

# GRIFFIOEN.

## LAND INFORMATION MEMORANDUM

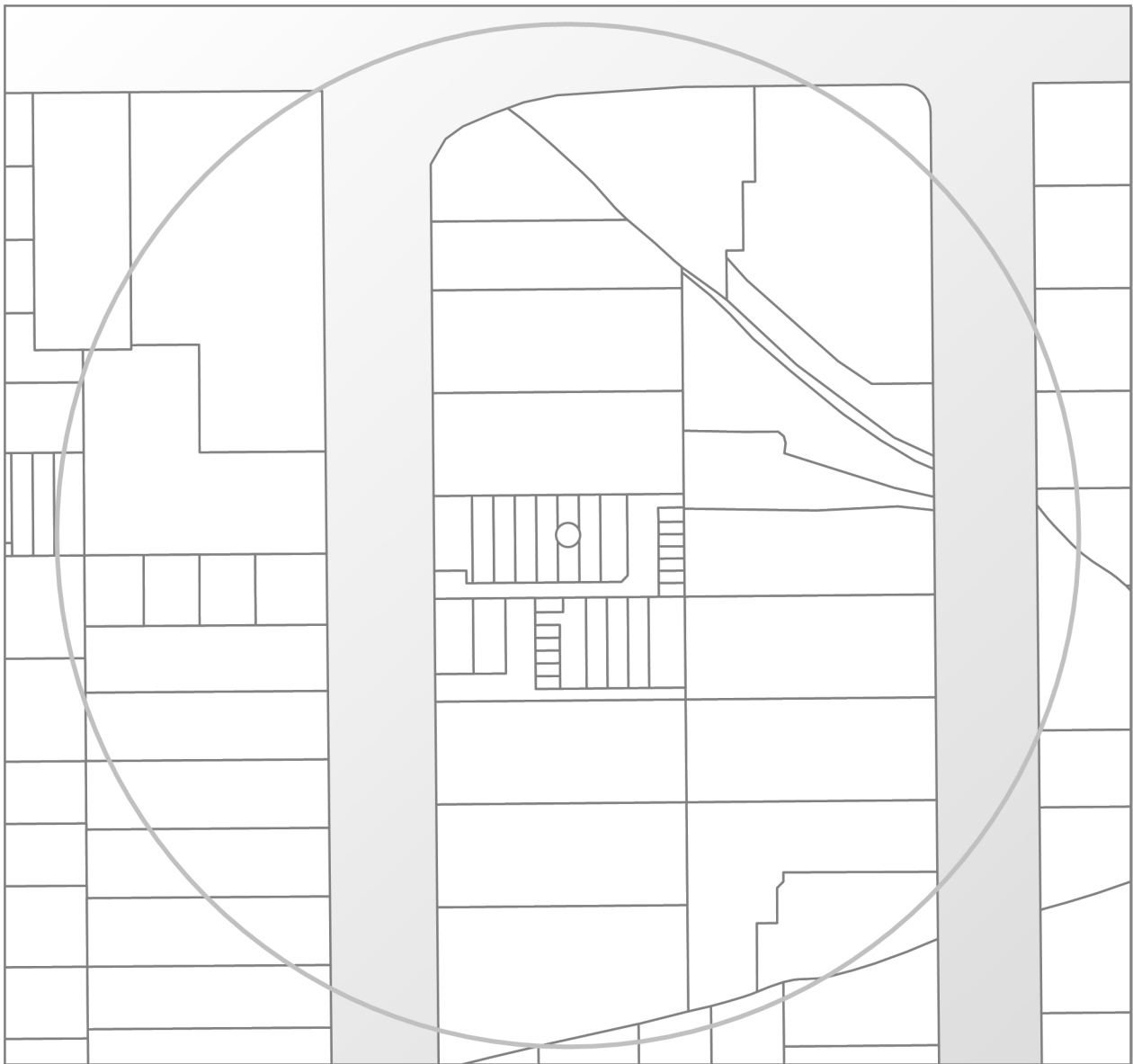
Statement of Passing Over: This building inspection has been supplied by the vendor in good faith. GRIFFIOEN. (Powered by Ownly Limited, Licensed REAA 2008) is merely passing over this information as supplied to us.

We cannot guarantee its accuracy as we have not checked, audited, or reviewed the information and all intending purchasers are advised to seek your own advice as to the information contained in this document.

Please note this LIM report is provided for informational purposes only. There may be matters relating to pre-1992 consents or permits which may need further investigation in order to determine their relevance.

To the maximum extent permitted by law we do not accept any responsibility to any party for the accuracy or use of the information herein.

# Land Information Memorandum



Property address:

6/196 Hills Road

LIM number: H07551061

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**Christchurch City Council**

53 Hereford Street, PO Box 73015

Christchurch 8154, New Zealand

Tel 64 3 941 8999

Fax 64 3 941 8984

[www.ccc.govt.nz](http://www.ccc.govt.nz)

## Application details

**Date issued** 13 March 2025  
**Date received** 10 March 2025

## Property details

**Property address** 6/196 Hills Road, Richmond, Christchurch  
**Valuation roll number** 22340 34206  
**Valuation information** Capital Value: \$  
Land Value: \$  
Improvements Value: \$  
*Please note: these values are intended for Rating purposes*  
**Legal description** Lot 6 DP 607358  
Lot 9 DP 607358  
Lot 14 DP 607358  
**Existing owner** Fern Lindsay Limited  
153 Waltham Road  
Christchurch 8023

## Council references

**Rate account ID** 73215138  
**LIM number** H07551061  
**Property ID** 1206439

## Document information

This Land Information Memorandum (LIM) has been prepared for the purpose of section 44A of the Local Government Official Information and Meetings Act 1987 (LGOIMA). It is a summary of the information that we hold on the property. Each heading or "clause" in this LIM corresponds to a part of section 44A.

Sections 1 to 10 contain all of the information known to the Christchurch City Council that must be included under section 44A(2) LGOIMA. Any other information concerning the land as the Council considers, at its discretion, to be relevant is included at section 11 of this LIM (section 44A(3) LGOIMA). If there are no comments or information provided in these sections this means that the Council does not hold information on the property that corresponds to that part of section 44A.

The information included in this LIM is based on a search of Council records only and there may be other information relating to the land which is unknown to the Council. Please note that other agencies may also hold information relevant to the property, or administer legislation relevant to the use of the land, for example, the Regional Council (Ecan), Heritage New Zealand Pouhere Taonga, and Land Information New Zealand.

Council records may not show illegal or unauthorised building or works on the property. The applicant is solely responsible for ensuring that the land is suitable for a particular purpose.

A LIM is only valid at the date of issue as information is based only upon information the Council held at the time of that LIM request being made.

## Property file service

This Land Information Memorandum does not contain all information held on a property file. Customers may request property files by phoning the Council's Customer Call Centre on (03) 941 8999, or visiting any of the Council Service Centres. For further information please visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

**To enable the Council to measure the accuracy of this LIM document based on our current records, we would appreciate your response should you find any information contained therein which may be considered to be incorrect or omitted. Please telephone the Customer Call Centre on (03) 941 8999.**

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A search of records held by the Council has revealed the following information:

## 1. Special features and characteristics of the land

*Section 44A(2)(a) LGOIMA. This is information known to the Council but not apparent from the district scheme under the Town and Country Planning Act 1977 or a district plan under the Resource Management Act 1991. It identifies each (if any) special feature or characteristic of the land concerned, including but not limited to potential erosion, avulsion, falling debris, subsidence, slippage, alluvion, or inundation, or likely presence of hazardous contaminants.*

☎ For enquiries, please phone (03) 941 8999 or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

- **Borelog/Engineer Report Image Available**

Borelog/Engineer Report Image Available

- **MAYORAL FLOODING TASKFORCE**

This property or parts of this property lie within the observed, reported or estimated flood extent of one or more of the flood events between February 2011 and April 2014. For more information please refer to <https://ccc.govt.nz/reports/> or phone council on 941-8999.

- **Predicted 1 in 50 Year Flood Extent**

This property, or parts of this property are predicted to be within the extent of a 1 in 50 year flood event. For new developments a minimum finished floor level may be required for flood limitation purposes under the Building Code. For more information please refer to (<https://ccc.govt.nz/floorlevelmap>) or phone 941 8999.

- **Liquefaction Assessment**

Christchurch City Council holds indicative information on liquefaction hazard for Christchurch. Information on liquefaction, including an interactive web tool, can be found on the Council website at [ccc.govt.nz/liquefaction](http://ccc.govt.nz/liquefaction). Depending on the liquefaction potential of the area that the property is in, the Council may require site-specific investigations before granting future subdivision or building consent for the property.

- **Softground**

Council records show that site contains Soft Ground. Predominant Ground Material: Peat. Reason for Assessment: Building Consent. Should further buildings be proposed on this site, specific foundation design may be required.

- **Consultant Report Available**

Land Information New Zealand (LINZ) engaged Tonkin and Taylor to provide a Geotechnical Report on Ground Movements that occurred as a result of the Canterbury Earthquake Sequence. The report indicates this property may have been effected by a degree of earthquake induced subsidence. The report obtained by LINZ can be accessed on their website at <https://www.linz.govt.nz> and search Information for Canterbury Surveyors.

### Related Information

- The latest soil investigation report for this property is attached for your information

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## 2. Private and public stormwater and sewerage drains

*Section 44A(2)(b) LGOIMA. This is information about private and public stormwater and sewerage drains as shown in the Council's records.*

 For stormwater and sewerage enquiries, please phone (03) 941 8999 or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

### Related Information

- This property is shown to be served by Christchurch City Council Sewer.
- The council plan shows no public stormwater lateral to this site.
- Attached are all drainage plans that Council hold for details of private and public drainage. Not all plans provided are verified by Council, and therefore Council cannot be liable for inaccuracies. Site investigation will be required by owners to determine exact layouts.

### 3. Drinking Water Supply

*Section 44A(2)(ba) and (bb) LGOIMA. This is information notified to the Council about whether the land is supplied with drinking water, whether the supplier is the owner of the land or a networked supplier, any conditions that are applicable, and any information the Council has about the supply.*

Please note the council does not guarantee a particular water quality to its customers. If you require information on current water quality at this property please contact the Three Waters & Waste Unit.

☎ For water supply queries, please phone (03) 941 8999 or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

#### **Water supply**

Christchurch City Council is the networked supplier of water to this property. This property is connected to the Christchurch City Council Water Supply. The conditions of supply are set out in the Christchurch City Council Water Supply and Wastewater Bylaw (2022), refer to [www.ccc.govt.nz](http://www.ccc.govt.nz).

## 4. Rates

Section 44A(2)(c) LGOIMA. This is information on any rates owing in relation to the land.

☎ For rates enquiries, please phone (03) 941 8999 or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

### (a) Annual rates

Annual rates to :

	Instalment Amount	Date Due
Instalment 1		
Instalment 2		
Instalment 3		
Instalment 4		

Rates owing as at 13/03/2025: \$0.00

### (b) Excess water charges

For excess water charge enquiries, please phone (03) 941 8999 or visit [www.ccc.govt.nz/contact-us](http://www.ccc.govt.nz/contact-us)

### (c) Final water meter reading required at settlement?

Property settlements must now ensure all water usage and outstanding debts are accurately accounted for.

To advise of a commercial property settlement, please complete the request for settlement information form at [www.ccc.govt.nz/services/rates-and-valuations/solicitors-request](http://www.ccc.govt.nz/services/rates-and-valuations/solicitors-request)

### Related Information

- There is no rates values showing as it is the start of the new financial year and the Councils rates team is yet to load the new rating year data into our Council rates database. For new rating year information please contact the rates team on 941-8999.

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## 5. Consents, certificates, notices, orders, or requisitions affecting the land and buildings

*Section 44A(2)(d) LGOIMA. This is information concerning any consent, certificate, notice, order, or requisition, affecting the land or any building on the land, previously issued by the Council. The information in this section may also cover building consent and/or code compliance information issued by building certifiers under the Building Act 1991 and building consent authorities that are not the Council under the Building Act 2004.*

You can check the property file to identify whether any consent or certificate was issued by a building certifier under the Building Act 1991.

*Section 44A(2)(da) LGOIMA. The information required to be provided to a territorial authority under section 362T(2) of the Building Act 2004. There is currently no information required to be provided by a building contractor to a territorial authority under section 362T(2) of the Building Act 2004. The Building (Residential Consumer Rights and Remedies) Regulations 2014 only prescribed the information that must be given to the clients of a building contractor.*

☎ For building enquiries, please phone (03) 941 8999, email [EPADutyBCO@ccc.govt.nz](mailto:EPADutyBCO@ccc.govt.nz) or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

### (a) Consents

- BCN/1963/1418 Applied: 26/03/1963 Status: Completed  
1/196 Hills Road Richmond  
Permit issued 09/04/1963  
ADDITION TO DWELLING- Historical Reference PER62630837 - No plans/ information held on property file.
- BCN/1978/2818 Applied: 13/06/1978 Status: Completed  
1/196 Hills Road Richmond  
Permit issued 01/08/1979  
ALTER DWELLING TO SURGERY- Historical Reference PER78790532
- BCN/1980/4617 Applied: 21/08/1980 Status: Completed  
1/196 Hills Road Richmond  
Permit issued 04/09/1980  
GARAGE- Historical Reference PER80810784
- BCN/1980/5018 Applied: 10/09/1980 Status: Completed  
1/196 Hills Road Richmond  
Permit issued 22/09/1980  
GARAGE- Historical Reference PER80810010
- BCN/1992/11976 Applied: 27/11/1992 Status: Completed  
1/196 Hills Road Richmond  
Permit granted 09/12/1992  
ALTERATIONS SURGERY- Historical Reference PER92009040
- BCN/2024/2563 Applied: 11/04/2024 Status: Completed  
1/196 Hills Road Richmond  
Accepted for processing 18/04/2024  
Building consent granted 30/05/2024  
Building consent issued 05/06/2024  
Code Compliance Certificate Issued 21/01/2025  
Construction of eight attached dwellings and detached bike shed
- BCN/2024/2563/A Amendment Applied: 01/07/2024 Status: Completed  
1/196 Hills Road Richmond  
Accepted for processing 04/07/2024  
Building consent granted 16/07/2024  
Building consent issued 21/07/2024

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Amendment 1 - Foundation adjustment, civil pavement design adjusted, building paper changed to Ecoply Rigid air barrier, bathroom extracts adjusted, first floor windows on East & West elevation changed from sloped to horizontal heads & 'false' external barn slider added to the west elevation

## **(b) Certificates**

Note: Code Compliance Certificates were only issued by the Christchurch City Council since January 1993.

## **(c) Notices**

## **(d) Orders**

## **(e) Requisitions**

## **Related Information**

- Please find an electrical certificate/s attached relating to works that have been carried out on the current building/dwelling at this address.

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## 6. Certificates issued by a building certifier

*Section 44A(2)(e) LGOIMA. This is information notified to the Council concerning any certificate issued by a building certifier pursuant to the Building Act 1991 or the Building Act 2004.*

☎ For building enquiries, please phone (03) 941 8999, email [EPADutyBCO@ccc.govt.nz](mailto:EPADutyBCO@ccc.govt.nz) or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

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## 7. Weathertightness

*Section 44A(2)(ea) LGOIMA. This is information notified to the Council under section 124 of the Weathertight Homes Resolution Services Act 2006.*

 For weathertight homes enquiries, please phone (03) 941 8999 or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

*If there is no information below this means Council is unaware of any formal Weathertight Homes Resolution Services claim lodged against this property.*

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## 8. Land use and conditions

Section 44A(2)(f) LGOIMA. This is information relating to the use to which the land may be put and conditions attached to that use. The planning information provided below is not exhaustive and reference to the Christchurch District Plan and any notified proposed changes to that plan is recommended: <https://ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/plans/christchurch-district-plan/>.

There may be some provisions of the Christchurch City Plan or Banks Peninsula District Plan that affect this property that are still operative.

☎ For planning queries, please phone (03) 941 8999, email [DutyPlanner@ccc.govt.nz](mailto:DutyPlanner@ccc.govt.nz) or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

- **Regional plan or bylaw**

There may be objectives, policies or rules in a regional plan or a regional bylaw that regulate land use and activities on this site. Please direct enquiries to Canterbury Regional Council (Environment Canterbury).

### (a)(i) Christchurch City Plan & Banks Peninsula District Plan

#### (ii) Christchurch District Plan

- **Development Constraint Conditions**

Council records show there is a specific condition on the use of this site: Consent Notice

- **Liquefaction Management Area (LMA)**

Property or part of property within the Liquefaction Management Area (LMA) Overlay, which is operative.

- **District Plan Zone**

Property or part of property within the Medium density residential zone, which has been publicly notified.

- **District Plan Zone**

Property or part of property within the Residential Suburban Density Transition Zone, which is operative.

- **Flood Management Area**

Property or part of property within the Flood Management Area (FMA) Overlay which is operative.

### (b) Resource consents

If there are any land use resource consents issued for this property the Council recommends that you check those resource consents on the property file. There may be conditions attached to those resource consents for the property that are still required to be complied with.

- RMA/1978/266 - Resource consents  
1/196 Hills Road Richmond  
Dispensation to allow temporary vehicle turning facilities within the proposed future street boundaries in respect of the development of the property. - Historical Reference RES9211518  
Status: Processing complete  
Applied 11/07/1978  
Granted 18/08/1978  
Decision issued 18/08/1978
- RMA/2023/2692 - Land Use Consent  
1/196 Hills Road Richmond  
Construct eight residential units  
Status: Processing complete  
Applied 13/10/2023  
18/01/2024  
Within scope amendment accepted 05/08/2024  
05/08/2024  
Granted 18/01/2024  
Decision issued 18/01/2024
- RMA/2023/3101 - Certification  
1/196 Hills Road Richmond  
Minimum floor level certificate  
Status: Processing complete  
Applied 30/11/2023  
Certificate issued 14/12/2023
- RMA/2024/2323 - Combined subdivision / land use consent  
196 Hills Road Richmond  
Subdivision - Fee simple - Eight lots with land use  
Status: Processing complete  
Applied 14/08/2024  
05/09/2024  
s223 Certificate issued 31/10/2024  
s224 Certificate issued 20/12/2024  
Granted 05/09/2024  
Decision issued 05/09/2024

## Related Information

- Council records show that there is a current/on hold monitoring job in our system. This monitoring is to ensure that the resource consent conditions have been met. For further information you can contact the Compliance & Investigation team A on 941 8999 or email: [rcmon@ccc.govt.nz](mailto:rcmon@ccc.govt.nz) and reference to resource consent RMA/2023/2692.

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## 9. Other land and building classifications


*Section 44A(2)(g) LGOIMA. This is information notified to the Council by any statutory organisation having the power to classify land or buildings for any purpose.*

 For land and building enquiries, please phone (03) 941 8999 or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

Please refer to Section 1 for details

## 10. Network utility information

*Section 44A(2)(h) LGOIMA. This is information notified to the Council by any network utility operator pursuant to the Building Act 1991 or the Building Act 2004.*

 For network enquiries, please phone (03) 941 8999 or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

- **None recorded for this property**

## 11. Other information

Section 44A(3) LGOIMA. This is information concerning the land that the Council has the discretion to include if it considers it to be relevant.

☎ For any enquiries, please phone (03) 941 8999 or visit [www.ccc.govt.nz](http://www.ccc.govt.nz).

### (a) Kerbside waste collection

- Your organics are collected Weekly on Wednesday. Please leave your organics at the Kerbside by 6:00 a.m.
- Your recycling is collected Fortnightly on the Week 2 collection cycle on a Wednesday. Please leave your recycling at the Kerbside by 6:00 a.m. Your nearest recycling depot is the Metro Place EcoDrop.
- Your refuse is collected Fortnightly on the Week 2 collection cycle on a Wednesday. Please leave your rubbish at the Kerbside by 6:00 a.m. Your nearest rubbish depot is the Metro Place EcoDrop.

### (b) Other

#### • Floor Levels Information

Christchurch City Council holds a variety of information relevant to building/property development across the city. This includes minimum finished floor levels that need to be set to meet the surface water requirements in clause E1.3.2 of the building code (where this applies), and the requirements of the Christchurch District Plan (where a property is in the Flood Management Area). Where this information has been processed for your site, it can be viewed at <https://ccc.govt.nz/floorlevelmap/>, otherwise site specific advice can be obtained by emailing [floorlevels@ccc.govt.nz](mailto:floorlevels@ccc.govt.nz)

#### • Guest Accommodation

Guest accommodation (including whole unit listings on Airbnb; BookaBach; etc.) generally requires a resource consent in this zone when the owner is not residing on the site. For more information, please refer to: <https://ccc.govt.nz/providing-guest-accommodation/>.

#### • Community Board

Property located in Papanui-Innes-Central Community Board.

#### • Tsunami Evacuation Zone

This property is not in a tsunami evacuation zone. It is not necessary to evacuate in a long or strong earthquake or during an official Civil Defence tsunami warning. Residents may wish to offer to open their home to family or friends who need to evacuate from a tsunami zone, and should plan with potential guests to do so in advance. More information can be found at <https://ccc.govt.nz/services/civil-defence/hazards/tsunami-evacuation-zones-and-routes/>

#### • Electoral Ward

Property located in Central Electoral Ward

#### • Listed Land Use Register

Hazardous activities and industries involve the use, storage or disposal of hazardous substances. These substances can sometimes contaminate the soil. Environment Canterbury identifies land that is used or has been used for hazardous activities and industries. This information is held on a publically available database called the Listed Land Use Register (LLUR). The Christchurch City Council may not hold information that is held on the LLUR. Therefore, it is recommended that you check Environment Canterbury's online database at [www.llur.ecan.govt.nz](http://www.llur.ecan.govt.nz)

#### • Spatial Query Report

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A copy of the spatial query report is attached at the end of this LIM. The spatial query report lists land use resource consents that have been granted within 100 metres of this property.

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# B1 Ground Report

Christchurch  
City Council



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BCN/2024/2563

Approved Building Consent  
Document

30/05/2024Menon, Gopika



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## GEOTECHNICAL REPORT

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196 Hills Rd, Christchurch

Prepared For: Rosefern Homes Limited

Project Number: 23175



Issue: D

Date: 13 May 2024

Tetrad Consulting Limited  
P: 03 365 0726  
71 Peterborough Street, Christchurch  
[www.tetradconsulting.co.nz](http://www.tetradconsulting.co.nz)



## DOCUMENT CONTROL

Prepared by:		<b>Callum Nish</b> Graduate engineer, B.E.Hons(Civil)
Reviewed By:		<b>Steven Roberts</b> CPEng (Geotechnical), CMEngNZ, IntPE(NZ)
Limitations:	This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in accordance with the agreement between the Client and Tetrad Consulting Ltd. Tetrad Consulting Limited Ltd accepts no liability or responsibility whatsoever for any use of or reliance upon this report by any third party. Any copying of this report to external parties requires the permission of the Client and Tetrad Consulting Limited.	

## DOCUMENT HISTORY

Revision	Date	Notes
D	13 May 2024	

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# 1 Introduction

## 1.1 Discussion

Tetrad Consulting Ltd has been engaged by Rosefern Homes Ltd to undertake a geotechnical investigation at 196 Hills Road for a residential development comprising a single block of eight two-storey units constructed with heavy weight cladding materials.

This report presents the results of a geotechnical investigation to characterize the subsurface soil profile and strength properties for foundation design and discussion of the following:

- Quantify liquefaction susceptibility for a design basis seismic event.
- Confirmation of Ministry of Business, Innovation and Employment land classification for the site.
- Provide foundation recommendations for the proposed development.

The scope of this geotechnical report does not include commentary on site-specific environmental issues, which is beyond the scope of our geotechnical engagement.

## 1.2 Supporting Documentation

The following design documentation has been provided by Petrie Architects for completion of this report:

- Architectural Concept Plan by Petrie Architects – “Hills Road Terraces”; dated 07 March 2024

# 2 Site Description

The setting is a flat residential site comprising of 196 Hills Road Street with a total land area of about 983 m<sup>2</sup> located along the south side of the street. The site is currently developed by a large single storey dwelling turned doctors office with an added extension to the rear and a detached garage.



Figure 1: Approximate location of subject site on the east side of Hills Road

### 3 Proposed Development

Architectural plans by Petrie Architects dated 28 July 2023 showed the site with eight attached two-storey residential units, constructed of heavy weight exterior cladding materials, lightweight framing, and a lightweight tin roof.

### 4 Ground Investigation

#### 4.1 Historical Investigation

A range of shallow and deep testing was performed near/on the southern and northern boundaries of the site. Cone penetrometer tests (CPT's) and the shallow tests within 15 m of the subject site will be taken as site specific and referred to alongside onsite testing shown in Section 4.2 below.

The CPT, hand auger (HA) and Scala penetrometer (SP/DCP) test locations and are shown in Appendix A and summarised in Table 1 below.

**Table 1: Summary of CPT and Scala investigation**

Test type	Depth of test (m)
CPT99751 (on boundary)	10 m
CPT99752 (12.5 m south)	10 m
CPT180290 (13.5 m south)	15 m
CPT180291 (15 m south)	15 m
CPT180292 (15 m south)	15 m
HASP_180282- HA02/SP02 (8 m South)	3 m
HASP_180282- HA03/SP03 (on boundary)	3 m
HASP_180282- HA04/SP04 (6 m South)	3 m
HASP_180282- HA05/SP05 (8 m South)	3 m

#### 4.2 Onsite testing

Three hand augers and Scala penetrometer tests to 3 m were performed across the site by Tetrad Consulting Ltd on 23/08/23. A Cone penetrometer test (CPT99651) was sourced from the NZGD and located on the northern boundary of the site. The hand auger (HA) and Scala penetrometer (SP/DCP) and Cone penetrometer test locations and are shown in Appendix A and summarised in Table 1 below.

**Table 2: Summary of CPT and Scala investigation**

Test type	Depth of test (m)
-----------	-------------------

CPT99651 (On sites' northern boundary)	10 m
HA01/SP01	3.0 m(HA), 2.5 m (SP)
HA02/SP02	3.0 m(HA), 2.4 m (SP)
HA03/SP03	3.0 m(HA), 2.5 m (SP)

### 4.3 Total test coverage

The historical and onsite tests assumed as site specific are shown together in Figure 2 below.



Figure 2: Nearby and onsite testing on or near the site

## 5 Subsurface soil conditions

### 5.1 Geology

A geological map of the area (Brown and Weeber, 1992) shows the site area as underlain with soils of the Christchurch Formation to approximately 20 m depth comprising beach, estuarine and coastal swamp deposits of sand, silt and peat. This is underlain by the Riccarton gravel formation, comprising well graded gravel with cobble sizes up to 100 mm.

## 5.2 Soil Profile from shallow testing

Onsite hand auger tests HA01- HA03 showed the soil profile comprised topsoil to a depth of up to 0.8 m and interbedded sands and to silts 3.0 m.

**Table 3: Soil profile from onsite tests**

Depth (m)	HA01	HA02	SP03
0 – 0.5	TOPSOIL	TOPSOIL	TOPSOIL
0.5 – 0.8	TOPSOIL	Sandy SILT	SAND
0.8 – 1.0	SILT with some sand	Sandy SILT	SAND
1.0 – 1.6	SILT with some sand	SAND	SAND
1.6 – 2.0	SILT with some sand	SAND	Sandy SILT
2.0 – 2.2	Organic SILT	Clayey SILT	Organic SILT
2.2 – 3.0	Clayey SILT	Clayey SILT	Clayey SILT

Nearby hand augers from NZGD log HASP\_180282 (HA02- HA05) are close enough to the property boundary to be considered site specific. These tests showed topsoil to 0.4 – 0.5 m underlain by sandy silts/silty sands to 1.5 – 1.8 m depth. A 0.2 m thick layer of organic silt was observed from 2.0 – 2.2 m depth across all four subject hand augers underlain by blue plastic clayey silt. The soil profile correlates well with Tetrad's onsite shallow borehole testing.

Onsite Scala penetrometer tests returned the below blow count results in Table 4. Scala penetrometer blow counts exceeded 2 blows/100 mm penetration from 0.8 m depth, equating to an ultimate geotechnical bearing capacity of 200 kPa. Scala blow counts increased beyond 1.8 m depth in clayey silts as indicated in Table 3.

**Table 4: Scala penetrometer tests**

Depth (m)	SP01	SP02	SP03
0 – 0.8	0.5 - 1	0.5 - 4	0.5 - 2
0.8 – 1.8	2 - 4	3 - 5	2 - 4
1.8 – 2.5	7 - 12	3 - 12	6 - 12

## 5.3 Soil Profile from CPT testing

Figure 3 below shows cone tip resistance profiles against depth for the NZGD sourced CPT tests shown in Figure 2. The cone penetrometer resistance values range between 0.5 – 1.0 MPa in the interbedded clayey silt and sand layers to 5.0 m depth. The  $Q_c$  values increase with depth from 5 to 15 m with medium dense silty sands to 6 - 9 m and dense sand below 10 m.



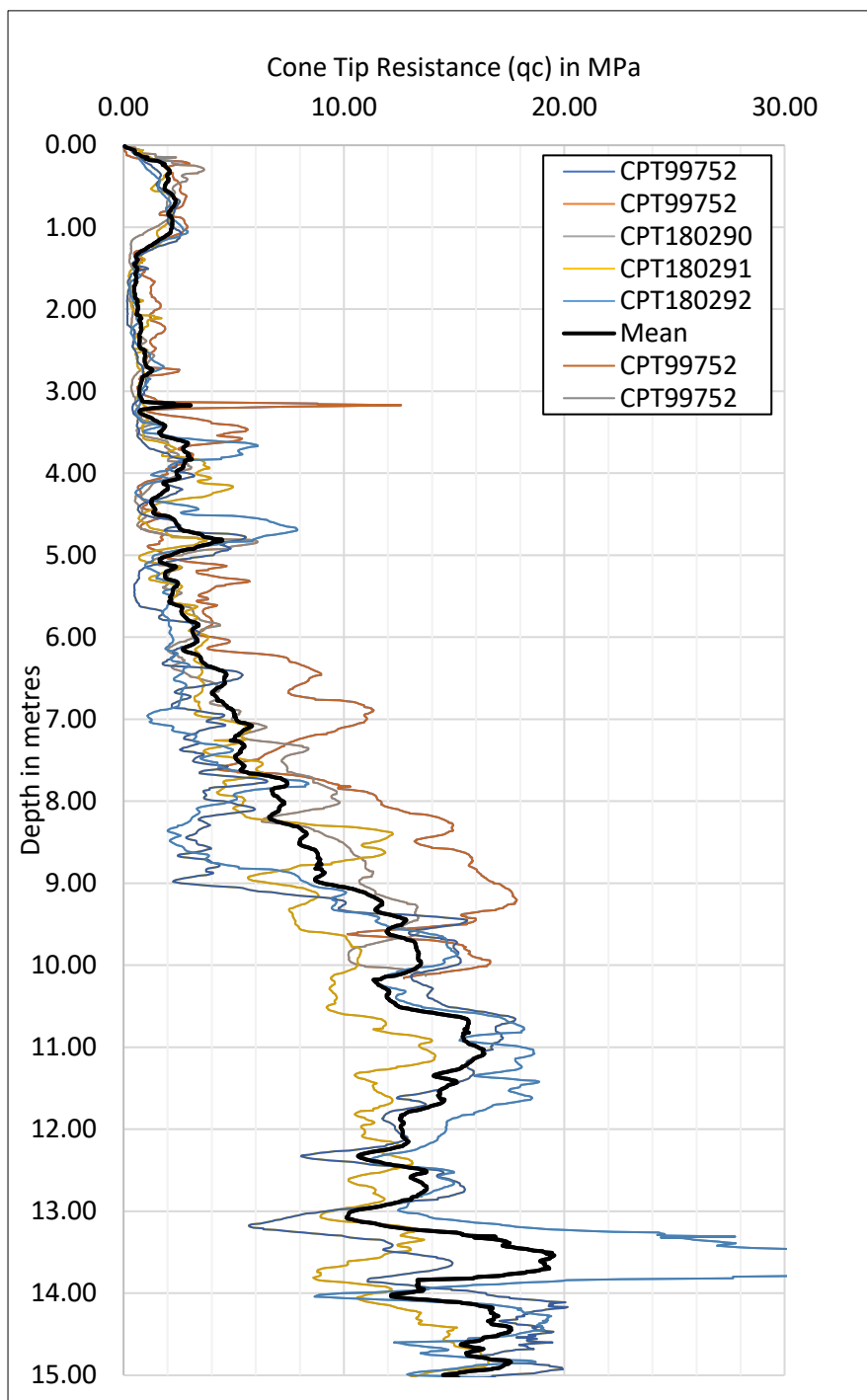


Figure 3: Cone tip resistance versus depth

#### 5.4 Ground Water Table

To assess the ground water table depth, reference had been made to the GNS Science Median Groundwater Surface Elevations from the NZGD which indicate the water surface contour range based on long term observation records at each site. The water surface contours are stated in terms of the LVD 1937 datum, which is set at 9.043 m above the Christchurch Drainage Datum (CDD). Table 5 below shows the water surface contours for the 15<sup>th</sup> and 85<sup>th</sup> percentile in terms of the LVD datum.



**Table 5: Water surface contour levels from NZGD**

	15th Percentile	Mean	85th Percentile
Water surface Depth (m)	2.95	3.05	3.30

When referenced to the CDD, the 15<sup>th</sup> Percentile water surface contour level translates to a water table depth (GWT) of 1.4m based on an average site ground level of RL 13.3 m as sourced from the Christchurch City Flood Management website. The 85<sup>th</sup> percentile water surface contour level translates to a GWT of 0.8 m based on a minimum site ground level of RL 13.03 m. This correlates reasonably well with the observed GWT depth from HA01 of 1.2 m below ground level. For liquefaction assessment an elevated ground water depth of 0.8m below the lowest ground level is considered appropriate at this site.

## 6 Seismic Assessment

### 6.1 Previous Earthquake Performance

The site has been subjected to repeated ground shaking from the Canterbury earthquake sequence. Reference to the New Zealand Geotechnical Database shows the conditional peak ground accelerations based on the method by Bradley et al (2012). The method combines the empirical strong motion attenuation with distance model, with the actual observation to produce conditional peak ground accelerations. Table 6 below summarises the PGA values for the 2010/2011 earthquake events.

**Table 6: Conditional PGA for recent earthquakes (Bradley et al)**

Earthquake	Magnitude- M <sub>w</sub>	PGA mean	Equivalent M <sub>7.5</sub> PGA			
			To MBIE	PGA <sub>16_7.5</sub>	PGA <sub>50_7.5</sub>	PGA <sub>84_7.5</sub>
4 September 2010	7.1	0.20	0.14	0.13	<b>0.18</b>	0.12
22 February 2011	6.2	0.37	0.25	0.19	<b>0.26</b>	0.17
13 June 2011	6.0	0.21	0.13	0.10	<b>0.14</b>	0.09
23 Dec 2011	5.9	0.245	0.09	0.11	<b>0.16</b>	0.10

PGA<sub>16\_7.5</sub> represents the 16<sup>th</sup> percentile (i.e 84% probability of exceedance) scaled to a M7.5 earthquake.

PGA<sub>84\_7.5</sub> represents the 84<sup>th</sup> percentile (i.e 16% probability of exceedance) scaled to a M7.5 earthquake.

The predicted mean PGA for each earthquake has been converted to an equivalent PGA for magnitude M7.5 earthquake in accordance with MBIE guideline recommendations by the method of Boulanger & Idriss 2014.

The adjusted PGA values are also shown with an 84% and 16% probability of being exceeded. The MBIE value in the table represents the 90% exceedance PGA which is accepted as being “well tested” for an SLS1 event. In this case, the site has been well tested to SLS1 and SLS2 levels of ground shaking from the September 2010 and February 2011 events with a mean PGA<sub>50\_7.5</sub> value of 0.20g and 0.37g, respectively.

### 6.2 Liquefaction from CPT Tests

Liquefaction assessment of the nearby historical CPT tests described by Section 4.1 has been completed by the method of Idriss and Boulanger (2014).

In applying this method, a water level at 0.80 m has been adopted for triggering of liquefaction in the alluvial deposits.

A ‘fines correction’ coefficient (CFC) of 0.2 and a CRR PL value of 30% was adopted for the liquefaction analysis in the Idriss and Boulanger method to provide a ‘best fit’ with the LIDAR imagery data from the NZGD.

Liquefaction induced settlement has been quantified by the method of Zhang et al (2002). Table 7 below summarises the predicted liquefaction settlements rounded up to the nearest 5 mm to a test depth of 10 m for a SLS1 and ULS event with PGAs of 0.13g and 0.35g, respectively. A second serviceability earthquake event (SLS2) has also been considered with a PGA of 0.19g and Magnitude M6.0.

Across the NZGD sourced CPT's liquefaction is triggered significantly from 5 – 9 m under SLS1 loading and from 3.5 – 10 m under ULS loading. The expected lower/upper bound and mean earthquake settlements from the nearby discrete CPT's discussed in Section 4.1 and for three earthquake cases considered have been calculated by performing a simple probabilistic analysis. A confidence interval of 95% was adopted in the analysis to quantify the lower and upper bound estimates of differential settlement. The settlement values for each of the design earthquake cases are shown in Table 7 below. The probabilistic assessment considers the dispersion of the free-field settlement from the mean value for each of the five CPT's discussed. The objective of this approach was to assess the likely spread of free field settlement from the CPT cluster before assessing the maximum differential settlement. In this case, maximum differential settlement of 70 mm is expected for a SLS1 event increasing to 115 mm for SLS and 190 mm for ULS based on a 95 % confidence interval.

**Table 7: Liquefaction settlements to the MBIE index depth of 10.0 m**

Test Location	SLS1 (M7.5)	SLS2 (M6.0)	ULS (M7.5)
Lower bound	25	60	140
Mean	50	90	160
Upper bound	70	115	190

The predicted settlements are an index only of settlement damage at the site with a +/-50% probability of occurring during seismic shaking. The predicted settlements are 'free field' and do not consider additional settlement damage due to ground interaction with foundations which may lead to an increase in foundation settlement from foundation bearing failure, if not mitigated by specific foundation design. Refer to Appendix C for liquefaction settlement profiles.

### 6.3 Previous Earthquake Damage from EQC Observations

Table 8 below summarises the liquefaction observations sourced from EQC records obtained from the NZGD and only returned ground surface damage from the February 2011 event. The EQC records suggest the site is susceptible to moderate ground surface damage from earthquake ground motions equivalent to or exceeding a Magnitude M6.2 event. LiDAR data from the NZGD indicated approximate vertical ground settlement of up to 100 mm after the September 2010 and February 2011 seismic events.

**Table 8: Summary of EQC liquefaction interpreted from EQC observations**

Earthquake Event	Ground surface Damage Observation
September 2010	No observations
February 2011	No lateral spreading but large quantities of ejected material.
June 2011	No observations
December 2011	No observations

### 6.4 Liquefaction Potential

We have assessed the 'Liquefaction Potential Indices' number for each of the liquefaction cases identified in Section above. The LPI number provides a performance-based assessment of liquefaction ground surface damage and is influenced by the ratio of the non-liquefiable crust layer to the total thickness of liquefiable soil deposit.

The LPI should be considered in the context of both the ground conditions and structure of interest. The ranges provided in Table 9 below are based on triggering calculations using Boulanger and Idriss (2014) method, and analysis and interpretation of liquefaction effects in the 2010-2011 Christchurch earthquake sequence. Table 9 has been reproduced from, 'Module 3: Identification, Assessment and Mitigation of Liquefaction Hazards': dated May 2016.

**Table 9: General performance levels for liquefied deposits**

Performance Level	Effects	Characteristics and Consequences	Characteristic LPI
L0	Insignificant	No significant excess pore water pressures (no liquefaction)	LPI = 0
L1	Mild	Limited excess pore water pressures; negligible deformation of the ground, and small settlements	LPI = 0
L2	Moderate	Liquefaction occurs in layers of limited thickness (small proportion of the deposit, say 10 percent or less) and lateral extent; ground deformation results in relatively small differential settlements	LPI < 5
L3	High	Liquefaction occurs in significant portion of the deposit thickness (30 to 50 percent) resulting in transient lateral displacements, moderate differential movements, and settlement of the ground in the order of 100mm to 200mm.	LPI = 5-15
L4	Severe	Complete liquefaction develops in most of the deposit resulting in large lateral displacements of the ground, excessive differential settlement, and total settlement of over 200mm.	LPI > 15
L5	Very severe	Liquefaction resulting in lateral spreading (flow), large permanent lateral ground displacements and/or significant ground distortion (lateral strains/stretch, vertical offsets and angular distortion).	LPI > 20

Liquefaction analysis of nearby historical CPT tests plots confirmed liquefaction potential Indices (LPI) values of up to 3 for a SLS1, 5 for a SLS2 event and 20 for an ULS event. These values translate to *Moderate* ground surface damage for a SLS1, *Moderate-to-High* for a SLS2 event, and *Severe-to-Very Severe* for an ULS event; therefore, moderate ground damage is predicted during SLS1 and SLS2 ground shaking, with ground deformation resulting in relatively small to moderate differential settlements.

## 6.5 Lateral Spread

Lateral spread risk has been assessed according to site and ground conditions, as well as proximity to significant waterways or steep changes in ground level. The subject property is generally level with a variance of 0.8 m in ground elevation over the site and is 34 m from a river.

Ground surface observations presented on the New Zealand Geotechnical Database (NZGD) indicates the site experienced ground cracking with cracks between 10 – 50 mm from past seismic events. Based on this observation, lateral spread damage is considered a moderate geotechnical risk at the site.

## 6.6 Technical Land Category Classification

Reference to the MBIE Technical Foundation Category Classification off the NZGD website indicates the site is TC3 rated land for the purpose of foundation design. Liquefaction analysis in Section 6.2 showed total *free-field* liquefaction of up to 70 mm for a SLS1 event and 190 mm for an ULS event to MBIE's index depth of 10 m. The predicted settlement values are consistent with the site's TC3 rating to MBIE's guidelines; therefore, we recommend a Technical Category 3 Classification for the purpose of foundation design.

## 6.7 Seismic Category

The thickness of the alluvial deposits beneath this area of the Christchurch area defines the site as Class D, 'Deep Soils', in terms of the seismic design requirements of NZS 1170.5.

## 7 Environmental Issues

We have undertaken a review of Environment Canterbury's 'Listed Land Use Register' (LLUR) (<http://llur.ecan.govt.nz/>). The LLUR is a public record of sites known to have been subject to historical and/or existing potentially contaminating land use activities prescribed in the Hazardous Activity and Industries List (HAIL). A review of the LLUR indicates:

*"The Listed Land Use Register does not currently have any information about a Hazardous Activities and Industries List site on this land parcel".*

Although the LLUR does not contain any records of potential HAIL at the subject site, the LLUR is not considered a complete record and is being continuously updated, and it is therefore recommended to contact the Christchurch City Council to enquire about any known hazardous activities at the subject site that may require consideration as part of any future consent application.

## 8 Flood Levels

The Christchurch City Council flood hazard maps at:

<https://www.ccc.govt.nz/services/stormwater-and-drainage/flooding/floorlevelmap> were accessed on the 28<sup>th</sup> August 2023. The CCC system shows that the site located in a flood management area, and accordingly the interim flood floor level will be required before lodging a building consent application.

## 9 Bearing Capacity

Shallow Scala tests completed on the 29<sup>th</sup> of August 2023 returned a bearing capacity of 200 kPa from 0.8 m depth for a *lower bound* Scala test result of 2 blows per 100 mm of ground penetration at SP01 to SP03. Blow counts increased significantly from 1.8 m depth to refusal at 2.4 – 2.5 m depth. Scala penetrometer blow counts for soils below 1.1 m depth show blow counts between 2 – 4 blows/100 mm penetration.

Therefore, from both Scala Penetrometer and CPT derived bearing capacities, 200 kPa can be assumed from 0.8 – 1.8 m depth provided static settlement analysis is performed on the underlying weak layers to 5.0 m depth. The Scala Penetrometer test results are shown in Appendix B.

## 10 Foundation Settlement

Calculation of static settlement is from the one-dimensional consolidation method applied to the silts to 5.0 m depth. The elastic modulus has been assessed from the following empirical relationship of CPT tip resistance versus elastic modulus ( $E_s$ ). In this case, the following relationship was adopted with a lower bound  $q_c$  value of 0.5 MPa over the critical layers of nearby CPTs (minimum  $q_c$  values of all CPT's mentioned in Section 4.1 taken).

The elastic modulus has been assessed from the following empirical relationship of CPT tip resistance versus elastic modulus ( $E_s$ ).

$$E_s = 2.5q_c - \text{in MPa}$$

Total static settlement of approximately 60 mm is predicted in the critical silt layer to 5.0 m for the lower bound cone tip resistance ( $q_c$ ) values for the CPT's described in Section 4.1 and based on an applied foundation load of 25 kPa for combined self-weight of the building, foundation slab and increase in material density of the gravel raft.

Accordingly, differential settlement up to 36 mm is predicted and translates to approximately 14 mm over a 6 m span when applied over the shortest distance (16m) between the CPT locations.

Seismic differential settlement of 70 mm is prediction from the deterministic CPT values for a SLS1 event and is applied over the shortest distance (16m) between the CPT locations.

Combined Seismic and Static settlement translates to approximately 40 mm of settlement over a 6 m span which exceeds the foundation performance requirement in Section B1/VM4 of the NZBC for shallow waffle slab foundations. Therefore, specific design of the gravel raft is required to moderate differential settlement and is discussed further in Section 11 below.

## **11 Foundations**

### **11.1 Discussion**

Appendix D shows the proposed development comprising eight two-storey residential units constructed of heavy-weight cladding with light weight framing and roofing materials in accordance with NZS 3604 type construction. As such, we have considered foundation options outlined in MBIE's Part C: "Repairing and rebuilding houses affected by the Canterbury earthquakes", December 2012, consistent with the TC3 Classification as discussed in Section 6.6 above.

Discussion with architect and structural engineer indicates a raised floor level is required to mitigate flood risk.

Ground surface damage during SLS1 and SLS2 ground shaking can be expected at this site with moderate seismic differential settlement consistent with the low LPI values predicted in Section 6.4. Approximately 40 mm of differential settlement over a 6 m span is predicted from combined static and SLS1 seismic settlement, with most of the static settlement expected in the clayey silt material to 5 m depth.

During a ULS event severe ground surface damage can be expected manifested by large permanent lateral ground displacements and/or significant ground distortion. Accordingly, a releveable concrete slab foundation as described in Section 11.2 below combined with a reinforced gravel raft would be suitable for the proposed multi-unit development and is expected to moderate differential settlement damage during SLS1 and SLS2 ground shaking, whilst mitigating irreparable damage to the units during an ULS event.

### **11.2 Reinforced Gravel Raft with releveable Waffle Slab**

The Option 4 releveable shallow foundation system is required to meet the performance objectives of the MBIE guidelines which requires the foundation to provide enough stiffness to support the imposed reduced gravity load of the buildings under a 2 m loss of edge ground support and 4 m loss of internal ground support.

Discussion with the architect and structural engineer indicate a raised floor level is required to mitigate flood risk, and therefore the waffle slab foundation could be specifically engineered as a double pod system (thicker slab) to meet the required interim flood floor level.

The block of eight two storey units (see Appendix D) has a foundation aspect ratio of 4.2 which doesn't comply within the MBIE guidelines' definition of a regular shaped building. A releveable shallow foundation system is required with a reinforced gravel raft to moderate settlement damage from static and seismic settlement.

A specifically designed 0.8 m thick gravel raft is required to provide a stable building platform for construction of the releveable waffle slab system.

The exposed silty soils at the gravel raft base provide an ultimate bearing capacity of 200 kPa from 0.8 m.

Excavation for the reinforced gravel raft is required to at least 0.8 m below the lowest adjacent ground level followed by placement of Bidim A19 geo-cloth over the exposed soils. The base of the gravel raft shall extend

at least 0.6 m beyond the foundation footprint. The gravel raft edges should be battered at 1H:2V and shall be constructed as follows.

- The gravel raft shall be constructed from a well graded fill material comprising stone with at least two subangular faces as per MBIE guideline recommendations.
- The gravel material shall be placed in 150 mm thick layers and compacted to 95 % of the MDD value in accordance with NZS 4431:2002.
- After placement of each compacted hardfill layer, a TriAx-160 geogrid (or similar) shall be laid before placement of the next gravel layer (2 layers of geogrid required in total).
- The compacted fill density should be confirmed via NDM testing at random intervals not exceeding 3 m in each direction on the first and last layer of compacted material.

In the case where extension of the gravel raft beyond the foundation edge is restricted by either a physical boundary line or from a legal easement instrument, the effected edge of the gravel raft should be reinforced by additional layers of geogrid to reinforce the entire depth of the gravel raft. The additional layers of geogrid shall be spaced at 150 mm vertical intervals and shall extend at least 3 m into the body of the gravel raft.

Refer to Appendix D for the proposed development layout.

## **12 Further Geotechnical Investigations**

### **12.1 Earthworks**

During development of the site appropriate stormwater and erosion control measures should be implemented and monitored throughout construction. Erosion control is likely to require the introduction of silt fences, or other similar devices, to intercept soil run-off and improve the quality of the stormwater that will be discharged from site.

### **12.2 Dewatering during Gravel Raft Excavation**

With the high water inferred from the CPT tests and in agreement with the GNS water surface contours off the NZGD, dewatering would be required during excavation of the gravel raft. The near-surface clayey silt soils would likely slow ground water seepage into the excavation, however the development of excess pore pressures due to release of the overburden soil weight may cause softening of the exposed soils at the base of the excavation. The excavation should be left for a period of a few days to allow adequate dissipation of the excess pore pressures in the exposed soils before placement of the gravel raft.

### **12.3 Pavement Design**

For design of flexible pavement areas, we recommend a CBR value of 2%, based on an averaged Scala blow count of 1 blows/100 mm from 0.40 m depth.

### **12.4 Review of Foundation Design**

To ensure the recommendations in this report have been interpreted correctly, we recommend that Tetrad Consulting Ltd is provided with the final foundation design drawings for an independent review. At the time of construction an appropriate level of construction monitoring will be required to confirm that the inferred near-surface soil profile from the CPT test is consistent with the observed soil profile during foundation excavation. Any notable variation (organic material, soft spots etc.) of the exposed soil, identified during construction should be brought to the attention of the geotechnical engineer before commencing foundation works.

Table 10 below states the mandatory geotechnical site inspections to be carried out by a suitably qualified geotechnical engineer during the construction phase of the shallow ground improvement phase:

**Table 10: Mandatory geotechnical site inspections**

Inspection type	Quantity
Gravel raft excavation	1
1 <sup>st</sup> layer of compacted fill to gravel raft	1
Placement of geogrid reinforcement	1
Final layer of compacted fill to gravel raft	1
Review of MDM test results of compacted fill	1

## 13 Limitations

This report has been prepared for Rosefern Homes Limited and the Christchurch City Council for the purpose of supporting a building consent application for the proposed multi-unit residential development at the subject property.

No liability is accepted by this company or any employee of this company with respect to its intended use by any other person or persons.

This report has been based on the results of cone penetrometer tests completed at discrete locations; therefore, subsurface soil conditions are 'inferred' based on interpreted data and could vary from the test locations at the time of the geotechnical assessment. Should exposed soil conditions vary from those described herein Tetrad Consulting Ltd requests that it be notified immediately.

The geotechnical investigation was confined to geotechnical aspects of the site only and did not involve the assessment for environmental contaminants.



## 14 References

Brown, L.J.; Weeber, J.H. (1992): *Geology of the Christchurch Urban Area*. Institute of Geological & Nuclear Sciences 1:25,000 geological map 1.

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Bradley and Hughes (2012a) *Conditional Peak Ground Accelerations in the Canterbury Earthquakes for Conventional Liquefaction Assessment*. Technical Report for the Ministry of Business, Innovation and Employment, April 2012. 22p.

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New Zealand Geotechnical Database (2012) "Observed Ground Crack Locations", Map Layer CGD0400 – 23 July 2012, retrieved September 2023 from <https://canterburygeotechnicaldatabase.projectorbit.com/>

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*This report has used information from maps and/or data extracted from the Canterbury Geotechnical Database (<http://canterburygeotechnicaldatabase.projectorbit.com>), which were prepared and/or compiled for the Earthquake Commission (EQC) to assist in assessing insurance claims made under the Earthquake Commission Act 1993. The sources maps and data were not intended for any other purpose. QEC and its engineers, Tonkin & Taylor, have no liability for any use of the maps or data or for the consequences of any persons relying on them in any way. This "important notice" must be reproduced wherever those figures or any derivatives are reproduced.*



## Appendix A

- Site Investigation Plan



LEGEND

Cone Penetrometer Test (CPT)

Scala Penetrometer Test (SP)

Hand Auger Borehole Test (HA)

LEGEND

Cone Penetrometer Test (CPT)

Dynamic Probe Super Hard Test (DPSH)

Scala Penetrometer Test (SP)

Hand Auger Borehole Test (HA)

1	24/08/23	01	CJN
No.	DATE	REVISION	BY



PROJECT	Multi Unit development
ADDRESS	196 Hills Road
CLIENT	Rosefern Homes Limited

TITLE	Multi Unit Development
-------	------------------------

DESIGNED BY	CJN	REVIEWED BY	CJN
DRAWN BY	CJN	JOB NO.	23175
SCALE			NA

	Soil test location plan
--	-------------------------

REV.	DRAWING NO.
1	S1.0

## Appendix B

- CPT Profiles
- Scala penetrometer results
- Hand auger results



Test Number

HA1

Project No:

23175

Client:

Rosefern Homes Ltd

Site Address:

196 Hills Rd

City:

Christchurch

Drill Type:

50 mm dia hand auger/ Scala penetrometer

Drilled By:





Callum

Drilling Date:

23/08/2023

Log Date:

24/08/2023

Stratigraphy	Depth (m)	Graphic Log	Soil Description	USCS	Groundwater depth(m)	Dynamic Cone (Scala) Penetrometer											
						Depth (m)	Blow Count	Blow Count/100 mm									
								0	5	10	15	20	25				
			<b>SILT</b> ; dark brown (TOPSOIL), soft, damp.		WT ▼												
	0.5																
	1.0		<b>SILT with some sand</b> ,coarse sand; light brown with mottled staining; soft; low plasticity.														
			Becomes saturated														
	1.5																
	2.0																
			<b>Organic SILT</b> ; dark brown, soft, saturated.														
	2.5		clayey <b>SILT</b> with trace of sand; blue; soft; saturated; high plasticity.														
	3.0																
						E.O.H at target depth at 3 m											
	3.5																
4.0																	

**Note:** Scala Penetrometer and hand auger log tests give an indication of the ground condition at the test location only. While they are representative of typical conditions across the site, they do not identify variations in the ground away from the test location.

