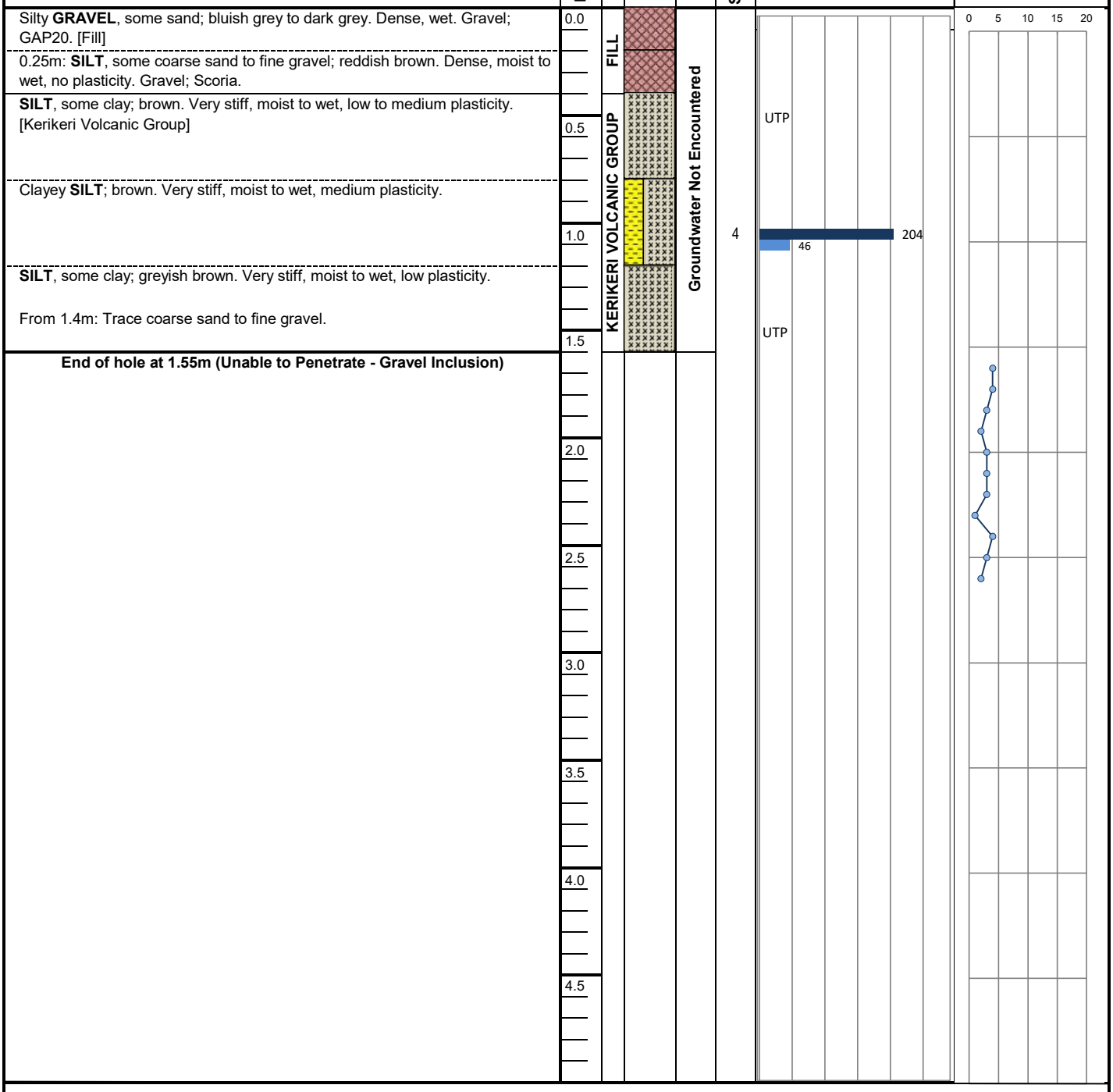
SILT, some clay; brown. Very stiff, moist to wet, low to medium plasticity. [Kerikeri Volcanic Group]

Clayey **SILT**; brown. Very stiff, moist to wet, medium plasticity.

SILT, some clay; greyish brown. Very stiff, moist to wet, low plasticity.

From 1.4m: Trace coarse sand to fine gravel.

End of hole at 1.55m (Unable to Penetrate - Gravel Inclusion)



LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.9m.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered.

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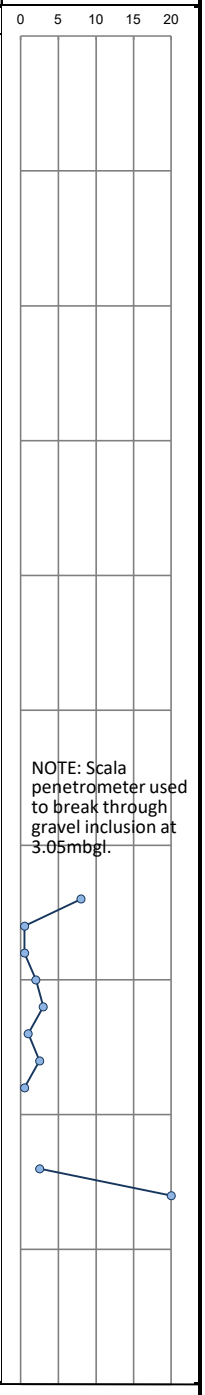
Borehole Log - BH10

Hole Location: Within TP14 (Refer to Site Plan)

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Silty **GRAVEL**, some sand; bluish grey. Dense, moist to wet. Gravel: GAP20. From 0.1m: Becomes light grey. [Fill]	0.0	FILL		Groundwater Not Encountered			
Silty **GRAVEL**; reddish pink. Dense, moist to wet. Gravel: Scoria subbase.							
0.25m: **SILT**, some clay; brown. Very stiff, moist, low plasticity. [Kerikeri Volcanic Group]		KERIKERI VOLCANIC GROUP					
Clayey **SILT**; brown. Very stiff, moist, low plasticity. From 0.8m: Becomes medium plasticity.	0.5					UTP	
	1.0					UTP	
SILT, some clay; brown. Very stiff, moist, low plasticity. From 1.8m: Trace coarse sand to fine gravel.	1.5					231	
SILT, trace clay, trace medium to coarse sand; greyish brown to dark brown, flecked light orange. Very stiff, moist, no to low plasticity. From 2.3m: Becomes mottled orange.	2.0					UTP	
SILT, trace clay, trace coarse sand to fine gravel; orange. Loose, moist to wet, no to low plasticity. Vesicular.	2.5				7	NOTE: Shear Vane pushed through due to loose material. 66 10	
From 3.0m: Becomes very stiff.	3.0					231	
SILT, trace clay, trace fine to medium sand; dark greyish brown, flecked orange. Stiff, moist to wet, no to low plasticity. From 3.3m: Trace fine to coarse sand. Firm From 3.4m: Becomes very stiff.	3.5					UTP	
	4.0					UTP	
End of hole at 4.1m (Unable to Penetrate)	4.5						



LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.9m.
Hand Held Shear Vane S/N: 1617
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Test Pit Log - TP01

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	Jcum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Reinforced Concrete.	0.0						
0.13m: Silty **CLAY**; brown. Moist. [Fill]		FILL		Groundwater Not Encountered		NOTE: Vane shear strength not recorded.	0 5 10 15 20
	0.5						
	1.0						
Silty **CLAY**, trace coarse gravel and cobbles; brown.	1.5	KVG					
	2.0						
End of hole at 2.1m (Target Depth)	2.5						
	3.0						
	3.5						
	4.0						
	4.5						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 2.1m. KVG = Kerikeri Volcanic Group.
Hand Held Shear Vane S/N: NA
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Test Pit Log - TP03

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	Jcum
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Reinforced Concrete.	0.0	FI		Groundwater Not Encountered		NOTE: Vane shear strength not recorded.	0 5 10 15 20
Silty CLAY; brown, stained dark brown to black. Moist. Hydrocarbon odour.							
Silty CLAY, trace coarse gravel and cobbles; brown. [Kerikeri Volcanic Group]	0.5	KVG					
End of hole at 0.9m (Target Depth)	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.9m. FI - Fill. KVG = Kerikeri Volcanic Group.
Hand Held Shear Vane S/N: NA
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Test Pit Log - TP05

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	Jcum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Tarmac; black.	0.0	FILL		Groundwater Not Encountered		NOTE: Vane shear strength not recorded.	0 5 10 15 20
GRAVEL, some medium to coarse sand; grey. Moist. Gravel: Fine to medium. [Fill]							
Silty CLAY; brown. Moist. [Kerikeri Volcanic group]		KVG					
From 0.8m: Trace fine gravel.	0.5						
End of hole at 0.9m (Target Depth)	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.9m. KVG = Kerikeri Volcanic Group.
Hand Held Shear Vane S/N: NA
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Test Pit Log - TP07

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	Jcum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Tarmac; black.	0.0	FILL		Groundwater Not Encountered		NOTE: Vane shear strength not recorded.	0 5 10 15 20
GRAVEL, some medium to coarse sand; grey. Moist. Gravel: Fine to medium.							
Silty **CLAY**, trace concrete; brown. Moist. Decomissioned polythene pipe at 0.2m. [Fill]							
From 0.6m: No concrete.	0.5						
	1.0						
Silty **CLAY**, some coarse gravel and cobbles; brown. Moist.		KVG					
	1.5						
End of hole at 1.6m (Target Depth)	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 1.6m. KVG = Kerikeri Volcanic Group.
Hand Held Shear Vane S/N: NA
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Test Pit Log - TP08

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	Jcum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Tarmac; black.	0.0	FILL		Groundwater Not Encountered		NOTE: Vane shear strength not recorded.	0 5 10 15 20
GRAVEL, some medium to coarse sand; grey. Moist. Gravel: Fine to medium. [Fill]							
Silty **CLAY**; brown. Moist.							
BOULDERS AND COBBLES; scoria. Ocasional scrap metal. Decomissioned cast iron pipe at 0.4m.	0.5						
	1.0						
	1.5						
	2.0						
2.35m: Silty **CLAY**; brown. Moist.		KVG					
End of hole at 2.5m (Target Depth)	2.5						
	3.0						
	3.5						
	4.0						
	4.5						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 2.5m. KVG = Kerikeri Volcanic Group.
Hand Held Shear Vane S/N: NA
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Test Pit Log - TP11

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	28/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	Jcum
Date Completed:	28/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
Concrete.	0.0						
Silty **CLAY**, trace shell fragments; brown. Moist.		FILL		Groundwater Not Encountered		NOTE: Vane shear strength not recorded.	0 5 10 15 20
Silty **CLAY**; brown. Moist.	0.5	KVG					
End of hole at 0.85m (Target Depth)							
	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.85m. KVG = Kerikeri Volcanic Group.
Hand Held Shear Vane S/N: NA
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Test Pit Log - TP13

Hole Location: Refer to Site Plan

JOB No. 22 277

CLIENT:	FNDC	**SITE:**	69 Broadway, Kaikohe		
Date Started:	27/07/2022	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	Jcum
Date Completed:	27/07/2022	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description (Based on NZGS Logging Guidelines 2005)	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
GRAVEL; grey. Traces concrete. Gravel: fine to medium. [Fill]	0.0	FILL		Groundwater Not Encountered		NOTE: Vane shear strength not recorded.	0 5 10 15 20
GRAVEL, some sand; reddish brown. Moist. Gravel: fine to medium, scoria.							
Silty **CLAY**, minor fine to medium gravel; brown. Moist. [Kerikeri Volcanic Group]	0.5	KVG					
End of hole at 0.85m (Target Depth)	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. Test pit excavated to 0.85m. KVG = Kerikeri Volcanic Group.
Hand Held Shear Vane S/N: NA
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Borehole Log - HA01

Hole Location: Refer to Site Plan

JOB No. 24 122

CLIENT:	Eclipse Architecture	**SITE:**	69 & 71 Broadway Road, Kaikohe		
Date Started:	10/10/2024	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	KM
Date Completed:	10/10/2024	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

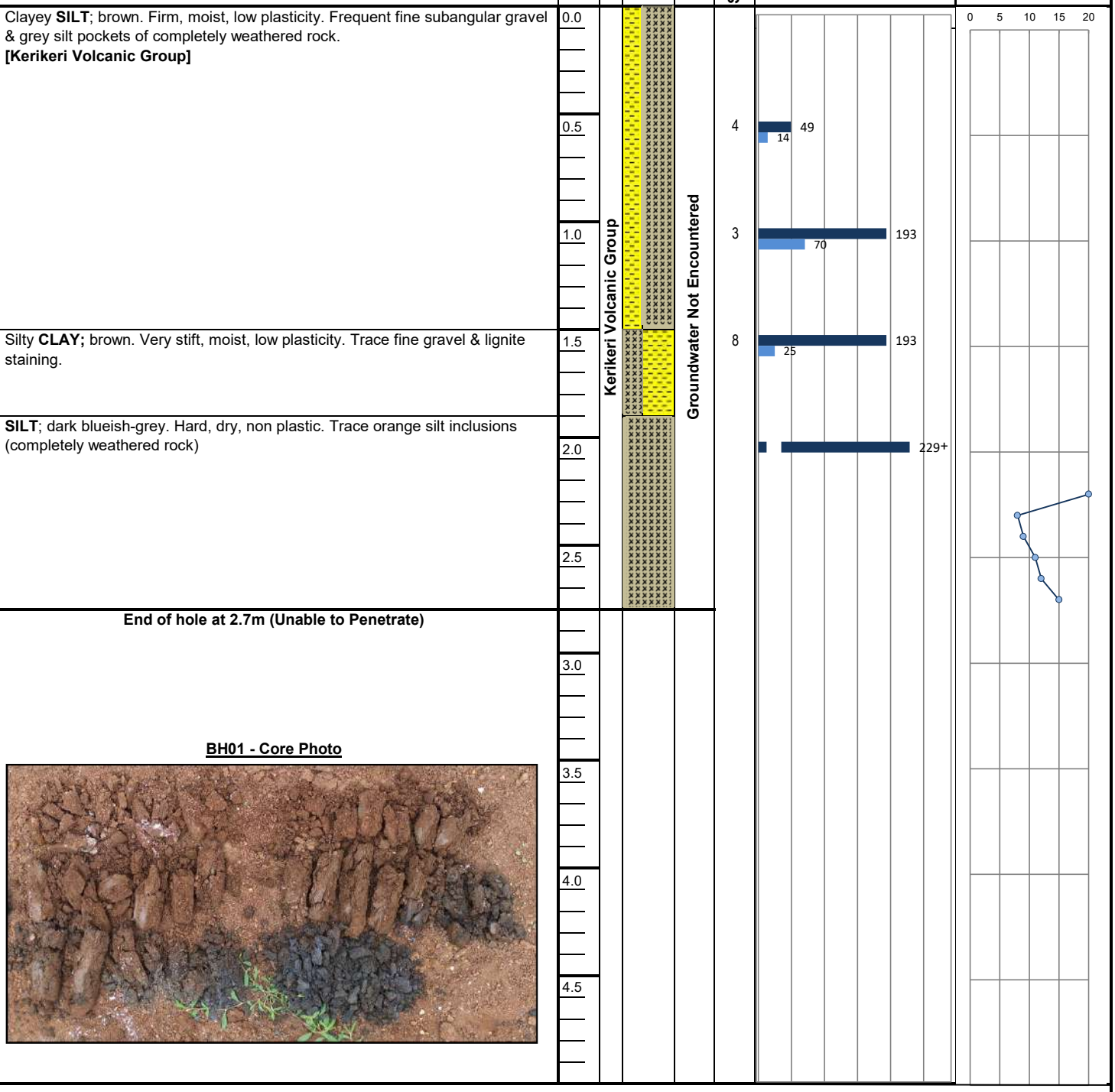
Clayey **SILT**; brown. Firm, moist, low plasticity. Frequent fine subangular gravel & grey silt pockets of completely weathered rock.
[Kerikeri Volcanic Group]

Silty **CLAY;** brown. Very stift, moist, low plasticity. Trace fine gravel & lignite staining.

SILT; dark blueish-grey. Hard, dry, non plastic. Trace orange silt inclusions (completely weathered rock)

End of hole at 2.7m (Unable to Penetrate)

BH01 - Core Photo



LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. T.S. = Topsoil.
Hand Held Shear Vane S/N: DR2278
Scala penetrometer testing undertaken from 2.2-2.7mbgl. Groundwater not encountered.

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Borehole Log - HA02

Hole Location: Refer to Site Plan

JOB No. 24 122

CLIENT:	Eclipse Architecture	**SITE:**	69 & 71 Broadway Road, Kaikohe		
Date Started:	10/10/2024	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	JP
Date Completed:	10/10/2024	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description
Based on NZGS Logging Guidelines 2005

SILT, minor clay, trace fine gravel; brown to reddish brown, streaked grey and orange. Very stiff, dry to moist, low plasticity. [Kerikeri Volcanic Group]

From 0.3m: Becomes moist.

SILT, trace clay; brown to orangish brown, streaked black, mottled light orange. Very stiff, moist, low plasticity.

SILT, minor fine to medium gravel, trace clay; brownish orange and brown, mottlled orange, speckled black. Very stiff, dry to moist, no plasticity.

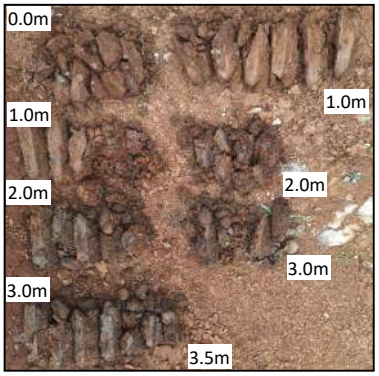
From 1.4m: Becomes moist to wet.

SILT, minor fine gravel, trace clay; dark brown to orangish brown, mottled orange. Very stiff, moist to wet, low to no plasticity.

SILT, some fine gravel, trace medium gravel, trace clay; dark brown to grey, mottled orange, streaked black. Very stiff, moist, no plasticity.

From 3.3m: Some fine to medium gravel.

End of Hole at 3.5m (Unable to Penetrate)



Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)	Scala Penetrometer (blows/100mm)
0.0	KERIKERI VOLCANIC GROUP		Groundwater Not Encountered	3	60 / 20	0 5 10 15 20
0.5					UTP	
1.0						
1.5				9	155 / 17	
2.0				6	100 / 17	
2.5				4	60 / 14	
3.0					UTP	
3.5					UTP	
4.0						
4.5						

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. T.S. = Topsoil.
Hand Held Shear Vane S/N: DR2220
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Borehole Log - HA03

Hole Location: Refer to Site Plan

JOB No. 24 122

CLIENT:	Eclipse Architecture	**SITE:**	69 & 71 Broadway Road, Kaikohe		
Date Started:	10/10/2024	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	JP
Date Completed:	10/10/2024	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

SILT, some clay; brownish orange to reddish brown. Very stiff, moist, low to medium plasticity. [Kerikeri Volcanic Group]

From 0.6m: Becomes brownish red.

From 1.0m: Becomes brown to reddish brown, mottled dark grey.

From 1.2m: Becomes light orangish brown.

SILT, minor clay, trace fine gravel; brown to orangish brown, mottled light yellow, streaked light pinkish red. Very stiff, moist, low plasticity.

From 1.8m: Becomes brownish orange, speckled orange and black.

SILT, minor fine gravel, trace clay; greyish brown, mottled orange. Very stiff, dry to moist, low to no plasticity.

End of Hole at 2.1m (Target Depth)

BH03 - Core Photo

Depth (m): 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

Geology: KERIKERI VOLCANIC GROUP

Graphic Log

Water Level: Groundwater Not Encountered

Sensitivity: 6

Vane Shear and Remoulded Vane Shear Strengths (kPa): UTP, UTP, 189, 32, UTP

Scala Penetrometer (blows/100mm): 0 5 10 15 20

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. T.S. = Topsoil.
Hand Held Shear Vane S/N: DR2220
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Borehole Log - HA04

Hole Location: Refer to Site Plan

JOB No. 24 122

CLIENT:	Eclipse Architecture	**SITE:**	69 & 71 Broadway Road, Kaikohe		
Date Started:	10/10/2024	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	10/10/2024	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

Clayey **SILT**; brown. Very stiff, moist, medium plasticity. *[KERIKERI VOLCANIC GROUP]*

Silty **CLAY**; brown to greyish brown. Very stiff, moist, medium to high plasticity.

Clayey **SILT**, trace medium to coarse sand; brown to greyish brown. Very stiff, moist, medium plasticity.

SILT, some clay, minor fine to coarse sand; brown to greyish brown, trace mottled brownish orange. Stiff to very stiff, moist, low plasticity.

From 1.5m: Some fine sand to fine gravel, trace medium gravel; mottled grey.

From 2.1m: Becomes firm to stiff. No gravel.
At 2.2m: Mottled orangish brown.

From 2.4m: Becomes brown to purplish brown, mottled light yellow and greyish brown.

From 2.6m: Becomes firm.

From 3.1m: Becomes very stiff

End of hole at 3.2m (Target Depth)

BH04 - Core Photo

Depth (m): 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

Geology: KERIKERI VOLCANIC GROUP

Water Level: Groundwater Not Encountered

Sensitivity	Vane Shear (kPa)	Remoulded Vane Shear (kPa)
3	188	66
14	199	15
17	96	6
20	144	7
70	129	2
11	61	6
48	88	2
18	33	2
18	133	7

Scala Penetrometer (blows/100mm): 0 5 10 15 20

NOTE: from 1.3m to 2.0m - Vane shear strength may be affected by granular material.

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. T.S. = Topsoil.
Hand Held Shear Vane S/N: DR1698
Scala penetrometer testing not undertaken. Groundwater not encountered.

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Borehole Log - HA05

Hole Location: Refer to Site Plan

JOB No. 24 122

CLIENT:	Eclipse Architecture	**SITE:**	69 & 71 Broadway Road, Kaikohe		
Date Started:	10/10/2024	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	CN
Date Completed:	10/10/2024	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

Clayey **SILT**; brown, mottled grey. Very stiff, moist, low plasticity. *[KERIKERI VOLCANIC GROUP]*

At 0.3m: Grey silt band.

From 0.6m: Minor fine to medium sand.
At 0.7m: Dark brownish grey.

From 1.0m: Trace fine gravel.

From 1.2m: Minor coarse sand to fine gravel.

Sandy **SILT**, some clay, minor coarse sand to fine gravel; greysih brown. Firm, moist to wet, no to low plasticity. Porous soil structure. Sand: fine to medium.

At 1.7m: Trace medium gravel.

From 2.0m: Some coarse sand to fine gravel. Becomes wet.

Sandy **SILT**, some clay, trace fine gravel; greysih brown, mottled light brownish yellow to light brownish orange. Stiff, wet, no to low plasticity. Sand: fine to medium.

From 2.5m: Trace coarse sand to fine gravel. Becomes very stiff.

From 2.7m: Becomes purplish brown to brown, mottled dark brownish grey and light brownish yellow.

End of hole at 4.0m (Target Depth)

Depth (m): 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

Geology: KERIKERI VOLCANIC GROUP

Water Level: Groundwater Not Encountered

Sensitivity	Vane Shear and Remoulded Vane Shear Strengths (kPa)
	UTP
	UTP
22	41 / 2
15	28 / 2
78	144 / 2
8	87 / 11
	228 +
98	180 / 2
59	217 / 4
61	223 / 4

Scala Penetrometer (blows/100mm): 0 5 10 15 20

NOTE: Vane shear strength may be affected by granular material.

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. T.S. = Topsoil.
Hand Held Shear Vane S/N: DR1698
Scala penetrometer testing undertaken from 3.3m to 4.9m. Groundwater not encountered.

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Borehole Log - HA06

Hole Location: Refer to Site Plan

JOB No. 24 122

CLIENT:	Eclipse Architecture	**SITE:**	69 & 71 Broadway Road, Kaikohe		
Date Started:	10/10/2024	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	KM
Date Completed:	10/10/2024	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description
Based on NZGS Logging Guidelines 2005

SILT; brown. Very stif f- hard, dry - moist, low - no plasticity.
[Kerikeri Volcanic Group]

- some coarse sand, fine gravels & weakly cemented clasts of volcanic rock.

- slight colour change to greyish-brown

- hard to auger due to inclusions of moderately weathered volcanic rock.

End of hole at 2.2m (Unable to Penetrate - Obstruction)

BH06 - Core Photo

Depth (m): 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

Geology: Kerikeri Volcanic Group

Graphic Log

Water Level: Groundwater Not Encountered

Sensitivity

Vane Shear and Remoulded Vane Shear Strengths (kPa): UTP, UTP, UTP

Scala Penetrometer (blows/100mm): 0, 5, 10, 15, 20

LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. T.S. = Topsoil.
Hand Held Shear Vane S/N: DR2278
Scala penetrometer testing undertaken from 1.7 - 2.3mbgl. Groundwater not encountered.

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Borehole Log - HA07

Hole Location: Refer to Site Plan

JOB No. 24 122

CLIENT:	Eclipse Architecture	**SITE:**	69 & 71 Broadway Road, Kaikohe		
Date Started:	10/10/2024	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	KM
Date Completed:	10/10/2024	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description
Based on NZGS Logging Guidelines 2005

Clayey **SILT**; brown. Very stiff, dry, low plasticity. Trace coarse subangular gravel. **[Kerikeri Volcanic Group]**

SILT; dark brownish-grey. Hard, dry - moist. Low plasticity.
- inclusions of bluish grey silt (completely weathered rock).

End of hole at 1.15m (Unable to Penetrate - Obstruction)

BH07 - Core Photo

Depth (m): 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

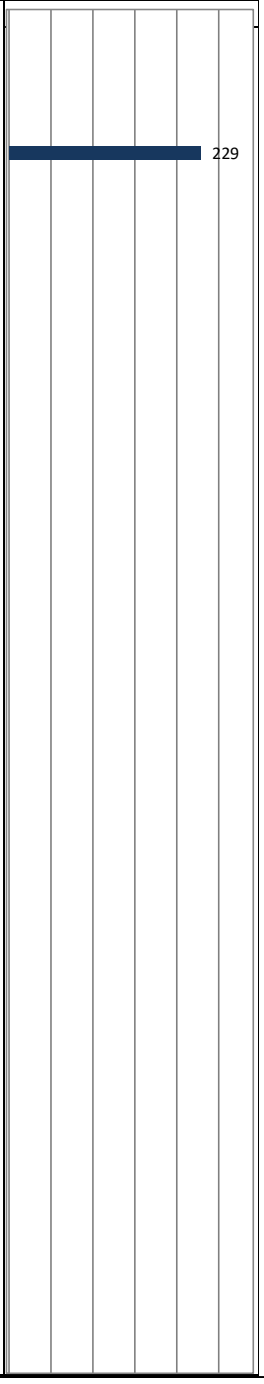
Geology: Kerikeri Volcanic Group

Graphic Log

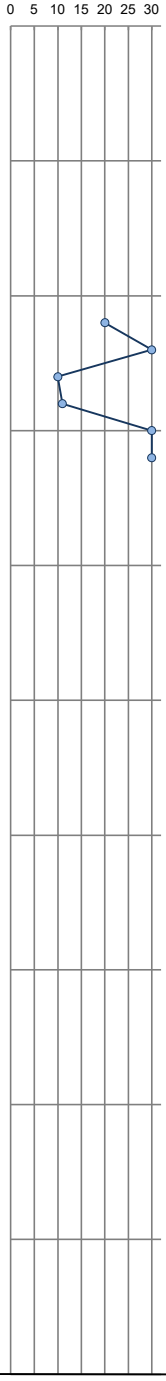
Water Level: Groundwater Not Encountered

Sensitivity

Vane Shear and Remoulded Vane Shear Strengths (kPa)



Scala Penetrometer (blows/100mm)



LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. T.S. = Topsoil.
Hand Held Shear Vane S/N: DR2278
Scala penetrometer testing undertaken from 1.1-1.6mbgl. Groundwater not encountered.

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Borehole Log - HA08

Hole Location: Refer to Site Plan

JOB No. 24 122

CLIENT:	Eclipse Architecture	**SITE:**	69 & 71 Broadway Road, Kaikohe		
Date Started:	10/10/2024	**DRILLING METHOD:**	Hand Auger	**LOGGED BY:**	JP
Date Completed:	10/10/2024	**HOLE DIAMETER (mm)**	50mm	**CHECKED BY:**	WT

Soil Description

Based on NZGS Logging Guidelines 2005

SILT, minor clay; brown to orangish brown. Very stiff, dry to moist, low to medium plasticity. [Kerikeri Volcanic Group]

From 0.4m: Becomes brown and light greyish brown. Moist.

SILT, minor clay, trace fine gravel; brownish grey to greyish brown, mottled orange. Very stiff, moist, low plasticity.

From 1.3m: Becomes orangish brown to brownish orange, speckled black. No gravel.

From 1.8m: Becomes brownish grey to orange, speckled black. Trace fine gravel.

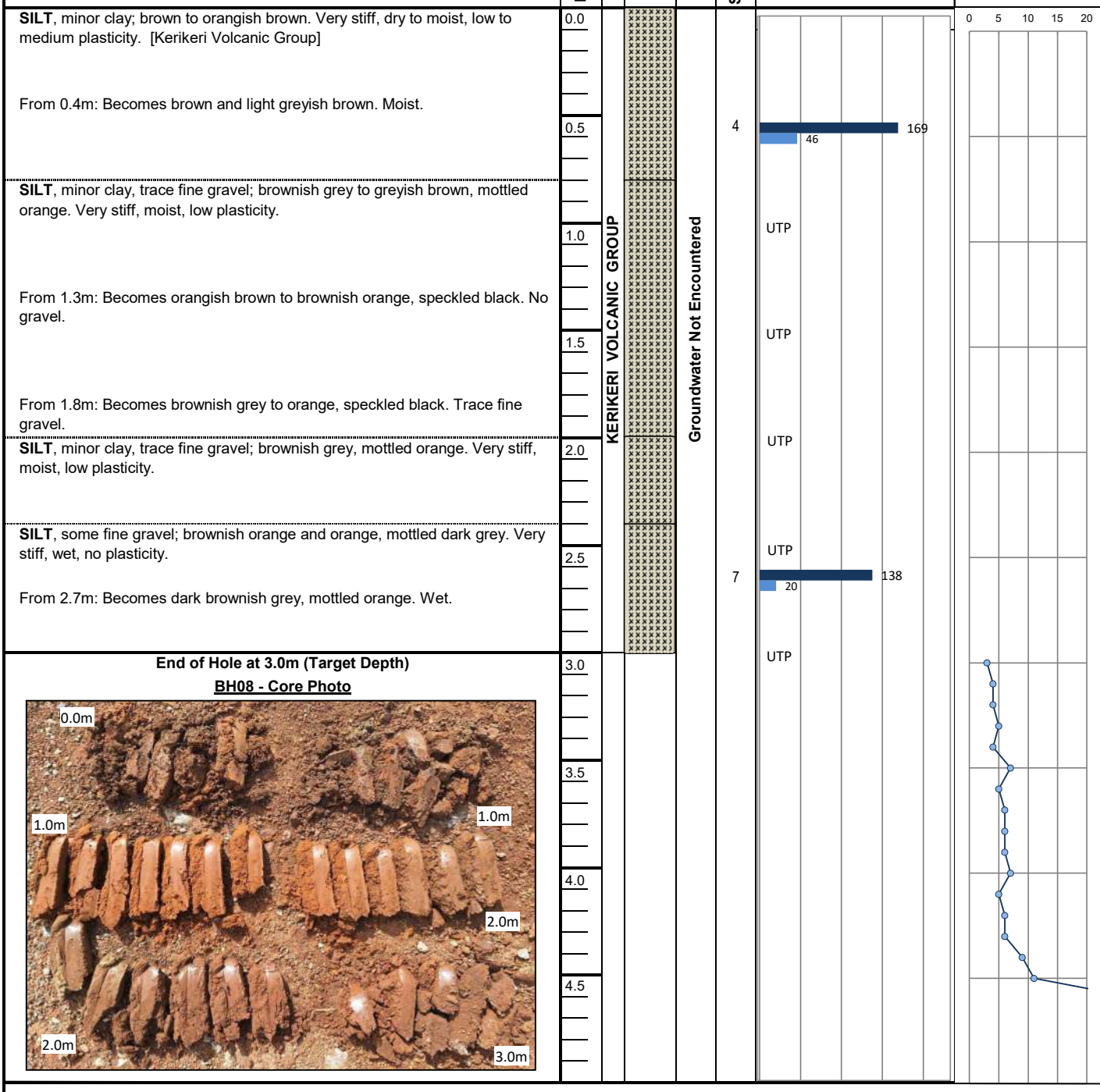
SILT, minor clay, trace fine gravel; brownish grey, mottled orange. Very stiff, moist, low plasticity.

SILT, some fine gravel; brownish orange and orange, mottled dark grey. Very stiff, wet, no plasticity.

From 2.7m: Becomes dark brownish grey, mottled orange. Wet.

End of Hole at 3.0m (Target Depth)

BH08 - Core Photo



LEGEND

TOPSOIL | CLAY | SILT | SAND | GRAVEL | FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. T.S. = Topsoil.
Hand Held Shear Vane S/N: DR2220
Scala penetrometer testing undertaken from 3.0m to 4.7mbgl. Groundwater not encountered.

CPT Client Engagement / Quote Request

Project Details		Date	16/10/2024
Project Name	Proposed Development	Job Identifier	HW Broadway
Project Address	Cnr Broadway and Rihara St, Kaikohe		
Engineering Consultant Company Name	Haigh Workman Ltd	Engineering Project Manager	Josh Cureen
Email		Mobile	
Client Name		Client Contact Details	

Test Requirements - CPT		Preferred Job Completion Date	
Target No of CPT Tests Required	6	Maximum Test Depth Required	20/Refusal
No of CPT Tests Required Through Pavement or Other Hard Surface		Type and Thickness of Hard Surface	
Other Requirements Outside Standard Greenfield Testing			

Please note: Service clearance is to be provided by the client or their agents and details are to be provided to the CPT operator prior to Underground Investigation Ltd commencing work. Any delays due to service clearance or H&S approvals will be at the clients expense and may reduce the amount of testing being able to be completed in the working day.

Test Requirements - Dissipation Testing		Please List Test No and Approximate Target Depth of Dissipation	
Test No	Depth	Test No	Depth

Please note: In order to provide useful dissipation data, UIL recommends carrying out at least one CPT prior to carrying out dissipation in order to select appropriate depths for testing. It is preferred if the Geotechnical Engineer for the project discusses this with the CPT operator after completion of the initial testing.

Any Other Site Requirements

UNDERGROUND INVESTIGATION

CPT Equipment Information

CPT Rig Type	Geotech AB - Georig 220	Maximum Push Capacity	200kN
Any Deviations From Common Setup		Reaction Restraint	Screw Anchors
Cone Penetrometer	Nova Cone 100MPa With Memory	Cone Penetrometer Type	TE2
Manufacturer	Geotech AB	Load Cell Configuration	Compresion
Tip Area	10cm	Pore Pressure Type	U_2
Full Scale Output of Sensors	q_c : 100 MPa	f_s : 1 MPa	u_2 : 2 MPa
Calibration Test Class	ISO 1	Saturation Method	Pump Saturation With Secondary Vacuum
Temprature Sensor	No	Data Interval	10mm
Temprature Conditioning	Cone Warmer set to 20^o C	Typical Cone Temprature at Start of Test	16-20^o C
Any Deviations From Above			

CPT Test Information

Test Hole Number	CPT01	Job Identifier	HW Broadway
Test Date	16/10/2024	Operator	Craig Greenfield
Cone Serial Number	5708	Battery Voltage Start	6.28
Cone Area Ratio	0.862	Start Recording	8:57:00 AM
Probe Radius	0.0177	Finish Recording	9:10:00 AM
Date of First Push Current Calibration	9/11/2023	Measured Ground Water Depth	7.1
Metres To Next Calibration	51	Total Penetration Depth (m)	7.502
Depth of Predrill	0	Test ended due to:	☑ High Tilt ☑ High Tip Pressure ☐ High Friction ☐ High Pore Pressure ☐ High Total load ☐ Danger of Rods Buckling ☐ Target Depth ☐ Anchor Failure
Depth at Start of Test	0		
Anchor Depth (Left)	1.5		
Anchor Depth (Right)	1.5		

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.06%	0.09%	0.38%
End of test with tip loosened	0.12%	0.12%	1.10%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged

qc

fs

u

UNDERGROUND INVESTIGATION

CPT Test Information

Test Hole Number	CPT02	Job Identifier	HW Broadway
Test Date	16/10/2024	Operator	Craig Greenfield
Cone Serial Number	5801	Battery Voltage Start	6.2
Cone Area Ratio	0.843	Start Recording	9:28:00 AM
Probe Radius	0.0178	Finish Recording	9:45:00 AM
Date of First Push Current Calibration	9/01/2024	Measured Ground Water Depth	6.8
Metres To Next Calibration	307	Total Penetration Depth (m)	11.28
Depth of Predrill	0	Test ended due to:	☑ High Tilt ☑ High Tip Pressure ☐ High Friction ☐ High Pore Pressure ☐ High Total load ☐ Danger of Rods Buckling ☐ Target Depth ☐ Anchor Failure
Depth at Start of Test	0		
Anchor Depth (Left)	1.5		
Anchor Depth (Right)	1.5		

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.03%	0.13%	0.86%
End of test with tip loosened	0.04%	0.04%	0.46%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc 9.54	fs	u 9.54

CPT Test Information

Test Hole Number	CPT03	Job Identifier	HW Broadway
Test Date	16/10/2024	Operator	Craig Greenfield
Cone Serial Number	5845	Battery Voltage Start	6.15
Cone Area Ratio	0.85	Start Recording	10:02:00 AM
Probe Radius	0.0179	Finish Recording	10:30:00 AM
Date of First Push Current Calibration	13/03/2024	Measured Ground Water Depth	7.25
Metres To Next Calibration	766	Total Penetration Depth (m)	13.427
Depth of Predrill	0	Test ended due to:	☑ High Tilt ☑ High Tip Pressure ☐ High Friction ☐ High Pore Pressure ☐ High Total load ☐ Danger of Rods Buckling ☐ Target Depth ☐ Anchor Failure
Depth at Start of Test	0		
Anchor Depth (Left)	1.5		
Anchor Depth (Right)	1.5		

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.08%	0.02%	0.56%
End of test with tip loosened	0.00%	0.00%	0.50%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc 7.31	fs	u

UNDERGROUND INVESTIGATION

CPT Test Information

Test Hole Number	CPT04	Job Identifier	HW Broadway
Test Date	16/10/2024	Operator	Craig Greenfield
Cone Serial Number	5959	Battery Voltage Start	6.08
Cone Area Ratio	0.869	Start Recording	10:40:00 AM
Probe Radius	0.0179	Finish Recording	12:24:00 PM
Date of First Push Current Calibration	26/06/2024	Measured Ground Water Depth	6.4
Metres To Next Calibration	1140	Total Penetration Depth (m)	11.47
Depth of Predrill	0	Test ended due to:	☑ High Tilt ☑ High Tip Pressure ☐ High Friction ☐ High Pore Pressure ☐ High Total load ☐ Danger of Rods Buckling ☐ Target Depth ☐ Anchor Failure
Depth at Start of Test	0		
Anchor Depth (Left)	1.5		
Anchor Depth (Right)	1.5		

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.18%	0.05%	2.92%
End of test with tip loosened	0.01%	0.00%	0.12%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments
CPT04-D1	7.215	4945	0.02

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u

UNDERGROUND INVESTIGATION

CPT Test Information

Test Hole Number	CPT05	Job Identifier	HW Broadway
Test Date	16/10/2024	Operator	Craig Greenfield
Cone Serial Number	5654	Battery Voltage Start	5.89
Cone Area Ratio	0.84	Start Recording	12:42:00 PM
Probe Radius	0.0179	Finish Recording	1:18:00 PM
Date of First Push Current Calibration	1/08/2024	Measured Ground Water Depth	6.2
Metres To Next Calibration	1324	Total Penetration Depth (m)	11.897
Depth of Predrill	0	Test ended due to:	☑ High Tilt ☑ High Tip Pressure ☐ High Friction ☐ High Pore Pressure ☐ High Total load ☐ Danger of Rods Buckling ☐ Target Depth ☑ Anchor Failure
Depth at Start of Test	0		
Anchor Depth (Left)	1.5		
Anchor Depth (Right)	1.5		

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.06%	0.01%	0.08%
End of test with tip loosened	0.01%	0.00%	0.04%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments
CPT05-D1	2.565	989	0

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u

CPT Test Information

Test Hole Number	CPT06	Job Identifier	HW Broadway
Test Date	16/10/2024	Operator	Craig Greenfield
Cone Serial Number	5681	Battery Voltage Start	5.87
Cone Area Ratio	0.847	Start Recording	1:38:00 PM
Probe Radius	0.018	Finish Recording	1:48:00 PM
Date of First Push Current Calibration	16/10/2024	Measured Ground Water Depth	EOB 5.0m, dry
Metres To Next Calibration	1500	Total Penetration Depth (m)	5.065
Depth of Predrill	0	Test ended due to:	☑ High Tilt ☑ High Tip Pressure ☐ High Friction ☐ High Pore Pressure ☐ High Total load ☐ Danger of Rods Buckling ☐ Target Depth ☑ Anchor Failure
Depth at Start of Test	0		
Anchor Depth (Left)	1.5		
Anchor Depth (Right)	1.5		

