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 Form 9). Prior to, and during, completion of this application form, please refer to Resource Consent Guidance Notes and Schedule of Fees and Charges — both available on the Council's web page.

1. Pre-Lodgement Meeting

Have you met with a council Resource Consent representative to discuss this application prior to lodgement?

◯ **Yes** ☑ **No**

If yes, who have you spoken with?

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)
◯ **Other (please specify)**

◯ **Discharge**
◯ **Change of Consent Notice (s.221(3))**
◯ **Extension of time (s.125)**

**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? NRC - Katie McGuire

*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: Te Runanga o NgaiTakoto C/o Craig Wells

Email:

Phone number:

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

Have you been the subject of abatement notices, enforcement orders, infringement notices and/or convictions under the Resource Management Act 1991? ◯ **Yes** ✔ **No**

If yes, please provide details.

6. Address for correspondence

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

Name/s: Barker & Associates c/o Makarena Dalton

Email:

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: Te Runanga o NgaiTakoto Custodian Trustee Limited

Property address/
location:

Postcode

8. Application site details

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

Name/s:

Site address/ location: 284, 454 and 458 Sandhills Road
Awanui
Postcode

Legal description: Various **Val Number:**

Certificate of title: 738050

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.

Please contact Makarena to arrange site visit - __. _ _ _ _ _ _

9. Description of the proposal

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

To establish a free-range egg farm, associated access and on-site infranstructure.

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

10. Would you like to request public notification?

○ **Yes** ☑ **No**

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

(more than one circle can be ticked):

○ **Building Consent** Enter BC ref # here (if known)

☑ **Regional Council Consent (ref # if known)** Ref # here (if known)

○ **National Environmental Standard Consent** Consent here (if known)

○ **Other (please specify)** Specify 'other' here

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

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

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

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

◯ **Subdividing land**

◯ **Changing the use of a piece of land**

◯ **Disturbing, removing or sampling soil**

◯ **Removing or replacing a fuel storage system**

13. Assessment of environmental effects:

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

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

14. Draft conditions:

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

If yes, please be advised that the timeframe will be suspended for 5 working days as per s107G of the RMA to enable consideration for the draft conditions.

15. 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)	Te Runanga o NgaiTakoto C/o Craig Wells
Email:	
Phone number:	
Postal address: (or alternative method of service under section 352 of the act)	

Fees Information

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

15. Billing details continued...

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) Craig Wells

Signature:
(signature of bill payer)

Date 4 February 2026

MANDATORY

16. 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.

17. Declaration

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

Name (please write in full) Makarena Dalton

Signature

Date 04-Feb-2026

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

See overleaf for a checklist of your information...

Checklist

Please tick if information is provided

- ◯ Payment (cheques payable to Far North District Council)
- ◯ A current Certificate of Title (Search Copy not more than 6 months old)
- ◯ Details of your consultation with Iwi and hapū
- ◯ Copies of any listed encumbrances, easements and/or consent notices relevant to the application
- ◯ Applicant / Agent / Property Owner / Bill Payer details provided
- ◯ Location of property and description of proposal
- ◯ Assessment of Environmental Effects
- ◯ Written Approvals / correspondence from consulted parties
- ◯ Reports from technical experts (if required)
- ◯ Copies of other relevant consents associated with this application
- ◯ Location and Site plans (land use) AND/OR
- ◯ Location and Scheme Plan (subdivision)
- ◯ Elevations / Floor plans
- ◯ Topographical / contour plans

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

NgāiTakoto Free-Range Egg Farm Development

FNDC Land Use Consent

284, 424 and 485 Sandhills Road, Ahipara

Assessment of Environmental Effects and Statutory Analysis

4 February 2026

B&A
Urban & Environmental

Prepared for:
Te Rūnanga O NgāiTakoto

B&A Reference:

25765

Status:

Final Revision 1

Date:

4 February 2026

Prepared by:

Melissa McGrath

Senior Associate, Barker & Associates Limited

Reviewed by:

Makarena Dalton

Senior Associate, Barker & Associates Limited

Contents

Appendices

1.0 Applicant and Property Details

To:	Far North District Council (FNDC)
Site Address:	284, 424 and 485 Sandhills Road, Ahipara
Applicant Name:	Te Rūnanga O NgāiTakoto
Address for Service:	Barker & Associates Ltd PO Box 1986, Shortland Street, Auckland 1140 Attention: Makarena Dalton
Legal Description:	Lot 1-2 Deposited Plan 156631 and Lot 1-2 Deposited Plan 170525 and Section 1-8 Survey Office Plan 42207 and Section 2-3 Survey Office Plan 472393 (refer to Records of Title as **Appendix 1**)
Site Area:	737.3562 ha
Site Owner:	Te Runanga O NgāiTakoto Custodian Trustee Limited
District Plan:	Operative Far North District Plan (**ODP**) Proposed Far North District Plan (**PDP**)
ODP Zoning:	Rural Production Zone
ODP Overlays & Controls:	Nil
PDP Zoning	Rural Production Zone
PDP Overlays & Controls	Treaty Settlement Land Overlay Outstanding Natural Feature -
Designations:	Nil
Additional Limitations:	NPS-HPL: LUC 3 Soil Mapped Wetlands Lake Rotoroa – Statutory Acknowledgement Area
Locality Diagram:	Refer to **Figure 2**
Brief Description of Proposal:	The development of a free-range egg farm with associated bulk earthworks, traffic and works in proximity to wetlands at 284, 424 and 485 Sandhills Road, Awanui.

Summary of Reasons for Consent:	ODP: The proposal is a discretionary activity pursuant to rules 12.3.6.3 (c), 12.7.6.3(b), 15.1.6A.5.1 and 15.1.6B.3.

2.0 Introduction

This Assessment of Environmental Effects report (**AEE**) has been prepared to address a resource consent application submitted by Te Rūnanga O NgāiTakoto' (hereafter referred to as 'the applicant or 'NgāiTakoto') for a free-range egg farm development at 284, 424 and 485 Sandhills Road, Awanui. The proposed free-range egg farm is proposed on land known as 'Te Make Farm's which was returned to NgāiTakoto as part of the NgāiTakoto Claims Settlement Act, which was given royal assent 22 September 2015.

This report is intended to address the relevant matters under the Resource Management Act 1991 (**RMA**) for resource consent under the Operative Far North District Plan (**ODP**) and Proposed Far North District Plan (**PDP**).

Resource consent from Northland Regional Council (**NRC**) is also required and is being sought simultaneously with this application.

2.1 Background

2.1.1 NgāTakoto Iwi

"Kurahaupo te Waka Pohurihanga Te Tangata Tuwhakatere te Tupuna NgaiTakoto Te Iwi. He iti Pioke no Rangaunu, He Au Tona"[1]

NgāiTakoto trace their ancestry from Te Kauri, Tumoana, and Tuwhakatere and primarily to the Kurahaupo waka. Prior to the arrival of Europeans, NgāiTakoto were largely based around Kapowairua, Parengarenga, Houhora, Waimanoni and Te Make (near present day Kaitaia). Waimanoni with its proximity to kaimoana, waterways for canoe traffic, and fertile gardens was favoured and the Awanui River provided important resources to sustain NgāiTakoto communities in the area. The 1820s and 1830s were a period of considerable movement and change in Te Hiku. NgāiTakoto, like other Te Hiku iwi, were highly mobile. NgāiTakoto defined its rohe, its pa, papakainga, gardens, urupa, fishing villages and other resources, by maintaining its relationships with other iwi through whakapapa, marriages and other alliances - see mapped area of interest shown in **Figure 1.**

NgāiTakoto marae are located on land adjacent to the Rangaunu Harbour, these being at Wharemaru, Paparore, Waimanoni and Mahimaru with future plans to construct a marae at Kaimaumau on the edges of the Rangaunu Harbour (also detailed in **Figure 1**).

NgāiTakoto Claims Settlement Act 2015 saw the return of Te Make Farm's (the Site) as part of a wider commercial and cultural redress package. In addition to lands soley owned NgāiTakoto, Treaty Settlement redress also included landholdings that are jointly owned with other Te Hiku Iwi.

NgāiTakoto are the kaitiaki (custodians) of those Treaty Settlement assets and seek to honour the spirit of their tupuna while providing for the hopes of future generations.

[1] NgāiTakoto pepeha.

Figure 1: NgāiTakoto Area of Interest (Source: NgāiTakoto Environmental Management Plan).

3.0 Site Context

3.1 Site Description

The site is located at 284, 424 and 485 Sandhills Road, Ahipara, and lies to the west and east of Sandhills Road and east of Te Oneroa-a-Tōhē (Ninety Mile Beach), as shown in **Figure 2**. Immediately to the west of the site is the Aupōuri Forest and large dairy units east of Sandhills Road. The site is otherwise bounded by rural lifestyle and rural production properties.

The site is 737.3562 ha in area, is comprised of a number of parcels held within a single record of title – refer to **Appendix 1**. It is used for a range of primary production activities including dairy farming, a large avocado orchard that incorporates a number of worker accommodation units, packhouses, storage, and loading facilities. The site also contains several standalone dwellings, each serviced by individual vehicle accessways connecting to Sandhills Road. In addition, a number of existing ancillary farm buildings are established across the site. A network of vehicle tracks is present and connects to surrounding properties under the same ownership to the northeast. The site also provides direct recreational access to Te Oneroa-a-Tōhē via a strip of land adjacent to the western boundary.

The wider site has a changeable topography, with natural features including several well-established inland wetlands and areas of pastureland. An overhead powerline is located along the Sandhills Road frontage of the site.

The proposal is located within a 30ha area of the site, which is located within the southern extent of the wider site (**Figure 3**). The proposed development spans two land parcels, with the majority of the free-range egg farm infrastructure located within the western parcel (Section 2 SO 472393).

The inland wetlands in proximity to the proposed development have been identified and mapped – see **Figure 4**. Toward the eastern extent of the site, a number of artificial watercourse / farm drains have been established to support the existing rural production activities. A large lake is also within the central portion of the site. The proposed free-range egg farm and associated ancillary services are predominantly located on moderately flat land, while the surrounding topography is generally undulating. The gradient increases in proximity to wetland areas. Scattered vegetation is present across both parcels.

The site is identified as Land Use Capability, classes 3 and 4 (**Figure 6**) and is zoned Rural Production Zone under the Operative Far North District Plan (**ODP**) and proposed to be zoned Rural Production Zone with Treaty Settlement Overlay under the Proposed Far North District Plan (**PDP**).

Finally, the site is also situated over the Aupōuri Aquifer that is identified by the PRP as a mapped Ground Water Management as shown in **Figure 5**. Outstanding Natural Feature Sweetwater Lake is also within the site, north of the orchard and west of Sandhills Road.

Figure 2: Locality Plan. (Source: Emap)

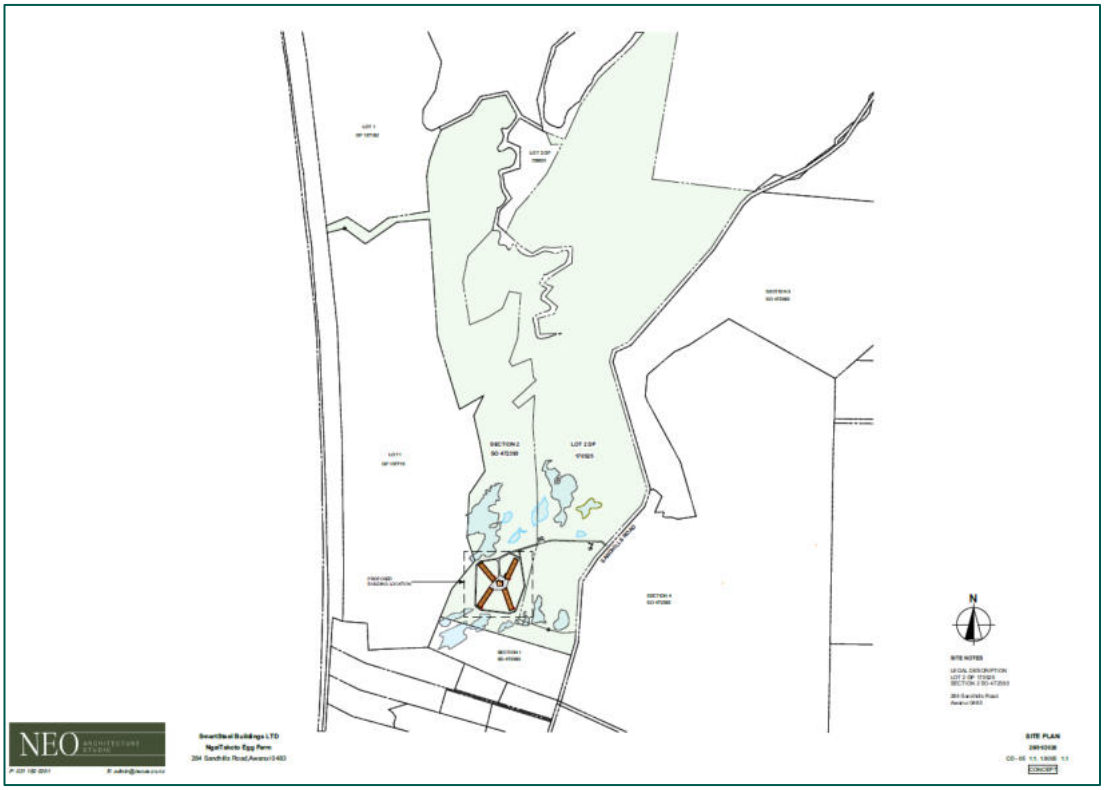


Figure 3: Site Plan. (Source: NEO Architecture refer to Appendix 2)

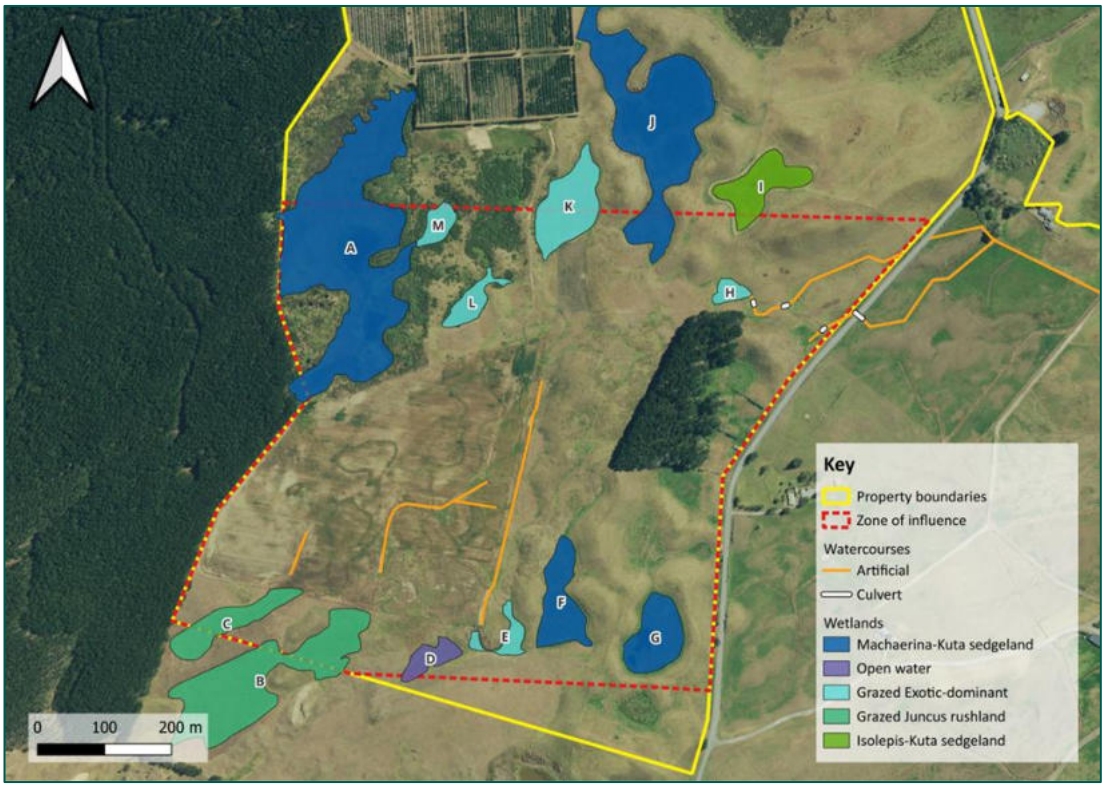


Figure 4: Wetland Plan. (Source: Viridis refer to Appendix 4)

Figure 5: PRP - Water Quality and Quantity Management Units – Outstanding Freshwater Bodies and Aupōuri Aquifer Overlay (Source: NRC Maps).

Figure 6: Land Use Capability Mapping. (Source: Landcare Research)

3.2 Surrounding Locality

The subject site is located in the rural environment, west of Awanui, and north of the township of Kaitaia and Ahipara. The surrounding area is predominantly rural in character, comprising a mix of rural lifestyle and rural production properties located across low-lying and gently sloping land, with areas of forestry activity situated on higher elevations and steeper terrain.

The land in the vicinity of 284, 452 and 458 Sandhills Road, Awanui, is generally low-lying to gently undulating rural terrain typical of the northern Northland coastal plain. Elevations in the wider Awanui area are relatively low, ranging between sea level and 70 m above sea level. The landscape supports productive rural uses with open contours that facilitate grazing, cropping, and other agricultural activities.

The site is located over the Aupōuri Aquifer which extends along the whole length of Te-Oneroa-a-Tōhe / Ninety Mile Beach on the west coast, and from Kokota (The Sandspit) to Waimanoni on the east coast. It also includes the low-lying land between Waimanoni and Ahipara.

North of the subject site are Lake's Ngatu, and Rorotoa (Sweetwater Lakes). Under the PRP, Lake Ngātu is mapped as a Significant Freshwater Body, while Lake Rotoroa is mapped as an Outstanding Natural Feature under the PRP.

The onsite irrigation channels and engineered watercourses drain through the catchment into the Awanui River and ultimately discharge into Rangaunu Harbour to the north. Te Oneroa-a-Tōhe / Ninety Mile Beach is located to the west of the subject site.

4.0 Proposal

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

NgāiTakoto wish to supplement the existing primary production operations within their farm providing economic growth and work opportunities for NgāiTakoto. The free-range egg farm will operate independently from the other farm operations and has been carefully designed and located within the wider site, being situated in approximately 30ha of the southern extent of the wider farm. The free-range egg farm will consist of four hen laying sheds with a combined capacity of 160,000 hens and one pack house in which eggs from the laying sheds are inspected, packed and stored prior to dispatch offsite. Enabling site works and supporting on-site infrastructure is required to support the proposal as described below.

4.1 Rural Production Activity - Free Range Egg Farm

4.1.1 Site Layout

Architectural Plans are prepared by NEO Architecture Studio and are enclosed as **Appendix 2.** The proposal has been designed to achieve the free-range standards, operational and functional requirements of the egg farm and to fit with the constraints of the site.

The proposed laying sheds (**Figure 5**) are arranged in a cross shape extending out from the central packhouse and hard stand area to support automation, product management and quality control.

Internal driveways, including loop road, are proposed to enable efficient manoeuvring around the laying sheds, internal driveways extend around the outer extent of the laying sheds with a hardstand manoeuvring area around the pack shed.

The buildings, access and stormwater management system have been located within the site in manner that is nestled within the wetlands.

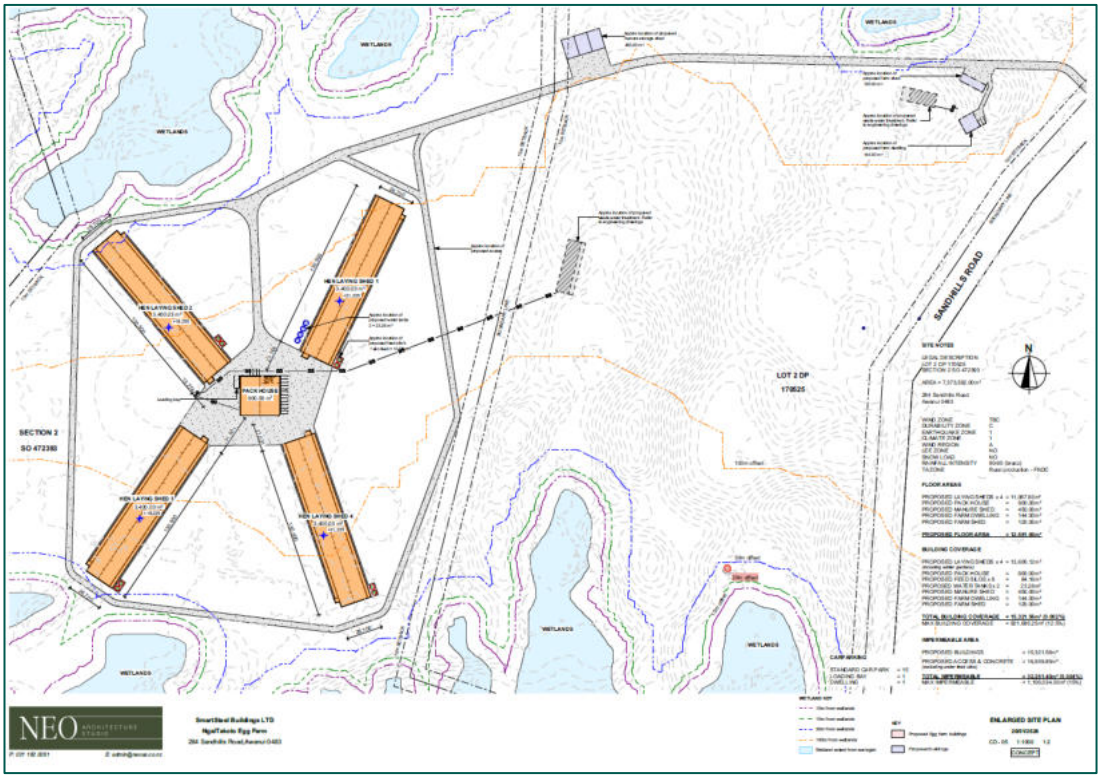


Figure 5: Egg farm layout. (Source: NEO Architecture refer to Appendix 2)

The proposed access route, several storage buildings, and one standalone dwelling are located within the eastern parcel, with portions of the access route encroaching within 10 metres of a small inland wetland.

4.1.2 Buildings

The proposal is to establish a free-range chicken farm, including 4 x 3,400m^2 laying sheds (roof area), 1 x 900m^2 packhouse with staff facilities, stormwater and drainage, on-site domestic wastewater and treatment system, access and parking, and bulk earthworks to establish level building platforms as set out in the Architectural Plans prepared by NEO Architecture Studio enclosed at Appendix 2.

The egg farm has been designed and will operate as a free-range system, which has indoor housing with daytime outdoor access. The indoor area includes infrastructure for roosting, laying, feeding and watering. Pop holes on the side of the shed allow the chickens to access the 'winter gardens' a covered outdoor area with ranging access to the wider 'ranging area'.

4.1.3 Layer shed design and capacity

These sheds provide controlled conditions for temperature, ventilation, lighting, and protection from predators and disease. The proposed site is to house four-layer sheds each of 3,400m^2 with dimensions of 31m (W) x 130.5m (L) and house 40,000 birds equating to a total capacity of 160,000 birds across the site.

Within each shed there are four aviaries, running the length of the shed which house the watering, feeding, egg and manure management systems.

Automated systems deliver feed and fresh water to hens. Feed formulations are adjusted through the laying cycle to support egg production, shell quality, and hen health.

Hens usually lay one egg per day during peak production. Eggs are collected automatically via conveyor belts and delivered to onsite egg packhouse.

4.1.4 Packhouse

The proposal includes a packhouse for processing the eggs located central to the sheds being 900m^2. The eggs are checked, graded, packed for consumers and stored in temperature-controlled rooms prior to transport offsite for distribution. Egg pickup via a truck will occur on a daily basis. The packhouse includes staff facilities comprised of lunchroom, office, toilets and shower. Refer to **Appendix 2** for details.

4.1.5 Scale of Activity

The proposal will include onsite management of the operation of the egg farm, with workers in the packhouse. The egg farm is anticipated to support 25 full time workers.

It is understood that farming and horticultural activities across the wider farm support 21-25 full time workers.

4.1.6 Farm Operations

An onsite farm manager will reside on side within the farmers residence proposed at the entrance to the site to provide oversight for all farm activities.

As a farm, caring for the animals will generally operate 24-hours per day. Operations within the laying sheds will generally commence at 5.30am and operate until 9.30pm

The packhouse will generally operate during daylight hours 7am to 10pm.

4.1.7 Manure and litter management

Waste is generated in the form of manure (bird droppings) and the bedding material (litter). The proposed design incorporates three manure belts situated within each bird aviary the length of the shed. One under the top row, one under the bottom row and one on the floor.

All the birds sleep up on the aviary in elevated positions in the shed, where the top row belt captures the manure. At ground level, manure scrapers on the floor push the manure onto the floor belt. Any residual is manually shovelled onto a manure belt. The floor level has a base of wood shavings which assists in absorbing any moisture.

Manure moves via the three main conveyors dropping onto the far end of each shed being a completely contained area. The waste is then lifted via a screw auger and dropped into a truck for disposal offsite. Each shed is emptied twice, weekly.

Additional onsite manure storage shed of 450m^2 is also proposed, it will be fully contained with concrete flooring as a temporary holding area and utilised as required for temporary storage.

4.1.8 Depopulation and Dead bird management

Young hens are introduced at point-of-lay (around 16–18 weeks of age) and are maintained in the shed for a period of 18 months at which time they are depopulated and a new batch of hens are introduced. Restocking of the four sheds are operated independently and the timing is offset between sheds.

At the end of the 18 months laying life cycle birds will be depopulated and carcases removed to an approved processing site. In the event that birds die of natural causes during their laying life cycle, carcases will be removed from the sheds daily and disposed of in the manure bunker and disposed of offsite as required.

4.1.9 Fencing

Fencing suitable for containing the ranging chickens is proposed around the out perimeter of the free-range egg farm. Fencing will be located to prevent chickens entering all identified natural inland wetlands and will be established to manage flocks within and across each laying shed.

4.2 Residential Activity

The proposal includes a residential dwelling located onsite to provide for onsite management of the egg farm. As a permitted activity, the location of this dwelling is indicative.

4.3 Bulk Earthworks and Construction

Earthworks have been designed by Chester Engineers in the Land Development Report enclosed at **Appendix 3**.

Earthworks of approximately 36,875m^3, comprising cut, 28,170m^3 and 8,705m^3 fill across an area of 102,730m^2 is proposed to establish suitable levels for the proposed building platforms, ranging acreage, sheds and accessway. A maximum cut depth of 3m and a maximum fill depth of 2m is proposed.

Erosion and sediment control measures are proposed in accordance with Auckland Council Guideline Document GD2016/005 are proposed and will be implemented for the duration of the works.

No earthworks are proposed within 10m of any freshwater waterbodies or mapped flood areas.

Geotechnical assessment has been undertaken by Tokin and Taylor (**Appendix 4**) which identifies areas of soft compressible soils which will need compaction to support foundation design. Pre-loading has been recommended and involves the placement of material on the building platforms to accelerate the consolidation process beneath the proposed development. Material will be placed on the building platforms for a specified period of time and then relocated to the next building platform requiring compaction. Final details of the final ground improvement solution will be required as part of detailed design.

4.4 Servicing

The servicing strategy for the proposed development is set out in the Land Development report and accompanying drawings by Chester, included as **Appendix 3**. In summary, it is concluded that the proposal can be appropriately serviced in terms of stormwater, wastewater, water supply.

4.4.1 Stormwater Management

4.4.1.1 Quality and Quantity

All stormwater runoff from impervious surfaces and buildings will be collected and conveyed, with runoff from accessways and parking areas conveyed via a network of grassed and vegetated

swales, which provide stormwater quality treatment through sedimentation and filtration processes.

Roof runoff will be discharged to inground dispersal trenches located upstream of the swale network, enabling initial attenuation, infiltration, and cooling prior to entering the swales.

Runoff from the hen ranging area will also be directed to the swale network, which will passively treat flows through sedimentation and filtration before discharging to the existing wetland system. This approach provides an effective mechanism for managing potential sediment and nutrient loads associated with the outdoor ranging area.

The vegetated swale system provides sufficient hydraulic residence time to enhance water quality prior to discharge to the wetlands. In addition, routing roof runoff through the swales allows runoff temperatures to naturally equilibrate before entering downstream receiving environments, supporting the protection of aquatic values.

4.4.1.2 Wetland Volume Management

The proposed earthworks and site formation result in a very minor alteration to the local catchment boundaries draining to Wetlands A (to the north) and Wetland B (to the south). Following site formation, post-development runoff has been calculated by Chester's in the Land Development report. A net increase in runoff of approximately 143 m^3 to Wetland A and 350 m^3 to Wetland B during the water quality design storm.

4.4.2 Wastewater Disposal

Onsite wastewater disposal is proposed to service the proposed residential unit and staff facilities within the pack house.

The development requires separate wastewater treatment systems to service the dwelling and the egg farm facility. Secondary treatment systems are recommended based on the groundwater levels observed during the site investigation and the need to achieve adequate vertical separation to the seasonal high groundwater table.

The dwelling will be serviced by a secondary treatment system designed for an estimated wastewater flow of approximately 1,000 L/day.

The egg farm facility will be serviced by a separate secondary treatment system designed for an estimated wastewater flow of approximately 1250 L/day.

The final selection of treatment unit types, performance standards, and suppliers for both systems will be confirmed during the detailed design phase to ensure compliance with AS/NZS 1547:2012 and relevant regional plan requirements.

4.4.3 Water Supply

4.4.3.3 Chicken Drinking Water

Chickens require approximately 250ml of water per day, the proposed development will require approximately 40m^3 of drinking water per day. It is proposed to utilise existing groundwater sourced from the Aupōuri Aquifer via an existing bore for the purpose of providing fresh water to meet the reasonable needs of animals in accordance with Section 14 of the RMA.

This demand is proposed to be met by the existing groundwater supply bores on site. The overall water take from the existing bore will not exceed the consented limit of 1,600,000 cubic metres per day.

4.4.3.4 Packhouse and Ancillary Water Supply

The egg farm is expected to accommodate approximately 25 employees per day, which will require an additional 1.25 m^3 of water per day (based on 50 litres per person per day).

The proposed design includes 4 x 30,000-litre rainwater storage tanks within the site capturing roof runoff from the proposed buildings. This water will be utilised to service the packhouse and ancillary water needs, including shed washdown.

The proposed residential unit will be serviced via roof catchment with the sizing of the water tank determined at the time of development.

4.4.3.5 Fire Fighting Water Supply

The proposal also includes firefighting water supply that will be established via rainwater storage tanks within the site.

4.5 Transport, Access and Parking

The transportation strategy for the proposed development is set out in the Transport Assessment report by Traffic Planning Group, included as **Appendix 6.** In summary, it is concluded that the proposal can be appropriately serviced in terms of access, parking and loading bays.

4.5.1 Traffic Movements

The proposed staff and truck operations are anticipated to result in the following traffic movements:

- Hen laying = 25 workers
- Feed drop = Three Class 4 trucks per week (6 movements per week)
- Manure collection = Three Class 4 trucks per week (6 movements per week)
- Egg collection = Five Class 5 trucks per week (10 movements per week)

From this, on the site's busiest day, 25 workers and 3 truck movements are expected to frequent the site. This volume of use is estimated to generate approximately 70 passenger vehicle movements and six truck movements per day. These movements are most likely to occur in the early morning (start of workday) and early evening (end of workday) for passenger vehicles, with truck movements occurring mid-way through the day. A nominal number of trips was applied for workers which may leave the site during a break period throughout the day.

4.5.2 Access

The site will be served by a single vehicle access which will connect to Sandhills Road, approximately 5.3 kilometres west of Gill Road. Vehicular access to the site will occur from Sandhills Road near an existing farm access point. The site's access at the boundary will be approximately 6 metres wide, allowing for two-way vehicle movement. Where connecting to the carriageway of Sandhills Road appropriate splays between the road and the access of

approximately 15 metres (in accordance with the FNDC-Engineering Standard Sheet 21 (Type 1B). This splay will allow for Class 5 trucks to suitably enter and exit the site.

From the site's vehicle crossing, sightlines along Sandhills Road will extend more than 200 metres to the north and south, allowing for suitable visibility to facilitate safe and efficient vehicle movement.

Internal access provides for manoeuvring around the outer edge of the laying sheds and around the packhouse.

4.5.3 Onsite Parking and Loading Bay

15 parking spaces and one loading bay are proposed for employee and operations parking. The parking spaces will be at least 5.4 metres deep and 2.4 metres wide, with more than 8 metres of manoeuvring depth. The loading bay will be 3.5 metres wide and 9.0 metres deep, although there will be no adjacent structures, thereby allowing for the space to accommodate larger trucks and semi-trailers with ease. Within the site, the parking, loading and circulation area will be unsealed.

4.6 Ecology

An Ecological Impact Assessment (**EcIA**) of the subject site has been prepared by Viridis and is included as **Appendix 5**. There are a number of natural inland wetlands identified within the site as shown in **Figure 4**. There is an existing farm drainage network within the development area that have been classified as artificial watercourses. Otherwise, there are no natural watercourses within the development site area. There are 13 natural inland wetlands (Wetlands A – M) that vary in size and vegetation composition. Collectively, these wetlands form a network of seasonal peatland habitats within a highly modified agricultural landscape. The condition of the wetlands varies, however, the EcIA confirms that all wetlands within the development area meet the 'significance criteria' in accordance with Appendix 5 of the PRP and collectively form a high-value wetland complex.

As shown in the Architectural and Civil Drawings (provided as **Appendix 2** and **Appendix 3** respectively), no vegetation clearance, earthworks, buildings or structures are proposed within 10m of the identified wetlands. The stormwater strategy will result in a net increase in runoff of approximately 143m³ to Wetland A and 350m³ to Wetland B that is likely to change the water level range within the identified wetlands.

Native planting is proposed in four discreet locations at the edges of Wetlands A, B, C and H where earthworks or infrastructure is proposed within 30m of these features in accordance with the EcIA recommendations.

5.0 Reasons for Consent

A rules assessment against the provisions of the Operative Far North District Plan (ODP) is attached as **Appendix 8.** The site is zoned Rural Production and is not subject to any overlays or additional controls under the ODP. The site is proposed to retain its Rural Production zoning under the Proposed Far North District Plan (PDP), with the addition of a Treaty Settlement Overlay. The PDP contains rules with immediate legal effect, and an assessment against those provisions is provided in **Appendix 8**. The proposed requires consent for the matters outlined below.

5.1 Operative Far North District Plan

Chapter 12.3 Soils and Minerals

- **Rule 12.3.6.3(c) Discretionary Activity** The proposed bulk enabling earthworks of approximately 3,6875m^3 cut, 28,170m^3 (-8705m^3 net) over approximately 102,730m^2 will exceed the standards of rules 12.3.6.1.1 and 12.3.6.2.3. Discretionary Activity.

Chapter 12.7 Lakes, Rivers, Wetlands and the Coastline

- **Rule 12.4.6.3(b) Discretionary Activity** Proposed Hen Laying Shed 2 and the internal access (impervious area) will be located within 30m of the wetlands and the proposed stormwater management system will result in a change to the natural water levels of wetlands, infringing the standards of rules 12.7.6.1.1 and 12.7.6.1.3. Discretionary Activity.

Chapter 15 – Transportation

- **Rule 12.1.6A.5.1 Discretionary Activity** The proposed activity falls within the definition of factory farming, applying the industrial Traffic Intensity Factor of Appendix 3 the activity will result in 1,254 movements associated with industrial activities. The proposal includes a residential unit which is not the first onsite, plus 10 movements. A total TIF of 1,264 will infringe rules 15.1.6A.2.1, 15.1.6A.3.1 and 15.1.6A.4.1. Discretionary Activity.
- **Rule 15.1.6B.3 Discretionary Activity** The proposal is a discretionary activity under this rule because:
    - The proposed activity falls within the definition of factory farming, applying the industrial parking factor of Appendix 3 being 1 per 100m^2 GBA, the activity will result in the requirement to provide 125 onsite car parks associated with industrial activities. The proposal will allow space for at least 15 parking spaces within the site, infringing rule 15.1.6B.1.1 On-Site Car Parking Spaces.
    - The proposal includes 15 formal parking spaces with no dedicated accessible parking space, infringing rule 15.1.6B.1.4 Accessible Car Parking Spaces.
    - Parking and loading areas will not be marked, infringing rule 15.1.6B.1.5 Car Parking Space Standards.
    - One loading space will be provided, infringing rule 15.1.6B.1.6 Loading Spaces.

5.2 National Environmental Standard – Contaminated Soils

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES Contaminated Soils) were gazetted on 13th October 2011 and took effect on 1st January 2012.

The standards are applicable if the land in question is or has been, or is more likely than not to have been, used for a hazardous activity or industry and the applicant proposes to subdivide or change the use of the land, or disturb the soil, or remove or replace a fuel storage system.

The subject site is not identified on Northland Regional Councils Selected Land Use register and there is no information that suggests that the site has been used for any activities that are on the

Hazardous Activities and Industry List (HAIL) or evidence of migration of hazardous substances from adjacent land use.

Based on the above, the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES-CS) does not apply to the proposal as the site is not considered to be a 'piece of land'.

5.3 Activity Status

Overall, this application is for a **discretionary** activity.

6.0 Public Notification Assessment (Sections 95A, 95C and 95D)

6.1 Assessment of Steps 1 to 4 (Sections 95A)

Section 95A 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.

6.1.1 Step 1: Mandatory public notification is required in certain circumstances

Step 1 requires public notification where this is requested by the applicant; or the application is made jointly with an application to exchange of recreation reserved land under section 15AA of the Reserves Act 1977.

The above does not apply to the proposal.

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

Step 2 describes that public notification is precluded where all applicable rules and national environmental standards preclude public notification; or where the application is for a controlled activity; or a restricted discretionary, discretionary or non-complying boundary activity.

In this case, the applicable rules preclude public notification. Therefore, public notification is precluded.

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

Step 3 describes that where public notification is not precluded by step, it is required if the applicable rules or national environmental standards require public notification, or if the activity is likely to have adverse effects on the environment that are more than minor.

As noted under step 2 above, public notification is not precluded, and an assessment in accordance with section 95A is required, which is set out in the sections below. As described below, it is considered that any adverse effects will be less than minor.

6.1.4 Step 4: Public notification in special circumstances

If an application is not required to be publicly notified as a result of any of the previous steps, then the council is required to determine whether special circumstances exist that warrant it being publicly notified.

Special circumstances are those that are:

- Exceptional or unusual, but something less than extraordinary; or
- Outside of the common run of applications of this nature; or
- Circumstances which make notification desirable, notwithstanding the conclusion that the adverse effects will be no more than minor.

It is considered that there is nothing noteworthy about the proposal. It is therefore considered that the application cannot be described as being out of the ordinary or giving rise to special circumstances.

6.2 Section 95D Statutory Matters

In determining whether to publicly notify an application, section 95D specifies a council must decide whether an activity will have, or is likely to have, adverse effects on the environment that are more than minor.

In determining whether adverse effects are more than minor:

- Adverse effects on persons who own or occupy the land within which the activity will occur, or any land adjacent to that land, must be disregarded.

  The land to be excluded from the assessment is listed in section 6.3 below.

- Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded.

  In this case the ODP provides for the following within the Rural Zone as a permitted activity:

  - Buildings – 10m setback from site boundary, compliant with sunlight recession plane, 12m in height, not exceeding gross site area of 12.5%.
  - Stormwater management – maximum proportion of gross site area covered by buildings and other impervious surfaces less than 15%
  - Keeping of animals (factory farming) – no closer than 50m from site boundary.
  - Scale of activity a maximum of 4 persons per site or 1 person per 1 hectare of net site area, whichever is the greater.
  - Excavation and/or filling, excluding mining and quarrying, on any site in the Rural Production Zone or Kauri Cliffs Zone is permitted, provided that: (a) it does not exceed 5,000m^3 in any 12 month period per site; and (b) it does not involve a

continuous cut or filled face exceeding an average of 1.5m in height over the length of the face i.e. the maximum permitted average cut and fill height may be 3m.

- Any building and impermeable surface set back 30m from the boundary of wetlands of 1ha or more in area.
- 60 maximum daily one-way traffic movements.

Given the productive nature of the proposed activity, it is considered appropriate to apply the permitted baseline.

- Trade competition must be disregarded.

This is not considered to be a relevant matter in this case.

- The adverse effects on those persons who have provided their written approval must be disregarded.

No persons have provided their written approval for this proposal.

6.3 Land Excluded from the Assessment

In terms of the tests for public notification (but not for the purposes of limited notification or service of notice), the adjacent properties to be excluded from the assessment are shown in **Figure 7** below, and include:

- **North:** Section 30 Block VIII Opoe Survey District; Section 48 Block VIII Opoe Survey District; Lot 1 and Lot 3 Deposited Plan 134738 and Lot 4 Deposited Plan 134738; Lot 4 Deposited Plan 134738 Section 2 Survey Office Plan 555604; Lot 2 Deposited Plan 134738; Part Lot 2-3 Deposited Plan 40865; Part Lot 2-3 Deposited Plan 40865.
- **South:** Section 1 Survey Office Plan 472393
- **East:** Section 21-22 Block 1 Takahue Survey District; Lot 1 Deposited Plan 593802 and Section 30 Block I Ahipara Survey District; Lot 1 Deposited Plan 196761 and Section 29 Block I Ahipara Survey District; Section 1 Block I Ahipara Survey District and Section 15 Block I Takahue Survey District and Lot 1 Deposited Plan 172560 and Section 2 Block I Ahipara Survey District; Section 4 Survey Office Plan 472393.
- **West:** Part Lot 2 Deposited Plan 63209, Lot 1 Deposited Plan 80129, Lot 2 Deposited Plan 105103, Lot 1 Deposited Plan 136786, Lot 1 Deposited Plan 136797, Lot 1 Deposited Plan 136798, Lot 1 Deposited Plan 136799, Lot 1 Deposited Plan 136800, Lot 2 Deposited Plan 136801, Lot 3 Deposited Plan 136802, Lot 1 Deposited Plan 136867, Lot 1 Deposited Plan 136868, Lot 1-2 Deposited Plan 136869, Lot 1 Deposited Plan 136871, Lot 1 Deposited Plan 136872, Lot 1 Deposited Plan 137182, Lot 1 Deposited Plan 137711, Lot 1 Deposited Plan 137712, Lot 1 Deposited Plan 137713, Lot 1 Deposited Plan 137714 and Lot 1 Deposited Plan 137715.

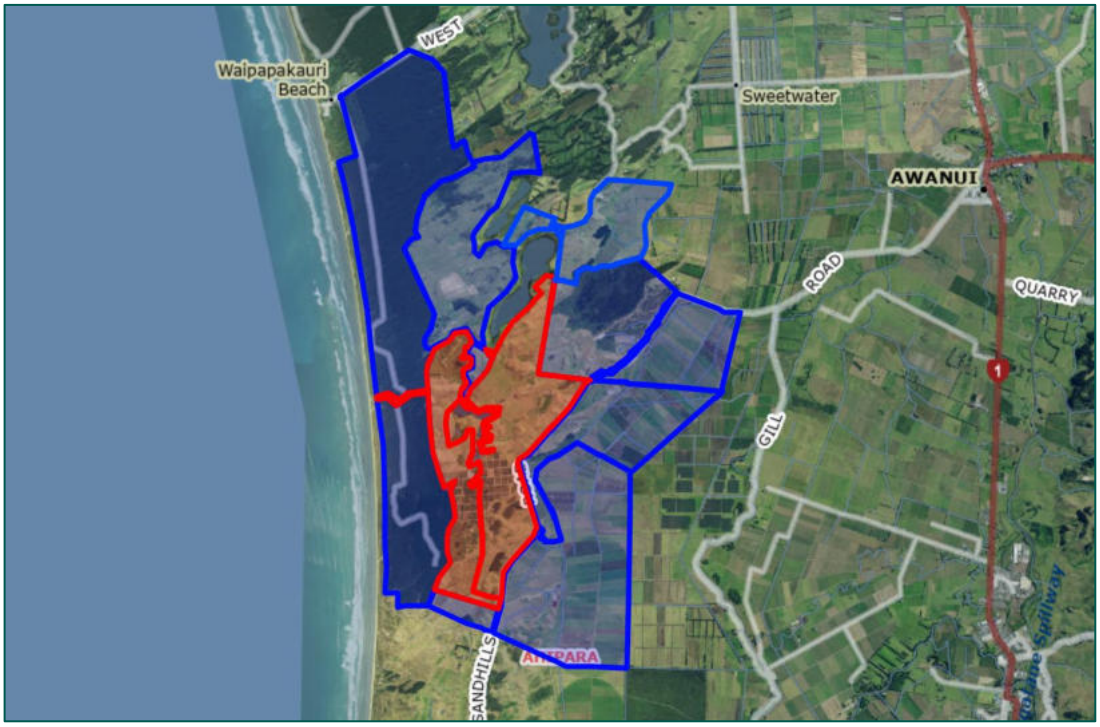


Figure 7: Adjacent properties in relation to subject site. (Source: Emaps)

6.4 Assessment of Effects on the Wider Environment

The following sections set out an assessment of wider effects of the proposal, and it is considered that effects in relation to the following matters are relevant:

- Rural character, amenity and building intensity effects;
- Transportation effects;
- Productive capacity effects;
- Earthworks and construction effects;
- Onsite servicing;
- Ecology effects;
- Cultural and heritage values; and
- Natural hazards.

These matters are set out and discussed below.

6.4.1 Rural Character, Amenity and Building Intensity Effects;

The proposed free range egg development is located within the rural production zone which is typically characterised by expansive pastural areas, associated residential dwellings and ancillary farm buildings, varying topography and indigenous and exotic areas of mature planting. The proposal involves establishing a 160,000-hen free range chicken farm, including 4 x 2,7451m^2 laying sheds, 900m^2 packhouse with staff facilities, stormwater and drainage, on-site domestic wastewater and treatment system, access and parking, and bulk earthworks to establish level building platforms.

The proposed productive land use and factory farming activity is consistent with the land use anticipated and provided for in the Rural Production zone. The proposed layout has been developed with regard to a range of factors, including potential ecological effects, retention of the land's productive capacity, management of reverse sensitivity effects associated with odour and amenity, and the achievement of a functional layout that efficiently supports the operation of the egg farm and the wellbeing of the chickens.

The proposed buildings have been located away from Sandhills Road and the adjoining properties complying with all permitted activity standards for bulk and location within the Rural Production zone and are therefore provided for and anticipated within the rural character.

Key natural features of the site being the wetlands have been identified, buildings and impervious areas have where possible been located to avoid infringement of the ODP setback requirements, protecting the wetlands. Wetlands will be enhanced with planting within 10m of the wetlands.

Whilst the proposal will result in an increase in traffic intensity from the site, it is considered that the operational requirements of the egg farm will in practice limit the timing of traffic movements avoiding significant change to overall traffic amenity on Sandhills Road.

Overall, it is considered that the proposal will fit comfortably within the rural character and amenity of the surrounding rural production context and is considered to have less than minor adverse effects on the amenity and rural character on the surrounding and wider environment.

6.4.2 Transportation Effects

A Transport Assessment has been prepared by Traffic Planning Consultants and is included as Appendix 6. The Report included a full analysis of the proposed design specifications and layout against the ODP.

The ODP applies a Traffic Intensity Factor (TIF) to development, the proposed activity has been calculated as an industrial activity in the absence of a specific factory farming or rural production TIF. Practically the egg laying sheds will result in traffic movements associated with the movement of manure and feed, which are estimated to be significantly less than that associated with an industrial activity. Traffic movements associated with the packhouse are workers and truck movements to move eggs. This volume of use is estimated to generate approximately 70 passenger vehicle movements and six truck movements per day. These movements are most likely to occur in the early morning (start of workday) and early evening (end of workday) for passenger vehicles, with truck movements occurring mid-way through the day.

The Transport Assessment has taken into account trip generation assessment based on first principles, and the realistic traffic movements associated with the proposal. The proposal represents a 35% increase in volumes on Sandhills Road. While a significant increase, the overall volumes and peak hour volumes along Sandhills Road remain quite low and well within the acceptable range for an unsealed rural road. Traffic Planning Consultants consider that the level of traffic generation from the site can be easily accommodated by the existing road environment without any additional mitigation and will have a less than minor effect.

The proposed vehicle crossing with Sandhills Road and internal access complies with the ODP permitted standards. Traffic Planning Consultants confirm that the future gradients of the road (internal access) are anticipated to be suitable for heavy vehicles to navigate, with localised earthworks removing any cresting or depressions which would negatively impact on the access' performance. Any effects resulting from the proposed gradients would be contained within the

site and would be less than minor onto users of the site, with no effects onto users of the public realm.

The proposal will not provide the required onsite parking expected by the ODP parking standards for an industrial activity. Traffic Planning Consultants consider that the pack house and manure shed are the main operation building (with human activity). With a combined GBA of 1,350 m^2, 14 parking spaces are required. Within the site, the parking, loading and circulation area will be unsealed, which is appropriate for the rural environment. With the available space within the main area of the site, the non-marking of parking will not have any detrimental effect onto the operation of parking, as should drivers park more spaced out, there is amble space available to accommodate additional parking. Overall, the site's parking and loading proposal is considered by Traffic Planning Consultants to suitably accommodate the likely demands associated with the operation

For these reasons it is considered that the proposal will result in less than minor transportation effects.

6.4.3 Productive Capacity Effects

The subject site is mapped as comprising a mix of Land Use Capability (LUC) Classes 3, 4, and 6 soils. According to section 3.5(7) of the National Policy Statement for Highly Productive Land (NPS-HPL), land is not referenced as Highly Productive Land (HPL) where it is zoned Rural Production Zone, LUC 3 and subject to a resource consent application for development on LUC 3 for any activity other than rural lifestyle.

The proposed egg farm is located within an area mapped as LUC Class 3 soils. However, a soil suitability assessment prepared by Hanmore Land Management (refer Appendix 7) concludes that the NZLRI classification is not representative of on-site conditions. The report identifies that the sandy soils present on the site are vulnerable to wind erosion and are unsuitable for arable production, with very limited capacity to support grazing or forestry activities.

The location of the egg farm has therefore been carefully selected and clustered toward the edge of the more productive land, having regard to the findings of the soil suitability assessment. Based on the site-specific analysis, the soils within the development footprint more closely align with LUC Classes 6 and 7. The wider site, including the established avocado orchard located to the north of the proposed egg farm, will continue to operate as a productive rural activity and maximise the productive potential of the land.

Furthermore, the egg farm will maximise free ranging of the chickens utilising the land for production of food. It is considered that the potential fragmentation effects have been appropriately managed by concentrating development within a localised area and aligning it with adjacent non-arable sandy soils located on the western extent of the site and the effect to productive capacity will be less than minor.

6.4.4 Earthworks and Construction Effects

Earthworks are required to enable the establishment of access, hardstand areas and building platforms. The proposed extent of these earthworks is outlined in the Land Development Report and accompanying cut and fill plan prepared by Chester (see Appendix 3). All fill material will be retained on site. No earthworks are proposed within 10m of the identified wetlands or within any mapped 1% or 10% AEP floodplains.

The Tokin + Taylor Geotechnical Assessment identifies compressible soils within the development site which require a ground improvement solution to resolve the identified geotechnical constraints. T+T recommend a pre-loading, involving the temporary loading of building platforms to compact the site to establish good ground. Where possible, excess fill and imported aggregate will be utilised to support compaction and future building foundations.

Comprehensive erosion and sediment control measures are proposed and set out in drawing C210 of the Civil design package and have been designed in Auckland Council Guideline Document GD2016/005 and will be implemented for the duration of the earthwork activities ensuring temporary erosion and sedimentation effects on surrounding freshwater bodies will be appropriately managed. Further, Viridis have reviewed the proposed earthworks arrangements and ESC measures and consider that ecological effects on the surrounding freshwater resources will be appropriately mitigated, such that ecological effects will be low. On this basis, it is considered that any adverse effects associated with silt and sediment runoff (and resulting effects on water quality) will be less than minor.

When having regard to the nature of construction activities, site works will be managed in accordance with a CMP that will set measures, including dust mitigation measure, to manage potential adverse effects associated with the construction phase of the project. A condition to this effect is offered as part of this application.

Overall, taking into account the temporary nature of the earthworks and construction effects, it is considered that any adverse will be less than minor and acceptable.

6.4.5 Servicing

The provision of infrastructure to service the development has been considered by Chester and detailed in their Land Development Report (Appendix 3). Their report and drawings confirm that the proposal can be adequately serviced.

6.4.5.6 Stormwater management

The proposal is supported by a stormwater management system designed to manage water quality. The Land Development Report and Plans detail the range of culverts and swale drains proposed and details the proposed stormwater management system which will ensure that stormwater will be treated prior to discharge improving quality of stormwater entering adjacent wetlands.

Chester consider that the proposed impervious areas are low- contaminant-yielding, given their intended use and limited traffic, comprising of building roofs, low-volume accessways, and a common parking area. Noting that suspended solids and hydrocarbons, contaminant generation from these areas are also expected to be low. The primary water quality consideration associated with roof runoff is thermal impact.

The vegetated swale system provides sufficient hydraulic residence time to enhance water quality prior to discharge to the wetlands. In addition, routing roof runoff through the swales allows runoff temperatures to naturally equilibrate before entering downstream receiving environments, supporting the protection of aquatic values.

Runoff from the chicken outdoor ranging area will also be directed to the swale network, which will passively treat flows through sedimentation and filtration before discharging to the existing

wetland system. This approach provides an effective mechanism for managing potential sediment and nutrient loads associated with the outdoor ranging area.

The vegetated swale system provides sufficient hydraulic residence time to enhance water quality prior to discharge to the wetlands. In addition, routing roof runoff through the swales allows runoff temperatures to naturally equilibrate before entering downstream receiving environments, supporting the protection of aquatic values.

The proposal will result in a net increase in runoff volume of approximately 143 m^3 for Wetland A and 350 m^3 for Wetland B during the water quality design storm. These increases are primarily attributable to the introduction of additional impervious surfaces associated with the proposed development, with a very minor contribution from catchment redistribution resulting from site formation works. As the catchment redistribution represents a negligible proportion of the total contributing catchment areas for each wetland, it is not expected to result in more than minor adverse hydrological effects.

Chester have noted that the receiving wetlands are naturally intended to hold water and accommodate variations in inflows. And they consider that the small additional runoff from the proposed development is consistent with their natural hydrological function and is not expected to cause harm. The proposed mitigation measures are designed to further reduce any potential adverse effects and may improve water quality before the runoff reaches the wetlands.

The following mitigation measures have been adopted by the proposal:

- In-ground dispersal trenches for roof runoff: Roof downpipes from the proposed buildings will be connected to in-ground dispersal trenches, as shown in our drawings. This approach promotes infiltration, increases groundwater recharge, and reduces the volume and velocity of surface runoff entering the wetlands.
- Shallow grass swales: Stormwater runoff from the site will be collected and conveyed through shallow grass swales with a gentle gradient. These swales provide hydraulic resistance, slow the flow of runoff, and allow additional time for infiltration. The slowed flow also improves water quality by promoting sedimentation and filtration of potential contaminants.

Overall, it is considered that the proposed stormwater management measures proposed are expected to effectively manage the increased runoff while minimising hydrological and ecological effects on the wetlands. On this basis, adverse effects of stormwater runoff including on water quality are considered to be less than minor and acceptable.

6.4.5.7 Onsite water supply:

The proposal includes a mix of water supply sourced from groundwater bores and onsite water tanks to appropriately service the potable, non-potable and firefighting supply necessary.

6.4.5.8 Wastewater disposal:

Onsite wastewater disposal is proposed to service the proposed residential unit and staff facilities within the pack house. The development requires separate wastewater treatment systems to service the dwelling and the egg farm facility. Secondary treatment systems are recommended by Chester based on the groundwater levels observed during the site investigation and the need to achieve adequate vertical separation to the seasonal high groundwater table.

Subject to compliance with the recommendations it is considered that the proposed servicing will be acceptable and effects will be less than minor.

6.4.6 Ecological Effects

An EcIA has been undertaken by Viridis and enclosed as **Appendix 4**. Viridis undertook desktop analysis and site investigations to identify and record any watercourses, natural inland wetlands and other ecological features within the site refer to **Figure 4**.

The proposed works to establish free range egg farm and associated stormwater management will result in stormwater diversion and discharge in proximity to a wetland. An iterative design process has been applied, and Viridis has assessed opportunities for avoiding, minimizing, or mitigating potential ecological impacts through design modifications, which has led to changes in the stormwater management system design.

6.4.6.9 Terrestrial Ecology

Viridis have confirmed that significant terrestrial vegetation is not located within proposal area, with vegetation primarily comprising scattered mature trees, both exotic and indigenous, alongside areas of exotic scrubland. It is proposed to remove pasture, crop and small stand of pine trees to facilitate the development, none of which are considered indigenous or natural habitats.

Importantly, no vegetation is proposed for removal within 10m of any identified natural inland wetlands.

6.4.6.10 Freshwater Ecology

Viridis have identified 13 natural inland wetlands within the development area, all of which are assessed as meeting the Proposed Northland Regional Plan (**PRP**) significance criteria under Appendix 5, particularly as it relates to representativeness, rarity and distinctiveness within the ecological context. Despite varying condition, this complex of wetlands retain important ecological functions, including water storage, maintenance of wetland hydrology, and provision of habitat for indigenous flora and fauna. Their occurrence within a landscape otherwise dominated by cropping and pasture further elevates their ecological importance. Overall, the natural inland wetlands are considered to have high ecological value under the PRP.

As set out in section **6.4.4** above, bulk earthworks are proposed to enable the development. ESC measures are described in Chester's Land Development Report and Civil drawings (refer to **Appendix 3**) to manage temporary erosion and sedimentation effects from the works. Provided the ESC measures are implemented, Viridis consider that ecological effects on the surrounding natural inland wetlands will be mitigated to a level that is low.

Regarding wetland hydrology and catchments, Chester's stormwater modelling indicates a net increase in runoff volume of approximately 143m³ to Wetland A and 350m³ to Wetland B for the modelled design event. These increases are primarily attributable to the introduction of additional impervious surfaces, with only a very minor contribution from catchment redistribution. Given the large size of the contributing catchments and the natural capacity of these wetlands to accommodate fluctuations in inflows, these increases are expected to result in low adverse hydrological effects.

The proposed design avoids any reduction in runoff volumes to the wetlands during frequent storm events. Maintaining, or marginally increasing, runoff inputs is important for the ongoing health of bog wetlands, which are seasonally wetland therefore sensitive to drying and changes in

water balance. In this context, the marginal increase in runoff volumes is consistent with the natural hydrological function of the wetlands and is not expected to result in adverse ecological effects.

Overall, Viridis has concluded that the proposed stormwater management measures are expected to maintain wetland hydrology and catchment processes and avoid significant changes to water levels, flow patterns, or ecological function. With the proposed mitigation in place, effects on the hydrology of the identified wetlands, particularly Wetlands A and B, are assessed as low.

On this basis, taking into account the proposed earthworks, stormwater management strategy and overall design considerations factored into the proposal and for the reasons outlined above, the adverse effects on terrestrial and freshwater ecology are considered to be less than minor.

6.4.7 Natural hazards – flooding

The site is not identified by Northland Regional Council as being subject to flood hazards. Chester have undertaken a flood assessment in support of the proposal (Appendix 3). They completed a rapid flood assessment to evaluate pre- and post-development conditions using the HEC-HMS model. Flood extent and depth were assessed for the 1% AEP event, incorporating a 20% allowance for climate change. The results indicate that the proposed works area is generally located outside the mapped flood extent, with only minor localised ponding observed. This shallow ponding is attributable to existing site topography rather than defined overland flow paths.

Under post-development conditions, runoff from the developed area is collected and conveyed via the proposed shallow, formed grassed swales, as shown on the engineering drawings. For the 1% AEP plus climate change event, minor localised flooding is predicted at some culvert inlets due to culvert capacity constraints. This results in a temporary backwater effect, causing water to pond along the swales before gradually draining through the culverts and being conveyed to the receiving waterbodies.

The rapid flood assessment indicates that the proposed development will not result in any material increase in flood extent, flood depth, or flood hazard beyond the site for the 1% AEP plus climate change event. The proposed building platforms and accessways are located above the assessed flood levels and are therefore not subject to inundation during the design event.

Minor, localised ponding at culvert inlets is temporary in nature, remains confined within the site, and does not adversely affect neighbouring properties, accessways, or building platforms.

Overall, based upon the findings of Chester the proposal is considered to have less than minor flood hazard effect.

6.4.8 Cultural and Heritage Effects

The ODP and PRP do not identify recorded sites or areas of significance to Māori within or adjacent to the subject site, nor are any recorded archaeological or historical sites shown on the site or direct vicinity on ArchSite.

The subject site is known to NgāiTakoto as Te Make and was previously owned by the Crown as a Landcorp farm until it was returned to the Iwi as part of their Treaty Settlement. According to NgāiTakoto, Te Make was traditionally known for its expansive gardening enterprises which stretched extensively throughout the area bordering the southern end of what was once a very extensive lake (Tangonge – land that has been returned to Te Rarawa via their Treaty Settlement).

The subject site and surrounds sits within the wider Te Make area and was traditionally held under the Mana of the NgāiTakoto Rangatira, Tikiahi, the father of Awarau whom was regarded as the last Paramount chief of NgāiTakoto. Tikiahi established a Wharekākāriki Pā, west of the subject site in order to overlook the Te Make rohe, with the Pā identified on a ridge next to Ohinu / Kaitaia Aerodrome. North of the subejct site is Lake Rotoroa, a Statutory Acknowledgement Area for NgāiTakoto.

NgāiTakoto are considered the kaitiaki of Te Make farms on behalf of the Iwi descents. As such, the proposal has been thoughtfully designed to avoid any mapped or mapped areas that are of significance to them. With respect to the natural environment, cultural values associated with freshwater have been managed through careful civil design to ensure the mauri of the freshwater network will not be affected.

For these reasons it is considered that the proposal will not result in less than minor cultural or heritage effects.

6.5 Summary of Effects

Overall, it is considered that any adverse effects on the environment relating to this proposal will be less than minor.

6.6 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 as it is considered that the activity will result in less than minor adverse effects; and
- Under step 4, there are no special circumstances.

Therefore, based on the conclusions reached under steps 3 and 4, it is recommended that this application be processed without public notification.

7.0 Limited Notification Assessment (Sections 95B, 95E to 95G)

7.1 Assessment of Steps 1 to 4 (Sections 95B)

If the application is not publicly notified under section 95A, the council must follow the steps set out in section 95B to determine whether to limited notify the application. These steps are addressed in the statutory order below.

7.1.1 Step 1: Certain affected protected customary rights groups must be notified

Step 1 requires limited notification where there are any affected protected customary rights groups or customary marine title groups; or affected persons under a statutory acknowledgement

affecting the land (being on land, or adjacent to land, that is subject to a statutory acknowledgement area).

Lake Rotoroa, north of the subject site has a Statutory Acknowledgement Area overlay that applies to it. NgāiTakoto is the only statutory acknowledgement holder over Lake Rotoroa as set out in the operative District Plan reference OTS-073-02.

As NgāiTakoto is the applicant, no further action is required.

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

Step 2 describes that limited notification is precluded where all applicable rules and national environmental standards preclude limited notification; or the application is for a controlled activity (other than the subdivision of land).

In this case, the applicable rules do not preclude limited notification, and the proposal is not a controlled activity. Therefore, limited notification is not precluded.

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

Step 3 requires that, where limited notification is not precluded under step 2 above, a determination must be made as to whether any of the following persons are affected persons:

- In the case of a boundary activity, an owner of an allotment with an infringed boundary;
- In the case of any other activity, a person affected in accordance with s95E.

The application is not for a boundary activity, and therefore an assessment in accordance with section 95E is required and is set out below.

Overall, it is considered that any adverse effects on persons will be less than minor, and accordingly, that no persons are adversely affected.

7.1.4 Step 4: Further notification in special circumstances

In addition to the findings of the previous steps, the council is also required to determine whether special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined as eligible for limited notification.

In this instance, having regard to the assessment in section 6.1.4 above, it is considered that special circumstances do not apply.

7.2 Section 95E Statutory Matters

If the application is not publicly notified, a council must decide if there are any affected persons and give limited notification to those persons. A person is affected if the effects of the activity on that person are minor or more than minor (but not less than minor).

In deciding who is an affected person under section 95E:

- Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded;
- Only those effects that relate to a matter of control or discretion can be considered (in the case of controlled or restricted discretionary activities); and
- The adverse effects on those persons who have provided their written approval must be disregarded.

These matters were addressed in section 6.2 above, and no written approvals have been obtained.

Having regard to the above provisions, an assessment is provided below.

7.3 Assessment of Effects on Persons

Adverse effects in relation to amenity on persons are considered below.

Wider effects, such as rural character, amenity and buildings intensity, transportation, productive capacity, earthworks and construction, servicing, ecology, cultural and heritage values and natural hazards were considered in section 6.4 above, and considered to be less than minor.

7.3.1 North: Persons at Section 30 Block VIII Opoe Survey District; Section 48 Block VIII Opoe Survey District; Lot 1 and Lot 3 Deposited Plan 134738 and Lot 4 Deposited Plan 134738; Lot 4 Deposited Plan 134738 Section 2 Survey Office Plan 555604; Lot 2 Deposited Plan 134738; Part Lot 2-3 Deposited Plan 40865; Part Lot 2-3 Deposited Plan 40865.

These properties are located to the north of the subject site and is separated from the proposed egg farm location by the wider farm and horticultural activity within the subject site. Due to the significant separation of these properties the proposed egg farm and increased built form will not be visible from these properties.

Majority of these properties gain access via Sweetwater Road, Spains Road or the northern extent of Sand Hills Road, as such these properties will not experience any change in amenity effects as a result of increased traffic proposed.

Due to the significant separation between these properties and the proposal it is considered any potential amenity or traffic effects on persons at this property will be negligible.

7.3.2 South: Persons at Section 1 Survey Office Plan 472393

This property is located directly south of the proposal; it is vacant farmland owned by Te Runanga o Ngāitakoto Custodian Trustee Limited and Te Waka Pupuri Putea Trust. As the site is owned by the Applicant, written approval is implied.

The proposed egg sheds and internal driveways will be located over 100m from the shared boundary resulting in separation to ensure amenity of the adjacent site.

Access to this site is located to the south of the proposed vehicle crossing to the egg farm, traffic movements will increase past this property, however, as detailed in the wider transport assessment in section 6.5 Sandhills Road is considered to be able to comfortably accommodate the increased traffic. The shift in amenity effects associated with the proposed increased traffic will not be significant due to the vacant and productive nature of the property.

For these reasons it is considered that effects on persons at this property will be less than minor.

7.3.3 East: Persons at Section 21-22 Block 1 Takahue Survey District; Lot 1 Deposited Plan 593802 and Section 30 Block I Ahipara Survey District; Lot 1 Deposited Plan 196761 and Section 29 Block I Ahipara Survey District; Section 1 Block I Ahipara Survey District and Section 15 Block I Takahue Survey District and Lot 1 Deposited Plan 172560 and Section 2 Block I Ahipara Survey District; Section 4 Survey Office Plan 472393.

These properties are located to the east of the proposal, being separated from the proposed egg farm location by farmland and Sand Hills Road being approximately 1.8km away at the nearest point. Due to the significant separation of these properties the proposed egg farm and increased built form will not be visible from these properties.

Majority of these properties gain access via Gill Road or the northern extent of Sand Hills Road, as such these properties will not experience any change in amenity effects as a result of increased traffic proposed.

For these reasons it is considered that effects on persons at these properties will be negligible.

7.3.4 West: Persons at Part Lot 2 Deposited Plan 63209, Lot 1 Deposited Plan 80129, Lot 2 Deposited Plan 105103, Lot 1 Deposited Plan 136786, Lot 1 Deposited Plan 136797, Lot 1 Deposited Plan 136798, Lot 1 Deposited Plan 136799, Lot 1 Deposited Plan 136800, Lot 2 Deposited Plan 136801, Lot 3 Deposited Plan 136802, Lot 1 Deposited Plan 136867, Lot 1 Deposited Plan 136868, Lot 1-2 Deposited Plan 136869, Lot 1 Deposited Plan 136871, Lot 1 Deposited Plan 136872, Lot 1 Deposited Plan 137182, Lot 1 Deposited Plan 137711, Lot 1 Deposited Plan 137712, Lot 1 Deposited Plan 137713, Lot 1 Deposited Plan 137714 and Lot 1 Deposited Plan 137715.

These properties are located directly west of the proposal; it is a commercial production forestry owned by Te Runanga o Ngāitakoto. As the property is owned by the Applicant, written approval is implied.

The proposed egg sheds and internal driveways will be located over 100m from the shared property boundary resulting in separation to ensure amenity of these properties. Due to separation of these properties, they will not experience any effect from the increased traffic proposed.

For these reasons it is considered that effects on persons at these properties will be negligible.

7.3.5 Summary of Effects

Taking the above into account, it is considered that any adverse effects on persons at the aforementioned properties will be less than minor in relation to amenity and odour effects. Wider effects, including rural character, amenity and buildings intensity, transportation, productive capacity, earthworks and construction, servicing, ecology, cultural and heritage values and natural hazards were assessed in section 6.4 above and are considered to be less than minor.

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

7.4 Limited Notification Conclusion

Having undertaken the section 95B limited notification tests, the following conclusions are reached:

- Under step 1, limited notification is not mandatory;
- Under step 2, limited notification is not precluded;
- Under step 3, limited notification is not required as it is considered that the activity will not result in any adversely affected persons; and
- Under step 4, there are no special circumstances.

Therefore, it is recommended that this application be processed without limited notification.

8.0 Consideration of Applications (Section 104)

8.1 Statutory Matters

Subject to Part 2 of the Act, when considering an application for resource consent and any submissions received, a council must, in accordance with section 104(1) of the Act have regard to:

- Any actual and potential effects on the environment of allowing the activity;
- Any relevant provisions of a national environmental standard, other regulations, national policy statement, a New Zealand coastal policy statement, a regional policy statement or proposed regional policy statement; a plan or proposed plan; and
- Any other matter a council considers relevant and reasonably necessary to determine the application.

As a discretionary activity, section 104B of the Act states that a council:

(a) may grant or refuse the application; and

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

8.2 Weighting of Proposed Plan Changes: Proposed Far North District Plan

The Far North Proposed District Plan (**PDP**) has recently completed the hearing process and a decisions version is expected in early 2026.

It is considered that that the proposal can be predominately assessed against the Far North Operative District Plan (**ODP**) provisions. There are some provisions of the PDP which have immediate legal effect including, Earthworks, Indigenous Biodiversity, and Historical and Cultural Values, the proposal will comply with these rules.

Under the PDP, the site is proposed to be zoned Rural Production. An assessment of the proposal against the relevant ODP and PDP objectives and policies is provided below. It is considered that similar outcomes would arise between the two plan versions. However, as no decisions have been issued, it is generally considered that greater weight should be given to the ODP provisions.

9.0 Effects on the Environment (Section 104(1)(A))

Having regard to the actual and potential effects on the environment of the activity resulting from the proposal, it was concluded in the assessment above that any wider adverse effects relating to the proposal will be less than minor and that no persons would be adversely affected by the proposal.

Further, it is considered that the proposal will also result in positive effects including:

- Efficient utilisation of farmland for productive land use, producing food for New Zealand residents; and
- Providing an economic income and employment opportunities for people of NgāiTakoto.

Overall, it is considered that the proposal will have positive effects, and any actual and potential adverse effects on the environment of allowing the activity are acceptable.

10.0 District Plan and Statutory Documents (Section 104(1)(B))

10.1 National Policy Statement for Freshwater Management 2020

The National Policy Statement for Freshwater Management 2020 (**NPS-FM**) replaced the NPS-FM 2014 and came into effect on 3 August 2020.

The NPS-FM includes one objective as follows:

> 1) *"The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises:*
>
> *(a) first, the health and well-being of water bodies and freshwater ecosystems*
>
> *(b) second, the health needs of people (such as drinking water)*
>
> *(c) third, the ability of people and communities to provide for their social, economic, and*
>
> *cultural well-being, now and in the future."*

This objective seeks to manage natural and physical resources through setting a clear hierarchy for which the resources should be managed. Specifically, it seeks to prioritise the health and wellbeing of water bodies and freshwater ecosystems over all other matters.

The subject site contains 14 wetlands identified as high value as confirmed by the Ecological Report prepared by Viridis (**Appendix 5**), as such the policies of the NPS-FM are relevant to the proposal.

Policies of the NPS-FM focuses upon the management of freshwater in an integrated way to ensure that the health and well-being of water bodies and freshwater ecosystems is maintained and improved.

Policy 2 seeks that Tangata whenua are actively involved in freshwater management (including decision making processes), and Māori freshwater values are identified and provided for. The proposal has been carefully designed by NgāiTakoto as tangata whenua and owner to mitigate effects of the proposed work on the freshwater values of the wetlands within the site.

Policies 3 and 4 require freshwater be managed in an integrated way and as part of New Zealand's integrated response to climate change. The proposed development has been designed to mitigate potential natural hazard effects including consideration of climate change. This proposal will give effect to policies 3 and 4.

Policy 5 focuses upon the management of freshwater in an integrated way to ensure that the health and well-being of water bodies and freshwater ecosystems is maintained and improved. Viridis has concluded that the proposed stormwater management measures are expected to maintain wetland hydrology and catchment processes and avoid significant changes to water levels, flow patterns, or ecological function. With the proposed mitigation in place, effects on the hydrology of the identified wetlands, particularly Wetlands A and B, are assessed as low giving effect to this policy.

Policy 6 requires that there is no further loss of the extent of natural inland wetlands, their values are protected and their restoration is promoted. Whilst the proposal will result in diversion and discharge of water in proximity to wetlands onsite, this will be careful managed with sedimentation and erosion control, stormwater treatment etc and restoration and enhancement of the wetlands will increase their extent. Therefore, the proposal will give effect to policy 6.

Overall, it is considered that the proposal will give effect to the NPS-FM.

10.2 National Policy Statement for Indigenous Biodiversity

The National Policy Statement for Indigenous Biodiversity (**NPS-IB**) was published by the Minister of the Environment on 7 July 2023 and came into force on 4 August 2023.

The NPS-IB applies to indigenous biodiversity in the terrestrial environment throughout Aotearoa New Zealand. Viridis have confirmed that significant terrestrial vegetation is not located within proposal area, with vegetation primarily comprising scattered mature trees, both exotic and indigenous, alongside areas of exotic scrubland. It is proposed to remove pasture, crop and small stand of pine trees to facilitate the development, none of which are considered indigenous or natural habitats. Therefore, it is considered that the NPS-IB does not apply to the proposal.

10.3 National Policy Statement for Highly Productive Land

The National Policy Statement for Highly Productive Land 2022 (**NPS-HPL**) came into force on 17 October 2022. The NPS-HP seeks to protect highly productive land for use in land-based primary production, for current and future generations.

The subject site is zoned Rural Production Zone and identified as Land Use Capability classes 3 and 4, according to section 3.5(7) of the NPS-HPL, land is not referenced as Highly Productive Land (**HPL**) under the NPS-HPL where it is zoned Rural Production Zone, LUC 3 and subject to a resource consent application for development on LUC 3 for any activity other than rural lifestyle.

Therefore it is considered that the NPH-HPL is not relevant to this proposal, however, it is noted that the location of the egg farm has therefore been carefully selected and clustered toward the edge of the more productive land and the wider site, including the established avocado orchard located to the north of the proposed egg farm, will continue to operate as a productive rural activity and maximise the productive potential of the land.

10.4 National Policy Statement for Natural Hazards

The National Policy Statement for Natural Hazards (**NPS-NH)** requires the natural hazard risk to people and proposed associated with subdivision, use and development to be managed using a risk based proportionate response. All applications must be assessed against the prescribed risk matrix. The risk matrix applies likelihood levels against consequence levels based upon the range of potential natural hazard risk.

In this instance the subject site is not identified by Northland Regional Council as subject to identified natural hazards. Chester have undertaken a flood assessment in support of the proposal (**Appendix 3**). The rapid flood assessment indicates that the proposed development will not result in any material increase in flood extent, flood depth, or flood hazard beyond the site for the 1% AEP plus climate change event.

According to the NPS-NH, risk matrix and based upon Chester's flood modelling, the likelihood of flood risk is "unlikely". The proposed development will not result in any residential development exposed to flood risk, the proposed activity has been designed to appropriately mitigate runoff from proposed built form, and the farming land use activities will continue as such it is considered that the consequence level is 'negligible'. Overall, the NPS-NH risk rating for flood hazard is considered to be "low".

Tonkin and Taylor have undertaken a Geotechnical Assessment of the subject site (**Appendix 4**) this assessment has considered the risk of landslide, seismic shaking, and liquefaction. They have considered the qualitative assessment of settlement and liquefaction. Stability was also considered, however, considering the reasonably gentle topography of the site and layout of the proposed development, slope stability was qualitatively assessed by Tokin and Taylor as not posing a material risk. Tonkin and Taylor conclude that:

> *Based on the assessment undertaken the geotechnical natural hazards are assessed to be below a 'Very high' risk rating. The risk associated with the geotechnical hazards assessed is 'Low' to 'Medium'.*

The NPS-NH then requires under clause 3.3 the scale and detail of information to be considered, and management of risk, requiring high or medium natural hazard risk is avoided or mitigated proportionate to the level of risk. In this case both Chester and Tokin and Taylor have undertaken site-specific assessment of natural hazards and provided recommendations which afford a proportionate level of mitigation relative to the risk rating.

This assessment is considered to meet the requirements of the NPS-NH, in accordance with the relevant objective and policies.

10.5 Northland Regional Policy Statement

The Northland Regional Policy Statement (**RPS**) covers the management of natural and physical resources across the Northland Region. The provisions within the RPS give guidance at a higher planning level in terms of the significant regional issues. As such it does not contain specific rules that trigger the requirement for consent but rather give guidance to consent applications and the development of District Plans on a regional level.

Objectives range from integrated catchment management, improvement of overall quality of Northland's water quality, maintaining ecological flows, protecting areas of significant indigenous ecosystems and biodiversity, sustainable management of natural and physical resources in a way

that is attractive for business and investment that will improve the economic wellbeing. enabling economic wellbeing, regional form, the role of tangata whenua kaitiaki role is recognised and provided for in decision making, risks and impacts of natural hazards are minimised, outstanding natural landscapes and features and historic heritage are protected from inappropriate subdivision, use and development.

Relevant policy has been identified and summarised as follows:

- Policy 4.2.1 seeks to improve the overall quality of Northlands water resources. Viridis confirms that the ecological value of the 14 wetlands onsite is high. The proposal to protect and restore the riparian margins of the stream and wetlands will improve the water quality of the wetlands giving effect to policy 4.2.1.
- Policy 4.4.1 seeks to maintain and protect significant ecological areas and habitats, outside of the coastal environment subclause (3) applies:

  (3) Outside the coastal environment and where clause (1) does not apply, avoid, remedy or mitigate adverse effects of subdivision, use and development so they are not significant on any of the following:

  (a) Areas of predominantly indigenous vegetation;

  (b) Habitats of indigenous species that are important for recreational, commercial, traditional or cultural purposes;

  (c) Indigenous ecosystems and habitats that are particularly vulnerable to modification, including wetlands, dunelands, northern wet heathlands, headwater streams, floodplains and margins of freshwater bodies, spawning and nursery areas.

  The subject site is outside of the coastal environment, furthermore, the ecological assessment confirms that the work will not occur within an area containing predominantly indigenous vegetation. The proposed mitigation measures and protection and enhancement of the riparian margin of the wetlands will ensure that the proposal will mitigate and offset adverse effects of the proposed work so that they are not significant to the natural wetlands within the site. The proposal will give effect to this policy.
- Policy 4.7.1 seeks to promote active management including measure to improve water quality, revegetation with indigenous species, exclusion of stock from waterways, restoration or creation of natural habitat and processes including ecological corridors. The proposal seeks to achieve all of these outcomes applying active management and giving effect to this policy.
- According to Policy 7.1.1 subdivision, use and development of land will be managed to minimise risks of natural hazards. The proposed works has been designed to mitigate the risk of natural hazards giving effect to this policy.
- Policy 8.1.1 – 8.1.3 direct regional and district councils to recognise and provide for the relationship of tangata whenua and their culture and traditions with their ancestral land, water, sites of wāhi tapu and other taonga, to have particular regard to kaitiakitanga and to take into account the principles of the Treaty of Waitangi including partnership. NgāiTakoto have been actively engaged to seek feedback and address concerns and therefore will give effect to these policies.

Overall, it is considered that the proposal will give effect to the RPS.

10.6 Operative Far North District Plan

10.6.1 Chapter 8.6 – Rural Production Zone

Objectives of the Rural Production Zone are focused upon the management of effects and enablement of rural production activities.

8.6.3.1 To promote the sustainable management of natural and physical resources in the Rural Production Zone.

8.6.3.2 To enable the efficient use and development of the Rural Production Zone in a way that enables people and communities to provide for their social, economic, and cultural well being and for their health and safety.

