

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

Discharge

Fast Track Land Use*

Change of Consent Notice (s.221(3))

Subdivision

Extension of time (s.125)

Consent under National Environmental Standard
(e.g. Assessing and Managing Contaminants in Soil)

Other (please specify)

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

3. Would you like to opt out of the fast track process?

Yes No

4. Consultation

Have you consulted with iwi/Hapū? Yes No

If yes, which groups have you consulted with?

Who else have you consulted with?

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

5. Applicant details

Name/s:

Lynette & Herbert Adams

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:

Nina Pivac C/-Logiplan Limited

Email:

Phone number:

Postal address:

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

Postcode

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

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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:

Lynette & Herbert Adams

Property address/
location:

Postcode

8. Application site details

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

Name/s:

Site address/
location:

 Postcode

Legal description:

Val Number:

Certificate of title:

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

Site visit requirements:

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

Is there a dog on the property? Yes No

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

9. Description of the proposal

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

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

Regional Council Consent (ref # if known)

National Environmental Standard Consent

Other (please specify)

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

Disturbing, removing or sampling soil

Changing the use of a piece of land

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)

Email:

Phone number:

Postal address:

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

Postcode

Fees Information

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

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)

Lynette Adams

Signature:

(signature of bill payer)

Date 14-May-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)

Nina Pivac

Signature

Date 14-May-2026

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

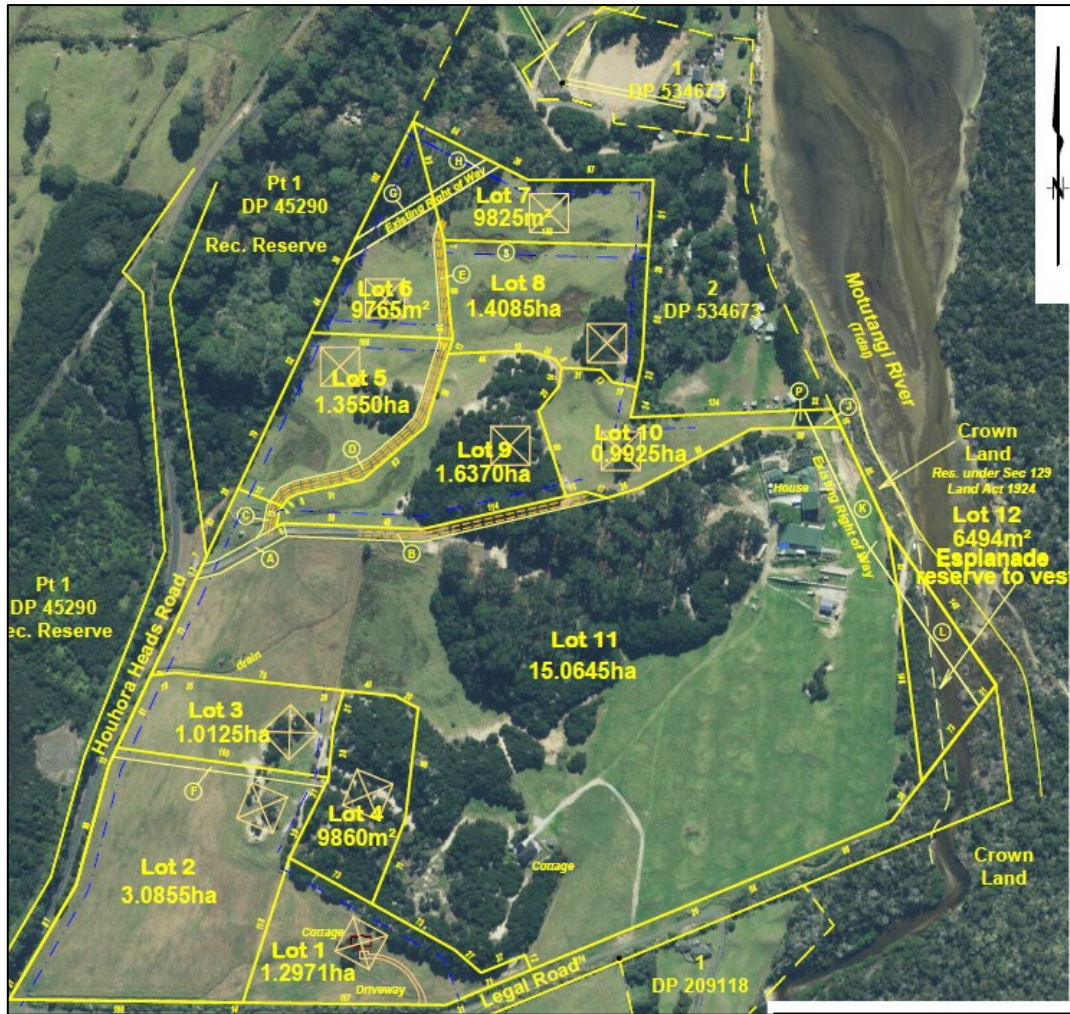
See overleaf for a checklist of your information...

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.



SUBDIVISION RESOURCE CONSENT APPLICATION

122 HOUHORA HEADS ROAD
 LOT 2 DP 70340

ASSESSMENT OF ENVIRONMENTAL EFFECTS

PREPARED FOR:
 LYNETTE & HERBERT ADAMS

14 May 2026
 REV A

Table of Contents

1.0	THE APPLICANT AND PROPERTY DETAILS	2
2.0	PROPOSAL	4
3.0	SITE CONTEXT	5
4.0	DISTRICT PLAN RULES ASSESSMENT	6
5.0	NATIONAL ENVIRONMENTAL STANDARDS FOR CONTAMINATED SOILS (NES CONTAMINATED SOILS)	9
6.0	NATIONAL ENVIRONMENTAL STANDARDS FOR FRESHWATER (NES FRESHWATER)	9
7.0	NATIONAL POLICY STATEMENT FOR HIGHLY PRODUCTIVE LAND (NPSHPL)	9
8.0	NATIONAL POLICY STATEMENT FOR INDIGENOUS BIODIVERSITY (NPS-IB)	9
9.0	PUBLIC NOTIFICATION ASSESSMENT (SECTIONS 95A, 95C TO 95D)	9
10.0	LIMITED NOTIFICATION ASSESSMENT (SECTIONS 95B, 95E TO 95G)	11
11.0	CONSIDERATION OF APPLICATIONS (SECTION 104)	16
12.0	EFFECTS ON THE ENVIRONMENT (SECTION 104(1)(A))	16
13.0	DISTRICT PLAN AND STATUTORY DOCUMENTS (SECTION 104(1)(B))	16
14.0	PART 2 MATTERS	17
15.0	OTHER MATTERS (SECTION 104(1)(C))	18
16.0	CONCLUSION	18

Appendices:

Appendix A – Scheme Plan

Appendix B – Certificate of Title & Interests

Appendix C – Civil & Site Suitability Report (Wilton Joubert)

Appendix D – Archaeological Report (Geometria)

Appendix E – HNZPT Consultation

Appendix F – Iwi Consultation

Appendix G – Top Energy Consultation

1.0 THE APPLICANT AND PROPERTY DETAILS

To:	Far North District Council
Site address:	122 Houhora Heads Road, Houhora
Applicant's name:	Lynette and Herbert Adams
Address for service:	Logiplan Limited Attn: Nina Pivac 50-64 Commerce Street Kaitaia 0410
Legal description:	Lot 2 DP 70340
Site area:	29.3967ha
Site owner/s:	Lynette and Herbert Adams
Operative District Plan zoning:	Coastal Living Zone
Operative overlays/resource areas:	NRC Coastal Environment
Proposed District Plan:	Rural Lifestyle
Proposed overlays/resource areas:	Treaty Settlement Area of Interest Coastal Environment
Brief description of proposal:	To undertake a staged subdivision in the Coastal Living Zone as follows: <u>Stage One:</u> <ul style="list-style-type: none"> • Lot 1 – 1.2971ha • Lot 2 – 3.0855ha • Lot 3 – 1.0125ha • Lot 4 – 9860m² • Lot 20 (balance) – 22.3746ha • Lot 12 (Esplanade Reserve to vest) – 6494m² <u>Stage Two:</u> <ul style="list-style-type: none"> • Lot 5 – 1.335ha • Lot 6 – 9765m² • Lot 7 – 9825m² • Lot 8 – 1.4085ha • Lot 9 – 1.6370ha • Lot 10 – 9925m² • Lot 11 (balance) – 15.0645ha
Summary of reasons for consent:	Overall, resource consent is required as a Restricted Discretionary Activity .

We attach an assessment of environmental effects that corresponds with the scale and significance of the effects that the proposed activity may have on the environment.

AUTHOR



Nina Pivac

Director | BAppSC | PGDipPlan | Assoc. NZPI

2.0 PROPOSAL

The applicants, Lynette and Herbert Adams, propose to undertake a staged subdivision in the Coastal Living Zone, as follows:

Stage One:

- Lot 1 – 1.2971ha
- Lot 2 – 3.0855ha
- Lot 3 – 1.0125ha
- Lot 4 – 9860m²
- Lot 20 (balance) – 22.3746ha

Stage Two:

- Lot 5 – 1.335ha
- Lot 6 – 9765m²
- Lot 7 – 9825m²
- Lot 8 – 1.4085ha
- Lot 9 – 1.6370ha
- Lot 10 – 9925m²
- Lot 11 (balance) – 15.0645ha

The proposed subdivision will be undertaken in two stages, and all necessary easements will be created as per the scheme plan (**Appendix A**).

A Site Suitability Report has been prepared by Wilton Joubert in support of the application (**Appendix C**) which concludes that the subject site is able to accommodate the proposed level of development, subject to the recommendations outlined in their report. The applicant accepts that their recommendations may form conditions of consent.

Consultation has been undertaken with Heritage New Zealand Pouhere Taonga (HNZPT) who have recommended that an archaeological assessment be undertaken. In response to this, Geometria were commissioned to undertake the required investigations as per **Appendices D and E**. Overall, Geometria have concluded that the proposed development can proceed under the Accidental Discovery Protocol (ADP). The applicant accepts that this may form a consent/notice condition or advice note.

Consultation was also undertaken with the relevant iwi authority (Ngai Takoto and Te Aupouri) as per **Appendix F**. No comments had been received at the time of lodging this application. However, it is anticipated that Council may circulate this application to external parties where warranted.

Overall, the proposal is a **Restricted Discretionary Activity** under the Operative District Plan.

The following Assessment of Environmental Effects (AEE) has been prepared in accordance with the requirements of Section 88 of and Schedule 4 of the Resource Management Act 1991 (the Act) and is intended to provide the information necessary for a full understanding of the activity for which consent is sought and any actual or potential effects the proposal may have on the environment.

3.0 SITE CONTEXT

The subject site consists of one title and is located at 122 Houhora Heads Road. The subject site is legally described as Lot 2 DP 70340 (NA27A/358).

A copy of the relevant Certificate of Title (CT) is attached as **Appendix B**.



Figure 1: Map showing subject site and surrounds (Premise)

The subject site is zoned Coastal Living under the ODP, and is located within the NRC Coastal Environment. There are no other overlays relevant to the subject site.

Under the PDP, the subject site is zoned Rural Lifestyle, and is subject to the Coastal Environment and Treaty Settlement Area of Interest overlays.

The site has rolling topography and is largely in pasture, with several areas of exotic vegetation that are predominantly pine interspersed with manuka scrub. The site does not contain any mapped areas of significant indigenous vegetation or habitats of indigenous fauna.

The subject site currently contains three existing dwellings and associated services as per previous Council approvals. Upon completion of the proposed subdivision, these dwellings will be contained within proposed Lot 11 of Stage Two. It should be noted that an additional dwelling will be constructed as per 2260368-RMALUC, and will be located within proposed Lot 1 of Stage One. The proposal is therefore able to comply with the permitted residential intensity thresholds which are discussed in further detail below.

The subject site is currently accessed via an existing vehicle crossing off Houhora Heads Road. This crossing will continue to serve Stage Two of the subdivision and will be upgraded to the required engineering standards. All necessary easements will also be created, as per the scheme plan.

Access to proposed Lots 2 to 4 of Stage One will be achieved via a new vehicle crossing off Houhora Heads Road. All necessary easements will be created as per the scheme plan. Meanwhile, access to proposed Lot 1 will be achieved via a new vehicle crossing off a legal road that adjoins the southern

boundary of the subject site. This vehicle crossing is already subject to a landuse consent condition associated with 2260368-RMALUC.

There are no registered heritage or archaeological sites within the property. However, due to the proximity to the coastal environment, comments were sought from HNZPT who requested an archaeological assessment be undertaken. This was prepared by Geometria who recommended that the proposed development proceed under the ADP.

4.0 DISTRICT PLAN RULES ASSESSMENT

OPERATIVE DISTRICT PLAN

SUBDIVISION:

An assessment of the proposal against the relevant subdivision rules of the Far North District Plan is provided below:

Coastal Living Zone	Restricted Discretionary Standards	Compliance
Rule 13.7.2.1 (ix) Subdivision within the Coastal Living Zone	1. The minimum lot size is 8,000m ² (with provision for stormwater and wastewater disposal as a necessary part of the application).	The proposed subdivision is able to meet this criteria. Resource consent is required for a Restricted Discretionary Activity
Rule 13.7.2.2 Allotment Dimensions	A minimum square building envelope of 30m x 30m is required and should not encroach into the permitted activity boundary setbacks for the relevant zones.	All existing development will remain compliant with setback requirements. Controlled Activity

LANDUSE:

An assessment of the proposal against the relevant subdivision rules of the Far North District Plan is provided below, where it relates to existing development on the subject site:

Coastal Living Zone		
District Plan Rule	Permitted Standard(s)	Compliance
10.7.5.1.1 Visual Amenity	(a) any new building(s) with max GFA of 50m ² ; or (b) any alteration/addition to an existing building which does not exceed 30% of the gross floor area of the building which is being altered or added to, provided that any alteration/addition does not	No new buildings are proposed as part of this application. Permitted

Coastal Living Zone		
District Plan Rule	Permitted Standard(s)	Compliance
	<p>exceed the height of the existing building and that any alteration/addition is to a building that existed at 28 April 2000; or</p> <p>(c) replacement of any building so long as the replacement does not exceed the building envelope occupied by the previous building; or</p> <p>(d) renovation or maintenance of any building.</p>	
10.7.5.1.2 Residential Intensity	One unit per 4ha, or one unit per site	<p>The proposed subdivision will result in Lot 11 (Stage 2) containing three dwellings. Based on a site area of 15.0645ha, the proposal is able to meet the permitted threshold for residential intensity. All other lots will enable the construction of one dwelling per new title.</p> <p>Permitted</p>
10.7.5.1.4 Building Height	The maximum height of any building shall be 8m.	<p>All existing built development will remain compliant with the 8m building height threshold.</p> <p>Permitted</p>
10.7.5.1.5 Sunlight	2m + 45-degree recession plane	<p>All existing built development is located at least 20m from new boundaries and will not encroach the recession plane.</p> <p>Permitted</p>
10.7.5.1.6 Stormwater Management	The maximum proportion or amount of the gross site area which may be covered by buildings and other impermeable surfaces shall be 10% or 600m ² whichever is the lesser.	<p>All existing impermeable surfaces have been addressed by previous Council approvals, with the most recent being 2260368-RMALUC. The proposed development will not result in any additional impermeable surfaces other than internal accessways. However, it is considered that stormwater management for accessways will be best addressed at detailed engineering design stage (s224/s223 stage). Stormwater associated with future development within each lot can also be addressed at building</p>

Coastal Living Zone		
District Plan Rule	Permitted Standard(s)	Compliance
		consent stage via consent notice conditions. Permitted
10.7.5.1.7 Setback from Boundaries	Buildings shall be set back a minimum 10m from any site boundary, except that on any site with an area less than 5,000m ² this set back shall be 3m from any site boundary.	All existing built development will remain compliant with all setback requirements. Permitted
15.1.6.A Traffic Intensity	Max TIF = 20	The proposed development provides for the construction of one dwelling per site, resulting in a TIF of 10 one-way daily traffic movements per site. While proposed Lot 11 of Stage 2 will contain three dwellings, this traffic breach has already been addressed as part of a separate landuse application referenced 2260368-RMALUC. It is therefore considered that existing use rights apply where it relates to this rule breach. Permitted

Overall, the proposal requires resource consent as a **Restricted Discretionary Activity**.

PROPOSED DISTRICT PLAN

The Proposed Far North District Plan (PDP) was notified on Wednesday 27 July 2022. Rules in a Proposed Plan have legal effect once the council makes a decision on submissions relating to that rule and publicly notified this decision, unless the rule has immediate legal effect in accordance with section 86(3) of the Resource Management Act 1991 (the Act).

As of Monday 4 September 2023, the further submission period on the PDP has closed. However, Council are yet to make a decision on submissions made and publicly notify this decision. Therefore, only rules in the PDP with immediate legal effect are relevant. These rules are identified with a 'hammer' in the plan. Rules that do not have immediate legal effect do not trigger the need for a resource consent under the PDP.

An assessment of the proposal against the PDP rules with immediate legal effect has been undertaken. The only rules of relevance are those contained within the earthworks chapter, specifically EW-R13 and EW-S3. As discussed below, adequate erosion and sediment control will be implemented along with the ADP.

5.0 NATIONAL ENVIRONMENTAL STANDARDS FOR CONTAMINATED SOILS (NES CONTAMINATED SOILS)

All applications that involve subdivision, or an activity that changes the use of a piece of land, or earthworks are subject to the provisions of the NES Contaminated Soils. The regulation sets out the requirements for considering the potential for soil contamination, based on the HAIL (Hazardous Activities and Industries List) and the risk that this may pose to human health as a result of the proposed land use.

Based on a search of Council records, historic aerial images and archives, and the documentation provided in support of this application, there is no evidence to suggest that a HAIL activity is, has been, or is more than likely to not have been undertaken on any part of the site. Therefore, the NES Contaminated Soils is not applicable in this instance.

6.0 NATIONAL ENVIRONMENTAL STANDARDS FOR FRESHWATER (NES FRESHWATER)

A review of aerial images, including NRC's wetland maps, reveal no evidence to suggest that there are any wetlands that may be subject to the NES Freshwater provisions. It is therefore considered that the NES Freshwater is not applicable in this instance.

7.0 NATIONAL POLICY STATEMENT FOR HIGHLY PRODUCTIVE LAND (NPSHPL)

The subject site is located within the Coastal Living Zone which is exempt from the NPSHPL. Therefore, no further consideration of the NPSHPL is required in this instance.

8.0 NATIONAL POLICY STATEMENT FOR INDIGENOUS BIODIVERSITY (NPS-IB)

As discussed earlier in the report, the subject site does not contain any significant areas of indigenous vegetation or habitats of indigenous fauna. The NPS-IB is therefore not relevant to this application.

9.0 PUBLIC NOTIFICATION ASSESSMENT (SECTIONS 95A, 95C TO 95D)

Step 1: Mandatory public notification is required in certain circumstances

Under Section 95A(3) an application must be publicly notified if:

- a) the applicant has requested that the application be publicly notified;*
- b) public notification is required under Section 95C.*

The applicant is not requesting public notification under clause (a). Clause (b) provisions relate to where an applicant does not provide further information formally requested under Section 92, which is not applicable in this case.

Public notification is not required and therefore Step 2 must be considered.

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

Under Section 95A (4) an application must not be publicly notified if:

- a) the application is for a resource consent for 1 or more activities, and each activity is subject to a rule or national environmental standard that precludes public notification;*
- b) the application is for a resource consent for 1 or more of the following, but no other, activities:
 - i. a controlled activity;*
 - ii. a restricted discretionary, discretionary, or non-complying activity, but only if the activity is a boundary activity;**

None of the above apply, therefore public notification is not precluded.

Step 3 must be considered.

Step 3: Public notification required in certain circumstances

Public notification is precluded if:

- a) the application is for a resource consent for 1 or more activities, and any of those activities is subject to a rule or national environmental standard that requires public notification;*
- b) the consent authority decides, in accordance with section 95D, that the activity will have or is likely to have adverse effects on the environment that are more than minor.*

The proposal requires consideration under s95D of the Act. An assessment of environmental effects is provided in Section 8.0 below which concludes that any adverse effect will be less than minor.

Step 4: Public notification in special circumstances

Section 95A(9) sets out that 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.

If the answer is yes, then those persons are required to be notified.

In this case, the proposal is for a subdivision activity which is provided for as restricted discretionary activity. As such, it is considered that this level of development is anticipated by the Far North District Plan and that there is nothing out of the ordinary that could give rise to special circumstances.

Public Notification Conclusion

Having undertaken the s95A 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 effect will be less than minor; and
- Under step 4, there are no special circumstances.

Therefore, this application can be processed without public notification.

10.0 LIMITED NOTIFICATION ASSESSMENT (SECTIONS 95B, 95E TO 95G)

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.

The above does not apply to this land.

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 NES preclude limited notification; or the application is for a controlled activity (other than the subdivision of land) or a prescribed activity under section 360H(1)(a)(ii).

The above does not apply to the proposal, and therefore limited notification is not precluded.

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 a prescribed activity under s360H(1)(b), a prescribed person; and
- In the case of any other activity, a person affected in accordance with s95E.

The application is not for a boundary or prescribed activity as defined in the Act or a prescribed activity under s360H(1)(b), and therefore an assessment in accordance with S95E is required, of which is set out below.

Overall, it is considered that any adverse effects in relation to adjacent properties will be less than minor, and accordingly that no persons are adversely affected.

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 above, special circumstances are not considered to apply to this proposal.

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).

The sections below set out an assessment in accordance with section 95E, and an assessment of potential adverse effects.

Written Approval

Written approval has been provided by HNZPT as per **Appendix E**. Comments from the relevant iwi authority (Te Aupouri and Ngai Takoto) were also sought, as per **Appendix F**. However, no formal response had been provided at the time of lodging this application.

As per the assessment of effects below, it is considered that the any adverse effect generated by the proposed development will be less than minor. As such, no other written approvals were sought.

Permitted Baseline

Under s104(2) of the RMA 1991, the consent authority may disregard adverse effects that are permitted by the District Plan (“the permitted baseline”).

The subject site is zoned Coastal Living, where residential activity is anticipated. The ODP provides for one residential unit per 4 hectares as a permitted activity. Existing resource consent approvals already authorise four residential units on the parent site, including one dwelling yet to be constructed. Accordingly, the environmental effects associated with residential living activities on the site have already been established and accepted through the consenting framework.

The proposed subdivision will enable one future dwelling per allotment. The nature of the anticipated development remains consistent with the established residential character and anticipated outcomes of the Coastal Living zone. Effects such as buildings, residential activity, traffic generation, servicing, lighting and noise are all anticipated within the zone environment.

Assessment of Effects on the ‘Localised Environment’

The matters to which Council shall restrict its discretion, as outlined in Sections 13.8.1 and 13.8.5 of the Far North District Plan, are addressed below:

PROPERTY ACCESS

The subject site is currently accessed via an existing vehicle crossing off Houhora Heads Road. This crossing will continue to service Stage Two of the subdivision and will be upgraded to the engineering standards required by consent conditions. All necessary easements will be created in accordance with the proposed scheme plan.

Access to proposed Lots 2 - 4 within Stage One will be provided via a new shared vehicle crossing off Houhora Heads Road, with the associated easements also to be created as shown on the scheme plan. Proposed Lot 1 will instead obtain access via a new vehicle crossing from the legal road adjoining the southern boundary of the site. This crossing has already been contemplated through resource consent 2260368-RMALUC, which authorised a dwelling and associated access in this location.

It is acknowledged that the existing and proposed vehicle crossings onto Houhora Heads Road do not fully achieve the required sightline distances under the District Plan. However, the Site Suitability Report prepared by Wilton Joubert (refer Appendix C) concludes that the proposed access arrangements represent the safest practicable solution given the physical constraints of the site and surrounding road geometry. The report also recommends mitigation measures including maintaining low roadside batters and open entrance treatments to maximise visibility for vehicles entering and exiting the site.

In considering the scale of traffic effects generated by the proposal, it is relevant to note that the parent site area of approximately 29ha currently provides for up to seven residential units as a permitted activity under the Operative District Plan residential intensity provisions. Existing Council approvals, including consent reference 2260368-RMALUC, have already authorised four dwellings on the property. Accordingly, the planning framework already anticipates the establishment of an additional three dwellings on the site irrespective of the proposed subdivision.

This permitted development potential forms a relevant baseline environment under Section 104(2) of the Resource Management Act 1991. As such, the assessment of traffic effects should appropriately focus on the net increase in effects beyond those already anticipated by the District Plan. In this regard, the proposal effectively results in four additional dwellings beyond the permitted baseline scenario.

SERVICING EFFECTS

The existing dwellings on site are fully serviced in terms of electricity, telecommunications, wastewater and stormwater disposal. The Site Suitability Report prepared in support of this application concludes that each new lot is able to accommodate adequate services. Consultation has been undertaken with Top Energy in regard to electricity requirements, as per **Appendix G**.

LOCATION OF BUILDING ENVELOPES

The proposed building locations have been carefully selected based on site specific characteristics, and have been identified in the Site Suitability Report as the 'most suitable' in terms of the topography, site stability and drainage capacity. All proposed building platforms are well-elevated and are positioned so that each future dwelling has the ability to maintain outlook and privacy, whilst remaining compliant with setback requirements.

EARTHWORKS

Wilton Joubert have stated that a reasonable overall preliminary allowance for access-related earthworks would be in the order of 250–500 m³, excluding any major regrading, retaining, undercut/replacement, or significant imported pavement layers. It is anticipated that final earthworks volumes will be calculated as part of detailed engineering design at s223/s224 stage. The applicant accepts that consent conditions may be imposed, requiring a sediment and erosion control plan being submitted to Council prior to any earthworks starting. Also per HNZPT recommendations, the applicant accepts that the ADP shall be implemented while undertaking earthworks. On this basis, it is considered that any adverse effects in relation to earthworks at subdivision stage will be less than minor subject to the implementation of appropriate consent conditions.

INDIGENOUS FLORA AND FAUNA

The site contains two large areas of vegetation which is predominantly pine with a few small stands of ti-tree scrub. However, there are no registered significant sites of indigenous flora or habitats of indigenous fauna. No vegetation clearance is required as part of this subdivision application.

NATURAL AND OTHER HAZARDS

As per NRC maps, the subject site is not subject to any natural hazards.

EASEMENTS FOR ANY PURPOSE

All necessary ROW easements will be created as per attached scheme plan.

PRESERVATION OF HERITAGE RESOURCES, VEGETATION, FAUNA AND LANDSCAPE, AND LAND SET ASIDE FOR CONSERVATION PURPOSES

As discussed earlier, the subject site contains two large areas of vegetation which is predominantly pine with a few small stands of ti-tree scrub. However, there are no registered significant sites of indigenous flora or habitats of indigenous fauna. No vegetation clearance is required as part of this subdivision application.

The site does not contain any registered heritage sites. In terms of archaeology, HNZPT comments were sought due to the subject site's proximity to the coastal environment. In response, HNZPT required an archaeological assessment to be undertaken (see **Appendix E**). Geometria were then engaged to undertake the necessary investigations (**Appendix D**), which concluded that any adverse effects will be less than minor and that the proposed development could proceed under the ADP. The applicant accepts that this may form conditions of consent/notice, or advice notes.

In terms of land set aside for conservation purposes, the subject site adjoins Conservation Land along the Motutangi River. However, the proposed subdivision does not involve the creation of any new lots or development in proximity to this area. All proposed allotments and anticipated building areas will remain at least 100m from the Conservation Land boundary. Accordingly, it is considered that the proposal will have no more than negligible adverse effects on the adjoining Conservation Land.

ACCESS TO RESERVES AND WATERWAYS

The proposed subdivision will not affect public access to reserves and waterways. There is already an esplanade strip along the Motutangi River. However, this requires re-alignment at the south-eastern corner of the subject site due to the river's natural course changing over time. As such, this application proposes to vest Lot 12 (6494m²) as an Esplanade Reserve in accordance with Rule 14.6.1 Esplanade Areas.

LAND USE COMPATIBILITY

The subject site is already used for residential purposes which will remain unchanged as a result of the proposal. The surrounding environment is predominantly characterised by rural lifestyle development, including a cluster of smaller allotments immediately south of the site which are similarly zoned Coastal Living. On this basis, the proposed subdivision is considered to be consistent and compatible with existing development patterns in the surrounding environment.

PROXIMITY TO AIRPORTS

The subject site is located at least 35km from the nearest airport. As such, this matter is not relevant to the proposal.

CONCLUSION

Taking the above into account, it is considered that there will be no adverse effects on the wider and localised environment. As such, no parties are considered to be adversely affected.

LIMITED NOTIFICATION CONCLUSION

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

- Under step 1, limited notification is not mandatory;
- Under step 2, 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.

11.0 CONSIDERATION OF APPLICATIONS (SECTION 104)

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 Restricted Discretionary activity, section 104C of the Act states that:

- 1) *When considering an application for a resource consent for a restricted discretionary activity, a consent authority must consider only those matters over which-*
 - a) *A discretion is restricted in national environmental standards or other regulations;*
 - b) *It has restricted the exercise of its discretion in its plan or proposed plan.*
- 2) *The consent authority may grant or refuse the application.*
- 3) *However, if it grants the application, the consent authority may impose conditions under section 108 only for those matters over which-*
 - a) *A discretion is restricted in national environmental standards or other regulations;*
 - b) *It has restricted the exercises of its discretion in its plan or proposed plan.*

12.0 EFFECTS ON THE ENVIRONMENT (SECTION 104(1)(A))

An assessment of effects on adjacent properties has been provided and it was concluded that any adverse effects will be less than minor.

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

- Efficient use of surplus land in a manner that maintains character and amenity values intrinsic to coastal-residential communities.
- Helping to relieve the housing shortage in the Far North.
- Local employment opportunities through the construction phase, and contributing to the local economy.

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

13.0 DISTRICT PLAN AND STATUTORY DOCUMENTS (SECTION 104(1)(B))

The following planning documents prepared under the RMA are considered relevant to this application.

Regional Policy Statement for Northland

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 significant regional issues, therefore providing guidance to consent applications and the development of District Plans on a regional level. Given the nature and scale of the proposed subdivision, being a restricted discretionary activity, it is considered that this level of development is compatible with the intent of the RPS.

Operative Far North District Plan – Objectives and Policies

The relevant objectives and policies of the District Plan can be found in the Coastal Environment, Coastal Living Zone, and Subdivision Chapters. As a restricted discretionary activity, the proposal is considered to be generally consistent with the relevant objectives and policies. The site is already in residential/lifestyle use which will remain unchanged as a result of the proposal. The coastal-residential character of the site will therefore not be eroded by the proposed subdivision.

Proposed Far North District Plan – Objectives and Policies

As of Monday 4 September 2023, the further submission period on the PDP has closed. However, Council are yet to make a decision on submissions made and publicly notify this decision. Therefore, the application shall only 'have regard to' the relevant objectives and policies in the PDP.

Relevant objectives and policies in the PDP are contained within the Subdivision and Rural Production Chapters. Based on the AEE, it is considered that the proposal is largely consistent with the anticipated outcome of the relevant objectives and policies, particularly the following:

- SUB-01
- SUB-P1
- SUB-P3
- SUB-P8
- SUB-P11
- RLZ-01 to RLZ-04
- RLZ-P1 to RLZ-P4

Conclusion

For the reasons outlined above, it is considered that the proposal is consistent with the relevant objectives and policies of the RPS, ODP, and PDP.

14.0 PART 2 MATTERS

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 objectives and policies of the RPS, and the Operative District Plan provisions. Accordingly, it is considered that the proposal will not offend the general resource management principles set out in Part 2 of the Act.

15.0 OTHER MATTERS (SECTION 104(1)(C))

There are no other matters considered relevant to this proposal.

16.0 CONCLUSION

The proposal involves a two-stage subdivision in the subdivision in the Coastal Living Zone, as follows:

Stage One:

- Lot 1 – 1.2971ha
- Lot 2 – 3.0855ha
- Lot 3 – 1.0125ha
- Lot 4 – 9860m²
- Lot 20 (balance) – 22.3746ha

Stage Two:

- Lot 5 – 1.335ha
- Lot 6 – 9765m²
- Lot 7 – 9825m²
- Lot 8 – 1.4085ha
- Lot 9 – 1.6370ha
- Lot 10 – 9925m²
- Lot 11 (balance) – 15.0645ha

Overall, the proposed subdivision has been assessed as a **Restricted Discretionary Activity** under the ODP.

Based on the assessment of effects above, it is concluded that any potential adverse effects on the existing environment would be no more than minor and can be managed in terms of appropriate conditions of consent.

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

AUTHOR



Nina Pivac

Director | BAppSC | PGDipPlan | Assoc. NZPI

Date: 14 May 2026

Appendices:

Appendix A – Scheme Plan

Appendix B – Certificate of Title & Interests

Appendix C – Civil & Site Suitability Report (Wilton Joubert)

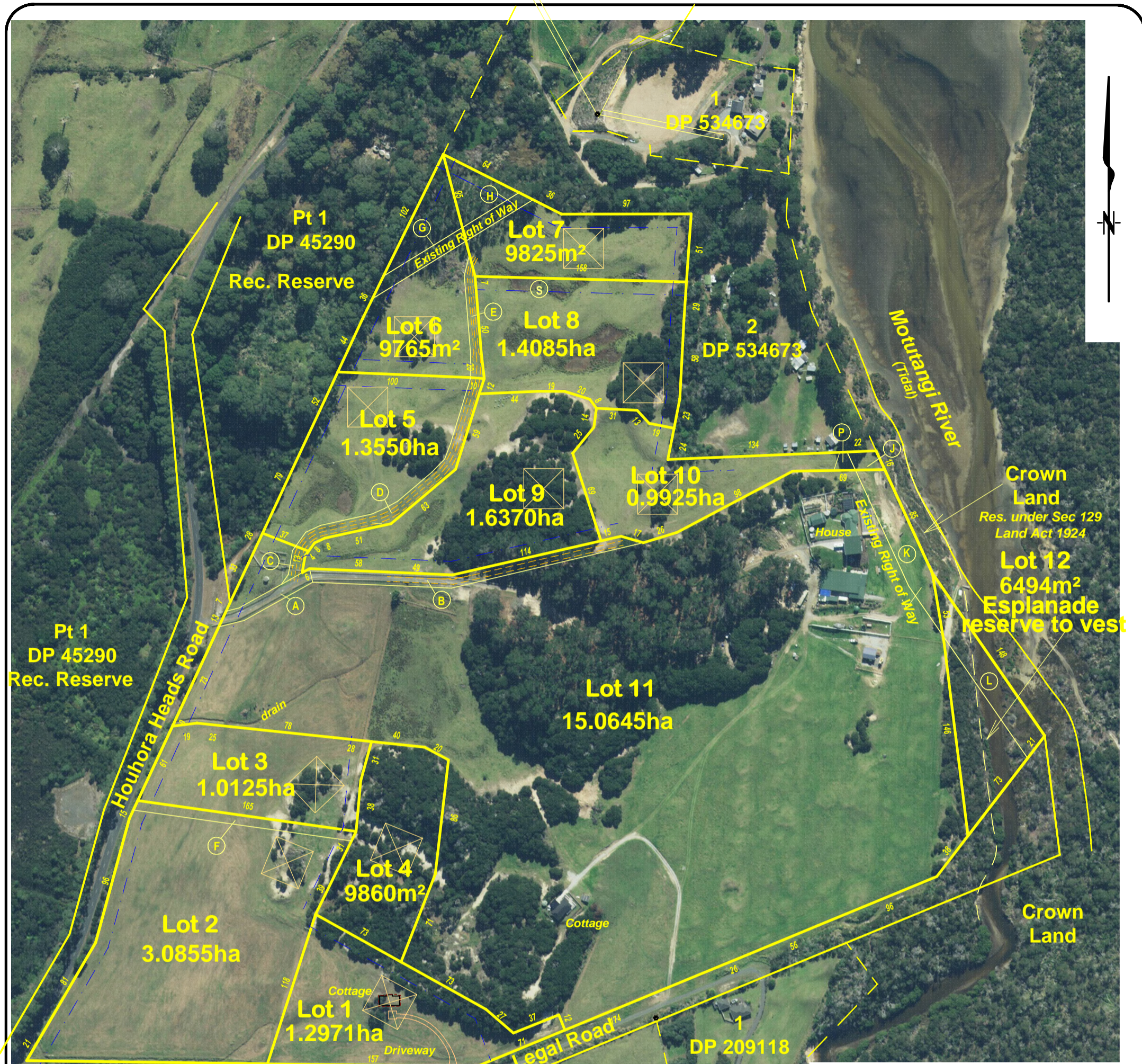
Appendix D – Archaeological Report (Geometria)

Appendix E – HNZPT Consultation

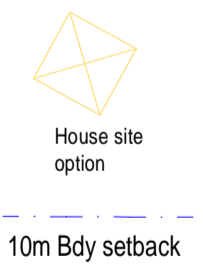
Appendix F – Iwi Consultation

Appendix G – Top Energy Consultation

Appendix A – Scheme Plan



Schedule of Existing Easements			
Purpose	Shown	Burdened Land	Created By Document:
Right of Way	G	Lot 6 hereon	EC 275139
	H	Lot 7 hereon	
	J	Lot 10 hereon	
	K	Lot 11 hereon	
	L	Lot 12 hereon	



Impermeable area Lot 1

Building (roof) area 142m²
 Proposed deck areas 10m²
 Proposed driveway 245m²

Total proposed impermeable areas 397m²
Total percentage of imperm surfaces Lot 1 3%

Memorandum of Proposed Easements			
Purpose	Shown	Burdened Land	Benefited Land
Right of Way Right to Convey Electricity, Water Telecommunications	A	Lot 11 hereon	Lots 6 - 10 hereon
	B	Lot 11 hereon	Lot 10 hereon
	C	Lot 11 hereon	Lots 5, 6, 7, 8 & 9 hereon
	D	Lot 5 hereon	Lots 6, 7, 8 & 9 hereon
	E	Lot 6 hereon	Lots 7 & 8 hereon
	F	Lot 2 hereon	Lots 3 & 4 hereon
Right to Convey Electricity	J & P	Lot 10 hereon	Lot 11 hereon

AREAS AND MEASUREMENTS SUBJECT TO FINAL SURVEY

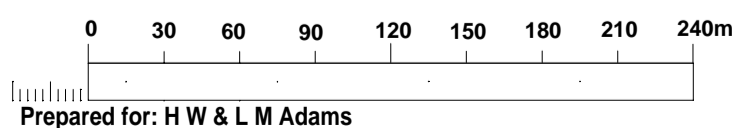
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OVERALL

Local Authority: Far North District Council

Total Area: 29.3967ha CT
 Comprised in: NA27A/358

This plan and accompanying report(s) have been prepared for the purpose of obtaining a Resource Consent only and for no other purpose. Use of this plan and/or information on it for any other purpose is at the user's risk.

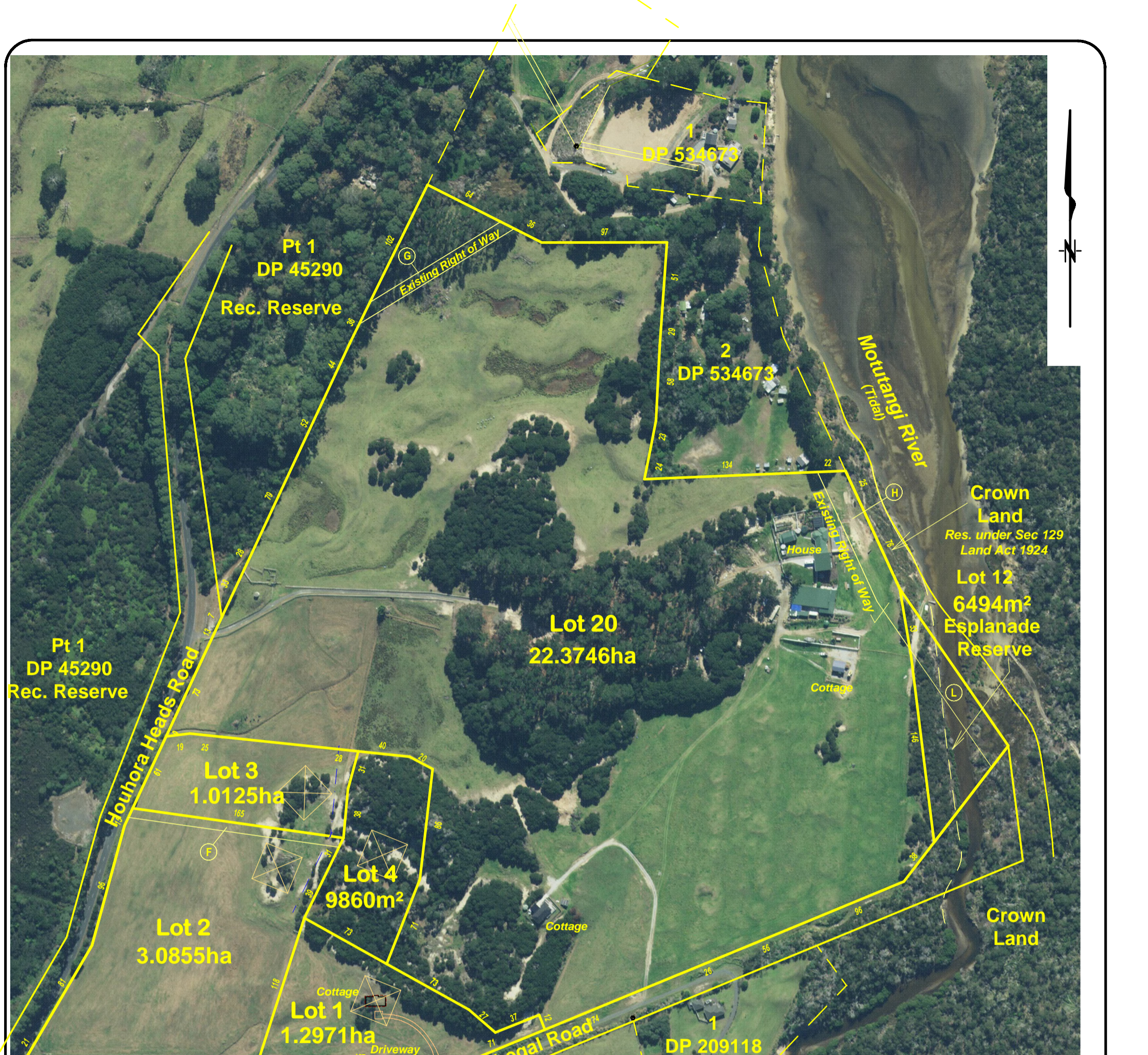


WILLIAMS AND KING
 Registered Land Surveyors, Planners & Land Development Consultants
 Ph: (09) 407 6030 27 Hobson Ave
 Email: kerikeri@saps.co.nz PO Box 937 Kerikeri

Proposed Subdivision of Lot 2 DP 70340

Name	Date	ORIGINAL SCALE	SHEET SIZE
Survey Design Drawn	W & K	Nov 2025	1:3000 A3
Rev		Apr 2026	

24630



Schedule of Existing Easements			
Purpose	Shown	Burdened Land	Created By Document:
Right of Way	G & H	Lot 20 hereon	EC 275139
	L	Lot 12 hereon	



House site option

10m Bdy setback

Memorandum of Proposed Easements			
Purpose	Shown	Burdened Land	Benefited Land
Right of Way Right to Convey Electricity, Water & Telecommunications	F	Lot 2 hereon	Lots 3 - 4 hereon

Impermeable area Lot 1

Building (roof) area 142m²
 Proposed deck areas 10m²
 Proposed driveway 245m²

Total proposed impermeable areas 397m²
 Total percentage of imperm surfaces Lot 1 3%

AREAS AND MEASUREMENTS SUBJECT TO FINAL SURVEY

Local Authority: Far North District Council

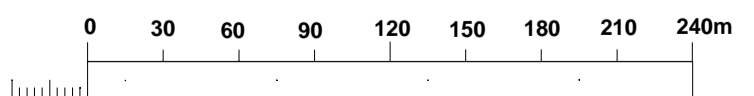
Total Area: 29.3967ha
 Comprised in: NA27A/358

Levels in terms of:
 Contour interval is:

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STAGE 1

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Prepared for: H W & L M Adams

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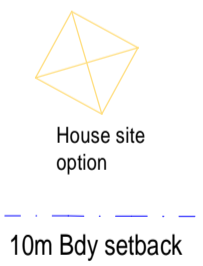
Proposed Subdivision of Lot 2 DP 70340

	Name	Date	ORIGINAL SCALE SHEET SIZE
Survey Design Drawn	W & K	Nov 2025	
Rev		Apr 2026	1:3000 A3

24630



Schedule of Existing Easements			
Purpose	Shown	Burdened Land	Created By Document:
Right of Way	G	Lot 6 hereon	EC 275139
	H	Lot 7 hereon	
	J	Lot 10 hereon	
	K	Lot 11 hereon	



Memorandum of Proposed Easements			
Purpose	Shown	Burdened Land	Benefited Land
Right of Way Right to Convey Electricity, Water Telecommunications	A	Lot 11 hereon	Lots 5 - 11 hereon
	B	Lot 11 hereon	Lot 10 hereon
	C	Lot 11 hereon	Lots 5 - 9 hereon
	D	Lot 5 hereon	Lots 6 & 9 hereon
	E	Lot 6 hereon	Lots 7 & 8 hereon
Right to Convey Electricity	J & P	Lot 10 hereon	Lot 11 hereon

AREAS AND MEASUREMENTS SUBJECT TO FINAL SURVEY

Local Authority: Far North District Council

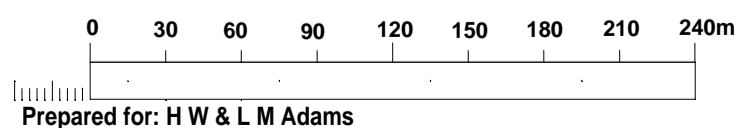
Total Area: 22.3746ha
Comprised in: Stage 1

Levels in terms of:
Contour interval is:

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Proposed Subdivision of Lot 20 Stage 1

Name	Date	ORIGINAL SCALE	SHEET SIZE
Survey Design			
Drawn	W & K Nov 2025		
Rev	Apr 2026		

24630

Appendix B – Certificate of Title & Interests



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD**

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




R. W. Muir
Registrar-General
of Land

Identifier **NA27A/358**
Land Registration District **North Auckland**
Date Issued 24 October 1973

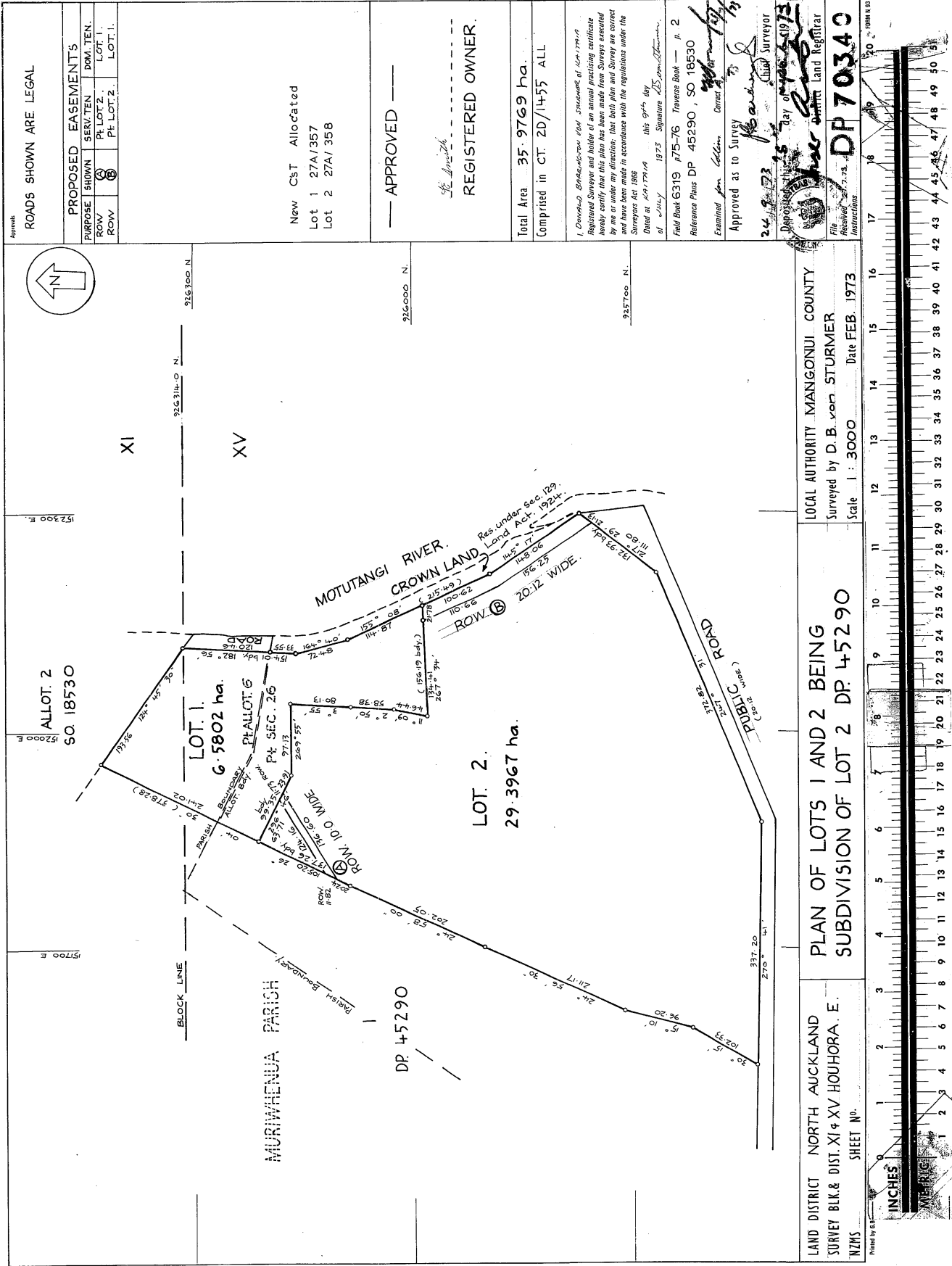
Prior References
NA2D/1455

Estate Fee Simple
Area 29.3967 hectares more or less
Legal Description Lot 2 Deposited Plan 70340

Registered Owners
Herbert Wayne Adams and Lynette Mary Adams

Interests



Subject to a right of way over parts marked A and B on DP 70340 specified in Easement Certificate 275139 - 22.1.1974 at 2.41 pm



Appendix C – Civil & Site Suitability Report (Wilton Joubert)

SITE	122 Houhora Heads Road, Pukenui
LEGAL DESCRIPTION	Lot 2 DP 70340
PROJECT	Proposed 11-Lot Subdivision
CLIENT	Adams Family Trust
REFERENCE NO.	145679
DOCUMENT	Civil Site Suitability Report
STATUS/REVISION NO.	02– Resource Consent
DATE OF ISSUE	30 April 2026

Report Prepared For	Attention	Email
Adams Family Trust	Nina Pivac	adamslogin@gmail.com nina@logiplan.co.nz

Authored by	G.M. Brant <i>(Be (Hons) Civil)</i>	Civil Engineer	gustavo@wjl.co.nz	
Reviewed & Approved by	B. Steenkamp <i>(CPEng, BEng Civil, CMEngNZ, BSc (Geology))</i>	Senior Civil Engineer	bens@wjl.co.nz	

1 EXECUTIVE SUMMARY

The following table is intended to be a concise summary which must be read in conjunction with the relevant report sections as referenced herein.

Legal Description:	Lot 2 DP 70340												
Lot Sizes:	Proposed Lot 1 – 1.2971ha Proposed Lot 2 – 3.0855ha Proposed Lot 3 – 1.0125ha Proposed Lot 4 – 9,860m ² Proposed Lot 5 – 1.3550ha Proposed Lot 6 – 9,765m ² Proposed Lot 7 – 9,825m ² Proposed Lot 8 – 1.4085ha Proposed Lot 9 – 1.7305ha Proposed Lot 10 – 8,985m ² Proposed Lot 11 – 15.0645ha (balance lot)												
Scope:	Civil Site Suitability Investigation: <ul style="list-style-type: none">- Potable Water Recommendations- Wastewater Assessment- Stormwater Assessment- Access												
Development Proposals Supplied:	3 x Subdivision Scheme Plans supplied by Williams & King (Ref No: 24630, dated: November 2025)												
District Plan Zone:	Coastal Living Zone												
Wastewater:	<p>Based on the geotechnical observations, the site is generally underlain by free-draining sandy soils that are considered broadly suitable for on-site wastewater disposal. Localised dense or cemented sand layers (hardpan) were encountered in some areas, which may constrain disposal performance and require site-specific design responses. Final treatment level, loading rates, and disposal field layout shall be confirmed at Building Consent stage in accordance with AS/NZS 1547:2012 and the Proposed Regional Plan for Northland.</p> <p>The following is an indicative Conventional Trench wastewater design for a 4-bedroom dwelling – given the subsoils encountered we recommend Primary Level Treatment or higher:</p> <table><tr><td>Daily Wastewater Production:</td><td>1,080L/day</td></tr><tr><td>Daily Application Rate:</td><td>20mm/day</td></tr><tr><td>Bed Length Required:</td><td>108m</td></tr><tr><td>Recommended Field Setup:</td><td>6 x 18mL x 0.5mW with 1.0m spacings</td></tr><tr><td>Disposal Area:</td><td>Basal = 54m² Covered Area = 144m² (with spacings)</td></tr><tr><td>Reserve Area:</td><td>Basal = 54m² (100%) Covered Area = 144m² (with spacings)</td></tr></table> <p>Recommendations for wastewater are provided in Section 6.</p>	Daily Wastewater Production:	1,080L/day	Daily Application Rate:	20mm/day	Bed Length Required:	108m	Recommended Field Setup:	6 x 18mL x 0.5mW with 1.0m spacings	Disposal Area:	Basal = 54m ² Covered Area = 144m ² (with spacings)	Reserve Area:	Basal = 54m ² (100%) Covered Area = 144m ² (with spacings)
Daily Wastewater Production:	1,080L/day												
Daily Application Rate:	20mm/day												
Bed Length Required:	108m												
Recommended Field Setup:	6 x 18mL x 0.5mW with 1.0m spacings												
Disposal Area:	Basal = 54m ² Covered Area = 144m ² (with spacings)												
Reserve Area:	Basal = 54m ² (100%) Covered Area = 144m ² (with spacings)												

**Stormwater
Management
– District Plan Rules:**

Permitted Activity: 10.7.5.1.6 STORMWATER MANAGEMENT – The maximum proportion or amount of the gross site area which may be covered by buildings and other impermeable surfaces shall be 10% or 600m² whichever is the lesser.

Restricted Discretionary Activity: 10.7.5.3.8 STORMWATER MANAGEMENT – The maximum proportion or amount of the gross site area covered by buildings and other impermeable surfaces shall be 15% or 1,500m², whichever is the lesser.

To comply with the parameters of the Permitted Activity Rule (10.7.5.1.6), the lots must not exceed an impermeable area of 600m². It is expected that future development of Lots 1 – 10 will fall within the Permitted / Restricted Discretionary / Discretionary range. The existing development within Lot 11 falls within the Discretionary range.

A stormwater report including a District Plan Assessment will be required for any future development that does not comply with Permitted Activity Rule (10.7.5.1.6) at Building Consent stage.

**Stormwater
Management:**

Based on the geotechnical observations, the site is predominantly underlain by free-draining sandy soils, which are generally considered suitable for stormwater disposal via soakage. Accordingly, stormwater from the proposed lots can typically be managed through appropriately designed soakage devices, subject to confirmation through site-specific soakage testing at the detailed design stage. It is noted, however, that isolated areas of dense or cemented sand layers (hardpan) were encountered at depths of approximately 1.0m to 1.5m in some locations. Where such layers are present within or beneath the proposed soakage zone, soakage performance may be locally constrained, and alternative or supplementary stormwater management measures may be required.

Stormwater management recommendations are provided in Section 7.

Access:

It is our understanding that Lot 1 intends to utilise a new access point off the Legal Road which makes up the parent property's southern boundary.

A new access point off Houhora Heads Road is proposed to service Lots 2 – 4, and an existing access point off Houhora Heads Road is proposed to service Lots 5 – 11.

The three existing / proposed access points do not comply with FNDC's sight distance requirements and must therefore be reviewed by Council.

Access recommendations provided in Section 8.

2 SCOPE OF WORK

Wilton Joubert Ltd (WJL) was engaged by the client to undertake a civil site suitability assessment (potable water, wastewater, stormwater and access) to support an 11-lot subdivision of the subject site as per the supplied Scheme Plan Set prepared by Williams and King (Ref No: 24630, dated: November 2025).

A Geotechnical Suitability Report (WJL Ref. 145678) has been completed for the proposed subdivision which should be read in conjunction with this report.

This report is based on available information and concept-level design inputs and is intended only to support the Resource/Subdivision Consent application and does not replace the requirement for detailed engineering design and site-specific investigations at the Building Consent stage.

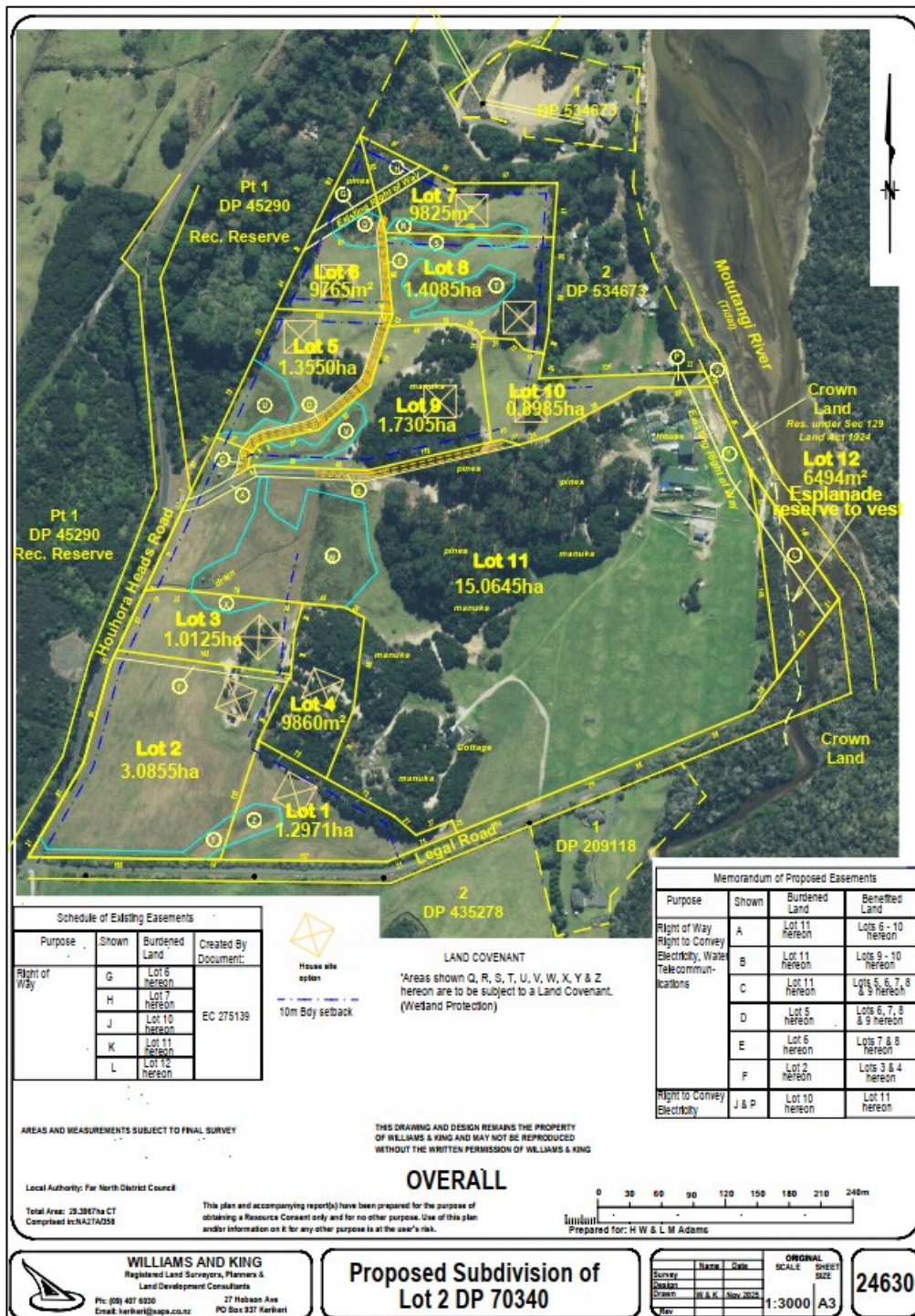


Figure 1: Snip of scheme plan prepared by Williams and King (Ref No: 24630, dated: November 2025)

THOROUGH ANALYSIS AND DEPENDABLE ADVICE
GEOTECHNICAL • STRUCTURAL • CIVIL

3 SITE DESCRIPTION

The proposed subdivision will be established within the following property, which is located off the eastern side of Houhora Heads Road, accessed 1.2km northeast of the State Highway 1 intersection:

- 122 Houhora Heads Road, Pukenui, legally described as Lot 2 DP 70340.

The surface area of the subject site is approximately 29 hectares (ha) and is accessed at the middle of the western boundary via an existing aggregate driveway that traverses towards the eastern boundary. A secondary access is present off an unnamed road that bounds the southern boundary.

Built development on-site comprises an existing residential development and associated buildings near the middle of the eastern boundary and an additional dwelling near the middle of the southern boundary. The site is covered in pasture, with pine and manuka trees planted across the elevated middle and southern portions of the site. Low-lying wetland-type areas are also intermittently present near the northern and northwestern boundaries.

Broadly speaking, the site covers a large area of land directly west of the Motutangi Stream mouth and is set around moderate to steeply rolling sand dune features that traverse from near the southwestern boundary towards the northern end of the site. The dunes generally range in heights between RL24m and RL6m New Zealand Vertical Datum (NZVD). The remaining land surrounding the base of the dunes is low-lying, generally above a height of RL5m NZVD, and is essentially flat to gently sloping.

The Far North District Council (FNDC) on-line GIS Water Services Map indicates that public underground service connections are not available to the property.

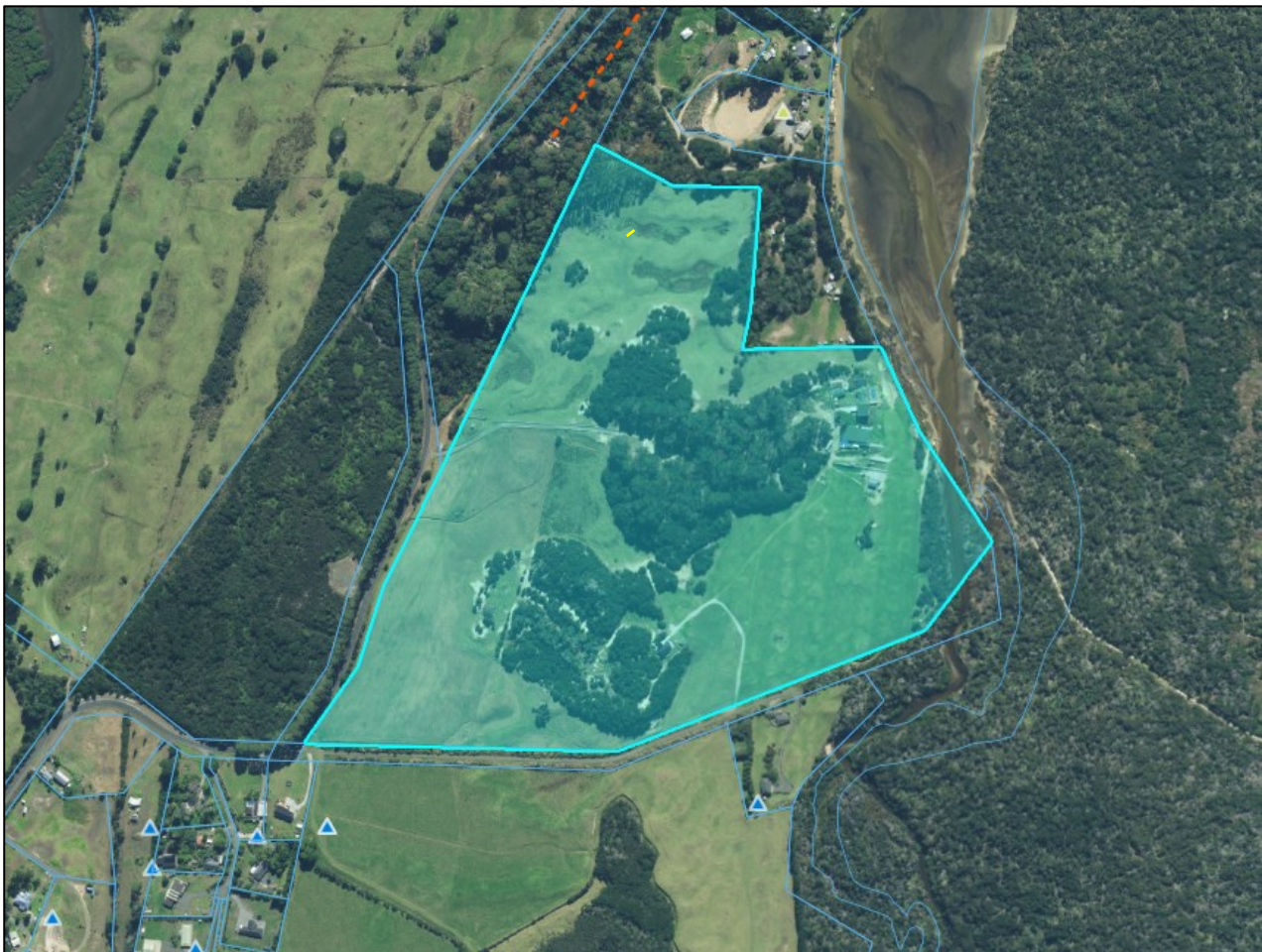


Figure 2: Aerial view with the subject property (parent lot) highlighted in cyan (from Far North District Council online GIS database)

4 PUBLISHED GEOLOGY

Local geology across proposed Lots 1-10 is noted on the GNS Science New Zealand Geology Web Map, Scale 1:250,000, as; **Karioitahi Group**, specifically being **Holocene Age Parabolic Dunes**. These deposits are up to approximately 14 thousand years in age and described as; *“Loose to poorly consolidated sand in fixed parabolic dunes. Interdune lake and swamp deposits”* (Ref: GNS Science Website).

Referring to the above mapping source, local geology across the southeastern portion of the existing property, which will be contained within proposed Lot 11, is noted as; **Holocene Age Stable Dune Deposits of Karioitahi Group**. The wider surrounding land that bounds the western side of Houhora Heads Road is geologically older (up to 1.8 million years) and noted as; **Early to Middle Pleistocene Age Dune Deposits of Karioitahi Group**.

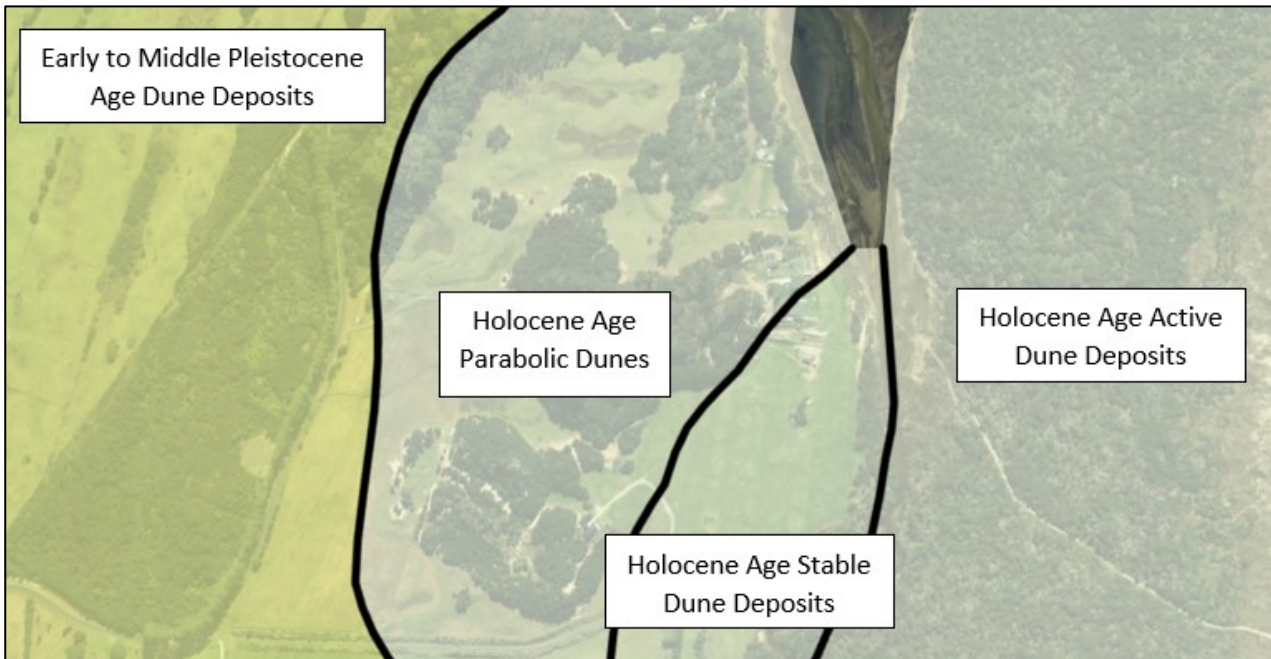


Figure 3: Screenshot aerial view from the New Zealand Geology Web Map

Shallow subsurface investigations were undertaken by WJL across the site, comprising hand auger boreholes to depths ranging between approximately 0.5m and 1.9m below ground level (bgl). The depth of augering was generally limited by sidewall collapse within the non-cohesive sandy soils encountered. In addition, 10 Cone Penetration Tests (CPTs) were undertaken (one within each proposed lot), extending to depths ranging between approximately 4.4m and 15.5m bgl.

The subsurface conditions encountered during the investigation were generally consistent across the site and comprise fine to medium sands associated with the Karioitahi Group dune deposits. These soils were observed to vary in density from loose to dense with depth. In several locations (including within proposed Lots 5, 7 & 10), testing encountered refusal or significantly increased resistance at relatively shallow depths, indicative of dense sand layers or cemented horizons (hardpan).

A surficial topsoil layer of approximately 100mm to 200mm thickness was encountered across the site.

Groundwater was not encountered during the shallow hand auger investigations at the time of testing.

Based on the soil profile, which is dominated by free-draining Fine to Medium SAND, the site is considered to be consistent with Category 2 soils in accordance with AS/NZS 1547:2012.

5 POTABLE WATER SUPPLY

It is recommended that potable water be provided for by rainwater tanks in accordance with the Countryside Living Toolbox requirements. It is recommended to provide at least 2 x 25,000L tanks for potable water usage per lot. The type of tank and volume is for the client to confirm.

6 WASTEWATER

Lots 1 – 10

No existing wastewater management system is present within Lots 1 – 10. As such, a new site-specific design in accordance with AS/NZS: 1547 will be required by FNDC for any future development within the proposed lots.

Lot 11

The existing dwelling and cottage are serviced by separate on-site wastewater treatment systems. Based on their locations relative to the proposed property boundaries, it is anticipated that these systems will remain within the new lot boundaries. Accordingly, it is recommended that the existing wastewater treatment and disposal systems continue to service the dwelling and cottage, provided they are in satisfactory condition. Should any system be found to be in poor condition, it must be upgraded or replaced in accordance with the recommendations outlined below.

6.1 DESIGN PARAMETERS

The following table is intended to be a concise summary of the design parameters, which must be read in conjunction with the relevant report sections as referenced herein.

As no development proposals are available at this stage for the eventual residential development within Lots 1 – 10, our recommendations have been based on a moderate size dwelling containing 4 bedrooms.

Given the subsoils encountered during WJL's fieldwork investigation, we recommend primary level treatment or higher for any new wastewater treatment system within the proposed lots.

Site-specific geotechnical hand auger testing is recommended at the proposed disposal location at Building Consent stage, to a minimum depth of 1.5m below ground level. This is to confirm the shallow soil profile, assess the presence and depth of any dense or cemented layers (e.g. hardpan), and verify adequate vertical separation to seasonal groundwater.

Where dense or potentially restrictive layers are encountered within or immediately below the proposed disposal zone, the design should be reviewed and adapted accordingly. This may include localised excavation and replacement with suitable clean sand material, or alternatively modification of the disposal system configuration (e.g. raised or bed systems), to ensure compliance with AS/NZS 1547:2012 and appropriate long-term performance of the system.

While a conventional trench disposal system is considered appropriate based on the site's predominantly sandy soils, alternative disposal methods may be required where site-specific investigations identify dense or restrictive layers that could influence system performance. Any such design shall be developed based on site-specific conditions and in accordance with AS/NZS 1547:2012.

6.1.1 Summary of Preliminary Design Parameters for a Primary Treatment System

Development Type:	Residential Dwellings
Effluent Treatment Level:	Primary (<BOD5 30 mg/L, TSS 45 mg/L)
Fill Encountered in Disposal Areas:	No
Water Source:	Rainwater Collection Tanks
Site Soil Category (AS/NZS 1547:2012):	Category 2 –Fine to Medium SAND

Estimate House Occupancy:	6 Persons
Land Disposal Method:	Conventional Trenches
Loading Rate:	20mm/day
Typical Wastewater Design Flow Per Person	180L/pp/pd (Estimated – introduction of water conservation devices may enable lower design flows)
Estimated Total Daily Wastewater Production per Lot:	1,080L
Loading Method:	Dosed loading by pump or syphon
Emergency Storage Capacity:	Total holding capacity = ~4,500L Required storage time = 48 hours
Overall Bed Length Required where; L = Q / (DLR x W) L = length in m Q = design daily flow rate in L/day DLR = daily loading rate in mm/day W = width in m	$L = 1080 / (20 \times 0.5) = 108\text{m}$
Recommended Field Setup:	6 x 18mL x 0.5mW with 1m spacings, See appended Site Plan (145679-C001)
Primary Disposal Area:	Basal = 54m ² Total Covered Area = 144m ² (including spacings)
Reserve Disposal Area:	Basal = 54m ² (100%) Total Covered Area = 144m ² (including spacings)
Buffer Zone:	Not Required
Cut-off Drain:	Not Required

6.1.2 Summary of Preliminary Design Parameters for a PCDI Secondary Treatment System

Development Type:	Residential Dwellings
Effluent Treatment Level:	Secondary (<BOD5 20 mg/L, TSS 30 mg/L)
Fill Encountered in Disposal Areas:	Not encountered
Water Source:	Rainwater Collection Tanks
Site Soil Category (AS/NZS 1547:2012):	Category 2 –Fine to Medium SAND

Estimate House AS/NZS 1547:2012 Occupancy:	6 Persons
Loading Rate:	5mm/day
Estimated Total Daily Wastewater Production:	1,080L/day
Typical Wastewater Design Flow Per Person:	Rainwater Supply: 180L/pp/day
Application Method:	Surface / Subsurface Laid PCDI Lines
Loading Method:	Dosed
Emergency Storage:	24 hours
Estimated Min. Disposal Area Requirement:	216m ²
Required Min. Reserve Area:	65m ² (30%)
Buffer Zone:	Not anticipated to be required
Cut-off Drain:	Not anticipated to be required

6.2 REQUIRED SETBACK DISTANCES

The disposal and reserve areas must be situated outside the relevant exclusion areas and setbacks described within Table 9 of the PRPN: Exclusion areas and setback distances for on-site domestic wastewater systems:

Table 9 of the PRPN (Proposed Regional Plan for Northland)			
Feature	Primary treated domestic wastewater	Secondary treated domestic wastewater	Greywater
Exclusion areas			
Floodplain	5% AEP	5% AEP	5% AEP
Horizontal setback distances			
Identified stormwater flow paths (downslope of disposal area)	5 meters	5 meters	5 meters
River, lake, stream, pond, dam or wetland	20 meters	15 meters	15 meters
Coastal marine area	20 meters	15 meters	15 meters
Existing water supply bore	20 meters	20 meters	20 meters
Property boundary	1.5 meters	1.5 meters	1.5 meters
Vertical setback distances			
Winter groundwater table	1.2 meters	0.6 meters	0.6 meters

Given the presence of wetland areas across the development, the location of all proposed wastewater disposal fields shall maintain the minimum setback distances in accordance with the PRPN. The current concept layout has been developed to accommodate these setbacks. Final system sizing and design shall be confirmed at Building Consent stage to ensure ongoing compliance with PRPN requirements and that no adverse effects on adjacent wetland environments occur.

6.3 NORTHLAND REGIONAL PLAN ASSESSMENT

The existing wastewater disposal systems servicing Lot 11 should meet the compliance points below, stipulated within Section C.6.1.1 of the Proposed Regional Plan for Northland:

C.6.1.1 Existing on-site domestic type wastewater discharge – permitted activity	
The discharge of domestic type wastewater into or onto land from an on-site system that was a permitted activity at the notification date of this Plan, and the associated discharge of any odour into air from the onsite system, are permitted activities, provided:	
#	Rule
1	the discharge volume does not exceed:
	a) three cubic metres per day, averaged over the month of greatest discharge, and
	b) six cubic metres per day over any 24-hour period, and
2	the following reserve disposal areas are available at all times:
	a) one hundred percent of the existing effluent disposal area where the wastewater has received primary treatment or is only comprised of greywater, or
	b) thirty percent of the existing effluent disposal area where the wastewater has received at least secondary treatment, and
3	the on-site system is maintained so that it operates effectively at all times and maintenance is undertaken in accordance with the manufacturer's specifications, and
4	wastewater irrigation lines are at all times either installed at least 50 millimetres beneath the surface of the disposal area or are covered by a minimum of 50 millimetres of topsoil, mulch, or bark, and
5	the discharge does not contaminate any groundwater supply or surface water, and
6	there is no surface runoff or ponding of wastewater, and
7	there is no offensive or objectionable odour beyond the property boundary.

We envision that there will be no issue meeting the Permitted Activity Status requirements as outlined above

Any future wastewater disposal system should meet the compliance points below, stipulated within Section C.6.1.3 of the Proposed Regional Plan for Northland:

C.6.1.3 Other on-site treated domestic wastewater discharge– permitted activity	
The discharge of domestic type wastewater into or onto land from an on-site system and the associated discharge of odour into air from the on-site system are permitted activities, provided:	
#	Rule
1	The on-site system is designed and constructed in accordance with the Australian/New Zealand Standard. On-site Domestic Wastewater Management (AS/NZS 1547:2012), and
2	The volume of wastewater discharged does not exceed two cubic metres per day, and
3	The discharge is not via a spray irrigation system or deep soakage system, and
4	The slope of the disposal area is not greater than 25 degrees, and
5	The wastewater has received secondary or tertiary treatment and is discharged via a trench or bed 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 is via an irrigation line system that is:
	a) dose loaded, and
	b) covered by a minimum of 50 millimetres of topsoil, mulch, or bark, and
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
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
8	for septic tank treatment systems, a filter that retains solids greater than 3.5 millimetres in size is fitted on the outlet, and
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

10	the on-site system is maintained so that it operates effectively at all times and maintenance is undertaken in accordance with the manufacturer's specifications, and
11	the discharge does not contaminate any groundwater water supply or surface water, and
12	there is no surface runoff or ponding of wastewater, and
13	there is no offensive or objectionable odour beyond the property boundary.

We envision that there will be no issue meeting the Permitted Activity Status requirements outlined above.

Based on current observations, topography, and the subsoil conditions encountered during the investigation, the lots appear to contain sufficient undeveloped natural ground to accommodate both primary and reserve wastewater disposal areas in accordance with AS/NZS 1547:2012. Final system sizing, configuration, and positioning will be confirmed through site-specific design and localized soil testing at the Building Consent stage.

7 STORMWATER MANAGEMENT

7.1 ASSESSMENT CRITERIA

7.1.1 District Plan

The stormwater assessment has been completed in accordance with the recommendations and requirements contained within the Far North District Engineering Standards and the Far North District Council District Plan.

As below, the site resides in a Coastal Living Zone.

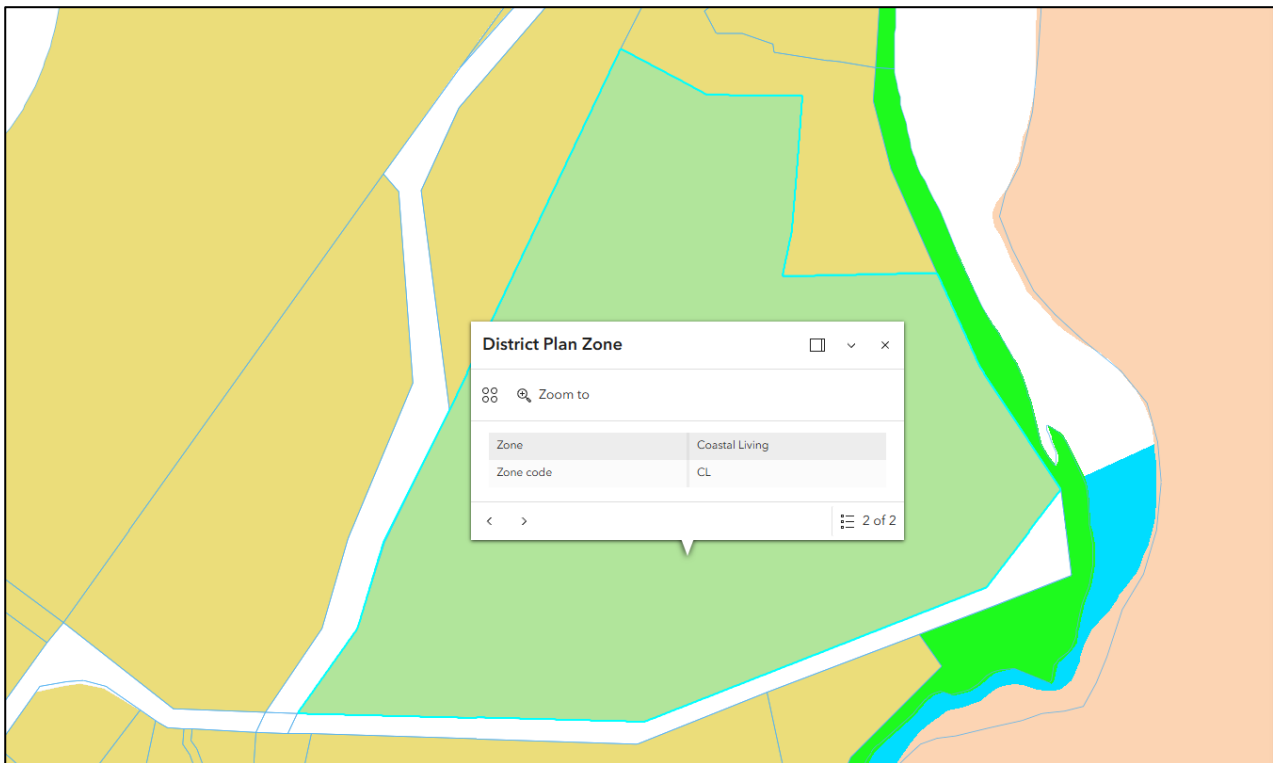


Figure 4: Snip of FNDC Maps showing site in Coastal Living Zone

The following Stormwater Management Rules Apply:

Permitted Activity: 10.7.5.1.6 STORMWATER MANAGEMENT – The maximum proportion or amount of the gross site area which may be covered by buildings and other impermeable surfaces shall be 10% or 600m² whichever is the lesser.

Restricted Discretionary Activity: 10.7.5.3.8 STORMWATER MANAGEMENT – The maximum proportion or amount of the gross site area covered by buildings and other impermeable surfaces shall be 15% or 1,500m², whichever is the lesser.

To comply with the parameters of the Permitted Activity Rule (10.7.5.1.6), the lots must not exceed an impermeable area of 600m². It is expected that future development of Lots 1 – 10 will fall within the Permitted / Restricted Discretionary / Discretionary range. The existing development within Lot 11 falls within the Discretionary range.

A stormwater report including a District Plan Assessment will be required for any future development that does not comply with Permitted Activity Rule (10.7.5.1.6) at Building Consent stage.

7.1.2 Stormwater Management Approach

Based on the geotechnical observations, the site is predominantly underlain by free-draining sandy soils, which are considered suitable for stormwater disposal via soakage. Accordingly, stormwater from the proposed lots can generally be managed through appropriately designed soakpits, subject to confirmation through site-specific soakage testing at the detailed design stage. It is noted, however, that isolated areas of cemented sands (hard pans) were encountered at depths of approximately 1.0m - 1.5m in some locations (Lots 5, 7 & 10). Where such layers are present, soakage may be locally constrained, and stormwater will need to be directed to a suitable discharge point.

Given the presence of wetlands on and in proximity to the site, any overland flow discharging toward these areas should be avoided where practicable and otherwise minimised. Where discharge toward wetland areas cannot be avoided, appropriate water quality treatment measures shall be implemented prior to discharge. This may include first flush diverters, vegetated sheet flow, filter strips, swales, or bioretention devices (raingardens), which provide improved contaminant removal and attenuation of runoff. Treated outflows should be discharged in a controlled and dispersed manner (e.g. via level spreaders or vegetated areas) to avoid concentrated discharge, scour, or adverse effects within or adjacent to wetland environments.

Soakage testing will be required at the location of each proposed soakpit during detailed design and/or the Building Consent stage.

Any soakage or attenuation devices should be designed and installed in accordance with the Far North District Council Engineering Standards.

To appropriately mitigate stormwater runoff from the existing and future proposed impermeable areas, we recommend utilising Low Impact Design Methods as a means of stormwater management. Design guidance should be taken from 'The Countryside Living Toolbox' design document, and where necessary, 'Technical Publication 10, Stormwater Management Devices – Design Guidelines Manual' Auckland Regional Council (2003).

Stormwater management recommendations are provided below.

7.1.3 National Environmental Standards for Freshwater (NES-F) and PRPN Considerations

The National Environmental Standards for Freshwater 2020 (NES-F) includes specific provisions relating to activities within and within 100m of natural wetlands. These provisions generally restrict activities that may result in the drainage, diversion, or discharge of contaminants to wetlands, unless it can be demonstrated that adverse effects on the wetland's hydrology and ecological values are avoided or appropriately mitigated.

In addition, the Proposed Regional Plan for Northland (PRPN) requires that discharges to land and water are managed such that adverse effects on receiving environments, including wetlands, are avoided, remedied, or mitigated.

In response to these requirements, the proposed stormwater management approach adopts a conservative treatment-train methodology that:

- Prioritises infiltration (soakage) where ground conditions allow;
- Avoids direct discharge to wetlands wherever practicable;
- Minimises the concentration and volume of runoff directed toward wetland areas; and
- Provides appropriate pre-treatment (e.g. bioretention devices, vegetated flow paths, and/or filter systems) prior to any discharge that may enter or influence a wetland.

This approach is consistent with best practice stormwater management and is intended to ensure that potential effects on wetland hydrology, water quality, and ecological function are appropriately managed to support resource consent approval.

Final confirmation of wetland extents, setback requirements, and activity status under both NES-F and PRPN should be undertaken by a suitably qualified planner and/or ecologist as part of the resource consent process.

7.2 PRIMARY STORMWATER

7.2.1 Stormwater Runoff from Roof Areas

Stormwater runoff from the roof of any future buildings must be captured by a gutter system and conveyed to potable water tanks on the corresponding lot.

Overflow from the rainwater tanks should be directed to a soakage system on the corresponding lot where practicable. Alternatively, where soakage is not viable, overflow from the rainwater tanks should be directed to a discharge point as specified below via sealed pipes.

7.2.2 Stormwater Runoff from Hardstand Areas

Where ROWs / driveways are formed perpendicular to the slope of the topography and the nearest downslope wetland is >100m away, the driveway may shed runoff to lower-lying grassed areas via even sheet flow, well clear of any structures. Runoff passed through grassed areas will be naturally filtered of entrained pollutants and will act to mitigate runoff by way of ground recharge and evapotranspiration.

Where even sheet flow is not practicable, or where there is a wetland within 100m downslope from the driveway, flows are recommended to be directed to an appropriately sized soakage channel along the driveway. Alternatively, where a soakage channel is not practicable, flows must be managed with swales. Swales should be sized to manage and provide capacity for secondary flows and mitigate flow velocity where appropriate. Swales are to direct runoff to silt traps with suitably sized grate / scruffy dome inlets, from which runoff may be piped to the lot's soakage system, or where this is not practicable, to an appropriate discharge point as specified below.

Alternatively, if sealed, driveways may be formed to shed runoff to catchpits installed per E1 of the NZ Building Code. Runoff collected via catchpits is to be directed to lot's soakage system, or where this is not practicable, to an appropriate discharge point as specified below.

Due to water quality concerns, runoff resulting from hardstand areas should not be allowed to drain to any potable water tanks.