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.00%	0.00%	0.00%
End of test with tip loosened	0.01%	0.01%	0.30%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u

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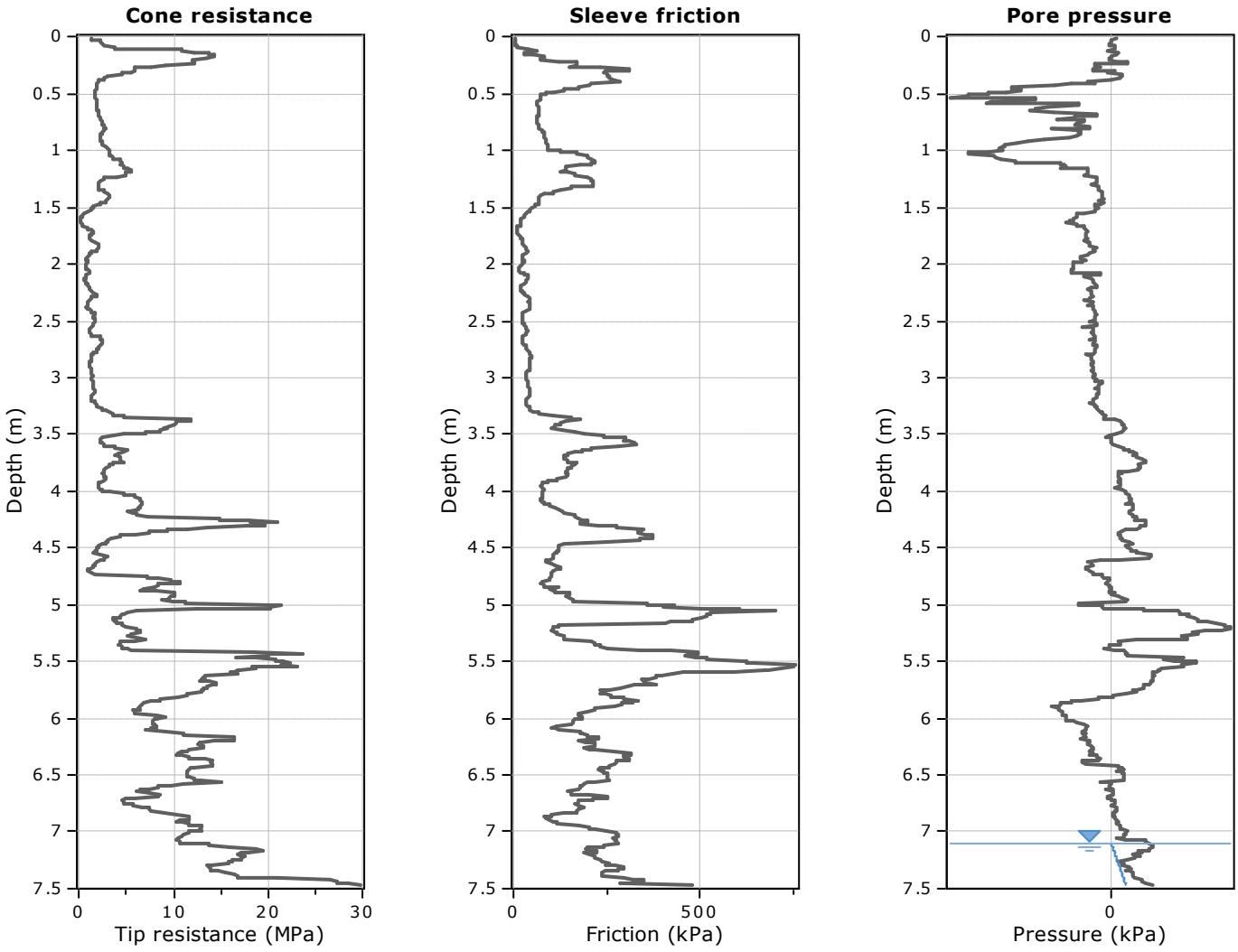
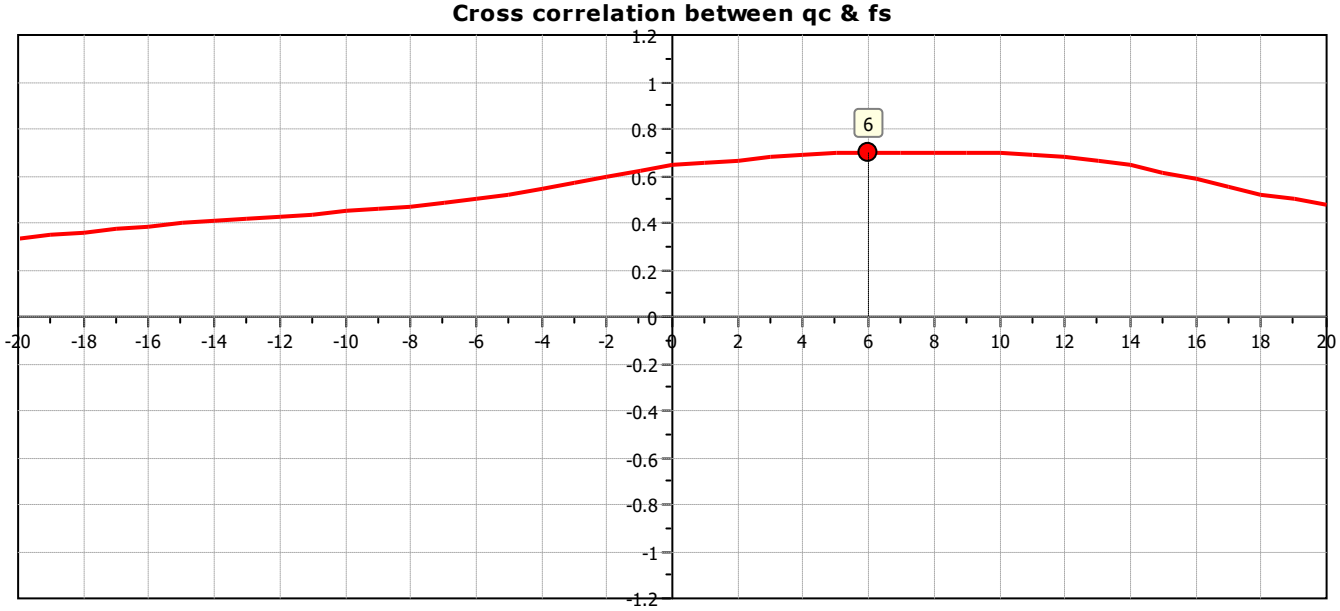
Project: **Kaikohe Library**
Location: **69-71 Broadway, Kaikohe**

CPT: CPT01
Total depth: 7.47 m, Date: 17/10/2024



The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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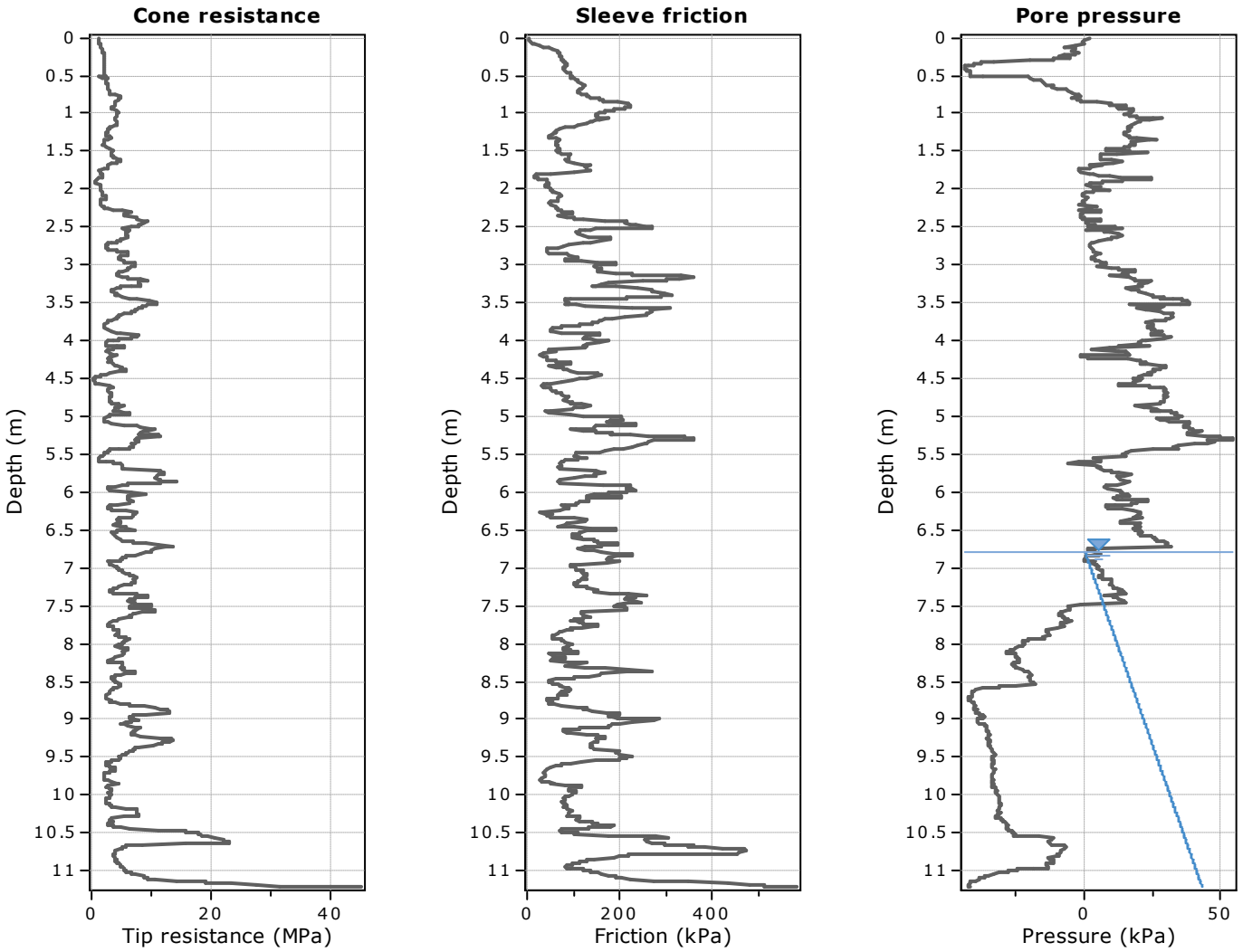
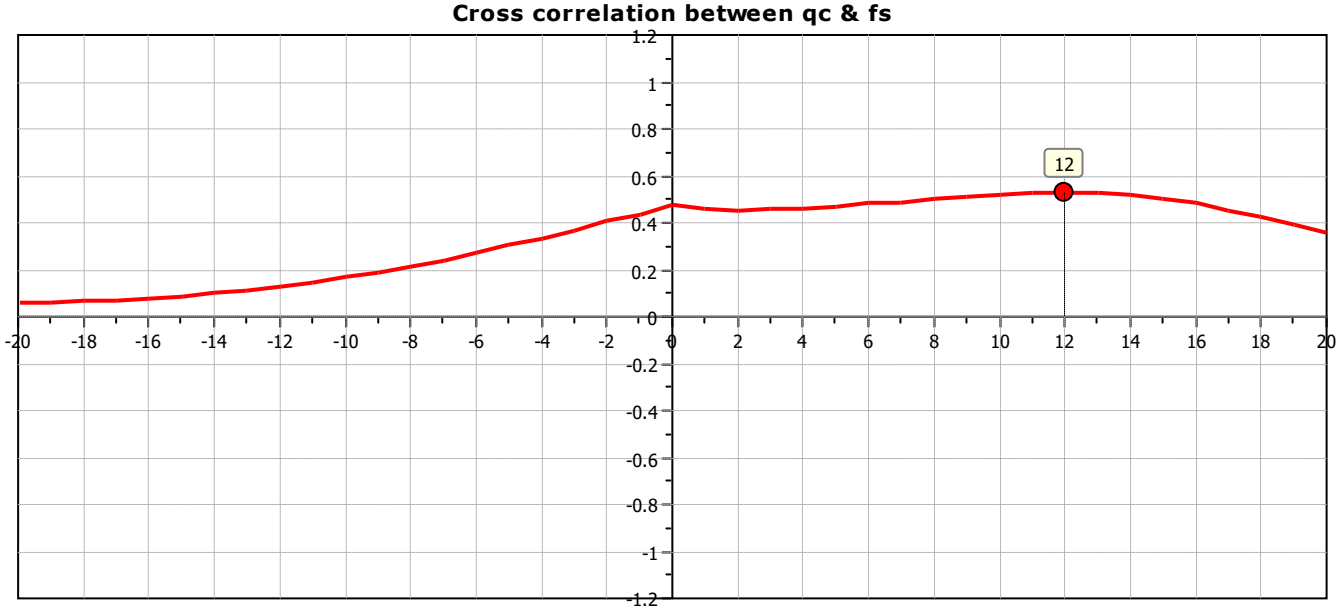
Project: **Kaikohe Library**
Location: **69-71 Broadway, Kaikohe**

CPT: CPT02
Total depth: 11.21 m, Date: 17/10/2024



The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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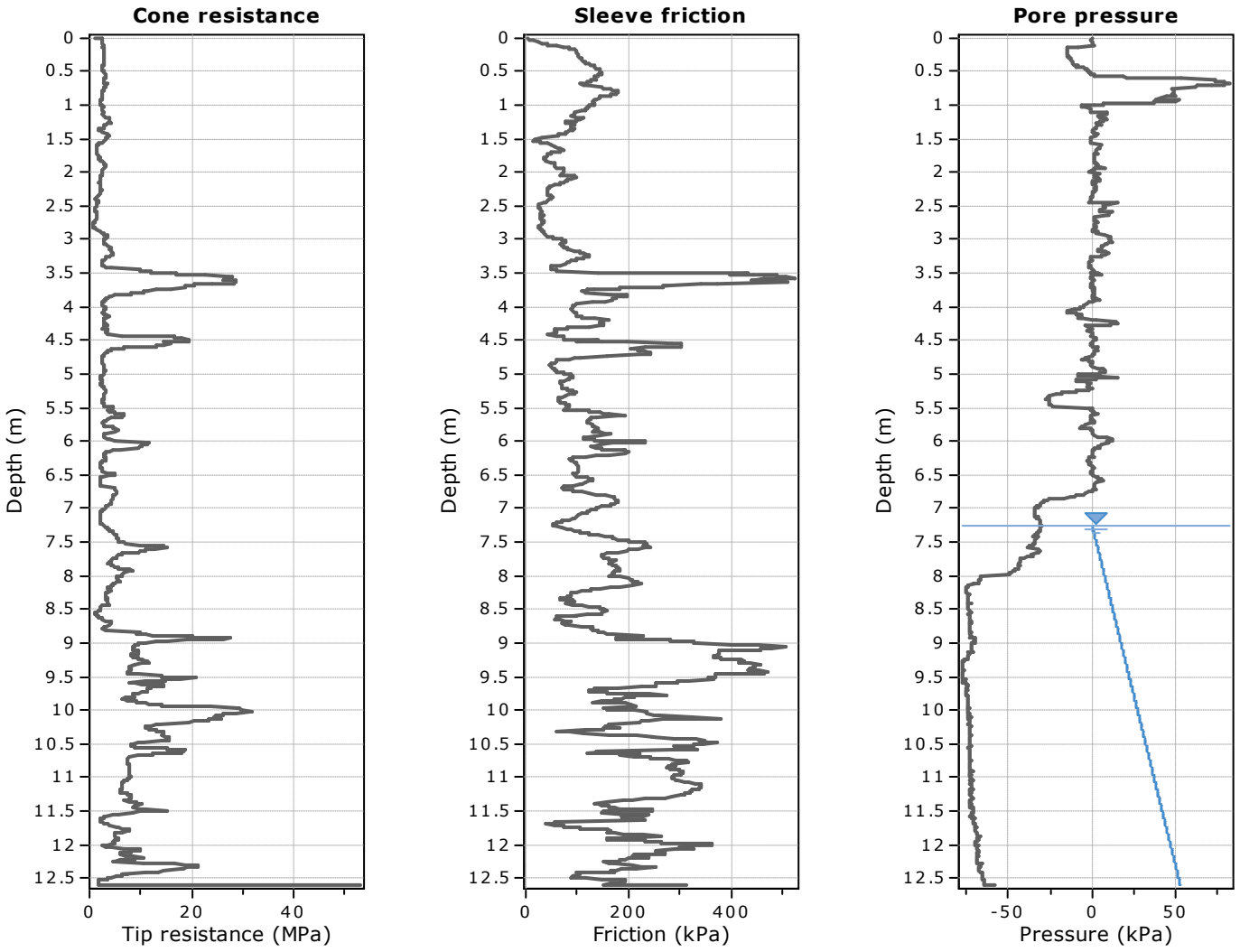
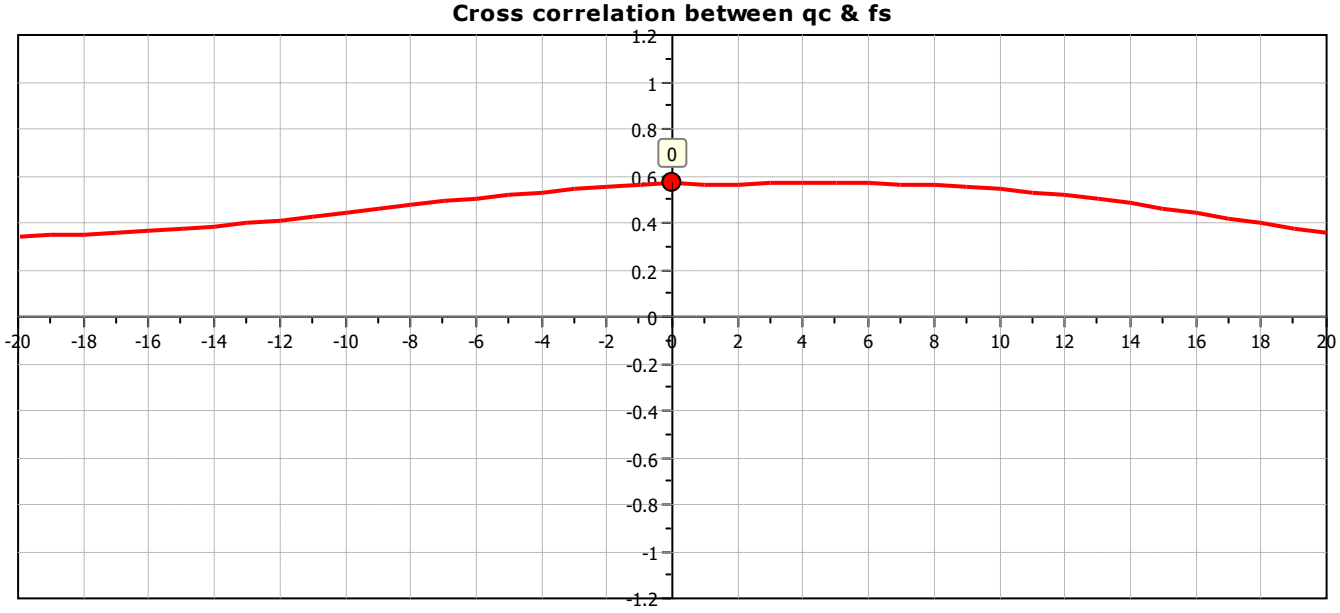
Project: **Kaikohe Library**
Location: **69-71 Broadway, Kaikohe**

CPT: CPT03
Total depth: 12.60 m, Date: 17/10/2024



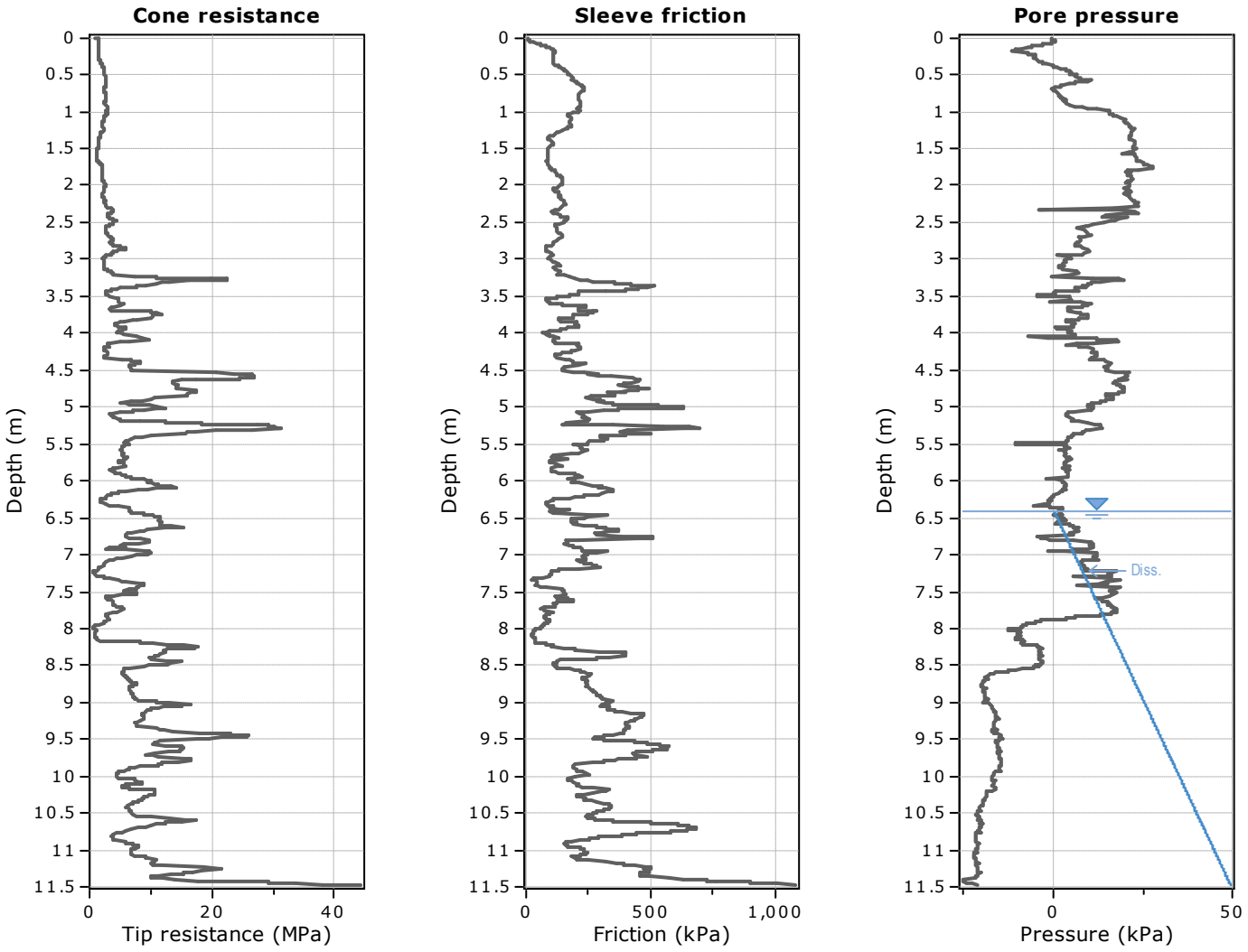
The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



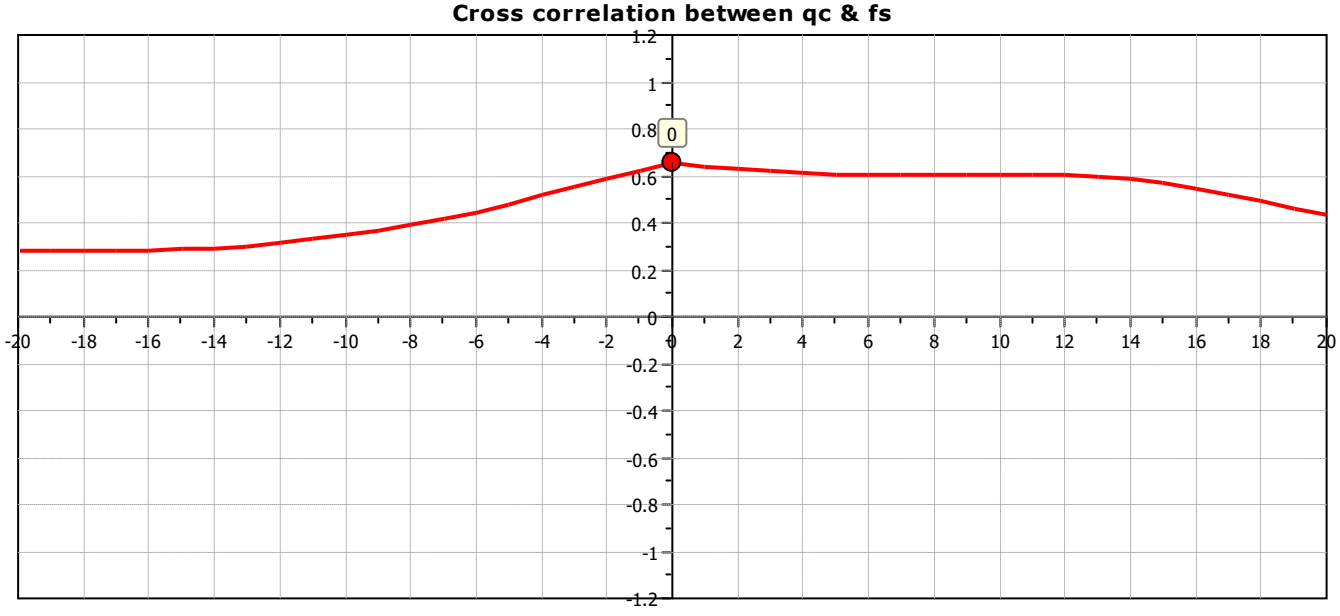
Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

Project: **Kaikohe Library**
Location: **69-71 Broadway, Kaikohe**

CPT: CPT04
Total depth: 11.47 m, Date: 17/10/2024



The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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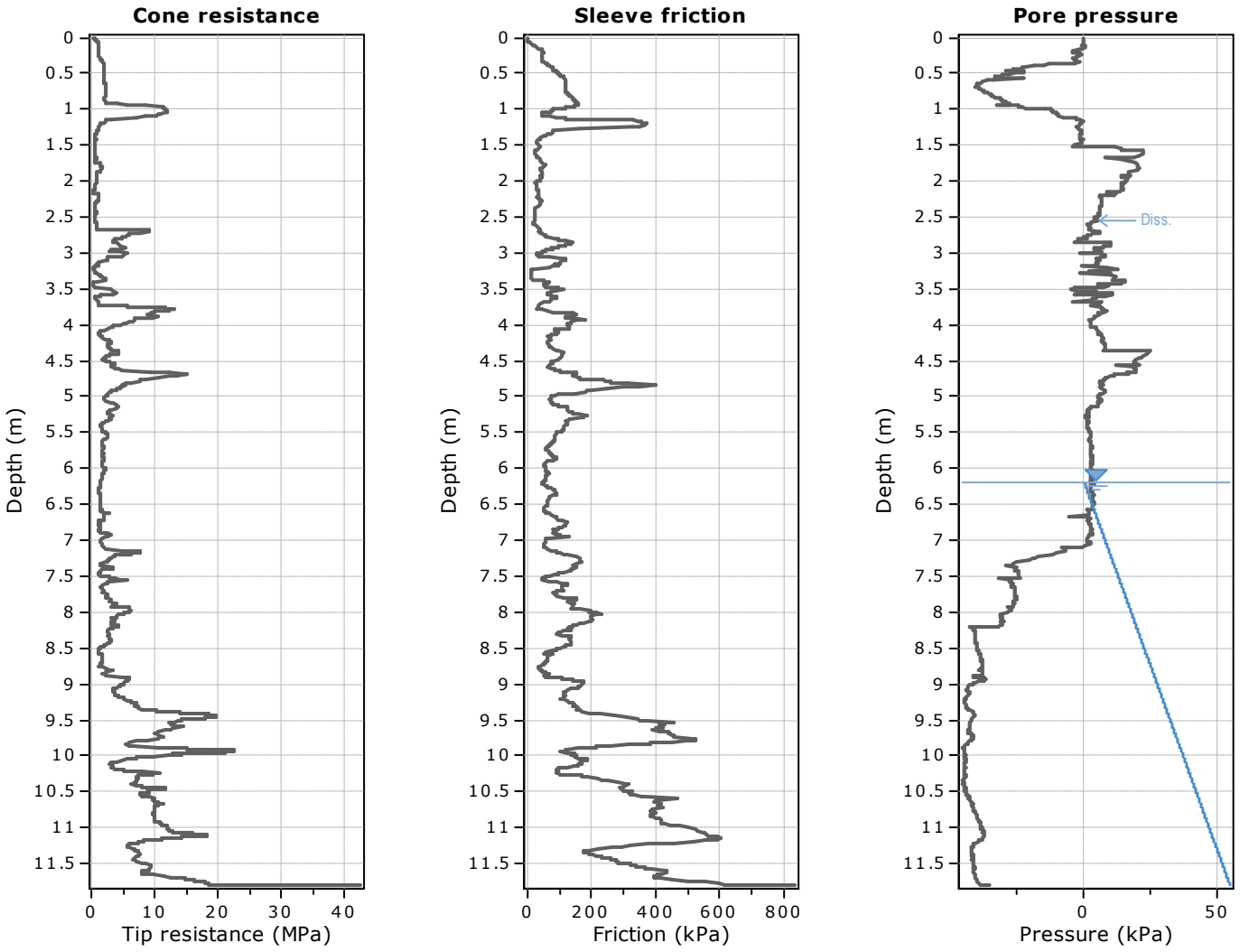
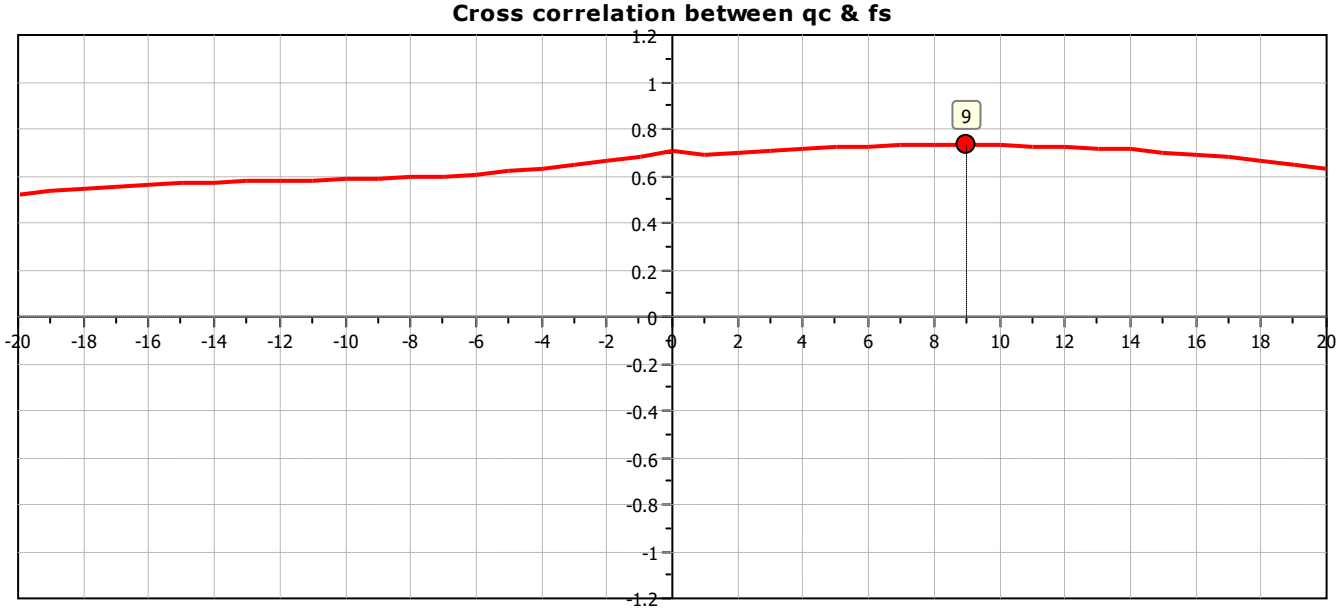
+64211473249

Project: **Kaikohe Library**
Location: **69-71 Broadway, Kaikohe**

CPT: CPT05
Total depth: 11.80 m, Date: 17/10/2024



The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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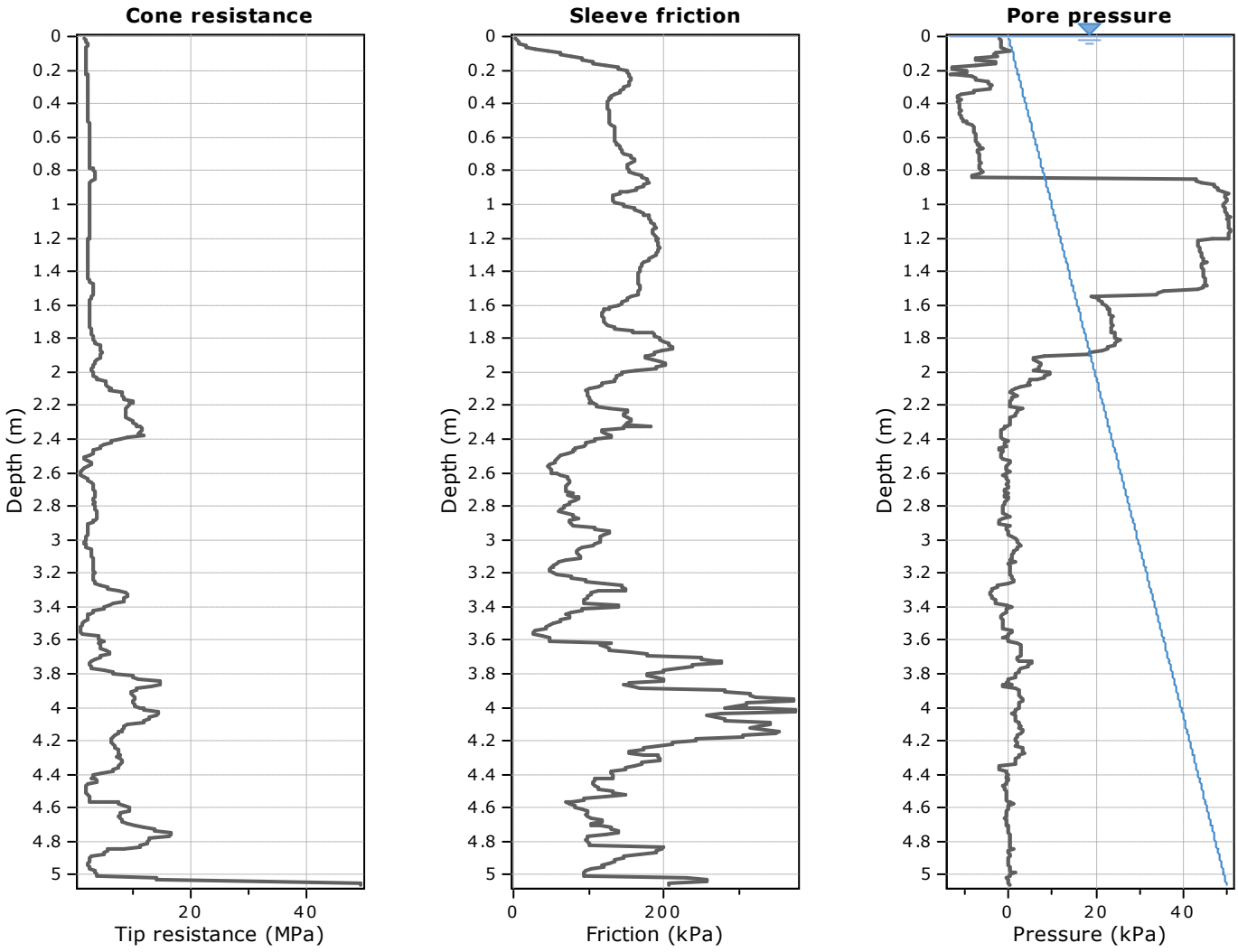
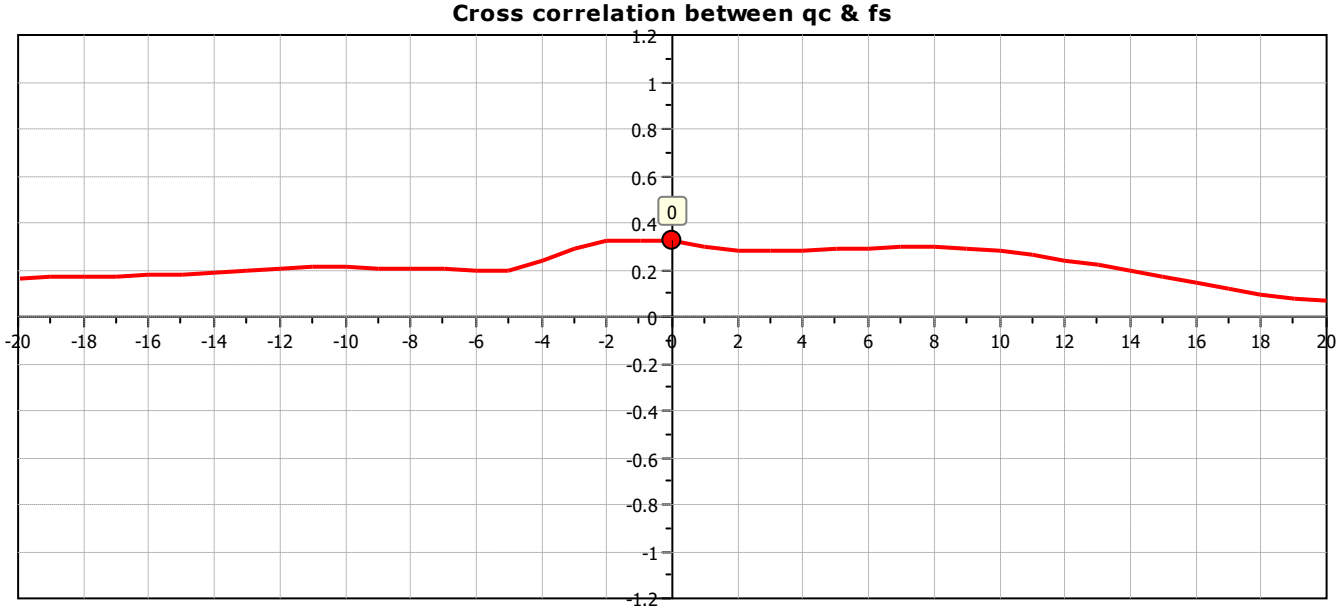
+64211473249

Project: **Kaikohe Library**
Location: **69-71 Broadway, Kaikohe**

CPT: CPT06
Total depth: 5.06 m, Date: 17/10/2024



The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



Appendix E – Laboratory Test Results

Babbage Geotechnical Laboratory
Level 4
68 Beach Road
Auckland 1010
Telephone
E-mail

P O Box 2027
New Zealand
64-9-367 4954
wec@babbage.co.nz

Please reply to: W.E. Campton

Haigh Workman Ltd.
PO Box 89
Kerikeri 0245

Attention: **CRAIG NELDER**

Job Number: 63632#L
BGL Registration Number: 2828
Checked by: WEC

23rd October 2024

ATTERBERG LIMITS & LINEAR SHRINKAGE TESTING

Dear Sir,

Re: 69 & 71 BROADWAY, KAIKOHE

Your Reference: 24 122
Report Number: 63632#L/AL 69 & 71 Broadway

The following report presents the results of Atterberg Limits & Linear Shrinkage testing at BGL of a soil sample delivered to this laboratory on the 16th of October 2024. Test results are summarised below, with page 3 showing where the sample plots on the Unified Soil Classification System (Casagrande) Chart.

Test standards used were:

Water Content:	NZS4402:1 986: Test 2.1
Liquid Limit:	NZS4402: 1986: Test 2.2
Plastic Limit:	NZS4402: 1986: Test 2.3
Plasticity Index:	NZS4402: 1986: Test 2.4
Linear Shrinkage:	NZS4402: 1986: Test 2.6

Borehole Number	Sample Number	Depth (m)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage (%)*
HA05	**Sample 1**	**0.20 – 0.70**	**43.6**	**81**	**42**	**39**	**23**

**The amount of shrinkage of the sample as a percentage of the original sample length.*

The whole soil was used for the water content test (the soil was in an unknown state), and for the liquid limit, plastic limit & linear shrinkage tests. The soil was wet up and dried where required for the liquid limit, plastic limit & linear shrinkage tests.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. Test 2.2: liquid limit, test 2.3: plastic limit, and test 2.6: linear shrinkage are reported to the nearest whole number.

