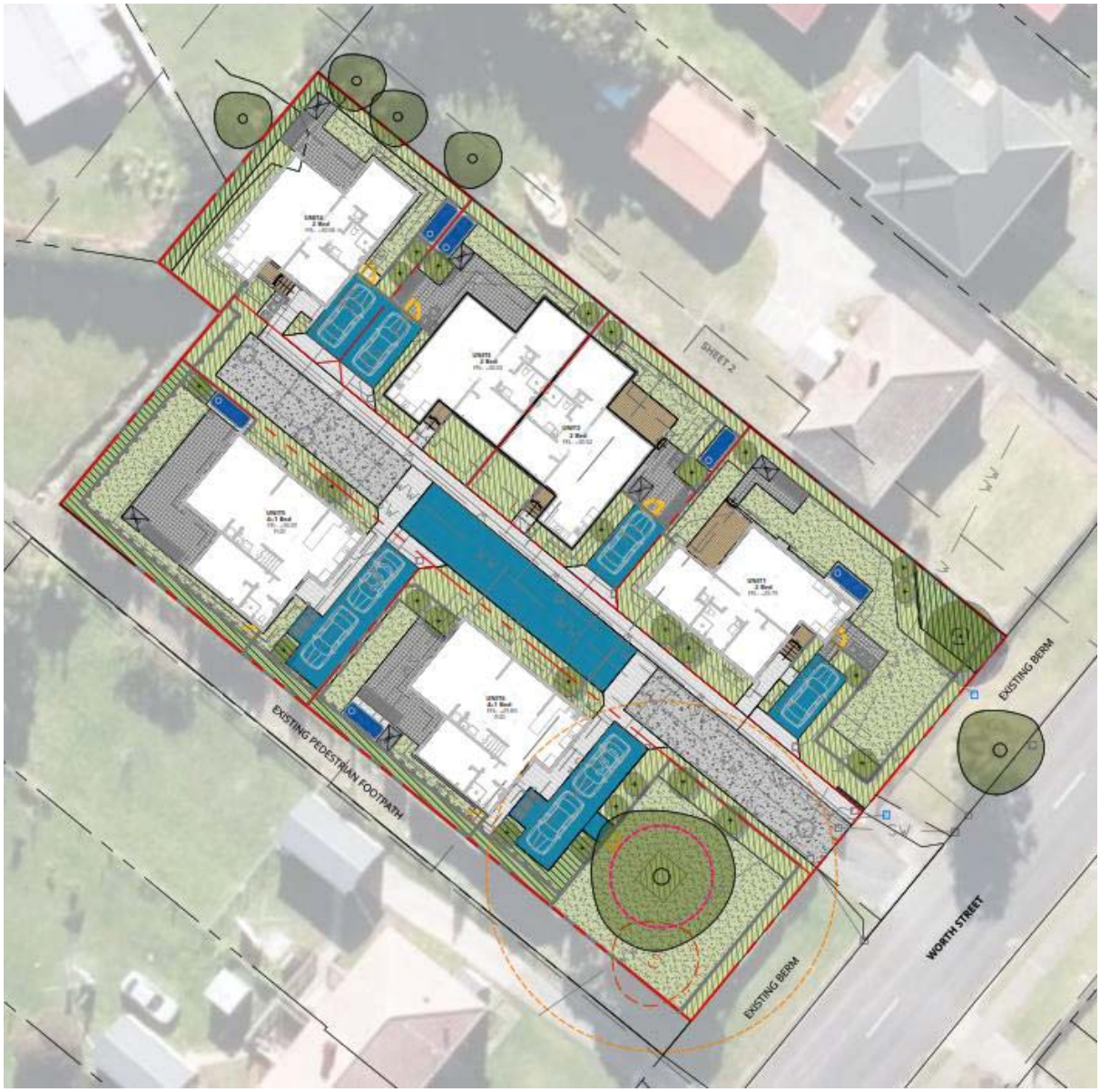
Kāinga Ora
Homes and Communities

Assessment of Environmental Effects

Six dwellings and subdivision

7 & 9 Worth Street, Kaitaia



Executive Summary

The following report has been prepared to support an application for resource consent for the development of six dwellings and subdivision, pursuant to Schedule 4 of the Resource Management Act 1991 ('the Act'). This report contains an Assessment of Environmental Effects which addresses all matters relevant to the proposal and is informed by specialist input and reports where required.

Resource consent is required for the proposal under the operative Far North District Plan For the reasons set out in subsequent assessment, it is considered that the application may be granted on a non-notified basis subject to appropriate conditions of consent.

Version No. 1

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19/06/2024

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Appendices

1.0 Applicant and Site Details

Applicant	Kāinga Ora – Homes and Communities ('Kāinga Ora')
Site Owner	Housing New Zealand Limited
Address for Service	Babbage Consultants Ltd PO Box 2027 Shortland Street Auckland CBD 1010 Attention: Jacob Turnbull Email: Jacob.Turnbull@babbage.co.nz
Location	7 & 9 Worth Street, Kaitaia
Legal Description	Lot 6 DP 38117 and Lot 23 DP 381127
Site Area	1,991m^2
Operative Plan(s)	Far North District Plan (OFNDP)
Proposed Plan(s)	Far North proposed District Plan
Operative Zone	Residential
Proposed Zone	General Residential
Operative Overlays	N/A
Proposed Overlays	Treaty Settlement Area of Interest: Ngai Takoto and Te Aupori
Other Notations	N/A

2.0 The Site and Surrounding Environment

2.1 Description of Site

The application site comprises two existing title areas, located on the north western side of Worth Street (refer **Figure 1**). The site is regular in shape and covers an area of 1,991m^2 with gently sloping topography. The site has a total frontage of 34 m along Worth Street.

Figure 1: Aerial map of application site (outlined yellow). Source: Far North Council Operative District Plan Maps

Worth Street is a local road which has a legal width of 20m with both sides of the street lined with grass berms. The southern side of Worth Street contains a concrete pedestrian footpath. There is a street tree located within the road reserve adjoining the site, in front of 7 Worth Street.

The site is currently occupied by 2 residential units in single storey, standalone formation on each of the existing Records of Title. At present 2 vehicle crossings serve the site, with stacked parking arrangements provided to the side of each dwelling. The two vehicle crossings are combined at the shared site boundary at the centre of the frontage. The site boundaries are defined by fencing of varying heights, with the rear and side yards provided with fencing approximately 1.8m high and the front yards provided with lower level fencing.

In terms of services, the site is currently served by reticulated wastewater and water supply. Stormwater from the site is currently discharged to the kerb.

The Records of Title for the site (attached as **Appendix 1**) are subject to a number of interests. None of these are anticipated to affect the resource consent application as discussed in **Table 1** below:

Table 1: Record of Title interests

Interest	Comment
K61610 Certificate that a pipeline for the passage of sewage passes through and serves the within land - 31.5.1957	This interest is to be retained. No impact on the resource consent.
K73925 Certificate that a pipeline for the passage of stormwater passes through the within land - 30.11.1959	This interest is to be retained. No impact on the resource consent.

2.2 Description of Surrounding Environment

The development site is located in the residential area of Kaitaia. The site is surrounded by residential land uses, predominantly being single storey detached dwellings. Immediately adjoining the rear of 9 Worth Street is an open space reserve with recreational activities zoning under the OFNDP, with pedestrian access to this reserve adjoining the southern boundary of the development site. The open space reserve also connects to Pukepoto Road and Tangonge Crescent. The open space reserve adjoins Anne West Kindergarten, with the outdoor play area adjoining the northwest corner of the site, with access off Pukepoto Road.

In terms of the wider environment, the closest commercial amenities are located in the Kaitaia town centre, approximately 0.5 km northwest of the development site. Kaitaia Primary School is also within 1 km of the site, with Kaitaia College located further from the site to the southwest. Kaitaia Hospital is located approximately 130 m to the southeast, with access provided from Worth Street (opposite 23 Worth Street) and Redan Road. The surrounding zoning under the Far North Operative District Plan is predominately Residential, with some Rural Living Zoned land located 150 m east of the site and Rural Production Zoned land located 230 m west of the site.

3.0 The Proposal

A summary of the key elements of the proposal is set out below. More detailed descriptions on particular aspects of the proposal are set out in the specialist reports and plans accompanying the application.

3.1 Overview

It is proposed to construct six dwellings, including 4 x 2 bedroom dwellings and 2 x 5 bedroom dwellings. The two bedroom dwellings are one storey and the 5 bedroom dwellings are two storey. The 5 bedroom dwellings are also Kainga Ora's "4 + 1" bedroom typologies, which means there is a bedroom located on the ground floor with a void above that can enable accessible design in the future if required. The site layout is shown in **Figure 2** below.

Figure 2: Proposed Site Layout (Source: Architectural Drawings)

3.2 Access and parking

The site will be accessed via one vehicle crossing from Worth Street. The new vehicle crossing will be located in the centre of the site, and provides access to 8 car parks associated with the new dwellings. It is proposed that the larger 5 bedroom homes are allocated 2 car parks each and the 2 bedroom dwellings are allocated with 1 car park each. All car parks will be located to the side of the dwellings they are associated with and within the legal boundaries of the same lot.

Sufficient on-site manoeuvring is provided so that all vehicles can exit the site in a forward direction as illustrated in the vehicle tracking diagrams in **Appendix 9**.

3.3 Infrastructure and servicing

The servicing strategy for the proposed development is set out in the report and accompanying drawings by Civix, included as **Appendix 7**. In summary, it is concluded that all dwellings can be appropriately serviced in terms of stormwater, wastewater, water supply, power and telecommunications. Above ground stormwater detention tanks (6,000 L tank per Unit) are proposed to mitigate the flows to 80% of the pre-development 100-year flow rate event and address downstream network capacity constraints, as detailed in the stormwater management report in **Appendix 7**.

3.4 Site works

The existing dwellings, hard surfaces and vegetation on the site will be removed to accommodate the redevelopment. Earthworks of approximately 348.8 m^3 of cut, 229.3 m^3 of fill, 308.7 m^3 of topsoil strip, and 152.6 m^3 of topsoil place across an area of 1,824 m^2 are required to establish suitable levels for foundations, civil works and accessways, and to carry out landscaping. The maximum depth of the cut will be 0.8m and the maximum depth of the fill will be 1.3 m. **Figure 3** below provides a summary of the earthworks proposed. The Geotechnical Assessment in **Appendix 4** was prepared to support the proposed earthworks and sets out measures to maintain stability within the site and on adjacent land.

EW ID	UNITS	EW001	TOTAL
AREA	**m²**	**1,824**	**1,824**
CUT	m³	348.8	348.8
BULK TOT. CUT	**m³**	**348.8**	**348.8**
MAX. CUT DEPTH	**m**	**0.8**	**0.8**
BULK FILL	m³	229.3	229.3
FILL +15% BF.	m³	263.7	263.7
BULK TOT. FILL	**m³**	**229.3**	**229.3**
BULK CUT OFFSITE	m³	-	85.1
BULK CUT TO FILL	m³	-	263.7
BULK FILL IMPORT	m³	-	0.0
BULK TOT. VOL.	**m³**	**578.1**	**578.1**
MAX. FILL HEIGHT	**m**	**1.3**	**1.3**
BULK TRUCKS	Trucks	-	15
TOPSOIL CLEAN STRIP	m³	308.7	308.7
TOPSOIL TOT. STRIP	m³	308.7	308.7
TOPSOIL TOT. PLACE	m³	152.6	152.6
TOPSOIL TOT. VOL.	**m³**	**461.3**	**461.3**
TOPSOIL TRUCKS	Trucks	-	77
EW TOT. VOL.	**m³**	**1,039.4**	**1,039.4**
EW TOT. TRUCKS	Trucks	-	92

Figure 3: Earthworks quantities. Source: Civil Drawings

3.4.1 Contamination

The Detailed Site Investigation (DSI) in **Appendix 8** includes an assessment against the relevant statutory documents which control contaminated land. The findings of the DSI are set out below:

- As the piece of land covered by this report does not meet the criteria outlined in regulation 5(7) (a) through to (c), and that it is more likely than not that a HAIL activity has not taken place on the piece of land, the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) does not apply to the site.
- Land disturbance can be conducted as a permitted activity under the proposed Northland Regional Plan.

- There are no specific rules with respect to contaminated land under the Far North District Council Fully Operative District Plan.

3.5 Landscaping

Landscaping is proposed throughout the site as illustrated on the plans prepared by Resilio studio, included as Appendix 6. The landscaping plans include planting, surface treatments and fencing.

The street tree at the front of the site will be retained, with no excavation proposed near root zone of the tree. Additionally, the large Pohutukawa tree at the southwest corner of the site will be retained to enhance the amenity of the development and the surrounding neighbourhood. The fence heights along the front of the site are 0.9 m in order to provide high quality residential character. 1.8m fencing is provided adjacent to outdoor living spaces and rear and side boundaries in order to create privacy.

3.6 Subdivision

It is proposed to carry out freehold subdivision around the approved development to contain each dwelling on its own lot and provide a Jointly Owned Access Lot ('JOAL'). Refer to the scheme plan included as Appendix 10 for further information.

4.0 Reasons for Consent

The proposal requires resource consent for the following activities, as required by the operative Far North District Plan. A detailed assessment of compliance with relevant rules and standards is attached as **Appendix 2**.

4.1 Operative Far North District Plan

Urban Environment

Residential intensity

- The proposal does not comply with the permitted activity of 600m^2 for each residential unit (Rule 7.6.5.1.2) or the restricted discretionary activity of 300m^2 per unit (Rule 7.6.5.3.1). Therefore, resource consent is required as a **discretionary activity** under Rule 7.6.5.4. Each residential unit will be provided the following site areas:
  - Lot 1: 351m^2
  - Lot 2: 193 m^2
  - Lot 3: 188 m^2
  - Lot 4: 221 m^2
  - Lot 5: 282 m^2
  - Lot 6: 442 m^2

Sunlight

- Proposed Unit 4 does not meet the permitted activity for sunlight (Rule 7.6.5.1.5) by a maximum vertical height of 1.5 m over a horizontal length of 9.0 m or the restricted discretionary activity (7.6.5.3.4) by a maximum vertical height of 0.45 m over a horizontal length of 1.7m. Therefore, resource consent is required as a **discretionary activity** under Rule 7.6.5.4.

Natural and Physical Resources

Soils and Minerals

- The proposal does not meet the permitted activity of 200m^3 of excavation and/or filling in any 12-month period per site (Rule 12.3.6.1.3) and does not meet the restricted discretionary activity of 500m^3 (Rule 12.3.6.2.2), as 1,042.6m^3 of earthworks are proposed. Therefore, resource consent is required as a **discretionary activity** under Rule 12.3.6.3.

Transportation

Traffic

- The proposal does not meet the permitted activity traffic movements of 20 per day in the residential zone (Rule 15.1.6A.2) and does not meet the restricted discretionary rule of 40 movements per day in the residential zone (Rule 15.1.6A.4). The proposed traffic movements of 60 per day is a **discretionary activity** under Rule 15.1.6A.5.

Parking

- The number of parking spaces do not meet the minimum of two per residential unit (15.1.6B.1), as 8 spaces are provided for 6 units. Therefore, resource consent is required as a **discretionary activity** under Rule 15.1.6B.3.
- The parking space depths do not meet the permitted activity dimension of 5.9 m (15.1.6B.1.5), which are 5.4 m deep. Therefore, resource consent is required as a **discretionary activity** under Rule 15.1.6B.3.

Access

- The legal width of the accessway for the 6 units does not meet the permitted standard of 7.5 m wide for 5-8 households equivalent (15.1.6C.1.1), which will be 5.6 m wide. Therefore, resource consent is required as a **discretionary activity** under Rule 15.1.6C.2.

Subdivision

Minimum Lot Sizes

- As a number of the proposed lots will be smaller than 300m^2, the proposal cannot comply with the minimum lot sizes required for a controlled or discretionary activity subdivision (being 600m^2 and 300m^2 respectively):
    - Lot 1: 351m^2
    - Lot 2: 193 m^2
    - Lot 3: 188 m^2
    - Lot 4: 221 m^2
    - Lot 5: 282 m^2
    - Lot 6: 442 m^2

  Therefore, the proposal is a **non-complying** activity under Rule 13.11.

Allotment Dimensions

- The following lots do not meet the controlled activity minimum building envelope dimensions in the Residential Zone of 14m by 14m (13.7.2.2):
    - Lot 2: 14.5 m x 12.5 m
    - Lot 3: 15.5 m x 12.1 m
    - Lot 4: 15.5 m x 13.7 m
    - Lot 5: 21.8 m x 13.0 m
    - Lot 6: 33.3 m x 13.0 m

  Therefore, the proposal is a **non-complying** activity under Rule 13.11.

5.0 Consultation and Engagement

As set out in Clause 6(3) of Schedule 4 and additionally in s36A of the Act, an applicant is not obliged to consult any person on an application, nor are there any grounds for expecting that the applicant will consult any person.

Notwithstanding the above, the details below set out the consultation and engagement that has been carried out in relation to the proposal.

5.1 Consultation with Council

A preapplication meeting was held with the Far North District Council on 31/05/2024. Provide an outline of the key matters discussed at the meeting.

Item	Description	Measure to address
1	Suggests a condition for the consent to minimize debris during construction, particularly in the flight path area.	Refer to erosion and sediment control measures proposed in the infrastructure report attached as **Appendix 7**
2	Concerns about monitoring noise complaints and acoustic insulation in new dwellings	Not a standard to be complied with. Reverse sensitivity effects are addressed in **Section 8.3**.
3	Sunlight breaches and shading impact on neighbour's and if there would be a breach on the southwest boundary of the site (specifically unit 4, 5 and 6). Applicants have checked and no further shadows will be cast from the units, so no need to seek neighbours' approval.	Additional shading is negligible, as shown in the Architectural Drawings in **Appendix 5**
4	Proposed district plan has not been notified, but rules with immediate effect should be considered.	Refer to **Appendix 2**
5	Council is undertaking hearings for the proposed district plan, with a focus on earthworks, vegetation, biodiversity, and heritage.	Refer to **Appendix 2**
6	Concern about exacerbating flooding in the area due to impermeable surfaces and lack of infrastructure development. Suggests that a combination of permeable surfaces and mitigation measures may be necessary to reduce fixed downstream, but more information is needed to make a decision.	Refer to Stormwater Management Report in **Appendix 7**
7	Address pedestrian safety measures, lighting, visitor parking, narrowing of the street due to vehicles parking on both sides, and parking shortfall in a new development project.	Refer to Traffic Assessment in **Appendix 9**

6.0 Assessment of Environmental Effects

Pursuant to Schedule 4 of the Act, an application for resource consent must include an assessment of actual and potential effects of the activity on the environment, identification of any persons affected by the activity, and a description of any mitigation measures proposed to help prevent or reduce an effect where appropriate.

Any assessment must: (a) include the information required by Schedule 6, (b) address the matters specified in Clause 7, and (c) include such detail as corresponds with the scale and significance of the effects the activity may have on the environment. Such assessment is subject to the provisions of any relevant policy statements and plans.

6.1 Relevant Considerations

6.1.1 The Receiving Environment

The surrounding environment as it exists today is described in **Section 3.2**.

Importantly however, the receiving environment beyond the subject site comprises not only those activities which have been lawfully established previously (as per **Section 3.2**), but also those activities which can occur as of right under relevant plans, and those activities enabled by unimplemented resource consents that are likely to be implemented:

- The following permitted activities are considered to be of relevance to the receiving environment:
    - One dwelling per 600m^2 net site area.

Any assessment of adverse effects of the proposal should be considered within this context, as framed by the receiving environment.

6.1.2 The Permitted Baseline

In deciding whether an activity will have or is likely to have adverse effects on persons and on the wider environment, and in accordance with s95D, 95E, and 104(1)(a), a consent authority may disregard an adverse effect if a rule or national environmental standard permits an activity with that effect.

With regards to the activities forming the basis of this resource consent application, and as described below, it is considered that the following permitted activities are of relevance to the proposal.

In this case, the following may be undertaken as a permitted activity on the site:

- One dwelling per 600m^2 net site area

6.1.3 Activity Status

In accordance with Schedule 4, any requirement to include information or to address a matter within an assessment of environmental effects is subject to the provisions of any policy statement or plan.

Overall, the application is for a **discretionary land use activity** and a **non-complying subdivision activity.**

It is considered appropriate that the land use and subdivision activities are bundled. As a non-complying activity, Council may have regard to any relevant planning matters in deciding the application and in imposing conditions of consent.

6.2 Actual and Potential Effects on the Environment

The following assessment addresses those matters required by Clauses 6 and 7 of Schedule 4, and is subject to those considerations outlined in Sections 6.1.1 to 6.1.3. For the avoidance of doubt, and subject to Part 2 and s77M, the below also addresses those matters which Council must have regard to for the purpose of s104(a) and (ab).

6.2.1 Neighbourhood Character and Amenity

As described in section 2.2 above, the surrounding locality is residential in nature, and features predominantly single storey dwellings with open, grassed frontages and low level fencing. It is considered that, although the proposed development will include two, two storey dwellings and four, one storey dwellings, the proposal will contribute positively to the character and amenity of the existing environment.

Chapter 11 of the operative Far North District Plan contains assessment criteria for activities that do not comply with the residential intensity standards of the residential zone. Of relevance to the proposed development is 11.1(a), which includes:

> *the character and appearance of buildings and the extent to which the effects they generate can be avoided, remedied or mitigated, consistent with the principal activity on the site and with other buildings in the surrounding area.*

It is considered that the proposed dwellings are consistent with the built character and amenity of the wider environment based on the following reasons:

- The design considerations, such as scale, massing, and architectural style, have been carefully addressed to align with the anticipated neighbourhood character. Moreover, these design considerations are sympathetic to the existing neighbour character.
- Setbacks and building heights have been incorporated to maintain the streetscape (including when viewed from the adjoining recreational activity zoned land), promoting visual continuity while allowing for individuality. The generous 8.7 m deep (unit 1) and 17.9 m deep (unit 6) front gardens, and the siting of one front dwelling within each existing lot, are in keeping with the existing streetscape character.
- The overall density of development is greater than what is provided for in the District Plan, however, four out of six of the proposed units contain 2 bedrooms, and two units contain 5 bedrooms. Units 2 & 3 are semi-detached 2-bedroom dwellings which form one building. Accordingly, the proposed units are smaller on balance than what would be generally anticipated for standard residential units in the Residential Zone, which reflects the smaller building footprints of the proposed units. The total building coverage across the sites is 29.6%, which is significantly less than the 45% permitted limit in the OFNDP.
- Rear dwellings, or two detached dwellings within one lot, is an existing feature within the local area, particularly to the south-west, e.g. 17A, 19A and 21A Worth Street. The siting of two new buildings within 9 Worth Street and three new buildings within 7 Worth Street is therefore not considered a significant departure from the existing pattern of development. The visual effects from the proposed number of buildings are also mitigated

by modest building footprints, proposed planting, and limiting units 1-4 to one-storey in height.

- The front yard of the site, and that part of the rear and southern side of the site adjoining the recreational activity zoned land, has been carefully considered with a combination of planting and fencing to maintain residential amenity when viewed from public spaces.
- It is not considered that the sunlight standard infringement for Unit 4 will be discernible or visually dominant from public spaces.
- There is a reduction in the overall number of vehicle crossings from what is existing on site (two in total). From a character and amenity perspective, this is an improvement on the existing use of the site. All of the car parking spaces served by these vehicle crossing will be to the rear of the proposed dwellings or located behind a fence and therefore screened from public view.

Regarding noise, while a higher level of noise from occupation and movement is inevitable, the character of this noise will be residential in nature.

Traffic and parking considerations have been taken into account to minimise potential congestion, ensuring adequate off-street parking for both residents and visitors, discussed further under Section 6.2.6.

Overall, it is considered that the proposal will be in keeping with the scale and form intended for the zone and any potential adverse effects in terms of amenity and built character will be less than minor and acceptable.

6.2.2 Infrastructure and Servicing

The provision of infrastructure to service the development has been considered in the Infrastructure Report prepared by Civix (refer Appendix 7). Their report and drawings confirm that the site can be adequately serviced.

In particular:

- It is proposed to discharge stormwater to the kerb. A detailed assessment shows compliance with the standards in the stormwater matters of control under 13.7.3.4, in the stormwater management report attached as Appendix 7. Provision is made for limiting the post development flow rates to 80% of the pre-development 1% AEP event flow rate (pre-development has been taken as a fully grassed site).
- Capacity analysis has been carried out on the wastewater infrastructure, which indicates that there is adequate capacity in the network to service the proposed development; and
- Connections will be made to the public network for water supply.

I also note that there is adequate provision for rubbish bin storage within each new residential lot, and accessible routes and space for moving bins to the road reserve for collection.

Having regard to the above, it is considered that the proposed development can be adequately serviced, and measures provided will ensure that any potential adverse effects are less than minor and acceptable.

6.2.3 Transport

A total of 8 car parking spaces are included as part of the proposed development which is less than the 12 required for the 6 units. The predicated daily vehicle movements of 60 per day for

the site also requires consent as it exceeds the permitted standard of 20. The parking space depths are 5.4 m which is short of the 5.9 m standard. The legal width of the proposed vehicle access is also 5.6 m wide which is short of the 7.5 m standard. The development has been designed to comply with all other Chapter 15 rules and vehicle tracking is attached as **Appendix 9**, to confirm all vehicles can exit the site in a forward manoeuvre.

The infringements to the transport standards have been assessed by a Traffic Planning Consultants traffic engineer in the Transport Assessment attached as **Appendix 9**. Key points from the traffic assessment include:

- Additional traffic movements to and within the site have been assessed, and the site is considered to have sufficient space to accommodate these movements as well as the adjoining road network having capacity to accommodate the additional trip generation. Worth Street has a good safety record.
- There is good forward visibility towards the carriageway and intervisibility with the footpath which will supplement safety.
- There is plenty of off-street parking available along the site's frontage and close vicinity for the residents and visitors to park.
- The number of parking spaces provided is appropriate for the expected demographic, number of residents, and access to cycling and public transport.
- The parking space length shortfall does can be attributed to a shortfall in overhang. However, the combined length of the parking and manoeuvring spaces meet the depth required by the standards.
- The dimensions of the proposed parking spaces are considered acceptable for operational and safety purposes.
- The formed and legal width of the accessway provides the best amenity and safety outcome. There are no adverse effects from the legal width of the access being less than the standard.

Overall, the transport effects will be less than minor.

6.2.4 Earthworks

During construction, it is proposed to install temporary sediment and erosion control measures to mitigate any potential adverse environmental effects as a result of the proposed land disturbance. Any adverse construction effects on the wider environment are considered to be less than minor as:

- It is anticipated that the construction works will be able to comply with the OFNDP's noise and vibration standards having regard to the nature of the proposal. It is considered that any adverse effects associated with noise and vibration would be temporary in nature, and are considered to be less than minor;

- It is anticipated that earthworks and construction will be carried out during standard construction hours, such that any adverse lighting effects on the wider environment are not anticipated;

- There is sufficient space on the subject site and within the surrounding road network to provide parking for construction vehicles. It is considered that any adverse construction traffic effects will be temporary and able to be appropriately managed;

- There are no known overland flow paths, flood hazards or areas containing significant ecological or indigenous biodiversity values that will be affected by the works;
- Accidental discovery protocol will be followed as required by the permitted activity standard prescribed in standard EW-S3 of the OFNDP;
- There are no known natural hazards that may give rise to increased risk to the works or be exacerbated by the works;
- Although the site has a topography that requires more extensive earthworks than might be required for other residential developments, the effects of the earthworks can be managed within the site; and
- Despite the level of cut and fill proposed, land stability within the site and for adjoining sites will be maintained. This is supported by the geotechnical assessment provided as Appendix 4.

Overall, having regard to the above, it is considered that any adverse construction effects will be less than minor and acceptable.

6.2.5 Subdivision

It is proposed to undertake a freehold subdivision around the development to contain each dwelling on its own lot, and provide COAL's for access to proposed lots 1-6. Further detail is provided in the scheme plan included in Appendix 10.

Having regard to the assessment criteria for subdivision at 13.10 the following comments are made:

- The proposed subdivision design and layout is consistent with the proposed land use and the outcomes anticipated for the Residential Zone. Based on the on-site amenity assessment in Section 6.2.6, the size and dimensions of the new lots would adequately provide for the functional and amenity needs of future occupants. The subdivision layout also supports operational and maintenance requirements, e.g. boundaries are set in from buildings to provide for future building maintenance.
- Physical and legal access is provided to each allotment to be created by the subdivision.
- For the reasons set out in Section 6.2.2 it is considered that the proposed subdivision can be adequately serviced;
- The site is not subject to natural hazards;
- Earthworks effects will be less than minor for the reasons provided in Section 6.2.4; and
- Appropriate easements have been provided in the scheme plan attached as Appendix 10.

Taking the abovementioned points into account, it is considered that any potential adverse effects arising from the proposed subdivision will be less than minor and acceptable.

6.2.6 On-Site Amenity

Although the assessment criteria for residential intensity focuses on ability for outdoor activities associated with the residential activities to be provided for, a full assessment is provided below due to the bundled non-complying activity status below.

Consideration has been given to site planning and building design to ensure that internal and external amenity is provided for the new dwellings, and it is considered that future residents will experience a good level of amenity and liveability, relative to their needs. The size and dimensions of internal spaces of each dwelling are expected to meet the needs of future occupants.

Based on the site layout, the provision of privacy, outlook, and sunlight and daylight access within each new residential lot is considered acceptable. Moreover, the proposed fencing along the site boundaries will help achieve a reasonable level of privacy.

The proposed dwellings also have spacious private gardens where there will be outlook into well landscaped spaces (Appendix 6). Proposed outdoor living spaces will be functional, accessible and have sunlight access.

The proposed land use complies with the zone's standards that manage on-site amenity.

Pedestrian approach routes to the proposed dwellings will be via delineated pedestrian paths. Variation in materials of the vehicle and pedestrian accesses will further enhance the amenity of the development for residents.

Taking the above into account, it is considered that sufficient on-site amenity is provided for future occupants of the dwellings and any adverse effects are less than minor.

6.2.7 Positive Effects

It is considered that the proposal will result in positive effects including:

- The development of six new dwellings of a size and layout that will provide a good level of amenity for future occupants;
- A development that enables residential activities at a density that is anticipated within the planned built environment for the Residential zone;
- New, warm, healthy homes;
- A site layout that is well-considered and positively addresses both the public and private realm; and
- A development which has an attractive interface to the street and will contribute positively to the amenity of the area.

6.2.8 Environmental Effects Summary

Overall, it is considered that when taking into account the positive effects, any actual and potential adverse effects on the environment of allowing the activity are acceptable.

7.0 Statutory Planning Documents (section 104(1)(b))

The following addresses requirements under Clause 2 of Schedule 4 of the Act, requiring an applicant to undertaken assessment of the activity against any relevant provisions of a document referred to in s104(1)(b).

7.1 Regional Policy Statement for Northland 2016

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

Of particular relevance to the proposal is Objective 3.11 Regional Form, which seeks that Northland has sustainable built environments that effectively integrates infrastructure with subdivision, use and development while having a sense of place and a range of lifestyle, employment and transport choices. This objective is supported by Policies 5.1 and 5.2. The proposed development will provide a coordinated development with a higher level of amenity, with extensive landscaping proposed and infrastructure design that will mitigate any potential adverse effects on the surrounding infrastructure network.

Policy 5.1.1 specifically addresses that subdivision, use and development should not result in incompatible land uses in proximity and avoids the potential for reverse sensitivity. Section 8.3 has assessed that there will be no reverse sensitivity effects from the land use.

7.2 Far North District Plan (Operative)

Urban Environment and Residential Zone

Objective 7.3.1 and 7.3.2 seek to ensure that urban activities do not cause adverse environmental effects on the natural and physical resources of the district and to enable the continuing use of the buildings and infrastructure in urban areas. Further, Objectives 7.3.3 and 7.3.4 aim to avoid, remedy or mitigate the adverse effects of activities on the amenity values of existing urban environments and to enable urban activities to establish in areas where their potential conflicts will not adversely affect the character and amenity of those areas.

Policies 7.4.1, 7.4.2, 7.4.4, 7.4.7 and 7.4.9 reinforce these objectives. Specifically, policy 7.4.1 seeks that amenity values of existing and newly developed areas be maintained or enhanced. Policy 7.4.2 state that the permissible level of effects created or received in residential areas reflects those appropriate for residential activities. Further, Policy 7.4.4 states that stormwater systems for urban development be designed to minimise adverse effects on the environment.

Objectives 7.3.3.1 and 7.6.3.2 aim to achieve the development of new residential areas at similar densities to those prevailing at present and to enable a wide range of activities within residential areas where the effects are compatible with the effects of residential activity.

These objectives are supported by Policy 7.6.4.4 which seeks that the Residential Zone provides for a range of housing types and forms of accommodation. Policy 7.6.4.6 seeks that activities with net effects that exceed those of a typical single residential unit, be required to avoid, remedy or mitigate those effects with respect to the ecological and amenity values and general peaceful enjoyment of adjacent residential activities.

Policy 7.6.4.7 seeks that residential activities have sufficient land associated with each household unit to provide for outdoor space, planting, parking and manoeuvring. With regard to stormwater management, Policy 7.6.4.8 seeks that the portion of a site or of a development that is covered in buildings and other impermeable surfaces be limited so as to provide open space around buildings to enable planting, and to reduce adverse hydrological, ecological and amenity effects. In the Residential Zone, Policy 7.6.4.9 aims for site to have adequate access to sunlight and daylight and Policy 7.6.4.10 seeks that provision be made to ensure a reasonable level of privacy for inhabitants of buildings on a site.

The proposal maintains the amenity values of the surrounding environment for the following reasons:

- The proposed development will facilitate the construction of six new housing units. This exceeds the permitted baseline for the subject sites. Nonetheless, the proposed low number of bedrooms, and modest building footprints, results in a building coverage for the site of 29.6%, significantly smaller than what would be generally anticipated in the Residential Zone.
- The proposal provides a range of housing options. Every unit is provided with an outdoor living area which is accessible and receives adequate sunlight.
- The development ensures sufficient privacy and sunlight access is provided as the proposed units comply with the setback requirements in the OFNDP along all internal and external boundaries, except for a small sunlight infringement for Unit 4. The landscaping and fencing treatments proposed will also offer partial screening of the development from the surrounding environment whilst retaining sufficient sunlight access.
- The landscaping will also 'soften' the development, when viewed from public spaces.
- Each of the proposed units will be provided individual wastewater and water supply connections, while stormwater will be collected in tanks and then discharged to the kerb in accordance with the recommendations of the civil infrastructure report attached in Appendix 7. This will ensure adequate servicing.

Subdivision

Objectives 13.3.1 and 13.3.2 aim to provide for the subdivision of land in such a way that will be consistent with the purpose of the zones in the Plan, while ensuring that subdivision of land is appropriate and that actual and potential effects on the environment, including reverse sensitivity effects are avoided, remedied or mitigated. Objective 13.3.5 seeks to ensure that all new subdivisions are provided with reticulated water supply and/or on-site water storage and include sufficient stormwater management.

Objective 13.3.8 aims to ensure that all new subdivisions are provided a sufficient electricity supply and Objective 13.3.9 seeks to ensure that new subdivisions support energy efficient design. With regard to transport, Objective 13.3.10 aims to ensure that the design of all new subdivision promotes efficient provision of infrastructure, including access to alternative transport options, communications and local services.

These objectives are supported by Policies 13.4.1, 13.4.2, 13.4.4, 13.4.5, 13.4.7, 13.4.8, 13.5.14 and 13.4.15.

The proposed units are consistent with the purpose of the Residential Zone as addressed in the comments on the objectives and policies of Chapter 7 above. The development is able to be

adequately serviced, as described in the Infrastructure Report. Each of the proposed units will be provided with individual wastewater and water supply connections. Stormwater will be managed in accordance with the stormwater management report. The proposed lots will be provided with safe and efficient accesses as detailed in Section 6.2.6 of this report. The proposed units will be provided with electricity connections. Overall, it is considered that the proposal accords with these objectives and policies.

Soils and Minerals

The objectives and policies for transport are contained in sections 12.3.3-12.3.4 of the OFNDP and aim to avoid, remedy or mitigate adverse effects on soil erosion, and natural and human/cultural values.

The proposed earthworks will have a limited duration on the site and erosion and sediment control measures have been proposed to mitigate effects during site preparation and construction. Onsite stability and stability for neighbouring sites will be controlled through the geotechnical report.

Transportation

The objectives and policies for transport are contained in sections 15.1.3-15.1.4 of the OFNDP and aim to ensure parking, loading and access is safe and efficient while being commensurate with the character, scale and intensity of the zone and that pedestrian safety and amenity is prioritised. Traffic effects are required to be evaluated and parking spaces are to be efficient and mitigate traffic generation.

The proposal involves constructing six dwellings, 2 containing two bedroom and two containing 5 bedrooms, where eight parking spaces are proposed. The location and design of the vehicle access will not create any adverse effects on pedestrian amenity and vehicle tracking has been provided to show vehicles can safely exit the site in a forward manoeuvre. Parking and traffic generation will not adversely affect impact traffic operation on the surrounding network. Sufficient carparking is available both on-site and on Worth Street to not cause adverse effects. The development is provided with options for cyclists and pedestrians to access the proposed units.

Overall, it is considered that the proposal accords with these objectives and policies.

7.3 Far North District Plan (Proposed)

The objectives and policies of the draft General Residential and Subdivision chapter generally seek to provide for consolidated residential development where there is three waters infrastructure by enabling a variety of housing types and densities to respond to housing needs and demands of the area, whilst taking into account the amenity and character of the receiving residential environment. The framework of the General Residential Zone relies on building coverage to manage density and permits up to 50% of the gross site area, and the threshold for subdivision remains the same. Another key outcome sought by the PDP is to consolidate urban residential development around available or programmed development infrastructure. For the same reasons assessed under the FNDP, it is considered that the proposal generally aligns with the future direction for the zone in the Draft District Plan which places an emphasis on intensification of development and a range and variety of housing types to meet the demands of the market

8.0 Notification Tests

8.1 Public Notification (Section 95A)

In accordance with s95A of the Act, a consent authority must follow the below steps in determining whether to publicly notify a resource consent application:

Step 1: Mandatory public notification in certain circumstances

Public notification is not required under Step 1, as the applicant has not requested that the application is notified and the application has not been made jointly with an application to exchange recreation reserved land under section 15AA of the Reserves Act 1977.

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

Public notification of the land use consent application is not precluded under Step 2, as the applicable rules do not preclude public notification, and the proposal is not a controlled activity or boundary activity. Therefore, public notification is not precluded.

Public notification of the subdivision consent application is not precluded under Step 2, as the applicable rules do not preclude public notification, and the proposal is not a controlled activity or boundary activity. Therefore, public notification is not precluded.

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

Public notification the land use consent application is not required under Step 3, as an assessment has been carried out in **Sections 6.21** to **Section 6.2.9** and it is concluded that effects on the wider environment will or are likely to be less than minor.

Public notification of the subdivision consent application is not required under Step 3, as an assessment has been carried out in **Section 6.2.6** and it is concluded that the subdivision related effects on the wider environment will or are likely to be less than minor.

Importantly, for the purposes of Step 3, positive effects and any effects on persons owning or occupying the subject site and any adjacent land must be excluded from consideration. That land which must be excluded is shown in **Figure 4** below.

- 11A Worth Street, Kaitaia
- 11B Worth Street, Kaitaia
- Section 33 Block V Takahue SD
- 8 Tangonge Crescent, Kaitaia
- 6 Tangonge Crescent, Kaitaia
- 5 Worth Street, Kaitaia
- 12 Worth Street, Kaitaia
- 14 Worth Street, Kaitaia
- 16 Worth Street, Kaitaia

Figure 4: Adjacent properties to be excluded from s95A consideration (outlined yellow) in relation to the application site.

Step 4: Public notification in special circumstances

Public notification is not required under Step 4, as the proposal is for a residential activity on a residentially zoned site. As such, it is considered that there is nothing special or noteworthy about the proposal.

Further, as discussed in this report above, it is considered that the development fits within the character of the area and that any adverse effects will be less than minor. There is not considered to be anything about the proposed intensity of the development nor its scale, form and appearance that is considered to give rise to special circumstances. It is considered that there is nothing noteworthy about the proposal. It is therefore concluded that the application cannot be described as being out of the ordinary or giving rise to special circumstances.

8.2 Limited Notification (Section 95B)

In accordance with s95B of the Act, a consent authority must follow the below steps in determining whether to limited notify a resource consent application:

Step 1: Certain affected groups and affected persons must be notified

Limited notification is not required under Step 1, as the proposal is not considered to affect protected customary rights grounds or customary marine titles, and the site is not subject to a statutory acknowledgment.

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

Limited notification land use consent application is not precluded under Step 2, a the applicable rules do not preclude limited notification and the proposal is not for a controlled activity. Thereofre, limited notification is not precluded.

Limited notification subdivision consent application is not precluded under Step 2, as the applicable rules do not preclude limited notification and the proposal is not for a controlled activity. Thereofre, limited notification is not precluded.

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

Assessment of whether there are any affected persons is included below in **Section 8.3**, and considers effects on persons subject to those considerations outlined in **Section 6.1**.

Limited notification land use consent application is not required under Step 3, as an assessment has been carried out and is included below in **Sections 8.3.1** to **8.3.7** which concludes that effects on persons will be less than minor.

Limited notification subdivision consent application is not required under Step 3, as an assessment of subdivision effects has been carried out and is included below within **Sections 8.3.1** to **8.3.7** which concludes that subdivision effects on persons will be less than minor.

Step 4: Further notification in special circumstances

Limited notification is not required under Step 4, for the reasons set out in **section 8.1** above.

8.3 Identification of Affected Persons

In accordance with s95E, a person is an affected person 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).

Importantly, a consent authority must disregard an adverse effect on a person who has given and not withdrawn their written approval for the proposal. In relation to the application, no written approvals were obtained.

In the following assessment, particular regard was had to those owners and occupiers of land identified in **Figure 5** below.

Figure 5: Adjacent properties to be considered in the s95E assessment (outlined yellow) in relation to the application site.

The following comments apply to persons at all adjacent properties:

- The building intensity of the development is of that expected in the Residential Zone, as discussed further under Section 6.2.1.
- The buildings are considered to feature a level of modulation and articulation through their overall form, use of different materials and glazing. These features create a visually interesting development that assists in avoiding perceived bulk;
- The proposal involves landscaping throughout the site which will assist in softening views of the development and allowing buildings to blend into the residential character intended for the zone;
- Privacy concerns have been mitigated through design elements like setbacks, fencing, and landscaping, fostering a sense of seclusion for the new dwellings and their neighbours.
- It is considered that no persons will be adversely affected by the proposal in terms of infrastructure capacity or servicing, noting that a stormwater management report has been prepared for the site and the assessment in Section 6.2.2; and
- Any effects of the earthworks proposed will be contained within the development site and although there are earthworks proposed that exceeds the permitted standards, it is considered to be reasonably anticipated for a residential development on a site where there is varying topography. Earthworks and construction will be of a limited duration and in compliance with the noise and acoustic standards of the AUP (OP).

The following comments are made in relation to persons at specific adjacent properties:

8.3.1 Effects on persons at 5 Worth Street

This property is located to the north of the subject site (adjoining the side boundary of 7 Worth St) and contains a residential dwelling and associated accessory buildings including a garage. There are four two-bedroom dwellings proposed adjoining this site (Units 1-4), which form three buildings.

The proposed dwellings adjoining this site are fully compliant with the bulk and location standards of the zone, one storey, and not out of character with the existing environment. Visual dominance effects on the neighbour are minimised with 6.8 m and 5.5 m wide spacings between the three new buildings (units 1-4). Moreover, the new buildings are generally set approximately 5 m in from the shared boundary, with small single-storey projections extending to within approximately 2 m of the boundary.

Privacy will be maintained with the site at 5 Worth St as units 1-4 are single storey and 1.8 m high fencing is proposed along the shared boundary. The shading diagrams in Appendix 5 demonstrate that sunlight access will be maintained within the adjacent site.

Landscaping will further soften the appearance of the proposed development, including where retaining is proposed, and to enhance the residential character within the site and when viewed from adjacent properties.

Overall, any adverse effects on the amenity values enjoyed at 5 Worth St are considered less than minor.

8.3.2 Effects on persons at 11A and 11B Worth Street

These properties are located to the south of the development site. The side boundaries of these properties are adjoining 9 Worth Street, in proximity of the two five-bedroom dwellings proposed (Units 5 and 6). A 3 m wide public accessway separates the subject site from the adjacent site. Given the proposed development meets the required setbacks and building heights for both of these dwellings, adverse effects on these adjacent sites are less than minor. It is further noted that the portion of these two proposed dwellings closest to 11A and 11B Worth St will be a single storey projection. The upper floors of proposed units 5 and 6 are set 8.3 m in from the adjacent site. Visual dominance effects on the adjacent site are therefore considered less than minor.

Privacy within 11A and 11B Worth St would be maintained as the internal and external living areas of units 5 & 6 are at the ground level and 1.8 m high fencing is proposed along the shared boundary. The shading diagrams in Appendix 5 demonstrate that sunlight access will be maintained within the adjacent site. From these adjacent sites, the development will appear as a typical residential development, with two storey dwellings and significant landscaping to soften the proposed bulk. Outdoor living space is oriented towards these adjacent sites, however retaining, fencing and landscaping will provide for a high level of privacy, along with the additional separation the vehicle accessway on 11A and 11B Worth St. This will mitigate any potential visual dominance effects.

Overall, any adverse effects on the amenity values enjoyed at 11A and 11B Worth St are considered less than minor.

8.3.3 Effects on persons at 12, 14 and 16 Worth Street

These properties are located to the east of the development site, on the opposite side of Worth St. Given the generous separation distance created Worth St, it is considered that the proposed development will not create any adverse effects on persons at these properties. The front dwellings will have an interface with the street that provides for high quality amenity and enhances the overall streetscape over what is existing on the site, particularly when viewed from these adjacent sites.

Additionally, the landscaping proposed along the site frontage has been carefully considered. A combination of planting placement and fencing will create a suburban character and soften the bulk of the proposed dwellings when viewed from these adjacent sites. The one to two-storey nature of the proposed dwellings will also allow the buildings to not appear visually dominant.

Overall, any adverse effects on the amenity values enjoyed at 12-16 Worth St are considered less than minor.

8.3.4 Effects on persons at 6 & 8 Tangonge Crescent

These properties are located to the west of the development site, immediately adjoining the boundary with No. 7 Worth. Unit 4 of the proposed development infringes the sunlight standards (permitted and restricted discretionary) along this shared boundary.

In terms of visual dominance effects, the sunlight infringement will be limited to the roof, eaves and a small area of cladding. Due to the minimal extent of the infringement as the roof is pitched in this infringement, and compliant setbacks to the boundary, there are no additional visual dominance effects when viewed from neighbouring sites. The dwellings are also setback considerably from the existing dwellings on these adjacent sites. The dwelling that will be most visible from these adjacent sites is one-storey, and consistent with what can be found in a suburban environment.

As no glazing is located within the sunlight infringement for Unit 4, there are considered to be no adverse effects on privacy above what is permitted in the zone. A reasonable level of privacy will be maintained to the adjacent sites as the proposed dwellings are adequately setback, and fencing is proposed along the shared boundary.

As illustrated in the sun shading visuals included in Appendix 5, not only is the additionally shading created by the sunlight infringement negligible but the outdoor living space of the adjacent sites are generously sized. In winter there will be no additional shading from this infringement. Therefore, there are no adverse effects with regard to sunlight access.

The proposed vehicle access is well separated from these adjacent site as to not create adverse effects from the additional traffic movements on the development site. Parking spaces are also well setback from the shared boundaries and the provision of fencing and landscaping further soften all aspects of the development when viewed from these sites.

Overall, any adverse effects on the amenity values enjoyed at 11A and 11B Tangonge Crescent are considered less than minor.

8.3.5 Effects on persons at Anne West Kindergarten and recreational activities zoned land

Anne West Kindergarten is located to the west of the subject site, and adjoining this to the north-west of the subject site is the recreation activities zoned land, under FNDC management (recreation reserve). These sites will have views of predominately Units 4 (2-bedroom one-storey dwelling) and 5 (two-storey, 5-bedroom dwelling) of the proposed development. Unit 5 has a spacious rear yard adjoining this sites and Unit 4 will have a low perceived bulk due to being one-storey and 2-bedrooms.

Given that Unit 5 dwelling will be setback 6 m from the site boundary it is not considered that there will be any reverse sensitivity effects from Anne West Kindergarten. Interms of noise, the kindergarten will be required to comply with the noise standards of the OFNDP, or standards included on any resource consent, and will be limited to its hours of operations due to the

nature of the activity. The new homes will have high noise insulating properties. In terms of privacy the proposed boundary fencing and living on the ground floor will mitigate privacy effects. It is noted there are no policies or rules in the OFNDP which control new residential development near existing activities like kindergartens.

The proposed vehicle access is well separated from these adjacent site as to not create adverse effects from the additional traffic movements on the development site. Parking spaces are also well setback from the shared boundaries and the provision of fencing and landscaping further soften all aspects of the development when viewed from these sites.

Overall, any adverse effects on Anne West Kindergarten and persons using the adjacent reserve are considered less than minor.

8.3.6 Effects on persons at Kaitaia Hospital

The helicopter landing area for the Kaitaia Hospital is located approximately 115 m south-east of the subject site and the infrequent operation of helicopters may cause noise and wind effects to the subject site. It is not considered that the proposal will result in reverse sensitivity effects given the setback from the landing area. Furthermore, as discussed in Section 6.2.1, the development largely comprises two-bedroom units and it is anticipated that the effects as a result of the development will be lesser than if dwellings of a larger size were established. For example, the residential zone provides for residential activities at a density of one unit per 300m^2. Based on the 1,991m^2, the ODP provides for up to 6 residential units as a permitted activity where compliance with the relevant bulk, location and district wide standards are achieved. This could result in 6 x 4 bedroom dwellings (24 bedrooms total), whereas 18 bedrooms are proposed.

Overall, any adverse effects on Kaitaia Hospital are considered less than minor.

8.3.7 Affected Persons Summary

Taking the above into account, it is considered that any adverse effects on persons at the aforementioned properties will be less than minor.

It is considered, therefore, that there are no adversely affected persons in relation to this proposal.

8.4 Notification Conclusion

In accordance with the above statutory tests, it is considered that the application may be processed without public notification.

In accordance with the above statutory tests, it is considered that the application may be processed without limited notification.

9.0 Part 2 of the Act

As set out in s104, a consent authority must have regard to Part 2 of the Act when considering and making a decision on a resource consent application. Part 2 comprises the 'Purpose and Principles' of the Act, with a focus on (paraphrased):

- The sustainable management of natural and physical resources, so as to safeguard their life-supporting capacity for future generations, and avoid, remedy, or mitigate adverse effects on the environment (s5);
- The recognition and protection of matters of national importance (s6);
- The recognition that other significant resource management matters should be given sufficient regard (s7); and
- The incorporation of the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) into the decision making process.

Notwithstanding the above, the Court of Appeal in *RJ Davidson Family Trust v Marlborough District Council* [2018] found that reference to Part 2 need not be necessary if a plan has been competently prepared having sufficient regard to Part 2.

In this case, it is considered that the Operative Far North District Plan has a coherent and consistent set of provisions which collectively will achieve clear environmental outcomes, thereby addressing the purpose and principles of the Act. Assessment of the proposal against relevant Objectives and Policies has been undertaken in earlier sections of this report, and it is considered that no further Part 2 assessment is required in this instance.

10.0 Other Sections of the Act

10.1 Section 104D of the Act

To be able to grant an application for a non-complying activity, the Council must be satisfied that either:

- the adverse effects of the activity on the environment will be minor (section 104D(1)(a)); or
- the proposed activity will not be contrary to the objectives and policies of a proposed plan or operative plan (section 104D(1)(b)).

This consideration is commonly known as the 'threshold test' or 'gateway test' and Council must be satisfied that either of the limbs of the test can be passed.

The proposal satisfies the threshold test of section 104D because the adverse effects on the environment will be less than minor and the proposal will not be contrary to the objectives and policies of the Far North District Plan (Operative) and Far North District Plan (Proposed).

The application, therefore, meets both the threshold tests of section 104D and the application can be assessed under section 104 and a determination can be made under section 104B.

10.2 Section 106 of the Act

A consent authority may refuse to grant a subdivision consent, or may grant a subdivision consent subject to conditions, if it considers that there is significant risk from natural hazards or if sufficient provision has not been made for legal and physical access to proposed allotments.

The development site is not subject to natural hazards. As the intention of the subdivision is to occur around land use resource consent, the subdivision will not create any effects over and above what has been assessed for the land use consent.

Pursuant to Section 106(1)(c) the Far North District Council may refuse subdivision consent if sufficient provision has not been made for legal and physical access to each allotment to be created by the subdivision. A vehicle crossing to the site will be provided as part of this proposal to provide access to the site.

Pedestrian access is also provided to each of the dwellings as illustrated on the site plan (refer Appendix 5). Therefore, it is considered that sufficient provision will be made for legal and physical access to each allotment to be created by the subdivision.

10.3 Other Matters (Section 104(1)(c))

There are no other matters considered relevant to the processing of this application.

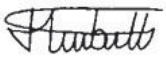
11.0 Conclusion

As described in the above report, and in relation to the proposal which involves 6 new dwellings and subdivision at 7 & 9 Worth Street, Kaitaia it is concluded that:

- Public notification is not required as adverse effects are considered to be less than minor.
- Limited notification is not required as no persons at adjacent properties are considered to be adversely affected by the proposal;
- The proposal accords with the relevant OFNDP and Proposed FNDP objectives, policies and assessment criteria; and
- The proposal is considered to be consistent with Part 2 of the Act.

It is therefore concluded that the proposal satisfies all matters the consent authority is required to assess, and that is can be granted on a non-notified basis.