Tetrad Consulting Ltd: 71 Peterborough Street, Christchurch Central City, 8013

Phone: (03) 365 0726

Email: info@tetrad.co.nz

Email: [info@tetrad.co.nz](mailto:info@tetrad.co.nz)

50 mm dia hand auger/ Scala penetrometer

Callum

23/08/2023

24/08/2023

Email: [info@tetrad.co.nz](mailto:info@tetrad.co.nz)

## Appendix C

- Liquefaction analysis results for:
  - SLS1 0.13g
  - SLS2 0.19g
  - ULS 0.35 g

## LIQUEFACTION ANALYSIS REPORT

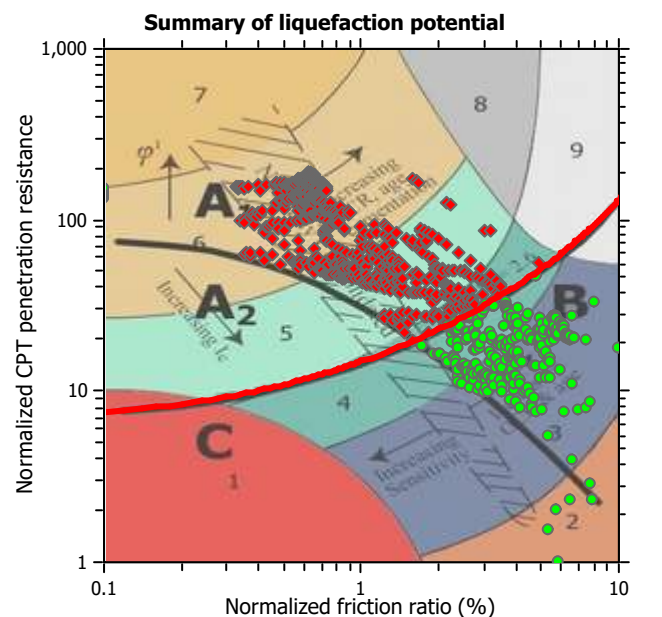
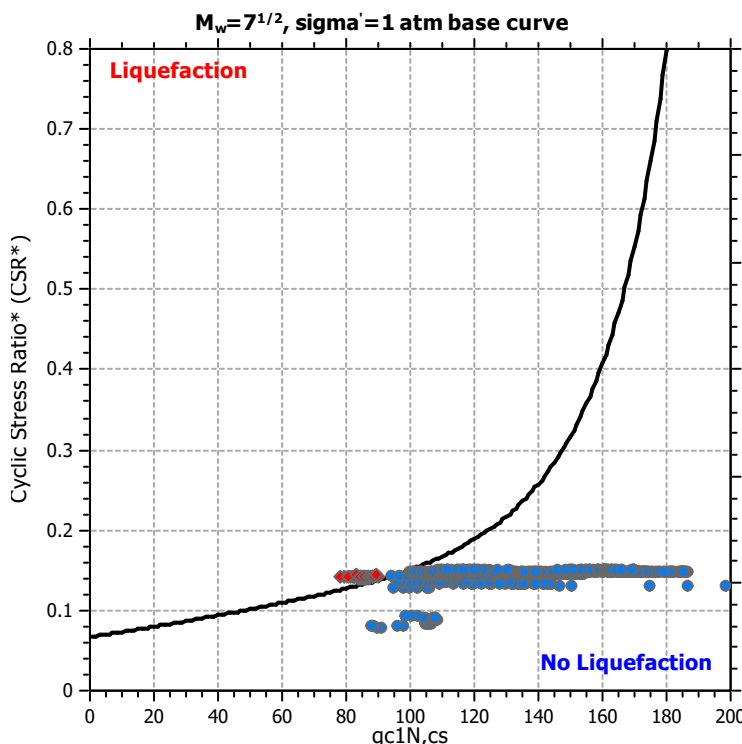
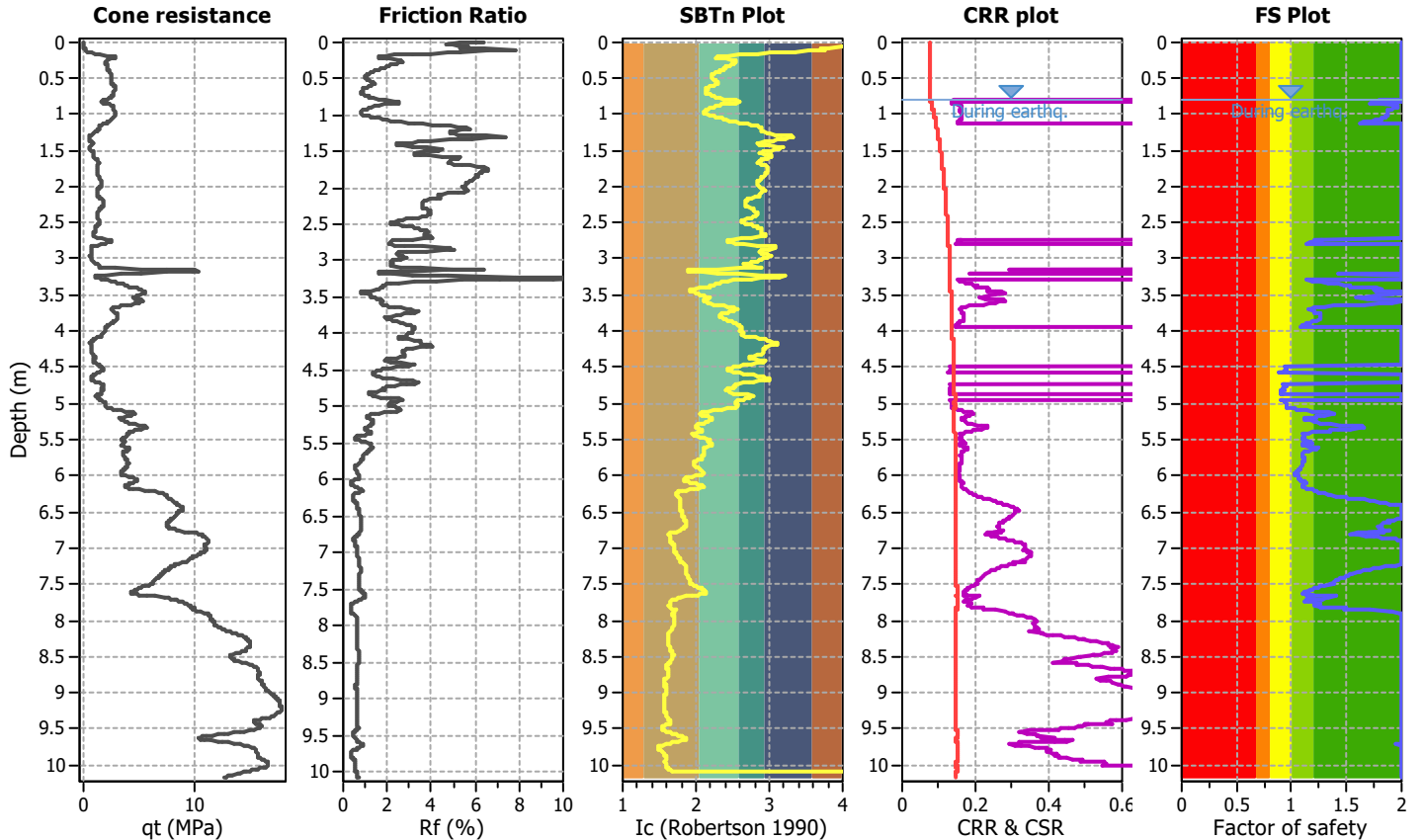
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT99751\_On boundary**

### Input parameters and analysis data

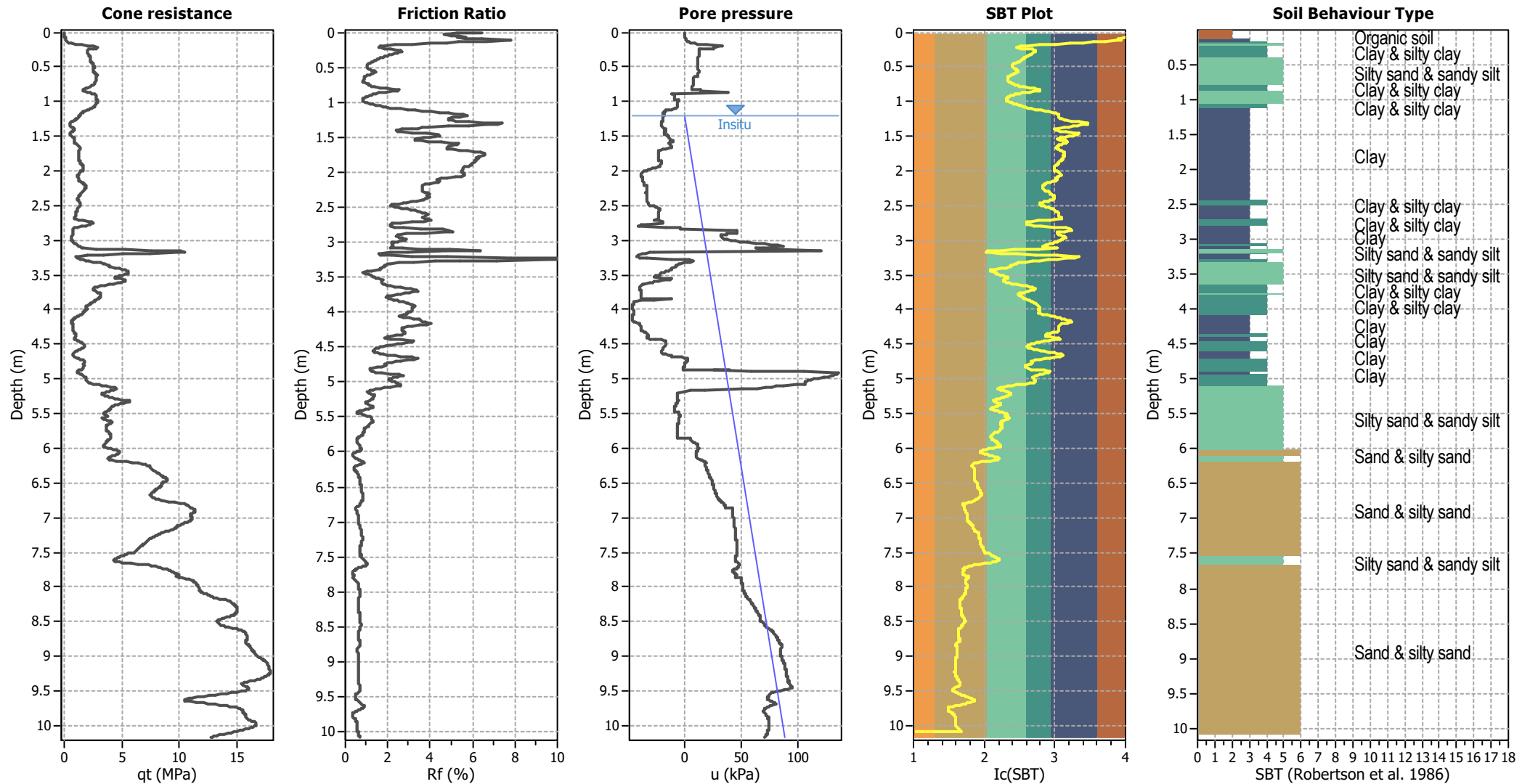
Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	10.00 m
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes		



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plots

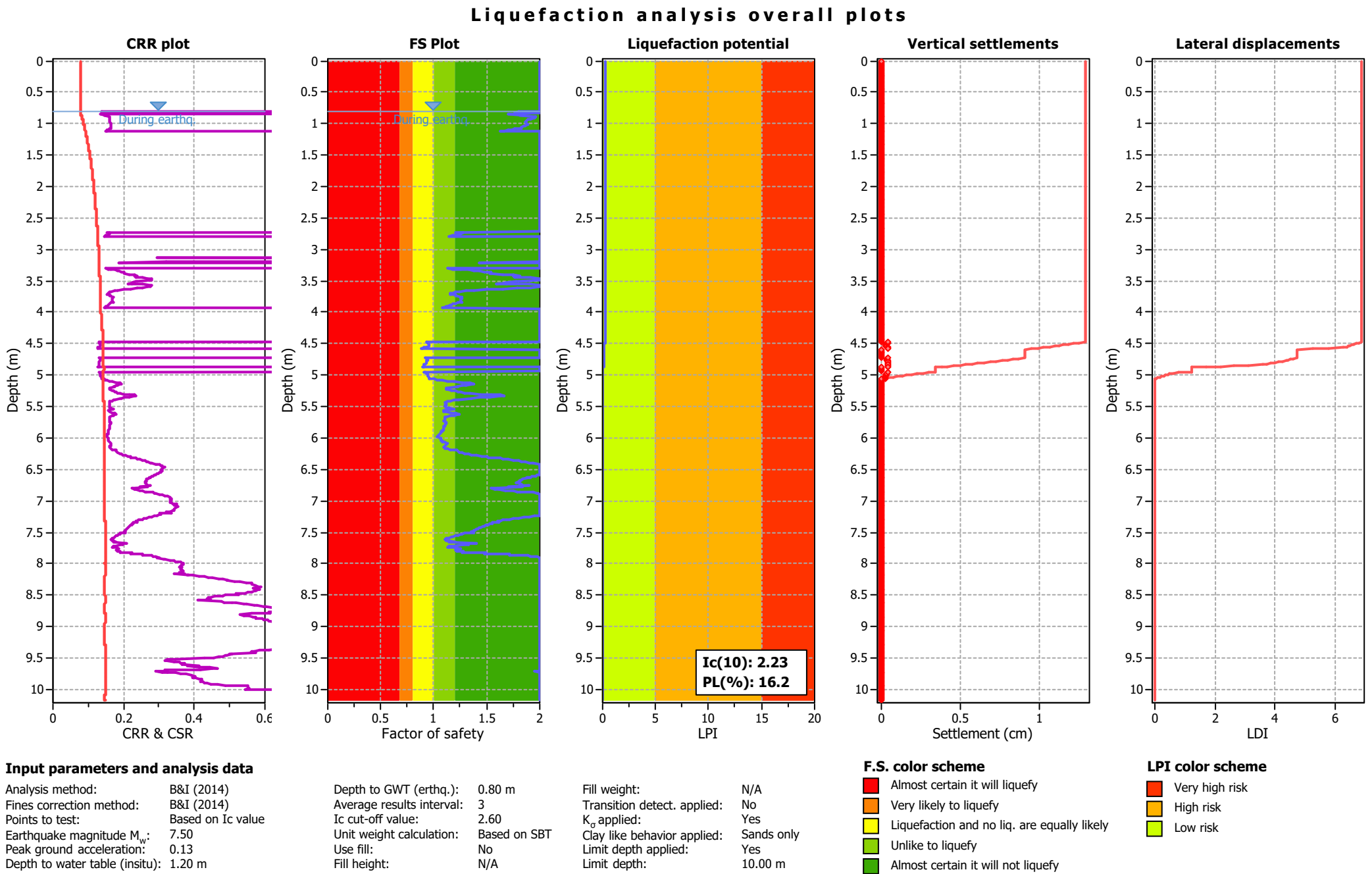


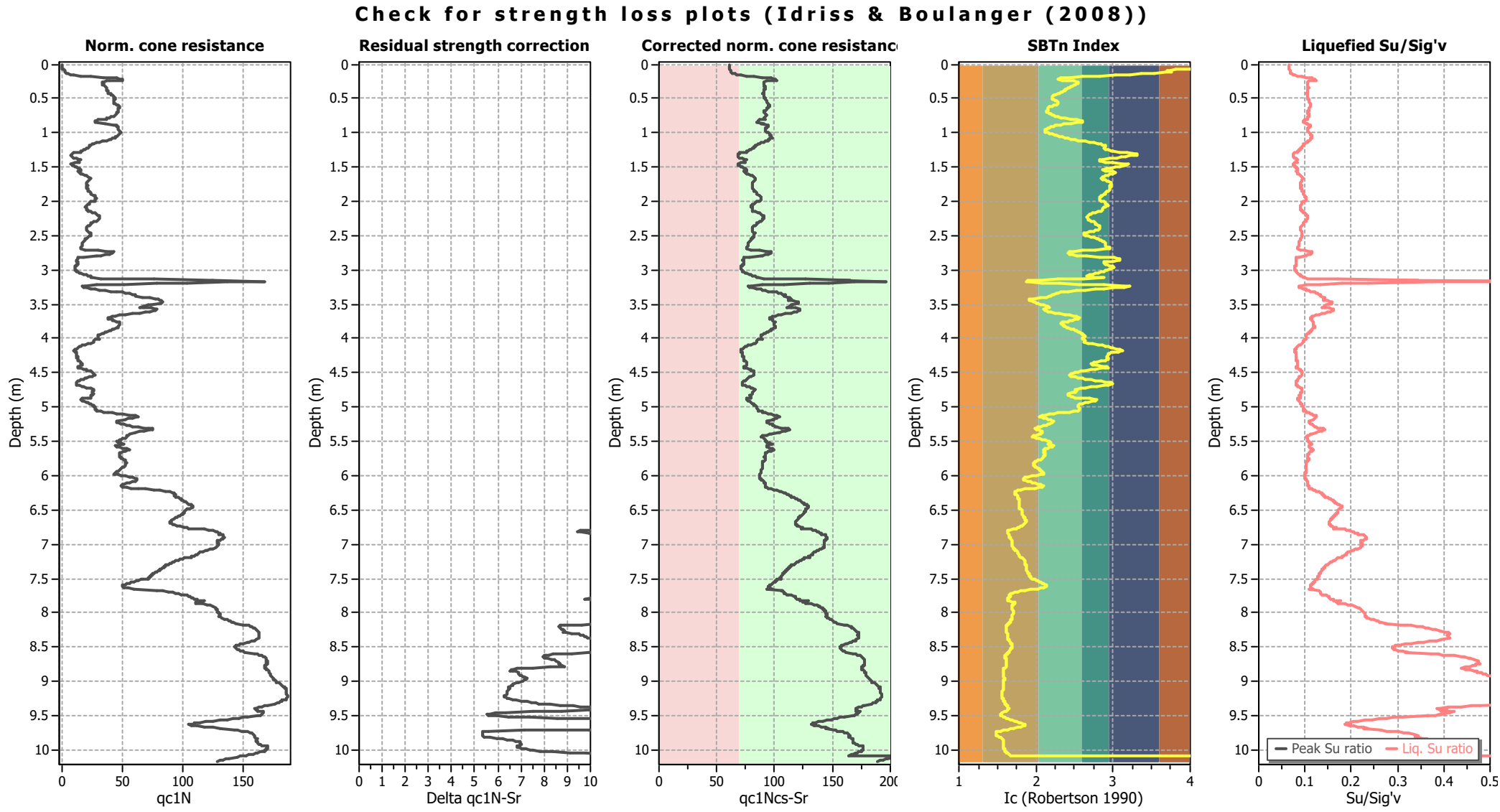
## Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_{\sigma}$ applied:	Yes
Earthquake magnitude $M_w$ :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

## SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

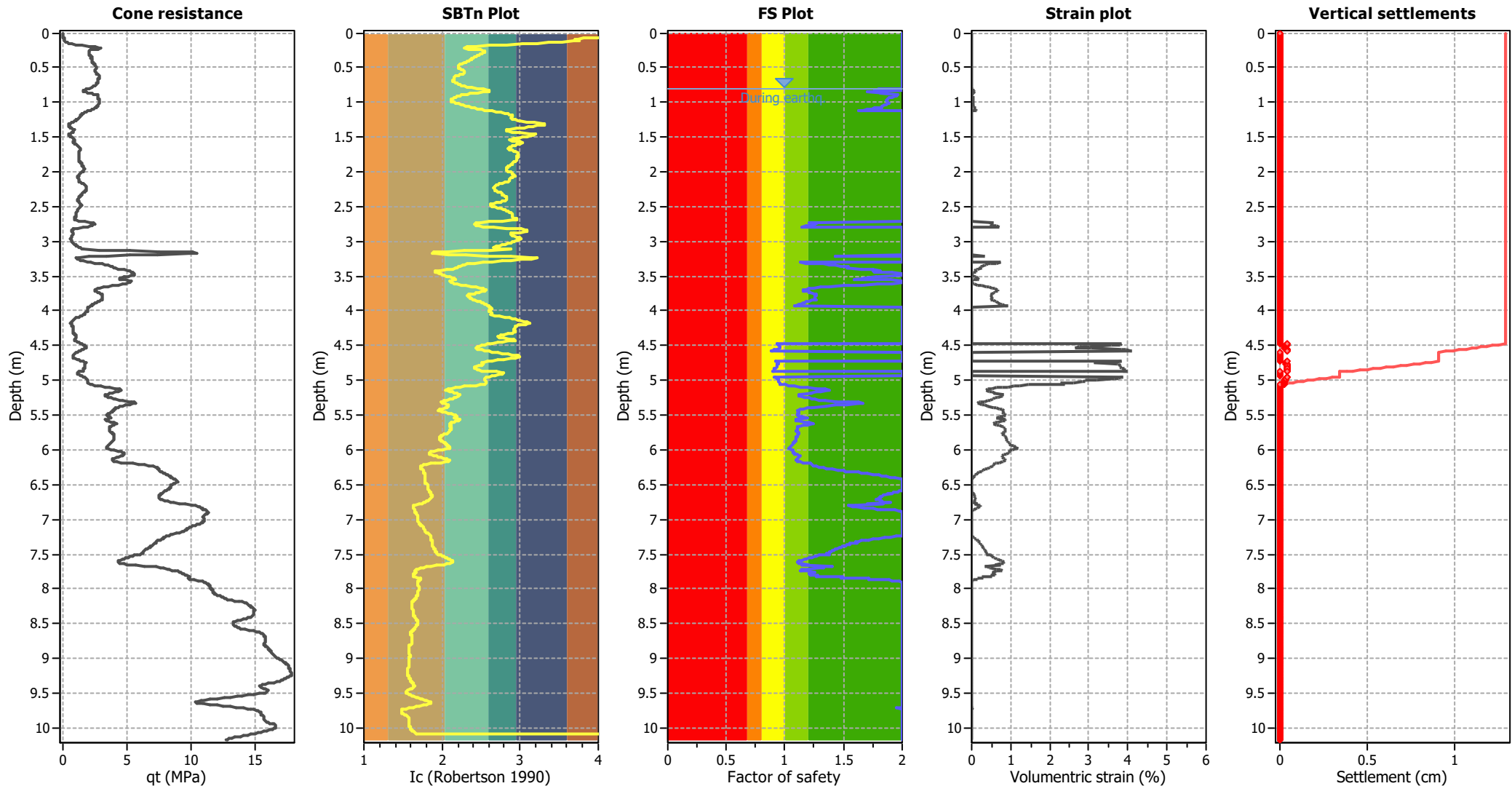




Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

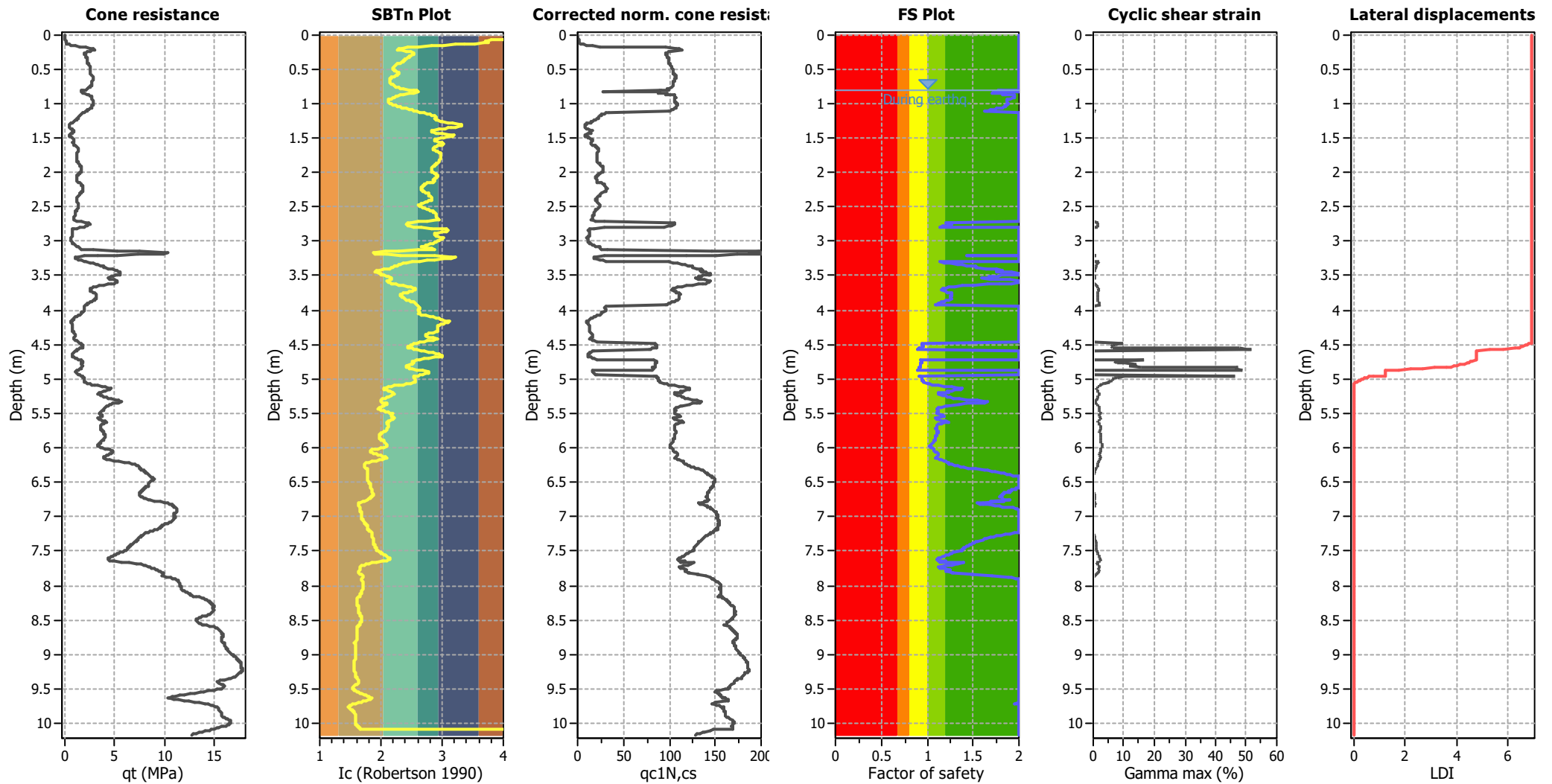
Estimation of post-earthquake settlements



Abbreviations

- q<sub>c</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain

### Estimation of post-earthquake lateral Displacements



#### Abbreviations

qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 Ic: Soil Behaviour Type Index  
 qc1N,cs: Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

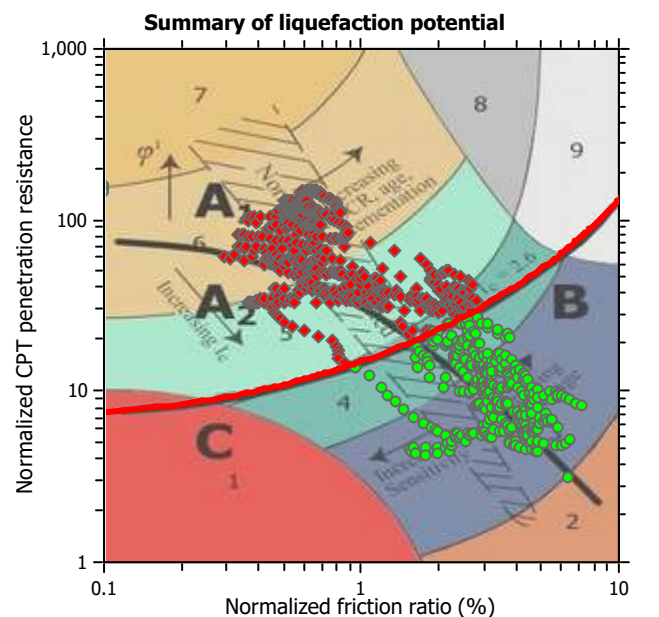
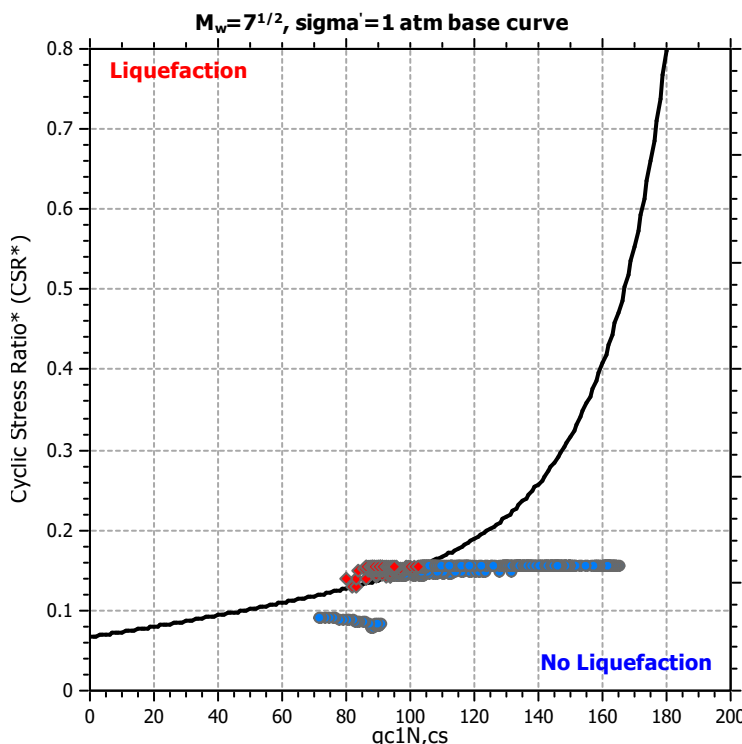
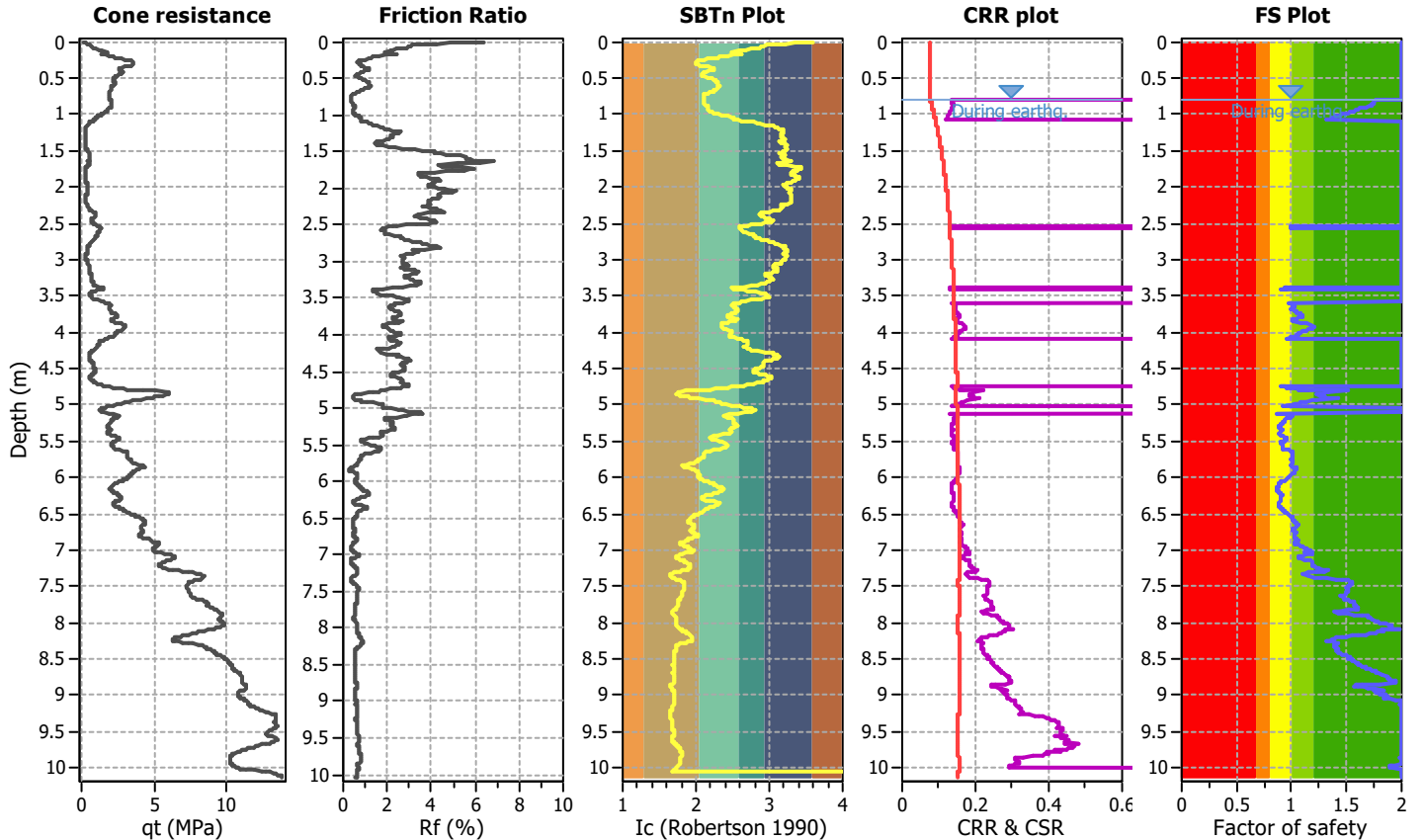
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT99752\_12.5 m N**

### Input parameters and analysis data

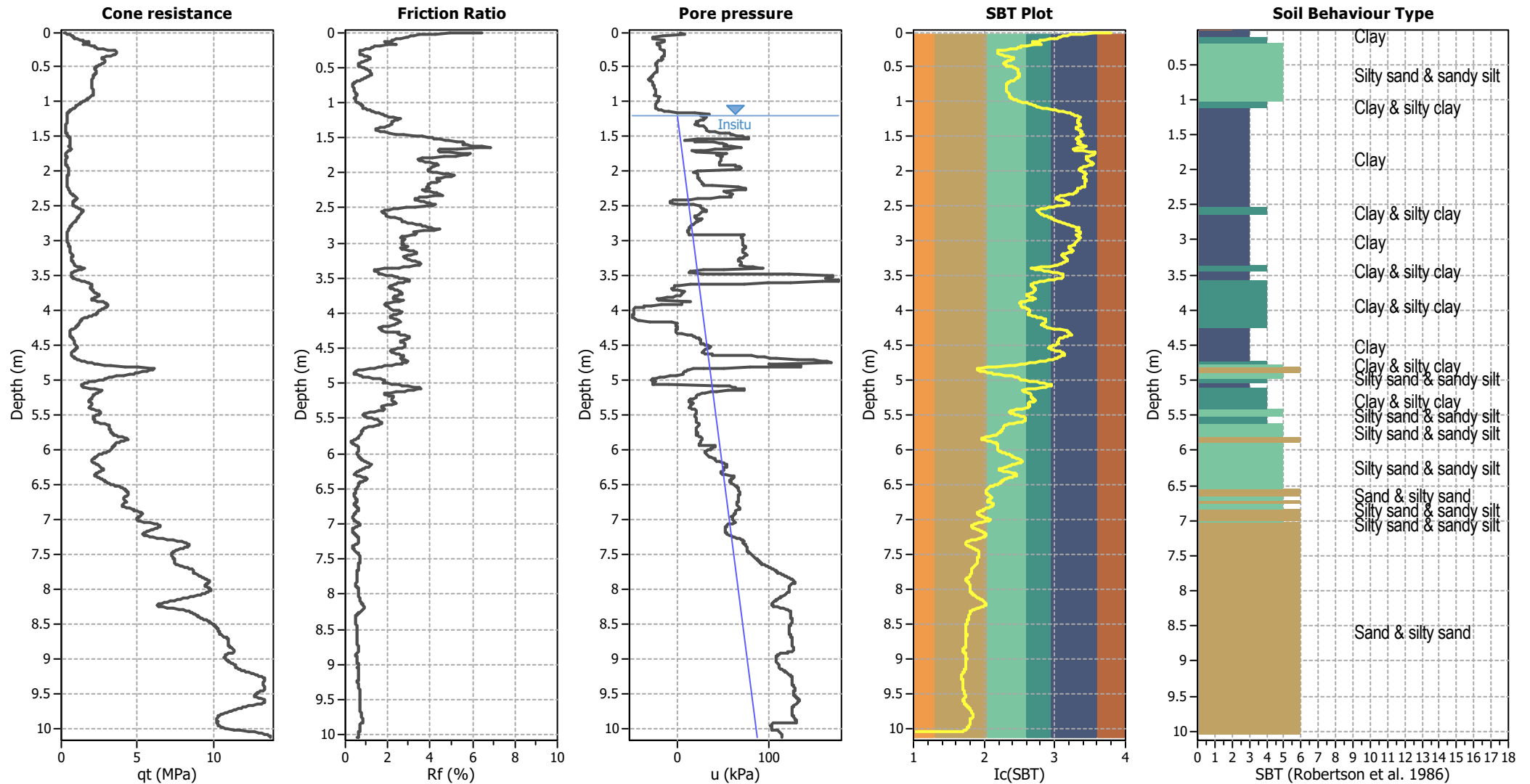
Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	10.00 m
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plots



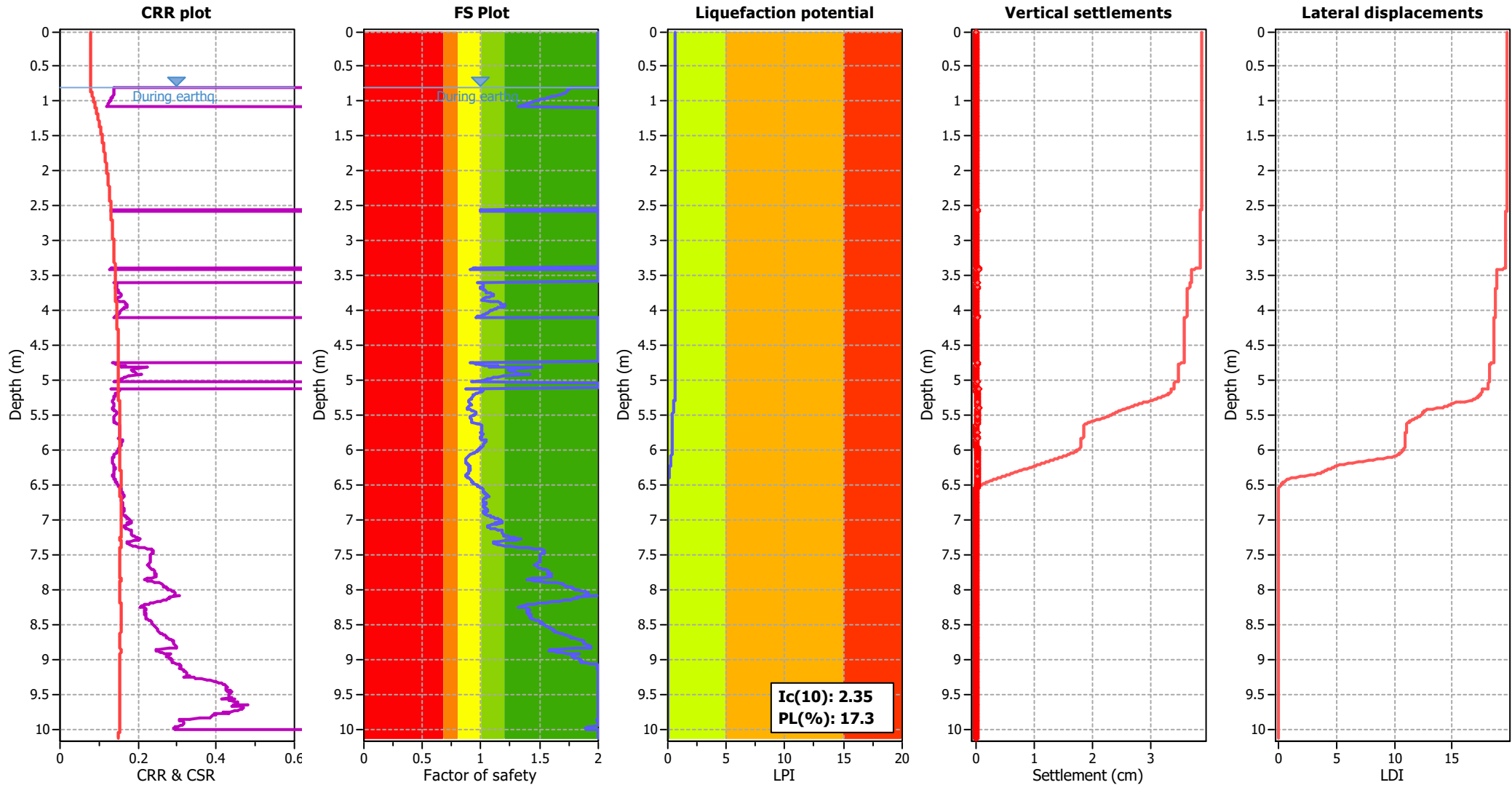
## Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_\sigma$ applied:	Yes
Earthquake magnitude $M_w$ :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

## SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

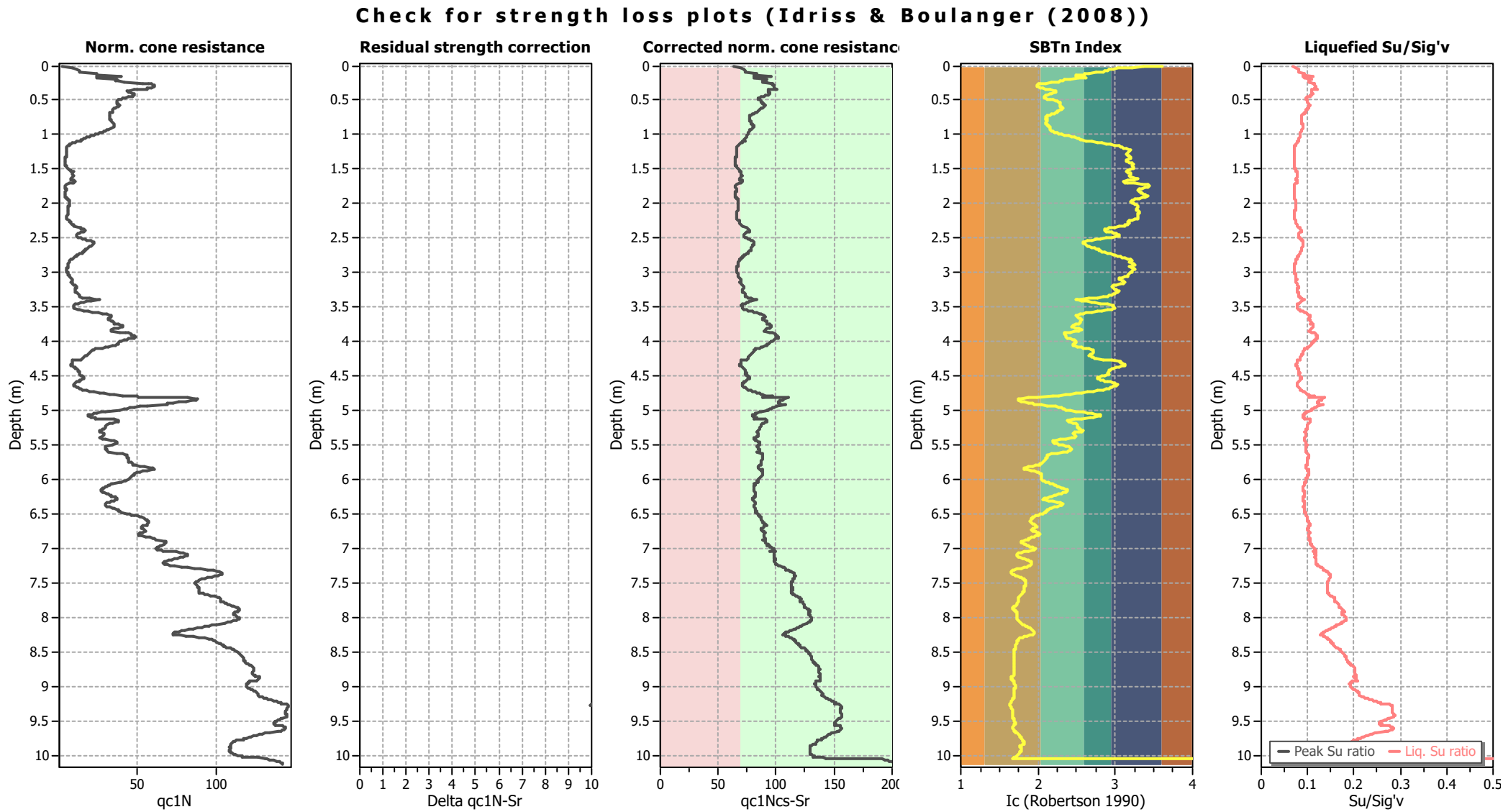
F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

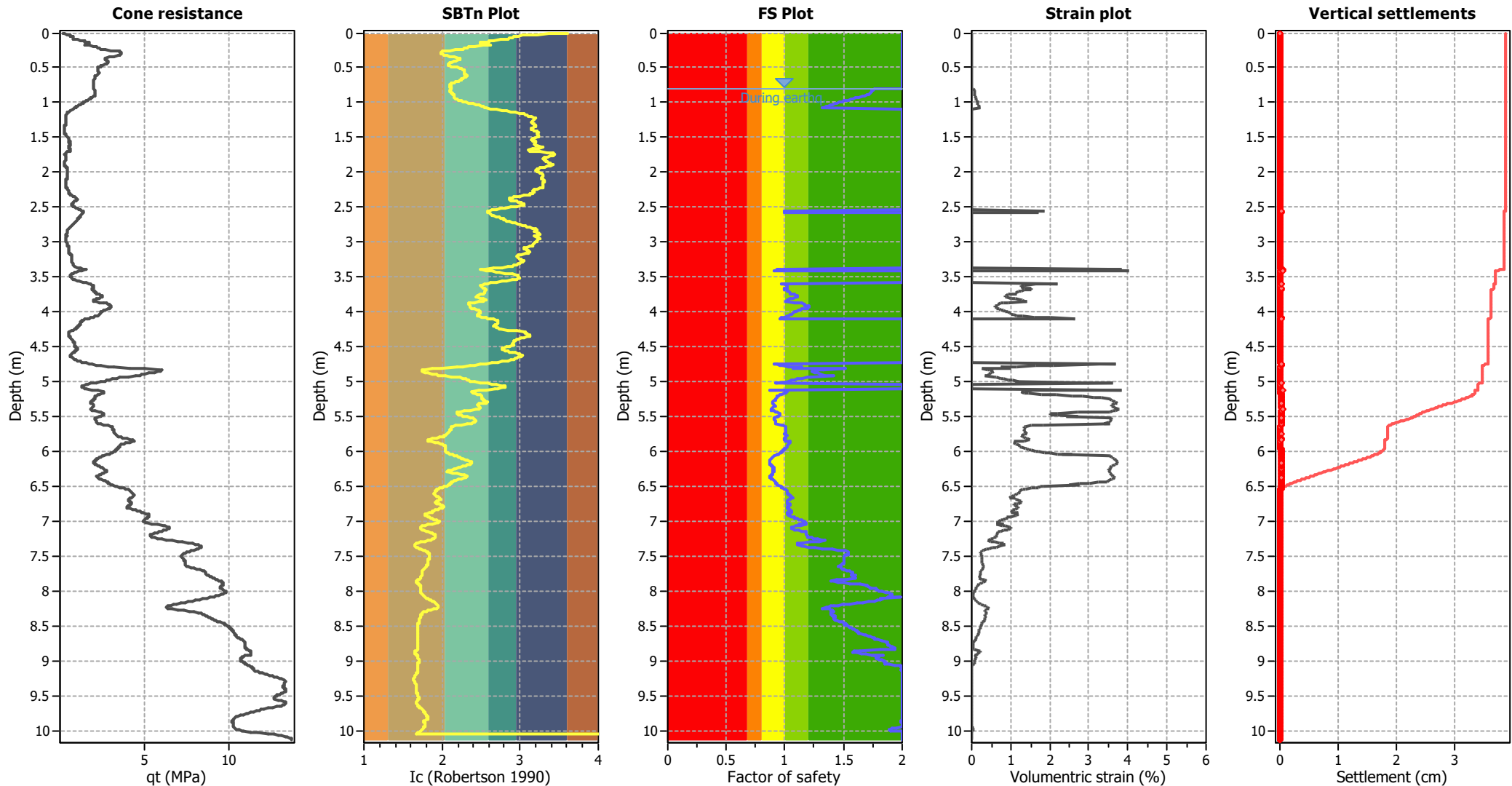




Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

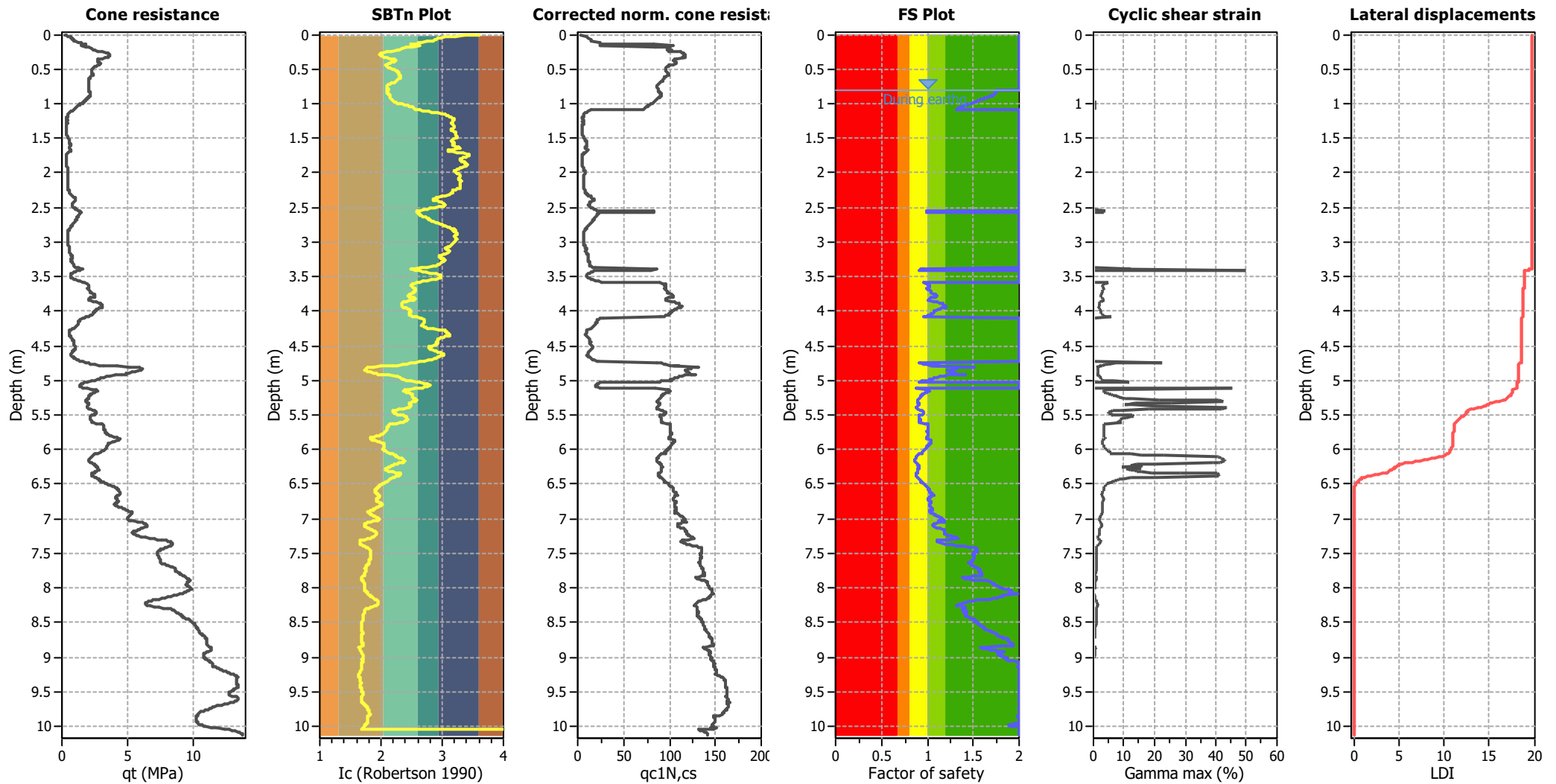
Estimation of post-earthquake settlements



Abbreviations

- q<sub>t</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain

## Estimation of post-earthquake lateral Displacements



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $q_{c1N,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

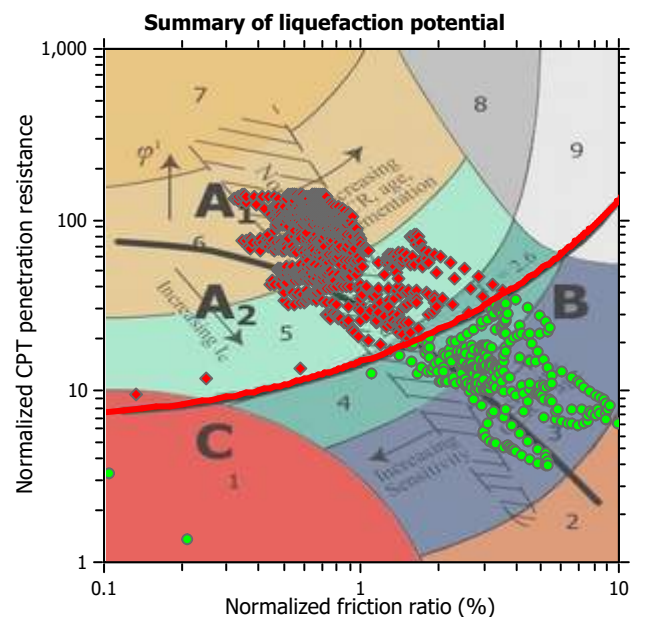
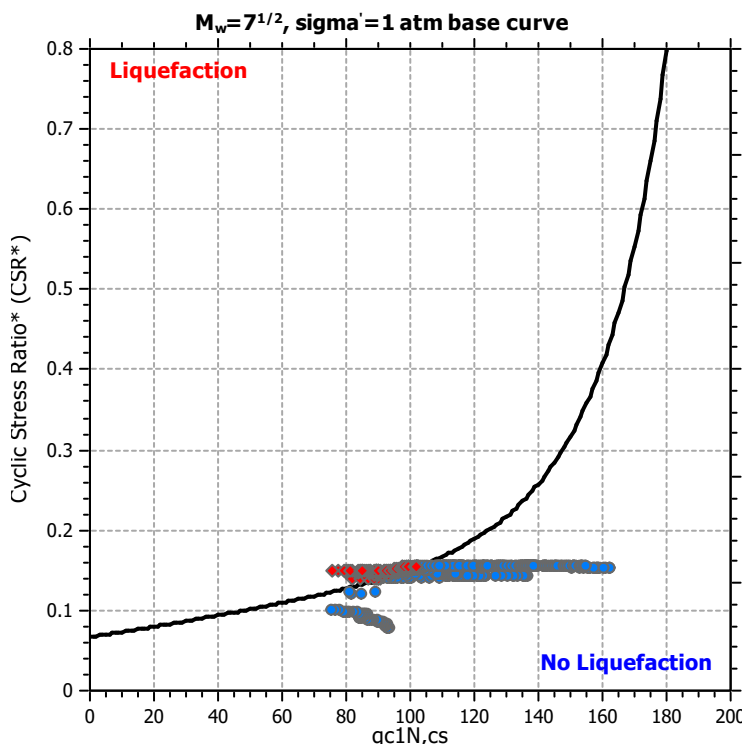
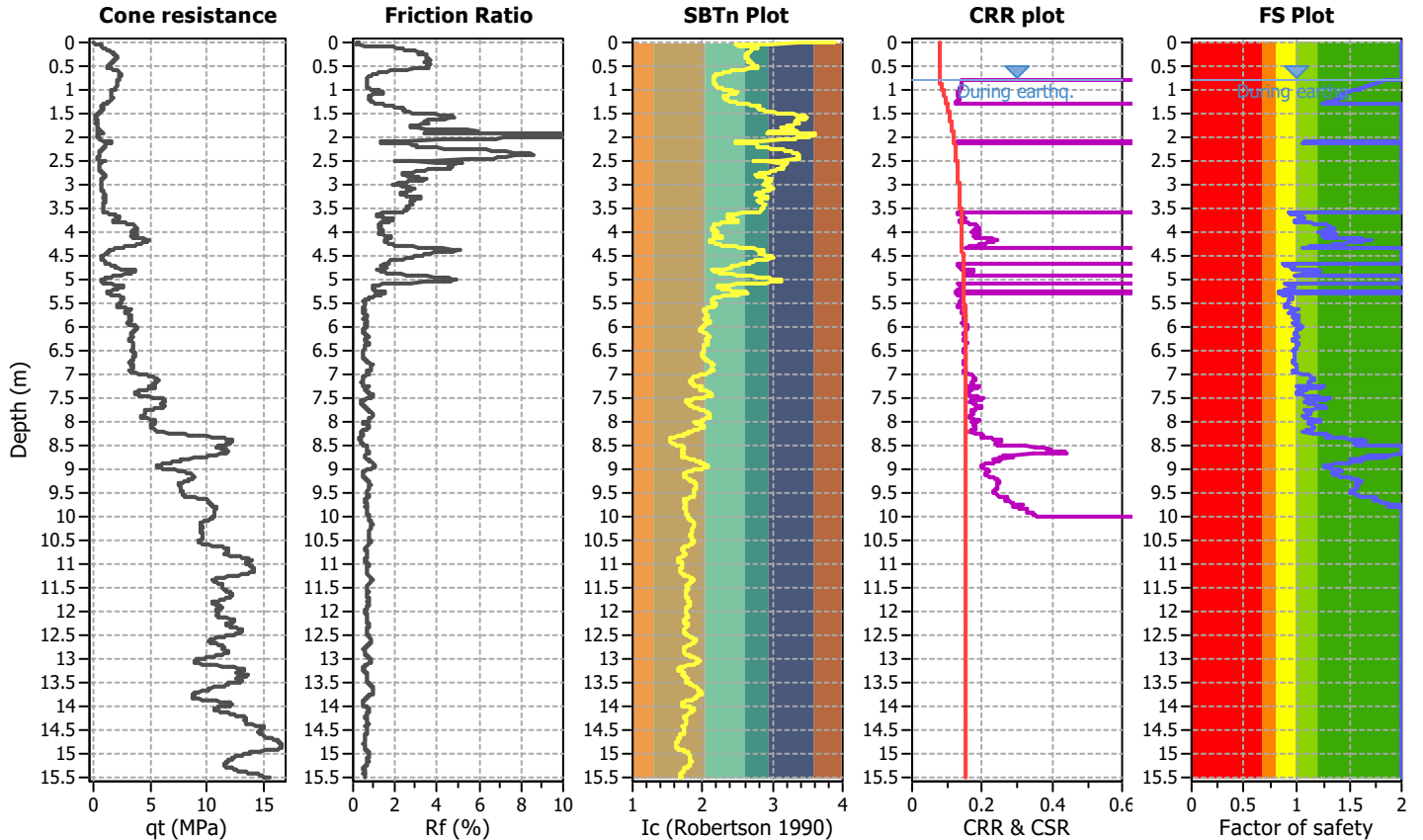
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT\_180290\_13.3mS**

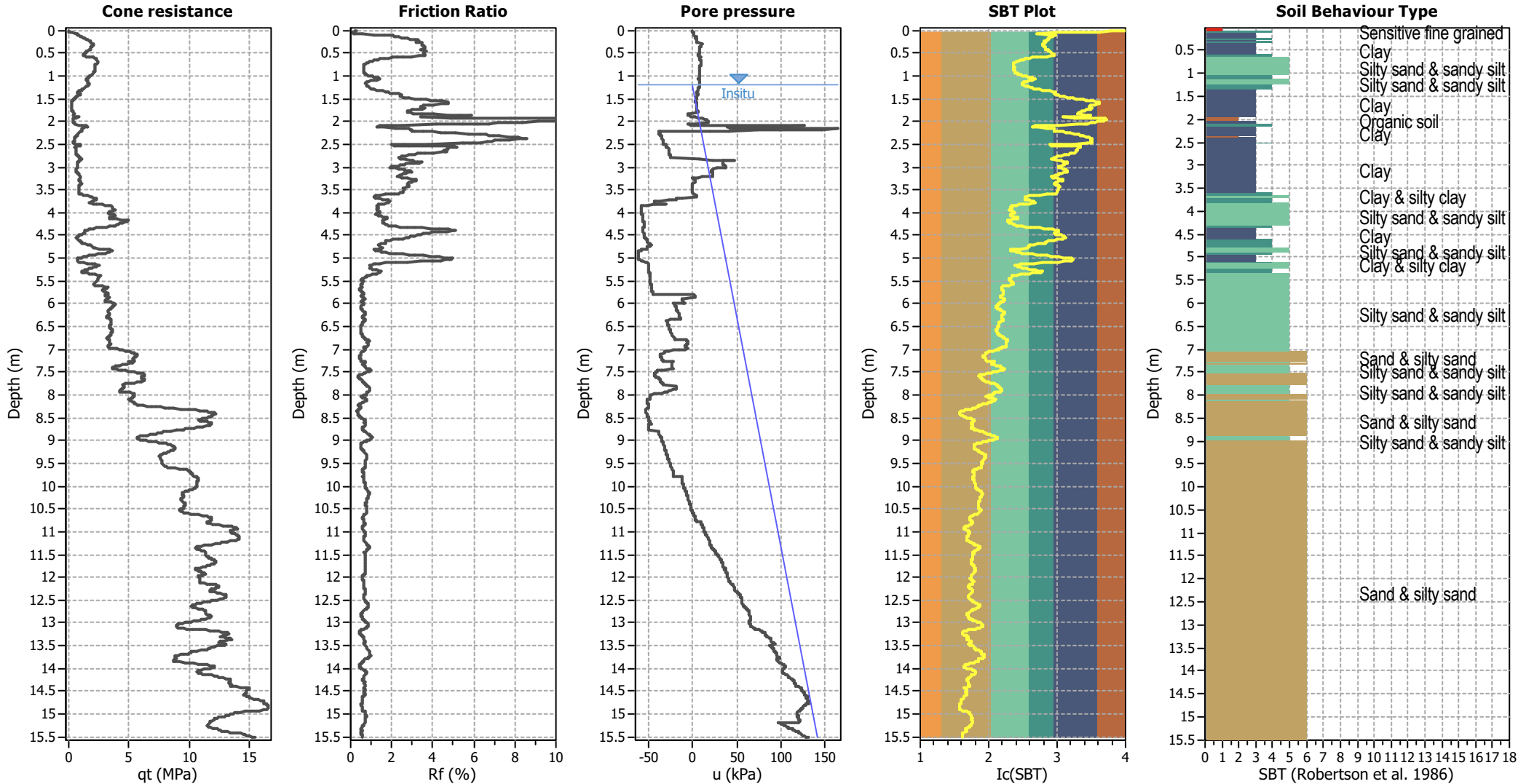
### Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	10.00 m
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



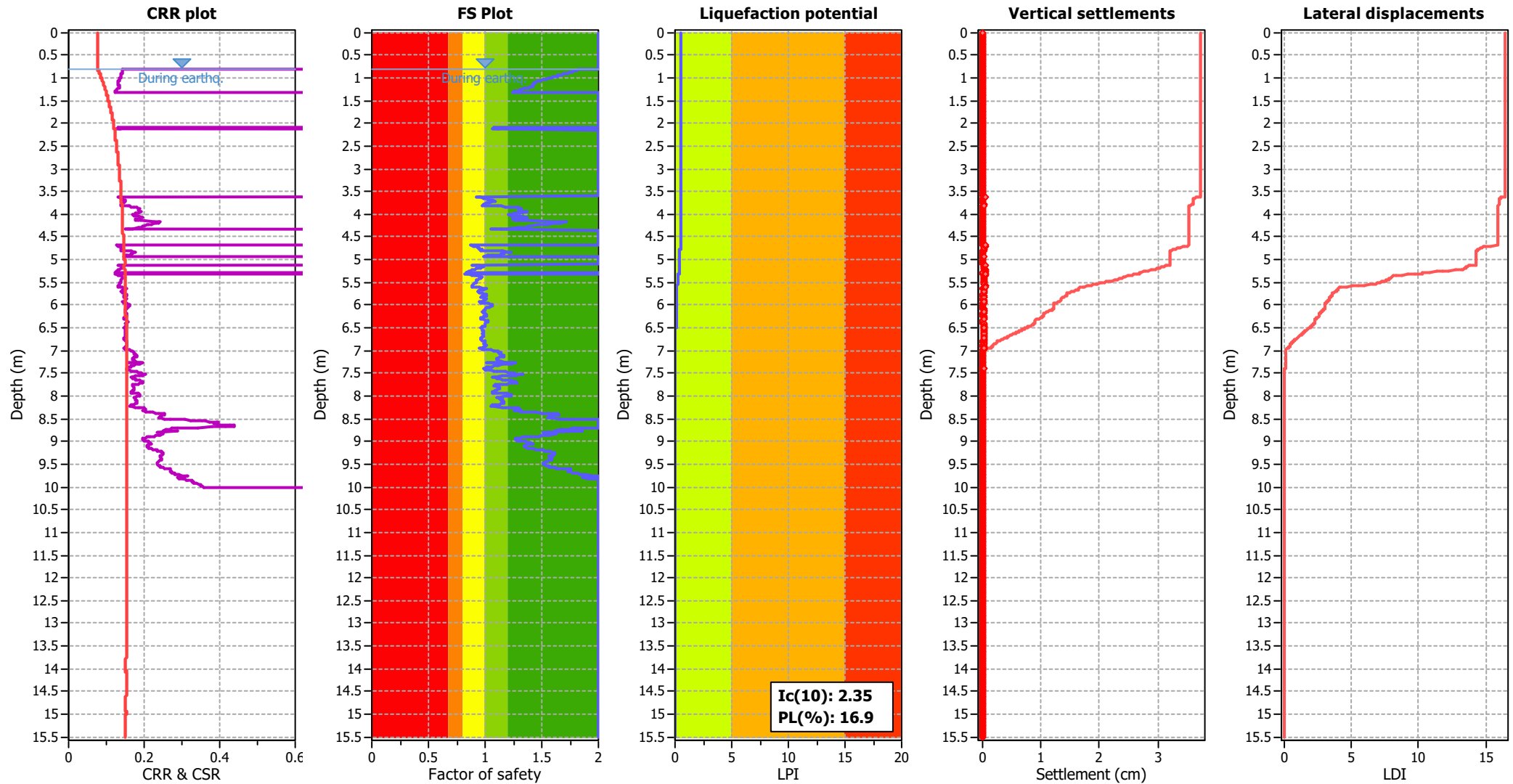
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

## Liquefaction analysis overall plots



### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

### F.S. color scheme

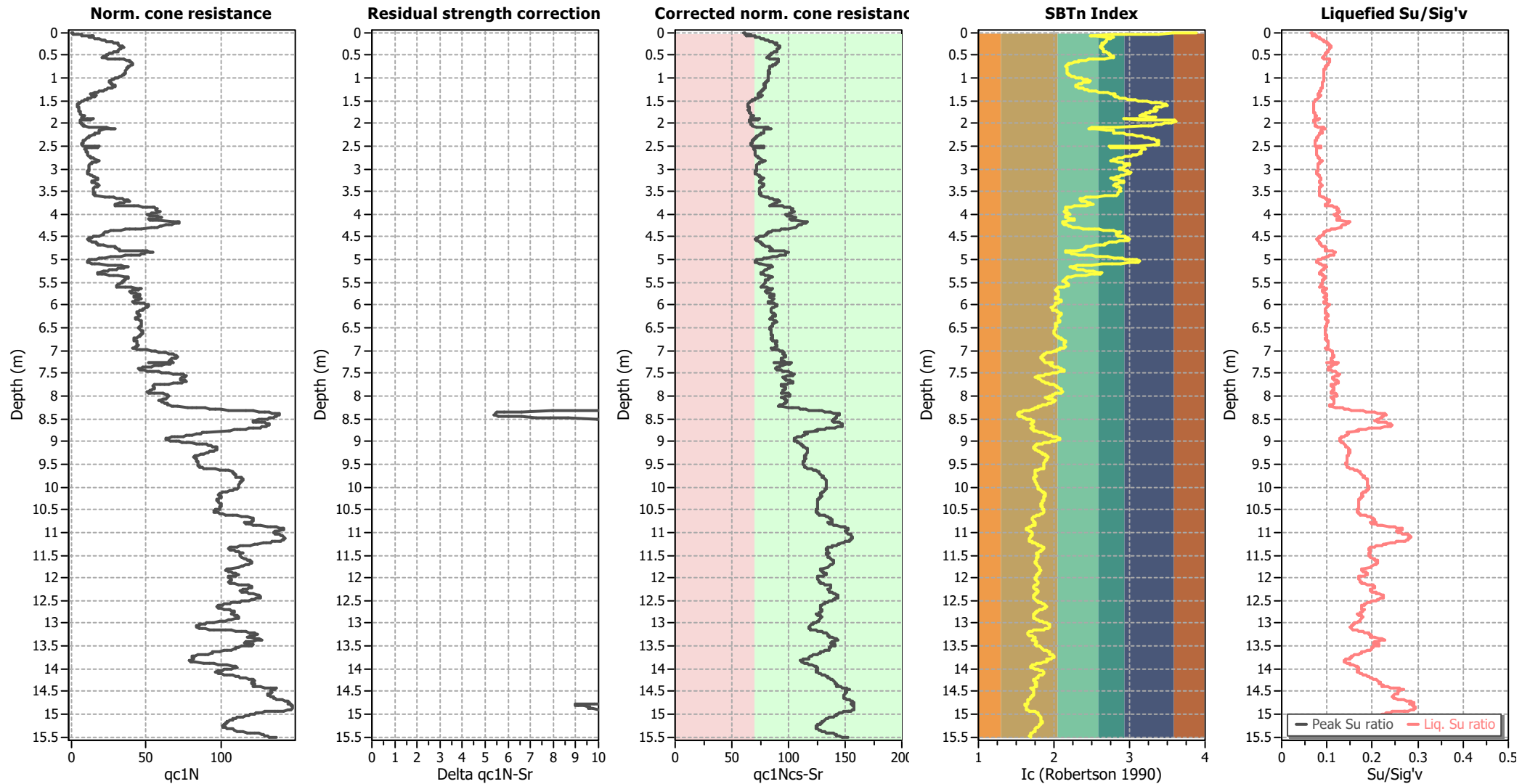
<span style="color: red;">■</span>	Almost certain it will liquefy
<span style="color: orange;">■</span>	Very likely to liquefy
<span style="color: yellow;">■</span>	Liquefaction and no liq. are equally likely
<span style="color: lightgreen;">■</span>	Unlike to liquefy
<span style="color: green;">■</span>	Almost certain it will not liquefy

