

Three large, light grey triangles are arranged in a larger triangular pattern in the upper left quadrant of the page. One triangle points upwards, while the other two point downwards towards it.

LAND INFORMATION MEMORANDUM

THIS LIM HAS BEEN OBTAINED BY THE VENDOR OR THE VENDOR'S AGENT FOR THEIR USE. PLEASE NOTE - A LIM IS A 'LIVING' DOCUMENT WHICH CAN BE CHANGED BY COUNCIL AT ANY TIME. ALTHOUGH A COPY OF THE VENDOR'S LIM HAS BEEN REQUESTED BY A PROSPECTIVE PURCHASER, IT IS THE SOLE RESPONSIBILITY OF THAT PURCHASER TO OBTAIN THEIR OWN ORIGINAL LIM FROM COUNCIL IN ORDER TO FULLY SATISFY THEMSELVES OF ITS CONTENTS.

This information has been supplied by the Vendor or the Vendor's agent.

Accordingly, Next Step Realty Limited is merely passing over the information as supplied to us by the Vendor or the Vendor's agent. All intending purchasers are advised to conduct their own due diligence investigation into the same. It is highly recommended that intended purchasers seek independent legal advice as part of due diligence. To the maximum extent permitted by law Next Step Realty Limited Real Estate Agency do not accept any responsibility to any person for the accuracy of the information herein. (I have been made aware that a court decision (ref Monticello) confirms that if I do not request or pay for a LIM myself the Council does not owe a duty of care to me in respect of the information provided in the LIM.)

Land Information Memorandum



Property address:
281A Innes Road

LIM number: H11610255

Page 1

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

Application details

Date issued 7 October 2026
Date received 6 October 2026

Property details

Property address 281A Innes Road, St Albans, Christchurch
Valuation roll number 22291 01702
Valuation information Capital Value: \$1,000,000
Land Value: \$440,000
Improvements Value: \$560,000
Please note: these values are intended for Rating purposes
Legal description Lot 4 DP 476751
Existing owner Robert Lester Warner
Lorraine Teresa Warner
281A Innes Road
Christchurch 8052

Council references

Rate account ID 73173763
LIM number H11610255
Property ID 1171604

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. It is essential that the applicant undertakes their own due diligence to verify the suitability of the property for their intended use.

Under Information Privacy Principle 3A (IPP3A) of the Privacy Act 2020, if personal information is collected indirectly (from someone other than the individual concerned), the affected person should be notified. If you are submitting a request on behalf of another individual and providing personal information to Council, please ensure that they are made aware of this prior to submission.

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.

Property address:
281A Innes Road

LIM number: H11610255

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

1. Special features and characteristics of the land

Section 44(A)(2)(aa) LGOIMA. This is information known to the Council but is not apparent from 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 the likely presence of hazardous contaminants.

☎ For enquiries, please phone (03) 941 8999 or visit www.ccc.govt.nz.

Natural Hazards

Section 44A(2)(a) LGOIMA. This is information known to the Council about natural hazards that is required by section 44B LGOIMA.

Council's information has primarily been obtained from external specialists with the technical expertise to carry out research, investigation or analysis. Under the Local Government (Natural Hazard Information in Land Information Memoranda) Regulations 2025, the Council isn't required to:

- prepare a risk assessment of the land concerned.
- undertake any further analysis relating to the land.
- conduct additional searches or inquiries about the existence of natural hazard information.

It is the LIM recipient's responsibility to seek qualified advice about any identified natural hazard and/or the suitability of the land for its intended purpose.

This section may also include natural hazard information provided by Environment Canterbury. Christchurch City Council is required to include such information in LIMs where Environment Canterbury considers it meets the criteria under section 44C of LGOIMA.

The following statement has been provided by Environment Canterbury:

This Land Information Memorandum includes natural hazard information deemed by Environment Canterbury to be the most up to date, useful, and relevant, and is provided in accordance with the Local Government (Natural Hazard Information in Land Information Memoranda) Regulations 2025. All due care has been taken to ensure current information required to be provided under the regulations is presented below.

Environment Canterbury may hold superseded or less reliable natural hazards information relating to the land that has not been included in this Land Information Memorandum. Please contact Environment Canterbury if you would like to enquire about this information.

(a) Coastal Hazards

- Regional Hazard Information: Shoreline Modelling

Future shoreline modelling has not been completed for this area, however given the distance of the property from the coast, it will not be susceptible to coastal erosion for at least the next 100 years.

(b) Earthquakes

- Liquefaction Assessment

Christchurch City Council holds indicative information about liquefaction hazards for Christchurch. Information, including an interactive web tool, can be found on the Council's website at ccc.govt.nz/liquefaction

Depending on the potential liquefaction hazard of an area that a property is in, the Council may require site-specific investigations before granting future subdivision or building consent for a property.

Title of report: Christchurch liquefaction vulnerability study

Purpose of report: To provide a district-wide liquefaction vulnerability assessment and to provide expected land performance for a range of potential future earthquake and groundwater scenarios. For use in land use planning, subdivision and building consenting

Scope of report: Christchurch urban area from the Waimakariri River mouth to Godley Head, and inland to the Selwyn District boundary

Where or how to access the report: <https://ccc.govt.nz/assets/Documents/Environment/Land/CCC-Liquefaction-ReportBody.pdf>

Date of report: July 2020

Name of person/entity that commissioned report: Christchurch City Council

Name of person/entity that prepared the report: Tonkin & Taylor Ltd

Title of Report: Geotechnical information on horizontal land movement due to the Canterbury earthquake sequence

Purpose of report: Background geotechnical information about shallow ground movements as a result of the earthquake sequence

Scope of Report: Christchurch City flat area, excluding Port Hills and Banks Peninsula

Where or how to access the report: <https://www.linz.govt.nz/resources/research/geotechnical-information-horizontal-land-movement-due-canterbury-earthquake-sequence>

Date of report: March 2015

Name of person/entity that commissioned report: Land Information New Zealand

The name of person/entity that prepared the report: Tonkin & Taylor Ltd

- Regional Liquefaction Information

Areas where there was evidence of liquefaction were mapped following the 2010/11 Canterbury earthquakes by Tonkin & Taylor for the Earthquake Commission (urban areas) and by a group of researchers for Environment Canterbury (rural, commercial and industrial areas). These are available in the Christchurch Liquefaction Viewer at <https://apps.canterburymaps.govt.nz/ChristchurchLiquefactionViewer/>.

Technical report information:

Title: Review of liquefaction hazard information in eastern Canterbury, including Christchurch City and parts of Selwyn, Waimakariri and Hurunui Districts.

Date: December 2012.

Author: H Brackley (compiler).

Commissioned by: Environment Canterbury.

Purpose of report: To collate liquefaction occurrence during the 2010/11 Canterbury earthquakes, and to determine liquefaction vulnerability. For use in land use planning, subdivision and building consenting.

Study area: Coastal Canterbury from the Waipara River mouth to the Rakaia River mouth, including Banks Peninsula, and inland to Rangiora, Aylesbury, Selwyn and Southbridge.

Accessible at: <https://www.ecan.govt.nz/document/download?uri=1702192>.

- Regional Hazard Information: Earthquake fault deformation

There are no known earthquake faults at the ground surface in Christchurch. However, it is possible there are some faults in Christchurch that are yet to be identified because they are not visible at the ground surface.

More information on fault deformation is available on Environment Canterbury's fault deformation map at <https://mapviewer.canterburymaps.govt.nz/?webmap=b5f859bd18ee4912828cb092b6f6c449>.

(c) Flooding

- Regional Hazard Information: Flood Photographs

Photographs showing the property during or following past flood events may be available. Flood photographs are available on Environment Canterbury's flood imagery register at <https://apps.canterburymaps.govt.nz/FIR>.

Property address:

281A Innes Road

LIM number: H11610255

Page 5

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

- **Regional Hazard Information: Site Specific Flood Assessment**
A site specific flood hazard assessment may have been completed for the property by Environment Canterbury. The information contained in this assessment may now be outdated. Please contact Environment Canterbury if you would like to request a copy.
- **Regional Hazard Information: Flood Assessment Request**
You can request a new site-specific flood hazard assessment for the property from Environment Canterbury at: <https://www.ecan.govt.nz/do-it-online/property-information/flood-hazard-assessments>.

(d) Landslides

As at the date of this LIM, Council research found no information under this heading.

(e) Subsidence

- **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.

(f) Tsunamis

As at the date of this LIM, Council research found no information under this heading.

(g) Volcanic and Geothermal Hazards

As at the date of this LIM, Council research found no information under this heading.

(h) Wind

As at the date of this LIM, Council research found no information under this heading.

(i) Any Other Natural Hazards

As at the date of this LIM, Council research found no information under this heading.

(j) District Plan Natural Hazard Information

Please refer to *Section 8. Land use and conditions* of this report for District Plan related natural hazard information.

(k) Building Notices

Please refer to *Section 5. Consents, certificates, notices, orders, or requisitions affecting the land and buildings* of this report for Building Act notice information.

Other Special Features or Characteristics of the Land

- **Borelog/Engineer Report Image Available**
Borelog/Engineer Report Image Available
- **Softground**
Council records show that site contains Soft Ground. Predominant Ground Material: Silt. Reason for Assessment: Building Consent. Should further buildings be proposed on this site, specific foundation design may be required.

The record is based on data that was compiled until 2013. It is not a geotechnical assessment. The information was derived by Council staff based on shallow borehole logs and scala penetrometer test results provided to Council by external parties to inform a Building Consent application, or from observations made by Council staff during site visits.

Related Information

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

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.

Related Information

- 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.
- This property is shown to be served by Christchurch City Council Sewer.
- The council plan shows no public stormwater lateral plotted to this site.

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.

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.

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.

(a) Annual rates

Annual rates to 30/06/2027: \$6,151.76

	Instalment Amount	Date Due
Instalment 1	\$1,537.88	15/08/2026
Instalment 2	\$1,537.88	15/11/2026
Instalment 3	\$1,537.88	15/02/2027
Instalment 4	\$1,538.12	15/05/2027

Rates owing as at 07/10/2026: \$331.12

(b) Excess Water Rates

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

(c) Final water meter reading required at settlement?

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

To advise of a property settlement, please complete the request for settlement information form at www.ccc.govt.nz/services/rates-and-valuations/solicitors-request.

A settlement statement of accounts will be provided on the expected settlement date advised.

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.

The building consents recorded in this LIM are only those that the Council has issued or been notified of by a stand-alone BCA. There may be others if a stand-alone BCA has issued consents without notifying the Council.

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.

Sections 71 to 74 of the Building Act 2004 require the Building Consent Authority to consider natural hazards when it receives a building consent application for the construction or major alteration of a building on land that is subject to, or likely to be subject to, a natural hazard. A building consent for this property may have been issued subject to a section 72 or 73 notice. This means at the time of building consent the Building Consent Authority was not satisfied that adequate provision would be made to protect the building and land from the natural hazard and was subsequently required to notify the Registrar-General of Land to record the natural hazard on the Record of Title. The Building Act 2004 defines natural hazards as erosion (including coastal erosion, bank erosion, and sheet erosion), falling debris (including soil, rock, snow, and ice), subsidence, inundation (including flooding, overland flow, storm surge, tidal effects, and ponding), and slippage.

If your property contains a notice under s73 of the Building Act 2004, this will be identified on the building consent decision below (decision under s72 of the Building Act 2004) and on the properties' Record of Title. The Record of Title may also record this as a s36 notice under the Building Act 1991, or a s641A notice under the Local Government Act 1974.

☎ For building enquiries, please phone (03) 941 8999, email EPADutyBCO@ccc.govt.nz or visit www.ccc.govt.nz.

(a) Consents

- BCN/2015/3290 Applied: 09/04/2015 Status: Completed
281A Innes Road St Albans
Accepted for processing 10/04/2015
PIM Granted 13/04/2015
PIM Issued 13/04/2015
Building consent granted 21/05/2015
Building consent issued 26/05/2015
Code Compliance Certificate Issued 14/10/2015
Dwelling with attached garage
- BCN/2015/3290/A Amendment Applied: 05/06/2015 Status: Completed
281A Innes Road St Albans
Accepted for processing 08/06/2015
Building consent granted 19/06/2015
Building consent issued 22/06/2015
Amendment 1 - Updated site plan incorporating a Living Space Plan

(b) Certificates

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

Property address:

281A Innes Road

LIM number: H11610255

Page 10

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

(c) Notices

(d) Orders

(e) Requisitions

Related Information

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

Property address:
281A Innes Road

LIM number: H11610255

Page 11

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

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 or visit www.ccc.govt.nz.

Property address:

281A Innes Road

LIM number: H11610255

Page 12

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

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.

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

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 or visit 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

- **Development Constraint Conditions**

Council records show there is a specific condition on the use of this site: Specific Foundation Design Required

- **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 Residential Suburban 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/2012/360 - Subdivision Consent
FEE SIMPLE SUBDIVISION s223 Certified 27/6/2014 DP 476751 s224 Issued 31/10/2014 - Historical Reference RMA92019691
Status: Processing complete
Applied 08/03/2012
Granted 20/04/2012

Property address:
281A Innes Road

LIM number: H11610255

Decision issued 20/04/2012

(c) Resource Consents Natural Hazard Information

Related Information

- The Council system shows a Development Constraint/Ongoing Condition Consent notice for this property. The consent notice should be registered against the record of title for the property and a search of that title and the consent notice will provide details in respect of the constraint / condition. If a search of the title does not record the consent notice or the consent notice is not clear then we suggest you contact the duty planner by either calling 941 8999 or emailing DutyPlanner@ccc.govt.nz. The Consent notice is as follows:

Specific foundation design with consideration for liquefaction and lateral spread and having regard to possible land remediation.

Property address:

281A Innes Road

LIM number: H11610255

Page 15

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

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.

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.

- **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.

(a) Kerbside waste collection

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

(b) Other

• Floor Levels Information

Council holds a variety of information on requirements for building or property development. This includes:

- required minimum finished floor levels, which 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 property, you can view it online at <https://ccc.govt.nz/flooding-and-floor-levels>.

Otherwise, if you are building or developing on this land, you can request a calculation on required finished floor levels for your proposed building by emailing us at 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 within the tsunami evacuation zone. You do not need to evacuate this area if you feel a long or strong earthquake, or in an official tsunami warning. More information is available on the Canterbury CDEM Group website at www.cdemcanterbury.govt.nz/hazards/tsunami. <https://ccc.govt.nz/services/civil-defence/hazards/tsunami-evacuation-zones-and-routes/>

• Electoral Ward

Property located in Papanui 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

Property address:

281A Innes Road

LIM number: H11610255

Page 18

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

- **Spatial Query Report**

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.

Rebecca



REVISED PLAN
20 May 2015
PROFESSIONAL BUILDING
CONSULTANTS LTD

GEOTECHNICAL INVESTIGATION

**281 & 283 INNES ROAD and 272 & 274 KNOWLES STREET
MAIREHAU, CHRISTCHURCH**

SUBMITTED TO:

ROBERT WARNER
283 INNES ROAD
MAIREHAU
CHRISTCHURCH 8052

29 February 2012

DISTRIBUTION

2 Copies	–	Robert Warner
1 Copy	–	Geoscience Consulting (NZ) Ltd

Geoscience Consulting (NZ) Limited
5 Norwich Quay, Lyttelton 8082, New Zealand
PO Box 110, Lyttelton 8841, New Zealand
T (+64) (3) 328 9012 F (+64) (3) 328 9013
www.nzgeoscience.co.nz

11315_1



CONTENTS

1	INTRODUCTION	4
2	SITE INFORMATION	4
3	PUBLISHED GEOTECHNICAL DATA	5
3.1	Geology	5
3.2	Publically Available Borehole Data	5
3.3	CERA Site Classification	5
4	GEOHAZARDS	5
4.1	Seismicity	5
4.2	Liquefaction and Lateral Spreading	6
5	FIELD INVESTIGATIONS	6
5.1	Hand Auger Boreholes	6
5.2	Scala Penetrometer Testing	6
5.3	Cone Penetrometer Testing	7
6	GEOTECHNICAL ASSESSMENT	7
6.1	Seismic Design Considerations	7
6.2	Liquefaction Description	8
6.3	Liquefaction and Lateral Spread Hazard Assessment	8
7	CONCLUSIONS	10
8	GEOTECHNICAL RECOMMENDATIONS	10
8.1	Foundation Options	10
8.1.1	Raft Foundations	11
8.1.2	Deep Piled Foundations	11
8.2	Ground Improvement	11
8.3	Consolidation Settlement	11
8.4	Future Liquefaction Risk	12
9	REFERENCES	12
10	LIMITATIONS	13

TABLES

Table 1:	Summary of Typical Subsurface Conditions
Table 2:	Summary of Inferred Geology from CPT Logs
Table 3:	Summary of Liquefaction Analyses

FIGURES

Figure 1:	Site Location Plan
Figure 2:	Proposed Foundation Option

APPENDICES

Appendix 1:	Site Photographs
Appendix 3:	Hand Auger Borehole Logs and Scala Penetration Tests
Appendix 2:	CPT Logs, Liquefaction Analyses

1 INTRODUCTION

Geoscience Consulting (NZ) Ltd (Geoscience) was requested by Robert Warner to undertake a geotechnical assessment of the residential properties at 281 & 283 Innes Road and 272 & 274 Knowles Street (herein referred to as 'the site') as outlined in our proposal (ref. P11416, dated 21st November 2011).

We understand that you wish to subdivide the adjoining properties and require a geotechnical investigation that meets the requirements of and satisfy Section 106 Resource Management Act 1991. Section 106 of the Resource Management Act 1991 provides for the refusal of consent for the subdivision of land by a territorial authority where the issuing authority is not satisfied that adequate provision has been made for the protection of land or buildings against erosion, falling debris, subsidence, slippage or inundation from any source. Subsidence is deemed to include liquefaction induced ground deformation.

Our scope of works included the following:

- Desktop study of relevant publically available geotechnical and geological publications;
- Completion of six hand auger and Scala Penetrometer tests to a target depth of 3 m;
- Organisation and technical supervision of eight Cone Penetrometer Tests (CPTs) to approximately 15 m depth or refusal;
- An assessment of liquefaction potential for the site; and
- Presentation of a report outlining our findings on the ground conditions and including geotechnical advice on foundation conditions and ground remediation if necessary.

2 SITE INFORMATION

The site is located on relatively flat ground in Mairehau, Christchurch (Figure 1). The site comprises of four individual adjoining residential sections which are proposed to be redeveloped and subdivided into smaller Lots.

The site at 281 Innes Road comprises of a single storey, brick clad dwelling on a concrete perimeter footing with tiled roof. A separate single garage is located to the north of the dwelling. At the rear of the section a vegetable garden and fruit trees are located. A shed on the western boundary of the site has suffered shaking damage with a block construction wall falling into the shed.

At 283 Innes Road the dwelling comprises of a single storey linear board clad house with a tiled roof and concrete perimeter footing. A separate double garage was located to the north of the dwelling and this has now been removed due to damage from the earthquakes.

The site at 272 Knowles Road consists of a single storey weatherboard dwelling with an iron roof and is supported on piles and a concrete perimeter footing. The rear of the property is an overgrown garden.

At 274 Knowles Road the dwelling is weatherboard clad with tiled roof and concrete perimeter footing. A concrete driveway leads up to a separate double garage and sleepout. A large grassed area is located at the rear of the section.

The nearest watercourse to the site is an unnamed stream approximately 235 m to the north of the site.

3 PUBLISHED GEOTECHNICAL DATA

3.1 Geology

The site is mapped¹ as being underlain by dominantly sand and silt overbank deposits with dense gravel at depth.

3.2 Publically Available Borehole Data

We have searched the Environment Canterbury (ECan) database and found three wells with logs numbered M35/2305, M35/2561 and M35/13177 which are located near the site. These logs extend to a maximum depth of 72 m and the geology consists of clay and silt to approximately 3 m depth underlain by peat to 6 m depth. This is then underlain by sand to 21 m. To a depth of 72 m consists of gravels with sand and interbedded layers of clay and sand. Groundwater is located approximately 1.3 m below the ground surface.

3.3 CERA Site Classification

The sites are currently mapped² by the Canterbury Earthquake Recovery Authority (CERA) as being within the 'Green Zone' where existing dwellings are generally considered suitable for repair or rebuilding. The Department of Building and Housing (DBH) has divided the CERA 'Green Zone' into the following Technical Categories³:

- TC1 ('Grey') where "future land damage from liquefaction is unlikely, and ground settlements are expected to be within normally accepted tolerances";
- TC2 ('Yellow') where "minor to moderate land damage from liquefaction is possible in future large earthquakes"; and
- TC3 ('Blue') where "moderate to significant land damage from liquefaction is possible in future large earthquakes".

The site is currently classified² as TC2, requiring "shallow soil strength testing standard for all homes".

4 GEOHAZARDS

4.1 Seismicity

Historically, Christchurch City has been considered to be in a region of low concentrations of active faults and seismicity. However, the Canterbury region has recently had four earthquakes with magnitude greater than 6. As a result, there is a heightened level of seismic risk stemming from the recently discovered Greendale, Lyttelton and Port Hills Faults. The recent seismic activity in the Canterbury region is currently considered to have increased the probability of another large (M6.0-7.9) earthquake to 16%⁴ between the time of writing and February 2013.

Preliminary mapping⁵ of the recent faulting in Canterbury illustrates the approximate locations of the Greendale Fault and sub-surface Lyttelton and Port Hills Fault ruptures, the distribution of associated aftershocks, and known active faults in the Canterbury area. Large regional areas of faulting^{6,7} namely the Ashley Fault, Porters Pass-Amberley Fault Zone, and the Hope and Alpine Faults, are further afield but present a high seismic hazard risk to the Christchurch area due to the anticipated size of earthquakes generated. The largest of these faults is the Alpine Fault, which has a return period of 250-300 years and is expected to produce a M8 earthquake. The last rupture on the Alpine Fault is believed to have occurred in 1717⁸.

4.2 Liquefaction and Lateral Spreading

The site is shown on the Christchurch Liquefaction Hazard Map⁹ to be located in an area with “potential for moderate subsidence (100 - 300 mm)”.

Aerial photography¹⁰ taken in the days following the 22nd of February event shows no volumes of ejected sand and silt at the site and surrounding areas. Lateral spreading is not considered likely to occur at the site owing to the distance from the nearest significant watercourse.

5 FIELD INVESTIGATIONS

Geoscience visited the site on the 31st of January 2012 and made the following observations:

- No ejected sand or silt was noted to be on any of the properties.
- Undulating paving and cracks were noted in the driveway of 281 Innes Road. A hairline crack was observed in the block fence on the roadside boundary at 283 Innes Road.
- 2 – 3 mm wide cracks were noted in the perimeter footings of 281 and 283 Innes Road.
- A garden shed has been damaged at 281 Innes Road. A shed has been removed from 274 Knowles Street and a double garage has been removed from 283 Innes Road.

Site photographs are presented in Appendix 1.

5.1 Hand Auger Boreholes

Geoscience visited the site on the 31st of January 2012 and completed six hand auger boreholes to depths of up to 3.6 m. Our investigations found the geology to be consistent with published mapping, as summarised in Table 1.

Table 1: Summary of Typical Subsurface Conditions

Depth (m)	Material Description	Material Type	Density/Consistency
0.0 – 0.6	SILT; dark brown. Low plasticity.	TOPSOIL	Stiff
0.6 – 3.0	Interbedded SILT, sandy SILT, silty SAND and SAND.	ALLUVIUM	Loose to Medium Dense / Firm to Stiff
3.0 – 3.6	PEAT; brown, fibrous.	PEAT	Very Soft

Groundwater was encountered between 1 and 1.8 m depth.

Full logs are presented in Appendix 2 and are written in accordance with the New Zealand Geotechnical Society 'Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes'¹¹.

5.2 Scala Penetrometer Testing

Scala tests were carried out at the hand auger borehole locations to a maximum depth of 4.4 m below ground level. The Scala tests were undertaken to assess the subsurface strength profile.

Scala results are presented with the borehole logs in Appendix 2.

5.3 Cone Penetrometer Testing

Following our site visit, eight Cone Penetrometer Tests (CPTs) were pushed by Pro-Drill Auckland Ltd (Pro-Drill) to a maximum depth of 20.4 m respectively before reaching effective refusal (high tip resistance). Test locations are presented in Figure 1.

The CPT probe gathers raw data including cone tip resistance, friction sleeve resistance and pore water pressure at 2 cm intervals during the test. This information is used to infer the soil type, soil density and water pressure in undisturbed conditions in the ground, and can be used to determine the liquefaction susceptibility of the ground.

A summary of the inferred geology from the CPT logs is presented in Table 1.

Table 2: Summary of Inferred Geology from CPT Logs

Av. Depth (m)	Material Description	Density/Consistency
0.0 – 2.5	Interbedded CLAY, silty CLAY, silty SAND and sandy SILT.	Firm to Stiff / Loose to Medium Dense
2.5 – 6.0	Interbedded CLAY, silty CLAY and ORGANIC SOIL.	Soft / Very Loose
6.0 – 20.4	Interbedded SAND and silty SAND with occasional layers of sandy SILT.	Dense

Standing groundwater level was recorded by Pro-Drill at 1.5 m depth in the CPT holes.

Full CPT logs are presented in Appendix 3.

6 GEOTECHNICAL ASSESSMENT

The New Zealand Geotechnical Society's 2010 Guideline for the Identification, Assessment and Mitigation of Liquefaction Hazards¹¹ recommends that liquefaction and lateral spread assessments should be carried out where there is a possibility of loss of life or loss of amenity of a building of Importance Level 2 or higher (as defined by NZS 1170.0:2002¹³). This has been considered below.

6.1 Seismic Design Considerations

According to NZS 1170.5:2004¹⁴, Importance Level 2 buildings are required to be designed to resist earthquake shaking with an annual probability of exceedance of 1/500 (i.e. a 500 year return period). This is the ultimate limit state (ULS) design seismic loading. It is necessary, therefore, that the ground supporting any building on the site remains stable under the same design level of earthquake. Furthermore, Importance Level 2 buildings should sustain little or no structural damage under a serviceability limit state (SLS) design load case, which is based on earthquake shaking with a 25 year return period.

The design peak ground accelerations (PGA) for deep soil sites in Canterbury are taken as:

ULS: $a_h = 0.43 g$

SLS: $a_h = 0.15 g$

These PGAs are based on advice given in the 8th February 2012 presentation from the DBH in a meeting to the Canterbury Geotechnical and Structural Engineers for Class D soils. We further understand that the current method for calculating the PGA may also change.

The actual PGAs measured during the 4th of September 2010, 22nd of February 2011, 13th of June 2011 and 23rd December 2011 earthquakes at a nearby recording station (Papanui High School) were 0.28 g¹⁶, 0.21 g¹⁷, 0.13 g¹⁸, and 0.14 g¹⁹ respectively; however these values may not be entirely representative of the site owing to variations in the underlying ground conditions and distance from the recording station.

6.2 Liquefaction Description

The following description of the hazards associated with soil liquefaction is given in the Guidelines for Geotechnical Earthquake Engineering¹¹ published by the New Zealand Geotechnical Society:

“The term “liquefaction” is widely used to describe ground damage caused by earthquake shaking even though a number of different phenomena may cause such damage.

Liquefaction is associated with significant loss of stiffness and strength in the liquefied soil and consequent large ground deformation. Particularly damaging for engineering structures are cyclic ground movements during the period of shaking and excessive residual deformations such as settlements of the ground and lateral spreads.

Ground surface disruption including surface cracking, dislocation, ground distortion, slumping and permanent deformations such as large settlements and lateral spreads are commonly observed at liquefied sites. Sand boils including ejected water and fine-grained fractions of liquefied soils are also typical manifestation of liquefaction at the ground surface. In case of massive sand boils, gravel-size particles and even cobbles can be ejected on the ground surface due to seepage forces caused by high excess pore water pressures. Note that sand boils are a definite sign of liquefaction, however they do not always occur at liquefied sites.

6.3 Liquefaction and Lateral Spread Hazard Assessment

We have assessed the risk of soil liquefaction occurring at the site using the subsurface data from the Cone Penetrometer Test (CPT) results using the methodology developed by NCEER and by Youd et al. (2001)²⁰.

The results of these analyses are presented graphically in Appendix 3 and indicate multiple liquefiable sand and silty sand layers between the inferred water table and 20.4 m.

The results of our liquefaction assessment are summarised in Table 2.

Table 3: Summary of Liquefaction Analyses

Test Location	Calculated Approximate Vertical Settlement*		Depth to Effective Refusal	Depth Range of Potentially Liquefiable Layers
	Ultimate Limit State	Serviceability Limit State		
CPT01	60mm	6 mm	8.3 m	1.5 – 3.4 m 5.8 – 6.2 m
CPT02	40 mm	3 mm	9.5 m	1.5 – 3.3 m 5.4 – 7.0 m 8.1 – 8.2 m
CPT03	55 mm	2.5 mm	8.2 m	1.5 – 3.4 m 5.8 – 7.0 m
CPT04	200 mm	12 mm	20.4 m	1.5 – 3.3 m 5.4 -6.4 m 9.3 – 19.5 m
CPT05	70 mm	6 mm	6.6 m	1.5 – 3.6 m 5.2 – 6.1 m
CPT06	70 mm	9 mm	6.9 m	1.5 – 3 m 5.3 – 6.1 m
CPT07	80 mm	23 mm	7.7 m	1.5 – 2.3 m 3.0 – 3.8 m 6.1 – 7.2 m
CPT08	40 mm	5 mm	6.4 m	1.5 – 2.1 m 5.0 – 6.0 m

* For an undeveloped site. Settlements beneath buildings are likely to be greater.

From the above observations and analyses, we consider that the likelihood of damaging soil liquefaction occurring at the site during ULS design earthquake shaking is **high**. We consider the likelihood of lateral spreading as a result of liquefaction at this site to be low owing to the distance to the nearest watercourse (235 m) and have therefore not considered this in our liquefaction assessment.

7 CONCLUSIONS

The key geotechnical issues identified at the site as a result of our investigation and geotechnical analyses have been discussed in the preceding sections and are summarised below:

- The natural ground conditions inferred from the CPTs and hand auger boreholes is generally consistent across the site and typically comprise of 0.6 m of SILT (TOPSOIL) overlying 2.4 m of interbedded SILT, sandy SILT and SAND. Below this PEAT and CLAY are found down to 6 m. Interbedded SAND and silty SAND was encountered down to 20.4 m.
- Groundwater was encountered at 1.5 m depth below ground level in the CPT locations.
- The results of our liquefaction analyses indicate that the site is at **high** likelihood of future liquefaction under ULS design seismic load conditions, with multiple liquefiable layers ranging between 1.5 to 3.5 m, 5.4 to 7.0 m and 9.3 to 19.5 m.
- Calculated vertical settlement for an undeveloped site resulting from ULS liquefaction is up to 200 mm, and we consider settlements beneath foundations may be greater.
- The results of our liquefaction analyses indicate that the site is at **low** likelihood of future liquefaction under SLS design seismic load conditions, with a liquefiable layer identified between 6 and 6.2 m.
- Calculated vertical settlements for an undeveloped site resulting from SLS liquefaction range between 2.5 and 23 mm, and we consider settlements beneath foundations may be greater.
- Lateral spreading is not anticipated at the site owing to the distance to the nearest watercourse (235 m).
- The presence of organic soils and potentially liquefiable soils imply that the site does not meet the requirements of 'good ground' as defined in NZS3604:2011¹².
- Peat soils may also be prone to consolidation settlement under static conditions if subjected to increased loads (e.g. building loads, fill platforms or groundwater drawdown) without appropriate engineering design and consideration.

In accordance with requirements of the DBH Technical Category² classification (TC2), the site may be suitable for the proposed redevelopment subject to the recommendations presented in the following sections.

We consider the original ground does not meet the provision of Section 106 of the Resource Management Act 1991 because of the potential for subsidence from the underlying Peat and also potentially liquefiable material. Therefore; specific design will be required to mitigate against this as outlined below.

8 GEOTECHNICAL RECOMMENDATIONS

8.1 Foundation Options

A number of foundation solutions may be suitable for new buildings to mitigate the potential effects of liquefaction following successful subdivision of the site. Foundations options depend upon the ability of the proposed structures to tolerate settlement and upon the client's acceptance of risk of further damage due to liquefaction. In addition to foundation considerations, liquefaction settlements may be significantly reduced by the use of lightweight building materials where possible (i.e. tin roof, timber

cladding and timber floors). These materials are also considered more readily repairable (and less costly to repair) than other forms of construction in the event of future liquefaction related settlements.

If new buildings are to be heavy, two-storey dwellings we recommend you contact Geoscience for further guidance.

Foundation options are presented in order of increasing cost and decreasing risk.

8.1.1 Raft Foundations

Given the depth of relatively weak and potentially liquefiable soils encountered during our investigation, founding a relatively small footprint building on a reinforced gravel raft could be an appropriate option. This would have the benefit of limiting differential settlement and may allow for re-levelling of the foundations after a future earthquake. A nominal raft thickness of 1.0 to 1.5 m should be adequate and will have the benefit of removing the bulk of the liquefiable soils identified during our investigation. However, it must be noted that the risk of future liquefaction related damage remains particularly as a result of a ULS seismic event.

We have been developing a foundation design based on a modified reinforced raft which includes a rigid drainage blanket of no-fines concrete to help reduce the effects of liquefaction and provide a relatively easy option for re-levelling buildings after significant earthquakes (Figure 2). We anticipate however that this solution should be a cost effective option and applicable to a large number of sites around Christchurch.

8.1.2 Deep Piled Foundations

Piled foundations should be installed to bear within suitable ground beneath both the PEAT and the liquefiable layers identified during our investigation. Potentially organic rich and liquefiable layers were identified between 0.5 and 6 m.

From the information available suitable bearing is expected below 6.5 m; however if the piling option is the preferred option it is important to limit the depth of the piles because of potentially liquefiable material below 9 m. For pile design we recommend contacting a specialist piling contractor such as Piletech or McMillans. Additional ground improvement works should not be required if a piled foundation solution is opted for. Driven (steel "H" or precast concrete) piles or screw piles should be suitable.

8.2 Ground Improvement

An alternative option to the reinforced raft discussed in section 8.1.1 above involves cement stabilisation of the upper 1.5 – 2 m of soil. This method has recently been trialled by the DHB and could be a relatively cost-effective and practical method of ground improvement, however access for the large machinery required to complete the work may be an issue. We recommend contacting a specialist contractor experienced in this field (e.g. Re-Level / Brian Perry & Keller Ground Engineering) for further advice if this option is to be pursued.

8.3 Consolidation Settlement

Due care must be taken to prevent increasing the net loading on the subsoils to avoid inducing consolidation settlement.

Therefore, it may be necessary to use lightweight expanded polystyrene fill (e.g. Polyrock or similar EPS product) within the upper portion of subsurface gravel rafts to compensate for the anticipated heavier weight of compacted gravel. The amount of polystyrene used should be sufficient to ensure no overall increase in net loads and is dependent on the final design.

Other measures, such as maintaining the prevailing groundwater level and limiting the placement of additional fill at the site should also be undertaken.

8.4 Future Liquefaction Risk

It should be noted that while the use of piled or raft foundations may reduce the settlement of the structure in future seismic events, there is still a risk of damage occurring to the foundations (and possibly other associated components of the structure), services and hardstand areas from ground shaking and liquefaction. The extent of potential damage may be reduced through appropriate design and reinforcement.