8.6.3.3 To promote the maintenance and enhancement of the amenity values of the Rural Production Zone to a level that is consistent with the productive intent of the zone

8.6.3.4 To promote the protection of significant natural values of the Rural Production Zone.

8.6.3.5 To protect and enhance the special amenity values of the frontage to Kerikeri Road between its intersection with SH10 and the urban edge of Kerikeri.

8.6.3.6 To avoid, remedy or mitigate the actual and potential conflicts between new land use activities and existing lawfully established activities (reverse sensitivity) within the Rural Production Zone and on land use activities in neighbouring zones.

8.6.3.7 To avoid remedy or mitigate the adverse effects of incompatible use or development on natural and physical resources.

8.6.3.8 To enable the efficient establishment and operation of activities and services that have a functional need to be located in rural environments.

8.6.3.9 To enable rural production activities to be undertaken in the zone.

Policies achieve these objectives, enabling activity that avoid, remedy or mitigate effects of activities:

8.6.4.1 That the Rural Production Zone enables farming and rural production activities, as well as a wide range of activities, subject to the need to ensure that any adverse effects on the environment, including any reverse sensitivity effects, resulting from these activities are avoided, remedied or mitigated and are not to the detriment of rural productivity.

8.6.4.2 That standards be imposed to ensure that the off site effects of activities in the Rural Production Zone are avoided, remedied or mitigated.

8.6.4.3 That land management practices that avoid, remedy or mitigate adverse effects on natural and physical resources be encouraged.

8.6.4.4 That the type, scale and intensity of development allowed shall have regard to the maintenance and enhancement of the amenity values of the Rural Production Zone to a level that is consistent with the productive intent of the zone.

8.6.4.5 That the efficient use and development of physical and natural resources be taken into account in the implementation of the Plan.

8.6.4.6 That the built form of development allowed on sites with frontage to Kerikeri Road between its intersection with SH10 and Cannon Drive be maintained as small in scale, set back from the road, relatively inconspicuous and in harmony with landscape plantings and shelter belts.

8.6.4.7 That although a wide range of activities that promote rural productivity are appropriate in the Rural Production Zone, an underlying goal is to avoid the actual and potential adverse effects of conflicting land use activities.

8.6.4.8 That activities whose adverse effects, including reverse sensitivity effects, cannot be avoided remedied or mitigated are given separation from other activities

8.6.4.9 That activities be discouraged from locating where they are sensitive to the effects of or may compromise the continued operation of lawfully established existing activities in the Rural Production zone and in neighbouring zones.

The proposal will give effect to these objectives and policies because:

- The proposed productive land use and factory farming activity is consistent with the land use anticipated and provided for in the Rural Production zone.
- The proposed layout has been developed with regard to a range of factors, including potential ecological effects, retention of the land's productive capacity, management of reverse sensitivity effects associated with odour and amenity, and the achievement of a functional layout that efficiently supports the operation of the egg farm and the wellbeing of the chickens and the buildings comply with all permitted activity bulk and location standards except setback from wetlands, being a type, scale and nature anticipated and provided for in the Rural Production Zone.
- The proposal will avoid conflicting activities and reverse sensitivity effects.
- The proposed buildings are centrally located within the site, avoiding any compromise of existing lawfully established existing activities.
- The central location of the proposed buildings, existing contour and vegetation onsite will maintain the wider landscape and maintain rural character and amenity.
- The proposed bulk and scale of buildings is consistent with that of the permitted activity standards and surrounding rural environment.

10.6.2 Chapter 12.3 Soils and Minerals

The objectives and policies of this chapter seek to maintain the life supporting capacity of soils of the district, and avoid, remedy or mitigate adverse effects associated with soil excavation or filling.

The location of the egg farm has been carefully selected and clustered toward the edge of the more productive land and the wider site, including the established avocado orchard located to the north of the proposed egg farm, will continue to operate as a productive rural activity and maximise the productive potential of the land and maintain the life supporting capacity of the soils.

Comprehensive erosion and sediment control measures are proposed and will be implemented for the duration of the earthwork activities ensuring temporary erosion and sedimentation effects on surrounding freshwater bodies will be appropriately managed. Furthermore, a CMP that will set measures, including dust mitigation measure, to manage potential adverse effects associated with the construction phase of the project.

For these reasons the proposal will give effect to the relevant soils and minerals objectives and policies.

10.6.3 Chapter 12.7 Lakes, Rivers, Wetlands and the Coastline

The objectives and policies of the Lakes, Rivers, Wetlands and the Coastline chapter are contained within Chapter 12.7 of the ODP and seek to ensure the amenity and natural values, including the quality and quantity of water are maintained. The Ecological Assessment (**Appendix 5**) confirms that there are wetlands within the subject site of high value. The location of proposed buildings and impermeable areas has been carefully selected to avoid the wetlands and enhance them with buffer planting. The proposal includes the discharge of stormwater to these wetlands; however, the stormwater management system will ensure filtration of water and maintenance of the natural values and quality of water within the wetlands is protected. For the reasons outlined above, it is considered that the proposal is consistent with the objectives and policies for Lakes, Rivers, Wetlands and the Coastline and will not be contrary to them.

10.6.4 Chapter 15 Transport

The objectives and policies for transportation are contained within sections 15.1.3 and 15.1.4. The objectives and policies seek to minimise the adverse effects of traffic on the natural and physical environment and promote safe and efficient movement within the wider transport network.

In this case, the proposal will result in increased traffic on Sandhills Road, Traffic Planning Consultants consider that the overall volumes and peak hour volumes along Sandhills Road remain quite low and well within the acceptable range for an unsealed rural road and that the level of traffic generation from the site can be easily accommodated by the existing road environment without any additional mitigation and will have a less than minor effect.

The proposed access, parking and loading space are of a sufficient design to service the proposed activity without resulting in adverse effects to the roading network.

Having regard to the above, it is considered that the proposal is consistent with the objectives and policies for transportation and will not be contrary to them.

10.7 Proposed Far North District Plan

10.7.1 Strategic Direction

This chapter sets the overarching direction for the district plan and the overall vision for the pattern and integration of land use within the Far North District. It is considered that the proposal achieves this overarching direction, particularly giving effect to the following relevant objectives include

> *SD-SP-02 Development of initiatives that will support the wellbeing of Tangata Whenua, in partnership with Iwi and hapū.*
>
> *SD-EP-01 A high-earning diverse local economy which is sustainable and resilient to economic downturns, with the district's Māori economy making a significant contribution.*
>
> *SD-RE-O1 Primary production activities are able to operate efficiently and effectively and the contribution they make to the economic and social well-being and prosperity of the district is recognised.*

SD-RE-O2 Protection of highly productive land from inappropriate development to ensure its production potential for generations to come.

10.7.2 Ecosystems and Indigenous Biodiversity

Objectives and policies of this chapter seek to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna and manage indigenous biodiversity to maintain its extent and diversity in a way that provides for the social, economic and cultural well-being of people and communities. The subject site does not contain areas of significant terrestrial indigenous vegetation or habitats of indigenous fauna. However, the 14 natural wetlands onsite are of high ecological value. The proposed stormwater management measures are expected by Viridis to maintain wetland hydrology and catchment processes and avoid significant changes to water levels, flow patterns, or ecological function and the proposed restoration and enhancement of the wetlands will increase their extent. Overall, the proposal is considered to give effect to the relevant objectives and policies of this chapter.

10.7.3 Natural Character

Objectives and policies of the Natural Character Chapter seek to manage the natural character of wetland, lake and river margins to ensure their long-term preservation and protection for future generations and to ensure that land use and subdivision is consistent with and does not compromise the characteristics and qualities of natural character. The Ecological Assessment (Appendix 5) confirms that there are wetlands within the subject site of high value. The location of proposed buildings and impermeable areas has been carefully selected to avoid the wetlands and enhance them with buffer planting. The proposal includes the discharge of stormwater to these wetlands; however, the stormwater management system will ensure filtration of water and maintenance of the natural values and quality of water within the wetlands is protected. For the reasons outlined above, it is considered that the proposal is consistent with the objectives and policies for Lakes, Rivers, Wetlands and the Coastline and will not be contrary to them.

10.7.4 Natural Features and Landscapes

Objectives and policies of this chapter seek to protect identified Outstanding Natural Landscapes and Features within the district. Several lakes within the wider site are proposed as Outstanding Natural Features under the PDP. The proposed activity will be well separated from these lakes and will not result in any effects to the natural characteristics or values, as such the proposal will give effect to relevant objectives and policies of this chapter.

10.7.5 Earthworks

Objectives and policies of the Earthworks Chapter enable earthworks where they are required to facilitate the efficient subdivision and development of land, while managing adverse effects on waterbodies, the coastal marine area, public safety, surrounding land and infrastructure. Earthworks are to be appropriately designed, located and managed to protect historical and cultural values, natural environmental values, preserve amenity and safeguard the life-supporting capacity of soils. Earthworks are to be undertaken in a manner which does not compromise the stability of land, infrastructure and public safety.

Comprehensive erosion and sediment control measures are proposed and will be implemented for the duration of the earthwork activities ensuring temporary erosion and sedimentation effects on surrounding freshwater bodies will be appropriately managed. Furthermore, a CMP that will

set measures, including dust mitigation measure, to manage potential adverse effects associated with the construction phase of the project.

Geotechnical Assessment (**Appendix 4**) has been completed The Tokin + Taylor, which provides recommendations to ensure site stability including identification of compressible soils within the development site which require a ground improvement solution to resolve the identified geotechnical constraints.

It is considered that the proposal will give effect to the relevant objectives and policies subject to compliance with the recommendations of Chester and Tonkin and Taylor.

10.7.6 Treaty Settlement Land Overlay

This chapter focuses on the viability of Treaty Settlement Land, with use and development on Treaty Settlement Land to reflect the sustainable carrying capacity of the land and surrounding environment. The subject site is located within this overlay, and the proposal seeks to establish a commercial activity which will support the economic well-being of NgāiTakoto. The proposal has been carefully designed to fit within the productive operations of the wider site and maintain the sustainable carrying capacity of the land. The proposal will give effect to these objectives and policies, particularly policy TSL-P3.

10.7.7 Rural Production Zone

Objectives of the Rural Production Zone are focused upon the management of effects and enablement of rural production activities.

> *RPROZ-O1 The Rural Production zone is managed to ensure its availability for primary production activities and its long-term protection for current and future generations.*
>
> *RPROZ-O2 The Rural Production zone is used for primary production activities, ancillary activities that support primary production and other compatible activities that have a functional need to be in a rural environment.*
>
> *RPROZ-O3 Land use and subdivision in the Rural Production zone:*
>
> *a. protects highly productive land from sterilisation and enables it to be used for more productive forms of primary production;*
>
> *b. protects primary production activities from reverse sensitivity effects that may constrain their effective and efficient operation;*
>
> *c. does not compromise the use of land for farming activities, particularly on highly productive land;*
>
> *d. does not exacerbate any natural hazards; and*
>
> *e. is able to be serviced by on-site infrastructure.*
>
> *RPROZ-O4 The rural character and amenity associated with a rural working environment is maintained.*

Policies achieve these objectives, enabling activity that avoid, remedy or mitigate effects of activities:

> *RPROZ-P1 Enable primary production activities, provided they internalise adverse effects onsite where practicable, while recognising that typical adverse effects associated with primary production should be anticipated and accepted within the Rural Production zone.*
>
> *RPROZ-P2 Ensure the Rural Production zone provides for activities that require a rural location by:*

a. *enabling primary production activities as the predominant land use;*

b. *enabling a range of compatible activities that support primary production activities, including ancillary activities, rural produce manufacturing, rural produce retail, visitor accommodation and home businesses.*

RPROZ-P3 Manage the establishment, design and location of new sensitive activities and other non-productive activities in the Rural Production zone to avoid where possible, or otherwise mitigate, reverse sensitivity effects on primary production activities.

RPROZ-P4 Land use and subdivision activities are undertaken in a manner that maintains or enhances the rural character and amenity of the Rural Production zone, which includes:

a. *a predominance of primary production activities;*

b. *low density development with generally low site coverage of buildings or structures;*

c. *typical adverse effects such as odour, noise and dust associated with a rural working environment; and*

d. *a diverse range of rural environments, rural character and amenity values throughout the district.*

RPROZ-P5 Avoid land use that:

a. *is incompatible with the purpose, character and amenity of the Rural Production zone;*

b. *does not have a functional need to locate in the Rural Production zone and is more appropriately located in another zone;*

c. *would result in the loss of productive capacity of highly productive land;*

d. *would exacerbate natural hazards; and*

e. *cannot provide appropriate on-site infrastructure.*

RPROZ-P7 Manage land use and subdivision to address the effects of the activity requiring resource consent, including (but not limited to) consideration of the following matters where relevant to the application:

a. *whether the proposal will increase production potential in the zone;*

b. *whether the activity relies on the productive nature of the soil;*

c. *consistency with the scale and character of the rural environment;*

d. *location, scale and design of buildings or structures;*

e. *for subdivision or non-primary production activities:*

f. *scale and compatibility with rural activities;*

g. *potential reverse sensitivity effects on primary production activities and existing infrastructure;*

h. *the potential for loss of highly productive land, land sterilisation or fragmentation*

i. *at zone interfaces:*

j. *any setbacks, fencing, screening or landscaping required to address potential conflicts;*

k. *the extent to which adverse effects on adjoining or surrounding sites are mitigated and internalised within the site as far as practicable;*

l. the capacity of the site to cater for on-site infrastructure associated with the proposed activity, including whether the site has access to a water source such as an irrigation network supply, dam or aquifer;

m. the adequacy of roading infrastructure to service the proposed activity;

n. Any adverse effects on historic heritage and cultural values, natural features and landscapes or indigenous biodiversity;

o. Any historical, spiritual, or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.

The proposal will give effect to these objectives and policies because:

- The proposed productive land use and factory farming activity is consistent with the land use anticipated and provided for in the Rural Production zone.
- The proposed layout has been developed with regard to a range of factors, including potential ecological effects, retention of the land's productive capacity, management of reverse sensitivity effects associated with odour and amenity, and the achievement of a functional layout that efficiently supports the operation of the egg farm and the wellbeing of the chickens and the buildings comply with all permitted activity bulk and location standards except setback from wetlands, being a type, scale and nature anticipated and provided for in the Rural Production Zone.
- The proposal will avoid conflicting activities and reverse sensitivity effects.
- The proposed buildings are centrally located within the site, avoiding any compromise of existing lawfully established existing activities.
- The central location of the proposed buildings, existing contour and vegetation onsite will maintain the wider landscape and maintain rural character and amenity.
- The proposed bulk and scale of buildings is consistent with that of the permitted activity standards and surrounding rural environment.

10.8 Summary

It is considered that the proposed development is generally in accordance with the objectives and policies of the NPS-HPL, NPS-NH, NPS-FM, RPS, ODP and PDP.

11.0 Part 2 Matters

While it is not necessary to take recourse to Part 2 given that it has already been incorporated into the ODP and PDP, we do so for completeness.

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

Section 6 of the Act sets out a number of matters of national importance including (but not limited to) the protection of outstanding natural features and landscapes and historic heritage from inappropriate subdivision, use and development.

Section 7 identifies a number of "other matters" to be given particular regard by Council and includes (but is not limited to) Kaitiakitanga, the efficient use of natural and physical resources, the maintenance and enhancement of amenity values, and maintenance and enhancement of the quality of the environment.

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

Overall, as the effects of the proposal are considered to be less than minor, and the proposal accords with the relevant ODP and PDP objectives and policies, it is considered that the proposal will not offend against the general resource management principles set out in Part 2 of the Act.

12.0 Other Matters (Section 104(1)(C))

12.1 Record of Title Interests

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

Table 1: Record of Title interests

Interest	Comment
Subject to Section 8 Atomic Energy Act 1945	Reserves control of atomic energy, radioactive materials, and nuclear-related substances or activities to the Crown.
Subject to Section 3 Geothermal Energy Act 1953	Reserves control of Geothermal Energy to the Crown.
Subject to Sections 6 and 8 Mining Act 1971	These sections reserve ownership of all minerals to the Crown unless specifically excluded.
Subject to Section 3 Petroleum Act 1937	This section vests ownership of all petroleum (oil and gas) in the Crown.
Subject to Sections 5 and 261 Coal Mines Act 1979	These sections vest ownership of coal and related rights in the Crown and establish controls over coal mining activities.
Subject to Part IV A Conservation Act 1987 (but section 24(2A), 24A and 24AA of that Act does not apply)	Part IV A governs how the Minister of Conservation manages Crown land and natural resources, including concessions, leases, and other uses.
Subject to Section 11 Crown Minerals Act 1991	Section 11 sets out the fundamental rule that when land is transferred from the Crown to any other party, the Crown keeps ownership of all minerals unless a law provides otherwise.
Appurtenant to Lot 1 and Lot 2 DP 170525, Lot 1 DP 156631 and Section 2 SO 472393 are rights of way and appurtenant to Lot 1 DP 170525 and Lot	These interests apply in locations within the wider site and will not impact the proposed development.

1 DP 156631 are rights to convey water created by Certificate C312160.2	
Subject to a right of way (in gross) over part Lot 2 DP 170525 marked E and K on SO 64320 and part Lot 1 DP 156631 marked D and E on DP 156631 in favour of Her Majesty the Queen created by Certificate C312160.2	
Subject to a conservation covenant under Section 77 of the Reserves Act 1977 as specified in Certificate C312160.2	
Subject to a right to convey water over part Lot 1 DP 170525 marked L and N on SO 64320 created by Certificate C312160.2	
Subject to a right of way over part Section 2 SO 472393 marked AA on SO 472393 created by C936254.1	
8220253.1 Open Space Covenant pursuant to Section 22 Queen Elizabeth the Second National Trust Act 1977 - 9.7.2009 at 9:00 am (affects parts of Section 2 SO 472393 and part Lot 2 DP 170525)	
Subject to a right (in gross) to convey electricity over part Lot 2 DP 170525 marked A on DP 550844 and over part Section 2 SO Plan 472393 marked B on DP 550844	
Appurtenant hereto is a right of way and a right to convey electricity and water created by Easement Instrument 12005741.3	
The easements created by Easement Instrument 12005741.3 are subject to Section 243 (a) Resource Management Act 1991	

13.0 Section 104(6A) Significant Non-compliances

Under Section 104(6A) of the RMA, a consent authority may decline an application for resource consent if the applicant has a record of significant non-compliance with a requirement of this Act.

The applicant, Te Rūnanga O NgāiTakoto, is not a natural person and has not been the subject of a non-compliance.

14.0 Section 106A Natural Hazards

Under section 106A of the Act, a consent authority may refuse to grant a land use consent, or may grant the consent subject to conditions, if it considers that there is a significant risk from natural hazards.

The subject site is not identified as being within an area of Natural Hazard, therefore it is considered that the proposal will not result significant risk.

15.0 Conclusion

The proposal involves the development of a free-range egg farm with associated bulk earthworks, traffic and works in proximity to wetlands at 284, 424 and 485 Sandhills Road, Ahipara works at 284, 424 and 485 Sandhills Road, Ahipara.

Based on the above report it is considered that:

- Public notification is not required as adverse effects in relation to rural character, amenity and buildings intensity, transportation, productive capacity, earthworks and construction, servicing, ecology, cultural and heritage values and natural hazards are considered to be less than minor;
- Limited notification is not required as is sufficiently separated from the adjacent properties, which are largely owned by the Applicant such that there will be no adverse effects;
- The proposal accords with the relevant ODP and PDP objectives, policies and assessment criteria. There are also positive effects including There are also positive effects including efficient use of production land, increased economic and job opportunities for the hapu and community;
- The proposal will not give rise to or be at significant risk from natural hazards; and
- The proposal is considered to be consistent with Part 2 of the Act.

It is therefore concluded that the proposal satisfies all matters the consent authority is required to assess, and that it can be granted on a non-notified basis. The applicant respectfully requests that draft conditions of consent be provided to them pursuant to section 107G of the Act.

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **719746**

Land Registration District **North Auckland**

Date Issued 05 October 2016

Prior References

735251 738050

Estate Fee Simple

Area 737.3562 hectares more or less

Legal Description Lot 1-2 Deposited Plan 156631 and Lot 1-2 Deposited Plan 170525 and Section 1-8 Survey Office Plan 42207 and Section 2-3 Survey Office Plan 472393

Registered Owners

Te Runanga o NgaiTakoto Custodian Trustee Limited

Interests

Subject to Section 8 Atomic Energy Act 1945

Subject to Section 3 Geothermal Energy Act 1953

Subject to Sections 6 and 8 Mining Act 1971

Subject to Section 3 Petroleum Act 1937

Subject to Sections 5 and 261 Coal Mines Act 1979

Subject to Part IV A Conservation Act 1987 (but section 24(2A), 24A and 24AA of that Act does not apply)

Appurtenant to Lot 1 and Lot 2 DP 170525, Lot 1 DP 156631 and Section 2 SO 472393 are rights of way and appurtenant to Lot 1 DP 170525 and Lot 1 DP 156631 are rights to convey water created by Certificate C312160.2 - 9.10.1991 at 1:39 pm

Subject to a right of way (in gross) over part Lot 2 DP 170525 marked E and K on SO 64320 and part Lot 1 DP 156631 marked D and E on DP 156631 in favour of Her Majesty the Queen created by Certificate C312160.2 - 9.10.1991 at 1:39 pm

Subject to a conservation covenant under Section 77 of the Reserves Act 1977 as specified in Certificate C312160.2 (affects part Lot 2 DP 170525 and part Section 2 SO 472393) - 9.10.1991 at 1:39 pm

Subject to a right to convey water over part Lot 1 DP 170525 marked L and N on SO 64320 created by Certificate C312160.2 - 9.10.1991 at 1:39 pm

Subject to a right of way over part Section 2 SO 472393 marked AA on SO 472393 created by C936254.1 - 19.12.1995 at 1.48 pm

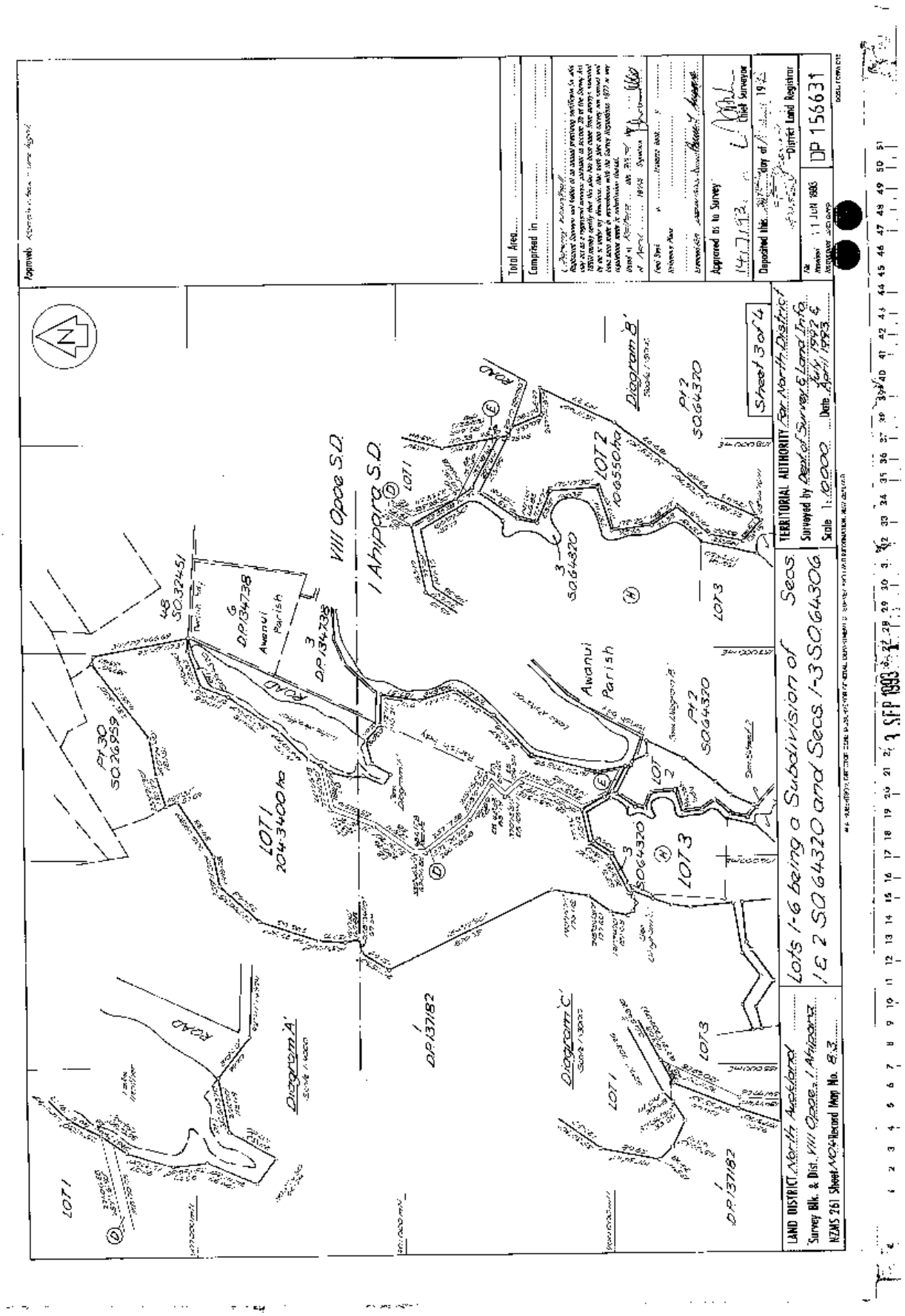
8220253.1 Open Space Covenant pursuant to Section 22 Queen Elizabeth the Second National Trust Act 1977 - 9.7.2009 at 9:00 am (affects parts of Section 2 SO 472393 and part Lot 2 DP 170525)

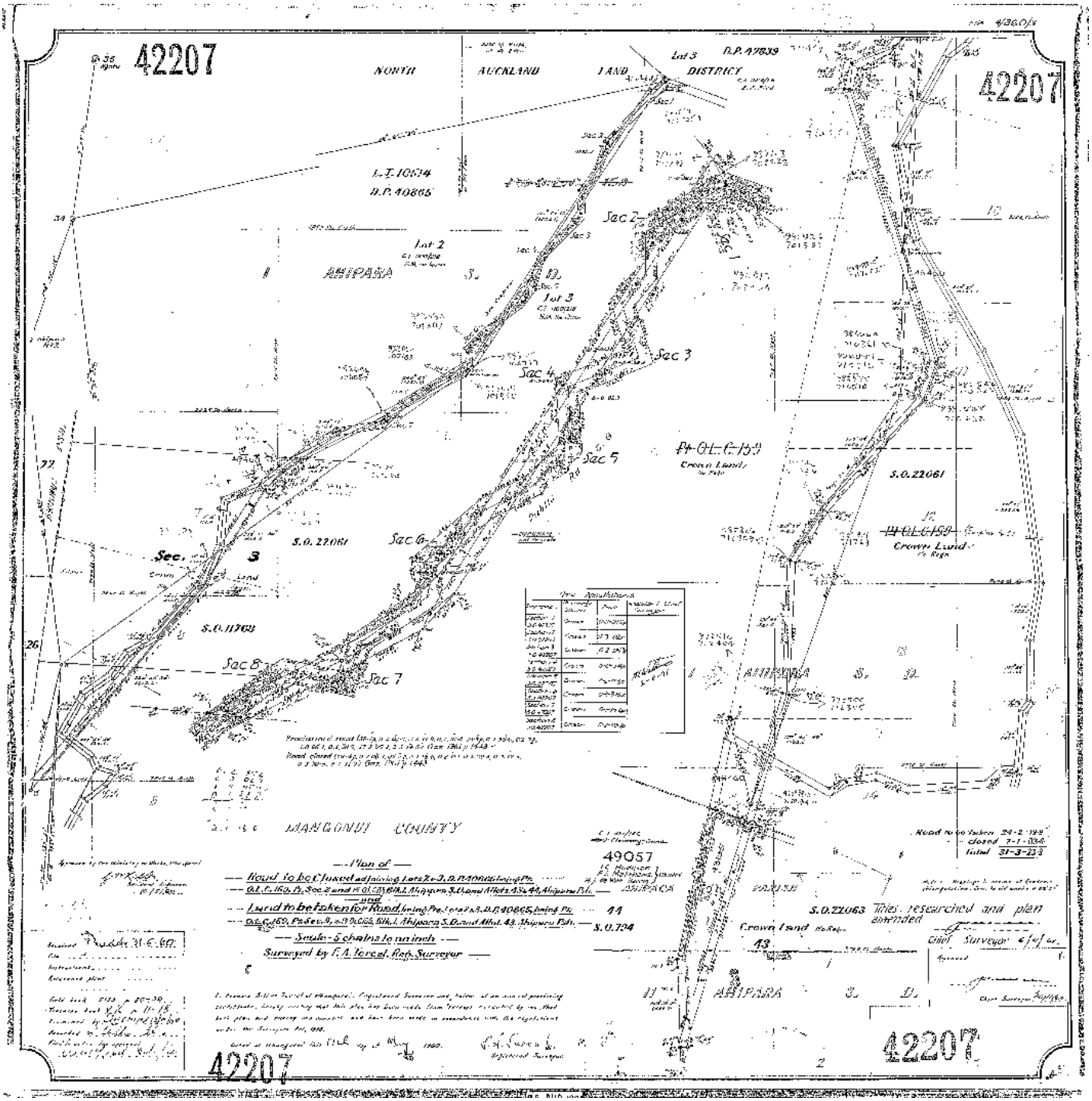
Subject to Section 11 Crown Minerals Act 1991

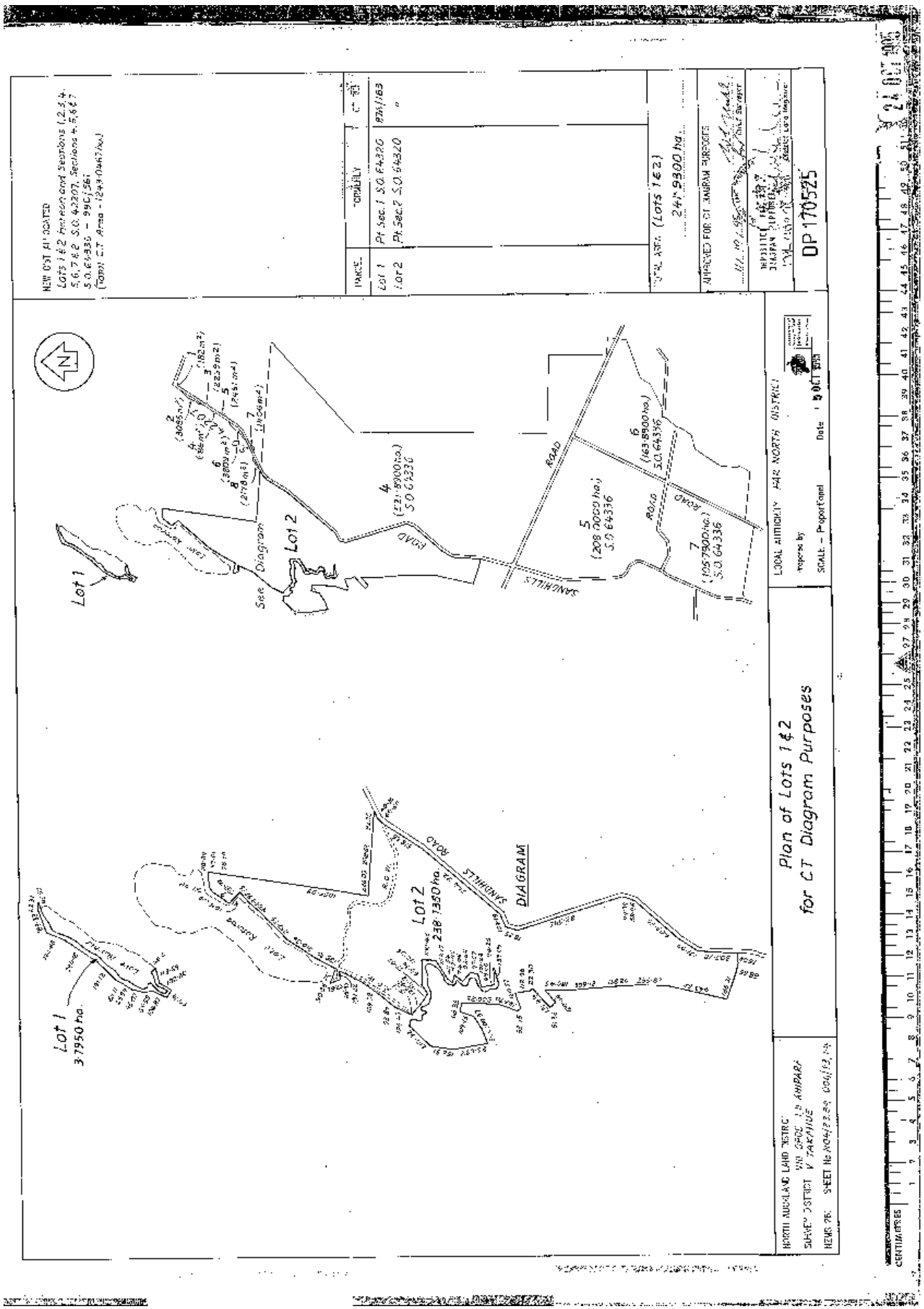
Subject to a right (in gross) to convey electricity over part Lot 2 DP 170525 marked A on DP 550844 and over part Section 2 SO Plan 472393 marked B on DP 550844 in favour of Top Energy Limited created by Easement Instrument 11839900.2 - 3.3.2021 at 11:01 am

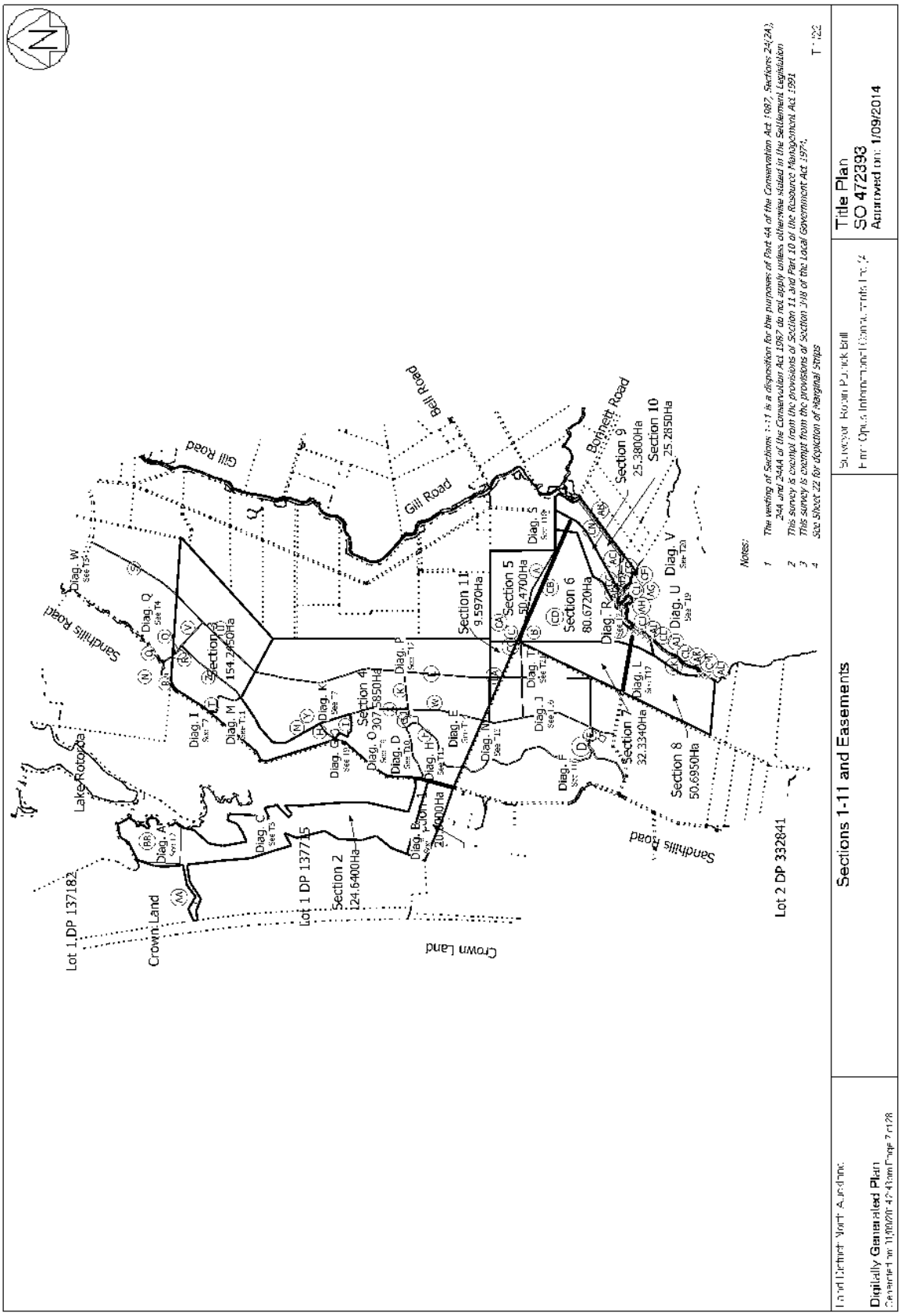
Appurtenant hereto is a right of way and a right to convey electricity and water created by Easement Instrument 12005741.3 - 27.5.2021 at 3:12 pm

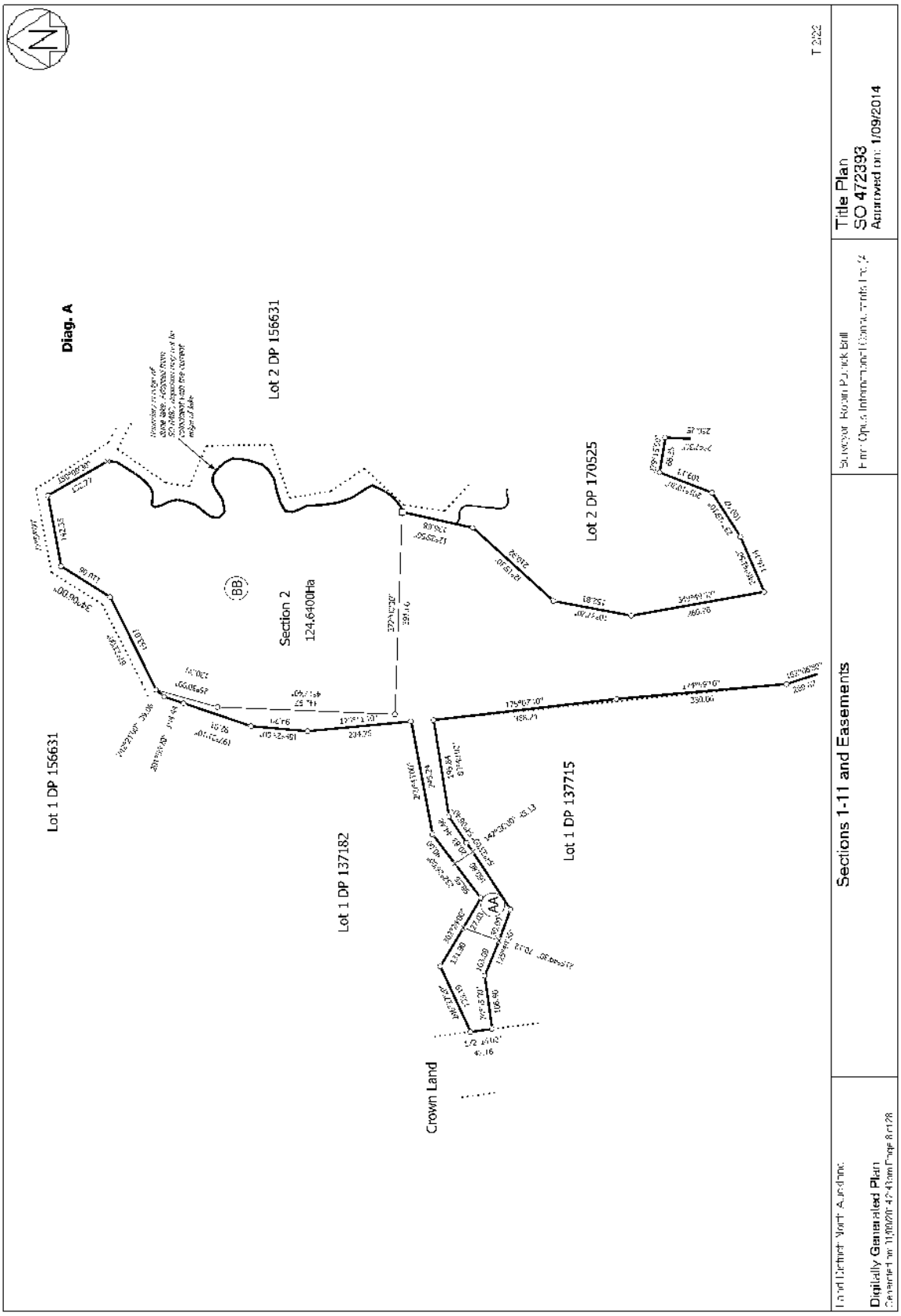
The easements created by Easement Instrument 12005741.3 are subject to Section 243 (a) Resource Management Act 1991

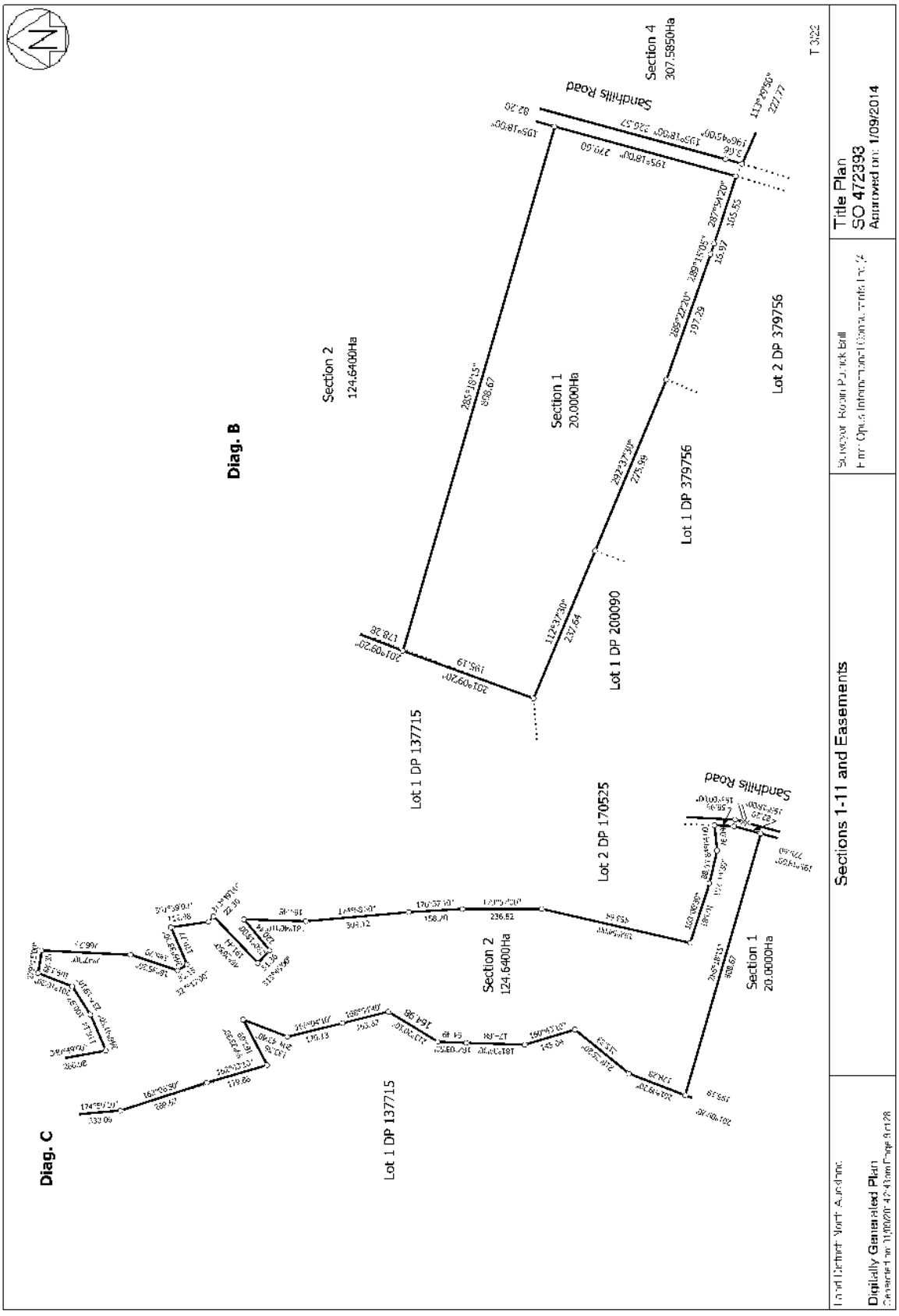

Lots 1-6 being a Subdivision of Secs 1-3 SO64320 and Secs 1-3 SO64306
LAND DISTRICT North Auckland
Survey Blk. & Dist. VIII Opaoa S.D. / Awanui
NZMS 261 Sheet No. 8.3
TERRITORIAL AUTHORITY Far North District
Surveyed by Head of Survey & Land Info.
Scale 1:1000
Date April 1993
Sheet 3 of 4
DP 156631
Approved as to Survey
Deposited this
District Land Registrar
Total Area
Completed in
Diagram A'
Diagram B'
Diagram C'
VIII Opaoa S.D.
I Ahipara S.D.
Awanui Parish
ROAD
LOT 1 DP 137182
LOT 3 DP 137182
LOT 1 204.3400 ha
LOT 2 106.5550 ha
LOT 3 SO64320
Pt 2 SO64320
Pt 30 SO26959
48 SO32451
G DP134738
3 DP134738
1 SEP 1993

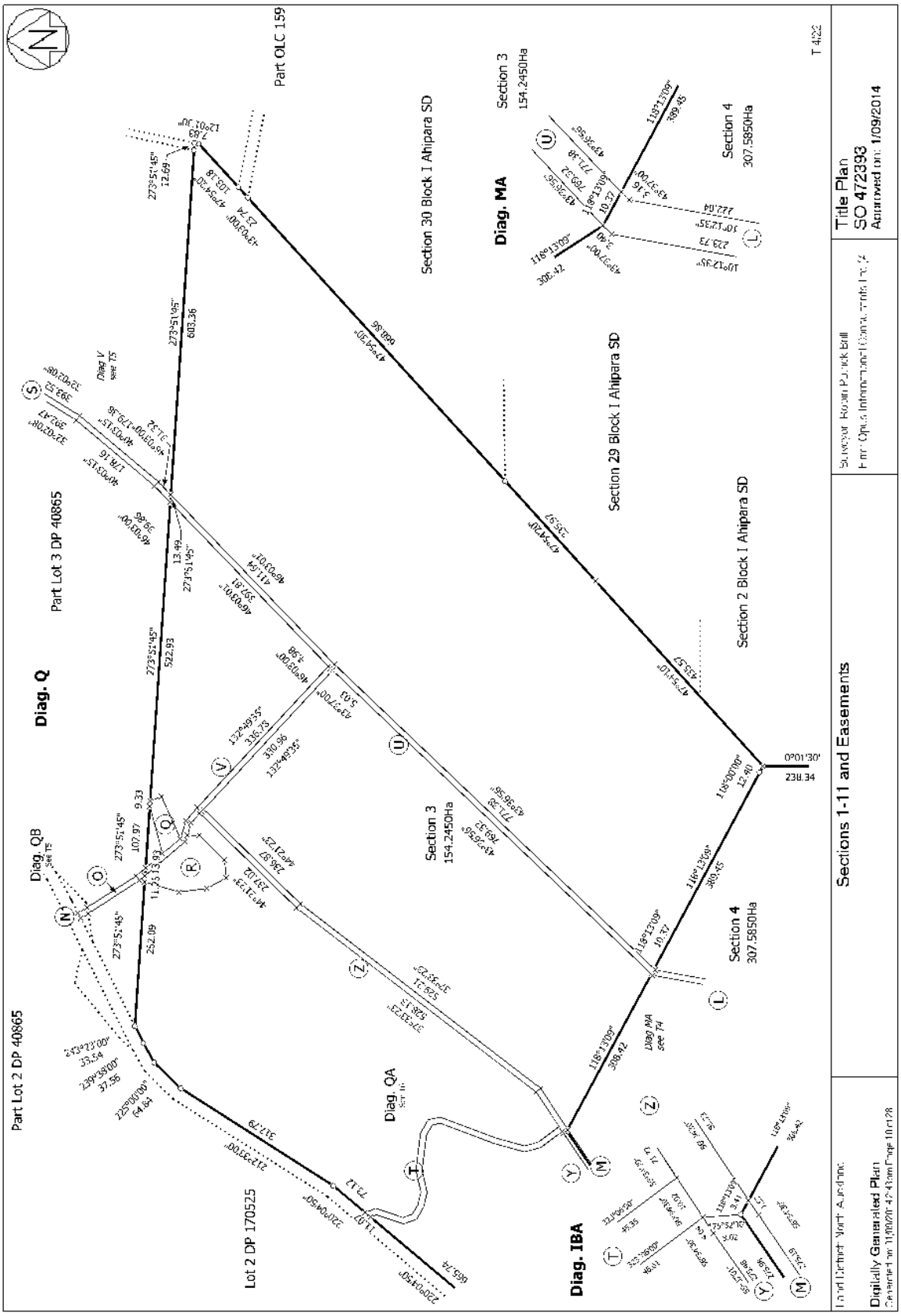

42207
NORTH AUCKLAND LAND DISTRICT
L.T. 10674
D.P. 40865
D.P. 47839
Lot 1
Lot 2
Lot 3
ANIPARA S. D.
Sec 1
Sec 2
Sec 3
Sec 4
Sec 5
Sec 6
Sec 7
Sec 8
Sec. 3
S.O. 22061
S.O. 11363
Crown Land
MANGONUI COUNTY
Plan of
Road to be Closed adjoining Lots 2 & 3 D.P. 40865 being Pts
O.L.C. 164, Pt. Sec. 2 and Pt O.L.C. 169, Pt. Anipara S. Dist and Allots 43 & 44 Anipara Pts.
and
Land to be taken for Road being Pts Lot 2 & 3 D.P. 40865 being Pts
O.L.C. 169, Pts Sec. 2, & Pt O.L.C. 164, Pt. Anipara S. D. and Allot. 43 Anipara Pts.
Scale - 5 chains to an inch
Surveyed by F. A. Jerrat, Reg. Surveyor
49057
S.O. 794
S.O. 22063 Title researched and plan amended
Chief Surveyor
Road to be Taken 24-2-194
Closed 7-1-1964
Title 31-3-233
43
2
42207

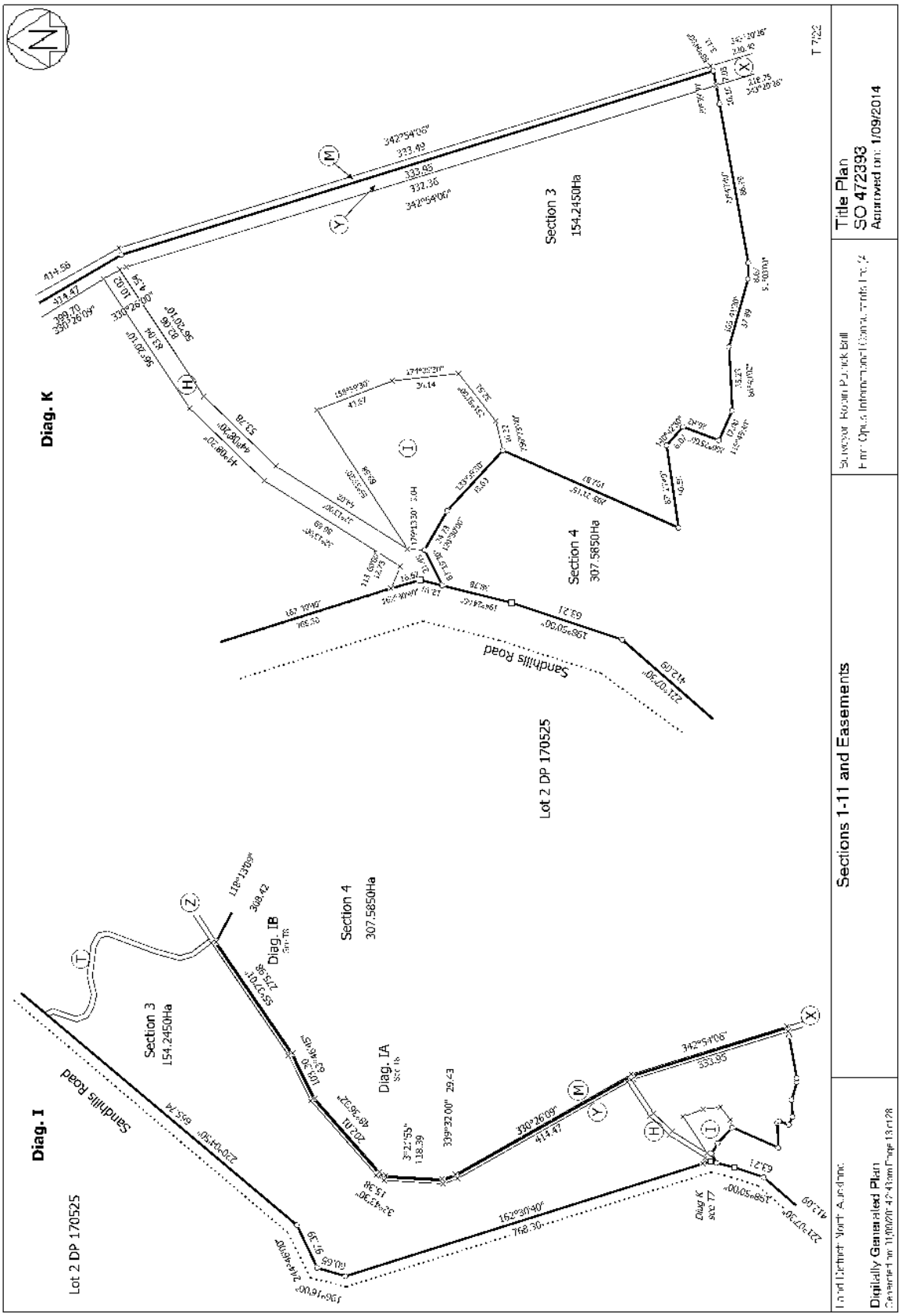

Plan of Lots 1 & 2
for CT Diagram Purposes
DIAGRAM
Lot 1
37.950 ha.
Lot 2
238.1350 ha.
SANDHILLS ROAD
DP 170525
LOCAL AUTHORITY: FAR NORTH DISTRICT
SCALE – Paperformed
Date


Title Plan
SO 472393
Approved on: 1/09/2014
Sections 1-11 and Easements
Digitally Generated Plan
Notes:
1 The vesting of Sections 1-11 is a disposition for the purposes of Part 4A of the Conservation Act 1987, Sections 24(2A), 24A and 24AA of the Conservation Act 1987 do not apply unless otherwise stated in the Settlement Legislation
2 This survey is exempt from the provisions of Section 11 and Part 10 of the Resource Management Act 1991
3 This survey is exempt from the provisions of Section 348 of the Local Government Act 1974.
4 See Sheet 22 for depiction of Marginal Strips
Section 1 154.2450Ha
Section 2 124.6400Ha
Section 3 20.1600Ha
Section 4 307.5850Ha
Section 5 50.4700Ha
Section 6 80.6720Ha
Section 7 32.3340Ha
Section 8 50.6950Ha
Section 9 25.3800Ha
Section 10 25.2850Ha
Section 11 9.5970Ha
Lot 1 DP 137182
Lot 1 DP 137715
Lot 2 DP 332841
Crown Land
Crown Land
Lake Rotoiti
Gill Road
Gill Road
Bell Road
Bonnett Road
Sandhills Road
Sandhills Road


Diag. A
Lot 2 DP 156631
Lot 2 DP 170525
Lot 1 DP 156631
Lot 1 DP 137182
Lot 1 DP 137715
Crown Land
Section 2
124.6400Ha
BB
AA
Sections 1-11 and Easements
Title Plan
SO 472393
Approved on: 1/09/2014
Digitally Generated Plan


Title Plan
SO 472393
Approved on: 1/09/2014
Sections 1-11 and Easements
Digitally Generated Plan
Diag. B
Diag. C
Section 1
20.0000Ha
Section 2
124.6400Ha
Section 4
307.5850Ha
Lot 1 DP 137715
Lot 1 DP 200090
Lot 1 DP 379756
Lot 2 DP 379756
Lot 2 DP 170525
Sandhills Road
T 3/22


Part OLC 159
Section 30 Block I Ahipara SD
Diag. MA
Section 3
154.2450Ha
Section 4
307.5850Ha
Section 29 Block I Ahipara SD
Section 2 Block I Ahipara SD
Part Lot 3 DP 40865
Diag. Q
Diag. QB
Diag. V
Part Lot 2 DP 40865
Lot 2 DP 170525
Diag. QA
Diag. IBA
Diag. NA
Sections 1-11 and Easements
Title Plan
SO 472393
Approved on: 1/09/2014
Digitally Generated Plan


Title Plan
SO 472393
Approved on: 1/09/2014
Sections 1-11 and Easements
Digitally Generated Plan
Section 3
154.2450Ha
Section 4
307.5850Ha
Lot 2 DP 170525
Sandhills Road
Diag. K
Diag. I
Diag. IA
Diag. IB
T 7122

Sheet Index		
Layout	**Revision**	**Layout Name**
1.1	RC - 01	SITE PLAN
1.2	RC - 01	ENLARGED SITE PLAN
1.3	RC - 01	SITE CONTEXT PLAN
1.4	RC - 01	LAYOUT PLAN
1.5	RC - 01	LAYING SHED 1 FLOOR PLAN
1.6	RC - 01	TYPICAL LAYING SHED ELEVATIONS
1.7	RC - 01	TYPICAL LAYING SHED ELEVATIONS
1.8	RC - 01	PACKING SHED

NEW COMMERCIAL DEVELOPMENT

For SmartSteel Buildings LTD &

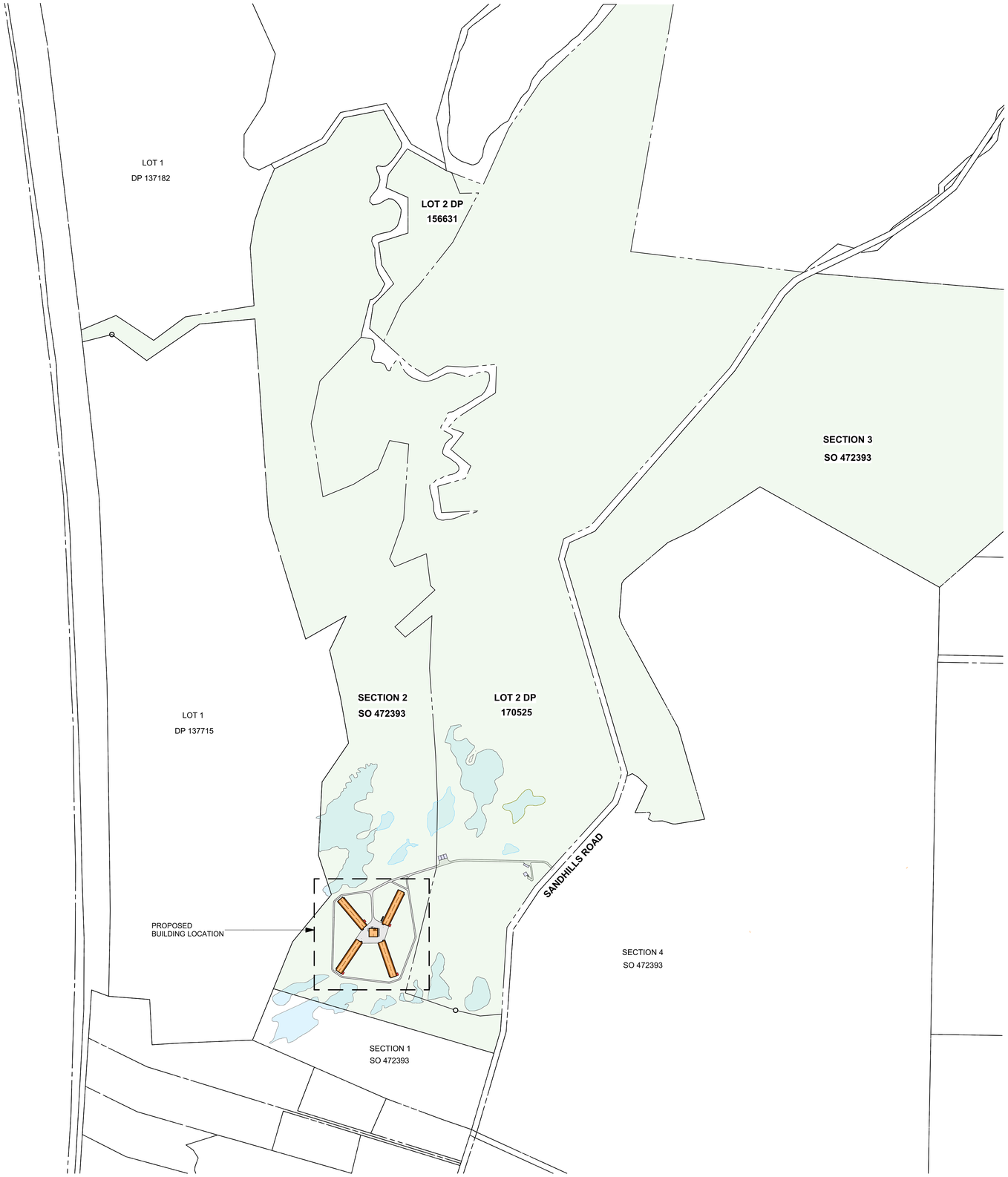
Te Runanga O NgaiTakoto Custodian Trustee LTD

284 Sandhills Road, Awanui 0483

Lot 2 DP 170525 & SECTION 2 SO 472393

NEO ARCHITECTURE STUDIO

JOB NO: 2519
ISSUE: RESOURCE CONSENT
DATE: 3/02/2026



N

SITE NOTES

LEGAL DESCRIPTION
LOT 2 DP 170525
SECTION 2 SO 472393

284 Sandhills Road
Awanui 0483

NEO ARCHITECTURE STUDIO

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

CLIENT
SmartSteel Buildings LTD & Te Runanga O NgaiTakoto Custodian Trustee LTD

PROJECT
NgaiTakoto Egg Farm

284 Sandhills Road
Awanui 0483

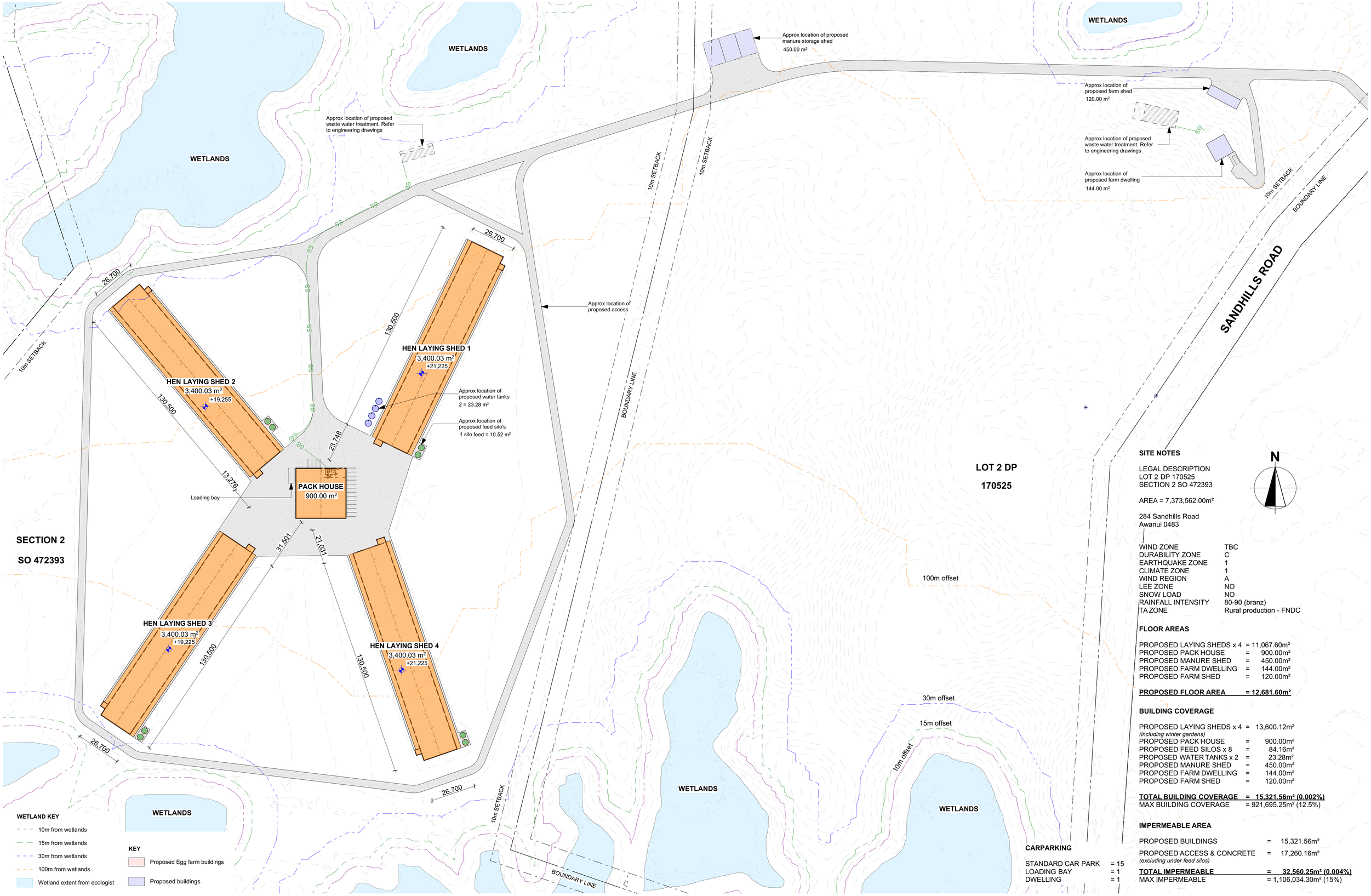
RevID	Transmittal Set Name	Date
CD - 04	CONCEPT	3/12/2025
CD - 05	CONCEPT	20/01/2026
RC - 01	RESOURCE CONSENT	3/02/2026

ISSUE RESOURCE CONSENT
For resource consent only. Not for pricing or construction.

DRAWN DANE ALLISON
CHECKED NEO AS LTD
ENGINEER TBC

SHEET TITLE
SITE PLAN

DATE **3/02/2026**
SCALE @ A1 **1:8000**
JOB NUMBER **2519**
REVISION **RC - 01**
SHEET NO **1.1**



SITE NOTES

LEGAL DESCRIPTION
LOT 2 DP 170525
SECTION 2 SO 472393

AREA = 7,373,562.00m²

284 Sandhills Road
Awanui 0483

WIND ZONE	TBC
DURABILITY ZONE	C
EARTHQUAKE ZONE	1
CLIMATE ZONE	1
WIND REGION	A
LEE ZONE	NO
SNOW LOAD	NO
RAINFALL INTENSITY	80-90 (branz)
TA ZONE	Rural production - FNDC

FLOOR AREAS

PROPOSED LAYING SHEDS x 4	=	11,067.60m²
PROPOSED PACK HOUSE	=	900.00m²
PROPOSED MANURE SHED	=	450.00m²
PROPOSED FARM DWELLING	=	144.00m²
PROPOSED FARM SHED	=	120.00m²
PROPOSED FLOOR AREA		**= 12,681.60m²**

BUILDING COVERAGE

PROPOSED LAYING SHEDS x 4 *(including winter gardens)*	=	13,600.12m²
PROPOSED PACK HOUSE	=	900.00m²
PROPOSED FEED SILOS x 8	=	84.16m²
PROPOSED WATER TANKS x 2	=	23.28m²
PROPOSED MANURE SHED	=	450.00m²
PROPOSED FARM DWELLING	=	144.00m²
PROPOSED FARM SHED	=	120.00m²
TOTAL BUILDING COVERAGE		**= 15,321.56m² (0.002%)**
MAX BUILDING COVERAGE		= 921,695.25m² (12.5%)

IMPERMEABLE AREA

PROPOSED BUILDINGS	=	15,321.56m²
PROPOSED ACCESS & CONCRETE *(excluding under feed silos)*	=	17,260.16m²
TOTAL IMPERMEABLE	=	**32,560.25m² (0.004%)**
MAX IMPERMEABLE		= 1,106,034.30m² (15%)

CARPARKING

STANDARD CAR PARK	= 15
LOADING BAY	= 1
DWELLING	= 1

NEO ARCHITECTURE STUDIO

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

CLIENT
SmartSteel Buildings LTD & Te Runanga O NgaiTakoto Custodian Trustee LTD

PROJECT
NgaiTakoto Egg Farm
284 Sandhills Road
Awanui 0483

RevID	Transmittal Set Name	Date
CD - 04	CONCEPT	3/12/2025
CD - 05	CONCEPT	20/01/2026
RC - 01	RESOURCE CONSENT	3/02/2026

ISSUE: RESOURCE CONSENT
For resource consent only. Not for pricing or construction.