Please note that the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

ACCREDITED
IANZ
TESTING LABORATORY
№ 126

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

Babbage Geotechnical Laboratory	Job Number:	63632#L	Sheet 1 of 1	Page 3 of 3
	Reg. Number:	2828	Version No:	7
	Report No:	63632#L/AL 69 & 71 Broadway	Version Date:	July 2022
	Project:	69 & 71 BROADWAY, KAIKOHE		

DETERMINATION OF THE LIQUID LIMIT, PLASTIC LIMIT & THE PLASTICITY INDEX

Test Methods: NZS4402: 1986: Test 2.2, Test 2.3 and Test 2.4

Tested By:	WEC	October 2024
Compiled By:	JF	23/10/2024
Checked By:	JF	23/10/2024

SUMMARY OF TESTING

Borehole Number	Sample Number	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification Based on USCS Chart Below
HA05	**Sample 1**	**0.20 - 0.70**	81	42	**39**	MH

The chart below & soil classification terminology is taken from ASTM D2487-17^{e1} "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)", April 2020, & is based on the classification scheme developed by A. Casagrande in the 1940's (Casagrande, A., 1948: Classification and identification of soil. Transactions of the American Society of Civil Engineers, v. 113, p. 901-930). The chart below & the soil classification given in the table above are included for your information only, and are not included in the IANZ endorsement for this report.

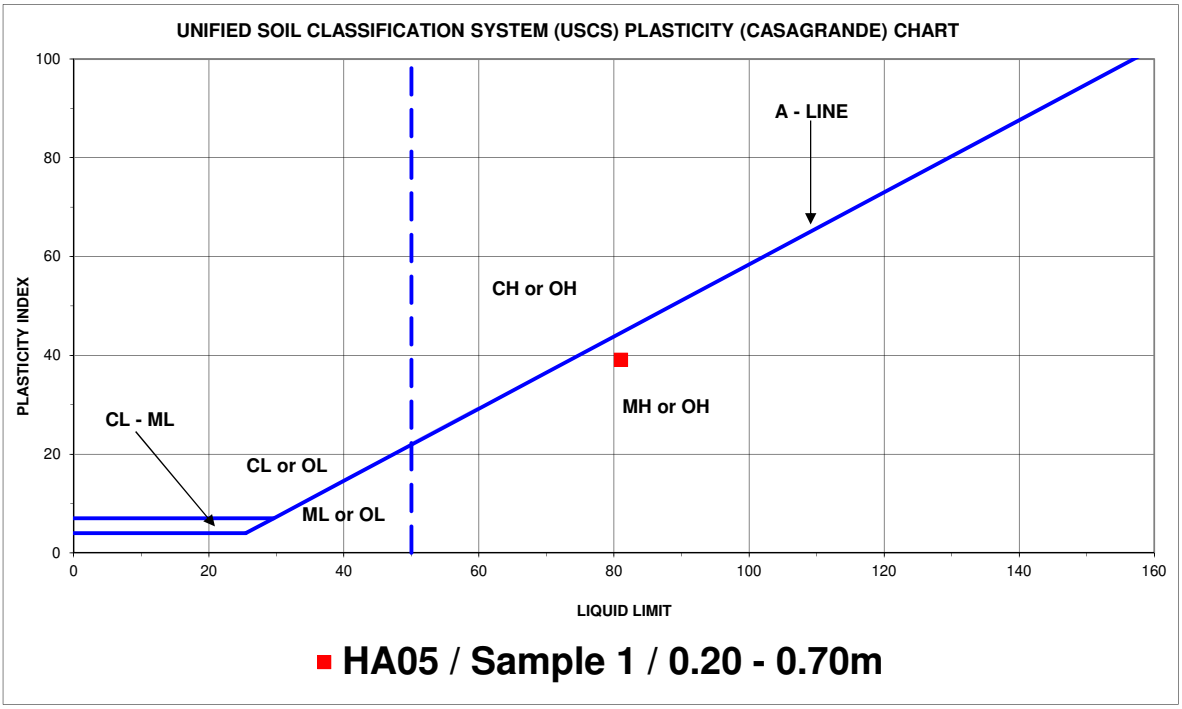


CHART LEGEND

CL = CLAY, low plasticity ('lean' clay)
OL = ORGANIC CLAY or ORGANIC SILT, low liquid limit
ML = SILT, low liquid limit
CL - ML = SILTY CLAY
CH = CLAY, high plasticity ('fat' clay)
OH = ORGANIC CLAY or ORGANIC SILT, high liquid limit
MH = SILT, high liquid limit ('elastic silt')

Babbage Geotechnical Laboratory
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68 Beach Road
Auckland 1010
Telephone
E-mail

P O Box 2027
New Zealand
64-9-367 4954
wec@babbage.co.nz

Please reply to: W.E. Campton

Haigh Workman Ltd.
PO Box 89
Kerikeri 0245

Job Number: 63632#L
BGL Registration Number: 2828
Checked by: WEC

Attention: **JOHN POWER**

12th August 2022

ATTERBERG LIMITS & LINEAR SHRINKAGE TESTING

Dear Sir,

Re: 6a BROADWAY, KAIKOHE

Your Reference: Job # 22 277
Report Number: 63632#L/AL 6a Broadway

The following report presents the results of Atterberg Limits & Linear Shrinkage testing at BGL of a soil sample delivered to this laboratory on the 4th of August 2022. Test results are summarised below, with page 3 showing where the sample plots on the Unified Soil Classification System (Casagrande) Chart. Test standards used were:

Water Content:	NZS4402:1986:Test 2.1
Liquid Limit:	NZS4402:1986:Test 2.2
Plastic Limit:	NZS4402:1986:Test 2.3
Plasticity Index:	NZS4402:1986:Test 2.4
Linear Shrinkage:	NZS4402:1986:Test 2.6

Borehole Number	Sample Number	Depth (m)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage (%)*
BH03	BAG	0.60 – 1.00	37.2	64	33	31	18

**The amount of shrinkage of the sample as a percentage of the original sample length.*

The whole soil was used for the water content test (the soil was in a natural state), and for the liquid limit, plastic limit and linear shrinkage tests. The soil was wet up and dried where required for the liquid limit, plastic limit and linear shrinkage tests.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. Test 2.2: liquid limit, test 2.3: plastic limit, and test 2.6: linear shrinkage are reported to the nearest whole number.

Please note that the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Signatory (Assistant Laboratory Manager)
Babbage Geotechnical Laboratory

ACCREDITED
IANZ
TESTING LABORATORY
№ 126

Babbage Geotechnical Laboratory

Project: 6a BROADWAY, KAIKOHE

DETERMINATION OF THE LIQUID LIMIT, PLASTIC LIMIT & THE PLASTICITY INDEX

Test Methods: NZS4402: 1986: Test 2.2, Test 2.3 and Test 2.4

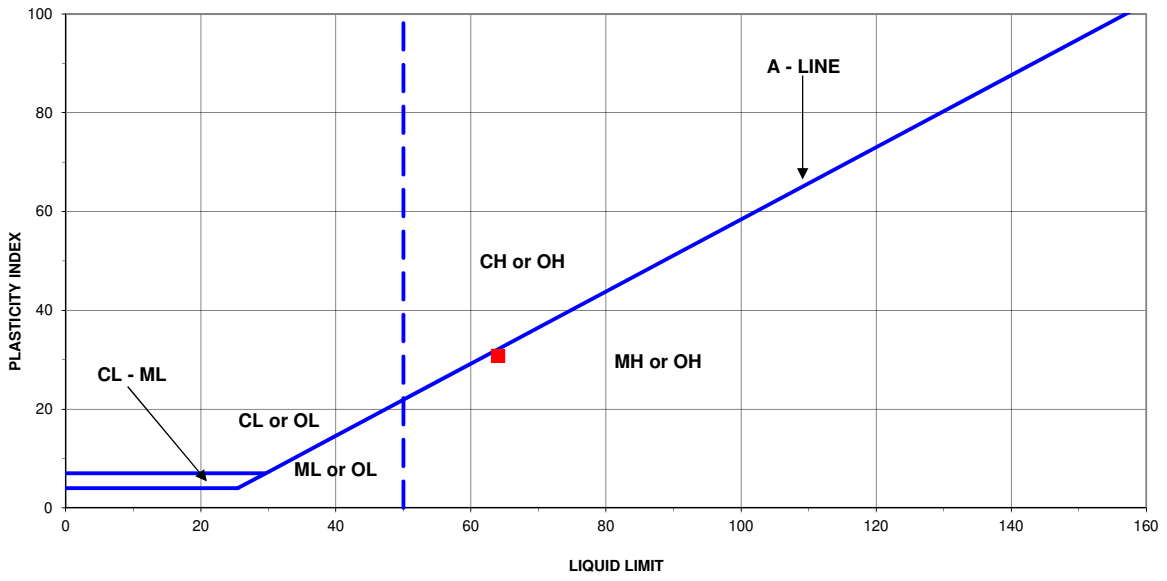
Tested By:	CBH	August 2022
Compiled By:	JF	12/08/2022
Checked By:	JF	12/08/2022

SUMMARY OF TESTING

Borehole Number	Sample Number	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification Based on USCS Chart Below
BH03	**BAG**	**0.60 - 1.00**	64	33	**31**	MH

The chart below & soil classification terminology is taken from ASTM D2487-17^{e1} "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)", April 2020, & is based on the classification scheme developed by A. Casagrande in the 1940's (Casagrande, A., 1948: Classification and identification of soil. Transactions of the American Society of Civil Engineers, v. 113, p. 901-930). The chart below & the soil classification given in the table above are included for your information only, and are not included in the IANZ endorsement for this report.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) PLASTICITY (CASAGRANDE) CHART



■ **BH03 / BAG / 0.60 - 1.00m**

CHART LEGEND

CL = CLAY, low plasticity ('lean' clay)
OL = ORGANIC CLAY or ORGANIC SILT, low liquid limit
ML = SILT, low liquid limit
CL - ML = SILTY CLAY
CH = CLAY, high plasticity ('fat' clay)
OH = ORGANIC CLAY or ORGANIC SILT, high liquid limit
MH = SILT, high liquid limit ('elastic silt')

Appendix F – Site Inspection Records

HAIGH WORKMAN LTD
Civil & Structural Engineers

Site Observations Note

Project No:	24 122	Visit No:	
Client:	Eclipse Architecture	Date:	01/08/24
Address:	69 & 71 Broadway, Kaikohe	Time:	12:00
Contact on site:	Mark and Hori (FNH) Matt, Peter and Jake (Keriland)	By:	OT

Site Clearing Observations

The pre-existing buildings have been demolished and removal of previous foundations and services in preparation for future development in under way. No building footprint location for the new development has been finalised.

Due to not understanding where new foundations will be located, it was only feasible/reasonable to take note of areas of (where exposed and obvious) any deleterious material, buried services and unsuitable foundation material.

Once the proposed building location is determined and foundation plans are known, locations where any unsuitable material that have been identified or suspected should be cleared and reinstated with engineered granular hard fill.

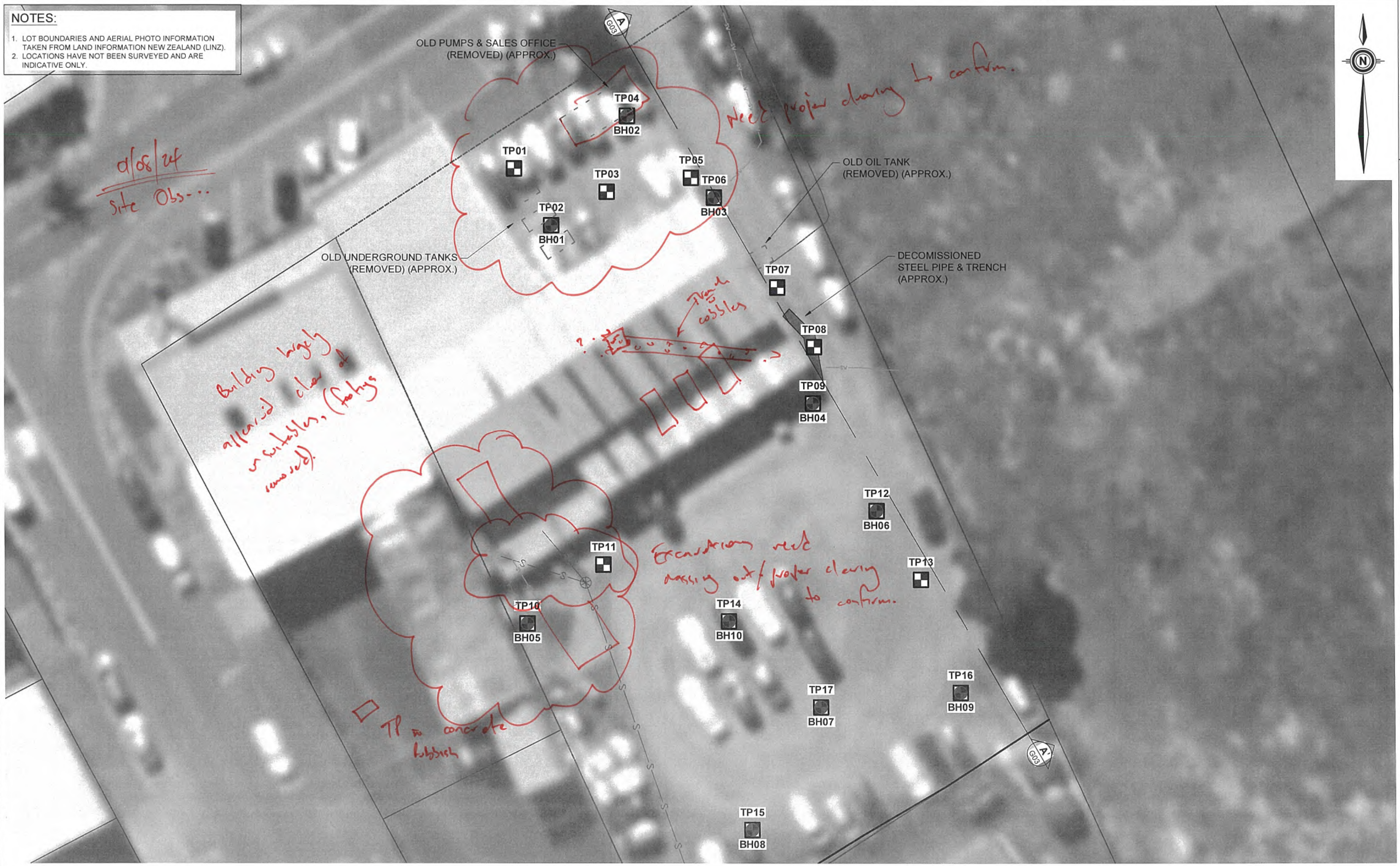
Refer annotated site plan and site photos for further info.

Re-inspections required.

NOTE:

It is understood construction will not proceed for some time, we recommend protecting any exposed foundation soils from weather wetting and drying as soon as is practicable, fluctuating soil moisture will deteriorate soil integrity.

Phone: +64 9 407 8327 Fax: +64 9 407 8378 info@haighworkman.co.nz www.haighworkman.co.nz
6 Fairway Drive PO Box 89 Kerikeri 0295 New Zealand



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.
OLD PUMPS & SALES OFFICE (REMOVED) (APPROX.)
OLD OIL TANK (REMOVED) (APPROX.)
OLD UNDERGROUND TANKS (REMOVED) (APPROX.)
DECOMISSIONED STEEL PIPE & TRENCH (APPROX.)
TP01
TP02
BH01
TP03
TP04
BH02
TP05
TP06
BH03
TP07
TP08
TP09
BH04
TP10
BH05
TP11
TP12
BH06
TP13
TP14
BH10
TP15
BH08
TP16
BH09
TP17
BH07
A
G03
A'
G03
N
9/08/24
Site Obs...
Need proper clearing to confirm.
Trench cobbles
Building largely alloured clear of unsuitables, (footings removed).
Excavations need massing out / proper clearing to confirm.
TP in concrete lobbish

Issue	Date	Revision
A	13/09/2022	FIRST ISSUE

DWG: Site Features & Investigation Plan

Scale 1:300 @A3 | Date 13 September 2022

Drawn CN | Checked WT | Approved JP

File C:\USERS\CRAIGNELDER\HAIGH WORKMAN LIMITED\SUITEFILES - CLIENTS\FNDC\JOBS\22 277 - 69 BROADWAY, KAIKOHE (LOT 1 DP 114630)\ENGINEERING\2. GEOTECH\DRAWINGS\22 277 GEOTECH DRAWINGS.DWG

HAIGH WORKMAN LTD
Civil & Structural Engineers
6 Fairway Drive
Kerikeri, BOI
T: 09 407 8327
F: 09 407 8378
E: info@haighworkman.co.nz

Project: Geotechnical Investigation
69 Broadway, Kaikohe

Client: FNDC

Project No. 22 277 | RC no. N/A

DWG No. G02

Sheet No. 2 of 3

Plotted By Craig Nelder at 20/09/2022 1:58:51 PM


01 August 2024 1:26 pm


01 August 2024 2:44 pm


01 August 2024 2:46 pm


AWHINA
01 August 2024 2:44 pm


01 August 2024 2:44 pm


01 August 2024 1:28 pm


01 August 2024 2:01 pm


01 August 2024 1:28 pm


01 August 2024 1:29 pm

HAIGH WORKMAN LTD
Civil & Structural Engineers

Site Observations Note

Project No:	24 122	Visit No:	
Client:	Eclipse Architecture	Date:	06/08/24
Address:	69 & 71 Broadway, Kaikohe	Time:	12:00
Contact on site:	Hori (FNH) Peter and Jake (Keriland)	By:	OT

Site Clearing Observations

During the previous site FNH indicated they would like to make the site safe until construction phase begins (Feb 2025indicated). FNH OK'd the backfilling of the 3 vehicle service bay pits and test pit holes excavated forcontamination checks to an engineered standard to avoid the need to do again come construction phase. On site to clear/inspect unsuitable material in preparation for hard filling and chase the trench containing the cobble material (suspected soakage trench).
Due to the final footprint being undefined, the intention is to remove all unsuitables and reinstate approximately 10 metres away from the property boundary/building setback so the future footprint can be located where required.

During excavations of the unsuitable materials, it became evident that the trench was more significant than initially suspected – the trench (system) was approximately 3 times the size of the vehicle service bays initially planned for backfilling. Hori (FNH) was asked to come to site to observe how significant the trench had become, and backfilling was placed on hold until further notice is given.

Refer annotated site plan and site photos for further info.

Due to time constraints and waiting for lab test results, the other area with excavations requiring backfilling will be cleared of unsuitables, inspected and backfilled tomorrow.

NOTE:

Jake (Keriland) happened to have his personal drone and offered to take aerial photographs indicating location and extent of work/excavations (see site photos attached)..

Phone: +64 9 407 8327 Fax: +64 9 407 8378 info@haighworkman.co.nz www.haighworkman.co.nz
6 Fairway Drive PO Box 89 Kerikeri 0295 New Zealand


Vehicle Service Bays
01 August 2024 2:00 pm


Vehicle Service Bays
06 August 2024 1:31 pm


Vehicle Service Bays


Vehicle Service Bays

HAIGH WORKMAN LTD
Civil & Structural Engineers

Site Observations Note

Project No:	24 122	Visit No:	
Client:	Eclipse Architecture	Date:	07/08/24
Address:	69 & 71 Broadway, Kaikohe	Time:	11:00
Contact on site:	Hori (FNH) Peter (Keriland)	By:	OT

Site Clearing Observations

On site to check and OK backfilling of the 3 test pits near the SSMH (see attached).

The excavation in the middle appeared to have a 'soft spot' needing to be cleared – similar to yesterday's events, the excavating grew legs and quickly went form a 'scratch' to a three-metre-deep excavation chasing out buried rubbish – glass, shells, plastic and bottles.

Hori was again asked to site to observe, and the visit concluded with the decision to simply backfill with non-engineered (track rolled) material.

Refer site photos for further info.

Re-inspections required.

CRITICAL OBSERVATIONS OUTCOME:

Based on the observations carried out at the site so far it is reasonable to expect that the site clearing and preparation for foundations during construction will uncover further unsuitable and unexpected ground (with potential to be significant).

Any unsuitable ground intended to support foundations will require removal and reinstatement with engineered fill to support foundations (including test pits excavated during site investigations), no ground has been "made good" over the course of the demolition visits, all excavations have been reinstated to a safe standard - not engineered standard.

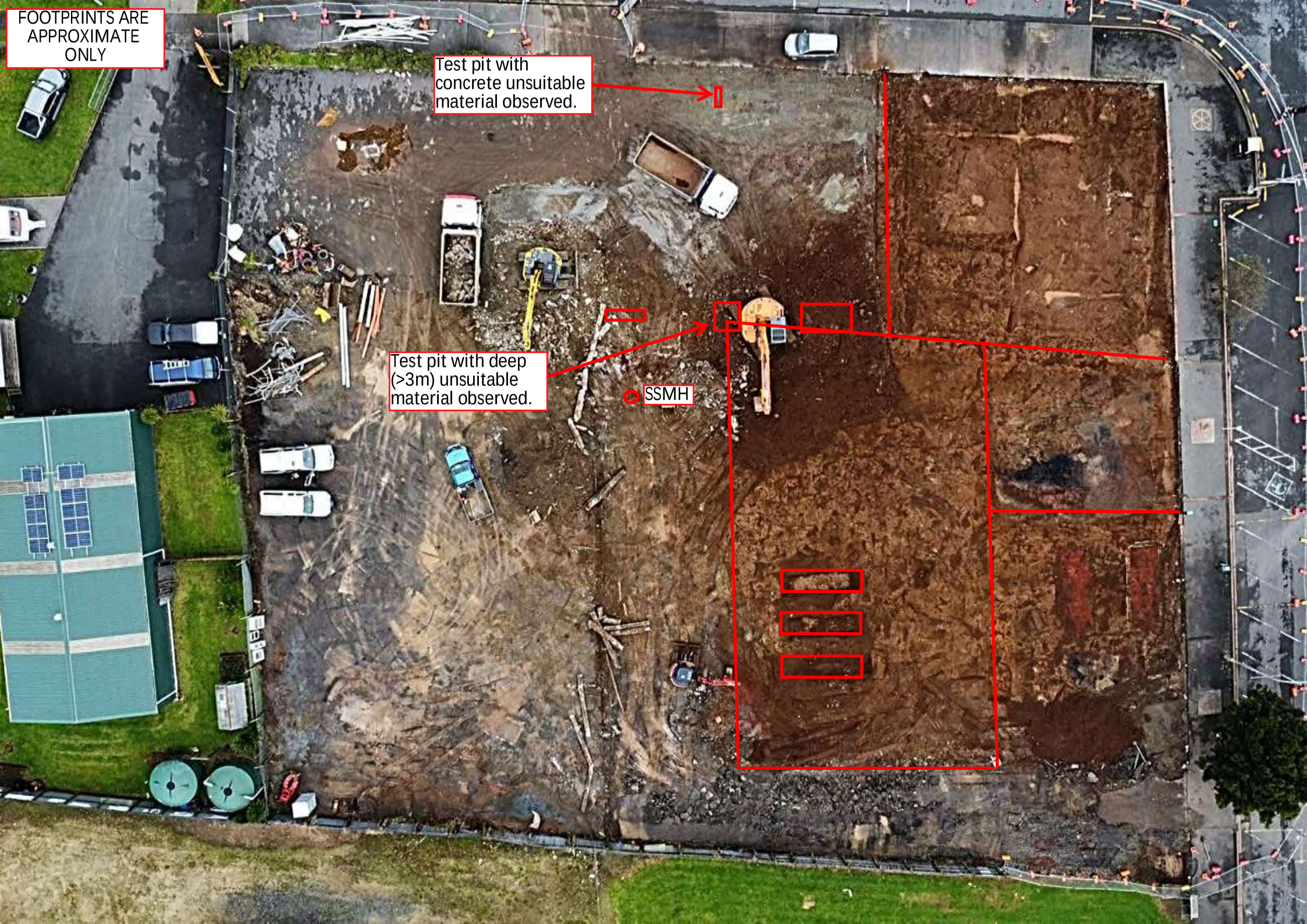
We recommend contingency is considered and planned for, for further unexpected/unforeseen ground remedial works.

Phone: +64 9 407 8327 Fax: +64 9 407 8378 info@haighworkman.co.nz www.haighworkman.co.nz
6 Fairway Drive PO Box 89 Kerikeri 0295 New Zealand


07 August 2024 11:32 am


07 August 2024 1:00 pm


SSMH
Deep rubbish pit >3m
07 August 2024 11:32 am


FOOTPRINTS ARE APPROXIMATE ONLY
Test pit with concrete unsuitable material observed.
Test pit with deep (>3m) unsuitable material observed.
SSMH


FOOTPRINTS ARE APPROXIMATE ONLY
SSMH
Remove suspected 'finger' off soakage trench network.
All excavations within the final building footprint's zone of influence that were excavated during investigations and clearing must have unsuitable backfill removed and excavations reinstated with engineered hardfill - refer geotech report for test pits locations.

Appendix G – PS4 Advisory Note

IMPORTANT ADVISORY NOTE

PRODUCER STATEMENT – CONSTRUCTION REVIEW (PS4)

The Building Consent Authority (BCA) frequently requires Producer Statements–Construction Review (PS4) to be submitted to the BCA in order for a Code of Compliance Certificate (CCC) to be issued. A PS4 is usually required for each specialist area. The requirement for a consultant to issue a PS4 related to their area of work will appear as a condition in the Building Consent documents.

It is the consent holder's responsibility to notify Haigh Workman Limited for geotechnical construction monitoring and testing required for subsequent issue of a PS4. An initial inspection of stripped or excavated ground must take place before any fill or blinding concrete is placed. Retrospective site monitoring of completed or partially completed geotechnical work is not possible and a PS4 will not be issued without all the required observations.

In order to secure our construction monitoring services and avoid delays on site, Haigh Workman Limited require at least 24 hours' notice prior to the time the site visit is required. Construction monitoring is limited to items that have been recommended, designed and detailed by Haigh Workman Limited. We are unable to inspect non-consented or unauthorised work. Haigh Workman Limited do not carry out construction monitoring or issue PS4's for work that has been recommended, designed or detailed by other consultants without prior approval from Haigh Workman Limited. Haigh Workman Limited will not issue a PS4 where construction monitoring and/or testing have been carried out by any other consultant. The PS4 must be sought from the consultant who carried out those inspections.

The full Building Consent, with stamped plans with consent numbers (or a legible copy of the same) including all amendments, shall be made available to us during inspections. We will not commence construction monitoring until the documentation is available or provided to us prior to our site visit.

Unless stated otherwise in our terms of engagement, the fees associated with construction monitoring and the issue of PS4's are separate from any work carried out prior to commencement of construction. We are able to provide a fee estimate for this work if required. We cannot provide a fixed quote because the quantum of work required frequently depends on the construction program and the performance of others. These things are not known to us in advance of construction. Our normal terms of trade require payment of fees monthly during the inspection period and full settlement prior to release of any PS4.

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

HE ARA TĀMATA
CREATING GREAT PLACES
Supporting our people

Parking Occupancy Study Results

December 2023

1. Context

On 21 September 2023, Council approved the development of a Parking Strategy.

Evidence indicates that the development of a parking strategy is the most appropriate way to address parking in the Far North District.

A parking Strategy has been recommended as part of the Integrated Transport Plan's recommended 10-year plan to achieve:

- A safer, better transport system with more transport choices for people and businesses
- Improved connectivity and access to social and economic activities
- Secure and reliable transport network
- Community supported prioritised transport investment to best use resources and attract funding.

Development of a parking policy would:

- assist the council in delivering good parking management through the Far North District
- support equity
- address automobile dependency
- support climate change and public spaces policy
- future proof population growth and infrastructure development
- determine if parking time limits and fee structures are required and how these will be set.
- determine if the use of technology, such as CCTV, is required.
- determine what resources will be required to monitor and enforce.
- ensure compliance with Waka Kotahi Guidelines
- support the new parking bylaw.
- allow evidence-based decisions when making amendments to the parking bylaw.

The primary purpose of this Parking Occupancy Study is to gather a baseline of data to identify how parking is currently being utilised in the Far North District. It is produced during the Conceive stage and used and updated during subsequent stages.

This to ensure that parking is managed to allow for optimal use (85% occupancy) and that the overflow of parking in town centres is not adversely impacting on residential streets. Disability parking will also be measured to find out levels of use. This study will inform council as to whether timed or paid parking may need to be introduced or updated.

This study will also help identify whether the introduction of parklets will impact on the levels of parking occupancy in town centres.

While this is a stand-alone study, it is hoped that consequent studies will be conducted to identify the changes in parking trends throughout the Far North over time. Further parking occupancy studies conducted during the peak summer months is strongly recommended to get a clear picture of how the influx of visitors over the summer period impacts on parking in the Far North, particularly in popular holiday destinations.

2. Objectives

Currently, Council does not know the current levels of parking within the Far North region. Subsequently, Council does not know how effective current parking management strategies such as time limits are, in order to ensure optimal levels within the Far North region.

The specific objectives of this study are to:

1. Gather a baseline of information of how parking is utilised in the Far North District.
2. Identify the parking occupancy levels of high use streets in the Far North District to ascertain what percentage levels of use they are currently at.
3. Identify whether spillover of parking is adversely impacting on residential streets.
4. Identify the impact an introduction of parklets would have on town centres.
5. Identify whether the streets with timed parking limits are ensuring optimal use of parking spaces (85%).
6. Identify whether disability parking is being utilised.

3. Project Scope

Parking will be measured by how many percent of parking spaces are being utilised for parking at any moment in time.

Each street being studied will have occupancy levels taken over three days: Tuesday, Saturday, and either Wednesday or Thursday. Over those three days, each street will have occupancy levels taken across the day:

- Streets with time limits will be checked at the end of each of the allocated times. For example, Streets with 180-minute time limits will be measured every 3 hours (8.30am, 11.30pm and 2.30pm) across the day.
- Streets without time limits will be measured at 3 time points across the day. For example, 9am, 12pm and 3pm.
- Each street will be measured by a percentage of the marked parking spaces being utilised. For example, if there are 10 parking spaces and 8 are being used, then 80% of parks are being utilised.
- For streets without marked parking spaces, an estimate of the percentage available parking space available being used will be estimated. For example, if 100m of street is available for parking and 30m of that 100m is being utilised for parking, then 30% of parking is being utilised.
- Each disability park will be measured as occupied or not occupied at the same times as proposed above according to lime limits.

4. Constraints

Several constraints were identified in the execution of this study, including the limited duration and specific dates on which data collection occurred. The study was conducted on the following days in late 2023:

- Kaitaia: Saturday, December 16th, Tuesday, December 19th, and Wednesday, December 20th
- Kaikohe: Saturday December 2nd, Tuesday December 5th, and Wednesday December 6th
- Kerikeri: Saturday November 25th, Wednesday November 29th, and Thursday November 30th
- Paihia: Saturday December 2nd, Tuesday December 5th, and Wednesday December 6th
- Kawakawa: Saturday December 9th, Tuesday December 12th and Wednesday December 13th
- Mangonui: Tuesday November 14th, Wednesday November 15th, Saturday November 18th

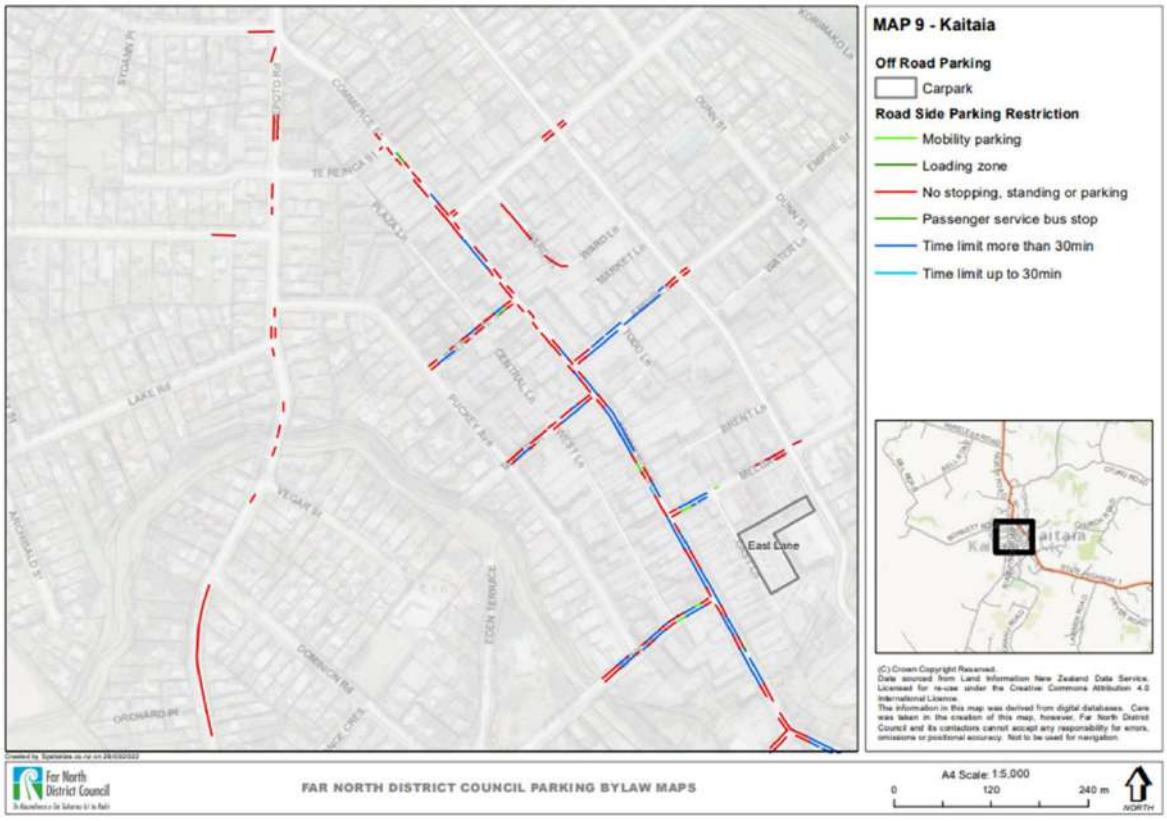
The study was confined to only three days at each urban area and during the busy period prior to Christmas, thereby potentially restricting the representation of parking behaviours across a broader spectrum of time periods, seasons, or events.

Furthermore, the inclusion of a weekend day and two weekdays may not fully capture the nuances of parking demand distribution across the entire week. Variations in parking behaviours on weekdays versus weekends, as

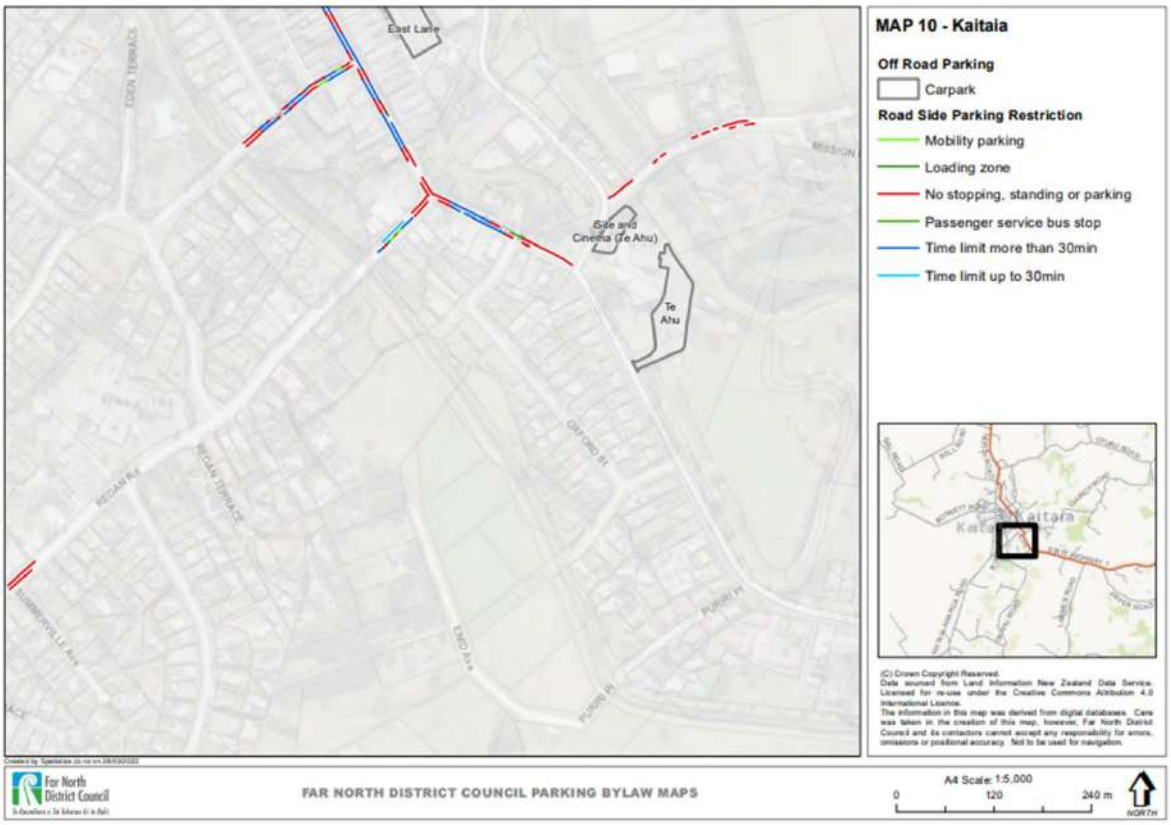
well as potential differences between specific weekdays (e.g., midweek versus end of the week), may not be fully captured within this limited timeframe.