### LPI color scheme

<span style="color: red;">■</span>	Very high risk
<span style="color: orange;">■</span>	High risk
<span style="color: yellow;">■</span>	Low risk



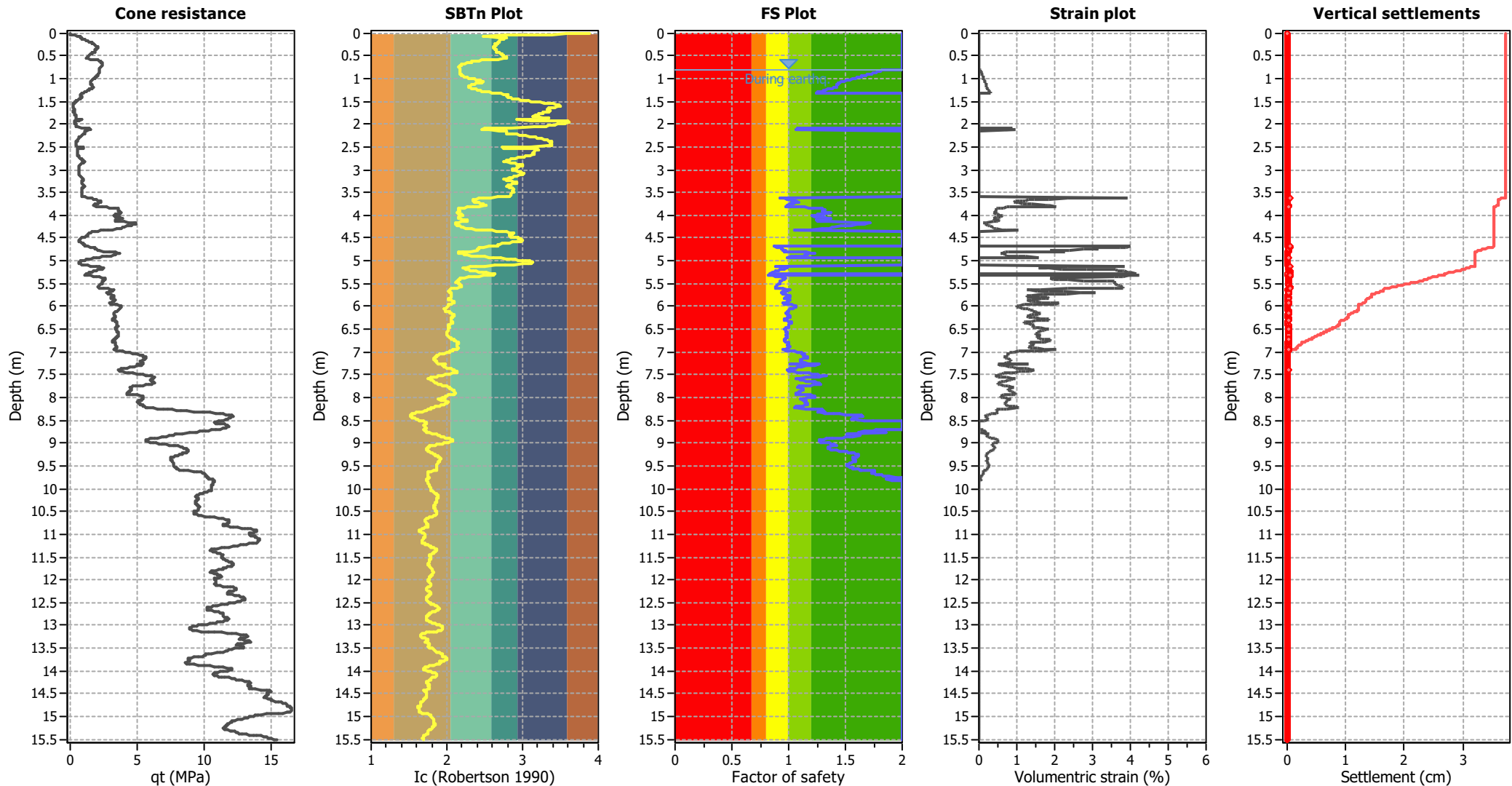
### Check for strength loss plots (Idriss & Boulanger (2008))



#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

Estimation of post-earthquake settlements

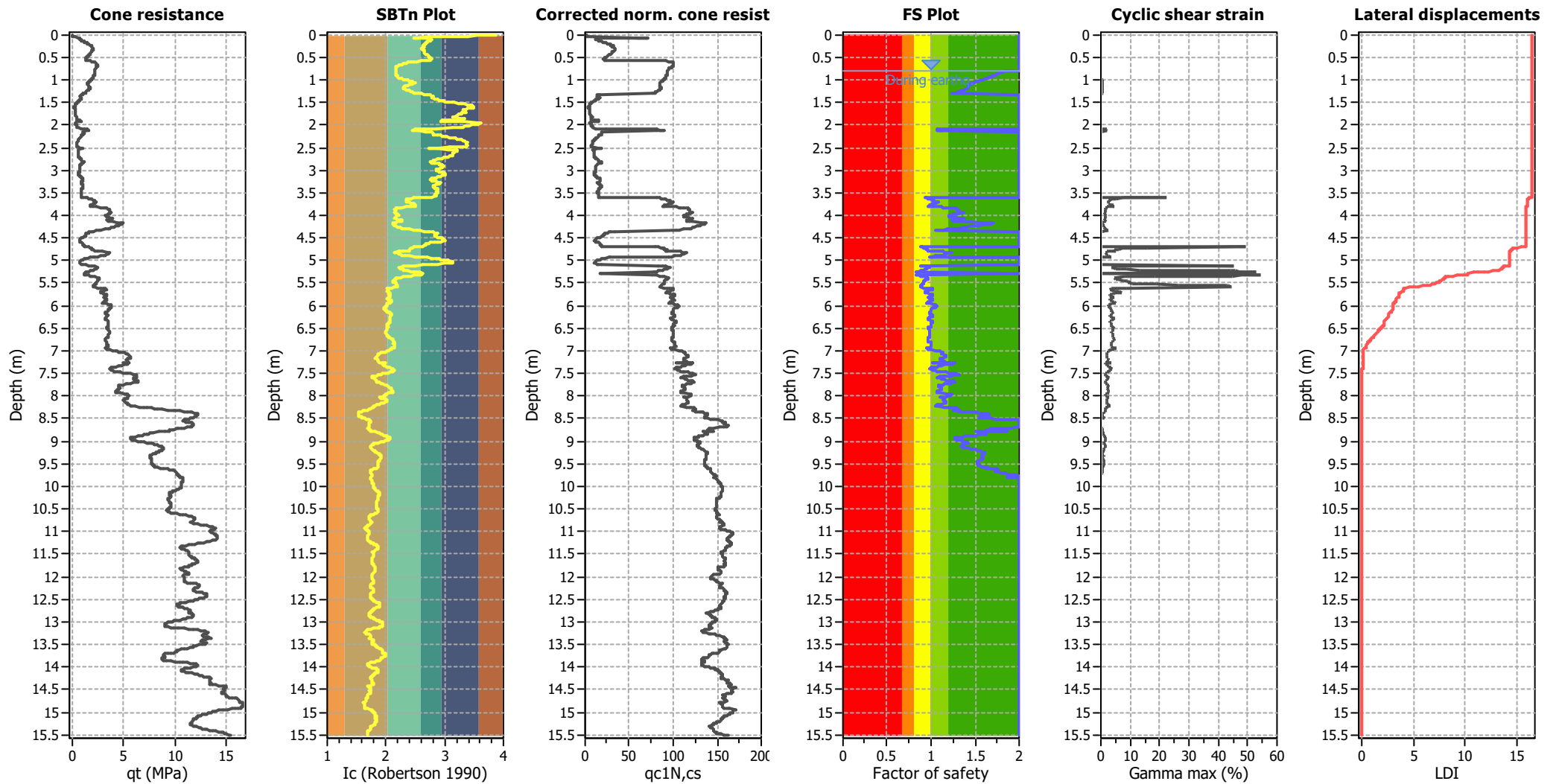


Abbreviations

- $q_c$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)
- $I_c$ : Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain



## Estimation of post-earthquake lateral Displacements



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $q_{c1N,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

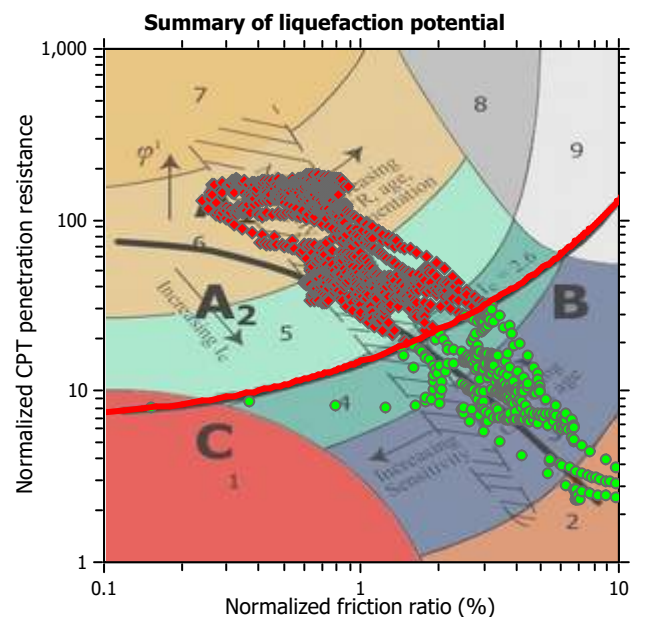
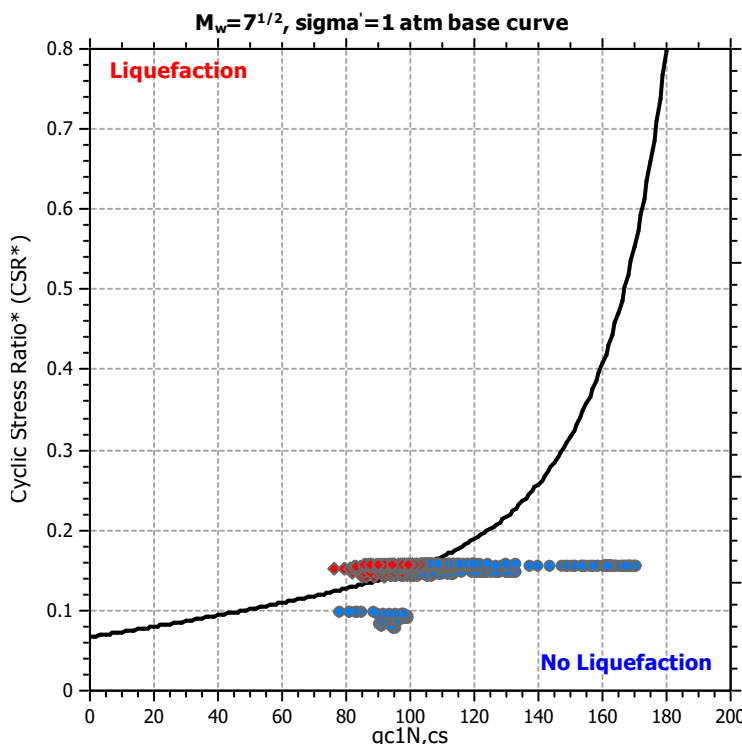
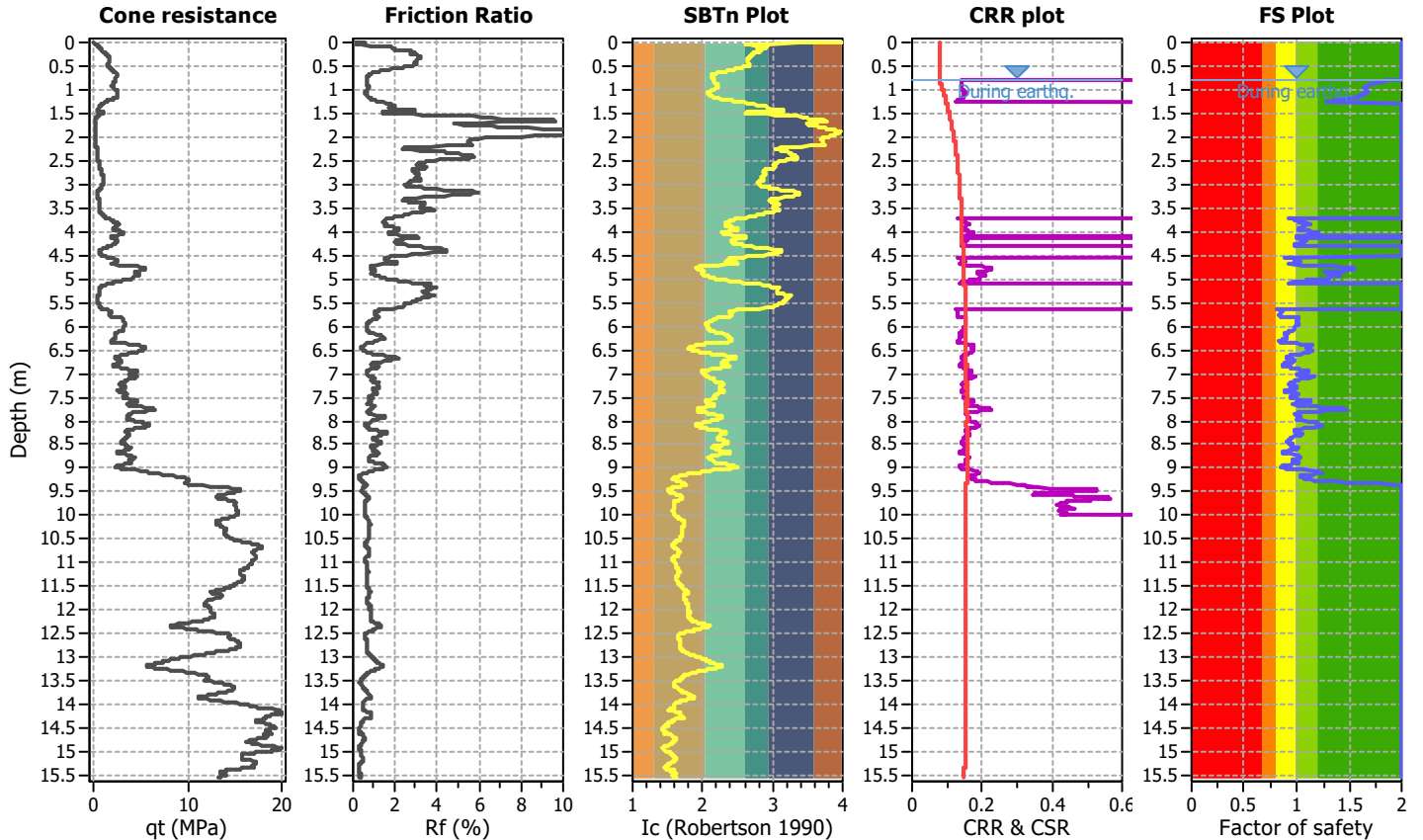
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT\_180291\_15mS**

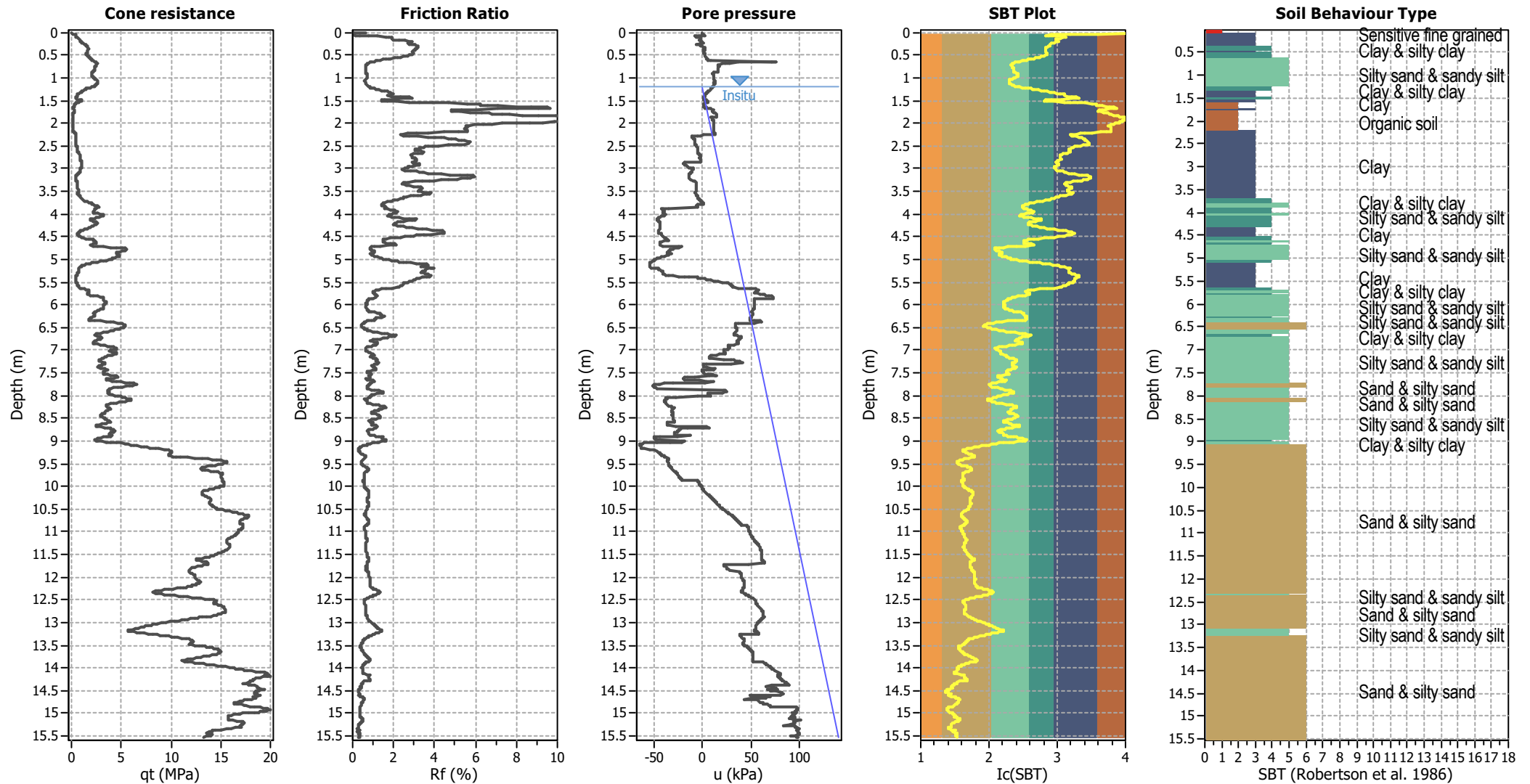
### Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	10.00 m
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plots



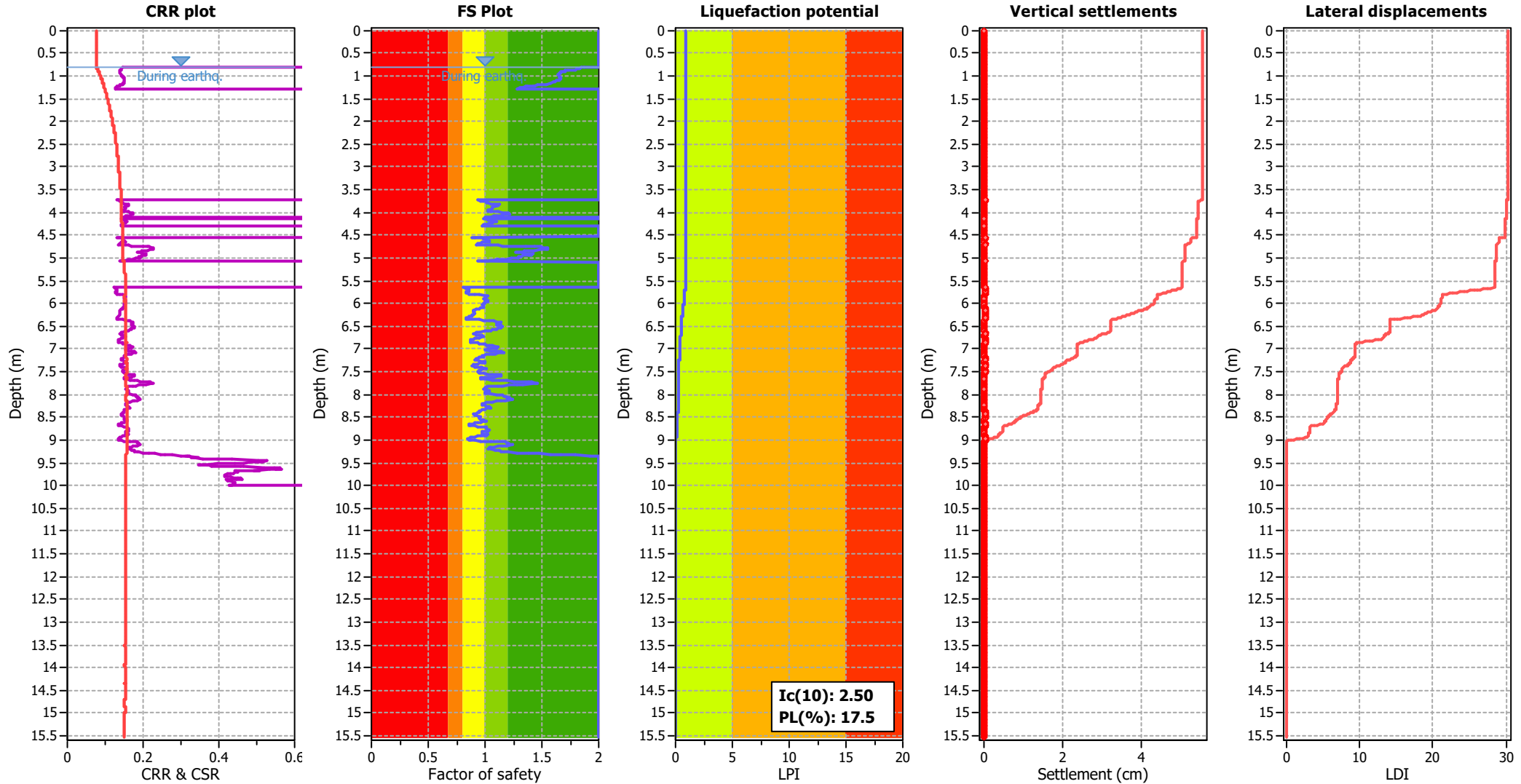
## Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

## SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

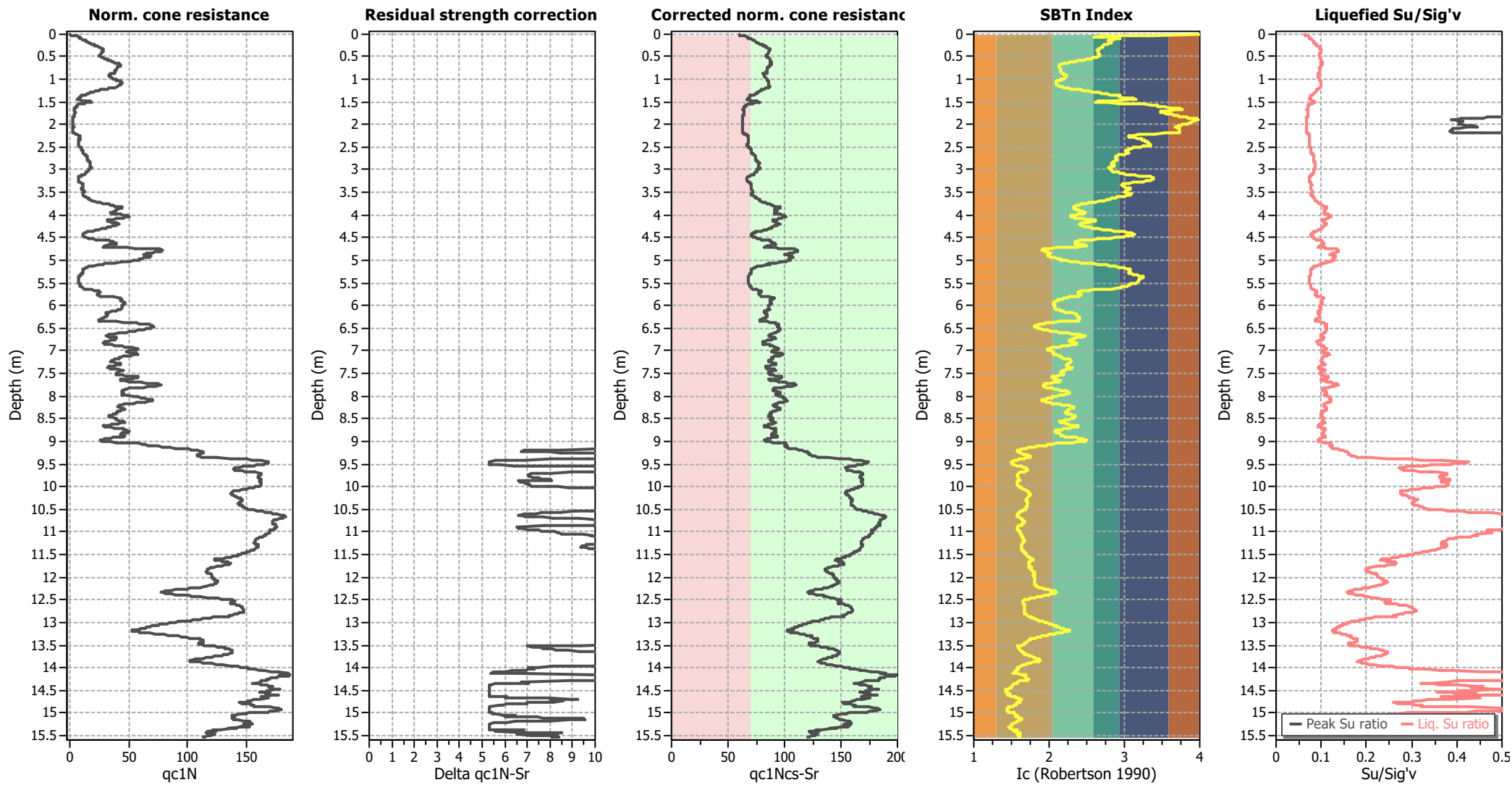
F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

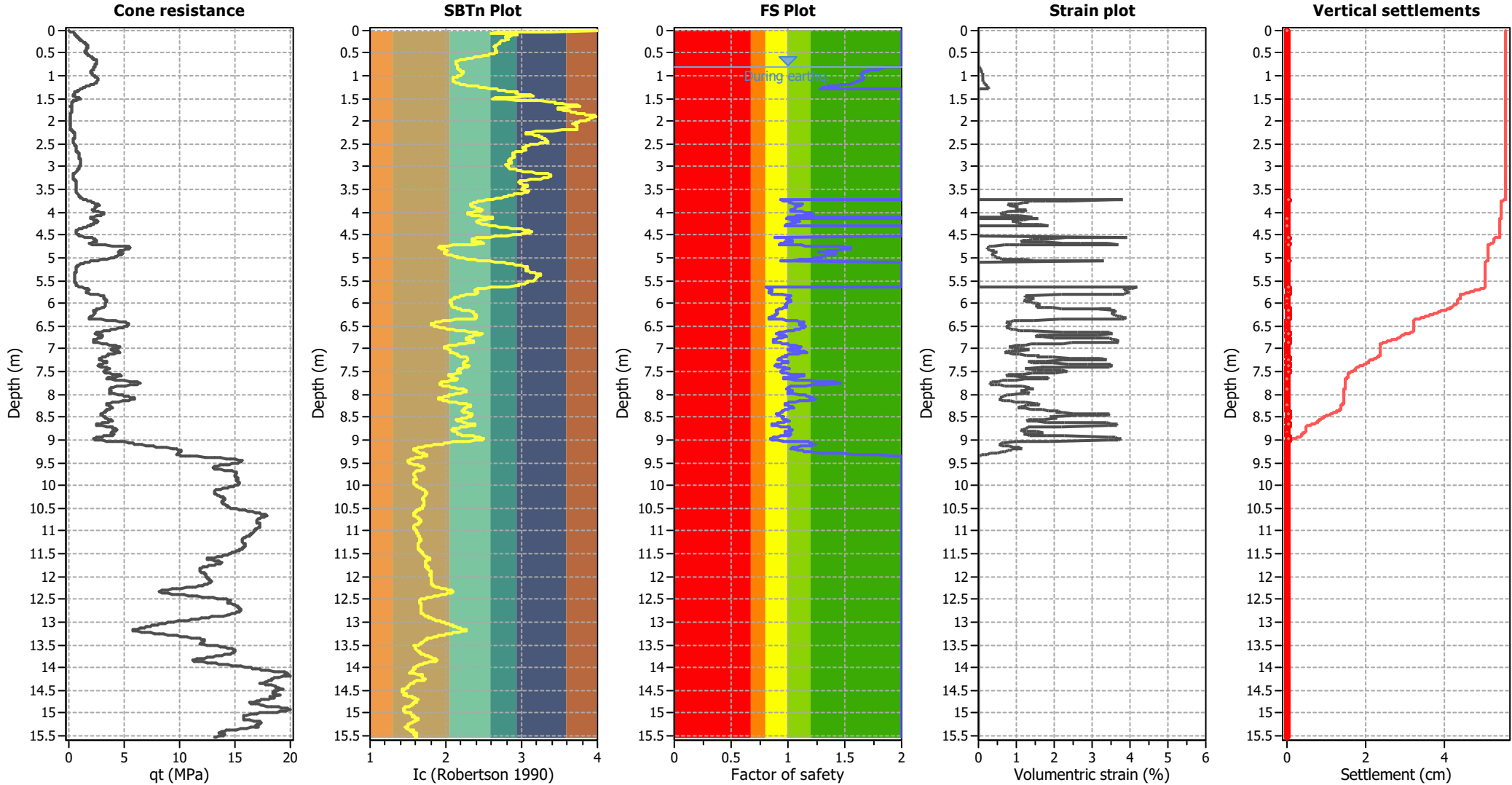
Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

Estimation of post-earthquake settlements

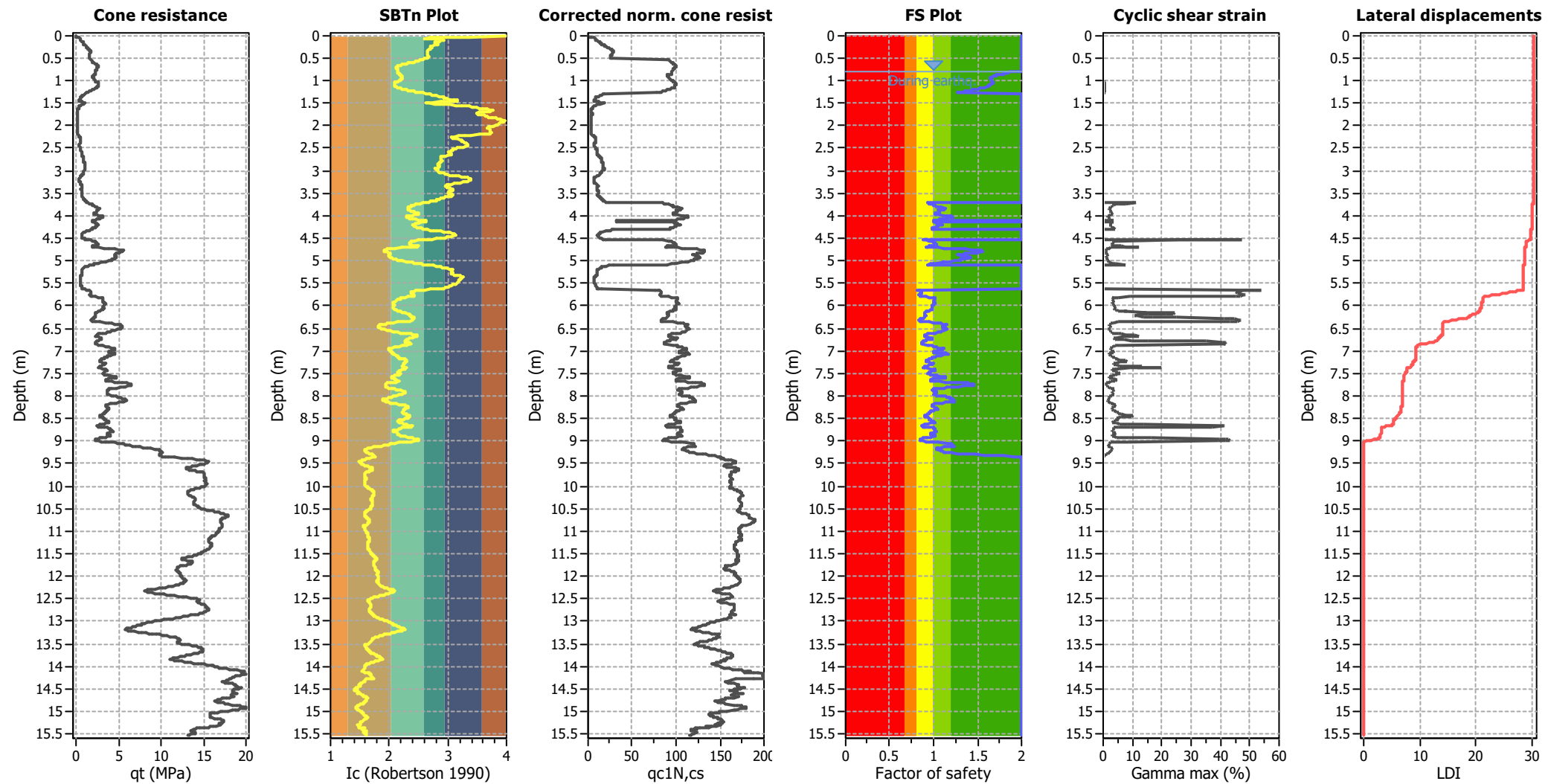


Abbreviations

- q<sub>c</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain



Estimation of post-earthquake lateral Displacements



Abbreviations

- qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

I<sub>c</sub>: Soil Behaviour Type Index

qc1N,cs: Equivalent clean sand normalized CPT total cone resistance
- F.S.: Factor of safety

γ<sub>max</sub>: Maximum cyclic shear strain

LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

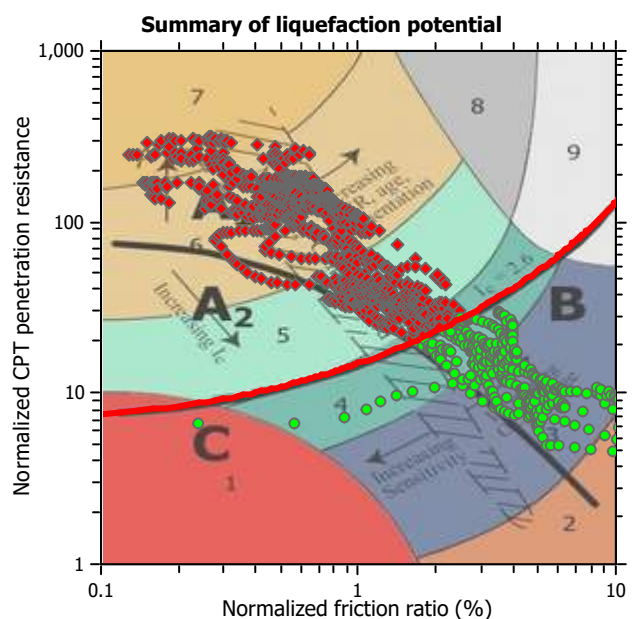
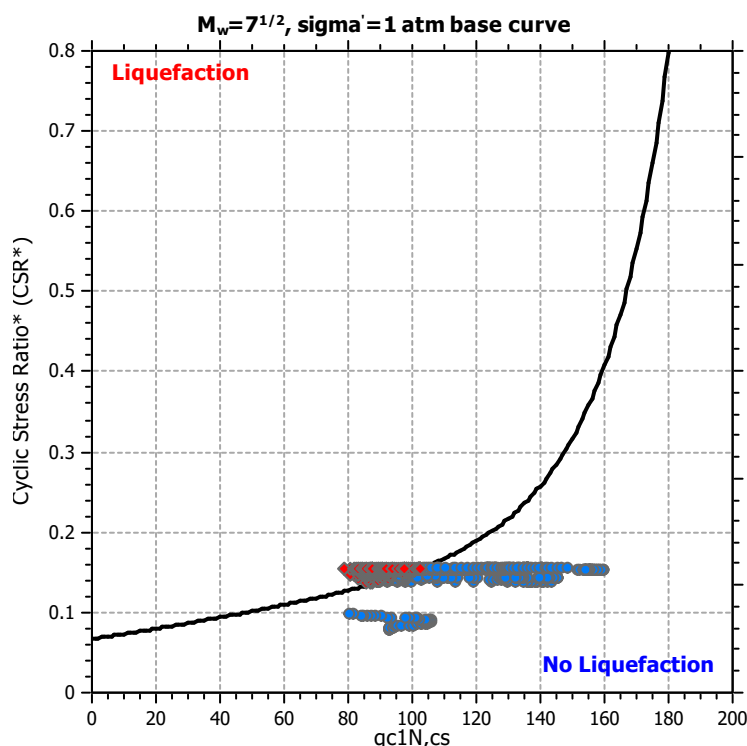
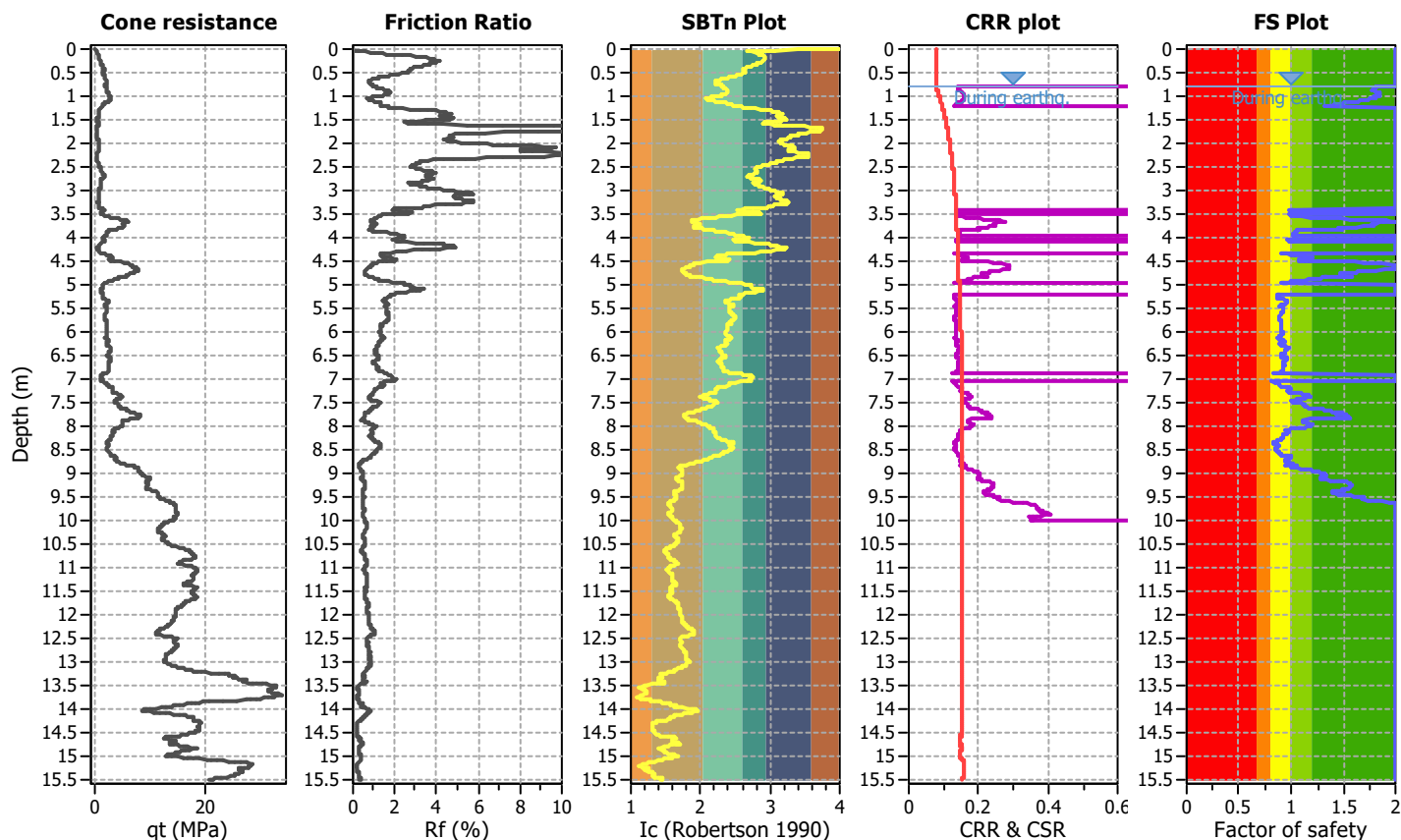
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT\_180292\_13ms**

### Input parameters and analysis data

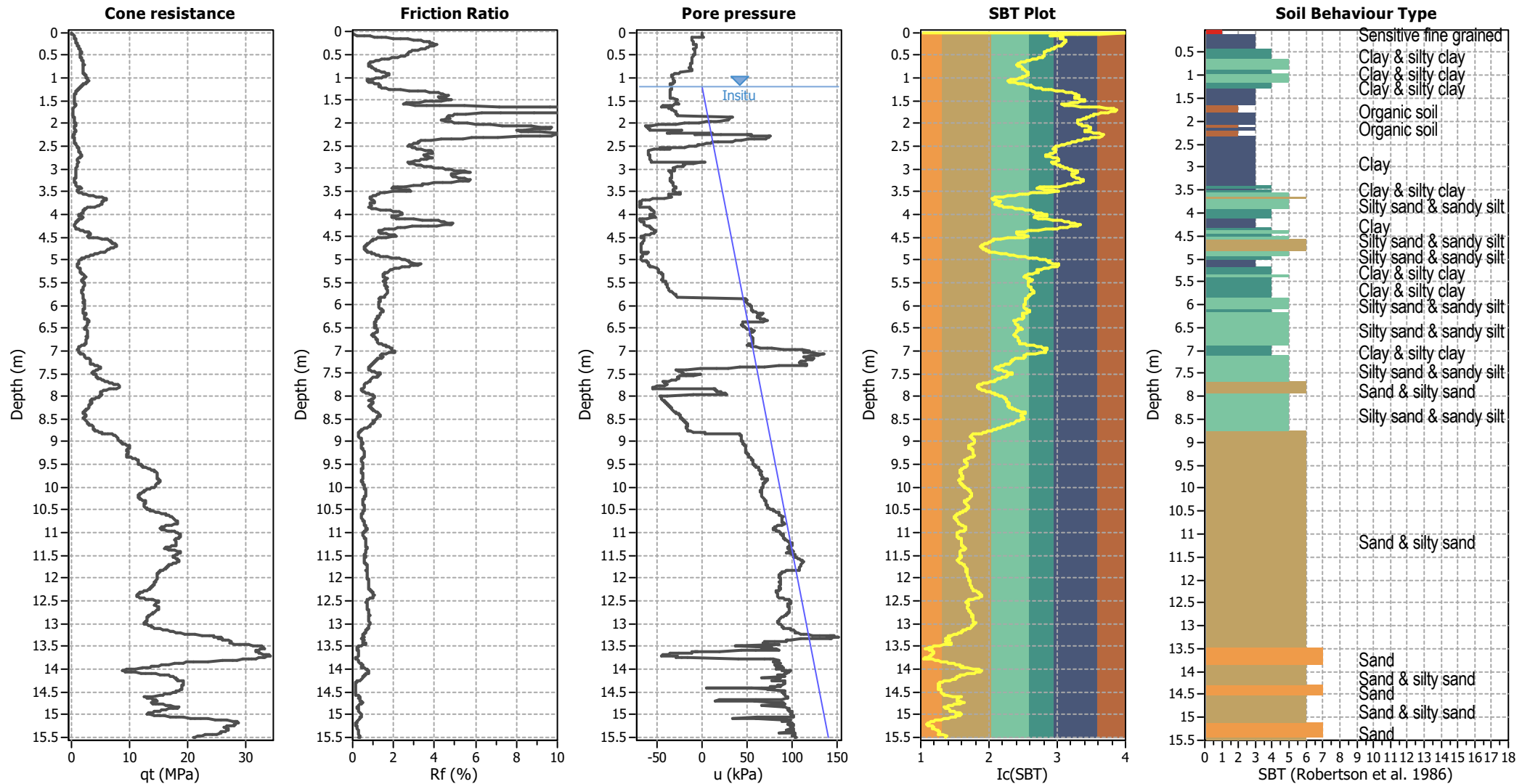
Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	10.00 m
Peak ground acceleration:	0.13	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plots



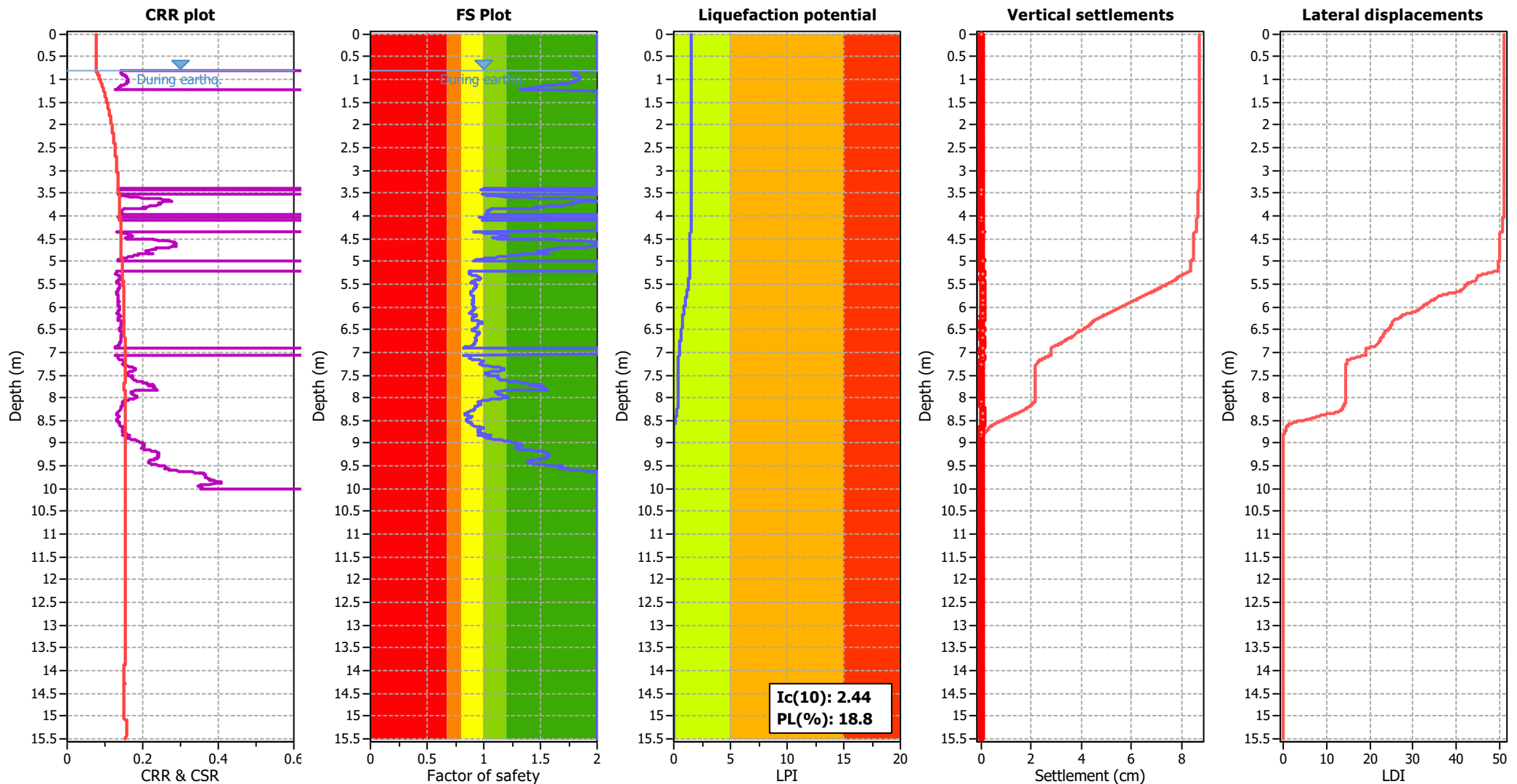
## Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>g</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

## SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

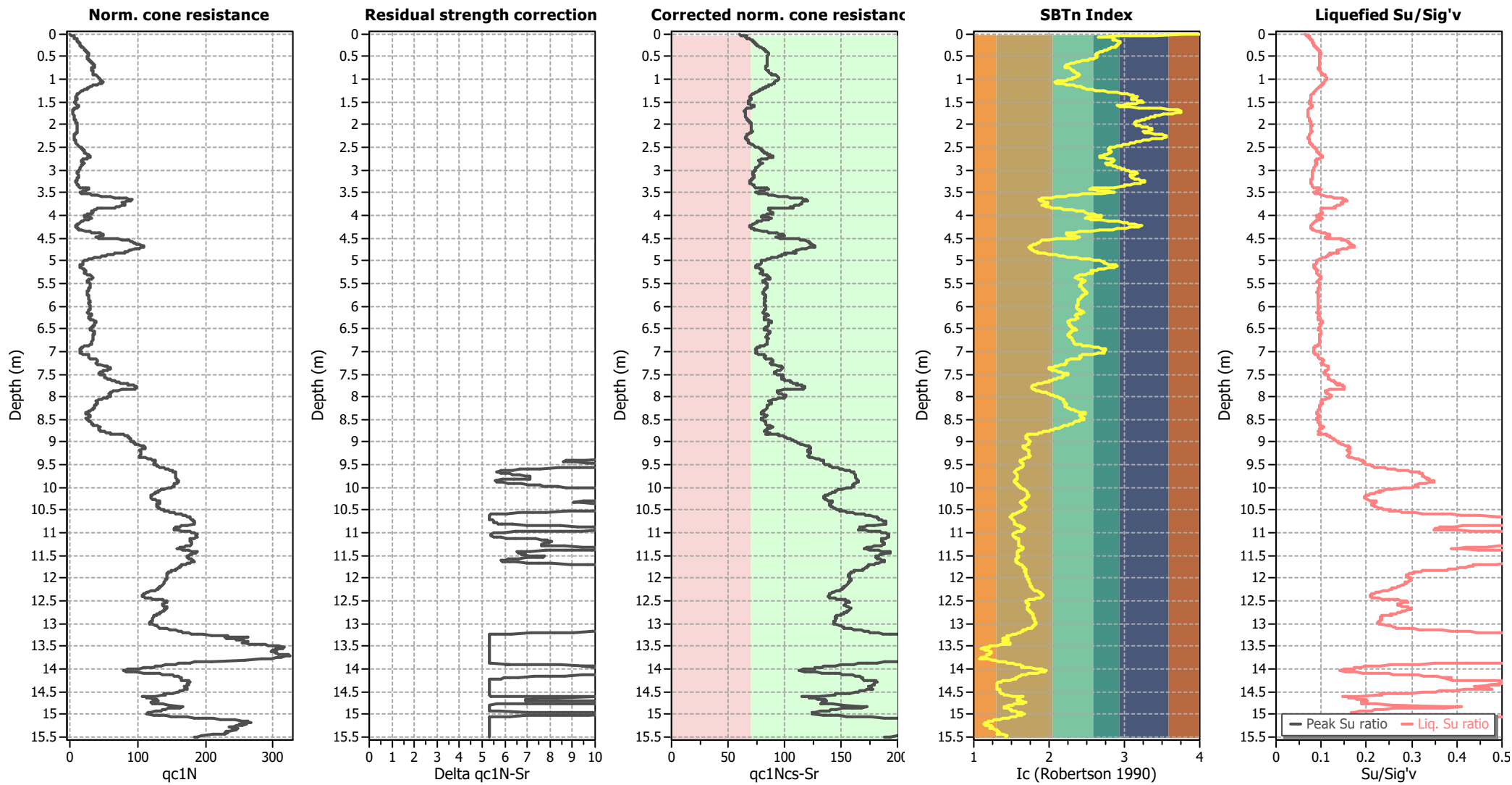
F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

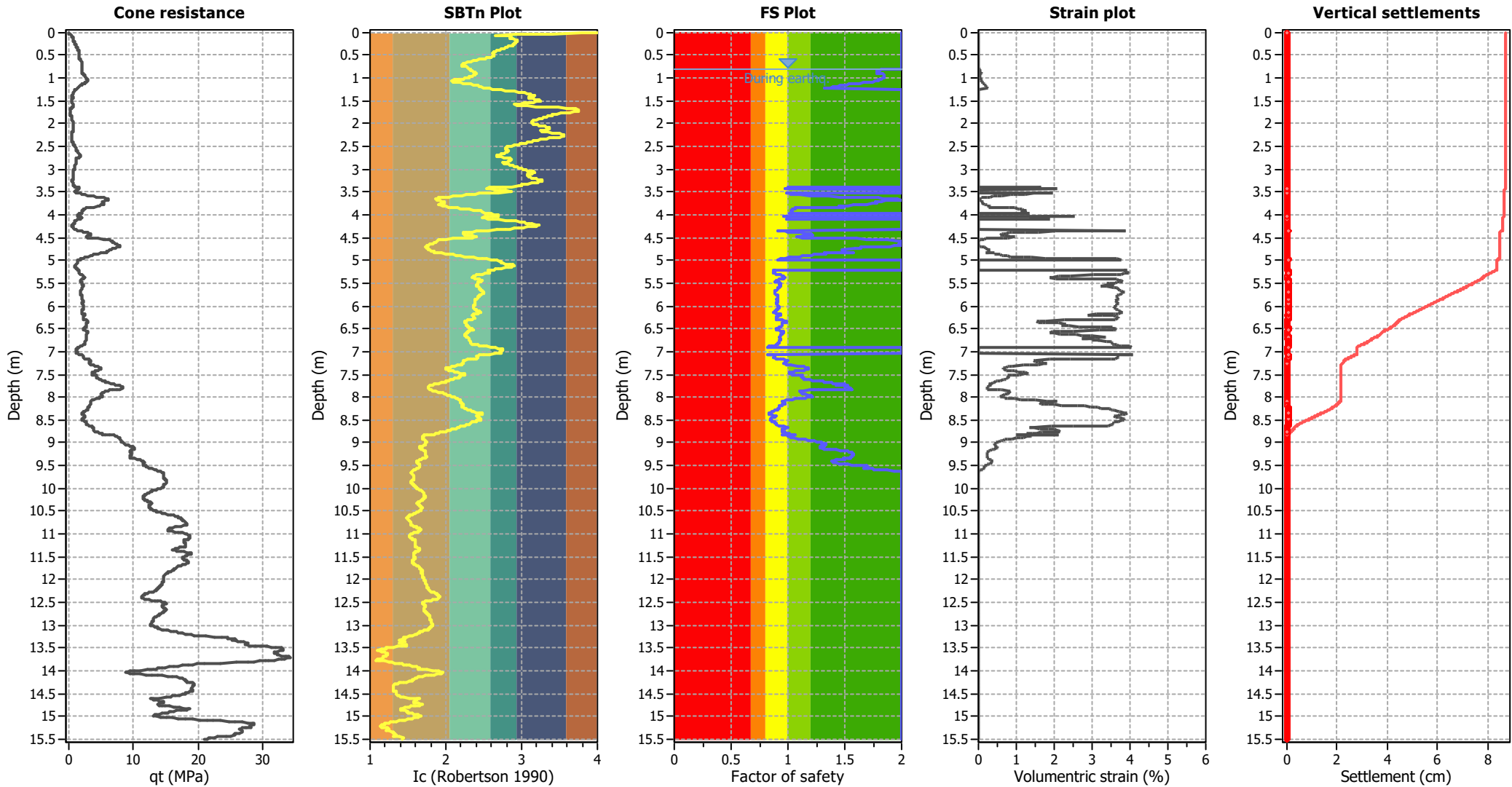
Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

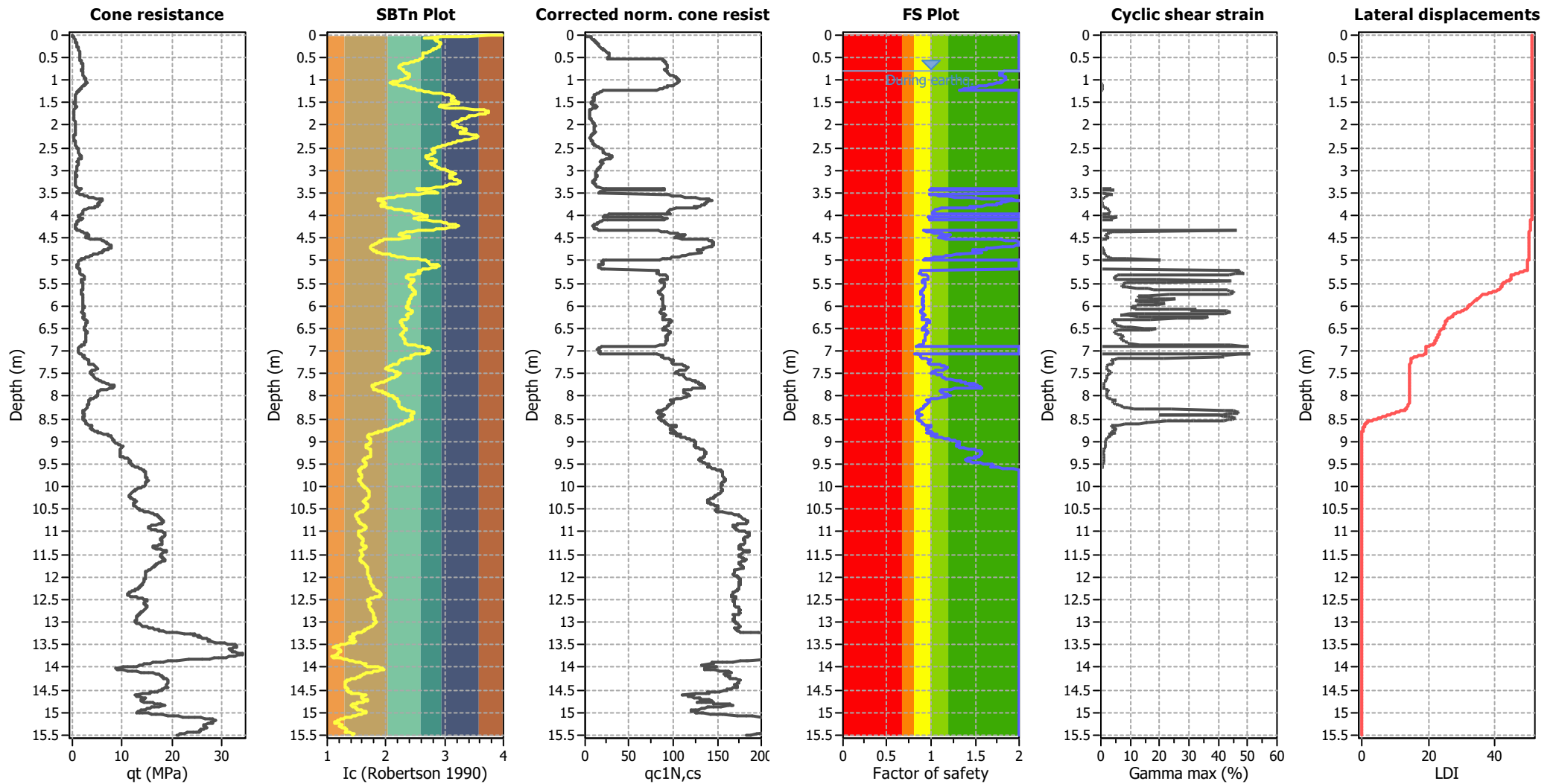
Estimation of post-earthquake settlements



Abbreviations

- q<sub>c</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain

### Estimation of post-earthquake lateral Displacements



#### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $q_{c1N,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

