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

Office Use Only
Application Number:

Application for resource consent or fast-track resource consent

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

1. Pre-Lodgement Meeting

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

2. Type of Consent being applied for

(more than one circle can be ticked):

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

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

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

✓ **Yes** ◯ **No**

4. Consultation

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

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

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

5. Applicant Details

Name/s: Terrence Edward Donnelly and Simon Charles David Weil (Beach Haven Trust)

Email: [redacted]

Phone number:

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

6. Address for Correspondence

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

Name/s: Penny Anson / Forme Planning

Email: [redacted]

Phone number:

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

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

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

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

Name/s: Terrence Edward Donnelly and Simon Charles David Weil (Beach Haven Trust)

Property Address/ Location: [redacted]

Postcode

8. Application Site Details

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

Name/s:

Site Address/ Location: 1945 State Highway 10, Waipapa

Postcode 0230

Legal Description: Lot 1 and 2 Deposited Plan 177522 **Val Number:** 3312579

Certificate of title: NA109C/42 and NA109C/43

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

Site visit requirements:

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

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

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

Site is accessible and unoccupied. Easy easy from legal road off SH10

9. Description of the Proposal:

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

To construct and operate a distribution facility for New Zealand Post together with ancillary earthworks and wastewater discharge. The proposal also includes a boundary adjustment between Lots 1 and 2.

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

10. Would you like to request Public Notification?

◯ **Yes** ✓ **No**

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

(more than one circle can be ticked):

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

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

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

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

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

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

13. Assessment of Environmental Effects:

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

Your AEE is attached to this application [x] **Yes**

13. Draft Conditions:

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

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

14. Billing Details:

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

Name/s: (please write in full) Chris Tuxford

Email: [redacted]

Phone number: [redacted]

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

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

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

Name: (please write in full) Chris Tuxford

Signature:
(signature of bill payer) [redacted]

Date 20-Aug-2025

MANDATORY

15. Important Information:

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

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

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

Assessment of Environmental Effects

New Zealand Post Distribution Facility

1945 State Highway 10 Waipapa

Prepared for

Beach Haven Trust

August 2025

Table of Contents

1 Key Information 4

2 Introduction 6

3 Consultation 7

4 Existing Environment 8

4.1 Surrounding Area 8

4.2 The Site 11

4.3 Far North Operative District Plan 2009 18

4.4 Far North Proposed District Plan 2023 19

4.5 Other Notations 20

5 Proposed Development 21

5.1 Overview 21

5.2 Operations 21

5.3 Proposed Site Layout and Building 22

5.4 Transportation 23

5.5 Civil, Infrastructure and Services 25

5.6 Boundary Adjustment 28

6 Matters Requiring Consent 30

6.1 National Environmental Standard – Contamination 30

6.2 Far North Operative District Plan 2009 30

6.3 Far North Proposed District Plan 2023 31

6.4 Proposed Regional Plan for Northland 2024 ..... Error! Bookmark not defined.

6.5 Scope of Application 31

7 Statutory Considerations 32

7.1 Resource Management Act 32

8 Effects on the Environment 37
8.1 Visual Amenity Effects 37
8.2 Earthworks effects 38
8.3 Subdivision 39
8.4 Conclusion 40
9 Public Notification Assessment 41
9.1 Legislative Tests 41
9.2 Public Notification Conclusion 43
10 Limited Notification Assessment 43
10.1 Legislative Tests 43
10.2 Limited Notification Conclusion 48
11 Policy Framework 49
11.1 National Policy Statements 49
11.2 National Environmental Standards 49
11.3 Northland Regional Policy Statement 2016 50
11.4 Northland Regional Plan 51
11.5 Far North Operative District Plan 2009 51
11.7 Weighting of ODP and PDP 55
11.8 Overall Statutory Conclusions 56
12 Conclusion 57

Appendices

Appendix 1	Records of Title
Appendix 2	Application Plans
Appendix 3	Scheme Plan
Appendix 4	Infrastructure Report
Appendix 5	Wastewater Disposal Report
Appendix 6	Geotechnical Investigation Report
Appendix 7	Contamination Assessment
Appendix 8	Transportation Assessment
Appendix 9	Powerline Clearance Report
Appendix 10	Correspondence with Council
Appendix 11	Rule Compliance Checklist

1 Key Information

Address	1945 State Highway 10, Waipapa
Legal Description	Lot 1 and Lot 2 Deposited Plan 177522
Site Area	Lot 1 DP 177522 – 3998m^2 Lot 2 DP 177522 – 3999m^2
Owner	Terrence Edward Donnelly and Simon Charles David Weil
Applicant	Beach Haven Trust
Operative District Plan	Far North District Council Operative District Plan 2009
Zoning	Industrial zone
Overlays / Controls	None
Proposed District Plan	Far North District Council Proposed District Plan 2023
Zoning	Heavy Industry zone
Overlays / Controls	Energy Infrastructure and Transport Overlay – Critical Energy Lines
Proposed Activity	To construct and operate a distribution facility for New Zealand Post together with ancillary earthworks and wastewater discharge. The proposal also includes a boundary adjustment between Lots 1 and 2.
Consent Triggers	**Far North Operative District Plan 2009** *Part 2 Environment Provisions* Chapter 7 Industrial Zone ▪ The proposal does not comply with Rule 7.8.5.1.2(b) Visual Amenity and Environmental Protection which requires that at least 50% of that part of the site between the road boundary and a parallel line 6m therefrom be landscaped. This requires resource consent as a restricted discretionary activity pursuant to Rule 7.8.5.3. *Part 3 District-wide Provisions* Chapter 12 Soils and Minerals

	▪ The proposal will exceed 200m^3 of earthworks within any 12 month period per site as permitted by Rule 12.3.6.1.3, where a volume of 1,380m^3 is proposed, requiring resource consent as a restricted discretionary activity pursuant to Rule 12.3.6.2. Chapter 13 Subdivision ▪ The proposal involves a boundary adjustment where it complies with standards 13.7.1, 13.7.2 and 13.7.3, requiring resource consent as a controlled activity pursuant to Rule 13.7.1. Overall, resource consent is required as a **restricted discretionary activity.**
Other consents/permits that may be required under legislation	Building consent will be required.

2 Introduction

This report is submitted as part of the application by Beach Haven Trust ("**the Applicant**") for land use and subdivision consent from Far North District Council ("**the Council** or **FNDC**") in respect of the land at 1945 State Highway 10, Waipapa ("**the site**") to construct and operate a distribution facility for New Zealand Post ("**NZ Post**") on the site. The proposal also includes a boundary adjustment between Lots 1 and 2 to align with the extent of the NZ Post lease, being the two contiguous lots which make up the site.

The purpose of this report is to provide sufficient information to enable a full understanding of the proposal and any effects that the proposed development may have on the environment.

In preparing this assessment, I have relied on the plans and specialist assessments appended to this report and have reviewed the relevant planning documents.

3 Consultation

Top Energy Limited

Overhead power lines (33kV) are located inside the site along the western boundary and are supported by two poles. An overhead powerline (11kv) is also located outside the site in the road reserve.

The location of the lines and the required separation distances (2.1m horizontal clearance) under NZECP 34: 2001 and AS/NZS 7000: 2016 have been considered in the proposed site layout. A minimum 4m horizontal separation is provided. Compliance with the relevant standards is detailed in the Powerline Clearance Engineering Report at **Appendix 9**. The Applicant's electricity consultant (LiveLine Consultants Ltd) will undertake consultation with the line owner, Top Energy Limited to confirm that the proposal meets the relevant requirements. A copy of the approval will be submitted to Council upon receipt.

There are no ODP rules relating to 33kv lines. New setback rules from 33kv lines are proposed to be introduced via the PDP however these provisions do not have immediate legal effect.

Fire and Emergency New Zealand

As set out in the Infrastructure Assessment at **Appendix 4**, the project engineer (Capture Land Development Consultants) has discussed the proposal with Fire and Emergency New Zealand ("**FENZ**") who have confirmed the proposal is suitable from a firefighting perspective. The water supply arrangement is further detailed in this report at section 5 and at **Appendix 4**.

Far North District Council

Correspondence has been received from FNDC on two matters which have assisted with the assessment. As confirmed in the correspondence provided at **Appendix 10,** the site is located in the FNDC Stormwater Management Plan – Waipapa. Stormwater discharge is therefore permitted under Rule 7.8.5.1.9 of the Operative District Plan ("**ODP**"). The Council have also confirmed that the legal road adjacent the site does not form part of the state highway but has been vested to Council as road reserve. The proposal therefore does not require the formation of a vehicle crossing or access directly to State Highway 10.

4 Existing Environment

4.1 Surrounding Area

The site is located at 1945 State Highway 10 ("**SH10**"), Waipapa, and is situated to the south of the intersection of State Highway 10 and the Twin Coast Discovery Road and 8km to the west of the Kerikeri as illustrated in Figure 1.

The site and surrounding land to the west of SH10 accommodate industrial activities which all have access to the state highway, more recently via the creation of private road (refer Pataka Lane and Industrial Way[1]). This area has historically accommodated service and manufacturing industries (including weigh stations and petrol stations) but has recently experienced redevelopment as detailed below. Commercial activities are located to the north of Kahikateroa Lane and include retail (The Warehouse, Pacific Motor Group) and other service activities (Kerikeri Hire and Cowley Hire). The land to the east and to the south of the Waipekakoura River is more rural in character and accommodates farming and horticulture activities.

[1] As shown on the FNDC Zoning Map.

Figure 1 – Surrounding environment (site indicatively outlined in blue)



The local road network is detailed in the Transport Assessment at **Appendix 8** and summarised below:

- The site is bounded by a "legal road" to the immediate east and connects to SH10 where it intersects with Pataka Lane 110m to the north.
- Industrial Way is a local road, located 220m to the south of the site and provides access to the rear industrial lots before connecting to Pataka Lane to the north of the site as shown in Figure 2.
- SH10 forms part of the wider State Highway network which is owned and operated by Waka Kotahi New Zealand Transport Agency ("**NZTA**"). The posted speed limit reduces from 100 kilometres per hour ("**kph**") to 70 kph for northbound traffic passing the site frontage and vice versa. Along the site frontage, SH10 has a southbound auxiliary lane for vehicle turning left into the parking lot for the Sports Hub with the removal of the central flush median.

As noted above FNDC have confirmed the legal road to the immediate east of the site is a Council asset. The other roads appear to be private roads.

The adjacent properties are illustrated in Figure 2 and described as follows:

- The site to the east at 1936 SH10 accommodates the Te Puāwaitanga - Bay of Islands Sports Hub ("**Sports Hub**") and is a Council-owned and operated multi-sports facility. The hub accommodates five fields and associated amenities.
- The property to the immediate west of the site is vacant and beyond that at 1945A State Highway 10 is a kiwifruit processing facility (Kainui Pack and Cool). Access to that site is via a 20m wide right of way which also incorporates Pataka Lane.
- The Waipapa Pine Sawmill is located 260m to the west of the site and is accessed via Pataka Lane.
- The property to the immediate south of the site is accessed via a 10m wide right of way and is vacant within the front portion. The rear half accommodates Industrial Way and the sawmill. To the south of that site, a dwelling is located at 1927 SH10 set back 65m from the common boundary.
- Further to the south at 1913 SH10 is Northland Farm Source (Diary Farming Retail / Supply).

Figure 2 – Surrounding environment – Local Roads and Activities (site outlined in blue)



4.2 The Site

The site is comprised of two titles being Lot 1 and Lot 2 Deposited Plan 177522 comprising an area of 3,998m^2 and 3,999m^2 respectively and recognised in FNDC's mapping system collectively as 1945 SH10, Waipapa as shown in Figure 3 below.

Figure 3 – Aerial Photograph of Site (shown in blue)



An existing drainage channel approximately 2m wide and 0.5 to 1m deep runs along the length of the southern boundary of Lot 2.

Existing hardfill is present across most of the site with the western portion in topsoil. Mature pine trees, visible in Figure 3 were located to the south of the drainage channel but have since been removed.

Overhead power lines (33kV) are located inside the property along the western boundary and are supported by two poles as shown in Figure 4. An overhead powerline (11kv) is also located outside the site within the legal road with further details provided in the Powerline Clearance Report at **Appendix 9**. The lines are owed by Top Energy.

The site is not connected to the public water or wastewater reticulation networks.

Lot 2 is vacant. A two storey building is located on Lot 1 which has in the past been occupied by a diesel and mechanical engineering business and truck stop. The building on Lot 1 is served by a septic tank.

Figure 4 – Topographical Site Survey (power lines in red)



Geology and Contamination

The site is registered as a Verified HAIL site (risk not quantified) in the Selected Land Use Register (refer Northland Regional Council's database). Historical land uses referenced are F8 Transport Depots or yards, F4 Motor vehicle Workshops and F7 Service Stations. A Contamination Assessment prepared by Williamson Water and Land Advisory ("**WWLA**") has been undertaken of Lot 2 (proposed to be developed as part of this application). This assessment provided at **Appendix 7** confirms that Lot 2 was previously accommodated market garden activities (A10) but does not contain soil contaminates which pose a risk to human health or the environment. WWLA advise that,

At the desk study stage HAIL Activity A10 related to market gardening was confirmed and depending on the results of soil testing, Activity I associated with storage of items associated with the mechanics activities. The laboratory results confirm:

- *As no persistent pesticides were detected we do not interpret Activity A10 as applicable.*

- *HAIL Activity I only applies if contaminants are present at a level that poses a risk to human health or the environment. Contaminant levels do not exceed a commercial land use or the environmental criteria and thus the test for applicability of Activity I is not met.*

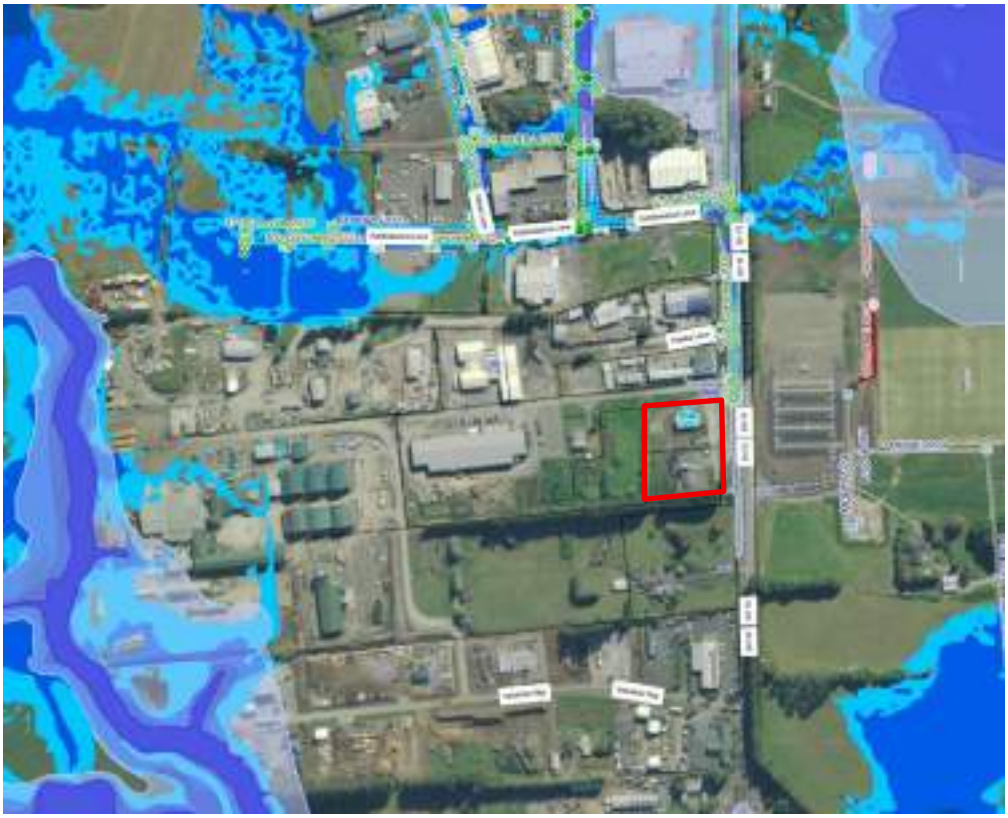
With regards to the underlying geology, CMW Geosciences have undertaken a Geotechnical Investigation Report ("**GIR**"). As set out in **Appendix 6**, the site is underlain by top soil to a depth of 0.6m and sand and gravel and hard fill to a depth of 1m. Beneath these layers is Tauranga Group Clay and Silt with Kerikeri Volancic Group Rocks beyond. Hand auger and cone penetration tests detected groundwater at a depth of 0.6m to 1.4m below ground level.

Natural Hazards

In respect of natural hazards and instability, section 7 of the GIR confirms there are no natural hazards or ground deformation, and the site is suitable for development.

There are no overland flow paths or flood hazards within or in the vicinity of the site – refer Figure 5. There are no streams or wetlands within the site, and nor are there any within 100m of the proposed development.

Figure 5 – Northland Regional Council Flood Hazards (site in red)

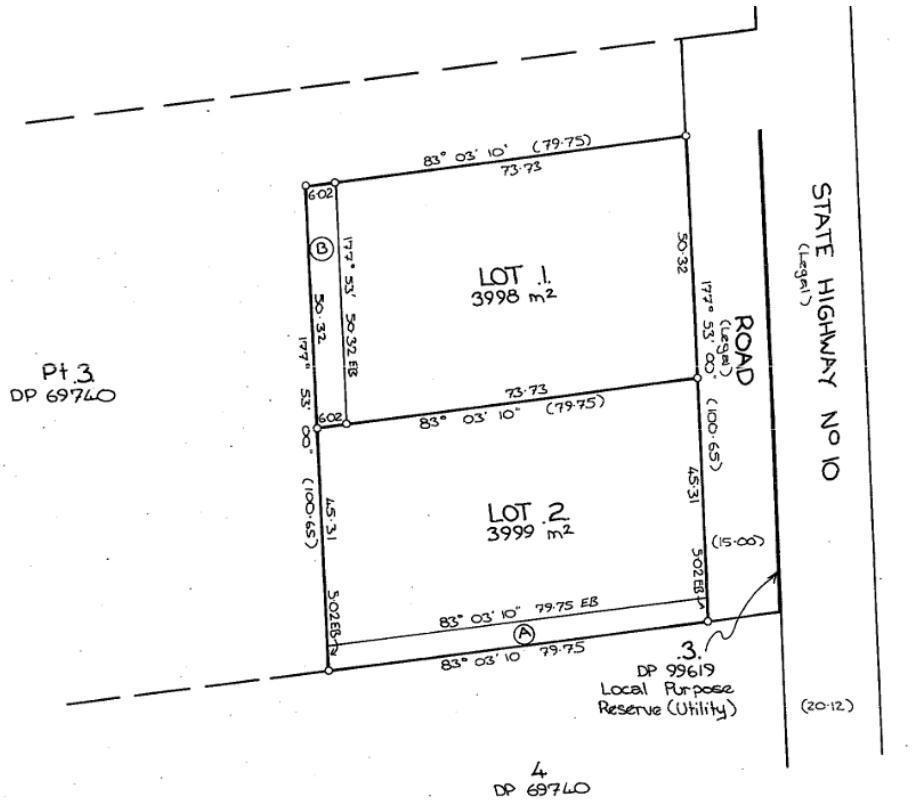


Records of Title

Lot 2 is subject to a drainage easement being Easement A, which extends along the length of the southern boundary and conveys stormwater from the property to the west (Part Lot 3 DP 697402) to a 0.2m wide drainage channel in the adjacent road (shown as the Local Purpose Utility Reserve in Figure 6). This is referred to as Easement Certificate B199494.4.

Lot 1 is subject to a right of way easement being Easement B which extends along that lot's western boundary connecting Lot 2 with Pataka Lane to the immediate north. This is referred to as Easement Certificate D293710.3.

Figure 6 – Title Plan



A copy of the Record of Title for each lot (and interests) is attached in Appendix 1.

Photographs of the site are provided at Figure 7.

[2] This rear parcel has since been subdivided and is now recognised as Lot 1 Deposited Plan 343062 in LINZ.

Figure 7 – Site Photographs



View South West



View North West



Lot 2, view south towards 1927 Stage Highway 10 (boundary trees removed)



Drain along southern boundary of Lot 2, facing east

Consent History

Subdivision application: Council Ref: 1960600, April 1996

The site was divided into Lots 1 and 2 in 1996 with Lot 1 being created an around existing Mobil Truck Stop and the workshop base for Northland Transport. It was acknowledged that Lot 2 gained its primary access off the local road however provision for rear access was created via right-of-way Easement B over Lot 1.

The subdivision consent was granted in 1996 and the titles were deposited with LINZ in 1998.

4.3 Far North Operative District Plan 2009

The site is zoned Industrial zone under the Far North Operative District Plan 2009 ("**ODP**"), as are the lots to the north. The immediately adjacent lots to the west are zoned Rural Production as shown in Figure 8. NZTA 2 Designation applies to the State Highway network.

FNDC have confirmed that the site is located within an existing consented urban stormwater management plan (Waipapa). No other planning notations apply to the site.

Figure 8 – ODP Planning Map (site in blue)



4.4 Far North Proposed District Plan 2023

On 27 July 2022, the Council notified the Far North Proposed District Plan ("**PDP**"). The submission period closed on 21 October 2022 and the further submissions period closed in September 2023. The PDP is now progressing through hearings (May 2024-November 2025). Following completion of the hearings, an independent Panel will make recommendations of which the Council will consider and then issue a Decisions version of the plan. The completion date of the final plan depends on any appeals that follow Council's decision.

Relevant Statutory Interests – PDP

The site is proposed to be zoned Heavy Industry under the PDP, as are all surrounding lots to the west of SH10. A new overlay is proposed to be introduced in respect of critical infrastructure. This overlay is intended to protect the district's 100kv and 33kv powerlines from inappropriate development, noting however these provisions currently do not have legal effect. SH10 is subject to NZTA 2 Designation. An extract from the zoning map is provided in Figure 9 and the location of the Critical Lines Infrastructure overlay (refer purple line) is provided at Figure 10.

Figure 9 – PDP Zoning Map (Lot 2 in black)

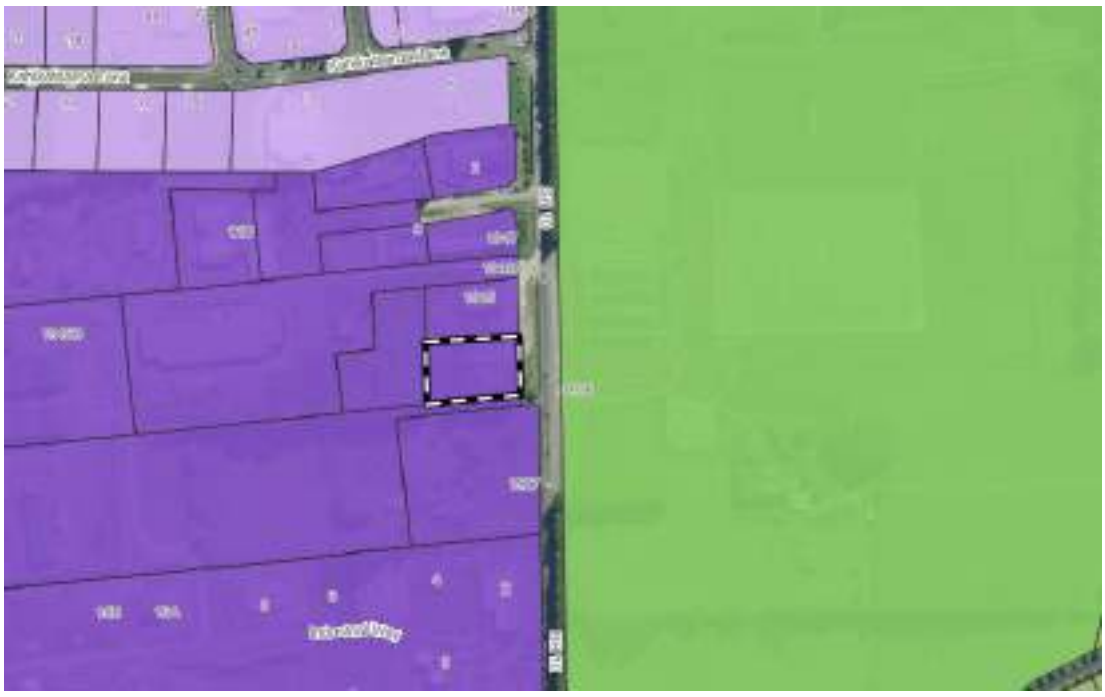


Figure 10 – PDP Critical Infrastructure Overlay Map (Lot 2 in blue)



Rules with legal effect – PDP

At the time of writing, the following provisions of relevance to the subject application have legal effect and are set out in full at **Appendix 11** and assessed accordingly:

- Subdivision Rules SUB-R6, SUB-R13, SUB-R14, SUB-R15, SUB-R17.
- Earthworks rules EW-R12, EW-R13 and standards EW-S3, EW-S5.

The proposal does not trigger consent in respect of any provisions with immediate legal effect.

4.5 Other Notations

The is site is not subject to any other statutory or non-statutory notations with respect to NZ Archaeological Association or Heritage NZ List. No Statutory Acknowledgements apply.

5 Proposed Development

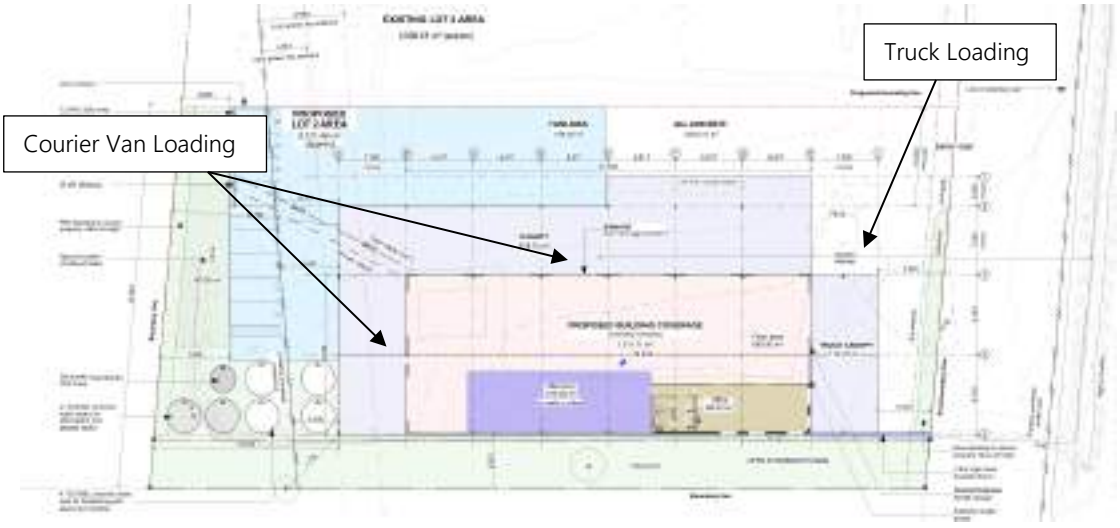
5.1 Overview

It is proposed to construct and operate a distribution facility on Lot 2 which will be used by NZ Post to service the Far North. The building will be used to receive and sort incoming deliveries (made by truck) and then deliver outgoing items to the northern region by courier van and motorbike. The proposed building and associated parking and loading areas have been designed to accommodate, trucks and vans, with the proposed site layout illustrated in Figure 11.

Following construction, it is proposed to shift the boundary between Lot 1 and Lot 2. The internal lot boundary is proposed to move to the south to align with the extent of the NZ Post lease.

No development is proposed on Lot 1 as part of this application.

Figure 11 – Proposed site layout



5.2 Operations

The building will be used to receive freight by truck (8 wheeler and 4 axle trailer and a line Haul van truck).

The trucks will enter the site and reverse into the loading area under the 'truck canopy' at the front of site. Freight will be unloaded then trucks will exit the site in a forward direction.

Courier vans will collect freight from the roller doors along the northern and western side of the building. Forklifts will operate within the building.

It is expected that approximately 20 contractors (courier van drivers) and staff will be on-site at the beginning of the day (from 5am onwards). Permanent on-site staff will reduce to about three persons from 9:00am. The numbers will increase to 20 persons again when couriers return to the site at the end of the day (at 6pm).

The facility will be operational 5am to 6pm, six days a week and closed on Sundays.

5.3 Proposed Site Layout and Building

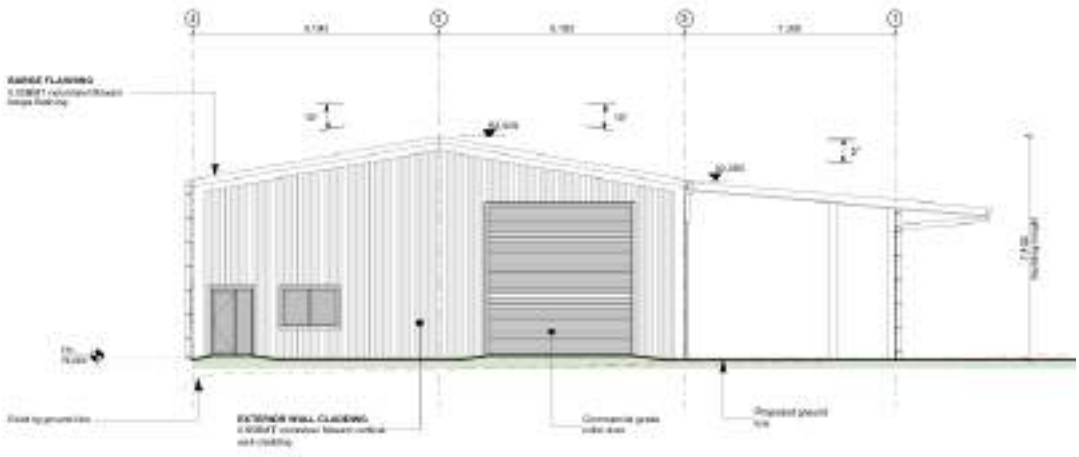
The proposed warehouse building will occupy a floor area of 1,311m^2 with canopies to the north and east comprising a covered loading of 630m^2. A mezzanine area will accommodate an office and lunch room.

The building is located to the north of the drainage easement with that area remaining unobstructed.

The building's position complies with the relevant setbacks from the power lines that cross the site as detailed in the Powerline Clearance Report at **Appendix 9**.

The building elevations are shown in Figure 12 and in the architectural drawings provided at **Appendix 2.**

Figure 12 – Proposed Elevations



Eastern Elevation (street frontage)



Northern Elevation (facing Lot 1)

A 2m wide landscape strip is provided at front of the site where it borders the legal road. A 1.5m wide landscape strip is provided along the length of the western boundary where the site adjoins the Rural Production zone. No landscaping is proposed along the southern extent of the site. The proposed building will screen loading and activities being undertaken to the north of the building. It is proposed to screen truck loading activities to the east of the building with a 2m high close boarded fence.

The perimeter of the site will be fenced with permeable security fencing and an entry gate is proposed across the site's access. External security lighting will comply with the illumination rules in Chapter 16 of the ODP.

One sign is proposed on the northern elevation of the building. The sign will be set back more than 50m from SH10. The size and location of the sign also complies with the rules in Chapter 16 of the ODP.

5.4 Transportation

Traffic

The Transportation Assessment prepared by TPC at **Appendix 8** explains that the proposed activity, including staff, truck and contractor delivery drivers will generate approximately 126 vehicles per day (vpd) movements which is equivalent to an average daily one-way vehicle movement of 64 vpd. TPC advise,

"Based on the information provided by NZ Post, it is expected that 6 truck movements and 80 van movements will occur during the operational day, including both entry and exit movements. In addition, approximately 20 vpd can be expected for staff activities. Therefore, a total daily traffic movement of 126 vpd can be expected, which is equivalent to an average daily one-way

vehicle movement of 64 vpd. Compared to the daily traffic volume of over 8,400 vpd on SH10, the net increase is within the daily fluctuation (1.5%). This level of traffic generation can be easily accommodated by the existing integrated access with "Legal Road" / Industrial Way / SH10 without any additional mitigation…"

As set out in the Traffic Assessment and the Rule Compliance Checklist at **Appendix 11**, this level of traffic generation is permitted under Rule 15.1.6A in the ODP.

Access

The existing vehicle access is not formed with the frontage of Lot 2 (and Lot 1) merging with the local road. It is proposed to formalise the access to Lot 2 by creating a 10m wide vehicle access at the northern corner of the lot. Similar to the current operation, vehicles will access SH10 from the legal local road.

The location and width of the vehicles crossing complies with the rules for accesses in Industrial zones as confirmed in **Appendix 8.**

Loading and Parking

Given the nature of the activity, the functional and operational requirements of the NZ Post facility have driven the site layout and have been designed to meet the ODP requirements. Loading areas comprise:

- The truck loading area to the east of the building, which has been designed to accommodate a 23m truck and trailer as illustrated by vehicle tracking appended to the Transport Assessment in **Appendix 8.**
- Eight loading bays which will be provided on the northern and western sides of the building under canopies, for courier vans. The van loading areas will be at least 6.9m wide with an unobstructed depth of over 7m. Vans will be able to reverse into the bays for loading / unloading and exit in a forward direction.

The proposal provides ten parking spaces including one accessible space, consistent with the ODP. All parking spaces are designed to comply with the dimensional and manoeuvring standards.

In summary the proposal complies with the ODP's parking and loading rules.

5.5 Civil, Infrastructure and Services

Earthworks

The Infrastructure Report at **Appendix 4** sets out the earthworks proposed to deliver the necessary site levels, building platform and manoeuvring areas.

Noting the generally flat gradient of the existing site, no retaining is required.

Overall, earthworks comprising 1,300m^3 cut plus 80m^3 fill volume is required (being a total of 1,380m^3) over an area of 2,780m^2.

All earthworks will be carried out in accordance with the recommendations set out in the GIR (**Appendix 9**) and the sediment and erosion control methodology included in the Infrastructure Report. The site is relatively flat, and as such, fairly standard sediment and erosion control measures can be utilised, including silt fencing, to the north of the drainage channel and a stabilised construction access.

While the Contamination Assessment at **Appendix 7** confirms contaminated soil can remain on-site, it is advised that cut exported off site cannot be considered cleanfill due to metal concentrations above published background levels. In this regard health and safety measures are to be employed during the earthworks phase, and will be confirmed at detailed design through the provision of a Land Management Plan (proffered by way of a condition of consent). This plan will confirm the appropriate disposal of cut soil.

Stormwater discharge and diversion

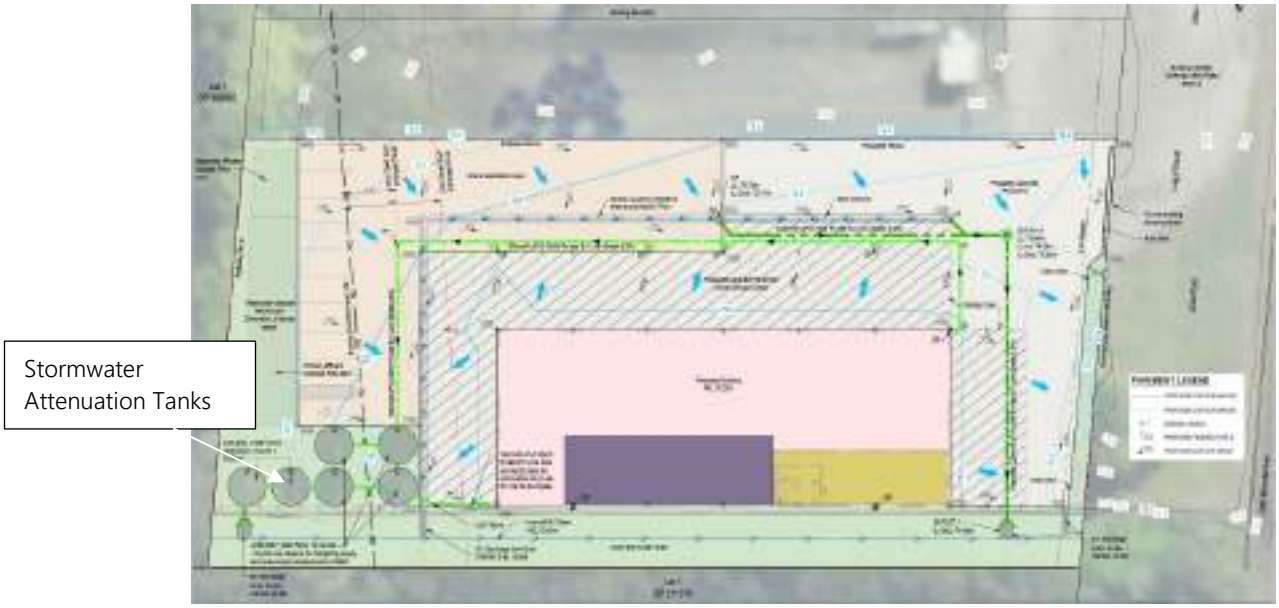
The Infrastructure Assessment (**Appendix 4**) sets out the stormwater discharge arrangements (refer engineering drawing 3001 in **Appendix 2** and Figure 13 below).

In summary stormwater will be discharged as follows:

- Stormwater runoff from the yard will be collected via stormwater catchpits and will be piped to discharge into the open drain via a rock rip rap outlet.
- The yard area adjacent to the open drain will discharge directly via kerb outlets and rock rip rap and will not be collected in a stormwater system.

- Runoff from the building and canopy roof areas will be collected via gutters and downpipes and conveyed via sealed pipes to the firefighting/reuse tanks and then into the stormwater attenuation tanks to the west of the building.

Figure 13 – Proposed Stormwater and Water Supply Arrangements



Water supply

There is no public water supply near the site and therefore the activity is required to be self-sufficient with respect to water supply. The Infrastructure Report explains the proposal in this regard (page 13):

For a commercial activity of Dry Retail where water is normally only used by staff for their own personal food preparation and toileting needs, the design water flow allowance is 65 litres per person per day, therefore : Daily Design Water Flow Allowance = 65 litres x 6 people = 390l/p/d

"... FENZ and they have specified that 100,000 litres of water will be required to be provided for combined firefighting and water re-use use on site as there is no existing firefighting water supply available to the site. The combination is acceptable to FENZ due to the low water use requirements on site ....

The firefighting volume and re-use water supply will be recharged via the runoff collected from the roof/canopy. During periods of low rainfall, the tanks will be monitored by the building occupiers and topped up as necessary.

Wastewater connections and discharge

The site is not connected to the public wastewater reticulation network and therefore onsite treatment, and disposal is proposed to service the proposed development.

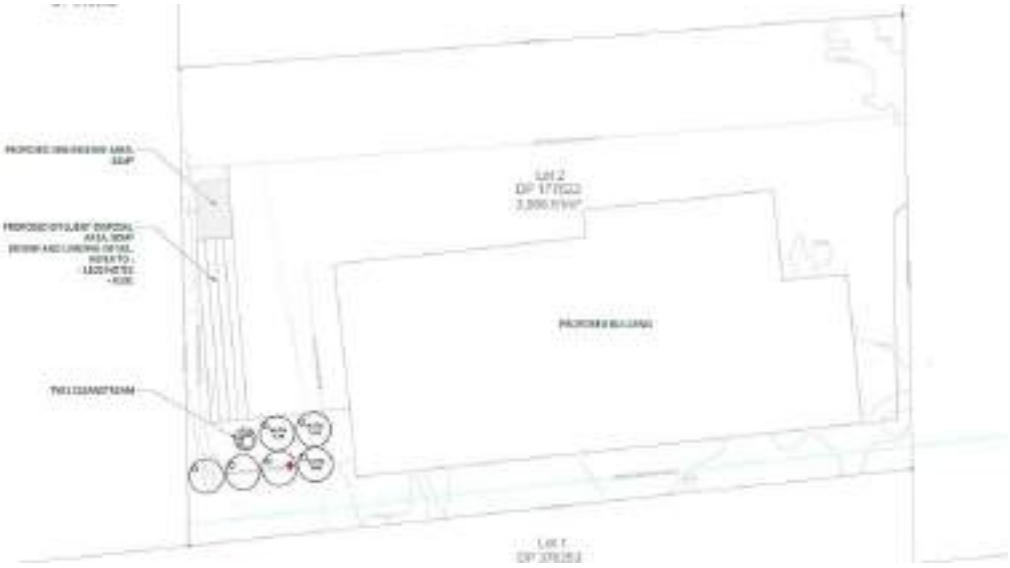
The Wastewater Disposal Report at **Appendix 5** sets out the proposed treatment and disposal arrangements which have been designed to comply with the Northland Regional Council's onsite domestic wastewater discharge rules (refer C.6.1.3).

In summary, the system comprises a Dripline Irrigation field disposal method with effluent to be dosed over a 24 hour time period via a 'Cleanstream' Treatment Unit. The system has been designed to cater for 12 persons. The design rate allows for potential fluctuations in daily wastewater production (from no use on a Sunday to up to 20 persons in the morning peak) and to mitigate the risk of hydraulic overloading within the effluent disposal field.

The treatment unit will be located to the immediate north of the stormwater attenuation tanks, with the treatment field extending along the western boundary as shown in Figure 14.

It is proposed to plant makamaka or a similar tree species (as recommended by the wastewater engineer) along the length of the western boundary within the waste treatment area. This planting will also provide screening to the parking and loading activities within the site from the properties to the west.

Figure 14 – Proposed Wastewater Treatment Arrangement



5.6 Boundary Adjustment

Following construction of the building on Lot 2, it is proposed to shift the boundary between Lots 1 and 2 to the south to align with the extent of the NZ Post lease. The existing and proposed lot sizes are shown in the table below. Figure 15 shows the new boundary location.

The proposed development on Lot 2 has been designed to be accommodated within the proposed new lot area of 3,121m^2.

	Existing Site Area	Proposed Site Area
Lot 1	3998m^2	4,873m^2
Lot 2	3999m^2	3,121m^2

Figure 15 – Proposed Scheme Plan (red line showing proposed boundary adjustment)



It is proposed to surrender Right of Way Easement B as Lot 2 has legal and physical access to the local road (such that access is not required to be taken over Lot 1). A separate LINZ process will be carried out accordingly. Drainage Easement A will be retained along the southern boundary.

The proposed scheme plan is provided at **Appendix 3**.

6 Matters Requiring Consent

6.1 National Environmental Standard – Contamination

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 ("**NES – Contamination**") will apply if the site is likely to have been used in the past for an activity described in the Ministry for the Environment's Hazardous Activities and Industries List ("**HAIL**").

The Contamination Assessment at **Attachment 6** confirms the site (Lot 2) previously accommodated market garden activities (HAIL activity A10) but does not contain soil contaminates which pose a risk to human health or the environment. As detailed in the Rule Compliance Checklist at **Appendix 11**, resource consent is not required under the NES Contamination.

6.2 Proposed Regional Plan for Northland 2024

The rule compliance checklist at **Appendix 11** confirms the proposal does not trigger consent in respect of rules relating to on-site domestic wastewater discharges. As confirmed in section 5 above and in the Wastewater Discharge Report at **Appendix 5**, the proposed system has been designed to comply with Rule C.6.1.3. As such resource consent is not required under PRP.

6.3 Far North Operative District Plan 2009

The Applicant seeks resource consent under the ODP for land use and subdivision consent for the activities as shown on the plans in **Appendix 2** and **3** and described in this AEE.

I have provided a detailed assessment of compliance with the relevant rules of the Regional Plan, ODP and the PDP in **Appendix 11**. It is my assessment that the proposed development requires consent for the following matters:

Far North Operative District Plan 2009

Part 2 Environment Provisions

Chapter 7 Industrial Zone

- The proposal does not comply with Rule 7.8.5.1.2(b) Visual Amenity and Environmental Protection which requires that at least 50% of that part of the site between the road

boundary and a parallel line 6m therefrom be landscaped. This requires resource consent as a **restricted discretionary** activity pursuant to Rule 7.8.5.3

Part 3 District-wide Provisions

Chapter 12 Soils and Minerals

- The proposal will exceed 200m^3 of earthworks within any 12 month period per site as permitted by standard 12.3.6.1.3, where a volume of 1,380m^3 is proposed, requiring resource consent as a restricted discretionary activity pursuant to Rule 12.3.6.2.

Chapter 13 Subdivision

- The proposal involves a boundary adjustment where it complies with standards 13.7.1, 13.7.2 and 13.7.3, requiring resource consent as a controlled activity pursuant to Rule 13.7.1.

Overall, resource consent is required as a **restricted discretionary** activity under the ODP.

6.4 Far North Proposed District Plan 2023

The rule compliance checklist at **Appendix 11** confirms the proposal does not trigger consent in respect of any rules or standards that have immediate legal effect. In particular, conditions of consent are proffered by the Applicant to confirm Accidental Discovery Protocols and sediment and erosion controls will be employed in order to achieve compliance with rules EW-R12 and R13 accordingly.

6.5 Scope of Application

This application is for all matters requiring resource consent rather than for the specific list of consent matters / non-compliances identified by the author.

As such, if the Council is of the view that resource consent is required for alternative or additional matters to those identified in this AEE, it has the discretion to grant consent to those matters as well as or in lieu of those identified in this AEE.

I also note that, if the Council is of the view that the activity status of any of the matters requiring consent is different to that described in this AEE, or that some or all of the matters requiring consent should be bundled or unbundled in a way that results in a different outcome to that expressed in this AEE, the Council has the ability under Section 104(5) of the Resource Management Act 1991 ("**RMA**") to process the application regardless of the type of activity that the application was expressed to be for.

7 Statutory Considerations

7.1 Resource Management Act

Council's decision on the proposal must have regard to the relevant matters in sections 104 to 108 of the RMA. Despite all section 104 considerations being "subject to Part 2", the Court of Appeal in *RJ Davidson Family Trust v Marlborough District Council* [2018] NZCA316 has held that reference to Part 2 should not be necessary if it is clear that a plan has been prepared having regard to Part 2 and with a coherent set of policies designed to achieve clear environmental outcomes.

In the context of this restricted discretionary activity application, it is considered that the ODP and rules pertaining to industrial activities, earthworks and subdivision have been competently prepared, and those provisions are coherent and comprehensive, and therefore there is no need to go beyond the relevant provisions of the planning documents and look to Part 2 in making a decision.

Notwithstanding, the following assessment provides an analysis against Part 2 for completeness.

7.1.1 Purpose and Principles of the RMA

The purpose of the RMA, set out in Section 5, is to promote the sustainable management of natural and physical resources. This is defined as:

> *"managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while—*
>
> *(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
>
> *(c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment."*

The broader principles of the Act are set out in sections 6 to 8 of the RMA. Of relevance to this application, section 7 requires Council to have regard to the following other matters of relevance:

> *(b) The efficient use and development of natural and physical resources:*
>
> *(c) The maintenance and enhancement of amenity values:*
>
> *(f) Maintenance and enhancement of the quality of the environment:*
>
> *(i) the effects of climate change:*

Section 8 requires Council to take into account the principles of the Treaty of Waitangi.

It is my assessment that the proposed development will promote the sustainable management of natural and physical resources by:

- Enabling the Applicant to develop the site in a manner that will contribute to the social, and economic wellbeing of Waipapa and adjacent areas by providing for a distribution centre which will provide local employment opportunities while providing for the efficient distribution of mail and parcels to Northland.
- Providing for the efficient use and development of the limited land resource, acknowledging that Lot 2 has been vacant for a substantial period of time. The development of this lot and the relocation of the boundary between Lots 1 and 2, reflects the efficient use of the industrial zoned site, noting the proposed activity is permitted in the Industrial zone.
- The proposal will maintain and enhance the amenity values of the industrial area, the existing activities and emerging new activities in the Rural Production zone (such as the Sports Hub), respecting the rural character through the providing of landscaping to the front and rear boundaries of Lot 2.
- The proposal will appropriately manage the discharge of stormwater and wastewater to maintain and enhance the intrinsic values of the ecosystem and quality of the environment.
- The stormwater analysis has accounted for the effects of climate change, to ensure the capacity and design of the private stormwater system is futureproofed in this regard.

- Appropriately managing the other potential adverse effects.

The potential adverse effects of the proposed works are discussed in section 8 of this report.

7.1.2 Section 104 – Matters for Assessment

Section 104(1) of the RMA requires the Council to have regard to:

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

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

(b) any relevant provisions of –

(i) a national environmental standard:

(ii) other regulations:

(iii) a national policy statement:

(iv) a New Zealand coastal policy statement:

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

(vi) a plan or proposed plan; and

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

Section 104(2) of the RMA states that, in considering the potential effects of allowing an activity, a consent authority may disregard an adverse effect if a national environmental standard or the plan permits an activity with that effect.

Section 104(3) states that a consent authority must not have regard to trade competition or the effects of trade competition, or any effect on a person who has given written approval to the application.

An assessment of the effects of the proposal on the environment is provided in section 8 of this report. Assessments against the relevant statutory documents are provided in section 11 below.

7.1.3 Matters of Discretion

The land use proposal requires consent for a restricted discretionary activity under s104(c) – the relevant matter of discretion are:

- Rule 7.8.5.1.2 Visual Amenity and Environmental Protection

a) *the visual effect on property in the vicinity of the proposed industrial development;*
b) *the scale and nature of the landscaping and the measures necessary for its maintenance.*

- Rule 12.3.6.2.2 Excavation and or filling in the Industrial zone
  i. *the effects of the area and volume of soils and other materials to be excavated; and*
  ii. *the effects of height and slope of the cut or filled faces; and*
  iii. *the time of the year when the earthworks will be carried out and the duration of the activity; and*
  iv. *the degree to which the activity may cause or exacerbate erosion and/or other natural hazards on the site or in the vicinity of the site, particularly lakes, rivers, wetlands and the coastline; and*
  v. *the extent to which the activity may adversely impact on visual and amenity values; and (*
  vi. *the extent to which the activity may adversely affect cultural and spiritual values; and*
  vii. *the number, trip pattern and type of vehicles associated with the activity; and*
  viii. *the location, adequacy and safety of vehicular access and egress; and*
  ix. *the means by which any adverse environmental effects of the activity will be avoided, remedied or mitigated.*

- Rule 12.3.7 Assessment Criteria
  a) *the degree to which the activity may cause or exacerbate erosion and/or other natural hazards on the site or in the vicinity of the site, particularly lakes, rivers, wetlands and the coastline;*
  b) *any effects on the life supporting capacity of the soil;*
  c) *any adverse effects on stormwater flow within the site, and stormwater flow to or from other properties in the vicinity of the site including public roads;*
  d) *any reduction in water quality;*
  e) *any loss of visual amenity or loss of natural character of the coastal environment;*
  f) *effects on Outstanding Landscape Features and Outstanding Natural Features (refer to Appendices 1A and 1B in Part 4, and Resource Maps);*
  g) *the extent to which the activity may adversely affect areas of significant indigenous vegetation or significant habitats of indigenous fauna;*

h) the extent to which the activity may adversely affect heritage resources, especially archaeological sites;

i) the extent to which the activity may adversely affect the cultural and spiritual values of Maori, especially Sites of Cultural Significance to Maori and waahi tapu (as listed in Appendix 1F in Part 4, and shown on the Resource Maps);

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

k) the effectiveness of any proposals to avoid, remedy or mitigate any adverse effects arising from the activity;

l) the ability to monitor the activity and to take remedial action if necessary;

m) the criteria in Section 11.20 Development Plans in Part 2.

n) the criteria

o) in Section 17.2.7 National Grid Yard.

7.1.4 Matters of Control

The subdivision proposal requires resource consent as a controlled activity under s104(a). The matters to which Council has reserved its control are:

- Rule 13.7.1 – and the standards set out in rules under 13.7.1, 13.7.2 and 13.7.3.

7.1.5 Permitted Activities

As set out in the Rule Compliance Checklist at **Appendix 11**, the proposed distribution centre and the associated traffic generated by the proposal and the access, parking and loading arrangements are permitted under Chapter 7 and 15 of the ODP. Signage, lighting and noise generated by the proposal are also permitted activities. Servicing of the building with respect to waste, wastewater and stormwater also complies with the relevant rules in the ODP and the PDP.

Consent conditions have been proffered to ensure compliance with the relevant standards. This is set out in Appendix 11 and section 5 of this report where relevant.

8 Effects on the Environment

Resource consent is required overall as a restricted discretionary activity. Therefore, Council's assessment is controlled and restricted to those matters set out in section 7.1.3 and 7.1.4 above.

Having regard to the potential effects arising from the proposal, the assessment of effects can be grouped into the following matters:

- Visual amenity effects
- Soil Disturbance effects
- Subdivision / Boundary Adjustment effects.

8.1 Visual Amenity Effects

The 'Visual Amenity and Environmental Protection' rule seeks to protect the amenity of adjacent properties and the wider surrounding environment from the effects arising from the use of outdoor areas of activities in the industrial zone. The rule applies to the road frontage of industrial zone sites and those which adjoin other zones (in this case, the western and southern boundaries adjoin the Rural Production zone).

The proposal does not comply with the road frontage requirement whereby 50% of the frontage for a depth of 6m must be landscaped. The operational requirements of the activity, namely the tracking area required for trucks in enter, unload and exit the site in a forward direction means the required landscaped buffer cannot be provided in its full entirety. The proposal does however provide landscaping between the open drain on the southern boundary to the proposed vehicle crossing. As shown on drawing RC-01 in **Appendix 3**, a landscaped strip of approximately 1.8m wide is proposed. A hardy buffer species (Phormium Black Flax as found on the road frontage of the site the north) or similar is proposed in this location and once established will provide a vegetated buffer at the interface between the local road and the loading area at the front of the site.

As noted in section 5.2 truck loading operations are concentrated to the morning, such that for most of each day, limited loading will occur. Regardless, views of the site from SH10 and the east will be of the landscaped buffer and the warehouse building behind.

For completeness, the proposal complies with the visual amenity standard relative to the site's southern and western boundaries which adjoin Rural Production zoned land as follows:

- Loading activities will be separated from properties to the south by the open drain and the building itself with loading occurring to the north away from the southern boundary. The building therefore acts as a screening device. The exception is the southeast corner of the site, and in this location a close boarded 2m high fence is proposed between the building and the site's eastern boundary to screen loading activities at the front of the site.

- Screening to the property to the immediate west (at Lot 1 Deposited Plan 343062) is provided via a landscaped buffer of between 4.8m and 7m wide. This area comprising formal landscaping along the boundary and landscaping and additional landscaping within the effluent treatment field. As noted in section 5.5 makamaka or a similar tree species as recommended by the wastewater engineer is be planted with these species being appropriate for wet ground conditions.

To ensure the successful establishment and ongoing maintenance of the planting required to screen loading activities a condition is proffered to provide a landscape maintenance plan. This will confirm the proposed planting species, garden bed preparation and ongoing maintenance. Any plant which does not successfully establish within the first two years of planting will be replaced.

Taking into account the above assessment and mitigation offered it is considered the potential adverse visual amenity effects on the wider surrounding environment will be less than minor.

8.2 Earthworks effects

Potential adverse effects from proposed volume of earthworks required to create the building platform and associated manoeuvring areas will be managed to avoid adverse environmental effects.

As described in detail within the Infrastructure Report, these measures will ensure silt and sediment (including air borne dust) is retained within the boundary of the site with only clean water entering the open drain to the south.

The extent of works (depth and fill) as such that no retaining is required. This means that the visual appearance of the landform will remain generally unchanged.

The site is not subject to natural hazards and therefore the earthworks will not exacerbate stability or flood hazards in the surrounding environment. There are no natural features of note, however, and as noted above, implementation of sediment control measures along the southern boundary will ensure that contaminates do not enter this watercourse.

As noted in section 5.5, any soil removed from the site will be managed in accordance with the Land Management Plan to ensure the safe disposal or appropriate reuse of this soil.

Finally, as set out in the Traffic Assessment, a Construction Traffic Management Plan ("**CTMP**") is proposed to ensure effects arising from traffic on the adjacent road network are managed. This includes management of contractor parking on the load road.

On this basis, it is considered the proposed works can appropriately mitigate the potential effects of earthworks on the surrounding environment.

8.3 Subdivision

The proposed boundary adjustment will deliver two lots which meet the minimum lot size in the industrial zone. As evident in the preceding assessment, the proposed distribution centre and the servicing of the building with respect to wastewater, water and stormwater can occur within the proposed (reduced) lot size of 3,121m^2.

Lot 1 will increase to 4,873m^2 which provides a suitable size, should this lot be developed.

The proposed development in Lot 1 and new Lot 2 can occur in such a way that sufficient clearance can be provided from the 33kv overhead power lines which cross the site. The boundary adjustment therefore does not implicate this critical infrastructure.

The access arrangements to both lots remain unchanged (since the 1996 subdivision) except it is proposed to remove Easement B as each lot has legal and physical access to the local road negating the need for a right of way easement. The easement will be surrendered at the time the new titles are created under the Land Transfer Act.

Both lots have the ability to connect to services in the road reserve.

Finally, the proposed boundary relocation meets the requirements of s106 of the RMA.

In summary the proposed subdivision is considered to have a less than minor adverse effect as it will deliver two sites which are consistent with the outcome of the Industrial zone.

8.4 Conclusion

Overall, having regard to the assessment set out above when read in conjunction with the technical reports appended to this application, it is considered that the proposal will result in less than minor adverse effects upon the surrounding receiving environment.

9 Public Notification Assessment

9.1 Legislative Tests

Section 95A of the Resource Management Act 1991 ("**RMA**") specifies the steps the Council is to follow to determine whether an application is to be publicly notified. These are addressed in statutory order below.

Step 1: Mandatory public notification is required in certain circumstances

Section 95A (step 1) of the Resource Management Act 1991 ("**RMA**") determines whether public notification of the application in mandatory if:

- the applicant requests public notification of the application; or
- it decides that public notification is required under section 95C; or
- the application is made jointly with an application to exchange recreation land.

The applicant has not requested public notification, the Council is yet to request any further information (in relation to section 95C), and the application is not made jointly with an application to exchange recreation land.

Public notification of the application is not mandatory.

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

An application for resource consent must be precluded from public notification if:

- the application is for a resource consent for 1 or more activities, and each activity is subject to a rule or environmental standard that precludes public notification, or
- The application is for one or more of the following, but no other, activities:
  - a controlled activity:
  - a restricted discretionary, discretionary, or non-complying activity, but only if the activity is a boundary activity:

The proposal is not for one of these activities and therefore is not precluded from public notification.

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

Step 3 states that an application is required to be publicly notified if it is for a resource consent for 1 or more activities and any of those activities is subject to a rule or national environmental standard that requires public notification, or the consent authority decides, in accordance with section 95D, that the activity will have or is likely to have adverse effects on the environment that are more than minor.

The preceding assessment within Section 8 of this report found that the actual and potential effects of the proposal will be less than minor upon the environment. Therefore, the application is not required to be publicly notified pursuant to Section 95A (Step 3).

Step 4: Public notification in special circumstances

Section 95A (Step 4) states that a Council may publicly notify an application for resource consent if it considers that special circumstances exist, notwithstanding the statutory tests that would otherwise allow the application to be processed without public notification.

"Special circumstances" have been defined by the Court of Appeal as those that are unusual or exceptional, but not necessarily extraordinary or unique (*Peninsula Watchdog Group (Inc.) v Minister of Energy* [1996] 2 NZLR 529).

In addition, Elias J has stated that circumstances which are "special" will be those which make notification desirable, notwithstanding the general provisions excluding the need for notification (*Murray v Whakatane DC* [1997] NZRMA 433).

Having regard to the proposal, the preceding assessment canvasses all actual and potential adverse effects of the proposal. The distribution facility is anticipated to occur in the zone having regard to its permitted activity status. The proposal complies with all relevant standards except in relation to Visual Protection requirements along the road frontage, which is not uncommon in the Industrial zone. Soil disturbance and subdivision are normal activities associated with land development and in this regard the proposal is not unusual.

On this basis, I do not consider that public notification would give rise to any alternative or additional information that would prove useful for the decision-maker in considering the application.

9.2 Public Notification Conclusion

Having undertaken the section 95A public notification tests, the following conclusions are reached:

- Under step 1, public notification is not mandatory;
- Under step 2, public notification is not precluded;
- Under step 3, public notification is not required; and
- Under step 4, no special circumstances are considered to arise.

Therefore, based on the preceding assessment and the assessment of effects in section 8 of this report, supported by expert analysis in accompanying appendices, public notification is not required in this circumstance.

10 Limited Notification Assessment

10.1 Legislative Tests

If the application is not publicly notified under s95A, the Council must follow the steps set out in s95B to determine whether to limited notify the application. These steps are addressed in the statutory order below.

Step 1: certain affected protected customary rights groups must be notified

There are no protected customary rights groups or customary marine title groups affected by the proposed activity (s95B(2)).

In addition, the Council must determine whether the proposed activity is on or adjacent to, or may affect, land that is subject of a statutory acknowledgement under schedule 11, and whether the person to whom the statutory acknowledgement is made is an affected person (s95B(3)).

In this case, the proposed activity is not on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement.

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

An application for resource consent must be precluded from limited notification if:

- the application is for a resource consent for 1 or more activities, and each activity is subject to a rule or environmental standard that precludes limited notification, or
- a controlled activity that requires consent under a district plan (other than a subdivision of land).

The proposed activity is not precluded from limited notification as it does not relate to any of the activities specified above.

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

As this application is not for a boundary activity, there are no affected persons related to those types of activities (s95B(7)).

The following assessment addresses whether there are any affected persons that the application is required to be limited notified to (s95B(8)).

In determining whether a person is an affected person:

- a person is affected if the activity's adverse effects on that person are minor or more than minor (but not less than minor)
- adverse effects permitted by a rule in a plan or NES (the permitted baseline) may be disregarded; and
- the adverse effects on those persons who have provided their written approval must be disregarded.

Written approval

No persons have provided written approval to the application.

Adjacent persons

Figure 16 identifies all persons that are considered to be adjacent to the subject site.

Figure 16 – Aerial photograph identifying adjacent persons



Persons owning and occupying the adjacent properties are not considered to be adversely affected by the proposal for the following reasons:

1936 State Highway 10 (Multi-Sports Hub)

The property to east accommodates the Sports Hub with parking adjacent the state highway and adjacent the subject site as illustrated in Figure 16.

It is noted that the proposed distribution centre and activities occurring within the Sports Hub will have different peak traffic times. As noted in section 5, truck deliveries to the subject site are expected in the morning (6am) with all freight loading into courier vans for delivery by 9am. The proposed distribution centre is not open on Sundays. Typically, community sporting activities are held in the evenings and weekends. The entrance to the Sports Hub is located 110m to the south of Pataka Lane.

As noted in section 8.1, loading activities in the eastern part of the site will be screened by the proposed landscaped buffer, and noting the proposed activity is permitted in the Industrial zone. The subject site is separated from the Sports Hub by the road corridor, a distance of 37m, therefore any views of the proposal will be within the context of the state highway road network and front landscaped buffer.

The Infrastructure Report (**Appendix 4**) confirms that comprehensive sediment and erosion control measures will be in place prior to the commencement of construction, ensuring that silt

and sediment laden material, including air borne dust, is contained within the boundary of the site.

For these reasons persons to the east are considered to be affected to a less than minor degree.

1945A State Highway 10 and Lot 1 Deposited Plan 343062 (western properties)

The 20m wide pan handle access to the immediate north of the site comprises Pataka Lane and serves the cool store to the west within 1945A SH10. Lot 1 Deposited Plan 343062 is located between the cool store and the subject site, with this lot forming a grassed area being used intermittently for storage.

Stormwater from these western properties is conveyed to the drain in the local road over Lot 2 via Easement A. The proposal retains this easement with stormwater runoff from the proposed development on Lot 2 being attenuated such that the capacity of the drain to serve the upstream properties is not affected.

In terms of visual amenity effects, these are considered to be appropriately mitigated by the boundary and wastewater effluent field planting as noted in section 8.1. A consent condition is offered requiring ongoing maintenance of the effluent field to the manufacturer's standards. This will ensure that adverse odour effects are avoided and that vegetation is maintained.

The Transportation Assessment (Appendix 8) confirms the access (where the local road joins Pataka Lane) will operate safely, will not adversely affect the safe and efficient operation of nearby vehicle crossings or the local road network, including in respect of construction traffic.

Finally and as set out in section 8.2, sediment control measures will be employed to ensure sediment laden water does not enter these properties.

For these reasons, persons to the north and west are considered to be adversely affected to a less than minor degree.

1927 State Highway 10 and Lot 1 Deposited Plan 376253

The property to the south is separated from the subject site by a 10m wide pan handle access and accommodates a dwelling located centrally within that site and set back a further 55m. As noted in section 8.1, loading associated with the activity will be undertaken to the north away from this neighbour. The proposed 2m high fence will screen loading activities to the east of the building. As such all views of the proposal from persons to the south will be of the building's

southern elevation, fencing and the tanks to the west of the building. Noise and any nuisance associated with the activity are therefore mitigated by the site's layout and the above-mentioned separation distances.

As set out in **Appendix 11**, the proposal will comply with the noise and lighting standards when received at persons to the south.

Potential adverse effects arising during the earthworks phase will be managed as noted in above.

In summary persons to the south are considered to be adversely affected to a less than minor degree.

Top Energy

As noted in section 3, the 33kv overhead powerlines which traverse the site parallel with the rear boundary are owned by Top Energy. The proposed building (and any scaffolding required for its construction) will maintain the required separation distances under NZECP 34: 2001 and AS/NZS 7000: 2016. The Applicant's electrical specialist will undertake consultation with Top Energy to confirm that the proposal meets the relevant requirements. A copy of the approval will be submitted to Council upon receipt.

NZTA

The site does not currently have direct access to SH 10 with this being provided via the local road and Pataka Lane / Industrial Way to the north. TPC have reviewed the crash data of the adjacent road network and have not identified any inherent safety concerns. While two serious crashes and one minor crash have occurred within 500m of the site, the causes of the crashes were not related to safety issues with the road network. As noted in section 4 the speed limit outside the site is 70 kph and there is good visibility in both directions. TPC advise that this section of the highway conveys a daily traffic volume of over 8,400 vpd. The proposed additional 126 vpd can therefore be easily accommodated.

For completeness the proposal does not involve the creation of a new vehicle access to SH10, therefore written consent from NZTA as the requiring authority of the designated state highway (NZTA 2) is not required under s177 of the RMA.

Overall, there are no adjacent persons that are considered to be affected parties of the proposal.

Step 4: further notification in special circumstances

Step 4 requires us to determine whether special circumstances exist in relation to the application that warrant it being notified to any other persons not already determined as eligible for limited notification.

Special circumstances are those that are:

- exceptional or unusual, but something less than extraordinary;
- outside of the common run of applications of this nature; or
- circumstances which make limited notification to any other person desirable, notwithstanding the conclusion that no other person has been considered eligible.

In this instance I have turned my mind specifically to the existence of any special circumstances under s95B(10) and conclude that there is nothing exceptional or unusual about the application for the reasons set out at section 9.1 of this report such that it is considered limited notification on special circumstances is not required.

10.2 Limited Notification Conclusion

Having undertaken the s95B limited notification tests, the following conclusions are reached:

- Under step 1, limited notification is not mandatory.
- Under step 2, there is no rule or NES that specifically precludes limited notification of the activities, and the application is for an activity other than those specified in s95B(6)(b).
- Under step 3, limited notification is not required as it is considered that the activity will not result in any adversely affected persons.
- Under step 4, there are no special circumstances that warrant the application being limited notified to any persons.

It is therefore considered appropriate that this application be processed without limited notification.

11 Policy Framework

11.1 National Policy Statements

National Policy Statement on Urban Development 2020

The NPSUD came into force on 20 August 2020 (and has since been amended as addressed below) and is intended to support productive and well-functioning cities, recognising that some urban areas in New Zealand are growing quickly. The NPSUD requires councils to plan well for that growth and to do so in a way that:

- Ensures the principles of the Treaty of Waitangi are taken into account
- Ensures that plans make room for growth both up and out, and that rules are not unnecessarily constraining growth
- Develops, monitors and maintains local evidential bases for demand, supply and prices of land (for housing and to inform planning decisions)
- Aligns and coordinates with planning across urban areas.

The NPSUD sets objectives and policies that are mandatory for some councils and strongly encouraged for others.

The Far North district is a Tier 3 local authority under the NPS-UD and therefore the NPS-UD does not materially affect development potential or the relevant planning framework therefore.

Further, amendments to the RMA in 2021 (Enabling Housing Supply and Other Matters) also do not have statutory relevance to the site and have not been further considered in this regard.

11.2 National Environmental Standards

National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health 2011

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 ("**NES – Contamination**") will apply if the sites are likely to have been used in the past for an activity described in the Ministry for the Environment's Hazardous Activities and Industries List ("**HAIL**").

The Contamination Assessment at **Appendix 7** confirms resource consent is not required under the NES Contamination. However as noted in section 5.5 and section 7, health and safety measures are to be employed during the earthworks phase and will be confirmed at detailed design through the provision of a Land Management Plan. This will ensure the safe management of any contaminated soil removed from the site. The Applicant proffers a condition of consent accordingly, and on this basis, it is considered that the proposal is consistent with the overarching outcomes of the NES – Contamination.

National Environmental Standards for Freshwater 2020

The NES Freshwater set requirements for carrying out certain activities that pose risks to freshwater and freshwater ecosystems and together with the NPS Freshwater set out the national direction for managing New Zealand's freshwater. No consents are required under the NES – Freshwater and therefore, it is not considered that the proposal is contrary to the overarching objectives of the Regulation.

11.3 Northland Regional Policy Statement 2016

The Regional Policy Statement of relevance is the Northland Regional Policy Statement 2016 ("**RPS**").

The RPS deals with region-wide issues and in this case, focuses on the following:

- The proceeding assessment in this report confirms the layout and design of the infrastructure and services supporting the proposal (and associated wastewater and stormwater discharges) have been comprehensively designed to deliver the anticipated outcomes at Objectives 3.1 – 3.3.
- The RPS seeks to ensure that Northland's natural and physical resources are sustainably managed in a way that is attractive for business and investment that will improve the economic wellbeing of Northland and its communities. The proposed boundary adjustment will deliver two industrial zoned lots (one accommodating the distribution facility) that are of a size and shape that will encourage small scale investment. The lots have good access to the state highway and other services in Waipapa. The proposal is therefore considered to align with the outcomes of Objective 3.5.
- The preceding assessment confirms that the layout and design of the site and the nature of the activities will avoid adverse effects, including reverse sensitivity effects on the adjacent Rural Production zoned sites. The effects generated by the distribution centre

are also consistent with other activities in the industrial zone. The land use activity is therefore consistent with Policy 5.1.3.

For the above reasons, the proposal is not considered to be contrary with the relevant provisions of the Northland RPS.

11.4 Northland Regional Plan

No resource consents are required from the Northland Regional Council with the proposed wastewater discharge arrangements complying with the standards in Chapter C.6 Discharges to Land and Water. The proposal is therefore considered to be consistent with the regional plan.

11.5 Far North Operative District Plan 2009

11.5.1 Industrial Zone

The site is zoned Industrial under the ODP and the proposed activity is permitted in the zone. The proposal is considered to be consistent with the outcomes of the zone therefore, and as follows:

Clause	Provision	Comment
Chapter 7.8 Industrial Zone		
7.8.3 Objectives		
7.8.3.1	To avoid, remedy or mitigate adverse effects of new industrial activities on existing activities in the Industrial zone, and on activities on adjoining land, and on the natural and physical resources of the District.	The distribution centre only requires resource consent for an infringement to the visual amenity standard relative to the road frontage (with the potential adverse effects being mitigated by the proposed planting). This illustrates that the proposal is consistent with the outcomes of the zone and with existing activities, including those not of an industrial nature. Effects on the water and land resources from earthworks and discharge (wastewater and stormwater) are mitigated as set out in the technical reports at **Appendix 4** and **5**.

Clause	Provision	Comment
7.8.4 Policies		
7.8.4.1	That the Industrial Zone be applied to those areas in which industry is a significant activity and where expansion or intensification of the industrial character can be accomplished without damage to the environment.	Lots 1 and 2 are zoned industrial however the adjacent properties are zoned Rural Production (but accommodate a range of activities including community uses). The proposal is considered an appropriate use of the site taking into account the 'spot' zoning, the proposed boundary interface design (planting and fencing) and the existing land use activities on surrounding properties.
7.8.4.2	That the range of activities provided for in the Industrial zone be limited only by the acceptability of the effects generated by the particular activity in relation to other activities in the zone.	This policy facilitates the establishment of activities in the Industrial zone where the potential effects of the activities are avoided, remedied or mitigated, as is the case here. As noted above, the proposal only infringes the visual amenity standard demonstrating that the activity is a wholly appropriate use of the site.
7.8.4.3	That standards be applied that protect visual and environmental amenity within the Industrial zone, and the amenity of adjacent zones.	The proposal complies with the amenity protection standard as it relates to the southern and western boundaries. Planting along the road frontage (Phormium Black Flax or similar) will assist with screening activities at the eastern end of the site and will protect the amenity of the adjacent rural production zone.
7.8.4.4	All activities should provide for a stormwater disposal system incorporating Low Impact Design principles, particularly for car park and landscaped areas.	The Infrastructure Report at **Appendix 4** sets out the design principles for stormwater disposal. This includes discharge of stormwater to the open drain via rock rap. This approach is considered appropriate given the number of parking spaces (ten) and the landscaped areas which surround the site to west, south and north (and which will perform a secondary treatment function from any sheet flow)

Clause	Provision	Comment
7.8.4.6	That stormwater disposal systems do not result in suspended solids, industrial by-products, oil, or other contaminated substance or waste entering the stormwater collection system in concentrations that are likely to pose an immediate or long term hazard to human health or the environment.	N/a - the proposed activity is associated with the distribution of 'dry' freight. No liquids or hazardous substances are processed within the distribution centre.

11.5.2 District-wide Objectives and Policies

Chapter 12 Natural and Physical Resources

With respect to Chapter 12 Natural and Physical Resources, the preceding assessment confirms that the proposal is not located within an outstanding landscape area and that no significant native vegetation removal is required. The layout of the proposed development is designed to align with existing gradients within the site, avoiding extensive changes to landform through cuts, battering or extensive retaining which may have otherwise adversely changed the landform. The Infrastructure Report provides comprehensive sediment and control measures to ensure silt and sediment are contained within the site during earthworks. There are no sites of cultural significance within the site or immediately surrounding environment. As such and therefore, the proposal will maintain and enhance the values of the natural and physical resources and is consistent with the objectives within Chapter 12 of the ODP.

Chapter 13 Subdivision

The subdivision chapter seeks to provide for the subdivision of land in such a way as to be consistent with the purpose of the various zones in the Plan, and that will promote the sustainable management of the natural and physical resources.

The proposal involves subdivision around the proposed development on Lot 2 and the shifting of a boundary to increase the size of Lot 1. The site does not contain any natural features, nor does it have high ecological, cultural or landscape values. Both lots will be of a size which can accommodate an activity as envisaged by Industrial zone (and comply with the 3,000m^2 minimum lot size area). Both lots have access to the local road and shifting the boundary does not change the existing safe and effective vehicular access arrangements to the site. The lots are not subject to natural hazards. Finally, both lots have the ability to be serviced by utilities in the local road

and are of a size that can provide for wastewater treatment and disposal and water storage infrastructure as required.

In summary the proposal is considered to be consistent with objective 13.3.1 and policies 13.4.1-13.4.4.

Chapter 15 Transportation

Turning to Chapter 15 Transportation, it has been confirmed in section 5 that the proposal complies with the relevant rules including with respect to traffic generation. TPC confirms the additional traffic movements will not result in adverse effects on the local or state highway network advising that,

"Compared to the daily traffic volume of over 8,400 vpd on SH10, the net increase (of 64 vpd one way) is within the daily fluctuation (1.5%). This level of traffic generation can be easily accommodated by the existing integrated access with "Legal Road" / Industrial Way / SH10 without any additional mitigation …"

The proposal is wholly consistent with objective 15.1.3.2 which seeks to ensure that appropriate and efficient provision is made for loading and access for activities. The nature of the activity requires access and loading within the site to function effectively. Tracking provided within the Transport Assessment confirms that the trucks and courier vans have sufficient space on the site to manoeuvre and exit in a forward direction. Finally, objective 15.1.3.3 seeks to ensure that appropriate provision is made for on-site car parking. The proposal complies with parking requirements, and the access design is suitable in respect of anticipated traffic volume and design, consistent with objective 15.1.3.3.

The proposal is therefore consistent with the relevant objectives and policies of Chapter 15 Transportation.

Overall, it is considered that the proposal is consistent with the district-wide objectives and policies.

11.6 Far North Proposed District Plan 2023

11.6.1 Heavy Industrial Zone

The site and surrounding sites are proposed to be zoned Heavy Industrial zone under the PDP. Activities not listed in the chapter require discretionary activity consent (with trade suppliers and service stations being the only listed permitted activities). The proposed distribution centre while not involved in processing does involve the distribution of materials. This activity is not considered sensitive to heavy industrial type activities should these be developed on the adjacent sites (including Lot 2 for example) as provided for by the proposed zoning.

Overall, while the proposal is not entirely consistent with the objectives and policies of the Heavy Industrial zone, it is not contrary to the outcomes of the zone.

11.7 Weighting of ODP and PDP

The proposal does not require consent in respect of any PDP rules that have been identified as having immediate legal effect. Notwithstanding, sections 104 and 104D of the Act require regard to be had to any relevant provisions of a plan or proposed plan, as is set out above. Where there is a policy shift between the ODP and PDP, it must be determined whether greater weighting should be applied to the ODP or to the PDP, relative to the progress and status of the PDP.

In this instance, the site is zoned Industrial under the ODP and Heavy Industrial under the PDP, narrowing land use towards more heavy industries (processing and manufacturing) as opposed to industrial activities more broadly.

At this stage, hearings of the PDP are being held and therefore the PDP has little weight relative to the ODP therefore. Greater weighting is to be given to the policy direction of the ODP when assessing the proposed application.

Overall, the ODP has greater policy weighting than the PDP at the time this application was prepared.

11.8 Overall Statutory Conclusions

Overall, it is my assessment that the proposal is acceptable having regard to all relevant provisions of the ODP and PDP and the higher order documents as assessed.

12 Conclusion

In considering whether to approve the application, the Council is required to have regard to any relevant provisions of any national policy statements, national environmental standards, regional policy statements, regional plans and district plans. The Council is also required to have regard to the effects of the proposal on the environment and those other matters listed in section 104(1).

It is my opinion that, in respect of those matters that are relevant to the proposal:

1. The adverse effects of the proposal will be less minor on the amenity values and on the environment as a result of proposed earthworks. The proposed boundary adjustment will not have wider environmental effects as set out in section 7. All other aspects of the proposal including those related to traffic, noise and servicing (stormwater and wastewater discharge) are permitted and anticipated by the ODP and the PDP.

2. The proposal is not considered to result in adversely affected persons beyond a less than minor degree as set out in section 9.

3. The proposal is acceptable having regard to the relevant objectives and policies of the relevant National Policy Statements, Regional Policy Statement and the ODP and PDP for the reasons outlined in section 11.

4. The proposal is considered to result in the following positive effects:

    a) The proposal will contribute to the social and economic wellbeing of Waipapa and adjacent areas by providing for a distribution centre which will provide local employment opportunities while providing for the efficient and resilient distribution of mail and parcels to Northland.

    b) The proposal will provide for the efficient use and development of the limited land resource, acknowledging that Lot 2 has been vacant for a substantial period of time.

    c) For the avoidance of doubt, the proposal will give effect to the purpose and principles of the RMA for the reasons outlined in this AEE.

Based on the above, it is my opinion that the proposal is worthy of being granted resource consent, and on a non-notified basis.

Prepared by:



Penny Anson

MPlanPrac (Hons), Full.NZPI

Reviewed by:



Hannah Edwards

BPlan (Hons), Int.NZPI

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

Identifier	**NA109C/43**
Land Registration District	**North Auckland**
Date Issued	21 July 1998

Prior References
NA54B/1070

Estate	Fee Simple
Area	3999 square metres more or less
Legal Description	Lot 2 Deposited Plan 177522
Registered Owners	

Terrence Edward Donnelly and Simon Charles David Weil

Interests

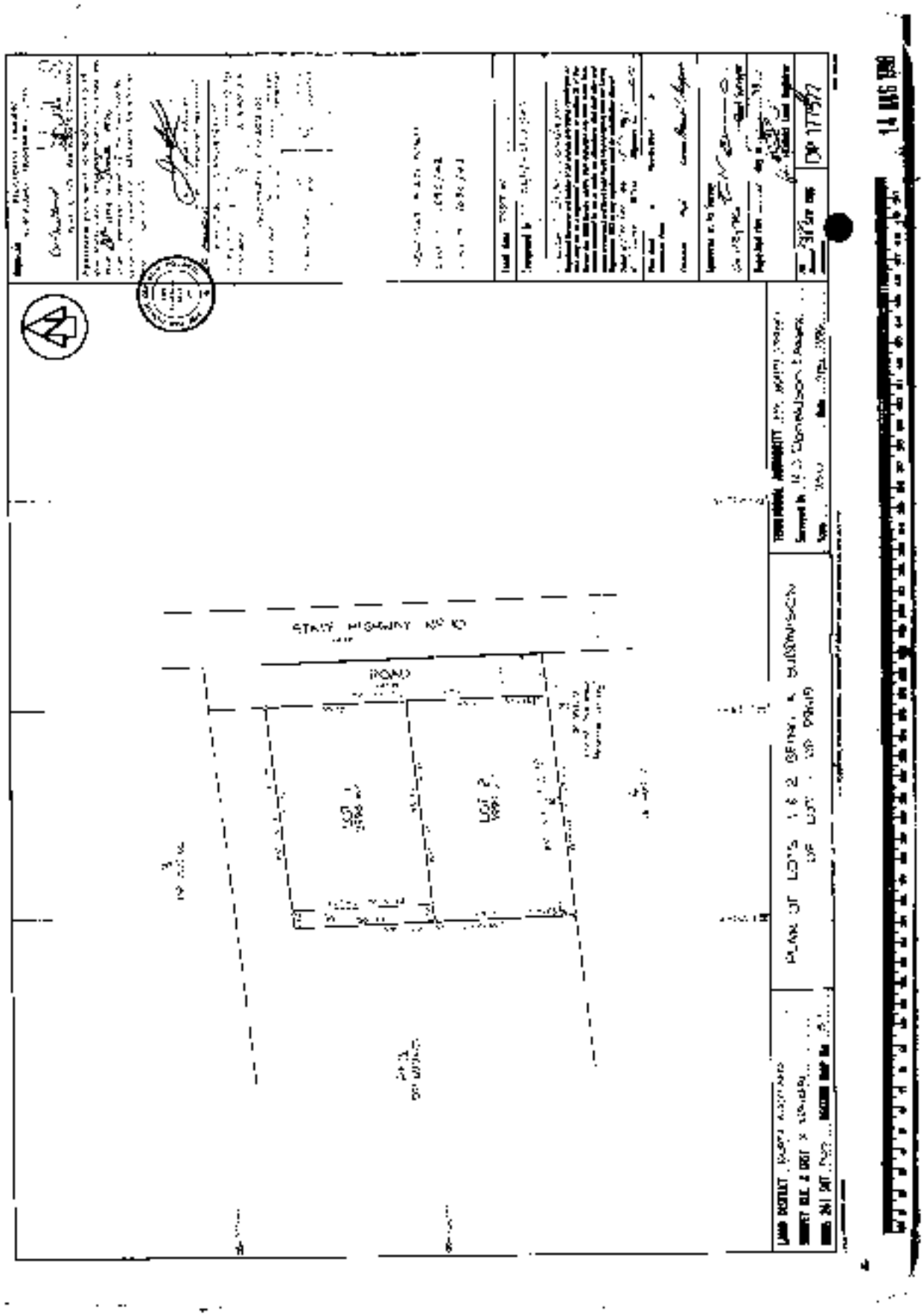
Appurtenant hereto is a right of way specified in Easement Certificate B199494.4 - 28.7.1983 at 9.03 am

Subject to a drainage right over part marked A on DP 177522 specified in Easement Certificate B199494.4 - 28.7.1983 at 9.03 am

The easements specified in Easement Certificate B199494.4 are subject to Section 309 (1) (a) Local Government Act 1974

Appurtenant hereto is a right of way specified in Easement Certificate D293710.3 - 21.7.1998 at 1.34 pm

12731468.3 Mortgage to Westpac New Zealand Limited - 24.5.2023 at 4:47 pm


STATE HIGHWAY NO 10
ROAD
LOT 1
DP 17977
LOT 2
DP 17977
PLAN OF LOTS 1 & 2 DEPOSITED PLAN 17977
LAND DISTRICT
SURVEY OFFICE PLAN
14 JUL 1992

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

Identifier	**NA109C/42**
Land Registration District	**North Auckland**
Date Issued	21 July 1998

Prior References
NA54B/1070

Estate	Fee Simple
Area	3998 square metres more or less
Legal Description	Lot 1 Deposited Plan 177522
Registered Owners	

Terrence Edward Donnelly and Simon Charles David Weil

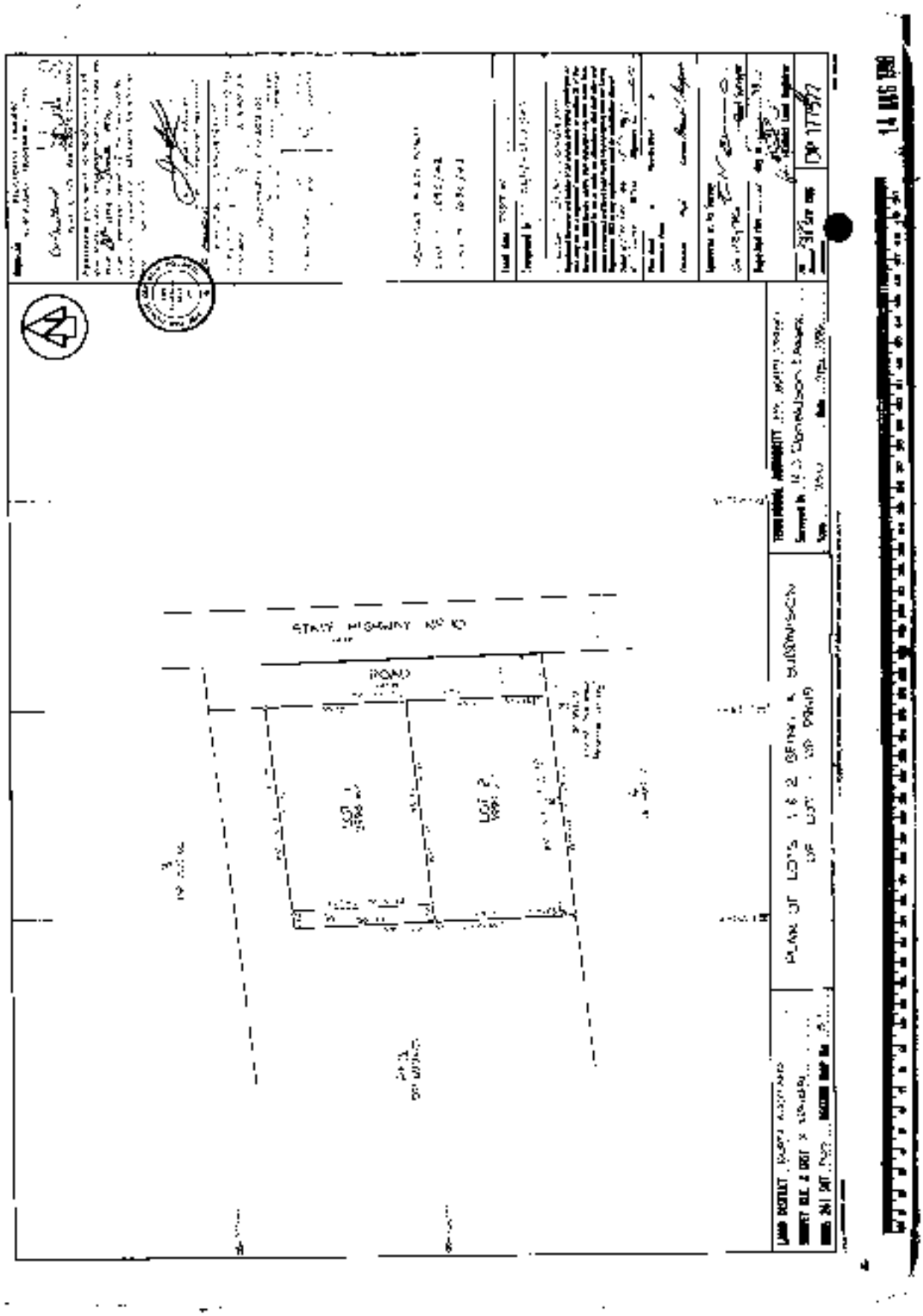
Interests

Appurtenant hereto is a right of way specified in Easement Certificate B199494.4 - 28.7.1983 at 9.03 am

The easements specified in Easement Certificate B199494.4 are subject to Section 309 (1) (a) Local Government Act 1974

Subject to a right of way over part marked B on DP 177522 specified in Easement Certificate D293710.3 - 21.7.1998 at 1.34 pm

12926425.2 Mortgage to Westpac New Zealand Limited - 2.2.2024 at 9:53 am


STATE HIGHWAY NO 10
ROAD
LOT 1
LOT 2
PLAN OF LOTS 1 & 2 BEING A SUBDIVISION
OF LOT 1 DP 17977
DP 17977

B199494.4EC

Approved by the District Land Registrar, North Auckland 5123/1, South Auckland 10B/1013/1/2/3/4, Gisborne 157/38, Hawke's Bay 109/251, Taranaki 214/62/1, Wellington 93B/89, Nelson 47B/9

EASEMENT CERTIFICATE

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

I, WE, LEONARD ROY HANSEN of Waipapa, Manufacturer and

CAROL JOSEPHINE HANSEN his wife

being the registered proprietor of the land described in the Schedule hereto hereby certify that the easements specified in that Schedule, the servient tenements in relation to which are shown on a plan of survey deposited in the Land Registry Office at Auckland on the 1st day of July 1983 under No. 99619 are the easements which it is intended shall be created by the operation of section 90A of the Land Transfer Act 1952

SCHEDULE

DEPOSITED PLAN NO. 99619

Nature of Easement (e.g., Right of Way, etc.)	Servient Tenement: Lot No(s) or other Legal Description	Servient Tenement: Object or Other Means of Identification of Part Subject to Easement	Dominant Tenement: Lot No(s) or other Legal Description	Title Reference
Right-of-Way	Part Lot 3 D.P. 69740	A	Lot 1 D.P. 99619	54B/1070
Drainage	Part Lot 1 D.P. 99619	B	Part Lot 3 D.P. 69740	25C/938

N.B. Do not use this space if full Description can be given above

N.B. Only the servient tenement requires description in this space

Notice to persons who may wish to present petitions for leave to introduce private bills or to be heard in opposition to such bills

1 Rights and powers. Bill 1

2 Terms, conditions, covenants or restrictions over lessor's land at the above estates Nil

N.B. The words printed thereon may be struck out

N.B. The words printed thereon may be used

Dated this 29th day of

1983

Signed by the above-named

LEONARD ROY HANSEN and

CAROL JOSEPHINE HANSON

in the presence of

Witness: .....

Occupation: .....

Address: .....

LTD

EASEMENT CERTIFICATE

IMPORTANT: Registration of this certificate does not of itself create any of the easements specified herein

Correct for purposes of the Land Transfer Act

Solicitor for the registered proprietor

The within easements when created will be subject to Section 309 (1) (a) Local Government Act 1974

ACR

Particulars entered in the Register as shown in the schedule of land hereon on the date and at the time stamped below

District Land Registrar of the District of

LAND REGISTRY AUCKLAND

PARTICULARS ENTERED IN REGISTER

28 JUL 83 B 199494

LAND REGISTRAR

544/208

548/1070

GRAHAM N. CAUTE
SOLICITOR
KERIKERI

1731 Avon Publishing Ltd P.O. Box 796 Auckland

D293710.3 EC

Approved by the District Land Registrar, South Auckland No. 351560
Approved by the District Land Registrar, North Auckland, No. 6180/81
Approved by the Registrar-General of Land, Wellington, No. 436748.2/81

EASEMENT CERTIFICATE

IMPORTANT Registration of this certificate does not of itself create any of the easements specified hereto

We JOHN HENRY PATERSON AND KEITH FREDERICK ARDERN (jointly inter se) as to an undivided one half share and EDITH LOGAN PATERSON and KEITH FREDERICK ARDERN (jointly inter se) as to an undivided one half share as tenants in common in the said shares.

being the registered proprietors of the land described in the Schedule hereto hereby certify that the easements specified in that Schedule, the servient tenements in relation to which are shown on a plan of survey deposited in the Land Registry Office at Auckland on the day of 198 under No 177522 are the easements which it is intended shall be created by the operation of section 90A of the Land Transfer Act 1952.

SCHEDULE

DEPOSITED PLAN NO. 177522

Nature of Easement (e.g. Right of Way, etc.)	Servient Tenement: Lot No.(s) or other Legal Description	Servient Tenement: Colour, or Other Means of Identification, of Part Subject to Easement	Dominant Tenement Lot No.(s) or other Legal Description	Title Reference
Right of Way	Lot 1 DP 177522	(B)	Lot 2 DP 177522	109C/42 (servient) 109C/43 (dominant)

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

1 Rights and powers:

The rights and powers and the terms, conditions, covenants or restrictions with respect to the easements of right of way described herein shall be those as set out in the Ninth Schedule to the Property Law Act 1952 and the Seventh Schedule to the Land Transfer Act 1952 insofar as such relate to easements of right of way.

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

DATED this 16 th day of 9 - 7 1998

SIGNED by the abovenamed
JOHN HENRY PATERSON &
EDITH LOGAN PATERSON
in the presence of:

Witness:

Witness name: S BLACKMORE

Occupation: SECRETARY

Address: KERIKERI

Dated this day of

Signed by the above-named

KEITH FREDERICK ARDERN

in the presence of

Witness: S Blackmore

Occupation: SECRETARY

Address: KERIKERI

EASEMENT CERTIFICATE

IMPORTANT: Registration of this certificate does not of itself create any of the easements specified herein

Correct for the purposes of the Land Transfer Act

Solicitor for the registered proprietor

3D EE - 43
(109c/42a043)

WEBB ROSS JOHNSON
SOLICITORS
WHANGAREI

(MR HOOPER)

21 JUL 98 D 293710

LAND DISTRICT
PARTICULARS ENTERED

DISTRICT LAND REGISTRAR
NORTH AUCKLAND

© AUCKLAND DISTRICT LAW SOCIETY 1993
REP 4082

NZ POST DEVELOPMENT

For SmartSteel Ltd

State Highway 10, Waipapa 0230

Lot 2 DP 177522

NEO ARCHITECTURE STUDIO

SMARTSTEEL BUILDINGS

JOB NO: 2423
ISSUE: RESOURCE CONSENT
DATE: 14/08/2025



Proposed building site
State Highway 10, Waipapa, 0230
Lot 2
DP 177522

LOCATION PLAN

NEO ARCHITECTURE STUDIO

CONTACT
P 021 182 0261
E admin@neoas.co.nz
W www.neoas.co.nz

CLIENT
SMARTSTEEL BUILDINGS

PROJECT
NZ POST DEVELOPMENT
State Highway 10
Waipapa 0230

RevID	Transmittal Set Name	Date
CD - 03	CONCEPT	14/04/2025
CD - 04	CONCEPT	15/04/2025
INF - 12	INFORMATION	1/07/2025
INF - 13	INFORMATION	17/07/2025
INF - 15	INFORMATION	29/07/2025
RC - 01	RESOURCE CONSENT	14/08/2025

DRAWN: DANE ALLISON
ENGINEER: TBC
ISSUE: RESOURCE CONSENT
For consultation only. Destroy all drawings once consent drawings are issued, not for pricing or construction.

SHEET TITLE: **LOCATION PLAN**

DATE: **14/08/2025**
SCALE @ A1: **N.T.S**
JOB NUMBER: **2423**
REVISION: **RC - 01**
SHEET NO: **1.1**

1DP343062

Boundary line

MH

76.00

PROPOSED
LOT 2 AREA
4,875.12 m² (approx)

CONCRETE

EXISTING BUILDING

Deck Area

CONCRETE

EXISTING SEPTIC TANK

Boundary line

Road boundary line

LEGAL ROAD

STATE HIGHWAY 10

74.00

OPEN STORMWATER DRAIN

B

P

Easement

Existing boundary line

EXISTING LOT 2 AREA
3,998.61 m² (approx)

8,589
8.5m power line setback

4,581
4.5m power line setback

Line of fence

7.2 kW (32/Io amp single phase)

Approx location of reserve effluent fields

24.00 m²

30 kW (60amp)

New planting to screen property. Max 2m high

Approx location of effluent fields

80.00 m²

Duracrete Cleanstream TRX Tank

2 / 25,000L concrete water tanks for attenuation and potable water

4 / 25,000L concrete water tank for firefighting with approved coupling

PROPOSED
LOT 2 AREA
3,121.48 m²
(approx)

YARD AREA
576.30 m²

ALL CONCRETE
1,672.31 m²

Proposed boundary line

Line of existing road

ENTRY / EXIT

auto gate

planting

CANOPY
516.72 m²

SIGNAGE
5.2x1.2m sign (6.24m²)

min 4.5m canopy height

Data cable (CAT)

Power supply

DATA

50,378
signage

PROPOSED BUILDING COVERAGE
(including canopies)
1,311.71 m²

Floor area
680.00 m²

TRUCK CANOPY
114.70 m²

Mail Sort
120.00 m²
no walls or ceiling

Office
80.00 m²

2m setback

Existing overhead power line

approx location

Road boundary line

New planting to screen property. Max 2m high

1.8m high close boarded fence

32amp/threphase forklift charger

2/20amp single phase

Easement

OPEN STORMWATER DRAIN

Boundary line

STATE HIGHWAY 10

SITE NOTES

LEGAL DESCRIPTION
LOT 2
DP 177522

AREA 3,999m²

State Highway 10
Waipapa 0230

WIND ZONE	High
DURABILITY ZONE	C
EARTHQUAKE ZONE	1
CLIMATE ZONE	1
WIND REGION	A
LEE ZONE	NO
SNOW LOAD	NO
RAINFALL INTENSITY	90-100
TA ZONE	Industrial / Heavy Industrial - FNDC
HAZARDS	River flood hazard (50 & 100 ARI) NRC floor susceptible

FLOOR AREA

FLOOR AREA	=680.00m²

COVERAGE

BUILDING AREA *(including canopy)*	=1,311.71m²
CONCRETE AREA	=1,672.31m²
TOTAL IMPERVIOUS AREA	**=2,352.31m²**

CARPARK REQUIREMENTS

FNDC Rule:
Industrial Activities 1 per 100m² GBA

Carparks
Floor area 680m² = 7

Total carparks required 7

NEO ARCHITECTURE STUDIO

CONTACT
P 021 182 0261
E admin@neoas.co.nz
W www.neoas.co.nz

CLIENT
SMARTSTEEL BUILDINGS

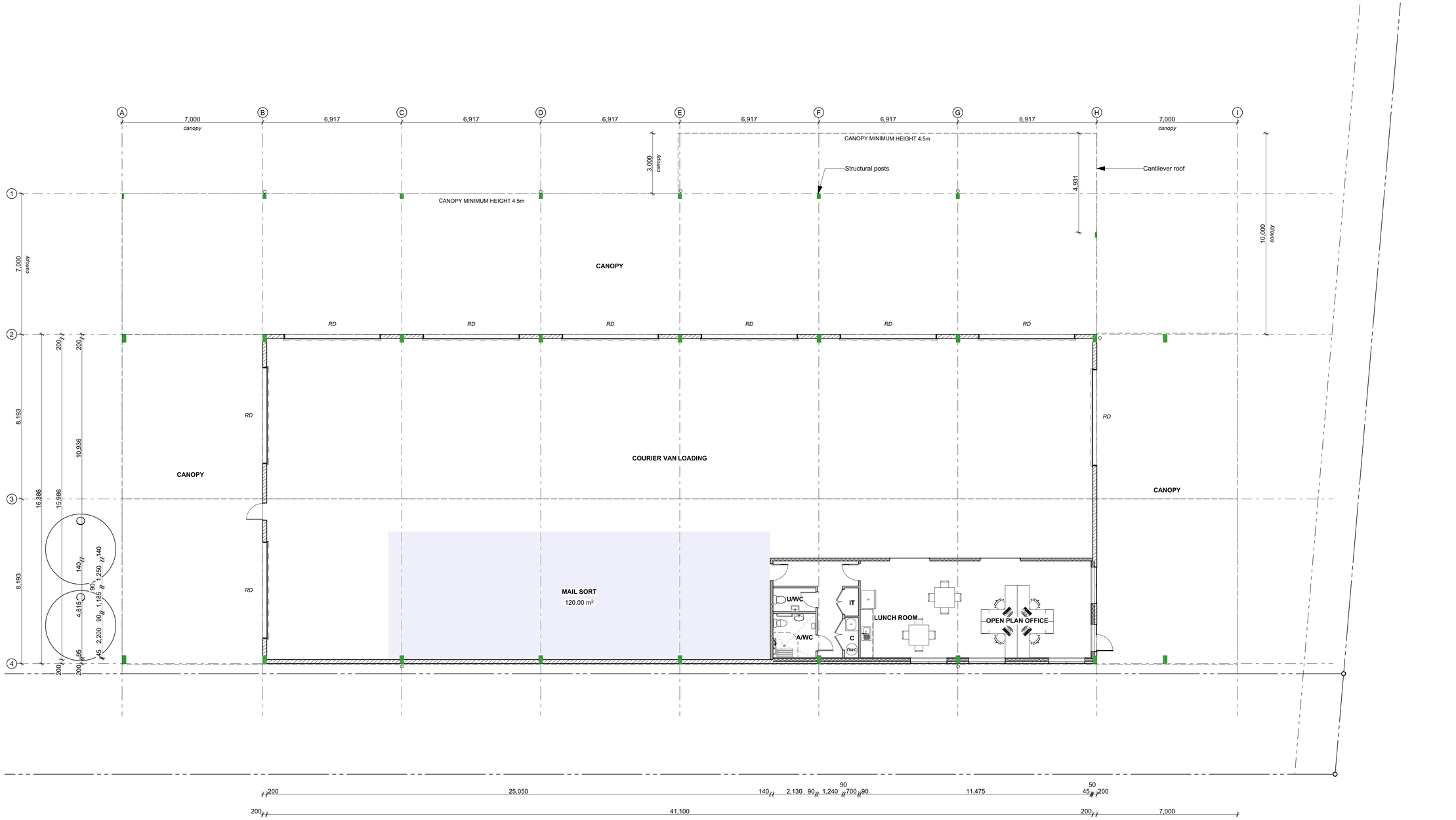
PROJECT
NZ POST DEVELOPMENT
State Highway 10
Waipapa 0230

RevID	Transmittal Set Name	Date
CD - 04	CONCEPT	15/04/2025
INF - 12	INFORMATION	1/07/2025
INF - 13	INFORMATION	17/07/2025
INF - 14	INFORMATION	25/07/2025
INF - 15	INFORMATION	29/07/2025
RC - 01	RESOURCE CONSENT	14/08/2025

DRAWN: DANE ALLISON
ENGINEER: TBC
ISSUE: RESOURCE CONSENT
For consultation only. Destroy all drawings once consent drawings are issued, not for pricing or construction.

SHEET TITLE: **SITE PLAN**

DATE: **14/08/2025**
SCALE @ A1: **1:200**
JOB NUMBER: **2423**
REVISION: **RC - 01**
SHEET NO: **1.2**



KEY

= Steel girts

= Insulated walls

= Internal non walls

= Structural posts

NEO ARCHITECTURE STUDIO

CONTACT

P 021 182 0261
E admin@neoas.co.nz
W www.neoas.co.nz

CLIENT

SMARTSTEEL BUILDINGS

PROJECT

NZ POST DEVELOPMENT

State Highway 10
Waipapa 0230

RevID	Transmittal Set Name	Date
CD - 03	CONCEPT	14/04/2025
CD - 04	CONCEPT	15/04/2025
INF - 12	INFORMATION	1/07/2025
INF - 13	INFORMATION	17/07/2025
INF - 15	INFORMATION	29/07/2025
RC - 01	RESOURCE CONSENT	14/08/2025

DRAWN: DANE ALLISON

ENGINEER: TBC

ISSUE: RESOURCE CONSENT

For consultation only. Destroy all drawings once consent drawings are issued, not for pricing or construction.