DRAWN: DANE ALLISON
CHECKED: NEO AS LTD
ENGINEER: TBC

SHEET TITLE: **ENLARGED SITE PLAN**

DATE: **3/02/2026**
SCALE @ A1: **1:1000**
JOB NUMBER: **2519**
REVISION: **RC - 01**
SHEET NO: **1.2**

N

SITE NOTES

LEGAL DESCRIPTION
LOT 2 DP 170525
SECTION 2 SO 472393

284 Sandhills Road
Awanui 0483

NEO ARCHITECTURE STUDIO

CONTACT
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CLIENT
SmartSteel Buildings LTD & Te Runanga O NgaiTakoto Custodian Trustee LTD

PROJECT
NgaiTakoto Egg Farm

284 Sandhills Road
Awanui 0483

RevID	Transmittal Set Name	Date
CD - 04	CONCEPT	3/12/2025
CD - 05	CONCEPT	20/01/2026
RC - 01	RESOURCE CONSENT	3/02/2026

ISSUE RESOURCE CONSENT
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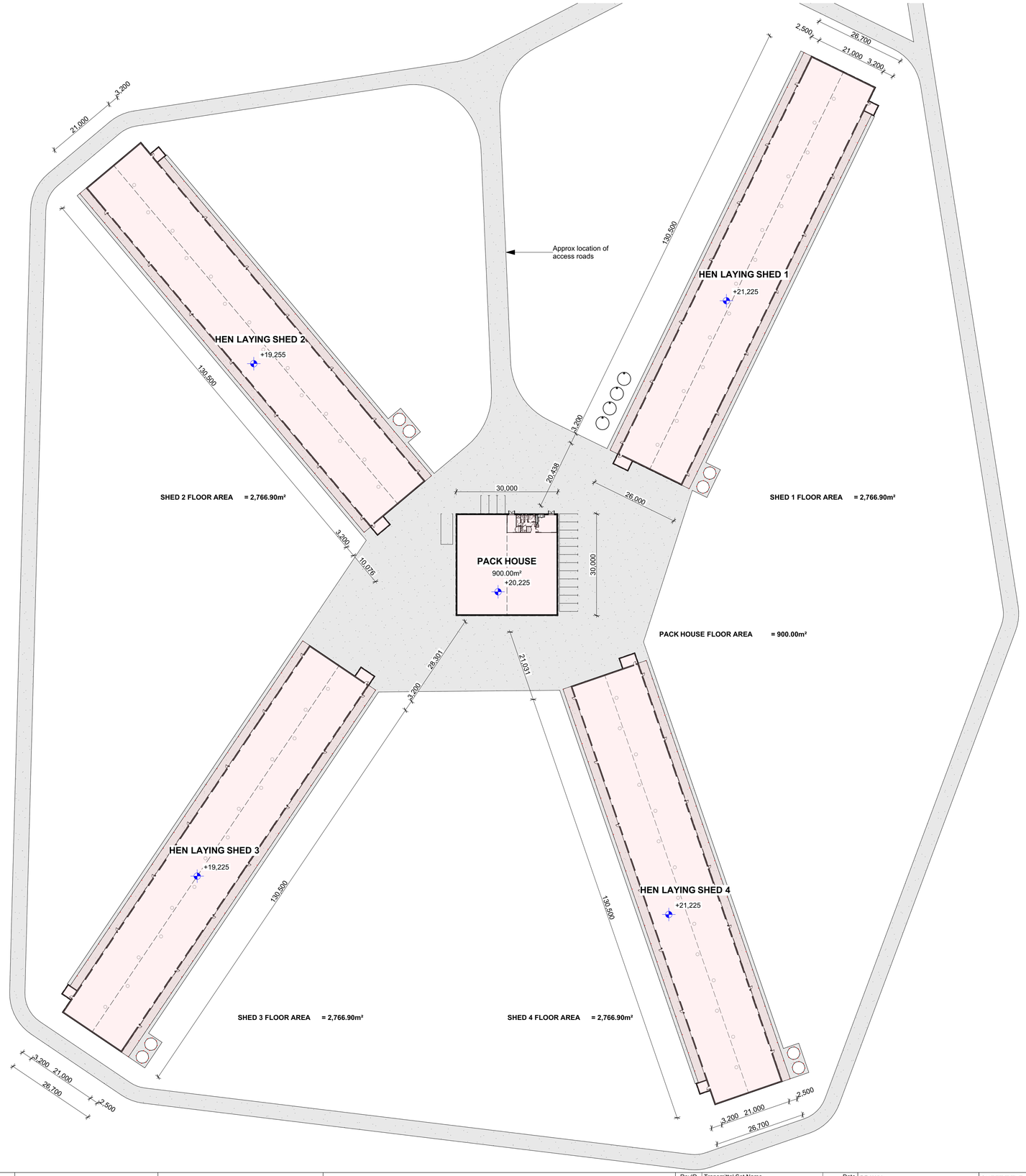
DRAWN DANE ALLISON
CHECKED NEO AS LTD
ENGINEER TBC

SHEET TITLE
SITE CONTEXT PLAN

DATE **3/02/2026**
SCALE @ A1 **1:1500**
JOB NUMBER **2519**
REVISION **RC - 01**
SHEET NO **1.3**



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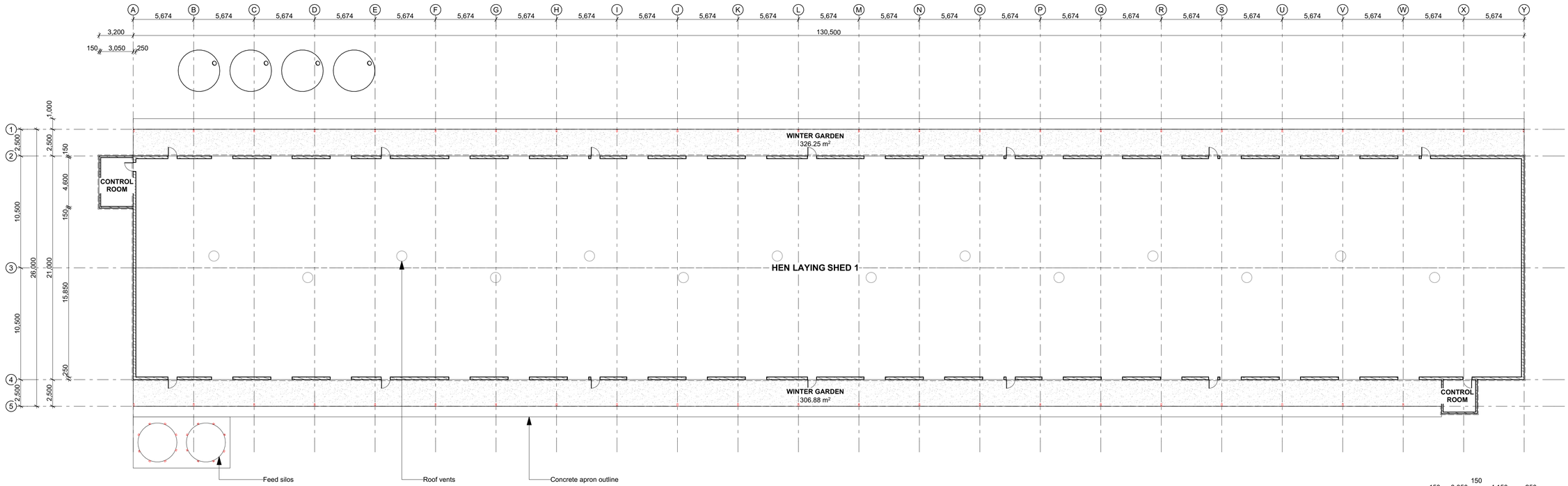
CHECKED: NEO AS LTD
ENGINEER: TBC

SHEET TITLE: **LAYOUT PLAN**

DATE: **3/02/2026**
SCALE @ A1: **1:650**
JOB NUMBER: **2519**
REVISION: **RC - 01**
SHEET NO: **1.4**



FLOOR AREA = 2,766.90m²

NEO ARCHITECTURE STUDIO

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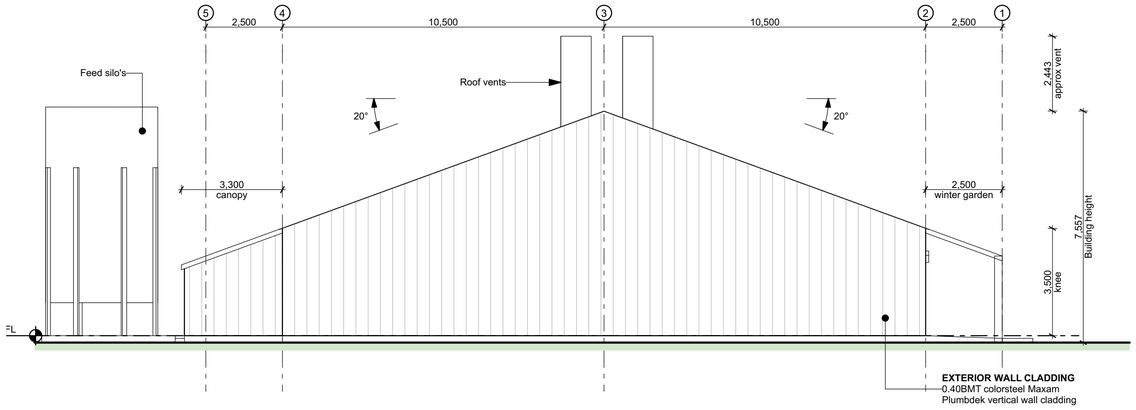
ENGINEER: TBC

SHEET TITLE
LAYING SHED 1 FLOOR PLAN

DATE	SCALE @ A1
3/02/2026	1:200
JOB NUMBER	REVISION / SHEET NO
2519	RC - 01 / 1.5



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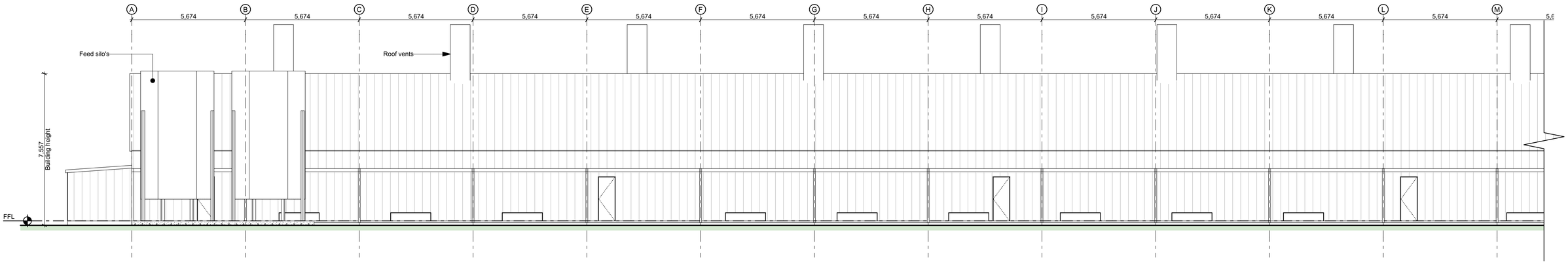

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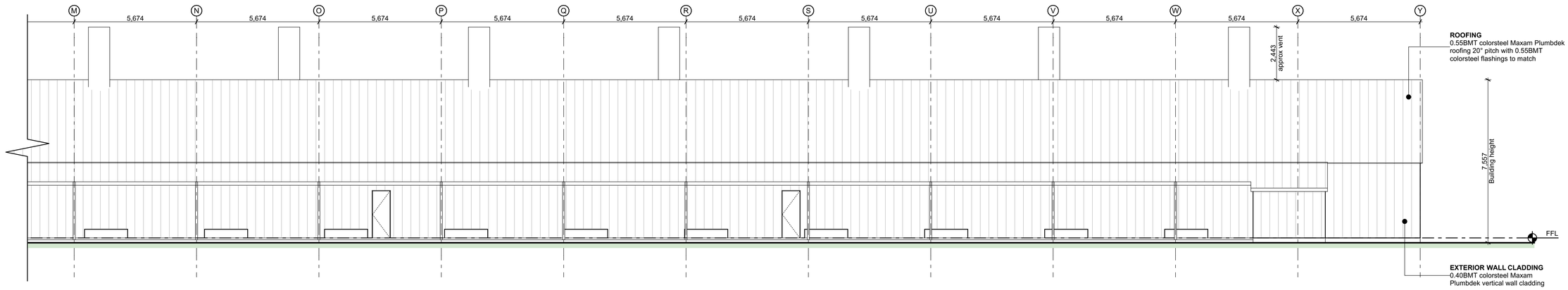

EAST ELEVATION
SCALE 1:100

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284 Sandhills Road
Awanui 0483

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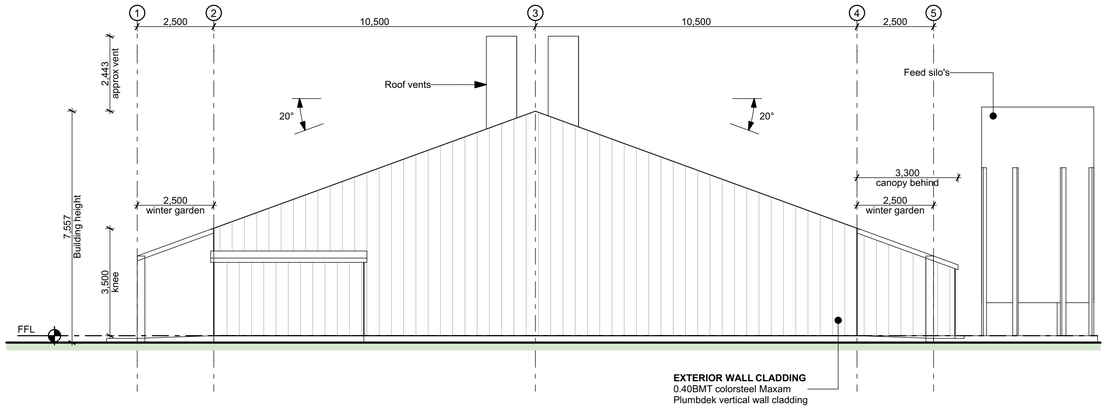
ENGINEER: TBC

SHEET TITLE
TYPICAL LAYING SHED ELEVATIONS

DATE: **3/02/2026**
SCALE @ A1: **1:100**
JOB NUMBER: **2519**
REVISION: **RC - 01**
SHEET NO: **1.6**



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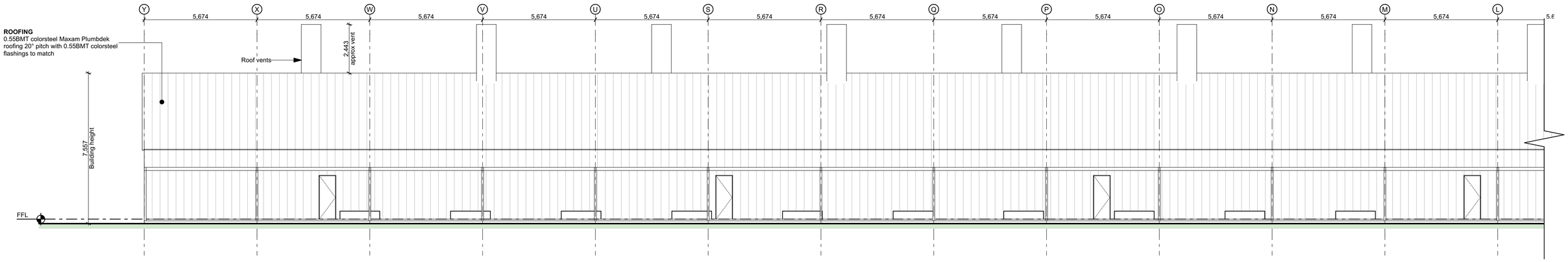

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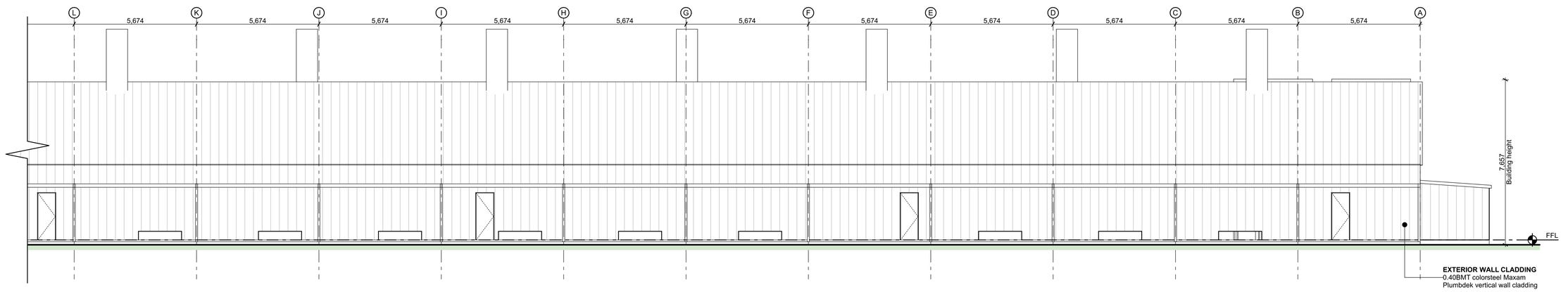

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SCALE 1:100

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PROJECT
NgaiTakoto Egg Farm

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Awanui 0483

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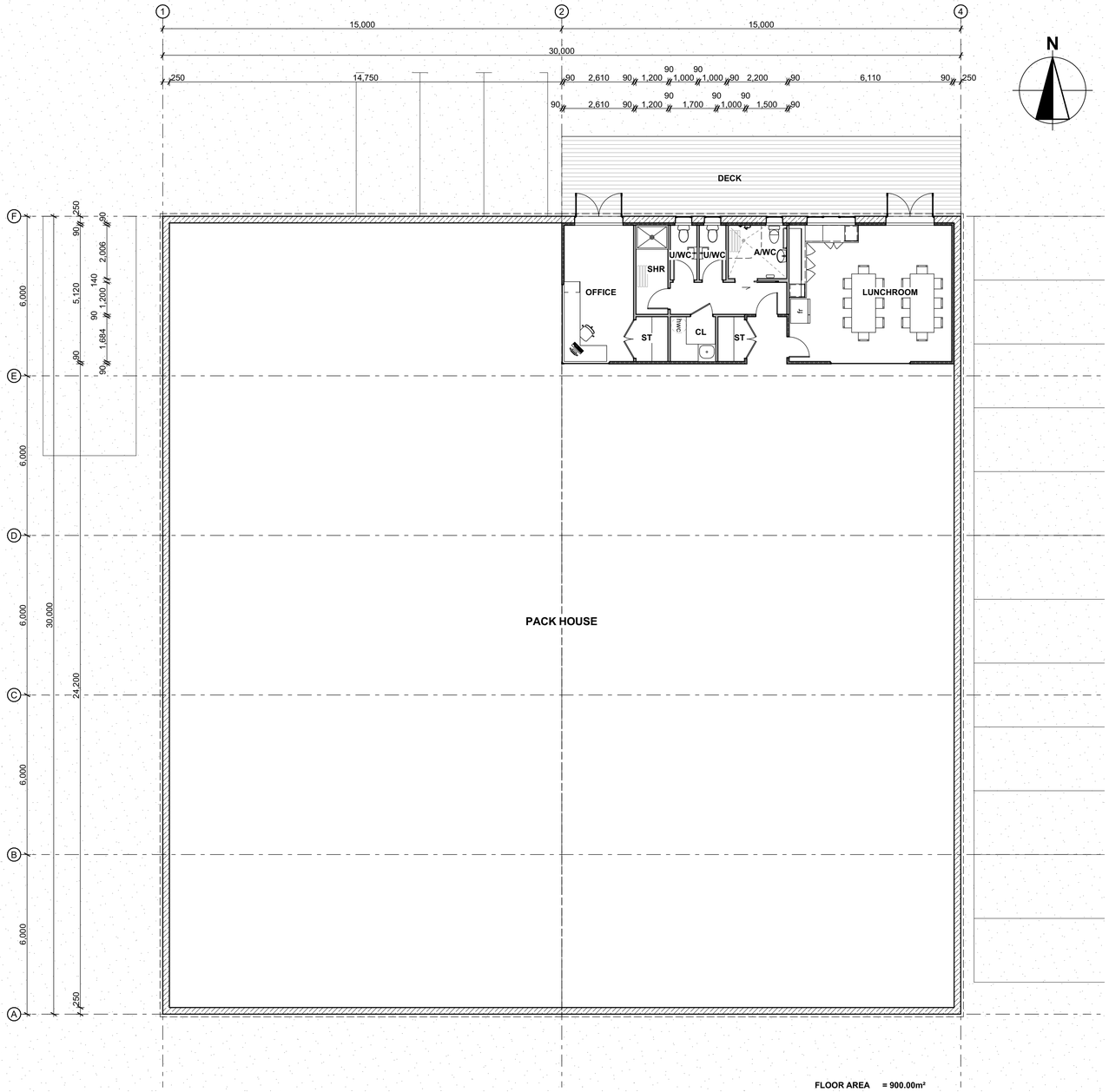
CHECKED: NEO AS LTD
ENGINEER: TBC

SHEET TITLE
TYPICAL LAYING SHED ELEVATIONS

DATE: **3/02/2026**
SCALE @ A1: **1:100**
JOB NUMBER: **2519**
REVISION: **RC - 01**
SHEET NO: **1.7**



FLOOR AREA = 900.00m²

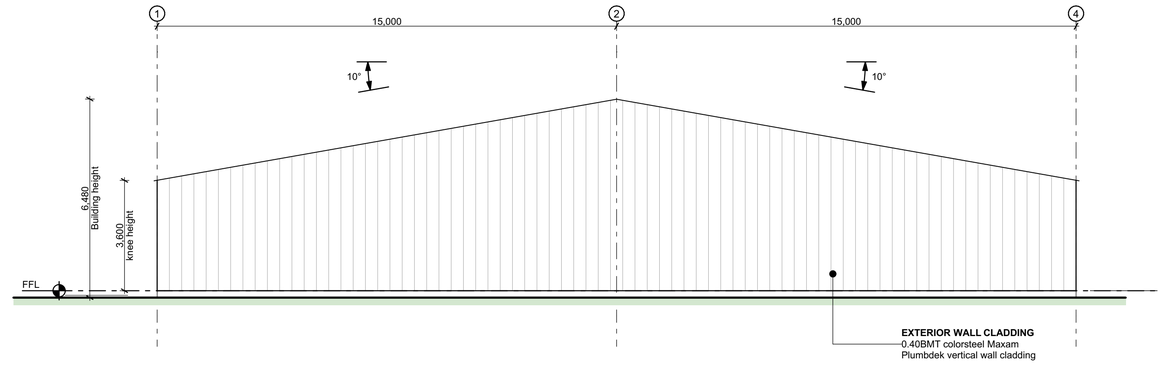
FLOOR PLAN
SCALE 1:100

KEY

= Steel girts

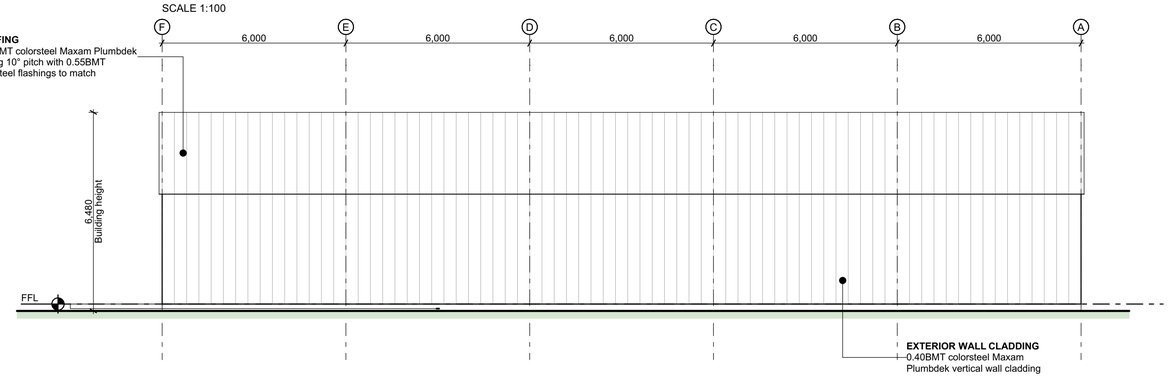
= Insulated timber walls

= Non insulated timber walls



NORTH ELEVATION
SCALE 1:100

ROOFING
0.55BMT colorsteel Maxam Plumbdek roofing 10° pitch with 0.55BMT colorsteel flashings to match



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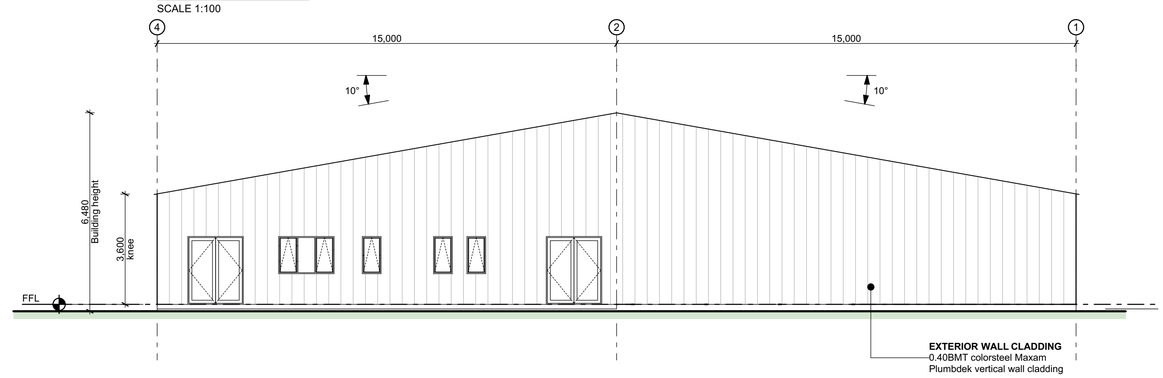
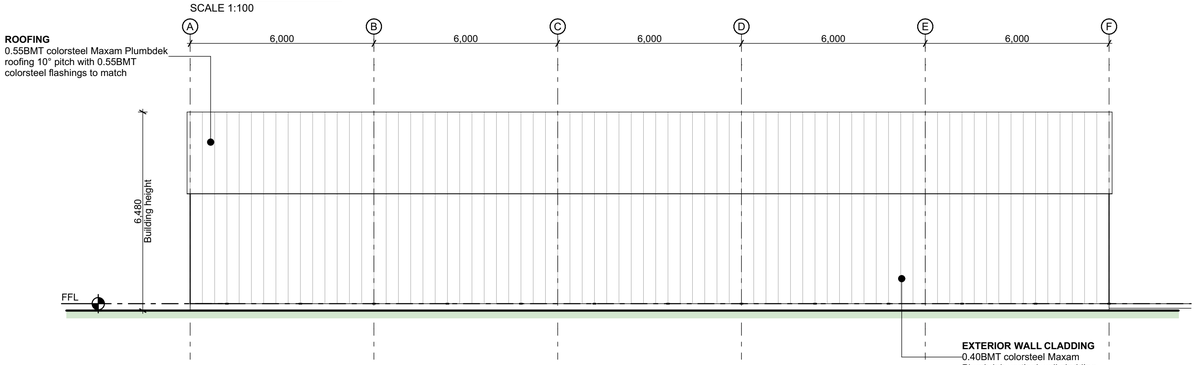


SOUTH ELEVATION
SCALE 1:100

ROOFING
0.55BMT colorsteel Maxam Plumbdek roofing 10° pitch with 0.55BMT colorsteel flashings to match



WEST ELEVATION
SCALE 1:100

NEO ARCHITECTURE STUDIO

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284 Sandhills Road
Awanui 0483

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DRAWN: DANE ALLISON
CHECKED: NEO AS LTD
ENGINEER: TBC

SHEET TITLE: **PACKING SHED**

DATE: **3/02/2026**
SCALE @ A1: **1:100**
JOB NUMBER: **2519**
REVISION: **RC - 01**
SHEET NO: **1.8**

Land Development Report

284 & 458 Sandhills Road, Awanui
Te Rūnanga O Ngaitakoto Free Range Egg Farm

Prepared For:

Te Runanga O Ngaitakoto Custodian Trustee Ltd

Job No.: 16007
Rev: 0
Date: 3 February 2026

CHESTER

Revision History

Revision No	Description/comments	Prepared By	Date
0	First Issue	S Siva	03/02/2026

Document Control

Action	Name	Signed	Date
Prepared by	S Siva Civil Engineer		30/01/2026
Reviewed by	N. Jull Senior Civil Engineer		02/02/2026
Approved by	Steven Rankin CPEng (1012095)		03/02/2026

Distribution

Business/company	Attention	Role
Te Runanga O Ngaitakoto Custodian Trustee Ltd	Craig Wells	CEO
Barker & Associates	Makarena Dalton	Planner

Table of Contents

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List of Tables

1 Introduction

Chester Consultants Ltd has been engaged by Te Runanga O Ngaitakoto Custodian Trustee Ltd to provide a Land Development Report with respect to the proposed development at 284 & 458 Sandhills Road, Awanui.

This report has been prepared solely for the benefit of this specific project, and Far North District Council (FNDC). Chester Consultants Ltd accepts no liability for inaccuracies in third party information used as part of this report. The reliance by other parties on the information or opinions contained in the report shall, without our prior review and agreement in writing, be at such parties' sole risk.

This report is based on development data provided by the client, Barker & Associates, Neo Architect Studio and data obtained from Far North District Council and Northland Regional Council maps current to the site at the time of this document's production. Should alterations be made which impact upon the development not otherwise authorised by this report then the design / comments / recommendations contained within this report may no longer be valid.

In the event of the above, the property owner should immediately notify Chester Consultants Ltd to enable the impact to be assessed and, if required, the design and or recommendations shall be amended accordingly and as necessary.

2 Existing Site Description

The site located at 284 and 458 Sandhills Road, Awanui comprises the following land parcels,

1. Lot 1-2 Deposited Plan 156631 and Lot 1-2
2. Deposited Plan 170525 and Section 1-8
3. Survey Office Plan 42207 and Section 2-3
4. Survey Office Plan 472393

The total site area is 737.3562 ha and the land is zoned Rural Production under both the Operative and Proposed Far North District Plans.

The site comprises a varied landscape with generally flat terrain interspersed with gentle knolls. A portion of the property remains in orchard use, while the balance is maintained as pasture. Several wetlands are distributed across the site.

The proposed building platform is situated in the south-western corner of the property, within an area previously used for farming activities and more recently, for annual cropping. It is bounded by wetlands to the north and south of the proposed development footprint. The building area itself is predominantly flat, with minor gradients falling toward the western boundary, reflecting prior recontouring undertaken to facilitate farm cropping. The proposed development site is accessed via Sandhills Road.

Figure 1: Existing Site Aerial Image (LINZ Data, 01.08.2025)

3 Proposal

It is proposed to construct four new hen laying sheds with a pack house, a farm manager's dwelling, storage shed and a manure bunker and associated access and servicing. For further information, refer to the site plan prepared by Neo Architect Studio in Figure 2 below.

Figure 2: Proposed Site Plan (Neo Architect Studio)

This report is intended to accommodate a Resource Consent application and will report on the following:

- Earthworks, Erosion & Sediment Control,
- Access,
- Water Supply,
- Wastewater,
- Stormwater,
- Flood Risk Assessment

This report is intended to be read in conjunction with the accompanying Chester drawings.

4 Earthworks, Erosion & Sediment Control

4.1 Earthworks

Earthworks are proposed across the site to establish level building platforms, form the accessway, and manage surface flows. Due to the site's topography, significant retaining structures or steep batter slopes are not anticipated. However, batter slopes will be required to construct the access roads and building platforms.

4.1.1 Earthworks Area and Volume

Table 1 below summarises the bulk earthwork volumes required in terms of existing ground versus proposed ground as shown on the civil drawings. The table below summarises the total earthwork proposed, noting that no earthworks will be located within the 10% AEP and 1% AEP NRC Mapped floodplains and within 10 m of the wetland.

Table 1: Cut – Fill Volumes

Location	Area (m^2)	Cut (m^3)	Fill (m^3)	Net (m^3)
Total Earthwork within Site	102730	35875	28170	8705 (Cut)
Within 10% AEP Floodplain	0	0	0	-
Within 1% AEP Floodplain	0	0	0	-
Within 10m of Wetland	0	0	0	-

We anticipate that excavated material may be reused onsite as fill, provided testing is undertaken and it meets the necessary requirements as recommended in the Geotechnical Report prepared by Tonkin & Taylor.

4.1.2 Cut/Fill Depths

Maximum cut and fill depths are anticipated to be approximately 2.92m cut and 2.42m fill across the site. The bulk of the cutting and filling is associated with the formation of accessways and building platforms.

4.1.3 Construction Methodology

In general work operations across the site will involve:

- Minor vegetation clearance.
- Installation of erosion and sediment controls.
- Progressive stripping of organic layers and unsuitable material, stockpiled clear of earthworks or removed from the site.
- Bulk earthworks and pre-loading as if required.
- Drainage and services.
- Roading.
- Progressive Stabilization and Landscaping.
- Decommissioning of erosion and sediment controls.
- On-going mulching and establishment of vegetation.

The final construction methodology to complete works will be determined with input from the contractor at pre-commencement stage.

4.2 Proposed Regional Plan for Northland

Table 2 sets out our assessment against section C.8.3.1 Earthworks – permitted activity of the Proposed Regional Plan for Northland, February 2024

Table 2:Proposed Regional Plan for Northland - Permitted Activity Assessment

Rule C.8.3.1	Assessment/Comment
1. *Within 10m of a natural wetland, the bed of a continually or intermittently flowing river or lake* a. *200m^2 of exposed earth at any time, and* b. *50m^3 of moved or placed earth in any 12-month period.*	No earthwork is proposed within 10m of the natural wetland.
2. *Within 10m of an īnanga spawning site* a. *200 m^2 of exposed earth at any time, and* b. *50m^3 of moved or placed earth in any 12-month period*	We understand the development site is <u>not</u> near any īnanga spawning site
3. *Catchment of an Outstanding Lake - 2,500m^2 of exposed earth at any time*	The development site is <u>not</u> within the catchment of an outstanding lake
4. *Erosion-prone Land - 2,500m^2 of exposed earth at any time*	The development site is <u>not</u> within any land hazard overlays
5. *High-risk flood hazard area - 50m^3 of moved or placed earth in any 12-month period.*	No earthworks proposed within High-risk flood hazard area.
6. *Coastal riparian and foredune management area- Excluding for coastal dune restoration, 200m^2 of exposed earth at any time*	The development site is <u>not</u> within coastal riparian and foredune management area
7. *Flood hazard area - 100 m^3 of moved or placed earth in any 12-month period.*	No earthworks proposed within flood hazard area
8. *Other areas - 5,000m^2 of exposed earth at any time.*	102,730m^2 of area of earthwork is proposed, which is more than 5000m^2

4.3 Erosion and sediment control

Best practice erosion and sediment control will be implemented to mitigate the effect of the earthworks to the surrounding environment. The sediment control devices will be constructed in general accordance with Auckland Council's Guidance Document 005 (GD05) and may include, but not be limited to the following:

- Stabilised Construction Entranceway,
- Silt Fences / Super Silt Fences,
- Clean / Dirty water diversion bunds,
- Decanting earth bunds,
- Progressive site stabilisation.

The Contractor will be ultimately responsible for specific design, installation, maintenance, and removal of various protection measures in accordance with GD05 as necessary to align with actual construction operations and staging.

Refer to drawing 210 of the accompanying civil design drawings for more information and an indicative erosion and sediment control plan.

5 Access

5.1 Traffic

A Traffic Report has been prepared that describes the existing and proposed traffic movements of the development site. Please refer to the Traffic Report prepared by Traffic Planning Consultants.

5.2 Vehicle Crossing

The project site is currently accessed via a 'farm gate' vehicle crossing to Sandhill Road that would resemble a Type 1A – Light Vehicles crossing as per FNDC ES 2023 Sheet 21. The existing crossing location provides suitable sight distances and it is proposed that this access point be retained with the vehicle crossing upgraded to a type 1B – Heavy Vehicle.

5.3 Private Access Road

A new private access road is proposed to service both the proposed farm manager's dwelling and the proposed egg farm. A 6 m-wide metalled accessway is proposed from the existing vehicle crossing location to the egg farm to accommodate two-way traffic, in accordance with the traffic engineer's recommendations. In addition, a 4.5 m-wide metalled ring accessway is proposed to operate as a one-way system for vehicle movements associated with loading and unloading activities at the shed.

The use of a metalled surface is considered appropriate given the rural context of the site. Shallow swales will be installed alongside the accessways to manage stormwater runoff and maintain adequate site drainage.

Refer to the Civil Design 800 series plans prepared by Chester for further details.

6 Water Supply

6.1 Existing Water Supply Network

There is no public reticulated water supply available to the site.

6.2 Proposed Potable Water Supply

6.2.1 Water Supply Demand

Please find the details below for the water supply demand calculation,

Table 3: Water Supply Demand

Water Demand Details	
Total number of chickens proposed for the operation	160 000
Approximate water requirement for a chicken, as per the farm operator data	0.25 L
Daily water supply requirement for chicken stock	40 m^3
Total number of staff proposed for the operation	25
Average daily water requirement per staff member	50 L
Total daily water requirement for staff members	1.25 m^3
Total water Demand for the Egg Farm Operation	40.25 m^3

The property is currently serviced by a consented bore water supply under Consent No. AUT.020995.01.04, which allows a combined groundwater take of 26,230 m^3 within any 24-hour period. This demand (approximately 0.1% of consented take) is proposed to be met by the existing groundwater supply bores on site. In addition, the use of roof-collected rainwater stored in on-site tanks is a viable option for providing potable water for staff use and non-potable water for shed washdown.

6.3 Fire Fighting Water Supply

We understand that, as the proposal does not involve a subdivision, there is no legislative requirement to provide a dedicated firefighting water supply for this development. However, in response to the client's preferences and to manage commercial risk, the design includes four 30,000-litre rainwater storage tanks within the site.

The indicative locations of these tanks are shown on the submitted plans. These tanks will provide a supplementary on-site water reserve that can be utilised for firefighting purposes if required. While not a requirement, the provision of on-site storage enhances the overall resilience of the development and supports emergency response capability.

7 Wastewater

7.1 Manure Disposal

The proposed laying sheds incorporates an automated three belt manure system that captures the manure from below the aviary's. At ground level, manure scrapers on the floor push the manure onto the belts with any residual droppings manually shovelled onto the belts. The floor level has a base of wood shavings or sand to absorb any moisture. Manure is temporarily stored at one end of the shed, with each shed emptied twice, weekly. It is proposed that manure waste generated by the chicken farm will be transported off-site for disposal.

A manure bunker is proposed to provide temporary storage capacity in the event of any overflow. The bunker will have a concrete base and walls and will be covered with a shed to contain the manure and prevent leachate from entering the soil. As advised by the applicant, the sheds are anticipated to be depopulated at approximately 18-month intervals, during which washdown of the sheds is undertaken using a water blaster. The resulting washdown runoff is expected to flow evenly through the side openings of the sheds into the chicken ranging area, effectively achieving land application. It is recommended that washdown activities are scheduled to avoid periods of heavy rainfall to ensure that the soil over the ranging area is not saturated and has sufficient soil moisture deficit to take the washdown volume.

Detail of the off-site manure disposal process is outside the scope of this report.

7.2 Wastewater System for Employees and Proposed Farm Manager's Dwelling

The development site does not have a connection to the existing public network. As such, on-site wastewater treatment and disposal is proposed. The sections below provide an indicative design for on-site wastewater disposal so as to demonstrate that on-site wastewater disposal can be achieved in accordance with the relevant design standard and permitted activity criteria rules.

7.2.1 Site Soil Assessment

On 11 August 2025, Chester staff undertook a site walkover and a series of hand auger investigations to assess soil conditions for on-site wastewater disposal in accordance with AS/NZS 1547:2012. Photographs from this investigation are included in Appendix B. The Northland Regional Council Northland Factsheet Viewer was also used to support and inform the on-site soil assessment.

Across much of the site, and in particular within the north-eastern portion where the indicative wastewater disposal field is proposed, soil observations were consistent with the Northland Factsheet Viewer mapping,

identifying mature Houhora sands. These soils are typically well drained and are considered suitable for on-site effluent disposal where design parameters are appropriately applied.

In the south-western portion of the site, soils were observed to transition to more recent sand soil types, which are typically classified as excessively drained. Isolated pockets of organic peat and semi-organic soils, which are generally poorly drained, were also encountered. These findings are consistent with the geotechnical investigation undertaken by Tonkin & Taylor for the project.

Based on the site walkover, hand auger investigations, and review of available soil information, the soils within the location of the indicative wastewater disposal field have been classified as shown in Table 4 below.

Table 4: Selected Soil Category as per ASNZS 1547:2012

Selected Soil Category	Soil Description
Category 2	Sandy Loams

7.2.2 Groundwater

Groundwater was encountered during the site investigation at an approximate depth of 700 mm below ground level.

It is noted that all hand auger investigations were undertaken within the relatively flat, central portion of the site where the proposed building platform is located. Based on the site topography, groundwater levels are anticipated to be deeper in the north-western portion of the site where the accessway and higher ground are proposed.

To ensure compliance with minimum vertical separation distances to the seasonal high groundwater table, as outlined in Table 9, Section C.6.1.3 of the Proposed Regional Plan for Northland, a conservative wastewater disposal approach is recommended. This includes the use of secondary treatment with pressure-compensating drip irrigation, in preference to primary treatment and trench-based disposal systems. In addition, dispersal fields should be located on elevated areas underlain by Category 2 soils, where increased vertical separation and improved treatment performance can be achieved.

7.2.3 Design Flow Volume

The following section outlines the design occupancy and corresponding design flow volumes for the proposed development. The egg farm is expected to accommodate approximately 25 staff, and the proposed farm manager's dwelling is assumed to be occupied by 5 residents.

Table 5: Design Flow Volume for Proposed Development Site

Design Flow Detail		
	Egg Farm	Farm Manager's Dwelling
Design Occupancy	25	5
Design Flow Allowance per Person	50 L/person/day (ASNZS 1547:2012, Table H4, Bore Water Supply)	200 L/person/day (ASNZS 1547:2012, Table H3, Bore Water Supply)
Design Flow Volume	1250 L/day	1000L/day

Refer to drawing 500 of the accompanying civil design drawings for further details.

7.2.4 Treatment System

The development requires separate wastewater treatment systems to service the farm manager's dwelling and the egg farm facility. Secondary treatment systems have been considered appropriate based on the groundwater levels observed during the site investigation and the need to achieve adequate vertical separation to the seasonal high groundwater table.

It is noted that alternative primary treatment-only systems may also be suitable, subject to further site investigation and confirmation of compliance with groundwater separation and soil category requirements at the detailed design stage.

7.2.4.1 Secondary Treatment System for Egg Farm and Farm Manager's Dwelling

This option provides two independent secondary treatment systems, servicing the farm manager's dwelling and the egg farm facility separately.

The farm manager's will be serviced by a secondary treatment system designed for an estimated wastewater flow of approximately 1,000 L/day (refer to Table 6). The egg farm facility will be serviced by a separate secondary treatment system designed for an estimated wastewater flow of approximately 1250 L/day.

The final selection of treatment unit types, performance standards, and suppliers for both systems will be confirmed during the detailed design phase to ensure compliance with AS/NZS 1547:2012 and relevant regional plan requirements.

7.2.5 Land Disposal Systems

Pressure Compensating Drip Irrigation (PCDI) is proposed for the land disposal of secondary treated effluent from both the farm manager's dwelling and the egg farm facility. This disposal method has been selected in response to the observed groundwater conditions and to maximise vertical separation and treatment performance.

Alternative controlled discharge trench systems may also be feasible, subject to confirmation of suitability during the detailed design stage.

7.2.5.1 Pressure Compensating Drip Irrigation for Secondary Treated Effluent

The PCDI system will be used exclusively for the disposal of secondary treated effluent and will be installed as a shallow subsurface application system.

The drip irrigation pipework will be installed within a minimum 100–150 mm layer of good quality topsoil to support effective treatment and soil moisture uptake. Where existing soil depths are insufficient, additional topsoil placement across the disposal field area may be required, subject to confirmation at detailed design.

Disposal fields will be located on elevated areas underlain by suitable soils to achieve appropriate vertical separation distances to groundwater. Final disposal field sizing, layout, application rates, and construction details will be confirmed during detailed design to ensure compliance with relevant standards and regulatory requirements.

Table 6: PCDI Land Disposal Detail (Secondary Treatment) – Egg Farm & Farm manager's dwelling

PCDI Land Disposal Detail (Secondary Treatment)		
	Egg Farm	Farm manager's dwelling
Disposal Method:	PCDI	
Distribution Pipe Spacing:	At 1m centres	
Selected Irrigation Rate:	5 mm/day (Category 2 soils, ASNZS 1547:2012, Table M1)	
Disposal Field Area:	1250/5 = **250m²**	1000/5 = **200m²**
Reserve Area:	250 x 30% = **75m²**	200 x30% = **60m²**
Servicing Requirement:	As per the manufacturer's specifications	

Refer to Chester Drawing 510 for the proposed location of the treatment and disposal system.

7.3 Planning Assessment

7.3.1 Far North District Council Operative Plan

We believe that the proposal is a permitted activity under Far North District Council Operative Plan. Table 8 below sets out the relevant rule under Section 7, Chapter 12:

Table 7: FNDC Operative Plan - Permitted Activity Assessment

Rule 12.7.6.1.4	Assessment/Comment
Land use activities which produce human sewage effluent (including grey water) are permitted provided that: *a. the effluent discharges to a lawfully established reticulated sewerage system; or* b. *the effluent is treated and disposed of on-site such that each site has its own treatment and disposal system no part of which shall be located closer than 30m from the boundary of any river, lake, wetland or the boundary of the coastal marine area.*	The development is proposed to be treated and disposed of by a system which has no part closer than 30 m from the bank of any river, lake, wetland, or the boundary of the coastal marine area.

7.3.2 Proposed Regional Plan for Northland

Table 9 sets out our assessment against section C.6.1.3 Other on-site treated domestic wastewater discharge – permitted activity of the Proposed Regional Plan for Northland, February 2024.

Table 8: Proposed Regional Plan for Northland - Permitted Activity Assessment

Rule C.6.1.3	Assessment/Comment
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*	The on-site wastewater system has been designed in accordance with AS/NZS 1547:2012.
2. *The volume of wastewater discharged does not exceed two cubic metres per day, and*	The maximum daily design flow volume from both systems combined is 2.25 m^3per day which is **more than** 2m^3
3. *The discharge is not via a spray irrigation system or deep soakage system, and*	The discharge is <u>not</u> via a spray irrigation system or deep soakage system.
4. *The slope of the disposal area is not greater than 25 degrees, and*	The disposal area is located on the slopes not greater than 25 degrees
5. *For wastewater that has received secondary or tertiary treatment, it is discharged via:* *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); or* *b. an irrigation line system that is dose loaded and covered by a minimum of 50 millimetres of topsoil, mulch, or bark, and*	Secondary treated wastewater is proposed to be disposed of to land via a Pressure Compensating Drip Irrigation (PCDI) system within Category 2 equivalent soils.

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*	The proposed disposal system discharges onto a slope shallower than 10 degrees, so this does not apply.
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*	The proposal complies with all exclusion areas and setback distances set out in Table 9.
8. *For septic tank treatment systems, a filter that retains solids greater than 3.5 millimetres in size is fitted on the outlet, and*	The proposed system will have a filter that meets this requirement.
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*	Secondary treatment disposal with 30% reserve disposal area is proposed.
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*	A maintenance agreement between the applicant and supplier (or other suitably qualified contractor) is to be entered into.
11. *The discharge does not contaminate any groundwater water supply or surface water, and*	Noted.
12. *There is no surface runoff or ponding of wastewater, and*	Noted.
13. *There is no offensive or objectionable odour beyond the property boundary.*	Noted.

8 Stormwater

8.1 Existing Reticulation Network

There is no public stormwater network available to the site. Stormwater runoff from the proposed development area, which was previously used for farming and annual cropping, is currently managed via three existing farm drains, as shown on Chester drawing C100. These drains collect runoff from the site and convey it to the wetlands located to the south of the development area.

8.2 Proposed Network

The site is located within the Rural Production Zone, as defined under both the Operative and Proposed Far North District Council (FNDC) District Plans. In accordance with the relevant planning frameworks, impervious surfaces are a permitted activity within this zone, provided they do not exceed 15% of the total site area.

The impervious area of the proposed development is less than 0.4% of the total site area, which remains well within the permitted threshold for stormwater management. Therefore, no further mitigation is required under the FNDC Operative Plan.

A small portion of stormwater runoff from the building roofs will be collected and stored in rainwater tanks for use as a firefighting water supply. The remaining roof runoff will be discharged via in-ground dispersal trenches upslope of the proposed swale network, which conveys flows to the existing wetlands located to the north and south of the site.

Surface runoff from the private accessways will also be intercepted by the swale network where possible and directed to the existing wetlands. This integrated stormwater management approach ensures that both roof and surface runoff are effectively controlled, promotes groundwater recharge, supports site drainage objectives while minimising environmental impacts.

Refer to the Civil Design 400 plans prepared by Chester for more information.

8.3 Stormwater Management

The following sections further discuss the proposed Best Practical Option (BPO) stormwater management approach for the development in accordance with the key stormwater management criteria outlined in Table 4-1 of the FNDC Engineering Standards 2023. Our proposal considers the site-specific catchment and downstream receiving environment characteristics. Table 9 below summarises the key stormwater consideration which are address in more detail in the following sections.

Table 9: Key Stormwater Considerations

Potential Effects	Proposed Solution
Decreased filtering of water: This could increase contaminant loads to wetlands and degrade the quality of the receiving environment.	Form the ground levels and swale network such that all run-off travels through filter strips and swales prior to discharge to the receiving environment.
Reduced flows to wetlands in dry periods.	Maintain existing catchments as much as practical and utilise imperviousness for increased run-off volume where catchment is slightly reduced.
Increased water temperatures: Water is no longer cooled as it moves through the ground and/or it absorbs the heat as it runs over impervious surfaces.	Discharge roof run-off into in-ground dispersal devices upstream of the swale network. This will ensure run-off from impervious areas has time to cool either in ground or within swales before discharge to the receiving environment.

8.3.1 Stormwater Quality Treatment

The proposed impervious areas comprise building roofs, low-volume accessways, and a common parking area. These surfaces are considered low contaminant-yielding, given their intended use and limited traffic exposure. In terms of suspended solids and hydrocarbons, contaminant generation from these areas is expected to be low. The primary water quality consideration associated with roof runoff is thermal impact.

Runoff from accessways and parking areas will be collected and conveyed via a network of grassed and vegetated swales, which provide stormwater quality treatment through sedimentation and filtration processes. Roof runoff will be discharged to in-ground dispersal trenches located upstream of the swale network, enabling initial attenuation, infiltration, and cooling prior to entering the swales.

Runoff from the hen ranging area will also be directed to the swale network, which will passively treat flows through sedimentation and filtration before discharging to the existing wetland system. This approach provides an effective mechanism for managing potential sediment and nutrient loads associated with the outdoor ranging area.

The vegetated swale system provides sufficient hydraulic residence time to enhance water quality prior to discharge to the wetlands. In addition, routing roof runoff through the swales allows runoff temperatures to naturally equilibrate before entering downstream receiving environments, supporting the protection of aquatic values.

The GD01 Online Toolbox Calculator has been used to assess the performance of the worst-case swale scenario (i.e. the swale receiving the largest contributing impervious catchment), with calculations included in Appendix D. At the proposed swale gradient of 0.3%, the calculations indicate a minimum effective swale length of approximately 30 m is required to achieve a hydraulic residence time of at least 9 minutes. All proposed swales exceed this effective length, providing confidence that the proposed stormwater quality treatment approach is appropriate. Final swale calculations and design details will be confirmed at the detailed design stage.

8.3.2 Wetland Volume Management

Table 10 presents the changes in pervious and impervious surface areas between pre-development and post-development conditions. The proposed earthworks and site formation result in a very minor alteration to the local catchment boundaries draining to Wetlands A and B. Following site formation, approximately 850 m² of catchment area that previously drained to Wetland B will instead drain to Wetland A.

Table 10: Pre & Post Development Pervious and Impervious Areas

		Wetland A	Wetland B
Pre Development	Existing Roof Area (m²)	0	0
	Existing Access Area (m²)	0	0
	Existing Grass Area (m²)	21443	65965
	Existing Impervious area (m²)	**0**	**0**
	Existing Pervious area (m²)	**21443**	**65965**
Post Development	New Roof Area (m²)	4130	11490
	Existing Access Area (m²)	3504	7534
	Existing Grass Area (m²)	14659	46092
	New Impervious area (m²)	**7634**	**19024**
	New Pervious area (m²)	**14659**	**46092**

The proposed development results in an overall increase in impervious area associated with building footprints, accessways, and hardstand areas, with a corresponding reduction in pervious surfaces. Table 12 below presents the resulting increase in runoff volumes draining to Wetlands A and B, reflecting the combined effects of increased impervious coverage and minor catchment redistribution arising from the proposed site formation. Table 11 provides the rainfall depth data used to calculate the pre- and post-

development runoff volumes presented in Table 12: Pre & Post Development Runoff Volume Comparison Table 12.

Table 11: Runoff Depth Details

Runoff Depth Detail	
Rainfall Depth, P (mm)	25
NRCS Soil Class (Per GD01, Table 23)	B
Permeable NRCS Curve Number, CN (mm)	61
Permeable Initial Abstraction, Ia (mm)	5
Permeable Max Storage, S (mm)	162.4
Permeable Run-off Depth, Q (mm)	**2.2**
Impervious SCS Curve Number, CN (mm)	98
Impervious Initial Abstraction, Ia (mm)	0
Impervious Surface Max Storage, S (mm)	5.2
Impervious Run-off Depth, Q (mm)	**20.7**

Table 12: Pre & Post Development Runoff Volume Comparison

		Wetland A	Wetland B
Pre Development	Existing Impervious area (m^2)	0	0
	Existing Pervious area (m^2)	21443	65965
	Pre-Development Runoff Volume (m^3)	47	145
Post Development	New Impervious area (m^2)	7634	19024
	New Pervious area (m^2)	14659	46092
	Post-Development Runoff Volume (m^3)	190	495
Pre & Post Development Runoff Volume Difference (m^3)		**143**	**350**

Based on the above, the net increase in runoff volume is approximately 143 m^3 for Wetland A and 350 m^3 for Wetland B during the water quality design storm. These increases are primarily attributable to the introduction of additional impervious surfaces associated with the proposed development, with a very minor contribution from catchment redistribution resulting from site formation works. As the catchment redistribution represents a negligible proportion of the total contributing catchment areas for each wetland, it is not expected to result in more than minor adverse hydrological effects.

It is also noted that the receiving wetlands are naturally intended to hold water and accommodate variations in inflows. The small additional runoff from the proposed development is consistent with their natural hydrological function and is not expected to cause harm. The proposed mitigation measures are designed to further reduce any potential adverse effects and may improve water quality before the runoff reaches the wetlands.

To manage and mitigate the increased runoff, the following measures are proposed:

1. In-ground dispersal trenches for roof runoff: Roof downpipes from the proposed buildings will be connected to in-ground dispersal trenches, as shown in our drawings. This approach promotes infiltration, increases groundwater recharge, and reduces the volume and velocity of surface runoff entering the wetlands.
2. Shallow grass swales: Stormwater runoff from the site will be collected and conveyed through shallow grass swales with a gentle gradient. These swales provide hydraulic resistance, slow the flow of runoff, and allow additional time for infiltration. The slowed flow also improves water quality by promoting sedimentation and filtration of potential contaminants.

Additional benefits of the proposed mitigation measures include:

1. Improved water quality: The increased flow resistance and contact with vegetated swales enhance natural filtration, reducing the load of sediments, nutrients, and other contaminants reaching the wetlands.
2. Temperature moderation: Runoff from impervious surfaces can be warmer than natural groundwater or surface flows. The proposed infiltration trenches and grass swales provide sufficient residence time for runoff to cool before entering the wetlands, helping to prevent thermal stress on aquatic vegetation and wildlife.

Overall, these measures are expected to manage the increased runoff effectively while minimising potential adverse hydrological or ecological impacts on Wetlands A and B. The additional runoff is consistent with the wetlands' natural function and, when combined with the proposed mitigation, is unlikely to cause any harm. The actual key to wetland health is to ensure that the run-off volume to wetlands, particularly for frequent storm events is not reduced as that is what could present a risk that they could dry out. In this case it is marginally increased so positive.

8.3.3 Flood Control (1% AEP event)

The wider catchment and downstream receiving environment comprise an extensive series of natural wetland depressions located between coastal sand dune formations. These features function as natural detention and infiltration systems, with surface water runoff—including during the 1% AEP event—predominantly ponding within the depressions and infiltrating into the underlying groundwater.

During extreme rainfall events, ponding and spill processes may ultimately connect with the coastal receiving environment to the south-east of the site. This behaviour reflects the existing natural drainage regime and is not constrained by defined downstream channels or infrastructure that would be sensitive to increased runoff volumes or peak flows.

The land between the site and the coastal receiving environment is predominantly used for rural production. Existing dwellings and utility structures are generally located on elevated landforms and are therefore not susceptible to inundation. No downstream flooding hazards or flow restrictions have been identified.

Given the nature of the downstream receiving environment, the absence of identified downstream flood hazards, and the lack of flow-sensitive infrastructure, post-development runoff is not expected to result in an increased flood risk. Accordingly, attenuation of the 1% AEP event for flood control purposes, as outlined in FNDC Design Guideline Table 4-1, is not considered necessary for this development.

8.4 Proposed Regional Plan for Northland

Table 13 and Table 14 below sets out our assessment against sections C.4.1.1 Land drainage – permitted activity and C.6.4.2 Other stormwater discharges – permitted activity of the Proposed Regional Plan for Northland, February 2024.

Table 13: Proposed Regional Plan for Northland - Permitted Activity Assessment against Rule C.4.1.1

Rule C.4.1.1	Assessment/Comment
1. *the activity complies with all relevant conditions of C.4.1.9 Land drainage and flood control general conditions, and*	The proposed activity complies with all point of C.4.1.9 except No *3) New land drainage does not occur within 50 metres of any natural wetland*. In this case the proposed land drainage i.e. swale network is within 50m a natural wetland but has been specifically designed and considered to mitigate potential effects on the wetland as outlined throughout this report.
2. *any resulting land subsidence or slumping does not cause adverse effects on*	There is a very low risk of subsidence or slumping and the proposed works are sufficiently clear of other property such that this is not an issue.

structures or infrastructure on other property, and	
3. *the discharge is in or from the same catchment in which the water would naturally flow, and*	There is minor alteration of the existing catchments proposed. However, the stormwater management approach has specifically considered the potential effects of this modification, and the proposed measures (e.g. run-off volume management) are targeted at mitigating potential effects to be no more than minor.
4. *the discharge is not within the catchment of an Outstanding Lake or a dune lake with outstanding or high ecological value, and*	The discharge is not within the catchment of an Outstanding Lake or a dune lake with outstanding or high ecological value.
5. *a new drain is not constructed within 15 metres of an existing wastewater disposal area.*	No drains are proposed within 15 meters of an existing wastewater disposal area.

Table 14: Proposed Regional Plan for Northland - Permitted Activity Assessment against Rule C.6.4.2

Rule C.6.4.2	Assessment/Comment
1. *The discharge or diversion is not from:* a. *a public stormwater network, or* b. *a high-risk industrial or trade premises, and*	The discharge is <u>not</u> from a public stormwater network or high-risk industrial or trade premises.
2. *The 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 percent annual exceedance probability, or flooding of buildings on another property in a storm event of up to and including a one percent annual exceedance probability, and*	For the reasons in the above sections, in our opinion the discharge will not cause or increase flooding on another property.
3. *where the diversion or discharge is from a hazardous substance storage or handling area:* a. *the stormwater collection system is designed and operated to prevent hazardous substances stored or used on the site from entering the stormwater system, or* b. *there is a secondary containment system in place to intercept any spillage of hazardous substances and either discharges that spillage to a trade waste system or stores it for removal and treatment, or* c. *if the stormwater contains oil contaminants, the stormwater is passed through a stormwater treatment system designed in accordance with the Environmental Guidelines for Water Discharges from Petroleum Industry Sites in New Zealand (Ministry for the Environment, 1998) prior to discharge, and*	The discharge is <u>not</u> from a hazardous substance storage or handling area.
4. *Where the diversion or discharge is from an industrial or trade premises:* a. *the stormwater collection system is designed and operated to prevent any contaminants stored or used on the site, other than those already controlled by condition 3) above, from entering*	The discharge is <u>not</u> from an industrial or trade premises.

	stormwater unless the stormwater is discharged through a stormwater treatment system, and *b. any process water or liquid waste stream on the site is bunded, or otherwise contained, within an area of sufficient capacity to provide secondary containment equivalent to 100 percent of the quantity of any process water or liquid waste that has the potential to spill into a stormwater collection system, in order to prevent trade waste entering the stormwater collection system, an*	
5.	*The diversion or discharge is not into potentially contaminated land, or onto potentially contaminated land that is not covered by an impervious area, and*	The discharge is <u>not</u> into potentially contaminated land, or onto potentially contaminated land that is not covered by an impervious area.
6.	*The diversion and discharge does not cause permanent scouring or erosion of the bed of a water body at the point of discharge, and*	Erosion and scour protection is proposed at the point of discharge.
7.	*The discharge does not contain more than 15 milligrams per litre of total petroleum hydrocarbons, and*	The proposed impermeable areas are all low contaminant yielding and are very unlikely to pick up petroleum hydrocarbon contaminants of more than 5 milligrams per litre.
8.	*The discharge does not cause any of the following effects in the receiving waters beyond the zone of reasonable mixing:* *a. the production of conspicuous oil or grease films, scums or foams, of floatable or suspended materials, or* *b. a conspicuous change in the colour or visual clarity, or* *c. an emission of objectionable odour, or* *d. the rendering of freshwater unsuitable for consumption by farm animals, or* *e. the rendering of freshwater taken from a mapped priority drinking water abstraction point (refer I Maps | Ngā mahere matawhenua) unsuitable for human consumption after existing treatment.*	None of these effects are anticipated on the receiving waters.

9 Flood Assessment

Based on the NRC Natural Hazard Regionwide Model flood mapping, the subject site is not located within any identified flood hazard areas (10, 50 & 100 year), as illustrated in the figure below. The model shows no inundation extents or overland flow paths across the site for the assessed events, indicating that no flood-related constraints are expected.

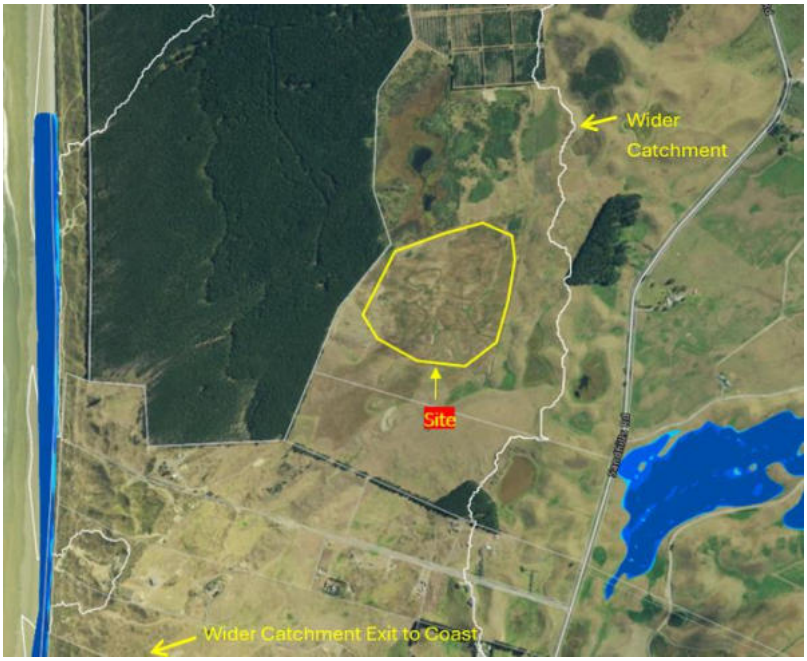

Figure 3: NRC Natural Hazard Regionwide Models Flood map (NRC Hazards Map 11/12/2025)

However, the map above highlights only flooding areas greater than 2,000 m^2, as smaller extents have been filtered out for clarity.

To further assess flood hazard at the site, a rapid flood assessment was undertaken to evaluate pre- and post-development conditions using the HEC-HMS model. Flood extent and depth were assessed for the 1% AEP event, incorporating a 20% allowance for climate change, as shown in the figures below.

Figure 4 illustrates the pre-development flooding results for the 1% AEP event derived from the HEC-HMS model, with flood depths less than 100 mm filtered out for clarity. The results indicate that the proposed works area is generally located outside the mapped flood extent, with only minor localised ponding observed. This shallow ponding is attributable to existing site topography rather than defined overland flow paths.

Figure 5 illustrates the post-development flooding results for the 1% AEP event, also filtered to exclude flood depths less than 100 mm. Under post-development conditions, runoff from the developed area is collected and conveyed via the proposed shallow, formed grassed swales, as shown on the engineering drawings. For the 1% AEP plus climate change event, minor localised flooding is predicted at some culvert inlets due to culvert capacity constraints. This results in a temporary backwater effect, causing water to pond along the swales before gradually draining through the culverts and being conveyed to the receiving waterbodies.

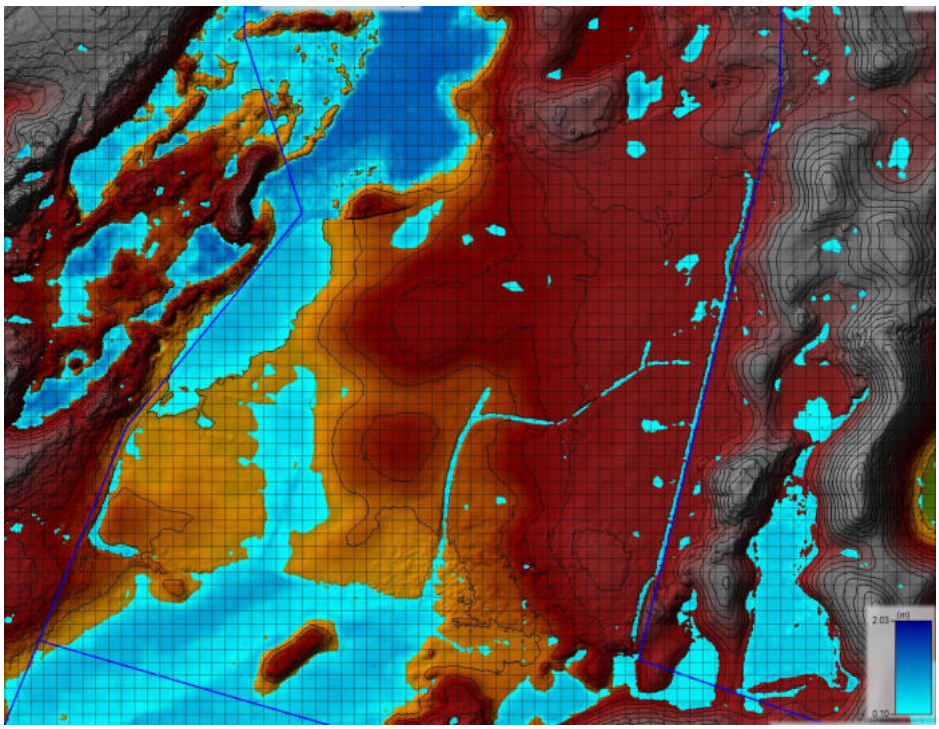

Figure 4: Pre Development 1% AEP +CC Flooding (HEC-RAS Model)

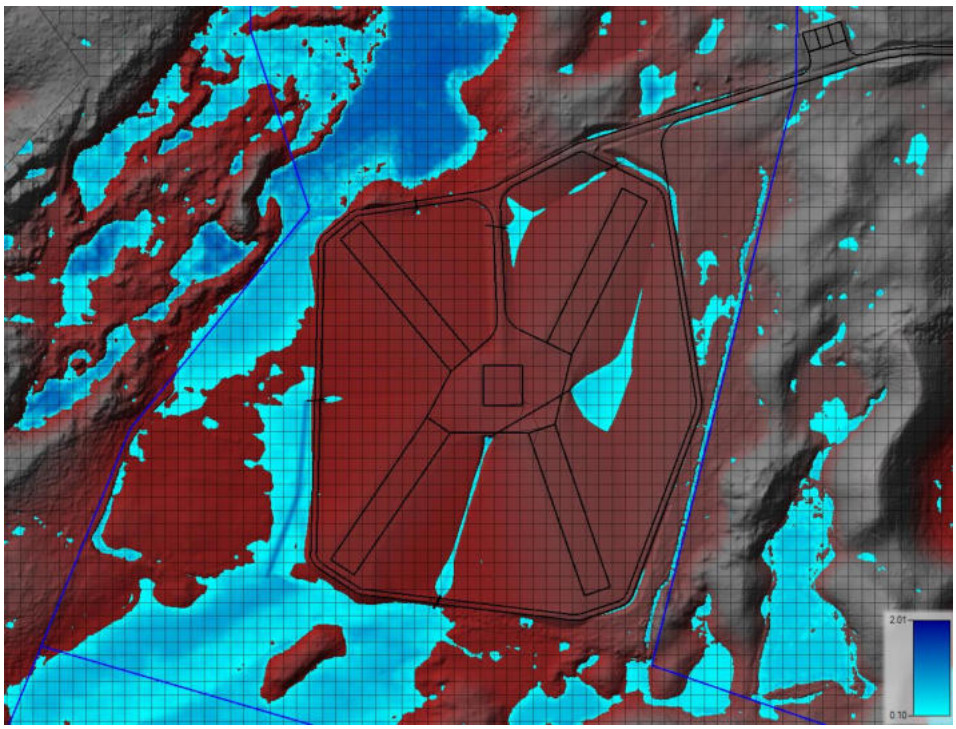

Figure 5: Post Development 1% AEP+CC Flooding (HEC-RAS Model)

The rapid flood assessment indicates that the proposed development will not result in any material increase in flood extent, flood depth, or flood hazard beyond the site for the 1% AEP plus climate change event. The proposed building platforms and accessways are located above the assessed flood levels and are therefore not subject to inundation during the design event.

Minor, localised ponding at culvert inlets is temporary in nature, remains confined within the site, and does not adversely affect neighbouring properties, accessways, or building platforms.

Overall, the proposed earthworks and stormwater management design are considered consistent with good engineering practice and are not expected to exacerbate flood risk on-site or downstream.

10 Summary

In our opinion the site is suitable for the proposed development, subject to Far North District and Northland Regional Council approvals with regards to the matters addressed in this report and summarised below. The development can be undertaken in general accordance with the engineering standards with no specific area of non-compliance that in our opinion would have an actual or potential adverse effect on the environment or negatively affect any persons.

10.1 Earthworks, Erosion & Sediment Control

Bulk earthworks are proposed to enable the development. Best practice erosion and sediment control measures in accordance with GD05 are proposed to manage the potential effect on the environment.

10.2 Access

Provision for access to and within the site has been made by proposing to upgrade the existing vehicle crossing in accordance the engineering standards and constructing a private road.

10.3 Water Supply

The site is not connected to a reticulated water supply network. Water demand for the proposed development will be met by the existing consented groundwater bores on-site, which provide adequate capacity for the activity. In addition, the use of roof-collected rainwater stored in on-site tanks is a viable option for providing potable water for staff use and non-potable water for shed washdown.

10.4 Wastewater

The existing property does not have access to the public wastewater service. It is proposed to service the developments domestic wastewater via an on-site wastewater treatment and land disposal system in accordance with ASNZS1547:2012.

10.5 Stormwater

Stormwater will be managed via the proposed swales and culverts, which ultimately discharge into the on-site wetlands. Best-practice stormwater management measures will be implemented in accordance with the relevant standards to improve the quality of runoff entering the wetlands and to safeguard the receiving environment.

10.6 Flooding Risk

The proposed building platforms and access are clear of the 1% AEP design flood extent, and the proposed works will not worsen flooding on neighbouring properties.

11 Limitations

- This assessment contains the professional opinion of Chester Consultants as to the matters set out herein, in light of the information available to it during the preparation, using its professional judgement and acting in accordance with the standard of care and skill normally exercised by professional engineers providing similar services in similar circumstances. No other express or implied warranty is made as to the professional advice contained in this report.
- We have prepared this report in accordance with the brief as provided and our terms of engagement. The information contained in this report has been prepared by Chester Consultants at the request of Te Runanga O Ngaitakoto Custodian Trustee Ltd and is exclusively for its client use and reliance. It is not possible to make a proper assessment of this assessment without a clear understanding of the terms of engagement under which it has been prepared, including the scope of the instructions and directions given to and the assumptions made by Chester Consultants Ltd. The assessment will not address issues which would need to be considered for another party if that party's particular circumstances, requirements and experience were known and, further, may make assumptions about matters of which a third party is not aware. No responsibility or liability to any third party is accepted for any loss or damage whatsoever arising out of the use of or reliance on this assessment by any third party.
- The assessment is also based on information that has been provided to Chester Consultants Ltd from other sources or by other parties. The assessment has been prepared strictly on the basis that the information that has been provided is accurate, completed, and adequate. To the extent that any information is inaccurate, incomplete, or inadequate, Chester Consultants Ltd takes no responsibility and disclaims all liability whatsoever for any loss or damage that results from any conclusions based on information that has been provided to Chester Consultants Ltd.

12 Appendices

Appendix A – Civil Design Drawings (Bound Separately)

Appendix B – Site & Sub-Surface Investigation Photos

Figure 6: General Site 1

Figure 7: General Site 2

Figure 8: Mature Sandy Soils in Northeast

Figure 9: Recent Sandy Soils in Southwest

Figure 10: Example Bore

Figure 11: Ground Water 700mm BGL

Appendix C – Relevant Northland soil factsheets

Recent sands

Soil types in this group

- Marsden sand - MD, MDH
- Pinaki sand - PN, PNH
- Whananaki sand - WD

*The H denotes the hill variant of this soil type, which occurs on slopes over 20° and has a shallower profile.

This fact sheet uses NZ Soil Bureau map series soil type names and abbreviations.

Features of recent sands

- Recent sand soils formed less than 4,000 years ago and cover 15% of Northland
- They are part of the Pinaki soil suite
- These soils are developing on stabilised former dunes inland of the mobile coastal sand dunes
- Topsoils are not well defined because organic matter has not built up yet, however they do support plant growth
- West coast dunes are more fertile than east coast dunes, because they are closer to nutrient-rich source rivers such as the Waikato
- East coast variants were carried around North Cape, leaving only fine, low fertility silica

Pinaki sand (PN)

Drainage classes

Soil symbol	Full name	Drainage class
PINAKI SUITE Formed from sands deposited by ocean currents		
MD, MDH	Marsden sand	6 - No natural water retention capability
PN, PNH	Pinaki sand	5 - Excessively drained
WD	Whananaki sand	5 - Excessively drained

Organic peat / sand soils

Soil types in this group

- Parore peaty sandy loam (PZ)
- Ruakākā fine sandy peat (RKu)
- Ruakākā loamy peat (RKd)
- Ruakākā peaty fine sandy loam (RKl)
- Ruakākā peaty sandy loam (RK)
- Ruakākā peaty silt loam (RKv)

This fact sheet uses NZ Soil Bureau map series soil type names and abbreviations.

Ruakākā peaty sandy loam (RK) soil profile

Features of organic peat / sand soils

- These soils are categorised according to the depth of peat and proportion of sand
- They are part of the Ruakākā soil suite
- These soils are formed from peat and windblown sand adjoining sand dunes or downstream of old dune terraces
- Over time, moving sand dunes and changes in sea level blocked off basins and valleys
- Partially decayed vegetation accumulated in these water-logged areas, forming peat
- This results in a soil that is very high in organic matter and very low in pH (acidic)

Northland REGIONAL COUNCIL

Drainage classes

Soil symbol	Full name	Drainage class
RUAKĀKĀ SUITE Basement rock: peat and sand with some ash where swamps have been burnt		
PZ	Parore peaty sandy loam	1 - Poorly drained
RK	Ruakākā peaty sandy loam	1 - Poorly drained
RKd	Ruakākā loamy peat	1 - Poorly drained
RKu	Ruakākā fine sandy peat	0 - Very poorly drained
RKl	Ruakākā peaty fine sandy loam	0 - Very poorly drained
RKv	Ruakākā peaty silt loam	0 - Very poorly drained

Northland soil factsheet series

- Northland's climate, topography, historic vegetation and mixed geology have combined to form a complex pattern of soils across the region. There are over 320 soil types in Northland. Other regions in New Zealand average only 20 soil types per region.
- The information in this fact sheet is based on a 1:50,000 mapping scale. Therefore, it is not specific to individual farms or properties. However, it may help you to understand general features and management options for recent alluvial soils.
- Knowing your soils' capabilities and limitations is the key to sustainable production in Northland. Northland Regional Council (NRC) land management advisors are available to work with landowners to provide free soil conservation advice, plans and maps specific to your property.
- Regular soil tests are recommended. If you are concerned about your soil structure or health, the Visual Soil Assessment test could be useful. Contact the land management advisors at Northland Regional Council for more information.
- Further background information about the processes that have formed these soils can be found here: **www.nrc.govt.nz/soilfactsheets**

MANAGING NORTHLAND SOILS

2.2 & 2.3

Mature sands

Soil types in this group

- Houhora sand - HO, HOH
- Red Hill sand - RLs, RLaH
- Red Hill sandy clay loam - RLI, RLIH
- Red Hill sandy loam - RL, RLH
- Tangitiki sandy loam and sand - TT, TTH

*The H denotes the hill variant of this soil type, which occurs on slopes over 20° and has a shallower profile

This fact sheet uses NZ Soil Bureau map series soil type names and abbreviations.

Red Hill (RLa, RLaH) soil profile

Features of mature sands

- Mature sands are older, consolidated dunes
- They are part of the Pinaki soil suite
- They are moderately leached to moderately podzolised
- There is extreme variability and intermixing of soils in this group
- Exposed subsoil sand is highly erodible and difficult to revegetate
- Podzolised (Tangitiki soils) patches exist where kauri used to grow
- These soils are generally drought prone, but subsoil pans can impede drainage, for example Redhill soils formed on iron-rich sands on easier slopes or basins may have an iron pan
- Some basins, old swamps or lake beds have peaty soil
- Landscapes are highly variable and range from easy and rolling consolidated dunes to steeper erosion-prone hills and gullies

Northland REGIONAL COUNCIL

The intermixing of soils can be seen here, where Tangitiki sand (TT, TTH) surrounds a path of podzolised Te Kopuru soil (described in Podzolised soils, Factsheet 7.0)

Drainage classes

Soil symbol	Full name	Drainage class
PINAKI SUITE Formed from sands deposited by ocean currents		
RLa, RLaH	Red Hill sand	5 - Excessively drained
HO, HOH	Houhora sand	4 - Well drained
RL, RLH	Red Hill sandy loam	4 - Well drained
RLI, RLIH	Red Hill sandy clay loam	3⇌4 - Moderately to well drained
TT, TTH	Tangitiki sandy loam and sand	3⇌2⇌1 - Moderately to poorly drained

Northland soil factsheet series

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- The information in this fact sheet is based on a 1:50,000 mapping scale. Therefore, it is not specific to individual farms or properties. However, it may help you to understand general features and management options for recent alluvial soils.
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- Regular soil tests are recommended. If you are concerned about your soil structure or health, the Visual Soil Assessment test could be useful. Contact the land management advisors at Northland Regional Council for more information.
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Appendix D – Preliminary Swale Calculations

Swales Calculator Output

This tool is intended to be used for initial estimation and validation purposes. It is not a substitute for professional expert advice and design.

Information

Date	23 January 2026
Project Identifier	16007 - Sandhills 284 & 458 - Worst Case Swale Example
Designer	S. Sivashanmugapillai
Reviewer	N. Jull

Disclaimer

This GD01 Online Toolbox Calculator (the tool) is intended for use within the Auckland region for validating the size and volumes of stormwater management devices which support Unitary Plan requirements for stormwater mitigation. The tool should only be used for calculation verification purposes.

Although all reasonable care has been taken in developing the tool, Auckland Council does not warrant that any calculation or result is accurate, correct or complete. Auckland Council does not accept responsibility for any loss or damage resulting from the use of the tool and any person relying on the tool does so at their own risk. Auckland Council strongly recommends that any person intending to rely on the tool should independently verify the accuracy of the calculations and results.

Auckland Council recommends that users seek professional advice when requiring formal volume estimations.

The tool may be updated or changed at any time without notice.

Copyright

Input data

Initial Parameters		
Impervious area contributing to device	9393	m^2
Pervious area contributing to device	36224	m^2
Control data		
10% AEP rainfall depth over 24 hours	152	mm
Swale specifications		
Swale type	Grassed	
Longitudinal slope (i)	0.3	%
Swale side slope (z)	5	1V:zH
Base width	1.5	m
Freeboard height	0	m
Effective length calculator		
Q1	0	%
Q2	75	%
Q3	25	%
Total length	315	m
Xa	0	m
Xb	295	m
Xc	175	m

Design summary

Hydraulic residence time	45.84	min
Effective length to achieve 9 min HRT	30.31	m
Total swale depth	352.21	mm
Total swale width	5022.05	mm

CIVIL ENGINEERING DRAWING SCHEDULE:

	REVISION DATE	02/02/2026									
SHEET	**TITLE**	**REVISION**									
C001	DRAWING SCHEDULE	0									
C002	NOTES AND ABBREVIATIONS	0									
C100	EXISTING SITE PLAN	0									
C110	PROPOSED SITE PLAN	0									
C111	ENLARGED SITE PLAN	0									
C200	EARTHWORKS PLAN	0									
C201	EARTHWORK CROSS SECTION A-A	0									
C202	EARTHWORK CROSS SECTION B-B	0									
C210	EROSION AND SEDIMENT CONTROL PLAN	0									
C410	DEVELOPMENT CATCHMENTS ASSESSMENT PLAN	0									
C420	STORMWATER LAYOUT PLAN - PRIVATE	0									
C421	ENLARGED STORMWATER PLAN	0									
C422	STORMWATER OUTLET DETAIL	0									
C510	WASTEWATER LAYOUT PLAN - PRIVATE	0									
C511	ENLARGED WASTEWATER PLAN	0									
C800	PRIVATE ACCESSWAY PLAN	0									
C801	PRIVATE ACCESSWAY DETAILS	0									

SCHEDULE LEGEND	
ORIGINAL ISSUE	0
NOT REVISED	
REVISED	1
NOT INCLUDED IN SET	-
DELETED FROM SET	~~TITLE~~

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TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
284 & 458 SANDHILLS ROAD, AWANUI

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

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DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

GENERAL ABBREVIATIONS:

EX	EXISTING
PROP	PROPOSED
BNDY	BOUNDARY
RL	REDUCED LEVEL
FFL	FINISH FLOOR LEVEL
GFL	GARAGE FLOOR LEVEL
RW	RETAINING WALL
TOW	TOP OF WALL
BOW	BOTTOM OF WALL

UTILITY ABBREVIATIONS:

SW	STORMWATER
WW	WASTEWATER
PUB.	PUBLIC
PRIV.	PRIVATE
IC	INSPECTION CHAMBER (675mmØ AND LARGER)
IP	INSPECTION POINT (100/150mmØ)
CP	CATCH PIT
SP	SPLAY PIT
LL	LID LEVEL
INV	INVERT LEVEL
RCRRJ	REINFORCED CONCRETE RUBBER RING JOINT
CLn	CLASS n CONCRETE
PE	POLYETHYLENE
uPVC	UNPLASTICIZED POLYVINYL CHLORIDE
AC	ASBESTOS CONCRETE
VC	VITRIFIED CLAY
EW	EARTHENWARE
CONC	CONCRETE
CLS	CEMENT LINED STEEL
DI	DUCTILE IRON
WS	WATER SERVICE
SV	SLUICE VALVE
GV	GATE VALVE
FH	FIRE HYDRANT
EC	END CAP
FP	FLUSHING POINT
AB	ANCHOR BLOCK
E	ELECTRICAL POWER
G	NATURAL GAS
T	TELECOMMUNICATIONS
CS	COMBINED SERVICES

GEOMETRY ABBREVIATIONS:

L	LEFT
R	RIGHT
CL	CENTRE LINE
HP	HIGH POINT
LP	LOW POINT
CH	CHAINAGE
BOA	BEGIN OF ALIGNMENT
EOA	END OF ALIGNMENT
BP	BEGIN POINT
EP	END POINT
MID	MIDDLE POINT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
IP	INTERSECTION POINT
BLS	BEGIN LONGSECTION
ELS	END LONGSECTION
VPC	VERTICAL POINT OF CURVATURE
VPT	VERTICAL POINT OF TANGENCY
BRK	GRADE BREAK
K	CURVE COEFFICIENT

CONTRACTOR CONSENT NOTES:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE RELEVANT STANDARDS, PROCESSES, AND APPROVALS REQUIRED TO EXECUTE WORK AS APPROVED BY RESOURCE CONSENT, BUILDING CONSENT, AND/OR ENGINEERING APPROVAL.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE RELEVANT STANDARDS, PROCESSES, AND APPROVALS REQUIRED TO WORK ON OR IN CLOSE PROXIMITY TO PUBLIC AND PRIVATE UTILITIES.
3. NOTES RELATING TO SPECIFIC APPROVALS AND/OR CONSENTS WITHIN THESE PLANS, OR IN RELATED REPORTS PREPARED BY CHESTER, ARE NOT INCLUSIVE OF ALL APPROVALS AND/OR CONSENTS REQUIRED TO EXECUTE THE WORK.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INFORM THE ENGINEER IF THE CONTRACTOR HAS DETERMINED THAT THE WORK CAN NOT BE EXECUTED IN ACCORDANCE WITH THE APPLICABLE STANDARDS, APPROVALS, AND/OR CONSENTS.
5. CONTRACTOR TO SECURE APPROVAL WHEN EXECUTING WORK WITHIN THE ROAD CORRIDOR FROM THE TERRITORIAL AUTHORITY AND/OR THE ROAD CONTROLLING AUTHORITY.
6. CONTRACTOR TO SECURE APPROVAL WHEN WORKING IN CLOSE PROXIMITY TO PUBLIC STORMWATER, WASTEWATER, WATER SERVICE ASSETS FROM THE TERRITORIAL AUTHORITY AND/OR ASSET OWNER/OPERATOR.
7. CONTRACTOR TO SECURE APPROVAL WHEN WORKING ON OR IN CLOSE PROXIMITY TO ELECTRICAL POWER, TELECOMMUNICATIONS, FIBRE, NATURAL GAS OR OTHER SERVICES FROM THE SERVICE OWNER/OPERATOR.

GENERAL NOTES:

1. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED AGAINST THE SITE DRAWINGS PRIOR TO COMMENCING WORK.
2. DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
3. ANY VARIATIONS OR DISCREPANCIES ARE TO BE REFERRED TO CHESTER CONSULTANTS LTD FOR RESOLUTION.
4. ALL SERVICES ARE TO BE LOCATED AND FLAGGED PRIOR TO COMMENCING WORK ON SITE.
5. WORKS TO BE IN ACCORDANCE WITH WSL STANDARDS, AUCKLAND COUNCIL STANDARDS, AND THE NEW ZEALAND BUILDING CODE.
6. THE CONTRACTOR IS TO OBTAIN ALL NECESSARY CONSENTS AND PERMITS FOR WORKS ON, IN, AND AROUND EXISTING SERVICES, ASSETS, AND THE ROAD AND ROAD RESERVE.
7. ELECTRONIC FILES PROVIDED AS SUPPLEMENTAL INFORMATION TO DRAWINGS AND REPORTS. IF DISCREPANCIES ARE FOUND BETWEEN ELECTRONIC FILES AND DRAWINGS, CONTRACTOR TO NOTIFY ENGINEER. DRAWINGS SHALL TAKE PRECEDENT OVER ELECTRONIC FILES UNLESS OTHERWISE NOTED OR DIRECTED BY ENGINEER.

UNDERGROUND UTILITIES NOTES:

1. UNDERGROUND UTILITIES SHOWN IN PLANS ARE BASED ON VARIOUS SOURCES OF DIFFERING QUALITY AND SHALL BE CONSIDERED INDICATIVE.
2. CONTRACTOR IS RESPONSIBLE FOR LOCATING UNDERGROUND UTILITIES TO CONFIRM LOCATIONS OF SHOWN UTILITIES OR IDENTIFY UTILITIES NOT SHOWN ON PLANS ALONG PATHS OF EXCAVATION.
3. IF UTILITY CLASHES ARE FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TOPOGRAPHIC DATA NOTES:

1. DRONE SURVEY DATA PROVIDED BY AERIAL VISION.
2. DRONE SURVEY DATA COLLECTED ON 22/08/2025.
3. DRONE IMAGERY PROVIDED BY AERIAL VISION AND CAPTURED ON 22/08/2025.
3. SUPPLEMENTAL GROUND DATA PROVIDED BY LINZ DATA SERVICE] AND DATED 2025.
4. SUPPLEMENTAL AERIAL IMAGERY PROVIDED BY LINZ AND DATED 2025.
5. DATA LOCATED ON MOUNT EDEN 2000 HORIZONTAL COORDINATE SYSTEM.
6. DATA SET TO NEW ZEALAND VERTICAL DATUM 2016.