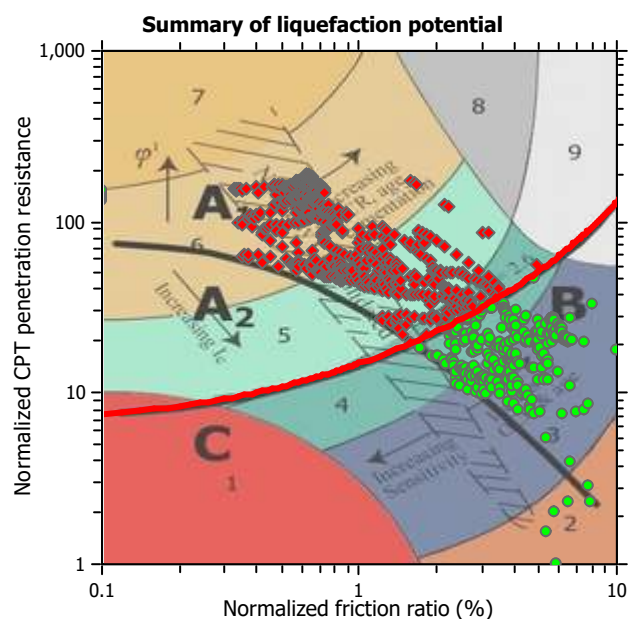
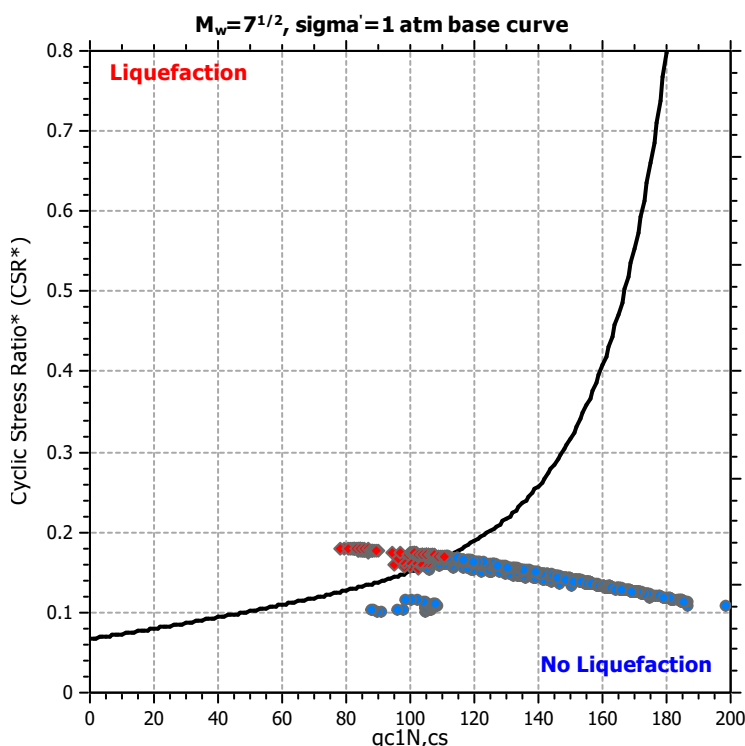
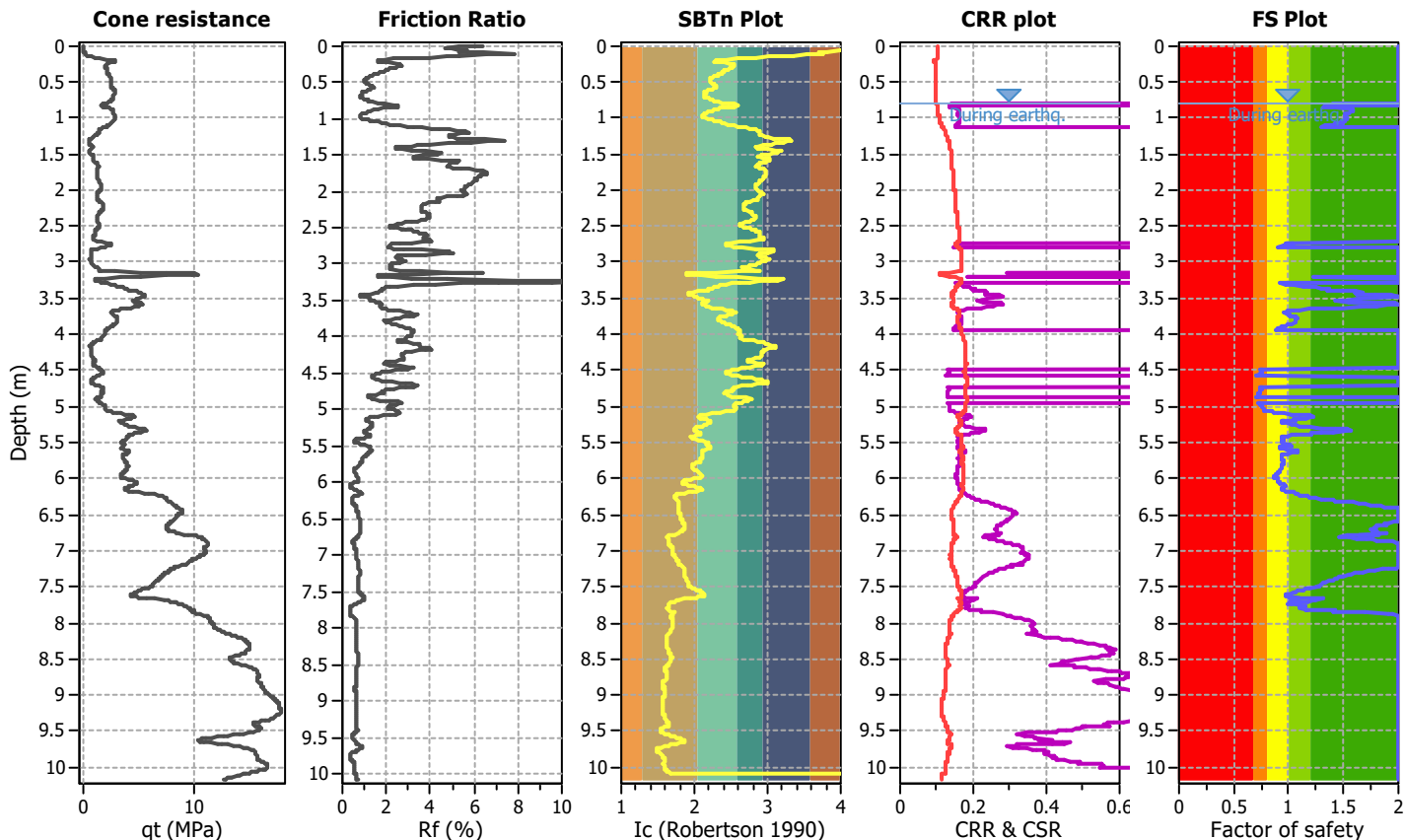
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT99751\_On boundary**

### Input parameters and analysis data

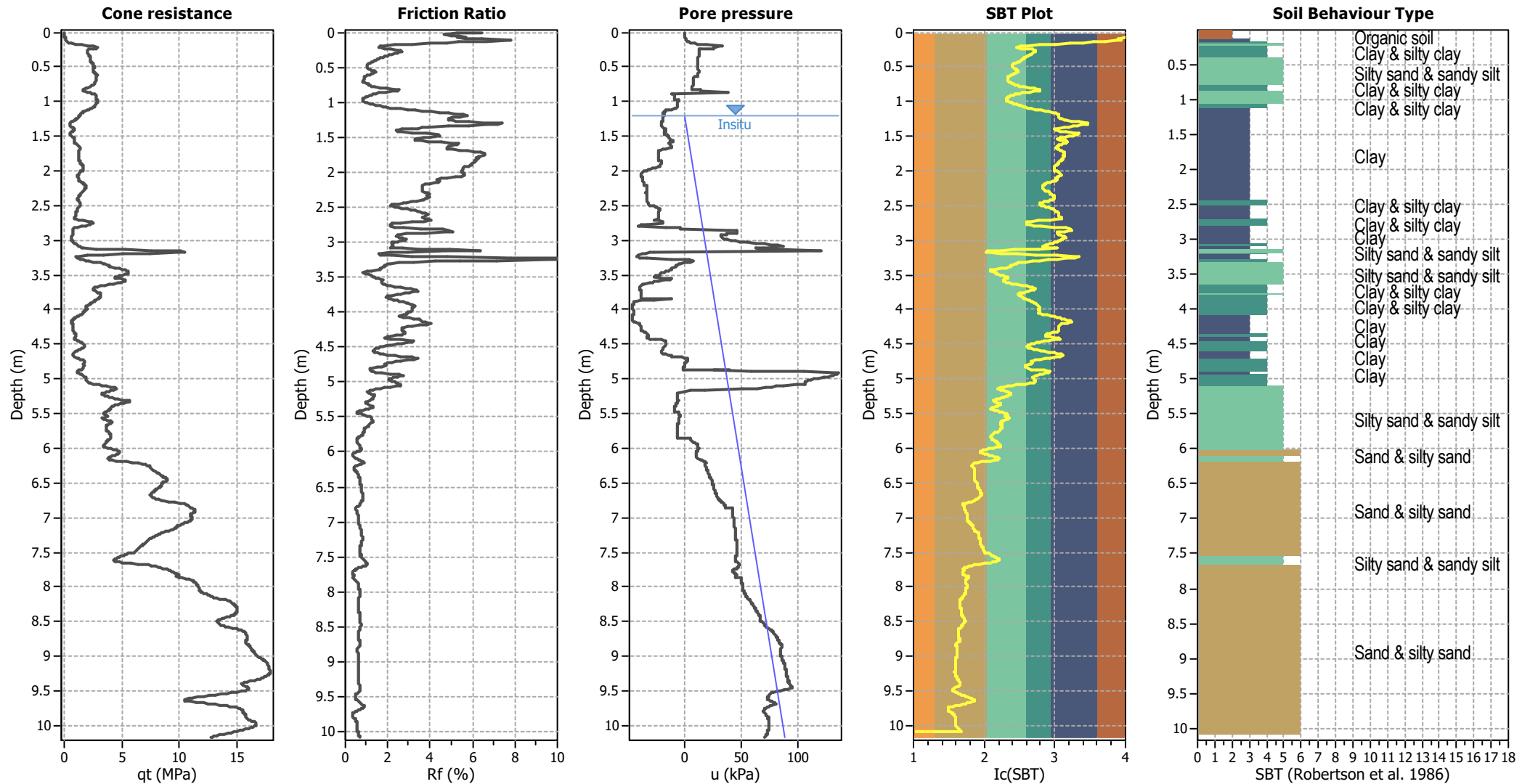
Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	10.00 m
Peak ground acceleration:	0.19	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plots



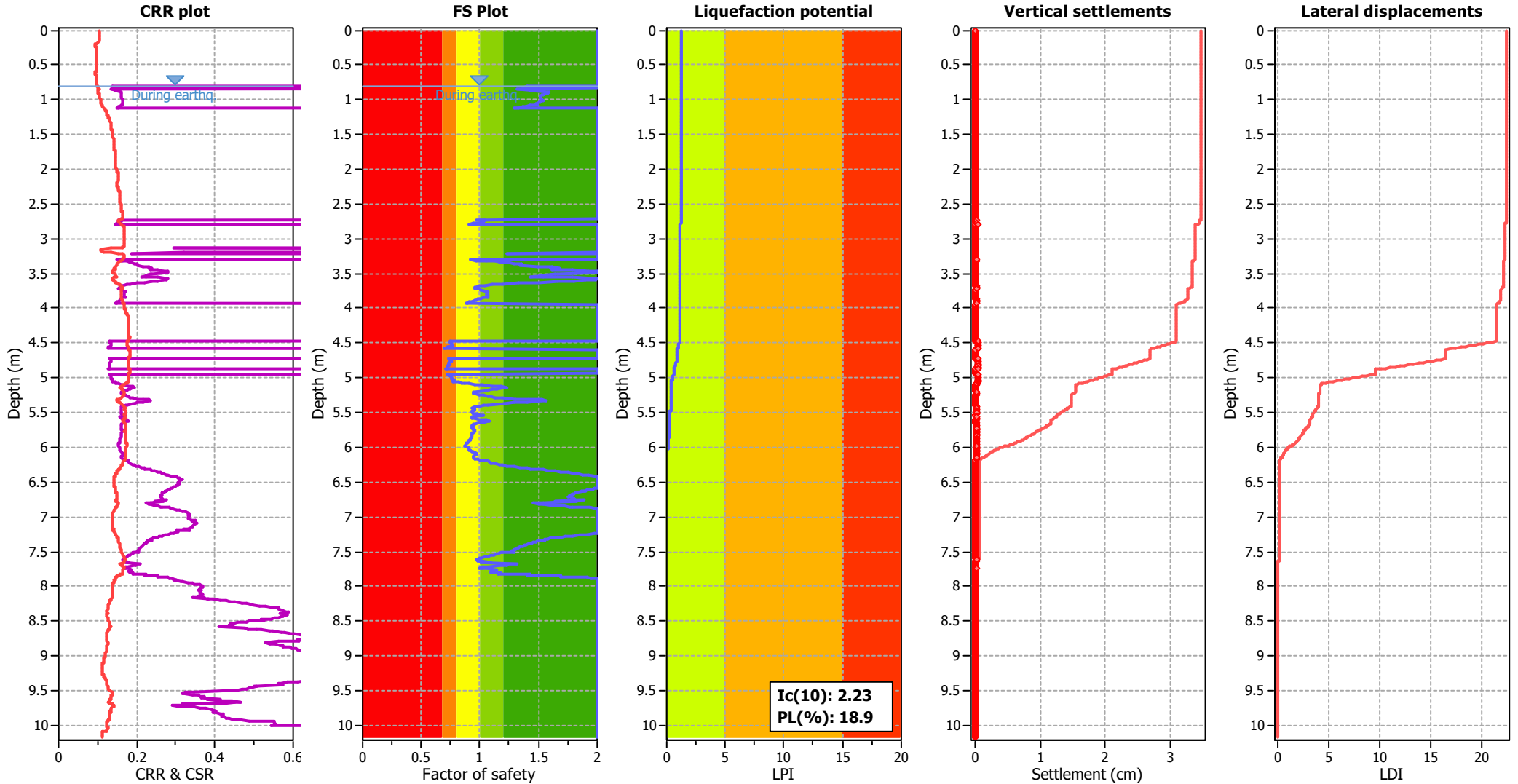
## Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

## SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

F.S. color scheme

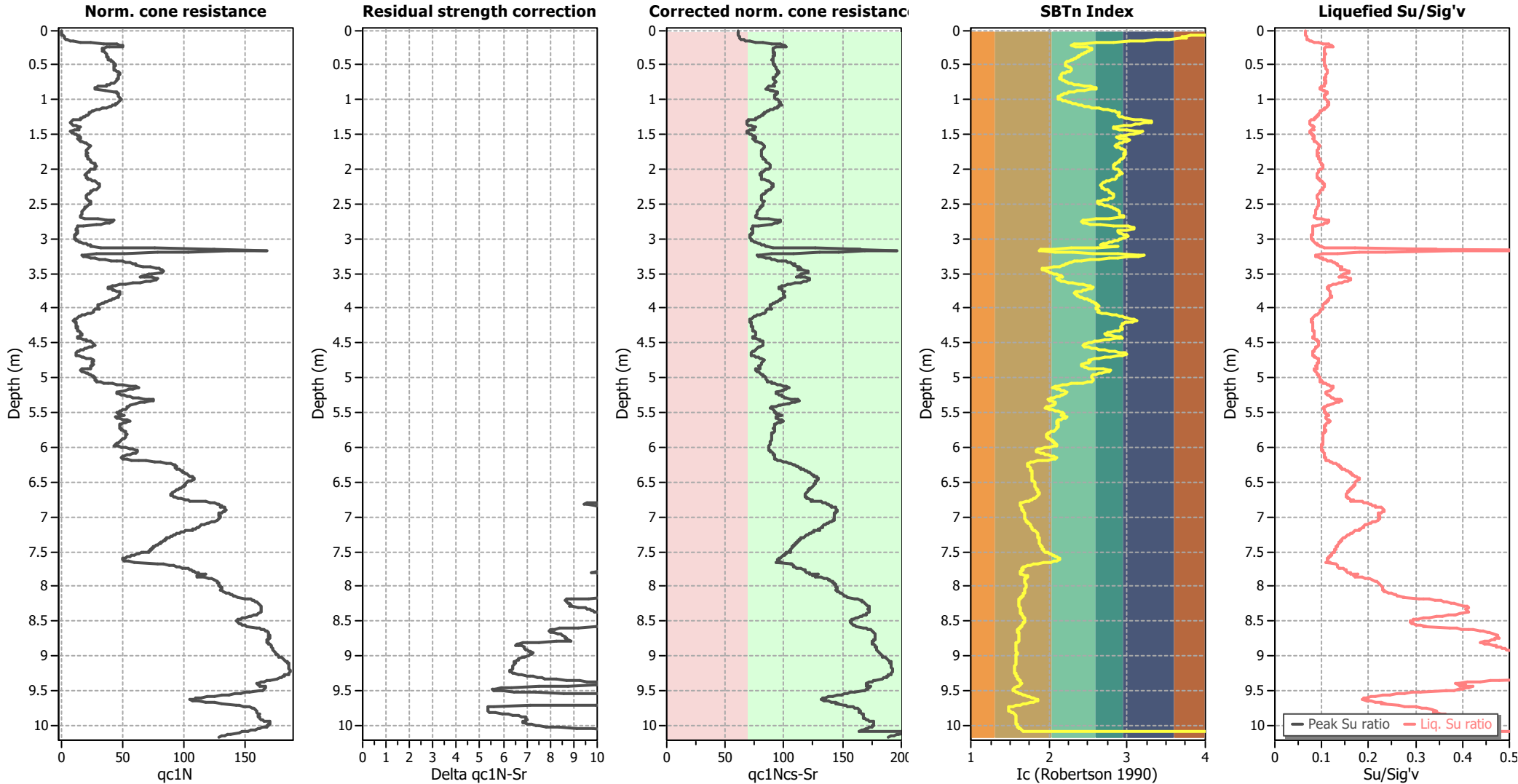
Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk



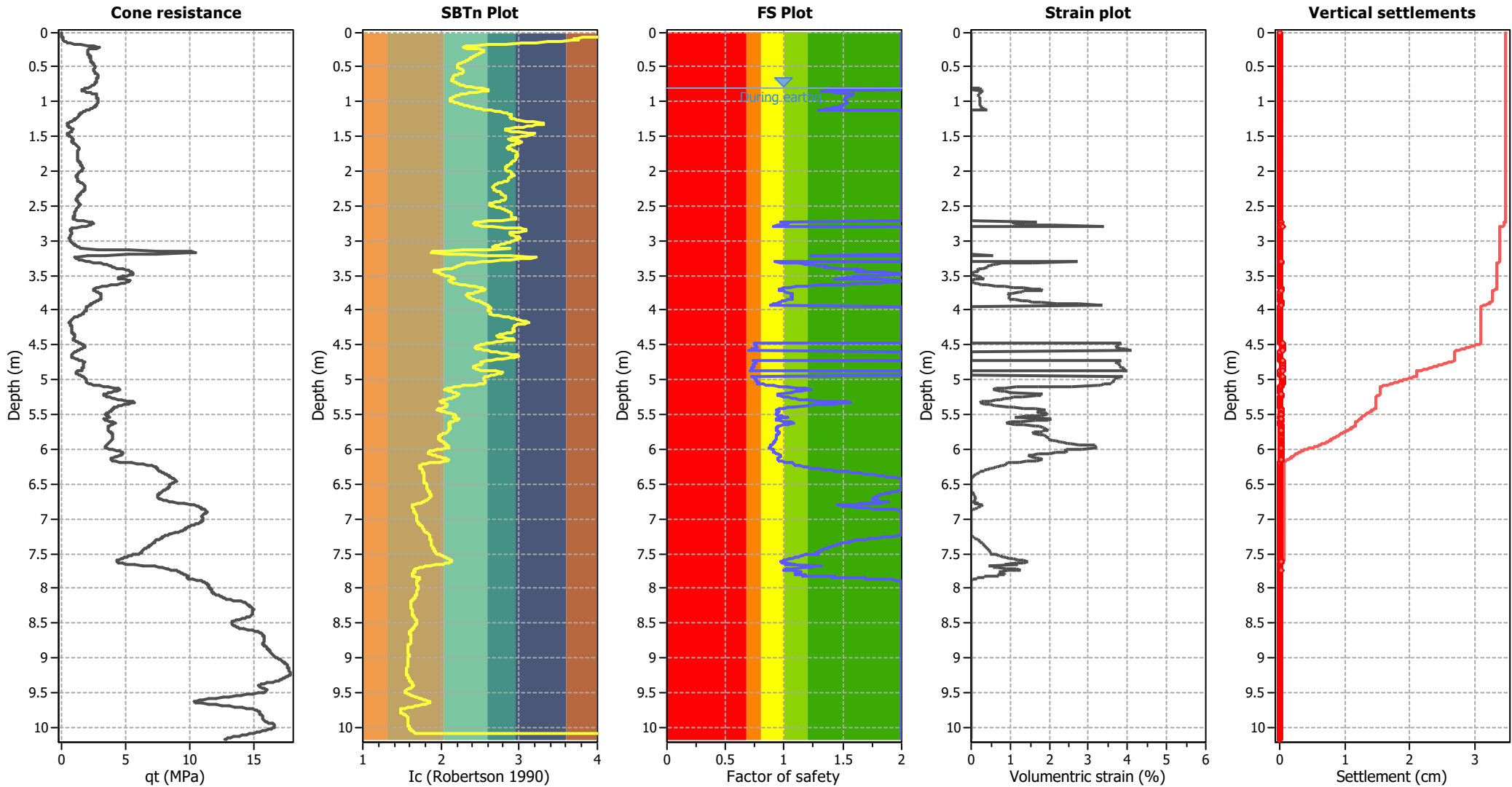
Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

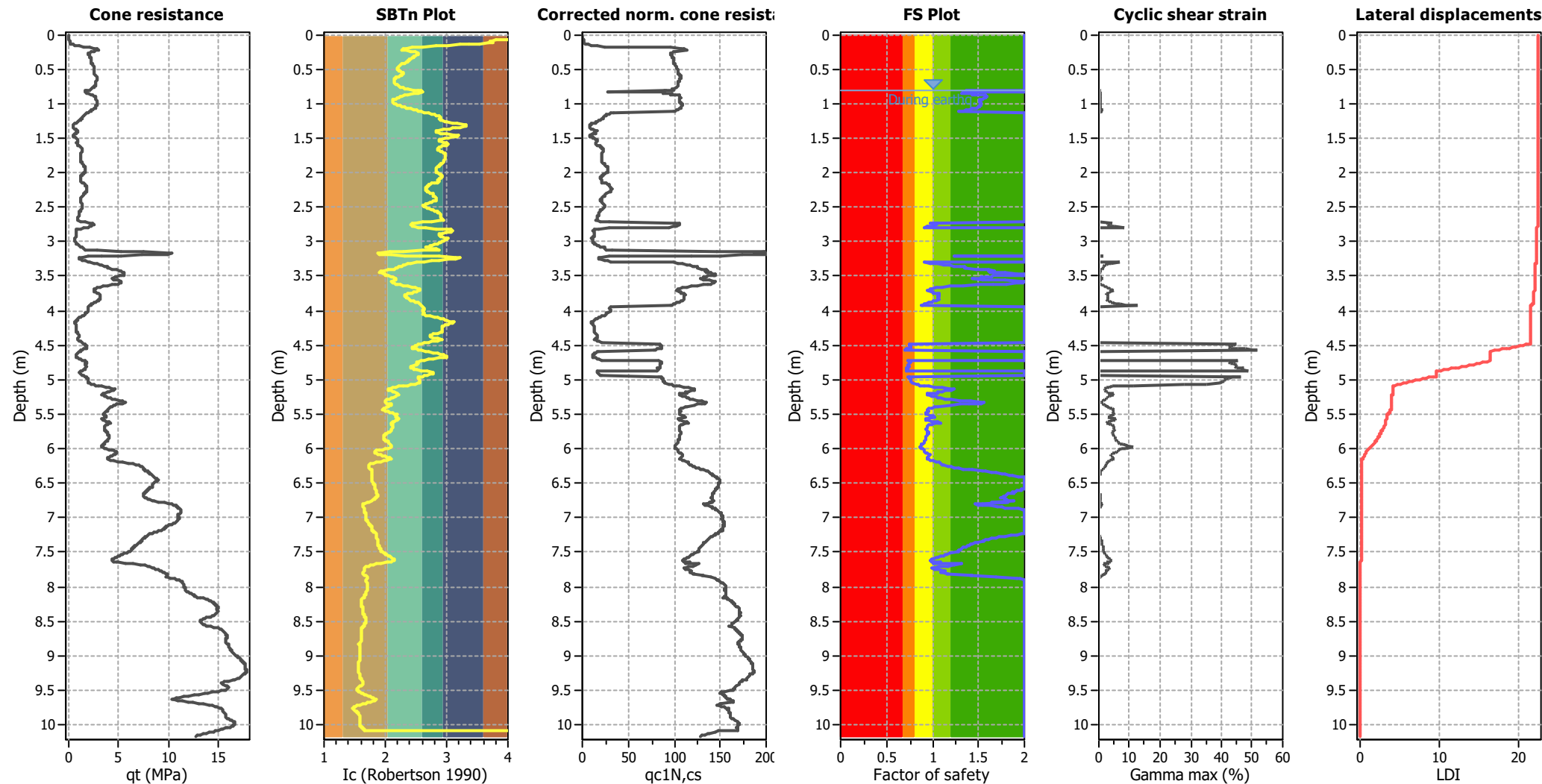
Estimation of post-earthquake settlements



Abbreviations

- q<sub>c</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain

Estimation of post-earthquake lateral Displacements



Abbreviations

qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
Ic: Soil Behaviour Type Index  
qc1N,cs: Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

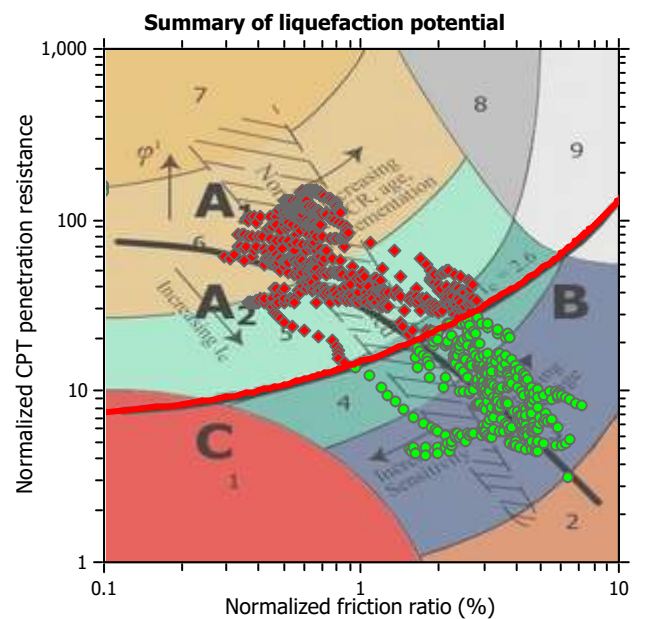
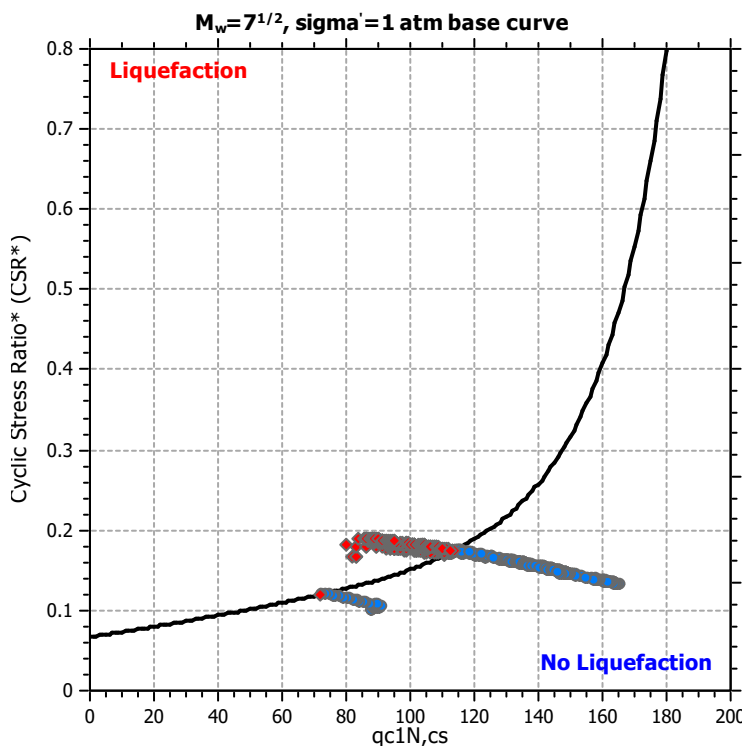
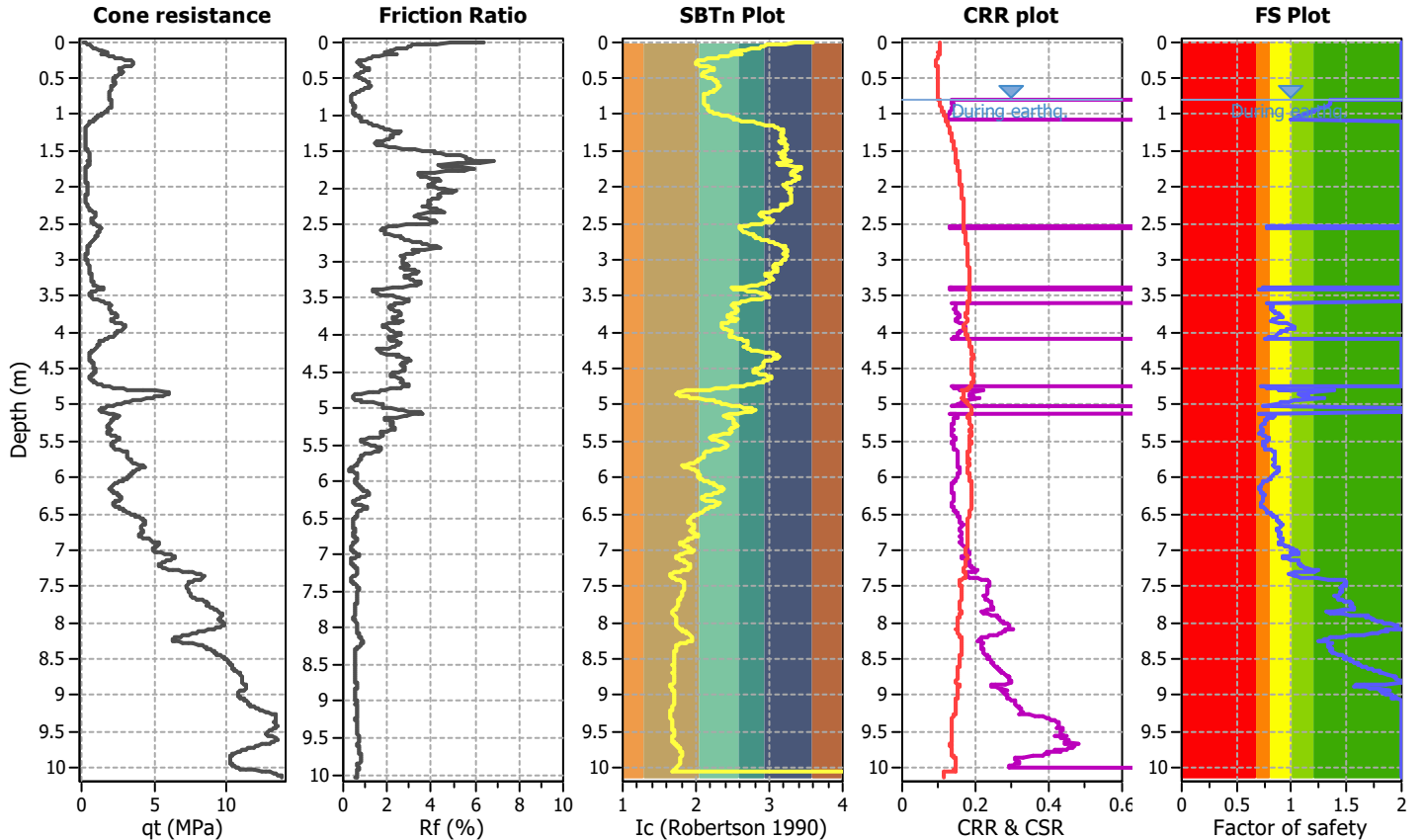
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT99752\_12.5 m N**

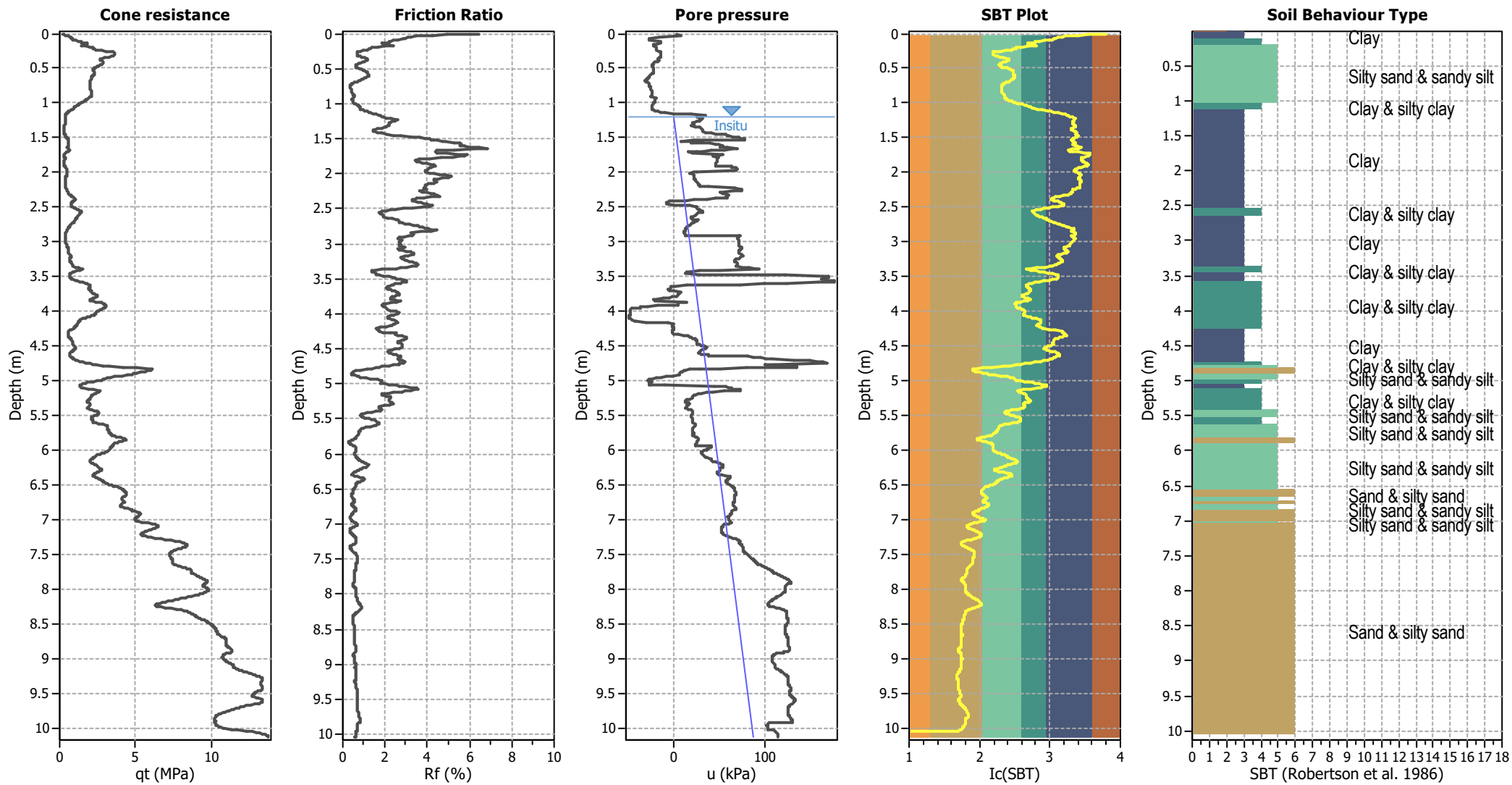
### Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	10.00 m
Peak ground acceleration:	0.19	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots

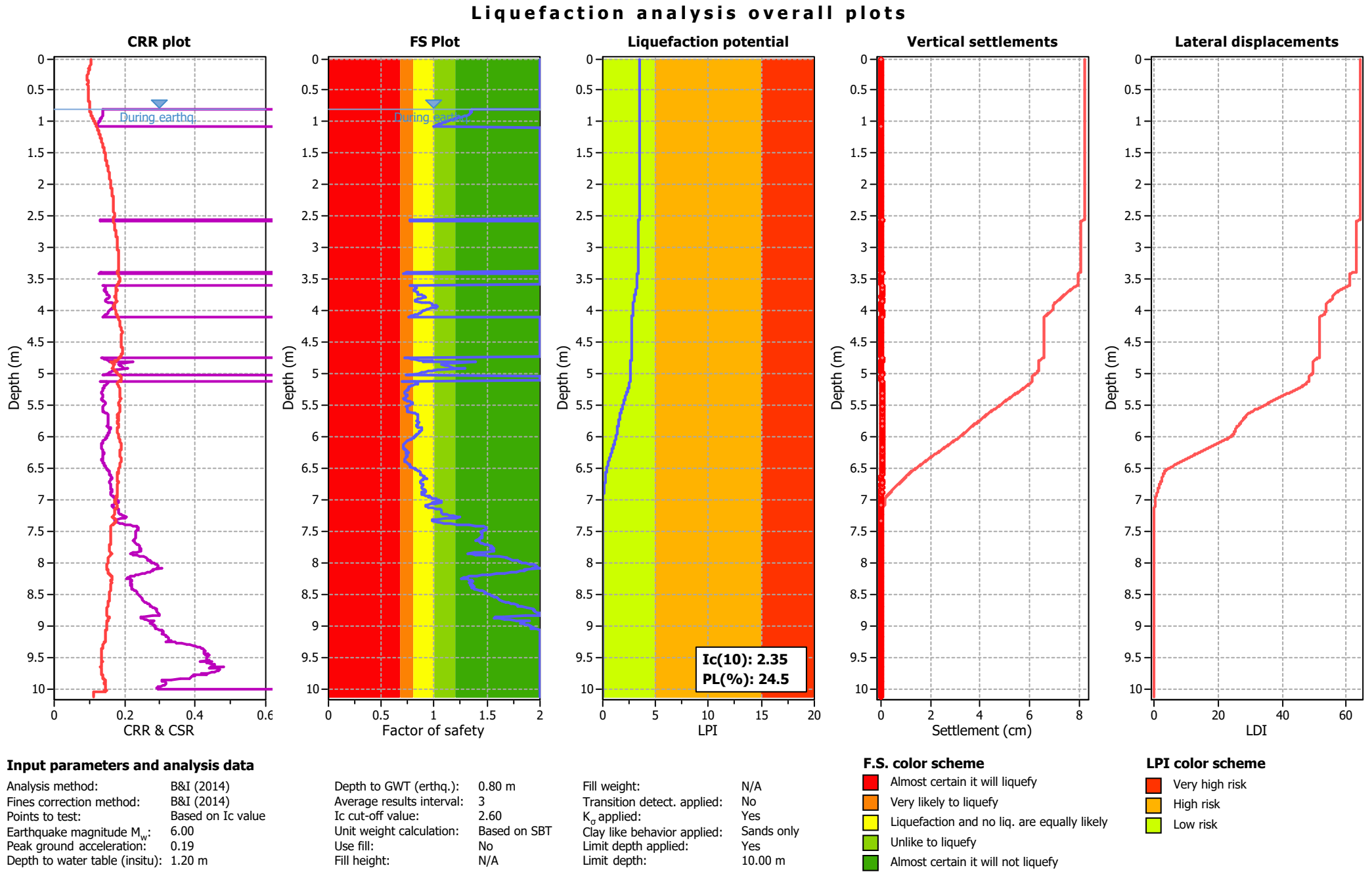


Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

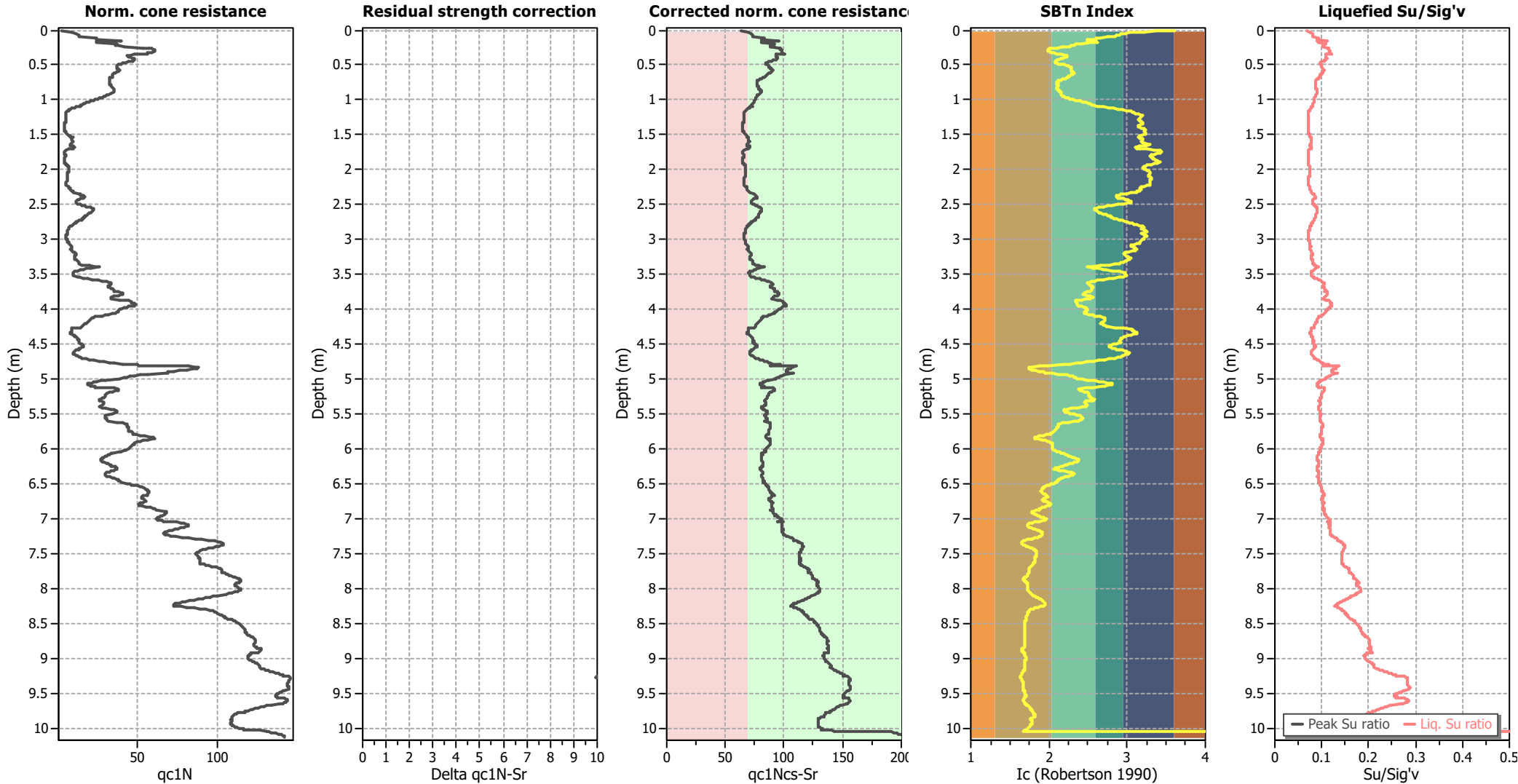
SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained



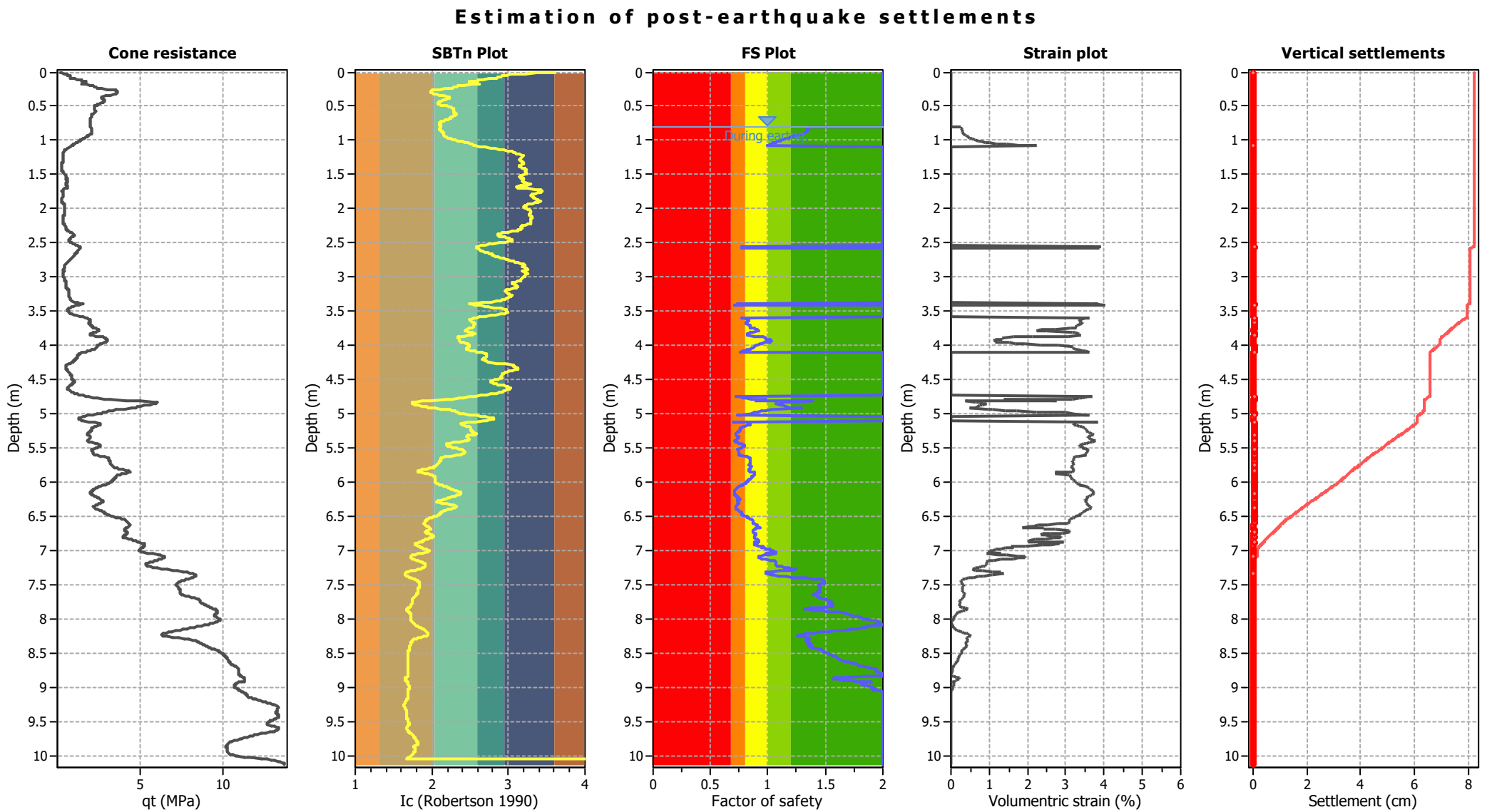


Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_o$ applied:	Yes
Earthquake magnitude $M_w$ :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

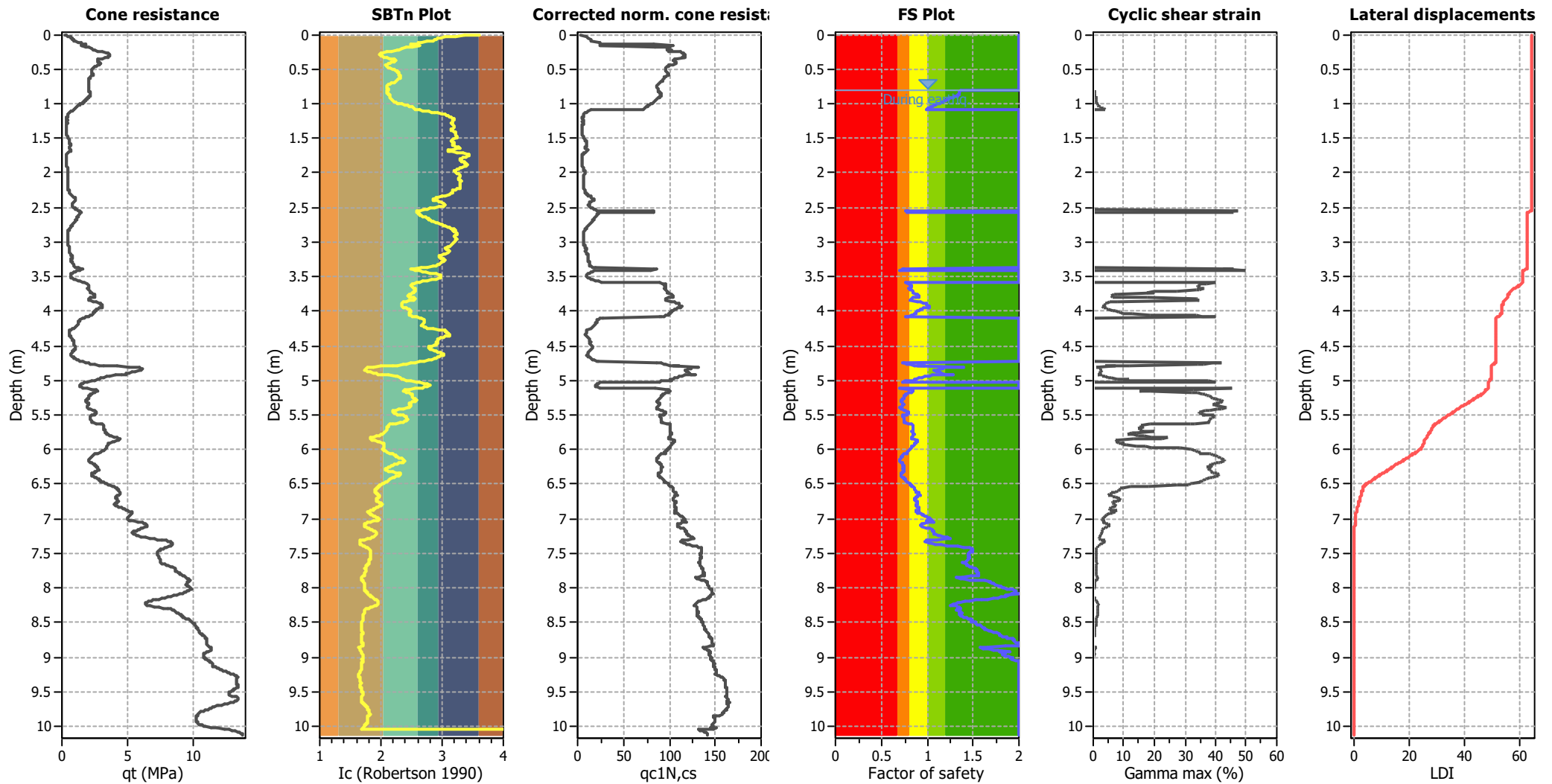


Abbreviations

- q<sub>t</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain



## Estimation of post-earthquake lateral Displacements



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $q_{c1N,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

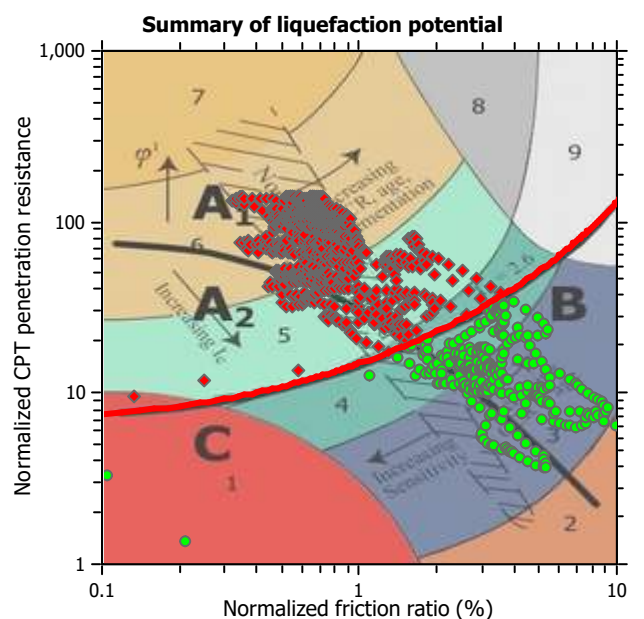
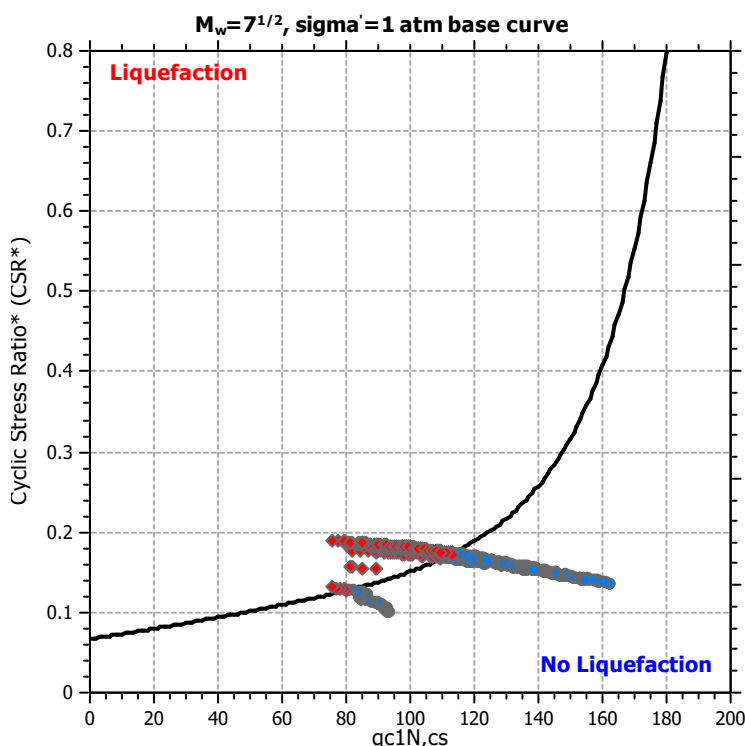
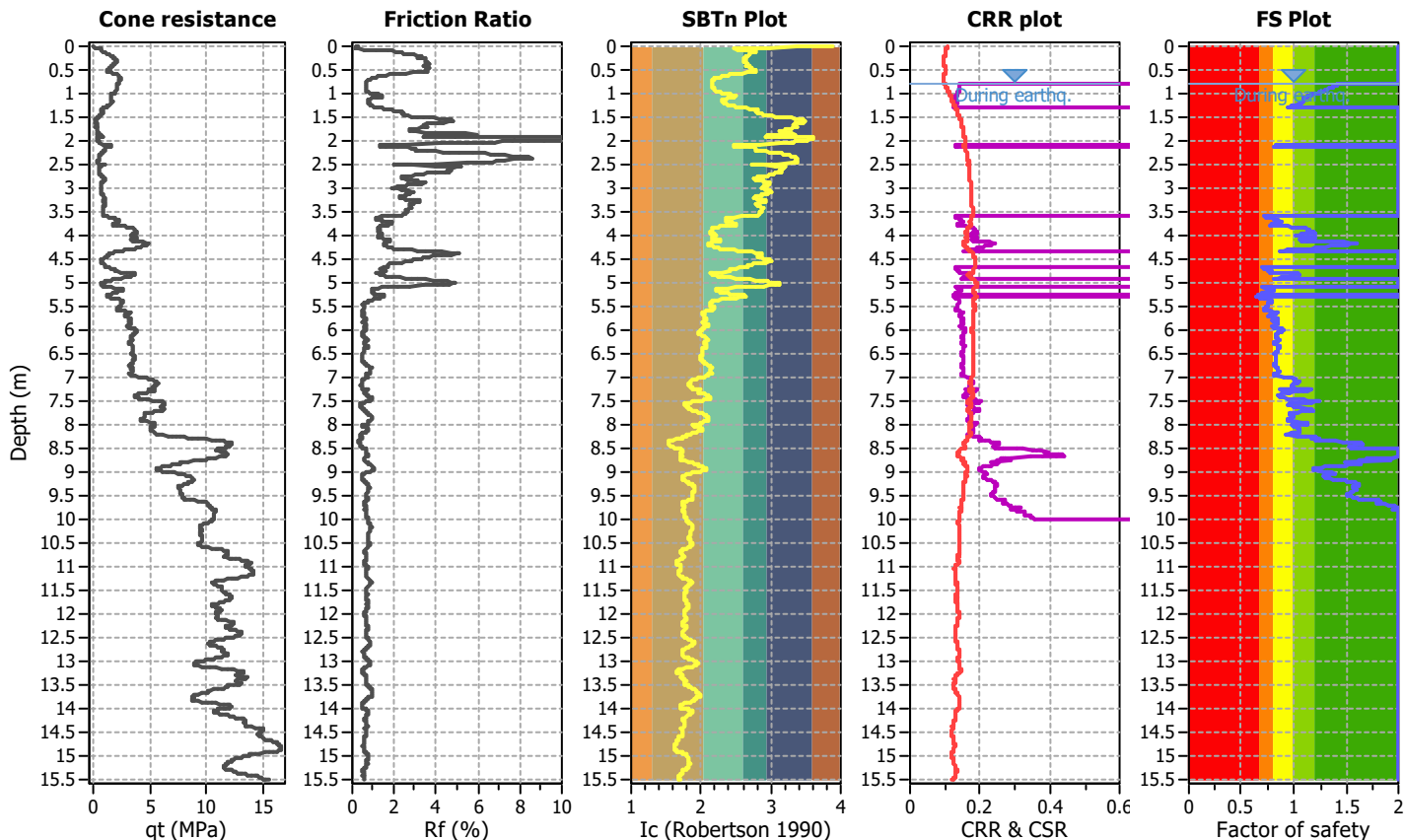
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT\_180290\_13.3mS**

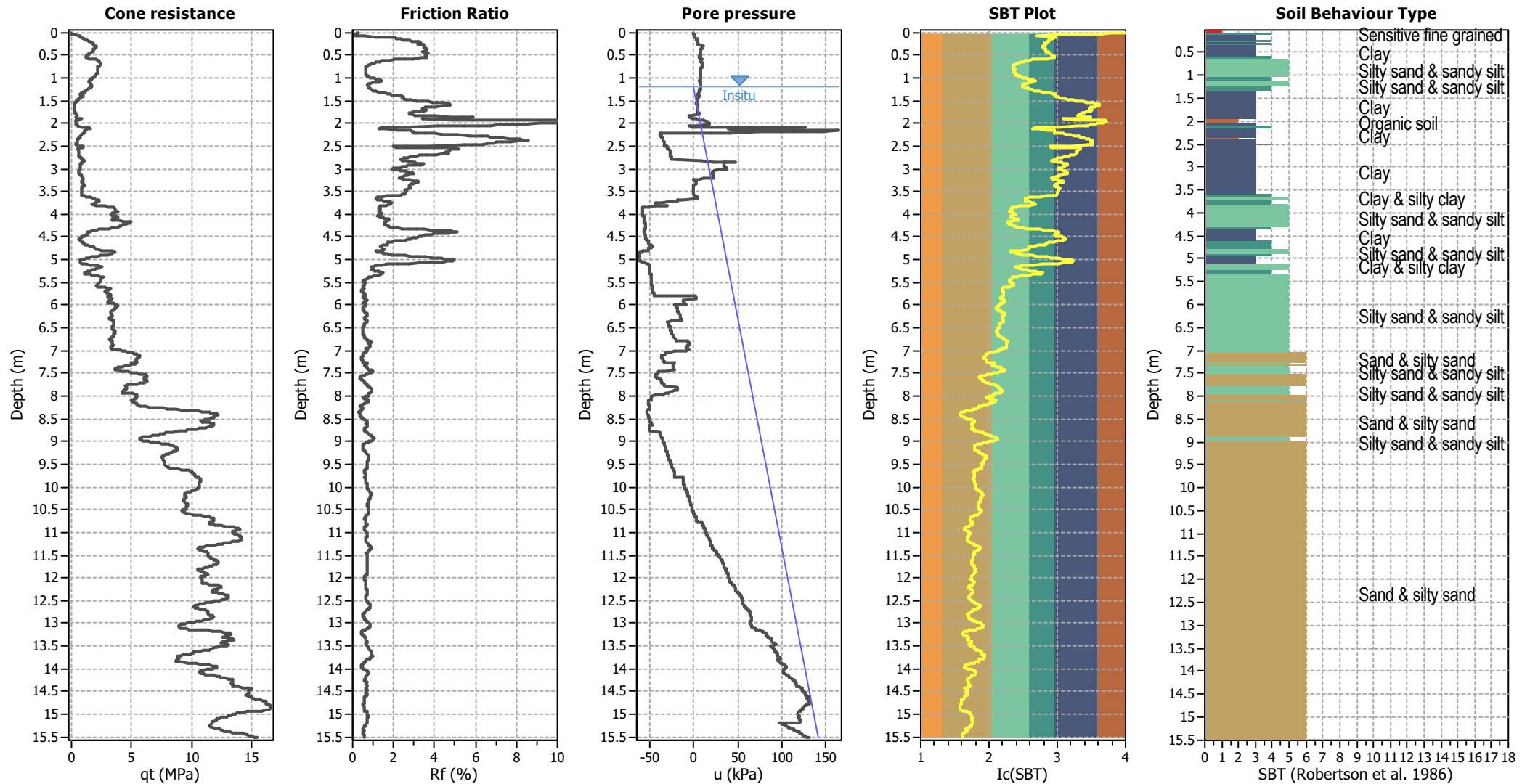
### Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	10.00 m
Peak ground acceleration:	0.19	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plots