SHEET TITLE

FLOOR PLAN

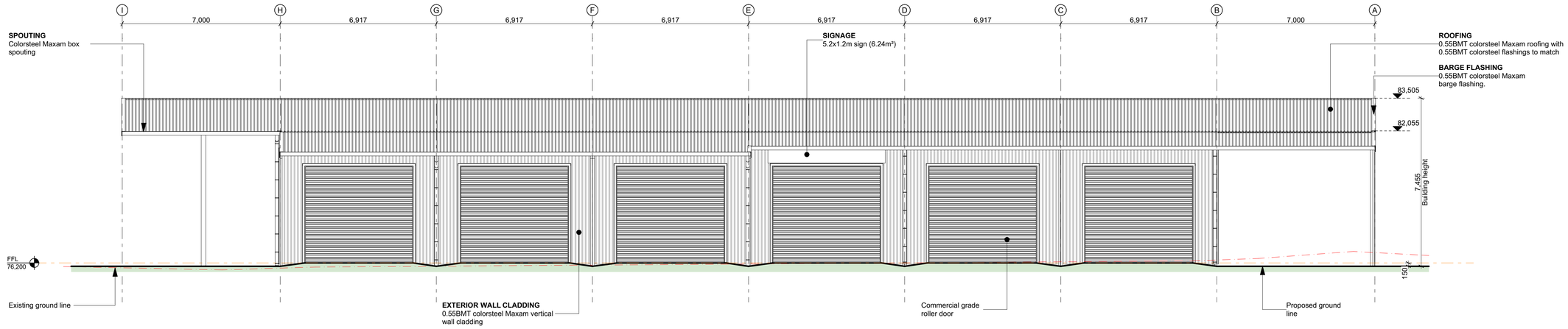
DATE: **14/08/2025**

SCALE @ A1: **1:100**

JOB NUMBER: **2423**

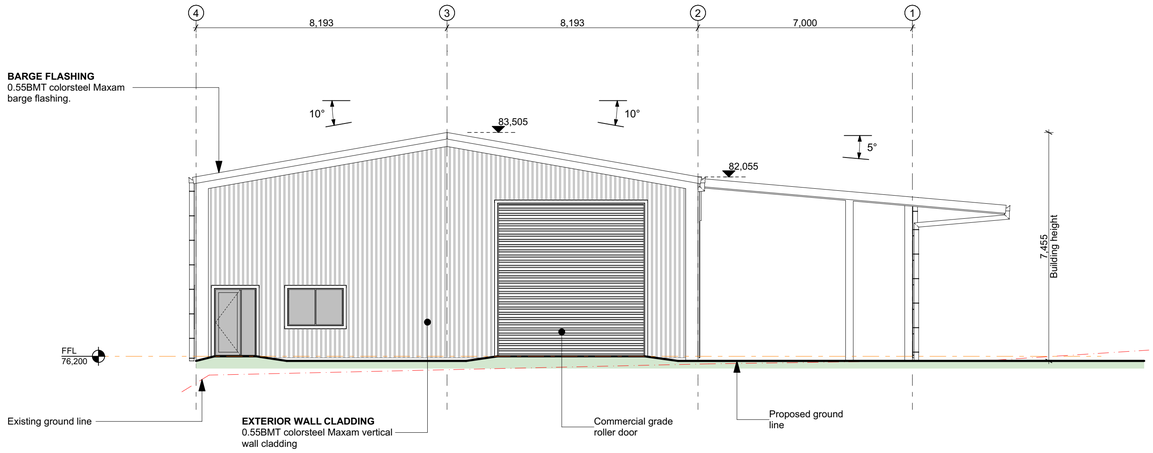
REVISION: **RC - 01**

SHEET NO: **1.3**



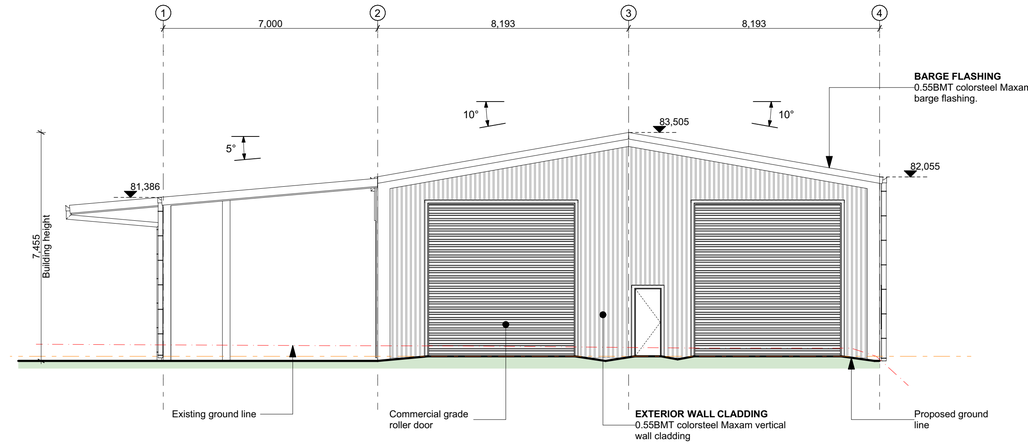
NORTH ELEVATION

SCALE 1:100



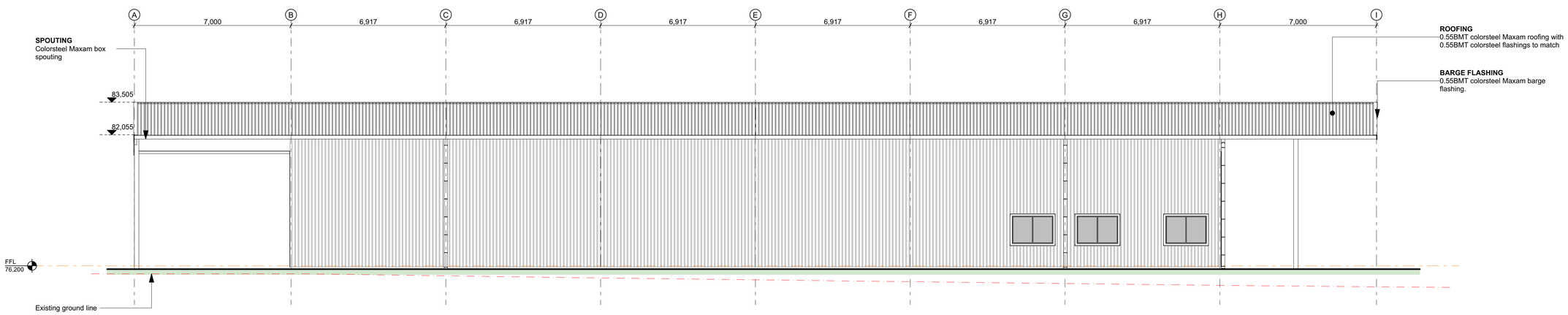
EAST ELEVATION

SCALE 1:100



WEST ELEVATION

SCALE 1:100



SOUTH ELEVATION

SCALE 1:100

NEO ARCHITECTURE STUDIO

CONTACT
P 021 182 0261
E admin@neoas.co.nz
W www.neoas.co.nz

CLIENT
SMARTSTEEL BUILDINGS

PROJECT
NZ POST DEVELOPMENT
State Highway 10
Waipapa 0230

RevID	Transmittal Set Name	Date
INF - 02	INFORMATION	28/08/2024
INF - 12	INFORMATION	1/07/2025
INF - 13	INFORMATION	17/07/2025
INF - 15	INFORMATION	29/07/2025
RC - 01	RESOURCE CONSENT	14/08/2025

DRAWN: DANE ALLISON
ENGINEER: TBC
ISSUE: RESOURCE CONSENT
For consultation only. Destroy all drawings once consent drawings are issued, not for pricing or construction.

SHEET TITLE: **ELEVATIONS**

DATE: **14/08/2025**
SCALE @ A1: **1:100**
JOB NUMBER: **2423**
REVISION: **RC - 01**
SHEET NO: **1.4**

PROPOSED WASTEWATER TREATMENT & DISPOSAL,

1945A STATE HIGHWAY 10, WAIPAPA,
FAR NORTH DISTRICT,
Lot 2 DP 177522,

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV 01



NOTES:

LEGAL DESCRIPTION:
LOT: 2,
DP: 177522,
AREA: 3,998.61M²,

ADDRESS:
1945 State Highway 10,
Waipapa

TERRITORIAL LOCAL AUTHORITY:
FAR NORTH DISTRICT COUNCIL,

REGIONAL COUNCIL:
NORTHLAND REGIONAL COUNCIL,

FAR NORTH DISTRICT GIS:

ZONE:INDUSTRIAL ZONES, HEAVY INDUSTRIAL. ,

EFFLUENT: HIGH RISK, REQUIRING SIGNIFICANT MANIPULATION,

SETBACK RESTRICTIONS:
BUILDINGS: >3M,
BOUNDARIES: >1.5M,
OVERLAND FLOW PATHS: >5M,
WATER TABLE: >600MM

CLIMATE ZONE: 1
EARTHQUAKE ZONE: ZONE 1
EXPOSURE ZONE: ZONE C
LEE ZONE: NO
RAINFALL RANGE: 80 - 90
WIND REGION: A
WIND ZONE: HIGH

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV 01

ON-SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
L101
LOCATION PLAN



NOTES:

LEGAL DESCRIPTION:
LOT: 2,
DP: 177522,
AREA: 3,998.61M²,

ADDRESS:
1945 State Highway 10,
Waipapa

TERRITORIAL LOCAL AUTHORITY:
FAR NORTH DISTRICT COUNCIL,

REGIONAL COUNCIL:
NORTHLAND REGIONAL COUNCIL,

FAR NORTH DISTRICT GIS:

ZONE: INDUSTRIAL ZONES, HEAVY INDUSTRIAL. ,

EFFLUENT: HIGH RISK, REQUIRING SIGNIFICANT MANIPULATION,

SETBACK RESTRICTIONS:
BUILDINGS: >3M,
BOUNDARIES: >1.5M,
OVERLAND FLOW PATHS: >5M,
WATER TABLE: >600MM

CLIMATE ZONE: 1
EARTHQUAKE ZONE: ZONE 1
EXPOSURE ZONE: ZONE C
LEE ZONE: NO
RAINFALL RANGE: 80 - 90
WIND REGION: A
WIND ZONE: HIGH

LEGEND:

— Boundaries,

Soil Testing Location,

COORDINATES:
HA01
EASTING: 1683677.44
NORTHING:
6102758.45

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV
0

ON-SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
L102
SITE PLAN



N

NOTES:

LEGAL DESCRIPTION:
LOT: 2,
DP: 177522,
AREA: 3,998.61M²,

ADDRESS:
1945 State Highway 10,
Waipapa

SOIL: CAT 4
Waipapa clay - YF

OCCUPATION RATE: 12
Wastewater Flow Allowance: 30
Total daily wastewater flow: 240
DLR: 3MM/DAY

EFFLUENT DISPOSAL FEILD:
80M²

RESERVE AREA:
A RESERVE AREA OF 30%, 24M² AVAILABLE WITHIN BOUNDARY PERIMETER.

TERRITORIAL LOCAL AUTHORITY:
FAR NORTH DISTRICT COUNCIL,

REGIONAL COUNCIL:
NORTHLAND REGIONAL COUNCIL,

SETBACK RESTRICTIONS:
BUILDINGS: >3M,
BOUNDARIES: >1.5M,
OVERLAND FLOW PATHS: >5M,

NRC REGIONAL PLAN: C.6.1.3

LEGEND:

CONTOURS,

SETBACK REQUIREMENTS

SOIL TESTING LOCATION,

COORDINATES:
HA01
EASTING: 1683677.44
NORTHING: 6102758.45

DURACRETE
PRECAST TO LAST

WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

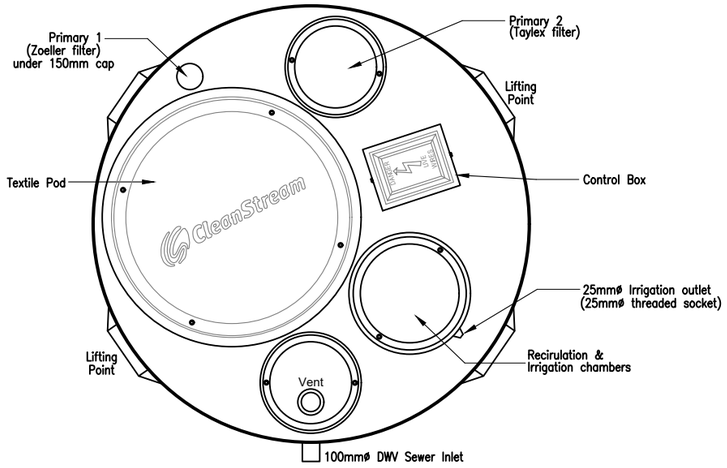
REV 01

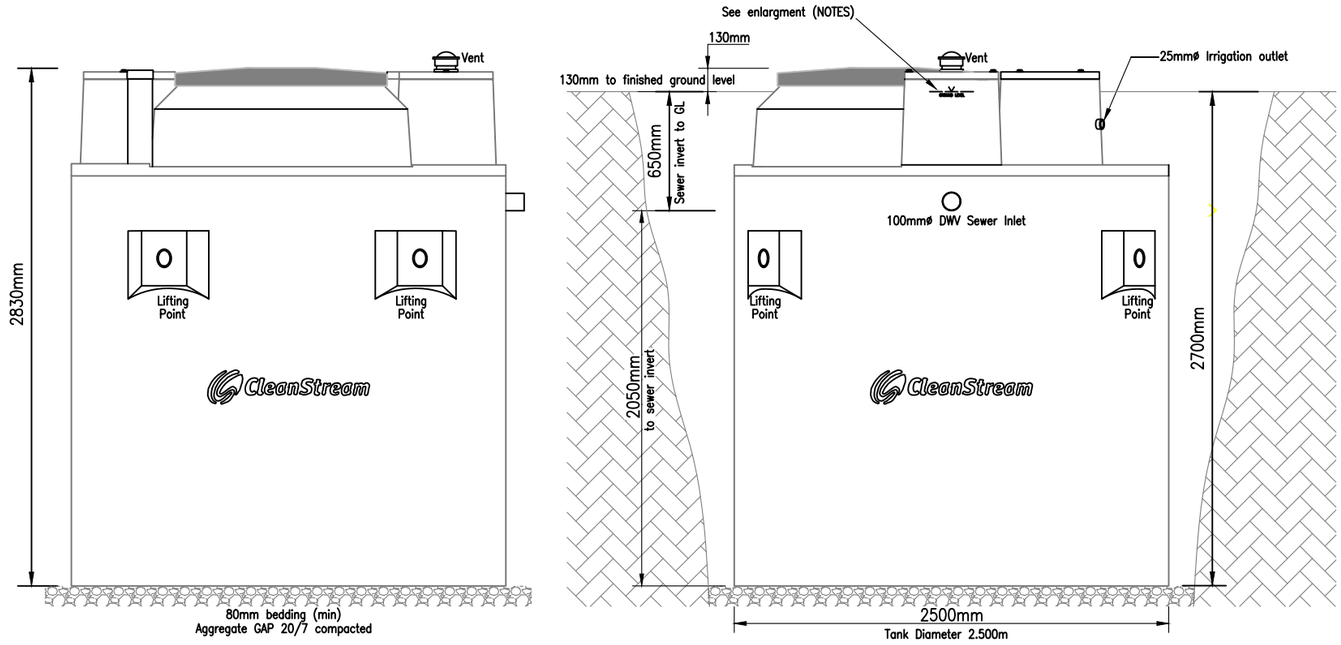
ON-SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
L103
DETAILED SITE PLAN





NOTES:

ENLARGEMENT:
CLEANSTREAM MUST NOT BE INSTALLED BELOW THIS LEVEL.



GROUND LEVEL:
FINISHED GROUND LEVEL NOT TO EXCEED INDICATED LEVEL ON CLEANSTREAM TXR.

INSTALLATION INSTRUCTIONS:
REFER TO INSTALLATION MANUAL, CLEANSTREM TXR BIOFILTRATION TEXTILE SYSTEM.

SETBACK RESTRICTIONS:
- BUILDINGS: >3M,
- BOUNDARIES: >15.M,
- OVERLAND FLOW PATHS: >5M,

TXR TO BE INSTALLED IN LOCATION ACCESSIBLE FOR FUTURE DE-SLUGGING.

WATER FILLING OF CHAMBER:
PRIMARY 1 - 3000L,
PRIMARY 2 - 1700L,
RETICULATION - 1500L,
IRRIGATION - 500L,

ELECTRICAL INSTRUCTIONS:
REFER TO ELECTRICAL WIRING INSTRUCTIONS FOR CLEANSTREAM TXR SEWAGE SYSTEM CONTROLLER, LOCATED UNDER THE CONTROL BOX.

THE CLEANSTREAM TXR SHOULD NOT BE USED IN ANY WAY UNTIL THE SYSTEM HAS BEEN COMMISSIONED. THIS INCLUDES CONTRACTORS DURING CONSTRUCTION OF THE HOUSE, AND OWNERS WISHING TO TAKE UP RESIDENCY.

ONCE INSTALLED THE WASTEWATER TREATMENT UNIT SHALL BE FILLED WITH WATER TO PREVENT ANY FLOATATION, AND ASSIST WITH THE COMMISSIONING OF THE PLANT.

ALL DRAINAGE WORK SHALL COMPLY IN ACCORDANCE WITH AS/NZS 3500.2:2021 PLUMBING AND DRAINAGE - PART 2: SANITARY PLUMBING AND DRAINAGE, THE BUILDING ACT 1991, THE BUILDING REGULATIONS 1992 AND APPROVED DOCUMENTS, (IN PARTICULAR, APPROVED DOCUMENT G13: FOUL WATER) AND THE RELEVANT NZ STANDARDS AND LEGISLATION, AND BE CARRIED OUT BY A REGISTERED DRAINLAYER.

DURACRETE
PRECAST TO LAST

WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV
01

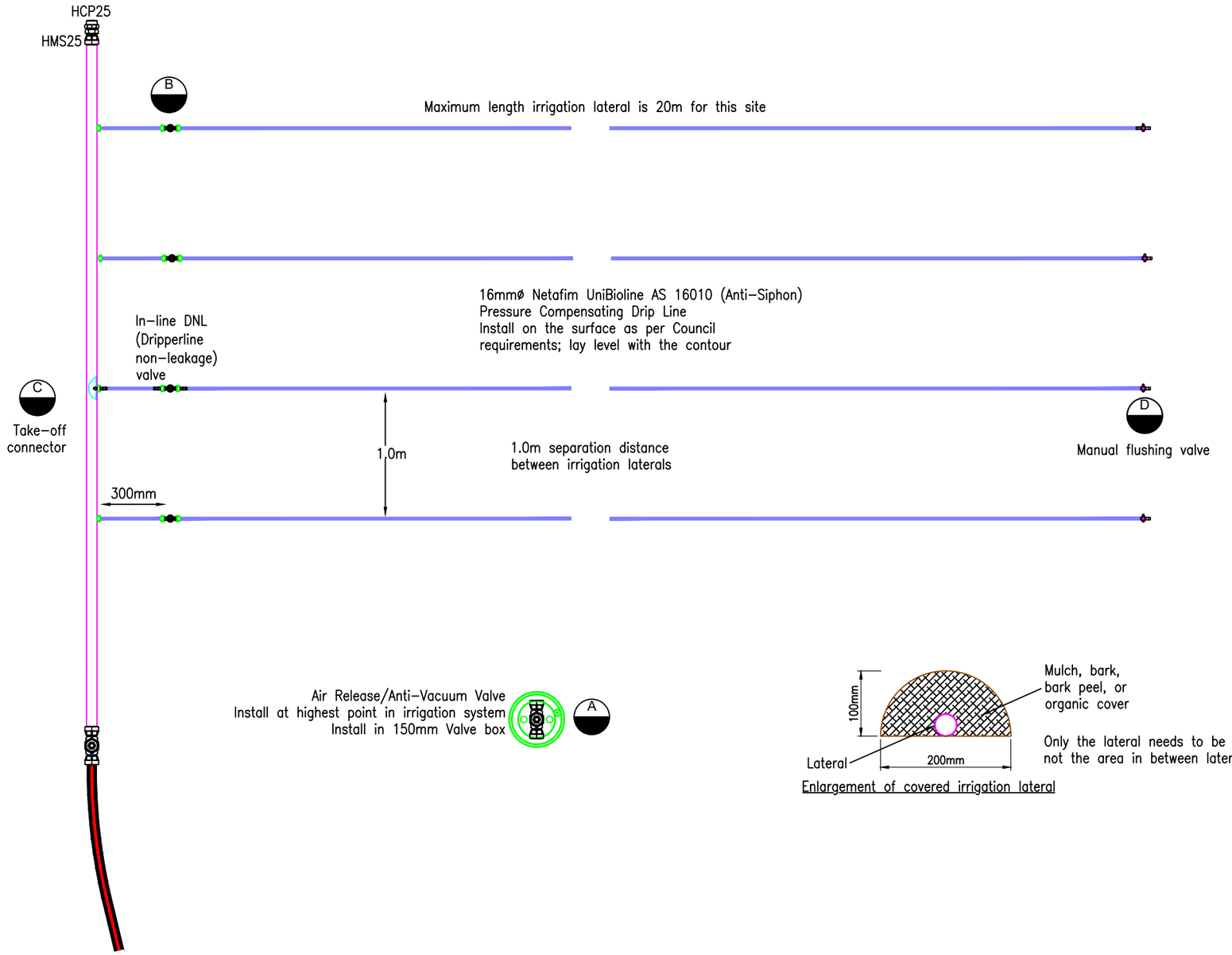
ON-SITE WASTEWATER MANAGEMENT

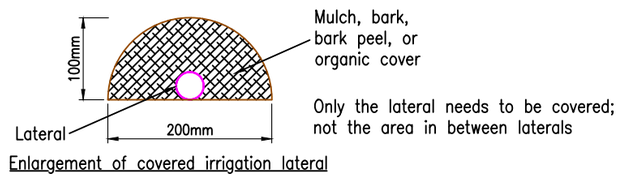
1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
A101
CLEANSTREAM TXR

Schematic Only:
Drainlayer or Installer
to confirm layout of
Irrigation system
on–site





Enlargement of covered irrigation lateral

NOTES:

SCHEMATIC ONLY:
DRAINLAYER OR INSTALLER TO CONFIRM LAYOUT OF IRRIGATION SYSTEM ON-SITE.

DESIGN OCCUPANCY RATE: 12,
DOMESTIC FLOW ALLOWANCE: 20L,
DAILY WASTEWATER FLOW: 240L,

IRRIGATION DISPOSAL AREA:
INSTALL 80 LINEAL METRES OF DRIP IRRIGATION. MAXIMUM LENGTH OF LATERAL 65M. DRIP IRRIGATION LATERALS SPACED AT A MINIMUM OF 1.0M APART.

PROPOSED DESIGN:
4 X LATERAL @ 20M,

DRIP IRRIGATION TO BE INSTALLED WITHIN THE AREA INDICATED ON DETAILED SITE PLAN.
INSTALLED LEVEL WITH CONTOUR.
AREA TO BE PLANTED WITH SUITABLE EVAPORATIVE UPTAKE PLANTS.

RESERVE AREA:
A RESERVE AREA OF 30%, APPROXIMATELY 24 M², IS AVAILABLE WITHIN THE BOUNDARY PERIMETER

AIR RELEASE VALVE:
RELOCATE THE ARV IF APPLICABLE. THE ARV SHOULD BE LOCATED AT THE HIGHEST POINT OF THE DISPOSAL SYSTEM.

SETBACK RESTRICTIONS:
- BUILDINGS: >3M,
- BOUNDARIES: >15.M,
- OVERLAND FLOW PATHS: >5M,
- POUND: >10M,
- OPEN WATER WAYS: >15M,

THE LOCATION OF THE LAND APPLICATION AREA AND THE DRIPLINES SHOULD BE SHOWN IN THE AS-BUILT PLAN. THE
AS-BUILT SHOULD ALSO SHOW BUILDINGS AND BOUNDARIES.
PHOTOS CAN SUPPLEMENT THE AS-BUILT

SURFACE WATER:
INFLOW OF SURFACE WATER INTO THE LAND APPLICATION IRRIGATION AREA SHALL BE CONTROLLED OR PREVENTED. THIS CAN BE ACHIEVED BY INSTALLING CUT-OFF TRENCHES OR SHALLOW DIVERSION DRAINS TO DIVERT SURFACE AND GROUNDWATER AWAY FROM THE IRRIGATION AREA (IF REQUIRED).

AS/NZS 1547:2012 "ON-SITE DOMESTIC WASTEWATER
MANAGEMENT" PROVIDES DESIGN METHODS FOR
IRRIGATION SYSTEMS. PLEASE REFER TO THE STANDARD
FOR THIS DESIGN INFORMATION. THESE GUIDELINES
SUPPORT THE STANDARD.

THE LOCATION OF THE LAND APPLICATION AREA AND THE DRIPLINES SHOULD BE CLEARLY INDICATED IN THE AS-BUILT PLAN. THE AS-BUILT PLAN MUST ALSO INCLUDE THE LOCATIONS OF BUILDINGS AND PROPERTY BOUNDARIES.
ADDITIONALLY, PHOTOGRAPHS MAY BE INCLUDED TO SUPPLEMENT THE AS-BUILT DOCUMENTATION.

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV 1.0

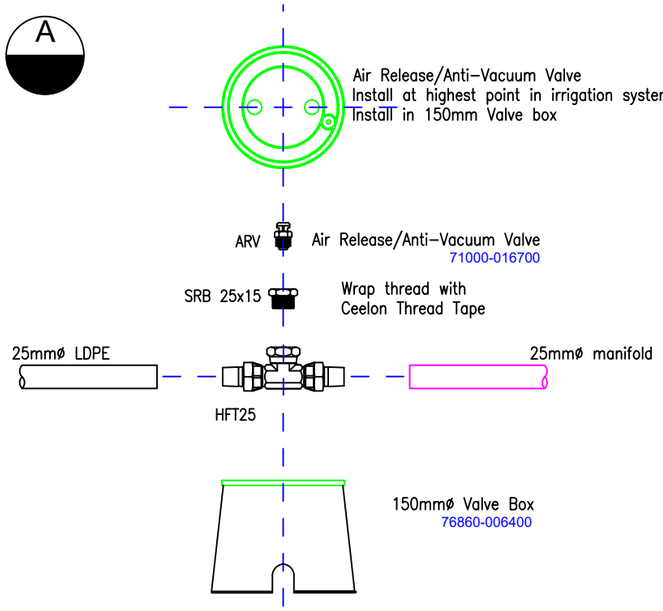
ON–SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

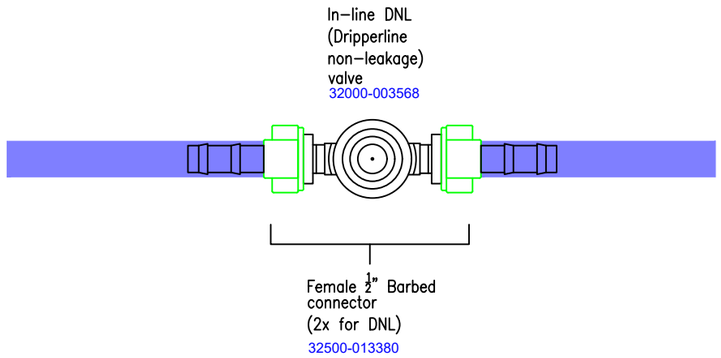
REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
A102
IRRIGATION LAYOUT

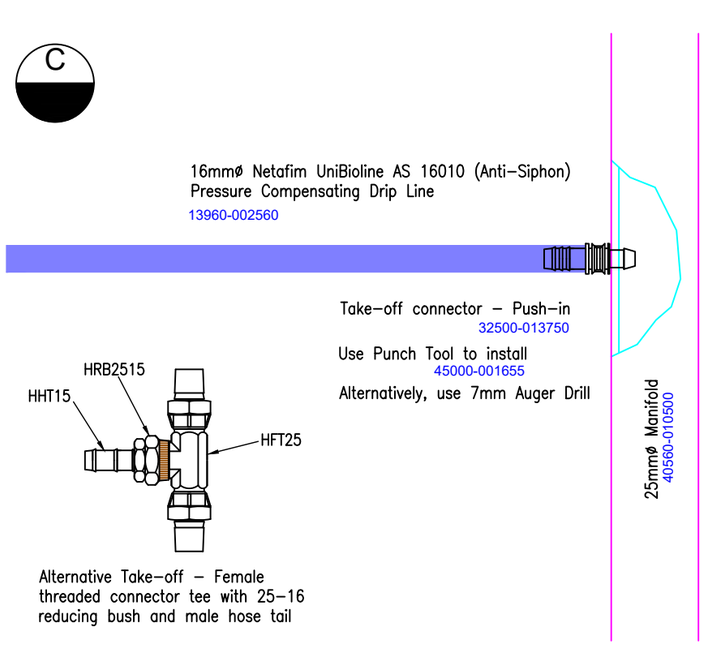
A



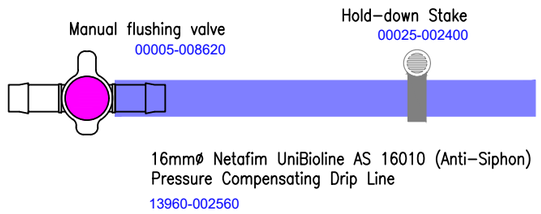
B



C



D



NOTES:

DESIGN SPECIFICATIONS:
CAPABLE OF ACCOMMODATING A DAILY WASTEWATER PRODUCTION OF 900 L, AS PER AS/NZS 1547:2012, TABLE H3, DOMESTIC WASTEWATER FROM HOUSEHOLD – NZ.

AS/NZS 1547:2012 "ON-SITE DOMESTIC WASTEWATER MANAGEMENT" PROVIDES DESIGN METHODS FOR IRRIGATION SYSTEMS. PLEASE REFER TO THE STANDARD FOR THIS DESIGN INFORMATION. THESE GUIDELINES SUPPORT THE STANDARD.

DO NOT SCALE, CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK.

© COPYRIGHT
THIS DESIGN AND DRAWING IS COPYRIGHT OF DURACRETE PRODUCTS LTD. IT MAY NOT BE COPIED OR REPRODUCED IN ANY FORMAT OR IN ANY MEDIUM WITHOUT THE WRITTEN AUTHORISATION FROM DURACRETE PRODUCTS LTD.

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV 01

ON–SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET: A103
Irrigation Components



REVISION HISTORY:

#	DATE	DESCRIPTION	APPROVED
1			
2			
3			
4			

NOTES:

- Levels are in terms of n/a
- Horizontal data is in Mt Eden 2000
- All underground and above services may not be surveyed or shown on this plan.
- Please consult Service Providers before carrying out any excavation or construction.
- Taiao Surveyors accepts no responsibility for services omitted by this survey.
- Contours are at n/a intervals.

Prepared By:	BY	DATE
SURVEY		
DRAWN	AR	10/08/2025
CHECKED	TW	10/08/2025
REVIEWED	PA	11/08/2025

TAIAO SURVEYORS
ENGINEERING SURVEYING
460 Kerikeri Rd, Kerikeri, Northland 0293
Phone: 021 1124021
Email: taiaosurveyors@gmail.com

Client:
CLL
1945 State Highway 10
Waipapa, Northland

Agent:

TITLE:
Proposed Boundary Adjustment Plan of Lot 2 DP177522 at
1945 State Highway 10, Waipapa

This drawing shall not be reproduced or copied in whole or in part,or used for any purpose other than originally intended, without the permission of Taiao Surveyors.

JOB: 202502
SHEET: 2
SCALE: 1:750 @ A3
PROJECT FILE: DATA
REVISION:

CAPTURE
Land Development Consultants

RESOURCE CONSENT INFRASTRUCTURE REPORT

NZ POST DEVELOPMENT
1945 STATE HIGHWAY 10, WAIPAPA, NORTHLAND

Document Record

Client:	CLL Service & Solutions
Site Address:	1945 State Highway 10, Waipapa, Northland
Project Number:	1348
Document Title	1348 NZ Post RC Infrastructure Report – Rev A

Document Status

Status:	For Resource Consent
Issue Date	August 2025

Report Author	Kerryn McPherson (Senior Engineer)	
Report Reviewer	Dean Lupton (Engineer / Director)	

Contents

1. Executive Summary 4
2. Site Description 4
3. Proposed Development 5
4. Earthworks 7
   4.1 Proposal 7
5. Erosion & Sediment Control 8
6. Site Access 9
   6.1 Proposal 9
7. Stormwater 9
   7.1 Existing Stormwater 9
   7.2 Existing Stormwater Management Plan 9
   7.3 Stormwater Proposal 10
      7.3.1 Stormwater Data 10
      7.3.2 Stormwater Attenuation 11
      7.3.3 1% AEP Post-development Discharge 11
   7.3 Stormwater Reticulation 12
   7.4 Overland Flowpath and Finished Floor Level 12
8. Wastewater 13
   8.1 Existing 13
   8.2 Proposal 13
9. Water Supply and Firefighting Requirements 13
10. Utilities 14

Appendix A – Engineering Design Plans 15
Appendix B – Stormwater Consultation 16
Appendix C – Infrastructure Report of Neighbouring Approved Development 17
Appendix D – Stormwater Calculations 18
Appendix E – Wastewater Design – Duracrete Ltd 19

1. Executive Summary

Capture Land Limited have been engaged by CLL Solutions Ltd to undertake civil engineering design and reporting to support the resource consent application for the NZ Post Development at 1945 State Highway 10, Waipapa, Northland.

The development consists of the following :

- Construct a 680m^2 industrial building with canopy for use by NZ Post.
- Form concrete and metal carparking and manoeuvring area.
- Install three water infrastructure and services to the new building.

The purpose of this report is to address the civil infrastructure and servicing requirements outlined below, in accordance with Far North District Council standards. This report should be read in conjunction with the consent application documents.

- Earthworks
- Sediment & Erosion Control
- Hardstand Carparking and Manoeuvring
- Stormwater
- Wastewater
- Water Supply
- Services

2. Site Description

The site is located at 1945 State Highway 10, Waipapa, Northland and is legally described as Lot 2 DP177522, RT NA109C/43. The site is zoned Industrial under the Far North District Plan and has an area of 4000m^2.

The site has industrial development to the north and west and grassed farm land to the south. Access is gained via the legal road which runs adjacent to State Highway 10. The site has a slight fall from middle of the site to all external boundaries. There is an open drain that is approximately 0.5m – 1m deep running along the southern boundary from west to east in direction.



Figure 1 – 1945 State Highway 10, Waipapa (GRIP)

3. Proposed Development

The development involves the construction of a 680m^2 industrial building with a 618m^2 canopy area. Surrounding this building will be a concrete and metal hardstand containing 9 standard carparks, 1 mobility carpark and manoeuvring area for delivery vehicles.

Two stormwater reticulation networks will be installed. One network will drain the roof/canopy water to the firefighting/reuse storage tanks and then to the attenuation tanks at the rear of the site which will overflow to the open drain. The second network will collect the hardstand area via catchpits and discharge to the open drain. There are two areas to the west and east of the building which will flow overland to the open drain via rock rip rap systems.



Figure 2 – Development Plan (1348-DR-C-3001)

A wastewater treatment and disposal system will be installed to the west of the site. The design of the wastewater system has been completed by Duracrete and is included as part of the wider application package.

Services will be extended to the site from the existing adjacent network.

Following construction of the development the boundary between Lot 2 DP177522 and Lot 1 DP177522 will be adjusted and the new site area will be 3121m^2 as shown on the scheme plan attached in the wider application package.

The Engineering Design Plans are included in **Appendix A** of this report.

4. Earthworks

4.1 Proposal

It is proposed to undertake cut and fill earthworks to create a suitable platform for the building and to form the hardstand area to drain to stormwater collection systems. All earthworks are contained within the site boundaries.

A summary of the proposed earthworks for the development are:

- Area of Earthworks = 2780m^2
- Volume of Cut = 1300m^3
- Volume of Fill = 80m^3
- Cut Material to be exported offsite = 1220m^3

The extent of the cut and fill depths are shown in Figure 3 (refer to plans 1348-DR-C-2100-B).

The earthworks methodology is likely to be as follows:

- Install initial erosion and sediment controls.
- Undertake clearing.
- Construct all erosion and sediment controls.
- Strip topsoil and remove from site or stockpile.
- Undertake cut to fill in conjunction with required geotechnical measures or remove cut from site as required.
- Progressively spread metal over hardstand areas and topsoil/straw mulch landscaped areas as earthworks are completed.
- Install Civil infrastructure.
- Remove erosion and sediment controls when the site is stabilised.

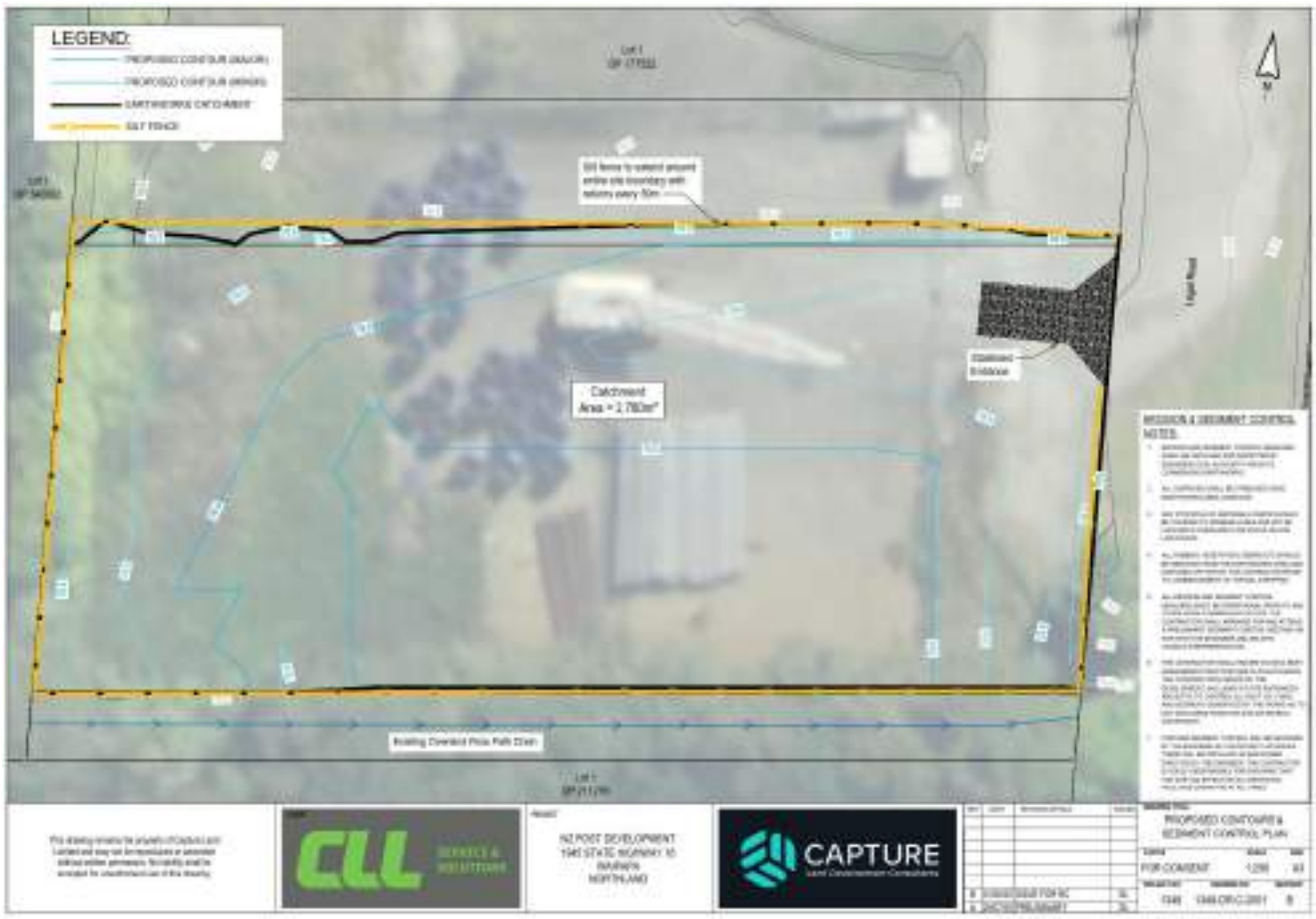


Figure 3 – Proposed Contours and Sediment Control Plan (1348-DR-C-2001)

A Geotechnical Investigation Report has been prepared by CMW Geosciences Ltd in support of the development. The report outlines the earthworks requirements for the development. All earthworks will be undertaken under the observation of the geotechnical engineer and certified upon completion.

5. Erosion & Sediment Control

Erosion and sediment controls for the development have been designed in accordance with Auckland Council Guidance Document 2016/005 - Erosion and Sediment Control Guideline for Land Disturbing Activities (GD05). The controls will need to be installed prior to the commencement of any earthworks on the site and maintained for the full duration of the works. The controls to be installed are:

- Stabilised Site Entrance off the Local Road adjacent to the site.
- Super Silt Fences with returns every 50m (max).

Due to the flat nature of the site and minor nature of the earthworks, sediment generation will be minor.

6. Site Access

6.1 Proposal

Access to the development will be obtained via the legal road to the east of the property. The hardstand area surrounding the building will be formed with a concrete pavement finish. This area will be used for manoeuvring for vehicles delivering packages to and from the building. The area to the north-west of the site will be formed from metal containing 9 standard carparks and 1 mobility carpark and manoeuvring to and from these carparks.

The hardstand area will be formed to grade to a lowpoint formed along the northern alignment of the canopy. This design therefore creates an overland flowpath that directs surface water to the east and then to the south to the open stormwater drain and away from the building.

The design of the hardstand pavement will be confirmed at detailed design stage following the issue of the Resource Consent.

A Traffic Assessment (TA) has been prepared by Traffic Planning Consultants Ltd in support of the proposal. This document should also be referred to for transportation related matters.

The proposed accessway layout is shown in Figure 2 above.

7. Stormwater

7.1 Existing Stormwater

The existing vacant site does not have any existing stormwater reticulation. There is an existing open drain that runs along the southern boundary of the site and discharges to the open drain that runs along State Highway 10.

7.2 Existing Stormwater Management Plan

There is an existing Stormwater Management Plan which applies to the site, but we have been unable to obtain a copy of this plan from Far North District Council as they have advised they cannot release the plan. Copies of the consultation with Far North District Council have been included in **Appendix B**.

The stormwater proposal has therefore been designed based on this consultation and the FNDC approved proposal for the recently developed site to the west of the property included in **Appendix C**.

7.3 Stormwater Proposal

The stormwater proposal collects water from the roof/canopy areas and discharges these flows to the firefighting/reuse tanks and then the stormwater attenuation tanks to the south-west of the site. The water from the concrete and metal surfaces bypass this system and discharge directly to open drain running along the southern boundary.

The flows discharging to the tanks are attenuated to compensated for the flows that are discharged directly from the hardstand areas. The stormwater discharge from the site is attenuated to pre-development rates for the 50% AEP (2 year ARI) and 10% AEP (10 year ARI) storms.

There are existing flooding issues downstream of the site as shown on the NRC map overlay. The 1% AEP (100 year ARI) post-development flow rates have therefore been assessed in Section 7.3.3 report.

The stormwater calculations are included in **Appendix D** of this report.

7.3.1 Stormwater Data

The pre-development and post-development flow analysis has been undertaken using the USDA Soil Conservation Service TR-55 Type 1A Storm Profile.

The rainfall figures for each storm have been obtained from NIWA's HIRDS V4 and are adjusted for climate change as shown in **Table 1** below. The climate adjusted figures have been obtained from The Auckland Code of Practice for Land Development and Subdivision Version 4 : Stormwater as adopted by the development to the west (see **Appendix C**).

Storm Event	HIRDS V4 Rainfall Depth (mm)	Climate Change Increase for 2.1 degree (%)	Revised Rainfall Depth (mm)
50% AEP (2 year)	114	9	124.3
10% AEP (10 year)	176	13.2	199.2
1% AEP (100 year)	269	16.8	314.2

Table 1 – Rainfall Data adjusted for Climate Change

Runoff Curve Numbers have been adopted from Table 4-3 in the Far North District Council Engineering Standards May 2023 as shown in **Table 2** below. The hydrological soil group C being low permeability has been used for the site.

Land Use	Curve Number
Grassed Area	74
Metal Area	89
Impervious Area	98

Table 2 – Curve Number

7.3.2 Stormwater Attenuation

The catchments draining from the site have been assessed for both the pre and post development scenarios during the 50% AEP (2 year ARI), 10% AEP (10 year ARI) and 1% AEP (100 year ARI) Storms using the HEC-HMS model included in **Appendix D**.

The land-use areas for the site have been assessed and are summarised in **Table 3** below :

Land Use	Pre-development Area (m^2)	Post-development Area (m^2)
Extg Grassed Area	2075	366
Extg Metal Area	1925	512
Proposed Roof/Canopy Area		1312
Proposed Concrete Area		465
Proposed Metal Area		576
Proposed Grassed Area		769
Total Area	**4000**	**4000**

Table 3 – Land Use Areas Pre and Post Development

The stormwater attenuation tanks will be fitted with an outlet system which will attenuate the roof water discharge back to pre-development discharge flow rate for the 50% AEP and 10% AEP storm events for the development site. The configuration of this tank system is detailed in the Attenuation Tank Storage Calculation and has been completed using the Duracrete Standard Attenuation Tank dimensions. The calculations and further details are included in **Appendix D** and are summarised in **Table 4** below :

Storm Event	Pre-development Discharge (m^3/s)	Post-development Discharge (m^3/s)
50% AEP (2 year)	0.0197	0.0194
10% AEP (10 year)	0.0353	0.0350
1% AEP (100 year)	0.0597	0.0754

Table 4 –Peak Discharge in Pre-development and Post-development scenarios

7.3.3 1% AEP Post-development Discharge

The post-development discharge rate for the 1% AEP storm event is slightly higher than the pre-development discharge rate as shown in **Table 4** above, as it increased by 0.0157m^3/s or 15.7 l/s.

An assessment of the effect of this increased discharge has therefore been completed for the open drain to the south of the site. The calculation uses the design of the open drain that was completed for the neighbouring development to the west which discharges flows to this drain. It has been determined that this minor increase has only raised the depth of the 1% AEP flood level in the open

drain by 0.003m. This is considered very minor and therefore does not have a detrimental effect on the 1% AEP flood levels upstream or downstream of the site which are spread out over a larger footprint and will therefore be less than 0.003m.

The calculations are included in **Appendix D.**

7.3 Stormwater Reticulation

The stormwater on site is discharged to the open drain along the southern boundary in three different ways.

The majority of the yard area stormwater runoff will be collected via stormwater catchpits and will be piped to discharge into the existing open drain via a rock rip rap outlet.

The yard area adjacent to the open drain will discharge directly via kerb outlets and rock rip rap and will not be collected in a stormwater system.

The building and canopy roof areas will be collected via gutters and downpipes and conveyed via sealed pipes to the firefighting/reuse tanks and then into the stormwater attenuation tanks to the south-west of the site. For further details of the stormwater attenuation requirements refer to Section 7.3.2 and for water reuse refer to Section 9.

The reticulation will be private and will be maintained by the property owner.

7.4 Overland Flowpath and Finished Floor Level

The existing overland flowpath that runs along the southern boundary will be maintained and will be utilised as part of this development.

The yard areas within the development have been designed to slope away from the building and create a secondary flowpath that runs to the west and east of the building to the existing open drain.

The floor level of the building is set at 76.20m which is provides a freeboard of 0.39m to the highest 1% AEP Flood Level in the open drain adjacent to the building of 75.81m. This complies with the 0.30m minimum freeboard for commercial and industrial buildings as per section 4.3.10.7 of the Far North District Council Engineering Standards 2023.

8. Wastewater

8.1 Existing

There is no existing wastewater service currently provided to the site.

8.2 Proposal

Duracrete Ltd have designed a wastewater disposal system for the site. The system has an 80m^2 effluent disposal area and a 24m^2 reserve area. These areas are set back 1.5m from the boundary and 5m from the existing open drain that runs along the southern boundary.

The wastewater disposal system location is shown in Figure 2 and the design is included in the wider application package.

9. Water Supply and Firefighting Requirements

The proposal for the development has been discussed with FENZ and they have specified that 100,000 litres of water will be required to be provided for combined firefighting and water re-use use on site as there is no existing firefighting water supply available to the site. The combination is acceptable to FENZ due to the low water use requirements on site as detailed below.

We have utilised the requirements under Table 6.1.c of The Auckland Code of Practice for Land Development and Subdivision Chapter 6 : Water publication to calculate the design water flow allowance for the development. The building will have 6 staff utilising the facilities as detailed in the AEE.

For a commercial activity of Dry Retail where water is normally only used by staff for their own personal food preparation and toileting needs, the design water flow allowance is 65 litres per person per day, therefore :

Daily Design Water Flow Allowance = 65 litres x 6 people = 390l/p/d

The firefighting volume and re-use water supply will be recharged via the runoff collected from the roof/canopy. During periods of low rainfall, the tanks will be monitored by the building occupiers and topped up as necessary.

10. Utilities

There is an existing overhead electricity line that traverses the rear of the property as shown on the Proposed Layout Plan in **Figure 2.** The building clearance from this overhead line has been assessed by LiveLine Consultants Ltd and their reporting is included in the AEE.

The existing electricity and fibre networks will be extended to provide connections to the new building.

Appendix A – Engineering Design Plans

NZ POST DEVELOPMENT
1945 STATE HIGHWAY 10
WAIPAPA

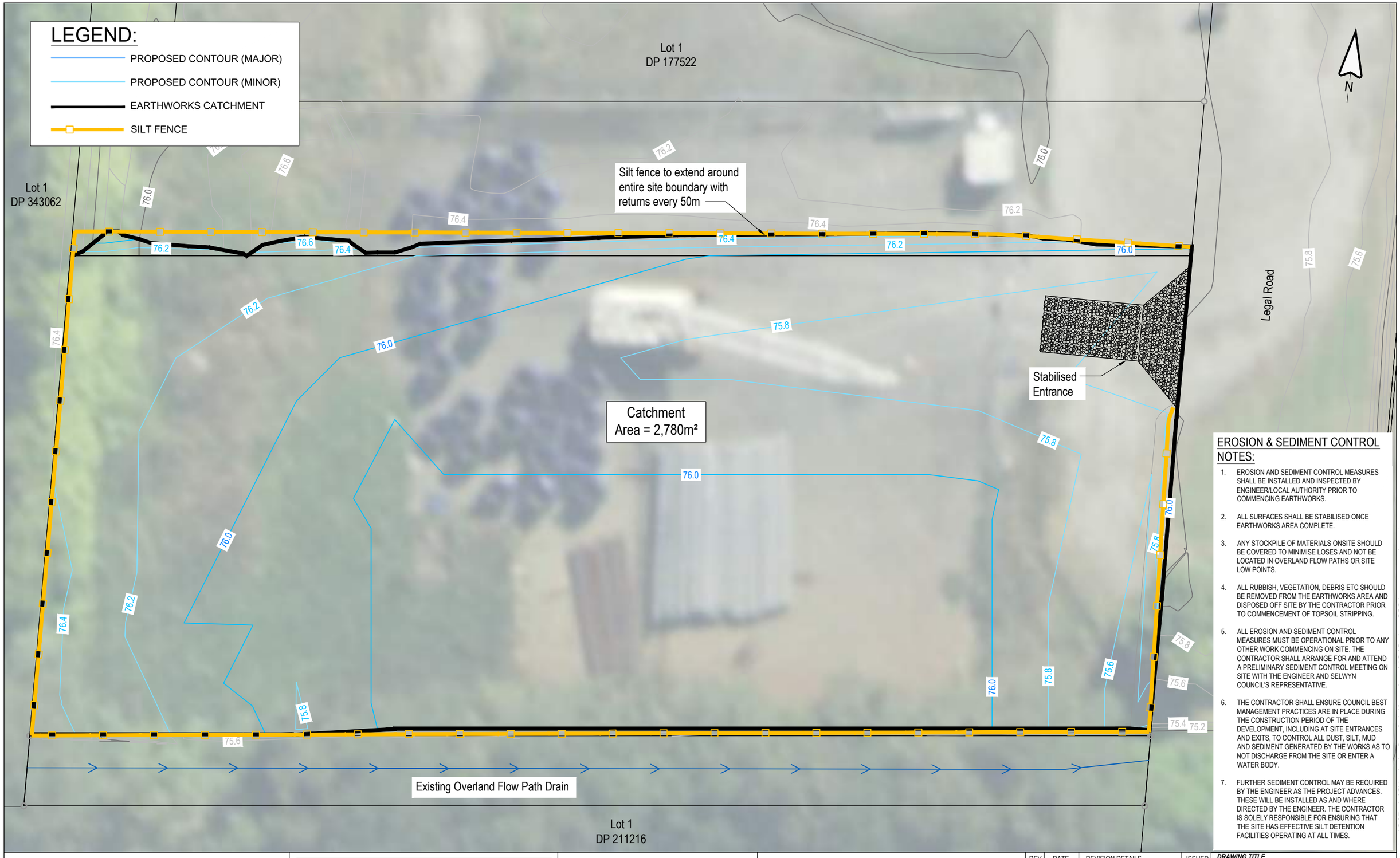


CLL SERVICE & SOLUTIONS

CAPTURE Land Development Consultants

DATE: 08/08/2025
SET STATUS: RESOURCE CONSENT
JOB No: 1348-DR-C-RCPS-C

Check all dimensions and levels on site before commencing construction. This drawing remains the property of Capture Land Limited and may not be reproduced or ammended without written permission. No liability shall be accepted for unauthorised use of this drawing.



EROSION & SEDIMENT CONTROL NOTES:

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND INSPECTED BY ENGINEER/LOCAL AUTHORITY PRIOR TO COMMENCING EARTHWORKS.
2. ALL SURFACES SHALL BE STABILISED ONCE EARTHWORKS AREA COMPLETE.
3. ANY STOCKPILE OF MATERIALS ONSITE SHOULD BE COVERED TO MINIMISE LOSES AND NOT BE LOCATED IN OVERLAND FLOW PATHS OR SITE LOW POINTS.
4. ALL RUBBISH, VEGETATION, DEBRIS ETC SHOULD BE REMOVED FROM THE EARTHWORKS AREA AND DISPOSED OFF SITE BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF TOPSOIL STRIPPING.
5. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE OPERATIONAL PRIOR TO ANY OTHER WORK COMMENCING ON SITE. THE CONTRACTOR SHALL ARRANGE FOR AND ATTEND A PRELIMINARY SEDIMENT CONTROL MEETING ON SITE WITH THE ENGINEER AND SELWYN COUNCIL'S REPRESENTATIVE.
6. THE CONTRACTOR SHALL ENSURE COUNCIL BEST MANAGEMENT PRACTICES ARE IN PLACE DURING THE CONSTRUCTION PERIOD OF THE DEVELOPMENT, INCLUDING AT SITE ENTRANCES AND EXITS, TO CONTROL ALL DUST, SILT, MUD AND SEDIMENT GENERATED BY THE WORKS AS TO NOT DISCHARGE FROM THE SITE OR ENTER A WATER BODY.
7. FURTHER SEDIMENT CONTROL MAY BE REQUIRED BY THE ENGINEER AS THE PROJECT ADVANCES. THESE WILL BE INSTALLED AS AND WHERE DIRECTED BY THE ENGINEER. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ENSURING THAT THE SITE HAS EFFECTIVE SILT DETENTION FACILITIES OPERATING AT ALL TIMES.

This drawing remains the property of Capture Land Limited and may not be reproduced or amended without written permission. No liability shall be accepted for unauthorised use of this drawing.

CLIENT

CLL SERVICE & SOLUTIONS

PROJECT

NZ POST DEVELOPMENT
1945 STATE HIGHWAY 10
WAIPAPA
NORTHLAND

CAPTURE Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
B	01/08/25	ISSUE FOR RC	DL
A	29/07/25	PRELIMINARY	DL

DRAWING TITLE

PROPOSED CONTOURS & SEDIMENT CONTROL PLAN

STATUS	SCALE	SIZE
FOR CONSENT	1:250	A3

PROJECT NO	DRAWING NO	REVISION
1348	1348-DR-C-2001	B

Surface Analysis: Elevation Ranges					
Number	Color	Minimum Elevation (m)	Maximum Elevation (m)	2D Area (m²)	Volume (m³)
1		-2.000	-1.500	0.0	0.0
2		-1.500	-1.000	72.0	1.9
3		-1.000	-0.500	1300.6	354.7
4		-0.500	0.000	1008.0	947.5
5		0.000	0.500	393.2	62.4
6		0.500	1.000	5.0	0.3

Area of Earthworks = 2,780m²
Volume of Topsoil = 140m³
Volume of Cut = 1,300m³
Volume of Fill = 80m³
Balance = 1,220m³ Cut to Waste
Volumes based on Existing Surface stripped of 50mm topsoil depth compared with estimated Subgrade Surface 350mm below Proposed Finished Ground levels.

Lot 1
DP 177522

Lot 1
DP 343062

Legal Road

Lot 1
DP 211216

This drawing remains the property of Capture Land Limited and may not be reproduced or amended without written permission. No liability shall be accepted for unauthorised use of this drawing.

CLIENT

CLL SERVICE & SOLUTIONS

PROJECT

NZ POST DEVELOPMENT
1945 STATE HIGHWAY 10
WAIPAPA
NORTHLAND

CAPTURE Land Development Consultants

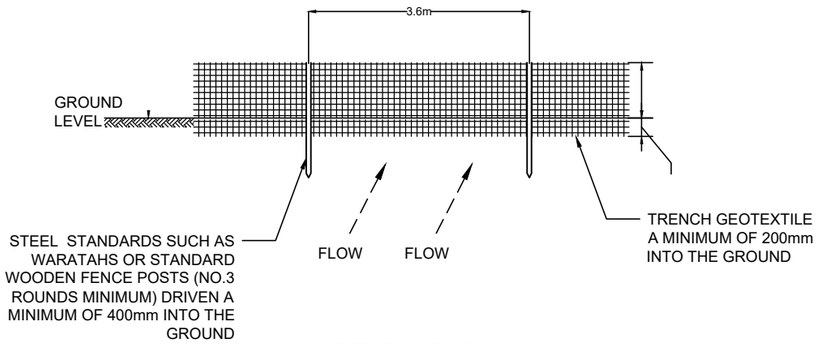
REV	DATE	REVISION DETAILS	ISSUED
B	01/08/25	ISSUR FOR RC	DL
A	29/07/25	PRELIMINARY	DL

DRAWING TITLE

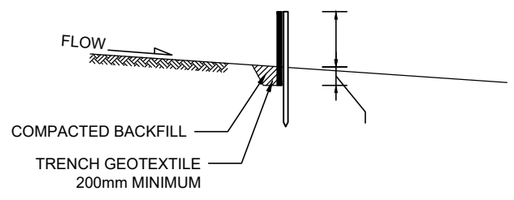
CUT & FILL PLAN

STATUS	SCALE	SIZE
FOR CONSENT	1:250	A3

PROJECT NO	DRAWING NO	REVISION
1348	1348-DR-C-2100	B



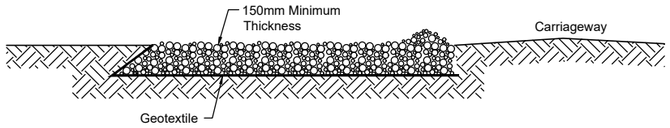
SILT FENCE ELEVATION
SCALE: 1:100 AT A3



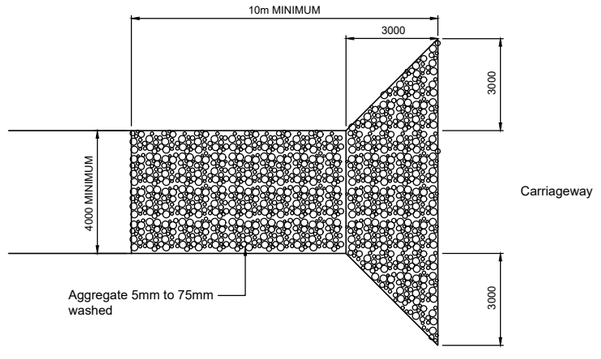
SILT FENCE CROSS-SECTION
SCALE: 1:100 AT A3

Table 12: Silt fence design criteria

Slope steepness %	Slope length (m) (maximum)	Spacing of returns (m)	Silt fence length (m) (maximum)
Flatter than 2%	Unlimited	NA	Unlimited
2 – 10%	40	60	300
10 – 20%	30	50	230
20 – 33%	20	40	150
33 – 50%	15	30	75
> 50%	6	20	40



STABILISED ENTRANCE SECTION



STABILISED ENTRANCE PLAN
NOT TO SCALE

This drawing remains the property of Capture Land Limited and may not be reproduced or amended without written permission. No liability shall be accepted for unauthorised use of this drawing.

CLIENT
CLL SERVICE & SOLUTIONS

PROJECT
NZ POST DEVELOPMENT
1945 STATE HIGHWAY 10
WAIPAPA
NORTHLAND

CAPTURE Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
B	01/08/25	ISSUE FOR RC	DL
A	29/07/25	PRELIMINARY	DL

DRAWING TITLE
SEDIMENT CONTROL DETAILS

STATUS	SCALE	SIZE
FOR CONSENT	NTS	A3

PROJECT NO	DRAWING NO	REVISION
1348	1348-DR-C-2200	B

Lot 1
DP 177522

Existing Boundary

Lot 1
DP 343062

LEGAL ROAD

Existing Metalled Driveway within Road Reserve

Legal Road

Secondary Effluent Disposal Field 24m²

Proposed Fence

Wastewater disposal fields as per Duracrete Ltd design report.

Primary Effluent Disposal Field 80m²

Existing Overhead Power Line

4.5m Offset From Overhead Power

8.5m Offset From Overhead Power

Gravel Hardstand Area

Proposed Fence

Shape up gravel hardstand area to provide SW Flow

CP
LL: 75.75m
IL (Out): 75.17m

Dish Channel

Proposed Concrete Pavement

225mmØ uPVC SN8 Private SW Line (Grade 0.5%)

150mmØ uPVC SN16 Private SW Line (Grade 0.5%)

SWMH 1A
LL: 75.64m
IL (In): 74.04m
IL (Out): 75.03m

2.0m Setback

Tie into existing driveway levels

Auto Gate

Insitu Kerb

Proposed Concrete Pavement (Under Canopy Areas)

Canopy Over

Proposed Building
FFL 76.20m

150mmØ uPVC SN16 Private SW Line (Grade 0.5%)

Proposed 225mmØ uPVC SN8 Private SW Line (Grade 0.5%)

Existing Road Reserve Boundary

2x25,000L Water Tanks
Attenuation Volume =
45.50m³

150mmØ uPVC SN16 Private SW Line. See Architects' plans for continuation of private SW line to downpipes.

22.5° Bend

Invert of SW Drain
= RL 75.40m

SW Discharge from Dish Channel to Ex. Swale

Open Stormwater Drain

OUTLET 1
IL (Out): 74.90m

SW Discharge to Ex. Swale via rock rip rap

4x25,000L Water Tanks to provide 100,000 litre capacity for firefighting supply and reuse supply as approved by FENZ.

SW Discharge to Ex. Swale via rock rip rap

Open Stormwater Drain

Lot 1
DP 211216

PAVEMENT LEGEND

- PROPOSED CONTOUR (MAJOR)
- PROPOSED CONTOUR (MINOR)
- EXISTING LEVELS
- PROPOSED FINISHED LEVELS
- PROPOSED SURFACE GRADE

This drawing remains the property of Capture Land Limited and may not be reproduced or amended without written permission. No liability shall be accepted for unauthorised use of this drawing.

CLIENT

CLL SERVICE & SOLUTIONS

PROJECT

NZ POST DEVELOPMENT
1945 STATE HIGHWAY 10
WAIPAPA
NORTHLAND

CAPTURE Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
C	08/08/25	MINOR REVISIONS	TL
B	01/08/25	ISSUE FOR RC	DL
A	29/07/25	PRELIMINARY	DL

DRAWING TITLE

PROPOSED LAYOUT PLAN

STATUS	SCALE	SIZE
FOR CONSENT	1:250	A3

PROJECT NO	DRAWING NO	REVISION
1348	1348-DR-C-3001	C

Appendix B – Stormwater Consultation

From: Penny Anson <penny@formeplanning.co.nz>
Sent: Wednesday, 23 July 2025 9:02 am

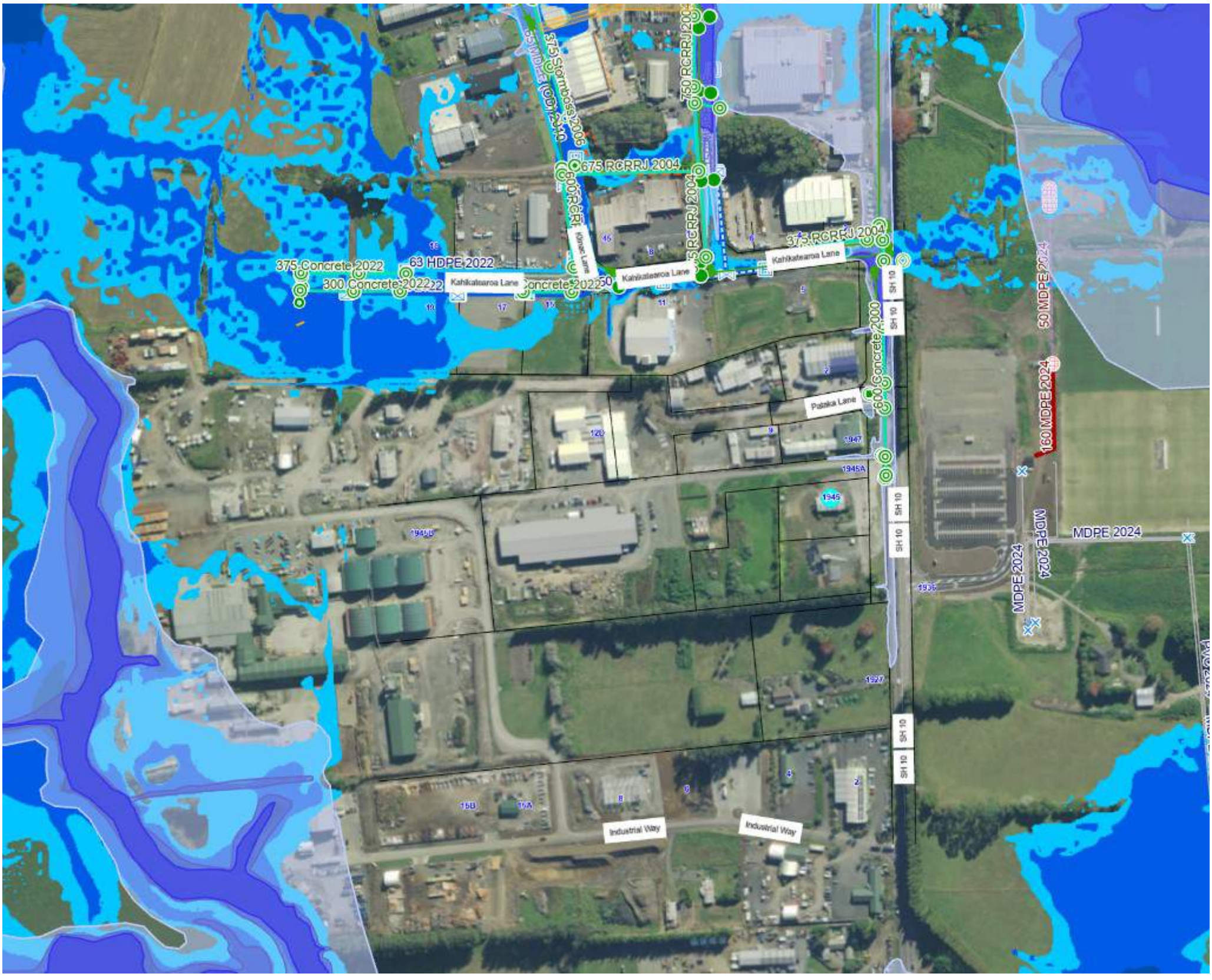
Subject: FW: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Penny Anson | Senior Planner | **Forme Planning Limited**

Mobile: 021 244 8001
Address: Suite 203, Achilles House, 8 Commerce Street, Auckland 1010

From: Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Sent: Wednesday, 23 July 2025 8:56 am
To: Penny Anson <penny@formeplanning.co.nz>
Subject: FW: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Hi Penny,
Below is a screenshot of the NRC map overlay showing the existing flood extent around the site.
Cheers



Sujeet Tikaram
Senior Resource Consents Engineer - Resource Consents - Engineering
M 275661191 | **P** 6494015376 | Sujeet.Tikaram@fndc.govt.nz
Te Kaunihera o Te Hiku o te Ika | Far North District Council

Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029
fndc.govt.nz

From: Sujeet Tikaram
Sent: Wednesday, 23 July 2025 8:53 am

To: Penny Anson <penny@formeplanning.co.nz>
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Hi Penny,
There are existing flood issues downstream of the site, so that will need to be taken into account when addressing stormwater management for the development. Stormwater mitigation measures will need to be in accordance with the FNDC Engineering Standards (either the 2009 or 2023 versions can be used).

Cheers

Sujeet Tikaram
Senior Resource Consents Engineer - Resource Consents - Engineering
M 275661191 | **P** 6494015376 | Sujeet.Tikaram@fndc.govt.nz
Te Kaunihera o Te Hiku o te Ika | Far North District Council

Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029
fndc.govt.nz

From: Penny Anson <penny@formeplanning.co.nz>
Sent: Wednesday, 23 July 2025 8:16 am
To: Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

You don't often get email from penny@formeplanning.co.nz. Learn why this is important

CAUTION: This email originated from outside Far North District Council.
Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hello Sujeet

Thanks very much for these screen shots.

It is not clear from the images what we are required to design to under the SMP in terms of stormwater discharge rates.

Do we need to provide mitigation to maintain stormwater flows to a predevelopment level? and if so for what storm event?

Appreciate you may not be able to share the full SMP but any text screenshots from the plan would really assist.

Many thanks

Penny Anson | Senior Planner | Forme Planning Limited

Mobile: 021 244 8001
Address: Suite 203, Achilles House, 8 Commerce Street, Auckland 1010

From: Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Sent: Tuesday, 22 July 2025 1:52 pm
To: Penny Anson <penny@formeplanning.co.nz>
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Hi Penny,
I am not sure if the SWMP can be shared outside Council or not but attached are screenshots of the property taken from the plan.

Cheers
Sujeet

Sujeet Tikaram
Senior Resource Consents Engineer - Resource Consents - Engineering
M 275661191 | **P** 6494015376 | Sujeet.Tikaram@fndc.govt.nz
Te Kaunihera o Te Hiku o te Ika | Far North District Council

Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029
fndc.govt.nz

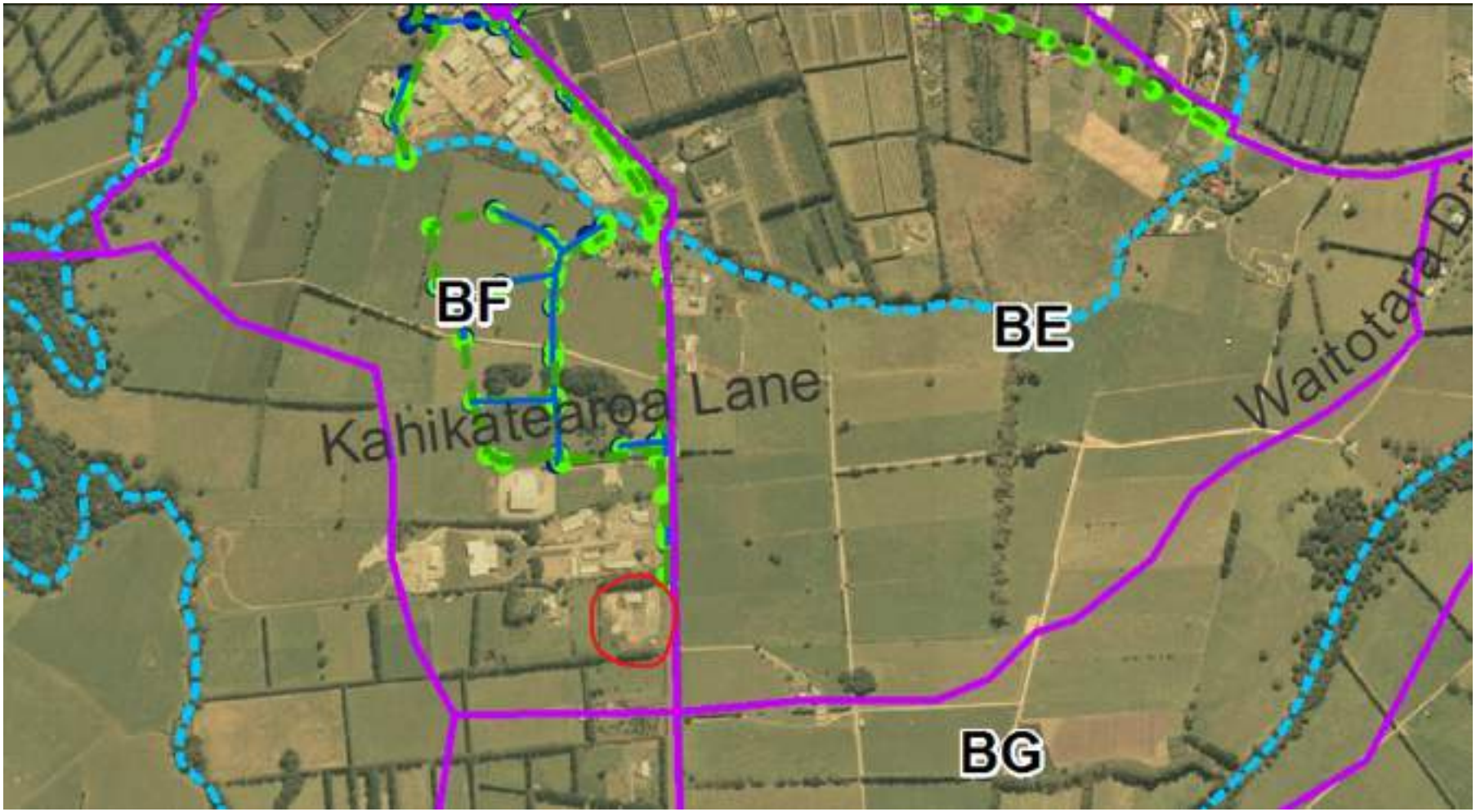
From: Penny Anson <penny@formeplanning.co.nz>
Sent: Tuesday, 22 July 2025 1:21 pm
To: Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Cc: Dean Lupton <dean@captureland.nz>; Kerryn McPherson <kerryn@captureland.nz>
Subject: FW: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

You don't often get email from penny@formeplanning.co.nz. Learn why this is important

CAUTION: This email originated from outside Far North District Council.
Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hello Sujeet

I am just following up on the below email trail.



Screenshots attached to Email



Screenshots attached to Email

Are you able to please provide a copy of the Stormwater Management Plan?

Thanks and regards

Penny Anson | Senior Planner | Forme Planning Limited

Mobile: 021 244 8001
Address: Suite 203, Achilles House, 8 Commerce Street, Auckland 1010

From: Hannah Edwards <hannah@formeplanning.co.nz>
Sent: Wednesday, 16 July 2025 12:26 pm
To: Duty Planner <Duty.Planner@fndc.govt.nz>; Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Cc: Dean Lupton <dean@captureland.nz>; Kathryn Gunman <kathryn@location.co.nz>; Penny Anson <penny@formeplanning.co.nz>; Chris Tuxford <chris.tuxford@cll.net.nz>
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Thanks for your email – we will just focus on the resource consent application for this meeting and would like to meet with a planner and development engineer. Is the pre-app process still the relevant process in that case?

Thanks
Hannah

Hannah Edwards | Director | Forme Planning Limited

Mobile: 021 922 164
Address: Suite 203, Achilles House, 8 Commerce Street, Auckland 1010

From: Duty Planner <Duty.Planner@fndc.govt.nz>
Sent: Wednesday, 16 July 2025 12:17 pm
To: Hannah Edwards <hannah@formeplanning.co.nz>; Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Cc: Dean Lupton <dean@captureland.nz>; Kathryn Gunman <kathryn@location.co.nz>; Penny Anson <penny@formeplanning.co.nz>; Chris Tuxford <chris.tuxford@cll.net.nz>
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Kia ora Hannah,

If your project is complex and likely to involve multiple Council departments (e.g., Building Consents, Resource Consents, or Infrastructure), we recommend that you request a Pre-Application or Concept Development Meeting (PAM or CDM). At these meetings, we can advise you about any additional consents or approvals you may need. We also recommend bringing as much information as possible about your project and any experts assisting you. The first half hour of this meeting is free. If you would like to meet with someone to discuss your project, please fill out the **Pre Application Meeting Request** at the forms link below to arrange a suitable time.

Resource Consent Application Forms:
https://www.fndc.govt.nz/services/resource-consents/Resource-Consent-Forms

I will let @Sujeet Tikaram respond regarding the Stormwater Management Plan.

Ngā mihi,

Rachel - Duty Planner
Resource Consents
P 09 407 0444 | Duty.Planner@fndc.govt.nz
Te Kaunihera o Te Hiku o te Ika | Far North District Council

Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029
fndc.govt.nz



Please note - The views and opinions provided by the Duty Planner in this email are their preliminary view only and relate to the specific questions and information you have asked/provided. If the details of the proposal change in the future, please be aware that the advice provided might change, and we would encourage you to come back for a further discussion. We would also encourage you to seek your own Professional Planning/Engineering advice before making decisions on a future development.

From: Hannah Edwards <hannah@formeplanning.co.nz>
Sent: Tuesday, 15 July 2025 11:16 am
To: Duty Planner <Duty.Planner@fndc.govt.nz>; Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Cc: Dean Lupton <dean@captureland.nz>; Kathryn Gunman <kathryn@location.co.nz>; Penny Anson <penny@formeplanning.co.nz>; Chris Tuxford <chris.tuxford@cll.net.nz>
Subject: FW: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

CAUTION: This email originated from outside Far North District Council.
Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi Rachel

Please can you provide a full copy of the relevant FNDC Stormwater Management Plan?

Also, we would like to have a concept development meeting to discuss the proposed development – is this something you can assist with arranging?

Thanks very much,
Hannah

Hannah Edwards | Director | Forme Planning Limited

Mobile: 021 922 164
Address: Suite 203, Achilles House, 8 Commerce Street, Auckland 1010

From: Duty Planner <Duty.Planner@fndc.govt.nz>
Sent: Friday, 11 July 2025 4:32 pm
To: Penny Anson <penny@formeplanning.co.nz>
Subject: FW: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Kia ora Penny,

Please see confirmation from one of our Resource Consent engineers that the property in question is part of the FNDC Stormwater Management Plan as per attached screenshots. This means that any new buildings on that site would meet the stormwater rule in the District Plan below.

7.8.5.1.9 STORMWATER

The disposal of collected stormwater from the roof of all new buildings and new impervious surfaces provided that the activity is within an existing consented urban stormwater management plan or discharge consent.

For any further general planning queries, please feel free to reach out.
Ngā mihi,

Rachel - Duty Planner
Resource Consents
P 09 407 0444 | Duty.Planner@fndc.govt.nz
Te Kaunihera o Te Hiku o te Ika | Far North District Council

Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029
fndc.govt.nz



Please note - The views and opinions provided by the Duty Planner in this email are their preliminary view only and relate to the specific questions and information you have asked/provided. If the details of the proposal change in the future, please be aware that the advice provided might change, and we would encourage you to come back for a further discussion. We would also encourage you to seek your own Professional Planning/Engineering advice before making decisions on a future development.

-----Original Message-----
From: Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Sent: Friday, 11 July 2025 11:36 am
To: Duty Planner <Duty.Planner@fndc.govt.nz>
Cc: Nadia de la Guerre <Nadia.DeLaGuerre@fndc.govt.nz>
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Morning Rachel,
1945 State Highway 10, Waipapa is covered by an FNDC Stormwater Management Plan as per attached screenshots.

Cheers

-----Original Message-----
From: Duty Planner <Duty.Planner@fndc.govt.nz>
Sent: Friday, 11 July 2025 10:50 am
To: Nadia de la Guerre <Nadia.DeLaGuerre@fndc.govt.nz>
Cc: Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Subject: FW: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Kia ora Nadia,

I have another query regarding connection to stormwater management plans or discharge consents required by 7.8.5.1.9. The customer is asking whether the site is already covered by these? Can I please reallocate this to you?

Ngā mihi,

Rachel

-----Original Message-----
From: Alicia Cassidy Tupou <Alicia.Tupou@fndc.govt.nz>
Sent: Thursday, 10 July 2025 1:15 pm
To: Duty Planner <Duty.Planner@fndc.govt.nz>
Subject: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

A new Customer Request has been lodged and you have been assigned as the Actioning Officer. Please check the Customer Services system for further information.

10-Jul-2025 13:14:10 - Alicia Cassidy Tupou

Name: Penny
Phone: +64 21 244 8001
Address: 1945 State Highway 10, Waipapa

Query: Customer above has called to speak with a planner regarding a generic question for urban storm water discharge consents operative district plans. Please contact customer and discuss further.

Thanks, team

Appendix C – Infrastructure Report of Neighbouring Approved Development

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 1 of 29 - 26/11/2021 - NZBTC

STORMWATER ATTENUATION DESIGN REPORT

PROPOSED COMMERCIAL BUILDING

1945A STATE HIGHWAY 10, WAIPAPA

Project Reference: 19514

Date: 8/11/2021

Revision 1

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 2 of 29 - 26/11/2021 - NZBTC

1 PROJECT DESCRIPTION

LDE Ltd was engaged by LD Family Investments Ltd to undertake a stormwater attenuation design for a proposed kiwifruit pack house at 1945A State Highway, Waipapa. The subject site location can be seen in Figure 1 below.

It is proposed to construct a new commercial building and pavement at the rear of the property and remove the existing dwelling. The existing accessway will be retained. New roof and pavement areas will be created as part of the development which require attenuation to mitigate adverse effects.

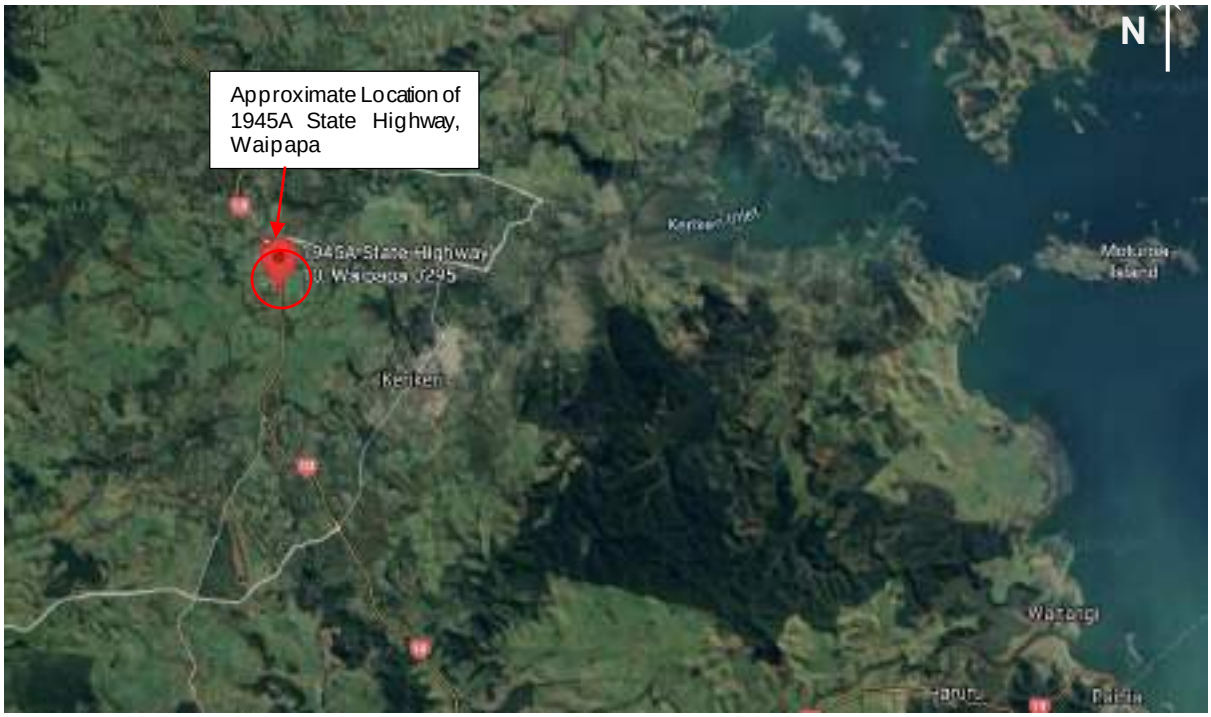


Figure 1 - Subject site location from Google Earth.

2 SITE DESCRIPTION

The site currently contains one existing dwelling and long accessway with a vehicle crossing extending along the northern boundary of the site. The remainder of the site is currently in grass and compacted gravel.

State Highway 10 has an existing open drain on the eastern side of the carriageway. This drains flows north via the culverts along public road as shown from the Far North District Council GIS map. The open drain is shown in Figure 2 below.

Stormwater runoff from the site is currently discharged to this road drain following existing contour of the site.

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 3 of 29 - 26/11/2021 - NZBTC



Figure 2 -Google Street View-Existing swale along State Highway 10



Figure 3 – Open drains and existing culvert shown on FNDC GIS map

3 PROPOSED DEVELOPMENT

It is proposed to construct a kiwifruit packhouse on the rear of the site. The existing dwelling will be removed and the accessway will be retained within the lot. The client has indicated that the proposed packhouse roof area is 4,236m^2 and the existing compacted gravel area will be used as the driveway and parking area. So, there is no increase on the impermeable pavement area for the driveway and parking area.

The site plan is shown in Figure 4 below.

From the site plan, there are two existing swales along the northern and southern boundaries which convey the onsite stormwater to the east and into the existing roadside swale.

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 4 of 29 - 26/11/2021 - NZBTC

There is an existing swale near the middle of the lot which flows in the north-south direction into a shallow silt pond. It is understood that the silt pond will be filled as part of this development.

It is proposed to construct a dry detention pond adjacent to the southern boundary which will have an outlet into the existing swale which flows to the roadside. Stormwater runoff from the impermeable areas within the site will be directed into the proposed dry pond.

This dry pond is designed to provide the mitigation requirements for the new impermeable areas within the site for the 2yr ARI and 10yr ARI storm events. The dry pond will discharge to the existing swale along the southern boundary of the site towards the SH10 roadside swale.



Figure 4 - Design site plan provided by Donaldsons Ltd.

4 COUNCIL REQUIREMENTS

The Far North District Council states that the design storm return period for Rural and Rural Residential Areas, Residential Areas and Commercial and Industrial Areas, shall be 10 years. Secondary protection shall be satisfied by a combination of the primary protection system and appropriately designed secondary flow paths, controlled flood plains and setting of appropriate building levels.

In addition to the requirements of Far North District Plan Rule Section 4, the stormwater management report for the site shall provide for the following aspects:

- Provide assessment of stormwater flows (pre- and post-development) in regard to disposal and future development of roof area during a 2yr and 10yr ARI storm event.

- Provide mitigation measures to protect outfalls and maintain stormwater flows to a pre-development level for the design storms.

5 STORMWATER MITIGATION DRY POND

As with any new development, new impervious areas are created, and these areas require stormwater management devices to be utilised to minimise their impact. Hydrological modelling of the site is required to specifically size the proposed dry pond and its outlet structure to mitigate peak flows to less than predevelopment peak flow rates for the 2yr ARI and 10yr ARI storm events. The following sections outline the modelling approach undertaken in the dry pond design.

A HEC-HMS model was developed to calculate the peak flow rates for the 2yr ARI and 10yr ARI storm events from the subject site for pre-development and post-development scenarios.

5.1 Soil Classification

The LDE geotechnical investigation and report indicate that the subject site is generally underlain by silty alluvial soils. This layer was encountered beneath hardfill of varying depths across the site. For the purpose of stormwater modelling, we have assessed these soils beneath the site as being SCS Group C soils.

5.2 Catchment Assessment

The assessment of the existing and proposed new increased roof area and the upstream catchment area are in Table 1 below. As shown, only the area affected by the post-development increase in imperviousness was considered in this assessment as the remainder of the site is to remain as grassed or landscaped.

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 5 of 29 - 26/11/2021 - NZBTC

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 6 of 29 - 26/11/2021 - NZBTC

Table 1 – Dry Pond catchment areas

Pre-Development		
Description	**Curve Number (CN)**	**Area (m^2)**
Grassed area	74	7,280
Existing gravel area	88	11,822
Existing dwelling roof area	98	240
Total pre-development area		19,342

Post Development		
Description	**Curve Number (CN)**	**Area (m^2)**
Grassed area	74	7,520
New packhouse roof area	98	4,086
New pavement area	98	5,394
Existing gravel area	88	2,342
Total post development area		19,342

As stated in the geotechnical report issued by LDE, the geotechnical investigation encountered compacted gravel fill across the western portion of the site. These overlying gravels is considered to reduce the infiltration of the soils therefore we have adopted an increased curve number for this area of 88. From the investigation logs, the inferred gravel area is measured as 11,822m^2.

As the existing dwelling within the lot will be demolished as part of this development, we have adopted the existing roof area of 240m^2 in the pre-development scenario. The new building will have a roof area of 4,086 m^2 with 5,394m^2 of pavement areas around its perimeter. The dry pond will also collect 7,520m^2 of permeable area. Accordingly, a total catchment of 1.93ha has been allowed for in the design of the dry pond.

It is only intended to mitigate the increase in stormwater runoff from the impermeable roof and pavement areas of 9,240m^2 for the 2-year and 10-year storm events. The dry pond is also sized to receive the runoff from upstream catchment however does not attenuate these areas as there is no change to the coverage for those areas.

The remaining area of the lot is assumed to remain grassed or landscaped and is not collected by the dry pond therefore has been excluded from this assessment.

5.3 Modelling Inputs

A HEC-HMS model for the dry pond was prepared to size the storage volume and outlet structure to attenuate peak flows to less than or equal to predevelopment peak flow rates for the 2yr ARI and 10yr ARI storm events.

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 7 of 29 - 26/11/2021 - NZBTC

HIRDS V4 rainfall data for the site was used in the modelling. The rainfall data was increased by the factors outlined in Table 2 below to account for increases in rainfall as a result of climate change. These values have been taken from Section 4.2.10 of Auckland Council's Stormwater Code of Practice.

Average Recurrence Interval	% Increase
2 year	9
10 year	13.2

Table 2-Increase applied to rainfall data to allow for climate change.

A time of concentration value of 10 minutes was used based on the small catchment area. The 24hr rainfall depths adopted for the site and climate change factors applied are shown in Table 3 below.

Storm Event (AEP)	24hr Rainfall Depth (mm)	Increase (%)	24hr Rainfall Depth + Climate Change (mm)
50%	107.8	9	154.6
10%	221.9	13.2	251.2

Table 3 – HIRDS V4 24hr rainfall depths.

6 DESIGN SUMMARY

It is proposed to provide attenuation of the 2 year and 10 year 24-hour storm events for the onsite increased impermeable areas proposed. The larger storm events runoff from the upstream catchment and onsite area are not proposed to be attenuated, but the attenuation dry pond is designed to receive the runoff from this area. The outflow will be conveyed by the existing swale and discharge east along the southern boundary to the existing roadside swale.

HEC-HMS modelling has been undertaken to size the outlet structure from the dry pond to mitigate post development peak flow rates for the 2 year and 10-year storm events to less than or equal to the predevelopment peak flow rates.

It is proposed to construct a dry pond on the southeast side within southern and eastern boundary with a base area of 550m^2 and minimum depth of 0.8m. The base of the dry pond should be constructed in flat gradient. This will provide a maximum storage of 569m^3. The downstream invert of the dry pond should match to the invert of the existing swale base level. The side slopes of the proposed outlet opening are 1V:3H. The peak water depths for the 2-year storm event is 0.33m, and 0.45m for the 10-year storm event.

A stepped spillway is proposed to be constructed at the downstream end of the dry pond to control peak flow rates from the site. A 1.5m wide slot is to be constructed in the downstream weir invert of the dry pond 0.5m high to control stormwater discharge and mitigate peak flows from the 2 and 10-year storm events. The 100yr ARI peak flow will then pass over the weir with a maximum water depth of 120mm.

A freeboard of 0.18m has been applied to the top of the 100-year storm event conveyance flow level which is considered sufficient.

Table 4 below shows the pre-development and attenuated post-development peak flow rates. The detailed output tables from the HEC-HMS modelling are attached to this report. The results show that the dry pond design attenuates post development peak flow rates less than the pre-development flow rates.

Table 4-HEC-HMS results.

Storm Event (ARI)	Pre-Development Peak Flow (L/s)	Post-Development Peak Flow (L/s)	Water depth from the bottom of the dry pond [m]
2yr	293	216.5	0.33
10yr	500	408	0.45
100yr		850	0.62

If impervious area other than those analysis are to be created above, then a revision of the design outlined in this report will be required.

The dry pond should be located such that all runoff from roof and pavement areas can be collected with sufficient fall to the discharge point towards the pond. Details can be seen on the engineering drawings.

6.1 Outlet Discharge

The dry pond's outlet structure will discharge to a conveyance swale along the southern boundary of the site to the existing swale along State Highway 10. An existing swale exists along the southern boundary however it is proposed to upgrade this as part of the stormwater management for the site.

The proposed conveyance swale is designed with a minimum base width of 0.5m, a minimum depth of 0.5m and 1V:3H side slopes. A minimum longitudinal slope of 1% has been adopted for the proposed swale. The swale shall be widened at the ponds outlet with a minimum base width of 1.5m. This shall taper down to 0.5m over 20m.

It is intended to vegetate the swale in grass. Accordingly, we have adopted a manning number of 0.03 for the capacity calculations.

The swale was designed for the 10yr ARI and 100yr ARI peak flows of 410L/s and 850L/s respectively/. The calculations show a peak water depth of 0.29m for the 10yr ARI event, and 0.41m for the 100-year storm event. The calculations show a velocity of 1.22m/s for the 100yr ARI storm event which is less than the 1.8m/s generally acceptable for grassed swales. Therefore, no additional erosion and scour protection is required along the length of the swale.

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 8 of 29 - 26/11/2021 - NZBTC

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 9 of 29 - 26/11/2021 - NZBTC

7 OTHER CONSIDERATIONS

This report has been prepared exclusively for LD Family Investments Ltd with respect to the particular brief given to us. Information, opinions and recommendations contained in it cannot be used for any other purpose or by any other entity without our review and written consent. LDE Ltd accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report by any third party.

For and on behalf of LDE Ltd

Report prepared by:



Stella Miao
Civil Engineer

Report reviewed by:



Jamie Simson
BE(Hons), MEngNZ
Civil Manager - Northern

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 10 of 29 - 26/11/2021 - NZBTC

APPENDIX A

HIRDS V4 RAINFALL DATA

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 11 of 29 - 26/11/2021 - NZBTC

PRE-DEVELOPMENT RAINFALL DATA (HISTORICAL)

ARI	10m	20m	30m	60m	2h	6h	12h	24h	48h	72h
2	0.5	10.8	15.8	19.6	28.4	40.5	67.7	89.8	114	138
5	0.2	14	20.4	25.4	36.9	52.7	88.4	117	150	181
10	0.1	16.3	23.8	29.7	43.1	61.7	104	138	176	214
20	0.05	18.7	27.3	34.1	49.5	70.9	119	159	203	247
30	0.033	20.1	29.4	36.7	53.3	76.4	129	172	220	267
40	0.025	21.1	30.8	38.5	56	80.3	136	181	231	281
50	0.02	21.8	32	39.9	58.1	83.4	141	188	240	293
60	0.017	22.5	32.9	41.1	59.9	85.9	145	194	248	302
80	0.012	23.5	34.4	43	62.6	89.9	152	203	260	316
100	0.01	24.2	35.5	44.4	64.7	93	157	210	269	328

POST-DEVELOPMENT 2YR ARI RAINFALL DATA

Rainfall +	9%	for Climate Change								
ARI	10m	20m	30m	60m	2h	6h	12h	24h	48h	72h
2	14.3	20.3	24.8	36.0	51.1	87.4	117.5	154.6	189.7	204.6
5	18.7	26.7	32.7	47.2	67.3	116.0	154.3	204.6	249.1	271.2
10	22.1	31.8	39.0	55.9	80.1	136.6	184.4	241.9	297.6	321.9
20	25.7	37.4	45.9	65.6	94.1	160.1	216.2	280.3	346.1	373.7
30	28.2	41.0	50.4	71.9	102.9	176.4	237.5	305.9	375.0	404.8
40	29.8	43.4	53.4	76.4	109.0	189.4	252.7	323.3	397.5	429.4
50	31.1	45.6	56.0	80.1	114.1	198.4	265.7	336.7	414.1	448.9
60	32.4	47.3	58.2	83.2	118.7	206.3	275.8	349.0	429.3	463.4
80	34.2	50.2	61.9	87.9	126.6	219.3	294.6	367.4	451.7	489.8
100	35.5	52.5	64.7	92.0	133.5	230.1	307.6	380.8	470.1	508.2

POST-DEVELOPMENT 10YR ARI RAINFALL DATA

Rainfall +	13.2%	for Climate Change								
ARI	10m	20m	30m	60m	2h	6h	12h	24h	48h	72h
2	14.8	21.0	25.7	37.3	53.1	90.7	122.1	160.6	197.1	212.5
5	19.4	27.7	34.0	49.0	69.9	120.5	160.3	212.5	258.7	281.7
10	22.9	33.1	40.5	58.1	83.2	141.9	191.5	251.2	309.1	334.3
20	26.7	38.9	47.7	68.1	97.7	166.3	224.5	291.1	359.4	388.0
30	29.3	42.6	52.3	74.6	106.9	183.2	246.7	317.7	389.5	420.4
40	30.9	45.1	55.5	79.4	113.2	196.7	262.4	335.8	412.8	445.9
50	32.3	47.4	58.2	83.2	118.5	206.0	275.9	349.7	430.1	466.2
60	33.6	49.1	60.4	86.4	123.2	214.3	286.4	362.4	445.8	481.2
80	35.5	52.1	64.3	91.3	131.5	227.8	305.9	381.6	469.1	508.6
100	36.9	54.5	67.2	95.5	138.7	239.0	319.4	395.5	488.3	527.8

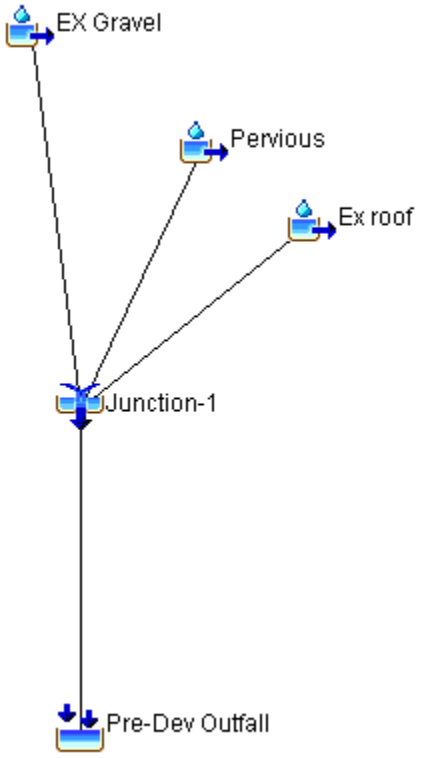
FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 12 of 29 - 26/11/2021 - NZBTC

APPENDIX B

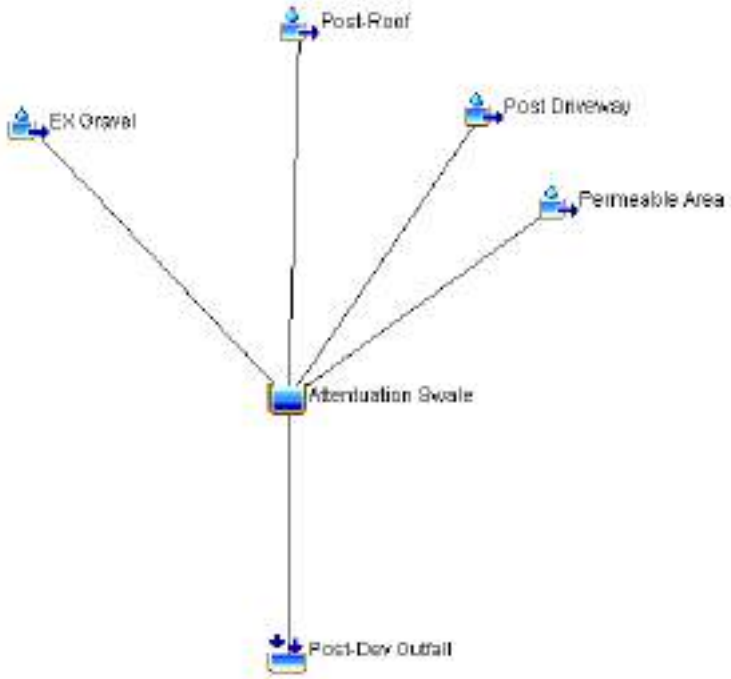
HEC-HMS RESULTS

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 13 of 29 - 26/11/2021 - NZBTC

PRE-DEVELOPMENT MODEL



POST DEVELOPMENT MODEL



FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 14 of 29 - 26/11/2021 - NZBTC

2 YEAR PRE-DEVELOPMENT

Project: 19514-SW Tank Simulation Run: 2Yr Pre

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: 27Oct2021, 11:41:55

Basin Model: Each Lot - Pre
Meteorologic Model: Pre 2y
Control Specifications: Control 1

Show Elements: All Elements | Volume Units: ○ MM ◉ 1000 M3 | Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
EX Gravel	0.011822	0.19745	01Jan2000, 12:03	1.32088
Pervious	0.007280	0.09142	01Jan2000, 12:03	0.60076
Ex roof	0.00024	0.00454	01Jan2000, 12:03	0.03396
Junction-1	0.019342	0.29341	01Jan2000, 12:03	1.95559
Pre-Dev Outfall	0.019342	0.29341	01Jan2000, 12:03	1.95559

2 YEAR POST-DEVELOPMENT

Project: 19514-SW Tank Simulation Run: 2Yr Post
Reservoir: Attentuation Swale

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: DATA CHANGED, RECOMPUTE

Basin Model: Each Lot - Post
Meteorologic Model: Post 2y
Control Specifications: Control 1

Volume Units: ○ MM ◉ 1000 M3

Computed Results

Peak Inflow:	0.29756 (M3/S)	Date/Time of Peak Inflow:	01Jan2000, 12:03
Peak Discharge:	0.21650 (M3/S)	Date/Time of Peak Discharge:	01Jan2000, 12:08
Inflow Volume:	2.33857 (1000 M3)	Peak Storage:	0.21143 (1000 M3)
Discharge Volume:	2.98341 (1000 M3)	Peak Elevation:	0.32657 (M)

Project: 19514-SW Tank Simulation Run: 2Yr Post

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: DATA CHANGED, RECOMPUTE

Basin Model: Each Lot - Post
Meteorologic Model: Post 2y
Control Specifications: Control 1

Show Elements: All Elements | Volume Units: ○ MM ◉ 1000 M3 | Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Permeable Area	0.007520	0.09444	01Jan2000, 12:03	0.62056
Post Driveway	0.005394	0.11094	01Jan2000, 12:03	0.83161
Post-Roof	0.004086	0.08422	01Jan2000, 12:03	0.62997
EX Gravel	0.002342	0.01729	01Jan2000, 12:43	0.25643
Attentuation Swale	0.019342	0.21650	01Jan2000, 12:08	2.98341
Post-Dev Outfall	0.019342	0.21650	01Jan2000, 12:08	2.98341

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 15 of 29 - 26/11/2021 - NZBTC

10 YEAR PRE-DEVELOPMENT

Project: 19514-SW Tank Simulation Run: 10Yr Pre

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: 26Oct2021, 17:48:21

Basin Model: Each Lot - Pre
Meteorologic Model: Pre 10y
Control Specifications: Control 1

Show Elements: All Elements | Volume Units: ○ MM ◉ 1000 M3 | Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
EX Gravel	0.011822	0.32553	01Jan2000, 12:03	2.23887
Pervious	0.007280	0.16818	01Jan2000, 12:03	1.11474
Ex roof	0.00024	0.00705	01Jan2000, 12:02	0.05311
Junction-1	0.019342	0.50075	01Jan2000, 12:03	3.40672
Pre-Dev Outfall	0.019342	0.50075	01Jan2000, 12:03	3.40672

10 YEAR POST-DEVELOPMENT

Project: 19514-SW Tank Simulation Run: 10Yr Post
Reservoir: Attentuation Swale

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: DATA CHANGED, RECOMPUTE

Basin Model: Each Lot - Post
Meteorologic Model: Post 10y
Control Specifications: Control 1

Volume Units: ○ MM ◉ 1000 M3

Computed Results

Peak Inflow: 0.50199 (M3/S)
Peak Discharge: 0.40847 (M3/S)
Inflow Volume: 3.96181 (1000 M3)
Discharge Volume: 4.17235 (1000 M3)

Date/Time of Peak Inflow: 01Jan2000, 12:03
Date/Time of Peak Discharge: 01Jan2000, 12:07
Peak Storage: 0.28731 (1000 M3)
Peak Elevation: 0.44377 (M)

Project: 19514-SW Tank Simulation Run: 10Yr Post

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: DATA CHANGED, RECOMPUTE

Basin Model: Each Lot - Post
Meteorologic Model: Post 10y
Control Specifications: Control 1

Show Elements: All Elements | Volume Units: ○ MM ◉ 1000 M3 | Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Permeable Area	0.007520	0.17373	01Jan2000, 12:03	1.15149
Post Driveway	0.005394	0.17883	01Jan2000, 12:03	1.35138
Post-Roof	0.004086	0.13579	01Jan2000, 12:02	1.02371
EX Gravel	0.002342	0.02879	01Jan2000, 12:42	0.43522
Attentuation Swale	0.019342	0.40847	01Jan2000, 12:07	4.17235
Post-Dev Outfall	0.019342	0.40847	01Jan2000, 12:07	4.17235

100 YEAR POST-DEVELOPMENT SPILLWAY

Project: 19514-SW Tank Simulation Run: Spillway-100 Yr Post
Reservoir: Attentuation Sw...