9 REFERENCES

- 1 Brown, L.J., Weeber, J.H., 1992: Sheet 1 - Geology of the Christchurch Urban Area 1:25,000. Institute of Geological and Nuclear Sciences, Lower Hutt.
- 2 <http://www.landcheck.org.nz>
- 3 The Department of Building and Housing, November 2011: Revised Guidance on Repairing and Rebuilding Houses affected by the Canterbury Earthquake Sequence (<http://www.dbh.govt.nz/guidance-on-repairs-after-earthquake>).
- 4 <http://www.geonet.org.nz/canterbury-quakes/aftershocks/>
- 5 http://www.geonet.org.nz/var/storage/images/media/images/news/2012/chch_seismicity_25_01_2012/59292-1-eng-GB/Chch_Seismicity_25_01_2012.jpg
- 6 Forsyth, P.J.; Barrell, D.J.A; Jongens, R. 2008: Sheet 16 - Geology of the Christchurch Area 1:250,000. Institute of Geological and Nuclear Sciences, Lower Hutt.
- 7 Rattenbury, M.S.; Townsend, D.B.; Johnston, M.R., 2006: Sheet 13 - Geology of the Kaikoura Area 1:250,000. Institute of Geological and Nuclear Sciences, Lower Hutt.
- 8 Pettinga J.R., Yetton M.D., Van Dissen R.J., and Downes G., 2001: Earthquake Source Identification and Characterisation for the Canterbury Region, South Island, New Zealand, Bulletin of the New Zealand Society for Earthquake Engineering, Vol 34, No. 4, pp 282-317
- 9 Christensen, S. 2002: Christchurch Liquefaction Study – Stage II ECan Report No. U02/22.
- 10 <http://koordinates.com/#!/layer/3185-christchurch-post-earthquake-aerial-photos-24-feb-2011/>
- 11 New Zealand Geotechnical Society Inc, 2010: Geotechnical Earthquake Engineering Practice in New Zealand: Module 1 – Guideline for the Identification, Assessment and Mitigation of Liquefaction Hazards. New Zealand Geotechnical Society Inc, Wellington.
- 12 Standards Association of New Zealand, 2011: Timber Framed Buildings – New Zealand, NZS 3604:2011. Standards New Zealand, Wellington.
- 13 Standards Association of New Zealand, 2002: Structural Design Actions, NZS 1170.0:2002. Standards New Zealand, Wellington.
- 14 Standards New Zealand. 2004: Structural Design Actions, Part 5: Earthquake Actions – New Zealand, NZS 1170.5:2004. Standards New Zealand, Wellington.
- 15 Department of Building and Housing 2011: Building Controls Update No. 114: Immediate changes to seismicity and foundation details for Christchurch. Department of Building and Housing, Wellington.
- 16 http://www.geonet.org.nz/images/news/2010/cbd_pga.png
- 17 http://www.geonet.org.nz/var/storage/images/media/images/news/2011/lyttelton_pga/57159-2-eng-GB/lyttelton_pga.png
- 18 http://www.geonet.org.nz/var/storage/images/media/images/news/2011/june_2_pga/58225-2-eng-GB/june_2_pga.png

- 19 <http://www.geonet.org.nz/var/storage/images/media/images/news/2011/3631380/59075-1-eng-GB/3631380.png>
- 20 Youd, T.L. et al., 2001: Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils. ASCE Journal of Geotechnical and Geoenvironmental Engineering, Vol.127, No. 10, pp.817-833.

We also acknowledge the New Zealand GeoNet project and its sponsors EQC, GNS Science and LINZ, for providing data used in this report.

10 LIMITATIONS

- (i) This report has been prepared for the use of our client, Robert Warner, his professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.
- (ii) Assessments made in this report are based on the ground conditions indicated from published sources, site inspections and subsurface investigations described in this report based on accepted normal methods of site investigations. Variations in ground conditions may exist between test locations and therefore have not been taken into account in the report.
- (iii) This Limitation should be read in conjunction with the IPENZ/ACENZ Standard Terms of Engagement.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on 03 328 9012 if you require any further information.

For and on behalf of Geoscience Consulting (NZ) Ltd,



Matt Wiley

Principal Engineering Geologist

APPENDIX 1

Site Photographs

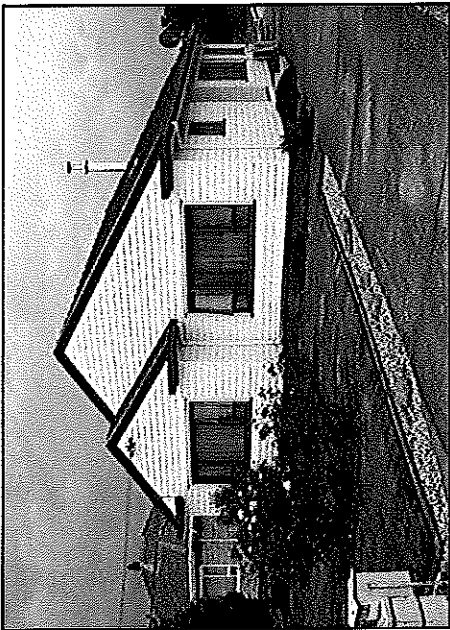


Photo 1: Dwelling at 283 Innes Road.

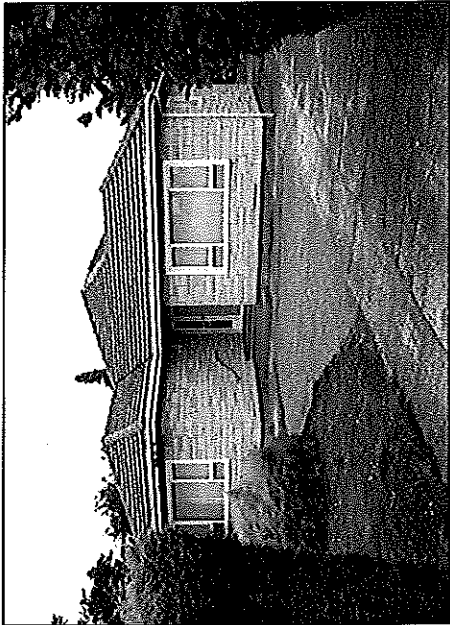


Photo 2: Dwelling at 281 Innes Road.

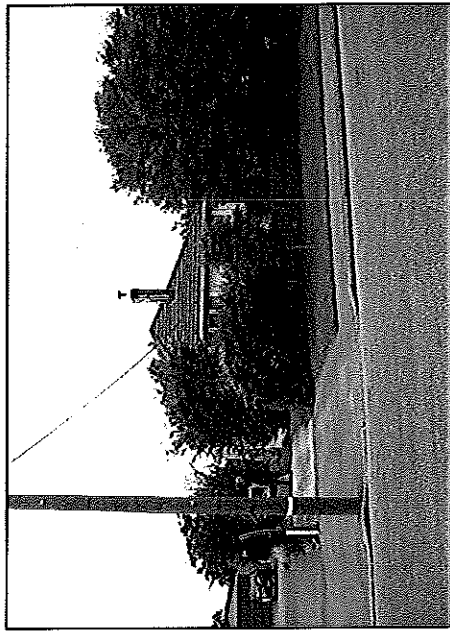


Photo 3: Dwelling at 272 Knowles Street.



Photo 4: Cracked driveway.

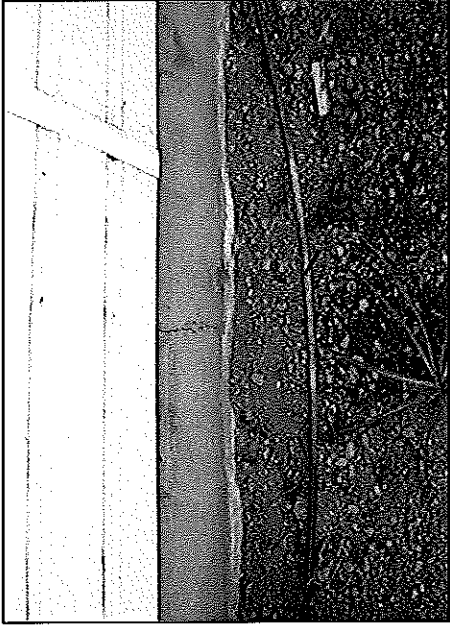


Photo 5: Crack in perimeter footing.

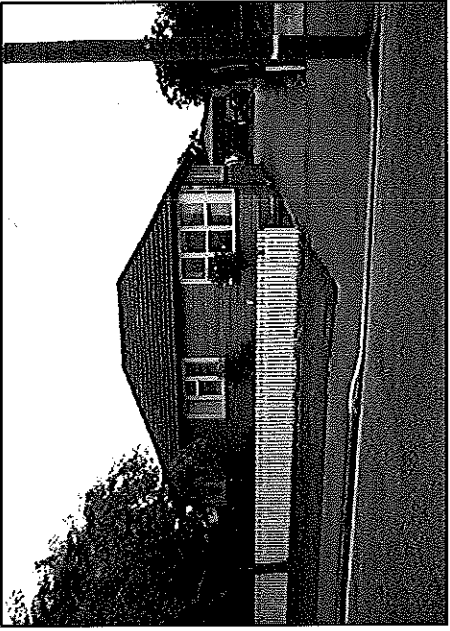
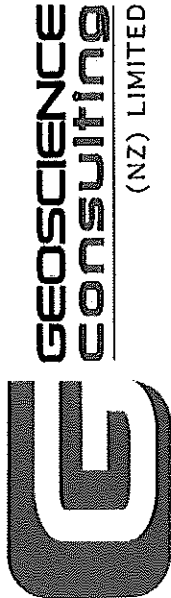


Photo 6: Dwelling at 274 Knowles Street.



Date taken	31/01/12	Client	Robert Warner
Taken by	JC	Project	281 & 283 Innes Road and 272 & 274 Knowles Street, Mairehau, Christchurch
Approved by	MW	Description	Site Photographs
Scale	N/A	Photo No.	1 to 6
			Project Number
			11315_1

APPENDIX 2

Hand Auger Borehole Logs & Scala Penetrometer Tests

Hand Auger No. **HA01**
Sheet **1 of 1**
Project No. **11315**

Engineering Log - Hand Auger Bore Hole

Client: Robert Warner

Date Started: 31/01/2012

Principal: -

Date Completed: 31/01/2012

Project: 281 Innes Road, Mairehau

Logged By: JC/CL

Hand Auger Location: Refer to Site Location Plan

Checked By: MW

Diameter (mm): 50 Vane No.: N/A									
Excavation Information				Material Substance					
Material	Water	Notes, samples, tests etc	Depth (m)	Graphic Log	Classification Symbol	Material	Moisture Condition	Consistency / Density Index	Shear Vane (Dial Readings kPa)
						Soil - soil type, colour, structure, grading, bedding, plasticity, sensitivity; Secondary and minor components Rock - colour, fabric, rock type; discontinuities; additional information			Scala (Blows/100mm) 2 4 6 8
TOPSOIL			0.2	TS	ML	SILT with minor rootlets; brown. Low plasticity. [TOPSOIL]	D-M	St	
			0.4	TS					
			0.6	TS					
			0.8		ML	SILT with minor rootlets; greyish brown with dark brown and orange mottles. Low plasticity.	D-M	F	
			1.0						
			1.2		SP	Fine to medium SAND; greyish brown with orange mottles. Poorly graded.	M W	L MD	
			1.4						
			1.6						
			1.8		SP	Fine SAND with some silt; grey with orange mottles. Poorly graded.	S	MD	
			2.0						
			2.2						
			2.4	MR	-	Inferred ALLUVIUM.	-	MD	
			2.6	MR					
			2.8	MR					

EOH: 2.9 m
Termination: Practical refusal
Notes:
Hole met practical refusal at 2.2 m due to hole collapsing.
Scala Penetrometer met target depth at 2.9 m.
Groundwater encountered at 1.8 m.

Hand Auger No. HA02
Sheet 1 of 1
Project No. 11315

Engineering Log - Hand Auger Bore Hole

Client: Robert Warner

Principal: -

Project: 281 Innes Road, Mairehau

Hand Auger Location: Refer to Site Location Plan

Date Started: 31/01/2012

Date Completed: 31/01/2012

Logged By: JC/CL

Checked By: MW

Diameter (mm): 50
Vane No.: N/A

Excavation Information				Material Substance						
Material	Water	Notes, samples, tests etc	Depth (m)	Graphic Log	Classification Symbol	Material	Moisture Condition	Consistency / Density Index	Shear Vane (Dial Readings kPa)	Scala (Blows/100mm)
						Soil - soil type, colour, structure, grading, bedding, plasticity, sensitivity; Secondary and minor components Rock - colour, fabric, rock type; discontinuities; additional information				2 4 6 8
TOPSOIL			0.2	TS	ML	SILT; brown. Low plasticity. [TOPSOIL].	D	St		
			0.4	TS						
			0.6	TS						
			0.8		ML	SILT; yellowish brown. Low plasticity.	M	F		
			1		ML	Sandy SILT; grey with orange mottles. Low plasticity.	W	F		
			1.2							
			1.4							
			1.6				S			
			1.8							
ALLUVIUM			2		SP	SAND with minor silt; grey. Poorly graded.	S	MD		
			2.2		-	Inferred ALLUVIUM.	-	MD		
			2.4	MR						
			2.6	MR						
			2.8	MR						

EOH: 2.9 m

Termination: Practical refusal

Notes:

Hole met practical refusal at 2.1 m due to hole collapsing.

Scala Penetrometer met target depth at 2.9 m.

Groundwater encountered at 1.8 m.

Engineering Log - Hand Auger Bore Hole

Client: Robert Warner

Date Started: 31/01/2012

Principal: -

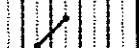
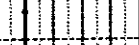
Date Completed: 31/01/2012

Project: 281 Innes Road, Mairehau

Logged By: JC/CL

Hand Auger Location: Refer to Site Location Plan

Checked By: MW

Diameter (mm): 50										
Vane No.: N/A										
Excavation Information				Material Substance						
Material	Water	Notes, samples, tests etc	Depth (m)	Graphic Log	Classification Symbol	Material Soil - soil type, colour, structure, grading, bedding, plasticity, sensitivity; Secondary and minor components Rock - colour, fabric, rock type; discontinuities; additional information	Moisture Condition	Consistency / Density Index	Shear Vane (Dial Readings kPa)	Scala (Blows/100mm)
										2468
TOPSOIL			0.2		ML	SILT with trace sand, charcoal and gravel; dark brown. Low plasticity. [TOPSOIL].	D	St		
			0.4							
			0.6							
			0.8		ML	SILT; greyish brown with orange mottles. Low plasticity.	M	F		
			1		ML	Sandy SILT; greyish brown with orange mottles. Low plasticity. Sand is fine.	W	F		
			1.2							
			1.4							
			1.6							
			1.8				S	St		
			2							
ALLUVIUM			2.2			No more mottles, bluish grey in colour.		VSt		
			2.4							
			2.6							
			2.8		-	Inferred ALLUVIUM.	-	VSt		

EOH: 2.9 m

Termination: Practical refusal

Notes:

Hole met practical refusal at 2.6 m due to hole collapsing.

Scala Penetrometer met target depth at 2.9 m.

Groundwater encountered at 1.8 m.

Engineering Log - Hand Auger Bore Hole

Client: Robert Warner

Date Started: 31/01/2012

Principal: -

Date Completed: 31/01/2012

Project: 281 Innes Road, Mairehau

Logged By: JC/CL

Hand Auger Location: Refer to Site Location Plan

Checked By: MW

Excavation Information		Material Substance								
Material	Water	Notes, samples, tests etc	Depth (m)	Graphic Log	Classification Symbol	Material	Moisture Condition	Consistency / Density Index	Shear Vane (Dial Readings kPa)	Scala (Blows/100mm)
										2 4 6 8
TOPSOIL			0.2		ML	SILT; dark brown. Low plasticity. [TOPSOIL]	D	S		
			0.4		ML	SILT with some sand; greyish brown with orange mottles. Low plasticity.	M	S		
ALLUVIUM			0.6		ML	SILT with some sand; greyish brown with orange mottles. Low plasticity.	M	S		
			0.8		ML	SILT with some sand; greyish brown with orange mottles. Low plasticity.	M	S		
			1.0		ML	SILT with some sand; greyish brown with orange mottles. Low plasticity.	M	S		
			1.2		SM	Silty SAND; greyish brown with orange mottles. Poorly graded.	W	L		
			1.4		SM	Silty SAND; greyish brown with orange mottles. Poorly graded.	S	MD		
			1.6		SM	Silty SAND; greyish brown with orange mottles. Poorly graded.	S	MD		
			1.8		SM	Silty SAND; greyish brown with orange mottles. Poorly graded.	S	MD		
			2.0		SP	SAND with some silt; bluish grey. Poorly graded.	S	MD		
			2.2		ML	Sandy SILT; bluish grey. Low plasticity.	S	Vst		
			2.4		ML	Sandy SILT; bluish grey. Low plasticity.	S	Vst		
		2.6		ML	Sandy SILT; bluish grey. Low plasticity.	S	Vst			
		2.8		ML	Sandy SILT; bluish grey. Low plasticity.	S	Vst			
		3.0		PI	PEAT; brown. Fibrous.	S	VS			
		3.2		PI	PEAT; brown. Fibrous.	S	VS			
		3.4		PI	PEAT; brown. Fibrous.	S	VS			
		3.6		PI	PEAT; brown. Fibrous.	S	VS			
				NR	-	Inferred ALLUVIUM.	-	D		

EOH: 3.8 m
Termination: Practical refusal
Notes:
Hole met practical refusal at 3.6 m due to poor recovery.
Scala Penetrometer met target depth at 3.8 m.
Groundwater encountered at 1 m.

Engineering Log - Hand Auger Bore Hole

Hand Auger No. HA05
Sheet 1 of 1
Project No. 11315

Client: Robert Warner

Date Started: 31/01/2012

Principal: -

Date Completed: 31/01/2012

Project: 281 Innes Road, Mairehau

Logged By: JC/CL

Hand Auger Location: Refer to Site Location Plan

Checked By: MW

Excavation Information		Material Substance								
Material	Water	Notes, samples, tests etc	Depth (m)	Graphic Log	Classification Symbol	Material Soil - soil type, colour, structure, grading, bedding, plasticity, sensitivity; Secondary and minor components Rock - colour, fabric, rock type; discontinuities; additional information	Moisture Condition	Consistency / Density Index	Shear Vane (Dial Readings kPa)	Scala (Blows/100mm) 2 4 6 8
TOPSOIL			0.2	TS	ML	SILT; dark brown. Low plasticity. [TOPSOIL]	D	F-St		
			0.4	TS						
			0.6	TS						
			0.8	TS						
			1.0							
			1.2							
			1.4							
			1.6							
			1.8							
			2.0							
ALLUVIUM			2.2		SP	Fine SAND; brown with orange mottles. Poorly graded.	M	VL		
			2.4							
			2.6							
			2.8							
			3.0							
			3.2							
			3.4							
			3.6							
			3.8							
			4.0							
			4.2		ML	Narrow band of orange mottles with rust concretions. Sandy SILT; bluish grey. Low plasticity.	S	MD		
			4.4							
EOH: 4.4 m Termination: Practical refusal Notes: Hole met practical refusal at 3.4 m due to poor recovery. Scala Penetrometer met target depth at 4.4 m. Groundwater encountered at 1.3 m.										

Engineering Log - Hand Auger Bore Hole

Client: Robert Warner

Principal: -

Project: 281 Innes Road, Mairehau

Hand Auger Location: Refer to Site Location Plan

Date Started: 31/01/2012

Date Completed: 31/01/2012

Logged By: JC/CL

Checked By: MW

Excavation Information		Material Substance								
Material	Water	Notes, samples, tests etc	Depth (m)	Graphic Log	Classification Symbol	Material	Moisture Condition	Consistency / Density Index	Shear Vane (Dial Readings kPa)	Scala (Blows/100mm)
										2 4 6 8
TOPSOIL			0.2	TS	ML	SILT; brown. Low plasticity. [TOPSOIL].	D	S		
			0.4	TS	ML	SILT; light brown with orange mottles. Low plasticity.	D	S		
ALLUVIUM			0.6		SP	Silty SAND; light brownish grey with orange mottles. Poorly graded.	M	L		
			0.8				W			
			1.0							
			1.2				S	MD		
			1.4							
			1.6							
		1.8								
		2.0			SP	Medium SAND; bluish grey. Poorly graded.	S	MD		
		2.2								
		2.4		MR	-	Inferred ALLUVIUM.	-	MD		
		2.6		MR						
		2.8		MR						
				MD						

EOH: 2.9 m
Termination: Practical refusal
Notes:
Hole met practical refusal at 2.3 m due to hole collapsing.
Scala Penetrometer met target depth at 2.9 m.

APPENDIX 3

CPT Logs, Liquefaction Analyses

LIQUEFACTION ANALYSIS REPORT

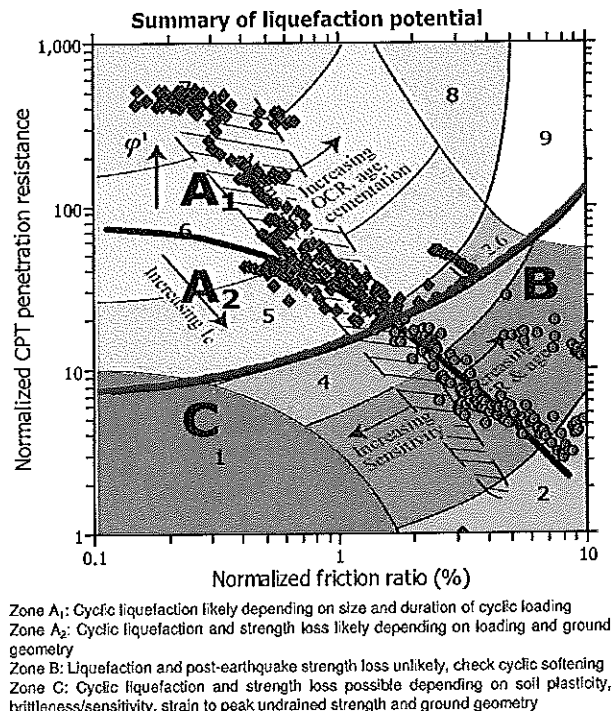
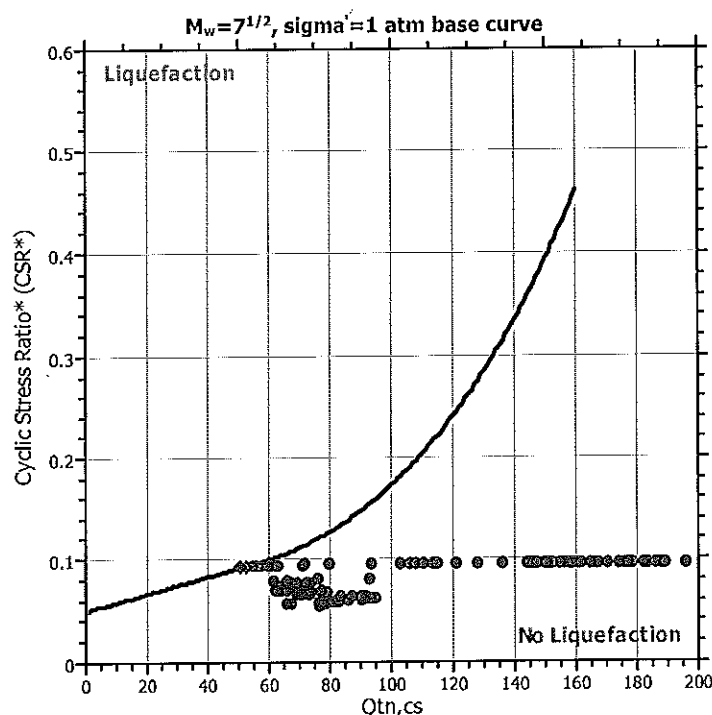
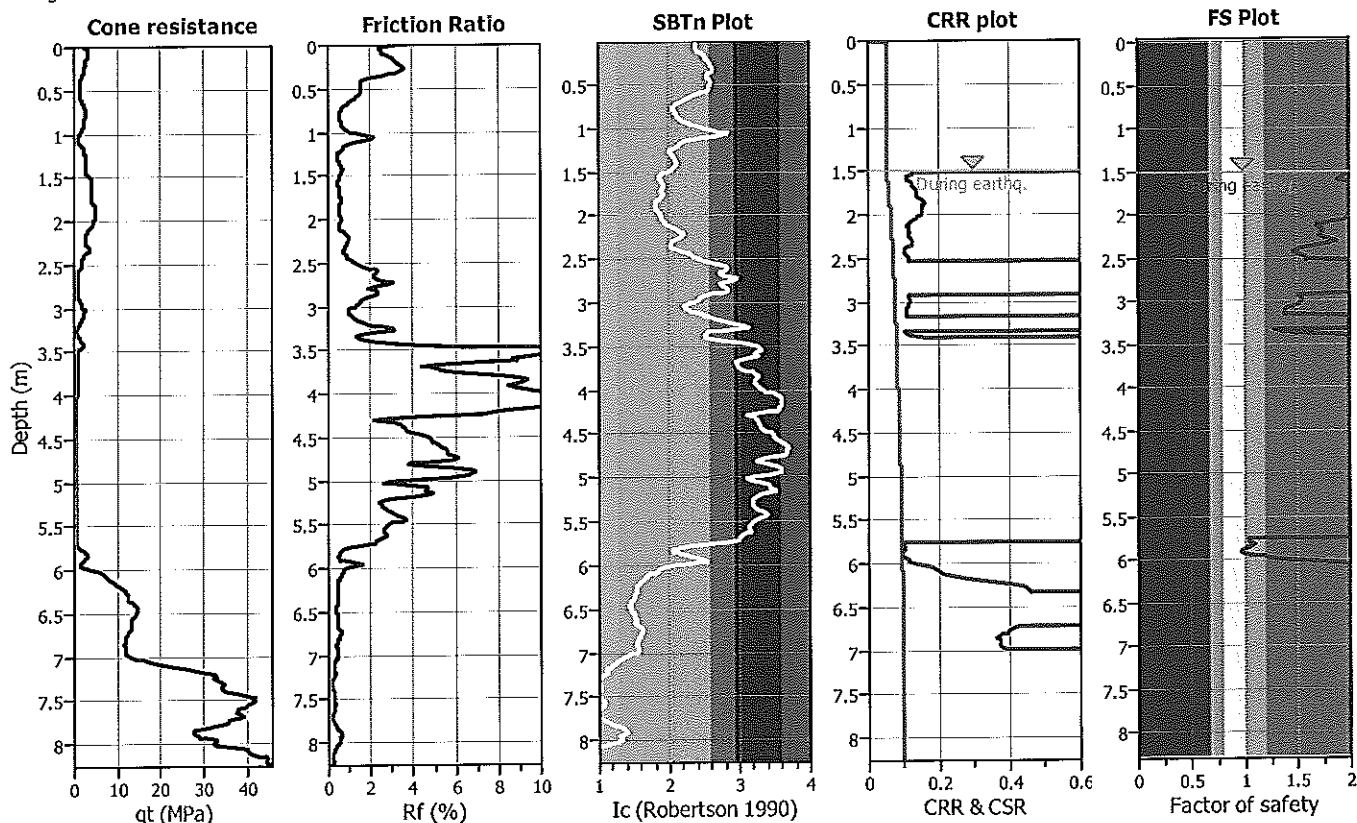
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

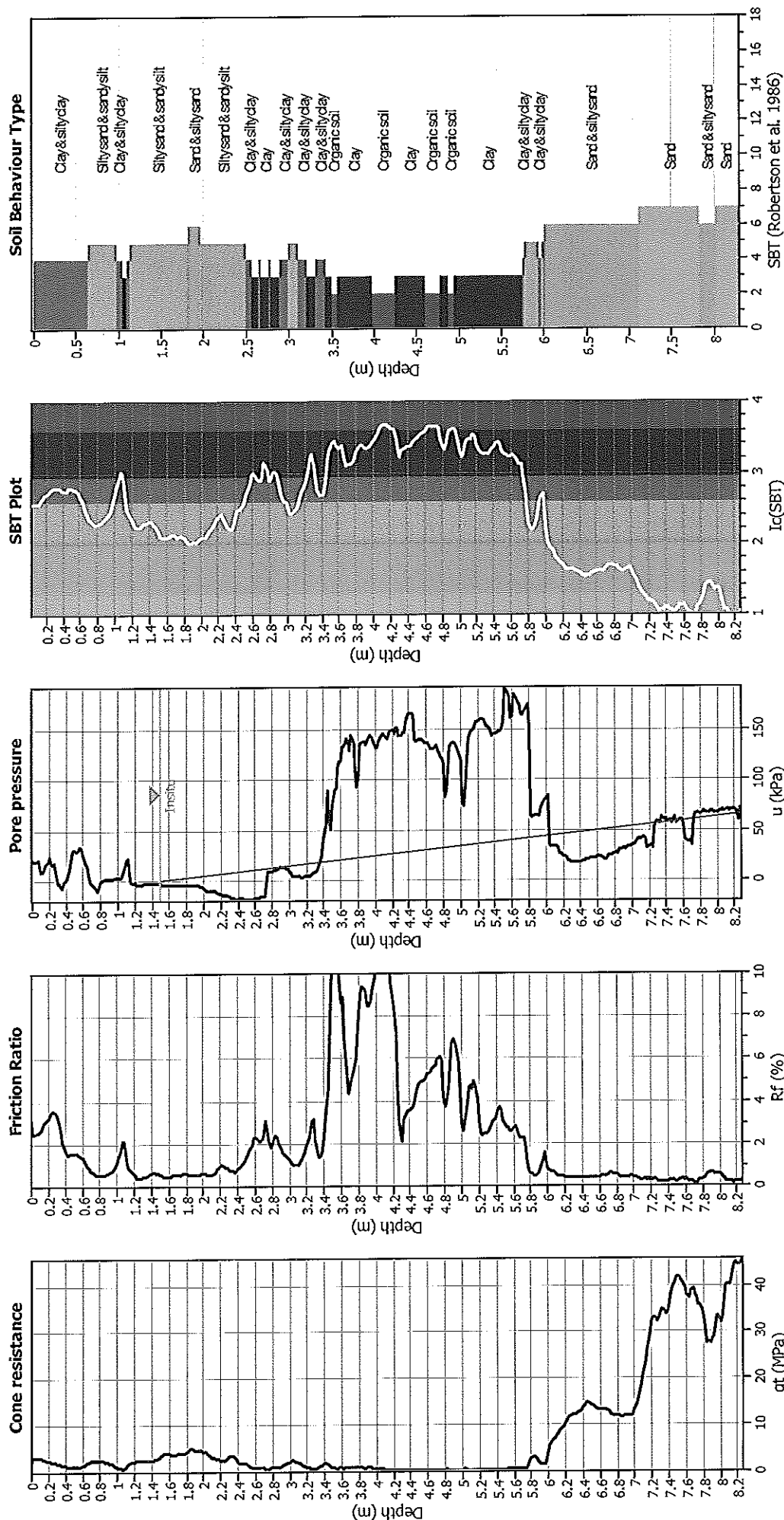
CPT file : 272 Knowles St CPT3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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 :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Unit depth:	N/A
Peak ground acceleration:	0.15	Unit weight calculation:	Based on SBT	K_0 applied:	Yes		



CPT basic interpretation plots



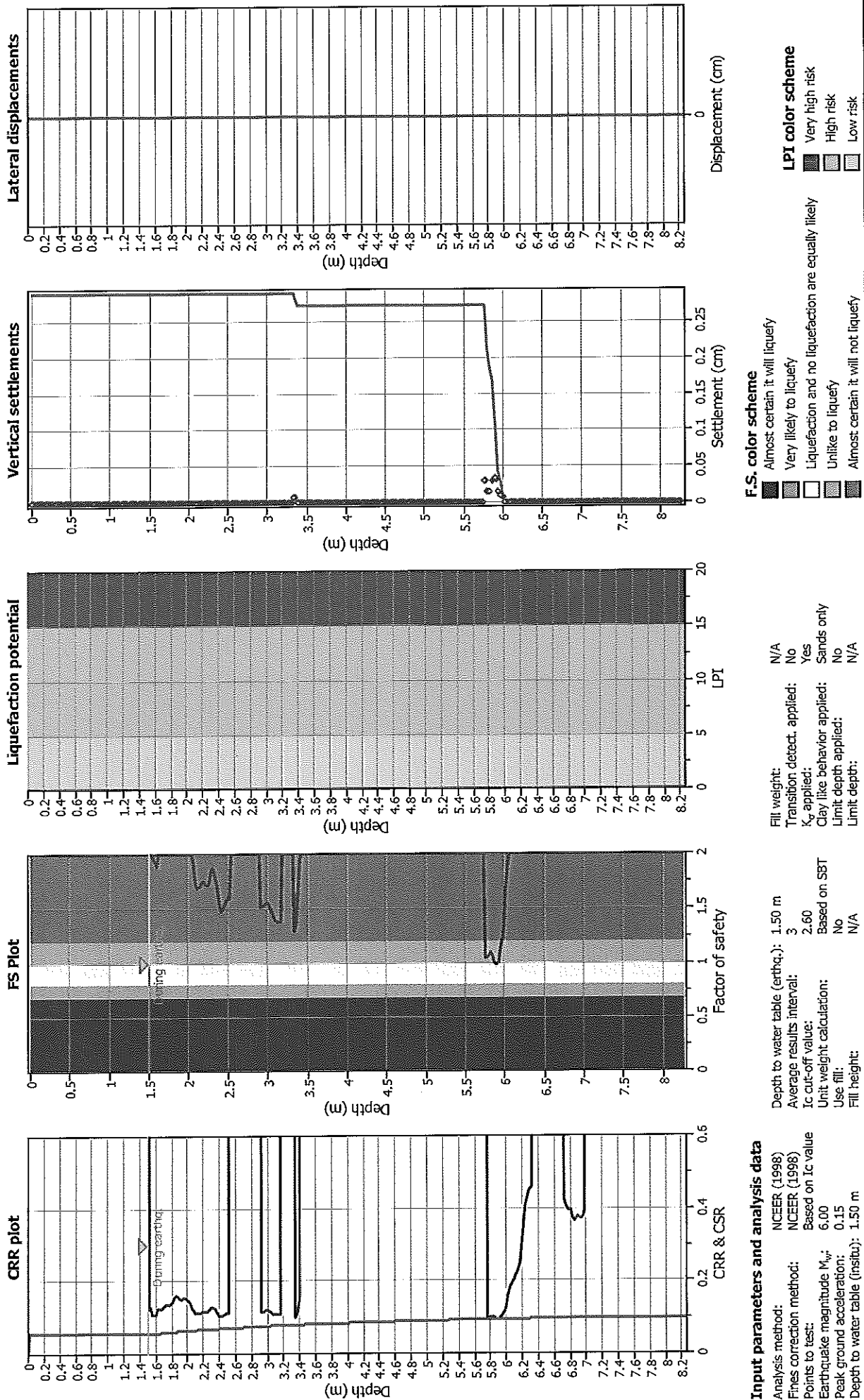
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (ortho.):	1.50 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _u applied:	Yes
Earthquake magnitude M _w :	6.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.15	Use fill:	No	Limit depth applied:	No
Depth to water table (nsitu):	1.50 m	Fill height:	N/A	Limit depth:	N/A

Cluq v.1.5.1.26 - CPT Liquefaction Assessment Software - Report created on: 1/03/2012, 1:27:41 p.m.