7.2.3 Stormwater Runoff Discharge Point

Where soakage is not practicable, discharge and overflow from future potable water tanks and any hardstand catchpits / silt traps should be directed to an appropriately sized dispersal device within the respective lot, unless discharge is directed to an open channel, where an appropriate riprap outlet is required for erosion protection. The dispersal device or discharge point should be positioned on/in stable ground downslope of any buildings and wastewater disposal, with setbacks as per the relevant standards. Where stormwater runoff is discharged onto land within 100m of a wetland, further assessment of activity status under NES-F / PRPN may be required.

7.3 SECONDARY STORMWATER

Where required, overland flows and any concentrated runoff from higher ground should be intercepted by means of shallow surface drains or small bunds near structures to protect these from both saturation and erosion.

7.4 DISTRICT PLAN ASSESSMENT

This section has been prepared to demonstrate the likely effects of the activity on stormwater runoff and the means of mitigating runoff.

In assessing an application under this provision, the Council will exercise discretion to review the following matters below, (a) through (r). In respect of matters (a) through (r), we provide the following comments:

13.10.4 – Stormwater Disposal

<p><i>(a) Whether the application complies with any regional rules relating to any water or discharge permits required under the Act, and with any resource consent issued to the District Council in relation to any urban drainage area stormwater management plan or similar plan.</i></p>	<p>No specific discharge permits or Council-held stormwater management plan requirements are currently known for the subject site. However, where stormwater discharge to land may occur within 100 m of a wetland, further assessment of activity status and any regional consenting requirements under NES-F / PRPN will be required.</p>
<p><i>(b) Whether the application complies with the provisions of the Council's "Engineering Standards and Guidelines" (2004) - Revised March 2009 (to be used in conjunction with NZS 4404:2004).</i></p>	<p>The proposal is generally capable of complying with the relevant provisions of the Council's Engineering Standards and Guidelines, subject to site-specific soakage testing and detailed design at Building Consent stage.</p>
<p><i>(c) Whether the application complies with the Far North District Council Strategic Plan - Drainage.</i></p>	<p>The proposed stormwater approach is generally consistent with the intent of the Far North District Council Strategic Plan – Drainage, subject to detailed design.</p>
<p><i>(d) The degree to which Low Impact Design principles have been used to reduce site impermeability and to retain natural permeable areas.</i></p>	<p>Stormwater management should be provided for the subject lot by utilising Low Impact Design Methods. Guidance for design should be taken from 'The Countryside Living Toolbox' design document, and where necessary, "Technical Publication 10, Stormwater Management Devices – Design Guidelines Manual" Auckland Regional Council (2003).</p> <p>All roof runoff is recommended to be collected by rainwater tanks for the conveyance of runoff to a soakage system, or alternatively, to an appropriately sized and located dispersal device/discharge point.</p>

	<p>Hardstand areas should be shaped to shed runoff to lower-lying grassed areas via even sheet flow as passive mitigation where appropriate. Alternatively, runoff resulting from hardstand areas should be directed to soakage devices, or alternatively, to an appropriately sized and located dispersal device/discharge point.</p>
<p><i>(e) The adequacy of the proposed means of disposing of collected stormwater from the roof of all potential or existing buildings and from all impervious surfaces.</i></p>	<p>The proposed means of stormwater disposal from future roof and impervious areas is considered appropriate on an indicative basis. Based on the geotechnical observations, the site is predominantly underlain by free-draining sandy soils that are generally suitable for soakage. Final disposal measures shall be confirmed by site-specific soakage testing at the location of each proposed soakage device during detailed design.</p>
<p><i>(f) The adequacy of any proposed means for screening out litter, the capture of chemical spillages, the containment of contamination from roads and paved areas, and of siltation.</i></p>	<p>Runoff from roof areas is free of litter, chemical spillages, or contaminants from roads.</p> <p>Hardstand areas should be shaped to shed runoff to lower-lying grassed areas via even sheet flow as passive mitigation where appropriate. Alternatively, runoff resulting from hardstand areas should be directed to soakage devices, or alternatively, to an appropriately sized and located dispersal device/discharge point. Large downslope pasture areas and swales act as bio-filter strips to filter out entrained pollutants and catchpits/silt traps allow for the settlement of sediment.</p>
<p><i>(g) The practicality of retaining open natural waterway systems for stormwater disposal in preference to piped or canal systems and adverse effects on existing waterways.</i></p>	<p>No alteration to waterways is proposed.</p>
<p><i>(h) Whether there is sufficient capacity available in the Council's outfall stormwater system to cater for increased run-off from the proposed allotments.</i></p>	<p>Not applicable.</p>
<p><i>(i) Where an existing outfall is not capable of accepting increased run-off, the adequacy of proposals and solutions for disposing of run-off.</i></p>	<p>Not applicable.</p>
<p><i>(j) The necessity to provide on-site retention basins to contain surface run-off where the capacity of the outfall is incapable of accepting flows, and where the outfall has limited capacity, any need to restrict the rate of discharge from the subdivision to the same rate of discharge that existed on the land before the subdivision takes place.</i></p>	<p>Not applicable.</p>

<i>(k) Any adverse effects of the proposed subdivision on drainage to, or from, adjoining properties and mitigation measures proposed to control any adverse effects.</i>	Outlet locations are to be determined during detailed design and are to be located such that there are no adverse effects on adjacent properties.
<i>(l) In accordance with sustainable management practices, the importance of disposing of stormwater by way of gravity pipe lines. However, where topography dictates that this is not possible, the adequacy of proposed pumping stations put forward as a satisfactory alternative.</i>	Not applicable.
<i>(m) The extent to which it is proposed to fill contrary to the natural fall of the country to obtain gravity outfall; the practicality of obtaining easements through adjoining owners' land to other outfall systems; and whether filling or pumping may constitute a satisfactory alternative.</i>	Not applicable.
<i>(n) For stormwater pipes and open waterway systems, the provision of appropriate easements in favour of either the registered user or in the case of the Council, easements in gross, to be shown on the survey plan for the subdivision, including private connections passing over other land protected by easements in favour of the user.</i>	Not applicable.
<i>(o) Where an easement is defined as a line, being the centre line of a pipe already laid, the effect of any alteration of its size and the need to create a new easement.</i>	Not applicable.
<i>(p) For any stormwater outfall pipeline through a reserve, the prior consent of the Council, and the need for an appropriate easement.</i>	Not applicable.
<i>(q) The need for and extent of any financial contributions to achieve the above matters.</i>	Not applicable.
<i>(r) The need for a local purpose reserve to be set aside and vested in the Council as a site for any public utility required to be provided.</i>	Not applicable.

8 ACCESS

8.1 GENERAL

A basic access and vehicle crossing assessment has been completed for the proposed subdivision.

It is our understanding that Lot 1 intends to utilise a new access point off the Legal Road which makes up the parent property's southern boundary.

A new access point off Houhora Heads Road is proposed to service Lots 2 – 4, and an existing access point off Houhora Heads Road is proposed to service Lots 5 – 11. The existing and proposed vehicle crossings and accessways are assessed under the Far North District Council Engineering Standards (2023).

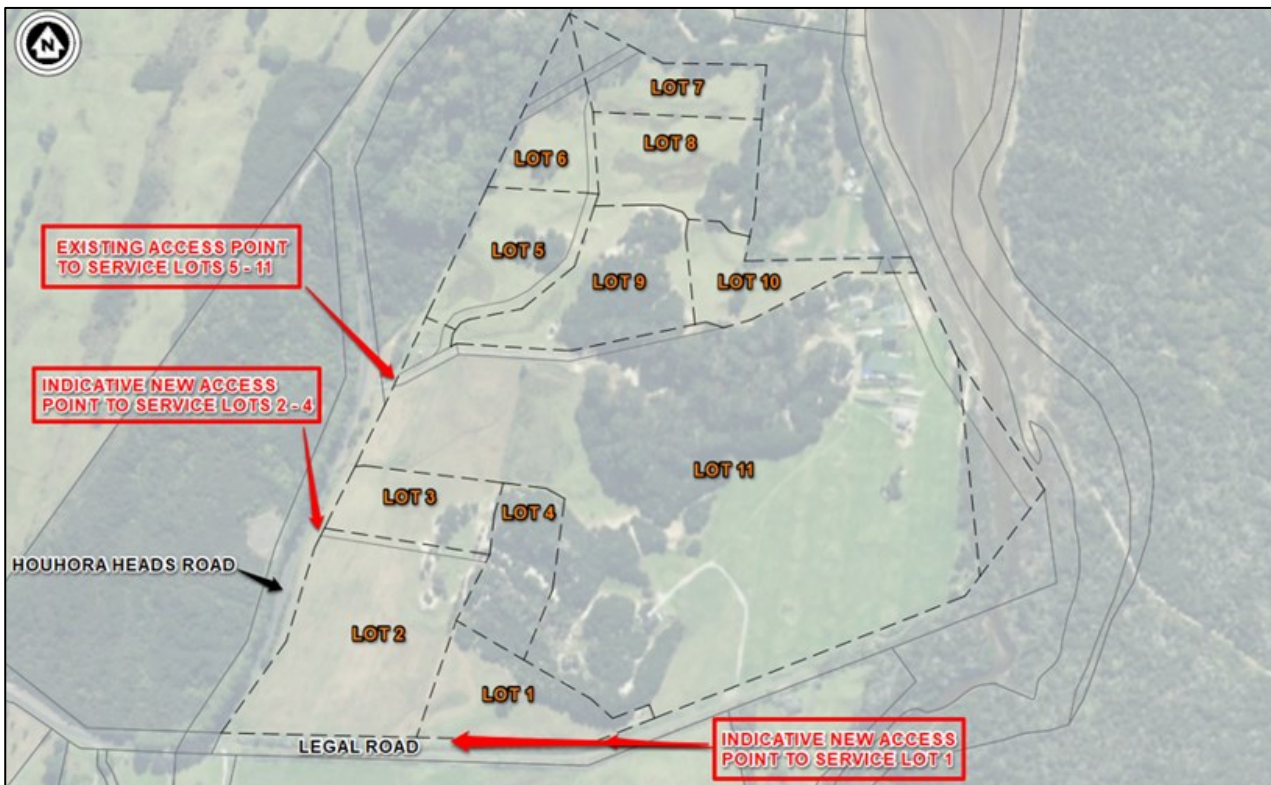


Figure 5: Snip of Scheme Plan showing access points

8.2 VEHICLE CROSSINGS

It is recommended that the vehicle crossing serving Lot 1 (Vehicle Crossing 1), and the vehicle crossing serving Lots 2–4 (Vehicle Crossing 2), be constructed in accordance with the Far North District Council Engineering Standards (2023), Sheet 21 Type 1A – Light Vehicles.

The existing vehicle crossing is sealed; however, visible surface deterioration and localised damage are present. It is recommended that the crossing be repaired and reinstated to an appropriate standard. As part of these works, the crossing width shall be reviewed and upgraded as necessary to ensure compliance with Type 1A (light vehicle) requirements in accordance with the Far North District Council Engineering Standards.

8.3 SIGHT DISTANCES

Houhora Heads Road has a general operating speed of 100km/hr (NZTA National Speed Limit Register) and is classified as a primary & secondary collector road. Legal Road, which makes up the parent lot's southern boundary has a general operating speed of 100km/hr and is classified as an access road. As such, the Far North District Council Engineering Standards (2023) – Sheet 4 notes that the minimum required sight distances for Vehicle Crossings 1, 2 & 3 are 195m, 210m and 210m respectively.

While the available sight distances do not comply with the Far North District Council Engineering Standards, the proposed access arrangement has been developed to provide the safest practicable outcome within the physical constraints of the site and surrounding road geometry. Potential mitigation measures include locating crossings to maximise available sight distance, consolidating access points where practicable, upgrading crossings to the applicable engineering standard, removing or trimming any localised visibility obstructions where permitted, and maintaining low roadside batters and open entrance treatments. In addition, the proposal is for a low-density rural-residential subdivision, such that traffic generation is expected to be relatively low. These matters should be considered by Council in its review of the proposed vehicle crossings.

8.3.1 Vehicle Crossing 1

At the time of report writing, the final location of Vehicle Crossing 1 has not been confirmed. It is recommended that the vehicle crossing be located to the southwestern corner of the lot to maximise available sight distance to the east and west. Based on the existing road geometry, the achievable sight distance should be ~130m to the east and to the end of the road to the west.

As this does not comply with the requirements of the Far North District Council (FNDC) Engineering Standards, this matter will require review and acceptance by Council.

8.3.2 Vehicle Crossing 2

The proposed vehicle crossing location provides ~165m of sight distance to the northeast and >140m to the southwest. As the available sight distance to the northeast and southwest does not comply with the requirements of the Far North District Council (FNDC) Engineering Standards, this matter will require review and acceptance by Council.



Figure 6: Annotated photo showing available sight distance from Vehicle Crossing 2 to the northeast



Figure 7: Annotated photo showing available sight distance from Vehicle Crossing 2 to the southwest

8.3.3 Vehicle Crossing 3

The existing vehicle crossing provides ~80m of sight distance to the northeast and >210m to the southwest. As the available sight distance to the northeast does not comply with the requirements of the Far North District Council (FNDC) Engineering Standards, this matter will require review and acceptance by Council.

It is noted that the vehicle crossing is located on a bend along Houhora Heads Road. As such, it is anticipated that approaching vehicles will be travelling at speeds lower than the posted 100km/h speed limit, which may partially mitigate the reduced sight distance in this direction.



Figure 8: Annotated photo showing available sight distance from Vehicle Crossing 3 to the northeast



Figure 9: Annotated photo showing available sight distance from Vehicle Crossing 3 to the southwest

8.4 VEHICLE ACCESS & PASSING BAYS

The vehicle access legal width, surfacing width and any passing bay requirements for the proposed ROWs (Easements A – F) will be assessed under the relevant required for the both the operative district plan (ODP), the proposed district plan (PDP) and the FNDC Engineering Standards (2023). See Figures 10, 11 & 12 below.

APPENDIX 3B-1: STANDARDS FOR PRIVATE ACCESS								
(Reference: <i>Part 3 District Wide Provisions, Section 15.1 Traffic, Parking and Access and Zone Maps</i>)								
Zone	No. of H.E.s	Legal Width	Carriageway Width	Maximum Gradient		Kerb	Foot-path	Storm-water Drain ¹
				Unsealed	Sealed			
Residential	1	-	3.0	1:6	1:4	-	-	Yes
Coastal Residential	2	5.0	3.0	-	1:4	-	-	Yes
Russell Township	3 - 4	7.5	3.0 with passing bays	-	1:4	-	-	Yes
Point Veronica	5 - 8	7.5	5.0	-	1:4	Yes	-	Yes
Commercial	1	-	3.0	1:8	1:5	-	-	Yes
Industrial	2 - 4	8.0	6.0	-	1:5	-	-	Yes
Orongo Bay Special Purpose	>5	8.0	6.0	-	1:5	-	-	Yes
Rural Production	1	-	3.0	1:5	1:4	-	-	Yes
Rural Living								
Waimate North Horticultural Processing	2	5	3.0	1:5	1:4	-	-	Yes
Carrington Estate								
General Coastal Coastal Living	3 - 4	7.5	3.0 with passing bays	1:5	1:4	-	-	Yes
South Kerikeri Inlet Recreational Activities	5 - 8	7.5	5.0	1:5	1:4	-	-	Yes

¹ All private access must have stormwater drainage measures such that adverse effects are not created on adjoining properties or the public road, in accordance with Council's "Engineering Standards and Guidelines" (June 2004 – Revised 2009)

Note 1: H.E. = Household Equivalent represented by 10 vehicle movements
Note 2: Refer to *Rules 15.1.6B.1(c) and (d)*.
Note 3: Access for more than 8 Household Equivalents shall be by public road and constructed to a standard identified in *Appendix 3B-2*.
Note 4: Access carriageways in urban zones that serve two or more users shall be sealed or concreted, refer *Rule 15.1.6B.1.2(c)*.

Figure 10: FNDC Operative DP Table 3B-1: Standards for Private Accessways

TRAN-Table 9 - Requirements for private accessways								
Number of residential units	Maximum length (m)	Minimum legal width (m)	Minimum carriageway width (m)			Footpath width (m)	Maximum gradient	Crossfall
			Unsealed shoulder	Surfacing width	Total			
Urban								
2-4	50	4.0	-	1 x 3.0	3.0	-	12.5% from the first 5m from the road boundary and 22% for the remainder restricted to straight sections	3%
5-8	100	6.0		1 x 4.5	4.5	1 x 0.95		
Rural								
2	-	4.0	2 x 0.25	1 x 3.0	3.5	-	12.5% for the first 5m from the road boundary and 22.2% for the remainder	3% where sealed; 6% where unsealed
3 - 5		6.0	2 x 0.25	1 x 3.0	4.5			
6 - 8		10.0	2 x 0.25	1 x 3.0	6.0			

Figure 11: Snip of FNDC proposed District Plan TRAN-Table 9

On accessways more than 200 m long and less than 4.5 m carriageway width, passing bays shall be provided at points of intervisibility (at approximate 100 m intervals). For such passing bays the carriageway width should be increased to 5.5 m over a 15 m length including 5 m tapers at each end.

Figure 12: Snip from FNDC Engineering Standards (2023) Section 3.2.28.3

Given the above, the below requirements are expected for the proposed ROWs split into Easements A – F per the Scheme Plan by Williams and King (Ref No: 24630, dated: November 2025). Refer to the appended Access Plan Easements A – E (145679-C400) and Access Plan Easement F (145679-C401).

Easement	Estimated No. of H.E.s	Minimum Legal Width	Minimum Carriageway Width	Passing Bay Required
A	7	ODP: 7.5m PDP: 10.0m	ODP: 5.0m PDP: 6.0m	Not required
B	3	ODP: 7.5m PDP: 6.0m	ODP: 3.0m PDP: 4.5m	ODP: Required PDP: Not required
C	5	ODP: 7.5m PDP: 6.0m	ODP: 5.0m PDP: 4.5m	Not required
D	5	ODP: 7.5m PDP: 6.0m	ODP: 5.0m PDP: 4.5m	Not required
E	2	ODP: 5.0m PDP: 4.0m	ODP: 3.0m PDP: 3.5m	Not required (>200m long)
F	3	ODP: 7.5m PDP: 6.0m	ODP: 3.0m PDP: 4.5m	Not required (>200m long)

Notes:

H.E.s = Household Equivalents

ODP = Operative District Plan

PDP = Proposed District Plan

9 LIMITATIONS

This report has been prepared for the benefit of the Client for the purpose of supporting a Resource/Subdivision Consent application for the project described herein and within the agreed scope of engagement. The report may be submitted to the relevant Territorial Authority for that purpose.

The Territorial Authority may rely on this report for the purposes of assessing the Resource Consent application, subject to the scope, assumptions, and limitations described herein. Any material changes to the development proposal, site conditions, or design assumptions from those described in this report should be referred to Wilton Joubert Limited for review.

This report remains the intellectual property of Wilton Joubert Limited. No responsibility or liability is accepted for the use of this report by any third party, or for any purpose other than that for which it was prepared, unless expressly agreed in writing. Any party choosing to rely on this report does so at their own risk.

While this report may be used in support of regulatory approvals, it does not remove the requirement for detailed, site-specific investigations, assessments, or inspections that may be required at subsequent design or Building Consent stages, in accordance with standard engineering practice.

The conclusions and recommendations in this report are based on information available at the time of preparation and are dependent on appropriate implementation during construction. Variations in site conditions or construction practices may affect performance and should be reviewed by a suitably qualified and experienced engineer if encountered.

Yours faithfully,

WILTON JOUBERT LIMITED

Enclosures:

- Overall Site Plan – C001 (1 sheet)
- Lots 1 – 4 Site Plan - C002 (1 sheet)
- Lots 5 – 10 Site Plan - C003 (1 sheet)
- Access Plan Easements A - E – C400 (1 sheet)
- Access Plan Easement F – C401 (1 sheet)
- Hand Auger Borehole Records (20 sheets)



- NOTES:**
1. SITE PLAN IS ONLY INDICATIVE FOR CONCEPT DESIGN. NO MEASUREMENTS MAY BE TAKEN FROM DRAWING.
 2. ALL DIMENSIONS TO BE CHECKED ON SITE PRIOR TO CONSTRUCTION.
 3. CONTOURS & LOCAL SERVICES ARE SHOWN INDICATIVELY ONLY.



Memorandum of Proposed Easements			
Purpose	Shown	Burdened Land	Benefited Land
Right of Way Right to Convey Electricity, Water Telecommunications	A	Lot 11 hereon	Lots 6 - 10 hereon
	B	Lot 11 hereon	Lots 9 - 10 hereon
	C	Lot 11 hereon	Lots 5, 6, 7, 8 & 9 hereon
	D	Lot 5 hereon	Lots 6, 7, 8 & 9 hereon
	E	Lot 6 hereon	Lots 7 & 8 hereon
	F	Lot 2 hereon	Lots 3 & 4 hereon
Right to Convey Electricity	J & P	Lot 10 hereon	Lot 11 hereon

Schedule of Existing Easements			
Purpose	Shown	Burdened Land	Created By Document:
Right of Way	G	Lot 6 hereon	EC 275139
	H	Lot 7 hereon	
	J	Lot 10 hereon	
	K	Lot 11 hereon	
	L	Lot 12 hereon	

LAND COVENANT
 'Areas shown Q, R, S, T, U, V, W, X, Y & Z hereon are to be subject to a Land Covenant. (Wetland Protection)

WILTON JOUBERT
 Consulting Engineers

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 Christchurch: 021 824 063
 Wanaka: 03 443 6209
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ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
01	APR '26	GMB	CIVIL SITE SUITABILITY REPORT

DESIGNED BY:
GMB

DRAWN BY:
GMB

CHECKED BY:
BGS

SURVEYED BY:
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RESOURCE CONSENT

DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
OVERALL SITE PLAN

PROJECT DESCRIPTION:
CIVIL SITE SUITABILITY REPORT

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS ROAD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: OREWA
DRAWING SCALE: 1:3000	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 145679-C001	ISSUE: 01
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DRAWING TITLE:
LOTS 1 - 4 SITE PLAN

PROJECT DESCRIPTION:
CIVIL SITE SUITABILITY REPORT

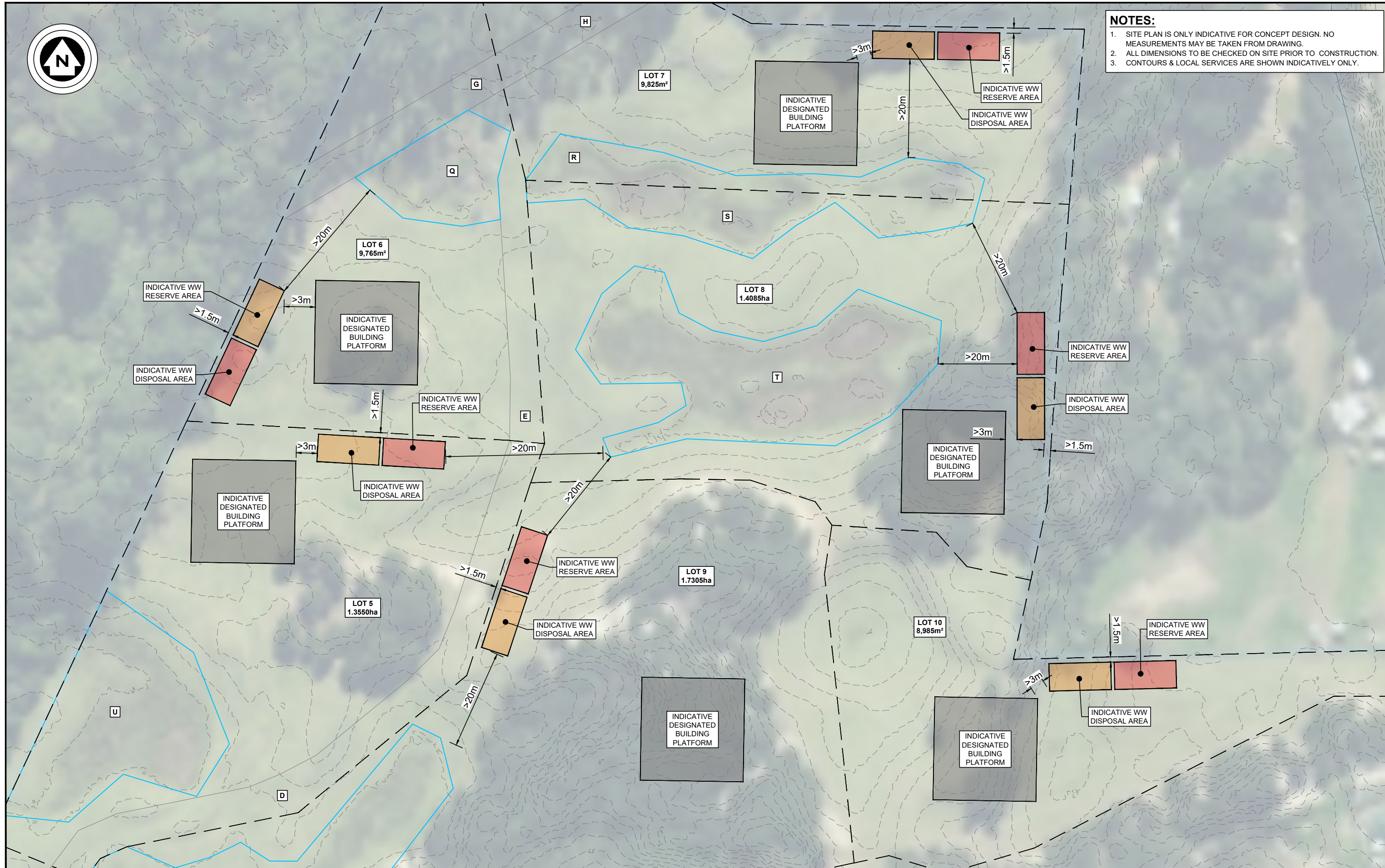
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PUKENUI
NORTHLAND**

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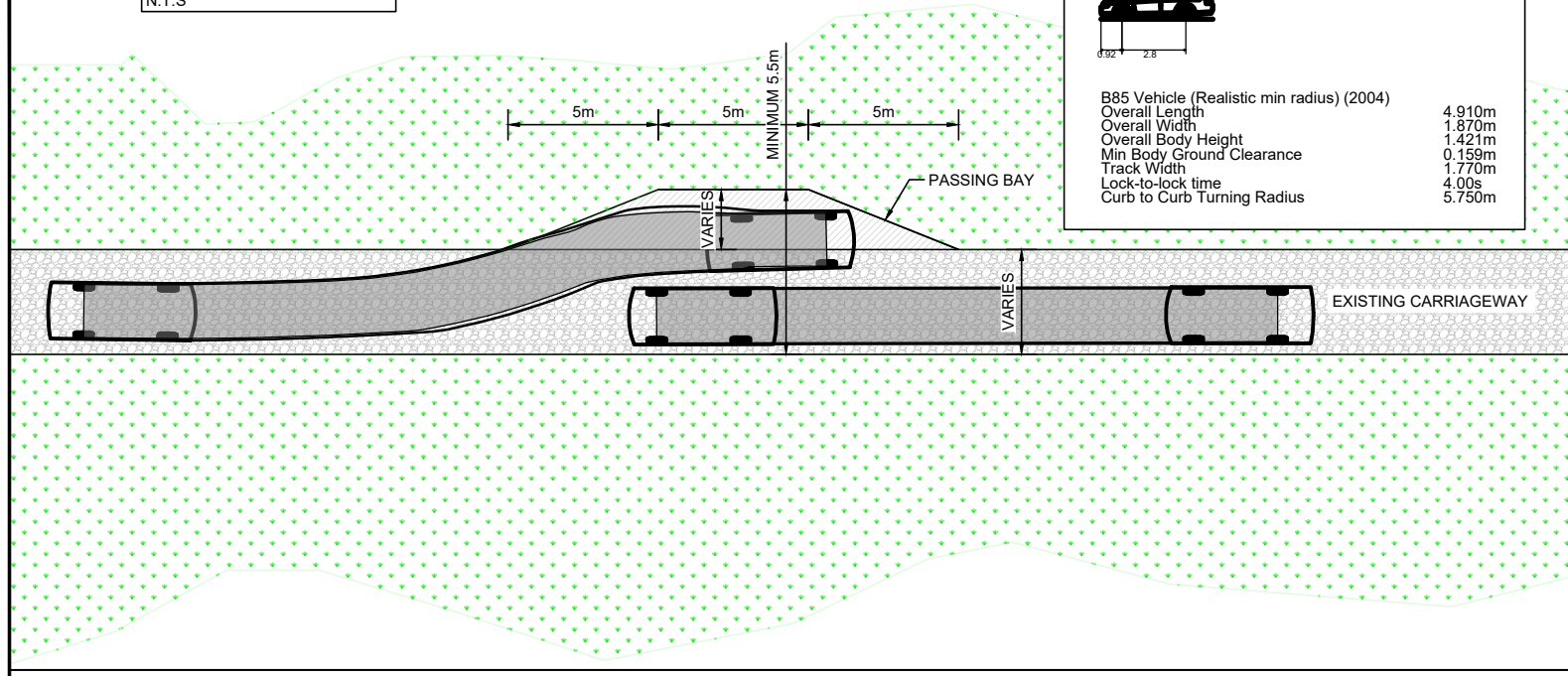
DRAWING TITLE:
LOTS 5 - 10 SITE PLAN

PROJECT DESCRIPTION:
CIVIL SITE SUITABILITY REPORT

PROJECT TITLE:
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122 HOUHORA HEADS ROAD
PUKENUI
NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: OREWA
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DETAIL A
TYPICAL PASSING BAY LAYOUT
N.T.S



B85 Vehicle (Realistic min radius) (2004)	
Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m



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RESOURCE CONSENT

DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
ACCESS PLAN EASEMENTS A - E

PROJECT DESCRIPTION:
CIVIL SITE SUITABILITY REPORT

PROJECT TITLE:
**LOT 2 DP 70340
122 HOUHORA HEADS ROAD
PUKENUI
NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: OREWA
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ROW EASEMENT F
 MINIMUM LEGAL WIDTH :
 7.5m (ODP) OR 6.0m (PDP)
 MINIMUM CARRIAGEWAY WIDTH:
 3.0m (ODP) OR 4.5m (PDP)

LOT 3
 1.0125ha

LOT 4
 9,860m²

LOT 2
 3.0855ha

LOT 1
 1.2971ha

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ISSUE / REVISION			
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RESOURCE CONSENT
 DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
ACCESS PLAN EASEMENT F

PROJECT DESCRIPTION:
CIVIL SITE SUITABILITY REPORT

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS ROAD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: OREWA
DRAWING SCALE: 1:1250	CO-ORDINATE SYSTEM: NOT COORDINATED
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HAND AUGER : HA01 (Lot 1)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Topsoil	Sandy TOPSOIL, dark brown, dry to moist.		0.0 - 0.1					0.5	
			0.1 - 0.2					0.5	
Kariotiahi Group	NATURAL: Fine to Medium SAND, brownish grey, dry to moist. 0.7m: Yellowish brown. 1.2m: Grey.		0.2 - 0.4	Groundwater Not Encountered				1	
			0.4 - 0.6					1	
			0.6 - 0.8					1	
			0.8 - 1.0					1	
			1.0 - 1.2					1	
			1.2 - 1.4					2	
			1.4 - 1.6					2	
			1.6 - 1.8					2	
			1.8 - 2.0					2	
			2.0 - 2.2					2	
			2.2 - 2.4					2	
			2.4 - 2.6					2	
			2.6 - 2.8					2	
			2.8 - 3.0					2	
			3.0 - 3.2					2	
			3.2 - 3.4					2	
			3.4 - 3.6					2	
			3.6 - 3.8					2	
			3.8 - 4.0					2	
			4.0 - 4.2					2	
4.2 - 4.4				2					
4.4 - 4.6				2					
4.6 - 4.8				2					
4.8 - 5.0				2					
EOH: 1.60m - Poor Recovery Due To Sidewall Collapse									

REMARKS

End of borehole @ 1.60m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



185 Waipapa Road, Kerikeri 0295
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 Website: www.wiltonjoubert.co.nz

HAND AUGER : HA02 (Lot 1)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS		
					PEAK STRENGTH (kPa)	REMOLD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)			
Topsoil	Sandy TOPSOIL, dark brownish black, moist.		0.0 - 0.1	Groundwater Not Encountered				1			
									1		
Kariotiahi Group	NATURAL: Fine to Medium SAND, greyish brown, loose, moist.		0.1 - 0.2						1		
			0.2 - 0.3						1		
			0.3 - 0.4						1		
			0.4 - 0.5						1		
			0.5 - 0.6						1		
			0.6 - 0.7		0.6m: Yellowish brown.					1	
			0.7 - 0.8							1	
			0.8 - 0.9							1	
			0.9 - 1.0		1.0m: Grey.					2	
			1.0 - 1.1							2	
			1.1 - 1.2							2	
			1.2 - 1.3							2	
			1.3 - 1.4							2	
			1.4 - 1.5							2	
			1.5 - 1.6							2	
			1.6 - 1.7							2	
			1.7 - 1.8		1.8m: Medium dense, moist to wet.					3	
			1.8 - 1.9							3	
EOH: 1.90m - Poor Recovery Due To Sidewall Collapse		1.9 - 2.0					2				
		2.0 - 2.1					1				
		2.1 - 2.2					2				
		2.2 - 2.3					3				
		2.3 - 2.4					3				
		2.4 - 2.5					3				
		2.5 - 2.6					3				
		2.6 - 2.7					3				
		2.7 - 2.8					4				
		2.8 - 2.9					5				
		2.9 - 3.0					6				
		3.0 - 3.1					6				
	3.1 - 3.2					6					
	3.2 - 3.3					9					
	3.3 - 3.4					10					
	3.4 - 3.5					6					
	3.5 - 3.6					6					
	3.6 - 3.7					10					
	3.7 - 3.8					10					
	3.8 - 3.9					14					
	3.9 - 4.0					12					
	4.0 - 4.1					13					
	4.1 - 4.2					14					
	4.2 - 4.3					14					
	4.3 - 4.4					16					
	4.4 - 4.5					20+					
	4.5 - 4.6										
	4.6 - 4.7										
	4.7 - 4.8										

REMARKS

End of borehole @ 1.90m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



185 Waipapa Road, Kerikeri 0295
 Phone: 09-945 4188
 Email: jobs@wjl.co.nz
 Website: www.wiltonjoubert.co.nz

HAND AUGER : HA03 (Lot 2)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Tops oil	Sandy TOPSOIL, dark grey, dry.		0.0	Groundwater Not Encountered				0.5	
	NATURAL: Fine to Medium SAND, grey, loose, dry.		0.2					0.5	
Karioitahi Group	EOH: 0.70m - No Recovery Due To Very Loose Sand Falling Back Into Hole	0.4						0.5	
		0.6						1	
		0.8						1	
		1.0						2	
		1.2						1	
		1.4						2	
		1.6						2	
		1.8						1	
		2.0						2	
		2.2						2	
		2.4						3	
		2.6						2	
		2.8						2	
		3.0						2	
		3.2						2	
		3.4						3	
		3.6						3	
		3.8						3	
4.0					3				
4.2					3				
4.4					3				
4.6					3				
4.8					3				

REMARKS
 End of borehole @ 0.70m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP ▼ Standing groundwater level

CHECKED BY: CSH ▽ GW while drilling

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 Consulting Engineers

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 Email: jobs@wjl.co.nz
 Website: www.wiltonjoubert.co.nz

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HAND AUGER : HA04 (Lot 2)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)		
Top soil	Sandy TOPSOIL, dark grey, dry.		0.0 - 0.05						0.5	
Kairiotehi Group	NATURAL: Fine to Medium SAND, grey, loose, dry.		0.05 - 0.2	Groundwater Not Encountered					0.5	
			0.2 - 0.4							1
			0.4 - 0.6						1	
			0.6 - 0.8						2	
			0.8 - 1.0						2	
			1.0 - 1.2						2	
			1.2 - 1.4						1	
			1.4 - 1.6						1	
			1.6 - 1.8						1	
			1.8 - 2.0						2	
			2.0 - 2.2						2	
			2.2 - 2.4						3	
			2.4 - 2.6						2	
			2.6 - 2.8						2	
			2.8 - 3.0						3	
			3.0 - 3.2						3	
			3.2 - 3.4						4	
			3.4 - 3.6						4	
			3.6 - 3.8						6	
			3.8 - 4.0						7	
			4.0 - 4.2						9	
			4.2 - 4.4						11	
			4.4 - 4.6						12	
			4.6 - 4.8						14	
			4.8 - 5.0						18	
									20+	

REMARKS

End of borehole @ 0.50m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA05 (Lot 3)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Top soil	Sandy TOPSOIL, dark brown, dry.		0.0 - 0.05					0.5	
Kariotiahi Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry.		0.05 - 0.1	Groundwater Not Encountered				0.5	
			0.1 - 0.2					0.5	
			0.2 - 0.3					0.5	
			0.3 - 0.4					0.5	
			0.4 - 0.5					1	
			0.5 - 0.6					1	
			0.6 - 0.7					1	
			0.7 - 0.8					2	
			0.8 - 0.9					1	
			0.9 - 1.0					1	
			1.0 - 1.1					2	
			1.1 - 1.2					2	
			1.2 - 1.3					2	
			1.3 - 1.4					3	
			1.4 - 1.5					3	
			1.5 - 1.6					2	
			1.6 - 1.7					2	
			1.7 - 1.8					3	
			1.8 - 1.9					2	
			1.9 - 2.0					2	
			2.0 - 2.1					2	
			2.1 - 2.2					3	
			2.2 - 2.3					3	
			2.3 - 2.4					3	
2.4 - 2.5	4								
2.5 - 2.6	3								
2.6 - 2.7	4								
2.7 - 2.8	4								
2.8 - 2.9	4								
2.9 - 3.0	4								
3.0 - 3.1	3								
3.1 - 3.2	4								
3.2 - 3.3	5								
3.3 - 3.4	5								
3.4 - 3.5	5								
3.5 - 3.6	5								
3.6 - 3.7	6								
3.7 - 3.8	6								
3.8 - 3.9	7								
3.9 - 4.0	6								
4.0 - 4.1	7								
4.1 - 4.2	7								
4.2 - 4.3	8								
4.3 - 4.4	8								
4.4 - 4.5	10								
4.5 - 4.6	8								
4.6 - 4.7	10								
4.7 - 4.8	9								
4.8 - 4.9	9								
4.9 - 5.0	10								
5.0 - 5.1	12								

REMARKS

End of borehole @ 1.20m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA06 (Lot 3)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOLD STRENGTH (kPa)	SENSITIVITY		
Top soil	Sandy TOPSOIL, dark brownish black, dry to moist.		0.0					0.5	
Kariotiaki Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry to moist.		0.2	Groundwater Not Encountered				0.5	
			0.4					1	
			0.6					1	
		0.6m: Moist.	0.8					1	
			1.0					2	
			1.2					1	
		1.2m: Dark grey, medium dense, moist to wet, poor recovery.	1.4					2	
			1.6					3	
		1.5m: Loose.	1.8					3	
			2.0					3	
			2.2					4	
			2.4					4	
			2.6					6	
			2.8					8	
			3.0					10	
			3.2					12	
		3.4				9			
		3.6				12			
		3.8							
		4.0							
		4.2							
		4.4							
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		6.8							
		7.0							
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		10.8							
		11.0							
		11.2							
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		41.0							
		41.2							
		41.4							
		41.6							
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		42.0							
		42.2							
		42.4							
		42.6							
		42.8							
		43.0							
		43.2							
		43.4							
		43.6							
		43.8							
		44.0							
		44.2							
		44.4							
		44.6							

HAND AUGER : HA07 (Lot 4)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY			
Top soil	Sandy TOPSOIL, dark brownish black, dry to moist.		0.0 - 0.1					1		
Karioitahi Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry to moist.		0.1 - 0.2	Groundwater Not Encountered				1		
			0.2 - 0.3						2	
			0.3 - 0.4						2	
			0.4 - 0.5						2	
			0.5 - 0.6						2	
			0.6 - 0.7						2	
		0.7m: Medium dense.			0.7 - 0.8				3	
					0.8 - 0.9				3	
		1.0m: Whitish grey, loose.			0.9 - 1.0				2	
					1.0 - 1.1				2	
		1.1m: Poor Recovery.			1.1 - 1.2				2	
					1.2 - 1.3				3	
					1.3 - 1.4				3	
					1.4 - 1.5				2	
		EOH: 1.50m - No Recovery Due To Very Loose Sand Falling Back Into Hole			1.5 - 1.6				3	
			1.6 - 1.7				3			
			1.7 - 1.8				3			
			1.8 - 1.9				3			
			1.9 - 2.0				3			
			2.0 - 2.1				2			
			2.1 - 2.2				2			
			2.2 - 2.3				3			
			2.3 - 2.4				3			
			2.4 - 2.5				3			
			2.5 - 2.6				2			
			2.6 - 2.7				3			
			2.7 - 2.8				4			
			2.8 - 2.9				4			
			2.9 - 3.0							
			3.0 - 3.1							
			3.1 - 3.2							
			3.2 - 3.3							
			3.3 - 3.4							
			3.4 - 3.5							
			3.5 - 3.6							
			3.6 - 3.7							
			3.7 - 3.8							
			3.8 - 3.9							
			3.9 - 4.0							
			4.0 - 4.1							
			4.1 - 4.2							
			4.2 - 4.3							
			4.3 - 4.4							
			4.4 - 4.5							
			4.5 - 4.6							
			4.6 - 4.7							
			4.7 - 4.8							
			4.8 - 4.9							

REMARKS
End of borehole @ 1.50m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM
CHECKED BY: CSH

Standing groundwater level
 GW while drilling



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HAND AUGER : HA08 (Lot 4)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Top soil	Sandy TOPSOIL, dark brown, dry.		0.05					0.5	
Kariotiaki Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry.		0.2	Groundwater Not Encountered				0.5	
			0.4					1	
			0.6					1	
			0.8					2	
			1.0					1	
			1.2					2	
			1.4					2	
			1.6					2	
			1.8					2	
			2.0					3	
			2.2					2	
			2.4					3	
			2.6					2	
			2.8					3	
			3.0					3	
			3.2					3	
			3.4					4	
			3.6					4	
			3.8					5	
			4.0					5	
	4.2				6				
	4.4				6				
	4.6				7				
	4.8				8				
					10				
					9				
					10				

REMARKS

End of borehole @ 0.90m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA10 (Lot 5)

JOB NO.: 145678 SHEET: 1 OF 1
 START DATE: 16/03/2026 NORTHING: GRID:
 DIAMETER: 50mm EASTING:
 SV DIAL: ELEVATION: Ground
 FACTOR: DATUM:

CLIENT: Adams Family Trust
 PROJECT: 11-Lot Subdivision
 SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Tops oil	Sandy TOPSOIL, black, moist.		0.0					1	
Karioitahi Group	NATURAL: Fine to Medium SAND, trace silt, grey, loose, moist.		0.2	Groundwater Not Encountered				2	
			0.4					2	
			0.6					1	
			0.8					2	
		0.8m: Minor silt, dark brown, medium dense.			1.0			6	
		0.9m: Dense.			1.2			14	
					1.4			15	
					1.6			20+	
					1.8				
					2.0				
					2.2				
					2.4				
					2.6				
					2.8				
					3.0				
			3.2						
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						
			4.4						
			4.6						
			4.8						
			5.0						
	EOH: 1.00m - Too Dense To Auger								

REMARKS
 End of borehole @ 1.00m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM
 CHECKED BY: CSH

Standing groundwater level
 GW while drilling



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Consulting Engineers

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HAND AUGER : HA11 (Lot 6)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)		
Tops oil Kariotiahi Group	Sandy TOPSOIL, dark brown, dry.		0.0	Groundwater Not Encountered					0.33	
	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry.		0.1						0.33	
		0.2							0.33	
		0.3							1	
		0.4							0.5	
		0.5							0.5	
		0.6							1	
		0.7							1	
		0.8							1	
		0.9							1	
		1.0							1	
		1.1							1	
		1.2							4	
		1.3							5	
		1.4							7	
		1.5							14	
		1.6							20+	
		1.7								
		1.8								
		2.0								
		2.2								
		2.4								
		2.6								
		2.8								
		3.0								
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		3.8								
		4.0								
		4.2								
		4.4								
		4.6								
		4.8								

REMARKS
End of borehole @ 0.50m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA12 (Lot 6)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOLD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Top soil	Sandy TOPSOIL, dark brownish black, dry.		0.0 - 0.1					0.5	
Kairaitahi Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry. 0.4m: Poor recovery.		0.1 - 0.2	Groundwater Not Encountered				0.5	
			0.2 - 0.3					1	
			0.3 - 0.4					1	
			0.4 - 0.5					1	
			0.5 - 0.6					1	
			0.6 - 0.7					0.5	
			0.7 - 0.8					0.5	
			0.8 - 0.9					1	
			0.9 - 1.0					1	
			1.0 - 1.1					1	
	1.1 - 1.2				1				
	1.2 - 1.3				1				
	1.3 - 1.4				3				
	1.4 - 1.5				5				
	1.5 - 1.6				5				
	1.6 - 1.7				6				
	1.7 - 1.8				12				
	1.8 - 1.9				20+				
	1.9 - 2.0								
	2.0 - 2.1								
	2.1 - 2.2								
	2.2 - 2.3								
	2.3 - 2.4								
	2.4 - 2.5								
	2.5 - 2.6								
	2.6 - 2.7								
	2.7 - 2.8								
	2.8 - 2.9								
	2.9 - 3.0								
	3.0 - 3.1								
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	3.4 - 3.5								
	3.5 - 3.6								
	3.6 - 3.7								
	3.7 - 3.8								
	3.8 - 3.9								
	3.9 - 4.0								
	4.0 - 4.1								
	4.1 - 4.2								
	4.2 - 4.3								
	4.3 - 4.4								
	4.4 - 4.5								
	4.5 - 4.6								
	4.6 - 4.7								
	4.7 - 4.8								
	4.8 - 4.9								
	4.9 - 5.0								
	EOH: 0.70m - No Recovery Due To Very Loose Sand Falling Back Into Hole								

REMARKS

End of borehole @ 0.70m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA13 (Lot 7)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Topsoil	Sandy TOPSOIL, dark brown, dry to moist.		0.0 - 0.1	Groundwater Not Encountered				1	
			0.1 - 0.2					1	
Kariotiahi Group	NATURAL; Fine to Medium SAND, grey, loose, dry to moist. 0.4m: Medium dense. 0.9m: Brown, dense.	0.2 - 0.3						2	
		0.3 - 0.4						3	
		0.4 - 0.5						3	
		0.5 - 0.6						5	
		0.6 - 0.7						5	
		0.7 - 0.8						6	
		0.8 - 0.9						8	
		0.9 - 1.0						11	
		1.0 - 1.1						20+	
	EOH: 1.00m - Too Dense To Auger		1.2						
			1.4						
			1.6						
			1.8						
			2.0						
			2.2						
			2.4						
			2.6						
			2.8						
			3.0						
			3.2						
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						
			4.4						
			4.6						
			4.8						

REMARKS

End of borehole @ 1.00m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA14 (Lot 7)

JOB NO.: 145678 SHEET: 1 OF 1
 START DATE: 16/03/2026 NORTHING: GRID:
 DIAMETER: 50mm EASTING:
 SV DIAL: ELEVATION: Ground
 FACTOR: DATUM:

CLIENT: Adams Family Trust
 PROJECT: 11-Lot Subdivision
 SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Topsoil	Sandy TOPSOIL, black, moist.		0.0 - 0.2						1
									2
Karioitahi Group	NATURAL; Fine to Medium SAND, grey, loose, dry to moist. 0.3m: Medium Dense. 0.5m: Greyish brown. 1.2m: Trace silt, brown, dense.		0.2 - 1.2	Groundwater Not Encountered					2
									2
									3
									3
									3
									4
									5
									4
									4
									4
									7
									7
20+									

REMARKS
 End of borehole @ 1.30m (Target Depth: 5.00m)
 NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense
 LOGGED BY: JEM
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▼ Standing groundwater level
 ▽ GW while drilling



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HAND AUGER : HA15 (Lot 8)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY			
Top soil	Sandy TOPSOIL, dark brown, dry.		0.0 - 0.05						0.5	
Kairaitahi Group	NATURAL: Fine to Medium SAND, grey, loose.		0.05 - 0.2	Groundwater Not Encountered					0.5	
			0.2 - 0.4						0.5	
			0.4 - 0.6						1	
			0.6 - 0.8						1	
			0.8 - 1.0						2	
			1.0 - 1.2						1	
			1.2 - 1.4						2	
			1.4 - 1.6						3	
			1.6 - 1.8						2	
			1.8 - 2.0						3	
			2.0 - 2.2						2	
			2.2 - 2.4						3	
			2.4 - 2.6						3	
			2.6 - 2.8						4	
			2.8 - 3.0						3	
			3.0 - 3.2						4	
			3.2 - 3.4						5	
			3.4 - 3.6						5	
			3.6 - 3.8						6	
			3.8 - 4.0						5	
			4.0 - 4.2						6	
			4.2 - 4.4						6	
			4.4 - 4.6						6	
			4.6 - 4.8						7	
			4.8 - 5.0						6	

EOH: 0.70m - No Recovery Due To Very Loose Sand Falling Back Into Hole

REMARKS

End of borehole @ 0.70m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP ▼ Standing groundwater level
 CHECKED BY: CSH ▽ GW while drilling



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HAND AUGER : HA16 (Lot 8)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Top soil	Sandy TOPSOIL, dark brown, dry.		0.05					0.5	
Kariotahi Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry.		0.2	Groundwater Not Encountered				0.5	
			0.4					1	
			0.6					1	
			0.8					2	
			1.0					2	
			1.2					2	
			1.4					3	
			1.6					4	
			1.8					4	
			2.0					4	
			2.2					3	
			2.4					3	
			2.6					3	
			2.8					3	
			3.0					4	
			3.2					4	
			3.4					5	
			3.6					5	
			3.8					5	
			4.0					6	
			4.2					6	
			4.4					5	
			4.6					5	
			4.8					7	
								9	
						9			
						13			

EOH: 0.60m - No Recovery Due To Very Loose Sand Falling Back Into Hole

REMARKS

End of borehole @ 0.60m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA17 (Lot 9)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Topsoil	Sandy TOPSOIL, dark brown, dry.		0.0 - 0.1					0.5	
Karioitahi Group	NATURAL: Fine to Medium SAND, yellowish brown, dry.		0.1 - 0.2	Groundwater Not Encountered				0.5	
			0.2 - 0.3					1	
			0.3 - 0.4					1	
			0.4 - 0.5					2	
			0.5 - 0.6					1	
			0.6 - 0.7					2	
			0.7 - 0.8					1	
			0.8 - 0.9					2	
			0.9 - 1.0					1	
			1.0 - 1.1					2	
	EOH: 1.00m - Poor Recovery Due To Sidewall Collapse		1.1 - 1.2				3		
			1.2 - 1.3				4		
			1.3 - 1.4				3		
			1.4 - 1.5				4		
			1.5 - 1.6				4		
			1.6 - 1.7				3		
			1.7 - 1.8				3		
			1.8 - 1.9				4		
			1.9 - 2.0				4		
			2.0 - 2.1				5		
			2.1 - 2.2				5		
			2.2 - 2.3				5		
			2.3 - 2.4				6		
			2.4 - 2.5				5		
			2.5 - 2.6				7		
			2.6 - 2.7				6		
			2.7 - 2.8				6		
			2.8 - 2.9				7		
			2.9 - 3.0				7		
			3.0 - 3.1						
			3.1 - 3.2						
			3.2 - 3.3						
			3.3 - 3.4						
			3.4 - 3.5						
			3.5 - 3.6						
			3.6 - 3.7						
			3.7 - 3.8						
			3.8 - 3.9						
			3.9 - 4.0						
			4.0 - 4.1						
			4.1 - 4.2						
			4.2 - 4.3						
			4.3 - 4.4						
			4.4 - 4.5						
			4.5 - 4.6						
			4.6 - 4.7						
			4.7 - 4.8						
			4.8 - 4.9						

REMARKS

End of borehole @ 1.00m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP
 CHECKED BY: CSH

Standing groundwater level
 GW while drilling



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HAND AUGER : HA18 (Lot 9)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Top soil	Sandy TOPSOIL, dark brown, dry.		0.00 - 0.05					0.25	
Kariotiahi Group	Fine to Medium SAND, yellowish brown, loose, dry. 0.5m: Medium dense.		0.05 - 0.10	Groundwater Not Encountered				0.25	
			0.10 - 0.15					0.25	
			0.15 - 0.20					0.25	
			0.20 - 0.25					0.25	
			0.25 - 0.30					4	
			0.30 - 0.35					4	
			0.35 - 0.40					4	
			0.40 - 0.45					4	
			0.45 - 0.50					4	
			0.50 - 0.55					3	
			0.55 - 0.60					3	
			0.60 - 0.65					3	
			0.65 - 0.70					3	
			0.70 - 0.75					3	
			0.75 - 0.80					3	
	EOH: 1.20m - Poor Recovery Due To Sidewall Collapse		0.80 - 0.85					3	
0.85 - 0.90	3								
0.90 - 0.95	3								
0.95 - 1.00	3								
1.00 - 1.05	3								
1.05 - 1.10	3								
1.10 - 1.15	3								
1.15 - 1.20	3								
1.20 - 1.25	3								
1.25 - 1.30	3								
1.30 - 1.35	3								
1.35 - 1.40	3								
1.40 - 1.45	3								
1.45 - 1.50	4								
1.50 - 1.55	6								
1.55 - 1.60	7								
1.60 - 1.65	7								
1.65 - 1.70	6								
1.70 - 1.75	5								
1.75 - 1.80	6								
1.80 - 1.85	5								
1.85 - 1.90	5								
1.90 - 1.95	5								
1.95 - 2.00	7								
2.00 - 2.05	6								
2.05 - 2.10	6								
2.10 - 2.15	5								
2.15 - 2.20	5								
2.20 - 2.25	5								
2.25 - 2.30	5								
2.30 - 2.35	7								
2.35 - 2.40	6								
2.40 - 2.45	6								
2.45 - 2.50	6								
2.50 - 2.55	6								
2.55 - 2.60	6								
2.60 - 2.65	8								
2.65 - 2.70	8								
2.70 - 2.75	11								
2.75 - 2.80	9								
2.80 - 2.85	8								
2.85 - 2.90	8								
2.90 - 2.95	7								
2.95 - 3.00	6								
3.00 - 3.05	6								
3.05 - 3.10	6								
3.10 - 3.15	6								
3.15 - 3.20	6								
3.20 - 3.25	6								
3.25 - 3.30	6								
3.30 - 3.35	6								
3.35 - 3.40	6								
3.40 - 3.45	8								
3.45 - 3.50	8								
3.50 - 3.55	10								
3.55 - 3.60	10								
3.60 - 3.65	14								
3.65 - 3.70	14								
3.70 - 3.75	12								
3.75 - 3.80	10								
3.80 - 3.85	10								
3.85 - 3.90	8								
3.90 - 3.95	8								
3.95 - 4.00	8								
4.00 - 4.05	8								
4.05 - 4.10	10								
4.10 - 4.15	9								
4.15 - 4.20	10								
4.20 - 4.25	10								
4.25 - 4.30	10								
4.30 - 4.35	10								
4.35 - 4.40	10								
4.40 - 4.45	13								
4.45 - 4.50	13								
4.50 - 4.55	18								
4.55 - 4.60	18								
4.60 - 4.65	20+								
4.65 - 4.70	20+								
4.70 - 4.75	20+								
4.75 - 4.80	20+								
4.80 - 4.85	20+								
4.85 - 4.90	20+								
4.90 - 4.95	20+								
4.95 - 5.00	20+								

REMARKS

End of borehole @ 1.20m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA19 (Lot 20)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Tops oil	Sandy TOPSOIL, dark brown, dry.		0.0	Groundwater Not Encountered				0.5	
	NATURAL: Fine to Medium SAND, grey, loose, dry.		0.2					0.5	
Kairaitahi Group	EOH: 1.50m - Too Dense To Auger	0.4					1		
		0.6					1		
		0.8					2		
		1.0					2		
		1.2					3		
		1.4					3		
		1.6					5		
		1.8					5		
		2.0					6		
		2.2					8		
		2.4					7		
		2.6					7		
		2.8					9		
		3.0					9		
		3.2					10		
		3.4					13		
		3.6					16		
		3.8					20+		
4.0									
4.2									
4.4									
4.6									
4.8									

REMARKS
 End of borehole @ 1.50m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP ▼ Standing groundwater level

CHECKED BY: CSH ▽ GW while drilling

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 Consulting Engineers

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HAND AUGER : HA20 (Lot 10)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Tops oil	Sandy TOPSOIL, black, dry.		0.00 - 0.05	Groundwater Not Encountered				0.33	
			0.05 - 0.10					0.33	
Kariotahi Group	NATURAL: Fine to Medium SAND, grey, loose, dry.		0.10 - 0.20					0.33	
			0.20 - 0.30					1	
	0.5m: Yellowish brown.		0.30 - 0.40					1	
			0.40 - 0.50					1	
	0.8m: Brown.		0.50 - 0.60					2	
			0.60 - 0.70					2	
	1.0m: Medium dense.		0.70 - 0.80					2	
			0.80 - 0.90					2	
			0.90 - 1.00					3	
			1.00 - 1.10					3	
			1.10 - 1.20					3	
			1.20 - 1.30					4	
			1.30 - 1.40					5	
			1.40 - 1.50					5	
			1.50 - 1.60					5	
			1.60 - 1.70					6	
			1.70 - 1.80					7	
			1.80 - 1.90					7	
		1.90 - 2.00				8			
		2.00 - 2.10				9			
		2.10 - 2.20				12			
		2.20 - 2.30				15			
		2.30 - 2.40				20+			
		2.40 - 2.50							
		2.50 - 2.60							
		2.60 - 2.70							
		2.70 - 2.80							
		2.80 - 2.90							
		2.90 - 3.00							
		3.00 - 3.10							
		3.10 - 3.20							
		3.20 - 3.30							
		3.30 - 3.40							
		3.40 - 3.50							
		3.50 - 3.60							
		3.60 - 3.70							
		3.70 - 3.80							
		3.80 - 3.90							
		3.90 - 4.00							
		4.00 - 4.10							
		4.10 - 4.20							
		4.20 - 4.30							
		4.30 - 4.40							
		4.40 - 4.50							
		4.50 - 4.60							
		4.60 - 4.70							
		4.70 - 4.80							
		4.80 - 4.90							
		4.90 - 5.00							
	EOH: 1.80m - Too Dense To Auger		1.80 - 5.00						

REMARKS

End of borehole @ 1.80m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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Appendix D – Archaeological Report (Geometria)

Appendix E – HNZPT Consultation

From: [Stuart Bracey](#)
To: [Nina Pivac](#)
Cc: [James Robinson](#); [Bill Edwards](#); [Atareiria Heiheii](#)
Subject: RE: Proposed subdivision 122 Houhora Heads Road
Date: Tuesday, 3 March 2026 4:34:10 pm
Attachments: [image003.png](#)
[image005.png](#)
[image006.png](#)

Kia Ora Nina,

I confirm that HNZPT has reviewed the proposed subdivision at 122 Houhora Heads Road in relation to the Archaeological Assessment completed by Georgia Kerby of Geometria. We note the following comments from this report:

- This short review suggests that the Houhora Harbour and in particular the southwestern shoreline and creeks were intensively utilised in the prehistoric and proto-historic period, and that archaeological sites which resulted from this activity were largely intact until 1979. Land development and management practices around Pukenui between 1979 and 2026 have largely destroyed this archaeological landscape, and this destruction has generally occurred without an authority to modify under the HNZPTA (or the preceding 1975 and 1993 Acts). No mitigation has been undertaken and few of the sites have been investigated, and apart from descriptions of surface site morphology, little else is known about the human behaviours represented.
- There is some potential of unrecorded archaeological sites and features in the areas closer to the Motutangi Stream which follow the dune alignments of the recorded site N03/834 to the south. However, this area on the eastern side of the property will not be affected by the proposed subdivision and associated future development.
- Any future development in that area will require additional archaeological assessment and investigation in the vicinity of the observed shell.
- Any ground disturbing activities involved with the development of new house sites, access and services on the other new lots may be carried out under a standard accidental discovery protocol. If archaeological remains or buried cultural deposits (layers of shell midden, oven stones, artefacts etc.) are encountered during ground disturbing activities on the property, the Adams or their contractors should cease work in the immediate vicinity and contact Heritage New Zealand Pouhere Taonga and Geometria Ltd. for advice on how to proceed.

Based on the above findings HNZPT suggest the following matters be addressed in the proposed resource consent application for subdivision.

- A plan be included that shows the building platforms and accessways for each new lot that were reviewed by the archaeologist.

- A consent notice or similar encumbrance be placed on each title
 - showing the approved developments areas on each lot.
 - Stating that any ground disturbing activities involved with the development of new house sites, access and services on new lots may be carried out under a standard accidental discovery protocol
 - Stating that any development and associated earthworks proposed outside of these areas will require a further assessment by an archaeologist.

Please contact me to discuss further if useful,

Cheers,
Stuart



Stuart Bracey | Kaiwhakamāhere | Heritage Planner | Northern Region | Heritage New Zealand
Pouhere Taonga | L10 SAP Tower 151 Queen Street Auckland CBD | Private Box 105 291 Auckland City
1143 | mobile 027 684 0833 | visit www.heritage.org.nz and learn more about NZ's heritage places.

Tairangahia a tua whakarere; Tatakihia nga reanga o amuri ake nei – Honouring the past; Inspiring the future

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From: Nina Pivac <nina@logiplan.co.nz>
Sent: Sunday, 1 March 2026 1:26 pm
To: Stuart Bracey <SBracey@heritage.org.nz>
Cc: James Robinson <jrobinson@heritage.org.nz>; Bill Edwards <BEdwards@heritage.org.nz>;
Atareiria Heihei <AHeihei@heritage.org.nz>
Subject: RE: Proposed subdivision 122 Houhora Heads Road

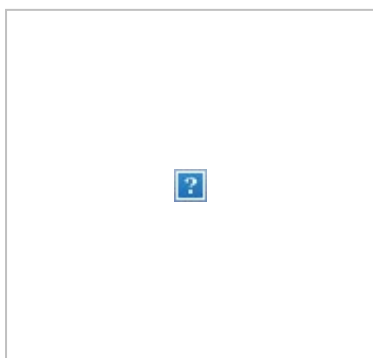
Some people who received this message don't often get email from nina@logiplan.co.nz. [Learn why this is important](#)

Kia ora Stuart,

As requested, see attached archaeological assessment.

Please advise whether HZNPT have any further concerns with the proposal.

Ngā Mihi,



Nina Pivac
Director | BAppSc | PGDip Planning | Assoc NZPI

Mobile 021 061 4725
Email nina@logiplan.co.nz
Web www.logiplan.co.nz

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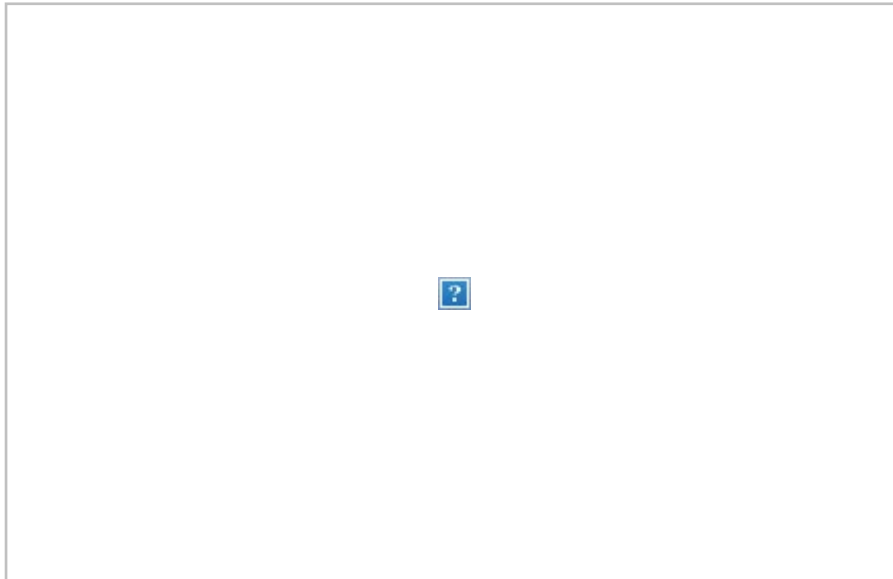
From: Stuart Bracey <SBracey@heritage.org.nz>
Sent: Wednesday, November 19, 2025 1:35 PM
To: Nina Pivac <nina@logiplan.co.nz>
Cc: James Robinson <jrobinson@heritage.org.nz>; Bill Edwards <BEdwards@heritage.org.nz>;
Atareiria Heihei <AHeihei@heritage.org.nz>
Subject: RE: Proposed subdivision 122 Houhora Heads Road

Hi Nina,

Thanks for engaging early in the process for a proposed subdivision of this site. The Archsite maps show a significant number of recorded archaeology in the Houhora location. There is a gap that includes your client's location. However, it is HNZPT's experience that this usually means no archaeologist has had a look into your client's property.

Therefore, HNZPT advise that an archaeological assessment should be carried out onsite, to support this subdivision proposal. Once HNZPT has seen and assessed the report we can advise further on if we have any concerns with the proposal,

Cheers,
Stuart



Stuart Bracey | Kaiwhakamāhere | Heritage Planner | Northern Region | Heritage New Zealand
Pouhere Taonga | L10 SAP Tower 151 Queen Street Auckland CBD | Private Box 105 291 Auckland City
1143 | mobile 027 684 0833 | visit www.heritage.org.nz and learn more about NZ's heritage places.

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From: Nina Pivac <nina@logiplan.co.nz>
Sent: Wednesday, 19 November 2025 1:16 pm
To: Stuart Bracey <SBracey@heritage.org.nz>
Subject: Proposed subdivision 122 Houhora Heads Road

Kia ora Stuart,

Our clients are wanting to subdivide their property at 122 Houhora Heads Road, see attached scheme plan. The development will be undertaken in two stages.

Please can you advise whether the site contains any known archaeological sites, and whether HNZPT have any concerns with the proposal.

Ngā Mihi,



Nina Pivac

Director | BAppSc | PGDip Planning | Assoc NZPI

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Email nina@logiplan.co.nz

Web www.logiplan.co.nz

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Appendix F – Iwi Consultation

From: [Nina Pivac](#)
To: [Kaio Hooper](#)
Subject: RE: Adams subdivision - 122 Houhora Heads Road
Date: Monday, 16 March 2026 11:41:00 am
Attachments: [image001.png](#)

Kia ora Kaio,

Just checking in to see if you have any comments on this proposal at this stage?

FYI our engineers are underway with their site suitability investigations. Once we have received their findings and recommendations, I will be able to get my AEE to at least a draft stage for your review. However, if you have any preliminary feedback that would be much appreciated.

My number is 0210614725 if you want to discuss over the phone.

Ngā Mihi,



Nina Pivac

Director | BAppSc | PGDip Planning | Assoc NZPI

Mobile 021 061 4725

Email nina@logiplan.co.nz

Web www.logiplan.co.nz

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From: Nina Pivac
Sent: Sunday, March 1, 2026 1:35 PM
To: Kaio Hooper <consult@moanawhenua.com>
Subject: RE: Adams subdivision - 122 Houhora Heads Road

Kia ora Kaio,

We have now received the attached archaeological assessment, which is generally positive in its findings. I have forwarded a copy to Heritage New Zealand Pouhere Taonga for their review and any further comment.

Our next step is to arrange a site visit with the engineers. This will inform their Site Suitability Report, addressing matters such as wastewater and stormwater disposal, access arrangements, and any proposed earthworks etc. Once that report is available, I will be in a position to complete the majority of the Assessment of Environmental Effects and will forward that through to you for review and comment.

In the meantime, I would appreciate it if you could review the archaeological assessment and advise whether you have any immediate concerns from an iwi perspective.

Feel free to give me a call if you would like to discuss anything further.

Ngā Mihi,



Nina Pivac

Director | BAppSc | PGDip Planning | Assoc NZPI

Mobile 021 061 4725

Email nina@logiplan.co.nz

Web www.logiplan.co.nz

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From: Kaio Hooper <consult@moanawhenua.com>
Sent: Wednesday, November 26, 2025 11:55 AM
To: Nina Pivac <nina@logiplan.co.nz>
Subject: Re: Adams subdivision - 122 Houhora Heads Road

Kia ora Nina,

Thank you for your email regarding the proposed subdivision at - 122 Houhora Heads Road. Your early engagement prior to the lodgement of the resource consent application is appreciated.

I support both Te Aupōuri and Ngāi Takoto Iwi in RMA matters and resource consent processes, and I am happy to collate and share their views and any concerns they may have in relation to this proposal.

The archaeological assessment is a proactive step and is strongly supported and recommended by both iwi, including consideration of any associated findings or outcomes. As you may be aware, this area contains numerous registered and unregistered archaeological sites of high cultural significance to both iwi, so being kept informed throughout this assessment process would be appreciated.

Lastly, if you have any additional relevant information, such as an Assessment of Environmental Effects (AEE), could you please forward this through? Providing this information early will help alleviate any potential concerns, particularly in relation to environmental impacts, and will support a smoother process for all parties by ensuring a full and clear picture of the proposal.

Once received, I will present this to both iwi and respond back to you in a timely manner.

Ngā manaakitanga



Moana Whenua Trust Limited

Kaio Hooper

Director | Senior Consultant

Mob: 022 025 6171

Email: consult@moanawhenua.com

Web: www.moanawhenua.com

On Tue, Nov 25, 2025 at 1:08 PM Nina Pivac <nina@logiplan.co.nz> wrote:

Kia ora Kaio,

I am getting in touch on behalf of the Adams whānau, who are looking to subdivide their property at 122 Houhora Heads Road. The proposal will be completed in two stages, as shown in the attached scheme plans.

We are aware that there are a number of archaeological features in the area, so we're currently seeking quotes for an archaeological assessment (from Geometria and Sunrise Archaeology). We're also lining up a quote for a site suitability report. As part of the resource consent process, we'd like to also consult with the relevant iwi authority.

Could you please confirm whether you're the right contact to provide comment on behalf of iwi, and whether this would fall under Ngāi Takoto, Te Aupōuri, or both?

If you have any questions about the proposal, feel free to get in touch.

Ngā Mihi,



Nina Pivac

Director | BAppSc | PGDip Planning | Assoc NZPI

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Email nina@logiplan.co.nz

Web www.logiplan.co.nz

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Appendix G – Top Energy Consultation

4 May 2026

Nina Pivac
Logiplan Ltd

Email: nina@logiplan.co.nz

To Whom It May Concern:

RE: PROPOSED SUBDIVISION

HW & LM Adams – 122 Houhora Heads Road, Houhora. Lot 2 DP 70340. Stage 1 & 2.

Thank you for your recent correspondence with attached proposed subdivision scheme plans.

Top Energy's requirement for this subdivision is nil. Top Energy advises that there is an existing power supply to the dwelling on proposed lot 11. Design and costs to provide a power supply to the additional lots could be provided after application and an on-site survey have been completed.

Link to application: [Top Energy | Top Energy](#)

In order to get a letter from Top Energy upon completion of your subdivision, a copy of the resource consent decision must be provided.

Yours sincerely



Aaron Birt

Planning and Design

E: aaron.birt@topenergy.co.nz

Archaeological Assessment of Effects: Lot 2 DP 70340 122 Houhora Heads Road, Pukenui

31 January 2026

Georgia Kerby

Commissioned by:

Lyn and Herb Adams
122 Houhora Heads Road
Pukenui
Far North

Prepared by:

Geometria Limited
P.O. Box 68-653
Newton
Auckland



Geometria

Executive Summary

Geometria Ltd. was commissioned by L. and H. Adams to undertake an archaeological survey and assessment of a proposed subdivision of Lot 2 DP 70340 at 122 Houhora Heads Road, Pukenui. Many archaeological sites, primarily shell middens and ovens, have been recorded at Houhora Heads, especially around the Ariawa and Motutangi Rivers. Additionally, two midden sites (N03/834 and N03/835) are recorded on the south neighbouring property.

No definite archaeological sites or features were identified during the site survey but two very small shell scatters of uncertain origin were located, indicating that it is possible that unidentified, subsurface archaeological sites and features exist on Lot 2 DP 70340. An archaeological authority is not required but an accidental discovery protocol should be adhered to by the Adams and any contractors while undertaking future work on the property and during the subdivision process.

Quality Information

Document: Archaeological Assessment of Effects of Lot 2 DP 70340 Pukenui

Ref.: 2026-411

Date: 3 February 2026

Prepared by: Georgia Kerby

Revision History

Revision	Revision Date	Details	Authorised Name
Draft	27/01/2026	Draft	G. Kerby
Final	31/01/2026	Final	J. Carpenter

Glossary

Classic	The later period of New Zealand settlement
Midden	The remains of food refuse usually consisting of shells, and bone, but can also contain artefacts
Pā	A site fortified with earthworks and palisade defences
Pit	Rectangular excavated pit used to store crops by Māori
Terrace	A platform cut into the hill slope used for habitation
Wāhi tapu	Sites of spiritual significance to Māori

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File ref.: C:\2026\2026-411_Lot 2 DP 70340_122 Houhora Heads Road

Title Image: View Northeast to Houhora Heads.

Contents

Executive Summary	i
Quality Information	ii
Revision History	ii
Glossary	ii
Contents	iii
List of Figures	iv
1 Introduction	1
2 Statutory Requirements	1
2.1 The Heritage New Zealand Pouhere Taonga Act 2014.....	1
2.2 The Resource Management Act 1991	2
3 Location	1
4 Proposed Development.....	1
5 Methodology	4
5.1 Site Assessment	4
5.2 Significance Assessment	4
6 Historical Background.....	4
7 Archaeological Background	8
7.1 Previous Archaeological Work	9
8 Other Heritage Sites and Features	11
9 Site Inspection	11
10 Assessment of Effects	17
11 Findings and Recommendations	18
12 Conclusion.....	18
References.....	19

List of Figures

Figure 1. Location of subject property.	1
Figure 2. Proposed subdivision of Lot 2 DP 70340 Stage 1.....	2
Figure 3. Proposed subdivision of Lot 2 DP 70340 Stage 2.....	3
Figure 4. Detail from So 948 (1858).....	6
Figure 5. Detail from SO 8508G (1893).	7
Figure 6. Detail from SO 25443 (1929).	7
Figure 7. 1944 aerial image with approximate property parcel in blue. (Retrolens 1944 CROWN_350_1046_11).	8
Figure 8. Archaeological sites in vicinity of the subject property. Archsite 2026.	10
Figure 9. Sites N03/834 and N03/835 recorded in 2011 by Carpenter.	10
Figure 10. Lot 1 House Site.....	12
Figure 11. Lot 2 House Site.....	12
Figure 12. Lot 3 House Site.....	13
Figure 13. Lot 4 House Site.....	13
Figure 14. Lot 8 House Site.....	14
Figure 15. View South from Lot 7.....	14
Figure 16. Accessway to Lot 10. Figure 17. Lot 9 House Site.....	15
Figure 18. View east across Lot 11.	15
Figure 19. View east over Lot 11 with shell location.	16
Figure 20. Fragmented surface shell on Lot 11.	16
Figure 21. Surface shell location on Lot 11.....	17

1 Introduction

L. and H. Adams commissioned Geometria Ltd to undertake an archaeological survey and assessment of a proposed subdivision on Lot 2 DP 70340. This report assesses the potential archaeological effects of the subdivision of Lot 2 DP 70340 into 12 Lots. Under the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA), all archaeological sites are protected from any modification, damage or destruction except by the authority of Heritage New Zealand Pouhere Taonga (HNZPT)

This survey and assessment uses archaeological techniques to assess archaeological values and does not seek to locate or identify wāhi tapu or other places of cultural or spiritual significance to Māori. Such assessments may only be made by Tangata Whenua, who may be approached independently of this report for advice.

Likewise, such an assessment by Tangata Whenua does not constitute an archaeological assessment and permission to undertake ground disturbing activity on and around archaeological sites and features may only be provided by Heritage New Zealand Pouhere Taonga, and may only be monitored or investigated by a qualified archaeologist approved through the archaeological authority process.

2 Statutory Requirements

There are two main pieces of legislation in New Zealand that control work affecting archaeological sites. These are the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA; previously the Historic Places Act 1993) and the Resource Management Act 1991 (RMA).

2.1 The Heritage New Zealand Pouhere Taonga Act 2014

Under the HNZPTA all archaeological sites are protected from any modification, damage or destruction except by the authority of Heritage New Zealand Pouhere Taonga. Section 6 of the HNZPTA defines an archaeological site as:

- "(a) any place in New Zealand, including any building or structure (or part of a building or structure), that—
- (i) was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900; and
 - (ii) provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand; and
- (b) includes a site for which a declaration is made under section 43(1)"

To be protected under the HNZPTA an archaeological site must have physical remains that pre-date 1900 and that can be investigated by scientific archaeological techniques. Sites from 1900 or post-1900 can be declared archaeological under section 43(1) of the Act.

If a development is likely to impact on an archaeological site, an authority to modify or destroy this site can be sought from the local Heritage New Zealand Pouhere Taonga office under section 44 of the Act. Where damage or destruction of archaeological sites is to occur Heritage New Zealand usually requires mitigation. Penalties for modifying a site without an authority include fines of up to \$300,000 for the destruction of a site.

Most archaeological evidence consists of sub-surface remains and is often not visible on the ground. Indications of an archaeological site are often very subtle and hard to distinguish on the ground surface. Sub-surface excavations on a suspected archaeological site can only take place with an authority issued under Section 56 of the HNZPTA issued by the Heritage New Zealand.

The archaeological authority process applies to all archaeological sites, regardless of whether:

- The site is recorded in the NZ Archaeological Association Site Recording Scheme or included in the Heritage New Zealand List,
- The site only becomes known about as a result of ground disturbance, and/ or
- The activity is permitted under a district or regional plan, or a resource or building consent has been granted

Heritage New Zealand also maintains the New Zealand Heritage List/ Rārangī Kōrero of Historic Places, Historic Areas, Wāhi Tupuna, Wāhi Tapu and Wāhi Tapu Areas. The List can include archaeological sites. Its purpose is to inform members of the public about such places.

2.2 The Resource Management Act 1991

Archaeological sites and other historic heritage may also be considered under the Resource Management Act 1991 (RMA). The RMA establishes (under Part 2) in the Act's purpose (Section 5) the matters of national importance (Section 6), and other matters (Section 7) and all decisions by a Council are subject to these provisions. Sections 6e and 6f identify historic heritage (which includes archaeological sites) and Māori heritage as matters of national importance.

Councils have a responsibility to recognise and provide for the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu and other taonga (Section 6e). Councils also have the statutory responsibility to recognise and provide for the protection of historic heritage from inappropriate subdivision, use and development within the context of sustainable management (Section 6f). Responsibilities for managing adverse effects on heritage arise as part of policy and plan preparation and the resource consent processes.

Historic heritage includes:

- historic sites, structures, places, and areas
- archaeological sites;
- sites of significance to Māori, including wāhi tapu;
- surroundings associated with the natural and physical resources (RMA section 2).

These categories are not mutually exclusive and some archaeological sites may include above ground structures or may also be places that are of significance to Māori.

Where resource consent is required for any activity the assessment of effects is required to address cultural and historic heritage matters (RMA 4th Schedule and the district plan assessment criteria [if appropriate]).

3 Location

The subject property Lot 2 DP 70340 is located on the south side of the Houhora Harbour at 122 Houhora Heads Road, Pukenui. It lies between Houhora Heads Road and the mouth of the Motutangi Stream (Figure 1). The property is 29.12ha in size and consists of undifferentiated sand and alluvium with low lying peat swamp land on the western side. The land is level to rolling at approximately 10m above sea level, with a series of high dunes in the centre rising to 20m above sea level. Small areas of pine trees have been established at the north-west corner of the property and on the central dunes, while manuka covers the southern dunes and other small patches throughout the property. Several buildings, including at least two residential dwellings and a large shed, are located to the east, accessed by a metalled road which bisects the property from Houhora Heads Road. Other sheds and farm structures are located within the central pines off this road. A second residential dwelling is located at the central south edge of the property accessed from the unnamed road which forms the southern boundary. The remainder of the property is in stocked pasture.

4 Proposed Development

The subdivision proposes the development of the Lot into 12 Lots of various sizes, divided into two stages (Figures 2-3). Stage One includes the subdivision of Lots 1-4 and Lots 11-12 at the south and east parts of the property, while Stage Two includes the subdivision of Lots 5-10 at the northern end. Lots 1-10 each contain proposed house sites, new easements and an access way from Houhora Heads Road, while Lot 11 is the balance lot containing all the existing residential and farm buildings. Lot 12 will be an esplanade reserve abutting the river. Several of the low-lying areas throughout the property will be covenanted as wetlands.



Figure 1. Location of subject property.

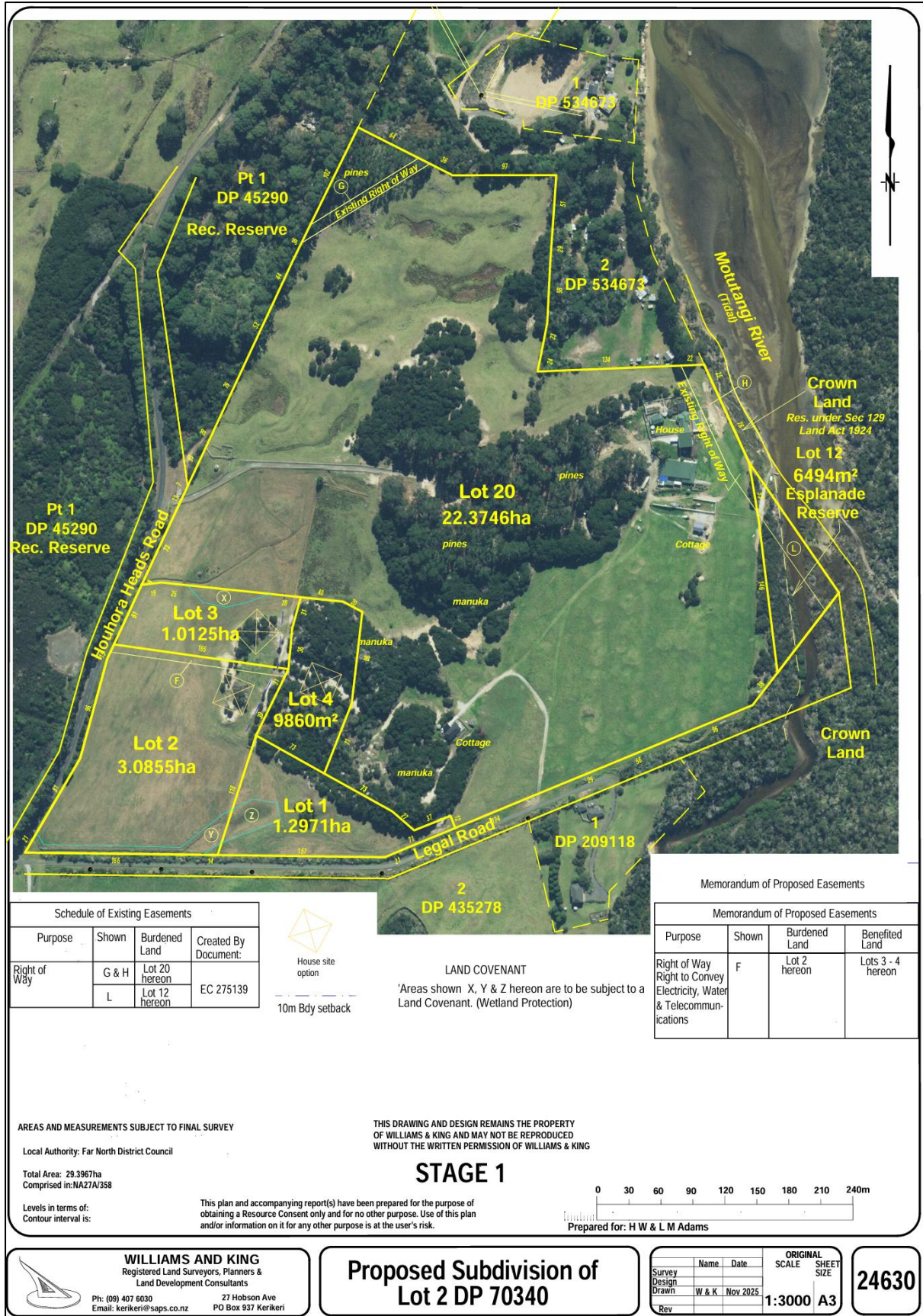


Figure 2. Proposed subdivision of Lot 2 DP 70340 Stage 1.

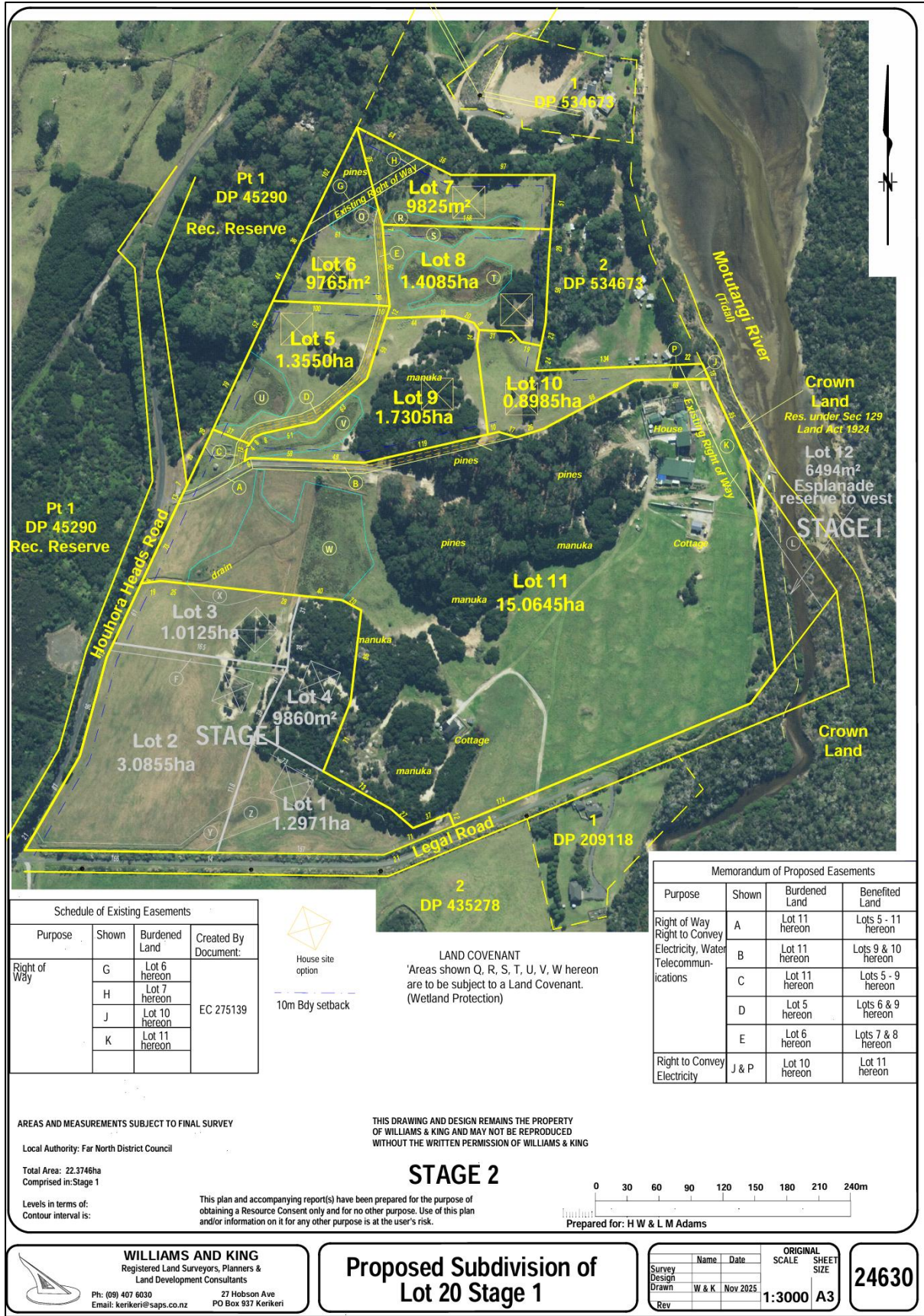


Figure 3. Proposed subdivision of Lot 2 DP 70340 Stage 2.

5 Methodology

5.1 Site Assessment

The methods used to assess the presence and state of archaeological remains on the property included both a desktop review and field survey. The desktop survey involved an investigation of written records relating to the history of the property. These included regional archaeological publications and unpublished reports, New Zealand Archaeological Association Site Record Files or NZAA SRF (ArchSite - www.archsite.org.nz - is the online repository of the NZAA SRF), and land plans held at Land Information New Zealand. The field survey was undertaken on 23 January 2026 and included pedestrian surface survey with a focus on eroded or exposed surfaces for the possible exposure of subsurface remains. Limited probing was undertaken and targeted the proposed house site locations.