Start of Run:	01Jan2000, 00:00	Basin Model:	Each Lot - Post
End of Run:	02Jan2000, 00:00	Meteorologic Model:	Post 100y
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: ○ MM ◉ 1000 M3

Computed Results

Peak Infl...	0.93224 (M3/S)	Date/Time of Peak Inflow:	01Jan2000, 12:03
Peak Discharge:	0.85056 (M3/S)	Date/Time of Peak Discharge:	01Jan2000, 12:05
Inflow Volume:	7.20202 (1000 M3)	Peak Storage:	0.42902 (1000 M3)
Discharge Volume:	7.23155 (1000 M3)	Peak Elevation:	0.62327 (M)

Project: 19514-SW Tank Simulation Run: Spillway-100 Yr Post

Start of Run:	01Jan2000, 00:00	Basin Model:	Each Lot - Post
End of Run:	02Jan2000, 00:00	Meteorologic Model:	Post 100y
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Show Elements: All Elements Volume Units: ◉ MM ○ 1000 M3 Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (MM)
Permeable Area	0.007520	0.37708	01Jan2000, 12:03	329.40694
Post Driveway	0.005394	0.29929	01Jan2000, 12:03	407.44253
Post-Roof	0.004086	0.22737	01Jan2000, 12:02	407.45243
EX Gravel	0.002342	0.05807	01Jan2000, 12:42	368.18281
Attentuation Swale	0.019342	0.85056	01Jan2000, 12:05	373.87795
Post-Dev Outfall	0.019342	0.85056	01Jan2000, 12:05	373.87795

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 16 of 29 - 26/11/2021 - NZBTC

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 17 of 29 - 26/11/2021 - NZBTC

APPENDIX C

CONVEYANCE SWALE RESULTS

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 18 of 29 - 26/11/2021 - NZBTC

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Nov 4 2021

Conveyance Swale 10Yr Post Development

Trapezoidal

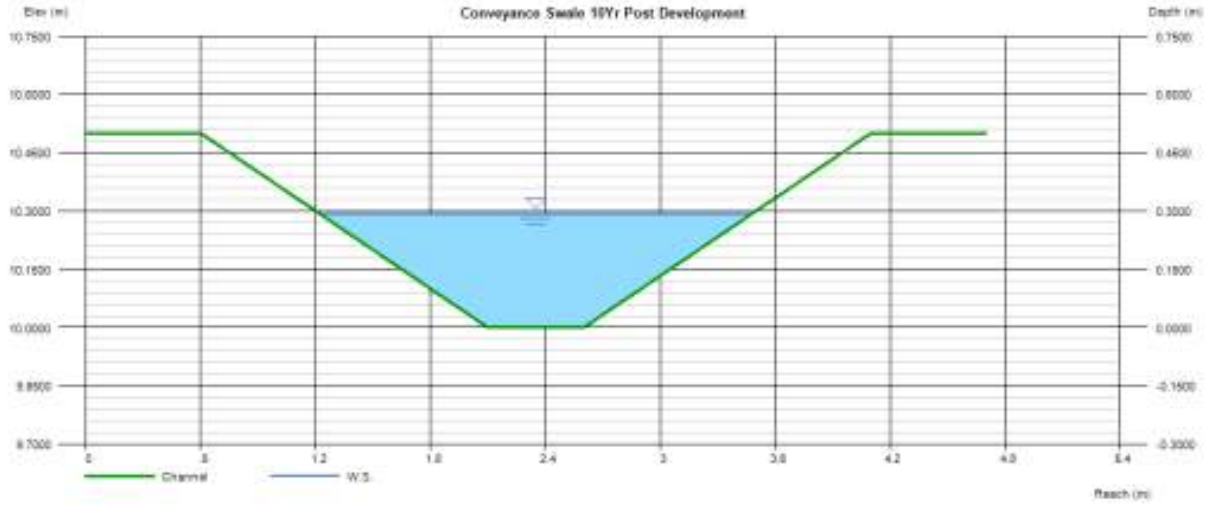
Bottom Width (m)	= 0.5000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 0.5000
Invert Elev (m)	= 10.0000
Slope (%)	= 1.0000
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cms)	= 0.4100

Highlighted

Depth (m)	= 0.2926
Q (cms)	= 0.4100
Area (sqm)	= 0.4032
Velocity (m/s)	= 1.0170
Wetted Perim (m)	= 2.3506
Crit Depth, Yc (m)	= 0.2591
Top Width (m)	= 2.2556
EGL (m)	= 0.3454



FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 19 of 29 - 26/11/2021 - NZBTC

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Nov 4 2021

Conveyance Swale 100Yr Post Development

Trapezoidal

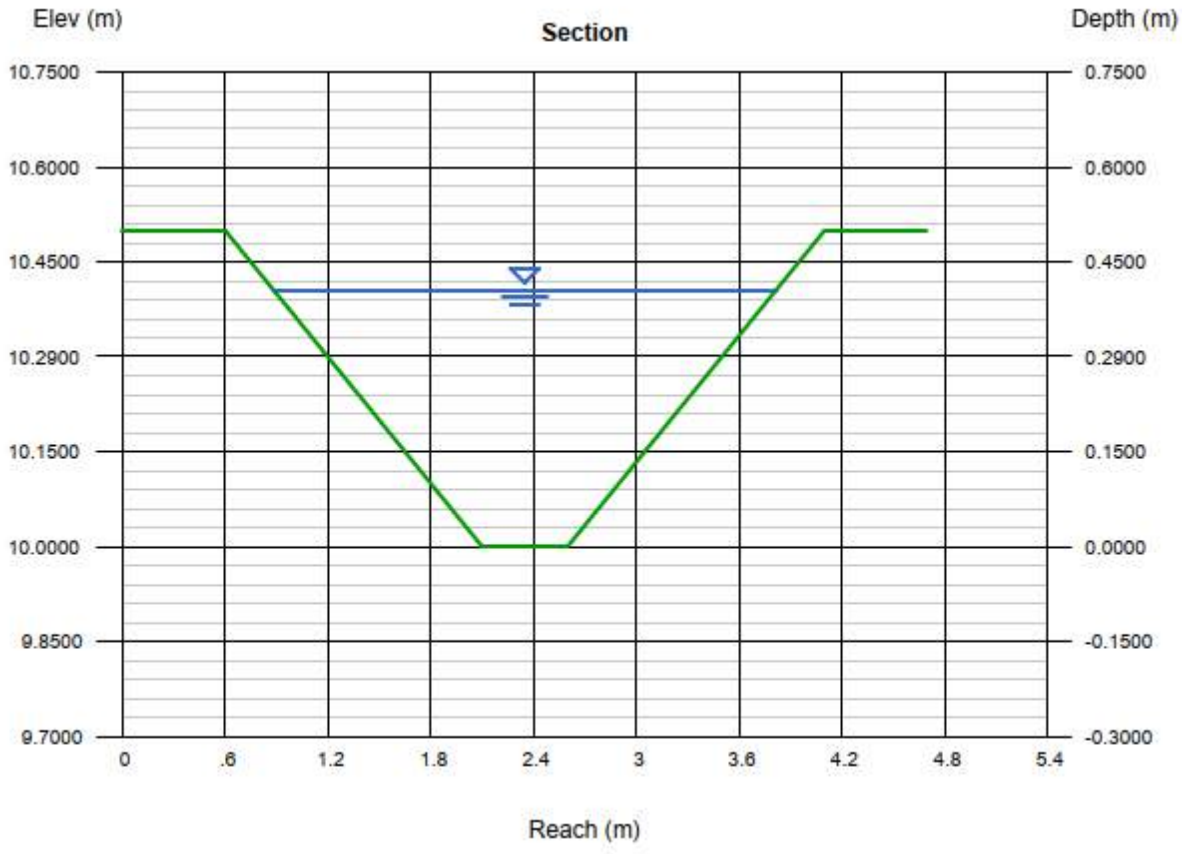
Bottom Width (m)	= 0.5000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 0.5000
Invert Elev (m)	= 10.0000
Slope (%)	= 1.0000
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cms)	= 0.8500

Highlighted

Depth (m)	= 0.4054
Q (cms)	= 0.8500
Area (sqm)	= 0.6957
Velocity (m/s)	= 1.2218
Wetted Perim (m)	= 3.0639
Crit Depth, Yc (m)	= 0.3658
Top Width (m)	= 2.9323
EGL (m)	= 0.4815



FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 20 of 29 - 26/11/2021 - NZBTC

APPENDIX D

DRAWINGS

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 21 of 29 - 26/11/2021 - NZBTC

Legend:

- Existing Private Swale
- Existing Building
- Existing Silt Pond
- Existing Accessway

north

1945A State Highway, Waipapa
Lot 2 DP 343062

1945A State Highway 1

EXTG Building

Existing building to be removed
Area: 240m^2

Existing private swale

existing drainage easement

existing drainage easement

Existing swale to be upgraded to meet minimum swale geometry as cross section detail CS-3. Swale gradient need to meet min. 1%

Existing silt pond has been backfilled

LOT1
DP
376253

Proposed dry pond
Base area is 550m2

Existing compacted gravel area 1.18ha

78.4 78.4 78.4 78.2 78.0 77.8 77.6 77.4 76.8 77.0 77.2 77.4 77.5 77.25

CS-2 5 CS-3 6 CS-3 6

0 10 20 30 40 50

Scale 1:1000 (m) Original Size = A3

Copyright: LDE Ltd. All rights reserved / Do not scale off drawings / Confirm all dimensions on site prior to work

CLIENT
LD Family Investments Ltd
15 Conifer Lane
RD1, Kerikeri

PROJECT
Proposed Packhouse
1945A State Highway 10,
Waipapa

DRAWING TITLE
Existing Site Gravel Area Plan

No.	REVISION	BY	DATE
1	Catchmenet area and dry pond update	SM	03.11.21
0	To issue to the client	S.M	11.06.21

DESIGN:	S.M
DRAWN:	S.M
DATE:	11.06.21
CHECKED:	JS
SCALE A3:	1:1000

PROJECT STATUS: For Construction
PROJECT: 19514
SHEET: 1 of 8
DRAWING No: 19514-C1
REV: 1

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 22 of 29 - 26/11/2021 - NZBTC

Legend:

- Existing Private Swale
- Existing Building
- Existing Silt Pond
- Existing Accessway
- Proposed Building
- Proposed New Accessway

1945A State Highway, Waipapa
Lot 2 DP 343062

1945A State Highway 1

EXTG Building

78.4 78.4 78.4 78.2 78.0 77.8 77.6 77.4 77.2 77.0 76.8 77.2 77.4 77.5 77.25

existing drainage easement

existing drainage easement

EG: 74.455

EG: 74.78

CS-3 6

CS-2 5

CS-3 6

Existing silt pond has been backfilled

LOT1 DP 376253

Proposed attenuation dry pond

Catchment area to flow into dry pond 1.93ha

0 10 20 30 40 50

Scale 1:1000 (m)

Original Size = A3

Copyright: LDE Ltd. All rights reserved / Do not scale off drawings / Confirm all dimensions on site prior to work

CLIENT
LD Family Investments Ltd
15 Conifer Lane
RD1, Kerikeri

PROJECT
Proposed Packhouse
1945A State Highway 10,
Waipapa

DRAWING TITLE
Dry Pond Catchment Area Plan

No.	REVISION	BY	DATE
1	Catchmenet area and dry pond update	SM	03.11.21
0	To issue to the client	S.M	11.06.21

DESIGN:	S.M
DRAWN:	S.M
DATE:	11.06.21
CHECKED:	JS
SCALE A3:	1:1000

PROJECT STATUS: For Construction
PROJECT: 19514
SHEET: 2 of 8
DRAWING No: 19514-C2
REV: 1

www.lde.co.nz ● Auckland 09 280 6645 ● Gisborne 06 867 3035 ● Napier 06 929 0720 ● Tauranga 07 975 0029 ● Warkworth 09 425 0137 ● Whanganui 06 867 3036 ● Whangarei 09 974 8799 ● email: info@lde.co.nz

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 23 of 29 - 26/11/2021 - NZBTC

Legend:

- Existing Private Swale
- Existing Building
- Existing Silt Pond
- Existing Accessway
- Proposed Building
- Proposed New Accessway

1945A State Highway, Waipapa
Lot 2 DP 343062

1945A State Highway 1

EXTG Building

Existing building to be removed
Area: 240m^2

Existing private swale

existing
drainage
easement

EG: 74.455

EG: 74.78

CS-3
6

existing
drainage
easement

Existing swale to be upgraded to meet minimum swale geometry as cross section detail CS-3. Swale gradient need to meet min. 1%

Min. 3m Away from building

3.0m Away from Boundary

33.5

10.0

4.0

15

78.4 78.4 78.4 78.2 78.0 77.8 77.6 77.4 77.2 77.0 77.2 77.4 77.5 77.25

CS-2
5

CS-3
6

LOT1
DP
376253

Proposed dry pond
Base area is 550m2

0 10 20 30 40 50

Scale 1:1000 (m)

Original Size = A3

Copyright: LDE Ltd. All rights reserved / Do not scale off drawings / Confirm all dimensions on site prior to work

CLIENT	LD Family Investments Ltd 15 Conifer Lane RD1, Kerikeri
PROJECT	Proposed Packhouse 1945A State Highway 10, Waipapa
DRAWING TITLE	Stormwater and Onsite Wastewater Site Plan

LDE LAND DEVELOPMENT & ENGINEERING LTD.

No.	REVISION	BY	DATE
1	Catchmenet area and dry pond update	SM	03.11.21
0	To issue to the client	S.M	11.06.21

DESIGN:	S.M
DRAWN:	S.M
DATE:	11.06.21
CHECKED:	JS
SCALE A3:	1:1000

PROJECT STATUS: For Construction

PROJECT: 19514 SHEET: 3 of 8

DRAWING No: 19514-C3 REV: 1

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 24 of 29 - 26/11/2021 - NZBTC

New pavement area 5,394m^2

New Pack house 4,086m^2

1945A State Highway,
Waipapa
Lot 2 DP 343062

north

EXTG Building

Existing building to be removed
Area: 240m^2

78.4 78.4 78.4 78.2 78.0 77.8 77.6 77.4 77.2 77.0 76.8 76.8 77.0

77.4 77.5 77.2

Conveyance swale @ min. 1% gradient. Base width reduce from 1.5m to 0.5m.

Existing private swale

Install gabion basket weir with 1.5m wide notch

77.25 20.0 1.5 25.8 3.0m top width

2.0 0.5m base

6.1 56 54.8

CS-3 6

CS-2 5

existing drainage easement

Dry pond edge to taper to ground level

Proposed dry pond
Base area is 550m2

Tie to existing swale @ approximate 1% gradient flowing towards SH10 road swale

Proposed attenuation dry pond, 55m long
0.8m height constructed with flat base

LOT1
DP
376253

0 5 10 15 20 25

Scale 1:500 (m)

Original Size = A3

Copyright: LDE Ltd. All rights reserved / Do not scale off drawings / Confirm all dimensions on site prior to work

CLIENT
LD Family Investments Ltd
15 Conifer Lane
RD1, Kerikeri

PROJECT
Proposed Packhouse
1945A State Highway 10,
Waipapa

DRAWING TITLE
Stormwater Site Plan

LDE LAND DEVELOPMENT & ENGINEERING LTD.

No.	REVISION	BY	DATE
1	Catchmenet area and dry pond update	SM	03.11.21
0	To issue to the client	S.M	11.06.21

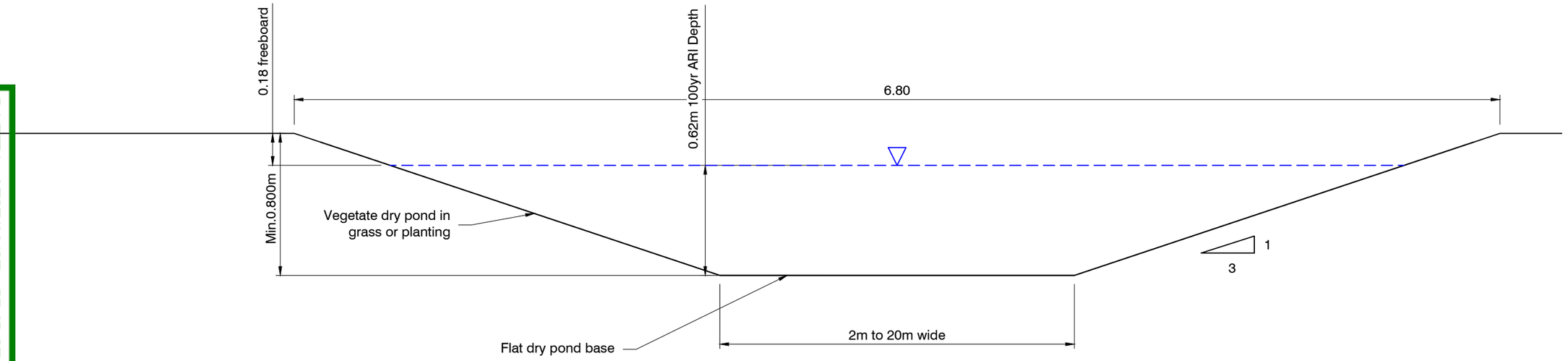
DESIGN:	S.M
DRAWN:	S.M
DATE:	11.06.21
CHECKED:	JS
SCALE A3:	1:500

PROJECT STATUS: For Construction

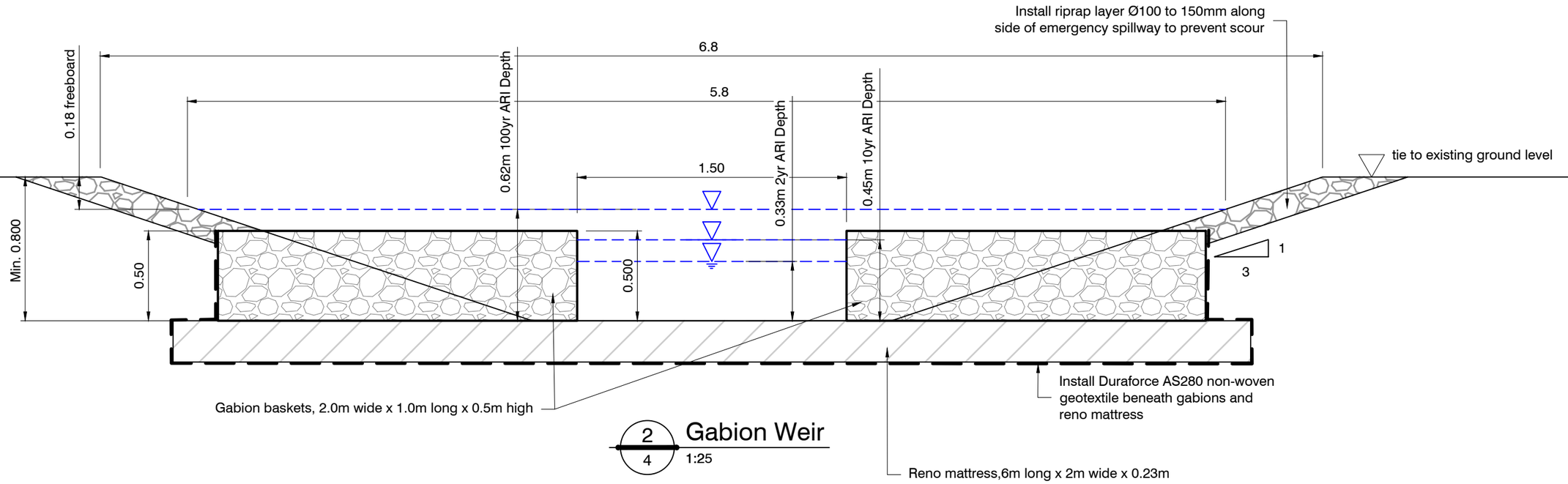
PROJECT: 19514 SHEET: 4 of 8

DRAWING No: 19514-C4 REV: 1

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 25 of 29 - 26/11/2021 - NZBTC



1/4 Dry Pond Section
1:25



2/4 Gabion Weir
1:25

Copyright: LDE Ltd. All rights reserved / Do not scale off drawings / Confirm all dimensions on site prior to work

Original Size = A3

CLIENT
LD Family Investments Ltd
15 Conifer Lane
RD1, Kerikeri

PROJECT
Proposed Packhouse
1945A State Highway 10,
Waipapa

DRAWING TITLE
Dry Pond Cross Section Details

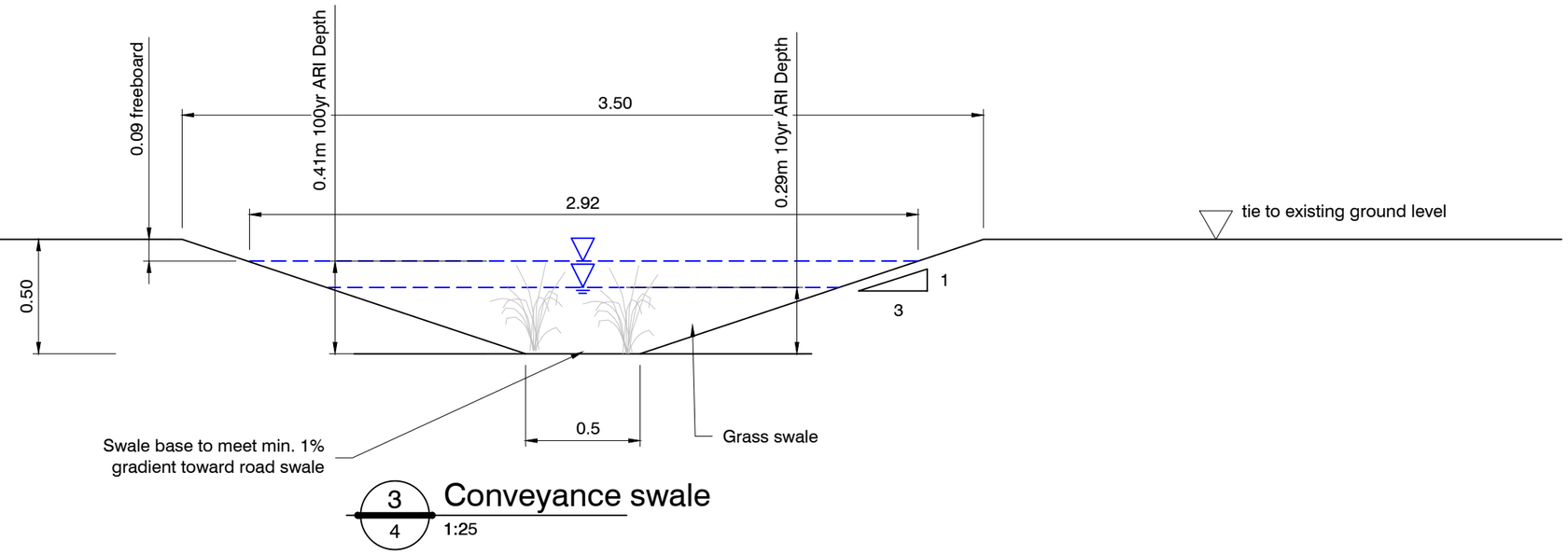
LDE LAND DEVELOPMENT & ENGINEERING LTD.

No.	REVISION	BY	DATE
1	Catchmenet area and dry pond update	SM	03.11.21
0	To issue to the client	S.M	11.06.21

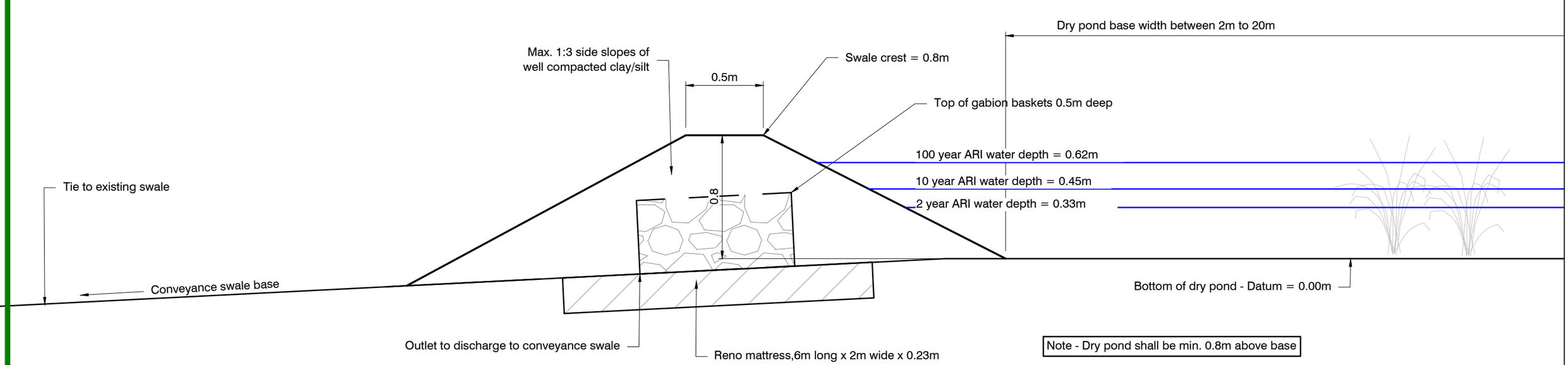
DESIGN:	S.M
DRAWN:	S.M
DATE:	11.06.21
CHECKED:	JS
SCALE A3:	1:25

PROJECT STATUS: For Construction
PROJECT: 19514
SHEET: 5 of 8
DRAWING No: 19514-C5
REV: 1

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 26 of 29 - 26/11/2021 - NZBTC



3/4 Conveyance swale
1:25



5/4 Dry Pond Outlet Details
1:25

Copyright: LDE Ltd. All rights reserved / Do not scale off drawings / Confirm all dimensions on site prior to work

Original Size = A3

CLIENT	LD Family Investments Ltd 15 Conifer Lane RD1, Kerikeri
PROJECT	Proposed Packhouse 1945A State Highway 10, Waipapa
DRAWING TITLE	Conveyance Swale and Dry Pond Outlet Details

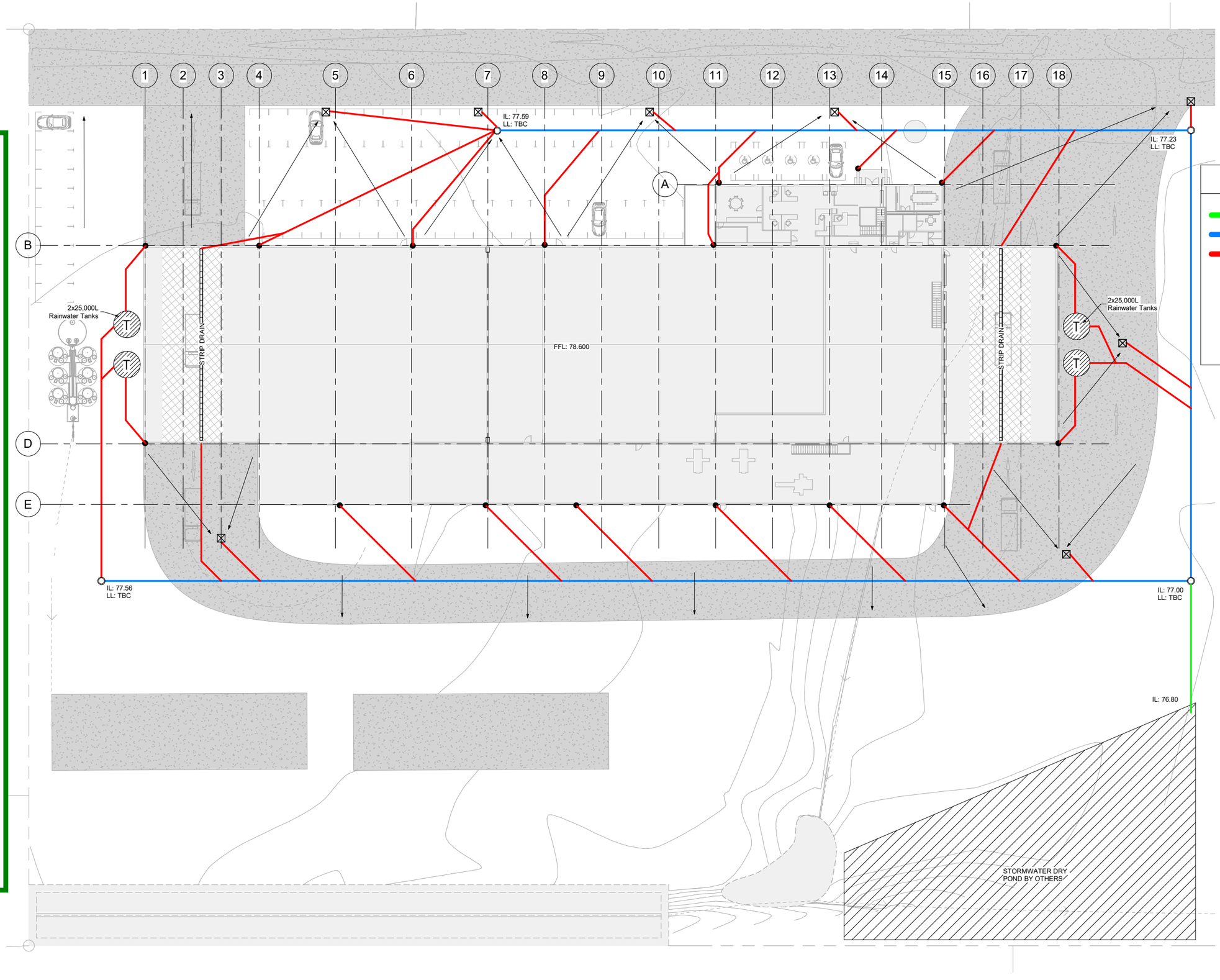
No.	REVISION	BY	DATE
1	Catchmenet area and dry pond update	SM	03.11.21
0	To issue to the client	S.M	11.06.21

DESIGN:	S.M
DRAWN:	S.M
DATE:	11.06.21
CHECKED:	JS
SCALE A3:	1:25

PROJECT STATUS: For Construction
PROJECT: 19514
SHEET: 6 of 8
DRAWING No: 19514-C6
REV: 1

www.lde.co.nz ● Auckland 09 280 6645 ● Gisborne 06 867 3035 ● Napier 06 929 0720 ● Tauranga 07 975 0029 ● Warkworth 09 425 0137 ● Whanganui 06 867 3036 ● Whangarei 09 974 8799 ● email: info@lde.co.nz

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 27 of 29 - 26/11/2021 - NZBTC



STORMWATER PLAN
SCALE 1 : 250 @ A1

STORMWATER LEGEND

- Ø450mm Civil Boss "twin wall" Polypropylene pipe @ 1:150 min fall
- Ø375mm Civil Boss "twin wall" Polypropylene pipe @ 1:250 min fall
- Ø150mm uPVC @ 1:200 min fall
- Stormwater Manhole
- Type 2 Surface water sump
- Pavement Fall
- Ø 150mm Downpipe

REV	DATE	AMENDMENT	BY
A	12/10/2021	Building Consent	

HFC
STRUCTURES LTD.
CIVIL & STRUCTURAL ENGINEERS
LEVEL 2, 19 MORGAN ST
P.O. BOX 109 106
NEWMARKET
T: +64 9 3671070
F: +64 9 367 1071
E: AUCK@HFC.CO.NZ

JOB TITLE
Kainui Packhouse
195A State Highway 10
Waipapa

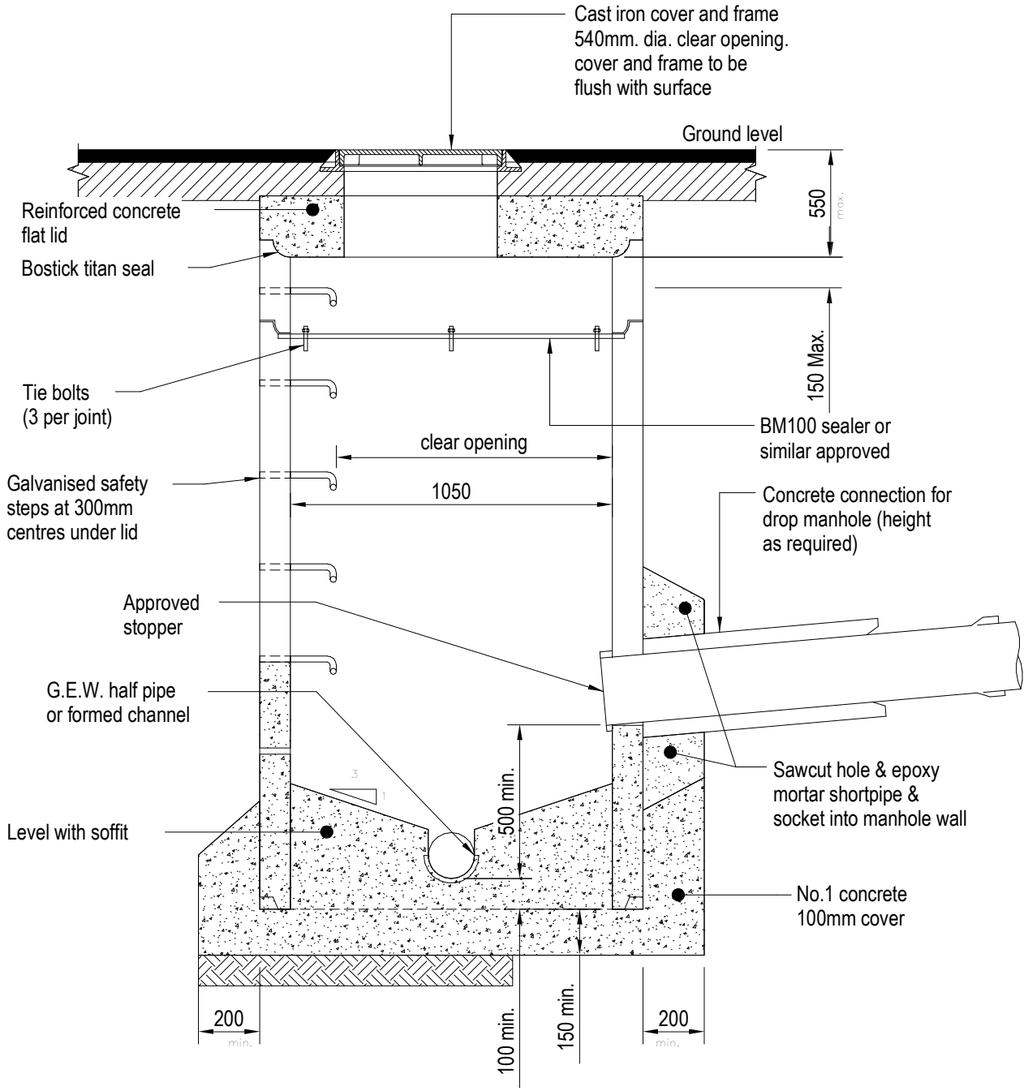
DRAWING TITLE
CIVILS - STORMWATER

DRAWING STATUS
CONSENT

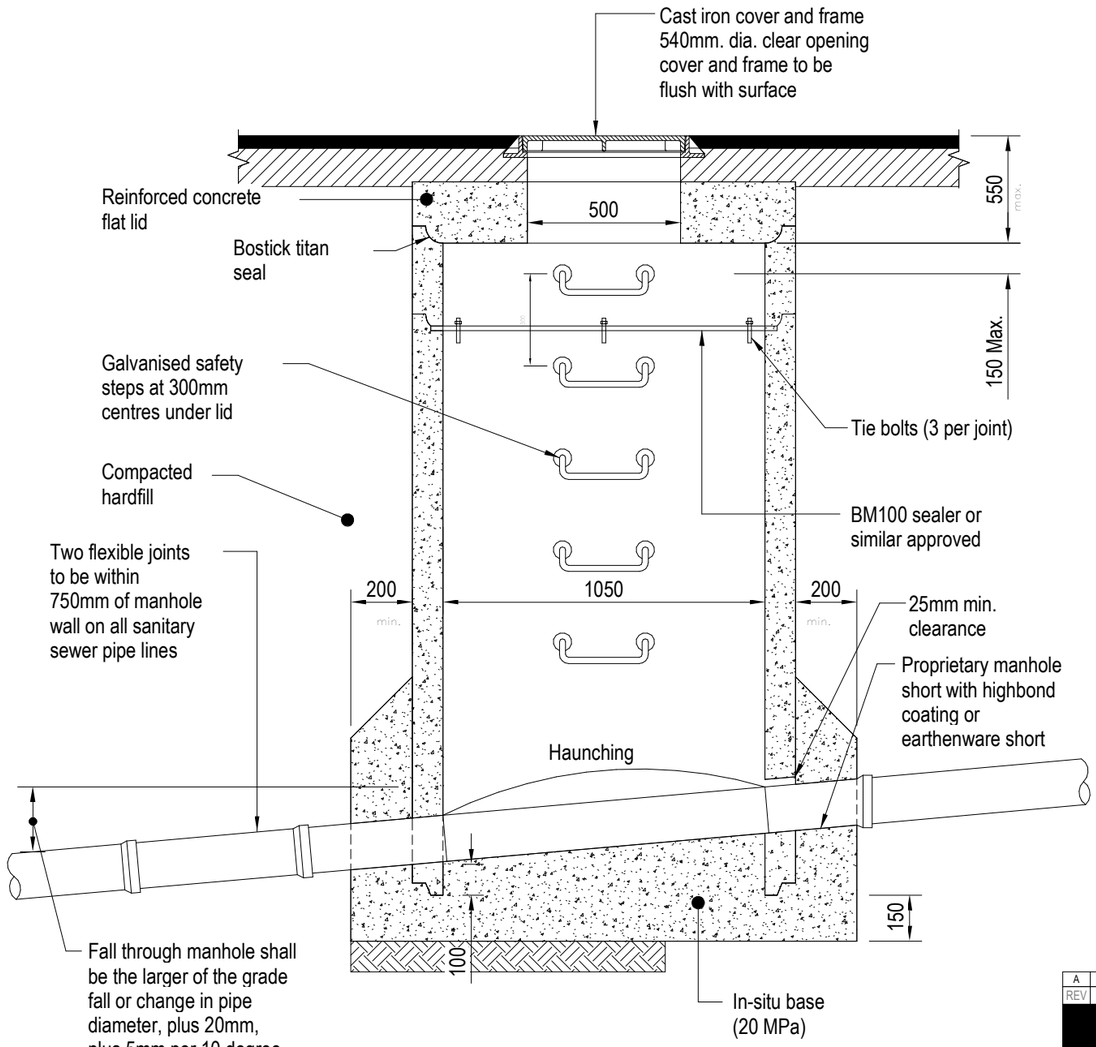
SCALE @ A1	DATE	CLIENT REF NO.	JOB NO.
	10/10/2021		21577
DRAWN	CF		
DESIGNED	CF	SHEET NO.	ISSUE
CHECKED	MG	C001	A

SAVED PATH: B:\21577 - Kainui Packhouse\Drawings\REVIT\21577 Kainui Packhouse - Structural 2021.11.15.rvt
DATE PLOTTED: 16/11/2021 4:04:05 PM

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 28 of 29 - 26/11/2021 - NZBTC



G1 / G101 STANDARD MANHOLE DETAIL



Manhole Section

NOTES :

1. Heavy duty covers to be used in drives, roads, berms, and industrial or commercial zoned land.
2. Light duty covers may be used outside road boundaries except in industrial areas.
3. 150mm dia. min. thick top slab to be used in drives, roads, berms, industrial and commercial zoned land.
4. 100mm thick slab may be used outside road boundaries except in industrial areas.
5. Precast manholes less than 2.4m deep to invert to be constructed of one section.
6. Precast manholes over 2.4m deep to invert must have bottom section of a min. length of 1.8m.
7. Any joints in the walls to be epoxy mortared.

REV	DATE	AMENDMENT	BY
A	12/10/2021	Building Consent	

HFC STRUCTURES LTD.
CIVIL & STRUCTURAL ENGINEERS
LEVEL 2, 19 MORGAN ST
P.O. BOX 109 106
NEWMARKET
T: +64 9 3671070
F: +64 9 367 1071
E: AUCK@HFC.CO.NZ

JOB TITLE
Kainui Packhouse
195A State Highway 10
Waipapa

DRAWING TITLE
DETAILS

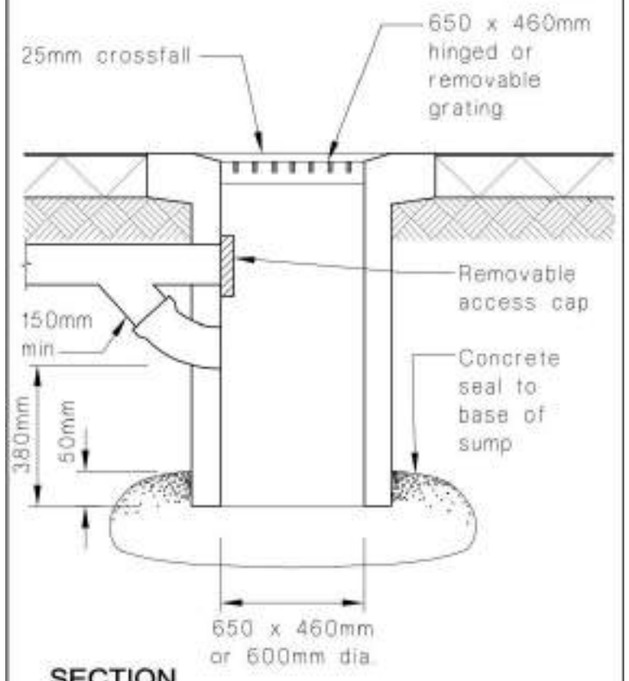
DRAWING STATUS
CONSENT

SCALE @ A1	DATE	CLIENT REF NO.	JOB NO.
	10/10/2021		21577
DRAWN	CF		
DESIGNED	CF	SHEET NO.	ISSUE
CHECKED	MG	C002	A

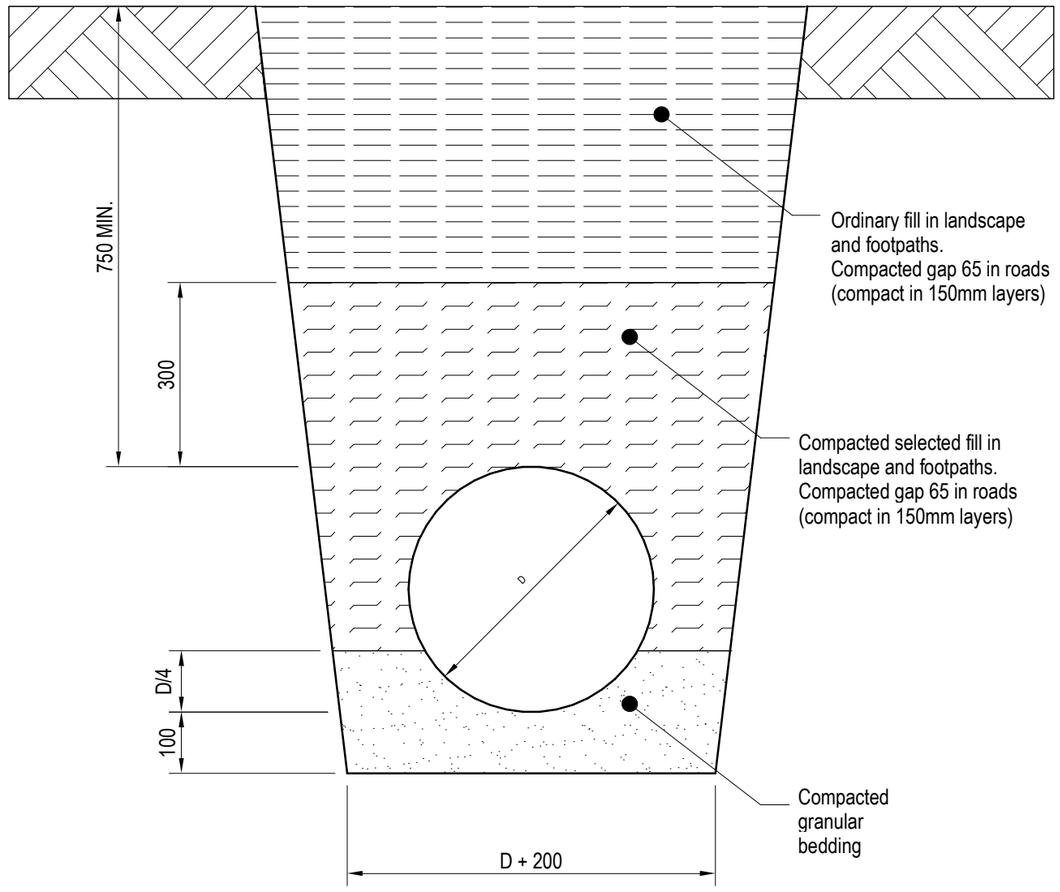
SAVED PATH: B:\21577 - Kainui Packhouse\Drawings\REVIT\21577 Kainui Packhouse - Structural 2021.11.15.rvt
DATE PLOTTED: 16/11/2021 4:04:08 PM

FNDC - Approved Building Consent Document - EBC-2022-619 - Pg 29 of 29 - 26/11/2021 - NZBTC

Figure 9: Type-two Surface Water Sump
Paragraph 3.6.2



G2 / G101 'TYPE 2' SUMP DETAIL



G3 / G101 TYPICAL TRENCH/BEDDING DETAIL

REV	DATE	AMENDMENT	BY
A	12/10/2021	Building Consent	

HFC
STRUCTURES LTD.
CIVIL & STRUCTURAL ENGINEERS
LEVEL 2, 19 MORGAN ST
P.O. BOX 109 106
NEWMARKET
T: +64 9 3671070
F: +64 9 367 1071
E: AUCK@HFC.CO.NZ

JOB TITLE
Kainui Packhouse
195A State Highway 10
Waipapa

DRAWING TITLE
DETAILS

DRAWING STATUS
CONSENT

SCALE @ A1	DATE	CLIENT REF NO.	JOB NO.
	10/10/2021		21577
DRAWN	CF		
DESIGNED	CF	SHEET NO.	ISSUE
CHECKED	MG	C003	A

SAVED PATH: B:\21577 - Kainui Packhouse\Drawings\REVIT\21577 Kainui Packhouse - Structural 2021.11.15.rvt
DATE PLOTTED: 16/11/2021 4:04:09 PM

Appendix D – Stormwater Calculations

HIRDS V4 DEPTH DURATION FREQUENCY RESULTS

Name	NZ Post Ltd
Address	1945 State Highway 10, Waipapa

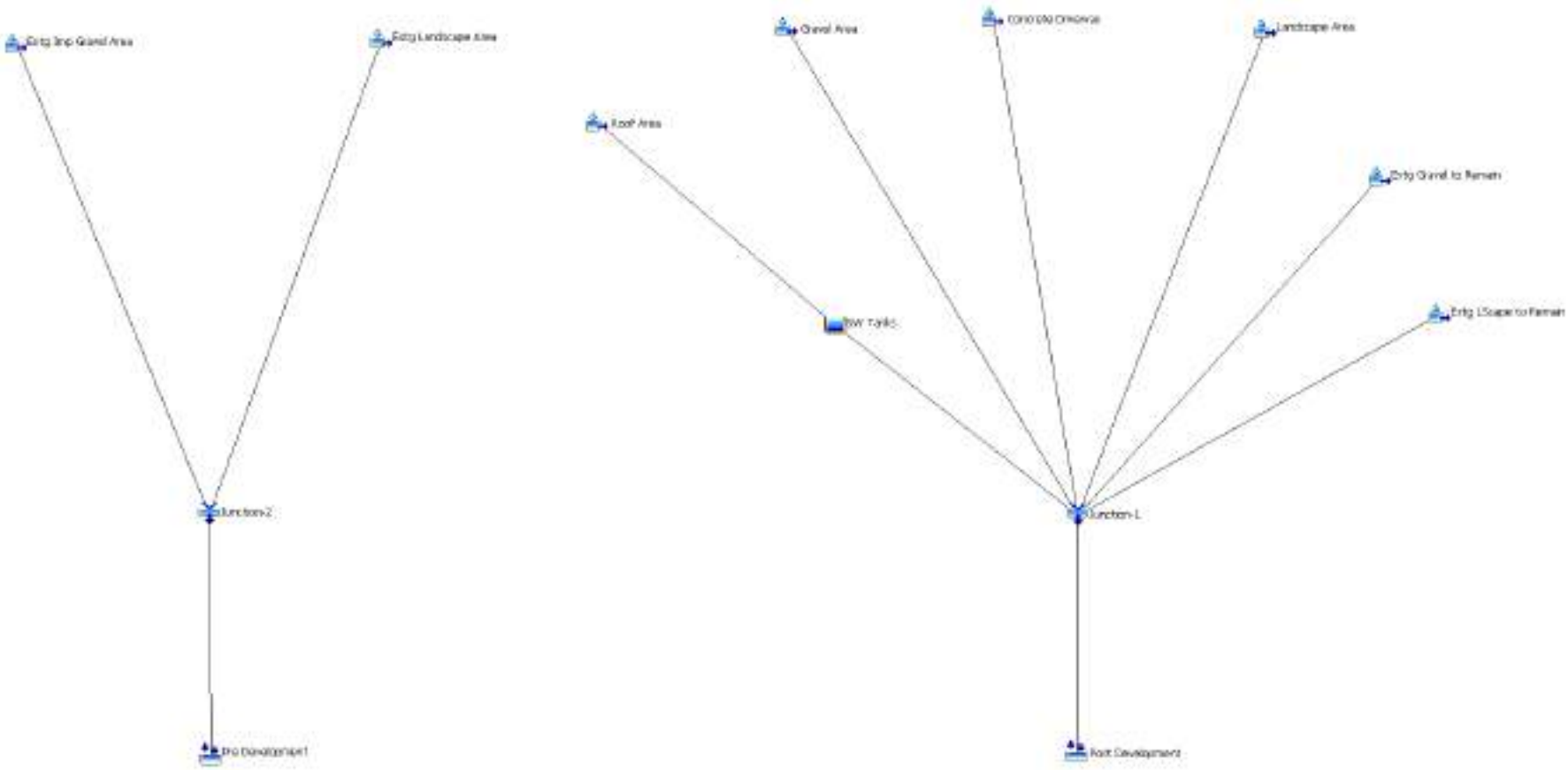
Job No.	1348
Date	1/08/2025

Coordinate system:	WGS84
Longitude:	173.92
Latitude:	-35.21

Rainfall depths (mm) :: Historical Data

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	**63%**	9.91	14.4	17.9	25.9	36.9	61.7	81.7	104	125	137	143	147
2	**50%**	10.8	15.8	19.6	28.4	40.5	67.7	89.8	114	138	150	157	162
5	**20%**	14	20.4	25.4	36.9	52.7	88.4	117	150	181	197	207	213
10	**10%**	16.3	23.8	29.7	43.1	61.7	104	138	176	214	233	244	252
20	**5.0%**	18.7	27.3	34.1	49.5	70.9	119	159	203	247	269	283	292
30	**3.3%**	20.1	29.4	36.7	53.3	76.4	129	172	220	267	291	306	316
40	**2.5%**	21.1	30.8	38.5	56	80.3	136	181	231	281	307	323	333
50	**2.0%**	21.9	32	40	58.1	83.4	141	188	240	292	319	336	346
60	**1.7%**	22.5	32.9	41.1	59.9	85.9	145	194	248	302	330	347	357
80	**1.3%**	23.5	34.4	43	62.6	89.9	152	203	260	316	346	364	375
100	**1.0%**	24.3	35.5	44.4	64.7	92.9	157	210	269	328	358	377	389
250	**0.4%**	27.3	40.1	50.2	73.2	105	179	239	307	374	409	431	445

	Daily Rainfall Depth	Climate Change Increase	Daily Rainfall Depth Adjusted for Climate Change
50% AEP	114	9.0%	124.3
10% AEP	176	13.2%	199.2
1% AEP	269	16.8%	314.2



HEC-HMS Model

Suitable Applications For Duracrete Standard Attenuation Tanks 25,000 Litre

Standard 25,000L Tank Above Ground

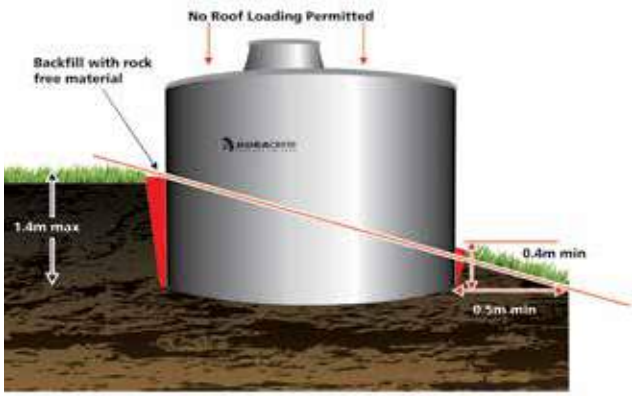


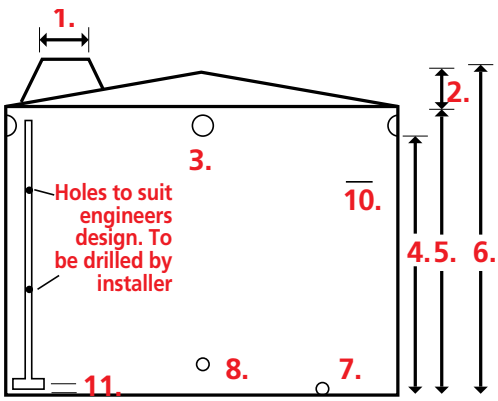
Attenuation tanks are often required as part of building consents by local authorities.

The tanks capture storm water run off, then slowly release the water into stormwater infrastructure. This saves the stormwater from being overwhelmed.

Suitable for above ground installations or buried applications to maximum height of 2.1m

Standard 25,000L Tank Unequally Buried





- 8.25 Tonne Weight
- 65mm Wall Thickness
- 100mm Floor Thickness
- 80 MPA Concrete Strength
- Manhole lid maximum load capacity 150kg

Standard 25,000L Tank Buried to 2.1m Max Height



1.	Hatch Opening Manhole lid maximum load capacity	550mm 150kg
2.	Height of Apex	350mm
3.	Overflow/inlet, 4 positions	110mm
4.	Water Level Height	2.40m
5.	Total Wall Height	2.55m
6.	Overall Height	2.90m
7.	Drain	50mm
8.	Outlet	40mm
9.	Outside Diameter	3.73m
10.	Maximum Ground Level	2.1m
11.	Height of 100mm PVC pipe off tank floor	100mm

Tank Warranty will be voided unless site preparation is carried out by a Duracrete approved earthworks contractor, in accordance with Duracrete's site preparation document. Please contact us and advise us of your proposed contractor.

DURACRETE
PRECAST TO LAST

WHANGAREI | WELLSFORD
Phone: 0800 387 227
Email: info@duracrete.co.nz
www.duracrete.co.nz

ATTENUATION TANK STORAGE CALCULATIONS - HEC HMS INPUTS

Name	NZ Post Ltd
Address	1945 State Highway 10, Waipapa

Job No.	1348
Date	1/08/2025

DESIGN PARAMETERS: Attenuation tanks for Proposed Development

Type and Size of Tank 25000 *Litre Tank*
Number of Tanks 2

Diameter of Tank (m) 3.6

Detention Tank Sizing

Head	Area of Tanks	H1	Outlet 1	H2	Outlet 2	H 3	Outlet 3	H 4	Outlet 4	Qi - total	
0.00	20.35	0.00	0.00000	0.000	0.00000	0.000	0.00000	0.000	0.0000	**0.00000**	
0.20	20.35	0.18	0.00146	0.000	0.00000	0.000	0.00000	0.200	0.0000	**0.00146**	
0.40	20.35	0.38	0.00213	0.000	0.00000	0.000	0.00000	0.400	0.0000	**0.00213**	
0.60	20.35	0.58	0.00263	0.000	0.00000	0.000	0.00000	0.600	0.0000	**0.00263**	
0.80	20.35	0.78	0.00305	0.000	0.00000	0.000	0.00000	0.800	0.0000	**0.00305**	
0.90	20.35	0.88	0.00324	0.000	0.00000	0.000	0.00000	0.900	0.0000	**0.00324**	
1.10	20.35	1.08	0.00359	0.000	0.00000	0.000	0.00000	1.100	0.0000	**0.00359**	
1.29	20.35	1.27	0.00389	0.000	0.00000	0.000	0.00000	1.290	0.0000	**0.00389**	2 yr elevation = 1.29
1.50	20.35	1.48	0.00420	0.195	0.00086	0.000	0.00000	1.500	0.0000	**0.00506**	
1.60	20.35	1.58	0.00434	0.295	0.00105	0.000	0.00000	1.600	0.0000	**0.00539**	
1.80	20.35	1.78	0.00460	0.495	0.00137	0.000	0.00000	1.800	0.0000	**0.00597**	
2.00	20.35	1.98	0.00486	0.695	0.00162	0.000	0.00000	2.000	0.0000	**0.00647**	
2.24	20.35	2.22	0.00514	0.935	0.00188	0.000	0.00000	2.240	0.0000	**0.00702**	10 yr elevation = 2.24
2.30	20.35	2.28	0.00521	0.995	0.00194	0.000	0.00000	2.300	0.0000	**0.00715**	
2.45	20.35	2.43	0.00538	1.145	0.00208	0.075	0.01329	2.450	0.0000	**0.02075**	
2.55	20.35	2.53	0.00549	1.245	0.00217	0.175	0.02030	2.550	0.0000	**0.02796**	100 yr elevation = 2.52

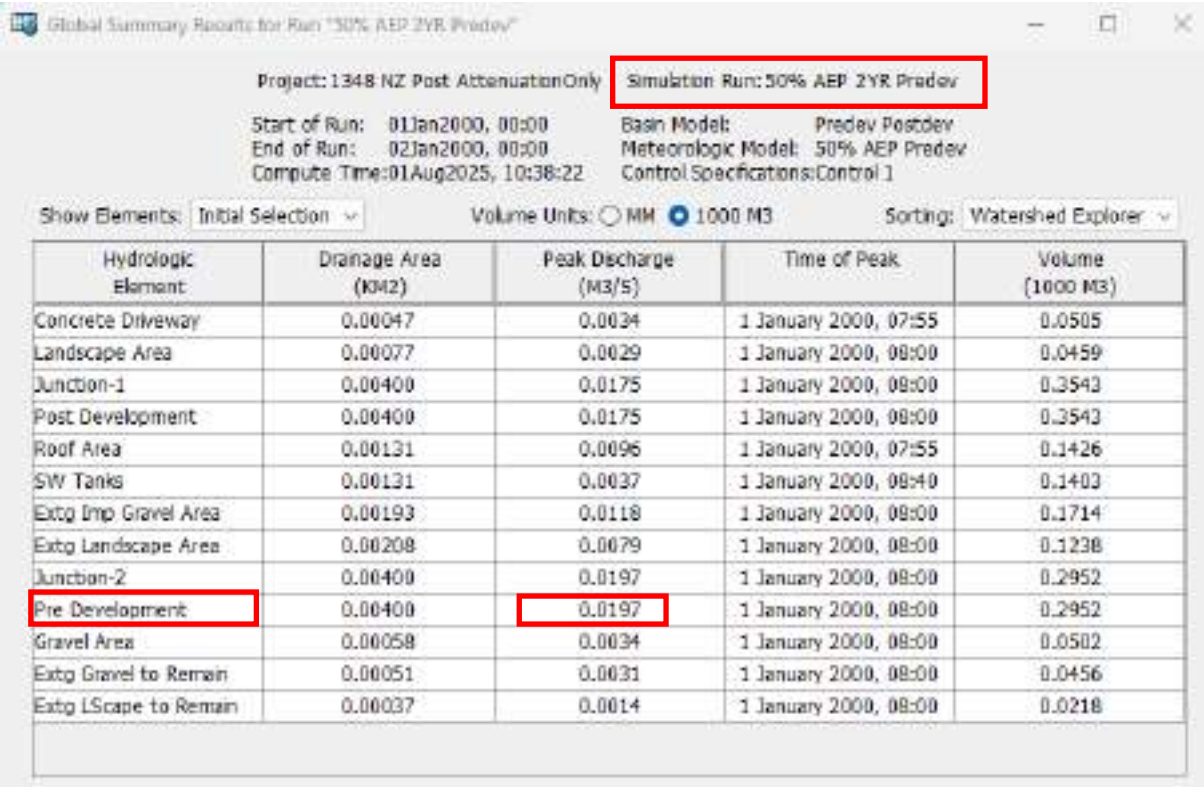
HEC HMS inputs		
Elevation	Vol'000m3	Outlfow
0.00	0.00000	0.00000
0.20	0.00407	0.00146
0.40	0.00814	0.00213
0.60	0.01221	0.00263
0.80	0.01628	0.00305
0.90	0.01831	0.00324
1.10	0.02238	0.00359
1.29	0.02625	0.00389
1.50	0.03052	0.00506
1.60	0.03256	0.00539
1.80	0.03662	0.00597
2.00	0.04069	0.00647
2.24	0.04558	0.00702
2.30	0.04680	0.00715
2.45	0.04985	0.02075
2.55	0.05189	0.02796

Type	**Dia / (m)**	**Height (m)**
Orifice 1	0.040	0.0000
Orifice 2	0.030	1.2900
Orifice 3	0.150	2.3000

Orifice Diameter (mm)	**Distance below Top of Overlow (m)**	
40	2.4500	Orifice 1
30	1.1600	Orifice 2
150	0.1500	Orifice 3

Tank Specifications

Internal Diameter of Base		3.6	*m*
Height	Overall	2.55	*m*
	Dead Storage depth	0.10	*m*
	Depth to top of Overflow	2.45	*m*
Outlet	Diameter	100	*mm*
	Quantity	1	
Wall	Width x 2		*m*
Internal	Diameter	3.60	*m*
Base area for number of tanks		20.35	m^2



Global Summary Results for Run "50% AEP 2YR Predev"

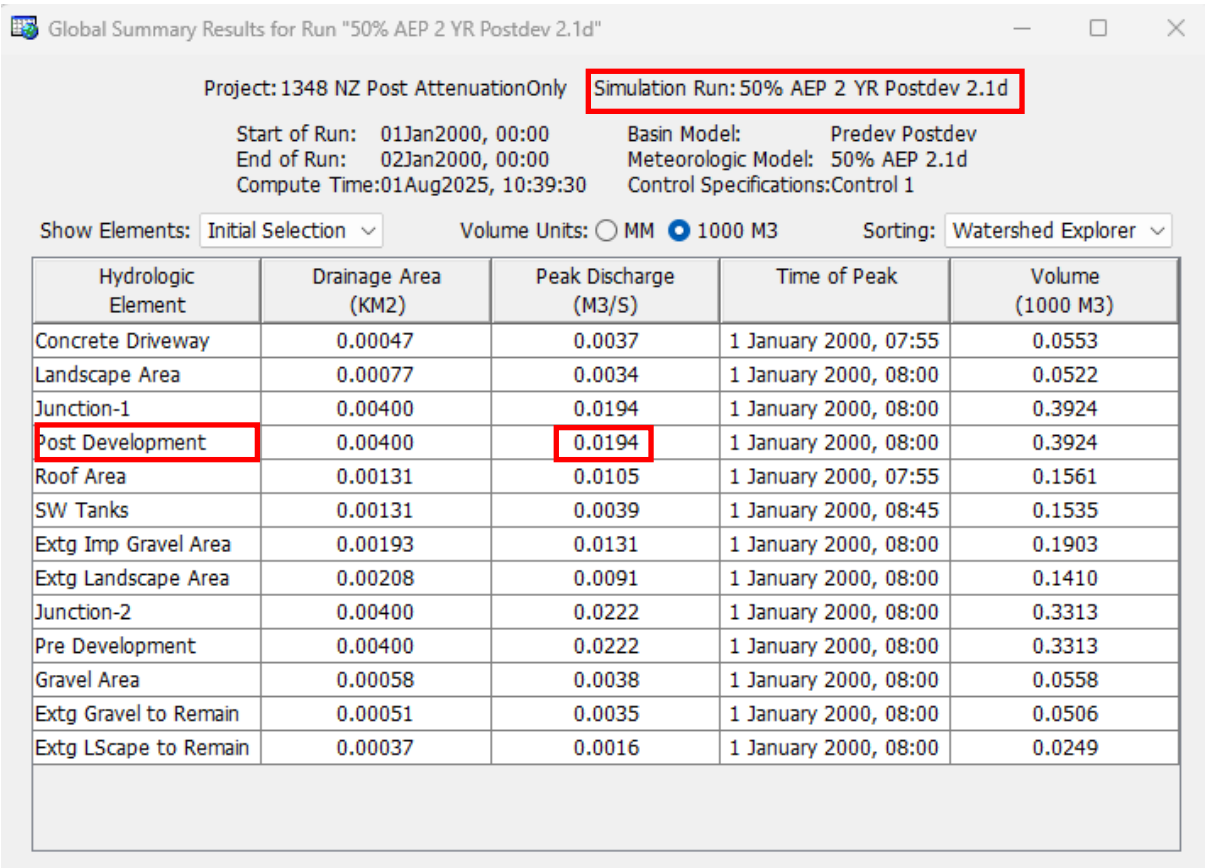
Project: 1348 NZ Post AttenuationOnly | Simulation Run: 50% AEP 2YR Predev

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: 01Aug2025, 10:38:22

Basin Model: Predev Postdev
Meteorologic Model: 50% AEP Predev
Control Specifications: Control 1

Show Elements: Initial Selection | Volume Units: MM / 1000 M3 | Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Concrete Driveway	0.00047	0.0034	1 January 2000, 07:55	0.0505
Landscape Area	0.00077	0.0029	1 January 2000, 08:00	0.0459
Junction-1	0.00400	0.0175	1 January 2000, 08:00	0.3543
Post Development	0.00400	0.0175	1 January 2000, 08:00	0.3543
Roof Area	0.00131	0.0096	1 January 2000, 07:55	0.1426
SW Tanks	0.00131	0.0037	1 January 2000, 08:40	0.1403
Extg Imp Gravel Area	0.00193	0.0118	1 January 2000, 08:00	0.1714
Extg Landscape Area	0.00208	0.0079	1 January 2000, 08:00	0.1238
Junction-2	0.00400	0.0197	1 January 2000, 08:00	0.2952
Pre Development	0.00400	0.0197	1 January 2000, 08:00	0.2952
Gravel Area	0.00058	0.0034	1 January 2000, 08:00	0.0502
Extg Gravel to Remain	0.00051	0.0031	1 January 2000, 08:00	0.0456
Extg LScape to Remain	0.00037	0.0014	1 January 2000, 08:00	0.0218



Global Summary Results for Run "50% AEP 2 YR Postdev 2.1d"

Project: 1348 NZ Post AttenuationOnly | Simulation Run: 50% AEP 2 YR Postdev 2.1d

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: 01Aug2025, 10:39:30

Basin Model: Predev Postdev
Meteorologic Model: 50% AEP 2.1d
Control Specifications: Control 1

Show Elements: Initial Selection | Volume Units: MM / 1000 M3 | Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Concrete Driveway	0.00047	0.0037	1 January 2000, 07:55	0.0553
Landscape Area	0.00077	0.0034	1 January 2000, 08:00	0.0522
Junction-1	0.00400	0.0194	1 January 2000, 08:00	0.3924
Post Development	0.00400	0.0194	1 January 2000, 08:00	0.3924
Roof Area	0.00131	0.0105	1 January 2000, 07:55	0.1561
SW Tanks	0.00131	0.0039	1 January 2000, 08:45	0.1535
Extg Imp Gravel Area	0.00193	0.0131	1 January 2000, 08:00	0.1903
Extg Landscape Area	0.00208	0.0091	1 January 2000, 08:00	0.1410
Junction-2	0.00400	0.0222	1 January 2000, 08:00	0.3313
Pre Development	0.00400	0.0222	1 January 2000, 08:00	0.3313
Gravel Area	0.00058	0.0038	1 January 2000, 08:00	0.0558
Extg Gravel to Remain	0.00051	0.0035	1 January 2000, 08:00	0.0506
Extg LScape to Remain	0.00037	0.0016	1 January 2000, 08:00	0.0249

50% AEP Peak Flows – Pre and Post Development

Global Summary Results for Run "10% AEP 10YR Predev"

Project: 1348 NZ Post AttenuationOnly Simulation Run: 10% AEP 10YR Predev

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: 01Aug2025, 10:46:31

Basin Model: Predev Postdev
Meteorologic Model: 10% AEP Predev
Control Specifications: Control 1

Show Elements: Initial Selection Volume Units: MM 1000 M3 Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Concrete Driveway	0.00047	0.0053	1 January 2000, 07:55	0.0793
Landscape Area	0.00077	0.0058	1 January 2000, 08:00	0.0860
Junction-1	0.00400	0.0302	1 January 2000, 08:00	0.5868
Post Development	0.00400	0.0302	1 January 2000, 08:00	0.5868
Roof Area	0.00131	0.0149	1 January 2000, 07:55	0.2236
SW Tanks	0.00131	0.0063	1 January 2000, 08:30	0.2199
Extg Imp Gravel Area	0.00193	0.0197	1 January 2000, 08:00	0.2865
Extg Landscape Area	0.00208	0.0155	1 January 2000, 08:00	0.2322
Junction-2	0.00400	0.0353	1 January 2000, 08:00	0.5187
Pre Development	0.00400	0.0353	1 January 2000, 08:00	0.5187
Gravel Area	0.00058	0.0058	1 January 2000, 08:00	0.0844
Extg Gravel to Remain	0.00051	0.0053	1 January 2000, 08:00	0.0762
Extg LScape to Remain	0.00037	0.0027	1 January 2000, 08:00	0.0410

Global Summary Results for Run "10% AEP 10 YR Postdev 2.1d"

Project: 1348 NZ Post AttenuationOnly Simulation Run: 10% AEP 10 YR Postdev 2.1d

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: 01Aug2025, 10:47:26

Basin Model: Predev Postdev
Meteorologic Model: 10% AEP 2.1d
Control Specifications: Control 1

Show Elements: Initial Selection Volume Units: MM 1000 M3 Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Concrete Driveway	0.00047	0.0060	1 January 2000, 07:55	0.0900
Landscape Area	0.00077	0.0069	1 January 2000, 08:00	0.1019
Junction-1	0.00400	0.0350	1 January 2000, 08:00	0.6748
Post Development	0.00400	0.0350	1 January 2000, 08:00	0.6748
Roof Area	0.00131	0.0169	1 January 2000, 07:55	0.2539
SW Tanks	0.00131	0.0070	1 January 2000, 08:30	0.2492
Extg Imp Gravel Area	0.00193	0.0227	1 January 2000, 08:00	0.3301
Extg Landscape Area	0.00208	0.0186	1 January 2000, 08:00	0.2750
Junction-2	0.00400	0.0413	1 January 2000, 08:00	0.6051
Pre Development	0.00400	0.0413	1 January 2000, 08:00	0.6051
Gravel Area	0.00058	0.0067	1 January 2000, 08:00	0.0974
Extg Gravel to Remain	0.00051	0.0060	1 January 2000, 08:00	0.0878
Extg LScape to Remain	0.00037	0.0033	1 January 2000, 08:00	0.0485

10% AEP Peak Flows – Pre and Post Development

Global Summary Results for Run "1% AEP 100 YR Predev"

Project: 1348 NZ Post AttenuationOnly | Simulation Run: 1% AEP 100 YR Predev

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: 01Aug2025, 10:49:01

Basin Model: Predev Postdev
Meteorologic Model: 1% AEP Predev
Control Specifications: Control 1

Show Elements: Initial Selection | Volume Units: MM / 1000 M3 | Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Concrete Driveway	0.00047	0.0081	1 January 2000, 07:55	0.1223
Landscape Area	0.00077	0.0104	1 January 2000, 08:00	0.1511
Junction-1	0.00400	0.0622	1 January 2000, 08:00	0.9413
Post Development	0.00400	0.0622	1 January 2000, 08:00	0.9413
Roof Area	0.00131	0.0229	1 January 2000, 07:55	0.3452
SW Tanks	0.00131	0.0215	1 January 2000, 08:05	0.3362
Extg Imp Gravel Area	0.00193	0.0317	1 January 2000, 07:55	0.4622
Extg Landscape Area	0.00208	0.0280	1 January 2000, 08:00	0.4078
Junction-2	0.00400	0.0597	1 January 2000, 08:00	0.8700
Pre Development	0.00400	0.0597	1 January 2000, 08:00	0.8700
Gravel Area	0.00058	0.0094	1 January 2000, 08:00	0.1368
Extg Gravel to Remain	0.00051	0.0084	1 January 2000, 07:55	0.1229
Extg LScape to Remain	0.00037	0.0049	1 January 2000, 08:00	0.0719

Global Summary Results for Run "1% AEP 100 YR Postdev 2.1d"

Project: 1348 NZ Post AttenuationOnly | Simulation Run: 1% AEP 100 YR Postdev 2.1d

Start of Run: 01Jan2000, 00:00
End of Run: 02Jan2000, 00:00
Compute Time: 01Aug2025, 10:49:30

Basin Model: Predev Postdev
Meteorologic Model: 1% AEP 2.1d
Control Specifications: Control 1

Show Elements: Initial Selection | Volume Units: MM / 1000 M3 | Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Concrete Driveway	0.00047	0.0095	1 January 2000, 07:55	0.1433
Landscape Area	0.00077	0.0127	1 January 2000, 08:00	0.1838
Junction-1	0.00400	0.0754	1 January 2000, 08:00	1.1146
Post Development	0.00400	0.0754	1 January 2000, 08:00	1.1146
Roof Area	0.00131	0.0268	1 January 2000, 07:55	0.4043
SW Tanks	0.00131	0.0261	1 January 2000, 08:00	0.3917
Extg Imp Gravel Area	0.00193	0.0375	1 January 2000, 07:55	0.5481
Extg Landscape Area	0.00208	0.0343	1 January 2000, 08:00	0.4960
Junction-2	0.00400	0.0718	1 January 2000, 08:00	1.0441
Pre Development	0.00400	0.0718	1 January 2000, 08:00	1.0441
Gravel Area	0.00058	0.0111	1 January 2000, 07:55	0.1625
Extg Gravel to Remain	0.00051	0.0100	1 January 2000, 07:55	0.1458
Extg LScape to Remain	0.00037	0.0060	1 January 2000, 08:00	0.0875

1% AEP Peak Flows – Pre and Post Development

OVERLAND FLOWPATH - MANNINGS CALCULATIONS

Name	NZ Post Development
Address	1945 State Highway 10, Waipapa, Northland

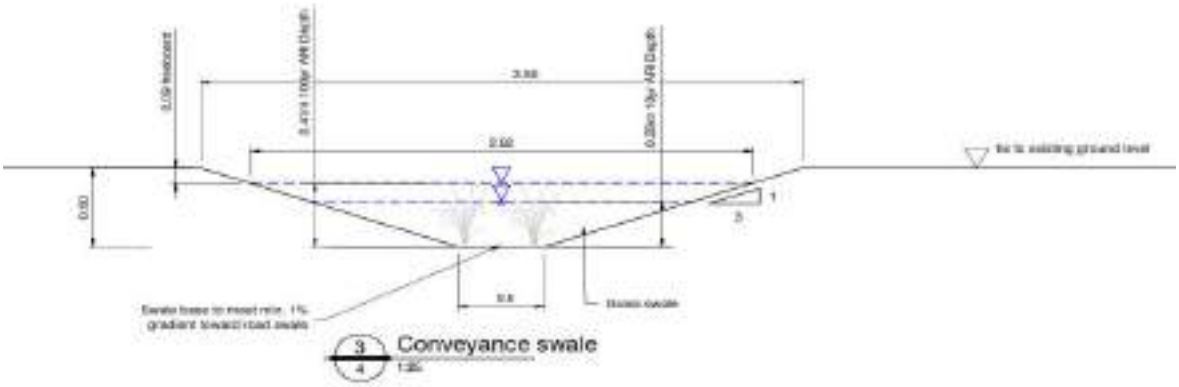
Date	1/08/2025

	Existing Open Drain Cross Section	**Existing Open Drain Cross Section with 1% AEP additional flow from site**	
Parameters	**Values**	**Values**	
AEP Event (%)	1%	1%	
Mannings Roughness Coefficient (n)	0.03	0.03	
Flow Area (A)	0.689	0.698	m^2
Wetted perimeter (P)	3.049	3.068	m
Hydraulic Radius R = A/P	0.226	0.228	
Slope S = H/L (m)	0.01	0.01	m/m
Velocity (V)	**1.237**	**1.242**	m/s
Flow (Q)	**0.85206**	**0.86710**	m^3/s
Neighbouring Development Calculated Flows	0.85	0.8657	m^3/s

Channel capacity >= Catchment flow	**YES**	**YES**

Channel Depth (m)	**0.403**	**0.406**	m

Manning Formula $V = 1/nR^{2/3}s^{1/2}$



Open Drain Design from Approved Design for Neighbouring Development

NZ POST DEVELOPMENT
SMARTSTEEL LTD
LOT 2 DP 177522
STATE HIGHWAY 10, WAIPAPA
FAR NORTH DISTRICT
REF: 25039

PROPOSED WASTEWATER TREATMENT & DISPOSAL:
ON-SITE WASTEWATER DISPOSAL ENGINEERING DESIGN
AS/NZS 1547 (2012)

DURACRETE
PRECAST TO LAST

DOCUMENT CONTROL

Version	Date	Issued For
1	15 August 2025	BC

Prepared By:	Review By:
 Christina Gibson (NDAT) Wastewater Design Engineer, Mobile 021 951 054 Email: design@duracrete.co.nz	 Gerald Lilley (B.Agr.Sc.(Ag.Eng.) Senior Wastewater & Design Engineer Duracrete

PROPOSED WASTEWATER TREATMENT & DISPOSAL:
ON-SITE WASTEWATER DISPOSAL ENGINEERING DESIGN
AS/NZS 1547 (2012)
LOT 2 DP 177522

Table of Contents

Project Overview....3

Design Parameters....7

Section A: PROPERTY DETAILS....9

Section B: SITE ASSESSMENT SUBSOIL INVESTIGATION 21

Section C: SITE ASSESSMENT SURFACE EVALUATION 26

Section D: Environmental Effects....30

Section E: SITE PHOTOS 33

Section F: DISCHARGE DETAILS....38

Section G: PRIMARY TREATMENT SECONDARY AND TERTIARY TREATMENT....41

Section H: LAND DISPOSAL METHOD....43

Section I: ARCHITECTURAL FLOOR PLAN:....47

Section J: WASTEWATER ENGINEER DRAWINGS: 49

Section K: INSTALLATION REQUIREMENTS 58

Section L: EFFLUENT EVAPO-TRANSPIRATION PLANTS 64

Section M: MANUFACTURER SPECIFICATIONS....74

ON-SITE WASTEWATER DISPOSAL ENGINEERING DESIGN & REPORT

Prepared in accordance with AS/NZS 1547:2012 and TP58 2004,

Client: SmartSteel Ltd

Location: 1945 State Highway 10, Waipapa

Legal Description: Lot 2 DP 177522

Report Reference: 25039

Site Visit: 28 July 2025 – 1430 HR

1. Project Overview:

Duracrete's Wastewater Design Engineer has been engaged by SmartSteel Ltd to design and document an on-site wastewater management system for a proposed NZ Post Depot.

The proposed development comprises a purpose-built commercial warehouse designed to function as a NZ Post distribution centre. It will accommodate a total number of 6 staff members, operating between the hours of 0500 and 1800.

The scope of works includes on-site wastewater treatment and land-based effluent disposal at the site located at 1945 State Highway 10, Waipapa. The property is legally described as Lot 2 DP 177522.

2. Site and Legal Information:

- Property Address: 1945 State Highway 10, Waipapa
- Legal Description: Lot 2 DP 177522
- Territorial Authority: Far North District Council

3. Site Evaluation and Soil Analysis:

A comprehensive site inspection, geotechnical assessment, and desktop study were conducted. Key findings include:

- Brown Rock Fill
- Waipapa clay – YF
- Soil Classification: Light Clay – *Category 5* (AS/NZS 1547)

This classification is critical to system selection and performance considerations for land-based disposal.

4. Proposed Structure Specifications:

- -A purpose-built commercial warehouse designed to operate as an NZ Post distribution centre.

- - The wastewater system is designed to accommodate an occupancy of 12 staff members. This design rate has been increased from the original 6 staff members to allow for potential fluctuations in daily wastewater production and to mitigate the risk of hydraulic overloading within the effluent disposal field.

5. Wastewater System Design:

Proposed System:

- Treatment Unit: CleanStream TXR1
- Disposal Method: Netafim Bioline Dripline Irrigation Field (surface application via aerial loading)
- Effluent will be time dosed over a 24-hour period:

  Timer dosed loading offers further advantages over demand dose loading enabling discharge as numerous small doses over the entire day rather than unequal on demand loading as wastewater is produced. Timer dose loading optimises land treatment while minimising potential for soil wetting through controlled volume and load/rest cycles.

This system efficiently treats wastewater generated from occupants of the property and ensures safe, sustainable land-based discharge.

6. Proposed Effluent Disposal Area (EDA):

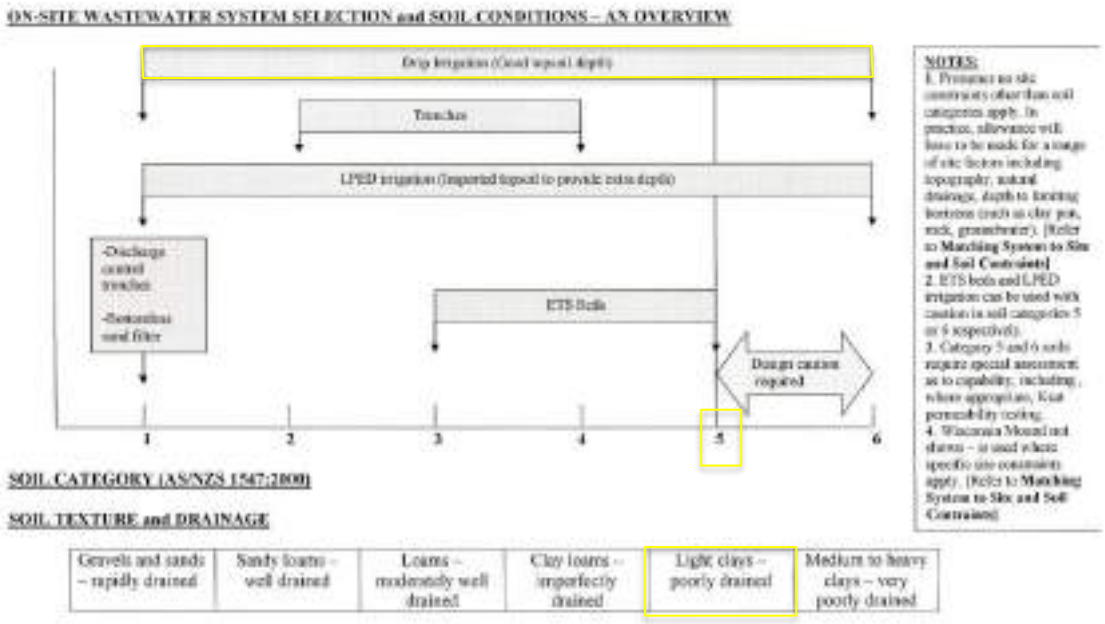
- The existing brown rock fill within the designated EDA is to be excavated and removed, exposing the original in-situ Waipapa clay subsoil.
- The excavated area is to be reinstated with clean, sieved fill material, placed to achieve the finished ground level as per the proposed site design.
- Fill is to be compacted using track rolling only, with no mechanical compaction, in accordance with TP58 guidance to maintain soil permeability.
- A minimum of 50 mm of topsoil is to be applied over the finished surface.
- Upon completion of construction, the EDA is to be landscaped with mulch and appropriate vegetation to support effluent evapotranspiration.

7. Justification for System Selection:

The proposed configuration was selected for the following reasons:

- Specifically designed to meet the hydraulic and treatment needs of occupancy design load associated with the dwelling,
- Matches the soil's Category 5 limitations for effluent loading,
- Ensures long-term performance and ease of maintenance,
- Complies with AS/NZS 1547 guidelines and land application standards,

- Complies with NRC Regional Plan C.6.1.3,
- Reflects client preferences and site-specific constraints,



8. Compliance and Statutory Considerations,

The proposed wastewater system will be designed to accommodate the commercial domestic grade wastewater generated by the purpose-built commercial warehouse, in full compliance with applicable statutory and best practice frameworks. The design will adhere to:

- ***Northland Regional Council*** *regulations (**C.6.1**: On-site Domestic Wastewater Discharges,)*

- C.6.1.3 Other on-site treated domestic wastewater discharge – **permitted activity**

The discharge of domestic type wastewater into or onto land from an on-site system and the associated discharge of odour into air from the on-site system are permitted activities, provided:

1) the on-site system is designed and constructed in accordance with the Australian/New Zealand Standard. On-site Domestic Wastewater Management (AS/NZS 1547:2012), and
2) the volume of wastewater discharged does not exceed two cubic metres per day, and

3) the discharge is not via a spray irrigation system or deep soakage system, and

4) the slope of the disposal area is not greater than 25 degrees, and

5) for wastewater that has received secondary treatment or tertiary treatment, it is discharged via:

b) an irrigation line system that is dose loaded and covered by a minimum of 50 millimetres of topsoil, or mulch, and

7) the disposal area and reserve disposal area are situated outside the relevant exclusion areas and setbacks in Table 9: Exclusion areas and setback distances for on-site domestic wastewater systems, and

9) the following reserve disposal areas are available at all times:

b) 30 percent of the existing effluent disposal area where the wastewater has received secondary treatment or tertiary treatment, and

10) the on-site system is maintained so that it operates effectively at all times and maintenance is

undertaken in accordance with the manufacturer's specifications, and

11) the discharge does not contaminate any groundwater water supply or surface water, and

12) there is no surface runoff or ponding of wastewater, and

13) there is no offensive or objectionable odour beyond the property boundary.

- *TP 58 – On-site Domestic Wastewater Management Manual,*

This rigorous compliance framework ensures that the system meets the highest standards of environmental protection and regulatory responsibility.

Should an alternative Geotechnical/Engineering Investigation Report be submitted for the property identified as ***Lot 2 DP 177522, 1945a State Highway 10, Waipapa***, which includes recommendations relevant to on-site wastewater design, any discrepancies between that report and the current wastewater design must be resolved prior to the submission of a building consent application.

DESIGN PARAMETERS

DURACRETE
PRECAST TO LAST

Duracrete Proposed Design Parameters: AS/NZS 1547:2012.

1945 State Highway 10, Waipapa			
Legal Description		Lot 2 DP 177522	
Type of Structure:		Commercial	
Number of Bedrooms:		0	
Occupancy Rate:		12 Staff (12 staff member average over a 24 Hr time frame)	
System Type:		Duracrete CleanStream TXR1	Secondary Treatment
Effluent Disposal Field:		PCDI (Pressure Compensating Drip Irrigation)	Aerial Loading
Soil Category:		CAT 5	
Wastewater Flow Allowance: TP58 Table 6.2 Commercial Flow Allowance – Day Staff,		20	litres/person/day
Total daily wastewater flow:		240	litres/day
Daily Loading Rate (DLR): AS/NZ: 1547,		3	litres/m²/day
DIR Slope Reduction:	0%	3	litres/m²/day
Effluent Disposal Area Required:		80	m²
Field Spacing:		1	m
Reserve Area 30%:		24	m²
Total Area:		104	m²

SECTION A

PROPERTY DETAILS

DURACRETE
PRECAST TO LAST

A1. Property for which this Application relates:

Physical Address of Property	1945 State Highway 10, Waipapa
Owners	NZ Post/SmartSteel Whangarei
Territorial Local Authority	Far North District Council,
Regional Council	Northland Regional Council,
Legal Status of Activity	Permitted: ✓ Controlled: Discretionary:

A2. Legal description of property:

Legal Description:	Lot 2 DP 177522	Parcel Id:	5018860
Property ID:	5018860	Cert. of Title	
Survey Area m²	3,121 m²		

A3. Previous existing discharge consents relating to this proposal or other waste discharge/disposal on the site:

Yes		No	✓

Reference Number(s) and Description

A4. Modern Google Earth Photo:



Figure 1: Google Earth imagery showing property ***Lot 2 DP 177522, 1945a State Highway 10, Waipapa*** *— proposed effluent disposal location.*



Figure 2: Google maps State Highway 10 imagery, **Lot 2 DP 177522, 1945a State Highway 10, Waipapa**.

A5. Aerial Photo:



Aerial photograph, Far North District Council GIS website, showing **Lot 2 DP 177522, 1945a State Highway 10, Waipapa**, with the property highlighted in a blue outline.



Aerial photograph, Far North District Council GIS website, showing **Lot 2 DP 177522, 1945a State Highway 10, Waipapa**, with the property highlighted in a blue outline.

A6. Property Coordinates:



Using the New Zealand Geodetic Datum 2000 (NZGD2000) and the New Zealand Transverse Mercator (NZTM) coordinate system on a GIS mapping platform, the approximate location of the proposed effluent disposal field is indicated by a yellow dot on the site plan:

- **Easting:** 1683677.44
- **Northing:** 6102758.45

A7. District Plan:



Far North District Council GIS maps, indicates that **Lot 2 DP 177522, 1945a State Highway 10, Waipapa**, is located within, **Industrial Zones, Heavy Industrial**.

A8. Flooding Hazard:



According to the flood modelling layer in the GIS Hazard Maps provided by the Far North District Council, the proposed effluent disposal area on **Lot 2 DP 177522, 1945a State Highway 10, Waipapa**, is located well outside any identified flood hazard zones. The site lies approximately **250.67 metres northeast** of the nearest flood-prone area. In the accompanying aerial image, the property boundary is delineated in blue. This spatial positioning confirms that the location is not at risk of flooding and is therefore suitable for its intended effluent management use.



The Local Natural Hazards Maps from the Northland Regional Council designate the river flood hazard zones in the area. The proposed effluent disposal area— **Lot 2 DP 177522, 1945a State Highway 10, Waipapa**—is identified by a yellow circle and lies outside any designated River Flood Hazard Zone.
The diagram indicates the following zones:

- **Regionwide Rivers Flood Hazard Zone 1 (RRFHZ1):** Areas with a 10% Annual Exceedance Probability (AEP) / 10-year Average Return Interval (ARI)

- **Regionwide Rivers Flood Hazard Zone 2 (RRFHZ2):** Areas potentially susceptible to river flooding in a 2% AEP / 50-year ARI
- **Regionwide Rivers Flood Hazard Zone 3 (RRFHZ3):** Areas potentially susceptible to river flooding in a 1% AEP / 100-year ARI, including climate change effects

Flood maps are produced using advanced computer models that analyse historical flood data, topography, rainfall patterns, and river flows to identify flood-prone areas. The proposed effluent disposal area, marked by a yellow circle, is situated well outside the 10-, 50-, and 100-year flood zones. The nearest identified flood risk area—Regionwide Rivers Flood Hazard Zone 3—is approximately **250.67 metres northeast**.

A9. Modelled flow paths:



According to the Far North District Council's Atlas — Water Services map**, Lot 2 DP 177522, 1945a State Highway 10, Waipapa**, contains no modelled catchment flow paths. The closest modelled catchment flow path is located approximately **121.08 metres northeast** of the proposed effluent disposal field. This distance provides an effective setback buffer of over 5 metres, significantly reducing the risk of potential contamination.

The proposal complies with the Proposed Regional Plan for Northland, which mandates a minimum setback of 5 metres, as outlined in NRC PRP Section C.6.1.3 Part 7 and Table 9. By exceeding this requirement, we enhance the environmental integrity of the proposed effluent disposal area and help protect surrounding water sources.

A9. Proximity to Existing Waterways:



No river section IDs were identified within an approximate **15-metre radius** of the proposed effluent field during the desktop investigation conducted via the Toitū Te Whenua LINZ website. The nearest identified river section ID is located approximately **450 metres southwest** of the proposed effluent disposal area.

River section ID: 1321527 (Kerikeri River) **- 450 metres southwest,**



Based on desktop investigation and the proposed location for the effluent disposal area, it has been determined that the identified waterway is situated beyond the regulated setback distances, specifically greater than **15 meters**. This complies with the Proposed Regional Policy Plan for Northland, which stipulates a minimum setback of **15 meters**, as outlined in NRC PRP Section C.6.1.3 Part 7 & Table 9. The proposed effluent disposal area not only meets but exceeds this requirement. This adherence to policy reinforces the environmental integrity of the proposed effluent field and ensures the protection of the surrounding water sources.

A10. Water Resources:



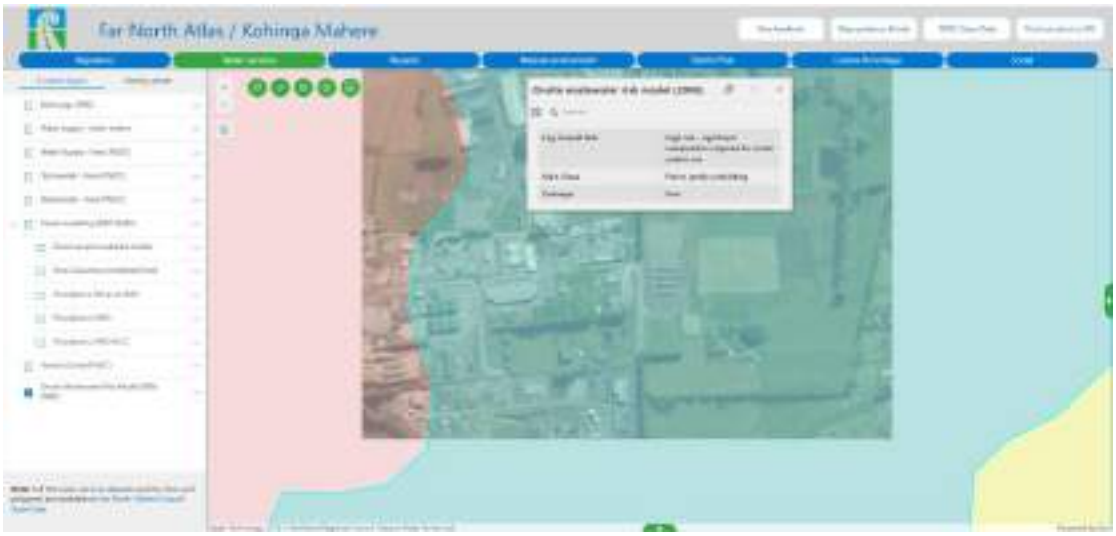
The Northland Regional Council Local Maps online service indicates no registered bores within a 20-meter radius of the property boundary Lot 2 DP 177522, 1945a State Highway 10, Waipapa,



The closest registered consented bore hole in the general vicinity of the proposed effluent disposal area, so located approximately 73.5 metres northeast, identified as:

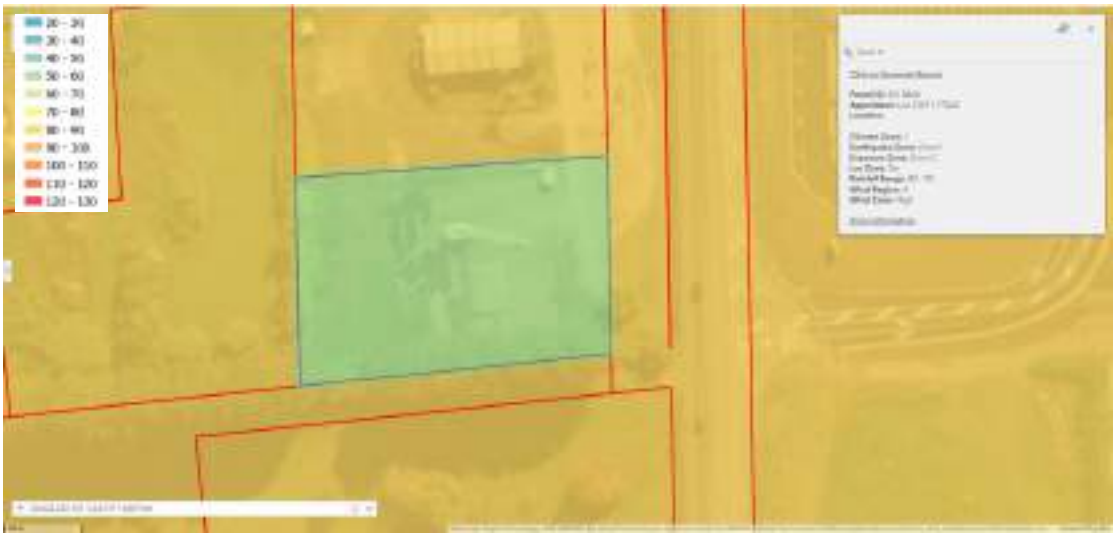
- IRISID: LOC.210258.

A11. Onsite Wastewater Risk Model 2006



According to the Far North District Council's Atlas — Water Services, Onsite Wastewater Risk Model (2006) map — the proposed effluent disposal field at **Lot 2 DP 177522, 1945a State Highway 10, Waipapa** is situated in an area classified as **High risk, requiring significant manipulation for onsite system use**. The yellow circle in the accompanying image indicates the approximate location of the proposed disposal field.

A12. Rainfall Range:



Based on the BRANZ maps for New Zealand, the subject property **Lot 2 DP 177522, 1945a State Highway 10, Waipapa**, falls within a rainfall range of **80 to 90 mm**. The rainfall intensity values utilized derived from the NIWA HIRDS calculator, reflecting a 10-minute rainfall intensity with an annual exceedance probability of 10%.

A13. Wind Zone:



Based on the BRANZ maps for New Zealand, the subject property **Lot 2 DP 177522, 1945a State Highway 10, Waipapa**, falls within a **High Wind Zone**.

Wind zones are an output from a 2014 research project at BRANZ. The project aimed to see if the calculation of wind zones (in accordance with NZS 3604:2011) could be automated using GIS (geographic information system) software. The method for calculating wind zones in NZS 3604:2011 is a simplification of the method described in AS/NZS 1170.2:2011

SECTION B

SITE ASSESSMENT
SUBSOIL INVESTIGATION

B1. Site Geology of the subject property:



The Northland Regional Council Soil Maps indicate one soil type located at the property **Lot 2 DP 177522, 1945a State Highway 10, Waipapa**.

- Soil type: YF covers 0.41ha. -> (100%) Relevant factsheet: 1.2

https://www.nrc.govt.nz/media/fdalgjeo/soilfactsheet12finalweb.pdf,

Fundamental Soils:	Dominant Soil	KYF
	Main Soil	YF
	Soil	YF
	Series	Waipapa
	Soil Type	clay
	Phase	
	Fact Sheet Number	1.2

The soil structure of the proposed site of the effluent disposal area is made up of young basalt volcanic soils, Kiripaka bouldery silt loam.

B2. Soil profile determination method:

Bore Hole	✓	Depth = 1500mm	No. of Bore Holes	1
Soil Report Attached	Yes	✓	No	

B3. Fill material intercepted during the subsoil investigation:

Yes	✓	No	

If yes, specify the effect of the fill on wastewater disposal.

Fill was encountered in the proposed effluent disposal area. A walkover inspection of the proposed effluent disposal area confirmed this.

Wastewater drainage medium is proposed to be imported on-site for the proposed effluent disposal area.

B4. Permeability Testing (K_{sat}) or Percolation Testing:

Yes		No	✓

K_{sat} testing was not conducted. Due to the nature of the soil type, a **Category 5** AS/NZ 1547:2012 soil type design loading rate should be adopted.

B5. Surface water interception/diversion drains:

Yes		No	✓

If yes, identify areas requiring water interception/diversion drains.

B6. Depth of the seasonal water table:

Winter	> 1500 (mm)			
Summer				
Measured		✓	Estimated	

B7. Potential short circuit paths:

Yes		No	✓

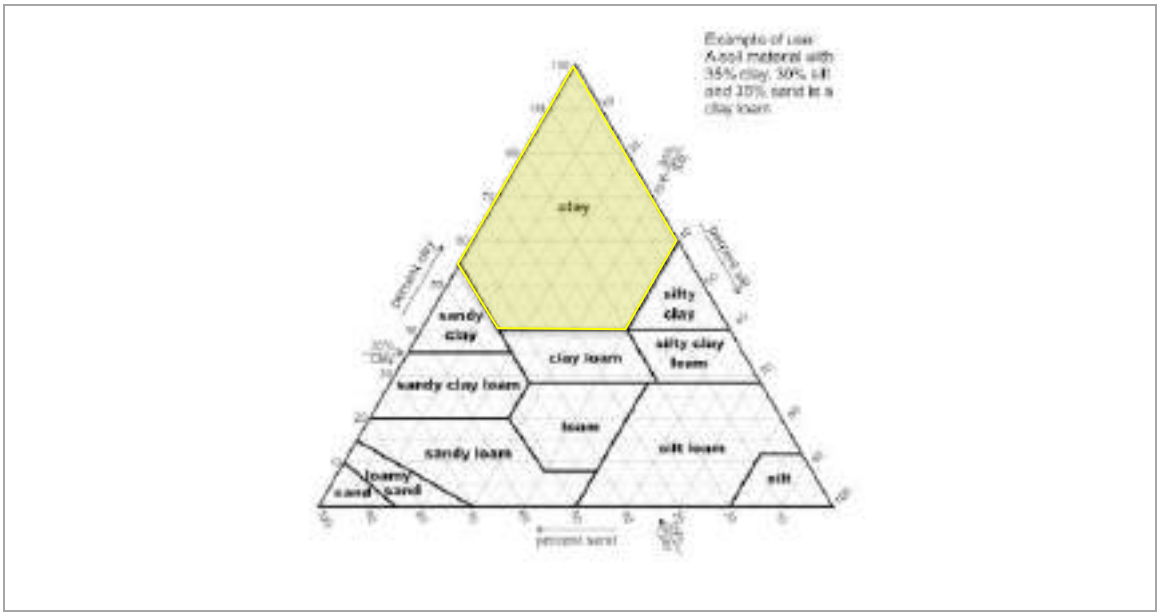
B8. Disposal field soil category:

Topsoil Present: NO	Topsoil Depth:	0(mm)

Soil Category	Description	Drainage	Tick One
1	Gravels and Sands	Rapidly drained	
2	Sandy Loams	Well drained	
3	Loams	Moderately well drained	
4	Clay Loams	Imperfectly drained	
5	Light Clays	Poorly drained	✓
6	Medium to Heavy Clays	Very poorly drained	

Reasons for placing in the stated category:

The subsoil profile aligns with those observed on surrounding properties. Soil texture classification was carried out using the Soil Textural Class Triangle diagram, alongside ball, ribbon, and feel tests for tactile assessment. Classification references include the “Field Description of Soil & Rock – Guideline for the field classification and description of Soil & Rock for engineering purposes” (NZ Geotechnical Society Inc.). The soil corresponds with the characteristics defined in Table 5.1 — Determination of Soil Category — of AS/NZS 1547:2012.



B9. Disposal field soil structure

Soil Structure	Tick One
Massive	
Single Grained	
Weak	
Moderate	✓
Strong	

The degree of soil structure has been assessed by examining exposed soil as per AS/NZS1547:2012, Table E4.

Hand Auger: HA01				
Date: 28 July 2025				
Client: SmartSteel Ltd,	Job No: 25039		Sheet: 1 of 1	
Project: Onsite Wastewater Management,	Easting: 1683677.44		Northing: 6102758.45	
Site Location: Lot 2 DP 177522, 1945 State Highway 10, Waipapa.				

Soil Description	Symbol	Depth (mm)	Water	Photo
Fill: 0-700mm – Brown Rock Clay loam: 700 - 900mm – Clay loam, Dark brown, moist, firm, medium plasticity, traces of brown rock fill. (Photo 1) Clay: 900 - 1200mm – Clay, brown, grey, moist, firm, medium plasticity, weathering (Photo 2) Clay: 1200 – 1500mm - Clay, brown, grey, moist, soft, medium plasticity, End of borehole @ 1500m Water table: 1500mm, (Photo 3) Sample taken from under water table. Clay, grey, pink, wet, soft, medium plasticity,		0 - -100- - -200- - -300- - -400- - -500- - -600- - -700- - -800- - -900- - -1000- - -1100- - -1200- - -1300- - -1400- -1500-	GROUND WATER IDENTIFED	   

SECTION C

SITE ASSESSMENT
SURFACE EVALUATION

DURACRETE
PRECAST TO LAST

C1. Desk Study been undertaken for this property.

Yes	✓	No	

If yes, please specify the findings of the Desk Study

- Study of personal data/information collected during the on-site investigation,
- Study of personal data/information collected during SSE,
- Northland Regional Council GIS map location information,
- Far North District Council GIS map location information,
- Toitū te Whenua Land Information New Zealand,
- New Zealand Archaeological Association,
- Branz Maps.

AS/NZS 1547:2012 – On-site domestic wastewater management,

C2. Site Characteristics:

Estimated Rainfall and Seasonal Variation:
Rainfall Range: 80 - 90mm,
Wind Zone:
Wind Zone: High, Areas subject to higher wind speeds typically experience elevated atmospheric evaporation demand, which can accelerate effluent loss from the disposal field through increased evapotranspiration.
Vegetation Cover:
A visual inspection of the proposed effluent disposal area confirmed that the site supports a mix of invasive species of vegetation, including but not limited to, Woolly nightshade (Solanum mauritianum), Pampas grass – (Cortaderia jubata)
Land Use Activity:
District Plan – Industrial Zones – Heavy Industrial Land has been recurrently sitting vacant, awaiting construction.
Slope Shape:
Linear planar sloping. Natural drainage less effective with distance from crest, no spreading or acceleration access site.
Slope Angle:
Flat
Surface Water Drainage Characteristics:
No distinct stormwater flow paths were observed during the site inspection. However, GIS analysis indicates the presence of stormwater flow paths 12.6m northwest of the proposed effluent disposal site. These identified pathways are located a significant distance from the proposed effluent disposal area and are not expected to pose any risk. The southern boundary contains an open stormwater drain, 5m setback as been implement within the design.
Site Clearances:

Site Clearance distances applicable to the property, which must be adhered to:

- 1.5m Clearance from property boundaries.
- 3m from buildings.
- 5m from overland flow paths.

Flooding Potential: ~~YES~~ / NO

No immediate flooding hazard is indicated on the **Far North District Council** or **Northland Regional Council** GIS IntraMaps website for the property.

Surface Water Separation:

Minimum distances are outlined in Table 9, Exclusion areas and setback distances for on-site domestic wastewater systems under the Proposed Regional Plan for Northland, Section C.6.1.3, Part 7). Other separation distances are provided below in this report.

Table 9: Exclusion areas and setback distances for on-site domestic wastewater systems

Feature	Primary treated domestic type wastewater	Secondary and tertiary treated domestic type wastewater	Greywater
Exclusion areas			
Floodplain	5% annual exceedance probability	5% annual exceedance probability	5% annual exceedance probability
Horizontal setback distances			
Identified stormwater flow path (including a formed road with kerb and channel, and water-table drain) that is down-slope of the disposal area	5 metres	5 metres	5 metres
River, lake, stream, pond, dam or natural wetland	20 metres	15 metres	15 metres
Coastal marine area	20 metres	15 metres	15 metres
Existing water supply bore	20 metres	20 metres	20 metres
Property boundary	1.5 metres	1.5 metres	1.5 metres
Vertical setback distances			
Winter groundwater table	1.2 metres	0.6 metres	0.6 metres

C3. Aspect(s) the proposed disposal system faces:

North	
North-West	
North-East	✓
East	

West	
South-West	
South-East	
South	

C4. Site Clearances:
Approximate distances based off satellite imagery.

Separation Distance from	Treatment Tank Separation Distance (m)(Approximate)	Disposal Field Separation Distance (m)(Approximate)
Boundaries	<1.5m	1.5m
Surface water	NA	NA
Groundwater	NA	1500mm
Wells, water bores IRISID: LOC.210258	>20m	73.5m
Embankments/Retaining walls	NA	NA
Buildings	<3m	12m
Stormwater drain	NA	7m
Flow paths	<5m	121.08m
River section ID: 1321527 – Kerikeri River	>15m	450m
- 5% annual exceedance probability, or River Flood Hazard Zone	NA	NA

Explanatory Notes:
The separation distances were assessed on-site and measured either through direct physical measurements or extrapolated from satellite imagery obtained from Google Earth and other government sources.