Project file: Z:\Projects\2011\11315 281 Innes Road, Mairehau\Analysis & Design\Cluq Analyses\SL5.dwg

Liquefaction analysis overall plots



LIQUEFACTION ANALYSIS REPORT

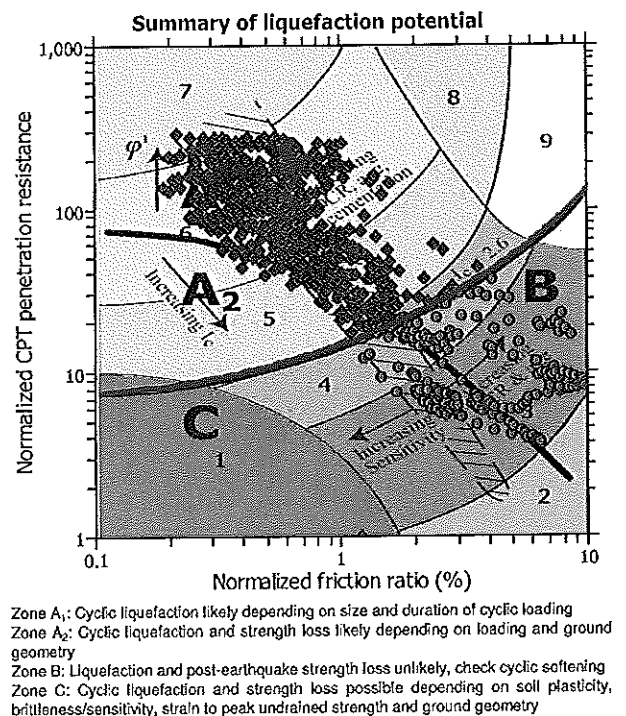
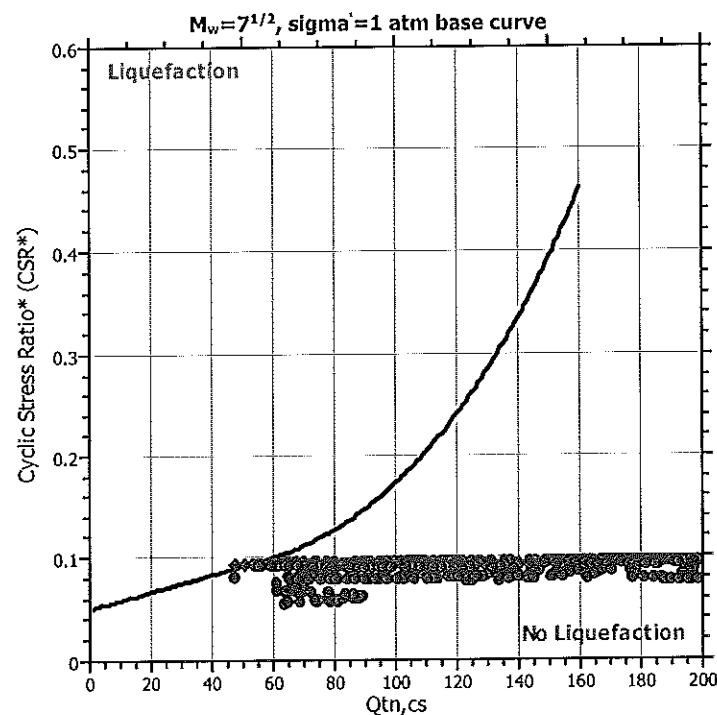
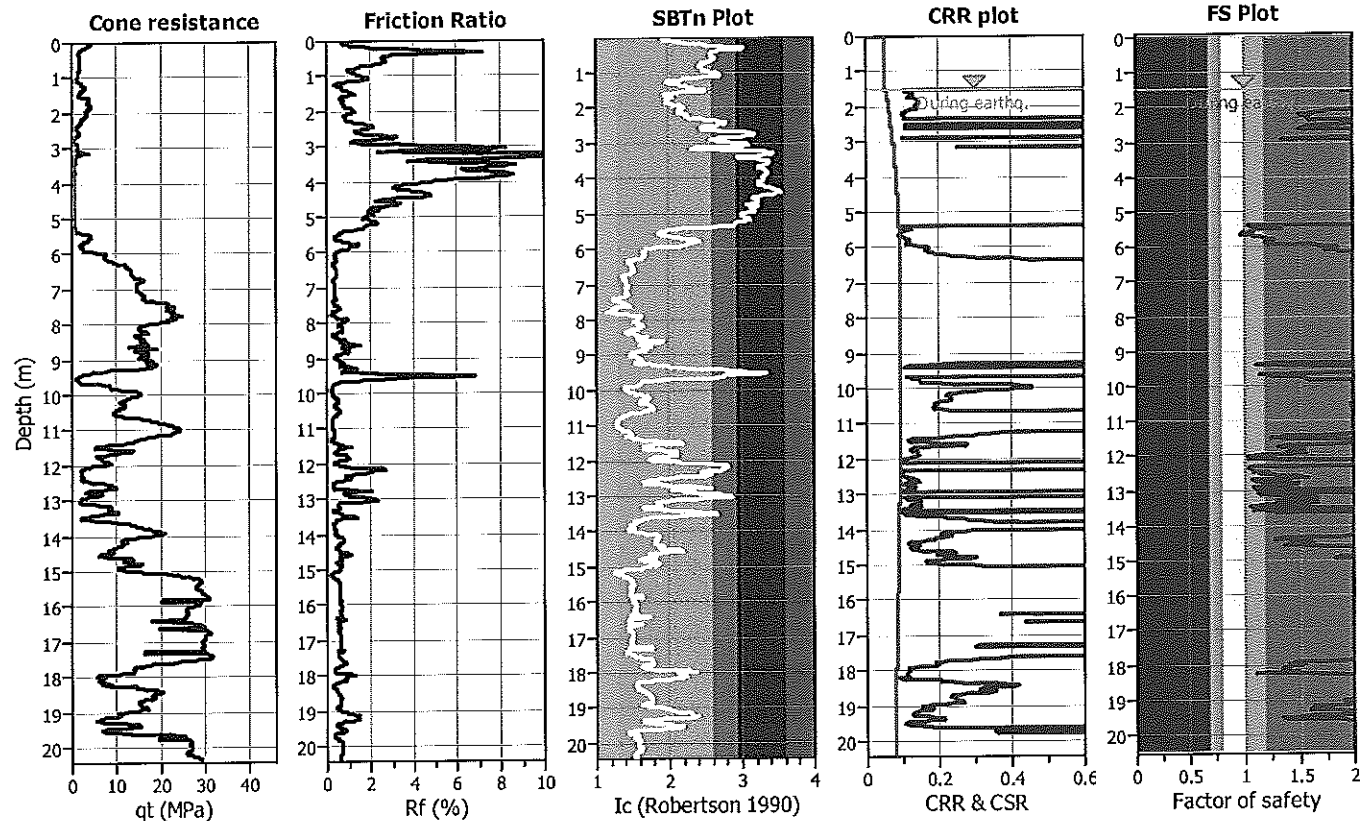
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

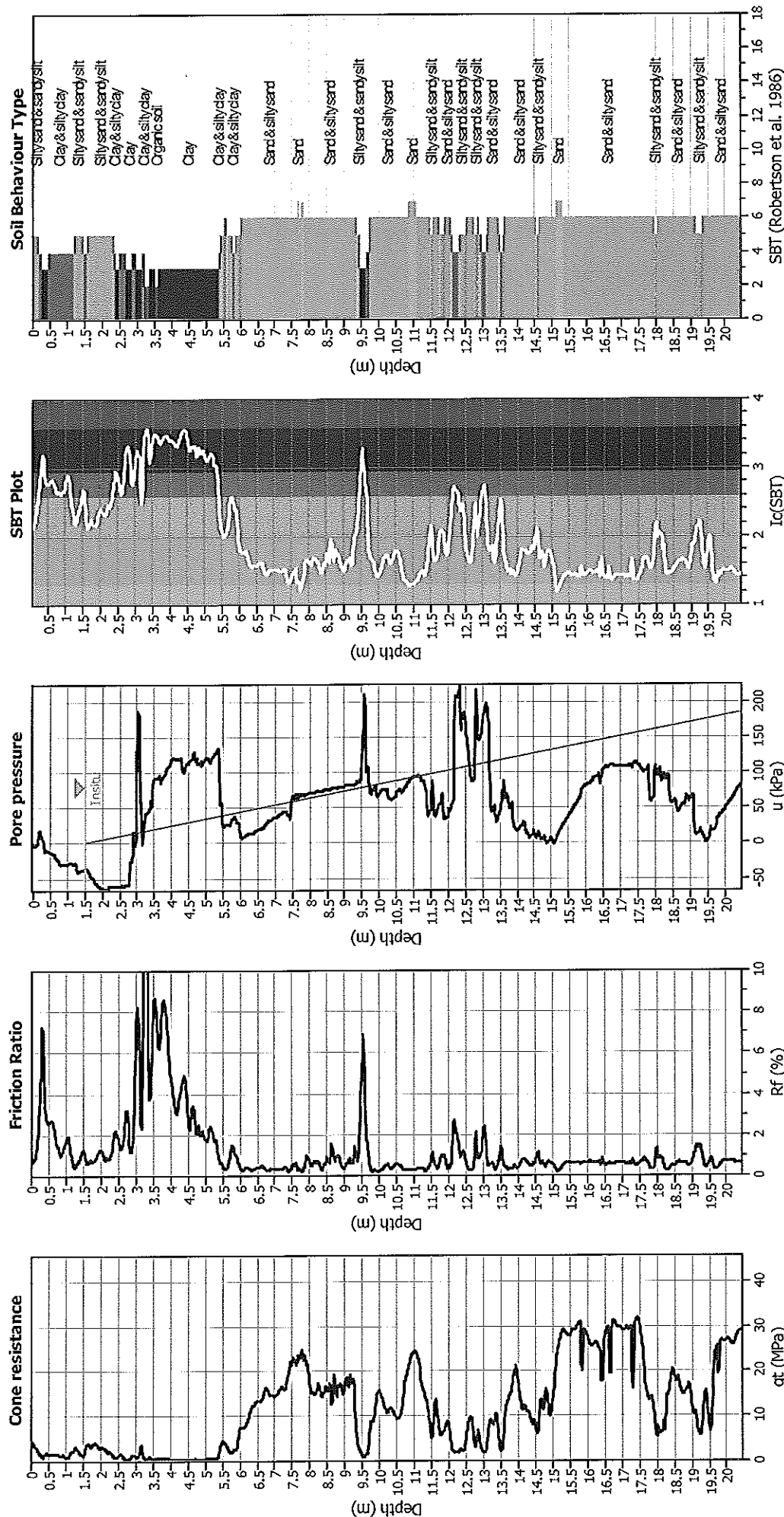
CPT file : 272 Knowles St CPT4

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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 :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	N/A
Peak ground acceleration:	0.15	Unit weight calculation:	Based on SBT	K_0 applied:	Yes		



CPT basic interpretation plots



Input parameters and analysis data

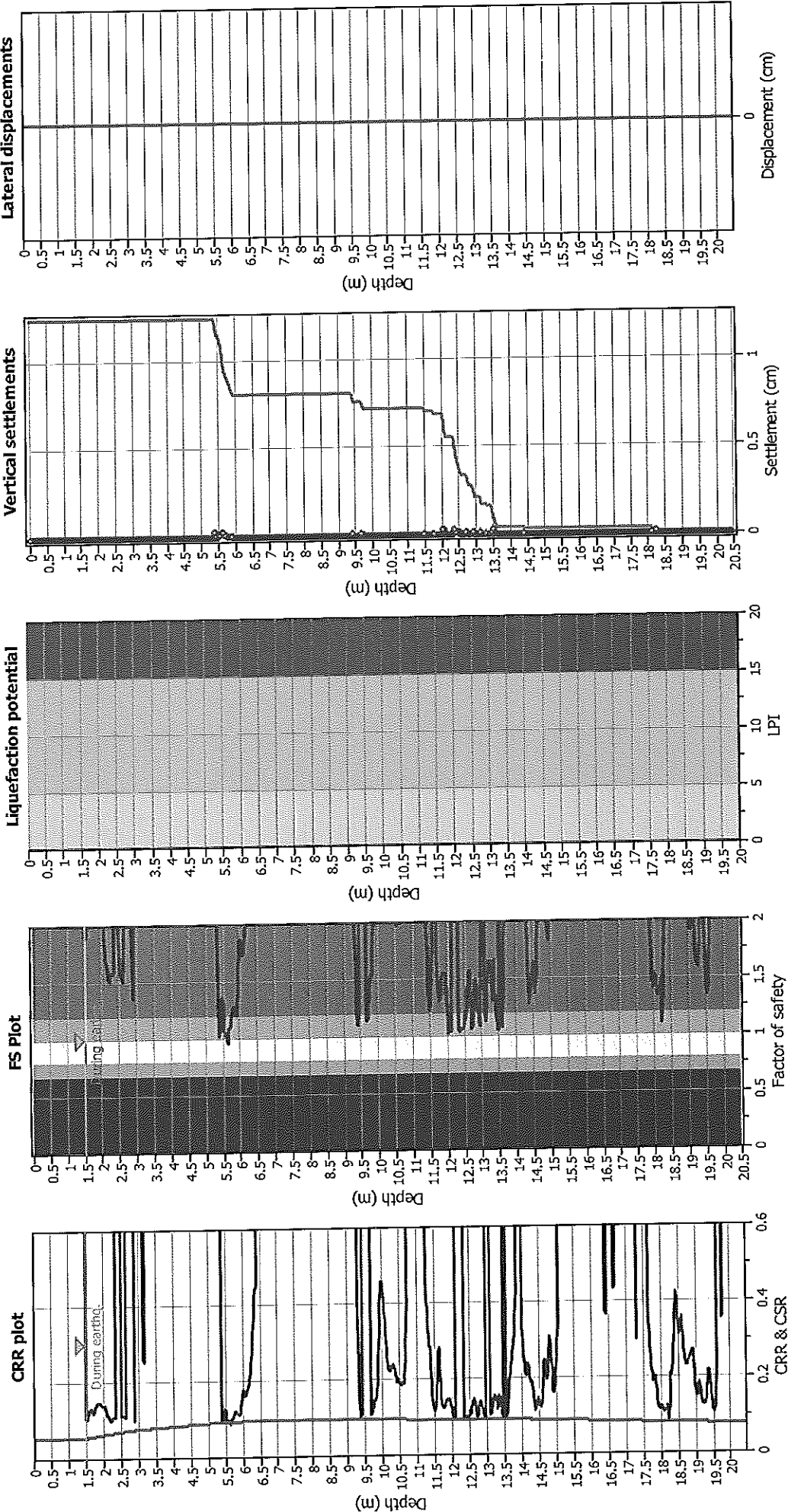
Analysis method:	NCEER (1998)	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Transition detect. applied:	No
Points to test:	Based on I_c value	K_p applied:	Yes
Earthquake magnitude M_w :	6.00	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.15	Limit depth applied:	No
Depth to water table (insitu):	1.50 m	Limit depth:	N/A

Depth to water table (earthq.):	1.50 m
Average results interval:	3
I_c cut-off value:	2.60
Unit weight calculation:	Based on SBT
Use fill:	No
Fill height:	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: NCEER (1998)
 Fines correction method: NCEER (1998)
 Points to test: Based on I_c value
 Earthquake magnitude M_w : 6.00
 Peak ground acceleration: 0.15
 Depth to water table (insitu): 1.50 m

Depth to water table (earthq.): 1.50 m
 Average results interval: 3
 I_c cut-off value: 2.60
 Unit weight calculation: Based on SBT
 Use fill: No
 Fill height: N/A

Fill weight: N/A
 Transition detect. applied: No
 K_c applied: Yes
 Clay like behavior applied: Sands only
 Limit depth applied: No
 Limit depth: N/A

F.S. color scheme

Almost certain it will liquefy
 Very likely to liquefy
 Liquefaction and no liquefaction are equally likely
 Unlikely to liquefy
 Almost certain it will not liquefy

LPI color scheme

Very high risk
 High risk
 Low risk



**GEOSCIENCE
consulting**
(NZ) LIMITED

Geoscience Consulting (NZ) Ltd
P.O Box 110
Lyttelton 8841

LIQUEFACTION ANALYSIS REPORT

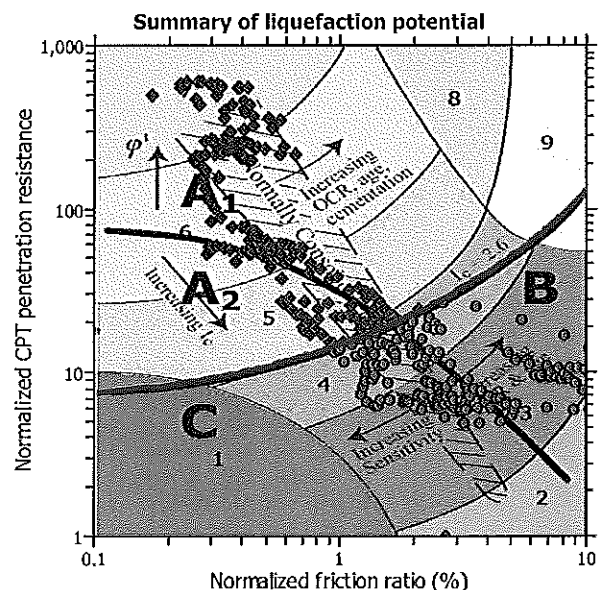
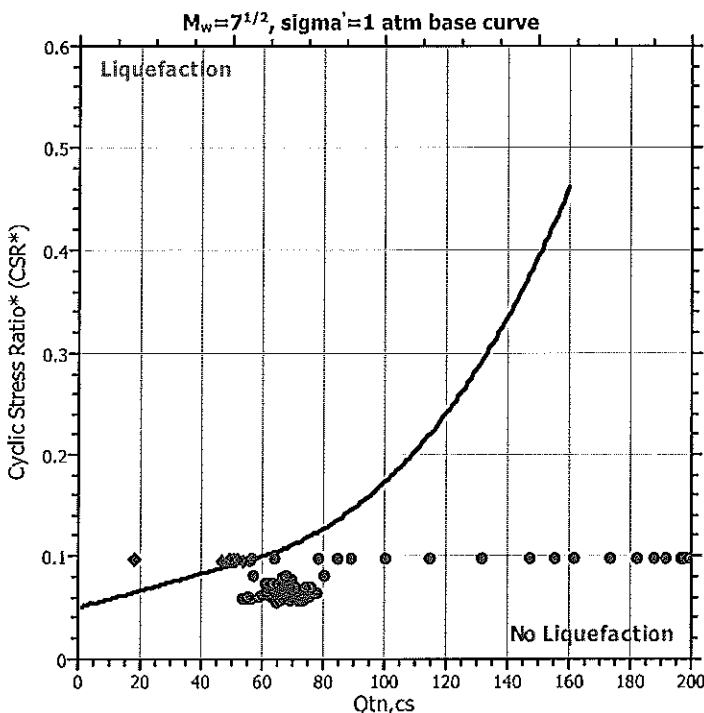
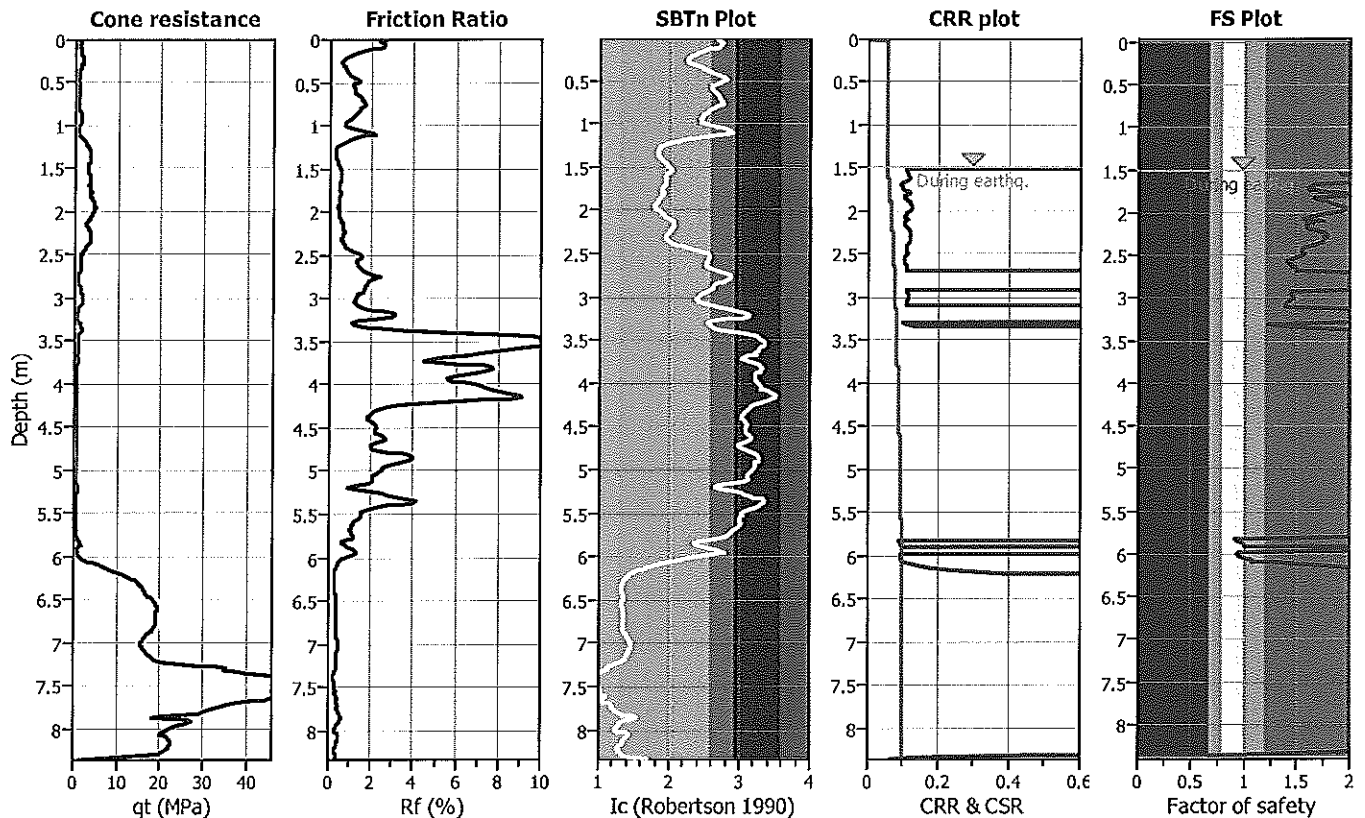
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

CPT file : 274 Knowles St CPT1

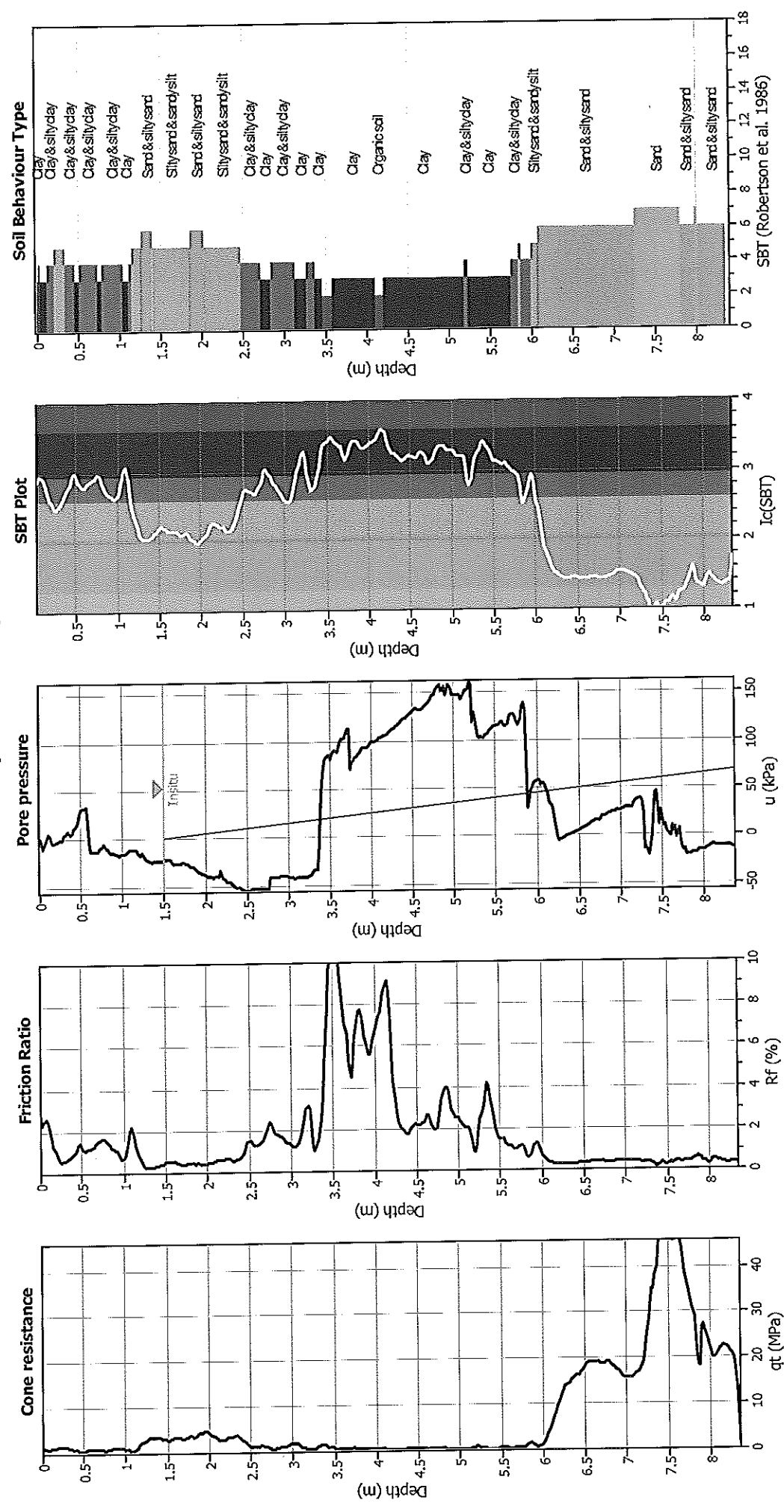
Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 m	Fill height:	N/A	applied:
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Sands only
Earthquake magnitude M_w :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth applied:
Peak ground acceleration:	0.15	Unit weight calculation:	Based on SBT	K_0 applied:	Yes	Limit depth:
						N/A



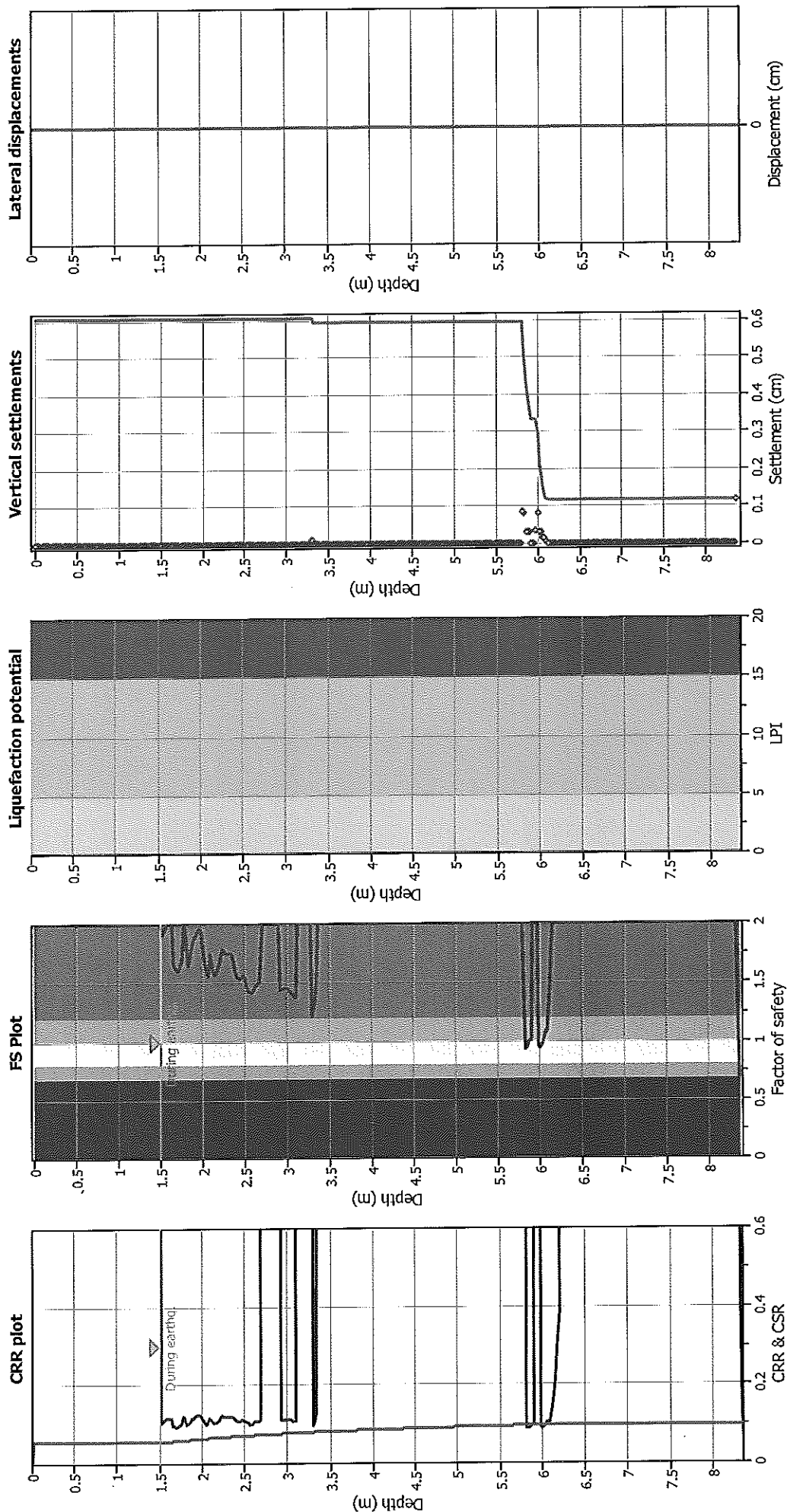
Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength 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:	NCEER (1998)	Fill weight:	N/A	
Fines correction method:	NCEER (1998)	Transition detect. applied:	No	
Points to test:	Based on I_c value	K_0 applied:	Yes	
Earthquake magnitude M_w :	6.00	Clay like behavior applied:	Sands only	
Peak ground acceleration:	0.15	Limit depth applied:	No	
Depth to water table (insitu):	1.50 m	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: NCEER (1998)
 Fines correction method: NCEER (1998)
 Points to test: Based on I_c value
 Earthquake magnitude M_w : 6.00
 Peak ground acceleration: 0.15
 Depth to water table (insttu): 1.50 m

Depth to water table (earthq.): 1.50 m
 Average results interval: 3
 I_c cut-off value: 2.60
 Unit weight calculation: Based on SBT
 Use fill: No
 Fill height: N/A

Fill weight: N/A
 Transition detect. applied: No
 K_0 applied: Yes
 Clay like behavior applied: Sands only
 Limit depth applied: No
 Limit depth: N/A

F.S. color scheme

Almost certain it will liquefy
 Very likely to liquefy
 Liquefaction and no liquefaction are equally likely
 Unlikely to liquefy
 Almost certain it will not liquefy

LPI color scheme

Very high risk
 High risk
 Low risk



LIQUEFACTION ANALYSIS REPORT

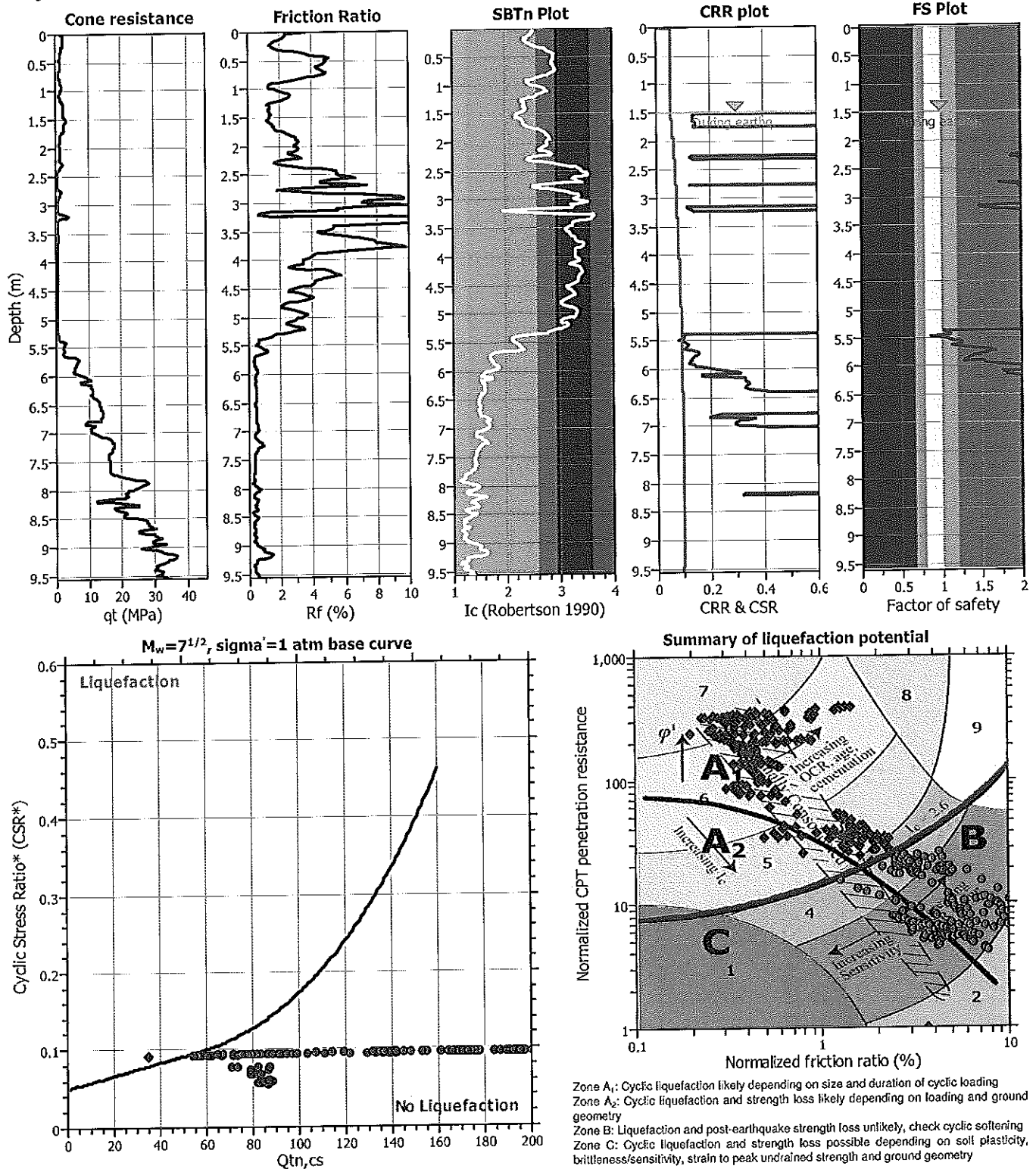
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

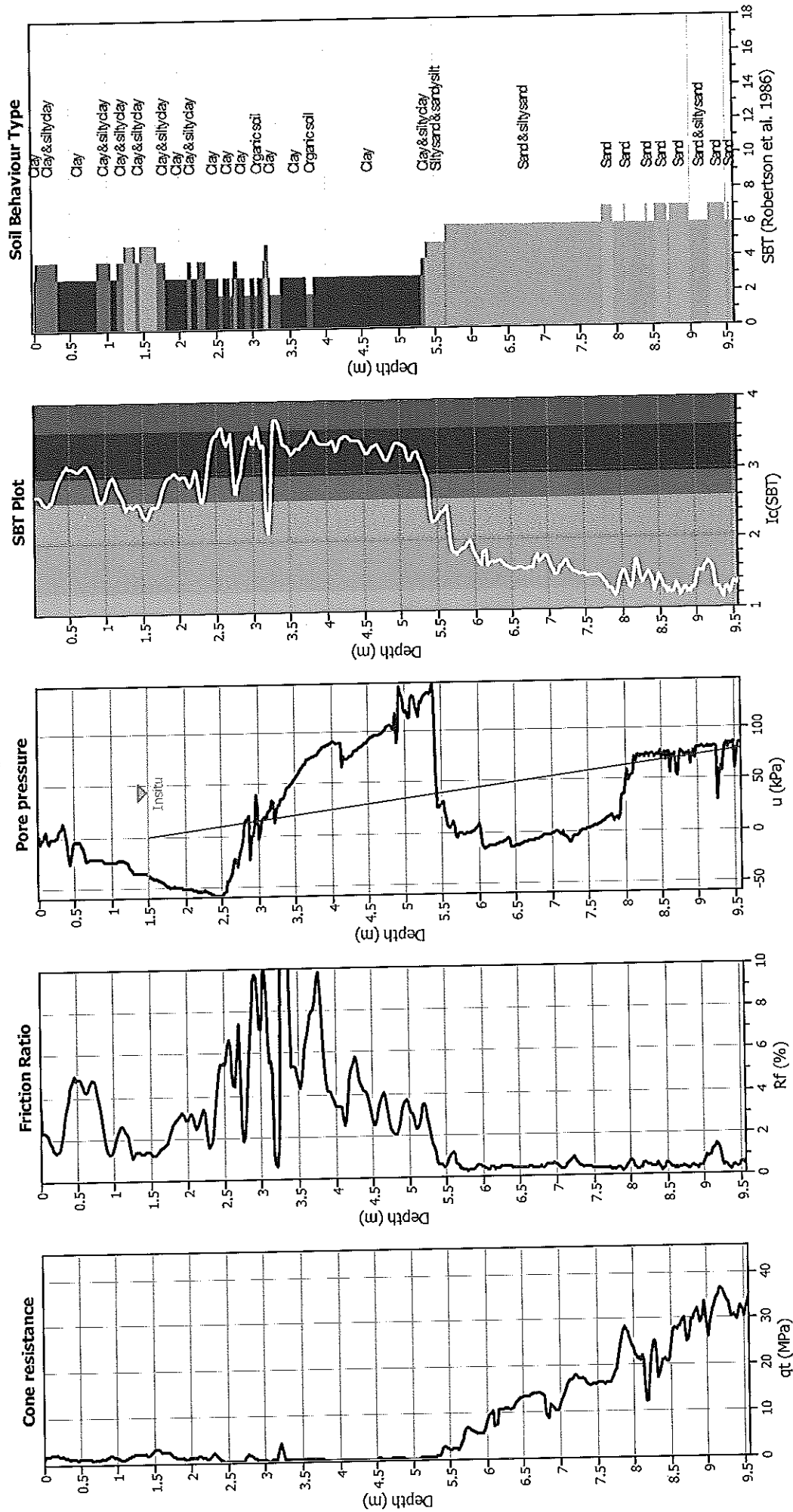
CPT file : 274 Knowles St CPT2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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 :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No		
Peak ground acceleration:	0.15	Unit weight calculation:	Based on SBT	K_0 applied:	Yes		