5.2 Significance Assessment

The archaeological significance of sites and features on the subject property will be assessed using criteria derived from guidance issued by Heritage New Zealand (New Zealand Historic Places Trust 2016).

The first set of criteria assess the potential of the site to provide a better understanding of New Zealand's past using scientific archaeological methods. These categories are focussed on the intra-site level.

- *How complete is the site? Are parts of it already damaged or destroyed?*

A complete, undisturbed site has a high value in this section, a partly destroyed or damaged site has moderate value and a site of which all parts are damaged is of low value.

- *How diverse are the features to be expected during an archaeological excavation on the site?*

A site with only one or two known or expected feature types is of low value. A site with some variety in the known or expected features is of moderate value and a site like a pa or kainga which can be expected to contain a complete feature set for a given historic/prehistoric period is of high value in this category.

- *How rare is the site?*

Rarity can be described in a local, regional and national context. If the site is not rare at all, it has no significance in this category. If the site is rare in a local context only it is of low significance, if the site is rare in a regional context, it has moderate significance and it is of high significance if the site is rare nationwide.

The second set of criteria puts the site into its broader context: inter-site, archaeological landscape and historic/oral traditions and community association.

- *What is the context of the site within the surrounding archaeological sites?*

The question here is the part the site plays within the surrounding known archaeological sites. A site which sits amongst similar surrounding sites without any specific features is of low value. A site which occupies a central position within the surrounding sites is of high value.

- *What is the context of the site within the landscape?*

This question is linked to the one above, but focuses onto the position of the site in the landscape. If it is a dominant site with many features still visible it has high value, but if the position in the landscape is ephemeral with little or no features visible it has a low value. This question is also concerned with the amenity value of a site and its potential for on-site education.

- *What is the context of the site within known historic events or people, or existing communities?*

This is the question of known cultural association either by tangata whenua or other descendant groups. The closer the site is linked with important historic events or people the higher the significance of the site. This question is also concerned with possible commemorative values of the site.

An overall significance value derives from weighing up the different significance values of each of the six categories. In most cases the significance values across the different categories are similar.

6 Historical Background

The Tangata Whenua of the Houhora area today are Te Aupouri, Ngāi Takoto and Ngāti Kuri. Te Aupouri, originally known as Ngāti Ruanui originally landed at the Hokianga on the Mamari canoe, settling on the north shore of the harbour and ultimately extending to Whangape. After coming into conflict with people already resident at Whangape and Mitimiti, a series of tragic events led to the iwi taking on the name of Te Aupouri and moving north, via Herekino, Ahipara, and Pukepoto, to Te Kao. Here they were given the Pā Tawhitirahi (Te Kao Pa) by their Ngāi Takoto relatives. Ngāti Kuri and Ngāi Takoto both trace their descent from the Kurahaupo canoe which landed at Takapaukura near North Cape and from the captain, Pohurihanga (Cloher 2002; Taonui 2010).

The area around Houhora was originally reserved for Māori as part of the Muriwhenua South Crown land purchase of approximately 87,000 acres, in 1858. The Houhora Block consisted of 7710 acres and it was subsequently sold in 1866, one year after private land sales started again in 1865. The Muriwhenua Land report issued by the Waitangi Tribunal (1997) suggests that arrangements to sell the land had been organised in advance, as titles were investigated in 1865 and conveyed in 1866, with the survey and court costs probably being covered by the traders purchasing the land as Māori generally didn't have the money to investigate title to their own lands. The Houhora Block reserve was sold to the gum traders Ludolph and Henry Subritzky for £550 and the Māori resident at the settlement at Houhora no longer had a legal interest in the land and moved on. The Subritzky and Evans families came to control most aspects of life and industry between Te Kao and Awanui for the next hundred years.

A review of historic survey plans provides a series of snapshots of the land use history of the area in the late 19th and early 20th century around Lot 2 DP 70340. The original survey is SO 948A (~1858; see Figure 4) associated with the Crown purchase. The area to the west of the subject property is shown as having a 220 acre block named "Motutengi" reserved, with what is now the Motutangi Stream to the east labelled the "Muiata River"; the land between the stream and the coast is also reserved. SO 8508G (1893; See Figure 5) shows the Subritzky house named as "Houhora House", with the Ariawa River and Evan's store/Post Office and Telegraph to the west at Pukenui, with the Muiata River/Motutangi Stream to the east renamed Stephenson's Creek. The foot track from Waiharera and Awanui is shown traversing the vicinity of the subject property, as is the telephone line.

The subject property itself was originally surveyed as part of the 164-acre Section 22 Block XV Houhora East Survey District, as shown on SO 25443 (1929; Figure 6). Large drains are shown on a drainage easement on this plan running around the property to the south of the subject property. Section 26, the subject property, is described as "Sand Hills, very poor country" with "Swampy flats"

on the west side and “Easy to level grades” on the south. The land to the east to the Motutangi Stream is labelled “Bare Sand Hills”.

As part of the review of historic documents, a 1944 aerial photograph covering the area was reviewed and no archaeological or historic features of interest are visible (Figure 7). There is no sign of any Māori ditch features similar to those to the south in the Motutangi swamp, nor more recent European drainage features and buildings which are visible on the properties to the south.



Figure 4. Detail from So 948 (1858).



Figure 5. Detail from SO 8508G (1893).



Figure 6. Detail from SO 25443 (1929).



Figure 7. 1944 aerial image with approximate property parcel in blue. (Retrolens 1944 CROWN_350_1046_11).

7 Archaeological Background

There are a large number of archaeological sites recorded within one kilometre of Lot 2 DP 70340, and site density in this area is high, as it is around the Houhora Harbour in general (Figure 8). However, there are no recorded sites on the subject property itself as the area south of Houhora Heads Road has not been previously surveyed other than one property surveyed by J. Carpenter in 2011. Houhora is well known in archaeological terms for the archaic period (or early prehistoric) occupation of Mt Camel on the north side of the harbour. The site was excavated in the 1960s and produced a wealth of artefactual material, midden and structures dating to the early 14th century AD (Shawcross 1972; Furey 2002).

A large number of sites were recorded on the southwest side of the harbour as part of the original archaeological survey of the area by J. C. Nugent and R. M. Bellingham in 1979. These clustered around the Ariawa and Motutangi Streams and the Houhora Harbour coastline and primarily include midden sites but also ovens, a canoe landing, pit/terraces, and pa. A smaller cluster of sites exists to the south and west of the subject property around the upper Ariawa Stream near the Whalers Road/Burnage Road intersection, associated with the occupation of a Pā site recorded as N03/255.

Further to the south lies the extensive prehistoric Motutangi swamp drainage ditch system and Muiata Pa, a low lying Pā on consolidated sand in the centre of the swamp (another two unnamed Pā are recorded nearby). The Motutangi swamp was drained for land development in the 1970s but the prehistoric drainage system has been extensively researched by I. Barber (e.g. 1983; 1989). The system covered 47ha with many kilometres of parallel linear ditches with shorter connecting ditches up to 500mm wide and 500mm deep. Radiocarbon dating suggested the ditch system, which was probably used to drain the water-logged and poorly drained soils (but perhaps to irrigate less wet areas and/or delineate plot boundaries) were abandoned by the mid-17th century. The gardens

around the drains were probably used to grow swamp taro, as kumara and dry land taro varieties would not tolerate the wet conditions.

Despite the large amount of development in the area over the last 20 years, few new archaeological assessments or excavations have been undertaken in the area.

7.1 Previous Archaeological Work

A. Slocombe monitored the construction of a telecom cell tower at Pukenui in 1990. The tower was built in the vicinity of a recorded Pā site. Outside the Pā they recorded shell midden consisting of locally available harbour/muddy shore species, charcoal and fire-cracked oven stones, along with a fire scoop or oven. Shell midden found within the eroding bank of the Pā was more varied and included rocky shore species and toheroa which probably came from the west coast at least eight kilometres distant. The Pā defences suggested a single stage of construction and no European artefacts were found, suggesting a prehistoric occupation. Unfortunately, no detailed analysis of the finds of the midden or radiocarbon dating was undertaken (Slocombe 1990: 11-13).

In 2000 V. Hensley undertook an assessment of the subdivision of Part of Section 9 Block XI into eleven lots; he recorded three badly damaged midden and recommended an authority to modify be applied for. V. Hensley also undertook a survey in 2002 over Section 2 Block 15 immediately west of the Ariawa Stream. He suggested almost all the sites recorded on the property had been destroyed or damaged in the intervening 23 years, except for three or four sites in the northeast corner of the property.

In 2003, I. Bruce undertook a survey of Section 2 Block 15 (Bruce 2003) in advance of their construction of a house, shed, and tennis court on the property. This assessment resulted in the re-location and recording of two largely undamaged sites, one on the property (N03/224) and one in the road reserve to the north (N03/117). Bruce suggested that the other 24 sites previously recorded on the property had been destroyed by recent earthworks as well as earlier land management practices (pig farming and horticulture). Bruce (2003: 9) recommended the application for an Authority under Section 12 of the Historic Places Act 1993 to modify unrecorded sites on the property during the development of the property but this recommendation was not followed.

In 2006, earthworks in the Water-front Road Road Reserve (administered by Far North District Council) between Section 2 and the harbour occasioned an archaeological damage assessment by M. Campbell (2007) who recommended an archaeological investigation to mitigate the damage, but this was not undertaken.

In 2011, J. Carpenter undertook a survey and assessment of the neighbouring property to the south of the subject property (Lot 2 DP 435287), Lot 2 DP 209118. He recorded two midden sites, N03/834 and N03/835 (Figure 9). The largest site N03/834 comprises six features each consisting of deflated tuatua and cockle midden with fire cracked oven stones and water rolled cobbles. The features were located on blowouts on the crest of a north-south trending dune near the Motutangi Stream and the midden remains extended up to 20m across and possibly subsurface. Approximately 400m to the west, N03/835 consisted of a scatter of fragmented and whole cockle shells over a 40 x 10m area on the crest and southern slope of a low (1-2m high) east-west trending dune. Historic artefacts including bottle glass and metal were identified in the same location but may not be related.

More recently, Leigh Johnson (2023) relocated four midden/oven sites (N03/115, 138, 139, and 351) one approximately 20m long and the others are small remnants at the Waterfront Road Road Reserve that had been previously recorded in 1979 and 2020. They consist of cockle and pipi midden and were damaged by bird burrows, an access track, erosion and more so from Cyclone Gabrielle.

This short review suggests that the Houhora Harbour and in particular the southwestern shoreline and creeks were intensively utilised in the prehistoric and proto-historic period, and that archaeological sites which resulted from this activity were largely intact until 1979. Land development

and management practices around Pukenui between 1979 and 2026 have largely destroyed this archaeological landscape, and this destruction has generally occurred without an authority to modify under the HNZPTA (or the preceding 1975 and 1993 Acts). No mitigation has been undertaken and few of the sites have been investigated, and apart from descriptions of surface site morphology, little else is known about the human behaviours represented.

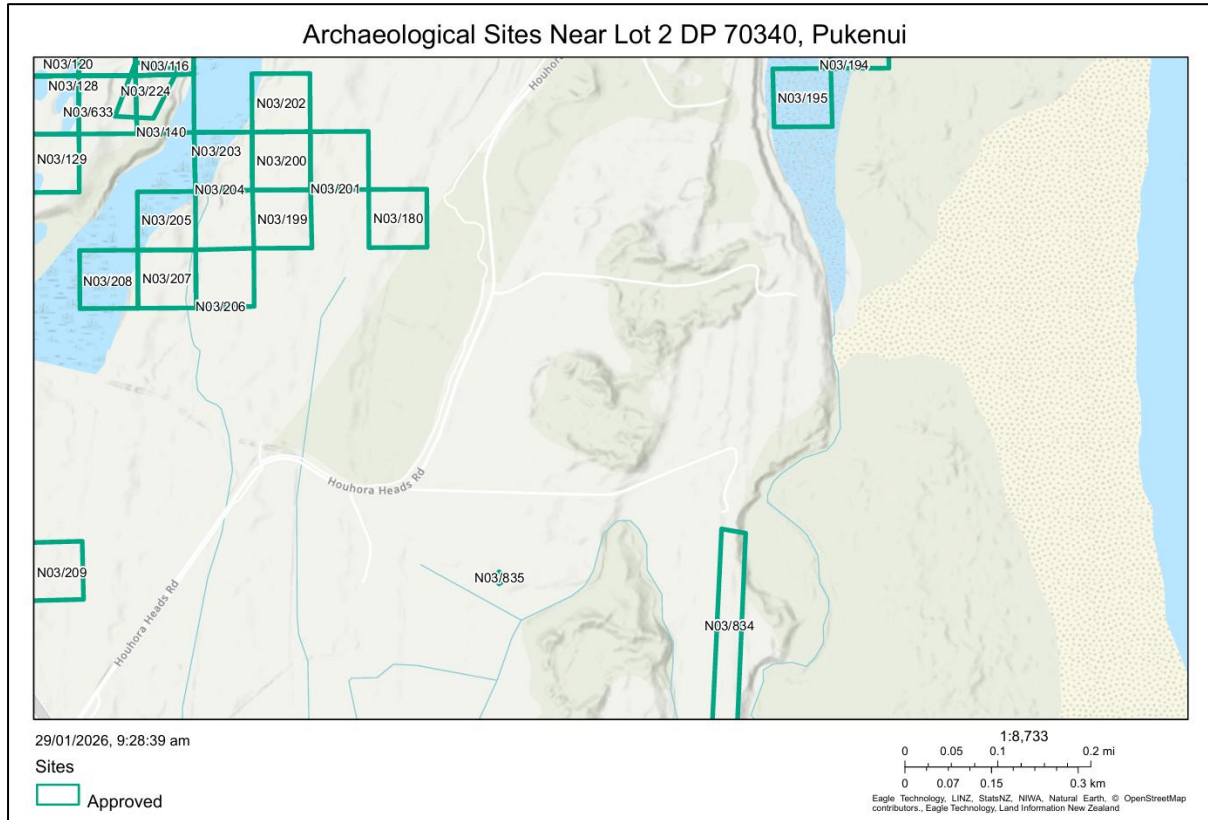


Figure 8. Archaeological sites in vicinity of the subject property. Archsite 2026.

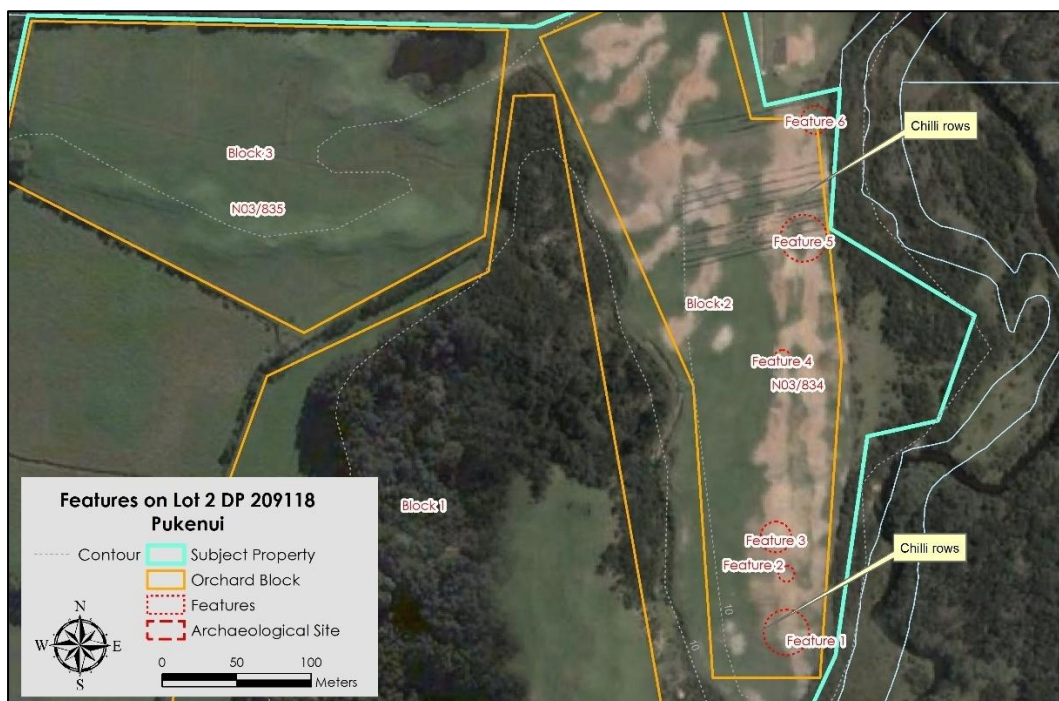


Figure 9. Sites N03/834 and N03/835 recorded in 2011 by Carpenter on Lot 2 DP 209118 directly south of subject property.

8 Other Heritage Sites and Features

The Far North District Plan, the New Zealand Heritage List/Rārangi Kōrero, historic and modern aerial imagery, and land plans were consulted. No registered historic places are on or in the vicinity of the planned subdivision.

9 Site Inspection

The assessment was undertaken on 23 January 2026. Each proposed Lot was traversed by foot with attention being paid to areas of exposed subsoil/sand including farm roads, tracks, blow outs and recently cleared/harvested areas. Probing was undertaken on the proposed house sites and where archaeological features were observed on the surface to determine if subsurface features were present. The proposed Lots are described below clustered into Stage One and Stage Two works. Surface shell was identified on Lot 9 and a single potential archaeological feature was recorded on Lot 11. No archaeological features were identified on the other Lots.

Stage One Survey

Lots 1 – 4 consisted of low lying pasture west of a clump of rolling sand dunes covered in grass and manuka scrub (Figures 10-13). The proposed house sites were positioned on the crests of the dunes and were all lightly covered in manuka. No archaeological features were identified on the exposed areas of dune or fields, nor found through probing the house sites.

Stage Two Survey

Lots 5 - 12 consisted of steep rolling sand dunes uprising to 10m above the surrounding landscape, with low rolling sand dunes under grass and patches of pine on the northwest boundary and manuka scrub on the middle and eastern portions of the block (Figures 14-19). Multiple areas throughout are low lying waterlogged dips which will be reserved as wetlands. As for the Stage One Lots, the proposed house sites were positioned on the crests of the dunes, mostly where manuka was clustered. The Lot 8 house site was located within a low point between blown and washed-out dunes but no archaeological material was evident in the exposed sands (Figure 14). An existing bulldozed access way off the main property driveway will be used to access Lot 10 and no archaeological material was evident in the exposed ground surface and sandy banks either side (Figure 16). The house site for Lot 9 was positioned on the highest point of the property on a flattish plateau that appeared to have been cleared amongst the surrounding manuka scrub. Two clusters of a few cockle shells only were visible on the western slopes off the plateau but no subsurface remains or further shell were identified on the Lot (Figure 11). This shell may have been carried by vehicles from shell used to fill holes in the main property driveway.

On the southeastern side of Lot 11 there was a series of grass covered north - south trending dunes which meet the proposed esplanade reserve and Motutangi Stream (Figures 19-20). A small scatter of fragmented shell was identified on the east facing side of one of these dunes just south of a manuka crested blow out, and a small 1 x 2 m area of subsurface shell was identified via probe (Figure 21). The feature comprised very diffuse and highly fragmented shell and it is uncertain whether it is archaeological in origin and has not been recorded as an archaeological site. The shell is located at Easting 1613589 Northing 6145561 (NZTM). No development is planned for this area.



Figure 10. Lot 1 House Site.



Figure 11. Lot 2 House Site.



Figure 12. Lot 3 House Site.



Figure 13. Lot 4 House Site.



Figure 14. Lot 8 House Site.



Figure 15. View South from Lot 7.



Figure 16. Accessway to Lot 10.



Figure 17. Lot 9 House Site.



Figure 18. View east across Lot 11.



Figure 19. View east over Lot 11 with shell location.



Figure 20. Fragmented surface shell on Lot 11.



Figure 21. Surface shell location on Lot 11.

10 Assessment of Effects

The proposed subdivision and development of the identified house sites and access will not affect any archaeological sites or features through modification of archaeological features or dissection by new lot boundaries. However, two very small surface deposits (one with possible subsurface material) of fragmented shell were located on Lot 2 DP 70340. If they were archaeological they are in very poor condition and not associated with a larger intact feature. There is some potential of unrecorded archaeological sites and features in the areas closer to the Motutangi Stream which follow the dune alignments of the recorded site N03/834 to the south. However, this area on the eastern side of the property will not be affected by the proposed subdivision and associated future development.

11 Findings and Recommendations

- The proposed subdivision of Lot 2 DP 70340 is unlikely to modify any archaeological sites or features and an archaeological authority from Heritage New Zealand Pouhere Taonga is not required.
- The presence of two very small scatter of stock trampled or otherwise modified shell features of uncertain origin suggests that unidentified subsurface archaeological sites and features may be present on the eastern side of Lot 2 DP 70340 and the proposed new Lot 11, south of the existing house and outbuildings.
- Any future development in that area will require additional archaeological assessment and investigation in the vicinity of the observed shell.
- Any ground disturbing activities involved with the development of new house sites, access and services on the other new lots may be carried out under a standard accidental discovery protocol. If archaeological remains or buried cultural deposits (layers of shell midden, oven stones, artefacts etc.) are encountered during ground disturbing activities on the property, the Adams or their contractors should cease work in the immediate vicinity and contact Heritage New Zealand Pouhere Taonga and Geometria Ltd. for advice on how to proceed.
- Consultation with Tangata Whenua should be carried out by the Adams independently of this report.

12 Conclusion

Geometria Ltd. was commissioned by L. and H. Adams to undertake an archaeological survey and assessment of a proposed subdivision of Lot 2 DP 70340 at 122 Houhora Heads Road, Pukenui. No definite archaeological sites or features were identified. However, two very small shell scatters of uncertain origin were identified on the ground surface of the property. One of these had a small associated subsurface deposit and may be archaeological, however no development is planned for the surrounding area and the feature has not been recorded as an archaeological site.

It is possible that subsurface archaeological sites and features exist elsewhere on the property but given the nature of the dune lands these are unlikely to be identified or encountered except by large-scale earthworks. An archaeological authority is not required but an accidental discovery protocol should be adhered to by the Adams and any contractors while undertaking future work on the property and during the subdivision process.

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Survey Plans and Aerial Photographs

- Aerial Photograph Run 1047 Survey Number 350 (1943). On file at the Department of Conservation, Northland Conservancy.
- SO 948 (~1858). LINZ.
- SO 8508G (1893). LINZ.
- SO 25443 (1929). LINZ.

SO 28411 (1936). LINZ.

SITES	122 Houhora Heads Road, Pukenui
LEGAL DESCRIPTIONS	Lot 2 DP 70340
PROJECT	Proposed 11-Lot Subdivision
CLIENT	Adams Family Trust
REFERENCE NO.	145678
DOCUMENT	Site Assessment Report
STATUS/REVISION NO.	FINAL – Issued for Resource (Subdivision) Consent
DATE OF ISSUE	9 April 2026

Report Prepared For	Attention	Email
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1. EXECUTIVE SUMMARY

The following table is intended to be a concise summary which must be read in conjunction with the relevant report sections as referenced herein.

Development Type:	11-Lot subdivision (proposed Lots 1-10 for assessment).
Development Proposals Supplied:	Yes – Three Subdivision Scheme Plans.
NZS3604:2011 Type Structure(s):	Future structures are assumed to be.
Geology Encountered:	Holocene Age Parabolic Dunes of Karioitahi Group.
Surficial Topsoil Encountered:	Yes – Surficial layers of topsoil were encountered to depths ranging between 0.10m and 0.20m below present ground level.
Overall Site Gradient in Proximity to Designated Building Platforms:	<p>The designated building platforms (DBPs) are generally positioned at the top of sand dunes with near level to very steeply sloping flanks and/or near level lower-lying ground.</p> <p>The sand dune above proposed Lot 4 is more elevated than the rest of the development areas, with ground sloping up to greater than 50° from the northeast down to the southwest towards the proposed DPB, as indicated on our appended Cross-section D-D' (Drawing No. 145678-G613).</p>
Site Stability Risk:	<p>Low risk of global, deep-seated instability to the proposed Lots 1-10 DBPs; however, shallow localised ground movements (in the form of soil creep) within steeply sloping ground may pose a risk to future residential development.</p> <p>Future residential housing within 5.0m from ground steeper than 1V:4H (14°) should be appropriately assessed in terms of any soil creep requirements during the Building Consent stage.</p> <p>The very steeply sloping ground above the Lot 4 DBP may pose a risk of deep-seated ground instability within the sand dune, however it is approximately 15m away from the proposed Lot 4 DBP. Nevertheless, the exact location of a future building platform should be positioned, bearing in mind that soil debris falling (sliding) from higher grounds is a potential risk. We recommend that the future building platform be located as far away as possible from the higher grounds.</p>
Liquefaction Risk:	Negligible risk of liquefaction susceptibility.
Preliminary Foundation Recommendations:	<p>Shallow and piled foundations may be suitable for supporting future residential houses within the proposed Lot 1-10 DBPs, provided they are away from minimum 5.0m from ground steeper than 1V:4H (14°).</p> <p>Due to the variability in subsoils encountered across all the DBPs, bearing capacities for design will need to be determined during site-specific Geotechnical investigations and assessments undertaken during the Building Consent stage.</p>

**NZBC B1 Expansive Soil
Classification:**

Class A – Sand and Rock Sites (no ground movement from moisture change ($\gamma_s=0\text{mm}$)).

**NZS1170.5:2004 Site Subsoil
Classification:**

Class C – Shallow soil stratigraphy.

Earthworks:

Due to the variable sands encountered across the DBPs, we recommend no earthworks are undertaken until site-specific proposals have been Geotechnically investigated and assessed during the Building Consent stage. Such assessments will need to provide appropriate cut-fill parameters and limits that are Geotechnically appropriate for the subsoils encountered across future development locations.

**Consent Application Report
Suitable for:**

Resource Consent: No geotechnical hazards were identified as listed in the Resource Management Act (RMA) Section 106 that is considered a constraint to the proposed subdivision and cannot be addressed by typical engineering design and construction.

This report is not intended to support any Building Consent application. Future development proposals at proposed Lots 1-10 will need to be subject to site-specific investigations and assessments during the Building Consent stage.

2. INTRODUCTION

2.1. SCOPE OF WORK

Wilton Joubert Limited (WJL) was engaged by **Adams Family Trust** (the Client) to undertake a geotechnical assessment of the above site, where we understand, it is proposed to subdivide the existing property into 11 (no.) individual allotments, which will be divided into two stages.

The primary purpose of this report is to provide Geotechnical assessments, along with preliminary design recommendations pertaining to future residential developments within the 10 (no.) proposed vacant lots, being proposed Lots 1-10. The remaining area and existing buildings at the eastern and southern portions of the property will be contained within proposed Lot 11.

It is our understanding that this report will be submitted to support a Resource Consent application for the proposed subdivision development.

2.2. SUPPLIED INFORMATION

At the time of preparing this report, we were supplied with 3 (no.) Subdivision Scheme Plans, dated November 2025 (Ref: 24630), prepared by Williams & King. The plans comprise of Stage 1, Stage 2, and Overall schemes.

Any revision of the Subdivision Scheme Plans supplied with geotechnical implications should be referred back to us for review.

3. SITE DESCRIPTION

The proposed subdivision will be established within the following property (the site), which is located off the eastern side of Houhora Heads Road, accessed 1.2km northeast of the State Highway 1 intersection:

- 122 Houhora Heads Road, Pukenui, legally described as Lot 2 DP 70340.

The surface area of the subject site is approximately 29 hectares (ha) and is accessed at the middle of the western boundary via an existing aggregate driveway that traverses towards the eastern boundary. A secondary access is present off an unnamed road the bounds the southern boundary.

Built development on-site comprises an existing residential development and associated buildings near the middle of the eastern boundary and an additional dwelling near the middle of the southern boundary. The site is covered in pasture, with pine and manuka trees planted across the elevated middle and southern portions of the site. Low-lying wetland-type areas are also intermittently present near the northern and northwestern boundaries.

Broadly speaking, the site covers a large area of land directly west of the Motutangi Stream mouth and is set around moderate to steeply rolling sand dune features that traverse from near the southwestern boundary towards the northern end of the site. The dunes generally range in heights between RL24m and RL6m New Zealand Vertical Datum (NZVD). The remaining land surrounding the base of the dunes is low-lying, appearing being above a height of RL5m NZVD, and is essentially flat to gently sloping.

The Far North District Council (FNDC) on-line GIS Water Services Map indicates that public underground service connections are not available to the property.

The site is shown on our appended Site Plans (Drawing No.'s 145678-G600 and 145678-G601) and in Figure 1 below.

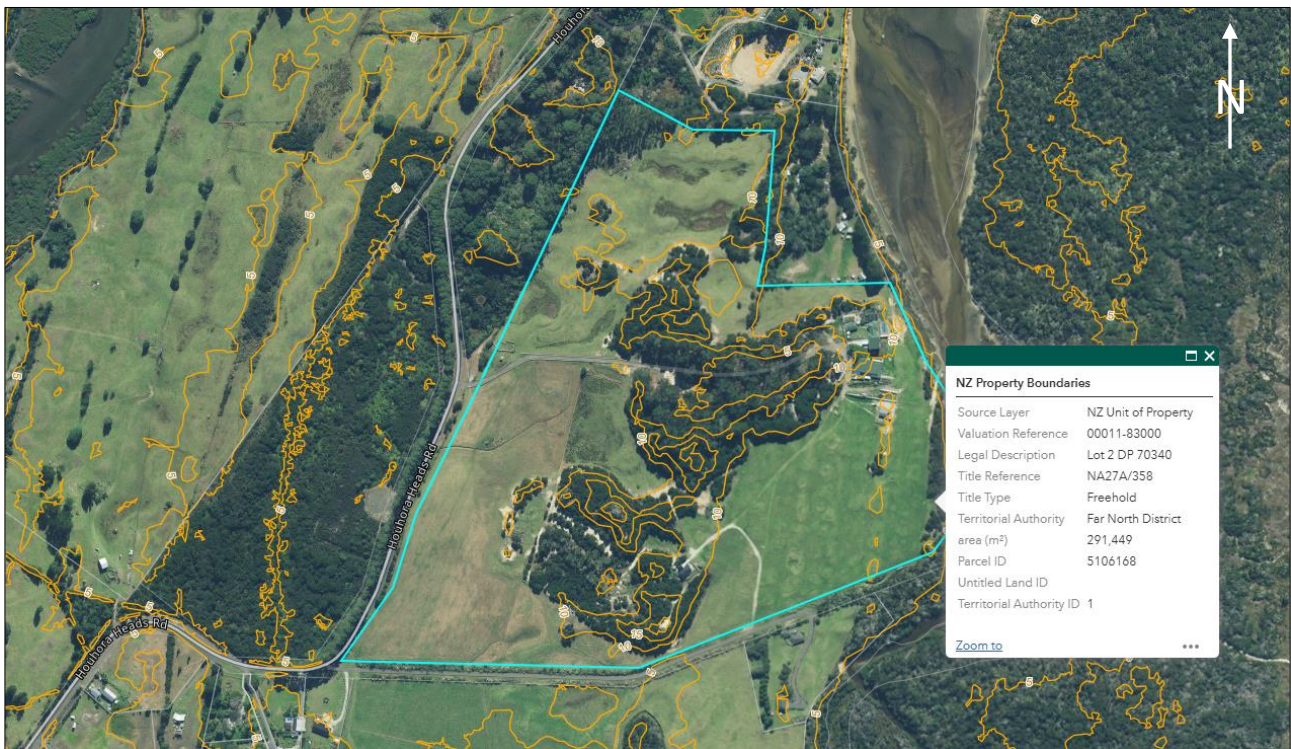


Figure 1: Aerial view with the subject property highlighted in cyan (from Northland Regional Councils on-line GIS database).

4. DEVELOPMENT PROPOSALS

Based on our review of the three Subdivision Scheme Plans supplied, it is our understanding that the Client intends to subdivide the existing property into 11 (no.) individual allotments, divided into two stages. All three plans are appended to this report.

Stage 1 will comprise the establishment of proposed Lots 1 – 4, encompassing areas ranging between 9,860m² and 3.08565ha, across the southwestern portion of the site.

Stage 2 will comprise the establishment of proposed Lots 5 – 10, encompassing areas ranging between 8,985m² and 1.7305ha, across the northern portion of the site. This stage will also include the establishment of proposed Lot 11, which will encompass the remaining 15.0645ha area of land and contain the existing buildings at the eastern and southern portions of the property. There is no future residential housing development proposed on this Lot; subsequently, it is excluded from our assessments.

Williams & King have identified 30m x 30m (900m²) designated building platforms (DBP) for future residential development within proposed Lots 1-10, as depicted on our appended Site Plan and in Figure 2 further below.

At this preliminary stage, we have assumed any future dwelling at proposed Lots 1-10 will be designed and constructed to apply loads generally in keeping with the requirements of NZS3604:2011.

As a result, the principal objectives were to investigate and assess the suitability of foundation options for the site soils, not only primarily in terms of bearing capacity, but also for slope stability and differential foundation movement.

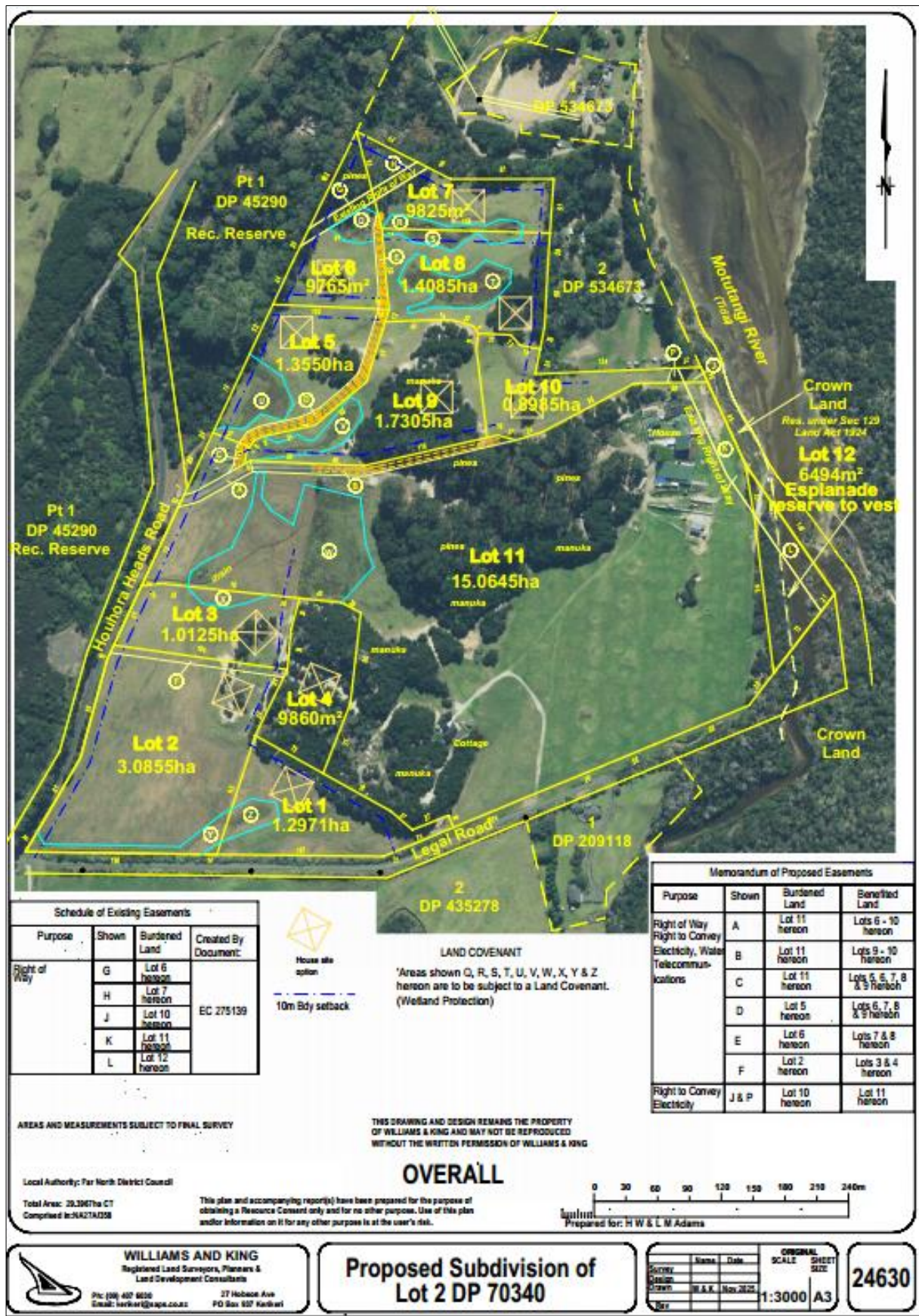


Figure 2: Overall Subdivision Scheme Plan (from William & King).

A brief description of each DBP location at proposed Lots 1 – 10 is summarised below:

PROPOSED LOT 1

The DBP is positioned towards the southern end of the site and is located on a west facing dune flank which falls to near level ground. The flank initially slopes at steep grades averaging 21°, before reducing to moderate grades averaging 12° to 13° and eventually becoming near level to the west. A wetland area is located to the southwest of the DBP.

PROPOSED LOT 2

The DBP is positioned near the southeastern corner of the site and is centred around a dune crest. Short, moderately to steeply sloping side flanks, averaging 12° to 22°, fall from the crest to the west and east down to near level ground.

PROPOSED LOT 3

The DBP is positioned near the eastern end of the site and is centred around a dune crest. Short, Steep to very steep sloping side flanks, averaging 17° to 30°, fall from the crest to the northwest and southeast down to near level ground.

PROPOSED LOT 4

The DBP is positioned near the middle of the site and is set around a lower crest area at the base of a southwest facing dune flank. The upslope portion of the DBP is near level to gently sloping, whilst the downslope portion is covered by a short, steep sloping flank, up to 34°, which falls to gently sloping ground to the west. A steep to very steep slope, up to 50°, is present above the DBP to the northeast.

PROPOSED LOT 5

The DBP is positioned near the northwestern corner of the site and is located on gently sloping ground, falling from the east to the west at gradients averaging 6°. A wetland area is located to the south/southwest of the DBP.

PROPOSED LOT 6

The DBP is positioned near the northwestern end of the site and is centred around a minor dune crest. Short, gently to moderately sloping flanks, up to 14°, fall from the crest in all directions, down to near level/gently sloping ground. A wetland area is located to the north of the DBP.

PROPOSED LOT 7

The DBP is positioned in the middle of the northern side of the site and is generally positioned on gently sloping ground (southwest down to the northeast). A short, moderate sloping flank, up to 18°, falls from the southwestern end of the DBP down to a wetland area.

PROPOSED LOT 8

The DBP is positioned near the southeastern corner and is located on a lower crest area at the base of two moderate to very steeply sloping dune flanks to the northeast and southwest. Most of the DBP is generally gently sloping, whilst the two flanks average 11° to 34°. A wetland area is located to the northwest of the DBP.

PROPOSED LOT 9

The DBP is positioned in the middle of the site and is centred around a recently levelled dune crest. Steeply sloping side flanks, averaging 20° to 22°, fall from the crest to the west and east down to gently sloping ground.

PROPOSED LOT 10

The DBP is positioned in the middle of the site and is centred around a dune crest. Gentle grades fall from the crest to the west, whilst a moderate to steeply sloping side flank, averaging up to 24°, falls to the east down to gently sloping ground.

5. DESKTOP STUDY

5.1. PUBLISHED GEOLOGY

Local geology across proposed Lots 1-10 is noted on the GNS Science New Zealand Geology Web Map, Scale 1:250,000, as; **Karioitahi Group**, specifically being **Holocene Age Parabolic Dunes**. These deposits are up to approximately 14 thousand years in age and described as; *“Loose to poorly consolidated sand in fixed parabolic dunes. Interdune lake and swamp deposits”* (Ref: GNS Science Website).

Referring to the above mapping source, local geology across the southeastern portion of the existing property, which will be contained within proposed Lot 11, is noted as; **Holocene Age Stable Dune Deposits of Karioitahi Group**. The wider surrounding land that bounds the western side of Houhora Heads Road is geologically older (up to 1.8 million years) and noted as; **Early to Middle Pleistocene Age Dune Deposits of Karioitahi Group**.

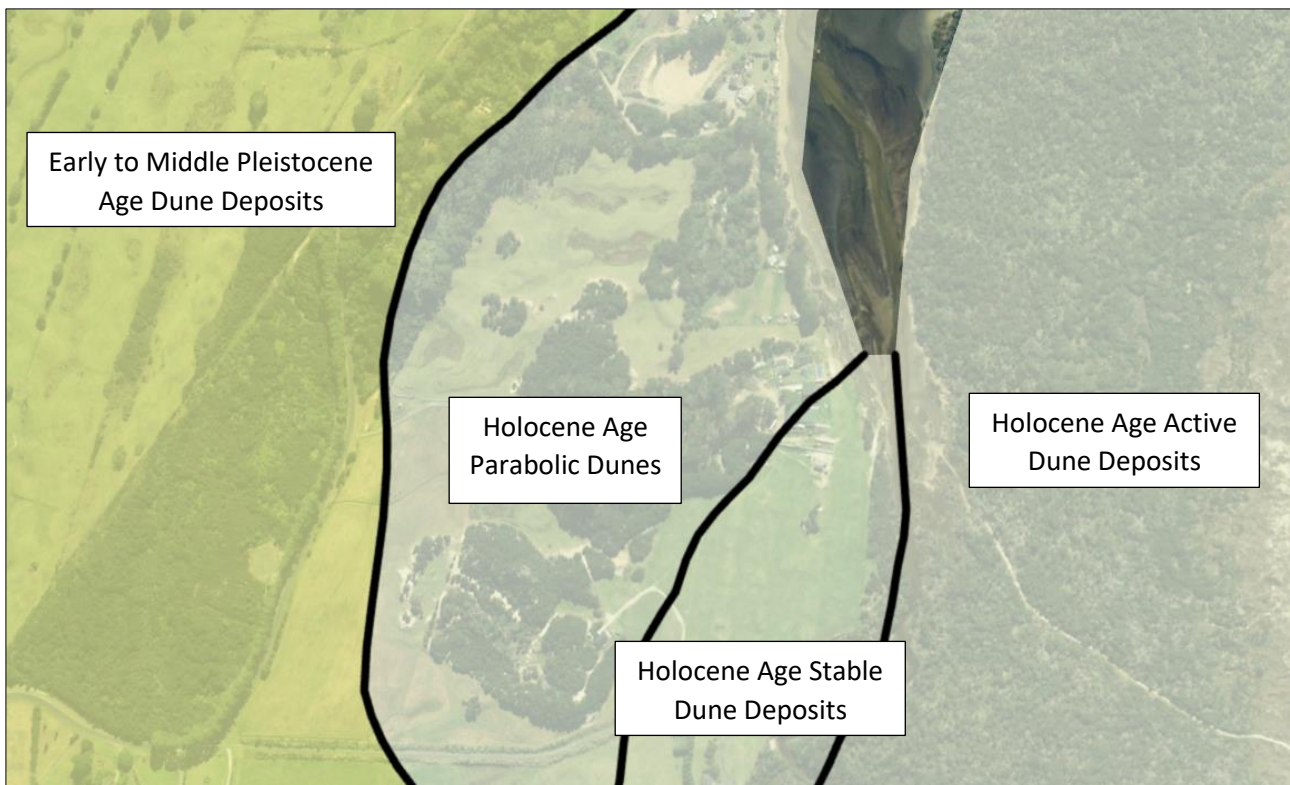


Figure 3: Screenshot from the New Zealand Geology Web Map hosted by GNS Science.

5.2. HISTORICAL AERIAL PHOTOGRAPHY REVIEW

A historical aerial photography review was undertaken to evaluate any slope instability features or changes in landform at the property. Aerial images from 1944 have been reviewed and compared to the present-day conditions.

There were no visible significant geomorphological changes in the landscape or obvious features consistent with major recent ground instability, indicating a period of stable ground conditions between 1944 and 2026, as depicted in Figures 4 and 7 below.

In 1944, the central dunes were largely exposed, with minor bush present on the dune flanks. The low-lying ground appeared to be covered in pasture and patchy vegetation.



Figure 4: Historical aerial photo from 1944 (source: <https://retrolens.co.nz>). Red circle approximately depicts property location.

By 1970, the exposed dune coverage had reduced, and the site was largely covered in dense bush and/or forestry.

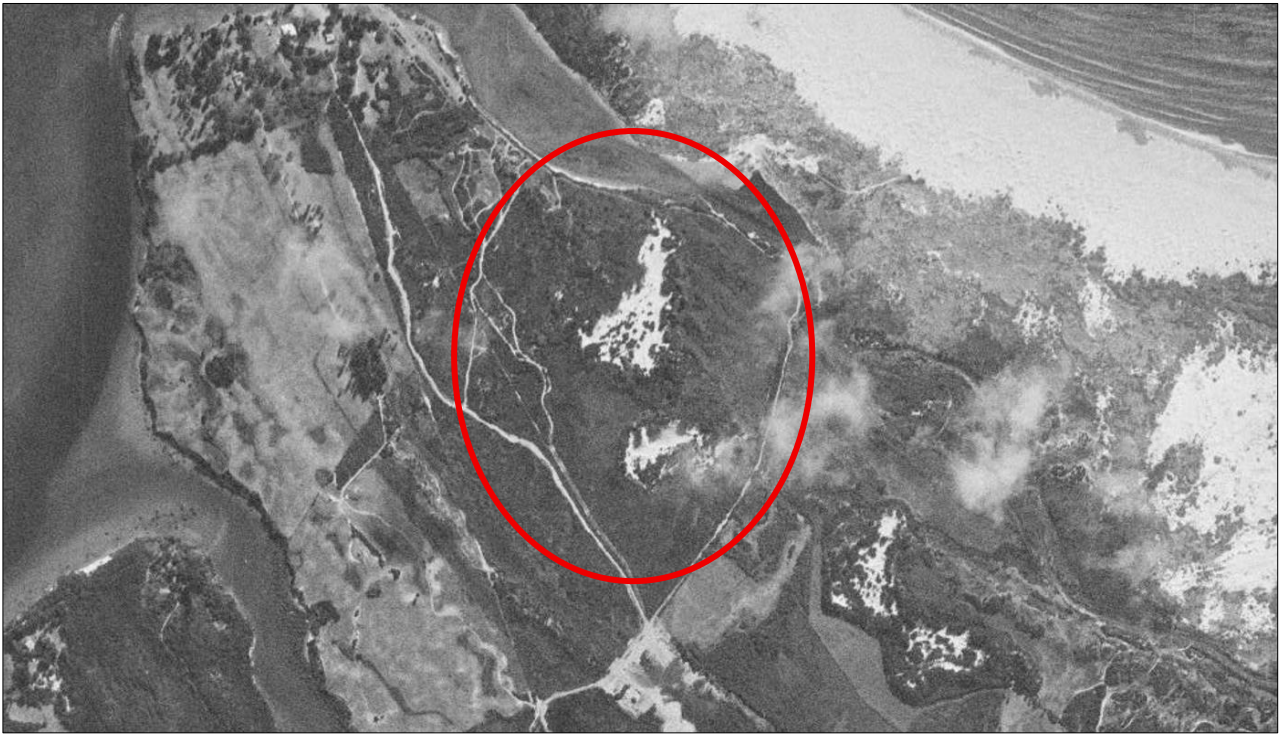


Figure 5: Historical aerial photo from 1970 (source: <https://retrolens.co.nz>). Red circle approximately depicts property location.

At some point before 1983, the dense vegetation had predominantly been removed, although the central dunes had been planted in trees.



Figure 6: Historical aerial photo from 1983 (source: <https://retrolens.co.nz>). Red circle approximately depicts property location.

By 2004, the existing eastern residential development was present and has included the construction of additional nearby structures, most notably between 2019 and 2020. The southern boundary dwelling was constructed between 2023 and 2024.



Figure 7: Historical aerial photo from 1982 (source: <https://retrolens.co.nz>). Red circle approximately depicts property location.

6. GEOTECHNICAL INVESTIGATION

6.1. FIELDWORK

Our fieldwork, as depicted on our appended Site Plan, was undertaken on the 16 March 2026 and involved:

- Drilling 20 (no.) 50mm diameter hand auger boreholes (HA01 to HA20) to depths ranging between 0.50m and 1.9m below present ground level (bpgl),
- Due to the non-cohesive nature of the sandy deposits encountered, our boreholes were supplemented with Dynamic Cone Penetrometer (DCP-Scala) tests from the surface to depths ranging between 1.1m and 4.9m bpgl, and
- Drawing 10 (no.) appended Cross Sections A-A' to J-J' (Drawing Nos. 145678-G610 to 145678-G619, respectively), using 1.0m LiDAR contours sourced from the Land Information New Zealand (LINZ) database, along with site measurements where appropriate, to represent of the topography of each of the proposed Lots 1-10 DBP's and surrounding influential land.

6.2. CONE PENETRATION TESTING

As part of our geotechnical investigation, 10 (no.) Cone Penetration Tests (CPT01 to CPT10) were undertaken to depths ranging between approximately 4m and 15.5m bpgl, by Underground Investigation Limited. A single CPT was undertaken at each DBP.

The CPT probes were pushed into the ground at a constant rate of approximately 20mm per second. The sensors of the probe produced continuous, analogue data of cone resistance (qc), sleeve friction (fs) and pore water pressure (u2).

7. GEOTECHNICAL FINDINGS

The soil sample arising from the boreholes were logged in accordance with the “*Field Description of Soil and Rock*”, New Zealand Geotechnical Society (NZGS), December 2005.

The following is a summary of the ground conditions encountered in our investigations. Please refer to the appended logs for greater detail.

7.1. TOPSOIL

Surficial topsoil was encountered in all boreholes to depths ranging between 0.10m to 0.20m bpgl.

7.2. NATURAL GROUND

The underlying natural deposits encountered were consistent with our expectations of Parabolic Dune deposits of the Karioitahi Group, comprising of fine to medium SAND of varying density.

DCP-Scala testing within natural ground returned blow counts that overall ranged from 0.25 to greater than 20 blows per 100mm penetration.

Our subsoil findings for each Lot are summarised as follows:

PROPOSED LOTS 1-4

All four DBPs were initially overlain by a thick cap of loose sand to depths ranging between 1.9 to 3.0m bpgl, overlying medium dense sand to depths ranging between 2.4m to 4.4m bpgl. Below these depths, dense to very dense sands were inferred.

PROPOSED LOTS 5-7 & 10

All four DBP's were initially overlain by a shallow cap of loose sand to depths ranging between 0.70 to 1.3m bpgl, overlying medium dense sand to depths ranging between 0.70m to 1.7m bpgl. Below these depths, dense to very dense sands were inferred.

PROPOSED LOTS 8 & 9

Both DBP's were initially overlain by a shallow cap of loose sand to depths ranging between 0.40 to 1.3m bpgl; however, were overlying a deep layer of medium dense sand to depths ranging between 2.5m to 4.5m bpgl. Below these depths, dense to very dense sands were inferred.

7.3. GROUNDWATER

Groundwater was not encountered in any of the boreholes on the day of our investigation.

Groundwater was measured in CPT01, CPT04, CPT05, CPT06 and CPT09 encountered groundwater at variable depths ranging between 2.3m and 13.8m bpgl on the day of the investigation. Where groundwater could not be measure due to hole collapse, these levels can be inferred based on the porewater pressure from the CPT data.

7.4. SUMMARY TABLE

The following table summarises our inferred stratigraphic profiling:

Table 1: Stratigraphic Summary Table

Investigation Hole ID	Termination Depth (m)	Depth to Base of Surficial Topsoil (m)	DCP-Scala Termination Depth (m) Below Borehole Base	DCP-Scala Blow Count Range Per 100mm Penetration within Natural Ground	Standing Groundwater Depth (m)
HA01 (Lot 1)	1.6 ⁽¹⁾	0.20	4.0	1 – 20+	NE
HA02 (Lot 1)	1.9 ⁽¹⁾	0.20	4.4	1 – 20+	NE
HA03 (Lot 2)	0.70 ⁽²⁾	0.15	2.9	0.5 - 3	NE
HA04 (Lot 2)	0.50 ⁽²⁾	0.10	4.1	0.5 – 20+	NE
HA05 (Lot 3)	1.2 ⁽²⁾	0.10	4.9	0.5 - 12	NE
HA06 (Lot 3)	1.6 ⁽²⁾	0.10	2.9	0.5 - 12	NE
HA07 (Lot 4)	1.5 ⁽²⁾	0.10	2.9	1 - 4	NE
HA08 (Lot 4)	0.90 ⁽²⁾	0.10	4.9	0.5 - 10	NE
HA09 (Lot 5)	1.3 ⁽³⁾	0.20	1.4	1 – 20+	NE
HA10 (Lot 5)	1.0 ⁽³⁾	0.15	1.1	1 – 20+	NE
HA11 (Lot 6)	0.50 ⁽²⁾	0.15	1.6	0.33 – 20+	NE
HA12 (Lot 6)	0.70 ⁽²⁾	0.10	1.9	0.5 – 20+	NE
HA13 (Lot 7)	1.0 ⁽³⁾	0.20	1.1	2 – 20+	NE
HA14 (Lot 7)	1.3 ⁽³⁾	0.20	1.5	2 – 20+	NE
HA15 (Lot 8)	0.70 ⁽²⁾	0.10	2.9	0.5 - 7	NE
HA16 (Lot 8)	0.60 ⁽²⁾	0.10	4.9	0.5 - 13	NE
HA17 (Lot 9)	1.0 ⁽¹⁾	0.15	2.9	0.5 - 7	NE
HA18 (Lot 9)	1.2 ⁽¹⁾	0.10	4.7	0.25 – 20+	NE
HA19 (Lot 10)	1.5 ⁽³⁾	0.15	2.1	1 – 20+	NE
HA20 (Lot 10)	1.8 ⁽³⁾	0.15	2.4	0.33 – 20+	NE

Table Note: (1) Poor recovery due to sidewall collapse. (2) No recovery. (3) Too hard to auger. NE = Not encountered.

7.5. EXPANSIVE SOILS

All DBP's are underlain by non-cohesive, fine to medium sand deposits. Therefore, we have adopted the following classification of the underlying site subsoils:

- NZBC B1 Expansive Soil A – Sand and Rock Sites.
- No ground movement from moisture change ($y_s=0\text{mm}$).

8. GEOTECHNICAL ASSESSMENTS

As appropriate to the site conditions, we have carried out the following geotechnical assessments for the proposed Lots 1-10 DBP's:

- Qualitative slope stability for proposed Lots 1, 2, 5, 6, 7 and 8.
- Quantitative slope stability for proposed Lots 3, 4, 9, and 10.
- Liquefaction susceptibility for proposed Lots 1-10.

8.1. QUALITATIVE SLOPE STABILITY (PROPOSED LOTS 1, 2, 5, 6, 7 & 8)

The DBPs are generally positioned at the top of sand dunes with near level to very steeply sloping flanks and/or near level lower-lying ground.

Our assessment has also considered the following:

- Loose to very dense SAND of the Karioitahi Group encountered during our investigations,
- Groundwater was not encountered in any of the boreholes on the day of our investigation. Groundwater was measured in CPT01, CPT04, CPT05, CPT06 and CPT09 encountered groundwater at variable depths ranging between 2.3m and 13.8m bpgl on the day of the investigation,
- There are no known active faults traversing through or close to the site,
- No visual signs of global instability were observed at the time of our investigation. A review of historical aerial photography also confirms the absence of any obvious global instability, and
- Our quantitative slope stability analyses undertaken on the remaining lots in Section 8.2 below.

8.2. QUANTITATIVE SLOPE STABILITY (PROPOSED LOTS 3, 4, 9 & 10)

All four DBPs are in influential proximity to long, moderate to very steeply sloping flanks. Most notably, the sand dune above proposed Lot 4 is more elevated than the rest of the development areas, with ground sloping down up to greater than 50° from the northeast down to the southwest towards the proposed DPB, as indicated on our appended Cross-section D-D' (Drawing No. 145678-G613).

Subsequently, it was deemed necessary to undertake slope stability analyses on appended Cross-sections C-C', D-D', I-I', and J-J', using computer program Slide 2 by Rocscience Limited.

Theoretical non-circular (composite) surfaces were assessed using the Spencer and GLE / Morgenstern-Price methods. An assumed Uniformly Distributed Load (UDL) of 10kPa was applied to represent the surcharge load of a future dwelling within each DBP.

The stability analyses have been undertaken for existing conditions (moderate groundwater), worst-case ground conditions (elevated groundwater) and extreme scenarios (seismic loading).

A Peak Ground Acceleration (PGA) value of 0.19g (ULS) was used for the 500-year seismic event, along with an effective earthquake magnitude of 6.5, as recommended by the NZGS (Earthquake Geotechnical Engineering Practice Module 1, dated: November 2021).

Effective shear stress (shear strength) parameters were used for our assessment, based on experience of the geology and using lower-bound soil parameters under normal and extreme groundwater conditions. The soil strength parameters used in the stability assessment are shown in the following Table 2 below:

Table 2: Effective Shear Stress (Shear Strength) Parameters

Soil Parameters	Karioitahi Group 35°	Karioitahi Group 37.5°	Karioitahi Group 40°	Karioitahi Group 45°
Unit Weight, γ (kN/m ³)	17	17	17	17
Effective Cohesion c' (kPa)	0	0	0	0
Friction Angle, ϕ' (°)	35	37.5	40	45

We have adopted the following scenarios:

- Moderate Groundwater Level:** Long-term stability when modelling the existing ground conditions.
Factor of Safety (FoS) required >1.5.
- Elevated Groundwater Level:** Transient (medium-term) stability when modelling the worst-case scenario and assumed a raised groundwater level.
FoS required >1.3.
It is important to consider that the construction of a future dwelling along with sealed surfaces is expected to intercept and redirect stormwater in a controlled fashion, such that ponding of rainwater and infiltration into the ground that would otherwise create extremely elevated groundwater conditions is highly unlikely.
- Seismic Loading:** Short-term stability when modelling extreme ground conditions under a 500-year seismic event and assuming a moderate groundwater level.
FoS required >1.1.

Moderate groundwater levels were based on the measured and inferred groundwater level from the CPT data. Elevated groundwater levels were modelled with a significant rise in level to near surface levels in low lying areas.

A summary of the calculated minimum FoS against failure across each DBP for the above scenarios is shown in Tables 3 to 8 below:

Table 3: Stability Analysis Results – Lot 3 - Northwestern Slope.

Section	Design Conditions	FoS within the DBP		Compliance
		Required	Calculated	
C-C'	Moderate Groundwater, plus Surcharge Load	≥1.5	>1.5	Yes
	Elevated Groundwater, plus Surcharge Load	≥1.3	>1.3	Yes
	Moderate Groundwater, plus Surcharge Load, plus Seismic Load	≥1.1	>1.1	Yes

Table 4: Stability Analysis Results – Lot 3 - Southeastern Slope.

Section	Design Conditions	FoS within the DBP		Compliance
		Required	Calculated	
C-C'	Moderate Groundwater, plus Surcharge Load	≥1.5	<1.5	Yes
	Elevated Groundwater, plus Surcharge Load	≥1.3	<1.3	Yes
	Moderate Groundwater, plus Surcharge Load, plus Seismic Load	≥1.1	<1.1	Yes

Unsatisfactory FoSs are present, however, we consider that the slopes that have failed are shallow 'local' instability which can be mitigated with specific engineering foundation design.

Table 5: Stability Analysis Results – Lot 4 – Southwestern Slope.

Section	Design Conditions	FoS within the DBP		Compliance
		Required	Calculated	
D-D'	Moderate Groundwater, plus Surcharge Load	≥1.5	>1.5	Yes
	Elevated Groundwater, plus Surcharge Load	≥1.3	>1.3	Yes
	Moderate Groundwater, plus Surcharge Load, plus Seismic Load	≥1.1	>1.1	Yes

Unsatisfactory FoSs are present on the upslope flank to the northeast; however, the DBP is positioned away clear of these failures. We also note that this slope should realistically calculate a FoS of at least 1.0 due to the slope being in a stable condition.

Table 6: Stability Analysis Results – Lot 9 – Western Slope.

Section	Design Conditions	FoS within the DBP		Compliance
		Required	Calculated	
I-I'	Moderate Groundwater, plus Surcharge Load	≥1.5	>1.5	Yes
	Elevated Groundwater, plus Surcharge Load	≥1.3	>1.3	Yes
	Moderate Groundwater, plus Surcharge Load, plus Seismic Load	≥1.1	>1.1	Yes

Table 7: Stability Analysis Results – Lot 9 – Eastern Slope.

Section	Design Conditions	FoS within the DBP		Compliance
		Required	Calculated	
I-I'	Moderate Groundwater, plus Surcharge Load	≥1.5	>1.5	Yes
	Elevated Groundwater, plus Surcharge Load	≥1.3	>1.3	Yes
	Moderate Groundwater, plus Surcharge Load, plus Seismic Load	≥1.1	>1.1	Yes

Marginal unsatisfactory FoSs encroach within the DBP and unsatisfactory FoS's are present downslope. We recommend the DBP is reduced in size, as approximately depicted in green on our appended Site Plan (Ref: 145678-G601).

Table 8: Stability Analysis Results – Lot 10 – Eastern Slope.

Section	Design Conditions	FoS within the DBP		Compliance
		Required	Calculated	
J-J'	Moderate Groundwater, plus Surcharge Load	≥1.5	>1.5	Yes
	Elevated Groundwater, plus Surcharge Load	≥1.3	>1.3	Yes
	Moderate Groundwater, plus Surcharge Load, plus Seismic Load	≥1.1	>1.1	Yes

Unsatisfactory FoSs are present, however, we consider that the slope that have failed are shallow 'local' instability which can be mitigated with specific engineering foundation design.

8.3. SHALLOW SOIL MOVEMENT (SOIL CREEP)

Soil Creep is the slow downslope movement of upper soil horizons, usually confined to the uppermost 1.0m to 2.0m of soil likely to be operating on slopes steeper than 1V:4H (14°) in such geological settings. This soil movement generally in the order of millimetres per year and the rate and depth are a product of the combination of the following conditions:

- Slope length,
- Slope angle,
- Stormwater runoff,
- Groundwater fluctuations,
- Soil expansivity,
- Vegetation,
- Surcharge loads,
- Cut/fill earthworks (if not retained).

Generally speaking, soil creep becomes mobilised on slopes steeper than 1V:4H (14°) largely as a cyclical phenomenon arising out of seasonal variations in moisture content of surficial soils, generally resulting in soil shrinkage during the dry summer months and swelling during wet winter months. It is generally considered that in the dry seasons, the soils shrink, and tension cracks are formed, sometimes with some minor downslope movement. When it rains, those cracks fill with water, which not only softens the adjacent soils, but also exerts hydrostatic lateral pressures on the sides of the cracks. As the desiccated soils absorb this free water, they swell and exert further lateral pressures on the adjacent block of soil. This cyclic action leads to the formation of “minor slump terracettes”.

8.4. SLOPE STABILITY ASSESSMENT CONCLUSION

Based on our qualitative and quantitative assessments, we consider there to be a low risk of global, deep-seated instability to the proposed Lots 1-10 DBPs; however, shallow localised ground movements (in the form of soil creep) within steeply sloping ground may pose a risk to future residential developments.

Future residential housing within 5.0m from ground steeper than 1V:4H (14°) should be appropriately assessed in terms of any soil creep requirements during the Building Consent stage.

The very steeply sloping ground above the Lot 4 DBP may pose a risk of deep-seated ground instability within the sand dune; however, it is approximately 15m away from the proposed Lot 4 DBP. Nevertheless, the exact location of a future building platform should be positioned, bearing in mind that soil debris falling (sliding) from higher grounds is a potential risk. We recommend that the future building platform be located as far away as possible from the higher grounds.

Our slope stability analysis outputs are appended to this report and preliminary design recommendations for future residential construction are provided in Section 9 below.

8.5. LIQUEFACTION SUSCEPTIBILITY

Liquefaction is the loss of effective strength of a cohesionless soil (typically sand) due to pore-water pressures generated during a seismic event (earthquake). The partial or complete loss of effective strength of loose, saturated soils can result in vertical settlement and/or horizontal movement (lateral spreading) of the ground.

A commonly accepted definition is: 'Areas susceptible to liquefaction generally correspond with geologically young deposits (less than 10,000 years) located in relatively flat areas close to active or abandoned waterways, in coastal or estuarine areas, and/or areas of uncompacted or poorly compacted fill.'

We have carried out liquefaction susceptibility assessments in order to identify the risk of ground damage during a seismic event, based on the following items:

- The FNDC online GIS Hazard Map categorises some of the DBP's as being within 'Possible' Liquefaction Vulnerability areas, with the remaining DBP's being within 'Undetermined' areas,
- Loose to very dense SAND of the Karioitahi Group encountered during our investigations,
- Groundwater was not encountered in any of the boreholes on the day of our investigation. Groundwater was measured in CPT01, CPT04, CPT05, CPT06 and CPT09 encountered groundwater at variable depths ranging between 2.3m and 13.8m bpgl on the day of the investigation,
- There are no known active faults traversing through or close to the site, and
- Holocene Age Parabolic Dunes of Karioitahi Group underlie the site (Oxygen Isotope Stage 2 to Oxygen Isotope Stage 1).

8.6. LIQUEFACTION TRIGGERING

Assessment of liquefaction induced free field settlement at the site has been carried out in general accordance with MBIE guidelines and using specialised software 'Cliq 3.0' developed by Geologismiki Limited.

Liquefaction assessments were carried out using the Boulanger & Idriss (2014) method and the Zhang et al (2002) procedure to determine possible ground subsidence across the site during an earthquake.

The analysis has been performed using the on-site CPT01 to CPT10 data, with assumed groundwater levels ranging between 2.5m to 13.5m bpgl during a seismic event. Horizontal distances to the toe of influential slopes were measured for each DBP to estimate lateral displacement, aside from CPT08 (Lot 3), where no calculation was performed due to groundwater likely being at a significant depth below the elevated crest or no free face being present if construction is on the lower-lying flat ground.

Design earthquake scenarios of Serviceability Limit State (SLS) and Ultimate Limit State (ULS) were considered using earthquake magnitudes and peak ground accelerations outlined in Table 9 below. Peak Ground Acceleration (PGA) values were used with effective earthquake magnitudes as recommended by the NZGS (Earthquake Geotechnical Engineering Practice Module 1, Dated: November 2021).

Table 9: Design Earthquake Scenarios

Location	25-year return period		500-year return period	
	SLS1		ULS1 (ULS2)	
	a _{max}	M	a _{max}	M
Pukenui	0.03	5.8	0.13 (0.19)	5.8 (6.5)

Table Note: a_{max} = Peak Ground Acceleration. M = Earthquake Magnitude.

The overall plots of the liquefaction triggering analysis are appended to this report and the detailed results are shown in Figures 8 to 11 further below.

The results in Figure 8 show that the liquefaction induced settlement is zero for 25-year (SLS), a maximum of 7mm for 500-year (ULS1), and maximum of 20mm for 500-year (ULS2) return periods. It is noteworthy that the majority of the predicted ground settlement may occur 3.0m bpgl.

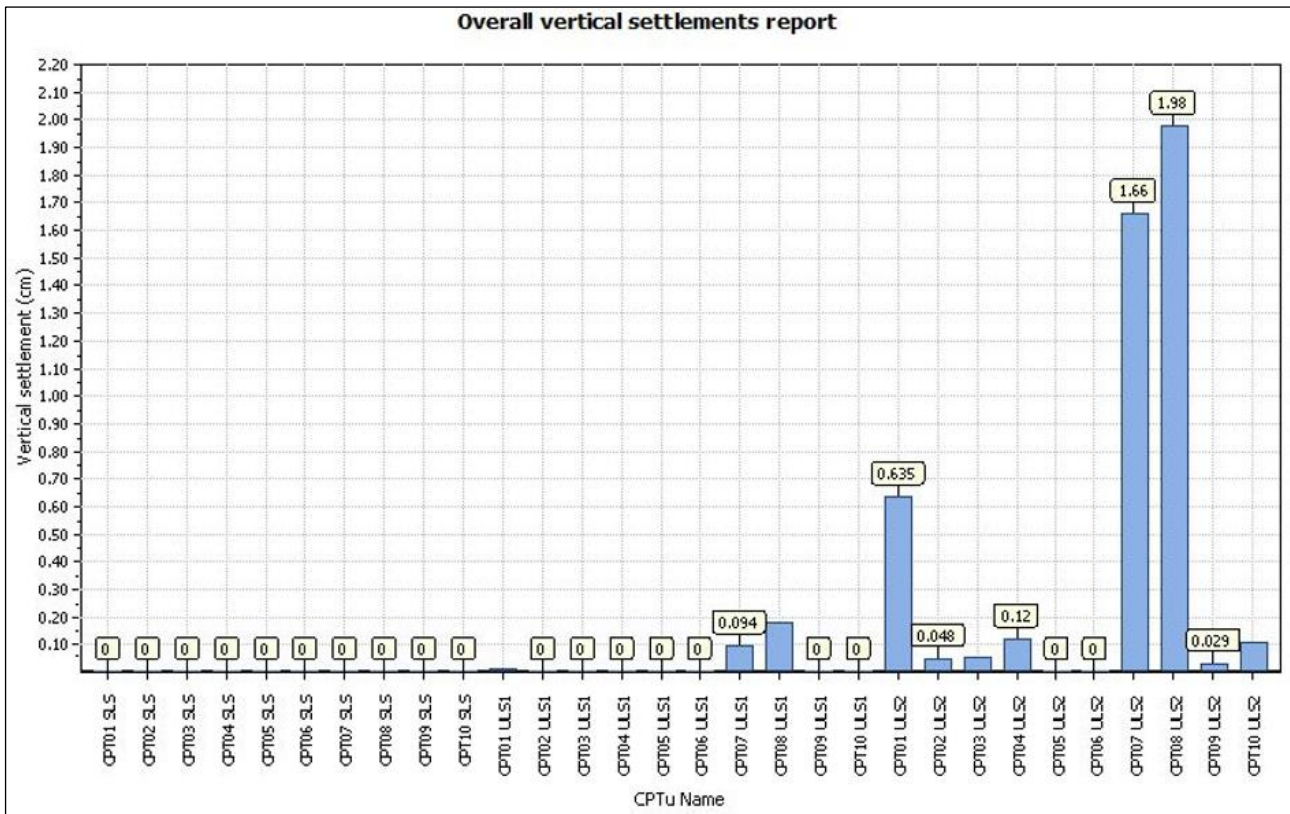


Figure 8: Overall Earthquake-Induced Free-Field Settlements.

The Liquefaction Potential Index (LPI) and the Liquefaction Severity Number (LSN) are indicators to assess the damage potential of liquefaction that may occur during a seismic event.

The LPI plots indicate a low risk of liquefaction potential for all return periods, whilst the LSN plots indicate a little to no expression of liquefaction for all return periods. These plots are shown in Figures 9 and 10 below.

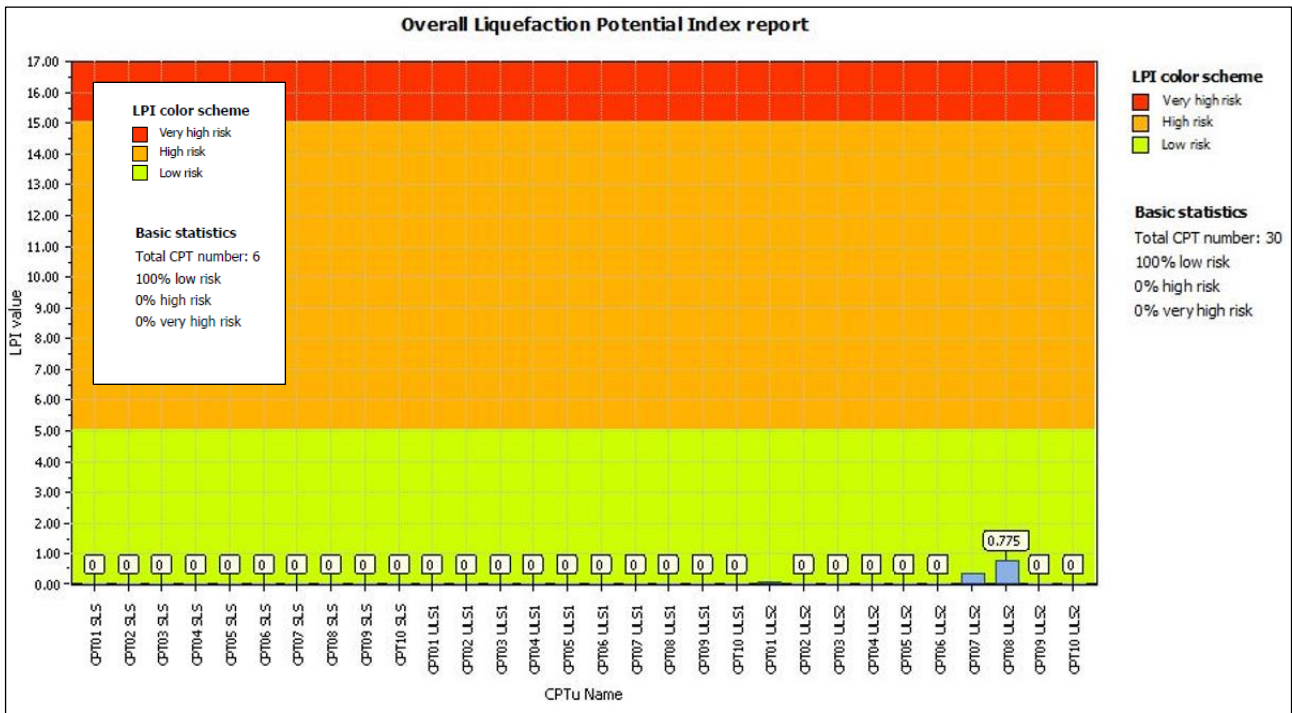


Figure 9: Overall Liquefaction Potential Index (LPI).

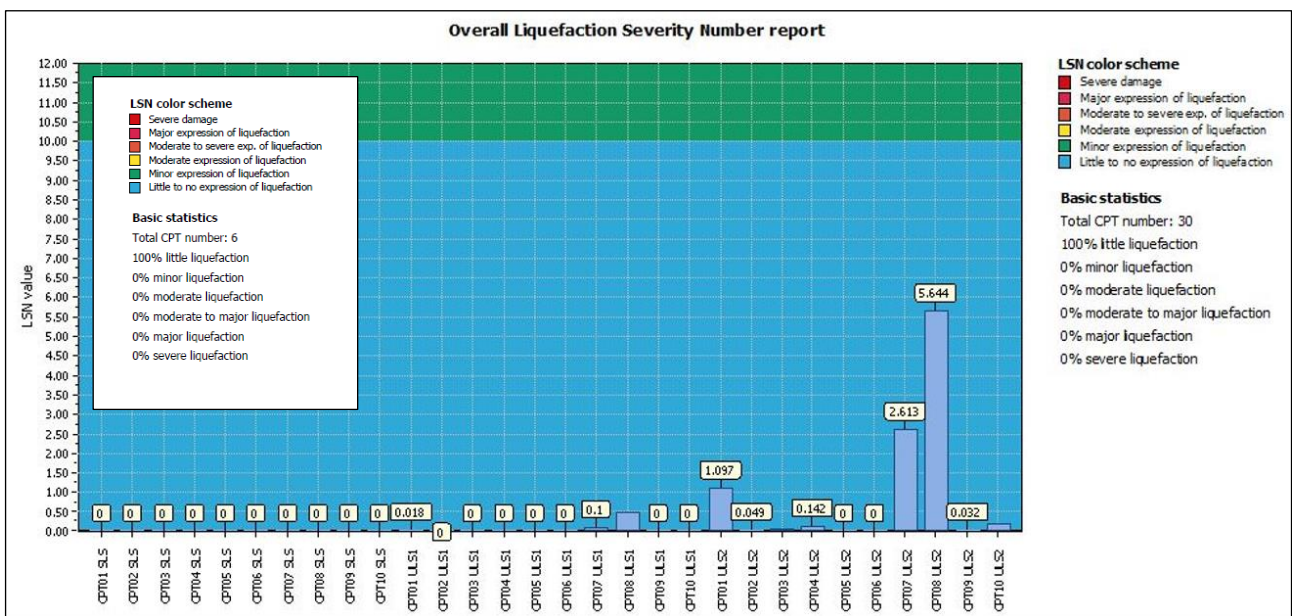


Figure 10: Overall Liquefaction Severity Number (LSN).

The results in Figure 8 show that the overall lateral displacement is essentially zero for 25-year (SLS) and 500-year (ULS1) return periods.

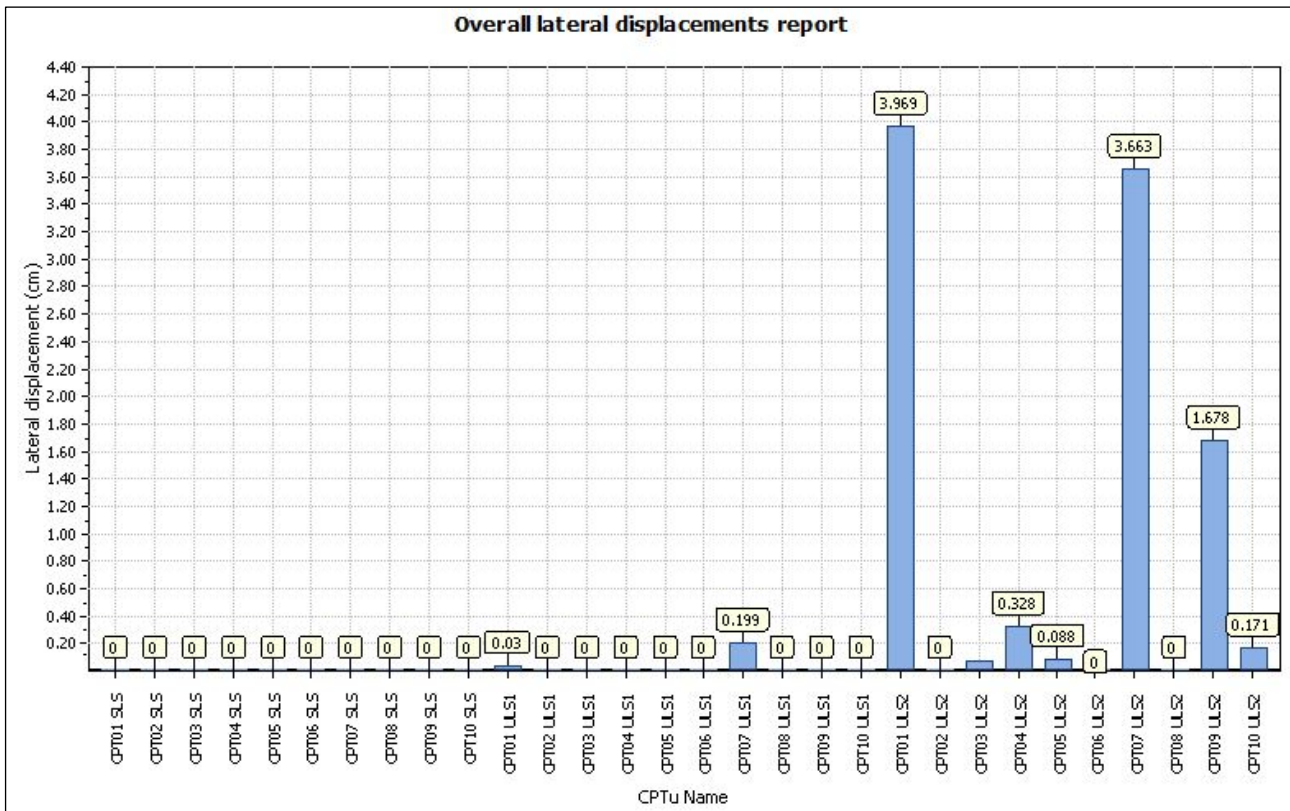


Figure 11: Overall Lateral Displacements.

During a (ULS2) return period, the overall lateral displacement across most of the DBP’s is within a tolerable limit, aside from proposed Lot 2 and Lot 5 where respective displacements of 37mm and 40mm are predicted.

8.7. LIQUEFACTION ASSESSMENT CONCLUSION

Based on our assessment, we conclude that the soils at each DBP have a low risk of liquefaction susceptibility. The vertical settlements do not exceed a tolerable limit of 25mm for all return periods. Additionally, lateral displacement of the soils generally does not exceed a tolerable limit for all return periods, aside from Lot 2 and 5, where displacements up to 40mm may occur at significant depths of 4.0m bpgl.

It is our opinion, based on engineering judgement, that the ULS1 case governs for Importance Level 2 (IL2) residential type developments in Northland, given the relatively low seismicity of the Northland region.

Our liquefaction analysis outputs are appended to this report.

9. CONCLUSIONS AND RECOMMENDATIONS

Based on our observations, site survey, record research, hand auger borehole and CPT investigation, and in-situ testing as described herein, we consider on reasonable grounds that this report can be submitted to the Territorial Authority in support of a Resource Consent application for subdividing the subject site, substantiating that in terms of section 106 of the Resource Management Act and its current amendments, either

- a) No land in respect of which the consent is sought, nor any structure on that land, is, nor is likely to be subject to material damage by erosion, falling debris, subsidence, or slippage from any source, or
- b) No subsequent use that is likely to be made of the land is likely to accelerate, worsen, or result in material damage to that land, other land, or structure, by erosion, falling debris, subsidence, or slippage from any source.

Therefore, we are satisfied that the DBPs at proposed Lots 1-10 should be generally suitable for future residential construction in terms of NZS3604:2011, provided the recommendations of this report are adhered to and future development proposals are subject to site-specific Geotechnical investigations and/or assessments undertaken during the Building Consent stage.

9.1 PRELIMINARY FOUNDATION DESIGN RECOMMENDATIONS

Shallow and piled foundations may be suitable for supporting future residential houses within the proposed Lot1-10 DBPs, provided they are away from minimum 5.0m from ground steeper than 1V:4H (14°).

Due to the variability in subsoils encountered across all the DBPs, bearing capacities for design will need to be determined during site-specific Geotechnical investigations and assessments undertaken during the Building Consent stage.

9.2 NZS1170.5:2004 SITE SUBSOIL CLASSIFICATION

We consider the DBPs at proposed Lots 1-10 to be underlain with a Class C – Shallow Soil stratigraphy.

9.3 SITE EARTHWORKS

At this preliminary stage, we are not aware of any future earthwork proposals for proposed Lots 1-10. Engineered cut-fill earthwork operations will be required to create level building platforms for any proposed concrete floor slab foundation.

Due to the variable sands encountered across the DBPs, we recommend no earthworks are undertaken until site-specific proposals have been Geotechnically investigated and assessed during the Building Consent stage. Such assessments will need to provide appropriate cut-fill parameters and limits that are Geotechnically appropriate for the subsoils encountered across future development locations.

All earthworks should be undertaken in accordance with the following standards:

- NZS4431:2022 “Code of Practice for Earth Fill Residential Development” &
- Section 2 “Earthworks & Geotechnical Requirements” of NZS4404:2010 “Land Development and Subdivision Infrastructure” &
- FNDC Engineering Standards (Version 0.6, dated 2023).

9.4 GENERAL SITE WORKS

We stress that all work should be undertaken in a careful and safe manner so that Health and Safety is not compromised, and that suitable Erosion and Sediment control measures should be put in place. Any stockpiles placed should be done so in an appropriate manner so that land stability and/or adjacent structures are not compromised.

Furthermore:

- All works must be undertaken in accordance with the Health and Safety at Work Act 2015,
- Any open excavations should be fenced off or covered, and/or access restricted as appropriate,
- **Crests above steeply sloping ground should be isolated, and heavy plant should be kept away from these areas,**
- The location of all services should be verified at the site prior to the commencement of construction,
- The Contractor is responsible at all times for ensuring that all necessary precautions are taken to protect all aspects of the works, as well as adjacent properties, buildings and services, and
- Should the contractor require any site-specific assistance with safe construction methodologies, please contact WJL for further assistance.

10. STORMWATER & SURFACE WATER CONTROL

Uncontrolled stormwater flows must not be allowed to run onto or over site slopes, or to saturate the ground, so as to adversely affect slope stability or foundation conditions.

All stormwater runoff from new roof and paved areas should be collected in sealed pipes and be discharged to a FNDC approved stormwater system.

Under no circumstances should concentrated overflows from any source discharge into or onto the ground in an uncontrolled fashion.

11. ON-SITE WASTEWATER DISPOSAL

No reticulated sanitary sewer is available for the subdivision; therefore, on-site wastewater treatment and disposal systems will be required to service future developments.

We recommend that all designs for future on-site wastewater systems should be carried out by an Engineer experienced in on-site wastewater disposal.

12. OVERHEAD & UNDERGROUND SERVICES

Overhead and underground services, public or private, mapped, or unmapped, of any type may be present.

A thorough service-search should be carried out prior to commencement of any excavations to locate the exact locations of the underground services.

13. EARTHWORKS MONITORING AND COMPLETION REPORT

Earthworks monitoring and reporting may be required if subdivisional earthworks will be conducted to prepare building platforms and/or accessways as part of the Resource (Subdivisional) Consent process.

It is usual practice for the FNDC to require a Geotechnical/Earthworks Completion Report (GCR/ECR) to be submitted by the Geotechnical Engineer at the completion of the subdivisional earthworks (if any), which will contain a 'Statement of Professional Opinion' (SOPO) to support RMA Section 224C processing.

Preliminary recommendations regarding soil characteristics and stability recommendations provided in this report will be confirmed or modified as appropriate within the GCR/ECR and SOPO which may result in 'tags' being placed on some or all titles, indicating future geotechnical assessments at Building Consent stage.

Because soil is not a homogeneous, manufactured building component, there always exists a level of risk that inferences about soil conditions across the greater site, which have been drawn from isolated 'pinprick' locations and may be subject to localized variations. Therefore, the foregoing statements are Professional Opinion, based on a limited collection of information, some of which is factual, and some of which is inferred. For these reasons, it must be appreciated that the investigation is not deemed complete until the construction works enable confirmation of design assumptions.

14. LIMITATIONS

We anticipate that this report is to be submitted to FNDC in support of a Resource Consent application.

This report has been commissioned solely for the benefit of our Client, **Adams Family Trust**, in relation to the project described herein, and to the limits of our engagement, with the exception that the local Territorial Authority may rely on it to the extent of its appropriateness, conditions and limitations, when issuing the subject consent. Any variations from the development proposals described herein as forming the basis of our appraisal should be referred to us for further evaluation. Copyright of Intellectual Property remains with WJL, and this report may NOT be used by any other entity, or for any other proposals, without our written consent. Therefore, no liability is accepted by this firm or any of its directors, servants, or agents, in respect of any other geotechnical aspects of this site, nor for its use by any other person or entity, and any other person or entity who relies upon any information contained herein does so entirely at their own risk. Where other parties may wish to rely on it, whether for the same or different proposals, this permission may be extended, subject to our satisfactory review of their interpretation of the report.

The recommendations provided in this Geotechnical Report are in accordance with the findings from our shallow investigation. However, it is important to acknowledge that additional refinement of the investigation and analysis may be necessary to meet the specific requirements set by the local Council.

Although this report may be submitted to a local authority in connection with an application for a consent, permission, approval, or pursuant to any other requirement of law, this disclaimer shall still apply and require all other parties to use due diligence where necessary and does not remove the necessity for the normal inspection of site conditions and the design of foundations as would be made under all normal circumstances.

Thank you for the opportunity to provide our service on this project, and if we can be of further assistance, please do not hesitate to contact us.