SECTION D

Environmental Effects

It is anticipated that the recommended on-site wastewater management system will have minimal impact on the surrounding environment. The system's level of wastewater treatment and low application rate ensure that the soils surrounding the effluent disposal area can effectively receive and further treat any residual contaminants in a sustainable manner.

D1. Impact on Groundwater:
The proposed effluent disposal field is located greater than **1500mm** below the measured ground level, providing an adequate buffer zone and minimising the potential for contamination. Northland Regional Council's C.6.1.3, Table 9, states that secondary and tertiary treated domestic-type wastewater requires a winter groundwater table vertical setback distance of 600 mm. With the application of a LPED irrigation disposal field, greywater effluent will be naturally filtered and treated through soil absorption and evaporation. This process can effectively remove sediments, pathogens, and some chemical contaminants, further minimising the potential for contamination.

Feature	Primary treated domestic type wastewater	Secondary and tertiary treated domestic type wastewater	Greywater
Vertical setback distances			
Winter groundwater table	1.2 metres	0.6 metres	0.6 metres

The proposed effluent disposal field is located **121.08 metres northeast** of the nearest overland flow path and **7.3 metres east** of the property's perimeter drain, providing a sufficient buffer and minimising the potential for contamination.

In accordance with Northland Regional Council's Rule C.6.1.3, Table 9, **secondary domestic wastewater systems** must maintain a horizontal setback of at least **5 metres** from any identified stormwater flow paths located downslope of the disposal area. This includes formed roads with kerb and channel, as well as water-table drains.

Feature	Primary treated domestic type wastewater	Secondary and tertiary treated domestic type wastewater	Greywater
Identified stormwater flow path (including a formed road with kerb and channel, and water-table drain) that is down-slope of the disposal area	5 metres	5 metres	5 metres

D3. Impact on Soils:
Applying effluent to land through Bioline drip irrigation provides several benefits for soil health by harnessing natural wastewater treatment processes. The soil's innate ability to break down organic matter and filter contaminants reduces the potential for groundwater pollution while enriching soil fertility. Additionally, the incorporation of vegetation landscaping into the system supports the uptake of nitrogen and phosphorus, helping to prevent the accumulation of these compounds in the soil.

D4. Potential Odour Effects:
If the wastewater system is correctly maintained and cared for, it should pose little to no smell to the surrounding environment. If any odours are noted, maintenance will be required.

D5. Noise Effects:
Wastewater tank features one submersible pumps integrated into the system. Thanks to the substantial concrete wall thickness of the system's chambers, the pumps being fully submerged in liquid, and the considerable soil coverage above, noise emissions are significantly reduced. As a result, the system operates with minimal to no audible noise—though perception may vary depending on an individual's hearing sensitivity

D6. Visual Effects:
The potential visual impact of the proposed on-site wastewater system will be mitigated through the following measures:

- The Cleanstream TXR1 is installed underground, with only the top section remaining visible to allow access for maintenance purposes.

- The effluent disposal area will be visually enhanced by the planting of evapotranspiration vegetation.

As a result, the system is expected to have little to no adverse visual impact on the surrounding area.

D7. Neighbourhood Impacts:
The site of the proposed effluent field is located within a current Industrial Zones, Heavy Industrial. therefore, no impact on the neighbourhood is anticipated at present. Northland Regional Council's C.6.1.3, Table 9, states that secondary treated domestic-type wastewater requires a horizontal setback distance of 1.5 metres from the property boundary. An adequate buffer zone has been incorporated into the proposed design to adhere to the setback restriction, minimising potential health and environmental impacts on adjacent properties.

Feature	Primary treated domestic type wastewater	Secondary and tertiary treated domestic type wastewater	Greywater
Property boundary	1.5 metres	1.5 metres	1.5 metres

D8. Alternatives:
There is no public wastewater system in the area. On-site wastewater treatment and disposal are considered the most appropriate solutions for the property.

SECTION E

SITE PHOTOS



Figure 3: Site Photo, taken from Pataka Lane, looking south, Easting - 1683736.02, Northing - 6102858.69.



Figure 4: Site photo taken from the property's eastern boundary, looking west across site. Easting: 1683750.06, Northing: 6102773.89.



Figure 5: Site Photo, taken from the property's eastern boundary looking north, view of roadside drain, Easting - 1683763.79, Northing - 6102789.72.



Figure 6: Site Photo, taken from the property's eastern boundary, looking south, view of roadside drain, Easting - 1683763.79, Northing - 6102789.72.



Figure 7: Site Photo, taken from the property's southern boundary. looking north, view of roadside drain, Easting - 1683711.24, Northing - 6102756.27.



Figure 8: Site Photo, looking west towards proposed location of effluent disposal area, Easting - 1683686.01, Northing - 6102765.23.



Figure 9: Site Photo, looking north along the proposed location of effluent disposal area, Easting - 1683686.01, Northing - 6102765.23.



Figure 9: Site Photo, looking southwest, proposed location of effluent disposal area, Easting - 1683686.01, Northing - 6102765.23.

SECTION F

DISCHARGE DETAILS

DURACRETE
PRECAST TO LAST

F1. Dwellings for which On-site Wastewater system is to be provided:

New	✓
Existing	
Multiple	

Number of Buildings on the property:	1	Commercial
Staff Capacity:	12	Calculated on a 24Hr average.

Property Occupancy Rate:	12

Notes:
The proposal outlines the on-site wastewater management system for a commercial development, based on a calculated 24-hour average staffing level of 12 employees. The system will be designed to accommodate the daily effluent production rate generated by day staff.

Occupancy Rate Allocation:
An occupancy rate of 12 employees has been established for the property.

F2. Water supply:

Rainwater (roof collection)	✓
Bore / Well/Spring	
Public supply	

F3. Maximum daily volume of wastewater to be discharged:

Building	Commercial	
Design Occupancy	12	(Number of people)
Per capita Wastewater Production	20	(Litres per person per day)
Other		
Total Daily Wastewater Production	240	(Litres per day)

Daily Wastewater Discharge Volume more than 2000 litres:

Yes	
No	✓

The discharge volume will total 240 litres per day.

F4. Peak wastewater flow allowance:

Explanatory Notes:
To summarise the key points regarding the wastewater design flow for the property based on AS/NZS 1547:2012 and related guidelines:

Design Flow Allocation:
A design flow of litres per person per day has been allocated for the property.

Standard Water Fixtures:
This design flow assumes the use of standard water fixtures, supplied by an on-site roof water tank supply, 20L.

Peak Wastewater Flow:
Given the number of occupants, the total peak wastewater flow is calculated to be 240 litres per day.

This flow must be managed and disposed of within the property boundaries.

Regulatory Compliance:
The design flow rate aligns with:

Table 6.2 from TP58 On-Site Wastewater Systems: Design & Management Manual for commercial flow allowance, day staff.

Facility Type	Water Usage (L/person/day)
High Water Usage (e.g. some factories) [Note 21]	60
Standard Facilities	40
Facilities with Full Water Reduction Fixtures [Note 22]	20–30

This design approach ensures efficient wastewater management practices while complying with relevant regulations and guidelines.

SECTION G

PRIMARY TREATMENT, SECONDARY, AND TERTIARY TREATMENT,

DURACRETE
PRECAST TO LAST

G1. Septic Tank Capacity:

Number of Tanks	Type of Tank	Capacity of Tank (Litres)
2	CleanStream Primary Tank	
First tank treatment plant	Septic Tank (Primary 1)	3,500
Second tank treatment plant	Septic Tank (Primary 2)	1,200
	Total Capacity	4,700

G2. Septic Tank Effluent Filter:

Yes	✓	No	

If yes, what type of filter is to be installed:

Zoeller 1.5mm effluent sieve filter in primary 1
Taylex Septic Filter plate, dam filter in primary 2

G3. Pump chamber/Unit to be fitted in or integral to the Septic Tank:

If yes, type of pump chamber to be installed:

G4. Additional treatment:

Secondary Treatment		
Home aeration plant		
Sand filter		
Recirculating textile filter	✓	
Tertiary Treatment		
Ultraviolet disinfection		
Chlorination		
Other		

SECTION H

LAND DISPOSAL METHOD

DURACRETE
PRECAST TO LAST

H1. Proposed loading method:

Gravity	
Dosing Siphon	
Pump	✓

H2. Distribution Method:

Perforated HDPE pipe (gravity or flood loading)	
"Drain coil" or equivalent (gravity or flood loading)	
PCDI (Pressure Compensating Drip Irrigation)	✓
LPP (Low Pressure Pipe) perforated line	
LPED (Low-Pressure Effluent Distribution) nested pipe system	

H3. If pumped loading method, is a high-water level alarm being installed?

Yes	✓	No	

H4. Pump information:

Total Design Head (m)	15m – Use D42AB Irrigation Pump
Pump Chamber Volume (litres)	700
Emergency storage volume (litres)	1200

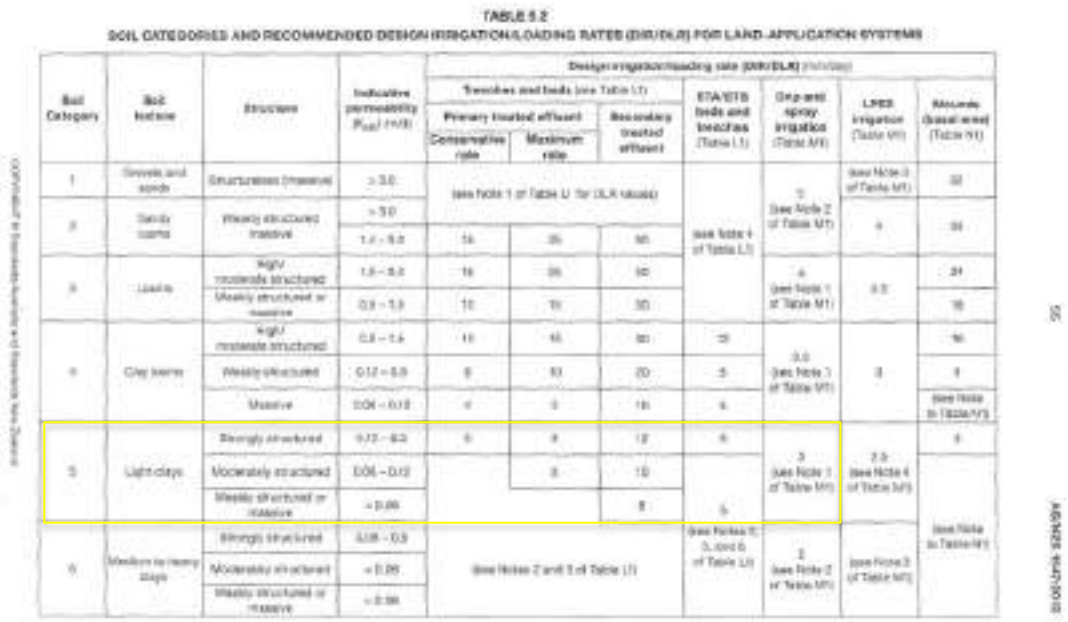
H5. Land disposal method proposed for this site:

Standard Trench	
Deep Trench	
Evapo-transpiration Beds	
Surface Dripper Irrigation	✓
Other	

H6. Long Term Acceptance Rate:

Loading Rate (Litres/m^2/day)	3

Explanatory Notes:
Table 5.2: Soil Categories and Recommended Design Irrigation/Loading Rates (DIR/DLR) for Land-Application Systems [AS/NZS 1547:2012]



For **Category 5 Light Clay** soil, the recommended Low Pressure Effluent Distribution drip irrigation rate is **3 mm/day**, equivalent to **3 litres/m²/day**.

Due to the flat nature of the proposed disposal field location, no deduction rate has been applied to the design in accordance with AS/NZS 1547:2012, Table.

TABLE M2
RECOMMENDED REDUCTIONS IN DIR ACCORDING TO SLOPE

Slope	Reduction in DIR
Flat up to 10%	No reduction
10% to 20%	20%
20% to 30%	50%
> 30%	Advice required from a suitably qualified and experience person
NOTE: See Table 1.1 for conversion of slope per cent grade into slope angle and slope ratio.	

To determine the appropriate size of the irrigation system, a total daily irrigation requirement of **240 litres** is needed. Dividing this volume by the recommended DIR of **3 litres/m²/day** yields a required system coverage of **80 m²**. This is further translated to **80 linear metres** of irrigation lines arranged with a horizontal spacing of **1 metre** between each line, in uniform with the land's contour.

The selected DIR and spacing configuration of the irrigation lines will ensure optimal soakage rates within the soil, effectively preventing over-saturation during periods of peak rainfall.

H7. Size of Irrigation Disposal Area:

Length of PCDI (Minimum)	80m

H8. Available reserve wastewater disposal area:

Percentage of Primary Disposal Area.100 %	100%
	$80m^2$

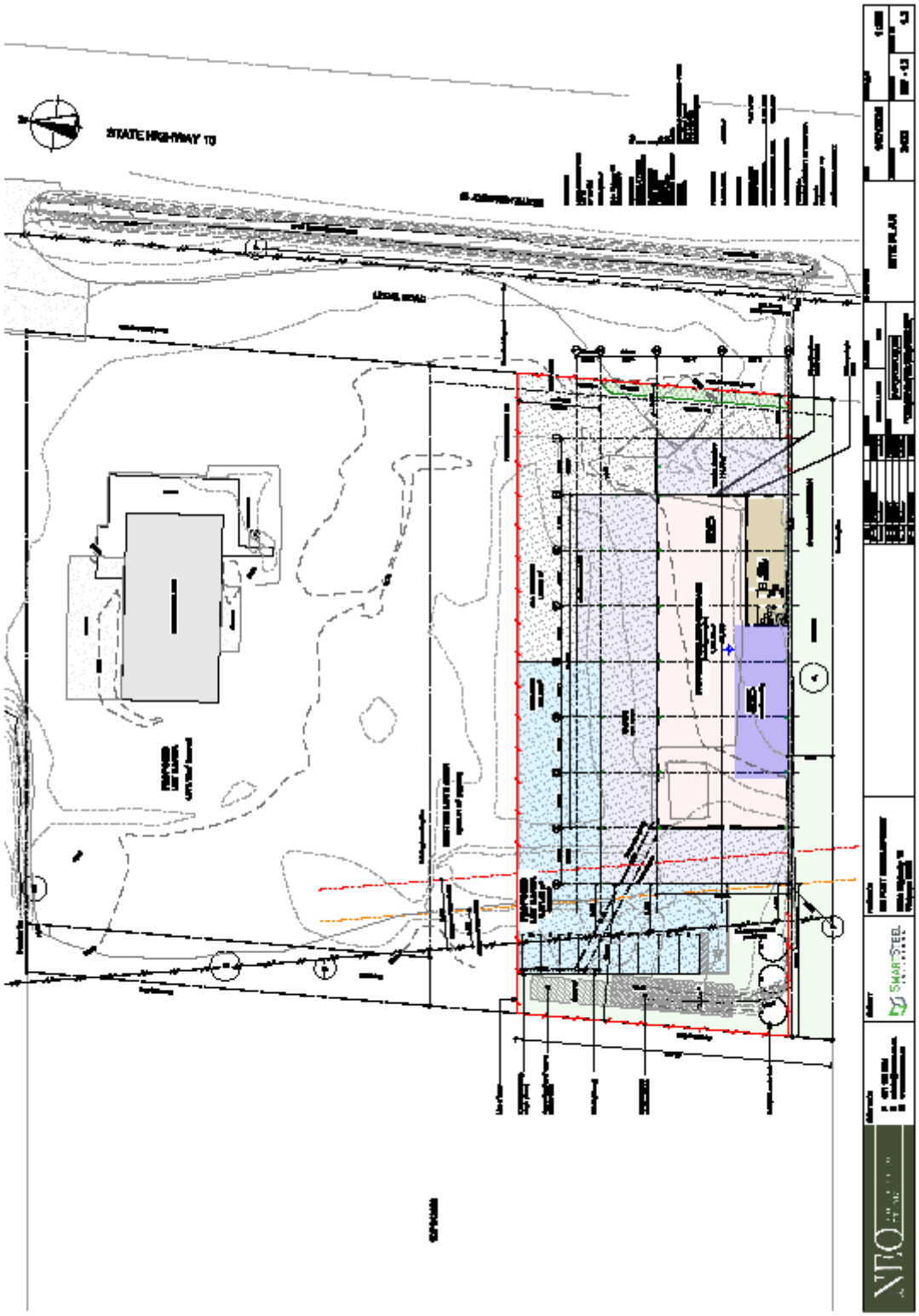
H9. Actual reserve wastewater disposal area required:

Percentage of Primary Disposal Area 30%	100%
	$30m^2$

SECTION I

ARCHITECTURAL FLOOR PLAN:

DURACRETE
PRECAST TO LAST


STATE HIGHWAY 10

SECTION J

WASTEWATER ENGINEER DRAWINGS:

PROPOSED WASTEWATER TREATMENT & DISPOSAL,

1945A STATE HIGHWAY 10, WAIPAPA,
FAR NORTH DISTRICT,
Lot 2 DP 177522,

Pohiha Lane
Pohiha Lane
LOT 1
DP 177522
LOT 2
DP 177522
3.7261 m²
Lot 1
DP 177522
Lot 1
DP 343052
Lot 2
DP 343052
Lot 1
DP 376383
ON-SITE WASTEWATER MANAGEMENT
1964A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522
DURACRETE
PRECAST TO LAST
L01


SHEET
L102
SITE PLAN
REVISION# 01
PROJECT# 25039
SCALE AS SHOWN
DRAWN BY CS
CHECKED BY BL
ISSUED DATE 06/08/2025
REV
1.0
ON-SITE WASTEWATER MANAGEMENT
1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,
DURACRETE
PRECAST TO LAST

Lot 1
DP 177522
Lot 2
DP 177522
3.566.81m²
PROPOSED BUILDING
Lot 1
DP 376283
Lot 1
DP 343262
Scale (m)
0
10
20
30
40
50
ON-SITE WASTEWATER MANAGEMENT
1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,
REV 10
L103
DETAILED SITE PLAN
DURACRETE
PRECAST TO LAST

ON-SITE WASTEWATER MANAGEMENT
1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REV 10

SHEET A101

REVISION# 01
PROJECT# 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

DURACRETE
PRECAST TO LAST

NOTES
SHEET
A102
ELEVATION LAYOUT
ON-SITE WASTEWATER MANAGEMENT
19454 STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522
REV
1.0
SCALE: AS SHOWN
DRAWN BY: CC
CHECKED BY: GL
ISSUED DATE: 18/08/2025
DURACRETE
PRECAST TO LAST

ON-SITE WASTEWATER MANAGEMENT
A103
DURACRETE
PRECAST TO LAST

Limitation

This system has been designed in accordance with Australian/New Zealand Standard 1547:2012 "On-Site Domestic Wastewater Management". Every effort by the author has been made to ensure the system is designed accordingly with the client's interests and property conditions.

This report has been prepared solely for the client at their request, and/or the request of their agent, and contains information pertaining to the client's property and the design of an on-site effluent disposal system for that property. Reliance by other parties on the information and recommendations given in this report shall be at the parties' own risk.

This report is prepared for Council Building Consent purposes. It should be noted that the report may be subject to change, depending on other professional reports prepared for the same property (such as geotechnical reports). The author reserves the right to make changes to the design should further information be provided. The client/agent will be made aware of the design change.

No part of the wastewater treatment system designed in this report should be installed prior to Building Consent being issued by the local Council authority.

Any discrepancy with the report and the installation should be addressed to the engineer prior to installation.

Report prepared by:



Christina Gibson (NDAT)
Wastewater Design Engineer,
Mobile 021 951 054
Email: design@duracrete.co.nz

Report reviewed by:



Gerald Lilley (B.Agr.Sc.(Ag.Eng.)
Senior Wastewater & Design Engineer
Duracrete

SECTION K

INSTALLATION REQUIREMENTS, COMMISSIONING, LOOKING AFTER THE WASTEWATER TREATMENT SYSTEM

DURACRETE
PRECAST TO LAST

1 Proposed Effluent Disposal Area Preparation (EDA):

- The existing brown rock fill within the designated EDA is to be excavated and removed, exposing the original in-situ Waipapa clay subsoil.
- The excavated area is to be reinstated with clean, sieved fill material, placed to achieve the finished ground level as per the proposed site design.
- Fill is to be compacted using track rolling only, with no mechanical compaction, in accordance with TP58 guidance to maintain soil permeability.
- A minimum of 50 mm of topsoil is to be applied over the finished surface.

2 Wastewater Treatment Unit Installation

a) As this system to be installed is an on-site wastewater treatment and disposal system, this assumes the effluent strength entering the treatment unit is of domestic nature and does not contain high concentrations of toxic substances that will affect the biological processes which occur in the treatment unit and within the soil microbial region. These typically include, but are not limited to:

- Quaternary Ammonium Compounds (disinfectants, cleaning products)
- Formaldehyde (disinfectant, chemical)
- Dichlorobenzene (sanitizers)
- Petrochemicals (waste oil, diesel, turpentine)
- Pharmaceuticals (drugs and/or medicines)
- Chlorine (pool and spa pool overflow)
- Fats, Oils, and Greases (cooking oils, kitchen waste)

b) The wastewater treatment unit shall comply and have performance characteristics in accordance with AS/NZS 1546.3:2017 On-Site Domestic-Wastewater Treatment Units

c) The wastewater treatment unit should be sited so that it does not affect the structural or foundation integrity of any building or residence. In most instances, a minimum 3m setback distance from such buildings should be adopted as a best practice.

d) The wastewater treatment unit should not be sited closer than 1.5m to a property boundary. Other setback distances have been recommended in this report.
e) The wastewater treatment unit should be sited for ease of future de-sludging purposes.
f) The wastewater treatment unit shall be installed in or on stable soils. Careful consideration should be taken towards hole excavation.
g) Any surface waters should be diverted away from the wastewater treatment unit. The unit shall not be installed in a flood-prone location.
h) All drainage work shall comply in accordance with AS/NZS 3500.2:2021 Plumbing and drainage - Part 2: Sanitary plumbing and drainage, the Building Act 1991, the Building Regulations 1992 and Approved Documents, (in particular, Approved Document G13: Foul Water) and the relevant NZ Standards and legislation, and be carried out by a registered drainlayer.
i) An appropriate gradient shall be installed for the wastewater pipe from the building or residence to the wastewater treatment unit. Appropriate bedding material for the sewer shall be used.
j) Once installed, the wastewater treatment unit shall be filled with water to prevent any flotation and assist with the commissioning of the plant.

3 Irrigation System Installation

The total combined length of irrigation, totalling 80 metres is to be installed within the hatched area shown on the proposed wastewater treatment and disposal design for Lot 2 DP 177522 (Ref: 25039, Revision 1), as indicated on drawing L103 and further detailed in Notes A102.

With shallow soakage systems, effluent organic matter is taken up by aerobic microorganisms within the well aerated upper soil layers at a faster rate than the anaerobic microorganisms which predominate under saturated conditions at depth. Hence application of the “KISS” (keep infiltration systems shallow) principle enables the aerobic upper subsoil and topsoil mantle to be utilised to provide for assimilation of effluent organic matter, uptake of nutrients into vegetation biomass, and transpiration thereby minimising effects on groundwater.

a) The irrigation system shall be constructed, installed, operated, and maintained in such a manner to ensure treated effluent or wastewater does not pool or pond or run off of the treated wastewater within or from the land application irrigation area.
b) Treated effluent or wastewater shall not be permitted to discharge into any natural waterway or stormwater drain. If possible, a minimum distance of 15m to any natural waterway or 5m from stormwater drain should be adopted.
c) The irrigation drip line shall be laid over topsoil and/or on lawn or pasture following of the distribution pipework and then covered with 50mm of mulch, vegetation or bark.
d) The irrigation lines should be spaced at a minimum of 1.0m apart for this site. Greater distances may be used if required.
e) Appropriate vacuum line breakers, air release valves, and manual flushing valves should be installed to facilitate operation of the irrigation system. These should be located on an as-built plan.
f) The Air Release Valve (ARV) used to dispel air from the irrigation manifold shall be located at the highest point in the irrigation system.
g) The irrigation area shall have adequate depth of natural topsoil to absorb the applied treated wastewater and to support the growth of evergreen plants and vegetation to maximise evapotranspiration. Where natural topsoil is not present, topsoil should be imported to the land application irrigation area.
h) Inflow of surface water into the land application irrigation area shall be controlled or prevented. This can be achieved by installing cut-off trenches or shallow diversion drains to divert surface and groundwater away from the irrigation area (if required).
i) Signage is to be erected to advise the area is used for wastewater irrigation.

4 Irrigation Field Maintenance

Dripper irrigation systems require regular 3 to 6 month maintenance including:

a) At least manual flushing of individual lines either to a soakage pit or back into the wastewater treatment system as flushing liquid can be a threat to surface water.

b) Flushing of the inline fine filter into the soakage pit or wastewater treatment plant.
c) Checking for emitter blockage (excessively dry areas and excessively wet areas)
d) Maintenance frequency is dependent on the wastewater quality discharge from the treatment plant being higher for aerated wastewater treatment plants without a disc filter than sand and textile filters.
e) The use of chlorine or other chemical cleaning agents for removal of slimes and algae is potentially damaging to the soil.
f) Root intrusion can be a problem with some vegetation types and result in clogging of emitters and laterals. Root intrusion can be controlled by installing PCDI lines impregnated with herbicide, or installing an in line herbicide dispenser to inhibit roots from entering the emitter.

4 Commissioning

a) The effluent and treated wastewater land application irrigation area shall be prepared and landscaped, and the irrigation system fully installed as required by Council prior to the commissioning of the treatment system.
b) An installation and commissioning report shall be produced and include as-built details. This information shall be provided to the Council or local authority, and to the owner if required.
c) The owner of the wastewater treatment unit shall enter into a service contract agreement with the Installer. The wastewater treatment unit shall be serviced to ensure trouble-free operation. The results of the service agreement will be passed on to the Council for their records.

5 Looking After The Wastewater Treatment System

Avoid putting the following into the kitchen sink, bath, shower, or laundry:

- ☒ Engine oils, hydrocarbons, cooking oils, fats, grease
- ☒ Compostable vegetable matter
- ☒ Don't use a garbage disposal. Be prepared to pump your system more often and have it serviced more often if you do use one.
- ☒ Acids, pesticides, paint, thinners or other materials which will kill the bacteria in the system
- ☒ Unused medications. Flushing unused medications is harmful to your onsite system, the aquifer and the environment. Contact your pharmacy for safe methods of disposing medications
- ☒ Septic tank "cleaning chemicals"
- ☒ Don't have downpipes discharge near or toward manhole covers. Make certain surface water does not pond over or at the treatment unit or the irrigation disposal area.

- ☑ Have the system inspected regularly
- ☑ Clean the irrigation filter, or have the filter cleaned on a regular basis
- ☑ Use biodegradable detergents and cleaners
- ☑ Check detergents cleaners to see if they are suitable for use with an on-site biological treatment system
- ☑ Do scrape all your dishes to remove fats and food particles before washing
- ☑ Do shake sand and dirt from clothes before washing them
- ☑ Spread out laundry loads throughout the week. Try not to have one day per week with all the laundry loads

Protect the Disposal Field

Do not allow vehicles or stock onto the disposal area,

- ☑ Do restrict access to any areas of land that have been especially planted as part of the land application area

SECTION L

EFFLUENT EVAPO-TRANSPIRATION PLANTS.

(SUITABLE FOR NORTHLAND CONDITIONS)

DURACRETE
PRECAST TO LAST

LIST OF WATER TOLERANT PLANTS SUITABLE FOR ON-SITE WASTEWATER DISPOSAL SYSTEMS

Grasses, ground covers, and other plants

Austrodreia fulvida (toetoe)



A grass like native plant growing to 1.5m wide by 1.5m tall. Large white flowers from September to December. Grows on stream and swamp margins

Apodasmia Similis (oioi)



A native reed plant with blue/green foliage, growing to 1m wide by 1.5m tall. Grows well in wet areas and tolerates a wide range of soil types, very hardy.

Arthropodium cirratum (rengarenga lily)



An attractive native plant growing 0.5m wide by 0.5m high with arching, fleshy leaves. White flowers from October to December. Will grow best on the outer edges of wet areas. Prefers full sun to light shade.

Astelia grandis (swamp astelia)



Large clump forming plant growing 1m wide by 1m high with bright green, flax-like leaves. Female plants produce berries in the centre of the plant. Grows best in wet soils, and light shade.

Blechnum novae zealandiae (kiokio)



Large, robust fern growing to 1m wide by 1m high. Hardy species that tolerates most conditions but does best in shady areas with well drained soils that gets regular water.

Carex dissita (purei)



Clumping grass like sedge with green to reddish tufts grows to 0.7m wide by 0.5m tall. Tolerates swampy areas through to drier soils and will grow in full sun to light shade.

Carex flagellifera



A grass like sedge with dense spreading reddish-brown tuffs, growing to 0.7m wide by 0.5m tall. Prefers damp soil and full sun, but also thrive in a variety of habitats including boggy pasture.

Carex secta (makura)



Grass like sedge species with tall arching green tufts. Grows to 1m wide by 1m tall, widespread in swampy areas. Useful in the creation of bird habitat. Very hardy and able to absorb large amounts of surface water.

Carex virgata (pukio)



Grass like sedge species that forms dense, light green tufts up to 1m wide by 1m tall. A fast-growing plant that thrives in a variety of habitats including swamps and wet pastures. Useful in the creation of bird habitat.

Coprosma robusta (karamu)



A shrub that grows to 2m wide by 3.5m tall, with glossy green leaves. Masses of orange-red fruit in autumn are attractive to birds. A very fast growing, hardy plant that will tolerate wet soils and drought, full sun to light shade.

Coprosma tenuicaulis (swamp coprosma)



A native species that grows to 2m wide by 3m tall. Leaves pale green with slender branches. Will tolerate a range of swampy to boggy habitats including standing water.

Cyperus ustulatus (giant umbrella sedge)



Vigorous leafy sedge growing to 1m wide by 1m tall in open damp places. Tolerates standing water within a range of habitats from boggy grass to wetlands, full sun to light shade.

Dianella nigra (turutu, NZ blueberry)



An attractive flax-like plant that will grow to 0.5m wide by 0.5m high. Dark green leaves with small white flowers in spring followed by vibrant purple berries in summer. Grows best in moist soils with light shade through to full sun.

Elatostema rugosum (parataniwha)



An interesting plant growing up to 1m wide by 0.7m tall, with large, fleshy, purple and green leaves. Grows on moist sites in light to heavy shade. Will not be tolerant of dry soil or full sun.

Fuchsia excorticata (NZ tree fuchsia, kotukutuku)



A small tree that will grow 2.5m wide by 5m tall. Dark green leaves and showy purple and red flowers in spring and early summer. Prefers to grow in moist soils and will tolerate full sun to full shade.

Geniostoma rupestre (hangehange)



Forest shrub that grows 2.5m wide by 3.5m high. Pale green glossy foliage with small white flowers giving off sweet fragrance in spring. Grows best in sunny position where it retains a bushy habit and prefers well-drained but moist soils.

Hebe stricta (koromiko)



Quick growing shrub to 2m wide by 2m high. Slender green leaves with a mass of white to bluish flowers in summer. Plant in full sun and moist soils.

Phormium tenax (harakeke, flax)



Fast growing flax, 2m wide by 2.5m tall. Large, deep green, stiff leaves with red flower spikes in spring, followed by seed heads in summer. Plant in full sun with moist to wet soils. A fantastic plant for absorbing sitting water and attracting birds.

Trees and shrubs

Consideration needs to be given to the effects of roots land application on wastewater distribution pipe networks. This problem can be more significant for large tree species.

Ackama rosaefolia (makamaka)



A small tree, native to Northland growing 2m wide by 3.5m high. Attractive green leaves with a red tinged underside. Large steams of white flowers turning to pink seeds. Best suited to moist soils in full sun but will need shelter from strong wind.

Carpodetus serratus (putaputaweta, marbleleaf)



A small native tree growing up to 4m wide by 7m tall. Attractive dark green to yellowy-green marbled leaves. Large bunches of cream-coloured flowers appear in spring followed by black berries. Best suited to moist soils and a semi shaded area when young.

Coprosma areolata



A large shrub/small tree species that grows to 1.5m wide by 4m tall. With small green leaves the structural shape of this plant will add a point of interest to a garden. Grows best in moist to wet, fertile soils with full sun to light shade.

Coprosma robusta (karamu)



A shrub that grows to 2m wide by 3.5m tall, with glossy green leaves. Masses of orange-red fruit in autumn are attractive to birds. A very fast growing, hardy plant that will tolerate wet soils and drought, full sun to light shade.

Coprosma tenuicaulis (swamp coprosma)



A slow growing shrub, 2m wide by 2.5m High. Small pale green leaves with slender branches. Will grow best in a range of swampy to boggy soils including standing water, prefers full sun.

Cordyline australis (ti kouka, cabbage tree)



Palm-like in appearance, growing to 2m wide by 7m tall. Strappy, glossy green leaves with branches of scented white flowers in summer. Prefers damp to moist soils, full sun to semi-shade.

Dacrycarpus dacrydioides (kahikatea)



New Zealand's tallest tree, growing to 10m wide by 55m tall. Attractive foliage with trunk base. Fruit and seeds attract birds to the garden. Prefers damps soils with full sun to light shade.

Dicksonia squarrosa (wheki, rough tree fern)



Hardy tree fern that grows up to 3m wide by 6m tall in the open. Tolerates regular flooding but will also survive dry periods, prefers light shade but will handle full sun. A great plant to provide a bit of height to a garden and attract birds.

Hoheria populnea (lacebark)



Fast growing tree, 3m wide by 6m tall. Leaves are and olive-green colour with a purple tinge on the underside. Large amounts of white flowers in summer and autumn. Grows well in damp soils in full sun or light shade.

Laurelia novae-zelandiae (pukatea)



Fast growing, large tree growing 6m wide by 20m high. Attractive bright green foliage and distinctive whitish bark and attractive trunks. Prefers to be grown in moist to wet soils, light shade and sheltered from strong wind.

Leptospermum scoparium (manuka)



A quick growing small tree, 3m wide by 5m high. Fine green leaves with lots of white flowers from spring to autumn. Attracts birds and bees to the garden. Will grow in a range of soil types from damp to dry, enjoys being in full sun.

Melicytus Ramiflorus (mahoe)



A small tree growing to 2.5m wide by 6m high. Glossy green leaves with small white flowers in summer followed by dark purple berries in autumn. Prefers moist to wet soils and can be planted in full sun or partial shade.

Pennantia corymbosa (kaikomako)



Slow growing tree, 2.5m wide by 10m high. Small leafed and spindly when young, matures into an attractive tree with glossy green leaves. Pale yellow flowers in spring followed by small black fruit that will attract birds in summer. Prefers to grow in rich damp soils with some shade when young.

Plagianthus betulinus (ribbonwood)



Fast growing tree, 5m wide by 10m high. Small leafed and spindly when young, matures into an attractive tree with larger green leaves and is one of New Zealand's few semi-deciduous trees. A hardy tree that will tolerate dry through to wet soils, prefers full sun or light shade.

Podocarpus totara (totara)



Large growing tree, 7m wide by 25m tall. Yellow to green, needle like leaves, with red fruit in autumn to attract birds. Will grow in moist to dry soils, with full sun.

Raopaostylis sipida 'Chathamica' (Chatham Island nikau palm)



An attractive palm growing to 1.5m wide by 8m high. Deep green fronds with an attractive trunk when older. Suitable for moist soils and full sun.

Rhopalostylis sapida (nikau)



An attractive palm growing to 1.5m wide by 8m high. Deep green fronds with an attractive trunk when older. Suitable for moist soils, best grown in shaded spots with shelter from strong winds.

Schefflera digitata (patē)



A medium sized tree growing 4m wide by 8m high. Long glossy green leaves give this tree a tropical look. Small pale green flowers in summer turn to purple berries in autumn attracting birds. Prefers moist soil and will grow in full shade to full sun.

Syzygium maire (maire tawake)



Growing to 5m wide by 12m high. Attractive bronze foliage, large bunches of reddish fruit and distinctive whitish bark. Prefers wet to damp soils, grows well in light shade to full sun.

Vitex lucens (puriri)



Fast growing to 10m wide by 20m tall. Dark glossy green leaves with light pink flowers and red berries that attract birds year-round. Needs well drained soils, grows best in full sun to light shade.

SECTION M
MANUFACTURER SPECIFICATIONS

DURACRETE
PRECAST TO LAST



Sump Pumps



Model Numbers:
D42A/B, D53A/B

COMMERCIAL

HIGH PRESSURE SUBMERSIBLE DRAINAGE PUMPS

APPLICATION

Ideal for non-potable rainwater applications, lawn and garden irrigation, sump emptying to higher heads, treated effluent disposal and water transfer from wells.

FEATURES & BENEFITS

Davey Sump Pumps are used to remove water that has accumulated in a sump or pit, as well as emptying swimming pools and removing flood water from buildings etc.

Davey Sump Pumps are used where there is flooding and to solve water entry in basements where the water table is above the foundation.

Double mechanical seal, one in oil bath on motor and extra mechanical seal on pump
- Superior reliability
- Long service life

Corrosion resistant 304 stainless steel shaft, motor shell and fasteners
- Long service life

Cast 316 stainless steel motor caps and super tough engineered thermo plastic pump casing
- Outstanding corrosion resistance
- Long life

Centrifugal multistage 2 and 3 impeller designs
- Higher pressures and increased efficiency

Closed vane impellers with long engagement "D" drives
- Positive operation
- Long service life

Patented independently floating neck rings
- Outstanding pump performance
- Long pump life

Corrosion resistant hard wearing polycarbonate impellers
- Long service life

Corrosion resistant stainless steel fine mesh suction strainer with large surface area
- Prevents blockages of the pump by solids

In-built automatic thermal overload
- Protects the motor in the event of blockage or voltage supply problems

HO7RNF oil resistant leads, 10 metres long with 3 pin power plug
- Easy to connect to power supply
- Longer life in dirty water

daveywater.com

DAVEY

Sump Pumps

OPERATING LIMITS

Model	D42A/B	D53A/B
Capacities to	120 lpm	130 lpm
Maximum total head	32m	45m
Maximum submergence	12m	
Maximum pumped water temperature	40°C	
Maximum soft solids	1.9mm O.D.	
Outlet size (BSP)	1" F	

SUITABLE FLUIDS

Clean water of neutral pH containing up to 1% small solids. Some wear should be expected while pumping hard solids in suspension.

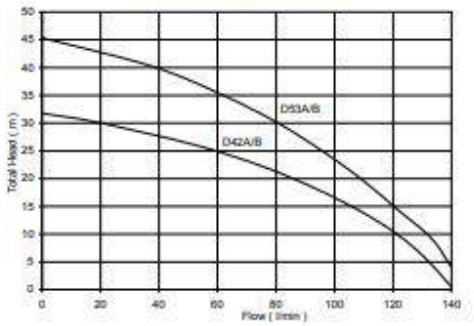
MATERIALS OF CONSTRUCTION

PART	MATERIAL
Impeller	Glass filled polycarbonate
Lock nut	304 stainless steel
Pump casing	Glass filled polycarbonate
Diffuser and blanking ring	Glass filled noryl
Mechanical seal – pump	Carbon / ceramic
Mechanical seal – motor	Silicon carbide / ceramic oil in bath
Shaft seal elastomer	Nitrile rubber
Pump shaft	304 stainless steel
O-rings	Nitrile rubber
Motor shell	304 stainless steel
Bottom bearing housing	Cast 316 stainless steel
Upper motor cover	Cast 316 stainless steel
Handle	304 stainless steel
Fasteners	304 stainless steel
Float and power supply leads	HO7RN-F oil resistant

ELECTRICAL DATA

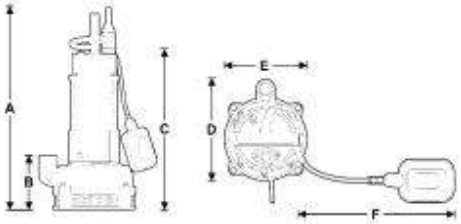
Model	D42A/B	D53A/B
Supply voltage	220-240V	
Supply frequency	50Hz single phase	
Speed	2 pole, 2850rpm	
Full load current (Run)	4.3A	5.7A
Locked rotor current (Start)	14A	
Input power (P_1)	1.00kW	1.31kW
Output power (P_2)	0.60kW	0.84kW
IP rating	X8	
Insulation class	Class F	
Starting	P.S.C.	
Lead	10m long	

HYDRAULIC PERFORMANCE



DIMENSIONS (mm)

Model	A	B	C	D	E	F	Outlet B.S.P.	Net Weight (kg)
D42A/B	475	130	370	235	195	330	1"F	10.8
D53A/B	535	170	430	235	195	330	1"F	16.5



INSTALLATION AND PRIMING

Use a rope to position and retrieve the pump. Do not lower or retrieve the pump using the power lead as this may damage the cable entry seals, causing water leaks and unsafe operation.

Do not use this product for recirculating or filtering swimming pools, spas, etc. While these pumps are built to high safety standards, they are not approved for installations where people will be in the water while they are operating.

Do not pump abrasive materials. Sand and grit in the water being pumped will accelerate wear, causing shortened pump life.

Keep your pump clean, particularly in situations where lint, hair or fibrous materials may get bound around the pump shaft. Regular inspection and cleaning will extend pump life.

Make room for the float switch to operate. Automatic models have a float switch to turn them on when the water level rises and turn them off again when it has been pumped down to the safe operating level of the pump. If the float switch is not free to rise and fall, correct pump operation may not be possible.

Do not run your pump dry. Non-automatic models must be switched off manually or by way of an external float/level switch when the water level is reduced to the top of the pump housing.

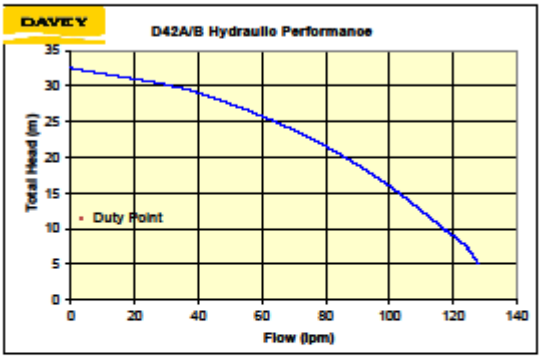
Job Name:	Waipapa - NZ Post
Address:	1945a State Highway 10, Waipapa 0230

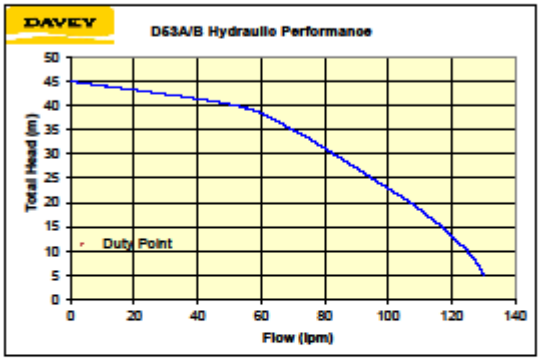
INPUT

NO. BEDROOMS/PEOPLE =	12		
DAILY USAGE PER PERSON =	20 litres	240	Total Litres per day
APPLICATION RATE =	3 mm/day or litres/m² (Clay = 2.5, Sandy soil = 5)		
AREA FOR IRRIGATION FIELD =	80 m²	IRRIGATION FIELD AREA (bigger required or Okay):	
MAXIMUM ELEVATION OF FIELD =	0 m		
LENGTH OF RISING MAIN =	10 m		
DIAMETER OF RISING MAIN =	32 mm		
LENGTH OF SUB-MAIN =	5 m		
DIAMETER OF SUB-MAIN =	25 mm		
LENGTH OF LONGEST LATERAL LINE =	20 m		
DIAMETER OF LATERAL LINE =	16 mm		
IS A FLOW METRE TO BE INSTALLED (Yes/No)	no		

SOLUTION

TOTAL HEAD REQUIRED =	12 m		
PUMP DUTY =	3 l/m @	12 mH	
PIPE VELOCITY CHECK:	OKAY		





TECHNICAL INFORMATION – CLEANSTREAM TXR-1

The Cleanstream TXR-1 is a complete, one tank textile media treatment system. Its multi-chambered design consists of 2 septic stages, a textile filter stage and irrigation and recirculation stages.

- 8400 litre total capacity
- Emergency storage (without cross contamination - 3500 litres)
- Alarm system (to notify the homeowner of any faults)
- Comprehensive maintenance **by Duracrete**





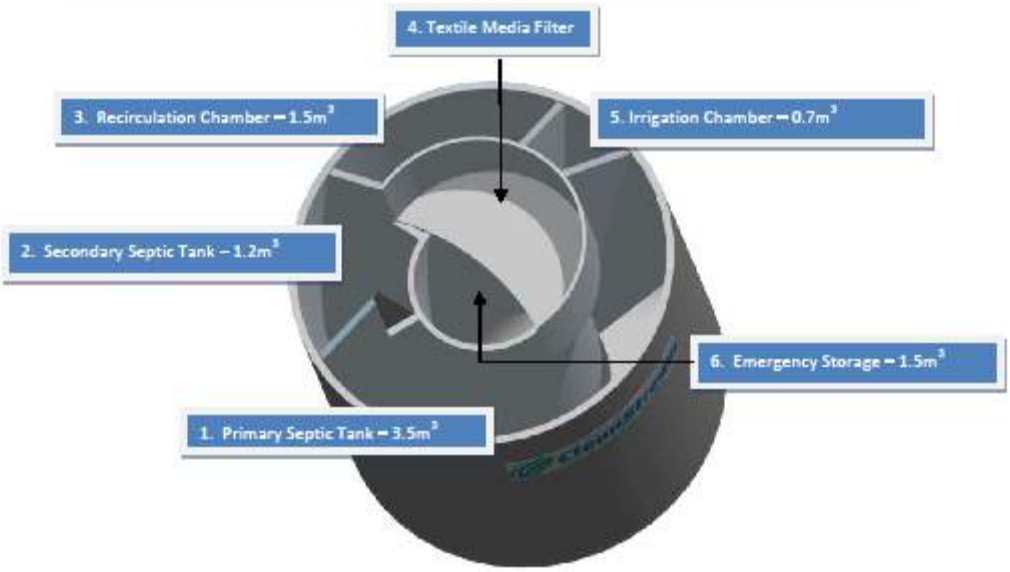
- The TXR-1 tank, roof and walls are constructed from galvanised, steel reinforced concrete **(70MPA at 28 days) and come with a manufacturer's warranty of** 10 years **from the day they leave the factory.** The mechanical components of the system **(pumps)** also come with a 2 year warranty **from the date of commission. Electrical components come with a 1 year manufacturers warranty.**
- The textile filter and recirculation stages are designed so that effluent is filtered multiple times through the textile media leading to much higher effluent quality than conventional aerobic systems.
- Separate septic stages mean there is always a working septic tank even after periods of non use, this allows the system to stay in a relatively active state.
- The system comes fully constructed, making installation a plug and play operation which provides for a faster turnaround while minimizing installation problems.
- Large emergency storage reduces problems during pump or power failure. The system has approximately 2.5 days of emergency capacity without cross contamination (based on typical flow through 1200L/day)

TREATMENT PERFORMANCE

12 monthly servicing is required to maintain efficient and effective treatment of household waste. This service must be performed by suitably trained personnel.

Expected treatment for medium size homes with daily flows up to 1500L is BOD5 10 mg/L, TSS 10 mg/L. However the system can treat up to 2000L per day whilst still complying with ARC TP58 effluent quality of BOD <15mg and TSS<15 mg/L for Advanced Secondary Treatment Systems – Packed Bed Reactors. Provision for 6 monthly service is required to achieve these larger daily flows.

TREATMENT OVERVIEW



1. The primary septic tank receives the wastewater. It acts like a conventional septic tank and reduces BOD and suspended solids. Effluent then passes through a particulates filter designed to stop large objects from inhibiting the treatment process further on.

2. The secondary septic provides an anoxic environment which aids in nitrate removal converting ammonia into nitrate, while reducing BOD and suspended solids. At the completion of this stage effluent passes through an attached growth filter, which provides an environment for denitrifying bacteria to flourish.

3. The Recirculation Chamber contains a large amount of emergency capacity and is a storage place for effluent before it passes through the textile filter.

4. From the Recirculation chamber treated wastewater is pumped onto the textile filter, this effectively aerates the effluent. Organic Nitrogen is converted to Ammonia by nitrifying bacteria. This process increases effluent quality as it passes through the textile media in the textile filter. The effluent then flows back into the secondary septic tank, unless there is sufficient forward flow to warrant irrigation in which case it drains into the irrigation chamber. Recirculation generally happens multiple times before irrigation is needed.

5. From the irrigation chamber the effluent is passed through a 130 micron Arkal Filter and then dispersed through self compensating drip irrigation.

6. In the event of pump failure emergency storage is provided in the central and recirculation chambers.

On-site Effluent Treatment National Testing Programme (OSET NTP)

PERFORMANCE CERTIFICATE
CleanStream TXR-1 On-site Domestic Wastewater Treatment System,
OSET NTP Trial 9, 2013/2014

System Tested
The **CleanStream TXR-1 system** is a packed bed recirculating textile filter wastewater treatment unit. The manufacturer's rated design capacity is 1,200 litres/day. Total liquid volume is 7,400 litres (primary treatment 2 tanks each with an effluent filter 3,700 and 1,200 litres; secondary treatment with packed bed 900 litres; recirculation tank 1,100 litres; pump chamber 700 litres). Emergency storage is 1,500 litres. No tertiary treatment (such as UV disinfection) is incorporated. The manufacturer's stated service frequency is annual.

Test Flow Rate
The **CleanStream TXR-1 system** was tested at 1,000 litres/day (equivalent to servicing a 3-bedroom 5 to 6 person household) over an 8 month (35 week) period November 2013 to July 2014 followed by a 1 month (4 week) high load effects test involving 5 days at 2,000 litres per day then 1,000 litres/day over the following 3 weeks.

Testing and Evaluation Procedures
A total of 37 treated effluent samples of organic matter (BOD_5) and suspended solids (TSS) at generally six day intervals during weeks 9 to 35 were tested and evaluated against the secondary effluent quality requirements of the joint Australia/NZ standard AS/NZS 1547:2012.

A total of 16 treated effluent samples of organic matter (BOD_5), total suspended solids (TSS), total nitrogen (TN), ammonia nitrogen (NH_4-N), total phosphorus (TP) and faecal coliforms (FC) at generally six day intervals during weeks 23 through 35 were tested and the results benchmarked and rated on their median values. In addition, the energy used by the treatment system was assessed on the mean of consumption levels over the benchmark period.

AS/NZS 1547:2012 Secondary Effluent Quality Requirements
These requirements are that 90% of all test samples must achieve a BOD_5 of $\leq$ 20 g/m^3 and TSS of $\leq$ 30 g/m^3 with no one result for BOD_5 being >30 g/m^3 and no one result for TSS being >45 g/m^3. The **CleanStream TXR-1 system achieved** a performance level of **100%** for BOD_5 and **100%** for TSS based on the full set of 37 test results in weeks 9 to 35, with no results exceeding the maximums. The **CleanStream TXR-1 system** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2012.

Benchmark Ratings
The **CleanStream TXR-1 system achieved** the following effluent quality ratings for the sixteen benchmarking results in weeks 20 to 35.

Indicator Parameters	Median	Std Dev	Rating	Rating System				
				A+	A	B	C	D
BOD (mg/L)	2	1	A+	<5	<10	<20	<30	≥30
TSS (mg/L)	3	1	A+	<5	<10	<20	<30	≥30
Total Nitrogen (mg/L)	37.1	5	D	<5	<15	<25	<30	≥30
NH_4- Nitrogen (mg/L)	1.9	4	A	<1	<5	<10	<20	≥20
Total phosphorus (mg/L)	4.4	0.5	B	<1	<2	<5	<7	≥7
Faecal Coliforms (cfu/100mL)	65,000	100,000	C	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)	0.98	0.12	A	0	<1	<2	<5	≥5

This Performance Certificate is specific to the **CleanStream TXR-1** model as specified above when operated at a flow rate of 1,000 litres/day, and is valid for 5 years from the date below. For the full OSET NTP report on the performance of the **CleanStream TXR-1 system** contact **Duracrete Products Ltd**, Kamo, Whangarei, Ph: 0800 387 227 Email:ric@duracrete.co.nz.

Authorised By:

Ray Hedgland, Technical Manager, OSET NTP
20 February 2015

On-site Effluent Treatment National Testing Programme, c/- Technical Manager, 2/12 Mt Blanc Pl, Northpark, Howick, AUCKLAND 2013 Mob: 021 626 772 E-mail: ray@hedgland.co.nz

3 June 2025

NZ POST BUILDING

1945 STATE HIGHWAY 10, WAIPAPA

GEOTECHNICAL INVESTIGATION REPORT

CLL Holdings Ltd

NTH2025-0002AA Rev 0



NTH2025-0002AA		
Date	**Revision**	**Comments**
29 May 2025	A	Initial draft for internal review
3 June 2025	0	Final issue to support Building Consent Application

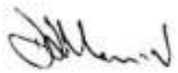
	Name	Signature	Position
Prepared by	Richard Tichborne		Associate Engineering Geologist
Reviewed by	Gaurav Mather		Principal Geotechnical Engineer
Authorised by	Dave Morton		Principal Geotechnical Engineer CMEngNZ, CPEng

Table of Contents

1 INTRODUCTION 1

2 SITE DETAILS 1

3 PROPOSED DEVELOPMENT 1

4 BACKGROUND 2

4.1 Related Documents 2
4.2 Site History 2

5 INVESTIGATION 3

5.1 Field Investigation 3

6 GROUND MODEL 3

6.1 Geology 3
6.2 Stratigraphic Units 4
6.3 Groundwater 4

7 GEOHAZARDS ASSESSMENT 6

8 RECOMMENDATIONS 8

8.1 Earthworks 8
8.2 Civil Works 8

9 FOUNDATION DESIGN 8

10 SUBGRADE PREPARATION 8

11 FURTHER WORK 8

12 CLOSURE 8

Appendices

Appendix A: NEO Architecture Studio Site Plan

Appendix B: Site Investigation Plan

Appendix C: Site Investigation Logs

Appendix D: Liquefaction Assessment

Appendix E: Settlement Analysis

Appendix F: Earthworks Specification

1 INTRODUCTION

CMW Geosciences (CMW) was engaged by CLL Holdings Ltd to carry out a geotechnical investigation of a site located at 1945 State Highway 10, Waipapa, which is being considered for the construction of a 680 m^2 industrial building with an additional 618 m^2 canopy.

The associated terms and conditions of our engagement were detailed in a standing services agreement between CLL Holdings Ltd and CMW Geosciences dated April 2022. This report is to support a building consent application to Far North District Council.

The purpose of this report is to describe the investigation completed, the ground conditions encountered, identify and quantify geotechnical risks to the development and to provide recommendations with respect to geotechnical aspects of the proposed building development including site preparation, temporary works, foundation construction and site / subsoil classification.

2 SITE DETAILS

The site comprises an area of approximately 4,000 m^2 and is located at 1945 State Highway 10, Waipapa northeast of Kerikeri (refer ***Figure 1***). Details of the site are as follows:

- The site is legally described as Lot 2 DP 177522.
- The site is near level with elevations ranging from RL 75 to 77 RL m. These levels continue at similar elevations into the neighbouring sites.
- The site is bound by industrial development to the north and west, State Highway 10 to the east and grassed farmland to the south.
- An existing drainage channel approximately 0.5 to 1.0 m deep is present inside the property along the southern boundary, and outside the property boundary on the eastern side along State Highway 10.
- Overhead power lines are located inside the property along the western boundary.
- Existing hardfill is present across most of the site with the western portion of the site covered in topsoil.
- An ~1 m high timber pole retaining wall is located approximately 34 m off the western boundary and a maximum of 20 m off the southern boundary of the site.

3 PROPOSED DEVELOPMENT

Brief details for the building development are as follows:

- A preliminary site plan ***Figure 2*** prepared by NEO Architecture Studio shows the creation of a 680 m^2 industrial building with 618 m^2 canopy, and concrete yard area.
- An approximate finished floor level of 76.1 RL m has been provided at present, and it is anticipated minimal earthworks will be required to create the building platform.
- It is anticipated the building is to be supported on shallow strip or pad footings with unspecified loads at the time of preparing this report.
- Widespread floor loads, including slab self-weight, have been specified as being no more than 5 kPa.
- Wastewater and stormwater are anticipated to be connected to the respective reticulated systems.



Figure 1: Site Location Plan (Ref. Far North District Council GIS).

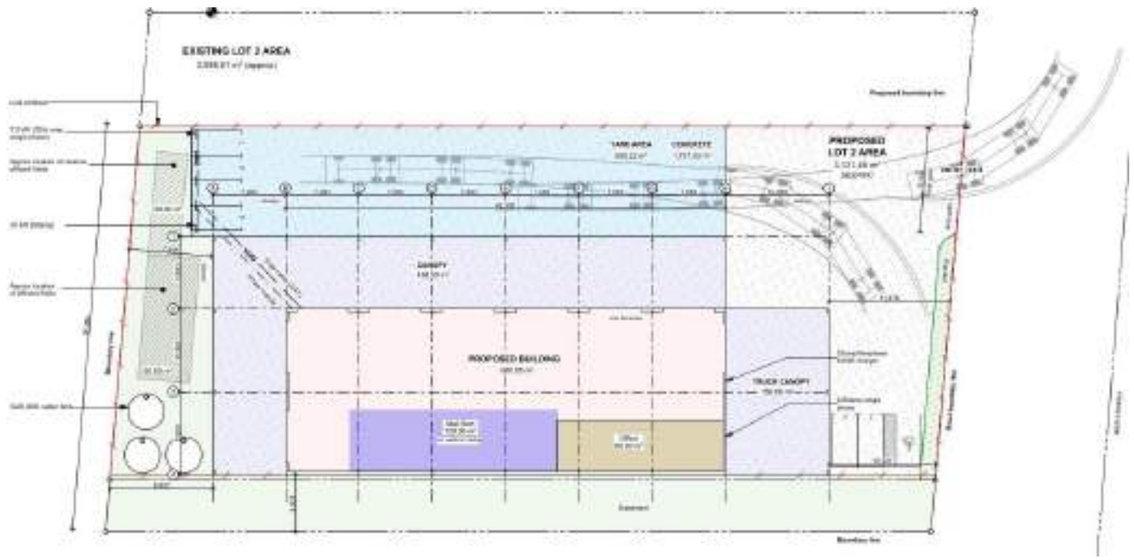


Figure 2: Preliminary Site Plan (Ref. NEO Architecture Studio, Job Number 24233 Sheet No. 1.2 dated 1 February 2025).

FACTUAL

4 BACKGROUND

4.1 Related Documents

The following documents were reviewed during preparation of this report:

- Preliminary Site Plan by NEO Architecture Studio job number 24233 Sheet 1.2 dated 1 February 2025.
- Information available on the NZGD online database.
  This includes existing machine borehole information from the Bunnings site approximately 800 m to the north.
- Publicly available information on Northland Regional Council GIS online database.
  The hazard maps on this database shows the site is located in Flood Susceptible land classed as Undulating Terraces and that the 100 year River Flood hazard zone is located ~280 m to the southeast and ~400 m to the west of the site.
- A Geotechnical report for the neighbouring property, referenced Geotechnical Investigation Report For Proposed Commercial Building, 195A State Highway 10, Waipapa by Land Development Engineering Ltd, Project Ref: 19514 dated 25 May 2021.

Historic reporting from the neighbouring property indicates that:

- Underlying a layer of surface hardfill, softer soils consisting of mainly silts and clay overlie a very hard inferred basalt layer, encountered at depths of 2.0 – 8.4 m below existing ground level.

4.2 Site History

Aerial photographs were reviewed from the website Retrolens and Google Earth between 1953 and 2023. Changes are summarised below and depicted in ***Figures 3*** to ***4***.

- From 1953 to 1979, the site and surrounds were used for agricultural and horticultural purposes.
- Sometime between 1979 and 2003, the site has been converted from agricultural and horticultural purposes to industrial.
- Since being converted the site has been used for industrial purposes up until the present day.



Figure 3: 1979 Aerial Imagery from Retrolens (retrolens.co.nz), approximate site boundaries in red.



Figure 4: 2003 Satellite Imagery Google Earth, approximate site boundaries in red.

FACTUAL

5 INVESTIGATION

5.1 Field Investigation

Following a dial before you dig search, and onsite service location, the field investigation was carried out on the 23rd of April 2025. The scope of fieldwork completed is shown below:

Table 1: Investigation Summary

Investigation Summary			
Test ID	**Test Type**	**Ground Surface Elevation (RL m)**	**Depth (m)**
HA01-25 to HA05-25	Hand Auger Borehole	~76	2.6m (refusal) to 4.4m (refusal)
DCP01-25 to DCP05-25	Dynamic Cone Penetration Test	~76	0.9m to 4.2m (refusal)
CPT01-25 to CPT09-25	Cone Penetration Test	~76	3.13m (refusal) to 28.99m (refusal)
Notes: [1]Refer Section 6.3 for details			

Additional to the fieldwork outlined above, 3 machine auger holes were undertaken at the location of CPT01-25, CPT05-25 and CPT06-25. The machine auger holes were completed with a 350mm diameter auger with rock teeth on a 25ton excavator. The purpose of the machine augers was to confirm refusal in hard material at the 3 locations. Each auger drilled ~0.5m into hard rock before the excavator started to lift and drilling was stopped due to risk of breaking equipment. Inferred hard rock was encountered at each location at the approximate depth of CPT refusal.

The approximate locations of the respective investigation sites referred to above are shown on the Geotechnical Investigation Plan in ***Appendix B***.

Engineering logs of the relevant investigations are presented in ***Appendix C***.

6 GROUND MODEL

6.1 Geology

Published geological maps[1] for the area depict the regional geology for the site as comprising Early Pleistocene – Middle Pleistocene undifferentiated estuary, river and swamp deposits of the Tauranga Group. Late Miocene Basalt of Kerikeri Volcanic Group is depicted to the north, east and south of site at 200 to 700 m.

Based on the known history of the site and our ground investigation surficial uncontrolled fills and compacted hardfill is also present.

Table 2: Summary of Typical Conditions of Mapped Geological Units

Tauranga Group Alluvium	
Location on Site	Entire site Regionally mapped in low-lying areas adjacent streams, rivers and estuaries
Formation	River, stream and estuary deposits, including landslide debris and erosion deposits
Typical Composition, Weathering/ Layering and Variability	Comparatively high variability in layering of particle sizes and locations of deposits. Predominantly mixtures of clays, silts and sands. Some gravels. Can contain pockets or layers of organic soils and peats or reworked and highly sensitive volcanic pumice silts
Behaviour, Instability Mechanism(s) and Principal Potential Geohazards	Poorly consolidated deposits, particularly organics, will usually settle/subside if unsupported or overloaded Liquefaction (if sandy lenses are present) Lateral Spread if liquefiable near a free face High shrink/swell/expansivity of clay deposits Prone to comparatively poor bearing capacity characteristics
Kerikeri Volcanic Group Basalt	
Location on Site	Mapped 200 m to north of the site, 700 m to the east and 500 m to the south
Formation	Basalt Lava, volcanic plugs and minor tuff
Typical Composition, Weathering/ Layering and Variability	Basalt: flows and cones of very fine to medium grained crystalline basalt, dense and moderately fractured; hard to very hard. Surfaces form terraces and plateaus generally without rock outcrops.
Behaviour, Instability Mechanism(s) and Principal Potential Geohazards	High strength rock that can make excavation difficult High shrink/swell/expansivity of clay deposits Boulder deposits and lava flows creating variability in depth and consistency

[1] Heron, D.W. (custodian) 2020. Geological map of New Zealand 1:250,000. 3rd ed. Lower Hutt, NZ: GNS Science. GNS Science geological map 1. 1 USB; https://doi.org/10.21420/03PC-H178

6.2 Stratigraphic Units

Our estimate of the distribution of the stratigraphic layers is presented below.

Table 3: Ground Model

Geological Unit	Description	Typical Depth to Base (m)		Typical Thickness (m)		Strength Range
		Min	Max	Min	Max	
Hardfill	Sand and Gravel Mixtures (GAP 65)	0.0	1.0	0.1	1.0	Loose to well compacted
Topsoil/fill	Organic silts and silt/gravel mixtures	0.1	0.6	0.1	0.6	50 kPa to 140 kPa
Tauranga Group	Clay and Silt mixtures with trace sand	2.6	28.99	2.6	5.44	30 kPa to 200+ kPa (CPT Nkt = 12) - refer ***Appendix C***.
Rock (Inferred Kerikeri Volcanic Group)*	High Strength Rock	-	-	-	-	20+ blows/100mm
***Notes**: indicated by refusal of testing equipment, base of unit not reached.						

6.3 Groundwater

During the investigation, completed in Autumn conditions (April 2025), groundwater was encountered at depths ranging from 0.6 to 1.4 m below existing ground levels.

Groundwater was also seen in the drainage channel that runs parallel to the southern boundary and is shown in ***Figure 7***.



Figure 5: Excavation through hardfill to show Hardfill Depth of ~0.5m at this location.



Figure 6: Typical view across the site of 0.1 to 1.0m of hardfill.



Figure 7: Drainage channel parallel to southern boundary near proposed building footprint.



Figure 8: Retaining wall located in the western portion of the site.

INTERPRETIVE

7 GEOHAZARDS ASSESSMENT

The table below is a summary of critical geohazards to this project and is based on information available to date. Where relevant, specific assessment details can be found in the respective design calculation packages in the appendices as noted.

Table 4: Geohazard Assessment Summary

Geohazard Assessment Summary											
Item	Geotechnical Hazard	Description	Area Affected	Assessment Outcome	Existing Risk of Damage to Land / Structures			Mitigation Measure	Residual Risk of Damage to Land / Structures		
					Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
1	Earthquake	Seismicity	Whole Site	Site subsoil class = Class D due to CPT refusal at ~29m. ULS PGA = 0.13g				Not applicable			
		Fault Rupture	Whole Site	Nearest active fault = Waikopua Fault, over 200km from the site. Recurrence interval unknown.				Not applicable			
		Liquefaction	Whole Site	Groundwater table 0.6 to 1.4m deep. ULS vertical settlements up to 33mm have been calculated and differential settlements of up to 20mm across building width predicted. Liquefaction assessment and results contained in ***Appendix D***	2	5	10	Vertical settlements expected to be within tolerances of proposed building (to be confirmed by structural engineer).	2	5	10
2	Slope Instability / Landslide	Global Instability	Proposed Platform	Due to the landform being generally near-level, slope instability is not anticipated.	1	3	3	Mitigation not required	1	3	3
3	Problematic Soils	Rockmass Exposure	Whole Site	Minor cuts if any cuts in proposed area	2	4	8	Mitigation not required	2	4	8
		Expansive Soils	Whole Site	Conservatively assessed as AS2870 Class H based on our field assessment of soils encountered on site and knowledge of soils in the area. Final expansive class dependent on proposed cut and fill earthworks and final material type.	5	3	15	Specific foundation design to be undertaken by structural engineer.	1	3	3
		Sensitive Soils	Whole Site	The Tauranga Group unit encountered within proposed earthworks cuts / exposed at or immediately below design subgrade level within cut areas typically contains very high moisture contents, sometimes approaching the soil liquid limit and are highly sensitive resulting in difficulty earthworking this material.	4	3	12	Careful earthworks management, and potential importing of fill material.	1	3	3
		Uncontrolled Fill	Whole Site	Uncontrolled fill comprising topsoil and gravel material present to depths of up to 0.6m.	5	1	5	Uncontrolled fill is to be excavated and replaced, some areas of hardfill may be able to remain in place subject to location and further testing during construction.	5	1	5
4	Settlement	Compressible Soils	Earthworks	10kPa widespread load (0.5m fill) = 15mm to 20mm settlement	4	4	16	Fill depths to be limited to 0.5m, monitor settlement during construction Settlement monitoring will include placement of settlement markers during	1	4	4

Geohazard Assessment Summary											
Item	Geotechnical Hazard	Description	Area Affected	Assessment Outcome	Existing Risk of Damage to Land / Structures			Mitigation Measure	Residual Risk of Damage to Land / Structures		
					Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
								earthworks, which will require monitoring on a regular basis by a surveyor until remaining settlements are considered within the limits of the proposed building.			
		Compressible Soils	Proposed Platform	3m x 3m pad foundations x 50kPa working pressure = 15mm to 32mm settlement. 3m x 3m pad foundations x 100kPa working pressure = 31mm to 63mm settlement. Refer ***Appendix E*** for settlement calculations from CPeT-IT and summary table.	4	4	16	Foundation dimensions and pressures to be carefully selected to limit settlement.	1	4	4
		Bearing Capacity	Proposed Platform	Geotechnical ultimate bearing capacity (GUBC) of 150kPa available for footing widths of 0.5m to 3.0m.	3	4	12	Bearing pressures likely to be limited due to allowable settlement. For 50kPa working pressure, as above, GUBC = 150kPa.	1	4	4
		Subgrade Preparation	Proposed Platform	Topsoil, any encountered organic material, soft disturbed material, and soft uncontrolled fills should be removed prior to placement of fills.	5	1	5	A suitably qualified Geotechnical engineer should inspect the subgrade stripping prior to the placement of fills.	5	1	5
5	Flooding	Flooding, Inundation	Whole Site	The site is mapped within the NRC flood hazard maps as being located in Flood Susceptible land classed as Undulating Terraces.	3	2	6	Buildings to have the minimum freeboard to meet the requirements of Far North Council Engineering Standards.	2	2	4

8 RECOMMENDATIONS

8.1 Earthworks

All earthwork activities must be carried out in general accordance with the requirements of NZS 4431:2022[2] (specifically Table A1 for fill materials), and the requirements of the Far North District Council Engineering Standards under the guidance of a Chartered Professional Geotechnical Engineer. In addition, a Earthworks Specification is provided as ***Appendix F***. This document provides the requirements for site preparation, fill placement, compaction requirements, quality assurance observations and testing and as-built requirements.

The temporary stability of the works is the responsibility of the main contractor. All works are to be completed in accordance with the requirements of current safety legislation and WorkSafe NZ.

Due to the compressible nature of the underlying natural soils, fill depths across the proposed building platform should be limited to no more than 0.5 m above existing ground levels.

8.2 Civil Works

Table 5: Civil Works Recommendations

Key Civil Inputs		
Item	**Value**	**Comment**
Subgrade CBR	2 – 3% 5 – 6%	Within natural cut ground Within engineered fills

9 FOUNDATION DESIGN

Shallow foundations are considered suitable for the site with parameters for design provided below:

Table 6: Anticipated Foundation Details

Anticipated Shallow Foundation Details			
Item	**Methodology**	**Value**	**Comment**
Geotechnical Ultimate Bearing Capacity (GUBC)		150 kPa	Footing widths of 0.5m to 3.0m.
Foundation Settlement		15 – 32 mm	FoS = 3.0 (50kPa working pressure)
Expansive Soil Site Class	AS2870	H1 (high)	Anticipated characteristic surface movement of up to 60mm (H1)
Strength reduction factors	B1/VM4[3]	0.8 0.5	Load combinations involving earthquake overstrength All other load combinations
Seismic Site Class(es)	NZS1170	D	Based on CPT refusal at ~29m.

[2] Standards New Zealand (2022) Engineered fill construction for lightweight structures, NZS 4431:2022

10 SUBGRADE PREPARATION

The natural silt and clay alluvium underlying the surface fill unit has low to moderate in-situ shear strength (Su>40 kPa) and is associated with a high groundwater table. These soils are therefore extremely sensitive to strength loss when disturbed such as from repetitive foot or vehicle trafficking.

It is therefore imperative that for all subgrade and footing excavations exposing these soils, excavations are deepened by nominally 150 to 300 mm to facilitate placement of a geotextile layer, such as Bidim A19 or similar, and lightly compacted hardfill layer as a protective wearing course.

11 FURTHER WORK

The following further work is recommended as the project progresses:

Geotechnical plan review, as plans develop and a foundation plan is finalised to ensure that the findings of our reporting is correctly interpreted and applied.

During construction, regular inspections and testing will be required as outlined in the Geotechnical Works Specification.

At the completion of the works, a Producer Statement – Construction Observations (PS4) will be prepared by a Chartered Professional Engineer outlining the works completed.

12 CLOSURE

Additional important information regarding the use of your CMW report is provided in the '*Using your CMW Report*' document attached to this report.

This report has been prepared for use by CLL Holdings Ltd in relation to the NZ Post Building, 1945 State Highway 10, Waipapa project in accordance with the scope, proposed uses and limitations described in the report. Should you have further questions relating to the use of your report please do not hesitate to contact us.

Where a party other than CLL Holdings Ltd seeks to rely upon or otherwise use this report, the consent of CMW should be sought prior to any such use. CMW can then advise whether the report and its contents are suitable for the intended use by the other party.

[3] Ministry of Business, Innovation and Employment (2019) *Acceptable Solutions and Verification Methods for NZ Building Code Clause B1 Structure,* B1/VM4, Amendment 19

INTERPRETIVE

USING YOUR CMW GEOTECHNICAL REPORT

Geotechnical reporting relies on interpretation of facts and collected information using experience, professional judgement, and opinion. As such it generally has a level of uncertainty attached to it, which is often far less exact than other engineering design disciplines. The notes below provide general advice on what can be reasonably expected from your report and the inherent limitations of a geotechnical report.

Preparation of your report

Your geotechnical report has been written for your use on your project. The contents of your report may not meet the needs of others who may have different objectives or requirements. The report has been prepared using generally accepted Geotechnical Engineering and Engineering Geology practices and procedures. The opinions and conclusions reached in your report are made in accordance with these accepted principles. Specific items of geotechnical or geological importance are highlighted in the report.

In producing your report, we have relied on the information which is referenced or summarised in the report. If further information becomes available or the nature of your project changes, then the findings in this report may no longer be appropriate. In such cases the report must be reviewed, and any necessary changes must be made by us.

Your geotechnical report is based on your project's requirements

Your geotechnical report has been developed based on your specific project requirements and only applies to the site in this report. Project requirements could include the type of works being undertaken; project locality, size and configuration; the location of any structures on or around the site; the presence of underground utilities; proposed design methodology; the duration or design life of the works; and construction method and/or sequencing.

The information or advice in your geotechnical report should not be applied to any other project given the intrinsic differences between different projects and site locations. Similarly geotechnical information, data and conclusions from other sites and projects may not be relevant or appropriate for your project.

Interpretation of geotechnical data

Site investigations identify subsurface conditions at discrete locations. Additional geotechnical information (e.g. literature and external data source review, laboratory testing etc) are interpreted by Geologists or Engineers to provide an opinion about a site specific ground models, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist due to the variability of geological environments. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. Interpretation of factual data can be influenced by design and/or construction methods. Where these methods change review of the interpretation in the report may be required.

Subsurface conditions can change

Subsurface conditions are created by natural processes and then can be altered anthropically or over time. For example, groundwater levels can vary with time or activities adjacent to your site, fill may be placed on a site, or the consistency of near surface conditions might be susceptible to seasonal changes. The report is based on conditions which existed at the time of investigation. It is important to confirm whether conditions may have changed, particularly when large periods of time have elapsed since the investigations were performed.

Interpretation and use by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical report. To help avoid misinterpretations, it is important to retain the assistance of CMW to work with other project design professionals who are affected by the contents of your report. CMW staff can explain the report implications to design professionals and then review design plans and specifications to see that they have correctly incorporated the findings of this report.

Your report's recommendations require confirmation during construction

Your report is based on site conditions as revealed through selective point sampling. Engineering judgement is then applied to assess how indicative of actual conditions throughout an area the point sampling might be. Any assumptions made cannot be substantiated until construction is complete. For this reason, you should retain geotechnical services throughout the construction stage, to identify variances from previous assumption, conduct additional tests if required and recommend solutions to problems encountered on site.

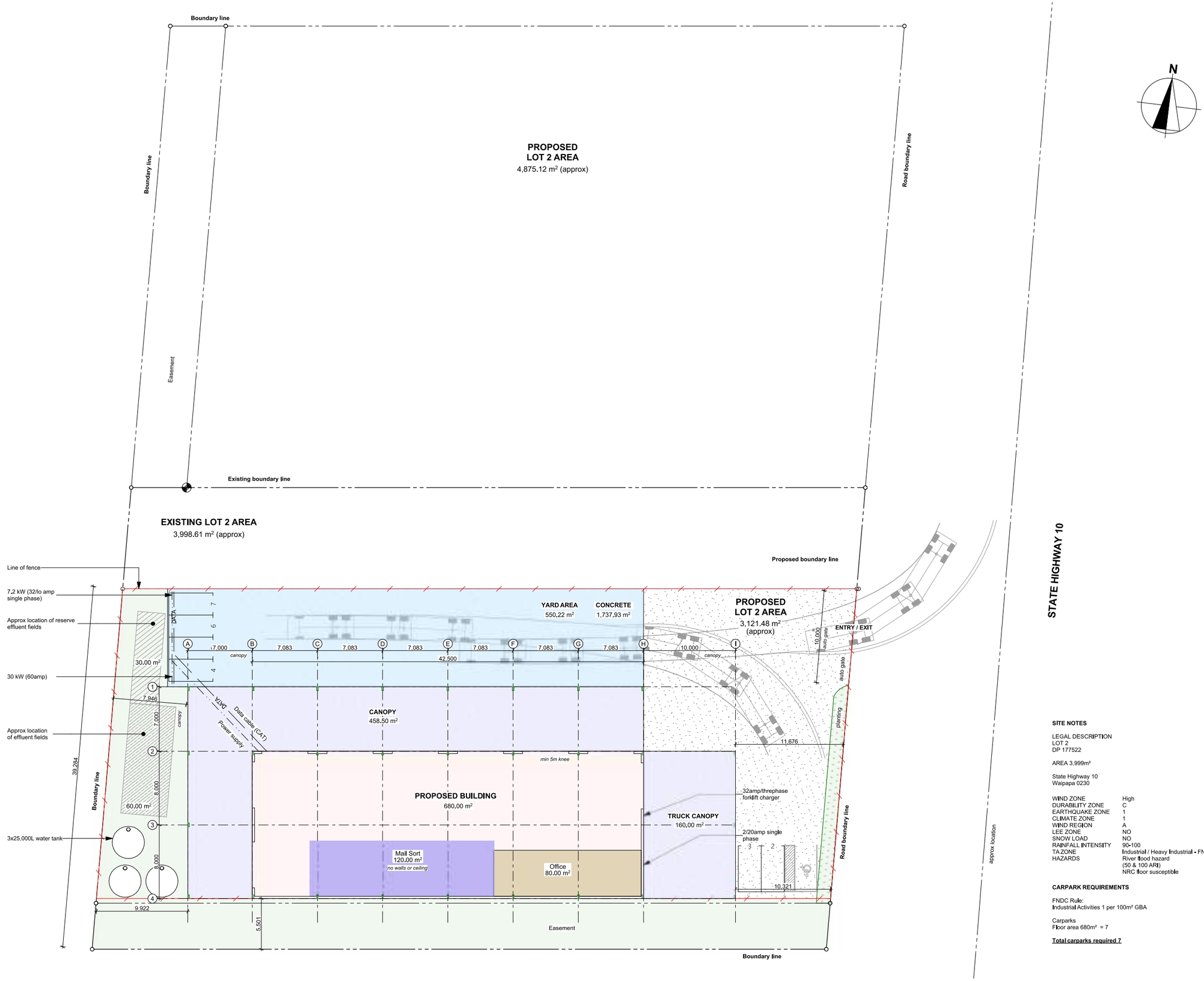
A Geotechnical Engineer, who is fully familiar with the site and the background information, can assess whether the report's recommendations remain valid and whether changes should be considered as the project develops. An unfamiliar party using this report increases the risk that the report will be misinterpreted.

Environmental Matters Are Not Covered

Unless specifically discussed in your report environmental matters are not covered by a CMW Geotechnical Report. Environmental matters might include the level of contaminants present of the site covered by this report, potential uses or treatment of contaminated materials or the disposal of contaminated materials. These matters can be complex and are often governed by specific legislation.

The personnel, equipment, and techniques used to perform an environmental study can differ significantly from those used in this report. For that reason, our report does not provide environmental recommendations. Unanticipated subsurface environmental problems can have large consequences for your site. If you have not obtained your own environmental information about the project site, ask your CMW contact about how to find environmental risk-management guidance.

Appendix A: NEO Architecture Studio Site Plan



SITE NOTES

LEGAL DESCRIPTION
LOT 2
DP 177522

AREA 3,999m²

State Highway 10
Waipapa 0230

WIND ZONE	High
DURABILITY ZONE	C
EARTHQUAKE ZONE	1
CLIMATE ZONE	1
WIND REGION	A
LEE ZONE	NO
SNOW LOAD	NO
RAINFALL INTENSITY	90-100
TA ZONE	Industrial / Heavy Industrial - FNDC
HAZARDS	River flood hazard (50 & 100 ARI) NRC floor susceptible

CARPARK REQUIREMENTS

FNDC Rule:
Industrial Activities 1 per 100m² GBA

Carparks
Floor area 680m² = 7

Total carparks required 7

NEO ARCHITECTURE STUDIO

CONTACT
P 021 182 0261
E admin@neoas.co.nz
W www.neoas.co.nz

CLIENT
SMARTSTEEL BUILDINGS

PROJECT
NZ POST DEVELOPMENT
State Highway 10
Waipapa 0230

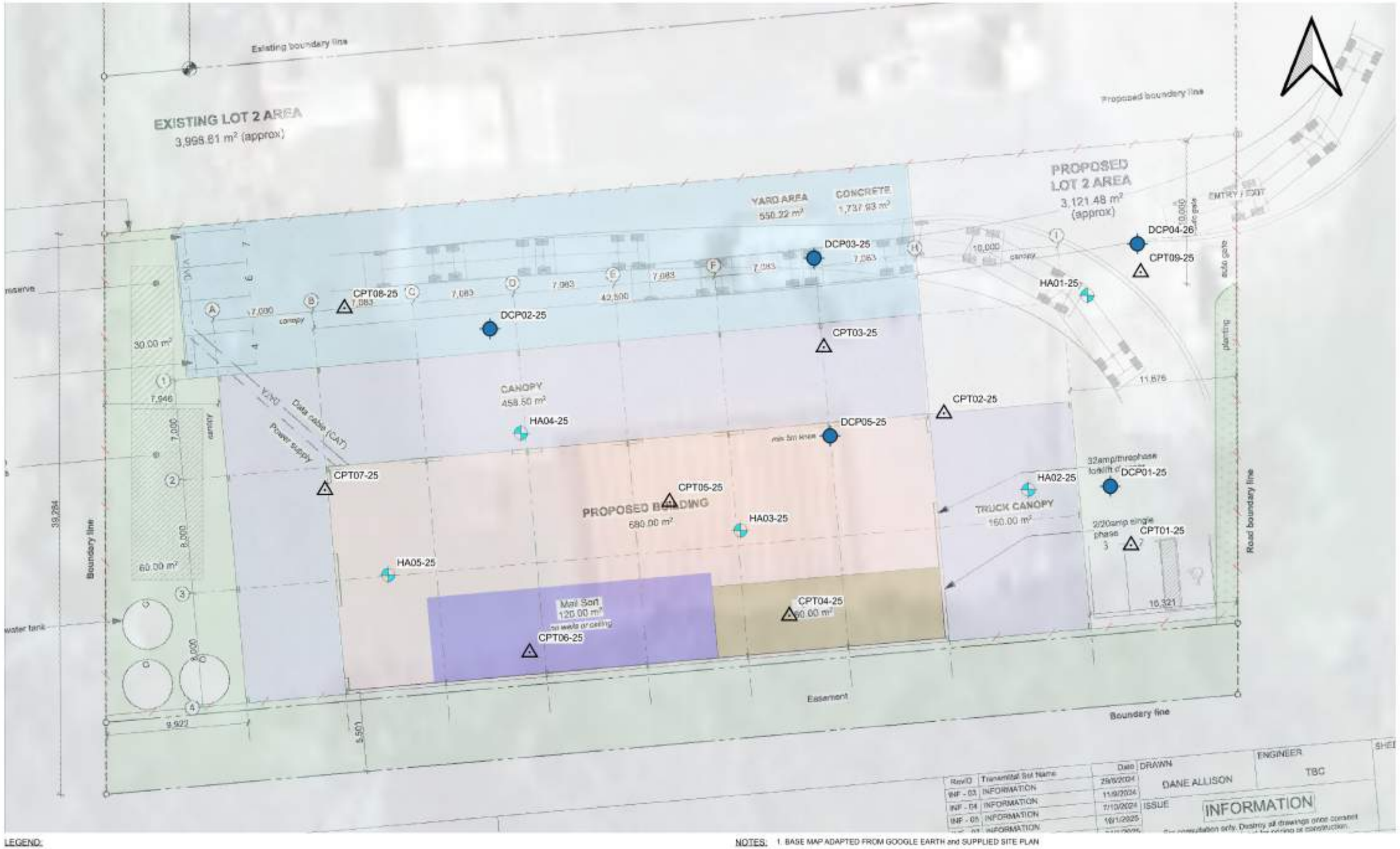
RevID	Transmittal Set Name	Date
INF - 03	INFORMATION	29/8/2024
INF - 04	INFORMATION	11/9/2024
INF - 05	INFORMATION	7/10/2024
INF - 07	INFORMATION	16/1/2025
INF - 08	INFORMATION	31/1/2025
INF - 09	INFORMATION	1/2/2025

DRAWN: DANE ALLISON
ENGINEER: TBC
ISSUE: INFORMATION
For consultation only. Destroy all drawings once consent drawings are issued, not for pricing or construction.

SHEET TITLE
SITE PLAN

DATE: **1/2/2025**
SCALE @ A1: **1:200**
JOB NUMBER: **2423**
REVISION: **INF - 09**
SHEET NO: **1.2**

Appendix B: Site Investigation Plan



LEGEND:

DCP Location | Hand Auger Location | CPT Location

0 7.5 15 m

NOTES: 1. BASE MAP ADAPTED FROM GOOGLE EARTH and SUPPLIED SITE PLAN

CMW Geosciences
Great People | Practical Solutions

CLIENT: CLL		DRAWN: RT	PROJECT: NTH2025-0002
PROJECT: 1945 State Highway 10, Waipapa		CHECKED: DM	DRAWING: 01
		REVISION: 0	
TITLE: SITE INVESTIGATION PLAN		DATE: 21/05/2025	SHEET: A3 L

Appendix C: Site Investigation Logs

HAND AUGER BOREHOLE LOG - HA01-25

Client: CLL
Project: 1945 State Highway 10, Waipapa
Site Location: 1945 State Highway 10, Waipapa
Project No.: NTH2025-0002
Date: 23/04/2025
Borehole Location: Building Platform Logged by: RT Checked by: GM Scale: 1:25 Sheet 1 of 1

CMW Geosciences
Great People | Practical Solutions

Position: 1683738.3mE; 6102776.9mN Projection: NZTM
Elevation: 76.00m Datum: NZVD2016 Survey Source: Far North Council GIS Map

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description (Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/ geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit))	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
			76.0			OL: SILT (Old Topsoil) : Black. Hand auger completed in base of test pit below 0.6m of compacted GAP 65 and drainage sand hard fill. (Topsoil)			
			75.9			MH: clayey SILT: Dark grey (Tauranga Group)	M		
	0.4	Peak = 100kPa Residual = 29kPa	75.6			CH: silty CLAY: Brownish grey. High plasticity. (Tauranga Group)		St to VSt	
▼	0.8	Peak = 128kPa Residual = 43kPa	75.2			CH: silty CLAY: Light brownish grey. High plasticity, limonite staining. (Tauranga Group)	W		
			75.0	1		ML: clayey SILT with trace Sand: Light grey. (Tauranga Group)			
	1.2	Peak = 43kPa Residual = 20kPa				*... at 1.00m, Poor to no recovery from this point*			
	1.6	Peak = 77kPa Residual = 43kPa						F to St	
	2.0	Peak = 43kPa Residual = 20kPa		2			S		
	2.4	Peak = 77kPa Residual = 43kPa							
	2.8	Peak = 91kPa Residual = 43kPa						VSt	
	3.2	Peak = 171kPa Residual = 57kPa		3					
						Borehole terminated at 3.3 m		MD	5, 5, 6
								L	2, 1, 1
				4				MD	4, 6, 3, 7, 20
				5					

Termination Reason: Hand Auger Refusal then Scala to Refusal
Shear Vane No: 4108 DCP No: 11
Remarks: Groundwater encountered at 0.8m

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 4 - April 2023.

HAND AUGER BOREHOLE LOG - HA02-25

Client: CLL
Project: 1945 State Highway 10, Waipapa
Site Location: 1945 State Highway 10, Waipapa
Project No.: NTH2025-0002
Date: 23/04/2025
Borehole Location: Building Platform Logged by: RT Checked by: GM Scale: 1:25 Sheet 1 of 1

CMW Geosciences
Great People | Practical Solutions

Position: 1683734.2mE; 6102763.1mN Projection: NZTM
Elevation: 76.00m Datum: NZVD2016 Survey Source: Far North Council GIS Map

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description (Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit))	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
			76.0			OL: SILT with trace Gravel (Old topsoil and Fill): Black. Hand auger completed below 100mm of compacted GAP 65. (Topsoil)			
			75.9			MH: clayey SILT: Grey (Tauranga Group)			
	0.4	Peak = 128kPa Residual = 57kPa					M	VSt	
▼	0.8	Peak = 157kPa Residual = 29kPa	75.2			MH: clayey Silt with trace sand: Light brown (Tauranga Group)			
				1		... at 1.00m, Poor recovery to no recovery from this point			
	1.2	Peak = 114kPa Residual = 29kPa							
	1.6	Peak = 57kPa Residual = 14kPa					S	St	
	2.0	Peak = 72kPa Residual = 29kPa		2					
								VD	20
						Borehole terminated at 2.6 m			
				3					
				4					
				5					

Termination Reason: Refusal on Hard Ground
Shear Vane No: 4108 DCP No: 11
Remarks: Groundwater encountered at 0.8m

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 4 - April 2023.

HAND AUGER BOREHOLE LOG - HA03-25

Client: CLL
Project: 1945 State Highway 10, Waipapa
Site Location: 1945 State Highway 10, Waipapa
Project No.: NTH2025-0002
Date: 23/04/2025
Borehole Location: Building Platform Logged by: RT Checked by: GM Scale: 1:25 Sheet 1 of 1

CMW Geosciences
Great People | Practical Solutions

Position: 1683713.7mE; 6102760.2mN Projection: NZTM
Elevation: 76.00m Datum: NZVD2016 Survey Source: Far North Council GIS Map

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description (Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/ geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit))	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
			76.0			OL: SILT (Old Topsoil and Fill): Black. Hand auger completed below 100mm of compacted GAP65.			
			75.9			(Topsoil)			
						MH: clayey SILT: Grey. Low plasticity. (Tauranga Group)	M		
▼	0.4	Peak = 86kPa Residual = 29kPa						St	
	0.8	Peak = 71kPa Residual = 14kPa	75.2			MH: clayey Silt: Light Brown (Tauranga Group)			
				1		... at 1.00m, Poor to no recovery down to 2.3m			
	1.2	Peak = 100kPa Residual = 29kPa							
	1.6	Peak = 57kPa Residual = 29kPa					S	F to St	
	2.0	Peak = 185kPa Residual = 20kPa		2					
			73.7			ML: sandy SILT: Dark Greenish Grey (Tauranga Group)			
	2.4	Peak = 200kPa						VSt	
				3		Borehole terminated at 3.0 m		L	4, 2, 1, 3, 3, 2, 3
								D	4, 4, 6, 10, 7, 3, 20
				4					
				5					

Termination Reason: Hand Auger Refusal then Scala to Refusal
Shear Vane No: 4108 DCP No: 11
Remarks: Groundwater encountered at 0.6m

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 4 - April 2023.

HAND AUGER BOREHOLE LOG - HA04-25

Client: CLL
Project: 1945 State Highway 10, Waipapa
Site Location: 1945 State Highway 10, Waipapa
Project No.: NTH2025-0002
Date: 23/04/2025
Borehole Location: Building Platform Logged by: RT Checked by: GM Scale: 1:25 Sheet 1 of 1

CMW Geosciences
Great People | Practical Solutions

Position: 1683698.0mE; 6102767.1mN Projection: NZTM
Elevation: 76.00m Datum: NZVD2016 Survey Source: Far North Council GIS Map

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description (Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/ geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit))	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
			76.0			OL: clayey SILT with sand and gravel: Dark Grey. Uncontrolled Fill. (Uncontrolled Fill)			
	0.4	Peak = 114kPa Residual = 43kPa					M		
			75.4			MH: clayey SILT: Light Brown (Tauranga Group)			
▼	0.8	Peak = 128kPa Residual = 14kPa		1					
						... at 1.00m, Poor to no recovery to 1.8m			
	1.2	Peak = 171kPa Residual = 57kPa						VSt	
	1.6	Peak = 200kPa							
			74.2			ML: sandy Silt: Dark Blueish Grey (Tauranga Group)	S		
	2.0	Peak = 200kPa		2					
	2.4	Peak = 200kPa							
	2.8	Peak = 200kPa							
				3		Borehole terminated at 3.0 m		L	2, 2, 3, 2, 2, 3
									20
				4					
				5					

Termination Reason: Hand Auger Refusal then Scala to Refusal
Shear Vane No: DCP No: 11
Remarks: Groundwater encountered at 0.8m

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 4 - April 2023.

HAND AUGER BOREHOLE LOG - HA05-25

Client: CLL
Project: 1945 State Highway 10, Waipapa
Site Location: 1945 State Highway 10, Waipapa
Project No.: NTH2025-0002
Date: 23/04/2025
Borehole Location: Building Platform Logged by: RT Checked by: GM Scale: 1:25 Sheet 1 of 1

CMW Geosciences
Great People | Practical Solutions

Position: 1683688.6mE; 6102757.1mN Projection: NZTM
Elevation: 76.00m Datum: NZVD2016 Survey Source: Far North Council GIS Map

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description (Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/ geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit))	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
			76.0			OL: SILT with gravel: Dark Grey, rootlets. Topsoil layer mixed with Fill. (Uncontrolled Fill)			
	0.4	Peak = 143kPa Residual = 43kPa	75.6			MH: clayey SILT with gravel: Light Reddish Brown. Low plasticity. (Uncontrolled Fill)			
			75.5			CH: silty CLAY: Light Brown. High plasticity. (Tauranga Group)	M		
	0.8	Peak = 128kPa Residual = 43kPa							
▼			75.0	1		MH: clayey SILT: Light Grey (Tauranga Group)		St to VSt	
	1.2	Peak = 200kPa				... at 1.20m, Poor to no recovery from this point			
	1.6	Peak = 171kPa Residual = 57kPa					S		
	2.0	Peak = 100kPa Residual = 29kPa		2					
						Borehole terminated at 2.1 m		VL	1, 1, 1
								L	4, 3, 4
				3					9
								VL	2, 2, 1, 2, 1, 1, 2, 2, 2
				4				D to VD	10, 20
				5					

Termination Reason: Hand Auger to 2.1m then Scala to refusal
Shear Vane No: 4108 DCP No: 11
Remarks: Groundwater encountered at 1.0m

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 4 - April 2023.

Dynamic Cone Penetration (DCP) LOG - DCP01-25

Client: CLL
Project: 1945 State Highway 10, Waipapa
Site Location: 1945 State Highway 10, Waipapa
Project No.: NTH2025-0002
Date: 23/04/2025
Borehole Location: Building Platform Logged by: RT Checked by: GM Scale: 1:25 Sheet 1 of 1

CMW Geosciences
Great People | Practical Solutions

Position: 1683740.0mE; 6102763.4mN Projection: NZTM
Elevation: 76.00m Datum: NZVD2016 Survey Source: Far North Council GIS Map

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/ geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				1					2, 2, 4, 6, 5, 4, 3, 2, 1, 1, 1, 2, 2, 6, 7, 5, 5, 4, 1, 2
				2					1, 2, 3, 2, 5, 5, 3, 3, 3, 3
				3					6, 20
				4					
				5					

Termination Reason: Refusal On Hard Ground at 3.1m
Shear Vane No: DCP No: 11
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 4 - April 2023.

LF14 Dynamic Cone Penetration (DCP) Test Report (Rev 20)

NZS 4402: 1988 Test 6.5.2

Project:	NZ Post Distribution Centre Waipapa
Project No:	NTH2025-0002
Location:	19454 State Highway 10, Waipapa
Report No:	
Test Date:	23/04/2025
Tested By:	RT
DCP ID#:	11
Client:	CLL
Client Address:	14 Wookey Lane, Kumeu 0810
CBR Test Calculation:	Austroads (2024) (fine grained cohesive)

Auckland Laboratory
CMW Geotechnical NZ Limited
11/63, Arrenway Drive, Rosedale, NZ 0632
Phone: +64 (09) 4144 632

Testing Locations Selected By: CMW Field Staff

*** Equivalent CBR Values are not accredited and are outside the scope of the laboratory's accreditation**

Test No	DCP02-25		DCP03-25		DCP04-25					
Test Location	See Site Plan		See Site Plan		See Site Plan					
Chainage & Offset										
Material & Layer	Cut to below hardfill		Cut to below hardfill		Cut to below hardfill					
Depth (mm)	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*
0 - 100	1	2	5	10	4	8				
100 - 200	3	6	6	13	4	8				
200 - 300	2	4	3	6	2	4				
300 - 400	2	4	2	4	2	4				
400 - 500	1	2	2	4	2	4				
500 - 600	2	4	2	4	2	4				
600 - 700	1	2	2	4	2	4				
700 - 800	2	4	1	2	3	6				
800 - 900	3	6	4	8	1	2				
900 - 1000										

Test No										
Test Location										
Chainage & Offset										
Material & Layer										
Depth	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*
0 - 100										
100 - 200										
200 - 300										
300 - 400										
400 - 500										
500 - 600										
600 - 700										
700 - 800										
800 - 900										
900 - 1000										

Created by: RT Date: 8/05/2025

Checked by: Date:

Authorised Signatory (KTP): Date:

This report should only be reproduced in full

* Equivalent CBR values are taken from Fig 5.3, Austroads Guide to Pavement Technology, Part 2: Pavement Structural Design, Austroads 2024. Values are relevant to fine grained soils only.

Dynamic Cone Penetration (DCP) LOG - DCP05-25

Client: CLL
Project: 1945 State Highway 10, Waipapa
Site Location: 1945 State Highway 10, Waipapa
Project No.: NTH2025-0002
Date: 23/04/2025
Borehole Location: Building Platform

CMW Geosciences
Great People | Practical Solutions

Scale: 1:25 Sheet 1 of 1

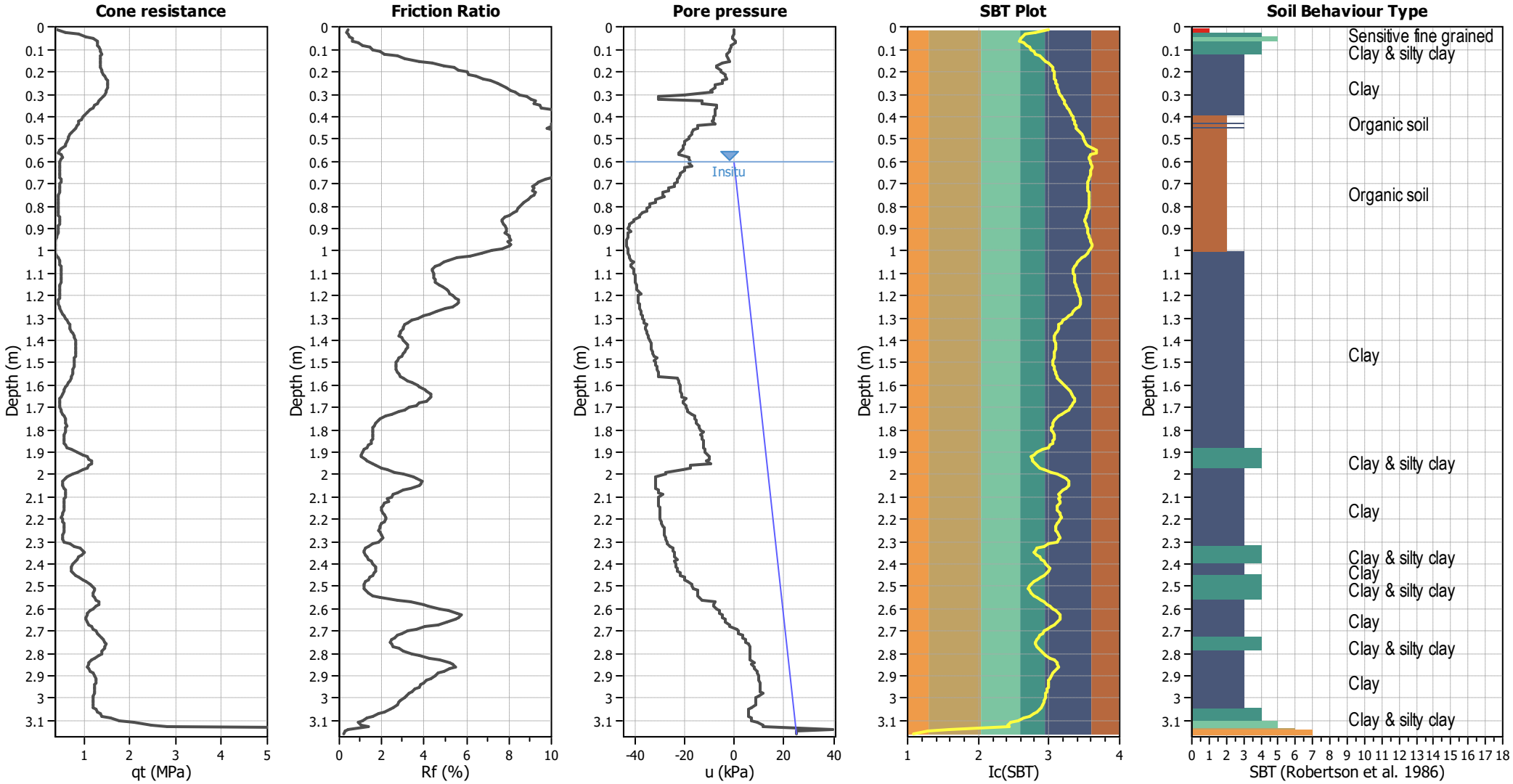
Position: 1683720.0mE; 6102766.9mN Projection: NZTM
Elevation: 76.00m Datum: NZVD2016
Survey Source: Far North Council GIS Map

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description (Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/ geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit))	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				1					4
									6
									3
									3
									2
									2
									2
									2
									2
									1
				2					3
									2
									4
									4
									3
									4
									2
									2
									1
									1
				3					3
									3
									4
									3
									4
									4
									3
									4
									2
									4
				4					3
									5
									7
									6
									4
									4
									4
									3
									2
									4
				5					5
									20

Termination Reason: Refusal on Hard Ground at 4.2m
Shear Vane No: DCP No: 11
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 4 - April 2023.