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DRAWING: NOTES AND ABBREVIATIONS

DRAWING: C002 REV: 0
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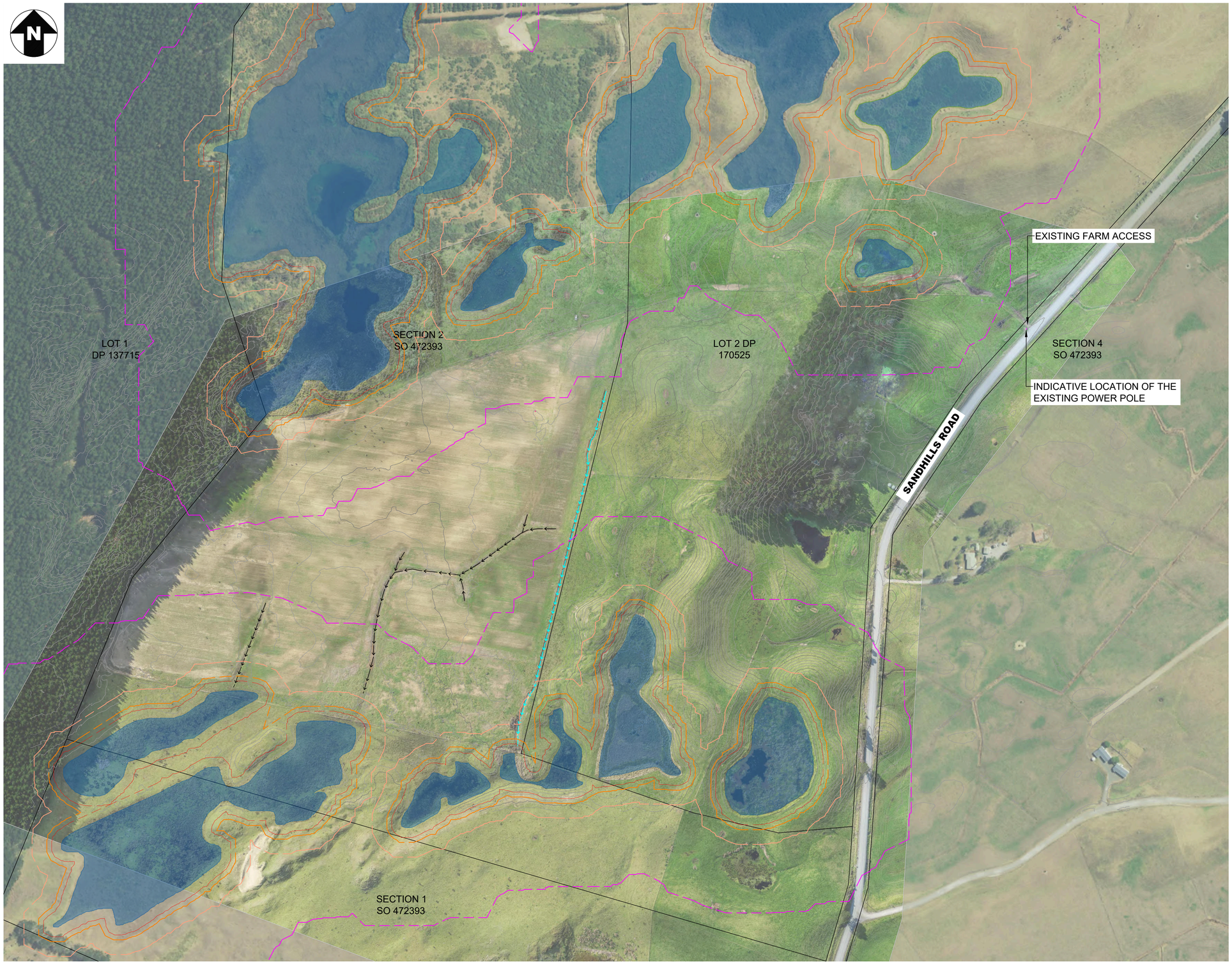

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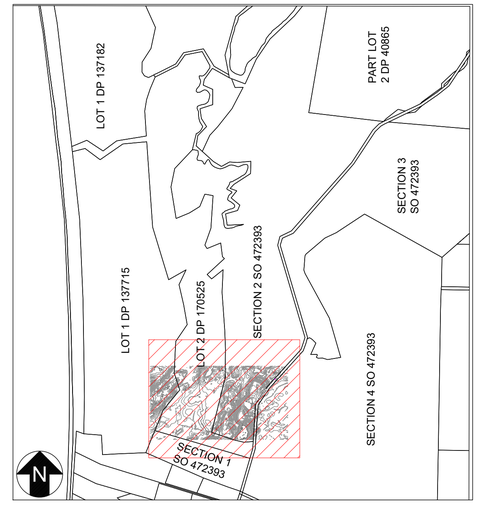
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- EXISTING SWALE/ FARM DRAIN TO REMAIN
- EXISTING SWALE/ FARM DRAIN TO BE ABANDONED



1 **KEY PLAN**
SCALE: 1:25000

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:2000 0 20 40 60 80 100 200

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DRAWING: EXISTING SITE PLAN

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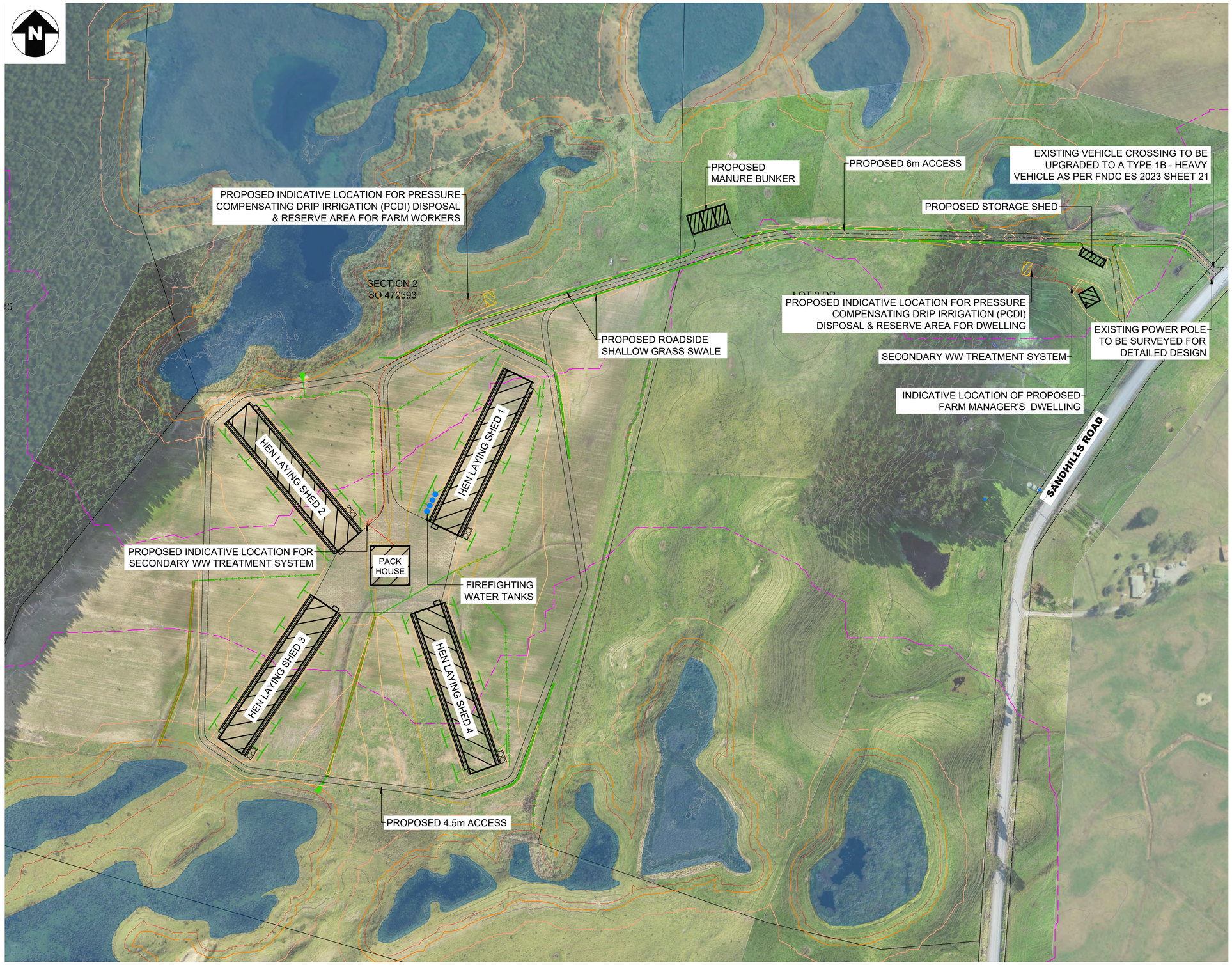

SITE LEGEND:

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- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- PROPOSED SWALE
- EXISTING SWALE/ FARM DRAIN
- PROPOSED CULVERT

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1:1500 0 15 30 45 60 75 150

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DRAWING: PROPOSED SITE PLAN

DRAWING: C110 REV: 0
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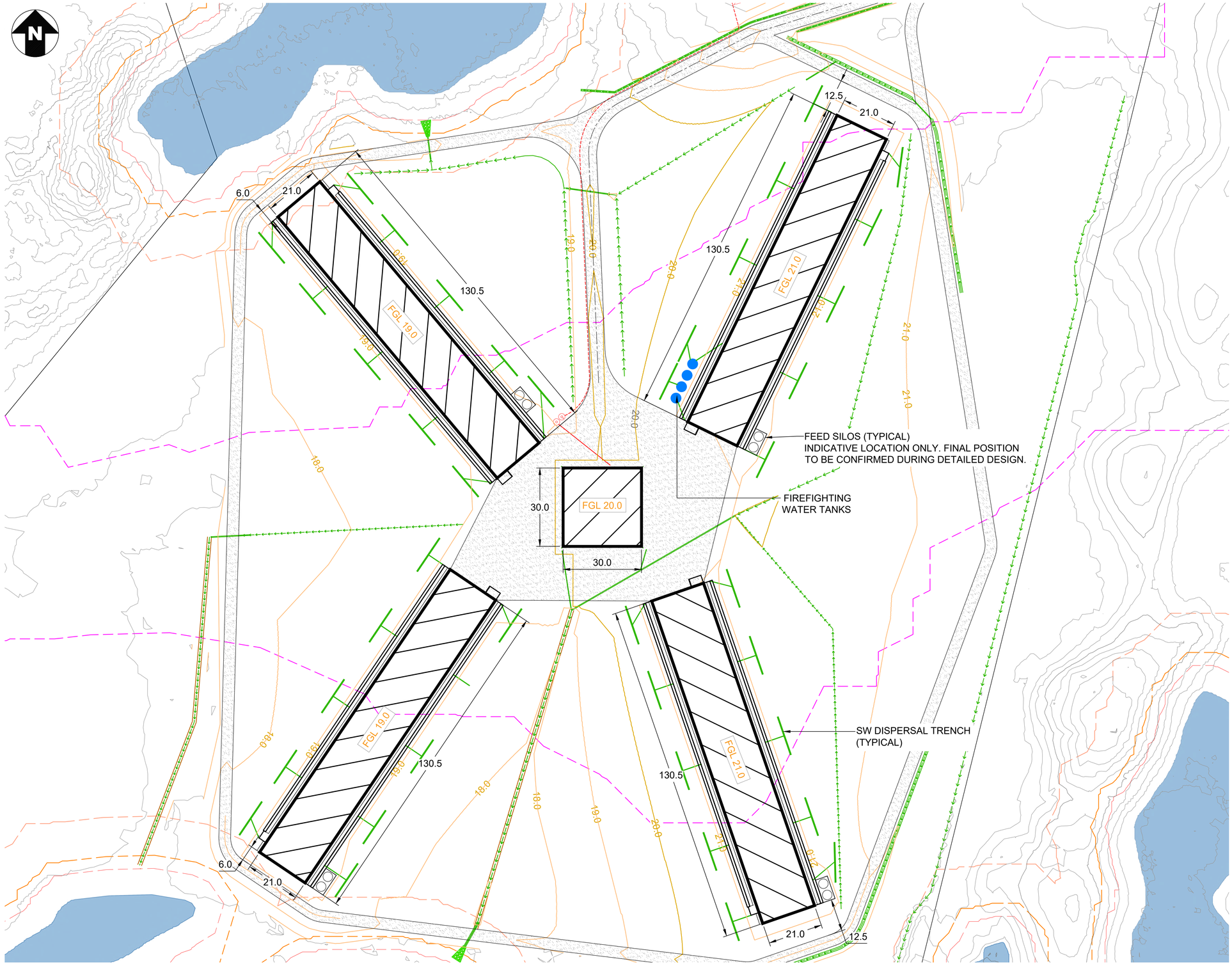

SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- PROPOSED SWALE
- EXISTING SWALE/ FARM DRAIN
- PROPOSED CULVERT

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:750 0 7.5 15 22.5 30 37.5 75

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DRAWING: ENLARGED SITE PLAN

DRAWING: C111 REV: 0
SCALE: 1:750 @ A1
PROJECT: 16007
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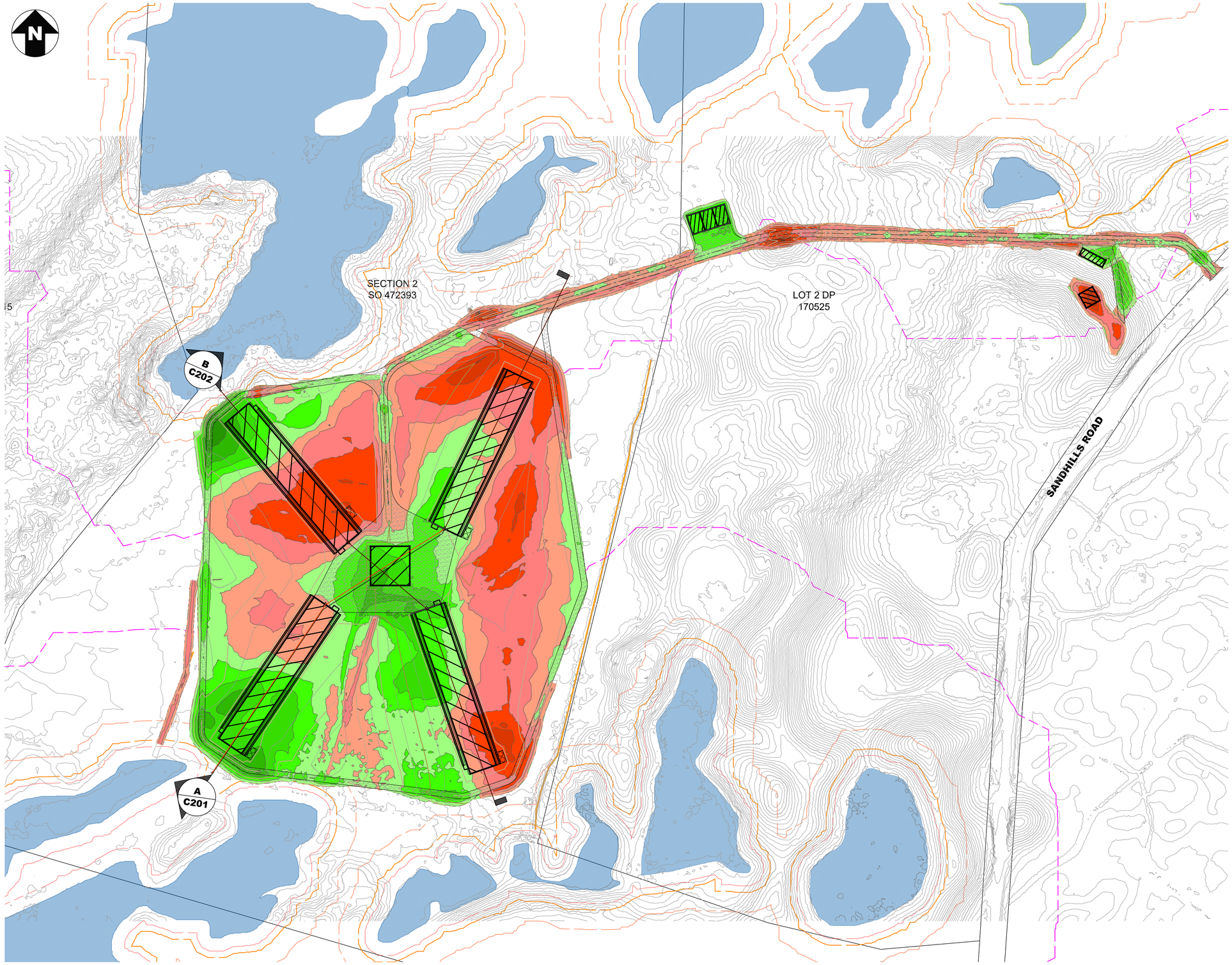

CUT/FILL DEPTHS TABLE

LOWER RANGE (m)	UPPER RANGE (m)	COLOUR
-3.00	-2.50	
-2.50	-2.00	
-2.00	-1.50	
-1.50	-1.00	
-1.00	-0.50	
-0.50	0.00	
0.00	0.50	
0.50	1.00	
1.00	1.50	
1.50	2.00	
2.00	2.50	

EARTHWORK VOLUMES:

CUT (m^3)	FILL (m^3)	NET (m^3)
-36875	28170	-8705
EARTHWORKS AREA (m^2)		102730

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DATE: 02/02/2026

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DRAWING: EARTHWORKS PLAN

DRAWING: C200 REV: 0
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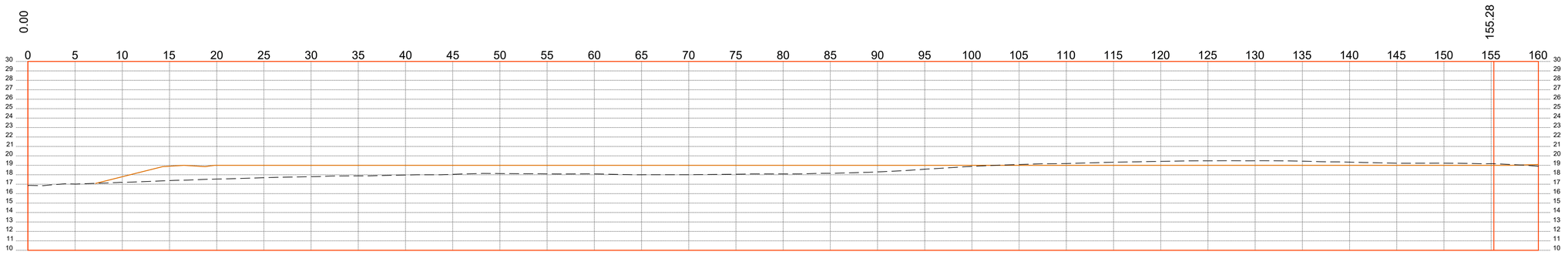

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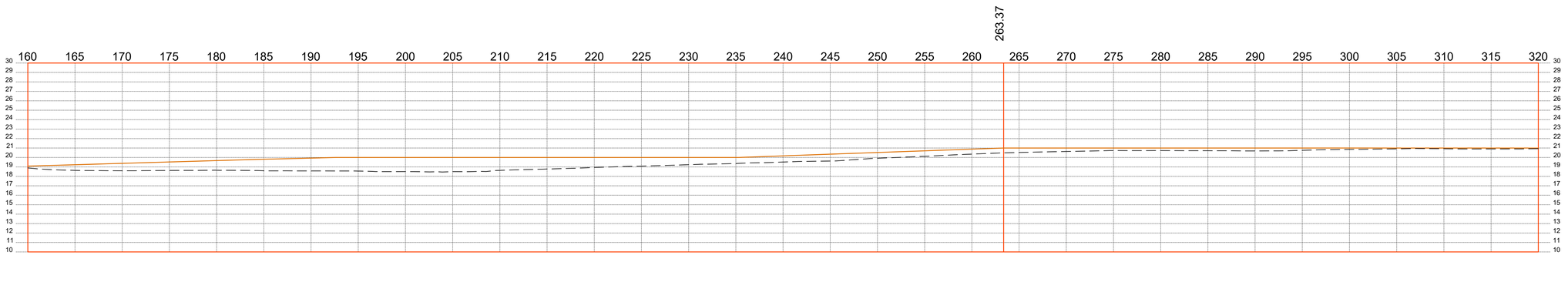
DATUM: 10.00
VERT. EXAGGERATION 1:1



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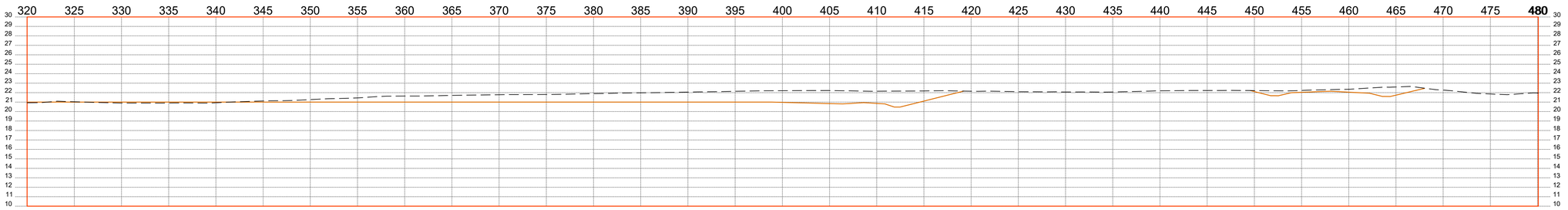

X SECTION A-A
DATUM: 10.00
VERT. EXAGGERATION 1:1

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:250 0 2.5 5.0 7.5 10 12.5 25

REV	DATE	AMENDMENTS	BY
0	02/02/26	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: EARTHWORK CROSS SECTION A - A

DRAWING: C201 REV: 0
SCALE: 1:250 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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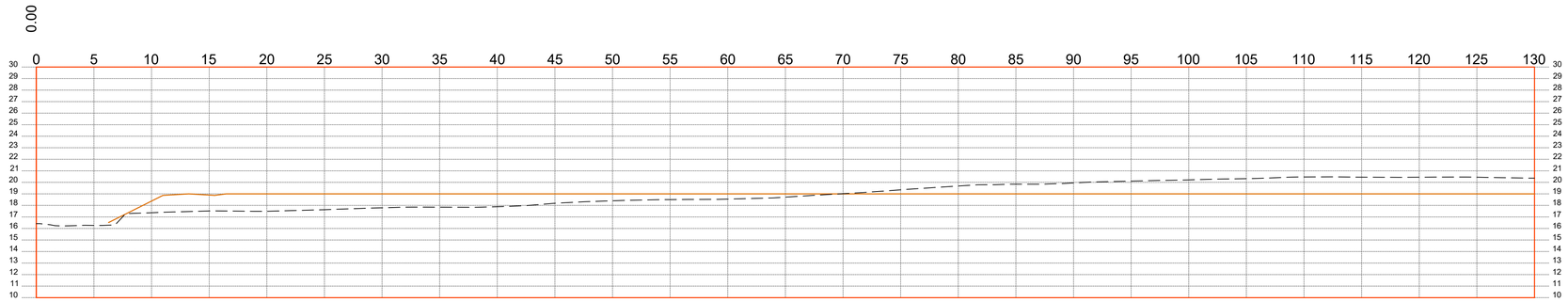
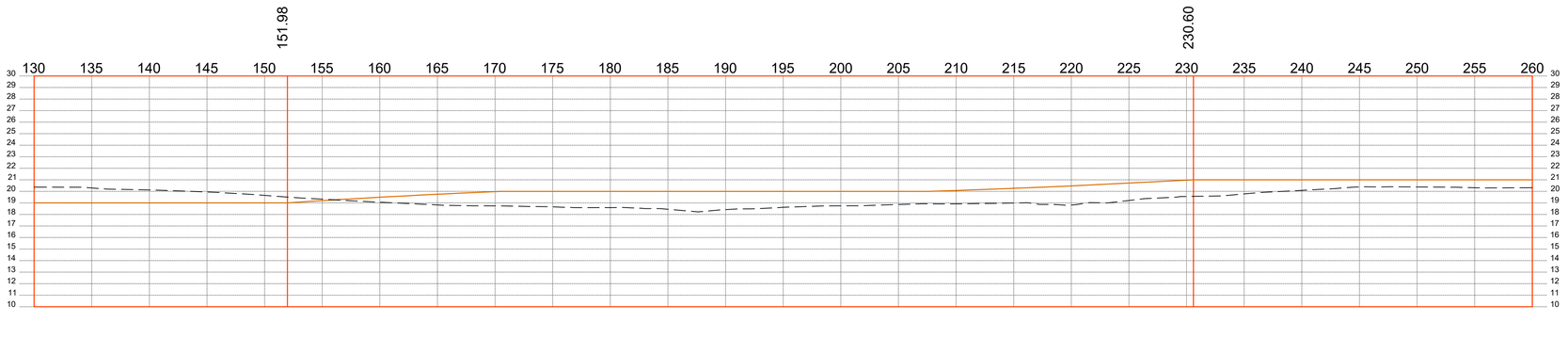
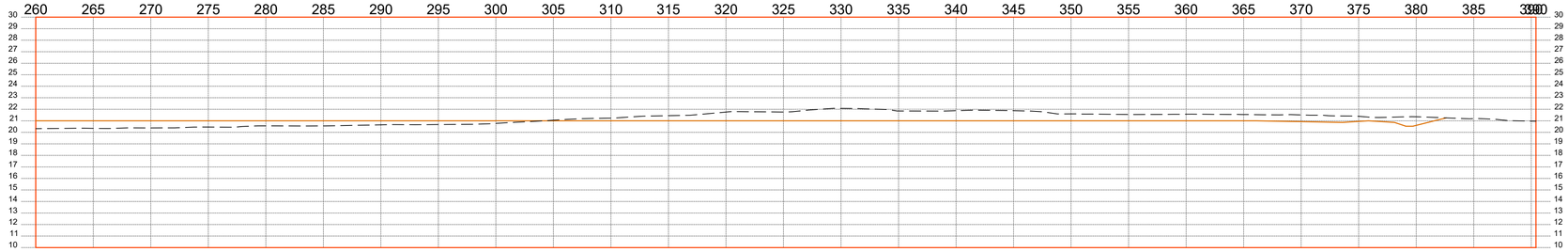


X SECTION B-B
DATUM: 10.00
VERT. EXAGGERATION 1:1



X SECTION B-B
DATUM: 10.00
VERT. EXAGGERATION 1:1



X SECTION B-B
DATUM: 10.00
VERT. EXAGGERATION 1:1

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:250 0 2.5 5.0 7.5 10 12.5 25

REV	DATE	AMENDMENTS	BY
0	02/02/26	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: EARTHWORK CROSS SECTION B - B

DRAWING: C202 REV: 0
SCALE: 1:250 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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EARTHWORK NOTES:

1. CUT TO FILL VOLUMES ARE FROM EXISTING GROUND INCLUDING TOP SOIL TO FINAL GROUND INCLUDING TOPSOIL, PAVEMENT.
2. NO BULKING FACTORS HAVE BEEN USED IN THE VOLUME ESTIMATION.
3. TEMPORARY EARTHWORKS, SHORING, AND ENABLING WORKS TO BE DESIGNED BY OTHERS AND ARE THE RESPONSIBILITY OF THE CONTRACTOR.
4. WORKS ARE TO BE IN ACCORDANCE WITH AUCKLAND COUNCIL GUIDANCE DOCUMENT 2016/05 (GD05), EROSION AND SEDIMENT CONTROL GUIDE.
5. PLANS DETAIL THE GENERAL SEDIMENT AND EROSION CONTROL MEASURES. ACTUAL CONTROLS ARE TO BE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE TO BE ADAPTED TO SUIT THE CURRENT STAGE OF WORKS.

CLEAN WATER DIVERSION (TYPICAL)

DECANTING EARTH BUND

DECANTING EARTH BUND

EARTH BUND (TYPICAL)

SECTION 2 SO 472393

EARTHWORK EXTENT (TYPICAL)

LOT 2 DP 170525

DECANTING EARTH BUND

TEMPORARY CULVERT FOR CLEAN WATER DIVERSION

STABILISED CONSTRUCTION ENTRANCE

SANDHILLS ROAD

DIRTY WATER DIVERSION (TYPICAL)

SEDIMENT RETENTION POND CATCHMENT AREA 4.0ha

SEDIMENT RETENTION POND CATCHMENT AREA 5.3ha

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:1500 0 15 30 45 60 75 150

REV	DATE	AMENDMENTS	BY
0	02/02/26	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: EROSION AND SEDIMENT CONTROL PLAN

DRAWING: C210 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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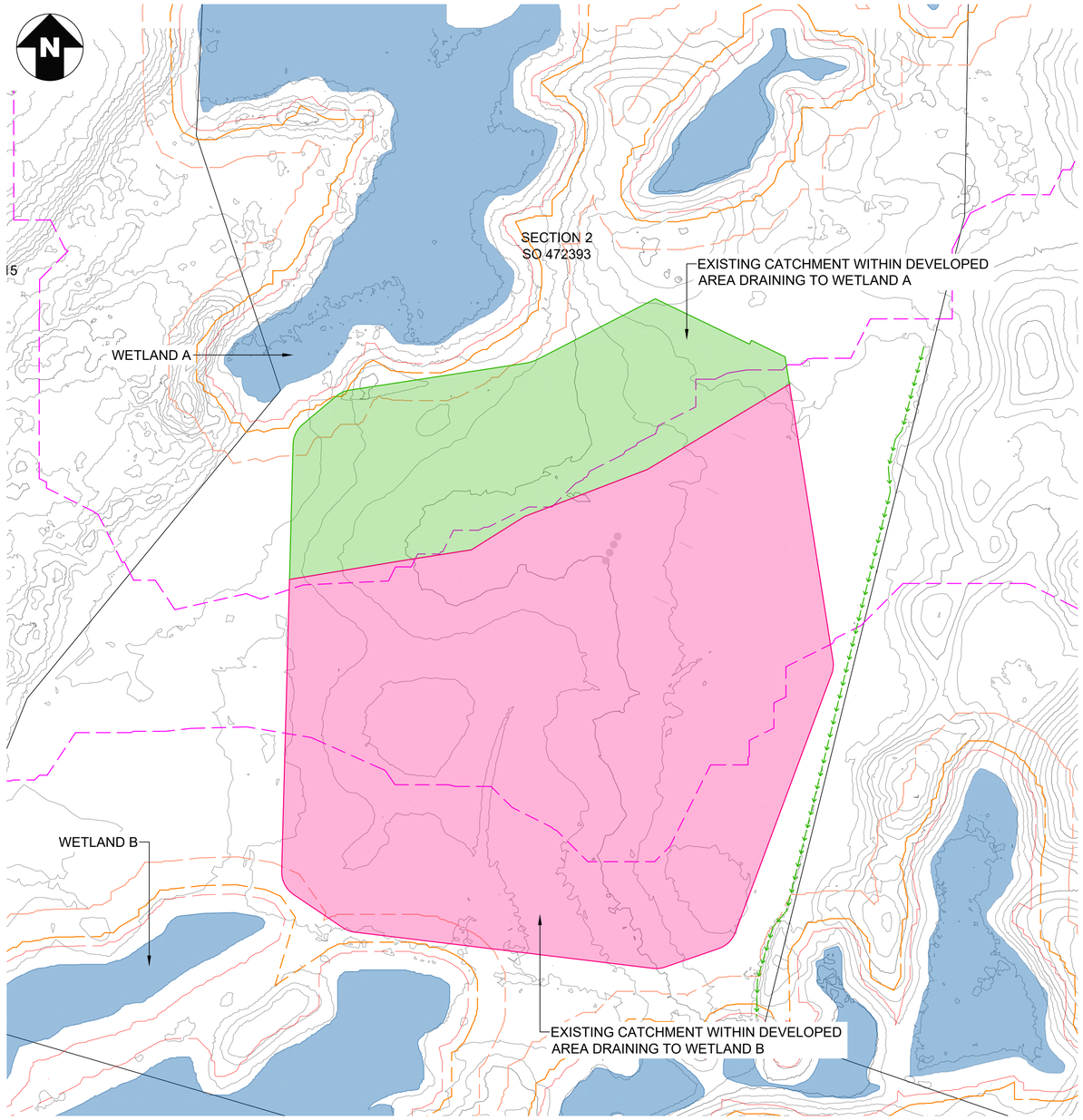

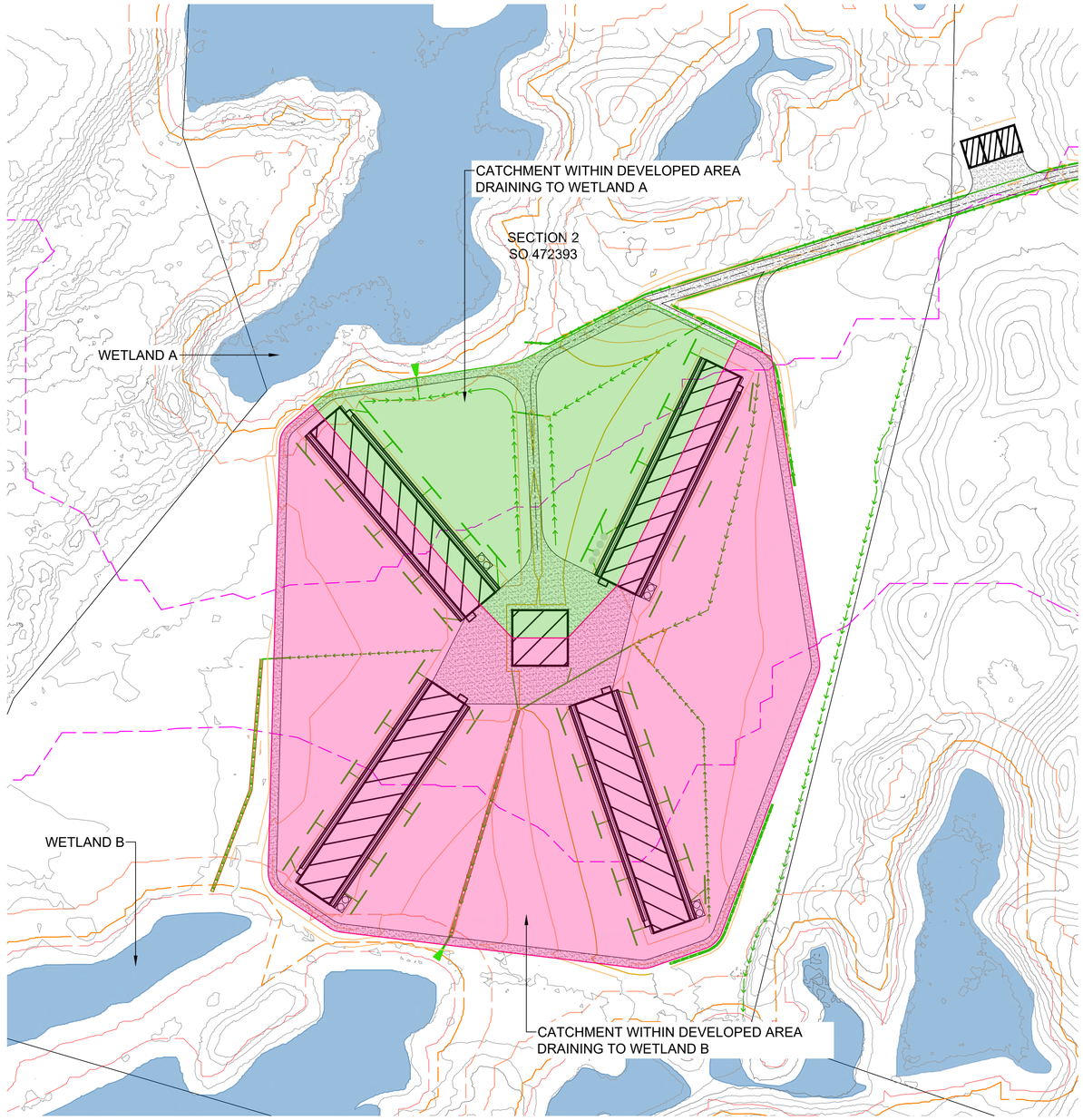

		Wetland A	Wetland B
Pre Development	Existing Roof Area (m^2)	0	0
	Existing Access Area (m^2)	0	0
	Existing Grass Area (m^2)	21443	65965
	Existing Impervious area (m^2)	**0**	**0**
	Existing Pervious area (m^2)	**21443**	**65965**
Post Development	New Roof Area (m^2)	4130	11490
	Existing Access Area (m^2)	3504	7534
	Existing Grass Area (m^2)	14659	46092
	New Impervious area (m^2)	**7634**	**19024**
	New Pervious area (m^2)	**14659**	**46092**

Runoff Depth Detail	
Rainfall Depth, P (mm)	25
NRCS Soil Class (Per GD01, Table 23)	B
Permeable NRCS Curve Number, CN (mm)	61
Permeable Initial Abstraction, Ia (mm)	5
Permeable Max Storage, S (mm)	162.4
Permeable Run-off Depth, Q (mm)	**2.2**
Impervious SCS Curve Number, CN (mm)	98
Impervious Initial Abstraction, Ia (mm)	0
Impervious Surface Max Storage, S (mm)	5.2
Impervious Run-off Depth, Q (mm)	**20.7**

		Wetland A	Wetland B
Pre Development	Existing Impervious area (m^2)	0	0
	Existing Pervious area (m^2)	21443	65965
	Pre-Development Runoff Volume (m^3)	47	145
Post Development	New Impervious area (m^2)	7634	19024
	New Pervious area (m^2)	14659	46092
	Post-Development Runoff Volume (m^3)	190	495
Pre & Post Development Runoff Volume Difference (m^3)		**143**	**350**

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1:1500 0 15 30 45 60 75 150

REV	DATE	AMENDMENTS	BY
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DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: DEVELOPMENT CATCHMENTS ASSESSMENT PLAN

DRAWING: C410 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- PROPOSED SWALE
- EXISTING SWALE/ FARM DRAIN
- PROPOSED CULVERT

PROPOSED SW CULVERT

PROPOSED SW CULVERT

ROADSIDE SWALE (TYPICAL)

SECTION 2 SO 472393

LOT 2 DP 170525

PROPOSED RIP-RAP SCOUR PROTECTION

PROPOSED SW CULVERT

PROPOSED SW CULVERT

PROPOSED SW CULVERT

PROPOSED SHALLOW GRASS SWALE (TYPICAL)

SANDHILLS ROAD

PROPOSED SW CULVERT

FIREFIGHTING WATER TANKS

PROPOSED SW CULVERT

SW DIPERSAL TRENCH(TYPICAL) REFER DWG C422 FOR DETAILS

PROPOSED VEGETATED SWALE

EXISTING SWALE/ FARM DRAIN TO REMAIN

DOUBLE BARREL CULVERT

PROPOSED SWALE BOTTOM TO TIE SEAMLESSLY INTO EXISTING FARM DRAIN.

PROPOSED RIP-RAP SCOUR PROTECTION TO TIE SEAMLESSLY INTO EXISTING FARM DRAIN

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:1500 0 15 30 45 60 75 150

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0	02/02/26	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: STORMWATER LAYOUT PLAN - PRIVATE

DRAWING: C420 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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PROPOSED RIP-RAP SCOUR PROTECTION

PROPOSED SW CULVERT

PROPOSED SW CULVERT

PROPOSED SW CULVERT

PROPOSED SHALLOW GRASS SWALE (TYPICAL)

FIREFIGHTING WATER TANKS

PROPOSED SW CULVERT

PROPOSED SW CULVERT

SW DIPERSAL TRENCH(TYPICAL) REFER DWG C422 FOR DETAILS

PROPOSED VEGETATED SWALE

EXISTING SWALE/ FARM DRAIN TO REMAIN

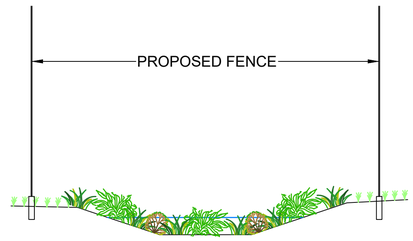
FGL 19.0

FGL 21.0

FGL 20.0

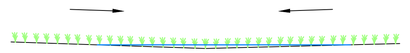
SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- PROPOSED SWALE
- EXISTING SWALE/ FARM DRAIN
- PROPOSED CULVERT



PROPOSED VEGETATED SWALE TYPICAL SECTION

SCALE: 1:50



PROPOSED SHALLOW GRASS SWALE TYPICAL SECTION

SCALE: 1:50

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1:750 0 7.5 15 22.5 30 37.5 75

REV	DATE	AMENDMENTS	BY
0	02/02/26	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: ENLARGED STORMWATER PLAN

DRAWING: C421 REV: 0
SCALE: 1:750 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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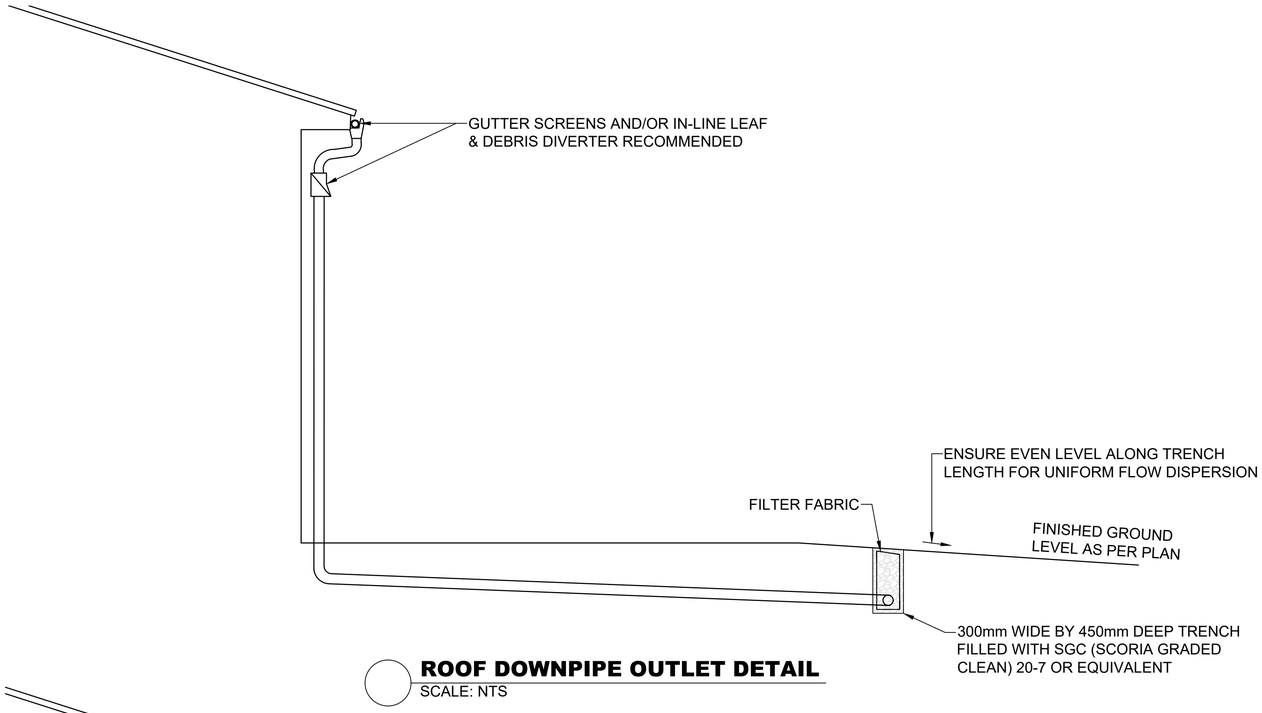
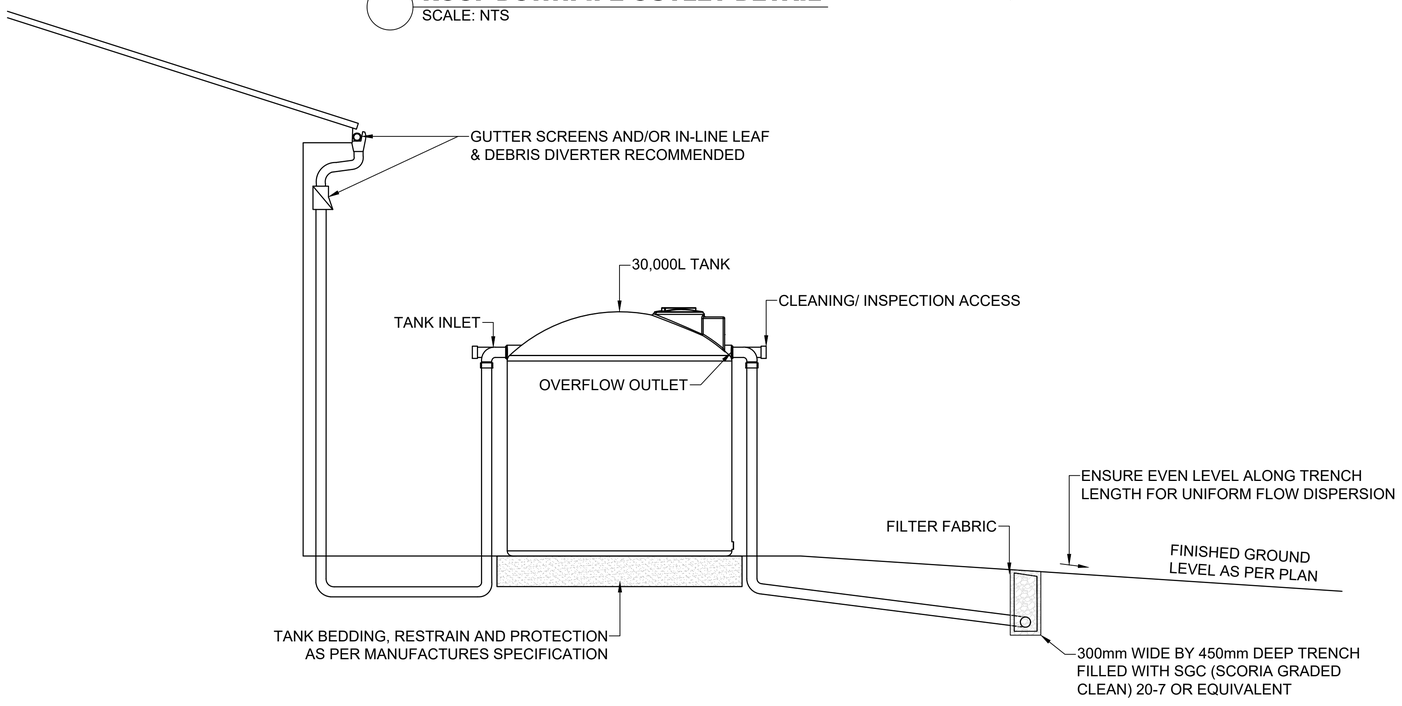
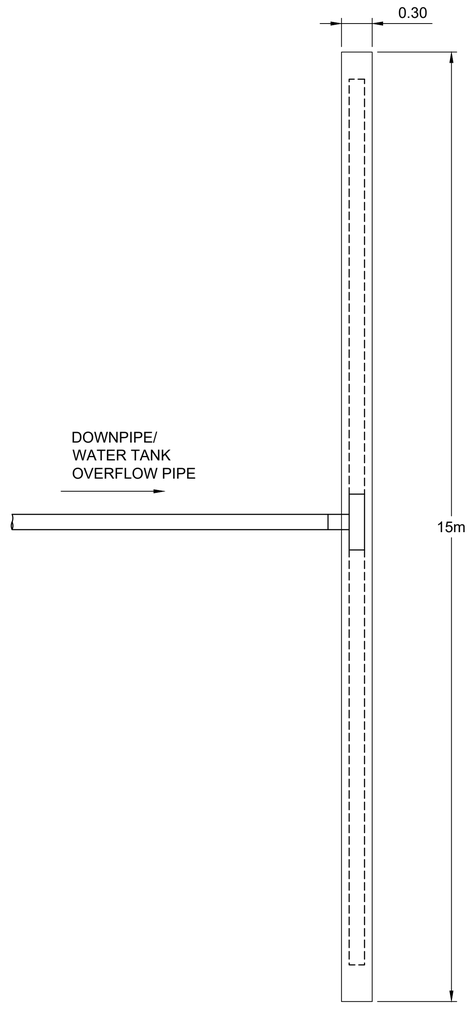


ROOF DOWNPIPE OUTLET DETAIL
SCALE: NTS



FIREFIGTING WATER TANK CONNECION AND OVERFLOW PIPE OUTLET DETAIL
SCALE: NTS



FLOW DISPERSAL TRENCH DETAIL
SCALE: NTS

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

REV	DATE	AMENDMENTS	BY
0	02/02/26	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: STORMWATER OUTLET DETAIL

DRAWING: C422 REV: 0
SCALE: NTS
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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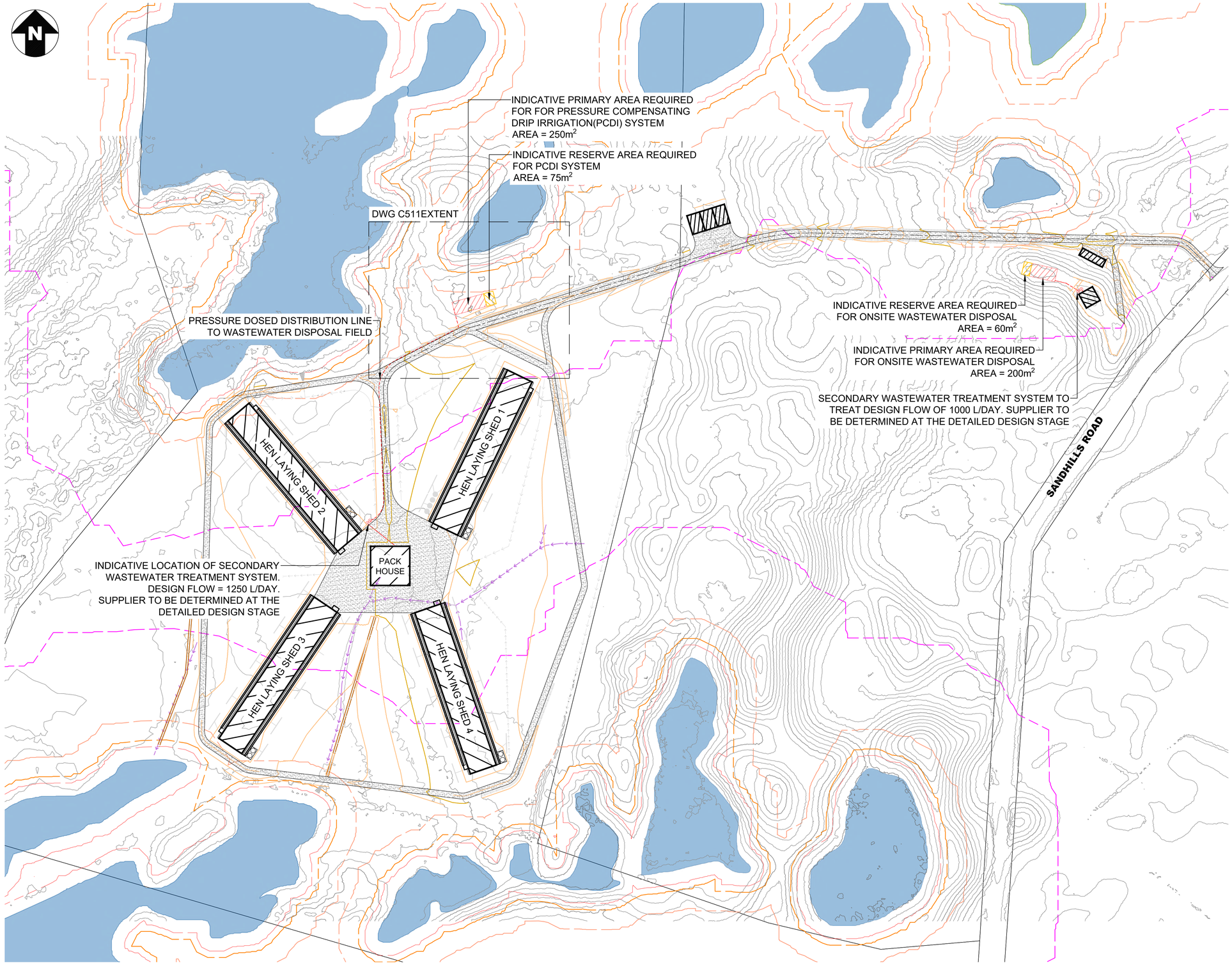

SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:1500 0 15 30 45 60 75 150

REV	DATE	AMENDMENTS	BY
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DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: WASTEWATER LAYOUT PLAN - PRIVATE

DRAWING: C510 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST

SECTION 2
SO 472393

INDICATIVE PRIMARY AREA REQUIRED FOR FOR PRESSURE COMPENSATING DRIP IRRIGATION(PCDI) SYSTEM
AREA = 250m^2

INDICATIVE RESERVE AREA REQUIRED FOR PCDI SYSTEM
AREA = 75m^2

10.0
25.0
7.5
7.0

PRESSURE DOSED DISTRIBUTION LINE TO WASTEWATER DISPOSAL FIELD

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:1500 0 15 30 45 60 75 150

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DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: ENLARGED WASTEWATER PLAN

DRAWING: C511 REV: 0
SCALE: 1:250 @ A1
PROJECT: 16007
ISSUE: CONSENT

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SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- PROPOSED SWALE
- EXISTING SWALE/ FARM DRAIN
- PROPOSED CULVERT

SECTION 2
SO 472393

1
C801
LOT 2 DP
170525

3
C801

2
C801

EXISTING VEHICLE CROSSING TO BE UPGRADED TO A TYPE 1B - HEAVY VEHICLE AS PER FNDC ES 2023 SHEET 21

SANDHILLS ROAD

HEN LAYING SHED 1
HEN LAYING SHED 2
HEN LAYING SHED 3
HEN LAYING SHED 4
PACK HOUSE

CH 0
CH 50
CH 100
CH 150
CH 200
CH 250
CH 300
CH 350
CH 400
CH 450
CH 500
CH 550
CH 600
CH 650
CH 700
CH 750
CH 800
CH 850
CH 900
CH 950
CH 1000
CH 1024

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1:1500 0 15 30 45 60 75 150

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DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: PRIVATE ACCESWAY PLAN

DRAWING: C800 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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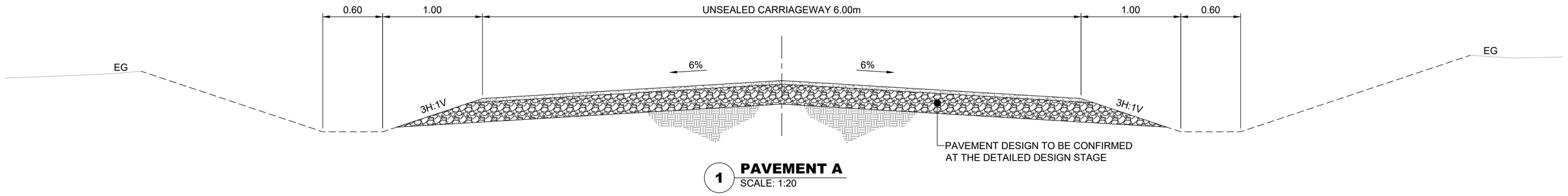

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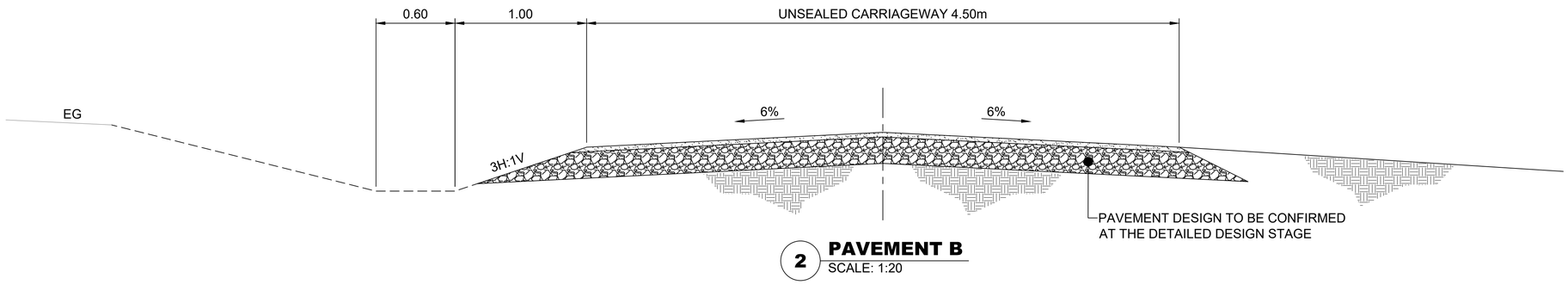

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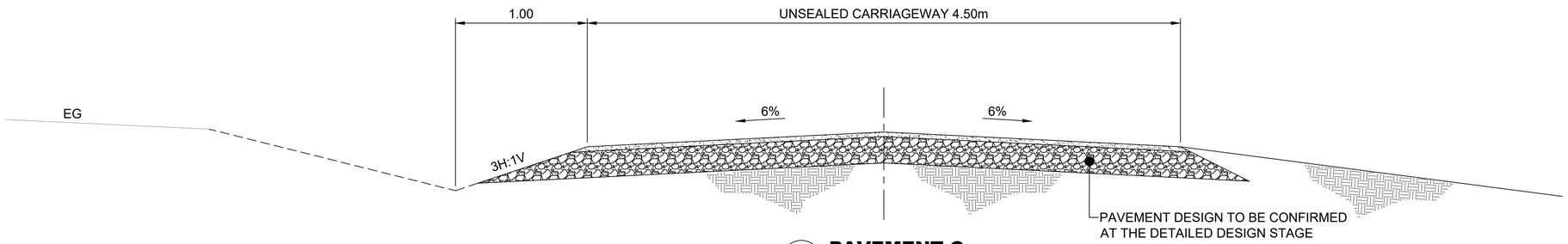

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REV	DATE	AMENDMENTS	BY
0	02/02/26	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 02/02/2026

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: PRIVATE ACCESSWAY DETAIL

DRAWING: C801 REV: 0
SCALE: 1:20 @ A1
PROJECT: 16007
ISSUE: CONSENT

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REPORT

Tonkin+Taylor

Proposed Free Range Egg Farm | 284 and 458 Sandhills Road, Ahipara

Geotechnical Investigation & Assessment Report

Prepared for
Te Rūnanga o NgaiTakoto Custodian Trustee Limited

Prepared by
Tonkin & Taylor Ltd

Date
February 2026

Job Number
1096663.0000 v2

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Document control

Title: Proposed Free Range Egg Farm | 284 and 458 Sandhills Road, Ahipara					
Date	**Version**	**Description**	**Prepared by:**	**Reviewed by:**	**Authorised by:**
29/01/2026	V1	DRAFT - Geotechnical Investigation & Assessment Report	P. Llorando	B, Francis	M. Child
3/02/2026	V2	FINAL - Geotechnical Investigation & Assessment Report. Updates made in response to feedback and updated assessment.	P. Llorando	B. Francis	M. Child

Distribution:

Te Rūnanga o NgaiTakoto Custodian Trustee Limited	1 electronic copy
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Appendices

1 Introduction

Tonkin & Taylor Ltd (T+T) have been engaged[1,2] by Te Rūnanga o NgaiTakoto Custodian Trustee Limited (the Client) to undertake geotechnical investigation, assessment, and reporting to support a proposed free range egg farm development at 284 and 458 Sandhills Road, Ahipara.

The work undertaken by T+T is intended to inform the Client's decisions regarding the suitability of the site for the proposed egg farm development. Work has comprised investigation to identify and assess potential geotechnical hazards, associated risks and opportunities, and to provide preliminary geotechnical recommendations to support a Resource Consent application and ensuing project stages.

This report has been prepared based on conceptual development plans[3] provided to T+T. The assessments and recommendations provided in this Geotechnical Investigation & Assessment Report (GIAR) are not suitable to support Building Consent or construction without review and detailed design.

We understand that this report will be used to support a Resource Consent application to the Far North District Council (FNDC) and/or Northland Regional Council (NRC).

2 Scope of work

The work undertaken by T+T has been carried out in accordance with the T+T Letter of Engagement (LoE)[1] and Variation Order VO1[2].

The scope of work undertaken comprised the following summarised list of tasks:

1 Undertake a desktop assessment of publicly available information to understand the inherent nature of the site and potential features of interest relevant to the proposed development.
2 Development of geotechnical investigation plans, subcontractor engagement, preparation of health & safety documentation, and a combination of onsite and remote supervision of 51 Cone Penetrometer Tests (CPTs).
3 Processing of CPT data using CPT interpretation software to interpret subsurface geological and groundwater conditions.
4 Development of a geological ground model using 3D geological modelling software.
5 Preliminary geotechnical assessment of potential site-specific geotechnical hazards to inform potential risks and opportunities for the project.
6 Preliminary geotechnical analysis of specific geotechnical hazards to inform quantitative and qualitative assessment of those hazards (e.g., settlement risk, liquefaction risk, etc.).
7 Development and provision of multiple revisions of an 'Inferred Settlement Risk Heat Map' based on qualitative interpretation of the ground conditions from the CPT investigations.
8 Development and provision of a 'Geotechnical Risk and Opportunity Matrix'.
9 Preparation of this GIAR to support a Resource Consent application. This report summarises the outcomes of the scope of work undertaken as outlined above and provides foundations options and recommended further work to support the project.

[1] Tonkin & Taylor Ltd (29 August 2025). Letter of Engagement – Preliminary geotechnical investigations and assessment – Proposed egg farm at 424 Sandhills Rd, Kaitaia. T+T reference: 1099963.0000.
[2] Tonkin & Taylor Ltd (23 January 2026). Variation Order VO1 – Geotechnical Investigations & Assessment to support Resource Consent – Proposed Egg Farm at 424 Sandhills Road, Ahipara. T+T reference: 1099963.
[3] Chester Engineering Consultants (11 November 2025) Te Rūnanga o NgaiTakoto Free Range Egg Farm Drawing Set rev 0. Project ref. 16007. Issued for information.

3 Site description

3.1 Location and setting

The site is located at 284 and 458 Sandhills Road, and spans across parcels of land legally described as Lot 2 Deposited Plan 170525, and Section 2 Survey Office Plan 472393. The site is situated adjacent to Sandhills Road, approximately 1 kilometre east of Te Oneroa-a-Tōhe (Ninety Mile Beach), is bound by a heavily vegetated forest to the west, and rural farmland to the north and south. The general location of the site is shown in Figure 3.1.

The site comprises mobile sand dunes overlying scattered peat wetlands. While elevations across the wider area vary by up to about 30 m reduced level (RL), the proposed development site lies on a gentle westward-sloping gradient between 22 m RL and 17 m RL. The present-day site topography was formed by earthworks which we understand was completed circa 2022-2023 to re-shape the land. There are currently no buildings or facilities present on the site.

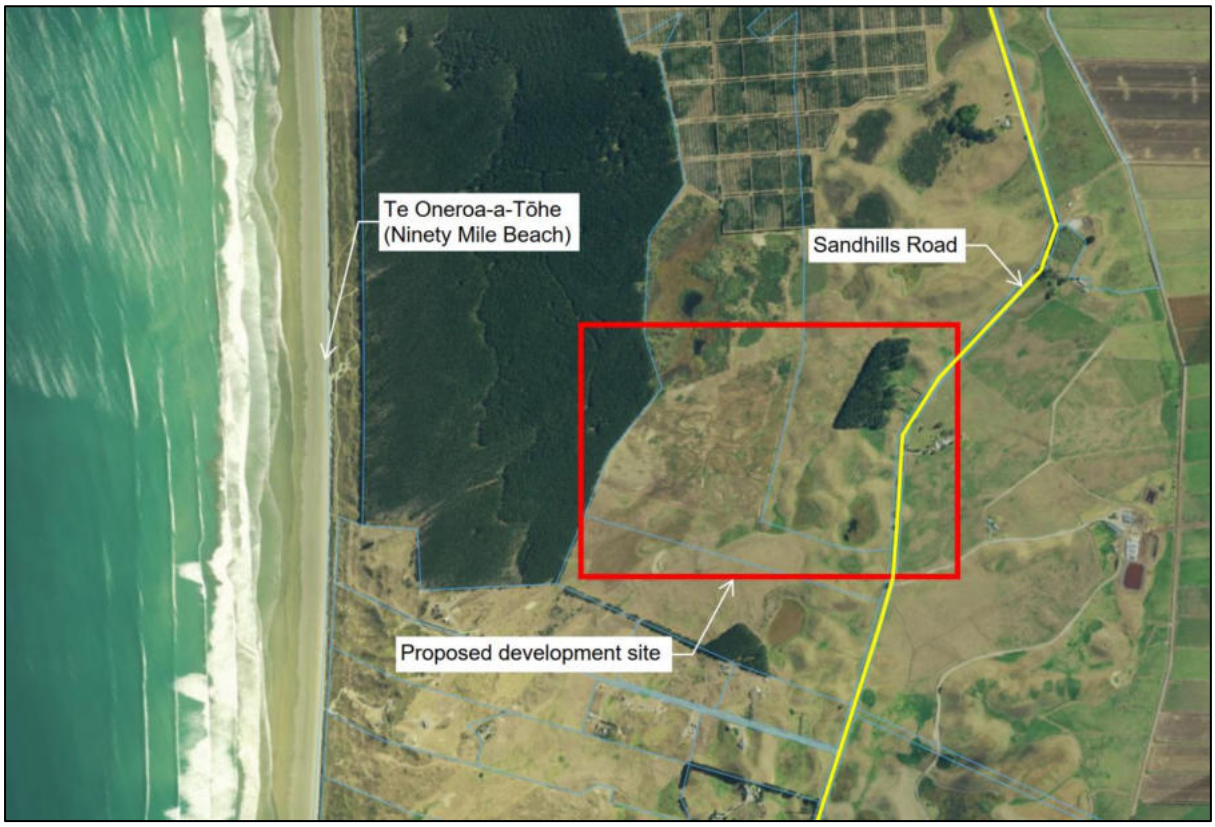


Figure 3.1: Site location plan.

3.2 Proposed development

The work undertaken by T+T considers the concept design drawings[3] for the proposed egg farm, prepared by Chester Engineering Consultants (Chesters). A copy of the drawings is provided in Appendix A, with an extract showing the proposed development presented in Figure 3.2.[4]

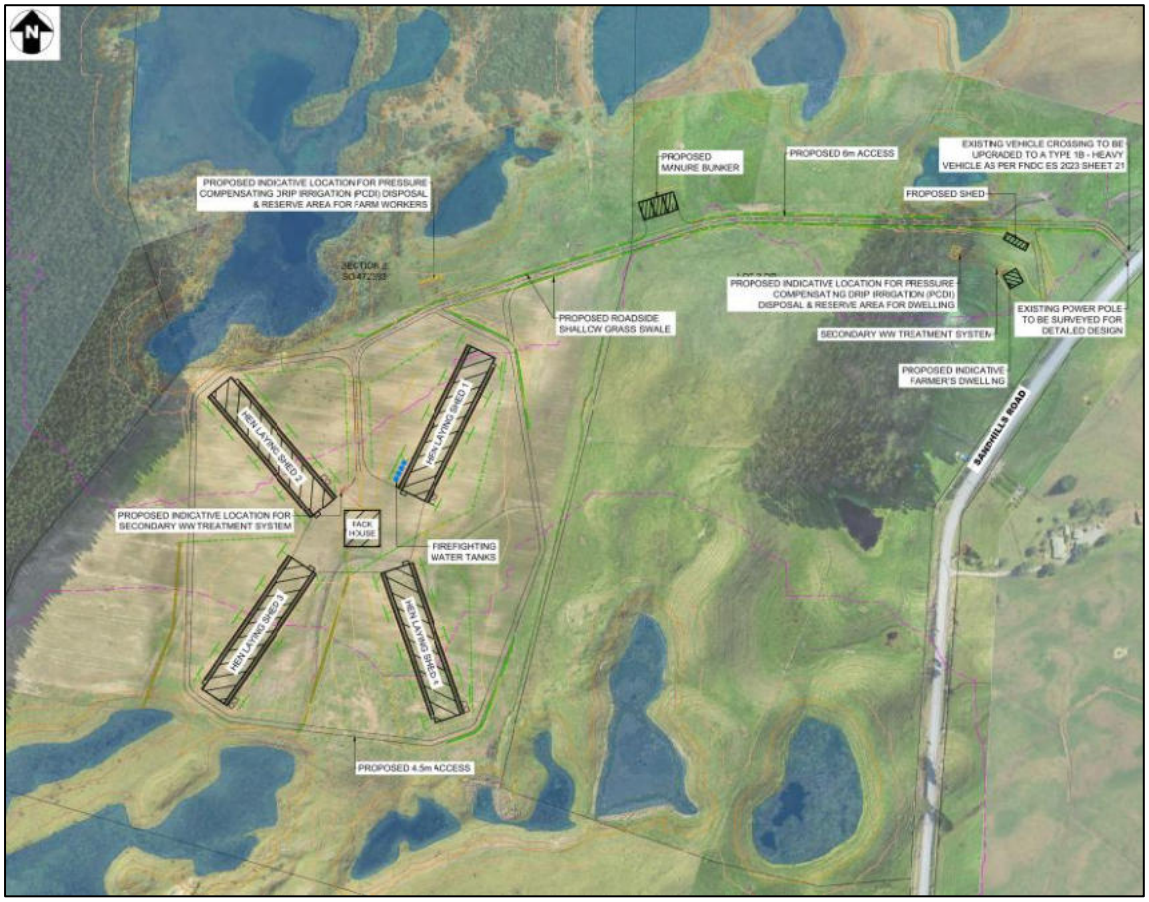


Figure 3.2: Proposed site plan (dated 10/12/2025)[3,4].

The proposed site plan comprises four laying sheds arranged around a central packhouse building, with separate ancillary structures and associated infrastructure proposed along the main accessway alignment. T+T's scope of work is in relation to the laying sheds and packhouse, with this GIAR focused thereon accordingly.

Each laying shed is approximately 130 m in length and 20 m in width, while the central packhouse is approximately 30 m long and 30 m wide. A 6 m wide main accessway is proposed to connect from Sandhills Road to a 4.5 m wide perimeter road that encircles the laying sheds.

The proposed layout shown in Figure 3.2 is an updated version of the original concept drawings[5]. The revised layout was developed based on geotechnical information provided to the Client to refine the location of the sheds and reduce the potential effect of geotechnical hazards while considering constraints related to other designer inputs i.e. civil, structural, and farm design.

[4] T+T have been provided with updated information from other disciplines while undertaking the assessments to inform this GIAR. Where reasonable, this information has been considered in the assessment, however, in some instances information and extracts herein may represent earlier information provided to T+T.
[5] Chester Engineering Consultants (10/12/2025) "Proposed Site Plan". Drawing ref. C110 rev 0, Project ref. 16007Issued for Consent.

4 Desktop assessment

4.1 Published geological conditions

Published geological maps[6,7] were consulted to understand the mapped geological conditions underlying the site. Each of the sources consulted were generally consistent and indicate that the site is underlain by Quaternary aged deposits (Pleistocene to Holocene) of the Karioitahi Group and Pakihi Supergroup, as described in Table 4.1[7].

Table 4.1: Summary of published geological conditions

Name of geological unit	Description of geological unit
OIS1 (Holocene) active dune deposits of Karioitahi Group	Loose sand in mobile dunes.
OIS4-OIS1 (Late Pleistocene to Holocene) estuary, river and swamp deposits	Unconsolidated to poorly consolidated sand, peat, mud and shell deposits (estuarine, lacustrine, swamp, alluvial and colluvial).
Early Pleistocene parabolic dunes	Weakly cemented and partly consolidated sand in parabolic dunes. Interdune lake and swamp deposits.
OIS5+ (Early Pleistocene to Middle Pleistocene) dune deposits	Uncemented to moderately cemented and partly consolidated sand in coastal foredunes. Clay-rich sandy soils.

An extract from the published geological maps with the relevant geological descriptors annotated is presented in Figure 4.1.

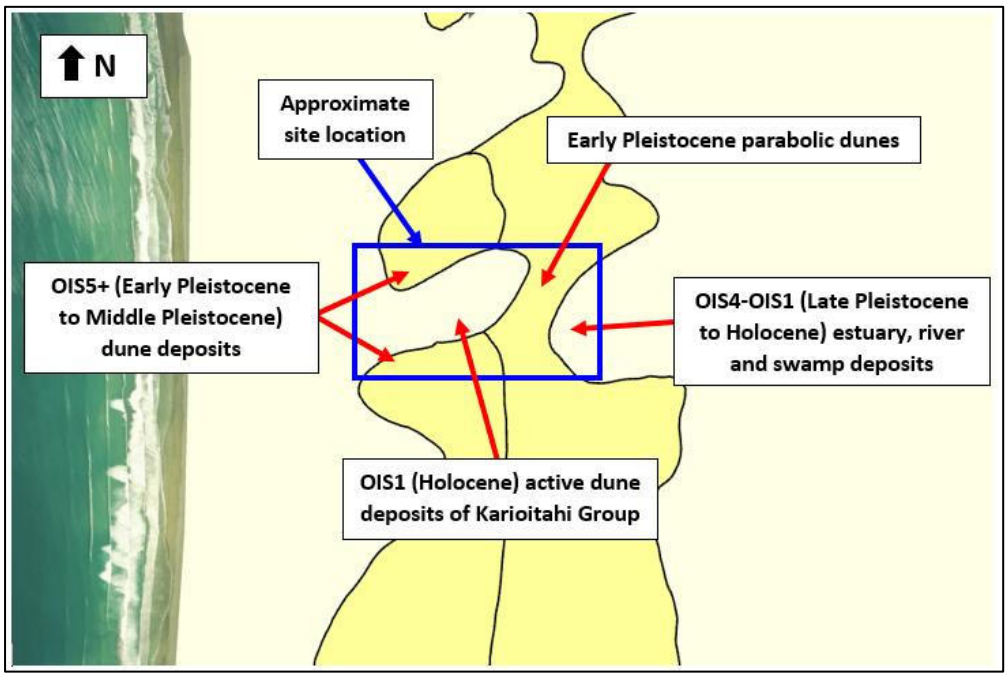


Figure 4.1: Published geological conditions based on the GNS Science geological web map application[7], including approximate site location (blue outline).

[6] Issac, M. J. (compiler). (1996). *Geology of the Kaitaia area.* Institute of Geological and Nuclear Sciences 1:250 000 geological map 1.1 sheet + 44 p. Lower Hutt, New Zealand: Institute of Geological and Nuclear Sciences Limited.
[7] GNS Science geological web map application: https://data.gns.cri.nz/geology/. Accessed January 2026.

4.2 Historical aerial imagery

Publicly available historical aerial imagery obtained from the Far North District Council 'Far North Maps' GIS platform[8], Retrolens databases[9], and Google Earth Pro[10] were reviewed to identify potential evidence of pre-existing geotechnical hazards/issues and/or features of interest. Images dating between 1977 and approximately 2025 were reviewed.

The review of the aerial images indicates that the land remained generally the same from 1977 through to approximately 2021, with minor changes associated with vegetation cover. Between approximately 2021 and 2023 it is apparent that some change occurred based on colouration changes and linear features becoming apparent relative to earlier images. This is consistent with our understanding that the site was modified through earthworks, with cutting and filling activities undertaken.

A summary of the observations made from the aerial images is provided in Table 4.2, with a schedule showing several of the images included in Appendix B.

Table 4.2 Summary of observations made from review of the historical aerial imagery

Image dates	Summary of observations
1976 to ~2021	The land is rural in nature, appearing to be of variable low-lying topography with mounds and depressions. There are some apparent areas that are lower lying with water bodies and/or low vegetation (inferred to be associated with wetter ground conditions). The ground cover colour changes with apparent seasonal changes, indicate periods of wetter and drier conditions.
2021 to 2023	Changes are observed between the 2021 and 2023 aerial images, with what appears to be subtle evidence of earthworks (e.g., lineations, changes in ground cover, and apparent filling of previous depressions).
2023 to 2025	Ground cover is more consistent than earlier image, with some potential evidence or earlier underlying depressions evident.

Note: The observations outlined are based on inference rather than evidence – the accuracy of observations should be considered commensurately.

4.3 Existing geotechnical investigations

A review of the New Zealand Geotechnical Database (NZGD)[11] did not indicate the presence of geotechnical investigations within the project extent, with the closest shown on the NZGD being some 1.5 km to the northeast.

T+T did however undertake a series of geotechnical investigations for the Client in 2023, for another project, approximately 1.7 km northeast of the proposed egg farm site. The investigations comprised 10 test pits excavated with an excavator to depths of up to 6.1 m below ground level (bgl). Eight standpipe piezometers were also installed in selected test pits during backfilling to enable groundwater level monitoring following completion of the investigations.

The ground conditions encountered in the test pits were generally consistent with published geological information of the area, with materials comprising fractions of wood, peat, clay, silt, and sands (where the fractions varied). Remnants of kauri trees were also encountered as obstructions, with branches and trunks observed. A distinctive sulphur odour was noted. Groundwater was measured at 1.0 m bgl to 2.5 m bgl in standpipes following an overnight period to equilibrate.

[8] Far North Maps public geographic information system – 'Aerial Imagery (LINZ). Accessed January 2026.
[9] Retrolens (https://retrolens.co.nz/). Accessed January 2024. All images credited to the relevant creator and attribution parties.
[10] Google Earth Pro (September 2025). Version: 7.3.6.10441 (64-bit). Accessed January 2026.
[11] New Zealand Geotechnical Database (NZGD): https://nzgd.org.nz/. Accessed January 2026.

5 Site-specific geotechncial investigation

T+T engaged Underground Investigation Ltd (Underground Investigation) to undertake two stages of subsurface geotechnical investigations at the site, under the supervision (onsite and remote) of T+T. The investigations comprised a total of 51 CPTs.

The stage 1 investigations were conducted on 15 September 2025 and comprised 13 CPTs (CPT01 to CPT13), advanced to a target depth of approximately 12 m bgl or otherwise to effective refusal[12]. The locations of the CPTs were selected to provide a broad coverage across the site and establish a general understanding of the subsurface ground conditions.

The stage 2 investigations were carried out between 8 and 10 December 2025 and comprised 38 CPTs (CPT101 to CPT138), advanced to a target depth of approximately 8 m bgl or until anchor failure[13] of the CPT rig was induced or otherwise to effective refusal[12]. One test location (CPT119) was omitted from the investigations due to time constraints. The locations of the CPTs were selected to provide subsurface information focused beneath the proposed shed and packhouse footprints (as shown in Figure 3.2).

The location of each CPT was provided by Underground Investigation and is based on handheld GPS, while the elevation of each CPT has been estimated based on the 2025 LiDAR contour data presented on the Chesters drawings package[3].

A summary of the CPT investigation undertaken is presented in Table 5.1. A plan showing the locations of the CPTs and the processed CPT traces are presented in Appendix C.

Table 5.1: Summary of CPT investigations

CPT ID	Elevation (m RL)	Depth (m bgl)	Location	
			Northing	Easting
CPT01	23.3	12.0	6117077	1617195
CPT02	18.4	12.0	6117010	1617208
CPT03	16.4	12.0	6117016	1617150
CPT04	21.7	12.0	6117058	1617076
CPT05	19.1	12.0	6116972	1617045
CPT06	23.5	12.0	6117004	1616958
CPT07	18.4	12.0	6116942	1617125
CPT08	21.4	12.0	6116944	1617192
CPT09	19.2	12.0	6116876	1617241
CPT10	16.5	12.0	6116855	1617157
CPT11	24.6	12.0	6116822	1617069
CPT12	21.1	12.0	6116878	1617045
CPT13	21.2	12.0	6116904	1616975
CPT101	17.2	8.0	6117044	1616994
CPT102	18.1	8.0	6117053	1617013

[12] Effective refusal reflects the condition where the downward force of the CPT rig does not provide sufficient resistance for the CPT cone to advance further due to ground density or intrusion.
[13] The CPT rig is anchored to the ground to enable sufficient counterforce to push the CPT probe down. Anchor failure occurs when the rig's anchors cannot supply sufficient counterforce, causing the anchors to slip, pull out, or move.

CPT ID	Elevation (m RL)	Depth (m bgl)	Location	
			Northing	Easting
CPT103	18.7	8.0	6117031	1617034
CPT104	18.2	8.0	6117015	1617017
CPT105	20.1	8.0	6117000	1617058
CPT106	20.3	8.0	6116973	1617083
CPT107	19.1	8.0	6116936	1617083
CPT108	19.7	8.0	6116959	1617100
CPT109	22.1	8.0	6117071	1617233
CPT110	21.4	8.0	6117046	1617196
CPT111	21.7	8.0	6117045	1617215
CPT112	20.7	8.0	6117021	1617184
CPT113	20.5	8.0	6116996	1617170
CPT114	19.8	8.0	6116952	1617149
CPT115	20.7	8.0	6116947	1617174
CPT116	19.0	8.0	6116941	1617109
CPT117	18.5	7.5	6116914	1617108
CPT118	19.0	9.5	6116915	1617136
CPT120	18.7	8.0	6116925	1617122
CPT121	18.7	8.0	6116912	1617067
CPT122	18.7	3.2	6116892	1617084
CPT123	19.0	8.0	6116866	1617066
CPT124	18.6	8.0	6116851	1617023
CPT125	17.9	1.9	6116832	1617044
CPT126	17.7	8.0	6116818	1617006
CPT127	18.0	8.0	6116809	1617024
CPT128	17.6	8.0	6116794	1616985
CPT129	17.3	8.0	6116777	1617011
CPT130	19.2	8.0	6116897	1617138
CPT130A	20.2	8.0	6116873	1617149
CPT131	20.1	8.5	6116900	1617166
CPT132	20.7	8.0	6116862	1617170
CPT133	21.2	8.0	6116836	1617181
CPT134	20.9	8.0	6116819	1617168
CPT135	21.3	8.0	6116788	1617177
CPT136	22.3	8.5	6116808	1617191
CPT137	20.8	8.0	6116766	1617180
CPT138	22.3	8.0	6116776	1617215

6 Geological ground conditions

6.1 General

To develop an understanding of the subsurface ground conditions at the site and inform the geotechnical assessment, the CPT investigations have been interpreted. This has been undertaken by processing the CPT investigation data provided by Underground Investigation using CPeT-IT software[14]. The resulting information, which contains various parameters related to the subsurface soil conditions, has then been used to infer stratigraphic layering of the subsurface soils to inform the development of a geological ground model. The inferred stratigraphic layering from the CPT interpretation has then been input into Leapfrog 3D geological modelling software[15], allowing a better understanding of the spatial variability of the ground conditions. The outcomes of these steps are outlined in the following subsections.

The CPT traces have been used to infer subsurface conditions across the site without physical recovery of subsoil material to validate the inferred soils. Based on the desktop assessment and T+T's local experience, a reasonable level of confidence can be assumed that the inferred conditions are representative of actual conditions. Notwithstanding this, the further geotechnical testing comprising physical recovery of core (e.g., borehole drilling) will be required, alongside geotechnical laboratory testing, to validate inferences and assumptions made herein.

It must be noted that, whilst our investigations are able to provide an indication of the ground conditions across the site, subsurface conditions can vary between investigation points. For this report, subsoil conditions have been interpolated between the investigation locations with consideration of topographical conditions, and it must be appreciated that soil conditions can and do vary between investigation locations.

6.2 Interpretation of CPT investigations

Interpretation of the ground conditions for the project has thus far been made based on the primary geotechnical hazard hypothesised to pose the greatest risk to the proposed development and/or govern the foundation options. This was qualitatively assessed to be settlement risk associated with soft ground conditions alongside the settlement-sensitive nature of the main structures and infrastructure for the proposed egg farm.

The CPT traces have been interpreted with the focus of delineating ground that poses a material settlement risk to the project and otherwise. Materials that are considered to pose this risk are grouped and described as "*soft cohesive and/or peat material*". It is likely that there are subunits within this grouping, however, interpretation on this basis is considered appropriate for supporting this stage of assessment.

An understanding of groundwater across the site is also required for geotechnical assessment. In the absence of physical groundwater testing information, the pore pressure parameter from the CPT has been used to infer the groundwater level in each CPT.

A summary of the inferred ground conditions from the CPT traces is presented in Table 6.1.

[14] Geologismki (2007). CPeT-IT v.3.0 – CPT interpretation software.