5. Streets Included in the Study

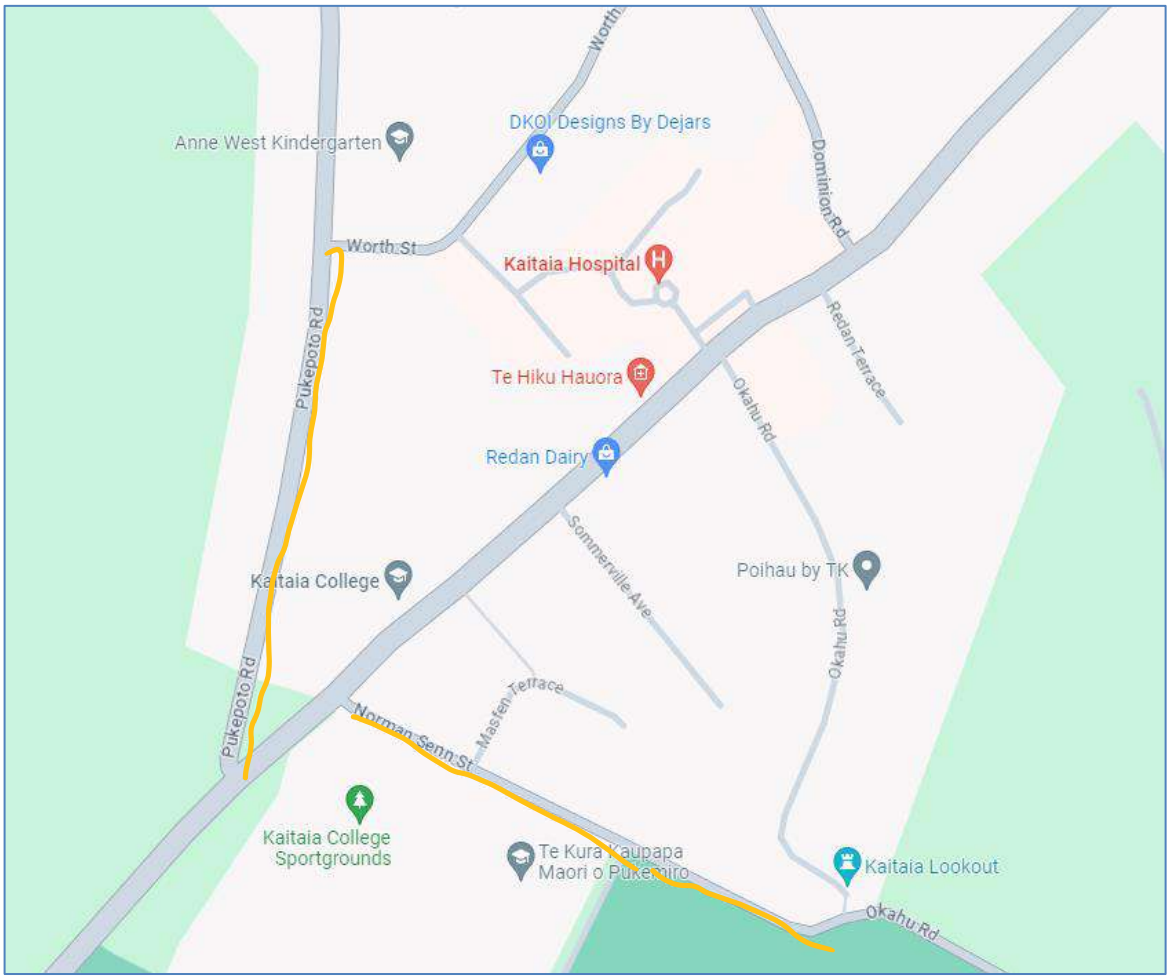
Kaitaia *(Map 9 – Schedule 5, Parking Bylaw 2022)*	
Commerce Street	5- and 60-minute time limits
Blencowe Street	120-minute time limit
Empire Street	120-minute time limit
Taffe Street	120-minute time limit
Melba Street	60-minute time limit
Bank Street	60-minute time limit
Te Araroa Trail	



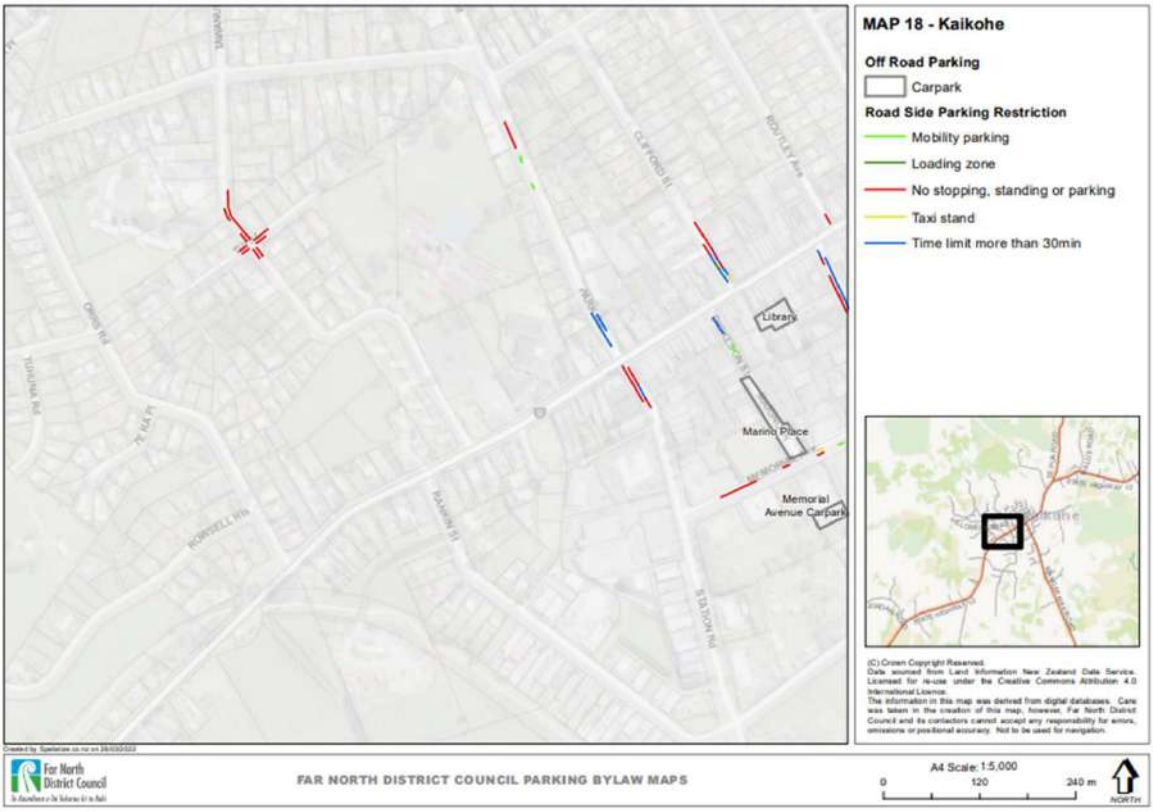
Kaitaia *(Map 10 – Schedule 5, Parking Bylaw 2022)*	
Bank Street	60-minute time limit
Redan Road	15- and 60-minute time limits
Commerce Street	60- and 120-minute time limits
Te Araroa Trail	



Kaitaia *(Map?)*	
Norman Senn Avenue	Only when Kaitaia College is operating
Pukepoto Road	Only when Kaitaia College is operating



Kaikohe *(Map 18 – Schedule 5, Parking Bylaw 2022)*	
Park Road	60-minute time limit
Clifford Street	60-minute time limit
Routley Avenue	No time limit
Dickeson Street	No time limit
Raihara Street	60-minute time limit



Kaikohe *(Map 19 – Schedule 5, Parking Bylaw 2022)*	
Raihara Street	
Wihongi Street	60-minute time limit

Kaikohe *(Map 4 – Schedule 6, Parking Bylaw 2022)*	
Broadway	60-minute time limit

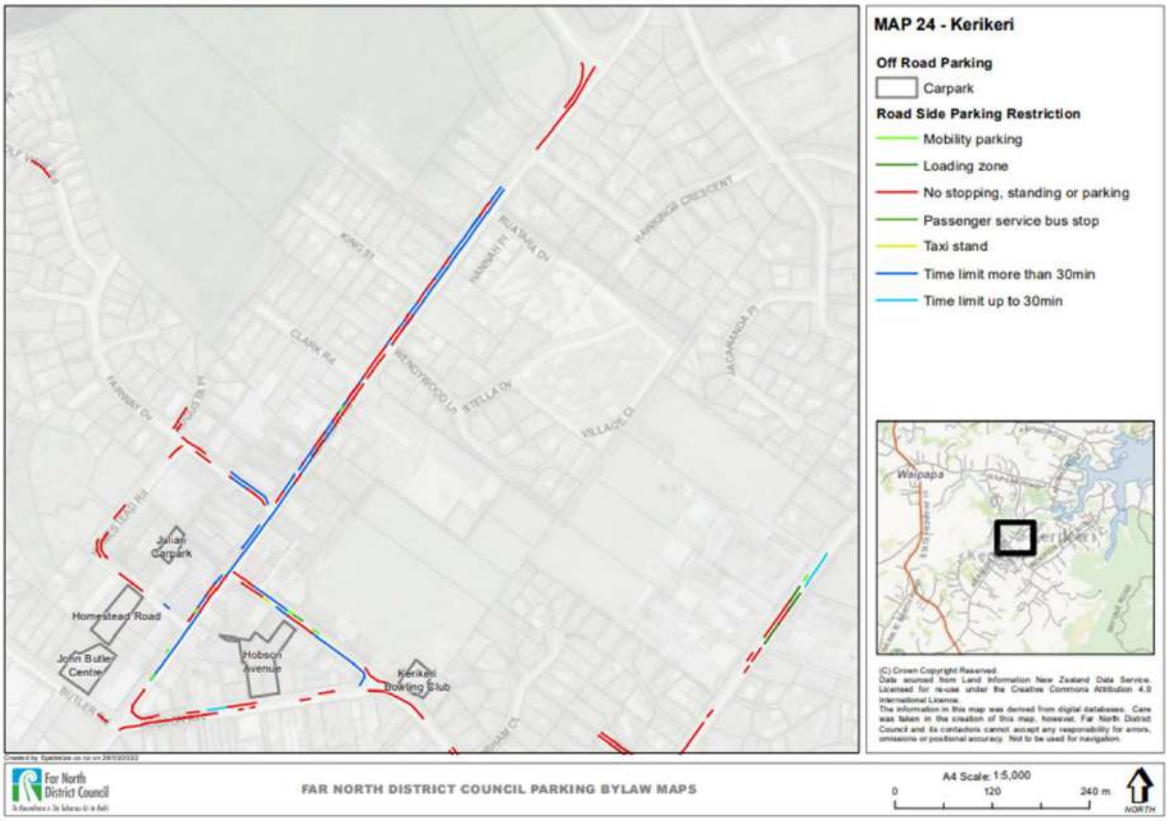
Kaikohe *(Map 5 – Schedule 6, Parking Bylaw 2022)*	
Broadway	60-minute time limit

Kaikohe *(Map 6 – Schedule 6, Parking Bylaw 2022)*	
Broadway	60-minute time limit

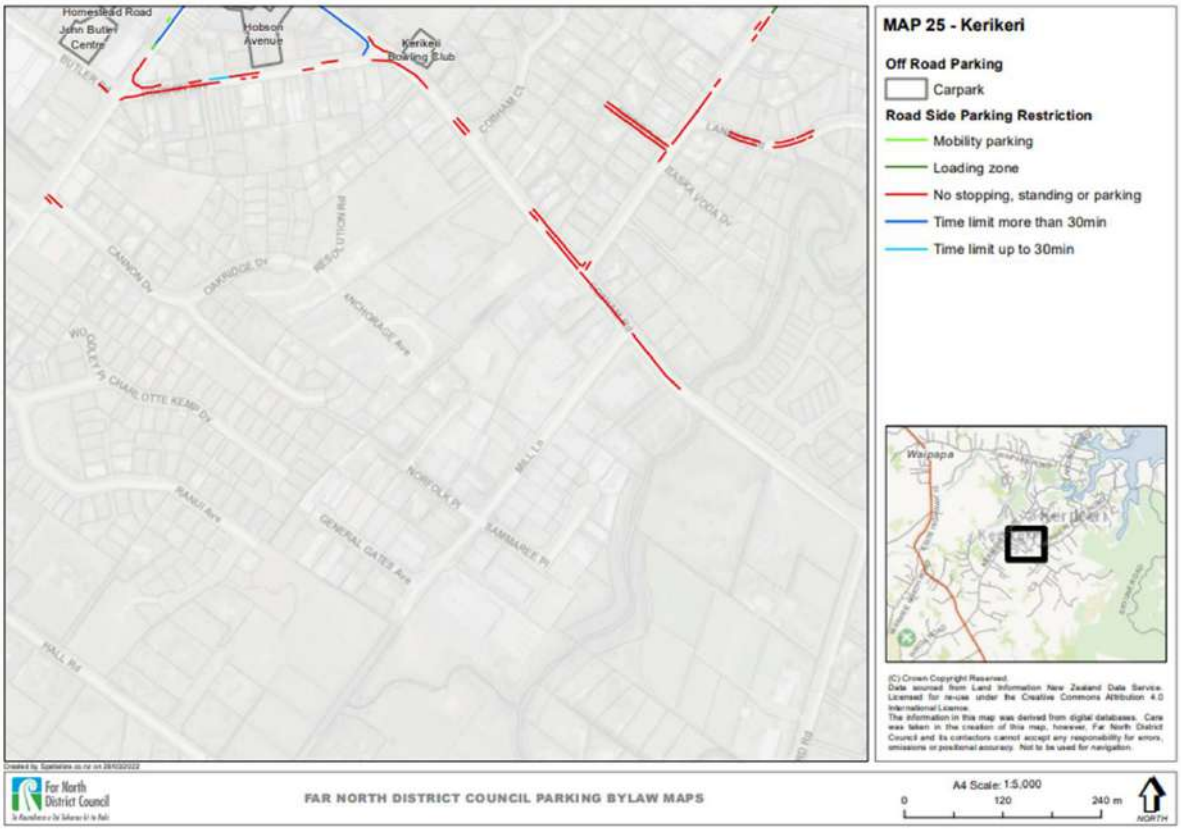
Kaikohe *(Map 5 – Schedule 6, Parking Bylaw 2022)*	
Memorial Ave	No time limit
The parking area by the public library	No time limit
Station Road (from Broadway down to Memorial Ave)	60-minute time limit

Kaikohe *(Map 6 – Schedule 6, Parking Bylaw 2022)*	
Broadway	60-minute time limit

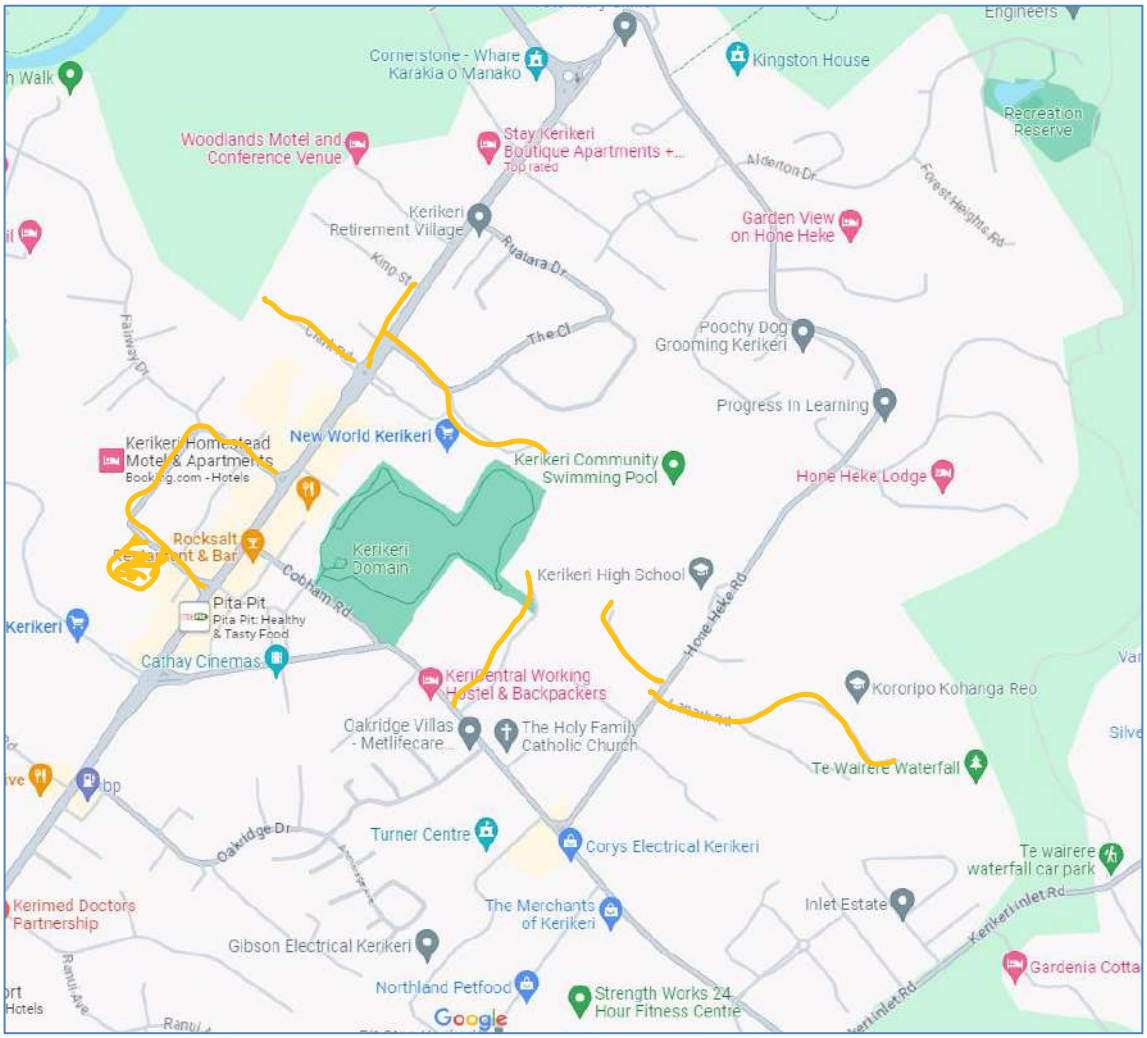
Kerikeri *(Map 24 – Schedule 5, Parking Bylaw 2022)*	
Homestead Road	60-minute time limit
Twin Coast Discover Highway/ Kerikeri Road	60- and 120-minute time limits
Hobson Ave	No time limit
Cobham Road	60-minute time limit
Hone Heke Road	No time limit



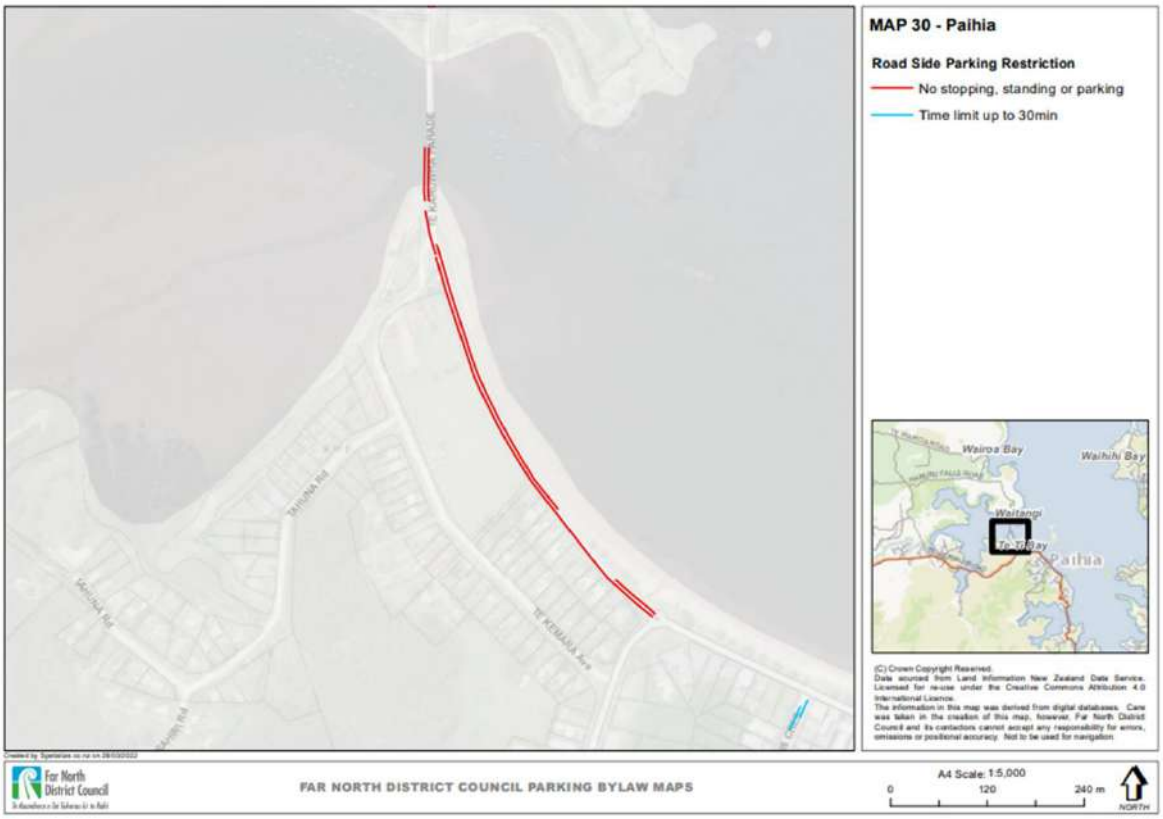
Kerikeri *(Map 25 – Schedule 5, Parking Bylaw 2022)*	
Hobson Ave	30-minute time limit
Cobham Road	60-minute time limit
Hone Heke Road	30-minute time limit



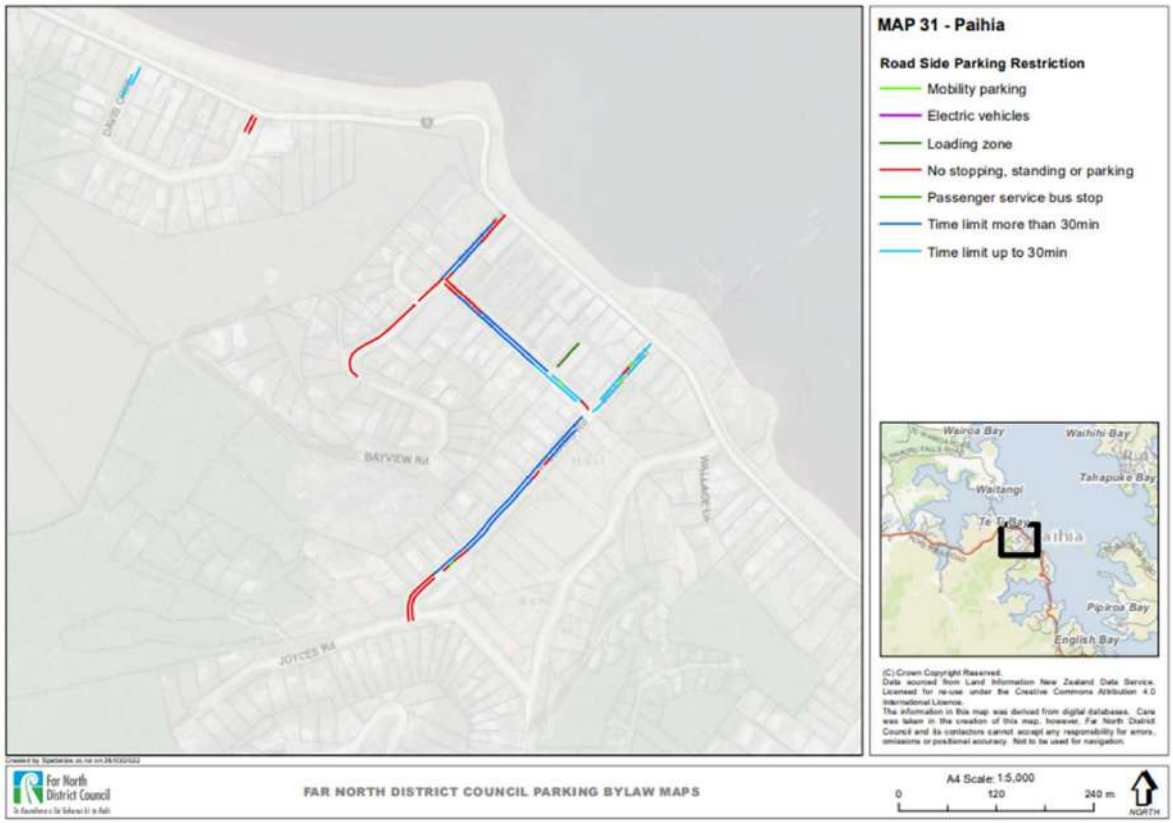
Kerikeri	
Kerikeri Road (past the roundabout at Clark Road. Left hand side down to King Street).	60- and 120-minute time limit
Clark Road	No time limit
Wendywood Lane	No time limit
Cobham Court, Construction works from the project on Cobham Road.	No time limit
Lanark Road.	No time limit
Oripiro Road	No time limit
Homestead Road	60-minute time limit
Fairway Drive	60-minute time limit
Car parking area at 5 Homestead Road.	



Paihia *(Map 30 – Schedule 5, Parking Bylaw 2022)*	
Davis Crescent	30-minute time limit



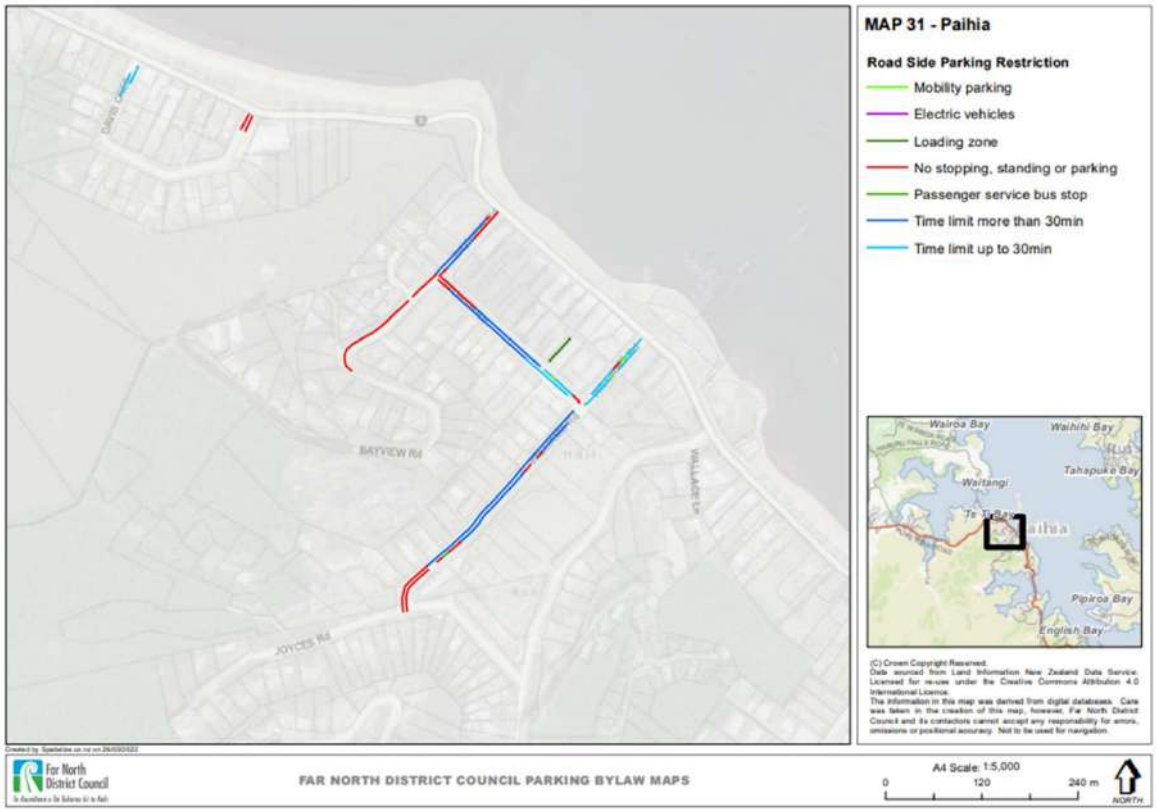
Paihia *(Map 31 – Schedule 5, Parking Bylaw 2022)*	
Bayview Road	240-minute time limit
Selwyn Road	30-, 60-, and 120-minute time limits
Williams Road	30- and 60-minute time limits

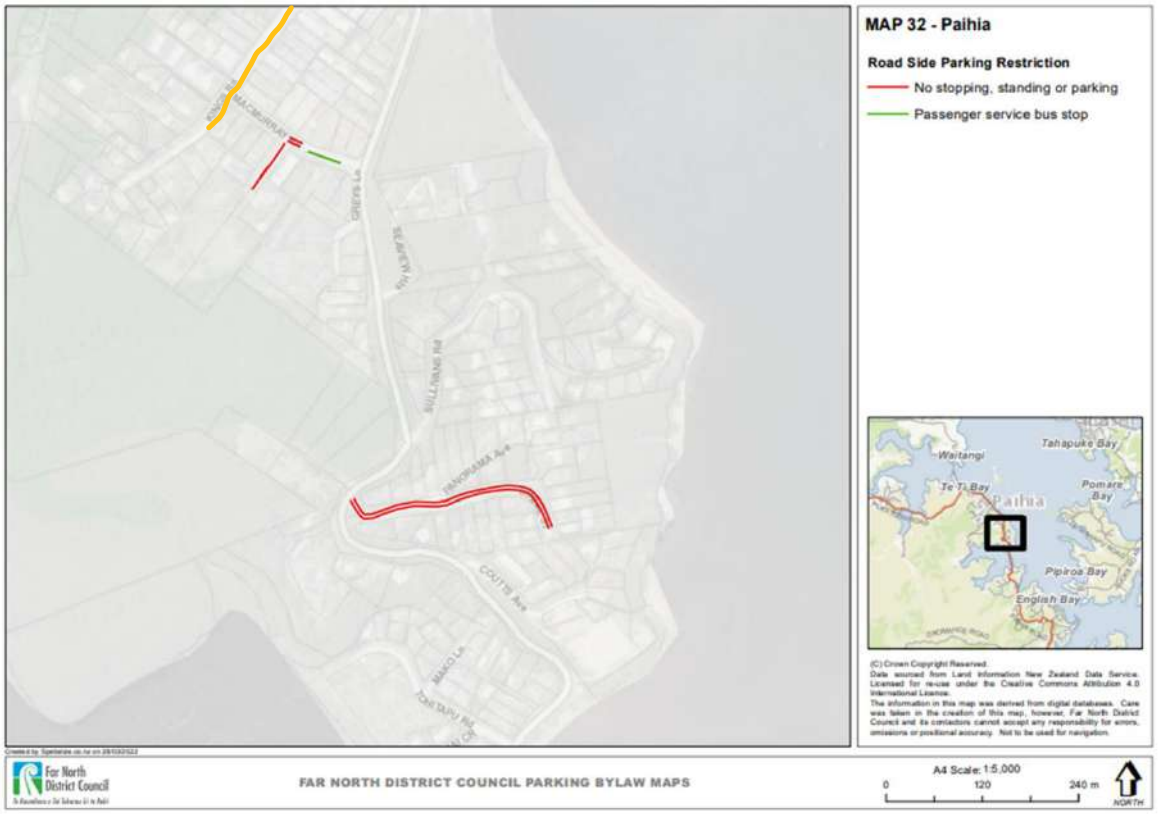


Paihia *(Map 7 – Section 6, Parking Bylaw 2022)*	
SH11/ Marsden Road	240-minute time limit

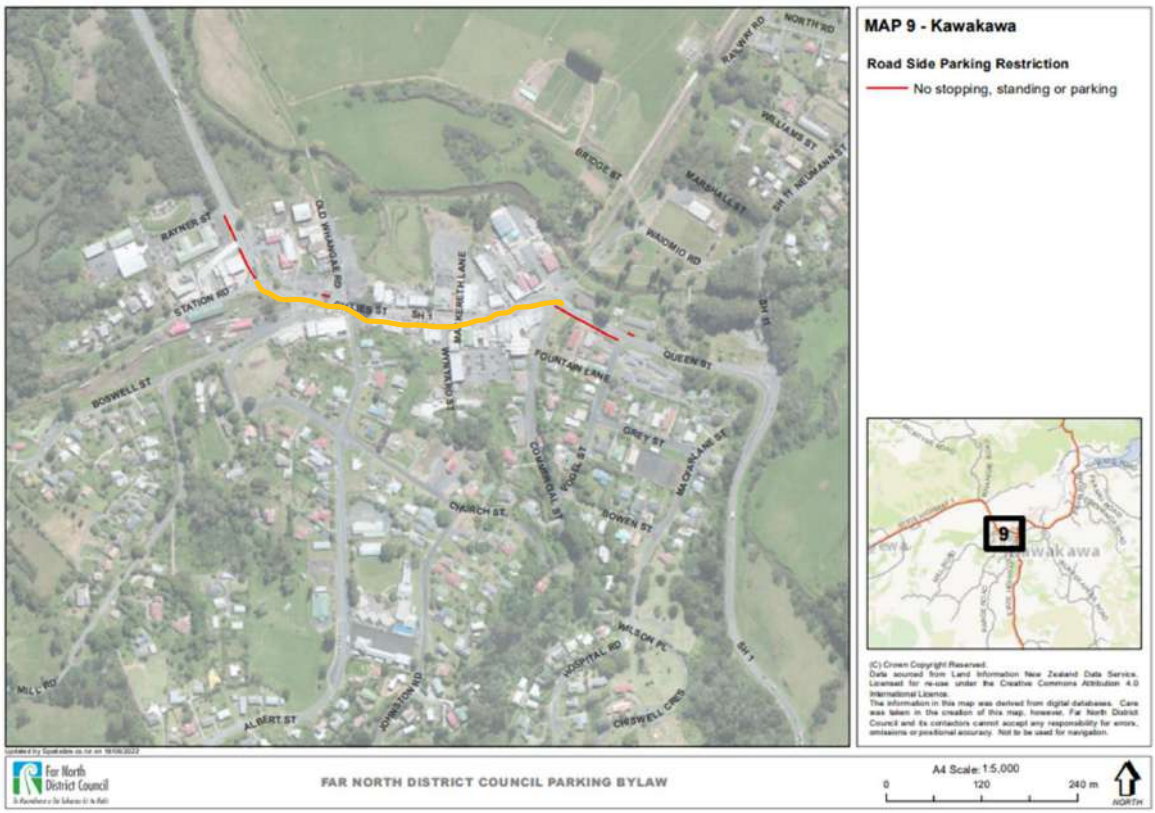
Paihia *(Map 8 – Section 6, Parking Bylaw 2022)*	
SH11/ Marsden Road	240-minute time limit

Paihia (Map?)	
Kings Road	No time limit
Williams Road (top part of road past entrance to public car park).	No time limit





Kawakawa *(Map 9 – Section 6, Parking Bylaw 2022)*	
SH1/ Gillies Ave	No time limit



Mangonui	
Waterfront Road	No time limit
Beach Road	No time limit

5.1 Disability Parking Included in the Study

Kaitaia	
Bank Street	60-minute time limit
Bank Street	No time limit
Commerce Street	No time limit
Commerce Street	No time limit
Melba Street	No time limit
Melba Street	60-minute time limit
Melba Street	No time limit
Melba Street	No time limit
Melba Street	No time limit
Redan Road	No time limit
Redan Road	No time limit

Kaikohe	
Dickeson Street	No time limit
Hongi Street	No time limit
Memorial Avenue	No time limit
Memorial Avenue	No time limit
Park Road	No time limit
Park Road	No time limit
Broadway	No time limit
Broadway	No time limit
Broadway	No time limit
Broadway	No time limit
Broadway	No time limit

Kawakawa	
Gillies Avenue	No time limit

Kerikeri	
Cobham Road	No time limit
Cobham Road	No time limit

Fairway Drive	No time limit
Hone Heke Road	No time limit
Kerikeri Road	120-minute time limit
Kerikeri Road	120-minute time limit
Kerikeri Road	No time limit
Kerikeri Road	No time limit

Mangonui	
Waterfront Road	No time limit

Paihia	
Selwyn Road	No time limit
Williams Road	30-minute time limit
Williams Road	No time limit
Williams Road	No time limit

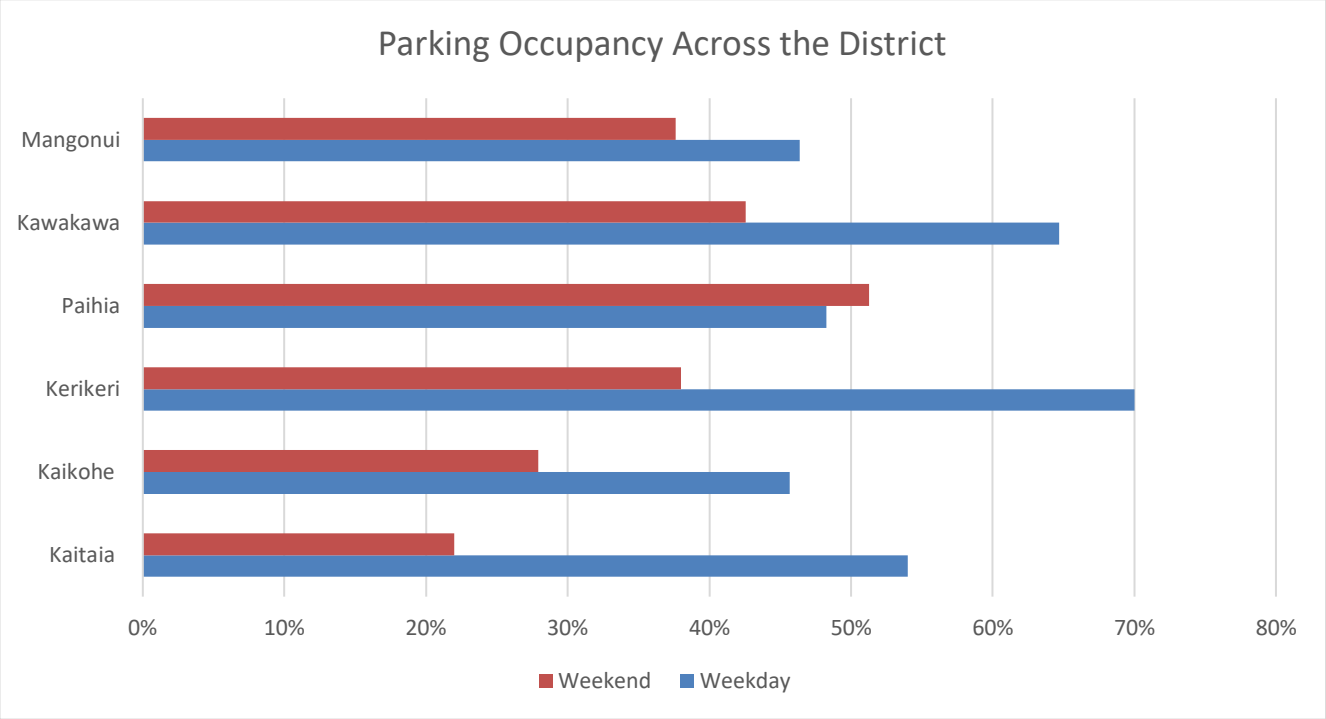
6. Results

6.1 Overall Parking Occupancy Across the District

The study highlights significant variations in parking occupancy rates across the district. Kerikeri has the highest occupancy rate while Paihia demonstrates a notable surge in parking demand over weekends, potentially linked to increased tourist activity or recreational pursuits. Conversely, Kaitaia, Kaikohe, and Mangonui generally register lower occupancy rates, indicating comparatively lesser demand for parking spaces in these areas. **Figure 1** illustrates the average parking occupancy across the district.

Detailed results for each urban area are discussed in depth further on in this report.

Figure 1- Average Parking Occupancy Across the District



6.2 Kaitaia Results

6.2.1 Overall Parking Occupancy

The results show that the overall parking occupancy for the Kaitaia Town Centre is 38%, however, parking occupancy is significantly higher on weekdays (54%) compared to weekends (22%). This discrepancy suggests a distinct pattern in parking demand influenced by factors such as commuter traffic and business activities that predominantly occur during the weekdays.

The peak average occupancy rate was recorded at 11 am at 55%. This peak aligns with typical mid-morning hours when businesses are fully operational, and various activities within the town centre are occurring. **Figures 2** and **3** illustrate the total average parking occupancy categorized by day type (weekday vs. weekend) and time of day, respectively.