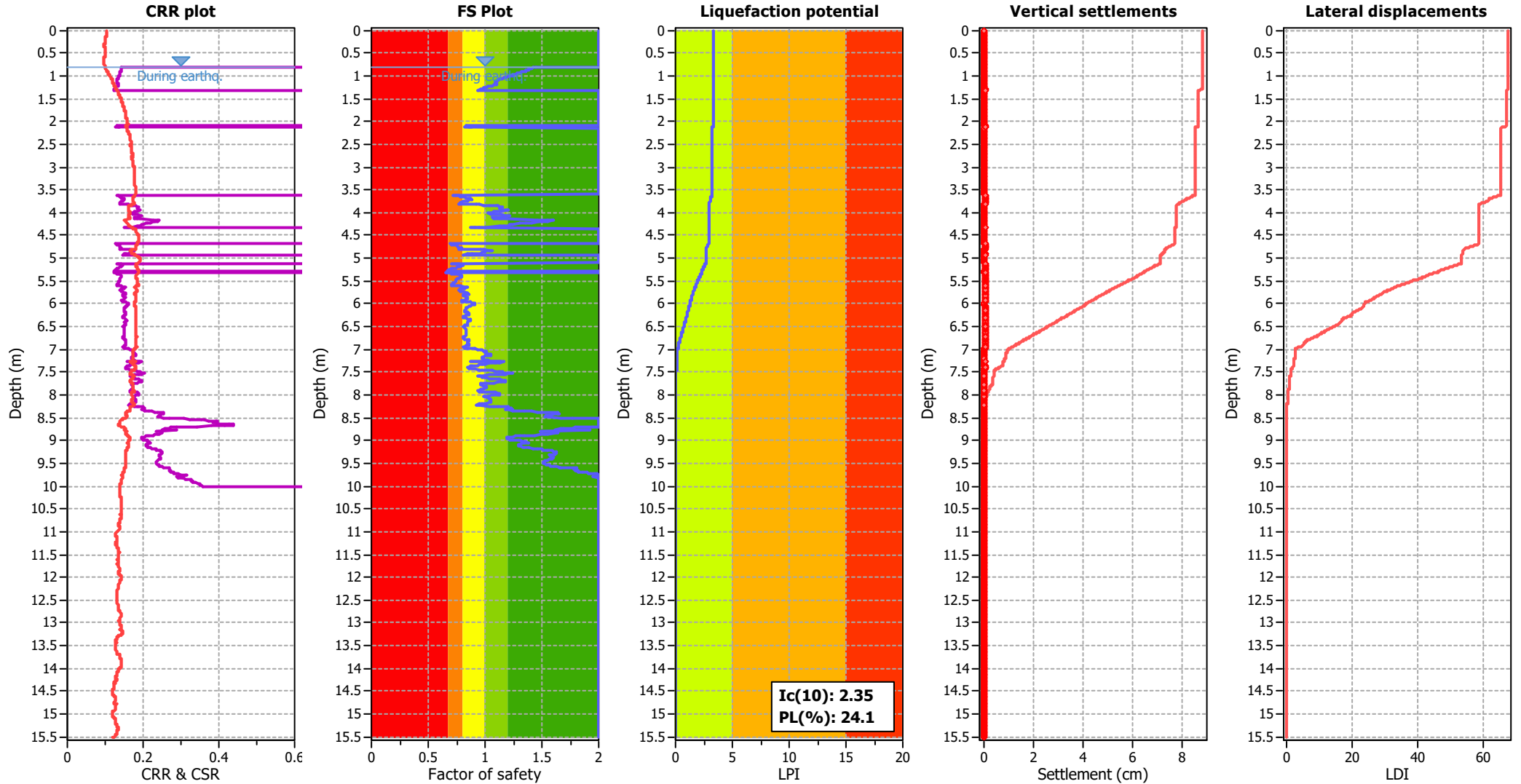
## Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

## SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

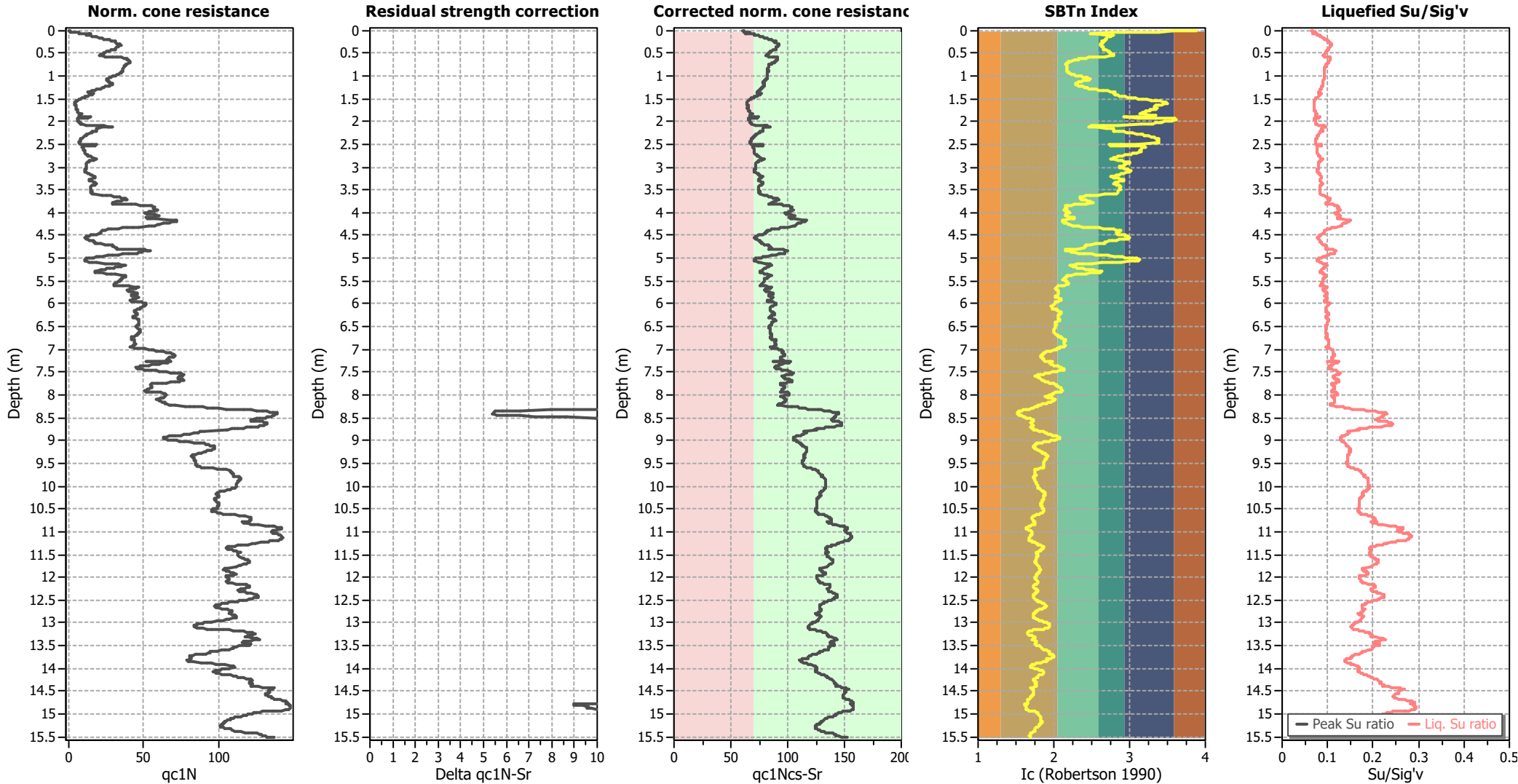
F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

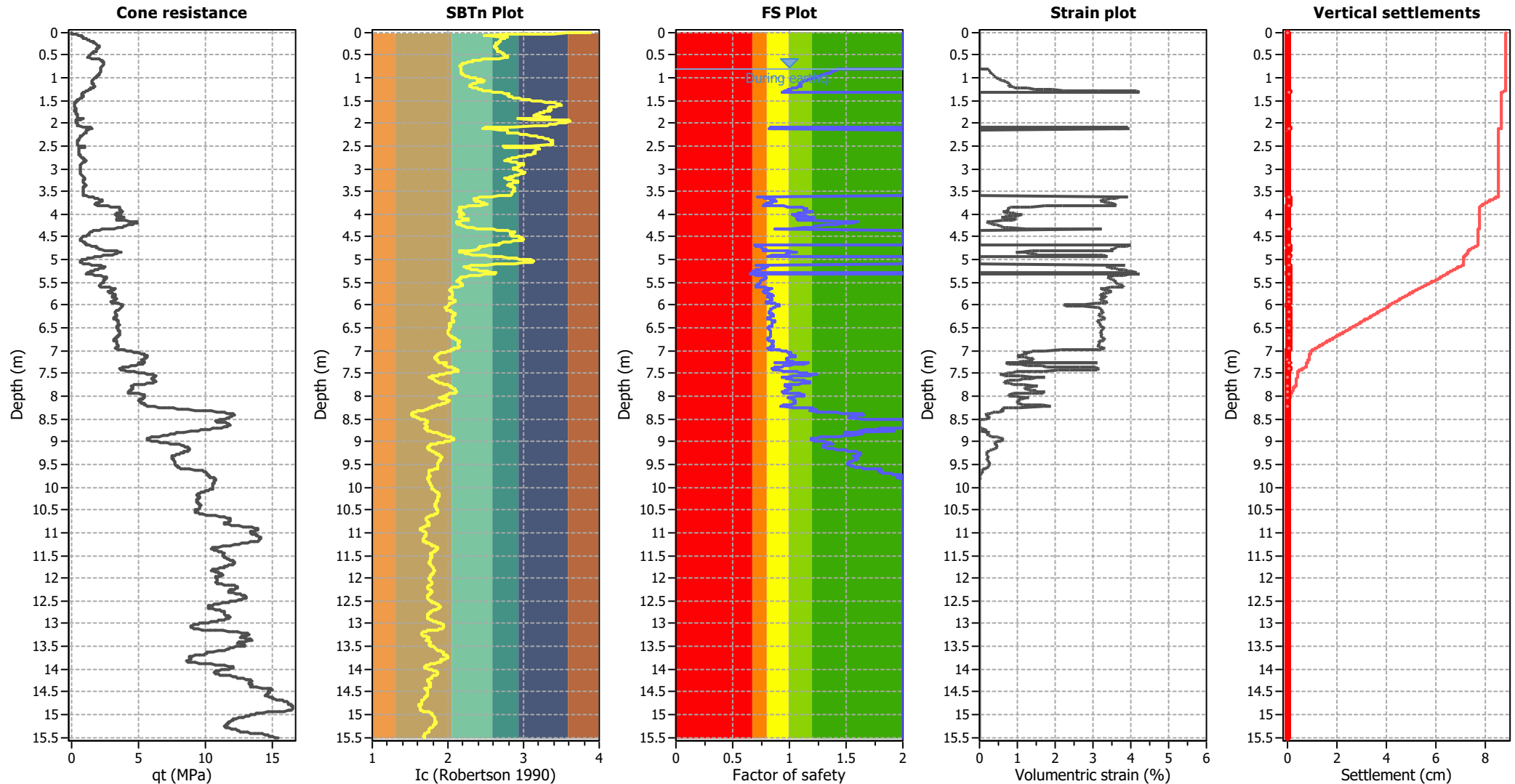
Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

## Estimation of post-earthquake settlements

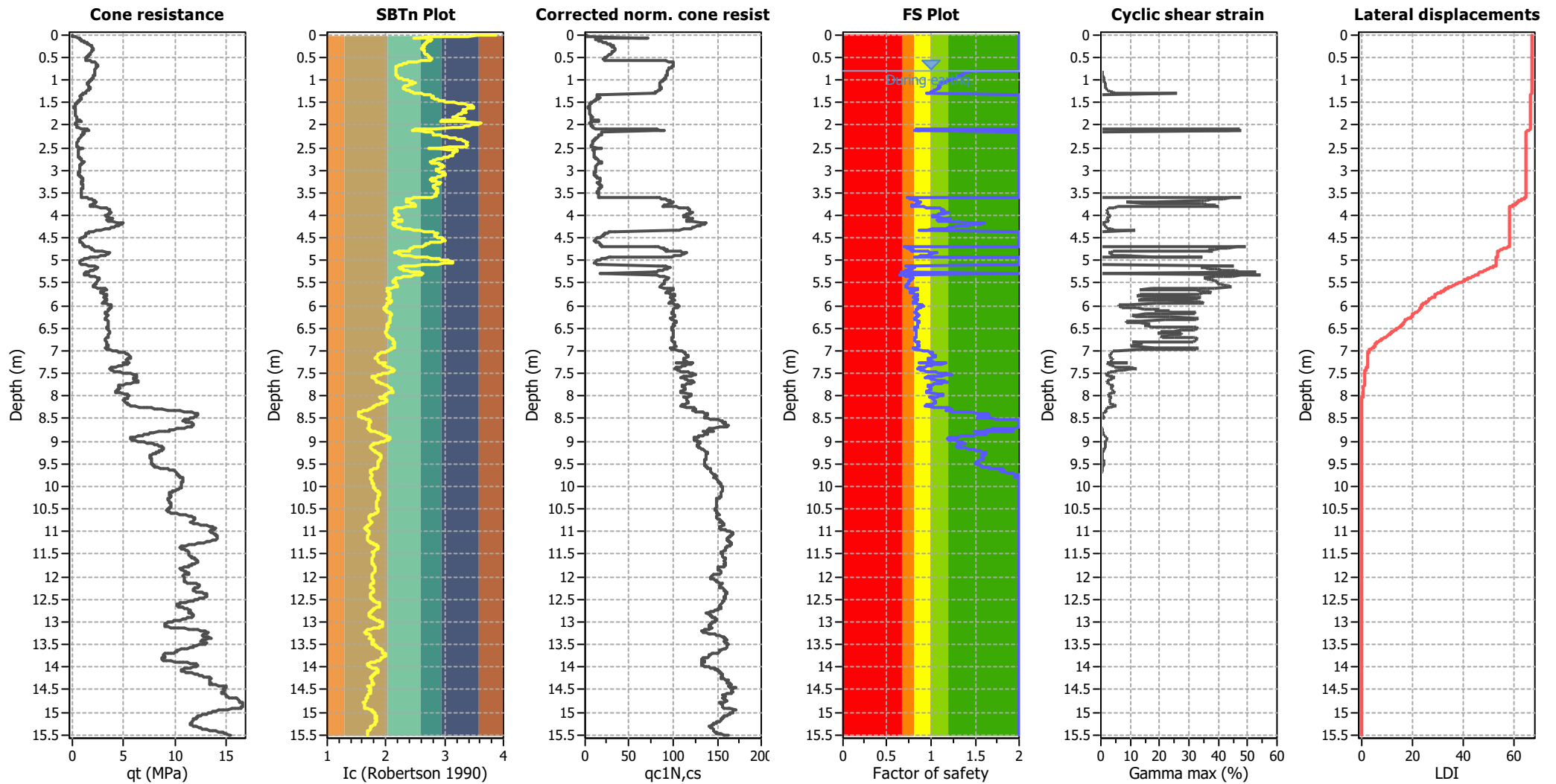


### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 FS: Calculated Factor of Safety against liquefaction  
 Volumetric strain: Post-liquefaction volumetric strain



## Estimation of post-earthquake lateral Displacements



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $qc_{1N,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

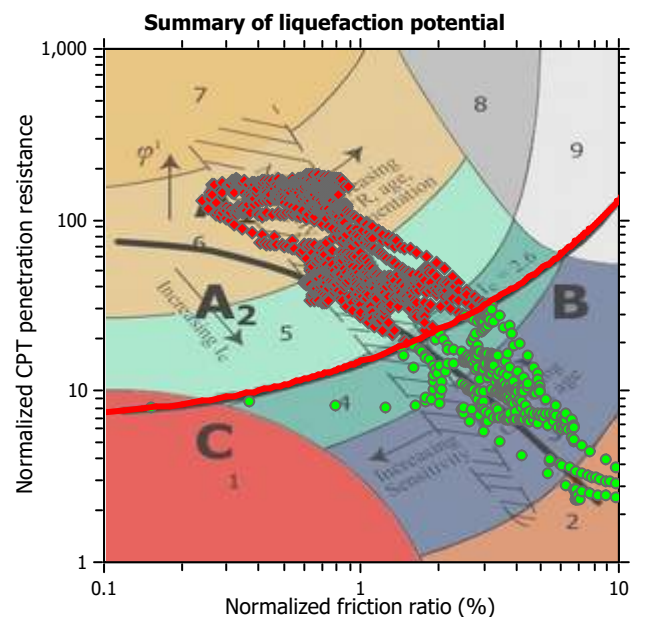
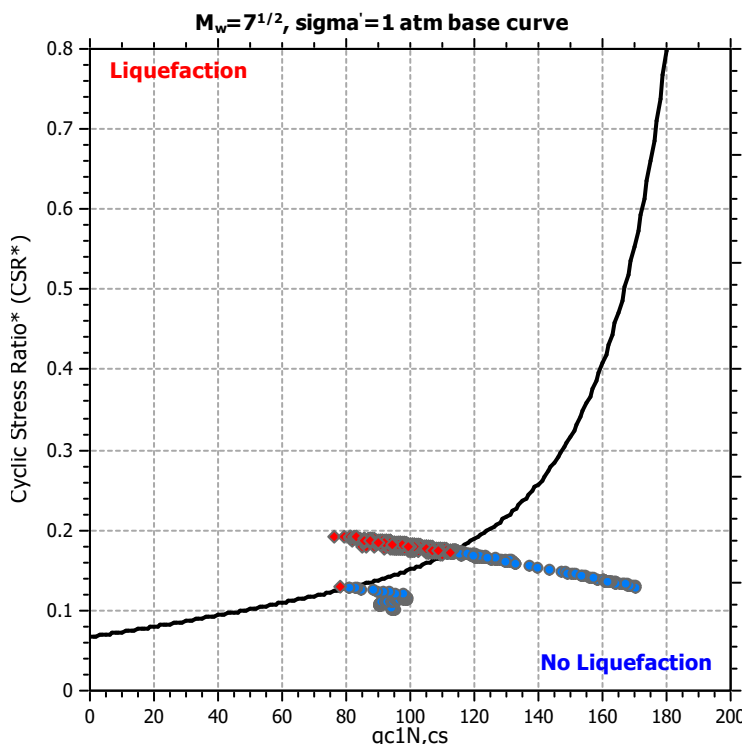
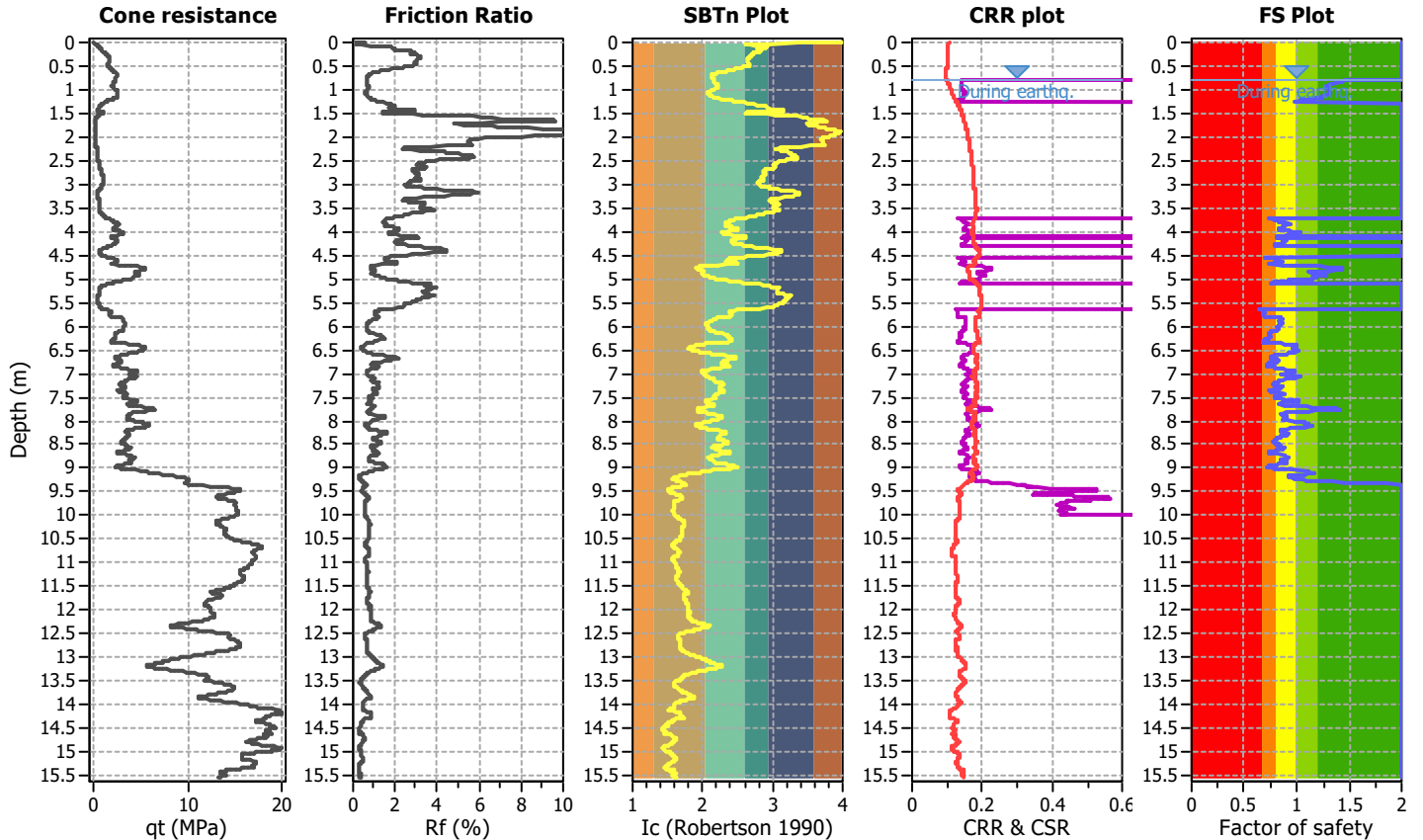
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT\_180291\_15mS**

### Input parameters and analysis data

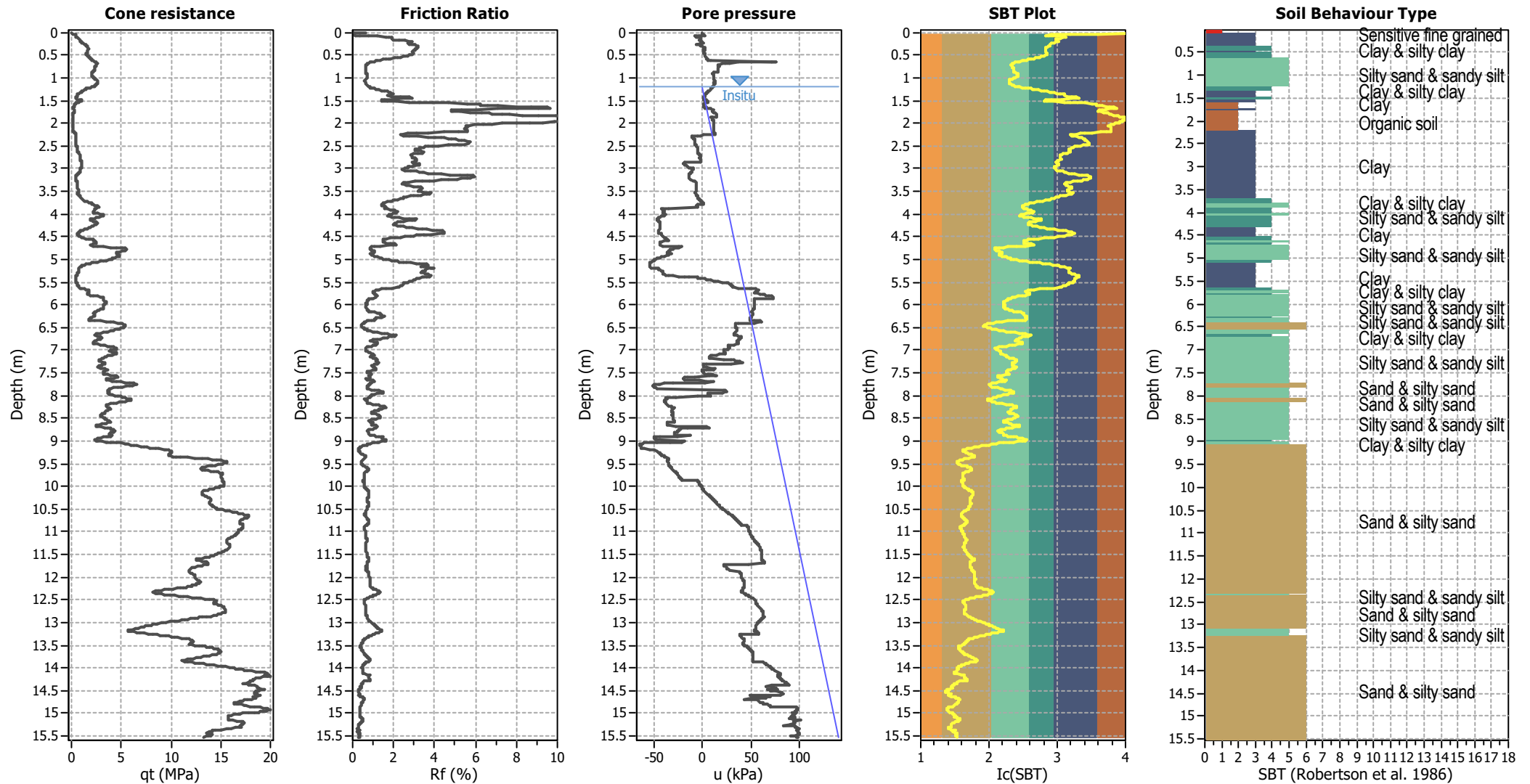
Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	10.00 m
Peak ground acceleration:	0.19	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plots



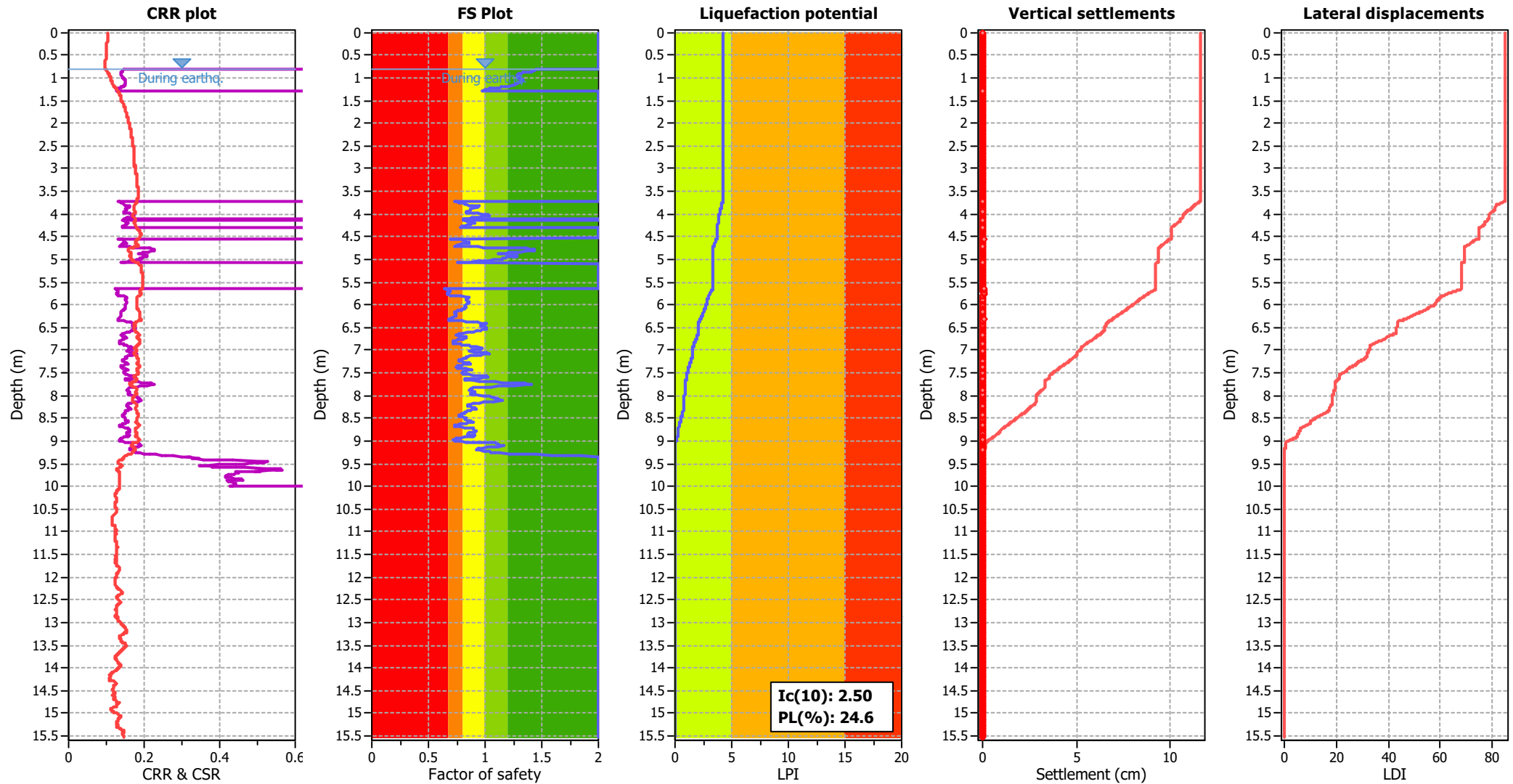
## Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

## SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

## Liquefaction analysis overall plots



### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

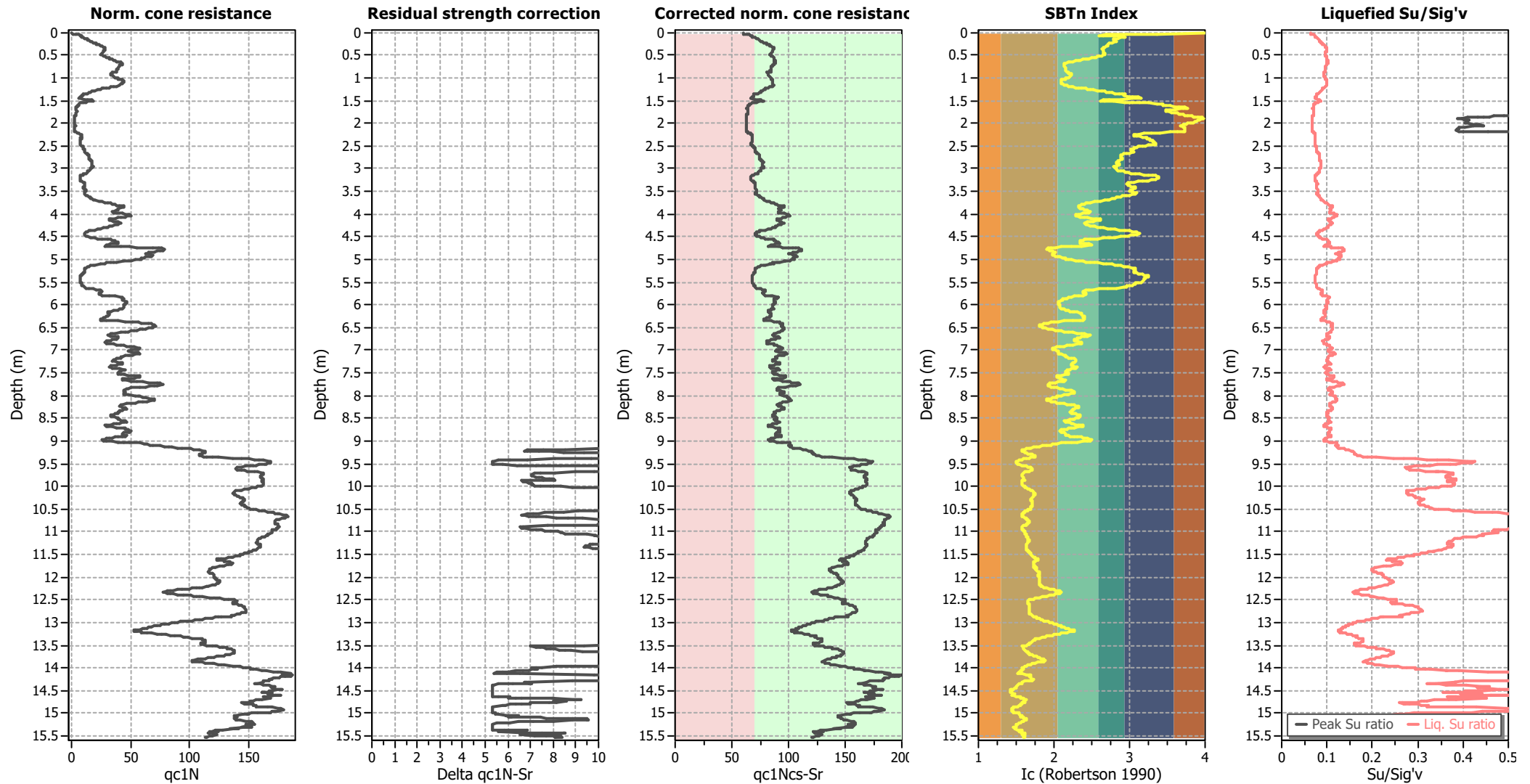
### F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

### LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

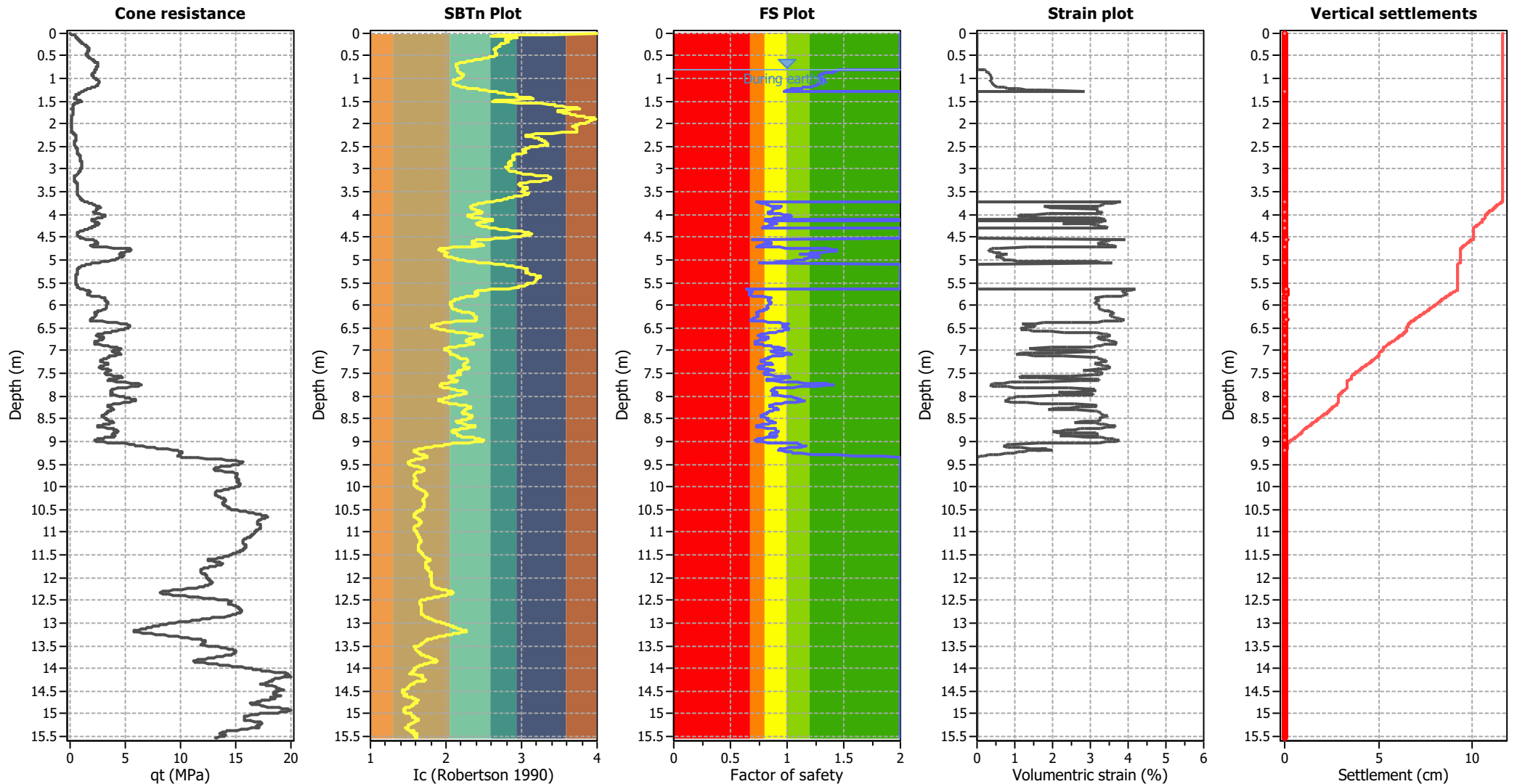
## Check for strength loss plots (Idriss & Boulanger (2008))



### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_\sigma$ applied:	Yes
Earthquake magnitude $M_w$ :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

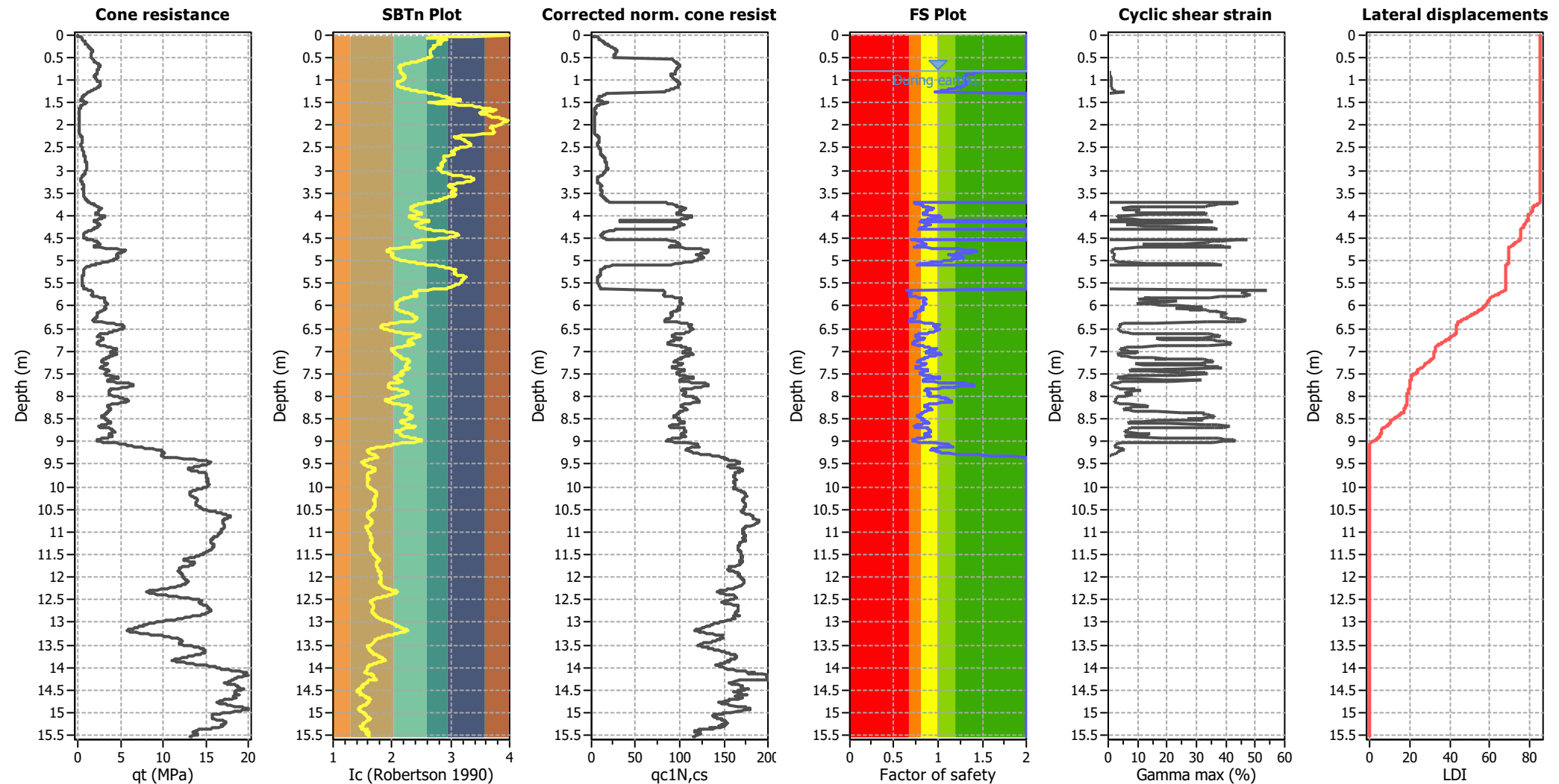
Estimation of post-earthquake settlements



Abbreviations

- q<sub>c</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain

Estimation of post-earthquake lateral Displacements



Abbreviations

qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

I<sub>c</sub>: Soil Behaviour Type Index

qc1N,cs: Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety

γ<sub>max</sub>: Maximum cyclic shear strain

LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

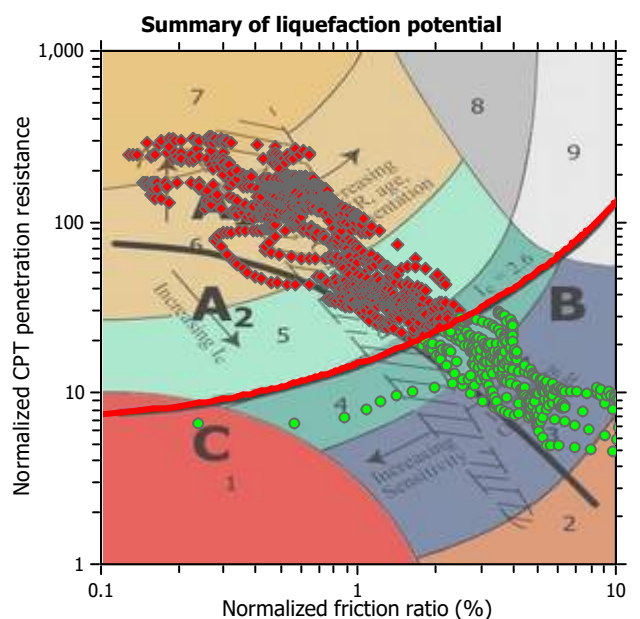
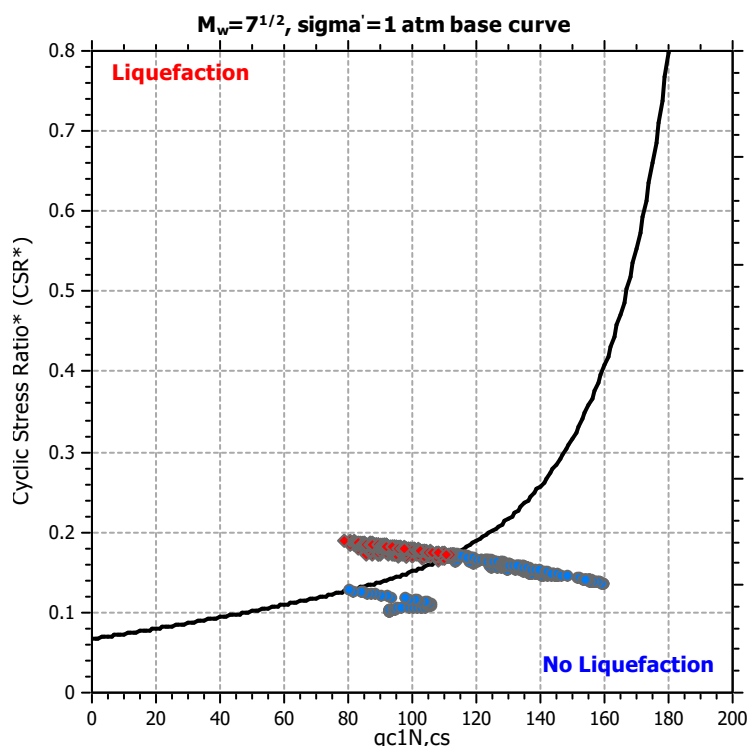
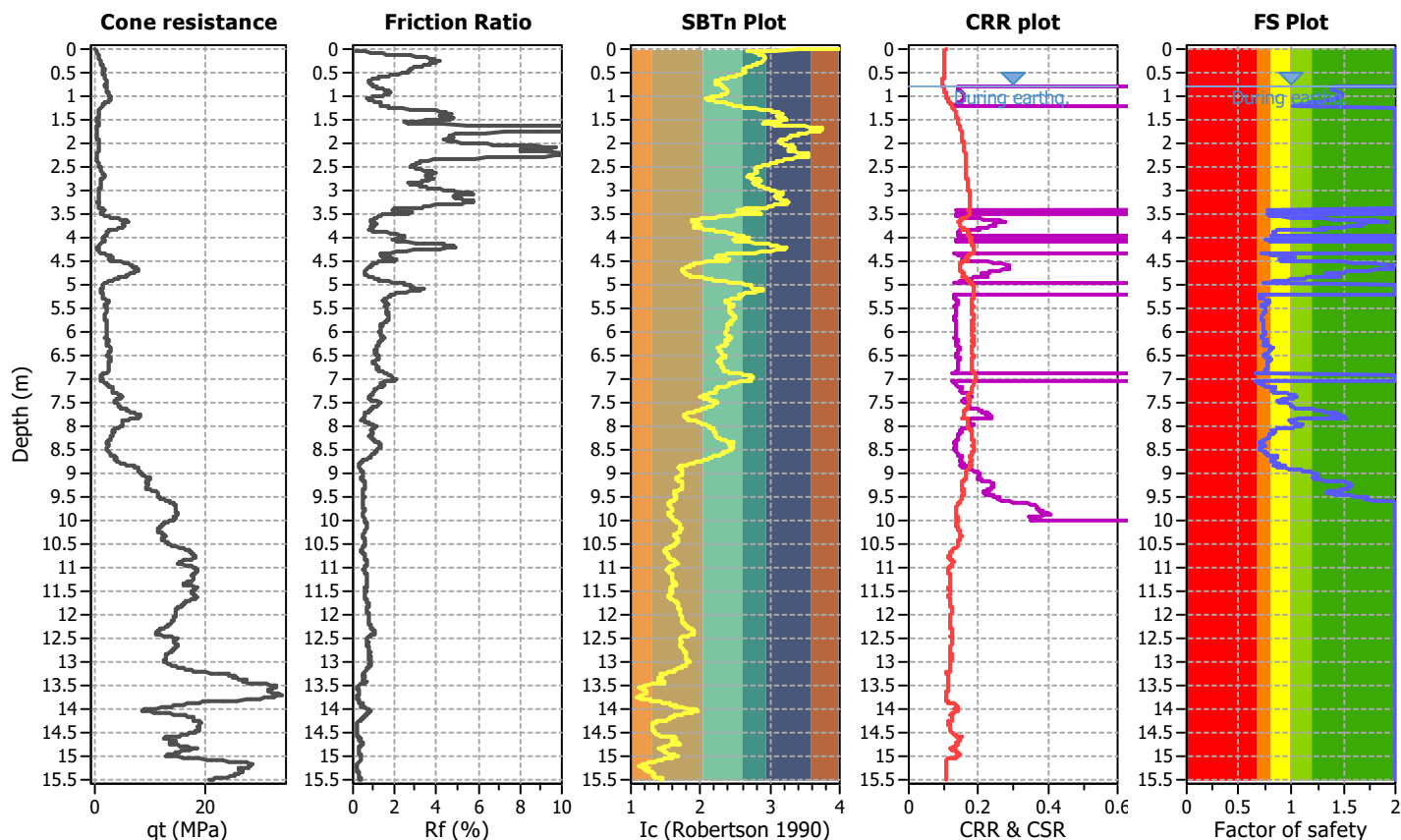
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT\_180292\_13ms**

### Input parameters and analysis data

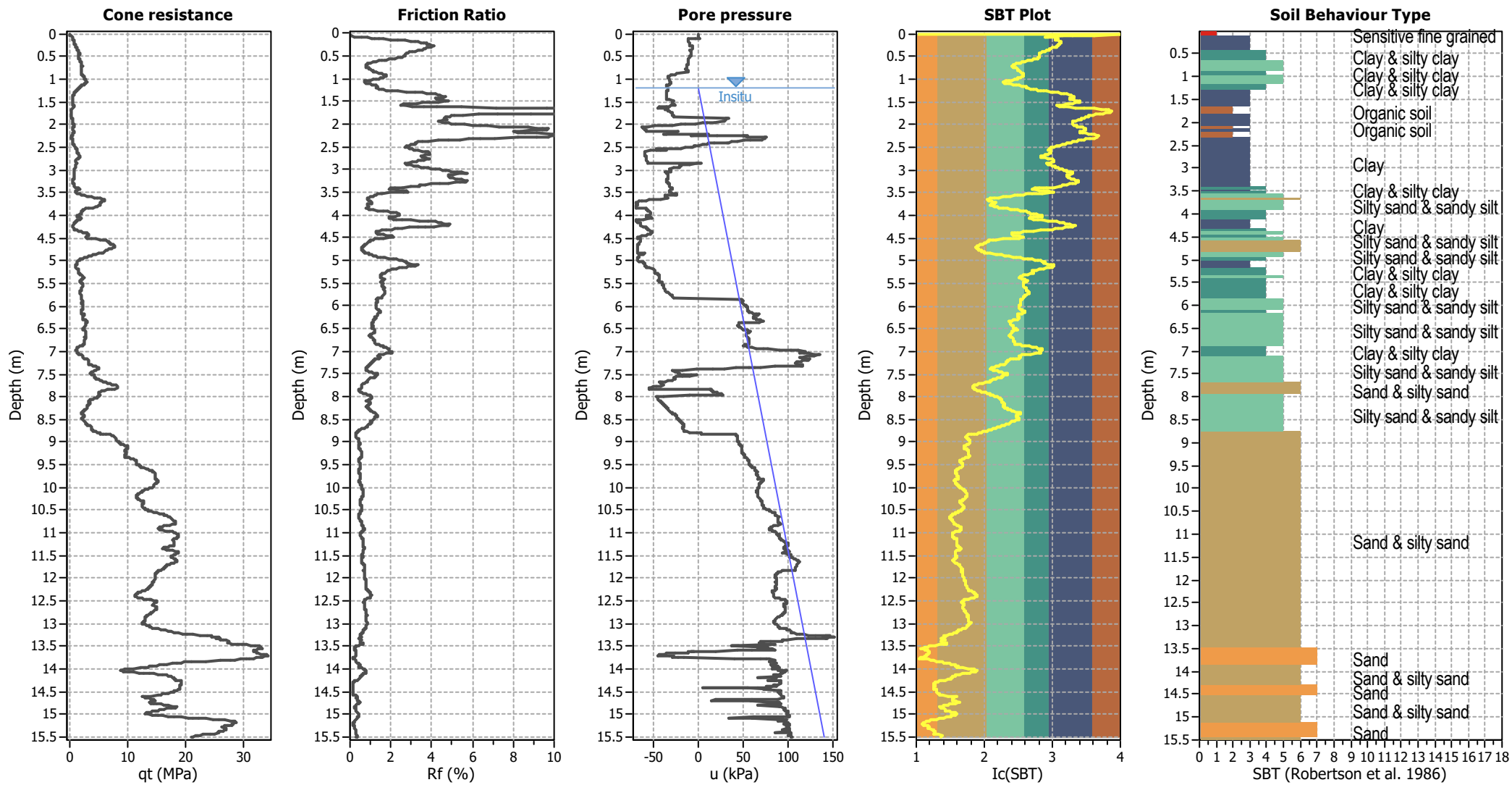
Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	10.00 m
Peak ground acceleration:	0.19	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading  
Zone A2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



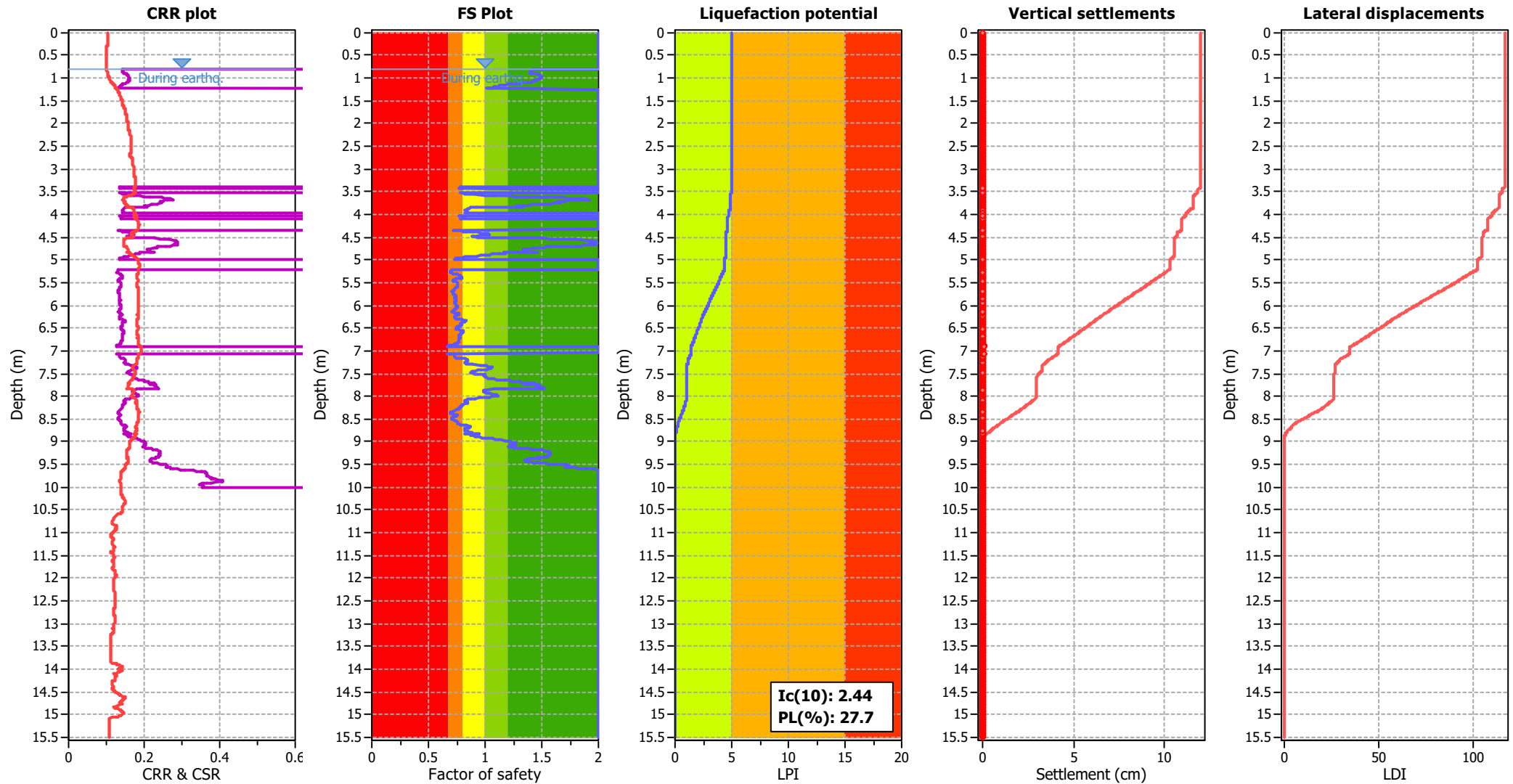
CPT basic interpretation plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>g</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

## Liquefaction analysis overall plots



### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

### F.S. color scheme

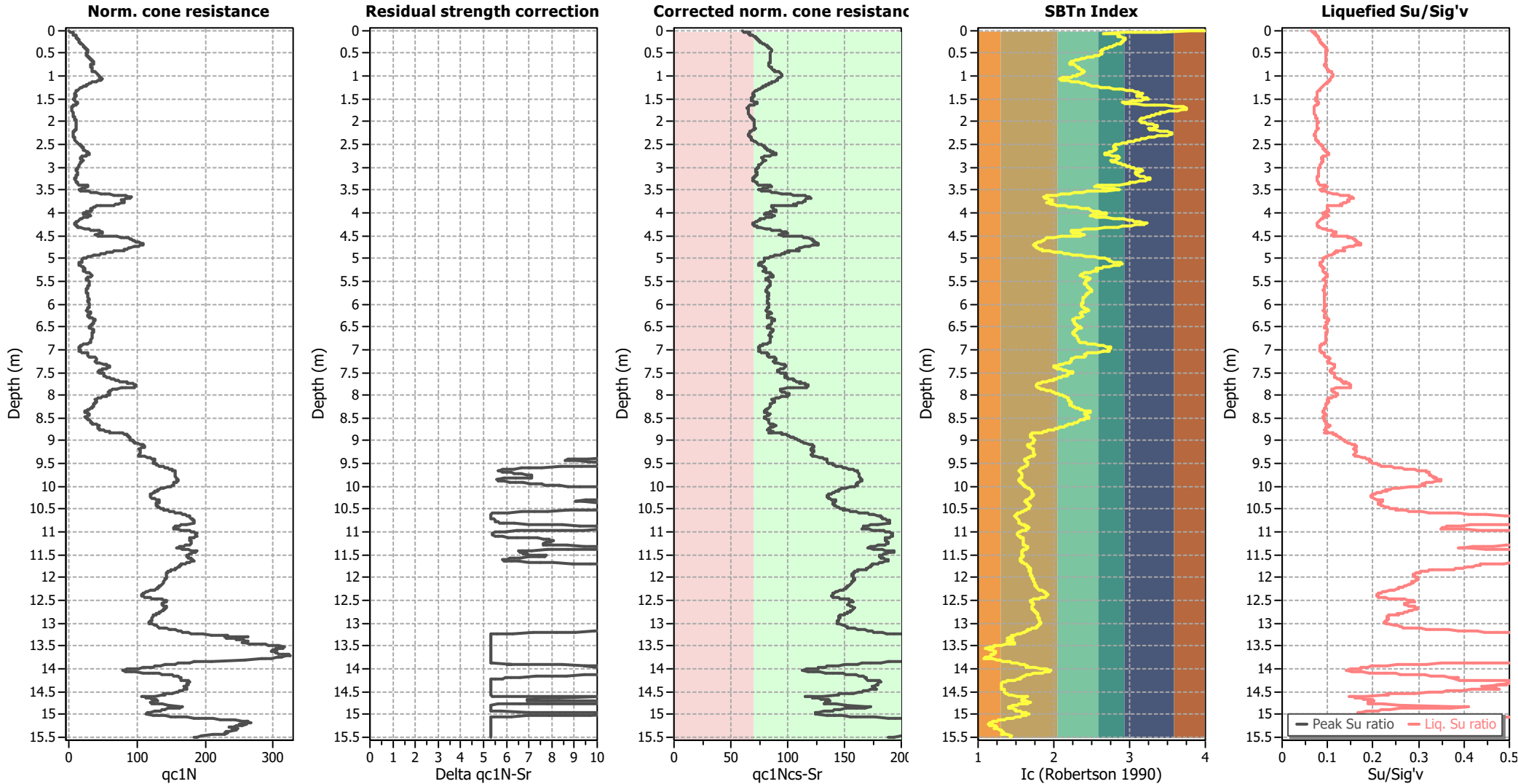
<span style="color: red;">■</span>	Almost certain it will liquefy
<span style="color: orange;">■</span>	Very likely to liquefy
<span style="color: yellow;">■</span>	Liquefaction and no liq. are equally likely
<span style="color: lightgreen;">■</span>	Unlike to liquefy
<span style="color: green;">■</span>	Almost certain it will not liquefy

### LPI color scheme

<span style="color: red;">■</span>	Very high risk
<span style="color: orange;">■</span>	High risk
<span style="color: yellow;">■</span>	Low risk



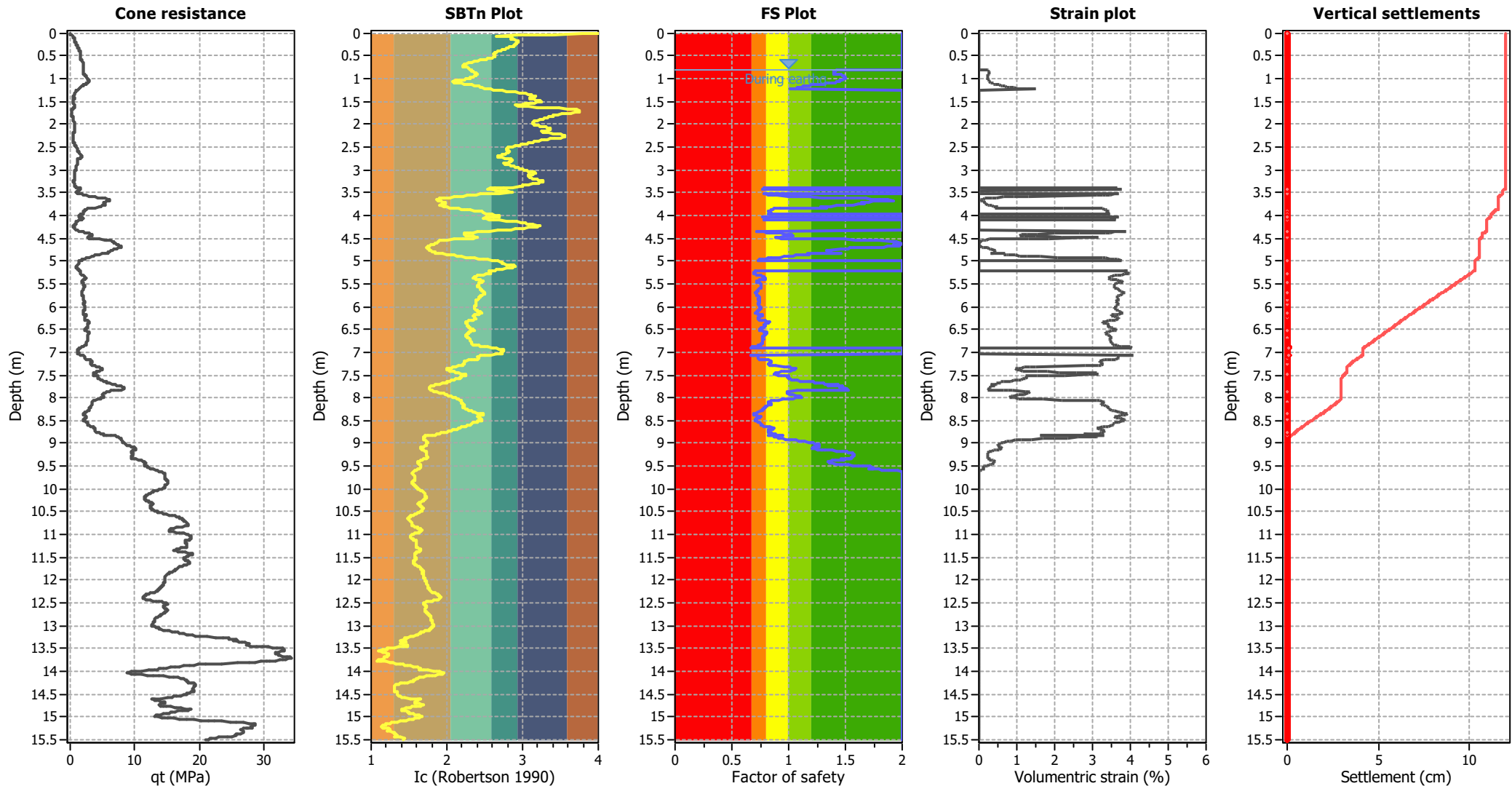
Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.00	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):	1.20 m	Fill height:	N/A	Limit depth:	10.00 m