CPT basic interpretation plots



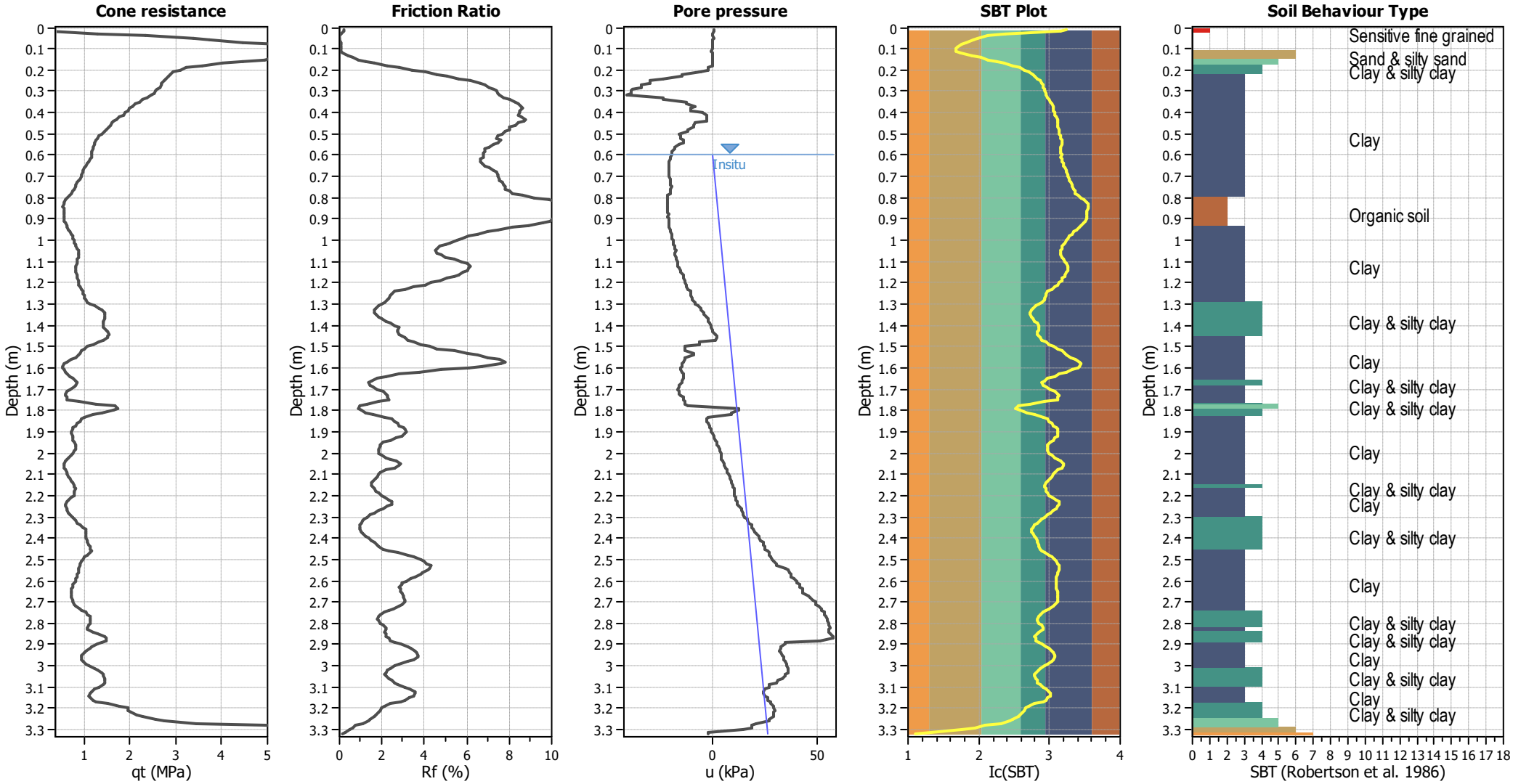
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots



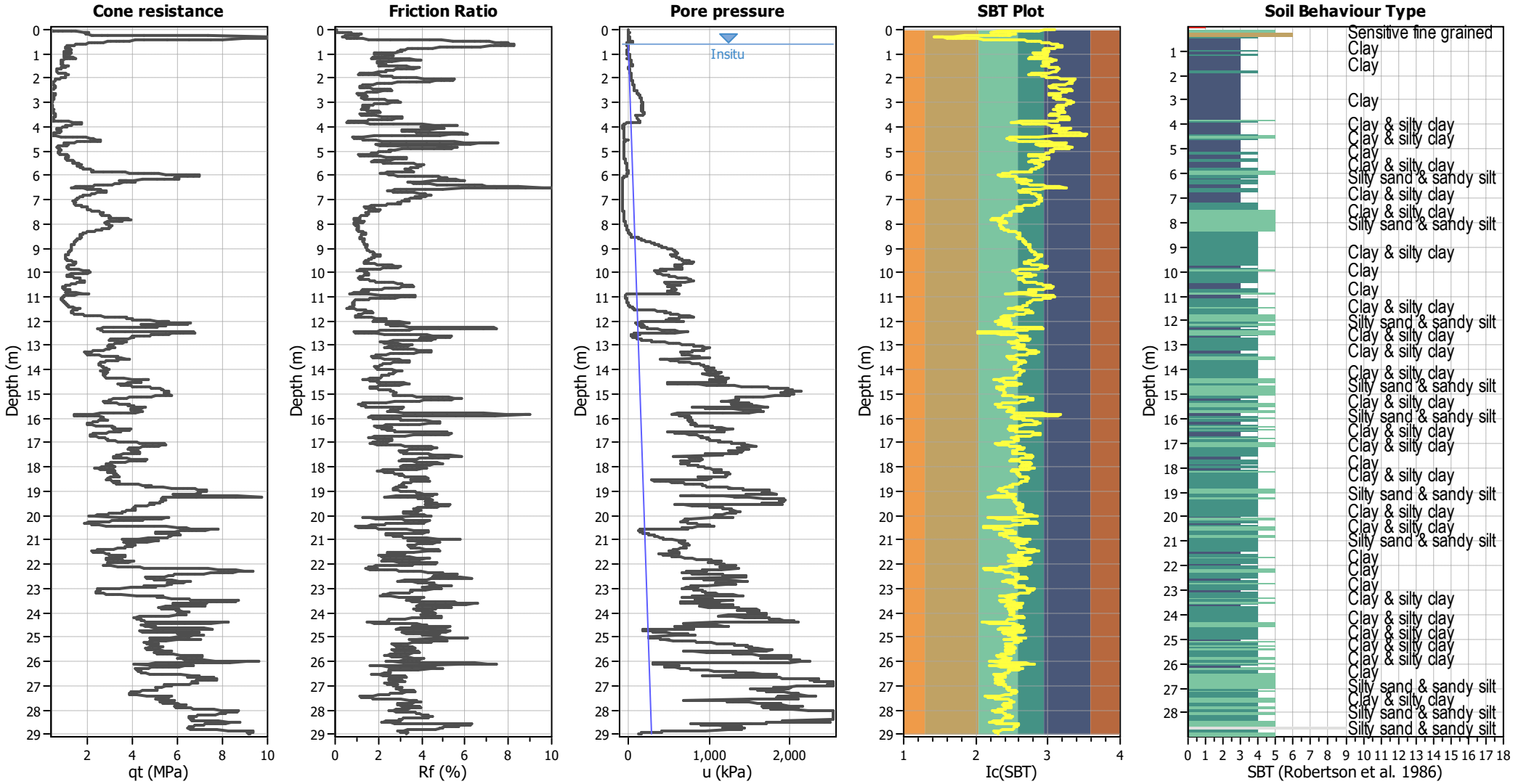
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots



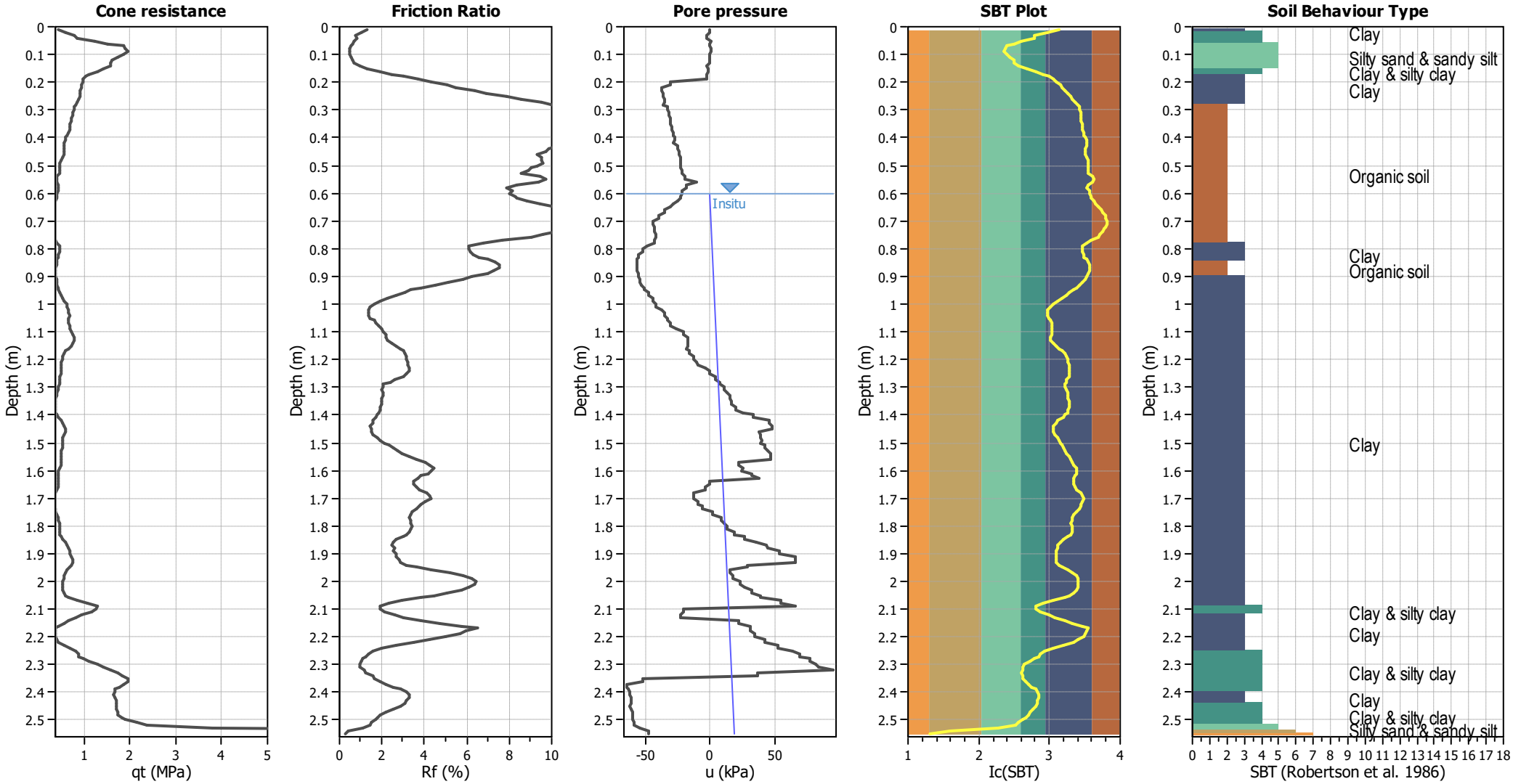
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots



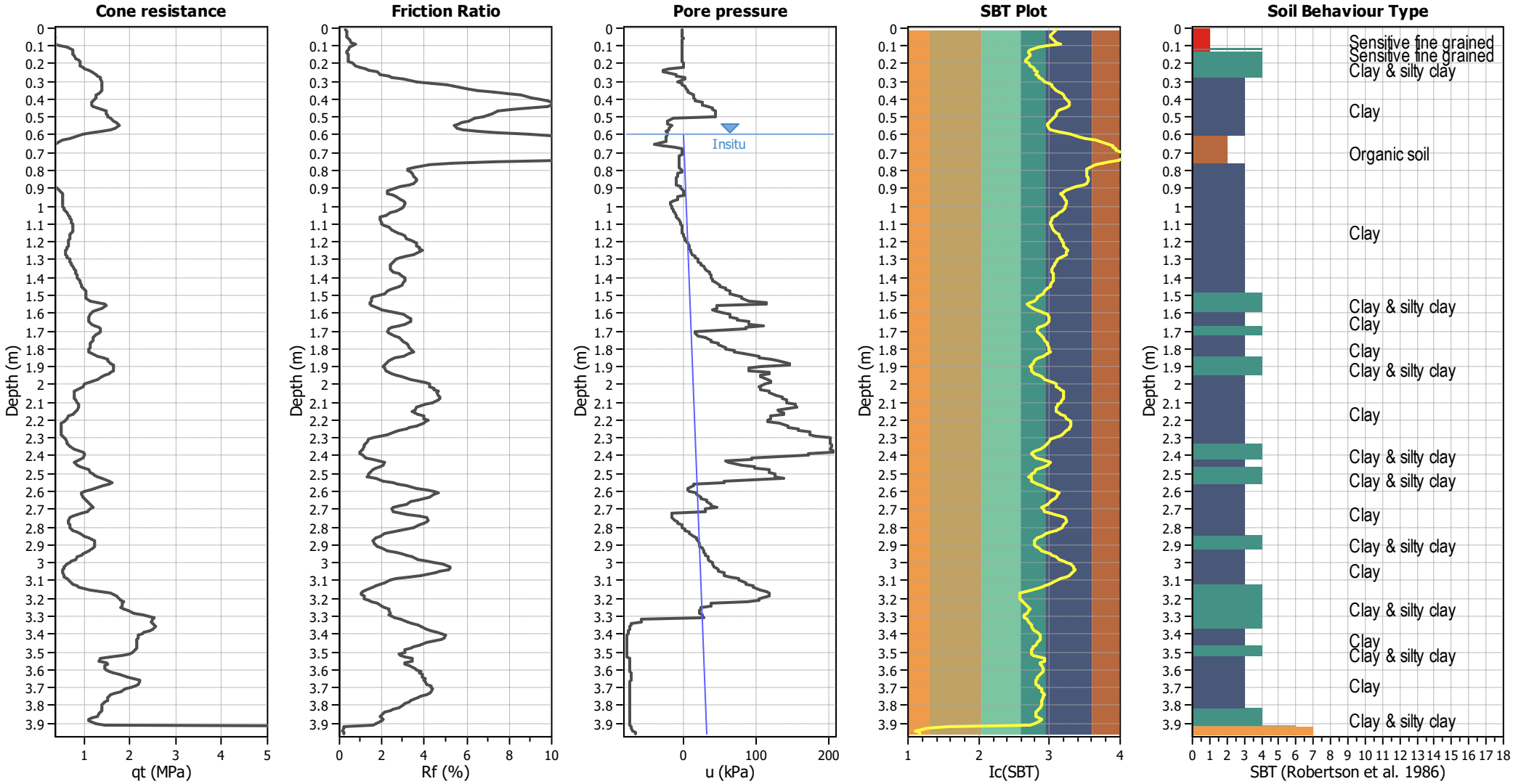
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots



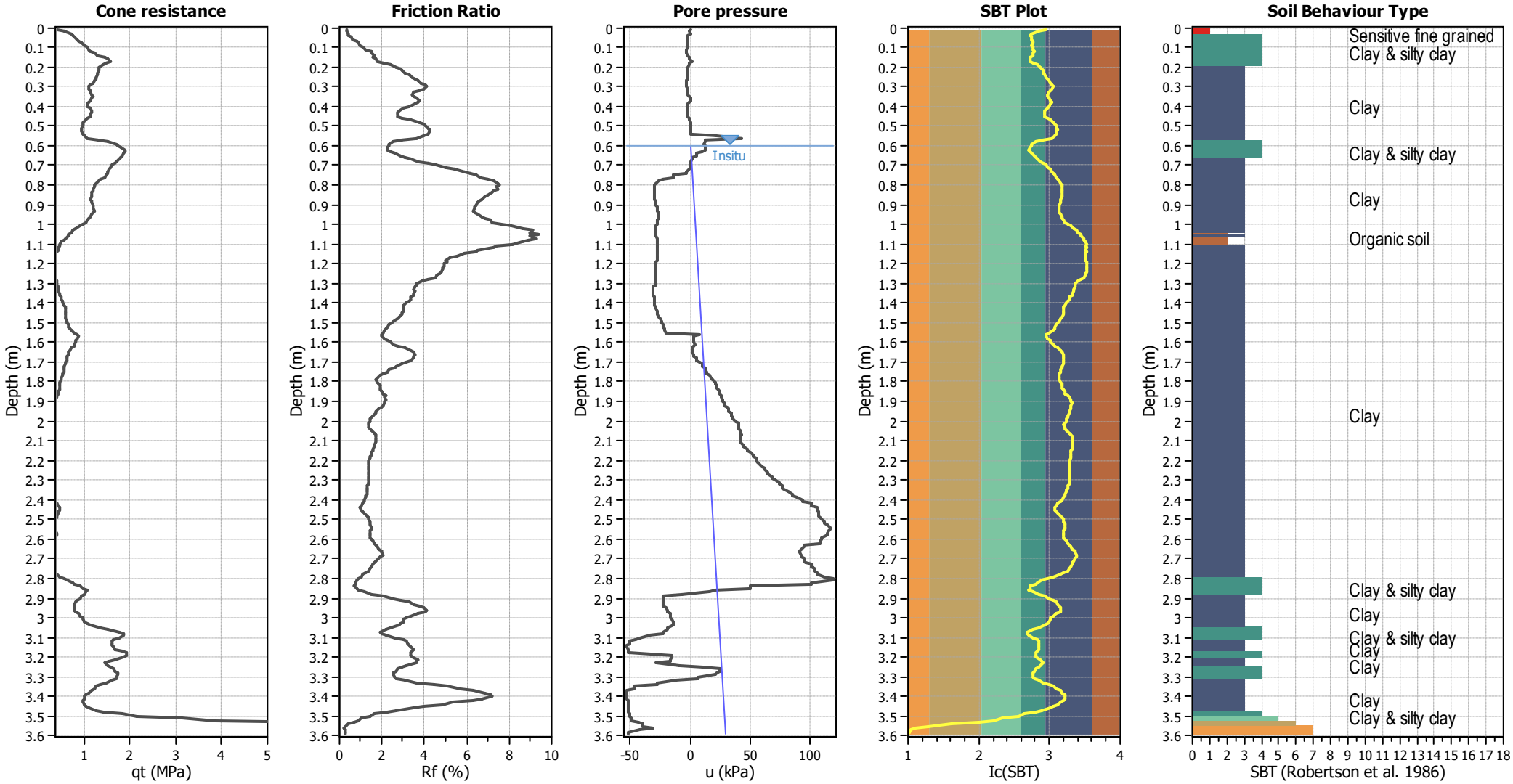
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots



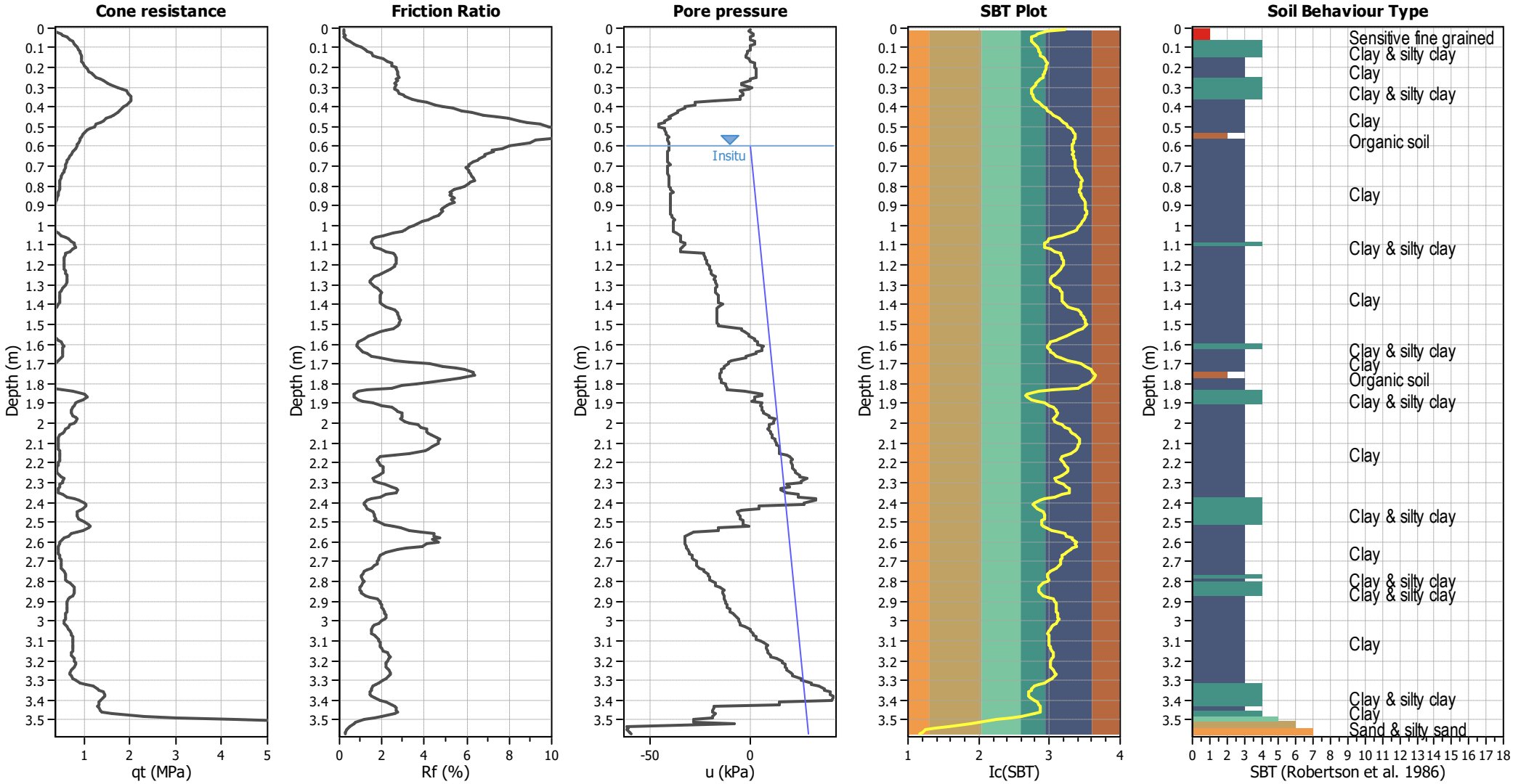
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots



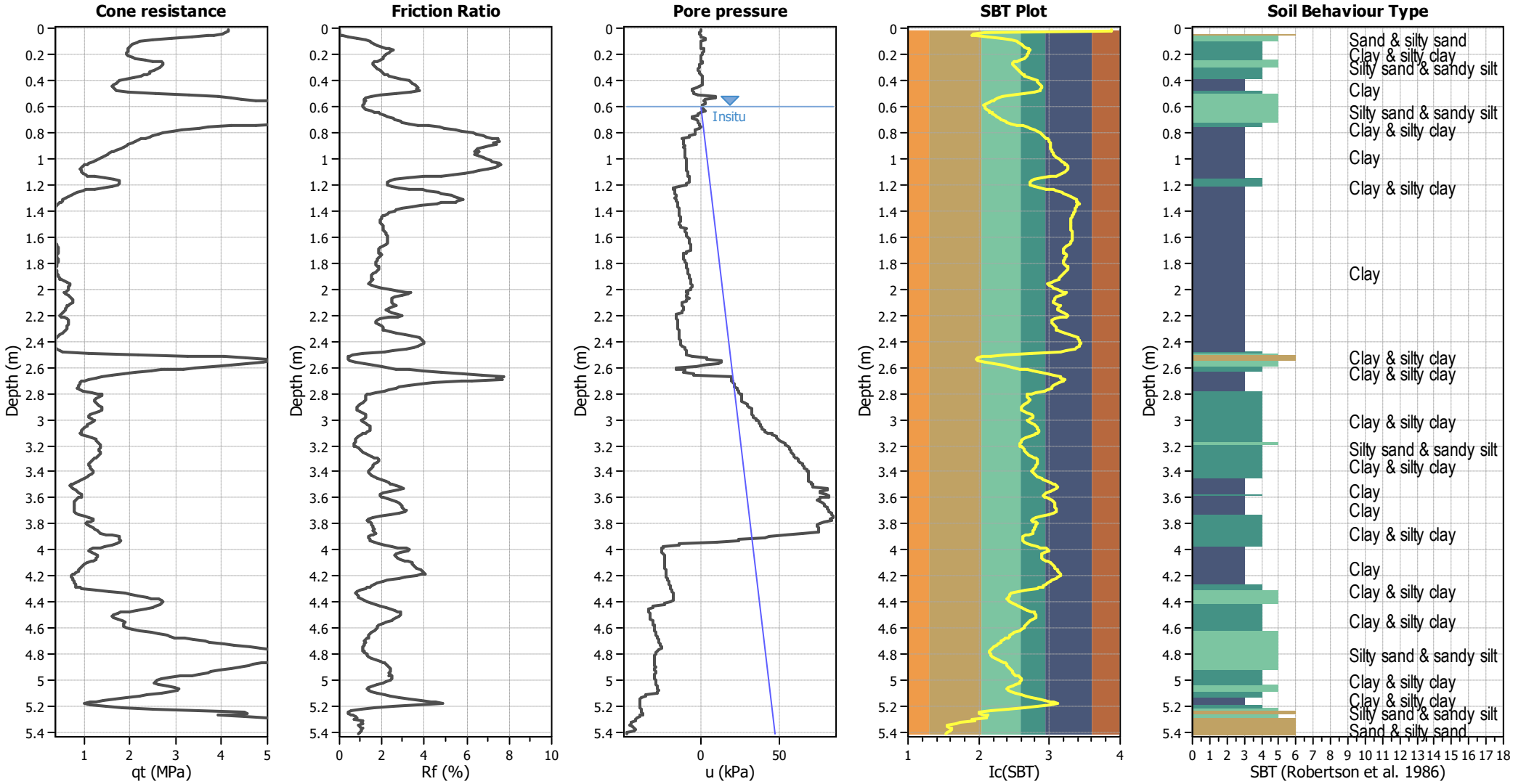
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots



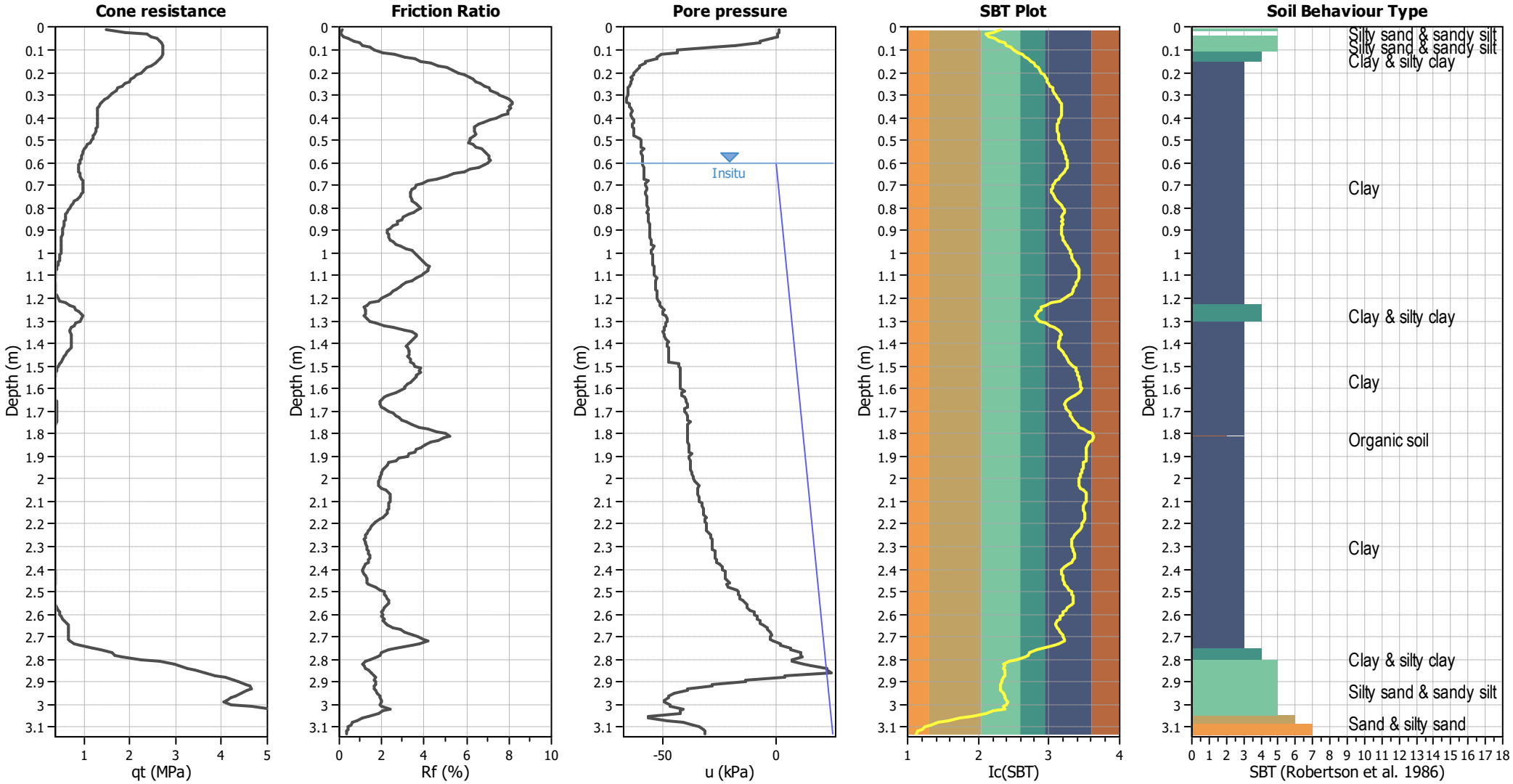
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots



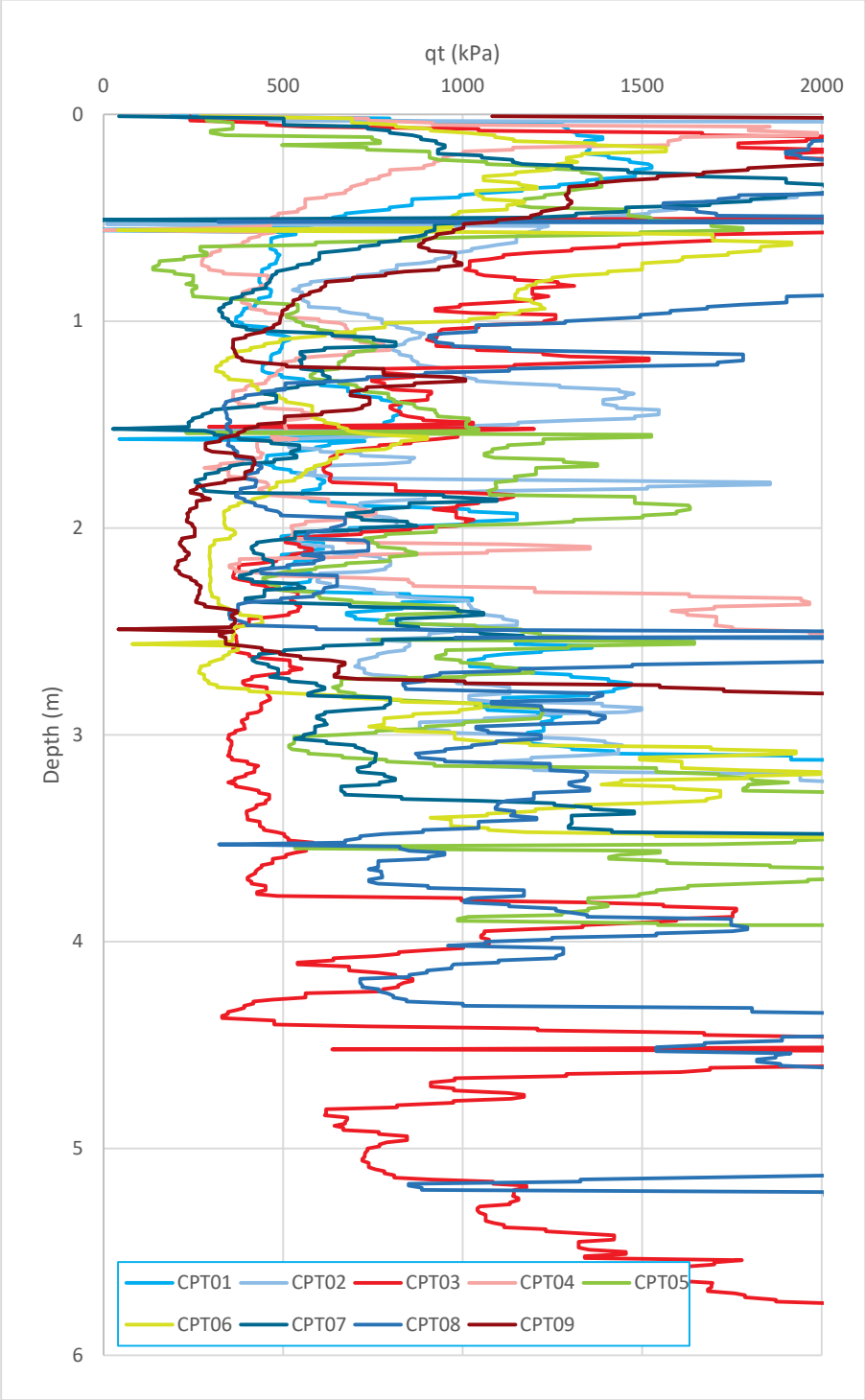
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

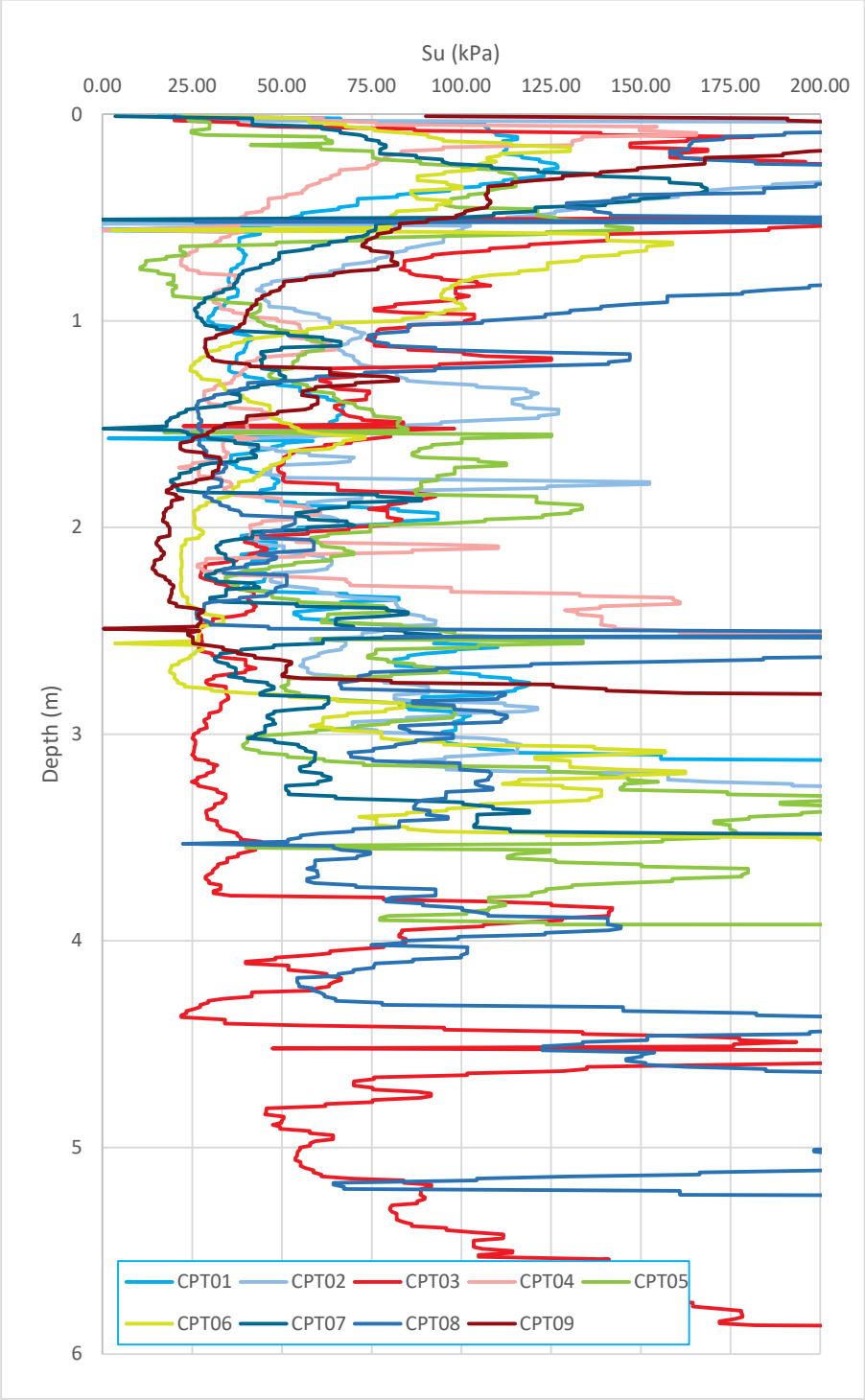
SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

qt (kPa) vs Depth (m)



Su (kPa) vs Depth (m)



Appendix D: Liquefaction Assessment

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

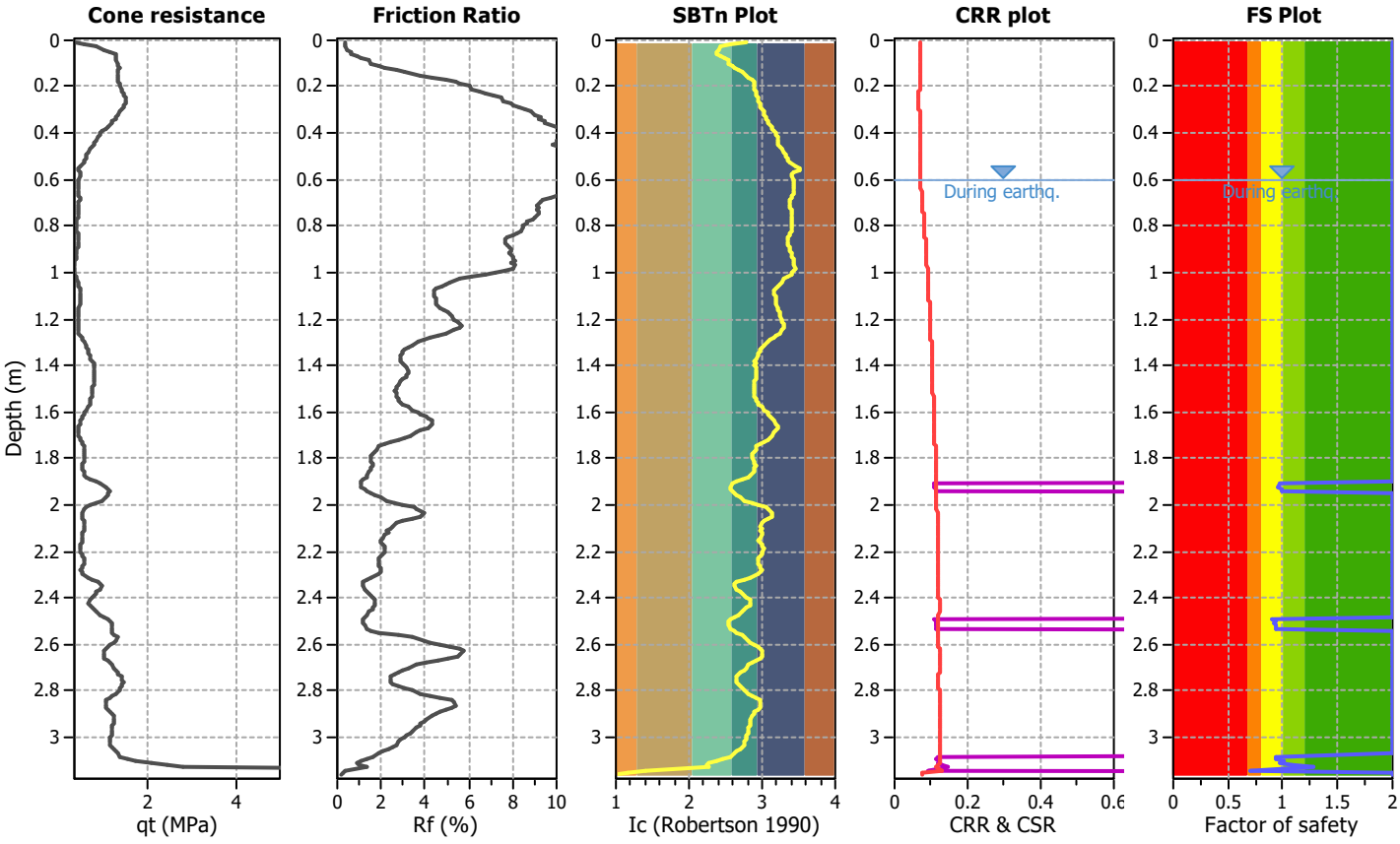
LIQUEFACTION ANALYSIS REPORT

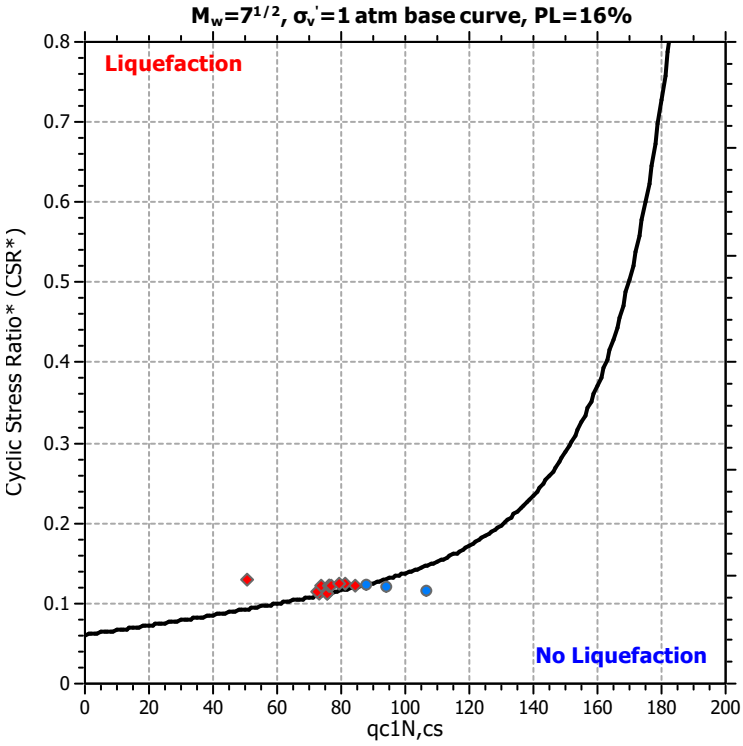
Project title : 1945 State Highway 10, Waipapa **Location : 1945 State Highway 10, Waipapa**

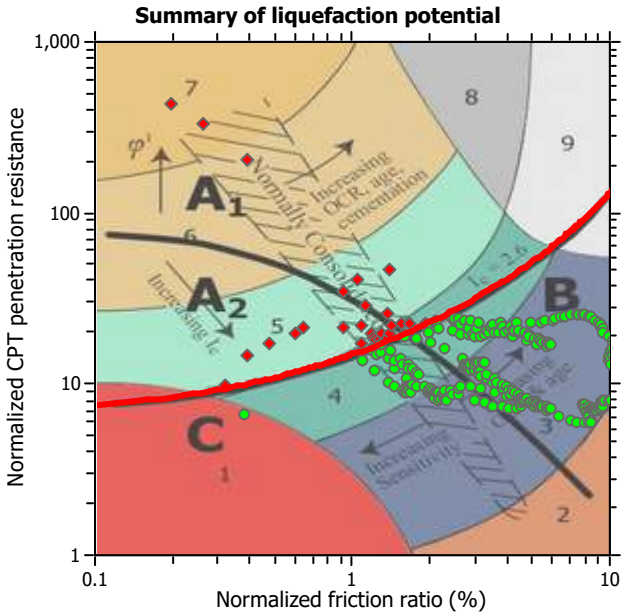
CPT file : CPT01

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	0.60 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.60 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude M_w:	5.80	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

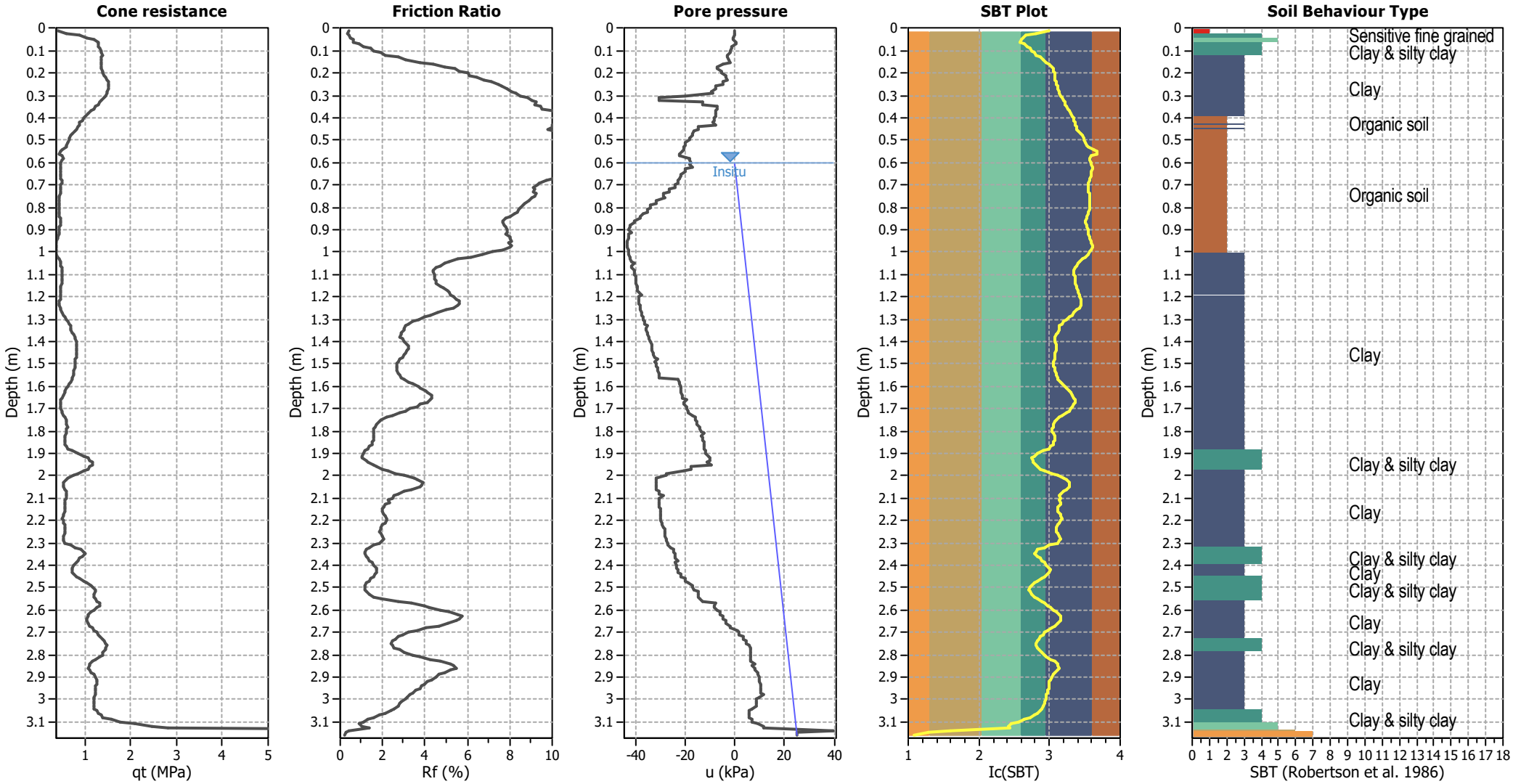






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



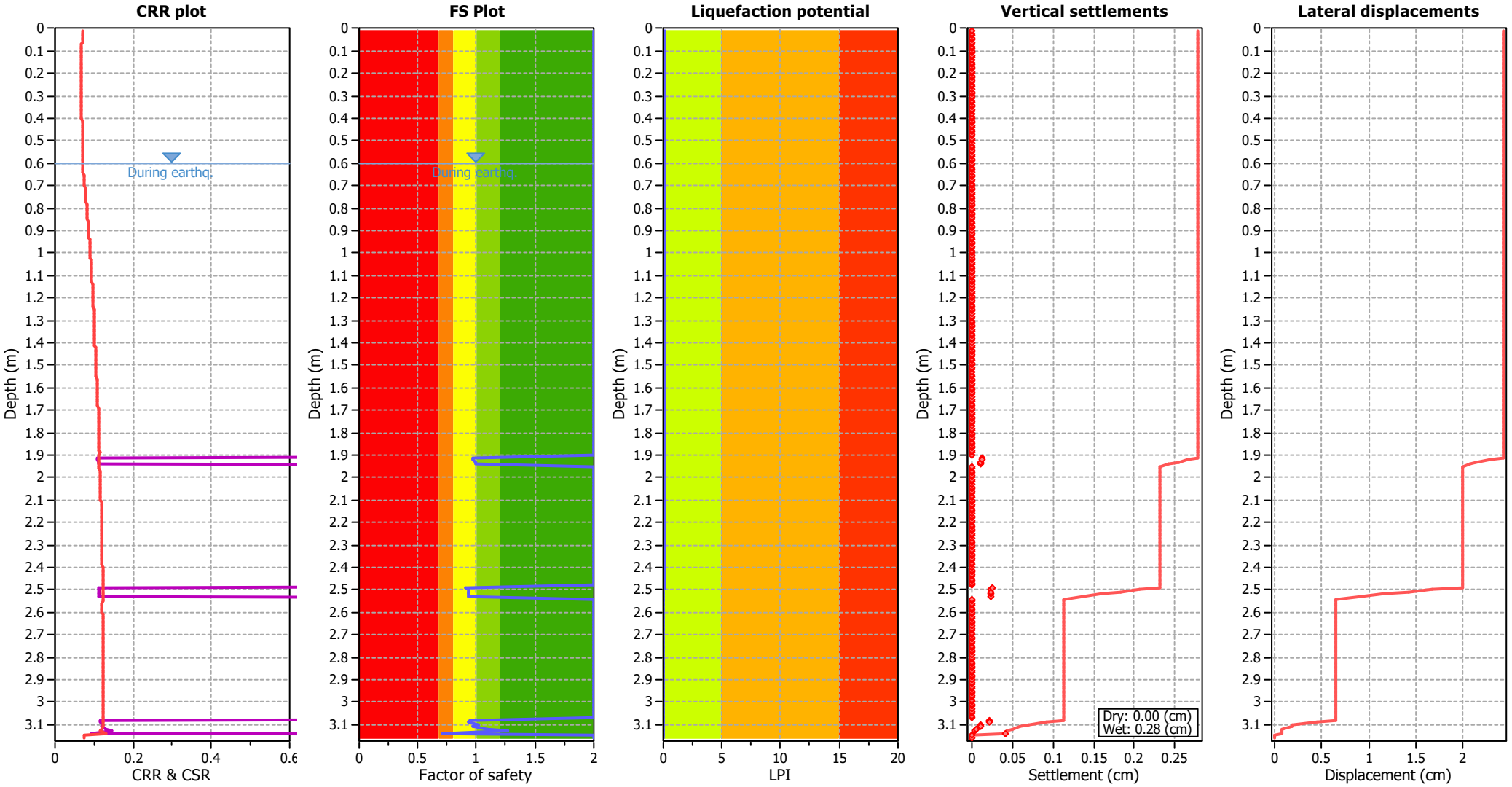
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

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

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

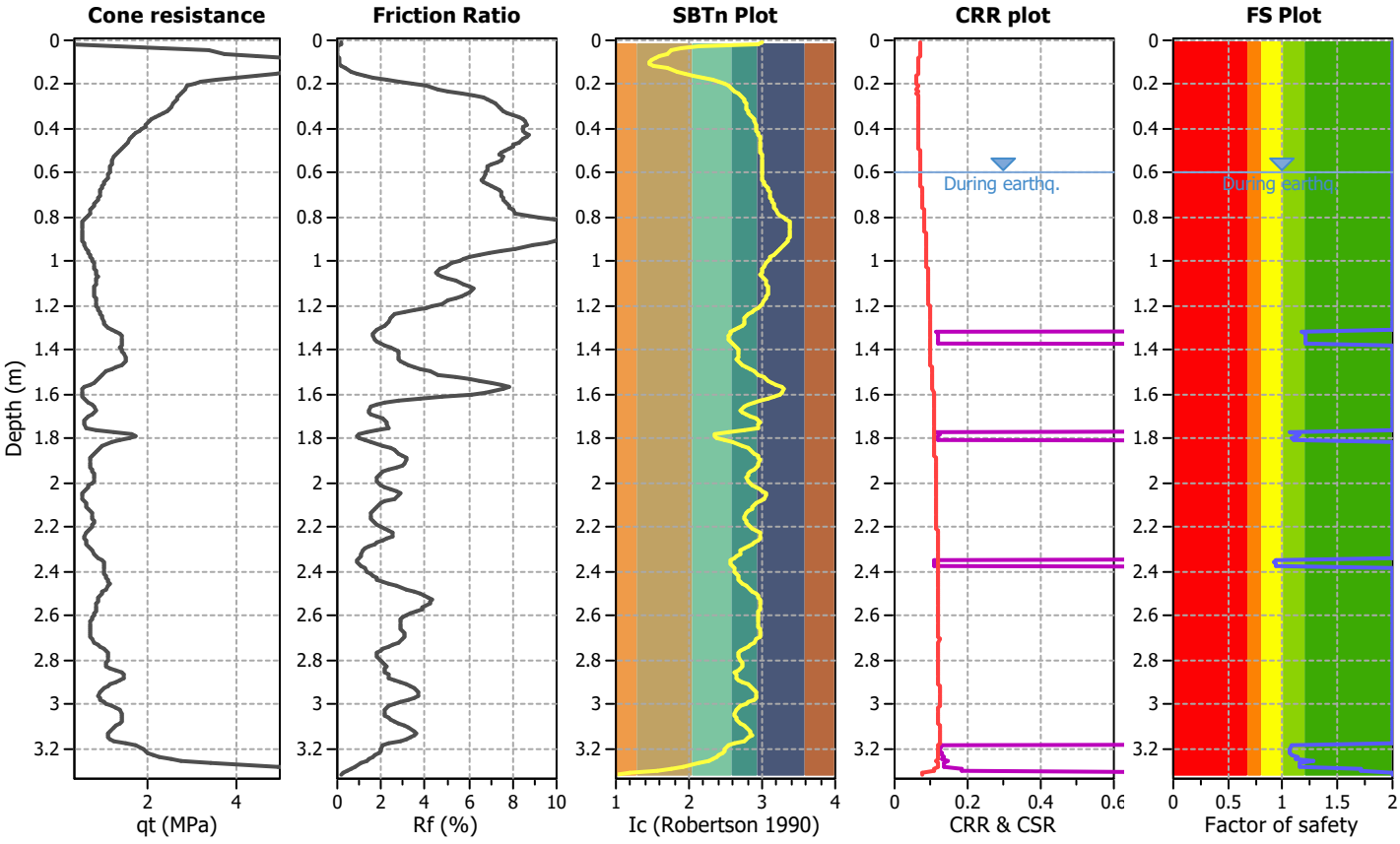
LIQUEFACTION ANALYSIS REPORT

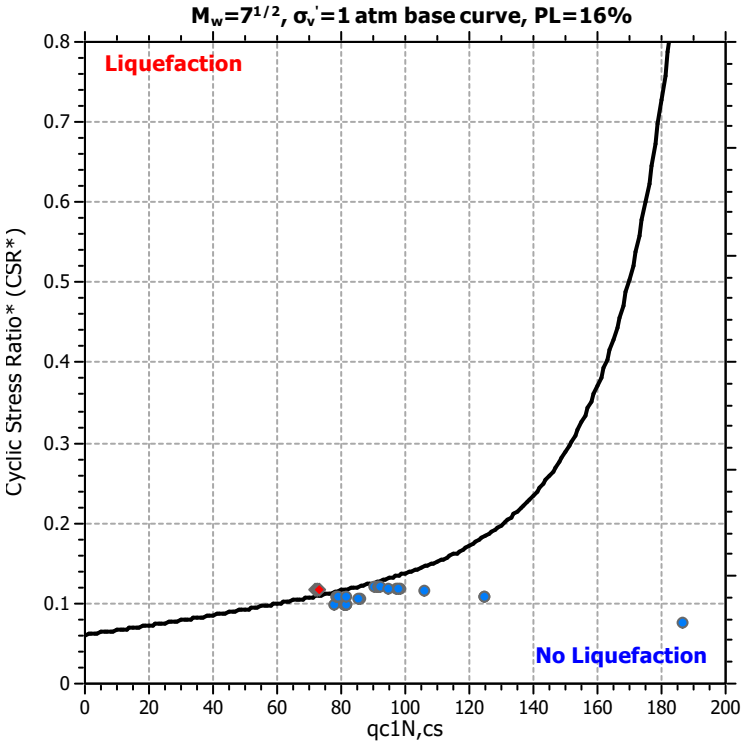
Project title : 1945 State Highway 10, Waipapa **Location : 1945 State Highway 10, Waipapa**

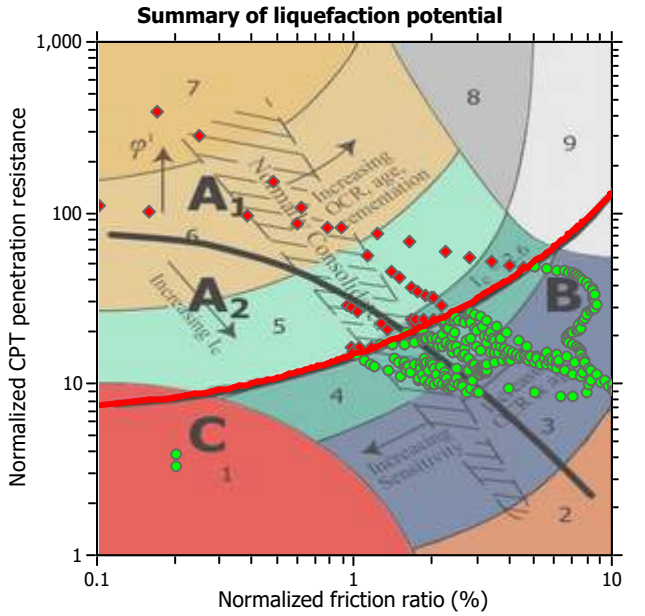
CPT file : CPT02

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	0.60 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.60 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude M_w:	5.80	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

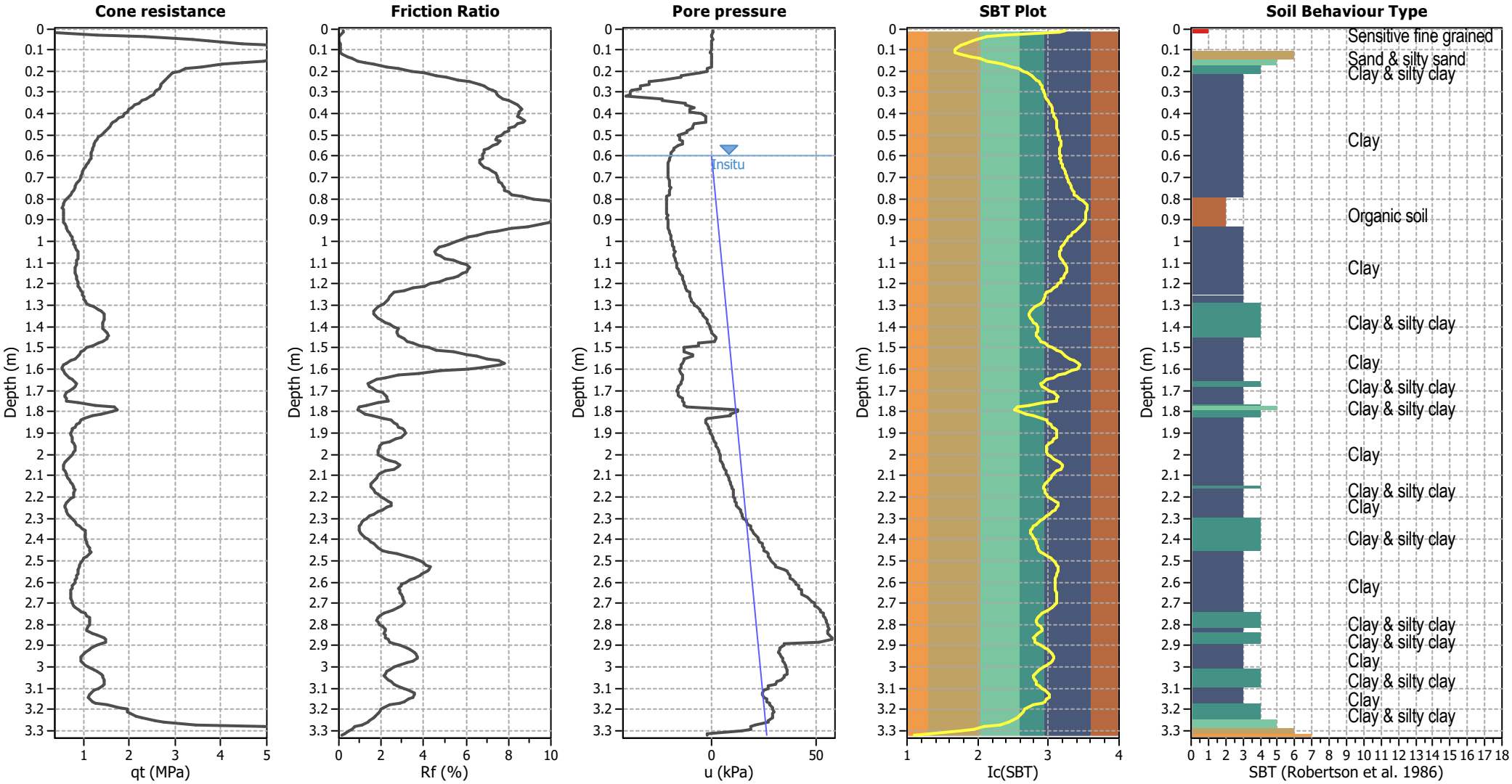






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



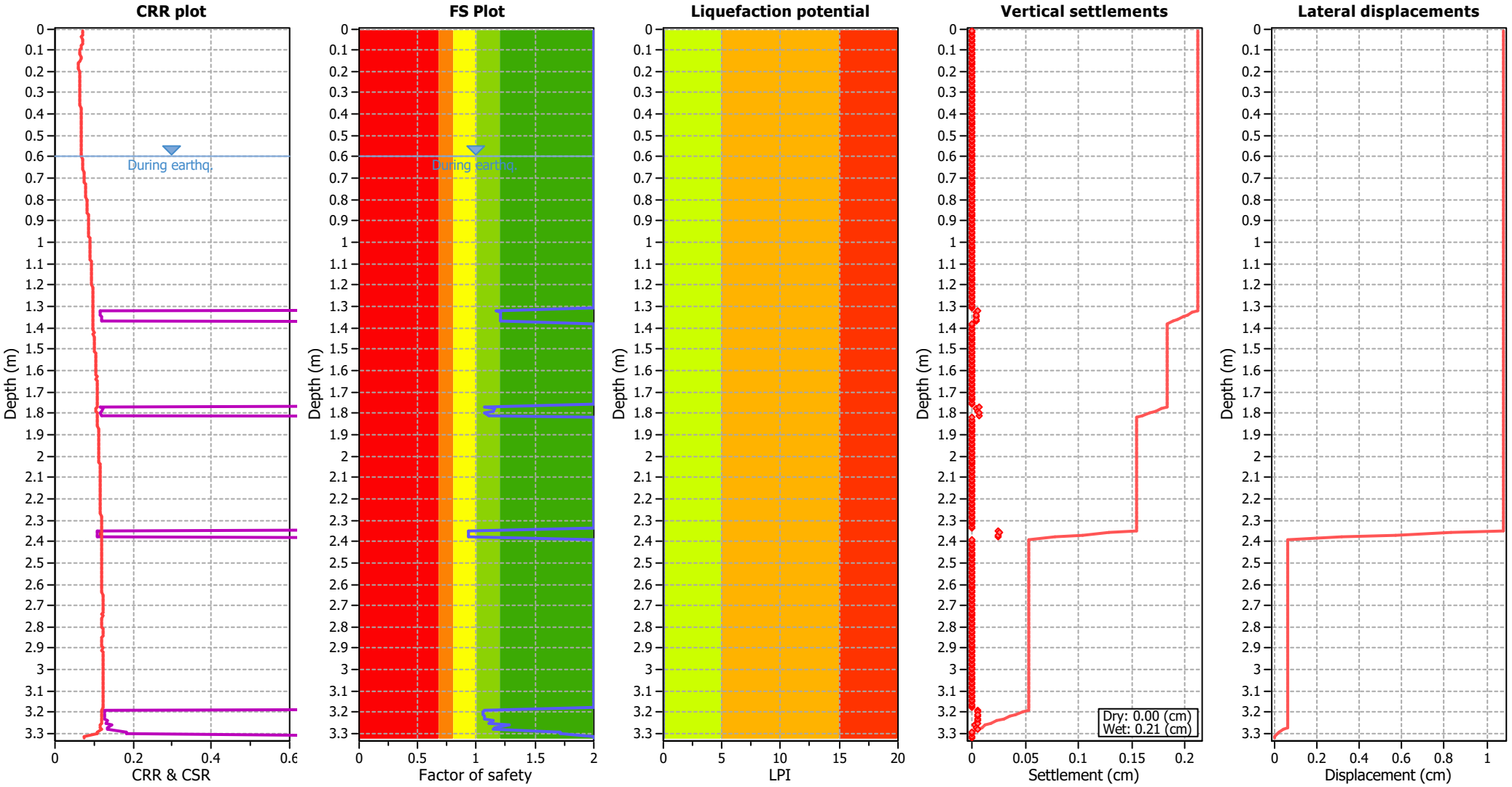
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

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

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

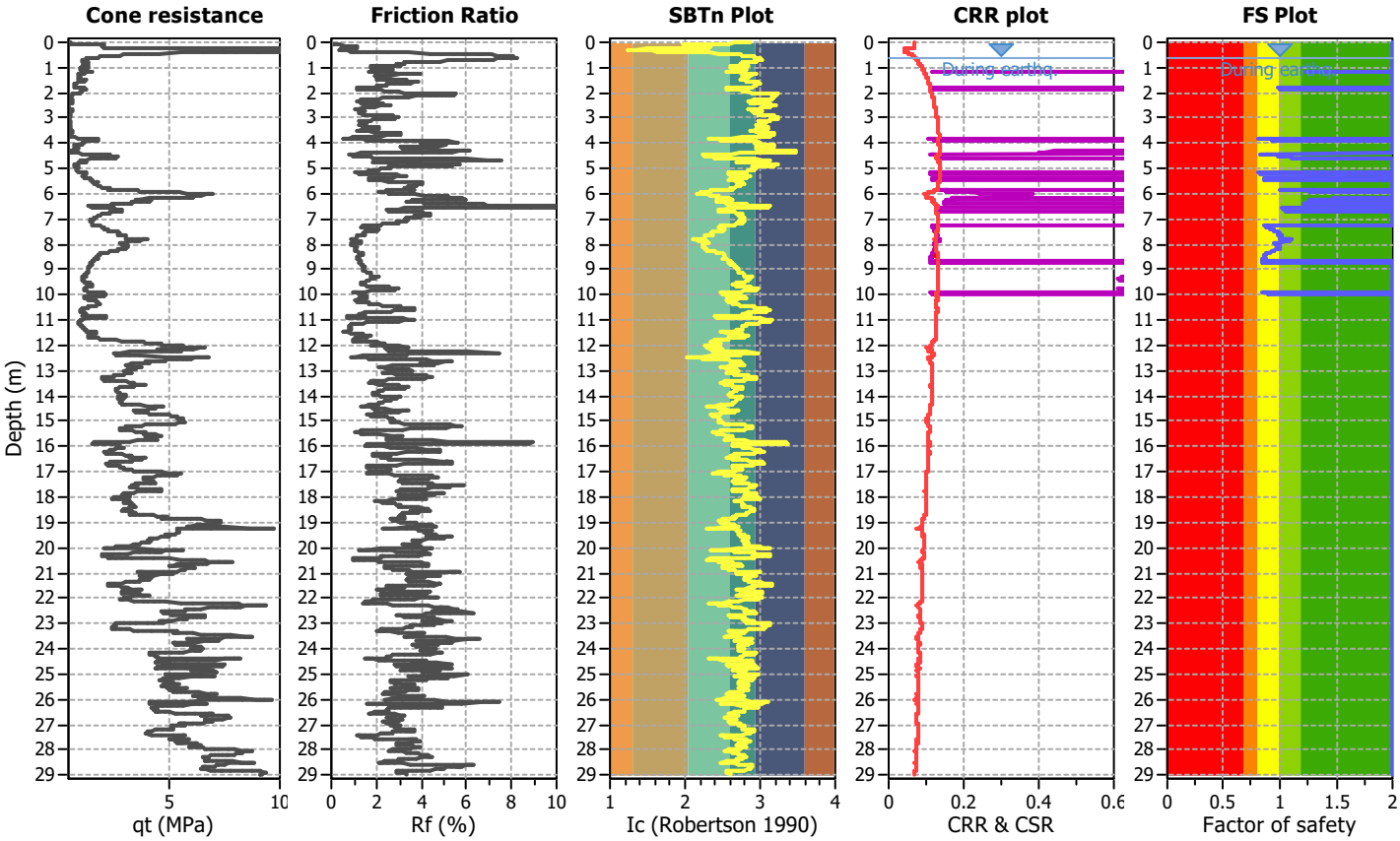
LIQUEFACTION ANALYSIS REPORT

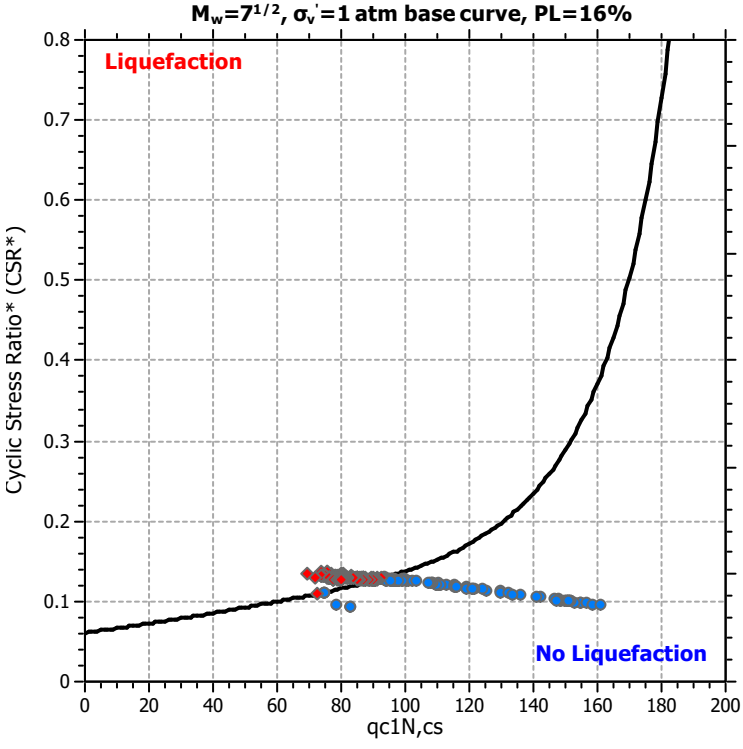
Project title : 1945 State Highway 10, Waipapa **Location : 1945 State Highway 10, Waipapa**

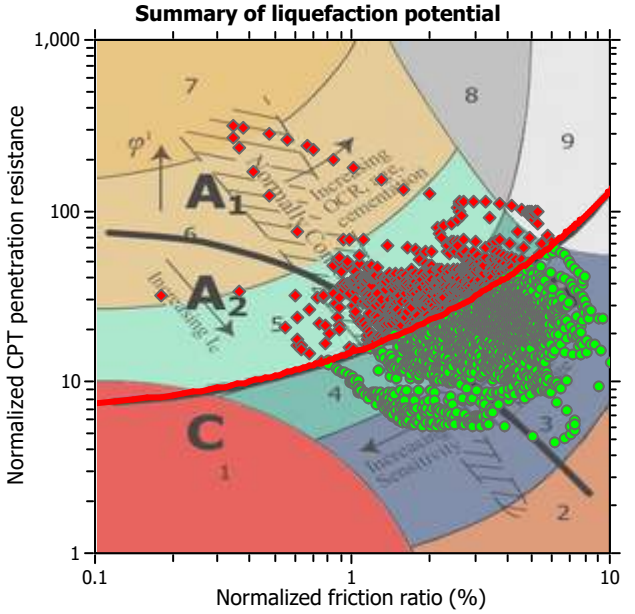
CPT file : CPT03

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	0.60 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.60 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude M_w:	5.80	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

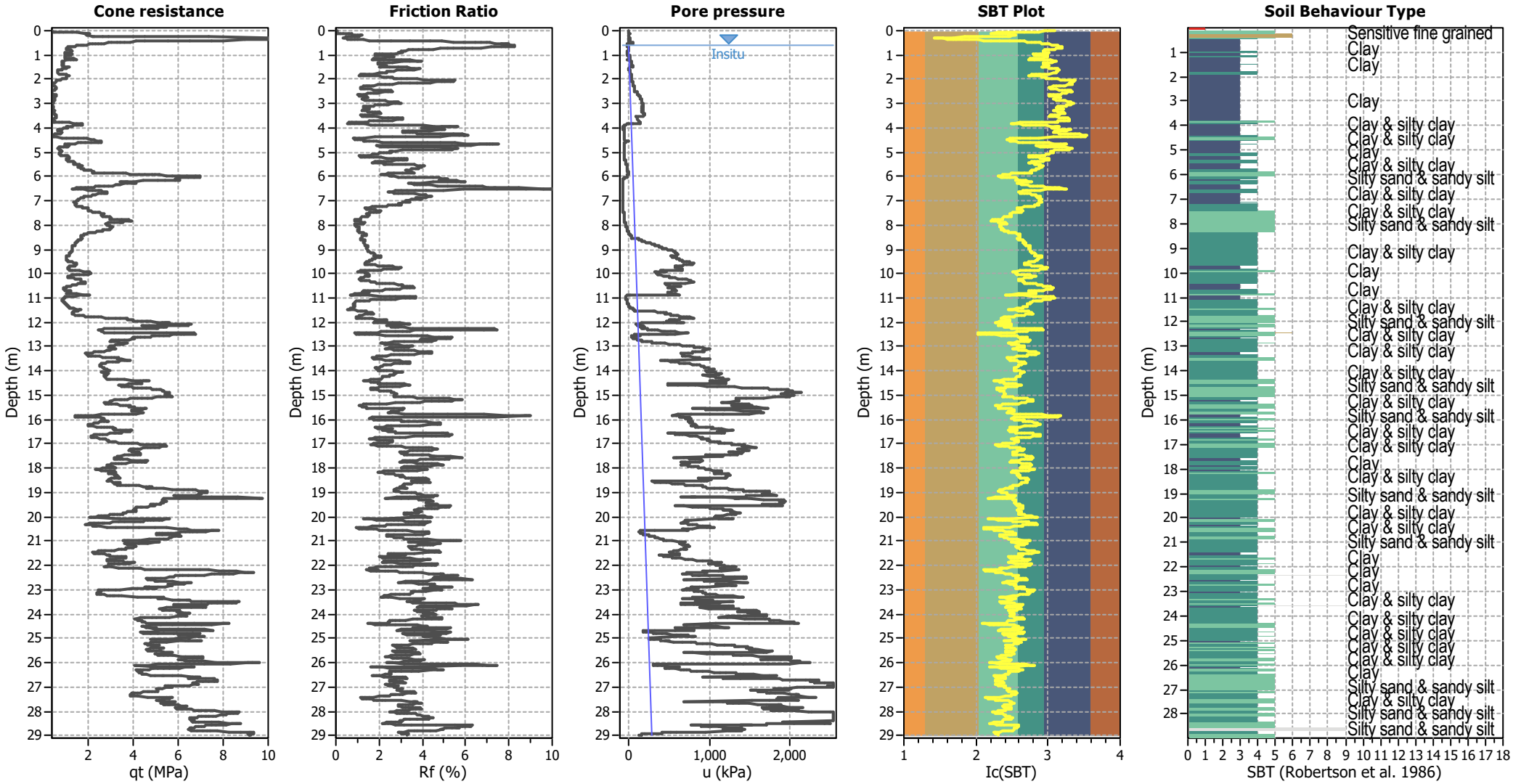






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



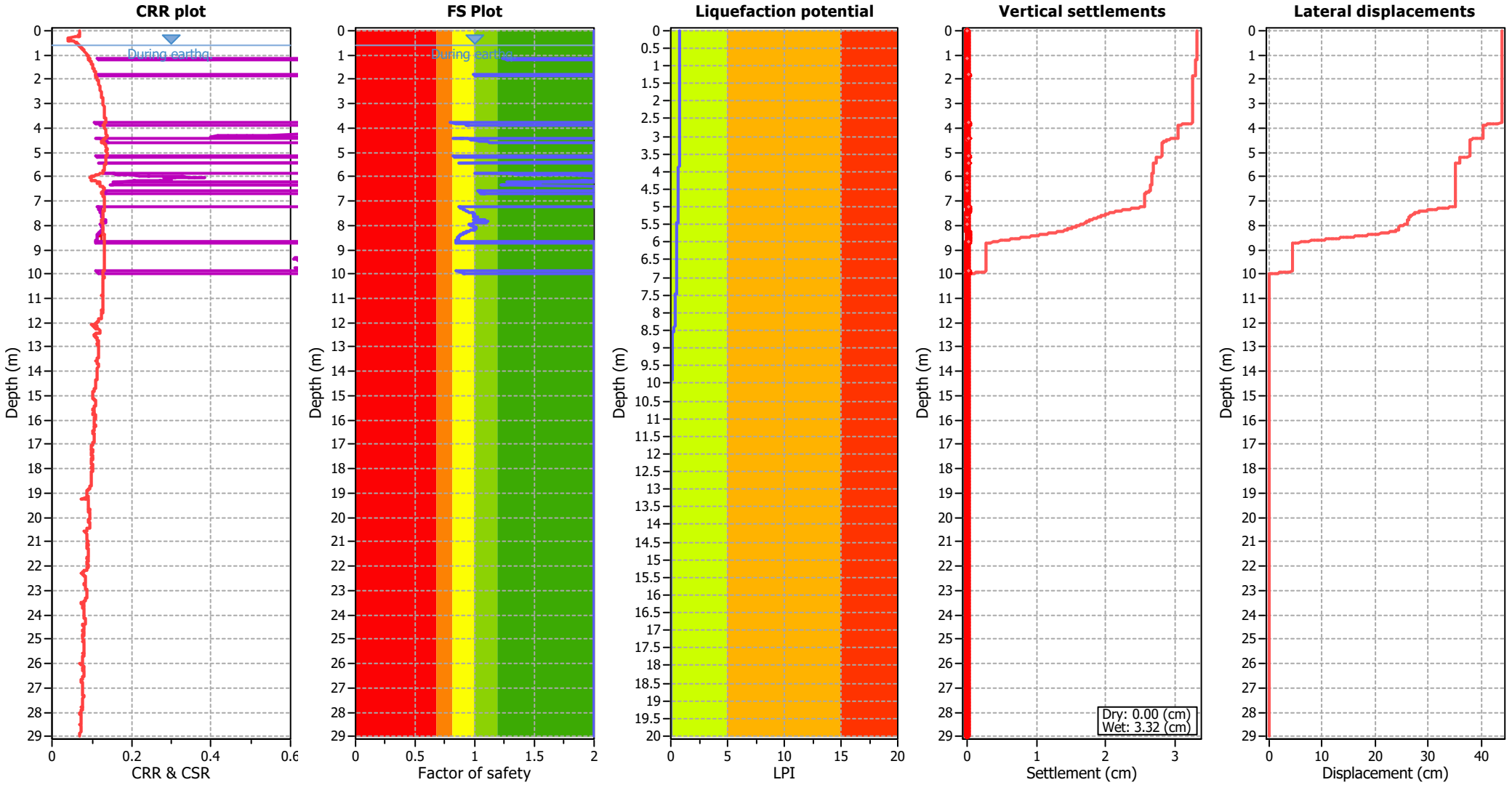
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

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

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

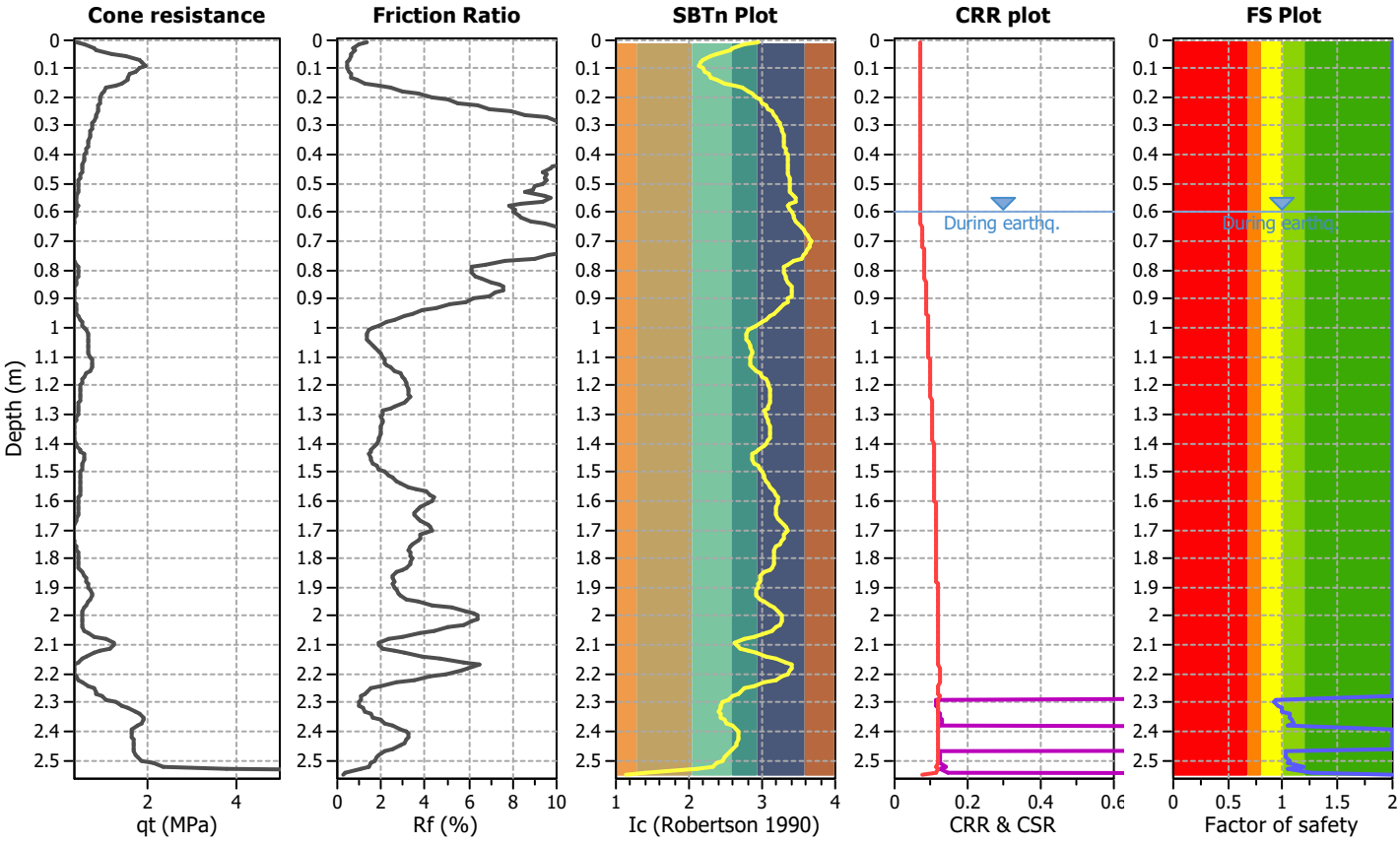
LIQUEFACTION ANALYSIS REPORT

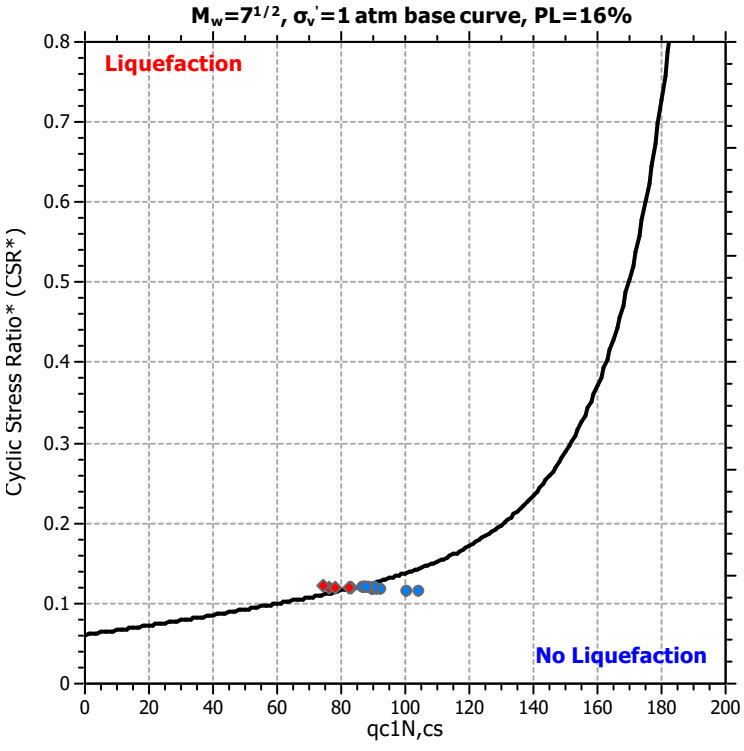
Project title : 1945 State Highway 10, Waipapa **Location : 1945 State Highway 10, Waipapa**

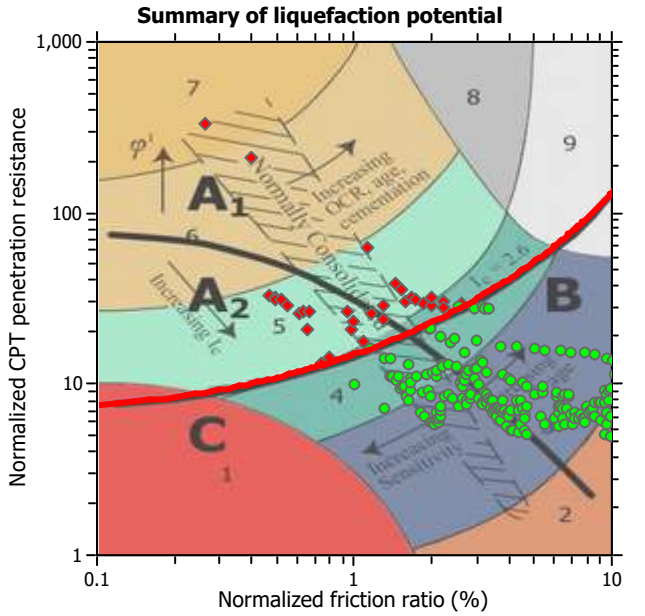
CPT file : CPT04

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	0.60 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.60 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude M_w:	5.80	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

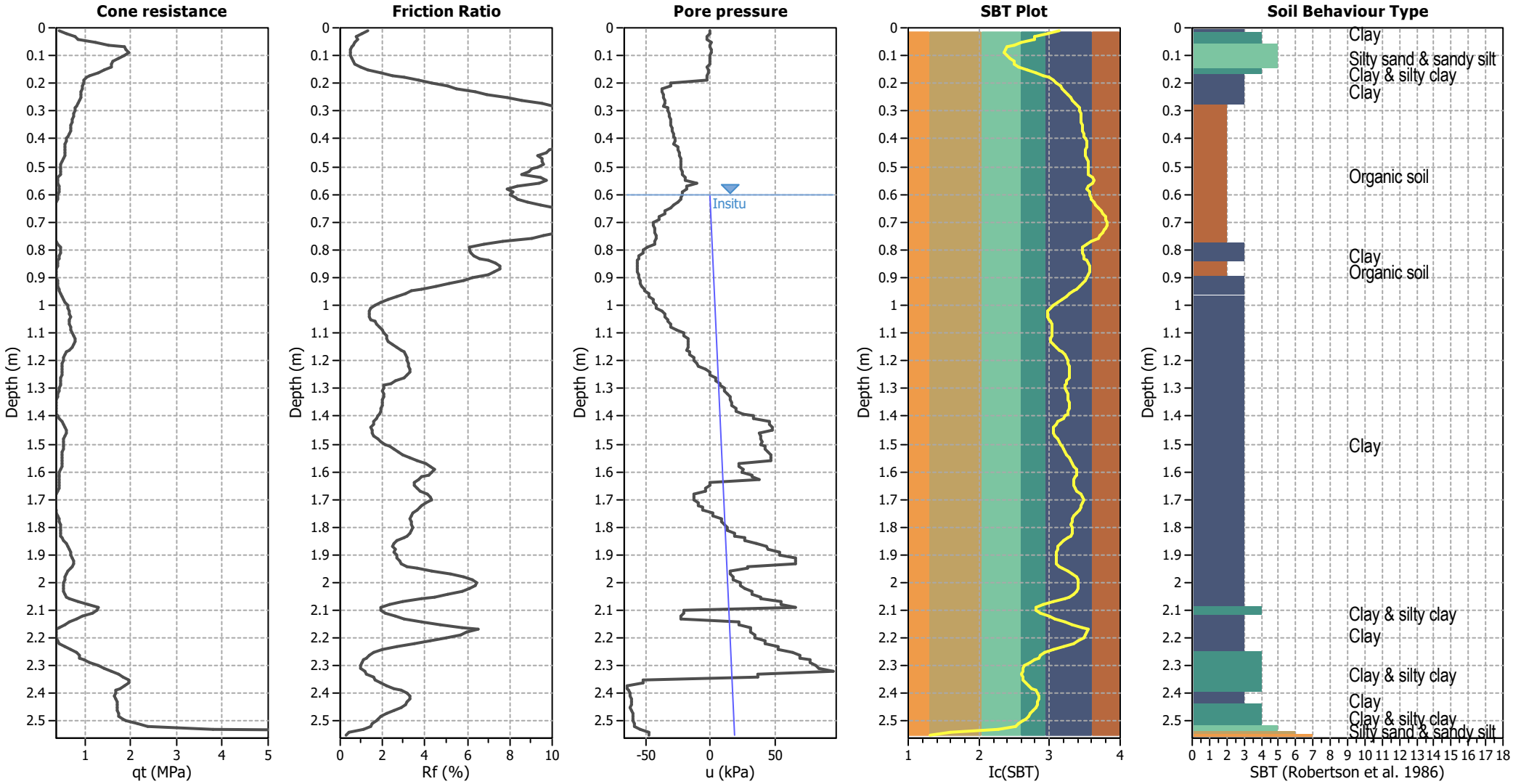






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



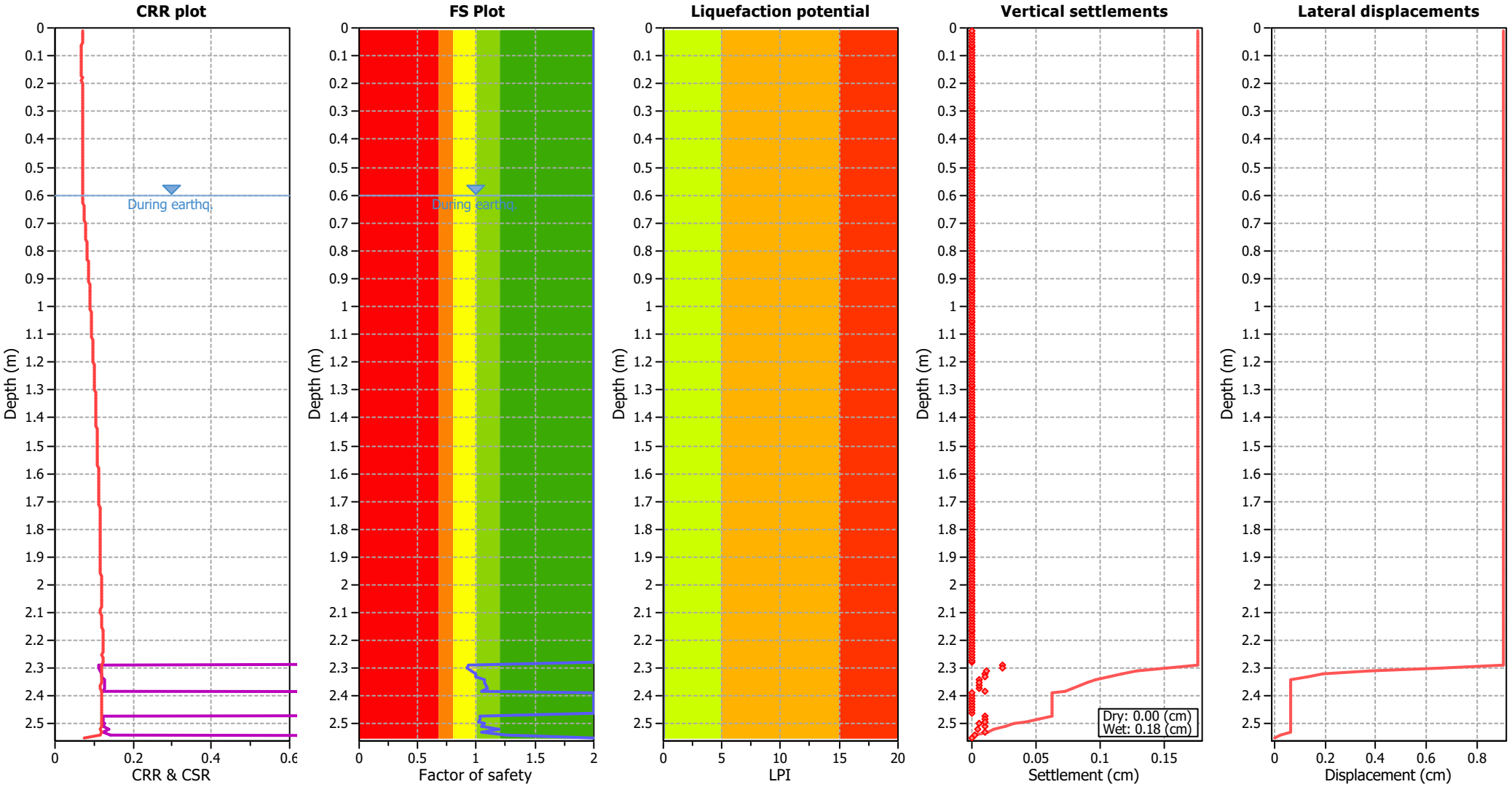
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

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

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

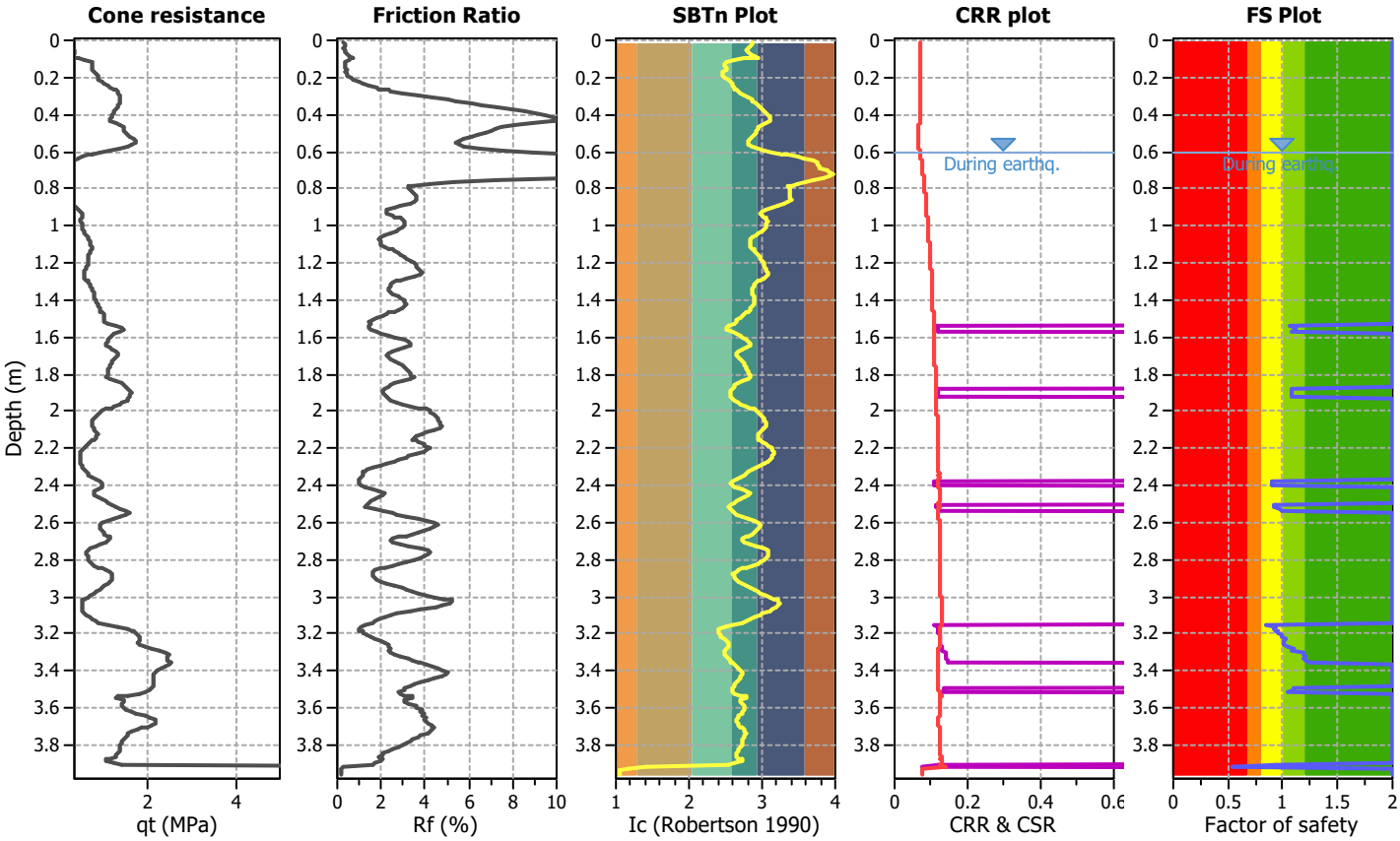
LIQUEFACTION ANALYSIS REPORT

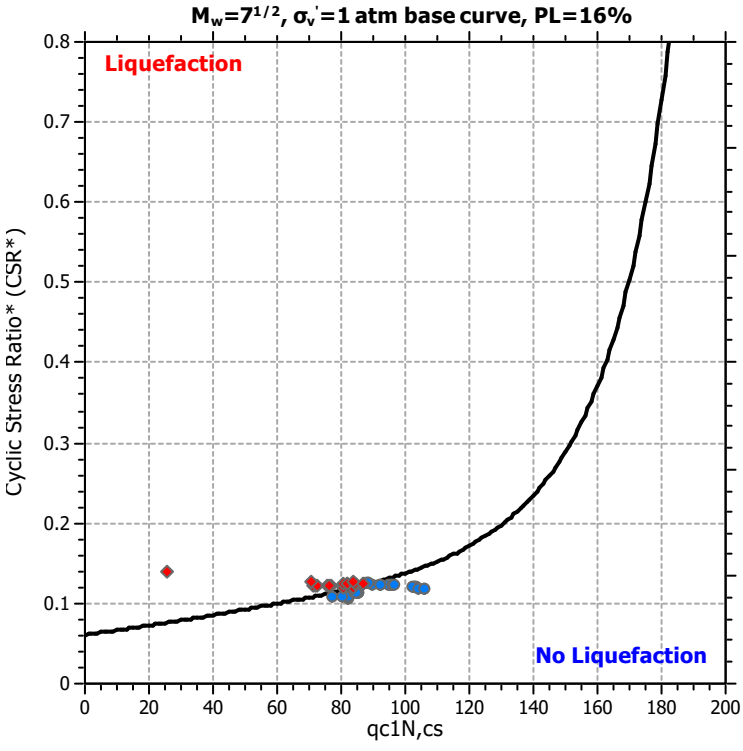
Project title : 1945 State Highway 10, Waipapa **Location : 1945 State Highway 10, Waipapa**

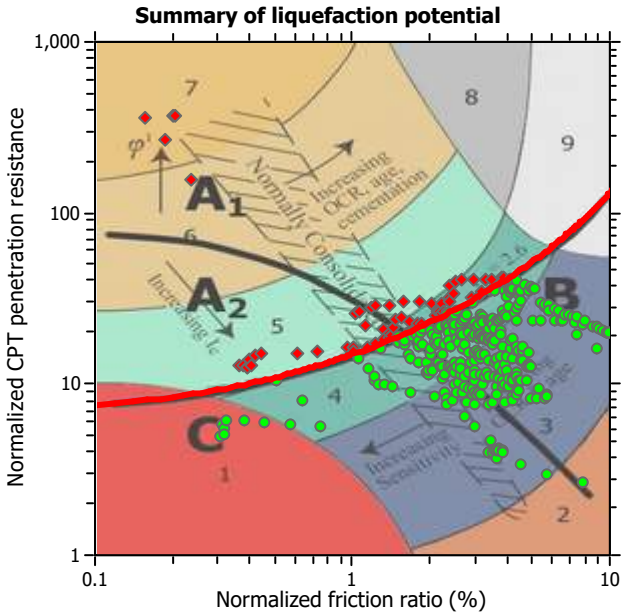
CPT file : CPT05

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	0.60 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.60 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude M_w:	5.80	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

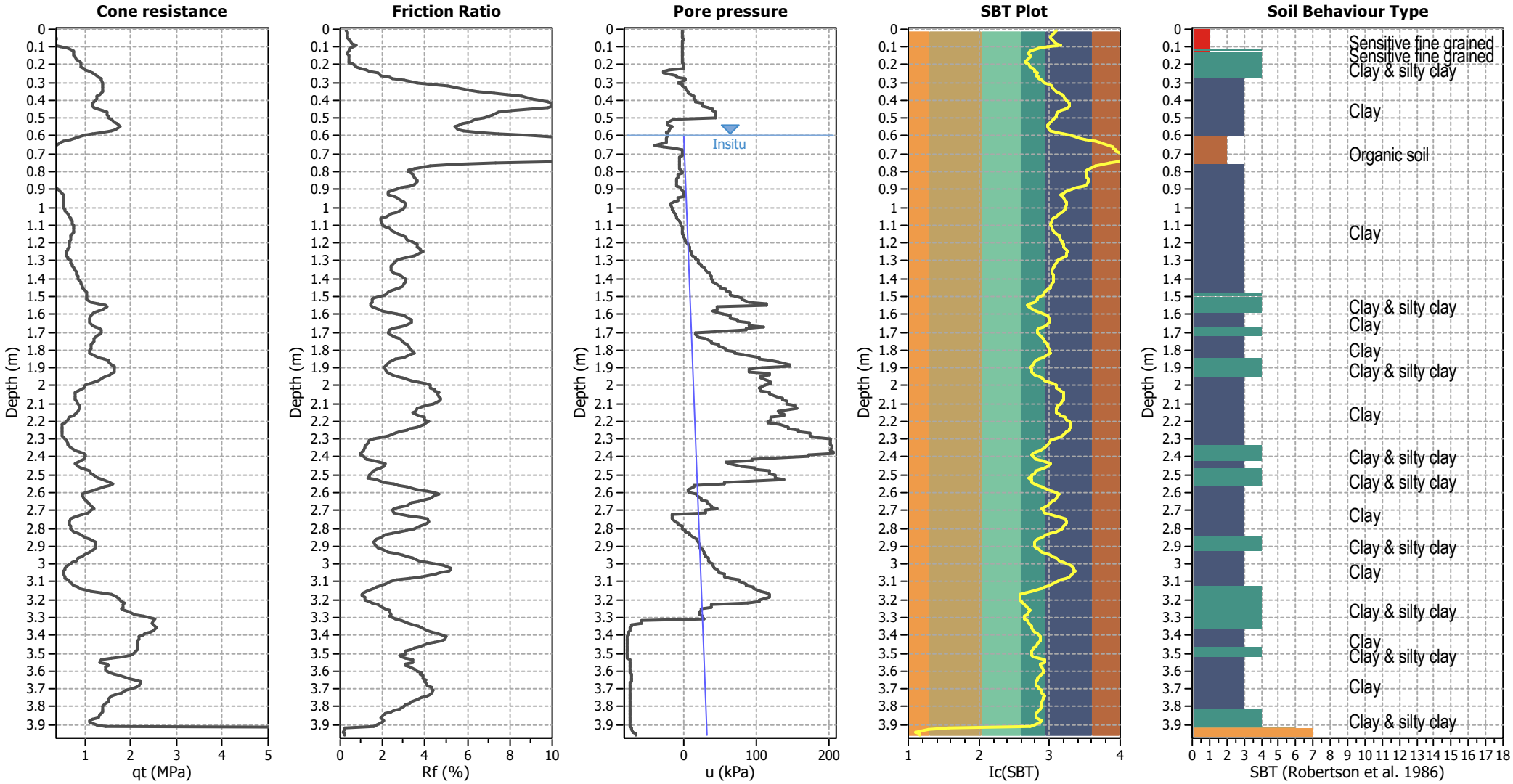






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



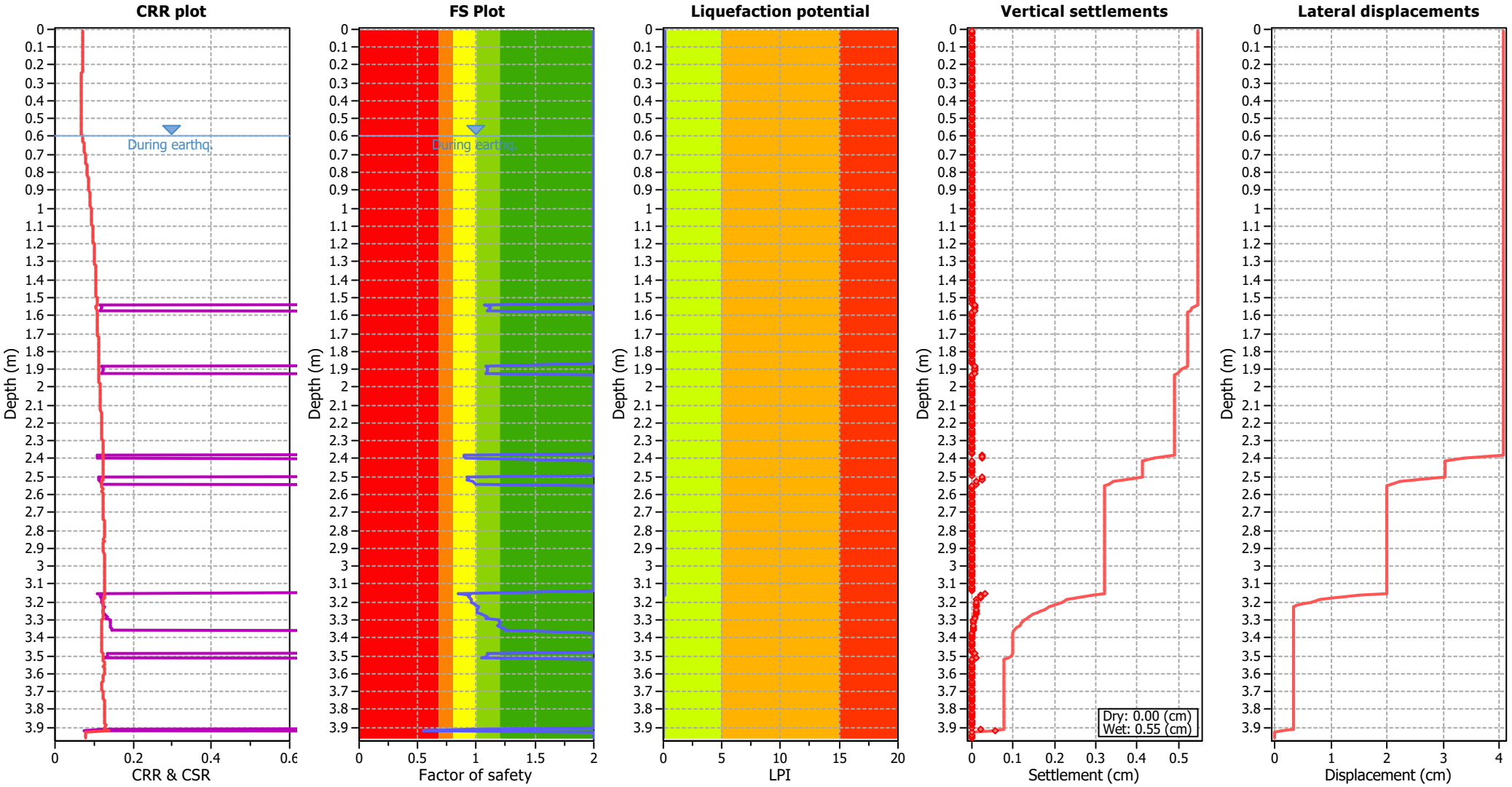
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