Yours faithfully,

WILTON JOUBERT LIMITED

Appendices:

Subdivision Scheme Plans (3 sheets)

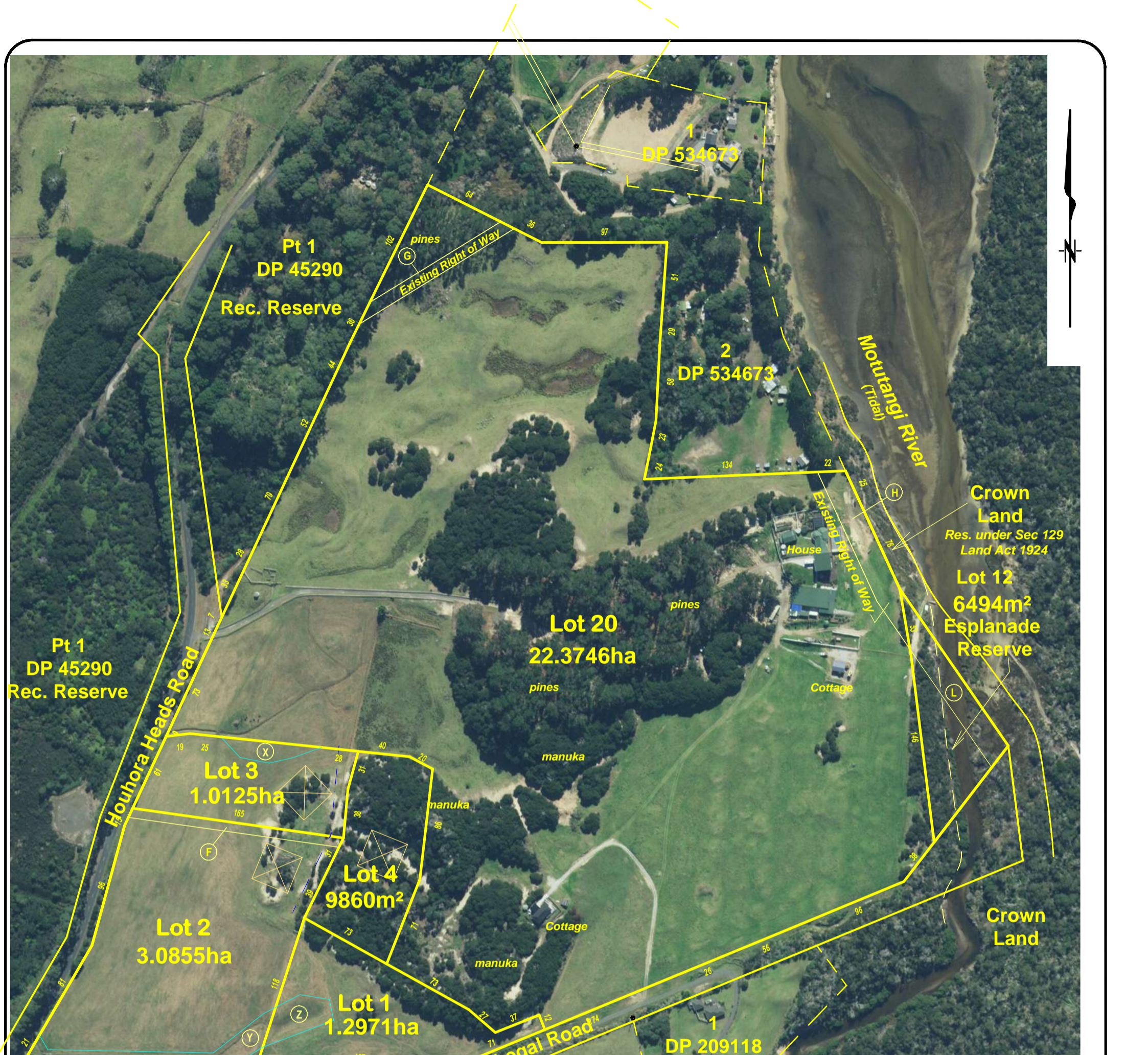
Site Plan & Cross Sections (12 sheets)

Hand Auger Boreholes Records (20 sheets)

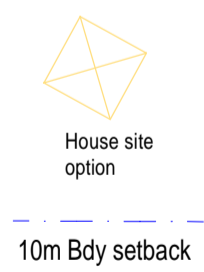
Slope Stability Analysis Outputs (18 sheets)

CPT Calibration Sheets & Results (42 sheets)

Liquefaction Triggering Analysis Outputs (30 sheets)



Schedule of Existing Easements			
Purpose	Shown	Burdened Land	Created By Document:
Right of Way	G & H	Lot 20 hereon	EC 275139
	L	Lot 12 hereon	



LAND COVENANT
 'Areas shown X, Y & Z hereon are to be subject to a Land Covenant. (Wetland Protection)

Memorandum of Proposed Easements			
Purpose	Shown	Burdened Land	Benefited Land
Right of Way Right to Convey Electricity, Water & Telecommunications	F	Lot 2 hereon	Lots 3 - 4 hereon

AREAS AND MEASUREMENTS SUBJECT TO FINAL SURVEY

Local Authority: Far North District Council

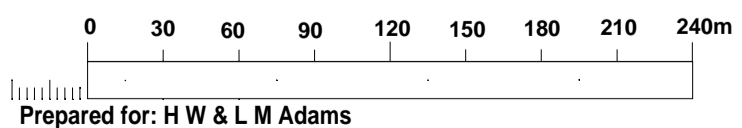
Total Area: 29.3967ha
 Comprised in: NA27A/358

Levels in terms of:
 Contour interval is:

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STAGE 1

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 Registered Land Surveyors, Planners & Land Development Consultants
 Ph: (09) 407 6030 27 Hobson Ave
 Email: kerikeri@saps.co.nz PO Box 937 Kerikeri

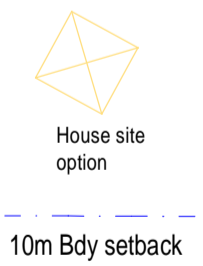
Proposed Subdivision of Lot 2 DP 70340

Name	Date	ORIGINAL SCALE	SHEET SIZE
Survey Design		1:3000	A3
Drawn	W & K Nov 2025		
Rev			

24630



Schedule of Existing Easements			
Purpose	Shown	Burdened Land	Created By Document:
Right of Way	G	Lot 6 hereon	EC 275139
	H	Lot 7 hereon	
	J	Lot 10 hereon	
	K	Lot 11 hereon	



LAND COVENANT
'Areas shown Q, R, S, T, U, V, W hereon are to be subject to a Land Covenant. (Wetland Protection)

Memorandum of Proposed Easements			
Purpose	Shown	Burdened Land	Benefited Land
Right of Way Right to Convey Electricity, Water Telecommunications	A	Lot 11 hereon	Lots 5 - 11 hereon
	B	Lot 11 hereon	Lots 9 & 10 hereon
	C	Lot 11 hereon	Lots 5 - 9 hereon
	D	Lot 5 hereon	Lots 6 & 9 hereon
	E	Lot 6 hereon	Lots 7 & 8 hereon
Right to Convey Electricity	J & P	Lot 10 hereon	Lot 11 hereon

AREAS AND MEASUREMENTS SUBJECT TO FINAL SURVEY

Local Authority: Far North District Council

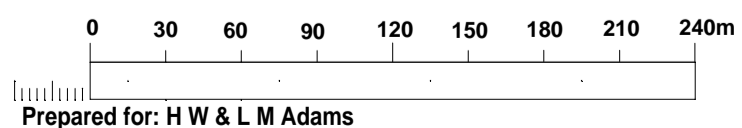
Total Area: 22.3746ha
Comprised in: Stage 1

Levels in terms of:
Contour interval is:

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STAGE 2

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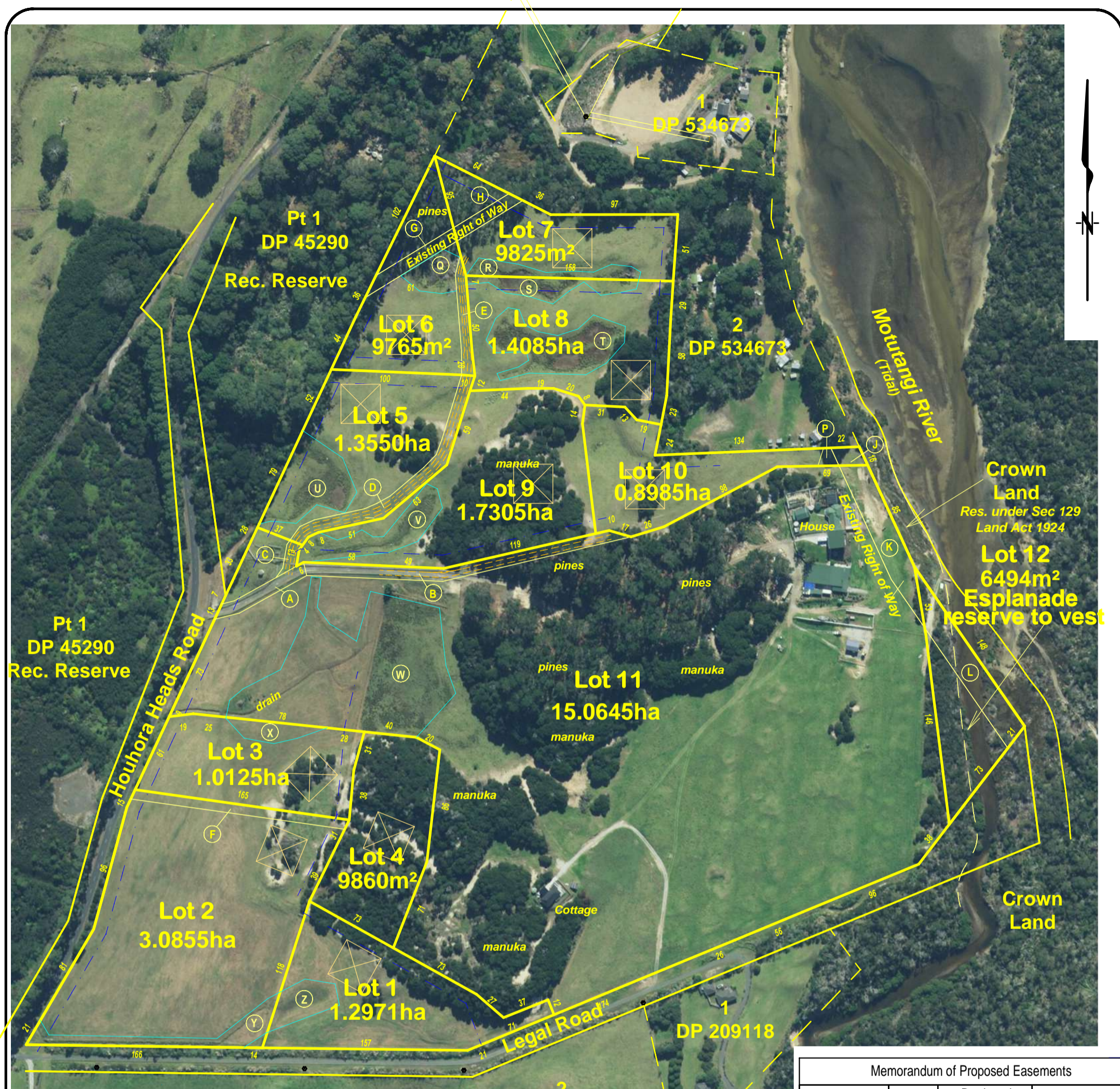


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27 Hobson Ave
PO Box 937 Kerikeri

Proposed Subdivision of Lot 20 Stage 1

Name	Date	ORIGINAL SCALE	SHEET SIZE
Survey Design		1:3000	A3
Drawn	W & K Nov 2025		
Rev			

24630



Schedule of Existing Easements			
Purpose	Shown	Burdened Land	Created By Document:
Right of Way	G	Lot 6 hereon	EC 275139
	H	Lot 7 hereon	
	J	Lot 10 hereon	
	K	Lot 11 hereon	
	L	Lot 12 hereon	



LAND COVENANT
 'Areas shown Q, R, S, T, U, V, W, X, Y & Z hereon are to be subject to a Land Covenant. (Wetland Protection)

Memorandum of Proposed Easements			
Purpose	Shown	Burdened Land	Benefited Land
Right of Way Right to Convey Electricity, Water Telecommunications	A	Lot 11 hereon	Lots 6 - 10 hereon
	B	Lot 11 hereon	Lots 9 - 10 hereon
	C	Lot 11 hereon	Lots 5, 6, 7, 8 & 9 hereon
	D	Lot 5 hereon	Lots 6, 7, 8 & 9 hereon
	E	Lot 6 hereon	Lots 7 & 8 hereon
	F	Lot 2 hereon	Lots 3 & 4 hereon
Right to Convey Electricity	J & P	Lot 10 hereon	Lot 11 hereon

AREAS AND MEASUREMENTS SUBJECT TO FINAL SURVEY

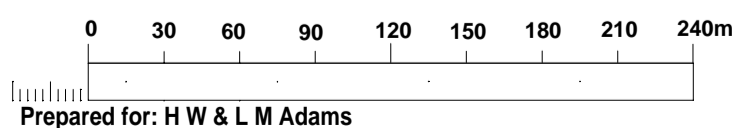
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OVERALL

Local Authority: Far North District Council

Total Area: 29.3967ha CT
 Comprised in: NA27A/358

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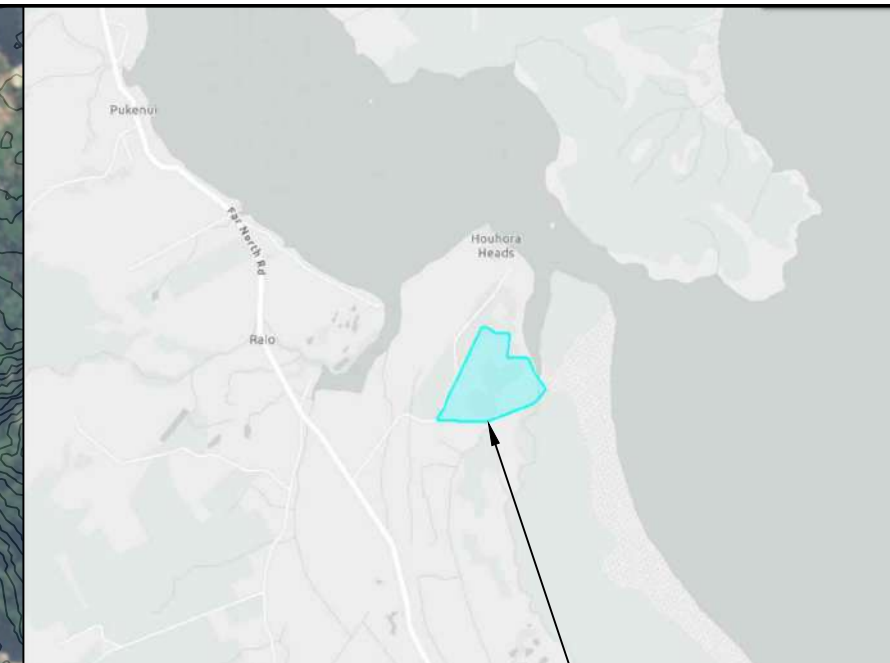
Prepared for: H W & L M Adams

WILLIAMS AND KING
 Registered Land Surveyors, Planners & Land Development Consultants
 Ph: (09) 407 6030 27 Hobson Ave
 Email: kerikeri@saps.co.nz PO Box 937 Kerikeri

Proposed Subdivision of Lot 2 DP 70340

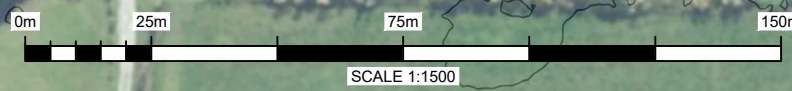
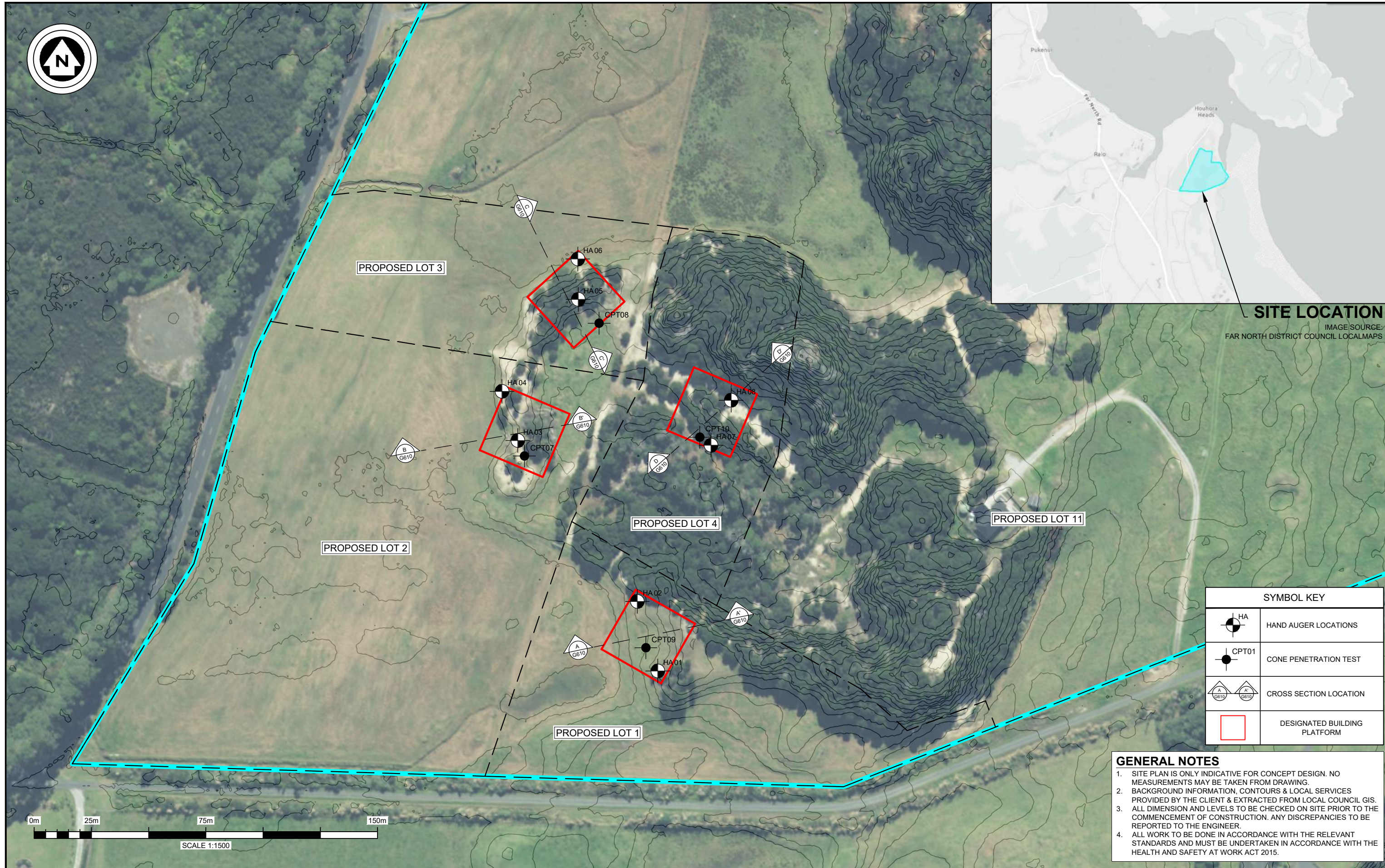
Survey	Name	Date	ORIGINAL SCALE	SHEET SIZE
Design				
Drawn	W & K	Nov 2025	1:3000	A3
Rev				

24630



SITE LOCATION

IMAGE SOURCE:
FAR NORTH DISTRICT COUNCIL LOCALMAPS



SYMBOL KEY	
	HAND AUGER LOCATIONS
	CONE PENETRATION TEST
	CROSS SECTION LOCATION
	DESIGNATED BUILDING PLATFORM

- GENERAL NOTES**
- SITE PLAN IS ONLY INDICATIVE FOR CONCEPT DESIGN. NO MEASUREMENTS MAY BE TAKEN FROM DRAWING.
 - BACKGROUND INFORMATION, CONTOURS & LOCAL SERVICES PROVIDED BY THE CLIENT & EXTRACTED FROM LOCAL COUNCIL GIS.
 - ALL DIMENSION AND LEVELS TO BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
 - ALL WORK TO BE DONE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND MUST BE UNDERTAKEN IN ACCORDANCE WITH THE HEALTH AND SAFETY AT WORK ACT 2015.

WILTON JOUBERT
Consulting Engineers

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

ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
A	MARCH 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY:
DRAWN BY:
CHECKED BY:
SURVEYED BY:

A.B

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GEOTECHNICAL

DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
SITE PLAN 1

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
122 HOUHORA HEADS RD
PUKENUI
NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:1500	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 145678-G600	ISSUE: A
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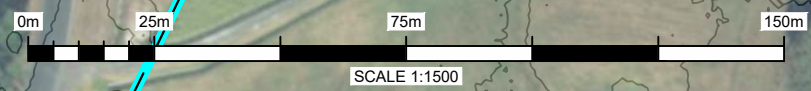


SITE LOCATION

IMAGE SOURCE:
FAR NORTH DISTRICT COUNCIL LOCALMAPS

THIS IS A TYPICAL MULTILEADER + FRAME & MASK

BUILDING PLATFORM MODELED FOR SLOPE STABILITY ASSESSMENT



SYMBOL KEY	
	HAND AUGER LOCATIONS
	CONE PENETRATION TEST
	CROSS SECTION LOCATION
	DESIGNATED BUILDING PLATFORM

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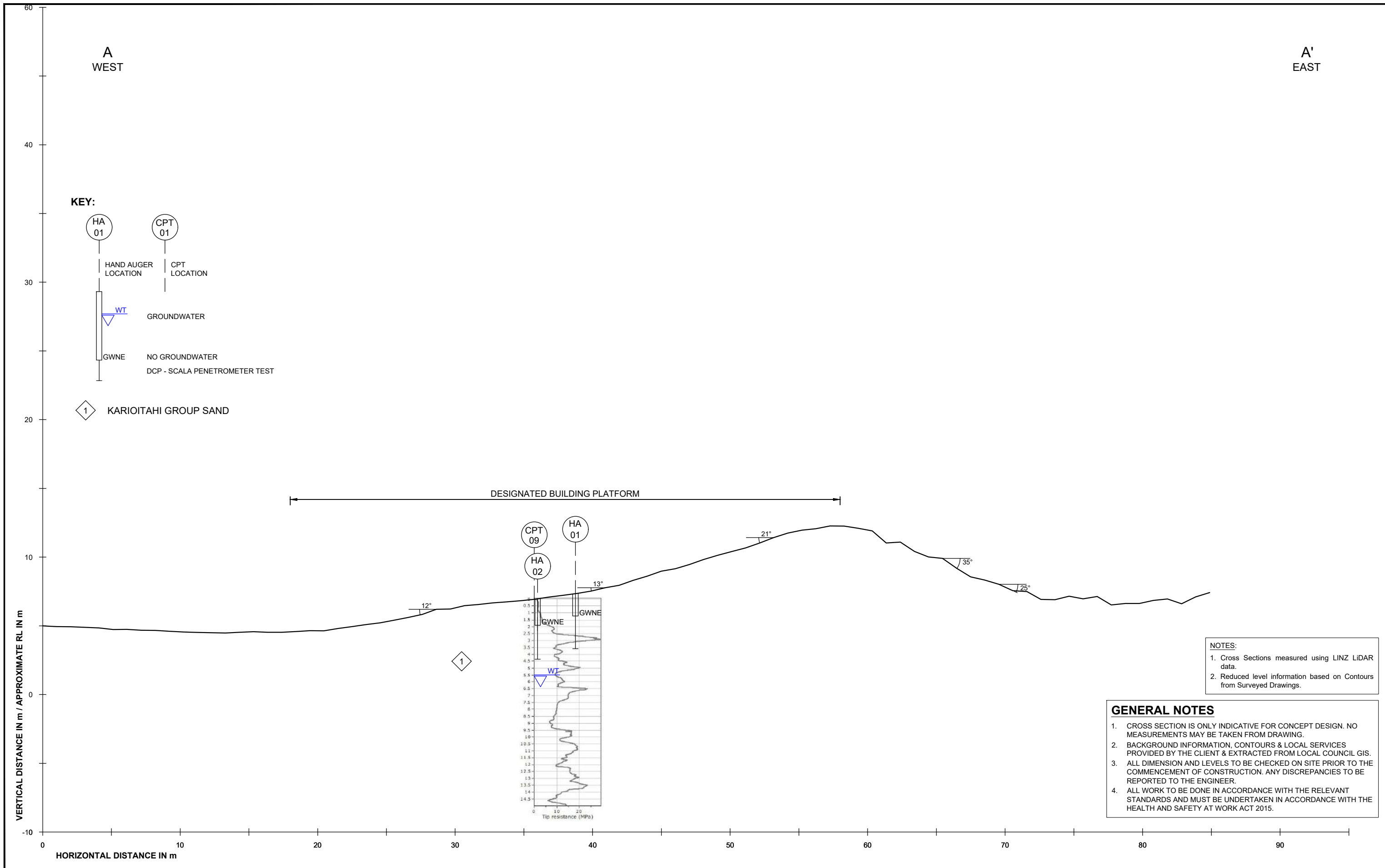
DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
SITE PLAN 2

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
122 HOUHORA HEADS RD
PUKENUI
NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:1500	CO-ORDINATE SYSTEM: NOT COORDINATED
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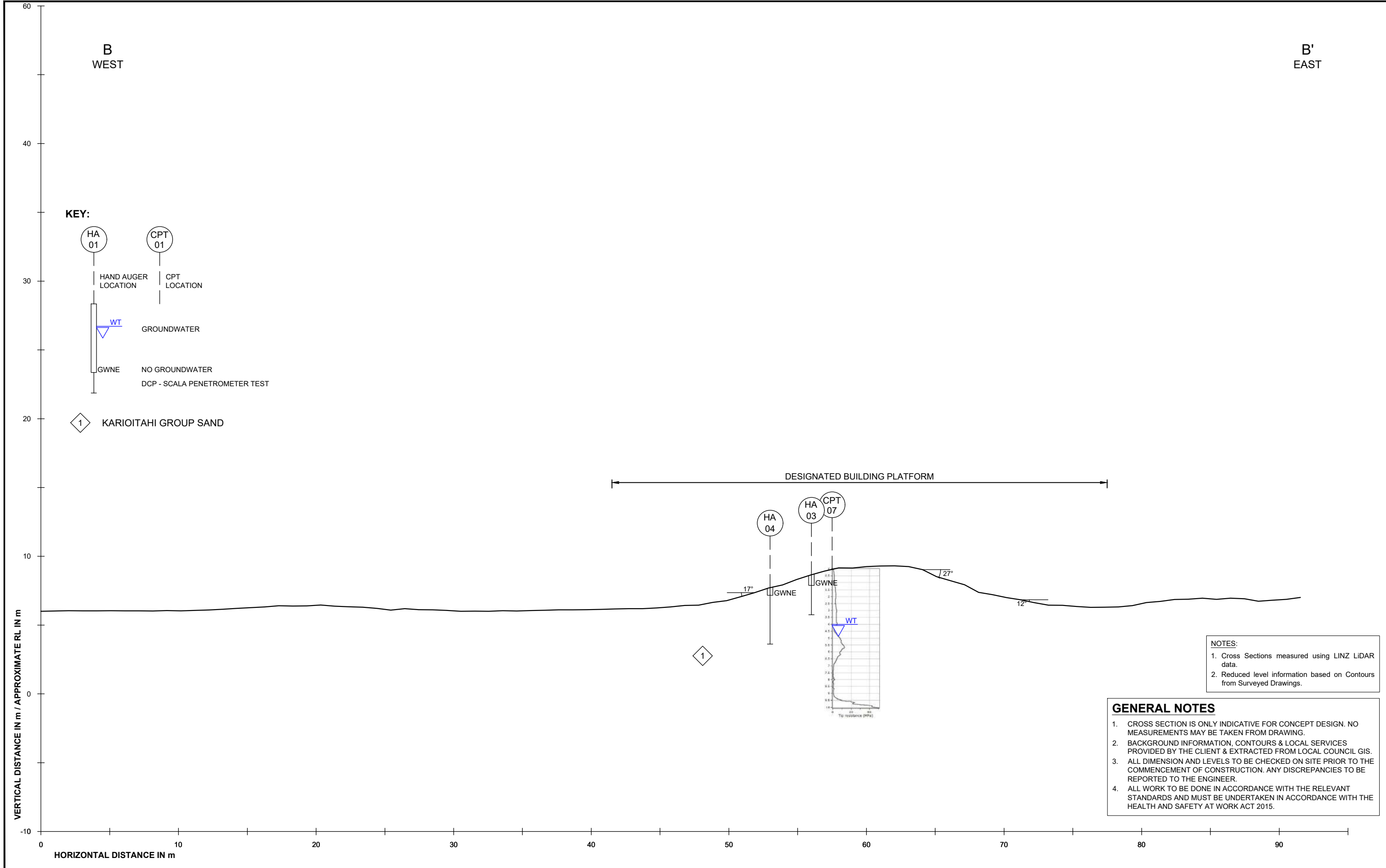
DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 1

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS RD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
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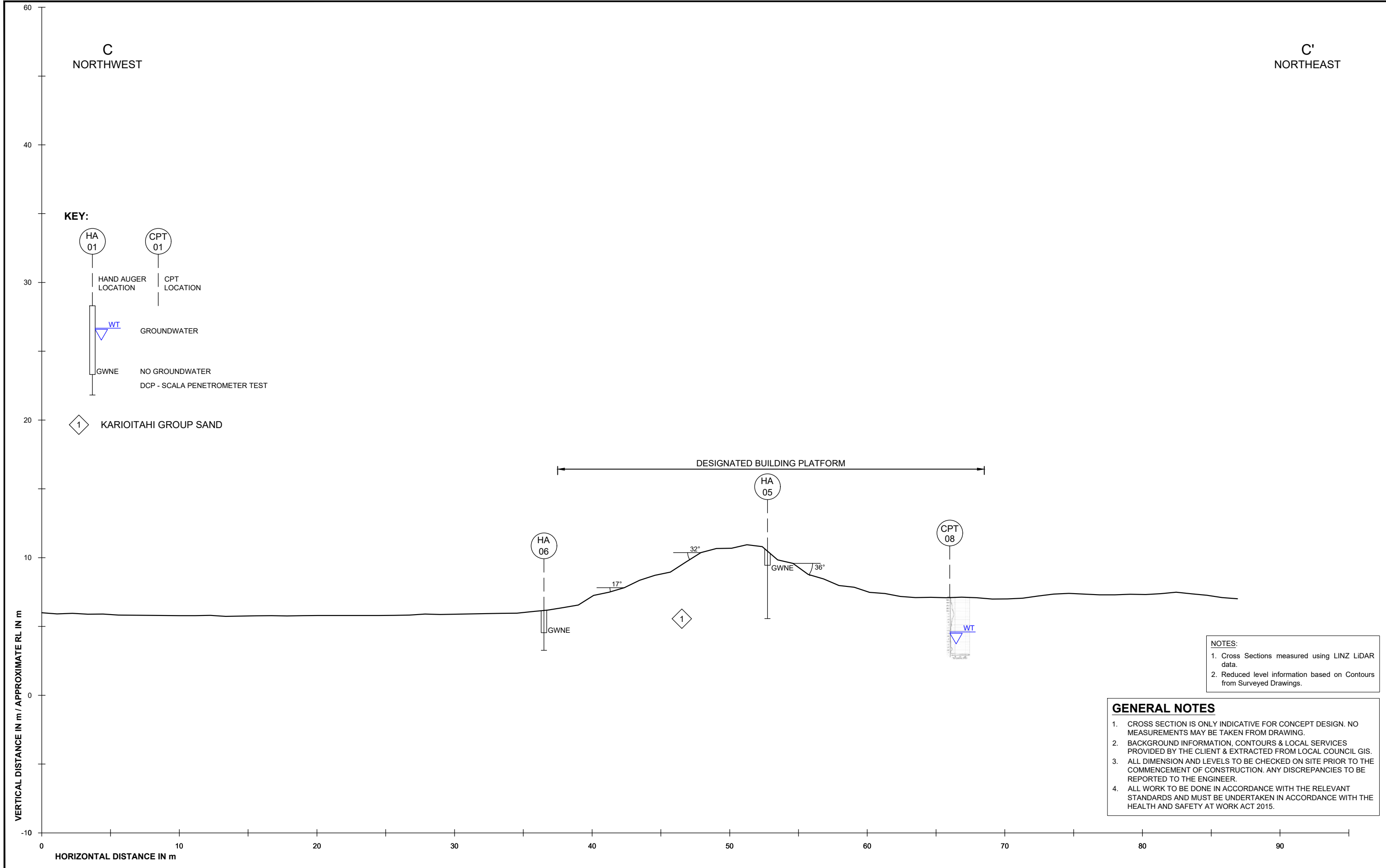
GEOTECHNICAL
 DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 2

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS RD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
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GEOTECHNICAL

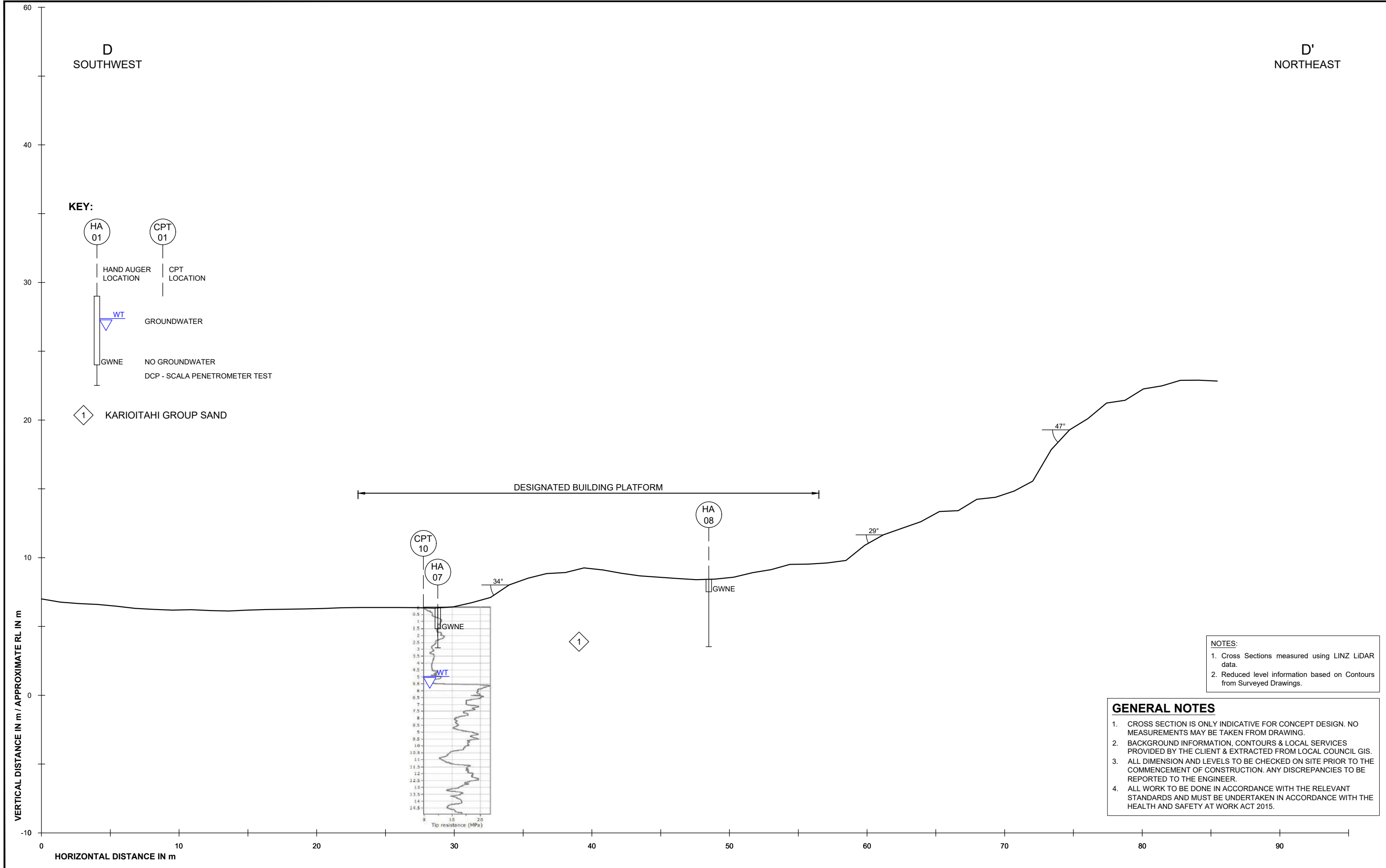
DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 3

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
122 HOUHORA HEADS RD
PUKENUI
NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
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KEY:

HA 01 HAND AUGER LOCATION
 CPT 01 CPT LOCATION

WT GROUNDWATER
 GWNE NO GROUNDWATER
 DCP - SCALA PENETROMETER TEST

1 KARIOITAHU GROUP SAND

NOTES:

1. Cross Sections measured using LINZ LiDAR data.
2. Reduced level information based on Contours from Surveyed Drawings.

GENERAL NOTES

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2. BACKGROUND INFORMATION, CONTOURS & LOCAL SERVICES PROVIDED BY THE CLIENT & EXTRACTED FROM LOCAL COUNCIL GIS.
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A	MARCH 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

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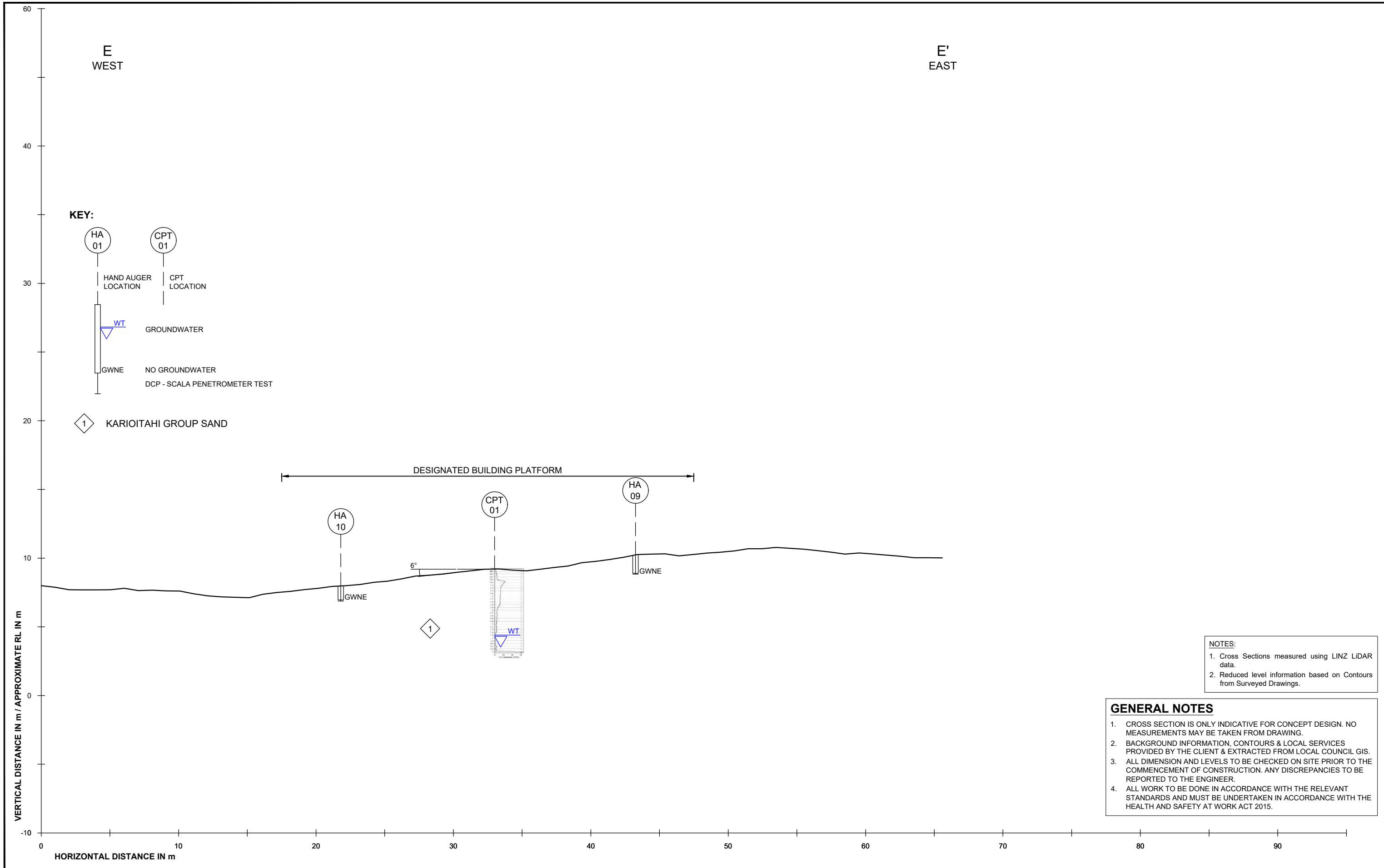
GEOTECHNICAL
 DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 4

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS RD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
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GEOTECHNICAL

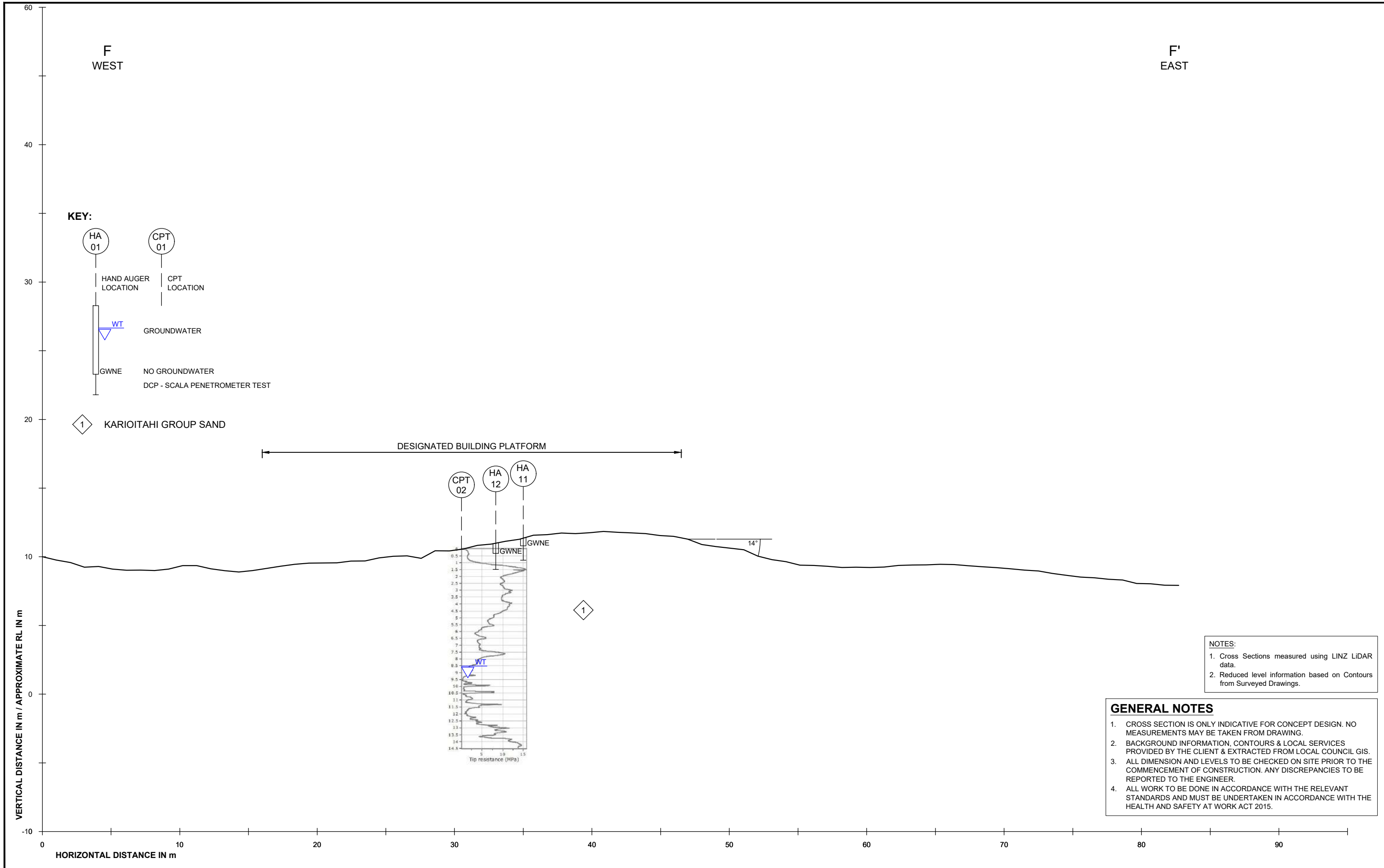
DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 5

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS RD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
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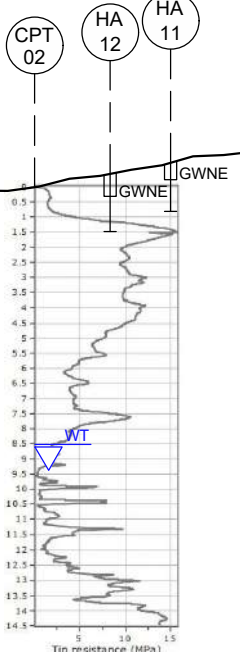
KEY:

HA 01 HAND AUGER LOCATION
 CPT 01 CPT LOCATION

WT GROUNDWATER
 GWNE NO GROUNDWATER
 DCP - SCALA PENETROMETER TEST

1 KARIOITAHU GROUP SAND

DESIGNATED BUILDING PLATFORM



NOTES:

1. Cross Sections measured using LINZ LiDAR data.
2. Reduced level information based on Contours from Surveyed Drawings.

GENERAL NOTES

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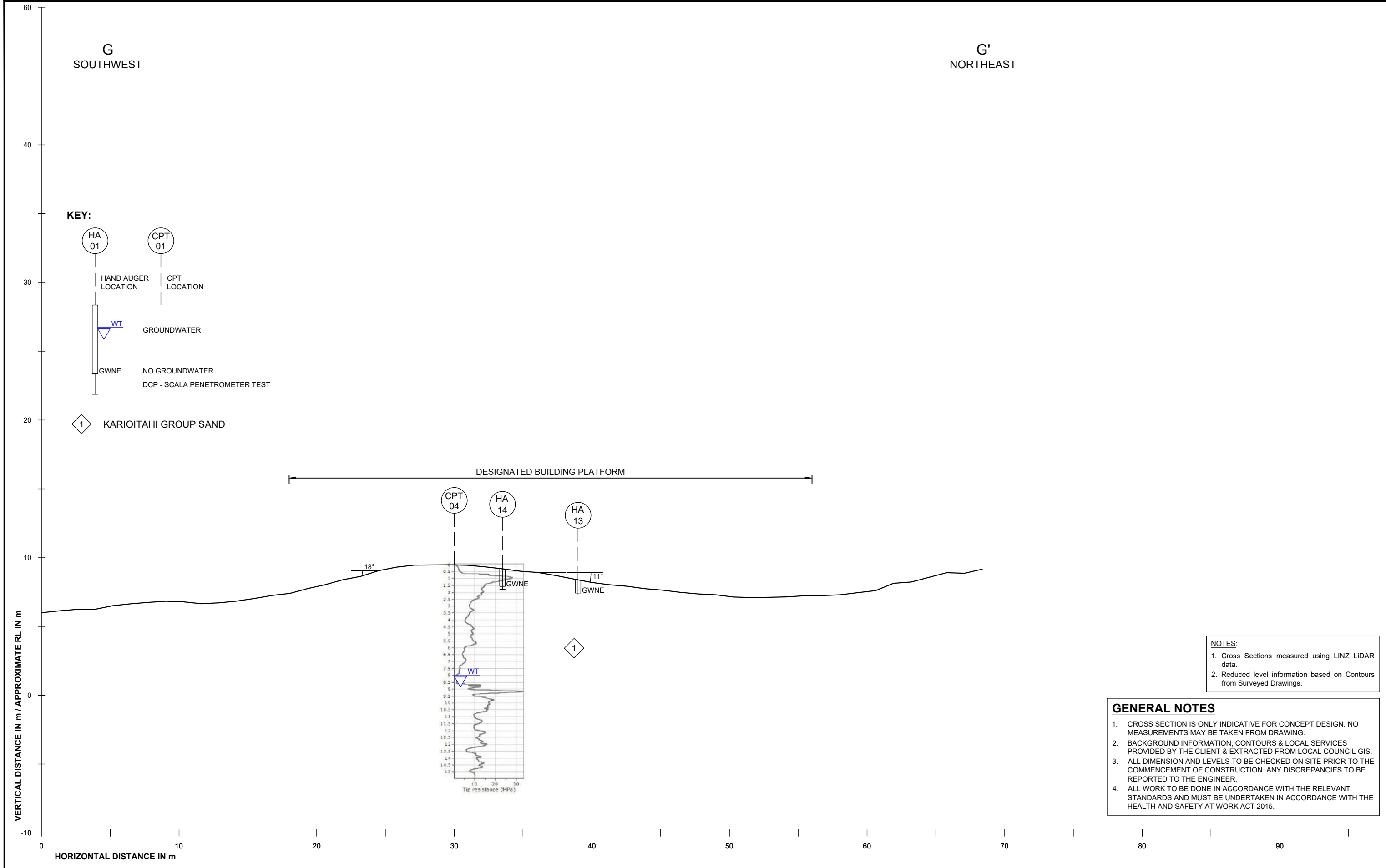
GEOTECHNICAL
 DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 6

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS RD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
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KEY:

HA 01 HAND AUGER LOCATION
 CPT 01 CPT LOCATION

WT GROUNDWATER
 GWNE NO GROUNDWATER
 DCP - SCALA PENETROMETER TEST

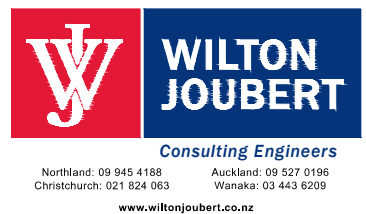
1 KARIOITAHU GROUP SAND

NOTES:

1. Cross Sections measured using LINZ LiDAR data.
2. Reduced level information based on Contours from Surveyed Drawings.

GENERAL NOTES

1. CROSS SECTION IS ONLY INDICATIVE FOR CONCEPT DESIGN. NO MEASUREMENTS MAY BE TAKEN FROM DRAWING.
2. BACKGROUND INFORMATION, CONTOURS & LOCAL SERVICES PROVIDED BY THE CLIENT & EXTRACTED FROM LOCAL COUNCIL GIS.
3. ALL DIMENSION AND LEVELS TO BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
4. ALL WORK TO BE DONE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND MUST BE UNDERTAKEN IN ACCORDANCE WITH THE HEALTH AND SAFETY AT WORK ACT 2015.



ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
A	MARCH 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY:
 DRAWN BY:
 A.B
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SERVICES NOTE
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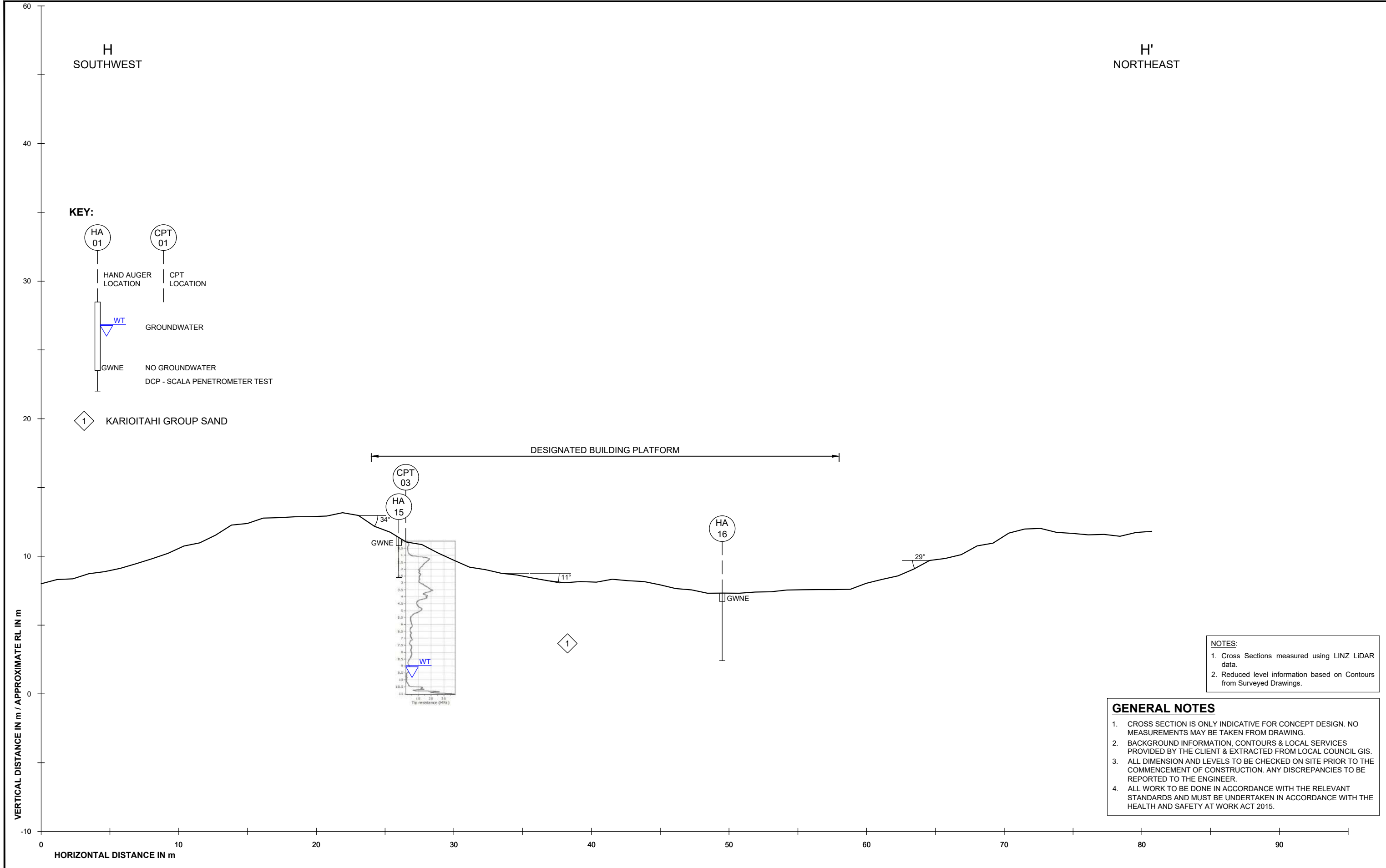
GEOTECHNICAL
 DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 7

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS RD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 145678-G616	ISSUE: A
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ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
A	MARCH 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY:

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SERVICES NOTE

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GEOTECHNICAL

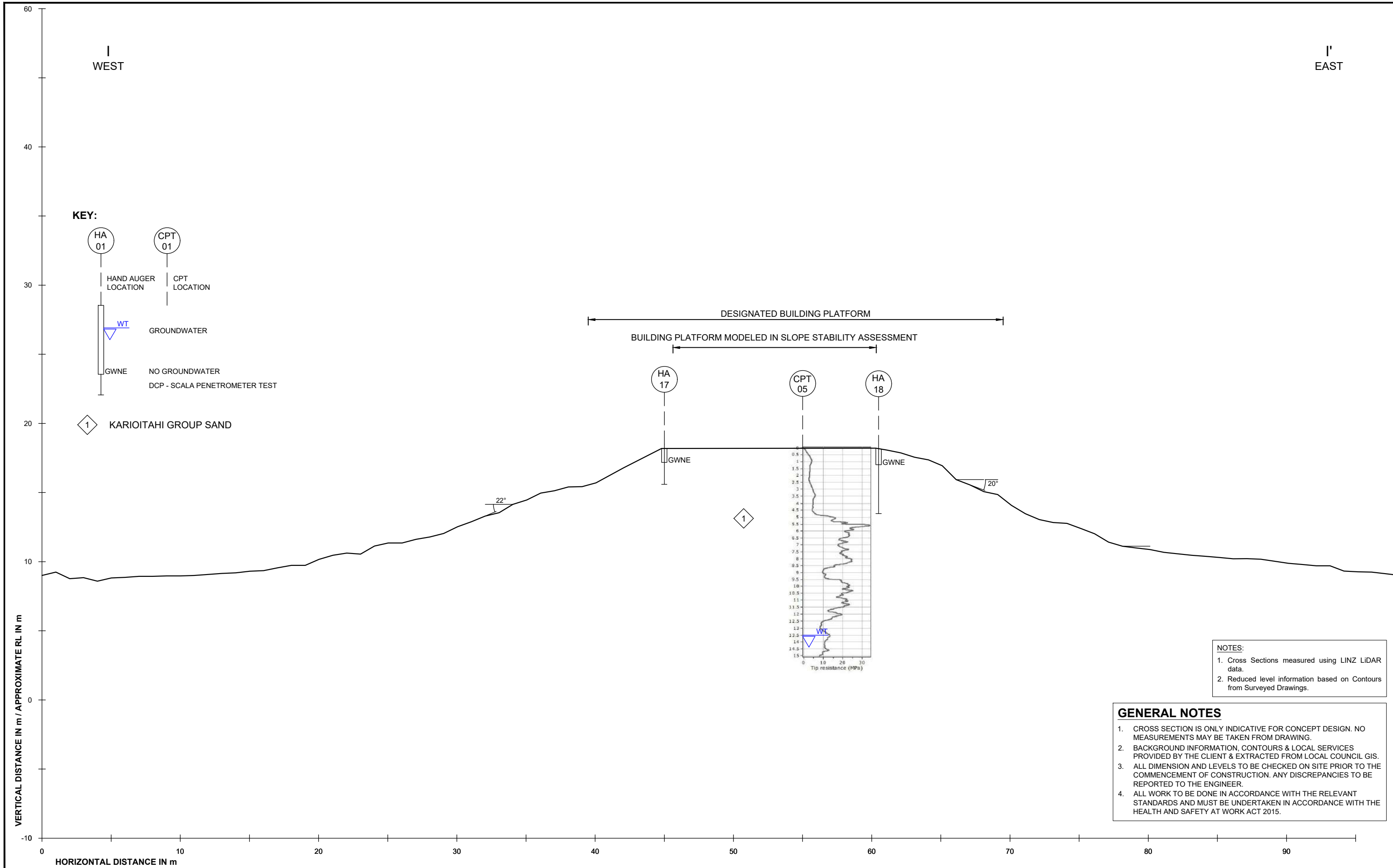
DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 8

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
122 HOUHORA HEADS RD
PUKENUI
NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 145678-G617	ISSUE: A
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KEY:

HA 01 HAND AUGER LOCATION
 CPT 01 CPT LOCATION
 WT GROUNDWATER
 GWNE NO GROUNDWATER
 DCP - SCALA PENETROMETER TEST
 1 KARIOITAHU GROUP SAND

NOTES:

1. Cross Sections measured using LINZ LiDAR data.
2. Reduced level information based on Contours from Surveyed Drawings.

GENERAL NOTES

1. CROSS SECTION IS ONLY INDICATIVE FOR CONCEPT DESIGN. NO MEASUREMENTS MAY BE TAKEN FROM DRAWING.
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4. ALL WORK TO BE DONE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND MUST BE UNDERTAKEN IN ACCORDANCE WITH THE HEALTH AND SAFETY AT WORK ACT 2015.

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ISSUE / REVISION			
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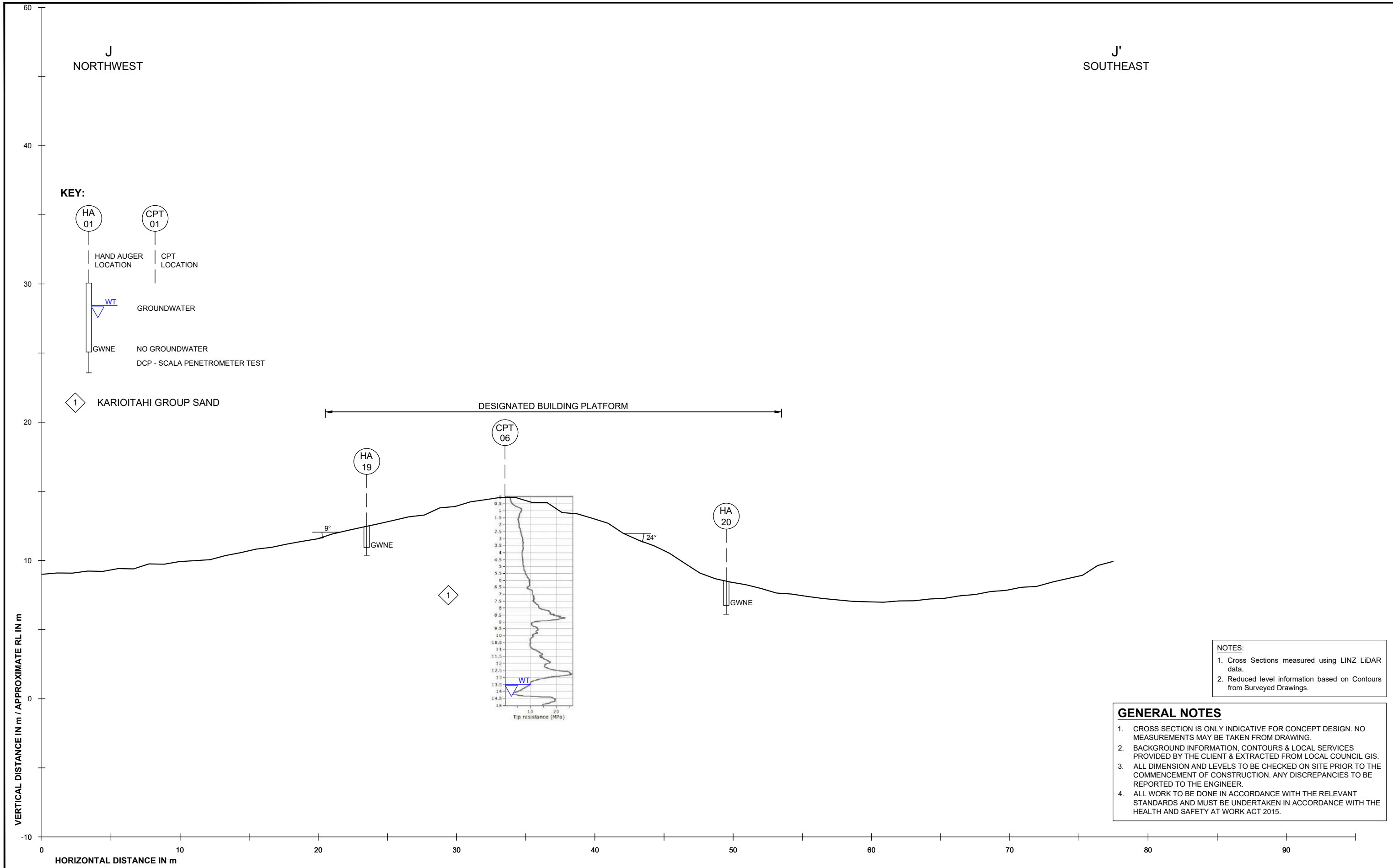
GEOTECHNICAL
 DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 9

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS RD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 145678-G618	ISSUE: A
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NOTES:
 1. Cross Sections measured using LINZ LiDAR data.
 2. Reduced level information based on Contours from Surveyed Drawings.

GENERAL NOTES

- CROSS SECTION IS ONLY INDICATIVE FOR CONCEPT DESIGN. NO MEASUREMENTS MAY BE TAKEN FROM DRAWING.
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- ALL DIMENSION AND LEVELS TO BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
- ALL WORK TO BE DONE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND MUST BE UNDERTAKEN IN ACCORDANCE WITH THE HEALTH AND SAFETY AT WORK ACT 2015.

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ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
A	MARCH 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY:
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GEOTECHNICAL
 DESIGN / DRAWING SUBJECT TO ENGINEERS APPROVAL

DRAWING TITLE:
CROSS SECTION - LOT 10

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION

PROJECT TITLE:
**LOT 2 DP 70340
 122 HOUHORA HEADS RD
 PUKENUI
 NORTHLAND**

ORIGINAL DRAWING SIZE: A3	OFFICE: WHANGAREI
DRAWING SCALE: 1:250	CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: 145678-G619	ISSUE: A
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HAND AUGER : HA01 (Lot 1)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Topsoil	Sandy TOPSOIL, dark brown, dry to moist.		0.0 - 0.1	Groundwater Not Encountered				0.5	
			0.1 - 0.2					0.5	
Kariotiahi Group	NATURAL: Fine to Medium SAND, brownish grey, dry to moist.		0.2 - 0.3					1	
			0.3 - 0.4					1	
			0.4 - 0.5					1	
			0.5 - 0.6					1	
			0.6 - 0.7					1	
			0.7 - 0.8					1	
			0.8 - 0.9					1	
			0.9 - 1.0					2	
			1.0 - 1.1					2	
			1.1 - 1.2					2	
			1.2 - 1.3					2	
			1.3 - 1.4					2	
			1.4 - 1.5					2	
			1.5 - 1.6					2	
	EOH: 1.60m - Poor Recovery Due To Sidewall Collapse		1.6 - 1.7					2	
			1.7 - 1.8					3	
			1.8 - 1.9					2	
			1.9 - 2.0					2	
			2.0 - 2.1				3		
			2.1 - 2.2				3		
			2.2 - 2.3				3		
			2.3 - 2.4				3		
			2.4 - 2.5				3		
			2.5 - 2.6				4		
			2.6 - 2.7				3		
			2.7 - 2.8				3		
			2.8 - 2.9				4		
			2.9 - 3.0				5		
3.0 - 3.1				5					
3.1 - 3.2				6					
3.2 - 3.3				6					
3.3 - 3.4				6					
3.4 - 3.5				9					
3.5 - 3.6				10					
3.6 - 3.7				10					
3.7 - 3.8				14					
3.8 - 3.9				16					
3.9 - 4.0				20+					
4.0 - 4.1									
4.1 - 4.2									
4.2 - 4.3									
4.3 - 4.4									
4.4 - 4.5									
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4.6 - 4.7									
4.7 - 4.8									

REMARKS
 End of borehole @ 1.60m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP ▼ Standing groundwater level

CHECKED BY: CSH ▽ GW while drilling

WILTON JOUBERT
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 Phone: 09-945 4188
 Email: jobs@wjl.co.nz
 Website: www.wiltonjoubert.co.nz

Generated with CORE-GS by Geric - WJL - Hand Auger v2 - 31/03/2026 8:57:02 AM

HAND AUGER : HA02 (Lot 1)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)		
Topsoli	Sandy TOPSOIL, dark brownish black, moist.		0.0 - 0.2					1		
Kariotiaki Group	NATURAL: Fine to Medium SAND, greyish brown, loose, moist. 0.6m: Yellowish brown. 1.0m: Grey. 1.8m: Medium dense, moist to wet.		0.2 - 0.4	Groundwater Not Encountered					1	
			0.4 - 0.6						1	
			0.6 - 0.8						1	
			0.8 - 1.0						1	
			1.0 - 1.2						2	
			1.2 - 1.4						2	
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			1.6 - 1.8						2	
			1.8 - 2.0						3	
			2.0 - 2.2						3	
			2.2 - 2.4						3	
			2.4 - 2.6						3	
			2.6 - 2.8						3	
			2.8 - 3.0						4	
			3.0 - 3.2						5	
			3.2 - 3.4						6	
			3.4 - 3.6						6	
			3.6 - 3.8						10	
3.8 - 4.0	10									
4.0 - 4.2	14									
4.2 - 4.4	12									
4.4 - 4.6	13									
4.6 - 4.8	14									
4.8 - 5.0	14									
5.0 - 5.2	16									
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75.0 - 75.2										
75.2 - 75.4										
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75.6 - 75.8										
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76.2 - 76.4										
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76.8 - 77.0										
77.0 - 77.2										
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77.6 - 77.8										
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78.2 - 78.4										
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78.6 - 78.8										
78.8 - 79.0										
79.0 - 79.2										
79.2 - 79.4										
79.4 - 79.6										
79.6 - 79.8										
79.8 - 80.0										
80.0 - 80.2										
80.2 - 80.4										
80.4 - 80.6										
80.6 - 80.8										
80.8 - 81.0										
81.0 - 81.2										
81.2 - 81.4										
81.4 - 81.6										
81.6 - 81.8										
81.8 - 82.0										
82.0 - 82.2										
82.2 - 82.4										
82.4 - 82.6										
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82.8 - 83.0										
83.0 - 83.2										
83.2 - 83.4										
83.4 - 83.6										
83.6 - 83.8										
83.8 - 84.0										
84.0 - 84.2										
84.2 - 84.4										
84.4 - 84.6										
84.6 - 84.8										
84.8 - 85.0										
85.0 - 85.2										
85.2 - 85.4										
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85.6 - 85.8										
85.8 - 86.0										
86.0 - 86.2										
86.2 - 86.4										
86.4 - 86.6										
86.6 - 86.8										
86.8 - 87.0										
87.0 - 87.2										
87.2 - 87.4										
87.4 - 87.6										
87.6 - 87.8										
87.8 - 88.0										
88.0 - 88.2										
88.2 - 88.4										
88.4 - 88.6										
88.6 - 88.8										
88.8 - 89.0										
89.0 - 89.2										
89.2 - 89.4										
89.4 - 89.6										
89.6 - 89.8										
89.8 - 90.0										
90.0 - 90.2										
90.2 - 90.4										
90.4 - 90.6										
90.6 - 90.8										
90.8 - 91.0										
91.0 - 91.2										
91.2 - 91.4										
91.4 - 91.6										
91.6 - 91.8										
91.8 - 92.0										
92.0 - 92.2										
92.2 - 92.4										
92.4 - 92.6										
92.6 - 92.8										
92.8 - 93.0										
93.0 - 93.2										
93.2 - 93.4										
93.4 - 93.6										
93.6 - 93.8										
93.8 - 94.0										
94.0 - 94.2										
94.2 - 94.4										
94.4 - 94.6										
94.6 - 94.8										
94.8 - 95.0										
95.0 -										

HAND AUGER : HA03 (Lot 2)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)		
Topsoil	Sandy TOPSOIL, dark grey, dry.		0.0 - 0.1						0.5	
Karioitahi Group	NATURAL: Fine to Medium SAND, grey, loose, dry.		0.1 - 0.2	Groundwater Not Encountered					0.5	
			0.2 - 0.3						0.5	
			0.3 - 0.4						0.5	
			0.4 - 0.5						1	
			0.5 - 0.6						1	
			0.6 - 0.7						1	
	EOH: 0.70m - No Recovery Due To Very Loose Sand Falling Back Into Hole		0.7 - 0.8						2	
			0.8 - 0.9						1	
			0.9 - 1.0						1	
			1.0 - 1.1						2	
			1.1 - 1.2						2	
			1.2 - 1.3						2	
			1.3 - 1.4						1	
			1.4 - 1.5						2	
			1.5 - 1.6						2	
			1.6 - 1.7						3	
			1.7 - 1.8						2	
			1.8 - 1.9						2	
			1.9 - 2.0						2	
			2.0 - 2.1						2	
			2.1 - 2.2						3	
			2.2 - 2.3						3	
			2.3 - 2.4						3	
			2.4 - 2.5						3	
			2.5 - 2.6						3	
			2.6 - 2.7						3	
			2.7 - 2.8						3	
			2.8 - 2.9						3	
			2.9 - 3.0						3	
			3.0 - 3.1							
			3.1 - 3.2							
			3.2 - 3.3							
			3.3 - 3.4							
			3.4 - 3.5							
			3.5 - 3.6							
			3.6 - 3.7							
			3.7 - 3.8							
			3.8 - 3.9							
			3.9 - 4.0							
			4.0 - 4.1							
			4.1 - 4.2							
			4.2 - 4.3							
			4.3 - 4.4							
			4.4 - 4.5							
			4.5 - 4.6							
			4.6 - 4.7							
			4.7 - 4.8							
			4.8 - 4.9							

REMARKS
 End of borehole @ 0.70m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP ▼ Standing groundwater level
 CHECKED BY: CSH ▽ GW while drilling



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Consulting Engineers

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HAND AUGER : HA04 (Lot 2)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust
PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)		
Top soil	Sandy TOPSOIL, dark grey, dry.		0.0 - 0.05						0.5	
Kairiotehi Group	NATURAL: Fine to Medium SAND, grey, loose, dry.		0.05 - 0.2	Groundwater Not Encountered					0.5	
			0.2 - 0.4							1
			0.4 - 0.6						1	
			0.6 - 0.8						2	
			0.8 - 1.0						2	
			1.0 - 1.2						2	
			1.2 - 1.4						1	
			1.4 - 1.6						1	
			1.6 - 1.8						1	
			1.8 - 2.0						1	
			2.0 - 2.2						2	
			2.2 - 2.4						2	
			2.4 - 2.6						3	
			2.6 - 2.8						2	
			2.8 - 3.0						3	
			3.0 - 3.2						3	
			3.2 - 3.4						4	
			3.4 - 3.6						4	
			3.6 - 3.8						6	
			3.8 - 4.0						7	
			4.0 - 4.2						9	
			4.2 - 4.4						11	
			4.4 - 4.6						12	
			4.6 - 4.8						14	
			4.8 - 5.0						18	
									20+	

REMARKS
End of borehole @ 0.50m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA05 (Lot 3)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)		
Top soil	Sandy TOPSOIL, dark brown, dry.		0.0 - 0.05						0.5	
Kariotiaki Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry.		0.05 - 0.1	Groundwater Not Encountered					0.5	
			0.1 - 0.2						0.5	
			0.2 - 0.3						0.5	
			0.3 - 0.4						0.5	
			0.4 - 0.5						1	
			0.5 - 0.6						1	
			0.6 - 0.7						1	
			0.7 - 0.8						2	
			0.8 - 0.9						1	
			0.9 - 1.0						1	
			1.0 - 1.1						2	
			1.1 - 1.2						2	
			1.2 - 1.3						2	
			1.3 - 1.4						3	
			1.4 - 1.5						3	
			1.5 - 1.6						2	
			1.6 - 1.7						2	
			1.7 - 1.8						3	
			1.8 - 1.9						2	
			1.9 - 2.0						2	
			2.0 - 2.1						2	
			2.1 - 2.2						3	
			2.2 - 2.3						3	
			2.3 - 2.4						3	
2.4 - 2.5	4									
2.5 - 2.6	3									
2.6 - 2.7	4									
2.7 - 2.8	4									
2.8 - 2.9	4									
2.9 - 3.0	3									
3.0 - 3.1	4									
3.1 - 3.2	5									
3.2 - 3.3	5									
3.3 - 3.4	5									
3.4 - 3.5	5									
3.5 - 3.6	6									
3.6 - 3.7	6									
3.7 - 3.8	7									
3.8 - 3.9	6									
3.9 - 4.0	7									
4.0 - 4.1	7									
4.1 - 4.2	8									
4.2 - 4.3	10									
4.3 - 4.4	8									
4.4 - 4.5	10									
4.5 - 4.6	9									
4.6 - 4.7	9									
4.7 - 4.8	10									
4.8 - 4.9	12									
EOH: 1.20m - No Recovery Due To Very Loose Sand Falling Back Into Hole										

REMARKS

End of borehole @ 1.20m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA06 (Lot 3)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Top soil	Sandy TOPSOIL, dark brownish black, dry to moist.		0.0 - 0.1					0.5	
Kariotiahi Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry to moist.		0.1 - 0.2	Groundwater Not Encountered				0.5	
			0.2 - 0.3					0.5	
			0.3 - 0.4					0.5	
			0.4 - 0.5					1	
			0.5 - 0.6					1	
		0.6m: Moist.			0.6 - 0.7			1	
					0.7 - 0.8			1	
					0.8 - 0.9			1	
					0.9 - 1.0			2	
					1.0 - 1.1			1	
					1.1 - 1.2			2	
		1.2m: Dark grey, medium dense, moist to wet, poor recovery.			1.2 - 1.3			3	
					1.3 - 1.4			3	
		1.5m: Loose.			1.4 - 1.5			2	
					1.5 - 1.6			1	
	EOH: 1.60m - No Recovery Due To Very Loose Sand Falling Back Into Hole		1.6 - 1.7			2			
			1.7 - 1.8			2			
			1.8 - 1.9			2			
			1.9 - 2.0			3			
			2.0 - 2.1			3			
			2.1 - 2.2			4			
			2.2 - 2.3			4			
			2.3 - 2.4			6			
			2.4 - 2.5			8			
			2.5 - 2.6			10			
			2.6 - 2.7			12			
			2.7 - 2.8			9			
			2.8 - 2.9			12			
			2.9 - 3.0						
			3.0 - 3.1						
			3.1 - 3.2						
			3.2 - 3.3						
			3.3 - 3.4						
			3.4 - 3.5						
			3.5 - 3.6						
			3.6 - 3.7						
			3.7 - 3.8						
			3.8 - 3.9						
			3.9 - 4.0						
			4.0 - 4.1						
			4.1 - 4.2						
			4.2 - 4.3						
			4.3 - 4.4						
			4.4 - 4.5						
			4.5 - 4.6						
			4.6 - 4.7						
			4.7 - 4.8						

REMARKS

End of borehole @ 1.60m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA07 (Lot 4)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)		
Top soil	Sandy TOPSOIL, dark brownish black, dry to moist.		0.0 - 0.1						1	
Karioitahi Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry to moist.		0.1 - 0.2	Groundwater Not Encountered					1	
			0.2 - 0.3						2	
			0.3 - 0.4						2	
			0.4 - 0.5						2	
			0.5 - 0.6						2	
			0.6 - 0.7						3	
		0.7m: Medium dense.			0.7 - 0.8				3	
					0.8 - 0.9				3	
		1.0m: Whitish grey, loose.			0.9 - 1.0				2	
					1.0 - 1.1				2	
		1.1m: Poor Recovery.			1.1 - 1.2				2	
					1.2 - 1.3				3	
		1.3m: Medium dense.			1.3 - 1.4				3	
					1.4 - 1.5				2	
		EOH: 1.50m - No Recovery Due To Very Loose Sand Falling Back Into Hole			1.5 - 1.6				3	
			1.6 - 1.7				3			
			1.7 - 1.8				3			
			1.8 - 1.9				3			
			1.9 - 2.0				3			
			2.0 - 2.1				2			
			2.1 - 2.2				2			
			2.2 - 2.3				3			
			2.3 - 2.4				3			
			2.4 - 2.5				3			
			2.5 - 2.6				2			
			2.6 - 2.7				3			
			2.7 - 2.8				4			
			2.8 - 2.9				4			
			2.9 - 3.0							
			3.0 - 3.1							
			3.1 - 3.2							
			3.2 - 3.3							
			3.3 - 3.4							
			3.4 - 3.5							
			3.5 - 3.6							
			3.6 - 3.7							
			3.7 - 3.8							
			3.8 - 3.9							
			3.9 - 4.0							
			4.0 - 4.1							
			4.1 - 4.2							
			4.2 - 4.3							
			4.3 - 4.4							
			4.4 - 4.5							
			4.5 - 4.6							
			4.6 - 4.7							
			4.7 - 4.8							

REMARKS

End of borehole @ 1.50m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA08 (Lot 4)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Top soil	Sandy TOPSOIL, dark brown, dry.		0.05					0.5	
Kariotiaki Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry.		0.1	Groundwater Not Encountered				0.5	
			0.2					0.5	
			0.3					0.5	
			0.4					0.5	
			0.5					1	
			0.6					1	
			0.7					2	
			0.8					1	
			0.9					2	
			1.0					2	
			1.1					1	
			1.2					2	
			1.3					2	
			1.4					2	
			1.5					2	
			1.6					2	
			1.7					2	
			1.8					2	
			1.9					3	
			2.0					2	
2.1	3								
2.2	2								
2.3	3								
2.4	3								
2.5	2								
2.6	3								
2.7	2								
2.8	3								
2.9	3								
3.0	3								
3.1	3								
3.2	3								
3.3	4								
3.4	5								
3.5	4								
3.6	4								
3.7	5								
3.8	4								
3.9	5								
4.0	5								
4.1	6								
4.2	5								
4.3	6								
4.4	6								
4.5	7								
4.6	8								
4.7	10								
4.8	9								
4.9	10								

REMARKS
 End of borehole @ 0.90m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP ▼ Standing groundwater level

CHECKED BY: CSH ▽ GW while drilling

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HAND AUGER : HA09 (Lot 5)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust
PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOLD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Topsoil	Sandy TOPSOIL, dark brown, dry to moist.		0.0 - 0.1	Groundwater Not Encountered				1	
			0.1 - 0.2					1	
Karioitahi Group	NATURAL: Fine to Medium SAND, grey, loose, dry to moist.	0.2 - 0.4					2		
		0.4 - 0.6					1		
		0.6 - 0.8					2		
		0.8 - 1.0					1		
		1.0 - 1.2					2		
		1.2 - 1.4					2		
		1.4 - 1.6					2		
		1.6 - 1.8					2		
		1.8 - 2.0					2		
		2.0 - 2.2					6		
		2.2 - 2.4					6		
		2.4 - 2.6					9		
		2.6 - 2.8					15		
2.8 - 3.0				20+					
	EOH: 1.30m - Too Dense To Auger		3.0 - 3.2						

REMARKS
End of borehole @ 1.30m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP ▼ Standing groundwater level
CHECKED BY: CSH ▽ GW while drilling



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HAND AUGER : HA10 (Lot 5)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS				
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)					
Tops oil	Sandy TOPSOIL, black, moist.		0.0						1				
Karioitahi Group	NATURAL: Fine to Medium SAND, trace silt, grey, loose, moist. 0.8m: Minor silt, dark brown, medium dense. 0.9m: Dense.		0.2	Groundwater Not Encountered						2			
			0.4								2		
			0.6									1	
			0.8									2	
			1.0									1	
			1.2									2	
			1.4									1	
			1.6									2	
			1.8									1	
			2.0									2	
			2.2									1	
			2.4									2	
			2.6									1	
			2.8									2	
			3.0									1	
3.2								2					
3.4								1					
3.6								2					
3.8								1					
4.0								2					
4.2								1					
4.4								2					
4.6								1					
4.8								2					
	EOH: 1.00m - Too Dense To Auger		1.0						6				
			1.2						14				
			1.4						15				
			1.6						20+				
			1.8										
			2.0										
			2.2										
			2.4										
			2.6										
			2.8										
			3.0										
			3.2										
			3.4										
			3.6										
			3.8										
			4.0										
			4.2										
			4.4										
			4.6										
			4.8										

REMARKS

End of borehole @ 1.00m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM
 CHECKED BY: CSH

Standing groundwater level
 GW while drilling



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HAND AUGER : HA11 (Lot 6)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS		
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)			
Tops oil Kariotiahi Group	Sandy TOPSOIL, dark brown, dry.		0.00 - 0.05	Groundwater Not Encountered					0.33		
	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry.		0.05 - 0.50							0.33	
			0.50 - 0.55							0.33	
			0.55 - 0.60							1	
			0.60 - 0.65							0.5	
			0.65 - 0.70							0.5	
			0.70 - 0.75							1	
			0.75 - 0.80							1	
			0.80 - 0.85							1	
			0.85 - 0.90							1	
			0.90 - 0.95							1	
			0.95 - 1.00							1	
			1.00 - 1.05							1	
			1.05 - 1.10							4	
			1.10 - 1.15							5	
			1.15 - 1.20							7	
			1.20 - 1.25							14	
			1.25 - 1.30							20+	
			1.30 - 1.35								
			1.35 - 1.40								
			1.40 - 1.45								
			1.45 - 1.50								
			1.50 - 1.55								
			1.55 - 1.60								
			1.60 - 1.65								
			1.65 - 1.70								
			1.70 - 1.75								
			1.75 - 1.80								
			1.80 - 1.85								
			1.85 - 1.90								
			1.90 - 1.95								
			1.95 - 2.00								
			2.00 - 2.05								
			2.05 - 2.10								
			2.10 - 2.15								
			2.15 - 2.20								
			2.20 - 2.25								
			2.25 - 2.30								
			2.30 - 2.35								
			2.35 - 2.40								
			2.40 - 2.45								
			2.45 - 2.50								
			2.50 - 2.55								
			2.55 - 2.60								
			2.60 - 2.65								
			2.65 - 2.70								
			2.70 - 2.75								
			2.75 - 2.80								
			2.80 - 2.85								
			2.85 - 2.90								
			2.90 - 2.95								
			2.95 - 3.00								
			3.00 - 3.05								
			3.05 - 3.10								
			3.10 - 3.15								
			3.15 - 3.20								
			3.20 - 3.25								
			3.25 - 3.30								
			3.30 - 3.35								
			3.35 - 3.40								
			3.40 - 3.45								
			3.45 - 3.50								
			3.50 - 3.55								
			3.55 - 3.60								
			3.60 - 3.65								
			3.65 - 3.70								
			3.70 - 3.75								
			3.75 - 3.80								
			3.80 - 3.85								
			3.85 - 3.90								
			3.90 - 3.95								
			3.95 - 4.00								
			4.00 - 4.05								
			4.05 - 4.10								
			4.10 - 4.15								
			4.15 - 4.20								
			4.20 - 4.25								
			4.25 - 4.30								
			4.30 - 4.35								
			4.35 - 4.40								
			4.40 - 4.45								
			4.45 - 4.50								
			4.50 - 4.55								
			4.55 - 4.60								
			4.60 - 4.65								
			4.65 - 4.70								
			4.70 - 4.75								
			4.75 - 4.80								
			4.80 - 4.85								
			4.85 - 4.90								
			4.90 - 4.95								
			4.95 - 5.00								

REMARKS
 End of borehole @ 0.50m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP ▼ Standing groundwater level
 CHECKED BY: CSH ▼ GW while drilling



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HAND AUGER : HA12 (Lot 6)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS				
					PEAK STRENGTH (kPa)	REMOLD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)					
Top soil	Sandy TOPSOIL, dark brownish black, dry.		0.0 - 0.1						0.5				
Kairaitahi Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry. 0.4m: Poor recovery.		0.1 - 0.2	Groundwater Not Encountered						0.5			
			0.2 - 0.3								1		
			0.3 - 0.4									1	
			0.4 - 0.5									1	
			0.5 - 0.6									1	
			0.6 - 0.7									0.5	
			0.7 - 0.8									0.5	
			0.8 - 0.9									1	
			0.9 - 1.0									1	
			1.0 - 1.1									1	
	1.1 - 1.2								1				
	1.2 - 1.3								1				
	1.3 - 1.4								1				
	1.4 - 1.5								3				
	1.5 - 1.6								5				
	1.6 - 1.7								5				
	1.7 - 1.8								6				
	1.8 - 1.9								12				
	1.9 - 2.0								20+				
	2.0 - 2.1												
	2.1 - 2.2												
	2.2 - 2.3												
	2.3 - 2.4												
	2.4 - 2.5												
	2.5 - 2.6												
	2.6 - 2.7												
	2.7 - 2.8												
	2.8 - 2.9												
	2.9 - 3.0												
	3.0 - 3.1												
	3.1 - 3.2												
	3.2 - 3.3												
	3.3 - 3.4												
	3.4 - 3.5												
	3.5 - 3.6												
	3.6 - 3.7												
	3.7 - 3.8												
	3.8 - 3.9												
	3.9 - 4.0												
	4.0 - 4.1												
	4.1 - 4.2												
	4.2 - 4.3												
	4.3 - 4.4												
	4.4 - 4.5												
	4.5 - 4.6												
	4.6 - 4.7												
	4.7 - 4.8												
	4.8 - 4.9												
	4.9 - 5.0												

REMARKS
End of borehole @ 0.70m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM
CHECKED BY: CSH

Standing groundwater level
 GW while drilling



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HAND AUGER : HA13 (Lot 7)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026

NORTHING:

GRID:

DIAMETER: 50mm

EASTING:

SV DIAL:

ELEVATION: Ground

FACTOR:

DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS		
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)			
Topsoil	Sandy TOPSOIL, dark brown, dry to moist.		0.0	Groundwater Not Encountered					1		
			0.2						1		
Kariotiahi Group	NATURAL; Fine to Medium SAND, grey, loose, dry to moist. 0.4m: Medium dense. 0.9m: Brown, dense.		0.4							2	
			0.6							3	
			0.8							3	
			1.0							5	
			1.2							5	
			1.4							6	
			1.6							8	
			1.8							11	
			2.0							20+	
	EOH: 1.00m - Too Dense To Auger		2.2								
			2.4								
			2.6								
			2.8								
			3.0								
			3.2								
			3.4								
			3.6								
			3.8								
			4.0								
			4.2								
			4.4								
			4.6								
			4.8								

REMARKS

End of borehole @ 1.00m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA14 (Lot 7)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOLD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)	
Topsoil	Sandy TOPSOIL, black, moist.		0.0	Groundwater Not Encountered				1	
			0.2					2	
Karioitahi Group	NATURAL; Fine to Medium SAND, grey, loose, dry to moist. 0.3m: Medium Dense. 0.5m: Greyish brown. 1.2m: Trace silt, brown, dense.		0.4					2	
			0.6					3	
			0.8					3	
			1.0					3	
			1.2					4	
			1.4					4	
			1.6					4	
			1.8					4	
			2.0					4	
			2.2					7	
	EOH: 1.30m - Too Dense To Auger		2.4					7	
			2.6				12		
			2.8				20+		
			3.0						
			3.2						
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						

REMARKS
 End of borehole @ 1.30m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM ▼ Standing groundwater level