Ngā mihi,



Jacob Turnbull

Senior Planner

Babbage Consultants

21/06/2024

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	**NA46A/538**
Land Registration District	**North Auckland**
Date Issued	24 January 1979

Prior References
NA1561/25

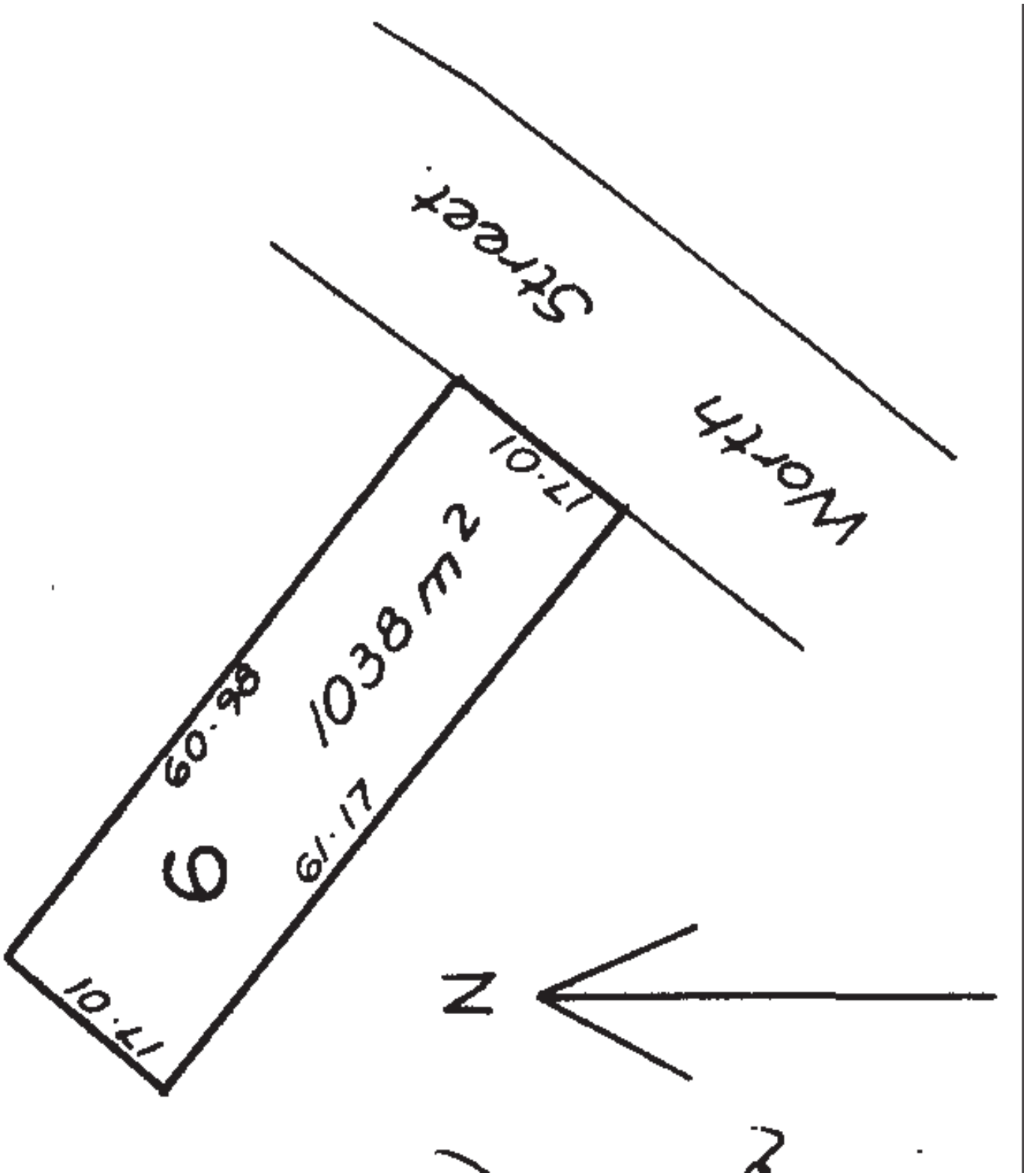
Estate	Fee Simple
Area	1038 square metres more or less
Legal Description	Lot 6 Deposited Plan 38117
Registered Owners	

Housing New Zealand Limited

Interests

K61610 Certificate that a pipeline for the passage of sewage passes through and serves the within land - 31.5.1957 at 2.15 pm

K73925 Certificate that a pipeline for the passage of stormwater passes through the within land - 30.11.1959 at 11.25 am


Worth Street
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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	**NA46A/540**
Land Registration District	**North Auckland**
Date Issued	24 January 1979

Prior References
NA1561/25

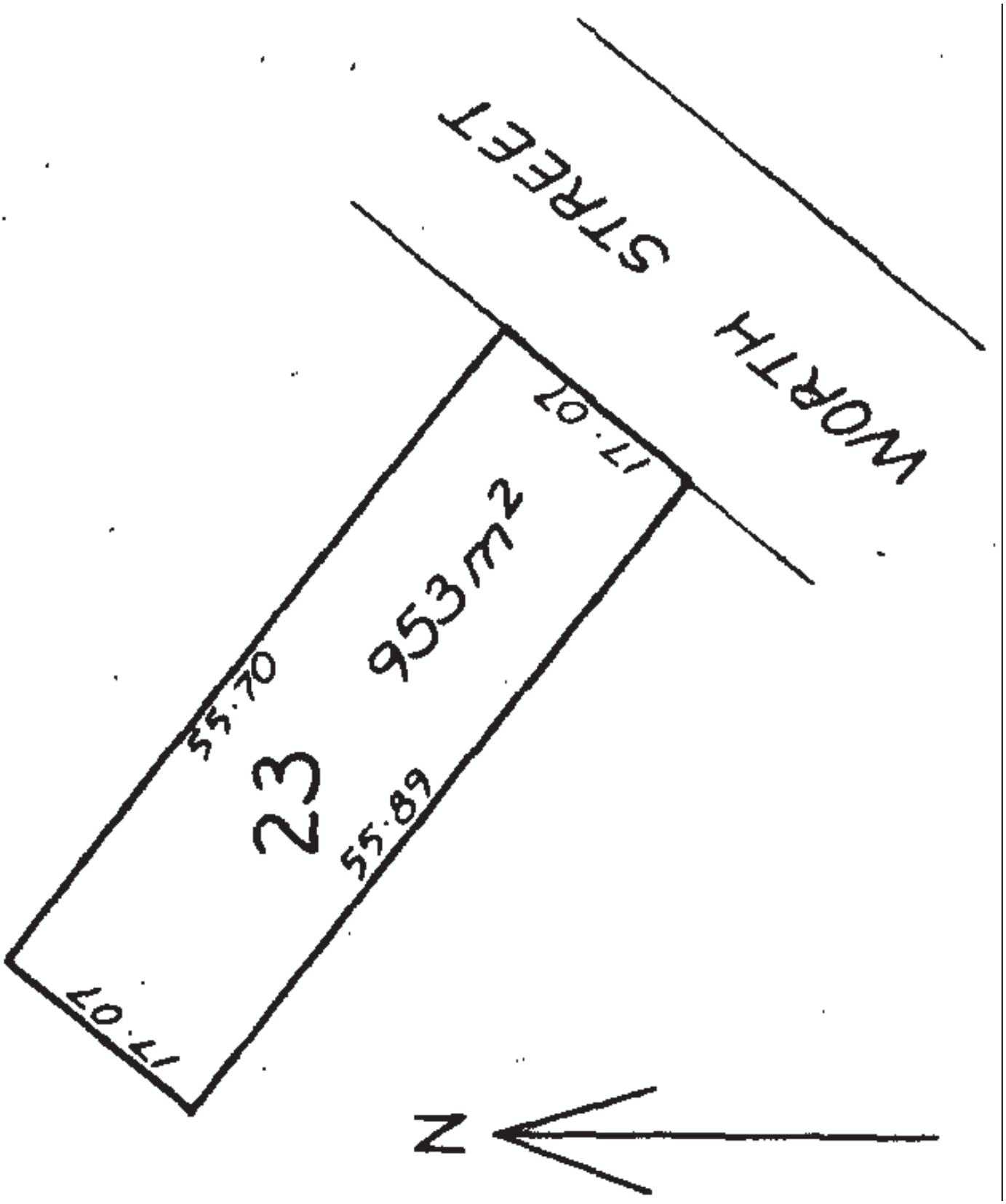
Estate	Fee Simple
Area	953 square metres more or less
Legal Description	Lot 23 Deposited Plan 38127
Registered Owners	

Housing New Zealand Limited

Interests

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

K73925 Certificate that a pipeline for the passage of stormwater passes through the within land - 30.11.1959 at 11.25 am


WORTH STREET
17.07
953m²
55.70
23
55.89
17.07
N

Request No: 1252

K61610 HCEC

[D. 52.

Approved by the Registrar-General of Land as No. 2511

PIPE LINE CERTIFICATE

Under Section 26 of the Housing Act 1955.

THE STATE ADVANCES CORPORATION OF NEW ZEALAND acting under Section 26 of the Housing Act 1955 (extracts from which are for convenience of reference printed on the back hereof) **HEREBY CERTIFIES** that a pipe line for the passage of (1) sewage passes over or through and serves, the several parcels of land specified in the First Schedule hereto as more particularly appears in the diagram (2) annexed hereto showing the several parcels of land served by the pipe line and the land over or through which the pipe line has been constructed, and showing the course of the pipe line in red.

(1) Insert water, stormwater or sewage.

(2) Insert "endorsed hereon," or otherwise refer to diagram.

and HEREBY FURTHER CERTIFIES that a pipe line for the passage of stormwater passes over or through and serves, the several parcels of land specified in the Second Schedule hereto as more particularly appears in the diagram annexed hereto showing the several parcels of land served by the pipe line and the land over or through which the pipe line has been constructed, and showing the course of the pipe line in green.

and HEREBY FURTHER CERTIFIES pursuant to Section 26 (2) (c) of the Housing Act 1955 that the section of the pipe line referred to above which passes over or through Lot 13 on Deposited Plan 38127 was constructed on the land while it belonged to the Crown.

FIRST SCHEDULE

Registered proprietor of fee simple.	Item	Dominant Tenement(s): official description of the parcels of land served by the pipe line.	Registered Agreement or Licence to Occupy affecting any dominant tenement, and names of purchasers or licensees.	Servient Tenement(s): official description of the parcels of land over or through which the pipe line passes.	Registered Agreement or Licence to Occupy affecting any servient tenement, official description and names of purchasers or licensees.
Column (a)		Column (b)	Column (c)	Column (d)	Column (e)
~~Her Majesty the Queen for the purposes of the Housing Act 1955.~~ Her Majesty the Queen for State housing purposes under the Housing Act 1955.	1.	Lot 19 Deposited Plan 38127		Lot 18 Deposited Plan 38127	
	2.	Lot 1 Deposited Plan 38101		Lots 2,3,4 & 18 Deposited Plan 38101	
	3.	Lot 2 Deposited Plan 38101		Lots 3,4,& 18 Deposited Plan 38101	
	4.	Lot 3 Deposited Plan 38101		Lots 4 & 18 Deposited Plan 38101	
	5.	Lot 4 Deposited Plan 38101		Lot 18 Deposited Plan 38101	
	6.	Lot 5 Deposited Plan 38117		Lot 23 Deposited Plan 38127 Lot 6 Deposited Plan 38117 and Lots 7,13 & 14 Deposited Plan 38101	
	7.	Lot 23 Deposited Plan 38127		Lot 6 Deposited Plan 38117 and Lots 7,13 & 14 Deposited Plan 38101	
	8.	Lot 6 Deposited Plan 38117		Lots 7,13,& 14 Deposited Plan 38101	
	9.	Lot 7 Deposited Plan 38101		Lots 13 & 14 Deposited Plan 38101	
	10.	Lot 8 Deposited Plan 38101		Lots 13 & 14 Deposited Plan 38101	

[Over

~~DIAGRAM~~

FIRST SCHEDULE (Continued)

Column (a)	Item	Column (b)	Column (c)	Column (d)	Column (e)
Her Majesty the Queen for State housing purposes under the Housing Act 1955	11.	Lot 9 Deposited Plan 38101		Lots 8,13 & 14 Deposited Plan 38101	
	12.	Lot 10 Deposited Plan 38101		Lots 11,12 & 13 Deposited Plan 38101	
	13.	Lot 11 Deposited Plan 38101		Lots 10,12 & 13 Deposited Plan 38101	
	14.	Lot 12 Deposited Plan 38101		Lots 10,11 & 13 Deposited Plan 38101	
	15.	Lot 13 Deposited Plan 38101		Lot 14 Deposited Plan 38101	
	16.	Lot 14 Deposited Plan 38101		Lot 13 Deposited Plan 38101	
	17.	Lot 15 Deposited Plan 38101		Lots 13 & 14 Deposited Plan 38101	
	18.	Lot 16 Deposited Plan 38101		Lots 13,14 & 15 Deposited Plan 38101	
	19.	Lot 17 Deposited Plan 38101		Lots 13,14,15 & 16 Deposited Plan 38101	
	20.	Lot 19 Deposited Plan 38101	Agreement for Sale and Purchase registered Volume 1018 Folio 91 Purchasers: James Garfield Johnson and Eileen Mary Johnson	Lot 18 Deposited Plan 38101	
	21.	Lot 20 Deposited Plan 38101		Lot 18 Deposited Plan 38101 and Lot 19 Deposited Plan 38101	Agreement for Sale and Purchase registered Volume 1018 Folio 91 Purchasers: James Garfield Johnson and Eileen Mary Johnson
	22.	Lot 21 Deposited Plan 38101		Lots 18 & 20 Deposited Plan 38101 and Lot 19 Deposited Plan 38101	Agreement for Sale and Purchase registered Volume 1018 Folio 91 Purchasers: James Garfield Johnson and Eileen Mary Johnson
	23.	Lot 22 Deposited Plan 38101		Lots 18,20 & 21 Deposited Plan 38101 and Lot 19 Deposited Plan 38101	Agreement for Sale and Purchase registered Volume 1018 Folio 91 Purchasers: James Garfield Johnson and Eileen Mary Johnson
		All the above Lots being part of the land in Certificate of Title Volume 1190 Folio 97		All the above lots being part of the land in Certificate of Title Volume 1190 Folio 97	

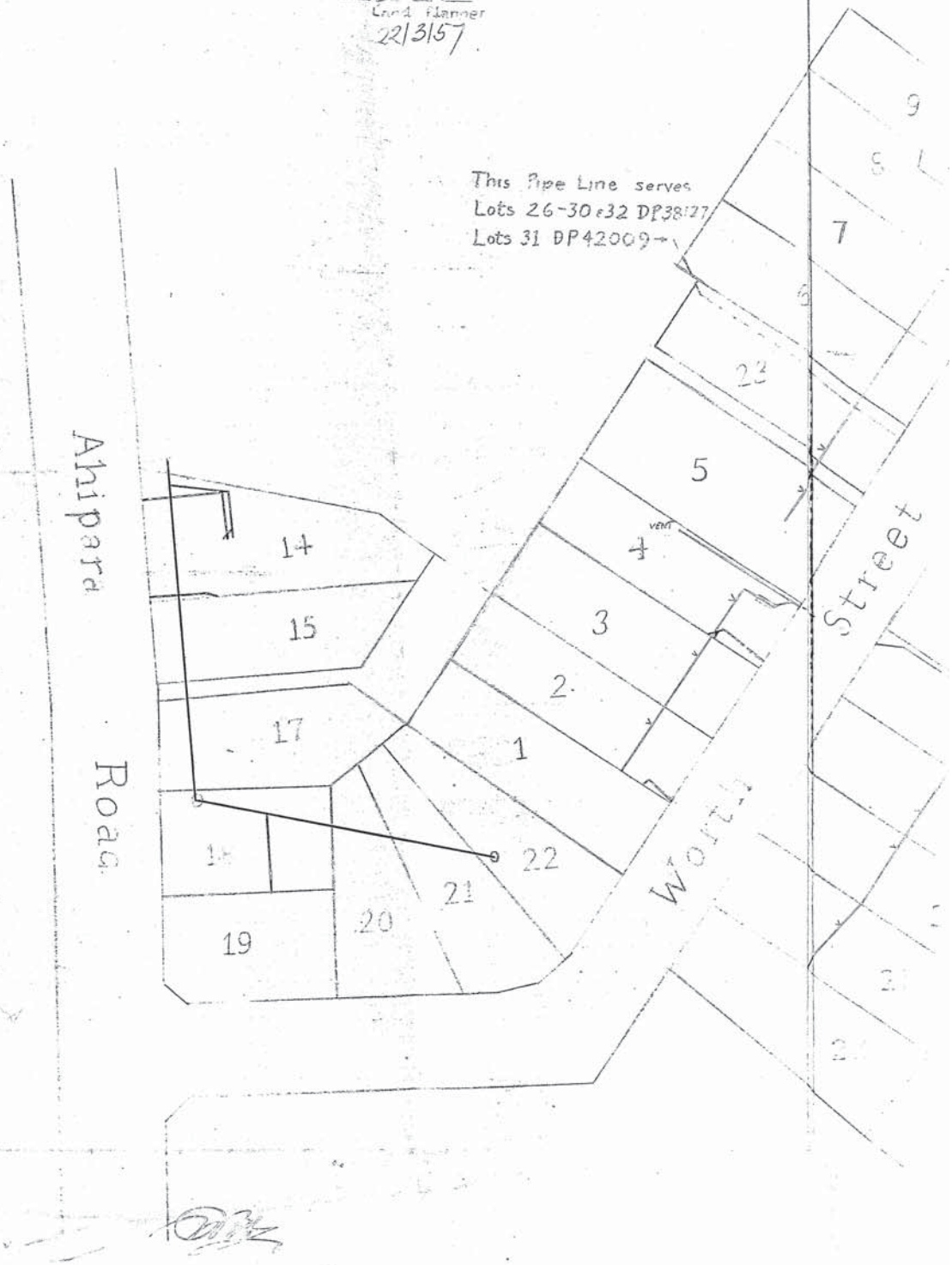
First Schedule Continued on page 3.

Continued on page 3.

Public Sanitary Sewer shown ——o——
Public Storm Water Sewer " ——————
Sanitary Pipe Line Easement " —— SEPTIC TANK ——
Storm Water Pipe Line Easement " ——————

A.D. Ihola
Land Planner
22/3157

This Pipe Line serves
Lots 26-30 & 32 DP38127
Lots 31 DP42009

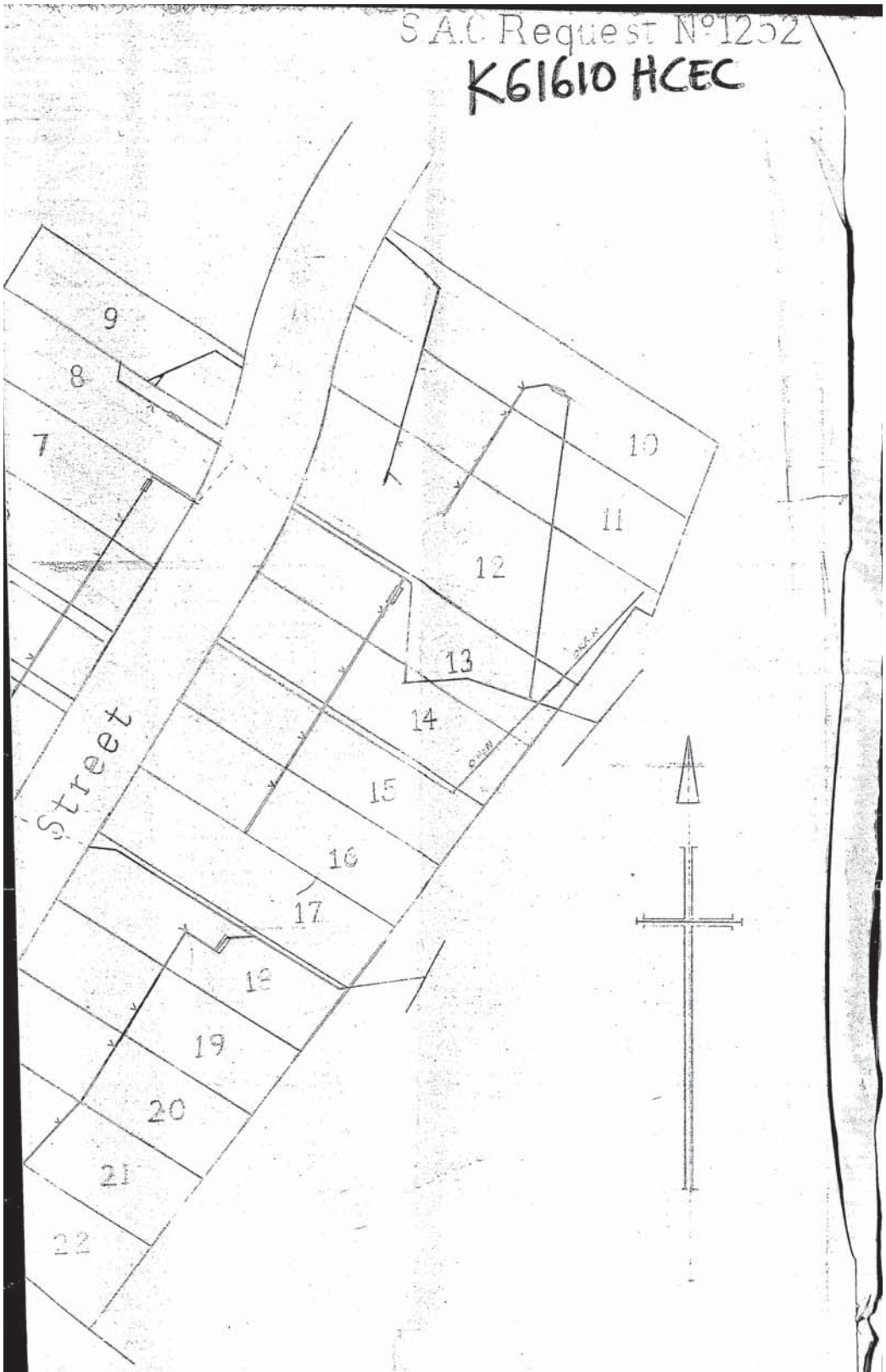


Lots 1-4 & 7 - 12 DP
Lots [illegible] 6 DP
Lots 14, 15 & 17 - 23 D

Scale: One Chain to [illegible]

S.A.C Request No 1252

K61610 HCEC



22 DP38101

6DP38117

7-23 DP38127

n to an inch

III A E 142

SECOND SCHEDULE

Column (a)	Item	Column (b)	Column (c)	Column (d)	Column (e)
Her Majesty the Queen for State Housing purposes under the Housing Act 1955	24.	Lot 15 Deposited Plan 38127		Lot 14 Deposited Plan 38127	
	25.	Lot 1 Deposited Plan 38101		Lot 2 Deposited Plan 38101	
	26.	Lot 3 Deposited Plan 38101		Lot 4 Deposited Plan 38101	
	27.	Lot 8 Deposited Plan 38101		Lot 9 Deposited Plan 38101	
	28.	Lot 11 Deposited Plan 38101		Lot 10 Deposited Plan 38101	
	29.	Lot 12 Deposited Plan 38101		Lots 10 & 11 Deposited Plan 38101	
		All the above lots being part of the land in Certificate of Title Volume 1190 Folio 97		All the above lots being part of the land in Certificate of Title Volume 1190 Folio 97	

FIRST SCHEDULE (Continued from page 2)

Her Majesty the Queen for State Housing purposes under the Housing Act 1955	30.	Lot 5 Deposited Plan 38117 being part of the land in Certificate of Title Volume 1190 Folio 97		Lot 13 Deposited Plan 38127 being formerly part of the land in Certificate of Title Volume 869 Folio 3	

DATED at AUCKLAND this 10th day of May 19 57

SIGNED on behalf of the State Advances Corporation of New Zealand by authority of the Board of Management under the common seal of the Corporation with the written consent of the Minister of Finance and pursuant to section 9 of the Finance Act 1948 by

FREDERICK WALTER SULLIVAN

an officer of the Corporation in the presence of:—

For and on behalf of the State Advances Corporation of New Zealand.

61610

PIPE LINE CERTIFICATE

given by the State Advances Corporation of New Zealand

Particulars entered in the Register Book

Vol. 1190 Folio 97 and Agreement for Sale 101891

the 31st day of May 1957

at 2.17 o'clock

[signature]

~~District~~ Land Registrar
Assistant

of the District of AUCKLAND

The District Land Registrar,
AUCKLAND

Please register all items comprised in within written Certificate except item numbered 30.

[signature]

Solicitor for the State Advances Corporation of New Zealand

14911
127 A05 04

The Branch Solicitor,
State Advances Corporation of New Zealand
Auckland C.1.

Correct for the purposes of the Land Transfer Act.

[signature]

Solicitor for the State Advances Corporation of New Zealand.

Pursuant to Section 29 (1) of the Housing Act 1955 it is hereby certified that the State Advances Corporation of New Zealand does not hold Certificate of Title Volume 869 Folio 3 and consequently cannot produce same.

[signature]

Solicitor for the State Advances Corporation of New Zealand.

Section 26(4) of the Housing Act 1955 is as follows:—

(4) While any pipe line certificate remains registered in accordance with section twenty-nine of this Act against the titles to the land to which the certificate relates, unless the certificate otherwise provides, the following provisions shall apply:—

(a) The owner for the time being of every parcel of land specified in the certificate as being served or intended to be served by the pipe line shall have a right to the free and uninterrupted use of the pipe line; and a right, for himself and his servants and agents, after giving reasonable notice, to enter upon any land shown in the certificate as land over or through which the pipe line passes and (so far as is reasonably necessary for the purpose) on other land to which the certificate relates for the purpose of relaying or effecting necessary repairs to the pipe line, subject to the restoration as nearly as is reasonably possible of the surface of the land to its former condition:

(b) The owner for the time being of any land specified in the certificate as being land over or through which the pipe line passes shall afford to the persons specified in paragraph (a) of this subsection the full and free exercise of the rights specified in that paragraph in respect of that land:

(c) The owner for the time being of each parcel of land specified in the certificate as being served or intended to be served by the pipe line may require and enforce reasonable contribution from all or any other such owners in respect of the cost of executing, providing, and doing all necessary relaying of or repairs to the pipe line and all things required in respect of the pipe line by any local authority having statutory powers in respect thereof:

Provided that, where relaying or repairs are rendered necessary by the act or default of any one or more of the owners, he or they shall bear the whole cost thereof.

Ppd: hrs
Tpd: MMR
Ckd:

Request No 1252
K61610 HCEC

Request No. 1249

K73925 HGEC.

[D.21/6

Approved by the District Land Registrar, Wellington
as No. 2598

PIPE LINE CERTIFICATE

Under Section 26 of the Housing Act 1955.

THE STATE ADVANCES CORPORATION OF NEW ZEALAND acting under Section 26 of the Housing Act 1955 (extracts from which are for convenience of reference printed on the back hereof) **HEREBY CERTIFIES** that a pipe line for the passage of (1) Sewage passes over or through and serves, the several parcels of land specified in the FIRST Schedule hereto as more particularly appears in the diagram (2) annexed hereto showing the several parcels of land served by the pipe line and the land over or through which the pipe line has been constructed. showing the course of the pipe line in red AND HEREBY FURTHER CERTIFIES that a pipe line for the passage of stormwater passes over or through and serves the several parcels of land specified in the Second Schedule hereto as more particularly appears in the diagram annexed hereto showing the several parcels of land served by the pipe line and the land over or through which the pipe line has been constructed and showing the course of the pipe line in green AND HEREBY FURTHER CERTIFIES pursuant to Section 26(2)(c) of the Housing Act 1955 that the section of the pipe line referred to above which passes over or through Lot 13 on Deposited Plan 38127 and Lot 38 on Deposited Plan 42009 was constructed on the land while it belonged to the Crown.

(1) Insert water, stormwater or sewage.

(2) Insert "endorsed hereon," or otherwise refer to diagram.

FIRST SCHEDULE

Registered proprietor of fee simple.	Item	Dominant Tenement(s): official description of the parcels of land served by the pipe line.	Registered Agreement or Licence to Occupy affecting any dominant tenement, and names of purchasers or licensees.	Servient Tenement(s): official description of the parcels of land over or through which the pipe line passes.	Registered Agreement or Licence to Occupy affecting any servient tenement, official description and names of purchasers or licensees.
Column (a)		Column (b)	Column (c)	Column (d)	Column (e)
~~Her Majesty the Queen for State housing purposes~~					
Her Majesty the Queen for State housing purposes under the Housing Act 1955	1.	Lot 37 Deposited Plan ~~45215~~		Lot 36 Deposited Plan 45215	
	2.	Lot 35 Deposited Plan 38127		Lot 36 Deposited Plan 45215	
	3.	Lot 1 Deposited Plan 38127		Lots 2 & 3 Deposited Plan 42009	
	4.	Lot 2 Deposited Plan 42009		Lot 3 Deposited Plan 42009	
		All the above Lots being part of the land in Certificate of Title Volume 1649 Folio 100 (Auckland Registry)		All the above Lots being part of the land in Certificate of Title Volume 1649 Folio 100 (Auckland Registry)	

SECOND SCHEDULE

Her Majesty the Queen for State housing purposes under the Housing Act 1955	5.	Lot 2 Deposited Plan 42009		Lots 1 Deposited Plan 38127 Lots 3,4,5,6 & 38 Deposited Plan 42009	1649/100 1678/72
	6.	Lot 3 Deposited Plan 42009		Lots 4,5,6,& 38 Deposited Plan 42009	1649/100 1678/72
	7.	Lot 4 Deposited Plan 42009		Lots 5,6,& 38 Deposited Plan 42009	1678/72
	8.	Lot 5 Deposited Plan 42009		Lots 6 & 38 Deposited Plan 42009	1649/100 1678/72
	9.	Lot 7 Deposited Plan 42009		Lot 6 Deposited Plan 42009	1649/100

[Over

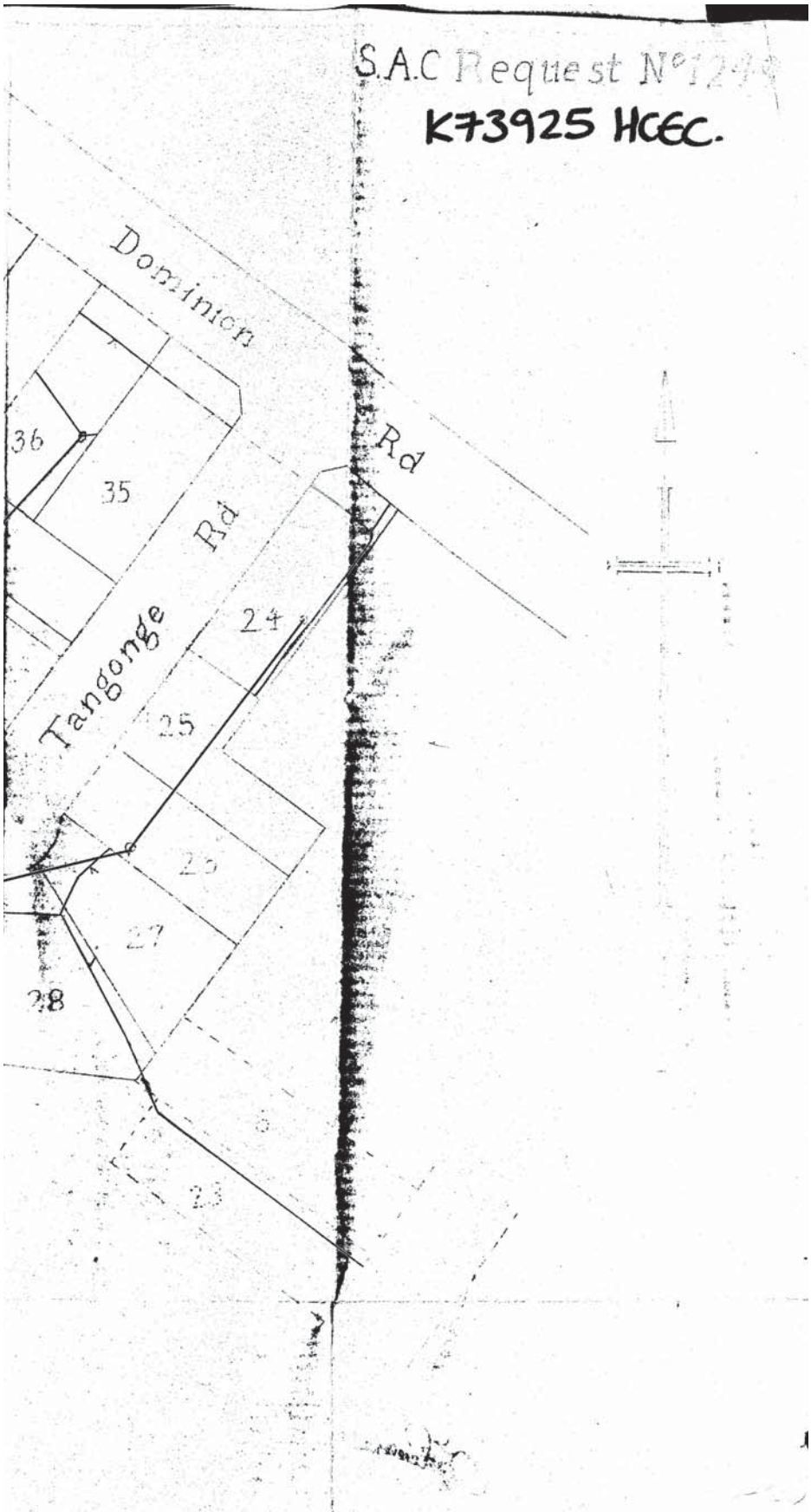
DIAGRAM

SECOND SCHEDULE (continued)

Column (a)	Item	Column (b)	Column (c)	Column (d)	Column (e)
Her Majesty the Queen for State housing purposes under the Housing Act 1955	10.	Lot 37 Deposited Plan 45215		Lot 36 Deposited Plan 45215 Lots 35 & 24 Deposited Plan 38127	1649/100
	11.	Lot 36 Deposited Plan 45215		Lots 35 & 24 Deposited Plan 38127	1649/100
	12.	Lot 35 Deposited Plan 38127		Lot 24 Deposited Plan 38127	1649/100
	13.	Lot 25 Deposited Plan 38127		Lot 24 Deposited Plan 38127	1649/100.
	14.	Lot 26 Deposited Plan 38127		Lots 27,28 & 23 Deposited Plan 38127 Lot 6, Deposited Plan 38117	27+28 1649/100 23+6 1561/25
	15.	Lot 26 Deposited Plan 38127		Lot 13 Deposited Plan 38127	
	16.	Lot 27 Deposited Plan 38127		Lots 28 & 23 Deposited Plan 38127 & Lot 6 Plan 38117	28 1649/100 23+6 1561/25
	17.	Lot 27 Deposited Plan 38127		Lot 13 Deposited Plan 38127	
	18.	Lot 32 Deposited Plan 38127		Lots 31 & 30 Deposited Plan 45215 Lots 29,28 & 23 Deposited Plan 38127 Lot 6 Deposited Plan 38117	1649/100 28.29 1649/100 1561/25
	19.	Lot 32 Deposited Plan 38127		Lot 13 Deposited Plan 38127	
	20.	Lot 31 Deposited Plan 45215		Lot 30 Deposited Plan 45215 Lots 29,28 & 23 Deposited Plan 38127 Lot 6 Deposited Plan 38117	1649/100 1561/25
	21.	Lot 31 Deposited Plan 45215		Lot 13 Deposited Plan 38127	
	22.	Lot 30 Deposited Plan 45215		Lots 29,28 & 23 Deposited Plan 38127 Lot 6 Deposited Plan 38117	1649/100 1561/25
	23.	Lot 30 Deposited Plan 45215		Lot 13 Deposited Plan 38127	
	24.	Lot 29 Deposited Plan 38127		Lots 28, & 23 Deposited Plan 38127 Lot 6, Deposited Plan 38117	1649/100 1561/25
	25.	Lot 29 Deposited Plan 38127		Lot 13 Deposited Plan 38127	
	26.	Lot 28 Deposited Plan 38127		Lot 6 Deposited Plan 38117 Lot 23 Deposited Plan 38127	1561/25
	27.	Lot 28 Deposited Plan 38127		Lot 13 Deposited Plan 38127	
	28.	Lot 12 Deposited Plan 38127		Lot 11 Deposited Plan 38127	1649/100
		All the above Lots being part of the land in Certificate of Title Volume 1649 Folio 100		All the above Lots except Lots 23 & 13 Deposited Plan 38127, Lot 6 Deposited Plan 38117 and Lot 38 Deposited Plan 42009, being part of the land in Certificate of Title Volume 1649 Folio 100. Lot 13 Deposited Plan 38127 being formerly part of the land in Certificate of Title Volume 369 Folio 3. Lot 38 Deposited Plan 42009 being all of the land in Certificate of Title Volume 1678 Folio 72. Lot 6 D.P.38117 & Lot 23 D.P.38127 being pt. land in C.T.1561/25	

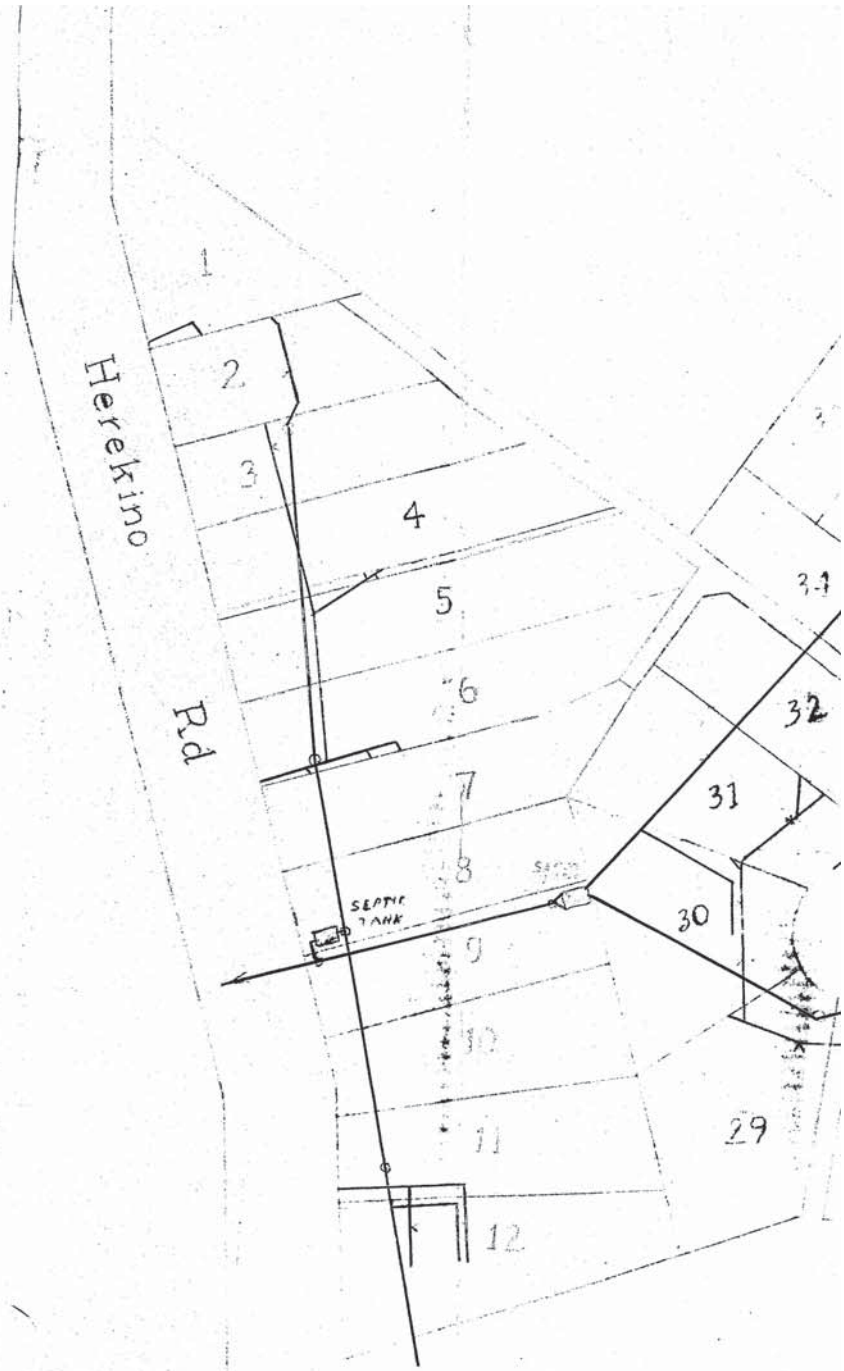
S.A.C Request No 1248

K73925 HCEC.



9, 32, & 34-35 DP 38127
3 & 38 DP 42009
& 37 DP 45215
ain to an Inch

HPA E 255



Public Sanitary Sewer shown ——
Sanitary Pipe Line Easement " ——
Storm Water Pipe Line Easement " ——

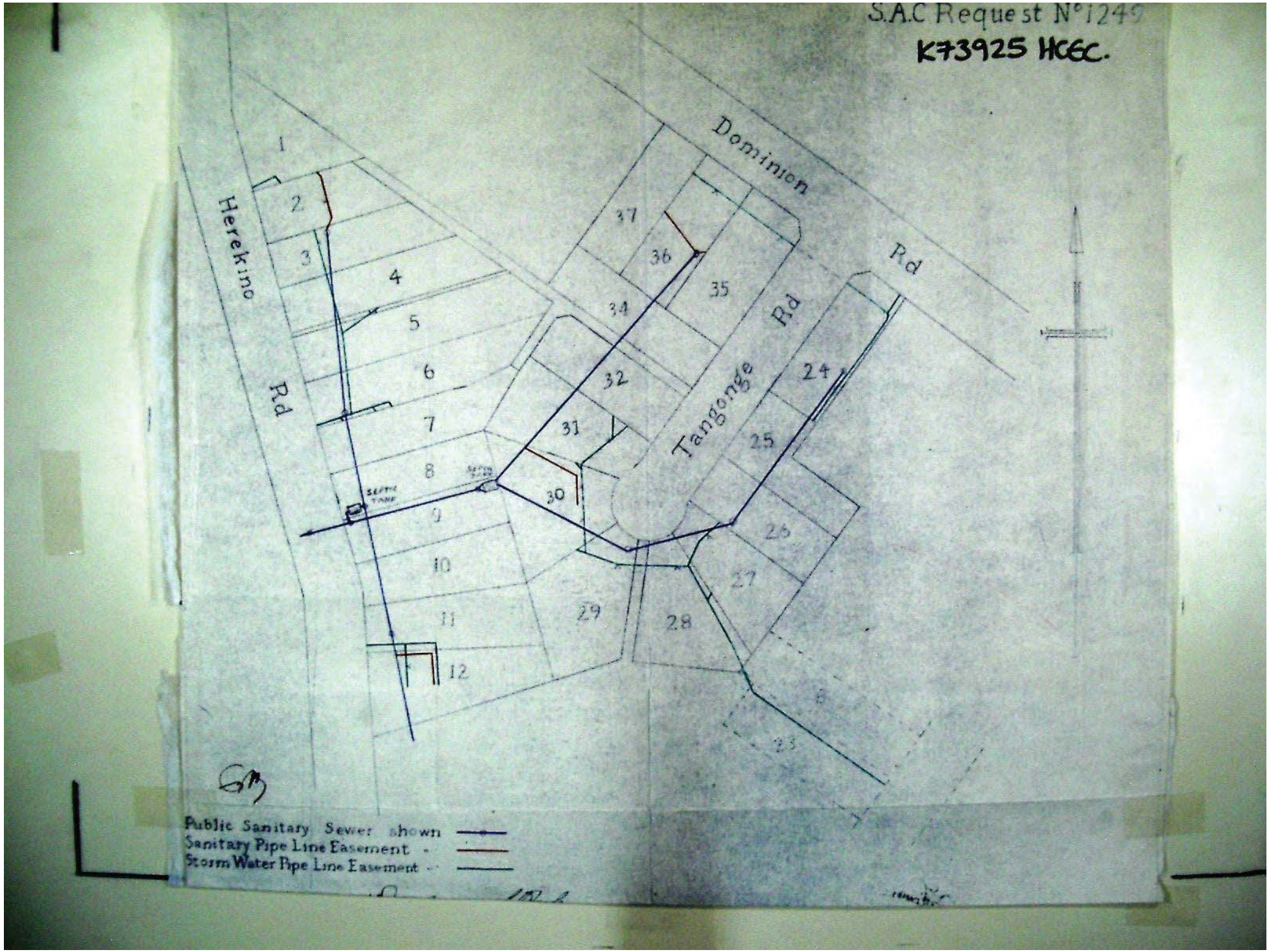
LAND PLANNER
20/5/59

Lots 1.8-12. 24-
Lots 2.-7,
Lots 30.31

Scale: One

S.A.C Request N°1249

K73925 HCEC.



APPENDIX 2 – RULES ASSESSMENT

Site Details	
Site address	7 & 9 Worth Street, Kaitaia
Legal description	Lot 6 DP 38117 and Lot 23 DP 381127
Plan Details	
Plan	Far North District Plan
Zone	Residential
Overlays	N/A
Designations	N/A
Proposed zone	General Residential
Plan Changes	Clause 16 amendments to the proposed district plan.

AUCKLAND UNITARY PLAN (OPERATIVE IN PART) RULES ASSESSMENT

Rule	Compliance	Non-Compliance
Residential Zone		
Rule 7.6.5.1 Permitted Activities		
Rule 7.6.5.1.2 Residential Intensity Activity status: **Permitted Activity** where: (a) Each residential unit for a single household shall have available to it a minimum net site area of: Sewered sites: 600m^2		**Does not comply-** the development site has access to reticulated wastewater connections and Lots 1-6 do not meet the minimum net site area of 600m^2.

Rule	Compliance	Non-Compliance
Unsewered sites: 3,000m^2		
Rule 7.6.5.1.3 Scale of Activities Activity status: **Permitted Activity** where: The total number of people engaged at any one period of time in activities on a site including employees and persons making use of any facilities, but excluding people who normally reside on the site shall not exceed: • 2 persons per 600m^2 (Sewered) • 2 persons per 3,000 m^2 (Unsewered)	**Complies**- the proposed dwellings will contain residential activities and no facilities or employment.	
Rule 7.6.5.1.4 Building Height **Permitted Activity:** The maximum height of any building shall be 8m.	**Complies**- the proposed dwellings will comply with the maximum height of 8m.	
Rule 7.6.5.1.5 Sunlight Activity status: **Permitted Activity** where: No part of any building shall project beyond a 45-degree recession plane as measured inwards from any point 2m vertically above ground level on any site boundary except that: a) A building may exceed this standard for a maximum distance of 10m along any one boundary other than a road boundary, provided that the maximum height of any building where it exceeds the standard is 2.7m.		**Does not comply**- Unit 4 infringes.

Rule	Compliance	Non-Compliance
b) Where a site boundary adjoins a legally established entrance strip, private way, access lot, or access way serving as rear site, the measurement shall be taken from the farthest boundary of the entrance strip, private way, access lot or access way.		
Rule 7.6.5.1.6 Stormwater Management Activity status: **Permitted Activity** where: The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 50%.	**Complies**	
Rule 7.6.5.1.7 Setback from Boundaries Activity status: **Permitted Activity** where: (a) The minimum building setback from road boundaries shall be 3 m (refer to exception under the Rule). (b) The minimum set-back from any boundary other than a road boundary shall be 1.2m (refer to exception under the Rule). (c) Not less than 50% of that part of the site between the road boundary and a parallel line 2m there from (i.e. a 2m wide planting strip along the road boundary) shall be landscaped.	**Complies.**	
Rule 7.6.5.1.9 Outdoor Activities Activity status: **Permitted Activity** except where:	**Complies.**	

Rule	Compliance	Non-Compliance
Except as otherwise provided by Rule 7.6.5.1.10, any activity may be carried out outside except that any commercial non- residential activity involving manufacturing, altering, repairing, dismantling or processing of any materials, live produce, goods or articles shall be carried out within a building.		
Rule 7.6.5.1.11 Transportation Refer to Chapter 15 – Transportation for traffic rules.		**Does not comply**- Refer to Transport Assessment in Appendix 9.
Rule 7.6.5.1.17 Building Coverage Activity status: **Permitted Activity** Any new building or alteration/ addition to an existing building is a permitted activity if the total building coverage of a site does not exceed 45% of the gross site area.	**Complies**	
Rule 7.6.5.2 Controlled Activities		
7.6.5.2.1 Stormwater Management The maximum proportion or amount of the gross site area covered by buildings and other impermeable surfaces shall be 60% or 600m², whichever is the lesser.	N/A – Permitted activity is complied with	
Rule 7.6.5.3 Restricted Discretionary Activities		
Rule 7.6.5.3.1 Residential Intensity Activity status: **Restricted Discretionary Activity** where: • Each residential unit for a single household shall have available to it a minimum net site area of:		**Does not comply**- the following lots do not comply with the 300m² standard for a sewered site: - Lot 2: 193m². - Lot 3: 193m².

Rule	Compliance	Non-Compliance
Sewered Sites: 300m^2 Unsewered Sites: 2,000m^2		- Lot 4: 218.8m^2. - Lot 5: 281.8m^2.
Rule 7.6.5.3.2 Scale of Activities Activity status: **Restricted Discretionary Activity** where: • The total number of people engaged at any one period of time in activities on a site, including employees and persons making use of any facilities, but excluding people who normally reside on the site or are members of the same household shall not exceed: 4 persons per 600 m^2 (Sewered) 4 persons per 3,000 m^2 (Unsewered)	**Complies**- the proposed dwellings will contain residential activities and no facilities or employment.	
Rule 7.6.5.3.3 Building Height Activity status: **Restricted Discretionary Activity** where: • The maximum height of any building shall be 9 m.	**Complies**- the proposed building heights are less than 9m.	
Rule 7.6.5.3.4 Sunlight Activity status: **Restricted Discretionary Activity** where: No part of any building shall project beyond a 45-degree recession plane as measured inwards from any point 3m vertically above ground level on any site boundary.	.	**Does not comply.** Unit 4 infringes
Rule 7.6.5.3.5 Building Coverage Activity status: **Restricted Discretionary Activity** where: Any new building or alteration/ addition to an existing building is a restricted discretionary activity if the total building coverage of a	**Complies. Storwater tanks xx**	

Rule	Compliance	Non-Compliance
site does not exceed 55% or 550m^2, which ever is lesser of the gross site area.		
Chapter 12- Natural and Physical Resources (Section 3- Soils and Minerals)		
Chapter 12.2: Indigenous Flora and Fauna		
12.2.6.1 Permitted Activities An activity is a permitted activity if: (a) it complies with the standards for permitted activities set out in Rules 12.2.6.1.1 to 12.2.6.1.4 below; and (b) it complies with the relevant standards for permitted activities in the zone in which it is located, set out in Part 2 of the Plan - Environment Provisions; and (c) it complies with the other relevant standards for permitted activities set out in Part 3 of the Plan - District Wide Provisions.		
12.2.6.1.1 INDIGENOUS VEGETATION CLEARANCE PERMITTED THROUGHOUT THE DISTRICT Notwithstanding any rule in the Plan to the contrary but subject to Rules 12.5.6.1.1, 12.5.6.1.3 and 12.5.6.2.2 in the Heritage section of this Plan, indigenous vegetation clearance is permitted throughout the District where the clearance is for any of the following purposes:	**Complies** with clause (o)	
Chapter 12.3: Soils and Minerals		
12.3.6.1 Permitted Activities An activity is a permitted activity if: (a) it complies with the standards for permitted activities set out in Rules 12.3.6.1.1 to 12.3.6.1.1 to 12.3.6.1.5 below; and (b) it complies with the relevant		

Rule	Compliance	Non-Compliance
standards for permitted activities in the zone in which it is located, set out in Part 2 of the Plan - Environment Provisions; and (c) it complies with the other relevant standards for permitted activities set out in Part 3 of the Plan-District Wide Provisions.		
12.3.6.1.3 Excavation and/or filling, excluding mining and quarrying in the Residential, Industrial, Horticultural Processing, Coastal Residential and Russell Township Zones Excavation and/or filling, excluding mining and quarrying, on any site in the Residential, Industrial, Horticultural Processing, Coastal Residential or Russell Township Zones is permitted, provided that: (a) it does not exceed 200m^3 in any 12 month period per site; and (b) it does not involve a cut or filled face exceeding 1.5m in height i.e. the maximum permitted cut and fill height may be 3m. **Note 1**: When undertaking any excavation (including cellar construction), or filling, compliance with Council's earthworks bylaw (Bylaw 22) is required. **Note 2:** Where a site is within a Coastal Hazard 1 or Coastal Hazard 2 Area (as shown on the Coastal Hazard Maps), more restrictive excavation and filling rules apply (refer to rules in 12.4). **Note 3**: Some normal rural practices that involve excavation or filling, such as the maintenance of rural tracks, dams, fences and fence lines; land cultivation; clearing of drains; and obtaining of roading material for use on the same production unit, are excluded from the definitions of excavation and filling (refer to Chapter 3 Definitions).		**Does not comply -** 1042.3m3 of total earthworks are proposed. Note: Complies with (b): Max cut is 0.8 m and max fill is 1.3 m.
12.3.6.1.4 Nature of Filling in Material in all Zones Filling in any zone shall meet the following standards:	**Complies.**	

Rule	Compliance	Non-Compliance
(a) the fill material shall not contain putrescible, pollutant, inflammable or hazardous components; and (b) the fill shall not consist of material other than soil, rock, stone, aggregate, gravel, sand, silt, or demolition material; and (c) the fill material shall not comprise more than 5% vegetation (by volume) of any load.		
12.3.6.2 Restricted Discretionary Activities An activity is a restricted discretionary activity if: (a) it does not comply with any one of the following Rules 12.3.6.1.1 Excavation and/or Filling, Excluding Mining and Quarrying in the Rural Production Zone or Kauri Cliffs Zone; 12.3.6.1.2 Excavation and/or Filling, Including Obtaining Roading Material but Excluding Mining and Quarrying, in the Rural Living, Coastal Living, General Coastal, Recreational Activities, Conservation, Waimate North and Point Veronica Zones; and 12.3.6.1.3 Excavation and/or Filling in the Residential, Industrial, Horticultural Processing, Coastal Residential and Russell Township Zones for permitted activities above; but (b) it complies with 12.3.6.1.4 Nature of Filling Material in All Zones; and (c) it complies with Rules 12.3.6.2.1 Excavation and/or Filling in the Rural Living, Coastal Living, General Coastal, Recreational Activities, Conservation, Waimate North and Point Veronica Zones; and 12.3.6.2.2 Excavation and/or Filling in the Residential, Industrial, Horticultural		**Does not comply –** See 12.3.6.2.2 assessment below

Rule	Compliance	Non-Compliance
Processing, Coastal Residential and Russell Township Zones and Rule 12.3.6.2.3 Excavation and/or Filling, Excluding Mining and Quarrying in the Rural Production Zone or Kauri Cliffs Zone below; and (d) it complies with the relevant standards for permitted, controlled or restricted discretionary activities set out in Part 2 of the Plan – Environment Provisions; and (e) it complies with the relevant standards for permitted, controlled or restricted discretionary activities set out in Part 3 of the Plan – District Wide Provisions.		
12.3.6.2.2 Excavation and/or filling, excluding mining and quarrying in the Residential, Industrial, Horticultural Processing, Coastal Residential and Russell Township Zones Excavation and/or filling, excluding mining and quarrying, on any site in the Residential, Industrial, Horticultural Processing, Coastal Residential or Russell Township Zones is a restricted discretionary activity provided that: (a) it does not exceed 500m^3 in any 12 month period per site; and (b) it does not involve a cut or filled face exceeding 1.5m in height i.e. the maximum permitted cut and fill height may be 3m. **Note 1**: When undertaking any excavation (including cellar construction), or filling, compliance with Council's earthworks bylaw (Bylaw 22) is required. **Note 2**: Where a site is within a Coastal Hazard 1 or Coastal Hazard 2 Area (as shown on the Coastal Hazard Maps), more restrictive excavation and filling rules apply (refer to rules in 12.4).		1042.3m3 of total earthworks are proposed. **Does not comply**

Rule	Compliance	Non-Compliance
Note 3: Some normal rural practices that involve excavation or filling, such as the maintenance of rural tracks, dams, fences and fence lines; land cultivation; clearing of drains; and obtaining of roading material for use on the same production unit, are excluded from the definitions of excavation and filling (refer to Chapter 3 Definitions).		
12.3.6 Discretionary Activities An activity is a discretionary activity if: (a) it does not comply with one or more of the standards for permitted or restricted discretionary activities as set out under Rules 12.3.6.1 and 12.3.6.2 above; or (b) The excavation and/or filling is for the purposes of mining or quarrying, other than a quarry covered by definition of 'normal rural practices', and a Development Plan is part of the application as provided for in Rule 12.3.6.3.1 below; but (c) it complies with the relevant standards for permitted, controlled, restricted discretionary and discretionary activities in the zone in which it is located, set out in Part 2 of the Plan - Environment Provisions; and (d) it complies with the other relevant standards for permitted, controlled, restricted discretionary or discretionary activities set out in Part 3 of the Plan - District Wide Provisions. The Council may impose conditions of consent on a discretionary activity or it may refuse consent to the application. When considering a discretionary activity application, the Council will have regard to the assessment criteria set out under Section 12.3.7 and, where appropriate, Chapter 11. **Note**: Quarrying is defined in Chapter 3 and Mining is defined in the Glossary to Chapter 3.	Complies	

Rule	Compliance	Non-Compliance
12.3.6.4 Non-Complying Activities An activity is a non complying activity if: (a) It does not comply with the standards as set out under Rule 12.3.6.1.5.	N/A	
Chapter 13- Subdivision		
13.7 Controlled (Subdivision) Activities Subdivision is a controlled activity where it complies with the following standards and the standards set out in rules under 13.7.1, 13.7.2 and 13.7.3.		
Table 13.7.2.1: Minimum Lot Sizes <u>Residential Zone</u> • Controlled Activity Status (refer also to 13.7.3): - 3,000m^2 (unsewered) - 600m^2 (sewered). • Discretionary Activity Status (refer also to 13.9): - 2,000m^2 (unsewered) - 300m^2 (sewered)		**Does not comply**- proposed minimum lot sizes are as follows: - Lot 1: 351.7m^2 - Lot 2: 193m^2 - Lot 3: 193m^2 - Lot 4: 218.8m^2 - Lot 5: 281.8m^2 - Lot 6: 441.5m^2
13.7.2.2 Allotment Dimensions Any allotment created in terms of these rules must be able to accommodate a square building envelope of the minimum dimensions specified below; which does not encroach into the permitted activity boundary setbacks for the relevant zones:		**Does not comply**- Refer AEE

Rule	Compliance	Non-Compliance
Residential Zone Minimum Dimension: 14m x 14m.		
13.7.2.6 Access, Utilities, Roads, Reserves Notwithstanding the standards for minimum net area, there shall be no minimum allotment areas in any zone for allotments created for access, utilities, roads and reserves.	**Complies** - Jointly Owned Access Lot (JOAL) to be created but no minimum lot size applies.	
13.7.3 Controlled (Subdivision) Activities: Other Matters to be Taken into Account Any application for a controlled (subdivision) activity resource consent must also make provision (where relevant) for the matters listed under Rules 13.7.3.1 to 13.7.3.12 (inclusive), and the Council shall take account of these matters in reaching a decision on the application.		
13.7.3.1 Property Access (see Chapter 15 Transportation) A controlled (subdivision) activity application must comply with rules for property access in Chapter 15, namely *Rules 15.1.6C.1.1 - 15.1.6C.1.11* (inclusive).		**Does not comply**- The private access width does not meet the minimum under 15.1.6C.1.1.a – Refer Transport Assessment.
13.7.3.2 Natural and Other Hazards Any proposed subdivision shall avoid, remedy or mitigate any adverse effects of natural hazards.	**Complies**- the proposed development site is not subject to natural hazards.	
13.7.3.3 Water Supply All new allotments shall be provided with the ability to connect to a safe potable water supply with an adequate capacity for the	**Complies**- all of the proposed lots will have a connection to reticulated water supply.	