[15] Seequent (2024). Leapfrog – 3D geological modelling software. Version 2023.2.3

Table 6.1: Summary of CPT interpretation

CPT ID	Elevation	Inferred depth to soft cohesive and/or peat material		Inferred thickness of soft cohesive and/or peat material	Post-CPT groundwater dip measurement	
	(m RL)	(m bgl)	(m RL)	(m)	(m bgl)	(m RL)
CPT01	22.0	N/A	N/A	N/A	11.3	10.7
CPT02	21.3	N/A	N/A	N/A	10.3	11.0
CPT03	20.2	4.00	16.2	2.0	2.9	17.3
CPT04	18.4	2.50	15.9	0.5	2.3	16.1
CPT05	20.0	N/A	N/A	N/A	10.5	9.5
CPT06	16.5	2.50	14.0	4.0	0.4	16.1
CPT07	19.4	2.00	17.4	5.0	0.9	18.5
CPT08	21.2	N/A	N/A	N/A	10.6	10.6
CPT09	21.5	1.5	20.0	0.5	0.9	20.6
CPT10	19.7	N/A	N/A	N/A	9.7	10.0
CPT11	17.5	N/A	N/A	N/A	8.1	9.4
CPT12	19.5	N/A	N/A	N/A	9.8	9.7
CPT13	17.0	3.0	14.0	2.5	0.7	16.3
CPT101	17.2	2.2	15.0	1.0	Dry to 0.8[1]	Dry to 16.4
CPT102	18.1	N/A	N/A	N/A	Dry to 7.0 m[1]	Dry to 11.1
CPT103	18.7	3.0	15.7	1.5	Dry to 2.0[1]	Dry to 16.7
CPT104	18.2	3.0	15.2	0.5	Collapsed at 2.4, moist	Collapsed at 15.8, moist
CPT105	20.1	N/A	N/A	N/A	Collapsed at 7.8, moist	Collapsed at 12.3, moist
CPT106	20.3	N/A	N/A	N/A	EOB 8, moist	EOB at 12.3, moist
CPT107	19.1	N/A	N/A	N/A	5.7	13.4
CPT108	19.7	2.5	17.2	1.0	2.2	17.5
CPT109	22.1	N/A	N/A	N/A	Dry	Dry
CPT110	21.4	N/A	N/A	N/A	Dry to 7.8[1]	Dry to 13.6
CPT111	21.7	N/A	N/A	N/A	Dry	Dry
CPT112	20.7	2.5	17.2	1.0	Dry to 7.8[1]	Dry to 12.9
CPT113	20.5	4.0	15.5	3.5	Dry to 2.3[1]	Dry to 18.2
CPT114	19.8	N/A	N/A	N/A	Dry to 7.8[1]	Dry to 12
CPT115	20.7	N/A	N/A	N/A	Collapsed at 7.8, moist	Collapsed at 12.9, moist
CPT116	19.0	2.5	16.5	4.0	Dry to 1.2 m[1]	Dry to 17.8
CPT117	18.5	2.0	16.0	5.0	0.9	17.6
CPT118	19.0	2.5	16.5	4.0	1.4	17.6
CPT120	18.7	2.0	16.7	4.5	1.1	17.6

CPT ID	Elevation	Inferred depth to soft cohesive and/or peat material		Inferred thickness of soft cohesive and/or peat material	Post-CPT groundwater dip measurement	
	(m RL)	(m bgl)	(m RL)	(m)	(m bgl)	(m RL)
CPT121	18.7	2.0	16.7	1.5	1.7	17.0
CPT122	18.7	1.5	16.2	1.0	0.8	17.9
CPT123	19.0	1.0	18.0	0.5	4.8	14.2
CPT124	18.6	N/A	N/A	N/A	Dry	
CPT125	17.9	1.0	16.9	0.5	Dry to 7.6[1]	Dry to 10.3
CPT126	17.7	N/A	N/A	N/A	Dry to 7.7[1]	Dry to 10
CPT127	18.0	N/A	N/A	N/A	Dry to 7.9[1]	Dry to 10.1
CPT128	17.6	2.5	15.1	1.5	Dry to 1.9[1]	Dry to 15.7
CPT129	17.3	N/A	N/A	N/A	Dry to 7.7[1]	Dry to 9.6
CPT130	19.2	3.0	16.2	1.5	Dry to 1.6[1]	Dry to 17.6
CPT130A	20.2	N/A	N/A	N/A	Dry	Dry
CPT131	20.1	N/A	N/A	N/A	8.0	12.1
CPT132	20.7	N/A	N/A	N/A	Dry	Dry
CPT133	21.2	N/A	N/A	N/A	Dry	Dry
CPT134	20.9	N/A	N/A	N/A	Dry	Dry
CPT135	21.3	N/A	N/A	N/A	Dry	Dry
CPT136	22.3	N/A	N/A	N/A	Dry	Dry
CPT137	20.8	N/A	N/A	N/A	Dry	Dry
CPT138	22.3	N/A	N/A	N/A	Dry	Dry

Table Notes:
1. Depth outlined reflects where the hole has collapsed prior to groundwater dip.
2. Where "N/A" is stated, this reflects there being no inferred soft cohesive and/or peat material.

6.3 Inferred site stratigraphy

Subsurface conditions at the site, as interpreted from available CPT data indicates that the area is predominantly underlain by reworked dune sand deposits / fill overlying in-situ dune sand deposits with occasional thin lenses of very dense sand, with interbedded layers of cohesive / organic clay (inferred as peat). The general subsurface profile encountered at the site is summarized below.

6.3.1 Fill (reworked dune sands)

Based on the site morphology and aerial photography we infer that some of the near surface sands encountered during the CPT investigation are likely to comprise fill placed during recent earthworks activities. We understand that these activities generally included trimming / cut of topographic highs and filling of topographic lows to create more uniform topography. Therefore, the fill is inferred to comprise loose Karioitahi Group dune sands likely mixed with topsoil.

6.3.2 Dune sands (Karioitahi Group)

Loose to medium-dense dune sands of the Karioitahi Group make up the majority of the stratigraphy on site with typical cone tip resistance (q_c) values ranging between 1.5 MPa and 10 MPa. The thickness of this layer is unknown due to CPT test depth constraints. Thin lenses of very dense sand (up to 1.0 m thick) are interbedded throughout, demonstrating q_c values of up to 70 MPa, suggestive of cemented or highly compacted granular material.

6.3.3 Alluvial / estuarine deposits

A layer of cohesive and/or organic silts and clays (peat) was typically inferred at depths between approximately 2 m and 4 m bgl. This layer was indicated by a drop in cone tip resistance to between 0.1 and 0.5 MPa, which persisted over spans of about 0.5 m to 5.0 m. The CPT locations where this material was inferred correspond to the lower-lying areas of the site when assessing contour levels prior to the 2022/2023 earthworks.

6.4 Groundwater conditions

Groundwater level measurements were obtained during the site-specific geotechnical investigations. However, the measurements were obtained by Underground by dipping the CPT holes immediately after the CPT probe was pulled out, which can lead to measurements that do not reflect the natural groundwater level because the hole may collapse, perched groundwater may influence levels, or it may take time for the groundwater level to equilibrate in some soils. Based on a review of the measurements obtained during the investigation, there are inconsistencies that indicate the groundwater readings are unlikely to be representative of the natural groundwater level.

The CPT investigation undertaken utilised a piezocone (i.e., CPTu), which measures the development of pore water pressures during penetration. In highly permeable soils the pore pressure may indicate the hydrostatic profile, which can be used to infer the static groundwater level, however, there is significant uncertainty. Based on a review of the pore pressure traces from the CPT investigation, it appears that both negative and elevated pore pressures occurred consistent with the inferred soil type, suggesting that these are not reflective of the static groundwater level. Consequently, this information has not been utilised for the groundwater assessment.

In the absence of reliable site-specific information, it is reasonable to consider the proximity of the site to the coast, where the regional groundwater level is typically governed by the sea level and tidal fluctuations. The site is within 1 km of the coastline, approximately 850 m from Te Oneroa-a-Tōhe (Ninety Mile Beach). Groundwater typically follows a hydraulic gradient of 0.01 to 0.002 above mean sea level (MSL) landward of the coast. On this basis, the regional groundwater level would be approximately 2 m to 10 m above MSL (i.e., a significant depth below the ground surface of 16 m RL to 24 m RL across the site).

As observed via aerial imagery and outlined in the reports by other disciplines, there are natural wetlands at the site, which suggests groundwater near to the ground surface. It is inferred that these are indicative of perched or impounded groundwater, which are created by the specific ground conditions (in particular the presence of both sand and peat materials). So, rather than being representative of the regional groundwater table, these are likely representative of local perched groundwater levels.

In the absence of having investigations to determine the site-specific groundwater conditions, we have elected to adopt groundwater levels based on the geotechnical assessment being undertaken, and they should not be used in any other context. Further investigation should be undertaken prior to detailed design to validate assumptions and/or update assessments to reflect a more refined understanding of groundwater conditions.

We have adopted the following:

- For the settlement assessment, we have adopted a near-surface groundwater level of 1.5 m bgl to reflect a perched groundwater level and saturation of peat material, which will govern the settlement assessment when the peat is subjected to imposed load.
- For the liquefaction assessment, it is likely that material susceptible to liquefaction (i.e., predominantly sand fraction) will experience groundwater conditions associated with the regional groundwater table. However, in the absence of site-specific groundwater information, and considering the stage of the project, we have adopted a higher groundwater level reflecting the lowest ground surface elevation at the site. This is based on the assumption that the local groundwater level will be approximately level across the site, that there will be negligible groundwater mounding over the extent of the site, and therefore with no ponding across the proposed development area the groundwater would be no higher than the lowest surface elevation. The adopted groundwater level for liquefaction assessment is therefore 16 mRL.

We note that standpipe piezometers were installed during the 2023 test pit investigations at the project site to the north of the proposed development .The recorded groundwater levels varied between approximately 1 m bgl to 2.5 m bgl following leaving the standpipe piezometers overnight. It is possible that these groundwater levels represent a perched groundwater level within the peat material, rather than the regional groundwater level.

7 Geotechnical assessment

7.1 General

The geotechnical assessment has been undertaken considering the geotechnical hazards relevant to the site based on T+T's experience and qualitative assessment of the site from the desktop assessment and the investigations undertaken.

The geotechnical hazards considered for qualitative assessment are settlement and liquefaction, the assessments for which are presented in subsequent subsections. Stability was also considered, however, considering the reasonably gentle topography of the site and layout of the proposed development, slope stability was qualitatively assessed as not posing a material risk.

Potential measures and/or foundation considerations that may mitigate the effects of geotechnical hazards at the site are presented in Section 8.

7.2 Consolidation Settlement

7.2.1 General

Consolidation settlement occurs when soils are subjected to an imposed load that is greater than the material has experienced at the time of loading. For the proposed egg farm, there will be a net imposed load where the structures are constructed, thereby resulting in consolidation settlement of underlying soils.

For granular materials such as sands, settlement is likely to occur immediately upon load application and be completed during the construction period. However, where cohesive materials are present (i.e., clays, silts, and peats), consolidation settlement is likely to occur. Consolidation settlement is comprised of primary consolidation (where volume decreases in a saturated cohesive soil due to the release of pore water pressure under an applied load), and secondary settlement (which occurs after primary consolidation due to ongoing long-term compression of the cohesive soil).

As inferred above, understanding the historical load experienced by the underlying soils is important. As outlined in Section 3.1, we understand that earthworks were undertaken circa 2022 at the site to form the current site levels. We understand that this comprised cut and fill, which will have resulted in a net unloading or loading of the ground, respectively. However, the majority of the primary consolidation from the historical earthworks activity is expected to be complete. Additional earthworks comprising cut and fill to approximately -3 m and 2.5 m, respectively are proposed (as shown in the Chester Earthworks Plan[16] in Appendix A). This additional earthworks has been considered in our assessment.

The settlement of a given material is dependent not only upon the net-imposed load, but also the thickness of the underlying susceptible soil layer. The thickness of the inferred "soft cohesive and/or peat material" differs across the site, and therefore, it is likely that consolidation settlements will also differ between different areas within the project extent.

The following subsections outline the methodology employed to estimate the potential consolidation settlement that may occur within the design life of the proposed structure(s), and the results thereof.

An 'Inferred Settlement Risk Heat Map' that illustrates the potential settlement risk across the site was provided to inform project decisions ahead of the Settle3 assessment being undertaken, which is presented in Appendix E for reference. This was developed based on the thickness of soft cohesive / peat material inferred from the CPT investigations and does not consider the proposed changes to the site that may influence the actual magnitude of settlement (i.e., earthworks and/or imposed loading).

7.2.2 Methodology

A high-level assessment of consolidation settlement was undertaken by processing representative CPT data from Stage 2 investigations using the 'Settle3' software. The assessment focused primarily on CPTs that were inferred to penetrate cohesive and/or organic clay layers, and was completed under the following assumptions:

- Pre-development cut and fill depths were interpolated based on the difference in ground surface elevations between FNDC GIS contours (representing pre-2022/2023 earthworks) and the 2025 drone survey contours provided by Chester Engineering Consultants.
- Proposed cut and fill depths have been estimated from the Chester Earthworks Plan[16], which is presented in Appendix A for reference.
- Loads comprised a fill embankment (assuming site-won material) with a unit weight of 16 kN/m³ (where applicable), together with an additional 20 kPa 'building load' applied over a 130 m × 20 m footprint, representative of a laying shed.
- Building foundations are assumed as a raft slab founded at the surface of the Karioitahi Group sands (i.e., no embedment).
- Geotechnical parameters adopted in the Settle3 analysis were based on our experience with similar materials.

[16] Chester Engineering Consultants (10 December 2025). Earthworks Plan. Drawing C200 - Rev 0. Project 16007.

7.2.3 Results

The results of the settlement analysis are summarised in Table 7.1 below. The consolidation settlement range below reflects both the variability and the compressibility of the cohesive soils present. Inorganic clays and silts are less compressible and correspond to the lower end of the range, while peat is highly compressible and represents the upper end of the range. Additional site investigations, such as boreholes, test pits, and laboratory testing, will be required to better characterise the cohesive soils / peat on site (refer to Section 11 for further detail).

Table 7.1: Settlement analysis results

Egg farm building	Inferred thickness of soft cohesive and/or peat material (m)	Estimated total consolidation settlement range (mm)	Estimated time to 90% primary consolidation (months)*
Laying sheds	0.5 to 3.5	50 to 400	3 to 20
Central packhouse	5	1,000 to 1,200	10 to 20
Note:* The estimated time to 90% primary consolidation is measured from the end of construction.			

The potential magnitude and range of settlement estimated indicates that there may be consequential effects to the proposed building foundations and connecting infrastructure, whereby the suggested serviceability limit state criteria may be exceeded (such as those outlined in Table C1 of AS/NZS 1170.0:2002[17]). Consequently, consideration of mitigation measures for settlement effects will likely be required for the laying sheds and packhouse, which should be confirmed during detailed design following the undertaking of further investigation, testing, and assessment (as outlined above and in Section 11).

7.3 Seismic assessment

The development has been assumed to have a design life of 50 years and an importance level (IL) that ranges between IL1 (the laying sheds) and IL2 (the packhouse), as defined in AS/NZS 1170.0: 2002[17]. For the purpose of geotechnical assessment IL2 has been applied to the overall proposed development, however, the opportunity to refine the assessment on a structure-by-structure basis may be considered in ensuing project stages.

The design life and importance level classification should be verified by the structural engineer as appropriate. If the intended design life and importance level differ from those assumed, or if it changes during the project life, then the design earthquake magnitude and PGA values, as well as the assessments and recommendations outlined in this report will require review.

The seismic shaking hazard for the site has been calculated in accordance with the guidance outlined in MBIE Module 1[18] guidelines. The design values for the effective earthquake magnitude (Meff) and peak ground acceleration (PGA) are provided in Table 7.2.

Based on the results of the investigations and the published geology of the area, the site is classified as subsoil **Class D – (Deep or soft soil sites)** in accordance with NZS 1170.5.2004[19]. This assessment has been made on the basis that the inferred soil conditions from the CPT investigation indicate "very soft" cohesive soil but that this is less than 10 m thick.

[17] Standards New Zealand; NZS 1170.0: 2002; Structural Design Actions; Part 0: General Principles
[18] MBIE (2021), Earthquake Geotechnical Engineering Practice – Module 1. Overview of the Guidelines
[19] Standards New Zealand; NZS 1170.5: 2004; Structural Design Actions; Part 5: Earthquake Actions – New Zealand

Table 7.2: Design earthquake magnitude and PGA

Earthquake return period	PGA (g)	Effective magnitude (Meff)
1 in 25 years (SLS)[Note 1]	0.03	5.8
1 in 500 years (ULS)[Note 1]	0.13[Note 2]	5.8[Note 2]

Notes:

1. *SLS – Serviceability Limit State. ULS – Ultimate Limit State.
2. ** Calculated ULS PGA coefficients were found to be below the lower bound coefficients specified in MBIE Module 1[18] for a 6.5 magnitude earthquake with a PGA of 0.19. As such, our seismic assessments have utilised these lower bound ULS values instead of those specified in the table.

Seismic hazard models carry an inherent amount of uncertainty, but more important is the uncertainty in what shaking a particular site or structure will be subject to during its actual life. This depends on which specific earthquakes actually occur over that time. Therefore, designers and asset owners are strongly encouraged to focus on resilient design practices, rather than the specific code minimum demand[20].

Liquefaction triggering and associated consequences are non-linear. Consequently, for liquefaction analysis we have considered a range of seismic loadings, including values between the current code minimum limit states of SLS and ULS, as well as beyond ULS. This allows us to understand the impact of the uncertainty in seismic loadings on the geotechnical performance of the site, in particular whether there are any step-changes which could be critical.

Table 7.2 outlines the seismic shaking hazard for the site as determined by the current minimum compliance pathway within the Building Code. We recommend that building owners liaise closely with their geotechnical and structural professionals to understand the potential impacts of uncertainty and how this can be managed for the site.

7.4 Liquefaction hazard and consequence

7.4.1 General

Considering the nature of the ground conditions at the site and the seismic assessment, an assessment has been undertaken to quantify the liquefaction hazard and potential consequences thereof. This assessment is outlined chronologically below in order of susceptibility, triggering, and consequence.

7.4.2 Liquefaction susceptibility

Generally, saturated sand, gravels and non-to-low plastic silts are susceptible to liquefaction. The materials inferred be present at the site have been assessed to be susceptible to liquefaction. The susceptibility assessment was undertaken based on the inferred soil types from the CPeT-IT outputs and considering the Soil Classification index (Ic), calculated using Robertson & Wride[21]. For the Ic classification, where the Ic value exceeds 2.6, the soil was assessed as likely to behave in a 'clay-like' manner and is therefore not considered to be susceptible to liquefaction.

[20] NZSEE, SESOC, NZGS (August 2022). *Earthquake Design for Uncertainty: Advisory.* Revision 1. https://www.nzsee.org.nz/db/PUBS/Earthquake-Design-for-Uncertainty-Advisory_Rev1_August-2022-NZSEE-SESOC-NZGS.pdf

[21] Robertson, P.K. & Wride, C.E. (1998). Evaluating cyclic liquefaction potential using the cone penetration test. Canadian Geotechnical Journal, 35(3), 442-459.

7.4.3 Liquefaction triggering

A liquefaction triggering assessment has been undertaken using the simplified Boulanger & Idriss (2014)[22] calculation method, completed using the T+T CPT Liquefaction Calculator. The CPT data attained from the geotechnical site investigation was used as input to the assessment. The analyses provide an indication of the spatial continuity/variability, depth, and cumulative thickness of liquefiable materials.

Liquefaction analyses were completed for ULS seismic shaking using the earthquake ground motions outlined in Table 7.2. From inspection of the results of the ULS analyses, triggering at SLS shaking is qualitatively assessed to be negligible, and therefore quantitative analyses were not undertaken. Further, a sensitivity analysis was undertaken for PGA values between 0 g to 0.3 g to understand liquefaction triggering at different PGA levels, between SLS and ULS, and beyond ULS. This is considered to be aligned with recent industry practice for designing for uncertainty.

Groundwater is an important consideration in the liquefaction triggering assessment. The basis for which the adopted groundwater level was selected is outlined in Section 6.4.

Results indicate that soils at this site are considered to have a negligible risk of liquefaction for the SLS design shaking event, whereas liquefaction is assessed to occur in layers of materials comprising dominant sand fractions under the ULS design shaking event. From the sensitivity assessment undertaken, a 'step-change' in ground improvement is observed in some assessments between the SLS and ULS shaking levels at variable PGAs. Although variable, this change in behaviour appears to typically occur from PGAs of approximately 0.15 g onwards (with some degree of variability).

Liquefaction assessment outputs from the T+T CPT Liquefaction Calculator are presented in Appendix D.

7.4.4 Liquefaction consequence

The potential consequence of liquefaction triggering requires assessment, as the effects can have a material impact on the design of foundations and structures forming the project. The potential liquefaction consequences were initially assessed qualitatively to determine those which were likely to materially affect the design. It was assessed that the liquefaction induced settlement (free-field) is the primary consequence of liquefaction, for which a quantitative assessment has been undertaken considering the ULS PGA, as this will be the governing seismic load case.

Liquefaction induced 'free-field' settlement is where the ground settles due to various contributing mechanisms. This settlement typically varies across/along the ground affected by liquefaction triggering due to variability in soil conditions. Consequently, the structures founded upon this ground are generally impacted by the free-field settlement, often leading to differential settlement effects in overlying infrastructure.

Vertical free-field liquefaction induced settlements were estimated using the CPT investigation results and the methodology developed by Zhang et al. (2002)[23]. It should be noted that the estimated settlement values are free-field settlement estimations only. This describes the settlement of ground not occupied by a structure due to dissipation of excess pore water pressure generated during earthquake shaking. In some cases, the presence of a structure may exacerbate the liquefaction-induced settlement. The robustness of a building foundation also influences the degree of differential settlement along with soil-structure interaction at the footing depth.

[22] Boulanger R.W. and Idriss, I.M. (2014). CPT and SPT based liquefaction triggering procedures. Report No. UCD/CMG-14/01, Dept. of Civil & Environmental Engineering, University of California at Davis

[23] Zhang, G., Robertson, P.K., and Brachman, R.W.I. (2002). Estimating liquefaction-induced ground settlements from CPT for level ground. Canadian Geotechnical Journal, 39(5): 1168-1180.

The assessment indicates that liquefaction-induced free-field settlement is estimated to range between negligible to approximately 100 mm, when all CPTs assessed are considered. For the Stage 2 CPTs, which are focused where the proposed structures are located, the estimated range of liquefaction induced free-field settlement is negligible to approximately 30 mm. The results from the assessment for each CPT are shown in the outputs from the T+T CPT Liquefaction Calculator presented in Appendix D.

The effects of liquefaction on bearing capacity for shallow foundation and pile capacities should be confirmed following the additional site investigation. groundwater monitoring, and detailed design recommended in Section 11.

8 Hazard mitgation and foundation considerations

8.1 General

The geotechnical assessments outlined in Section 7 quantify the potential impact of settlement and liquefaction on the proposed development. The subsections below outline the foundation options and potential geotechnical mitigation measures, if required for the proposed development.

Based on the ground conditions and assessed settlements (static and seismic), the development may predominantly be founded on shallow foundations subject to appropriate mitigation measures being implemented, where required. Where structures or connecting infrastructure spans across areas of thick, soft cohesive and/or peat materials, or where predicted total settlement is excessive and/or differential settlements exceed serviceability limit state criteria / acceptable design tolerances, then mitigation measures and/or alternative foundations may be required (e.g., pre-loading, material replacement / enhancement, piled foundations, etc). Reference should be made to the subsections below for commentary of foundation options and potential mitigation measures.

Connections between structures and machinery/equipment that is sensitive to movement (e.g., conveyors, processing plant, etc.) may need to be designed to accommodate differential movement or allow for reactive adjustment to accommodate differential movement, respectively.

The magnitude of differential movement can be provided following further assessment during detailed design.

8.2 Shallow foundations

Shallow strip and/or pad foundations may be founded within dune sand deposits provided they are extended through any fill, topsoil, or unsuitable material and founded a minimum of 450 mm bgl. Shallow raft foundations may also be adopted providing a greater allowance for potential ground movement than traditional shallow foundations (i.e., strip and/or pad foundations).

Where dune sand deposits are not present near to the ground surface, or where dune sand deposits are underlain by soft cohesive and/or peat materials, consideration will need to be given to the effect of the ground strength and/or settlement risk, and whether mitigation measures or alternative foundations may need to be considered – refer to Section 8.3, Section 8.3, and Section 8.5 for further commentary.

The bearing capacities presented in Table 8.1 may be adopted for the design of shallow strip or pad footings up to 1 m in width, bearing on dune sands, and subject to site confirmation of capacity and excavation of any unsuitable material encountered in foundation excavations. Following further investigation ahead of detailed design, it is possible that the bearing capacity may be increased.

Table 8.1: Bearing capacities for strip or pad footings on dune sands

Design parameter	Bearing on natural dune sands or engineered fill [1]
Geotechnical ultimate bearing capacity [2]	300 kPa
Allowable bearing pressure (FOS = 3)	100 kPa

Table notes:
1. Placed and compacted in accordance with approved earthworks specifications.
2. Geotechnical ultimate bearing capacity should be reduced by a strength reduction factor ϕ_g = 0.5 when assessing against factored ultimate limit state structural loads.
3. Foundation subgrades should be inspected and tested by a Geotechnical Engineer during construction.

8.3 Site layout refinement

There is opportunity for further refinement of the site layout from a geotechnical perspective, in particular the building footprints to avoid areas where settlement estimates indicate potential excessive settlement and/or differential settlement that may exceed tolerable serviceability limit state criteria.

Based on the current layout which has been considered, it appears that relatively minor shifting of the building footprints may serve to reduce the impact of settlement and the consequent need for other mitigation measures. This will need to be balanced against constraints posed by other designers considerations, however, should be considered ahead of detailed design and finalisation of the site layout.

8.4 Ground improvement

To reduce the potential for building damage due to settlement, ground improvement measures may be required prior to construction.

Excavation and replacement of soft cohesive and/or peat material may be a suitable option depending on the depth of the material encountered, to provide better founding conditions. Fill could comprise imported hardfill to create a gravel raft, or otherwise site-won sand fill, provided adequate compaction can be achieved.

Where project timelines allow, preloading of specific areas of the site could be undertaken to initiate consolidation settlement of underlying compressible layers. The intention being to advance settlement ahead of construction to minimise post-construction settlement. If required to meet programme constraints, surcharge may also be adopted to increase the rate of consolidation and reduce the construction programme.

It is also noted that the sand layers situated above and below the cohesive or peat layer may act as natural drainage pathways within the compressible soils, promoting relatively rapid consolidation. If the timeframe for settlement needs to be quicker, then further drainage measures could be considered (e.g., wick drains installed into the compressible soils).

Alternatively, other means of mechanical ground improvement measures could be explored.

8.5 Pile foundations

Pile foundations may be a suitable alternative for areas where shallow foundations are unable to accommodate anticipated settlements. Pile foundations should be embedded below compressible materials and depending on the installation method will need to achieve a minimum embedment of 3x the pile diameter into the dense dune sands to achieve the specified end bearing capacity and/or achieve a specified set. Consideration of the specific material type for piles (e.g., timber, steel, etc.)

will need to be confirmed during detailed design, with due consideration of soil chemistry (e.g., acidity, corrosivity, etc. within the peat materials).

The following capacities presented in Table 8.2 below may be adopted for the preliminary design of driven timber piles which extend a minimum of 3x the pile diameter into underlying dense dune sands below the cohesive soil / peat layer, and are subject to site confirmation of capacity.

The pile type and dimensions should be confirmed by the project structural engineer during the detailed design stage, if required.

If piles are proposed, consideration shall be made of connecting structures and/or infrastructure in respect of differential settlement effects.

Table 8.2: Driven timber pile capacities for piled foundations

Soil unit	Driven within dune sands	Driven within cohesive soils or peat
Geotechnical ultimate end bearing capacity [1]	1,350 kPa	N/A
Geotechnical ultimate shaft friction (compression and uplift) [1]	25 kPa	

Table notes:

1. Geotechnical ultimate bearing capacity should be reduced by a strength reduction factor ϕ_g = 0.5 when assessing against factored ultimate limit state structural loads.

2. Where bored piles are adopted, pile holes should be inspected by a Geotechnical Engineer during construction, and confirmed to align with design parameters.

3. Where driven piles are adopted, pile driving shall be observed and sets checked by the Geotechnical Engineer and/or Structural Engineer.

4. Piles extending through cohesive soils / peat that are subject to consolidation settlement or sand layers susceptible to liquefaction induced free field settlements should be designed to resist negative skin friction. This should be confirmed at detailed design stage.

9 Other considerations

9.1 Composition of peat

Organic soils and peat often contain wood fabric or fragments. Based on our observations in the area it is likely that the peat soils will contain buried kauri logs. Buried logs present a risk to the installation of piled foundations and achieving uniform / consistent settlements under preload.

We consider that this risk should be further investigated in the ensuing ground investigation / detailed design phase, and can be suitably mitigated through structural design (i.e. flexibility in pile spacings and foundation connectivity) and detailed settlement monitoring during preload and surcharge regimes.

9.2 Earthworks

We understand that cut and fill earthworks were undertaken on site circa 2022 to 2023 to soften the topography for agricultural purposes.

Further earthworks are proposed to achieve finished levels at the site[24], upon which the proposed buildings and infrastructure will be constructed. The maximum cut and fill depths are anticipated to be approximately 3 m and 2.5 m, respectively. No significant retaining structures or steep batter

[24] Chester (22 January 2026). Land Development Report. 284 & 458 Sandhills Road, Awanui. Te Rūnanga O Ngaitakoto Free Range Egg Farm. Job No.: 16007, Rev: 0.

slopes are anticipated, however, batter slopes will be required to construct access road and building platforms. Based on a preliminary review of the Land Development Report by Chester, the proposed earthworks recommendations are aligned with accepted practice.

The following shall also be adopted for proposed earthworks:

- Any areas of organic, topsoil, or other unsuitable material encountered at subgrade level within the earthworks area should be removed and replaced with engineered fill.
- Any batter slopes should be at 3H:1V or shallower with appropriate setbacks to be confirmed during detailed design
- All new fill should be engineer designed and placed in accordance with an approved earthworks specification, and should be carried out in accordance with a standard such as NZS 4431:2002[25]. All fill foundations should be stripped, benched and drained prior to backfilling with engineered fill.
- Subgrade surfaces should be protected from moisture infiltration and plant traffic to prevent degradation. It is recommended that, where possible, any excavation be delayed 200 mm above the foundation elevation until immediately prior to foundation construction, to minimise disturbance. A comprehensive earthworks specification specific to the proposed development, taking into account any preload and surcharge regimes will be provided at detailed design stage.

9.3 Structural, civil, and mechanical design considerations

Given the spatial extent of compressible soils on the site consideration should be given to structural, civil, and mechanical design aspects to accommodate differential settlements, particularly in settlement sensitive structures, services or machinery.

Such allowances may include, but are not limited to:

- Segmental construction of linear structures with flexible jointing such that adverse settlement effects are limited to the affected areas. Noting that ground conditions are expected to vary from the inferred model.
- Allowance for re-levelling of mechanical components should they be sensitive to settlements. Alternatively, settlement sensitive machinery may also need to be founded on deep piles.
- Due consideration given to address the potential for total and differential settlements in the design of services such as stormwater and wastewater. Preload and surcharge may be required to mitigate this risk. This will be particularly relevant where services extend between structures and/or are buried, such as the proposed collection of stormwater runoff from structures to be stored in rainwater tanks[24]. The proposed stormwater management that relies upon in-ground dispersal trenches and the swale network is less at risk of settlement effects, however, is likely to require reactive maintenance where settlement impacts the design grades.

[25] Standards New Zealand. (2022). *NZS 4431:2022 – Engineered fill: Earthworks for residential development.* Wellington, New Zealand: Standards New Zealand.

10 Suitability of the site for development

10.1 General

We consider the site to be generally suitable for the purposes of the proposed egg farm development, subject to detailed geotechnical design and the recommendations outlined in this report. Particular consideration should be given to the following during detailed design and prior to construction:

1 Settlements should be considered in accordance with Section 7.2. In particular, total and differential settlements due to a combination of earthworks, building surcharge, and ground water levels and characteristics of the underlying cohesive soils / peat should be assessed further during detailed design.

2 Earthworks are undertaken in accordance with Section 9.2 of the report. An earthworks specification should be developed following confirmation of the development plan and programme and include allowance for monitoring of proposed pre-load and surcharge regimes, if required.

3 Allowance for liquefaction induced settlements in accordance with Section 7.4, subject to confirmation of the site groundwater levels and foundation systems.

4 Given the spatial extent of compressible soils on the site consideration should be given to structural, mechanical and civil design aspects to accommodate differential settlements, particularly in settlement sensitive structures, services or machinery, in accordance with Section 9.3.

10.2 Geotechncial natural hazard considerations

The geotechnical natural hazards (landslide, seismic shaking, and liquefaction) considered at the site have been assessed against the risk matrix outlined in the National Policy Statement for Natural Hazards 2025[26]. Based on the assessment undertaken the geotechnical natural hazards are assessed to be below a 'Very high' risk rating. The risk associated with the geotechnical hazards assessed is 'Low' to 'Medium'.

Reference should be made to Section 7 for the geotechnical assessment of each hazard.

11 Further work

The following sections present recommendations for further work to support detailed design of the development and Building Consent application.

11.1 Additional site investigation

Additional site investigations in the form of boreholes and/or test pits with allowance for groundwater monitoring and laboratory testing should be undertaken to provide the detailed geotechnical information required to support a building consent application for the proposed works. These investigations should confirm the subsurface conditions beneath the finalised building layout, including composition of the peat and/characterisation of the underlying cohesive soil / peat and presence of buried obstructions, and provide data to refine the ground model and groundwater level assessment and resulting recommendations presented in this report. Samples for soil corrosivity (acid sulphate soils) testing should also be considered given the presence of peat at the site.

[26] Ministry for the Environment (2025). National Policy Statement for Natural Hazards 2025. Wellington. Retrieved from: https://environment.govt.nz/assets/publications/RMA/npsnh-2025.pdf

11.2 Detailed design assessment

Refinement of the liquefaction and settlement assessment based on the results of the additional site investigations, laboratory testing, and actual building loads. Provision of foundation design parameters and anticipated differential settlements for the preferred foundation solutions and the final building locations to enable design of the civil, structural, and mechanical components by the respective designers.

11.3 Pre-load and surcharge programme

Pre-loading and surcharge of the site may be a feasible option to accelerate the consolidation process beneath the proposed development. If this is a preferred option moving forward, the duration and magnitude of the pre-load and surcharge and the need for wick drains should be confirmed in order to meet the development programme.

11.4 Earthworks specification

An earthworks specification should be developed to define the standards and procedures to be followed during construction. This document should outline the requirements for all relevant earthworks activities associated with the proposed development, including (but not limited to) excavation, filling, and compaction. The specification should also be reviewed to ensure compliance with the applicable building codes and standards.

12 Conclusions

Tonkin & Taylor Limited (T+T) was engaged by Te Rūnanga o NgaiTakoto (the Client) to undertake geotechnical investigation, assessment, and reporting to support a proposed free range egg farm development at 284 and 458 Sandhills Road, Ahipara.

The work undertaken by T+T can be used to inform the Client's decisions regarding the suitability of the site for the proposed egg farm development and work being undertaken by other disciplines to support the project. Work has comprised investigation to identify and assess potential geotechnical hazards, associated risks and opportunities, and to provide preliminary geotechnical recommendations to support a Resource Consent application and ensuing project stages.

The assessments and recommendations provided in this Geotechnical Investigation & Assessment Report (GIAR) are not suitable to support Building Consent or construction without further investigation, review, and detailed design.

The main outcomes of the work undertaken are summarised in the following points. For further information and details pertaining to the assessments, assumptions made and limitations thereof, and the results, reference should be made to the relevant sections and appendices of this report.

- The layout of the proposed egg farm considered in this GIAR has been developed through an iterative process based on geotechnical information provided to the Client following the Stage 1 geotechnical investigations and provision of preliminary geotechnical advice, ahead of this GIAR being issued. The layout has been primarily governed by a qualitative assessment of the settlement risk associated with soft cohesive and/or peat materials, which were presented in an 'Inferred Settlement Risk Heat Map', alongside constraints related to other discipline inputs.

- A desktop assessment was undertaken to develop an understanding of the site based on information publicly available to T+T and from other work undertaken for the Client at a nearby site. The main outcomes of the desktop assessment were:
  - The published geological conditions are consistent with the observed nature of the site and experience from nearby site investigations. However, T+T are aware that the site was subject to earthworks, and as such, the landform has been modified. It is inferred that site-won fill will be present across the site.
  - The historical aerial imagery (1976 to 2025) indicates that the site was generally consistent until approximately 2023, at which time it appears that the earthworks were undertaken, consistent with T+T's understanding.
  - There was no existing geotechnical investigation at the site, however, T+T had undertaken investigations approximately 1.6 km to the north of the site for the Client. These investigations comprised test puts, which encountered ground conditions consistent with the published geological conditions, while also encountering obstructions within the peat soils.
- A site-specific geotechnical investigation comprising 51 Cone Penetration Tests (CPTs) was undertaken by Underground Investigation under the supervision of T+T, in two stages:
  - Stage 1 of the investigation comprised 13 CPTs to a target depth of 12 m bgl across the wider site to establish a general understanding of the subsurface conditions.
  - Stage 2 if the investigation comprised 38 CPTs to a target depth of 8 m bgl, with the investigation focused on the proposed laying shed and packhouse structures that form the main egg farm infrastructure.
- The CPT investigations have been processed using CPeT-IT software, with the resulting information used to infer stratigraphic layering of the subsurface soils to inform the development of a geological ground model using Leapfrog 3D geological modelling software.
- Interpretation of the ground conditions for the project have been made based on the primary geotechnical hazard hypothesised to pose the greatest risk to the proposed development, qualitatively assessed to be settlement risk. Materials that are considered to pose this risk are grouped and described as "*soft cohesive and/or peat material"*. The depth to and thickness of this material based on the inferred ground conditions are summarised.
- In the absence of site-specific groundwater monitoring information, the groundwater conditions for the site have been assessed based on the proximity of the site to the coastline (considering typical hydraulic gradients), the desktop assessment, and with due consideration of the geotechnical assessments being undertaken and the likely influence of groundwater assumptions on those assessments. Further investigation and assessment will be required ahead of detailed design to validate assumptions made and/or refine the groundwater levels adopted.
- A geotechnical assessment has been undertaken considering the geotechnical hazards relevant to the site. Quantitative assessments have been undertaken for settlement and liquefaction based on a qualitative assessment of the ground conditions. The outcomes are summarised as follows:
  - Consolidation settlement has been assessed to understand the potential effects of earthworks and imposed loads on the underlying cohesive soils from the proposed egg farm. The assessment has been undertaken utilising Settle3 software, considering the pre- and post- development earthworks (cut and fill) undertaken and proposed at the site, and the anticipated loading conditions from the proposed structures (laying sheds and packhouse). For the laying sheds, we have presented an estimated consolidation settlement range of 50 mm to 400 mm, with a 'T90' (i.e. the amount of time it takes for

90% of primary consolidation to take place) ranging between 3 months and 20 months. For the central packhouse, we have presented an estimated consolidation settlement range of 1,000 mm to 1,200 mm, with a 'T90' ranging between 10 months and 20 months. The greatest settlements and longer 'T90' timeframes are predicted near the central portion of the site, corresponding to areas where the inferred soft cohesive and/or peat material is thickest (up to approximately 5 m) and the imposed loading is greatest.

- A seismic assessment has been undertaken assuming a 50 year design life and an importance level 2 structure, which is associated with the packhouse. There is an opportunity to consider a lower importance level for some structures. The seismic assessment has been completed using the MBIE Module 1 Guideline, with the SLS and ULS design shaking parameters for geotechnical assessment and design adopted accordingly. Based on the inferred ground conditions, the site is classified as a subsoil Class D – Deep or soft soil sites.
- Liquefaction hazard and consequence have been assessed in a staged approach, considering susceptibility, triggering, and then consequence, chronologically. Based on the inferred ground conditions, certain units within the stratigraphy are considered susceptible to liquefaction. Liquefaction triggering has been assessed based on Boulanger & Idriss (2014), considering the ULS shaking conditions, alongside a sensitivity analysis for PGA below, between, and beyond the SLS and ULS conditions. The results indicate that no liquefaction triggering at SLS conditions will be negligible but that under ULS conditions there are layers of liquefaction triggering within the soil profile across the site. The consequence of liquefaction to the site is free-field settlement, with estimates based on Zhang et al (2002) indicating up to approximately 100 mm of seismic settlement when considering all CPTs, and 30 mm of seismic settlement when considering the Stage 2 CPTs focused at proposed structure locations. It is also highlighted that based on the PGA sensitivity assessment, it appears that there is a step change in the behaviour of the ground at levels of shaking between SLS and ULS, meaning that the structures may have adverse performance at lower shaking levels than ULS. This should be considered by the other design disciplines providing input to the project.

- The development may predominantly be founded on shallow foundations. Where structures or connecting infrastructure spans across areas of thick, soft cohesive and/or peat materials, resulting in predicted total magnitude of settlement being excessive or differential settlements exceeding accepted design tolerances, then mitigation measures and/or alternative foundations may be required. Connections between structures and machinery/equipment that is sensitive to movement (e.g., conveyors, processing plant, etc.) may need to be designed to accommodate differential movement or allow for reactive adjustment to accommodate differential movement, respectively.
- Other geotechnical considerations that should be considered by the structural, mechanical, and civil designers providing input to the project have been outlined.
- Further geotechnical input will be required to support the project in ensuing assessment, design, and construction stages. This includes additional site investigations, the opportunity for geotechnical review and alignment with other designers, detailed design, the provision of an earthworks specification, review of ground conditions during construction validate assumptions made in geotechnical assessment and design, and provision of documentation to confirm construction in accordance with the design.

13 Applicability

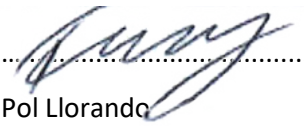
This report has been prepared for the exclusive use of our client Te Rūnanga o NgaiTakoto Custodian Trustee Limited, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written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

We understand and agree that our client will submit this report as part of an application for resource consent and that Far North District Council and/or Northland Regional Council as the consenting authority will use this report for the purpose of assessing that application.

Recommendations and opinions in this report are based on data from discrete investigation locations. The nature and continuity of subsoil away from these locations are inferred but it must be appreciated that actual conditions could vary from the assumed model.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:



Pol Llorando
Geotechnical Engineer

Reviewed by:

Ben Francis
Senior Geotechnical Engineer /
Project Manager

Authorised for Tonkin & Taylor Ltd by:

Mark Child
Project Director

3-Feb-26
p:\1099963\issueddocuments\3. giar\v2 - final\1099963_t+t giar - sandhills road proposed egg farm_v2.docx

Appendix A Chester Engineering Consultants Ltd Design Drawings

CIVIL ENGINEERING DRAWING SCHEDULE:

SHEET	TITLE	REVISION	REVISION DATE: 10/12/2025								
C001	DRAWING SCHEDULE	0									
C002	NOTES AND ABBREVIATIONS	0									
C100	EXISTING SITE PLAN	0									
C110	PROPOSED SITE PLAN	0									
C111	ENLARGED SITE PLAN	0									
C200	EARTHWORKS PLAN	0									
C201	EARTHWORK CROSS SECTION A-A	0									
C202	EARTHWORK CROSS SECTION B-B	0									
C210	EROSION AND SEDIMENT CONTROL PLAN	0									
C410	DEVELOPMENT CATCHMENTS ASSESSMENT PLAN	0									
C420	STORMWATER LAYOUT PLAN - PRIVATE	0									
C421	ENLARGED STORMWATER PLAN	0									
C422	STORMWATER OUTLET DETAIL	0									
C510	WASTEWATER LAYOUT PLAN - PRIVATE	0									
C511	ENLARGED WASTEWATER PLAN	0									
C800	PRIVATE ACCESSWAY PLAN	0									
C801	PRIVATE ACCESSWAY DETAILS	0									

SCHEDULE LEGEND	
ORIGINAL ISSUE	0
NOT REVISED	
REVISED	1
NOT INCLUDED IN SET	-
DELETED FROM SET	~~TITLE~~

TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
284 & 458 SANDHILLS ROAD, AWANUI

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: DRAWING SCHEDULE

DRAFT
FOR COMMENT ONLY

DRAWING: C001 REV: 0
SCALE: NTS @ A1
PROJECT: 16007
ISSUE: CONSENT

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GENERAL ABBREVIATIONS:

EX	EXISTING
PROP	PROPOSED
BNDY	BOUNDARY
RL	REDUCED LEVEL
FFL	FINISH FLOOR LEVEL
GFL	GARAGE FLOOR LEVEL
RW	RETAINING WALL
TOW	TOP OF WALL
BOW	BOTTOM OF WALL

UTILITY ABBREVIATIONS:

SW	STORMWATER
WW	WASTEWATER
PUB.	PUBLIC
PRIV.	PRIVATE
IC	INSPECTION CHAMBER (675mmØ AND LARGER)
IP	INSPECTION POINT (100/150mmØ)
CP	CATCH PIT
SP	SPLAY PIT
LL	LID LEVEL
INV	INVERT LEVEL
RCRRJ	REINFORCED CONCRETE RUBBER RING JOINT
CLn	CLASS n CONCRETE
PE	POLYETHYLENE
uPVC	UNPLASTICIZED POLYVINYL CHLORIDE
AC	ASBESTOS CONCRETE
VC	VITRIFIED CLAY
EW	EARTHENWARE
CONC	CONCRETE
CLS	CEMENT LINED STEEL
DI	DUCTILE IRON
WS	WATER SERVICE
SV	SLUICE VALVE
GV	GATE VALVE
FH	FIRE HYDRANT
EC	END CAP
FP	FLUSHING POINT
AB	ANCHOR BLOCK
E	ELECTRICAL POWER
G	NATURAL GAS
T	TELECOMMUNICATIONS
CS	COMBINED SERVICES

GEOMETRY ABBREVIATIONS:

L	LEFT
R	RIGHT
CL	CENTRE LINE
HP	HIGH POINT
LP	LOW POINT
CH	CHAINAGE
BOA	BEGIN OF ALIGNMENT
EOA	END OF ALIGNMENT
BP	BEGIN POINT
EP	END POINT
MID	MIDDLE POINT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
IP	INTERSECTION POINT
BLS	BEGIN LONGSECTION
ELS	END LONGSECTION
VPC	VERTICAL POINT OF CURVATURE
VPT	VERTICAL POINT OF TANGENCY
BRK	GRADE BREAK
K	CURVE COEFFICIENT

CONTRACTOR CONSENT NOTES:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE RELEVANT STANDARDS, PROCESSES, AND APPROVALS REQUIRED TO EXECUTE WORK AS APPROVED BY RESOURCE CONSENT, BUILDING CONSENT, AND/OR ENGINEERING APPROVAL.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE RELEVANT STANDARDS, PROCESSES, AND APPROVALS REQUIRED TO WORK ON OR IN CLOSE PROXIMITY TO PUBLIC AND PRIVATE UTILITIES.
3. NOTES RELATING TO SPECIFIC APPROVALS AND/OR CONSENTS WITHIN THESE PLANS, OR IN RELATED REPORTS PREPARED BY CHESTER, ARE NOT INCLUSIVE OF ALL APPROVALS AND/OR CONSENTS REQUIRED TO EXECUTE THE WORK.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INFORM THE ENGINEER IF THE CONTRACTOR HAS DETERMINED THAT THE WORK CAN NOT BE EXECUTED IN ACCORDANCE WITH THE APPLICABLE STANDARDS, APPROVALS, AND/OR CONSENTS.
5. CONTRACTOR TO SECURE APPROVAL WHEN EXECUTING WORK WITHIN THE ROAD CORRIDOR FROM THE TERRITORIAL AUTHORITY AND/OR THE ROAD CONTROLLING AUTHORITY.
6. CONTRACTOR TO SECURE APPROVAL WHEN WORKING IN CLOSE PROXIMITY TO PUBLIC STORMWATER, WASTEWATER, WATER SERVICE ASSETS FROM THE TERRITORIAL AUTHORITY AND/OR ASSET OWNER/OPERATOR.
7. CONTRACTOR TO SECURE APPROVAL WHEN WORKING ON OR IN CLOSE PROXIMITY TO ELECTRICAL POWER, TELECOMMUNICATIONS, FIBRE, NATURAL GAS OR OTHER SERVICES FROM THE SERVICE OWNER/OPERATOR.

GENERAL NOTES:

1. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED AGAINST THE SITE DRAWINGS PRIOR TO COMMENCING WORK.
2. DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
3. ANY VARIATIONS OR DISCREPANCIES ARE TO BE REFERRED TO CHESTER CONSULTANTS LTD FOR RESOLUTION.
4. ALL SERVICES ARE TO BE LOCATED AND FLAGGED PRIOR TO COMMENCING WORK ON SITE.
5. WORKS TO BE IN ACCORDANCE WITH WSL STANDARDS, AUCKLAND COUNCIL STANDARDS, AND THE NEW ZEALAND BUILDING CODE.
6. THE CONTRACTOR IS TO OBTAIN ALL NECESSARY CONSENTS AND PERMITS FOR WORKS ON, IN, AND AROUND EXISTING SERVICES, ASSETS, AND THE ROAD AND ROAD RESERVE.
7. ELECTRONIC FILES PROVIDED AS SUPPLEMENTAL INFORMATION TO DRAWINGS AND REPORTS. IF DISCREPANCIES ARE FOUND BETWEEN ELECTRONIC FILES AND DRAWINGS, CONTRACTOR TO NOTIFY ENGINEER. DRAWINGS SHALL TAKE PRECEDENT OVER ELECTRONIC FILES UNLESS OTHERWISE NOTED OR DIRECTED BY ENGINEER.

UNDERGROUND UTILITIES NOTES:

1. UNDERGROUND UTILITIES SHOWN IN PLANS ARE BASED ON VARIOUS SOURCES OF DIFFERING QUALITY AND SHALL BE CONSIDERED INDICATIVE.
2. CONTRACTOR IS RESPONSIBLE FOR LOCATING UNDERGROUND UTILITIES TO CONFIRM LOCATIONS OF SHOWN UTILITIES OR IDENTIFY UTILITIES NOT SHOWN ON PLANS ALONG PATHS OF EXCAVATION.
3. IF UTILITY CLASHES ARE FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TOPOGRAPHIC DATA NOTES:

1. DRONE SURVEY DATA PROVIDED BY AERIAL VISION.
2. DRONE SURVEY DATA COLLECTED ON 22/08/2025.
3. DRONE IMAGERY PROVIDED BY AERIAL VISION AND CAPTURED ON 22/08/2025.
3. SUPPLEMENTAL GROUND DATA PROVIDED BY LINZ DATA SERVICE] AND DATED 2025.
4. SUPPLEMENTAL AERIAL IMAGERY PROVIDED BY LINZ AND DATED 2025.
5. DATA LOCATED ON MOUNT EDEN 2000 HORIZONTAL COORDINATE SYSTEM.
6. DATA SET TO NEW ZEALAND VERTICAL DATUM 2016.

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REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: NOTES AND ABBREVIATIONS

DRAFT
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DRAWING: C002 REV: 0
SCALE: NTS @ A1
PROJECT: 16007
ISSUE: CONSENT

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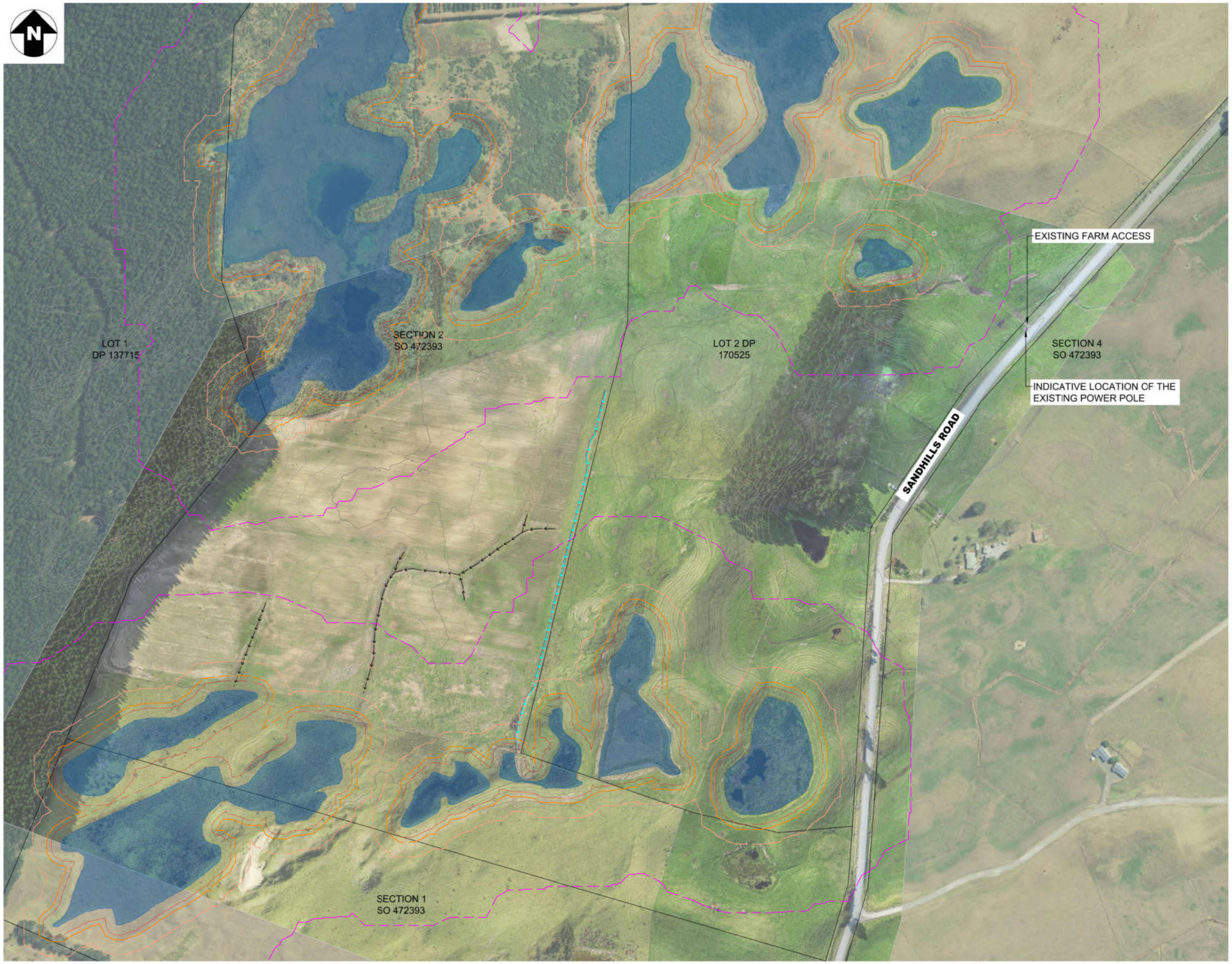
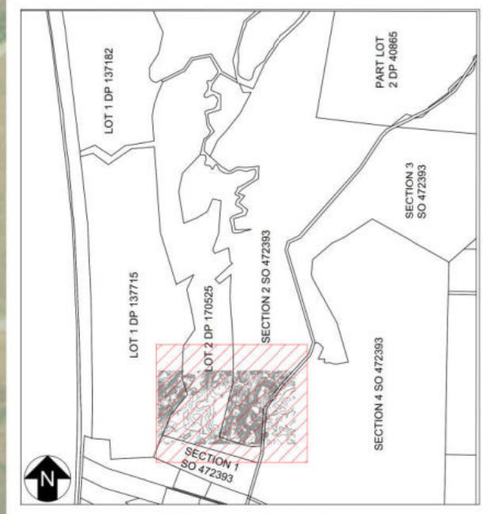
DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR



SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- EXISTING SWALE/ FARM DRAIN TO REMAIN
- EXISTING SWALE/ FARM DRAIN TO BE ABANDONED



1 **KEY PLAN**
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REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: EXISTING SITE PLAN

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DRAWING: C100 REV: 0
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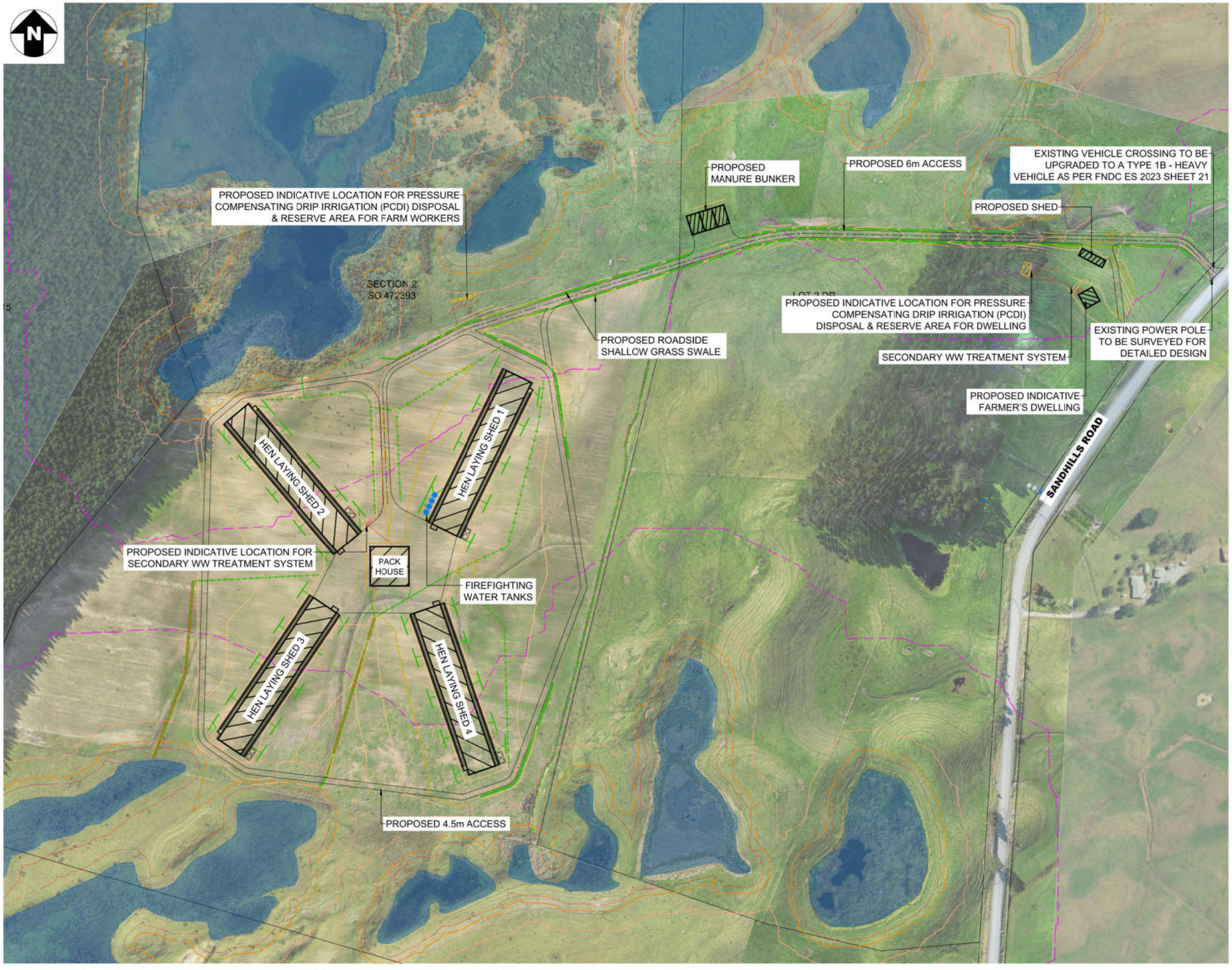

SITE LEGEND:

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- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- PROPOSED SWALE
- EXISTING SWALE/ FARM DRAIN
- PROPOSED CULVERT

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REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: PROPOSED SITE PLAN

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SCALE: 1:1500 @ A1
PROJECT: 16007
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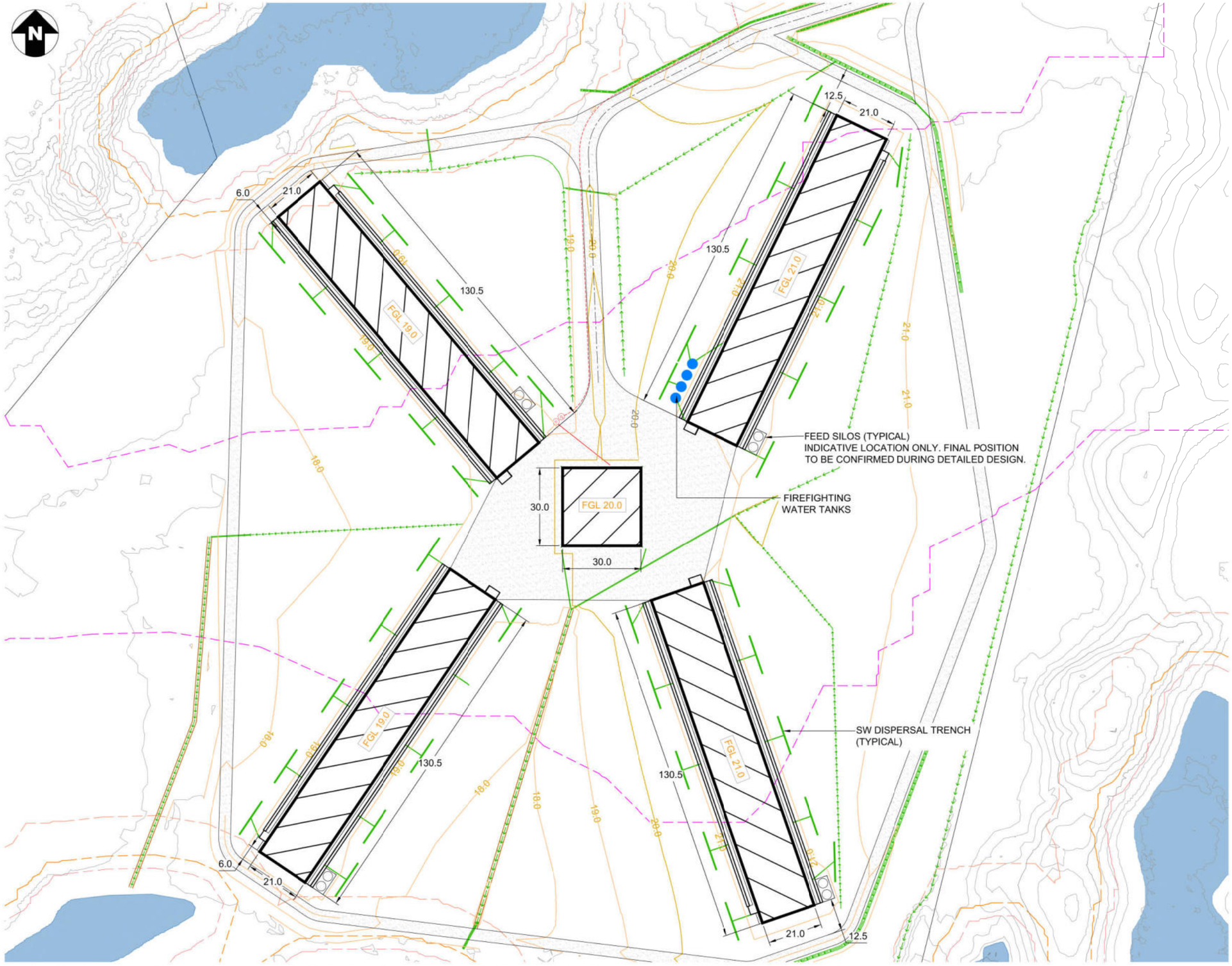

SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- PROPOSED SWALE
- EXISTING SWALE/ FARM DRAIN
- PROPOSED CULVERT

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

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REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: ENLARGED SITE PLAN

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DRAWING: C111 REV: 0
SCALE: 1:750 @ A1
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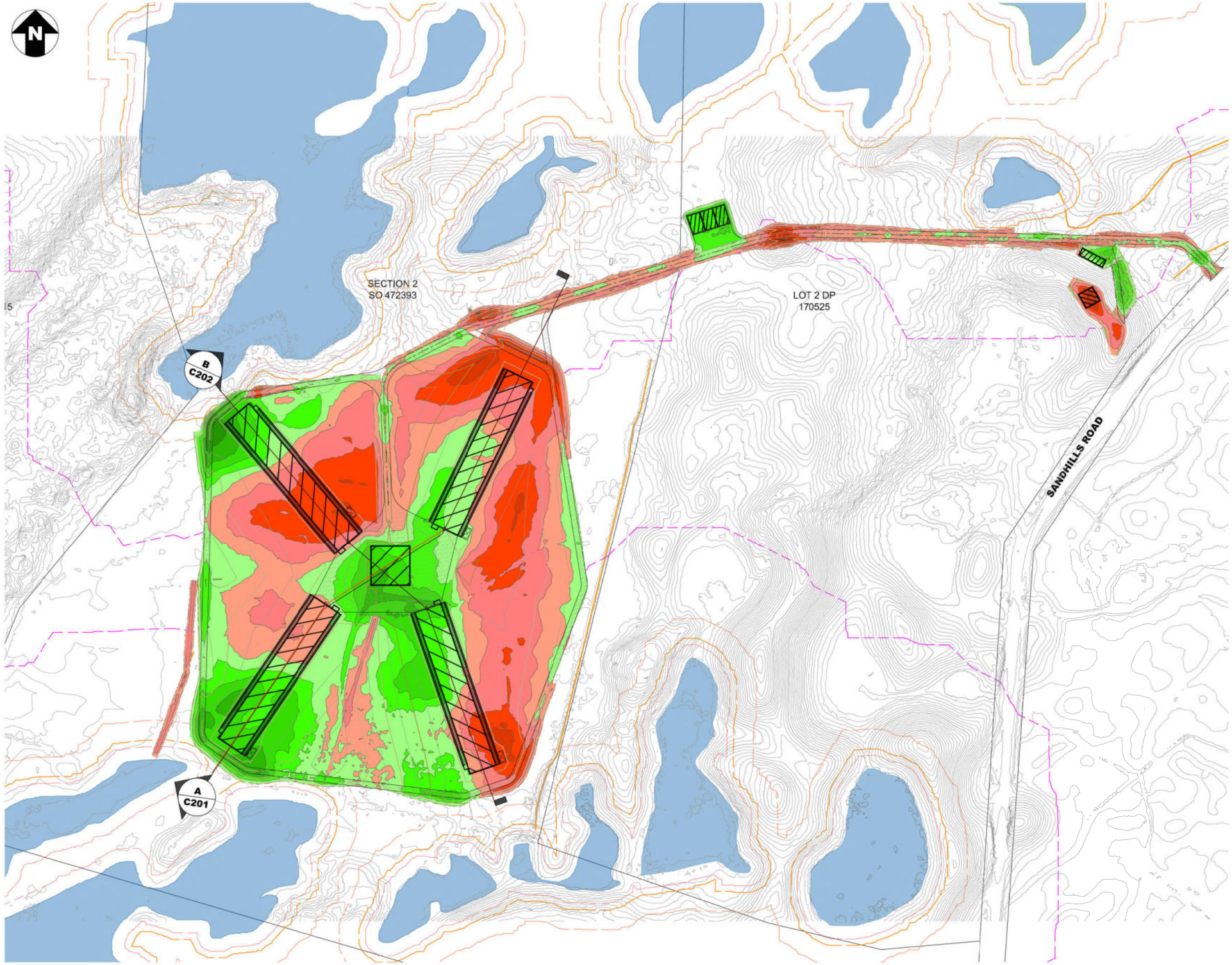
DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR



CUT/FILL DEPTHS TABLE

LOWER RANGE (m)	UPPER RANGE (m)	COLOUR
-3.00	-2.50	
-2.50	-2.00	
-2.00	-1.50	
-1.50	-1.00	
-1.00	-0.50	
-0.50	0.00	
0.00	0.50	
0.50	1.00	
1.00	1.50	
1.50	2.00	
2.00	2.50	

EARTHWORK VOLUMES:

CUT (m^3)	FILL (m^3)	NET (m^3)
-36875	28170	-8705
EARTHWORKS AREA (m^2)		102730

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1:1500 0 15 30 45 60 75 150

REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
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DATE: 10/12/2025

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CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: EARTHWORKS PLAN

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DRAWING: C200 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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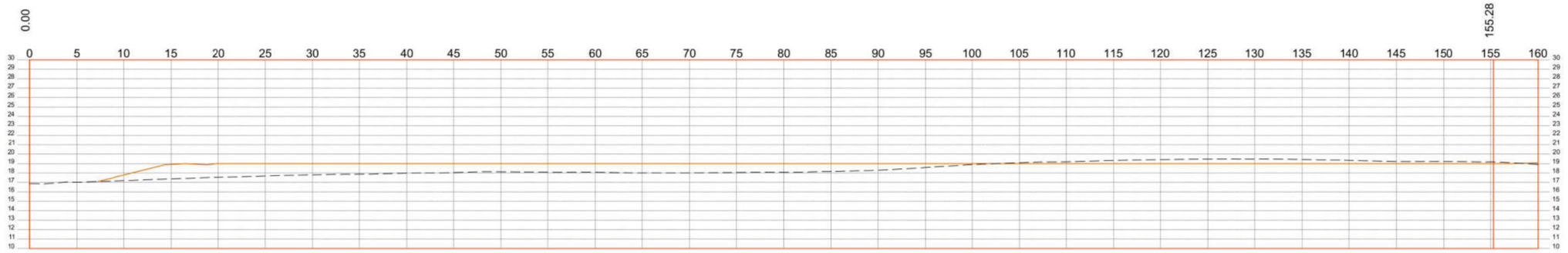
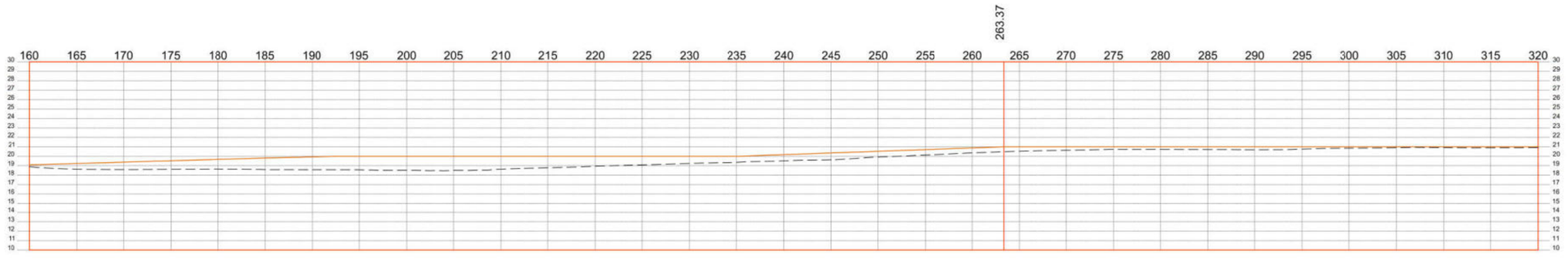
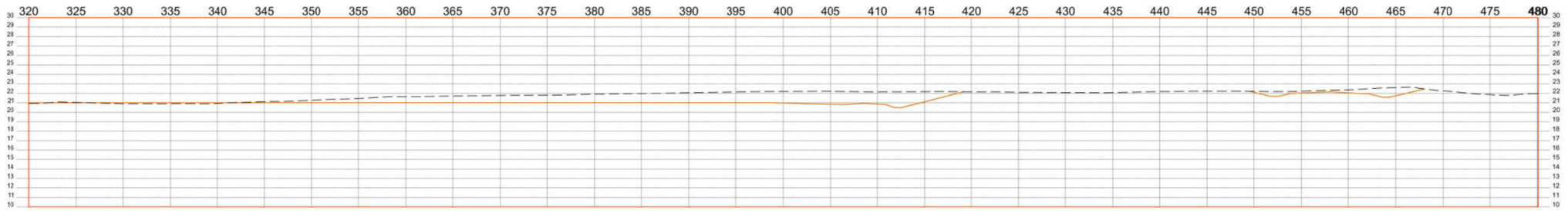


X SECTION A-A
DATUM: 10.00
VERT. EXAGGERATION 1:1



X SECTION A-A
DATUM: 10.00
VERT. EXAGGERATION 1:1



X SECTION A-A
DATUM: 10.00
VERT. EXAGGERATION 1:1

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:250 0 2.5 5.0 7.5 10 12.5 25

REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: EARTHWORK CROSS SECTION A - A

DRAFT
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DRAWING: C201 REV: 0
SCALE: 1:250 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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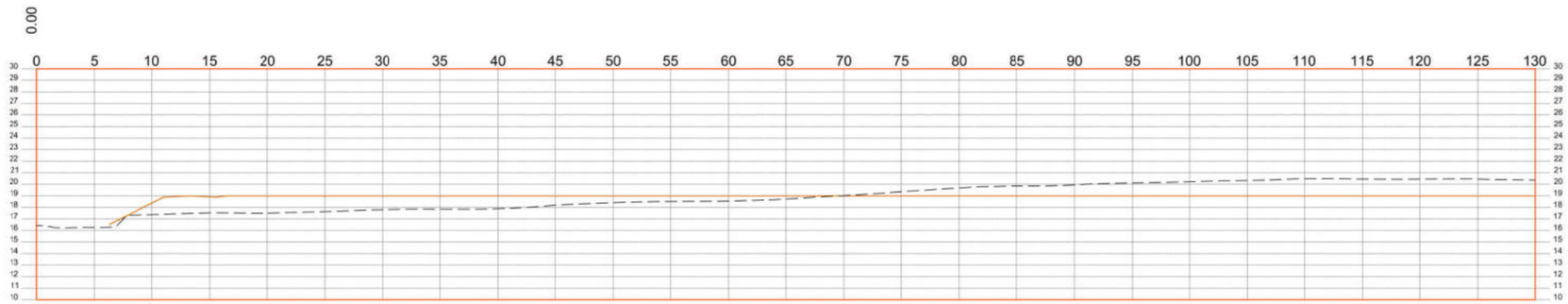
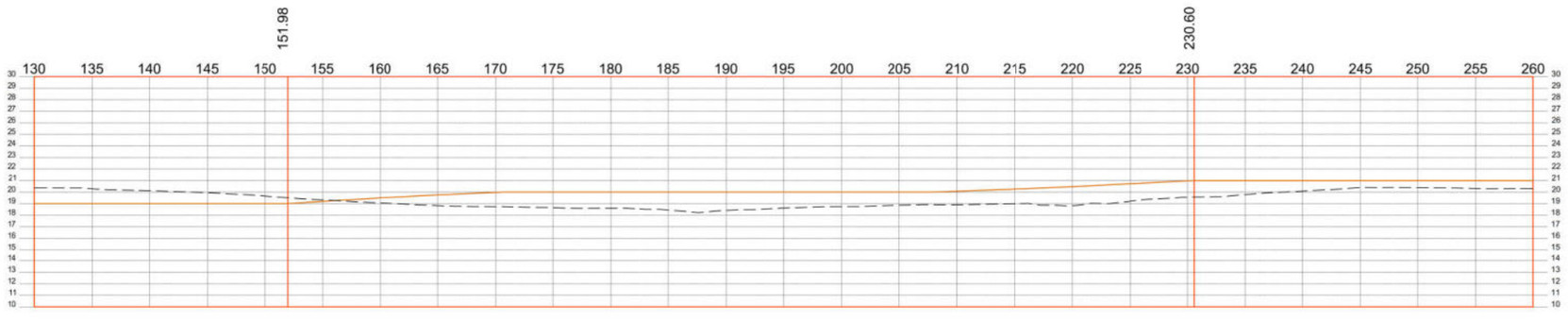


X SECTION B-B
DATUM: 10.00
VERT. EXAGGERATION 1:1



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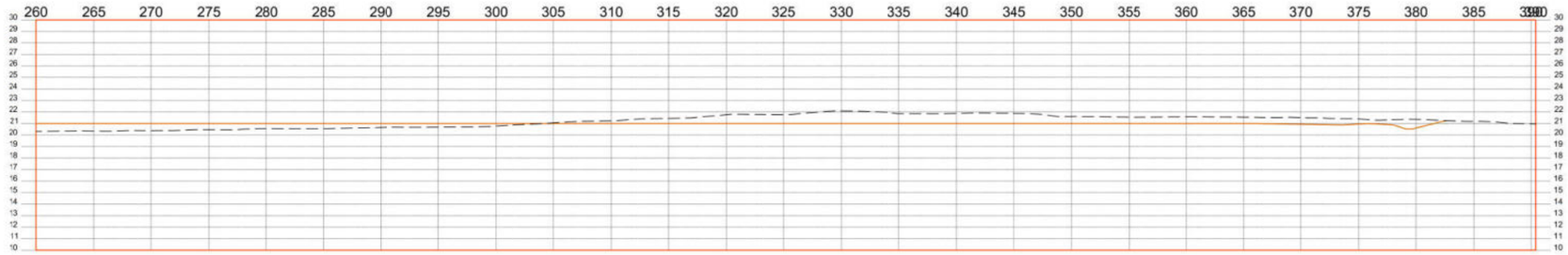
DATUM: 10.00
VERT. EXAGGERATION 1:1



X SECTION B-B
DATUM: 10.00
VERT. EXAGGERATION 1:1

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:250 0 2.5 5.0 7.5 10 12.5 25

REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: EARTHWORK CROSS SECTION B - B

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DRAWING: C202 REV: 0
SCALE: 1:250 @ A1
PROJECT: 16007
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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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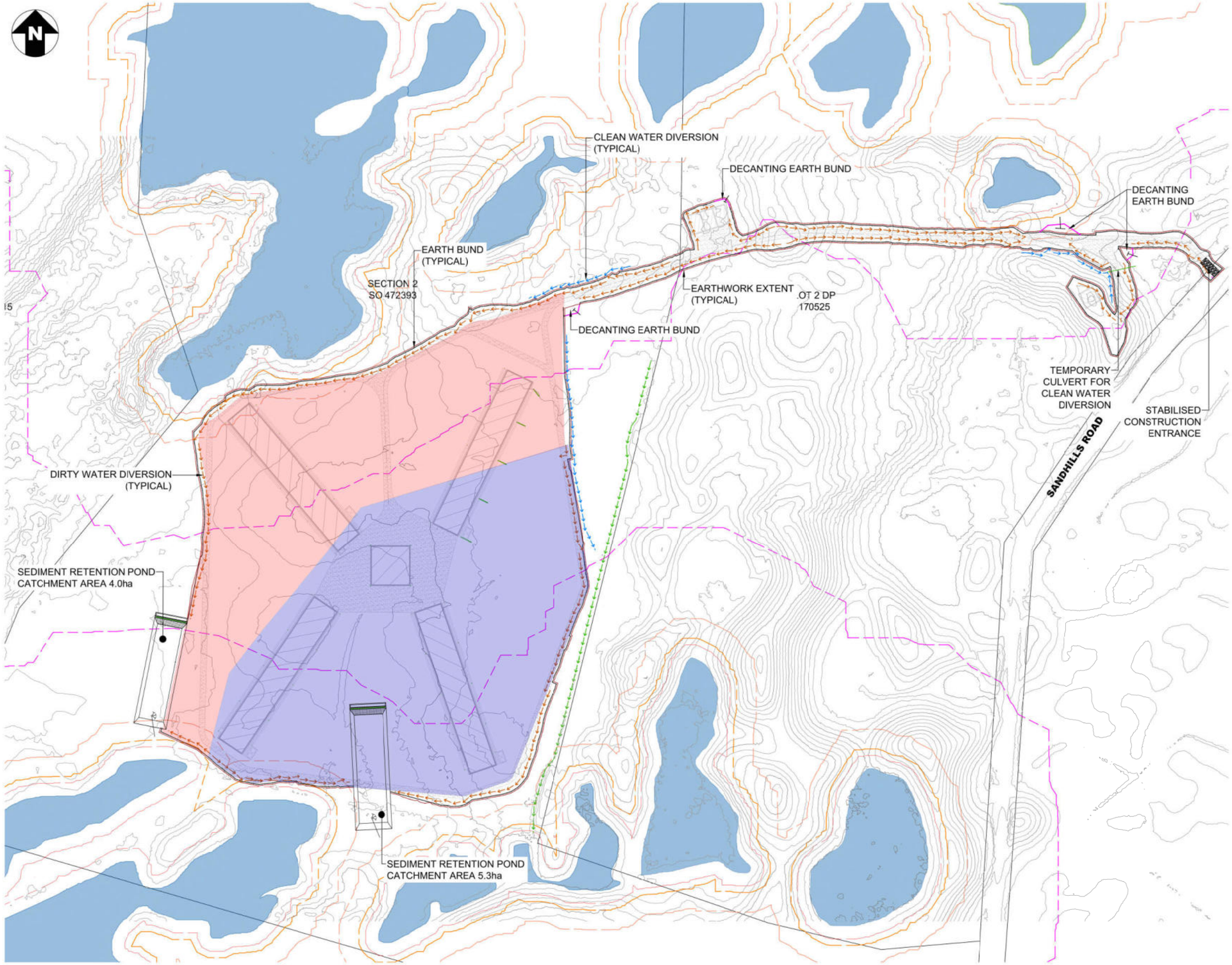

EARTHWORK NOTES:

1. CUT TO FILL VOLUMES ARE FROM EXISTING GROUND INCLUDING TOP SOIL TO FINAL GROUND INCLUDING TOPSOIL, PAVEMENT.
2. NO BULKING FACTORS HAVE BEEN USED IN THE VOLUME ESTIMATION.
3. TEMPORARY EARTHWORKS, SHORING, AND ENABLING WORKS TO BE DESIGNED BY OTHERS AND ARE THE RESPONSIBILITY OF THE CONTRACTOR.
4. WORKS ARE TO BE IN ACCORDANCE WITH AUCKLAND COUNCIL GUIDANCE DOCUMENT 2016/05 (GD05), EROSION AND SEDIMENT CONTROL GUIDE.
5. PLANS DETAIL THE GENERAL SEDIMENT AND EROSION CONTROL MEASURES. ACTUAL CONTROLS ARE TO BE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE TO BE ADAPTED TO SUIT THE CURRENT STAGE OF WORKS.