CHECKED BY: CSH ▽ GW while drilling

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HAND AUGER : HA15 (Lot 8)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)		
Top soil	Sandy TOPSOIL, dark brown, dry.		0.0 - 0.05						0.5	
Kairaitahi Group	NATURAL: Fine to Medium SAND, grey, loose.		0.05 - 0.1	Groundwater Not Encountered					0.5	
			0.1 - 0.2						0.5	
			0.2 - 0.3						0.5	
			0.3 - 0.4						0.5	
			0.4 - 0.5						1	
			0.5 - 0.6						1	
			0.6 - 0.7						2	
			0.7 - 0.8						1	
			0.8 - 0.9						2	
			0.9 - 1.0						3	
			1.0 - 1.1						2	
			1.1 - 1.2						3	
			1.2 - 1.3						2	
			1.3 - 1.4						3	
			1.4 - 1.5						3	
			1.5 - 1.6						4	
			1.6 - 1.7						3	
			1.7 - 1.8						4	
			1.8 - 1.9						5	
			1.9 - 2.0						5	
			2.0 - 2.1						4	
			2.1 - 2.2						5	
			2.2 - 2.3						6	
			2.3 - 2.4						5	
			2.4 - 2.5						6	
			2.5 - 2.6						6	
			2.6 - 2.7						6	
2.7 - 2.8	7									
2.8 - 2.9	6									
2.9 - 3.0										
3.0 - 3.1										
3.1 - 3.2										
3.2 - 3.3										
3.3 - 3.4										
3.4 - 3.5										
3.5 - 3.6										
3.6 - 3.7										
3.7 - 3.8										
3.8 - 3.9										
3.9 - 4.0										
4.0 - 4.1										
4.1 - 4.2										
4.2 - 4.3										
4.3 - 4.4										
4.4 - 4.5										
4.5 - 4.6										
4.6 - 4.7										
4.7 - 4.8										
4.8 - 4.9										
4.9 - 5.0										

EOH: 0.70m - No Recovery Due To Very Loose Sand Falling Back Into Hole

REMARKS

End of borehole @ 0.70m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA16 (Lot 8)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Top soil	Sandy TOPSOIL, dark brown, dry.		0.0 - 0.05					0.5	
Kairiotehi Group	NATURAL: Fine to Medium SAND, yellowish brown, loose, dry.		0.05 - 0.2	Groundwater Not Encountered				0.5	
			0.2 - 0.4					1	
			0.4 - 0.6					1	
			0.6 - 0.8					2	
			0.8 - 1.0					2	
			1.0 - 1.2					3	
			1.2 - 1.4					4	
			1.4 - 1.6					4	
			1.6 - 1.8					4	
			1.8 - 2.0					5	
			2.0 - 2.2					5	
			2.2 - 2.4					5	
			2.4 - 2.6					5	
			2.6 - 2.8					5	
			2.8 - 3.0					6	
			3.0 - 3.2					6	
			3.2 - 3.4					6	
			3.4 - 3.6					7	
			3.6 - 3.8					7	
			3.8 - 4.0					6	
			4.0 - 4.2					6	
			4.2 - 4.4					5	
			4.4 - 4.6					5	
			4.6 - 4.8					6	
	4.8 - 5.0				7				
					9				
					9				
					13				

EOH: 0.60m - No Recovery Due To Very Loose Sand Falling Back Into Hole

REMARKS

End of borehole @ 0.60m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA17 (Lot 9)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Tops oil	Sandy TOPSOIL, dark brown, dry.		0.0					0.5	
Karioitahi Group	NATURAL: Fine to Medium SAND, yellowish brown, dry.		0.2	Groundwater Not Encountered				0.5	
			0.4					1	
			0.6					1	
			0.8					2	
			1.0					1	
			1.2					2	
			1.4					1	
			1.6					3	
			1.8					4	
			2.0					4	
	EOH: 1.00m - Poor Recovery Due To Sidewall Collapse		2.2				5		
			2.4				5		
			2.6				6		
			2.8				6		
			3.0				7		
			3.2				7		
			3.4						
			3.6						
			3.8						
			4.0						
			4.2						
			4.4						
			4.6						
			4.8						

REMARKS
End of borehole @ 1.00m (Target Depth: 3.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP ▼ Standing groundwater level

CHECKED BY: CSH ▽ GW while drilling



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HAND AUGER : HA18 (Lot 9)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY		
Top soil	Sandy TOPSOIL, dark brown, dry.		0.00 - 0.05					0.25	
Kariotiahi Group	Fine to Medium SAND, yellowish brown, loose, dry. 0.5m: Medium dense.		0.05 - 0.10	Groundwater Not Encountered				0.25	
			0.10 - 0.15					0.25	
			0.15 - 0.20					0.25	
			0.20 - 0.25					0.25	
			0.25 - 0.30					4	
			0.30 - 0.35					4	
			0.35 - 0.40					4	
			0.40 - 0.45					4	
			0.45 - 0.50					4	
			0.50 - 0.55					4	
			0.55 - 0.60					4	
			0.60 - 0.65					4	
			0.65 - 0.70					3	
			0.70 - 0.75					3	
			0.75 - 0.80					3	
			0.80 - 0.85					3	
			0.85 - 0.90					3	
			0.90 - 0.95					3	
			0.95 - 1.00					3	
			1.00 - 1.05					3	
1.05 - 1.10	3								
1.10 - 1.15	3								
1.15 - 1.20	3								
1.20 - 1.25	3								
1.25 - 1.30	3								
1.30 - 1.35	3								
1.35 - 1.40	3								
1.40 - 1.45	3								
1.45 - 1.50	3								
1.50 - 1.55	4								
1.55 - 1.60	6								
1.60 - 1.65	7								
1.65 - 1.70	7								
1.70 - 1.75	6								
1.75 - 1.80	5								
1.80 - 1.85	6								
1.85 - 1.90	5								
1.90 - 1.95	5								
1.95 - 2.00	5								
2.00 - 2.05	7								
2.05 - 2.10	6								
2.10 - 2.15	8								
2.15 - 2.20	11								
2.20 - 2.25	9								
2.25 - 2.30	8								
2.30 - 2.35	7								
2.35 - 2.40	6								
2.40 - 2.45	6								
2.45 - 2.50	6								
2.50 - 2.55	6								
2.55 - 2.60	8								
2.60 - 2.65	10								
2.65 - 2.70	14								
2.70 - 2.75	12								
2.75 - 2.80	10								
2.80 - 2.85	8								
2.85 - 2.90	8								
2.90 - 2.95	10								
2.95 - 3.00	9								
3.00 - 3.05	10								
3.05 - 3.10	9								
3.10 - 3.15	10								
3.15 - 3.20	13								
3.20 - 3.25	18								
3.25 - 3.30	20+								
3.30 - 3.35									
3.35 - 3.40									
3.40 - 3.45									
3.45 - 3.50									
3.50 - 3.55									
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3.70 - 3.75									
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3.80 - 3.85									
3.85 - 3.90									
3.90 - 3.95									
3.95 - 4.00									
4.00 - 4.05									
4.05 - 4.10									
4.10 - 4.15									
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4.65 - 4.70									
4.70 - 4.75									
4.75 - 4.80									
4.80 - 4.85									
4.85 - 4.90									
4.90 - 4.95									
4.95 - 5.00									

REMARKS

End of borehole @ 1.20m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

▼ Standing groundwater level

CHECKED BY: CSH

▽ GW while drilling



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HAND AUGER : HA19 (Lot 20)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE			DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY			
Tops oil	Sandy TOPSOIL, dark brown, dry.		0.0	Groundwater Not Encountered				0.5		
	NATURAL: Fine to Medium SAND, grey, loose, dry.							0.5		
Kairaitahi Group					0.2				1	
					0.4				1	
					0.6				2	
					0.8				2	
					1.0				3	
					1.2				3	
					1.4				5	
					1.6				5	
					1.8				6	
					2.0				8	
					2.2				7	
					2.4				7	
					2.6				9	
					2.8				9	
					3.0				10	
					3.2				13	
					3.4				16	
					3.6				20+	
		3.8								
		4.0								
		4.2								
		4.4								
		4.6								
		4.8								
		5.0								
		5.2								
		5.4								
		5.6								
		5.8								
		6.0								
		6.2								
		6.4								
		6.6								
		6.8								
		7.0								
		7.2								
		7.4								
		7.6								
		7.8								
		8.0								
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		10.8								
		11.0								
		11.2								
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		17.8								
		18.0								
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		19.0								
		19.2								
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		22.0								
		22.2								
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		26.0								
		26.2								
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		31.0								
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		41.0								
		41.2								
		41.4								
		41.6								
		41.8								
		42.0								
		42.2								
		42.4								
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		42.8								
		43.0								
		43.2								
		43.4								
		43.6								
		43.8								
		44.0								
		44.2								
		44.4								

HAND AUGER : HA20 (Lot 10)

JOB NO.: 145678 SHEET: 1 OF 1

START DATE: 16/03/2026 NORTHING: GRID:

DIAMETER: 50mm EASTING:

SV DIAL: ELEVATION: Ground

FACTOR: DATUM:

CLIENT: Adams Family Trust

PROJECT: 11-Lot Subdivision

SITE LOCATION: 122 Houhora Heads Road, Pukenui

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE				COMMENTS, SAMPLES, OTHER TESTS	
					PEAK STRENGTH (kPa)	REMOULD STRENGTH (kPa)	SENSITIVITY	DCP - SCALA (Blows / 100mm)		
Tops oil	Sandy TOPSOIL, black, dry.		0.00 - 0.05						0.33	
			0.05 - 0.10						0.33	
Kariōitahi Group	NATURAL: Fine to Medium SAND, grey, loose, dry.		0.10 - 0.20						0.33	
			0.20 - 0.30						1	
	0.5m: Yellowish brown.		0.30 - 0.40						1	
			0.40 - 0.50						1	
	0.8m: Brown.		0.50 - 0.60						2	
			0.60 - 0.70						2	
	1.0m: Medium dense.		0.70 - 0.80						2	
			0.80 - 0.90						2	
			0.90 - 1.00						3	
			1.00 - 1.10						3	
			1.10 - 1.20						3	
			1.20 - 1.30						4	
			1.30 - 1.40						5	
			1.40 - 1.50						5	
			1.50 - 1.60						5	
			1.60 - 1.70						6	
			1.70 - 1.80						7	
			1.80 - 1.90						7	
		1.90 - 2.00						8		
		2.00 - 2.10						9		
		2.10 - 2.20						12		
		2.20 - 2.30						15		
		2.30 - 2.40						20+		
		2.40 - 2.50								
		2.50 - 2.60								
		2.60 - 2.70								
		2.70 - 2.80								
		2.80 - 2.90								
		2.90 - 3.00								
		3.00 - 3.10								
		3.10 - 3.20								
		3.20 - 3.30								
		3.30 - 3.40								
		3.40 - 3.50								
		3.50 - 3.60								
		3.60 - 3.70								
		3.70 - 3.80								
		3.80 - 3.90								
		3.90 - 4.00								
		4.00 - 4.10								
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		4.90 - 5.00								
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		5.90 - 6.00								
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		6.60 - 6.70								
		6.70 - 6.80								
		6.80 - 6.90								
		6.90 - 7.00								
		7.00 - 7.10								
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		7.90 - 8.00								
		8.00 - 8.10								
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		8.70 - 8.80								
		8.80 - 8.90								
		8.90 - 9.00								
		9.00 - 9.10								
		9.10 - 9.20								
		9.20 - 9.30								
		9.30 - 9.40								
		9.40 - 9.50								
		9.50 - 9.60								
		9.60 - 9.70								
		9.70 - 9.80								
		9.80 - 9.90								
		9.90 - 10.00								

REMARKS
End of borehole @ 1.80m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM
CHECKED BY: CSH



Standing groundwater level
 GW while drilling

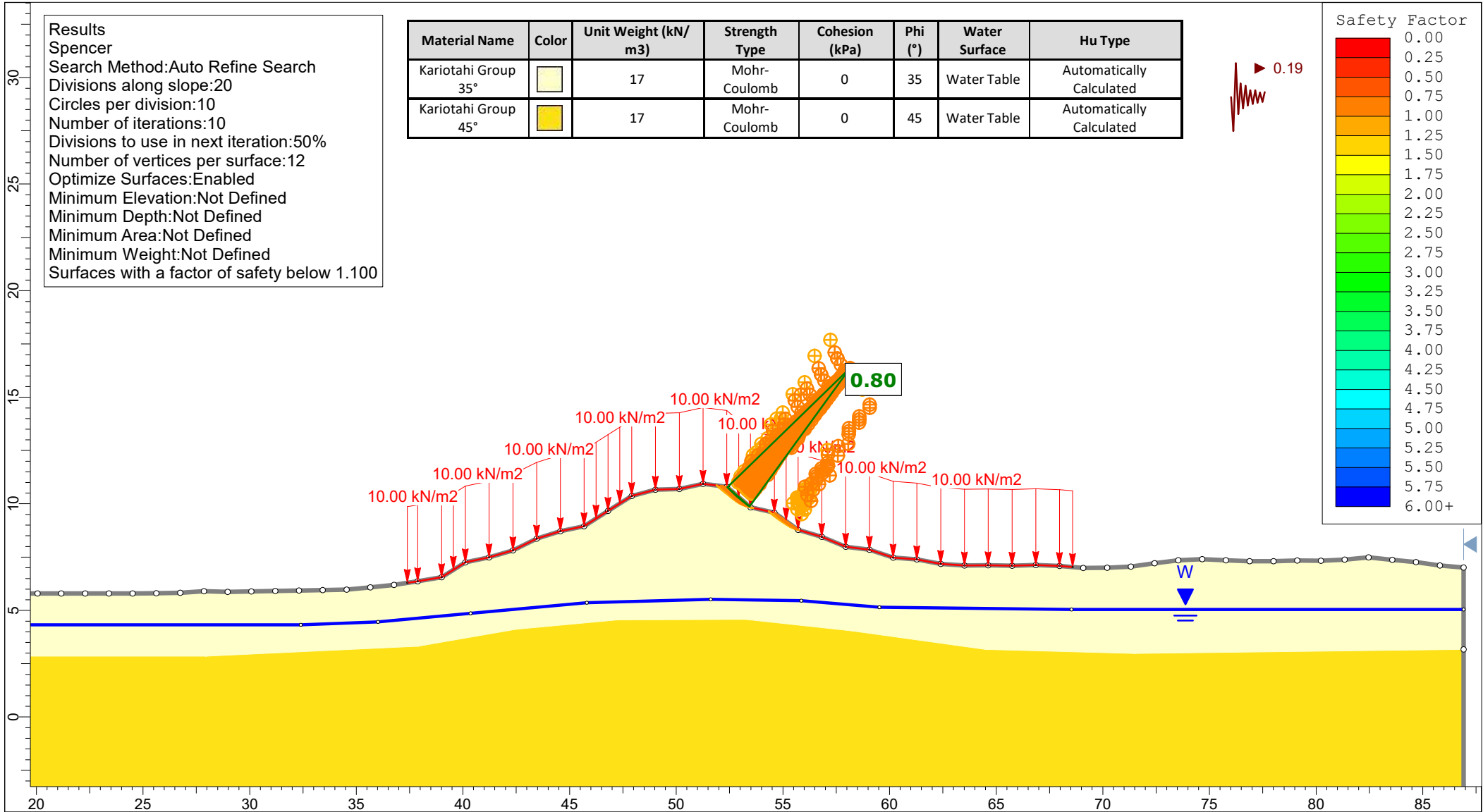
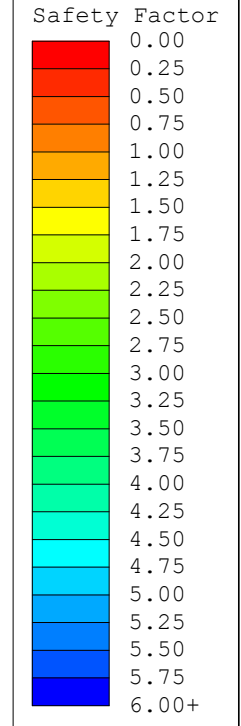


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Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.100

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 35°		17	Mohr-Coulomb	0	35	Water Table	Automatically Calculated
Kariotahi Group 45°		17	Mohr-Coulomb	0	45	Water Table	Automatically Calculated



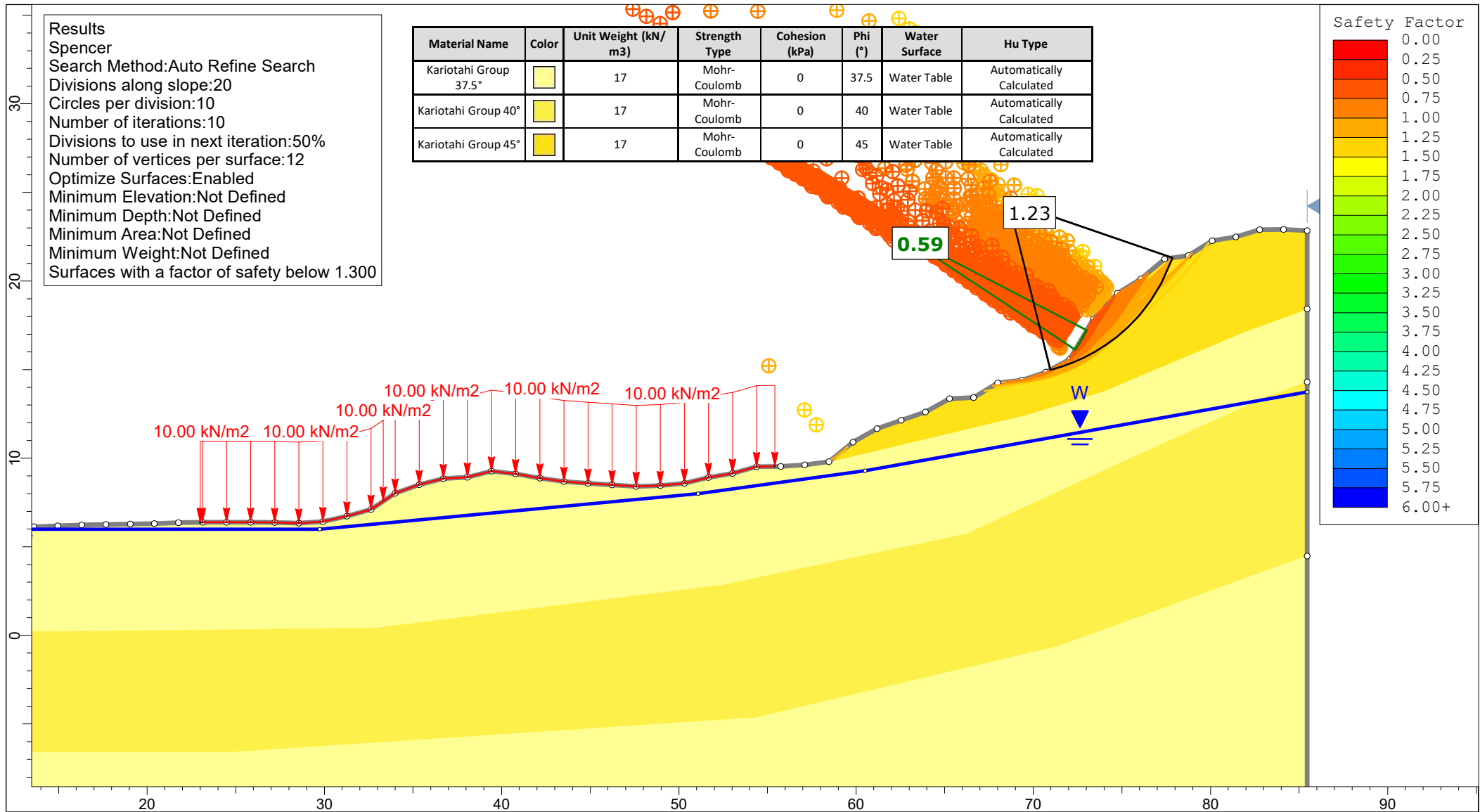
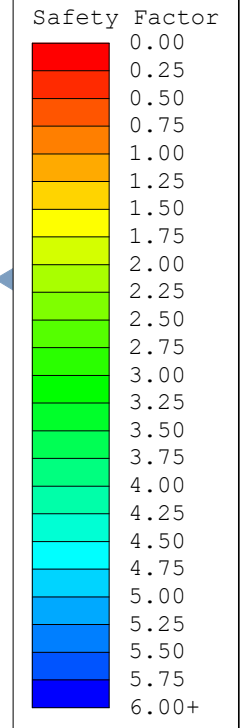
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JOUBERT**

Consulting Engineers

Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section C - C'	Scenario	Measured Groundwater Level - Seismic
Drawn By	A.B	Company	Wilton Joubert Limited
Date	31/03/2026	File Name	145678 - C-C' - Lot 3.slm

Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.300

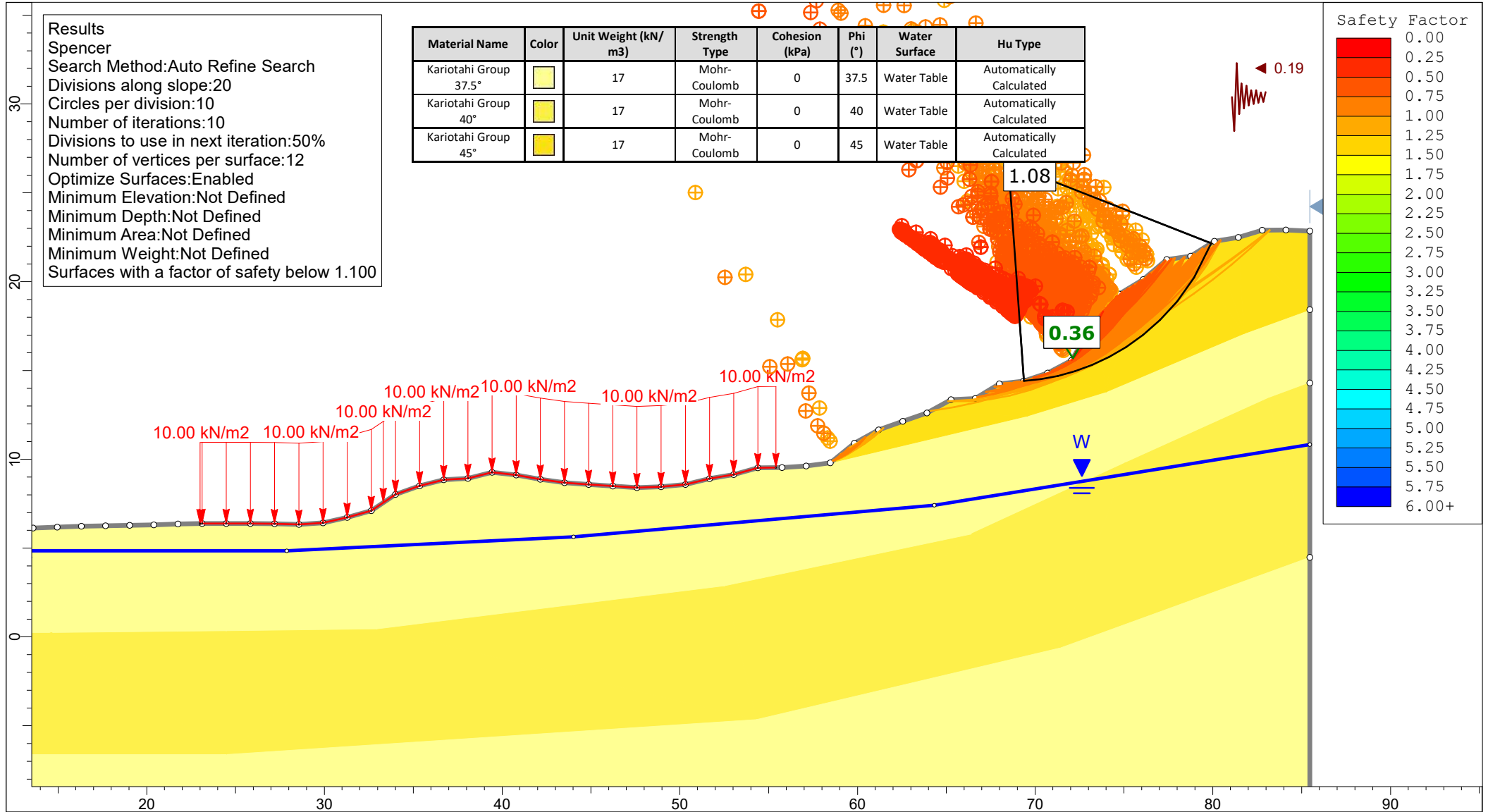
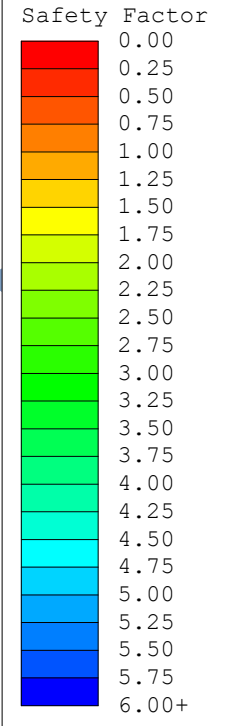
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated
Kariotahi Group 40°		17	Mohr-Coulomb	0	40	Water Table	Automatically Calculated
Kariotahi Group 45°		17	Mohr-Coulomb	0	45	Water Table	Automatically Calculated



Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section D - D'	Scenario	Elevated Groundwater Level
Drawn By	A.B	Company	Wilton Joubert Limited
Date	31/03/2026	File Name	145678 - D-D' - Lot 4.sldm



Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.100

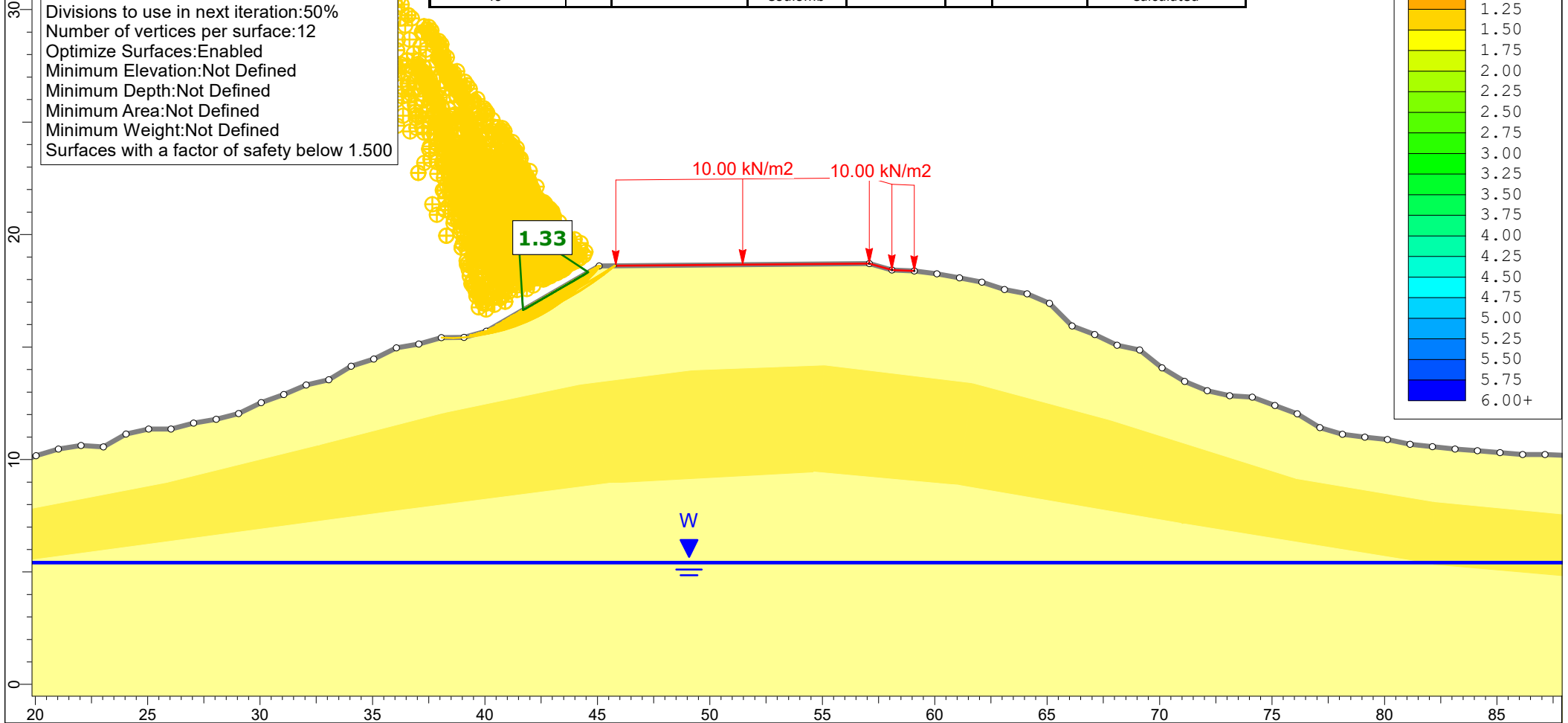
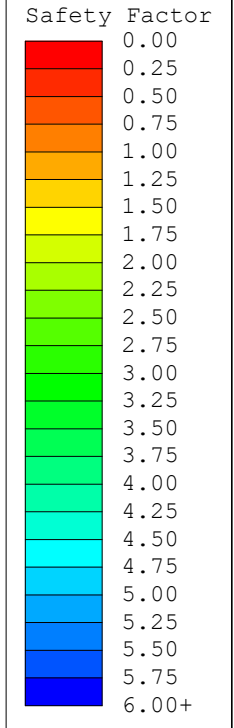
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°	Light Yellow	17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated
Kariotahi Group 40°	Yellow	17	Mohr-Coulomb	0	40	Water Table	Automatically Calculated
Kariotahi Group 45°	Yellow-Green	17	Mohr-Coulomb	0	45	Water Table	Automatically Calculated



Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section D - D'	Scenario	Measured Groundwater Level - Seismic
Drawn By	A.B	Company	Wilton Joubert Limited
Date	31/03/2026	File Name	145678 - D-D' - Lot 4.sldm

Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.500

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated
Kariotahi Group 40°		17	Mohr-Coulomb	0	40	Water Table	Automatically Calculated



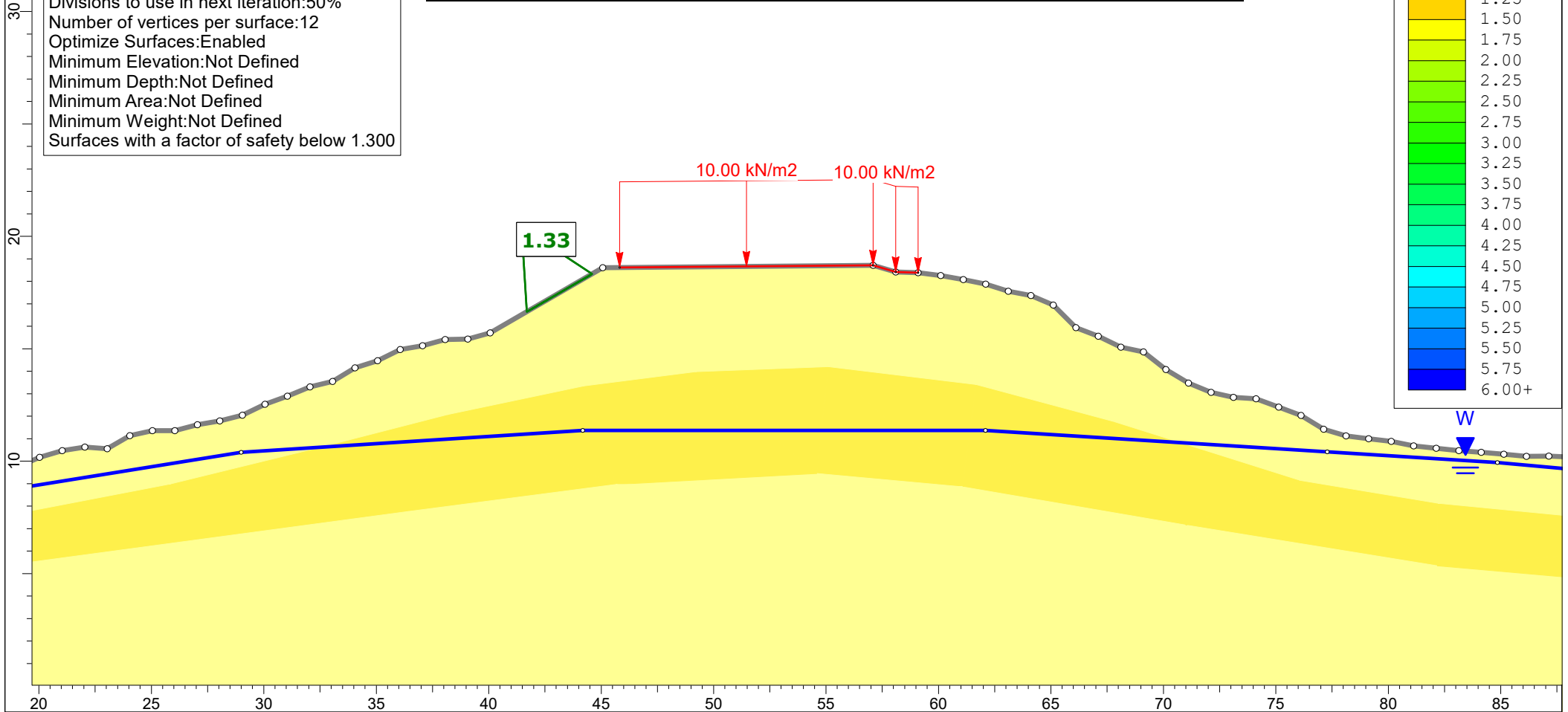
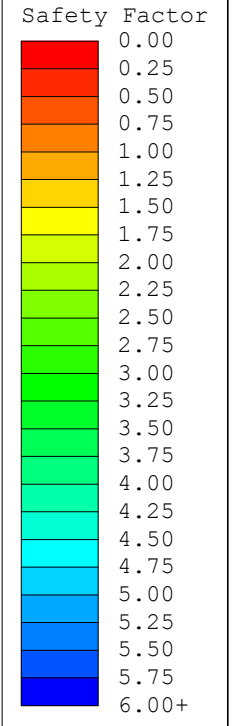
**WILTON
 JOUBERT**

Consulting Engineers

Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section I - I'	Scenario	Measured Groundwater Level
Drawn By	A.B	Company	Wilton Joubert Limited
Date	1/04/2026	File Name	145678 - I-I' - Lot 9.slm



Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.300

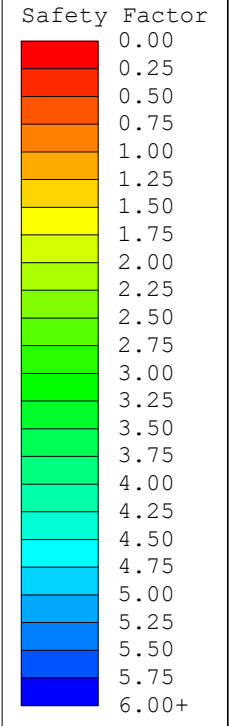
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated
Kariotahi Group 40°		17	Mohr-Coulomb	0	40	Water Table	Automatically Calculated



Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section I - I'	Scenario	Elevated Groundwater Level
Drawn By	A.B	Company	Wilton Joubert Limited
Date	1/04/2026	File Name	145678 - I-I' - Lot 9.slmd

Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.100

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated
Kariotahi Group 40°		17	Mohr-Coulomb	0	40	Water Table	Automatically Calculated




30

20

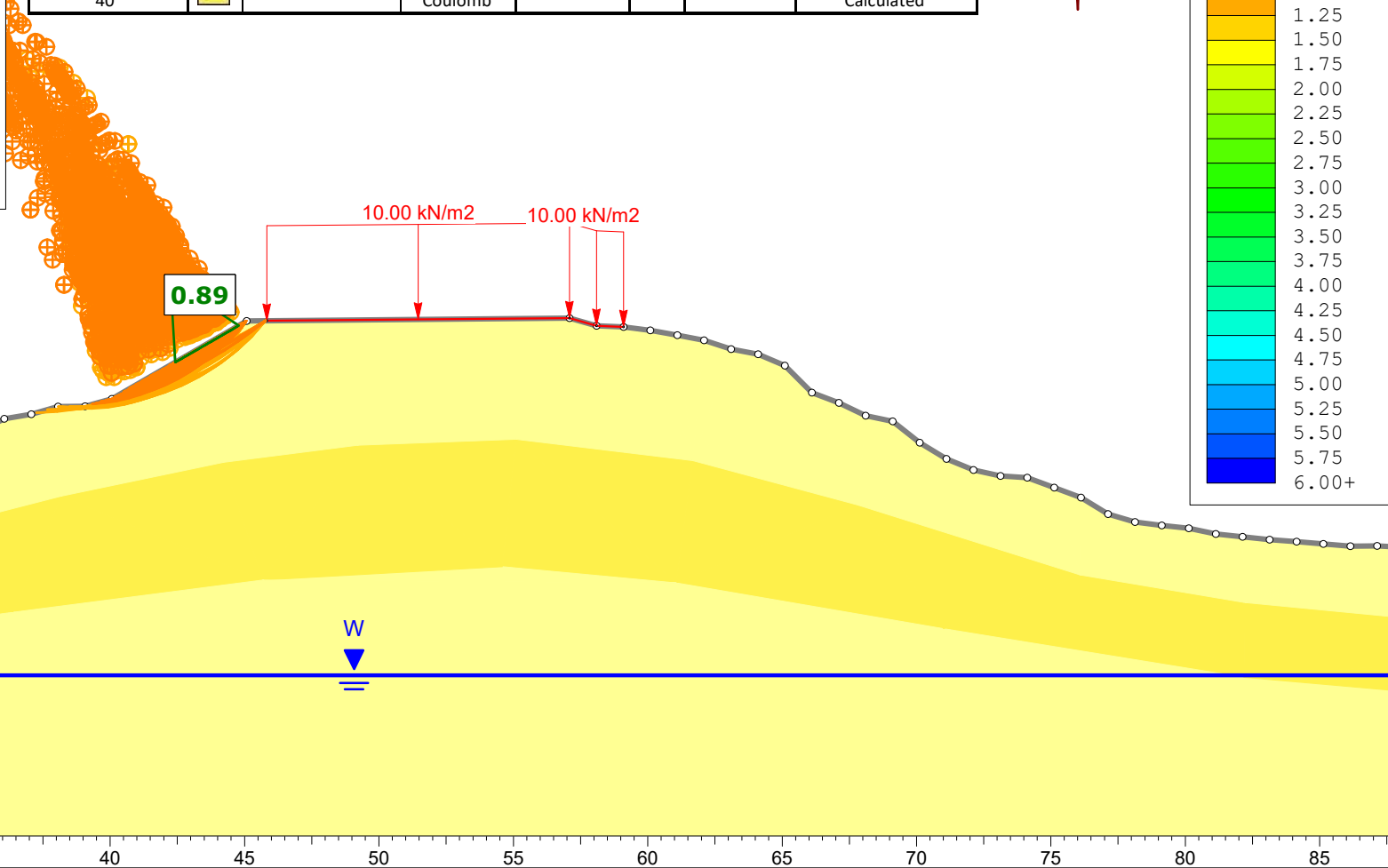
10

0

20 25 30 35 40 45 50 55 60 65 70 75 80 85



 WILTON JOUBERT Consulting Engineers	Project		145678 - 122 Houhora Heads Road, Pukenui		
	Group		Cross Section I - I'	Scenario	Measured Groundwater Level - Seismic
	Drawn By		A.B	Company	Wilton Joubert Limited
	Date		1/04/2026	File Name	145678 - I-I' - Lot 9.slmd

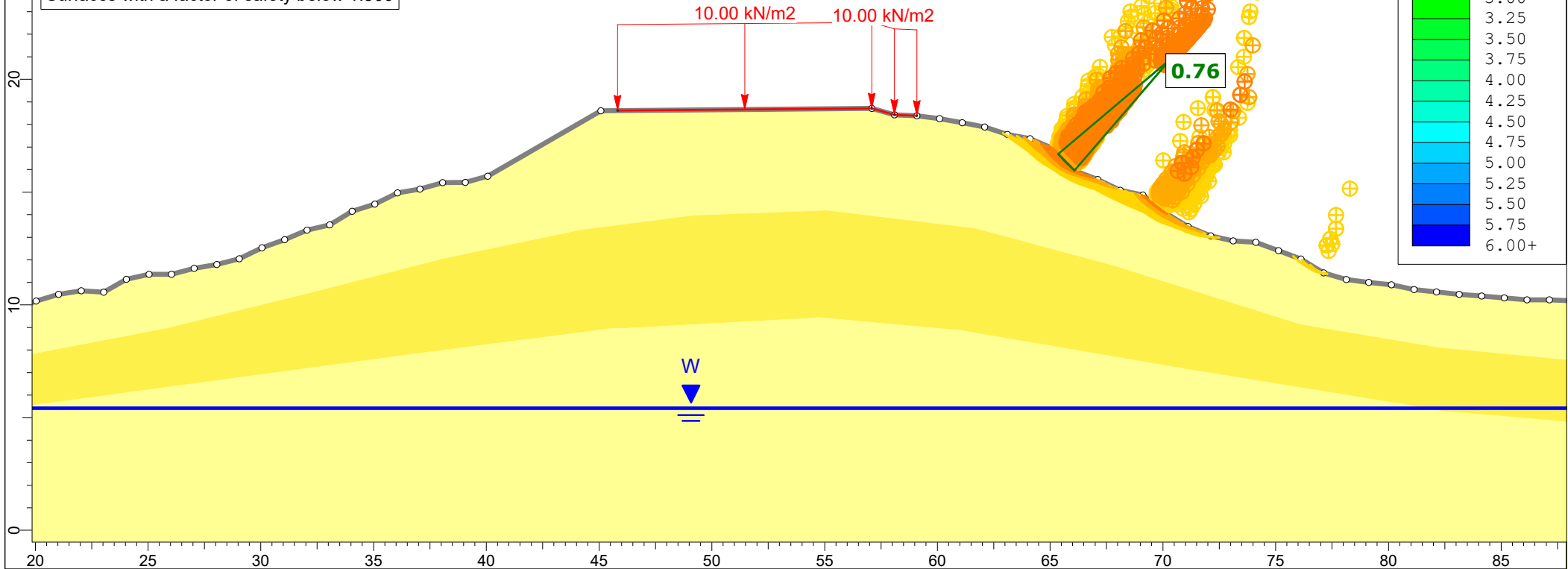
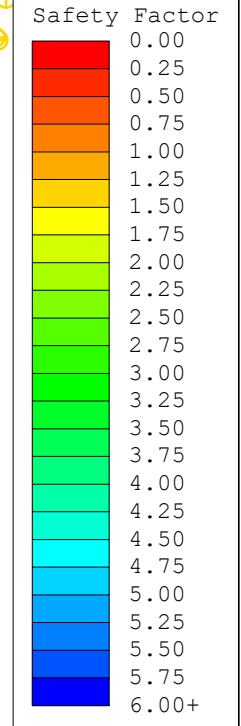
SLIDEINTERPRET 9.040



0.19

Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.500

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated
Kariotahi Group 40°		17	Mohr-Coulomb	0	40	Water Table	Automatically Calculated





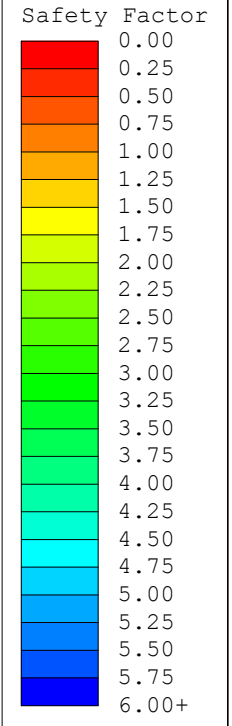
**WILTON
JOUBERT**

Consulting Engineers

Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section I - I'	Scenario	Measured Groundwater Level
Drawn By	A.B	Company	Wilton Joubert Limited
Date	1/04/2026	File Name	145678 - I-I' - Lot 9.slm

Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.300

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated
Kariotahi Group 40°		17	Mohr-Coulomb	0	40	Water Table	Automatically Calculated



30

20

10

20 25 30 35 40 45 50 55 60 65 70 75 80 85

10.00 kN/m² 10.00 kN/m²



0.76

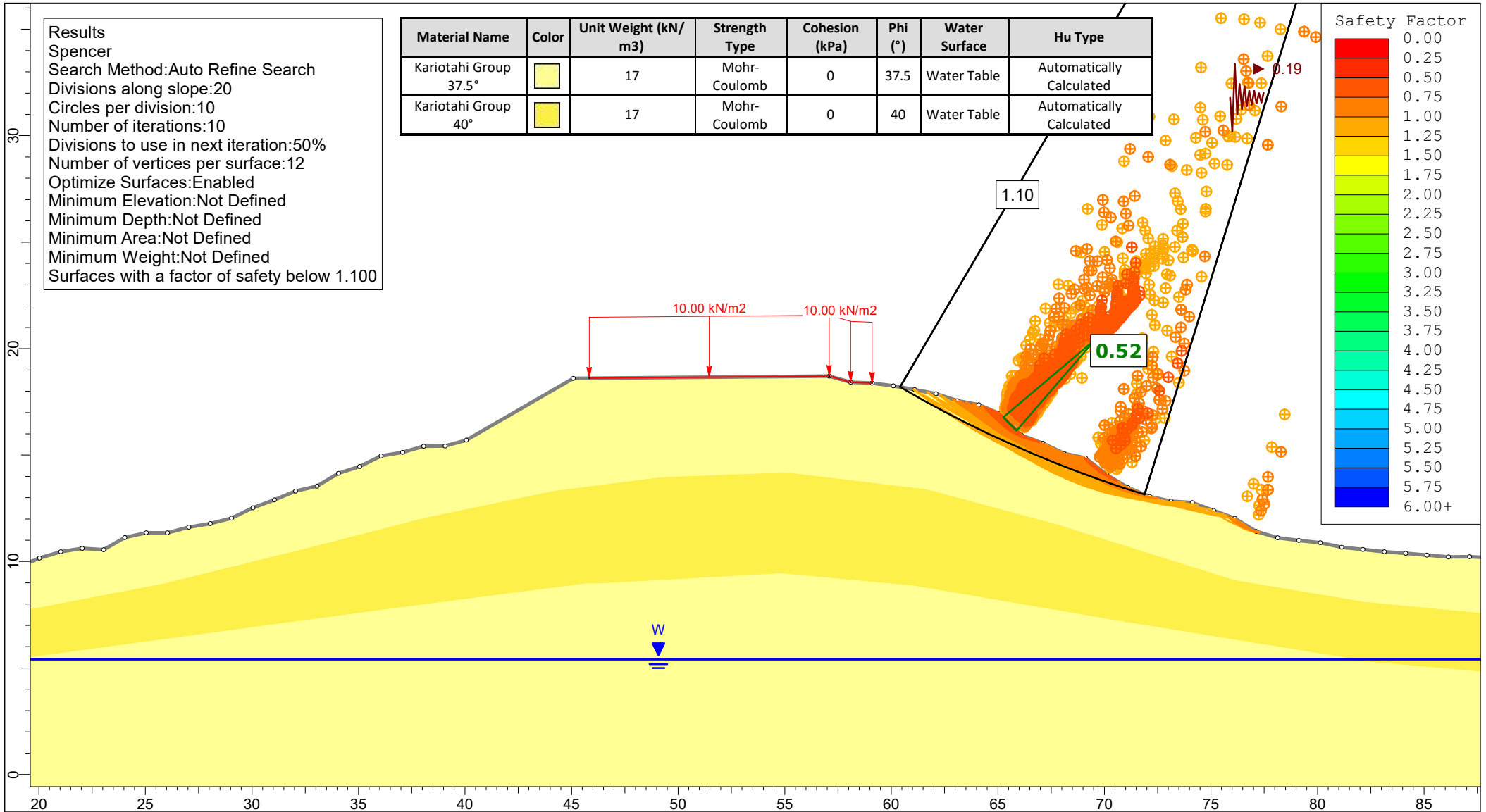
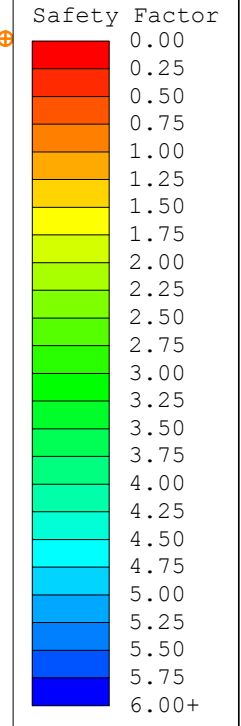
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Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section I - I'	Scenario	Elevated Groundwater Level
Drawn By	A.B	Company	Wilton Joubert Limited
Date	1/04/2026	File Name	145678 - I-I' - Lot 9.slm

Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.100

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated
Kariotahi Group 40°		17	Mohr-Coulomb	0	40	Water Table	Automatically Calculated




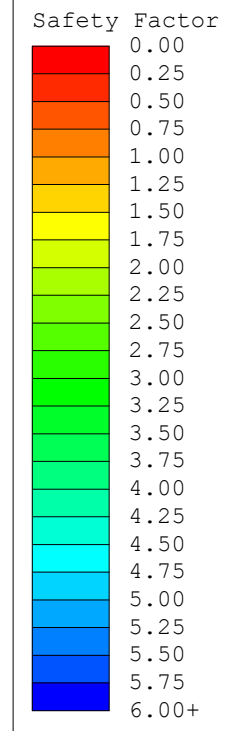
**WILTON
JOUBERT**

Consulting Engineers

Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section I - I'	Scenario	Measured Groundwater Level - Seismic
Drawn By	A.B	Company	Wilton Joubert Limited
Date	1/04/2026	File Name	145678 - I-I' - Lot 9.sldm

Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.500

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated

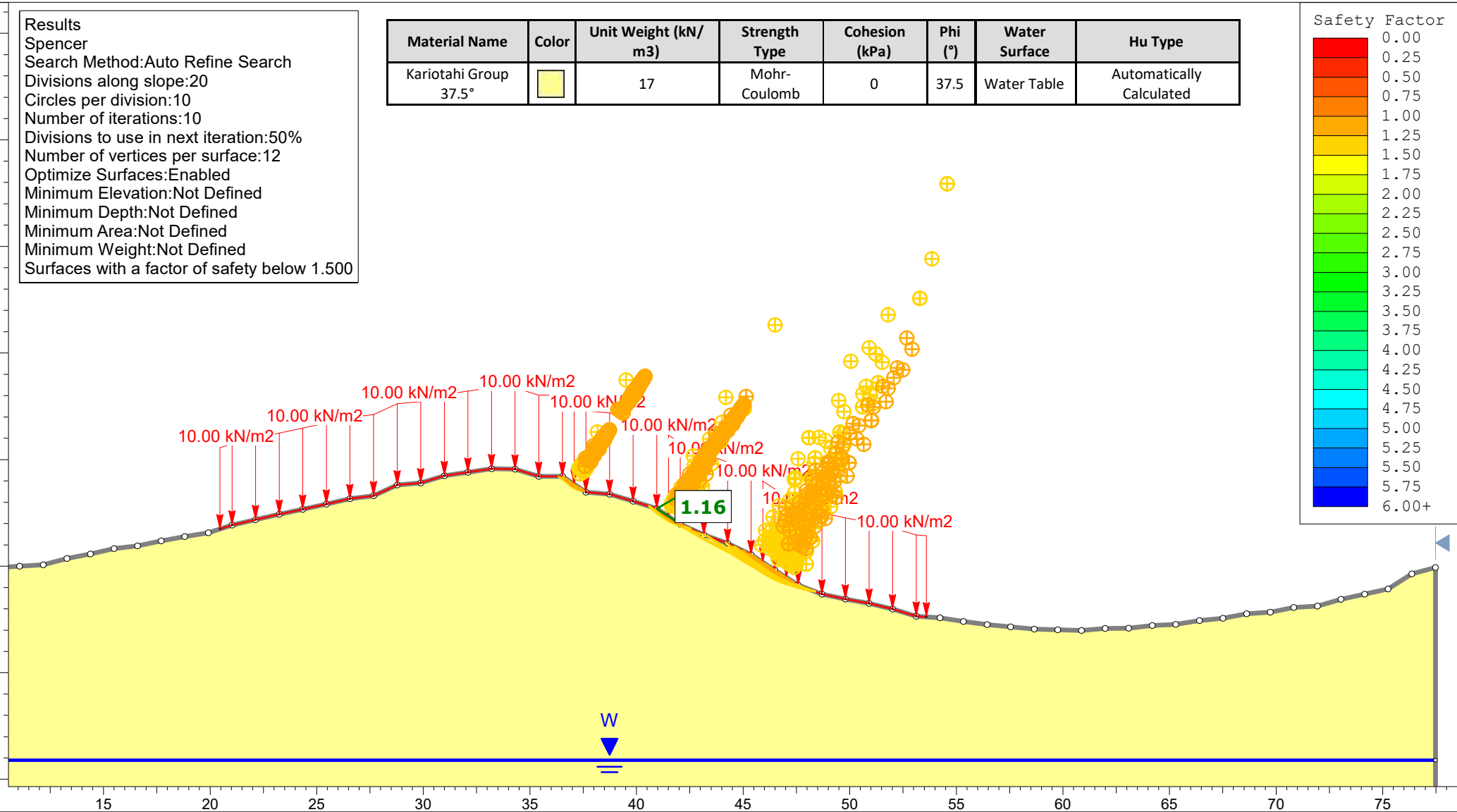


30

20

10


0

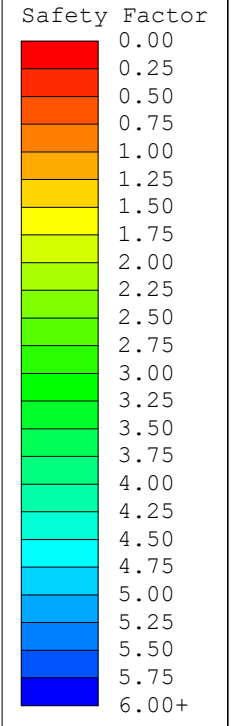


WILTON JOUBERT
 Consulting Engineers

Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section J - J'	Scenario	Measured Groundwater Level
Drawn By	A.B	Company	Wilton Joubert Limited
Date	31/03/2026	File Name	145678 - J-J' - Lot 10.slmd

Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.300

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated



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20

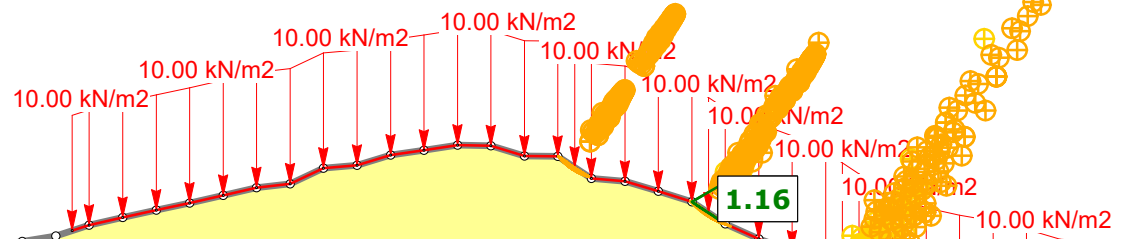
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0

W



1.16




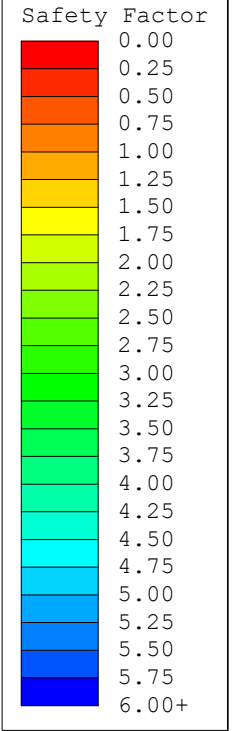
**WILTON
JOUBERT**

Consulting Engineers

Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section J - J'	Scenario	Elevated Groundwater Level
Drawn By	A.B	Company	Wilton Joubert Limited
Date	31/03/2026	File Name	145678 - J-J' - Lot 10.slmd

Results
 Spencer
 Search Method:Auto Refine Search
 Divisions along slope:20
 Circles per division:10
 Number of iterations:10
 Divisions to use in next iteration:50%
 Number of vertices per surface:12
 Optimize Surfaces:Enabled
 Minimum Elevation:Not Defined
 Minimum Depth:Not Defined
 Minimum Area:Not Defined
 Minimum Weight:Not Defined
 Surfaces with a factor of safety below 1.100

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Kariotahi Group 37.5°		17	Mohr-Coulomb	0	37.5	Water Table	Automatically Calculated



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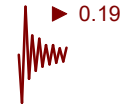
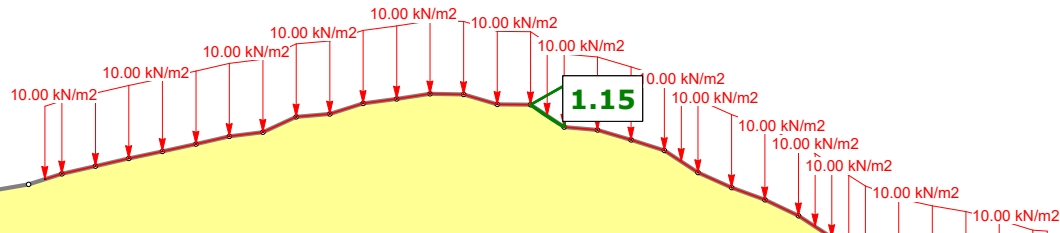
55

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70

75



Consulting Engineers

Project	145678 - 122 Houhora Heads Road, Pukenui		
Group	Cross Section J - J'	Scenario	Measured Groundwater Level - Seismic
Drawn By	A.B	Company	Wilton Joubert Limited
Date	31/03/2026	File Name	145678 - J-J' - Lot 10.slm



CPT Client Engagement / Quote Request

Project Details		Date	16/03/2026
Project Name	Proposed Development	Job Identifier	WJL 122 Houhora Heads Rd
Project Address		122 Houhora Heads Rd	
Engineering Consultant Company Name	Wilton Jubert Ltd	Engineering Project Manager	Shaun Page
Email		Mobile	
Client Name		Client Contact Details	
Test Requirements - CPT		Preferred Job Completion Date	
Target No of CPT Tests Required	10	Maximum Test Depth Required	15m/Refusal
No of CPT Tests Required Through Pavement or Other Hard Surface		Type and Thickness of Hard Surface	
Other Requirements Outside Standard Greenfield Testing			
Please note: Service clearance is to be provided by the client or their agents and details are to be provided to the CPT operator prior to Underground Investigation Ltd commencing work. Any delays due to service clearance or H&S approvals will be at the clients expense and may reduce the amount of testing being able to be completed in the working day.			
Test Requirements - Dissipation Testing		Please List Test No and Approximate Target Depth of Dissipation	
Test No	Depth	Test No	Depth
Please note: In order to provide useful dissipation data, UIL recommends carrying out at least one CPT prior to carrying out dissipation in order to select appropriate depths for testing. It is preferred if the Geotechnical Engineer for the project discusses this with the CPT operator after completion of the initial testing.			
Any Other Site Requirements			



CPT Equipment Information

CPT Rig Type	Geotech AB - Georig 220	Maximum Push Capacity	10/09/2025
Any Deviations From Common Setup		Reaction Restraint	RSE Whirinaki
Cone Penetrometer	RS Eng	Cone Penetrometer Type	Matthew Jacobson
Manufacturer	Geotech AB	Load Cell Configuration	Compression
Tip Area	10cm	Pore Pressure Type	U ₂
Full Scale Output of Sensors	q _c : 100 MPa	f _s : 1 MPa	u ₂ : 2 MPa
Calibration Test Class	13	Saturation Method	20/Refusal
Temperature Sensor	No	Data Interval	10mm
Temperature Conditioning	Cone Warmer set to 20° C	Typical Cone Temperature at Start of Test	16-20° C
Any Deviations From Above			



CPT Test Information

Test Hole Number	CPT01	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	16/03/2026	Operator	CG/TF
Cone Serial Number	5708	Battery Voltage Start	6.09
Cone Area Ratio	0.849	Start Recording	9:30:00 AM
Probe Radius	0.0177	Finish Recording	9:44:00 AM
Date of First Push Current Calibration	21/11/2024	Measured Ground Water Depth	2.3
Metres To Next Calibration	209	Total Penetration Depth (m)	6.042
Depth of Predrill	0	Test ended due to:	<input type="checkbox"/> High Tilt
Depth at Start of Test	0		<input checked="" type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5		<input type="checkbox"/> High Friction
Anchor Depth (Right)	1.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input type="checkbox"/> Target Depth
			<input type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.12%	0.10%	0.64%
End of test with tip loosened	0.02%	0.01%	0.04%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u
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CPT Test Information

Test Hole Number	CPT02	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	16/03/2026	Operator	CG/TF
Cone Serial Number	5959	Battery Voltage Start	6.07
Cone Area Ratio	0.85	Start Recording	10:06:00 AM
Probe Radius	0.0178	Finish Recording	10:29:00 AM
Date of First Push Current Calibration	4/12/2024	Measured Ground Water Depth	collapsed at 4.5m, dry
Metres To Next Calibration	368	Total Penetration Depth (m)	14.57
Depth of Predrill	0	Test ended due to:	<input type="checkbox"/> High Tilt
Depth at Start of Test	0		<input type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5		<input type="checkbox"/> High Friction
Anchor Depth (Right)	1.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input type="checkbox"/> Target Depth
			<input checked="" type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.01%	0.03%	0.24%
End of test with tip loosened	0.03%	0.00%	0.28%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u
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CPT Test Information

Test Hole Number	CPT03	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	16/03/2026	Operator	CG/TF
Cone Serial Number	5801	Battery Voltage Start	6
Cone Area Ratio	0.843	Start Recording	10:48:00 AM
Probe Radius	0.0178	Finish Recording	11:09:00 AM
Date of First Push Current Calibration	17/01/2025	Measured Ground Water Depth	collapsed at 4.0m, dry
Metres To Next Calibration	629	Total Penetration Depth (m)	11.032
Depth of Predrill	0	Test ended due to:	<input type="checkbox"/> High Tilt
Depth at Start of Test	0		<input checked="" type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5		<input type="checkbox"/> High Friction
Anchor Depth (Right)	1.5 > 2.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input type="checkbox"/> Target Depth
			<input checked="" type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.02%	0.00%	0.30%
End of test with tip loosened	0.04%	0.02%	0.40%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u
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CPT Test Information

Test Hole Number	CPT04	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	16/03/2026	Operator	CG/TF
Cone Serial Number	5845	Battery Voltage Start	5.94
Cone Area Ratio	0.857	Start Recording	11:35:00 AM
Probe Radius	0.0179	Finish Recording	11:57:00 AM
Date of First Push Current Calibration	10/09/2025	Measured Ground Water Depth	4.5
Metres To Next Calibration	1029	Total Penetration Depth (m)	15.492
Depth of Predrill	0	Test ended due to:	<input type="checkbox"/> High Tilt
Depth at Start of Test	0		<input type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5		<input type="checkbox"/> High Friction
Anchor Depth (Right)	1.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input checked="" type="checkbox"/> Target Depth
			<input type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.15%	0.07%	0.40%
End of test with tip loosened	0.03%	0.01%	0.16%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u
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CPT Test Information

Test Hole Number	CPT05	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	16/03/2026	Operator	CG/TF
Cone Serial Number	5654	Battery Voltage Start	5.93
Cone Area Ratio	0.832	Start Recording	1:02:00 PM
Probe Radius	0.0179	Finish Recording	1:28:00 PM
Date of First Push Current Calibration	4/02/2026	Measured Ground Water Depth	collapsed at 13.6m, wet
Metres To Next Calibration	1481	Total Penetration Depth (m)	15.175
Depth of Predrill	0	Test ended due to:	<input type="checkbox"/> High Tilt
Depth at Start of Test	0		<input type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5 > 2.5		<input type="checkbox"/> High Friction
Anchor Depth (Right)	1.5 > 2.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input checked="" type="checkbox"/> Target Depth
			<input type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.02%	0.00%	0.14%
End of test with tip loosened	0.03%	0.02%	0.06%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs 13.09	u 11.23 13.09
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CPT Test Information

Test Hole Number	CPT06	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	16/03/2026	Operator	CG/TF
Cone Serial Number	5681	Battery Voltage Start	5.88
Cone Area Ratio	0.867	Start Recording	1:51:00 PM
Probe Radius	0.018	Finish Recording	2:18:00 PM
Date of First Push Current Calibration	17/03/2026	Measured Ground Water Depth	13.8
Metres To Next Calibration	1500	Total Penetration Depth (m)	15.072
Depth of Predrill	0	Test ended due to:	<input type="checkbox"/> High Tilt
Depth at Start of Test	0		<input type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5		<input type="checkbox"/> High Friction
Anchor Depth (Right)	1.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input checked="" type="checkbox"/> Target Depth
			<input type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.00%	0.00%	0.00%
End of test with tip loosened	0.08%	0.02%	0.00%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u
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CPT Test Information

Test Hole Number	CPT07	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	16/03/2026	Operator	CG/TF
Cone Serial Number	5708	Battery Voltage Start	5.86
Cone Area Ratio	0.849	Start Recording	2:56:00 PM
Probe Radius	0.0177	Finish Recording	3:14:00 PM
Date of First Push Current Calibration	21/11/2024	Measured Ground Water Depth	
Metres To Next Calibration	203	Total Penetration Depth (m)	10.04
Depth of Predrill	0	Test ended due to:	<input type="checkbox"/> High Tilt
Depth at Start of Test	0		<input checked="" type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5 > 2.5		<input checked="" type="checkbox"/> High Friction
Anchor Depth (Right)	1.5 > 2.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input type="checkbox"/> Target Depth
			<input checked="" type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.09%	0.10%	0.28%
End of test with tip loosened	0.06%	0.00%	0.44%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u
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CPT Test Information

Test Hole Number	CPT08	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	17/03/2026	Operator	CG/TF
Cone Serial Number	5959	Battery Voltage Start	5.82
Cone Area Ratio	0.85	Start Recording	3:29:00 PM
Probe Radius	0.0178	Finish Recording	3:37:00 PM
Date of First Push Current Calibration	4/12/2024	Measured Ground Water Depth	collapsed at 1.9m, dry
Metres To Next Calibration	354	Total Penetration Depth (m)	4.147
Depth of Predrill	0	Test ended due to:	<input checked="" type="checkbox"/> High Tilt
Depth at Start of Test	0		<input checked="" type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5		<input checked="" type="checkbox"/> High Friction
Anchor Depth (Right)	1.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input type="checkbox"/> Target Depth
			<input checked="" type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.05%	0.05%	0.06%
End of test with tip loosened	0.00%	0.02%	0.72%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u
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CPT Test Information

Test Hole Number	CPT09	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	17/03/2026	Operator	CG/TF
Cone Serial Number	5801	Battery Voltage Start	5.92
Cone Area Ratio	0.843	Start Recording	8:20:00 AM
Probe Radius	0.0178	Finish Recording	8:45:00 AM
Date of First Push Current Calibration	17/01/2025	Measured Ground Water Depth	3.3
Metres To Next Calibration	618	Total Penetration Depth (m)	15.025
Depth of Predrill	0	Test ended due to:	<input type="checkbox"/> High Tilt
Depth at Start of Test	0		<input type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5 > 2.5		<input type="checkbox"/> High Friction
Anchor Depth (Right)	1.5 > 2.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input checked="" type="checkbox"/> Target Depth
			<input type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.01%	0.02%	0.14%
End of test with tip loosened	0.02%	0.05%	0.10%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u
			10.57
			10.58



CPT Test Information

Test Hole Number	CPT10	Job Identifier	WJL 122 Houhora Heads Rd
Test Date	17/03/2026	Operator	CG/TF
Cone Serial Number	5845	Battery Voltage Start	5.84
Cone Area Ratio	0.857	Start Recording	9:00:00 AM
Probe Radius	0.0179	Finish Recording	9:25:00 AM
Date of First Push Current Calibration	10/09/2025	Measured Ground Water Depth	collapsed at 1.2m, dry
Metres To Next Calibration	1014	Total Penetration Depth (m)	15.027
Depth of Predrill	0	Test ended due to:	<input type="checkbox"/> High Tilt
Depth at Start of Test	0		<input type="checkbox"/> High Tip Pressure
Anchor Depth (Left)	1.5 > 2.5		<input type="checkbox"/> High Friction
Anchor Depth (Right)	1.5 > 2.5		<input type="checkbox"/> High Pore Pressure
			<input type="checkbox"/> High Total load
			<input type="checkbox"/> Danger of Rods Buckling
			<input checked="" type="checkbox"/> Target Depth
			<input type="checkbox"/> Anchor Failure

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.05%	0.10%	1.10%
End of test with tip loosened	0.03%	0.00%	0.04%

Dissipation Testing

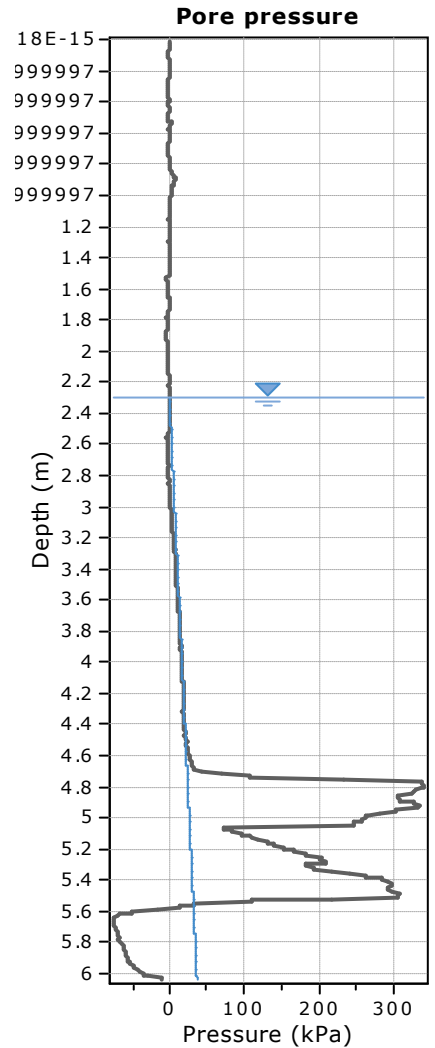
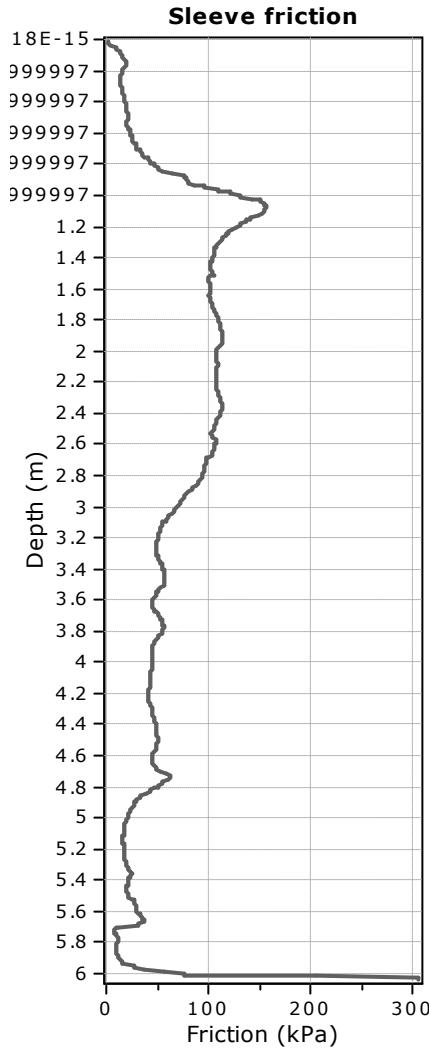
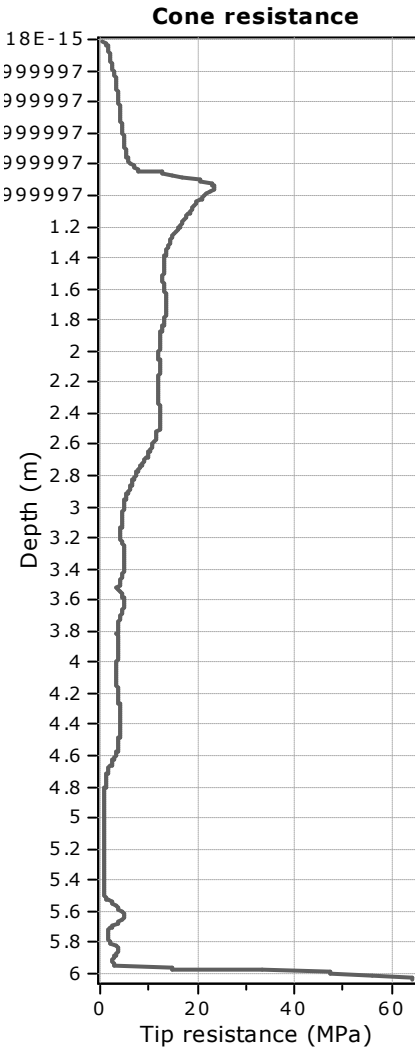
Test No	Depth (m)	Duration (secs)	Comments

Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u
--	----	----	---

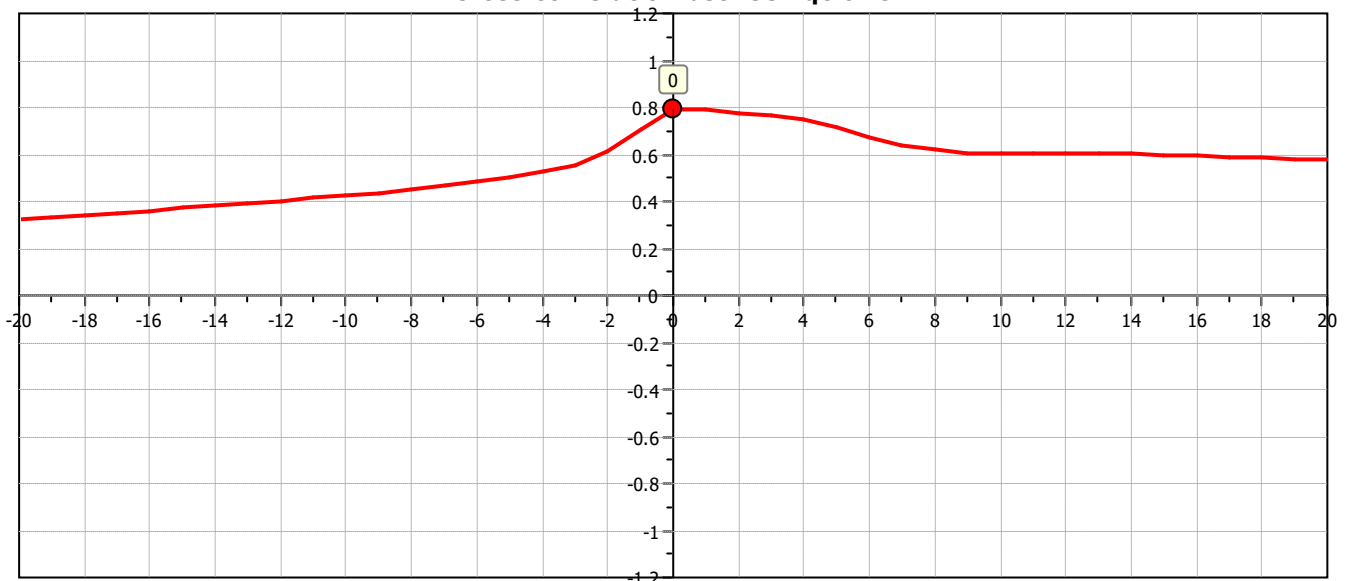
Project:

Location:



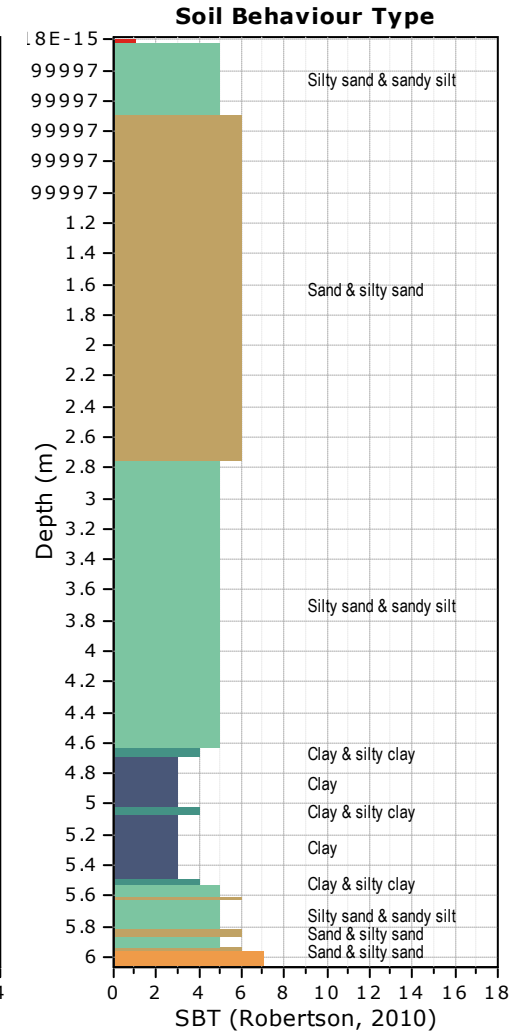
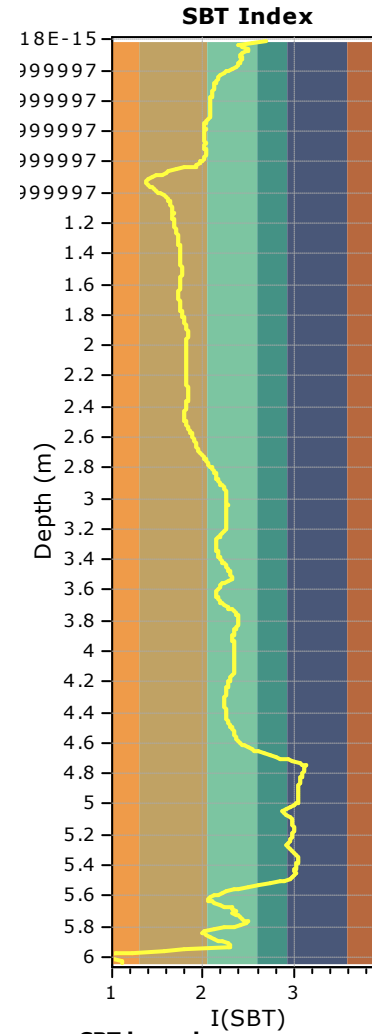
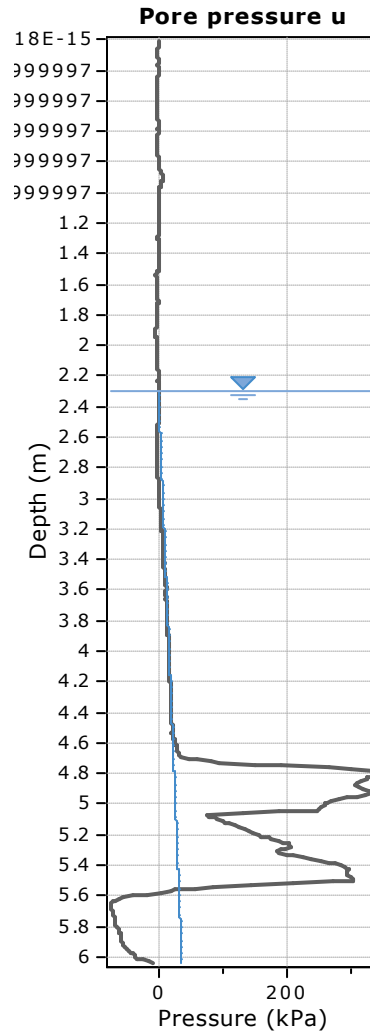
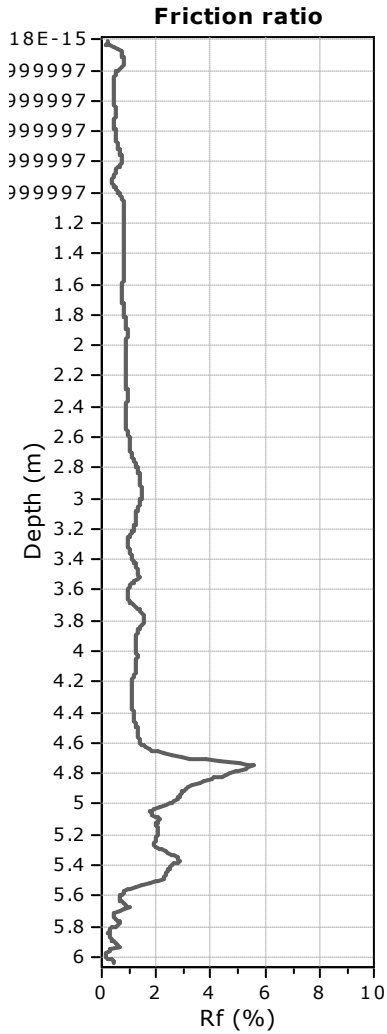
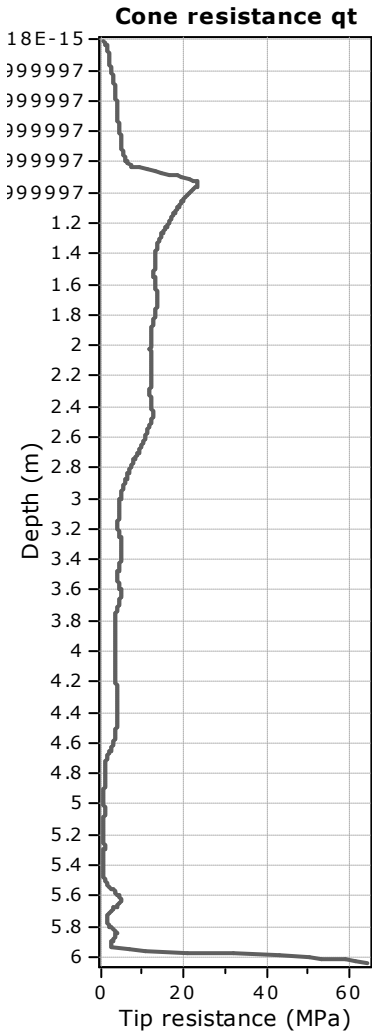
The plot below presents the cross correlation coefficient between the raw q_c and f_s values (as measured on the field). X axes presents the lag distance (one lag is the distance between two successive CPT measurements).