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

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

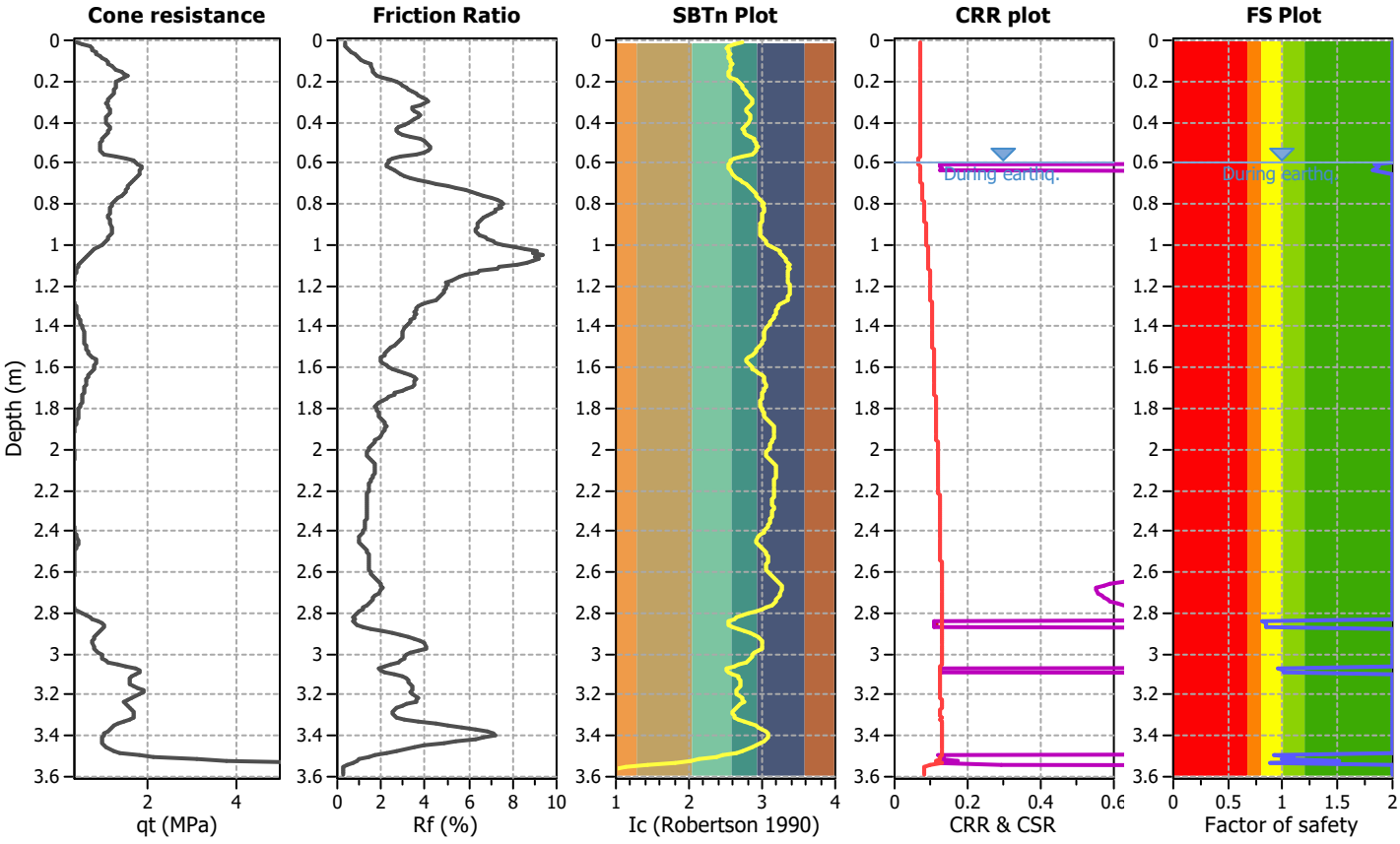
LIQUEFACTION ANALYSIS REPORT

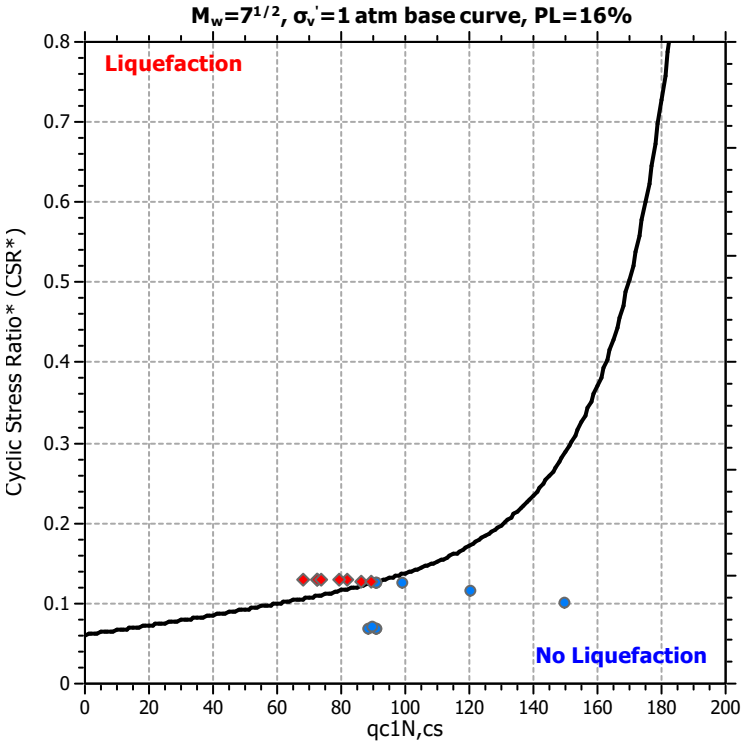
Project title : 1945 State Highway 10, Waipapa **Location : 1945 State Highway 10, Waipapa**

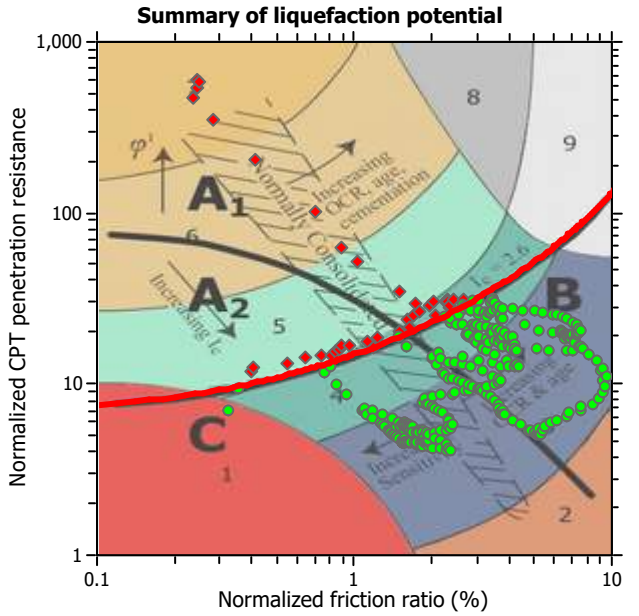
CPT file : CPT06

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	0.60 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.60 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude M_w:	5.80	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

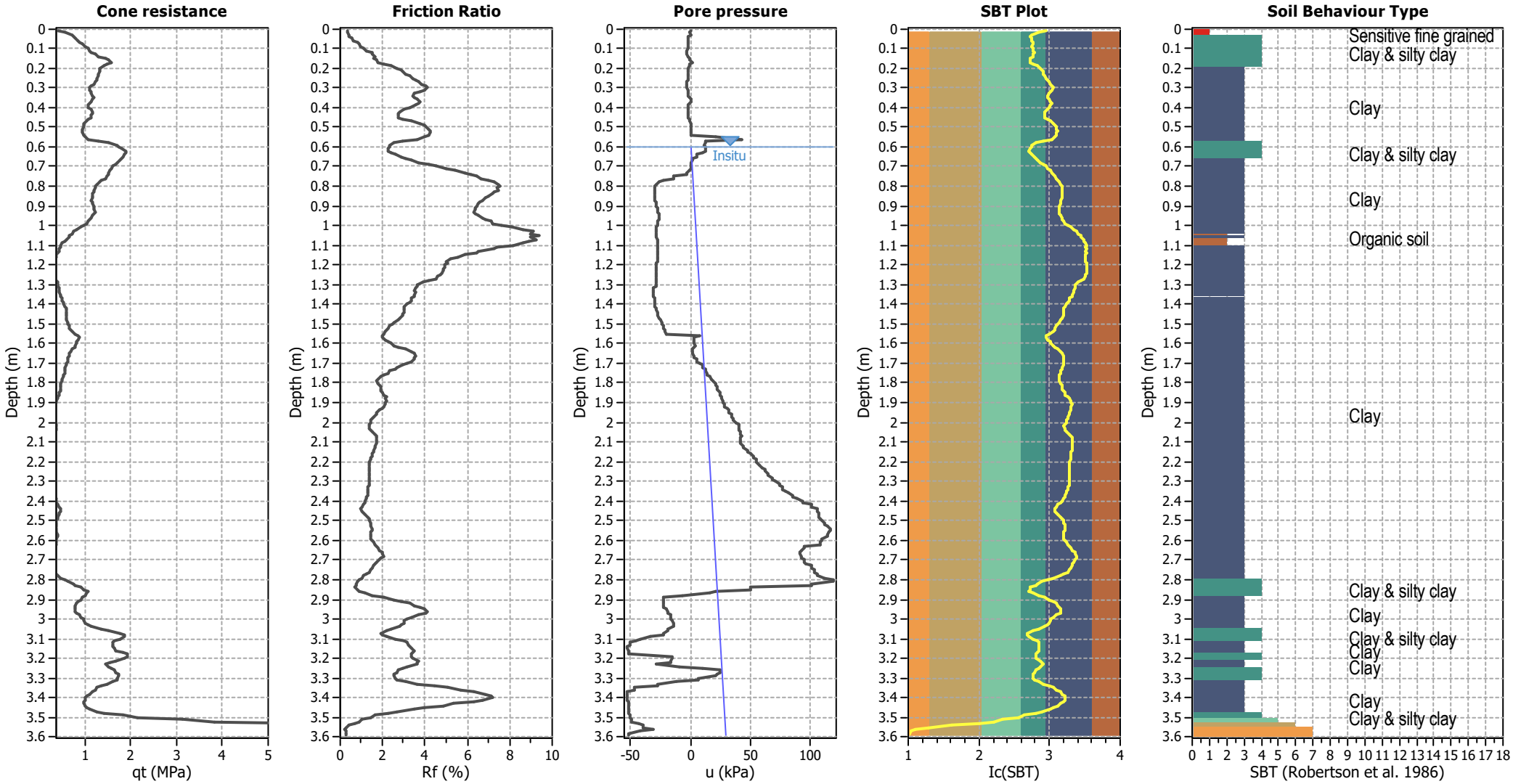






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



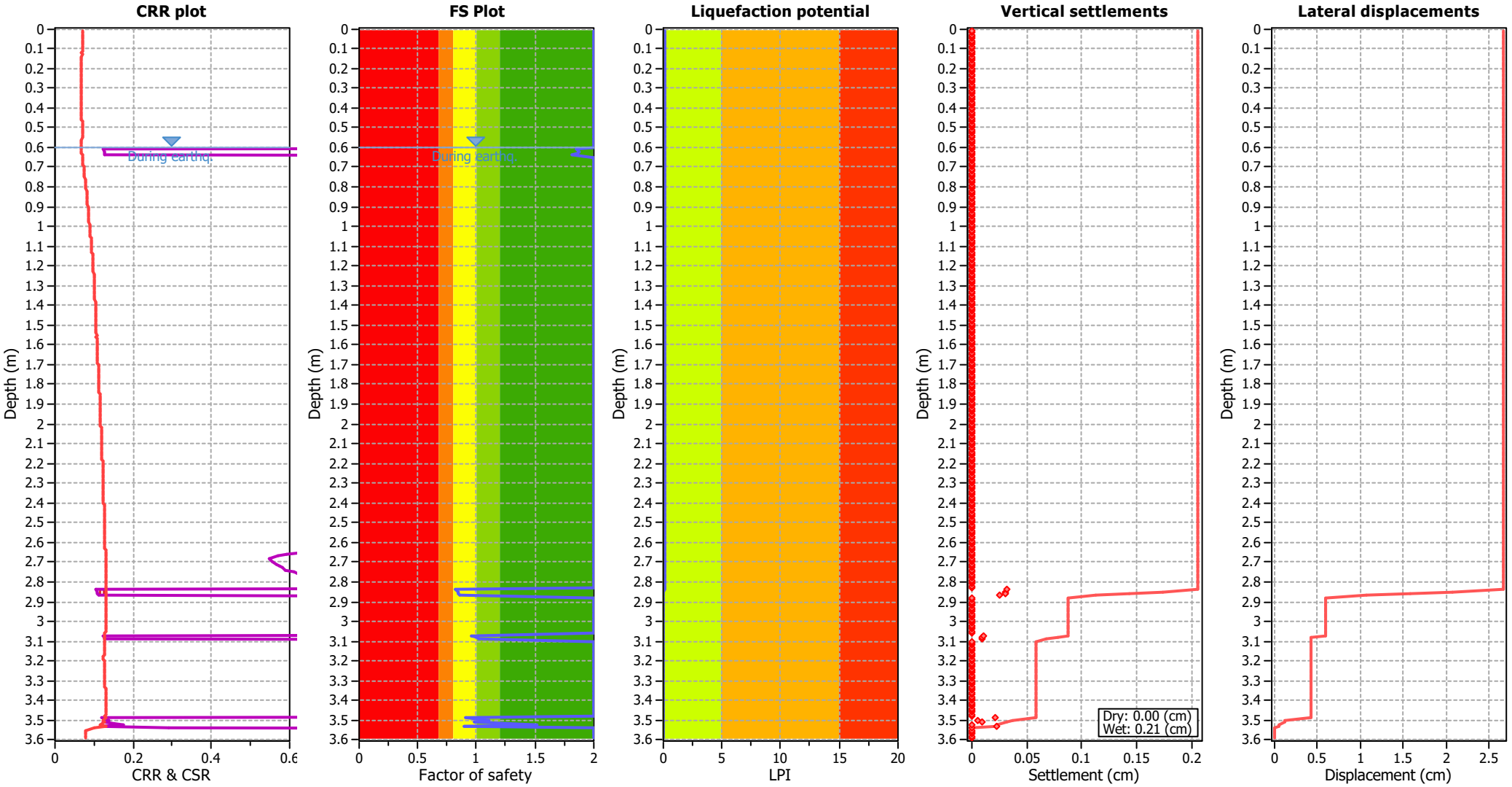
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

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

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

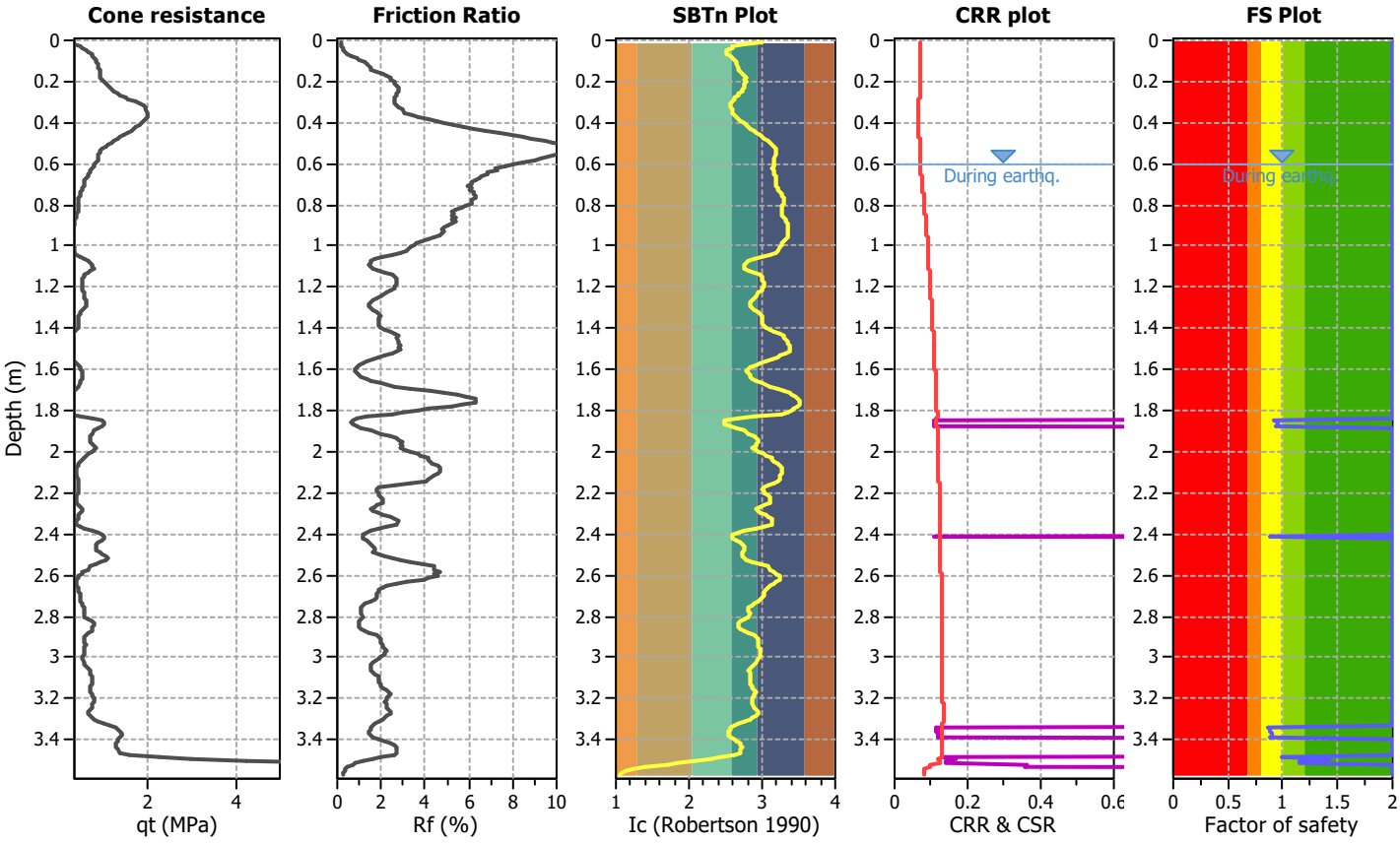
LIQUEFACTION ANALYSIS REPORT

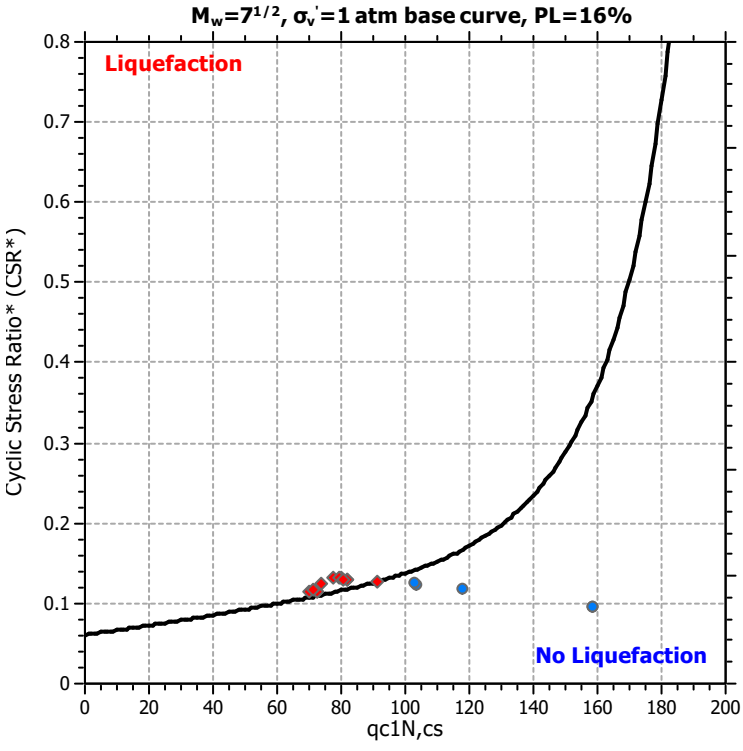
Project title : 1945 State Highway 10, Waipapa **Location : 1945 State Highway 10, Waipapa**

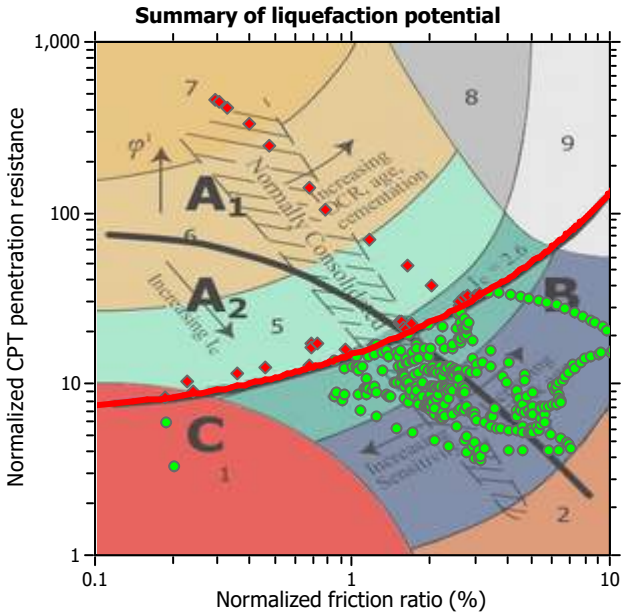
CPT file : CPT07

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	0.60 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.60 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude M_w:	5.80	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

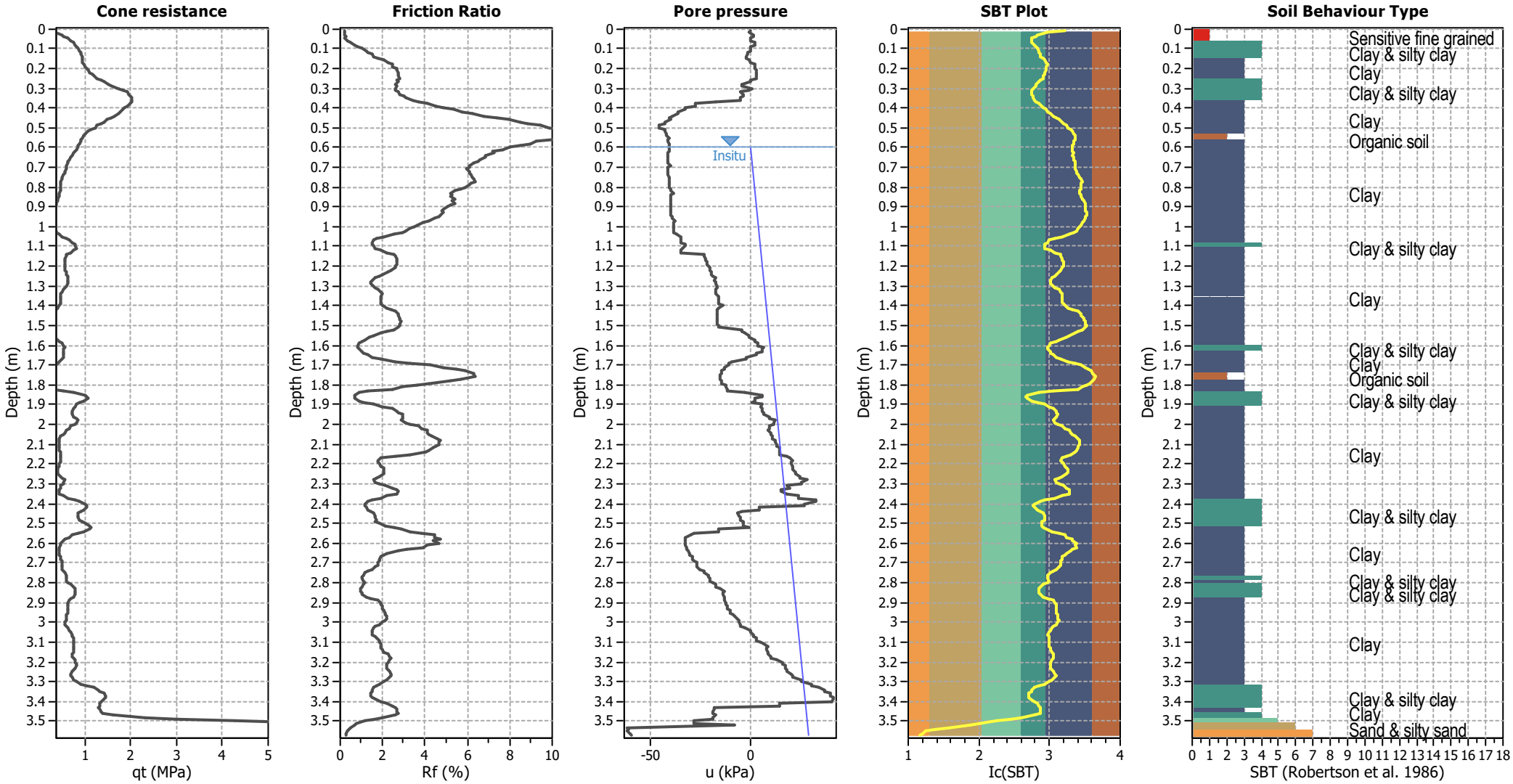






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



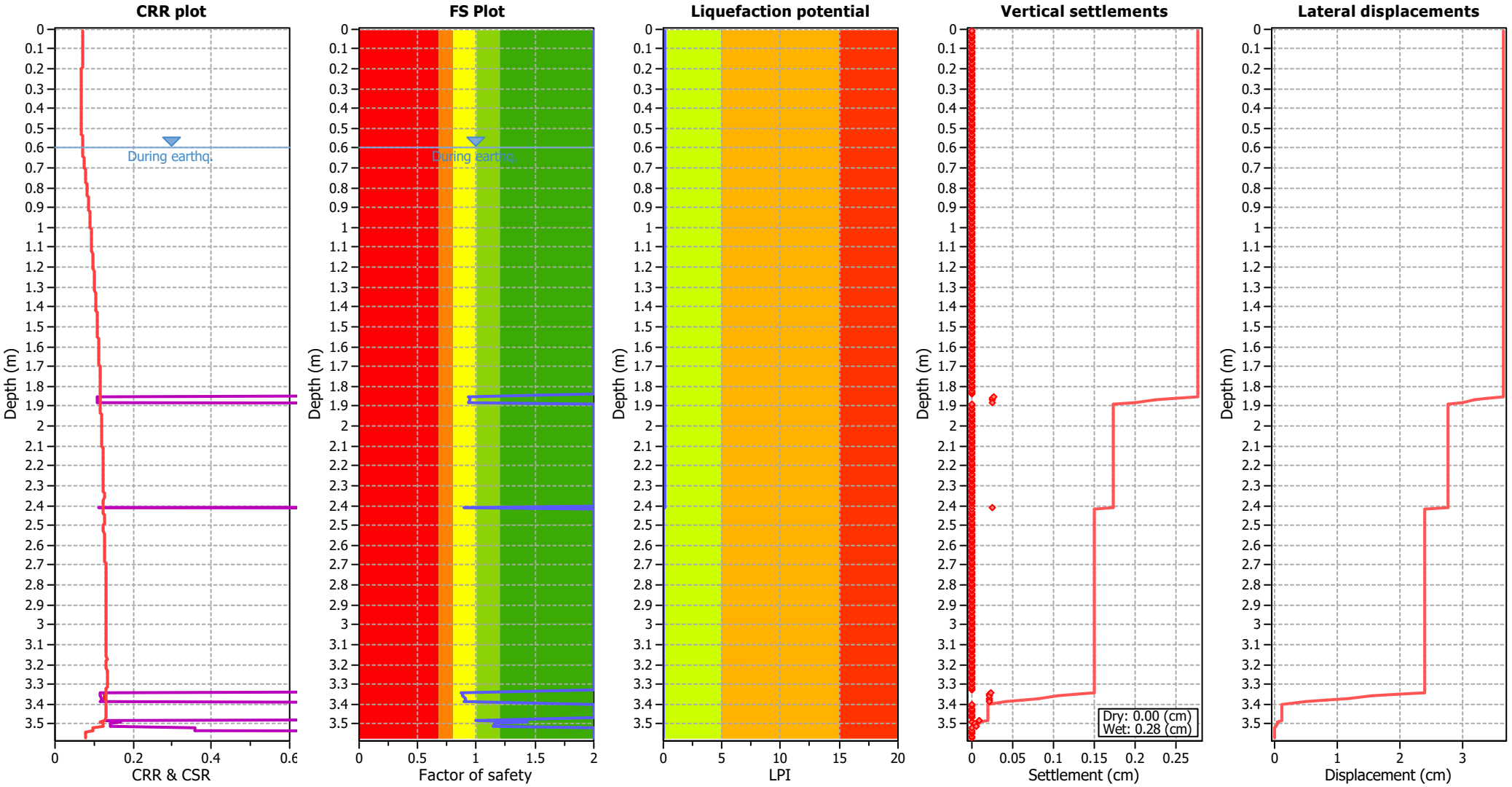
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

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

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

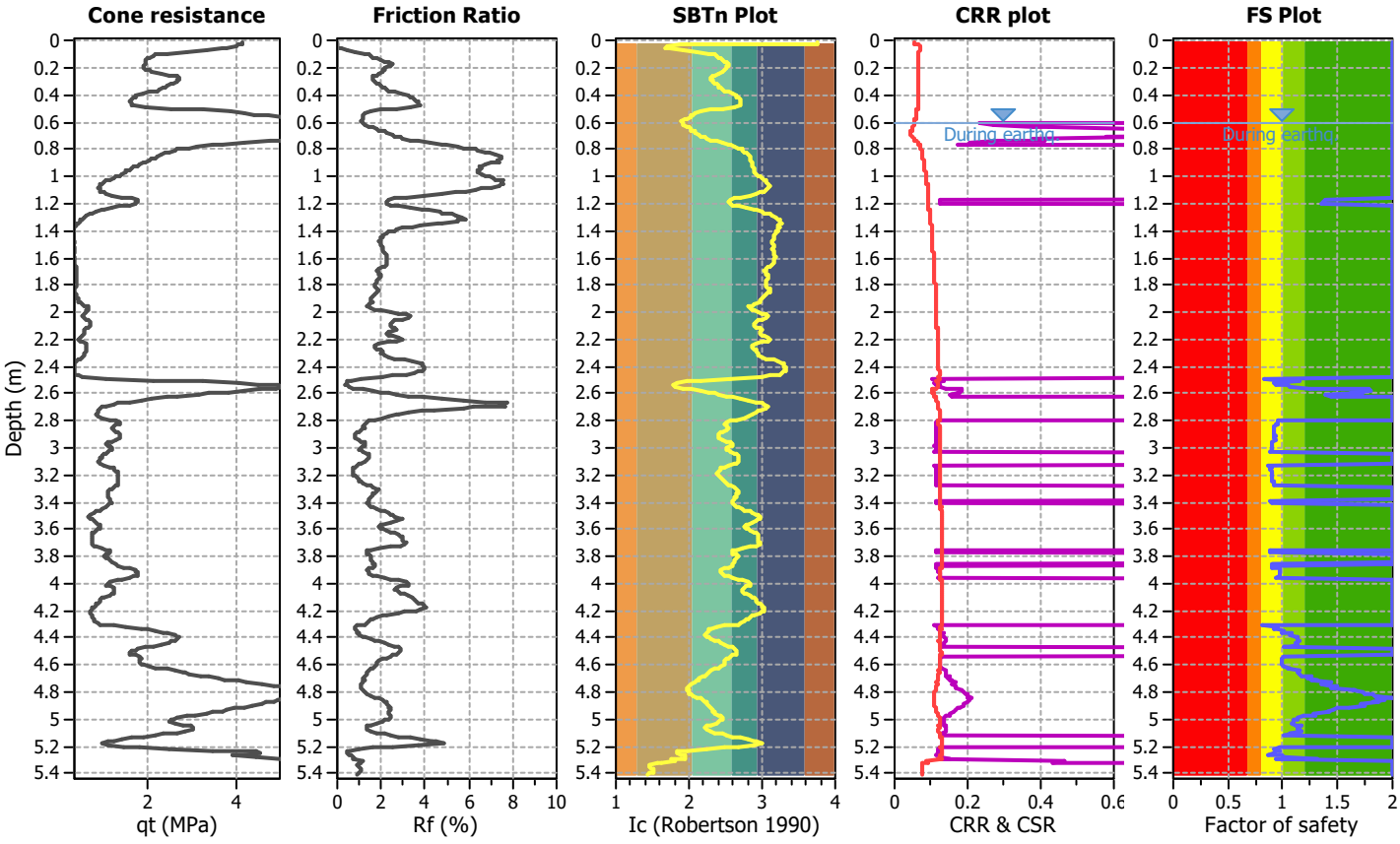
LIQUEFACTION ANALYSIS REPORT

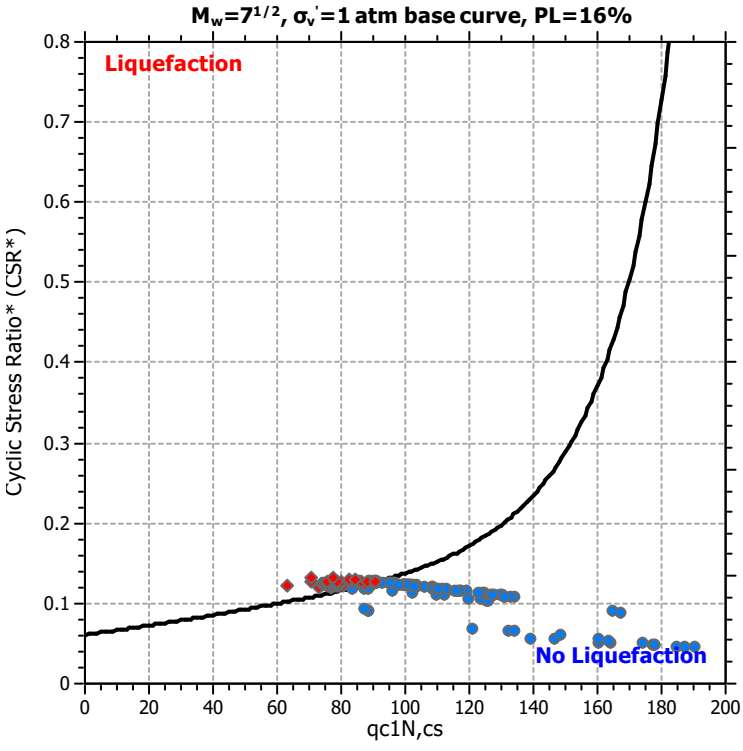
Project title : 1945 State Highway 10, Waipapa **Location : 1945 State Highway 10, Waipapa**

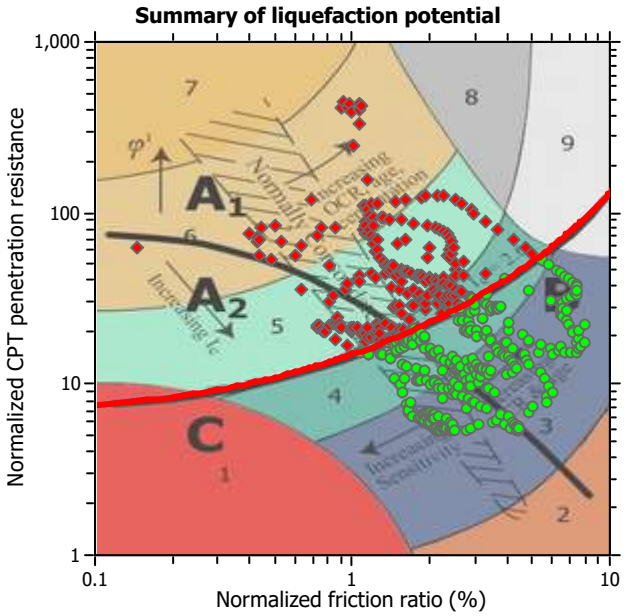
CPT file : CPT08

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	0.60 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.60 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude M_w:	5.80	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

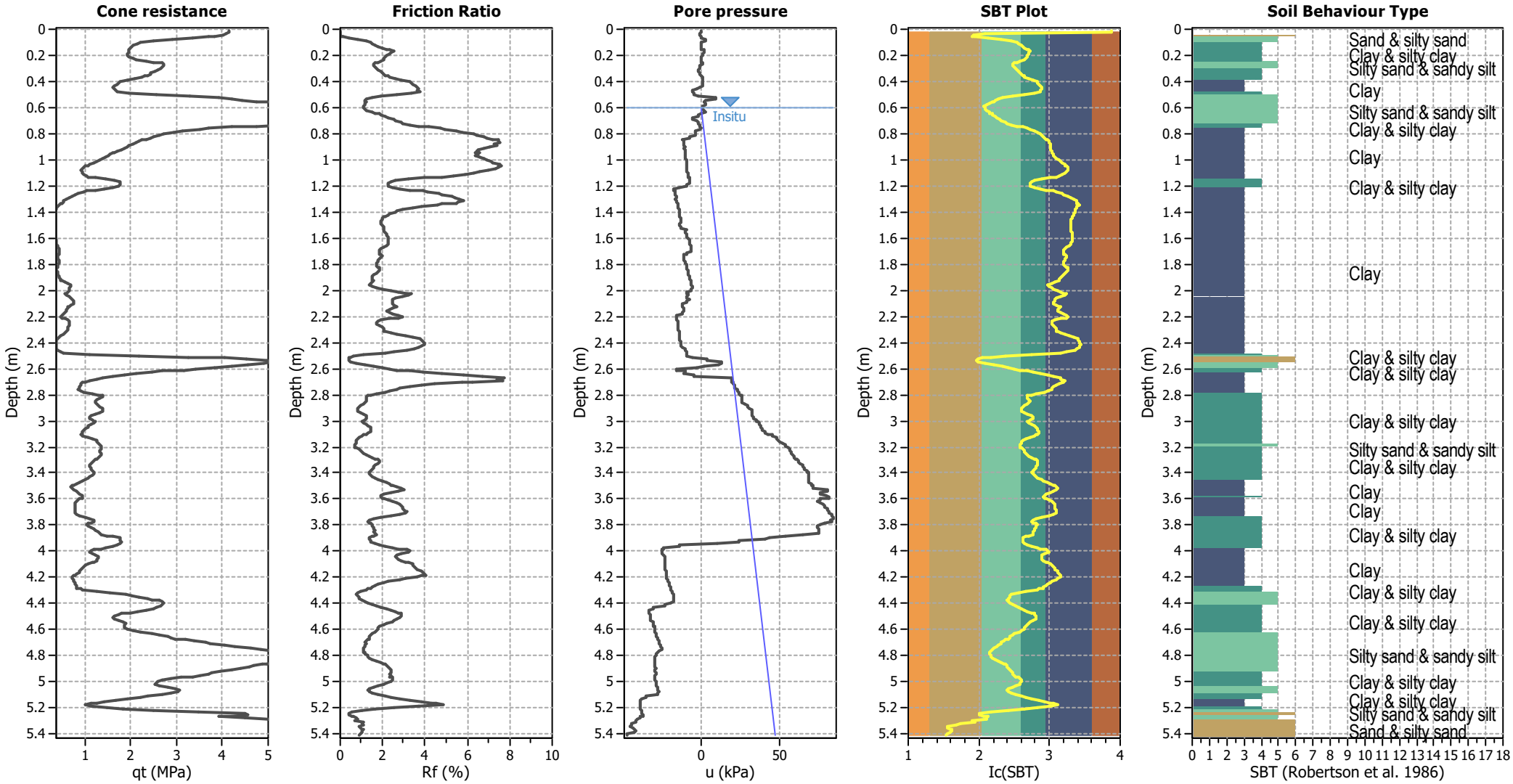






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



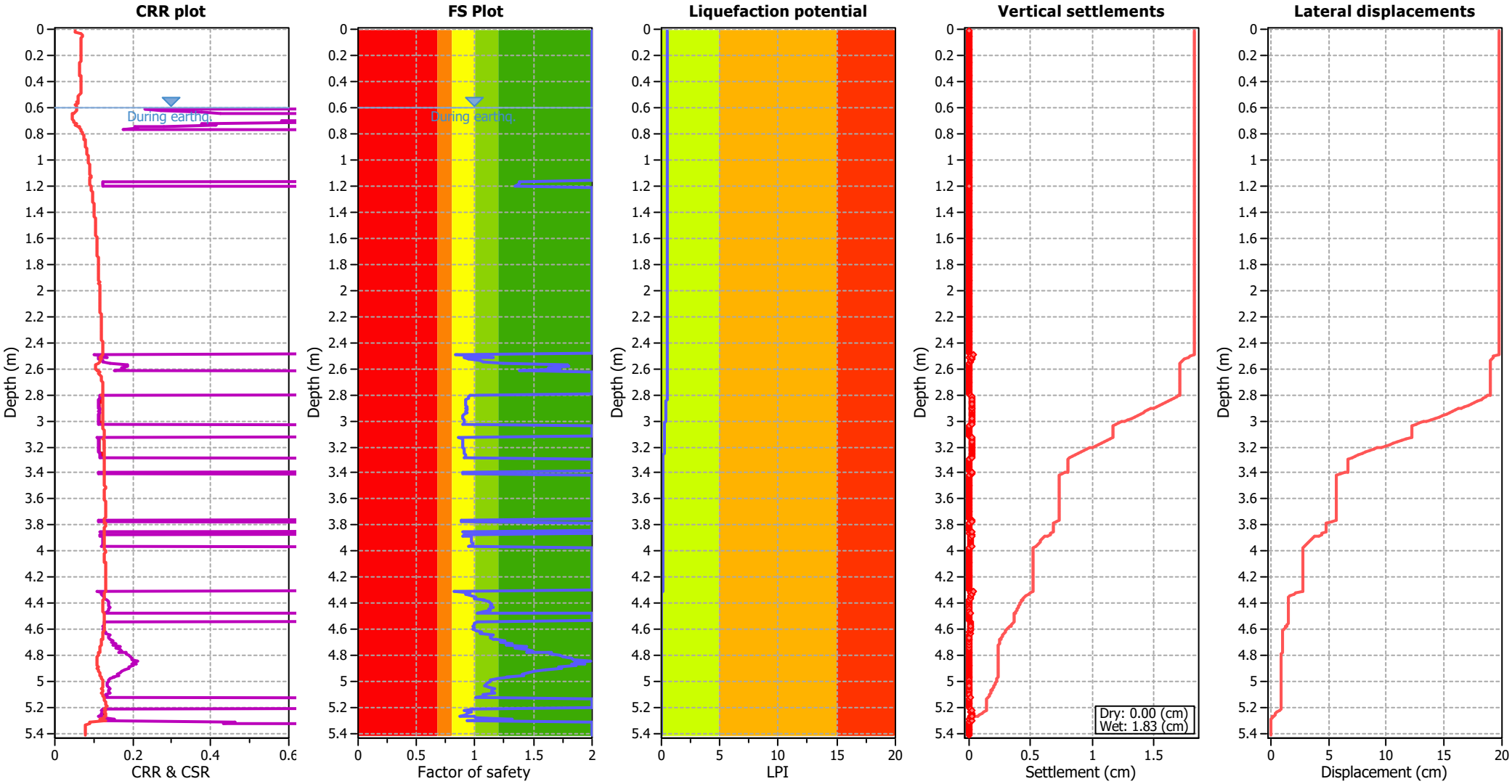
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

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

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

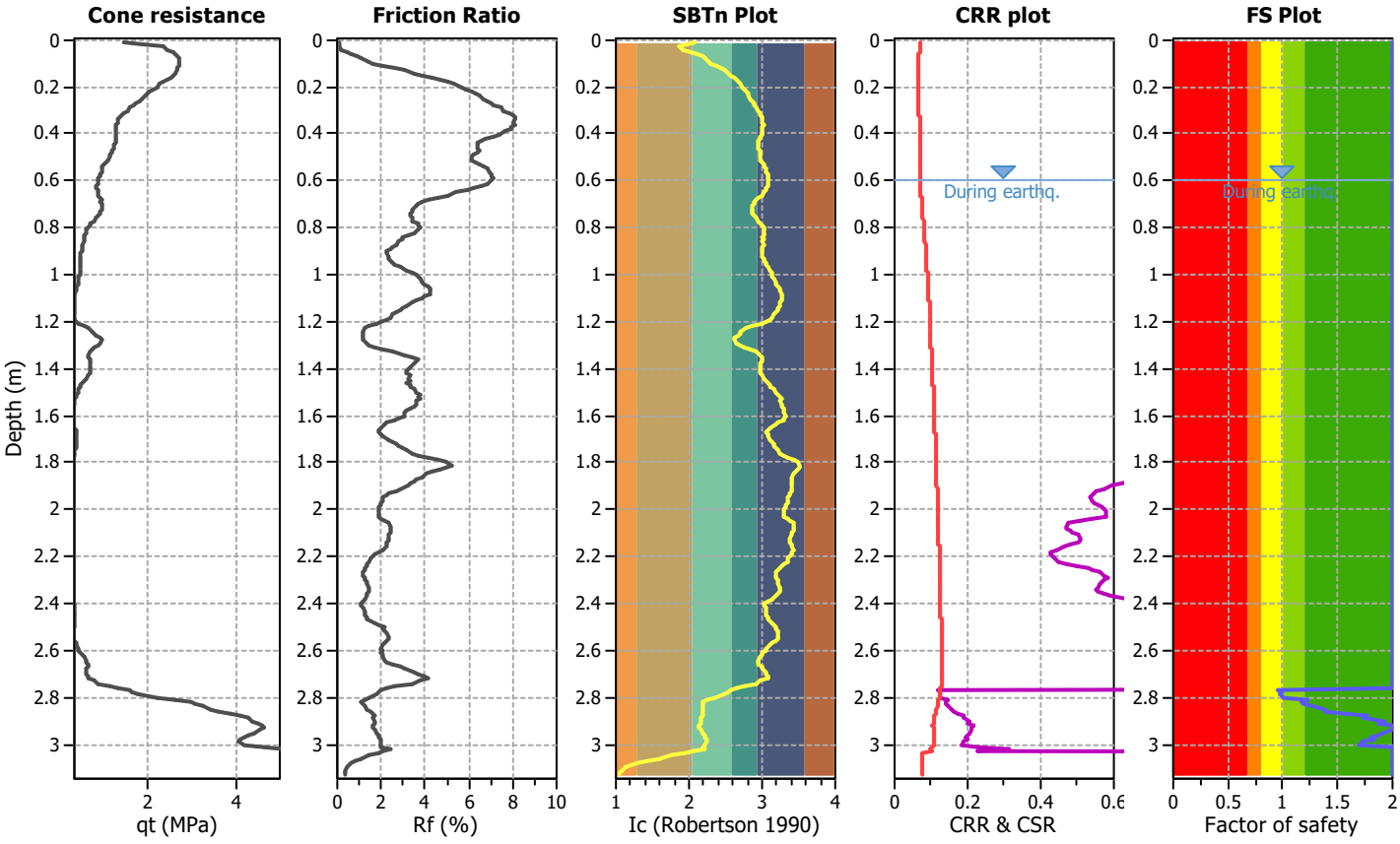
LIQUEFACTION ANALYSIS REPORT

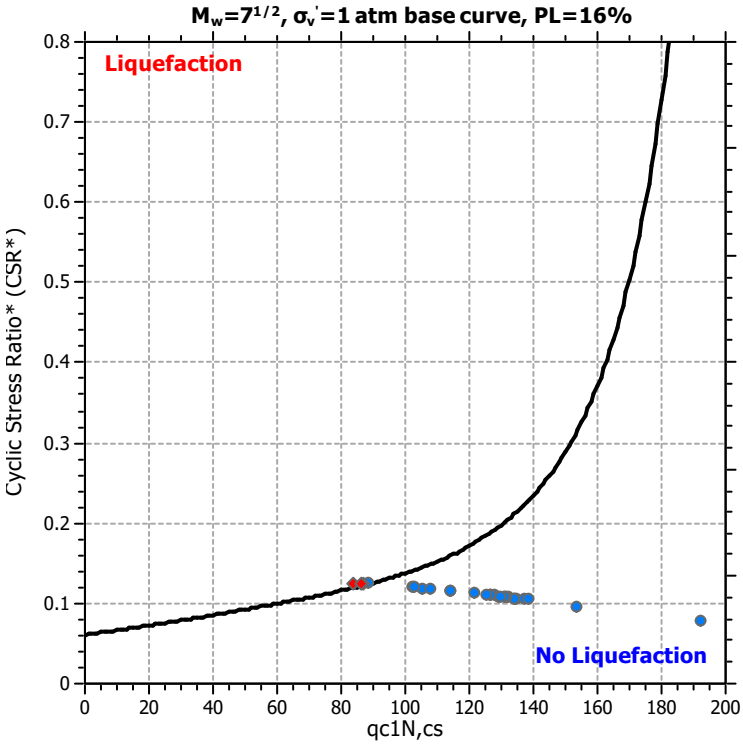
Project title : 1945 State Highway 10, Waipapa **Location : 1945 State Highway 10, Waipapa**

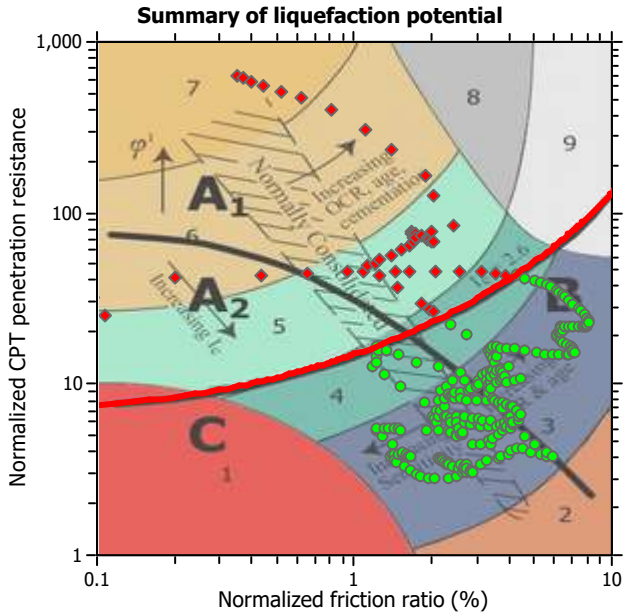
CPT file : CPT09

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	0.60 m	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.60 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude M_w:	5.80	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

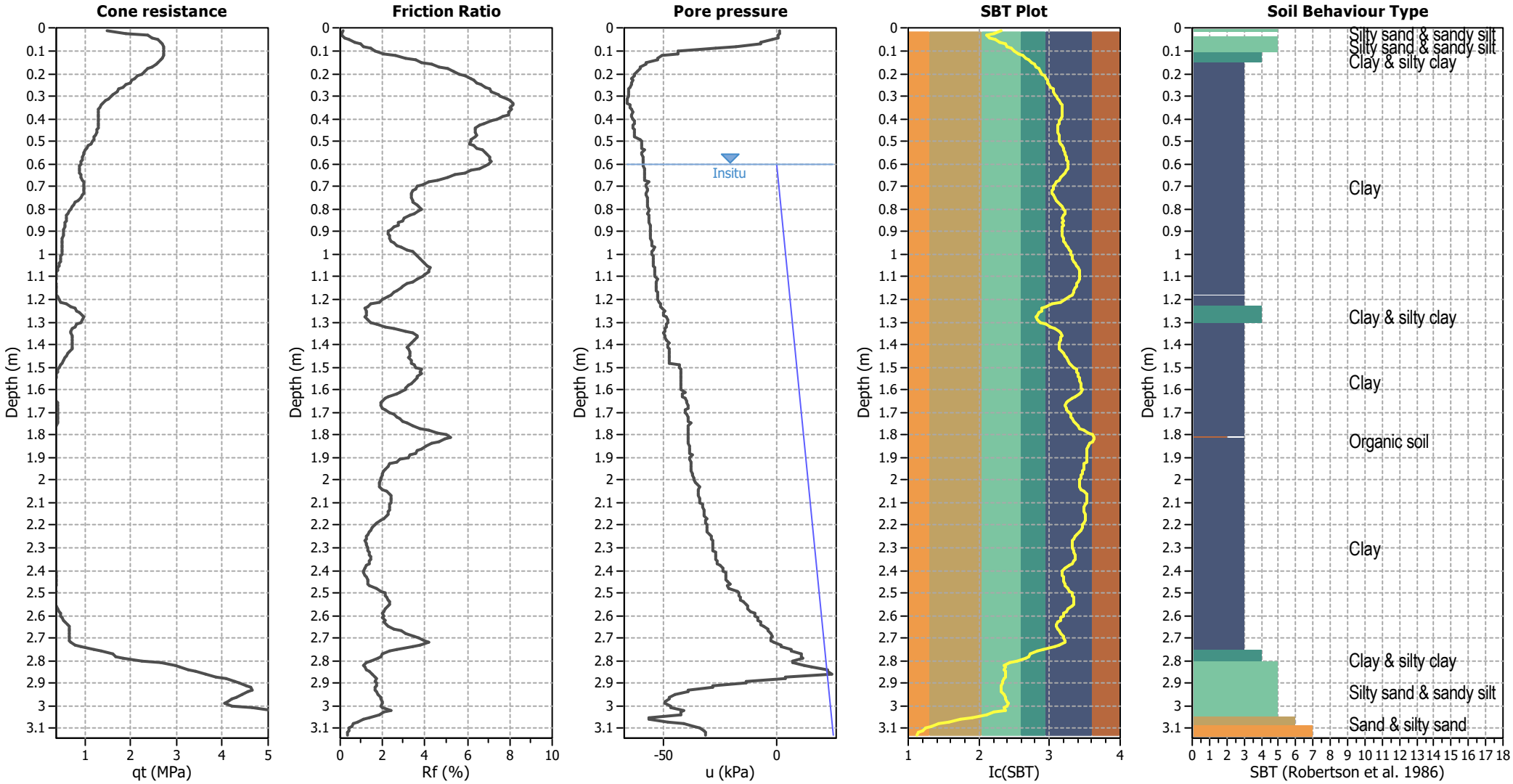






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



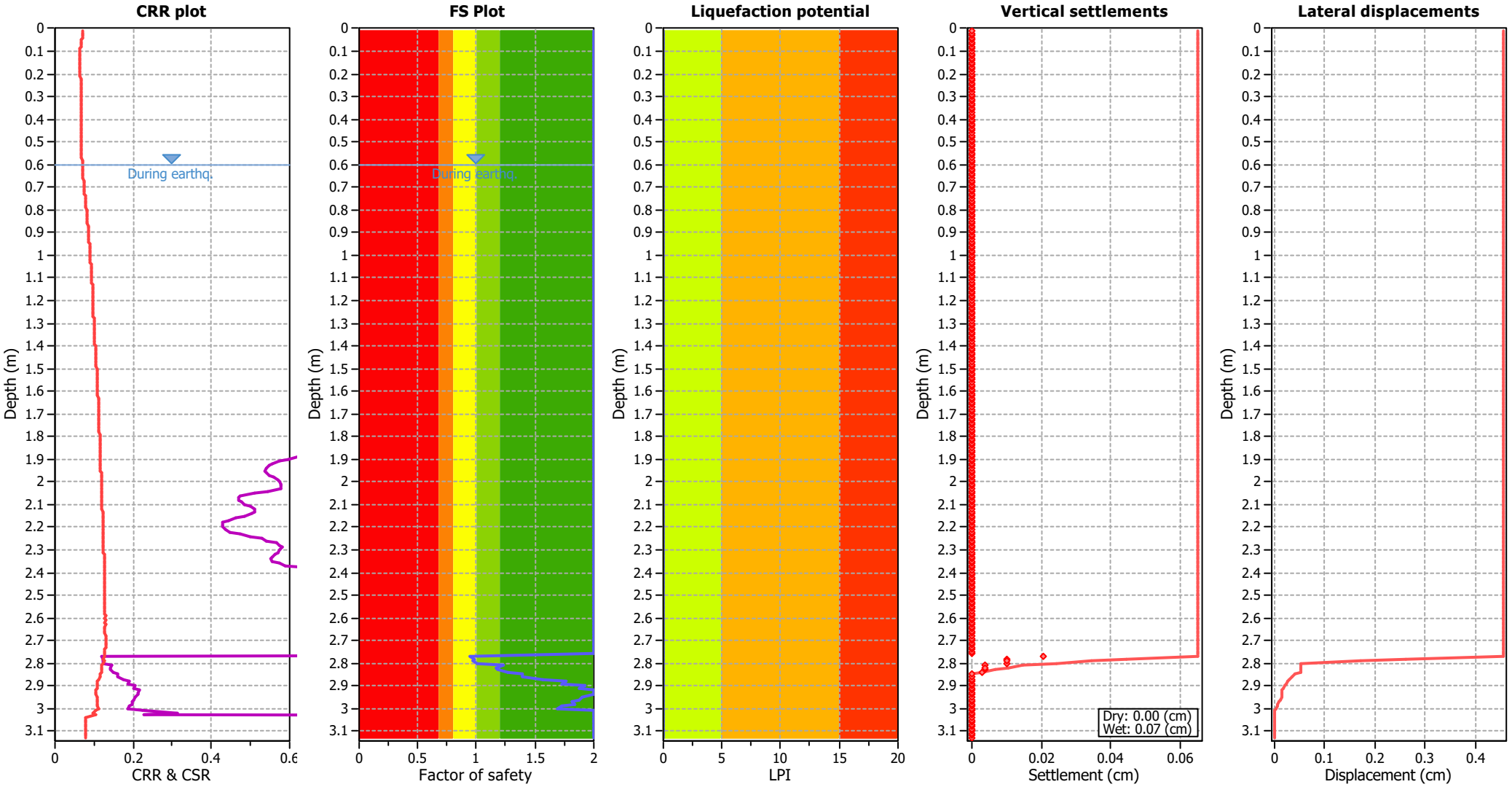
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.60 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.60 m	Fill height:	N/A	Limit depth:	10.00 m

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

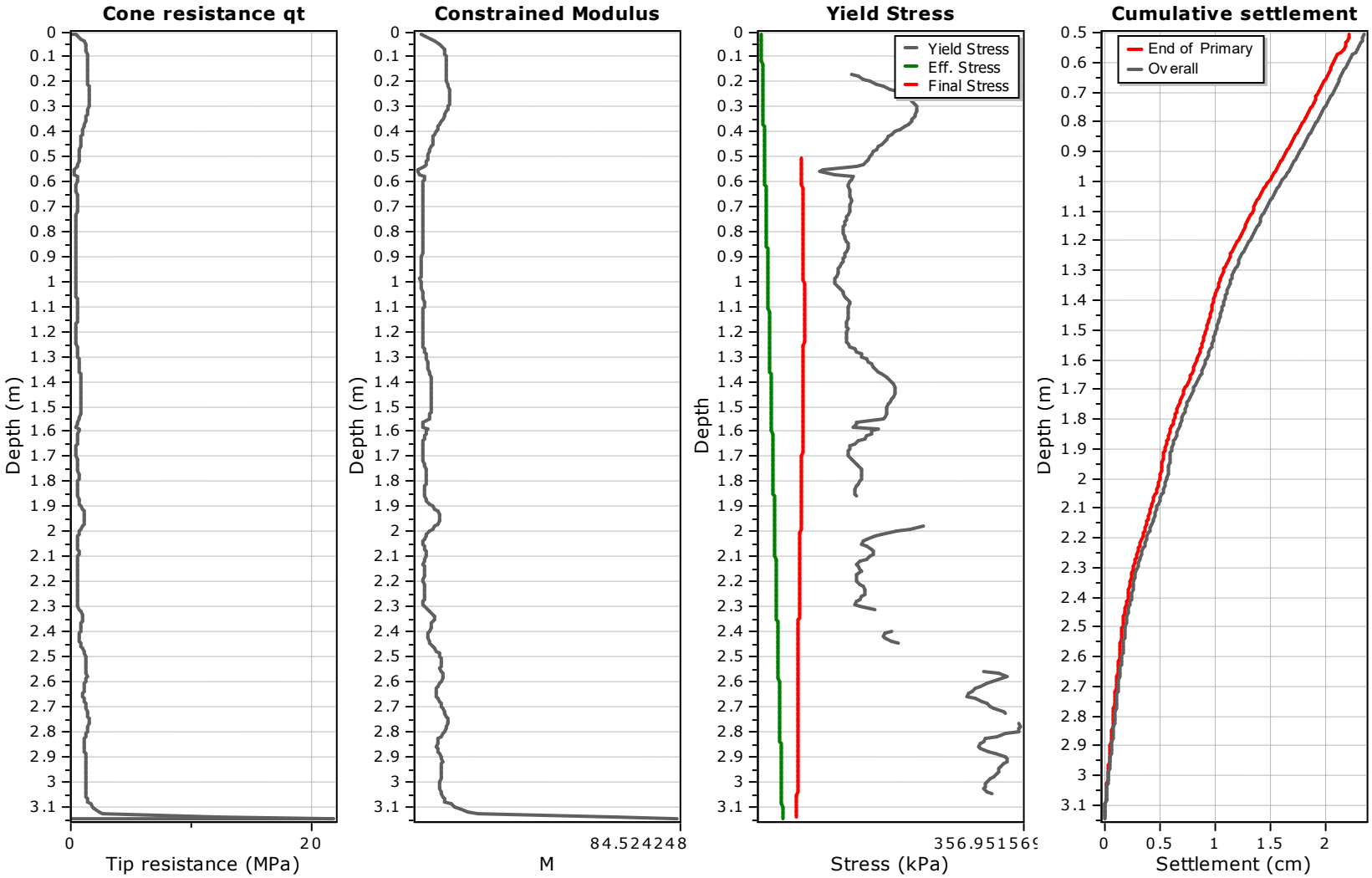
Appendix E: Settlement Analysis

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT01
Total depth: 3.15 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 50.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta \sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

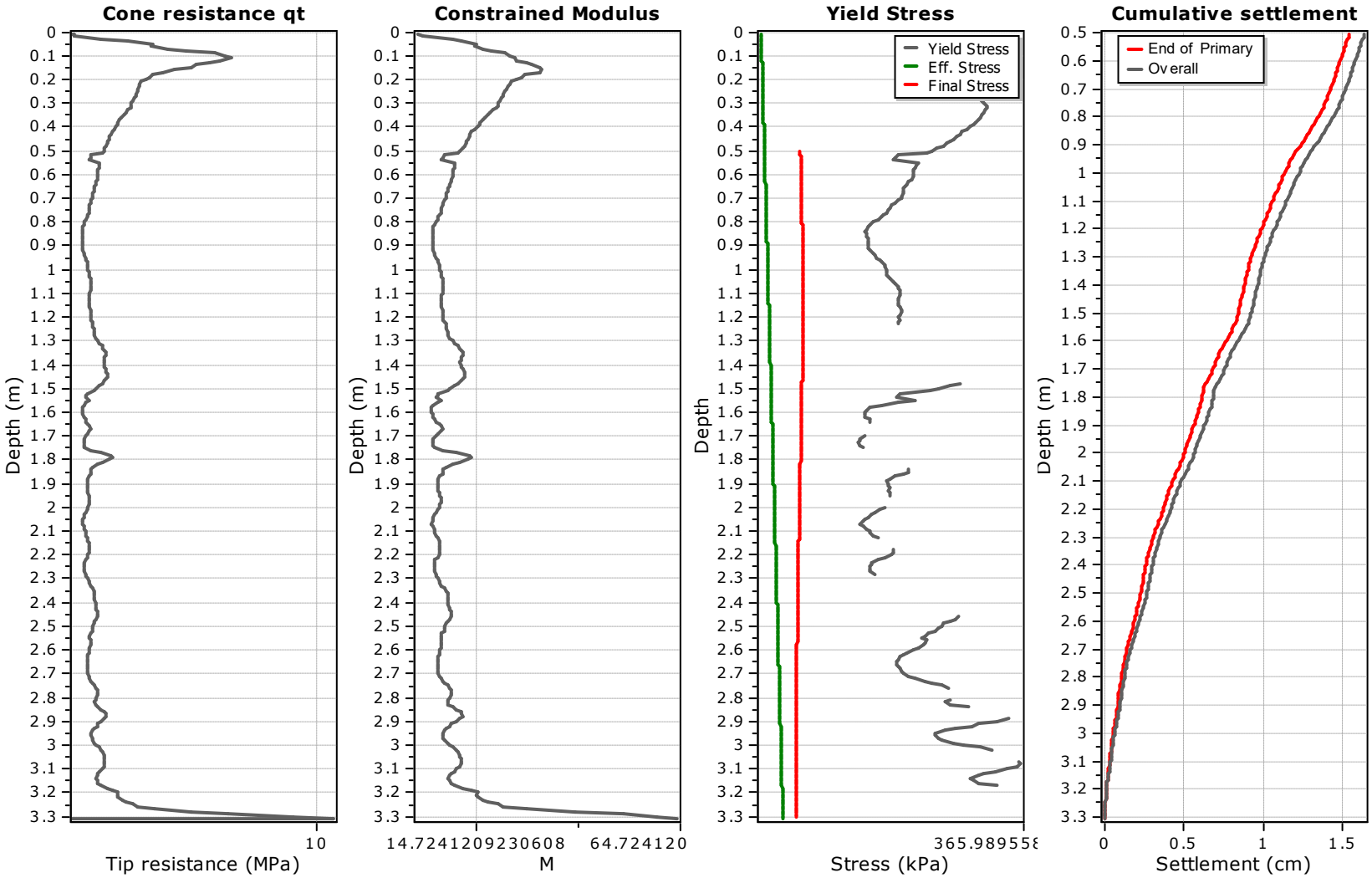
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT02
Total depth: 3.31 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 50.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

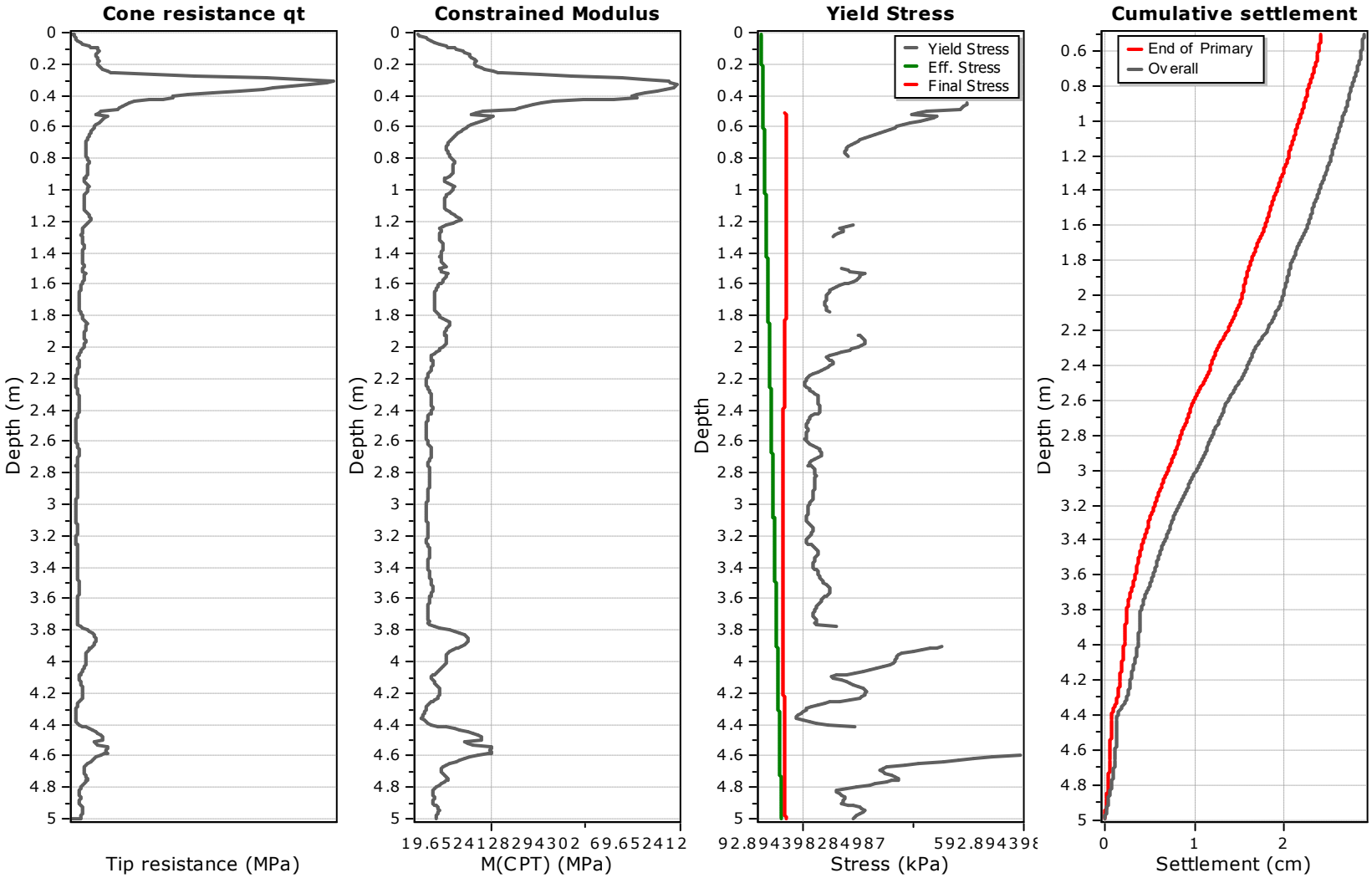
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT03
Total depth: 5.00 m, Date: 20/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 50.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

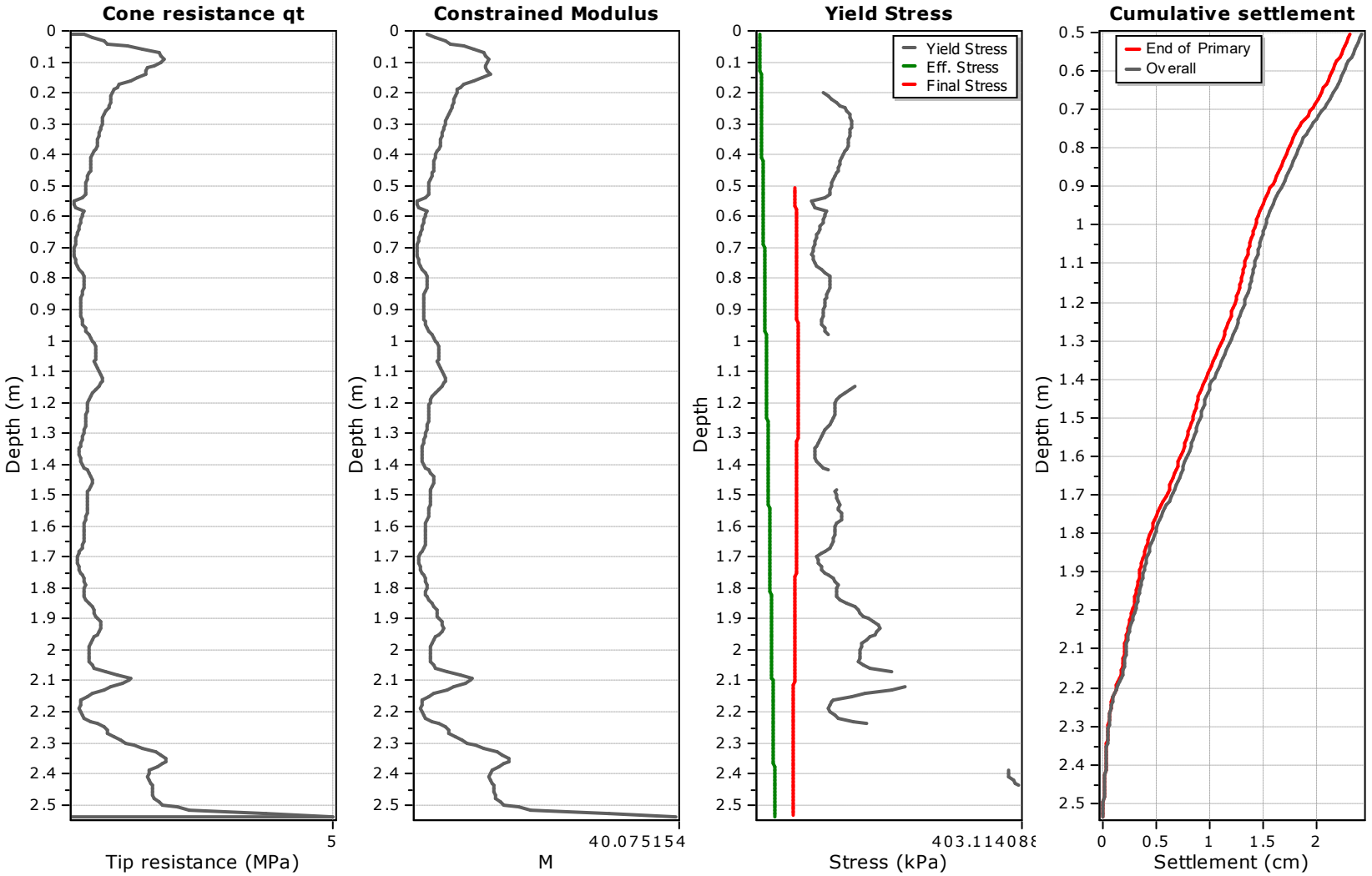
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT04
Total depth: 2.54 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 50.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

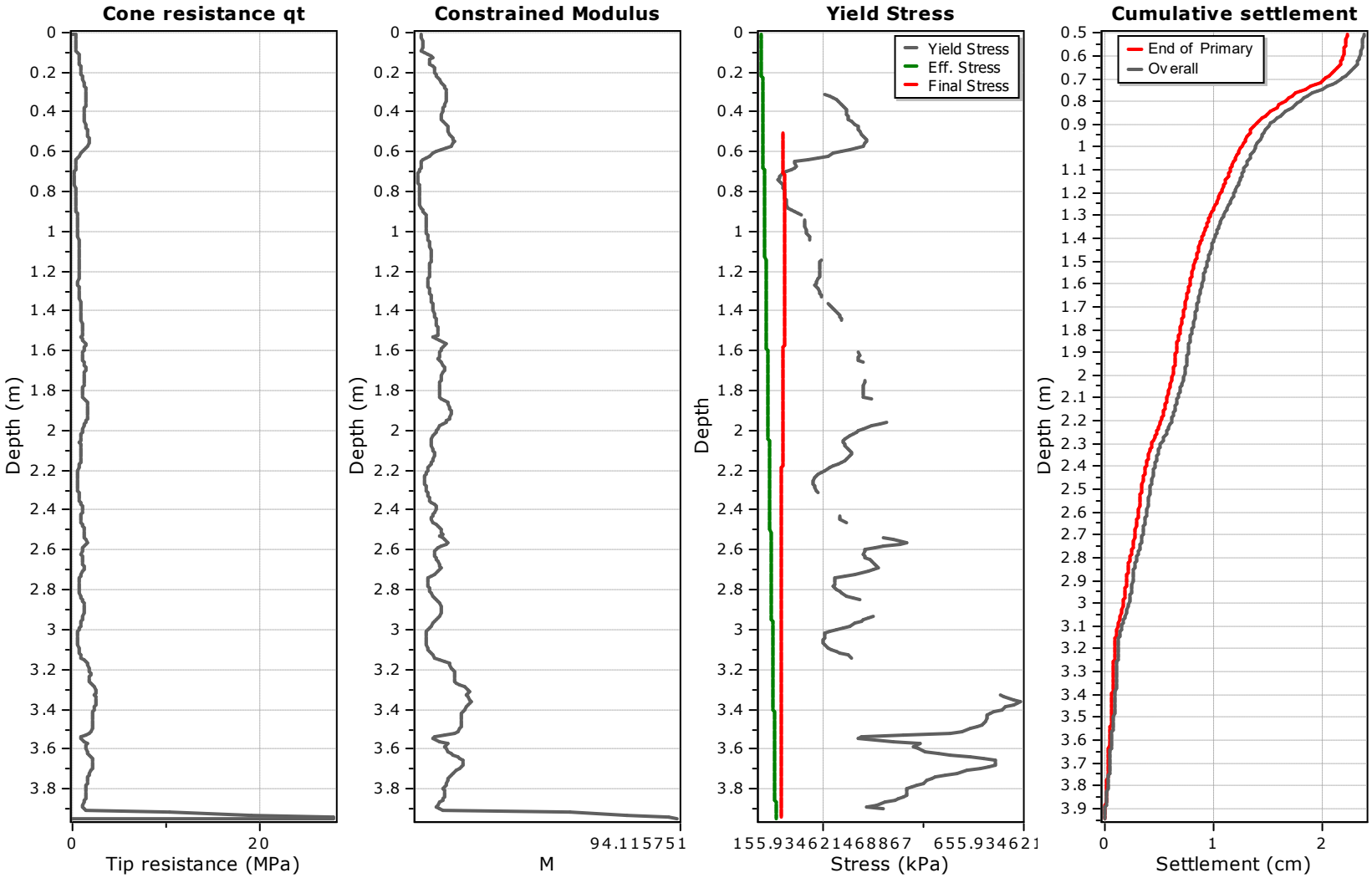
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT05
Total depth: 3.95 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 50.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta \sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

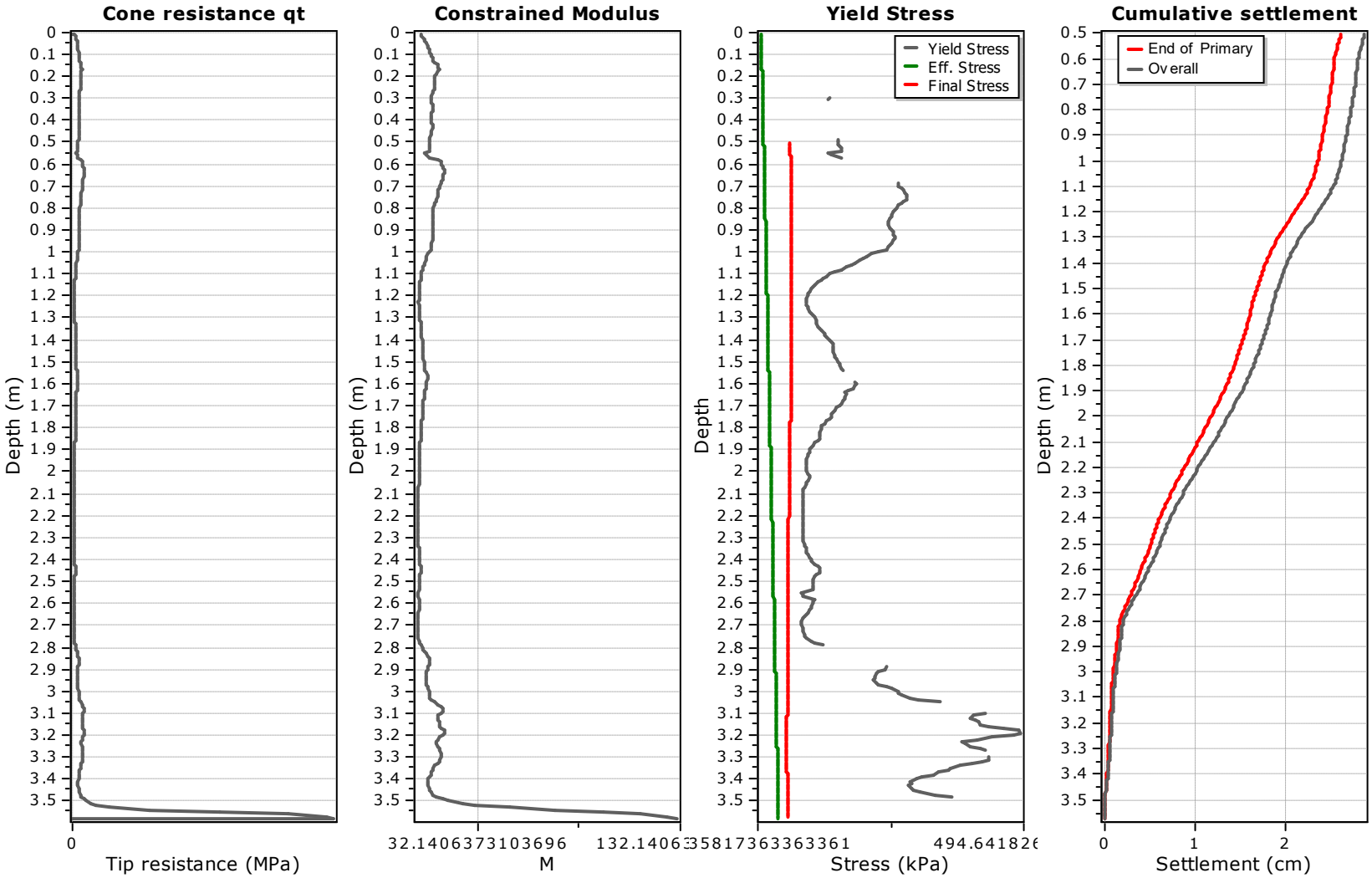
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT06
Total depth: 3.58 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 50.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta \sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

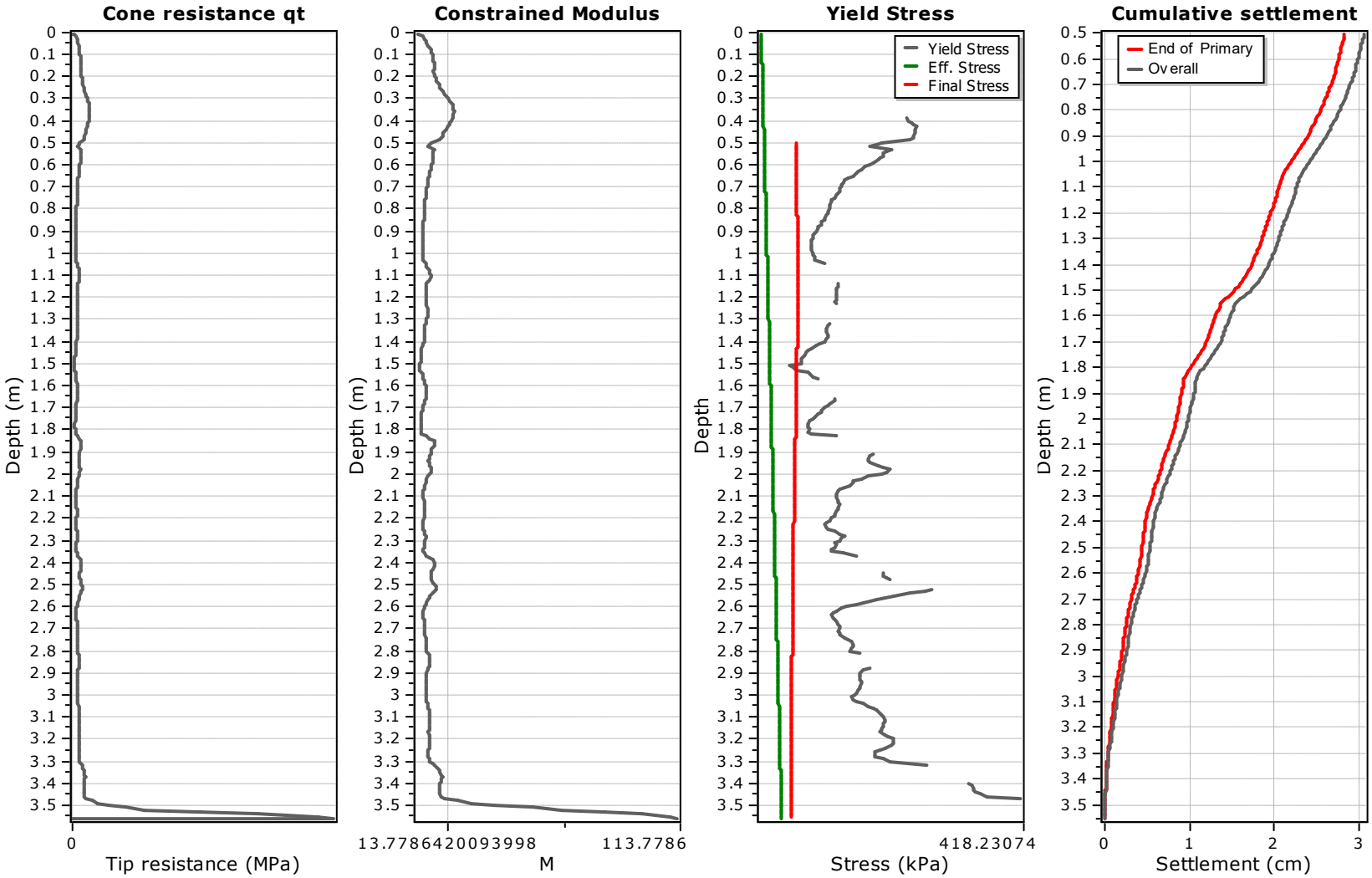
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT07
Total depth: 3.56 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 50.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

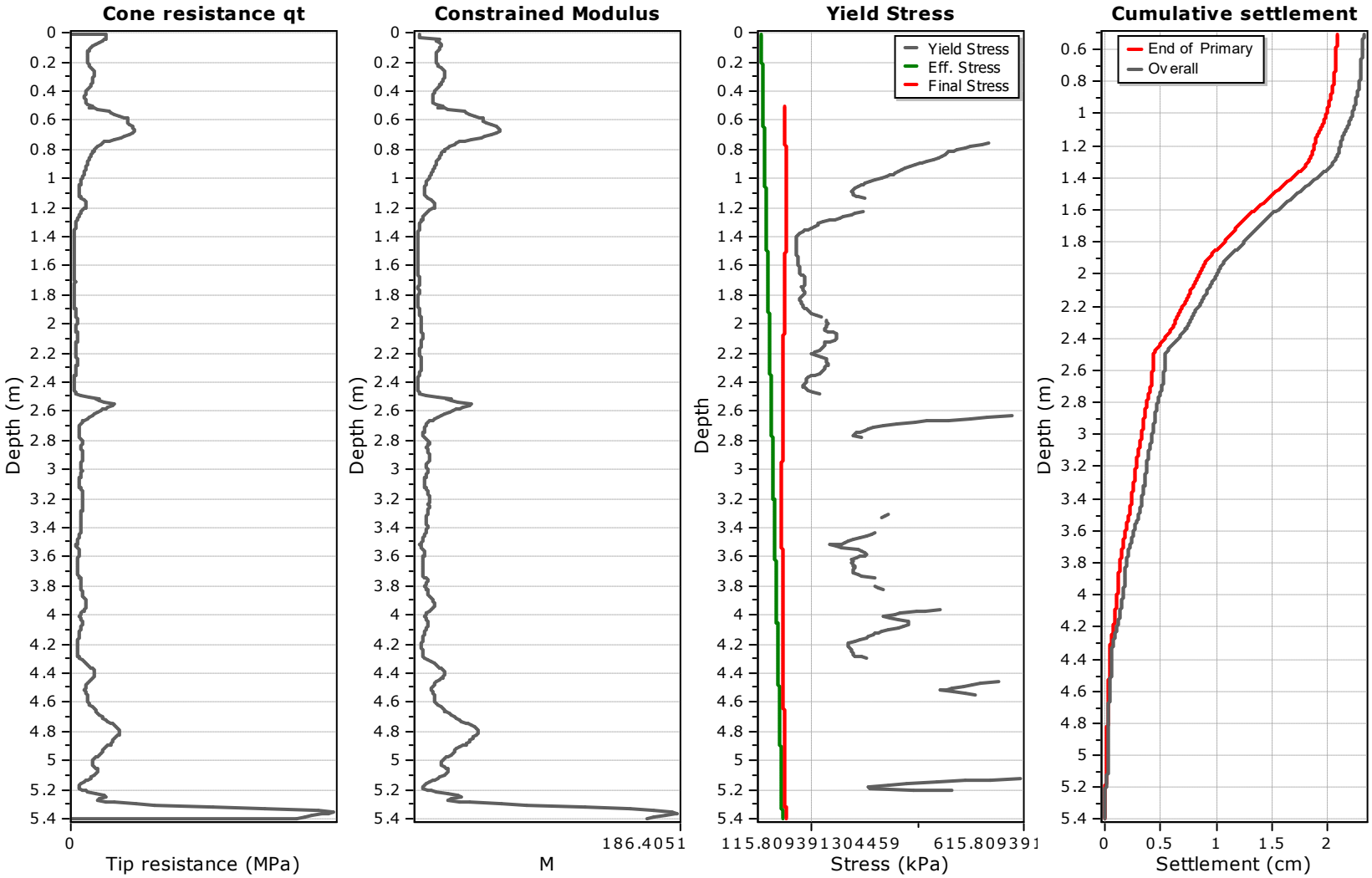
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT08
Total depth: 5.40 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 50.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

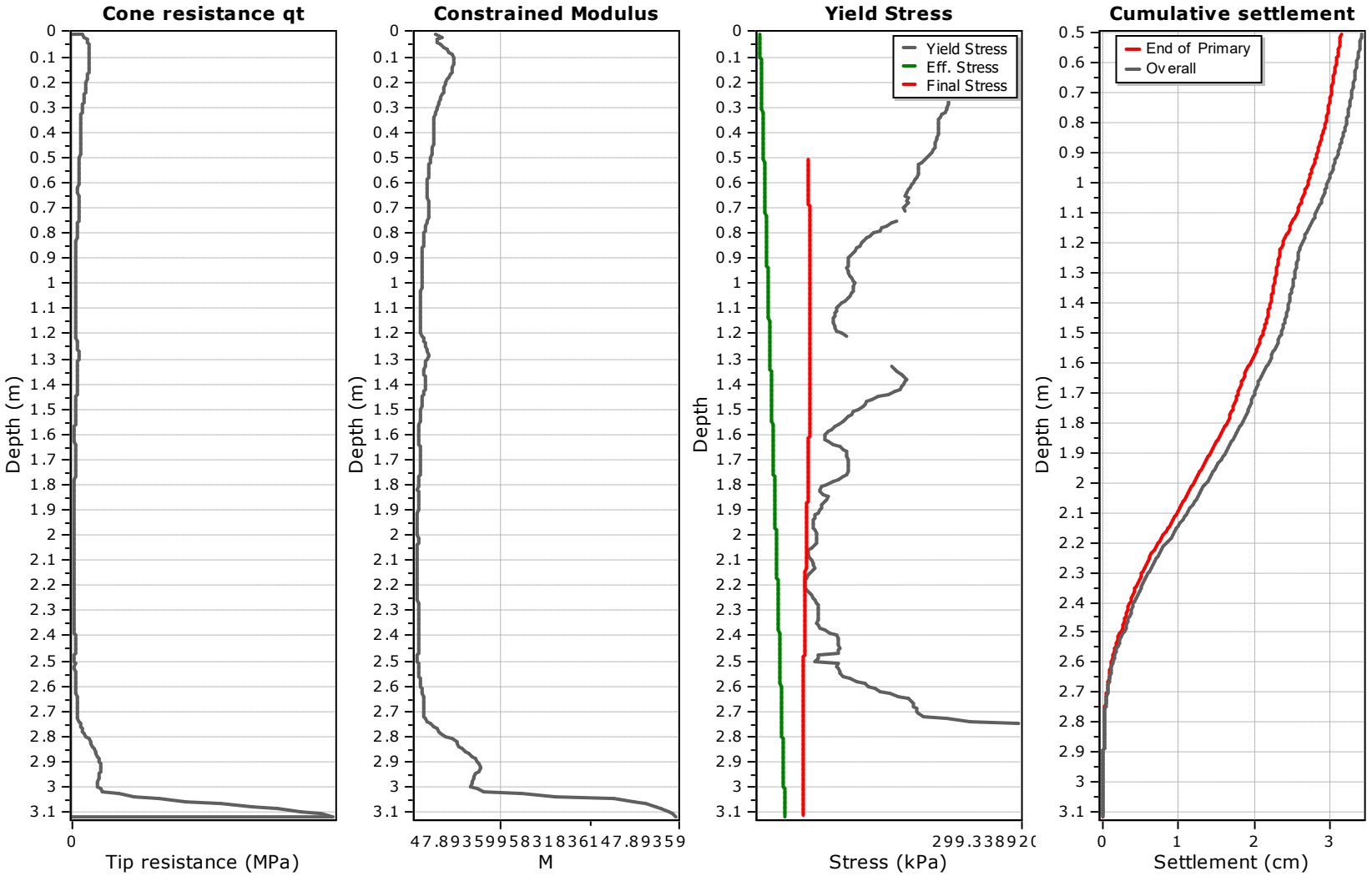
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT09
Total depth: 3.12 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 50.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta \sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

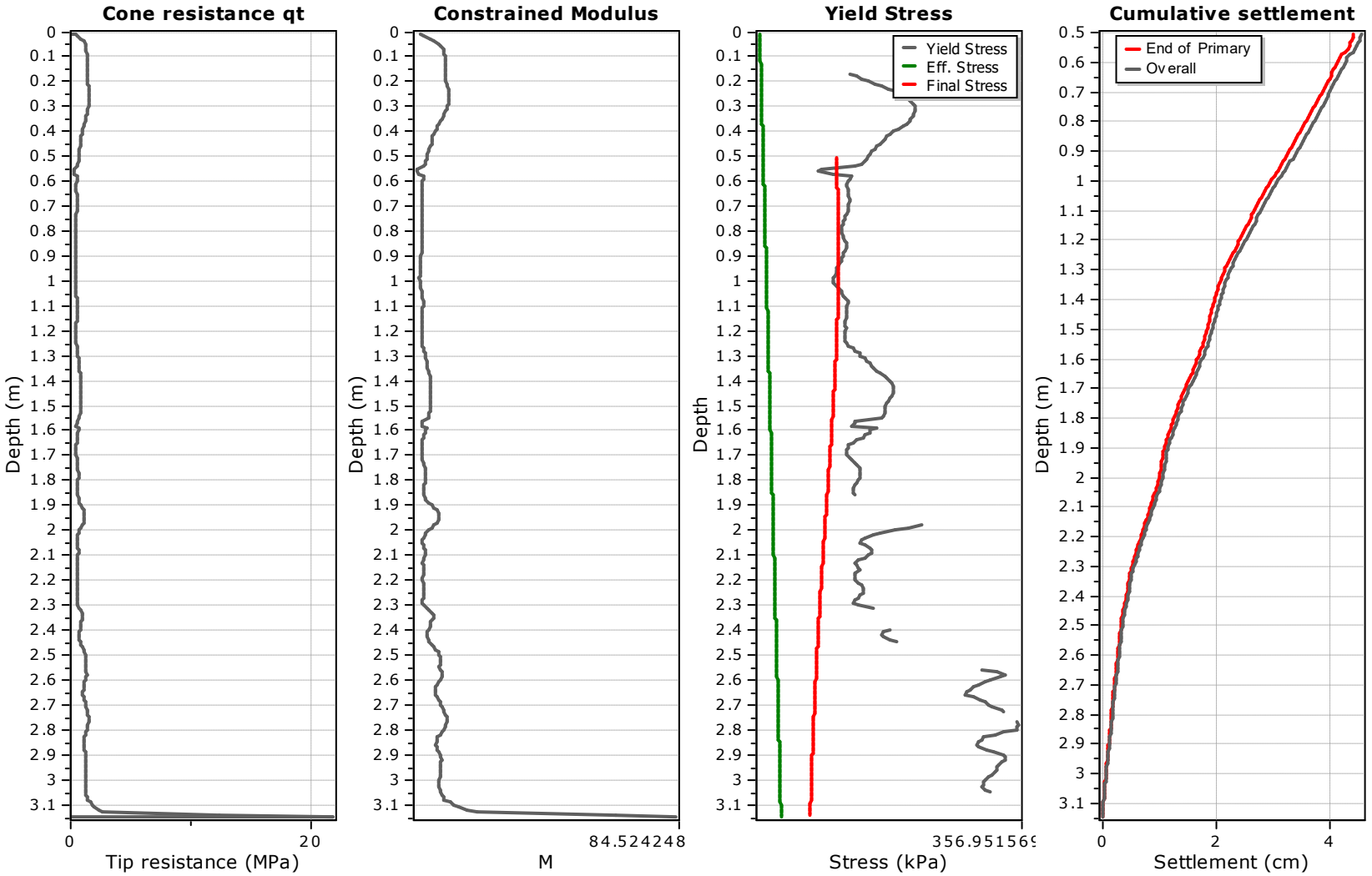
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT01
Total depth: 3.15 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 100.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta \sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

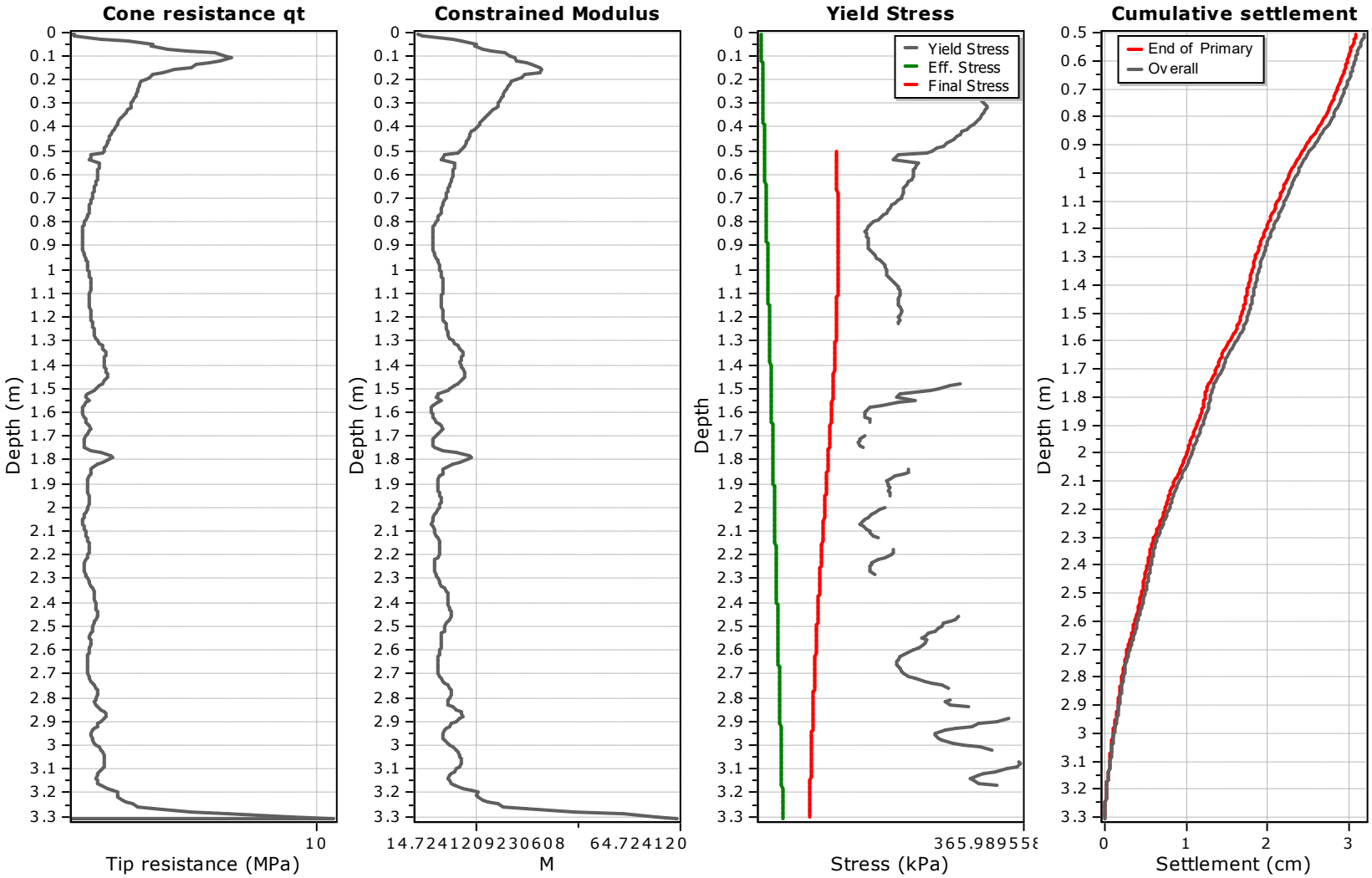
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT02
Total depth: 3.31 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 100.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

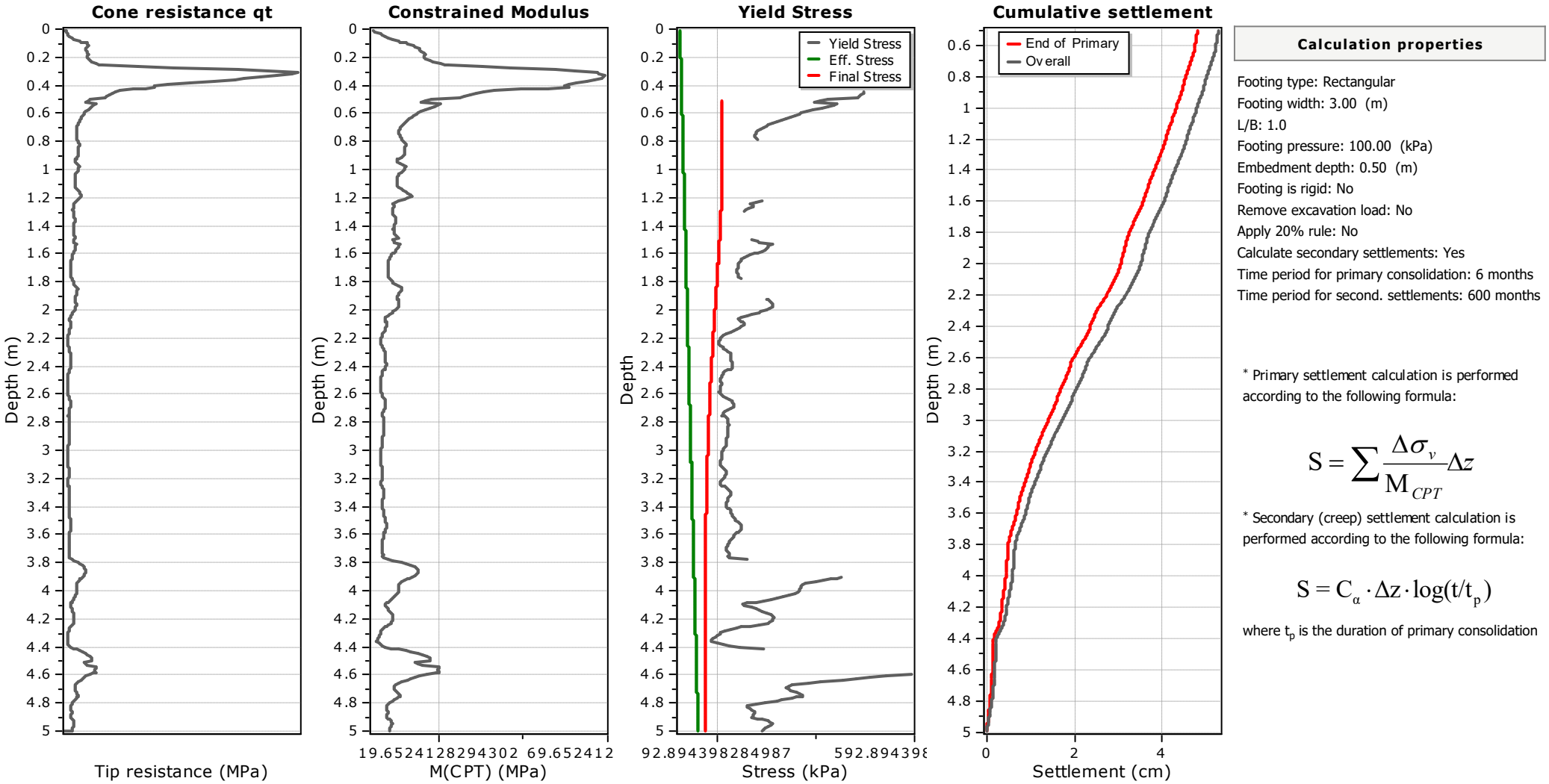
$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

where t_p is the duration of primary consolidation

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 100.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta \sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

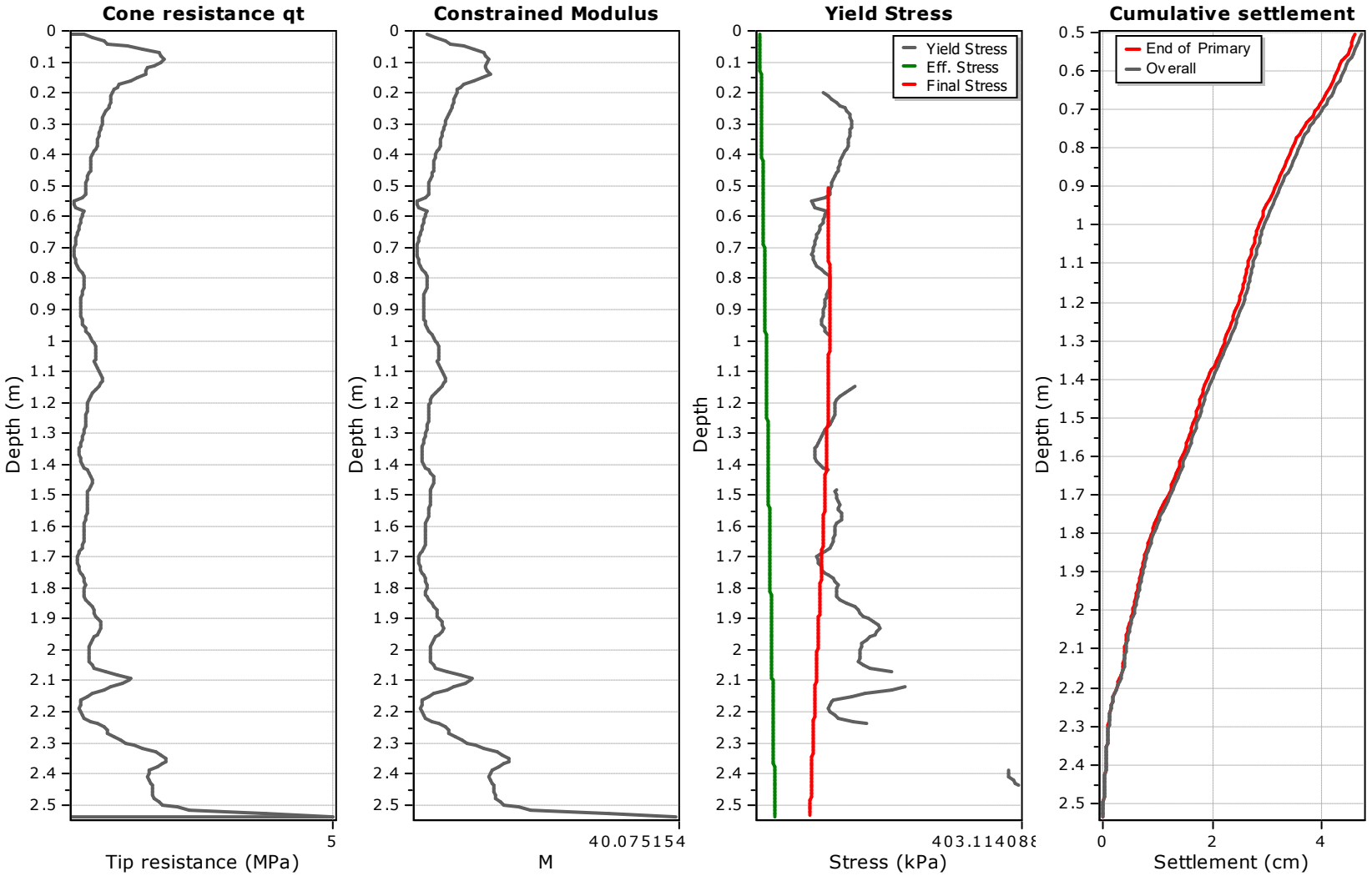
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT04
Total depth: 2.54 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 100.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