Rule	Compliance	Non-Compliance
respective potential land uses, except where the allotment is for a utility, road, reserve or access purposes, by means of one of the following: (a) a lawfully established reticulated water supply system; or (b) where no reticulated water supply is available, the ability to provide an individual water supply on the respective allotment.		
13.7.3.4 Stormwater Disposal (a) All allotments shall be provided, within their net area, with a means for the disposal of collected stormwater from the roof of all potential or existing buildings and from all impervious surfaces, in such a way so as to avoid or mitigate any adverse effects of stormwater runoff on receiving environments, including downstream properties. This shall be done for a rainfall event with a 10% Annual Exceedance Probability (AEP). (b) The preferred means of disposal of collected stormwater in urban areas will be by way of piping to an approved outfall, each new allotment shall be provided with a piped connection to the outfall laid at least 600mm into the net area of the allotment. This includes land allocated on a cross lease or company lease. The connection should be at the lowest point of the site to enable water from driveways and other impervious surfaces to drain to it. Where it is not practical to provide stormwater connections for each lot then the application for subdivision shall include a report detailing how stormwater from each lot is to be disposed of without	**Complies.** It is proposed to discharge stormwater to the kerb. A detailed assessment of the controlled stormwater management matters under 13.7.3.4 has been provided in the stormwater management report attached as Appendix 7. A summary of the stormwater management regime, which will have less than minor adverse effects, is provided below: o To reduce the impact of the development on flooding downstream of the site, on-site stormwater detention is proposed to mitigate runoff via a $6m^3$ above ground detention tank for each Unit. This will mitigate the runoff to 80% of pre-development flows. o Permeable paving has also been implemented on the site as shown on the	

Rule	Compliance	Non-Compliance
adversely affecting downstream properties or the receiving environment. (c) The provision of grass swales and other water retention devices such as ponds and depressions in the land surface may be required by the Council in order to achieve adequate mitigation of the effects of stormwater runoff. (d) All subdivision applications creating sites 2ha or less shall include a detailed report from a Chartered Professional Engineer or other suitably qualified person addressing stormwater disposal. (e) Where flow rate control is required to protect downstream properties and/or the receiving environment then the stormwater disposal system shall be designed in accordance with the onsite control practices as contained in "*Technical Publication 10, Stormwater Management Devices – Design Guidelines Manual" Auckland Regional Council (2003).*	Landscape Drawings in Appendix 6 to minimise runoff from the site. o As no overland flow paths traverse through the site, the proposed design is not expected to exacerbate any existing flooding. o Water quality will be maintained due to the roofing type proposed and the bubble up chamber;	
13.7.3.5 Sanitary Sewage Disposal (a) Where an allotment is situated within a duly gazetted district or drainage area of a lawfully established reticulated sewerage scheme, or within an area to be serviced by a private reticulated sewerage scheme for which Northland Regional Council has issued a consent, each new allotment shall be provided with a piped outfall connected to that scheme and shall be laid at least 600mm into the net area of the allotment.	**Complies**- all of the proposed lots will have connection to the reticulated wastewater network.	

Rule	Compliance	Non-Compliance
(b) Where connection is not available, all allotments in urban, rural and coastal zones shall be provided with a means of disposing of sanitary sewage within the net area of the allotment, except where the allotment is for a road, or for access purposes, or for a purpose or activity for which sewerage is not necessary (such as a transformer).		
13.7.3.6 Energy Supply All urban allotments (Residential, Commercial, Industrial Zones) including the Coastal Residential, Russell Township, and Rural Living Zones, shall be provided with the ability to connect to an electrical utility system and applications for subdivision consent should indicate how this could be done.	**Complies**- each proposed lot will have a connection to the electricity network.	
13.7.3.7 Telecommunications All urban allotments (Residential, Commercial, Industrial Zones) including the Coastal Residential, Russell Township, and Rural Living Zones, shall be provided with the ability to connect to a telecommunications system at the boundary of the site.	**Complies**- each proposed lot will have the ability to connect to the telecommunications system at the boundary of the site.	
13.7.3.8 Easements for Any Purpose Easements shall be provided where necessary for public works and utility services.	**Complies**- easements are provided on the scheme plan as necessary.	
13.7.3.11 Land Use Compatibility Subdivision shall avoid, remedy or mitigate any adverse effects of incompatible land uses (reverse sensitivity).	**Complies**- the proposed subdivision is around a residential land use activity, in a residential	

Rule	Compliance	Non-Compliance
	zone and any potential reverse sensitivity effects are avoided, remedied or mitigated.	
13.9 Discretionary Activities Subdivision is a discretionary activity where: (a) it does not comply with one or more of the standards for controlled or restricted-discretionary (subdivision) activities set out in rules under 13.7 and 13.8, but (b) it complies with the rules under 13.9.1, 13.9.2 or 13.9.3; (c) it is located in the Pouerua Heritage Precinct. If a subdivision activity does not comply with the standards for a discretionary (subdivision) activity, it will be a non-complying (subdivision) activity.		
13.9.1 Minimum Net Area for Vacant New Lots and New Lots Which Already Accommodate Structures Refer to Table 13.7.2.1 under Rule 13.7.2.1 column headed "Discretionary Activity Status".		**Does not comply.** Refer to Rule 13.7.2.1 assessment above
13.9.2 Management Plans	**N/A** because the subdivision is in a residential zone.	
13.11 Non-Complying (Subdivision) Activities (a) If a subdivision activity does not comply with the standards for a discretionary (subdivision) activity.		Consent is required for a non-complying subdivision under this Rule. Refer to AEE.

Rule	Compliance	Non-Compliance
The Council will use the assessment criteria in 13.10 as a guide when assessing non-complying subdivision activities in conjunction with the matters set out in Sections 104, 104B, 104D and 106 of the Act.		
Chapter 15 - Transportation		
Refer to Transport Assessment in Appendix 9		
Chapter 16 – Signs and Lighting		
16.6.1 Light Spill & Glare **Permitted Activity** (a) Outdoor lighting used by, or in association with, any activity, including any illuminated sign, shall not exceed the following limits: (i) between 0700hrs and 2200hrs the use of any outdoor lighting shall not cause an added luminance in excess of 25Lux measured horizontally or vertically at any point on the boundary of any adjacent site zoned Residential, Coastal Residential, Rural Living, Russell Township, South Kerikeri Inlet or Coastal Living; (ii) between 2200hrs and 0700hrs the following day the use of any outdoor lighting shall not cause an added luminance in excess of 10Lux measured horizontally or vertically at any point 2m within the boundary of any adjacent site zoned Residential, Coastal Residential, Rural Living, Russell Township, South Kerikeri Inlet or Coastal Living. (b) All outdoor lighting, except street lighting, shall be directed away from roads and any adjacent sites zoned Residential, Coastal	**Complies.**	

Rule	Compliance	Non-Compliance
Residential, Rural Living, Russell Township, South Kerikeri Inlet or Coastal Living. Street lighting shall be designed and constructed in accordance with the AS/NZS 1158, NZS 4404:2002 "Land Development and Subdivision Engineering" and Council's "Engineering Standards and Guidelines" (June 2004 – Revised 2009). (c) Any activity which involves lighting and is situated on a site adjacent to a State Highway and within 50m of the carriageway is permitted provided that all exterior lighting on properties adjacent to State Highways is in accordance with Australian Standard No. 4282-1997 "Control of Obtrusive Effects of Outdoor Lighting".		

FAR NORTH PROPOSED DISTRICT PLAN RULES ASSESSMENT

Subdivision- Proposed rules that have immediate legal effect.		
SUB – R6 Environmental benefit subdivision	N/A – No environmental benefit / protection of vegetation proposed	
SUB – R13 Subdivision of a site within a heritage area overlay	N/A – The site is not in a heritage overlay	
SUB-R14 Subdivision of a site that contains a scheduled heritage resource	N/A – The site does not contain a scheduled heritage resource	

SUB- R15 Subdivision of a site containing a scheduled site and area of significance to Māori	N/A – The site does not contain a scheduled site or area of significance to Māori	
SUB-R16 Subdivision of a site containing a mineral extraction overlay	N/A – Site does not contain a mineral extraction overlay	
Earthworks		
Rule: EW- R12 Earthworks and the discovery of suspected sensitive material Activity Status is permitted where: **PER- 1** The earthworks complies with standard EW-S3 - Accidental Discovery Protocol.	Complies – The Accidental Discovery Protocol will be adhered to.	
Rule: EW – R13Earthworks and erosion and sediment control Activity Status is permitted where: **PER- 1** The earthworks complies with standard EW-S5 Erosion and sediment control	Complies – The earthworks will comply with this 'best practice' standard	
Ecosystems and Indigenous Biodiversity		
Rule: IB-R1 to IB-R5	N/A - This chapter does not apply to indigenous vegetation clearance in urban environment allotments.	

PROPOSED CONDITIONS OF CONSENT

The following consent conditions are proposed for the development of 7 & 9 Worth Street, Kaitaia.

Land Use Consent

Activity in accordance with plans

(1) The residential activity must be as described in the application and assessment of environmental effects prepared by Jacob Turnbull (dated 21/06/24) and must be carried out in accordance with the plans stamped and referenced by the council as resource consent number LUCXXX. The consent must also be carried out in accordance with all other reports and information detailed below and all referenced by the council as consent number LUCXXX.

Report title and reference	Author	Rev	Dated
Infrastructure Report	Civix	-	18/06/24
Geotechnical Report	Beca	01	26/04/24
Transport Assessment	Traffic Planning Consultants Ltd	Final	Jun 2024

Lapse Date

(2) Under section 125 of the RMA, this consent lapses five years after the date it is granted unless:

a. The consent is given effect to; or

b. The council extends the period after which the consent lapses.

Monitoring Charges

(3) The consent holder must pay the council an initial consent compliance monitoring charge of $684 (inclusive of GST), plus any further monitoring charge or charges to recover the actual and reasonable costs incurred to ensure compliance with the conditions attached to this consent.

Advice Note:

The initial monitoring deposit is to cover the cost of inspecting the site, carrying out tests, reviewing conditions, updating files, etc., all being work to ensure compliance with the resource consent(s). In order to recover the actual and reasonable costs, monitoring of the conditions, in excess of those covered by the deposit, shall be charged at the relevant hourly rate applicable at the time. The consent holder will be advised of the further monitoring charge. Only after all conditions of the

resource consent have been met, will the council issue a letter confirming compliance on request of the consent holder.

Pre-commencement conditions

Advance Notification

(4) The Council must be notified at least five (5) working days prior to earthwork activities commencing on the subject site.

During construction conditions

Accidental Discovery Protocols

(5) If, at any time during site works, sensitive materials (koiwi/human remains, an archaeology site, a Māori cultural artefact, a protected NZ object, or a lava cave greater than 1m in diameter) are discovered, then the protocol set out in standard EW-S3 of the Far North District Plan (Proposed) must be followed.

(6) There must be no obstruction of access to public footpaths, berms, private properties, vehicle crossings, public services/utilities, or public reserves resulting from the construction and earthworks activity unless authorised by Far north District Council (where it is authorised to do so). All materials and equipment must be stored within the subject site's boundaries unless otherwise authorised by Far north District Council.

Advice Note:

- *There shall be no damage to public roads, footpaths, berms, kerbs, drains, reserves or other public asset as a result of the earthworks, demolition and construction activity.*
- *There shall be no airborne or deposited dust beyond the subject site as a result of the earthworks and construction activity, which is in the opinion of the Council, is noxious, offensive or objectionable.*

Earthworks, Erosion and Sedimentation Control

(7) All earthworks must be managed to minimise any discharge of debris, soil, silt, sediment or sediment-laden water is discharged beyond the subject site to either land, stormwater drainage systems, watercourses or receiving waters. In the event that a discharge occurs, works must cease immediately and the discharge must be mitigated and/or rectified to the satisfaction of the Council.

Advice Note:

In accordance with above condition all earthworks shall be undertaken to ensure that all potential sediment discharges are appropriately managed. Such means and measures may include:

- *Catchpit protection*
- *run-off diversions*
- *silt and sediment traps*
- *decanting earth bunds*
- *silt fences*

During excavation, the ingress and accumulation of surface run-off water and/or perched groundwater can be minimised by:

- *maintaining a waterproof cover over any excavation trenches and pits outside of working hours,*
- *diversion of surface water flow around the works area, and*
- *regular disposal of the water into an appropriate sediment control device, if ponding occurs within the excavation.*

(8) Earthworks must be managed to avoid deposition of earth, mud, dirt or other debris on any public road or footpath resulting from earthworks activity on the subject site. In the event that such deposition does occur, it must immediately be removed. In no instance must roads or footpaths be washed down with water without appropriate erosion and sediment control measures in place to prevent contamination of the stormwater drainage system, watercourses or receiving waters.

Advice Note:

In order to prevent sediment laden water entering waterways from the road, the following methods may be adopted to prevent or address discharges should they occur:

- *provision of a stabilised entry and exit(s) point for vehicles*
- *provision of wheel wash facilities*
- *ceasing of vehicle movement until materials are removed*
- *cleaning of road surfaces using street-sweepers*
- *silt and sediment traps*
- *catchpits or environpods*

In no circumstances should the washing of deposited materials into drains be advised or otherwise condoned.

It is recommended that you discuss any potential measures with the council's monitoring officer who may be able to provide further guidance on the most appropriate approach to take. Alternatively, please refer to "GD05 Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland region".

(9) All earthworks must be managed to ensure that they do not lead to any uncontrolled instability or collapse affecting either the site or adversely affecting any neighbouring properties. In the event that such collapse or instability does occur, it shall immediately be rectified.

(10) During land disturbance activities all necessary must be taken to prevent dust generation and sufficient water shall be available to dampen exposed soil, and/or other dust supressing measures shall be available to minimise dust discharges as far as practicable. The consent holder shall ensure that dust management during the excavation works generally complies with the Good Practice Guide for Assessing and Managing Dust (Ministry for the Environment, 2016).

Advice Note:

In order to manage dust on the site consideration should be given to adopting the following management techniques:

- *Stopping of works during high winds*
- *Watering of haul roads, stockpiles and manoeuvring areas during dry periods*
- *Installation and maintenance of wind fences and vegetated strips*
- *Positioning of haul roads, manoeuvring areas and stockpiles or the staging of works (in relation to sensitive receptors such as dwellings)*

In assessing whether the effects are noxious, offensive or objectionable, the following factors will form important considerations:

- *The frequency of dust nuisance events*
- *The intensity of events, as indicated by dust quantity and the degree of nuisance*
- *The duration of each dust nuisance event*
- *The offensiveness of the dust nuisance, having regard to the sensitivity of the receiving environment*

(11) The consent holder must design, install, and maintain a private on-site stormwater management system. The stormwater management system must be completed in accordance with the following specific requirements:

a. Infrastructure Report and plans prepared by CIVIX Ltd, dated 18 June 2024 and referenced in Condition 1; and

b. The stormwater management system, including but not limited to all devices and permeable paving, shall provide stormwater mitigation to 80% of predevelopment levels in the 1% AEP storm event.

Advice Note:

The dwellings on this development must have the stormwater detention tanks for the roof runoff mitigation prior to discharge to the public stormwater infrastructure. Detailed design of the tank and calculations must be provided at building consent stage with the following mitigation volumes outlined in this consent:

Dwellings	Detention Volume
1	*6,000 litres*
2	*6,000 litres*
3	*6,000 litres*
4	*6,000 litres*
5	*6,000 litres*
6	*6,000 litres*

- *A Building Consent will be required for private stormwater drainage work.*
- *The on-going operation and maintenance of the stormwater management systems is the responsibility of the owner.*
- *The detention tank design and location shall be reviewed at Building Consent stage.*

Vehicle Access

(12) The consent holder must provide a new vehicle crossing to serve Units 1 – 6. The crossing must be designed and formed in accordance with the requirements of Far North District Council. The new crossing must maintain an at-grade (level) pedestrian footpath across the length of the crossing, using the same materials, kerbing, pavings, patterns and finish as the footpath on each side of the crossing. Certification that works have been satisfactorily undertaken must be provided to council prior to occupation of the dwellings.

(13) Prior to the occupation of the residential units, all access, parking, manoeuvring and pedestrian areas must be formed, sealed with an all-weather surface, and drained in accordance with the approved plans. The surface finish of the driveways, surface parking areas and pedestrian routes must be in accordance with the approved plans in Condition 1.

Advice Notes

(1) Any reference to number of days within this decision refers to working days as defined in s2 of the RMA.

(2) If you disagree with any of the above conditions, and/or disagree with the additional charges relating to the processing of the application(s), you have a right of objection pursuant to sections 357A and/or 357B of the Resource Management Act 1991. Any objection must be made in writing to the council within 15 working days of your receipt of this decision (for s357A) or receipt of the council invoice (for s357B).

(3) The consent holder is responsible for obtaining all other necessary consents, permits, and licences, including those under the Building Act 2004, and the Heritage New Zealand Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable Acts (including the Property Law Act 2007 and the Health and Safety at Work Act 2015), regulations, relevant Bylaws, and rules of law. This consent does not constitute building consent approval. Please check whether a building consent is required under the Building Act 2004.

Services

(4) Any provision being made for telecommunications, power or gas to this subdivision are to be underground and are to be to the requirements of the respective utility services.

Subdivision Consent

Activity in accordance with plans

(1) The 6-lot subdivision must be as described in the application and assessment of environmental effects prepared by Jacob Turnbull (dated 21/06/24) and must be carried out in accordance with the plans stamped and referenced by the council as resource consent number SUBXXX(BUNXXX). The consent must also be carried out in accordance with all other reports and information detailed below and all referenced by the council as consent number SUBXXX(BUNXXX).

Report title and reference	Author	Rev	Dated
Infrastructure Report	Civix	-	18/06/24

Advice Note:

- *This consent has been granted on the basis of all documents and information provided by the consent holder, demonstrating that the new lot(s) can be appropriately serviced (infrastructure and access).*
- *Details and specifications for the provision of infrastructure (e.g., public/ private drainage, location, and types of connections) and access (including drainage of accessways, construction standards etc) are subject to a separate Engineering Plan Approval (EPA) and/or Building Consent approval process.*
- *Should it become apparent during the EPA and/or Building Consent process that a component of the granted resource consent cannot be implemented (e.g., detailed tests for soakage fail to achieve sufficient soakage rates, or sufficient gradients for drainage cannot be achieved in accordance with engineering standards/ bylaws etc), changes to the proposal will be required. This may require either a variation to this subdivision consent (under section 127 of the Resource Management Act 1991) or a new consent.*
- *Similarly, should the detailed design stage demonstrate that additional reasons for consent are triggered (e.g., after detailed survey the access gradient increases to now infringe or increase an approved infringement to a standard in the plan), a new or varied resource consent is required.*
- *It is the responsibility of the consent holder to ensure that all information submitted and assessed as part of the subdivision consent is correct and can be implemented as per the subdivision consent (without requiring additional reasons for consent). Any subsequent*

approval processes (such as the EPA) do not override the necessity to comply with the conditions of this resource consent.

Lapse Date

(2) Under section 125 of the RMA, this consent lapses five years after the date it is granted unless:

a. A survey plan is submitted to Council for approval under section 223 of the RMA before the lapse date, and that plan is deposited within three years of the date of approval of the survey plan in accordance with section 224(h) of the RMA; or

b. An application under section 125 of the RMA is made to Council before the lapse date to extend the period after which the consent lapses and the Council grants an extension.

Survey plan approval (s223) conditions

Survey Plan Approval

(3) The consent holder must submit a survey plan in accordance with the approved resource consent subdivision scheme plan titled 'Lots 1 to 6 and 100 Being a Subdivision of Lots 6 DP 38117 and Lot 23 DP 38127', prepared by McKenzie & Co, dated 17/06/2024. The survey plan must show all easements and any amalgamation conditions required by this subdivision consent.

Easements

(4) The easements must be included in a memorandum of easements endorsed on the survey plan and must be created, granted, or reserved as necessary. The consent holder must meet the costs for the preparation, review, and registration of the easement instruments on the relevant Records of Title.

Section 224(c) Compliance Conditions

(5) The application for a certificate under section 224(c) of the RMA must be accompanied by certification from a suitably qualified and experienced surveyor or engineering professional that all the conditions of subdivision consent SUBXXX have been complied with, and identify all those conditions that have not been complied with and are subject to the following:

a. A completion certificate has been issued in relation to any conditions to which section 222 applies.

Connection to Public Network-Wastewater

(6) The consent holder must design and construct connections to the public wastewater reticulation network to serve Lots 1-6 in accordance with the requirements of the wastewater utility provider.

Certification from the utility provider that works have been satisfactorily undertaken must be provided when applying for a certificate under s224(c) of the RMA.

Advice Note:

- *The existing portion of the wastewater pipe which runs within the subject property shall be replaced and upgraded.*
- *Plans approved under Resource Consent do not constitute an Engineering Plan Approval and should not be used for the purposes of constructing public reticulation works in the absence of that approval.*

Connections to Public Network- Potable Water Supply

(7) The consent holder must design and construct connections to the public water reticulation network to serve Lots 1-6 in accordance with the requirements of the water utility provider. Certification from the utility provider that works have been satisfactorily undertaken must be provided when applying for a certificate under s224(c) of the RMA.

Advice Note:

- *Acceptable forms of evidence from the Utility Providers include a Certificate of Acceptance.*
- *Alterations to the public water reticulation network require Engineering Plan Approval. Additional approval is required from Watercare/ Veolia as part of the Engineering Plan Approval Process.*
- *Public water supply is required to ensure an acceptable water supply for each lot, including for fire-fighting purposes.*
- *Public connections are to be constructed in accordance with the Water and Wastewater Code of Practice.*
- *Plans approved under Resource Consent do not constitute an Engineering Plan Approval and should not be used for the purposes of constructing public reticulation works in the absence of that approval.*

Utilities

(8) The consent holder must make provision for telecommunications and electricity to serve Lots 1-6 in accordance with the requirements of the respective utility operators. These utilities must be underground. Certification from the utility providers that works have been satisfactorily undertaken must be provided when applying for a certificate under section 224(c) of the RMA.

Advice Note:

- *The consent holder may also provide gas servicing to the lots, but this is not a requirement of the AUP (OP) and no proof is required at the time of section 224(c). Any gas lines are required to be installed underground.*

Vehicle Crossing

(9) The consent holder must provide a new vehicle crossing(s) to serve Lots 1-6. The crossing(s) must be designed and formed in accordance with the requirements of the road controlling authority. The new crossing must maintain an at-grade (level) pedestrian footpath across the length of the crossing, using the same materials, kerbing, pavings, patterns and finish as the footpath on each side of the crossing. Certification that works have been satisfactorily undertaken must be provided when applying for a certificate under section 224(c) of the RMA.

Advice Note:

- *An approval letter and completion certificate from Auckland Transport is required to be submitted to Auckland Council as a verification that Auckland Transport has completed approval and a final vehicle crossing inspection before this condition is considered fulfilled.*
- *Works within the road reserve require prior approval from Auckland Transport. The consent holder should contact Auckland Transport as soon as possible to ensure any required approvals are issued prior to construction.*
- *A vehicle crossing approval permit is required to be obtained from Auckland Transport for these works.*
- *Please note that any redundant vehicle crossings are required to be reinstated.*

Vehicle Access

(10) Prior to the application for s224(c) approval, the consent holder shall provide evidence to Council that the dwellings approved under land use consent LUCXXX (BUNXXX) have been constructed to roof framing stage to the satisfaction of Council.

Advice Notes:

- *Any reference to number of days within this decision refers to working days as defined in s2 of the RMA.*
- *For more information on the resource consent process with Auckland Council see the council's website: www.aucklandcouncil.govt.nz. General information on resource consents, including making an application to vary or cancel consent conditions can be found on the Ministry for the Environment's website: www.mfe.govt.nz.*

- *If you disagree with any of the above conditions, and/or disagree with the additional charges relating to the processing of the application(s), you have a right of objection pursuant to sections 357A and/or 357B of the Resource Management Act 1991. Any objection must be made in writing to the council within 15 working days of your receipt of this decision (for s357A) or receipt of the council invoice (for s357B).*
- *The consent holder is responsible for obtaining all other necessary consents, permits, and licences, including those under the Building Act 2004, and the Heritage New Zealand Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable Acts (including the Property Law Act 2007 and the Health and Safety at Work Act 2015), regulations, relevant Bylaws, and rules of law. This consent does not constitute building consent approval. Please check whether a building consent is required under the Building Act 2004.*

Geotechnical Report

7-9 Worth Street, Kaitaia

Prepared for Kāinga Ora
Prepared by Beca Limited

23 April 2024

Creative people together transforming our world

Contents

Appendices

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Revision History

Revision Nº	Prepared By	Description	Date
01	Rocky Parsons	For Resource Consent	26/04/24

Document Acceptance

Action	Name	Signed	Date
Prepared by	Rocky Parsons		26/04/24
Reviewed by	James Johnson		26/04/24
Approved by	James Johnson		26/04/24
on behalf of	Beca Limited		

Executive Summary

Ground Investigations Conducted	
6x Cone Penetrometer Tests (CPTs)	
6x Hand Augers (HAs)	
2x Shrink Swell Tests	
3x Plasticity Index Tests	
Ground Conditions	
The site investigations revealed a soil profile consisting of late Pleistocene to Holocene alluvium (Pakihi Supergroup) to a depth of at least 27mbgl.	
Seismic Assessment	
NZS1170.5 Site Subsoil Class for Structural Design	Site Class D
Predicted maximum SLS free field liquefaction settlements	Negligible
Predicted SLS free field lateral displacements	Negligible
Predicted maximum ULS free field liquefaction settlements	10 – 50 mm (no surface manifestation)
Predicted ULS free field lateral displacements	Negligible
Design and Foundation Recommendations	
Measured depth to groundwater at time of investigations	> 1.75 m bgl on 18/10/2022, not encountered on 9/4/2024
Measured topsoil / fill thickness	0.2 – 0.35 m
Recommended foundation type	Shallow foundation – Waffle Slab
Recommended ultimate bearing capacity	300 kPa (shallow foundations)
Predicted long term static settlement	< 10 mm. Differential settlement less than 25mm over 6m.
Recommended driveway CBR	3%

1 Introduction

Kāinga Ora is redeveloping the site at 7-9 Worth Street, Kaitaia. Beca Ltd (Beca) has been commissioned to undertake a geotechnical investigation and to provide analysis and recommendations to support the redevelopment of the site. This report outlines the findings from the geotechnical investigations, along with geotechnical design recommendations.

2 Site Location & Description

The house redevelopment is located in Kaitaia, at 7-9 Worth Street. The site is being uplifted from two dwellings to six dwellings on a plot covering an area of 1994m^2. The site has predominately flat topography and is located some 350m between two unnamed tributaries of the Awanui River (Far North District Council, 2023). A review of historic aerial imagery shows the land was previously used for agricultural purposes. Residential development started in the area in approximately 1940, with construction of the existing dwelling finishing in 1940 (Kāinga Ora, 2023). The site location of the development is presented in Figure 1.

Figure 1: Site location plan of 7-9 Worth St.

The *Far North District Council GeoHazards* database indicates an overland flow path is mapped within the southwestern corner of the site, draining from northeast to southwest. The site is not classified as Flood Prone, and not located in a Flood Plain or in a tsunami evacuation zone (Far North District Council, 2023). Refer to information prepared by Civix Ltd for civil constraints.

3 Geology

3.1 Published Geology

The 1:250,000 *Geological Map of New Zealand* indicates the site is underlain by Late Pleistocene to Holocene Pakihi Supergroup sedimentary deposits, comprising “Unconsolidated to poorly consolidated sand, mud, peat, and shell deposits of estuarine, lacustrine, swamp, alluvial, and colluvial origins” (Heron, 2023). The relevant section of the geological map is presented in Figure 2.

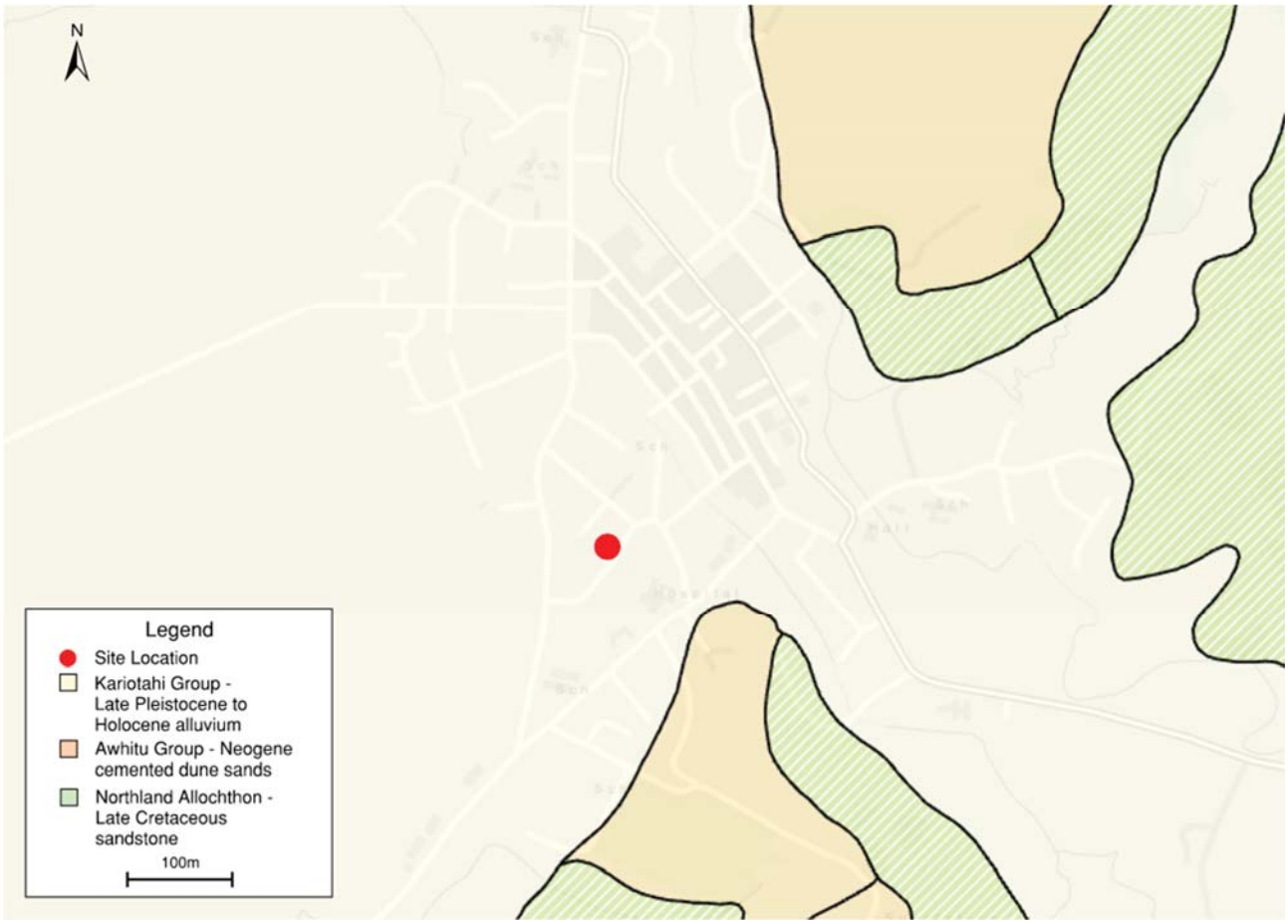

Figure 2: Geological map of 7-9 Worth St, Kaitaia (Geology 2.0.0 (gns.cri.nz))

3.2 Active Faults

The *GNS Science New Zealand Active Faults Database* (GNS Science, 2020) indicates the nearest active fault is the Waikopua Fault approximately 260km south-east of the site. Additional unknown or unpublished faults may be present in closer proximity but have not been identified in this database.

4 Geotechnical Investigation

4.1 Previous Geotechnical Investigations

4.1.1 Site Specific Investigations

Geo Civil on behalf of Tonkin & Taylor Ltd, undertook geotechnical investigations at 7-9 Worth St, Kaitaia on the 18th of October 2022. The investigations comprised of 5 hand augers (HA) and have been summarised in Table 2. The site plans and logs are presented in Appendix A.

4.1.2 Nearby Investigations

The *New Zealand Geotechnical Database* (NZGD, 2016) and the *Beca Geotechnical Reports Database* (Beca, 2022) indicates there are few existing geotechnical data within 250m of the site. Available information showed the site is likely to be underlain by late Pleistocene to Holocene aged alluvial deposits of variable lithology. Northland Allochthon rock is inferred to be encountered at depths greater than 50m below ground level (bgl). Groundwater was measured at depths greater than 1.75m bgl.

4.2 Recent Geotechnical Investigations

A geotechnical investigation commenced on Tuesday 9th April 2024 and was completed on the same day. The investigation locations were surveyed before construction in terms of NZTM2000 and NZVD2016 and are presented in Appendix B. Site investigations were observed and logged by two Beca Geo-professionals, and the logs have been verified by a Beca Senior Engineering Geologist.

Investigations comprised of 1 HA with shear measurements and 6 Cone Penetration Tests (CPTs). CPT locations were co-located to the HA's previously undertaken in 2022. A summary of investigations is provided in Table 4.

- The hand auger logs and photographs are presented in Appendix C.
- Soil recovered by hand augers was logged in general accordance with the NZGS guideline *Field description of soil and rock* (NZGS, 2005).
- Shear vane tests were completed in general accordance with the NZGS *Guideline for Hand Held Shear Vane Test* (NZGS, 2001). Testing was undertaken in cohesive layers between the ground surface and the base of the augured hole at 250mm intervals.
- CPTs were undertaken by LandTech Consulting Ltd from 9 April to 10 April 2024 in general accordance with *ASTM D5778-20* (American Society for Testing and Materials, 2020). Test records for cone resistance, sleeve friction, friction ratio, zero drift and pore pressure are included in Appendix D.
- Laboratory testing was completed as part of expansive soil assessment. Sample IDs and results are presented in Table 4 and shown in Appendix F.

4.3 Standards and Calibration

Investigations were undertaken in general accordance with the *New Zealand Ground Investigation Specification* (NZGS, 2017), and a list of standards used during the site investigation is shown in Table 1.

Table 1: Summary of standards adhered to during investigations

Field Procedure	Standard Used
Soil and Rock Logging	In general accordance with *Field description of soil and rock* (NZGS, 2005)
Hand-Held Shear Vane Test	In general accordance with *Guideline for Hand Held Shear Vane Test* (NZGS, 2001)
Cone Penetration Testing	*ASTM D5778-20*[1] (American Society for Testing and Materials, 2020)

Notes: 1 Standard widely adopted by contractors in NZ with the requirement of a maximum of half the allowable zero drift limit

Up to date calibration certificates for equipment used during investigations are attached in Appendix E.

4.4 Ground Investigation Summary

Table 2 and Table 3 summarise investigations used to inform design. Table 2 summarises investigations completed by Geo Civil in October 2022, and Table 3 summarises investigations completed by Beca and LandTech in April 2024.

Table 2: Summary of ground investigations completed (Geo Civil, 2022)

Hole ID	Location	Estimated Easting (m)	Estimated Northing (m)	Ground Level (m RL)	Total Depth (m bgl)	GWL (m bgl)
AR112533-GE-HA01	Northeast corner of site.	1623644.75	6113898.81	30[1]	0.70	N/E
AR112533-GE-HA02	Northwest corner of site.	1623631.84	6113878.28	30[1]	2.10	N/E
AR112533-GE-HA03	Middle of site.	1623655.50	6113876.93	30[1]	5.00	3.70
AR112533-GE-HA04	Southeast corner of site.	1623691.26	6113879.85	29[1]	2.80	1.75
AR112533-GE-HA05	Southwest corner of site.	1623668.64	6113851.33	29[1]	3.00	2.30

[1] Source: FNDC Online Map Viewer

Table 3: Summary of ground investigations completed (Beca, 2024)

Hole ID	Location	Easting (m)	Northing (m)	Ground Level (m RL)	Total Depth (m bgl)	GWL (m bgl)
AR112533-GE-HA06	Middle of northeastern boundary of site.	1623659.75	6113887.93	29.63	3.00	N/E
AR112533-GE-CPT01	South boundary of in front yard of 9 Worth Street.	1623679.31	6113863.64	26.68	21.49	N/A
AR112533-GE-CPT02	Middle of site.	1623655.73	6113876.59	29.77	15.00	N/A
AR112533-GE-CPT03	Middle of northeastern boundary of site.	1623659.75	6113887.93	29.63	15.00	N/A
AR112533-GE-CPT04	Northwestern boundary of site, backyard of 9 Worth Street.	1623637.19	6113895.77	30.18	24.37	N/A
AR112533-GE-CPT05	Middle of backyard of 7 Worth Street, southern boundary.	1623649.04	6113861.30	30.08	26.98	N/A
AR112533-GE-CPT06	Northwest corner of site	1623633.10	6113879.83	30.40	15.00	N/A

Notes:

RL (Relative Level)

m bgl (metres below ground level)

GWL (Groundwater Level)

N/E (groundwater Not Encountered)

Survey coordinates are given in NZTM2000 and NZVD2016. Set A coordinates were estimated from GIS based on site investigation plan.

4.5 Laboratory Testing

Laboratory testing has been undertaken on selected soil samples collected during the investigation. Tests undertaken are in accordance with:

- Soil Reactivity Test – Shrink-Swell Index *AS 1289.7.1.1 2003* (Standards Australia, 2003). The Site Classification of the samples are classified using Table 2.3 in *AS 2870:2011* (Standards Australia, 2011).
- Atterberg Limits – *NZS4402:1986* Tests 2.2, 2.3 and 2.4 (Standards New Zealand, 1988).
    - Liquid Limit – Test 2.2
    - Plastic Limit – Test 2.3
    - Plasticity Index – Test 2.4

Laboratory testing completed is summarised in Table 4, and full results are presented in Appendix F. Undisturbed samples used for shrink swell testing were collected adjacent to CPT locations. Disturbed samples used to determine linear shrinkage and Atterberg limits were collected from hand auger material.

Table 4: Summary of Lab Testing Data

Hole ID	Sample Depth Top (m)	Sample Depth Bottom (m)	Shrink Swell Index (%)	Liquid Limit (%)	Linear Shrinkage (%)	Moisture Content (%)
AR112533-GE-S01 (CPT01)	0.30	0.60	3.70 [H1]	-	-	-
AR112533-GE-S02 (CPT02)	0.40	0.60	4.80 [H1]	-	-	-
AR112533-GE-S03 (CPT01)	0.35	0.65	-	101	21	42.0
AR112533-GE-S04 (CPT03)	0.35	0.65	-	75	21	36.2
AR112533-GE-S05 (CPT06)	0.20	0.40	-	35	6	8.7
AR112533-GE-HA03 (Geo Civil)	1.10	1.50	-	170	29	-

[x] = site classification

4.6 Groundwater

Depth to groundwater was measured in CPT and hand auger holes following the completion of drilling. Groundwater depths measured in hand auger holes are considered to be more representative of true levels at the time of investigation. Depths measured in CPT holes are only indicative as natural groundwater levels may be disturbed during testing, and groundwater levels may not stabilise between the completion of testing and time of measurement. Measured groundwater depths are summarised in in Table 2. A groundwater table of 1.75m bgl, per Table 2, has been adopted for design.

5 Design Soil Profile & Soil Parameters

A generalised soil profile and soil parameters adopted for design are presented in Figure 3 and Table 5, respectively.

Table 5: Soil Strength Parameters

Soil Unit	Description	Depth to Top of Layer (m bgl)	Unit Weight (kN/m^3)	Friction Angle, Φ' (degree)	Effective Cohesion c' (kPa)	Design Undrained Shear Strength, s_u (kPa)	Young's Modulus, E (MPa)	$C_c/(e_0+1)$ (%)
1a	Stiff, SILT/Clayey SILT [Topsoil]	0.0	N/A	N/A	N/A	N/A	N/A	N/A
2	Very stiff to hard, SILT [Fill]	0.2 – 0.35	18	32	5	150	50	1
3a	Very stiff, clayey SILT [Pakihi Supergroup]	0.2 – 1.1	18	31	3	160	35	2
3b	Very stiff, silty CLAY [Pakihi Supergroup]	1.8 – 2.0	17	29	3	100	25	4
3c	Dense, silty fine to medium SAND [Pakihi Supergroup]	9.7	19	32	1	200	50	N/A
3d	Very stiff, clayey SILT [Pakihi Supergroup]	10.3 – 13.6	17	30	3	100	25	N/A
3c	As above	20.0 – 20.3	As above					
m bgl (metres below ground level)								

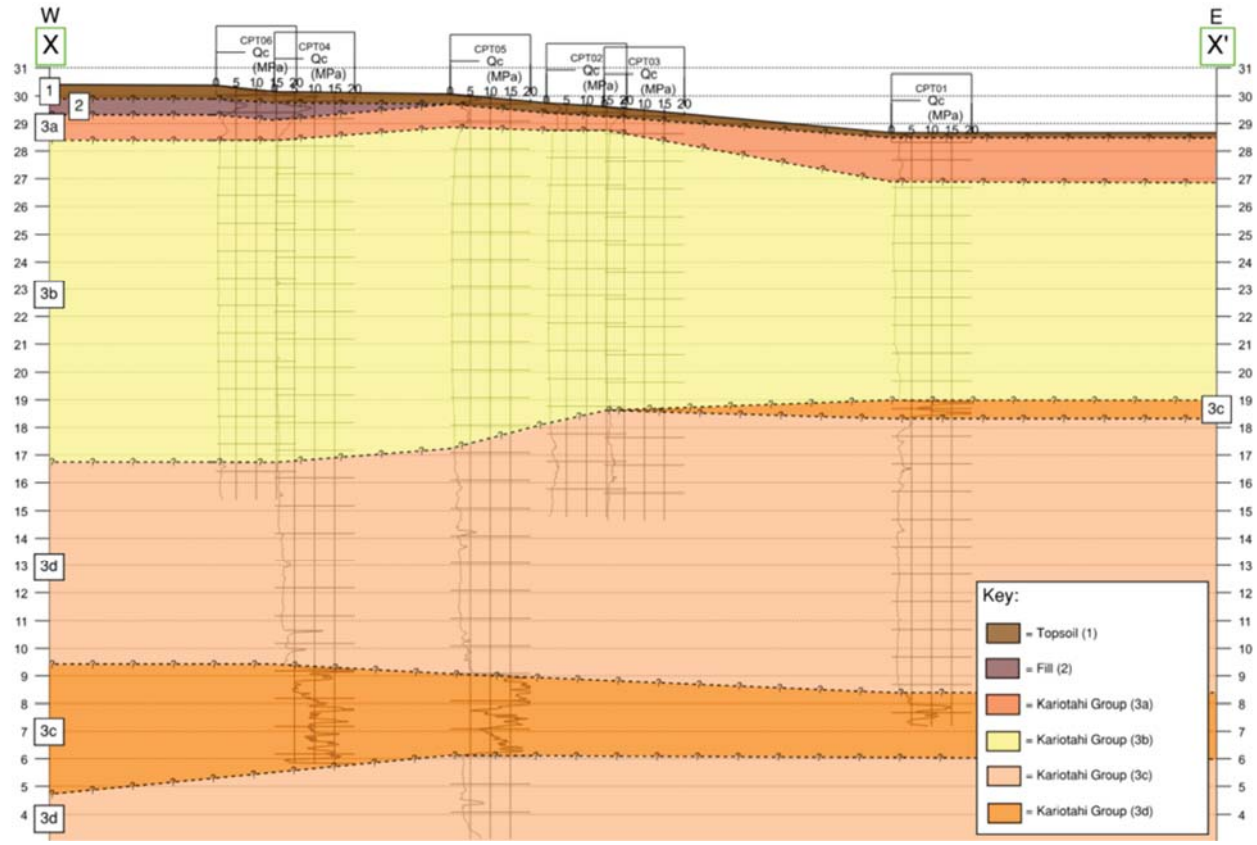

Figure 3: Ground Model Cross Section

6 Seismic Design Requirements

6.1 Design Life and Importance Level

Proposed structures will be designed with an Importance Level of 2 (IL2) and design life of 50 years, in accordance with AS/NZS 1170.0 (Standards New Zealand, 2002) and agreed with Kāinga Ora.

6.2 Site Subsoil Class D

The site subsoil class in accordance with NZS 1170.5 (Standards New Zealand, 2004) depends on the depth and stiffness of the underlying soil or rock, with each site being classified as either Site Class A, B, C, D or E.

CPT investigations did not encounter Northland Allochthon rock at depths shallower than 27m bgl. A review of the geological map, Beca data and publicly available information suggests moderately weathered Northland Allochthon rock may be at depths greater than 50m bgl. As such, site subsoil Class D – Deep or Soft Soil Sites will be adopted for this assessment.

6.2.1 Liquefaction Analysis

While site Class D should be adopted for structural design, for the purpose of liquefaction analysis site Class C should be adopted as per the MBIE guidance document *Module 3: Identification, assessment and mitigation of liquefaction hazards* (MBIE, 2021).

6.3 Seismic Loads

Seismic (earthquake) loads have been computed for the site in accordance with NZS 1170.5:2004 (Standards New Zealand, 2004) for the selected site soil subclass, importance level, and design life. Two limit state loads cases were analysed: Serviceability Limit State (SLS) and Ultimate Limit State (ULS) design earthquake:

- For a SLS design earthquake: The structure is intended to be used without the need for repair.
- For a ULS design earthquake: The structure is required to maintain life safety of the building's occupants and ensure the structural integrity of the building is not lost following the event.

Peak ground acceleration (PGA) and effective magnitude (M_w) values adopted for design are summarised in Table 6.

Table 6: Seismic Design Parameters

Design Event	Annual Probability of Exceedance	Return Period Factor (R_u)	Weighted Peak Ground Acceleration (Class C)	Weighted Peak Ground Acceleration (Class D)	Effective Magnitude (M_w)
SLS	1/25	0.25	0.03g	0.03g	7.5
ULS	1/500	1	0.13g	0.11g	

7 Liquefaction Assessment Methodology

7.1 Overview

Liquefaction describes the short-term loss of strength of a loosely packed cohesionless (sandy) soil during an earthquake or other dynamic loading. Liquefaction occurs when soil particles are disturbed and densify during dynamic loading, temporarily raising pore water pressures and reducing effective stress between particles to near zero. This causes the affected soil to behave essentially like a liquid until excess pore pressures are dissipated.

In accordance with recommendations from *CPT and SPT Based Liquefaction Triggering Procedures* (Boulanger & Idriss, 2014), site soils are divided into two categories: soils that behave under seismic shaking in a 'sand-like' manner (i.e., potentially subject to classical cyclic liquefaction) and soils that behave in a 'clay-like' manner which do not liquefy but may be subject to cyclic softening. Soils are generally assessed quantitatively from CPT tests using the soil behaviour type (SBT) index, I_c. Generally, soils are assumed to be 'clay-like' where the $I_c > 2.6$ and 'sand-like' where $I_c < 2.6$. In addition, soils with a plasticity index (PI) less than 12 are typically assumed to be 'sand-like', while soils with a plasticity index greater than 12 are assumed to be 'clay-like'.

Soils present on site have been characterized into 'sand-like' and 'clay-like' categories based on CPT data and material descriptions of samples. An I_c cut-off of 2.6 has been adopted for the assessment. Unsaturated soils above the groundwater table are assumed not to be susceptible to liquefaction. A groundwater level of 1.75m bgl derived from Table 2 has been used for the liquefaction assessment.

7.2 Assessment Results

Free field liquefaction analysis has been undertaken using the *CLiq* software package (Geologismiki, 2018). The results from the liquefaction assessment are summarised in Table 7, and the analysis output is attached in Appendix G.

Table 7: Liquefaction Analysis Results

Seismic Case	Estimated Free Field Liquefaction Settlement (mm)		Estimated ULS Lateral Displacement (mm)
	SLS	ULS	
AR112533-GE-CPT01	Negligible for all CPTs	50	Negligible for all CPTs
AR112533-GE-CPT02		10	
AR112533-GE-CPT03		15	
AR112533-GE-CPT04		15	
AR112533-GE-CPT05		20	
AR112533-GE-CPT06		Negligible	

The risk of surface manifestation of liquefaction is considered low, as liquefiable deposits are found at depths greater than 8m and overlain by cohesive material.

7.1.2 Lateral Spreading

Lateral spreading occurs as liquefied soils lose shear strength and flow towards an unconfined free face exposure (i.e., towards a riverbank), resulting in horizontal displacements of the ground surface. Surface effects typically include cracking and ejection of liquefied deposits.

Due to low topographical variability across the site and the nearest watercourse being approximately 350m away, the site is considered to have a very low risk of lateral spreading.

8 Foundation Design Recommendations

8.1 Static Settlement

The magnitude of static settlement will vary due to the dwelling load and the compressibility of the underlying soils. A settlement analysis has been undertaken using the *CPeT-IT* software (Geologismiki, 2018) and has been based on the following inputs:

- The soil parameters, ground profile and layer thicknesses summarised in Table 5.
- A serviceably limit state load of 20kPa vertical load, which accounts for the combined weight of fill being placed on the dwelling platform and the structural load.
- The foundation is suitably stiff such that it is essentially rigid.

The total settlement is expected to be less than 10mm. Differential settlement is expected to be less than 20mm over 6m.

8.2 Soil Classification

We recommend the following to account for the expansive soil risk on site:

- The near surface very stiff, SILT/clayey SILT soils do not meet ‘good ground’ criteria as per the requirements of NZS 3604:2011 (Standards New Zealand, 2011).
- For this reason, the site needs to be classified into one of the expansivity classes set out in AS 2870:2011 (Standards Australia, 2011) as detailed in Section 8.3.

8.3 Foundation solution

Waffle slab foundations founded on natural soils are considered suitable for all units of the proposed development. An ultimate bearing capacity of 300kPa should be adopted for design providing the following criteria are met:

- Topsoil and fill is to be cut and removed at foundation locations. Topsoil and fill was found to extend to between 0.2 and 0.35m bgl across the site.
- Natural soils found on site are expansive. The average expansivity class across the site was determined as Class H1. The proposed dwellings are to be of a lightweight clad timber frame construction. Foundations are to be specified as per *AS 2870:2011* Section 1.8.9 (Standards Australia, 2011).

A geotechnical strength reduction factor of 0.5 is recommended as per *B1/VM4:2021* (MBIE, 2023). The ultimate bearing capacity calculations are presented in Appendix H.

To confirm soil strength design assumptions, the subgrade below the waffle slab footings is to be inspected prior to construction by a suitably qualified Geo-professional to ensure the average undrained shear strength of the subgrade is at least 60kPa. If the above minimum subgrade testing requirement is not achieved, soil beneath the footing shall be undercut and replaced with hardfill. The extent of the undercut is to be based on the values achieved and is to be agreed by the Geotechnical Engineer prior to further construction. The proposed hardfill replacement is GAP20 or GAP40 with a maximum fines content (<75 micron) of 10% compacted to ≥92% MDD (Maximum Dry Density by Standard Compaction Effort).

9 Retaining Wall Recommendations

Retaining walls will be required where stable batters cannot be achieved within the property boundary. Walls will comprise of round timber posts and sawn timber rails. Walls will be designed in accordance with verification method *B1/VM4* (MBIE, 2023) and the Waka Kotahi *Bridge manual (SP/M/022)* (Waka Kotahi, 2022). Retaining wall details will be provided within the Building Consent package.

10 Cut & Fill

Hardfill Batters

Where hardfill batters under 500mm high are designed for the site, a maximum slope gradient of 1V:2H is recommended. Should it be required, hardfill with 5% cement by dry weight can be used to form batters up to 1V:1H.

In-Situ Soil Cut Batters

Where cut batters located in the in-situ material are designed for the site, a maximum slope gradient of 1V:3H is recommended. Soil batters should be topsoiled and planted to reduce erosion.

11 Pavement Design Recommendations

The California Bearing ratio (CBR) for pavement design was assessed by using shear vane testing completed down hand auger holes. The CBR percentages are calculated in accordance with *Austroads – Guide to Pavement Technology Part 2* (Austroads, 2019). A recommended CBR of 3% is proposed for pavement design provided all topsoil and uncontrolled fill is stripped. Topsoil and fill was found to be between 0.2 and 1.0m deep across the site.

All excavated topsoil and fill should be removed from the site or stockpiled away from the building platform and earthworks area.

12 Site Specific Risks

The following specific geotechnical and natural hazard risks and proposed mitigations are outlined below:

	Hazard	Likelihood/Risk	Proposed mitigation
Geotechnical	Heavy rain during subgrade cut or backfilling works	[**Likely**] Foundation softens and requires additional over-excavation. Fill becomes contaminated with fines and cannot be compacted to target density, fill removed and replaced, significant delays.	Aim to complete foundation excavation works only during fine weather. Install geotextile between cut subgrade and fill to reduce risk of fines migration into fill during rain events. Backfill the excavation promptly. Adjust the compaction methodology to match the subgrade and aggregate moisture content.
	Encountering groundwater during foundation excavations	[**Possible**] Groundwater may to be encountered, recorded at 1.75m bgl (shallowest).	If work is completed during winter months, erosion and sediment control measures are recommended to be in place during construction. Minor dewatering may be required.
	Isolated soft zones in subgrade cut	[**Possible**] Additional over-excavation required, minor delays.	Test subgrade cut surface during construction and recommend additional excavation and replacement with compacted GAP20 or GAP40 in affected areas.
	Existing underground utilities	[**Likely**] Utilities are noted to cross the site.	None of the proposed structures are situated over existing assets.
Natural Hazard	Subsidence and settlement (Seismic)	[**Low Risk**] The site investigations have classified the land as TC2/TC3, however liquefication assessment indicates there is a non-liquefiable crust, resulting in minimal surface movement.	The foundations have been designed appropriately.
	Subsidence and settlement (Static)	[**Low Risk**] CPTs and hand augers have indicated there is no peat or soft cohesive soils within the ground profile.	An assessment has estimated loading of the site results in less than 10mm static consolidation settlement.
	Lateral Spreading	[**Low Risk**] the site is not situated near any free faces or waterbodies, with the nearest being 350m NE, that may cause lateral spreading in an earthquake.	
	Slips	[**Low Risk**] the property is not located near a slope or channel.	
	Volcanic activity	[**Low Risk**] there are no active volcanoes in close proximity.	
	Flood inundation	[**Low Risk**] Far North District Council does not indicate the site is located in a flood zone.	Stormwater management is being designed in accordance with the] Far North District Council Stormwater Management Guideline by the civil engineers.

13 Applicability Statement

This report has been prepared by Beca on the specific instructions of our Client. It is solely for our Client's use for the purpose for which it is intended in accordance with the agreed scope of work. Any use or reliance by any person contrary to the above, to which Beca has not given its prior written consent, is at that person's own risk.

The site investigation has been undertaken at discrete locations and no inferences about the nature and continuity of ground conditions away from the investigation locations are made. Furthermore, logs are

provided presenting description of the soils and geology based on our observation of the samples recovered in the fieldwork and may not be truly representative of the actual underlying conditions.