Cross correlation between q_c & f_s



Project:

Location:

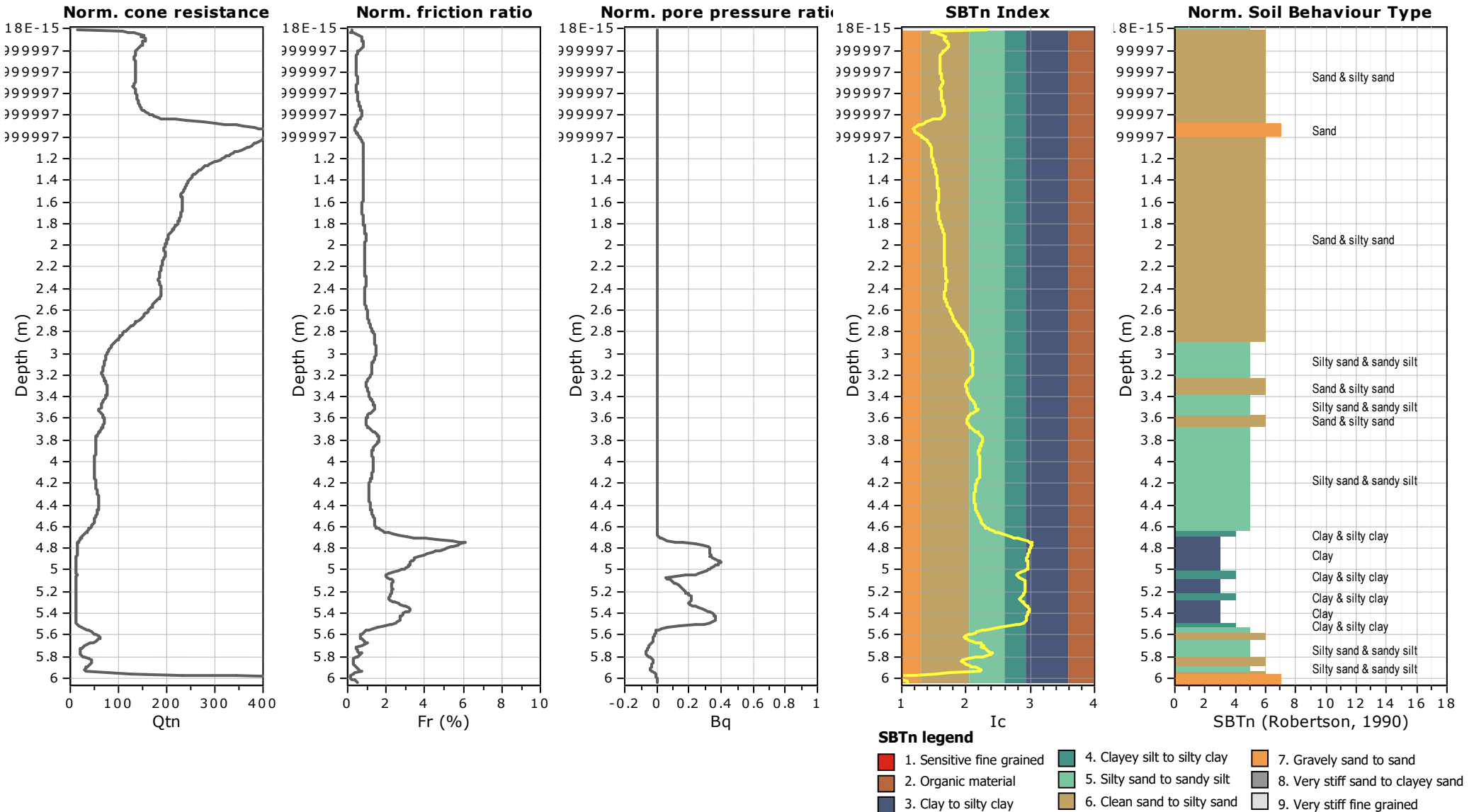


SBT legend

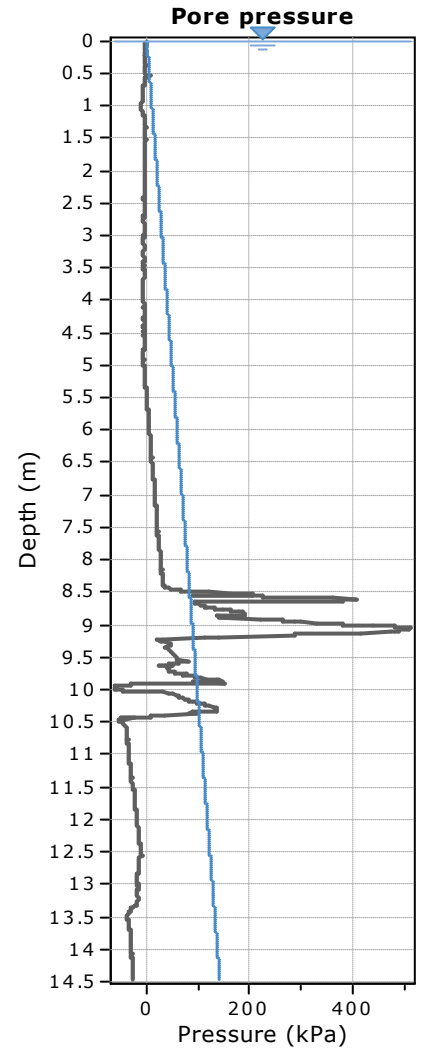
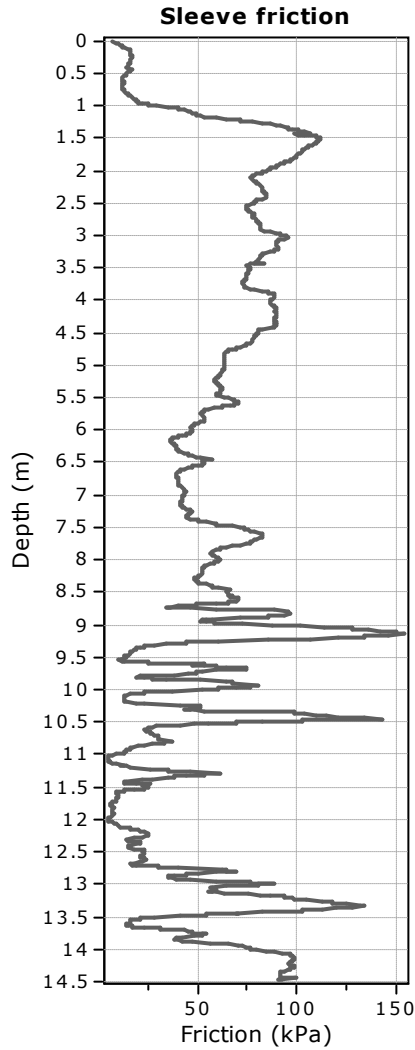
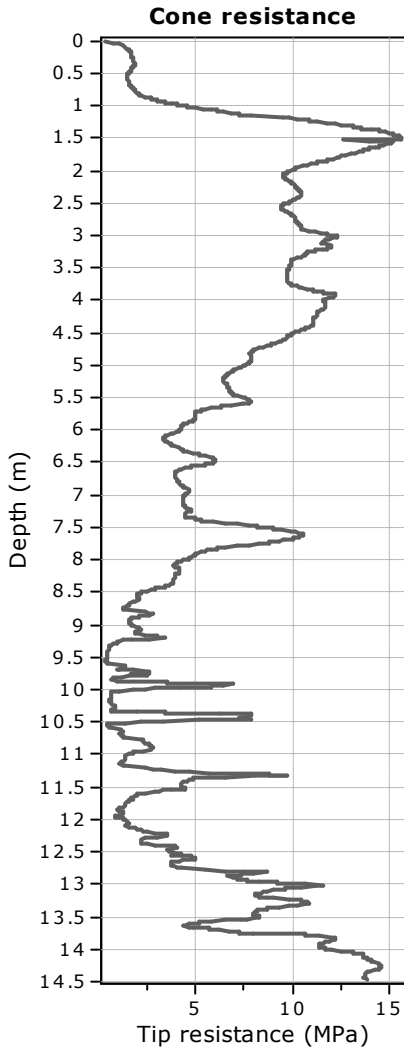
- | | | |
|---|---|---|
| ■ 1. Sensitive fine grained | ■ 4. Clayey silt to silty clay | ■ 7. Gravely sand to sand |
| ■ 2. Organic material | ■ 5. Silty sand to sandy silt | ■ 8. Very stiff sand to clayey sand |
| ■ 3. Clay to silty clay | ■ 6. Clean sand to silty sand | ■ 9. Very stiff fine grained |

Project:

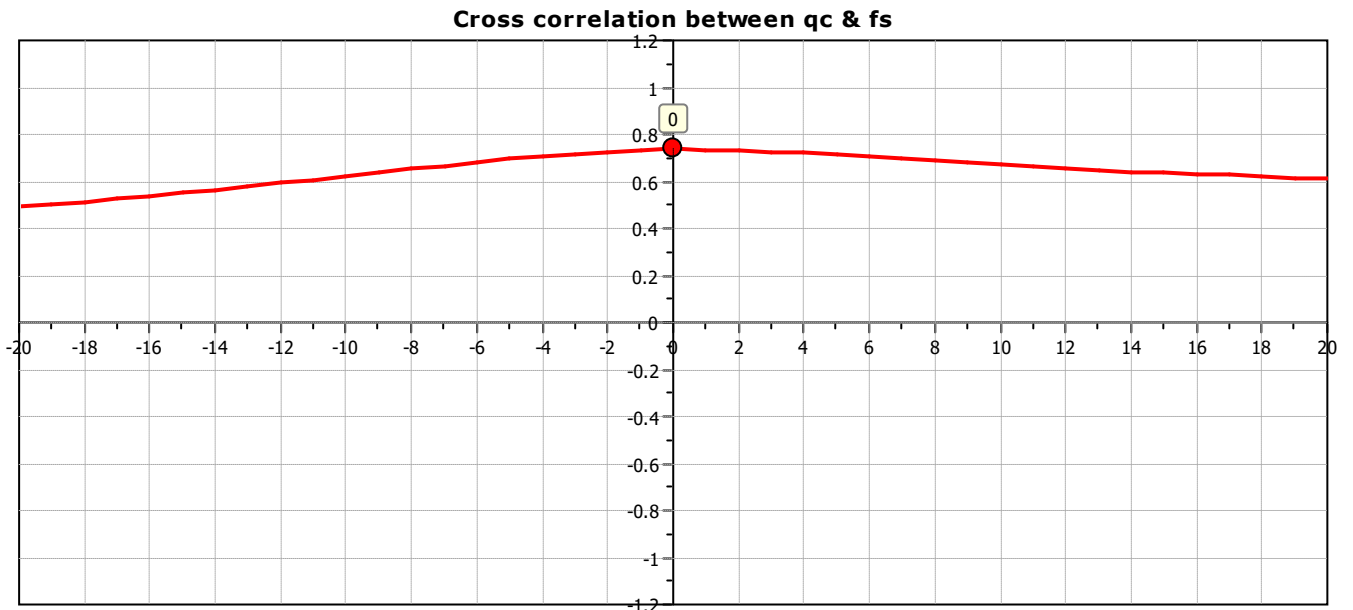
Location:



Project:
Location:

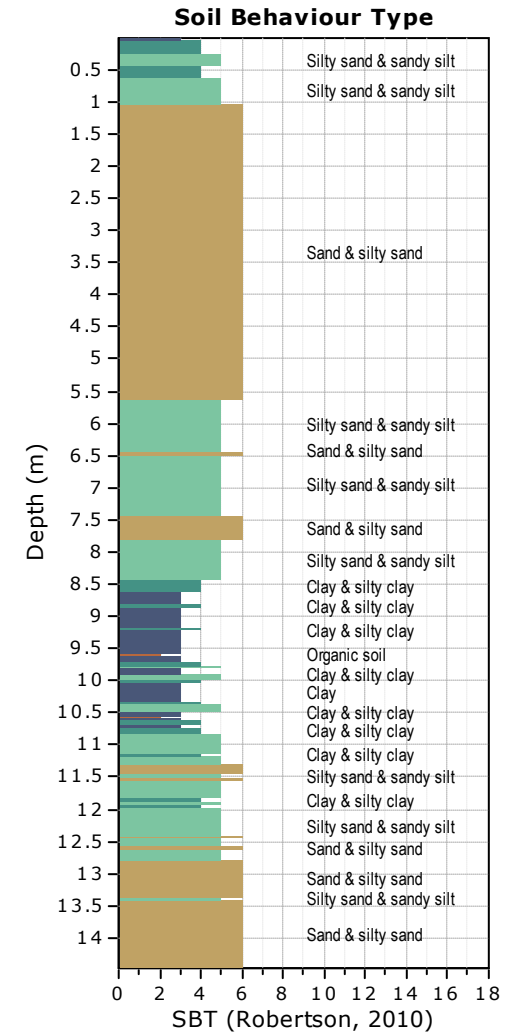
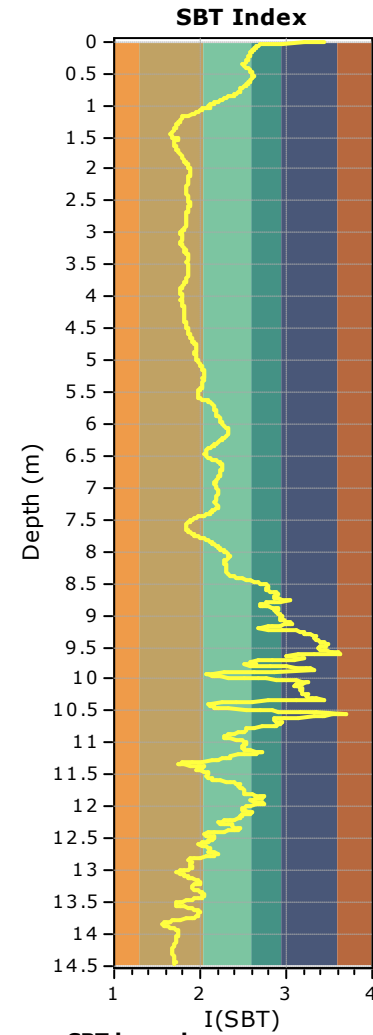
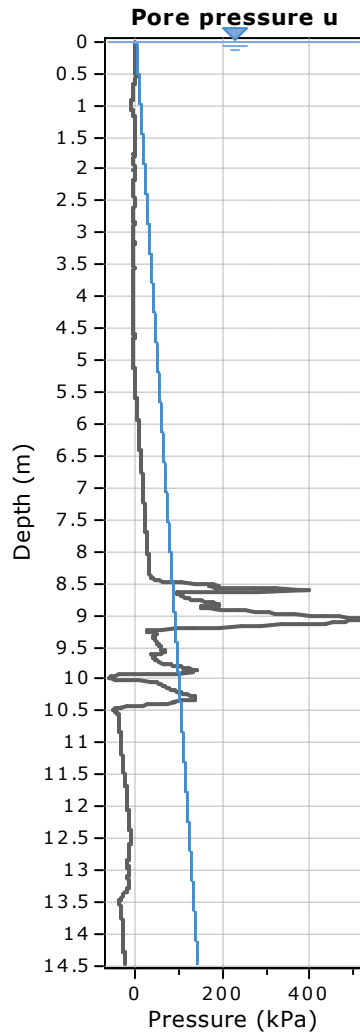
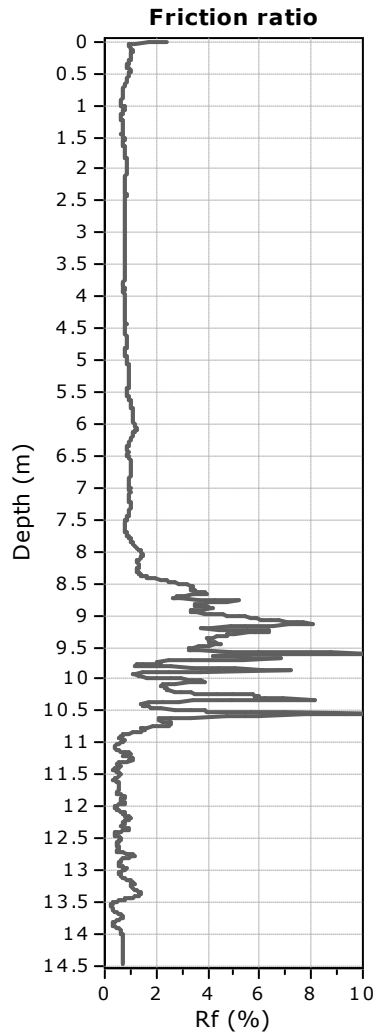
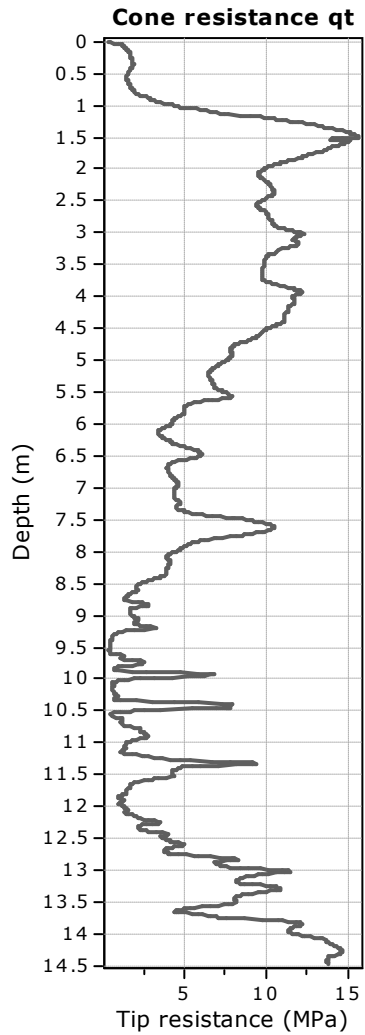


The plot below presents the cross correlation coefficient between the raw q_c and f_s values (as measured on the field). X axes presents the lag distance (one lag is the distance between two successive CPT measurements).



Project:

Location:

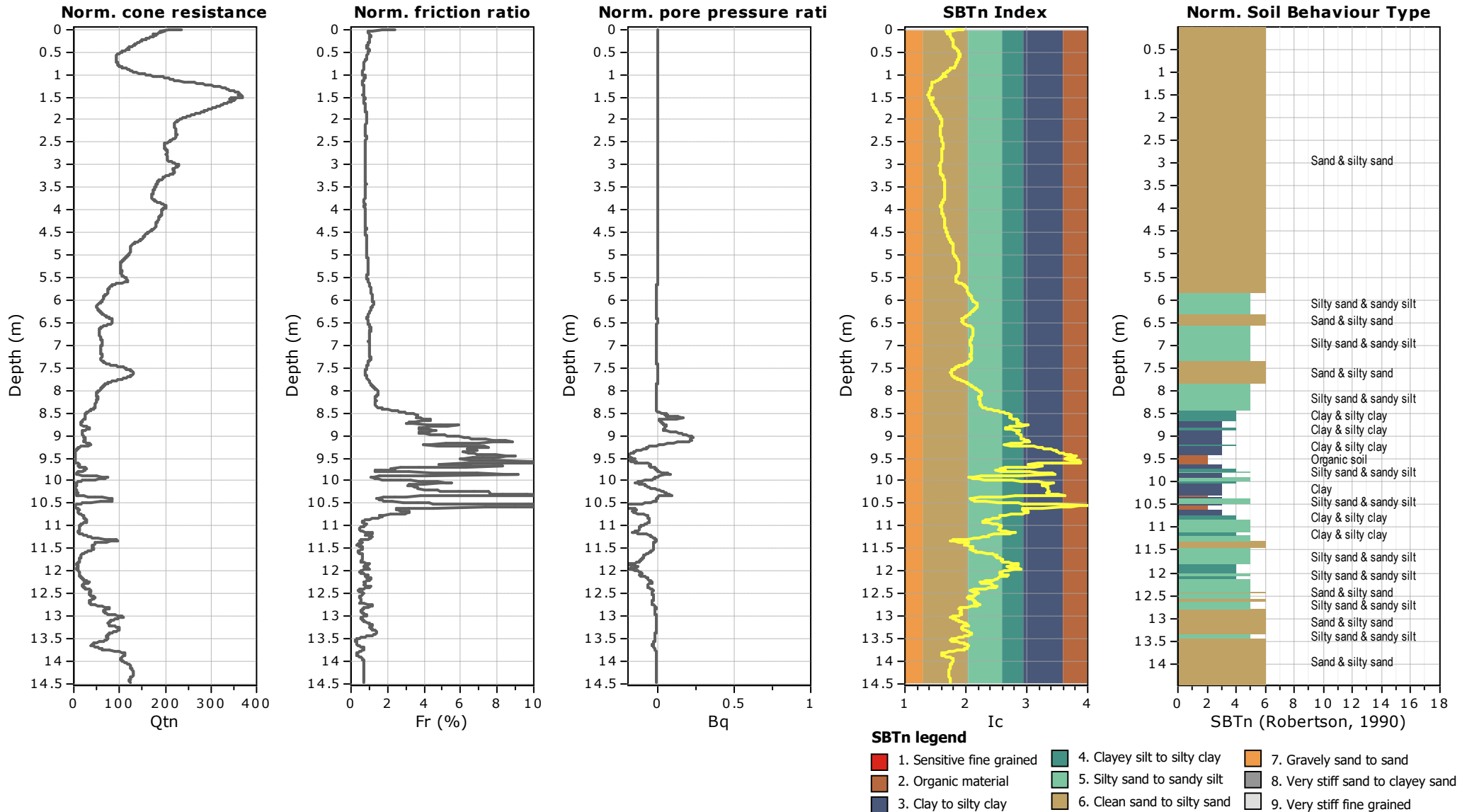


SBT legend

- | | | |
|--|---|---|
| ■ 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 |

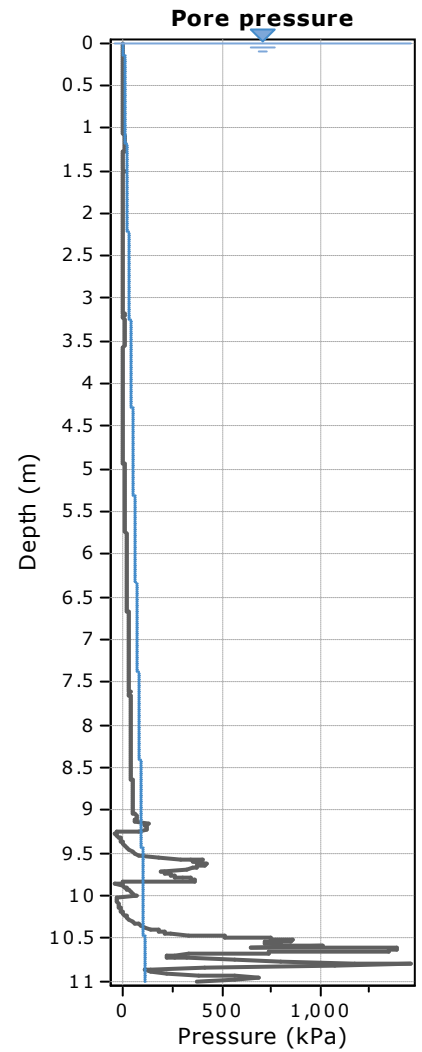
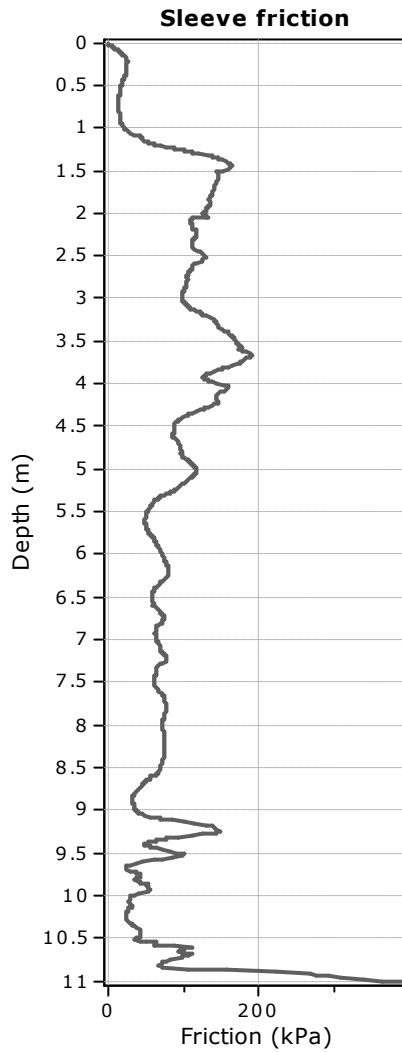
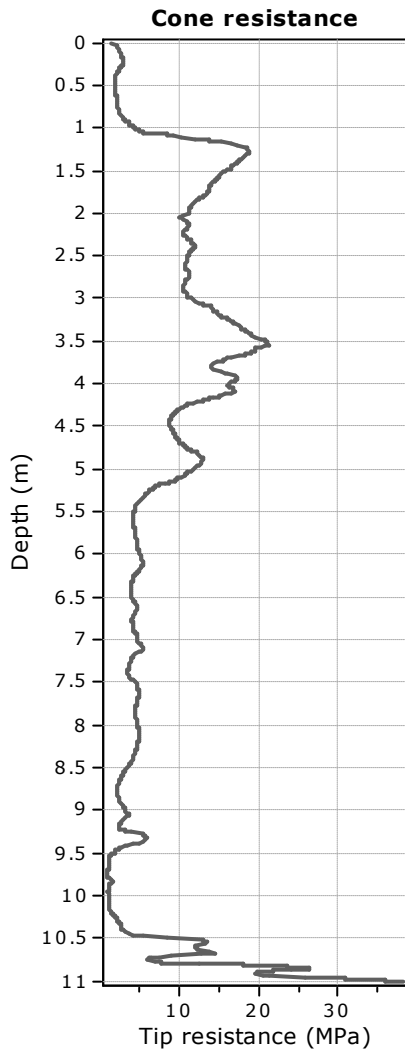
Project:

Location:

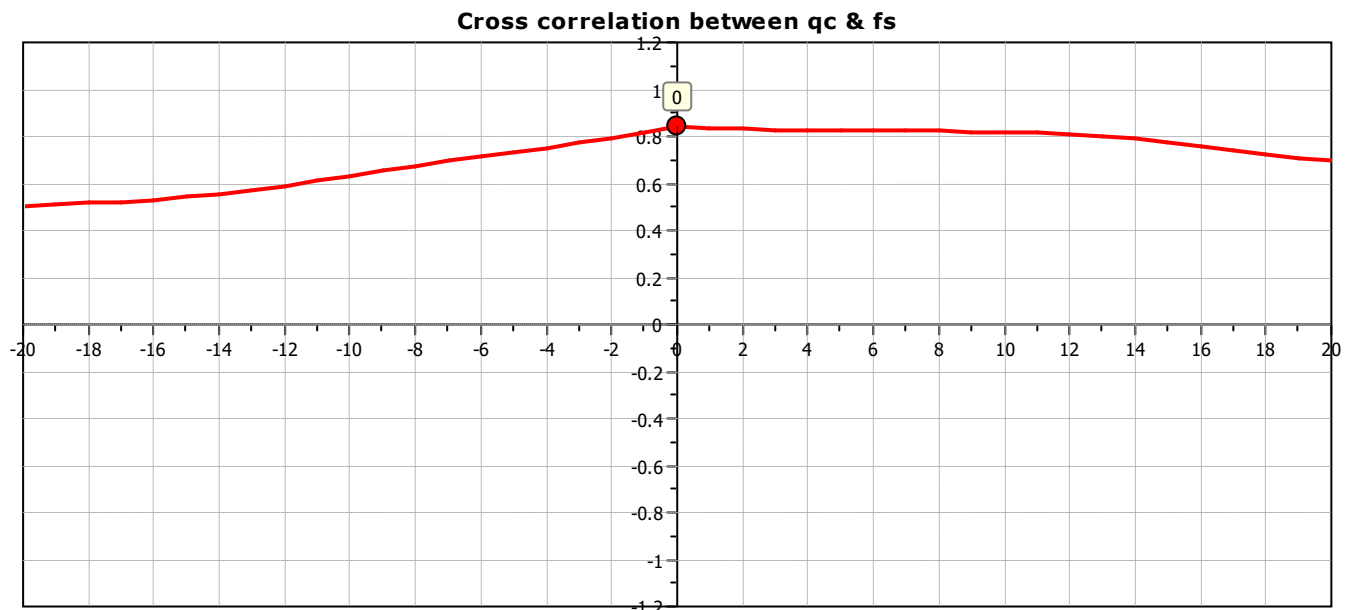


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Location:

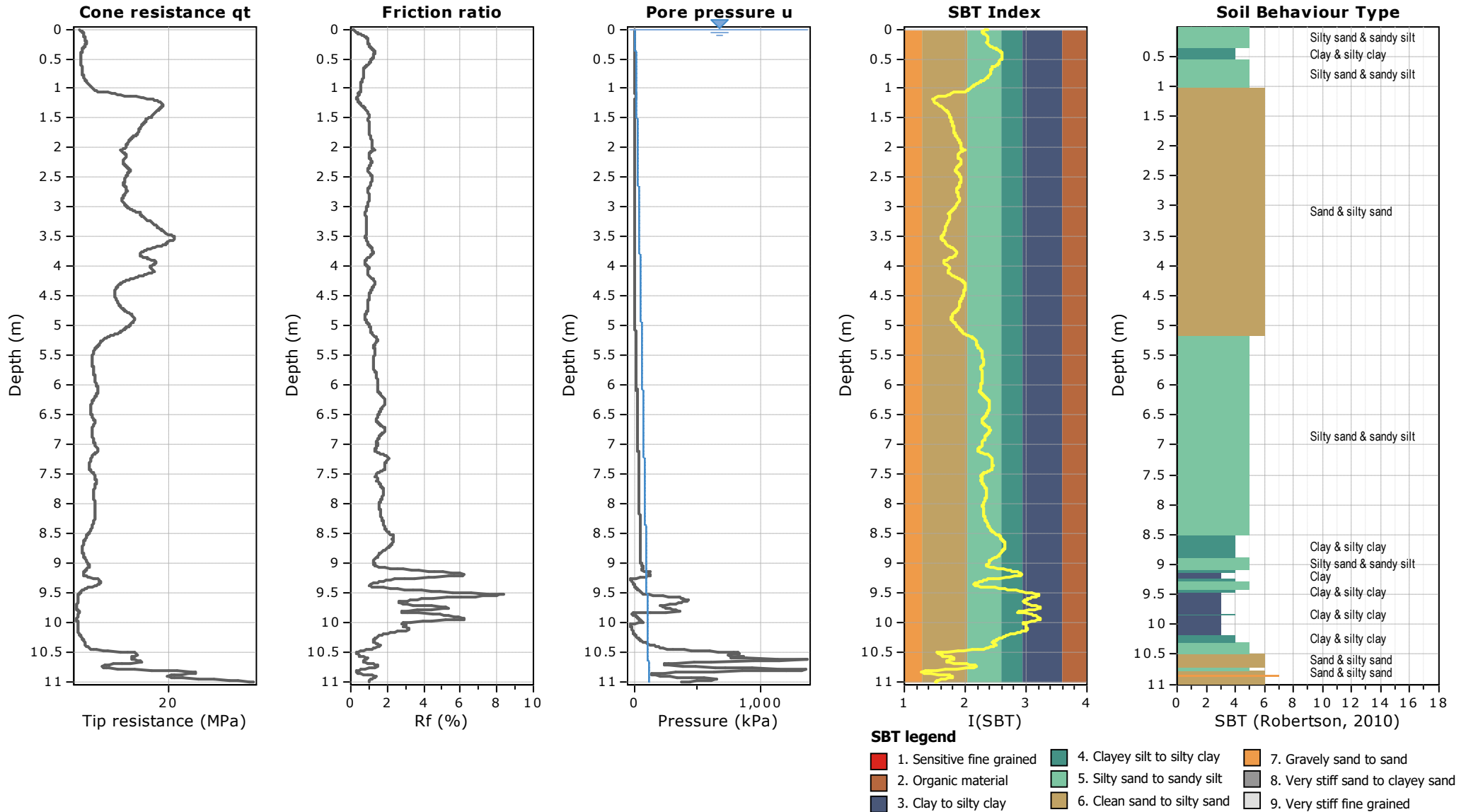


The plot below presents the cross correlation coefficient between the raw q_c and f_s values (as measured on the field). X axes presents the lag distance (one lag is the distance between two successive CPT measurements).



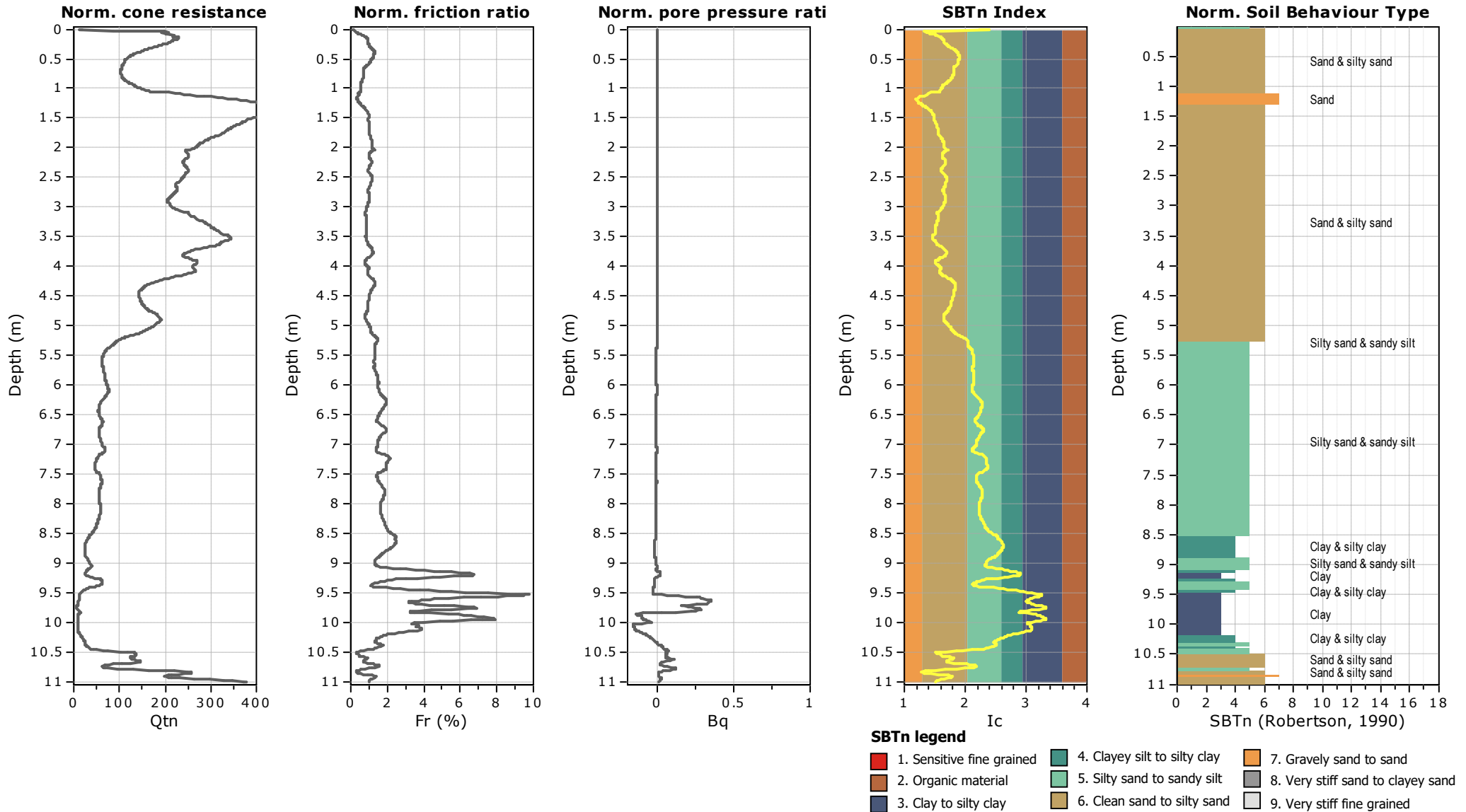
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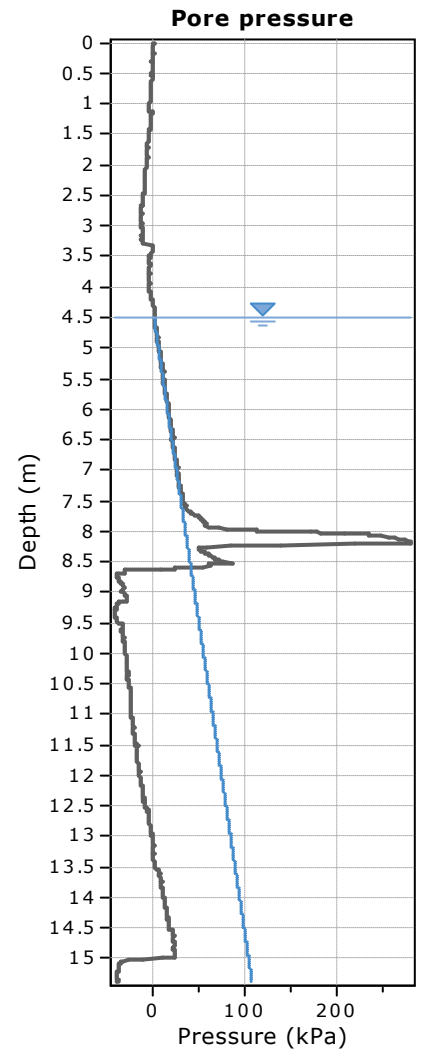
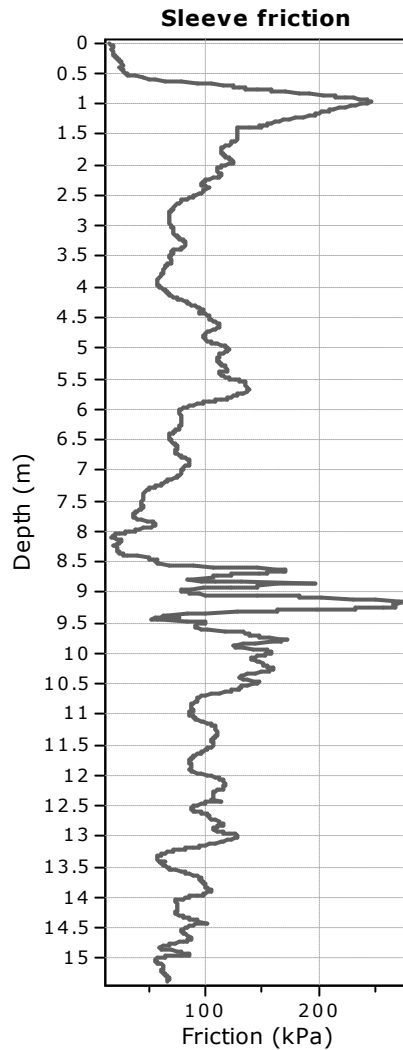
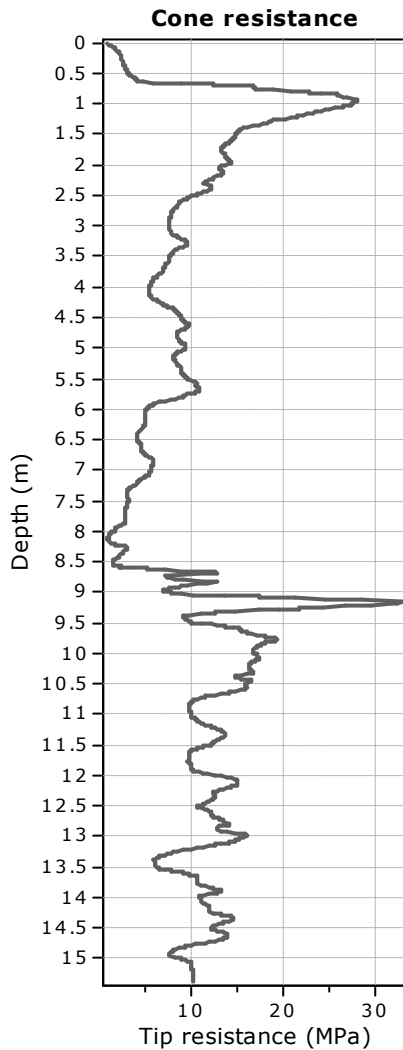
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Location:

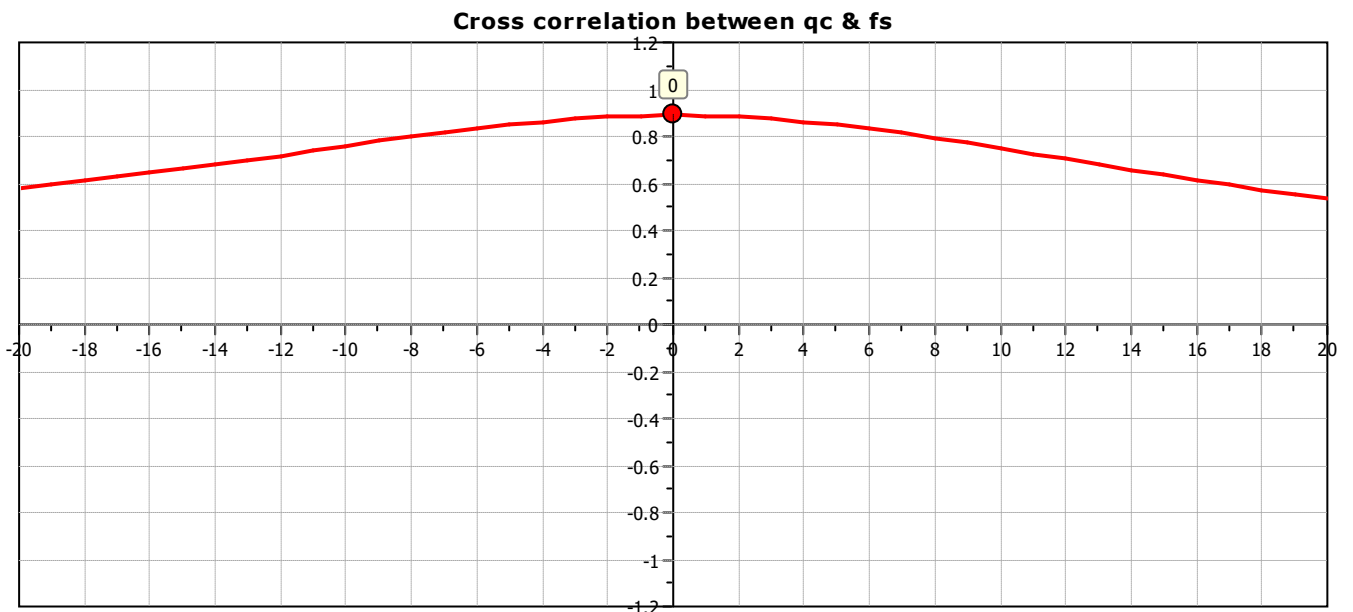


Project:

Location:

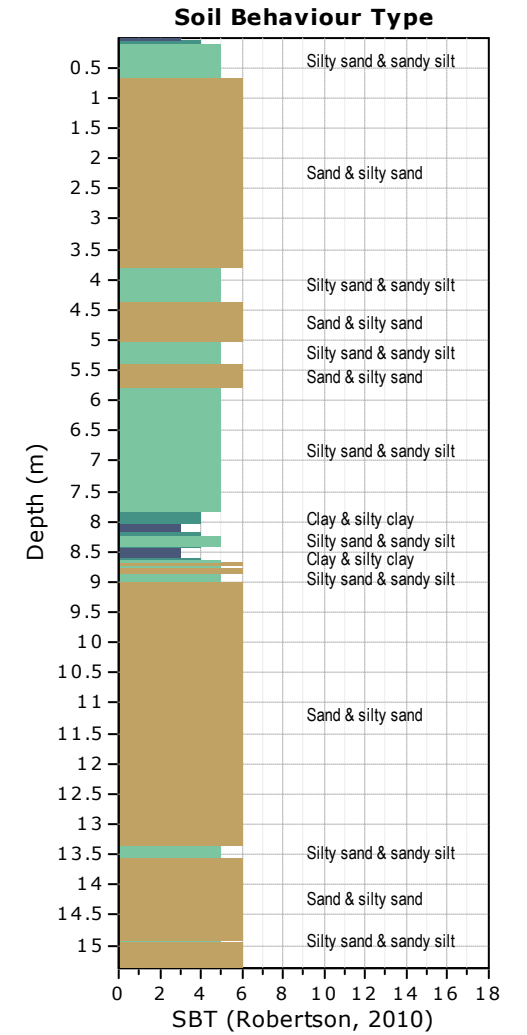
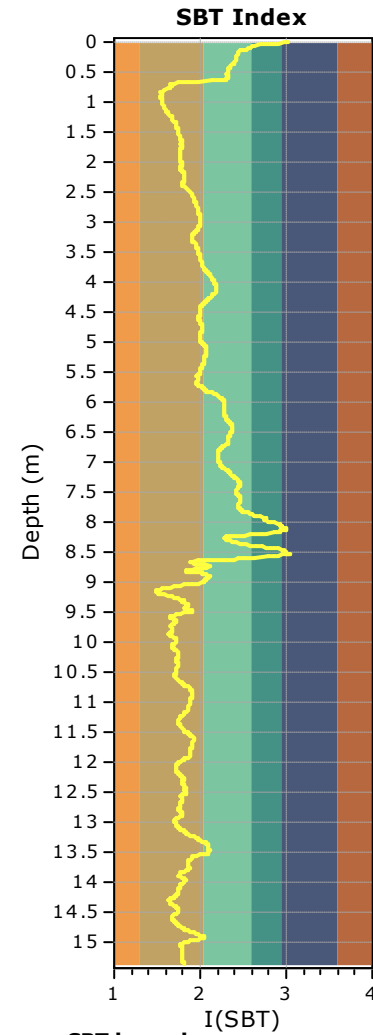
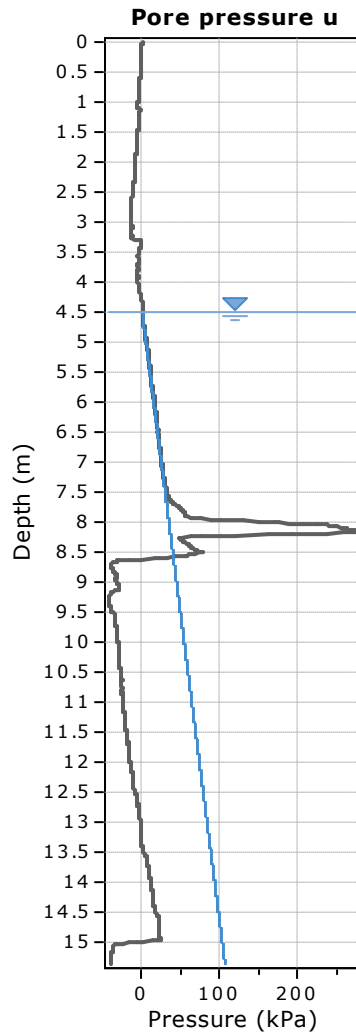
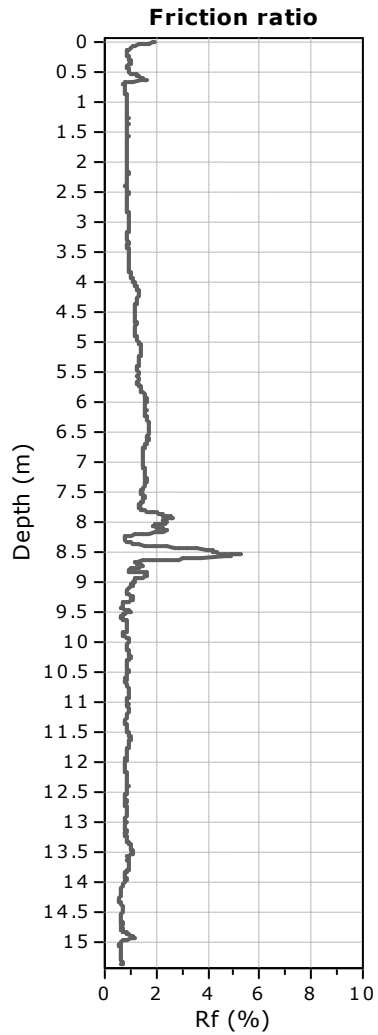
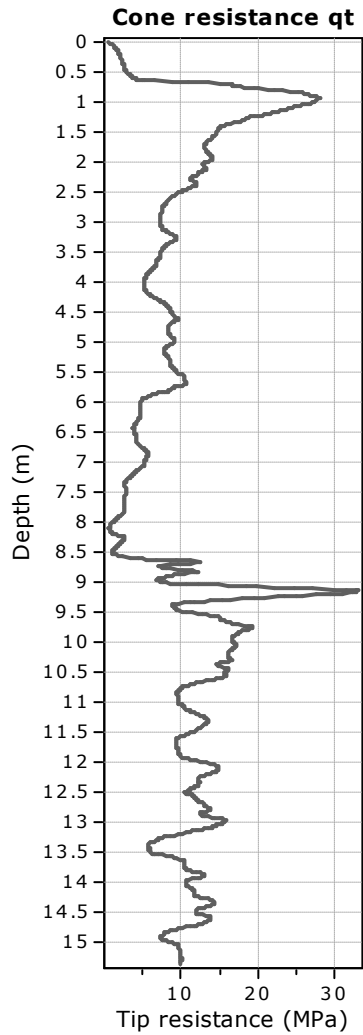


The plot below presents the cross correlation coefficient between the raw q_c and f_s values (as measured on the field). X axes presents the lag distance (one lag is the distance between two successive CPT measurements).



Project:

Location:

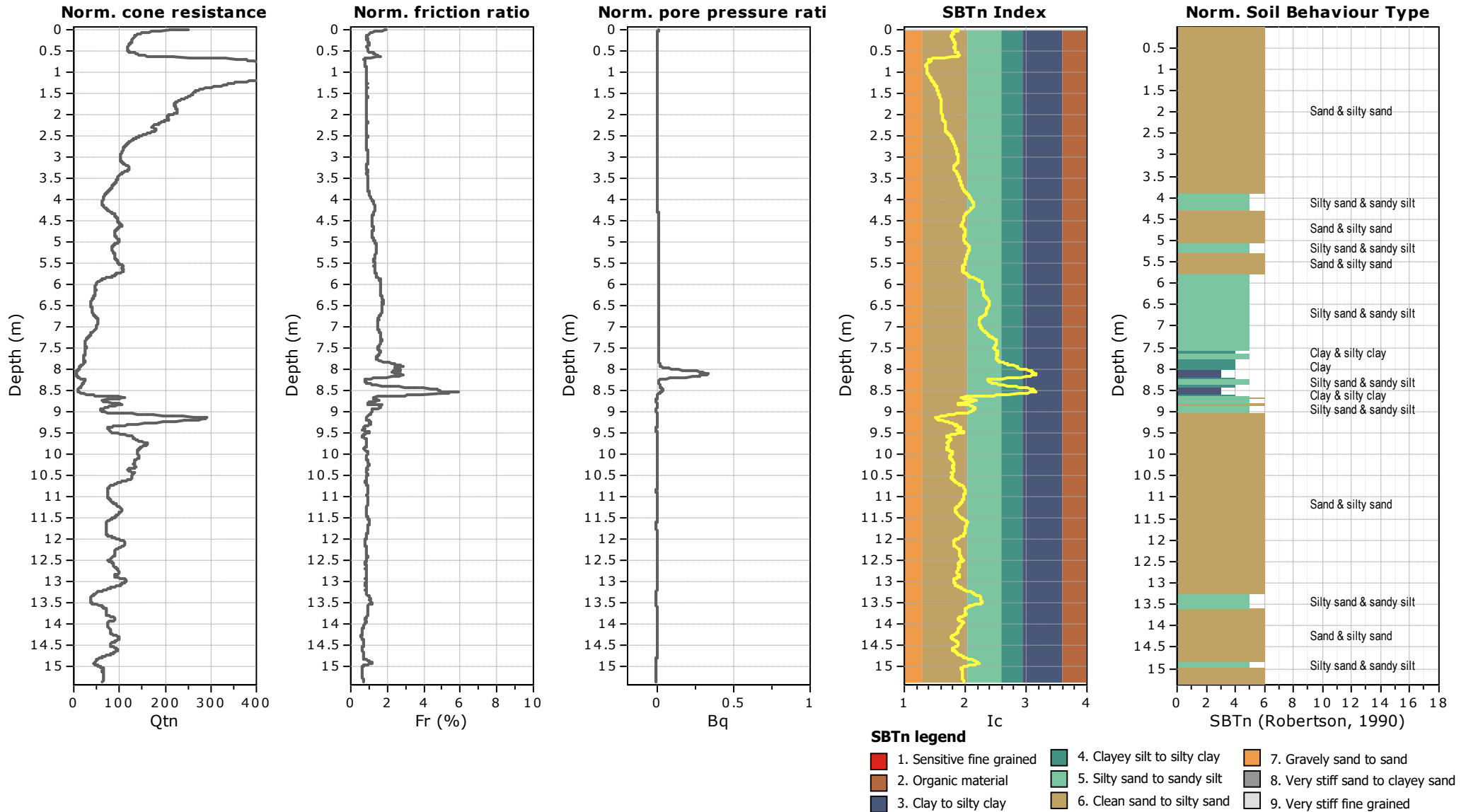


SBT legend

- | | | |
|--|---|---|
| ■ 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 |

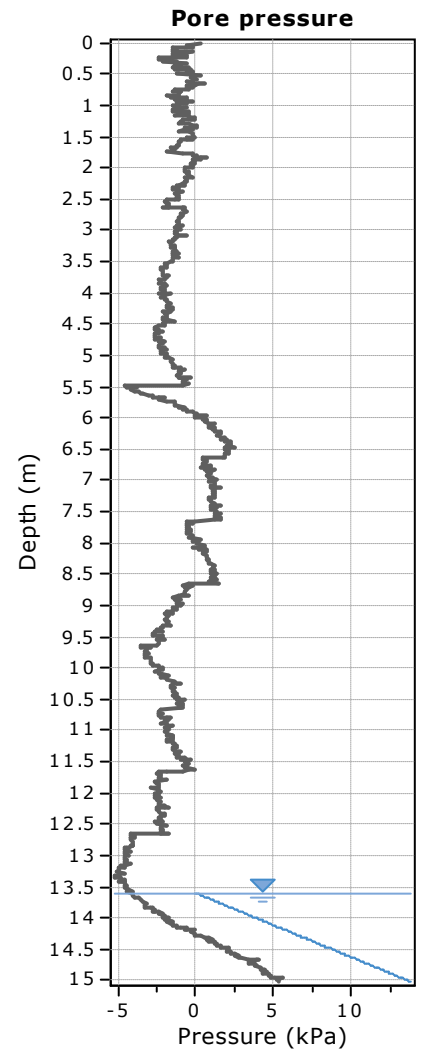
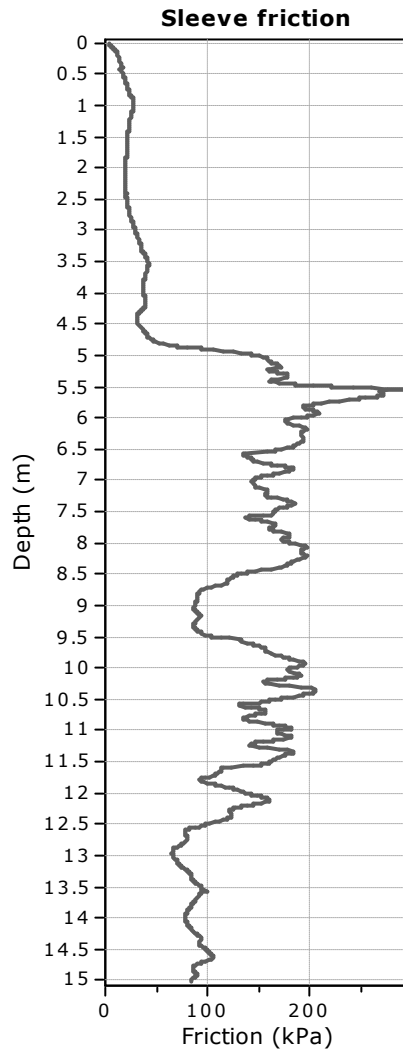
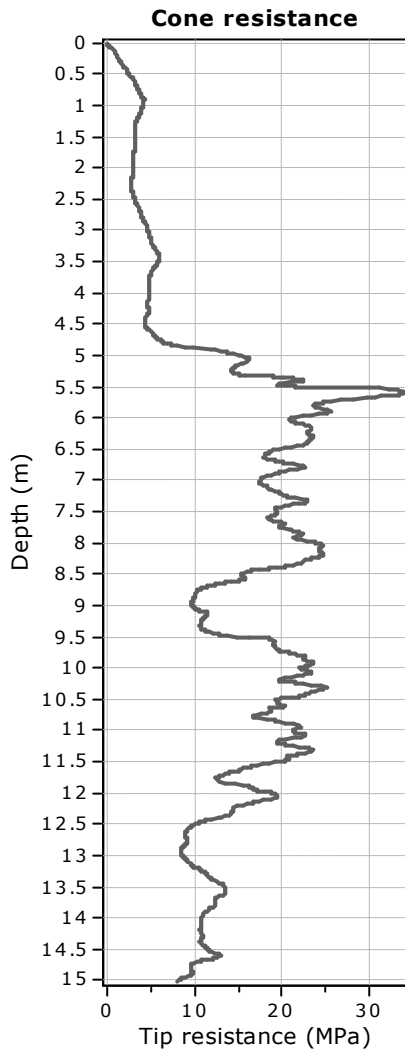
Project:

Location:

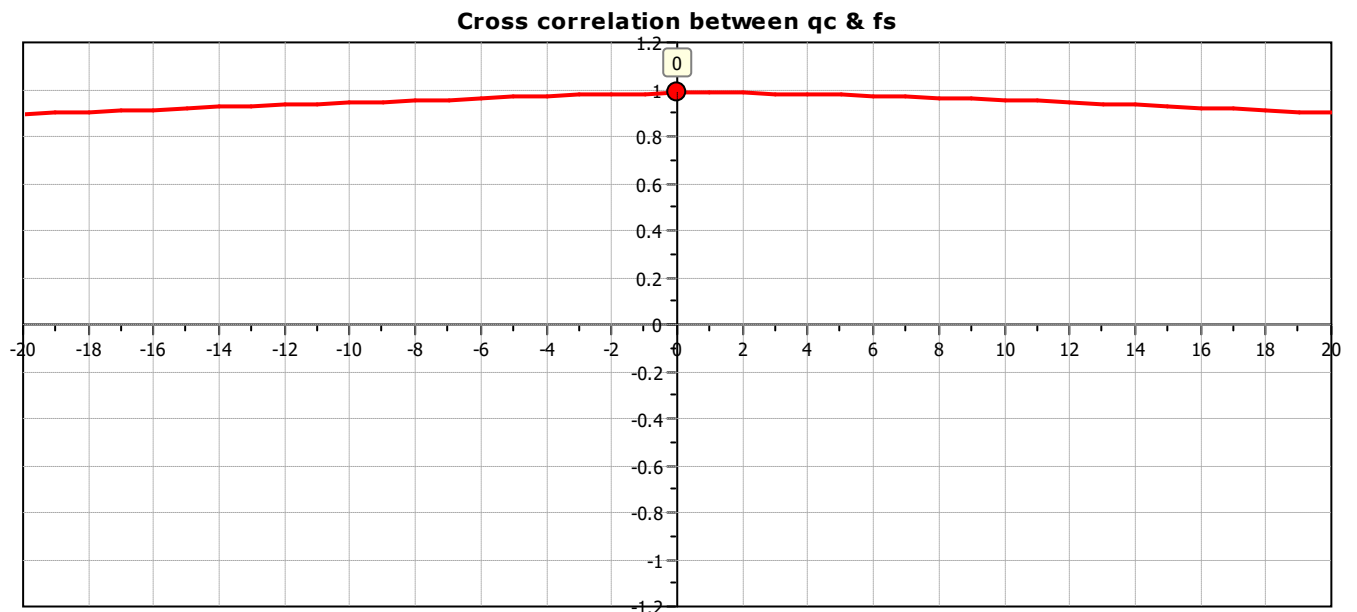


Project:

Location:

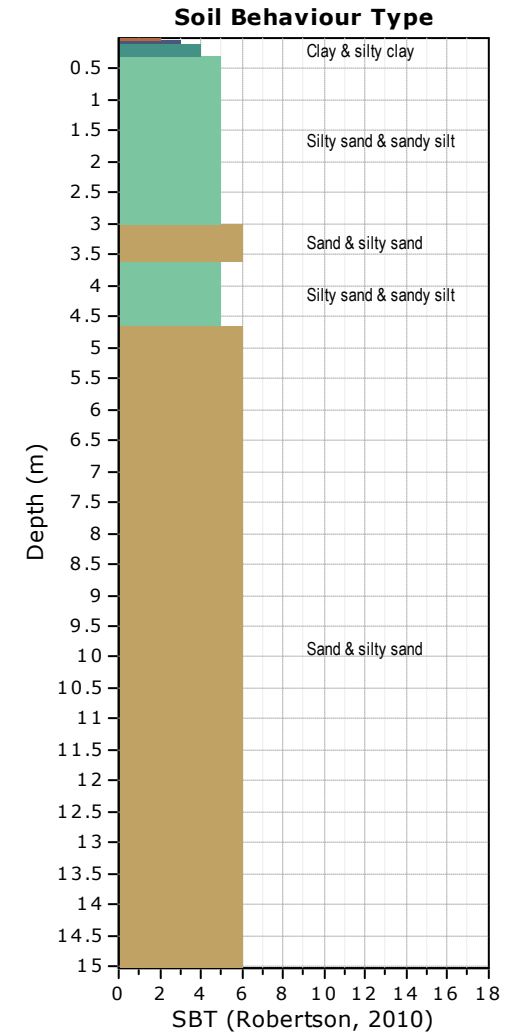
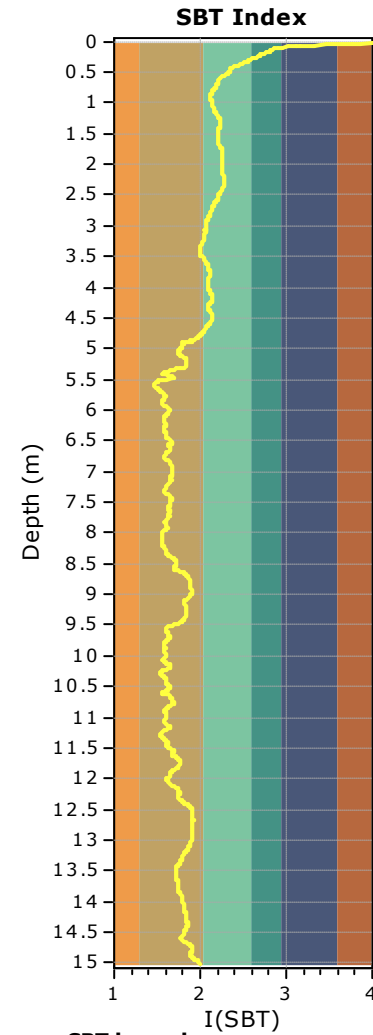
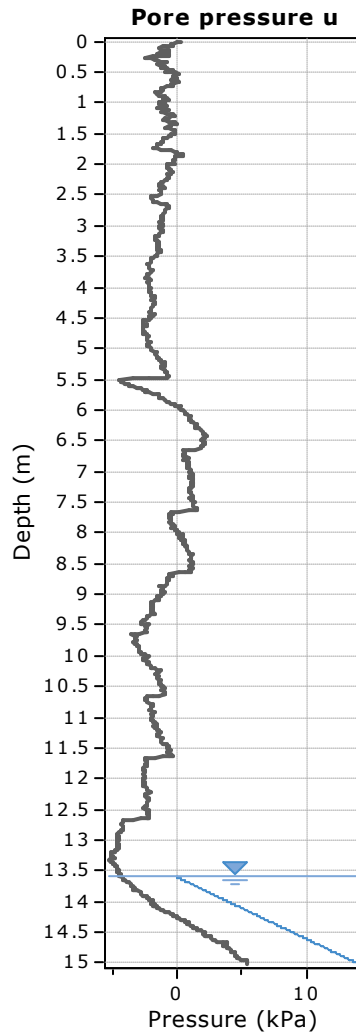
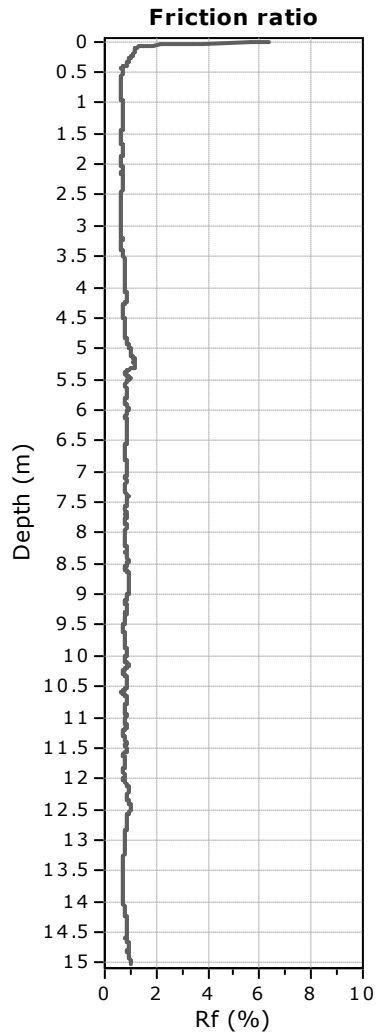
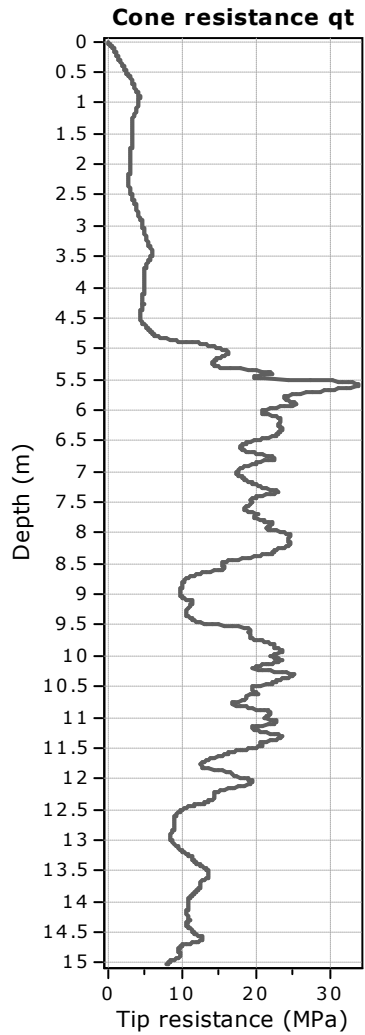


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Project:

Location:

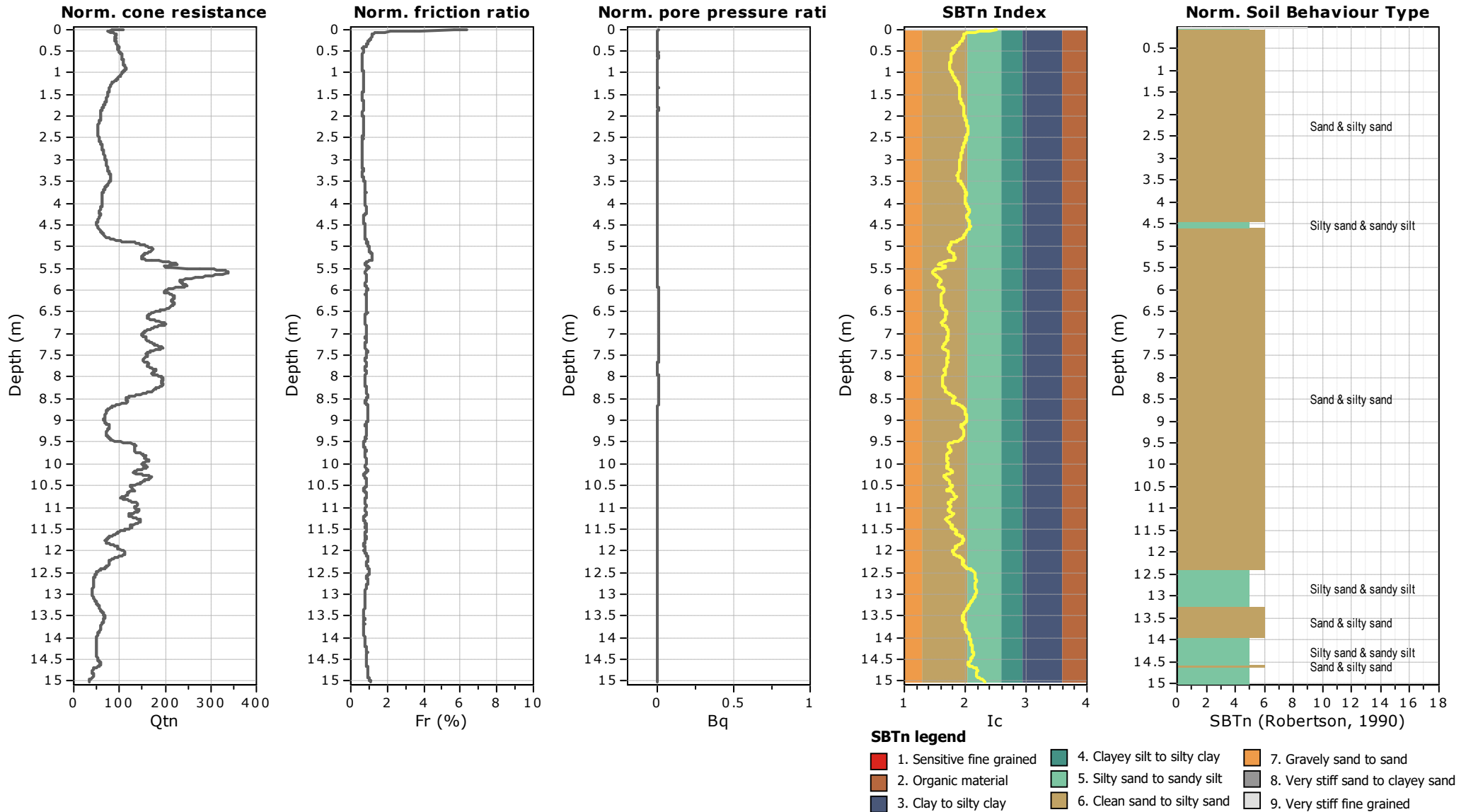


SBT legend

- | | | |
|--|---|---|
| ■ 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 |

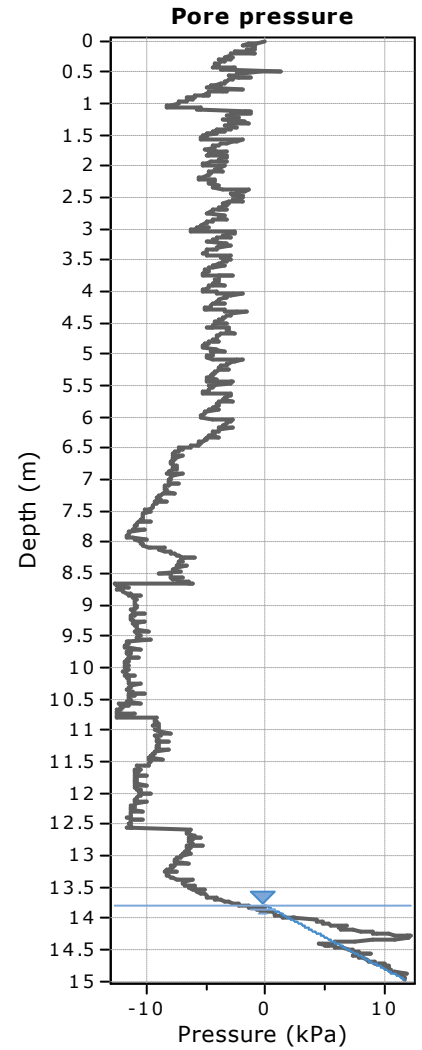
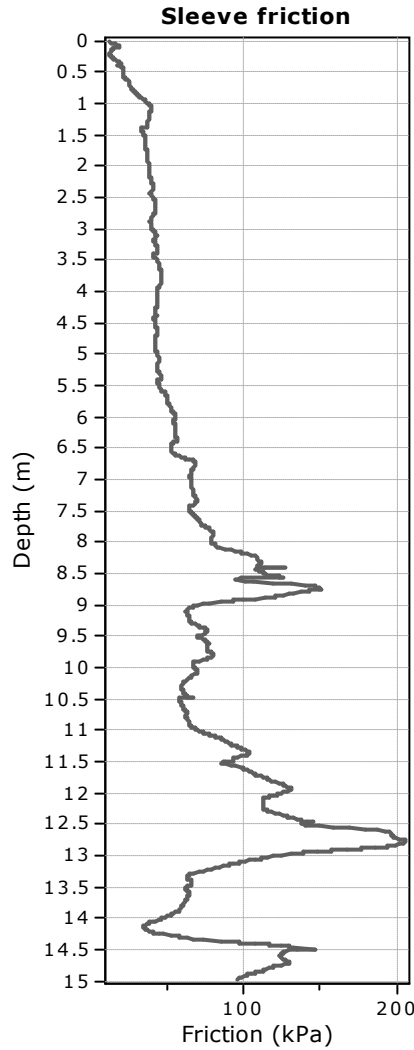
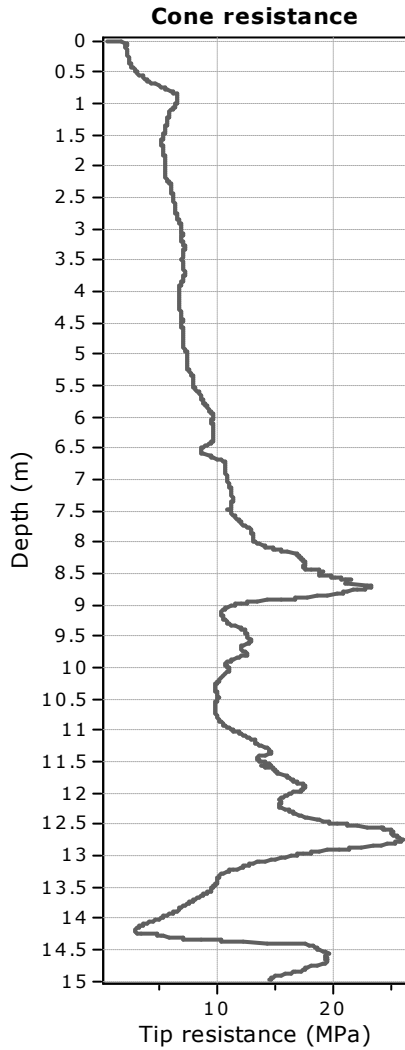
Project:

Location:

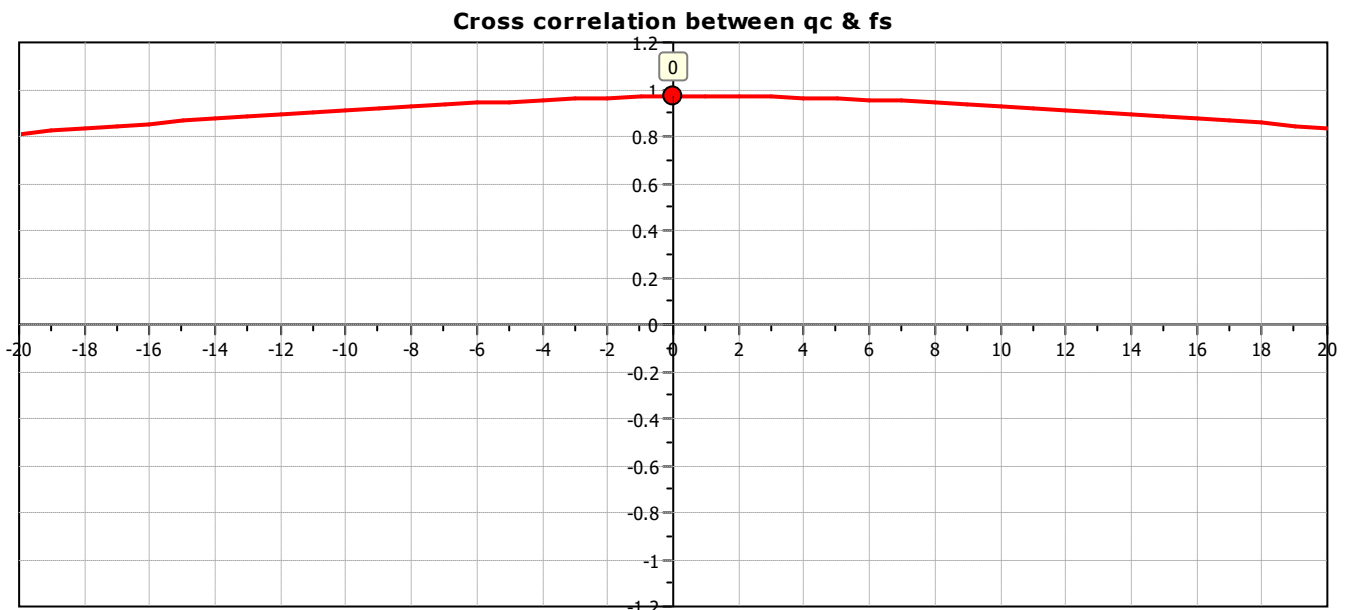


Project:

Location:

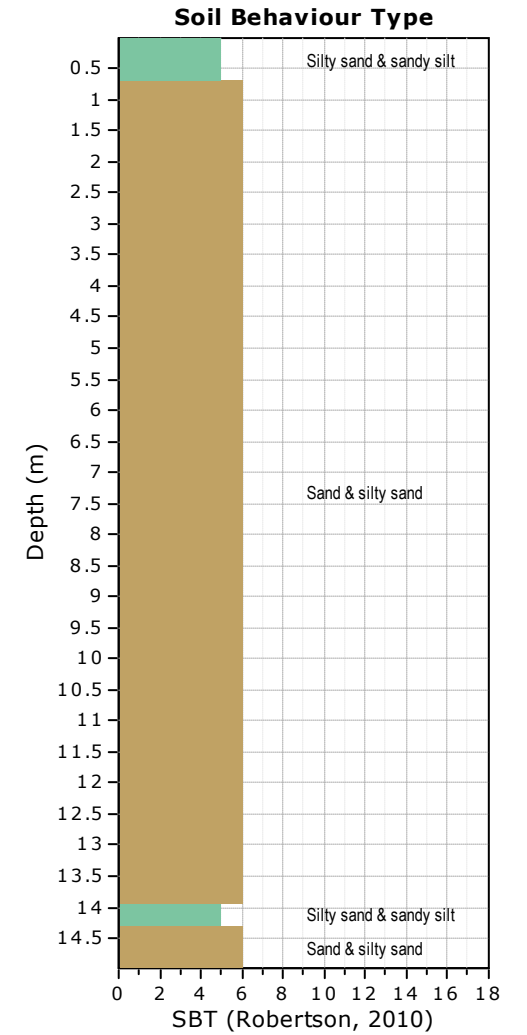
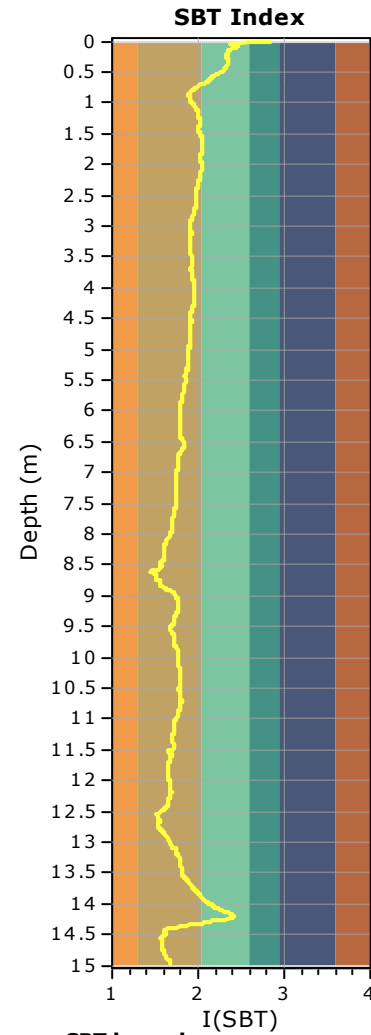
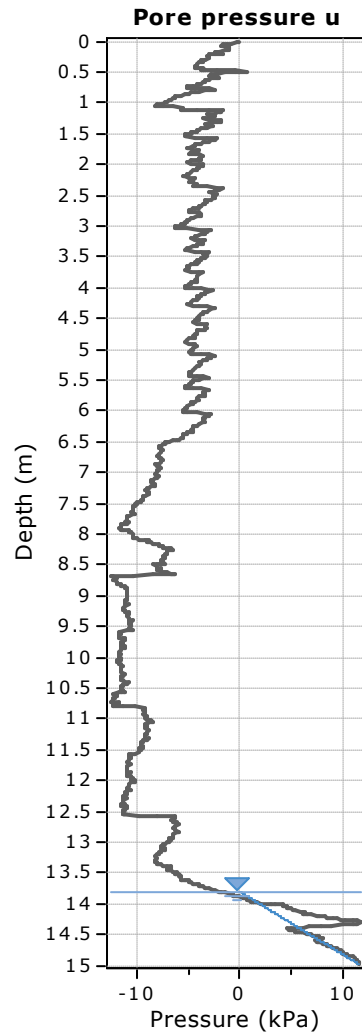
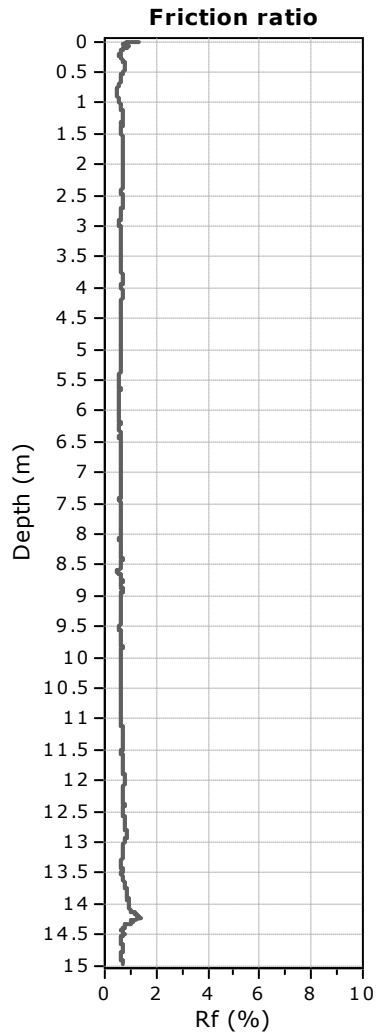
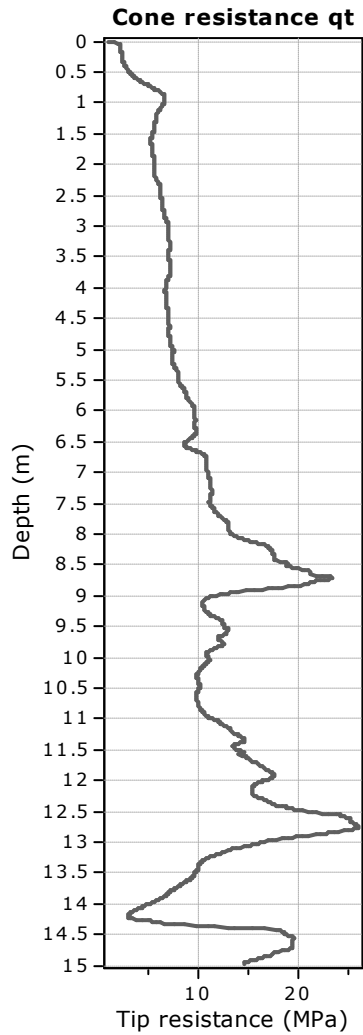


The plot below presents the cross correlation coefficient between the raw q_c and f_s values (as measured on the field). X axes presents the lag distance (one lag is the distance between two successive CPT measurements).