CPT basic interpretation plots

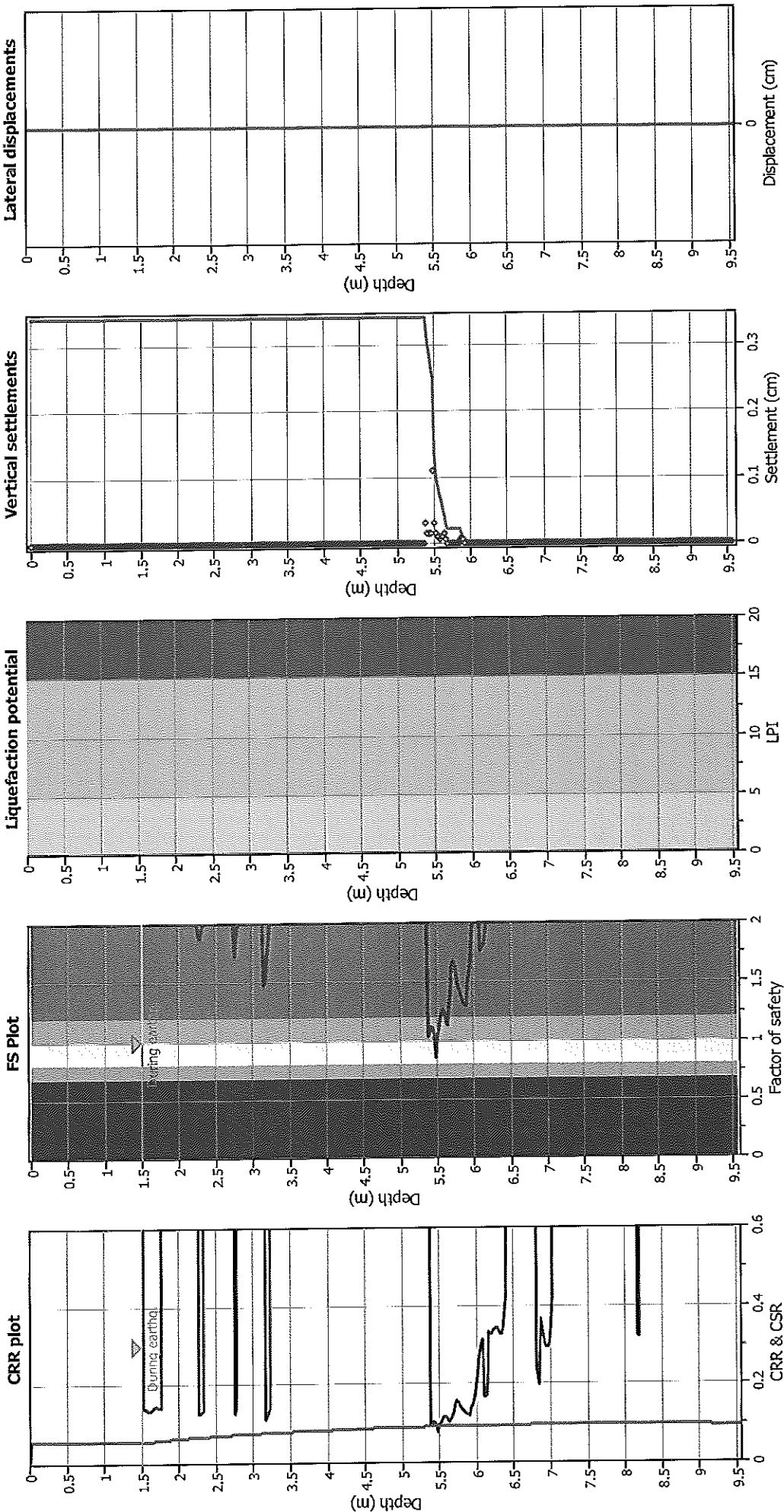


Input parameters and analysis data

Analysis method:	NCEER (1998)	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Transition detect:	No
Points to test:	Based on Ic value	K _v applied:	Yes
Earthquake magnitude M _w :	6.00	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.15	Limit depth applied:	No
Depth to water table (insitu):	1.50 m	Limit depth:	N/A
Depth to water table (earth):	1.50 m		
Average results interval:	3		
Ic cut-off value:	2.60		
Unit weight calculation:	Based on SBT		
Use fill:	No		
Fill height:	N/A		

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

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method: NCEER (1998)
Fines correction method: NCEER (1998)
Points to test: Based on ic value
Earthquake magnitude M_w : 6.00
Peak ground acceleration: 0.15
Depth to water table (insitu): 1.50 m

Fill weight: N/A
Transition detect. applied: No
 K_0 applied: Yes
Clay like behavior applied: Sands only
Limit depth applied: No
Limit depth: N/A

F.S. color scheme
Almost certain it will liquefy
Very likely to liquefy
Liquefaction and no liquefaction are equally likely
Unlike to liquefy
Almost certain it will not liquefy

LPI color scheme
Very high risk
High risk
Low risk

LIQUEFACTION ANALYSIS REPORT

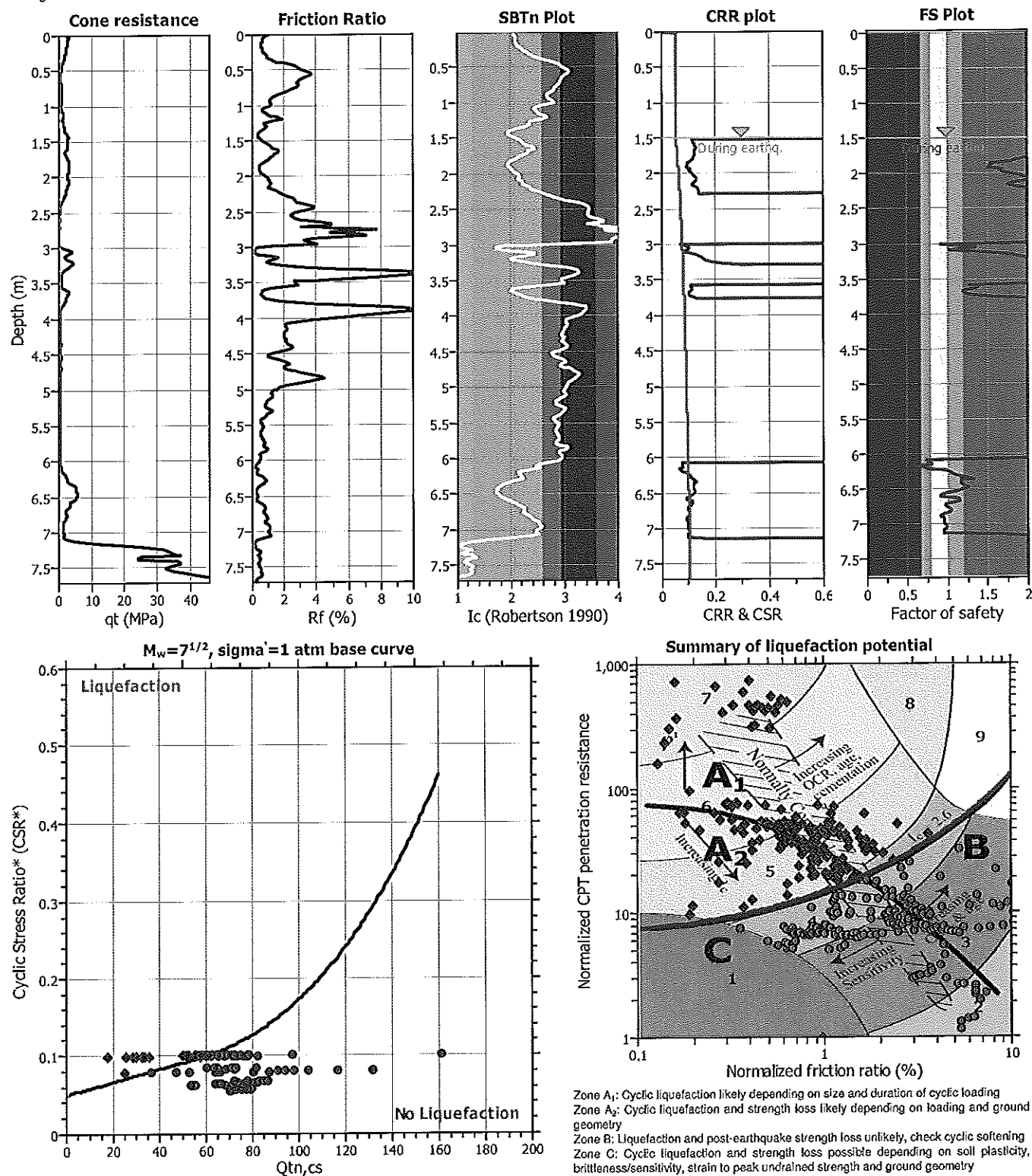
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

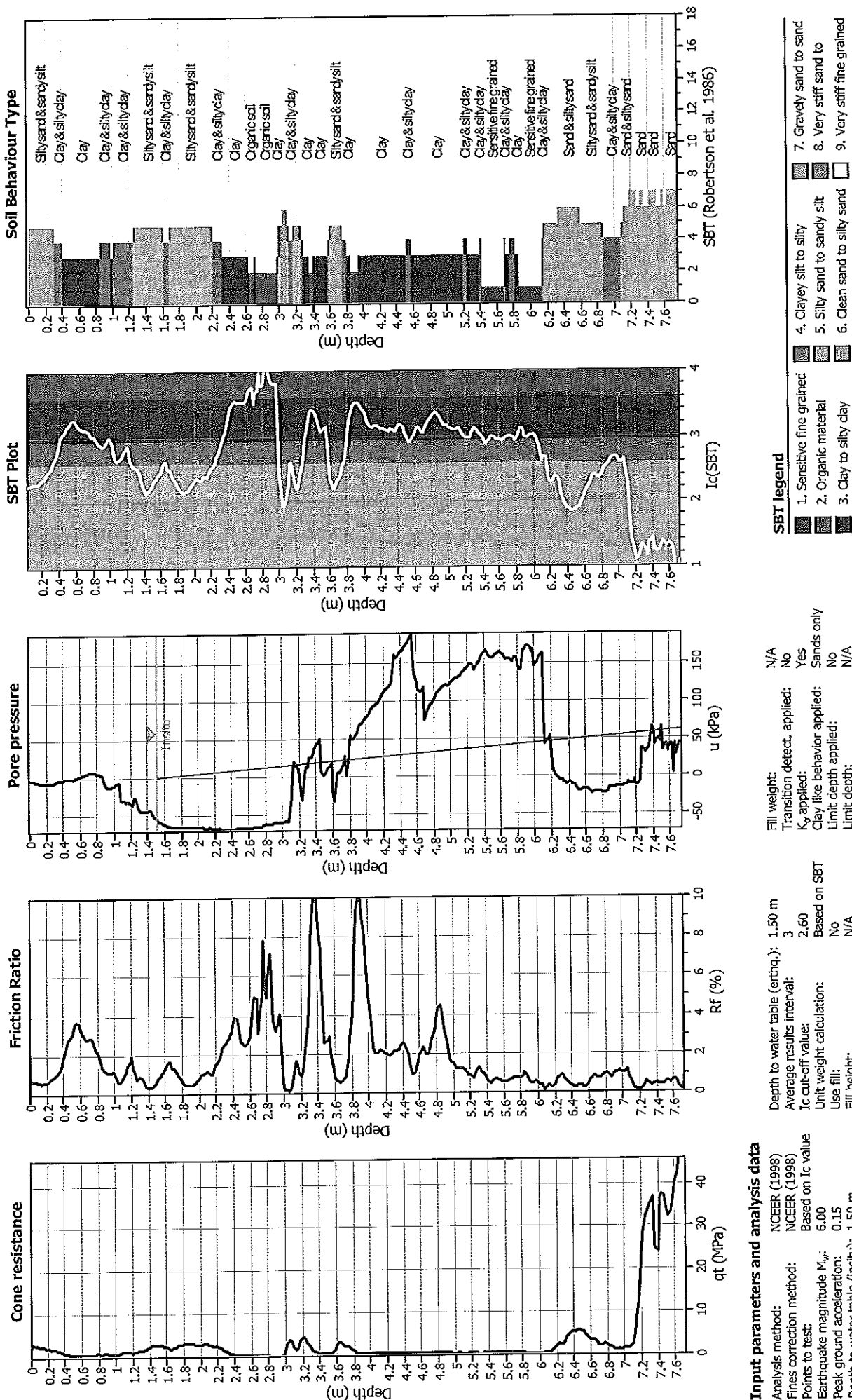
CPT file : 281 Innes St CPT7

Input parameters and analysis data

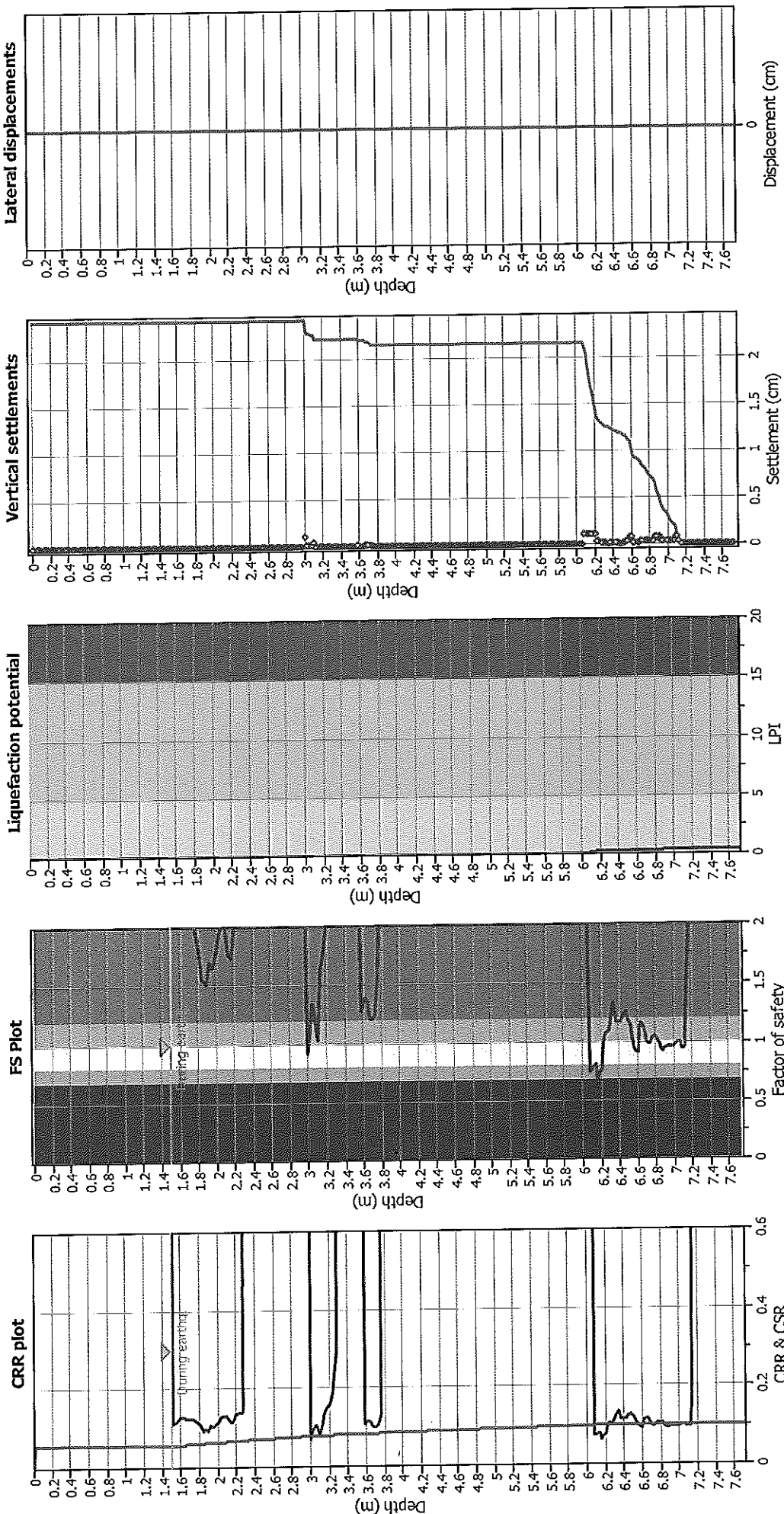
Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 m	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude M_w :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	N/A
Peak ground acceleration:	0.15	Unit weight calculation:	Based on SBT	K_0 applied:	Yes		



CPT basic interpretation plots



Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method: NCEER (1998)
 Fines correction method: NCEER (1998)
 Points to test: Based on I_c value
 Earthquake magnitude M_w : 6.00
 Peak ground acceleration: 0.15
 Depth to water table (instu): 1.50 m

Fill weight: N/A
 Transition detect. applied: No
 K_0 applied: Yes
 Clay like behavior applied: Sands only
 Limit depth applied: No
 Limit depth: N/A

Depth to water table (earthq.): 1.50 m
 Average results interval: 3
 I_c cut-off value: 2.60
 Unit weight calculation: Based on SBT
 Use fill: No
 Fill height: N/A

F.S. color scheme

Almost certain it will liquefy
 Very likely to liquefy
 Liquefaction and no liquefaction are equally likely
 Unlike to liquefy
 Almost certain it will not liquefy

LPI color scheme

Very high risk
 High risk
 Low risk

LIQUEFACTION ANALYSIS REPORT

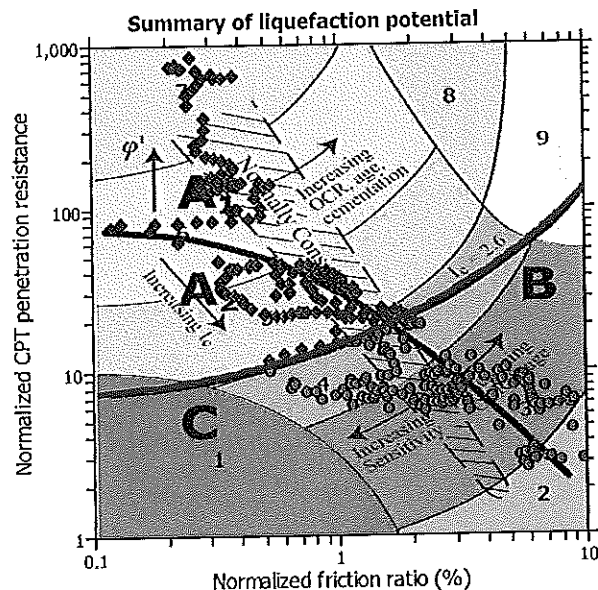
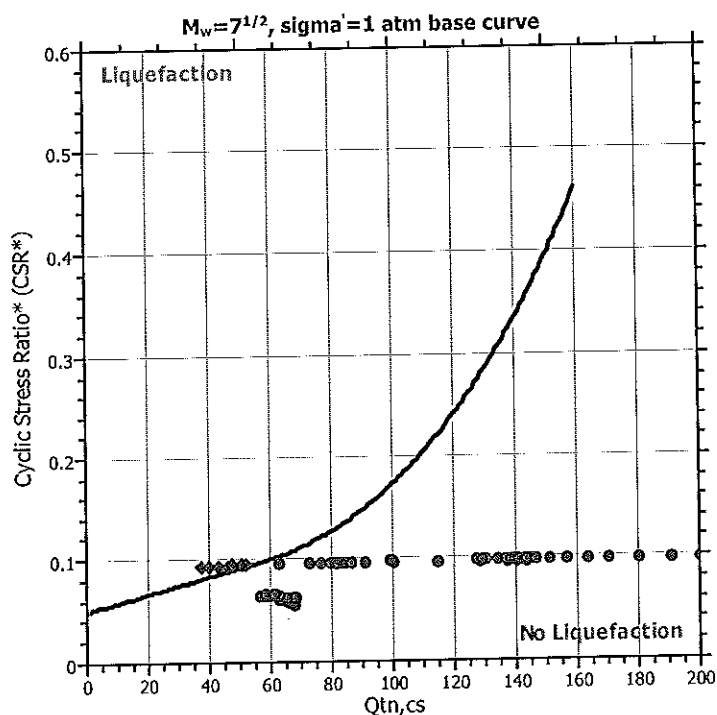
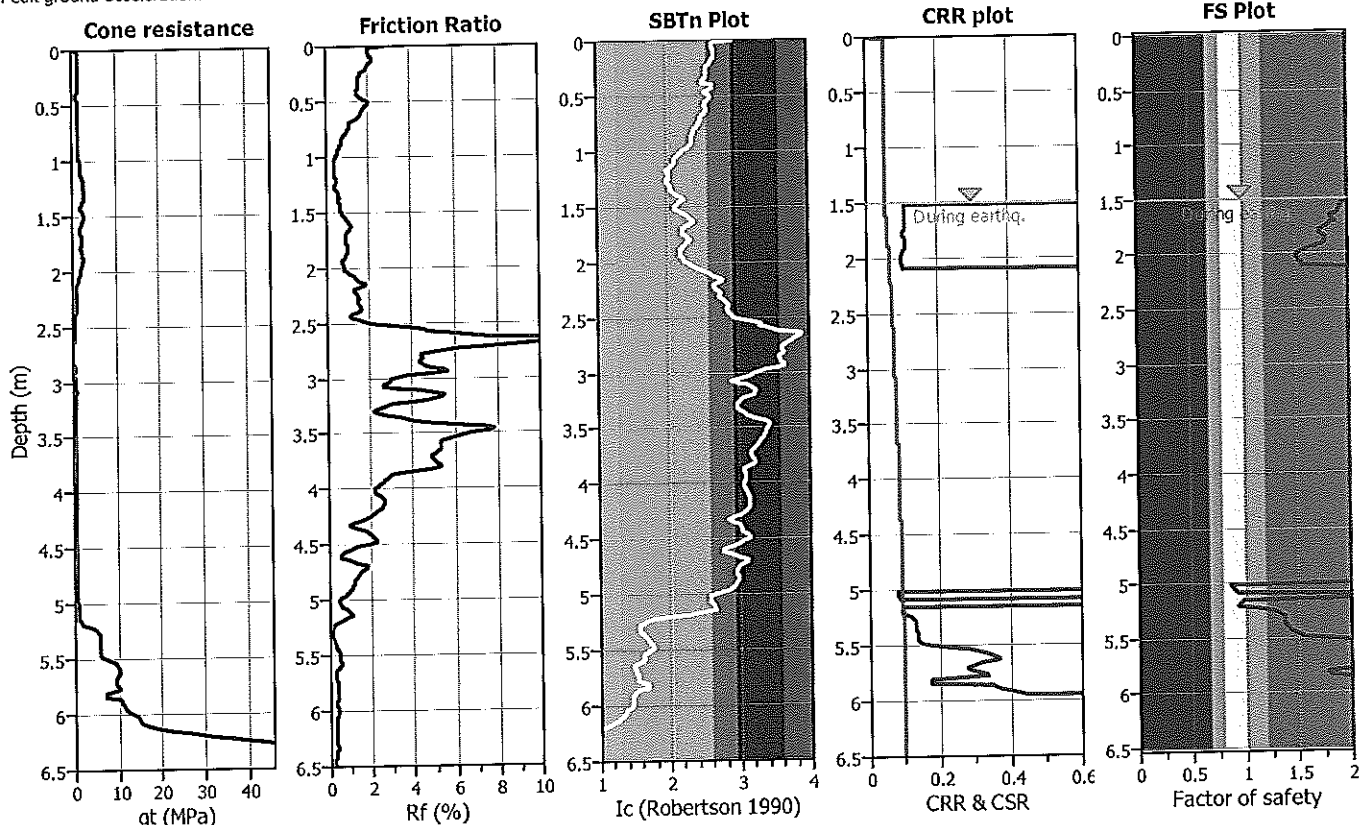
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

CPT file : 281 Innes St CPT8

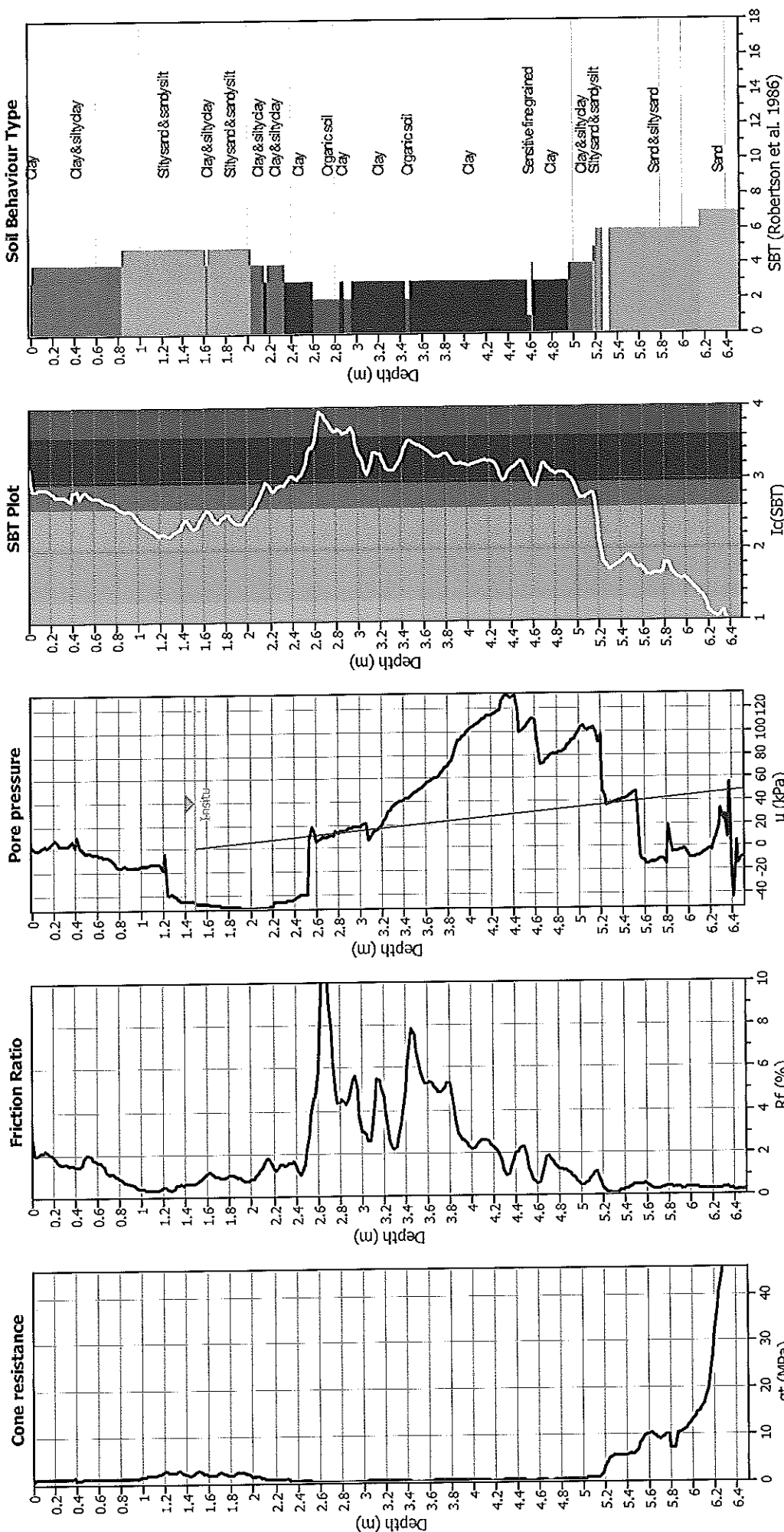
Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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 :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	N/A
Peak ground acceleration:	0.15	Unit weight calculation:	Based on SBT	K_u applied:	Yes		



Zone A: 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



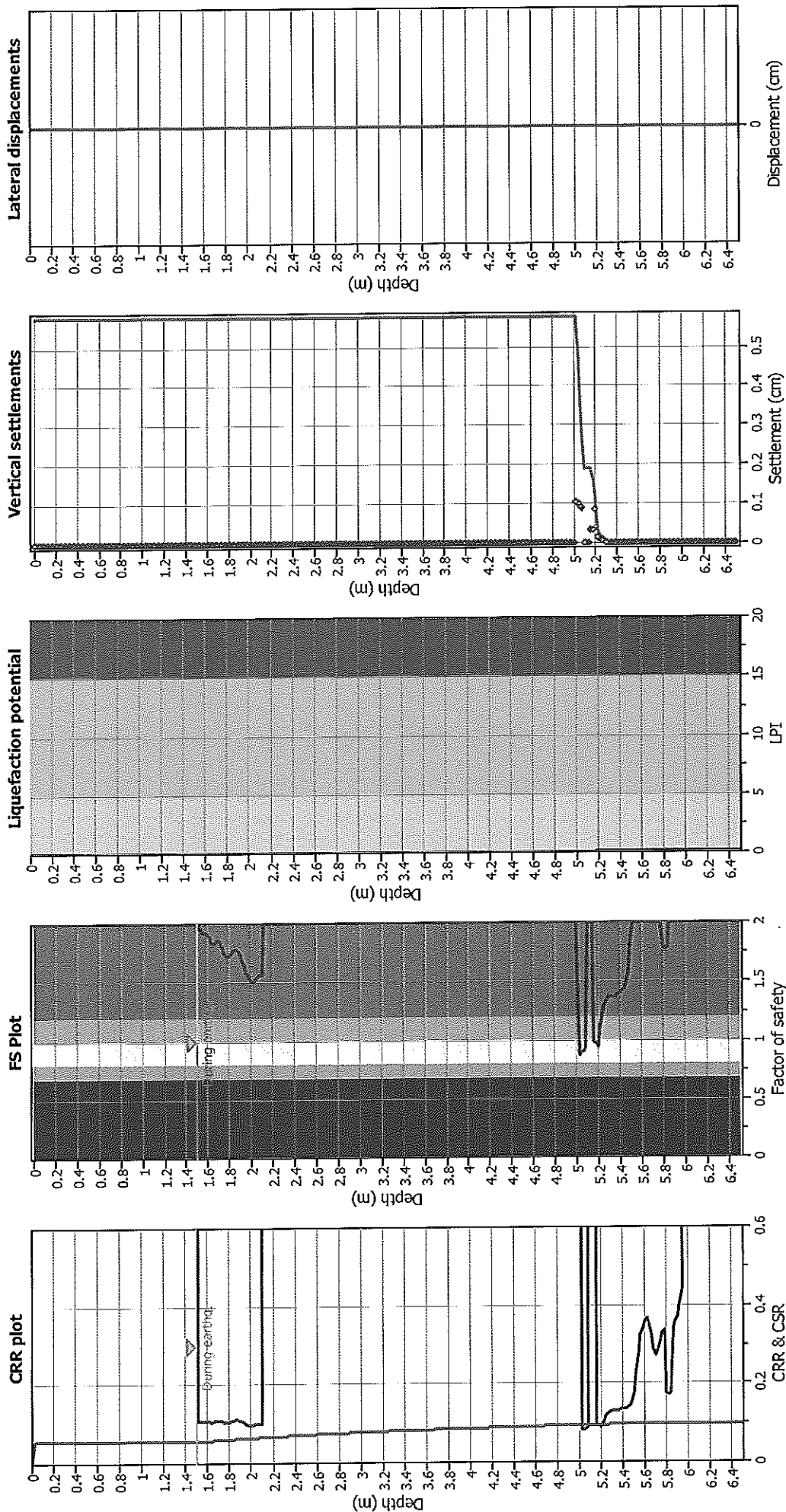
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earth):	1.50 m	Fill weight:	N/A
Finest correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _c applied:	Yes
Earthquake magnitude M _w :	6.00	Unit weight calculation:	No	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.15	Use fill:	N/A	Limit depth applied:	No
Depth to water table (In situ):	1.50 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:	NCEER (1998)	Depth to water table (earthq.):	1.50 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on I_c value	Ic cut-off value:	2.60	K_D applied:	Yes
Earthquake magnitude M_w :	6.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.15	Use fill:	No	Limit depth applied:	No
Depth to water table (instu):	1.50 m	Fill height:	N/A	Limit depth:	N/A

CLiq v.1.5.1.26 - CPT Liquefaction Assessment Software - Report created on: 1/03/2012, 1:27:45 p.m.