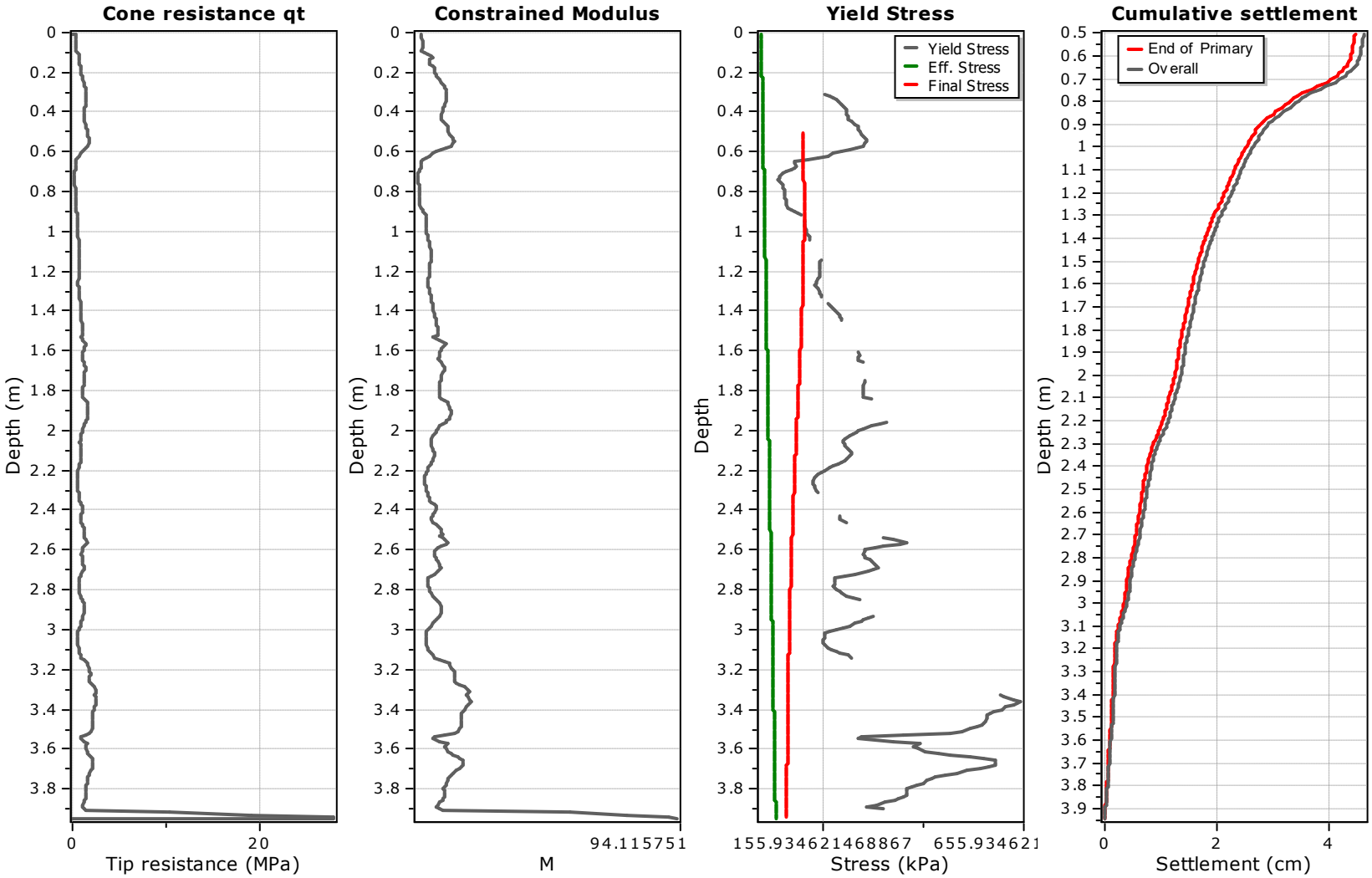
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT05
Total depth: 3.95 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 100.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta \sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

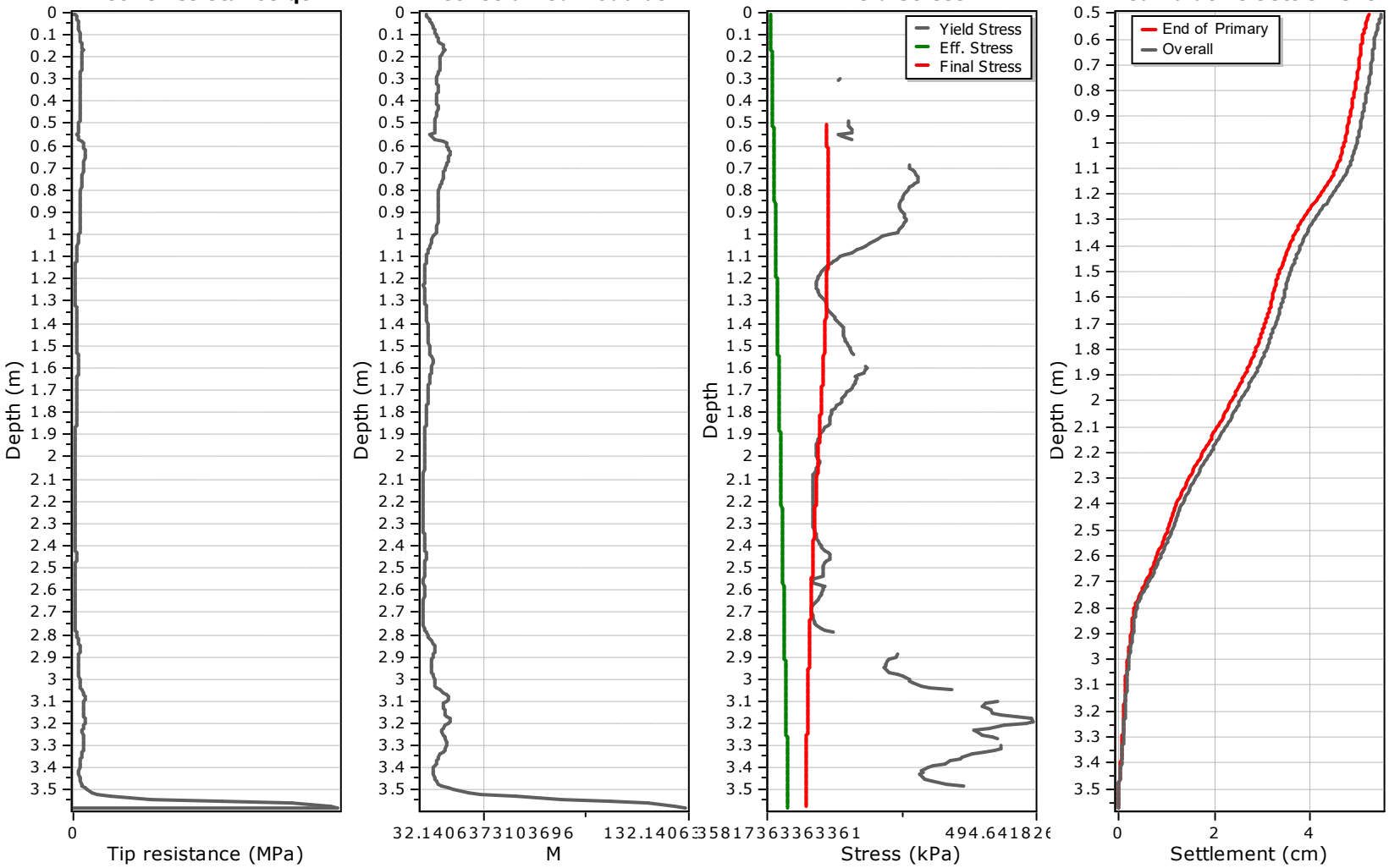
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT06
Total depth: 3.58 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 100.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta \sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

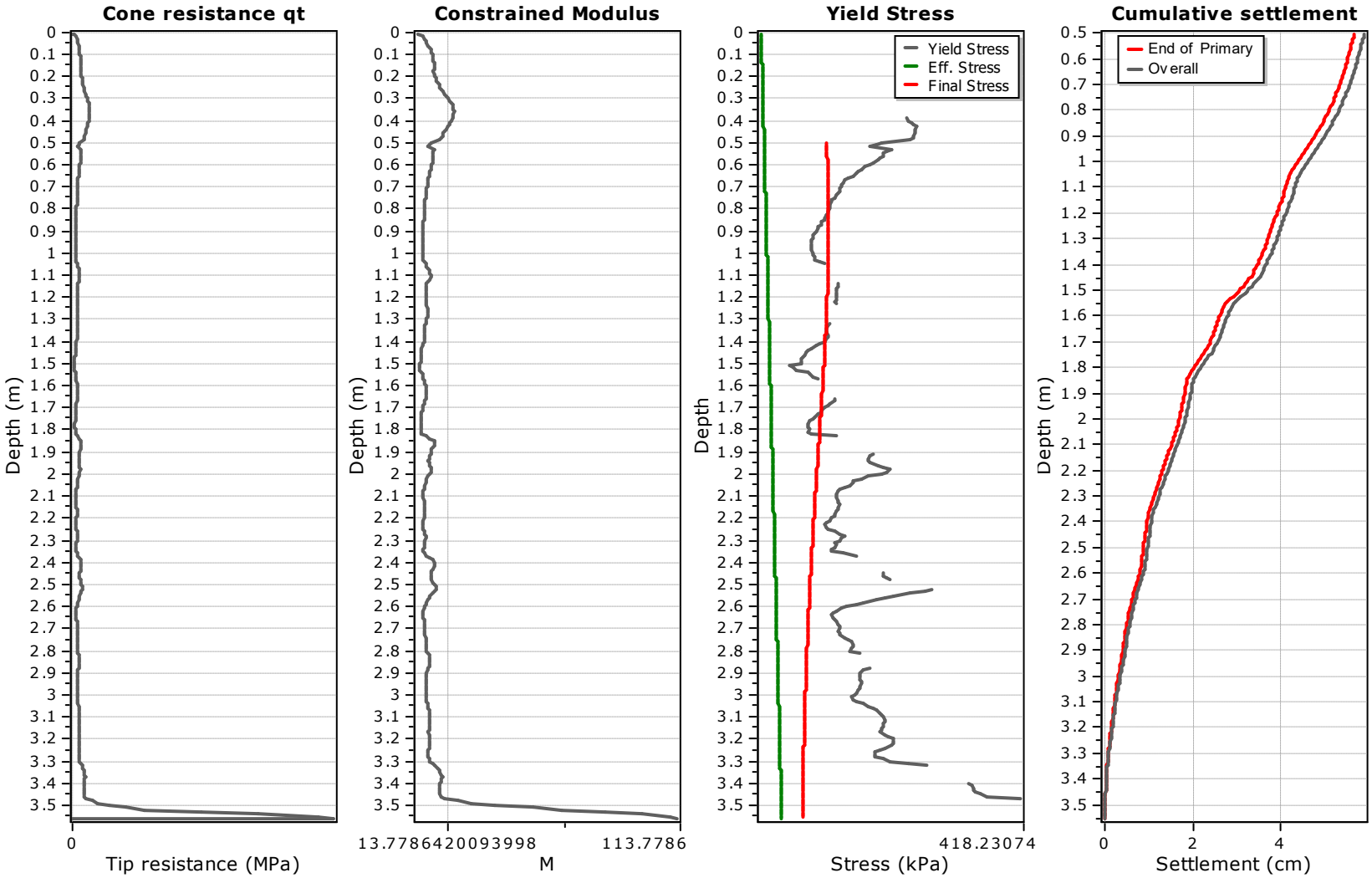
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT07
Total depth: 3.56 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 100.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

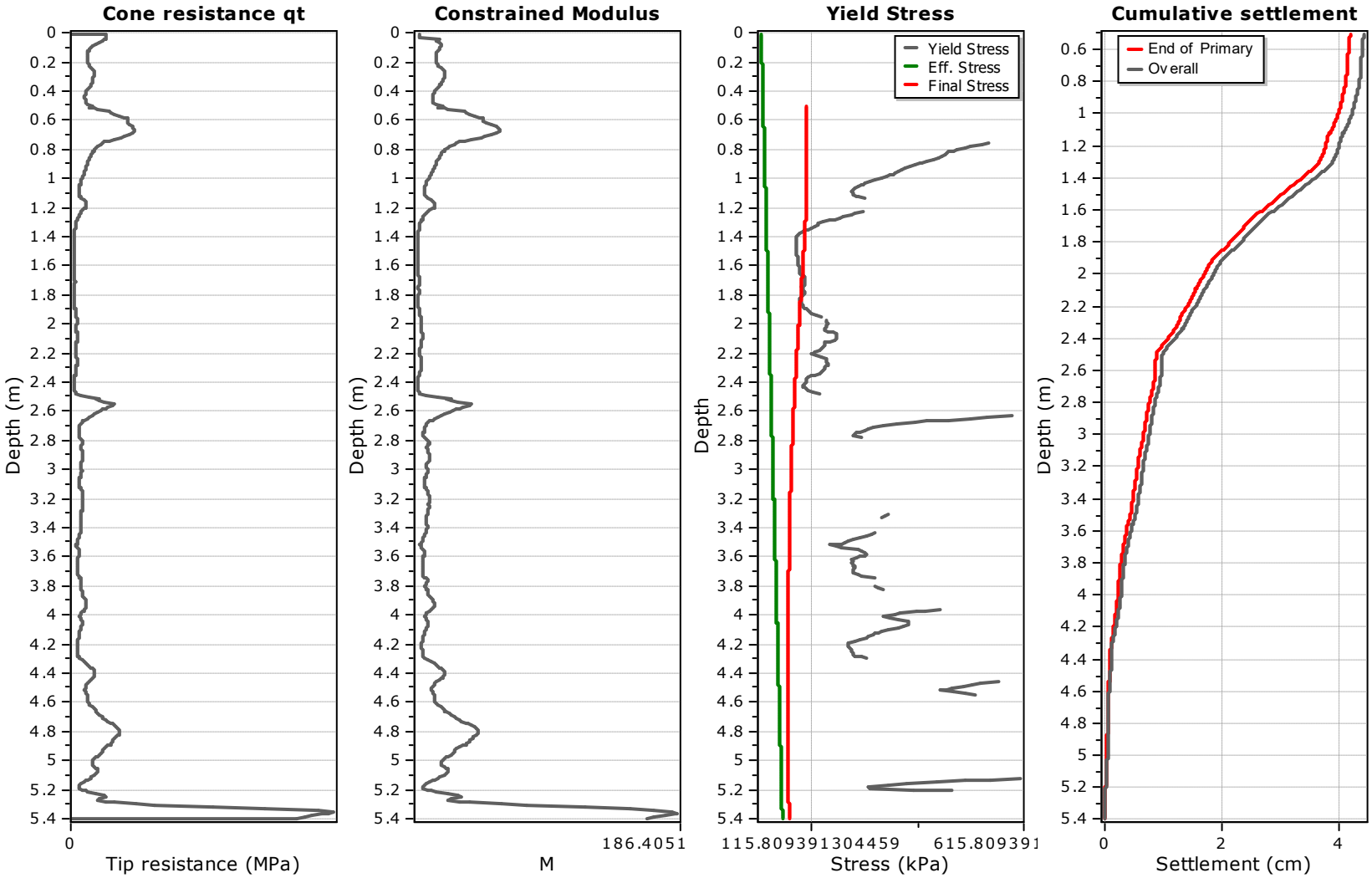
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT08
Total depth: 5.40 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 100.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

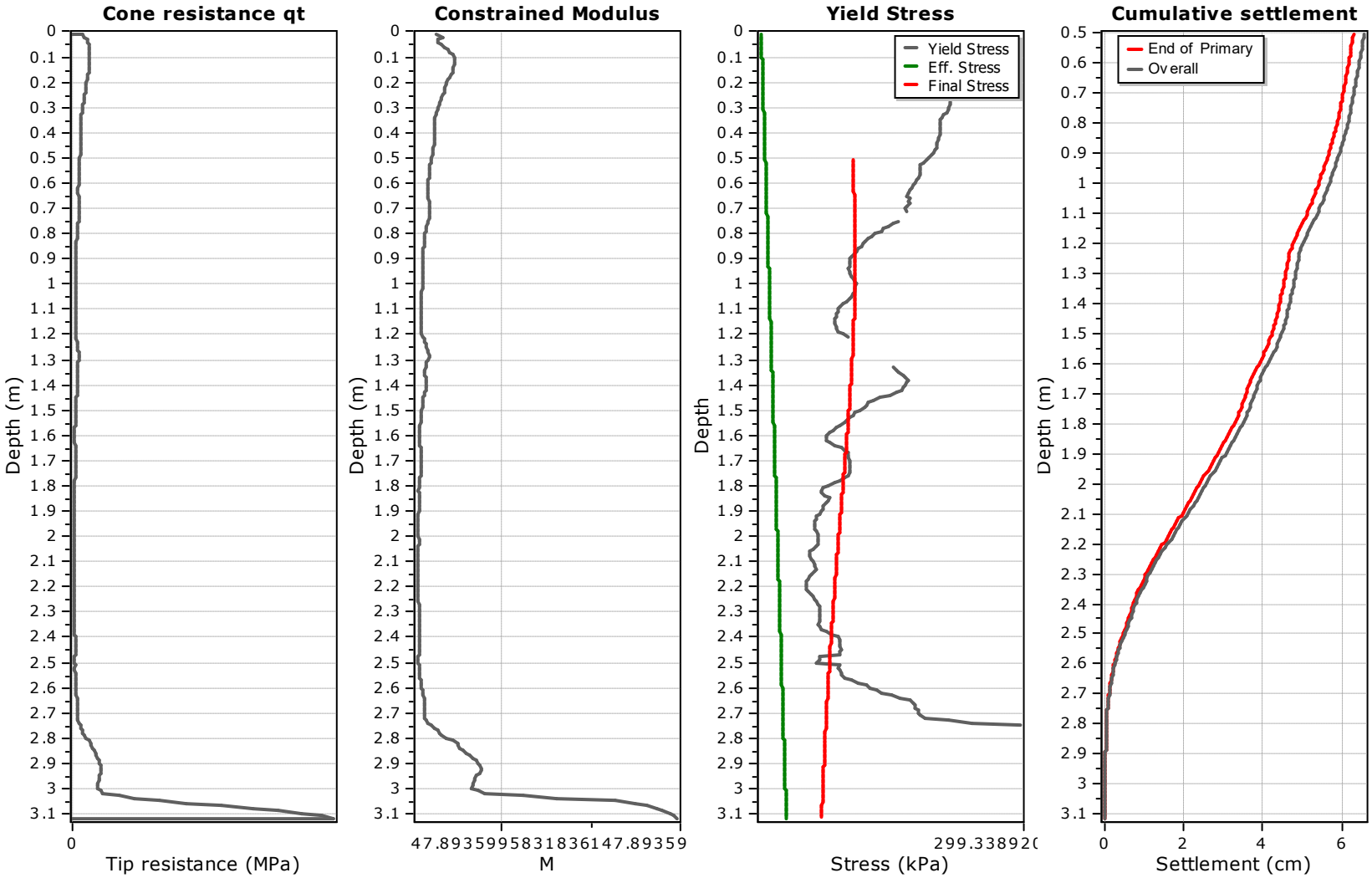
where t_p is the duration of primary consolidation

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: CPT09
Total depth: 3.12 m, Date: 8/05/2025
Surface Elevation: 0.00 m, Est. GWL: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

Settlements calculation according to theory of elasticity*



Calculation properties

Footing type: Rectangular
Footing width: 3.00 (m)
L/B: 1.0
Footing pressure: 100.00 (kPa)
Embedment depth: 0.50 (m)
Footing is rigid: No
Remove excavation load: No
Apply 20% rule: No
Calculate secondary settlements: Yes
Time period for primary consolidation: 6 months
Time period for second. settlements: 600 months

* Primary settlement calculation is performed according to the following formula:

$$S = \sum \frac{\Delta\sigma_v}{M_{CPT}} \Delta z$$

* Secondary (creep) settlement calculation is performed according to the following formula:

$$S = C_\alpha \cdot \Delta z \cdot \log(t/t_p)$$

where t_p is the duration of primary consolidation

SETTLEMENT SUMMARY TABLE

CPT	Footing Depth (m)	Footing Width (m)	Footing Pressure (kPa)	Settlements - 6 months (mm)	Settlements - 50 years (mm)
1	0.5	3	50	22	23.5
2	0.5	3	50	15	16
3*	0.5	3	50	24	29
4	0.5	3	50	23	24
5	0.5	3	50	22	24
6	0.5	3	50	26	29
7	0.5	3	50	28	31
8	0.5	3	50	21	23
9	0.5	3	50	31	34
1	0.5	3	100	44	46
2	0.5	3	100	31	32
3*	0.5	3	100	48	53
4	0.5	3	100	46	47
5	0.5	3	100	45	46
6	0.5	3	100	52	55
7	0.5	3	100	57	59
8	0.5	3	100	42	44
9	0.5	3	100	63	65
*Limited to 5m depth					

Appendix F: Earthworks Specification



Great People | Practical Solutions

03 June 2025

Proposed Industrial Building

1945 State Highway 10, Waipapa

EARTHWORKS SPECIFICATION

CLL

Job No. NTH2025-0002| Version 0

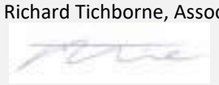
Auckland

A3 | 63 Apollo Drive
Rosedale 0632
New Zealand

Ph: +64 9 4144 632

www.cmwgeosciences.com

Version control

Document version information	
Job number	NTH2025-0002
Prepared by	Richard Tichborne, Associate Engineering Geologist 
Reviewed by	Gaurav Mathur, Principal Geotechnical Engineer 
Authorised by	Dave Morton, Principal Geotechnical Engineer CMEngNZ, CPEng 

Review and update history

Version	Date	Comments
A	29 May 2025	Initial draft for internal review
0	03 June 2025	Final draft for client review

CONTENTS

1.0 INTRODUCTION 3

2.0 RELEVANT DOCUMENTS 3

2.1 Standards, Guidelines and Consents 3
2.2 Geotechnical Investigation / Design Report 3
2.3 Conflicting Information 3

3.0 GEOTECHNICAL OBSERVATIONS 3

4.0 CONSTRUCTION SPECIFICATION 3

4.1 Site Preparation 3
4.2 Erosion and Sediment Control 3
4.3 Stockpiles 4
4.4 Fill Foundations and Benching Slopes 4
4.5 Fill Materials and Conditioning 4
4.5.1 Material Types 4
4.5.2 Blending of Unsuitables 4
4.5.3 Hardfill 4
4.5.4 Material Conditioning 4
4.6 Fill Placement, Compaction and Testing Requirements 4
4.6.1 Soil Fill 4
4.6.2 Site Won Rock Fill 5
4.6.3 Hardfill 5
4.6.4 Compaction Testing Reporting Requirements 6
4.6.5 Depth and Extent 6
4.7 Finishing Works and Topsoil Spread 6
4.7.1 Overcut 6
4.7.2 Topsoil Depth 6
4.7.3 Unsuitable Materials 6
4.7.4 Road Subgrades 7

5.0 ASBUILT INFORMATION REQUIREMENTS 7

1.0 INTRODUCTION

CMW Geosciences (CMW) was engaged by CLL to prepare an Earthworks Specification for a site located at 1945 State Highway 10, Waipapa, which is being considered for the construction of an industrial building.

This report is to support a Building Consent application to the Far North District Council**.**

This specification covers the geotechnical remediation works and associated earthworks outlined in the CMW Investigation Report (GIR), referenced NTH2025-0002 Rev 0. It supplements the information provided on the design drawings and GIR. It provides detail on the required specification for:

- Site clearance and preparation including topsoil stripping and stockpiling.
- Cut to fill earthworks operations.
- Fill materials and testing requirements.
- Earthworks finishing and respread of topsoil; and,
- As-built records.

Excluded from the scope are geotextile reinforced slopes with a face and steeper than 30 degrees or retaining structures covered by a Building Consent. Such works will be carried out in accordance with an independent structure specific specification.

Unless varied onsite by the Geotechnical Engineer, the following specification requirements must be met in order for CMW to provide a Geotechnical Completion Report (GCR) for the works.

2.0 RELEVANT DOCUMENTS

2.1 Standards, Guidelines and Consents

The works shall comply with the relevant sections of the following standards, guidelines, and consents:

- Health and Safety at Work Act 2015 and Regulations 2016.
- All Project Resource Consent Conditions and Engineering Works Approvals.
- Auckland Council Code of Practice for Land Development and Subdivision Chapter 2 (v2, May 2023)
- Auckland Council Erosion and Sediment Control Guide, GD05 (August 2023).
- NZS 4431:2022 Engineered Fill Construction for Lightweight Structures.
- NZS 4402: 1986 Methods of Testing Soils for Civil Engineering Purposes; and,
- NZS 4404: 2010 Code of Practice for Urban Land Subdivision.
- WorkSafe NZ – Excavation Safety Good Practice Guidelines, July 2016.

2.2 Geotechnical Investigation / Design Report

Details of the geotechnical investigation, soil and rock conditions encountered, and the design of the geotechnical remedial works are contained in the CMW report NTH2025-0002 Rev 0. The contractor should be aware of the contents and comply with the recommendations contained in that report.

2.3 Conflicting Information

Where there is any conflict or discrepancy in the requirements of this specification and the documents listed above the matter shall be referred to the Geotechnical Engineer (CMW) for clarification.

3.0 GEOTECHNICAL OBSERVATIONS

The following items form hold points in the construction works that require observation, testing and approval by the Geotechnical Engineer (CMW):

- Foundations for filling once topsoil and unsuitable materials have been stripped prior to fill placement.
- Any imported soil fill materials prior to placement on site.
- Drainage aggregate quality prior to placement.
- Geotextile layers once in place and prior to backfilling.
- Filling placed at regular intervals to comply with the fill test frequency requirements below.
- Compaction of backfilling in critical service trenches.
- Any unforeseen ground conditions that may impact on the construction works or future land use; and,
- Installation of any settlement monitoring plates or points, application of pre-load and approval prior to its removal.

It is the contractor's responsibility to ensure that the Geotechnical Engineer is given reasonable notice and opportunity to observe the above works and that the works do not proceed until approval has been gained from the Geotechnical Engineer.

72 hours is considered reasonable notice.

4.0 CONSTRUCTION SPECIFICATION

4.1 Site Preparation

The Contractor shall remove all vegetation from the site of the earthworks except for trees indicated for preservation by either markings on site or notes on the drawings.

Clearing shall mean the felling of all trees, except those indicated, removal of all growth other than grass and weeds, extraction of tree stumps, demolition of fences and other minor items remaining in the way of site stripping, and the complete disposal of all items. Stumping shall mean the removal of all roots greater than 25mm in diameter.

Cleared areas shall be stripped to remove all turf and organic topsoil to depths designated by the Engineer ahead of or during the stripping operations. Stripping shall also cover picking up any old topsoil stockpiles and any buried topsoil detected during the course of the works. The depth shall be sufficient to remove all materials considered unsuitable as fill or unsuitable to remain beneath fill but will not necessarily extend to the full limit of organic penetration.

4.2 Erosion and Sediment Control

The works shall be carried out in accordance with the project Erosion and Sediment Control Management Plan and associated drawings.

The contractor shall ensure good control of surface water runoff at all times by shaping of the surface in cut and fill areas to prevent ponding during rainfall events.

The location of temporary Sediment Retention Ponds (SRP) on sloping ground shall be decided upon with input from the Geotechnical Engineer. Where comment of SRP stability is sought by Council then all fill materials used to form batters, must be placed as engineered fill and tested accordingly unless advised otherwise by the Geotechnical Engineer.

When decommissioning temporary sediment ponds, all water softened material in the bases and sides of the ponds shall be removed and undercut to the satisfaction of the Geotechnical Engineer. Backfilling of temporary ponds shall be to the compaction standard for general filling unless otherwise specified.

4.3 Stockpiles

Topsoil stockpiles can add significant driving force for slope instability when placed at or near the crest of a slope. The location of all temporary stockpiles must be approved by the Geotechnical Engineer prior to placement. Where stockpiles cannot be avoided above sloping ground, they should be placed over a wide area with the height restricted under the direction of the Geotechnical Engineer.

4.4 Fill Foundations and Benching Slopes

The foundation on which filling is to be placed must be observed by the Geotechnical Engineer following clearing and prior to the placement of any filling to confirm the strength of the underlying soils is sufficient.

Where it is found, after clearing and stripping operations as specified, that the foundation on which filling is to be placed is unstable, or in cuttings if it is found after the excavation has been cut down to the levels shown in the drawings that unstable ground is encountered, then the Engineer may direct that the soft, yielding, or unstable materials causing such instability shall be removed to such depth as directed.

Benching of slopes prior to the placement and compaction of filling should be carried out in accordance with the normal requirements of NZS 4431 and related documents as mentioned above, especially on the steeper areas of the site, to ensure that the filling placed is keyed into the underlying natural ground. This would involve the cutting of benches approximately the width of a bulldozer, with a slight reverse gradient back into the slope. The optimum depth of each bench is best confirmed by careful Engineering inspections during construction.

4.5 Fill Materials and Conditioning

4.5.1 Material Types

Table 1: Material Types

Material Type	Description	Comments
T	Topsoil	Natural material at surface
F	Fine-grained	≥35% material passing the 75µm sieve. 100% passing 19mm sieve.
I	Intermediate-grained	15% to 35% passing the 75µm sieve. 100% passing 75mm sieve.
C	Coarse Grained or aggregate	15% material passing the 75µm sieve. 100% passing 150mm sieve.
R	Rock	Material described as rock as per NZGS Field Description of Soil and Rock
M	Manufactured	Any manufactured material created or modified for the purpose of earthworks (such as crushed concrete, recycled asphalt, etc)

The soils at this site are predominantly classified as material type F and C.

4.5.2 Blending of Unsuitables

The blending of ‘unsuitables’ into structural fills may be undertaken only at the discretion of the Geotechnical Engineer following a request by the contractor and with sufficient time for appropriate consideration. Approval for any such blending must be sought from and provided by the Geotechnical Engineer in writing prior to the commencement of any blending.

In consideration of any such requests, the Geotechnical Engineer will need to be able to assess, inter alia, the composition of the materials requested to be blended, the location on the site for the proposed fills, the fill depths and the elevation of the blended materials within the fills and any environmental constraints.

As a minimum, it is expected that any blended fills will be directed to comply with the following conditions:

- All significant, solid inorganics (such as roots and stumps) to be removed prior to blending; and,
- All inclusions of suitable man-made materials (e.g. concrete) and any excavated rock must comply with the normal compaction requirements specified herein in terms of size and ability for appropriate compaction to be achieved in close vicinity to the inclusions.
- All blended materials must be appropriately mixed/ blended normal fill materials to the specified ratio. Un-mixed interlayering of normal engineered filling with unsuitables will not be accepted.
- As a preliminary indication, it is expected that the ratio of unsuitables to suitable fill will not exceed 1 in 10 by volume.

It is expected that the Geotechnical Engineer will also need to apply limits to the location/ depth of blended fills within any specified fill area.

4.5.3 Hardfill

Hardfill used as structural filling shall be a graded, unweathered, durable, crushed rock product approved by the Geotechnical Engineer, with a grading suitable for compaction.

4.5.4 Material Conditioning

The cut materials on site may require some drying prior to compaction to achieve the required specification. This may be done by harrowing (such as with discs) and air drying when conditions permit or by the addition of hydrated lime.

The addition of lime and/or cement to engineered filling in concentrations greater than 3% requires the approval of the Geotechnical Engineer.

All additives such as lime or cement proposed for use in backfill materials for Reinforced Earth Slopes or other materials in contact with geosynthetics must be approved and monitored by the Geotechnical Engineer.

4.6 Fill Placement, Compaction and Testing Requirements

4.6.1 Soil Fill

Soil placed in fills shall be conditioned and compacted until the following conditions are satisfied.

It should be noted that the surface of the fill area prior to placement of subsequent fill lifts should be in a state so as not to create a break in the consistency of the fill material between lifts. For example, if surfaces are left to dry out, or rolled to seal them from rainfall infiltration then the surface must be broken up and scarified with rippers or by other means to ensure a good bond between fill lifts.

The maximum lift of filling placed before compaction is dependent on the size and nature of the compaction equipment. Typically, 250mm to 300mm loose depth is considered the maximum for a Cat 815/820 type compactor. In any event the contractor must ensure that the fill is placed and compacted to achieve even and adequate compaction throughout each layer/lift.

The test criteria and frequency are set out below.

Table 2: Soil Fill Testing Requirements

Material Type	Test and Methods	Acceptance Requirements	Min. Frequency
F (Fine Grained)	Particle size distribution (NZS4407 test 3.8 or NZS4402.2.8.1)	Refer to Table 1	1 per source and 1 per change in material
	Dry density / water content relationship (NZS4402.4.1.1, NZS4402.4.1.2)	OMC and MDD determined	
	Water content (NZS4402.2.1)	Between OMC -2% and OMC +4%	
	Solid density (NZS4402.2.7.1 or 2.7.2)	Solid density determined	
	Liquid and plastic limits (NZS4402.2.2, NZS4402.2.3 and NZS4402.2.4)	Determined	1 per source, 1 per change in material and 1 per 4,000m^3
	Field water content and density (NDM) (NZS4402.2.1 and NZS4407 test 4	Maximum 10% air voids over 10 tests. Maximum single value 12%	2 per 1,000m^3 (minimum 2 per lift)
	Shear strength (NZGS guideline for hand held shear vane)	Minimum average 140kPa over 10 tests. Minimum single value 110kPa	2 per 1,000m^3 (minimum 2 per lift)
I (Intermediate Grained)	Particle size distribution (NZS4407 test 3.8 or NZS4402.2.8.1)	Refer to Table 1	1 per source and 1 per change in material
	Dry density / water content relationship (NZS4402.4.1.1, NZS4402.4.1.2)	OMC and MDD determined	
	Water content (NZS4402.2.1)	Between OMC -2% and OMC +4%	
	Solid density (NZS4402.2.7.1 or 2.7.2)	Solid density determined	
	Liquid and plastic limits (NZS4402.2.2, NZS4402.2.3 and NZS4402.2.4)	Determined	1 per source, 1 per change in material and 1 per 4,000m^3
	Field water content and density (NDM) (NZS4402.2.1 and NZS4407 test 4	Maximum 10% air voids over 10 tests. Maximum single value 12%	2 per 1,000m^3 (minimum 2 per lift)
	Shear strength (NZGS guideline for hand held shear vane)	Minimum average 140kPa over 10 tests. Minimum single value 110kPa	2 per 1,000m^3 (minimum 2 per lift)
	Dynamic Cone Penetrometer	>5 blows per 100mm	Only if and as specified by Geotechnical Engineer for additional assurance.
C (Coarse Grained)	Particle size distribution (NZS4407 test 3.8 or NZS4402.2.8.1)	Refer to Table 1	1 per source and 1 per change in material
	Dry density / water content relationship (NZS4402.4.1.1, NZS4402.4.1.2)	OMC and MDD determined	1 per source and 1 per change in material
	Water content (NZS4402.2.1)	Between OMC -2% and OMC +4%	
	Solid density (NZS4402.2.7.1 or 2.7.2)	Solid density determined	
	Field water content and density (NDM) (NZS4402.2.1 AND NZS4407 test 4)	>90% MDD or Maximum 10% air voids over 10 tests. Maximum single value 12%	1 per 1,000m^3 (min 2 per lift)
	Dynamic Cone Penetrometer	>5 blows per 100mm	2 per 1,000m^3 (min 2 per lift)

The test criteria and/or frequency may be relaxed at the discretion of the Geotechnical Engineer (CMW) for the project or in a discrete fill area subject to the consistency of the results achieved being acceptable over a specified period of time.

4.6.2 Site Won Rock Fill

A compaction specification is to be determined by the Geotechnical Engineer based on site trials.

4.6.3 Hardfill

The test criteria and frequency are set out below for hardfill.

Table 3: Hardfill Testing Requirements

Material Type	Test and Method	Acceptance Requirement	Min. Frequency
GAP 65	Particle size distribution (NZS4407 test 3.8 or NZS4402.2.8.1)	Refer GAP65 particle size criteria in NZS4431 (Table A2)	1 per source and 1 per change in material
	Dry density / water content relationship (NZS4402.4.1.1, NZS4402.4.1.2)	OMC and MDD determined	
	Solid density (NZS4402.2.7.1 or 2.7.2)	Solid density determined	
	Weathering quality index	AA, AB, AC, BA, BB or CA	
	Field water content and density (NDM) (NZS4402.2.1 AND NZS4407 test 4)	>95% MDD	1 per 1,000m^3 (min 2 per lift)
	Impact test – 4.5kg hammer (ASTM D 5874)	CIV > 25	1 per 50m^2 on each compacted layer (min 2 per lift)
GAP 40	Particle size distribution (NZS4407 test 3.8 or NZS4402.2.8.1)	Refer GAP40 particle size criteria in NZS4431	1 per source and 1 per change in material
	Dry density / water content relationship (NZS4402.4.1.1, NZS4402.4.1.2)	OMC and MDD determined	

Material Type	Test and Method	Acceptance Requirement	Min. Frequency
	Solid density (NZS4402.2.7.1 or 2.7.2)	Solid density determined	
	Weathering quality index	AA, AB, AC, BA, BB or CA	
	Field water content and density (NDM) (NZS4402.2.1 AND NZS4407 test 4)	>95% MDD	1 per 1,000m^3 (min 2 per lift)
	Impact test – 4.5kg hammer (ASTM D 5874)	CIV > 25	1 per 50m^2 on each compacted layer (min 2 per lift)

4.6.4 Compaction Testing Reporting Requirements

All test location coordinates to be recorded by handheld GPS with reference to the NZTM projection. If testing is undertaken by the contractor, test location coordinates, with date and test number reference are to be provided to the Geotechnical Engineer in electronic (excel) format on a weekly basis. Alternatively, the Geotechnical Engineer may approve the use of site plans to mark the location of tests in lieu of GPS location.

The volume of filling placed for each progress claim month (typically ending 20th of the month) including all filling placed (undercut and cut to fill) to be provided to the Geotechnical Engineer monthly by the contractor or Engineer to the Contract to allow assessment of test frequency adequacy.

Interim fill test summaries are to be provided to the Geotechnical Engineer for review on a regular basis.

4.6.4.1 Aggregate

Auckland Council now generally require that subsoil drainage has a 100-year design life and is essentially maintenance free, unless there is an entity such as body corporate or resident's association that maintenance responsibility can be transferred to. Maintenance by individual owners is not practical as the subsoil drainage systems usually cross over, and generally benefit, multiple lots.

This requires a high-quality drainage aggregate with the following properties:

- Self-filters against the soils present on site preventing loss of permeability over time; or, able to be practically wrapped in a suitable geofabric filter.
- High permeability, which translates to a low fines content; and
- Stable and not subject to crushing, weathering, internal erosion or piping, or significant loss of volume (settlement) over time.

Ideally the drainage aggregate should be a well graded self-filtering material such as a clean (free of significant cohesive fines) scoria SAP50 product or Transit F/2 specification filter media.

Alternatively, for shear key drainage, blanket drains, underfill drainage and all applications where full encapsulation with a geofabric filter cloth can be relatively simply and safely achieved, an open graded product, preferably 27/7 Scoria may be used. Care will need to be taken to ensure that the cloth fully encapsulates the aggregate. Observation of the cloth wrap should form an inspection hold point prior to backfilling over the drain. Drain coils in this instance do not require a filter sock.

For counterfort trench drains and applications where a full filter cloth wrap is not practical to construct, and the performance of the drain is not critical to maintaining slope stability then a SAP20 or SAP50 may be used without a filter cloth wrap. Drains which fall into this category must be defined and confirmed as such by the Geotechnical Engineer. Additionally, where such materials are used, regular visual inspections and approval of the aggregate quality and laboratory grading curves is required. This is to comprise visual inspection of each site stockpile prior to material being placed in the trench. One wet sieve grading curve from each site stockpile per week is required while material is being imported to site to monitor the fines content. Drain coils in this instance do not require a filter sock.

For counterfort trench drains and applications where a full filter cloth wrap is not practical to construct, and the performance of the drain is critical to maintaining slope stability then a TNZ/F2 or (approved) modified F2 aggregate must be used. In conjunction with this an approved high specification drainage pipe with filter cloth surround such as the Megaflo products may be specified.

Light compaction (i.e. tamping with back of excavator bucket) only is to be applied to drainage aggregates.

4.6.4.2 Filter Cloth

Any filter cloth surround specified on the drawings shall meet the requirements of Transit Specification TNZ/F7, Filtration Class 2 and Strength Class B unless otherwise specified on the drawings.

4.6.4.3 Trench Backfill in Service Trenches

It is important on all sloping land that service trenches running parallel to contours are avoided where possible as they can permit the ingress of surface water and/or lateral movement of trench sides that could lead to progressive land slippage, help develop tension cracks and possibly lead to slope and building instability.

Backfilling of all trenches should be to the general fill standard above unless specifically varied in writing by the Geotechnical Engineer and where possible the pipe bedding in all trenches on steep ground should contain a 50mm diameter perforated drain coil that is connected into each manhole on the line. This is to help prevent instability arising from the ingress of surface water and/or lateral movement of trench sides that could lead to progressive land slippage and is especially important where the lines are in close proximity to buildings.

The subdivision drain laying contractor must be made aware of these requirements and of the need to contact us when trench backfilling is to take place.

4.6.5 Depth and Extent

The location, extent and depth of the drainage shown on the design drawings may be varied on site by the Geotechnical Engineer in response to the ground conditions encountered.

4.7 Finishing Works and Topsoil Spread

4.7.1 Overcut

All areas cut to below finished level should be reinstated with engineered filling to the satisfaction of the Geotechnical Engineer.

4.7.2 Topsoil Depth

Topsoil respread depth should be between 100mm and 300mm, or as directed by the Engineer to the contract. On ground steeper than 1V:3H the surface should be roughened under the supervision of the Geotechnical Engineer prior to topsoil placement.

4.7.3 Unsuitable Materials

At the conclusion of earthworks all surplus unsuitable materials should be removed from site or placed in designated permanent stockpiles. The size and location of such stockpiles must be approved by the Geotechnical Engineer and recorded on the as-built drawings.

4.7.4 Road Subgrades

Testing and formation of road subgrades will be carried out as part of the subdivision civil works package.

5.0 ASBUILT INFORMATION REQUIREMENTS

In order to provide a Geotechnical Completion Report (GCR) if required certain as-built information must be provided to CMW. It is the contractor's responsibility to ensure that all of the following items are surveyed prior to placing filling. The survey of these items should therefore form a hold point in the construction sequence.

- The location and invert of all sub surface drainage; and,
- The depth of filling placed including all benching, undercuts, shear or fill drainage keys and temporary ponds which have been backfilled.

CMW require the following as-built information to be provided for the GCR:

- Cut and fill depth plan (including undercuts and shear keys).
- Final contour plan.
- Drainage locations and inverts (surface and subsurface).
- Drainage outlet locations (surface and subsurface).
- Details of any defined overland flow paths.
- Location and heights of any retaining walls and Mechanically Stabilised Earth (MSE) structures.
- Position and extent of any geogrid layers (in plan view).
- Material data for imported products used such as draincoils, aggregates and geofabrics as well as confirmation that products installed comply with the requirements of the project drawings and this specification; and,
- Any settlement Monitoring Data.

CMW Geosciences

Great People | Practical Solutions

Auckland

A3 | 63 Apollo Drive
Rosedale 0632
New Zealand

Ph: +64 9 4144 632

www.cmwgeosciences.com

WILLIAMSON
WATER & LAND ADVISORY

Auckland | Whangārei | Tauranga
New Zealand
T +64 21 613 408
E wendi.williamson@wwla.kiwi
W www.wwla.kiwi

CLL Group
via email

Attention: Tim Hunger
tim@cll.net.nz

8 July 2025 WWLA1534

Redevelopment at State Highway 10, Waipapa – Contamination Assessment

1. Introduction

Williamson Water & Land Advisory Ltd (WWLA) is pleased to provide this contamination assessment of CLL Group's redevelopment of Lot 2 DP177522 at State Highway 10, Waipapa (the site, location shown in **Figure 1**).



Figure 1. Site location.

2. Proposed Development

CLL Group propose to construct a building on the southern portion of the site for use by NZ Post. The building will be a single storey warehouse-type structure with paved yard and accessways, requiring only minimal soil disturbance for building foundations and services installation.

3. Objective and Scope of Work

The purpose of this letter is to assess the likelihood for soil contamination at the site and the potential risks posed during future soil disturbance. The scope of work involved:

- An investigation of the site history via:
  - Review of historic aerial photographs from Retrolens.co.nz and Google Earth.
  - Review of Northland Regional Council's (NRC) Selected Land Use Register (SLU).
- An assessment of the former site uses against the Ministry for the Environment's Hazardous Activities and Industries List (HAIL), the likelihood for contamination to occur as a result of identified HAIL activities, and the potential extent and magnitude of any contamination.
- Review of soil investigation information and laboratory testing results provided by CLL Group.
- An evaluation of the implications for future redevelopment of the site in terms of consenting, further investigation, earthworks and construction.

4. Site History

A review of the site history from the various listed sources is presented in **Table 1**.

In summary, the site history review shows the site was used for market gardening in the late 1970s and early 1980s, and was later used as the laydown yard for a neighbouring diesel mechanic, who had a truck stop with fuel bowser located to the north of the site. The fuel bowser and tank appear to have been removed in 2023-2024. The site features on the Northland Regional Council's (NRC) Selected Land Use Register (SLU) for these activities.

Table 1. Site history review

<table>
<tr><th>Source</th><th>Information</th></tr>
<tr><td>Historical aerial photographs:
Retrolens.co.nz (1953, 1968, 1977, 1979, 1981); Google Earth Pro (2003, 2007, 2009, 2012, 2012-2023).</td><td>

In the 1953 to 1977 aerial images the site is vacant and grassed, likely used for pasture consistent with surrounding land use.
The 1979 and 1981 images show planting indicating market gardening (refer Figure 2).
The next available image is from 2003 and shows the site part of a larger property that includes the lot to the north. The site itself is largely vacant, with the property to the north containing a workshop building.
A fuel bowser is evident on the neighbouring site from 2007 onwards.

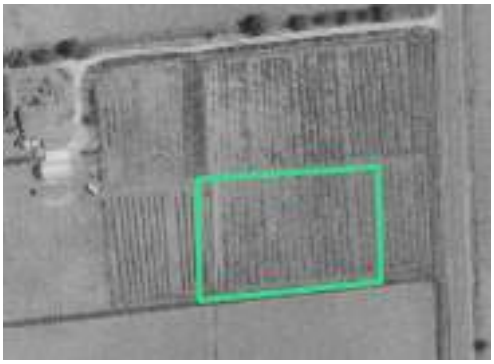

Figure 2. 1979 aerial photograph with site footprint in green (Image source: Retrolens.co.nz).

Figure 3.. 2016 aerial image (Good Earth)
</td></tr>
<tr><td>Google Streetview</td><td>

June 2012: The site is a mostly vacant gravelled yard with some boats and truck parts stored on the periphery. Land to the north of the site (Lot 1 DP177522) has a two-storey building occupied by a diesel and mechanical engineering business (Norstar Truck and Marine) and an Allied diesel truck stop.
February 2013, September 2019: No significant changes observed.
September 2022: The site has a 'for sale' sign, while on the adjacent site the diesel mechanic business appears to have vacated and the property subdivided.
May 2023, September 2024: The site has been cleared and hardfill laid, and there is a crane onsite. The CLL logo is evident and metal items are stored along the western site edge. By 2024 the fuel bowsers on the lot to the north have been removed.

</td></tr>
</table>

Source	Information
NRC SLU	The site is listed on the NRC selected land use (SLU) register as an unverified HAIL site, under Activity F8 (Transport depots or yards), F4 (Motor vehicle workshops), and F7 (Service stations). The classification is expected to have been applied prior to subdivision of the site as discussed further below.

5. Potential for Contamination

Land where HAIL activities are likely to have occurred and contaminants are present above published background levels are subject to the requirements of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (the NESCS).

Potentially contaminating activities identified for the site are described in **Table 2** along with an assessment of the likelihood and magnitude of any contamination resulting from the activity, and whether the activity constitutes a HAIL. The HAIL assessments have been shaded red where a HAIL is considered likely to have occurred, activities that have potential to have caused contamination but require soil testing to confirm are highlighted in orange, and those shaded green are not considered HAIL activities in the context of this site.

In summary, the SLU entries either relate to the adjacent allotment or there is no evidence to substantiate. There is low potential for residual levels of contaminants associated with former market gardening and storage of machinery/ vehicles associated with the adjacent diesel mechanic. Soil testing was required to assess whether contamination exists.

Table 2. Potential contaminating activities from previous land uses

Previous land use and potential HAIL	Potential contaminants	Possible extent of contamination	HAIL Assessment
Application of persistent pesticides across the site due to market gardening in the 1970s and 1980s. *HAIL Activity A10. Persistent pesticide use including market gardens.*	Organochlorine pesticides (OCPs), arsenic, copper, lead.	The site was used for market gardening at a time when OCPs and other persistent pesticides were used in New Zealand. Spray application can result in pesticide residues being present in surficial soils, however topsoil on this site has been disturbed/ removed as part of placement of hardstand. There is a low potential of traces of pesticides to be present in the underlying soils.	Activity A10 **applies** to the site.
SLU entry: Diesel mechanic on lot to north using site as laydown yard. *HAIL Activity F4. Motor vehicle workshops.*	Total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), metals, asbestos.	It appears that the subject site was once part of a larger lot that was used by a diesel engine mechanic. The main workshop was located on the land to the north while the subject site was hardstand with evidence of parking of vehicles and machinery. This subsidiary activity occurred on the site until it was subdivided around 2022.	Activity F4 **does not apply** to the site but is applicable to the adjacent allotment.

Previous land use and potential HAIL	Potential contaminants	Possible extent of contamination	HAIL Assessment
Storage of ancillary equipment/ machinery associated with the workshop. *HAIL Activity I. Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.*	TPH, PAH, metals, asbestos.	The storage of machinery and parts associated with the workshop activities does have potential for localised impacts on mainly shallow soils. Spills or leaks of fuel or oil could occur from stored items, or from entrainment of contaminants rainwater runoff from stored items.	Activity I **may apply if** contaminants are present at levels that pose a risk to human health or the environment.
SLU entry: *HAIL activity F8. Transport depots or yards.*	TPH, PAH, metals.	There is no record of a transport depot on or near the site. In accordance with MfE's HAIL guidance[1], this category relates to refuelling and bulk storage of hazardous substances associated with transport yards. There is no evidence that such activity occurred on the site.	Activity F8 **does not apply** to the site.
SLU entry: *HAIL activity F7. Service stations.*	TPH, metals.	HAIL Activity A17 is indicated to apply to the site on the NRC's SLU but the fuel tank and bowsers were located on the lot to the north and did not encroach on the site. The small scale and recent operation of this development (approx. 2007-2024) presents low likelihood for unreported significant tank leaks or migration of contaminants onto the subject site.	Activity A17 **does not apply** to the site.

6. Soil Contaminant Testing

6.1 Investigation

CLL Group undertook subsurface soil investigations using a mechanical excavator, with soil samples collected for laboratory analysis of asbestos, OCPs and heavy metals, in accordance with the potential contaminants identified in **Table 2**. In total, 6 test pits were excavated at the locations shown in **Figure 4**, with soil samples collected from the natural soil underlying the hardfill that had been recently placed on the site.

[1] MfE, 2023. *Hazardous Activities and Industries List Guidance. Identifying HAIL Land*. Wellington: Ministry for the Environment.



Figure 4. CLL Group sampling plan.

6.2 Results

Sample locations 1-4 encountered around 0.2 m of aggregate hardfill overlying topsoil to the maximum excavation depth of around 0.4. Sample 5 did not have hardfill, with only topsoil down to 0.44 m depth. No contamination was noted including visual or olfactory evidence of hydrocarbons.

Laboratory testing results are attached and presented in **Table 3** along with the applicable soil evaluation criteria as referenced. In summary the results show:

- No asbestos or OCPs were detected.
- Chromium and/or lead and/or nickel were above background in three samples. We note the published background value for this area is based on sandstone rock, but market gardening occurred in this area due to the presence of volcanic soils. The published geological map[2] for the area confirms the present of soils associated with the Kerikeri Volcanics. Chromium, lead and nickel can be naturally elevated in volcanic soils.
- There were no exceedances of the criteria protective of human health (NESCS) or the environment (Eco-SGV).

7. Implications of Findings

7.1 HAIL re-evaluation

At the desk study stage HAIL Activity A10 related to market gardening was confirmed and depending on the results of soil testing, Activity I associated with storage of items associated with the mechanics activities. The laboratory results confirm:

[2] GNS online map. https://data.gns.cri.nz/geology/

- As no persistent pesticides were detected we do not interpret Activity A10 as applicable.
- HAIL Activity I only applies if contaminants are present at a level that poses a risk to human health or the environment. Contaminant levels do not exceed a commercial land use or the environmental criteria and thus the test for applicability of Activity I is not met.

On this basis no HAIL activities are applicable to the site.

7.2 Regulatory Requirements and Consenting

The NESCS applies to sites where HAIL Activities have or are more than likely to have occurred. ***Based on our assessment in Section 7.1 the NESCS does not apply to the site:***

Under NRC's Proposed Regional Plan for Northland (PRPN), the site is ***not deemed "contaminated land" because contaminants are not at levels posing a risk to human health or the environment***. The PRPN does not need to be considered further in regard to contamination consenting.

7.3 Development Considerations

Soil does not present a risk to human health or environmental receptors so is suitable for retaining or reusing on site, but if offsite soil disposal is required this cannot be considered cleanfill due to metal concentrations above published background levels. Standard earthworks controls will be applicable.

Table 3. Soil testing results summary.

Sample information	Sample Location	NESCS Commercial/ Outdoor worker [1]	Eco SGV [2]	Background (sandstone)[3]	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
	Depth (m bgl)				0.18	0.23	0.16	0.18	0.05
	Date				30/04/2025	30/04/2025	30/04/2025	30/04/2025	30/04/2025
	Material type				Topsoil	Topsoil	Topsoil	Topsoil	Topsoil
Asbestos	ACM (bonded) %w/w [6]	0.05	-	-	None detected	None detected	None detected	None detected	None detected
	AF+FA* %w/w [6]	0.001	-	-					
Metals	Arsenic	70	147	12	6	<2	<2	8	<2
	Cadmium	1,300	40	0.31	0.1	0.26	0.2	0.29	0.26
	Chromium	6,300	655	62	26	43	70	68	59
	Copper	NL	614	61	18	16	42	34	39
	Lead	3,300	3059	38	16.6	11.3	10.8	80	13.9
	Nickel	6,000 [4]	-	34	13	34	57	27	38
	Zinc	400,000 [4]	498	143	49	16	62	122	63
OCPs	Refer transcript	-	-	-	<LR	<LR	<LR	<LR	<LR

Notes:

All values in mg/kg.

A dash (-) indicates no value provided. <LR signifies results below the laboratory limit of reporting.

Grey values are below background; black values exceed either background or the laboratory reporting limit if no background has been provided; there were no exceedances NESCS or Eco SGVs.

1 MfE, 2011 Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated). Soil Contamination Standard - Commercial/industrial land use.

2. Manaaki Whenua Landcare Research, 2019. *Updated Development of Soil Guideline Values for the Protection of Ecological Receptors (Eco-SGVs): Technical document.* Added concentration limits using EC30 and site predicted background used. Typical soils, aged contaminants.

3. Manaaki Whenua Landcare Research, 2015. *Background Soil Concentrations of Selected Trace Elements and Organic Contaminants in New Zealand* . Values for sandstone used. https://lris.scinfo.org.nz/layer/48470-pbc-predicted-background-soil-concentrations-new-zealand.

4. National Environment Protection Council [Australia] - National Environment Protection Measure (Assessment of Site Contamination). Health Investigation Levels - Commercial/industrial land use (HIL D)

8. Conclusions

This contamination assessment has found:

- At the desk study stage HAIL Activity A10 related to possible use of persistent pesticides was confirmed and depending on soil contaminant levels Activity I could apply to the storage of vehicles and equipment associated with former mechanic workshop activities on the adjacent site. HAIL activities associated with the SLU entries either relate to the adjacent allotment or there is no evidence to substantiate.
- Soil testing showed no persistent pesticides present, meaning Activity A10 does not apply. In relation to yard activities associated with the mechanic workshop, key contaminants were either not present or below human health and environmental protection levels, meaning that Activity I is not valid.
- Because no HAIL activities are applicable, the NESCS does not apply.
- Contaminated land-related consent is not required under NRC's PRPN.

9. Closure

Please do not hesitate to contact us if you have any questions or require further advice.

Yours sincerely.





Penelope Lindsay
Environmental Geologist
+64 22 1909 648
penelope.lindsay@wwla.kiwi | www.wwla.kiwi

Wendi Williamson
Principal Contaminated Land Consultant
+64 21 613 408
wendi.williamson@wwla.kiwi | www.wwla.kiwi

Attached:

Laboratory transcripts

R J Hill Laboratories Limited
Ground Fl, 28 Heather Street
Parnell
Auckland 1052 New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Certificate of Analysis

Client:	CLL Solutions Limited	**Lab No:**	3875525	A2Pv1
Contact:	Tim Hunger	**Date Received:**	01-May-2025	
	15 Ranginui Street	**Date Reported:**	05-May-2025	
	Mangonui 0420	**Quote No:**		
		Order No:	10809	
		Client Reference:	Waipapa NZ Post Testing	
		Add. Client Ref:	Sampled 30/04/25	
		Submitted By:	Tim Hunger	

Sample Type: Soil

Sample Name	Lab Number	As Received Weight Presence / Absence Testing (g)	Dry Weight Presence / Absence Testing (g)	<2mm Subsample Weight Presence / Absence Testing (g dry wt)	Asbestos Presence / Absence from Presence / Absence Testing	Description of Asbestos Form Presence / Absence Testing
Sample 1	3875525.1	173.9	155.1	14.5	Asbestos NOT detected.	-
Sample 2	3875525.2	157.9	123.2	24.4	Asbestos NOT detected.	-
Sample 3	3875525.3	129.3	88.3	17.6	Asbestos NOT detected.	-
Sample 4	3875525.4	153.3	115.9	18.4	Asbestos NOT detected.	-
Sample 5	3875525.5	132.1	93.6	17.2	Asbestos NOT detected.	-

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Soil			
As Received Weight Presence / Absence Testing	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-5
Dry Weight Presence / Absence Testing	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-5
<2mm Subsample Weight Presence / Absence Testing	Sample ashed at 400°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1-5
Asbestos Presence / Absence from Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-5
Description of Asbestos Form Presence / Absence Testing	Description of asbestos form and/or shape if present. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1-5

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 02-May-2025 and 05-May-2025. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Alexa Badenhorst BSc (Hons)
Team Leader - Asbestos

R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Certificate of Analysis

Client:	CLL Solutions Limited	**Lab No:**	3875400 SPv1
Contact:	Tim Hunger 15 Ranginui Street Mangonui 0420	**Date Received:**	01-May-2025
		Date Reported:	07-May-2025
		Quote No:	
		Order No:	10809
		Client Reference:	Waipapa NZ Post Testing
		Submitted By:	Tim Hunger

Sample Type: Soil

Sample Name:		Sample 1 30-Apr-2025 10:30 am	Sample 2 30-Apr-2025 10:30 am	Sample 3 30-Apr-2025 10:30 am	Sample 4 30-Apr-2025 10:30 am	Sample 5 30-Apr-2025 10:30 am
Lab Number:		3875400.1	3875400.2	3875400.3	3875400.4	3875400.5
Individual Tests						
Dry Matter	g/100g as rcvd	84	74	64	73	68
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	< 2	< 2	8	< 2
Total Recoverable Cadmium	mg/kg dry wt	0.10	0.26	0.20	0.29	0.26
Total Recoverable Chromium	mg/kg dry wt	26	43	70	68	59
Total Recoverable Copper	mg/kg dry wt	18	16	42	34	39
Total Recoverable Lead	mg/kg dry wt	16.6	11.3	10.8	80	13.9
Total Recoverable Nickel	mg/kg dry wt	13	34	57	27	38
Total Recoverable Zinc	mg/kg dry wt	49	16	62	122	63
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
alpha-BHC	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
beta-BHC	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
delta-BHC	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
gamma-BHC (Lindane)	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
cis-Chlordane	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
trans-Chlordane	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
2,4'-DDD	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
4,4'-DDD	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
2,4'-DDE	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
4,4'-DDE	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
2,4'-DDT	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
4,4'-DDT	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Total DDT Isomers	mg/kg dry wt	< 0.08	< 0.09	< 0.10	< 0.09	< 0.09
Dieldrin	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Endosulfan I	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Endosulfan II	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Endosulfan sulphate	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Endrin	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Endrin aldehyde	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Endrin ketone	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Heptachlor	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Heptachlor epoxide	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Hexachlorobenzene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Methoxychlor	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil						
Sample Name:		Sample 1 30-Apr-2025 10:30 am	Sample 2 30-Apr-2025 10:30 am	Sample 3 30-Apr-2025 10:30 am	Sample 4 30-Apr-2025 10:30 am	Sample 5 30-Apr-2025 10:30 am
Lab Number:		3875400.1	3875400.2	3875400.3	3875400.4	3875400.5
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4
1-Methylnaphthalene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
2-Methylnaphthalene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Acenaphthylene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Acenaphthene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Anthracene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Benzo[a]anthracene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.029	< 0.033	< 0.038	< 0.033	< 0.035
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.029	< 0.033	< 0.038	< 0.033	< 0.035
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Benzo[e]pyrene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Benzo[k]fluoranthene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Chrysene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Fluoranthene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Fluorene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Naphthalene	mg/kg dry wt	< 0.06	< 0.07	< 0.08	< 0.07	< 0.08
Perylene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Phenanthrene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015
Pyrene	mg/kg dry wt	< 0.012	< 0.014	< 0.016	< 0.014	< 0.015

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-5
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1-5
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-5
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	1-5
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	1-5
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-5
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	1-5

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	1-5

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 02-May-2025 and 07-May-2025. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Ara Heron BSc (Tech)
Client Services Manager - Environmental

TRAFFIC PLANNING CONSULTANTS LTD

PROPOSED NZ POST DEPOT

1945 STATE HIGHWAY 10
WAIPAPA

TRAFFIC IMPACT ASSESSMENT

Prepared By:
Elemit Fu

August 2025
Reference: 250360
Issue B – Final

Auckland Office:
P O Box 60-255, Titirangi, Auckland 0642
Level 1, 400 Titirangi Road, Titirangi Village
Tel: (09) 817 2500
Fax: (09) 817 2504
www.trafficplanning.co.nz

Project Information:

Client	Beach Haven Trust
Job Number	250360
Title	Proposed Depot Centre, 1945 State Highway 10, Waipapa Traffic Impact Assessment
Prepared By	Elemit Fu
Date	August 2025

Document History and Status

Revision	Date Issued	Reviewed By	Approved by	Date approved	Status
A	10/08/2025	A Sergejew	T Langwell	12/08/2025	Draft
B	12/08/2025	T Langwell	T Langwell	12/08/2025	Final

This document and information contained herein is the intellectual property of Traffic Planning Consultants Ltd and is solely for the use of Traffic Planning Consultants Ltd contracted client. This document may not be used, copied or reproduced in whole or part for any purpose other than that for which it is supplied, without the written consent of Traffic Planning Consultants Ltd. Traffic Planning Consultants Ltd accepts no responsibility to any third party who may use or rely upon this document.

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 EXISTING TRANSPORT ENVIRONMENT 2

2.1 Existing Site Environment 2
2.2 The Surrounding Road Network and Land Use 2
2.3 Road Safety 3
2.4 Public Transport Accessibility 4
2.5 Pedestrian Facilities 4
2.6 Cyclist Facilities 4

3.0 THE PROPOSAL & ASSESSMENT OF EFFECTS 5

3.1 General Site Layout Description 5
3.2 Site Operation and Trip Generation 6
3.3 Vehicle Access 6
3.4 Car Parking 7
3.5 Delivery and Loading 7
3.6 Construction Related Traffic Impacts 7

4.0 FAR NORTH DISTRICT PLAN STANDARDS 9

5.0 CONCLUSIONS 12

1.0 INTRODUCTION

This report describes and examines the traffic and parking effects of a proposal to construct a depot centre for New Zealand Post (NZ Post) on land at 1945 State Highway 10, Waipapa (the site). As shown in **Figure 1**, the site is located on the western side of State Highway 1 approximately 860 metres south to its roundabout with Waipapa Road. Under the operative version of the Far North District Plan (FNDP), the site is zoned Industrial.

The proposal is described in more detail within the application and illustrated within the plans. Basically, it comprises construction of a building for the use of NZ Post as a Depot Centre and its associated office area, with a total gross floor area (GFA) of 680 m^2.

This report describes the nature of the local transport environment around the development; sets out the transport characteristics of the proposal; assesses its likely impacts on the surrounding transport environment, including any mitigation measures that are considered necessary to minimise those impacts; and considers the application in terms of the Standards set out in Section 15 of the FNDP and its assessment criteria.



Figure 1: Site Location
Source: Far North District Council

2.0 EXISTING TRANSPORT ENVIRONMENT

2.1 Existing Site Environment

The site is located on the southern portion of the land at 1945 State Highway 10, Waipapa, which is known as Lot 2 in the title illustrated in **Figure 2**. Currently, the site gains access from State Highway 10 via a "Legal Road" that has been paved and shown on the title. The "Legal Road" provides an integrated access to Lot 1, Lot 2 and other lots in the rear via a private lane (Industrial Way). The "Legal Road" also extends north past Industrial Way and stopped at its "intersection" with Kahikatearoa Lane.

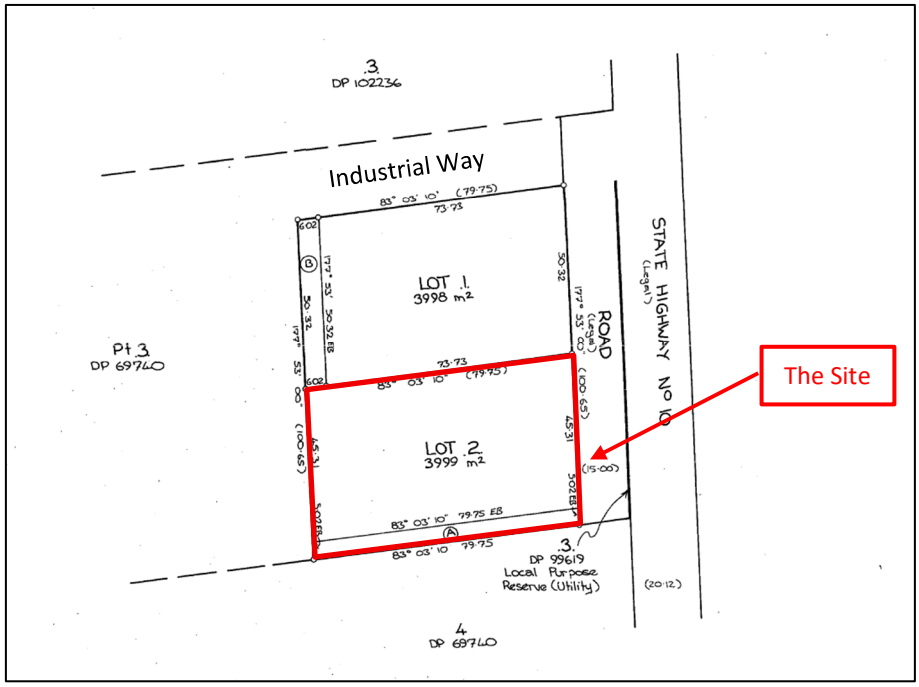


Figure 2: Property Title

Lot 1 was previously occupied by a truck petrol station, which has been removed now. There is no dedicated lane use on Lot 2.

2.2 The Surrounding Road Network and Land Use

The site is located in the Waipapa Town Centre. It is bounded by the "Legal Road" in the east and surrounded by industrial activities in other directions. The site is accessible from State Highway 10 via the "Road". There is a parking lot for the Te Puāwaitanga - Bay of Islands Sports Hub on the other side of State Highway 10 opposite to the site.

State Highway 10

State Highway 10 (SH10) is the major route to connect towns in the Far North District and adjoins State Highway 1 at both ends. It is part of the State Highway network owned and operated by Waka Kotahi New Zealand Transport Agency (NZTA). A speed limit change occurs at the northern boundary of the site. The posted speed limit reduces from 100 kilometres per hour (kph) to 70 kph for northbound traffic passing the site frontage and vice versa.

Within the vicinity of the site, SH10 has a typical sealed carriageway width (between edge line markings) of some 9.8 metres with one traffic lane in each direction separated by a flush median. Sealed shoulders are provided on both sides of the road. Along the site frontage, SH10 has a southbound auxiliary lane for vehicle turning left into the parking lot for the Sports Hub with the removal of the central flush median.

According to the traffic monitoring by NZTA to the south of Puketotara Road, this section of State Highway 10 has an average daily traffic of 8,417 vehicle movements per day (vpd). There is no information on the traffic volume during peak hours. Assuming 10% of the daily traffic volume could occur during the peak hours, this is equivalent to approximately 850 vehicle movements per hour (vph).

2.3 Road Safety

Information from the New Zealand Transport Agency's 'Crash Analysis System' for the latest available five-year period, January 2020 to 2025 (subject to delay at the time of the data was extracted in 2025), along the length of SH 10 within 500 metres to the site, indicates that 11 crashes have been reported including 2 serious injuries and 1 minor injury. Details of the crashes are summarised in **Table 1**.

Table 1: Site Vicinity Crash History

Location	Reported Crashes			Key Factors
	Total	Injury	Non-Injury	
Midblock: SH10 (within 500 metres to the site)	6	1 serious, 1 minor	4	1 – Pedestrian Crossing Road (serious) 1 – Crossing with Vehicle Turning (minor) 1 – Cornering 1 – Rear End 1 – Lost Control 1 – Miscellaneous
Intersection: SH10 and Kahikatearoa Lane	4	1 serious	3	1 – Crossing with Vehicle Turning (serious) 1 – Rear End 1 – Right Turn Against 1 – Merging
Intersection: SH10 and Pataka Lane	1	-	1	1 – Cornering
TOTAL	**11**	**2 serious, 1 minor**	**8**	

There are two serious injuries, one was related to a pedestrian running into the live traffic lane and the approaching driver has no time to react. The other one was related to a driver failing to give way to the traffic on the main road at an intersection when entering SH 10.

There is one crash related to traffic using a vehicle access. A motorist driving out of a vehicle access failed to give way to traffic on SH10 and caused a collision with another vehicle with minor injury, which is not related to the access to the subject site.

Based on the above information, there is no reason to suggest an inherent road safety issue concerning property access near the subject site.

2.4 Public Transport Accessibility

There are only two public transport services passing Waipapa Town Centre with a stop on Klinac Lane located approximately 500 metres north of the site.

Mid North Link 2 provides services between Waipapa and Kaikohe via Kerikeri, and Mid North Link 3 provides services between Waipapa and Kaikohe via Kerikeri, Waitangi, Paihia, Kawakawa, Moerewa, Pakaraka and Ohaeawai. Both services only have one service for each direction and only operate on Tuesday and Thursday. The stops in Waipapa are scheduled between 10:45AM and 1:45PM, which is outside of normal commuter periods.

Therefore, the site is not considered as being well served by public transport.

2.5 Pedestrian Facilities

There is no footpath or dedicated cyclist facility on either side of the SH10 near the site.

2.6 Cyclist Facilities

For on-street cyclists, the on-road cycle occurs on the sealed shoulders.

3.0 THE PROPOSAL & ASSESSMENT OF EFFECTS

3.1 General Site Layout Description

The proposal is described in more detail within the application, and the general layout of the ground floor is illustrated in **Figure 3**. It comprises the construction of a building in the middle of the site to be used as a distribution depot by NZ Post. The development includes a building with a total GFA of 680 m^2 including an auxiliary office with a GFA of 80 m^2.

A total of 10 parking spaces will be provided at the rear of the site, including an accessible parking space. Access to the site will continue from the "Legal Road" and then onto State Highway 10 via the existing private access and concrete vehicle crossing (also known as Industrial Way).

One truck loading area will be provided to the immediate east of the building, which is anticipated to be used by large rigid trucks and truck and trailers. Eight loading bays will be provided to the immediate north and west of the building for courier vans to load and deliver parcels. The operation hour for the depot centre is anticipated to be from 5AM to 6PM on weekdays and Saturday.

To address the security requirement for a depot centre, the site will be fenced.

Further discussion of the appropriateness and formation of the access point and parking in relation to the FNDP is included later in this report.

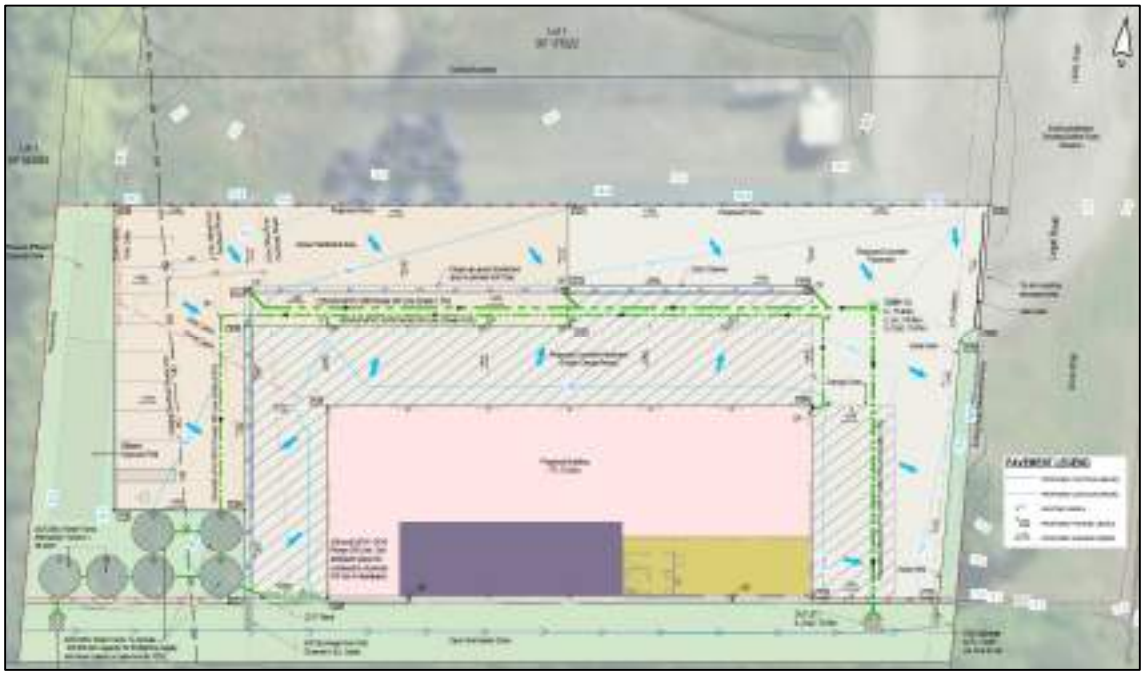


Figure 3: Proposed Site Layout
Source: CLL Service & Solutions

3.2 Site Operation and Trip Generation

Although *Appendix 3* of the FNDP provides a quote for a normal industrial activity with an average daily one-way vehicle movement of 10 per 100 m^2 of gross business area (GBA), a depot centre is expected to operate with a planned schedule. The FNDP does allow the assessment based on a more detailed and realistic traffic generation source.

Based on information provided by NZ Post for the it is expected that approximate 20 contractors (courier van drivers) and staff will be on-site at the beginning of the day and then reducing from 9:00am. This includes the office staff and couriers so some will take private vehicles to the site, and some will drive to the site with courier vans.

The following details the expected truck and courier operation for the depot centre:

- It is anticipated that a truck and trailer would enter the site early morning. The truck and trailer will leave after parcels are processed. The first "batch" of courier van deliveries are expected to only leave the site after the first truck is unloaded.
- A second truck and trailer will enter around 9:00am and leave once the load / unload is completed. The second truck is expected to enter after the first "batch" of vans departs from the site.
- A third truck and trailer will enter the site at the end of the day once courier vans are unloaded. It will leave after loading is completed.
- Apart from the first "batch" of courier van activities mentioned above, courier vans will enter and leave the site through the day. It is expected that no courier van movements will occur during a truck visit.

Based on the information provided by NZ Post, it is expected that 6 truck movements and 80 van movements will occur during the operational day, including both entry and exit movements. In addition, approximately 20 vpd can be expected for staff activities. Therefore, a total daily traffic movement of 126 vpd can be expected, which is equivalent to an average daily one-way vehicle movement of 64 vpd.

Compared to the daily traffic volume of over 8,400 vpd on SH10, the net increase is within the daily fluctuation (1.5%). This level of traffic generation can be easily accommodated by the existing integrated access with "Legal Road" / Industrial Way / SH10 without any additional mitigation and will have a less than minor effect.

3.3 Vehicle Access

Vehicular access to the site will occur onto the "Legal Road" near the northern boundary of the site with an auto gate. At the road boundary, the vehicle access will be 10 metres wide, and it will widen for vehicle manoeuvring immediately into the site. Within the site, the access will be formed with gradients no steeper than 1 in 25 (4%).

Similar to the current operation, vehicles will be able to access SH 10 via the paved "Legal Road" and through the existing integrated private lane (Industrial Way) for Lot 1 and other lots at the rear. Truck and trailers can be accommodated to enter and leave in a forward direction as illustrated by vehicle tracking in **Attachment 1**.

The compliance of the vehicle access design and its detailed assessment will be discussed later in this report.

3.4 Car Parking

The development will provide 10 parking spaces at the rear including an accessible parking space. All spaces will be 90-degree angled parking spaces. They will be 2.5 metres wide and 4.9 metres deep with a minimum manoeuvring depth of 10 metres. The accessible parking space will have an operational width of 3.5 metres and a marked depth of 5.0 metres.

All parking spaces provided will have a gradient not exceeding 1 in 50 (2%). Furthermore, all parking spaces can accommodate a B85 vehicle entering and exiting the site in a forward direction with no reverse manoeuvring required, as demonstrated in **Attachment 1.**

The compliance of the parking provision and design and its detailed assessment will be discussed later in this report.

3.5 Delivery and Loading

The delivery and loading plan have been discussed in Section 3.2.

A truck loading area will be provided to the immediate east of the building, which has been designed to accommodate a 23-metre truck and trailer as illustrated by vehicle tracking in **Attachment 1**. The truck loading area will be at least 7.0 metres wide with an unobstructed depth of over 26 metres. The truck and trailer will be able to enter from the gate near the northern boundary of the site and get into the northern yard, then reverse into the loading area.

Eight loading bays will be provided to the immediate north and west of the building under canopies, for courier vans. The van loading areas will be at least 6.9 metres wide with an unobstructed depth of over 7 metres. Vans will be able to reverse into the bays for loading / unloading and exit in a forward direction as illustrated by vehicle tracking in **Attachment 1**.

The canopies over the truck and van routes will be set out to be at least 4.5 metre high so not to collide with the designed vehicle types. Similarly, the structural columns will be located outside of the truck manoeuvre path by vehicle tracking.

3.6 Construction Related Traffic Impacts

The need to introduce truck and other vehicle movements during the construction phases of any development always has a potential to impact on the surrounding area and road network, but a certain degree of impact for what is normally a relatively short period of time (at least in the context of the life of the proposed development) is inevitable and should not normally be a reason for restricting development.

Initial planning for the construction of this phase of the development is that it is likely to be completed in key stages; site establishment, earth and civil works, followed by stages of road construction. All stages, except earthworks, are expected to generate a moderate amount of truck movements spread out over multiple months that will require minimal management with the earthwork stage expected to generate the highest levels.

With regards to earthworks, approximately 1,230m^2 of soil will be excavated from the site. A truck can typically load 6 m^3 of soil, which equates to about 410 truck movements (including entry and exit) during the full earthwork stage. This is anticipated to last for a two-month period. The truck activities for transporting excavated soil will occur between 9AM and 3PM on weekdays to avoid peak commuter periods. As a result, an estimated truck activity of 10 truck movements per day and less than 2 truck movements per hour can be expected throughout the earthwork stage.

In terms of capacity, the surrounding road network can accommodate the anticipated traffic volumes associated with the construction phases, and the application of a Construction Traffic Management Plan (CTMP) will ensure that any potential impact on the surrounding area and neighbours can be minimised. The CTMP is prepared and approved prior to work commencing, and where necessary seeks to control the times of operation (e.g. avoiding peak periods), routes used, and other matters to minimise potential impact.

The application of a CTMP will ensure that any potential effects on the surrounding area are appropriately managed. Where necessary, the CTMP should address the following objectives:

- Ensure that all construction traffic activities remain within the limits and standards approved under the consent and set out the management procedures and methods to be implemented in order to avoid, remedy, or mitigate potential adverse effects arising from construction traffic activities;
- Ensure the provision of safe and effective temporary pedestrian access past the site during construction of the project;
- Always provide for the safety of everyone;
- Manage integration with other construction projects within the area;
- Implement measures to raise awareness of construction traffic activity;
- Specify measures to reduce vehicle traffic and parking demands associated with construction staff; and
- Provide a mechanism for addressing queries and responding to complaints.

4.0 FAR NORTH DISTRICT PLAN STANDARDS

Section 15 of the operative version of the Far North District Plan (FNDP) sets out the development controls relating to transport. **Table 2** lists the relevant rules that apply to this development and comments on compliance. Where there is non-compliance, further assessment will be undertaken against the criteria set out in the FNDP.

Table 2: Transport Development Controls

Standard	Requirement/Details	Comment
15.1.6A Traffic	Sets out the requirement for maximum daily traffic movement for new developments within underlying zones. For development within the Industrial zone, maximum daily one-way traffic movements should be no more than 200 vpd.	As discussed in Section 3.2, the proposal is expected to generate 126 vpd – **complies**
15.1.6B.1.1 On-site Car Parking Spaces	Defines the minimum number of parking spaces for new developments within industrial zones. For industrial activities, there is a minimum requirement for 1 parking space per 100 m^2 GBA.	The proposal includes an approximate GBA of 600 m^2 excluding loading area. A minimum of 6 parking spaces should be provided, and the proposal provides 10 parking spaces – **complies**
15.1.6B.1.4 Accessible Car Parking Spaces	Defines the minimum number of accessible parking spaces for new developments. For 20 or less car parking spaces provided, a minimum of 1 accessible car parking space should be provided. NZS4121-2001 defines the minimum dimensions for an accessible parking space to be 3.5 metres wide and 5.0 metres deep.	The proposal includes 10 car parking spaces including 1 accessible parking space – **complies** The accessible parking space will have an operational width of 3.5 metres and a marked depth of 5.0 metres – **complies**
15.1.6B.1.5 Car Parking Space Standards	Defines the size and formation of parking spaces. For regular user parking spaces, it spaces should be at least 4.9 metres deep with a minimum of 6.7-metre-deeo manoeuvring space for a 2.5-metre-wide and 90-degree parking space. All parking, loading, access drives and manoeuvring areas shall be formed and provided with an all-weather surface, drained, marked out and maintained to the satisfaction of the	All spaces will be set out as 90-degree spaces. They will be 2.5 metres wide and 4.9 metres deep with a minimum manoeuvring depth of 10 metres – **complies** All parking, loading and access areas will be formed and drained – **complies** All parking spaces will be located at rear and away from the "Legal Road" – **complies**

Standard	Requirement/Details	Comment
	Council, and shall be kept free and available for the uses intended. Where a parking area provides four or more car parking spaces is adjacent to a road, a kerb or a barrier shall be provided to prevent direct access except at the designated vehicle access point.	
15.1.6B.1.6 Loading Spaces	Defines the minimum number, size and formation of loading spaces. For building GFA between 500 m^2 and 5,000m^2, two loading spaces should be provided. For loading to be used by courier vans, it should be no less than 6 metres long and 3 metres wide with a minimum height clearance of 3.2 metres. Other loading spaces shall be designed to accommodate the largest size of truck expected to use them. All loading areas shall be formed and provided with an all-weather surface, drained, marked out and maintained to the satisfaction of the Council, and shall be kept free and available for the uses intended.	The proposal includes a covered area of more than 1,300 m^2 including building and canopies. One truck loading bay and eight van loading bays will be provided – **complies** Van loading spaces will be at least 6.9 metres wide with an unobstructed depth of over 7 metres and a minimum height clearance of 4.5 metres – **complies** The truck loading space has been designed to accommodate a design vehicle of 23-metre truck and trailer – **complies** All loading areas will be formed and drained – **complies**
15.1.6C.1.1 Private Accessway in All Zones	Sets out the requirements for the vehicle access. For industrial activities with more than 50 vpd (5 household equivalent), the carriageway width should be at least 6.0 metres, and the legal width should be more than 8.0 metres. The access must have stormwater drainage. The access within the Industrial zone should be no steeper than 1 in 20 (5%) adjoining the road boundary for at least 6 metres. The access should not be: ▪ onto a State Highway ▪ onto a local road within 30 metres of its intersection with an arterial or collector road.	The access will be at least 10 meters wide and widens for manoeuvring within the site – **complies** The access will be formed with stormwater drainage – **complies** The access will have a maximum gradient of 1 in 25 (4%) – **complies** The access will be located on a separated local road ("Legal Road") and at least 50 metres south to its integrated access / "intersection" with SH10 and the private access (Industrial Way) – **complies**

Standard	Requirement/Details	Comment
15.1.6C.1.3 Passing Bays on Private Accessways in All Zones	Sets out the requirements for the passing bays. Where required, passing bays on private accessways are to be at least 15 metres long and provide a minimum usable access width of 5.5 metres.	The access will have a minimum formed width of 10 metres and does not require passing bays – **complies**
15.1.6C.1.4 Access over Footpaths	Sets out the requirements for the access over footpaths.	The access has no crossing over footpath – **does not apply**
15.1.6C.1.7 General Access Standards	Sets out the requirements for the private access within the site. Provision shall be made such that there is no need for vehicles to reverse off a site serving four or more parking spaces. All bends and corners on the private accessway are to be constructed to allow for the passage of a Heavy Rigid Vehicle.	Vehicle access has been configured with the help of vehicle tracking tools (with illustration in **Attachment 1**) so that all anticipated vehicles are able to enter and leave the site in a forward direction and heavy vehicles are able to travel through the access with adequate clearance to any obstructions – **complies**

5.0 CONCLUSIONS

Based on the analyses described in this report, the following conclusions can be made in respect of the proposal to establish a depot centre at 1945 State Highway 10, Waipapa:

- The proposed depot centre is feasible from a transportation perspective.
- The estimated traffic generation of the proposal is likely to be about 126 vehicle movements per day.
- The traffic generated by the proposal to and from the site can be accommodated on the road network with no significant impact on the performance of the integrated access with Industrial Way.
- Review of the transport standards has not identified any items which require consent under the Section 15 of the operative version of Far North District Plan.
- The proposed development will have no more than minor effect on the operation and safety of the surrounding road network.
- The application of a CTMP will ensure that any potential effects during the construction phase on the surrounding area are appropriately managed.

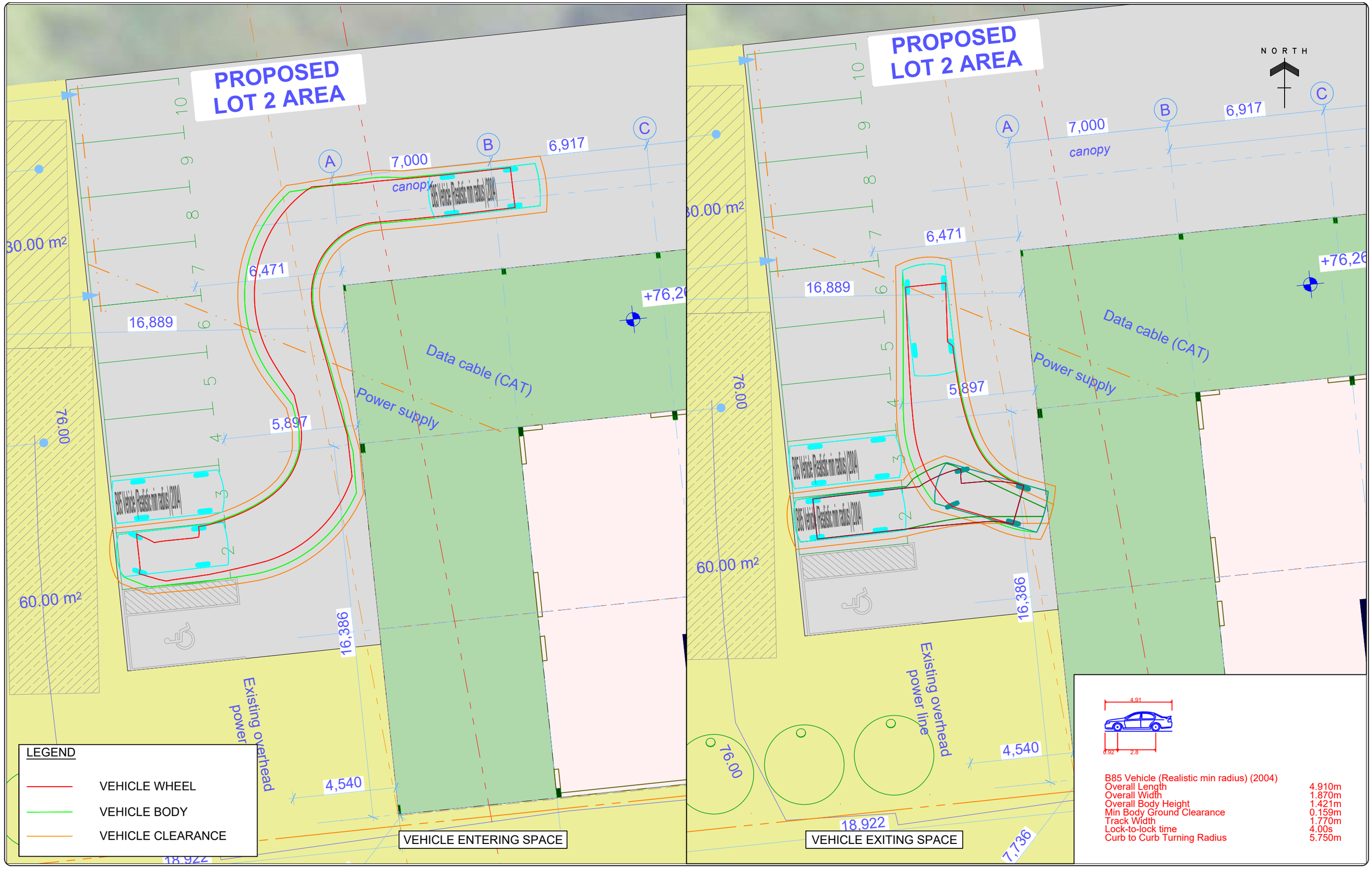
Overall, it is considered that the traffic engineering effects of the proposal can be accommodated on the road network without compromising its function, capacity or safety. Therefore, from a traffic engineering perspective it is considered that the proposal will have less than a minor impact on the surrounding road network.

Prepared by



Elemit Fu
Traffic Engineer

ATTACHMENT 1 – VEHICLE TRACKING DIAGRAM



Rev	Revisions	By	Date

TPC TRAFFIC PLANNING CONSULTANTS LTD
Level 1, 400 Titirangi Rd, Titirangi, P.O Box 60-255, Auckland 0604
Phone: 09 817-2500 www.trafficplanning.co.nz

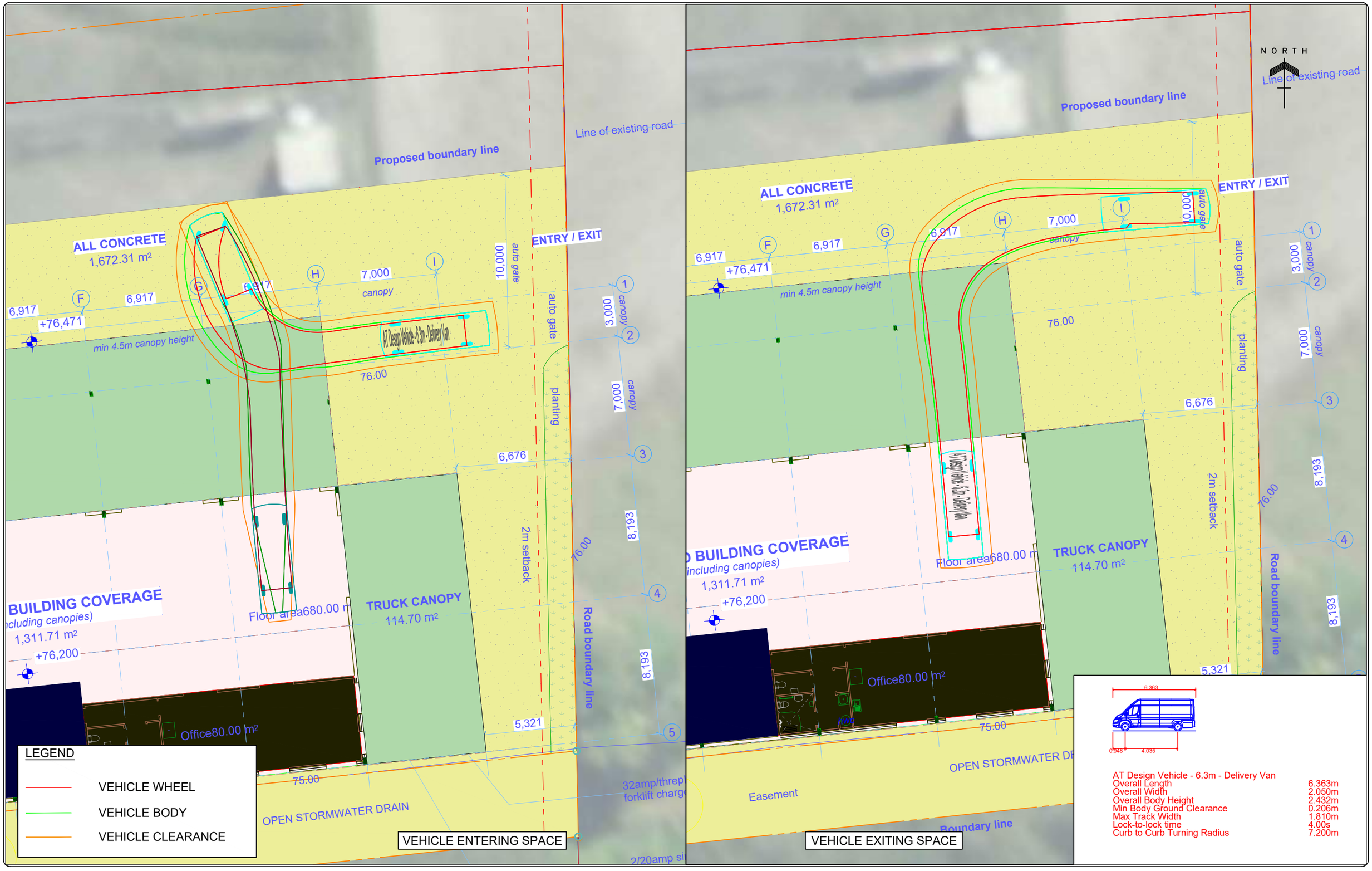
Project Title: Proposed Development
1945 SH10, Waipapa

Sheet Title: Vehicle Tracking - B85 Vehicle (300mm Clearance)

Designed	CE	Drawn	CE	Project No - (Sheet No)	Scales 1:150 (A3)
Checked	TL	Approved	TL	250360 VTB - (1)	Date 12.08.25

This drawing is the property of Traffic Planning Consultants Ltd. It is an instrument of service, and as such is a confidential document. It therefore cannot be traced, scanned, copied, reproduced, used or exhibited by any third party without the express permission in writing of Traffic Planning Consultants Ltd.
© Copyright 2025 Traffic Planning Consultants Ltd

C:\Users\Christeena\Traffic Planning Dropbox\A TPC Projects\2025 Projects\250360 - 1945 State Highway 10, Waipapa\TPC DWGs\Vehicle Tracking\VTB\250360 VTB.dwg



Rev	Revisions	By	Date

TPC TRAFFIC PLANNING CONSULTANTS LTD
Level 1, 400 Titirangi Rd, Titirangi, P.O Box 60-255, Auckland 0604
Phone: 09 817-2500 www.trafficplanning.co.nz

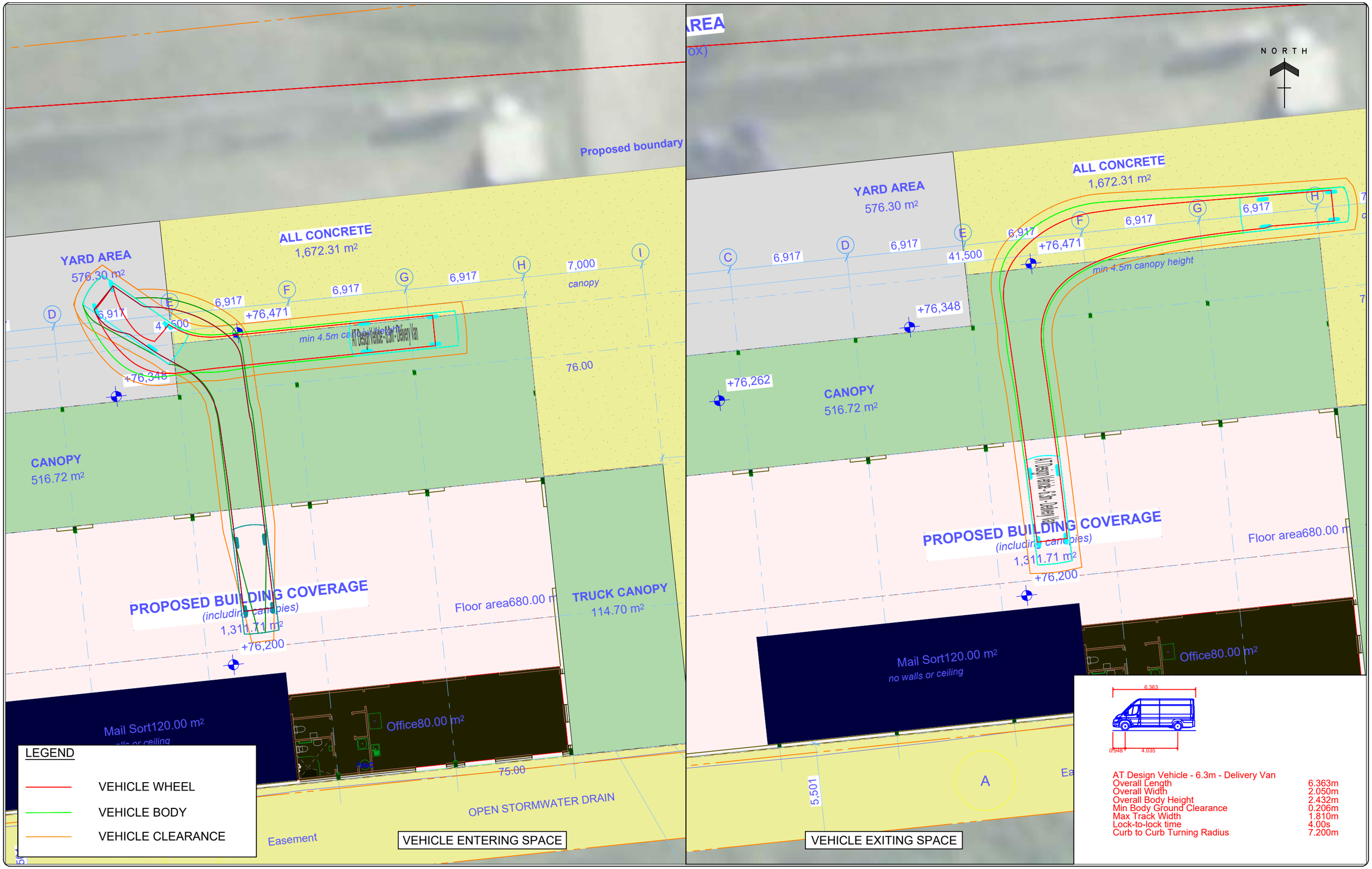
Project Title: Proposed Development
1945 SH10, Waipapa

Sheet Title: Vehicle Tracking - 6.3m Delivery Van (500mm Clearance)

Designed	CE	Drawn	CE	Project No - (Sheet No)	Scales 1:200 (A3)
Checked	TL	Approved	TL	250360 VTB - (2)	Date 12.08.25

This drawing is the property of Traffic Planning Consultants Ltd. It is an instrument of service, and as such is a confidential document. It therefore cannot be traced, scanned, copied, reproduced, used or exhibited by any third party without the express permission in writing of Traffic Planning Consultants Ltd.
© Copyright 2025 Traffic Planning Consultants Ltd

C:\Users\Christeena\Traffic Planning Dropbox\A TPC Projects\2025 Projects\250360 - 1945 State Highway 10, Waipapa\TPC DWGs\Vehicle Tracking\VTB\250360 VTB.dwg



Rev	Revisions	By	Date

TPC TRAFFIC PLANNING CONSULTANTS LTD
Level 1, 400 Titirangi Rd, Titirangi, P.O Box 60-255, Auckland 0604
Phone: 09 817-2500 www.trafficplanning.co.nz

Project Title: Proposed Development
1945 SH10, Waipapa

Sheet Title: Vehicle Tracking - 6.3m Delivery Van (500mm Clearance)

Designed	CE	Drawn	CE	Project No - (Sheet No)	Scales 1:200 (A3)
Checked	TL	Approved	TL	250360 VTB - (3)	Date 12.08.25

This drawing is the property of Traffic Planning Consultants Ltd. It is an instrument of service, and as such is a confidential document. It therefore cannot be traced, scanned, copied, reproduced, used or exhibited by any third party without the express permission in writing of Traffic Planning Consultants Ltd.
© Copyright 2025 Traffic Planning Consultants Ltd

C:\Users\Christeena\Traffic Planning Dropbox\A TPC Projects\2025 Projects\250360 - 1945 State Highway 10, Waipapa\TPC DWGs\Vehicle Tracking\VTB\250360 VTB.dwg



Rev	Revisions	By	Date

TPC TRAFFIC PLANNING CONSULTANTS LTD
Level 1, 400 Titirangi Rd, Titirangi, P.O Box 60-255, Auckland 0604
Phone: 09 817-2500 www.trafficplanning.co.nz

Project Title: Proposed Development
1945 SH10, Waipapa

Sheet Title: Vehicle Tracking - 6.3m Delivery Van (500mm Clearance)

Designed	CE	Drawn	CE	Project No - (Sheet No)	Scales 1:200 (A3)
Checked	TL	Approved	TL	250360 VTB - (4)	Date 12.08.25

This drawing is the property of Traffic Planning Consultants Ltd. It is an instrument of service, and as such is a confidential document. It therefore cannot be traced, scanned, copied, reproduced, used or exhibited by any third party without the express permission in writing of Traffic Planning Consultants Ltd.
© Copyright 2025 Traffic Planning Consultants Ltd

C:\Users\Christeena\Traffic Planning Dropbox\A TPC Projects\2025 Projects\250360 - 1945 State Highway 10, Waipapa\TPC DWGs\Vehicle Tracking\VTB\250360 VTB.dwg



AT Design Vehicle - 6.3m - Delivery Van

Overall Length	6.363m
Overall Width	2.050m
Overall Body Height	2.432m
Min Body Ground Clearance	0.206m
Max Track Width	1.810m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.200m

Rev	Revisions	By	Date

TPC TRAFFIC PLANNING CONSULTANTS LTD
Level 1, 400 Titirangi Rd, Titirangi, P.O Box 60-255, Auckland 0604
Phone: 09 817-2500 www.trafficplanning.co.nz

Project Title: Proposed Development
1945 SH10, Waipapa

Sheet Title: Vehicle Tracking - 6.3m Delivery Van (500mm Clearance)

Designed	CE	Drawn	CE	Project No - (Sheet No)	Scales 1:200 (A3)
Checked	TL	Approved	TL	250360 VTB - (5)	Date 12.08.25

This drawing is the property of Traffic Planning Consultants Ltd. It is an instrument of service, and as such is a confidential document. It therefore cannot be traced, scanned, copied, reproduced, used or exhibited by any third party without the express permission in writing of Traffic Planning Consultants Ltd.
© Copyright 2025 Traffic Planning Consultants Ltd

C:\Users\Christeena\Traffic Planning Dropbox\A TPC Projects\2025 Projects\250360 - 1945 State Highway 10, Waipapa\TPC DWGs\Vehicle Tracking\VTB\250360 VTB.dwg

PROPOSED LOT 2 AREA

YARD AREA 576.30 m²

LOT 2 AREA

NORTH

CANOPY 516.72 m²

Data cable (CAT)

Power supply

AT Design Vehicle - 6.3m - Delivery Van

Mail Sort120.0 no walls or ceiling

Existing overhead power line

7,000 canopy

6,471

16,889

5,897

16,386

4,540

18,922

7,736

5,501

+76,348

+76,262

A B C D E

6,917

VEHICLE ENTERING SPACE

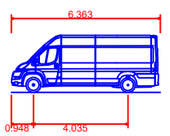
VEHICLE EXITING SPACE

LEGEND

VEHICLE WHEEL

VEHICLE BODY

VEHICLE CLEARANCE



AT Design Vehicle - 6.3m - Delivery Van	
Overall Length	6.363m
Overall Width	2.050m
Overall Body Height	2.432m
Min Body Ground Clearance	0.206m
Max Track Width	1.810m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.200m

Rev	Revisions	By	Date

TPC TRAFFIC PLANNING CONSULTANTS LTD
Level 1, 400 Titirangi Rd, Titirangi, P.O Box 60-255, Auckland 0604
Phone: 09 817-2500 www.trafficplanning.co.nz

Project Title: Proposed Development
1945 SH10, Waipapa

Sheet Title: Vehicle Tracking - 6.3m Delivery Van (500mm Clearance)

Designed	CE	Drawn	CE	Project No - (Sheet No)	Scales 1:200 (A3)
Checked	TL	Approved	TL	250360 VTB - (6)	Date 12.08.25

This drawing is the property of Traffic Planning Consultants Ltd. It is an instrument of service, and as such is a confidential document. It therefore cannot be traced, scanned, copied, reproduced, used or exhibited by any third party without the express permission in writing of Traffic Planning Consultants Ltd.
© Copyright 2025 Traffic Planning Consultants Ltd

C:\Users\Christeena\Traffic Planning Dropbox\A TPC Projects\2025 Projects\250360 - 1945 State Highway 10, Waipapa\TPC DWGs\Vehicle Tracking\VTB\250360 VTB.dwg



Rev	Revisions	By	Date

TPC TRAFFIC PLANNING CONSULTANTS LTD
Level 1, 400 Titirangi Rd, Titirangi, P.O Box 60-255, Auckland 0604
Phone: 09 817-2500 www.trafficplanning.co.nz

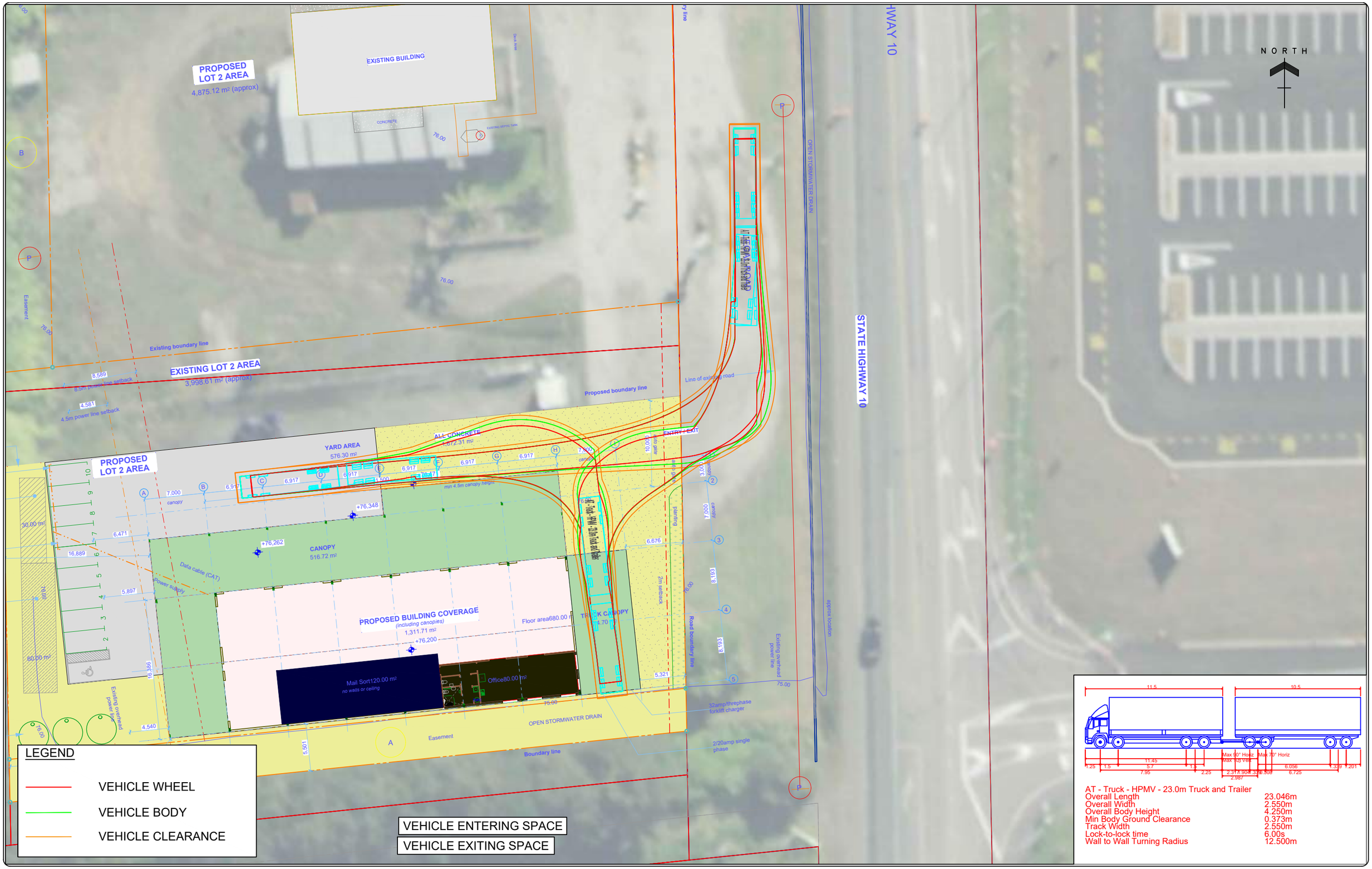
Project Title: Proposed Development
1945 SH10, Waipapa

Sheet Title: Vehicle Tracking - Large Rigid Truck (500mm Clearance)

Designed	CE	Drawn	CE	Project No - (Sheet No)	Scales 1:250 (A3)
Checked	TL	Approved	TL	250360 VTB - (7)	Date 12.08.25

This drawing is the property of Traffic Planning Consultants Ltd. It is an instrument of service, and as such is a confidential document. It therefore cannot be traced, scanned, copied, reproduced, used or exhibited by any third party without the express permission in writing of Traffic Planning Consultants Ltd.
© Copyright 2025 Traffic Planning Consultants Ltd

C:\Users\Christeena\Traffic Planning Dropbox\A TPC Projects\2025 Projects\250360 - 1945 State Highway 10, Waipapa\TPC DWGs\Vehicle Tracking\VTB\250360 VTB.dwg



AT - Truck - HPMV - 23.0m Truck and Trailer

Overall Length	23.046m
Overall Width	2.550m
Overall Body Height	4.250m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m

Rev	Revisions	By	Date

TPC TRAFFIC PLANNING CONSULTANTS LTD
Level 1, 400 Titirangi Rd, Titirangi, P.O Box 60-255, Auckland 0604
Phone: 09 817-2500 www.trafficplanning.co.nz

Project Title: Proposed Development
1945 SH10, Waipapa

Sheet Title: Vehicle Tracking - 23m Truck and Trailer (500mm Clearance)

Designed	CE	Drawn	CE	Project No - (Sheet No)	Scales 1:400 (A3)
Checked	TL	Approved	TL	250360 VTB - (8)	Date 12.08.25

This drawing is the property of Traffic Planning Consultants Ltd. It is an instrument of service, and as such is a confidential document. It therefore cannot be traced, scanned, copied, reproduced, used or exhibited by any third party without the express permission in writing of Traffic Planning Consultants Ltd.
© Copyright 2025 Traffic Planning Consultants Ltd

C:\Users\Christeena\Traffic Planning Dropbox\A TPC Projects\2025 Projects\250360 - 1945 State Highway 10, Waipapa\TPC DWGs\Vehicle Tracking\VTB\250360 VTB.dwg

28th July 2025

7225: Job reference number

Attention:
Olly Gunman
ollyg@location.co.nz

1945 State Highway 10, Waipapa, Northland: Powerline clearance engineering report (ER)

Qualifications

This report has been produced with input from or given on behalf of the customer, together with our observations, measurements, and computer modelling at the time of inspection. IAMSL does not accept liability for errors, omissions, or assumptions made by the customer in their submission of requirements or information provided by or on behalf of the customer, or in connection with a change in any of the information upon which our report is based.