Project:

Location:

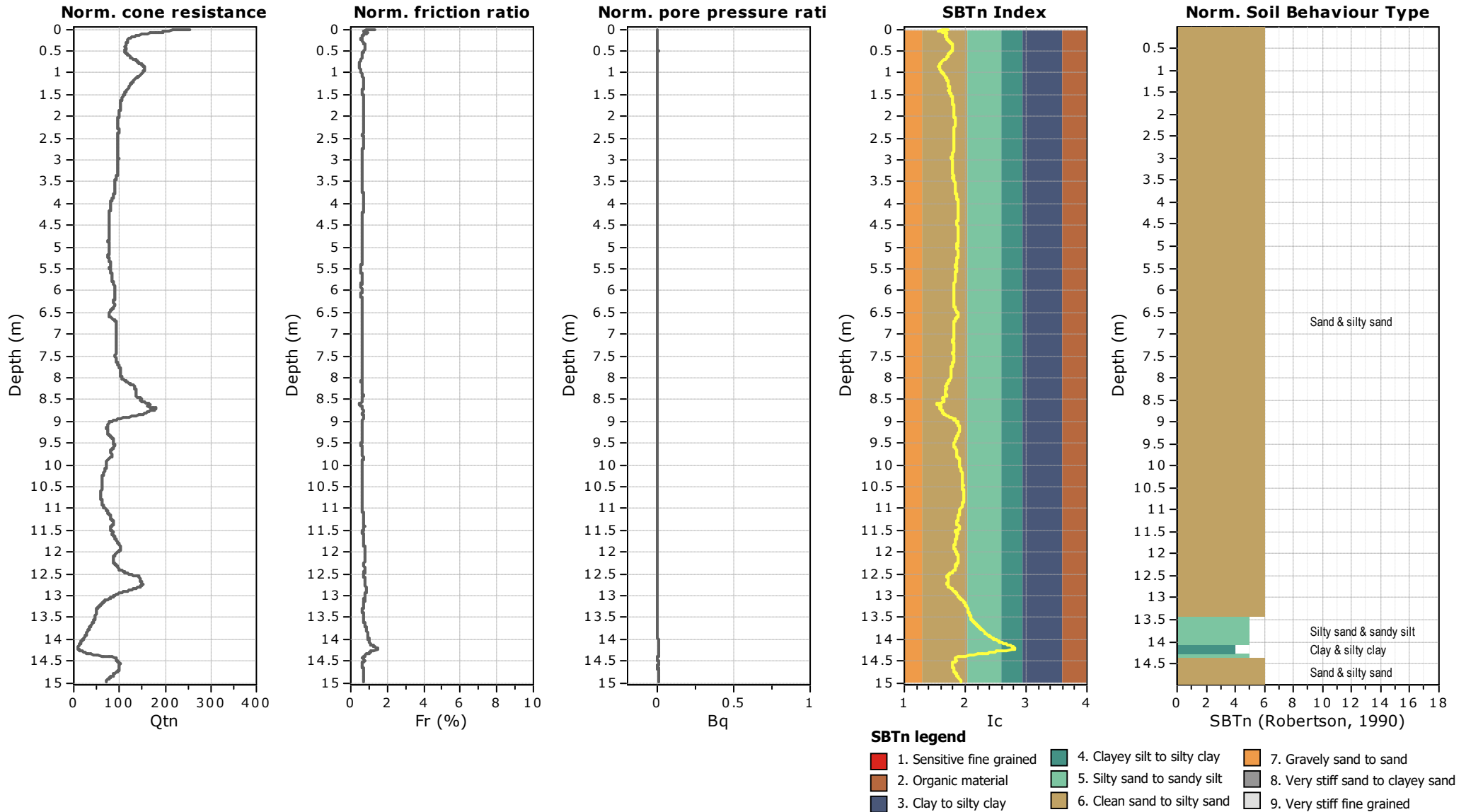


SBT legend

- | | | |
|---------------------------|------------------------------|-----------------------------------|
| 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 |

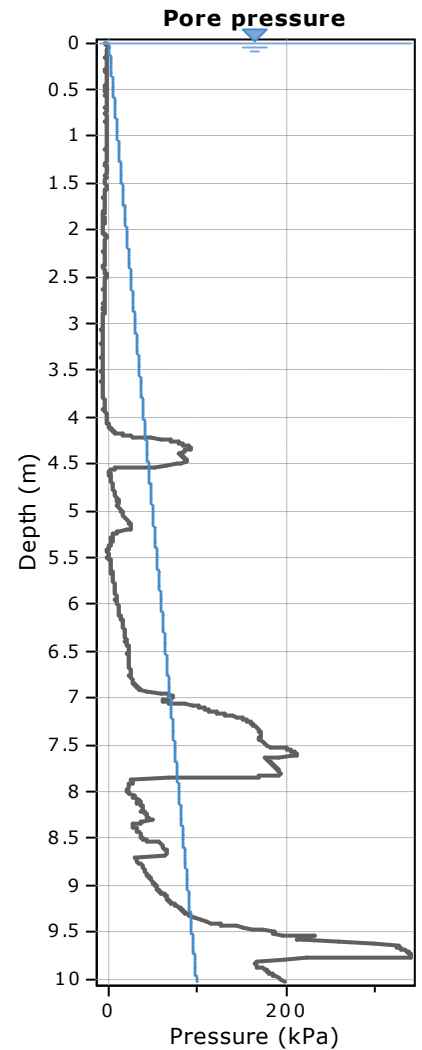
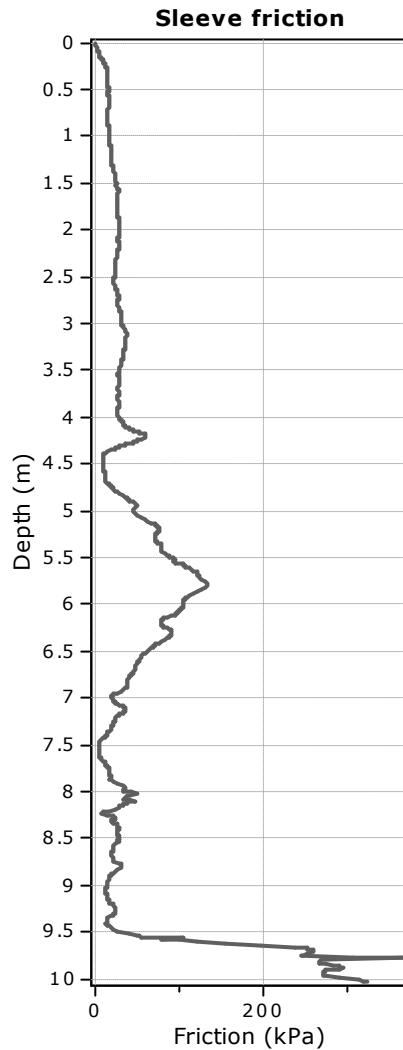
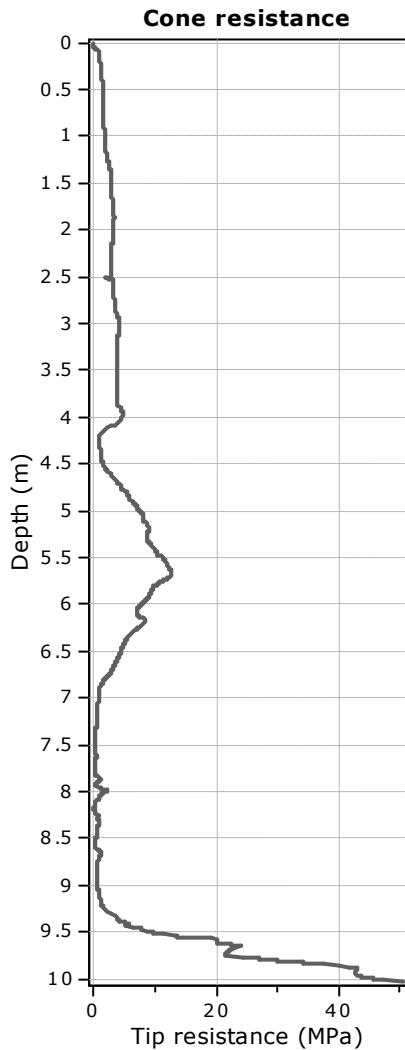
Project:

Location:

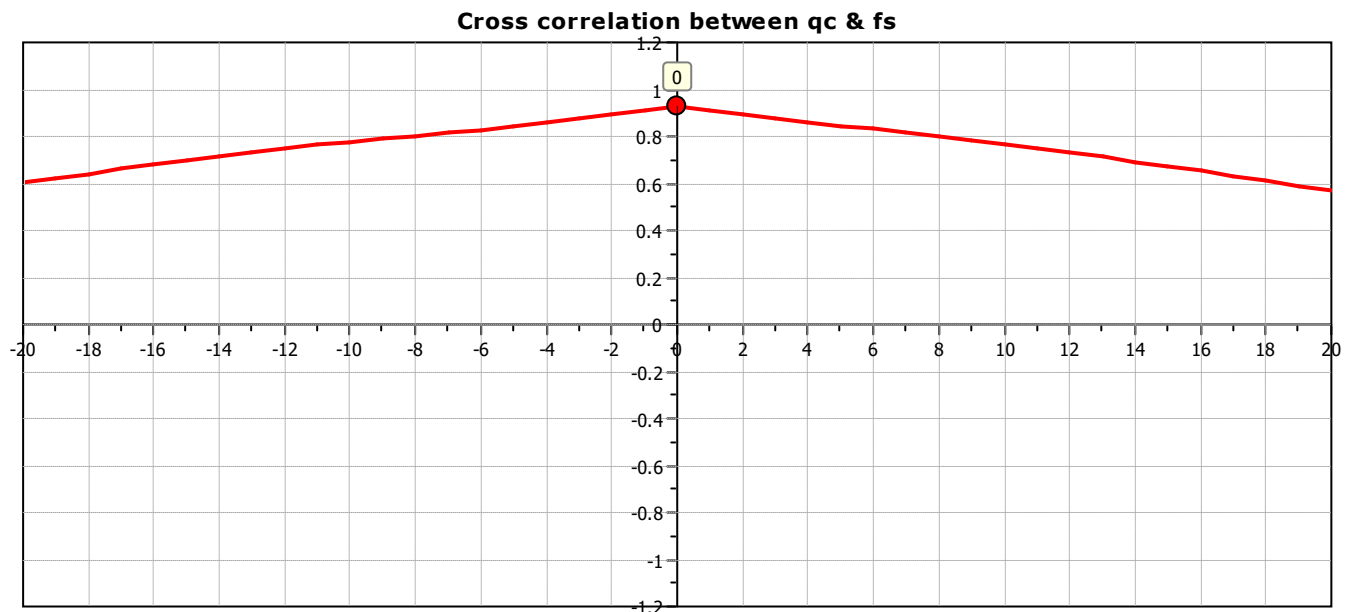


Project:

Location:

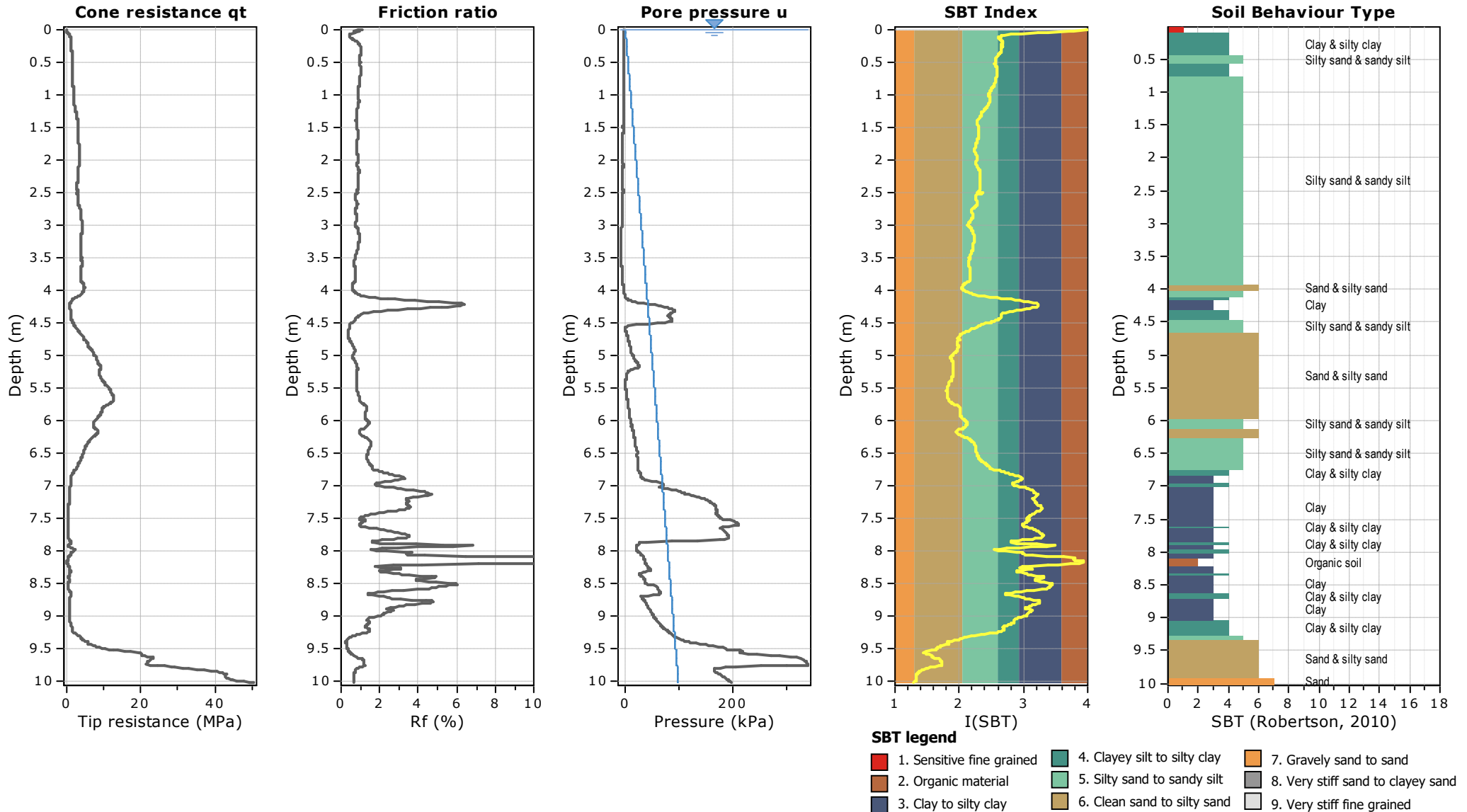


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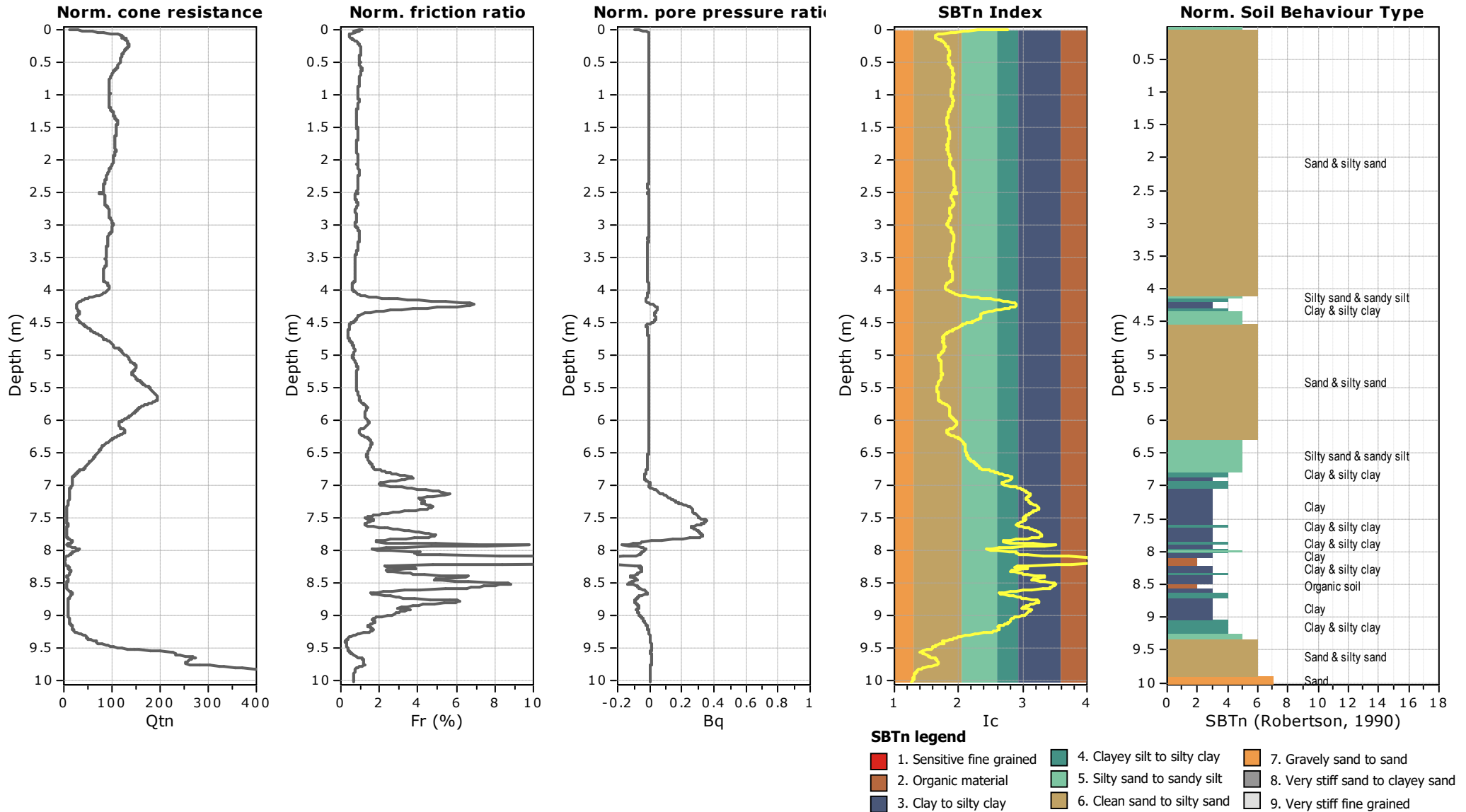
Project:

Location:



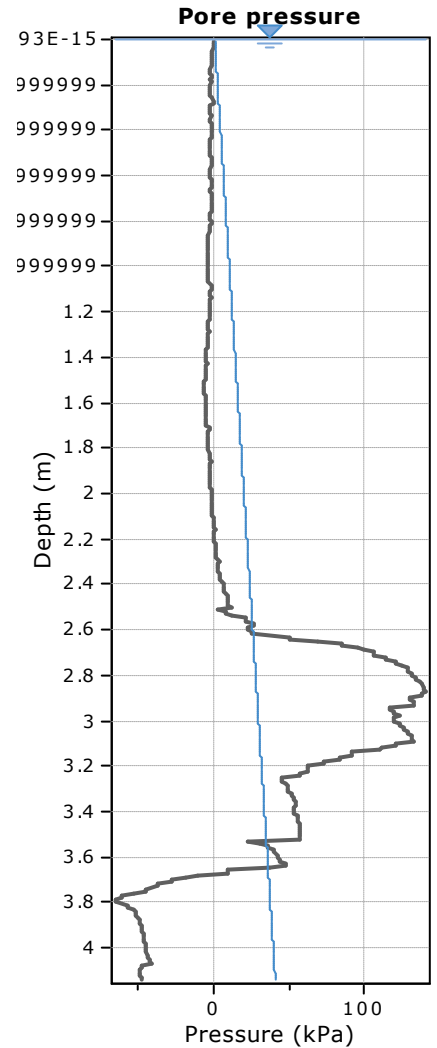
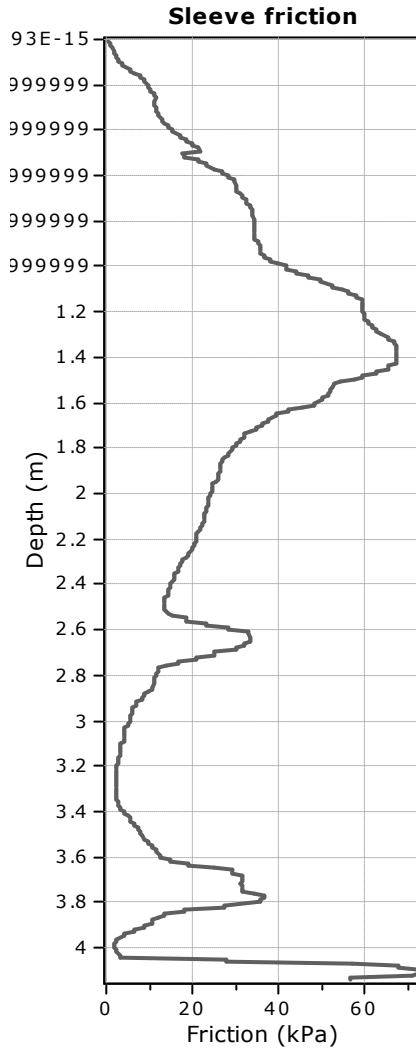
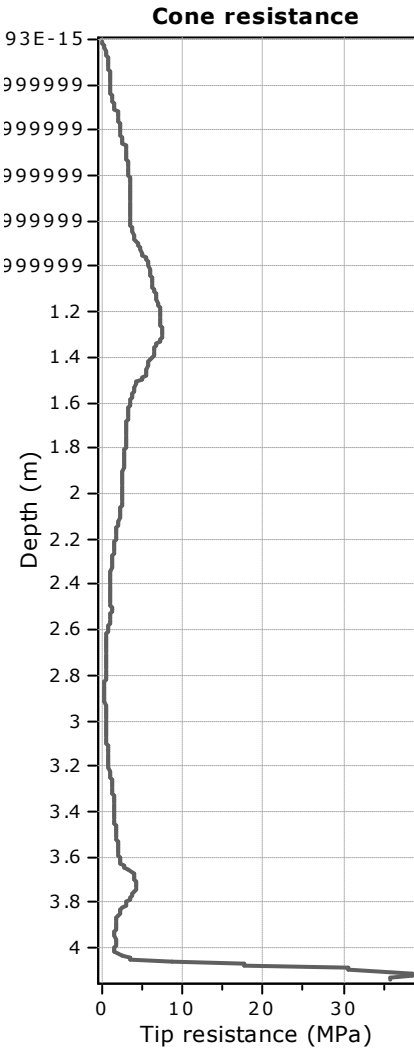
Project:

Location:

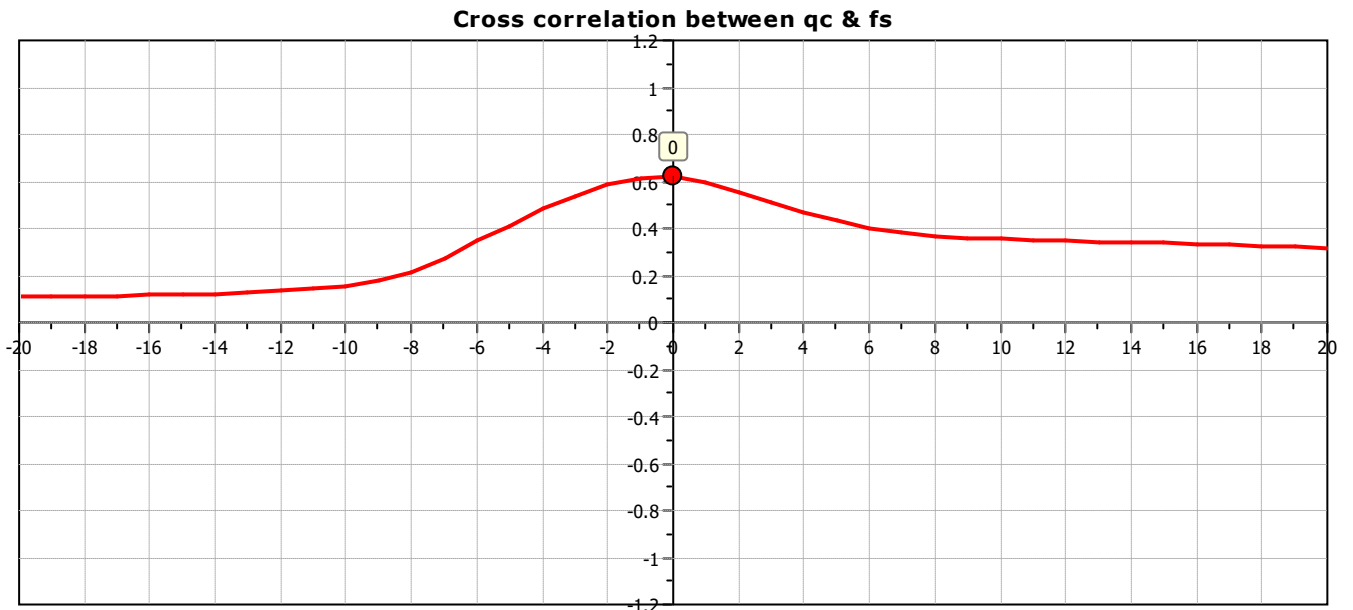


Project:

Location:

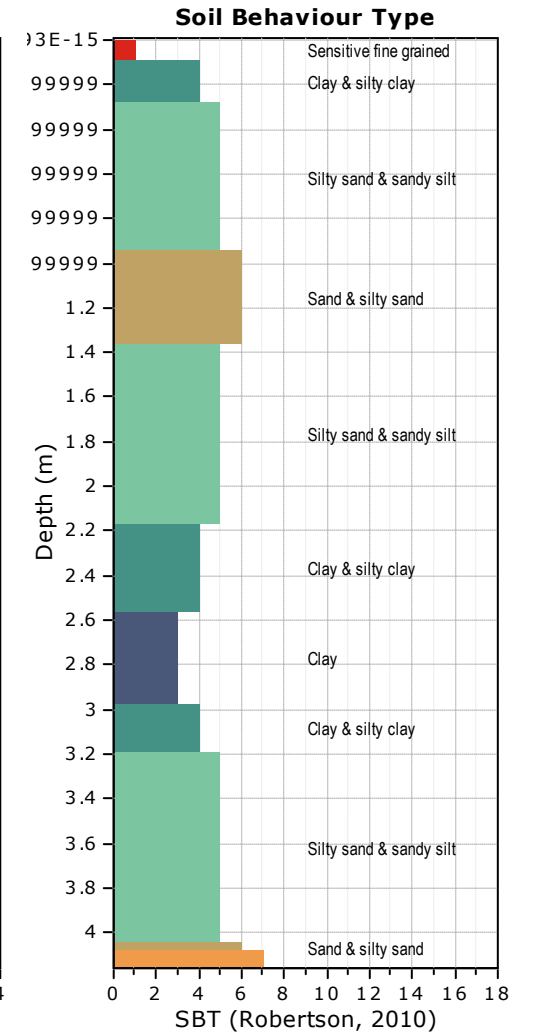
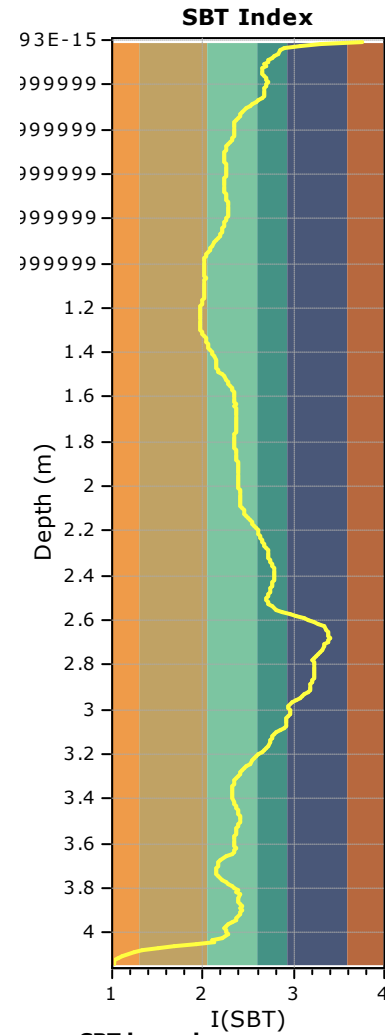
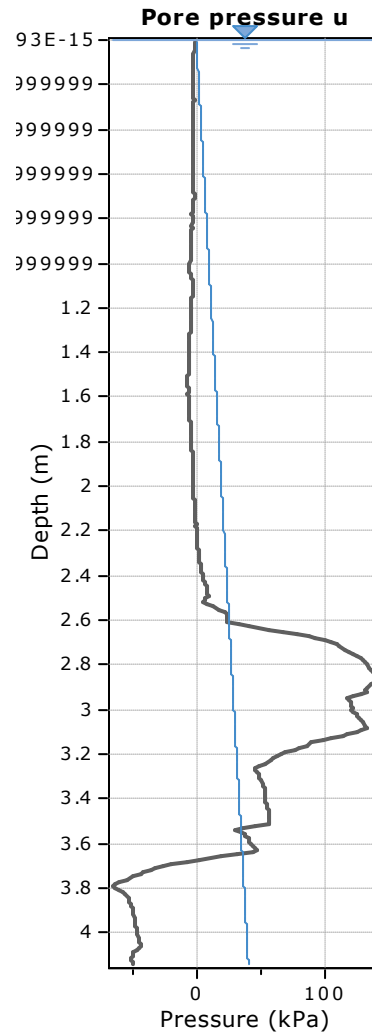
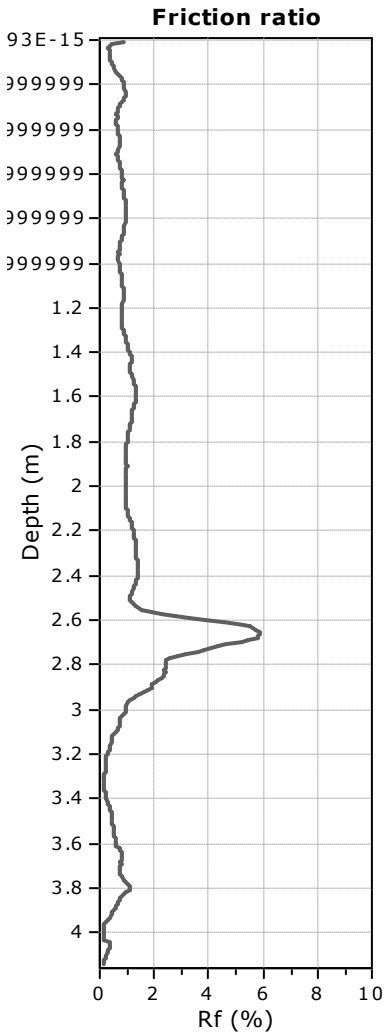
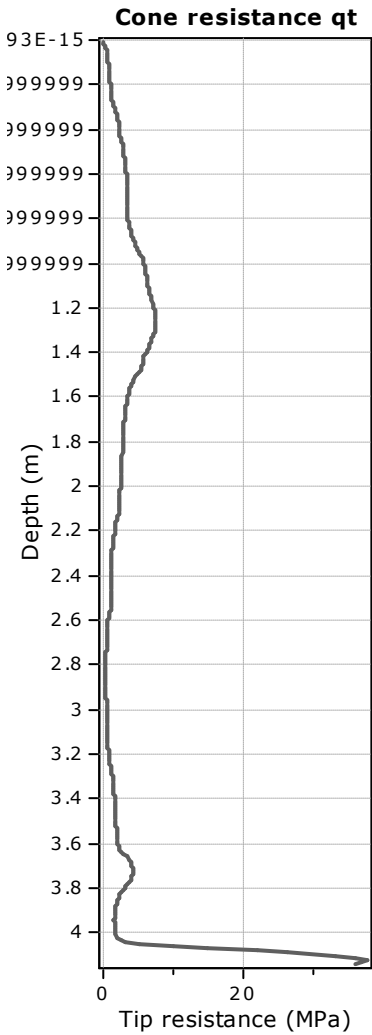


The plot below presents the cross correlation coefficient between the raw q_c and f_s values (as measured on the field). X axes presents the lag distance (one lag is the distance between two successive CPT measurements).



Project:

Location:

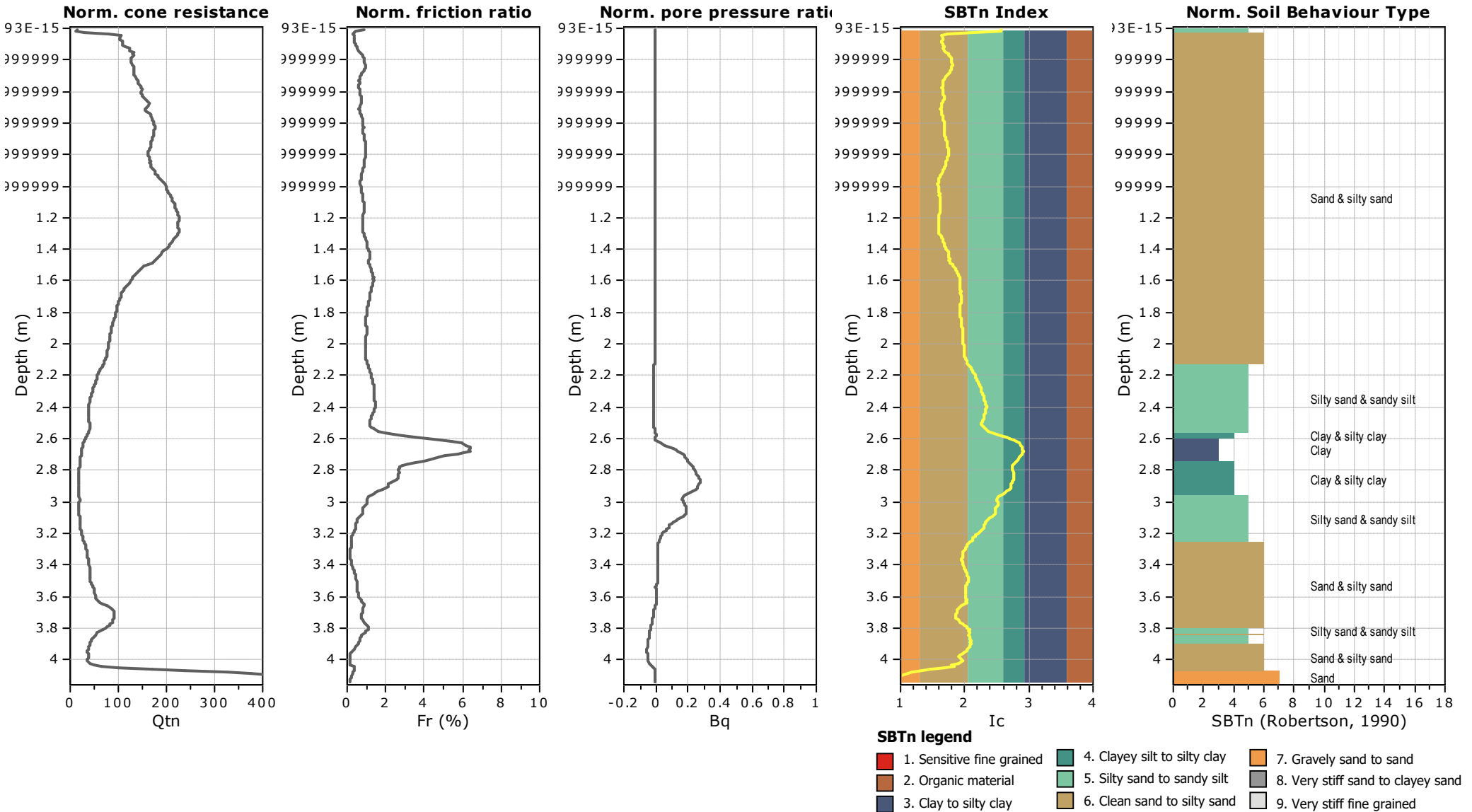


SBT legend

- | | | |
|---|---|---|
| ■ 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 |

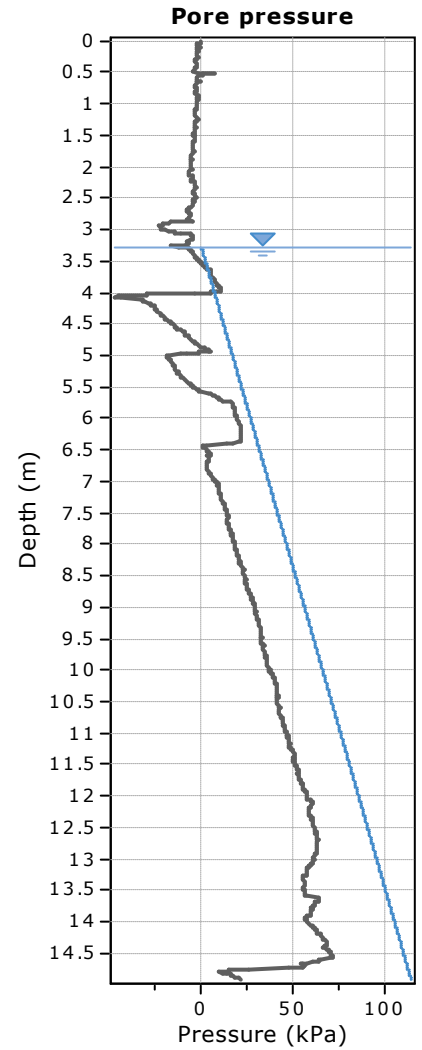
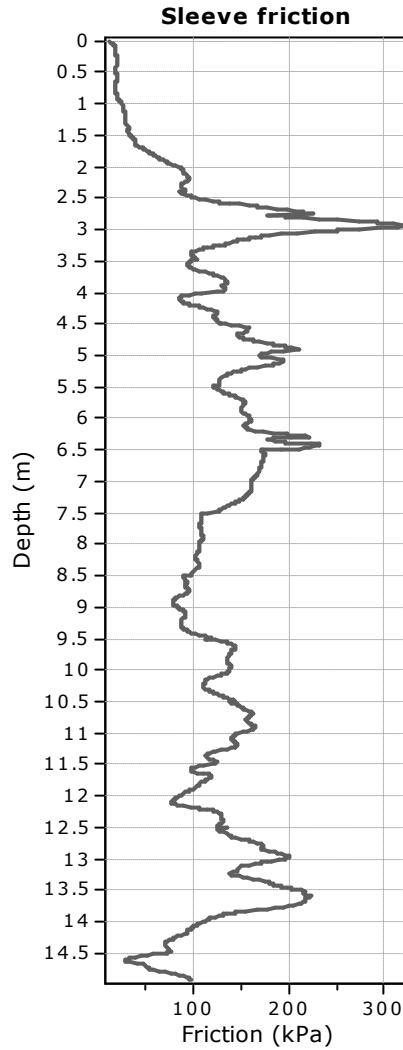
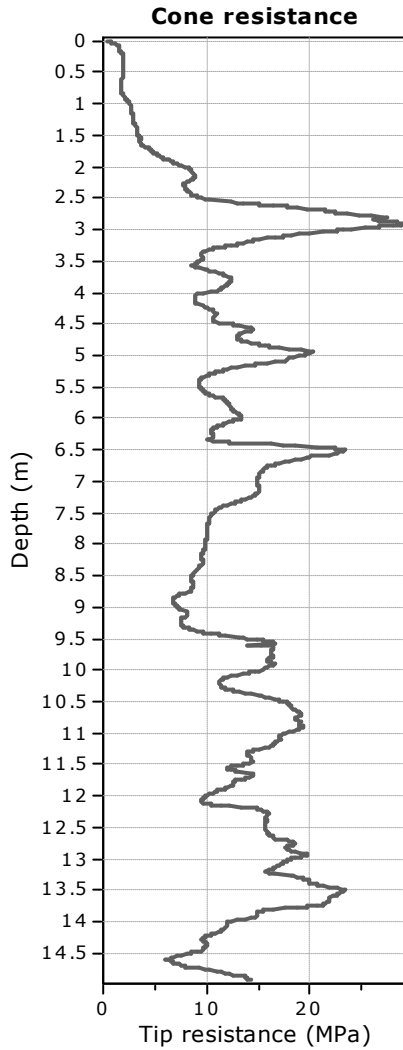
Project:

Location:

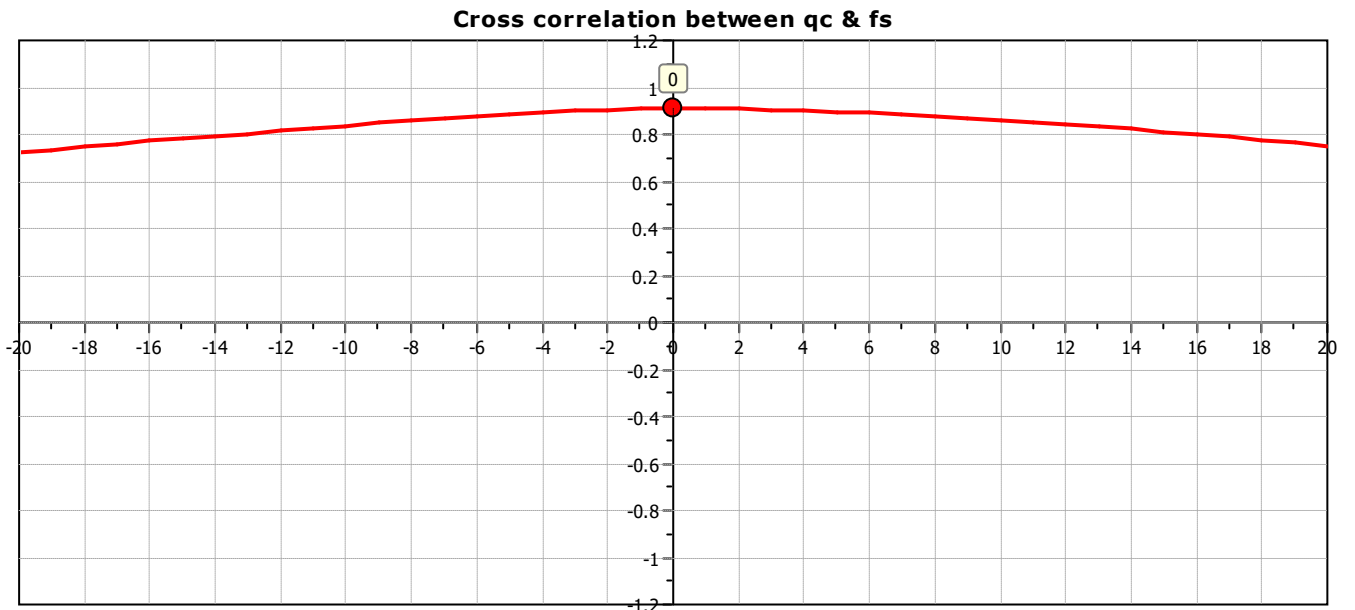


Project:

Location:

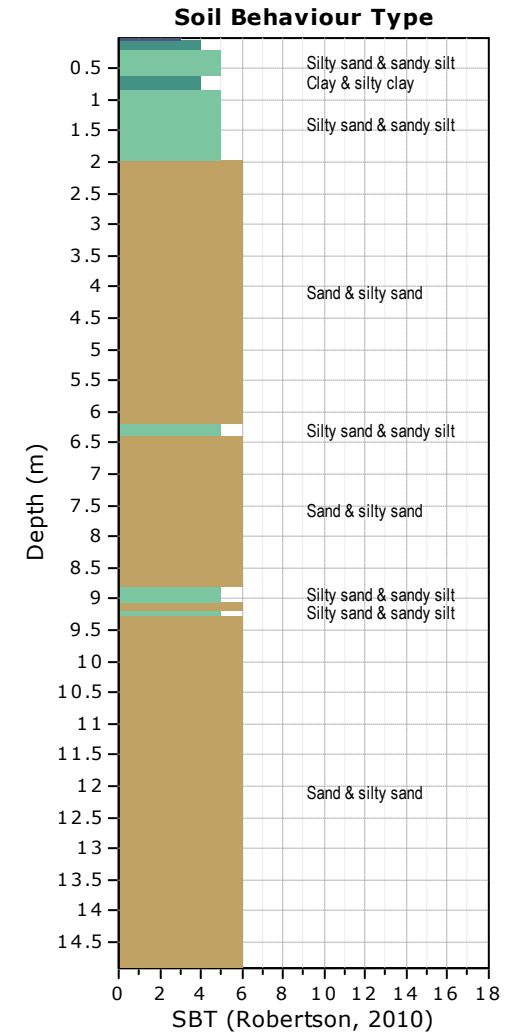
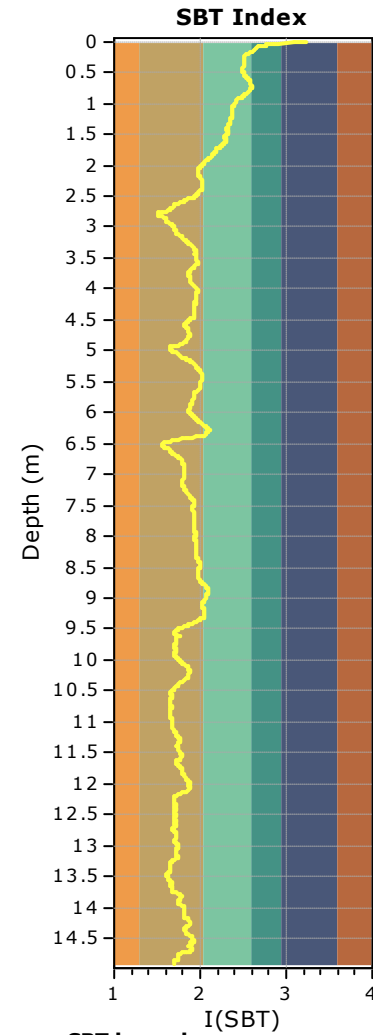
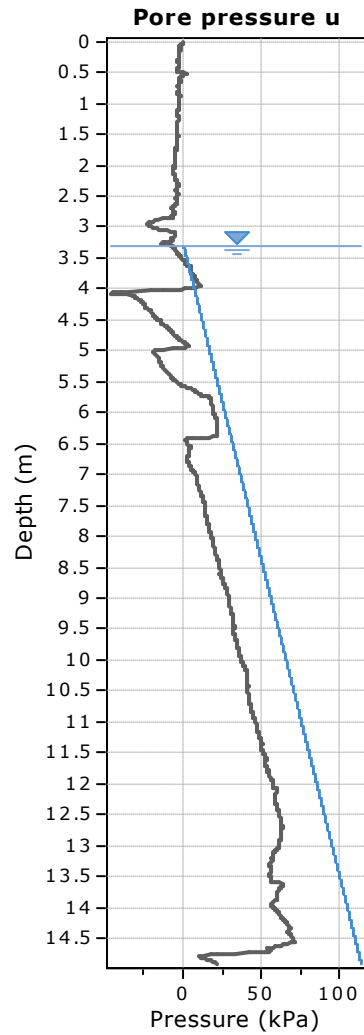
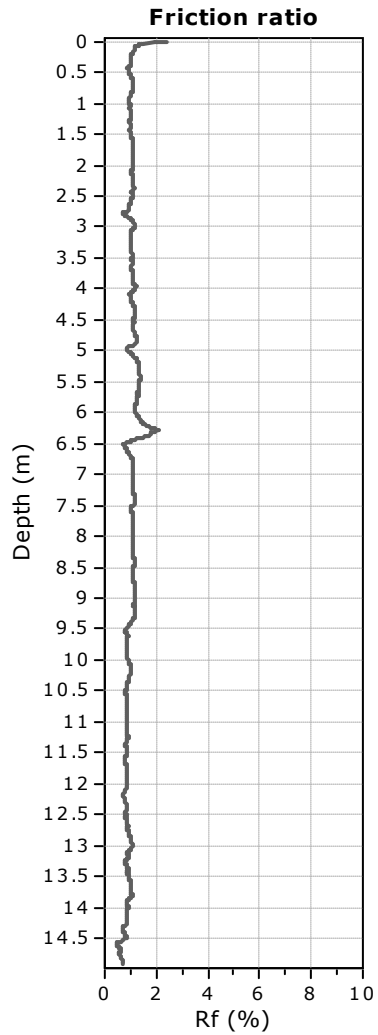
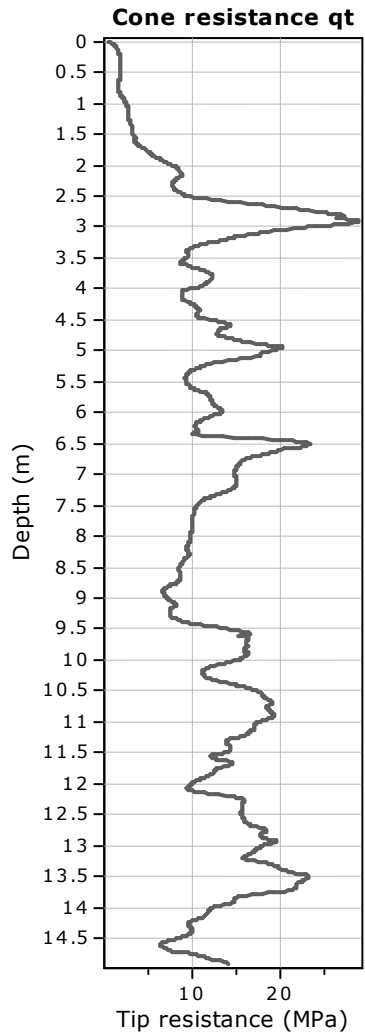


The plot below presents the cross correlation coefficient between the raw q_c and f_s values (as measured on the field). X axes presents the lag distance (one lag is the distance between two successive CPT measurements).



Project:

Location:

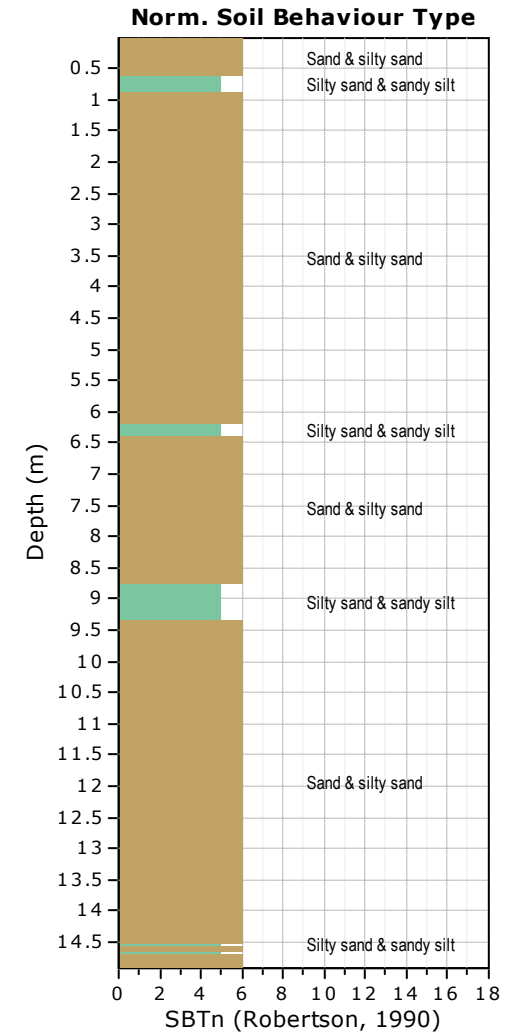
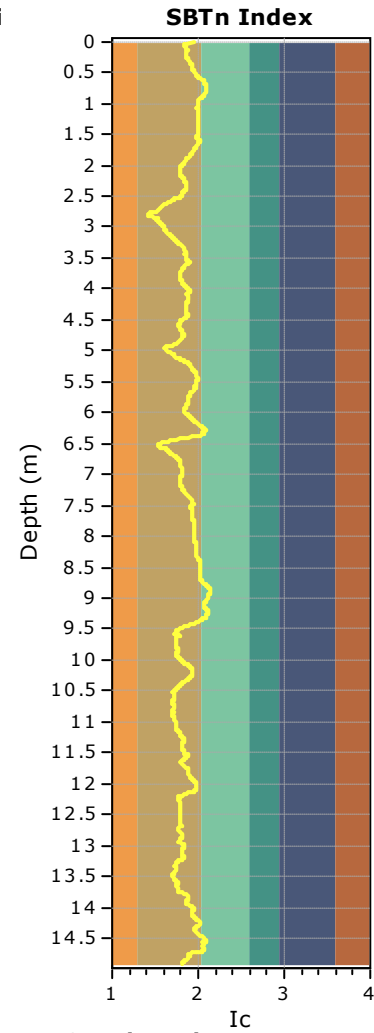
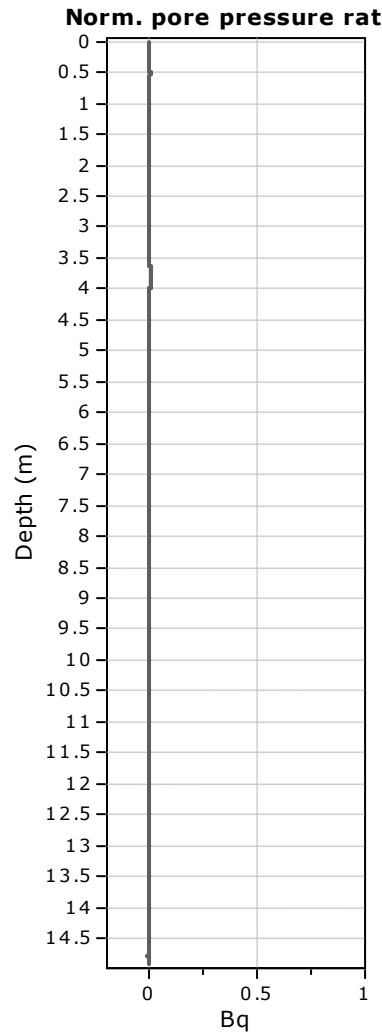
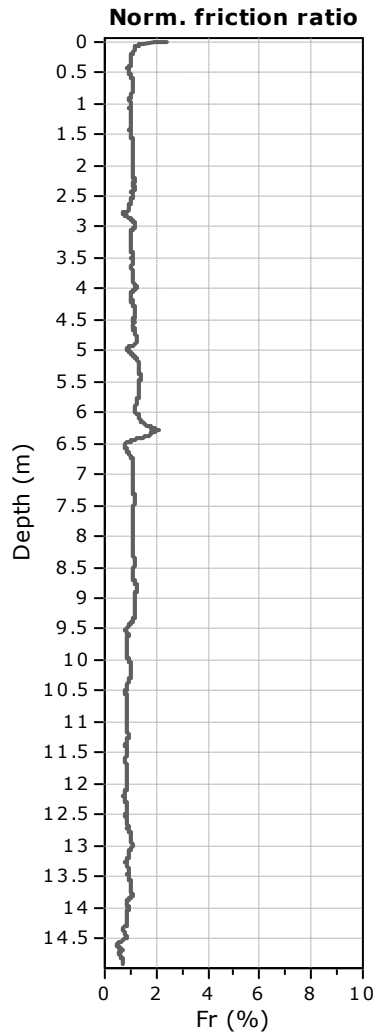
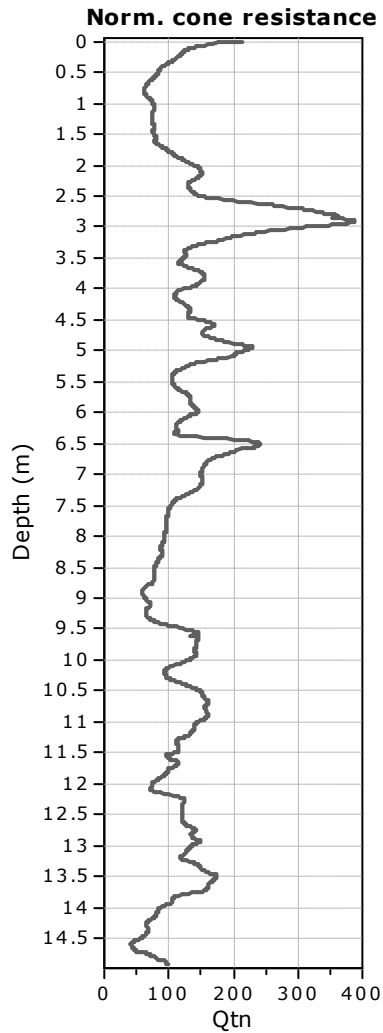


SBT legend

- | | | |
|---------------------------|------------------------------|-----------------------------------|
| 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 |

Project:

Location:

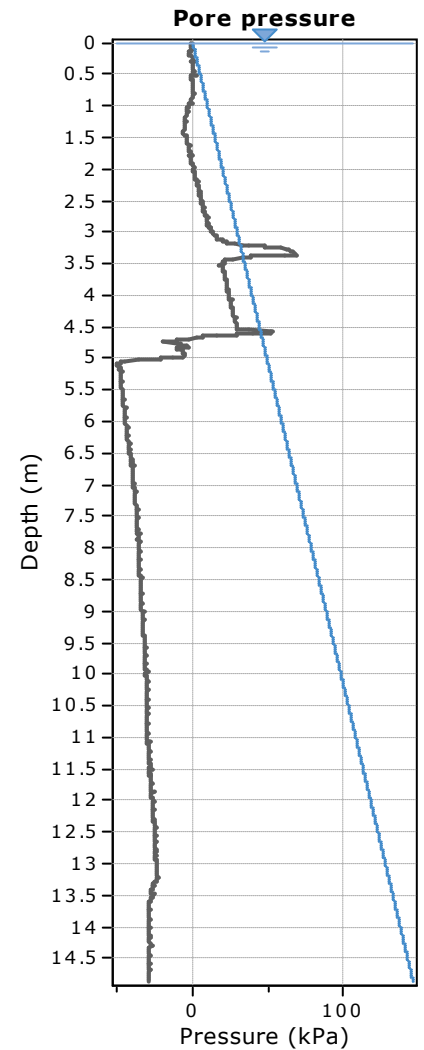
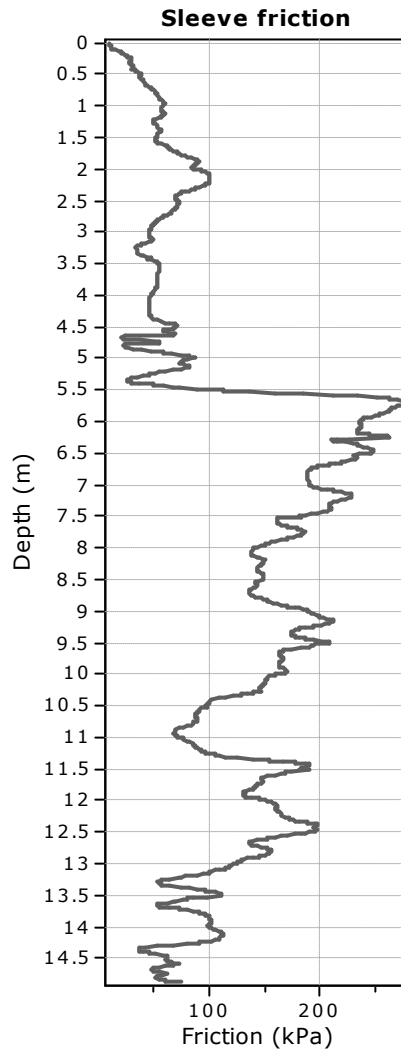
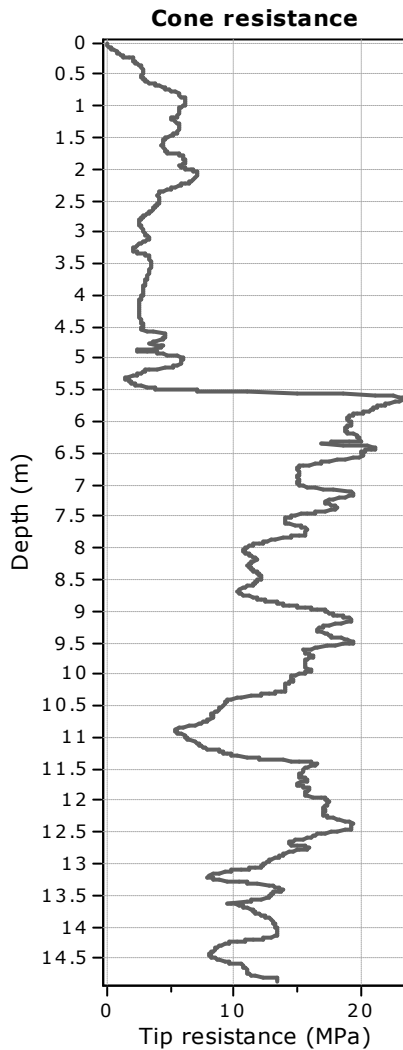


SBTn legend

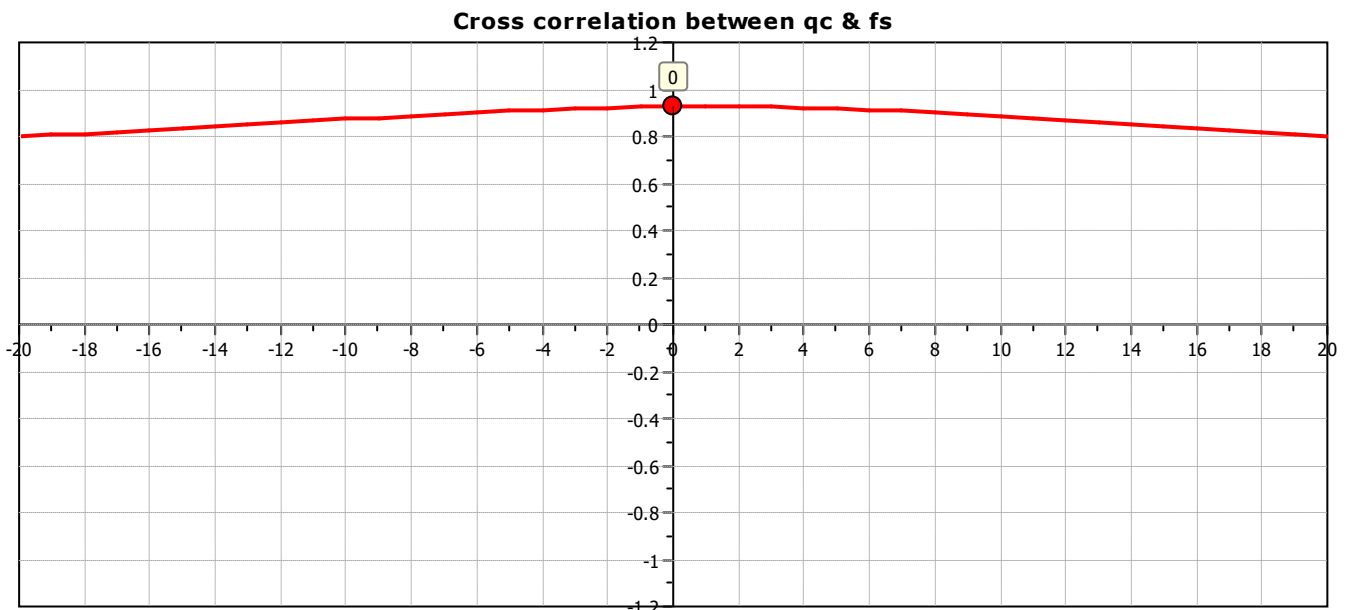
- | | | |
|--|---|---|
| ■ 1. Sensitive fine grained | ■ 4. Clayey silt to silty clay | ■ 7. Gravely sand to sand |
| ■ 2. Organic material | ■ 5. Silty sand to sandy silt | ■ 8. Very stiff sand to clayey sand |
| ■ 3. Clay to silty clay | ■ 6. Clean sand to silty sand | ■ 9. Very stiff fine grained |

Project:

Location:

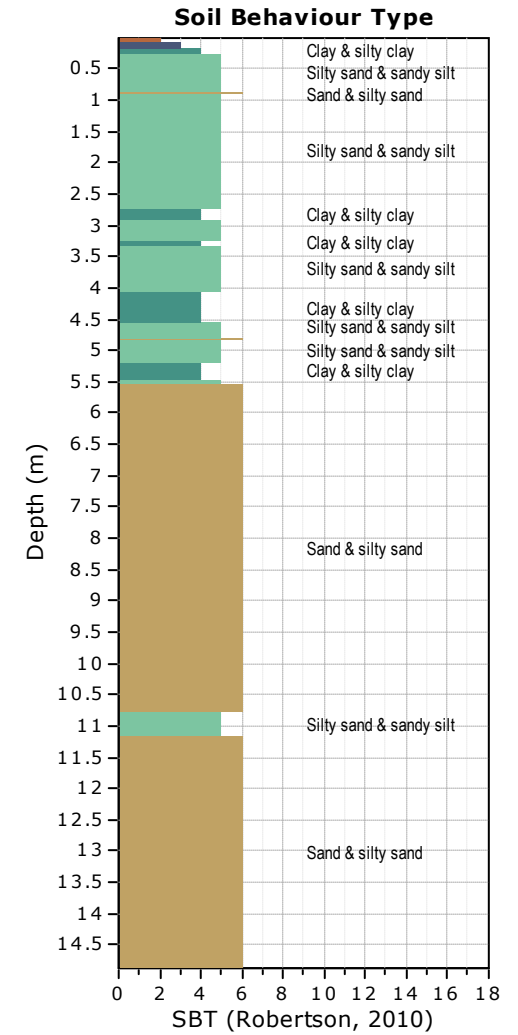
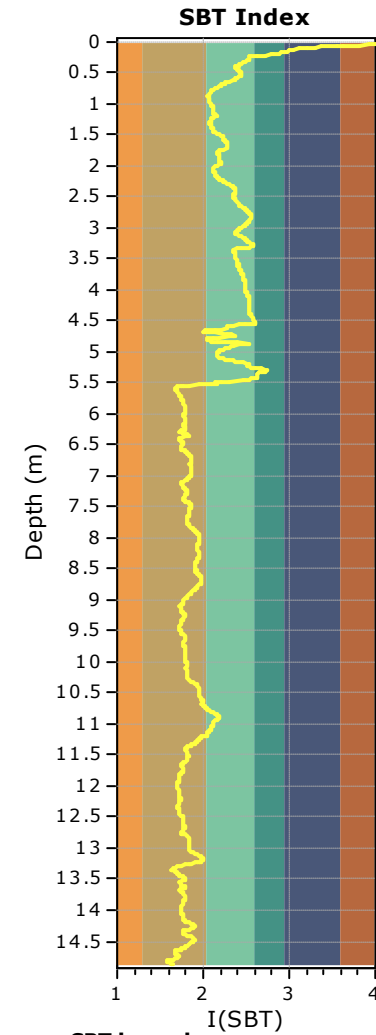
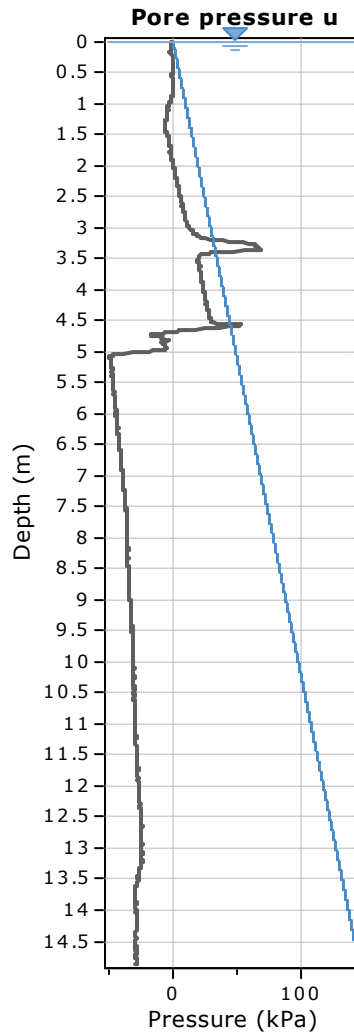
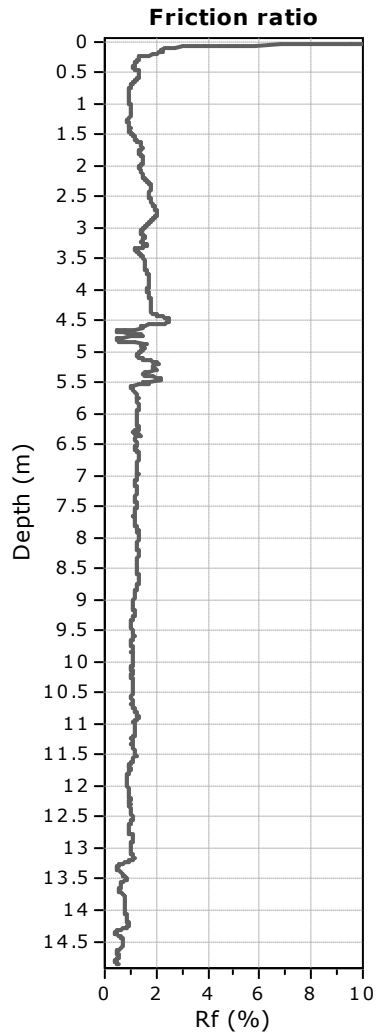
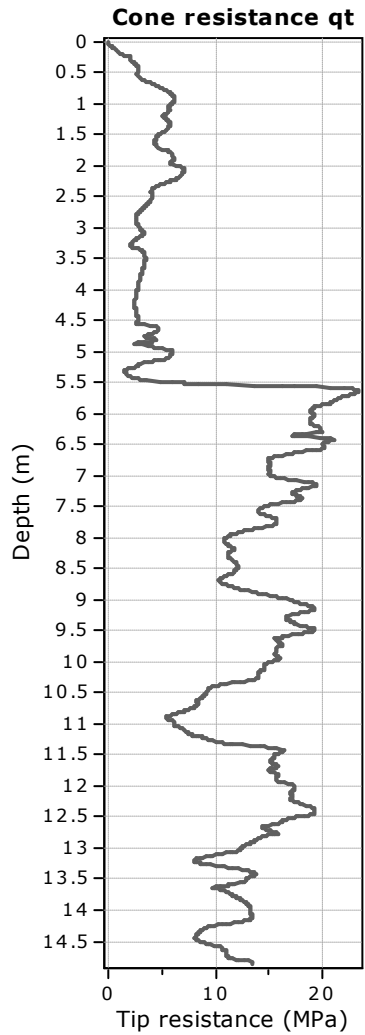


The plot below presents the cross correlation coefficient between the raw q_c and f_s values (as measured on the field). X axes presents the lag distance (one lag is the distance between two successive CPT measurements).



Project:

Location:

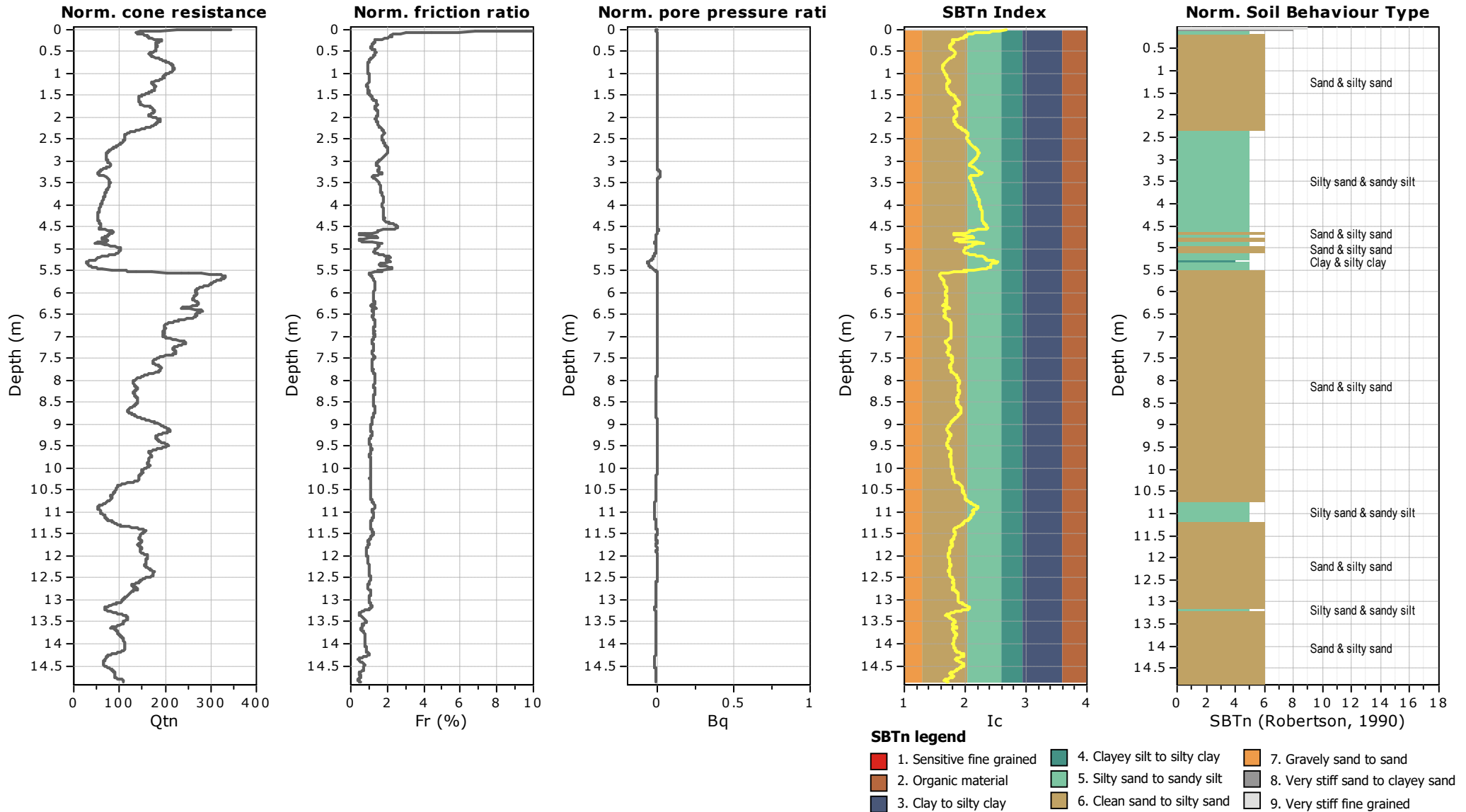


SBT legend

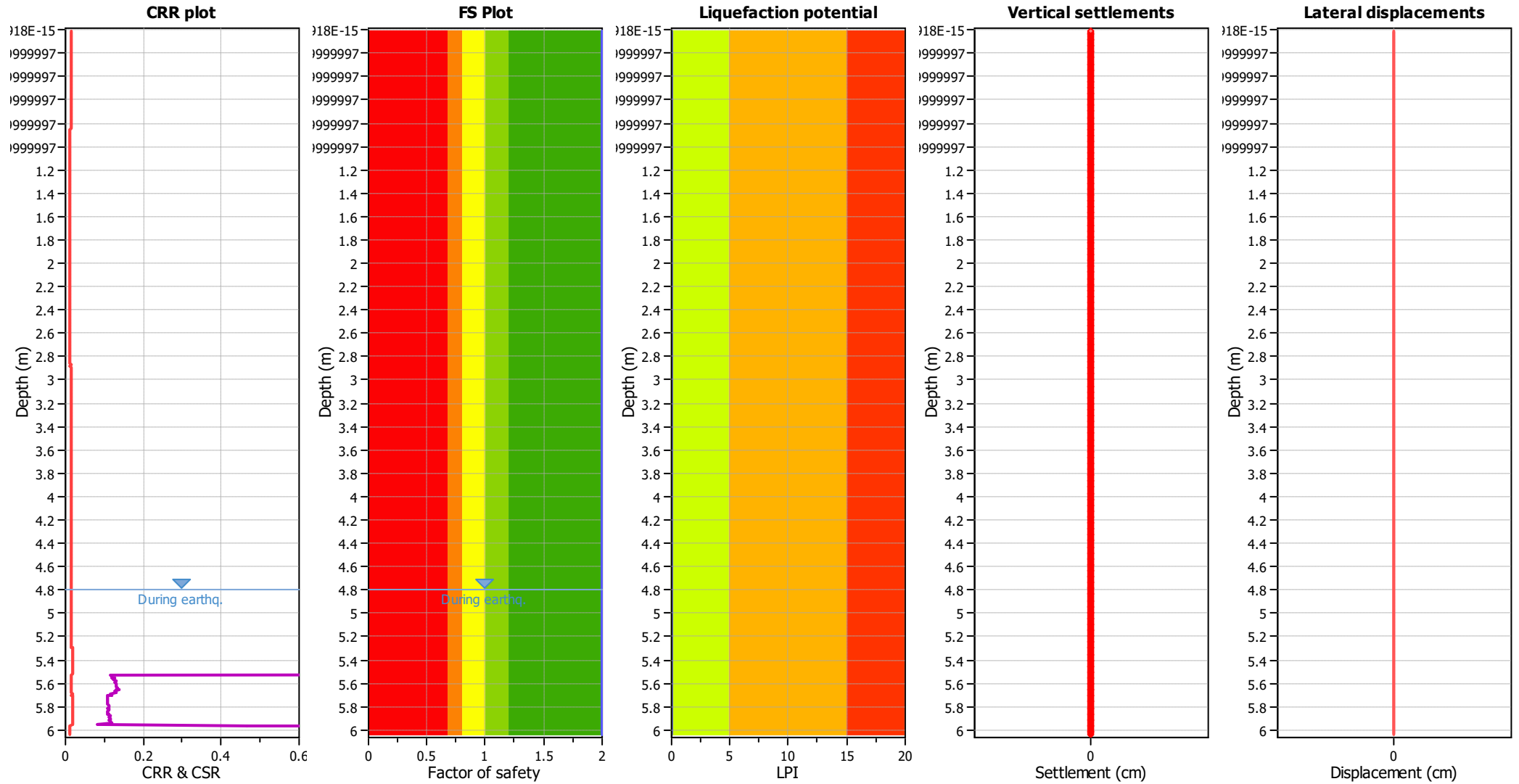
- | | | |
|--|---|---|
| ■ 1. Sensitive fine grained | ■ 4. Clayey silt to silty clay | ■ 7. Gravely sand to sand |
| ■ 2. Organic material | ■ 5. Silty sand to sandy silt | ■ 8. Very stiff sand to clayey sand |
| ■ 3. Clay to silty clay | ■ 6. Clean sand to silty sand | ■ 9. Very stiff fine grained |

Project:

Location:



Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	4.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	2.30 m	Fill height:	N/A	Limit depth:	10.00 m

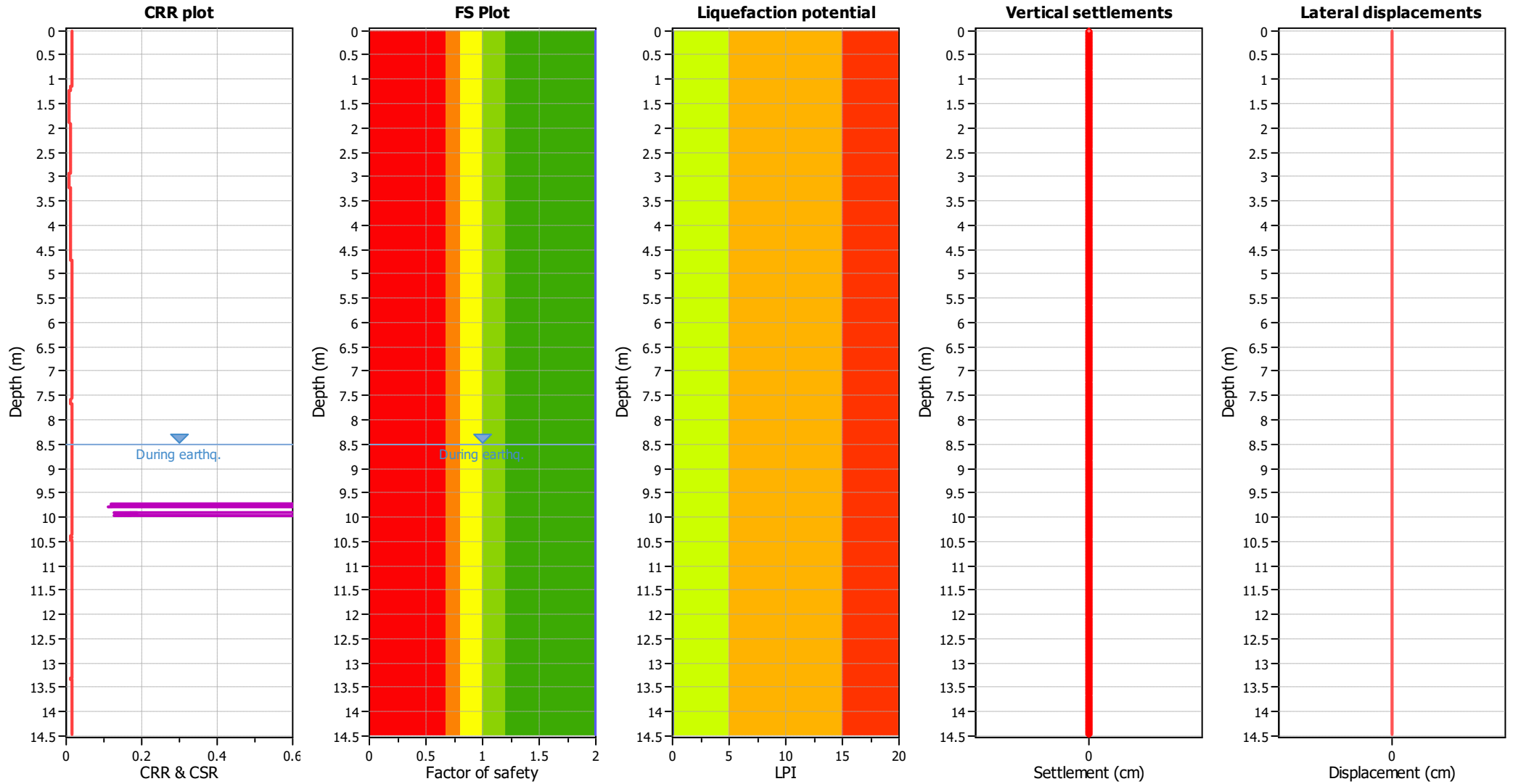
F.S. color scheme

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

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	8.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

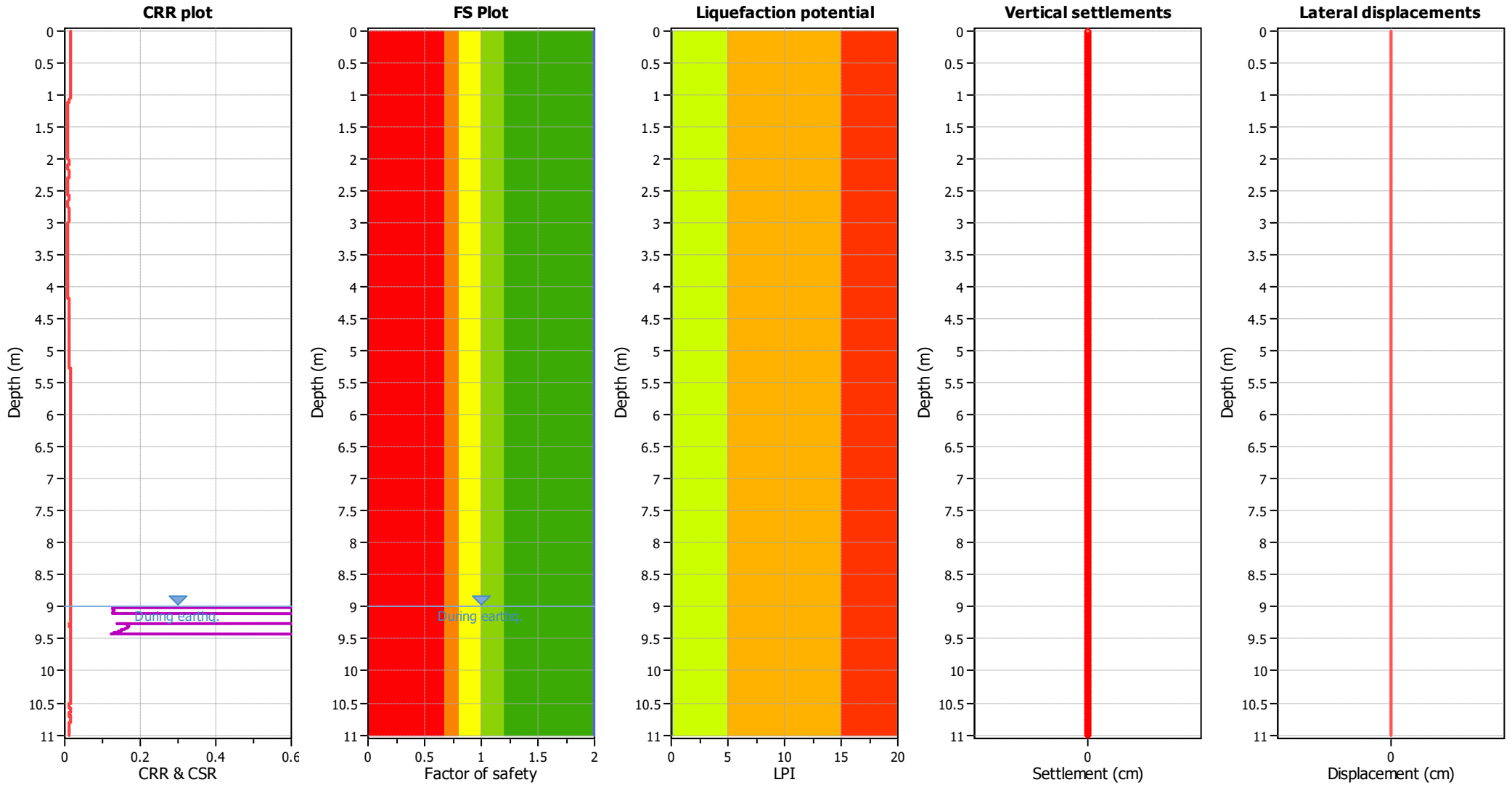
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LPI color scheme

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- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	9.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

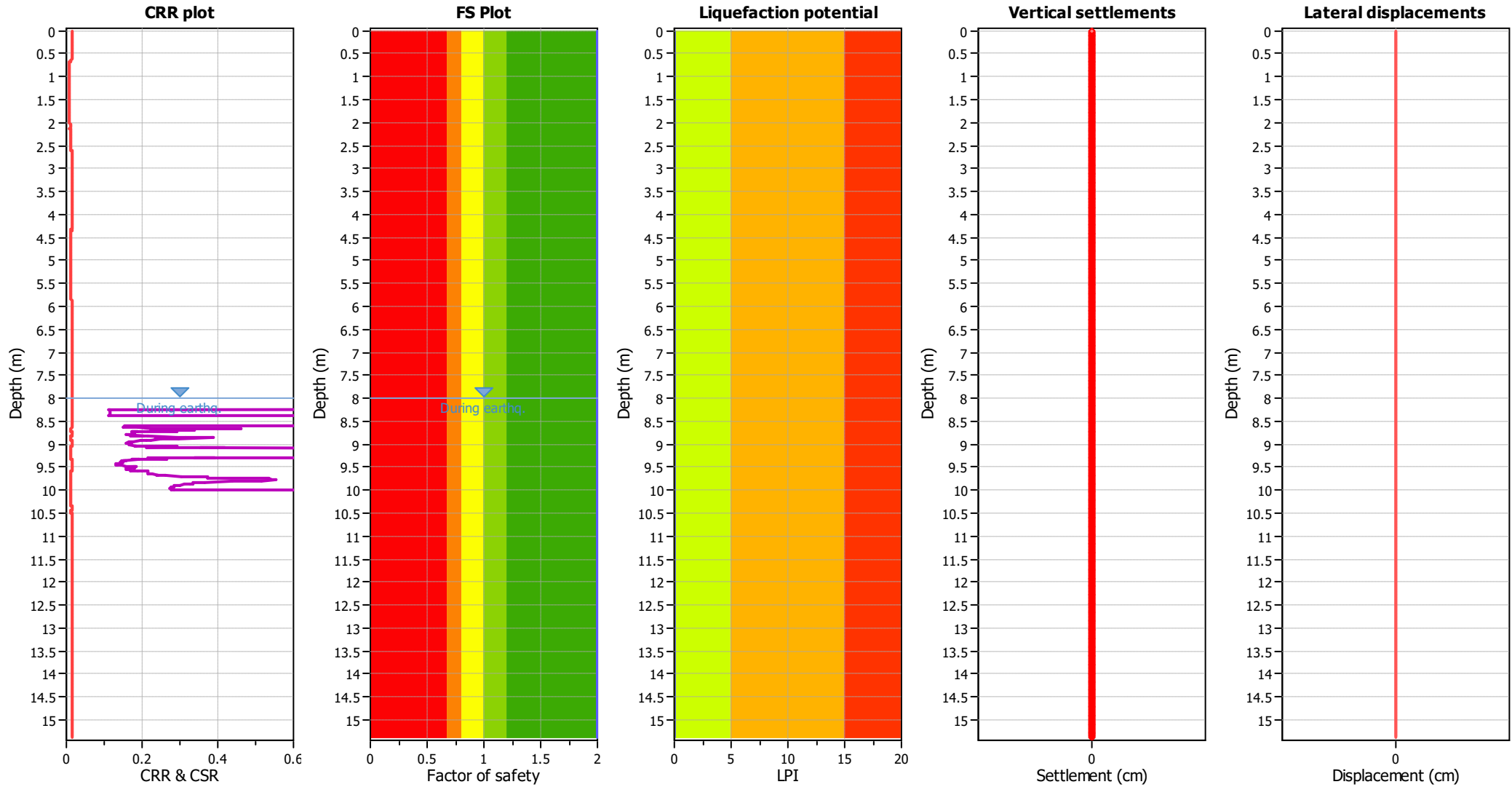
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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	8.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	4.50 m	Fill height:	N/A	Limit depth:	10.00 m

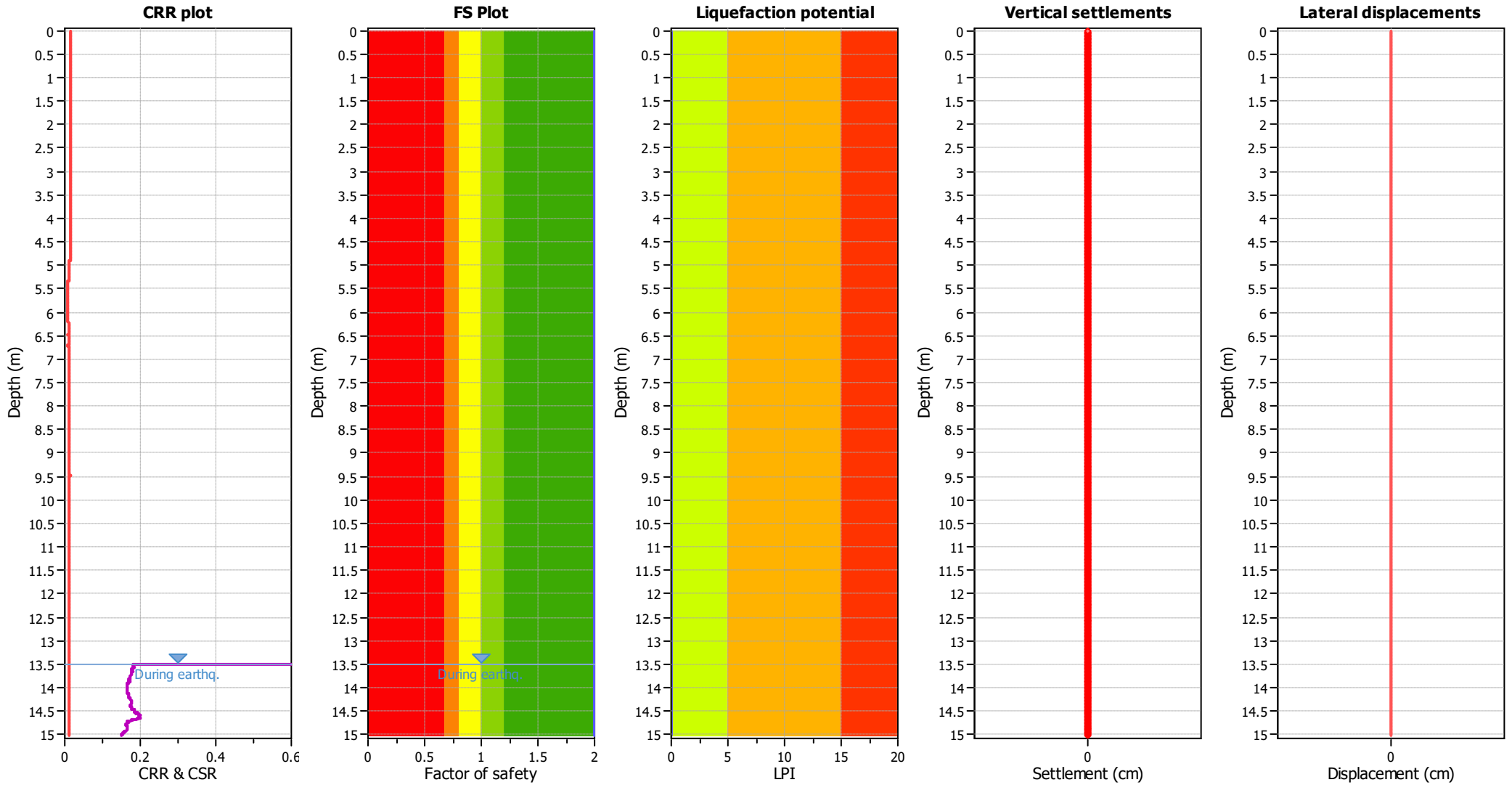
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LPI color scheme

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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	13.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_d applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	13.60 m	Fill height:	N/A	Limit depth:	N/A

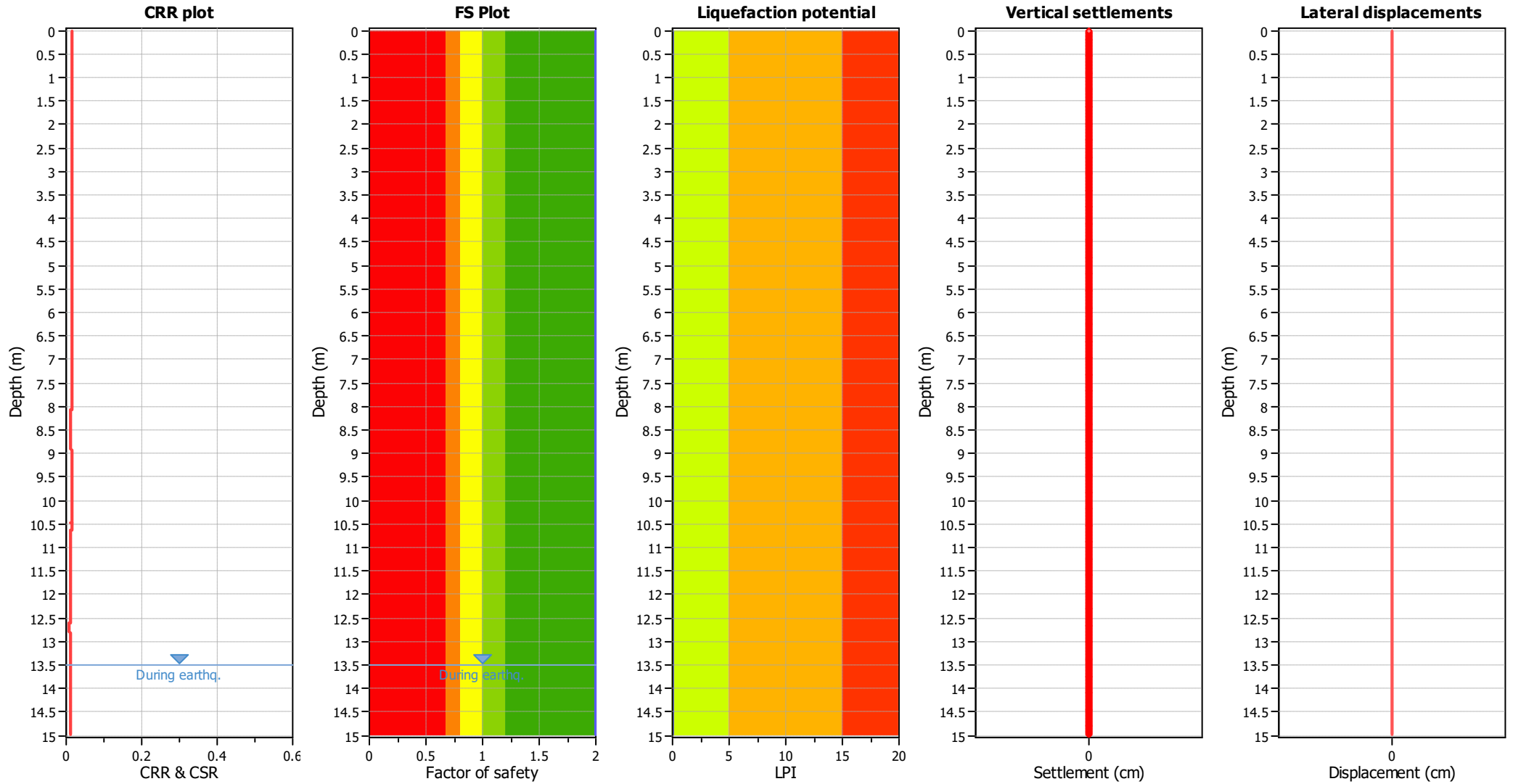
F.S. color scheme

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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	13.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	13.80 m	Fill height:	N/A	Limit depth:	10.00 m

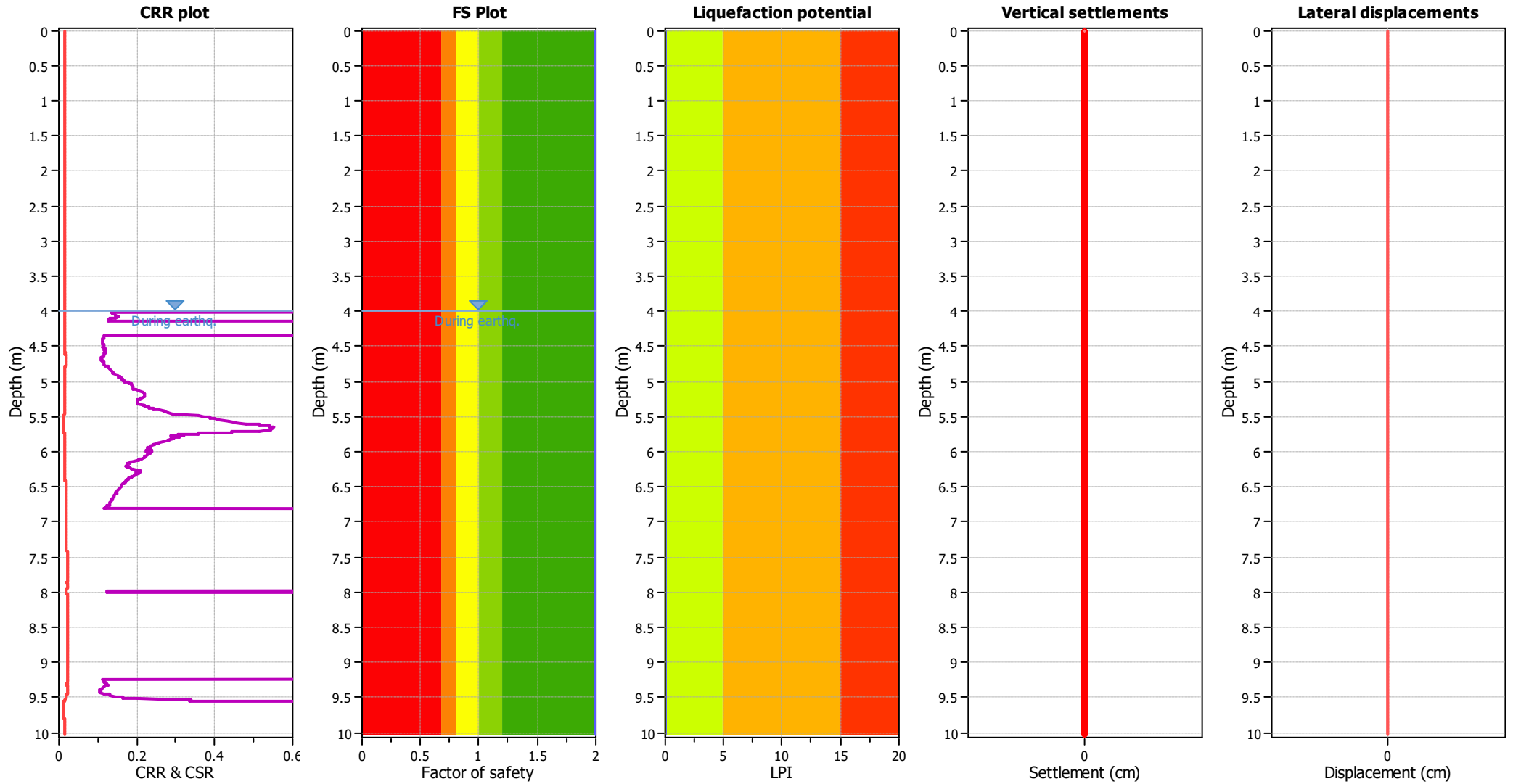
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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	4.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