Project file: Z:\Projects\2011\11315 281 Innes Road, Mairehau\Analysis & Design\Cltq Analyses\SL5.dq



LIQUEFACTION ANALYSIS REPORT

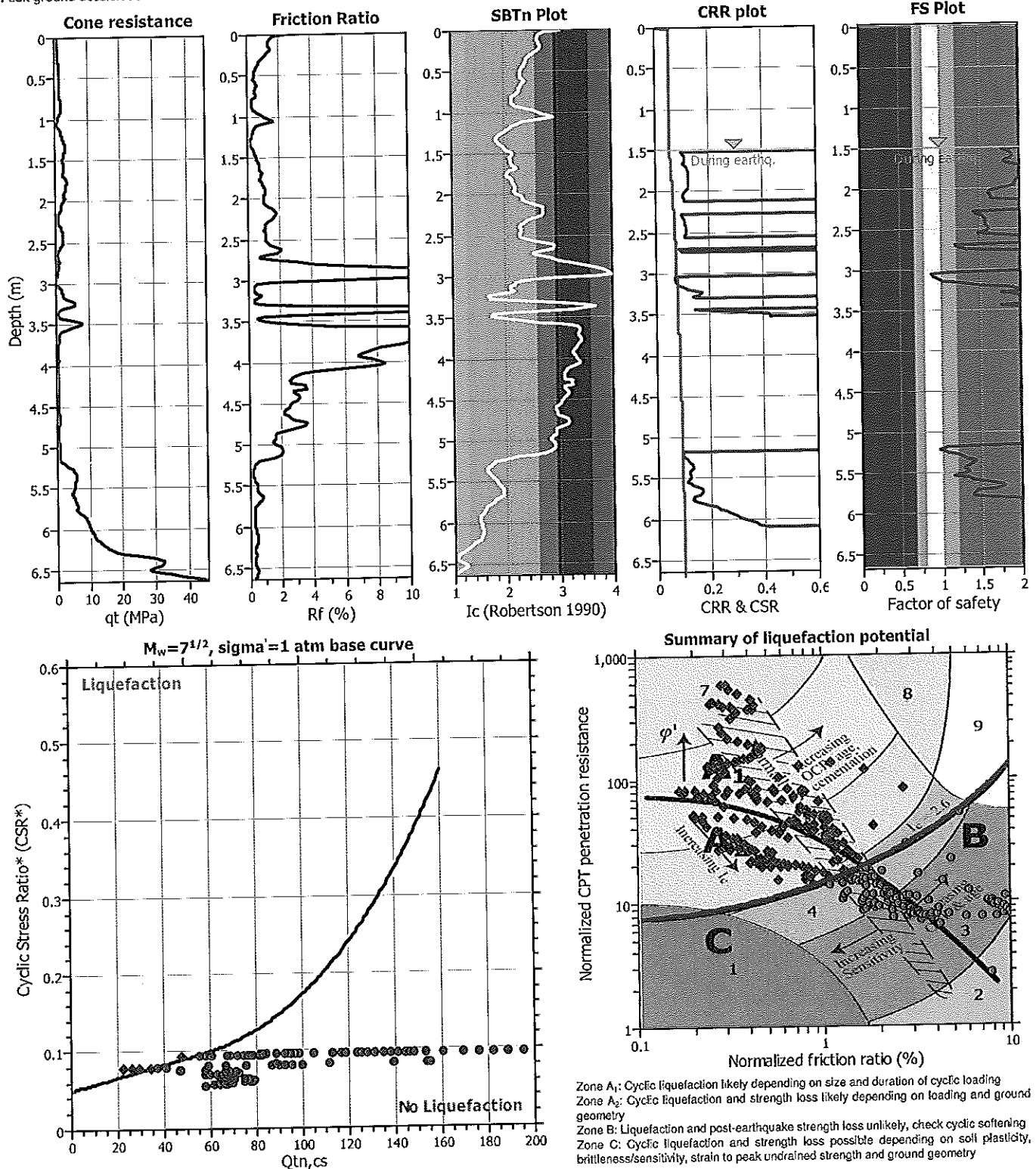
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

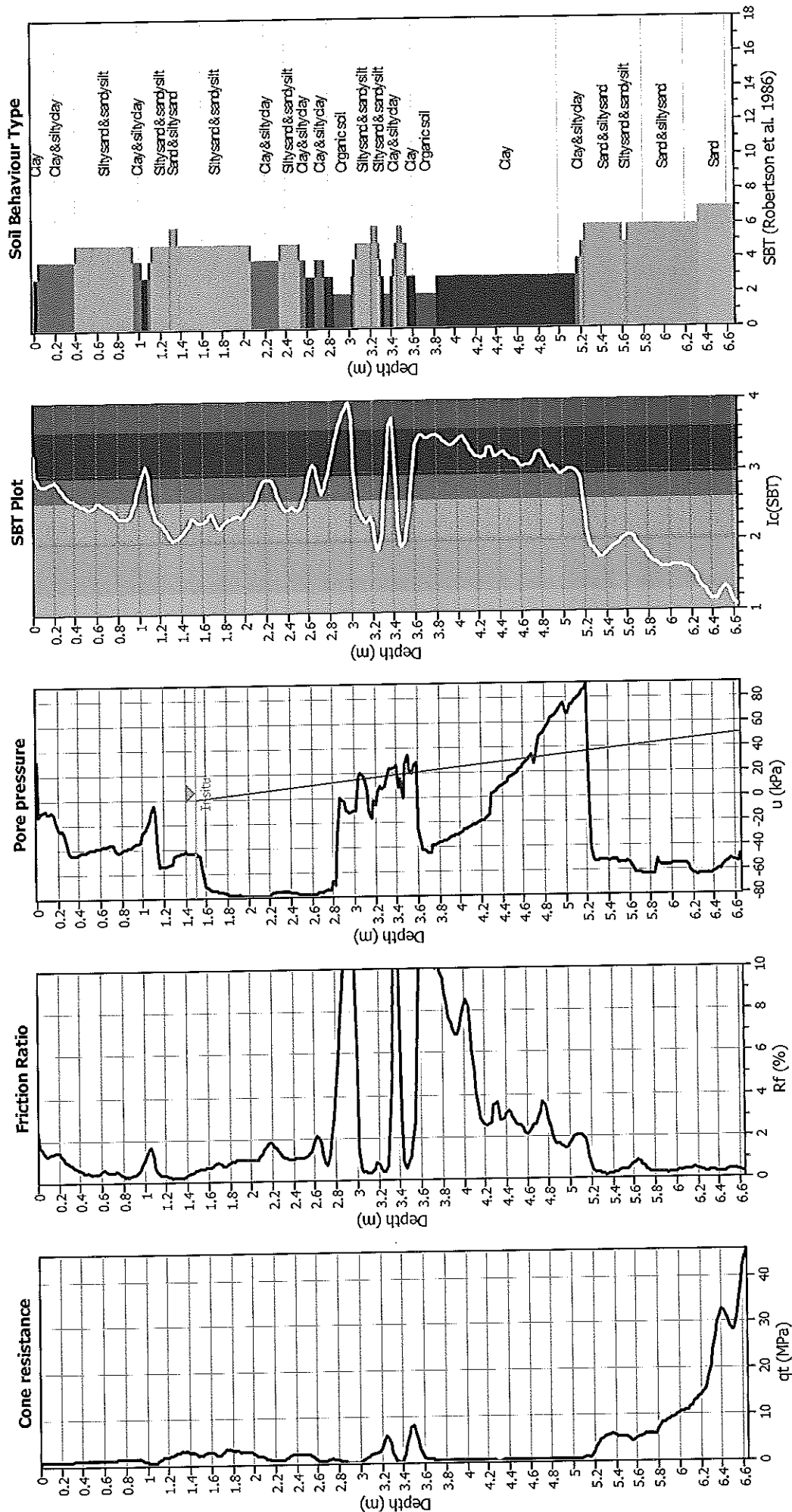
CPT file : 283 Innes St CPT5

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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 :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No	Limit depth:	N/A
Peak ground acceleration:	0.15	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		



CPT basic interpretation plots



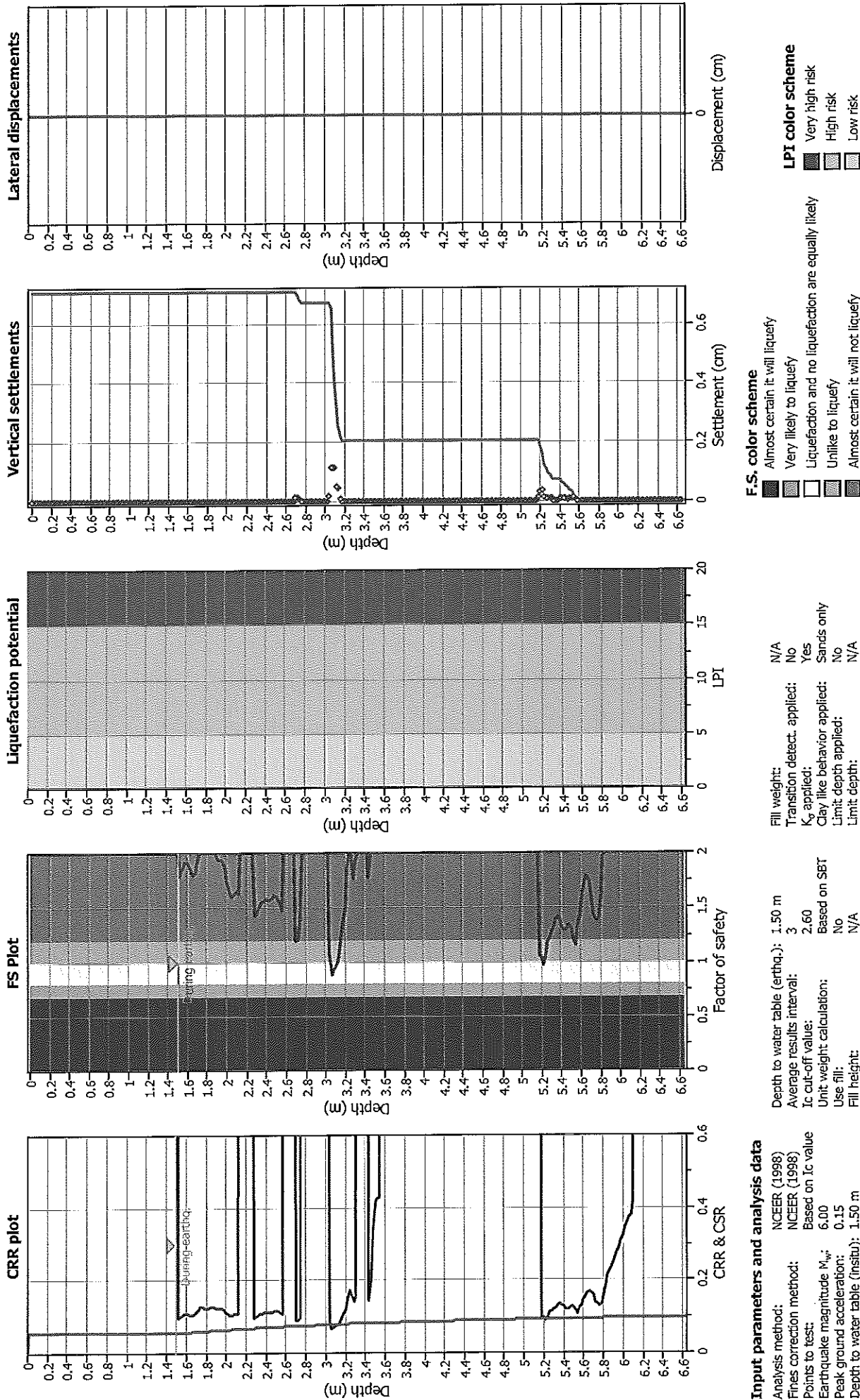
Input parameters and analysis data

Analysis method:	NCEER (1998)	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Transition detected, applied:	No
Points to test:	Based on Ic value	K _c applied:	Yes
Earthquake magnitude M _w :	6.00	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.15	Limit depth applied:	No
Depth to water table (insitu):	1.50 m	Limit depth:	N/A
Depth to water table (ortho.):	1.50 m		
Average results interval:	3		
Ic cut-off value:	2.60		
Unit weight calculation:	Based on SBT		
Use fill:	No		
Fill height:	N/A		

CLiQ v.1.5.1.26 - CPT Liquefaction Assessment Software - Report created on: 1/03/2012, 1:27:47 p.m.

Project file: Z:\Projects\2011\11315 281 Innes Road, Mairere\Analysis & Design\CLiQ Analyses\SLS.dq

Liquefaction analysis overall plots





LIQUEFACTION ANALYSIS REPORT

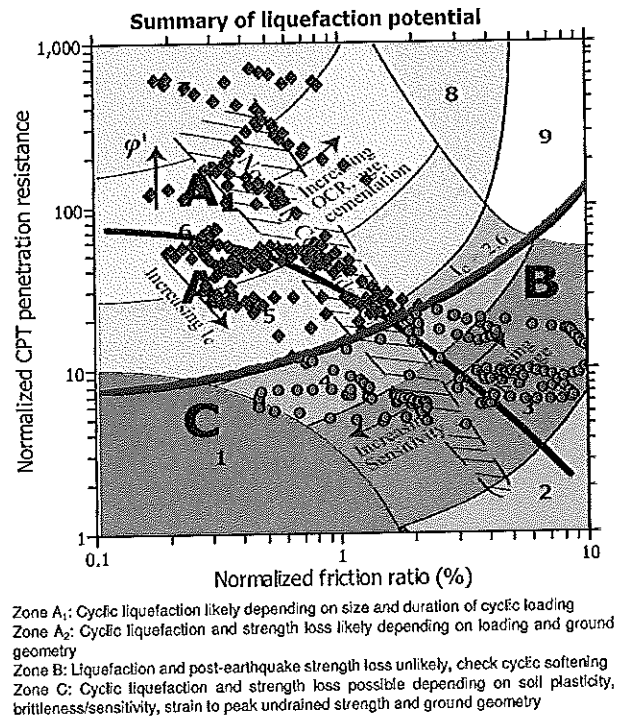
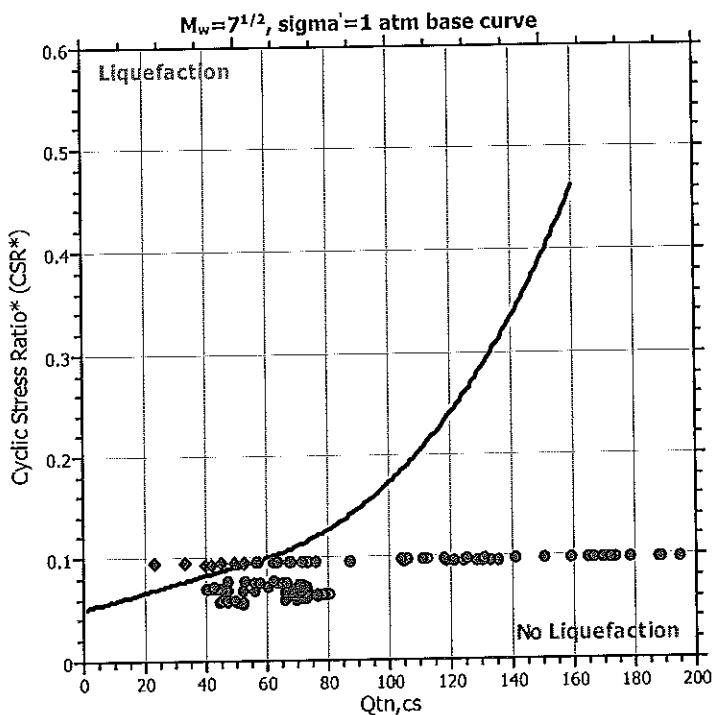
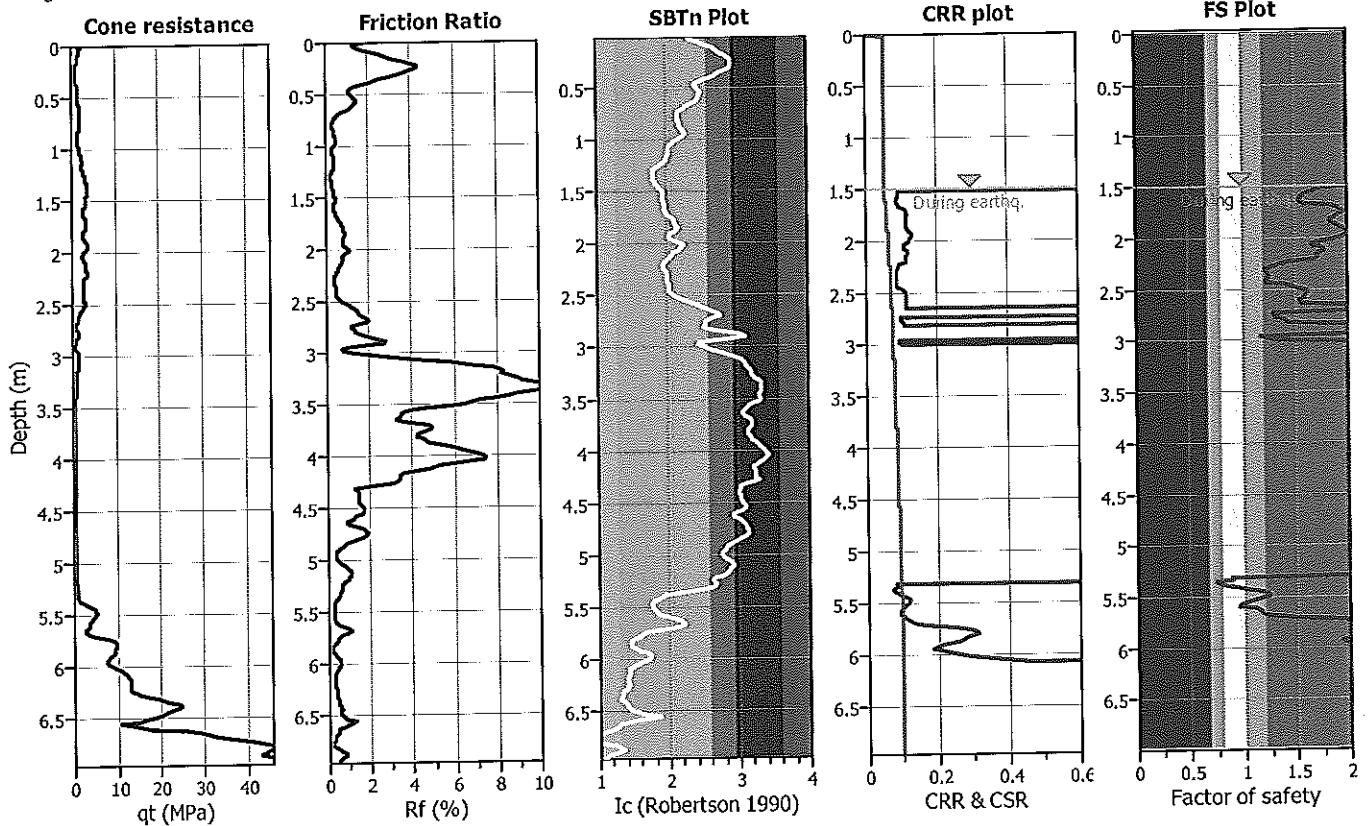
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

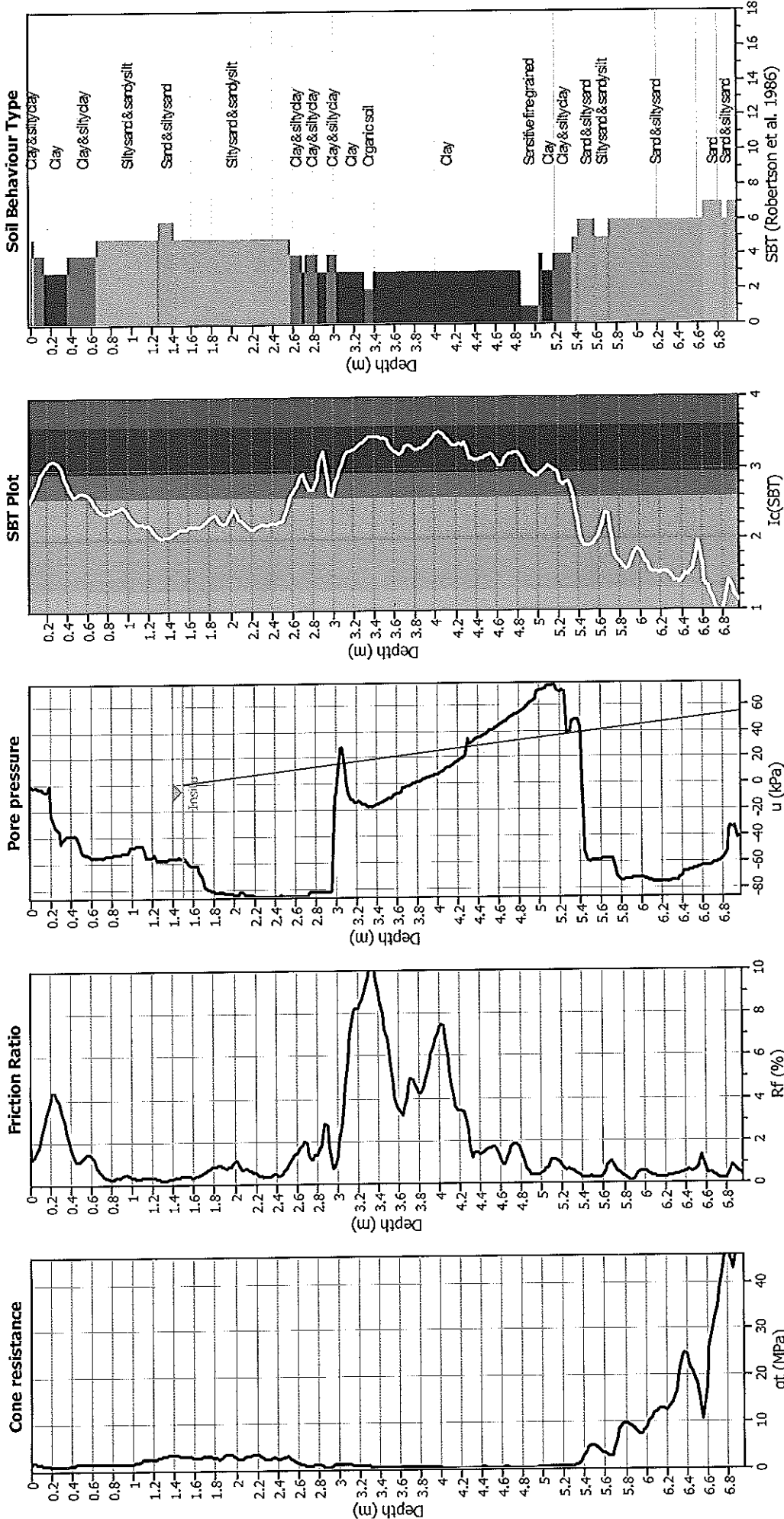
CPT file : 283 Innes St CPT6

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (In-situ):	1.50 m	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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 :	6.00	Ic cut-off value:	2.60	Trans. detect. applied:	No		
Peak ground acceleration:	0.15	Unit weight calculation:	Based on SBT	K_0 applied:	Yes		



CPT basic interpretation plots



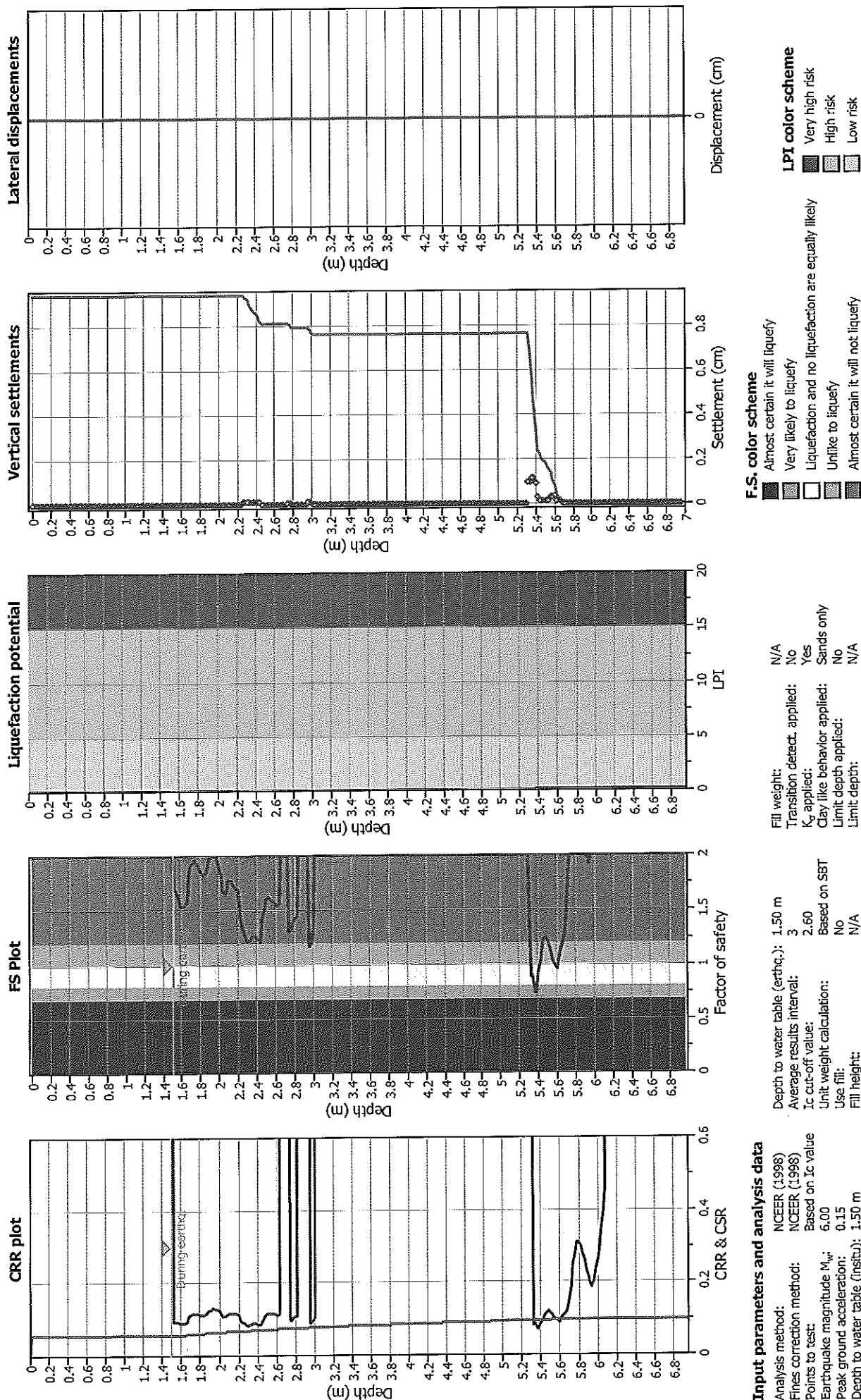
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earth):	1.50 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.50	K ₀ applied:	Yes
Earthquake magnitude M _w :	6.00	Unit weight calculation:	No	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.15	Use fill:	N/A	Limit depth applied:	No
Depth to water table (insitu):	1.50 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



LIQUEFACTION ANALYSIS REPORT

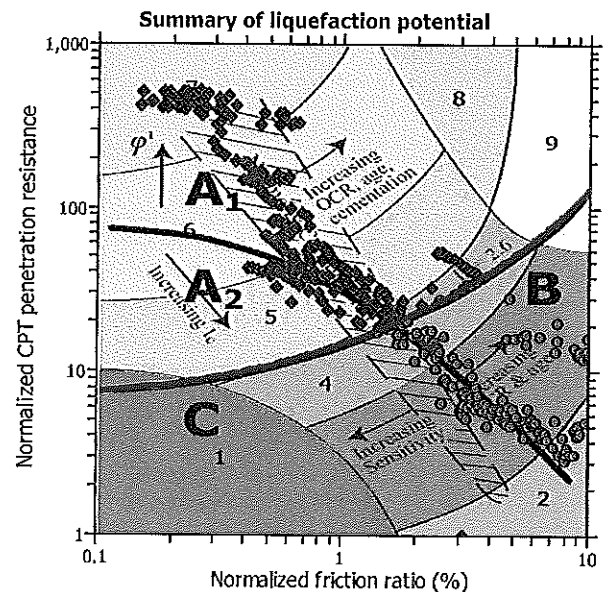
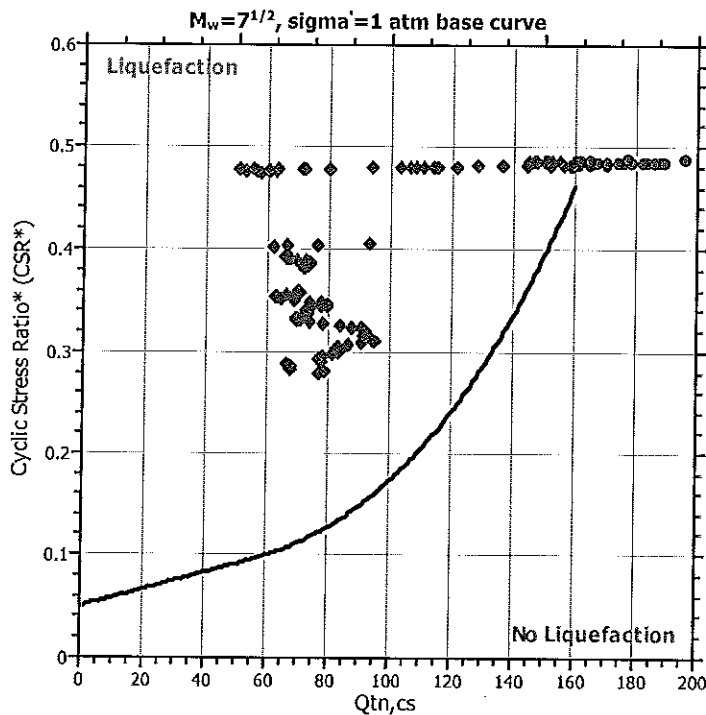
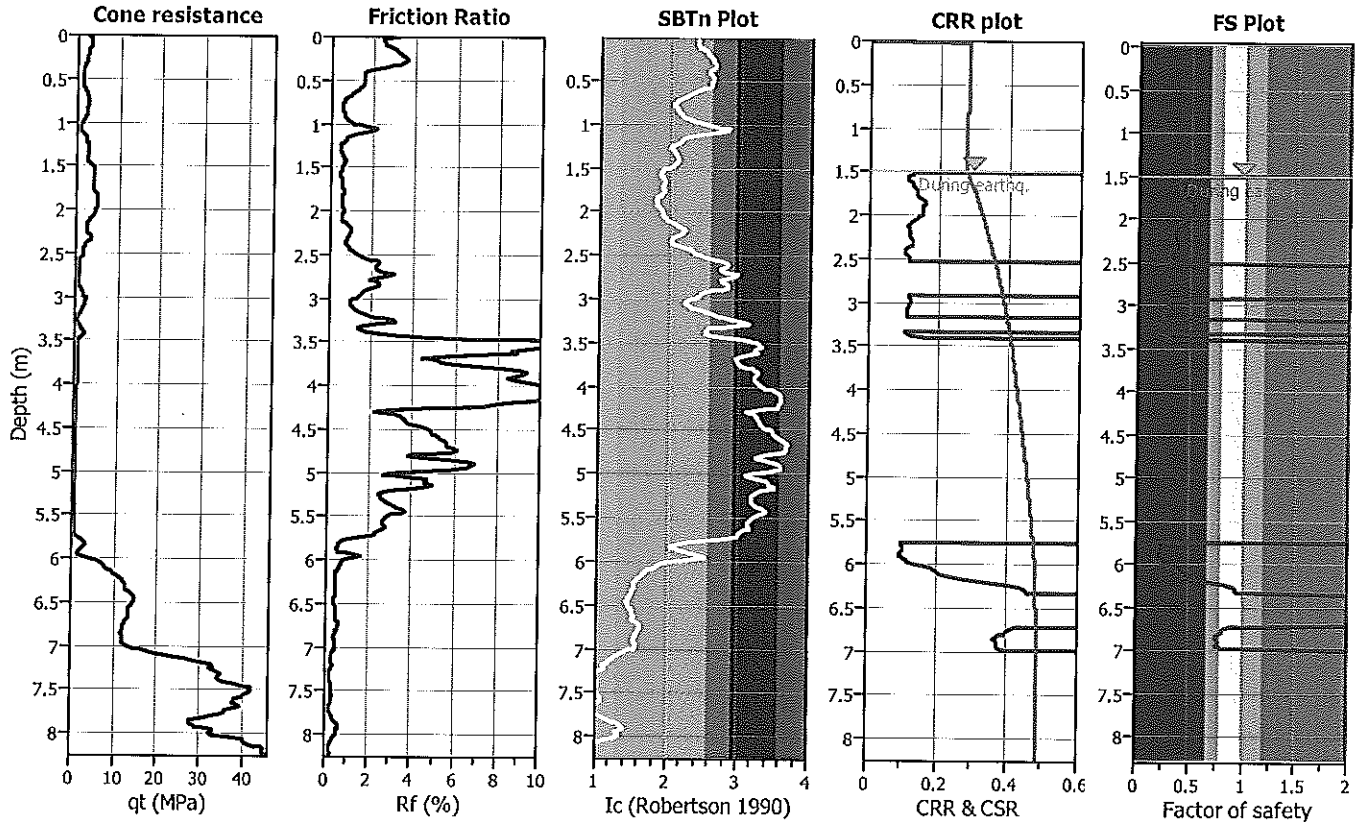
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

CPT file : 272 Knowles St CPT3

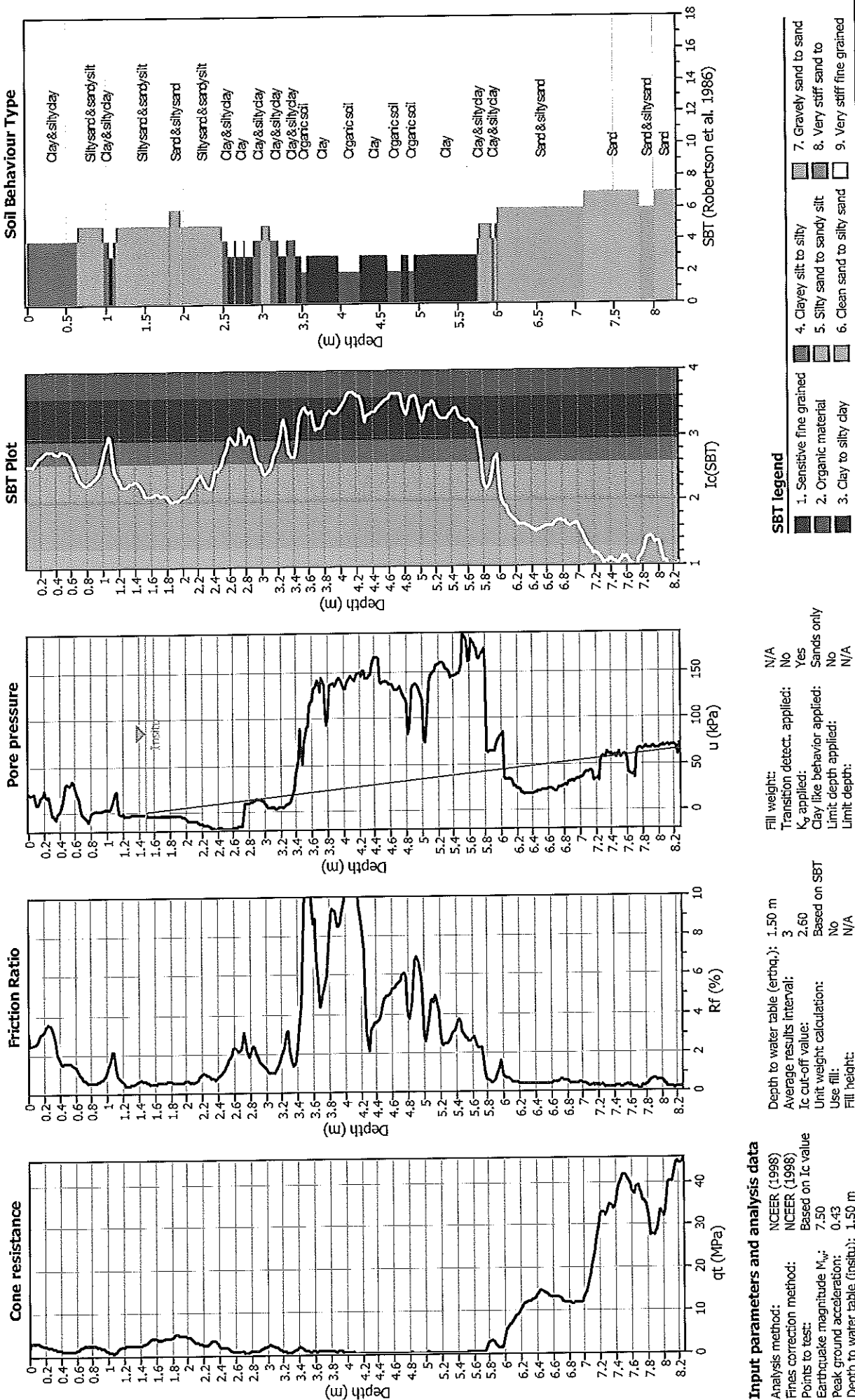
Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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:	0.43	Unit weight calculation:	Based on SBT	K_0 applied:	Yes		

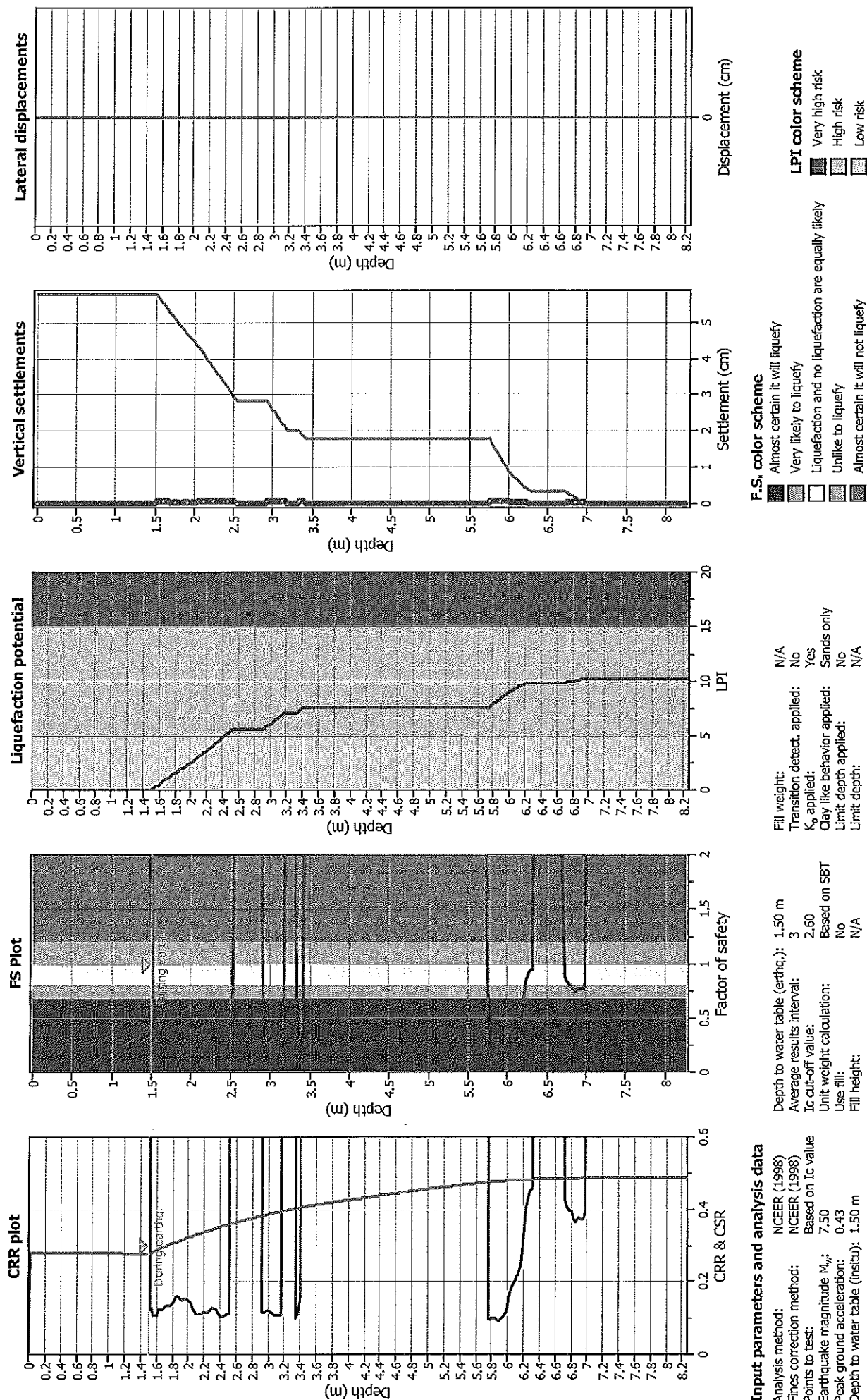


Zone A₁: Cyclic liquefaction likely depending on size and duration of cyclic loading
 Zone A₂: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
 Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