Should you be in any doubt as to the applicability of this report for the proposed development described herein, it is essential that you carry out independent investigations to satisfy your needs.

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A

Appendix A – Previous Investigation Report

REPORT

Tonkin+Taylor

Geotechnical Pre-purchase Assessment

7 - 9 Worth Street, Kaitaia

Prepared for
Kainga Ora
Prepared by
Tonkin & Taylor Ltd
Date
November 2022
Job Number
1089709 v1

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Document control

Title: Geotechnical Pre-purchase Assessment					
Date	**Version**	**Description**	**Prepared by:**	**Reviewed by:**	**Authorised by:**
November 2022	V1	First issue to client	A. McCarthy	K. Speight	P. Malan

Distribution:

Kainga Ora	1 electronic copy
Tonkin & Taylor Ltd (FILE)	1 electronic copy

Table of contents

Summary and Recommendations

Kāinga Ora (KO) has engaged Tonkin & Taylor Ltd (T+T) to carry out geotechnical pre-purchase assessments to support development of the property at 7 – 9 Worth Street, Kaitaia. The proposed residential development comprises six duplex/terraced housing units.

This report provides early advice on geotechnical considerations for development of the site. For the geotechnical scope considered in this report, we assess that the site area is expected to be **suitable** for the proposed development subject to the conditions and further details outlined in this report.

This assessment is based upon review of publicly available information, information sourced from T+T archives, site walkover observations and the geotechnical investigation results completed. Further site and project specific investigations and studies will be required for consenting and design stages when detailed development plans are available. The table below summarises the key findings and geotechnical considerations for the pre-purchase stage of the development.

Summary of geotechnical considerations

Aspect	Assessment summary	
Ground conditions	The site is generally level with a slight (less than 5°) fall to the south. Subsoils comprise Late Pleistocene to Holocene alluvial deposits. The soils encountered in the investigations (to a depth of 3 m below ground level) comprise stiff to very stiff clays and silts. Approximately 0.2 m of topsoil was encountered in all boreholes. Groundwater was encountered between 1.75 and 3.7 m below ground level. Refer to section 4.2 for more information.	
Proposed housing	Up to two storey terraced housing	
Foundation options	Shallow piles (i.e. less than 2.5 m depth) or shallow foundations (i.e. less than 1.5 m depth) are likely to be suitable. Refer to section 0 for more information.	
Further Work	Develop the foundation design in conjunction with the structural engineer. Further tests to assess expansive soils can also be done to refine the recommendations in this report.	
Hazard	**Impact** [Note 1]	**Assessment summary**
Presence of uncontrolled fill	Low	No uncontrolled fill was encountered the in the boreholes, however localised shallow pockets may be present.
Slope stability and ground retention	Low	The site is generally level and no or minor ground retention (less than 1 m in height) is anticipated to be required.
Expansive soils	Medium	The subsoils do not meet the NZS3604 criteria for good ground and are susceptible to shrink/swell. We recommend an embedment depth of 1.2 m for the foundations or specific assessment and design.
Groundwater	Low	Groundwater was encountered at depths of between 1.75 and 3.7 m below ground level. Seasonal fluctuations are likely to be +/-1 m. Groundwater is unlikely to be intercepted by the proposed development unless excavations are carried out during or immediately following periods of heavy rain.
Consolidation settlement	Low	Settlement is expected to be limited to <10 mm based on an ultimate geotechnical bearing capacity of 300 kPa.
Seismicity and vicinity to active fault	Low	Seismicity in Northland is low when compared to the rest of New Zealand. The closest known active fault is more than 100 km away.
Liquefaction induced ground surface settlement	Low to Medium	Liquefaction is not likely to occur within the upper 3 m due to the cohesive nature. Sandy layers prone to liquefaction may be present below the depth of investigations, but we expect the non-liquefiable crust will differential settlements.
Liquefaction induced Lateral spreading	Low	Lateral spreading is considered to be unlikely as there is no free face for lateral spreading to occur.
Underground services	Medium	There is a public 100 mm dia wastewater line within the property boundaries which my need re-routing or bridging if building foundations are within the zone of influence of the pipe.
Note 1. The impact rating is intended as a guide in terms of perceived importance to the project.		

1 Introduction

Kāinga Ora has engaged Tonkin & Taylor Ltd (T+T) to undertake a geotechnical pre-purchase assessment of 7 and 9 Worth Street, Kaitaia ('the site'). The proposed residential development comprises six duplex terrace housing units, up to three storey high.

This report provides early advice on the geotechnical considerations for development of the sites. Separate reports have been prepared for transport/traffic, infrastructure, and hydrology/flooding assessments.

This report has been prepared in accordance with our proposal as per the T+T Letter of Engagement dated 13 October 2022.[1]

Figure 1.1: Site location

2 Key objectives

The objective of this report is to provide early advice on the geotechnical considerations for Kāinga Ora during the feasibility stage of the development of the site. The assessment has been carried out by reviewing publicly available information, information sourced from T+T archives and the site walkover and geotechnical investigation results completed.

Further site and project specific investigations and studies will be required for consenting and design stages when detailed development plans are available.

[1] T+T Letter of Engagement, "7 – 9 Worth Street, Kaitaia – Pre-purchase Desktop Assessment" dated 13 October 2022, signed by Anthony Law on behalf of Kāinga Ora on 14 October 2022.

2.1 Scope of work

The scope of work for the geotechnical assessment is as follows:

1 Desktop assessment including review of property file, readily available geological maps, historical aerial photographs and historical investigation data.

2 Site walkover.

3 Geotechnical site investigation comprising:
- 5 hand augered boreholes to a depth of 3 m below ground.
- Laboratory testing to determine soil expansivity.

4 Interpretation of the ground conditions and development of a subsurface ground model.

5 Soil expansivity assessment.

6 Provision of preliminary geotechnical recommendations for foundation design.

3 Site description

The site is located on 7 and 9 Worth Street in the town of Kaitaia, approximately 500 m from the town centre. Each site contains a detached single storey dwelling. The site identification details are presented in Table 3.1.

Table 3.1: Site identification

Address	Legal Description	Area (m^2)
7 Worth Street, Kaitaia	Lot 6 DP38117	1038
9 Worth Street, Kaitaia	Lot 23 DP38127	953

Source: Far North District Council Online Maps[2].

A Geotechnical Engineer carried out a site walkover on 18 October 2022. The observations from that walkover are described in this section and site photos are provided in Appendix A.

The site is surrounded on all sides by single storey residential properties. An early childhood education centre is located to the northwest of the sites but does not share a direct boundary with either property.

The sites are both predominantly flat, with a gentle fall (<5°) towards the southeast. The sites front onto Worth Street, with a grass berm and a footpath separating the properties from the street. The dwellings are located on the southern portion of the sites, with small, grassed lawns to the front of the dwellings and larger grassed lawns to the rear. A separate garage is located to the rear of 9 Worth Street. There is a well-established Pohutukawa tree with an estimated height of 5 m in the front garden of 9 Worth Street and a Bottlebrush tree with an estimated height of 3 m in the berm in front of 7 Worth Street. The property boundaries are generally fenced with scrubby vegetation, small trees and shrubs forming the northern boundary of 7 Worth Street.

The dwellings are single storey, with weatherboard cladding, a concrete perimeter footing, and a concrete tile roof. There is no evidence of significant building movement or settlement at either property, however the properties do not appear to be well maintained and much of the footing of No 9 Worth Street was obscured by household items and vegetation.

There are no overhead services.

[2] Far North District Council online property and land map (accessed 16 November 2022). www.fndc.govt.nz/our-services/far-north-maps

4 Geotechnical considerations

4.1 Published geology

A published geological map[3] shown in Figure 4.1 indicates that the site is underlain by alluvial and colluvial deposits of the Kariotahi Group. This unit comprises unconsolidated to poorly consolidated sand, mud, peat and shell deposits of estuarine, lacustrine, swamp, alluvial and colluvial origins.

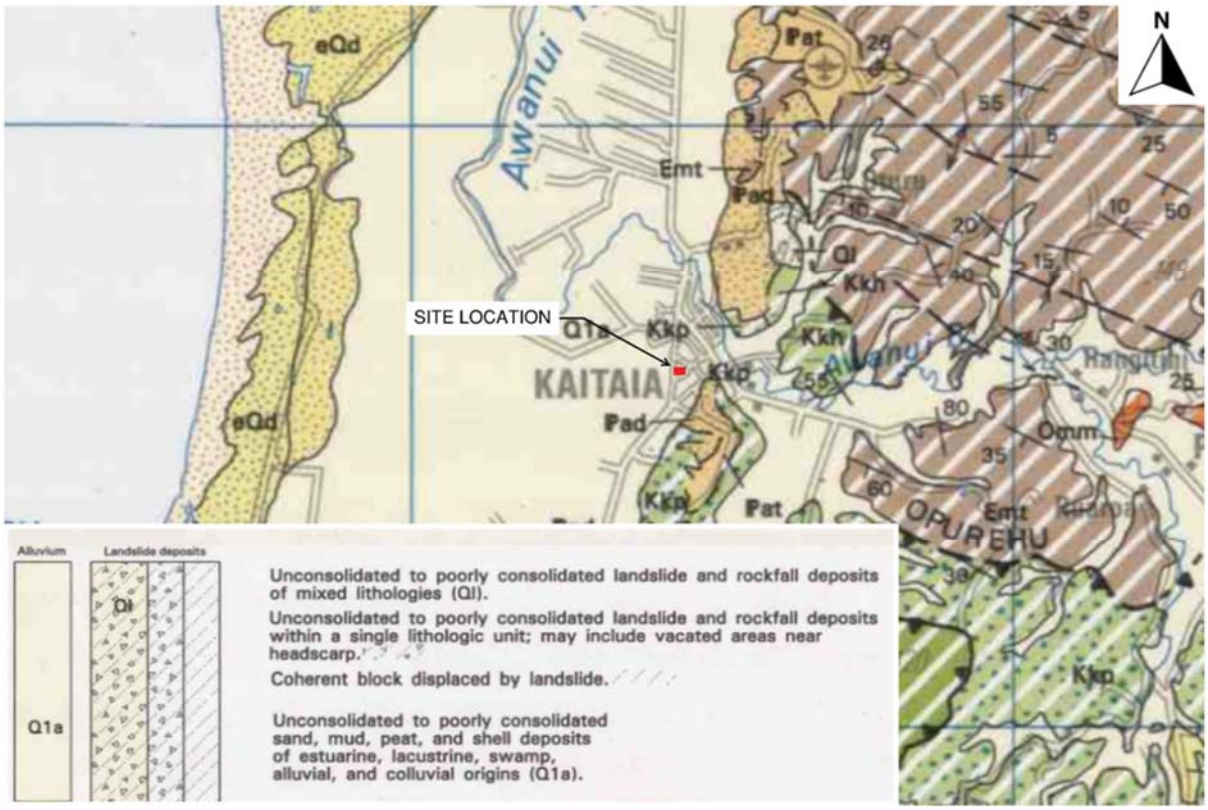

Figure 4.1: Geological map

4.2 Geotechnical investigation

A site-specific geotechnical investigation was carried out by Geocivil on 18 October 2022 under instruction from T+T. The investigations comprised 5 no. hand auger boreholes, designated HA1 to HA5. Services were identified on site by a service clearance technician from Underground Service Locators. The hand auger boreholes had a target depth of 3.0 m (below ground level) with shear vane tests to measure in situ undrained shear strengths carried out at 0.25 m centres.

Summaries of the site investigation locations and the Scala Penetrometer testing are given in Table 4.1, with the borehole logs enclosed in Appendix B. The investigation locations are shown on the Site Investigation Plan, 1020533-F1 which is provided in Appendix B. Table 4.2 presents a summary of the shear vane tests done during the investigations.

[3] Isaac, M.J. (compiler) 1996. Geology of the Kaitaia area. *Institute of Geological & Nuclear Sciences 1:250,000 geological map 1*. 1 sheet + 44 p. Lower Hutt, New Zealand. Institute of Geological & Nuclear Sciences Limited.

Table 4.1: Summary of geotechnical site investigation locations

Investigation ID	Location [NZTM2000][1]		Ground Surface RL (m) [NZVD2016][2]	Hand Auger Termination Depth (m)	Groundwater Level Depth (m)
	Easting (mE)	Northing (mN)			
HA01	1623644	6113899	30	0.7	Not encountered
HA02	1623630	6113879	30	2.8	Not encountered
HA03	1623651	6113882	30	5.0	3.7
HA04	1623683	6113868	29	2.8	1.75
HA05	1623670	6113850	29	3.0	2.3
Note:	1 Coordinates and elevations were collected using GIS and are approximate (estimated accuracy ±5.00 m). 2 Source: FNDC Online Map Viewer.				

Table 4.2: Summary of shear vane testing

Geological Unit	SV Peak Undrained Shear Strength Values (kPa)		
	Minimum	Maximum	Typical Value
Clayey SILT/Silty CLAY	52	243	150

5 Geotechnical Assessments

5.1 General

The subsurface model presented in this report has been inferred using the results of the hand auger boreholes at discrete locations. The nature and continuity of the subsoil away from those locations is inferred and interpreted based on that point location data, but it must be appreciated that actual conditions could vary from the assumed model.

5.2 Geological model

From review of the site investigation logs the site was identified as being underlain by the following sequence of geological units:

a Topsoil.

b Silty clays and clayey silts of the Kariotahi Formation.

A brief description of these geological units is presented below and a summary of the site stratigraphy encountered at the investigation locations is presented in Table 5.1.

Table 5.1: Inferred subsurface conditions

Geological Unit	Below Existing Ground Level (m)	Typical Unit Thickness (m)	Typical Description	Typical Shear Vane Value (kPa)
Topsoil	0.00 – 0.2	0.2	Organic SILT; dark brown. Stiff, moist, low-plasticity.	N/A
Silty CLAY and clayey SILT	0-0.3	3 +	Silty CLAY; brown. Very stiff, moist.	150

5.3 Seismic considerations

5.3.1 Design ground shaking

There are few deep geotechnical boreholes in the Kariotahi Formation in Kaitaia and we have not been able to identify depth to rock. Accordingly, we assess the seismic soil class in terms of 1170.5[4] to be Subsoil Class D – Deep Soils, noting that specific geotechnical investigation or information may allow re-assessment, possibly to Class C.

The design ground shaking for Importance Level 2 (IL2)[5] developments in Northland, such as residential buildings, is as follows for geotechnical design:

- Serviceability Limit State (SLS), 1/25-year return interval ground shaking = 0.03g, Magnitude 5.8.
- Ultimate Limit State (SLS), 1/500-year return interval ground shaking = 0.19g, Magnitude 6.5.

[4] NZS1170.5:2004. Structural design actions – Part 5: Earthquake actions- New Zealand

[5] MODULE 1: Overview of the guidelines - Earthquake geotechnical engineering practice (building.govt.nz)

5.3.2 Liquefaction and lateral spreading assessment

The site is underlain by cohesive, fine-grained materials. We do not assess these as susceptible to liquefaction due to their cohesive nature.

The likelihood of lateral spreading is also low given that the site soils are unlikely to liquefy.

5.4 Geotechnical considerations

5.4.1 Earthworks

Soils at the site are expected to be generally suitable for "cut and fill" earthworks subject to site specific testing and contamination levels, and the possible need for conditioning if they are wet or dry of optimum.

5.4.2 Slope Stability/ Retention requirements

Based on the topography, we do not expect significant retention (greater than 1 m in height) will be required unless the architectural detailing suggests otherwise.

5.4.3 Expansive soils

Expansive soils are typically fine grained clayey and silty soils that undergo appreciable volume change (shrink/swell behaviour) upon changes in moisture content.

The alluvial soils found on the site are potentially derived from Northland Allochthon, which, in our experience can be highly susceptible to shrink/swell behaviour. Linear shrinkage and liquid limit tests were carried out on one soil sample obtained during the investigation for comparison with the criteria required to meet the "good ground" definition as per NZS 3604[6]. To meet the good ground criteria, the liquid limit must be less than 50% and the linear shrinkage less than 15%. The test results for this site were 170% and 29% respectively, so they do not meet the 'good ground' criteria. In our experience this is broadly consistent with a class E soil (Extreme) in terms of AS2870.

Without specific foundation assessment, an embedment of 1.2 m for the foundations to mitigate seasonal shrink/swell induced movement should be adopted. Further testing including the shrink-swell index test (AS1289.7.1.1 – 2003) can be carried out to refine this recommendation at the Building Consent stage, however, this test has been found to be unreliable at predicting the expansive potential of soils in the upper North Island[7]. It is worth noting that there are no signs of expansive soil damage to the existing dwellings (e.g. excessive perimeter footing cracking).

Removal or planting of trees can also have an impact on the shrink/swell of soils and should be considered as part of the foundation design. We note that there is a large pōhutukawa within the property boundary of 9 Worth Street.

5.4.4 Consolidation settlements

We expect consolidation settlement of the proposed terraced houses will be within normal building code guidance (i.e. B1/VM4 limiting differential settlement over a horizontal distance of 6 m to no more than 25 mm) provided that the ultimate geotechnical bearing capacity is limited to 300 kPa (unfactored). Settlement will need to be assessed during the design stage to account for earthworks effects such as cutting and filling. Mixture of pad and pile foundations are also not advisable, as this might accentuate differential stiffness behaviour and potentially settlement effects.

[6] NZS 3604:2011. Timber-framed buildings

[7] Teal,J and Rogers, N 2021, 'Identifying and classifying expansive soils in New Zealand – time to find a better way?', proceedings from the NZGS Symposium, Dunedin, 2021.

5.4.5 'Good ground' in terms of NZS3604

The near surface soils are not assessed to meet the NZS 3604 definition of good ground due to presence of potentially expansive soils.

5.4.6 Proposed foundation options

The following foundation options are all considered potentially suitable for the site:

1 Driven or bored shallow piles (less than 2.5 m embedment).

2 Strip footings.

3 Waffle slab foundations in accordance with AS 2870:2011, Section 3.4 and 5.3. We recommend the perimeter footing extends to at least 1.2 m below the finished ground level without specific assessment and risk discussions.

The design will need to consider the following:

a **The public 100 mm diameter wastewater line:** the pipe may be re-routed or bridged if the development is within the zone of influence of the pipe.

b **Consolidation settlement:** limit the ultimate geotechnical bearing capacity to 300 kPa and keep filling to a minimum.

c **Expansive soils**: shrink/swell effects can be mitigated if the footings are embedded below the zone of seasonal moisture change. We recommend an embedment of 1.2 m for the foundations, or specific assessment and design, to mitigate seasonal shrink/swell induced movement.

5.5 Further work

We recommend the following further works are carried out to understand the ground conditions at the site and to support design of the proposed dwellings if the site is purchased:

1 Consider doing the following geotechnical investigations:
- Up to 2 CPTs to 'refusal' or 20 m depth to assess liquefaction susceptibility with depth.
- Shrink-swell index test to better understand the soil expansivity at the site.

2 Selection of a foundation system and design of the foundations. The structural and geotechnical engineers should work collaboratively and in consultation with the client and architect in selecting the preferred building foundation system.

3 Specific engineering design of any required retaining walls, earthworks and bridging details over public underground services.

6 Applicability

This report has been prepared for the exclusive use of our client Kainga Ora, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
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Jessie Dalglish
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Appendix A Site Walkover Photographs

- **7 Worth Street – photos taken 18 October 2022**

Photograph Appendix A.1: View from Worth Street of No 7 on RHS and No 9 on LHS (looking northwest), with the driveways shown in the centre of the photograph.

Photograph Appendix A.2: View of 7 Worth Street from footpath (looking north)

Photograph Appendix A.3: Back garden and rear vegetated boundary of 7 Worth Street (looking northwest). Boundary fence with 9 Worth St on left hand side

Photograph Appendix A.4: Back garden of 7 Worth Street (looking southeast).

Photograph Appendix A.5: Front of dwelling of 7 Worth Street (looking northwest)

Photograph Appendix A.6: Front garden, driveway and street frontage of 7 Worth Street. Bottle brush tree on berm visible in centre of photograph (looking southeast).

- **9 Worth Street – photos taken 18 October 2022**

Photograph Appendix A.7: View of 9 Worth Street from footpath. Mature pōhutakawa tree visible in front garden (looking northwest)

Photograph Appendix A.8: Back garden and garage of 9 Worth Street (taken from 7 Worth St looking west)

Photograph Appendix A.9: Back garden and rear of garage of 9 Worth Street (looking south)

- **General streetscape – photos taken on 18 October 2022**

Photograph Appendix A.10: Worth Street (looking north) showing the driveways of Nos 7 and 9. Photo taken from opposite 9 Worth St

Photograph Appendix A.11: Worth Street (looking west) showing the driveways of Nos 7 and 9. Photo taken from opposite 7 Worth St

Appendix B Geotechnical Investigations

- **Site Investigation Plan**
- **T+T Engineering Log Terminology + Hand Auger Logs (HA01 to HA05)**
- **Laboratory Test Results (Atterberg Limit and Linear Shrinkage tests)**

LEGEND

Property Boundary

Parcel Boundary

Proposed Hand Auger (HA) Location
Depth: 5 m (HA01 - HA03)
3 m (HA04 - HA05)
DIA: 50mm
Testing: Shear Vane Testing at 250 mm increments
Logging as per NZGS Field Description of Soil and Rock

A4 SCALE: 1:500

0 5 10 15 20 (m)

N

1. Geological Boundaries GNS Science, Lower Hutt, New Zealand.
2. Parcel Boundary,Property Boundary sourced from the LINZ Data Service and licensed for re-use under the Creative Commons Attribution 3.0 New Zealand licence.
3. World_Imagery Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
4. Reference/World_Boundaries_and_Places Esri, HERE,

Created On:	06/10/2022
Created By:	TWilson
Approved By:	
TT Proj Ref:	1089709
TT Map Ref:	TTMAPREF1433463001.902

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7-9 WORTH STREET - PRE-PURCHASE ASSESSMENT
Proposed Investigation locations

FIGURE No.
1

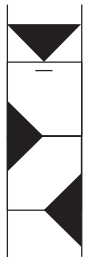
Tonkin+Taylor

Engineering log terminology

General

Soil and rock descriptions follow the "Guidelines for the field classification and description of soil and rock for engineering purposes" by the New Zealand Geotechnical Society (2005). Refer to this document for methods of field determination.

Water



Core recovery

Expressed as percentage of the length of the core run recovered.

Drilling method/casing

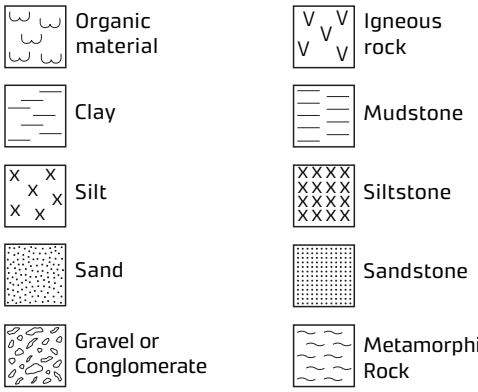
Common types:

OB	Open barrel
W	Wash
HQ3	HQ triple tube
PQ3	PQ triple tube
HSA	Hollow Stem Auger
WS	Window Sampler
HA	Hand Auger
HFS	High Frequency Sonic Drilling
LFS	Low Frequency Sonic Drilling

Graphic logs

The graphic log shows soil and rock types. The defect log indicates the location, orientation and abundance of defects of all types.

Typical material symbols:



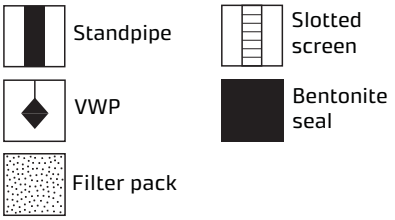
Tests

- **N=22:**SPT uncorrected blow count for 300 mm
- **75/12:**Undrained shear strength (peak /residual as measured by field vane.

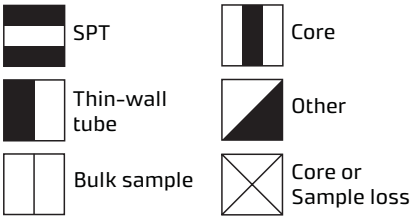
Laboratory test(s) carried out:

PMT	Pressuremeter test
LT	Lugeon test
LV	Laboratory vane
AL	Atterburg limits
UU	Undrained triaxial
PSD	Particle size distribution
c' Ø'	Effective stress
CONS	Consolidation
DS	Direct shear
COMP	Compaction
UCS	Unconfined compression
IS_{50}	Point load

Installation type



Sample type



Soil description

Moisture content

D	Dry, looks and feels dry
M	Moist, no free water on hand when remoulding
W	Wet, free water on hand when remoulding
S	Saturated, free water present on sample

Consistency/undrained shear strength

		S_u(kPa)
VS	Very soft	< 12
S	Soft	12 to 25
F	Firm	25 to 50
St	Stiff	50 to 100
VSt	Very stiff	100 to 200
H	Hard	> 200

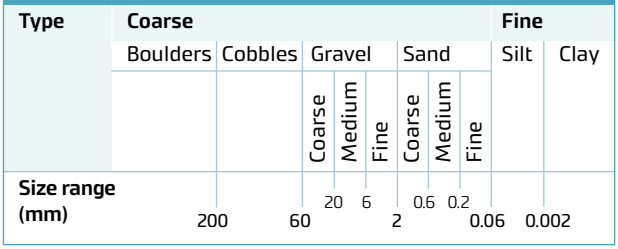
Density index

		SPT(N) - uncorrected
VL	Very loose	0 to 4
L	Loose	4 to 10
MD	Medium dense	10 to 30
D	Dense	30 to 50
VD	Very dense	> 50

Proportional terms definition (Coarse soils)

Fraction	**Term**	**% of soil mass**	**Example**
Major	(UPPER CASE)	Major constituent	GRAVEL
Subordinate	(lower case)	> 20	Sandy
Minor	with some... with minor...	12 - 20 5 - 12	with some sand with minor sand
	with trace of... (or slightly)...	< 5	with trace of sand (slightly sandy)

Grain size criteria



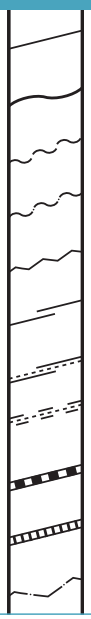
Tonkin+Taylor

Engineering log terminology

Rock description

Signifcant defects

B	Bedding
J	Joint
Sc	Schistosity
Cl	Cleavage
BZ	Broken zone/crushed zone
F	Fault
Fg	Fault with gouge
SZ	Shear zone
Iz	Infilled seam
XD	Extremely weathered seam
DD	Drilling - induced defect



Weathering

UW	Unweathered
SW	Slightly weathered
MW	Moderately weathered
HW	Highly weathered
CW	Completely weathered
RS	Residual soil

Defect shape

ST	Stepped
UN	Undulating
PL	Planar

Roughness of defect surface

R	Rough
SM	Smooth
SL	Slickensided

Field strength

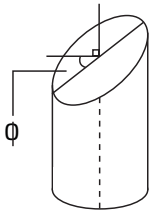
		UCS (MPa)	$I_{S(50)}$ (MPa)
EW	Extremely weak	< 1	N/A
VW	Very weak	1 - 5	N/A
W	Weak	5 - 20	N/A
MS	Moderately strong	20 - 50	1 - 2
S	Strong	50 - 100	2 - 5
VS	Very strong	100 - 250	5 - 10
ES	Extremely strong	> 250	> 10

Defect coding

Type
Angle (perpendicular to core axis)
Infilling description (as per soil description)

J 60˚, PL, SL, T, CV, STIFF GREEN CLAY

Infilling/coating type
Aperture
Roughness
Shape



Defect Orientation: for vertical unoriented boreholes defect orientation is measured normal to core axis e.g horizontal = 0˚(see diagram). For angled boreholes defect orientation is measured relative to core axis e.g parallel to core axis = 0˚.

Aperture

		Aperture (mm)
T	Tight	nil
VN	Very narrow	0 - 2
N	Narrow	2 - 6
MN	Moderately narrow	6 - 20
MW	Moderately wide	20 - 60
W	Wide	60 - 200
VW	Very wide	> 200

Infillings and coatings

CG	Clay gouge	Joints have openings between opposing faces of intact rock substance in excess of 1 mm filled with clay gouge. Clay is generally described in terms of soil properties.
CV	Clay veneers	Joints contain clay coating whose maximum thickness does not exceed 1 mm. Note: Describe clay in terms of soil properties.
PL	Penetrative limonite	Joint traces are marked in terms of well defined zones of slightly to moderately weathered ferruginised rock-substance within the adjacent rock.
FeSt	Limonite stained	Joint surfaces are stained or coated with limonite, although the rock substance immediately adjacent to the joints is fresh.
CT, SC	Coated	Joints exhibit coatings other than clay or limonite, e.g. Carbonate (CT) or Silica (SC).
CL, CS, CC	Cemented	Joints are cemented with limonite (CL), Silica (CS), or Carbonates (CC).
CN	Clean	Joint surface show no trace of clay, limonite, or other coatings.

Spacing

Term	Spacing
Very wide	> 2 m
Wide	0.6 - 2 m
Moderately wide	200 - 600 mm
Close	60 - 200 mm
Very close	20 - 60 mm
Extremely close	> 20 mm

Excavator penetration

Easy	1
Moderate	2
Difficult	3

RQD: Rock Quality Designation - percentage of core run consisting of sound rock longer than 10 cm.

GEO CIVIL
TEST RIGHT • BUILD RIGHT

AUGERHOLE LOG

166 Bank Street,
Whangarei,
M:0276565226
E:info@geocivil.co.nz

Lab Job No.: 8404-010 **Borehole No.:** HA01 **Sheet:** 1 of 1

Client: Tonkin & Taylor **Hole Depth:** 0.70 m

Job: Geotechnical Investigation **Date:** 18/10/22

Report No.: ADD INTERNAL REPORT NUMBER! **Location:** 7-9 Worth Street, Kaitaia

Client Ref. No.: 1089709

Unit	Geological Interpretation (In accordance with NZGS 2005)	USC	Legend	Depth (m)	Water	Relative Density	Vane Shear Strength (kPa) / Scala Penetrometer (NZS4402: 1986 Test 6.5.2 - Procedure 2, blows / 100mm)	Samples
	Silty TOPSOIL, some organics, dark brown. moist, low plasticity.	Pt	TS T		Groundwater Not Encountered			
	SILT, minor clay, brown mottled with whitish grey. moist, friable, low plasticity.	ML						191/39
	Colour change to orange brown.	ML		0.5				113/32
	End of Borehole - Too firm to auger.			1.0				UTP
				1.5				
				2.0				
				2.5				
				3.0				

Vane Shear Strength (kPa) — Tested in accordance with NZGS Aug 2001: 25, 50, 75, 100, 125, 150, 175, 200, 225

Scala Penetrometer — NZS4402: 1986 Test 6.5.2 - Procedure 2 (blows / 100mm): 5, 10, 15, 20; Blows; Peak; Residual

Remarks

Note: All Scala Penetrometer readings taken below 1.5m from start depth are outside the scope of this test
Note: Scala Penetrometer interpretation is not endorsed

Water

- Standing Water Level
- Out flow
- In flow

Investigation Type

- [x] Hand Auger
- [ ] Hand Auger + Scala (DCP)

Contractor:	Equipment:	Recorded By:	Laboratory Technician:	Approved Signatory:
Geocivil	HA	S.K		
		Recorded Date: 18/10/2022		

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AUGERHOLE LOG

166 Bank Street,
Whangarei,
M:0276565226
E:info@geocivil.co.nz

Lab Job No.: 8404-010 **Borehole No.:** HA02 **Sheet:** 1 of 1

Client: Tonkin & Taylor **Hole Depth:** 2.80 m

Job: Geotechnical Investigation **Date:** 18/10/22

Report No.: ADD INTERNAL REPORT NUMBER! **Location:** 7-9 Worth Street, Kaitaia

Client Ref. No.: 1089709

Unit	Geological Interpretation (In accordance with NZGS 2005)	USC	Legend	Depth (m)	Water	Relative Density	Vane Shear Strength (kPa) / Scala Penetrometer (NZS4402: 1986 Test 6.5.2 - Procedure 2, blows / 100mm)	Peak	Residual	Samples
	Silty, clayey TOPSOIL, traces of fine sand, traces of organics (rootlets), dark brown, moist, low plasticity.	Pt		0						
	SILT, minor clay, browny grey, friable, slightly moist.	ML						243+		
	Clayey SILT, traces of organics (rootlets), dark brown, friable, slightly moist.	ML		0.5				159/10		
	Clayey SILT, orangey brown. friable, slightly moist.	ML						243+		
	Silty CLAY, traces of organics (rootlets), orangey brown. low plasticity, slightly moist.	CL		1.0				159/49		
	Silty CLAY, orangey brown with light grey and white mottling. slightly moist, low-medium plasticity.	CL		1.5	Groundwater Not Encountered			159/80		
								232/66		
								139/87		
	Clayey SILT, whitey gray with orangey brown mottling. moist, medium to high plasticity.	MH		2.0				114/52		
								153/97		
				2.5				118/62		
								107/38		
	End of Borehole - Too difficult to extract rods, hole collapse at 2.1m			3.0						

Remarks

Note: All Scala Penetrometer readings taken below 1.5m from start depth are outside the scope of this test
Note: Scala Penetrometer interpretation is not endorsed

Water
- Standing Water Level
- Out flow
- In flow

Investigation Type
- [x] Hand Auger
- [ ] Hand Auger + Scala (DCP)

Contractor:	Equipment:	Recorded By:	Laboratory Technician:	Approved Signatory:
Geocivil	HA	J.H		
		Recorded Date: 18/10/2022		

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AUGERHOLE LOG

166 Bank Street,
Whangarei,
M:0276565226
E:info@geocivil.co.nz

Lab Job No.: 8404-010 **Borehole No.:** HA03 **Sheet:** 1 of 1

Client: Tonkin & Taylor **Hole Depth:** 5.00 m

Job: Geotechnical Investigation **Date:** 18/10/22

Report No.: ADD INTERNAL REPORT NUMBER! **Location:** 7-9 Worth Street, Kaitaia

Client Ref. No.: 1089709

Unit	Geological Interpretation (In accordance with NZGS 2005)	USC	Depth (m)	Water	Relative Density	Vane Shear Strength (kPa) / Scala Penetrometer (NZS4402: 1986 Test 6.5.2 - Procedure 2, blows / 100mm)	Samples
	TOPSOIL, some organics, dark brown. moist, low plasticity.	Pt	0.0			226+	
	Silty CLAY, minor sand, brown. friable, moist, moderate plasticity.	CL	0.5			226+	
	Clayey SILT, traces of fine sand, light brown. mottled grey and white, friable, moist, low plasticity.	ML	1.0			200/65 168/65	
	Silty CLAY, traces of fine sand, brown. moist, high plasticity.	CH	1.5			158/81 174/74	
	CLAY, some silt, greyish brown. moist, high plasticity.	CH	2.0			184/94 220/139 158/84 168/97 129/68	
	CLAY some silt, traces of fine sand, orangey brown with minor grey. moist, high plasticity.	CH	3.0			145/74 142/74	
	Silty CLAY, traces of fine sand, light grey with minor reddish orange streaks. wet, high plasticity.	CH	3.5	SWL 3.70m		129/81	
	Moisture change to saturated.	CH	4.0			84/45 90/39 87/42 71/39 68/32	
	End of Borehole - Target depth reached		5.0			68/45	

Remarks

Water Table at end of Day 2.9m bgl

Note: All Scala Penetrometer readings taken below 1.5m from start depth are outside the scope of this test
Note: Scala Penetrometer interpretation is not endorsed

Water

- Standing Water Level
- Out flow
- In flow

Investigation Type

- [x] Hand Auger
- [ ] Hand Auger + Scala (DCP)

Contractor:	Equipment:	Recorded By:	Laboratory Technician:	Approved Signatory:
Geocivil	HA	S.K		
		Recorded Date: 18/10/2022		

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E:info@geocivil.co.nz

AUGERHOLE LOG

Lab Job No.: 8404-010 **Borehole No.:** HA04 **Sheet:** 1 of 1

Client: Tonkin & Taylor **Hole Depth:** 2.80 m

Job: Geotechnical Investigation **Date:** 18/10/22

Report No.: ADD INTERNAL REPORT NUMBER! **Location:** 7-9 Worth Street, Kaitaia

Client Ref. No.: 1089709

Unit	Geological Interpretation (In accordance with NZGS 2005)	USC	Depth (m)	Water	Relative Density	Vane Shear Strength (kPa) / Scala Penetrometer (NZS4402: 1986 Test 6.5.2 - Procedure 2, blows / 100mm)	Peak / Residual	Samples
	Silty TOPSOIL, some organics, dark brown. moist.	Pt	0				149/45	
	Silty CLAY, minor fine sand, traces of organics, grey brown. moist, moderate to high plasticity.	CH					191/81	
	Colour Change to greyish brown.	CH	0.5				191/100	
	Colour Change yellowish brown.	CH	1.0				178/94	
	Colour change, yellowish brown, minor grey.	CH					174/94	
	Moisture change to saturated.	CH	1.5	SWL 1.75m			132/48	
	CLAY, minor silt, yellowish brown, saturated, high plasticity.	CH	2.0				52/13	
			2.5				155/87	
							129/81	
							125/78	
	End of Borehole - Due to hole collapse.		3.0				129/71	

Remarks

Water Table at end of Day 1.75m bgl

Note: All Scala Penetrometer readings taken below 1.5m from start depth are outside the scope of this test
Note: Scala Penetrometer interpretation is not endorsed

Water

- Standing Water Level
- Out flow
- In flow

Investigation Type

- [x] Hand Auger
- [ ] Hand Auger + Scala (DCP)

Contractor:	Equipment:	Recorded By:	Laboratory Technician:	Approved Signatory:
Geocivil	HA	S.K		
		Recorded Date: 18/10/2022		

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AUGERHOLE LOG

166 Bank Street,
Whangarei,
M:0276565226
E:info@geocivil.co.nz

Lab Job No.: 8404-010 **Borehole No.:** HA05 **Sheet:** 1 of 1

Client: Tonkin & Taylor **Hole Depth:** 3.00 m

Job: Geotechnical Investigation **Date:** 18/10/22

Report No.: ADD INTERNAL REPORT NUMBER! **Location:** 7-9 Worth Street, Kaitaia

Client Ref. No.: 1089709

Unit	Geological Interpretation (In accordance with NZGS 2005)	USC	Legend	Depth (m)	Water	Relative Density	Vane Shear Strength (kPa) / Scala Penetrometer (NZS4402: 1986 Test 6.5.2 - Procedure 2, blows / 100mm)	Samples
	Silty clayey, TOPSOIL, traces of fine sand, traces of organics (rootlets), dark brown. slightly moist, low plasticity, slightly friable.	Pt	TS T					
	CLAY, minor silt, traces of fine sand, orangey brown. slightly moist, medium plasticity.	CL		0.5			243+	
	CLAY, orangey brown, moist, medium to high plasticity	CH		1.0			198/69	
				1.5			156/62	
							153/69	
							177/97	
							166/104	
	Clayey SILT, light brown/white. moist, medium plasticity.	CL		2.0			153/73	
	Moisture change to very moist.	CL			SWL 2.30m		173/45	
	CLAY, minor silt, light purple. wet, high plasticity.	CH		2.5			180/135	
							83/28	
							73/28	
	End of Borehole - Target depth reached.			3.0			69/28	

Vane Shear Strength (kPa) — Tested in accordance with NZGS Aug 2001: 25, 50, 75, 100, 125, 150, 175, 200, 225

Scala Penetrometer — NZS4402: 1986 Test 6.5.2 - Procedure 2 (blows / 100mm): 5, 10, 15, 20, Blows; Peak, Residual

Remarks

Water Table at end of Day 1.50m bgl

Note: All Scala Penetrometer readings taken below 1.5m from start depth are outside the scope of this test
Note: Scala Penetrometer interpretation is not endorsed

Water

- Standing Water Level
- Out flow
- In flow

Investigation Type

- [x] Hand Auger
- [ ] Hand Auger + Scala (DCP)

Contractor:	Equipment:	Recorded By:	Laboratory Technician:	Approved Signatory:
Geocivil	HA	J.H		
		Recorded Date: 18/10/2022		

Whangarei Laboratory
166 Bank Street,
Whangarei
M: 021 0263 7711
E: martin@geocivil.co.nz

TEST REPORT

Lab Job No: 8404-010

Your ref.: -

Date of Issue: 31/10/2022

Date of Re-Issue: -

Page: 1 of 3

Test Report No. WRE8404-010-R001

PROJECT: **7-9 WORTH STREET - - Soil Classification Testing**

CLIENT: Tonkin + Taylor
PO BOX 5271 Victoria Street West, Auckalnd

ATTENTION: Thomas Wilson

TEST METHODS: Determination of the liquid & plastic limits, plasticity index and water content
NZS 4402:1986 Tests 2.1,2.2,2.3,2.4
Determination of the Linear Shrinkage
NZS 4402:1986 Test 2.6

SAMPLING METHOD: N/A

TEST RESULTS: As per attached sheets

M.Adams
General Manager

S. Kokich
Approved Signatory

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

Geocivil Laboratory
Northland - Wellington - Christchurch - Otago
P: 09 438 4417
E: info@geocivil.co.nz

DETERMINATION OF THE LIQUID & PLASTIC LIMITS, PLASTICITY INDEX & WATER CONTENT

NZS 4402:1986 Test 2.2,2.3,2.4

Lab Job No:	8404-010	**Sample No.:**	WRE8404-010-S001
Client:	Tonkin + Taylor	**Tested By:**	N.K
Location:	7-9 WORTH STREET - HA03 1.1-1.5m	**Date Tested:**	26/10/2022
		Checked By:	M.A
Date Received:	18/10/2022	**Date Checked:**	31/10/2022
Report No:	WRE8404-010-R001	**Page:**	2 of 3
REF:	-		
Sampling Method:	Hand bore hole – Sampling not accredited	**Sampled By:**	S.K.
Date Sampled:	18/10/2022		

Test Details:

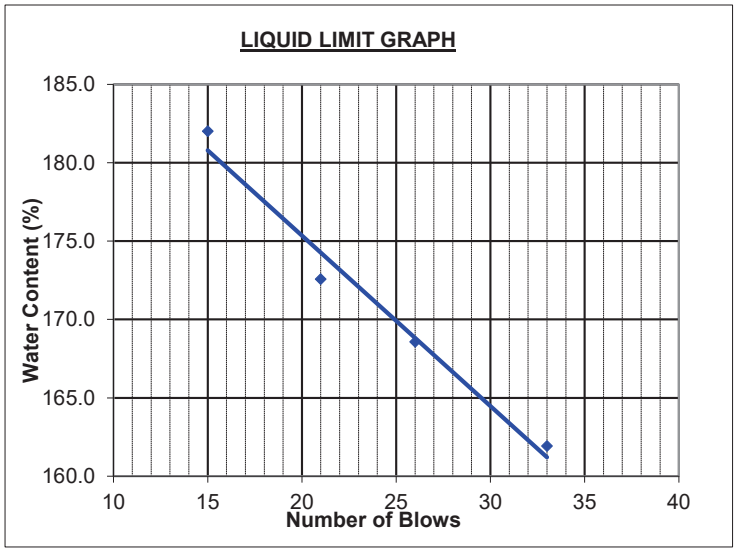
Test performed on: Fraction passing 425μm sieve

Sample history: As received

Description of Sample: Silty CLAY, light brown, moist

	Liquid Limit				Plastic Limit	
No. of blows	15	21	26	33		
Water content (%)	182.0	172.6	168.6	161.9	41.2	41.2

NWC	**55.5**
Liquid Limit	**170**
Plastic Limit	**41**
Plasticity Index	**129**



S. Kokich
Approved Signatory

Geocivil Laboratory
Northland - Wellington - Christchurch - Otago
P: 09 438 4417
E: info@geocivil.co.nz

DETERMINATION OF THE LINEAR SHRINKAGE

NZS 4402:1986 Test 2.6

Lab Job No:	8404-010	**Sample No:**	WRE8404-0
Client:	Tonkin + Taylor	**Tested By:**	N.K
Location:	7-9 WORTH STREET - HA03 1.1-1.5m	**Date:**	21/10/2022
		Checked By:	M.A
Date Received:	18/10/2022	**Date:**	31/10/2022
Report No:	WRE8404-010-R001	**Page:**	3 of 3
REF:	-		

Test performed on: Fraction passing 425mm sieve
History: As received

Description of Sample: Silty CLAY, light brown, moist

Linear shrinkage	**29**

S. Kokich
Approved Signatory

www.tonkintaylor.co.nz

B

Appendix B – Site Investigation Plan

Key:

Lot Area

Cone Penetration Test 1

Hand Auger

No.	Revision	By	Chk	Appd	Date
01	GEOTECHNICAL SITE INVESTIGATION PLAN	OKM		JJ	10.05.24

Drawing Originator: Beca

Original Scale (A1) / Reduced Scale (A3)

Design	OKM	10.05.24
Drawn		
Dsg Verifier		
Dwg Check		

* Refer to Revision 1 for Original Signature

Client: Kāinga Ora Homes and Communities

Project: HOUSING DELIVERY SYSTEM (HDS) - AR112533 7-9 Worth Street, Kaitaia

Title: GEOTECHNICAL INVESTIGATION LOCATION PLAN

Discipline: GEOTECHNICAL

Drawing No.

Rev. A

DO NOT SCALE

IF IN DOUBT ASK.

C

Appendix C – Hand Auger Logs and Core Photographs

Geotechnical Log Key Sheet

SOIL AND ROCK DESCRIPTIONS

Soil and Rock Descriptions are in general accordance with the NZ Geotechnical Society (NZGS), 2005.
Hand-held Vane Shear Strength measurements are in general accordance with the NZGS, 2001.

METHODS

BH	Machine Borehole
CPT	Cone Penetration Test
DCP	Dynamic Cone Penetration
HA	Hand Auger
SPT	Standard Penetration Test
IVAN	In-situ Vane Test
MA	Machine Auger
OB	Open Barrel
SNC	Sonic Core Drilling
TP	Test Pit/Trench
TT	Triple Tube
PT	Thin-walled Open Drive Tube
VE	Vacuum Excavation
W	Wash Boring

WEATHERING

CW	Completely Weathered
HW	Highly Weathered
MW	Moderately Weathered
SW	Slightly Weathered
UW	Unweathered

SAMPLES

B	Bulk Disturbed Sample
C	Core Sample
D	Small Disturbed Sample
U	Thin-wall Open Drive (Push) Tube Sample

WATER

Groundwater Level (GWL)

IN-SITU TESTS

Shear Vane

Su	In-situ peak undrained shear strength and remoulded undrained shear strength
UTP	Unable to Penetrate
CB	Pilcon-type vane tested in Core Barrel
DH	Pilcon-type vane tested in-situ (downhole)
GV	Geonor vane, tested in-situ
IcV	Icone vane, tested in-situ

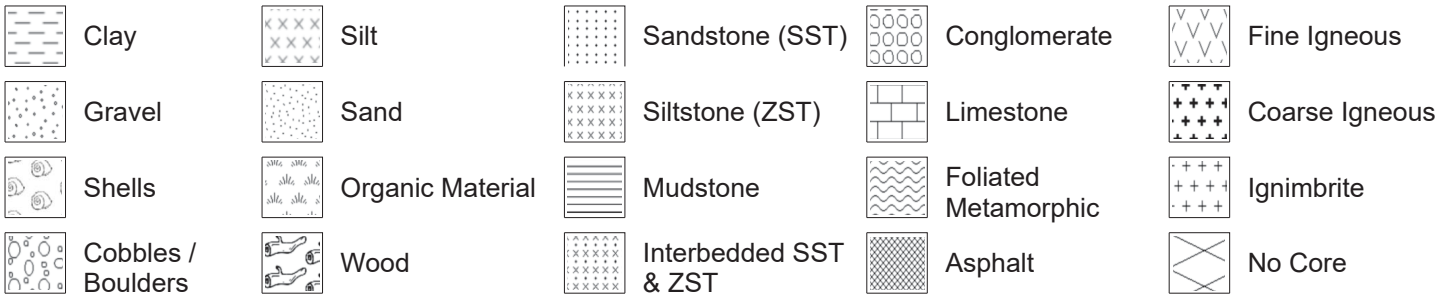
Standard Penetration Test (SPT)

N	SPTn Sampler (Split-spoon)
Nc	SPTn Solid Cone
HB	SPT Hammer Bouncing

TERMINOLOGY

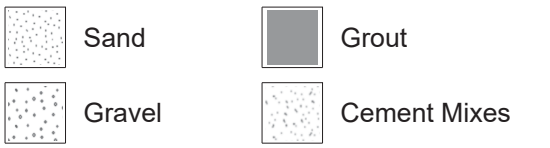
RL	Reduced Level
RQD	Rock Quality Designation

GRAPHIC LOG (1 or a combination of the following)



MONITORING INSTALLATION

Backfill Material



Standpipe

ORGANIC SOILS

Von Post Degree of Humification

H1	Completely unconverted and mud-free peat, when pressed gives clear water and plant structure is visible.
H2	Partially unconverted and mud-free peat, when pressed gives almost clear water and plant structure is visible.
H3	Very slightly decomposed or very slightly muddy peat, when pressed gives marked muddy water, no peat substance passes through the fingers and plant structure is less visible.
H4	Slightly decomposed or slightly muddy peat, when pressed gives muddy water and plant structure is less visible.
H5	Moderately decomposed or very muddy peat with growth structure evident but slightly obliterated.
H6	Moderately decomposed or very muddy peat with indistinct growth structure.
H7	Fairly well decomposed or very muddy peat but the growth structure can just be seen.
H8	Well decomposed or very muddy peat with very indistinct growth structure.
H9	Practically decomposed or mud-like peat in which almost no growth structure is evident.
H10	Completely decomposed or mud peat where no growth structure can be seen, entire substance passes through the fingers when pressed.