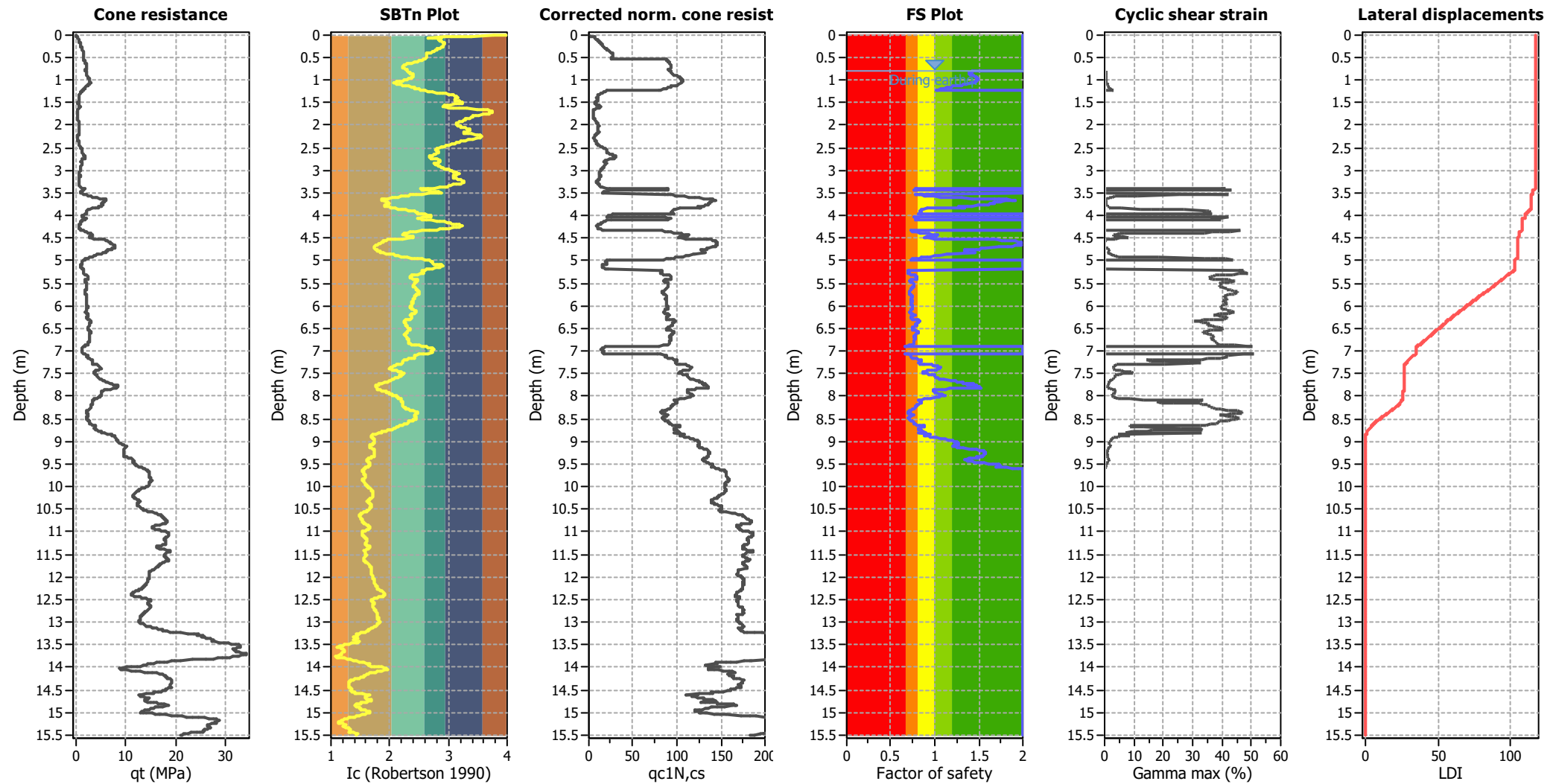
Estimation of post-earthquake settlements



Abbreviations

- q<sub>c</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain

Estimation of post-earthquake lateral Displacements



Abbreviations

- qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

Ic: Soil Behaviour Type Index

qc1N,cs: Equivalent clean sand normalized CPT total cone resistance
- F.S.: Factor of safety

$\gamma_{max}$ : Maximum cyclic shear strain

LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

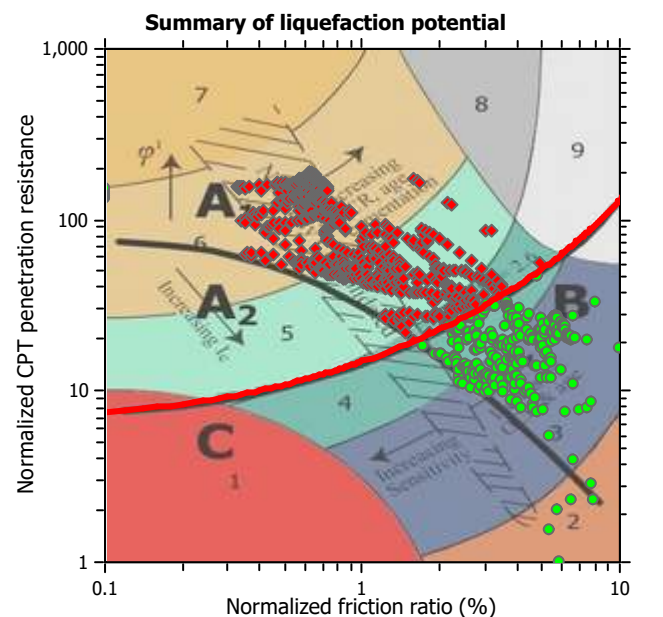
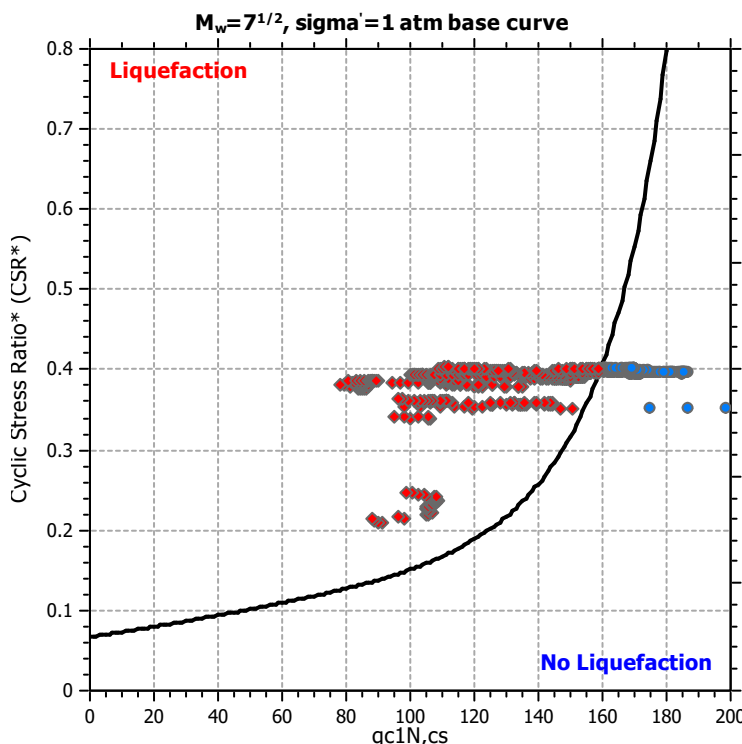
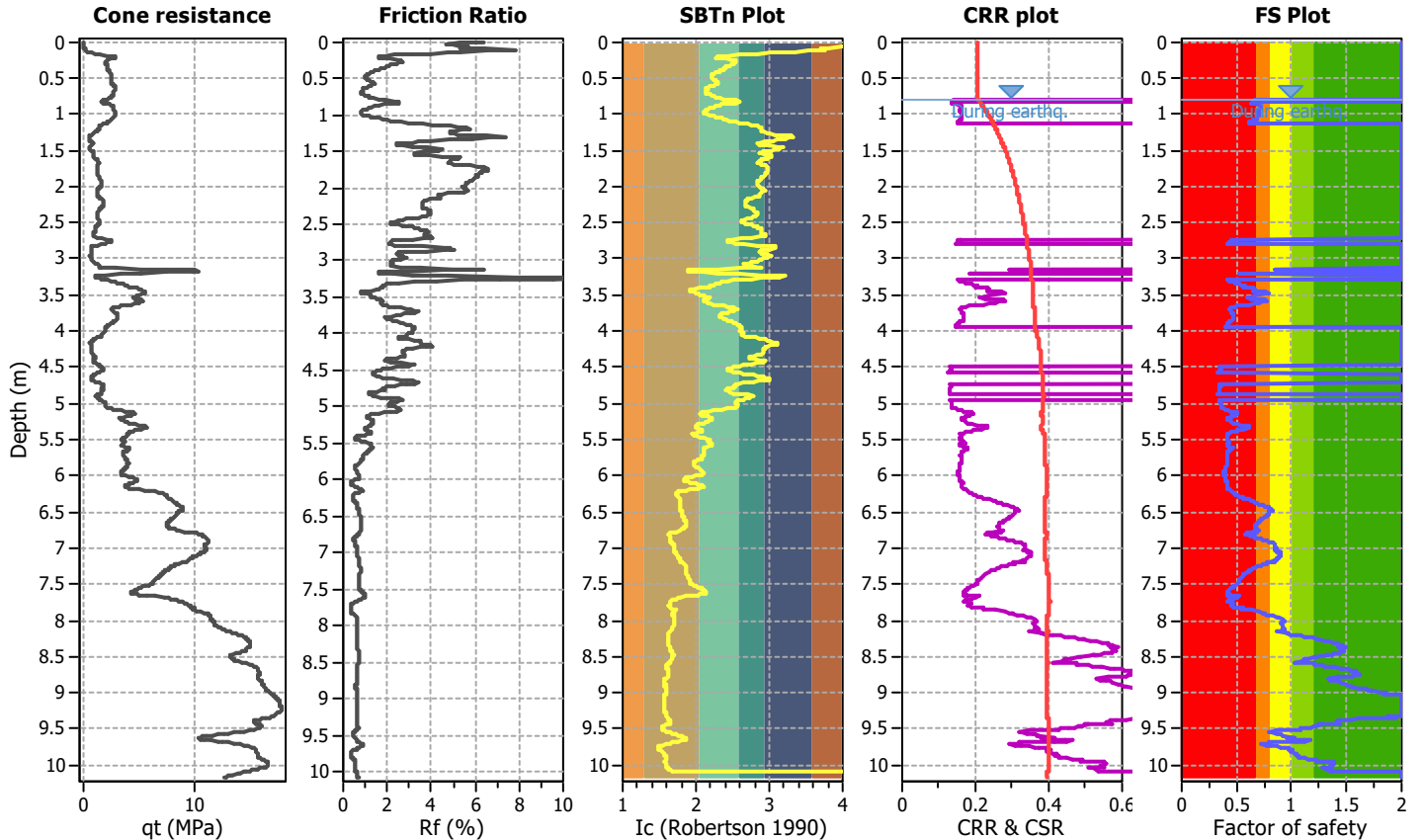
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT99751\_On boundary**

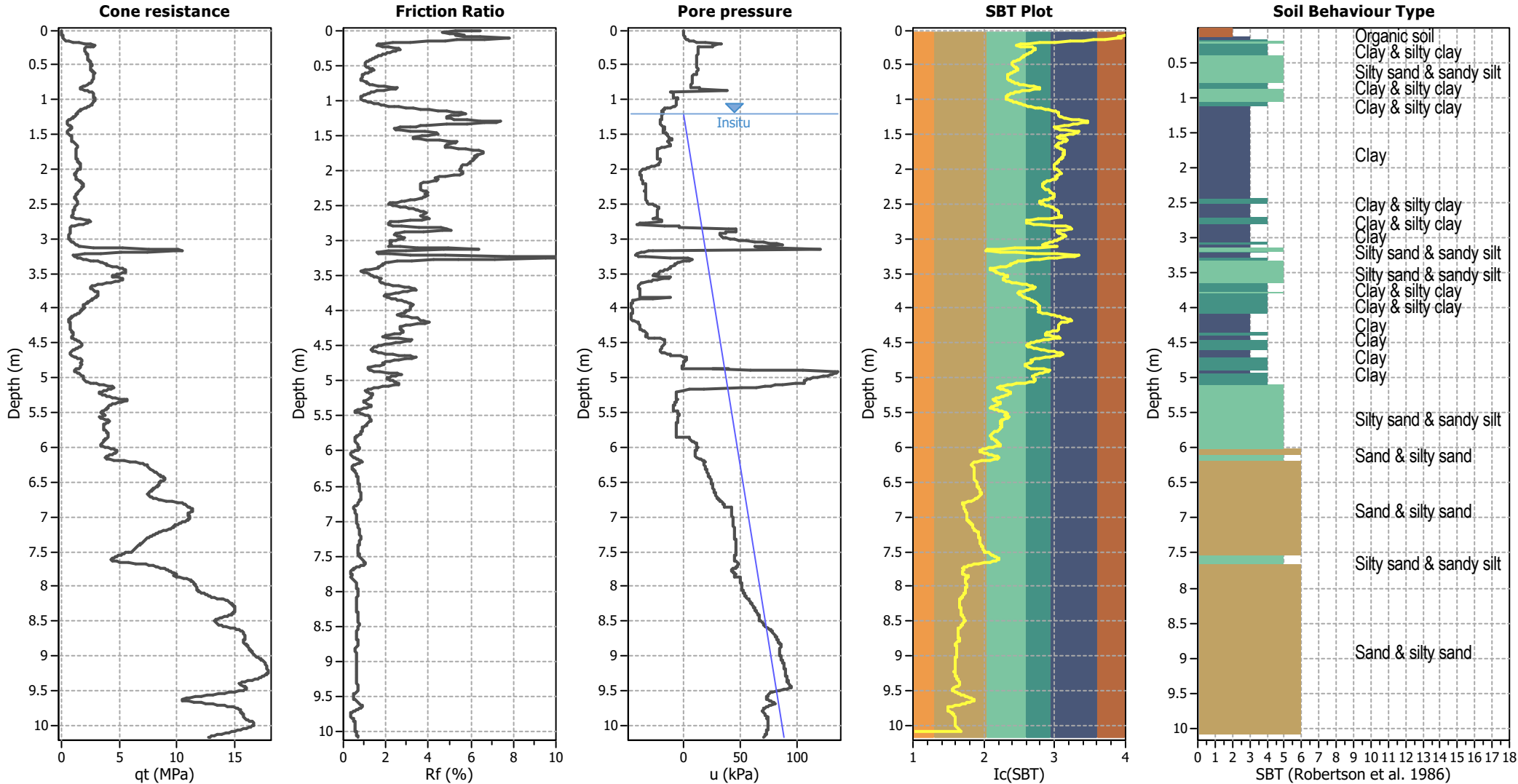
### Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.35	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes		



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



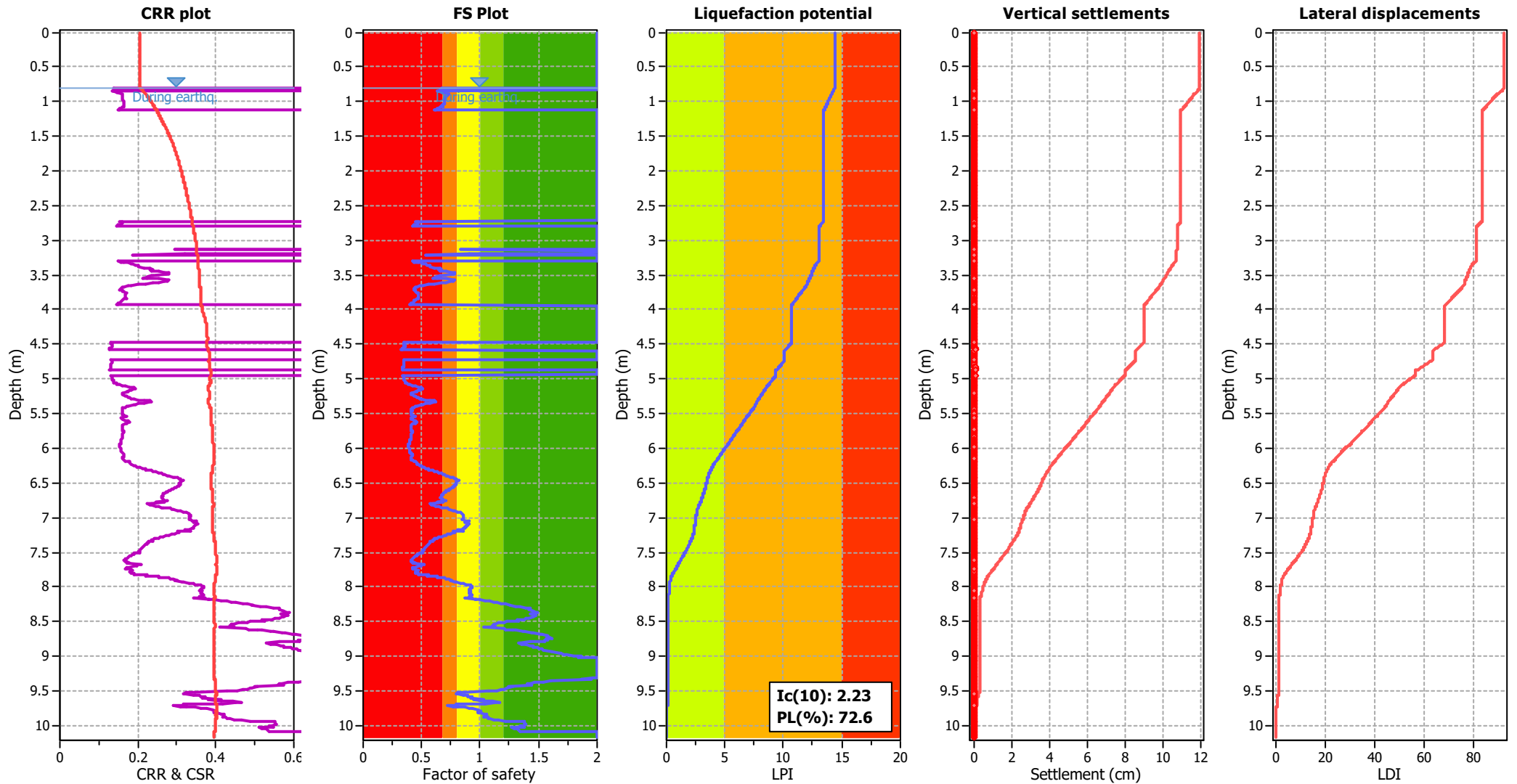
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

SBT legend

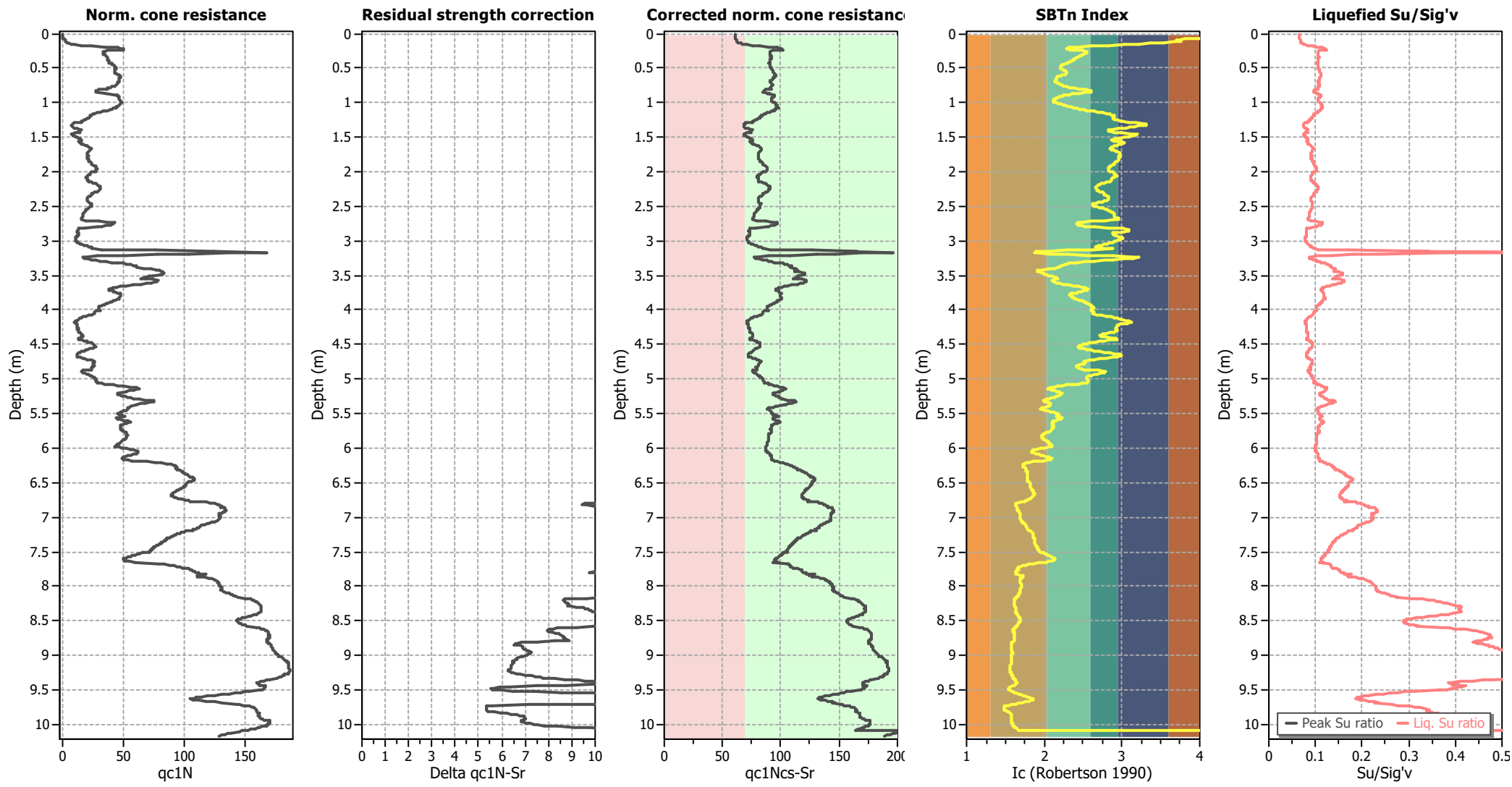
1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Liquefaction analysis overall plots





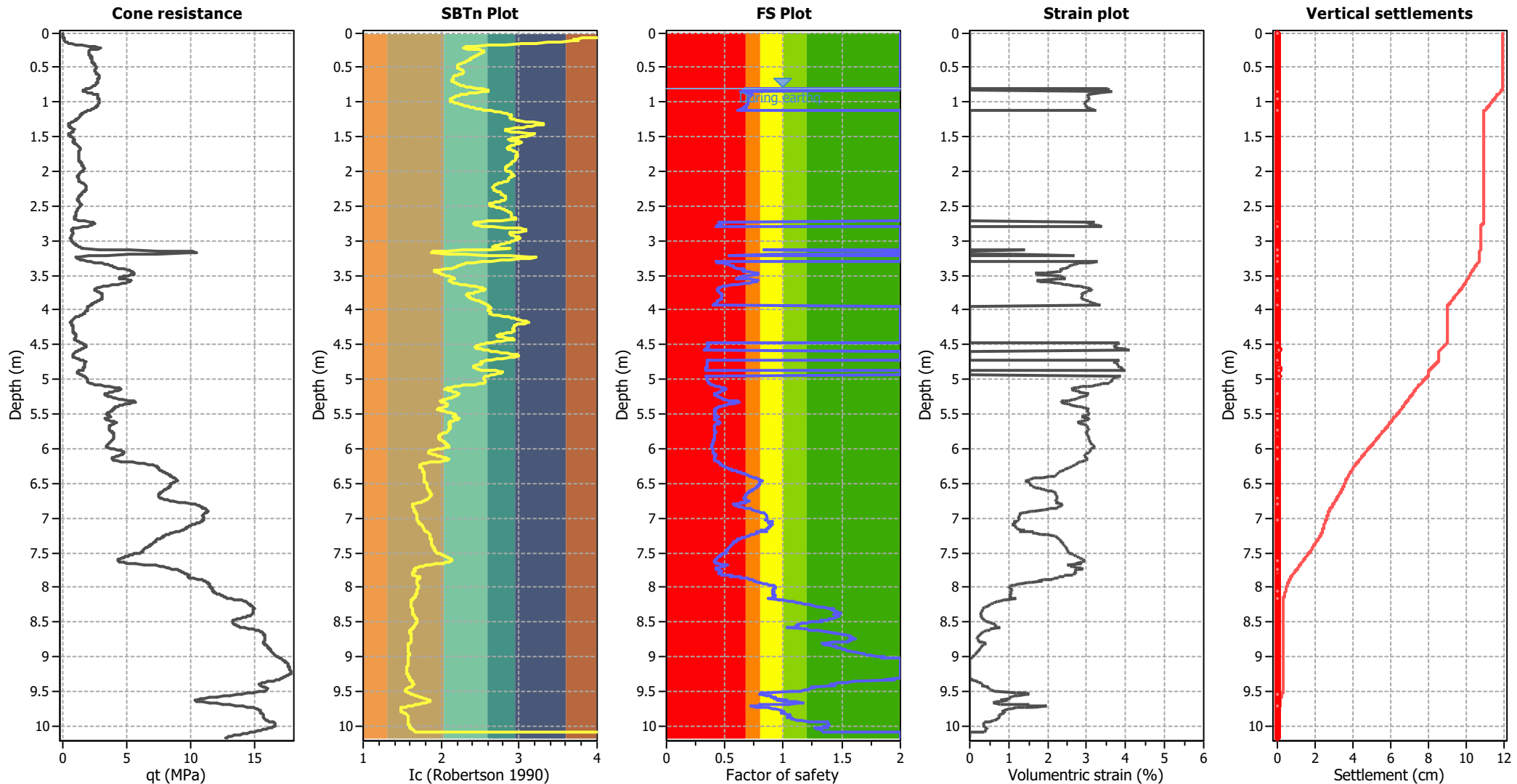
Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

Estimation of post-earthquake settlements

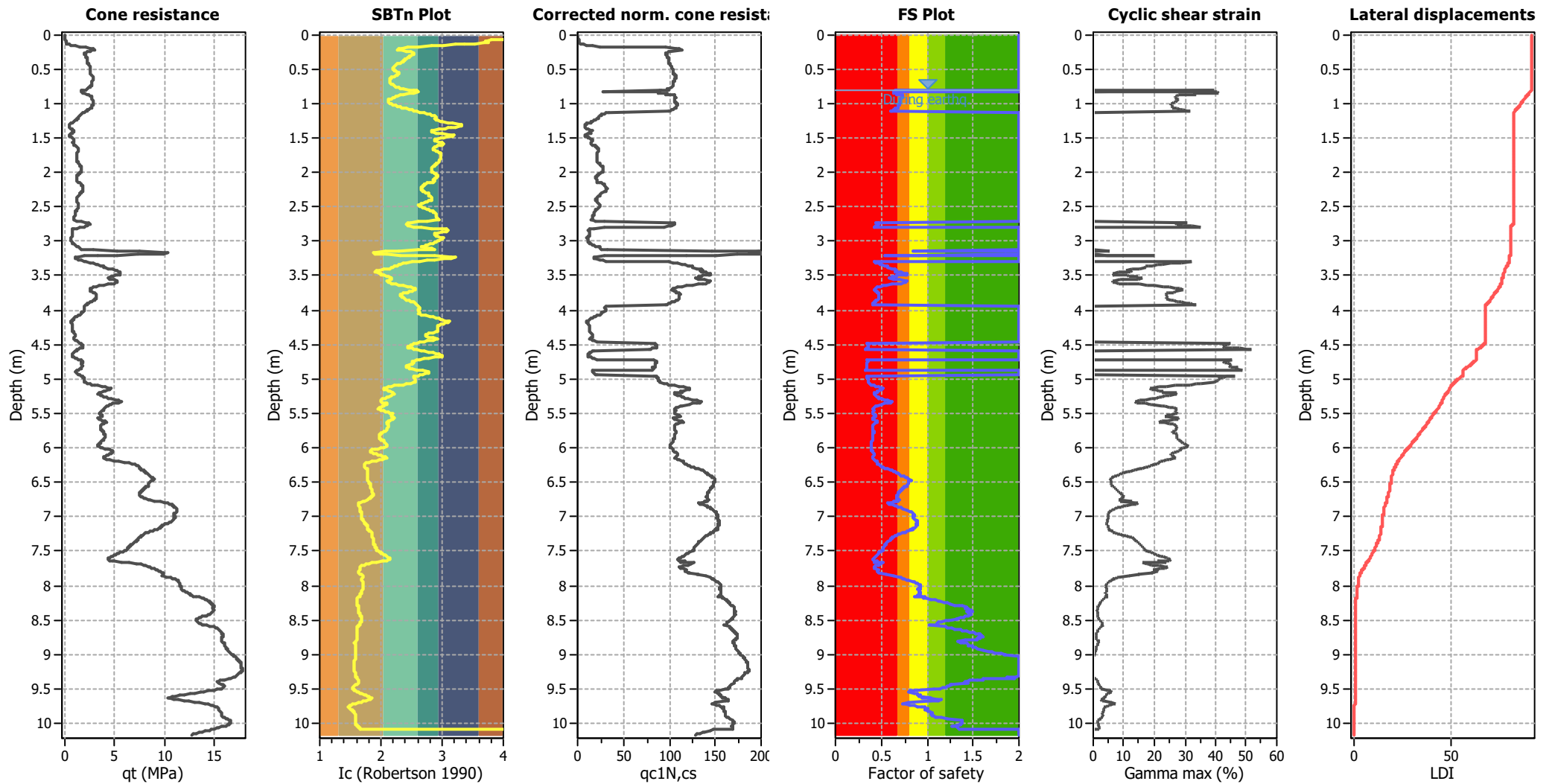


Abbreviations

- q<sub>c</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain



### Estimation of post-earthquake lateral Displacements



#### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $q_{c1N,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

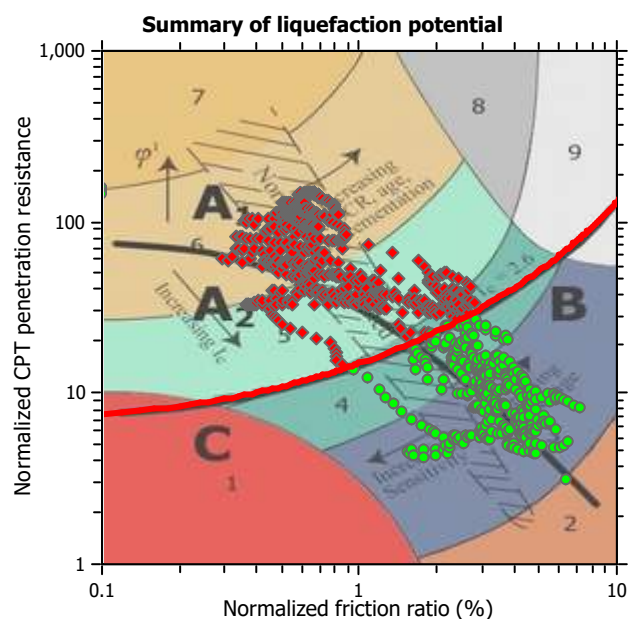
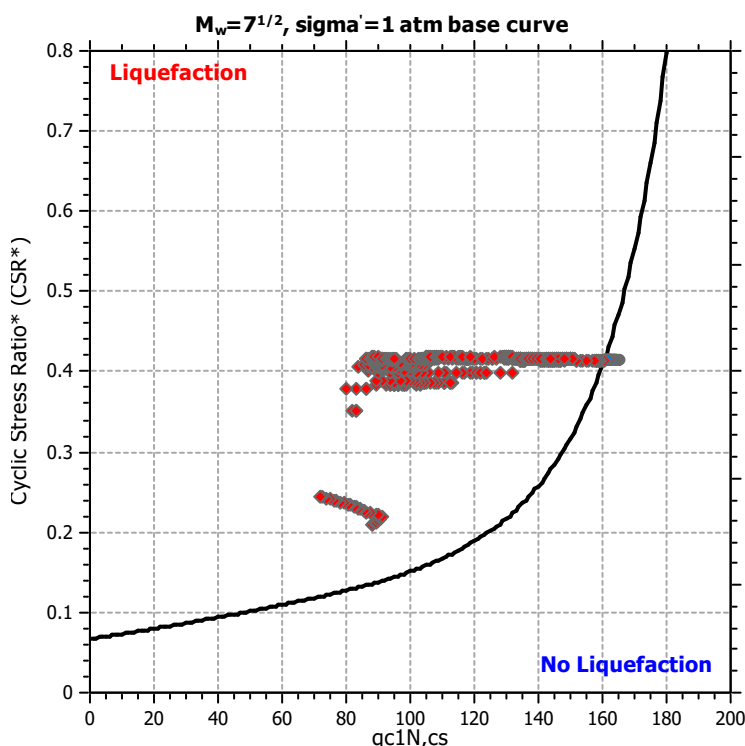
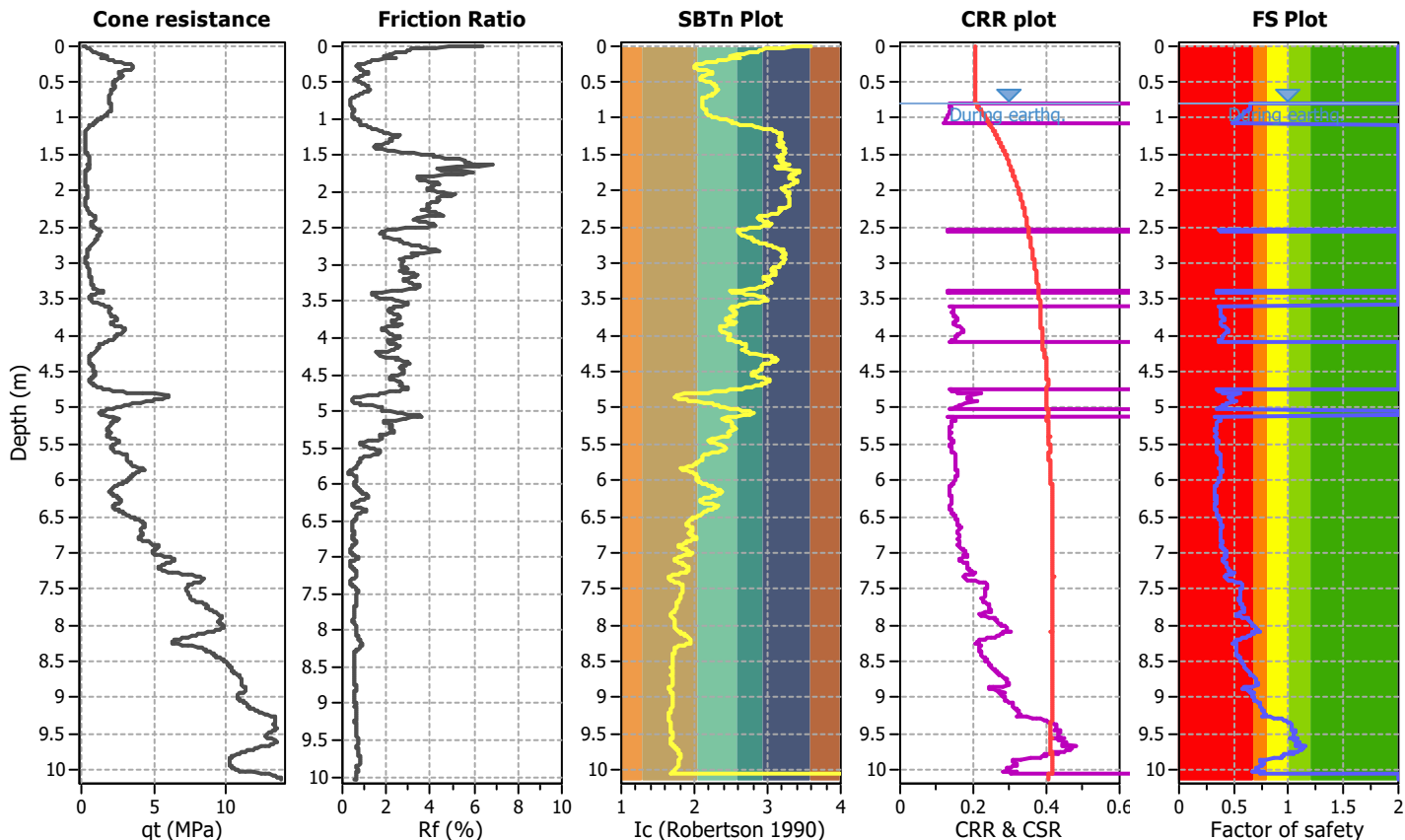
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT99752\_12.5 m N**

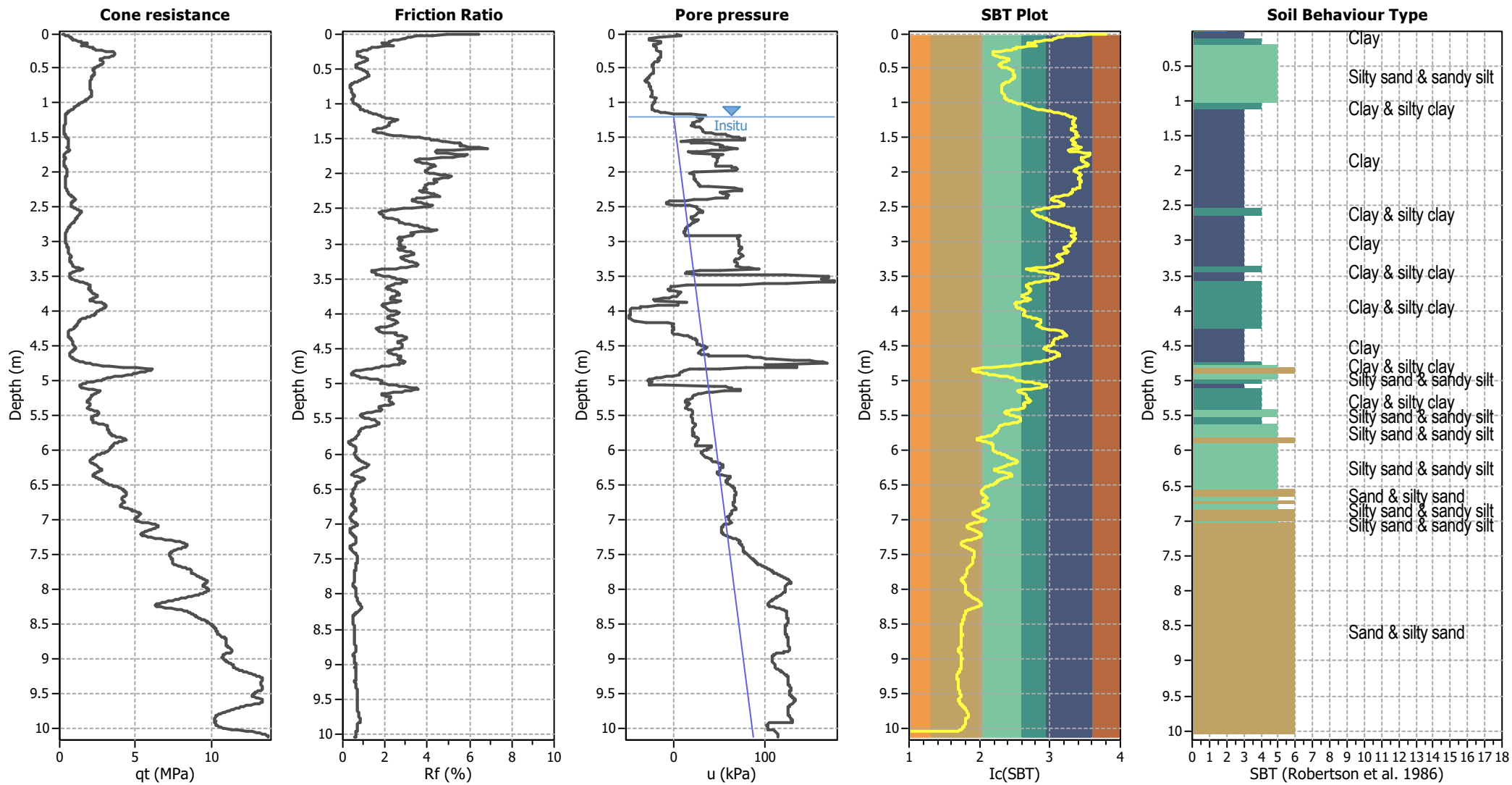
### Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.35	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes		



Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



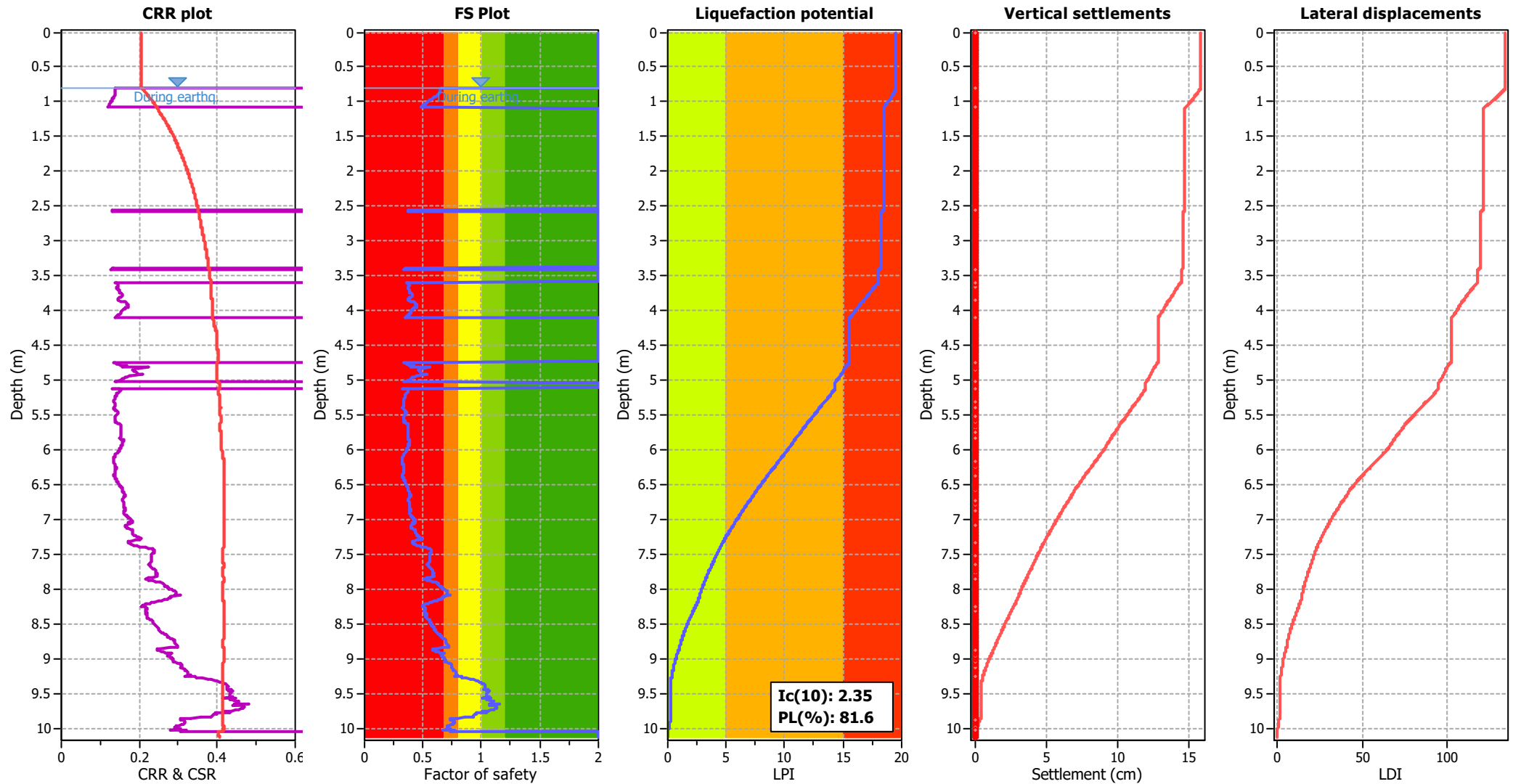
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

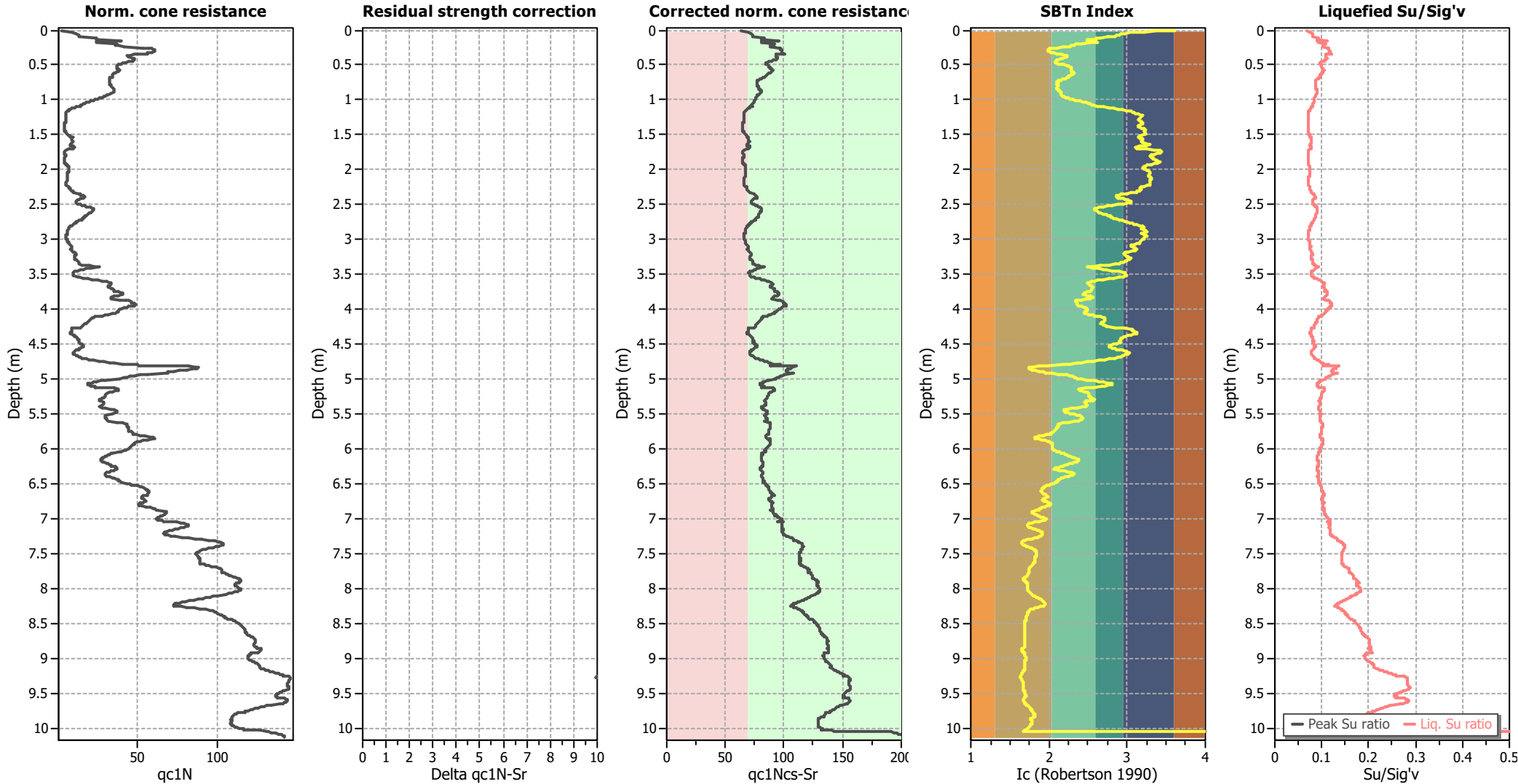
SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

## Liquefaction analysis overall plots



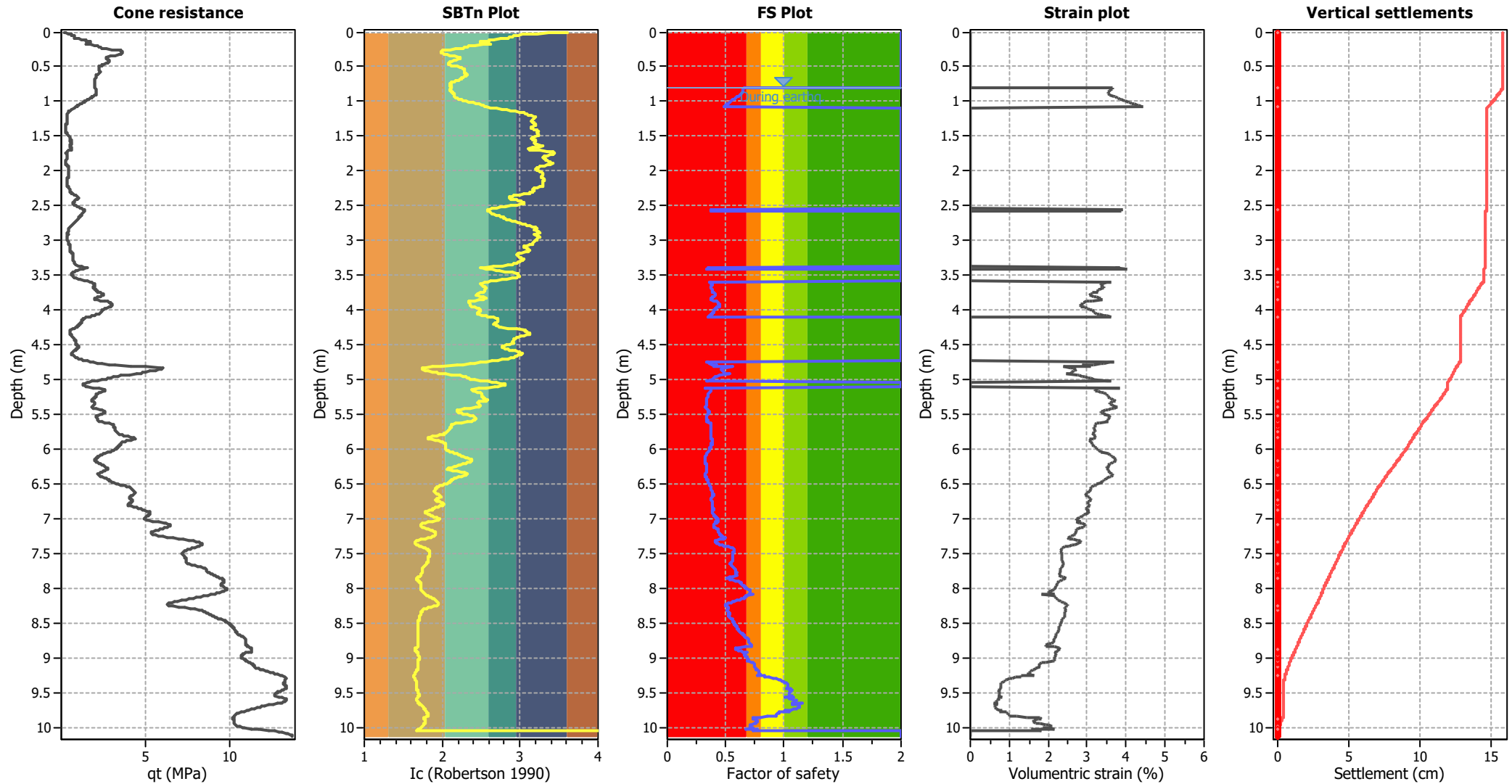
Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_\sigma$ applied:	Yes
Earthquake magnitude $M_w$ :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

## Estimation of post-earthquake settlements

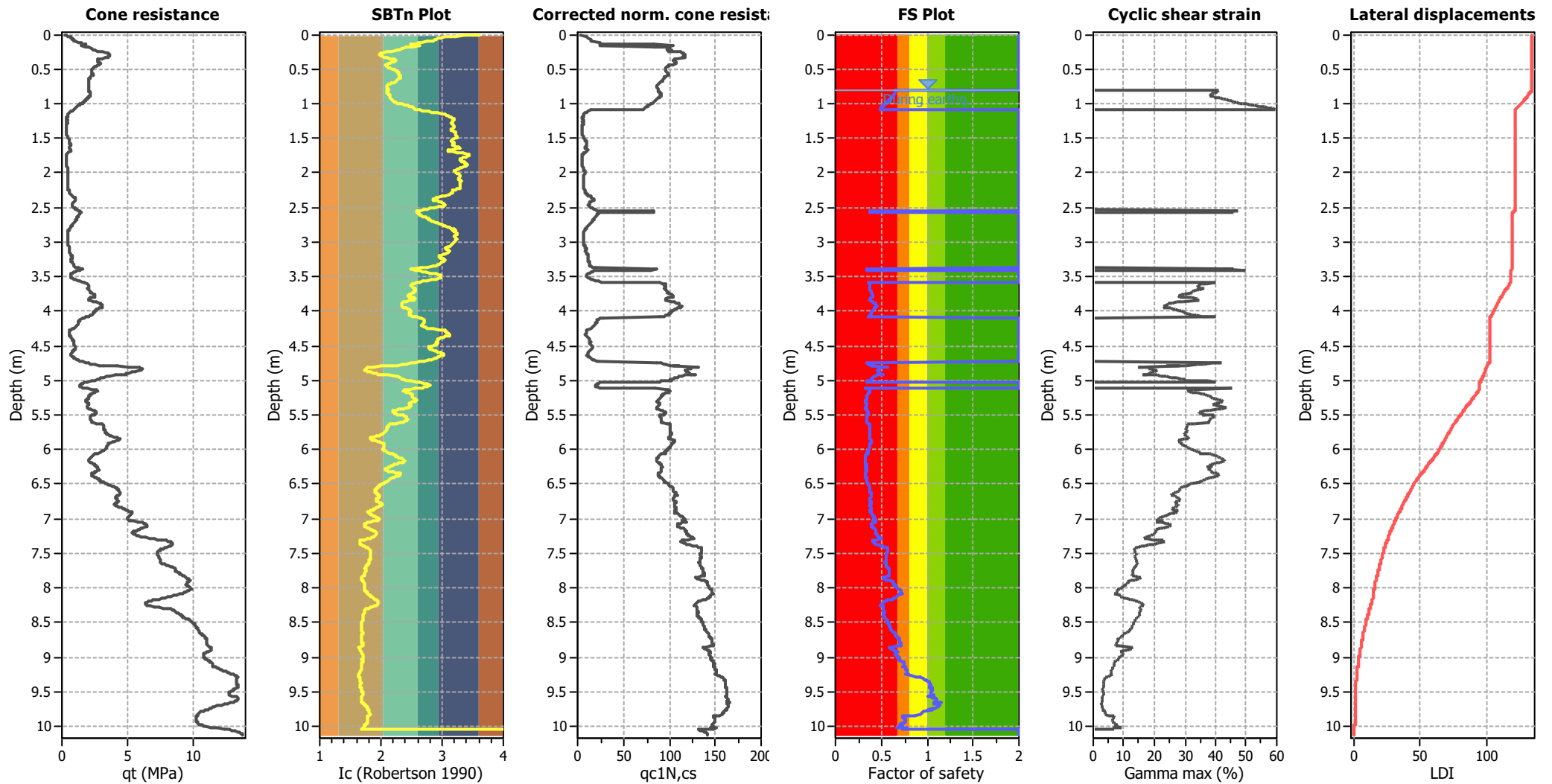


### Abbreviations

$q_c$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 FS: Calculated Factor of Safety against liquefaction  
 Volumetric strain: Post-liquefaction volumetric strain



## Estimation of post-earthquake lateral Displacements



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $q_{c1N,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index



## LIQUEFACTION ANALYSIS REPORT

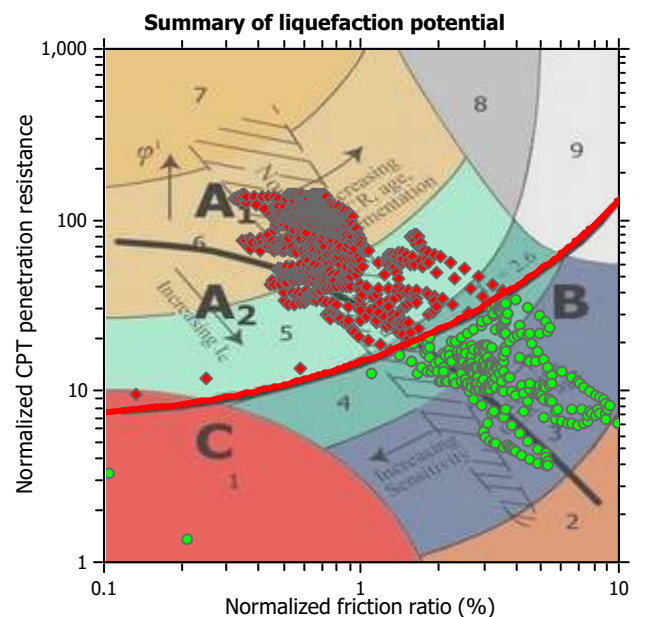
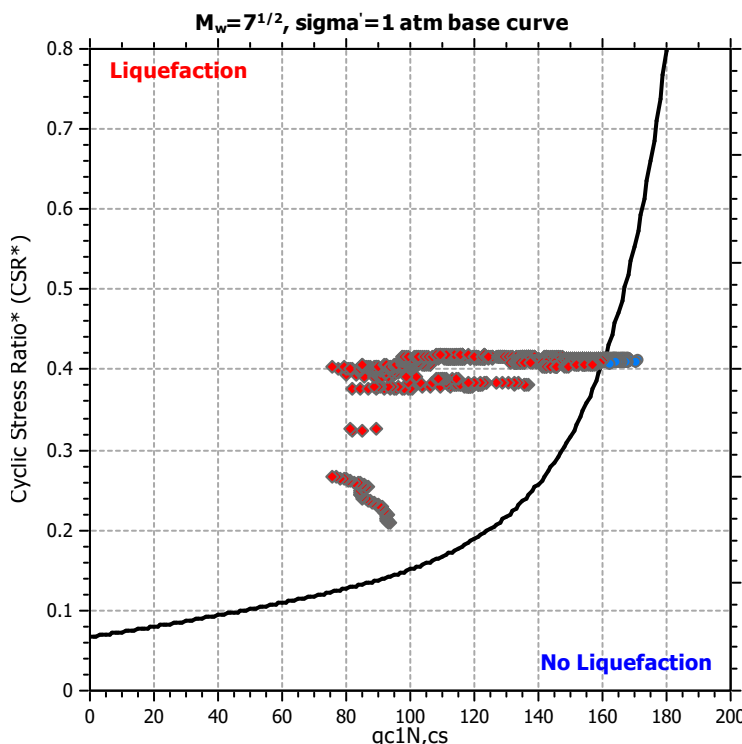
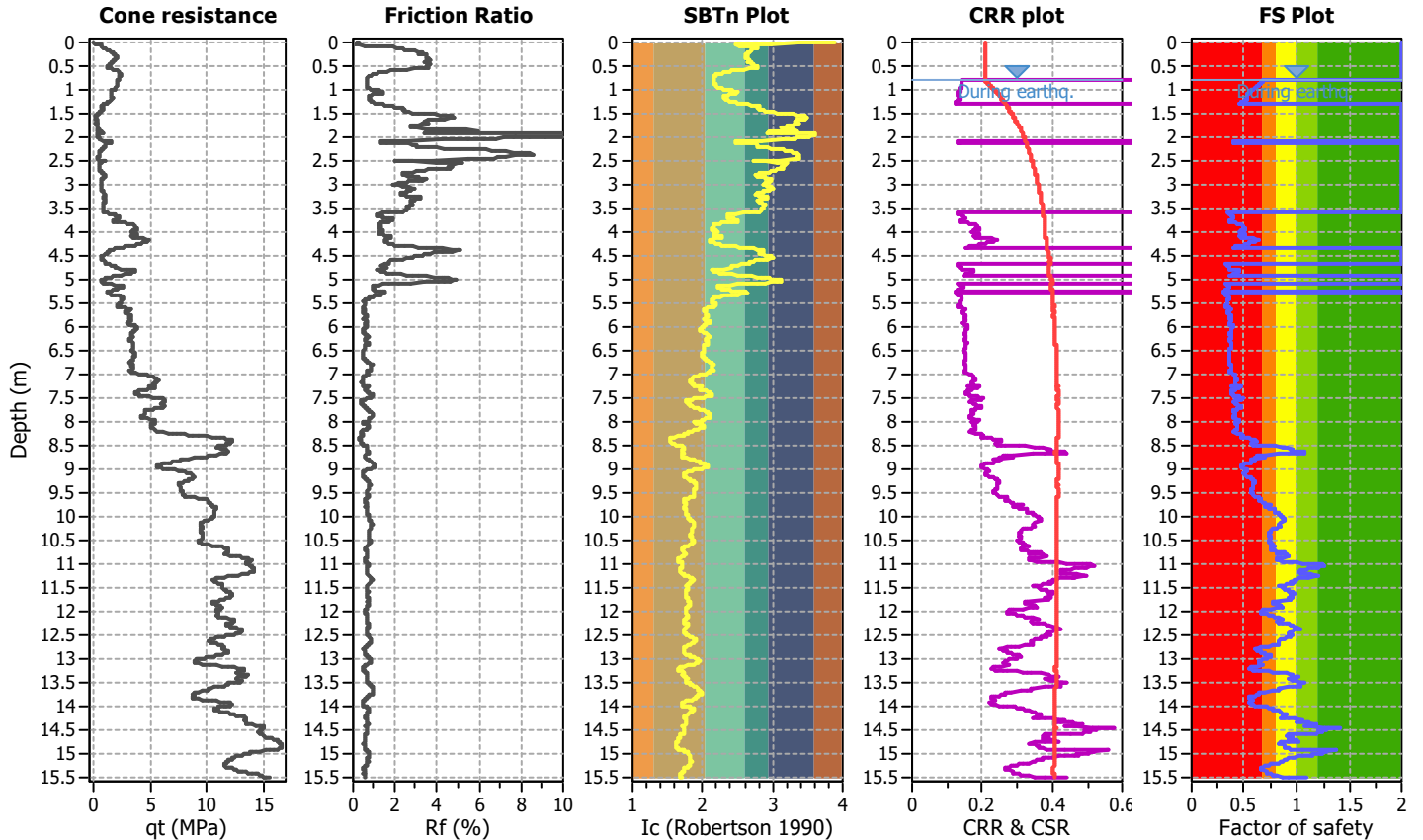
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT\_180290\_13.3mS**