Liquefaction analysis overall plots





**GEOSCIENCE
consulting**
(NZ) LIMITED

Geoscience Consulting (NZ) Ltd
P.O Box 110
Lyttelton 8841

LIQUEFACTION ANALYSIS REPORT

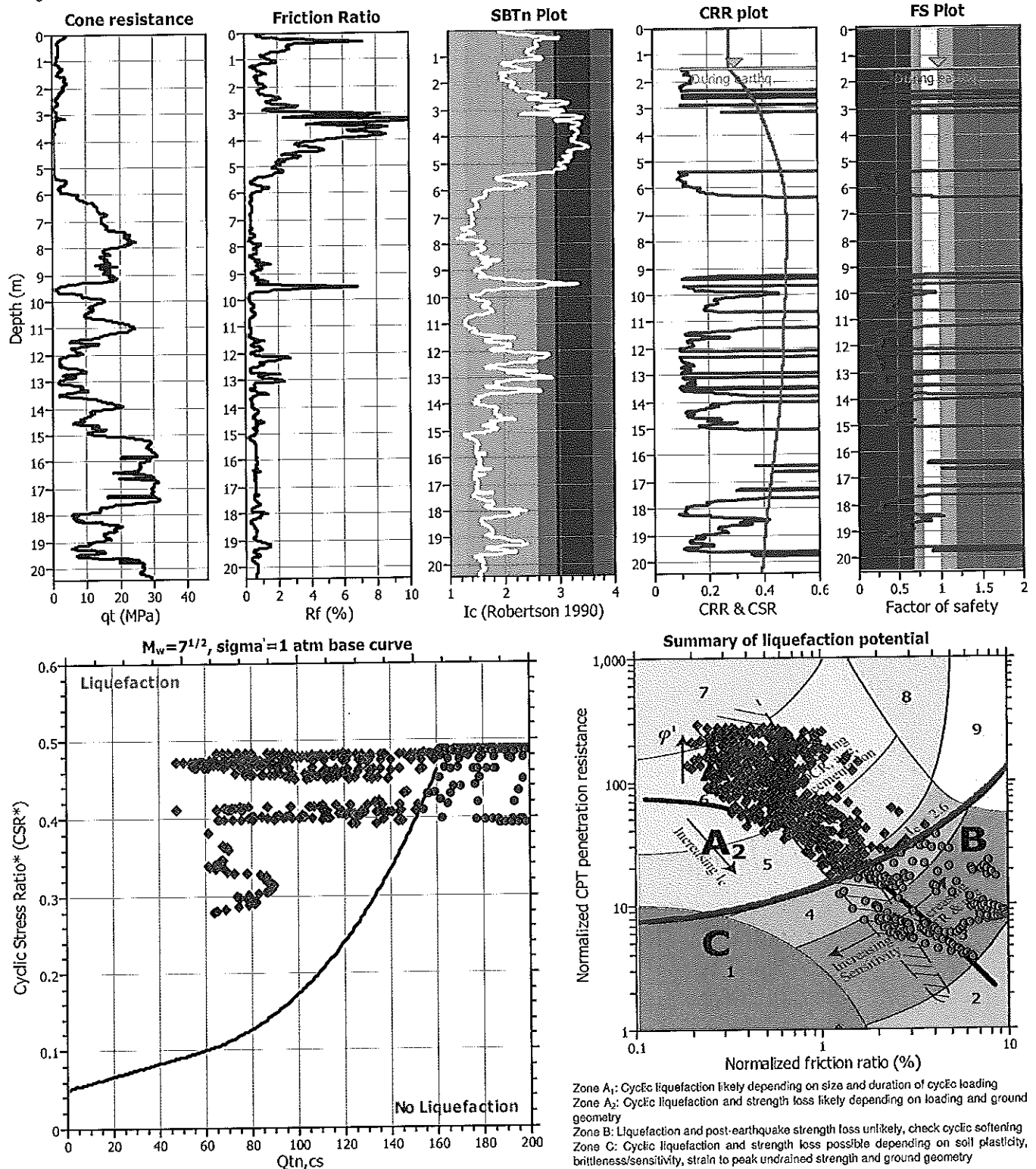
Project title : 11315

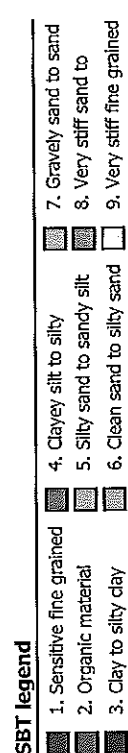
Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

CPT file : 272 Knowles St CPT4

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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:	0.43	Unit weight calculation:	Based on SBT	K_g applied:	Yes		

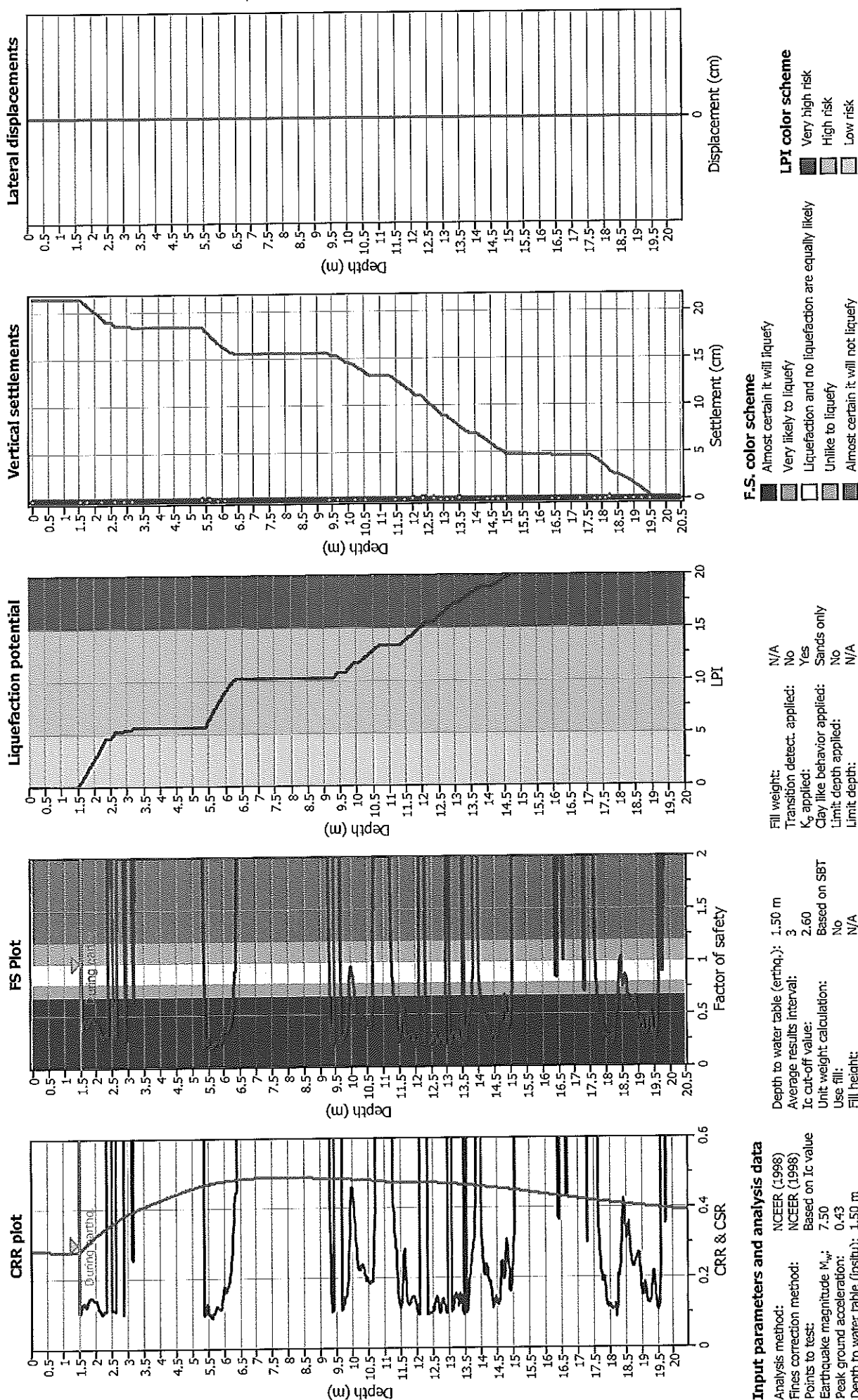




Depth to water table (erthq.):	1.50 m	Fill weight:	N/A
Average results interval:	3	Transition detect. applied:	No
Cut-off value:	2.50	K _g applied:	Yes
Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Use fill:	No	Limit depth applied:	No
Fill height:	N/A	Limit depth:	N/A

13

Liquefaction analysis overall plots





**GEOSCIENCE
consulting**
(NZ) LIMITED

Geoscience Consulting (NZ) Ltd
P.O Box 110
Lyttelton 8841

LIQUEFACTION ANALYSIS REPORT

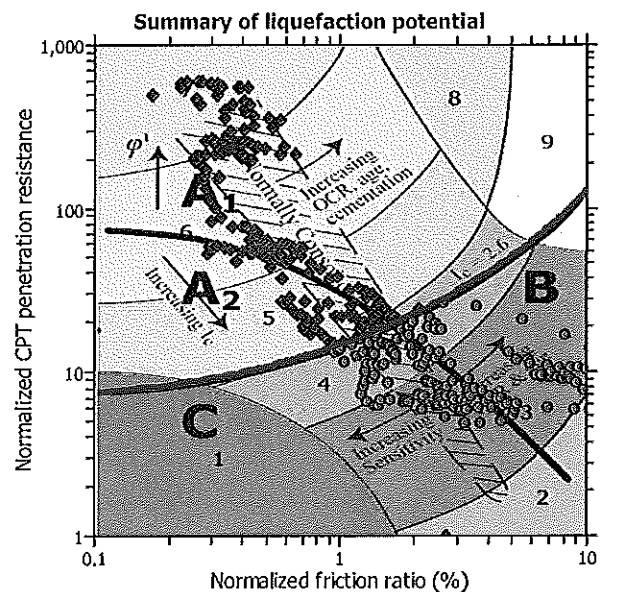
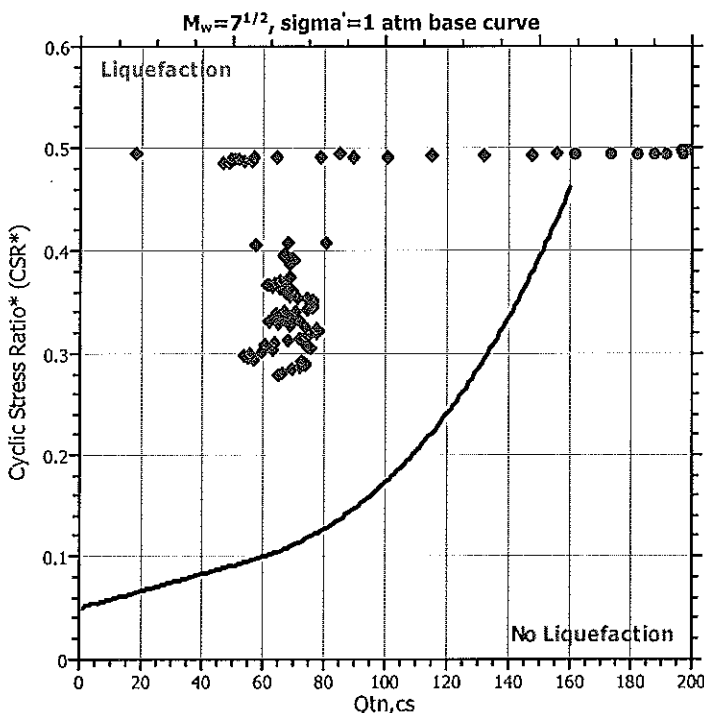
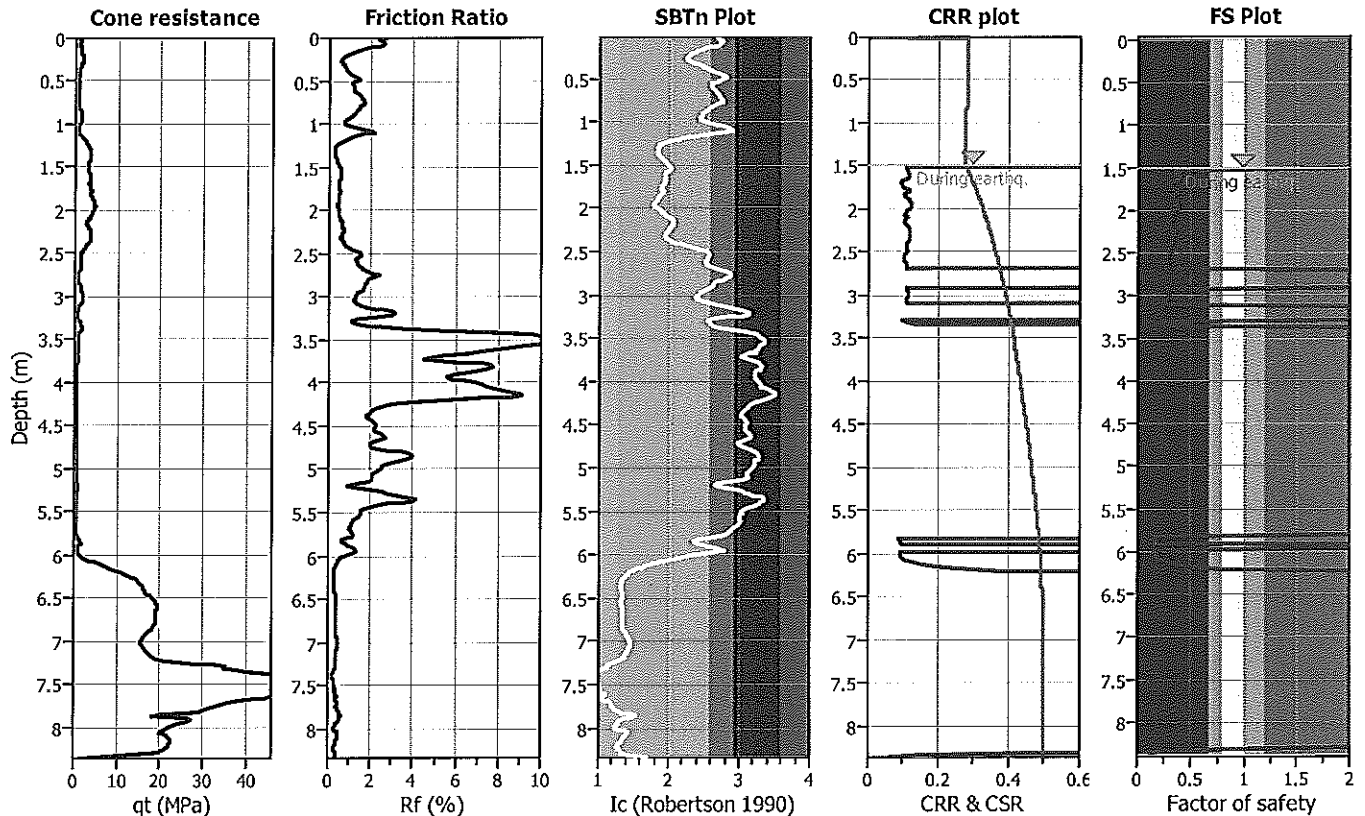
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

CPT file : 274 Knowles St CPT1

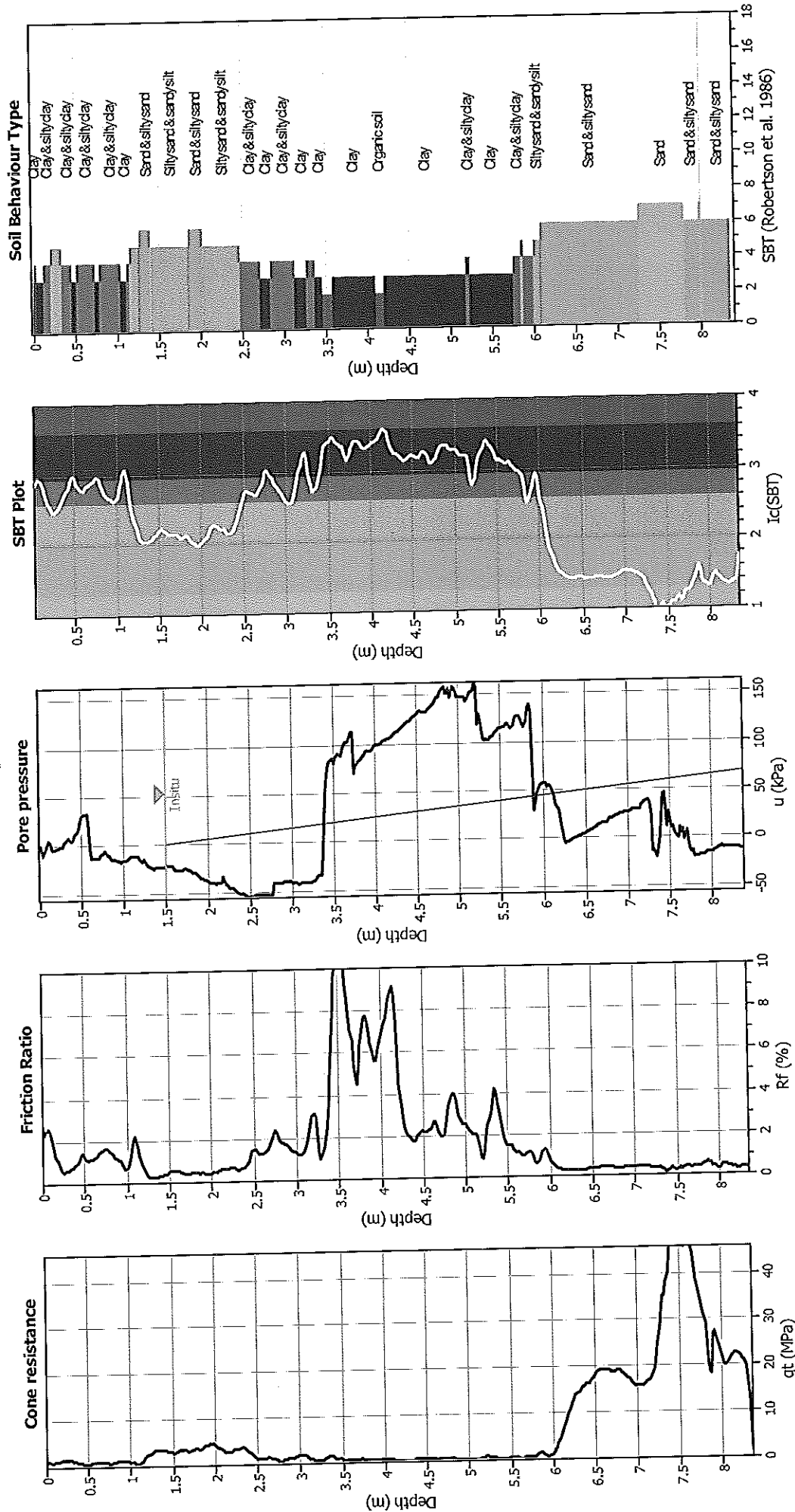
Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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:	0.43	Unit weight calculation:	Based on SBT	K_a applied:	Yes		



Zone A: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone B: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone C: 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



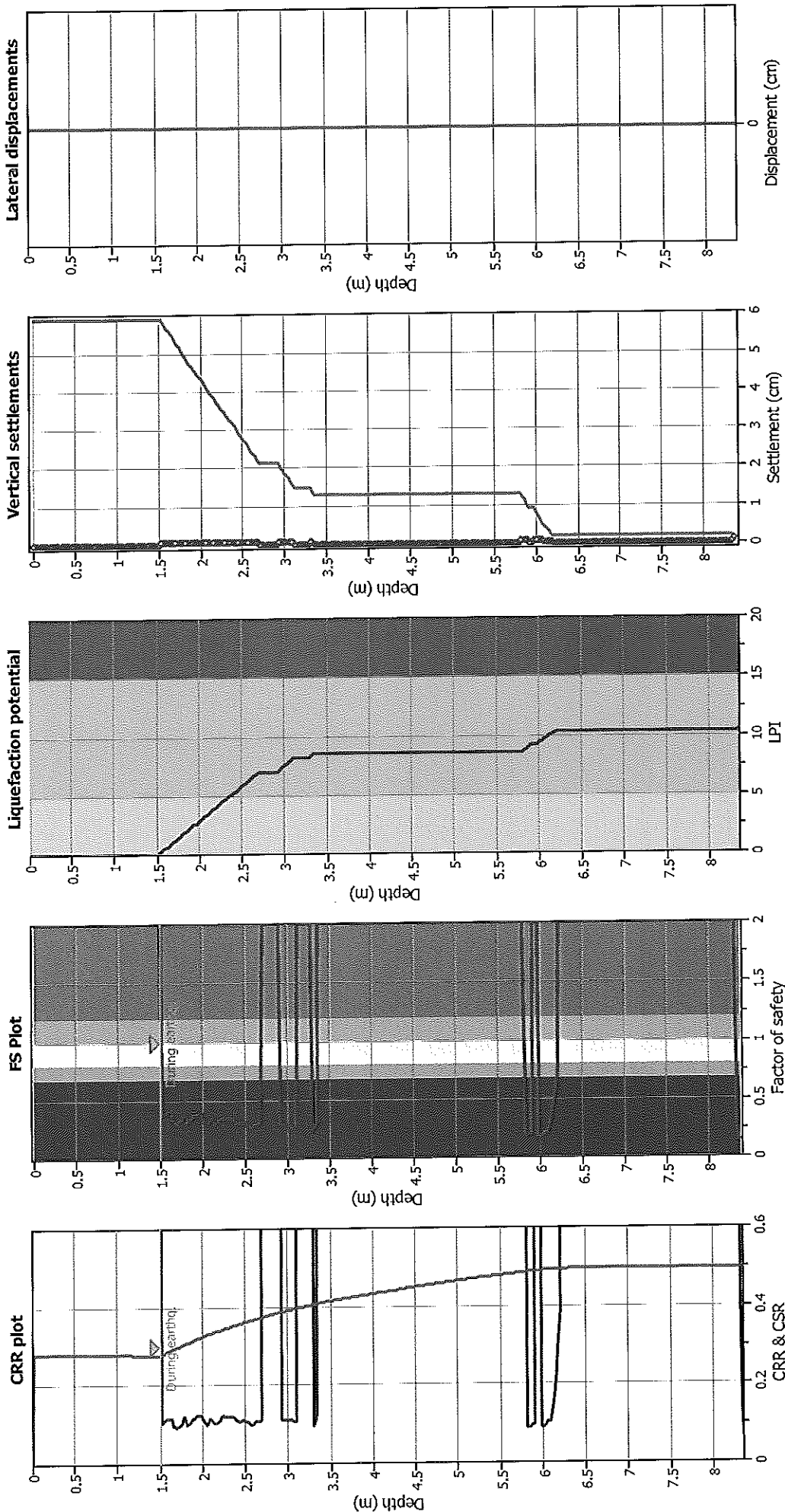
Input parameters and analysis data

Analysis method:	NCEER (1998)	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Transition detected:	No
Points to test:	Based on I_c value	K_p applied:	Yes
Earthquake magnitude M_w :	7.50	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.43	Limit depth applied:	No
Depth to water table (instu):	1.50 m	Limit depth:	N/A
Depth to water table (earth):	1.50 m		
Average results interval:	3		
I_c cut-off value:	2.60		
Unit weight calculation:	Based on SBT		
Use fill:	No		
Fill height:	N/A		

Clq v.1.5.1.26 - CPT Liquefaction Assessment Software - Report created on: 1/03/2012, 4:04:20 p.m.

Project file: \\GEOSCIEN\CE0\GeoData\Projects\2011\11315 281 Innes Road, Mairehau\Analysis & Design\Clq Analyses\U.LS.dq

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method: NCEER (1998)
 Fines correction method: NCEER (1998)
 Points to test: Based on I_c value
 Earthquake magnitude M_w : 7.50
 Peak ground acceleration: 0.43
 Depth to water table (insitu): 1.50 m

Depth to water table (earthq.): 1.50 m
 Average results interval: 3
 I_c cut-off value: 2.60
 Unit weight calculation: Based on SBT
 Use fill: No
 Fill height: N/A

Fill weight: N/A
 Transition detect. applied: No
 K_0 applied: Yes
 Clay like behavior applied: Sands only
 Limit depth applied: No
 Limit depth: N/A

F.S. color scheme

Almost certain it will liquefy
 Very likely to liquefy
 Liquefaction and no liquefaction are equally likely
 Unlike to liquefy
 Almost certain it will not liquefy

LPI color scheme

Very high risk
 High risk
 Low risk



**GEOSCIENCE
consulting**
(NZ) LIMITED

Geoscience Consulting (NZ) Ltd
P.O Box 110
Lyttelton 8841

LIQUEFACTION ANALYSIS REPORT

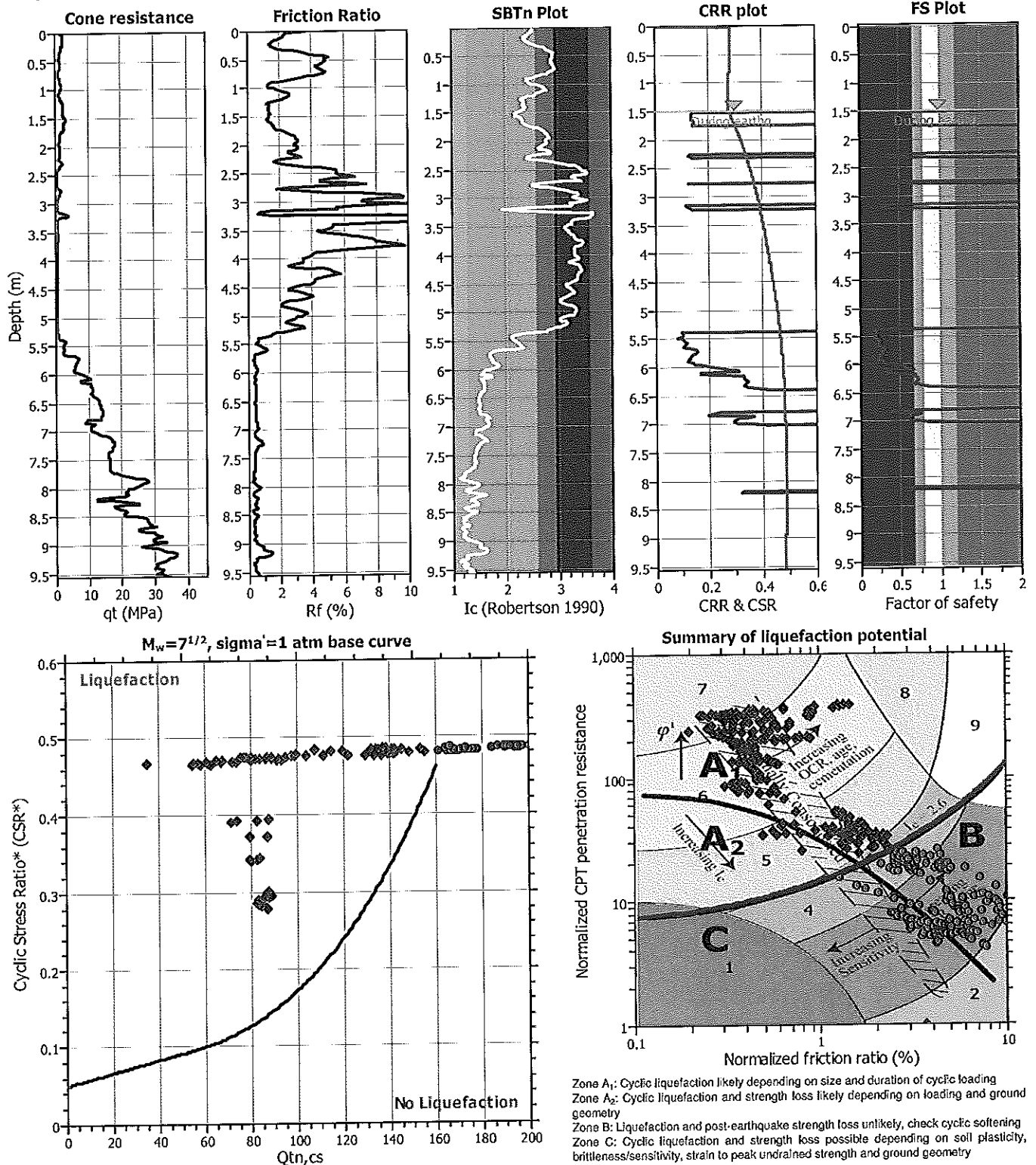
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

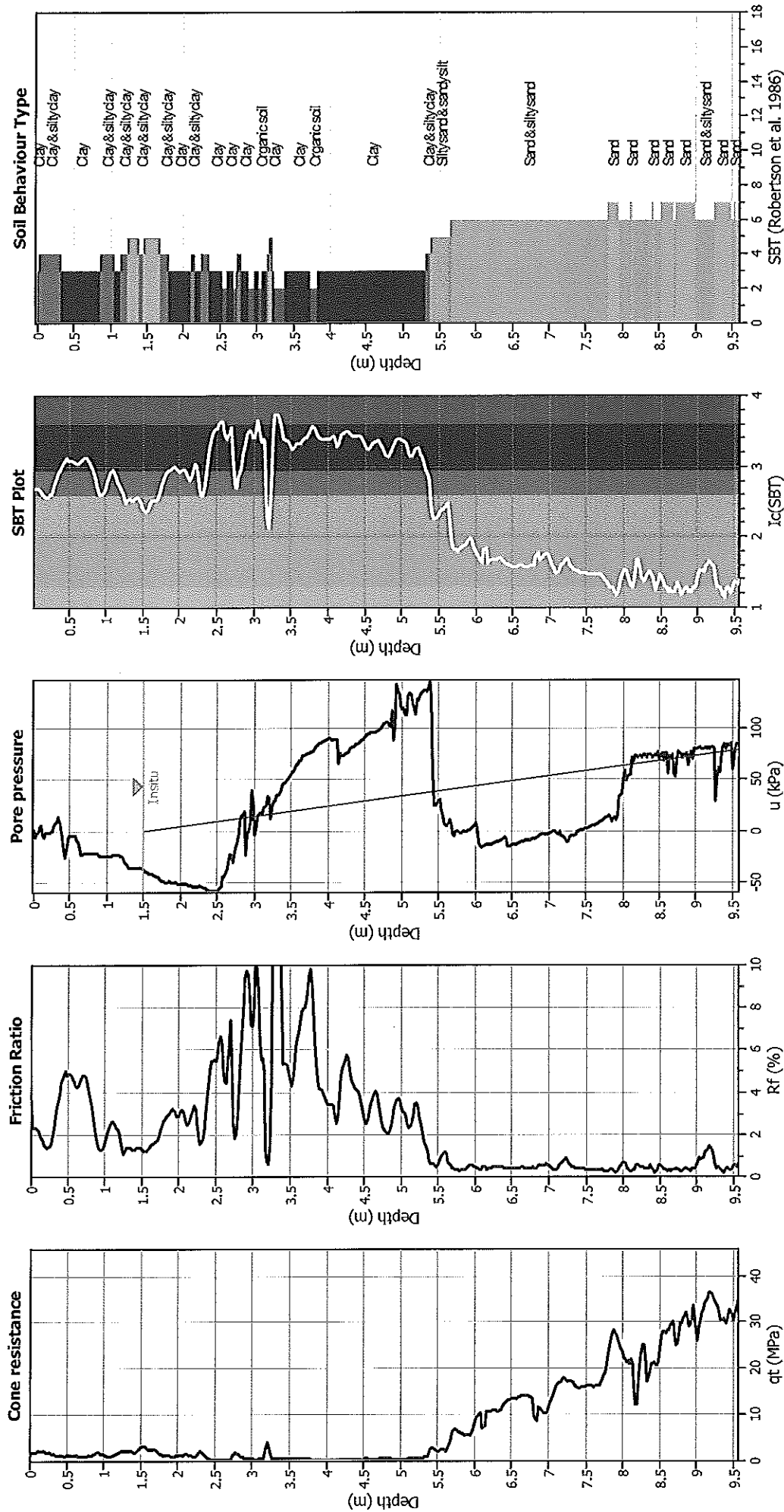
CPT file : 274 Knowles St CPT2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (In-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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:	0.43	Unit weight calculation:	Based on SBT	K_0 applied:	Yes		



CPT basic interpretation plots



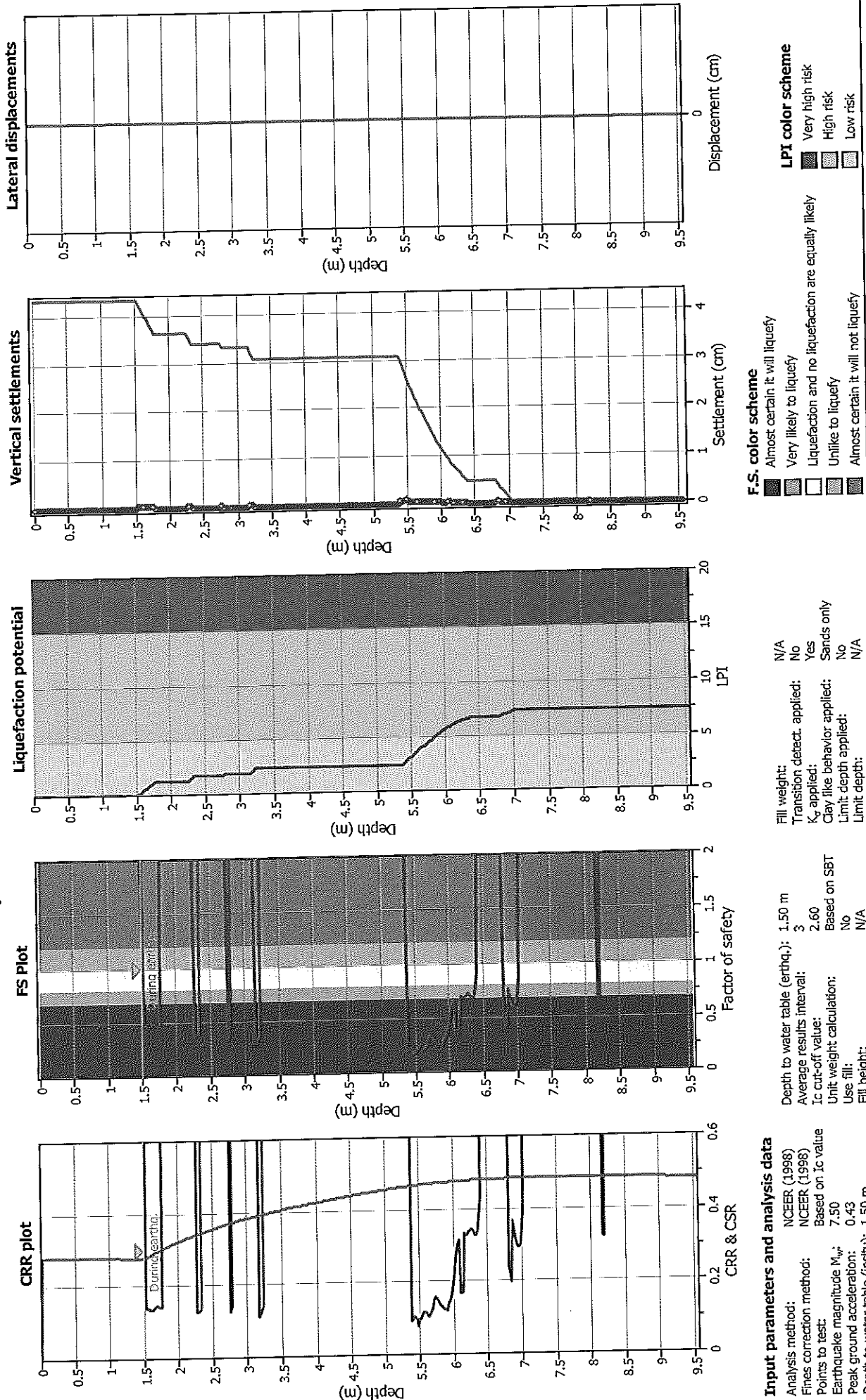
Input parameters and analysis data

Analysis method:	NCEER (1998)	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Transition detect. applied:	No
Points to test:	Based on Ic value	K _g applied:	Yes
Earthquake magnitude M _w :	7.50	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.43	Limit depth applied:	No
Depth to water table (instu):	1.50 m	Limit depth:	N/A
Depth to water table (earthq.):	1.50 m		
Average results interval:	3		
Ic cut-off value:	2.60		
Unit weight calculation:	Based on SBT		
Use fill:	No		
Fill height:	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