Hand Auger Log

Hand Auger ID: HA06

Sheet 1 of 1

Project:	HDS - 7-9 Worth Street, Kaitaia	**Project Number:**	3912124/AR112533
Site Location:	Kaitaia, New Zealand	**Client:**	Kāinga Ora
Location:	Middle of site, approximately 3m SW of NE boundary, 35m NW of SE boundary.	**Coordinate System:**	NZTM2000
		Northing:	6113887.9
		Easting:	1623659.8
		Vertical Datum:	NZVD 2016
		Ground level (mRL):	29.63
		Location Method:	Survey

Groundwater (m)	In Situ Tests: Su (kPa)	In Situ Tests: Scala blows/50mm	Samples	Depth (m)	RL (m)	Graphic Log	Soil/ Rock Description	Geological Unit
					29.5		Very stiff, SILT, trace fine to medium sand, trace organics; light brown; dry, non plastic. Organics: rootlets. [Topsoil]	
	202+							
	202+			0.5	29.0		Hard, SILT, minor fine sand, minor clay; light orange; moist, low plasticity.	Pakihi Supergroup
	193/58							
	173/58			1.0	28.5		Very stiff, silty CLAY, trace fine to medium sand; light yellowish orange; moist, high plasticity. *0.95m: light yellowish grey.*	
	173/63							
	170/75			1.5	28.0		*1.50m: light yellowish grey streaked light orange.*	
	132/78							
	124/75			2.0	27.5		*2.00m: light yellowish grey streaked dark orange, mottled black.*	
	138/84						*2.30m: trace fine to coarse sand; streaked dark red.*	
	170/112			2.5	27.0		*2.60m: minor fine to medium sand, trace organics. Organics: fibrous.*	
	144/95							
	124/86			3.0	26.5		3.00m - End of hand auger, hole terminated at target depth.	
				3.5	26.0			
				4.0	25.5			
				4.5	25.0			

Date Started:	09/04/2024	**Vane ID:**	GEO2321	**Comments:**
Logged By:	REHP	**Vane Width:**	19mm	Groundwater not encountered.
Diameter:	50mm	**Vane Type:**	Hand held	

For Explanation of Symbols and Abbreviations See Key Sheet

Photo Log

Location ID: HA06

Project:	HDS - 7-9 Worth Street, Kaitaia		**Project number:**	3912124/AR112533	
Site location:	Kaitaia, New Zealand		**Client Name:**	Kāinga Ora	
Location:	Middle of site, approximately 3m SW of NE boundary, 35m NW of SE boundary.	**Coordinate system:**	NZTM2000	**Vertical datum:**	NZVD 2016
		Northing:	6113887.9	**Ground level (mRL):**	29.63
		Easting:	1623659.8	**Location method:**	Survey

Box 1 - 0.00mbgl to 3.00mbgl

D

Appendix D – Cone Penetration Testing Results

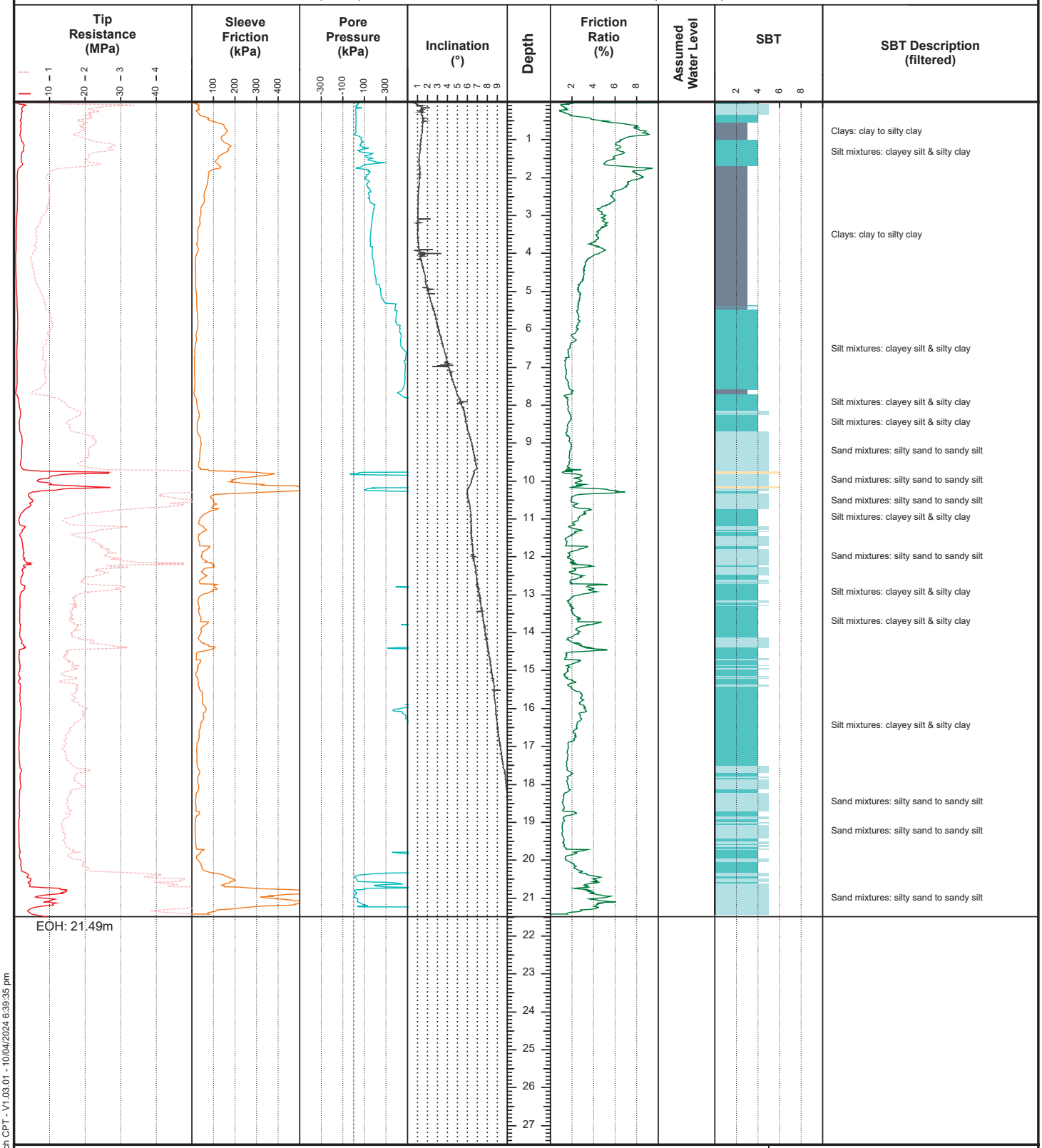
CONE PENETRATION TEST (CPT) LOG

HOLE NO.: CPT01

CLIENT: Kāinga Ora - Homes and Communities
PROJECT: CPT Testing
JOB NO.: LTA24088

SITE LOCATION: 7 - 9 Worth Street, Kaitaia
OPERATOR: CW
START DATE: 10/04/2024

CO-ORDINATES: 1623680.00mE, 6113863.00mN (NZTM)
ELEVATION: 24m (NZVD2016)
END DATE: 10/04/2024



REMARKS:

Groundwater not measured due to hole collapse at 2.5m
Coordinates from handheld GPS accurate to +/-4m
Pagani TG63-150 Rig, 10 cm² piezocone

NOTES:

TEST DETAILS:

Cone Number	000862
Cone Type	PC
Area Ratio	0.80
Filter Location	u2
Termination Reason	u2 refusal

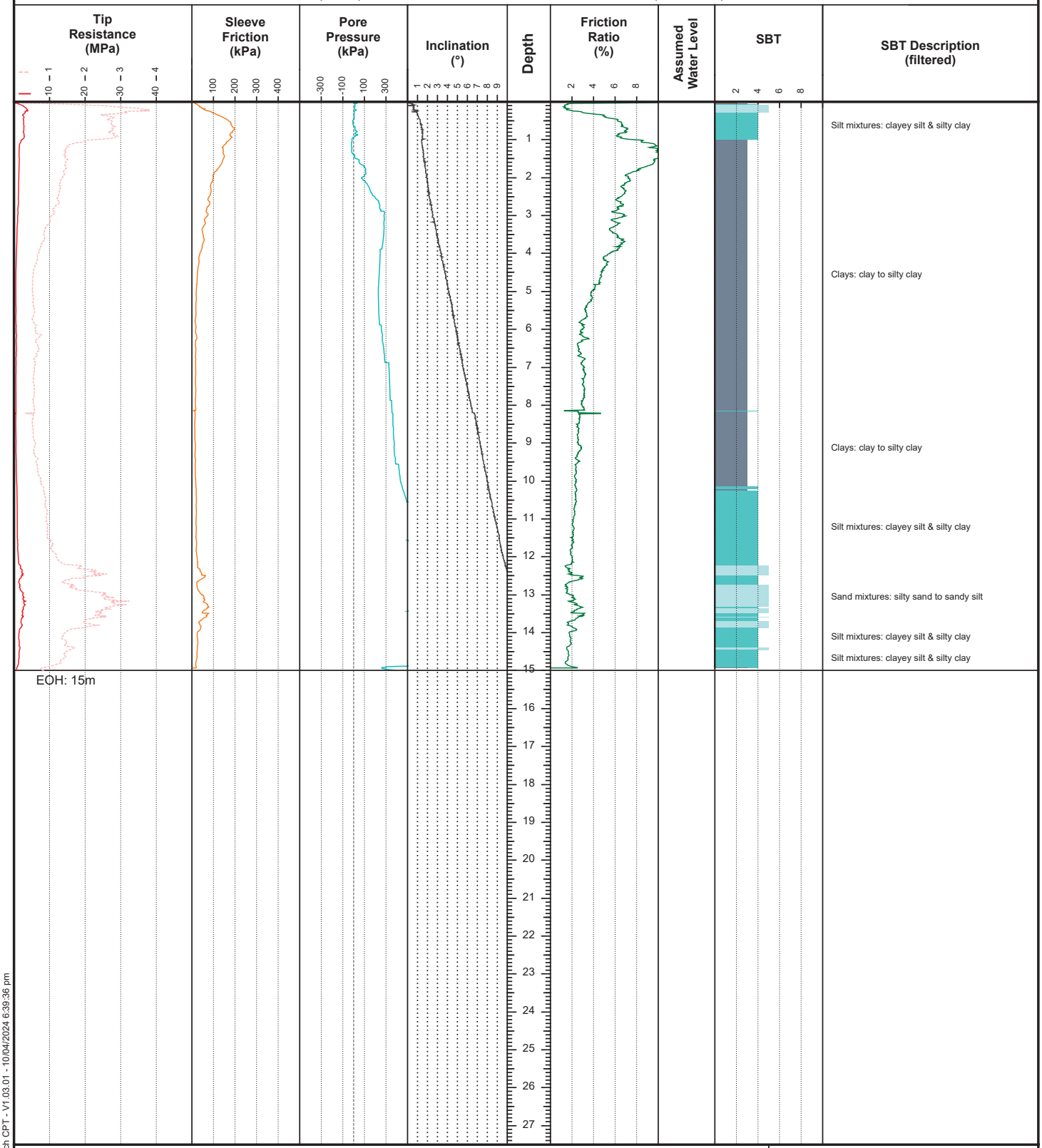
CONE PENETRATION TEST (CPT) LOG

HOLE NO.: CPT02

CLIENT: Kāinga Ora - Homes and Communities
PROJECT: CPT Testing
JOB NO.: LTA24088

SITE LOCATION: 7 - 9 Worth Street, Kaitaia
OPERATOR: CW
START DATE: 10/04/2024

CO-ORDINATES: 1623652.00mE, 6113877.00mN (NZTM)
ELEVATION: 24m (NZVD2016)
END DATE: 10/04/2024



REMARKS:

Groundwater not measured due to hole collapse at 4.4m
Coordinates from handheld GPS accurate to +/-4m
Pagani TG63-150 Rig, 10 cm² piezocone

NOTES:

TEST DETAILS:

Cone Number	000862
Cone Type	PC
Area Ratio	0.80
Filter Location	u2
Termination Reason	Target depth

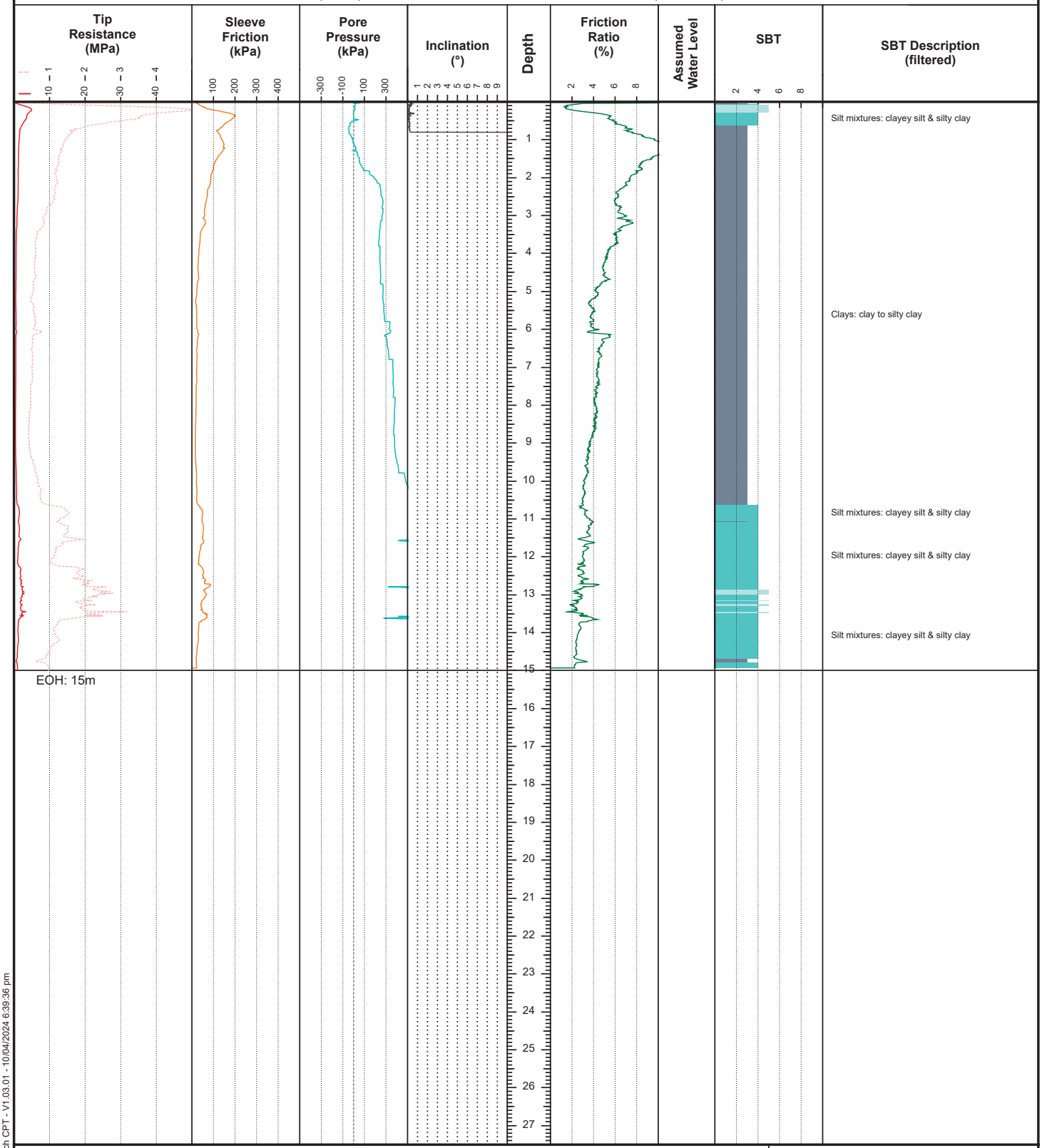
CONE PENETRATION TEST (CPT) LOG

HOLE NO.: CPT03

CLIENT: Kāinga Ora - Homes and Communities
PROJECT: CPT Testing
JOB NO.: LTA24088

SITE LOCATION: 7 - 9 Worth Street, Kaitaia
OPERATOR: CW
START DATE: 10/04/2024

CO-ORDINATES: 1623659.00mE, 6113887.00mN (NZTM)
ELEVATION: 24m (NZVD2016)
END DATE: 10/04/2024



REMARKS:

Groundwater not measured due to hole collapse at 6.0m
Coordinates from handheld GPS accurate to +/-4m
Pagani TG63-150 Rig, 10 cm² piezocone

NOTES:

TEST DETAILS:

Cone Number	000862
Cone Type	PC
Area Ratio	0.80
Filter Location	u2
Termination Reason	Target depth

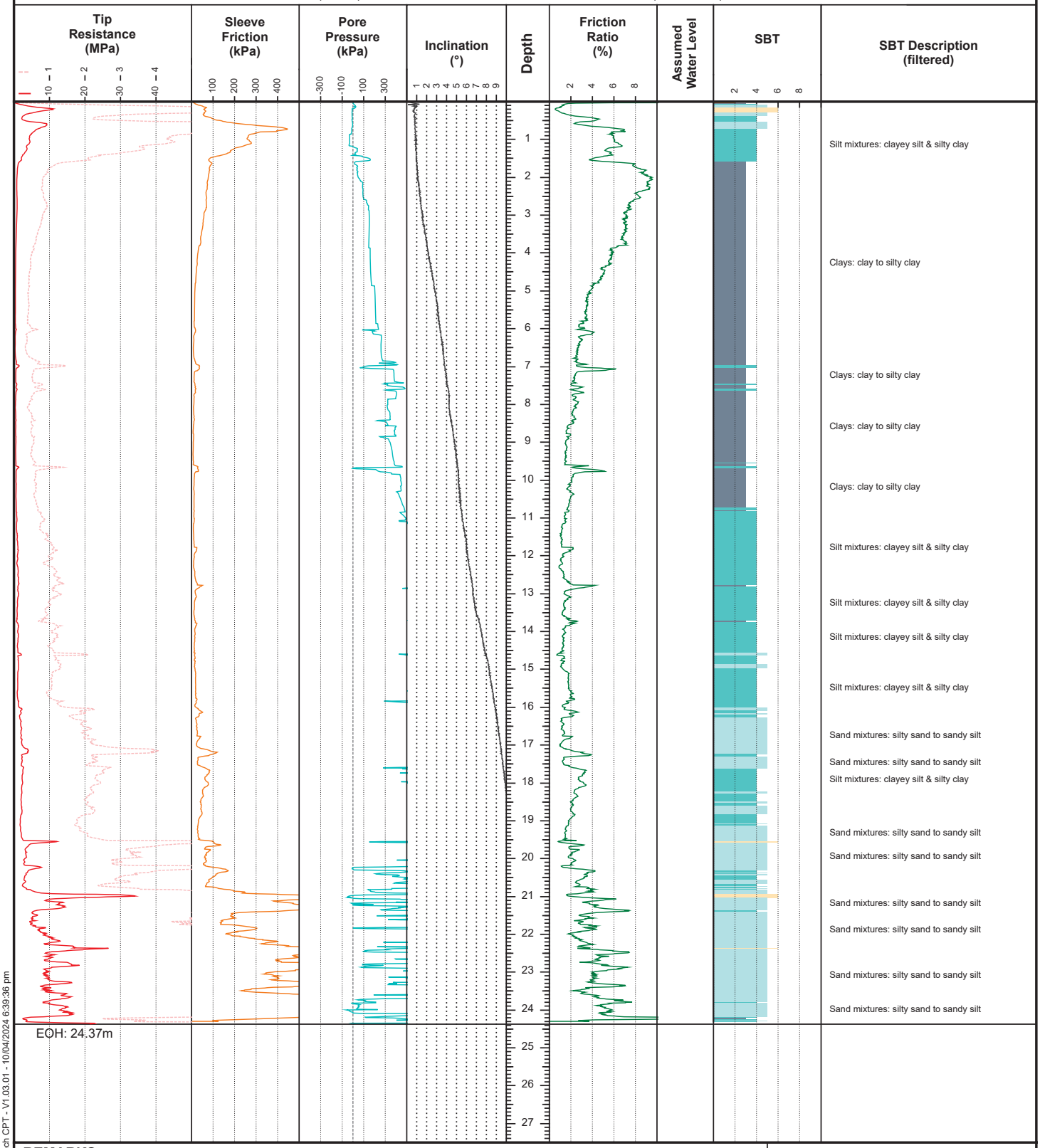
CONE PENETRATION TEST (CPT) LOG

HOLE NO.: CPT04

CLIENT: Kāinga Ora - Homes and Communities
PROJECT: CPT Testing
JOB NO.: LTA24088

SITE LOCATION: 7 - 9 Worth Street, Kaitaia
OPERATOR: CW
START DATE: 10/04/2024

CO-ORDINATES: 1623639.00mE, 6113899.00mN (NZTM)
ELEVATION: 24m (NZVD2016)
END DATE: 10/04/2024



REMARKS:

Groundwater not measured due to hole collapse at 4.0m
Coordinates from handheld GPS accurate to +/-4m
Pagani TG63-150 Rig, 10 cm² piezocone

NOTES:

TEST DETAILS:

Cone Number	000862
Cone Type	PC
Area Ratio	0.80
Filter Location	u2
Termination Reason	Auger fail

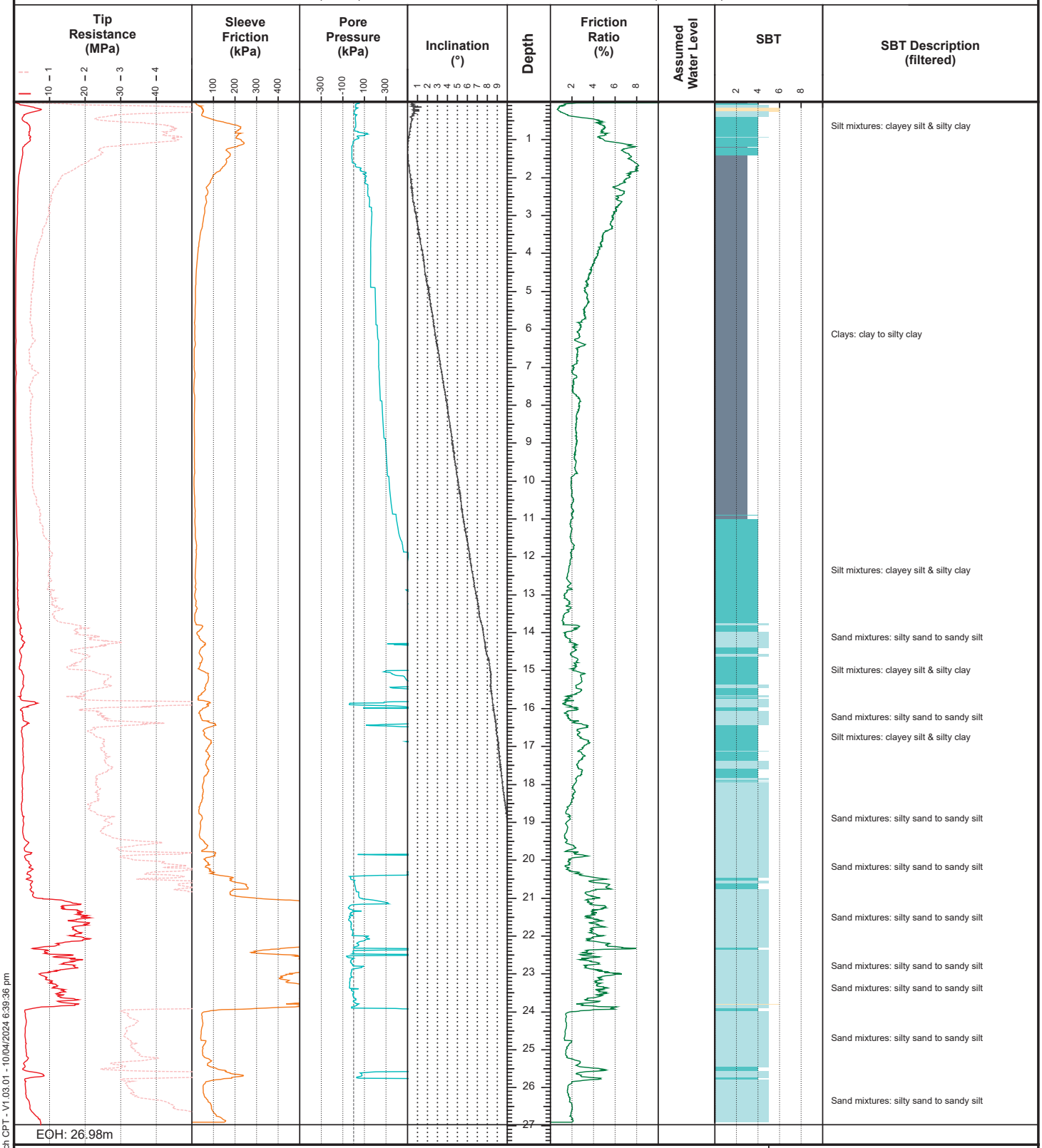
CONE PENETRATION TEST (CPT) LOG

HOLE NO.: CPT05

CLIENT: Kāinga Ora - Homes and Communities
PROJECT: CPT Testing
JOB NO.: LTA24088

SITE LOCATION: 7 - 9 Worth Street, Kaitaia
OPERATOR: CW
START DATE: 10/04/2024

CO-ORDINATES: 1623648.00mE, 6113861.00mN (NZTM)
ELEVATION: 24m (NZVD2016)
END DATE: 10/04/2024



REMARKS:

Groundwater not measured due to hole collapse at 4.4m
Coordinates from handheld GPS accurate to +/-4m
Pagani TG63-150 Rig, 10 cm² piezocone

NOTES:

TEST DETAILS:

Cone Number	000862
Cone Type	PC
Area Ratio	0.80
Filter Location	u2
Termination Reason	u2 refusal

CONE PENETRATION TEST (CPT) LOG

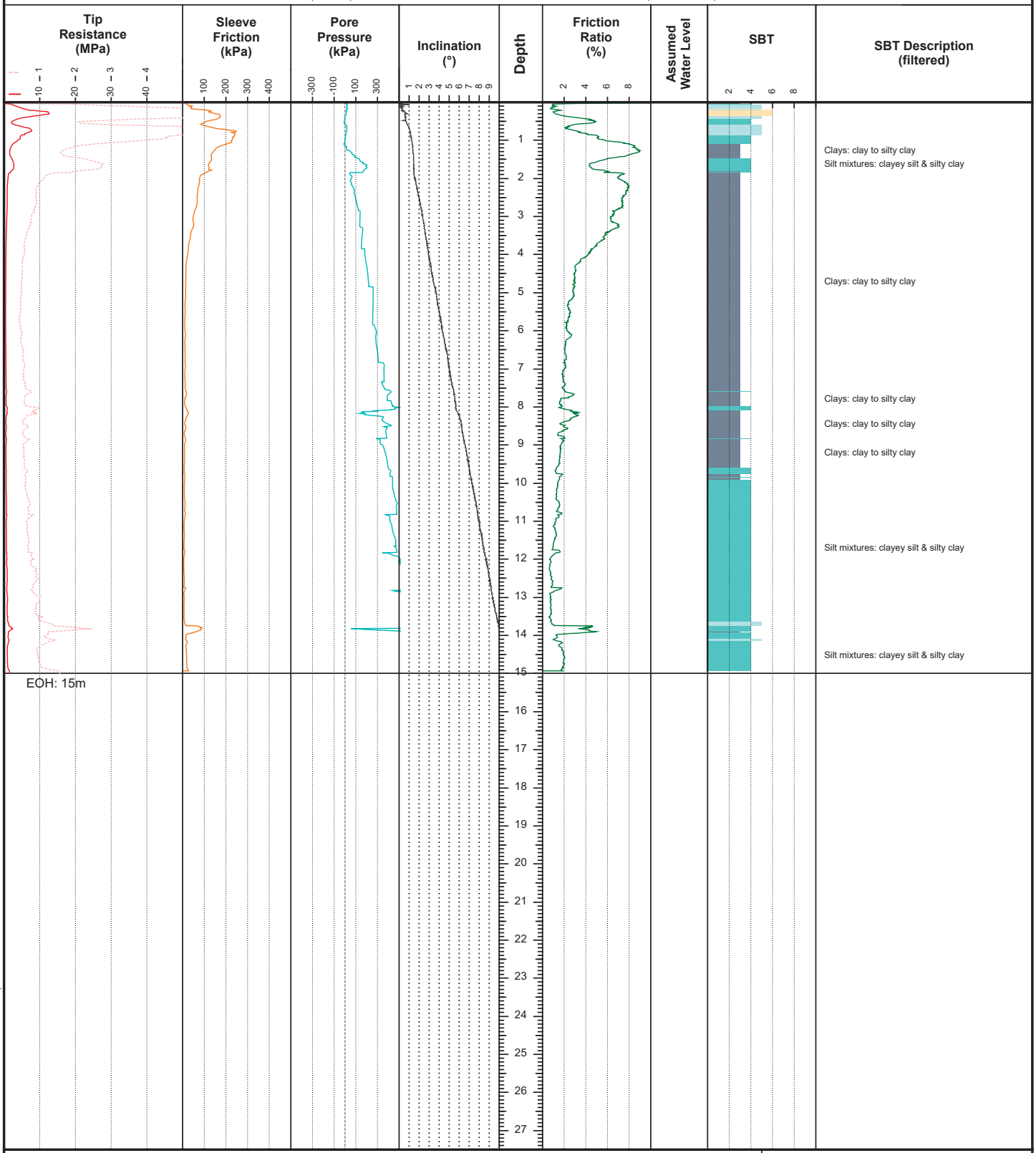
HOLE NO.: CPT06

CLIENT: Kāinga Ora - Homes and Communities
PROJECT: CPT Testing

JOB NO.: LTA24088

SITE LOCATION: 7 - 9 Worth Street, Kaitaia
OPERATOR: CW
START DATE: 10/04/2024

CO-ORDINATES: 1623634.00mE, 6113880.00mN (NZTM)
ELEVATION: 24m (NZVD2016)
END DATE: 10/04/2024



REMARKS:

Groundwater not measured due to hole collapse at 3.5m
Coordinates from handheld GPS accurate to +/-4m
Pagani TG63-150 Rig, 10 cm² piezocone

NOTES:

TEST DETAILS:

Cone Number	000862
Cone Type	PC
Area Ratio	0.80
Filter Location	u2
Termination Reason	Target depth

E

Appendix E – Calibration Certificates

MCC

Calibration Certificate

Certificate No: M720561

Certificate Issued To	Beca Ltd	**Address**	21 Pitt Street Auckland		
Purchase Order No					
Manufacturer	Geotechnics	**Model**	Geovane	**S/No**	2243
				Unique ID	
Description	Handheld shear vane with matching blade(s)				
Calibration Date	22/03/2023	**Temp During Test**	19.5 to 19.9 °C		
Method	MCC 5.51c.01 – Handheld Soil Shear Vane Testers (2021), Guideline for Hand Held Shear Vane Test (NZGS, 2001) was used as a guide.				

Results

19 mm Ø Vane Blade

Shear Strength = A × Reading	**A (kPa/div)**	**1.489**	**Area Ratio**	22.9%

Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)
0	0	30	45	60	89	90	134	120	179
2	3	32	48	62	92	92	137	122	182
4	6	34	51	64	95	94	140	124	185
6	9	36	54	66	98	96	143	126	188
8	12	38	57	68	101	98	146	128	191
10	15	40	60	70	104	100	149	130	194
12	18	42	63	72	107	102	152	132	197
14	21	44	66	74	110	104	155	134	199
16	24	46	68	76	113	106	158	136	202
18	27	48	71	78	116	108	161	138	205
20	30	50	74	80	119	110	164	140	208
22	33	52	77	82	122	112	167		
24	36	54	80	84	125	114	170		
26	39	56	83	86	128	116	173		
28	42	58	86	88	131	118	176		

The expanded uncertainty of measurement, expressed at the 95% confidence level, is ±4.9 kPa. The coverage factor (k) is 2.

Remarks

When received, this equipment was in good condition.

Measurement results are traceable to the International System of Units (SI), or other recognised references via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

This certificate has been prepared for the benefit of Beca Ltd, with respect to the particular brief given to us and it cannot be relied upon in other contexts or for any other purpose without our prior review and agreement.

This calibration was performed at 1 Hill Street, Onehunga, Auckland, NZ.

Prepared by

Ivan Caresosa
Calibration Technician

Checked by

Agnelo Vaz
Senior Metrologist

Key Technical Person

Agnelo Vaz
Senior Metrologist

ACCREDITED CALIBRATION LABORATORY

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

PAGANI®
GEOTECHNICAL EQUIPMENT

Loc. Campogrande , n° 26
29010 CALENDASCO (PC)
ITALY

www.pagani-geotechnical.com
info@pagani-geotechnical.com
Tel: +39 0523 771535 - Fax: +39 0523 773449

CONE CALIBRATION CERTIFICATE

N° Z222/23 **30/08/2023**

Calibrated system (Sistema tarato):

Type	**P-C**
Serial number	**000862**
Sensor	**TIP RESISTANCE**
Max. Capacity [MPa]:	**50**
Scaling Factor:	**180060**
Tip net area ratio (a_n):	**0,79**
Sleeve net ratio (b_n):	**0,00**

Addressee *(destinatario)* **:**
LandTech Consulting Ltd
11b Carlyle Street, Sydenham,
Christchurch 8023 (New Zealand)

Applied load measurement system:
(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	65495

Power press:

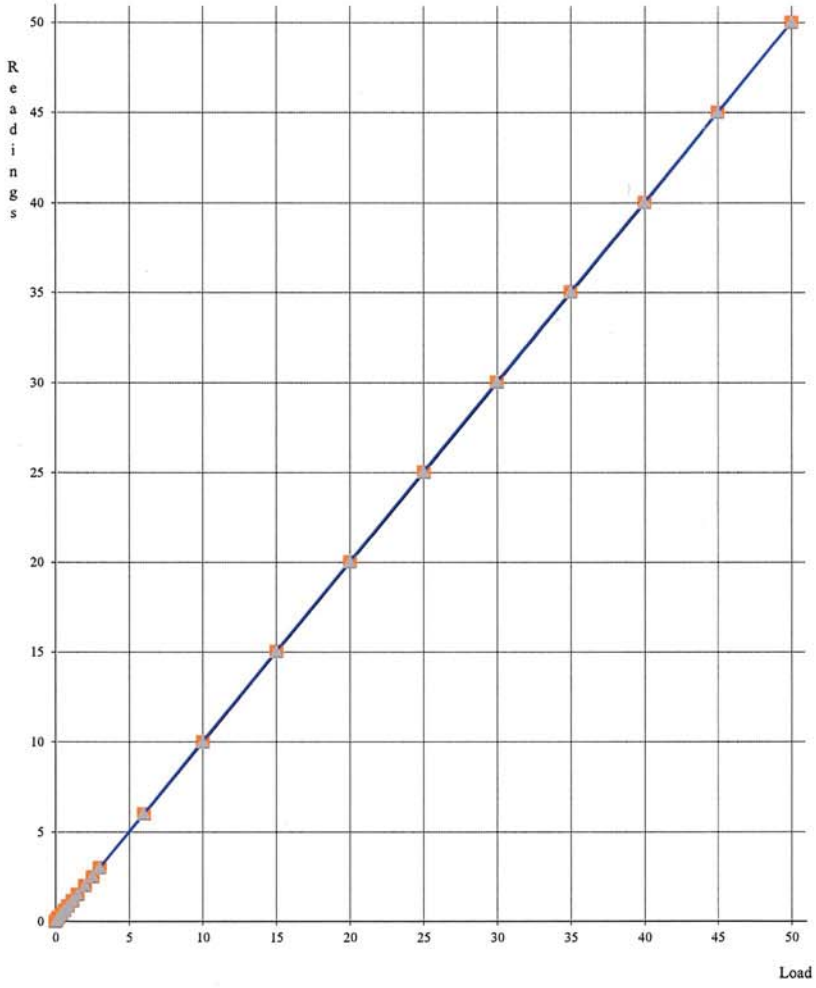
Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	12/01/2023
Certificate N.	LAT 091 2023-010

Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with :
ASTM D5778-12 Validity 12 Months



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	-0,01
2	0,03	0,03	0,03	0,02
3	0,20	0,19	0,20	0,19
4	0,40	0,39	0,40	0,39
5	0,60	0,59	0,60	0,59
6	0,85	0,84	0,85	0,84
7	1,15	1,14	1,15	1,15
8	1,50	1,49	1,50	1,50
9	2,00	1,99	2,00	2,00
10	2,50	2,49	2,50	2,50
11	3,00	3,00	3,00	3,00
12	6,00	6,01	6,00	6,02
13	10,00	10,01	10,00	10,02
14	15,00	15,02	15,00	15,03
15	20,00	20,03	20,00	20,04
16	25,00	25,04	25,00	25,05
17	30,00	30,04	30,00	30,05
18	35,00	35,04	35,00	35,04
19	40,00	40,03	40,00	40,04
20	45,00	45,02	45,00	45,02
21	50,00	50,00	50,00	50,01

Unit: Mpa

Zero-load error:	=	0,022	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,080	% FSO
Hysteresis:	=	0,022	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,000	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by _____

Date of issue 30/08/2023

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CONE CALIBRATION CERTIFICATE

N° Z222/23 **30/08/2023**

Calibrated system (Sistema tarato):

Type	**P-C**
Serial number	**000862**
Sensor	**SLEEVE FRICTION**
Max. Capacity [kPa]:	**1600**
Scaling Factor:	**29946**

Addressee *(destinatario)* **:**
LandTech Consulting Ltd
11b Carlyle Street, Sydenham,
Christchurch 8023 (New Zealand)

Applied load measurement system:
(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	65495

Power press:

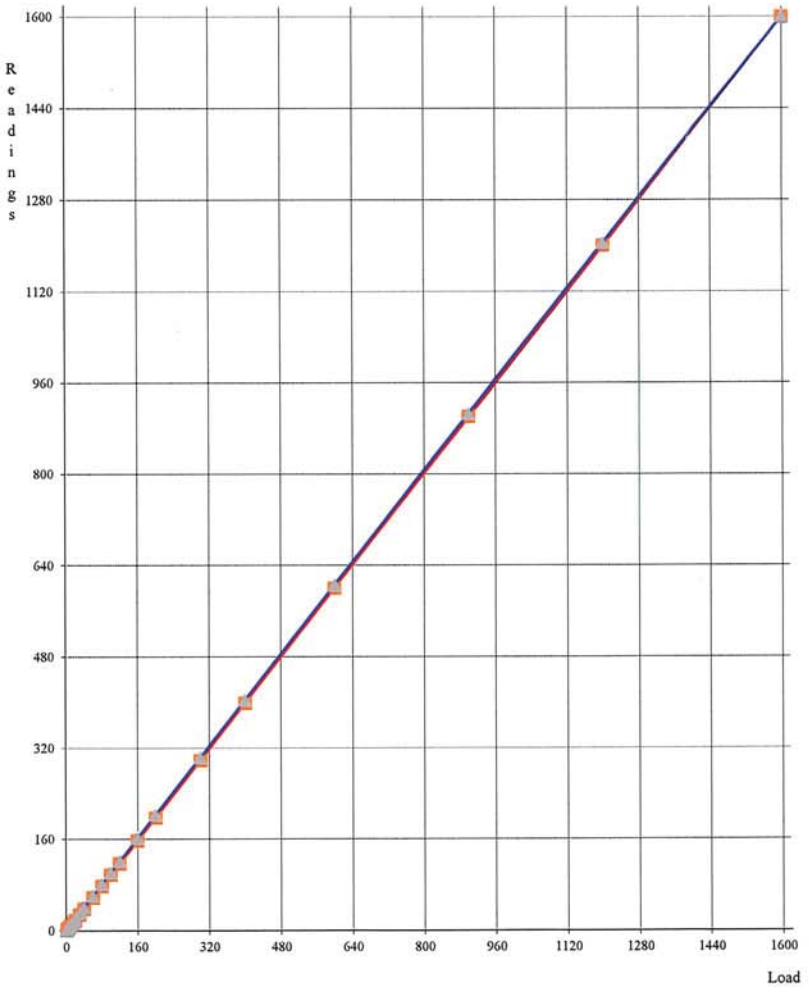
Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	12/01/2023
Certificate N.	LAT 091 2023-010

Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with :
ASTM D5778-12 Validity 12 Months



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	-0,07	0,00	0,13
2	2,00	0,80	2,00	1,73
3	5,00	3,53	5,00	4,67
4	7,00	5,33	7,00	6,73
5	10,00	8,27	10,00	9,80
6	16,00	13,93	16,00	15,67
7	20,00	17,87	20,00	19,67
8	30,00	27,73	30,00	29,60
9	40,00	37,60	40,00	39,67
10	60,00	57,40	60,00	60,07
11	80,00	77,27	80,00	80,53
12	100,00	97,07	100,00	100,87
13	120,00	117,00	120,00	121,13
14	160,00	156,87	160,00	161,47
15	200,00	197,07	200,00	201,80
16	300,00	297,73	300,00	302,80
17	400,00	398,53	400,00	403,73
18	600,00	599,67	600,00	605,00
19	900,00	900,80	900,00	905,73
20	1200,00	1201,00	1200,00	1205,20
21	1600,00	1600,00	1600,00	1600,40

Unit: kPa

Zero-load error:	=	0,013	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,196	% FSO
Hysteresis:	=	0,333	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,086	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by _____ Date of issue 30/08/2023

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CONE CALIBRATION CERTIFICATE

N° Z222/23 **30/08/2023**

Calibrated system (Sistema tarato):

Type	**P-C**
Serial number	**000862**
Sensor	**PORE PRESSURE**
Max. Capacity [kPa]:	**2500**
Scaling Factor:	**10287**
Sensor	**TILT ANGLE**
Max. Inclination [°]:	**20**
Scaling Factor:	**334354**

Addressee *(destinatario)* **:**
LandTech Consulting Ltd
11b Carlyle Street, Sydenham,
Christchurch 8023 (New Zealand)

Applied load measurement system:
(Sistema di rilevamento del carico applicato)

Pressure Generator:

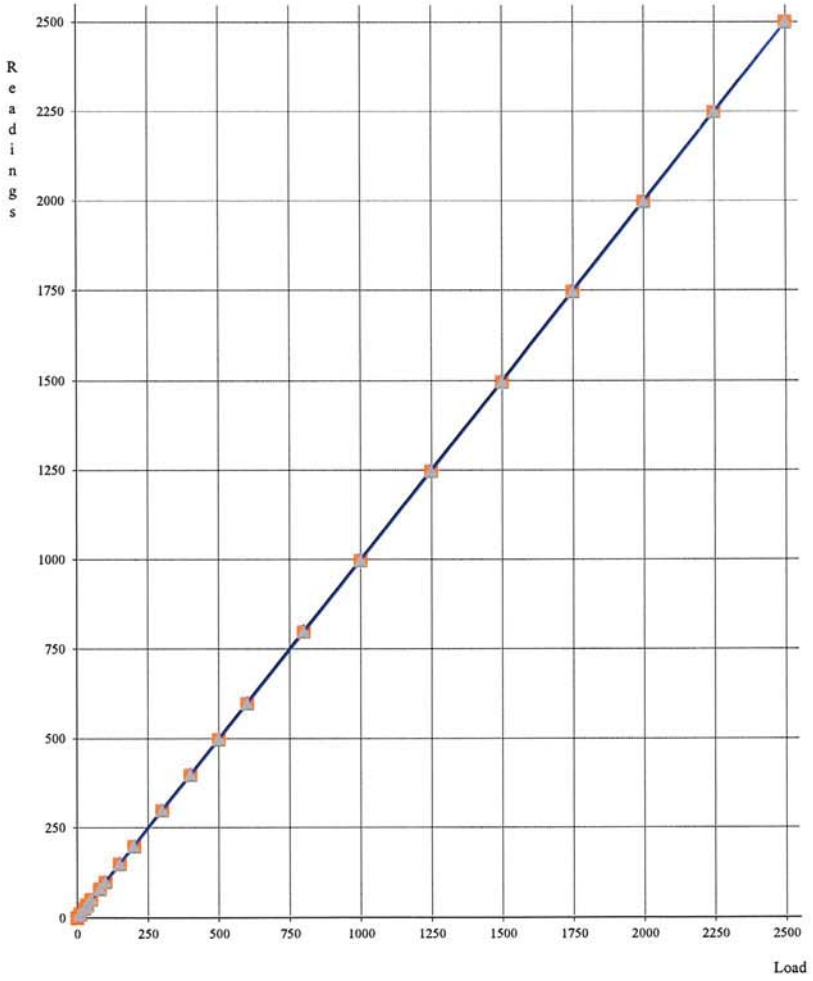
Manufacturer	MENSOR
Model	CPC 4000
Serial Number	41000V56
Sensor Descr	Silicon Pressure Transducer
Sensor Serial Number	41000SYF

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	09/05/2023
Certificate N.	0370-SP-23

Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with :
ASTM D5778-12 Validity 12 Months



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,10	0,00	0,10	-0,20
2	10,00	9,70	9,80	9,40
3	25,00	24,60	25,00	24,40
4	35,00	34,40	35,00	34,20
5	50,00	49,30	50,00	49,10
6	80,00	78,80	80,00	78,70
7	100,00	98,60	100,00	98,60
8	150,00	148,20	150,00	148,20
9	200,00	197,70	199,90	197,90
10	300,00	297,40	300,00	297,60
11	400,00	397,00	399,90	397,10
12	500,00	496,70	500,00	496,90
13	600,00	596,50	600,00	596,60
14	800,00	796,20	800,00	796,30
15	1000,00	996,00	1000,00	996,10
16	1250,00	1246,00	1250,00	1246,00
17	1500,00	1496,10	1500,00	1496,20
18	1750,00	1746,60	1750,00	1746,60
19	2000,00	1997,40	2000,00	1997,50
20	2250,00	2248,70	2250,00	2248,50
21	2500,00	2500,00	2500,00	2500,00

Unit: kPa

Zero-load error:	=	0,008	% FSO
Nonlinearity:	=	0,160	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by _____ Date of issue 30/08/2023

PAGANI® GEOTECHNICAL EQUIPMENT

Loc. Campogrande , n° 26
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www.pagani-geotechnical.com
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Tel: +39 0523 771535 - Fax: +39 0523 773449

CONE CALIBRATION CERTIFICATE

N° Z222/23 **30/08/2023**

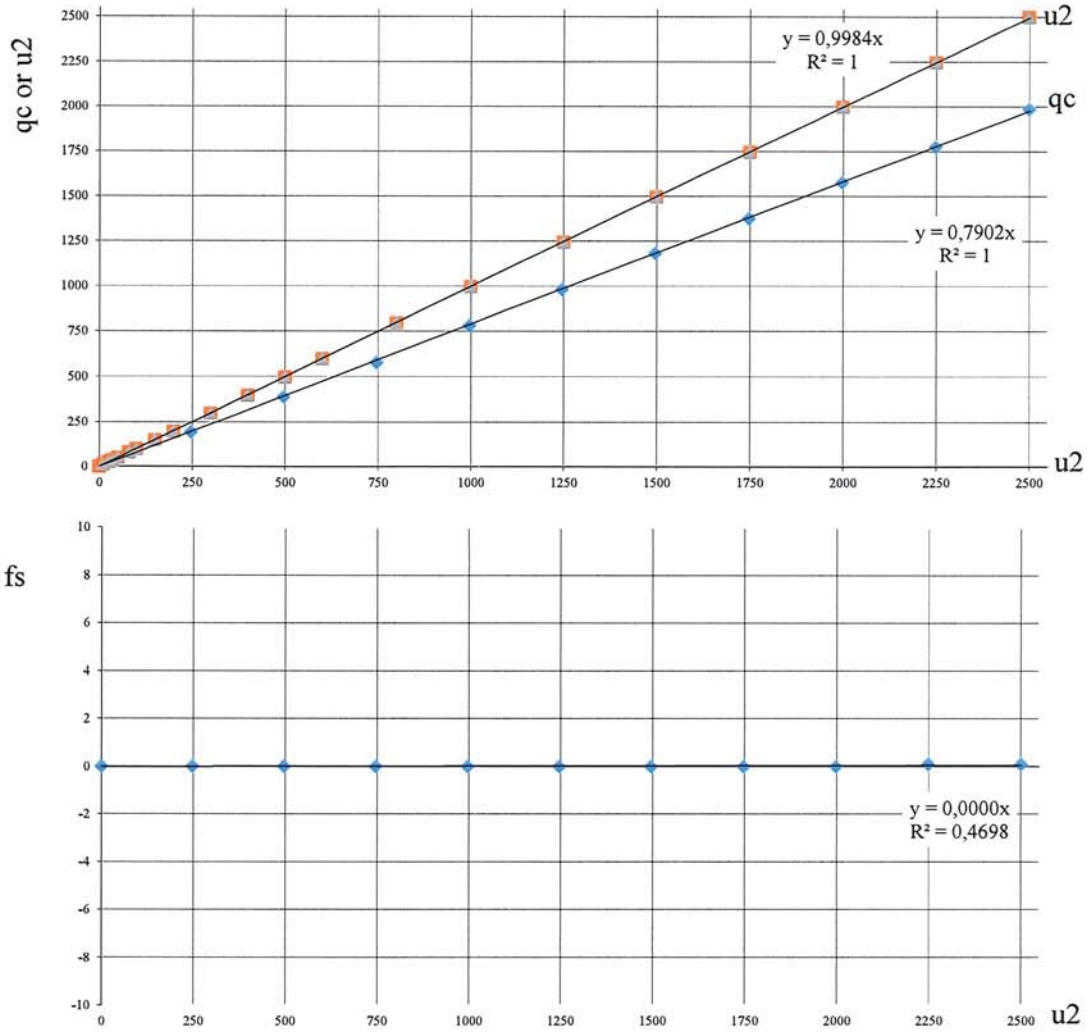
Calibrated system (Sistema tarato):

Type	**P-C**
Serial number	**000862**
Tip net area ratio (a_n):	**0,7902**
Sleeve net ratio (b_n):	**0,0000**

Addressee *(destinatario)* **:**
LandTech Consulting Ltd
11b Carlyle Street, Sydenham,
Christchurch 8023 (New Zealand)

	u2 (kPa)	qc (kPa)	fs (kPa)	u2 (psi)	qc (psi)	fs (psi)
0 (0)	0,00	0,00	0,00	0,00	0,00	0,00
250 (36,26)	247,80	194,00	0,00	35,94	28,14	0,00
500 (72,52)	496,90	389,00	0,00	72,07	56,42	0,00
750 (108,78)	746,70	578,00	0,00	108,30	83,83	0,00
1000 (145,04)	996,60	783,00	0,00	144,54	113,56	0,00
1250 (181,30)	1246,60	983,00	0,00	180,80	142,57	0,00
1500 (217,56)	1496,90	1183,00	0,00	217,11	171,58	0,00
1750 (253,82)	1747,50	1377,00	0,00	253,45	199,72	0,00
2000 (290,08)	1998,40	1577,00	0,00	289,84	228,72	0,00
2250 (326,33)	2249,40	1777,00	0,10	326,25	257,73	0,01
2500 (362,59)	2501,00	1988,00	0,10	362,74	288,33	0,01

Unit: kPa - (psi)



Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with :
ASTM D5778-12 Validity 12 Months

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by _____ Date of issue 30/08/2023

Cleaning instructions for the U sensor on the piezocone

The U sensor shall be cleaned at the end of each test.
To clean the U sensor, remove the piezocone tip and the saturation ring to access the space where the sensor is located (see Figure 1). Carefully clean the U sensor membrane using paper or cotton buds (see Figure 2).

Figure 1 - U sensor position

Figure 2 - U sensor cleaning

It is important to be careful when cleaning leaving the sensor in perfect condition (see Figure 3) to ensure its perfect functionality.
Damage to the sensor may cause abnormalities during use.

Figure 3 - U sensor properly cleaned

ATTENTION

- ***Never touch the U sensor membrane with your fingers.***
- ***Do not use air compressors with high pressure jets on the U sensor membrane.***
- ***Do not clean with hard objects (screwdrivers, keys, etc.) that could damage the U sensor membrane.***

F

Appendix F – Laboratory Testing Results

Beca Geotest
21 Pitt Street
PO Box 6345
Auckland 1141
New Zealand

p + 64 9 300 9380

Report Number: MAT:AKL24-00111-S03
Date of Issue:16/04/2024
Issue Number: 1

Material Test Report

Client:	Kainga Ora - Homes and Communities
Project Name:	Project Velocity
Project No:	3170470
Client Request ID:	3912124/300/GA

ACCREDITED IANZ TESTING LABORATORY

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

Authorised Signatory:
Kajal Ranchal
(Laboratory Technician)

Sample Details

Sample ID	AKL24-00111-S03	**Client Sample ID**	HA01
Field Sample ID	HA01		
Date Sampled	9/04/2024		
Date Received	10/04/2024		
Source	Borehole		
Material	Soil		
Specification	No Specification		
Sampling Method	Tested as Received		
Material Description	Hard SILT		
Depth (m)	0.35-0.65		
Location	7-9 Worth St, Kaitaia		
Tested By	Kajal Ranchal		

Test Results

Description	Method	Result	Limits
Liquid Limit	NZS 4402 : 1986 Test 2.2 (Note 12) and 2.6	101	
Linear Shrinkage		21	
Curling		No	
Cracking		No	
Sample History		As Received	
Fraction Tested		0.425mm	
Tested By		K.Ranchal	
Date Tested		15/04/2024	
Moisture Content (%)	NZS 4402:1986 Test 2.1	42.0	
Tested By		Kajal Ranchal	
Date Tested		11/04/2024	

Comments

Sample description (Not IANZ endorsed)

Beca Geotest
21 Pitt Street
PO Box 6345
Auckland 1141
New Zealand

p + 64 9 300 9380

Report Number: MAT:AKL24-00111-S04
Date of Issue:16/04/2024
Issue Number: 1

Material Test Report

Client:	Kainga Ora - Homes and Communities
Project Name:	Project Velocity
Project No:	3170470
Client Request ID:	3912124/300/GA

ACCREDITED IANZ TESTING LABORATORY

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

Authorised Signatory:
Kajal Ranchal
(Laboratory Technician)

Sample Details

Sample ID	AKL24-00111-S04	**Client Sample ID**	HA03
Field Sample ID	HA03		
Date Sampled	9/04/2024		
Date Received	10/04/2024		
Source	Borehole		
Material	Soil		
Specification	No Specification		
Sampling Method	Tested as Received		
Material Description	Hard SILT		
Depth (m)	0.35-0.65		
Location	7-9 Worth St, Kaitaia		
Tested By	Kajal Ranchal		

Test Results

Description	Method	Result	Limits
Liquid Limit	NZS 4402 : 1986 Test 2.2 (Note 12) and 2.6	75	
Linear Shrinkage		21	
Curling		No	
Cracking		No	
Sample History		As Recieved	
Fraction Tested		0.425mm	
Tested By		K.Ranchal	
Date Tested		15/04/2024	
Moisture Content (%)	NZS 4402:1986 Test 2.1	36.2	
Tested By		Kajal Ranchal	
Date Tested		11/04/2024	

Comments

Sample description (Not IANZ endorsed)

Beca Geotest
21 Pitt Street
PO Box 6345
Auckland 1141
New Zealand

p + 64 9 300 9380

Report Number: MAT:AKL24-00111-S05
Date of Issue:16/04/2024
Issue Number: 1

Material Test Report

Client:	Kainga Ora - Homes and Communities
Project Name:	Project Velocity
Project No:	3170470
Client Request ID:	3912124/300/GA

ACCREDITED IANZ TESTING LABORATORY

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

Authorised Signatory:
Kajal Ranchal
(Laboratory Technician)

Sample Details

Sample ID	AKL24-00111-S05	**Client Sample ID**	HA06
Field Sample ID	HA06		
Date Sampled	9/04/2024		
Date Received	10/04/2024		
Source	Borehole		
Material	Soil		
Specification	No Specification		
Sampling Method	Tested as Received		
Material Description	Hard SILT		
Depth (m)	0.2-0.4		
Location	7-9 Worth St, Kaitaia		
Tested By	Kajal Ranchal		

Test Results

Description	Method	Result	Limits
Liquid Limit	NZS 4402 : 1986 Test 2.2 (Note 12) and 2.6	35	
Linear Shrinkage		6	
Curling		No	
Cracking		No	
Sample History		As Receievd	
Fraction Tested		0.425mm	
Tested By		K.ranchal	
Date Tested		15/04/2024	
Moisture Content (%)	NZS 4402:1986 Test 2.1	8.7	
Tested By		Kajal Ranchal	
Date Tested		11/04/2024	

Comments

Sample description (Not IANZ endorsed)

Beca Geotest
21 Pitt Street
PO Box 6345
Auckland 1141
New Zealand

p + 64 9 300 9380

Report Number: SSI:AKL24-00111-S01
Date of Issue:16/04/2024
Issue Number: 1

Shrink Swell Index Report

Client:	Kainga Ora - Homes and Communities
Project Name:	Project Velocity
Project No:	3170470
Client Request ID:	3912124/300/GA

ACCREDITED IANZ TESTING LABORATORY

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

Authorised Signatory:
Kajal Ranchal
(Laboratory Technician)

Sample Details

Sample ID:	AKL24-00111-S01	**Sampling Method:**	Tested as Received
Field ID:	CPT01	**Material:**	Soil
Date Sampled:	9/04/2024	**Source:**	Borehole
Date Submitted:	10/04/2024	**Specification:**	No Specification
Project Location:	7-9 Worth St, Kaitaia		
Sample Location:	7-9 Worth St, Kaitaia		
Borehole Number:	CPT01		
Borehole Depth (m):	0.3-0.6		
Soil Description:	Hard SILT		

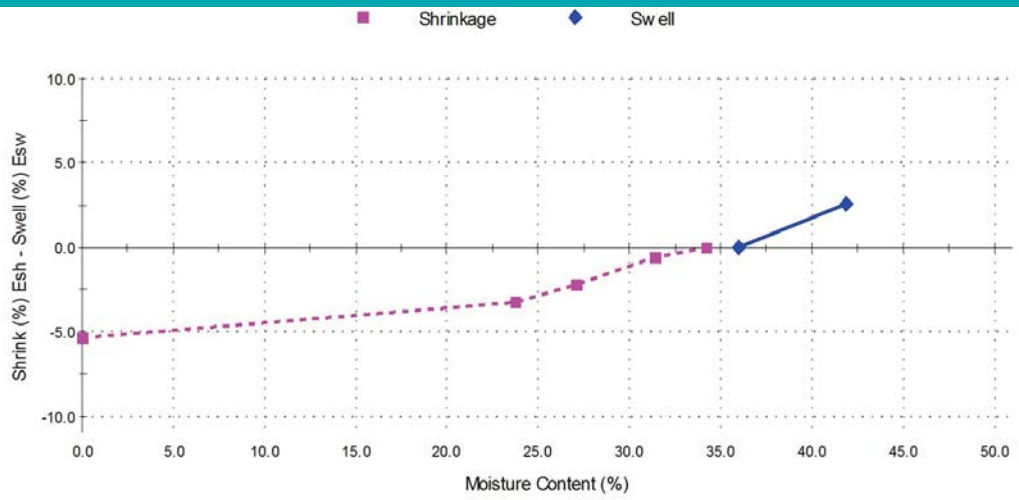
Swell Test — AS 1289.7.1.1

Swell on Saturation (%):	2.6
Moisture Content before (%):	35.9
Moisture Content after (%):	41.9
Est. Unc. Comp. Strength before (kPa):	-
Est. Unc. Comp. Strength after (kPa):	-

Shrink Test — AS 1289.7.1.1

Shrink on drying (%):	5.4
Shrinkage Moisture Content (%):	34.2
Est. inert material (%):	0
Crumbling during shrinkage:	-
Cracking during shrinkage:	-

Shrink Swell



Shrink Swell Index - Iss (%): 3.7

Comments

Sample description (Not IANZ endorsed)
The Shrinkage specimen does not have a length within the range of 1.5 to 2 diameters.