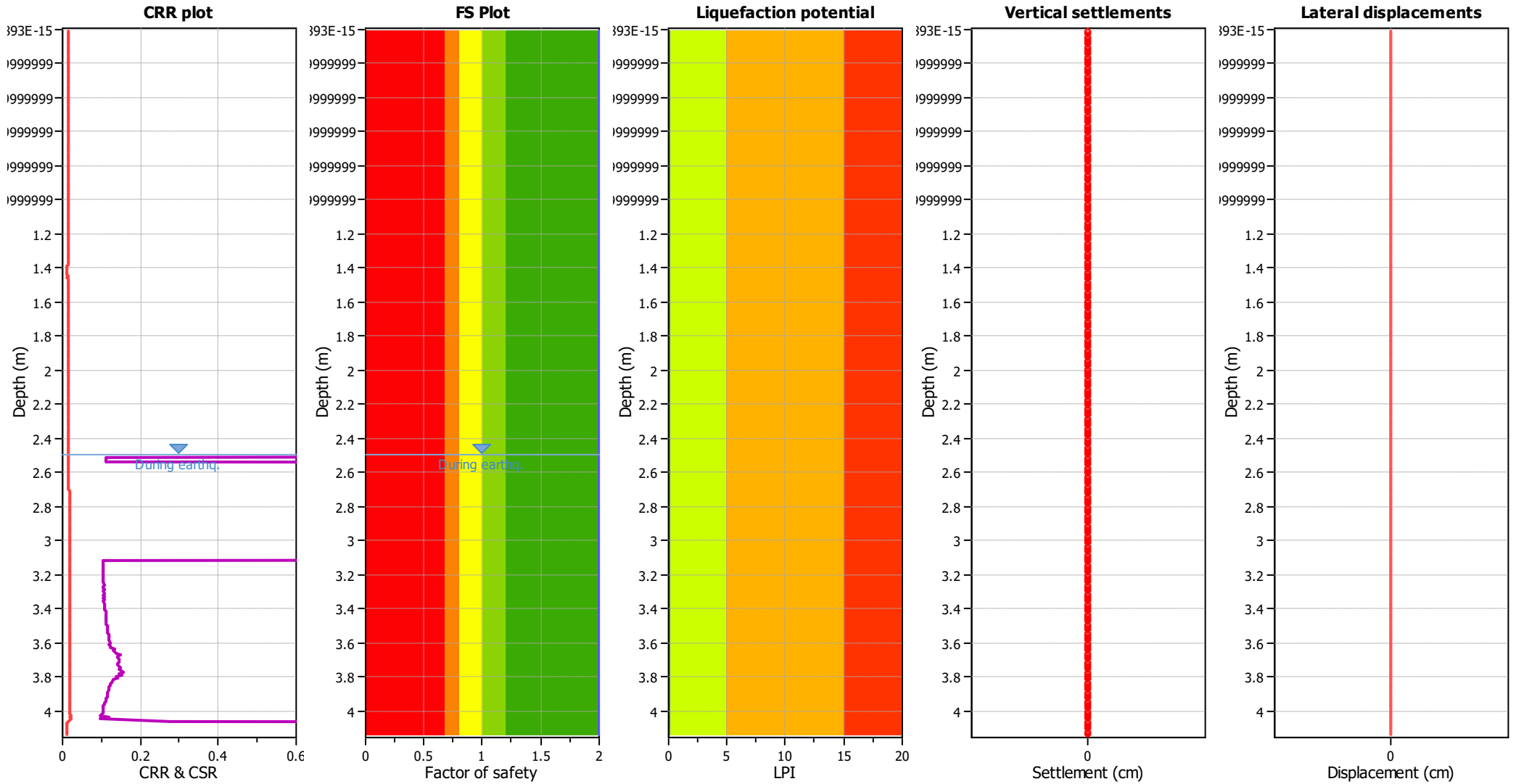
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LPI color scheme

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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

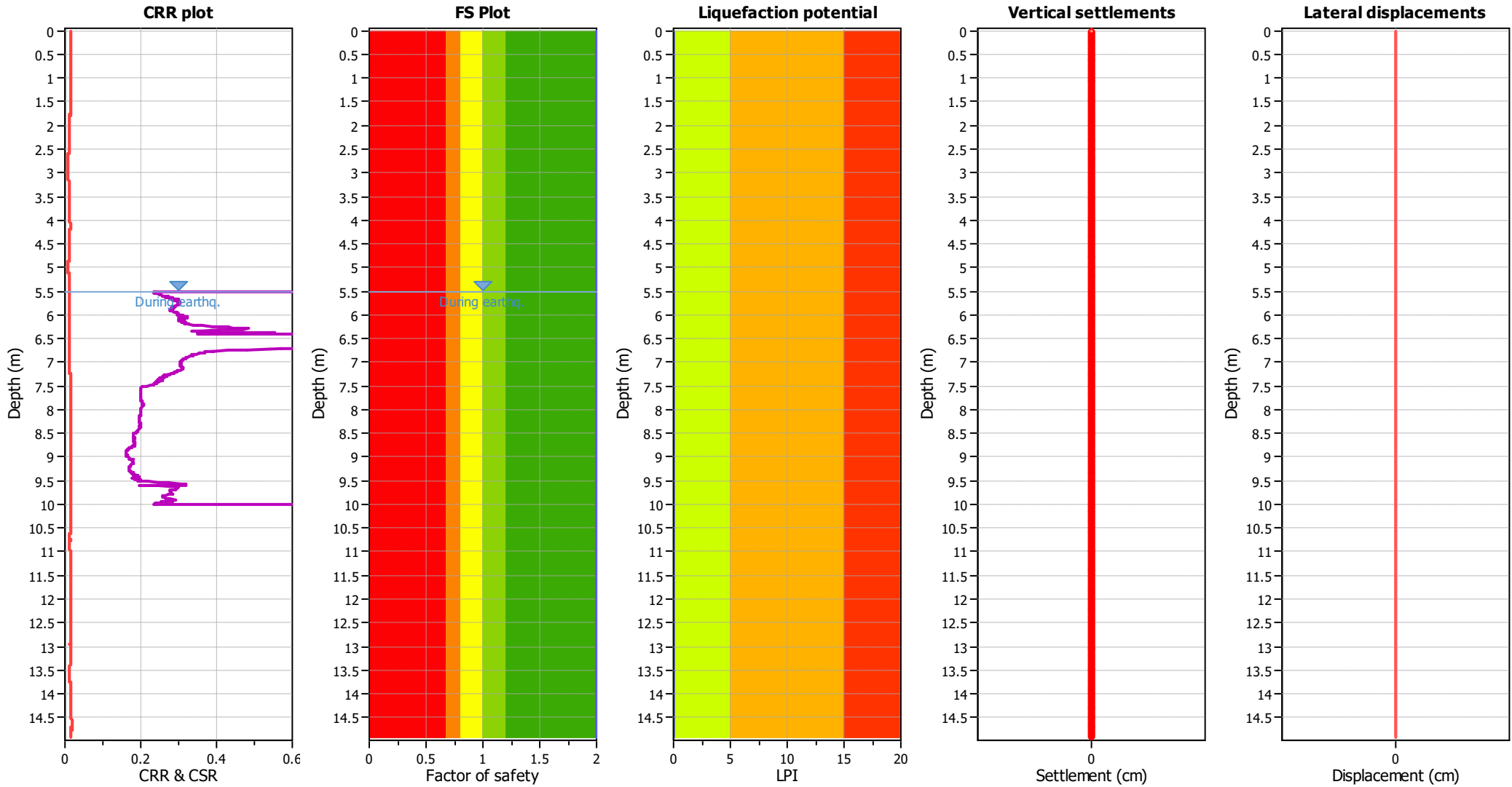
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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	5.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	3.30 m	Fill height:	N/A	Limit depth:	10.00 m

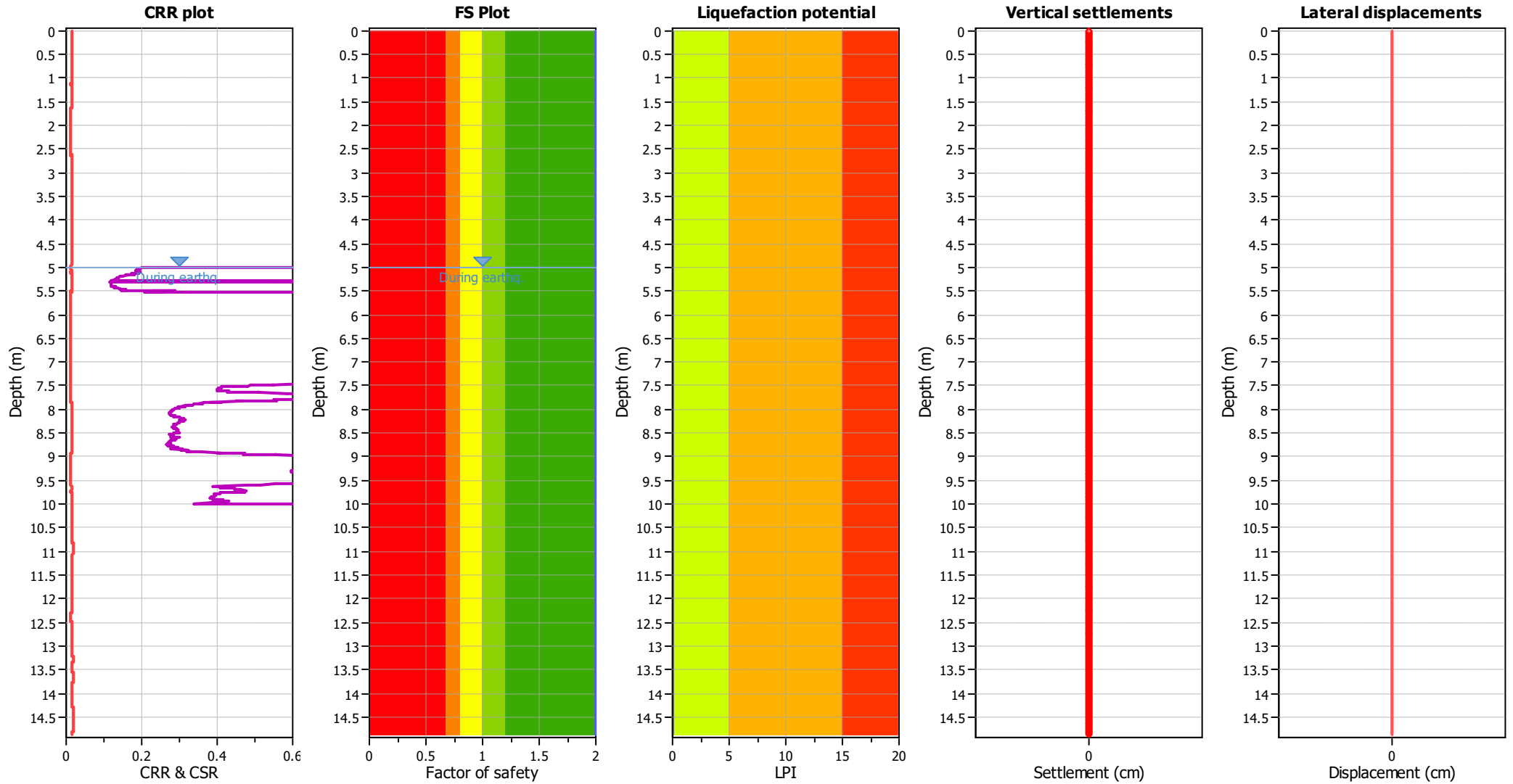
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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	5.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

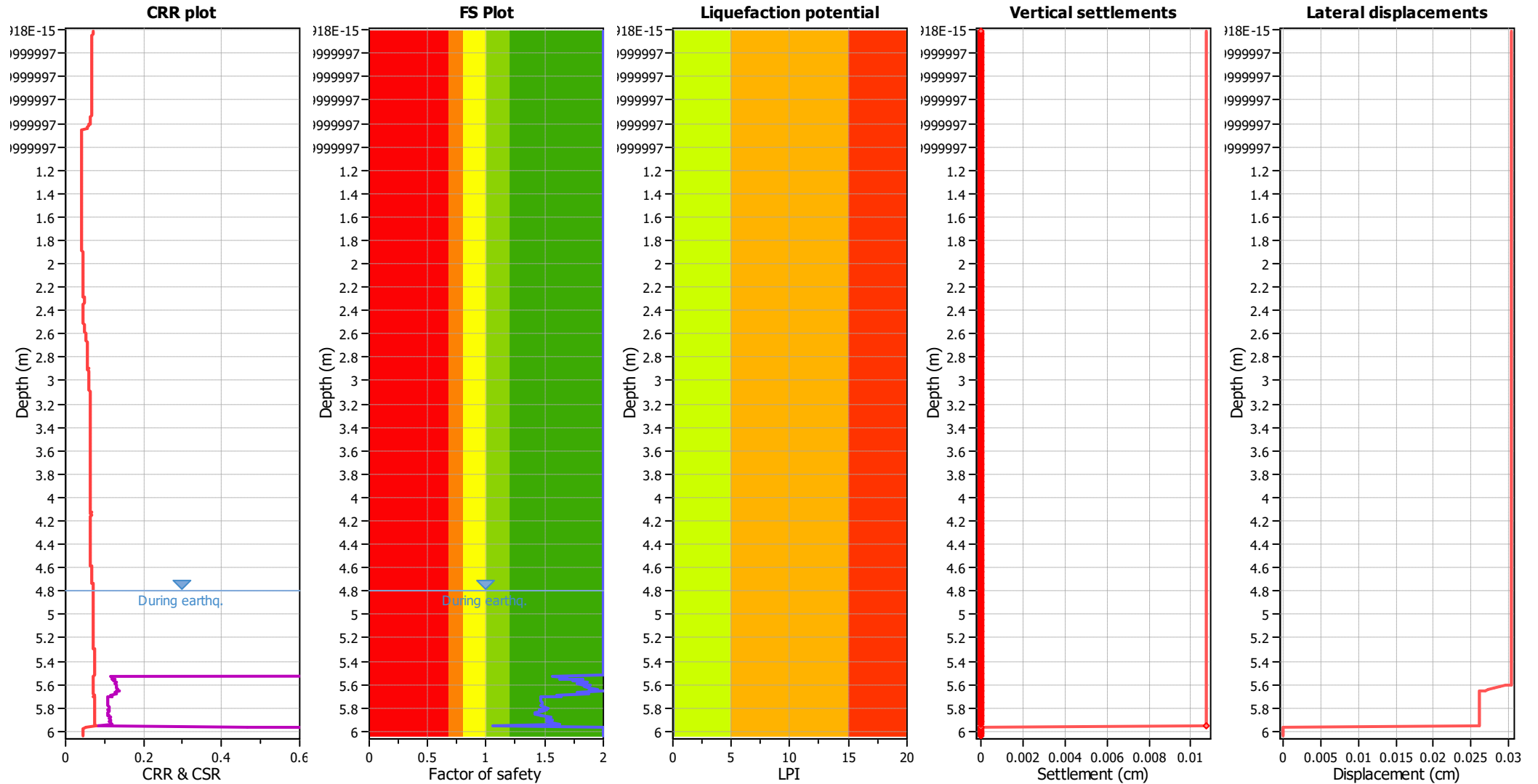
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LPI color scheme

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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	4.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	2.30 m	Fill height:	N/A	Limit depth:	10.00 m

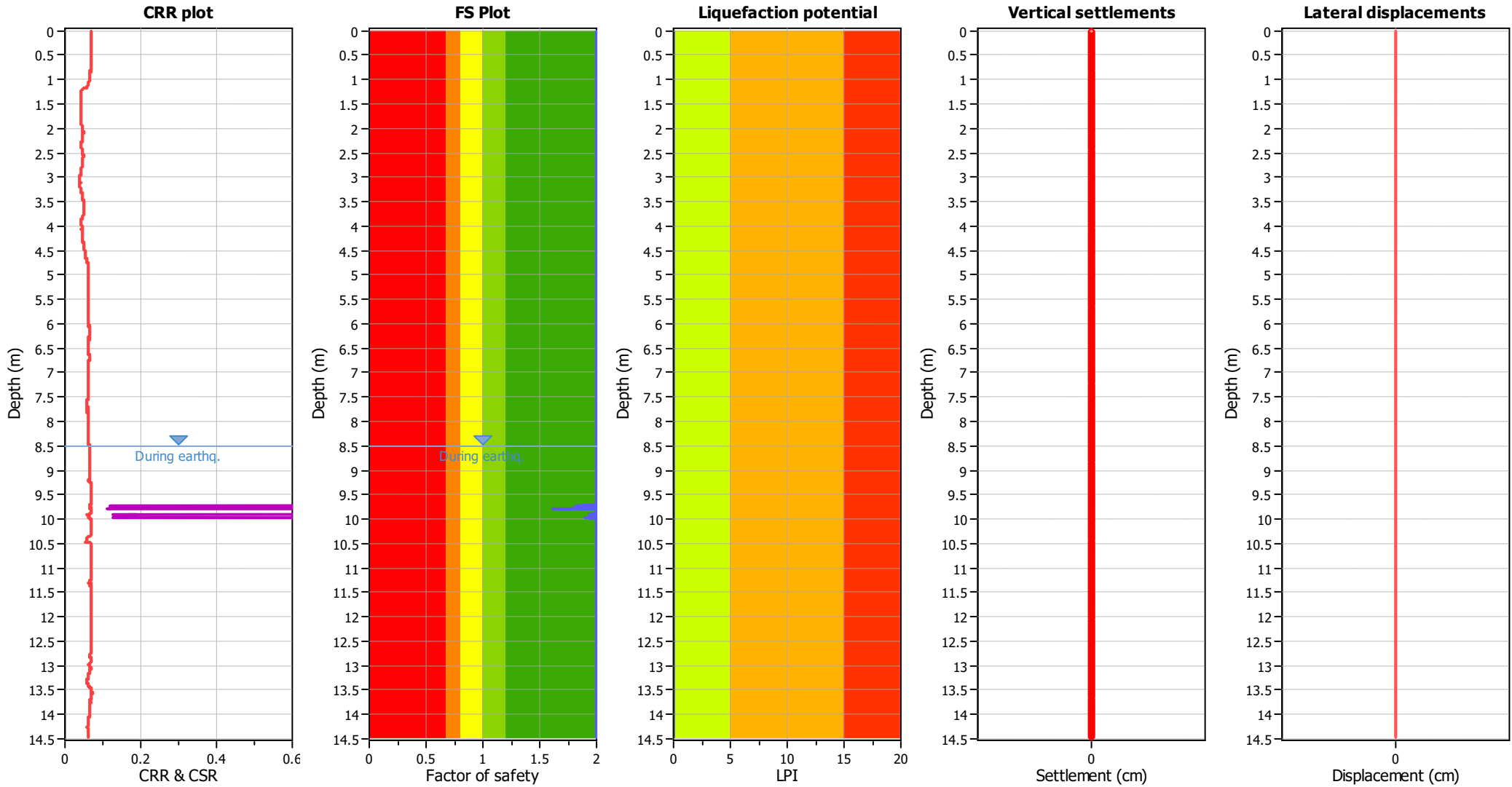
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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	8.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

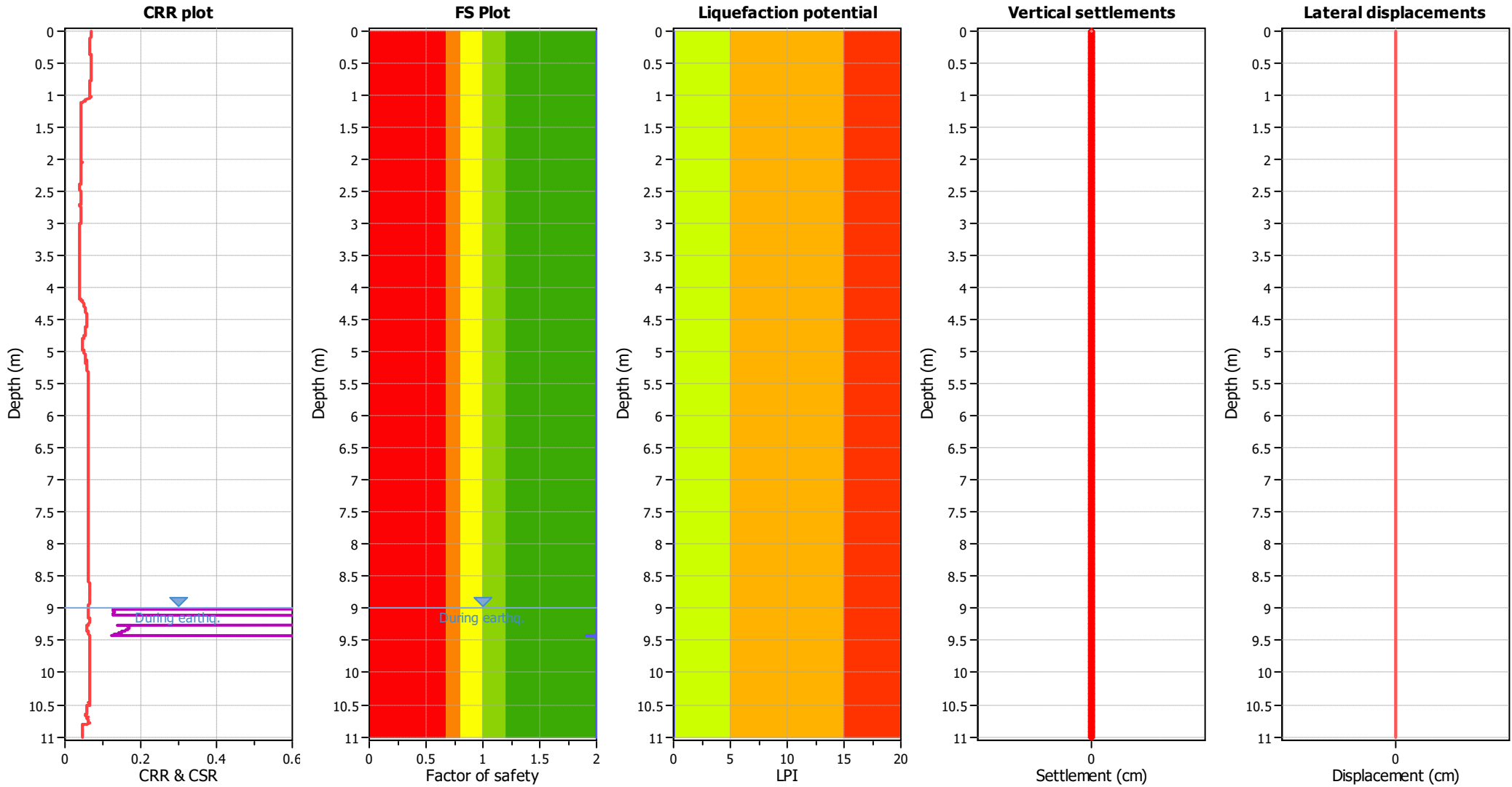
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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	9.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

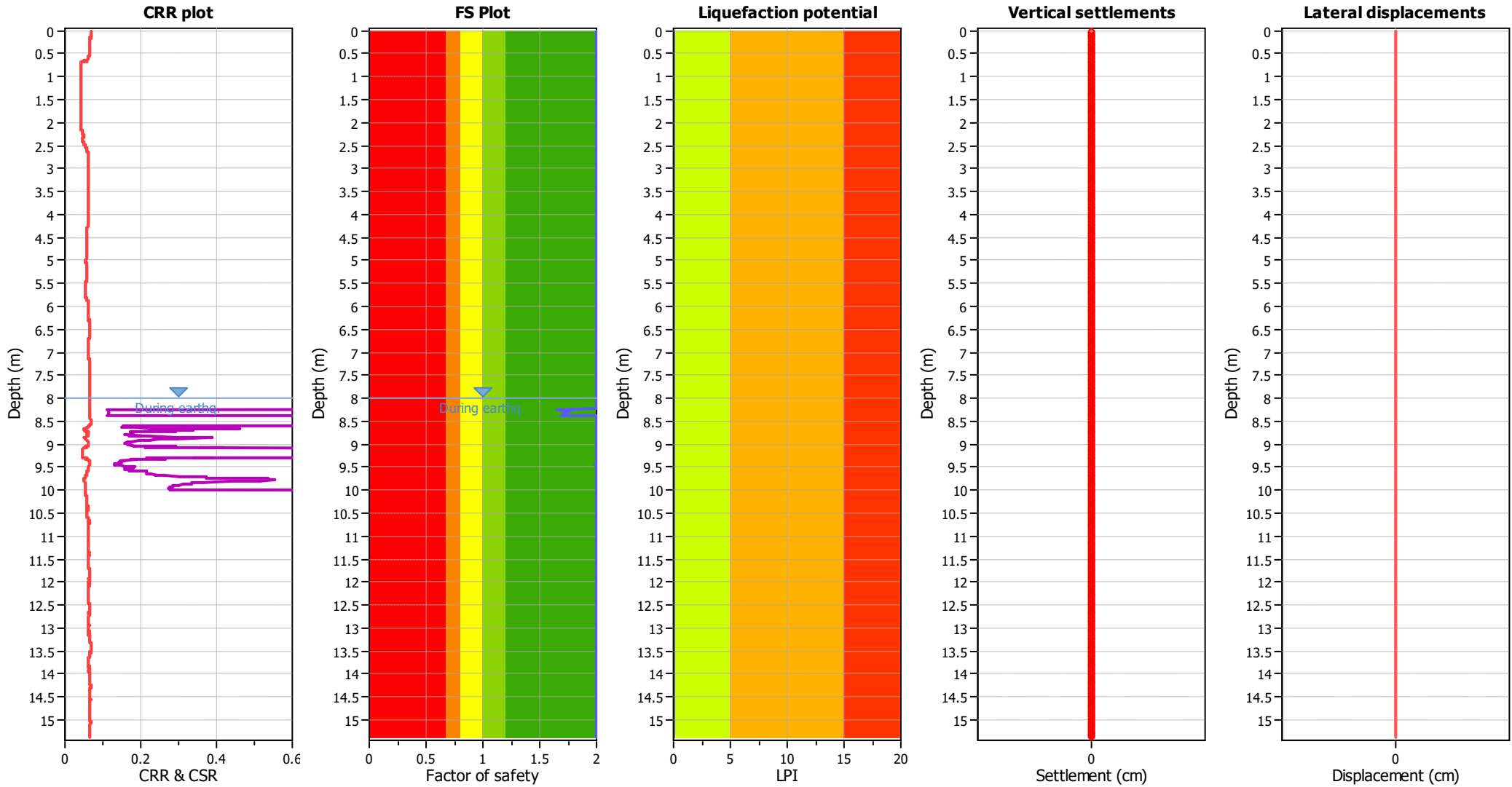
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Liquefaction analysis overall plots



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Analysis method:	B&I (2014)	Depth to GWT (earthq.):	8.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	4.50 m	Fill height:	N/A	Limit depth:	10.00 m

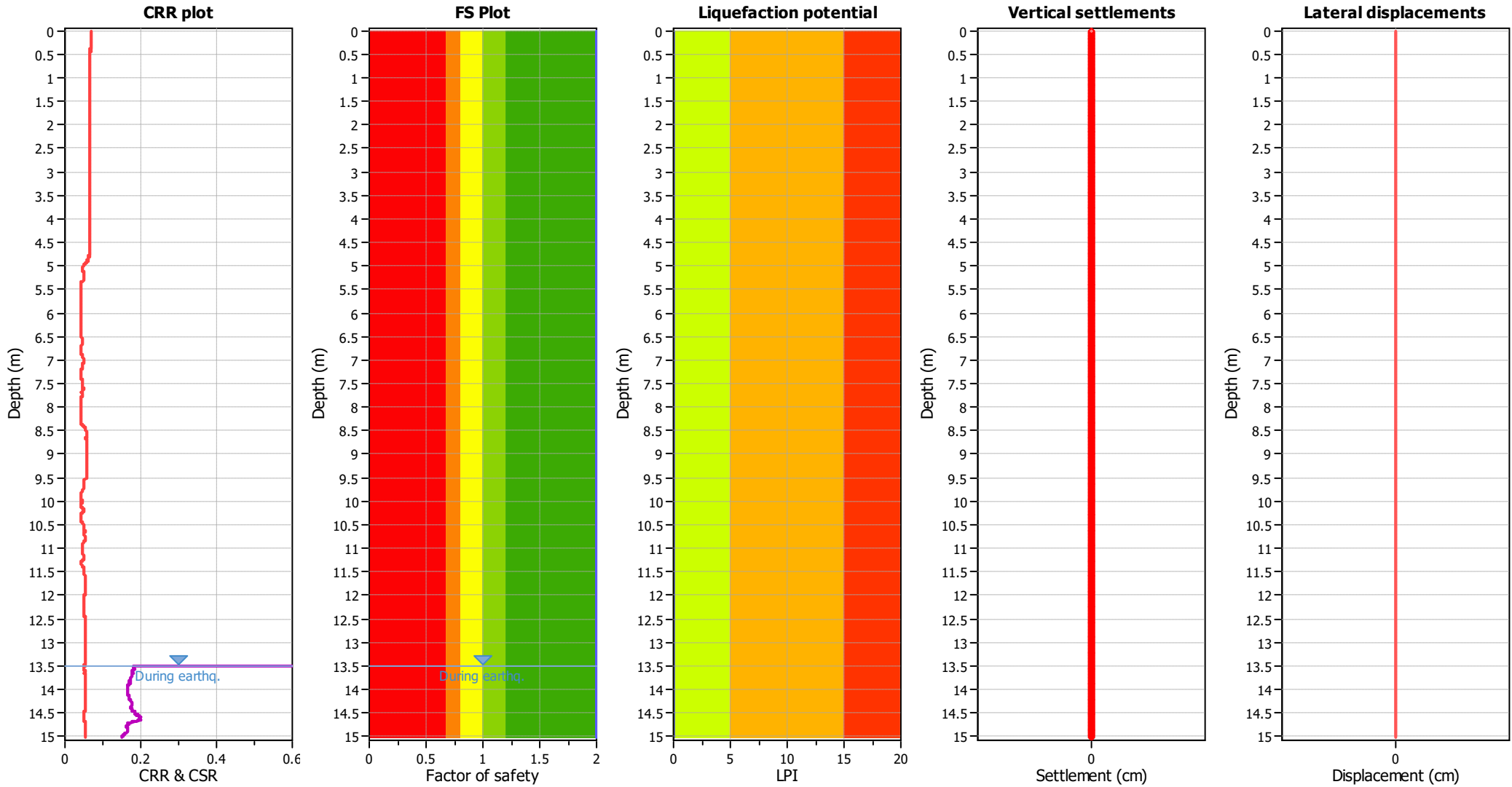
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Liquefaction analysis overall plots



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Analysis method:	B&I (2014)	Depth to GWT (earthq.):	13.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	13.60 m	Fill height:	N/A	Limit depth:	N/A

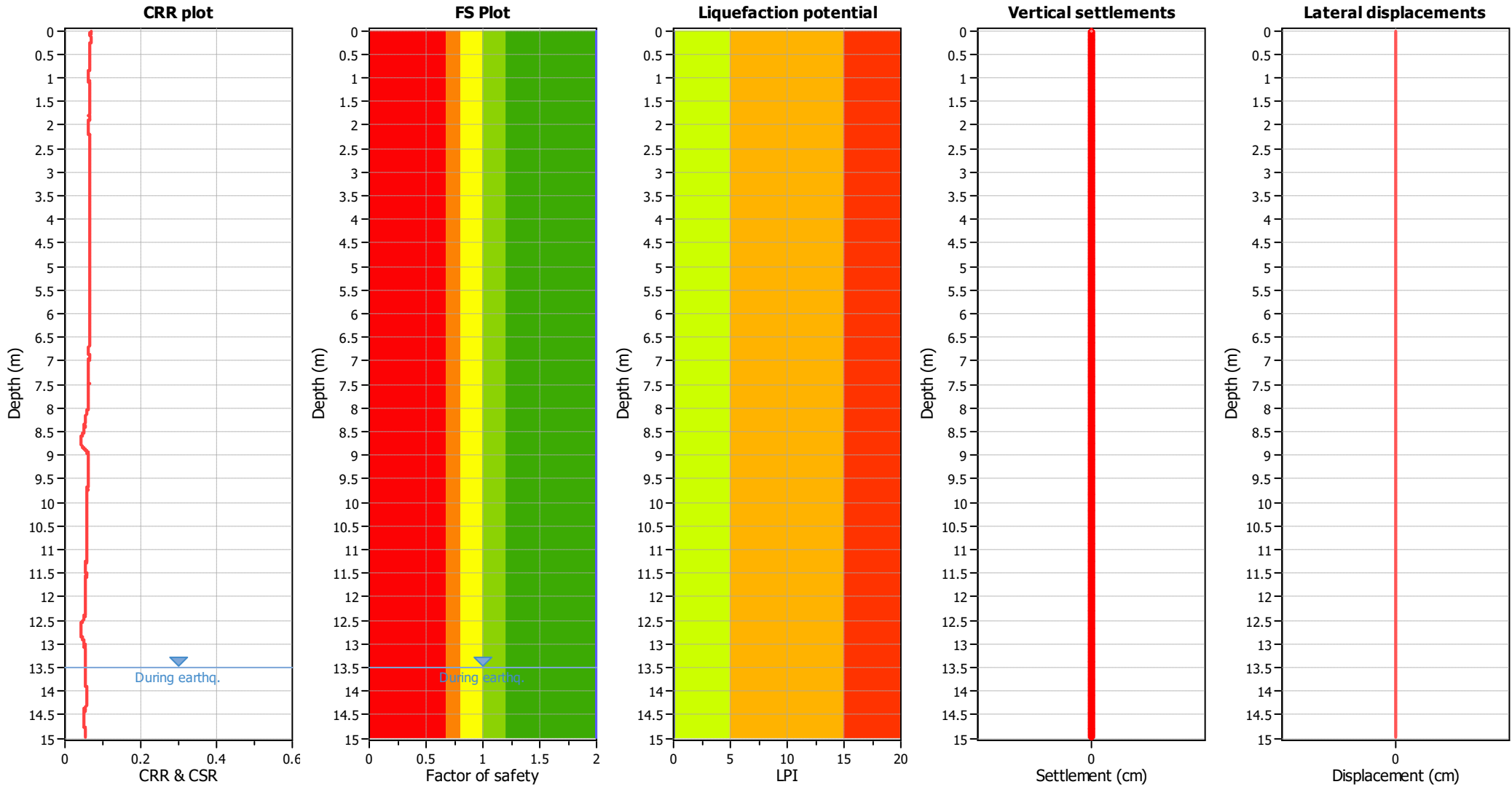
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Liquefaction analysis overall plots



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Analysis method:	B&I (2014)	Depth to GWT (earthq.):	13.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
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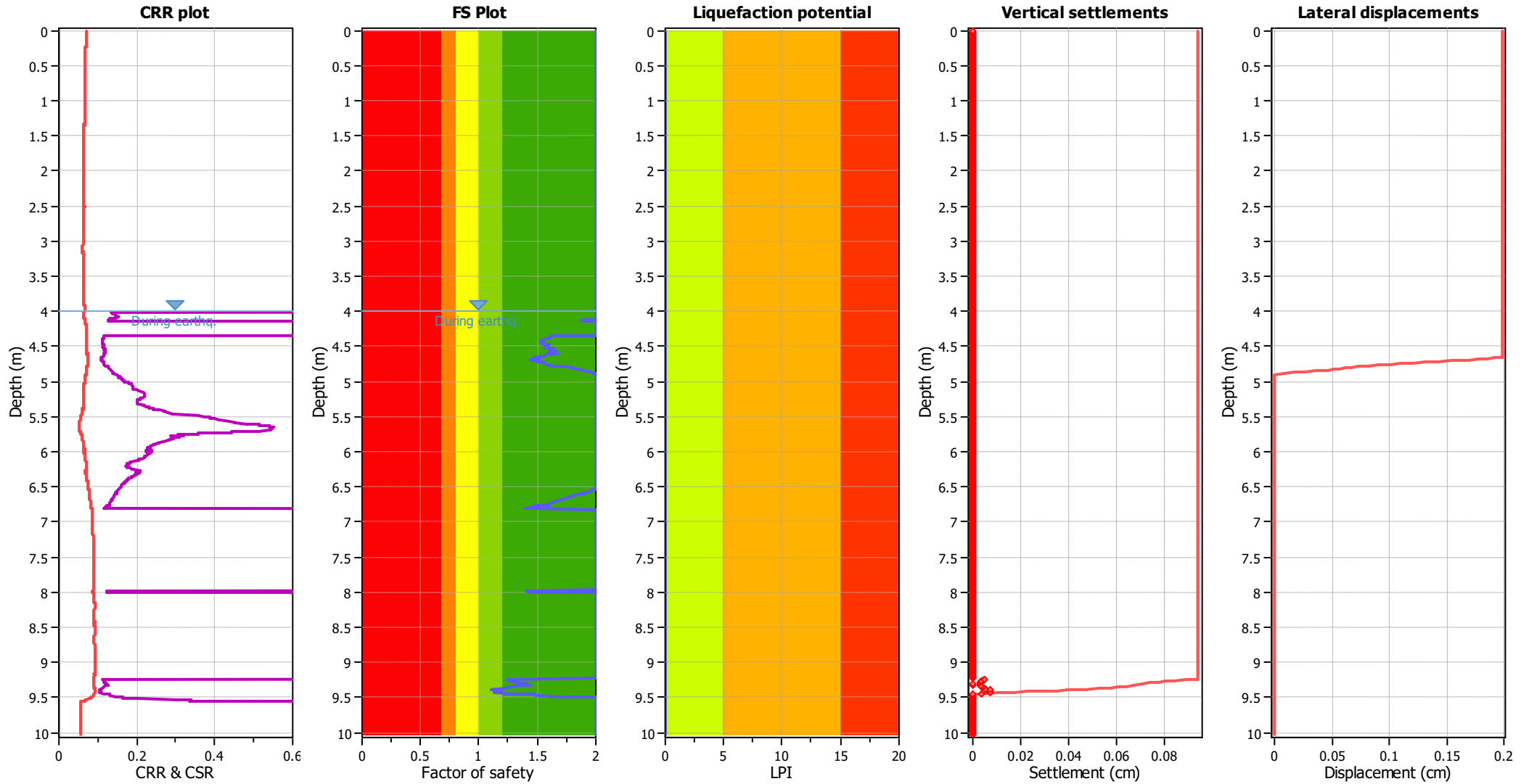
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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	4.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

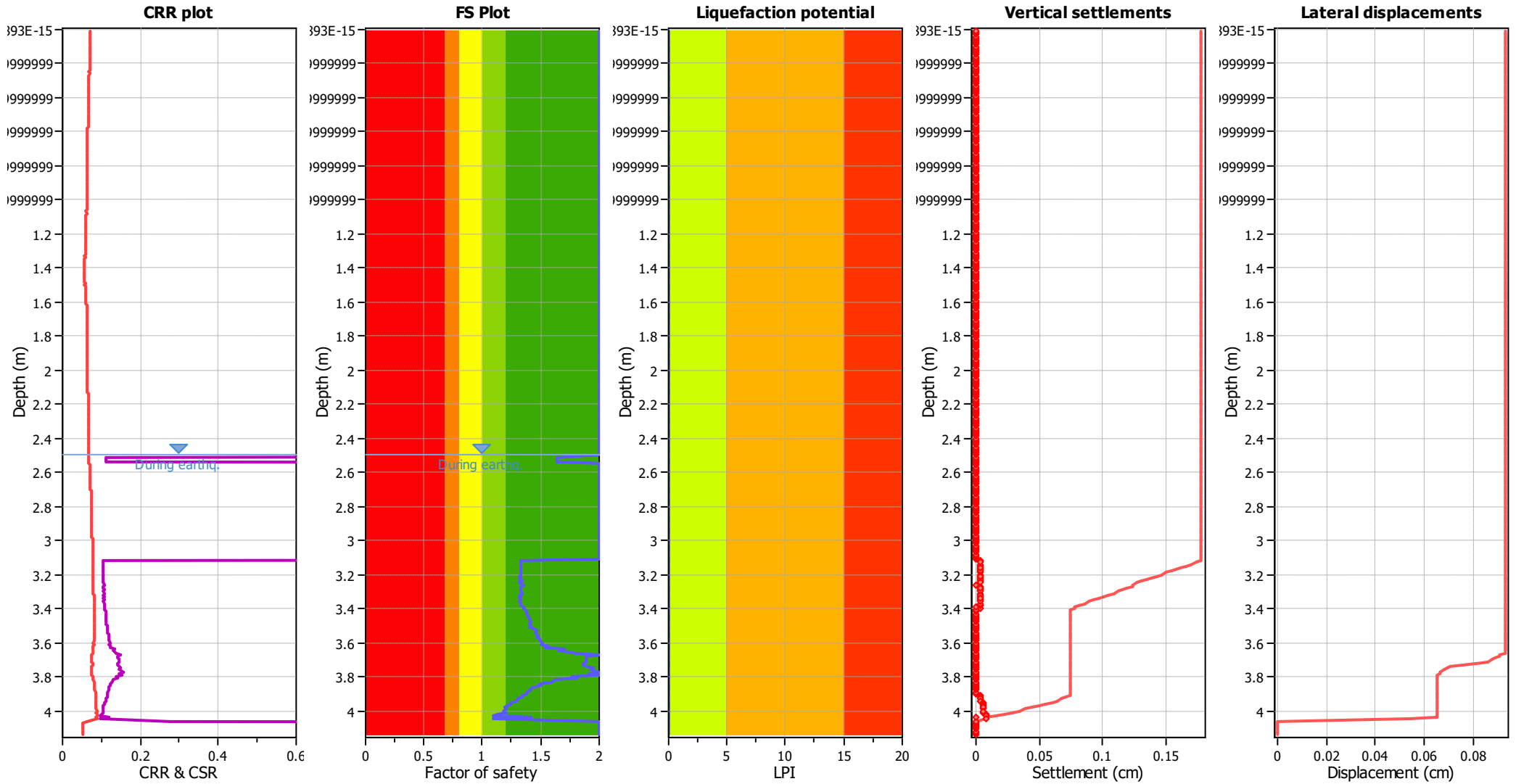
F.S. color scheme

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

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

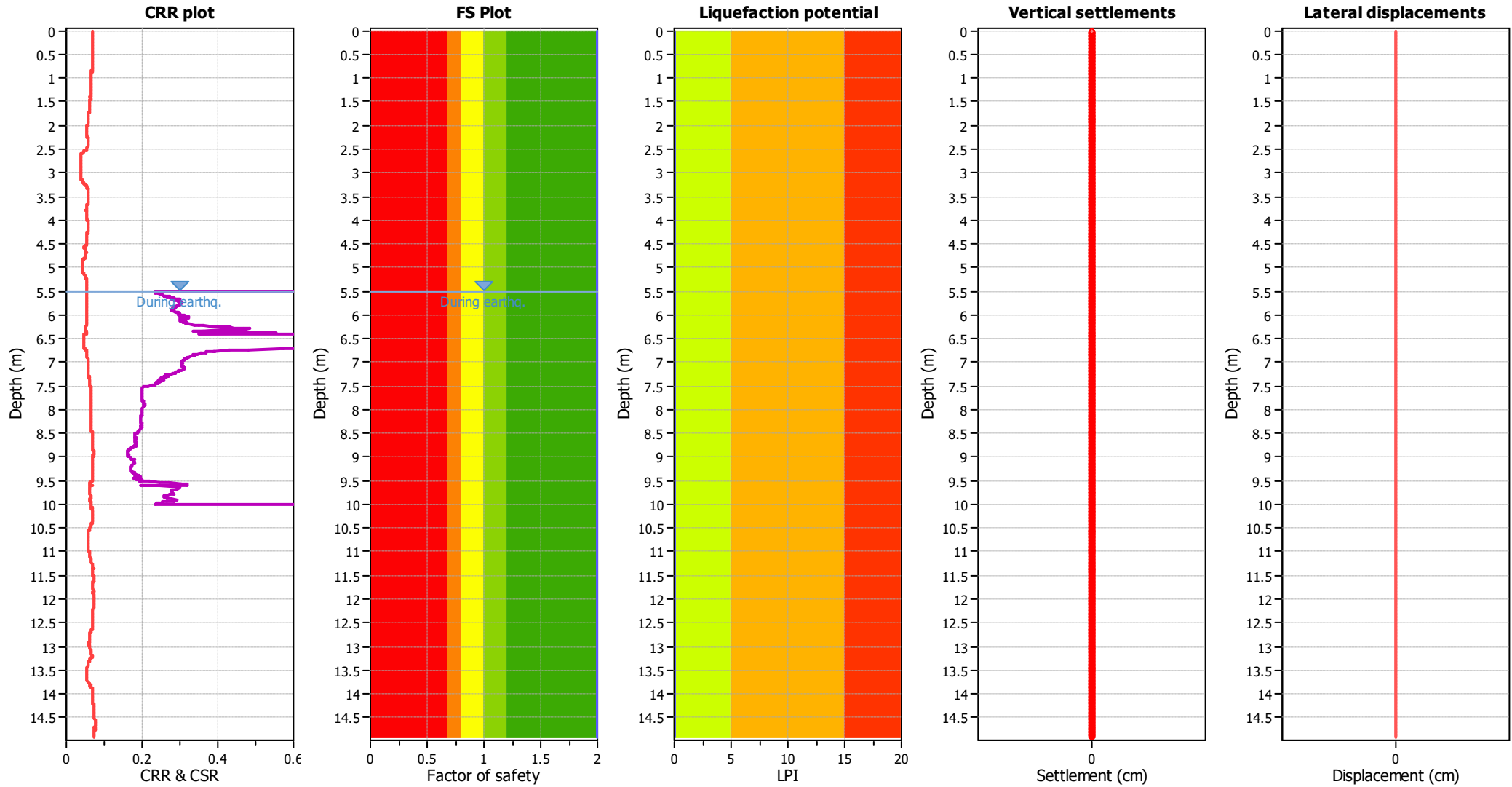
F.S. color scheme

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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	5.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	3.30 m	Fill height:	N/A	Limit depth:	10.00 m

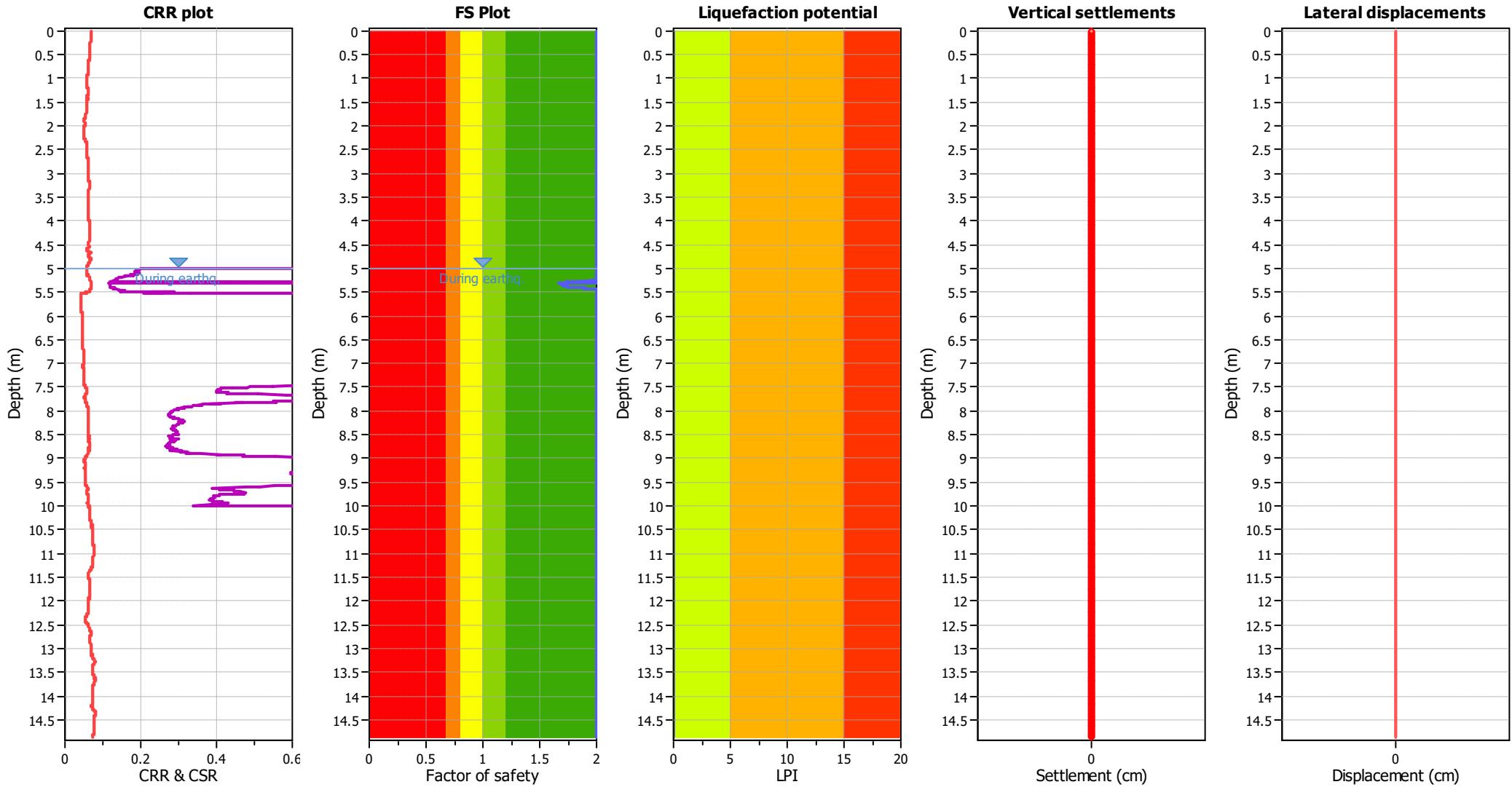
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Liquefaction analysis overall plots



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Analysis method:	B&I (2014)	Depth to GWT (earthq.):	5.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

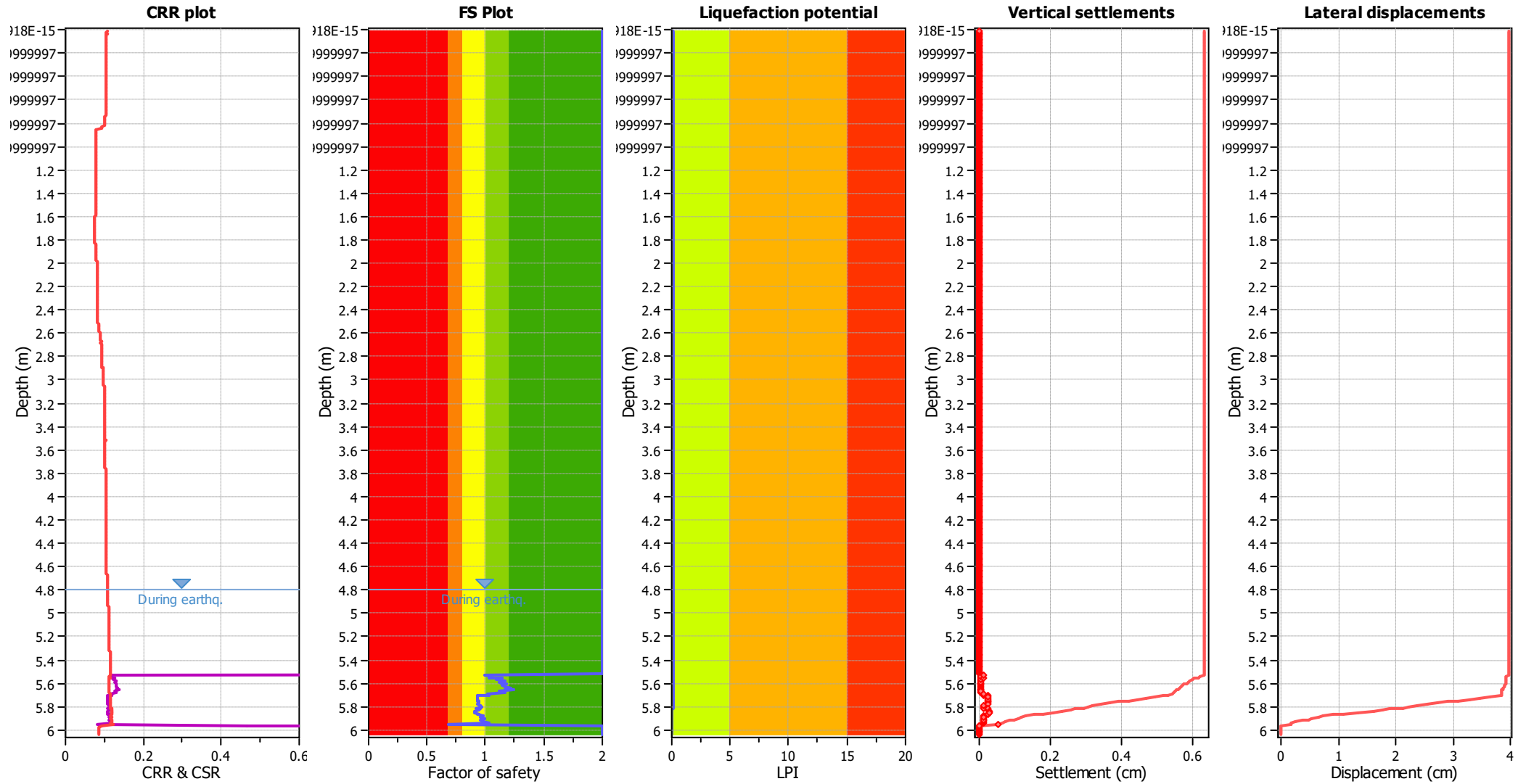
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LPI color scheme

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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	4.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	2.30 m	Fill height:	N/A	Limit depth:	10.00 m

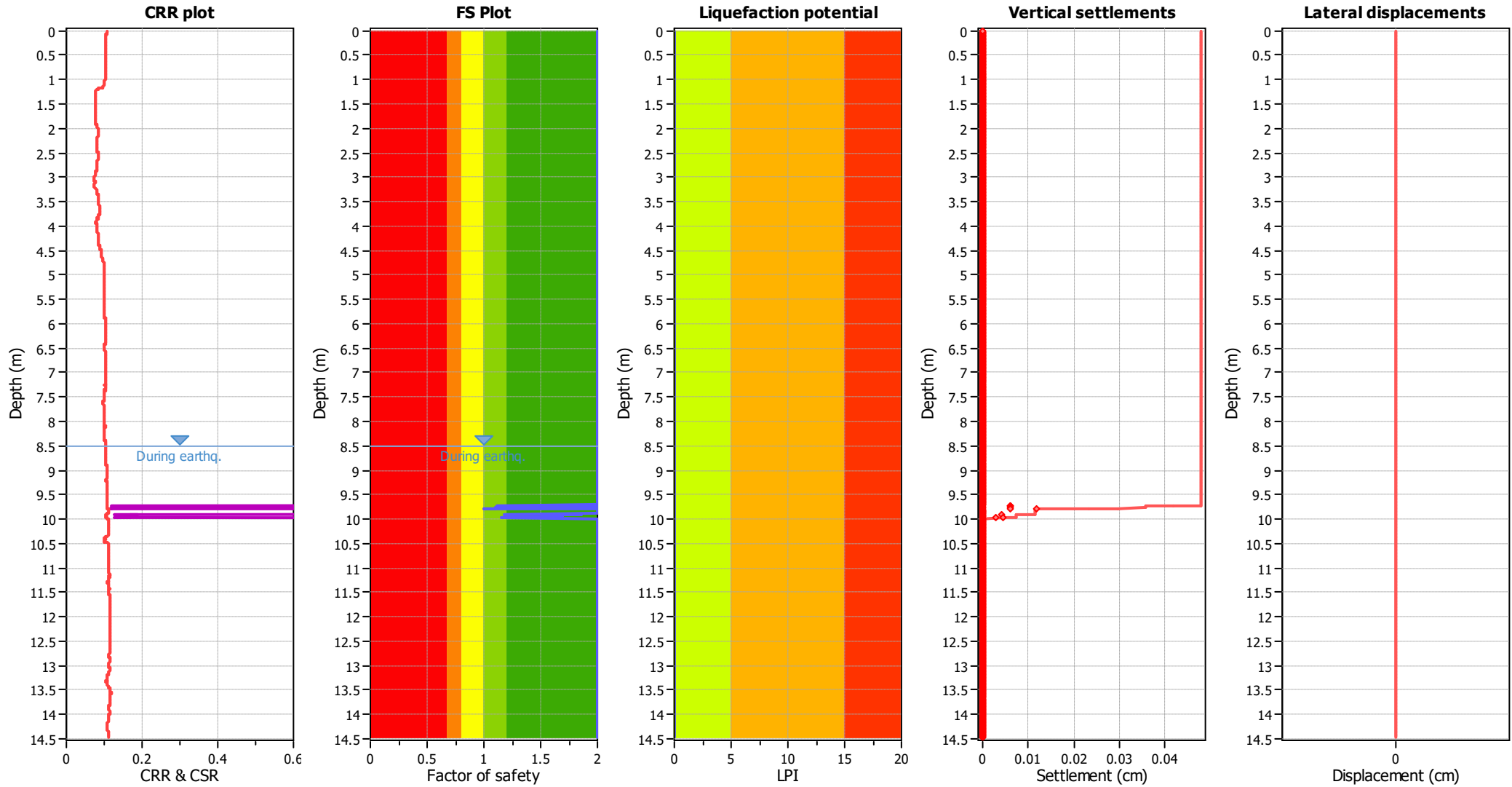
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LPI color scheme

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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	8.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

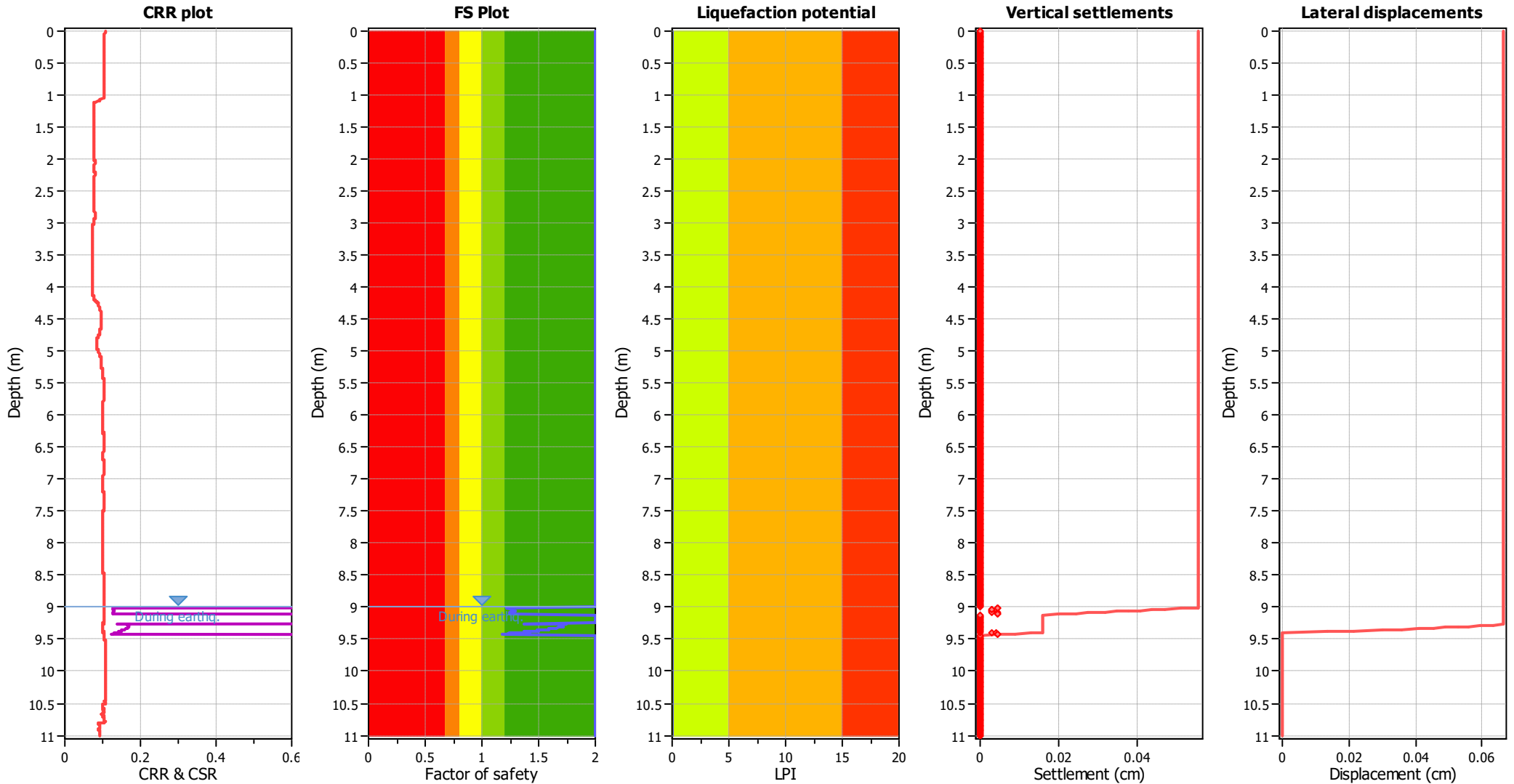
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LPI color scheme

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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	9.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
Earthquake magnitude M _w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

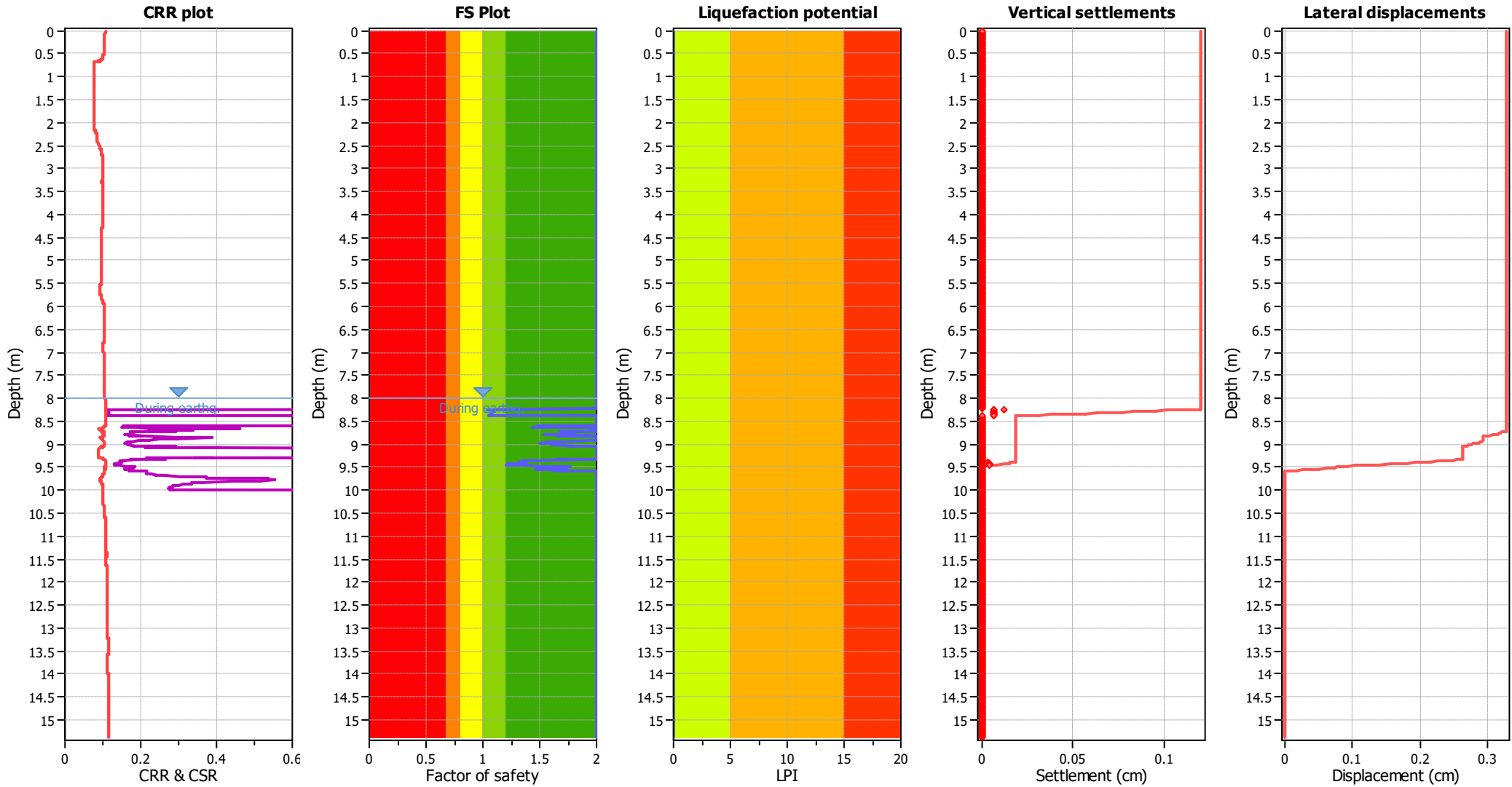
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LPI color scheme

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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	8.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	4.50 m	Fill height:	N/A	Limit depth:	10.00 m

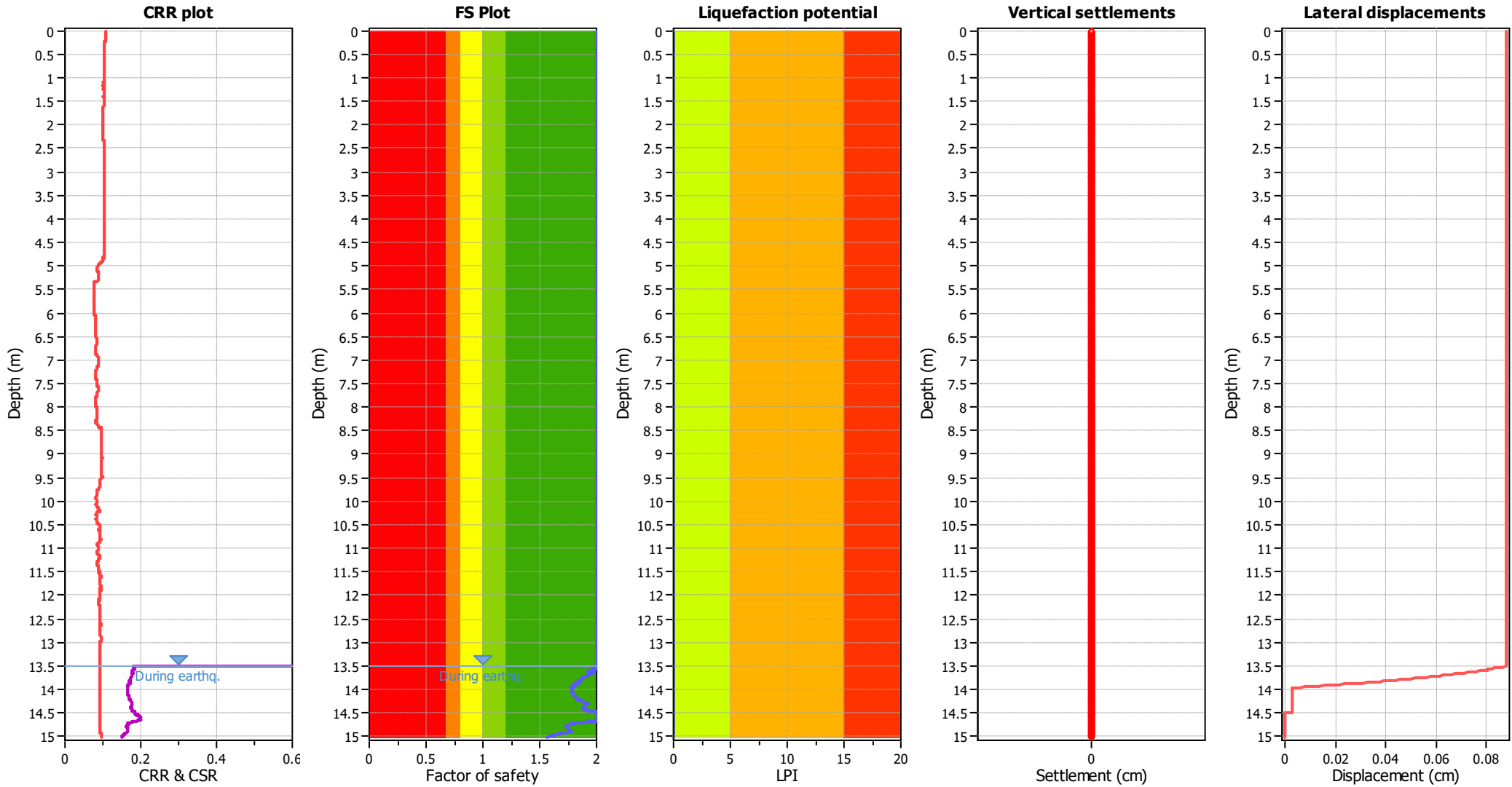
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Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	13.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	13.60 m	Fill height:	N/A	Limit depth:	N/A

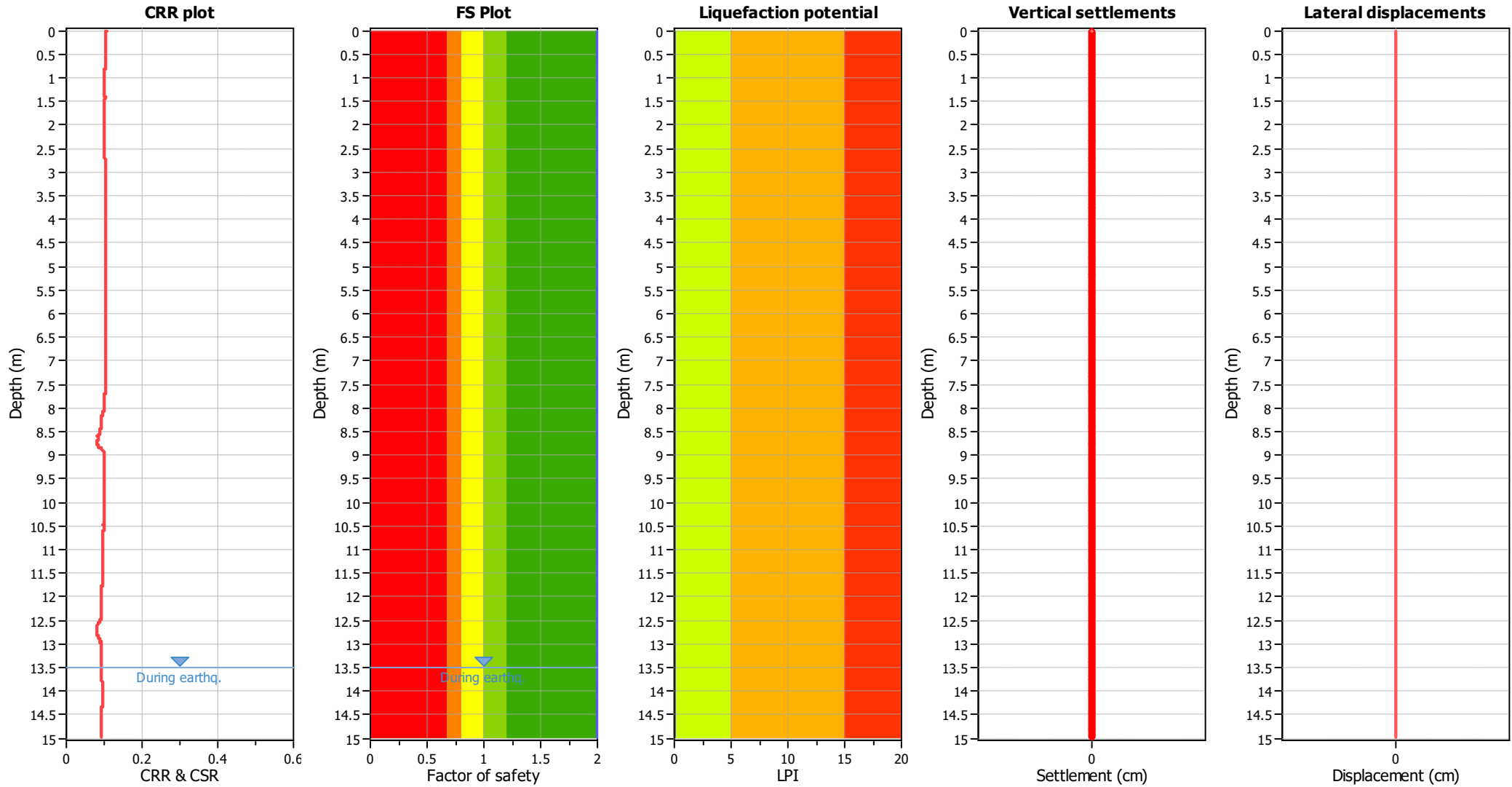
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Liquefaction analysis overall plots



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Analysis method:	B&I (2014)	Depth to GWT (earthq.):	13.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	13.80 m	Fill height:	N/A	Limit depth:	10.00 m

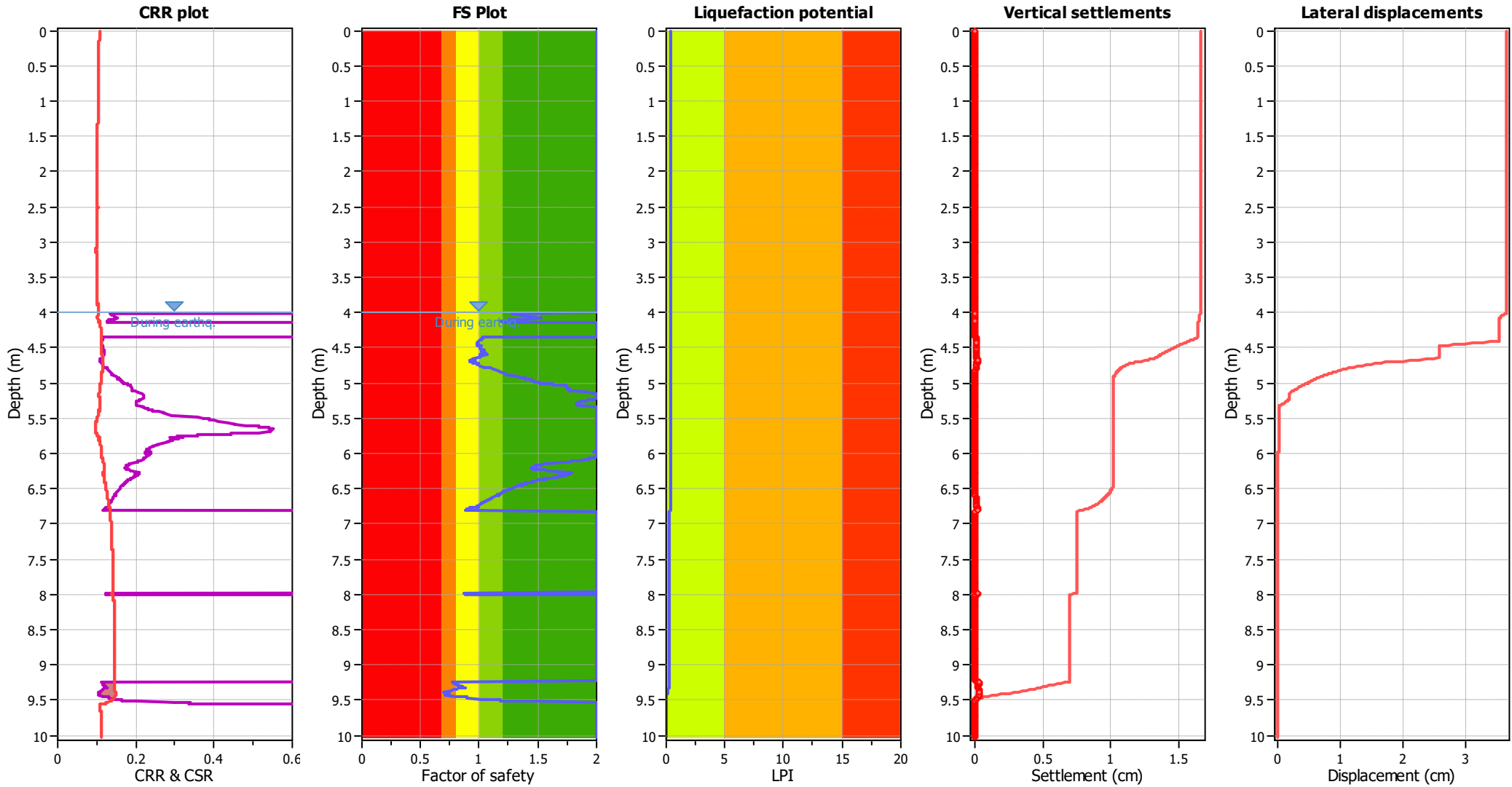
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Liquefaction analysis overall plots



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Analysis method:	B&I (2014)	Depth to GWT (earthq.):	4.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	0.00 m	Fill height:	N/A	Limit depth:	10.00 m

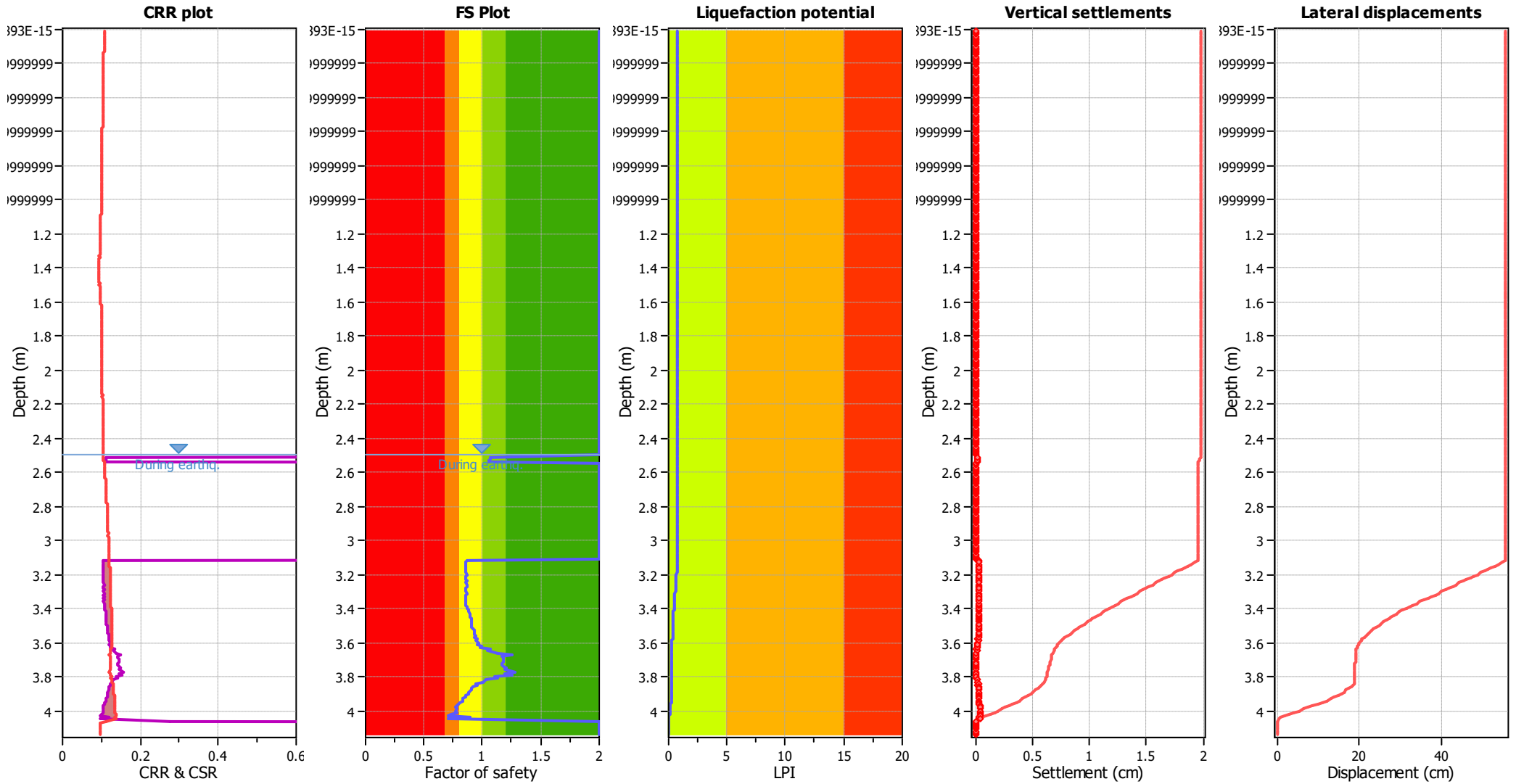
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Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	Yes
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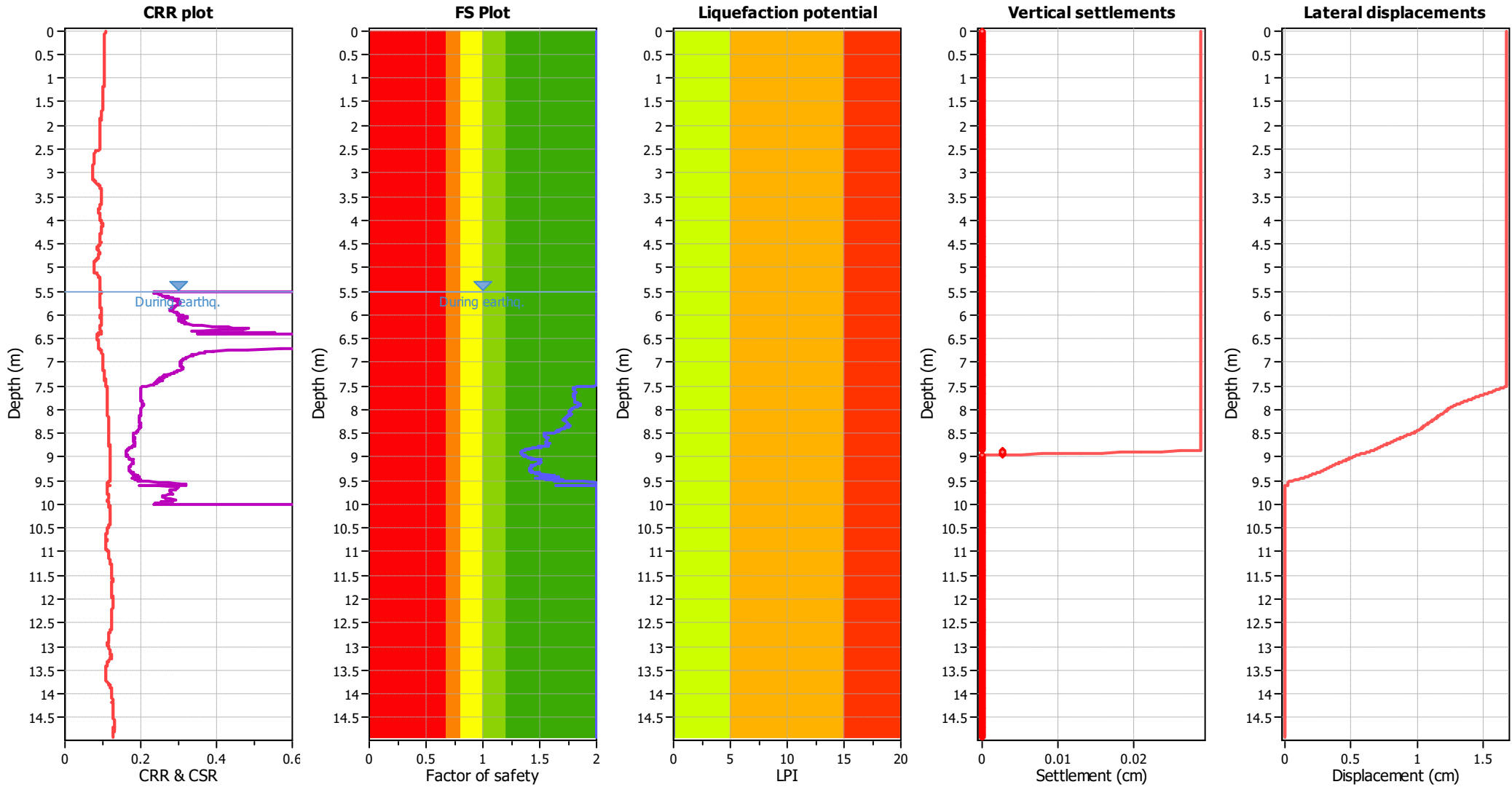
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Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	3.30 m	Fill height:	N/A	Limit depth:	10.00 m

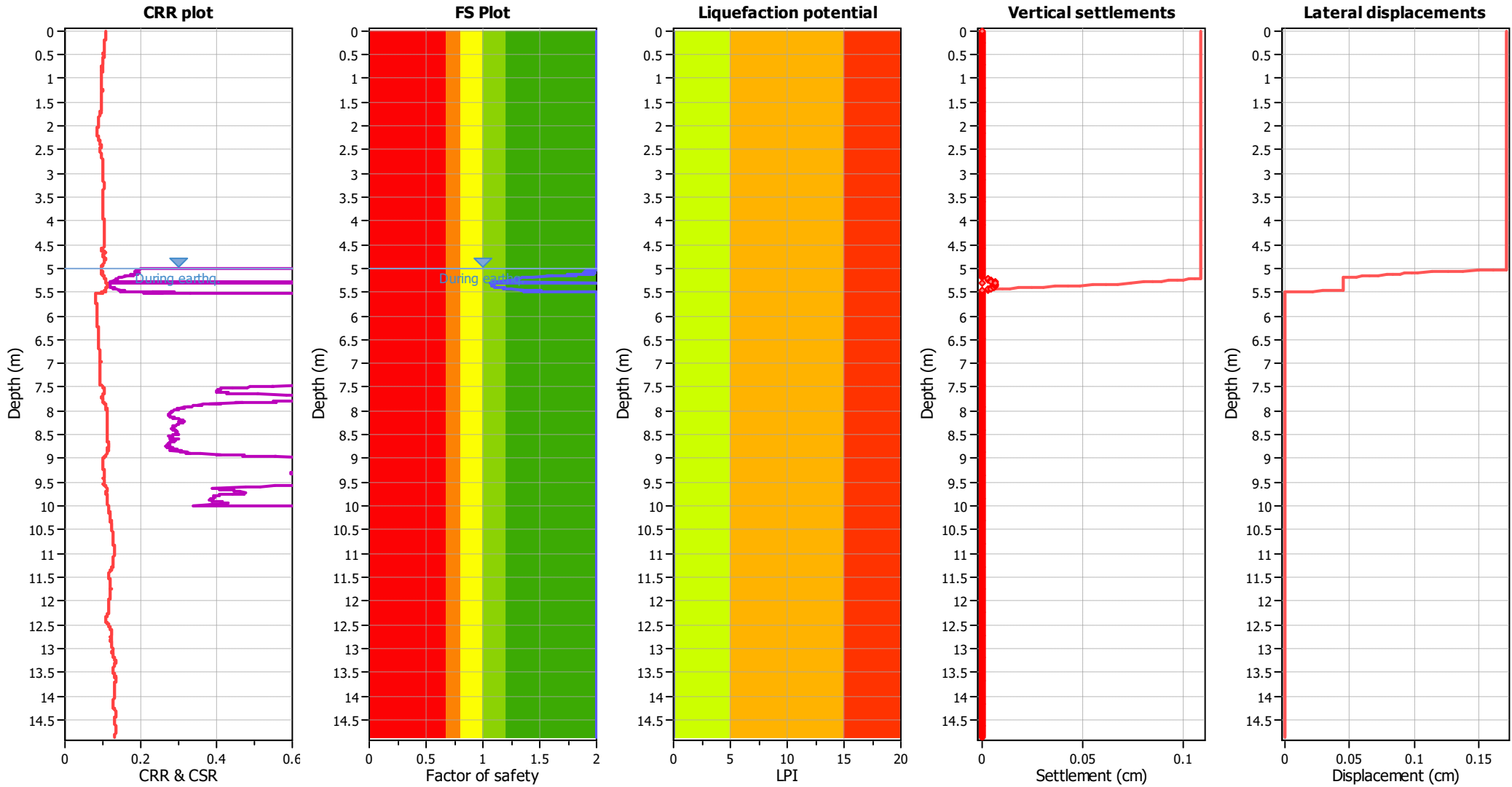
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