LIQUEFACTION ANALYSIS REPORT

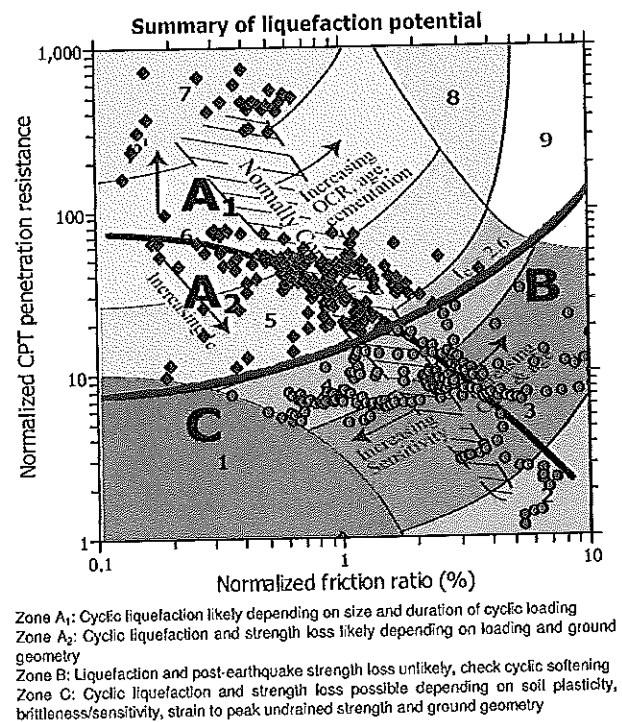
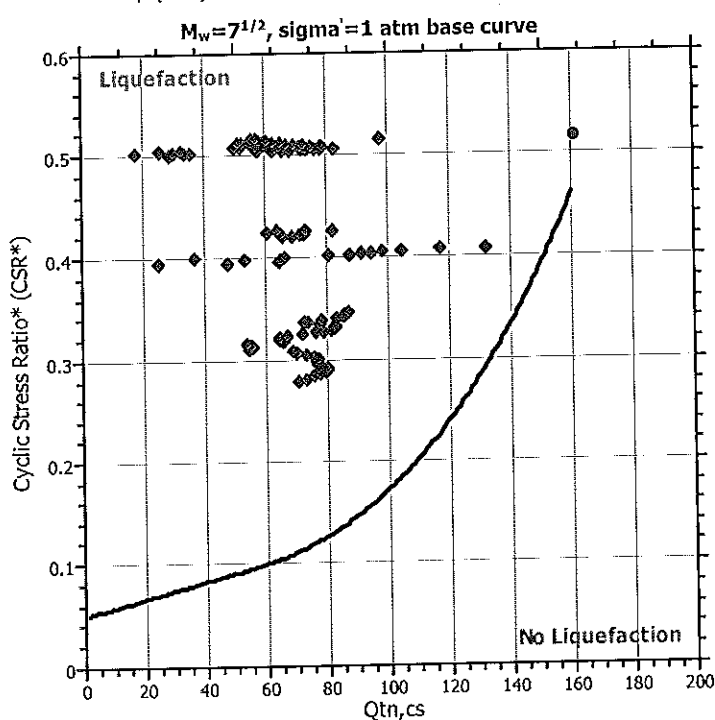
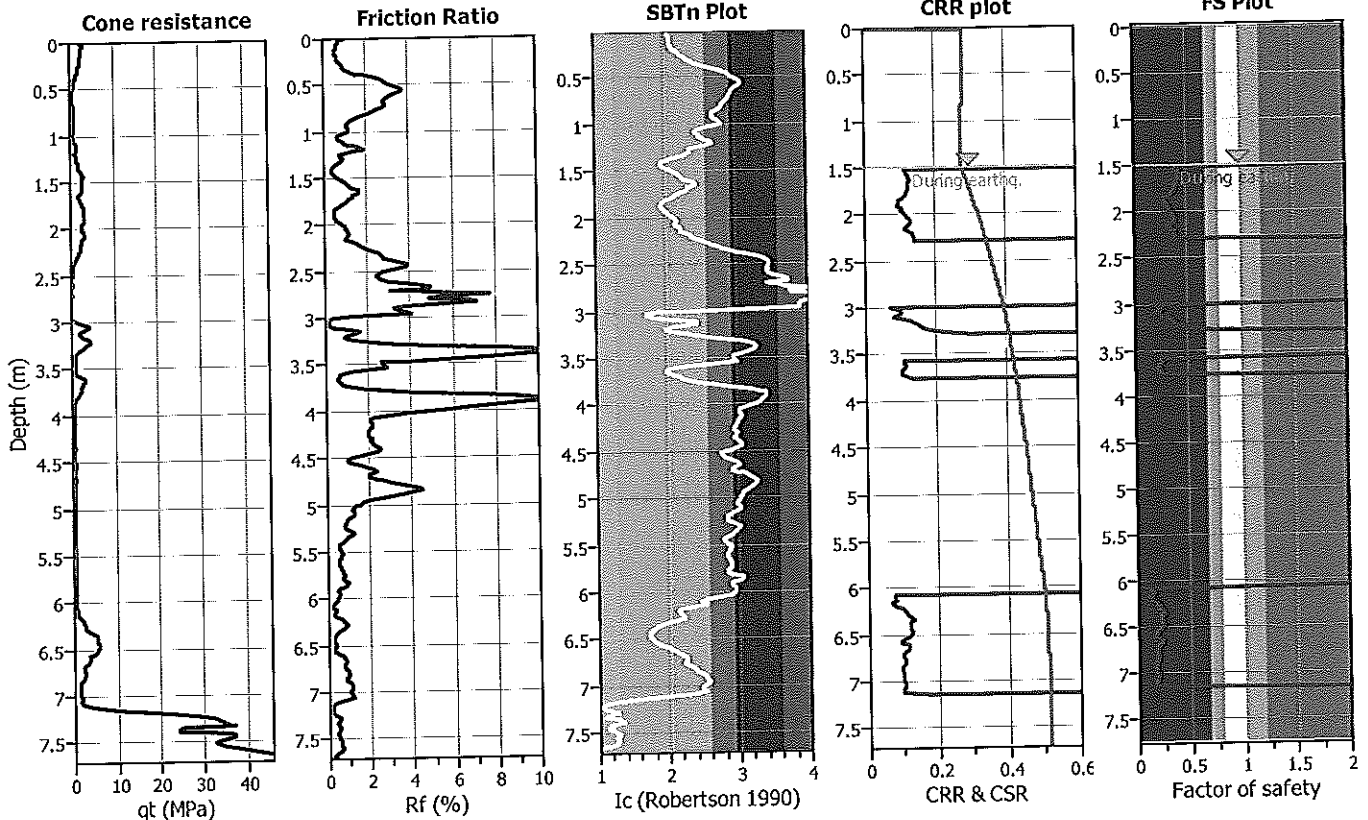
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

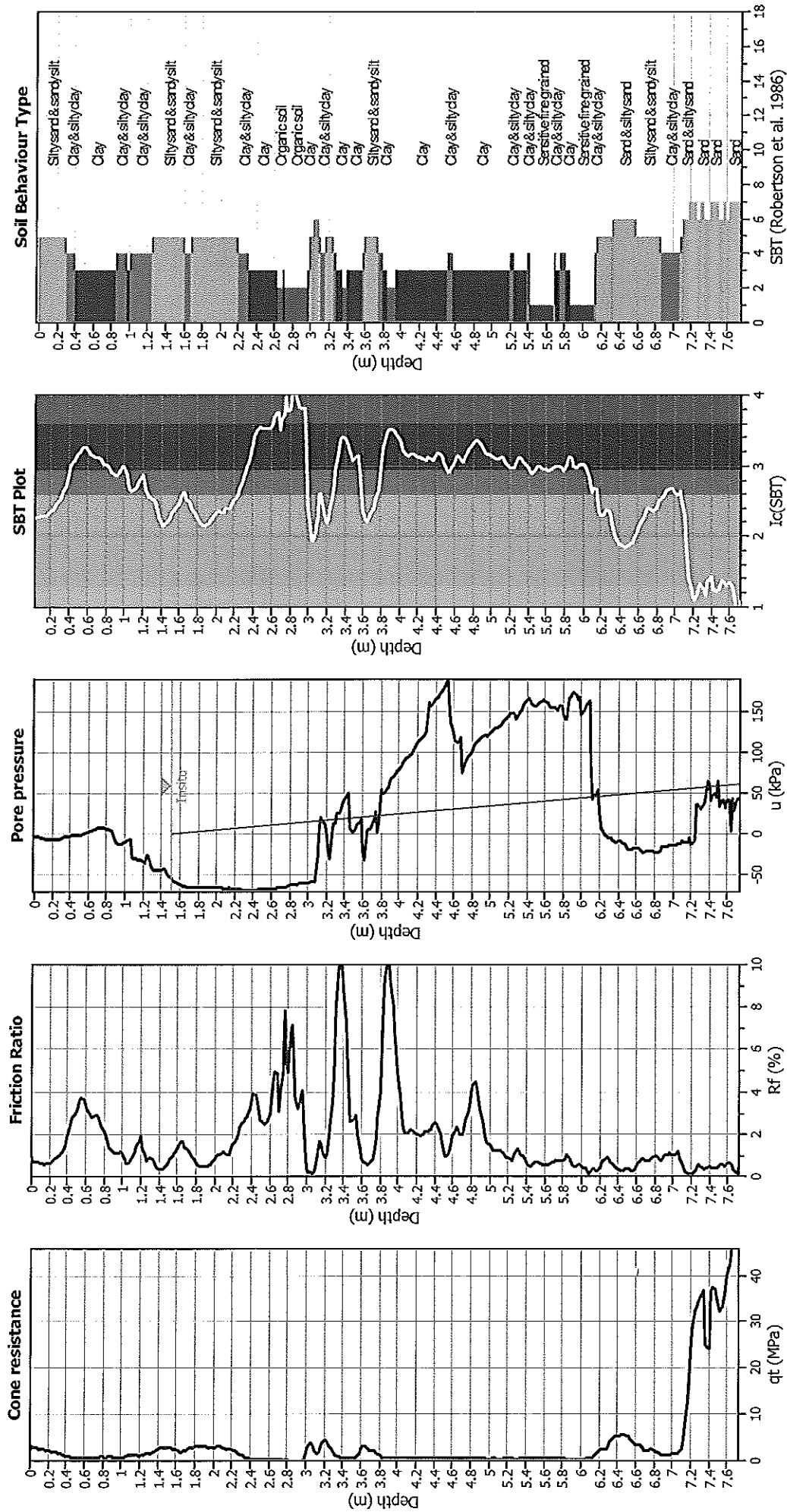
CPT file : 281 Innes St CPT7

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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:	0.43	Unit weight calculation:	Based on SBT	K_a applied:	Yes		



CPT basic interpretation plots



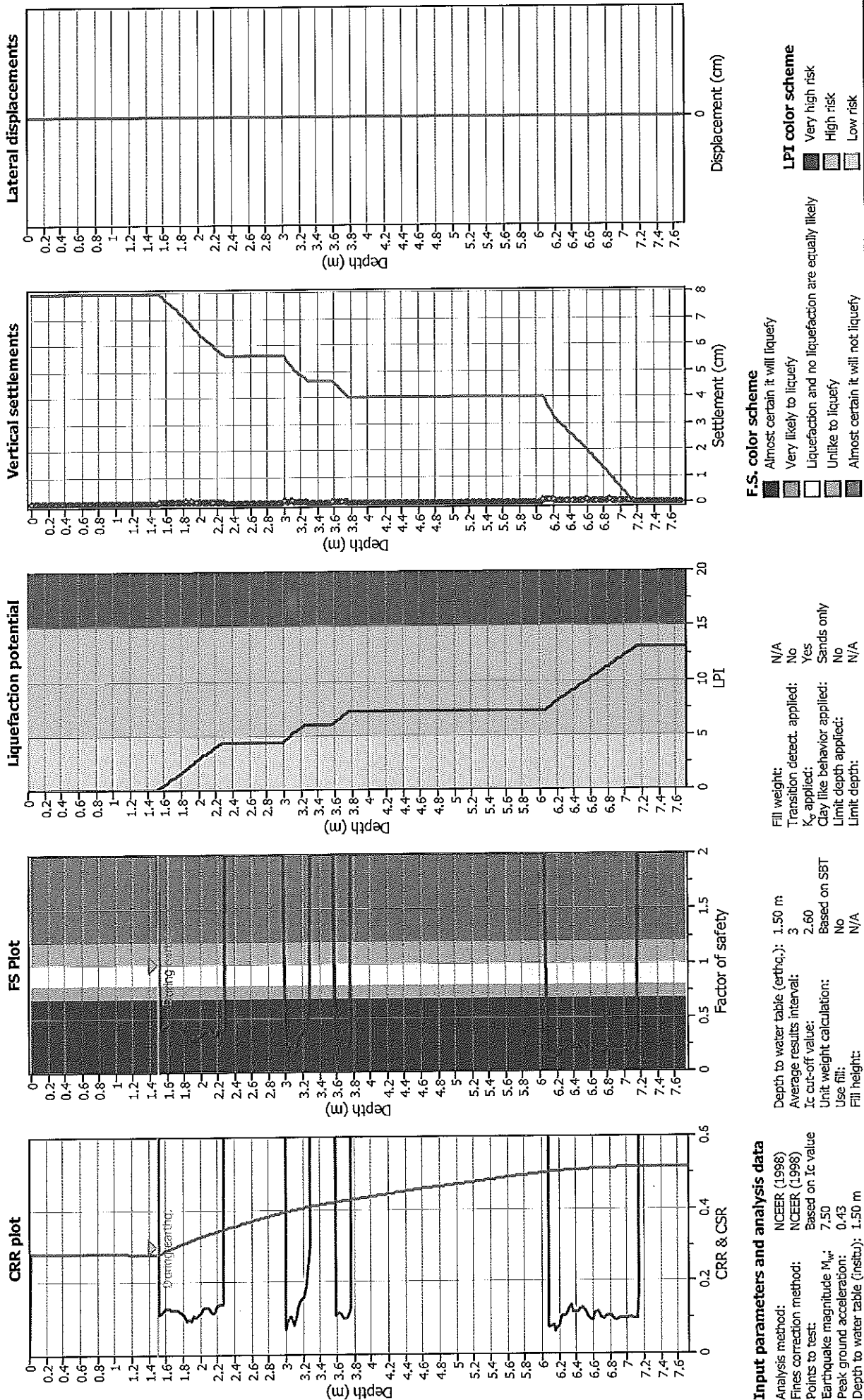
Input parameters and analysis data

Analysis method:	NCEER (1998)	Fill weight:	N/A
Finis correction method:	NCEER (1998)	Transition detect. applied:	No
Points to test:	Based on Ic value	K _c applied:	Yes
Earthquake magnitude M _w :	7.50	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.43	Limit depth applied:	No
Depth to water table (instu):	1.50 m	Limit depth:	N/A

Clq v.1.5.1.26 - CPT Liquefaction Assessment Software - Report created on: 1/03/2012, 4:04:22 p.m.

Project file: \\GEOENGINE\Projects\2011\1315 281 Innes Road, Mairehau\Analysis & Design\Clq Analyses\ULS.dq

Liquefaction analysis overall plots





LIQUEFACTION ANALYSIS REPORT

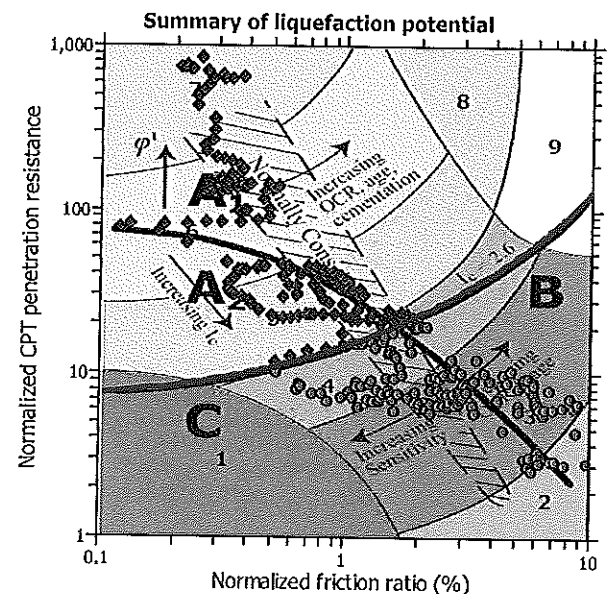
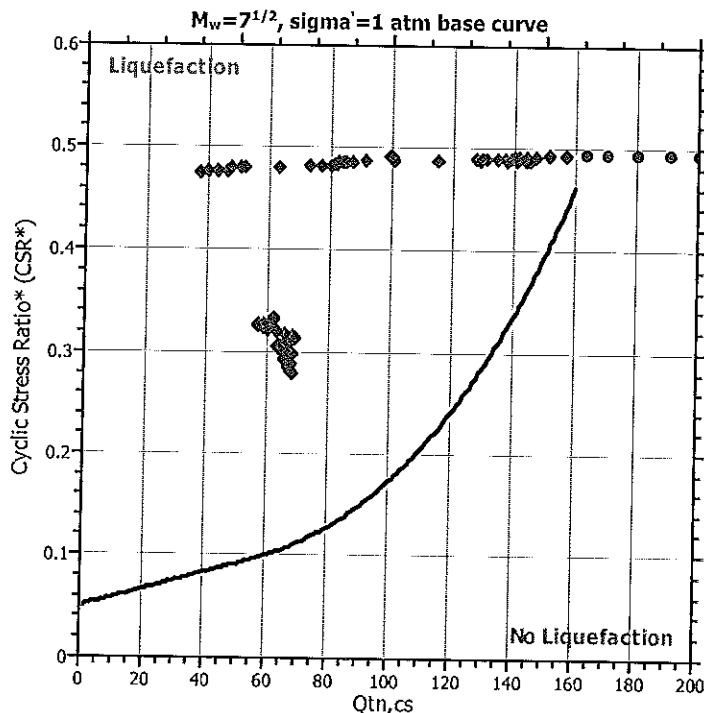
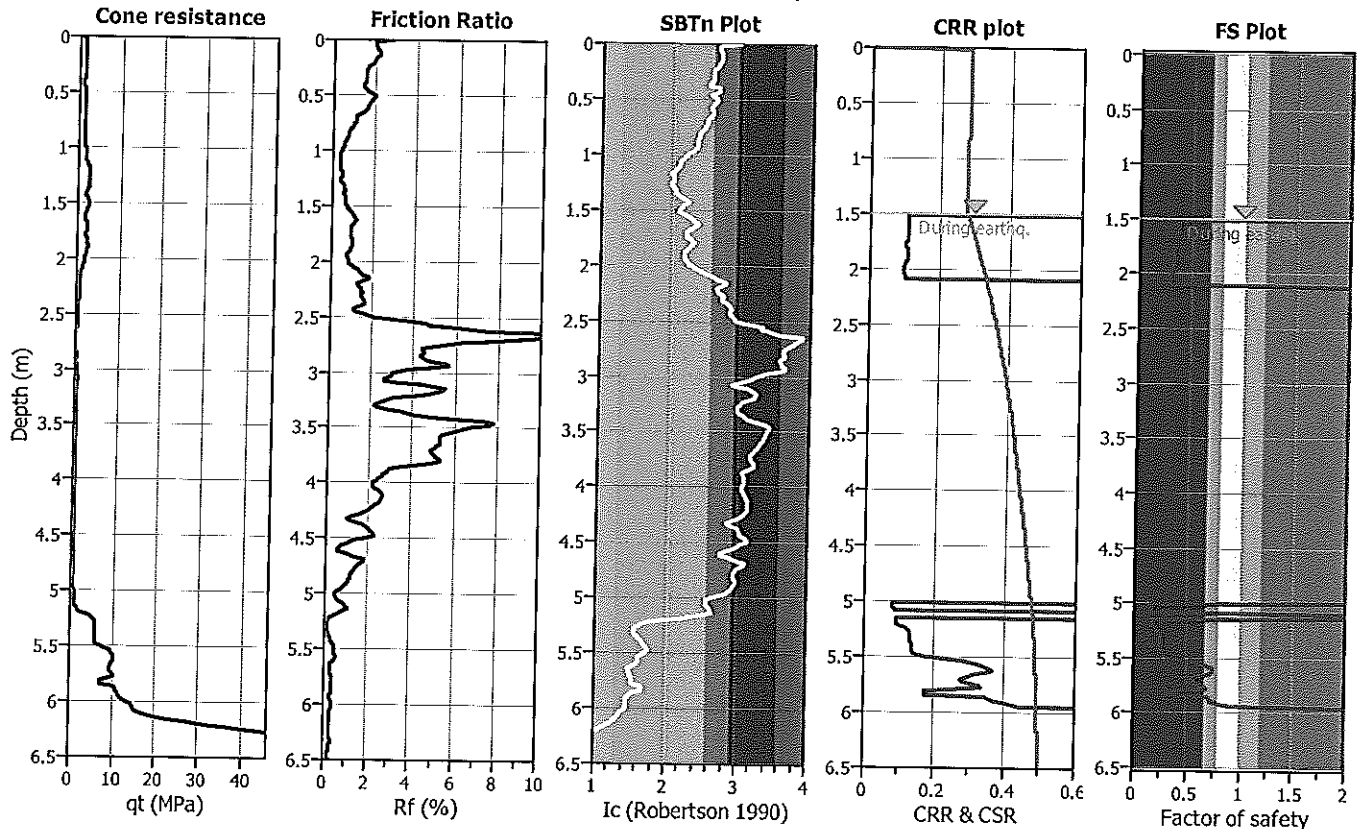
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

CPT file : 281 Innes St CPT8

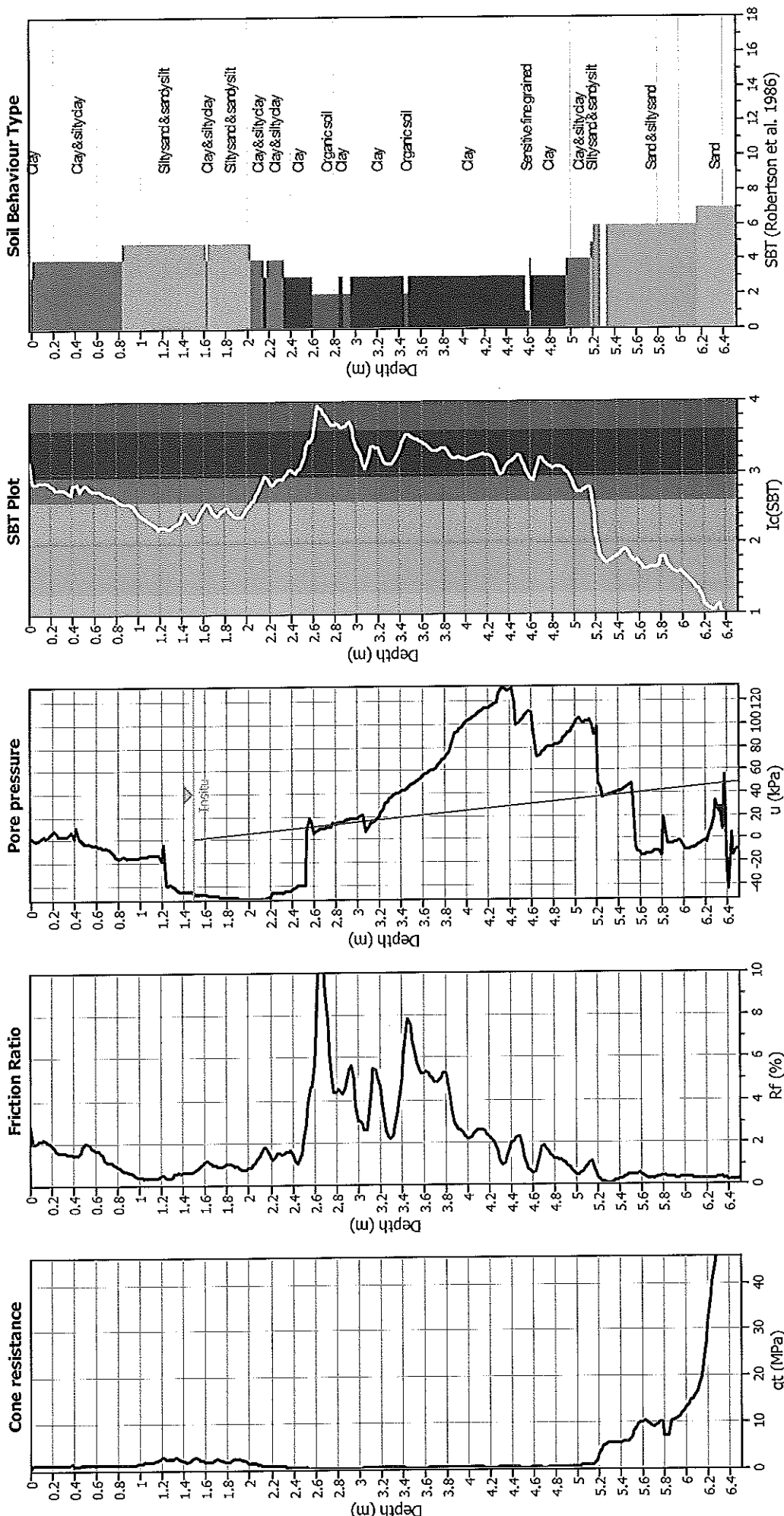
Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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:	0.43	Unit weight calculation:	Based on SBT	K_0 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



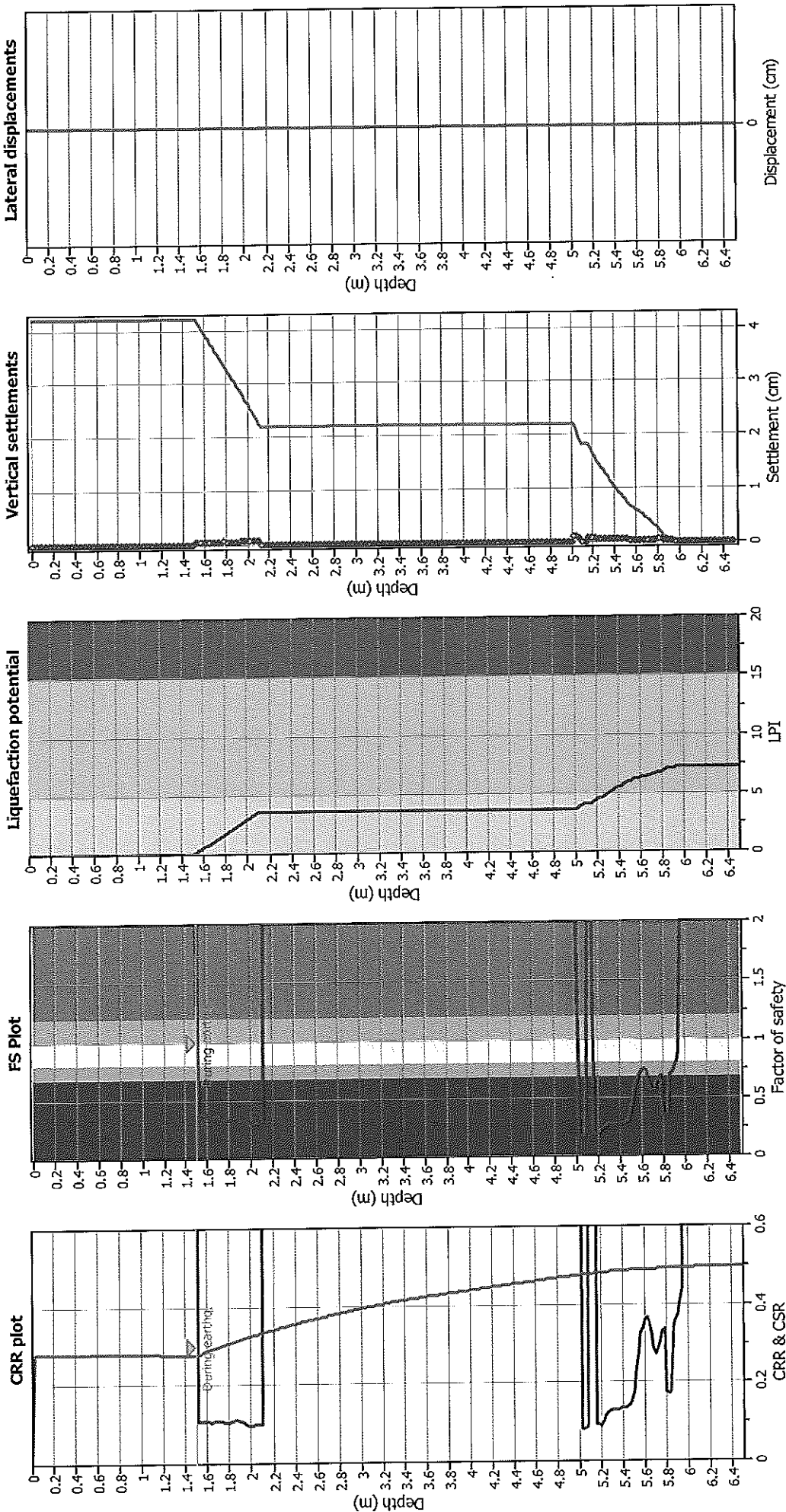
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	1.50 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _a applied:	Yes
Earthquake magnitude M _w :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.43	Use fill:	No	Limit depth applied:	No
Depth to water table (In situ):	1.50 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: NCEER (1998)
Fines correction method: NCEER (1998)
Points to test: Based on I_c value
Earthquake magnitude M_w : 7.50
Peak ground acceleration: 0.43
Depth to water table (institu): 1.50 m

Depth to water table (earthq.): 1.50 m
Average results interval: 3
 I_c cut-off value: 2.60
Unit weight calculation: Based on SBT
Use fill: No
Fill height: N/A
Fill weight: N/A
Transition detect. applied: No
 K_0 applied: Yes
Clay like behavior applied: Sands only
Limit depth applied: No
Limit depth: N/A

F.S. color scheme

Almost certain it will liquefy
Very likely to liquefy
Liquefaction and no liquefaction are equally likely
Unlikely to liquefy
Almost certain it will not liquefy

LPI color scheme

Very high risk
High risk
Low risk



LIQUEFACTION ANALYSIS REPORT

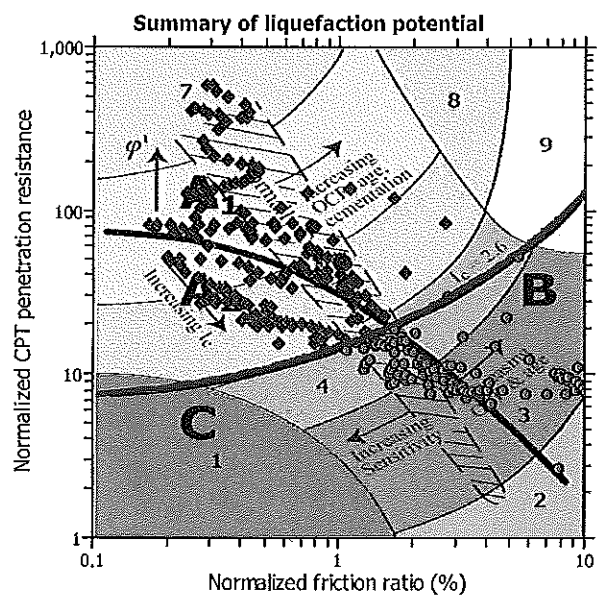
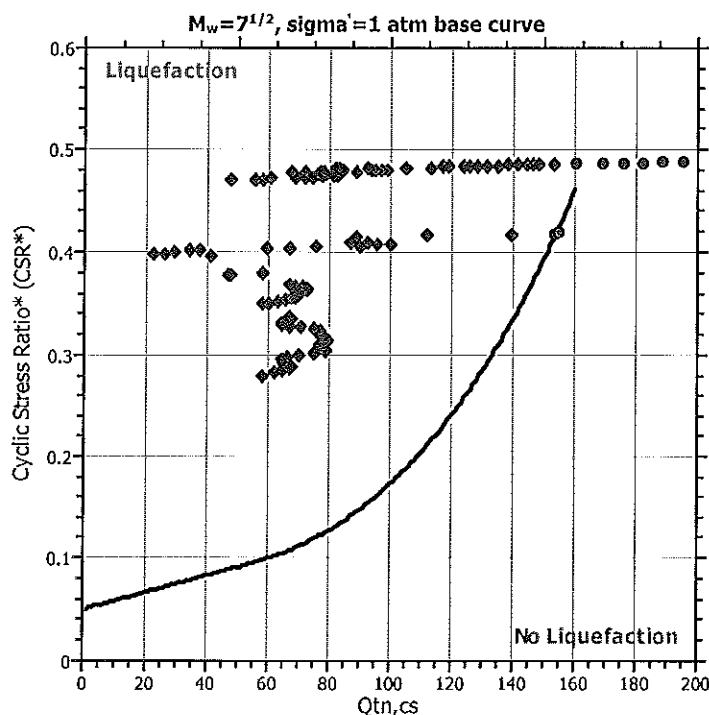
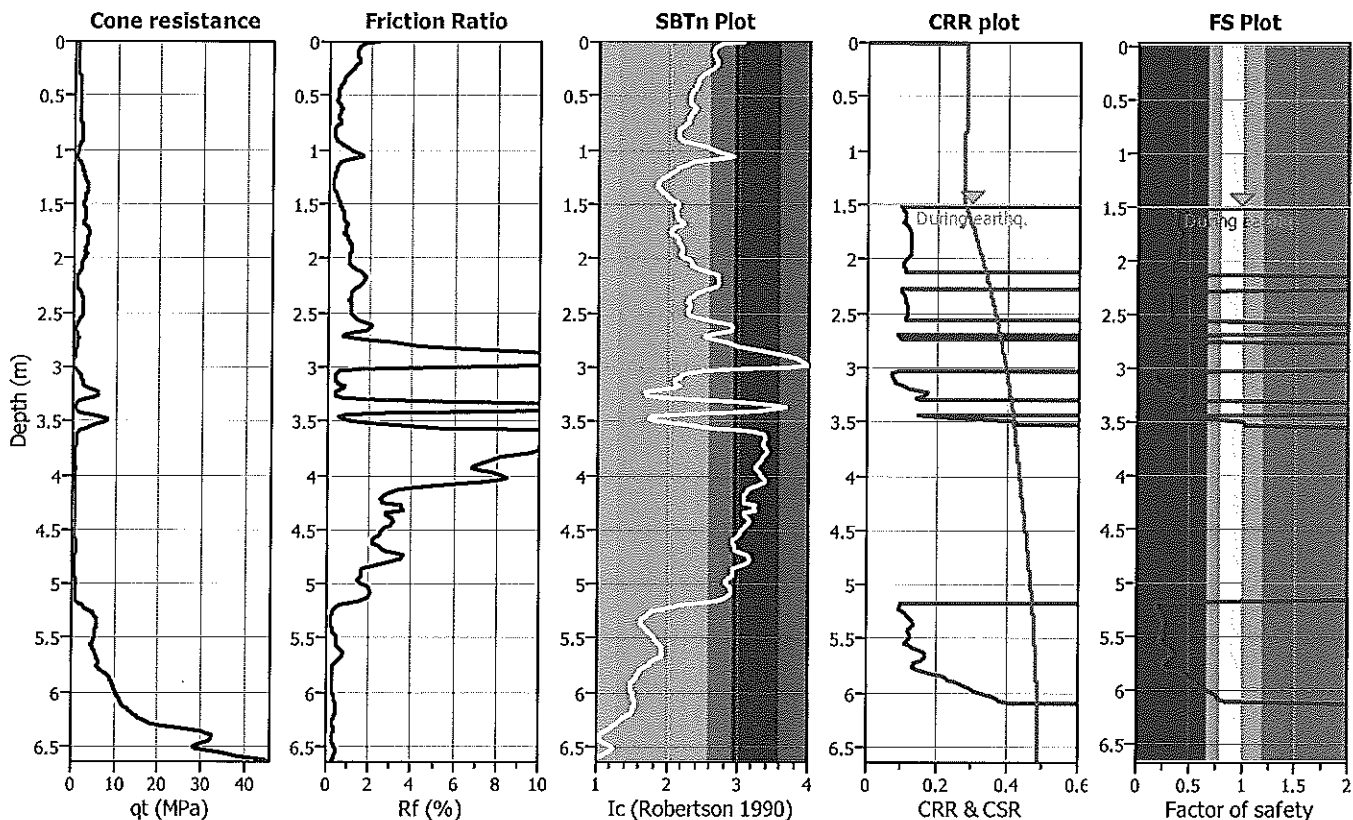
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