Although IAMSL has used all reasonable endeavours to ensure the reliability of the information contained in this report, some inaccuracies may exist. All statements, technical information and recommendations contained in this report are given in good faith and are based on tests and analysis believed to be reliable, but their accuracy and completeness are not guaranteed. IAMSL shall have no liability for damages of any kind that may result from the use of this report by any person, including, without limitation, direct, special, indirect, or consequential damages. This report does not provide any warranty or representation as to quality or fitness for purpose. Our investigations do not constitute a regulatory audit. If our report contains conclusions and recommendations, our conclusions do not constitute legal advice, and we do not provide any express or implied guarantee that implementing our recommendations will meet all applicable legislative and regulatory requirements.

Unless specifically agreed, no responsibility is undertaken by IAMSL to update this report. If there is a change in any of the information upon which our report is based, the information in our report may no longer be valid and the customer should not rely on it. IAMSL will have no liability to the customer if the customer does so. Without limiting the foregoing, the information contained in this report is liable to be modified by IAMSL from time to time.

This report has been produced for the benefit of the customer, and is strictly limited to the matters stated in it. No responsibility or liability of duty of care is or will be accepted by IAMSL to any person other than the customer.

Planning Only

Version history

Date	Version No.	Description	Pages	Engineering	Review
28th June 2025	V1.0	Planning report	13	PvH	AM

Purpose

The purpose of this report is to present information about distances between overhead power lines and structures adjacent to power lines.

Detailed structural engineering for poles and other components is excluded.

Site details

Description	Details
Overhead power line owner	Top Energy
Pole (tower) number(s)	437425, 437426, 402040, Nil Pole #
Line voltage(s)	33kV, 11kV
Date inspected by IAMSL	22nd June 2025
Weather conditions	20°C
Building / structure	Building proposed

Information from client

1. Plans – PDF (Preliminary). This report has been issued as a planning report only due to the preliminary nature of the plans. Once progressed plans are received this report is to be updated and can then be used in the application of a close approach consent.

Standards

1. NZECP 34: 2001.
2. AS/NZS 7000: 2016.
3. HB 331-2012 Overhead Line Design

Terms used

Conductor – means a wire, cable, bar, form of metal designed for carrying electric current but does not include the wire of an electric fence.

Distance (for conductors) – unless otherwise specified, means the distance under the worst case combination of maximum sag, ~~ice and current~~, solar radiation, climatic conditions, wind, etc, and in which the conductor creep process is complete.

Mobile plant – means cranes, elevating work platforms, tip trucks or similar plant, irrigation booms, any equipment fitted with a jib or boom and any device capable of being raised and lowered.

Overhead electric line – means conductors and support (pole or tower) structures.

Structure – Existing or proposed buildings or parts of buildings, scaffold, streetlights, traffic lights and various types of signs near overhead electric lines or power lines.

Temperature – means ambient temperature.

Wind pressure – The pressure on conductors due to wind, which increases with wind velocity.

Abbreviations

1. kV Kilovolts

Planning Only

2. LV Low voltage (not exceeding 1 kV)
3. V Volts

Wind pressure to wind speed conversion table (rounded)

Wind Pressure (Pa)	50	100	150	200	250	300	400	500	600	900	1000	1200
Wind speed (km/h)	32	45	55	63	71	78	90	100	110	134	142	155

Scope

Use information supplied by the client, visit the site to observe overhead electric line layout, environment conditions, survey, and record overhead line section data. Survey key visible points needed to prepare a digital model of the power line and structure. Model the power line section with structure to determine everyday (no wind) distances between the power line conductors (wires) and structure.

Model for various wind pressures acting on conductors causing them to blow-out or sway, include ambient temperature changes where applicable.

Present results using photos, images of power line and structure, and distances between the power line conductors and structure summarised in tables.

Notes:

1. Ignore building shape in model images.
2. Structure or building presented in images as block only. Details about walls, eaves, other protrusions, and different building heights are found on building plans.
3. The table below shows the meaning of distances between conductors (wires) and structures.

Table 1: Meaning of highlighted distance

Distance (m)	Meaning	Reference
2.0	Scaffold: Indicates a distance less than required, if a scaffold standard offset from the structure (building) of 1.6m is adopted.	WorkSafe: Scaffolding in New Zealand.
2.0	Building: Indicates a distance less than required from the building.	NZECP 34: 2001. Table 3.
2.0	Scaffold: Indicates a distance less than required, from the scaffold.	NZECP 34: 2001. Table 3.

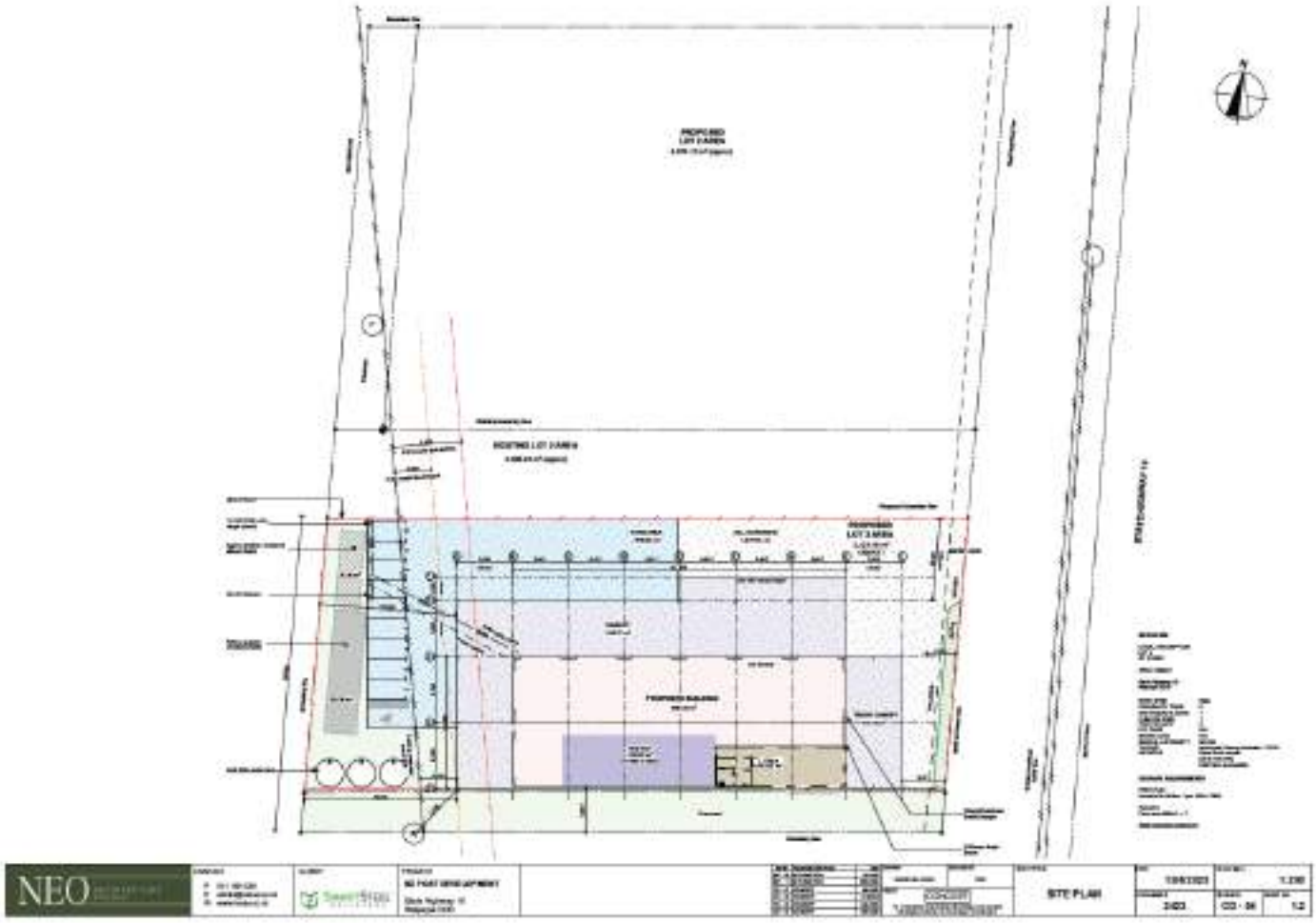
Planning Only

Image 1:



Image 2:

2423 NZ Post St Highway 10 Dev CD04 250415



Plan

Image 3:



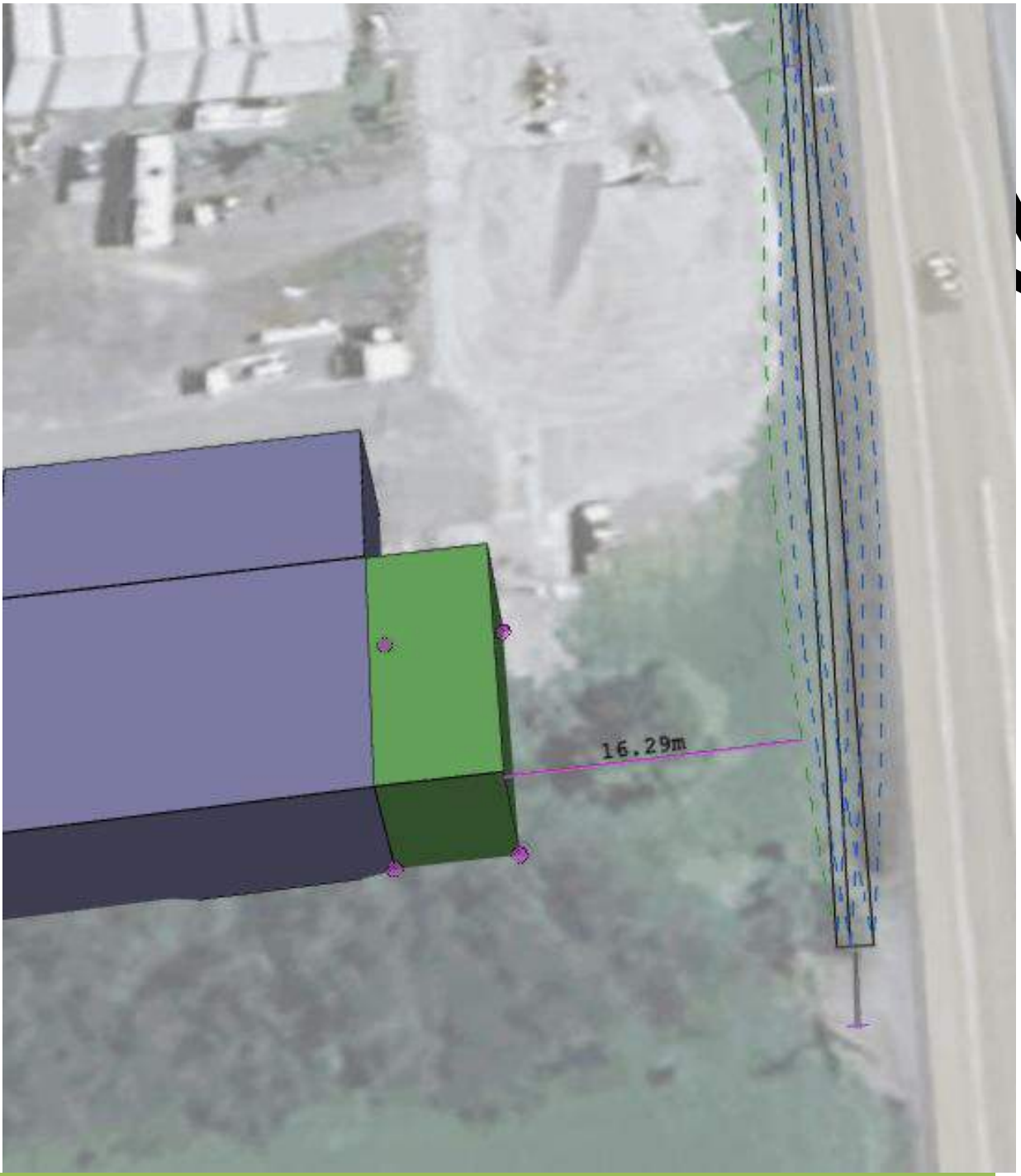
Plan

Image 4: Perspective view north aligned



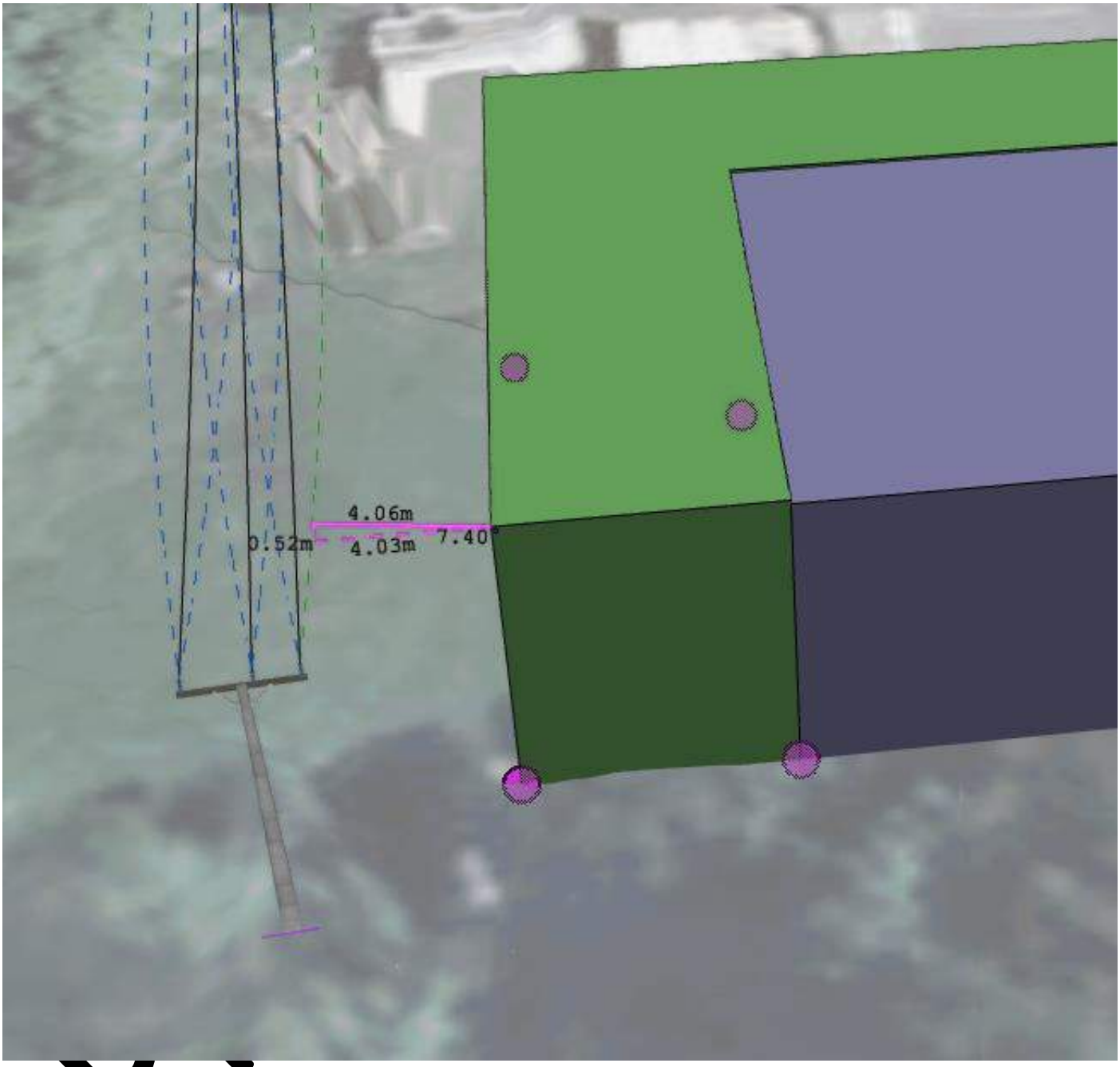
Plan

Image 5: 11kV (Roadside) to Canopy



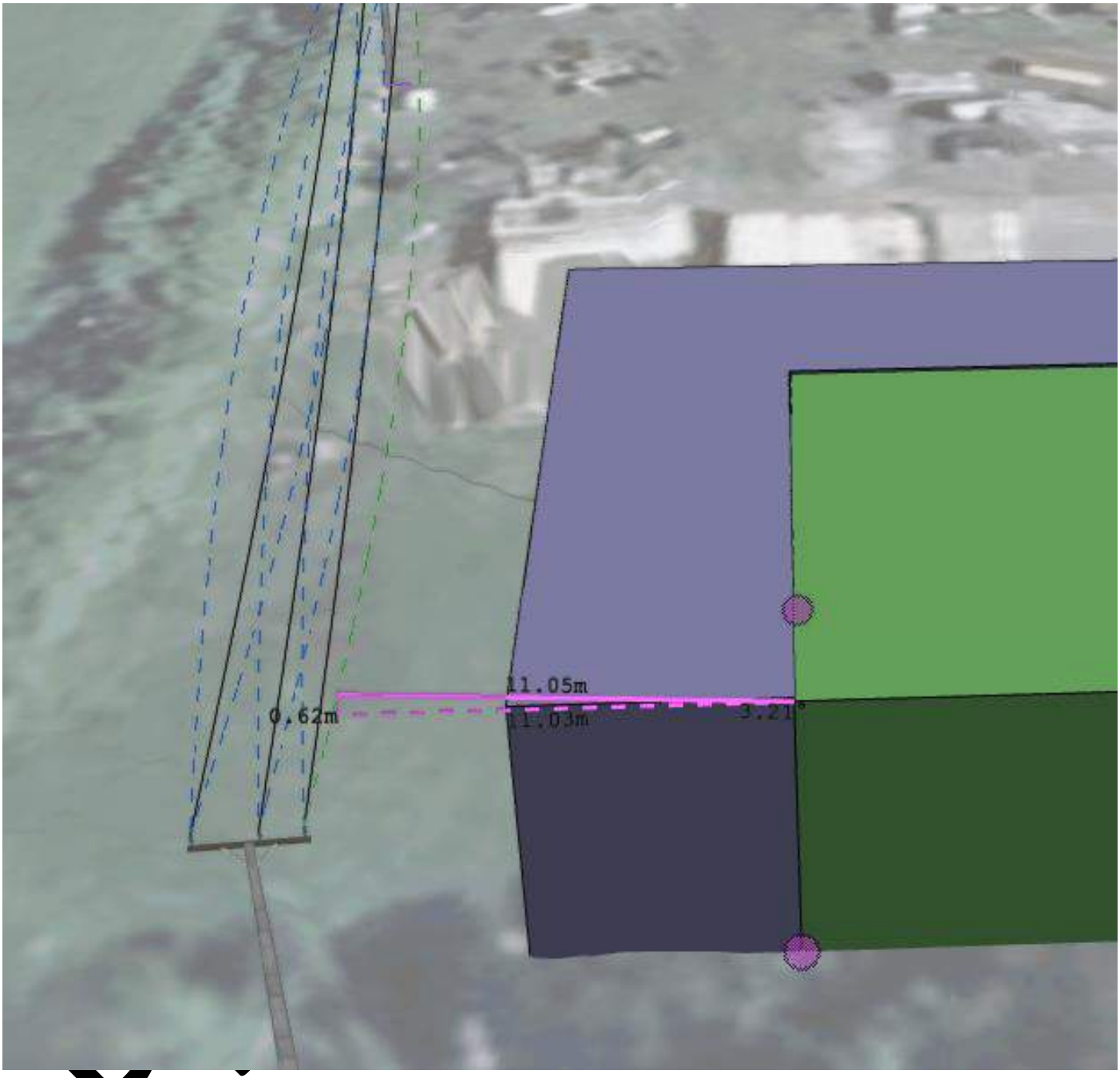
Voltage	Structure	Distance (m)			Temperature (°C)	Wind (Pa)
		Slope	Vertical	Horizontal		
11kV	Wall			17.4	20	No
11kV	Wall			16.2	15	1000

Image 6: 33kV (Rear) to Canopy



Voltage	Structure	Distance (m)			Temperature (°C)	Wind (Pa)
		Slope	Vertical	Horizontal		
33kV	Wall			4.4	20	No
33kV	Wall			4.0	15	1000

Image 7: 33kV to Building wall



Voltage	Structure	Distance (m)			Temperature (°C)	Wind (Pa)
		Slope	Vertical	Horizontal		
33kV	Wall			11.4	20	No
33kV	Wall			11.0	15	1000

NZECP 34

The New Zealand Electrical Code of Practice NZECP 34 specifies the minimum distances allowed based on an engineering assessment. A safety clearance should also be included.

https://worksafe.govt.nz/laws-and-regulations/standards/electricity-standards-and-codes-of-practice/

Example building elevation and balcony section typical arrangement

FIGURES 3 AND 4 BUILDING ELEVATION AND BALCONY SECTION

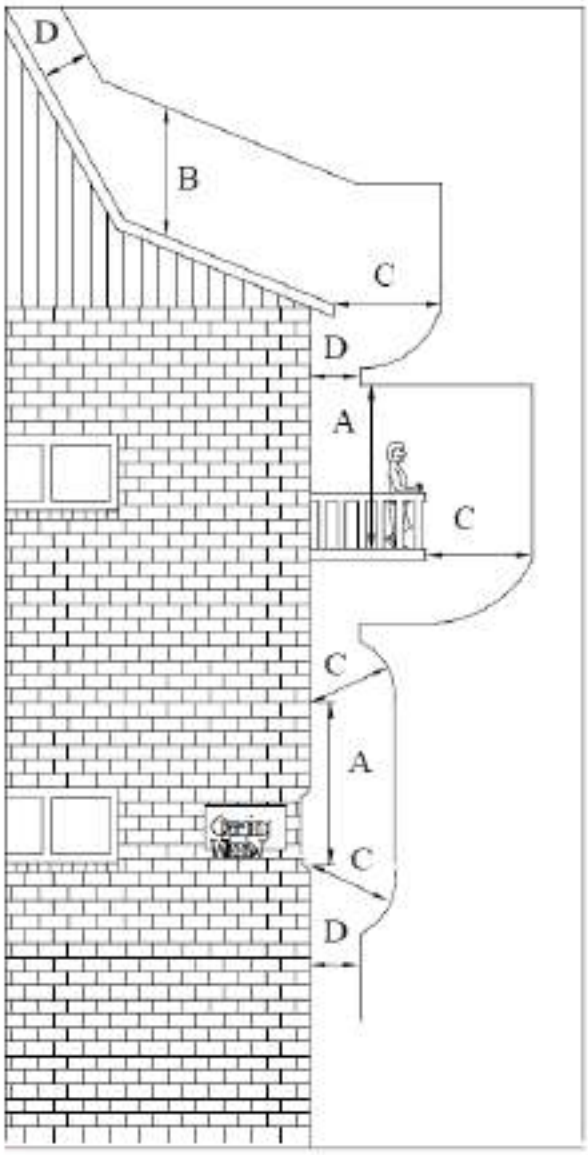


Figure 3

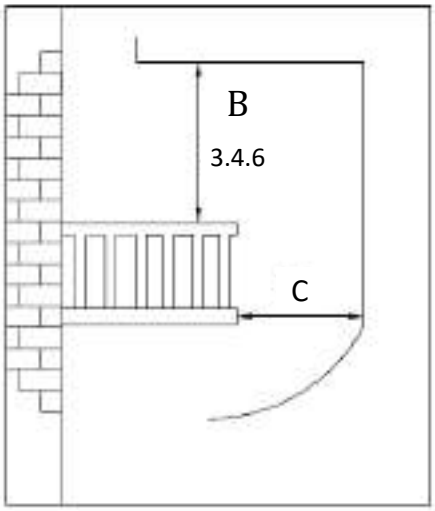


Figure 4

The example building elevation above illustrates the application of the Table 3 to a particular building. The letters A to D refer to the distances A to D as set out in Table 3.

11

TABLE 3 MINIMUM SAFE DISTANCES OF CONDUCTORS FROM BUILDINGS AND OTHER STRUCTURES WHERE SPECIFIC CALCULATION OF CONDUCTOR MOVEMENT HAS BEEN CARRIED OUT

Safe distance conditions	not exceeding 1 kV			Exceeding 1 kV		Exceeding 1 kV but not exceeding 33 kV	Exceeding exceeding 110 kV	Exceeding 110 kV but not exceeding 220 kV	Exceeding 220 a.c. or d.c.
	Insulated m	Bare neutral (1)	Bare active (1)	Insulated with earthed screen m	Insulated without earthed screen m	Bare or covered m	Bare m	Bare m	Bare m
A Vertically above those parts of any structure normally accessible to persons	2.7	2.7	3.7	2.7	3.7	4.5	5	6.5	7
B Vertically above those parts of any structure not normally accessible to persons but on which a person can stand	0.1	2.7	2.7	0.1	2.7	3.7	4.5	6	6.5
C In any direction (other than vertically above) from those parts of any structure normally accessible to persons, or from any part not normally accessible to persons but on which a person can stand	0.1	0.9	1.5	0.1	1.5	2.1	3	4.5	5
D In any direction from those parts of any structure not normally accessible to persons	0.1*	0.3*	0.6*	0.1	0.6	1.5	2.5	3.5	4
E In any direction from the ground	Refer to Table 4								

* This distance can be further reduced to allow for termination at the point of attachment

Requirements for compliance

Legal electrical clearance criteria are found in the New Zealand Electrical Code of Practice NZECP 34: 2001.

NZECP 34 Section 2:
Minimum Safe Distances for Excavation and Construction near Overhead Electric Line Supports.

NZECP 34 Section 3:
Safe Distance Requirements between Conductors and Buildings (and other structures).

NZECP 34 Section 5
Safe Distances for the Operation of Mobile Plant Near Conductors.

NZECP34 Section 9
Minimum Safe Approach Distance Limits for Persons Working Near Exposed Live Parts.

Excerpt from NZECP 34 9.2
Minimum approach distance limits for non-competent persons working near exposed live parts.

9.2.1 For non-competent persons working near exposed live parts, where written consent from the owner of the live parts has not been obtained, the minimum safe approach distances limits are:
(a) For circuit voltages 110 kV and below - 4 metres.
(b) For circuit voltages above 110 kV - 6 metres.

Planning

The landowner and the contractor undertaking works are responsible for ensuring that their equipment and materials do not encroach closer than 4 metres to the conductors (measured radially). Workers should be informed of the available clearance, and the need to keep their plant and materials more than 4 metres from the conductors. If required, appropriate controls of such tall vehicles may include:

1. Careful positioning and planning of movements.
2. Assigning someone to observe the vehicle clearances.
3. Limiting the vehicle's scope of movement.
4. Planning and monitoring the control and movement of any items lifted into place by cranes.

There is a requirement for a warning sign to be clearly displayed at the operator position on any mobile plant which could enter proximity to the conductors. "WARNING, KEEP CLEAR OF POWER LINES"

Note

This report is not an approval to proceed with any work.

This report must be sent to the owner of the overhead line for their consideration.

The power line owner may require additional conditions. Do not proceed with any work without approval from the power line owner.

Conclusion

Conclusions and recommendations will be made by the power line owner.

If you have any questions about this report, please contact us.

Thank you.

Dan McLeely
LiveLine Consultants
P: 0800-LIVE-LINE M: 021 [illegible] 127
E: dan.mcleely@liveline.co.nz W: www.liveline.co.nz

Planning Only

From: Duty Planner
To: Hannah Edwards
Cc: Dean Lupton; Kathryn Gunman; Penny Anson; Chris Tuxford
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.
Date: Thursday, 17 July 2025 4:20:05 pm
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png
image009.png
image010.png

Kia ora Hannah,

As far as I can see that parcel has been vested into council road reserve. You can confirm this on Far North Maps.

My understanding is, you will be contacted within the week once a CDM or Pre app is lodged to book a time.

Ngā mihi,

Rachel - Duty Planner
Resource Consents
P 09 407 0444 | Duty.Planner@fndc.govt.nz
Te Kaunihera o Te Hiku o te Ika | Far North District Council

Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029
fndc.govt.nz



Please note - The views and opinions provided by the Duty Planner in this email are their preliminary view only and relate to the specific questions and information you have asked/provided. If the details of the proposal change in the future, please be aware that the advice provided might change, and we would encourage you to come back for a further discussion. We would also encourage you to seek your own Professional Planning/Engineering advice before making decisions on a future development.

From: Hannah Edwards <hannah@formeplanning.co.nz>
Sent: Wednesday, 16 July 2025 2:50 pm
To: Duty Planner <Duty.Planner@fndc.govt.nz>; Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Cc: Dean Lupton <dean@captureland.nz>; Kathryn Gunman <kathryn@location.co.nz>; Penny Anson <penny@formeplanning.co.nz>; Chris Tuxford <chris.tuxford@cll.net.nz>
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

CAUTION: This email originated from outside Far North District Council.
Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi Rachel

One query you may be able to assist with at this, which my colleague Penny has previously enquired about – can you confirm the "Lot 2 Road to Vest" shown below adjacent to the frontage of 1945 SH10 is an FNDC local road?

Thanks
Hannah



Hannah Edwards | Director | Forme Planning Limited

Mobile: 021 922 164
Address: Suite 203, Achilles House, 8 Commerce Street, Auckland 1010

From: Duty Planner <Duty.Planner@fndc.govt.nz>
Sent: Wednesday, 16 July 2025 12:56 pm
To: Hannah Edwards <hannah@formeplanning.co.nz>; Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Cc: Dean Lupton <dean@captureland.nz>; Kathryn Gunman <kathryn@location.co.nz>; Penny Anson <penny@formeplanning.co.nz>; Chris Tuxford <chris.tuxford@cll.net.nz>
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Kia ora Hannah,

If you have any questions that I may be able to answer, please ask them and I can provide some general advice in a duty planner capacity. You may also wish to reach out to the development engineers for general advice. Otherwise yes, a CDM or Pre App would be suitable.

From: Duty Planner
To: Penny Anson
Subject: FW: Allocated: RFS 4259530 Priority 3: Planning - Message Track.
Date: Friday, 11 July 2025 4:32:31 pm
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png
image007.png
Screenshot 2025-07-11 113112.png
Screenshot 2025-07-11 112905.png

Kia ora Penny,

Please see confirmation from one of our Resource Consent engineers that the property in question is part of the FNDC Stormwater Management Plan as per attached screenshots. This means that any new buildings on that site would meet the stormwater rule in the District Plan below.

7.8.5.1.9 STORMWATER

The disposal of collected stormwater from the roof of all new buildings and new impervious surfaces provided that the activity is within an existing consented urban stormwater management plan or discharge consent.

For any further general planning queries, please feel free to reach out.

Ngā mihi,

Rachel - Duty Planner
Resource Consents
P 09 407 0444 | Duty.Planner@fndc.govt.nz
Te Kaunihera o Te Hiku o te Ika | Far North District Council

Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029
fndc.govt.nz



Please note - The views and opinions provided by the Duty Planner in this email are their preliminary view only and relate to the specific questions and information you have asked/provided. If the details of the proposal change in the future, please be aware that the advice provided might change, and we would encourage you to come back for a further discussion. We would also encourage you to seek your own Professional Planning/Engineering advice before making decisions on a future development.

-----Original Message-----
From: Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Sent: Friday, 11 July 2025 11:36 am
To: Duty Planner <Duty.Planner@fndc.govt.nz>
Cc: Nadia de la Guerre <Nadia.DeLaGuerre@fndc.govt.nz>
Subject: RE: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Morning Rachel,
1945 State Highway 10, Waipapa is covered by an FNDC Stormwater Management Plan as per attached screenshots.

Cheers

-----Original Message-----
From: Duty Planner <Duty.Planner@fndc.govt.nz>
Sent: Friday, 11 July 2025 10:50 am
To: Nadia de la Guerre <Nadia.DeLaGuerre@fndc.govt.nz>
Cc: Sujeet Tikaram <Sujeet.Tikaram@fndc.govt.nz>
Subject: FW: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

Kia ora Nadia,

I have another query regarding connection to stormwater management plans or discharge consents required by 7.8.5.1.9. The customer is asking whether the site is already covered by these? Can I please reallocate this to you?

Ngā mihi,

Rachel

-----Original Message-----
From: Alicia Cassidy Tupou <Alicia.Tupou@fndc.govt.nz>
Sent: Thursday, 10 July 2025 1:15 pm
To: Duty Planner <Duty.Planner@fndc.govt.nz>
Subject: Allocated: RFS 4259530 Priority 3: Planning - Message Track.

A new Customer Request has been lodged and you have been assigned as the Actioning Officer. Please check the Customer Services system for further information.

10-Jul-2025 13:14:10 - Alicia Cassidy Tupou
Name: Penny
Phone: +64 21 244 8001
Address: 1945 State Highway 10, Waipapa

Query: Customer above has called to speak with a planner regarding a generic question for urban storm water discharge consents operative district plans. Please contact customer and discuss further.

Thanks, team

Appendix 11 – Rule Compliance Checklist

1 Site Information

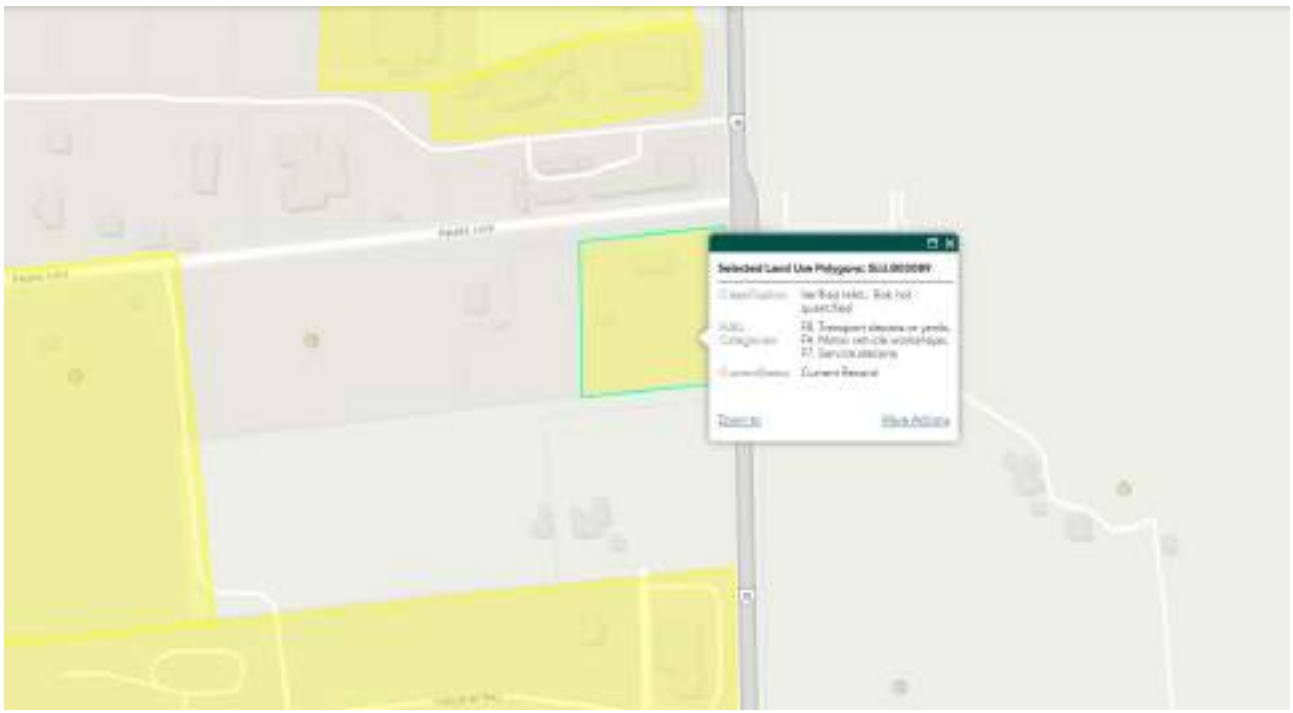
Address	1945 State Highway 10, Waipapa
Legal Description	Lot 1 and Lot 2 Deposited Plan 177522 – Lot 2 is the subject of this application, however a boundary adjustment is proposed between Lots 1 and 2.
Land Area	Lot 1 DP 177522 – 3998m^2 Lot 2 DP 177522 – 3999m^2
Relevant Interests on Title	Right of way easement Area B serving Lot 2 across Lot 1. Drainage easement Areas A along southern boundary of Lot 2 serving rear site.
Current Land Use	Former service station and industrial buildings
Operative District Plan Zone and Notations	Industrial zone
Proposed District Plan Zone and Notations	Heavy Industrial zone Critical Electricity Lines Overlay parallel to rear boundary
Cultural Heritage Inventory	None in vicinity
Heritage NZ List	
NZ Archaeological Association	
Hazards known to Council	None identified on Far North District Council maps. Not subject to flooding according to Northland Regional Council flood hazard maps.
Other Information	The site is accessed from State Highway 10 via a Local Road. The site (Lot 1 and Lot 2) is registered as a Verified HAIL site (risk not quantified) in the Selected Land Use Register

NES – Managing Contaminants

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 ("**NES – Contamination**") will apply if the sites are likely to have been used in the past for an activity described in the Ministry for the Environment's Hazardous Activities and Industries List ("**HAIL**").

The site is registered as a Verified HAIL site (risk not quantified) in the Selected Land Use Register (refer Northland Regional Council's database) with historical land uses referenced as F8 Transport Depots or yards, F4 Motor vehicle Workshops an F7 Service Stations. (refer Figure 1)

Figure 1 - Selected Land Use Register



A Contamination Assessment prepared by Williamson Water and Land Advisory ("WWLA") has been undertaken of Lot 2 (proposed to be developed as part of this application). This assessment confirms that Lot 2, which previously accommodated market garden activities (A10) does not contain soil contaminates which pose a risk to human health or the environment. WWLA advise that,

At the desk study stage HAIL Activity A10 related to market gardening was confirmed and depending on the results of soil testing, Activity I associated with storage of items associated with the mechanics activities. The laboratory results confirm:

- *As no persistent pesticides were detected we do not interpret Activity A10 as applicable.*
- *HAIL Activity I only applies if contaminants are present at a level that poses a risk to human health or the environment. Contaminant levels do not exceed a commercial land use or the environmental criteria and thus the test for applicability of Activity I is not met.*

Accordingly WWLA confirm that no HAIL activities apply to the site (Lot 2) and therefore the NES Contamination does not apply.

Consolidated Regional Soil and Water Plan 2014

Rule	Comment	Resource Consent
Section 15 – Rules for Sewage Discharges		
N/a not operative. Refer C6.1.3 of the Proposed Regional Plan.		
Section 21 – Rules for Stormwater Discharges		
N/a not operative. Refer C6.4.2 of the Proposed Regional Plan.		
Section 33 – Rules for Land Disturbance Activities		
N/a not operative. Refer C8.3.1 of the Proposed Regional Plan.		

Proposed Regional Plan for Northland (February 2024)

Rule	Comment	Resource Consent
C6.1 On-site domestic wastewater discharges		
Domestic type wastewater is defined as "*Wastewater originating from toilets, kitchens, bathrooms, showers, baths, basins, and laundries from residential dwellings, commercial, industrial or other premises. It does not include industrial or trade wastewater*"		
C6.1 On-site domestic wastewater discharges	The discharge of domestic type wastewater into or onto land from an on-site system that was a permitted activity at the notification date of this Plan, and the associated discharge of any odour into air from the on-site system, are permitted activities, provided:	Refer C.6.1.3
	1) the discharge volume does not exceed: a) three cubic metres per day, averaged over the month of greatest discharge, and b) six cubic metres per day over any 24-hour period, and	
	2) the following reserve disposal areas are available at all times: a) 100 percent of the existing effluent disposal area where the wastewater has received primary treatment or is only comprised of greywater, or	

Rule	Comment	Resource Consent
	b) 30 percent of the existing effluent	
	3) the on-site system is maintained so that it operates effectively at all times and maintenance is undertaken in accordance with the manufacturer's specifications, and	
	4) wastewater irrigation lines are at all times either installed at least 50 millimetres beneath the surface of the disposal area or are covered by a minimum of 50 millimetres of topsoil, mulch, or bark, and	
	5) the discharge does not contaminate any groundwater supply or surface water, and there is no surface runoff or ponding of wastewater, and	
	6) there is no offensive or objectionable odour beyond the property boundary.	
C.6.1.3 Other on-site treated domestic wastewater discharge – permitted activity	The discharge of domestic type wastewater into or onto land from an on-site system and the associated discharge of odour into air from the on-site system are permitted activities, provided:	Permitted activity – refer **Appendix 5** – Wastewater Discharge Report
	1) the on-site system is designed and constructed in accordance with the Australian/New Zealand Standard. On-site Domestic Wastewater Management (AS/NZS 1547:2012), and	
	2) The volume of wastewater discharged does not exceed two cubic metres per day, and	Complies – volume is 3 litres (0.003m^3)
	3) the discharge is not via a spray irrigation system or deep soakage system, and	Complies – discharge is via dripline irrigation
	4) the slope of the disposal area is not greater than 25 degrees, and	Complies – slope gradient is 0 degrees
	5) for wastewater that has received secondary treatment or tertiary treatment, it is discharged via	Refer Appendix 5

<table>
<tr><th>Rule</th><th>Comment</th><th>Resource Consent</th></tr>
<tr><td></td><td>a) a trench or bed system in soil categories 3 to 5 that is designed in accordance with Appendix L of Australian/New Zealand Standard On-Site Domestic Wastewater Management (AS/NZS 1547:2012);
b) or an irrigation line system that that is dose loaded and covered by a minimum of 50 millimetres of topsoil, mulch, or bark, and</td><td></td></tr>
<tr><td></td><td>6) for the discharge of wastewater onto the surface of slopes greater than 10 degrees:
a) the wastewater, excluding greywater, has received at least secondary treatment, and
b) the irrigation lines are firmly attached to the disposal area, and
c) where there is an up-slope catchment that generates stormwater runoff, a diversion system is installed and maintained to divert surface water runoff from the up-slope catchment away from the disposal area, and
d) a minimum 10 metre buffer area down-slope of the lowest irrigation line is included as part of the disposal area, and
e) the disposal area is located within existing established vegetation that has at least 80 percent canopy cover, or
f) the irrigation lines are covered by a minimum of 100 millimetres of topsoil, mulch, or bark, and</td><td>N/a</td></tr>
<tr><td></td><td>7) the disposal area and reserve disposal area are situated outside the relevant exclusion areas and setbacks in Table 9: Exclusion areas and setback distances for on-site domestic wastewater systems, and
Table 9: Exclusion areas and setback distances for on-site domestic wastewater systems
<table>
<tr><th>Feature</th><th>Primary treated domestic type wastewater</th><th>Secondary and tertiary treated domestic type wastewater</th><th>Greywater</th></tr>
<tr><td colspan="4">Exclusion areas</td></tr>
<tr><td>Floodplain</td><td>5 percent annual exceedance probability</td><td>5 percent annual exceedance probability</td><td>5 percent annual exceedance probability</td></tr>
<tr><td colspan="4">Horizontal setback distances</td></tr>
<tr><td>Identified stormwater flow path (including a formed road with kerb and channel, and water-table drain) that is down-slope of the disposal area</td><td>5 metres</td><td>5 metres</td><td>5 metres</td></tr>
<tr><td>River, lake, stream, pond, dam or natural wetland</td><td>20 metres</td><td>15 metres</td><td>15 metres</td></tr>
<tr><td>Coastal marine area</td><td>20 metres</td><td>15 metres</td><td>15 metres</td></tr>
<tr><td>Existing water supply bore</td><td>20 metres</td><td>20 metres</td><td>20 metres</td></tr>
</table></td><td>Complies – refer Section D, Appendix 5.</td></tr>
</table>

Rule	Comment	Resource Consent
		
	8) for septic tank treatment systems, a filter that retains solids greater than 3.5 millimetres in size is fitted on the outlet, and	N/a
	9) The following reserve disposal areas are available at all times: a) 100 percent of the existing effluent disposal area where the wastewater has received primary treatment or is only comprised of greywater, or b) 30 percent of the existing effluent disposal area where the wastewater has received secondary treatment or tertiary treatment, and	Complies with b)
	10) the on-site system is maintained so that it operates effectively at all times and maintenance is undertaken in accordance with the manufacturer's specifications, and	Will comply
	11) the discharge does not contaminate any groundwater water supply or surface water, and	Will comply Disposal field is separated 1.5m from ground water and 12.6m from nearest surface water
	12) there is no surface runoff or ponding of wastewater, and	Complies - refer Section C, Appendix D
	13) there is no offensive or objectionable odour beyond the property boundary.	Will comply
C.6.4 Stormwater discharges		
C.6.4.1 Stormwater discharges from a public stormwater	Diversion and discharge of stormwater from a public stormwater network into water or onto or into land where it may enter water is permitted, where 1) discharge is not from public stormwater network servicing Waipapa 2) etc – largely N/A because (1) not met	Not permitted given location in Waipapa – refer below

Rule	Comment	Resource Consent
network – permitted		
C.6.4.2 Other stormwater discharges – permitted	Diversion and discharge of stormwater into water or onto or into land where it may enter water from an impervious area or by way of a stormwater collection system is permitted, provided: 1) not from a public network or a high risk industrial or trade premises 2) diversion and discharge does not cause or increase flooding of land on another property in a storm event of up to and including a 10% AEP, or flooding of buildings on another property in a storm even up to and including 1% AEP 3) N/A 4) N/A 5) Diversion or discharge is not into potentially contaminated land or onto potentially contaminated land that is not covered by an impervious area 6) Does not cause permanent scouring or erosion of bed of water body at point of discharge 7) Does not contain more than 15mg/l of TPH 8) Does not cause any of following effects on receiving waters (refer Plan)	Permitted Activity The proposed activity is not an TIA. Diversion and discharge will not increase flooding. stormwater attenuation tanks proposed. Refer section 7 of the Infrastructure Report at Appendix 4. Diversion is to the open drain along the southern boundary of Lot 2 (as per the existing situation).
C.8 Land use and disturbance activities		
C8.3.1 Earthworks Table 15: permitted activity	1) the area and volume of earthworks at a particular location or associated with a project complies with the thresholds in Table 15:	Permitted 1,380m^3 over 2,780m^2 is proposed where 5000m^2 is permitted

<table>
<tr><th>Rule</th><th>Comment</th><th>Resource Consent</th></tr>
<tr><td>earthworks thresholds</td><td>

Table 15: Permitted activity earthworks thresholds

<table>
<tr><th>Location</th><th>Earthworks thresholds</th></tr>
<tr><td>Within 10m of a natural wetland, the bed of a continually or intermittently flowing river or lake</td><td>200 square metres of exposed earth at any time, and
50 cubic metres of moved or placed earth in any 12-month period.</td></tr>
<tr><td>Within 10m of an inanga spawning site</td><td>200 square metres of exposed earth at any time, and
50 cubic metres of moved or placed earth in any 12-month period.</td></tr>
<tr><td>Catchment of an outstanding lake</td><td>2500 square metres of exposed earth at any time.</td></tr>
<tr><td>Erosion-prone land</td><td>2500 square metres of exposed earth at any time.</td></tr>
<tr><td>High-risk flood hazard area</td><td>50 cubic metres of moved or placed earth in any 12-month period.</td></tr>
<tr><td>Coastal riparian and foredune management area</td><td>Excluding for coastal dune restoration, 200 square metres of exposed earth at any time.</td></tr>
<tr><td>Flood hazard area</td><td>100 cubic metres of moved or placed earth in any 12-month period.</td></tr>
<tr><td>Other areas</td><td>5000 square metres of exposed earth at any time.</td></tr>
</table>

</td><td></td></tr>
<tr><td></td><td>2) the discharge is not within 20 metres of a geothermal surface feature, and except for coastal dune restoration activities, good management practice erosion and sediment control measures equivalent to those set out in the Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region 2016 (Auckland Council Guideline Document GD2016/005), are implemented for the duration of the activity, and</td><td>N/a</td></tr>
<tr><td></td><td>3) batters and side castings are stabilised to prevent slumping, and</td><td></td></tr>
<tr><td></td><td>4) exposed earth is stabilised upon completion of the earthworks to minimise erosion and avoid slope failure, and</td><td>Condition offered – will comply</td></tr>
<tr><td></td><td>5) earth and debris are not deposited into, or in a position where they can enter, a natural wetland, a continually or intermittently flowing river, a lake, an artificial watercourse, or the coastal marine area, and</td><td>N/a</td></tr>
<tr><td></td><td>6) the earthworks activity does not
a) reduce the height of a dune crest in a coastal riparian and foredune management area….N/a
b) exacerbate flood or coastal hazard risk on any other property, or
c) create or contribute to the instability or subsidence of land on other property, or
d) divert flood flow onto other property, and</td><td>Complies – refer Infrastructure Report at Appendix 4.</td></tr>
</table>

Rule	Comment	Resource Consent
	7) any associated damming, diversion and discharge of stormwater does not give rise to any of the following effects in the receiving waters beyond the zone of reasonable mixing: a) any conspicuous change in colour or visual clarity, or b) the rendering of fresh water unsuitable for consumption by farm animals, or c) contamination which may render freshwater taken from a mapped priority drinking water abstraction point (refer I Maps | Ngā mahere matawhenua) unsuitable for human consumption after existing treatment, and	Complies
	8) information on the source and composition of any clean fill material and its location within the disposal site are recorded and provided to the Regional Council on request, and	Wiil comply
	9) the Regional Council's Compliance Manager is given at least five working days' notice	Wiil comply
C.8.3.2 Earthworks – controlled activity	Earthworks outside the bed of a river or lake, wetland and the coastal marine area that exceed 5000m^2 of exposed earth at any time at a particular location or associated with a project area, provided the earthworks are not located: 5) in a flood hazard or high-risk flood hazard area, or	N/a – earthworks will not exceed this threshold
C.8.3.3 Earthworks in a flood hazard area	Controlled activity Flood hazard area where more than 50m^3 and less than 1000m^3 of moved or placed earth in any 12 month period.	N/a the site is not in a flood plain.
C.8.3.4 Earthworks – discretionary activity	Earthworks outside the bed of a river or lake, that are not a permitted or controlled activity under another rule in section C.8.3 of this Plan.	N/a

Operative Far North District Plan 2009

Zone	Industrial
Overlays	None
Designation	None
Designations	N/A albeit NZTA SH10 adjacent
Road Classification	SH10 is a state highway

Figure 2 – Operative District Plan Zone Map (Industrial)



Environment Provisions

The site is located in the Urban Environment under the Operative Far North District Plan, specifically within the Industrial zone.

Rule	Comment	Resource Consent
Industrial Zone		
7.8.5.1 Permitted Activities	An activity is a permitted activity in the Industrial Zone if: (a) it complies with the standards for permitted activities set out in Rules 7.8.5.1.1 to 7.8.5.1.10 below; and (b) it complies with the relevant standards for permitted activities set out in Part 3 of the Plan - District Wide Provisions. Particular attention is drawn to Section 12.8 Hazardous Substances.	N/a

7.8.5.1.1 Sunlight	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 the nearest site boundary which adjoins a Residential, Coastal Residential, Russell Township, Rural Living or Coastal Living zones (refer to definition of Recession Plane in Chapter 3 - Definitions), except 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.	N/A – the rear and southern boundaries adjoin the Rural Production zone.
7.8.5.1.2 Visual Amenity And Environmental Protection	a) Along boundaries adjoining any zone other than the Commercial or Industrial Zone, outdoor areas providing for activities such as parking, loading, outdoor storage and other outdoor activities associated with non-residential activities on the site shall be screened from adjoining sites by landscaping, wall/s, close boarded fence/s or trellis/es or a combination thereof. They shall be of a height sufficient to wholly or substantially separate these areas from the view of neighbouring properties. Structures shall be at least 1.8m in height, but no higher than 2.0m, along the length of the outdoor area. Where such screening is by way of landscaping it shall be a strip of vegetation which has or will attain a minimum height of 1.8m for a minimum depth of 2m. b) At least 50% of that part of the site between the road boundary and a parallel line 6m therefrom, where it is not occupied by buildings, shall be landscaped. c) Any landscaping required by these rules shall remain on the site for the duration of the activity and be maintained, and if such landscaping dies, or becomes diseased or damaged, shall be replaced.	a) Complies, with planting proposed along boundary to west (Rural Production zone). Landscape strip is 1.5m wide however planting also proposed in wastewater treatment field adjacent (makamaka or a similar tree species). 2m high fence proposed to southern boundary to screen truck loading area. All other outdoor activities screened by the building or tanks.

		b) **Infringement,** approx. 2m wide landscape strip proposed.. c) Will comply – condition offered
7.8.5.1.3 Noise Mitigation For Residential Activities	Applies to new residential activities	N/A
7.8.5.1.4 Transportation	Refer to Chapter 15 – Transportation for Traffic, Parking and Access rules.	See Chapter 15 assessment below.
7.8.5.1.5 Keeping of animals	N/A	N/A
7.8.5.1.6 Noise	(a) All activities within the zone shall be conducted so that noise measured at any point within any other site in the zone shall not exceed: 0700 to 2200 hours 65 dBA L_{10} 2200 to 0700 hours 55 dBA L_{10} and 80 dBA L_{max} **Noise Measurement and Assessment:** Sound levels shall be measured in accordance with NZS 6801:1991 "Measurement of Sound" and assessed in accordance with NZS 6802:1991" Assessment of Environmental Sound". The notional boundary is defined in NZS 6802:1991 "Assessment of Environmental Sound" as a line 20m from any part of any dwelling, or the legal boundary where this is closer to the dwelling. **Construction Noise:** Construction noise shall meet the limits recommended in, and shall be measured and assessed in accordance with, NZS 6803P:1984 "The Measurement and Assessment of Noise from Construction, Maintenance and Demolition Work".	Will comply Loading activities commence at 5am, finish at 6pm. Loading from the truck canopy area will be screened by the 2m high fence. Loading separated more than 20m from the dwelling at 1927 SH10.

7.8.5.1.7 Setback from boundaries	The minimum building setback from State Highways and arterial roads shall be 2m.	Complies Building is set back 6m from the access road and 15m from the State Highway
7.8.5.1.8 Building height	No restriction (other than at Opua)	Complies / no restriction
7.8.5.1.9 Stormwater	The disposal of collected stormwater from the roof of all new buildings and new impervious surfaces provided that the activity is within an existing consented urban stormwater management plan or discharge consent.	Complies Site is within the Waipapa Urban Stormwater management plan..
7.8.5.1.9 Helicopter landing	N/A	N/A
7.8.5.2 Controlled activities	An activity is a controlled activity in the Industrial Zone if: a) it complies with all of the standards for permitted activities except for any one of the following Rules 7.8.5.1.1 Sunlight, 7.8.5.1.4 Transportation and 7.8.5.1.9 Stormwater above; and b) it complies with Rules 7.8.5.2.1 Sunlight, 7.8.5.2.2 Transportation and 7.8.5.2.3 Stormwater below; and c) it complies with the relevant standards for permitted or controlled activities set out in Part 3 of the Plan - District Wide Provisions. The Council must approve an application for a land use consent for a controlled activity but it may impose conditions on that consent.	N/A
7.8.5.2.1 Sunlight	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 the nearest site boundary which adjoins a Residential, Coastal Residential, Russell Township, Coastal Living or Rural Living Zone (refer to definition of Recession Plane in Chapter 3 - Definitions).	N/A – the site does not adjoin any of these zones.
7.8.5.2.2 Transport	Refer to Chapter 15 – Transportation for Traffic, Parking and Access rules.	Refer below.

7.8.5.2.3 Stormwater	The disposal of collected stormwater from the roof of all new buildings and new impervious surfaces provided that: a) where the means of disposal of collected stormwater will be by the way of piping to an approved outfall, each 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; and b) the stormwater collection system shall be designed to avoid any contaminants stored or used on the site from being entrained in any stormwater discharge unless that stormwater is discharged through a stormwater interceptor system; and c) the site is managed such that the concentration of contaminants in stormwater leaving the site do not pose an immediate or long term hazard to human health or the environment.	Complies – refer Infrastructure Report at **Appendix 4.**
7.8.5.3 Restricted discretionary activities	An activity is a restricted discretionary activity in the Industrial Zone if: a) it does not comply with any one of the following Rules 7.8.5.1.2 Visual Amenity and Environmental Protection; 7.8.5.1.3 Noise Mitigation for Residential Activities; 7.8.5.1.6 Noise; 7.8.5.1.7 Setback From Boundaries; 7.8.5.2.1 Sunlight and/or 7.8.5.2.2 Transportation as set out above; but b) it complies with all of the other rules for permitted and controlled activities under Rules 7.8.5.1 and 7.8.5.2; and (c) it complies with Rule 7.8.5.3.1 Transportation; 7.8.5.3.2 Visual Amenity and Environmental Protection; 7.8.5.3.3 Noise Mitigation for Residential Activities; 7.8.5.3.4 Noise; 7.8.5.3.5 Setbacks from Boundaries and 7.8.5.3.6 Sunlight below; and (d) it complies with the relevant standards for permitted, controlled or restricted discretionary activities set out in Part 3 of the Plan - District Wide Provisions.	**Restricted discretionary** activity. The proposal does not comply with Rules 7.8.5.1.2(b).
7.8.5.3.1 Transportation	Refer to Chapter 15 – Transportation for Traffic, Parking and Access rules.	Refer below.
7.8.5.3.2 Visual Amenity And Environmental Protection	In assessing an application resulting from a breach of Rule 7.8.5.1.2 Visual Amenity and Environmental Protection the matters to which the Council will restrict its discretion are: a) the visual effect on property in the vicinity of the proposed industrial development; b) the scale and nature of the landscaping and the measures necessary for its maintenance.	Refer AEE

7.8.5.3.3 Noise Mitigation For Residential Activities	N/a applies to new residential activities	N/A
7.8.5.3.4 Noise	In assessing a breach of Rule 7.8.5.1.6 Noise the matters to which the Council will restrict its discretion are: a) the character, level and duration of noise from any activity as received at the boundary, or notional boundary of another site; b) the hours of operation in relation to the surrounding environment; c) (c) the effectiveness of any noise mitigation measures proposed.	Will comply
7.8.5.3.5 Setback from boundaries	In assessing an application resulting from a breach of Rule 7.8.5.1.7 Setback from Boundaries the matters to which the Council will restrict its discretion are: a) the extent to which the building(s) reduces outlook and privacy of adjacent properties; b) the extent to which the building(s) restricts visibility for access and egress of vehicles; c) the ability to mitigate any adverse effects on the surrounding environment, for example by way of planting; d) the extent to which provision has been made to enable and facilitate all building maintenance and construction activities to be contained within the boundaries of the site; e) the extent to which the buildings and their use will impact on the public use and enjoyment of adjoining esplanade reserves and strips and adjacent coastal marine areas.	Complies
7.8.5.3.6 Sunlight	In assessing an application resulting from a breach of Rule 7.8.5.2.1 Sunlight the matters to which the Council will restrict its discretion are the same as those listed under Rule 7.8.5.2.1 above.	N/A – the site does not adjoin the relevant zones.

District-wide Provisions

Rule	Comment	Resource Consent
12 Natural & Physical Resources		
12.2 Indigenous Flora and Fauna – TBC if any indigenous vegetation is on site / to be removed		
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 12.3.6.1.5 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.	N/a
12.3.6.1 Permitted Activity Standards		
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.	**Infringement** with 1,380m^3 proposed Cut and fill heights are less than 0.5m.
12.3.6.1.4 Nature of filling material in all zones	Filling in any zone shall meet the following standards: (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.	Will comply
12.3.6.1.5 Excavation and/or filling, including mining and	N/A	N/A

quarrying within the national grid yard in all zones		
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 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.	**Restricted discretionary** activity consent required to infringe standard 12.3.6.1.3 (as per above).
12.3.6.2 Restricted Discretionary Activity Standards		
12.3.6.2.2 Excavation and/or filling, excluding mining and quarrying, in	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	**Infringement** with 1,380m^3 proposed Cut and fill heights are less than 0.5m

the residential, industrial, horticultural processing, coastal residential and Russell township zones	(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.	
12.4 Natural hazards – N/A rules only apply to coastal hazard areas and fire risk to residential buildings		
12.5 Heritage – N/A		
12.6 Air - deleted		
12.7 Lakes, rivers, wetlands and the coastline – N/A		
Chapter 13 Subdivision		
13.7.1 Boundary Adjustments	Boundary adjustments to lots may be carried out as a controlled (subdivision) activity provided that:	**Controlled** activity resource consent required
	a) there is no change in the number and location of any access to the lots involved; and	Will comply. Lots 1 and 2 have access to the local road. The crossing for Lot 2 will be formalised at the northern end of that lot
	(b) there is no increase in the number of certificates of title; and - will comply	Will comply Both lots have one certificate of tile. Each title will be updated to reflect the new lot area
	(c) the area of each adjusted lot complies with the allowable minimum lot sizes specified for the relevant zone, as a controlled activity in all zones except for General Coastal or as a restricted discretionary activity in the General Coastal Zone (refer Table 13.7.2.1); except that where an existing lot size is already non-complying the degree of	Complies Both lots greater than 3,000m^2

<table>
<tr><td></td><td>non-compliance shall not be increased as a result of the boundary adjustment; and ,</td><td></td></tr>
<tr><td></td><td>(d) the area affected by the boundary adjustment is within or contiguous with the area of the original lots; and – will comply</td><td>Complies</td></tr>
<tr><td></td><td>(e) all boundary adjusted sites must be capable of complying with all relevant land use rules (e.g building setbacks, effluent disposal); and</td><td>Complies
Noting the proposed effluent disposal for Lot 2 has been designed to be accommodated with amended lot area</td></tr>
<tr><td></td><td>(f) all existing on-site drainage systems (stormwater, effluent disposal, potable water) must be wholly contained within the boundary adjusted sites.</td><td>Complies</td></tr>
<tr><td>13.7.2 Allotment sizes, dimensions and other standards</td><td>(vii) INDUSTRIAL ZONE<table><tr><th>Controlled Activity Status (Refer also to 13.7.3)</th><th>Restricted Discretionary Activity Status (Refer also to 13.8)</th><th>Discretionary Activity Status (Refer also to 13.9)</th></tr><tr><td>The minimum lot sizes are 3,000m² (unsewered) and 500m² (sewered).</td><td></td><td>The minimum lot size is 2,000m² (unsewered).
There is no limit for sewered sites, provided that servicing of the site (including car parking, loading etc), can be achieved.</td></tr></table></td><td>Complies
Lot 1 – 4,873m^2
Lot 2 – 3,121m^2</td></tr>
<tr><td>13.7.2.2-13.7.2.7 Allotment Standards</td><td>N/a – for industrial sites</td><td></td></tr>
<tr><td>13.7.2.8 Proximity to Top Energy Transmission Lines</td><td>Where an electricity transmission line (of 110 kV or more) crosses land subject to a proposed subdivision, the application shall clearly show those lines and all proposed building sites in relation to those lines. No activity (including earthworks) or proposed building sites shall be located within 20m of any support structure and no building platform shall be located within a corridor measured 20m from the centre line of the transmission lines.</td><td>N/a
33 kV power lines cross Lots 1 and 2. These powerlines are shown on the proposed scheme pan.</td></tr>
<tr><td>13.7.2.9 Proximity to National Grid</td><td>N/a</td><td></td></tr>
</table>

13.7.3 Controlled Subdivision Other Matters	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	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).	Complies – refer Chapter E15
13.7.3.2 Natural and other hazards	Any proposed subdivision shall avoid, remedy or mitigate any adverse effects of natural hazards. In considering a controlled (subdivision) activity application under Rule 13.7.3.2 the Council will restrict the exercise of its control to the following matters and shall have regard to section 106 of the Resource Management Act 1991: (a) the degree to which the proposed subdivision avoids, remedies or mitigates the potential adverse effects of: (i) erosion; (ii) overland flow paths, flooding and inundation; landslip; (iii) rockfall; (iv) alluvion (deposition of alluvium); (v) avulsion (erosion by streams or rivers); (vi) unconsolidated fill; (vii) soil contamination; (viii) subsidence; (ix) fire hazard; (x) sea level rise	N/a the lots are not subject to 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 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	Complies with (b)
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).	Complies No change to stormwater disposal for Lot 1. Lot 2 will discharge to the

	(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 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).	open drain (easement A) via attenuation tanks
13.7.3.5 Sanitary Sewage Disposal	(a)…N/a (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).	Complies No change to disposal arrangements of Lot 1 (to septic tank) noting this lot is of sufficient size to provide onsite treatment and disposal The proposed effluent disposal for Lot 2 has been designed to be accommodated

		with amended lot area
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 Connections available in the local road
17.7.3.7 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 Connections available in the local road
13.7.3.8 Easements for any Purpose	Easements shall be provided where necessary for public works and utility services.	Complies Easement A Drainage easement retained and will continue to provide for conveyance of stormwater from Lot 1 Deposited Plan 343062 through Lot 2 to the open channel in the road reserve. Right of way easement B no longer required as Lot 2 has legal frontage to road.
Chapter 15 Transportation		
15.1.6A Traffic generation	For industrial activities, the average daily one-way vehicle movement is calculated as 10 per 100m^2 of GFA. Maximum daily one way traffic movements for industrial activities: 200 as a permitted activity 201-200 as a controlled activity 200+ as a restricted discretionary activity	Permitted activity – 64 daily one way traffic movements estimated.

<table>
<tr><td></td><td></td><td>Refer Transport Assessment at Appendix 8</td></tr>
<tr><td>15.1.6B Parking</td><td>Minimum number of car parks required for industrial activities: 1 per 100m^2 gross business area</td><td>Complies
680m2 GFA = 6.8 parking spaces where 10 are proposed</td></tr>
<tr><td>15.1.6B.1.4 Accessible car parking spaces</td><td><table><tr><th>Number of General Car Parking Spaces Provided</th><th>Number of Accessible Car Parking Spaces Required</th></tr><tr><td>20 or less car parking spaces provided</td><td>One accessible car parking space</td></tr><tr><td>21 – 50 car parking spaces provided</td><td>Two accessible car parking spaces</td></tr><tr><td>Every additional 50 car parking spaces where more than 50 spaces are provided</td><td>One additional accessible car parking space</td></tr></table></td><td>Complies .</td></tr>
<tr><td>15.1.6B.1.5 Car parking space standards</td><td>Diagrams and tracking provided in ODP</td><td>Complies – refer tracking appended to the Transport Assessment at Appendix 8.</td></tr>
<tr><td>15.1.6B.1.6 Loading spaces</td><td><table><tr><th>Building Gross Floor Area</th><th>Number of Loading spaces required</th></tr><tr><td>No greater than 200m^2</td><td>No loading space</td></tr><tr><td>Between 200m^2 and 500m^2</td><td>One loading space</td></tr><tr><td>Between 500m^2 and 5,000m^2</td><td>Two loading spaces</td></tr><tr><td>Exceeding 5,000m^2</td><td>Three loading spaces</td></tr></table></td><td>Two loading spaces required where One truck loading bay and eight van loading bays will be provided – complies</td></tr>
<tr><td colspan="3">Chapter 16 – Signs and Lighting</td></tr>
<tr><td colspan="3">16.6.1 An activity is a permitted activity if:
(a) it complies with the standards for permitted activities set out in Rules 16.6.1.1 to 16.6.1.5 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</td></tr>
<tr><td></td><td>(a) Outdoor lighting used by, or in association with, any activity, including any illuminated sign, shall not exceed the following limits:</td><td>Will comply
Consent condition offered to confirm</td></tr>
</table>

16.6.1.1 16.6.1.2 16.6.1.3 Light and Spill Glare	(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	compliance with this standard.
	(b) All outdoor lighting, except street lighting, shall be directed away from roads and any adjacent sites zoned Residential, Coastal 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	Will comply Consent condition offered to confirm compliance with this standard.
	(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".	Will comply Consent condition offered to confirm compliance with this standard.
16.6.1.2 General Requirement for all signs	(a) The maximum height of any sign, including its support structure, on any site shall not exceed 4m, except: (i) That in the Commercial and Industrial Zones the maximum height of any signs attached to, or displayed on a building or veranda may exceed 4m but shall not exceed the height of the building; or (ii) Otherwise provided for in Rules 16.6.1.4 and 16.6.1.5.	
	(b) The maximum sign area per site for any sign type, excluding Rule 16.6.1.4 is that shown in Rule 16.6.1.3 Maximum Sign Area Per Site.	
	(c) For double sided and v-shaped signs (provided that the internal angle of the 'v' does not exceed 90o) the maximum sign area shall be calculated from one side only.	N/a
	(d) No sign shall: (i) use reflective materials that may interfere with a road user's vision; or	Will comply

	(ii) use flashing or revolving lights or be animated in any way.	
	(e) The maximum number of freestanding signs on a site shall not exceed 1 per site frontage except: (i) That in the Commercial and Industrial Zone there are no limits on the number of freestanding signs; or (ii) Otherwise restricted or provided for in Rules 16.6.1.4 and 16.6.1.5.	Will comply
	(f) No sign shall be erected or allowed to remain on or near a road which will: (i) obstruct the line of sight of any corner, bend, intersection or vehicle crossing; (ii) obstruct, obscure or impair the view of any traffic sign or signal; (iii) resemble or be likely to be confused with any traffic sign or signal	Will comply
16.6.1.3 Maximum Sign Area per Site	Freestanding signs and signs attached to or displayed on buildings or other objects located in the following zones/locations are subject to the following requirements – Industrial - Greater than 24m: 0.25m^2 for every 1m of road frontage, up to 12m^2.	Complies Site frontage is 49m long therefore 6.25m^2 is permitted One sign is proposed on the northern elevation measuring 6.24m^2
16.6.1.4 Signs Excluded from Maximum Site Area Threshold	N/a	
16.6.1.5 Signs Adjacent to State Highways	Refer Rule	N/a - Sign is set back 50m from State Highway 10 on the northern elevation of the buiding
Chapter 17 – Designations And Utility Services		

17.2.6.1 Permitted Activities An activity is a permitted activity if: a) it complies with the standards set out in Rules 17.2.6.1.1 to 17.2.6.1.7; 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, except where these standards overlap (refer 17.2.6 above); and c) it complies with the relevant standards for permitted activities set out in Part 3 of the Plan - District Wide Provisions or the relevant National Environmental Standards except where any such provision allows for the activity affected by this section to be a "permitted activity" or where in any case the maintenance, replacement and upgrading of an existing use is specifically excluded from the operation of any rule.		
17.2.6.1.8 Buildings and structures in the National Grid Yard	Within any part of the National Grid Yard the following are permitted activities: Activities around National Grid support structures a) No buildings or structures shall be erected within 12m of any National Grid support structure. Exemptions: 1.1.1.1.1.1 Network Utilities within a transport corridor or any part of electricity infrastructure that connects the National Grid, 1.1.1.1.1.2 Fences less than 2.5m in height and more than 5m from a National Grid support structure. Under the National Grid Conductors (wires) b) Fences less than 2.5m high; c) Alterations and additions to existing buildings used for sensitive activities that do not involve an increase in the building envelope; d) Network Utilities within a transport corridor or any part of electricity infrastructure that connects the National Grid; e) Uninhabitable farm/horticultural buildings and structures used for agricultural and horticultural activities but excluding intensive farming activities such as milking sheds, piggeries, poultry sheds, commercial greenhouses and protective canopies.	Power lines traverse the rear/western boundary of the site. The lines do not form part of the National Grid Yard.

Proposed Far North District Plan (Notified version) 2023

Zone	Heavy Industry
Overlays	▪ Historical and Cultural Values Overlay – none ▪ Energy Infrastructure and Transport Overlay – none shown on maps as notified however maps later updated to include Critical Electricity Lines overlay parallel to rear boundary (refer below) ▪ Natural Environments Overlay – none ▪ Natural Hazards and Risks Overlay – none
Precincts	None
Designations	None within site; adjacent SH10 is subject to the NZTA 2 designation

Figure 3 – Proposed District Plan Zone Map (Heavy Industrial)



Figure 4 – Critical Electricity Lines overlay (purple line)



District-wide Matters – Rules with Legal Effect

Rule	Comment	Resource Consent
Subdivision		
SUB-R6	Rural Production Zone -	N/a
SUB-R13	Subdivision of a site within a Heritage Overlay Area	N/a
SUB-R14	Subdivision of a site that contains a scheduled Heritage Resource	N/a
SUB-R15	Subdivision of a site containing a scheduled site	N/a
SUB-R17	Subdivision of a site containing a scheduled SNA	N/a
Earthworks		
EW-R12	Earthworks and the discovery of suspected sensitive material PER-1 The earthworks complies with standard EW-S3 - Accidental Discovery Protocol.	Permitted

		The proposal complies with EW-S3.
EW-R13	Earthworks and erosion and sediment control PER-1 The earthworks complies with standard EW-S5 Erosion and sediment control.	Permitted The proposal complies with EW-S5. Refer Sediment and Erosion Control Plan at Appendix 4
Standards		
EW-S3	**Accidental discovery protocol** On discovery of any suspected sensitive material, the person must take the following steps: 1. Cease all works within 20m of any part of the discovery immediately and secure the area, including: i. shutting down all earth disturbing machinery and stopping all earth moving activities; and ii. establish a sufficient buffer area to ensure that all material remains undisturbed. 2. Within 24 hours of the discovery the owner of the site, tenant or the contractor must: i. inform the following parties of the discovery: • The **New Zealand Police** if the discovery is of human remains or kōiwi; • The Council in all cases; • **Heritage New Zealand Pouhere Taonga** if the discovery is an archaeological site, Māori cultural artefact, human remains or kōiwi; • Tangata Whenua if the discovery is an archaeological site, Māori cultural artefact, or kōiwi. 3. No works shall recommence until the discovery area is inspected by the relevant authority or agency, this shall include: i. If the discovery is human remains or kōiwi the **New Zealand Police** are required to investigate the human remains to determine whether they are those of a missing person or a crime scene. The remainder of this process will not apply until the **New Zealand Police** confirm that they have no further interest in the discovery; or ii. If the discovery is of archaeological material, other than evidence of contaminants, a site inspection for the purpose of initial assessment and response will be arranged by the Council in consultation with **Heritage New Zealand Pouhere Taonga** and appropriate Tangata Whenua representatives. 4. Recommencement of work: ◦ **Heritage New Zealand** has confirmed that an archaeological authority has been approved for the work or that none is required; ◦ Any required notification under the **Protected Objects Act 1975** has been made to the **Ministry for Culture and Heritage**; ◦ Resource consent has been granted to any alteration or amendment to the earthworks or land disturbance that may be necessary to avoid the sensitive materials that is not otherwise permitted under the plan or allowed by any existing resource consent.	
EW-S5	Erosion and sediment control Earthworks must for their duration be controlled in accordance with the Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region 2016 (Auckland Council Guideline Document GD2016/005); shall be implemented to prevent silt or sediment from entering water bodies, coastal marine area, any stormwater system, overland flow paths, or roads.	Permitted

Area-specific Matters – No Rules have Legal Effect

The site is located in the Heavy Industrial zone under the Proposed Far North District Plan. The zone rules do not have legal effect therefore no further assessment is required.

PROPOSED WASTEWATER TREATMENT & DISPOSAL,

1945A STATE HIGHWAY 10, WAIPAPA,
FAR NORTH DISTRICT,
Lot 2 DP 177522,

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV 01



NOTES:

LEGAL DESCRIPTION:
LOT: 2,
DP: 177522,
AREA: 3,998.61M²,

ADDRESS:
1945 State Highway 10,
Waipapa

TERRITORIAL LOCAL AUTHORITY:
FAR NORTH DISTRICT COUNCIL,

REGIONAL COUNCIL:
NORTHLAND REGIONAL COUNCIL,

FAR NORTH DISTRICT GIS:

ZONE:INDUSTRIAL ZONES, HEAVY INDUSTRIAL. ,

EFFLUENT: HIGH RISK, REQUIRING SIGNIFICANT MANIPULATION,

SETBACK RESTRICTIONS:
BUILDINGS: >3M,
BOUNDARIES: >1.5M,
OVERLAND FLOW PATHS: >5M,
WATER TABLE: >600MM

CLIMATE ZONE: 1
EARTHQUAKE ZONE: ZONE 1
EXPOSURE ZONE: ZONE C
LEE ZONE: NO
RAINFALL RANGE: 80 - 90
WIND REGION: A
WIND ZONE: HIGH

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV 01

ON-SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
L101
LOCATION PLAN



NOTES:

LEGAL DESCRIPTION:
LOT: 2,
DP: 177522,
AREA: 3,998.61M²,

ADDRESS:
1945 State Highway 10,
Waipapa

TERRITORIAL LOCAL AUTHORITY:
FAR NORTH DISTRICT COUNCIL,

REGIONAL COUNCIL:
NORTHLAND REGIONAL COUNCIL,

FAR NORTH DISTRICT GIS:

ZONE: INDUSTRIAL ZONES, HEAVY INDUSTRIAL. ,

EFFLUENT: HIGH RISK, REQUIRING SIGNIFICANT MANIPULATION,

SETBACK RESTRICTIONS:
BUILDINGS: >3M,
BOUNDARIES: >1.5M,
OVERLAND FLOW PATHS: >5M,
WATER TABLE: >600MM

CLIMATE ZONE: 1
EARTHQUAKE ZONE: ZONE 1
EXPOSURE ZONE: ZONE C
LEE ZONE: NO
RAINFALL RANGE: 80 - 90
WIND REGION: A
WIND ZONE: HIGH

LEGEND:

— Boundaries,

Soil Testing Location,

COORDINATES:
HA01
EASTING: 1683677.44
NORTHING:
6102758.45

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV
0

ON-SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
L102
SITE PLAN



N

NOTES:

LEGAL DESCRIPTION:
LOT: 2,
DP: 177522,
AREA: 3,998.61M²,

ADDRESS:
1945 State Highway 10,
Waipapa

SOIL: CAT 4
Waipapa clay - YF

OCCUPATION RATE: 12
Wastewater Flow Allowance: 30
Total daily wastewater flow: 240
DLR: 3MM/DAY

EFFLUENT DISPOSAL FEILD:
80M²

RESERVE AREA:
A RESERVE AREA OF 30%, 24M² AVAILABLE WITHIN BOUNDARY PERIMETER.

TERRITORIAL LOCAL AUTHORITY:
FAR NORTH DISTRICT COUNCIL,

REGIONAL COUNCIL:
NORTHLAND REGIONAL COUNCIL,

SETBACK RESTRICTIONS:
BUILDINGS: >3M,
BOUNDARIES: >1.5M,
OVERLAND FLOW PATHS: >5M,

NRC REGIONAL PLAN: C.6.1.3

LEGEND:

CONTOURS,

SETBACK REQUIREMENTS

SOIL TESTING LOCATION,

COORDINATES:
HA01
EASTING: 1683677.44
NORTHING: 6102758.45

DURACRETE
PRECAST TO LAST

WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

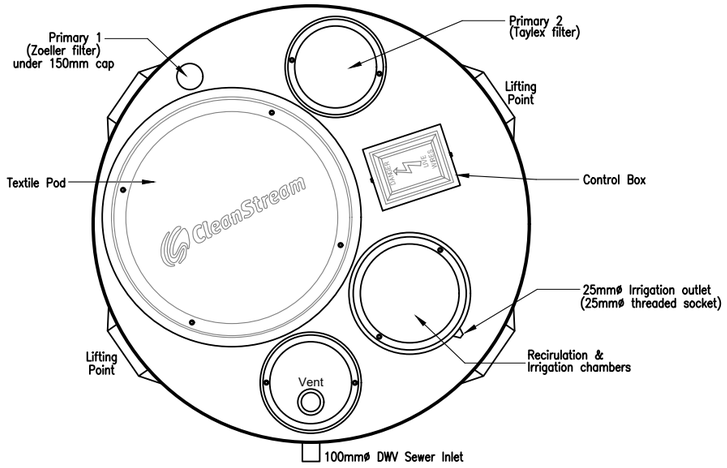
REV 01

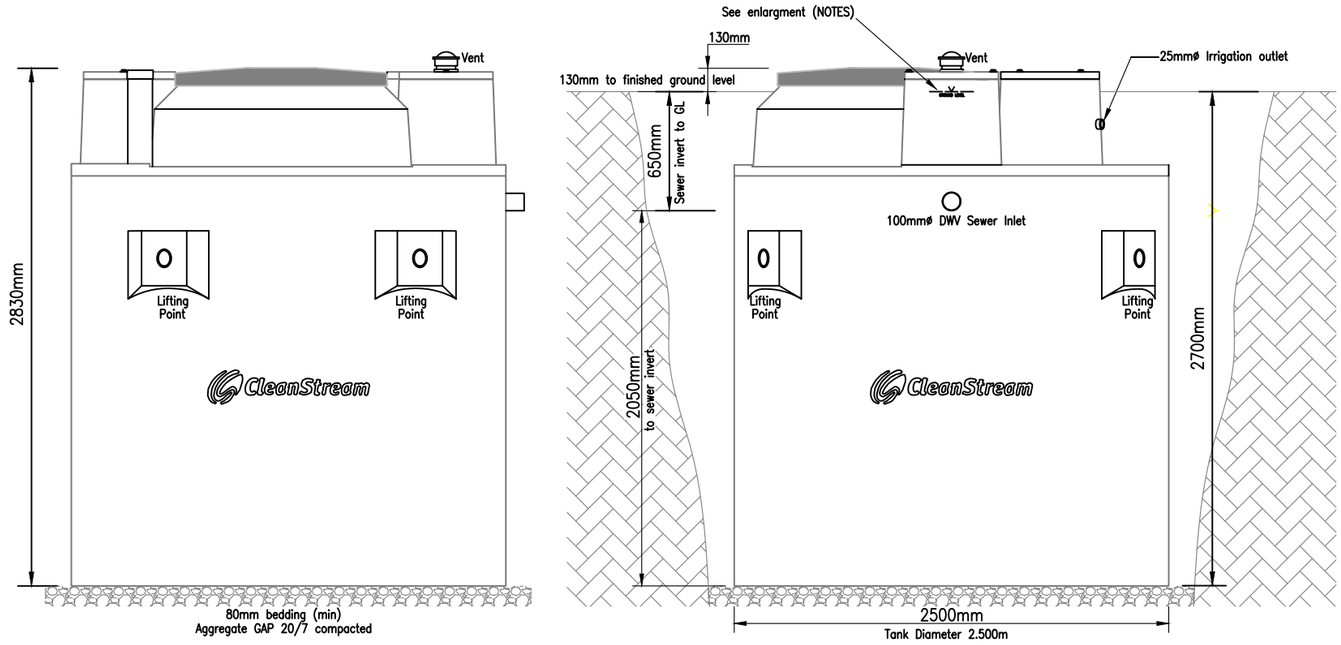
ON-SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
L103
DETAILED SITE PLAN





NOTES:

ENLARGEMENT:
CLEANSTREAM MUST NOT BE INSTALLED BELOW THIS LEVEL.



GROUND LEVEL:
FINISHED GROUND LEVEL NOT TO EXCEED INDICATED LEVEL ON CLEANSTREAM TXR.

INSTALLATION INSTRUCTIONS:
REFER TO INSTALLATION MANUAL, CLEANSTREM TXR BIOFILTRATION TEXTILE SYSTEM.

SETBACK RESTRICTIONS:
- BUILDINGS: >3M,
- BOUNDARIES: >15.M,
- OVERLAND FLOW PATHS: >5M,

TXR TO BE INSTALLED IN LOCATION ACCESSIBLE FOR FUTURE DE-SLUGGING.

WATER FILLING OF CHAMBER:
PRIMARY 1 - 3000L,
PRIMARY 2 - 1700L,
RETICULATION - 1500L,
IRRIGATION - 500L,

ELECTRICAL INSTRUCTIONS:
REFER TO ELECTRICAL WIRING INSTRUCTIONS FOR CLEANSTREAM TXR SEWAGE SYSTEM CONTROLLER, LOCATED UNDER THE CONTROL BOX.

THE CLEANSTREAM TXR SHOULD NOT BE USED IN ANY WAY UNTIL THE SYSTEM HAS BEEN COMMISSIONED. THIS INCLUDES CONTRACTORS DURING CONSTRUCTION OF THE HOUSE, AND OWNERS WISHING TO TAKE UP RESIDENCY.

ONCE INSTALLED THE WASTEWATER TREATMENT UNIT SHALL BE FILLED WITH WATER TO PREVENT ANY FLOATATION, AND ASSIST WITH THE COMMISSIONING OF THE PLANT.

ALL DRAINAGE WORK SHALL COMPLY IN ACCORDANCE WITH AS/NZS 3500.2:2021 PLUMBING AND DRAINAGE - PART 2: SANITARY PLUMBING AND DRAINAGE, THE BUILDING ACT 1991, THE BUILDING REGULATIONS 1992 AND APPROVED DOCUMENTS, (IN PARTICULAR, APPROVED DOCUMENT G13: FOUL WATER) AND THE RELEVANT NZ STANDARDS AND LEGISLATION, AND BE CARRIED OUT BY A REGISTERED DRAINLAYER.

DURACRETE
PRECAST TO LAST

WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV
01

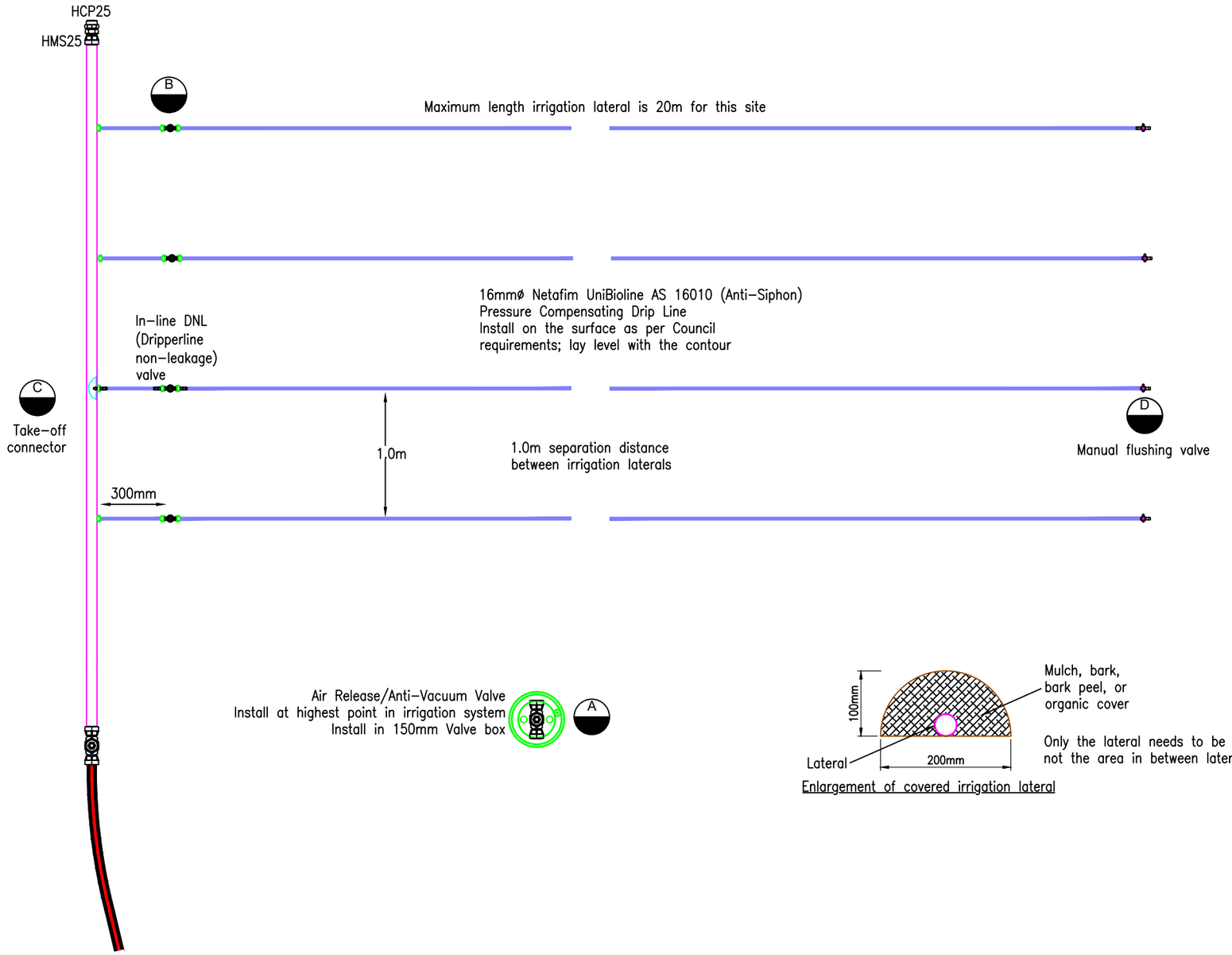
ON-SITE WASTEWATER MANAGEMENT

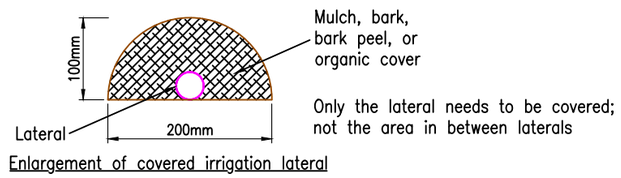
1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
A101
CLEANSTREAM TXR

Schematic Only:
Drainlayer or Installer
to confirm layout of
Irrigation system
on–site





Enlargement of covered irrigation lateral

NOTES:

SCHEMATIC ONLY:
DRAINLAYER OR INSTALLER TO CONFIRM LAYOUT OF IRRIGATION SYSTEM ON-SITE.

DESIGN OCCUPANCY RATE: 12,
DOMESTIC FLOW ALLOWANCE: 20L,
DAILY WASTEWATER FLOW: 240L,

IRRIGATION DISPOSAL AREA:
INSTALL 80 LINEAL METRES OF DRIP IRRIGATION. MAXIMUM LENGTH OF LATERAL 65M. DRIP IRRIGATION LATERALS SPACED AT A MINIMUM OF 1.0M APART.

PROPOSED DESIGN:
4 X LATERAL @ 20M,

DRIP IRRIGATION TO BE INSTALLED WITHIN THE AREA INDICATED ON DETAILED SITE PLAN.
INSTALLED LEVEL WITH CONTOUR.
AREA TO BE PLANTED WITH SUITABLE EVAPORATIVE UPTAKE PLANTS.

RESERVE AREA:
A RESERVE AREA OF 30%, APPROXIMATELY 24 M², IS AVAILABLE WITHIN THE BOUNDARY PERIMETER

AIR RELEASE VALVE:
RELOCATE THE ARV IF APPLICABLE. THE ARV SHOULD BE LOCATED AT THE HIGHEST POINT OF THE DISPOSAL SYSTEM.

SETBACK RESTRICTIONS:
- BUILDINGS: >3M,
- BOUNDARIES: >15.M,
- OVERLAND FLOW PATHS: >5M,
- POUND: >10M,
- OPEN WATER WAYS: >15M,

THE LOCATION OF THE LAND APPLICATION AREA AND THE DRIPLINES SHOULD BE SHOWN IN THE AS-BUILT PLAN. THE
AS-BUILT SHOULD ALSO SHOW BUILDINGS AND BOUNDARIES.
PHOTOS CAN SUPPLEMENT THE AS-BUILT

SURFACE WATER:
INFLOW OF SURFACE WATER INTO THE LAND APPLICATION IRRIGATION AREA SHALL BE CONTROLLED OR PREVENTED. THIS CAN BE ACHIEVED BY INSTALLING CUT-OFF TRENCHES OR SHALLOW DIVERSION DRAINS TO DIVERT SURFACE AND GROUNDWATER AWAY FROM THE IRRIGATION AREA (IF REQUIRED).

AS/NZS 1547:2012 "ON-SITE DOMESTIC WASTEWATER
MANAGEMENT" PROVIDES DESIGN METHODS FOR
IRRIGATION SYSTEMS. PLEASE REFER TO THE STANDARD
FOR THIS DESIGN INFORMATION. THESE GUIDELINES
SUPPORT THE STANDARD.

THE LOCATION OF THE LAND APPLICATION AREA AND THE DRIPLINES SHOULD BE CLEARLY INDICATED IN THE AS-BUILT PLAN. THE AS-BUILT PLAN MUST ALSO INCLUDE THE LOCATIONS OF BUILDINGS AND PROPERTY BOUNDARIES.
ADDITIONALLY, PHOTOGRAPHS MAY BE INCLUDED TO SUPPLEMENT THE AS-BUILT DOCUMENTATION.

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV 1.0

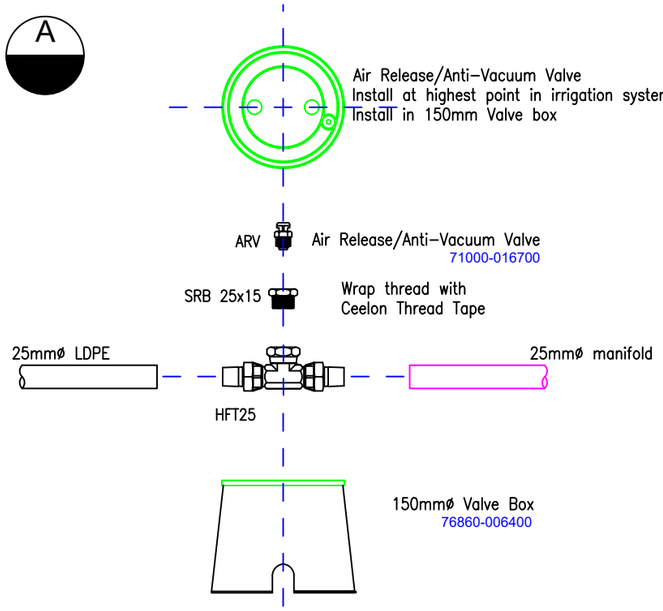
ON–SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

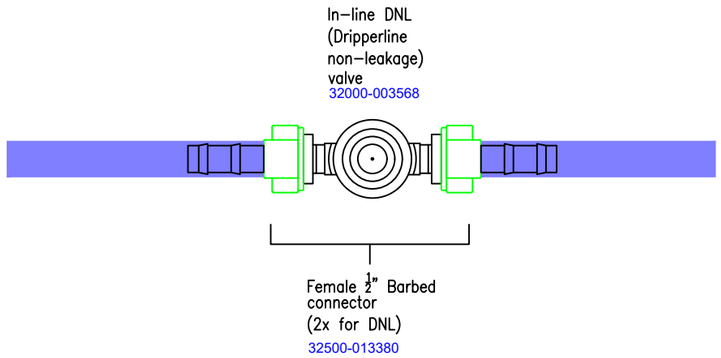
REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET:
A102
IRRIGATION LAYOUT

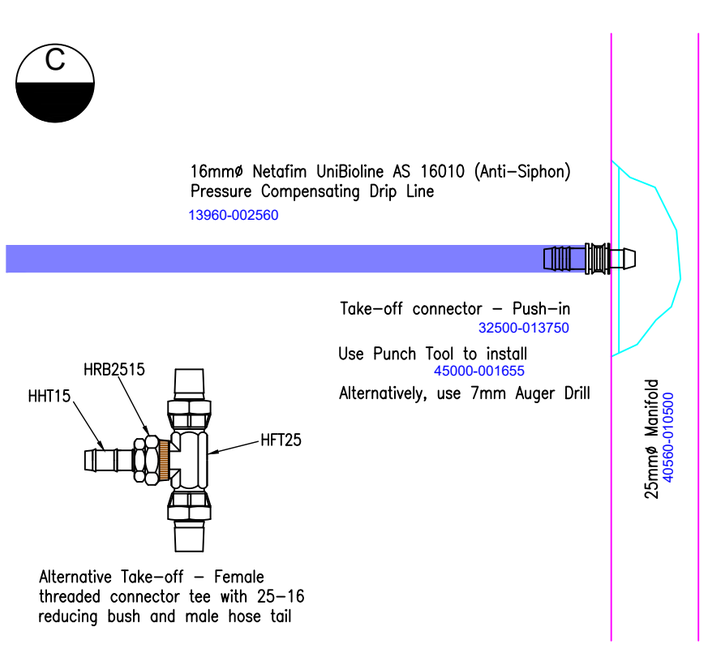
A



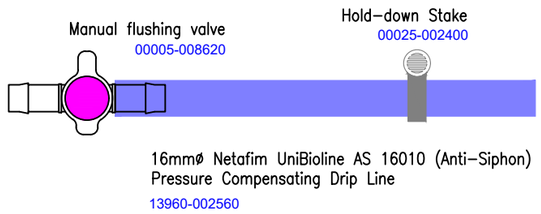
B



C



D



NOTES:

DESIGN SPECIFICATIONS:
CAPABLE OF ACCOMMODATING A DAILY WASTEWATER PRODUCTION OF 900 L, AS PER AS/NZS 1547:2012, TABLE H3, DOMESTIC WASTEWATER FROM HOUSEHOLD – NZ.

AS/NZS 1547:2012 "ON-SITE DOMESTIC WASTEWATER MANAGEMENT" PROVIDES DESIGN METHODS FOR IRRIGATION SYSTEMS. PLEASE REFER TO THE STANDARD FOR THIS DESIGN INFORMATION. THESE GUIDELINES SUPPORT THE STANDARD.

DO NOT SCALE, CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK.

© COPYRIGHT
THIS DESIGN AND DRAWING IS COPYRIGHT OF DURACRETE PRODUCTS LTD. IT MAY NOT BE COPIED OR REPRODUCED IN ANY FORMAT OR IN ANY MEDIUM WITHOUT THE WRITTEN AUTHORISATION FROM DURACRETE PRODUCTS LTD.

DURACRETE
PRECAST TO LAST
WWW.DURACRETE.CO.NZ – DESIGN@DURACRETE.CO.NZ – PH: 0800 387 227

REV 01

ON–SITE WASTEWATER MANAGEMENT

1945A STATE HIGHWAY 10, WAIPAPA
LEGAL DESCRIPTION: Lot 2 DP 177522,

REVISION#: 01
PROJECT#: 25039
SCALE: AS SHOWN
DRAWN BY: CG
CHECKED BY: GL
ISSUED DATE: 06/08/2025

SHEET: A103
Irrigation Components