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:1500 0 15 30 45 60 75 150

REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: EROSION AND SEDIMENT CONTROL PLAN

DRAFT
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DRAWING: C210 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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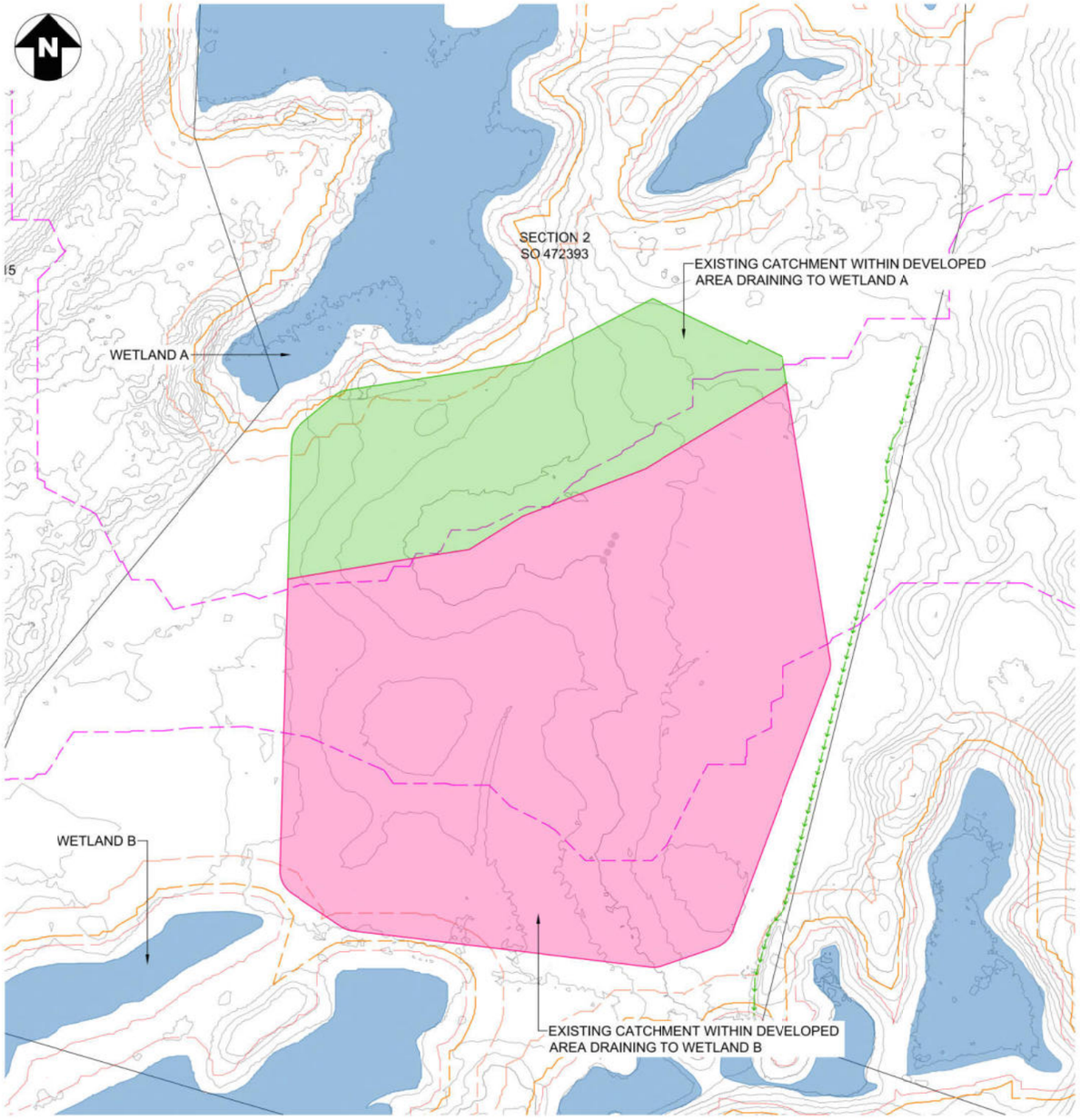

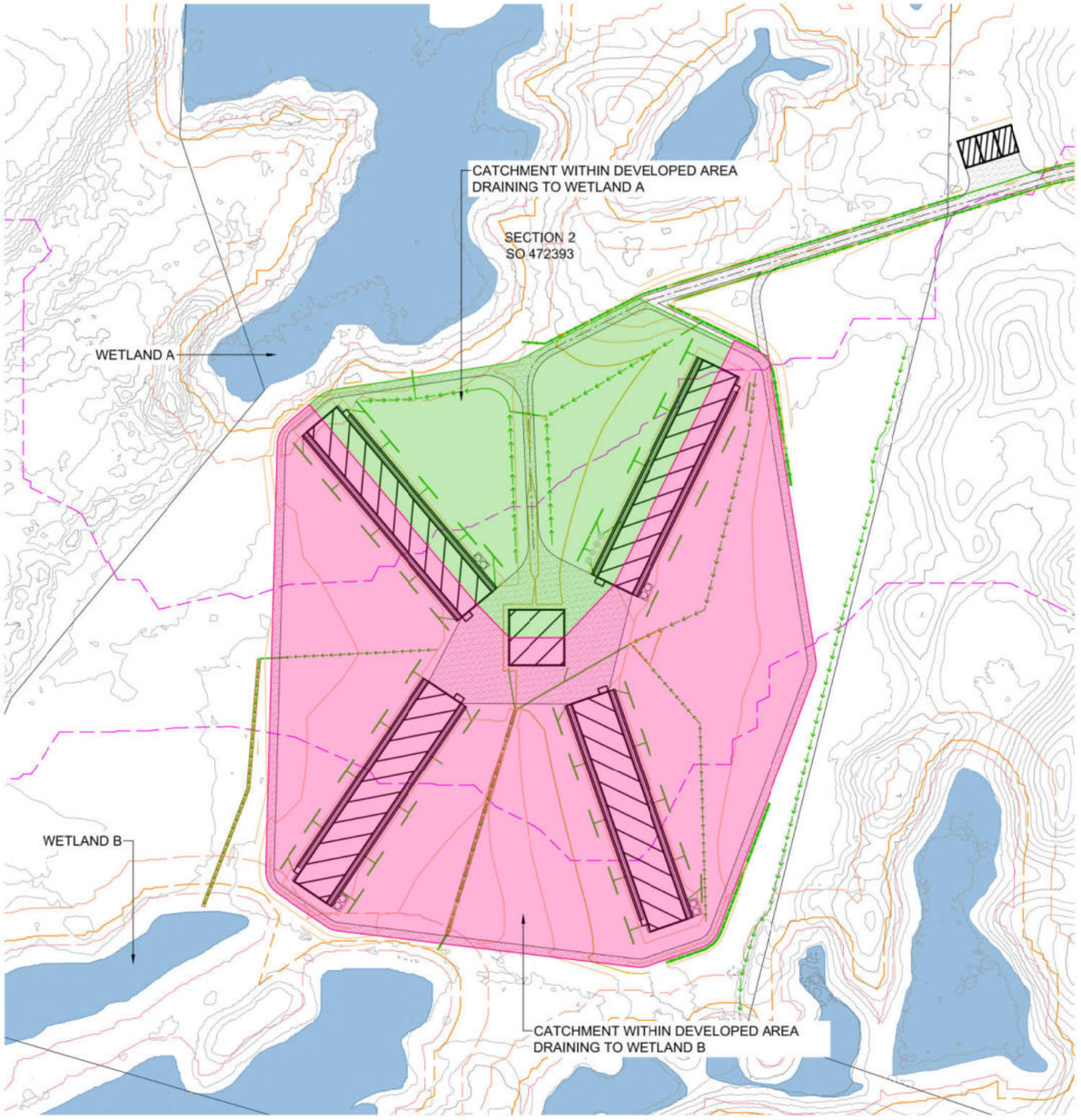

		Wetland A	Wetland B
Pre Development	Existing Roof Area (m²)	0	0
	Existing Access Area (m²)	0	0
	Existing Grass Area (m²)	21443	65965
	Existing Impervious area (m²)	**0**	**0**
	Existing Pervious area (m²)	**21443**	**65965**
Post Development	New Roof Area (m²)	4130	11490
	Existing Access Area (m²)	3504	7534
	Existing Grass Area (m²)	14659	46092
	New Impervious area (m²)	**7634**	**19024**
	New Pervious area (m²)	**14659**	**46092**

Runoff Depth Detail	
Rainfall Depth, P (mm)	25
NRCS Soil Class (Per GD01, Table 23)	B
Permeable NRCS Curve Number, CN (mm)	61
Permeable Initial Abstraction, Ia (mm)	5
Permeable Max Storage, S (mm)	162.4
Permeable Run-off Depth, Q (mm)	**2.2**
Impervious SCS Curve Number, CN (mm)	98
Impervious Initial Abstraction, Ia (mm)	0
Impervious Surface Max Storage, S (mm)	5.2
Impervious Run-off Depth, Q (mm)	**20.7**

		Wetland A	Wetland B
Pre Development	Existing Impervious area (m²)	0	0
	Existing Pervious area (m²)	21443	65965
	Pre-Development Runoff Volume (m³)	47	145
Post Development	New Impervious area (m²)	7634	19024
	New Pervious area (m²)	14659	46092
	Post-Development Runoff Volume (m³)	190	495
Pre & Post Development Runoff Volume Difference (m³)		**143**	**350**

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1:1500 0 15 30 45 60 75 150

REV	DATE	AMENDMENTS	BY
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DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: DEVELOPMENT CATCHMENTS ASSESSMENT PLAN

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DRAWING: C410 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
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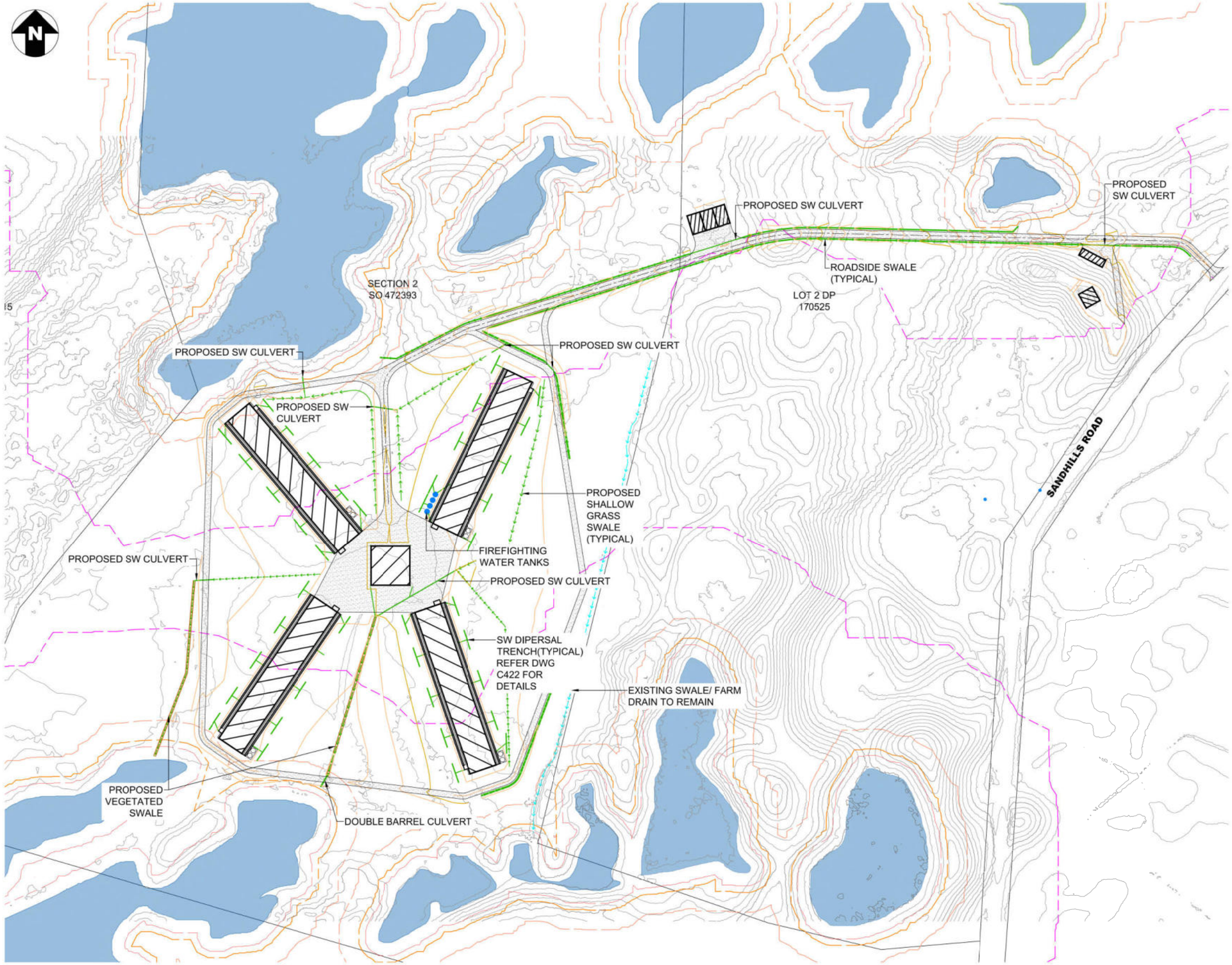

SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- PROPOSED SWALE
- EXISTING SWALE/ FARM DRAIN
- PROPOSED CULVERT

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:1500 0 15 30 45 60 75 150

REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: STORMWATER LAYOUT PLAN - PRIVATE

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DRAWING: C420 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
ISSUE: CONSENT

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

PROPOSED SW CULVERT

PROPOSED SW CULVERT

PROPOSED SW CULVERT

PROPOSED SW CULVERT

PROPOSED SW CULVERT

PROPOSED SHALLOW GRASS SWALE (TYPICAL)

FIREFIGHTING WATER TANKS

SW DIPERSAL TRENCH(TYPICAL) REFER DWG C422 FOR DETAILS

PROPOSED VEGETATED SWALE

EXISTING SWALE/ FARM DRAIN TO REMAIN

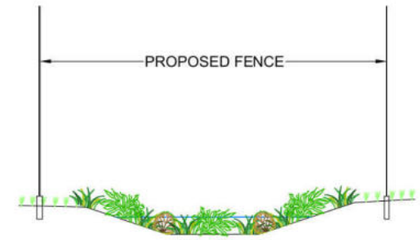
FGL 19.0

FGL 20.0

FGL 21.0

SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
- PROPOSED SWALE
- EXISTING SWALE/ FARM DRAIN
- PROPOSED CULVERT



PROPOSED VEGETATED SWALE TYPICAL SECTION

SCALE: 1:50

PROPOSED SHALLOW GRASS SWALE TYPICAL SECTION

SCALE: 1:50

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:750 0 7.5 15 22.5 30 37.5 75

REV	DATE	AMENDMENTS	BY
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DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: ENLARGED STORMWATER PLAN

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DRAWING: C421 REV: 0
SCALE: 1:750 @ A1
PROJECT: 16007
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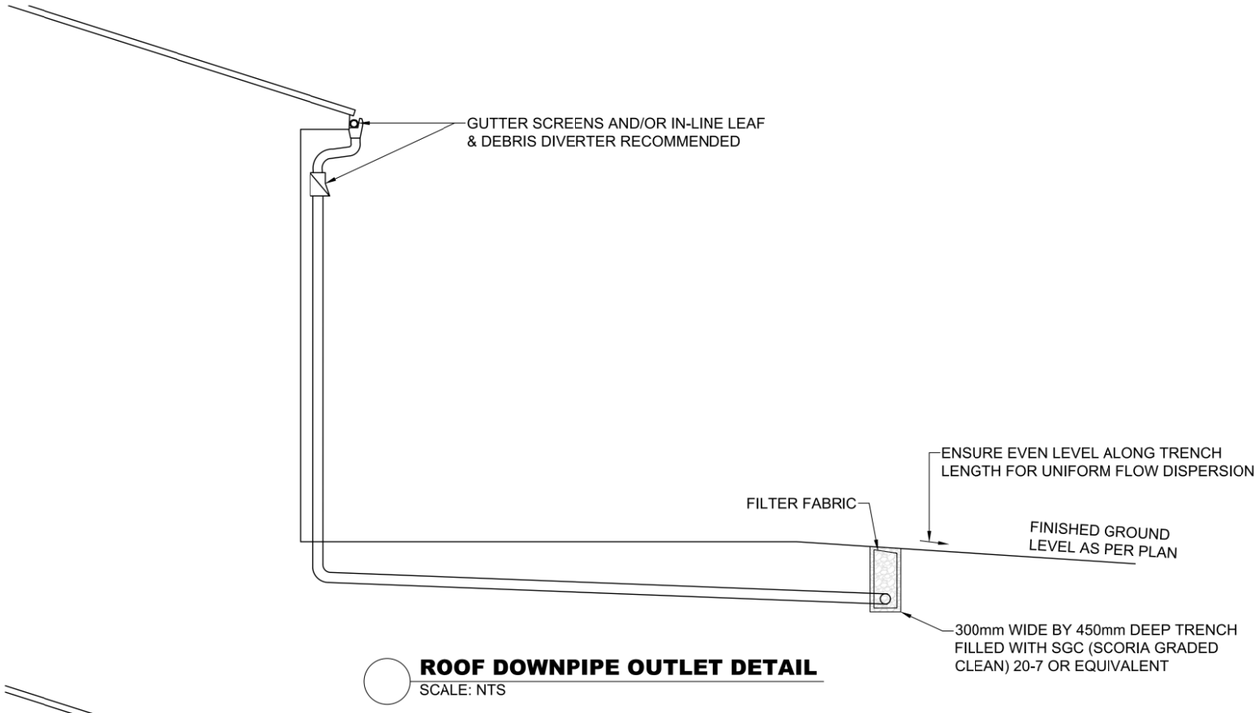
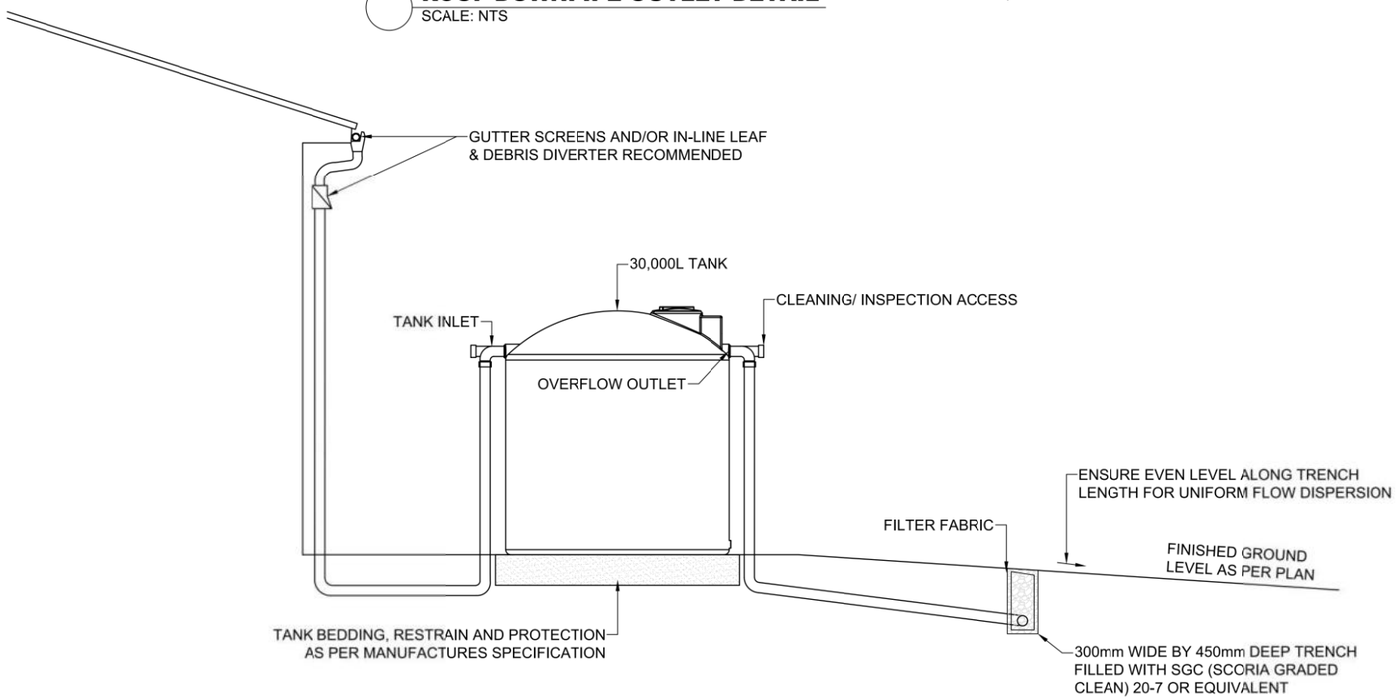
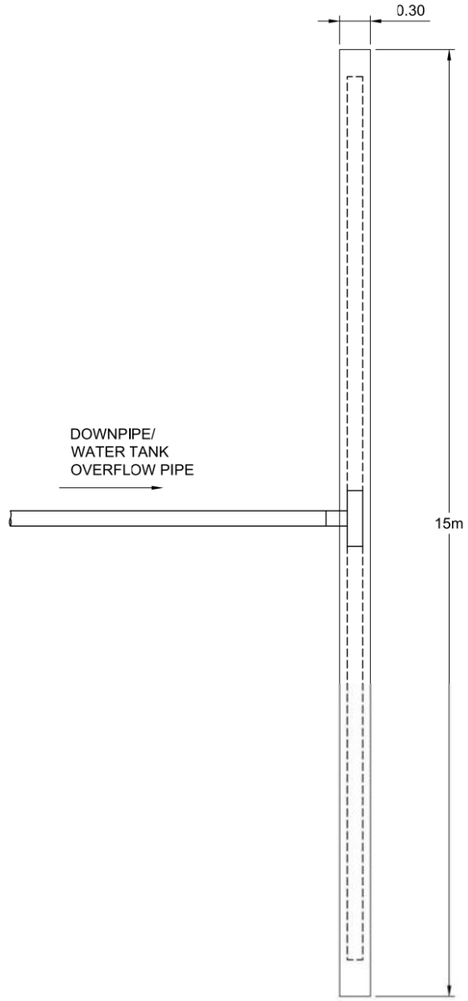


ROOF DOWNPIPE OUTLET DETAIL
SCALE: NTS



FIREFIGTING WATER TANK CONNECION AND OVERFLOW PIPE OUTLET DETAIL
SCALE: NTS



FLOW DISPERSAL TRENCH DETAIL
SCALE: NTS

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

REV	DATE	AMENDMENTS	BY
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DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: STORMWATER OUTLET DETAIL

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DRAWING: C422 REV: 0
SCALE: NTS
PROJECT: 16007
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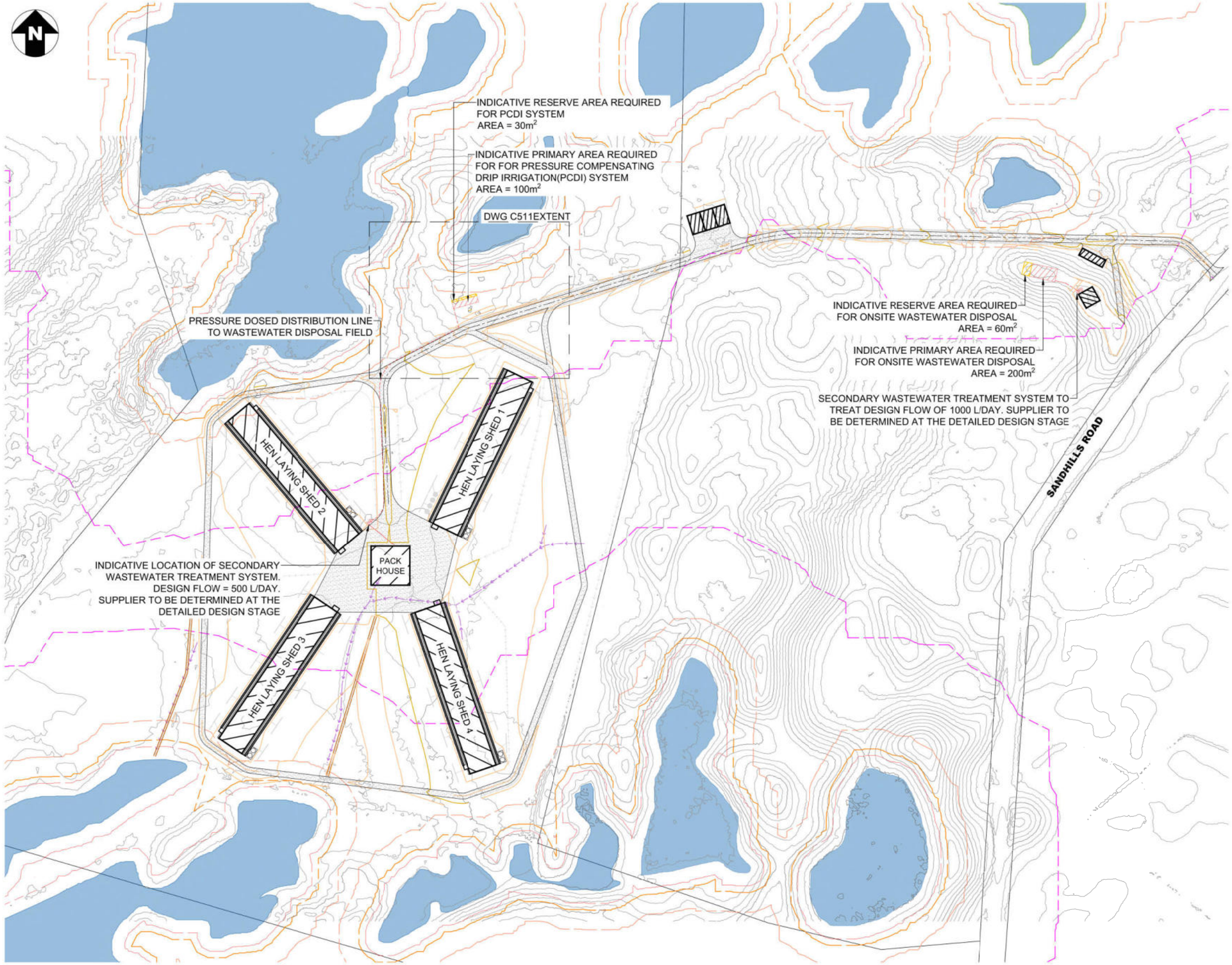

SITE LEGEND:

- 10m WETLAND SETBACK
- 15m WETLAND SETBACK
- 30m WETLAND SETBACK
- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

1:1500 0 15 30 45 60 75 150

REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: WASTEWATER LAYOUT PLAN - PRIVATE

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DRAWING: C510 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
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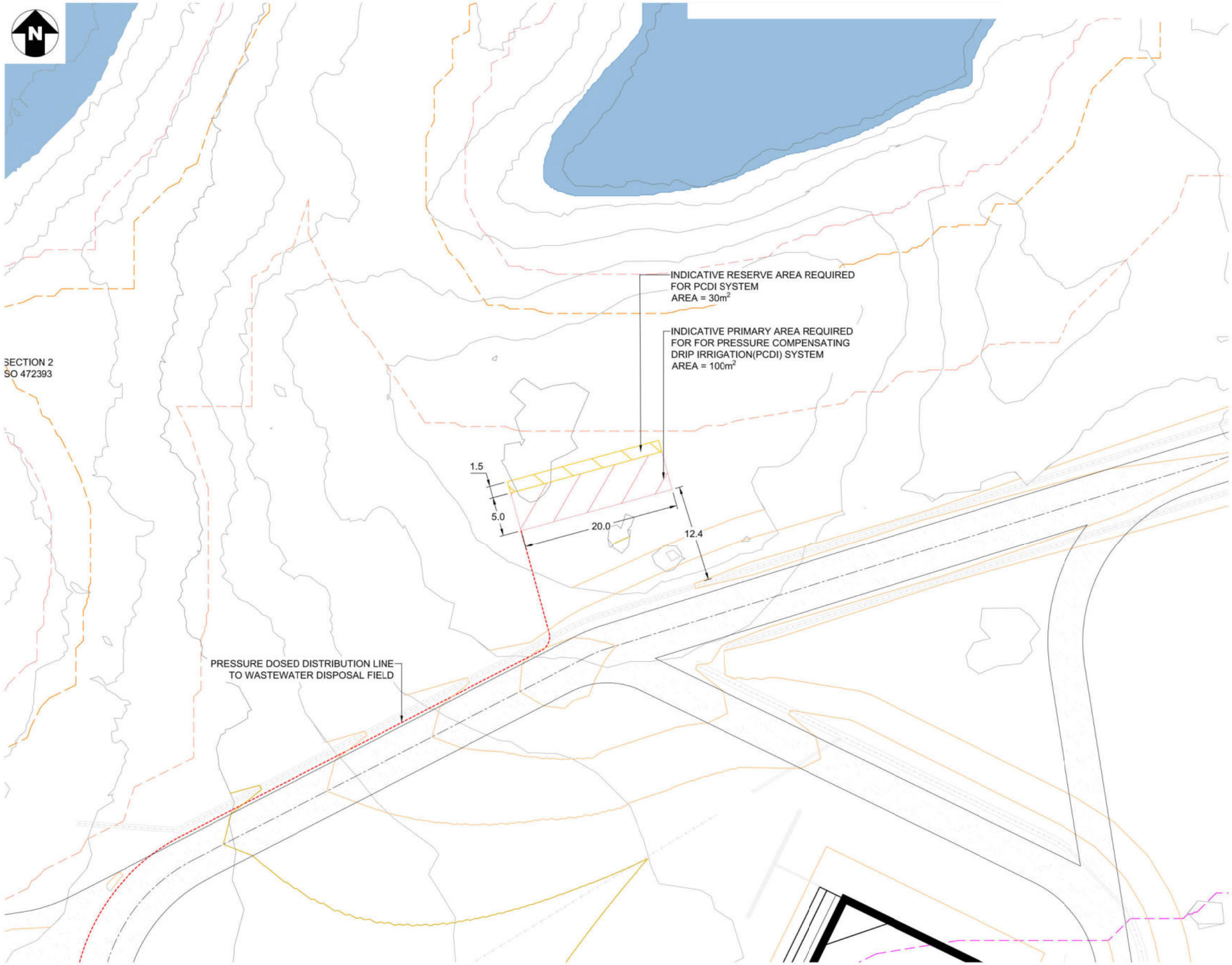

SITE LEGEND:

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- 15m WETLAND SETBACK
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- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST

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DRAFTER: S SIVA
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DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: ENLARGED WASTEWATER PLAN

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DRAWING: C511 REV: 0
SCALE: 1:250 @ A1
PROJECT: 16007
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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

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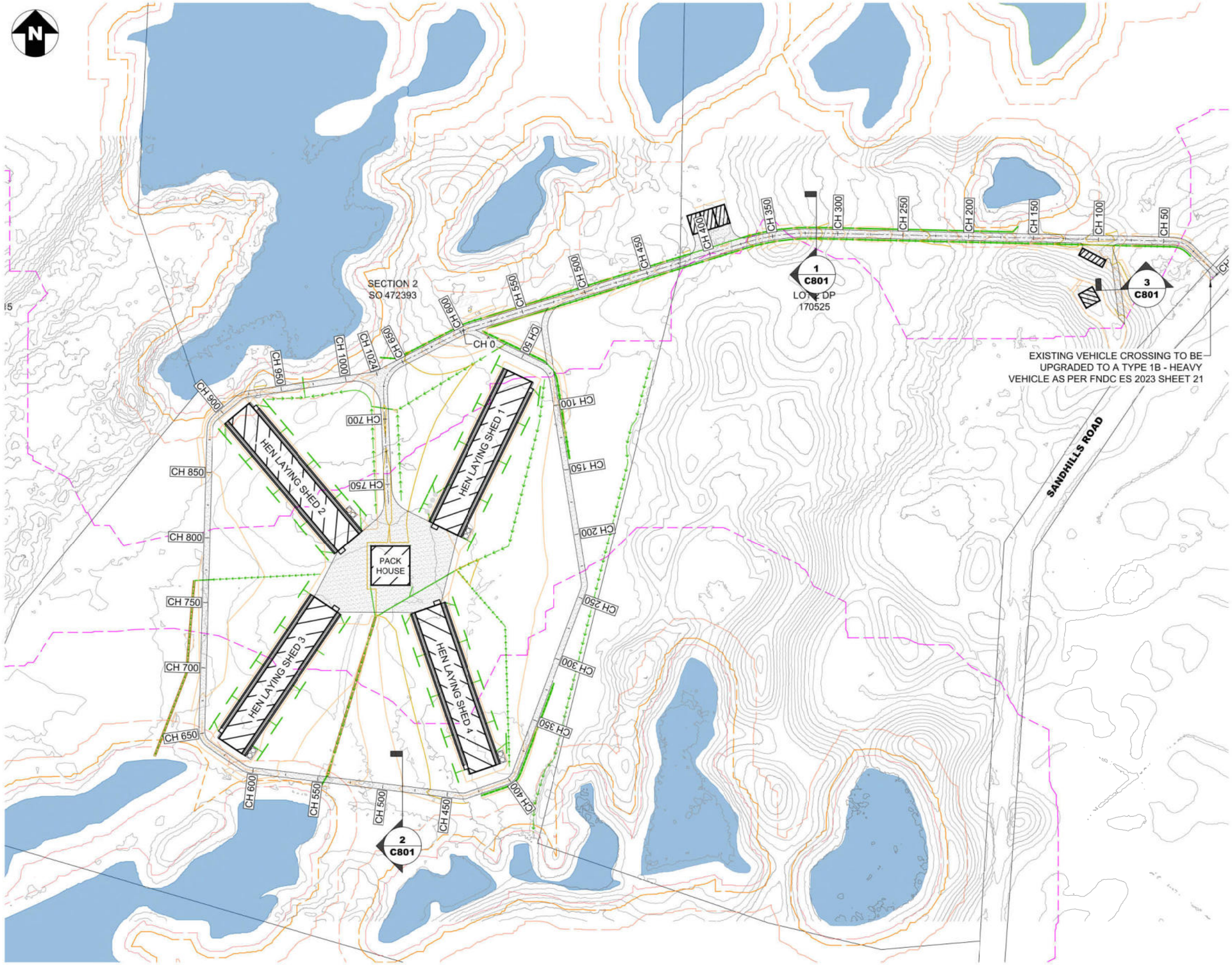

SITE LEGEND:

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- 100m WETLAND SETBACK
- WETLAND EXTENT FROM ECOLOGIST
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- PROPOSED CULVERT

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CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: PRIVATE ACCESWAY PLAN

DRAFT
FOR COMMENT ONLY

DRAWING: C800 REV: 0
SCALE: 1:1500 @ A1
PROJECT: 16007
ISSUE: CONSENT

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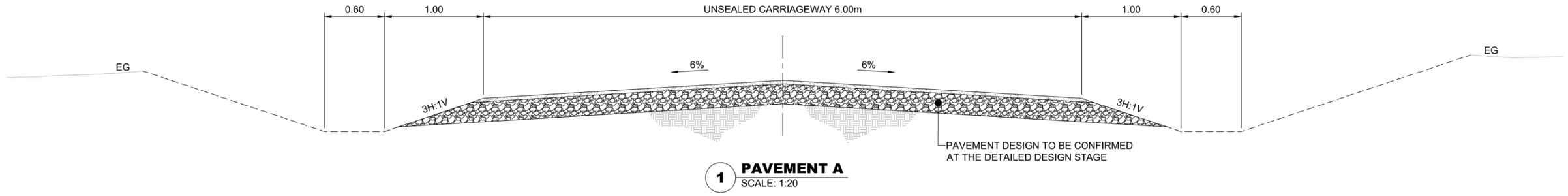
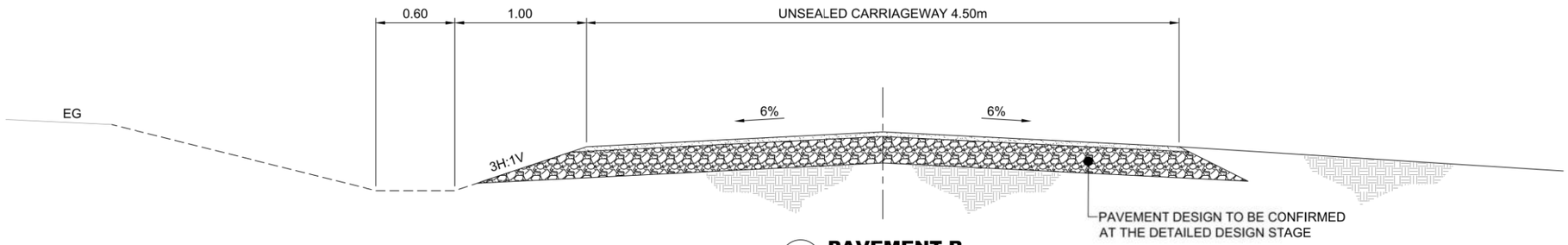
DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

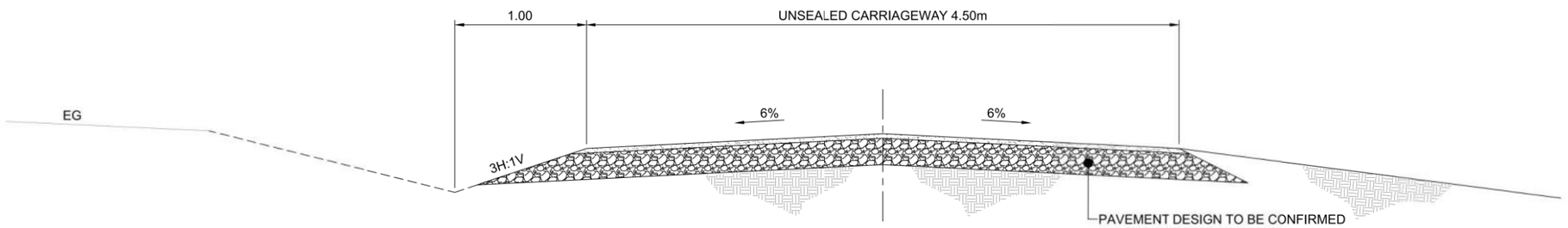
C:\Users\SivatharsanSivasharm\Chester Consultants\Central Library - 16007 - Sandhills 284 & 458\3.0 Design\3.2 Civil\3.2.1 ACAD\DWG Layouts\16007-C-DWG-800.dwg 1/23/2026 1:04 pm LAST SAVED BY: SIVATHARSANSIVASHANM



1 PAVEMENT A
SCALE: 1:20



2 PAVEMENT B
SCALE: 1:20



3 PAVEMENT C
SCALE: 1:20

DRAWING NOTE: DRAWING SET TO BE DISTRIBUTED AND READ IN ITS ENTIRETY. REFER TO DRAWING C001 FOR DRAWING SCHEDULE. REFER TO DRAWING C002 FOR NOTES, LEGENDS, AND ABBREVIATIONS UNLESS OTHERWISE NOTED.

REV	DATE	AMENDMENTS	BY
0	10/12/25	FOR CONSENT	SS

DRAFTER: S SIVA
DESIGNER: S SIVA
CHECKER: N JULL
DATE: 10/12/2025

JOB: TE RŪNANGA O NGAITAKOTO FREE RANGE EGG FARM
CLIENT: TE RUNANGA O NGAITAKOTO CUSTODIAN TRUSTEE LIMITED
ADDRESS: 284 & 458 SANDHILLS ROAD, AWANUI
DRAWING: PRIVATE ACCESSWAY DETAIL

DRAFT
FOR COMMENT ONLY

DRAWING: C801 REV: 0
SCALE: 1:20 @ A1
PROJECT: 16007
ISSUE: CONSENT

1:20 0 0.2 0.4 0.6 0.8 1 2

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DRAWING SET TO A1 DIMENSIONS AND CONTAINS ELEMENTS PLOTTED IN COLOUR

C:\Users\SivatharsanSivasharm\Chester Consultants\Central Library - 16007 - Sandhills 284 & 458\3.0 Design\3.2 Civil\3.2.1 ACAD\DWG Layouts\16007-C-DWG-800.dwg 1/23/2026 1:04 pm LAST SAVED BY: SIVATHARSANSIVASHANM

Appendix B Historical Aerial Images

Appendix B Table 1: Summary of historical aerial images reviewed

Date of image	Source
1976	Retrolens historical aerial image (SN5006)
1981	Retrolens historical aerial image (SN5932)
1985	Google Earth Pro historical aerial images
2012	
2015	
2017	
2021	
2023	
2023-2025	Far North Maps aerial images

Note: The red outline on each image indicates the approximate project location.

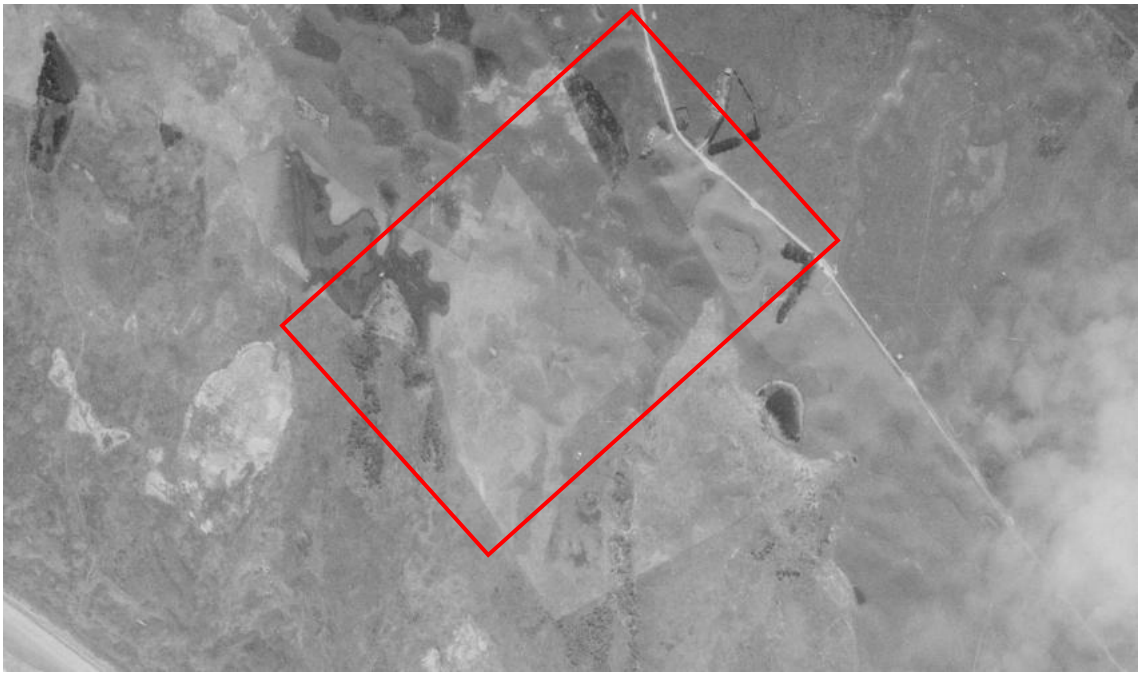

Figure Appendix B 1: Retrolens historical aerial image from the 1976 (SN5006). Note that the image is not oriented to the North as a function of the image available.

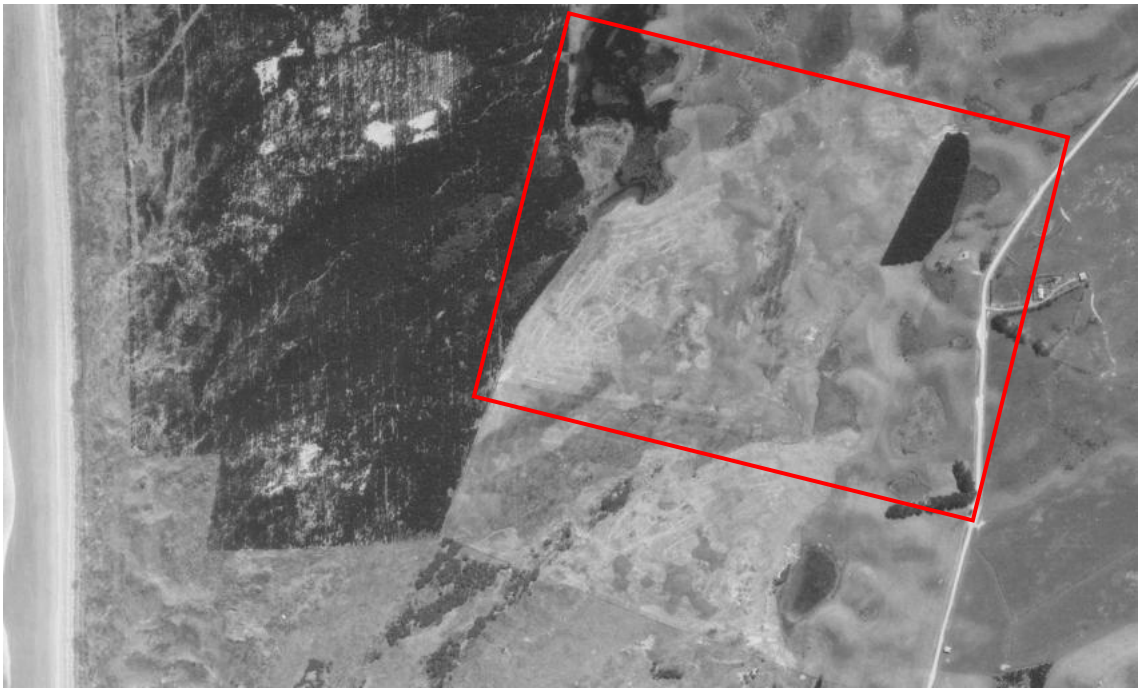

Figure Appendix B 2: Retrolens historical aerial image from the 1981 (SN5932). Note that the image is not oriented to the North as a function of the image available.

Figure Appendix B 3: Google Earth Pro historical aerial image from 1985.

Figure Appendix B 4: Google Earth Pro historical aerial image from 2012.

Figure Appendix B 5: Google Earth Pro historical aerial image from 2015.

Figure Appendix B 6: Google Earth Pro historical aerial image from 2017.

Figure Appendix B 7: Google Earth Pro historical aerial image from 2021.

Figure Appendix B 8: Google Earth Pro historical aerial image from 2023

Figure Appendix B 9: Far North Maps aerial image from 2023 to 2025.

Appendix C Site Investigations

- C1 – Stage 1 CPT Logs
- C2 – Stage 2 CPT Logs
- C2 – Site Plan & Geological Cross Sections

Underground Investigation Ltd
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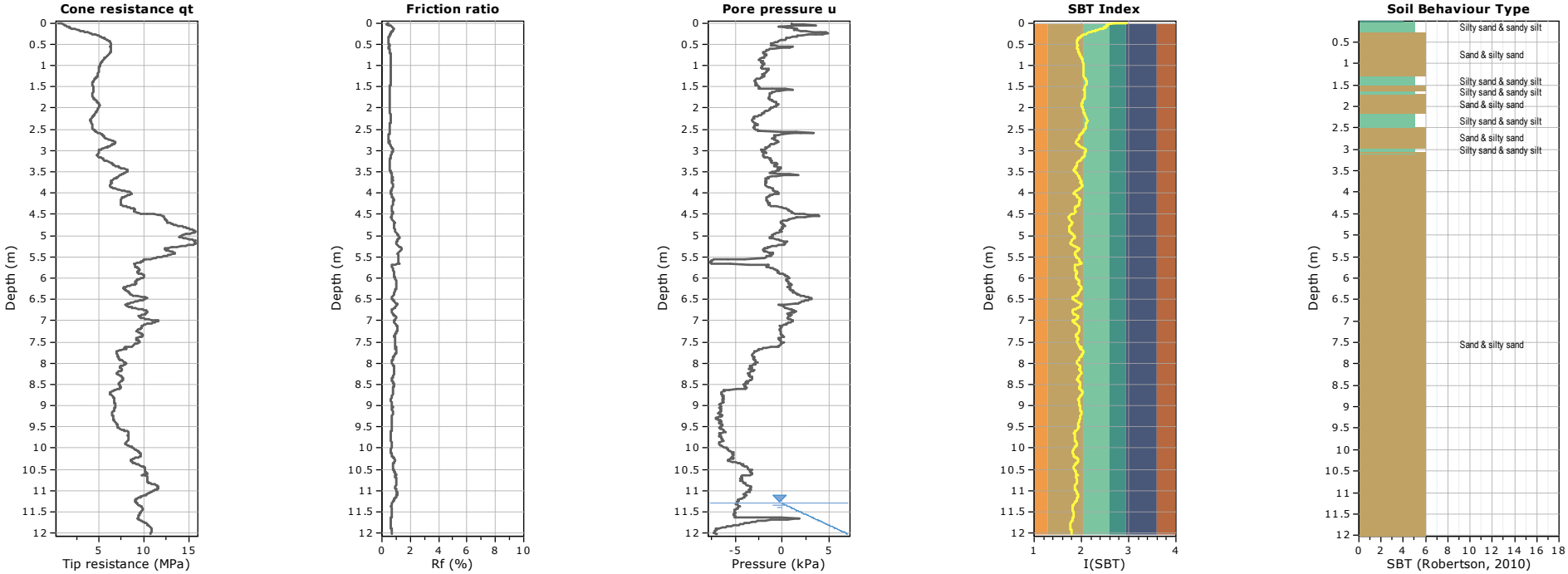
CPT: CPT01
Total depth: 12.02 m, Date: 18/09/2025
Surface Elevation: 22.00 m
Coords: X:1617195.00, Y:6117077.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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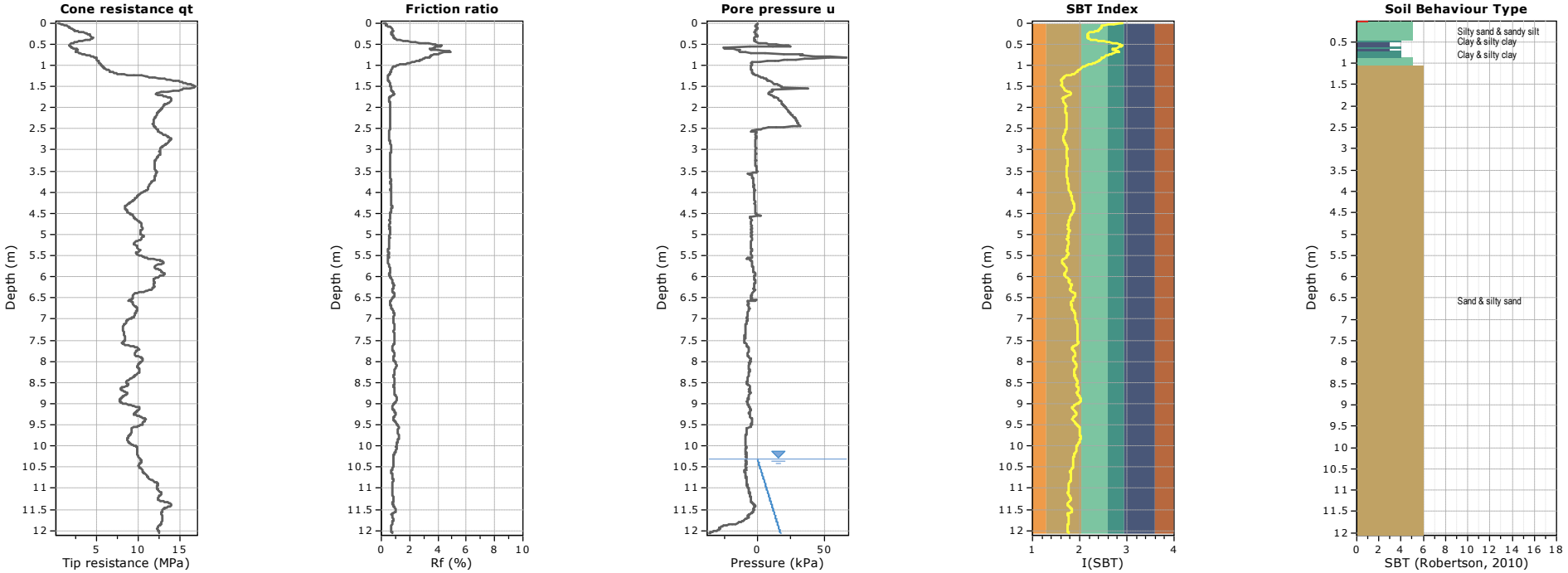
CPT: CPT02
Total depth: 12.06 m, Date: 18/09/2025
Surface Elevation: 21.30 m
Coords: X:1617208.00, Y:6117010.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

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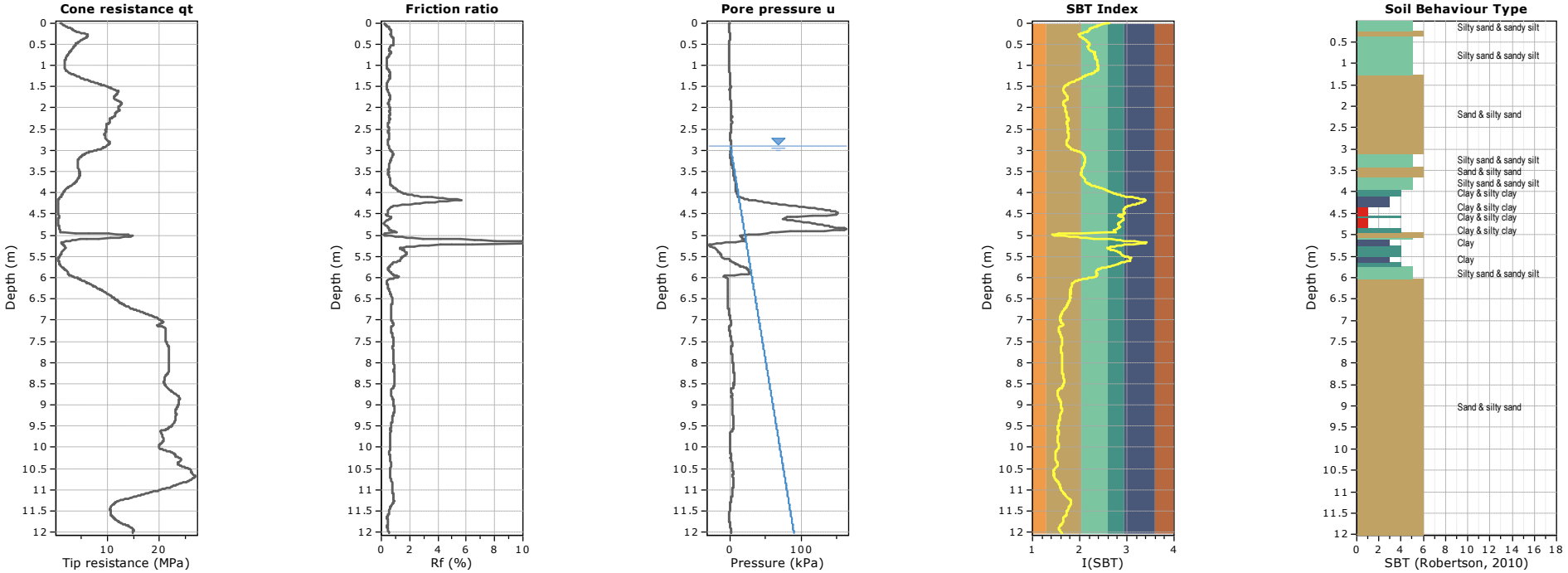
CPT: CPT03
Total depth: 12.02 m, Date: 18/09/2025
Surface Elevation: 20.20 m
Coords: X:1617150.00, Y:6117016.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

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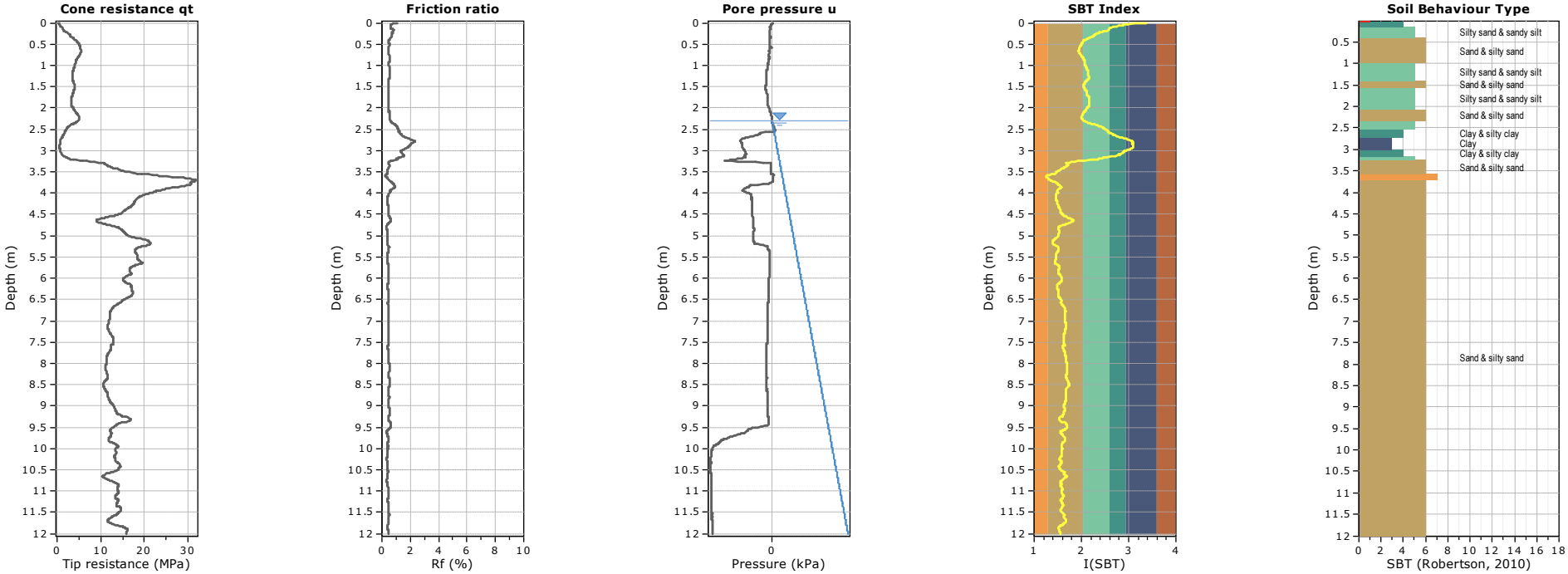
CPT: CPT04
Total depth: 12.01 m, Date: 18/09/2025
Surface Elevation: 18.40 m
Coords: X:1617076.00, Y:6117058.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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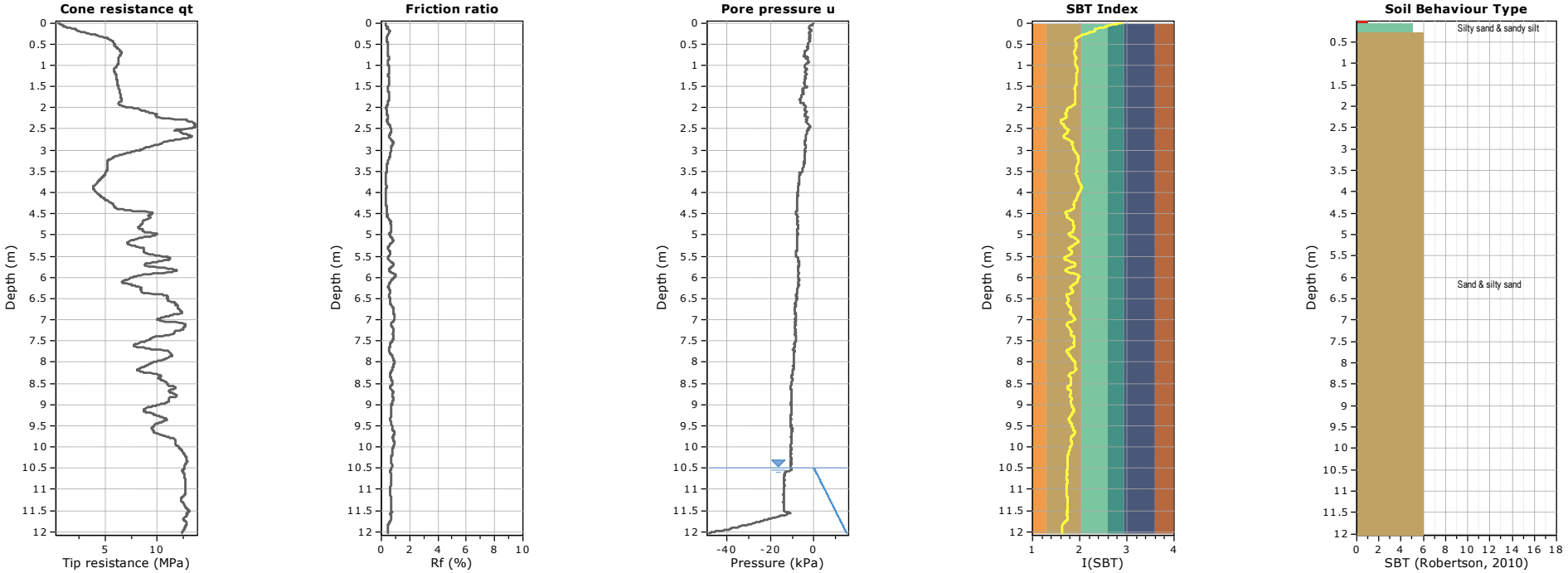
CPT: CPT05
Total depth: 12.03 m, Date: 18/09/2025
Surface Elevation: 20.00 m
Coords: X:1617045.00, Y:6116972.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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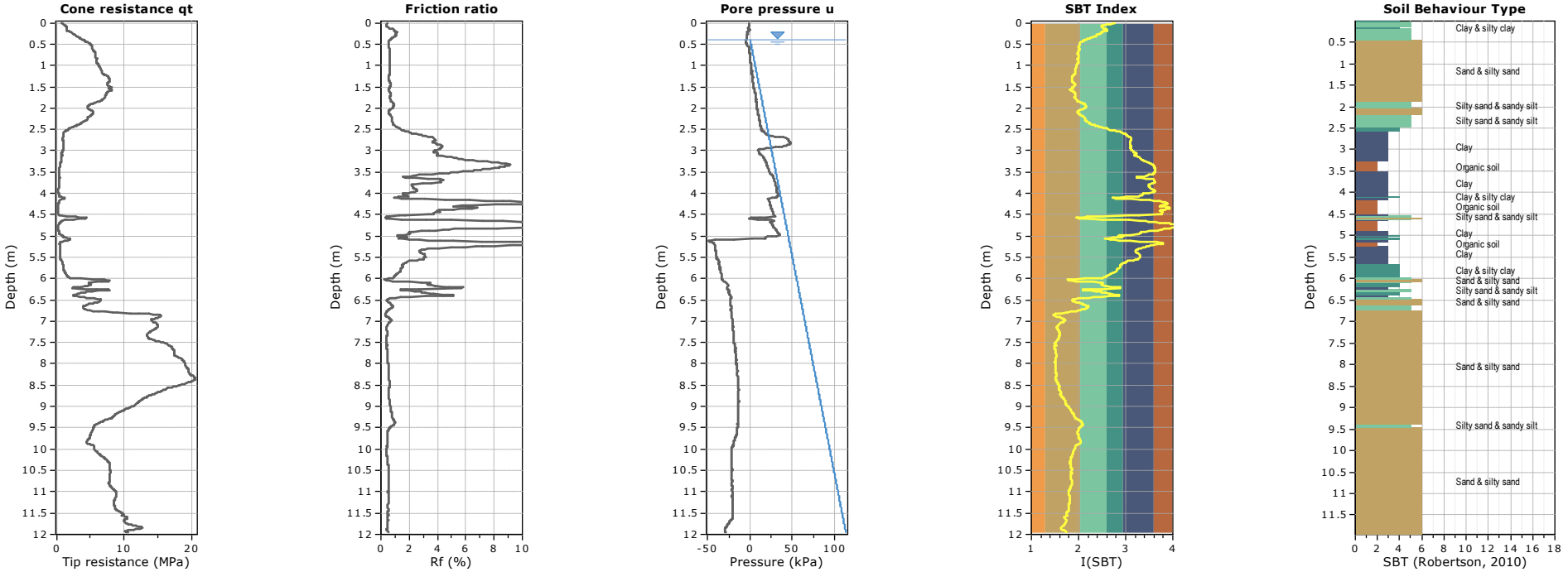
CPT: CPT06
Total depth: 11.95 m, Date: 18/09/2025
Surface Elevation: 16.50 m
Coords: X:1616958.00, Y:6117004.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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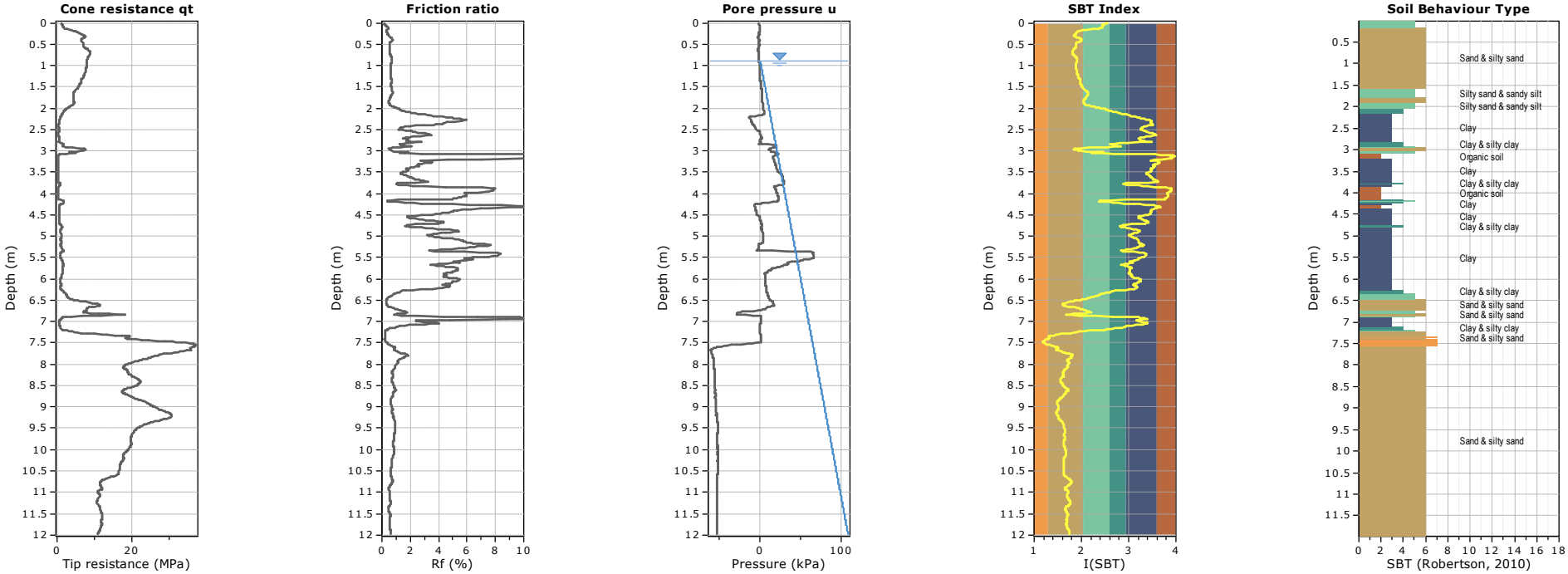
CPT: CPT07
Total depth: 11.98 m, Date: 18/09/2025
Surface Elevation: 19.40 m
Coords: X:1617125.00, Y:6116942.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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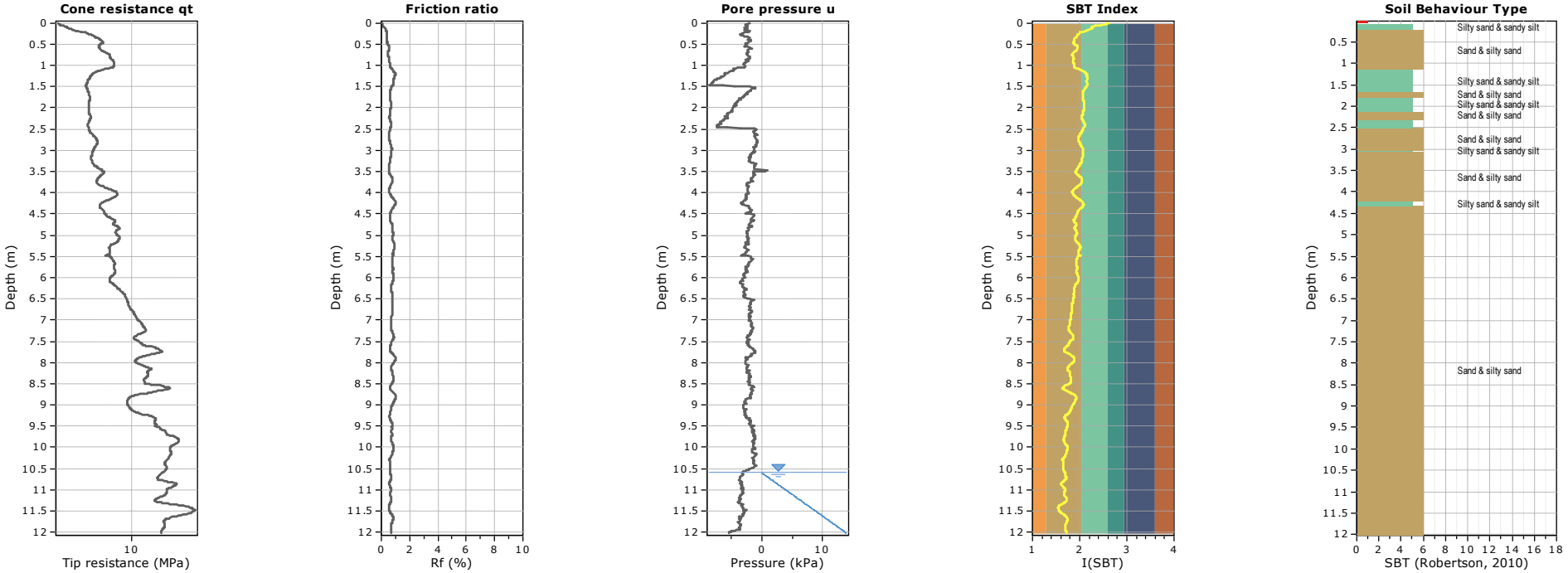
CPT: CPT08
Total depth: 12.02 m, Date: 18/09/2025
Surface Elevation: 21.20 m
Coords: X:1617192.00, Y:6116944.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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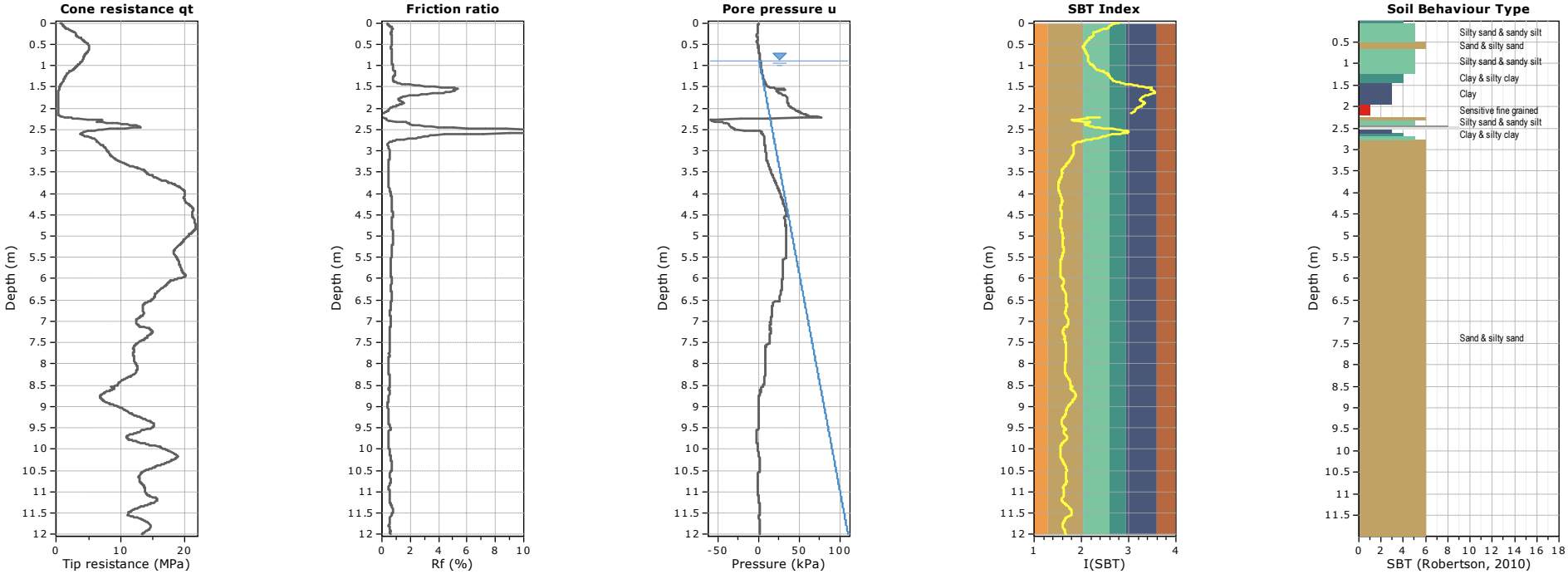
CPT: CPT09
Total depth: 11.99 m, Date: 18/09/2025
Surface Elevation: 21.50 m
Coords: X:1617241.00, Y:6116876.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