Figure 2- Kaitaia- Overall Parking Occupancy

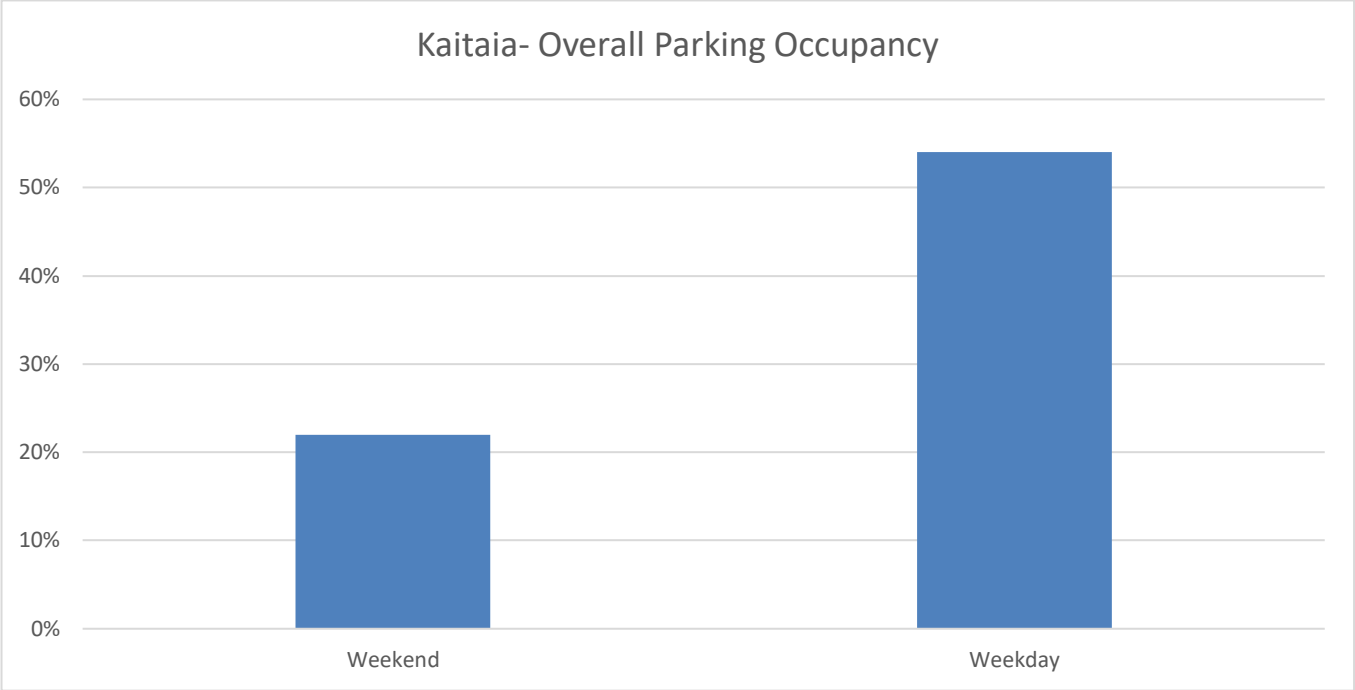
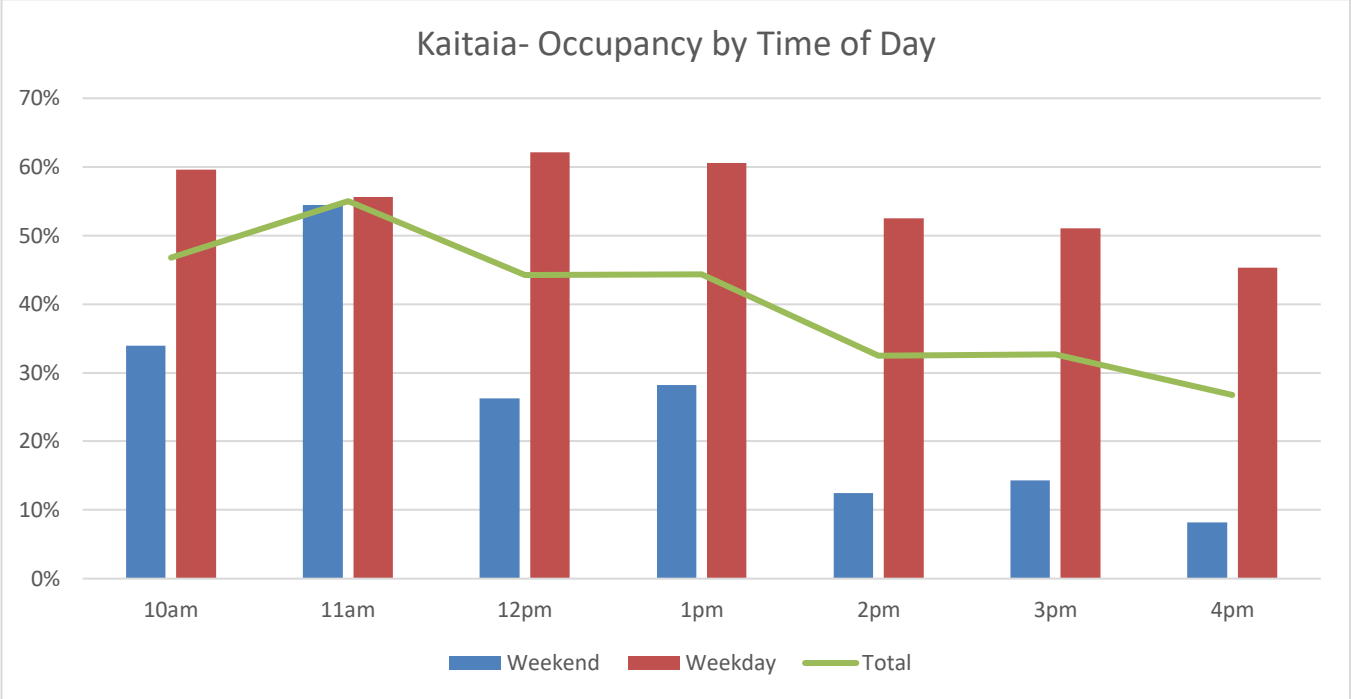


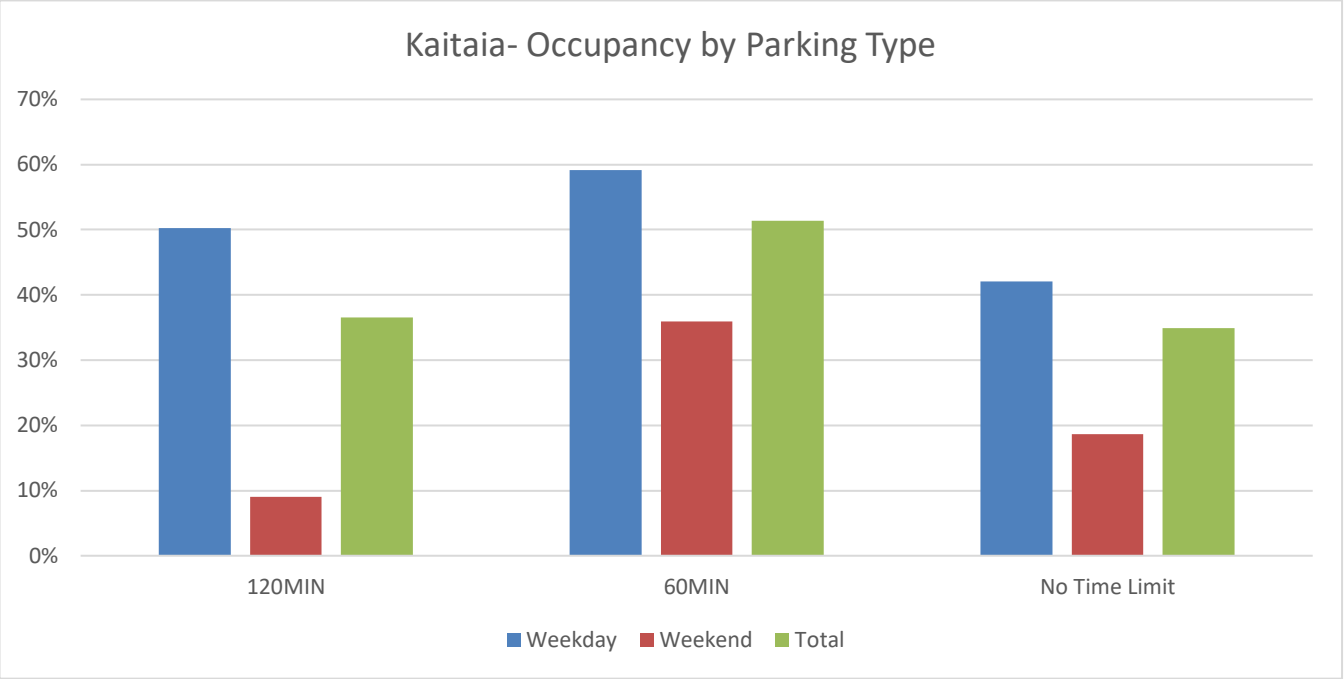
Figure 3- Kaitaia Parking Occupancy by Time of Day



6.2.2 Parking Type Occupancy

This study surveyed three distinct types of parking spaces: those with a 60-minute time limit, those with a 120-minute time limit, and those without any time restrictions. Results indicate that 60-minute parking spaces exhibited the highest occupancy rate, reaching 51%, while both 120-minute and unrestricted parking spaces showed similar overall occupancy rates of 36% and 34%, respectively. Additionally, the data underscores the trend of higher occupancy rates on weekdays compared to weekends. **Figure 4** shows the average parking occupancy across these parking types.

Figure 4- Kaitaia Parking Occupancy by Parking Type



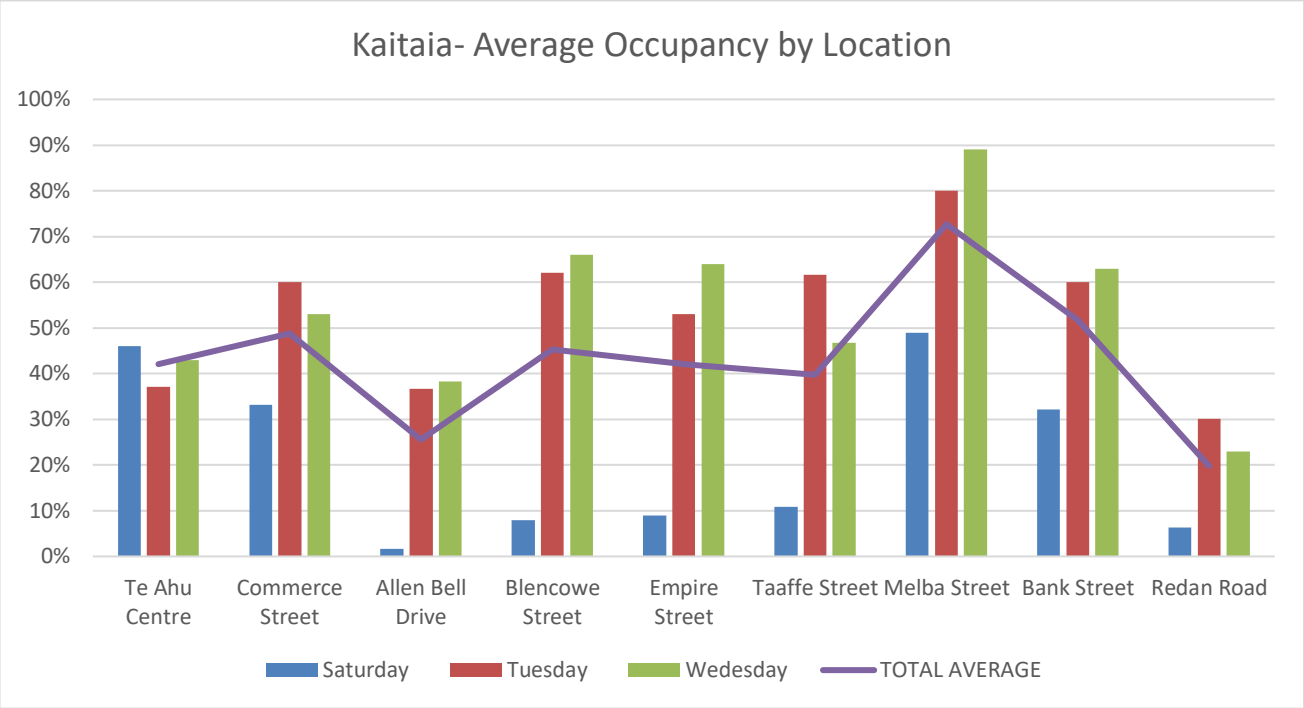
6.2.3 Parking Occupancy by Location

Parking occupancy was assessed across nine locations within the Kaitaia Town Centre. These are:

- Te Ahu Centre
- Commerce Street
- Allen Bell Drive
- Blencowe Street
- Empire Street
- Taaffe Street
- Melba Street
- Bank Street
- Redan Road

The study revealed a wide range of occupancy rates across these sites, ranging from 85% on weekdays at Melba Street to as low as 1% on Weekends at Allen Bell Drive. Notably, Melba Street exhibited the highest level of parking occupancy among the surveyed locations on both weekends and weekdays. For a comprehensive overview of the average occupancy rates at each location, refer to **Figure 5**.

Figure 5- Kaitaia Parking Occupancy by Location



6.2.4 Disability Parking Occupancy

Out of the locations surveyed, 5 of them included disability parking:

- Te Ahu Centre
- Commerce Street
- Melba Street
- Bank Street
- Redan Road

The study found that overall occupancy of the disability parking is low. Disability parking occupancy is higher on weekdays at 22% compared to 12% on weekends. **Figure 6** shows the overall occupancy of disability parking in the Kaitaia Town Centre and **Figure 7** shows the occupancy of disability parks by location.

The higher occupancy of disability parking on weekdays compared to weekends suggests that individuals with disabilities may have greater need for accessible parking during typical business days, likely due to increased activity in the town centre related to work, shopping, or appointments. However, the overall low occupancy rates indicate that there may be sufficient availability of disability parking spaces in the area.

Figure 6- Kaitaia Disability Parking Occupancy

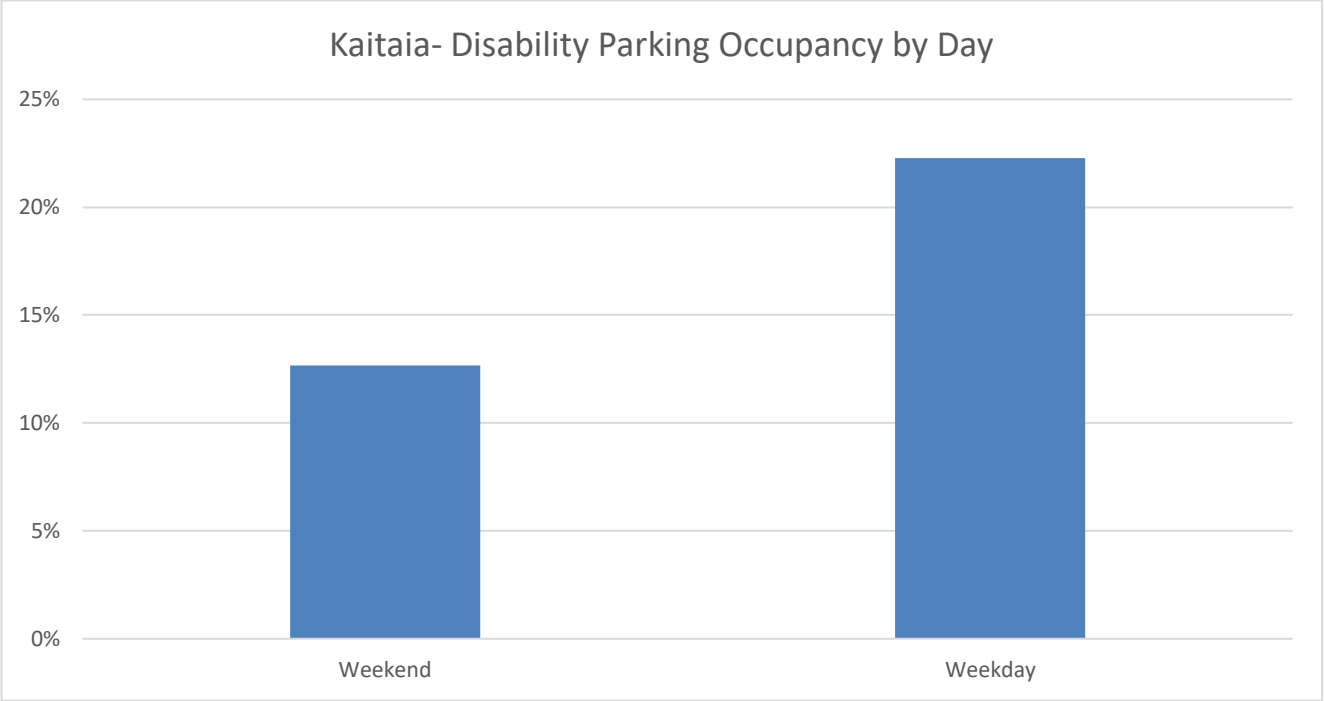
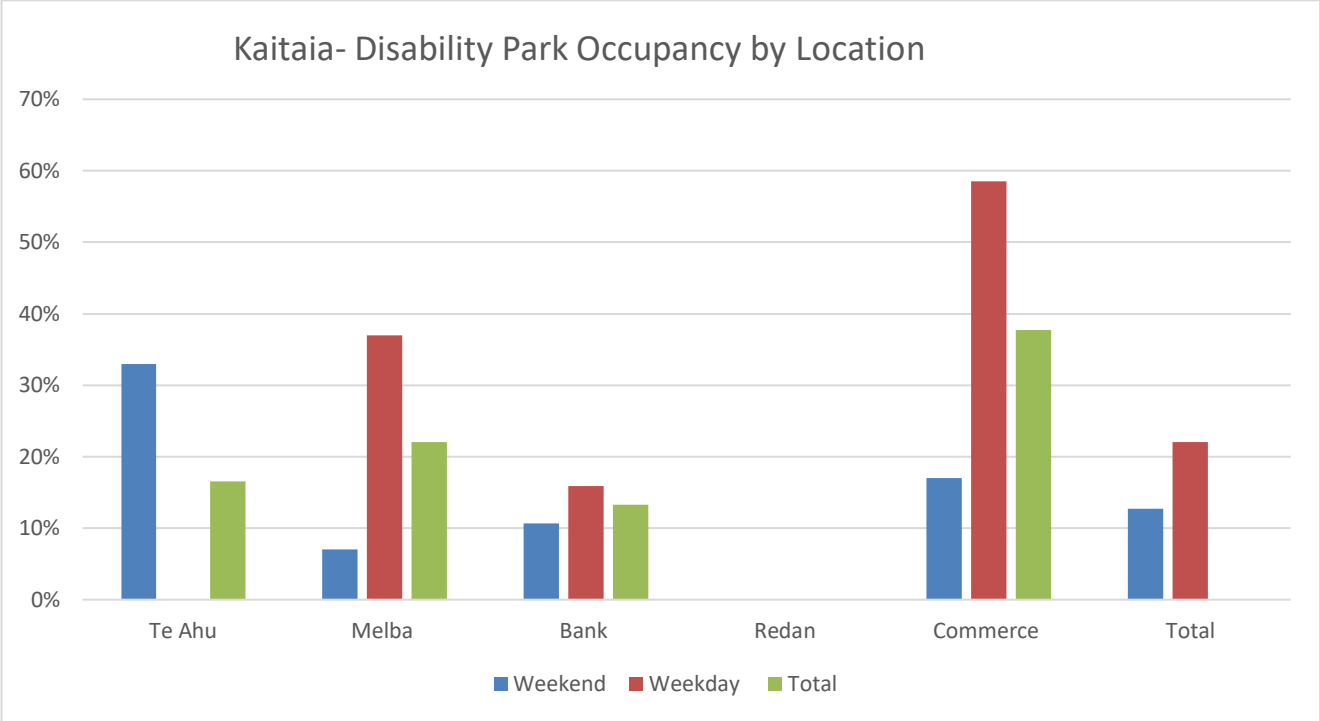


Figure 7- Kaitaia Disability Park Occupancy by Location



6.2.5 Summary

In summary, the study conducted on parking occupancy in the Kaitaia Town Centre reveals significant variations based on location, time of day, and type of parking surveyed with an overall average occupancy of 38%. Weekdays consistently exhibit higher demand for parking compared to weekends, with peak occupancy observed around 11 am.

Analysis by parking type shows that 60-minute time limit parks are most heavily utilized, followed by 120-minute time limit parks and those with no time limit. Among the surveyed locations, Melba Street stands out with the highest occupancy rate, while Redan Road and Allen Bell Drive show the lowest rates. Disability parking occupancy is generally low across all locations, with slightly higher rates on weekdays compared to weekends.

6.3 Kaikohe Results

6.3.1 Overall Parking Occupancy

The results show that the overall parking occupancy for the Kaikohe Town Centre is 37%, however parking occupancy is higher on weekdays (46%) compared to weekends (28%).

The peak average occupancy rate on weekdays occurs at 1pm at 63% and 11am on weekends at 48.73%. **Figure 8** and **Figure 9** illustrate the total average parking occupancy categorized by day type (weekday vs. weekend) and time of day, respectively.

Figure 8- Kaikohe Overall Parking Occupancy

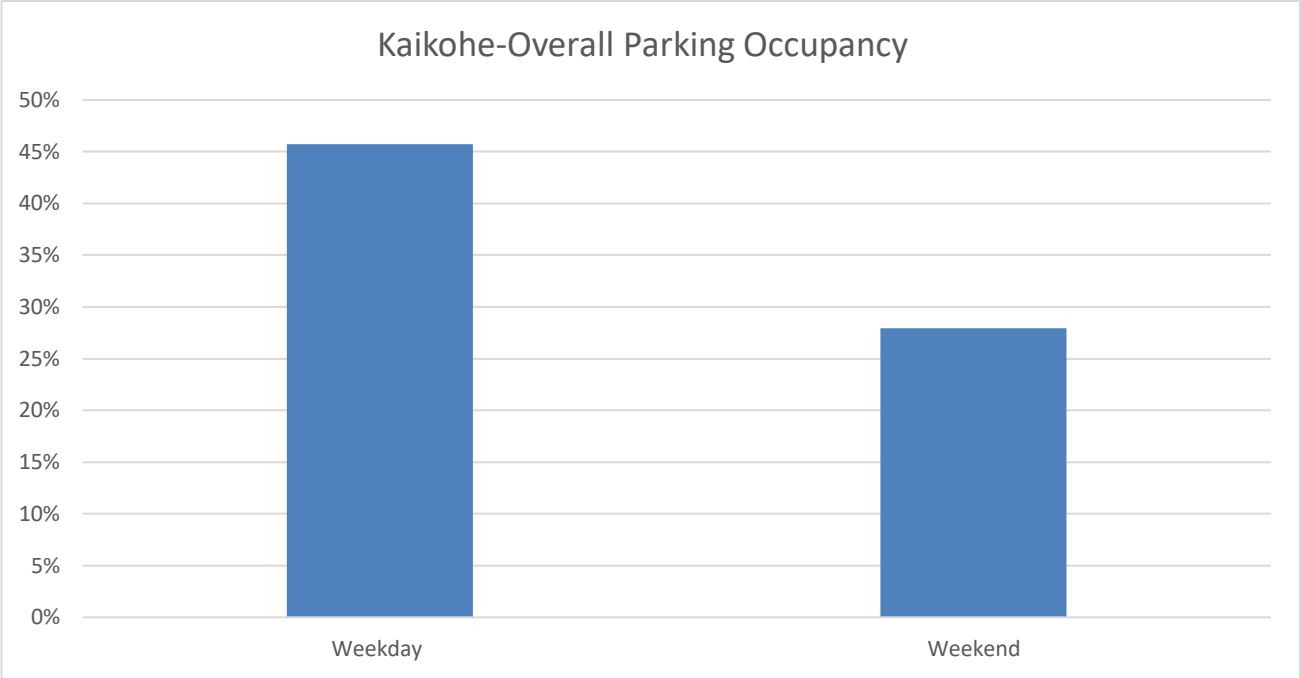
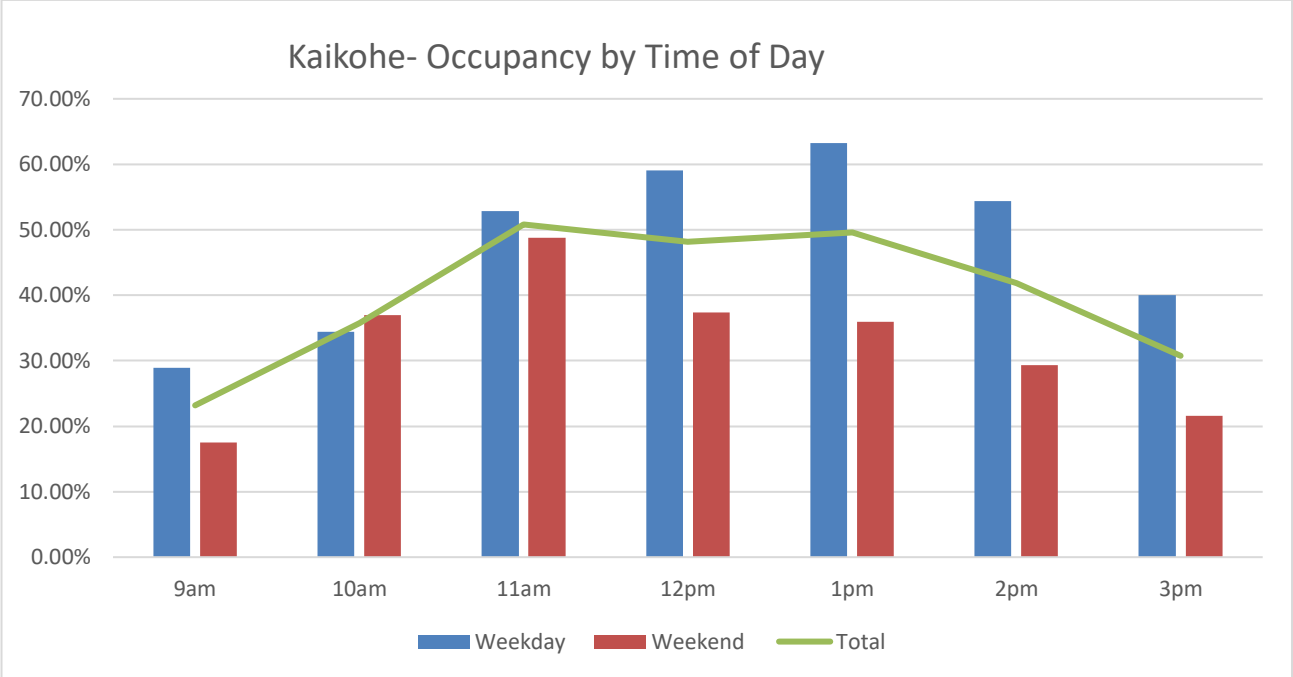


Figure 9- Kaikohe Parking Occupancy by Time of Day

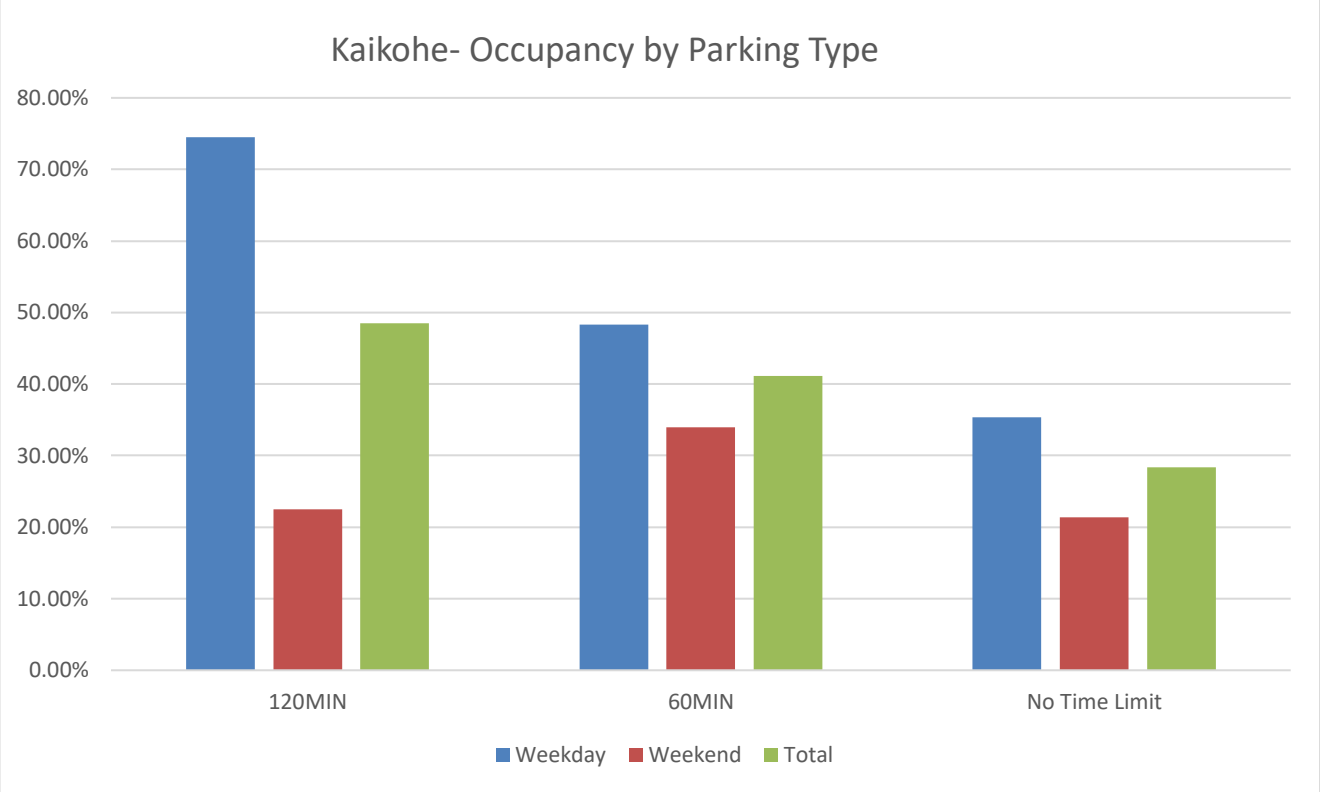


6.3.2 Parking Type Occupancy

The study found the 120-minute parking spaces exhibit the highest overall occupancy at 49% with the 60-minute parking spaces closely behind at 41% while the parking spaces with no time limit have the lowest overall occupancy at 28%.

These results also show Weekday occupancy rates are consistently higher across all types of parking spaces compared to weekends. 120-minute parking spaces experience the largest disparity between weekdays (74.50%) and weekends (22.50%), suggesting a significant shift in parking behaviour between the two periods. The difference in occupancy rates between weekdays and weekends is less pronounced for 60-minute and "No Time Limit" parking spaces. **Figure 10** shows the average parking occupancy across these parking types.

Figure 10- Kaikohe Parking Occupancy by Parking Type



6.3.3 Parking Occupancy by Location

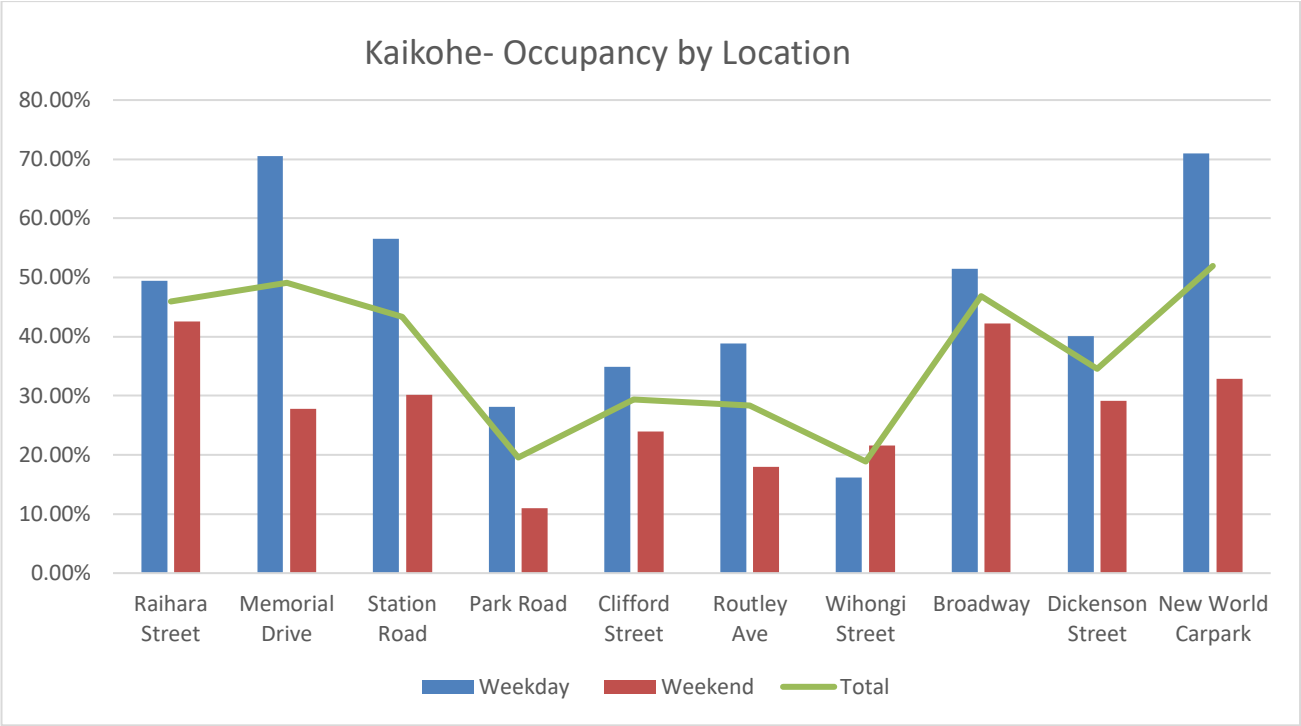
Parking occupancy was assessed across ten locations within the Kaikohe Town Centre. These are:

- Raihara Street
- Memorial Drive
- Station Road
- Park Road
- Clifford Street
- Routley Ave
- Wihongi Street
- Broadway
- Dickenson Street
- New World Carpark

The New World Carpark has the highest overall occupancy at 51.95%, making it one of the busiest parking locations, while Memorial Drive, Broadway and Raihara Steet follow closely behind. Weekends see lower occupancy rates across most locations, with the highest weekend occupancy observed at New World Carpark (32.89%).

For a comprehensive overview of the average occupancy rates at each location, refer to **Figure 11.**

Figure 11- Kaikohe Parking Occupancy by Location Surveyed



6.3.4 Disability Parking Occupancy

Disability carparks were included in the study conducted in Kaikohe, with five of the surveyed locations featuring them. Across all these sites, the parking occupancy for disability carparks was consistently low, ranging from 3.57% to 16.95%.

This low occupancy suggests that there may be available parking spaces specifically designated for individuals with disabilities throughout Kaikohe.

Figures 12 and 13 show an overview of disability parking occupancy in Kaikohe.

Figure 12- Kaikohe Disability Parking Occupancy

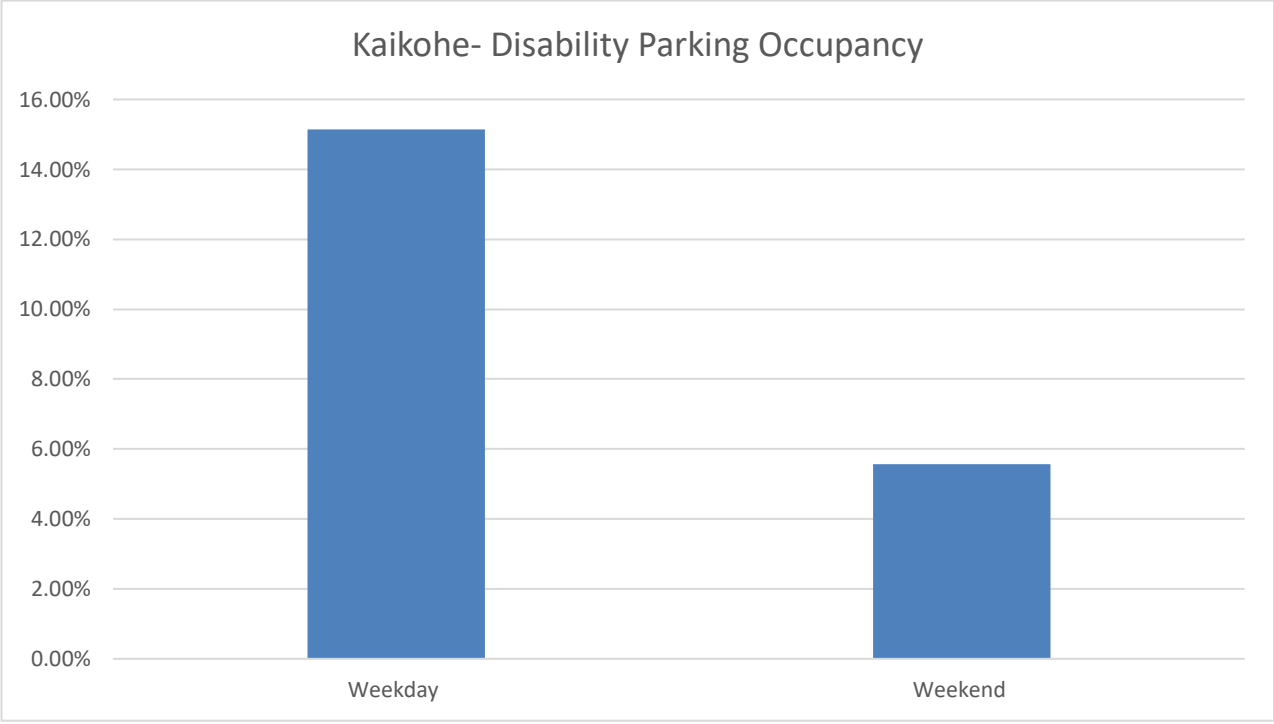
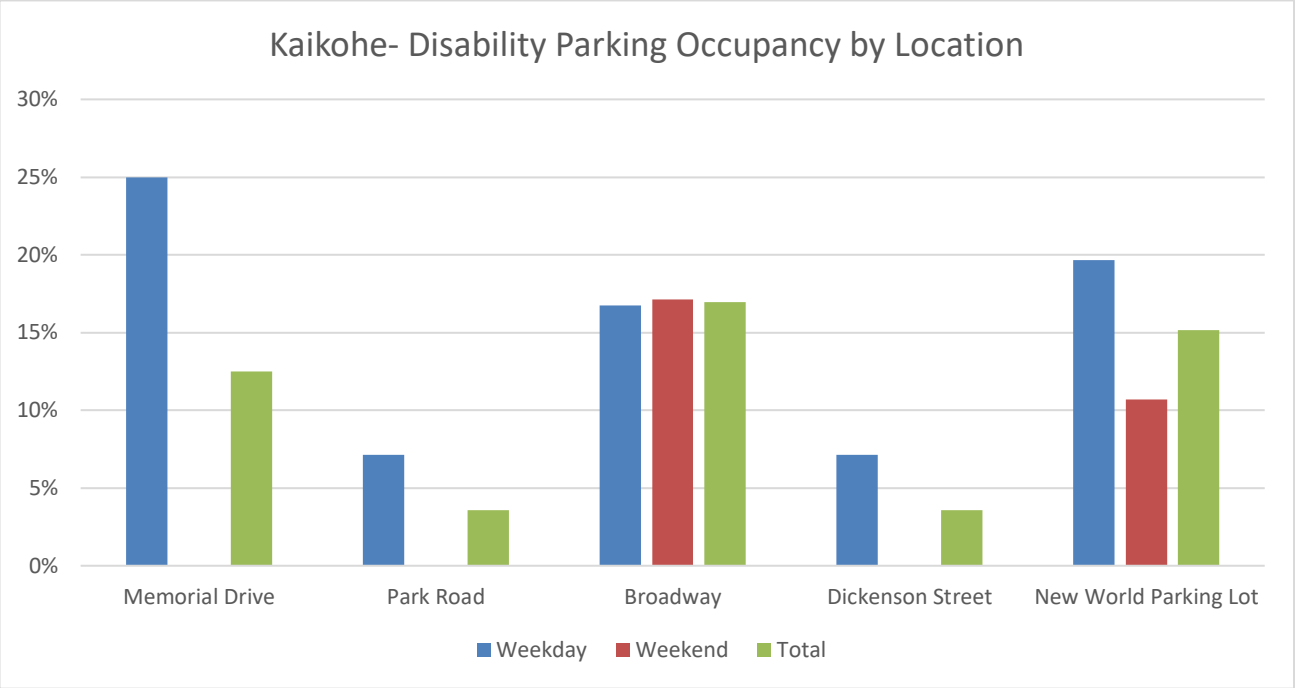


Figure 13- Kaikohe Disability Parking Occupancy by Location



6.3.5 Summary

The analysis of parking occupancy in Kaikohe Town Centre revealed an overall low occupancy rate of 37%, with higher rates observed on weekdays (46%) compared to weekends (28%). Peak occupancy on weekdays occurs at 1pm (63%), while on weekends, it peaks at 11am (48.73%).

Parking rates vary across different parking spaces and locations across the Kaikohe Town Centre. Additionally, disability carparks had consistently low occupancy rates ranging from 3.57% to 16.95%, indicating available designated spaces for individuals with disabilities throughout Kaikohe.

6.4 Kerikeri Results

6.4.1 Overall Parking Occupancy

The results show that the overall parking occupancy for Kerikeri is 54%, however parking occupancy is significantly higher on weekdays (70%) compared to weekends (38%). This discrepancy suggests a distinct pattern in parking demand influenced by factors such as commuter traffic and business activities that predominantly occur during the weekdays.

The peak average occupancy rate was recorded at 1pm at 61%. This peak aligns with the typical lunch hour for many businesses and institutions, where people often take breaks and go out to eat or run errands. It's common for occupancy rates to peak around midday as people are active and moving around during their lunch breaks. **Figure 14** and **Figure 15** illustrate the total average parking occupancy categorized by day type (weekday vs. weekend) and time of day, respectively.