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Auckland 1141
New Zealand

p + 64 9 300 9380

Report Number: SSI:AKL24-00111-S02
Date of Issue:16/04/2024
Issue Number: 1

Shrink Swell Index Report

Client:	Kainga Ora - Homes and Communities
Project Name:	Project Velocity
Project No:	3170470
Client Request ID:	3912124/300/GA

ACCREDITED IANZ TESTING LABORATORY

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

Authorised Signatory:
Kajal Ranchal
(Laboratory Technician)

Sample Details

Sample ID:	AKL24-00111-S02	**Sampling Method:**	Tested as Received
Field ID:	CPT02	**Material:**	Soil
Date Sampled:	9/04/2024	**Source:**	Borehole
Date Submitted:	10/04/2024	**Specification:**	No Specification
Project Location:	7-9 Worth St, Kaitaia		
Sample Location:	7-9 Worth St, Kaitaia		
Borehole Number:	CPT02		
Borehole Depth (m):	0.4-0.6		
Soil Description:	Hard SILT		

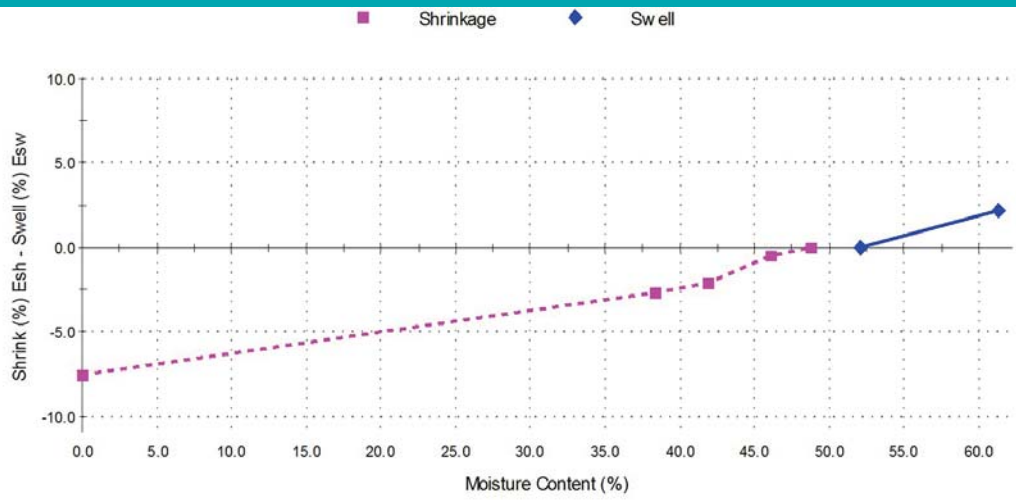
Swell Test — AS 1289.7.1.1

Swell on Saturation (%):	2.2
Moisture Content before (%):	52.1
Moisture Content after (%):	61.3
Est. Unc. Comp. Strength before (kPa):	-
Est. Unc. Comp. Strength after (kPa):	-

Shrink Test — AS 1289.7.1.1

Shrink on drying (%):	7.6
Shrinkage Moisture Content (%):	48.7
Est. inert material (%):	-
Crumbling during shrinkage:	-
Cracking during shrinkage:	5%

Shrink Swell



Shrink Swell Index - Iss (%): 4.8

Comments

Sample description (Not IANZ endorsed)

G

Appendix G – Liquefaction Assessment Results

ULS

Beca House
21 Pitt Street
Auckland 1010
New Zealand

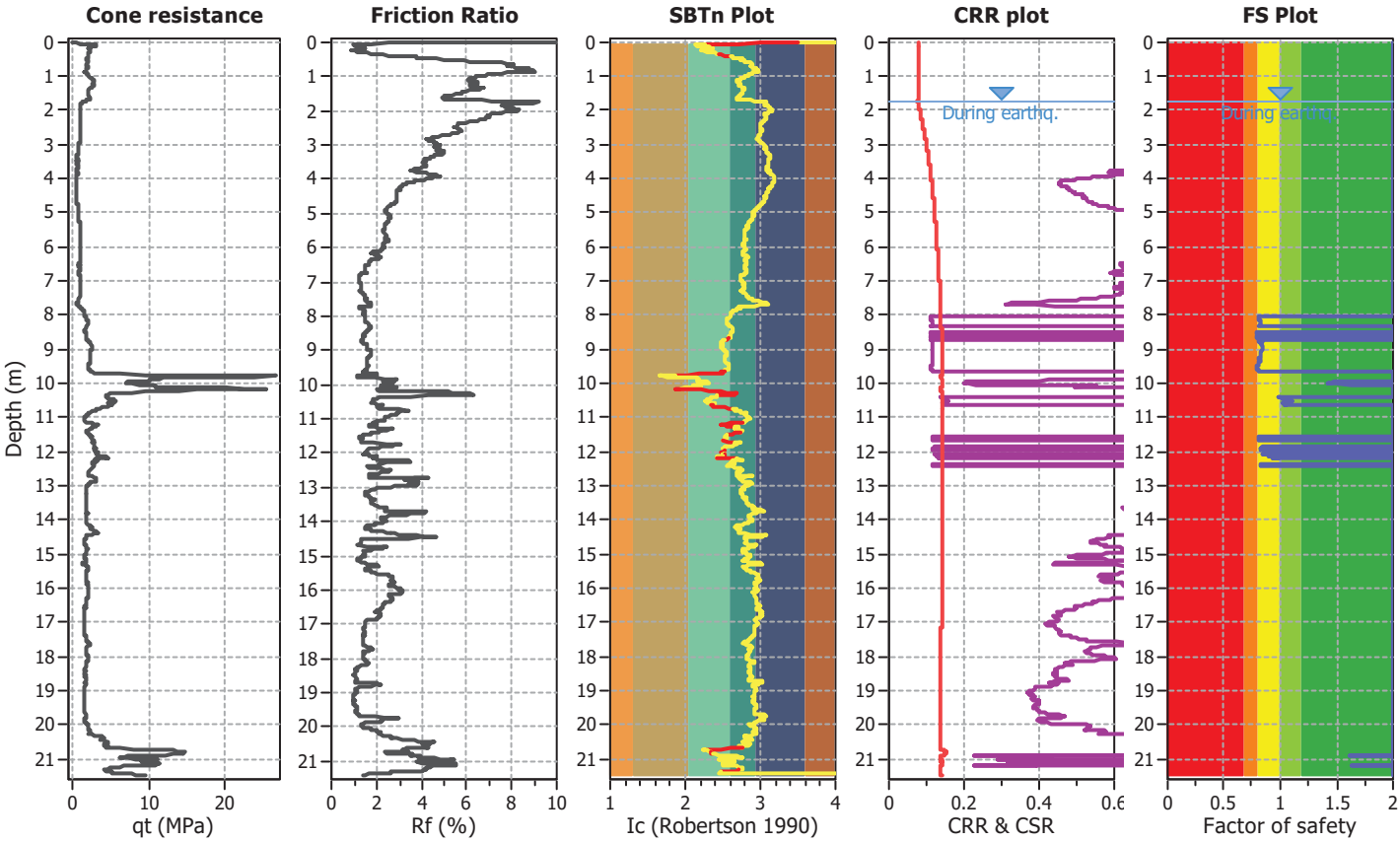
LIQUEFACTION ANALYSIS REPORT

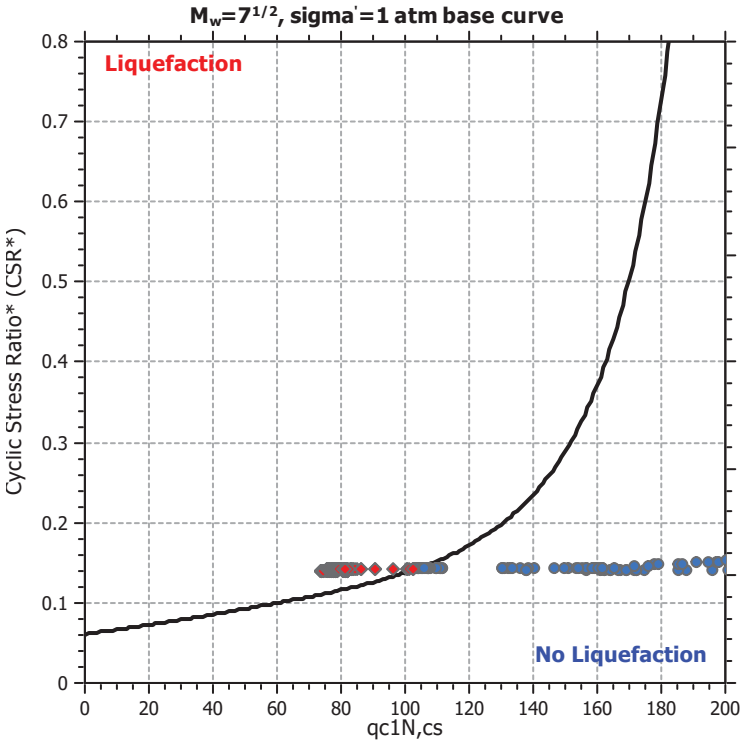
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

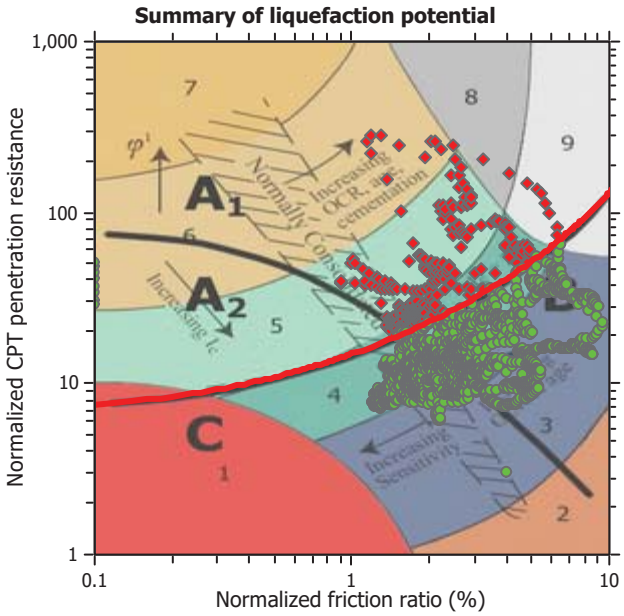
CPT file : CPT01 ULS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

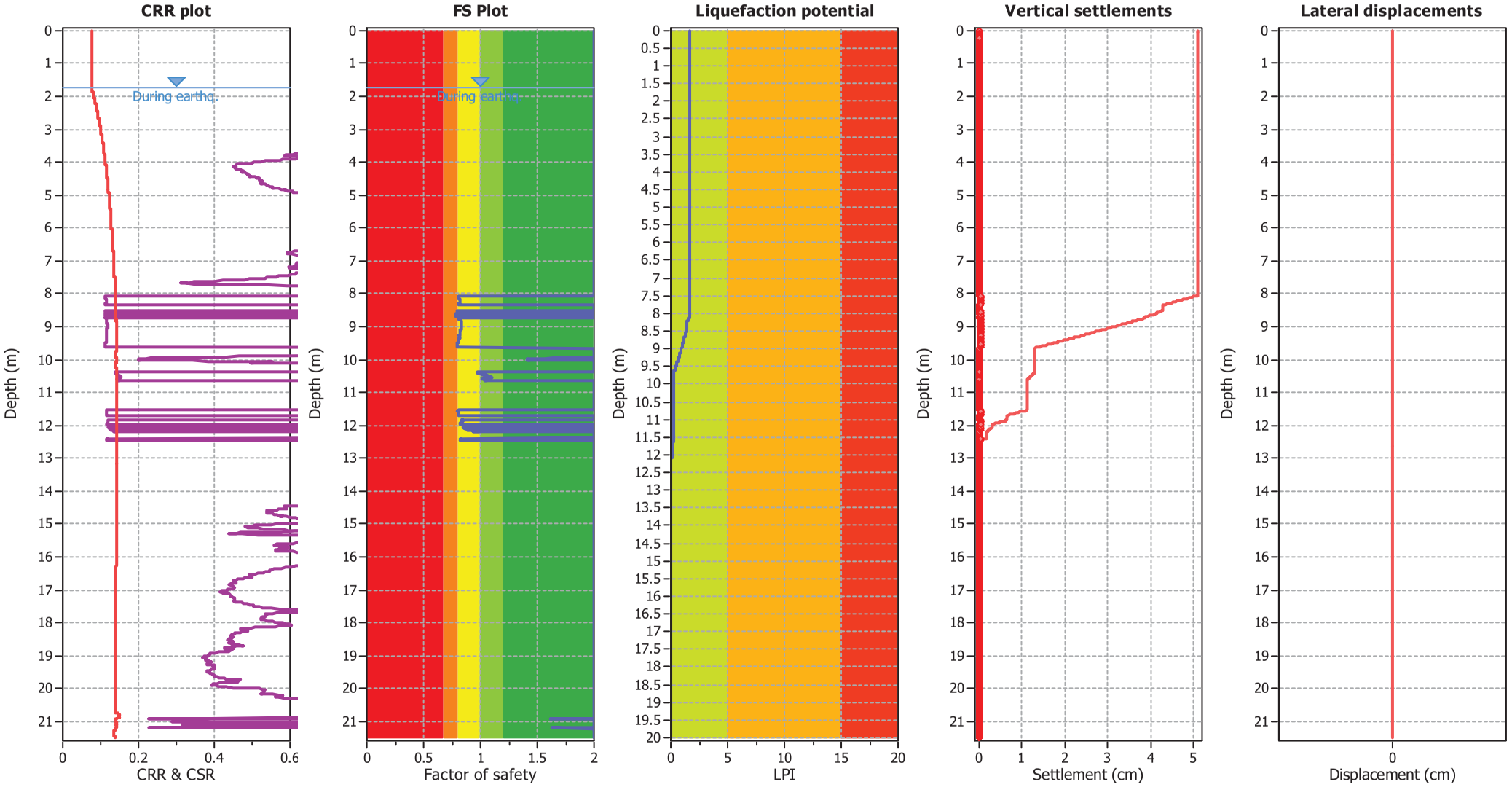






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Beca House
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New Zealand

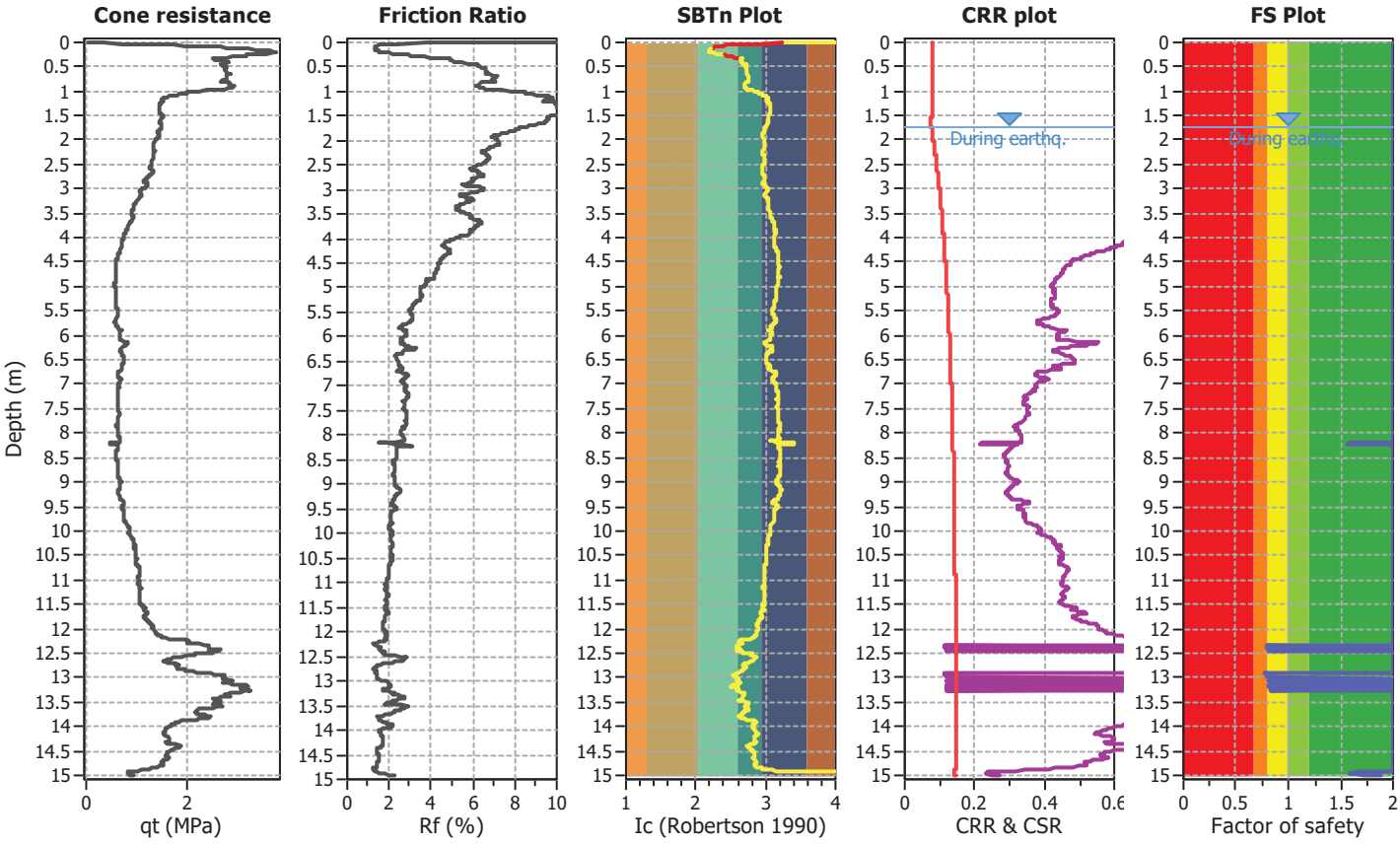
LIQUEFACTION ANALYSIS REPORT

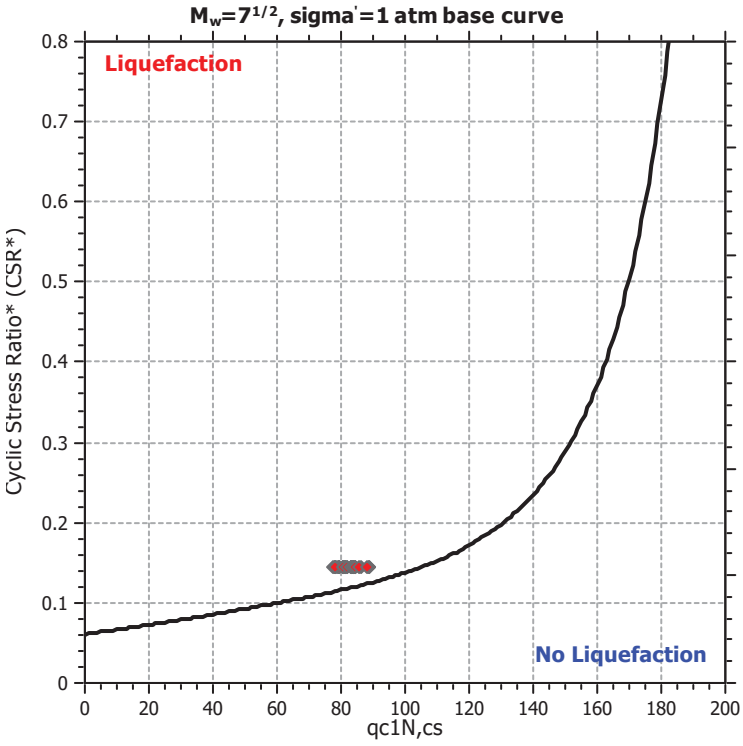
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

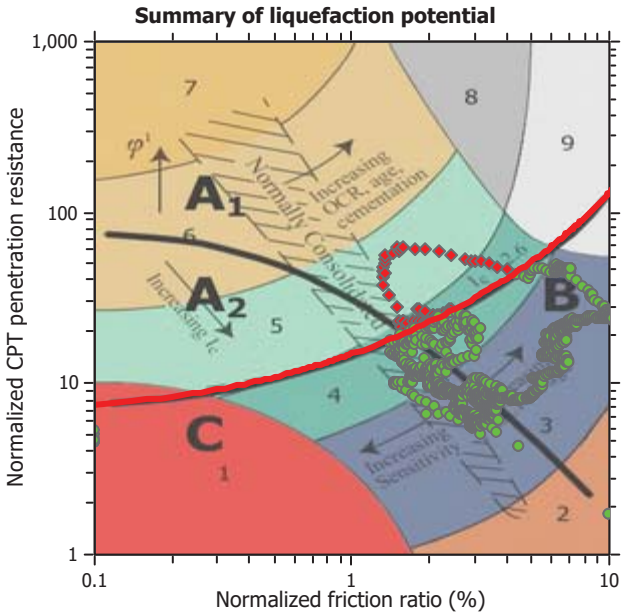
CPT file : CPT02 ULS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

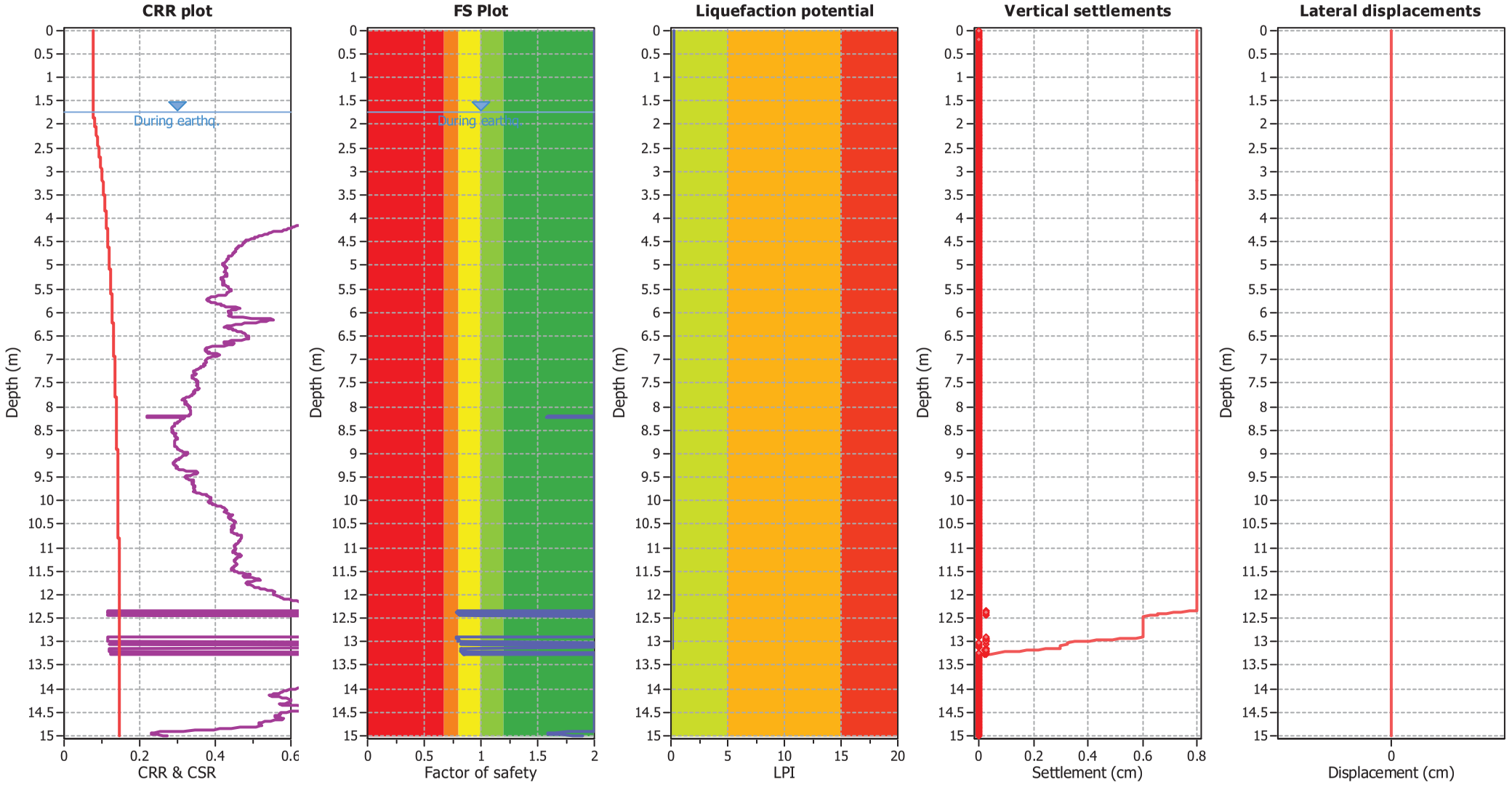






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

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New Zealand

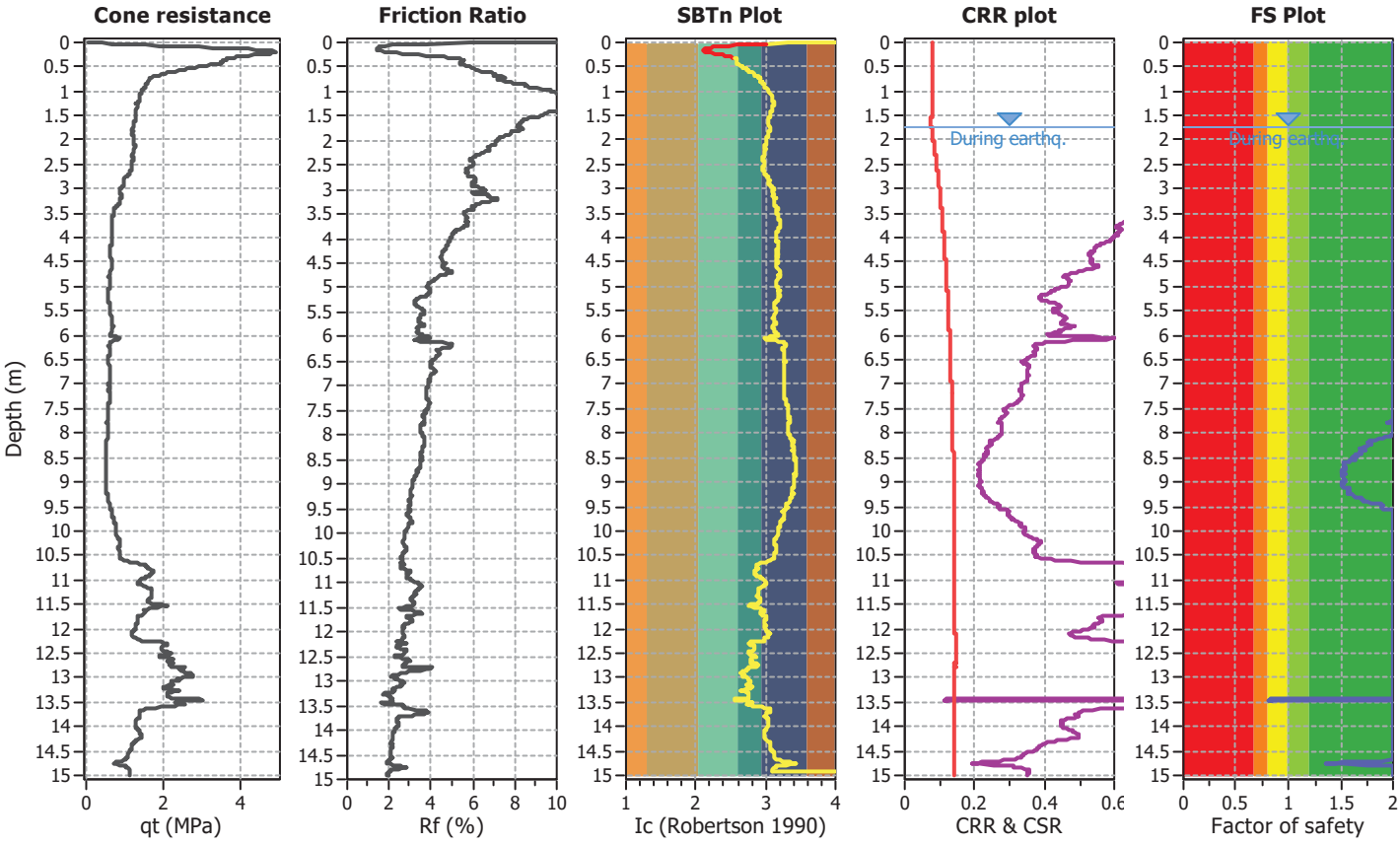
LIQUEFACTION ANALYSIS REPORT

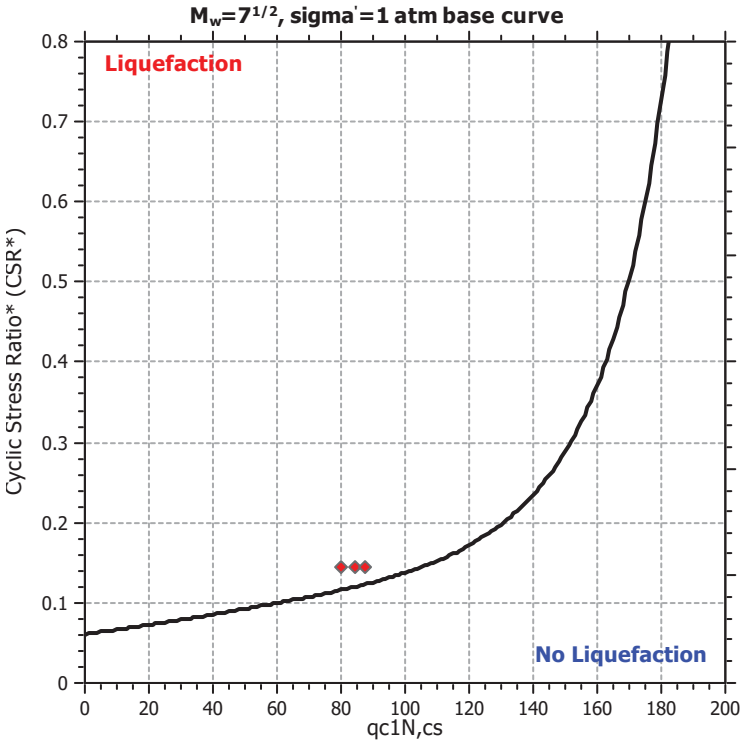
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

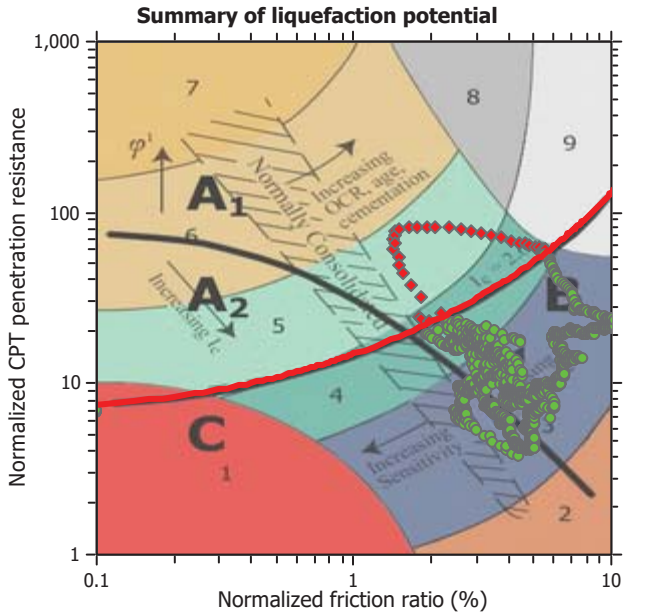
CPT file : CPT03 ULS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

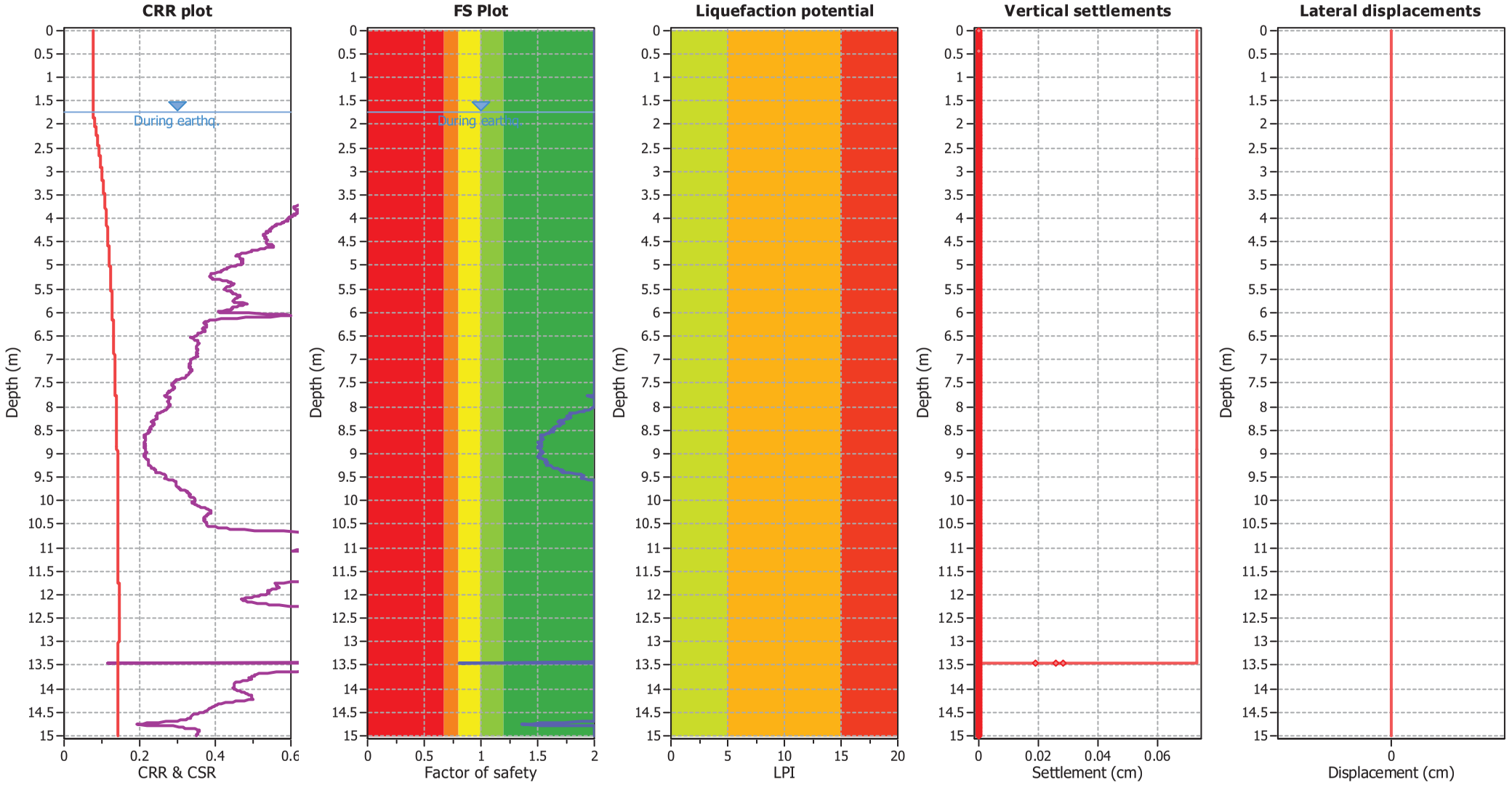






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

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New Zealand

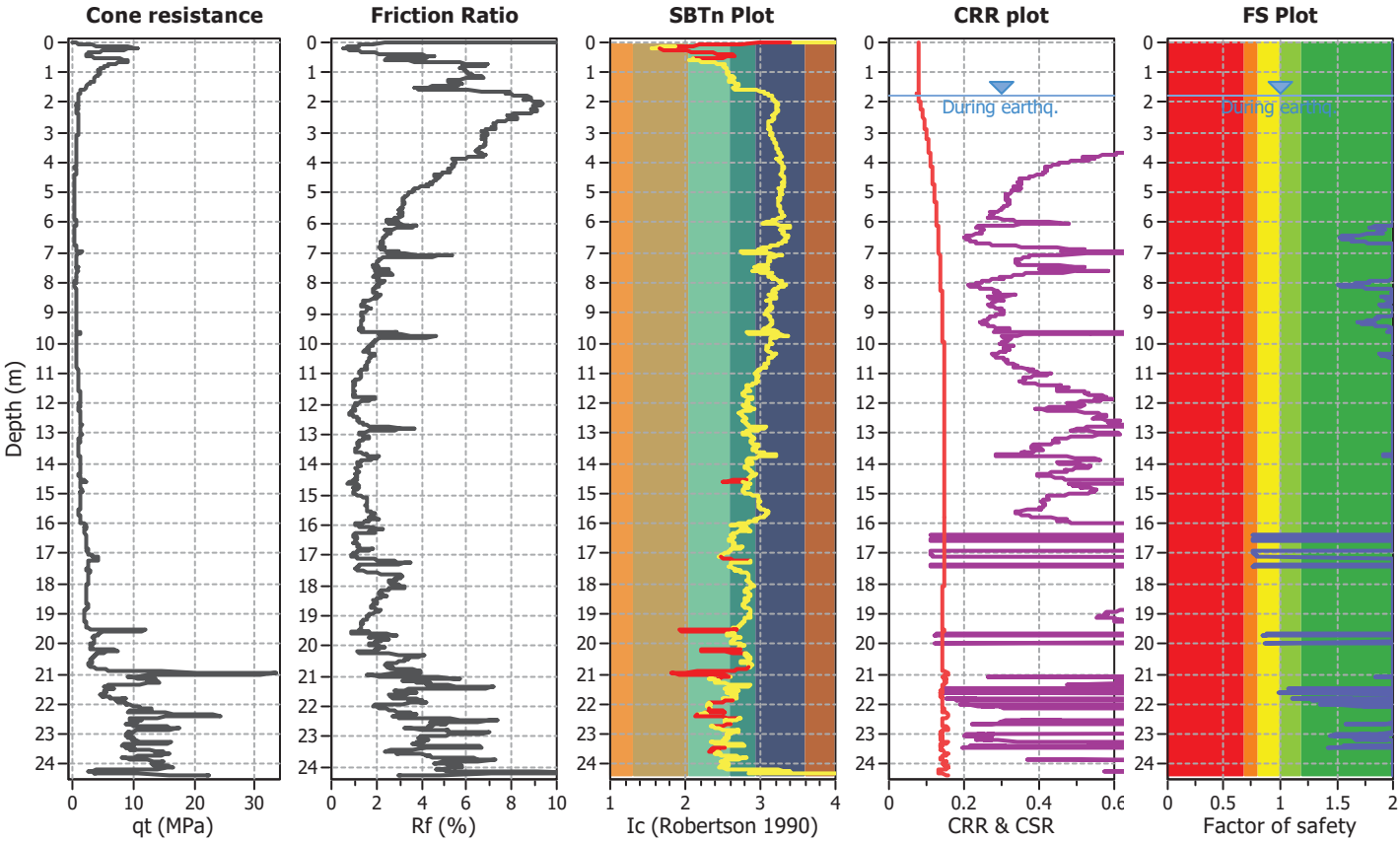
LIQUEFACTION ANALYSIS REPORT

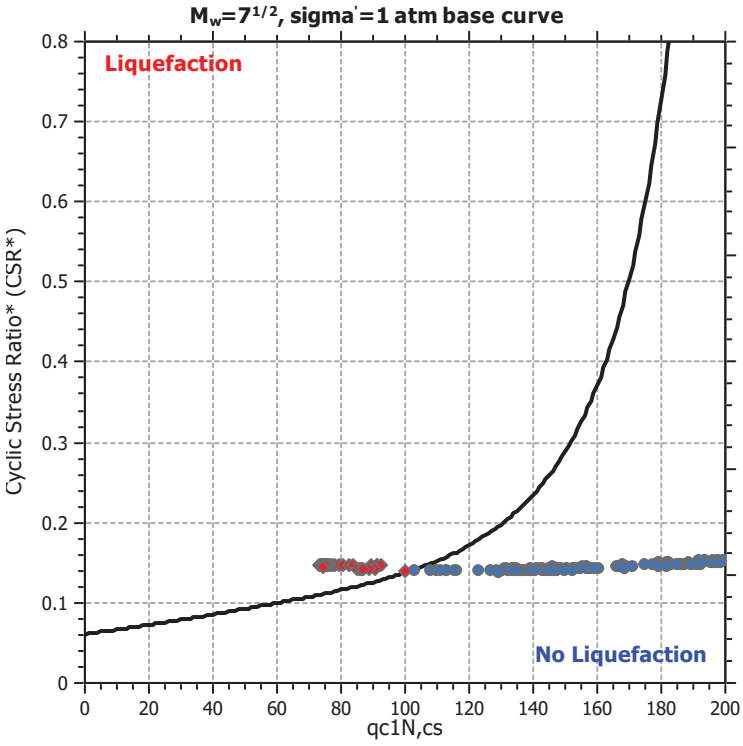
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

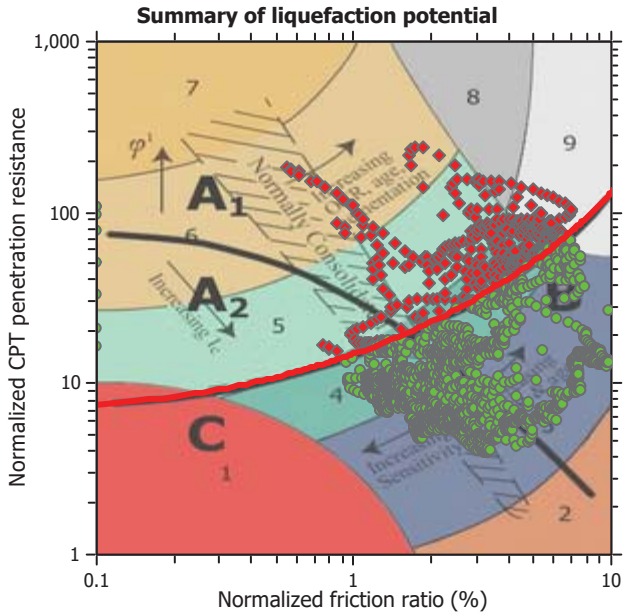
CPT file : CPT04 ULS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

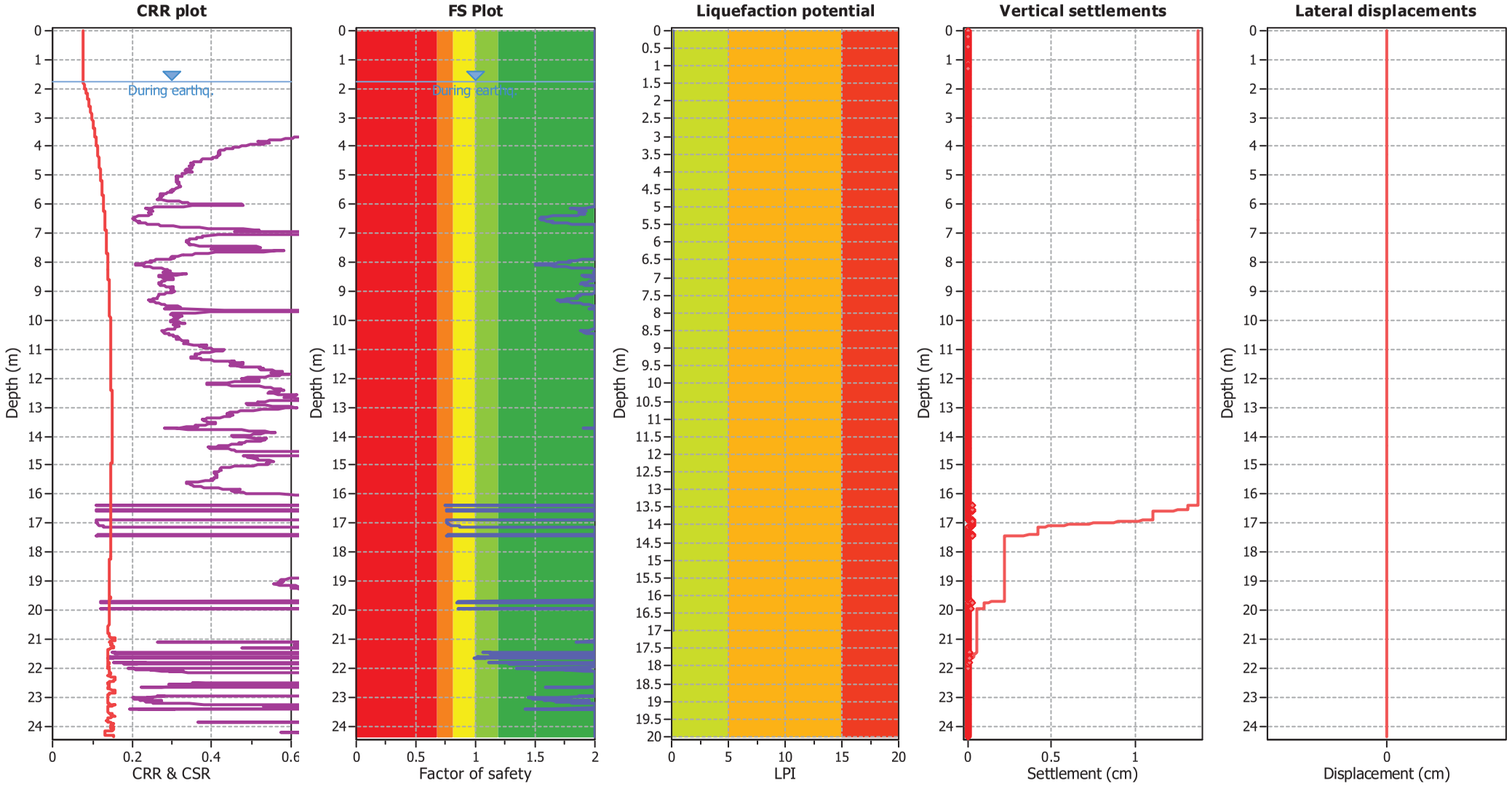






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

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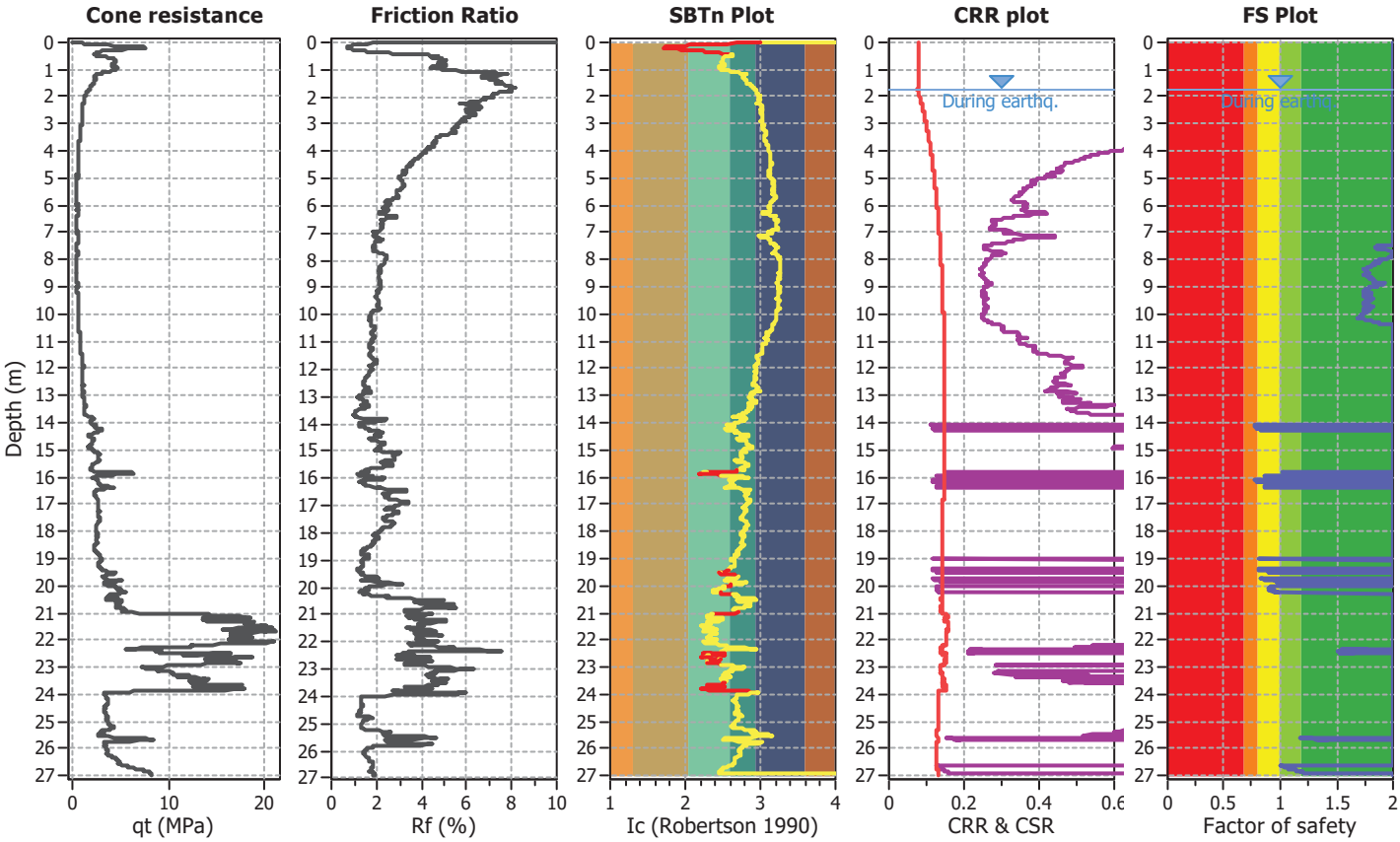
LIQUEFACTION ANALYSIS REPORT

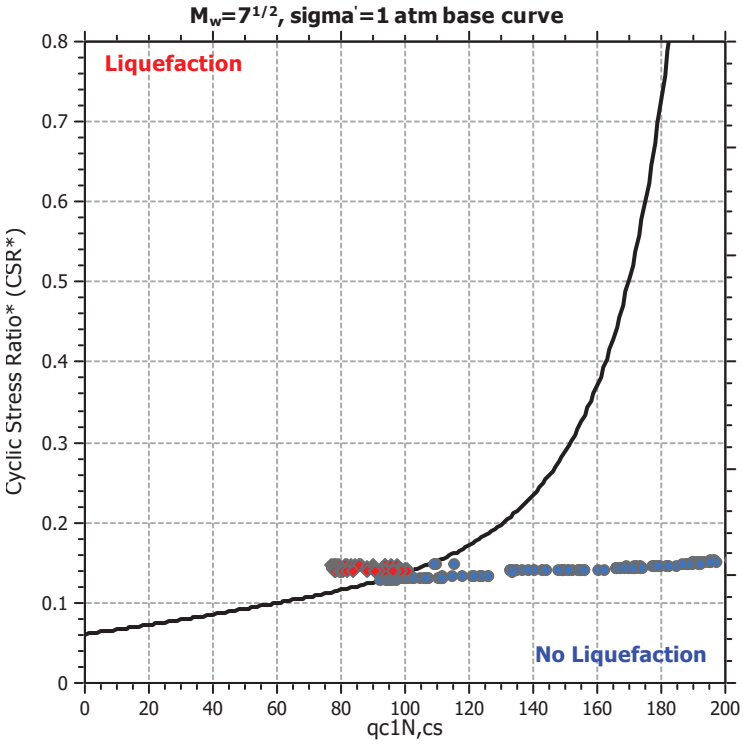
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

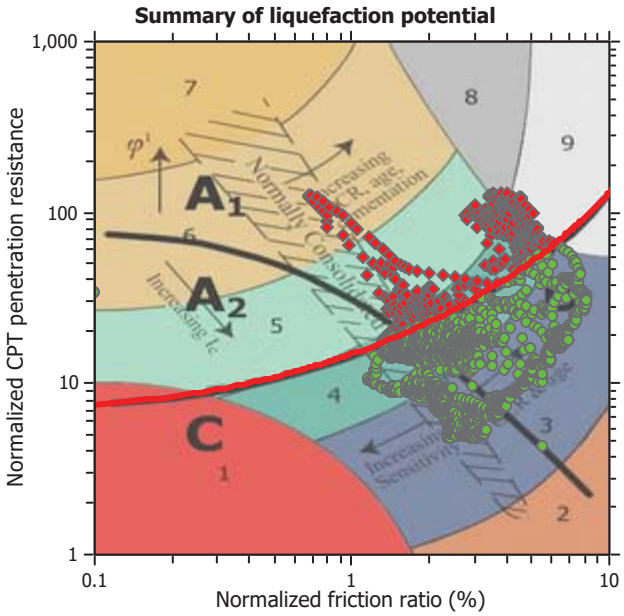
CPT file : CPT05 ULS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

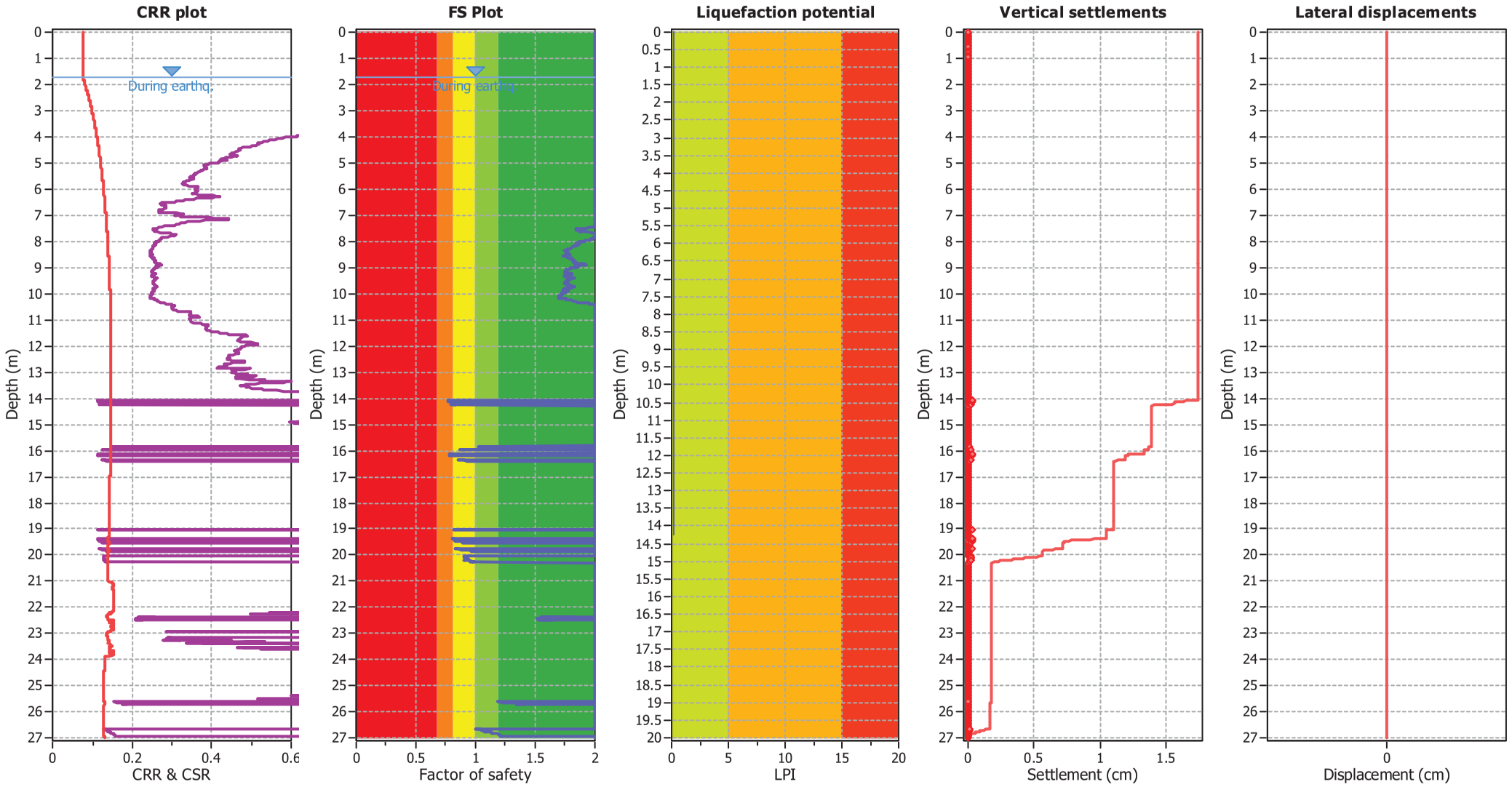






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Beca House
21 Pitt Street
Auckland 1010
New Zealand