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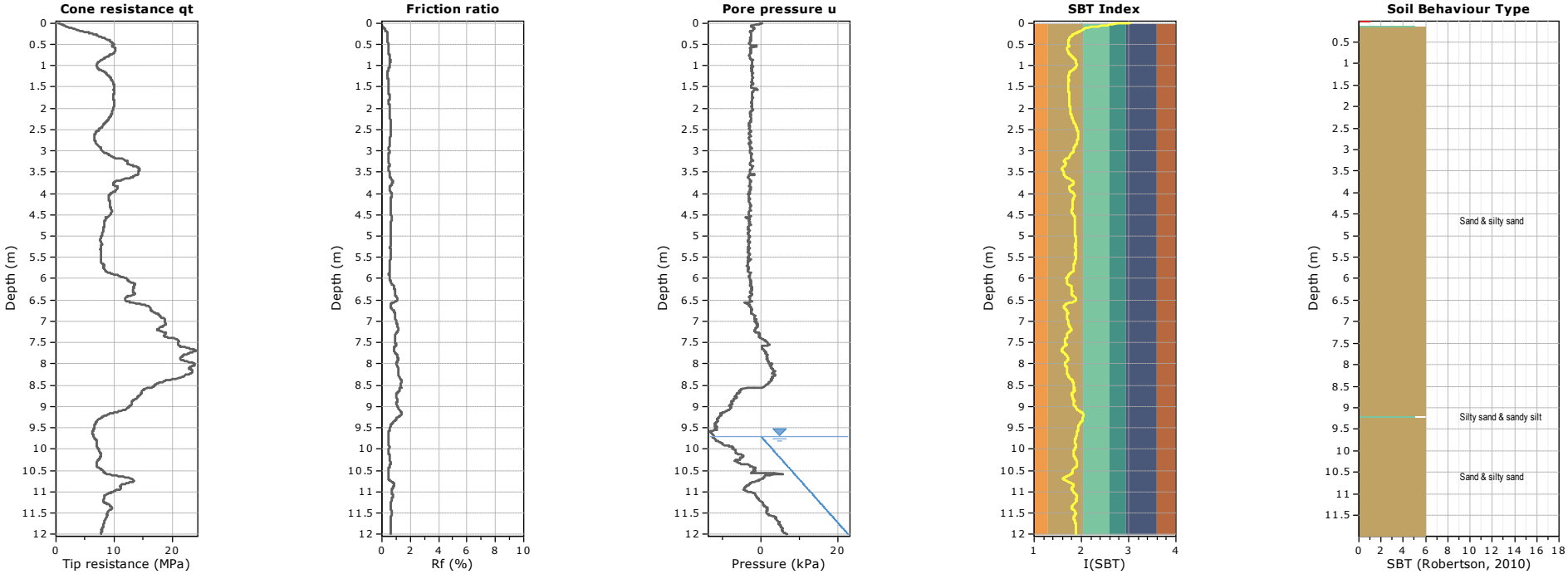
CPT: CPT10
Total depth: 11.99 m, Date: 18/09/2025
Surface Elevation: 19.70 m
Coords: X:1617157.00, Y:6116855.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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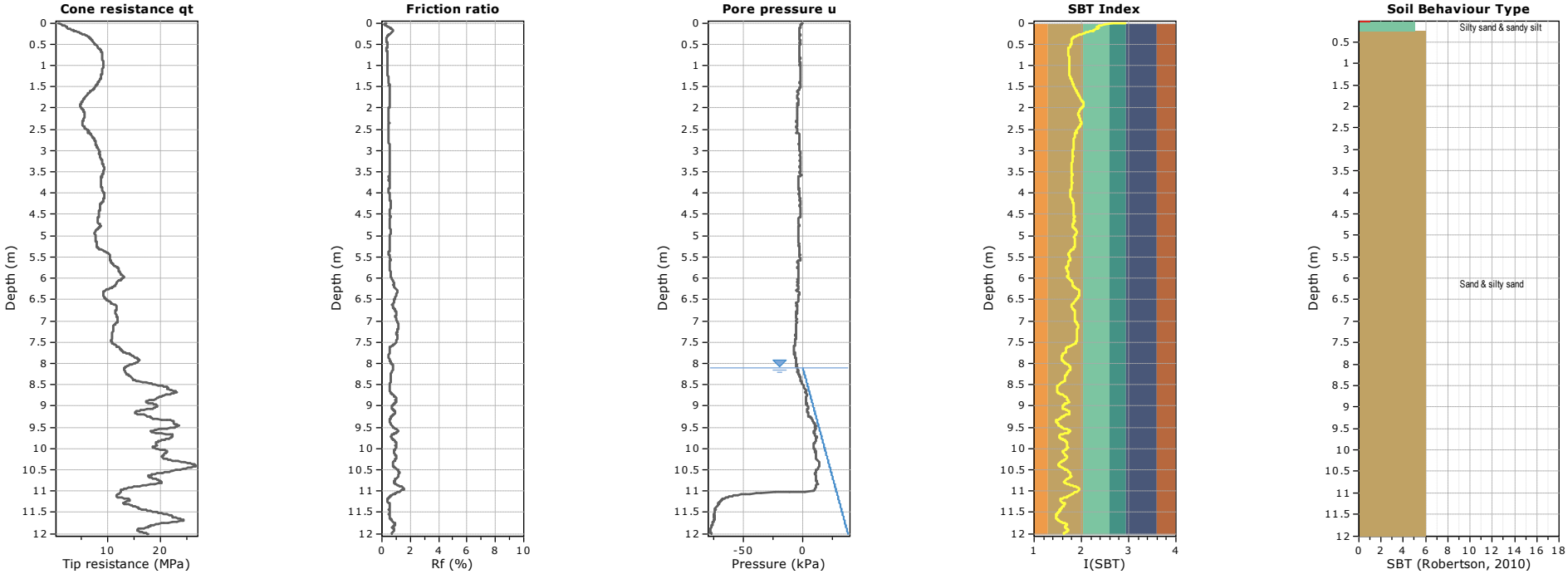
CPT: CPT11
Total depth: 12.01 m, Date: 18/09/2025
Surface Elevation: 17.50 m
Coords: X:1617069.00, Y:6116822.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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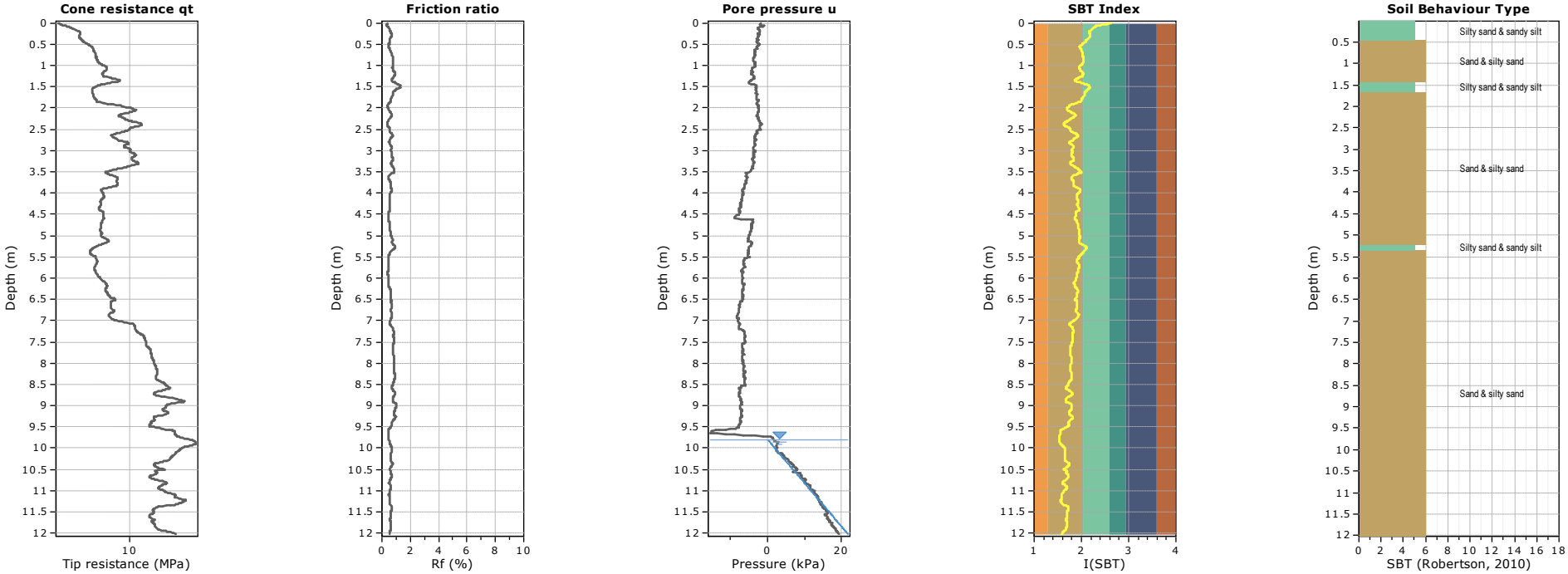
CPT: CPT12
Total depth: 12.02 m, Date: 18/09/2025
Surface Elevation: 19.50 m
Coords: X:1617045.00, Y:6116878.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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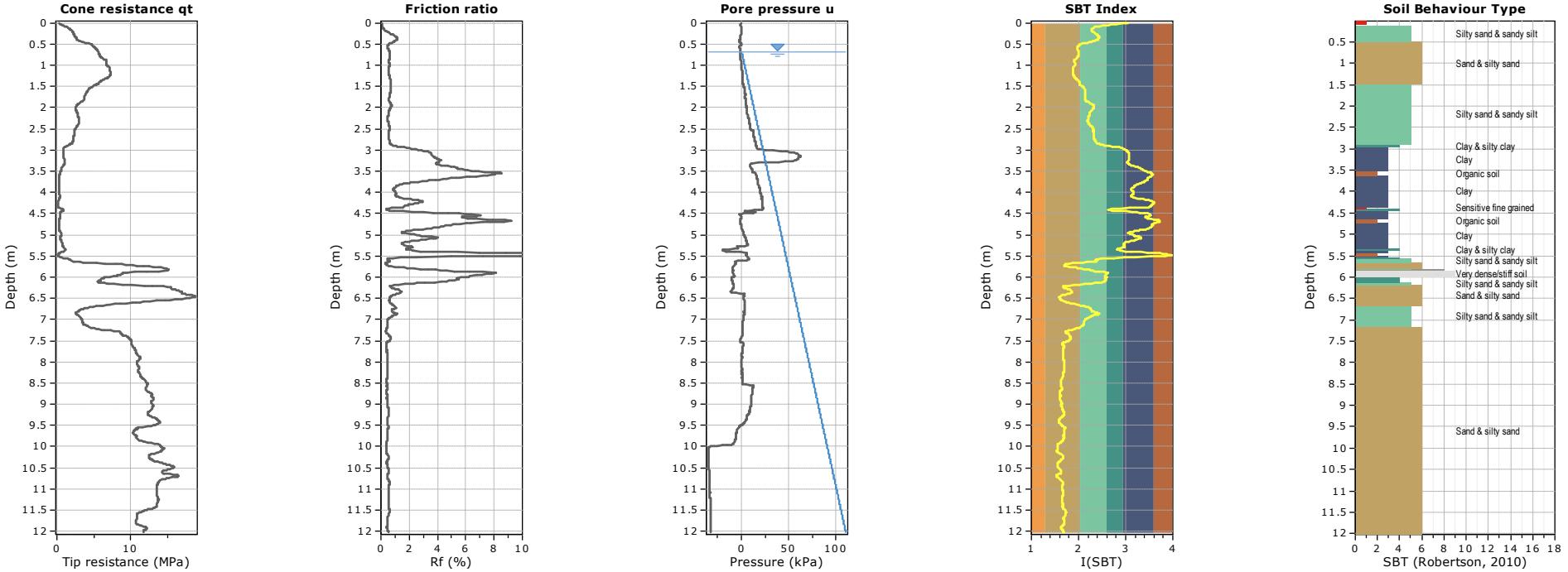
CPT: CPT13
Total depth: 12.02 m, Date: 18/09/2025
Surface Elevation: 17.00 m
Coords: X:1616975.00, Y:6116904.00
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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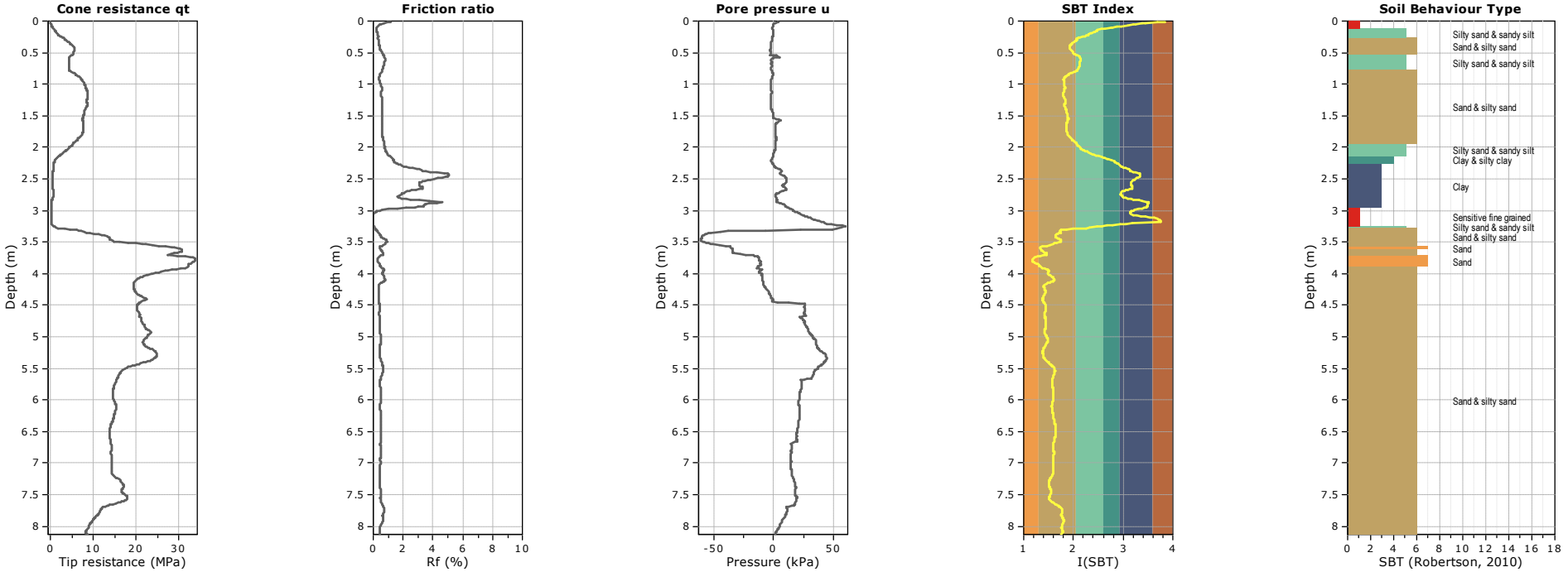
CPT: CPT101
Total depth: 8.13 m, Date: 12/12/2025
Surface Elevation: 17.20 m
Coords: X:1616993.57, Y:6117043.66
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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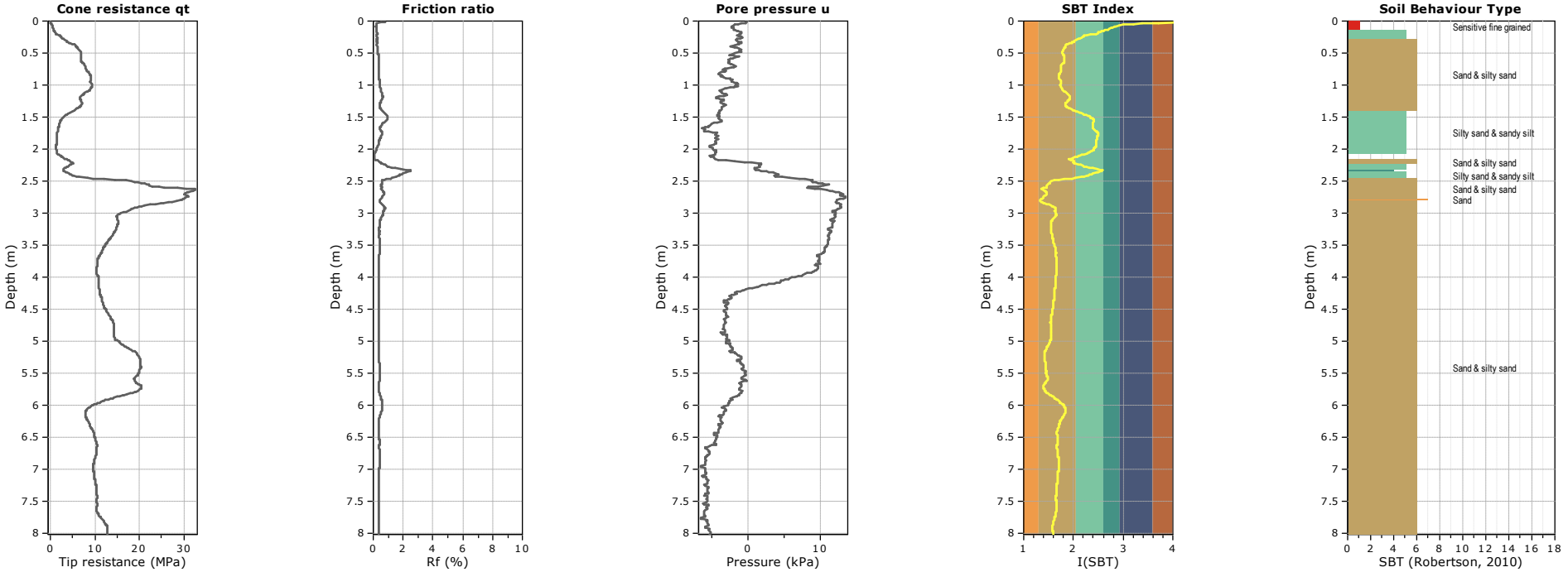
CPT: CPT102
Total depth: 8.02 m, Date: 12/12/2025
Surface Elevation: 18.10 m
Coords: X:1617013.37, Y:6117053.05
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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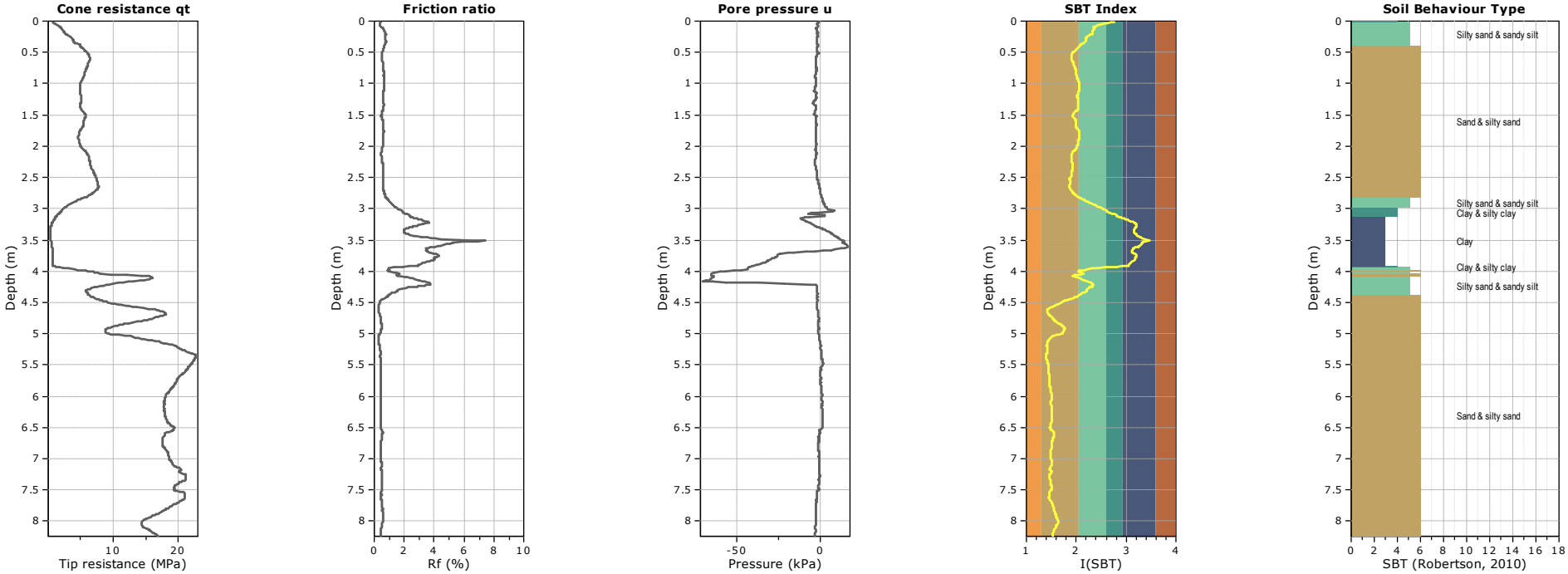
+64211473249

CPT: CPT103
Total depth: 8.24 m, Date: 12/12/2025
Surface Elevation: 18.70 m
Coords: X:1617033.93, Y:6117031.06
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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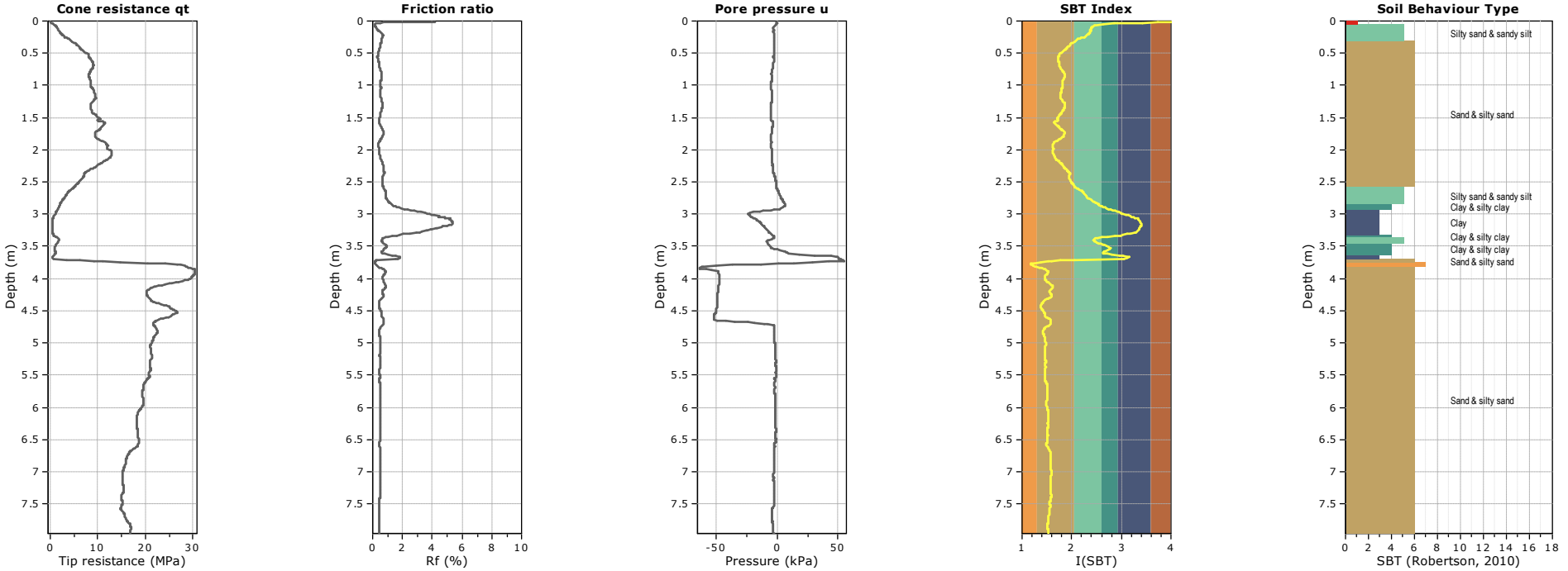
+64211473249

CPT: CPT104
Total depth: 7.96 m, Date: 12/12/2025
Surface Elevation: 18.20 m
Coords: X:1617016.85, Y:6117015.01
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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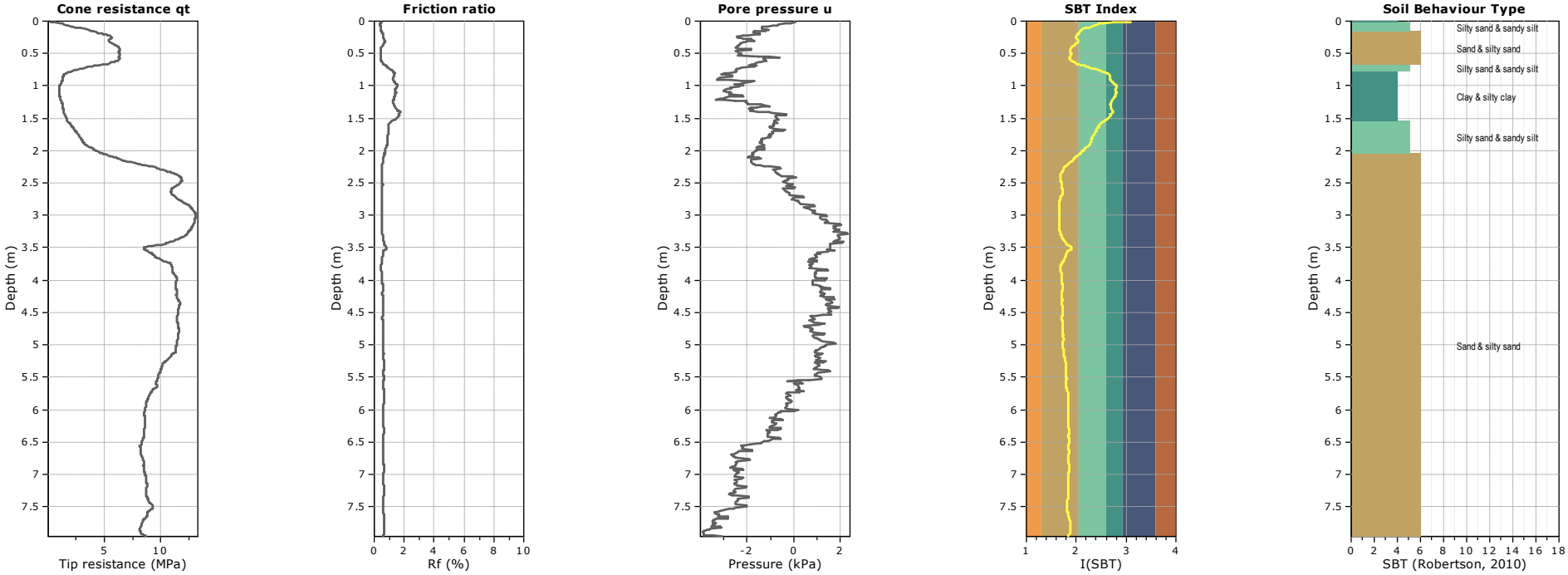
+64211473249

CPT: CPT105
Total depth: 7.96 m, Date: 12/12/2025
Surface Elevation: 20.10 m
Coords: X:1617057.93, Y:6116999.74
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

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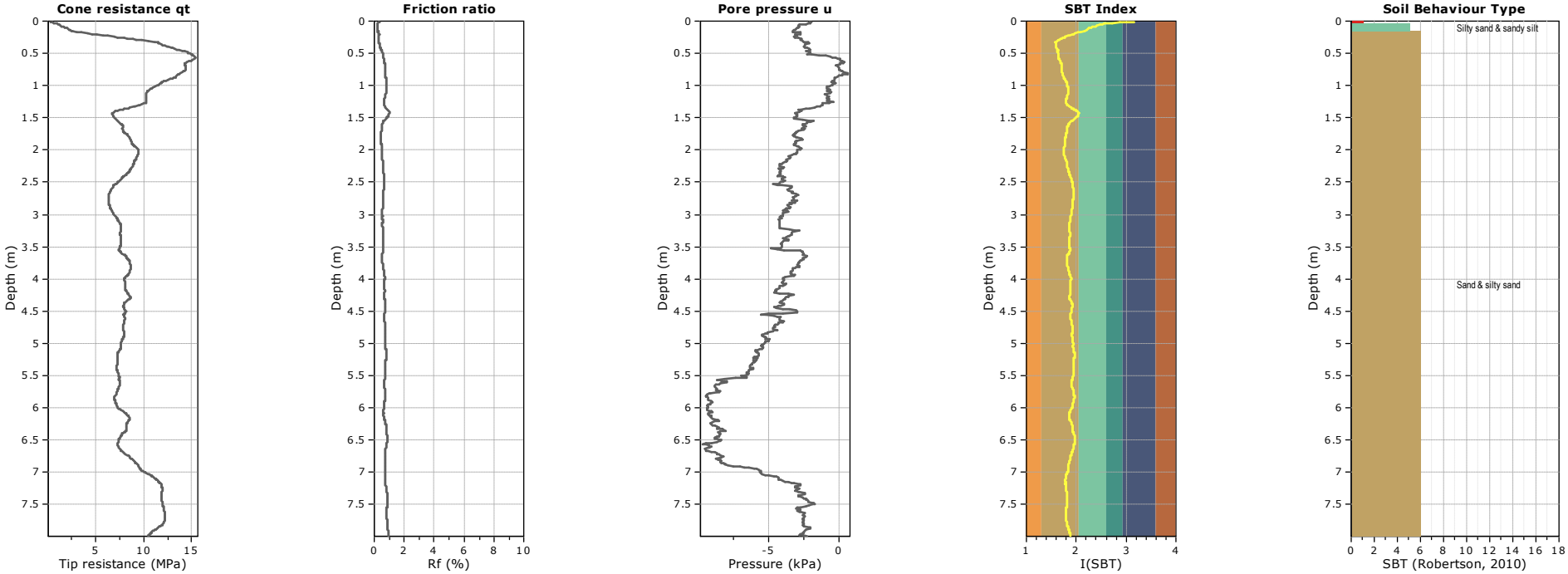
CPT: CPT106
Total depth: 7.99 m, Date: 12/12/2025
Surface Elevation: 20.30 m
Coords: X:1617083.40, Y:6116972.63
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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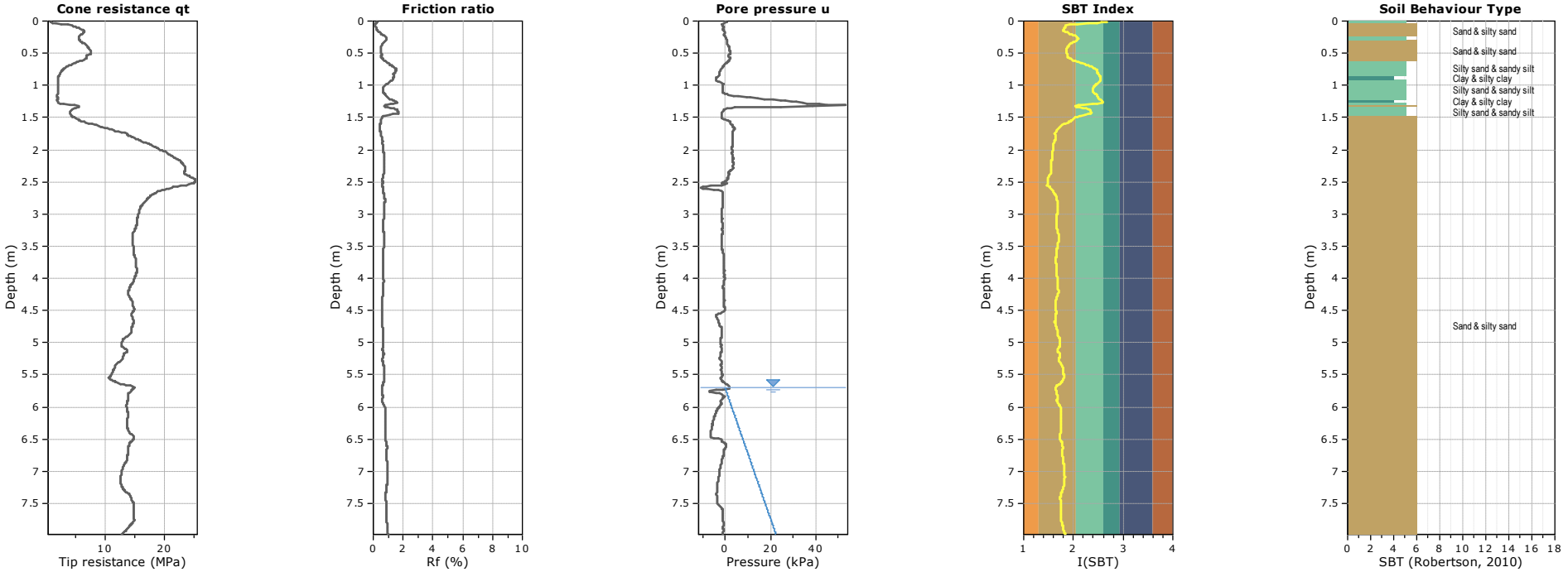
CPT: CPT107
Total depth: 7.98 m, Date: 12/12/2025
Surface Elevation: 19.10 m
Coords: X:1617082.79, Y:6116935.81
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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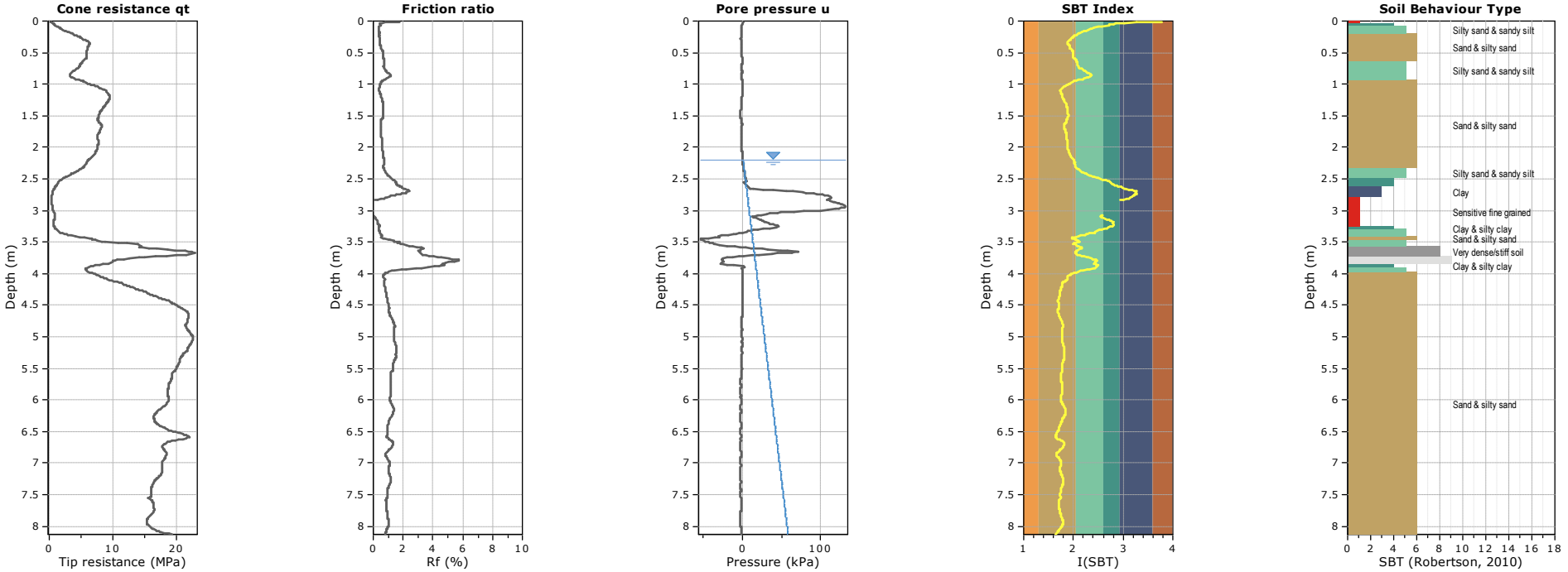
CPT: CPT108
Total depth: 8.13 m, Date: 12/12/2025
Surface Elevation: 19.70 m
Coords: X:1617100.39, Y:6116958.76
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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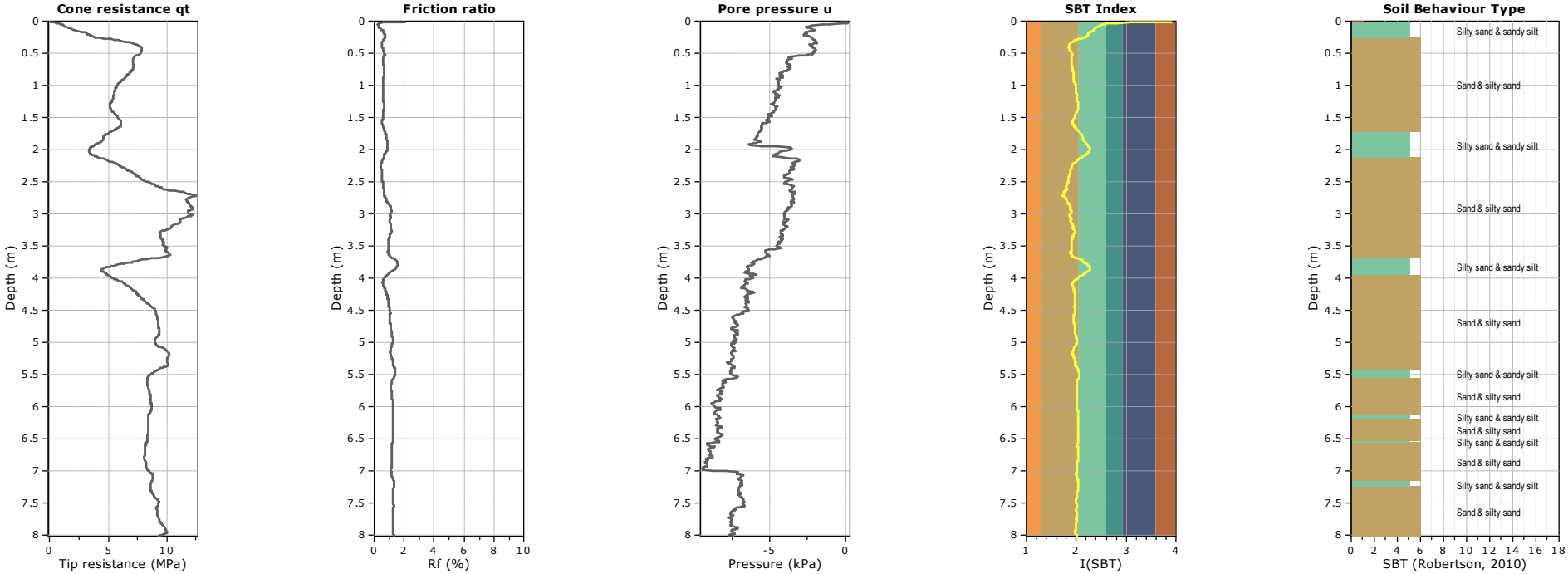
CPT: CPT109
Total depth: 8.01 m, Date: 12/12/2025
Surface Elevation: 22.10 m
Coords: X:1617232.90, Y:6117071.27
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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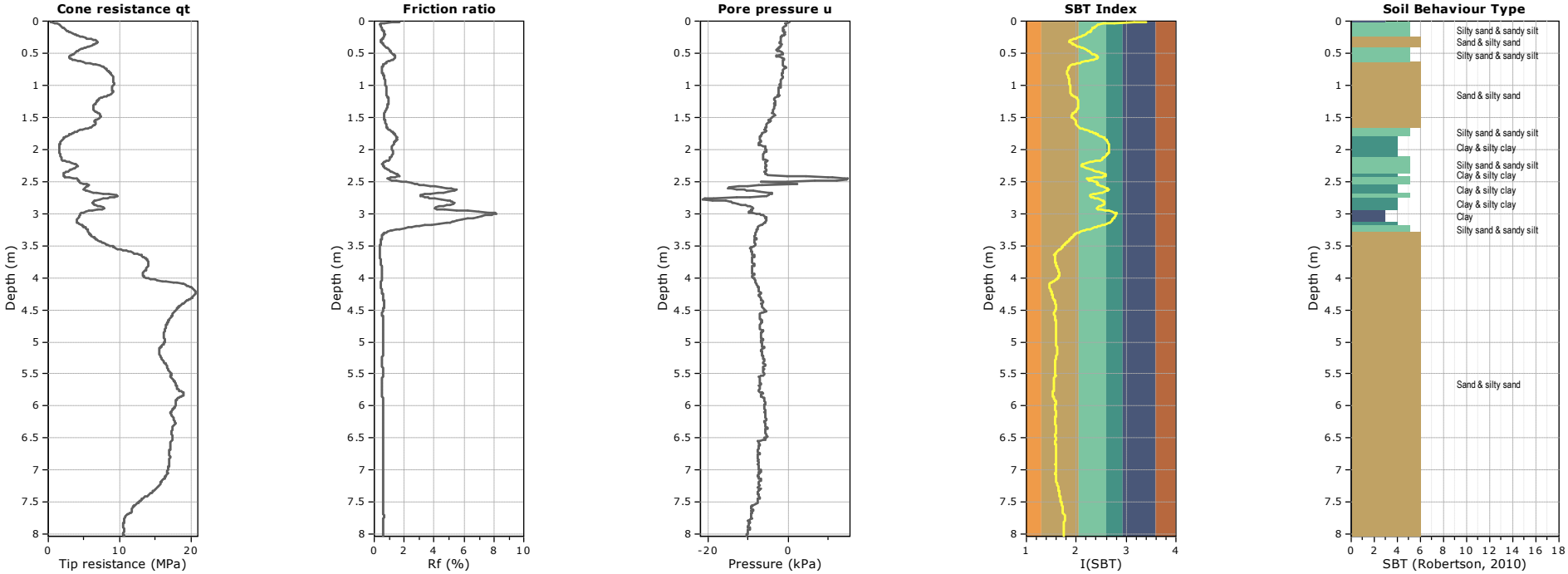
CPT: CPT110
Total depth: 8.03 m, Date: 12/12/2025
Surface Elevation: 21.40 m
Coords: X:1617196.39, Y:6117046.17
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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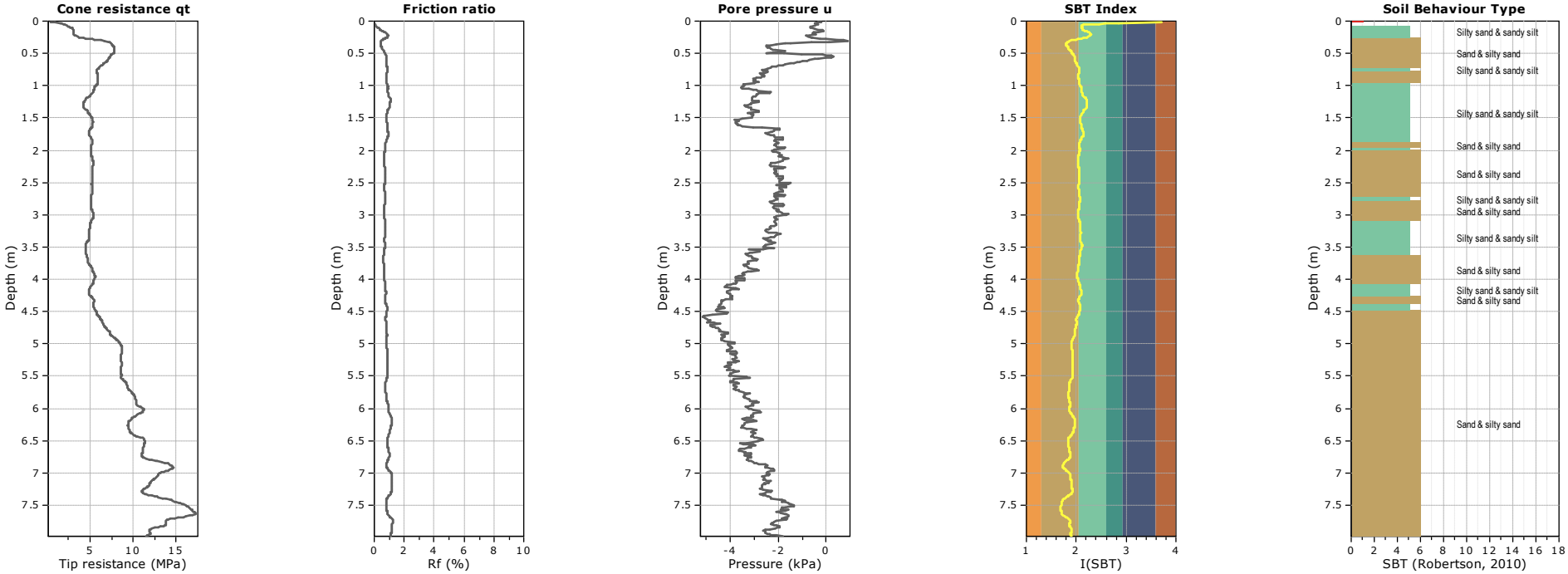
CPT: CPT111
Total depth: 7.98 m, Date: 12/12/2025
Surface Elevation: 21.70 m
Coords: X:1617214.89, Y:6117045.02
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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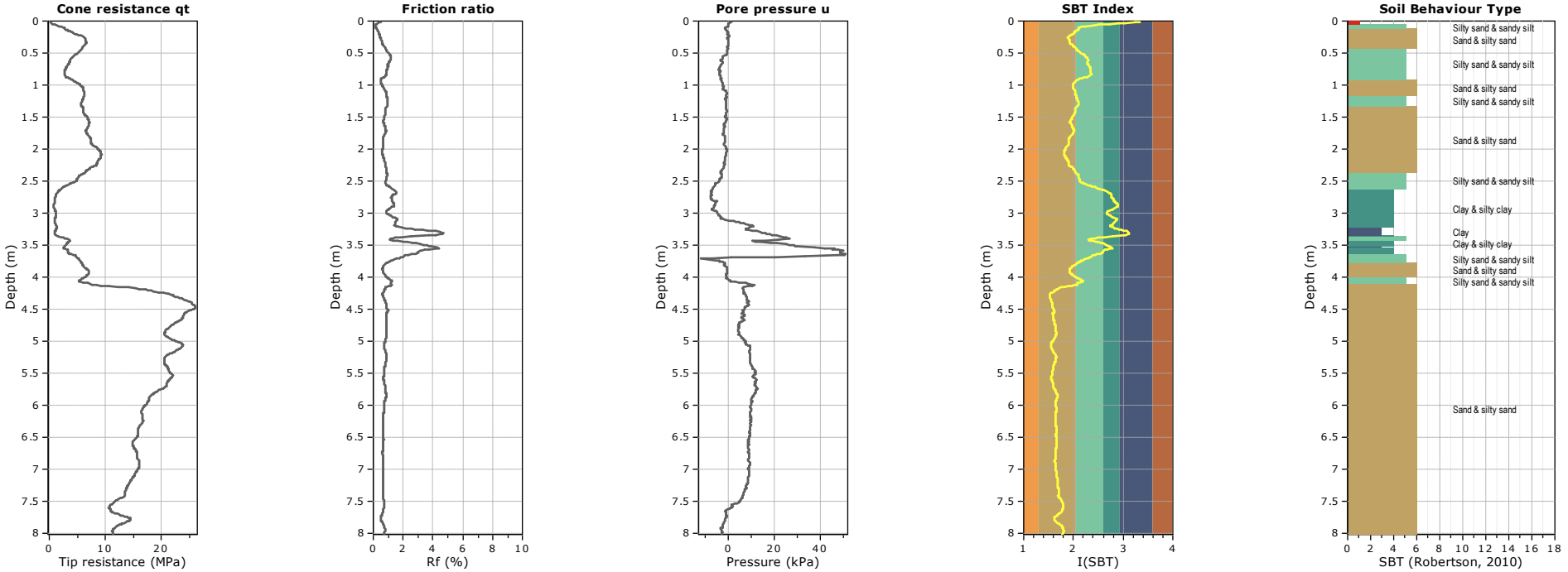
CPT: CPT112
Total depth: 8.01 m, Date: 12/12/2025
Surface Elevation: 20.70 m
Coords: X:1617183.76, Y:6117020.90
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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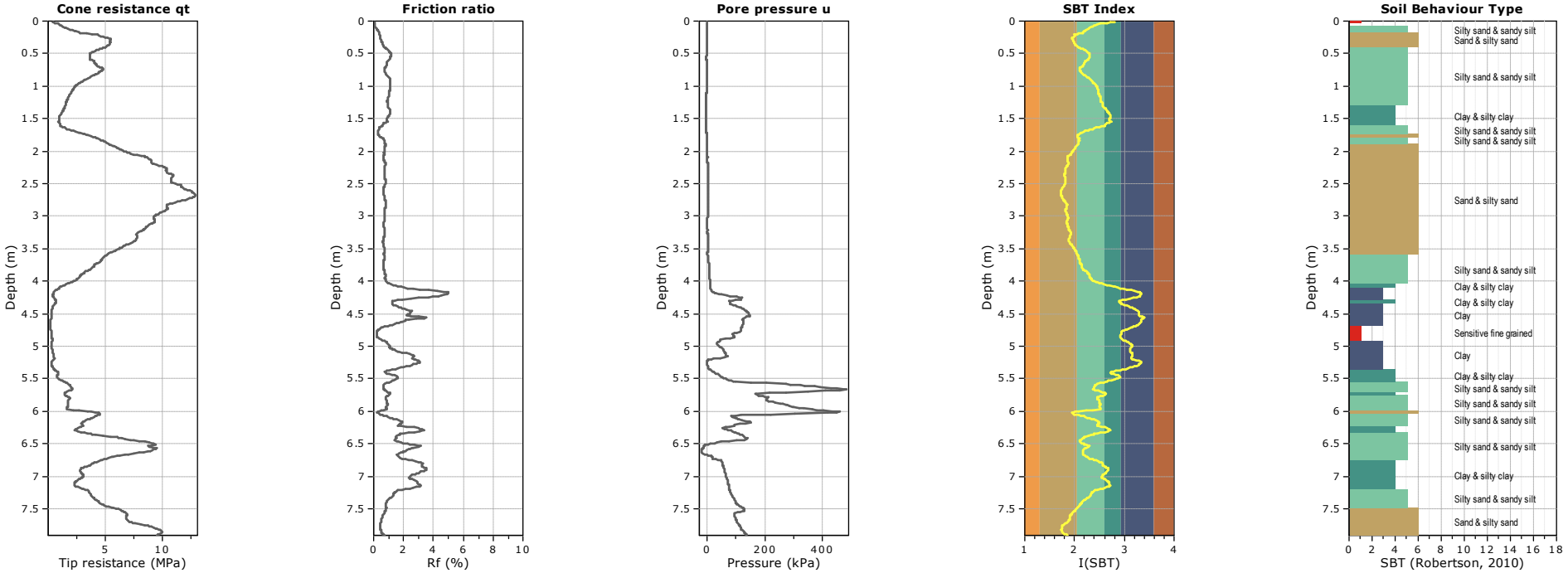
CPT: CPT113
Total depth: 7.91 m, Date: 12/12/2025
Surface Elevation: 20.50 m
Coords: X:1617169.77, Y:6116995.65
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

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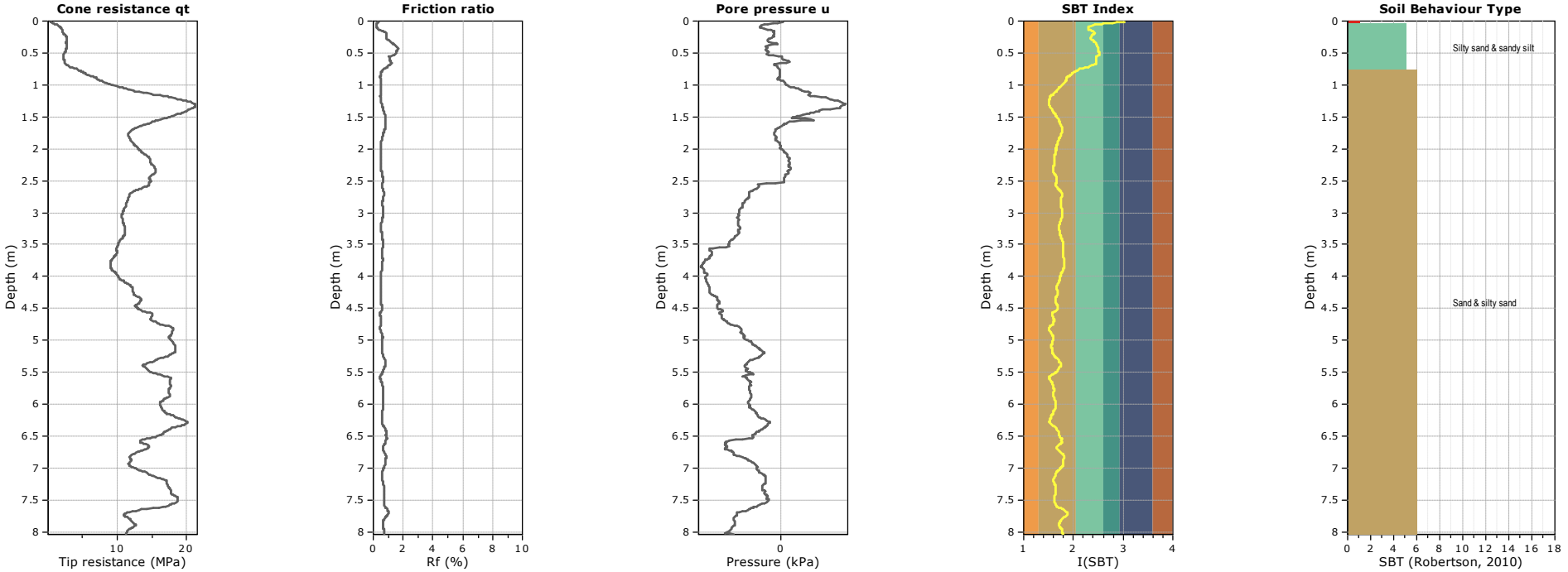
CPT: CPT114
Total depth: 8.04 m, Date: 12/12/2025
Surface Elevation: 19.80 m
Coords: X:1617148.99, Y:6116951.77
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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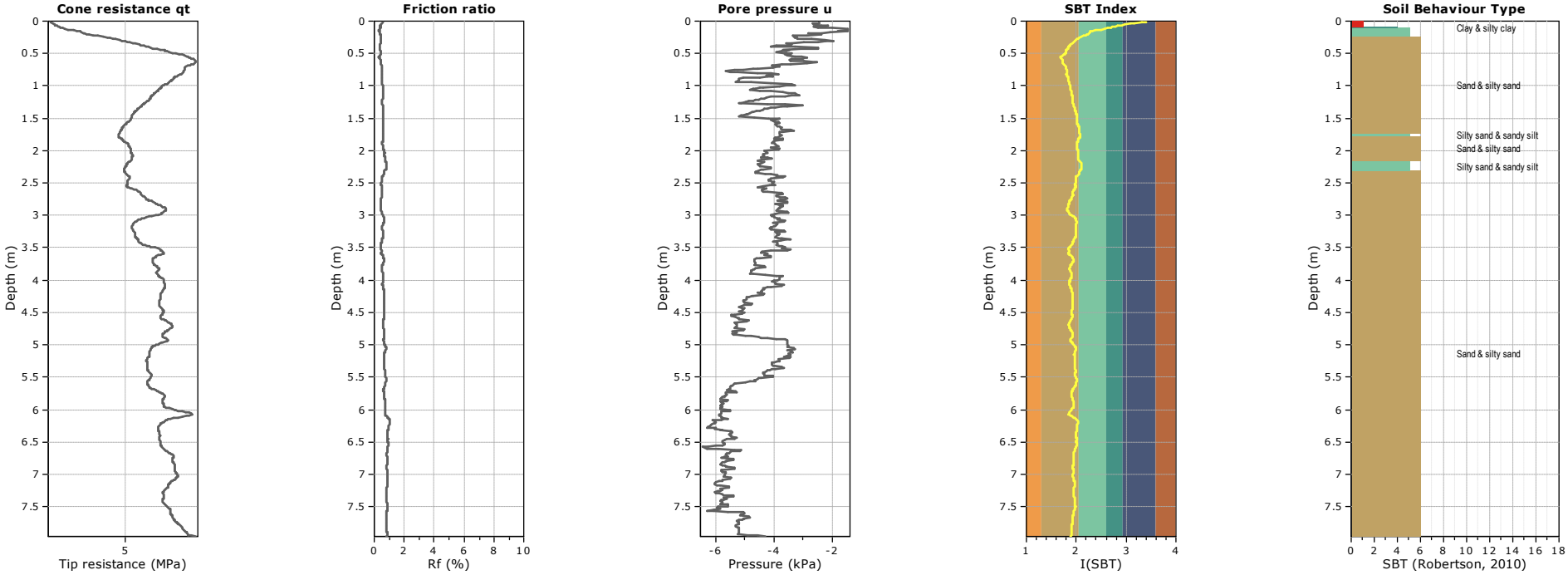
CPT: CPT115
Total depth: 7.96 m, Date: 12/12/2025
Surface Elevation: 20.70 m
Coords: X:1617174.42, Y:6116946.95
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

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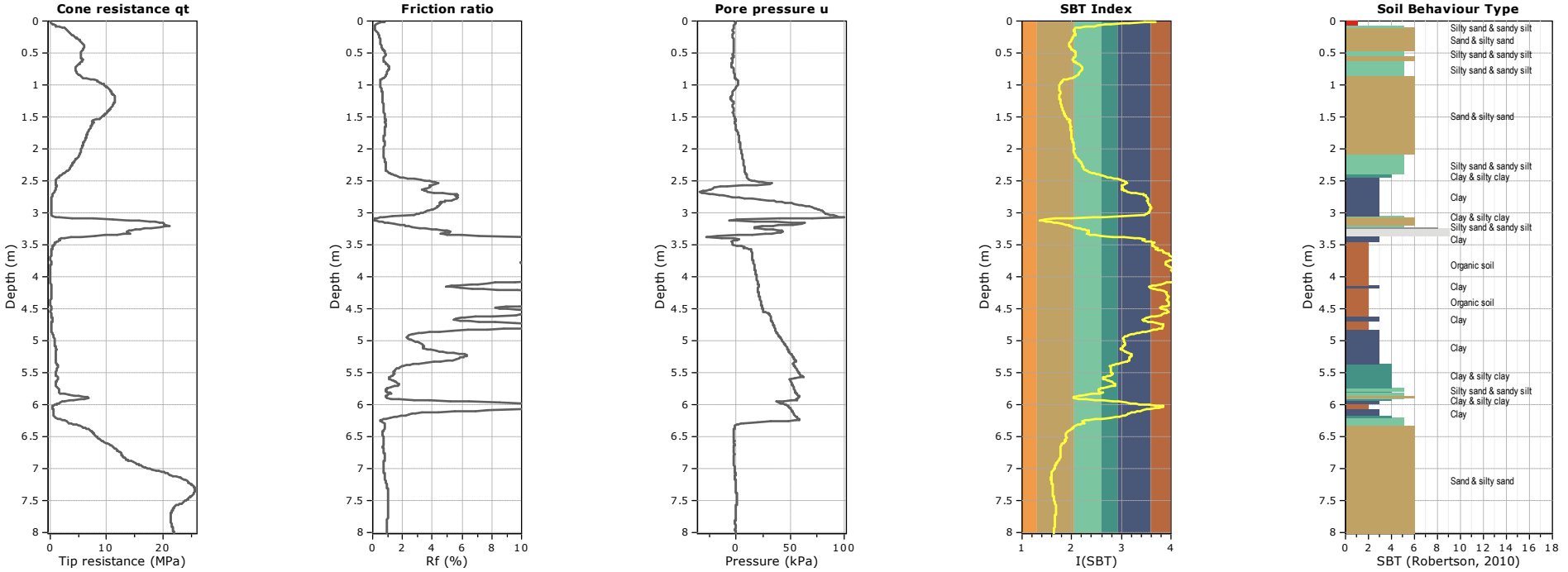
CPT: CPT116
Total depth: 8.01 m, Date: 12/12/2025
Surface Elevation: 19.00 m
Coords: X:1617108.50, Y:6116941.42
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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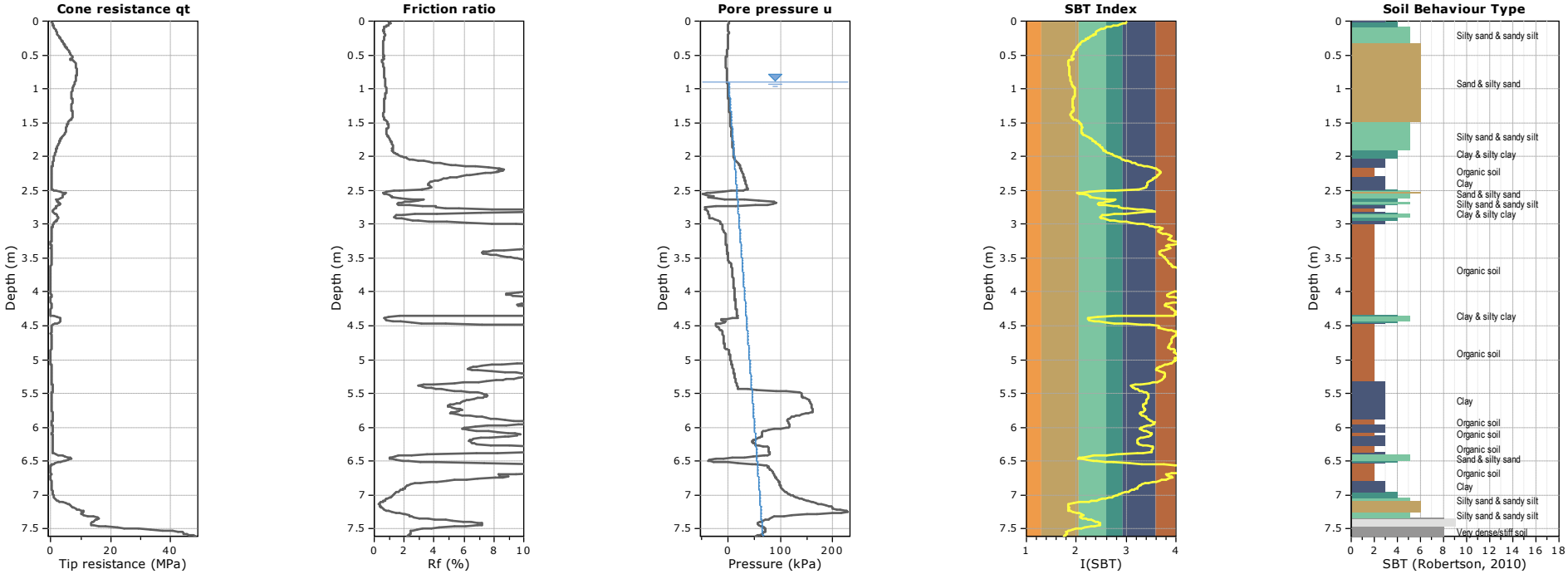
CPT: CPT117
Total depth: 7.61 m, Date: 12/12/2025
Surface Elevation: 18.50 m
Coords: X:1617108.45, Y:6116914.03
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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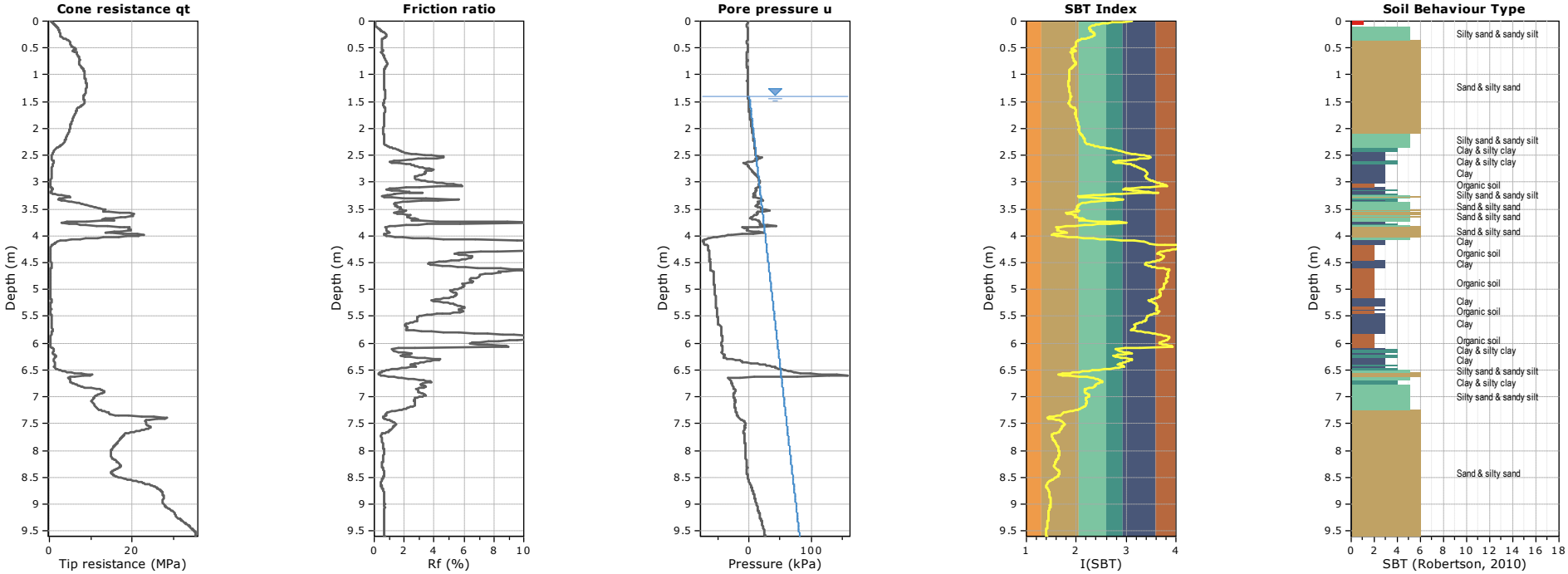
CPT: CPT118
Total depth: 9.60 m, Date: 12/12/2025
Surface Elevation: 19.00 m
Coords: X:1617136.25, Y:6116914.95
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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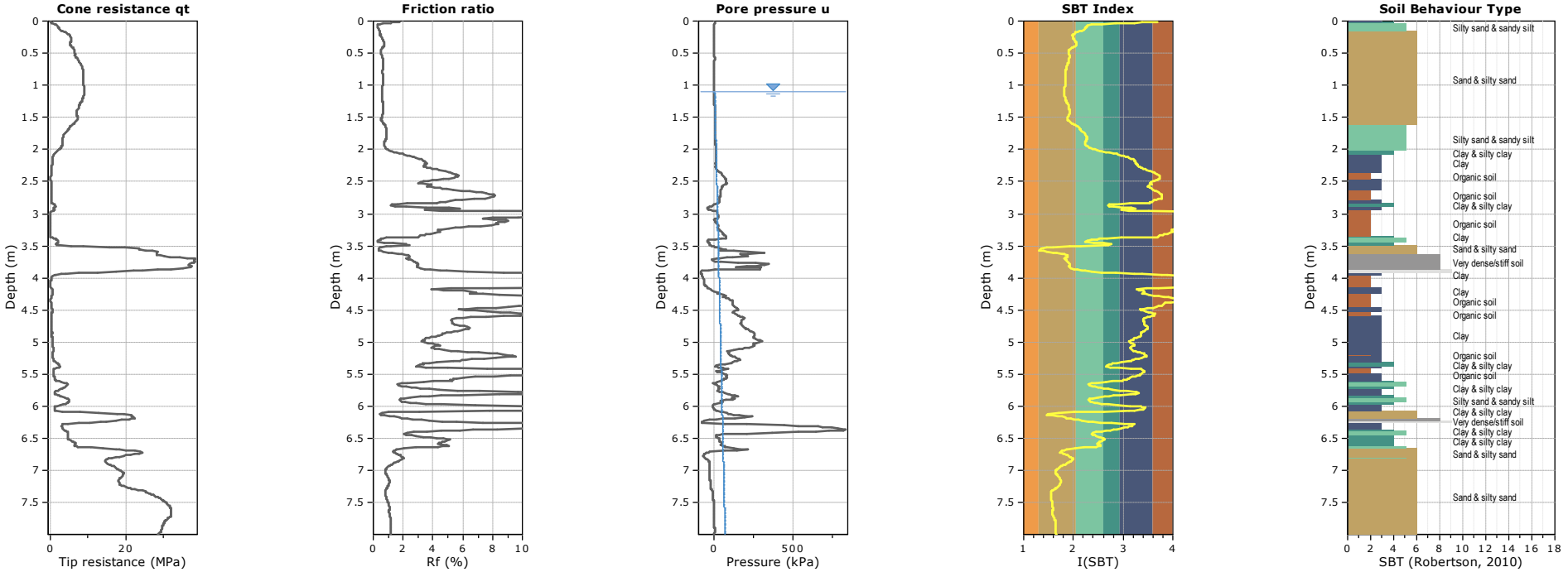
CPT: CPT120
Total depth: 7.99 m, Date: 12/12/2025
Surface Elevation: 18.70 m
Coords: X:1617121.96, Y:6116925.21
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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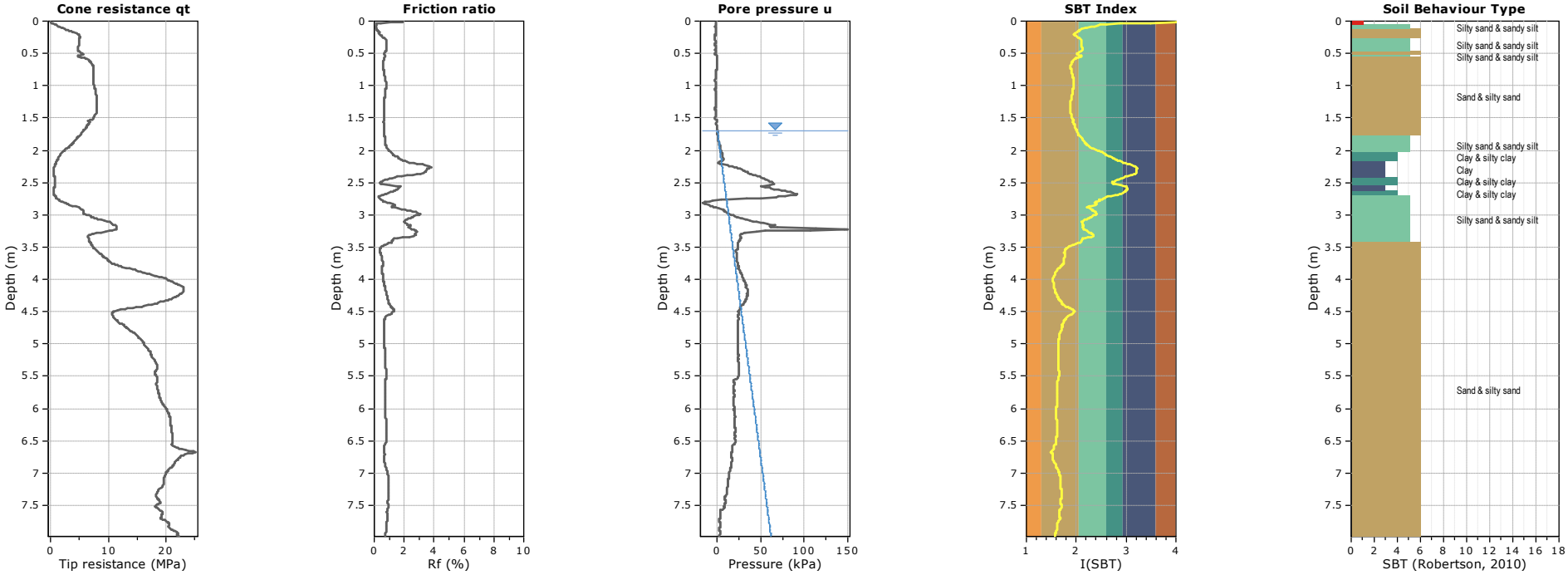
CPT: CPT121
Total depth: 7.98 m, Date: 12/12/2025
Surface Elevation: 18.70 m
Coords: X:1617066.61, Y:6116911.78
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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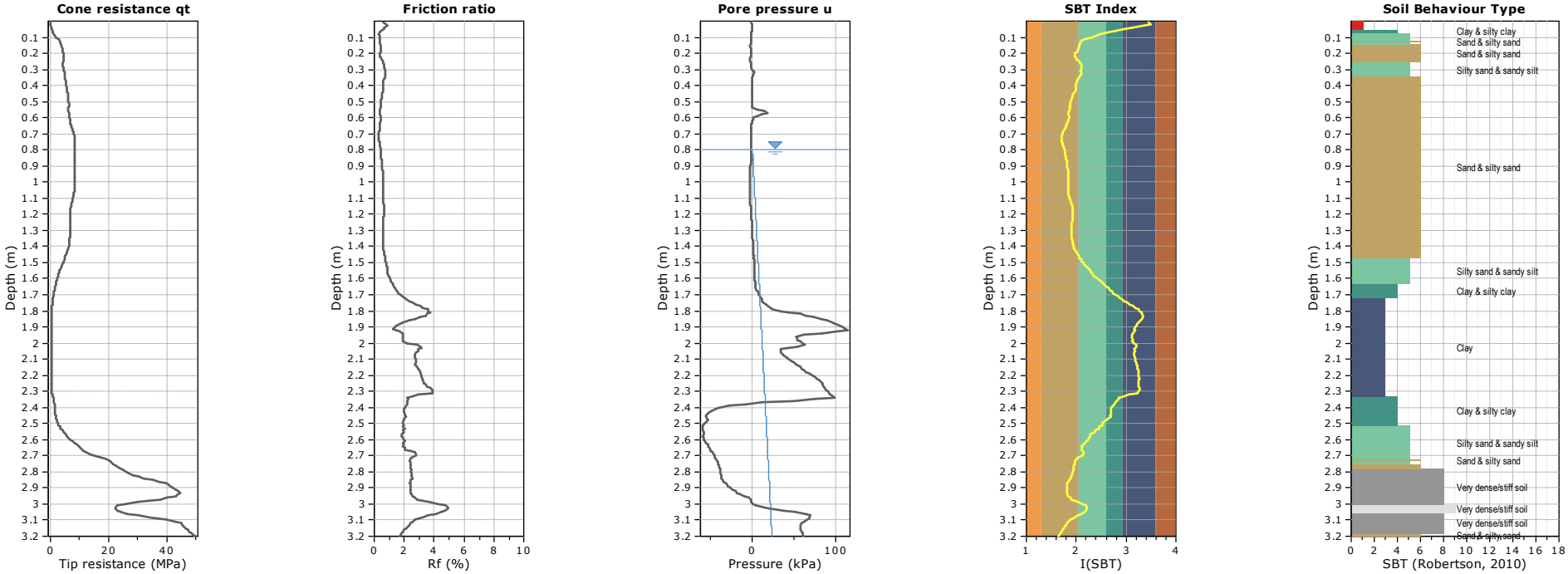
CPT: CPT122
Total depth: 3.20 m, Date: 12/12/2025
Surface Elevation: 18.70 m
Coords: X:1617084.16, Y:6116892.34
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

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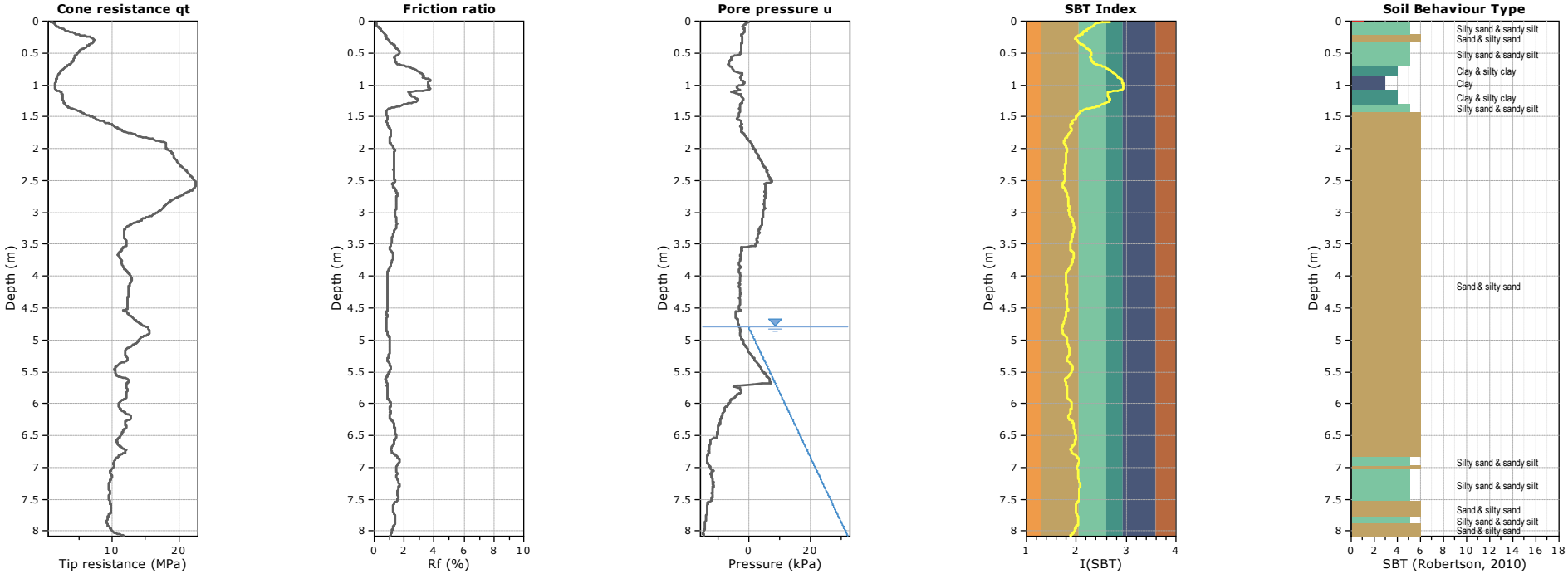
CPT: CPT123
Total depth: 8.08 m, Date: 12/12/2025
Surface Elevation: 19.00 m
Coords: X:1617065.52, Y:6116865.76
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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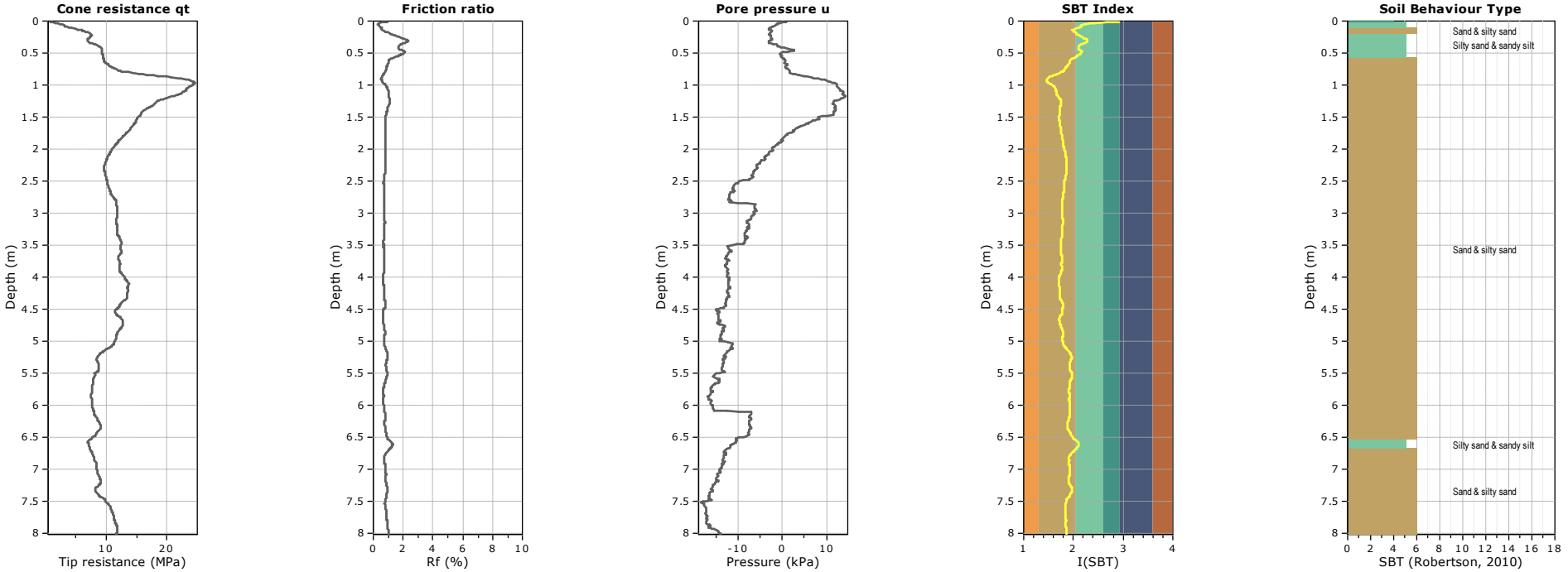
CPT: CPT124
Total depth: 8.02 m, Date: 12/12/2025
Surface Elevation: 18.60 m
Coords: X:1617023.38, Y:6116850.76
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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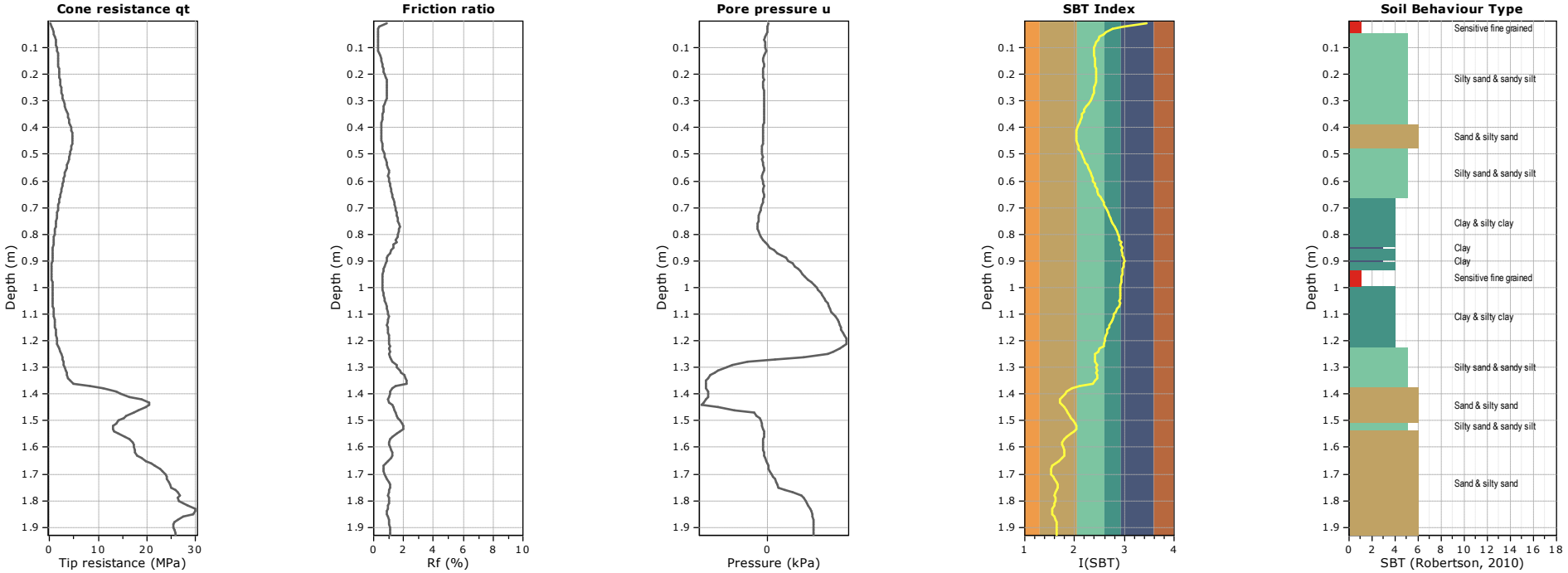
CPT: CPT125
Total depth: 1.93 m, Date: 12/12/2025
Surface Elevation: 17.90 m
Coords: X:1617044.22, Y:6116832.31
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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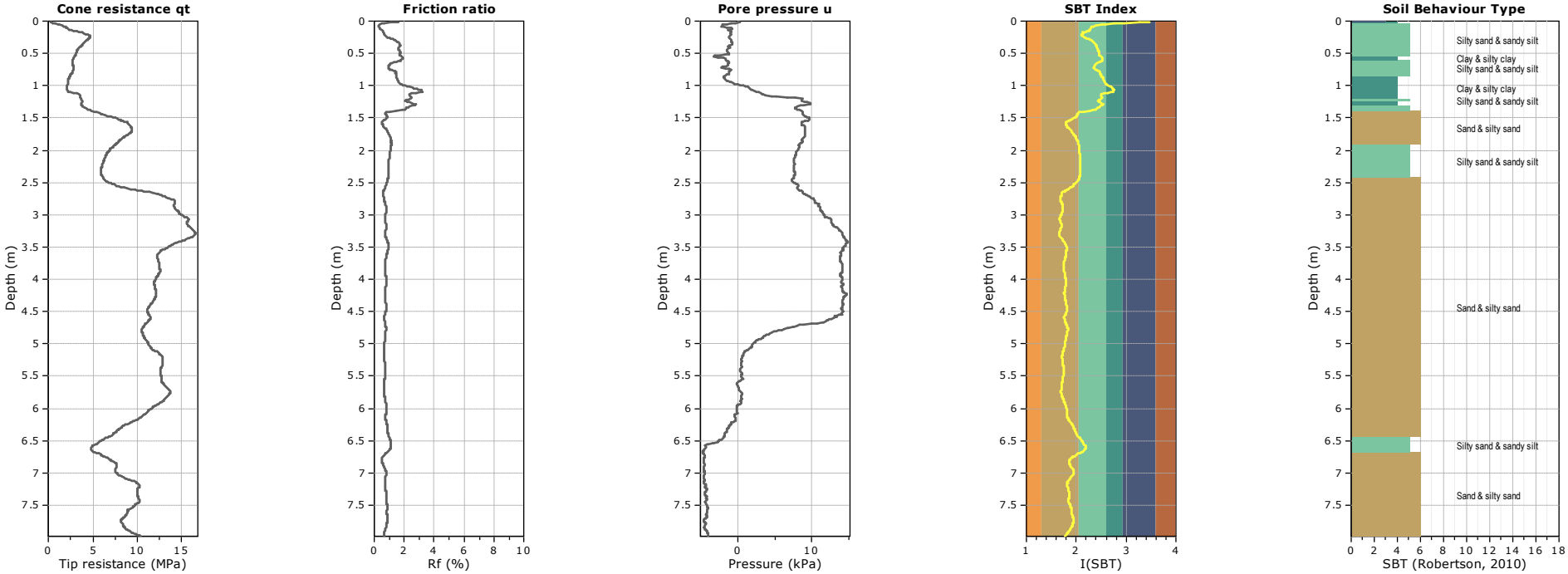
CPT: CPT126
Total depth: 7.98 m, Date: 12/12/2025
Surface Elevation: 17.70 m
Coords: X:1617005.91, Y:6116817.96
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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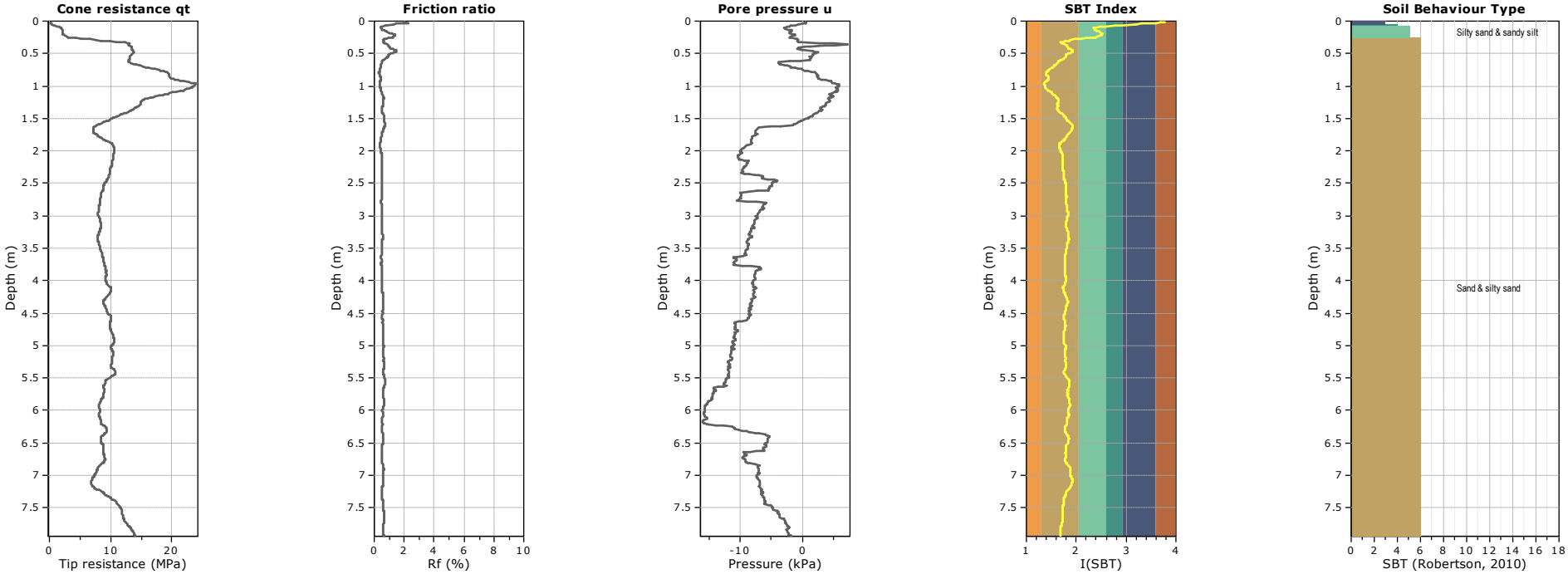
CPT: CPT127
Total depth: 7.94 m, Date: 12/12/2025
Surface Elevation: 18.00 m
Coords: X:1617024.31, Y:6116809.39
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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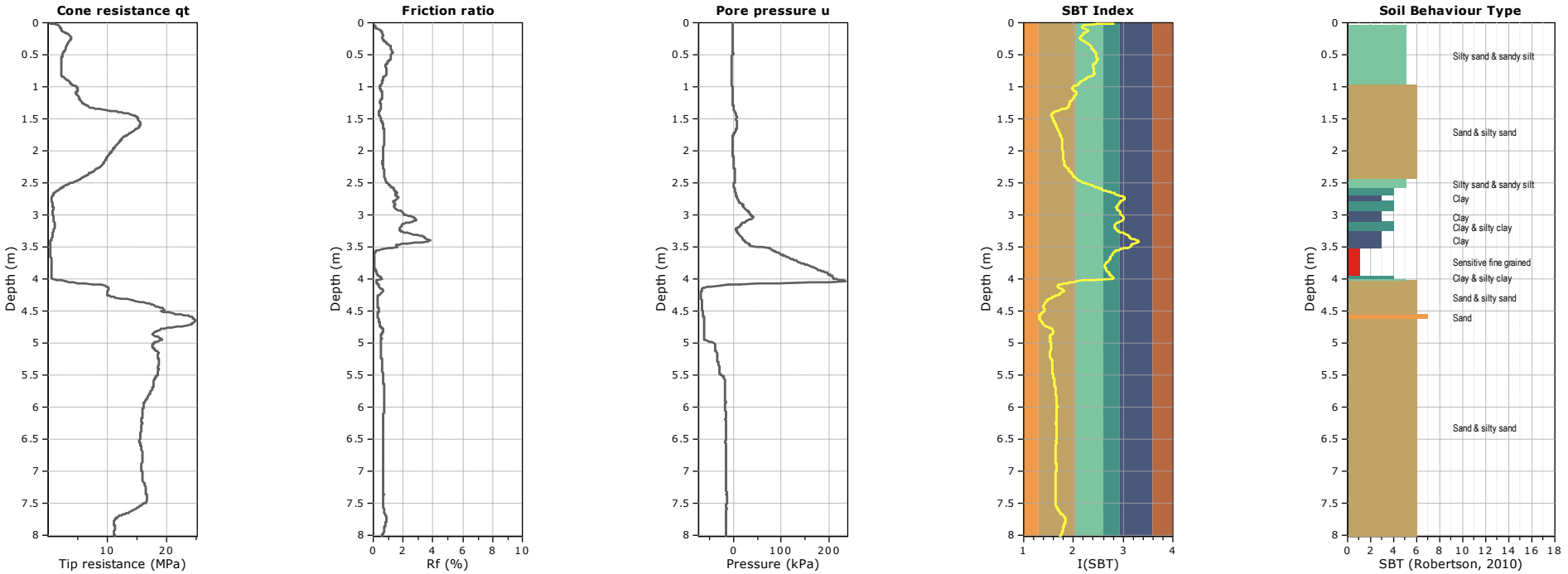
CPT: CPT128
Total depth: 8.01 m, Date: 12/12/2025
Surface Elevation: 17.60 m
Coords: X:1616984.99, Y:6116794.05
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