Figure 14- Kerikeri Overall Parking Occupancy

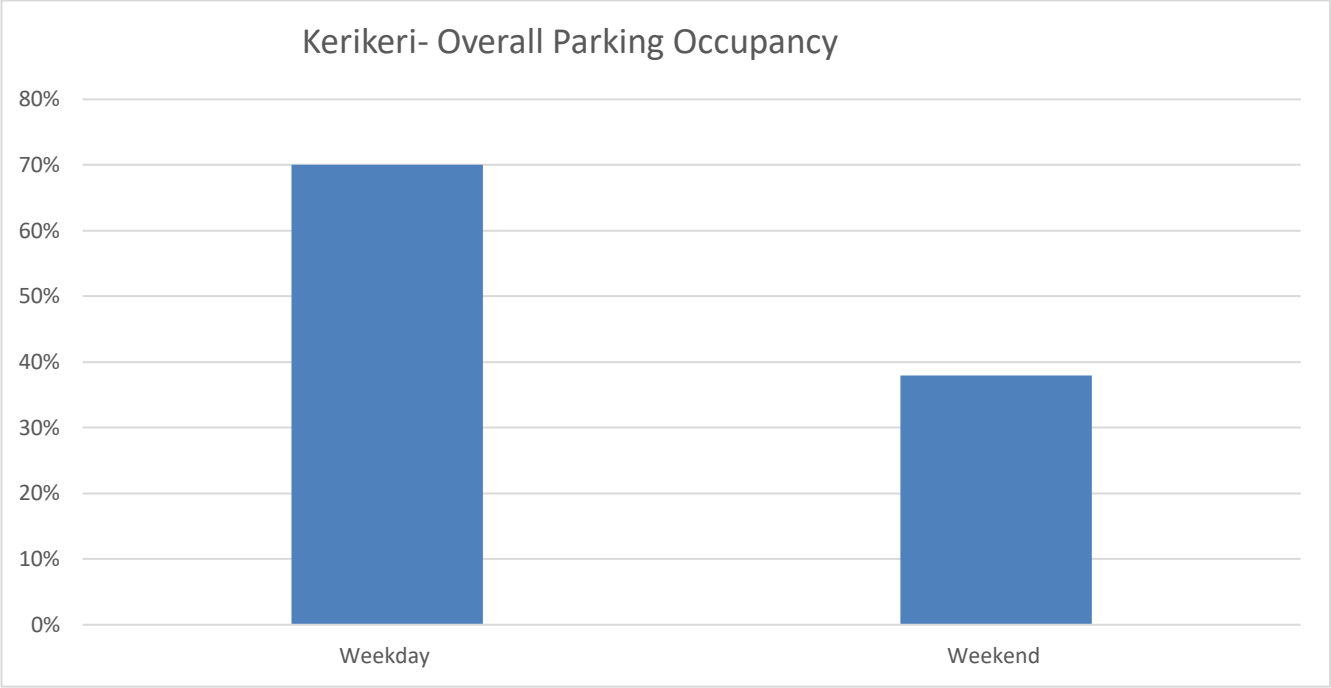
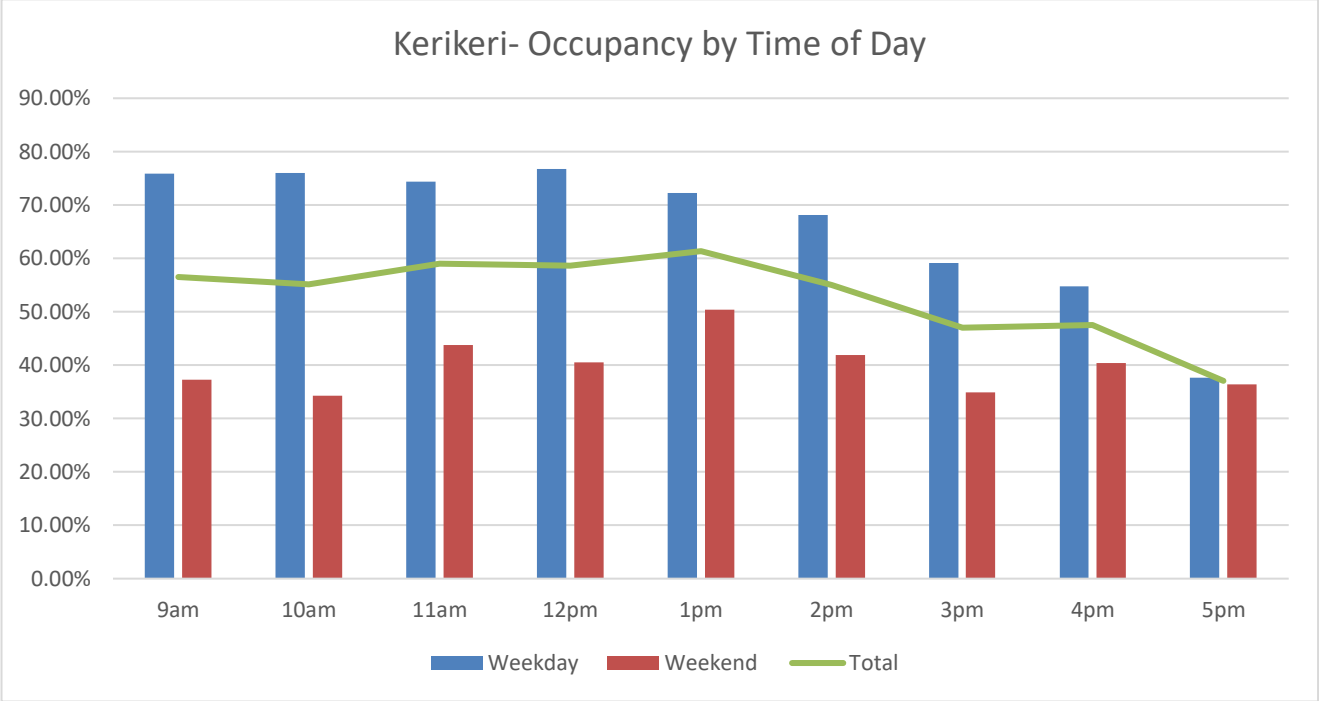


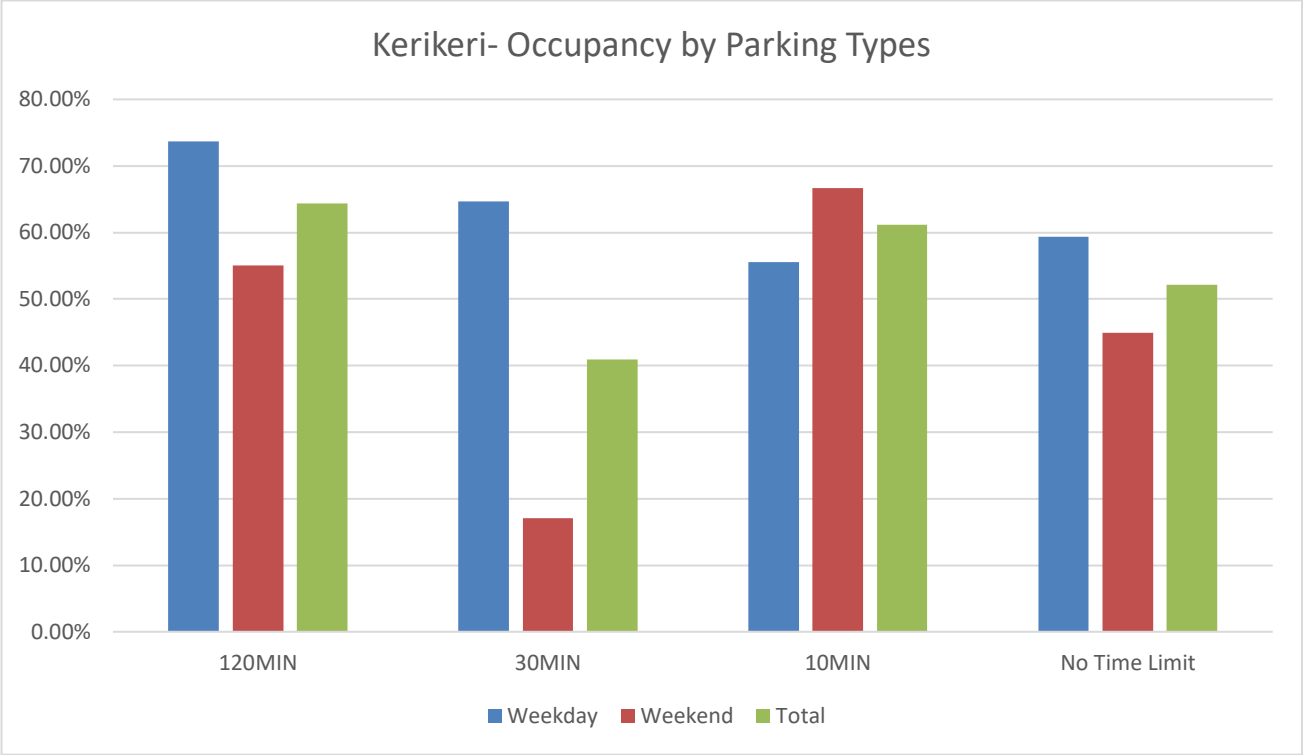
Figure 15- Kerikeri Parking Occupancy by Time of Day



6.4.2 Parking Type Occupancy

This study surveyed four distinct types of parking spaces: those with a 10-minute time limit, those with a 30-minute time limit, those with a 120-minute time limit, and those without any time restrictions. Results indicate that 120-minute parking spaces and 10-minute parking spaces exhibited the highest occupancy rate, reaching 64% and 61%, while both 30-minute and unrestricted parking spaces showed similar overall occupancy rates of 41% and 52%, respectively. **Figure 16** shows the average parking occupancy across these parking types.

Figure 16- Kerikeri Parking Occupancy by Parking Type



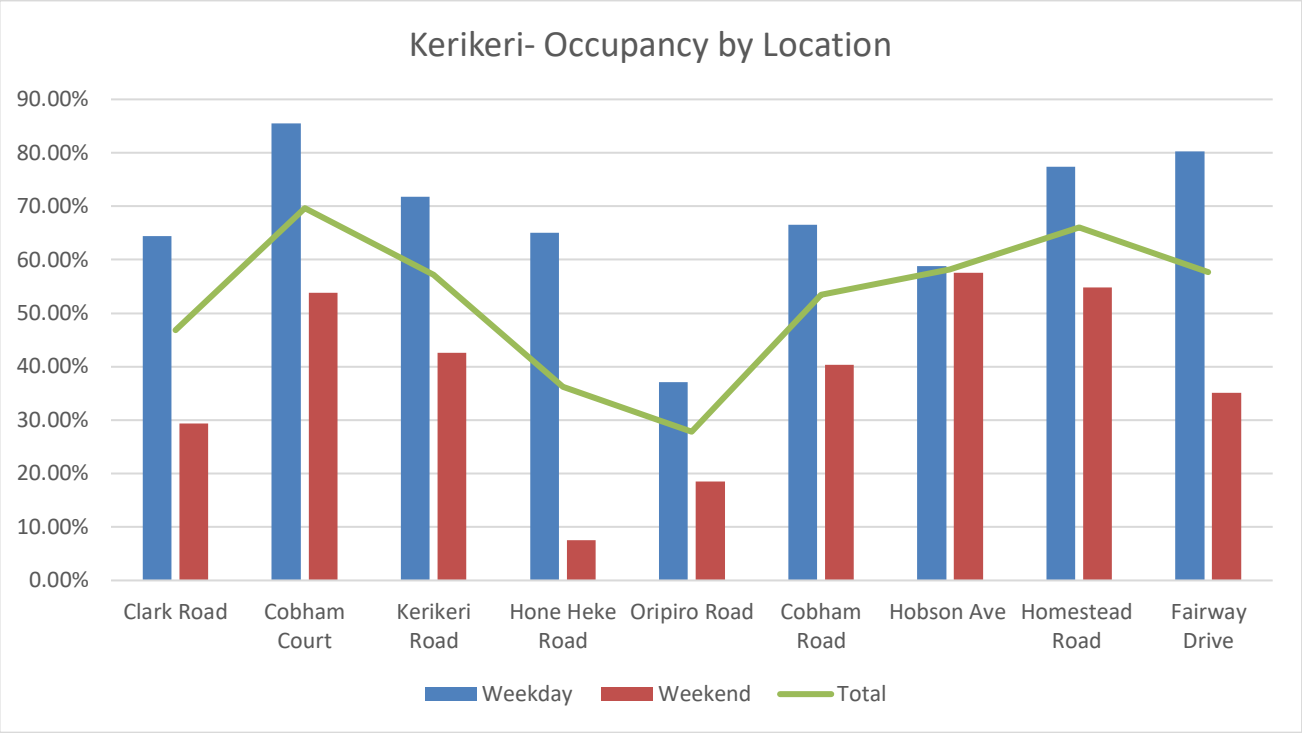
6.4.3 Parking Occupancy by Location

Parking occupancy was assessed across nine locations within the Kerikeri Town Centre. These are:

- Clark Road
- Cobham Court
- Kerikeri Road
- Hone Heke Road
- Oripiro Road
- Cobham Road
- Hobson Ave
- Homestead Road
- Fairway Drive

The study revealed a wide range of occupancy rates across these sites, ranging from 85% on weekdays at Cobham Court to as low as 29% on Weekends at Clark Road. For a comprehensive overview of the average occupancy rates at each location, refer to **Figure 17**.

Figure 17- Kerikeri Parking Occupancy by Location



6.4.4 Disability Parking Occupancy

Out of the locations surveyed, 4 of them included disability parking:

- Kerikeri Road
- Hone Heke Road
- Cobham Road
- Homestead Road

The study found that overall occupancy of the disability parking is low. Disability parking occupancy is higher on weekdays at 27% compared to 13% on weekends. **Figure 18** shows the overall occupancy of disability parking in the Kerikeri Town Centre and **Figure 19** shows the occupancy of disability parks by location.

The higher occupancy of disability parking on weekdays compared to weekends suggests that individuals with disabilities may have greater need for accessible parking during typical business days, likely due to increased activity in the town centre related to work, shopping, or appointments. However, the overall low occupancy rates indicate that there may be sufficient availability of disability parking spaces in the area.

Figures 18 and 19 show an overview of disability parking occupancy in Kerikeri.

Figure 18- Kerikeri Disability Parking Occupancy

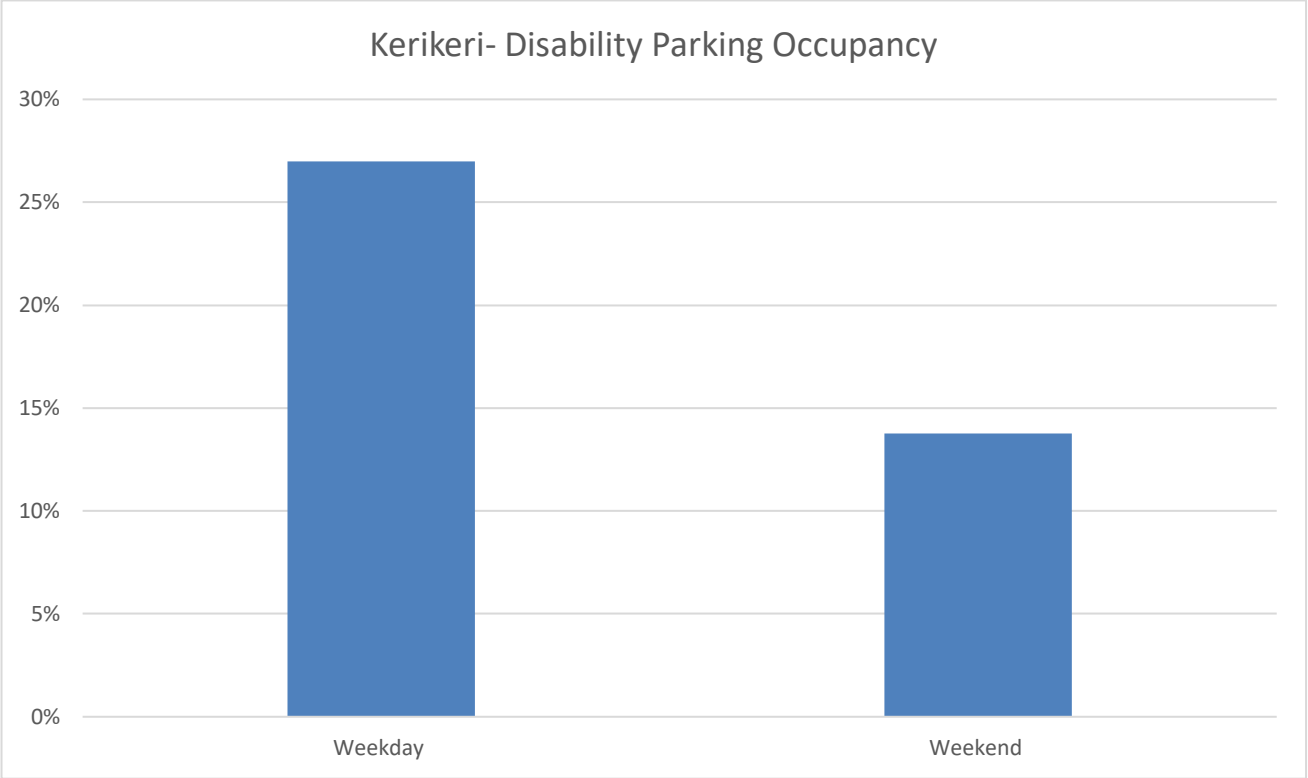
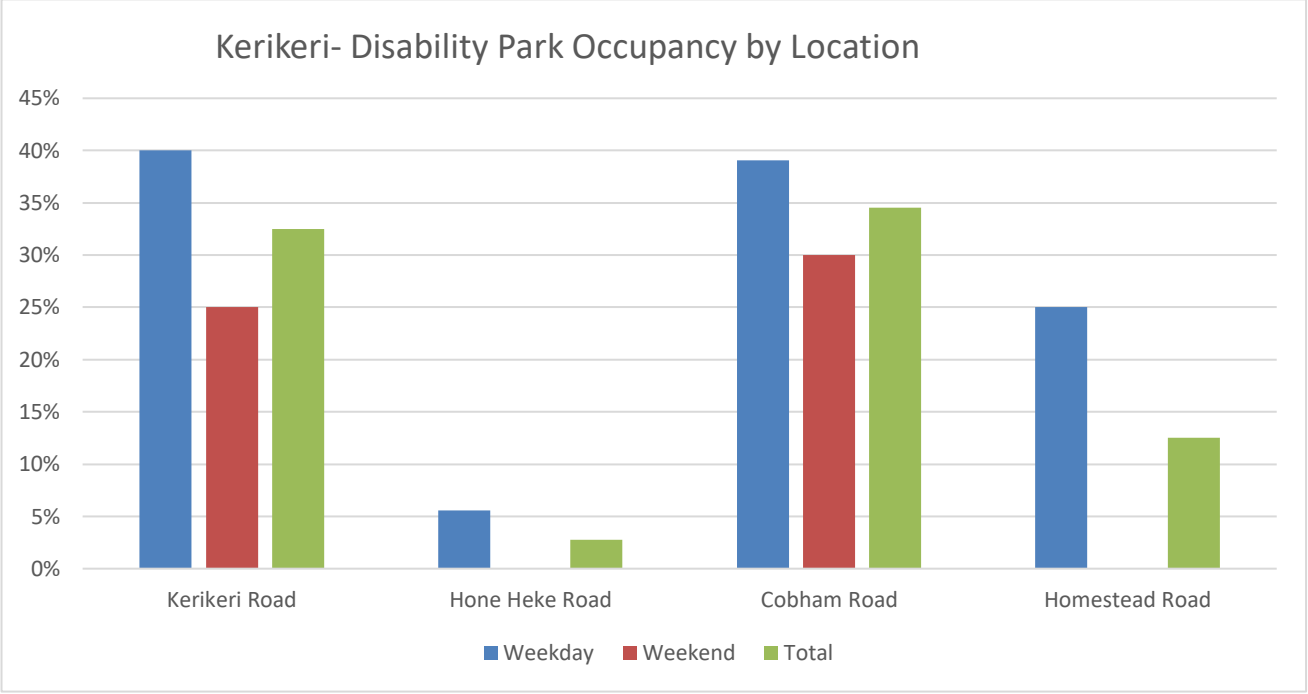


Figure 19- Kerikeri Disability Parking Occupancy by Location



6.4.5 Summary

In summary, the study on parking occupancy in Kerikeri Town Centre reveals discrepancies in parking demand based on location, time, and parking type, with an average occupancy of 54%.

Weekdays consistently show higher parking demand compared to weekends, peaking around 1pm. Time-limited parking spaces of 120 and 10 minutes have the highest occupancy rates (64% and 61% respectively), while 30-minute and unrestricted spaces have lower rates (41% and 52% respectively).

Assessment across nine locations indicates varied occupancy rates, ranging from 85% at Cobham Court on weekdays to 29% at Clark Road on weekends.

Disability parking occupancy is generally low but higher on weekdays (27%) compared to weekends (13%), suggesting greater need during business days. Overall low occupancy rates suggest sufficient availability of disability parking spaces.

6.5 Paihia Results

6.5.1 Overall Parking Occupancy

The data shows that the overall parking occupancy in Paihia is 51% on weekends and 48% on weekdays. This indicates a similar demand for parking on both weekends and weekdays.

Weekends experience higher peak demand during mid-morning hours, particularly at 11 am. While the parking occupancy on weekdays remains relatively high during midday hours (12 pm - 2 pm), indicating potential sustained demand from various sources such as businesses, offices, and tourists. Weekdays exhibit more stable parking demand patterns compared to weekends.

Figure 20 and **Figure 21** illustrate the total average parking occupancy categorized by day type (weekday vs. weekend) and time of day, respectively.

Figure 20- Paihia Overall Parking Occupancy

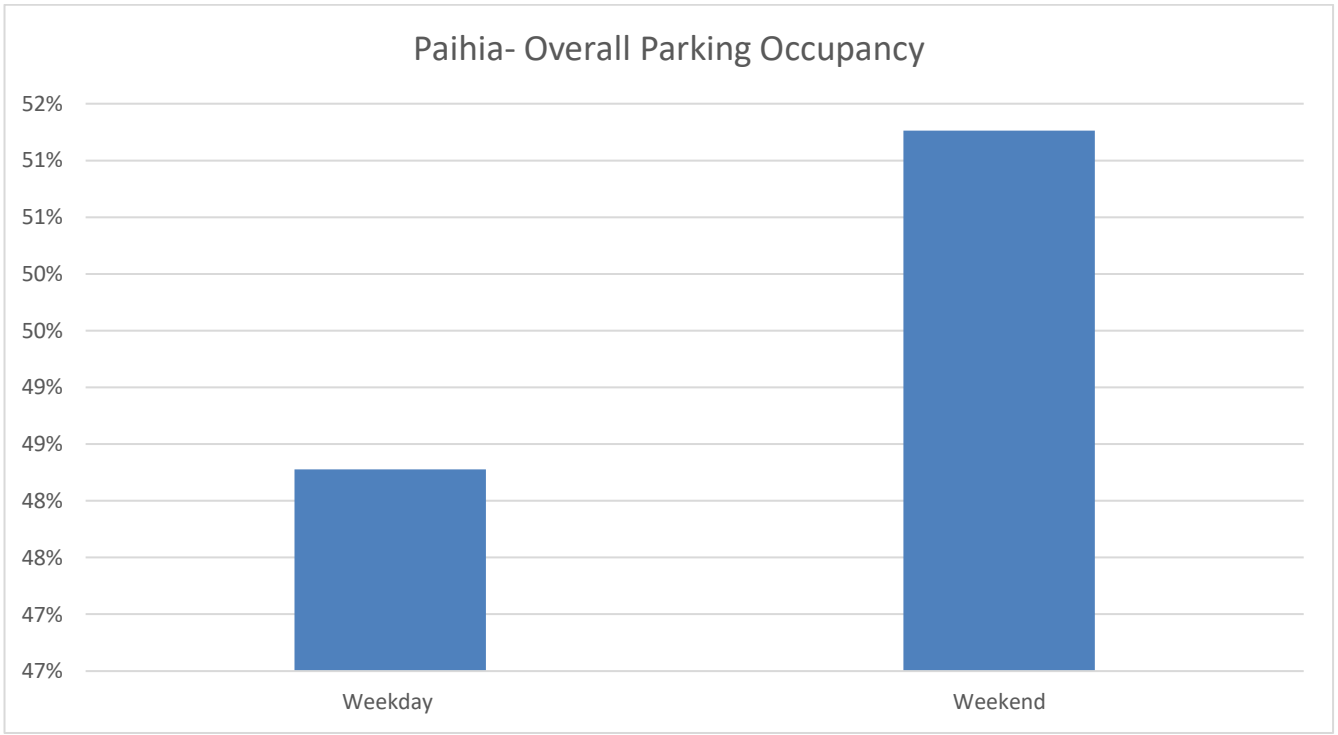
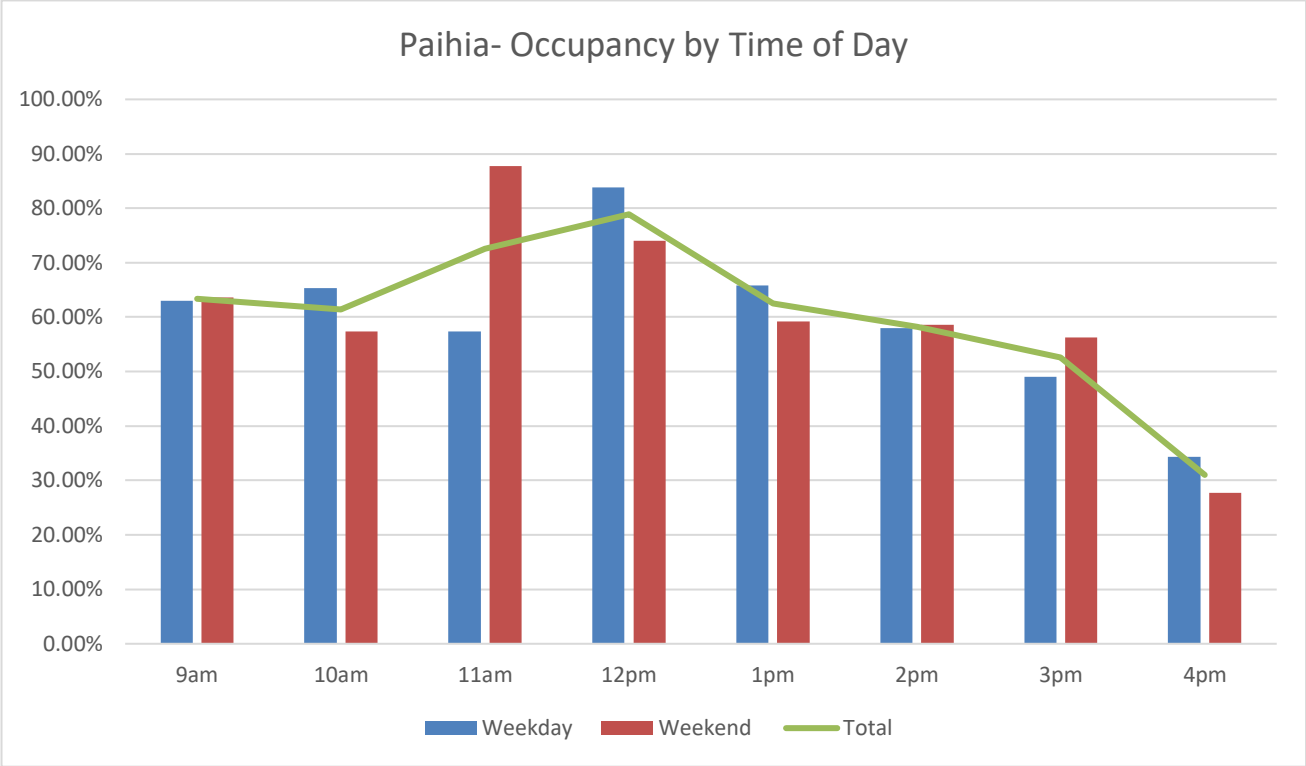


Figure 21- Paihia Parking Occupancy by Time of Day



6.5.2 Parking Type Occupancy

This study surveyed six distinct types of parking spaces:

- 30-minute time limit parks
- 60-minute time limit parks
- 120- minute time limit parks
- 240-minute time limit parks
- Parks with no time limit
- Paid carpark on Williams Road

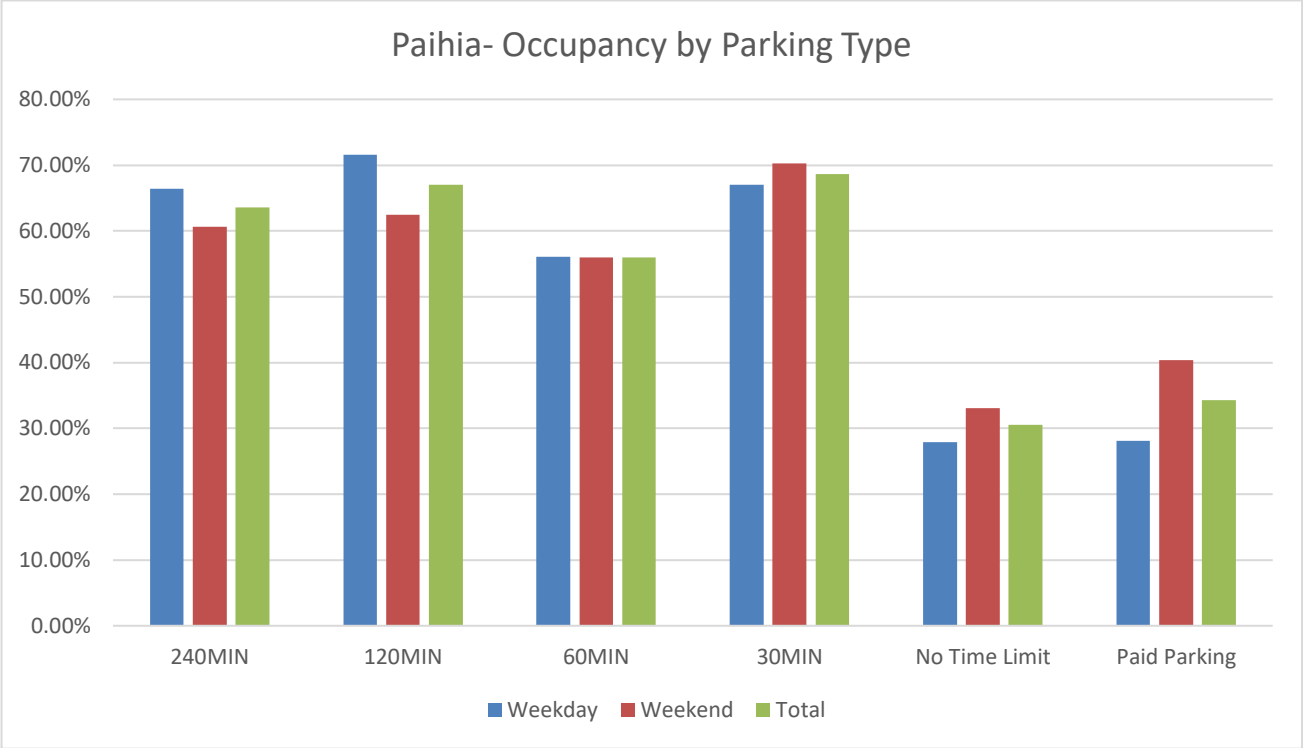
The data shows that overall, 30-minute parking spots have the highest utilization rate closely followed b 120-minute car parks. Generally, there's a higher utilization of longer parking durations on weekdays compared to weekend.

Paid parking spots have a significantly higher utilization rate on weekends compared to weekdays. No Time Limit parking spots also see increased utilization on weekends compared to weekdays, but the difference isn't as pronounced as with paid parking. Overall, there's a higher utilization rate for Paid Parking compared to No Time Limit parking spots.

In summary, this analysis provides insights into the utilization patterns of different parking types in Paihia. It seems that shorter duration parking spots are consistently utilized. Additionally, there's a notable difference in utilization patterns between weekdays and weekends, especially for paid parking spots. This information could be valuable for optimizing parking management strategies in Paihia to better accommodate visitors' needs.

Figure 22 shows the average parking occupancy across these parking types.

Figure 22- Paihia Parking Occupancy by Parking Type



6.5.3 Parking Occupancy by Location

Parking occupancy was assessed across seven locations within Paihia. These are:

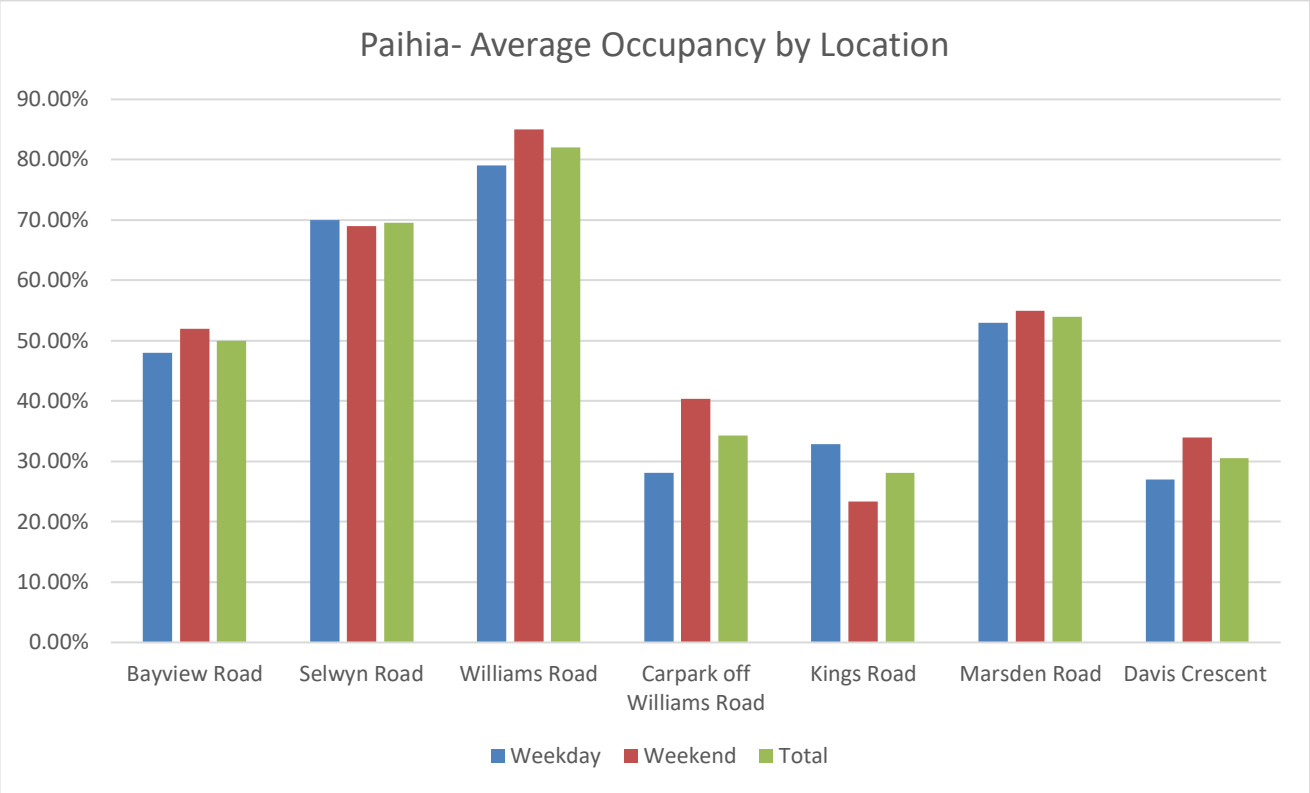
- Bayview Road
- Selwyn Road
- Williams Road
- Carpark off Williams Road
- Kings Road
- Marsden Road
- Davis Crescent

Williams Road has the highest occupancy rates across all periods, with Selwyn Road and Marsden Road also showing consistently high occupancy rates. Kings Road has the lowest occupancy rates among the listed locations.

Some locations, such as Williams Road and Marsden Road, see slight increases in occupancy on weekends compared to weekdays. However, locations like Kings Road experience decreased occupancy on weekends compared to weekdays.

In summary, this analysis highlights the variations in parking occupancy across different locations in Paihia. It's evident that certain areas, particularly Williams Road, Selwyn Road, and Marsden Road, experience higher demand for parking. For a comprehensive overview of the occupancy rates at each location, refer to **Figure 23**.

Figure 23- Paihia Occupancy by Location



6.5.4 Disability Parking Occupancy

Out of the locations surveyed in Paihia, 3 of them included disability parking:

- Selwyn Road
- Williams Road
- Carpark off Williams Road

The results show disability parking occupancy rates in Paihia are generally lower on weekends compared to weekdays, indicating a potential decrease in demand during weekends. Williams Road has the highest disability parking occupancy rates among the specified locations, with consistent utilization across weekdays, weekends, and the total period. The carpark off Williams Road has the lowest occupancy rates, indicating lower demand or availability of disability parking spots in this area.

Figures 24 and 25 show an overview of disability parking occupancy in Paihia.

Figure 24- Paihia Disability Parking Occupancy

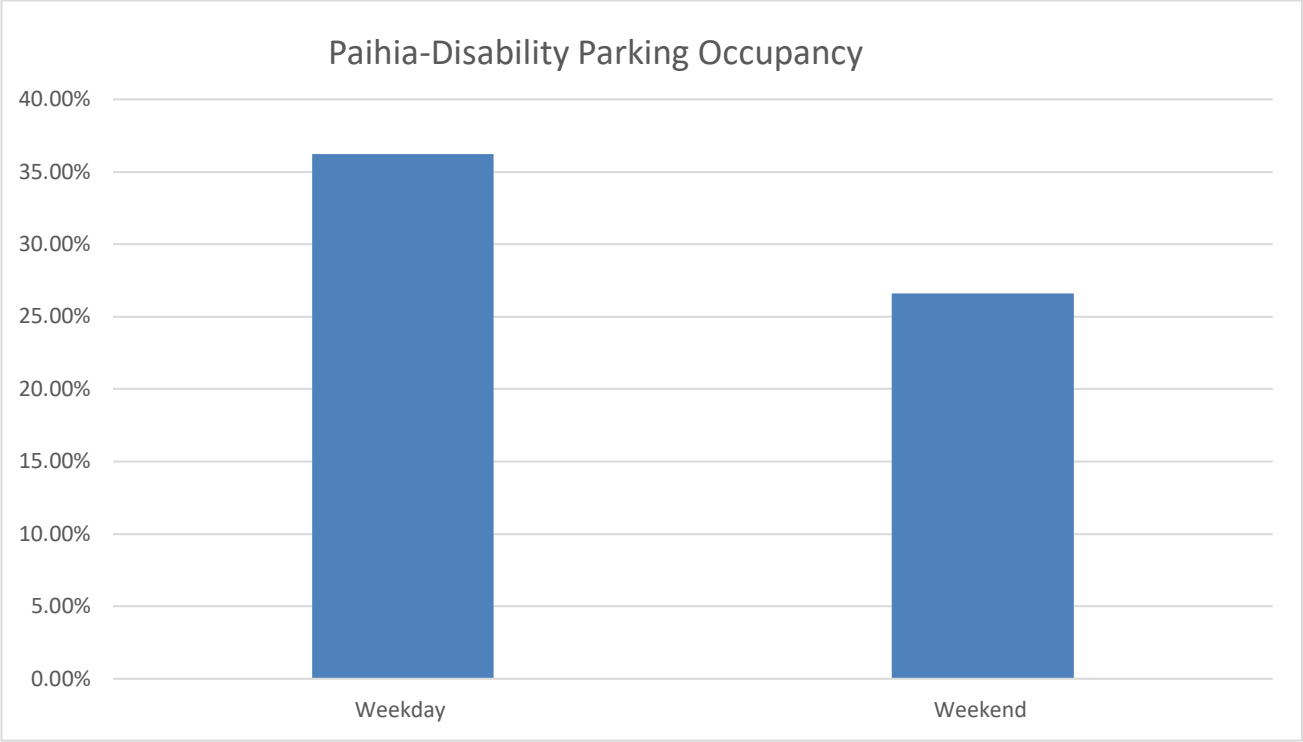
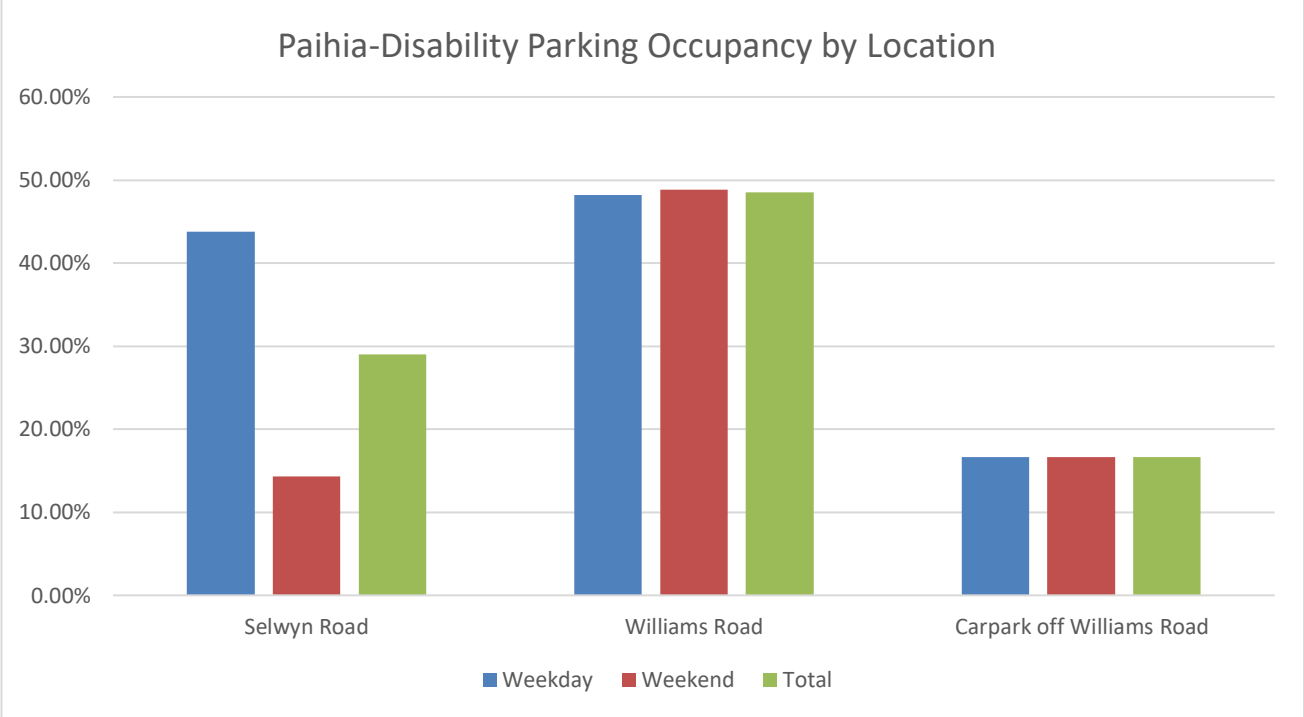


Figure 25- Paihia Disability Park Occupancy by Location



5.5.5 Summary

In summary, the parking analysis in Paihia reveals consistent demand across weekdays and weekends, with peak demand occurring on weekends during mid-morning hours. Shorter duration parking spots are consistently used, while longer durations see higher utilization on weekdays. Paid parking spots are significantly busier on weekends. Location-wise, Williams Road consistently experiences high occupancy rates. Understanding these patterns can

inform tailored management strategies to alleviate congestion, enhance accessibility, and improve visitor satisfaction in Paihia.

6.6 Kawakawa Results

6.6.1 Overall Parking Occupancy

The parking study in Kawakawa indicates notable differences in parking occupancy between weekdays and weekends, as well as variations throughout the day. On weekdays, the parking occupancy is higher at 65%, compared to 43% on weekends. The total average parking occupancy is calculated at 54%.

These findings suggest that weekdays generally have higher parking demand compared to weekends, with peak demand occurring during midday hours. Additionally, there's a substantial decrease in parking occupancy during evening hours, especially pronounced on weekends.

Figure 26 and **Figure 27** illustrate the total average parking occupancy categorized by day type (weekday vs. weekend) and time of day, respectively.