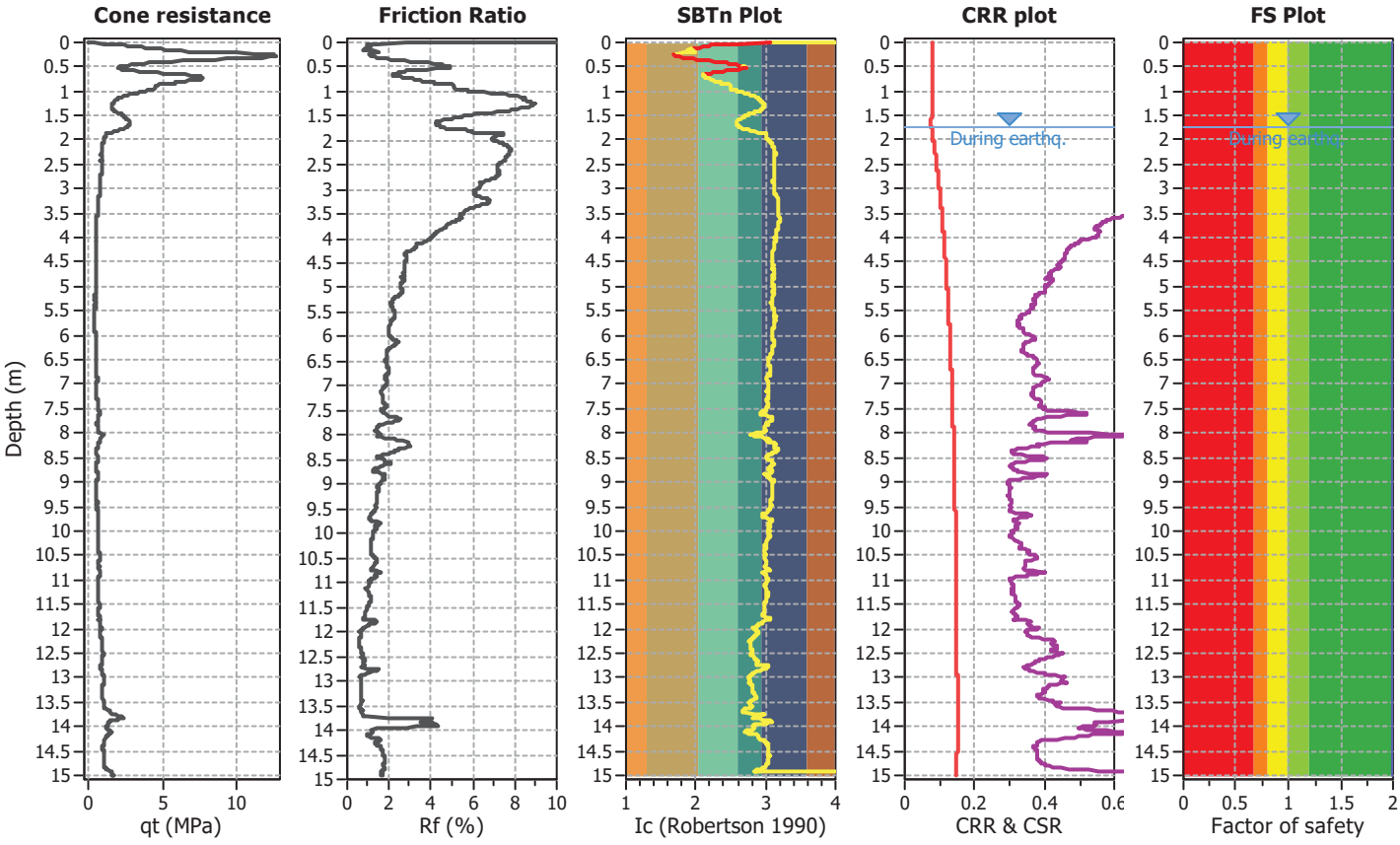
LIQUEFACTION ANALYSIS REPORT

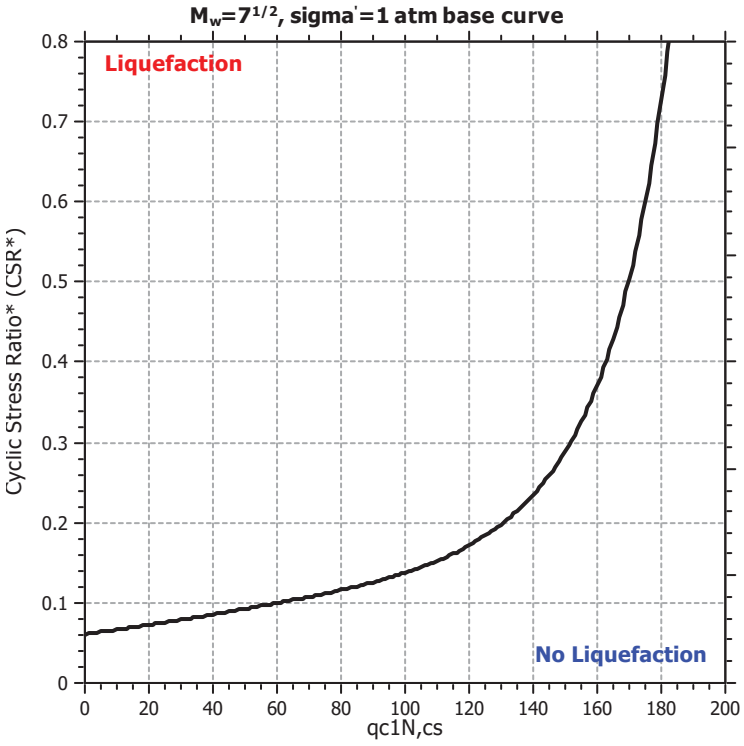
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

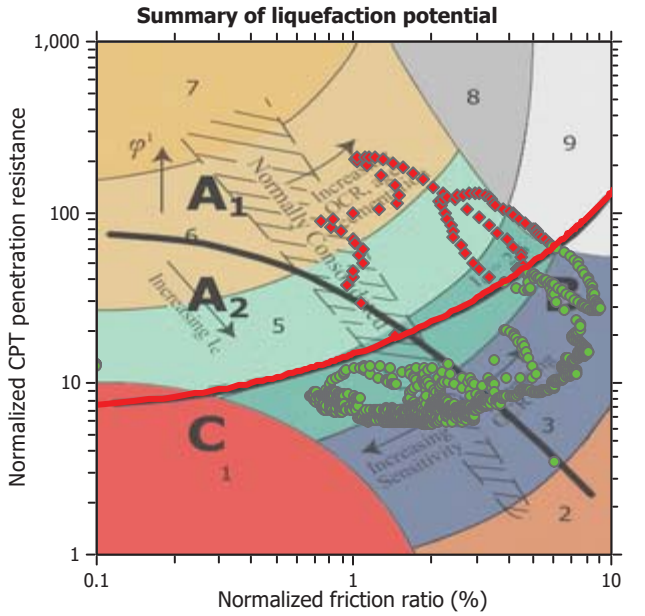
CPT file : CPT06 ULS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

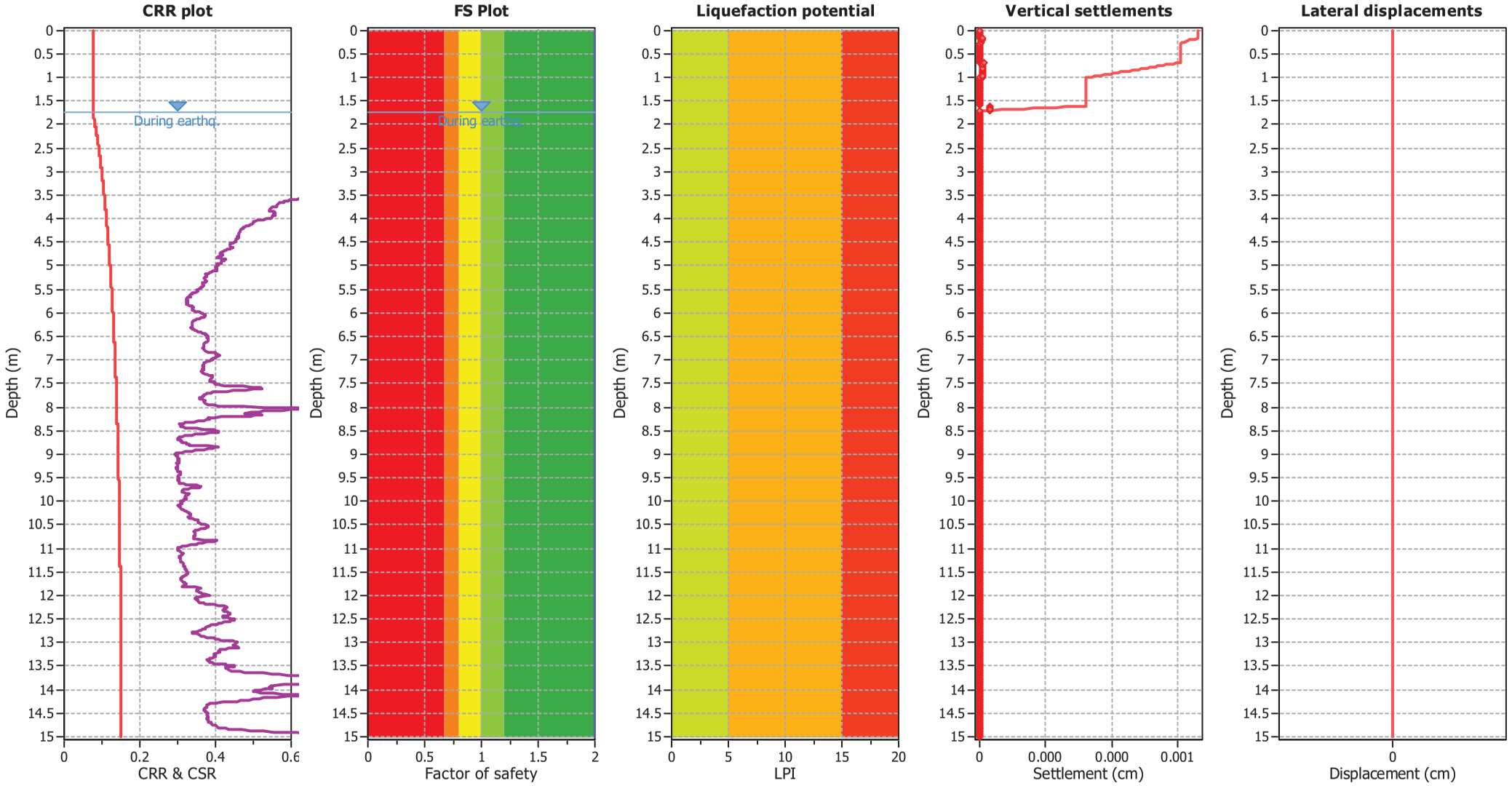






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

SLS

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21 Pitt Street
Auckland 1010
New Zealand

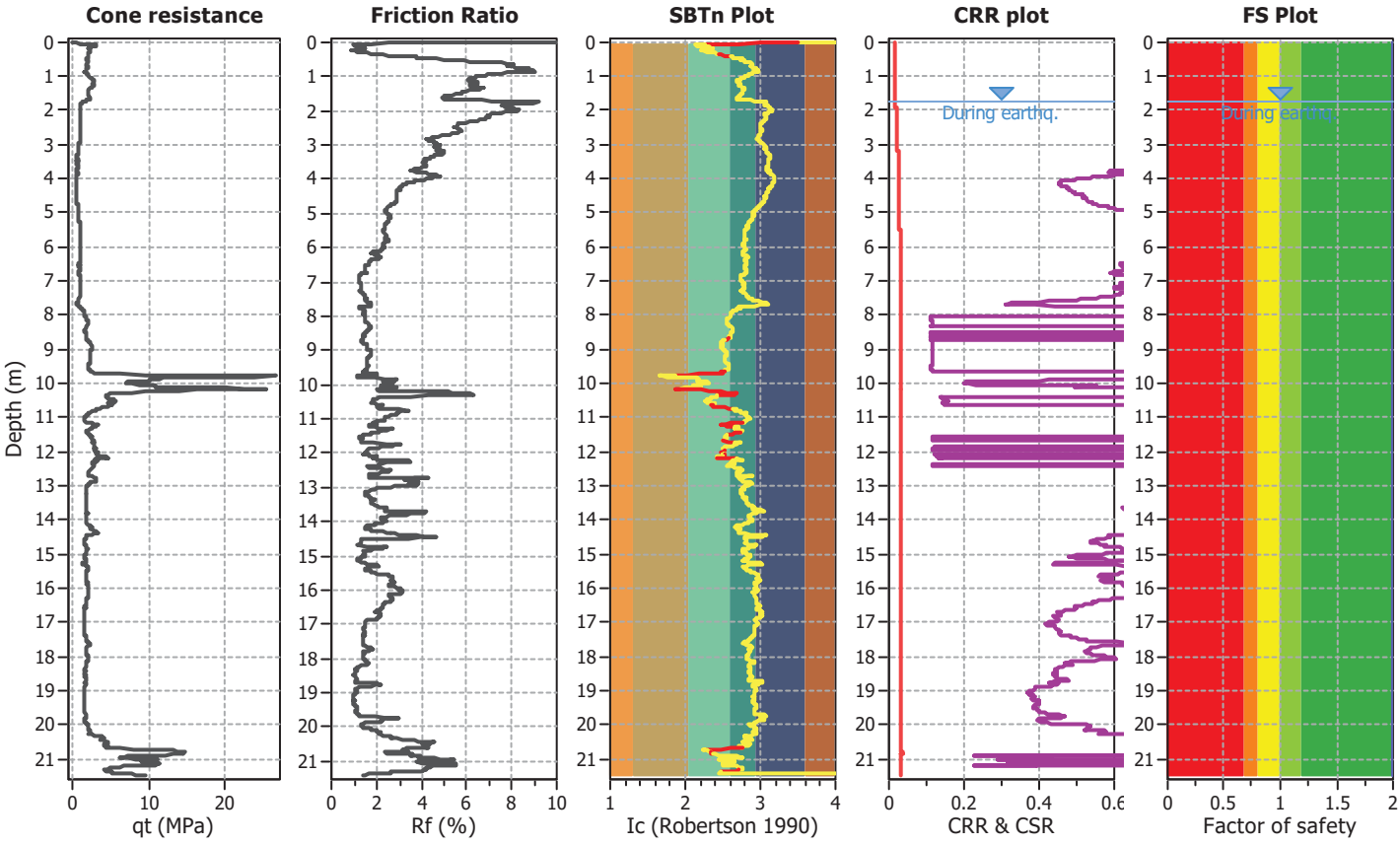
LIQUEFACTION ANALYSIS REPORT

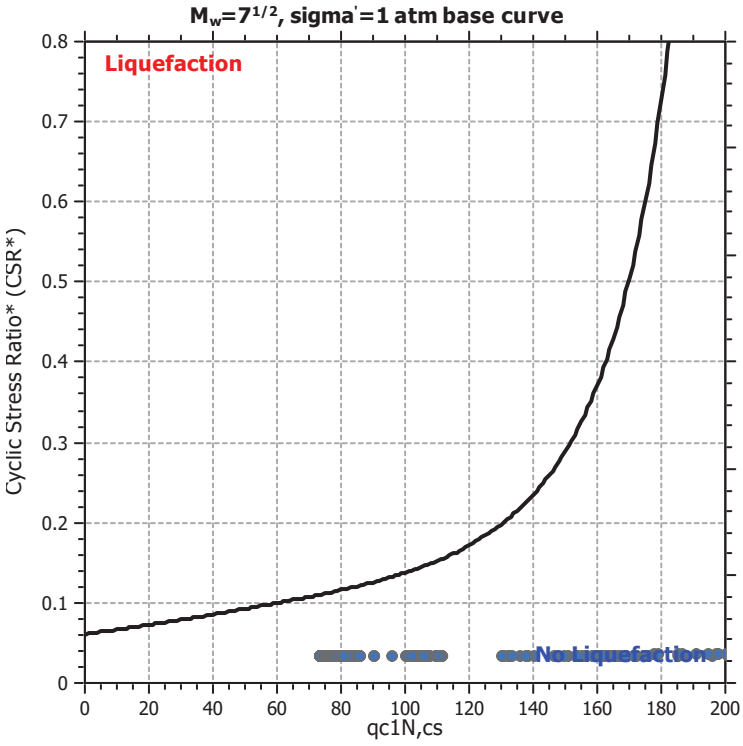
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

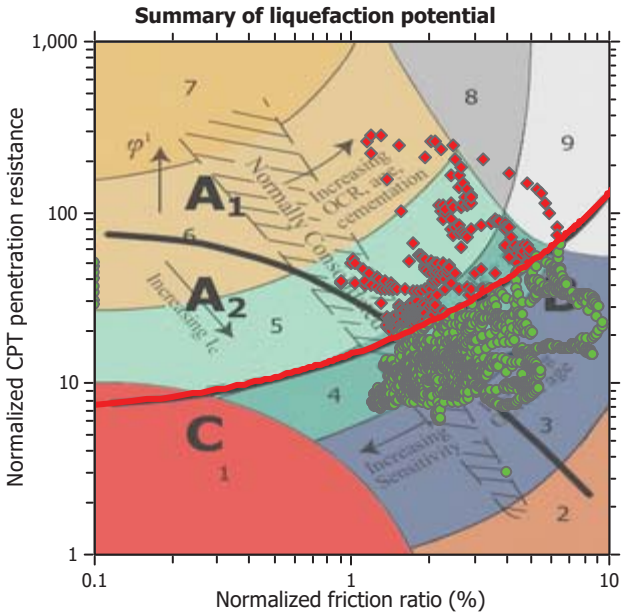
CPT file : CPT01 SLS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.03	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

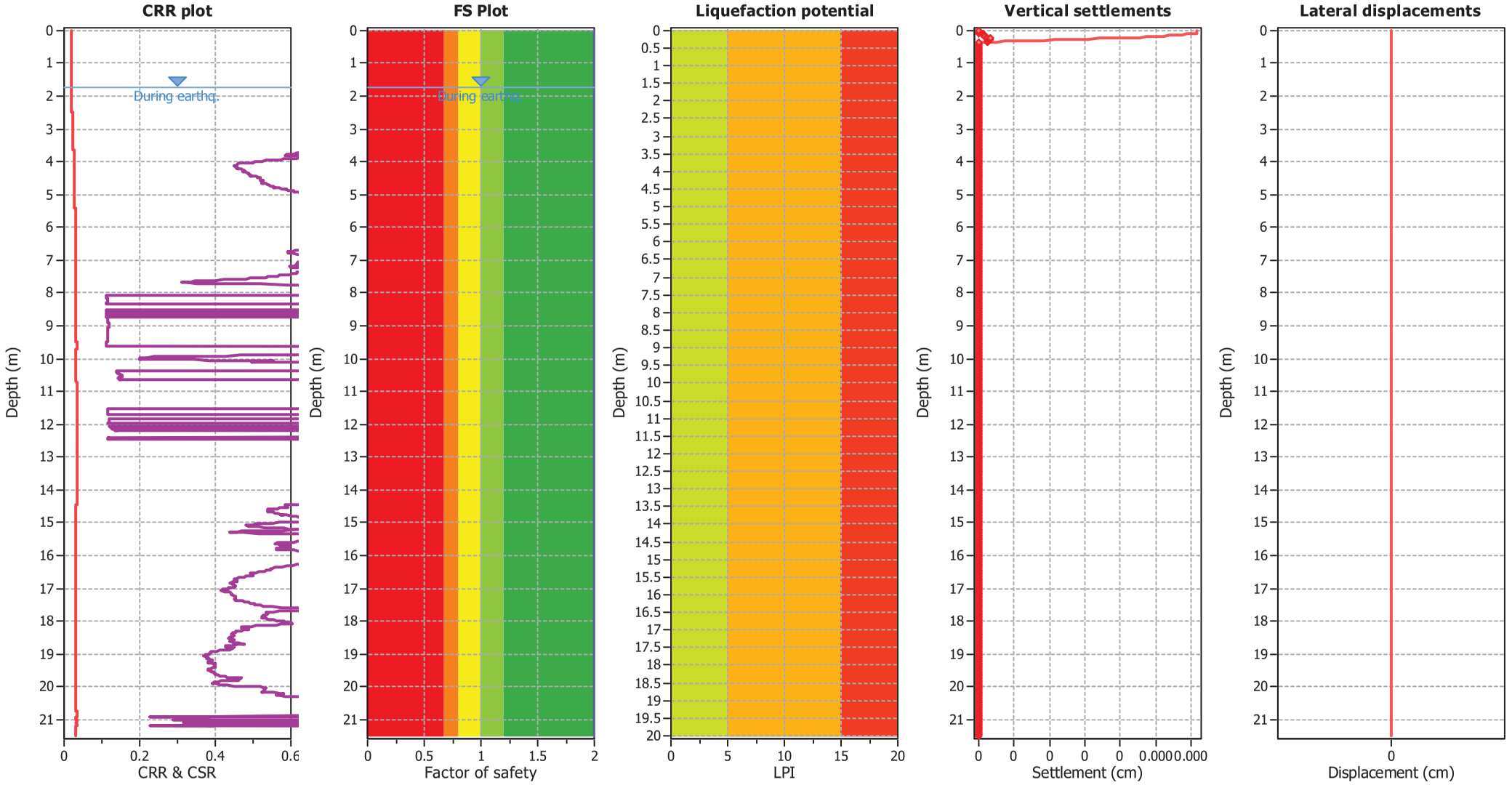






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

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LPI color scheme

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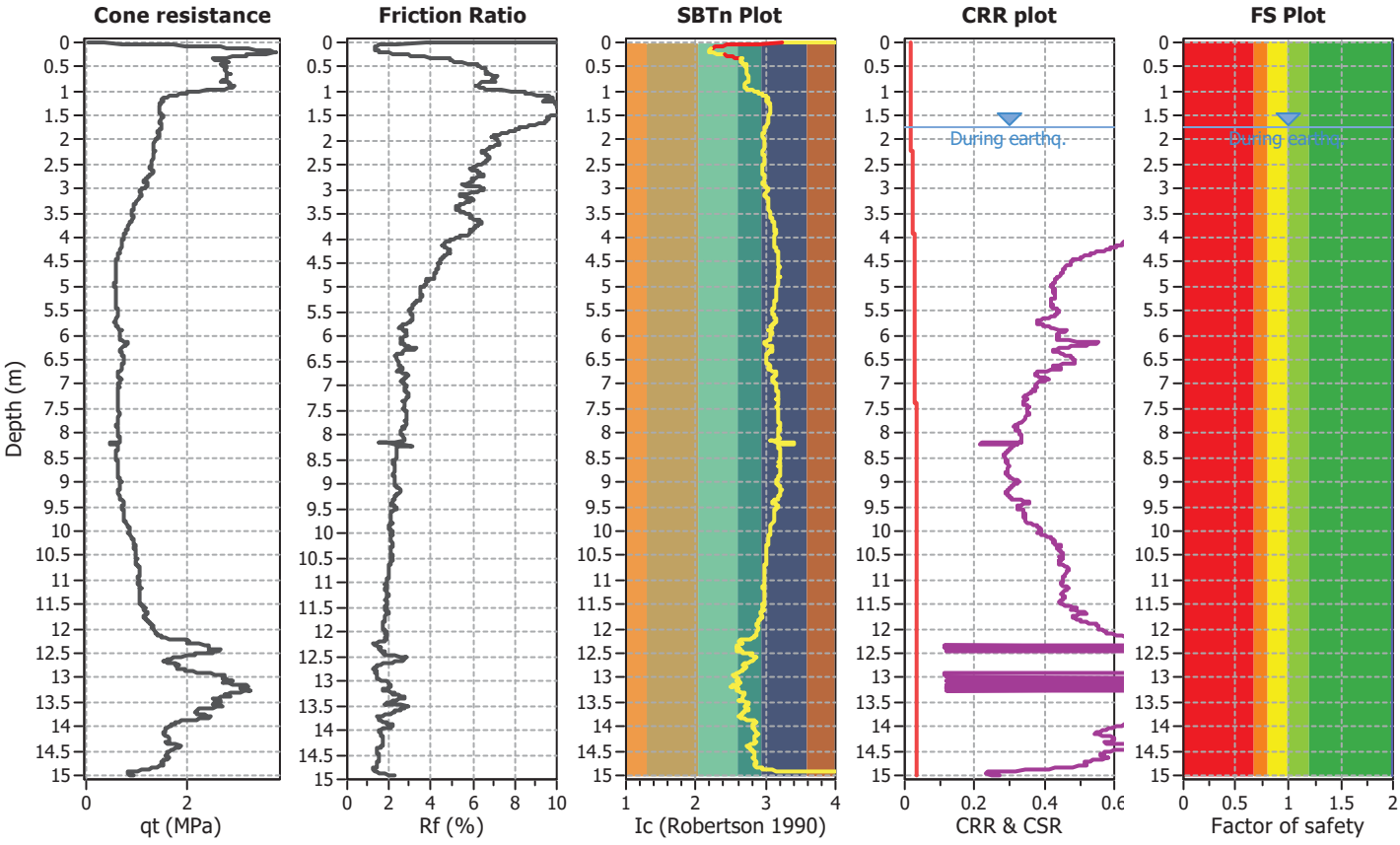
LIQUEFACTION ANALYSIS REPORT

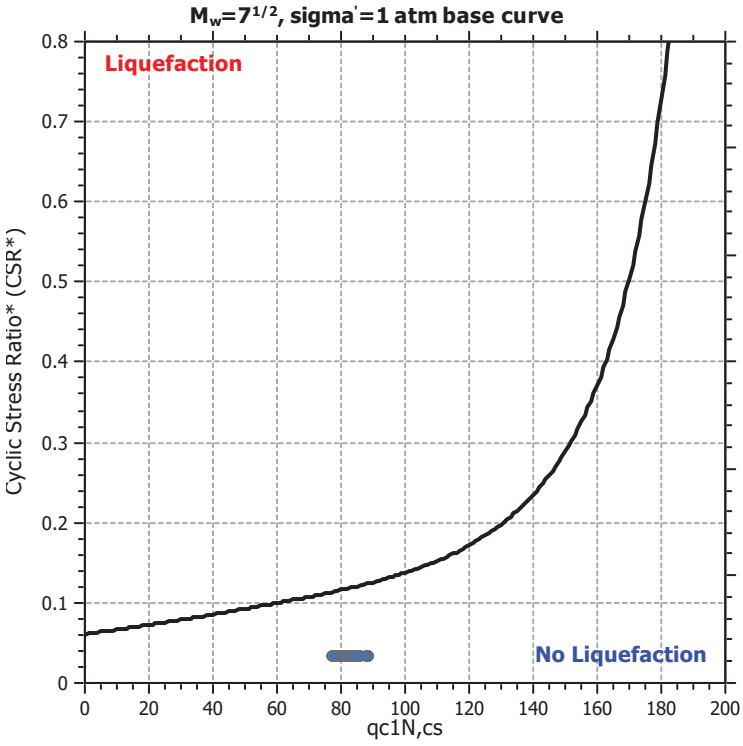
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

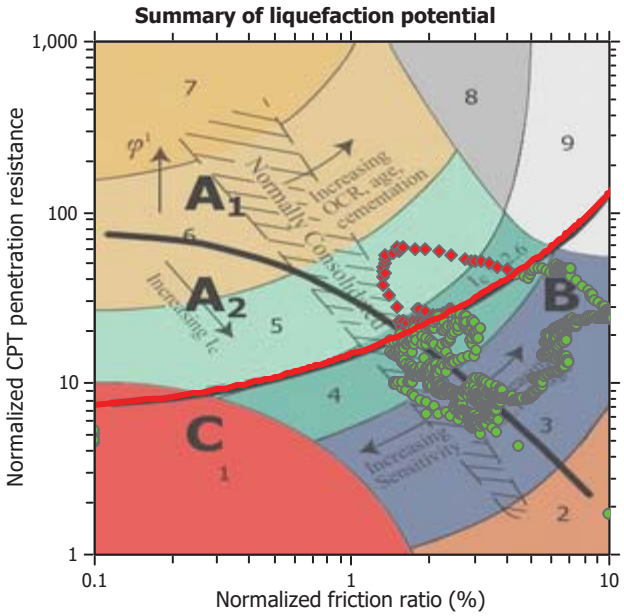
CPT file : CPT02 SLS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.03	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		







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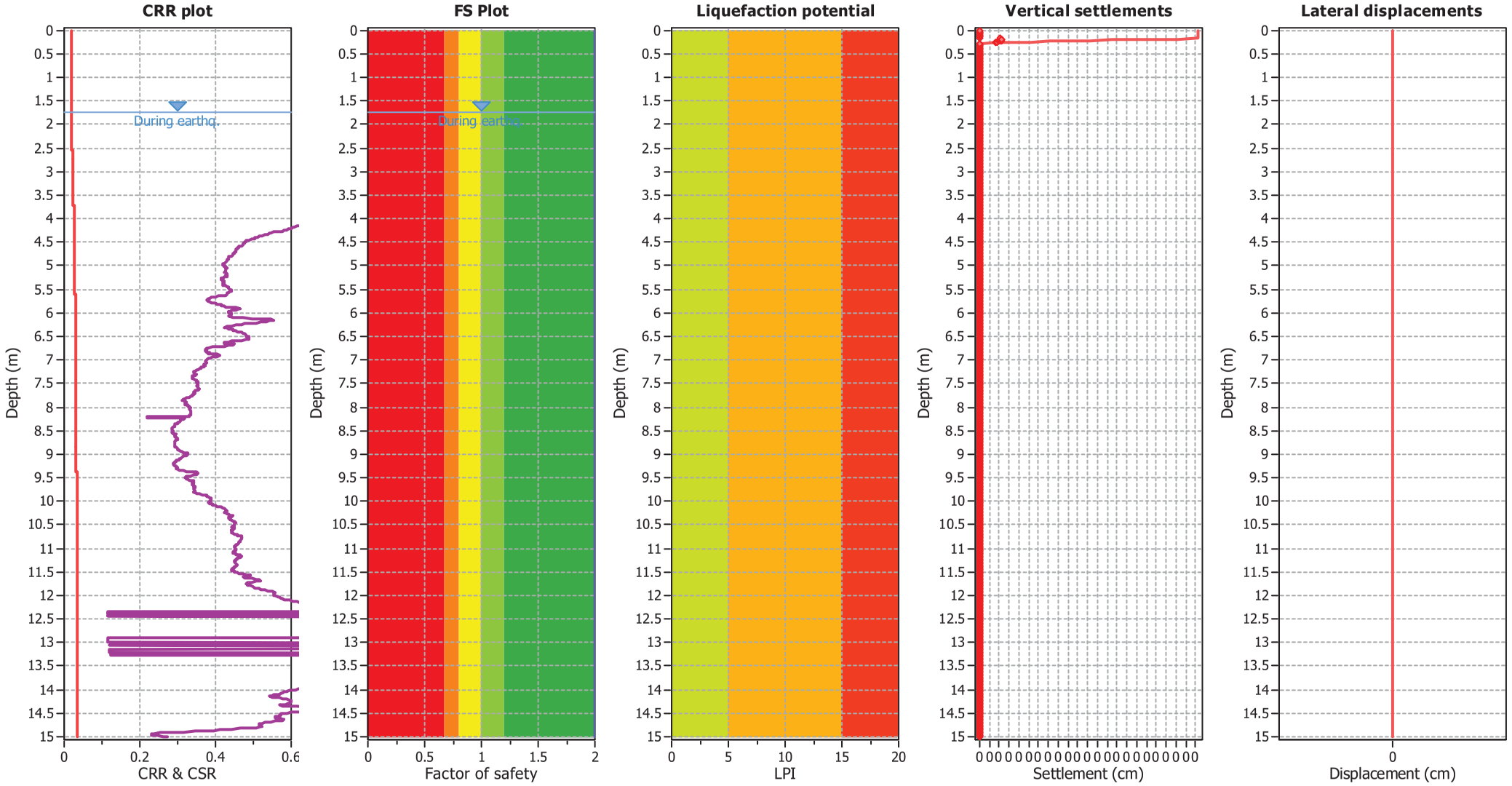
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

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LPI color scheme

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- High risk
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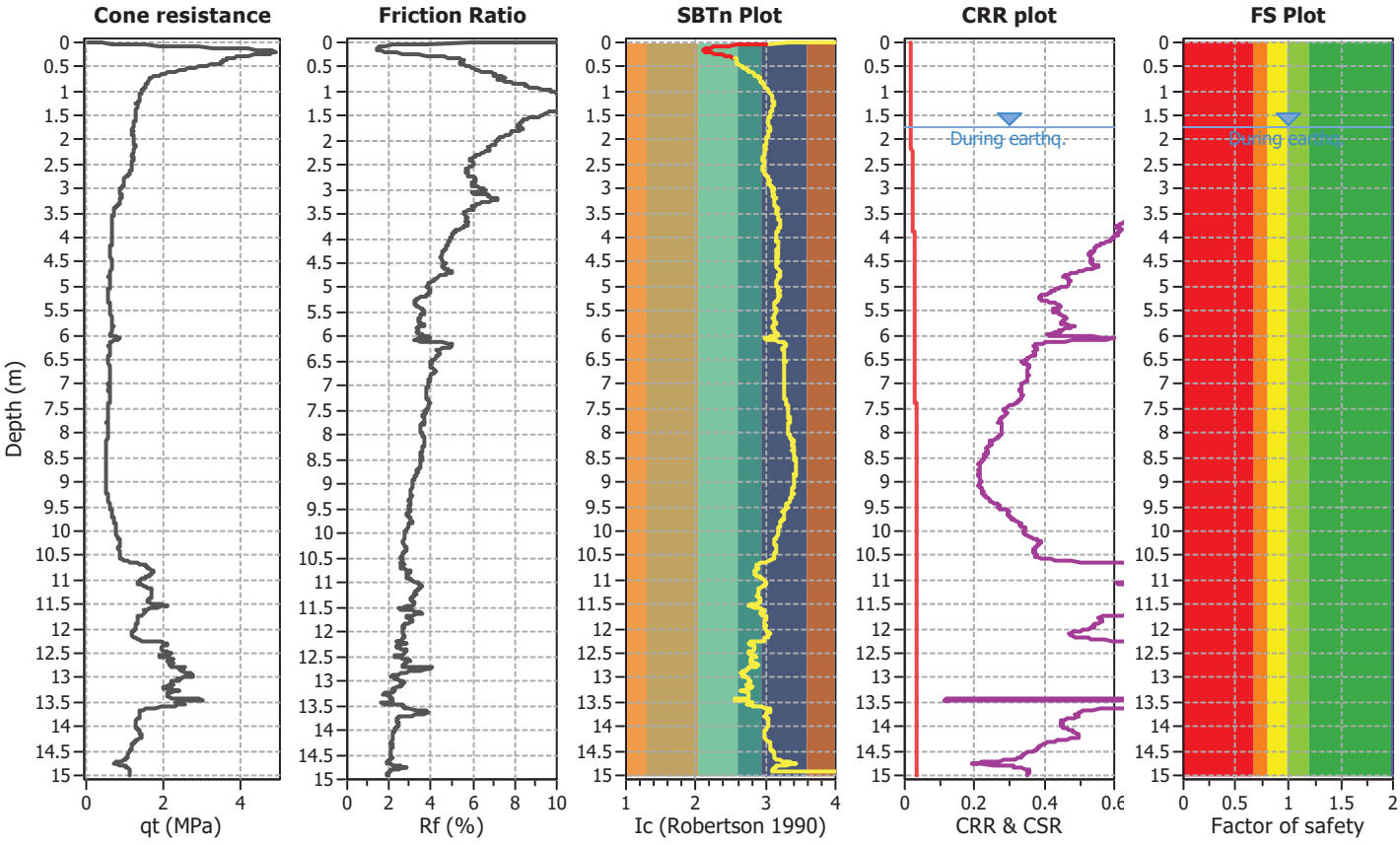
LIQUEFACTION ANALYSIS REPORT

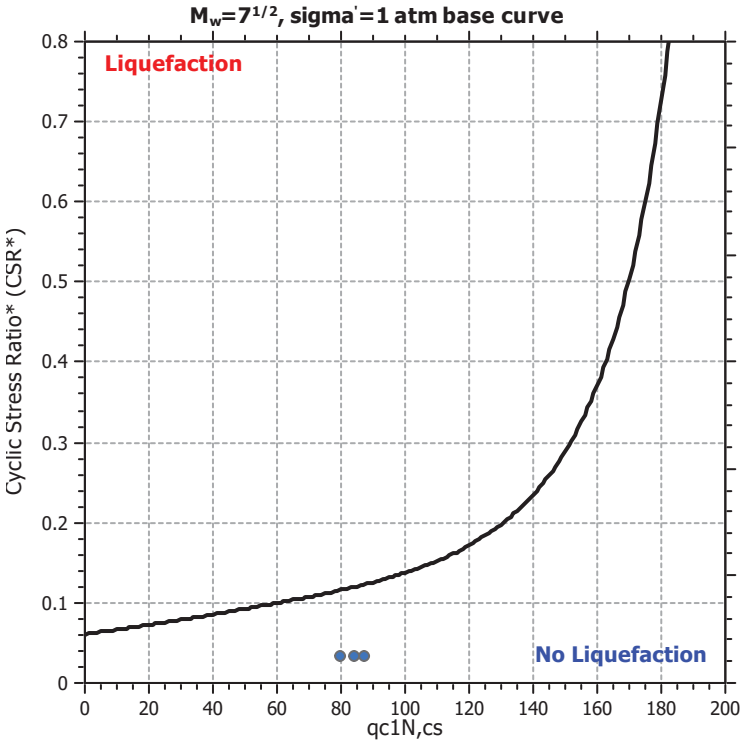
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

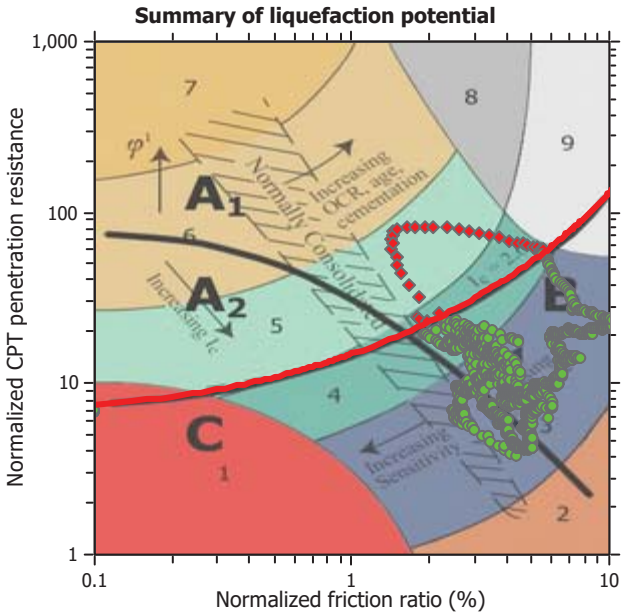
CPT file : CPT03 SLS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.03	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		







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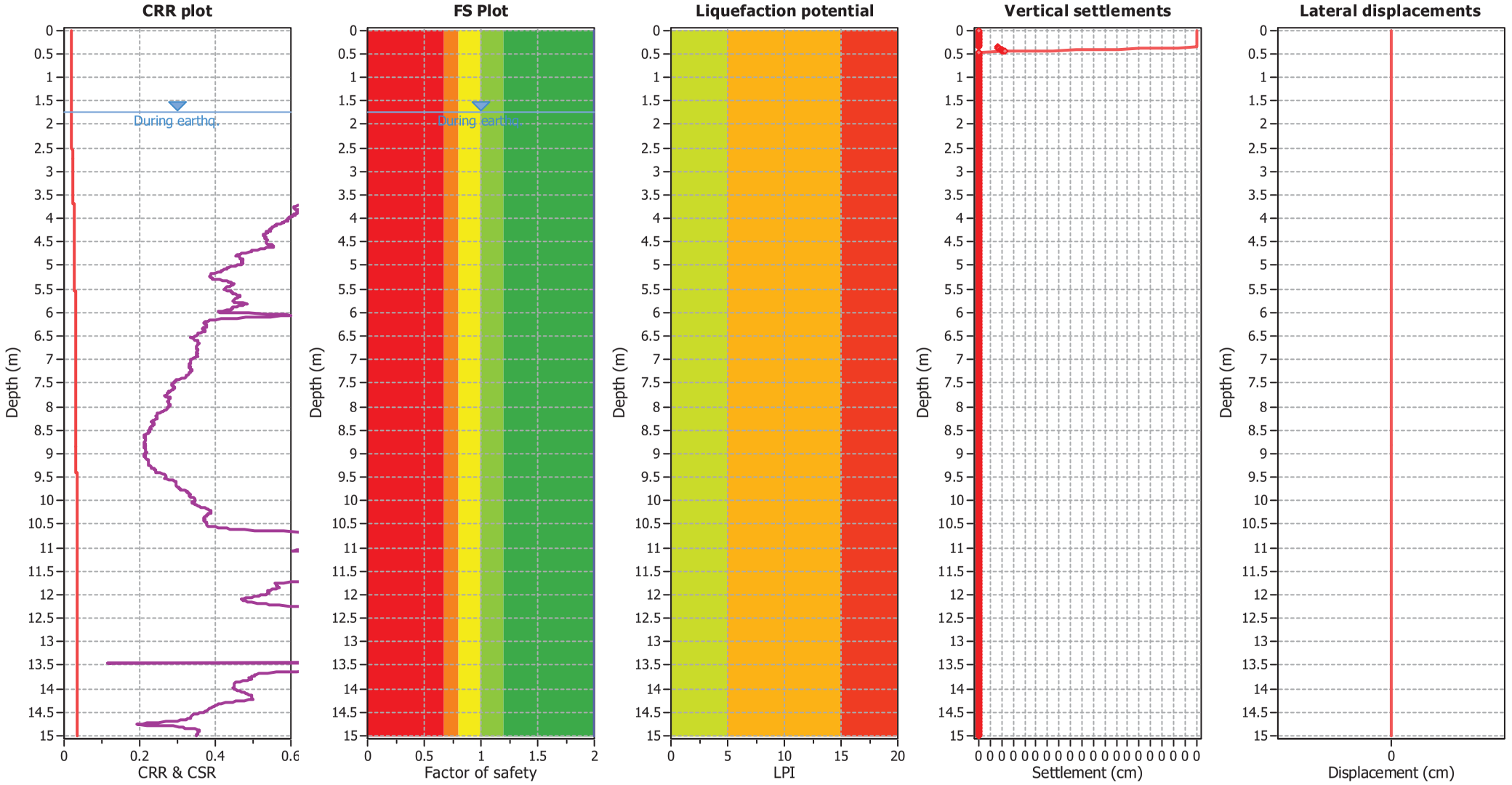
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

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LPI color scheme

- Very high risk
- High risk
- Low risk

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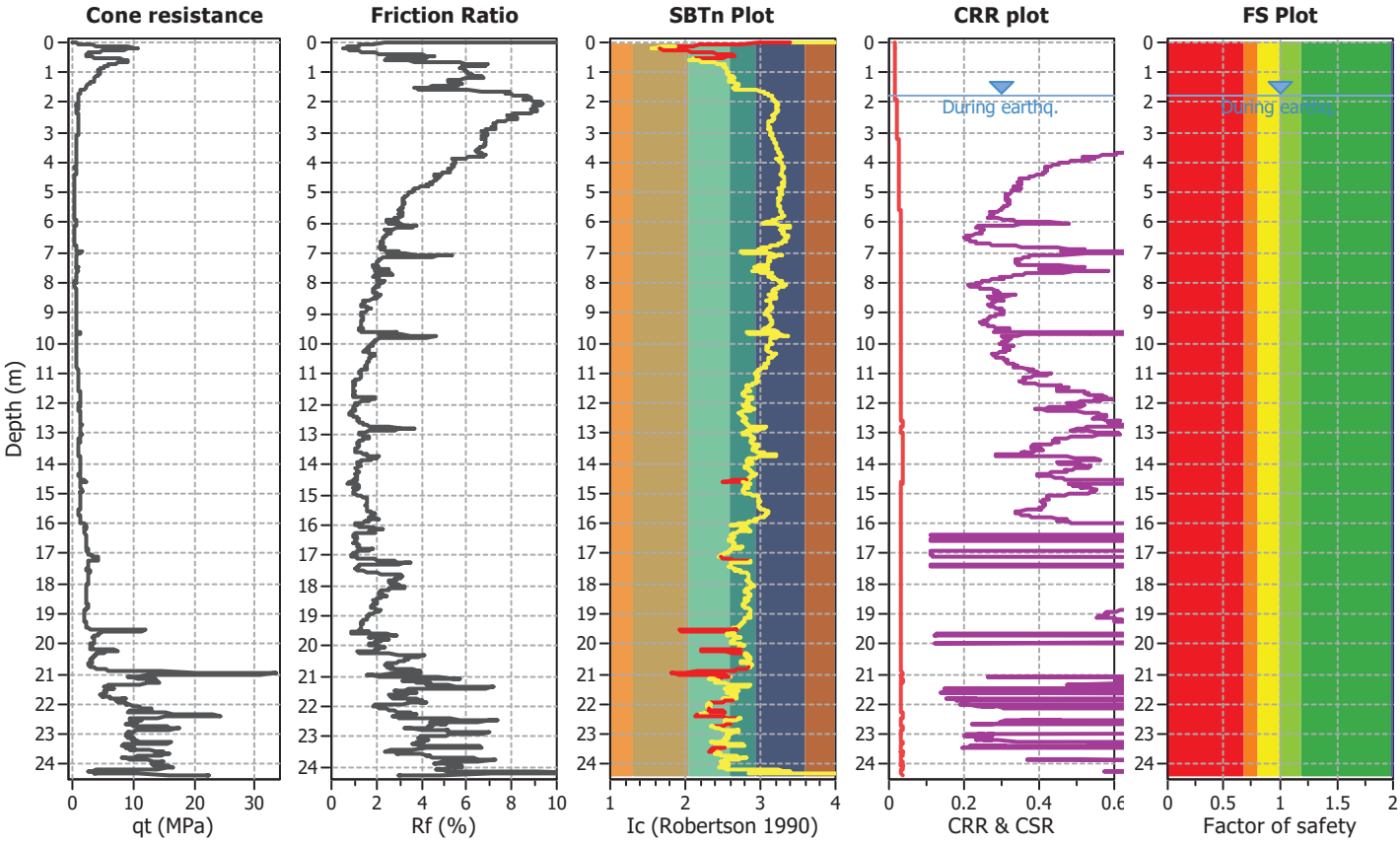
LIQUEFACTION ANALYSIS REPORT

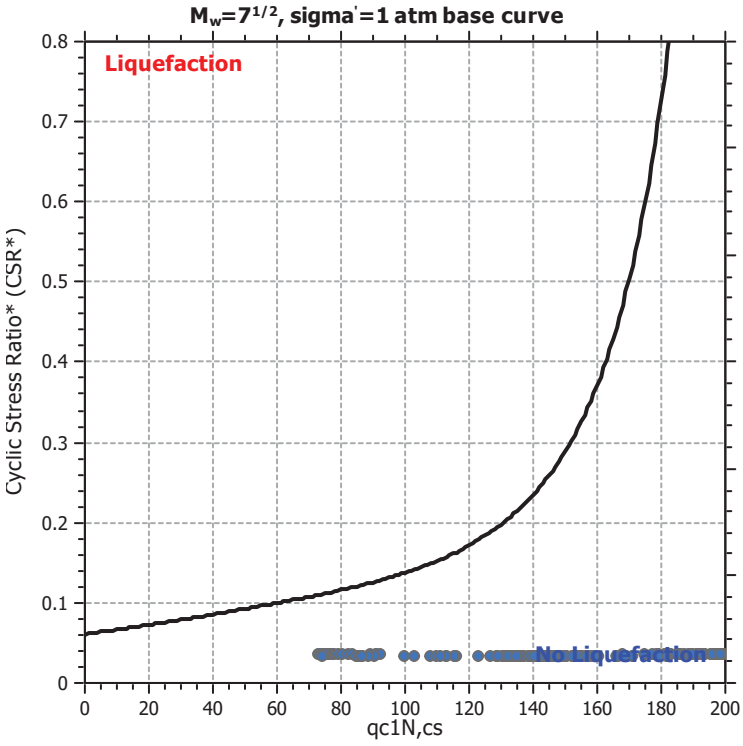
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

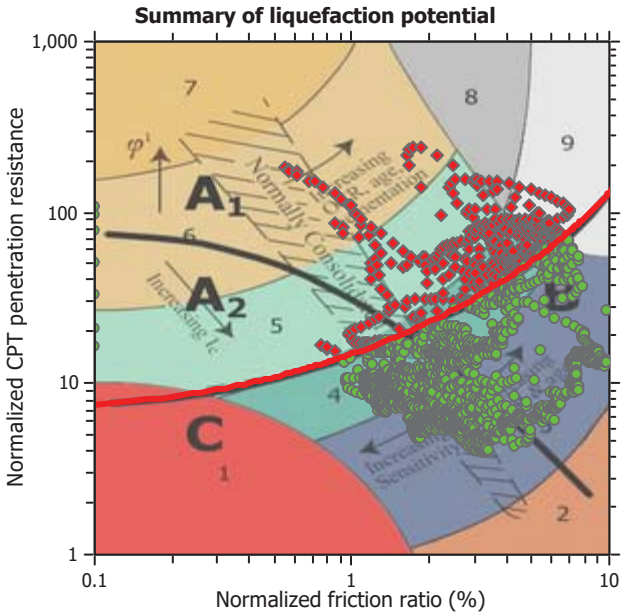
CPT file : CPT04 SLS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.03	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

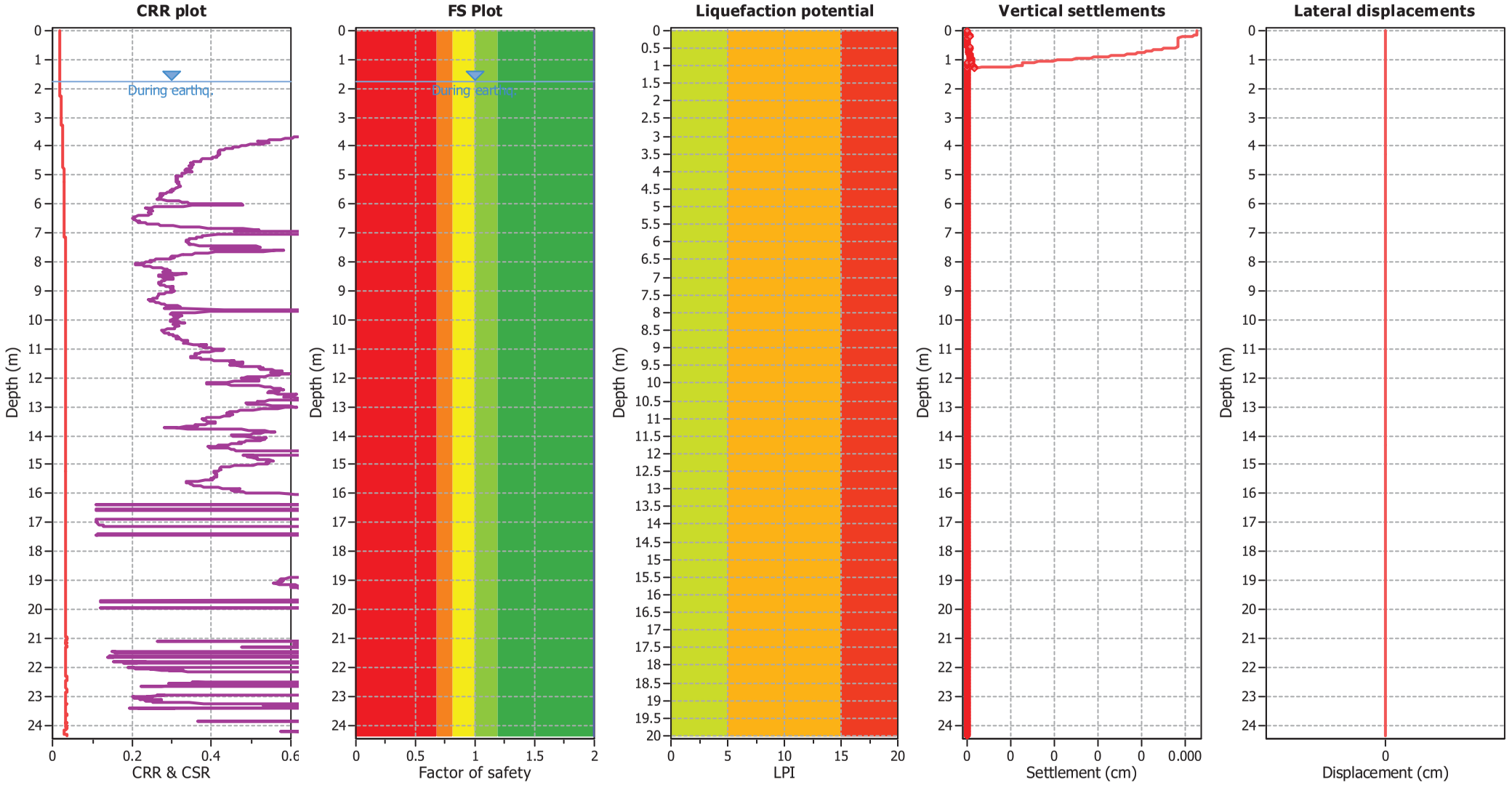






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

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- Unlike to liquefy
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LPI color scheme

- Very high risk
- High risk
- Low risk

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New Zealand

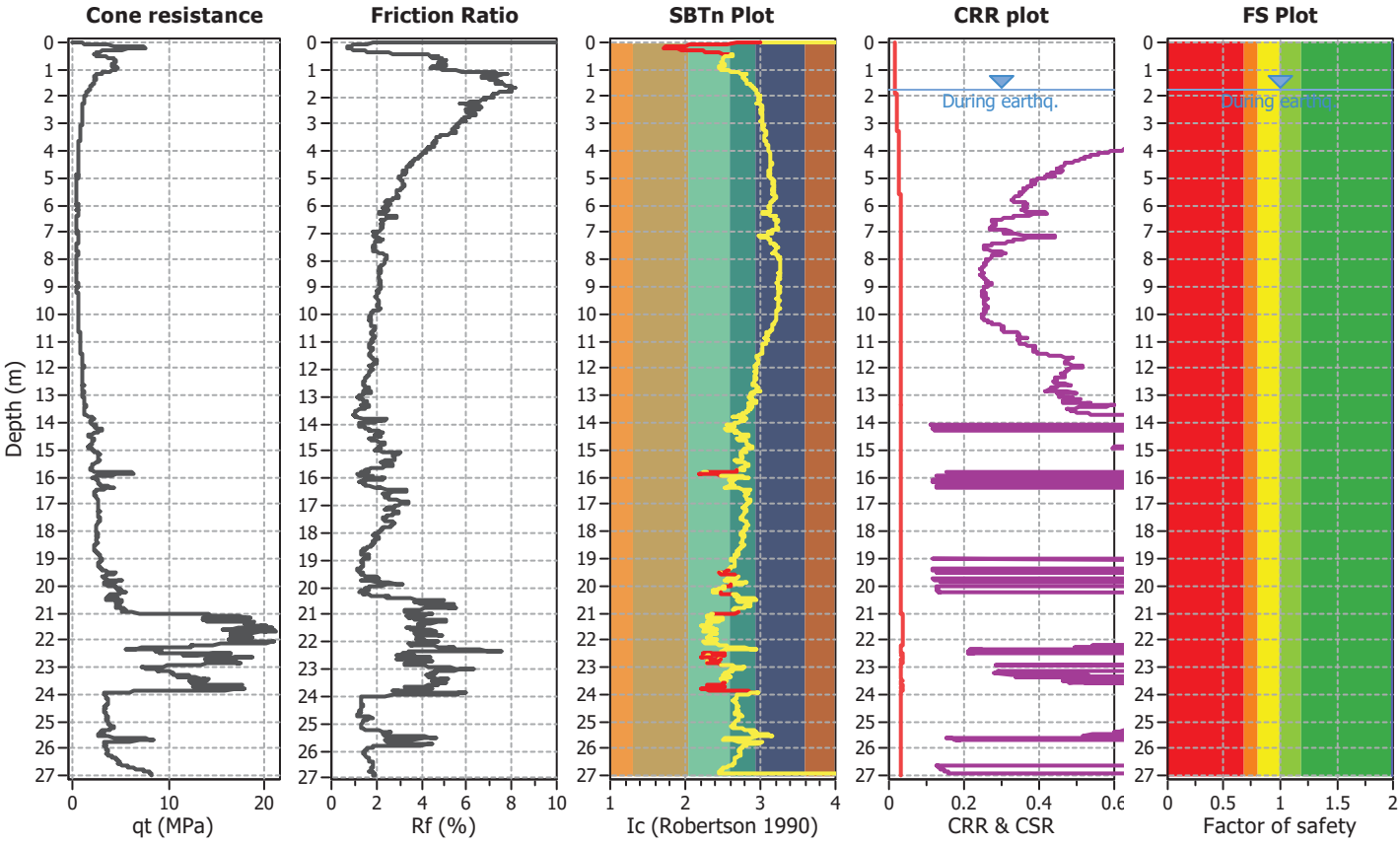
LIQUEFACTION ANALYSIS REPORT

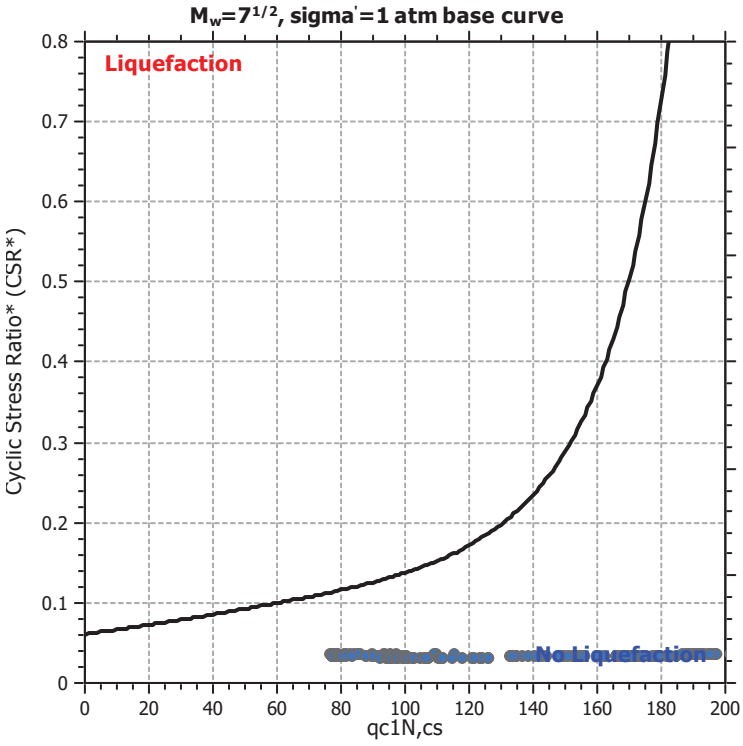
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