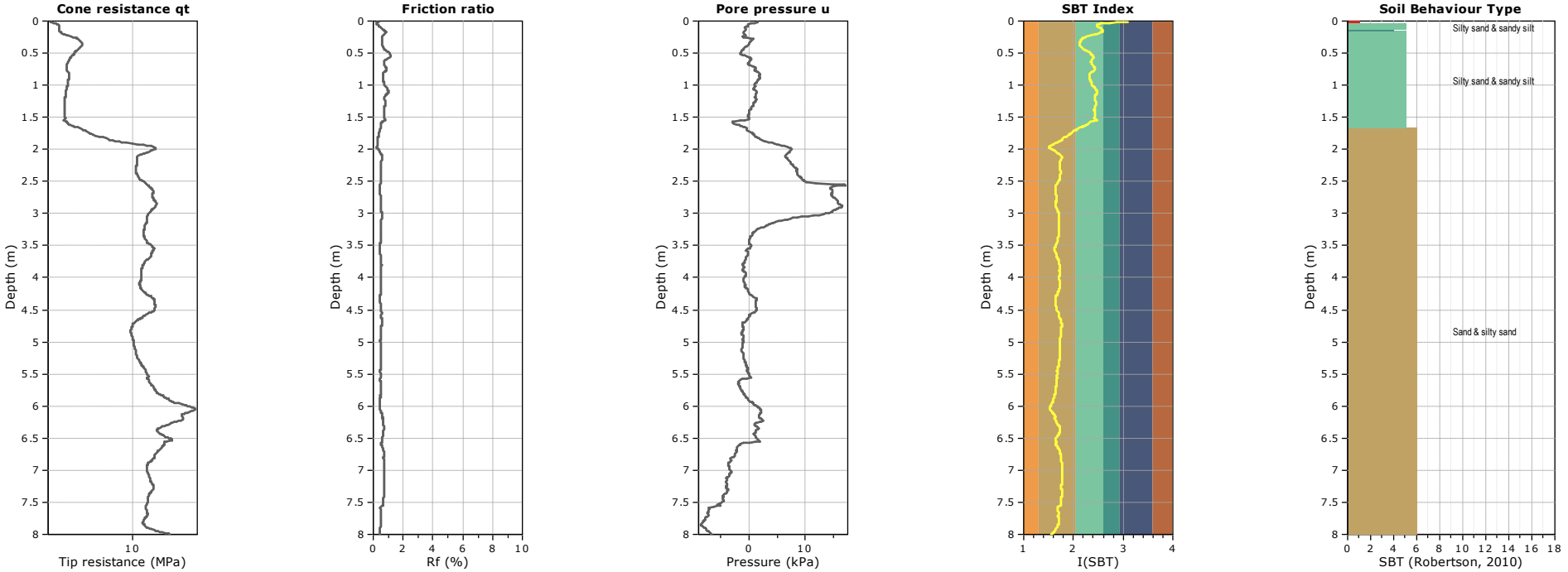
SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

CPT: CPT129
Total depth: 8.00 m, Date: 12/12/2025
Surface Elevation: 17.30 m
Coords: X:1617011.12, Y:6116777.47
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

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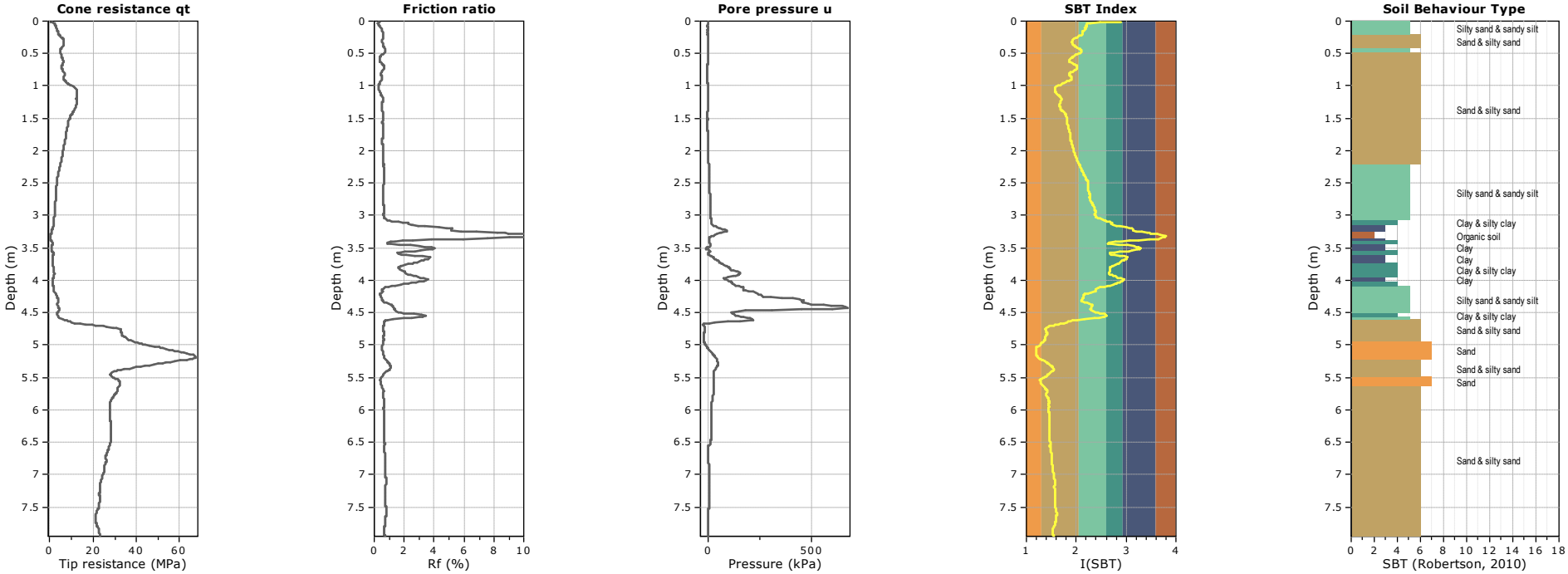
+64211473249

CPT: CPT130
Total depth: 7.95 m, Date: 12/12/2025
Surface Elevation: 19.20 m
Coords: X:1617138.04, Y:6116896.67
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Underground Investigation Ltd
Cone Penetration Testing
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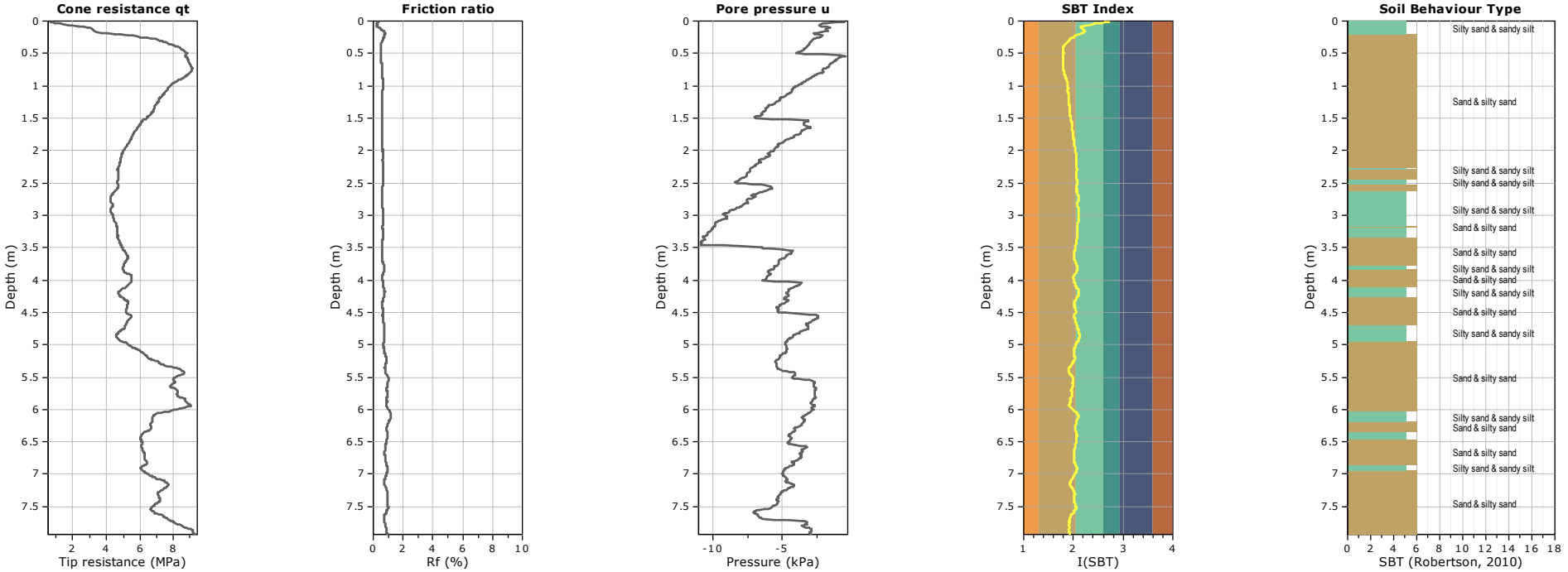
+64211473249

CPT: CPT130A
Total depth: 7.93 m, Date: 12/12/2025
Surface Elevation: 20.20 m
Coords: X:1617148.75, Y:6116872.59
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



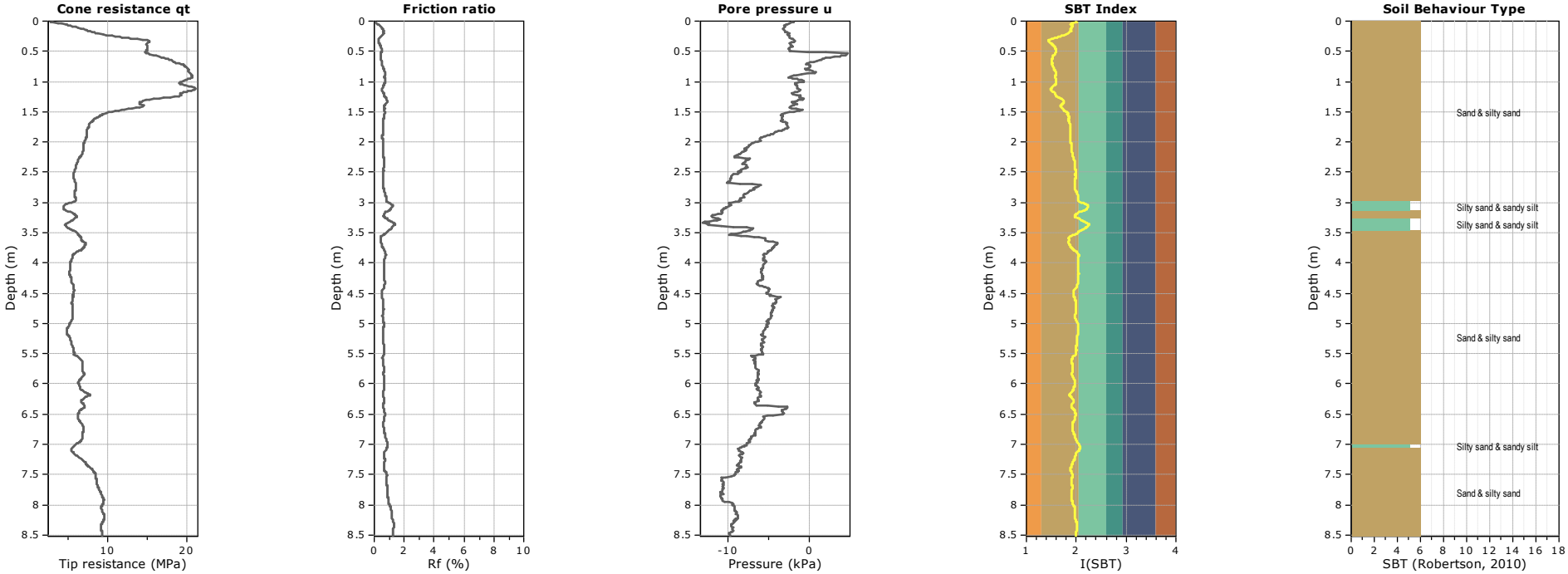
SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

CPT: CPT131
Total depth: 8.52 m, Date: 12/12/2025
Surface Elevation: 20.10 m
Coords: X:1617165.58, Y:6116900.06
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



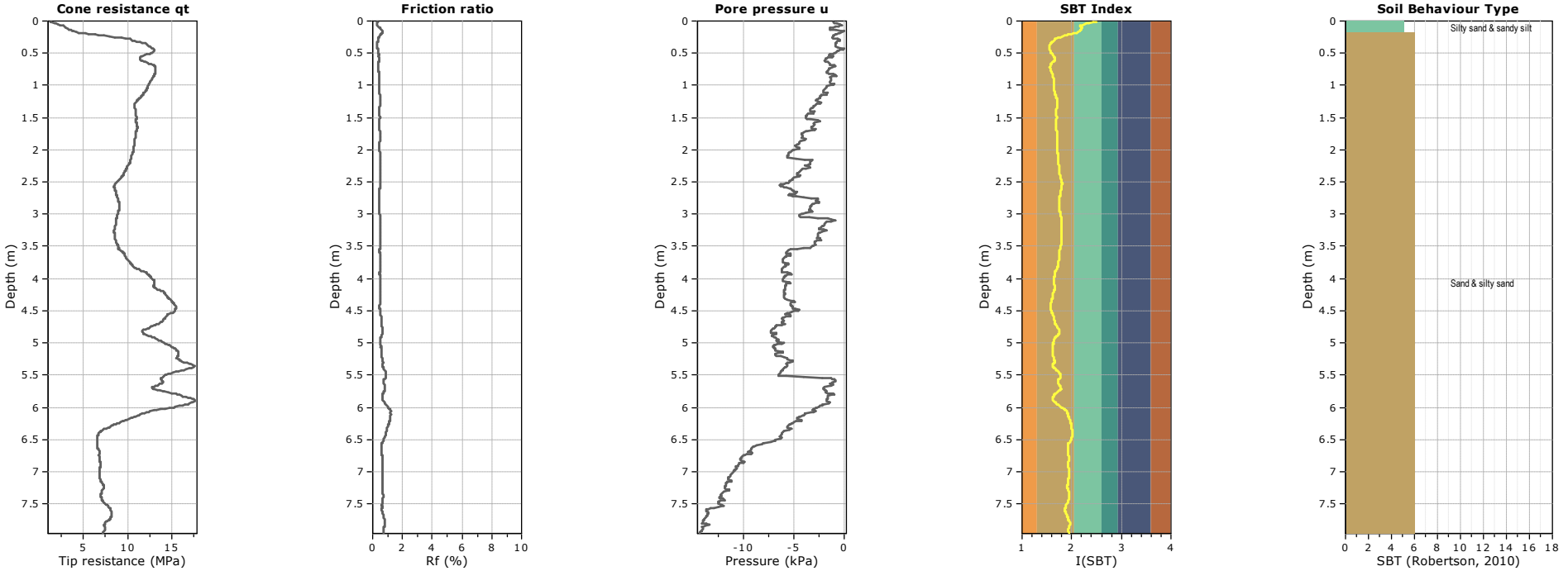
SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

CPT: CPT132
Total depth: 7.96 m, Date: 12/12/2025
Surface Elevation: 20.70 m
Coords: X:1617170.15, Y:6116862.01
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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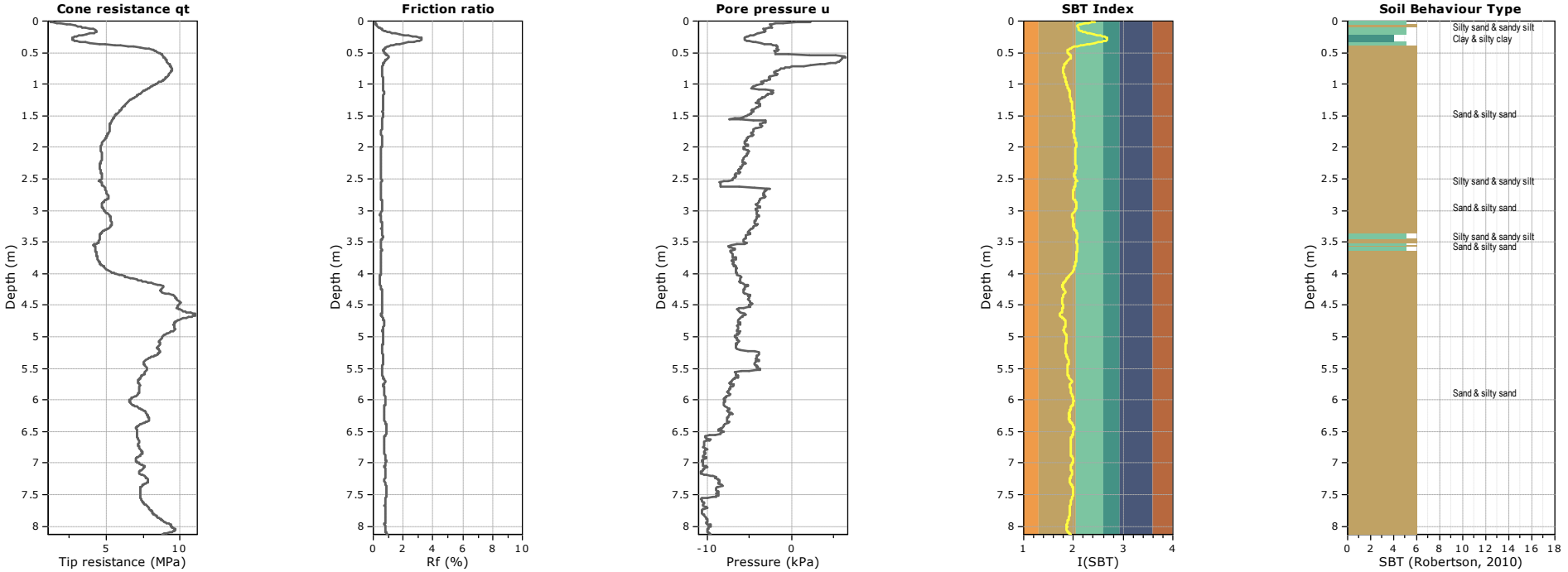
CPT: CPT133
Total depth: 8.13 m, Date: 12/12/2025
Surface Elevation: 21.20 m
Coords: X:1617181.23, Y:6116835.82
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Underground Investigation Ltd
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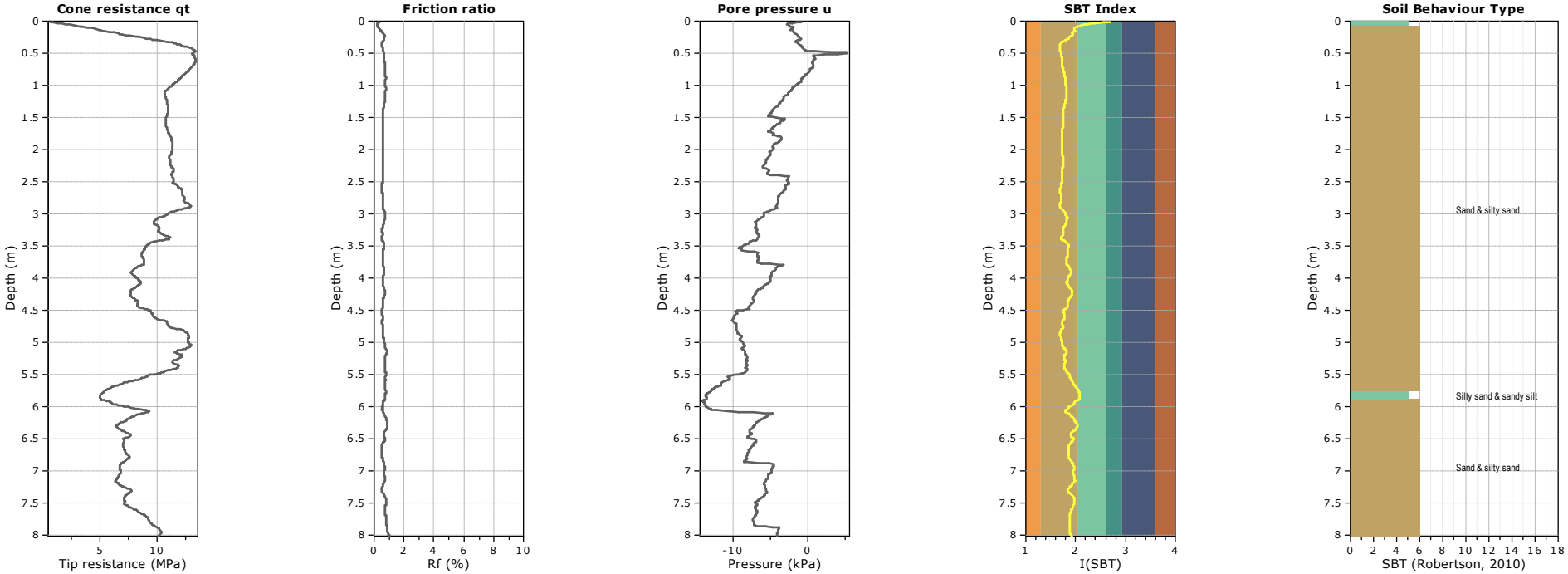
craig@undergroundinvestigation.co.nz
+64211473249

CPT: CPT134
Total depth: 8.02 m, Date: 12/12/2025
Surface Elevation: 20.90 m
Coords: X:1617167.70, Y:6116818.88
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



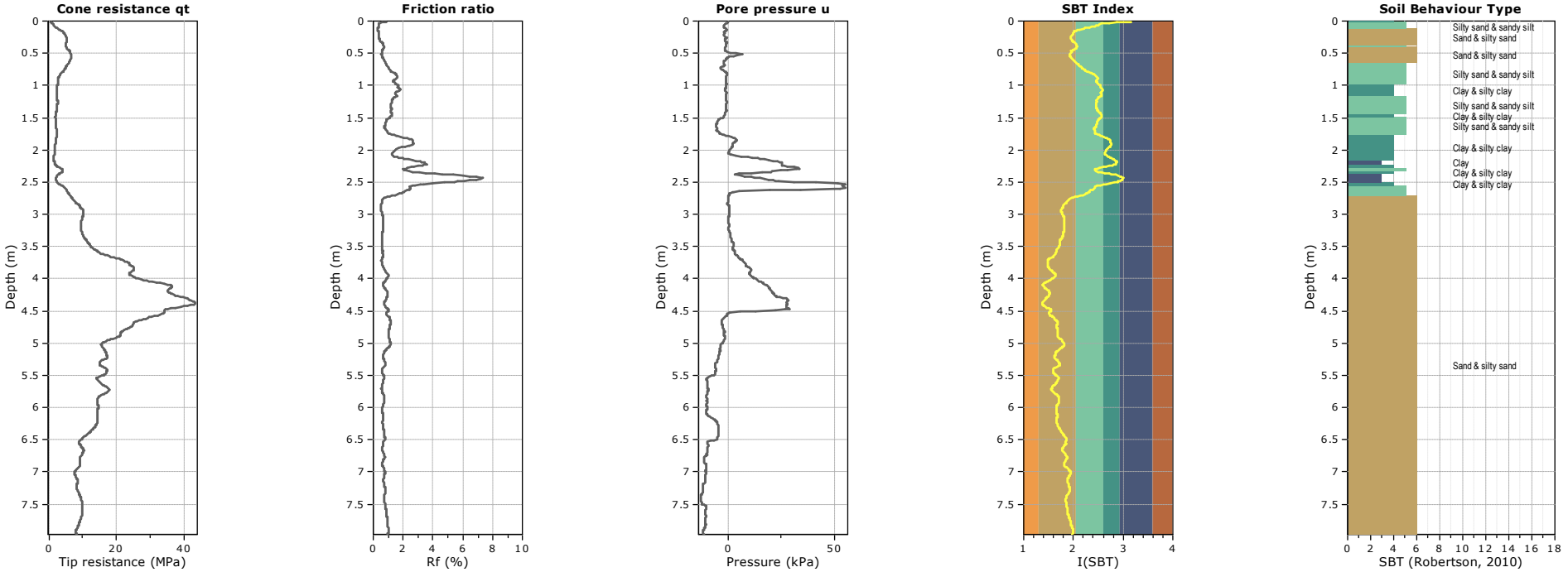
SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

CPT: CPT135
Total depth: 7.97 m, Date: 12/12/2025
Surface Elevation: 21.30 m
Coords: X:1617176.58, Y:6116788.03
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Underground Investigation Ltd
Cone Penetration Testing
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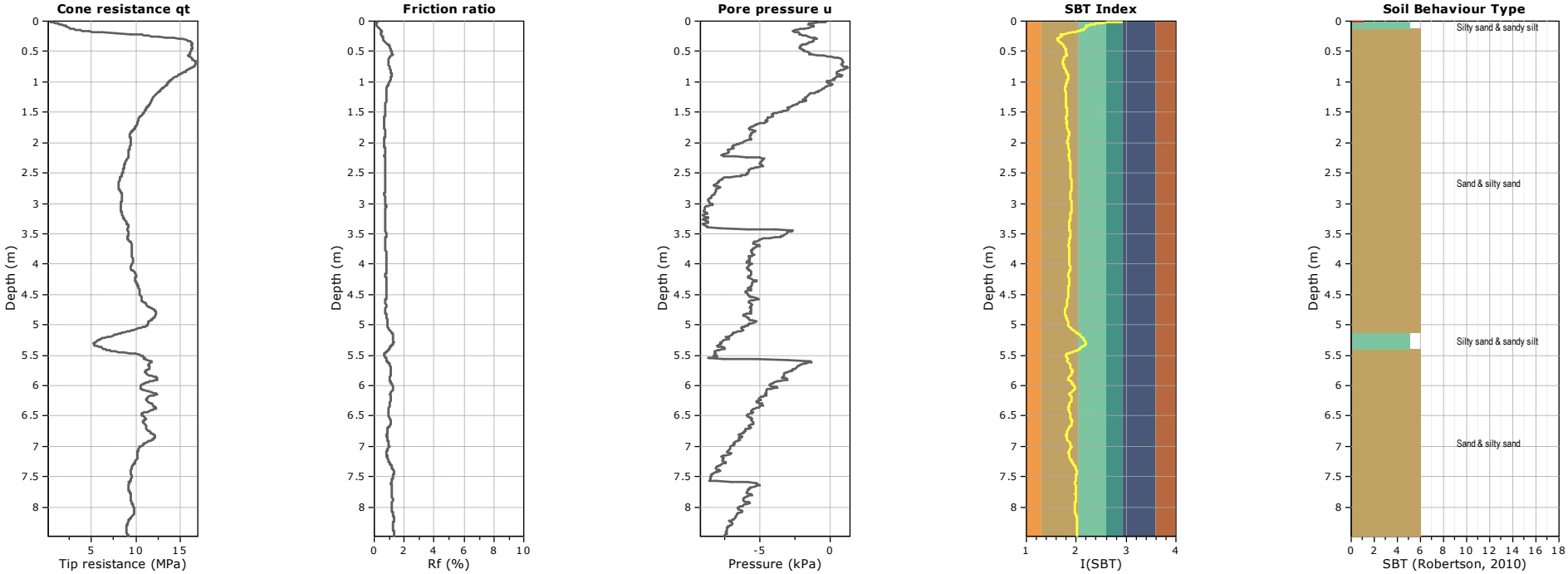
+64211473249

CPT: CPT136
Total depth: 8.48 m, Date: 12/12/2025
Surface Elevation: 22.30 m
Coords: X:1617190.74, Y:6116807.63
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



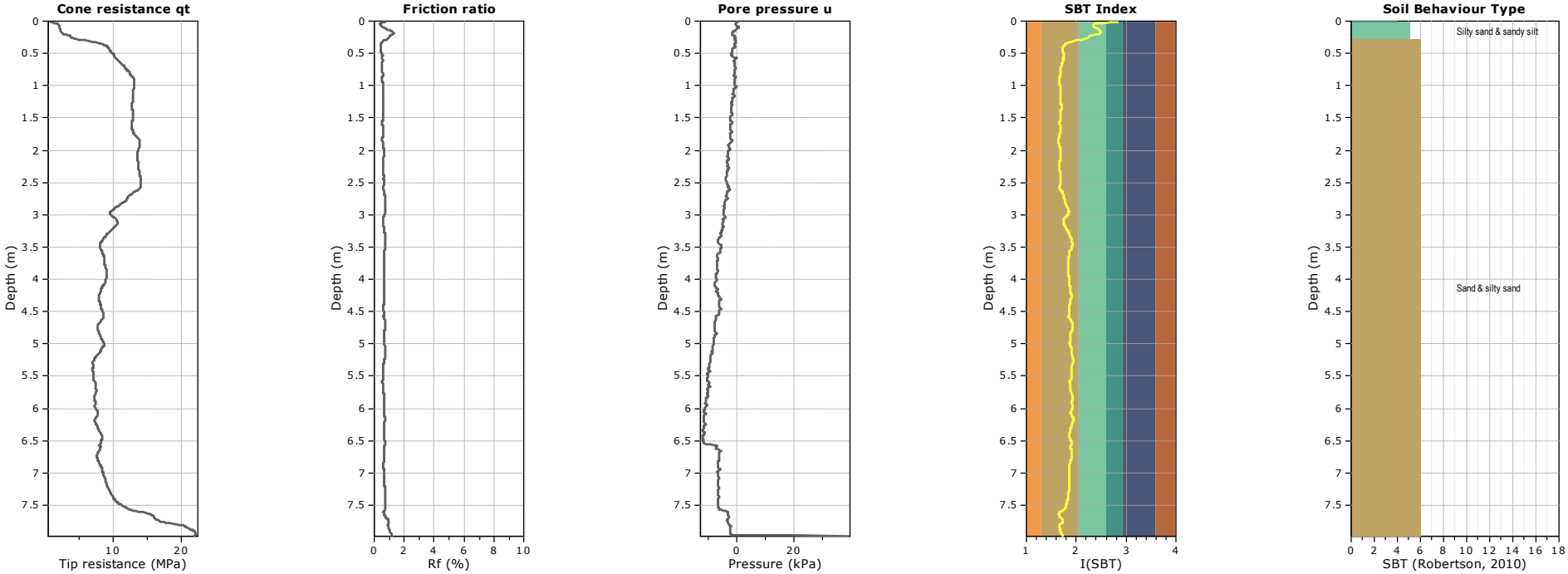
SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

CPT: CPT137
Total depth: 7.98 m, Date: 12/12/2025
Surface Elevation: 20.80 m
Coords: X:1617180.18, Y:6116766.18
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: Te Rūnanga o NgaiTakoto Free Range Egg Farm
Location: 284 and 458 Sandhills Road, Ahipara



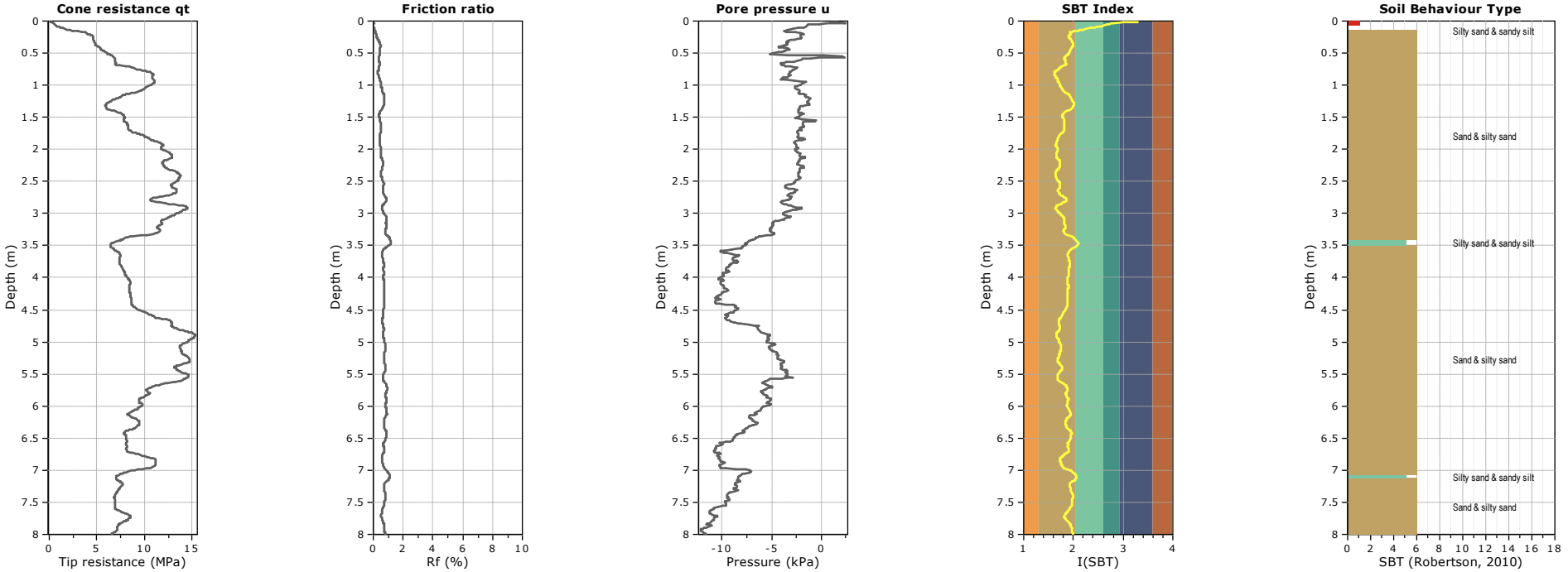
SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

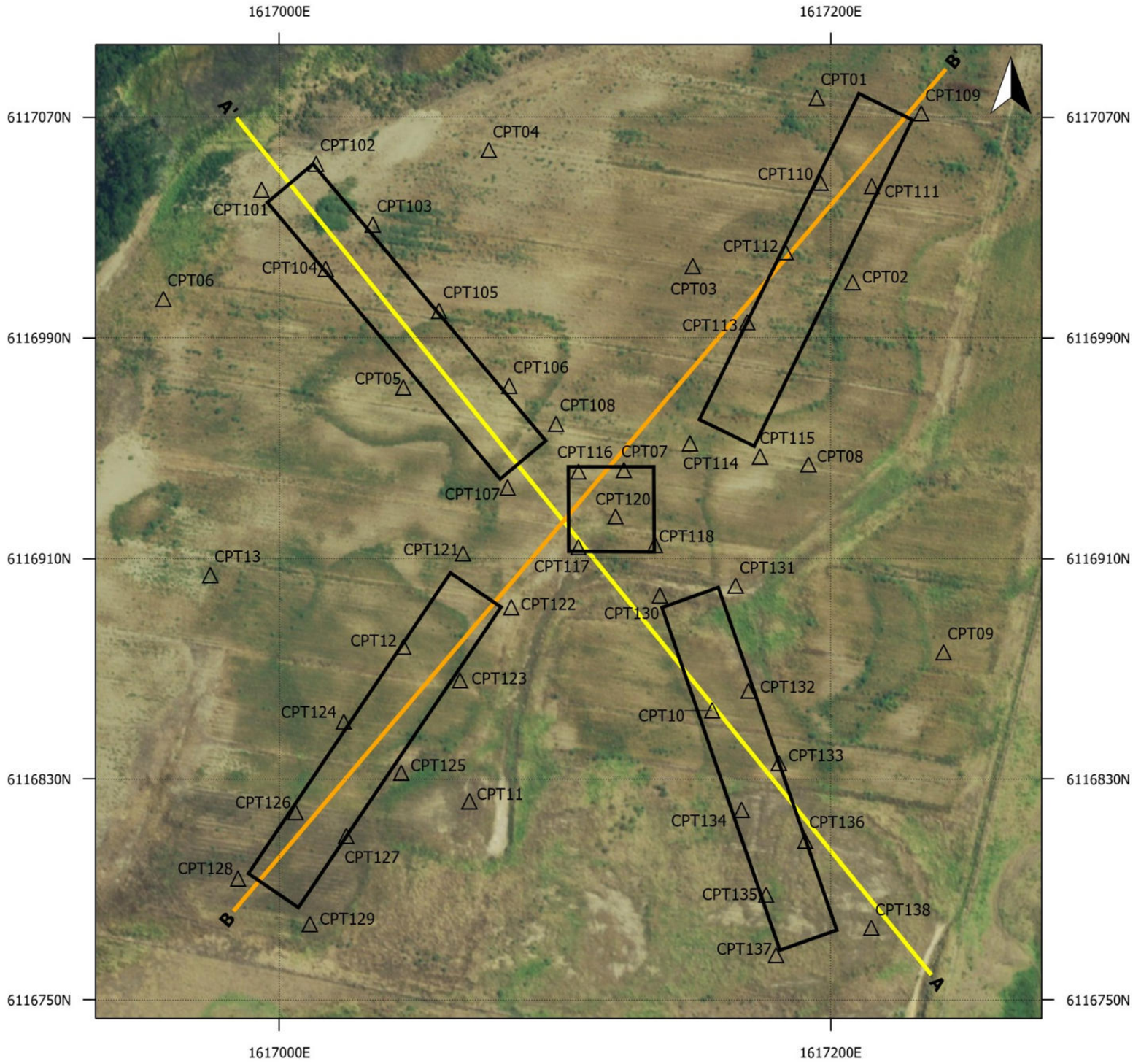
CPT: CPT138
Total depth: 8.00 m, Date: 12/12/2025
Surface Elevation: 22.30 m
Coords: X:1617214.75, Y:6116776.09
Cone Type: Geotech AB - Georig 220
Cone Operator: Underground Investigation

Project: **Te Rūnanga o NgaiTakoto Free Range Egg Farm**
Location: **284 and 458 Sandhills Road, Ahipara**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained



Legend

- Proposed egg farm layout
- Cross Section 1 (A-A')
- Cross Section 2 (B-B')

Scale: 1:1,500

0m 50m

Tonkin+Taylor

Exceptional thinking together www.tonkintaylor.co.nz

NOTES

REV	DESCRIPTION	CAD	CHK	DATE	APPROVED	DATE

DESIGNED	MOGW	Jan. 26	DRAWING STATUS: DRAFT
DRAWN	MOGW	Jan. 26	PROJECT PHASE: CONCEPT DESIGN
DESIGN CHECKED			
DRAWING CHECKED			

FOR INFORMATION

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED

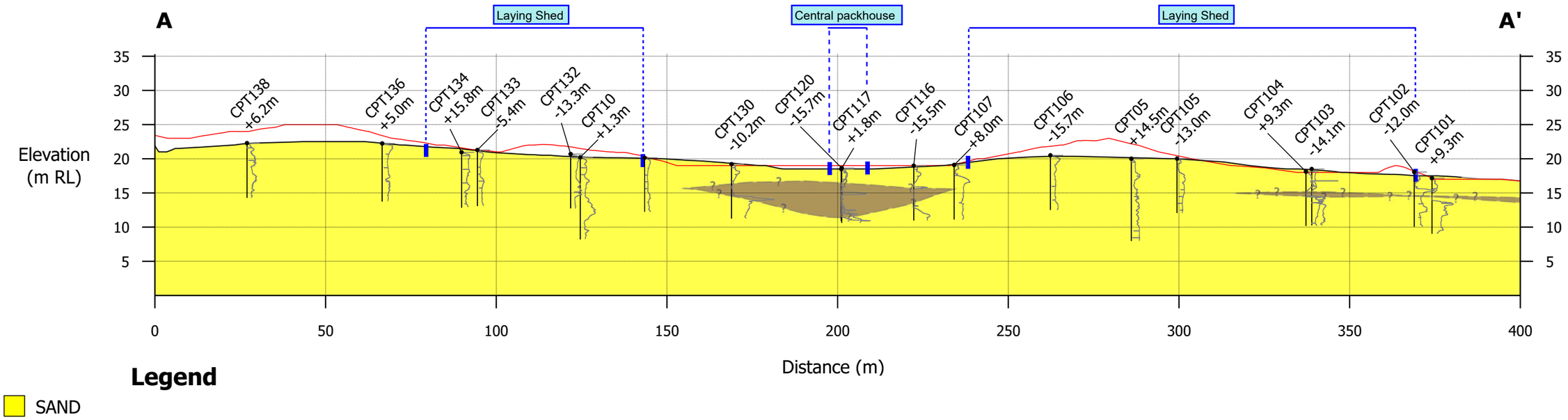
CLIENT **TE RŪNANGA Ō NGĀITAKOTO**

PROJECT **FREE RANGE EGG FARM**

TITLE CPT INVESTIGATION SITE PLAN

SCALE (A3) 1:1,500 REV 1

Cross Section 1 (A-A')



Legend

- SAND
- PEAT / SOFT MATERIAL

- Original Contours from LiDAR
- Current contours from drone survey
- Proposed egg farm extent
- CPT cone resistance trace

Scale: 1:1,250

Vertical exaggeration: 2x

0m 50m

Location

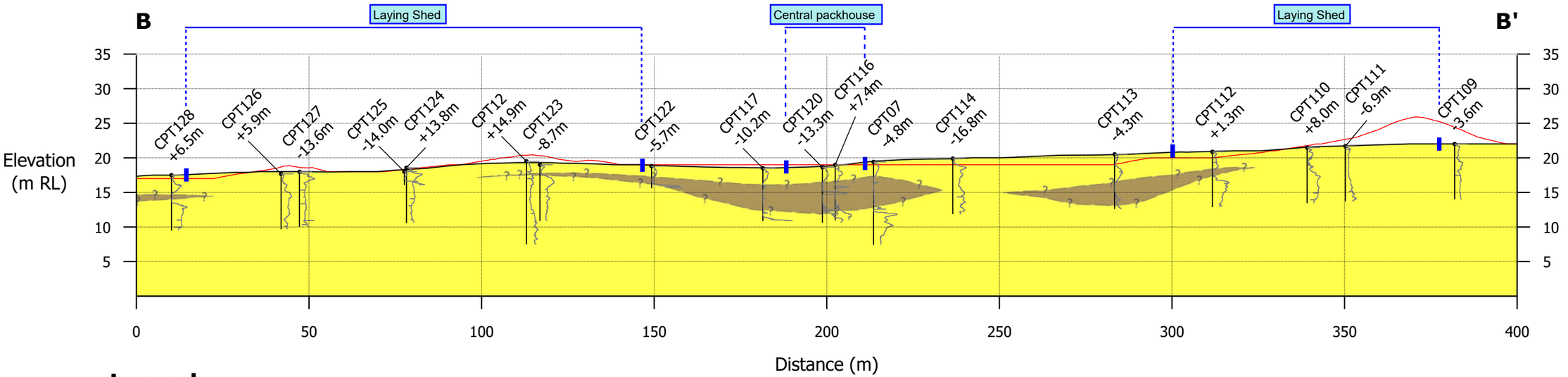
A: 1617237, 6116759

A': 1616984, 6117070

NOTES:
1. Ground model is based on observations and interpretation between discrete testing locations. The continuity of ground is likely to vary from that presented on this drawing.
2. This information is to support the concept design stage and should not be relied upon for detailed design or construction.
3. No differentiation has been made between peat and very soft or soft clay. This will need refining at the subsequent design stage.
4. CPT Traces: To provide a consistent visual scale across all sections, the initial CPT value has been adjusted to 20 MPa. This adjustment is not representative of actual measured value and should not be used for quantitative analysis. Refer to original CPT data sources for precise geotechnical interpretation.

Responsible dept.	Technical reference	Creator	Approved by	
GEOTECHNICAL	GEO SECTION	J. MURAHIDY / M. CURNOW		
Legal owner: Tonkin+Taylor		Document type: CROSS SECTION A-A'		Document status: DRAFT
		Title: Proposed Egg Farm at 424 Sandhills Rd, Kaitaia		Identification number: 1099963
			Rev.: 0	Date of issue: January 2026 / Sheet:

Cross Section 2 (B-B')



Legend

- SAND
- PEAT / SOFT MATERIAL

- Original Contours from LiDAR
- Current contours from drone survey

- Proposed egg farm extent

- CPT cone resistance trace

Scale: 1:1,250

Vertical exaggeration: 2x

0m 50m

Location

B: 1616983, 6116782

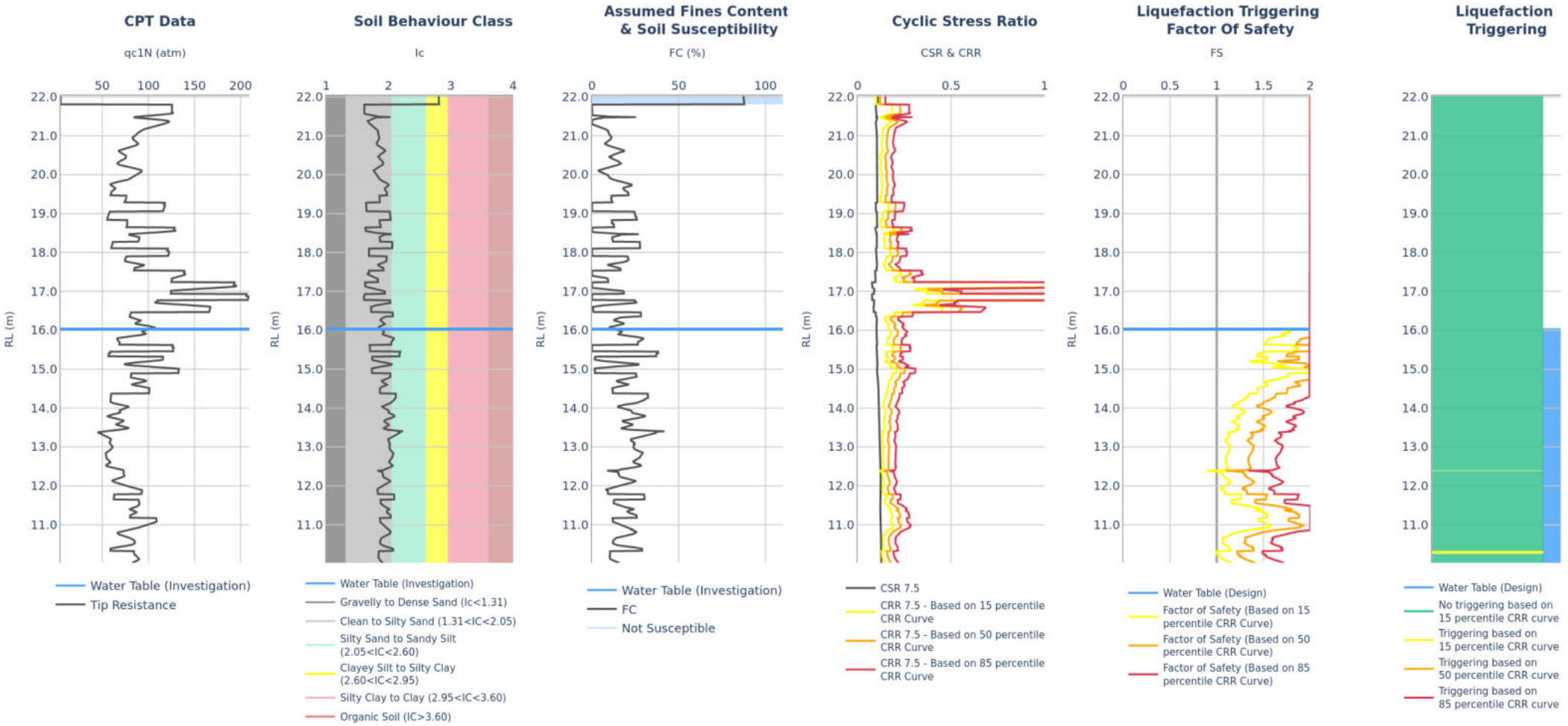
B': 1617242, 6117087

NOTES:
1. Ground model is based on observations and interpretation between discrete testing locations. The continuity of ground is likely to vary from that presented on this drawing.
2. This information is to support the concept design stage and should not be relied upon for detailed design or construction.
3. No differentiation has been made between peat and very soft or soft clay. This will need refining at the subsequent design stage.
4. CPT Traces: To provide a consistent visual scale across all sections, the initial CPT value has been adjusted to 20 MPa. This adjustment is not representative of actual measured value and should not be used for quantitative analysis. Refer to original CPT data sources for precise geotechnical interpretation.

Responsible dept.	Technical reference	Creator	Approved by	
GEOTECHNICAL	GEO SECTION	J. MURAHIDY / M. CURNOW		
Legal owner		Document type		Document status
Tonkin+Taylor		CROSS SECTION B-B'		DRAFT
		Title		Identification number
		Proposed Egg Farm at 424 Sandhills Rd, Kaitaia		1099963
			Rev. / Date of issue / Sheet	
			0 / January 2026 /	

Appendix D Liquefaction Analyses

CPT DATA AND LIQUEFACTION TRIGGERING ASSESSMENT



Input

Note: Inverse filter Qc/Fs data (10 cm²).

Run Description	NZGD ID	Investigation Date	Pre-drill depth (m)	EQ Magnitude	EQ PGA (g)	Trigger Method	Settlement Method	Surcharge/Cut/Fill	Surcharge (kPa)	Cut/Fill Height (m)
CPT01	CPT_TT275201	15/09/2025	0	6.5	0.19	BI-2014	ZRB-2002	None	N/A	N/A

Output

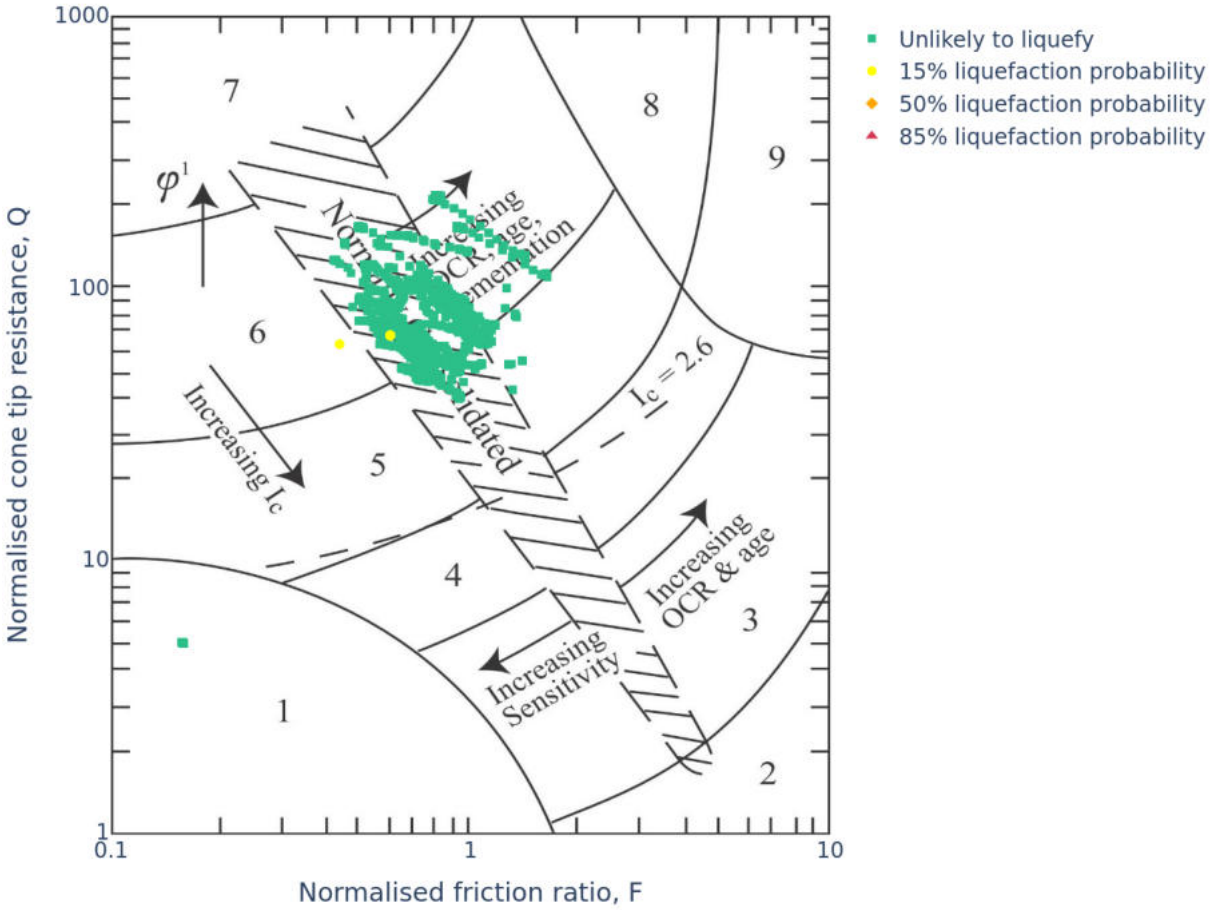
PL	SV1D (mm)	CTL (m)	LPI	LSN	CT (m)	LPIish
15%	22	0.1	0	2	12.0	0
50%	10	0.0	0	1	12.0	0
85%	4	0.0	0	0	12.0	0

Reviewed by

CPT inversion	ABL
Groundwater	ABL
Stress	ABL
Susceptibility	ABL
Triggering	ABL
Consequence	ABL

Tonkin+Taylor	*CLIENT*	*Te Runanga o NgaiTakoto Custodian Trust*	*LOCATION*	*424 Sandhills Road*	*DATE: 29/01/2026*
	PROJECT	*Sandhills Road - Proposed Egg Farm*		*,Ahipara*	*ANALYSED: BJFR*
	TITLE	*CPT01 to CPT07 - ULS*	*JOB NUMBER*	*1099963*	
	COMMENT	*nan*			*Page 1/28*

SOIL BEHAVIOUR TYPE CLASSIFICATION ASSESSMENT

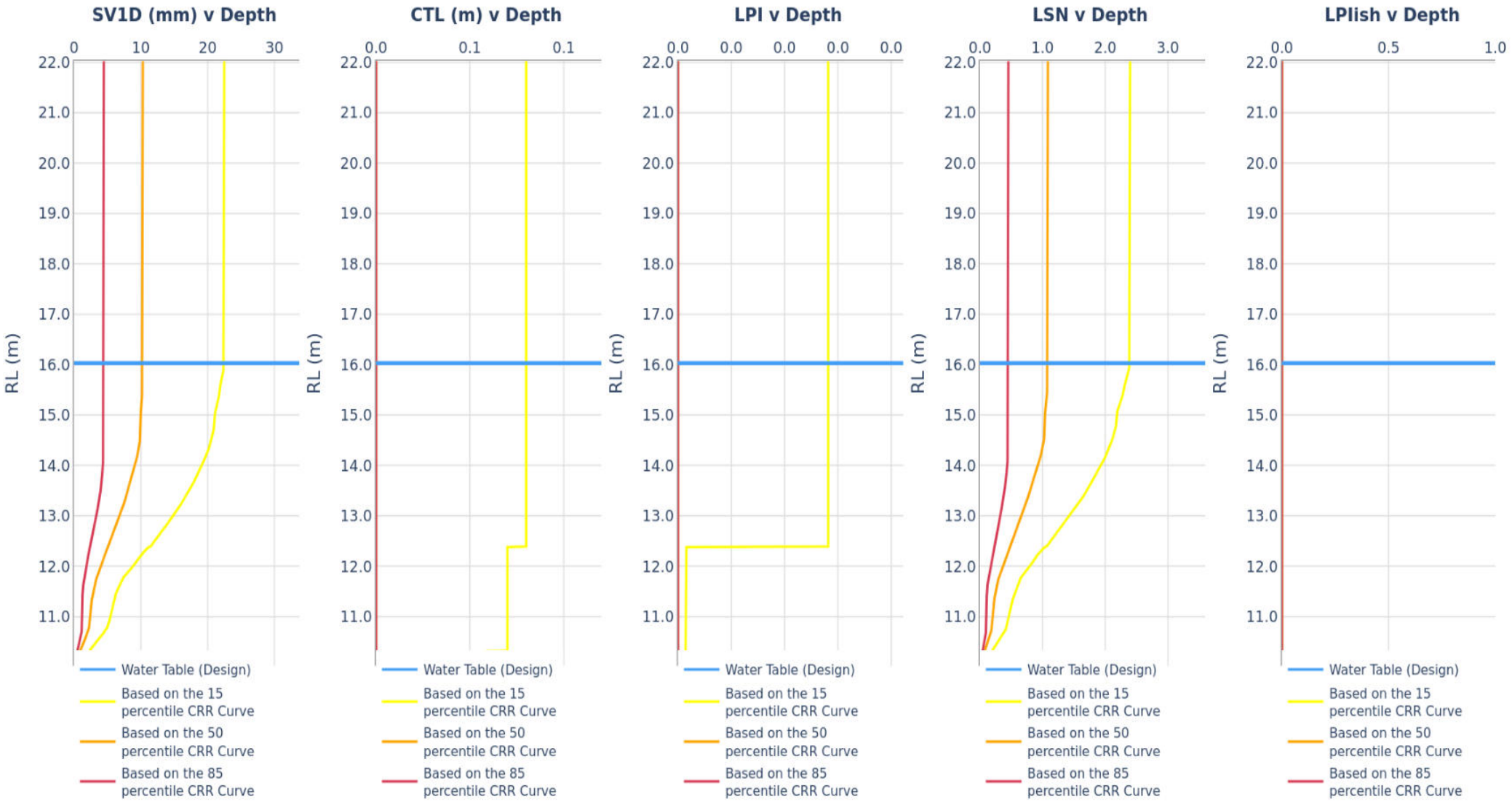


1. Sensitive, fine grained
2. Organic soils - peats
3. Clays - silty clay to clay
4. Silt mixtures - clayey silt to silty clay
5. Sand mixtures - silty sand to sandy silt
6. Sands - clean sand to silty sand
7. Gravelly sand to dense sand
8. Very stiff sand to clayey sand
9. Very stiff, fine grained *

*Heavily overconsolidated or cemented

CPT-based soil behavior type classification chart by Robertson (1990)

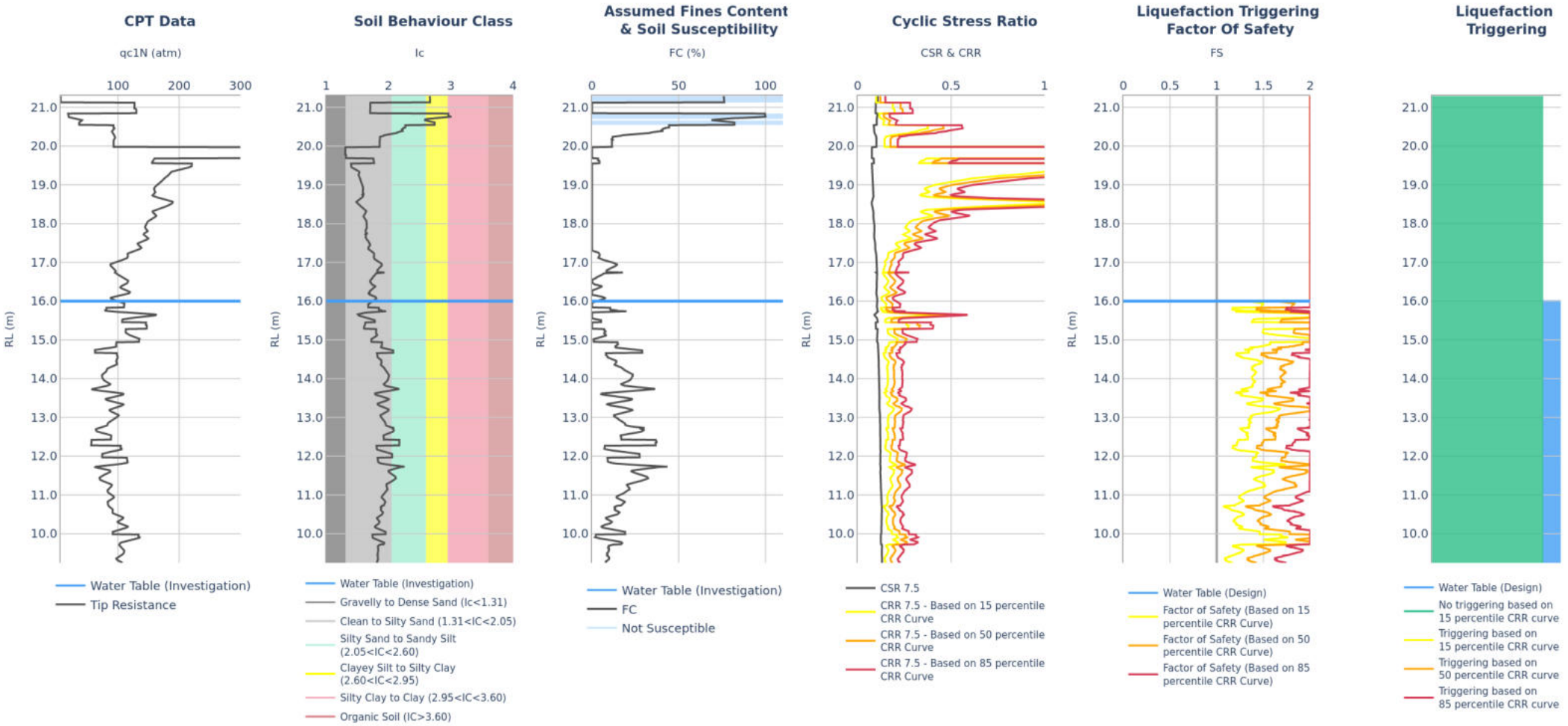
LIQUEFACTION CONSEQUENCE AND GROUND DAMAGE INDICATORS ASSESSMENT



Input

Run Description	NZGD ID	Investigation Date	Pre-drill depth (m)	EQ Magnitude	EQ PGA (g)	Trigger Method	Settlement Method	Surcharge/Cut/Fill	Surcharge (kPa)	Cut/Fill Height (m)
CPT01	CPT_TT275201	15/09/2025	0	6.5	0.19	BI-2014	ZRB-2002	None	N/A	N/A

CPT DATA AND LIQUEFACTION TRIGGERING ASSESSMENT



Input

Note: Inverse filter Qc/Fs data (10 cm²).

Run Description	NZGD ID	Investigation Date	Pre-drill depth (m)	EQ Magnitude	EQ PGA (g)	Trigger Method	Settlement Method	Surcharge/Cut/Fill	Surcharge (kPa)	Cut/Fill Height (m)
CPT02	CPT_TT275202	15/09/2025	0	6.5	0.19	BI-2014	ZRB-2002	None	N/A	N/A

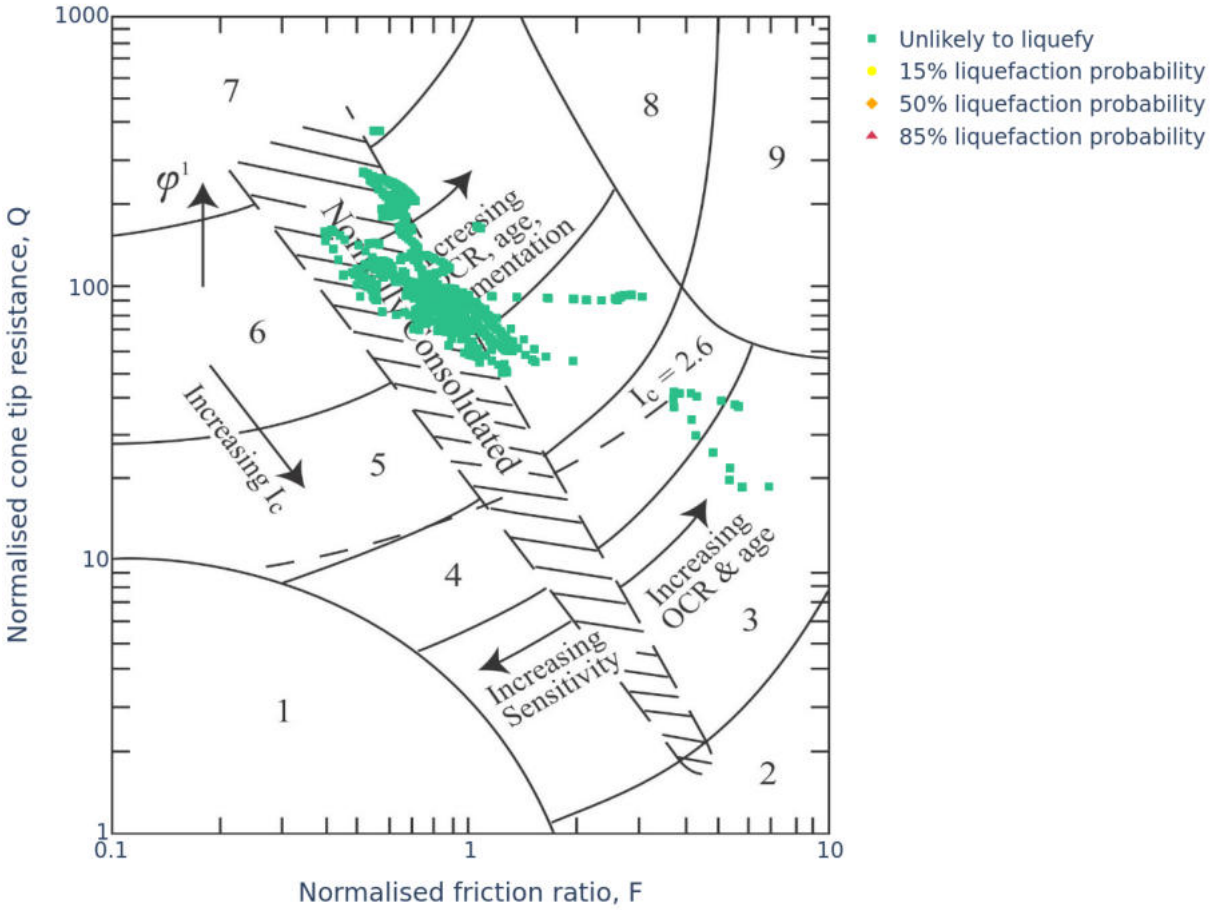
Output

PL	SV1D (mm)	CTL (m)	LPI	LSN	CT (m)	LPIish
15%	16	0.0	0	1	12.0	0
50%	7	0.0	0	0	12.0	0
85%	1	0.0	0	0	12.0	0

Reviewed by

CPT inversion	ABL
Groundwater	ABL
Stress	ABL
Susceptibility	ABL
Triggering	ABL
Consequence	ABL

SOIL BEHAVIOUR TYPE CLASSIFICATION ASSESSMENT

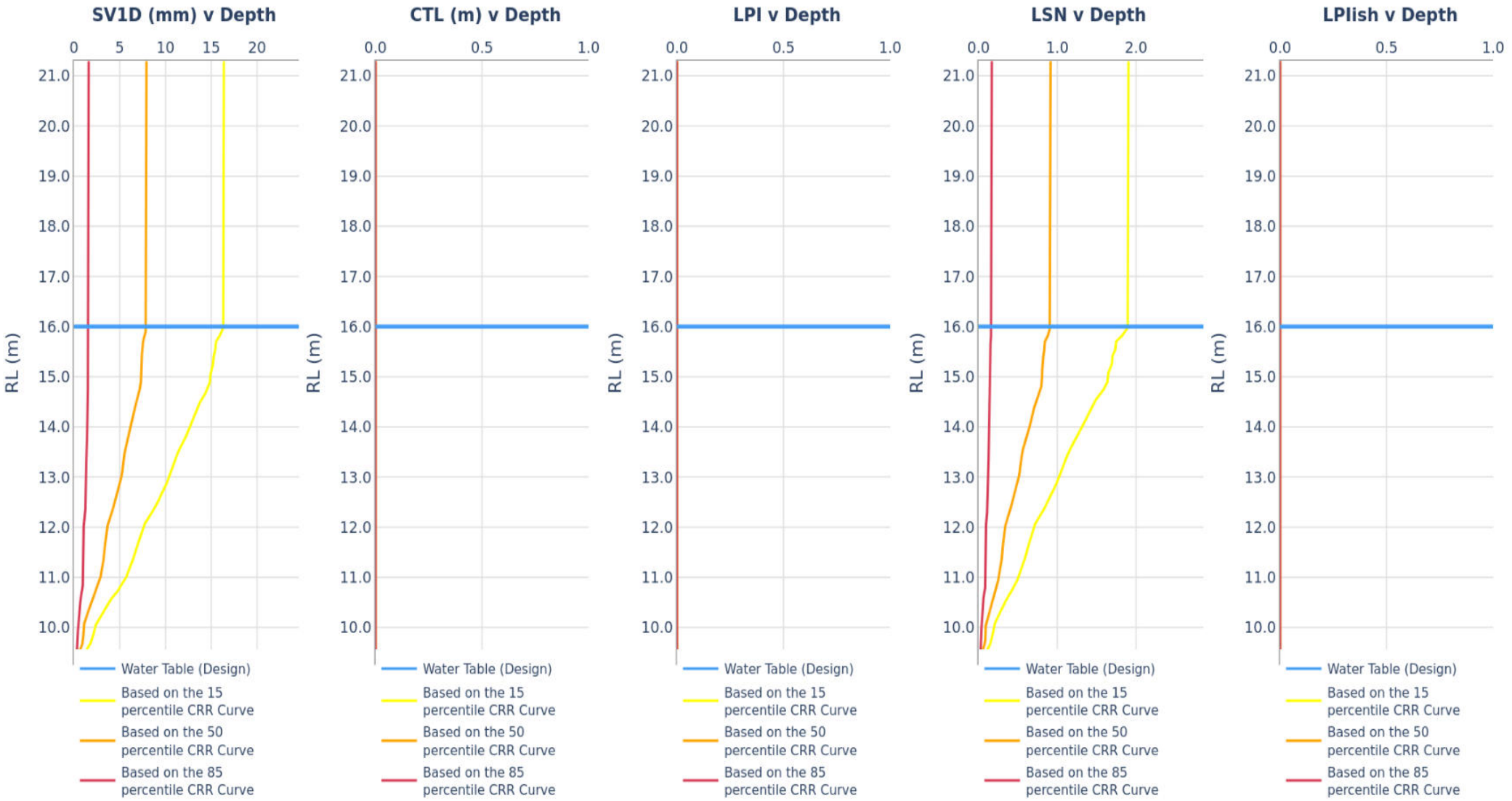


1. Sensitive, fine grained
2. Organic soils - peats
3. Clays - silty clay to clay
4. Silt mixtures - clayey silt to silty clay
5. Sand mixtures - silty sand to sandy silt
6. Sands - clean sand to silty sand
7. Gravelly sand to dense sand
8. Very stiff sand to clayey sand
9. Very stiff, fine grained *

*Heavily overconsolidated or cemented

CPT-based soil behavior type classification chart by Robertson (1990)

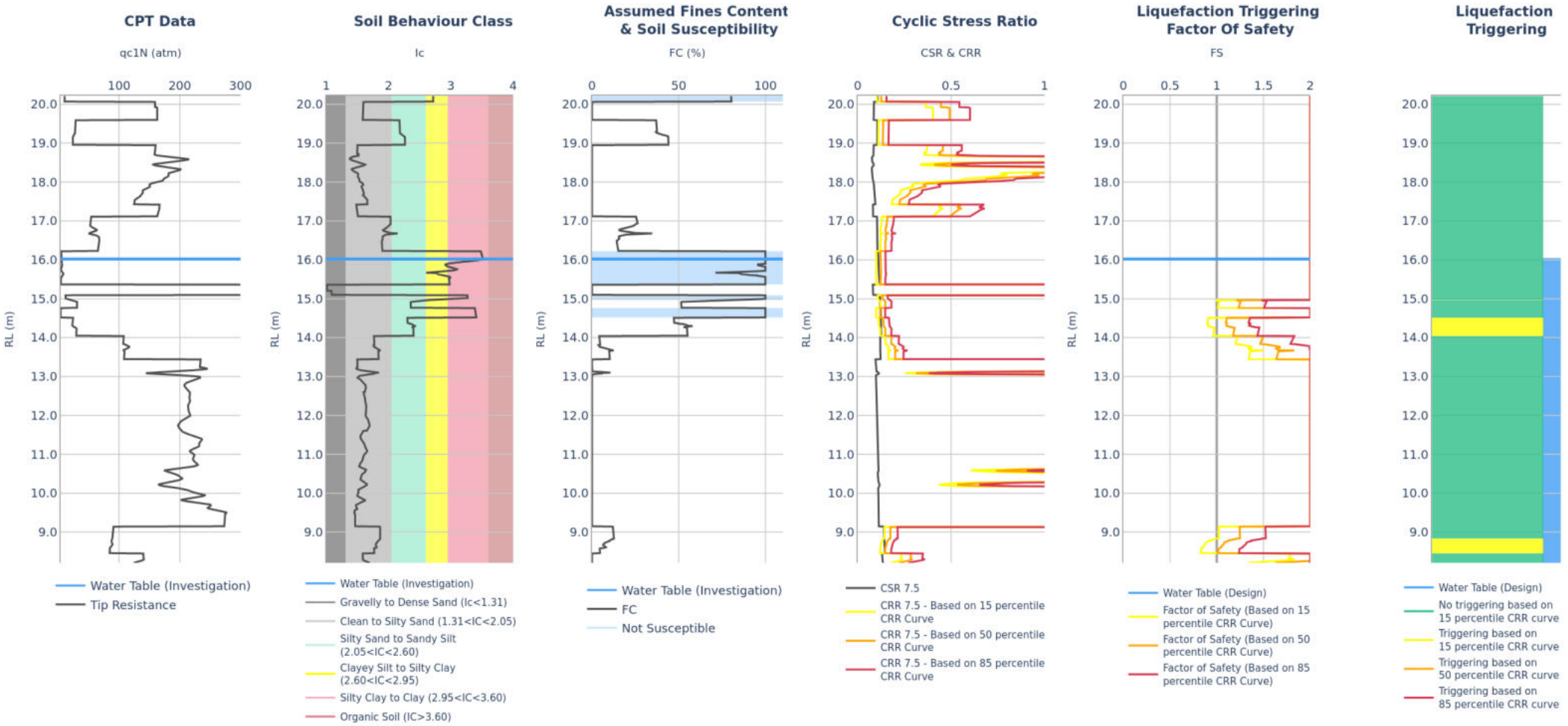
LIQUEFACTION CONSEQUENCE AND GROUND DAMAGE INDICATORS ASSESSMENT



Input

Run Description	NZGD ID	Investigation Date	Pre-drill depth (m)	EQ Magnitude	EQ PGA (g)	Trigger Method	Settlement Method	Surcharge/Cut/Fill	Surcharge (kPa)	Cut/Fill Height (m)
CPT02	CPT_TT275202	15/09/2025	0	6.5	0.19	BI-2014	ZRB-2002	None	N/A	N/A

CPT DATA AND LIQUEFACTION TRIGGERING ASSESSMENT



Input

Note: Inverse filter Qc/Fs data (10 cm²).

Run Description	NZGD ID	Investigation Date	Pre-drill depth (m)	EQ Magnitude	EQ PGA (g)	Trigger Method	Settlement Method	Surcharge/Cut/Fill	Surcharge (kPa)	Cut/Fill Height (m)
CPT03	CPT_TT275203	15/09/2025	0	6.5	0.19	BI-2014	ZRB-2002	None	N/A	N/A

Output

PL	SV1D (mm)	CTL (m)	LPI	LSN	CT (m)	LPIish
15%	22	0.9	0	2	5.8	0
50%	8	0.0	0	1	12.0	0
85%	3	0.0	0	0	12.0	0

Reviewed by

CPT inversion	ABL
Groundwater	ABL
Stress	ABL
Susceptibility	ABL
Triggering	ABL
Consequence	ABL