Figure 26- Kawakawa Overall Parking Occupancy

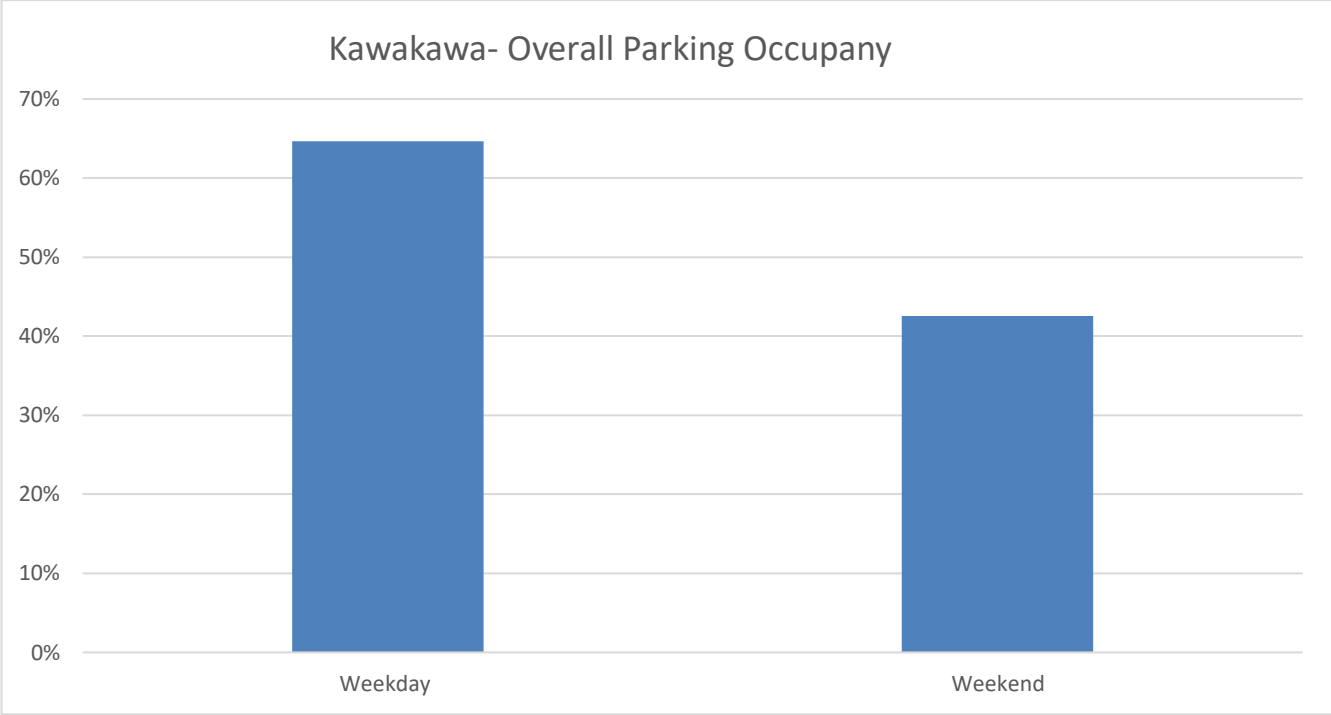
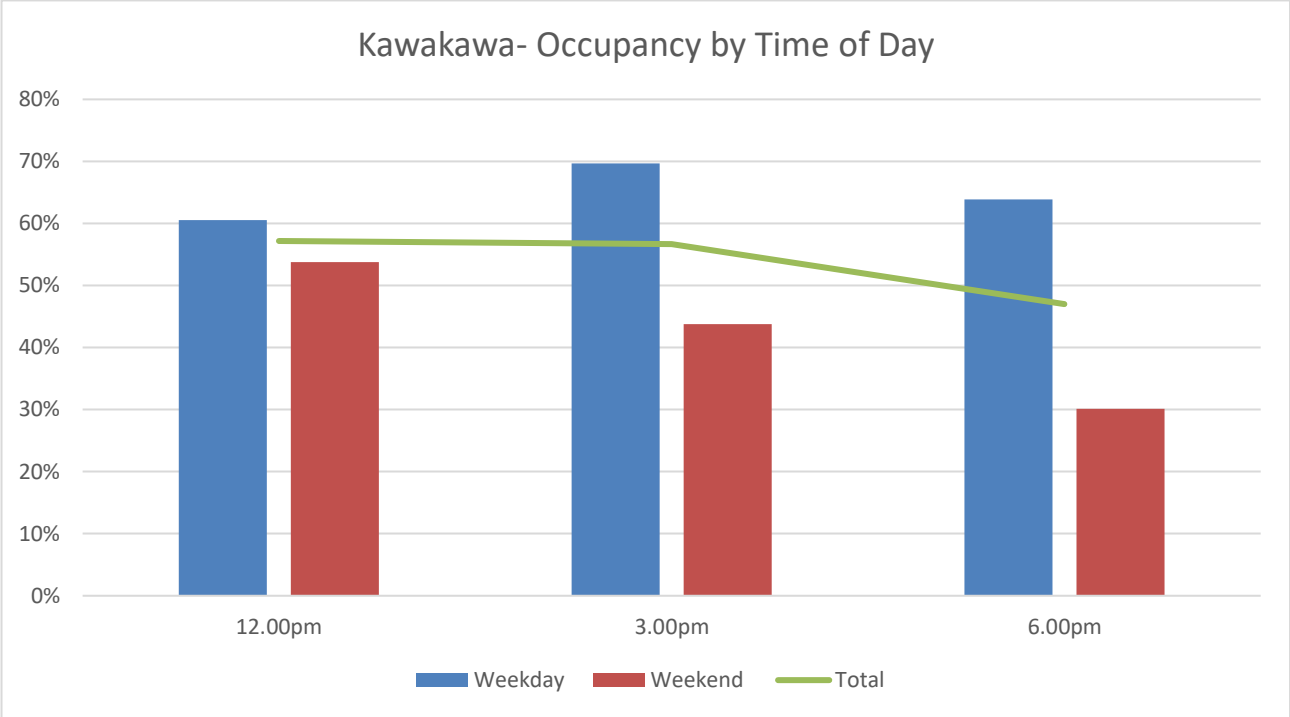


Figure 27- Kawakawa Parking Occupancy by Time of Day



6.6.2 Parking Type Occupancy

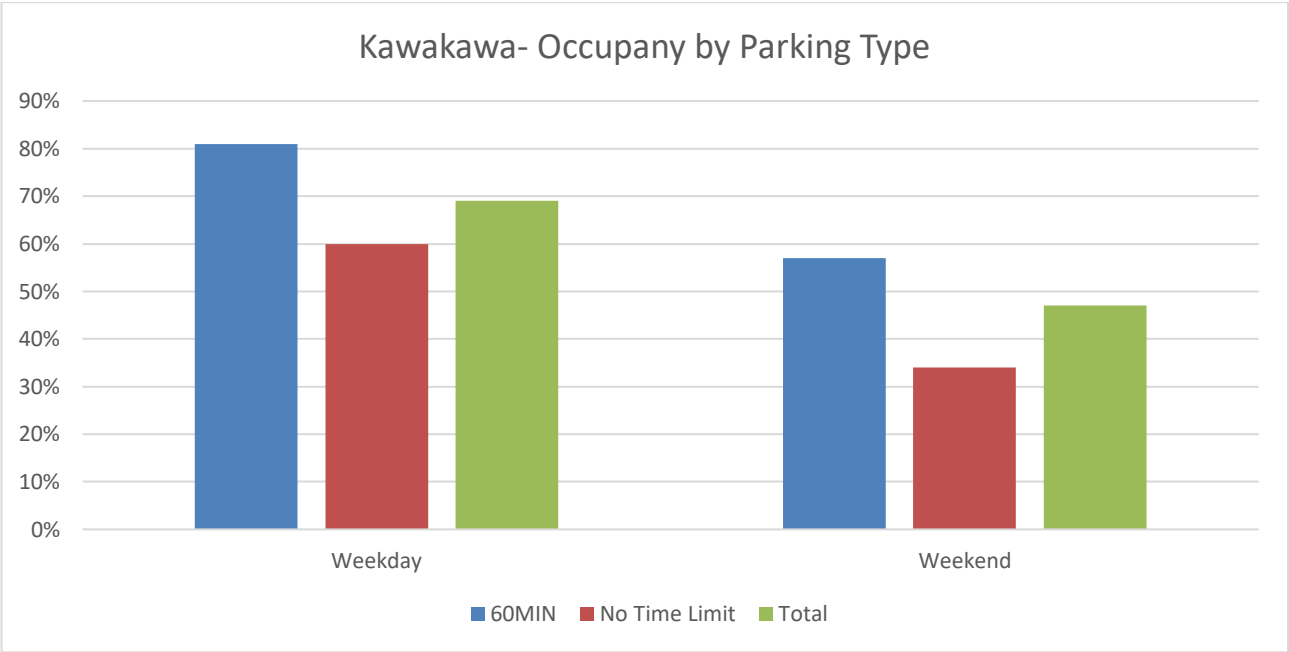
The study included two different types of parking spaces in Kawakawa:

- 60-minute time limit parking spaces
- Parking spaces with no time limit

The data shows significant differences in parking utilization between weekdays and weekends across the two parking types. The 60-minute parking spaces in Kawakawa exhibit significantly higher occupancy rates compared to those with no time limit.

Figure 28 outlines the average parking occupancy across these parking types.

Figure 28- Kawakawa Parking Occupancy by Parking Type



6.6.3 Parking Occupancy by Location

Parking occupancy was assessed across two locations within Kawakawa. These are:

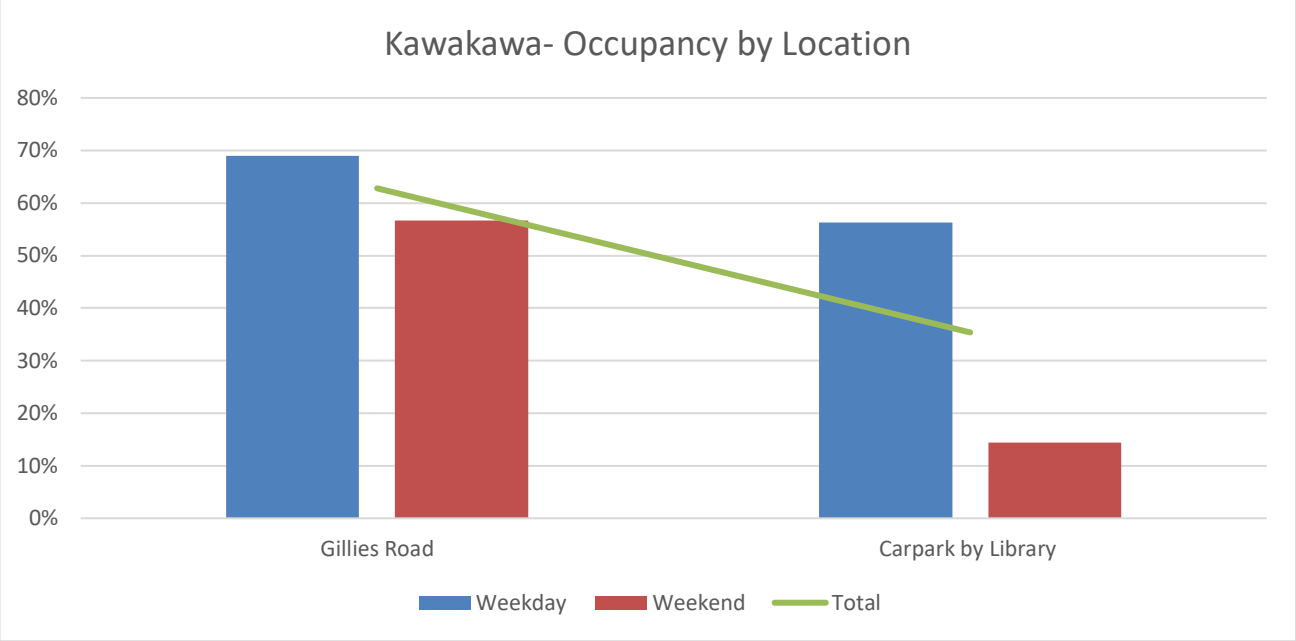
- Gillies Road

- Carpark by Library

Gillies Road experiences relatively consistent parking demand throughout the week, with slightly lower utilization on weekends. In contrast, the carpark by the library experiences a substantial decrease in demand during weekends, indicating that it may primarily serve weekday visitors or residents.

For a comprehensive overview of the occupancy rates at each location, refer to **Figure 29**.

Figure 29- Kawakaw Parking Occupancy by Location



6.6.4 Disability Parking Occupancy

Both locations surveyed in Kawakawa include disability parking spaces.

The findings indicate that disability parking occupancy rates in Kawakawa are notably higher during weekdays compared to weekends, with Gillies Road experiencing a substantial peak occupancy rate of 75% on weekdays.

Figures 30 and 31 show an overview of disability parking occupancy in Kawakawa.

Figure 30- Kawakawa Disability Parking Occupancy

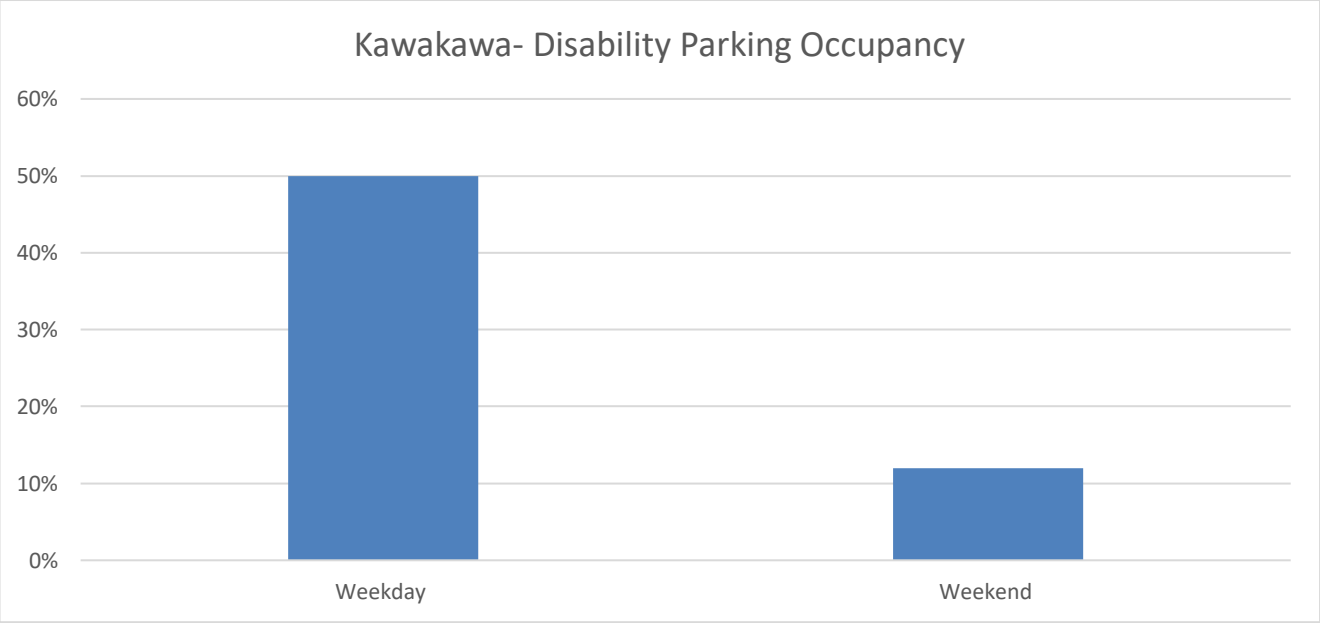
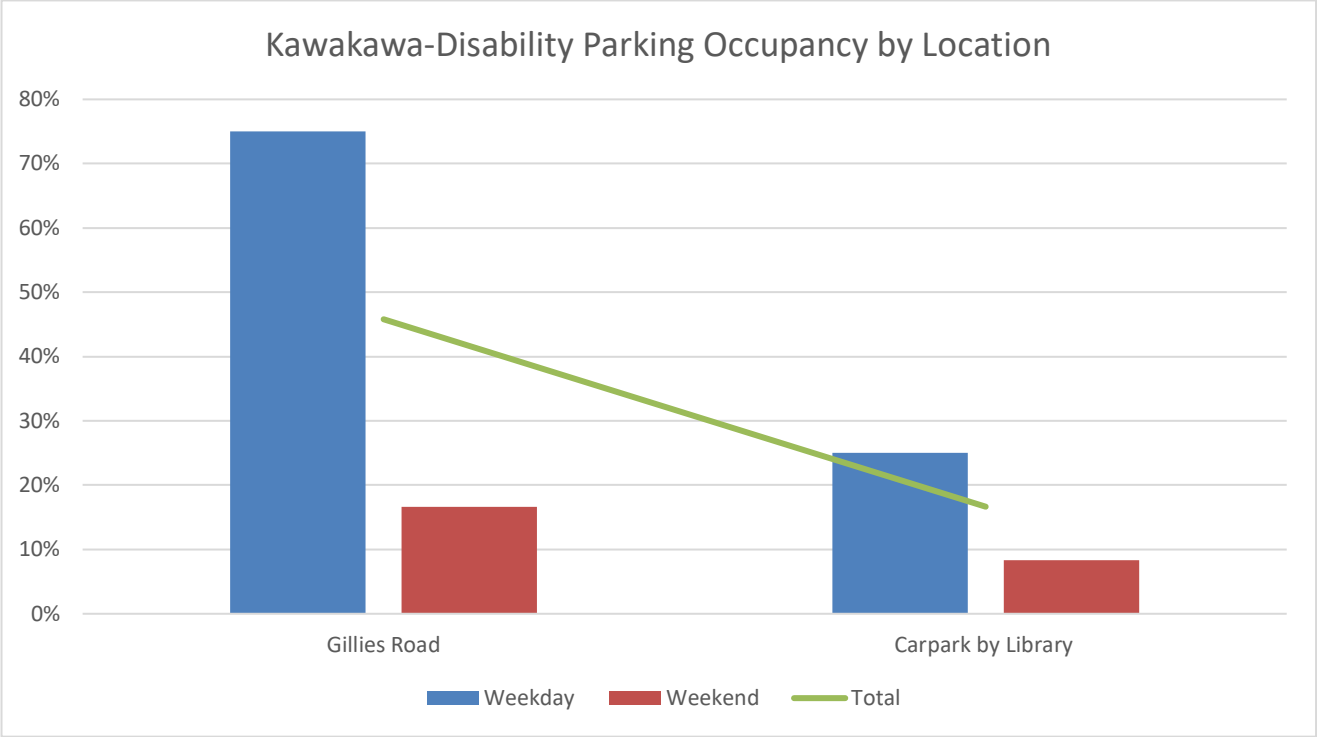


Figure 31- Kawakawa Disability Parking Occupancy by Location



6.6.5 Summary

The parking study conducted in Kawakawa reveals a difference in parking occupancy patterns between weekdays and weekends, as well as variations throughout the day. Weekdays consistently exhibit higher parking demand compared to weekends, with peak occupancy observed during midday hours. Moreover, there is a noticeable decline in parking occupancy during evening hours, particularly pronounced on weekends. Furthermore, disability parking occupancy rates are notably higher during weekdays, with Gillies Road showing a significant peak occupancy rate during these days. These findings highlight the importance of tailored parking management strategies to accommodate varying demand patterns across different days, times, and locations within Kawakawa.

6.7 Mangonui Results

6.7.1 Overall Parking Occupancy

All parking spaces surveyed in the Mangonui Area were unrestricted by time limits and situated in the main area of town. Consequently, the primary results collected pertain to the overall average occupancy categorized by day and time of day.

The results indicate that Mangonui's parking occupancy stands at 42% on average, with a split of 46% on weekdays and 42% on weekends. Peak occupancy occurs at 12pm, reaching 48%, compared to 33% at 9am and 45% at 3pm. **Figures 32 and 33** depict the average parking occupancy, segmented by day type (weekday versus weekend) and time of day.

Figure 32- Mangonui Overall Parking Occupancy

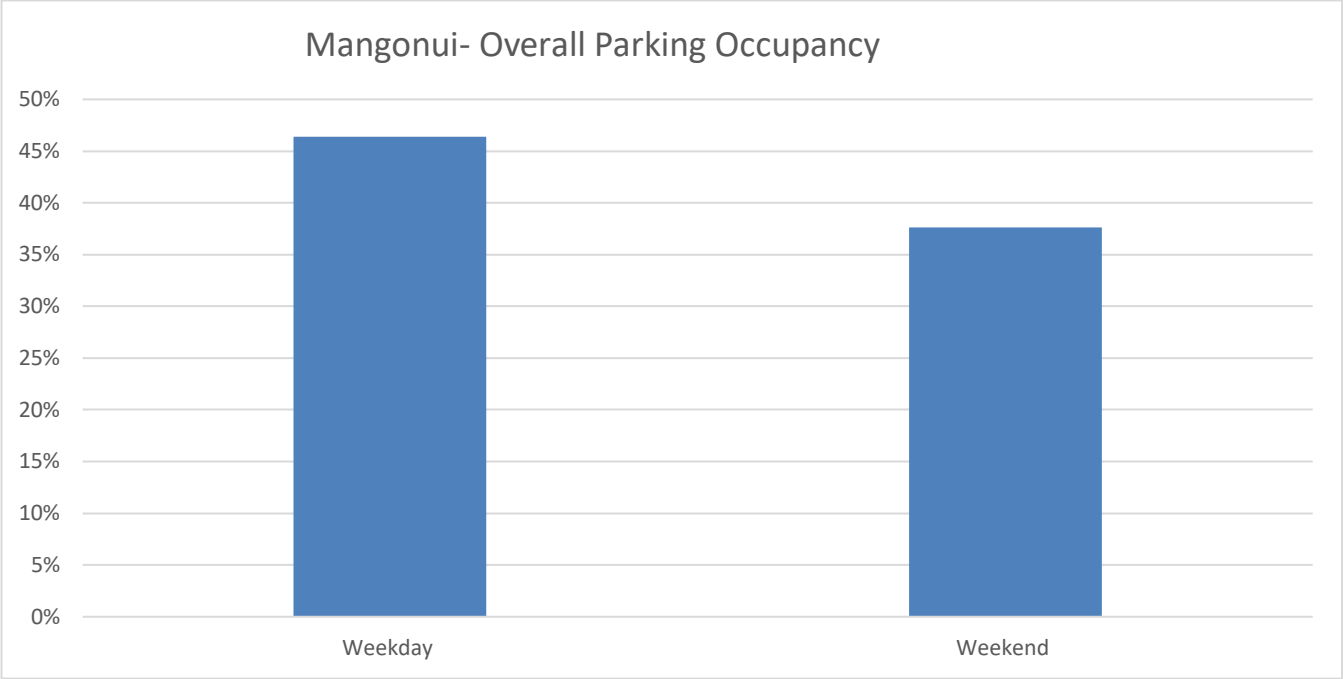
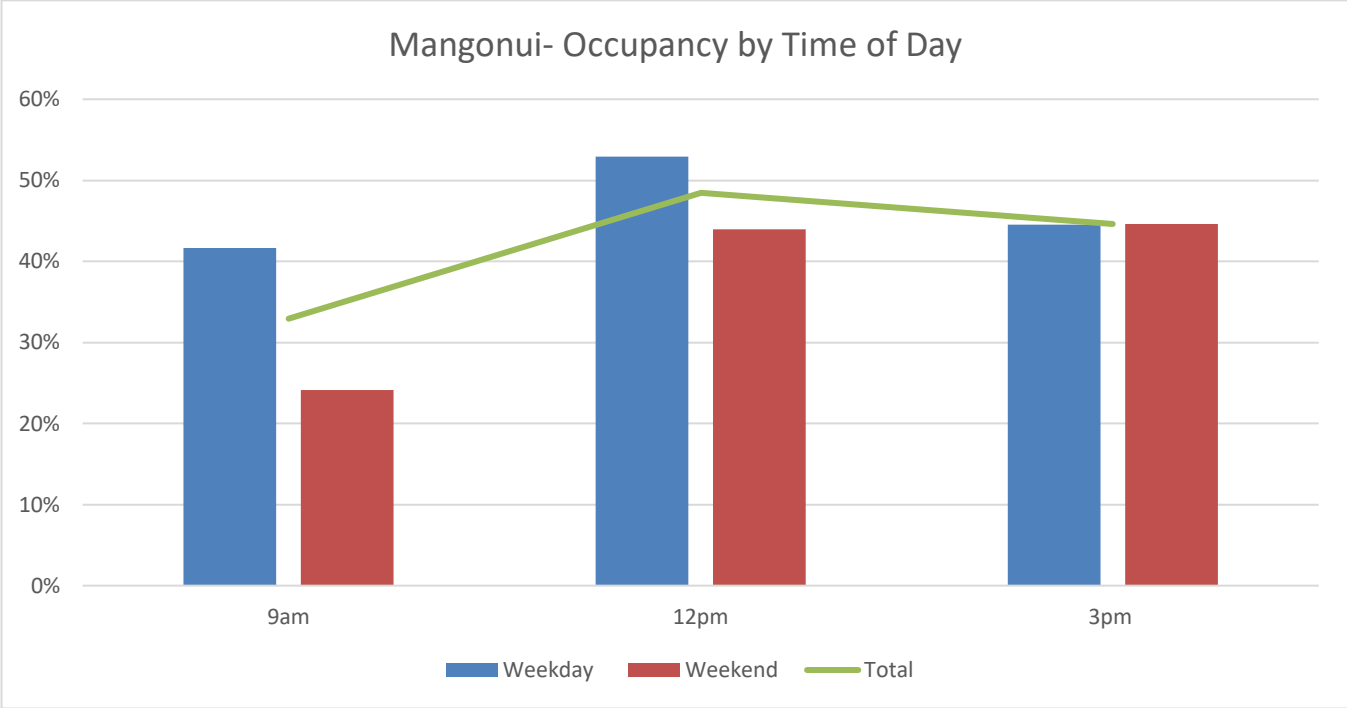


Figure 33- Mangonui Parking Occupancy by Time of Day



6.7.2 Disability Parking Occupancy

Among the parking spaces surveyed in the Mangonui Area, three were designated for disability parking. Throughout the entire survey period, there were no observed instances of vehicles parking in any of these spaces. Consequently, the overall occupancy rate for disability parking in the Mangonui Area is 0%.

6.7.3 Summary

In the Mangonui Area, all parking spaces were without time restrictions and centrally located in the town's main area. The overall parking occupancy is 46% on weekdays and 42% on weekends with a peak occupancy in the middle of the day at 12pm. During the survey there were no observed instances of vehicles parking in any of the disability parking spaces.

Overall, the data suggests that while parking demand fluctuates between weekdays and weekends, there is a consistent need for efficient management of parking resources, especially during peak hours.

7. Conclusion

The parking occupancy analysis across the district's urban areas reveals varied results across the district. The results are influenced by factors such as weekdays versus weekends, peak hours, and location-specific demand. Kaitaia, Kaikohe, Kerikeri, Paihia, and Kawakawa all exhibit varying levels of parking demand. While Paihia exhibits consistent demand throughout the week. This illustrates that each urban area has different parking needs and availability.

This study underscores the necessity of a comprehensive parking strategy aligned with the Integrated Transport Plan's vision for a safer, more accessible transport system.

Building Services Engineering
22 degrees

7566 – Kaikohe Library

DESIGN FEATURES REPORT

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CONTENTS

INTRODUCTION

22 Degrees Ltd has been engaged by Eclipse Architecture to provide engineering design for the building services for the development of Kaikohe Library.

This report is to cover the proposed services and provide a scope of works for the project and to highlight important design considerations for future discussion.

This report shall be read in conjunction with our Preliminary design drawings.

BUILDING OVERVIEW

The proposed development will involve the demolition and removal of existing commercial structures to allow the construction of a single level library.

REPORTING CONDITIONS

The building services proposed for this project are described within this document.

This document is a Preliminary Design Features report intended to define the general principles of the services design to assist in providing an estimate of the project cost and to confirm the proposed features for approval prior to undertaking the developed design.

This document is neither a 'detailed design specification' nor a 'detailed design build performance specification' and it is not for use for construction purposes.

This report is preliminary and subject to further refinement once additional information becomes available.

ELECTRICAL SERVICES

The following is an outline of the proposed electrical services. A specification and drawings for electrical services will form part of the electrical services documentation.

POWER SUPPLY

A new power supply will be applied for from the local power authorities network.

DISTRIBUTION BOARDS (DB'S)

The DB will meet the following requirements:

Be a MCB (miniature circuit breaker) distribution switchboard, with a minimum 30% nominal spare capacity and space.

Have RCD protection for circuits servicing teaching areas, all damp areas and to the extent required by AS/NZS 3000.

Include lighting controls for common and external areas, as well as the emergency lighting control within the control panel of the DB

Have central emergency lighting test facility as per AS2293.

Provide a surge diverter to stop any power surge imposing on the sensitive IT equipment.

CABLING

SUB-MAINS

All new sub-main cables if required shall be of XLPE/PVC insulated cables with aluminium or copper conductors. A nominal 30% spare capacity will be provided for the new sub-mains. These cables will be protected by MCCBs' at the MSB.

CABLE ACCESS ROUTES AND SUPPORTS

Cabling in areas likely to be disturbed (e.g. accessible roof spaces) will be on cable tray, ladder-tray, catenary wire or in ducting. Cabling in other areas will be run loose (e.g. within walls).

All underground cabling will be run in uPVC conduit/ducts to assist in future replacement and additions.

Each different service will be on or in separate cable support systems (eg. power vs. communications).

Within plant rooms and the like, surface conduits may be used.

EARTHING

Multiple Earthed Neutral (MEN) earthing system and equipotential bonding will be provided in accordance with AS/NZS 3000 and the Electricity (Safety) Regulations.

LIGHTING

The following is an outline of the proposed lighting. A specification for lighting will form part of the electrical services documentation.

GENERAL

Lighting in the building will be designed in accordance with the recommendations of AS/NZS1680 (Interior Lighting).

Generally, long life and energy efficient, LED luminaires will be used. Luminaires will be of a durable and maintainable type. They will be selected to match with the architectural finishes and themes. The number of different lamp types will be minimised to aid maintenance.

Exterior security lighting will be provided for the courtyard and all walkway/corridors areas where required.

Linear extrusion will be used in all areas as shown on the architectural drawings. Luminaire types to match that depicted within the architectural render unless otherwise instructed.

CONTROL

General lighting in open plan teaching areas and in offices will be controlled by local manual light switches. Occupancy/motion sensors will be installed in all circulation areas (corridors, toilets, etc.).

Exterior lighting will be generally controlled by time clocks and photocell sensors combined.

EMERGENCY LIGHTING

Emergency and exit lighting will be provided in accordance with AS/NZS2293, the NZBC and the project Fire Report.

Emergency lighting will be a self-contained standalone emergency lighting system.

COMMUNICATIONS

The following is an outline of the proposed existing communications. A specification for communications will form part of the electrical services documentation.

A new data rack shall be installed in the admin area. This will be a wall mounted swing cabinet fixed at high level.

Passive equipment will be provided under the communications specification. All active equipment will be provided by the clients nominated IT representative.

VOICE & DATA CABLING

Structured cabling and data outlets will be Category 6 rated. In addition to any specific connections (e.g. security monitoring, plant monitoring, data.), extra data outlets will be provided at different locations as required (for example fire alarm, security, etc.). Data and power will be provided to suit the architectural layout and Library requirements.

SECURITY SYSTEM

The following is an outline of the proposed security system. A specification for the security system will form part of the electrical services documentation.

INTRUDER ALARM

A new intruder detection system will be provided. This will comprise of a keypad at the main entrance & PIR sensors monitoring all spaces on the external perimeter.

ACCESS CONTROL

A new access control systems will be installed to all external doors and doors between library and admin spaces. Access will be via swipe cards/pin entry.

MECHANICAL SERVICES

The following is an outline of the proposed mechanical ventilation services along with some commentary on the existing. A specification for the mechanical services will form part of the mechanical services documentation during the design process.

AIR CONDITIONING / HEATING SYSTEMS

PROPOSED SYSTEMS

We have proposed a series of ceiling concealed ducted ac units to provide heating and cooling throughout the library spaces, including some ceiling mounted cassette type units in the smaller cellular spaces.

These are Dx coil units so run on refrigerant.

Electric radiant heating throughout is not currently considered as an option based on the significant increase in electrical loading to the building will raise a requirement to upgrade the power supply and removes the reverse cycle cooling capabilities.

PERFORMANCE CRITERIA

The design of the system will be based on the following criteria:

Winter	
Ambient	4°C DB
Internal	21°C DB
Summer	
Ambient	28°C DB
Internal	22°C DB

Generally, thermostats will be set at 22°C and will have a control tolerance of approximately ± 1.5°C measured at the thermostat.

For most of the time, the internal temperature at a transmitter will be expected to be between 19.5°C and 22.5°C. During extreme winter ambient conditions, which are outside the above limits, the indoor temperature range may increase.

Unit selections will be based on based on:

Equipment heat load	10 W/m2
Lighting	10 W/m2
Occupancy	1 person / 10 sq.m2, or higher density according to the Fire Report
Outside air flow	to NZS 4303
Glazing	Double Glazing is recommended

CONTROL ZONES

Each space will have its own temperature sensor and enable control for the ac systems serving this space. A central control unit can be provided so controls on the floor are locked out and can't be tampered with by members of the public.

VENTILATION SERVICES DESIGN

Ventilation is designed in accordance with AS1668.2 and NZS4303.

EXTRACT SYSTEMS

Extract air systems will be provided to the bathroom and kitchen facilities of the library in accordance with AS/NZS 1668.2:2002 for compliance with NZBC G4. Make up air will be by means of low level door grilles and door under cuts.

OUTDOOR AIR SYSTEMS

Outdoor air shall be provided to the habitable spaces of the library at a rate in accordance with NZS 4303:1990 to ensure compliance with G4 of the NZBC.

The outdoor air system to the library will modulate on CO2 sensing control and an EC fan to ensure the fan only provides the air needed to maintain indoor air quality.

H1 – ENERGY EFFICIENCY

Clause H1 of the building refers to energy efficiency. The thermal envelope is defined as construction elements separating occupied and unoccupied areas. Inter-tenancy walls are not considered as part of the thermal envelope.

Minimum insulation levels are proposed as follows

Roof	R 3.40	
Wall	R 2.20	
Floor	R 1.30	
Glass	R 0.15	Clear Single glazing with aluminium frames.

HYDRAULICS

SANITARY WASTE DRAINAGE

The following is an outline of the proposed sanitary waste drainage. A specification for the sanitary waste drainage will form part of the hydraulic services documentation.

SANITARY WASTE DESIGN

All sanitary waste drainage will discharge via gravity to existing gully traps around L block. The system will be designed in accordance with AS/NZS 3500.2 *Plumbing and drainage - Sanitary plumbing and drainage*. The requirements of NZBC Clause G13 *Foul Water* Acceptable Solution G13/AS3 will also be met.

Sanitary waste pipe work will be suspended under the elevated floor and run with a specified grade to existing gully traps.

Typically ø50 pipes will run from the new sinks to the existing gully traps, with a separate discharge pipe for all fixtures.

Sanitary waste will be provided to each fixture as shown on the architectural drawings.

Drainage via tundishes will be provided to all under bench hot water cylinders.

Some of the existing gully traps will need to be remediated to ensure that they are compliant and do not allow ingress of surface water.

SANITARY PIPE WORK MATERIALS

In general the sanitary waste material will be specified as uPVC with pipe work & fittings to comply with AS/NZS 1260 and called to be installed to meet the requirements of AS/NZS 2032.

STORMWATER DRAINAGE

The following is an outline of the proposed Stormwater Drainage. A specification for the Stormwater Drainage will form part of the Hydraulic Services documentation.

STORMWATER DESIGN

All stormwater drainage will discharge via gravity where possible to the existing stormwater services. The system will be designed in accordance with AS/NZS 3500.3 *Plumbing and drainage - Stormwater drainage* and E1/AS1 of NZBC Clause E1 *Surface Water*.

The specific drainage requirements of E2/AS1 of NZBC Clause E2 External Moisture will be provided.

The NIWA HIRDS website will be used to determine the design ARI (Average Reoccurrence Interval) figure.

DOWNPIPES

Downpipes will be provided from rain water outlets located by the architect. All rainwater outlets will be checked for size relative to the catchment area it serves.

Downpipe material selection will be to architects selection.

PIPE WORK MATERIALS

In general the stormwater material will be specified as uPVC with pipe work & fittings to comply with AS/NZS 1254 and called to be installed to meet the requirements of AS/NZS 2032.

WATER SERVICES

The following is an outline of the proposed Water Services. A specification for the Water Services will form part of the Hydraulic Services documentation.

WATER SERVICES DESIGN

The system will be designed in accordance with AS/NZS 3500.1 *Plumbing and drainage – Water services*, AS/NZS 3500.4 *Plumbing and drainage – Heated water services*. NZBC Clause G12 *Water Supplies* Acceptable Solution G12/AS1 will also be met.

SIZING OF RETICULATION SYSTEM

Pipe work will be sized on the number of fixtures each water supply branch is feeding. Due to the age of the building, new water reticulation will be provided from the existing connection serving the building to al fixtures.

WATER SUPPLIES

Preliminary sizing indicates that likely no water pipe work larger than ø25 will be required.

Domestic cold water pipe work and fittings shall be a Rehau Rautitan Platinum.
All pipe work will be clearly labelled to comply with NZS 5807.

Domestic hot water will be distributed out from the hot water cylinders under the benches at 45°C to fixtures as required. Pipe work will be concealed where possible. Existing hot water cylinders will not be able to be re-used as they are in poor condition and at end of life.

Domestic hot water pipe work and fitting shall be Rehau Rautitan Platinum.

ENVIRONMENTALLY SUSTAINABLE DESIGN OPTIONS

Successful environmentally sustainable design involves close cooperation between the client, consultants and contractors at all stages of the project. Environmental and financial aspects of design and construction are such that outcomes are beneficial for both human health and whole of life costs which can include maintenance, energy efficiency, durability, and resource use.

BUILDING CONSTRUCTION

Improvements to the glazing including specifying double glazing as well as low emissivity ensures that the indoor environment maintains heat in winter as well keeps out heat in the summer. Fixed shading over glazed areas is also beneficial to ensure daylight glare is controlled.

Improvements to the insulation resistance values provide means of retaining heat in winter as well was keeping out heat in the summer. High performance insulation provides a higher overall level of comfort in the space and means that space is healthier to work and learn in. The energy costs are reduced as the cooling (only if AC is provided) loads as well as the heating loads will be reduced.

BUILDING MANAGEMENT SYSTEMS

A BMS is a software program that monitors all the energy used to heat, cool and light a building and run its equipment. A BMS lets you respond quickly as energy demand changes and reports on energy use over time. The systems are generally more effective in larger premises.

There are 2 types of BMS:

- monitoring and targeting systems - these are designed to monitor energy use and target areas for improvement.
- continuous commissioning systems - these systems adjust your HVAC and other systems continuously to meet demand.

A BMS makes sure your building is always comfortable for students and staff and that your equipment switches off when not needed. Some systems can be controlled remotely, allowing property managers, caretakers, or environmentally conscious students to make changes and get reports even when out of a monitored building.

This is an area that this project will be focusing on, providing a cost effective and pragmatic BMS for the client.

ENERGY EFFICIENT LIGHTING

The lighting throughout the buildings will consist of high efficiency LED technology. A review of a number of LED options would be undertaken to ensure quantity vs. light distribution and uniformity are maximized.

Integrated motion sensors and daylight sensors in low traffic areas could allow the lighting to be zoned and adjusted according to the light level in the room and in areas that are infrequently used there by saving power.

WATER USE

Domestic cold water will be reticulated to all fixtures and plant and metered accordingly. The selection of water fittings throughout the buildings is able to be more efficient with Wels rated fittings. This is an architectural item.

FIRE PROTECTION

The following is the proposed Fire Protection services for the development and covers fire alarm.

Generally, the fire protection systems shall be as per the project fire report which will outline fire alarm types required for the building.

ATTENDANCE POINT

The proposed attendance point is on the north side of the site situated by the main Broadway Road site entry. The attendance point is required to be within 18m of the hardstand location, the hardstand location is proposed by the fire engineer and will be located on Broadway Road. The attendance point will contain the buildings fire alarm panel (FAP). The final location and configuration is subject to approval by Fire and Emergency New Zealand (FENZ). This will be facilitated by 22 degrees and the fire engineer.

DETECTION & ALARM SYSTEMS

Detection and alarm systems to be a design build contract with input from 22 degrees and the fire engineer. This will consist of the supply and install of all required components for a fully functioning Type 4 alarm system in accordance with NZS4512 (Fire detection and alarm systems in buildings), as per the building fire report.

Detector spacing and location requirements shall comply with NZBC Clause F7 (Warning systems) and NZS4512.

DESIGN FEATURES REPORT FOR:

KAIKOHE LIBRARY & COMMUNITY HUB

69 & 71 BROADWAY, KAIKOHE

PRELIMINARY DESIGN

Job Number: 11730

Date: November 2024

Contents

1 GENERAL

1.1 Objective

The Design Features Report (DFR) is a detailed document defining the structural design criteria and recording key decisions or outcomes. It outlines design loadings, structural modelling assumptions, material properties, foundation requirements and design standards.