### Input parameters and analysis data

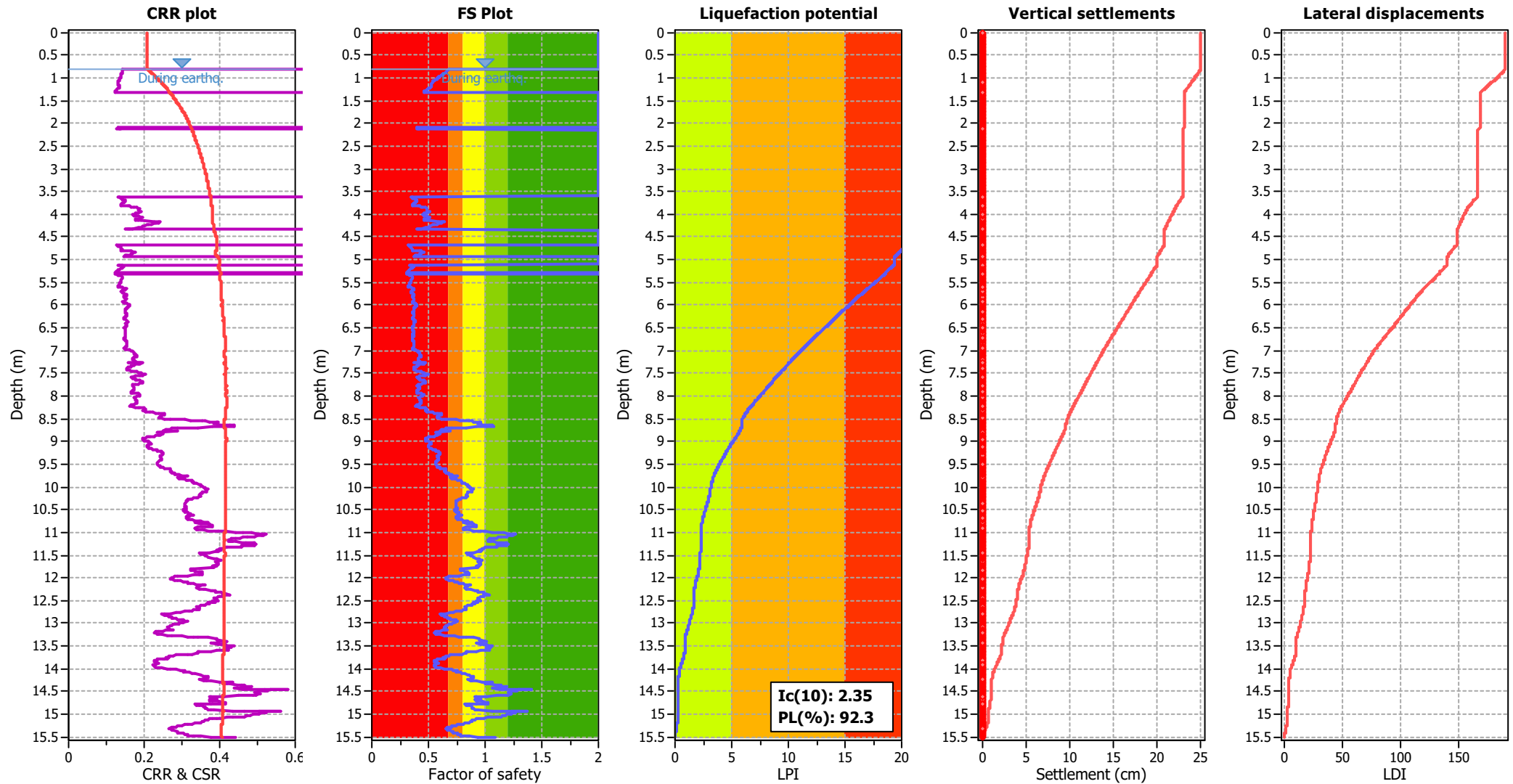
Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	N/A
Peak ground acceleration:	0.35	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



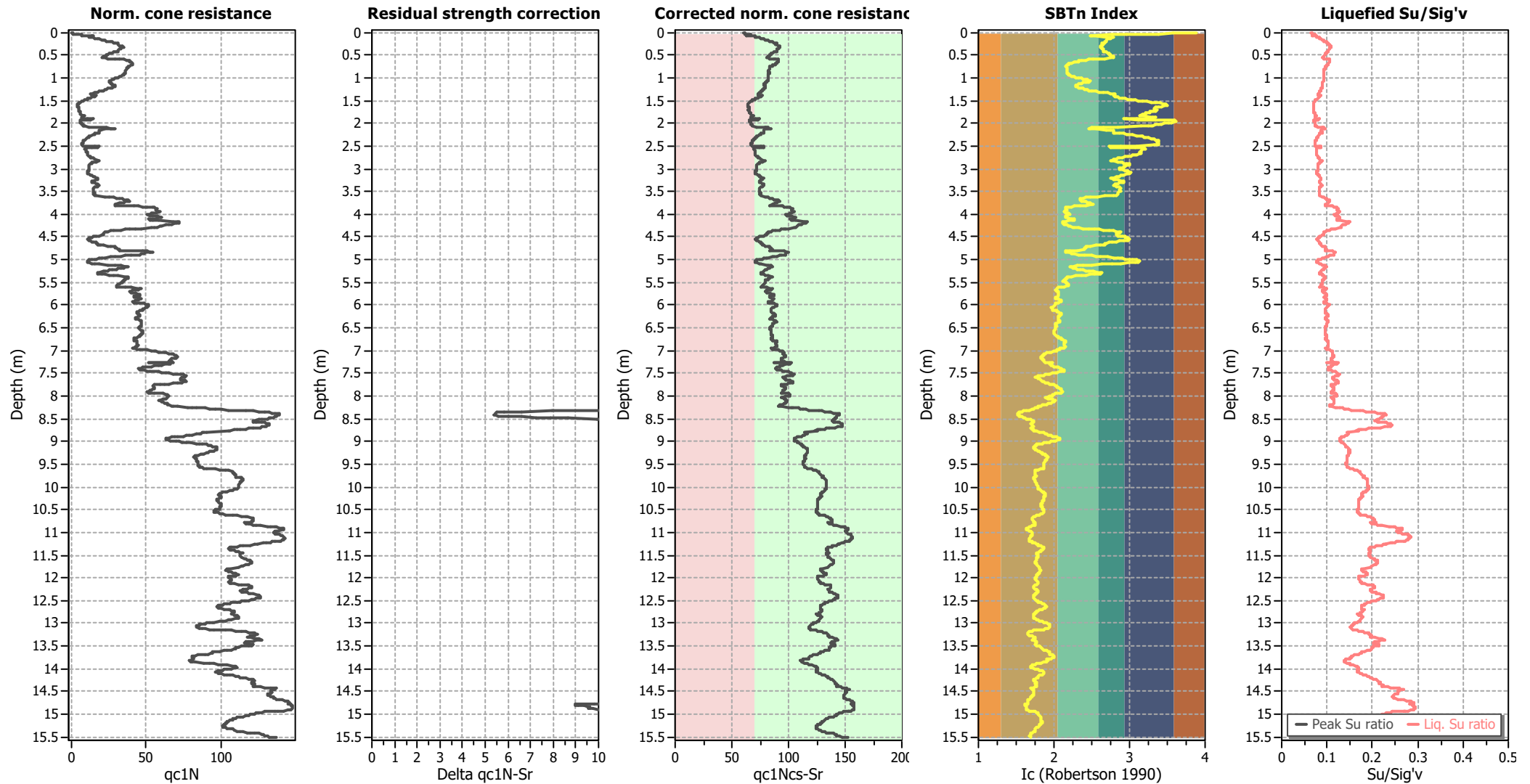
Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

### Pore pressure

## Liquefaction analysis overall plots



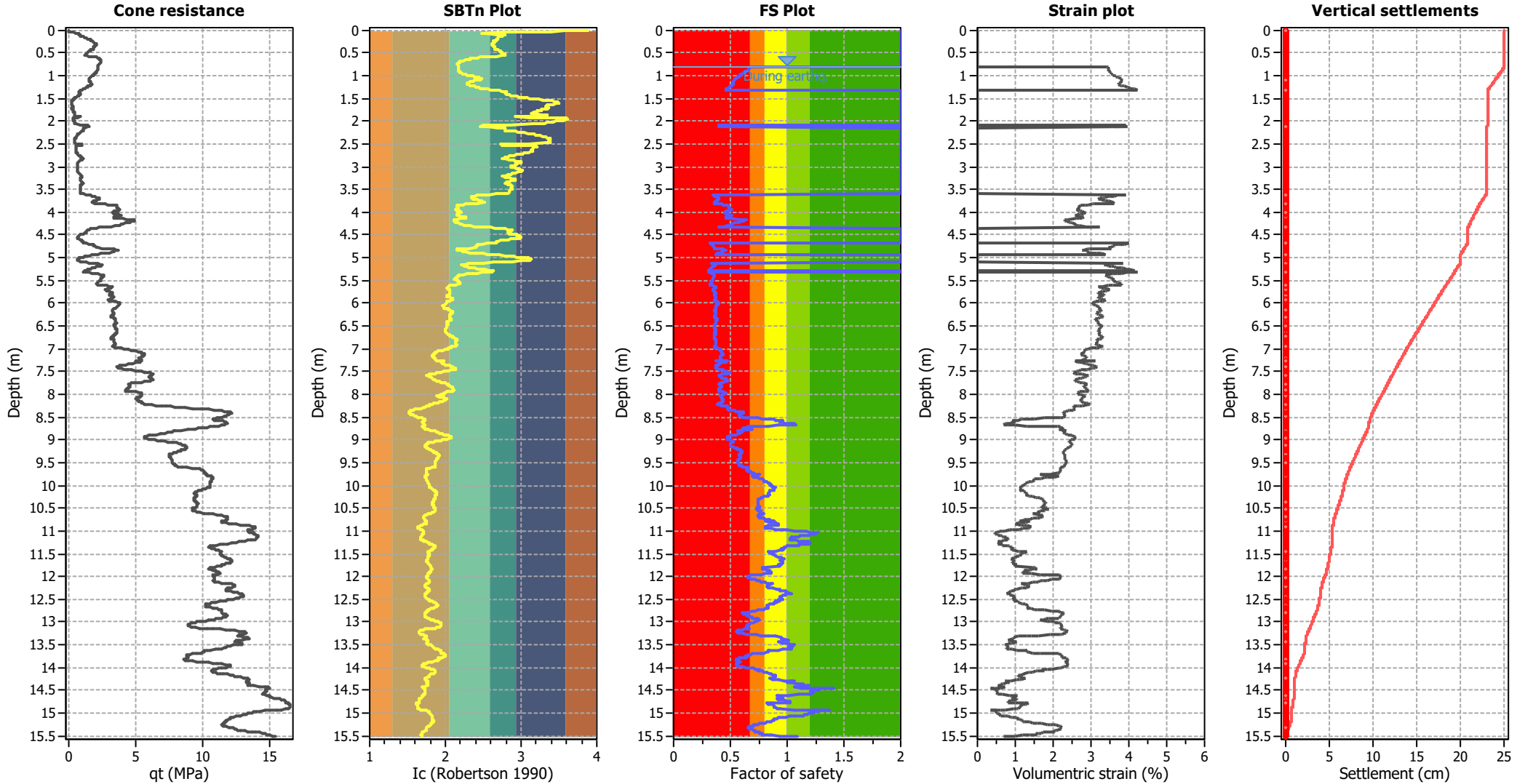
## Check for strength loss plots (Idriss & Boulanger (2008))



### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

Estimation of post-earthquake settlements

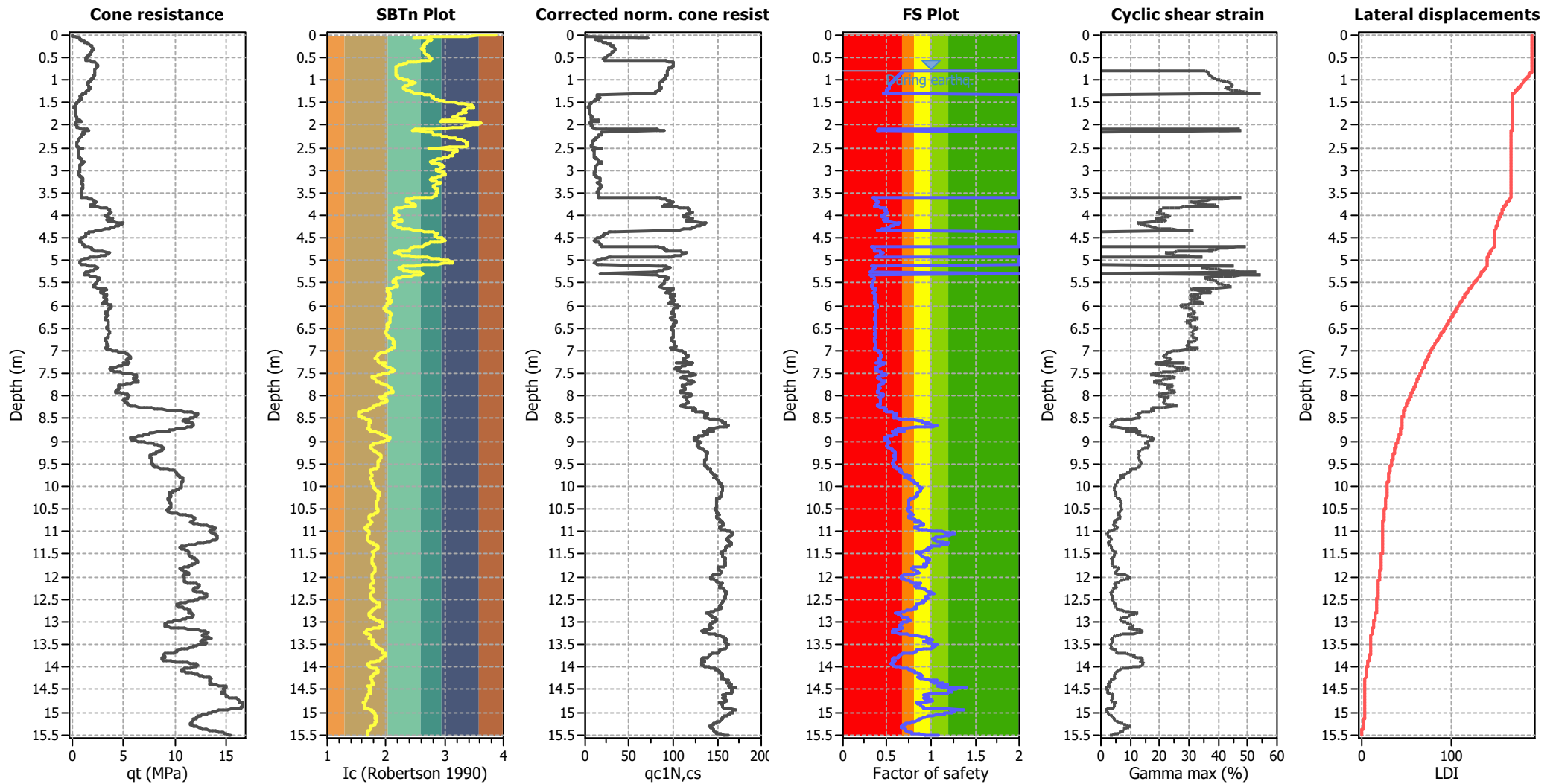


Abbreviations

- q<sub>t</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain



## Estimation of post-earthquake lateral Displacements



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $q_{c1N,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

## LIQUEFACTION ANALYSIS REPORT

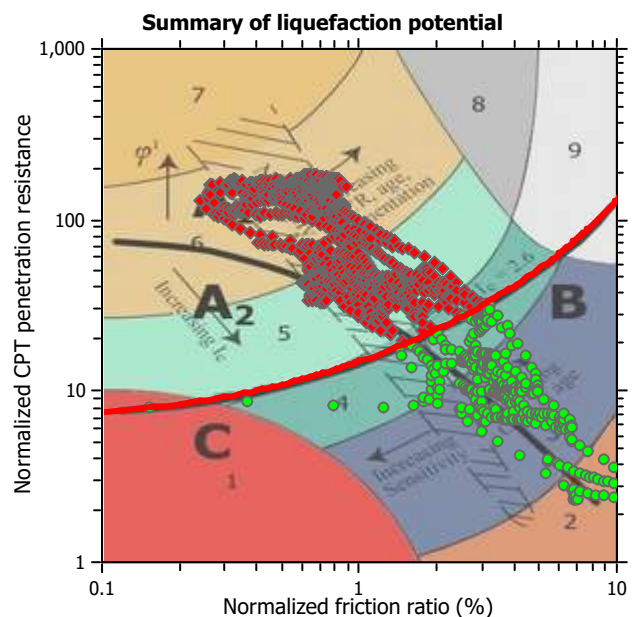
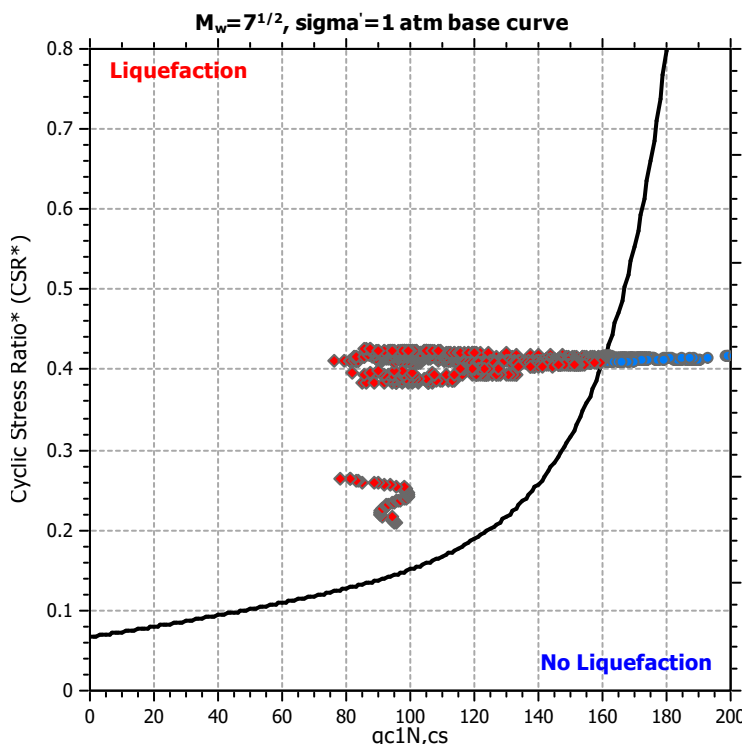
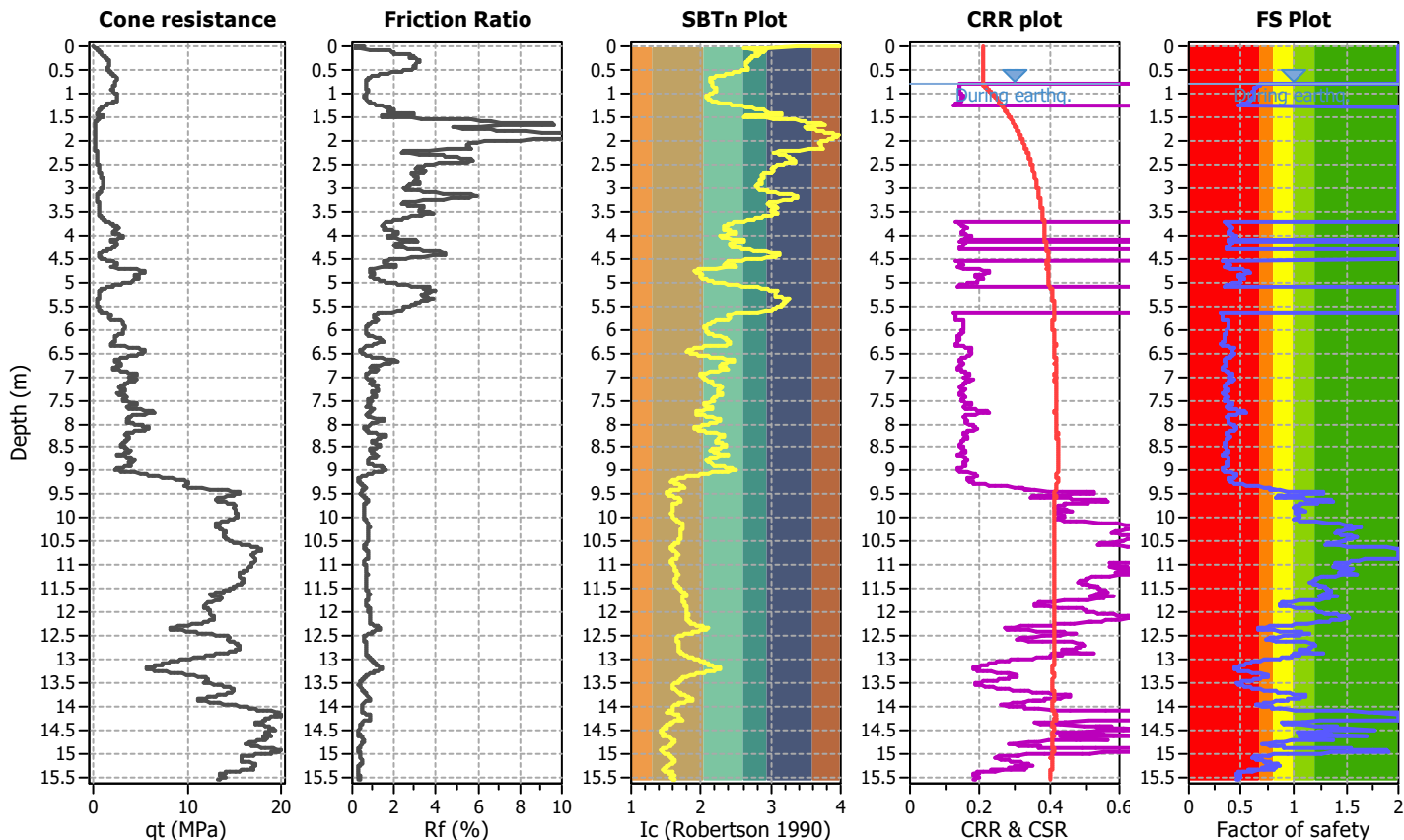
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT\_180291\_15ms**

### Input parameters and analysis data

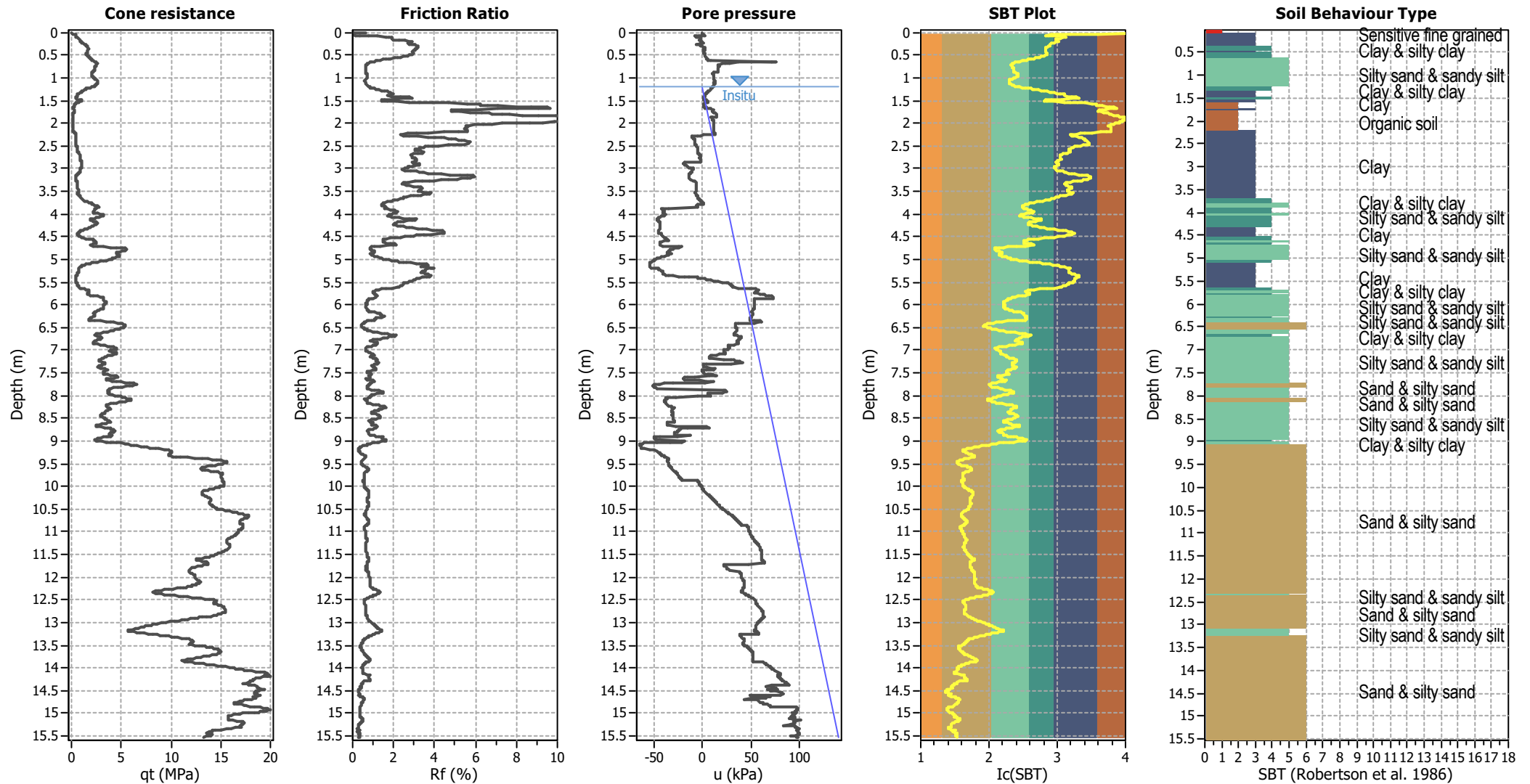
Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	N/A
Peak ground acceleration:	0.35	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plots



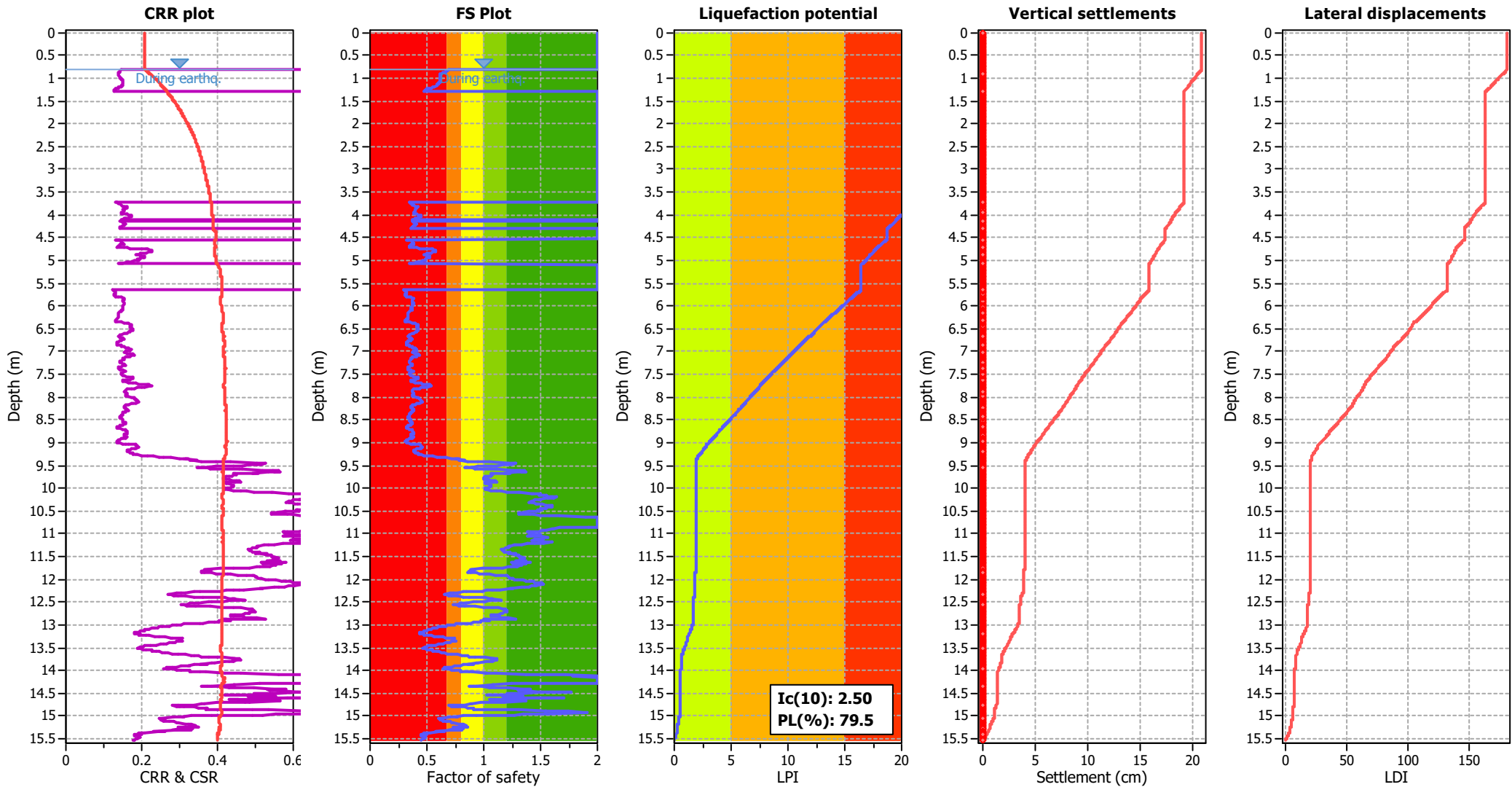
## Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

## SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

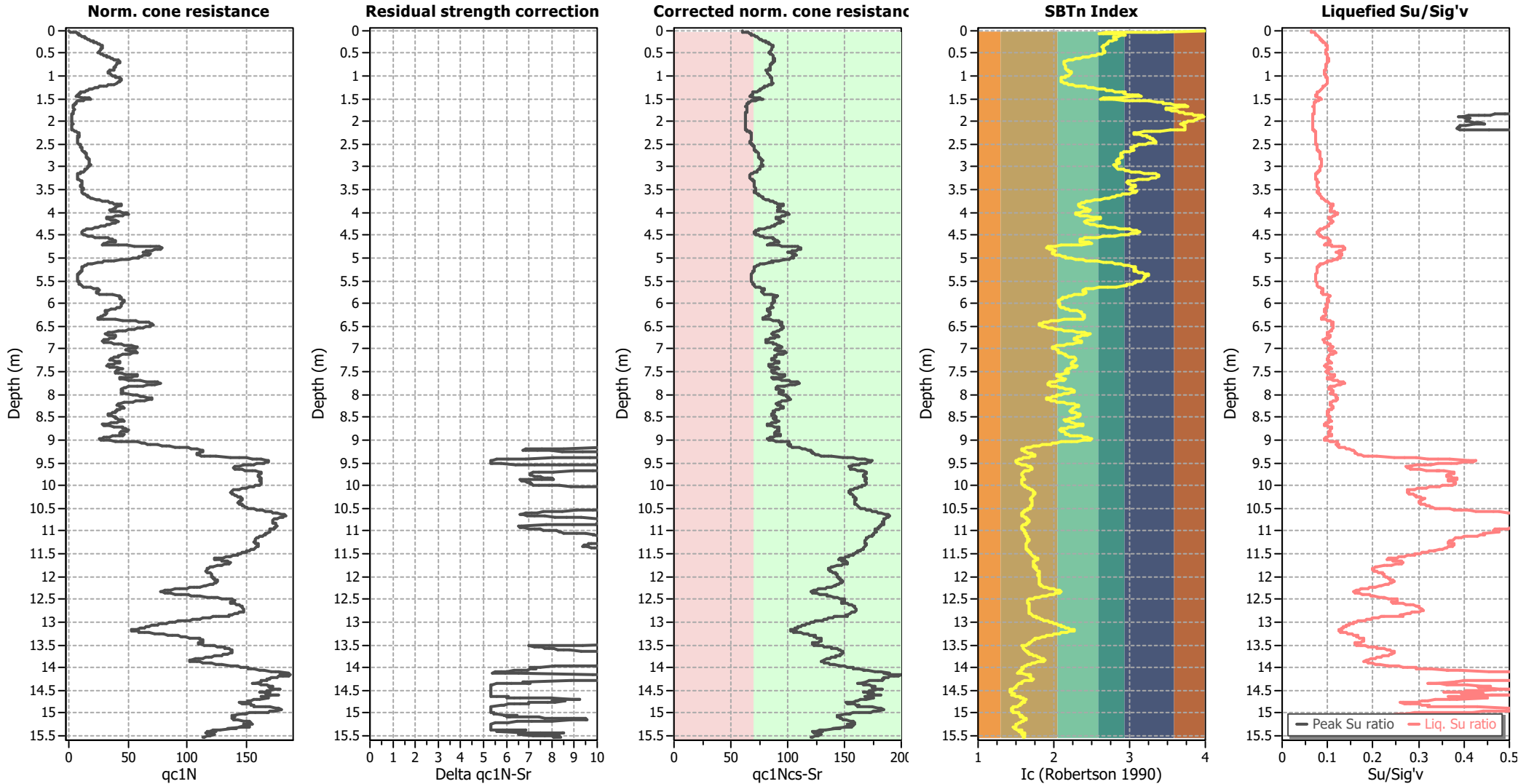
F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

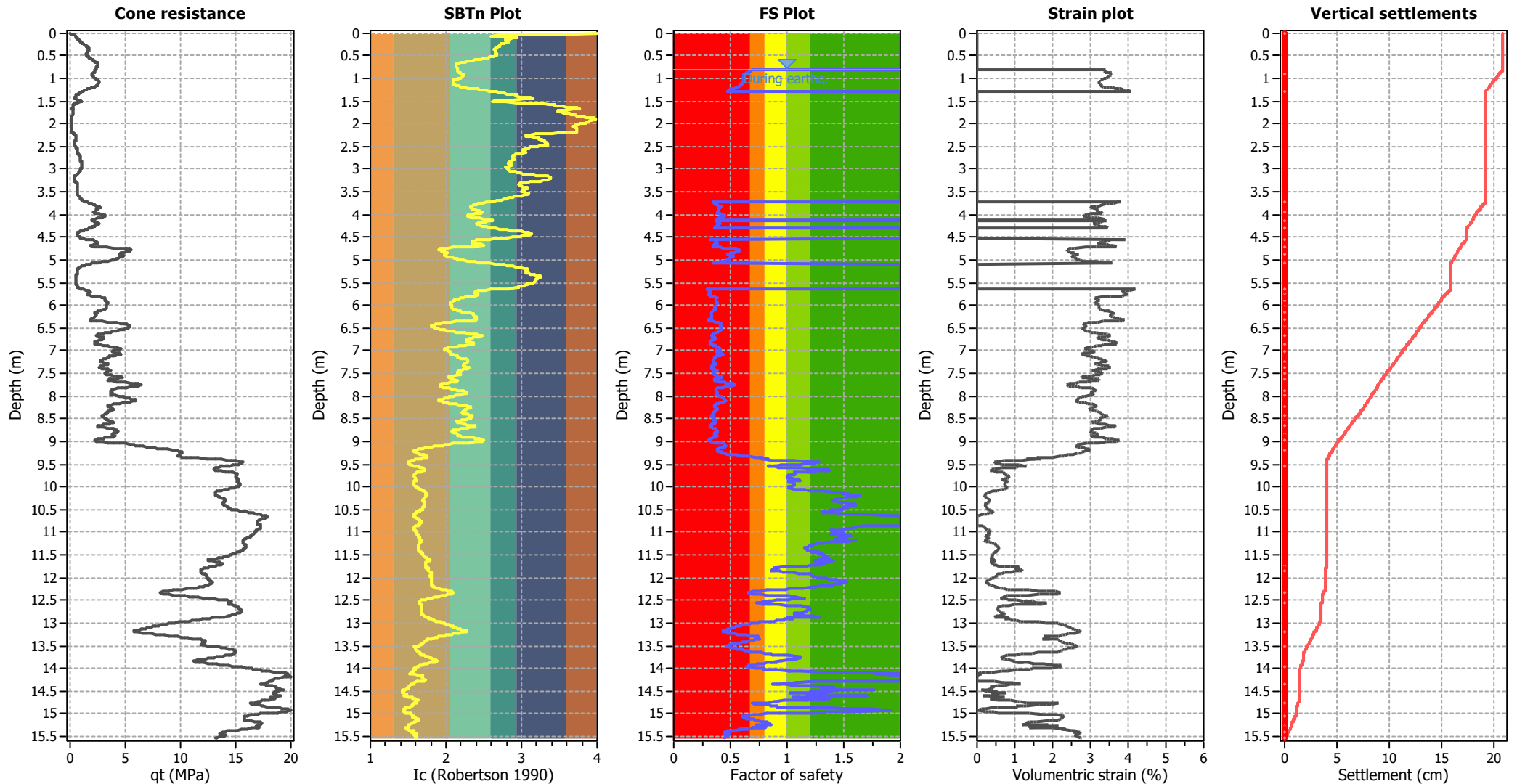
Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

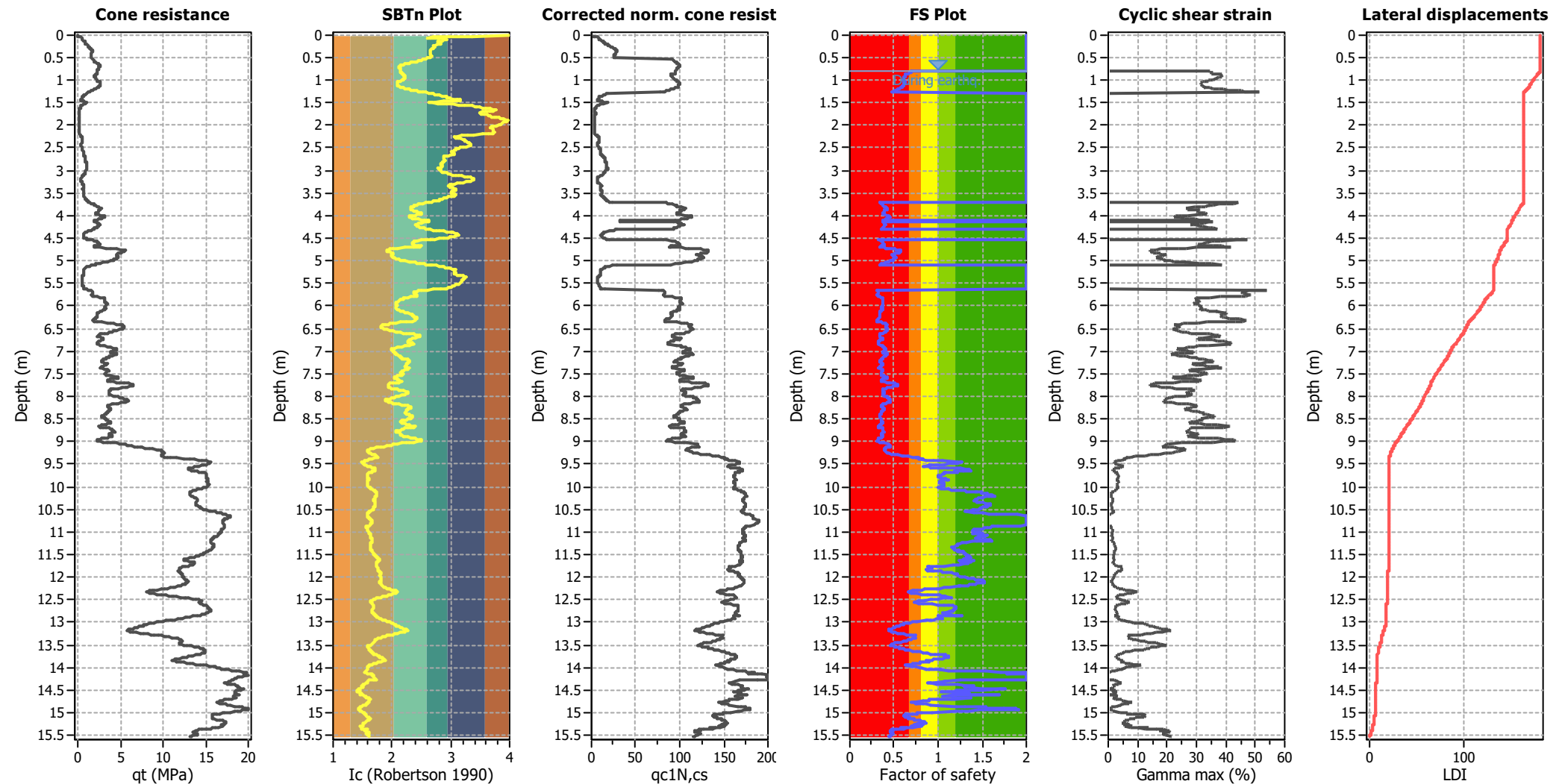
Estimation of post-earthquake settlements



Abbreviations

- q<sub>c</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)
- I<sub>c</sub>: Soil Behaviour Type Index
- FS: Calculated Factor of Safety against liquefaction
- Volumetric strain: Post-liquefaction volumetric strain

Estimation of post-earthquake lateral Displacements



Abbreviations

- qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

Ic: Soil Behaviour Type Index

qc1N,cs: Equivalent clean sand normalized CPT total cone resistance
- F.S.: Factor of safety

$\gamma_{max}$ : Maximum cyclic shear strain

LDI: Lateral displacement index



## LIQUEFACTION ANALYSIS REPORT

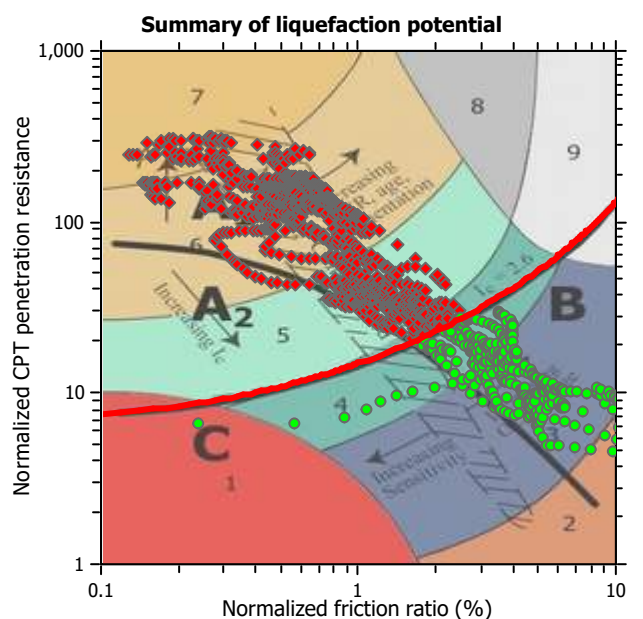
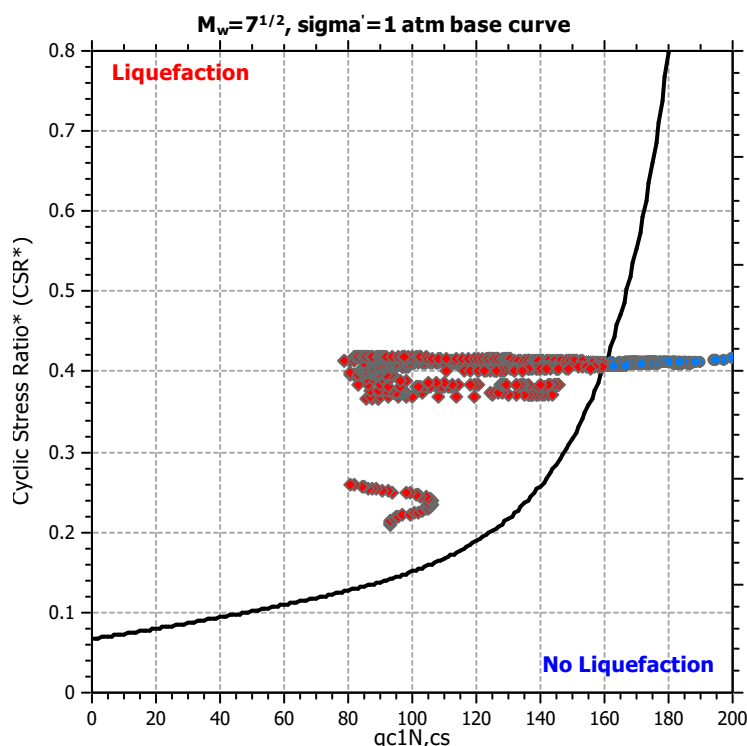
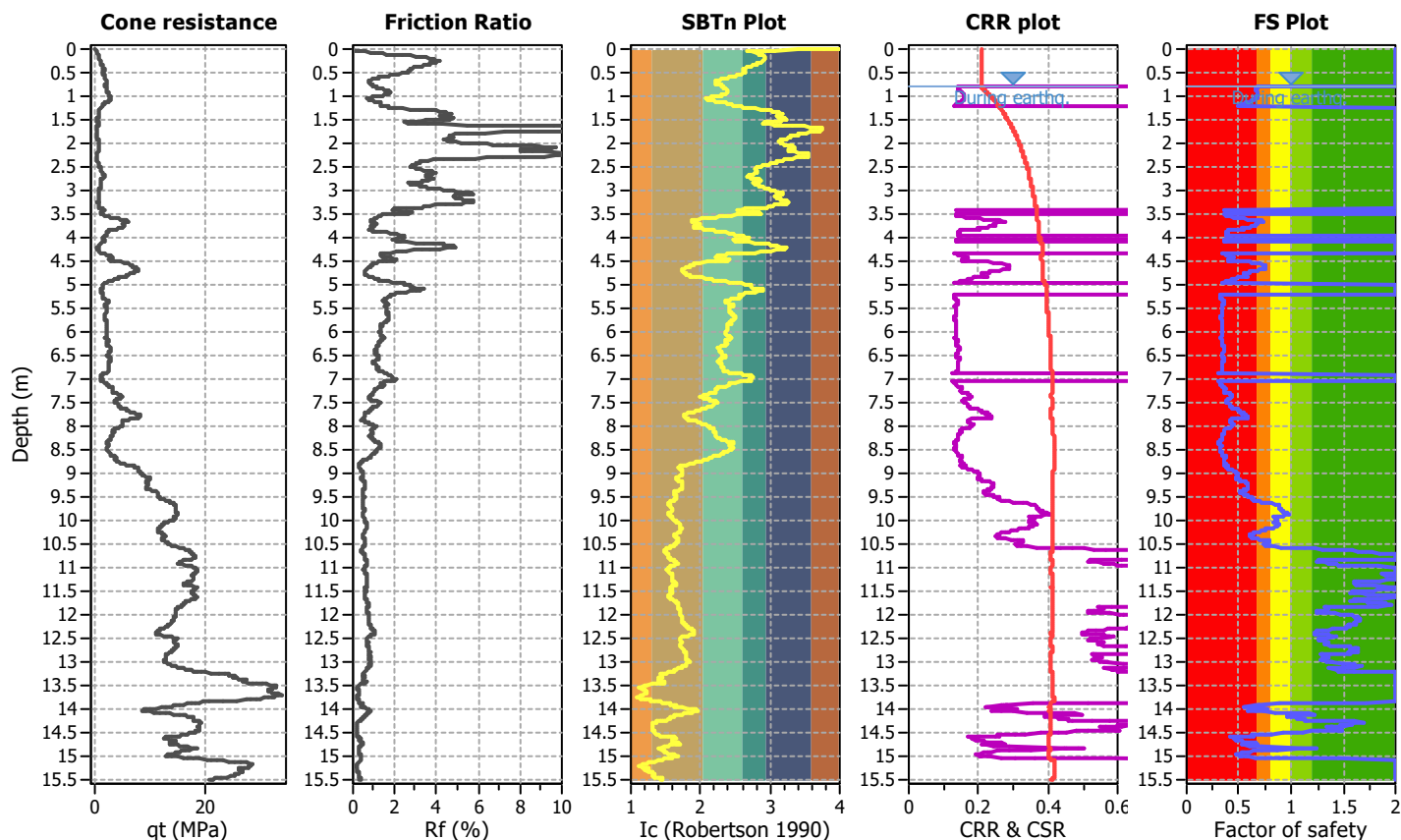
**Project title : Multi Unit development**

**Location : 196 Hills Road- nearby NZGD sourced CPT's**

**CPT file : CPT\_180292\_13ms**

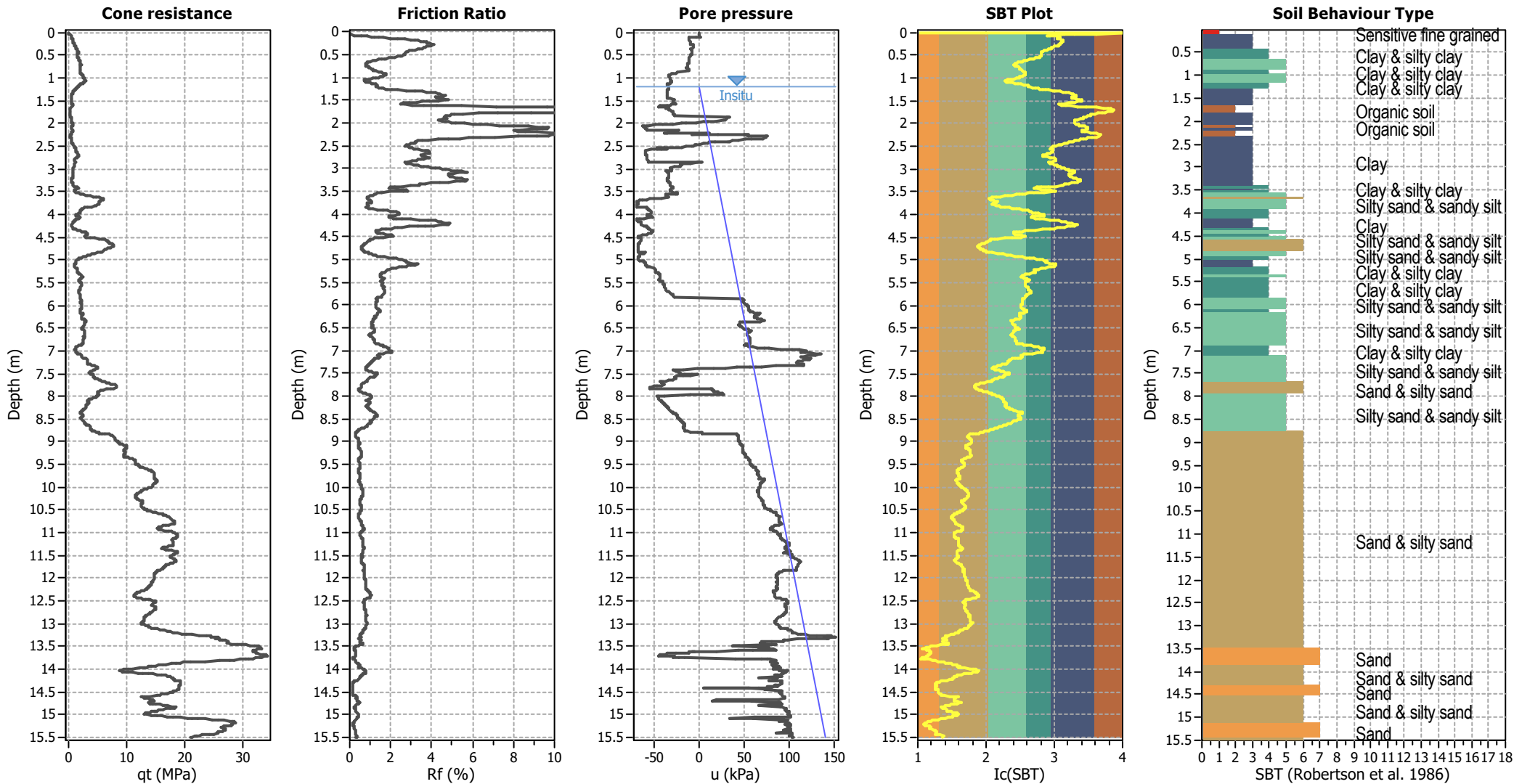
### Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	0.80 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	N/A
Peak ground acceleration:	0.35	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



Input parameters and analysis data

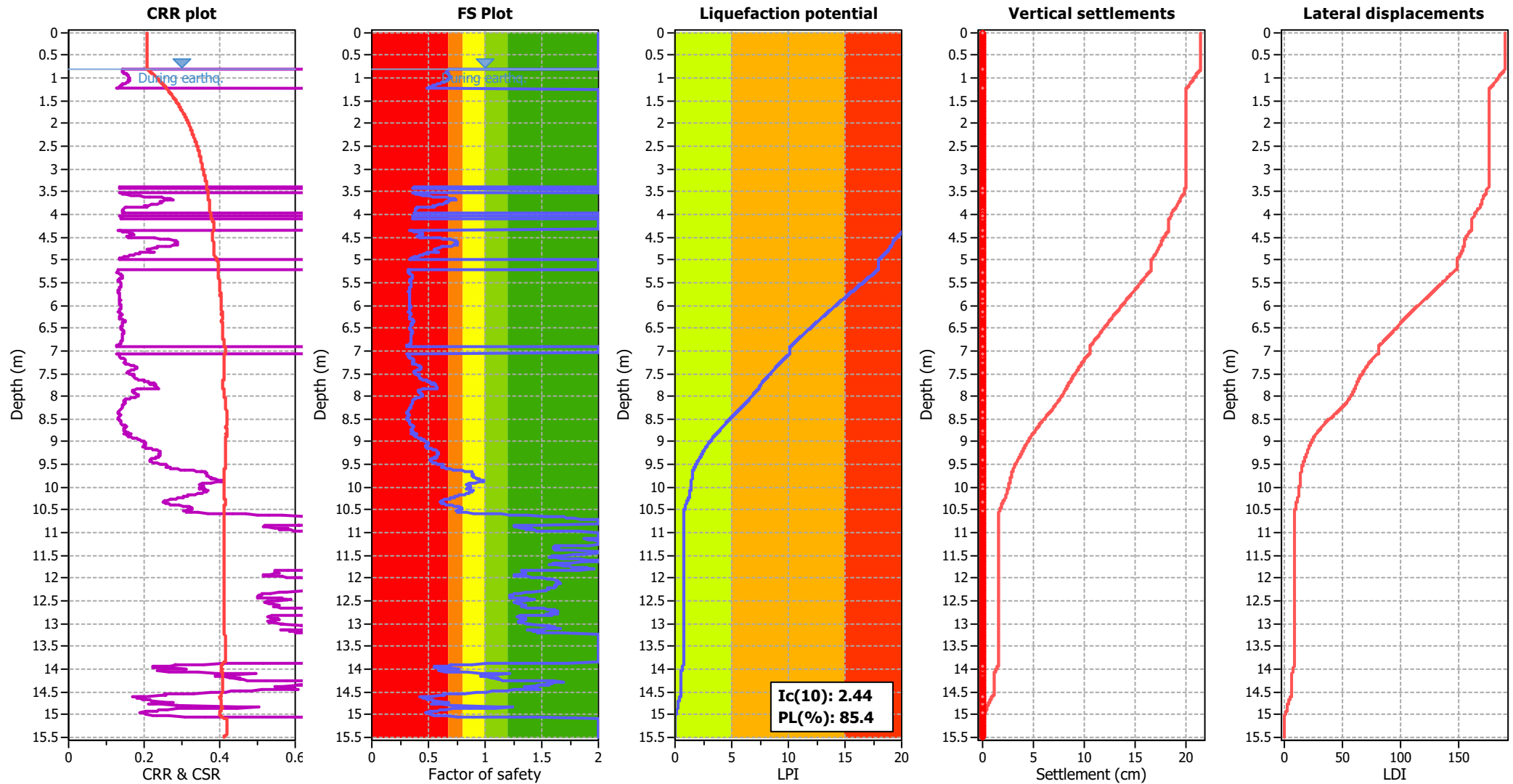
Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained



## Liquefaction analysis overall plots



### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

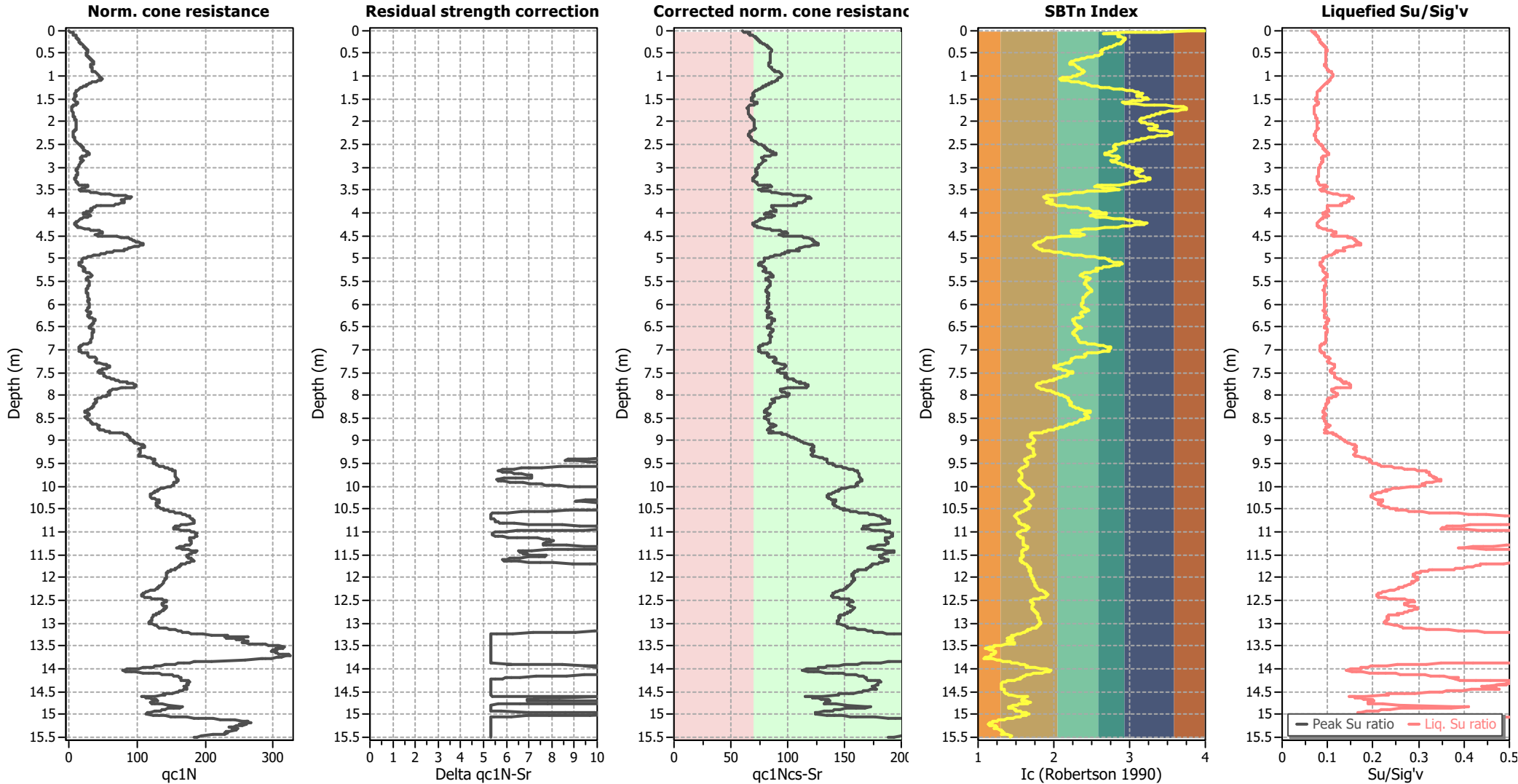
### F.S. color scheme

<span style="color: red;">■</span>	Almost certain it will liquefy
<span style="color: orange;">■</span>	Very likely to liquefy
<span style="color: yellow;">■</span>	Liquefaction and no liq. are equally likely
<span style="color: lightgreen;">■</span>	Unlike to liquefy
<span style="color: green;">■</span>	Almost certain it will not liquefy