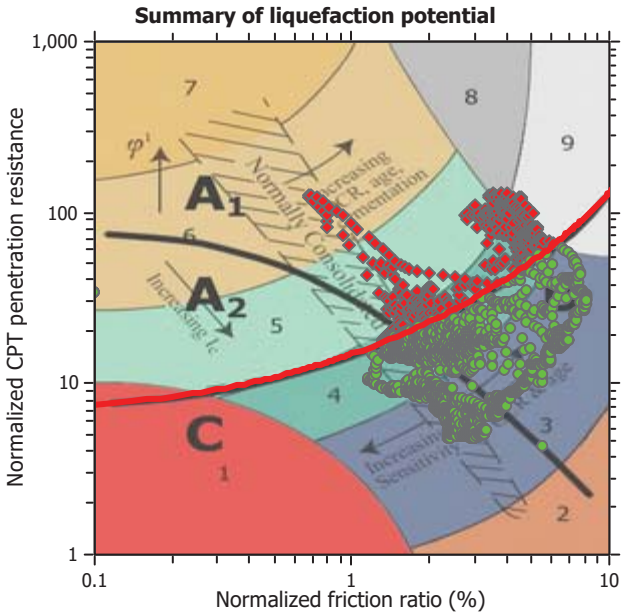
CPT file : CPT05 SLS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.03	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
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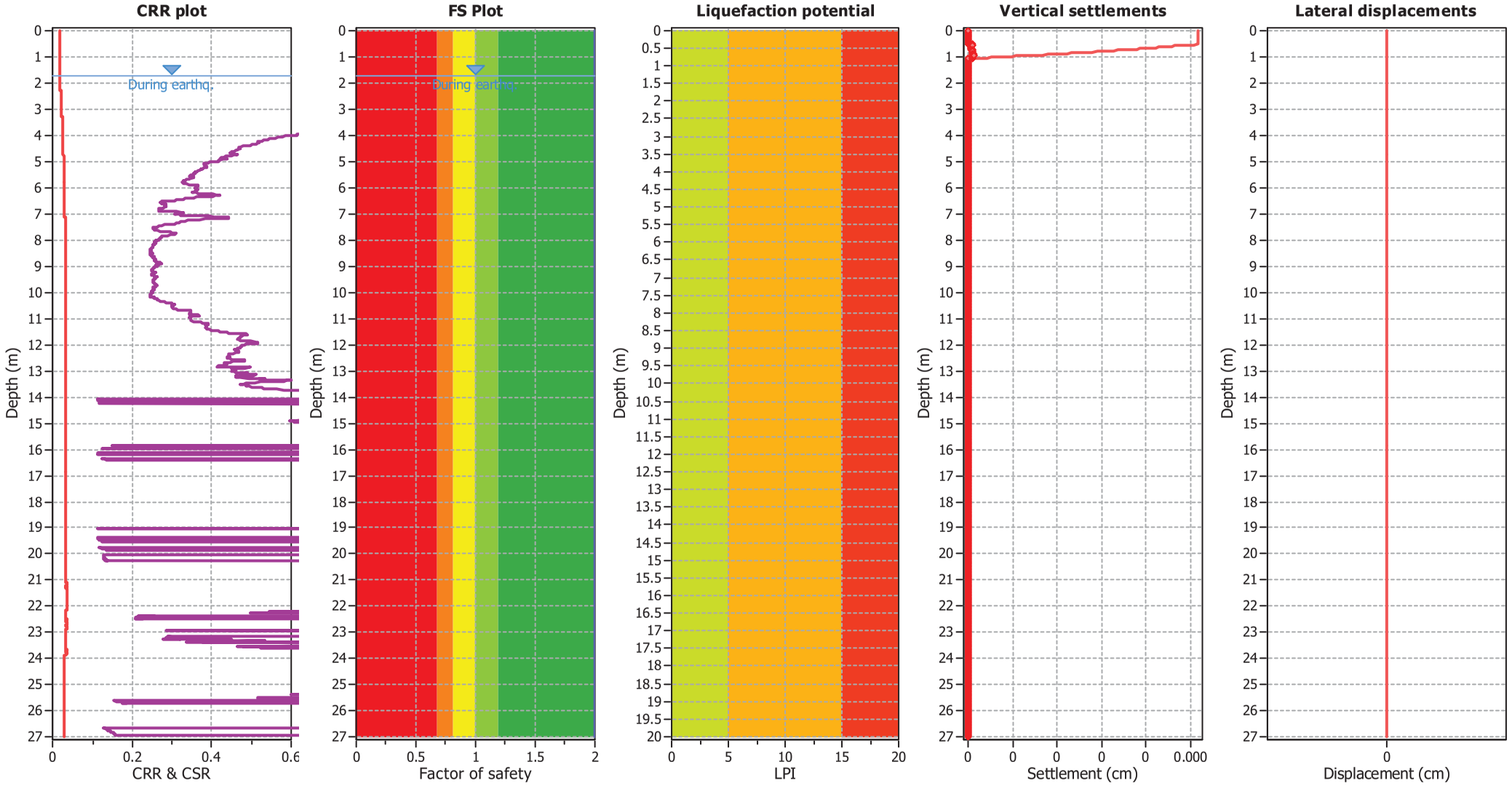
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.75 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

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LPI color scheme

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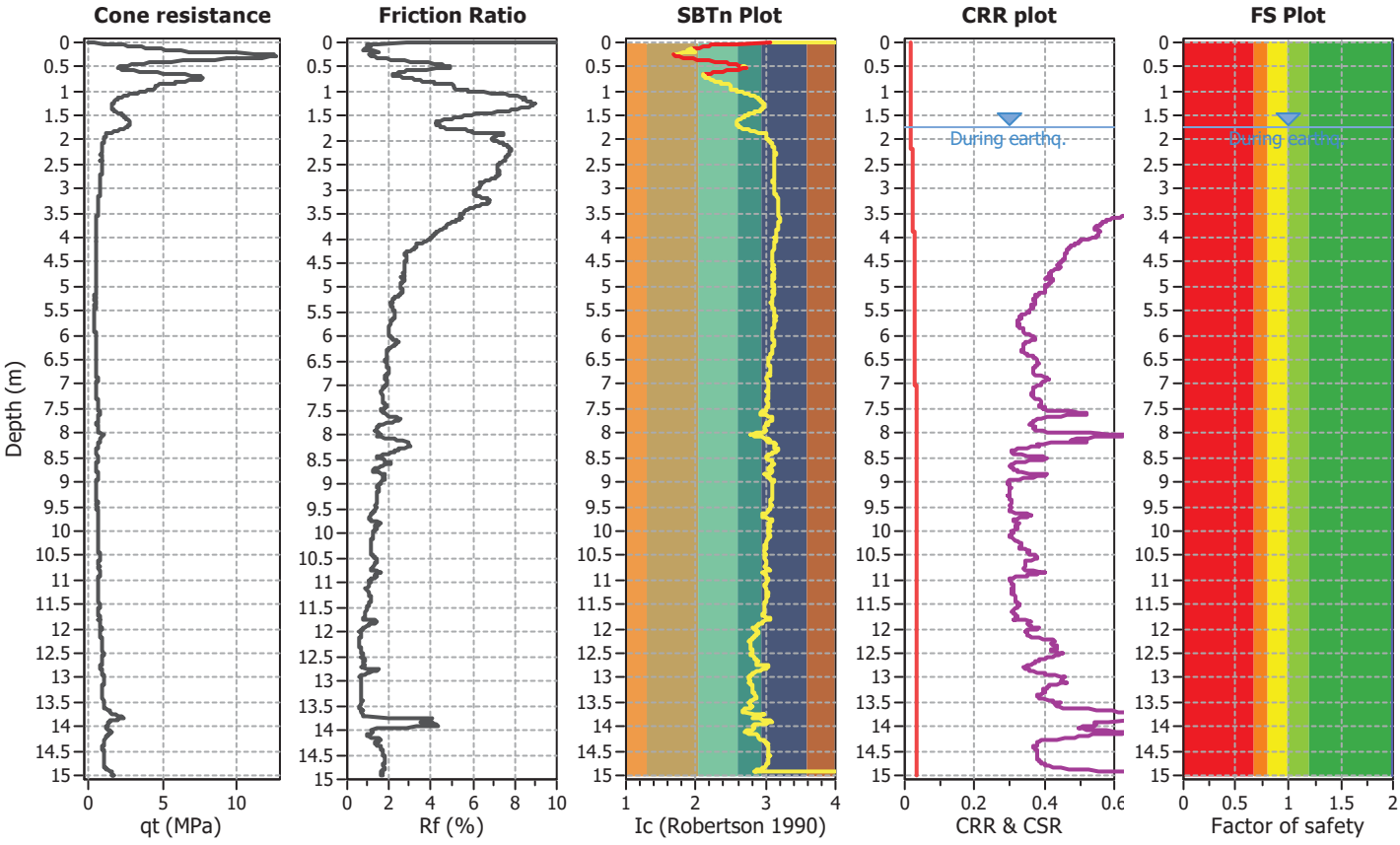
LIQUEFACTION ANALYSIS REPORT

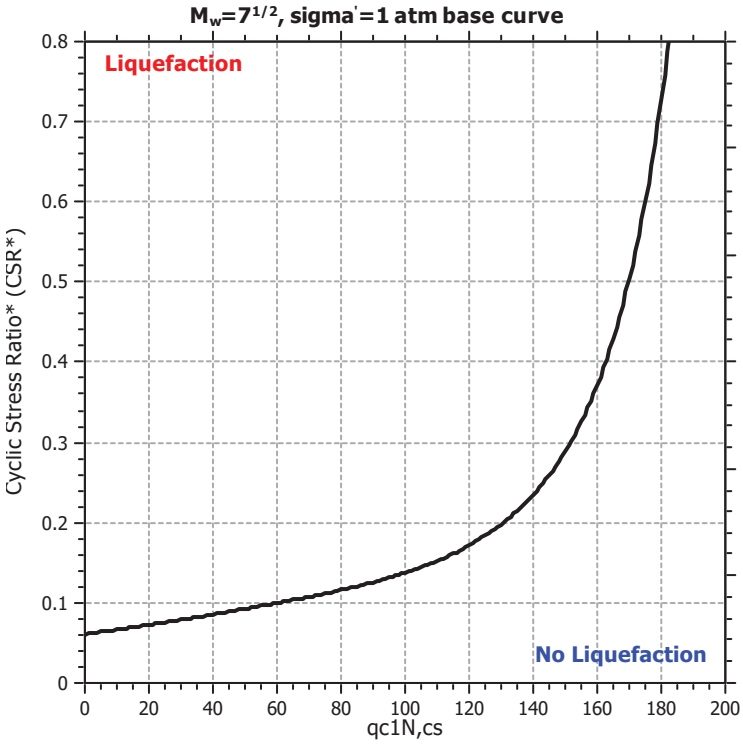
Project title : AR112533 7-9 Worth Street, Kaitaia **Location : 7-9 Worth Street, Kaitaia**

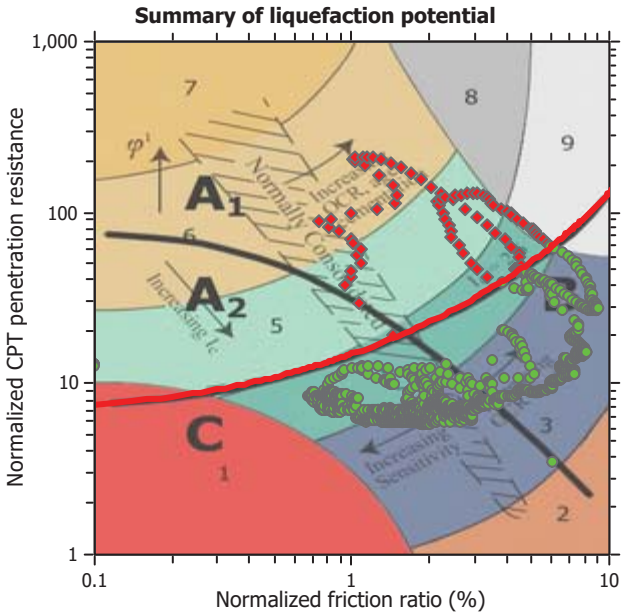
CPT file : CPT06 SLS

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.75 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	1.75 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.03	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		







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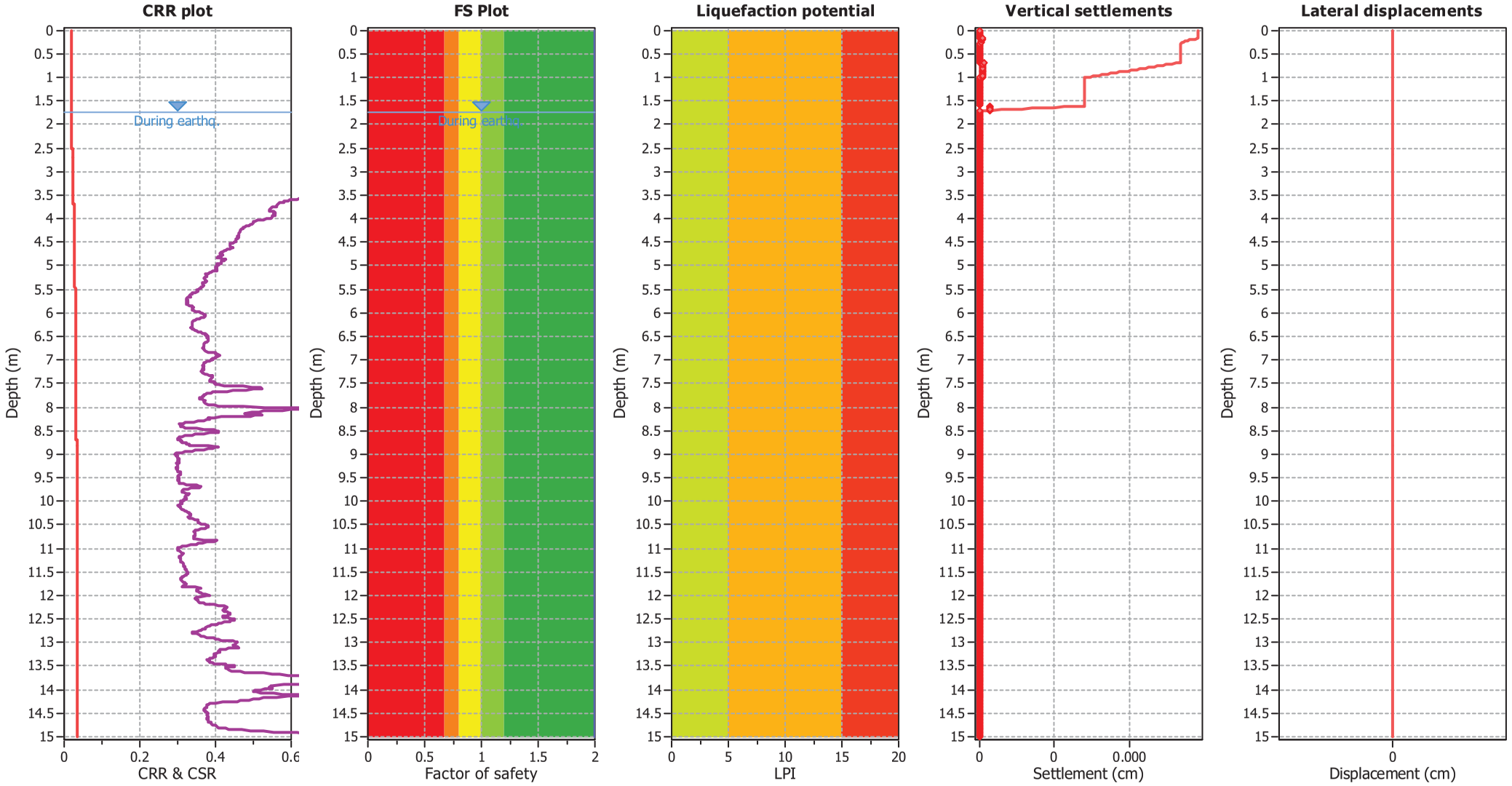
Liquefaction analysis overall plots



Input parameters and analysis data

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Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.75 m	Fill height:	N/A	Limit depth:	N/A

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H

Appendix H – Bearing Capacity Assessment Results

Project	Housing Delivery System - 7-9 Worth St, Kaitaia
Client	Kainga Ora
Job No.	3912124
Date	16/05/2024
Calculated by	REHP
Reviewed by	JJ
Design Case	Static

Input

1.0 Foundation Geometry

Foundation breadth	B	6.00	m
Foundation length	L	10.00	m
Foundation thickness	T	0.31	m
Depth to underside of foundation	D_f	0.10	mbgl
Groundwater Depth	D_w	1.00	mbgl
Foundation Type		Cast-in-situ Concrete	

2.0 Slope Profile

Minimum horizontal distance from the edge of the underside of the foundation to the face of an adjacent downward slope	D_e	100.00	m
Slope, below horizontal, of the ground adjacent to the edge of the foundation	ω	20	degrees

3.0 Applied Forces or Structural Demands (refer to sketch below)

A Static Case

Design factored vertical load	V	0	kN
Unfactored vertical load	V_{uf}	0	kN
Design factored horizontal load - along the breadth	H	0	kN
Unfactored horizontal load - along the breadth	H_{uf}	0	kN
Design factored horizontal load - along the length	H_L	0	kN
Unfactored horizontal load - along the length	H_{Luf}	0	kN
Design factored momemt - axis parallel to the breadth	M_b	0	kNm
Design factored momemt - axis parallel to the length	M_l	0	kNm

B Seismic Case

EQ_Design factored vertical load	V_e	0	kN
EQ_Unfactored vertical load	V_{e_uf}	0	kN
EQ_Design factored horizontal load - along the breadth	H_e	0	kN
EQ_Unfactored horizontal load - along the breadth	H_{e_uf}	0	kN
EQ_Design factored horizontal load - along the length	H_{le}	0	kN
EQ_Unfactored horizontal load - along the length	H_{le_uf}	0	kN
EQ_Design factored moment - axis parallel to the breadth	M_{be}	0	kNm
EQ_Design factored moment - axis parallel to the length	M_{le}	0	kNm

4.0 Load Factors

C3.0 Load Factors and Strength Reduction Factors

Load factor for foundation selfweight	LF_{DL}	1.25	
Strength reduction factor for static and EQ bearing failure	Φ_{bc}	0.45	
Strength reduction factor for static and EQ sliding failure	Φ_{sl}	0.8	
Base sliding coefficient	δ_{sl}	1	ϕ

5.0 Ground Profile & Soil Parameters

Unit weight	γ	18	kN/m^3
Undrained shear strength	Su	160	kPa
Effective cohesion	c'	3	kPa
Friction Angle	ϕ'	31	degrees
Soil Type		Sand Like	

Output & Reference

6.0 Summary of LRFD Bearing Capacity Checks

		Along the Breadth	Along the Length
ST Static	Reaction force within middle 2/3? (As per B1/VM4 requirement)	YES	YES
	Reaction force within middle 1/3? (Beca Geotechnical practice)	YES	YES
	Base Sliding (Factored resistance > Factored demand?)	OK	OK
	Bearing Capacity (Factored resistance > Factored demand?)	OK	
ST EQ	Reaction force within middle 2/3? (As per B1/VM4 requirement)	YES	YES
	Reaction force within middle 1/3? (Beca Geotechnical practice)	YES	YES
	Base Sliding (Factored resistance > Factored demand?)	OK	OK
	Bearing Capacity (Factored resistance > Factored demand?)	OK	
LT Static	Reaction force within middle 2/3? (As per B1/VM4 requirement)	YES	YES
	Reaction force within middle 1/3? (Beca Geotechnical practice)	YES	YES
	Base Sliding (Factored resistance > Factored demand?)	OK	OK
	Bearing Capacity (Factored resistance > Factored demand?)	OK	

7.0 Bearing Capacities and Design Bearing Strengths

	q_u (kPa)	q_{dbs} (kPa)	q_d (kPa)
Short Term - Static (ST Static)	560	251	10
Short Term - Earthquake (ST EQ)	560	251	10
Long Term - Static (LT Static)	560	251	10

8.0 Lateral Capacities and Design Sliding Resistance

	S (kN)	ΦS (kN)	H (kN)
Short Term - Static (ST Static)	529	423	0
Short Term - Earthquake (ST EQ)	459	368	0
Long Term - Static (LT Static)	529	423	0

9.0 Reference Formulae

q_d design bearing pressure = V/A' (kPa).

q_u ultimate bearing strength (kPa).

q_{dbs} design bearing strength = $\Phi_{bc} q_u$ (kPa).

$$q_u = c'\lambda_{cs}\lambda_{cd}\lambda_{ci}\lambda_{cg} N_c + q'\lambda_{qs}\lambda_{qd}\lambda_{qi}\lambda_{qg} N_q + {}^1/_2\gamma' B'\lambda_{\gamma s}\lambda_{\gamma d}\lambda_{\gamma i}\lambda_{\gamma g} N_\gamma$$

$$q_u = s_u\lambda_{cs}\lambda_{cd}\lambda_{ci}\lambda_{cg} N_c + \lambda_{qg} q$$

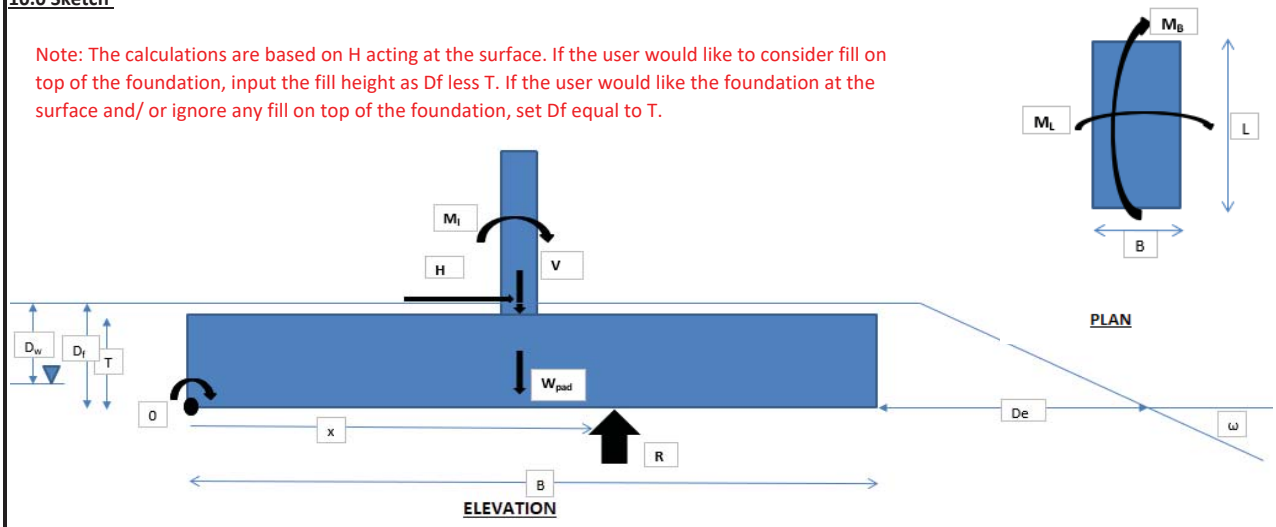
S ultimate shear strength between the base of the foundation and the ground (kN).

$$S = A's_u$$

$$S = c'A' + V' \tan\delta' \qquad H \le \Phi_{sl} S$$

10.0 Sketch

Note: The calculations are based on H acting at the surface. If the user would like to consider fill on top of the foundation, input the fill height as Df less T. If the user would like the foundation at the surface and/ or ignore any fill on top of the foundation, set Df equal to T.



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ISSUE NO.	10
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DRG NO.	DRAWING/DOCUMENT TITLE	SIZE	SCALE	
A2-00-0000	COVER	A3	None	D
A2-00-0001	DRAWING INDEX	A3	None	D
A2-00-0005	VICINITY & LOCATION & PROJECT INFORMATION	A3	None	B
A2-00-0060	EXTERIOR COLOUR SCHEME	A3	None	B
A2-00-2001	EXISTING SITE PLAN	A3	1:300	B
A2-00-2200	SITE PLAN - GROUND FLOOR	A3	1:300	D
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A2-00-2203	SITE PLAN - ROOF	A3	1:300	D
A2-00-2500	SITE DEVELOPMENT CONTROLS PLAN	A3	As indicated	D
A2-00-2501	SITE COVERAGE CALCULATION	A3	None	D
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A2-00-2601	HIRB DIAGRAMS	A3	As indicated	B
A2-00-2602	3D HIRB DIAGRAMS	A3	1:500	B
A2-00-2702	SUN SHADING VISUALS - SPRING EQUINOX	A3	As indicated	D
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A2-06-4021	PROPOSED ELEVATION - UNIT 6	A3	1:100	B

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Kāinga Ora
Homes and Communities

Proposal for:

KĀINGA ORA – HOMES AND COMMUNITIES

240054

7-9 WORTH STREET
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A2-00-0001 - DRAWING INDEX

Sheet Number	Sheet Name	Current Revision	Current Revision Date	Current Revision Description
A2-00-0000	COVER	D	18/06/2024	RESOURCE CONSENT
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A2-04-2303	PROPOSED ROOF CONTEXT PLAN - UNIT 4	D	18/06/2024	RESOURCE CONSENT
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A2-06-4021	PROPOSED ELEVATION - UNIT 6	B	10/06/2024	RESOURCE CONSENT
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7-9 WORTH STREET
KAITAIA
NORTHLAND 0410

PROJECT NUMBER
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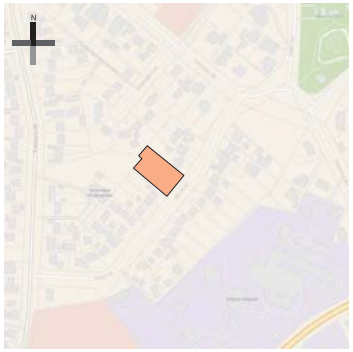
VICINITY MAP

LOCATION MAP



AERIAL PHOTO

A3-A00-0002 - LEGAL DESCRIPTION

CATEGORY	DESCRIPTION	REFERENCE
SITE ADDRESS	7-9 WORTH STREET, KAITAIA, NORTHLAND 0410	FAR NORTH DISTRICT MAPS
TERRITORIAL AUTHORITY	FAR NORTH DISTRICT COUNCIL	FAR NORTH DISTRICT MAPS
LOT	LOT 6, LOT 23	CERTIFICATE OF TITLE
DEPOSITED PLAN	DP 38117, DP 38127	CERTIFICATE OF TITLE
CERTIFICATE OF TITLE	NA46A/538, NA46A/540	CERTIFICATE OF TITLE
SITE AREA	1991 M²	CERTIFICATE OF TITLE
ZONE	GENERAL RESIDENTIAL ZONE	FAR NORTH DISTRICT MAPS
WIND ZONE	VERY HIGH	BECA LTD
EXPOSURE ZONE	C	BRANZ
EARTHQUAKE ZONE	ZONE 1	BRANZ

PLANNING CONTROLS (GENERAL RISIDENTIAL ZONE)

OPERATIVE DISTRICT PLAN

	PERMITTED STANDARD	CONTROLLED/RESTRICTED DISCRETIONARY CONSENT STANDARD
RESIDENTIAL INTENSITY		
EACH RESIDENTIAL UNIT FOR A SINGLE HOUSEHOLD SHALL HAVE AVAILABLE TO IT A MINIMUM NET SITE AREA OF:	SEWERED SITES: 600M² UNSEWERED SITES: 3,000M²	SEWERED SITES: 300M² UNSEWERED SITES: 2,000M²
	NOTES: • THIS MINIMUM NET SITE AREA MAY BE FOR THE EXCLUSIVE USE OF THE RESIDENTIAL UNIT, OR AS PART OF LAND HELD ELSEWHERE ON THE PROPERTY, PROVIDED THAT A RATIO OF ONE RESIDENTIAL UNIT PER MINIMUM NET SITE AREA (AS STATED ABOVE) IS NOT EXCEEDED.	
BUILDING HEIGHT		
	THE MAXIMUM HEIGHT OF ANY BUILDING SHALL BE 8M	THE MAXIMUM HEIGHT OF ANY BUILDING SHALL BE 9M
SUNLIGHT		
	A 45 DEGREE RECESSION PLANE AS MEASURED INWARDS FROM ANY POINT 2M VERTICALLY ABOVE GROUND LEVEL ON ANY SITE BOUNDARY, EXCEPT THAT: (A) A BUILDING MAY EXCEED THIS STANDARD FOR A MAXIMUM DISTANCE OF 10M ALONG ANY ONE BOUNDARY OTHER THAN A ROAD BOUNDARY, PROVIDED THAT THE MAXIMUM HEIGHT OF ANY BUILDING WHERE IT EXCEEDS THE STANDARD IS 2.7M; AND (B) WHERE A SITE BOUNDARY ADJOINS A LEGALLY ESTABLISHED ENTRANCE STRIP, PRIVATE WAY, ACCESS LOT, OR ACCESS WAY SERVING A REAR SITE, THE MEASUREMENT SHALL BE TAKEN FROM THE FARTHEST BOUNDARY OF THE ENTRANCE STRIP, PRIVATE WAY, ACCESS LOT, OR ACCESS WAY.	A 45 DEGREE RECESSION PLANE AS MEASURED INWARDS FROM ANY POINT 3M VERTICALLY ABOVE GROUND LEVEL ON ANY SITE BOUNDARY
	NOTES: SITE BOUNDARY INCLUDES THE ROAD BOUNDARY. BUILDING DEFINITION INCLUDES "ANY FENCE OR BOUNDARY RETAINING WALL OR COMBINATION THEREOF EXCEEDING 2M IN HEIGHT MEASURED FROM THE LOWEST ADJACENT GROUND LEVEL, AND ANY RETAINING WALL MORE THAN 1.5M ABOVE GROUND LEVEL"	
STORMWATER MANAGEMENT		
	THE MAXIMUM PROPORTION OF THE GROSS SITE AREA COVERED BY BUILDINGS AND OTHER IMPERMEABLE SURFACES SHALL BE: 50%	60% OR 600M², WHICHEVER IS THE LESSER. ADDITIONALLY, A REPORT MUST BE PREPARED TO DEMONSTRATE THE LIKELY EFFECTS OF THE ACTIVITY ON STORMWATER RUN-OFF AND THE MEANS OF MITIGATING RUN-OFF TO NO MORE THAN THE LEVELS THAT WOULD RESULT FROM THE PERMITTED THRESHOLD OF BUILDINGS AND OTHER IMPERMEABLE SURFACE COVERAGE IN RULE 7.6.5.1.6
BUILDING SETBACKS		
	• THE MINIMUM BUILDING SETBACK FROM ROAD BOUNDARIES SHALL BE: 3M • THE MINIMUM SET-BACK FROM ANY BOUNDARY OTHER THAN A ROAD BOUNDARY SHALL BE: 1.2M EXCEPT THAT NO SET-BACK IS REQUIRED FOR A MAXIMUM TOTAL LENGTH OF 10M ALONG ANY ONE SUCH BOUNDARY	N/A
FRONT YARD LANDSCAPING	NOT LESS THAN 50% OF THAT PART OF THE SITE BETWEEN THE ROAD BOUNDARY AND A PARALLEL LINE 2M THERE FROM SHALL BE LANDSCAPED	

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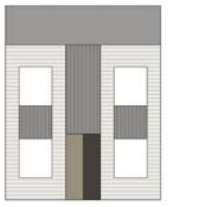


Barge Boards, Fascia Boards — Resene Half Athens Grey
Barge&Ridge Flashing — match colour Colorsteel Sandstone Grey
Gutters & Downpipes — White @Marley uPVC
Slab Edge Insulation — Resene Jumbo
Window Trim Work/Facings — Resene Half Athens Grey

ENTRY DOOR

UNIT 4: Matt Sandstone Grey
UNIT 6: Matt Charcoal

JOINERY: Interpon Appliance White Satin finish

ROOFING: COLORSTEEL — TSR: 42% LRV: 27% — Sandstone Grey

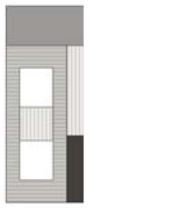
HORIZONTAL CLADDING: RGB: 228 228 223 — APPROX. LRV: 79 — Resene Half Athens Grey

VERTICAL CLADDING: RGB: 135 135 133 — APPROX. LRV: 32 — Resene Jumbo

1. Aluminium Canopy & Aluminium Screen colour to match roof colour
2. Entry Roof Post to match light cladding colour
3. Soffit colour to match light cladding colour
4. Exterior entry stair balustrade colour to match light cladding colour
5. Aluminium Window shrouds to match joinery colour
6. Inter Floor Cladding Flashing powder coated colour to match cladding colour
7. Staircase and deck side panel to match dark cladding colour

SCALE: NONE

EXTERIOR COLOUR SCHEME - C4
UNIT 4, UNIT 6
03



Barge Boards, Fascia Boards — Resene Half Athens Grey
Barge&Ridge Flashing — match colour Colorsteel Sandstone Grey
Gutters & Downpipes — White @Marley uPVC
Slab Edge Insulation — Resene Quarter Delta
Window Trim Work/Facings — Resene Half Athens Grey

ENTRY DOOR

UNIT 1: Matt Charcoal

JOINERY: Interpon Appliance White Satin finish

ROOFING: COLORSTEEL — TSR: 42% LRV: 27% — Sandstone Grey

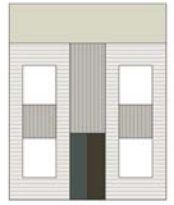
HORIZONTAL CLADDING: RGB: 191 192 187 — APPROX. LRV: 59 — Resene Quarter Delta

VERTICAL CLADDING: RGB: 228 228 223 — APPROX. LRV: 79 — Resene Half Athens Grey

1. Aluminium Canopy & Aluminium Screen colour to match roof colour
2. Entry Roof Post to match light cladding colour
3. Soffit colour to match light cladding colour
4. Exterior entry stair balustrade colour to match light cladding colour
5. Aluminium Window shrouds to match joinery colour
6. Inter Floor Cladding Flashing powder coated colour to match cladding colour
7. Staircase and deck side panel to match dark cladding colour

SCALE: NONE

EXTERIOR COLOUR SCHEME - C2
UNIT 1
02



Barge Boards, Fascia Boards — Resene Half Athens Grey
Barge&Ridge Flashing — match colour Colorsteel Cloud
Gutters & Downpipes — White @Marley uPVC
Slab Edge Insulation — Resene Half Foggy Grey
Window Trim Work/Facings — Resene Half Athens Grey

ENTRY DOOR

UNIT 2: Matt Flaxpod
UNIT 3, UNIT 5: Matt Karaka

JOINERY: Interpon Appliance White Satin finish

ROOFING: COLORSTEEL — TSR: 72% LRV: 76% — Cloud

HORIZONTAL CLADDING: RGB: 226 228 223 — APPROX. LRV: 79 — Resene Half Athens Grey

VERTICAL CLADDING: RGB: 184 183 175 — APPROX. LRV: 56 — Resene Half Foggy Grey

1. Aluminium Canopy & Aluminium Screen colour to match roof colour
2. Entry Roof Post to match light cladding colour
3. Soffit colour to match light cladding colour
4. Exterior entry stair balustrade colour to match light cladding colour
5. Aluminium Window shrouds to match joinery colour
6. Inter Floor Cladding Flashing powder coated colour to match cladding colour
7. Staircase and deck side panel to match dark cladding colour

SCALE: NONE

EXTERIOR COLOUR SCHEME - C1
UNIT 2&3, UNIT 5
01

Young+
Richards+

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120 Tennyson St Napier 4110 NZ +64 6 929 9945
info@youngrichards.com www.youngrichards.com

CLIENT
Kāinga Ora
Homes and Communities

PROJECT NAME
7-9 WORTH STREET

PROJECT ADDRESS
7-9 WORTH STREET
KAITAIA
NORTHLAND 0410

PROJECT NUMBER
240054

KEY PLAN

STAMP

THE FINE PRINT

- ALL WORK SHALL COMPLY WITH THE NZ RESOURCE MANAGEMENT ACT, NZ BUILDING ACT, RELEVANT STANDARDS, ORDINANCES, RULES, AND REGULATIONS OF THE TERRITORIAL AUTHORITY GOVERNING THE WORK. REFER TO NZ BUILDING ACT, SECTION 17.
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SHEET NAME
EXTERIOR COLOUR SCHEME

PROJECT STATUS
RESOURCE CONSENT

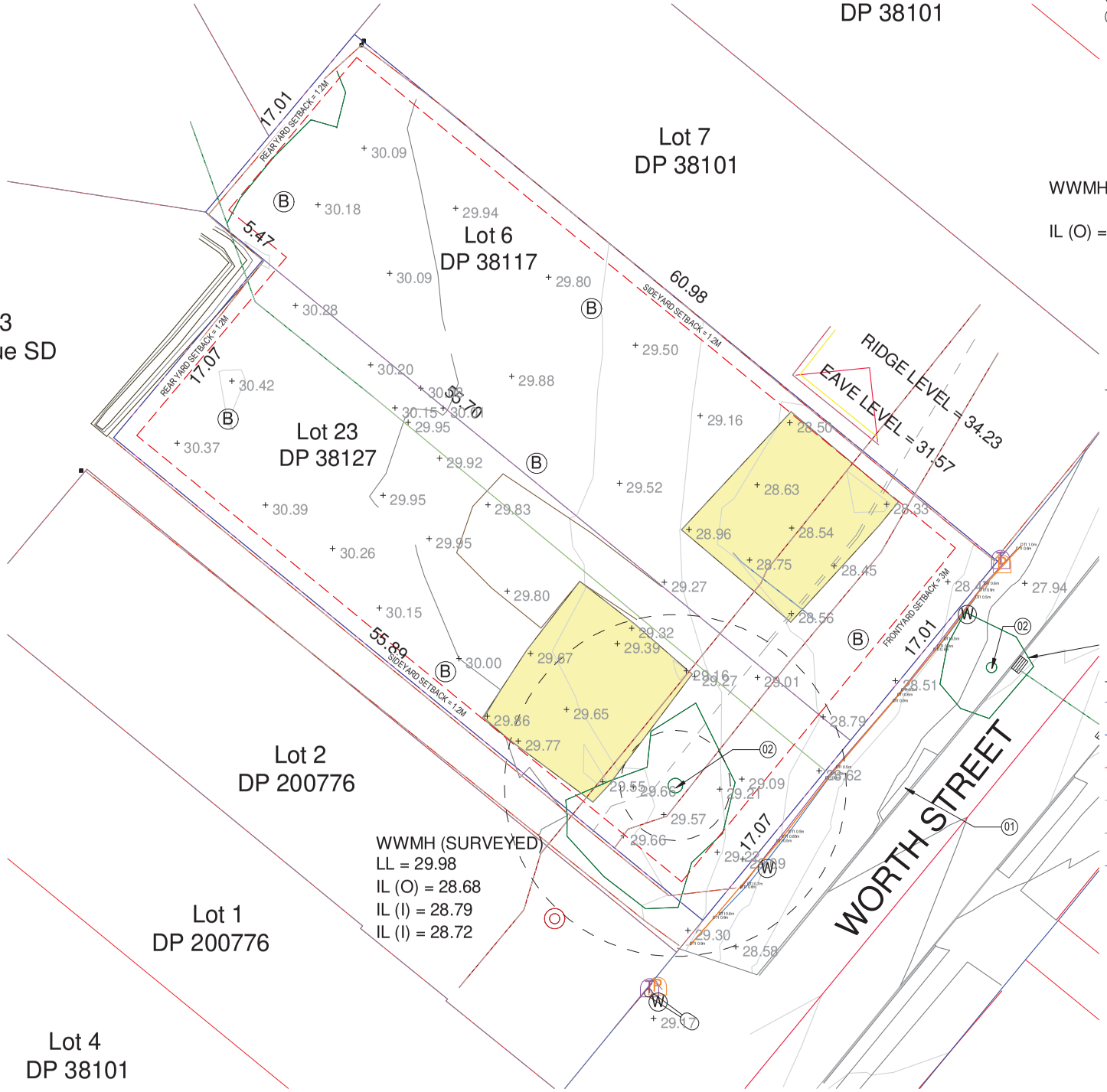
SHEET SCALE
NONE

SHEET SIZE
A3=100%

PRINT IN COLOUR

SHEET NUMBER
A2-00-0060

REVISION
B



KEY NOTES

01 PROPOSED VEHICLE CROSSING
02 EXISTING TREES TO REMAIN

SHEET NOTES

- SITE SURVEY INFORMATION AS PROVIDED BY MCKENZIE & CO. (MAY 2024)

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- YARD SETBACK
- EXISTING PUBLIC STORMWATER
- EXISTING PUBLIC WASTEWATER
- EXISTING MAINS WATER
- EXISTING WASTEWATER MANHOLE
- EXISTING POWER POLE
- EXISTING POWER PILLAR
- EXISTING WATER METER
- EXISTING TELECOM PILLAR

SCALE: 1 : 300
2 / A3-00-9420

EXISTING AND DEMOLITION SITE PLAN 01

Young+ Richards+

4d Edwin St Mt Eden Auckland 1024 NZ +64 9 520 6444
120 Tennyson St Napier 4110 NZ +64 6 929 9945
info@youngrichards.com www.youngrichards.com

CLIENT
Kāinga Ora Homes and Communities

PROJECT NAME
7-9 WORTH STREET

PROJECT ADDRESS
7-9 WORTH STREET
KAITAIA
NORTHLAND 0410

PROJECT NUMBER
240054

KEY PLAN

STAMP

SHEET NAME
EXISTING SITE PLAN

PROJECT STATUS
RESOURCE CONSENT

SHEET SCALE
1 : 300

SHEET SIZE
A3=100%

PRINT IN COLOUR

SHEET NUMBER
A2-00-2001

REVISION
B

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KEY NOTES

01 PROPOSED VEHICLE CROSSING
02 EXISTING TREES TO REMAIN

SHEET NOTES

- SITE SURVEY INFORMATION AS PROVIDED BY MCKENZIE & CO. (MAY 2024)
- LANDSCAPE PLAN AS PROVIED BY RESILIO STUDIO (MAY 2024)
- REFER TO CIVIL INFRASTRUCTURE REPORT FOR PROPOSED SERVICES

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- YARD SETBACK
- OUTDOOR LIIVING AREA
- EXISTING PUBLIC STORMWATER
- EXISTING PUBLIC WASTEWATER
- DIM STANDARD DIMENSION

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Kāinga Ora
Homes and Communities

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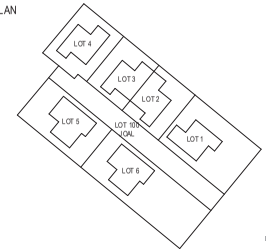
7-9 WORTH STREET

PROJECT ADDRESS
7-9 WORTH STREET
KAITAIA
NORTHLAND 0410

PROJECT NUMBER
240054

KEY PLAN



STAMP

SHEET NAME
SITE PLAN - GROUND FLOOR

PROJECT STATUS
RESOURCE CONSENT

SHEET SCALE
1 : 300

SHEET SIZE
A3=100%

PRINT IN COLOUR

SHEET NUMBER
A2-00-2200

REVISION
D

SCALE: 1 : 300
2 / A3-00-9420

PROPOSED GROUND FLOOR PLAN 01

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KEY NOTES

SHEET NOTES

- SITE SURVEY INFORMATION AS PROVIDED BY MCKENZIE & CO. (MAY 2024)
- LANDSCAPE PLAN AS PROVIED BY RESILIO STUDIO (MAY 2024)
- REFER TO CIVIL INFRASTRUCTURE REPORT FOR PROPOSED SERVICES

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- YARD SETBACK
- DIM STANDARD DIMENSION

SCALE: 1 : 300
2 / A3-00-9420

SITE - FRIST FLOOR 01

Young+ Richards+

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120 Tennyson St Napier 4110 NZ +64 6 929 9945
info@youngrichards.com www.youngrichards.com

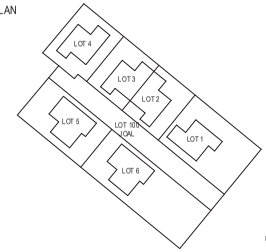
CLIENT
Kāinga Ora
Homes and Communities

PROJECT NAME
7-9 WORTH STREET

PROJECT ADDRESS
7-9 WORTH STREET
KAITAIA
NORTHLAND 0410

PROJECT NUMBER
240054

KEY PLAN



STAMP

SHEET NAME
SITE PLAN - FIRST FLOOR

PROJECT STATUS
RESOURCE CONSENT

SHEET SCALE
1 : 300

SHEET SIZE
A3=100%

PRINT IN COLOUR

SHEET NUMBER
A2-00-2201

REVISION
D

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Plotted: 18/06/2024 9:37:34 am

KEY NOTES

SHEET NOTES

- SITE SURVEY INFORMATION AS PROVIDED BY MCKENZIE & CO. (MAY 2024)
- LANDSCAPE PLAN AS PROVIED BY RESILIO STUDIO (MAY 2024)
- REFER TO CIVIL INFRASTRUCTURE REPORT FOR PROPOSED SERVICES

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- YARD SETBACK
- DIM — DIMENSION FROM ROOF TO BOUNDARY

SCALE: 1 : 300
2 / A3-00-9420

SITE - ROOF PLAN 01

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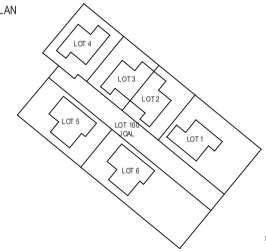
CLIENT
Kāinga Ora Homes and Communities

PROJECT NAME
7-9 WORTH STREET

PROJECT ADDRESS
7-9 WORTH STREET
KAITAIA
NORTHLAND 0410

PROJECT NUMBER
240054

KEY PLAN



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SHEET NAME
SITE PLAN - ROOF

PROJECT STATUS
RESOURCE CONSENT

SHEET SCALE
1 : 300

SHEET SIZE
A3=100%

PRINT IN COLOUR

SHEET NUMBER
A2-00-2203

REVISION
D

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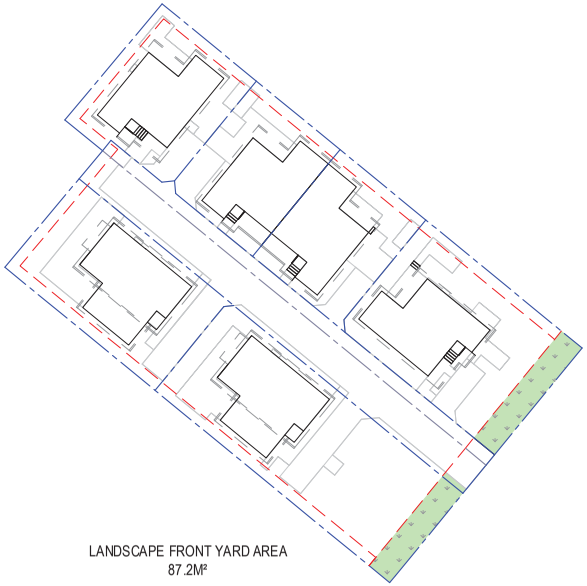
SCALE: 1 : 600
2 / A3-00-9420

BUILDING COVERAGE **03**

SCALE: 1 : 600
2 / A3-00-9420

IMPERVIOUS AREA **02**



SCALE: 1 : 600
2 / A3-00-9420

LANDSCAPE FRONT YARD AREA **04**

SCALE: 1 : 600
2 / A3-00-9420

SITE AREA **01**

SHEET NOTES

- SITE SURVEY INFORMATION AS PROVIDED BY MCKENZIE & CO. (MAY 2024)
- LANDSCAPE PLAN AS PROVIED BY RESILIO STUDIO (MAY 2024)
- REFER TO CIVIL INFRASTRUCTURE REPORT FOR PROPOSED SERVICES

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- YARD SETBACK
- BUILDING COVERAGE
- IMPERVIOUS AREA
- LANDSCAPED FRONT YARD

SITE COVERAGE CALCULATIONS

GROSS SITE AREA	1991 M²	COVERAGE	MAX	MIN	COMPLIANCE
IMPERVIOUS AREA	915.8 M²	46%	50%	-	YES
BUILDING COVERAGE	589.2 M²	29.6%	45%		YES
FRONT YARD AREA	102.2 M²	-	-	-	-
LANDSCAPE FRONT YARD AREA	87.2 M²	85.3%	-	50%	YES

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info@youngrichards.com www.youngrichards.com

CLIENT
Kāinga Ora
Homes and Communities

PROJECT NAME
7-9 WORTH STREET

PROJECT ADDRESS
7-9 WORTH STREET
KAITAIA
NORTHLAND 0410

PROJECT NUMBER
240054

KEY PLAN

STAMP

SHEET NAME
SITE DEVELOPMENT CONTROLS PLAN

PROJECT STATUS
RESOURCE CONSENT

SHEET SCALE
As indicated

SHEET SIZE
A3=100%

PRINT IN COLOUR

SHEET NUMBER
A2-00-2500

REVISION
D

V220808

SITE COVERAGE CALCULATIONS

TOTAL SITE AREA 1991²		MAXIMUM IMPERVIOUS		BUILDING COVERAGE	
LOT	GROSS SITE AREA (M2)	IMPERVIOUS AREA	IMPERVIOUS AREA (%)	BUILDING COVERAGE	COVERAGE (%)
1	351.2	117.9	33.6%	98.7	28.1%
2	193.5	110.5	57.1%	97.7	50.5%
3	187.8	110.4	58.8%	97.7	52.0%
4	220.9	119.2	54.0%	98.7	44.7%
5	282.1	127.1	45.1%	98.2	34.8%
6	441.2	129.2	29.3%	98.2	22.3%
100 (JOAL)	312.9	201.5	64.4%	0	0.0%

GROSS FLOOR AREA CALCULATIONS

TOTAL SITE AREA= 1991 M²

LOT	BUILDING TYPE	TYPOLOGY	GROUND FLOOR AREA	FIRST FLOOR AREA	GROSS AREA
1	2 BED (STANDALONE)	RH-C1	78 M²	-	78 M²
2	2 BED (DUPLEX)	RH-CD (BESPOKE)	78 M²	-	78 M²
3	2 BED (DUPLEX)	RH-CD (BESPOKE)	78 M²	-	78 M²
4	2 BED (STANDALONE)	RH-D1	78 M²	-	78 M²
5	4+1 BED (STANDALONE)	RB3 (BESPOKE)	90.6 M²	70.6 M²	161.2 M²
6	4+1 BED (STANDALONE)	RB3 (BESPOKE)	90.6 M²	70.6 M²	161.2 M²
TOTAL			493.2 M²	141.2 M²	634.4 M²

NOTE: GFA IS CALCULATED TO THE EXTENT OF EXTERNAL CLADDING

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Kāinga Ora Homes and Communities

PROJECT NAME
7-9 WORTH STREET

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7-9 WORTH STREET
KAITAIA
NORTHLAND 0410

PROJECT NUMBER
240054

KEY PLAN

STAMP

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SHEET NAME
SITE COVERAGE CALCULATION

PROJECT STATUS
RESOURCE CONSENT

SHEET SCALE
NONE

SHEET SIZE
A3=100%

PRINT IN COLOUR

SHEET NUMBER
A2-00-2501

REVISION
D

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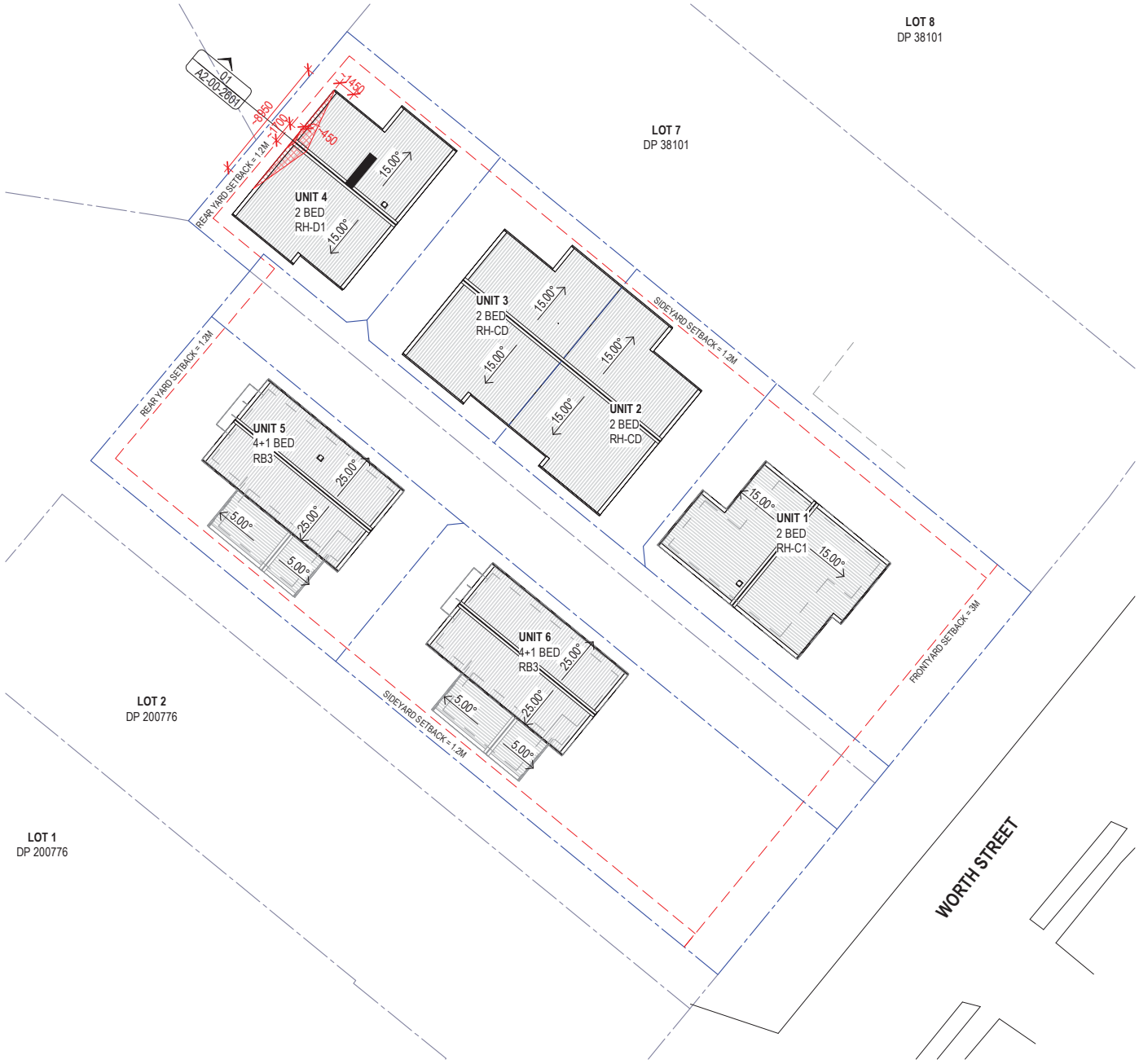

KEY NOTES

SHEET NOTES

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- REFER TO CIVIL INFRASTRUCTURE REPORT FOR PROPOSED SERVICES

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- YARD SETBACK
- DIM STANDARD DIMENSION
- STANDARD HIRB INFRINGEMENT
- CONTROLLED HIRB INFRINGEMENT

SCALE: 1 : 300
2 / A3-00-9420

SITE - HIRB PLAN **01**

Young+ Richards+

4d Edwin St Mt Eden Auckland 1024 NZ +64 9 520 6444
120 Tennyson St Napier 4110 NZ +64 6 929 9945
info@youngrichards.com www.youngrichards.com

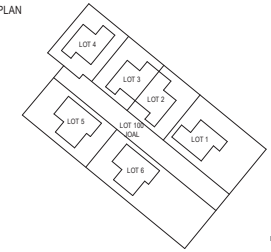
CLIENT
Kāinga Ora Homes and Communities

PROJECT NAME
7-9 WORTH STREET

PROJECT ADDRESS
7-9 WORTH STREET
KAITAIA
NORTHLAND 0410

PROJECT NUMBER
240054

KEY PLAN



STAMP

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SHEET NAME
HIRB PLAN & DIAGRAMS

PROJECT STATUS
RESOURCE CONSENT

SHEET SCALE **1 : 300**
SHEET SIZE **A3=100%**
PRINT IN COLOUR

SHEET NUMBER **A2-00-2600**
REVISION **D**

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