1.2 Scope

The scope is in accordance with the Design Brief and Conditions of Engagement.
In general terms, the scope of work is as follows:

- Full structural engineering design and documentation.

1.3 Means of Compliance

The design of the structure is compliant with the New Zealand Building Code (NZBC), section B1 and B2 (see section 5.5).

The following standards have been used:

- AS/NZS1170:2002
- NZS3101:2006
- NZS3404:2009
- NZS3604:2011
- NZS1720.1:2022

1.4 Alternative Options

Alternative options for super structure were evaluated at scheme and preliminary design stage, but were either not practical, not appropriate or did not lend themselves to the Architectural concept.

2 THE STRUCTURE

2.1 General Description

The site location is at 69 & 71 Broadway, Kaikohe

The building is a single storey, lightweight framed public library and community centre.

2.2 Gravity Structure

The building is a single level structure, with a lightweight roof. The roof will be framed with DHS purlins and structural steel beams and columns. The walls are made up of infill timber framing between the slab and structural steelwork. The foundations are shallow reinforced concrete pads and strip footings, with RCM foundation walls.

2.3 Lateral Load Resisting Structure

Steel roof cross bracing utilised to transfer the horizontal forces into structural steel portal frames and CBF/EBF braced frames within the wall framing.

2.4 Secondary Seismic Restraint(s)

Secondary element lateral restraint design for suspended services, ceilings and similar are to be designed by others.

3 SOIL CONDITIONS

3.1 Description of Site Soil Conditions

The site subsoils consist of shallow topsoil and non-certified fill across the platform underlain with natural Kerikeri Volcanic Group soils.

The site subsoils are deemed suitable for shallow foundations with a lower than normal bearing pressure as noted below, embedded within the stiff natural soils, provided they are a minimum 600mm embedment for strip foundations, or 800mm for localised post/pad foundations. from steep 1V:4H slopes. Basalt boulders are present in the soils, so it is likely rock excavation/breaking equipment may be required when forming the building platform and foundation excavations.

The soils are classified as type M, moderately reactive to B1/AS1.

Liquefaction is not believed to be likely.

Settlements are expected to be within the limits of B1/VM4.

There is not known to be any slope stability issues around the proposed building platforms.

Refer to ***Haigh Workman's Geotechnical Investigation Report, Ref. 24 122, Revision 1, dated 1st November 2024***, for more information.

3.2 Soil Design Values

3.2.1 Ultimate Soil Strengths

Shallow foundation dependable bearing capacity (ULS) = 75kPa

If deep foundations are necessary, Haigh Workman with provide design parameters as required.

3.2.2 Strength Reduction Factors

Ultimate limit state strength reduction factor: $\varphi = 0.5$

4 DESIGN LOADINGS

4.1 General

Due to the occupancy of less than 300 people, the structure is to be designed as Importance Level 2 (IL2).

4.2 Imposed Loads

4.2.1 Vertical Loads

Floor slab on grade (C2)	LL:	4.0 kPa
Roof (R2)	LL:	0.25 kPa

4.2.2 Barriers and Handrails

At this stage no safety from falling barriers are required, however: The following loads apply for all barriers and handrails. All safety from falling barriers are proprietary systems, by others.

Table: Barrier and Handrail loads

Level/area	Top Edge			Infill	
	Horizontal kN/m	Vertical kN/m	Inwards, outwards, or downwards kN	Horizontal kPa	Any direction kN
Stairs/landings	0.75	0.75	0.6	1.0	0.5
External Balconies	0.75	0.75	0.6	1.0	0.5

4.2.3 Retaining Values

Soil retaining loads are generally in accordance with the recommendations of the report referenced in 3.1.

4.3 Wind Loads

In accordance with AS/NZS 1170.2:2021.

4.3.1 Site Wind Speed Profile

To AS/NZS 1170.2:2021 (IL2): V_{25} = 39 m/s (SLS1)
V_{500} = 45 m/s

4.3.2 Parts of Structure

Pressure coefficients are used to give design wind pressures to AS/NZS 1170.2:2021 – refer to structural calculations for building structural elements as appropriate.

4.3.3 Glazing

Wind loads for glazing to be in accordance with the NZ Building Code and NZS 4223:1985, Code of practice for glazing in buildings.

Unfactored basic site pressure Q_{SLS} = 0.57 kPa
Unfactored basic site pressure Q_{ULS} = 0.76 kPa

4.4 Seismic Loads

4.4.1 Site Parameters

Site subsoil class to AS/NZS 1170.5:2004: C

4.4.2 Analysis Methodology

The seismic analysis has been completed in accordance with AS/NZS 1170.5:2004, using the equivalent static method.

4.4.3 Seismic Load Coefficient

In accordance with AS/NZS 1170.5:2004: $C_{d\,(0.4s)}$ = 0.248 (ULS)

4.4.4 Parts and Portions

In accordance with AS/NZS1170.5:2004 section 8 as required.

4.5 Design Software

The following computer applications have been used:

Table: Software Used

Analysis type	**Software used**
2D/3D frame analysis	SPACEGASS
General spreadsheet design	Brown & Thomson Engineers

5 SERVICEABILITY CRITERIA

5.1 Seismic Deflections

The building is a lightweight single storey structure. Significant seismic drifts/movements are not anticipated. All deflections will be within NZS1170.5's limit of 2.5%.

For individual components, refer to the structural calculations.

5.2 Wind Deflections

Overall structure and specific structural elements are designed to the recommended serviceability deflection limits of AS/NZS 1170.0:2002, Table C1.

5.3 Gravity Deflections

Overall structure and specific structural elements are designed to the recommended serviceability deflection limits of AS/NZS 1170.0:2002, Table C1.

5.4 Shrinkage and Creep Constants

The effect of creep and shrinkage in columns is considered negligible due to the low height of the structure.

5.5 Design Life for Durability

5.5.1 Design Life

Foundations:	50 yrs
Superstructure:	50 yrs

Note: non-structural elements are by others and are not covered by this design features report.

5.5.2 Durability Provisions

Durability provisions are achieved by:

Acceptable Solutions B2/AS1

- Reinforced Concrete: NZS 3101: 2006 Part 1 Section 5 is an acceptable solution for durability with durability requirements met through covers equal to or in excess of the requirements of the standard.
- Timber: NZS 3602: 2003 Part 1 is an acceptable solution for meeting durability through treatment in accordance with the standard.

Alternative Solutions

- Structural Steel: There is no acceptable solution available for structural steel, protection is to be provided through surface treatment in accordance with NZS/AS 2312:2002.

5.6 Floor Vibration

Transient vibration limits for the precast seating units to be not less than 5 Hz.
We note there are no suspended slabs, therefore floor vibrations aren't considered.

5.7 Fire Resistance Ratings

None of the structure requires fire rating.

Refer Asset Care's Fire Design Report, dated 11/10/24.

6 DRAWING AND SPECIFICATION NOTES

The purpose of this section is to ensure that the design requirements are included in the drawings or the specification.

6.1 Floors

6.1.1 Design Loads

Refer to Section 4 Design Loads, section 5.3 Gravity Deflections and Section 5.6 Floor Vibration.

6.1.2 Fire rating Requirements

Refer to Section 5.7 Fire Resistance Ratings

6.1.3 Propping Requirements

No propping is required.

6.2 Foundations

Refer to the Excavation and Concrete - General sections of the specification which discuss in detail all requirements for the foundations.

6.3 Material Properties (Typical)

6.3.1 Concrete Strengths

Foundations:	30 MPa
Slabs on Grade	30 MPa

6.3.2 Concrete Masonry

Blockwalls:	Grade B

6.3.3 Reinforcing Steel

Reinforcing:	300 and 500 MPa
Ductile mesh:	500 MPa MA

6.3.4 Structural Steel

Rolled Steel Sections:	300 MPa – Grade 300 L0 to AS 3679.1
Hollow Sections:	350 MPa - AS 1163
Bolt Grades:	Grade 4.6 and grade 8.8 high strength

7 PROPRIETARY SYSTEMS

There are no proprietary structural components in this project at this stage.

7.1 Manufacturer Design Requirements

The design assumptions and criteria that the proprietary systems must meet include:

- Loads - Refer to Section 4, section 5.3 Gravity Deflections and Section 5.6 Floor Vibration.
- Durability – Refer to Section 5.5
- Design Submissions required – design and shop drawings for review
- PS1 and PS2, as required by the conditions of consent.

7.2 Manufacturer construction requirements

Inspection QA requirements:

- Producer Statement PS3 and/or PS4 by manufacturer as required by the conditions of consent.

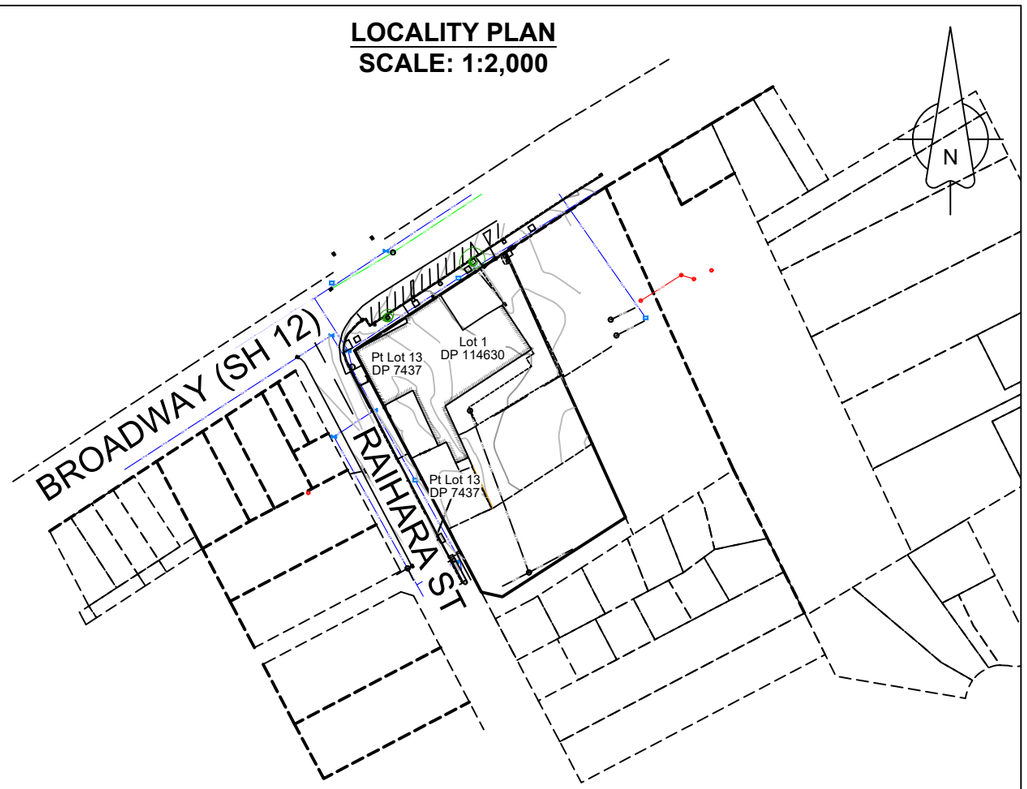
SCHEDULE OF DRAWINGS		
SHEET #	TITLE	REV
BC000	COVER SHEET	B
BC100	EXISTING SITE PLAN	B
BC300	ROADING PLAN	B
BC400	THREE WATERS SERVICING PLAN	B
BC410	EXISTING IMPERVIOUS AREAS CATCHMENT PLAN	B
BC415	PROPOSED DEVELOPMENT IMPERVIOUS AREAS CATCHMENT PLAN	B
BC320-421	STORMWATER LONGSECTIONS - SHEET 1-2	B

CIVIL ENGINEERING DESIGN FOR BUILDING CONSENT

KAIKOHE LIBRARY,
69 & 71 BROADWAY, KAIKOHE

PROJECT REF: 24041

LOCALITY PLAN
SCALE: 1:2,000



SCALE 1:2000
0 20 40 60 80 100

REV.	REVISION DETAILS	DRAWN	APP.
C			
B	TOILET BLOCK REMOVED FROM PLANS	31-10-2024	AP --
A	1ST ISSUE	29-10-2024	JSY --

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SCALE 1:2000
0 20 40 60 80 100

PROJECT DETAILS
KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437
69 & 71 BROADWAY, KAIKOHE

TITLE
CONCEPT DESIGN

COVER SHEET

DATE CREATED	DRAWN	DESIGNED	APPROVED
29-10-2024	JSY	AP	--
VECTA REF NO	SCALE		STATUS
24041	1:2000 @ A3		PRELIMINARY
DWG NUMBER			REVISION
BC000			B

DATE PLOTTED: Thursday, 31 October 2024 11:20:41 am FILE PATH: W:\PROJECT\2024\24041 Kaikohe Library\CAD\Building Consent\24041-BC000 Cover Sheet.dwg

ROUTLEY AVENUE

BROADWAY (SH 12)

RAIHARA STREET

REMOVED TREE PIT

SW KERB OUTLET

CONCRETE ROTARY

FIRE HYDRANT FROM GIS

CONCRETE ROTARY

SEAT

TOYOTA SIGN

CONCRETE ROTARY

SW KERB OUTLET

SW SUMP
LL = 197.22
OUT IL = 196.31

COVER CHORUS

PHONEBOX

CONCRETE ROTARY

SS MH
LL = 196.51

SS MH
LL = 196.49

Lot 1
DP 114630

Pt Lot 13
DP 7437

PART RAIHARA BLOCK

2x SW KERB OUTLET

Lot 1 DP 46398

Lot 2 DP 46398

Lot 2 DP 10045

Lot 3 DP 46398

Lot 3 DP 10045

SEALED AREA

SS MH
LL = 197.11
OUT IL = 195.67

METALLED AREA

Pt Lot 13
DP 7437

SS MH
LL = 197.46
OUT IL = 196.03

SW KERB OUTLET

Lot 4
DP 10045

SEALED AREA

KERB
OUTLET

Lot 2
DP 114630

Lot 5
DP 10045

2x SW KERB OUTLET

SW MH
LL = 197.29
OUT IL = 196.51

SS MH
LL = 197.03
OUT IL = 195.20

Lot 3
DP 114630

Lot 4
DP 532097

Lot 3
DP 532097

Pt Lot 6
DP 10045

SW KERB OUTLET

SCALE 1:500

0 10 20

NOTES:

1. EXISTING SERVICES ARE BASED ON FAR NORTH DISTRICT COUNCIL GIS. CONTRACTOR TO LOCATE ALL EXISTING SERVICES & UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM EXACT LOCATIONS.

SURVEY NOTES:

THIS SURVEY HAS BEEN COMPLETED UNDER INSTRUCTION BY THE CLIENT FOR ITS INTENDED PURPOSE. THIS DATA MAY NOT BE SUITABLE FOR OTHER PURPOSES AND THEREFORE WRITTEN AUTHORITY IS NEEDED FROM VECTA FOR ANY OTHER USE OR REPRODUCTION.

MAJOR CONTOURS ARE AT 1.0m INTERVALS
MINOR CONTOURS ARE AT 0.2m INTERVALS
LOCAL AUTHORITY: FAR NORTH DISTRICT COUNCIL
COORDINATE SYSTEM: NZGD MT EDEN 2000
LEVELS DATUM: NZ VERTICAL DATUM 2016
ORIGIN OF LEVELS: SM 1085 SO 61964 (C8BP)
RL= 195.51m

SURVEY DATE: 3RD JULY 2024

DRAINAGE FEATURES DENOTED "INDICATIVE PIPE POSITION FROM FNDC GIS" HAVE BEEN SCALED/TAKEN FROM COUNCIL GIS RECORDS AND MUST BE CHECKED PRIOR TO DESIGN AND CONSTRUCTION AS A RESULT, VECTA ACCEPTS NO LIABILITY FOR THE SERVICES AND THEIR POSITIONS SHOWN OR OMITTED FROM THIS PLAN LIABILITY

LEGEND:

- CH — EX CHORUS
- EX W — EXISTING WATER
- EX SW — EXISTING SW
- EX SS — EXISTING SS
- EXISTING SW MH (SURVEYED)
- EXISTING SW MH (GIS)
- EXISTING CESSPIT
- EXISTING SS MH (SURVEYED)
- EXISTING SS MH (GIS)
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING VALVE (SURVEYED)
- EXISTING VALVE (GIS)
- EXISTING LIGHT POLE
- EXISTING POWER PILLAR
- EXISTING TELECO PILLAR
- EXISTING SIGN
- EXISTING RUBBISH BIN
- EXISTING TREE
- EXISTING FENCE
- EXISTING CONTOURS

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REV.	REVISION DETAILS	DRAWN	APP.
C			
B	TOILET BLOCK REMOVED FROM PLANS	31-10-2024	AP --
A	1ST ISSUE	29-10-2024	JSY --

PROJECT DETAILS
KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437
69 & 71 BROADWAY, KAIKOHE

TITLE
CONCEPT DESIGN
EXISTING SITE PLAN

DATE CREATED	DRAWN	DESIGNED	APPROVED
29-10-2024	JSY	AP	--
VECTA REF NO	SCALE		STATUS
24041	1:500 @ A3		PRELIMINARY
DWG NUMBER			REVISION
BC100			B

SCALE 1:500

DATE PLOTTED: Thursday, 31 October 2024 11:21:01 am FILE PATH: W:\PROJECT\2024\24041 Kaikohe Library\CAD\Building Consent\24041-BC100 Ex Site Plan.dwg

ROUTLEY AVENUE

BROADWAY (SH 12)

EXISTING FOOTPATH

RAIHARA STREET

EXISTING ROAD CENTRELINE

EXISTING KERB & CHANNEL

EXISTING FOOTPATH

Lot 1 DP 46398

Lot 2 DP 46398

Lot 3 DP 46398

Lot 5 DP 10045

Pt Lot 6 DP 10045

PART RAIHARA BLOCK

Lot 2 DP 114630

Lot 3 DP 114630

FFL=89.25

RW (0-0.4)

RW (0.4-0.8)

RW (0.8-0.5)

RW (0.5-0.5)

RW (0.5-0)

DISH

NIB

LEVEL NIB KERB

2.0m FOOTPATH

2.0m FLUSH FOOTPATH

3.0m FLUSH FOOTPATH

FLUSH LOW PLANTED ISLANDS

FLUSH PEDESTRIAN PATHS (CONCRETE OR PAINTED ASPHALT) WITH WHEEL STOPS AND BOLLARDS TO PROTECT PEDESTRIANS

BERM AREA TO HAVE EXISTING VEHICLE CROSSINGS REMOVED, FOOTPATH REINSTATED, AND LINEMARKING AMENDMENTS TO REFLECT REVISED LAYOUT

PROPOSED COMMERCIAL VEHICLE CROSSING TO BE IN ACCORDANCE WITH FNDC ES 2023 SHEET 19. LEVELS TO MATCH EXISTING FOOTPATH & BERM GRADES.

NOTES:

1. DESIGN CONTOURS SHOWN AT 0.1m INTERVALS.

RW = RETAINING WALL
K&C = KERB AND CHANNEL
DISH = DISH CHANNEL
NIB = NIB KERB

KEY:

- BUILDING
- PAVEMENT
- FOOTPATH
- LANDSCAPING (SEE LANDSCAPING PLANS)
- MAJOR CONTOURS (0.5m)
- MINOR CONTOURS (0.1m)
- RW=0.0-1.6 TIMBER RETAINING WALL & HEIGHT
- PRAM CROSSING

SCALE 1:400

0 5 10 15

SCALE 1:400

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REV.	REVISION DETAILS	DRAWN	APP.
C			
B	TOILET BLOCK REMOVED FROM PLANS	31-10-2024	AP --
A	1ST ISSUE	29-10-2024	AP --

PROJECT DETAILS

KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437
69 & 71 BROADWAY, KAIKOHE

TITLE

CONCEPT DESIGN

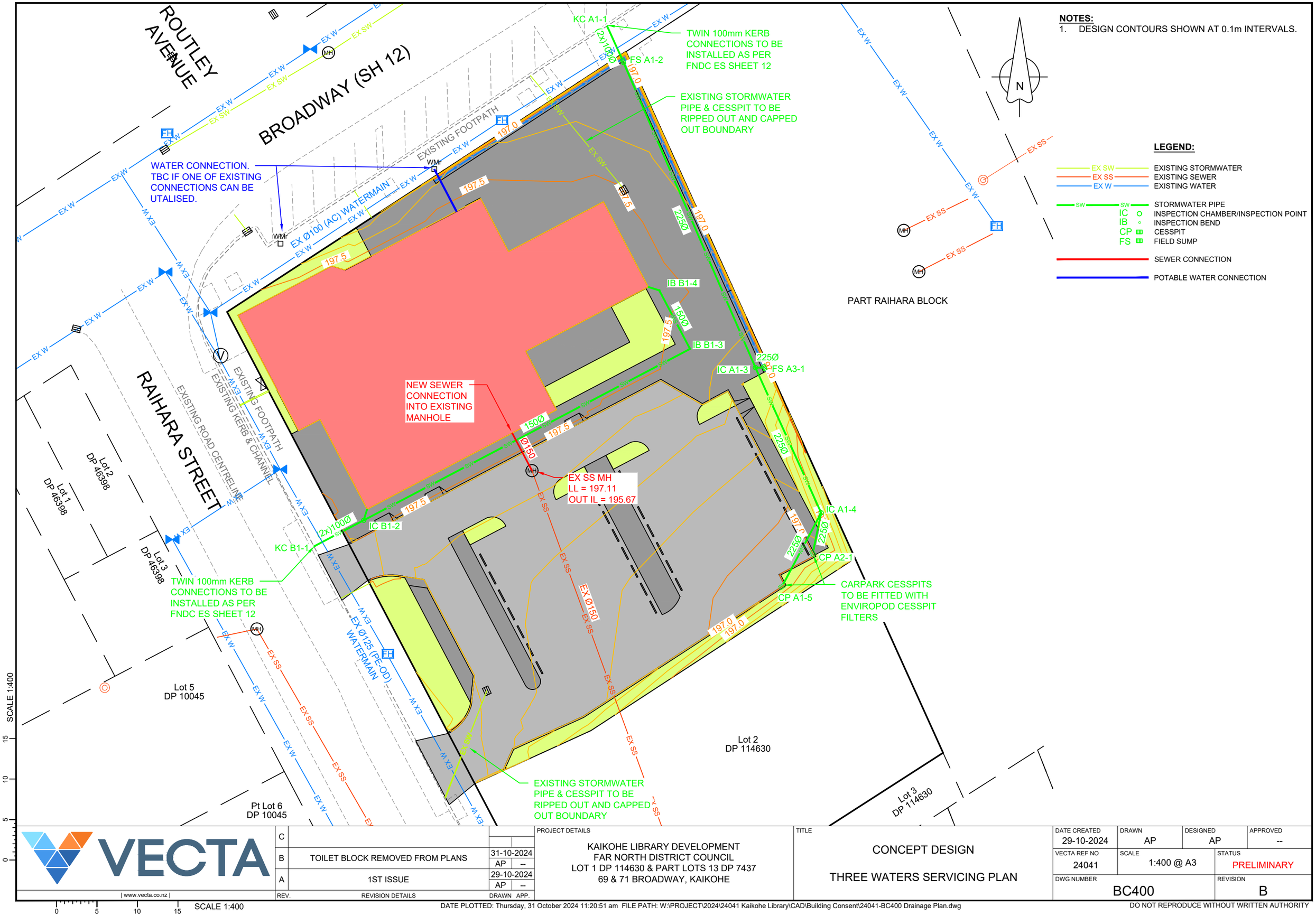
ROADING PLAN

DATE CREATED	DRAWN	DESIGNED	APPROVED
29-10-2024	AP	AP	--

VECTA REF NO	SCALE	STATUS
24041	1:400 @ A3	PRELIMINARY

DWG NUMBER	REVISION
BC300	B

DATE PLOTTED: Thursday, 31 October 2024 11:21:10 am FILE PATH: W:\PROJECT\2024\24041 Kaikohe Library\CAD\Building Consent\24041-BC300 Roading Plan.dwg



NOTES:

1. DESIGN CONTOURS SHOWN AT 0.1m INTERVALS.

LEGEND:

- EX SW — EXISTING STORMWATER
- EX SS — EXISTING SEWER
- EX W — EXISTING WATER
- SW — STORMWATER PIPE
- IC — INSPECTION CHAMBER/INSPECTION POINT
- IB — INSPECTION BEND
- CP — CESSPIT
- FS — FIELD SUMP
- SEWER CONNECTION
- POTABLE WATER CONNECTION

REV.	REVISION DETAILS	DRAWN	APP.
C			
B	TOILET BLOCK REMOVED FROM PLANS	31-10-2024	AP --
A	1ST ISSUE	29-10-2024	AP --

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PROJECT DETAILS
KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437
69 & 71 BROADWAY, KAIKOHE

TITLE
CONCEPT DESIGN
THREE WATERS SERVICING PLAN

DATE CREATED	DRAWN	DESIGNED	APPROVED
29-10-2024	AP	AP	--

VECTA REF NO	SCALE	STATUS
24041	1:400 @ A3	PRELIMINARY

DWG NUMBER	REVISION
BC400	B

SCALE 1:400

DATE PLOTTED: Thursday, 31 October 2024 11:20:51 am FILE PATH: W:\PROJECT\2024\24041 Kaikohe Library\CAD\Building Consent\24041-BC400 Drainage Plan.dwg

ROUTLEY AVENUE

SW KERB OUTLET

SW KERB OUTLET

BROADWAY (SH 12)

Lot 1
DP 114630

Pt Lot 13
DP 7437

2660m² DISCHARGING
TO BROADWAY (NORTH)

PART RAIHARA BLOCK

PART KOHEWHATA 4 BLOCK

2x SW KERB OUTLET

1170m² DISCHARGING
TO RAIHARA ST (WEST)

RAIHARA STREET

Lot 1
DP 46398

Lot 2
DP 46398

Lot 2
DP 10045

Lot 3
DP 46398

Lot 3
DP 10045

NOTE THAT SOME OF THIS
CATCHMENT WILL SHEET FLOW
ACROSS THE BOUNDARY TO
THE EAST AND THEN IN TURN TO
BROADWAY TO THE NORTH
(WHICH IS WHY IT IS INCLUDED
IN THIS CATCHMENT)

SW KERB OUTLET

Pt Lot 13
DP 7437

Lot 4
DP 10045

Lot 2
DP 114630

Lot 6
DP 532097

Lot 5
DP 10045

Lot 3
DP 114630

Lot 4
DP 532097

Lot 3
DP 532097

2x SW KERB OUTLET

Pt Lot 6
DP 10045

SW KERB OUTLET

N

SCALE 1:500

0 10 20

LEGEND:

- EXISTING ROOF AREA (1335m²)
- EXISTING PAVEMENT AREA (1520m²)
- EXISTING METALLED AREA (976m²)
- TOTAL AREA: 3831m²

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SCALE 1:500

REV.	REVISION DETAILS	DRAWN	APP.
C			
B	TOILET BLOCK REMOVED FROM PLANS	31-10-2024	AP --
A	1ST ISSUE	29-10-2024	JSY --

PROJECT DETAILS

KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437
69 & 71 BROADWAY, KAIKOHE

TITLE

CONCEPT DESIGN

EXISTING IMPERVIOUS AREAS
CATCHMENT PLAN

DATE CREATED	DRAWN	DESIGNED	APPROVED
29-10-2024	JSY	AP	--
VECTA REF NO	SCALE		STATUS
24041	1:500 @ A3		PRELIMINARY
DWG NUMBER			REVISION
BC410			B

DATE PLOTTED: Thursday, 31 October 2024 11:21:19 am FILE PATH: W:\PROJECT\2024\24041 Kaikohe Library\CAD\Building Consent\24041-BC410 Catchment Existing.dwg

NOTES:
1. DESIGN CONTOURS SHOWN AT 0.1m INTERVALS.

LEGEND:

- BUILDING AREA (1017m²)
- PAVEMENT AREA (1313m²)
- FOOTPATH AREA (1088m²)
- LANDSCAPING AREA (413m²)

TOTAL AREA: 3831m²

BROADWAY (SH 12)

ROUTLEY AVENUE

RAIHARA STREET

EXISTING FOOTPATH

EXISTING ROAD CENTRELINE

EXISTING KERB & CHANNEL

EXISTING FOOTPATH

EX SW

KC A1-1

(2x)100Ø

KERB CONNECTION

FS A1-2

IB B1-4

150Ø

IB B1-3

225Ø

IC A1-3

FS A3-1

1170m² DISCHARGING TO RAIHARA ST (WEST)

2480m² DISCHARGING TO BROADWAY (NORTH)

IC B1-2

KC B1-1

(2x)100Ø

KERB CONNECTION

IC A1-4

CP A2-1

CP A1-5

197.5

197.0

PART RAIHARA BLOCK

Lot 1 DP 46398

Lot 2 DP 46398

Lot 3 DP 46398

Lot 5 DP 10045

Pt Lot 6 DP 10045

Lot 2 DP 114630

Lot 3 DP 114630

SCALE 1:400

SCALE 1:400

REV.	REVISION DETAILS	DRAWN	APP.
C			
B	TOILET BLOCK REMOVED FROM PLANS	31-10-2024	AP
A	1ST ISSUE	29-10-2024	AP

VECTA | www.vecta.co.nz |

PROJECT DETAILS

KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437
69 & 71 BROADWAY, KAIKOHE

TITLE

CONCEPT DESIGN

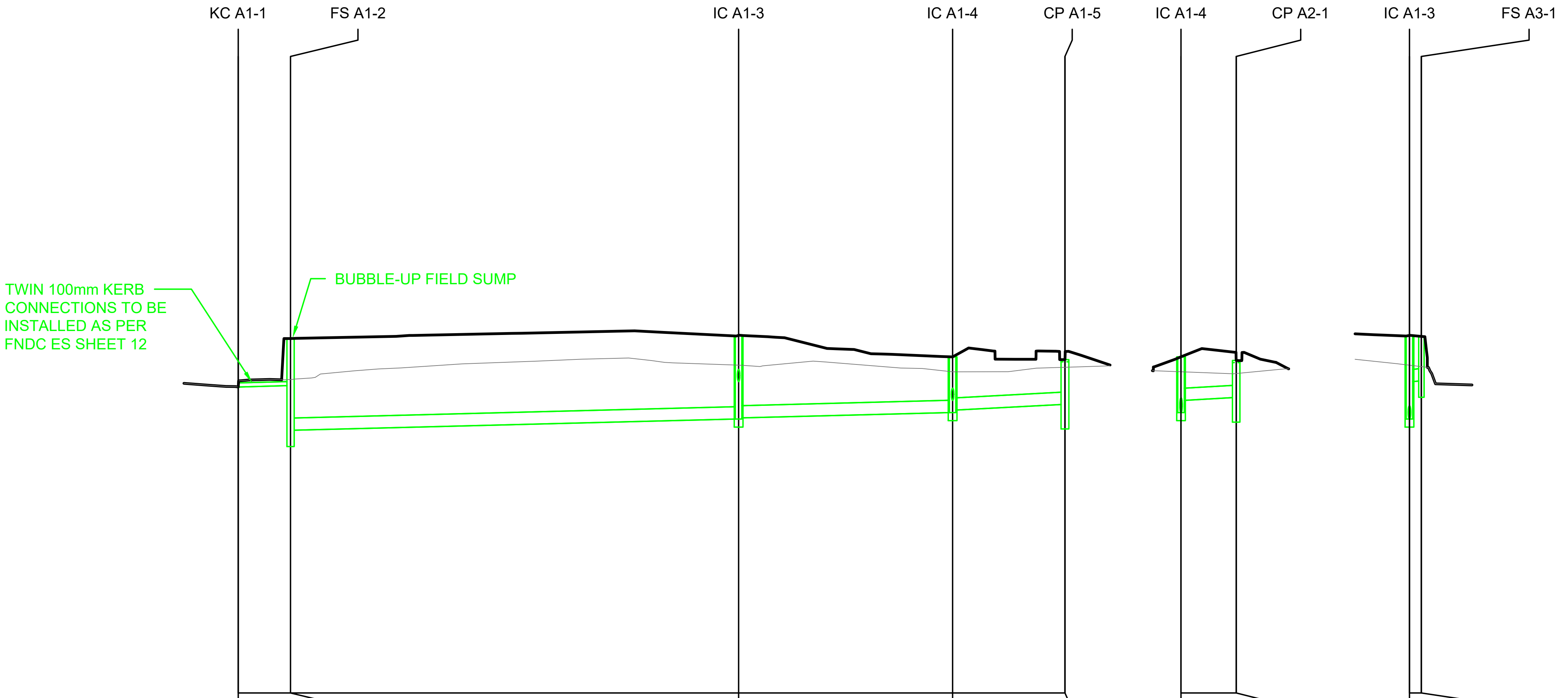
PROPOSED DEVELOPMENT IMPERVIOUS AREAS CATCHMENT PLAN

DATE CREATED	DRAWN	DESIGNED	APPROVED
29-10-2024	AP	AP	--

VECTA REF NO	SCALE	STATUS
24041	1:400 @ A3	PRELIMINARY

DWG NUMBER	REVISION
BC415	B

DATE PLOTTED: Thursday, 31 October 2024 11:20:46 am FILE PATH: W:\PROJECT\2024\24041 Kaikohe Library\CAD\Building Consent\24041-BC415 Catchment Proposed.dwg



LINE A1

	KC A1-1 – FS A1-2	FS A1-2 – IC A1-3	IC A1-3 – IC A1-4	IC A1-4 – CP A1-5
Pipe Size/Type	Ø(2x)100 uPVC SN16	Ø225 uPVC SN16	Ø225 uPVC SN16	Ø225 uPVC SN16
Grade (%)	0.5%	0.5%	0.5%	1%
Datum	187.000			

	KC A1-1	FS A1-2	IC A1-3	IC A1-4	CP A1-5
Depth To Invert	0.075 / 0.075	0.868 / 1.985 / 1.685	1.537 / 1.517	1.024 / 0.979	0.824 / 1.274
Invert Levels	196.424 / 196.424	196.448 / 195.330 / 195.630	195.836 / 195.856	195.954 / 195.999	196.103 / 195.653
Finished Surface	196.499	197.316	197.373	196.978	196.927
Chainage	0.000	4.804	45.995	65.671	76.000

LINE A2

	IC A1-4	CP A2-1
Pipe Size/Type	Ø225 uPVC SN16	
Grade (%)	1%	
Datum	187.000	
Depth To Invert	1.024 / 0.801	0.684 / 1.134
Invert Levels	195.954 / 196.177	196.228 / 195.778
Finished Surface	196.978	196.911
Chainage	0.000	5.070

LINE A3

	IC A1-3	FS A3-1
Pipe Size/Type	Ø225 uPVC SN16	
Grade (%)	1%	
Datum	187.000	
Depth To Invert	1.537 / 0.850	0.820 / 1.120
Invert Levels	195.836 / 196.523	196.534 / 196.234
Finished Surface	197.373	197.354
Chainage	0.000	1.093

SCALE 1:100

VECTA

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REV.	REVISION DETAILS	DRAWN	APP.	DATE
C				
B	TOILET BLOCK REMOVED FROM PLANS	AP	--	31-10-2024
A	1ST ISSUE	AP	--	29-10-2024

PROJECT DETAILS
KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437
69 & 71 BROADWAY, KAIKOHE

TITLE
CONCEPT DESIGN
STORMWATER LONGSECTIONS - SHEET 1

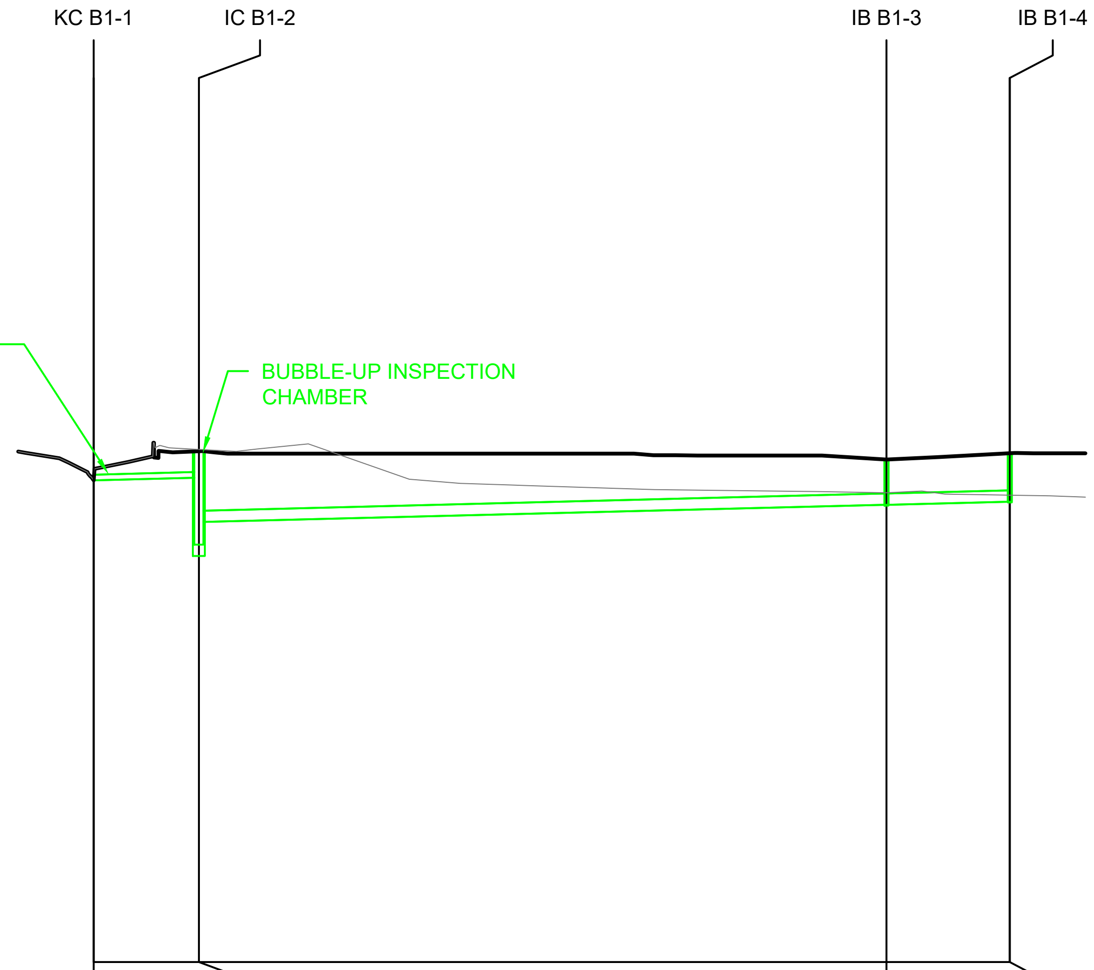
DATE CREATED	DRAWN	DESIGNED	APPROVED
29-10-2024	AP	AP	--

VECTA REF NO	SCALE	STATUS
24041	1:500 @ A3 (H) 1:100 @ A3 (V)	PRELIMINARY

DWG NUMBER	REVISION
BC420	B

SCALE 1:500

DATE PLOTTED: Thursday, 31 October 2024 11:20:55 am FILE PATH: W:\PROJECT\2024\24041 Kaikohe Library\CAD\Building Consent\24041-BC420 SWLS.dwg



	KC B1-1 → IC B1-2	IC B1-2 → IB B1-3	IB B1-3 → IB B1-4
Pipe Size/Type	Ø(2x)100 uPVC SN16	Ø150 uPVC SN16	Ø150 uPVC SN16
Grade (%)	0.5%	0.5%	0.5%
Datum	187.000		

	KC B1-1	IC B1-2	IB B1-3	IB B1-4
Depth To Invert	0.075 / 0.075	0.350 / 1.236 / 0.936	0.599 / 0.599	0.642
Invert Levels	197.175 / 197.175	197.210 / 196.324 / 196.624	196.852 / 196.852	196.892
Finished Surface	197.250	197.560	197.450	197.535
Chainage	0.000	6.957	52.457	60.617

LINE B1

SCALE 1:100

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REV.	REVISION DETAILS	DATE / DRAWN	APP.
C			
B	TOILET BLOCK REMOVED FROM PLANS	31-10-2024 / AP	--
A	1ST ISSUE	29-10-2024 / AP	--

PROJECT DETAILS
KAIKOHE LIBRARY DEVELOPMENT
FAR NORTH DISTRICT COUNCIL
LOT 1 DP 114630 & PART LOTS 13 DP 7437
69 & 71 BROADWAY, KAIKOHE

TITLE
CONCEPT DESIGN
STORMWATER LONGSECTIONS - SHEET 2

DATE CREATED	DRAWN	DESIGNED	APPROVED
29-10-2024	AP	AP	--

VECTA REF NO	SCALE	STATUS
24041	1:500 @ A3 (H) 1:100 @ A3 (V)	PRELIMINARY

DWG NUMBER	REVISION
BC421	B

SCALE 1:500

DATE PLOTTED: Thursday, 31 October 2024 11:21:14 am FILE PATH: W:\PROJECT\2024\24041 Kaikohe Library\CAD\Building Consent\24041-BC420 SWLS.dwg