### LPI color scheme

<span style="color: red;">■</span>	Very high risk
<span style="color: orange;">■</span>	High risk
<span style="color: yellow;">■</span>	Low risk

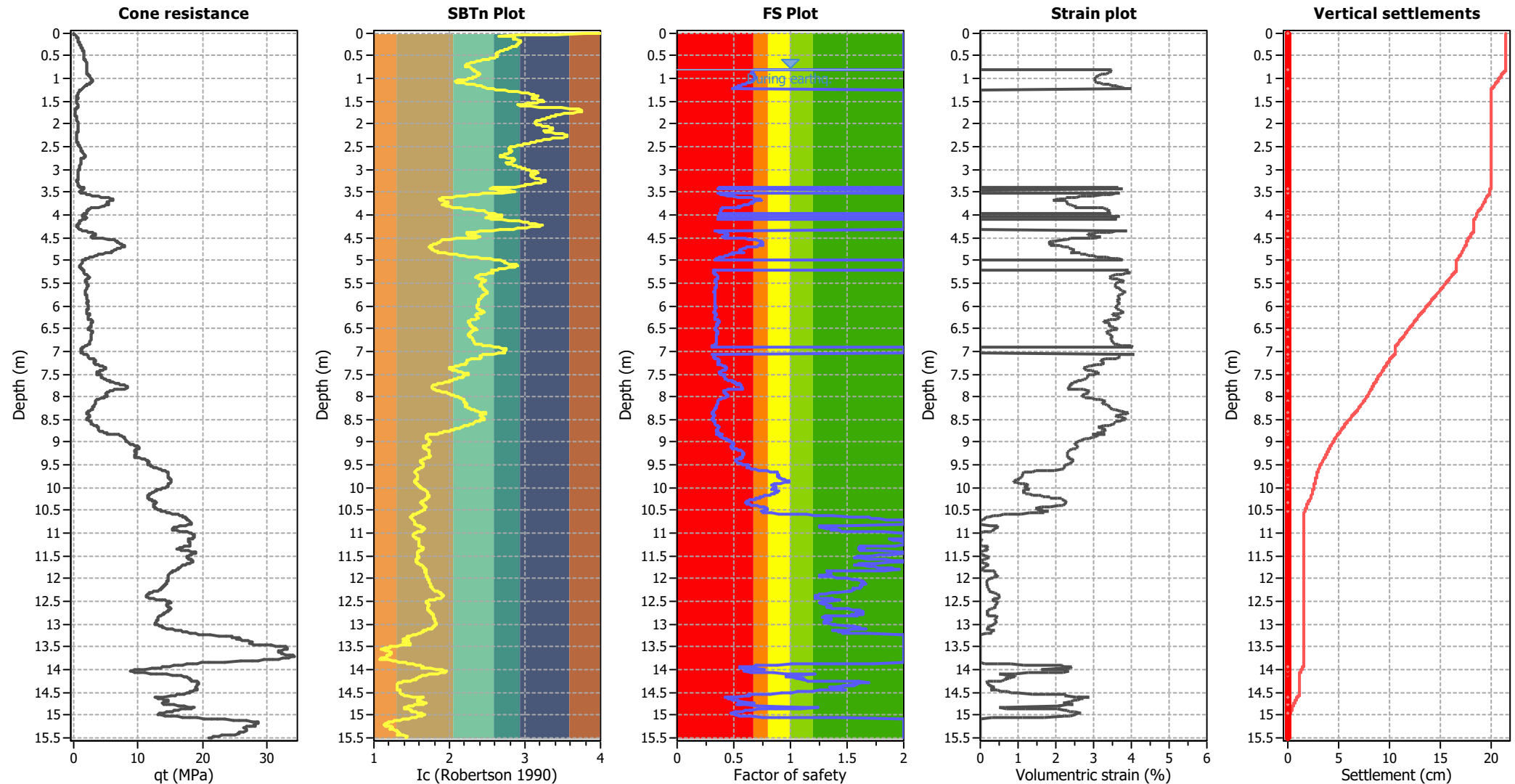
Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.80 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 <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.20 m	Fill height:	N/A	Limit depth:	N/A

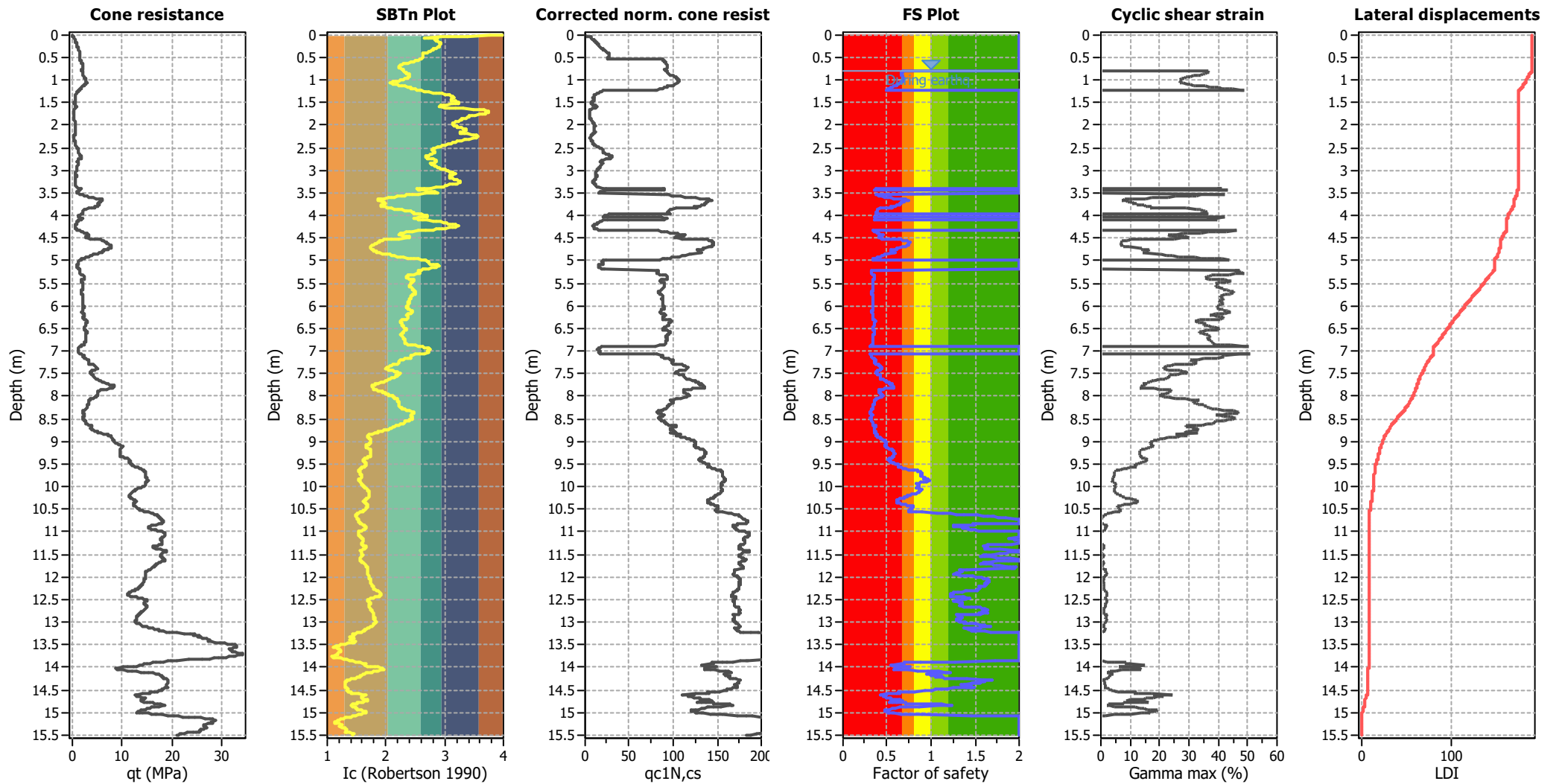
## Estimation of post-earthquake settlements



### Abbreviations

$q_c$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 FS: Calculated Factor of Safety against liquefaction  
 Volumetric strain: Post-liquefaction volumetric strain

### Estimation of post-earthquake lateral Displacements



#### Abbreviations

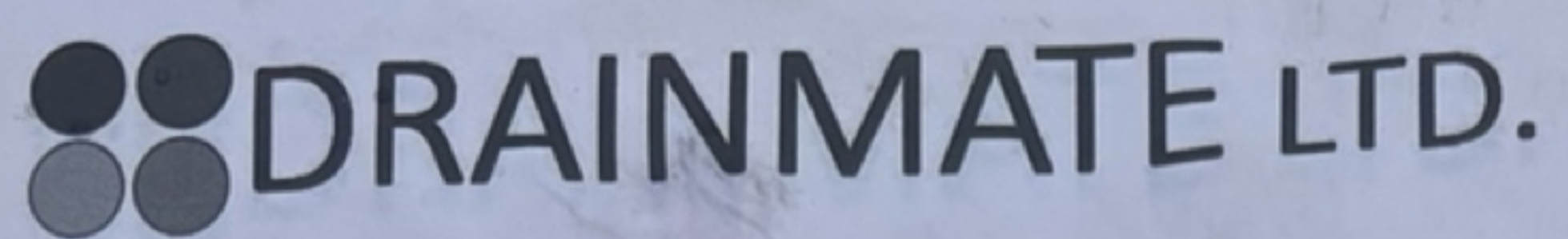
$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $q_{c1N,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index



- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>Buildings</li> <li>WwAccess</li> <li>Standard Manhole</li> <li>WwLocalPressureCon</li> <li>WwLocalPressureTan</li> <li>WwEye</li> <li>Eye</li> <li>Eye</li> <li>WwLateralFitting</li> <li>Lateral Fitting</li> <li>WwPipeFlowDirection</li> <li>WwPipe</li> <li>NominalDiameter</li> <li>Diameter is greater than 200mm, up to 450mm</li> <li>WwLateral</li> <li>WwLateral (non CCC)</li> <li>In Service</li> <li>Removed</li> <li>SwInlet</li> <li>Single Sump</li> <li>Double Sump</li> <li>SwPipeFlowDirection</li> <li>SwLateralFitting</li> <li>Inspection Point</li> <li>SwPipe</li> <li>NominalDiameter</li> <li>Diameter is 450mm or smaller</li> </ul> | <ul style="list-style-type: none"> <li>SwPipeProtection</li> <li>SwPipe (non CCC)</li> <li>In Service</li> <li>SwLateral (non CCC)</li> <li>In Service</li> <li>WwValve</li> <li>Gate</li> <li>Sluice</li> <li>WwHydrant</li> <li>WwConnection</li> <li>Meter</li> <li>WwPipeRestraint</li> <li>WwFitting</li> <li>End Cap</li> <li>Connector</li> <li>Connector</li> <li>Connector</li> <li>Connector</li> <li>Connector</li> <li>WwPipe</li> <li>NominalDiameter</li> <li>Diameter is 110mm or smaller</li> <li>Diameter is greater than 225mm</li> <li>WwLateral</li> <li>WwLateral (non CCC)</li> <li>In Service</li> <li>RatingUnit</li> </ul> |
|--|---|

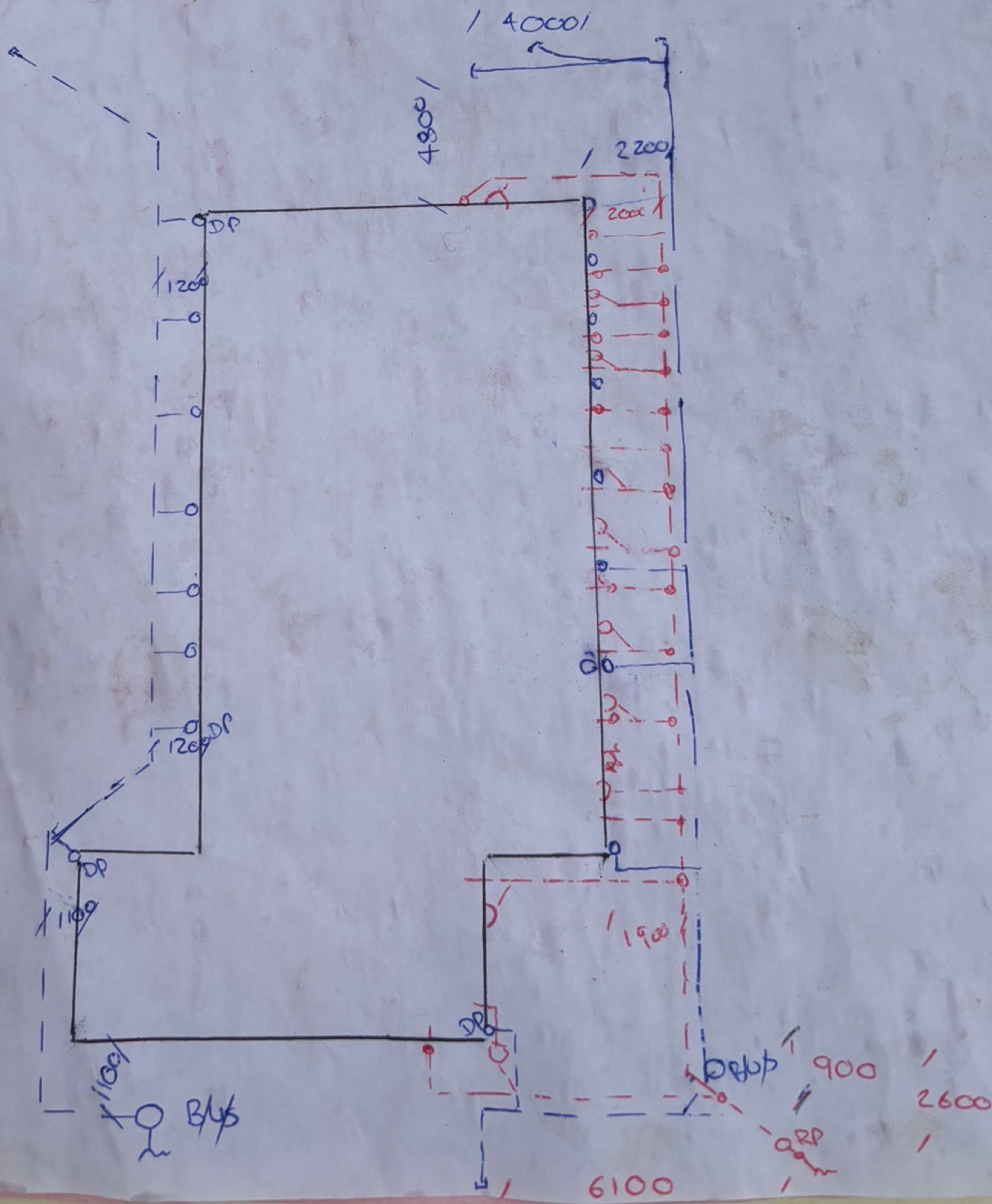




☐ Lewis Walker      Reg # 19383

Job No.	
Date	8-8-2024
Address	196 Hills Rd
Builder	
S/W Grade	1:100
F/W Grade	

**DRAINAGE AS LAID FOR CONSENT NO. ....**





PLUMBING & DRAINAGE PLAN NOTES

All drainage shown as indicative only. Drain sizes and gradients are to be confirmed and finalised by Plumber and Drainlayer.

All plumbing & drainage to comply with the NZBC approved documents:  
E1/AS1 Surface Water  
G13/AS1-AS3 Foul Water  
AS/NZS 3500.2.2021

All plumbing and drainage to comply with above by qualified tradesperson. Allow to check all dimensions and falls of drains onsite prior to installation.

All waste pipes PVC. Sizes, fall, venting & discharge to be confirmed by NZ qualified plumber. Confirm positions of available services cabling etc. on site prior to any excavation.

All pipework & pipes exposed to freezing to be lagged with closed cell foam.

Each title will require an individual water meter and supply lateral to ensure that each title is separately metered without creating a cross boundary supply.

HWC to be installed with safety tray with a 40mmØ drain discharging to outside in a visible position.

Hose tap positions to be confirmed with client.

Integrated overflow required to sinks & tubs as per E3/AS1 2.02.

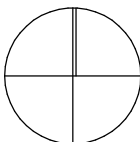
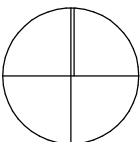
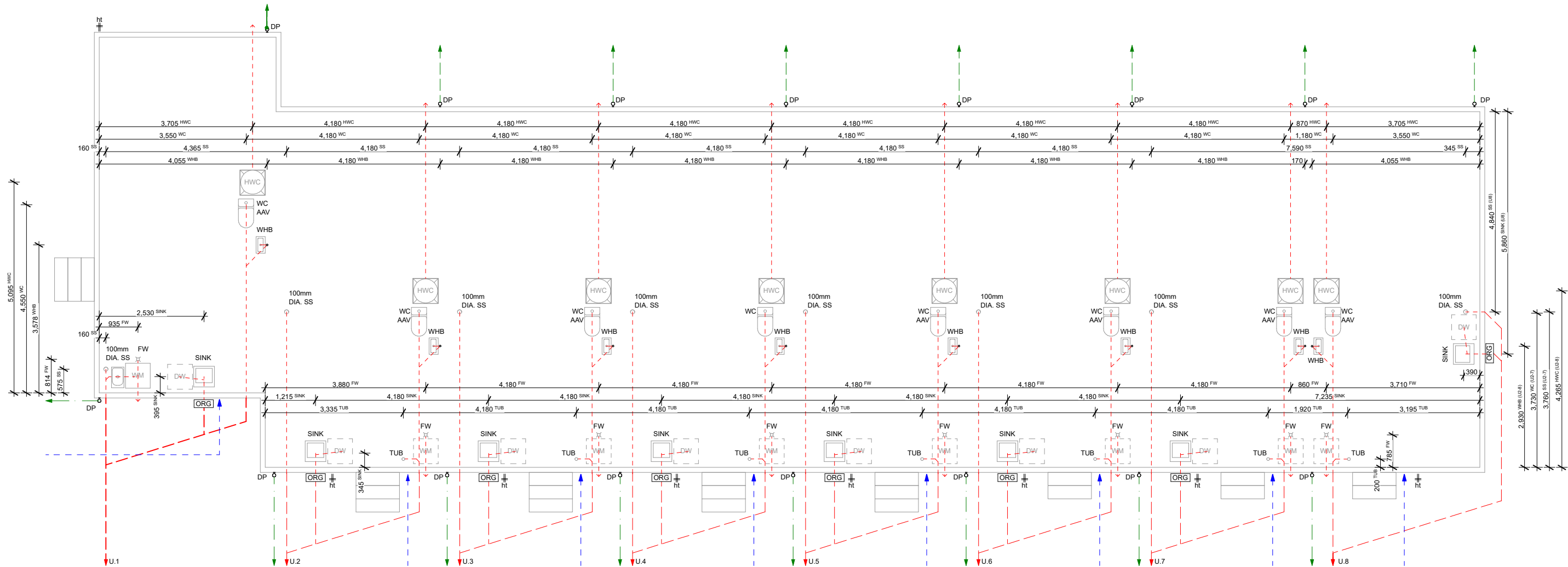
DRAINAGE KEY

- 100dia. Sewer Drain @ 1:60 fall
- 100dia. Stormwater Drain @ 1:60 fall
- Water Service - refer Civil plans
- Fixture discharge pipes - refer to Schedule for sizes and falls
- DP Downpipe - 80Ø
- SS Sanitary sewer
- SW Stormwater
- IP Inspection port

- WHB Wash Hand Basin
- WC Water closet
- DW Dish Washer
- WM Washing Machine
- GT Gully Trap
- FU's Fixture Units
- TV 50dia. branch drain vent
- 80dia. main drain vent
- ht Hose tap

INTERNAL PLUMBING KEY

Fixture	Pipe Ø	Fall
Sink	50Ø	1:40
Bath	40Ø	1:40
WHB	40Ø	1:40
Shower	40Ø	1:40
Tub	50Ø	1:40
WC	100Ø	1:60
DW	40Ø	1:40
WM	50Ø	1:40







# Certificate of Compliance

## Unique ID: 454.6/E278163



This form has been designed to be used by licensed electrical workers to certify that installations or Part installations under Part 1 or Part 2 of AS/NZS 3000 are safe to be connected to the specified system of electrical supply.

### (1) Location of Installation or Part Installation

Address: Unit 6, 196 Hills Road, Edgeware, Christchurch 8013

### (2) Customer / Occupier / Owner Information

Name: Rosefern Homes

Address: 153 Waltham Road, Sydenham, Christchurch 8023

Email: japdeep@rosefernhomes.co.nz

Phone: \_\_\_\_\_

### (3) Electrical Worker Information

Name: Quentin Schuster

Registration/Practising Licence No.: E278163

Organisation: BT Electrical Solutions

Phone: 021 210 3879

Email: quin@btelectricalsolutions.co.nz

Name of person(s) being supervised: \_\_\_\_\_

### (4) Work Details

This work is: ☒ Is New Work ☐ Is Addition ☐ Is Alteration ☐ Is Maintenance

The prescribed electrical work is: ☐ Home Owner ☐ Low Risk ☐ General ☒ High Risk

High Risk Specified: New mains installed new build

Reference Standards: ☐ Part 1 of AS/NZS 3000

☒ Part 2 of AS/NZS 3000

☐ AS/NZS 3012

☐ Additional Standards \_\_\_\_\_

Indicate the number of each item installed or altered:

Lighting Outlets: 20

Socket Outlets: 21

Ranges: 1

Water Heaters: 1

Work Done: Electrical services to 8 x 2 Bedroom, 1 x Bathroom Units

The work was done within the period: Date Commenced: 08/10/2024

Date Completed: 10/12/2024

### (5) Certification of Work

I certify that the completed prescribed electrical work to which this certificate applies, has been done lawfully and safely and the information in the certificate is correct in that the installation, or part of the installation:

☒ Relies on manufacturer's instructions ☐ Attached/Ref

☒ Relies on Declaration of Conformity ☐ Attached/Ref

☒ Accordance with certified design ☐ Attached/Ref

Reference: JARussell.co.nz

☒ Tested in accordance with ESR2010

☒ Earthing system that is correctly rated

☒ Fittings safe to connect

☒ Safe to connect to a power supply

#### Test Results

Continuity of Earthing System: 0.3ohms

Insulation Resistance: 500Mohms

Polarity – Correct Circuit Connections: Correct

Verification of Impedance:

Bonding: All below 0.5

Other:

Signature: \_\_\_\_\_

Date: 11/12/2024



# Certificate of Compliance

## Unique ID: 454.5/E278163



This form has been designed to be used by licensed electrical workers to certify that installations or Part installations under Part 1 or Part 2 of AS/NZS 3000 are safe to be connected to the specified system of electrical supply.

### (1) Location of Installation or Part Installation

Address: 196 Hills Road, Edgeware, Christchurch 8013

### (2) Customer / Occupier / Owner Information

Name: Rosefern Homes

Address: 153 Waltham Road, Sydenham, Christchurch 8023

Email: japdeep@rosefernhomes.co.nz

Phone: \_\_\_\_\_

### (3) Electrical Worker Information

Name: Quentin Schuster

Registration/Practising Licence No.: E278163

Organisation: BT Electrical Solutions

Phone: 021 210 3879

Email: quin@btelectricalsolutions.co.nz

Name of person(s) being supervised: \_\_\_\_\_

### (4) Work Details

This work is: ☒ Is New Work ☐ Is Addition ☐ Is Alteration ☐ Is Maintenance

The prescribed electrical work is: ☐ Home Owner ☐ Low Risk ☐ General ☒ High Risk

High Risk Specified: New mains installed new build

Reference Standards: ☐ Part 1 of AS/NZS 3000

☒ Part 2 of AS/NZS 3000

☐ AS/NZS 3012

☐ Additional Standards \_\_\_\_\_

Indicate the number of each item installed or altered:

Lighting Outlets: 20 Socket Outlets: 21 Ranges: 1 Water Heaters: 1

Work Done: Electrical services to 8 x 2 Bedroom, 1 x Bathroom Units

The work was done within the period: Date Commenced: 08/10/2024

Date Completed: 10/12/2024

### (5) Certification of Work

I certify that the completed prescribed electrical work to which this certificate applies, has been done lawfully and safely and the information in the certificate is correct in that the installation, or part of the installation:

☒ Relies on manufacturer's instructions ☐ Attached/Ref

☒ Relies on Declaration of Conformity ☐ Attached/Ref

☒ Accordance with certified design ☐ Attached/Ref

Reference: JARussell.co.nz

☒ Tested in accordance with ESR2010

☒ Earthing system that is correctly rated

☒ Fittings safe to connect

☒ Safe to connect to a power supply

#### Test Results

Continuity of Earthing System:	0.2
Insulation Resistance:	500Mohms
Polarity – Correct Circuit Connections:	Correct
Verification of Impedance:	
Bonding:	All below 0.5ohms
Other:	

Signature: \_\_\_\_\_

Date: 11/12/2024

## ELECTRICAL SAFETY CERTIFICATE

This Electrical Safety Certificate provides a legally recognisable statement that the connected installation or part installation, or any fitting that supplies an installation or a part of an installation, is safe to use following prescribed electrical work

### JOB INFORMATION

**Reference / Job#:** FD122024-6-196HRESC  
**Installation address:** unit 6/196 Hills Road, Edgware, Christchurch, 8013

### CUSTOMER INFORMATION

**Name:** BT Electrical Solution  
**Email:** quin@btelectricalsolutions.co.nz  
**Phone:**  
**Postal address:** Christchurch, Christchurch  
**Mobile:**

### WORK DETAILS

#### DESCRIPTION OF WORK DONE

Mains Work , Metering  
New Connection-New House  
Testing and Livening to Main Switch Only

### ELECTRICAL SAFETY CERTIFICATE

*I certify that the installation, or part of the installation, to which the Electrical Safety Certificate applies is connected to a power supply and is safe to use.*

**This ESC applies to:** Part Installation



**Name:** Filimoni Dretiverata  
**Certificate Issue Date** 9/12/2024

**Registration:** I068979  
**Connection Date:** 9/12/2024



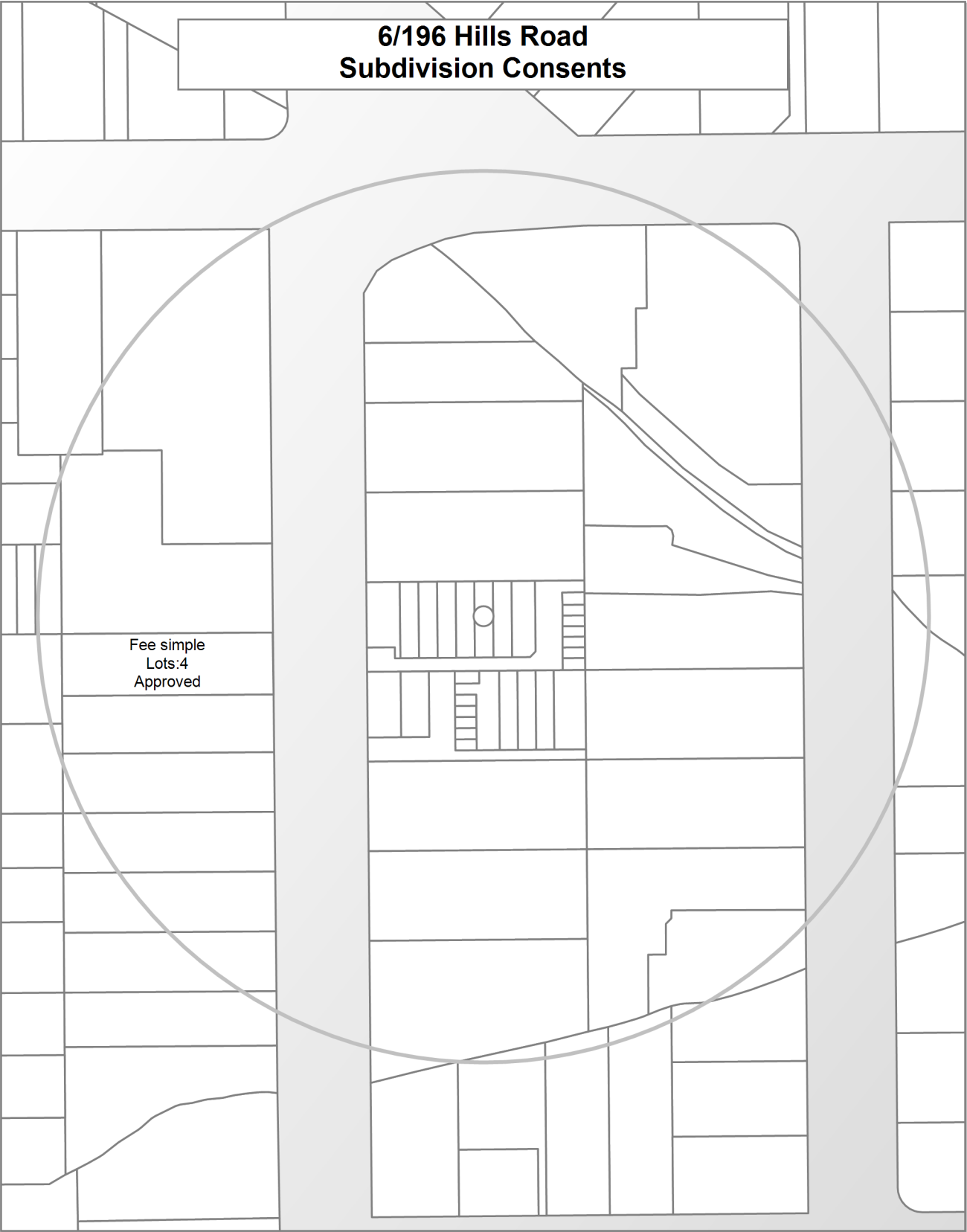
*This certificate also confirms that the electrical work complies with the building code for the purposes of Section 19 (1)(e) of the Building Act* Version 3.01

***This is an important document and should be retained for a minimum of seven years.***

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**6/196 Hills Road  
Subdivision Consents**

Fee simple  
Lots:4  
Approved



## Land Use Resource Consents within 100 metres of 6/196 Hills Road

Note: This list does not include subdivision Consents and Certificates of Compliance issued under the Resource Management Act.

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### 1/149 Slater Street

RMA/2006/2906

Vehicle workshop - Historical Reference RMA92007023

Processing complete

Applied 06/12/2006

Decision issued 19/02/2007

Granted 16/02/2007

### 1/192 Hills Road

RMA/2022/3520

Minimum Floor Level Certificate

Processing complete

Applied 16/11/2022

Certificate issued 22/11/2022

RMA/2022/3526

Construct seven residential units

Processing complete

Applied 17/11/2022

Decision issued 13/01/2023

Granted 13/01/2023

Within scope amendment accepted 10/03/2023

Within scope amendment decision issued 14/03/2023

RMA/2024/569

Subdivision - Fee simple - Seven lots with land use

Processing complete

Applied 06/03/2024

s223 Certificate issued 06/08/2024

s224 Certificate issued 06/08/2024

Decision issued 08/04/2024

Granted 08/04/2024



## **1/196 Hills Road**

RMA/1978/266

Dispensation to allow temporary vehicle turning facilities within the proposed future street boundaries in respect of the development of the property. - Historical Reference RES9211518

Processing complete

Applied 11/07/1978

Decision issued 18/08/1978

Granted 18/08/1978

RMA/2023/2692

Construct eight residential units

Processing complete

Applied 13/10/2023

Decision issued 18/01/2024

Granted 18/01/2024

Within scope amendment accepted 05/08/2024

Within scope amendment decision issued 05/08/2024

RMA/2023/3101

Minimum floor level certificate

Processing complete

Applied 30/11/2023

Certificate issued 14/12/2023

RMA/2024/2323

Subdivision - Fee simple - Eight lots with land use

Processing complete

Applied 14/08/2024

s223 Certificate issued 31/10/2024

s224 Certificate issued 20/12/2024

Decision issued 05/09/2024

Granted 05/09/2024

## **10 Shirley Road**

RMA/1979/436

Consent to site a relocatable classroom 4.1m from street boundary, in lieu of 4.5m - Historical Reference RES9216345

Processing complete

Applied 12/03/1979

Decision issued 15/03/1979

Granted 15/03/1979

RMA/1999/4627

Landscaping of Shirley Communit Centre and waterway enchancement. Does not comply with the filling and filling depth and excavation requirements. - Historical Reference RMA1372

Processing complete

Applied 24/11/1999

Decision issued 25/05/2000

Granted 24/05/2000

RMA/2000/2567

Erect a building to replace an exis building that does not comply with street setback, area exceeds100m2, exceeds 1% coverage. - Historical Reference RMA20003322

Processing complete

Applied 11/10/2000

Decision issued 24/11/2000

Granted 24/11/2000

RMA/2001/2960

To prune the protected trees on the site of the Shirley Community Centre and remove one Beech Tree along the Shirley Road frontage. - Historical Reference RMA20008891

Processing complete

Applied 03/12/2001

Decision issued 21/12/2001

Granted 20/12/2001

RMA/2002/1677

Reconstruction of existing footpath and road within 10m of a protected tree. - Historical Reference RMA20010690

Processing complete

Applied 09/07/2002

Decision issued 23/08/2002

Granted 22/08/2002

RMA/2002/271

Work within 10 metres of a protected tree - Historical Reference RMA20009243

Processing complete

Applied 28/01/2002

Decision issued 01/03/2002

Granted 25/02/2002

RMA/2008/1366

Earthquake strengthening alterations to a listed building. Works requiring pruning of a notable tree - Historical Reference RMA92012221

Processing complete

Applied 27/06/2008

Decision issued 26/11/2008

Granted 26/11/2008

RMA/2017/1446

Temporary Depot/Storage facility for Downer in association with Dudley Creek Flood mitigation work

Processing complete

Applied 22/06/2017

Decision issued 10/05/2018

Granted 10/05/2018

### **137 Slater Street**

RMA/1998/277

Relocate garage within the 5m waterway setback required from a Utility waterway, and parking in tandem without on-site manoeuvring. - Historical Reference RES980214

Processing complete

Applied 28/01/1998

Decision issued 24/02/1998

Granted 24/02/1998

RMA/2006/1451

Additions to dwelling - Historical Reference RMA92005508

Processing complete

Applied 26/06/2006

Decision issued 03/07/2006

Granted 03/07/2006

## **141 Slater Street**

RMA/2022/1551

Minimum Floor Level Certificate

Processing complete

Applied 13/05/2022

Certificate issued 15/06/2022

RMA/2022/1909

Subdivision - Fee simple - Boundary Adjustment

Processing complete

Applied 09/06/2022

s223 Certificate issued 16/11/2022

s224 Certificate issued 16/11/2022

Decision issued 13/07/2022

Granted 13/07/2022

## **143 Slater Street**

RMA/2022/1551

Minimum Floor Level Certificate

Processing complete

Applied 13/05/2022

Certificate issued 15/06/2022

RMA/2022/1909

Subdivision - Fee simple - Boundary Adjustment

Processing complete

Applied 09/06/2022

s223 Certificate issued 16/11/2022

s224 Certificate issued 16/11/2022

Decision issued 13/07/2022

Granted 13/07/2022

RMA/2024/1017

Minimum Floor Level Certificate

Processing complete

Applied 10/04/2024

Certificate issued 15/04/2024

RMA/2024/672

Construct a dwelling with detached garage

Processing complete

Applied 15/03/2024

Decision issued 07/05/2024

Granted 07/05/2024

## **151 Slater Street**

RMA/1990/162

Erect a garage and studio exceeding 65m<sup>2</sup> for a single accessory building and exceeding 85m<sup>2</sup> in total accessory buildings. proposed 170m<sup>2</sup>. exceeds 3.6m - Historical Reference RES9203041

Processing complete

Applied 12/02/1990

Decision issued 21/02/1990

Granted 21/02/1990

RMA/2005/2033

To convert the garage/rumpus room to a house, & to build a new garage. Proposal does not comply with rules for outdoor living, recession planes & boundary setbacks. - Historical Reference RMA20020911

Processing complete

Applied 02/09/2005

Decision issued 15/09/2005

Granted 14/09/2005

RMA/2010/564

New garage encroaching recession plane and SAM 10 road setback - Historical Reference RMA92016077

Processing complete

Applied 22/04/2010

Decision issued 20/05/2010

Granted 20/05/2010

RMA/2018/1697

New double garage between dwelling and road in a character area, and a dwelling extension to the rear.

Processing complete

Applied 16/07/2018

Decision issued 22/08/2018

Granted 22/08/2018

## **155 Slater Street**

RMA/2006/2985

Erect a double garage in the front yard - Historical Reference RMA92007109

Withdrawn

Applied 15/12/2006

## **156 Slater Street**

RMA/1995/901

2nd dwelling on site. Existing dwelling is 1.65m from boundary and breaks through the recession plane. - Historical Reference RES951043

Processing complete

Applied 19/05/1995

Decision issued 14/06/1995

Granted 14/06/1995

RMA/2014/3118

Replacement Dwelling Rejected under s.88. Replaced by RMA92027960 - Historical Reference RMA92027818

Withdrawn

Applied 26/11/2014

RMA/2014/3257

Dwelling with attached garage Replaces RMA92027818 - Historical Reference RMA92027960

Processing complete

Applied 05/12/2014

Decision issued 28/01/2015

Granted 28/01/2015

## **157 Slater Street**

RMA/2001/2796

New dwelling less than 7 metres from an environmental asseset waterway and 1.5 from internal boundary. - Historical Reference RMA20008720

Processing complete

Applied 14/11/2001

Decision issued 20/12/2001

Granted 20/12/2001



## **165A Slater Street**

RMA/1967/23

Convert dwelling into 2 flats. - Historical Reference RES9203045

Processing complete

Applied 28/06/1967

Decision issued 22/08/1967

Granted 22/08/1967

RMA/1991/186

Erect a workshop which protrudes into the 35 degree recession plane by 300mm on the south boundary. - Historical Reference RES9203043

Processing complete

Applied 19/10/1991

Decision issued 05/11/1991

Granted 05/11/1991

RMA/2002/888

New garage. - Historical Reference RMA20009872

Processing complete

Applied 17/04/2002

Decision issued 02/05/2002

Granted 02/05/2002

RMA/2005/2696

To construct ten apartments with garages on 0.1862ha Living 1 SAM10. - Historical Reference RMA20021596

Withdrawn

Applied 29/11/2005

RMA/2006/1716

Application for the construction of 8 Elderly persons housing units - Historical Reference RMA92005784

Processing complete

Applied 10/07/2006

Decision issued 03/11/2006

Granted 02/11/2006

**165B Slater Street**

RMA/2006/1716

Application for the construction of 8 Elderly persons housing units - Historical Reference RMA92005784

Processing complete

Applied 10/07/2006

Decision issued 03/11/2006

Granted 02/11/2006

**165C Slater Street**

RMA/2006/1716

Application for the construction of 8 Elderly persons housing units - Historical Reference RMA92005784

Processing complete

Applied 10/07/2006

Decision issued 03/11/2006

Granted 02/11/2006

**165D Slater Street**

RMA/2006/1716

Application for the construction of 8 Elderly persons housing units - Historical Reference RMA92005784

Processing complete

Applied 10/07/2006

Decision issued 03/11/2006

Granted 02/11/2006

**165E Slater Street**

RMA/2006/1716

Application for the construction of 8 Elderly persons housing units - Historical Reference RMA92005784

Processing complete

Applied 10/07/2006

Decision issued 03/11/2006

Granted 02/11/2006

**165F Slater Street**

RMA/2006/1716

Application for the construction of 8 Elderly persons housing units - Historical Reference RMA92005784

Processing complete

Applied 10/07/2006

Decision issued 03/11/2006

Granted 02/11/2006

### **165G Slater Street**

RMA/2006/1716

Application for the construction of 8 Elderly persons housing units - Historical Reference RMA92005784

Processing complete

Applied 10/07/2006

Decision issued 03/11/2006

Granted 02/11/2006

### **165H Slater Street**

RMA/2006/1716

Application for the construction of 8 Elderly persons housing units - Historical Reference RMA92005784

Processing complete

Applied 10/07/2006

Decision issued 03/11/2006

Granted 02/11/2006

### **168 Hills Road**

RMA/2008/781

EXTENSION OF GARAGE - Historical Reference RMA92011588

Processing complete

Applied 14/04/2008

Decision issued 23/04/2008

Granted 21/04/2008

### **187 Hills Road**

RMA/2013/1137

Replace earthquake damaged dwelling - Historical Reference RMA92022784

Processing complete

Applied 25/06/2013

Decision issued 11/07/2013

Granted 11/07/2013

## **189 Hills Road**

RMA/2011/257

Application to erect a double garage - Historical Reference RMA92017773

Processing complete

Applied 14/03/2011

Decision issued 04/04/2011

Granted 29/03/2011

## **199A Hills Road**

RMA/2020/2324

Construction of four units with attached garages

Processing complete

Applied 14/10/2020

Decision issued 30/11/2020

Granted 30/11/2020

RMA/2020/2755

Minimum floor level certificate

Processing complete

Applied 25/11/2020

Certificate issued 26/11/2020

RMA/2021/2375

Reapplied under 2021 DC Policy - Fee simple subdivision in four lots

Surrendered

Applied 23/07/2021

Decision issued 16/09/2021

Granted 16/09/2021

RMA/2021/4238

Reapplied under 2021 DC Policy - Fee simple subdivision in four lots

Processing complete

Applied 16/12/2021

s223 Certificate issued 28/01/2022

s224 Certificate issued 25/02/2022

Decision issued 25/01/2022

Granted 24/01/2022

## **199B Hills Road**

RMA/2020/2324

Construction of four units with attached garages

Processing complete

Applied 14/10/2020

Decision issued 30/11/2020

Granted 30/11/2020

RMA/2020/2755

Minimum floor level certificate

Processing complete

Applied 25/11/2020

Certificate issued 26/11/2020

RMA/2021/2375

Reapplied under 2021 DC Policy - Fee simple subdivision in four lots

Surrendered

Applied 23/07/2021

Decision issued 16/09/2021

Granted 16/09/2021

RMA/2021/4238

Reapplied under 2021 DC Policy - Fee simple subdivision in four lots

Processing complete

Applied 16/12/2021

s223 Certificate issued 28/01/2022

s224 Certificate issued 25/02/2022

Decision issued 25/01/2022

Granted 24/01/2022

## **199C Hills Road**

RMA/2020/2324

Construction of four units with attached garages

Processing complete

Applied 14/10/2020

Decision issued 30/11/2020

Granted 30/11/2020

RMA/2020/2755

Minimum floor level certificate

Processing complete

Applied 25/11/2020

Certificate issued 26/11/2020

RMA/2021/2375

Reapplied under 2021 DC Policy - Fee simple subdivision in four lots

Surrendered

Applied 23/07/2021

Decision issued 16/09/2021

Granted 16/09/2021

RMA/2021/4238

Reapplied under 2021 DC Policy - Fee simple subdivision in four lots

Processing complete

Applied 16/12/2021

s223 Certificate issued 28/01/2022

s224 Certificate issued 25/02/2022

Decision issued 25/01/2022

Granted 24/01/2022

## **199D Hills Road**

RMA/2020/2324

Construction of four units with attached garages

Processing complete

Applied 14/10/2020

Decision issued 30/11/2020

Granted 30/11/2020

RMA/2020/2755

Minimum floor level certificate

Processing complete

Applied 25/11/2020

Certificate issued 26/11/2020



RMA/2021/2375

Reapplied under 2021 DC Policy - Fee simple subdivision in four lots

Surrendered

Applied 23/07/2021

Decision issued 16/09/2021

Granted 16/09/2021

RMA/2021/4238

Reapplied under 2021 DC Policy - Fee simple subdivision in four lots

Processing complete

Applied 16/12/2021

s223 Certificate issued 28/01/2022

s224 Certificate issued 25/02/2022

Decision issued 25/01/2022

Granted 24/01/2022

## **2/149 Slater Street**

RMA/2006/2906

Vehicle workshop - Historical Reference RMA92007023

Processing complete

Applied 06/12/2006

Decision issued 19/02/2007

Granted 16/02/2007

## **2/192 Hills Road**

RMA/2022/3520

Minimum Floor Level Certificate

Processing complete

Applied 16/11/2022

Certificate issued 22/11/2022

RMA/2022/3526

Construct seven residential units

Processing complete

Applied 17/11/2022

Decision issued 13/01/2023

Granted 13/01/2023

Within scope amendment accepted 10/03/2023

Within scope amendment decision issued 14/03/2023

RMA/2024/569

Subdivision - Fee simple - Seven lots with land use

Processing complete

Applied 06/03/2024

s223 Certificate issued 06/08/2024

s224 Certificate issued 06/08/2024

Decision issued 08/04/2024

Granted 08/04/2024

## **2/196 Hills Road**

RMA/1978/266

Dispensation to allow temporary vehicle turning facilities within the proposed future street boundaries in respect of the development of the property. - Historical Reference RES9211518

Processing complete

Applied 11/07/1978

Decision issued 18/08/1978

Granted 18/08/1978

RMA/2023/2692

Construct eight residential units

Processing complete

Applied 13/10/2023

Decision issued 18/01/2024

Granted 18/01/2024

Within scope amendment accepted 05/08/2024

Within scope amendment decision issued 05/08/2024

RMA/2023/3101

Minimum floor level certificate

Processing complete

Applied 30/11/2023

Certificate issued 14/12/2023

RMA/2024/2323

Subdivision - Fee simple - Eight lots with land use

Processing complete

Applied 14/08/2024

s223 Certificate issued 31/10/2024

s224 Certificate issued 20/12/2024

Decision issued 05/09/2024

Granted 05/09/2024

## **2/197 Hills Road**

RMA/1991/955

Garage on second unit penetrates recession plane by 300mm. Living court reduced to 47m2 Unit 1- existing dwelling.Reduce street setback for garageable space, existing dwelling to 1.5m. Neighbours consent - Historical Reference RES9217559

Processing complete

Applied 30/09/1991

Decision issued 14/10/1991

Granted 14/10/1991

## **204 Hills Road**

RMA/1999/4345

To erect a single storey building for retail purposes, to building within 10m of dudley Stream and to store an re and use up to 320kg of LPG. - Historical Reference RMA1214

Processing complete

Applied 04/11/1999

Decision issued 14/09/2000

Declined 14/09/2000

Granted on appeal 11/10/2001

RMA/2001/646

To erect two single storey buildings with a floor space of 1216.7m2 at 8 Shirley Road within stream setba ck. - Historical Reference RMA20004513

Withdrawn

Applied 14/03/2001

RMA/2002/2545

To erect signage 2m x 1.5m freestanding illuminated pole signs on the site. - Historical Reference RMA20011588

Processing complete

Applied 08/10/2002

Decision issued 02/12/2002

Granted 29/11/2002

RMA/2003/1866

Retrospective consent to erect two 0.6m x 0.5m signs attached to two existing 2.0m x 1.5m freestanding illuminated pole signs on the site. - Historical Reference RMA20014171

Processing complete

Applied 21/07/2003

Decision issued 25/07/2003

Granted 25/07/2003

## **205A Hills Road**

RMA/1974/299

Consent to erect an oververandah sign, double faced vertical 5'10" x 1'6". - Historical Reference RES9219769

Processing complete

Applied 28/08/1974

Decision issued 24/09/1974

Declined 24/09/1974

RMA/1996/1876

To removal existing shops and dwellings and establish a shopping complex which totals 1000.1m2 of gross leasable floorspace on the south-west - Historical Reference RES962199

Processing complete

Applied 20/08/1996

Decision issued 10/01/1997

Granted 10/01/1997

RMA/1997/2883

Signage exceeding 1m2 permitted, Main pole signage not setback required distance of 50 metres (approx 32 metres proposed). - Historical Reference RES973333

Processing complete

Applied 20/11/1997

Decision issued 16/12/1997

Granted 16/12/1997

RMA/1997/3126

Signage exceeds permitted area under the pcg (underlying zone is currently L1 and R1). - Historical Reference RES973614

Processing complete

Applied 15/12/1997

Decision issued 16/12/1997

Granted 16/12/1997

RMA/1998/2032

To establish and operate a cafe/ bar, licensed for the sale of liquor and food for consumption on the premises, with associated servicing facilities, car park - Historical Reference RES982324

Processing complete

Applied 26/08/1998

Decision issued 01/01/1999

Granted 01/01/1999

RMA/1999/5623

To establish and operate a AA Express which provides drivers license renewals and driver testing. - Historical Reference RMA881

Processing complete

Applied 07/04/1999

RMA/2000/2214

To extend the Shirley Plaza shopping centre by approximately 460m2, associated parking and signage. - Historical Reference RMA20002956

Processing complete

Applied 30/08/2000

Decision issued 17/01/2001

Granted 17/01/2001

RMA/2001/2030

The construction and use of an office complex in association with an existing retail and office centre Shirley Plaza (565m2) with associated parking, signage etc. - Historical Reference RMA20007932

Processing complete

Applied 23/08/2001

Decision issued 25/10/2001

Granted 17/10/2001

## **205B Hills Road**

RMA/2000/2214

To extend the Shirley Plaza shopping centre by approximately 460m2, associated parking and signage. - Historical Reference RMA20002956

Processing complete

Applied 30/08/2000

Decision issued 17/01/2001

Granted 17/01/2001

## **205C Hills Road**

RMA/2000/2214

To extend the Shirley Plaza shopping centre by approximately 460m2, associated parking and signage. - Historical Reference RMA20002956

Processing complete

Applied 30/08/2000

Decision issued 17/01/2001

Granted 17/01/2001

## **205D Hills Road**

RMA/2000/2214

To extend the Shirley Plaza shopping centre by approximately 460m2, associated parking and signage. - Historical Reference RMA20002956

Processing complete

Applied 30/08/2000

Decision issued 17/01/2001

Granted 17/01/2001

## **205E Hills Road**

RMA/2000/2214

To extend the Shirley Plaza shopping centre by approximately 460m2, associated parking and signage. - Historical Reference RMA20002956

Processing complete

Applied 30/08/2000

Decision issued 17/01/2001

Granted 17/01/2001



## **205F Hills Road**

RMA/2000/2214

To extend the Shirley Plaza shopping centre by approximately 460m2, associated parking and signage. - Historical Reference RMA20002956

Processing complete

Applied 30/08/2000

Decision issued 17/01/2001

Granted 17/01/2001

## **205G Hills Road**

RMA/2000/2214

To extend the Shirley Plaza shopping centre by approximately 460m2, associated parking and signage. - Historical Reference RMA20002956

Processing complete

Applied 30/08/2000

Decision issued 17/01/2001

Granted 17/01/2001

## **3/192 Hills Road**

RMA/2022/3520

Minimum Floor Level Certificate

Processing complete

Applied 16/11/2022

Certificate issued 22/11/2022

RMA/2022/3526

Construct seven residential units

Processing complete

Applied 17/11/2022

Decision issued 13/01/2023

Granted 13/01/2023

Within scope amendment accepted 10/03/2023

Within scope amendment decision issued 14/03/2023

RMA/2024/569

Subdivision - Fee simple - Seven lots with land use

Processing complete

Applied 06/03/2024

s223 Certificate issued 06/08/2024

s224 Certificate issued 06/08/2024

Decision issued 08/04/2024

Granted 08/04/2024

### **3/196 Hills Road**

RMA/1978/266

Dispensation to allow temporary vehicle turning facilities within the proposed future street boundaries in respect of the development of the property. - Historical Reference RES9211518

Processing complete

Applied 11/07/1978

Decision issued 18/08/1978

Granted 18/08/1978

RMA/2023/2692

Construct eight residential units

Processing complete

Applied 13/10/2023

Decision issued 18/01/2024

Granted 18/01/2024

Within scope amendment accepted 05/08/2024

Within scope amendment decision issued 05/08/2024

RMA/2023/3101

Minimum floor level certificate

Processing complete

Applied 30/11/2023

Certificate issued 14/12/2023

RMA/2024/2323

Subdivision - Fee simple - Eight lots with land use

Processing complete

Applied 14/08/2024

Decision issued 05/09/2024

Granted 05/09/2024

s223 Certificate issued 31/10/2024

s224 Certificate issued 20/12/2024

## **4/192 Hills Road**

RMA/2022/3520

Minimum Floor Level Certificate

Processing complete

Applied 16/11/2022

Certificate issued 22/11/2022

RMA/2022/3526

Construct seven residential units

Processing complete

Applied 17/11/2022

Decision issued 13/01/2023

Granted 13/01/2023

Within scope amendment accepted 10/03/2023

Within scope amendment decision issued 14/03/2023

RMA/2024/569

Subdivision - Fee simple - Seven lots with land use

Processing complete

Applied 06/03/2024

s223 Certificate issued 06/08/2024

s224 Certificate issued 06/08/2024

Decision issued 08/04/2024

Granted 08/04/2024

## **4/196 Hills Road**

RMA/1978/266

Dispensation to allow temporary vehicle turning facilities within the proposed future street boundaries in respect of the development of the property. - Historical Reference RES9211518

Processing complete

Applied 11/07/1978

Decision issued 18/08/1978

Granted 18/08/1978

RMA/2023/2692

Construct eight residential units

Processing complete

Applied 13/10/2023

Decision issued 18/01/2024

Granted 18/01/2024

Within scope amendment accepted 05/08/2024

Within scope amendment decision issued 05/08/2024

RMA/2023/3101

Minimum floor level certificate

Processing complete

Applied 30/11/2023

Certificate issued 14/12/2023

RMA/2024/2323

Subdivision - Fee simple - Eight lots with land use

Processing complete

Applied 14/08/2024

s223 Certificate issued 31/10/2024

s224 Certificate issued 20/12/2024

Decision issued 05/09/2024

Granted 05/09/2024

## **5/192 Hills Road**

RMA/2022/3520

Minimum Floor Level Certificate

Processing complete

Applied 16/11/2022

Certificate issued 22/11/2022

RMA/2022/3526

Construct seven residential units

Processing complete

Applied 17/11/2022

Decision issued 13/01/2023

Granted 13/01/2023

Within scope amendment accepted 10/03/2023

Within scope amendment decision issued 14/03/2023

RMA/2024/569

Subdivision - Fee simple - Seven lots with land use

Processing complete

Applied 06/03/2024

s223 Certificate issued 06/08/2024

s224 Certificate issued 06/08/2024

Decision issued 08/04/2024

Granted 08/04/2024

## **5/196 Hills Road**

RMA/1978/266

Dispensation to allow temporary vehicle turning facilities within the proposed future street boundaries in respect of the development of the property. - Historical Reference RES9211518

Processing complete

Applied 11/07/1978

Decision issued 18/08/1978

Granted 18/08/1978

RMA/2023/2692

Construct eight residential units

Processing complete

Applied 13/10/2023

Decision issued 18/01/2024

Granted 18/01/2024

Within scope amendment accepted 05/08/2024

Within scope amendment decision issued 05/08/2024

RMA/2023/3101

Minimum floor level certificate

Processing complete

Applied 30/11/2023

Certificate issued 14/12/2023

RMA/2024/2323

Subdivision - Fee simple - Eight lots with land use

Processing complete

Applied 14/08/2024

s223 Certificate issued 31/10/2024

s224 Certificate issued 20/12/2024

Decision issued 05/09/2024

Granted 05/09/2024

## **6/192 Hills Road**

RMA/2022/3520

Minimum Floor Level Certificate

Processing complete

Applied 16/11/2022

Certificate issued 22/11/2022

RMA/2022/3526

Construct seven residential units

Processing complete

Applied 17/11/2022

Decision issued 13/01/2023

Granted 13/01/2023

Within scope amendment accepted 10/03/2023

Within scope amendment decision issued 14/03/2023

RMA/2024/569

Subdivision - Fee simple - Seven lots with land use

Processing complete

Applied 06/03/2024

s223 Certificate issued 06/08/2024

s224 Certificate issued 06/08/2024

Decision issued 08/04/2024

Granted 08/04/2024

## **7/192 Hills Road**

RMA/2022/3520

Minimum Floor Level Certificate

Processing complete

Applied 16/11/2022

Certificate issued 22/11/2022

RMA/2022/3526

Construct seven residential units

Processing complete

Applied 17/11/2022

Granted 13/01/2023

Within scope amendment accepted 10/03/2023

Within scope amendment decision issued 14/03/2023

Decision issued 13/01/2023

RMA/2024/569

Subdivision - Fee simple - Seven lots with land use

Processing complete

Applied 06/03/2024

s223 Certificate issued 06/08/2024

s224 Certificate issued 06/08/2024

Decision issued 08/04/2024

Granted 08/04/2024

## **7/196 Hills Road**

RMA/1978/266

Dispensation to allow temporary vehicle turning facilities within the proposed future street boundaries in respect of the development of the property. - Historical Reference RES9211518

Processing complete

Applied 11/07/1978

Decision issued 18/08/1978

Granted 18/08/1978



RMA/2023/2692

Construct eight residential units

Processing complete

Applied 13/10/2023

Granted 18/01/2024

Within scope amendment accepted 05/08/2024

Within scope amendment decision issued 05/08/2024

Decision issued 18/01/2024

RMA/2023/3101

Minimum floor level certificate

Processing complete

Applied 30/11/2023

Certificate issued 14/12/2023

RMA/2024/2323

Subdivision - Fee simple - Eight lots with land use

Processing complete

Applied 14/08/2024

Decision issued 05/09/2024

Granted 05/09/2024

s223 Certificate issued 31/10/2024

s224 Certificate issued 20/12/2024

## **7/42 Woodville Street**

RMA/1997/1543

A two Lot subdivision which does not comply with either the old City Transitional Plan or the Proposed Plan. - Historical Reference RES971724

Processing complete

Applied 01/07/1997

Decision issued 04/07/1997

Granted 04/07/1997

RMA/2021/3022

Proposed new multi-unit residential complex - 7 units

Processing complete

Applied 10/09/2021

Conditions changed/cancelled - s127 14/06/2022

Decision issued 10/11/2021

Granted 09/11/2021

RMA/2022/2678

Subdivision - Fee simple - 13 lots with land use

Processing complete

Applied 18/08/2022

s223 Certificate issued 09/11/2022

s224 Certificate issued 09/11/2022

Decision issued 10/10/2022

Granted 10/10/2022

## **7B Warden Street**

RMA/2002/1442

Application to erect a garage which intrudes the recession plane and waterway setback - Historical Reference  
RMA20010449

Processing complete

Applied 19/06/2002

Decision issued 12/07/2002

Granted 11/07/2002

RMA/2020/1391

Minimum floor level certificate

Processing complete

Applied 03/07/2020

Certificate issued 05/08/2020

RMA/2020/1998

Proposed multi-unit residential complex - two units

Processing complete

Applied 10/09/2020

Decision issued 24/02/2021

Granted 24/02/2021

RMA/2021/3997

Subdivision - Fee simple - and land use non-compliance

Processing complete

Applied 29/11/2021

s223 Certificate issued 25/08/2022

s224 Certificate issued 25/08/2022

Decision issued 04/02/2022

Granted 03/02/2022

## **8/196 Hills Road**

RMA/1978/266

Dispensation to allow temporary vehicle turning facilities within the proposed future street boundaries in respect of the development of the property. - Historical Reference RES9211518

Processing complete

Applied 11/07/1978

Decision issued 18/08/1978

Granted 18/08/1978

RMA/2023/2692

Construct eight residential units

Processing complete

Applied 13/10/2023

Decision issued 18/01/2024

Granted 18/01/2024

Within scope amendment accepted 05/08/2024

Within scope amendment decision issued 05/08/2024

RMA/2023/3101

Minimum floor level certificate

Processing complete

Applied 30/11/2023

Certificate issued 14/12/2023

RMA/2024/2323

Subdivision - Fee simple - Eight lots with land use

Processing complete

Applied 14/08/2024

s223 Certificate issued 31/10/2024

s224 Certificate issued 20/12/2024

Decision issued 05/09/2024

Granted 05/09/2024

## **9 Warden Street**

RMA/2015/843

Relocate two residential units to be used as EPH units - Historical Reference RMA92029080

Processing complete

Applied 27/03/2015

Decision issued 13/05/2015

Granted 13/05/2015

## **Data Quality Statement**

### **Land Use Consents**

All resource consents are shown for sites that have been labelled with an address. For sites that have been labelled with a cross (+) no resource consents have been found. Sites that have no label have not been checked for resource consents. This will be particularly noticeable on the margins of the search radius. If there are such sites and you would like them included in the check, please ask for the LIM spatial query to be rerun accordingly. This will be done free of charge although there may be a short delay. Resource consents which are on land occupied by roads, railways or rivers are not, and currently cannot be displayed, either on the map or in the list. Resource consents that relate to land that has since been subdivided, will be shown in the list, but not on the map. They will be under the address of the land as it was at the time the resource consent was applied for. Resource consents that are listed as Non-notified and are current, may in fact be notified resource consents that have not yet been through the notification process. If in doubt. Please phone (03)941 8999.

The term "resource consents" in this context means land use consents. Subdivision consents and certificates of compliance are excluded.

### **Subdivision Consents**

All subdivision consents are shown for the sites that have been labelled with consent details. For Sites that have been labelled with a cross (+) no records have been found. Sites that have no label have not been checked for subdivision consents. This will be particularly noticeable on the margins of the search radius. If there are such sites and you would like them included in the check, please ask for the LIM spatial query to be rerun accordingly. This will be done free of charge although there may be a short delay.

The term "subdivision consents" in this context means a resource consent application to subdivide land. Non subdivision land use resource consents and certificates of compliance are excluded.

This report will only record those subdivision applications which have not been completed i.e once a subdivision has been given effect to and the new lots/properties have been established the application which created those lots will not be shown

All subdivision consent information is contained on the map and no separate list is supplied