CPT file : 283 Innes St CPT5

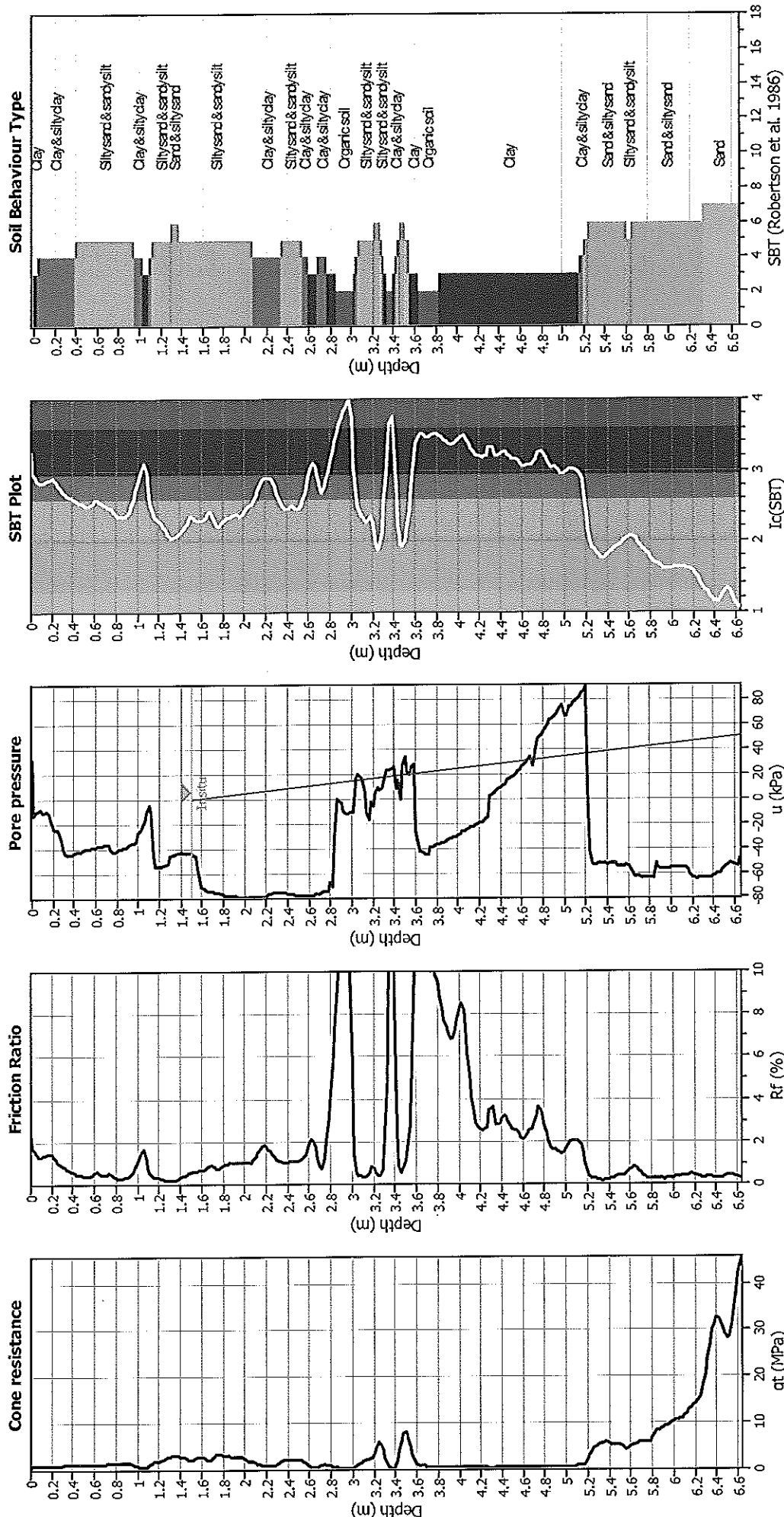
Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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:	0.43	Unit weight calculation:	Based on SBT	K_f applied:	Yes		



Zone A: 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



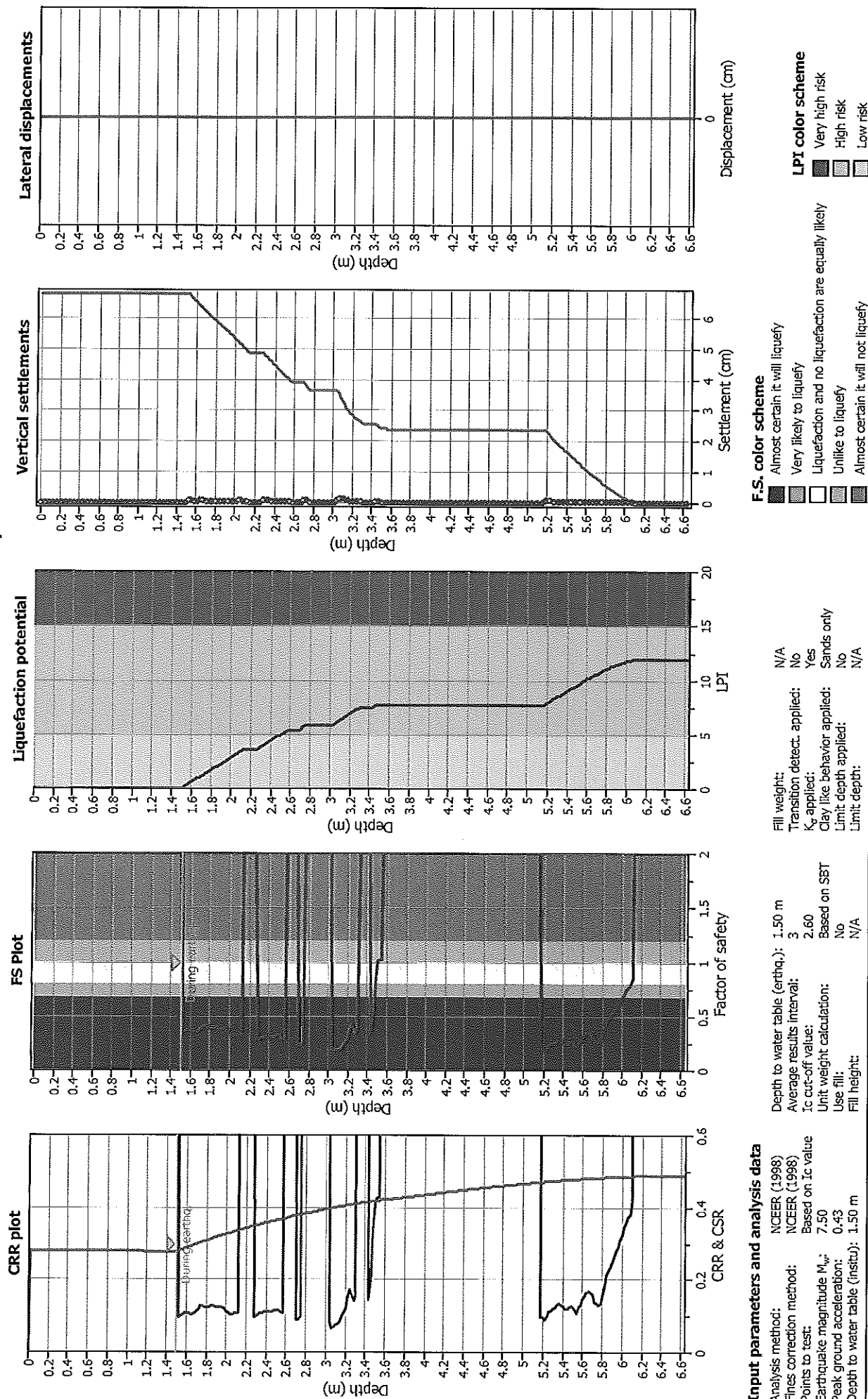
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (ortho.):	1.50 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.50	K _u applied:	Yes
Earthquake magnitude M _w :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.43	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.50 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:	NCEER (1998)	Depth to water table (earthq.):	1.50 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on I_c value	I_c cut-off value:	2.60	K_p applied:	Yes
Earthquake magnitude M_w :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.43	Use fill:	No	Limit depth applied:	No
Depth to water table (insttd):	1.50 m	Fill height:	N/A	Limit depth:	N/A

Clq v.1.5.1.26 - CPT Liquefaction Assessment Software - Report created on: 1/03/2012, 4:04:25 p.m.

Project file: \\GEOSCIENCED\Geodata\Projects\2011\1315 281 Innes Road, Mairehau\Analysis & Design\Clq Analyses\ULS.dwg



LIQUEFACTION ANALYSIS REPORT

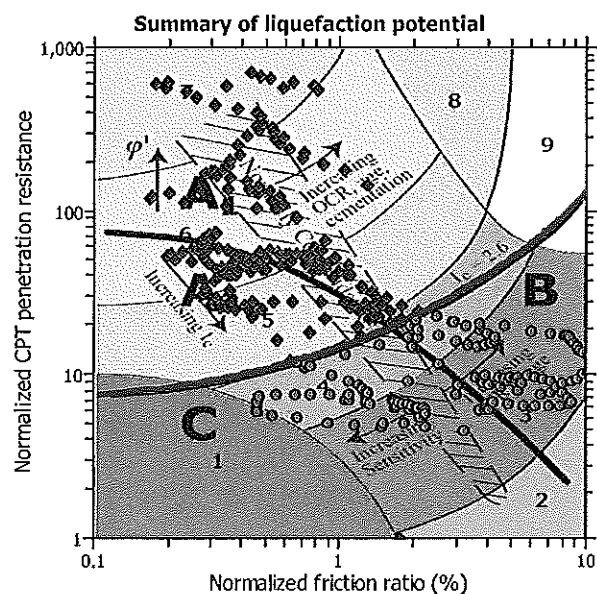
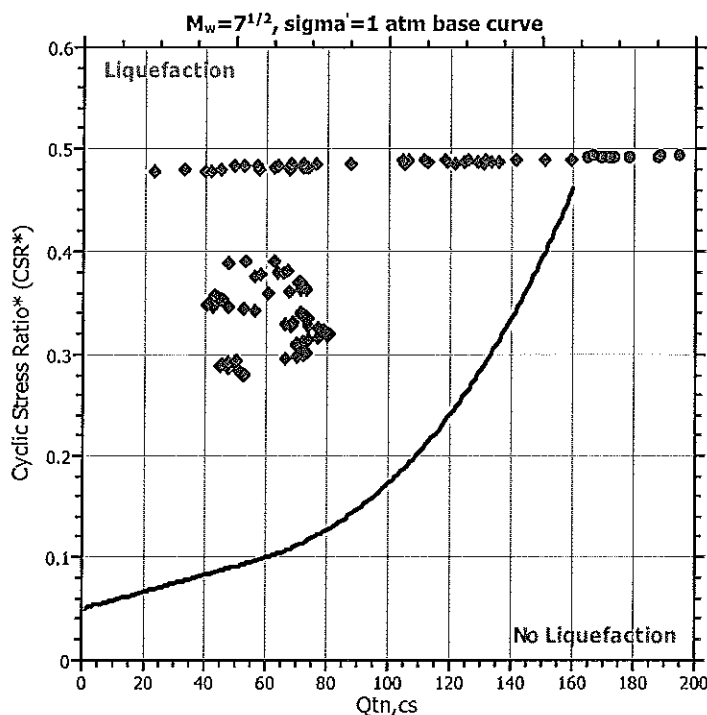
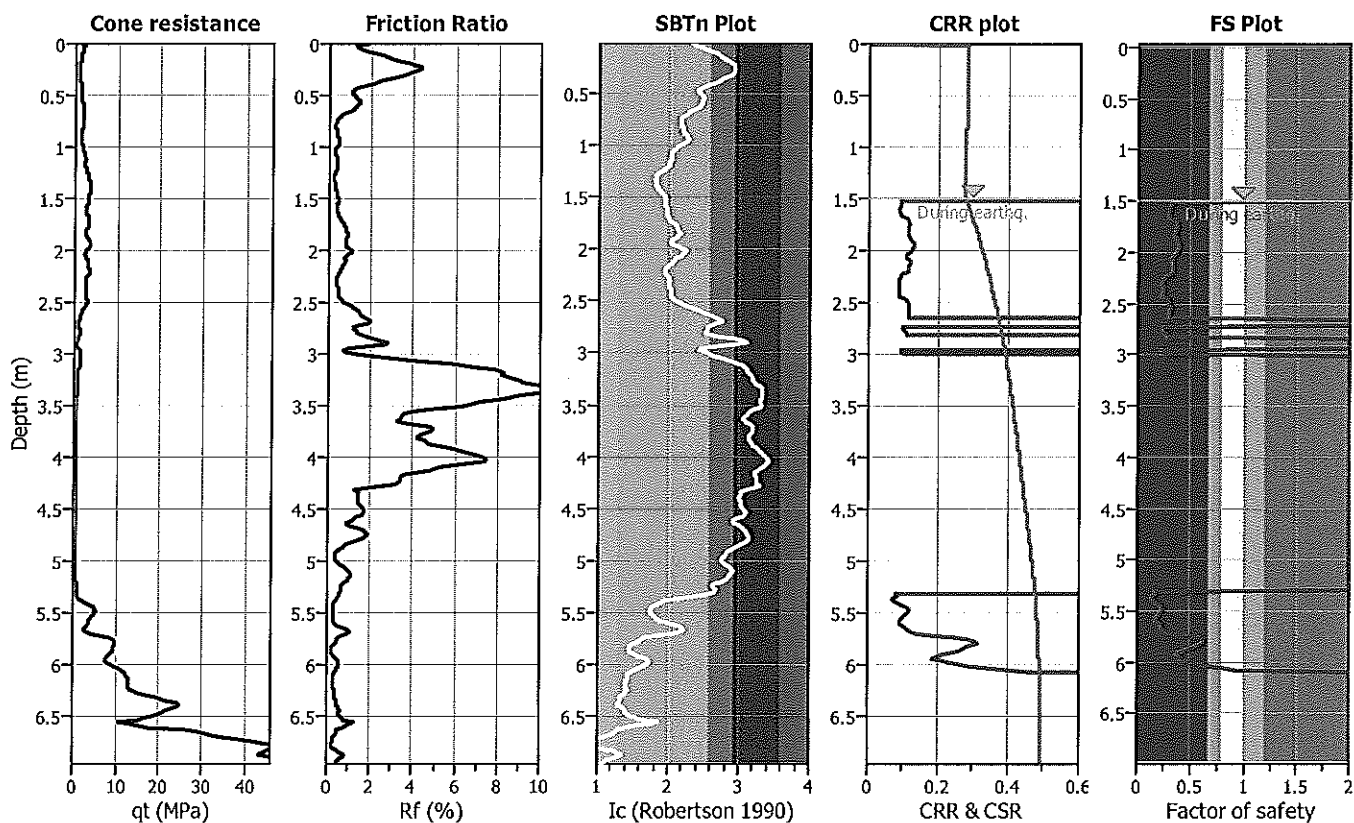
Project title : 11315

Location : 281 & 283 Innes Street , 272 & 274 Knowles Street

CPT file : 283 Innes St CPT6

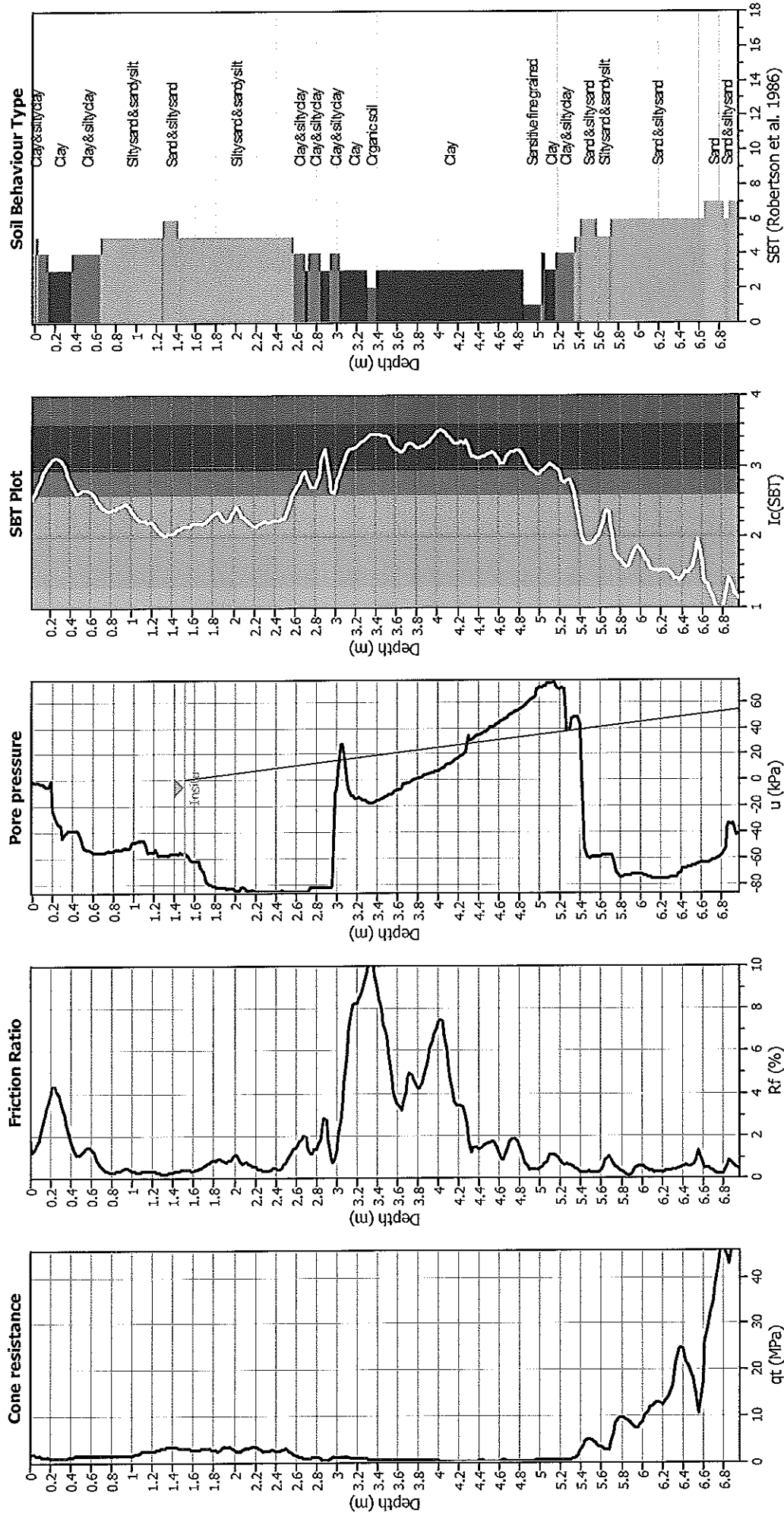
Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	1.50 m	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	1.50 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:	0.43	Unit weight calculation:	Based on SBT	K_0 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

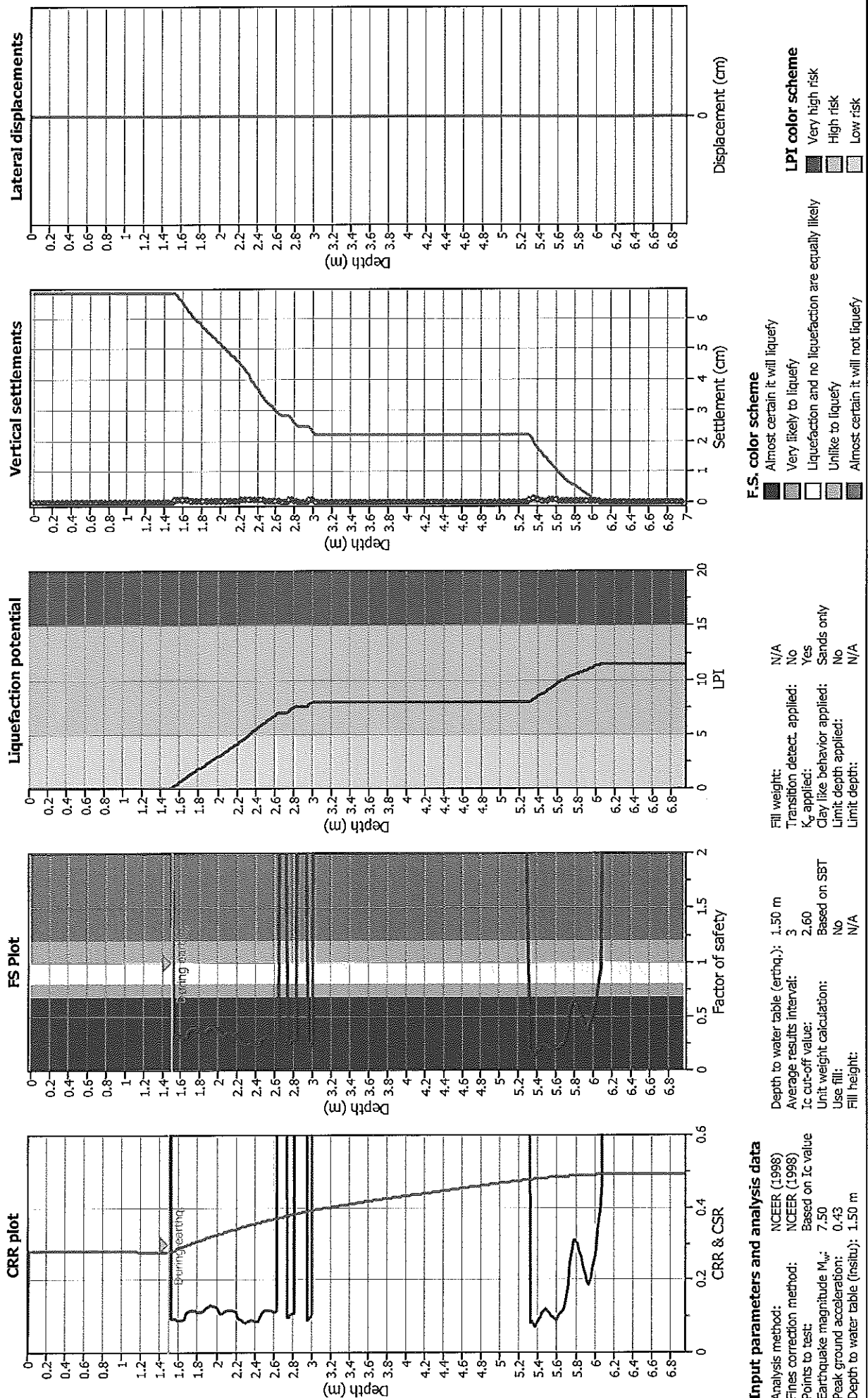
CPT basic interpretation plots



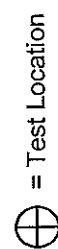
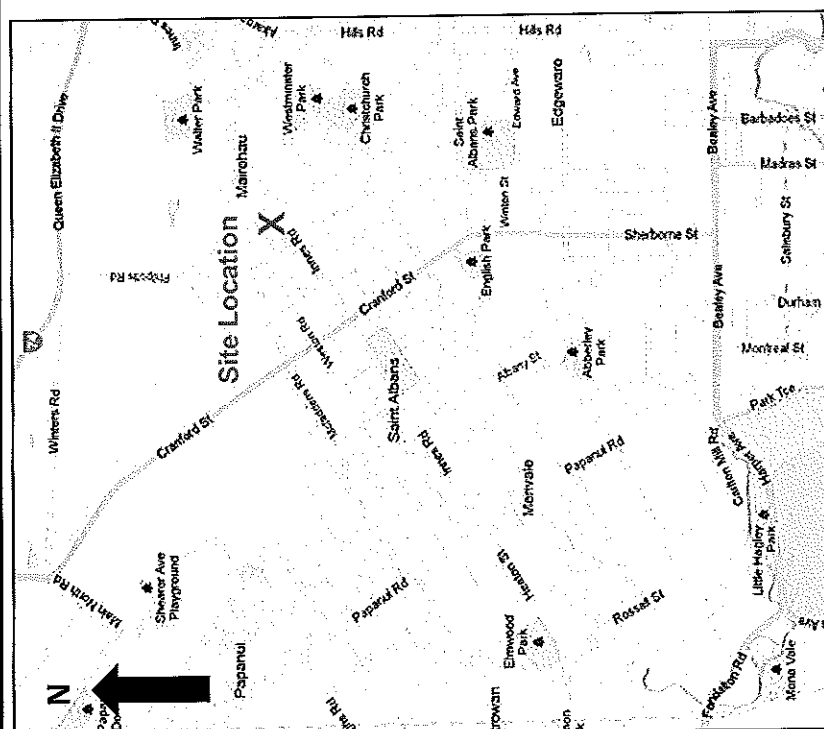
Input parameters and analysis data

Analysis method:	NCEER (1998)	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Transition detect. applied:	No
Points to test:	Based on I_c value	K_p applied:	Yes
Earthquake magnitude M_w :	7.50	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.43	Limit depth applied:	No
Depth to water table (instu):	1.50 m	Limit depth:	N/A
Depth to water table (earthq.):	1.50 m		
Average results interval:	3		
I_c cut-off value:	2.60		
Unit weight calculation:	Based on SBT		
Use fill:	No		
Fill height:	N/A		

Liquefaction analysis overall plots



FIGURES



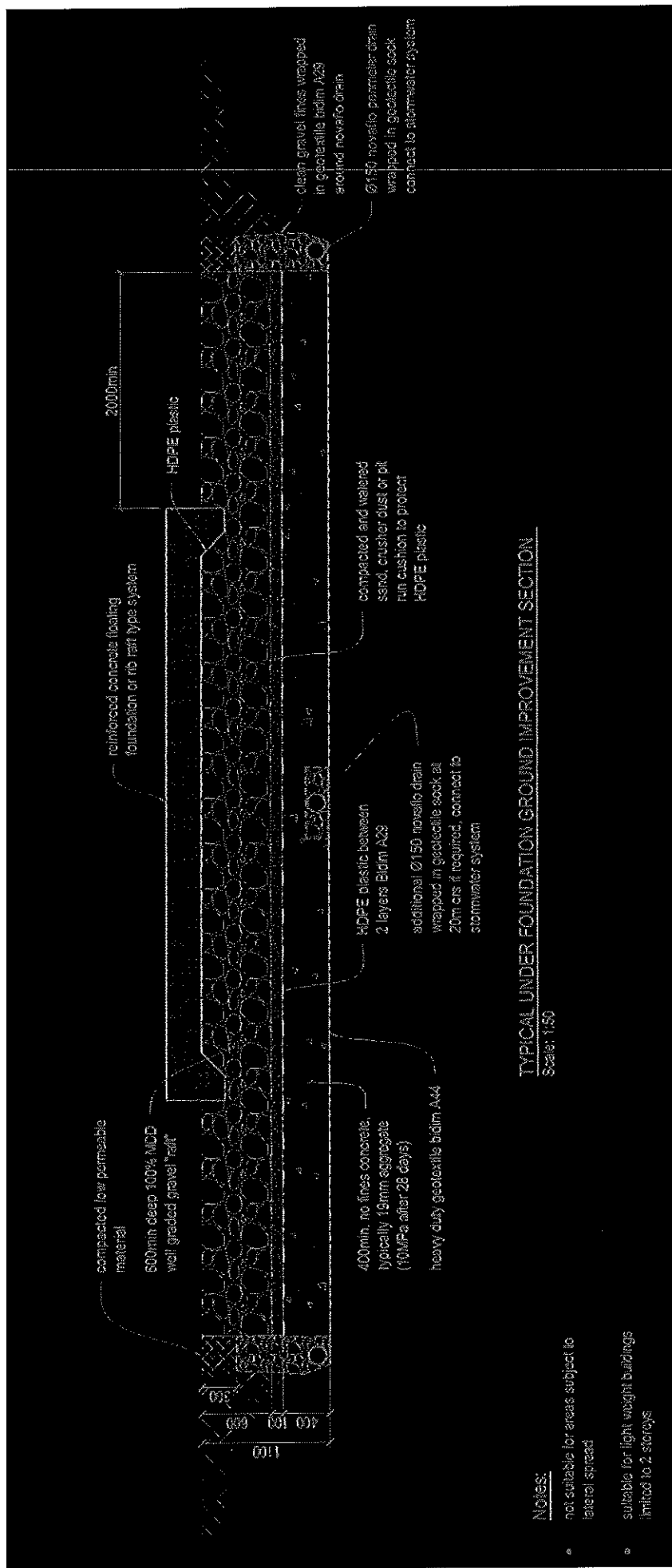
= Test Location

Note: Aerial photo sourced from Koordinates.com
Map sourced from Google Maps



**GEOSCIENCE
CONSULTING**
(NZ) LIMITED

Date	Feb-12	Client	Robert Warner		
Drawn by	CM	Project	281 & 283 Innes Road and 272 & 274 Knowles Street, Mairehau, Christchurch		
Approved by	MW	Description	Site Location Plan		
Scale	NTS	Figure Number	1	Project Number	11315_1



Date	Feb-12	Client	Robert Warner
Drawn by	TL	Project	281 & 283 Innes Road and 272 & 274 Knowles Street, Mairehau, Christchurch
Approved by	MW	Description	Proposed Foundation Option for New Buildings
Scale	1:50	Figure Number	2
		Project Number	11315_1

Mr Robert Warner
288 Innes Road
Mairehau
Christchurch 8052

8 December 2014

REVISED PLAN

20 May 2015

PROFESSIONAL BUILDING
CONSULTANTS LTD

Our Ref: 14863-A

Attention: Mr Robert Warner

Dear Sir

**GEOTECHNICAL ASSESSMENT REPORT
PROPOSED SUBDIVISION
281-283 INNES ROAD AND 272-274 KNOWLES STREET
MAIREHAU, CHRISTCHURCH**

1.0 Introduction

This report, prepared by Riley Consultants Ltd (RILEY), presents findings of a geotechnical assessment of the suitability of land at the above addresses for subdivision. The assessment has been based on geotechnical investigations undertaken (by others). The addresses are presently occupied by four dwellings, two of these are located adjacent to each other on Innes Road with the remaining two located adjacent to each other on Knowles Street. The lots are currently designated by the Ministry of Business, Innovation and Employment (MBIE) as TC2 type land. We understand it is proposed to subdivide the sites and create a total of six lots.

2.0 Scope of Work

As part of our assessment, the following tasks have been undertaken:

- A review of the Canterbury Geotechnical Database (CGDb) to assess available land damage information (if any).
- Review of the existing geotechnical information. RILEY has been supplied with a geotechnical investigation report prepared by Geoscience Consulting Ltd (Geoscience), Project No: 09617.011.315, Document ID: 02. As part of the Geoscience investigation, eight Cone penetrometer tests (CPT1 to CPT8) and six hand auger boreholes, with Scala penetrometer tests (Scalas), were undertaken at the site. The geotechnical investigations undertaken as part of the Geoscience assessment are considered consistent with those described in the MBIE Guidance Document for Repairing and Rebuilding Houses affected by the Canterbury Earthquakes (December 2012) and as such no further testing was undertaken as part of the RILEY assessment.
- An assessment of liquefaction susceptibility of the site, based on the eight CPT's and assessment of the available bearing capacity across the site based on six hand auger boreholes and Scalas undertaken by Geoscience.
- Provide preliminary foundation options, consistent with options outlined in the MBIE Guidance document, for development on the proposed lots.

3.0 Regional Geology

The published geological map of the area (Geology of the Christchurch Urban Area, Institute of Geological and Nuclear Sciences, 1:25 000, Map 1, 1992) indicates the property is underlain predominantly by alluvial sand and silt overbank deposits of the Yaldhurst Member, Springston Formation.

A review of the CGDb indicates data is available from a machine borehole and several CPT's located within 250m of the properties. A review of the geotechnical information indicates that subsurface ground conditions in the general area comprise sand to approximately 3m depth underlain by soft peat and clay layers to 6m to 7m depth, where inter-bedded layers of medium dense to dense sand and gravel are encountered.

The GNS median groundwater depth map (CGDb) indicates the average depth to the water table is between 1m and 2m.

4.0 Ground Damage from Canterbury Geotechnical Database

Based on the information provided, the existing dwellings on the sites are supported on shallow foundations. From discussions with the property's owner, we understand the dwellings have performed reasonably well and have only suffered minor damage following the earthquake events.

A review of the CGD map, EQC Liquefaction Interpreted from Aerial Photographs, indicates very minor liquefaction ejecta was observed on roads surrounding the properties following the September 2010, February, and December 2011 earthquake events. There were no obvious signs of liquefaction ejecta in the aerial photographs following the June 2011 earthquake.

Lateral spread occurs where differences in ground level or soil consistency allow liquefied soils to flow laterally, typically occurring near streams, rivers and sloping ground. The site is generally flat and there are no streams or rivers near the sites. A review of the CGD map, Observed Ground Crack Locations, indicates no ground cracking was located on or near the sites.

5.0 Ground Conditions

As indicated previously, eight CPT and six hand auger boreholes (with Scalas) were undertaken as part of the Geoscience investigation. The existing geotechnical test data is considered appropriate to develop a geotechnical model and assess liquefaction risk, and as such, no further geotechnical testing has been undertaken as part of the RILEY assessment. A description of the ground conditions is provided below with the test locations shown on RILEY Dwg: 14863-1.

5.1 Shallow Investigations

Six hand auger boreholes (HA1 to HA6), which included strength testing (Scalas) were drilled at the site by Geoscience.

From a review of borehole logs, subsurface ground conditions comprise a capping of topsoil to 0.6m depth underlain by inter-bedded layers of silt and sand to a maximum depth of 2.5m to 3.6m where boreholes were terminated due to collapse of the borehole walls. In HA4 and HA5, located within the proposed Lots 1 and 4, a peat layer was encountered from 3m to 3.4/3.6m depth. Groundwater was encountered across the site between 1m to 1.8m.

Strength testing indicates that a geotechnical ultimate bearing capacity of 200kPa is available below topsoil. A geotechnical ultimate bearing capacity of 300kPa is consistently encountered below 1.8m depth in the northern portion of Lot 4 (HA2). In the remaining portions of Lots 3 and 4, a geotechnical ultimate bearing capacity of 300kPa is not consistently encountered. Notwithstanding the above, bearing capacities for design should be confirmed by a geotechnical engineer once details regarding the work to be undertaken on the foundation system are known.

The ultimate bearing capacities above have been derived from Scala blow counts in accordance with the MBIE Guidelines (i.e. two blows/100mm for 200kPa) and NZS 3604 (i.e. five blows/100mm for 300kPa).

5.2 Deep Investigations

Deep geotechnical investigations comprised eight CPT's undertaken by Geoscience. The inferred soil profile comprised sand to approximately 3m depth. Below this, soft clay is inferred to approximately 6m to 7m depth where all CPT's (except CPT4) were terminated on an inferred dense gravel/sand layer. CPT4 penetrated this dense layer and indicated the inferred soil profile below 9m depth comprises inferred inter-bedded layers of loose to dense sand with silt and clay layers between 12m to 14m depth.

6.0 Geotechnical Considerations

6.1 Seismic Design Parameters

The preliminary design Peak Ground Accelerations (PGA) for the site, based on the latest update to the MBIE Guidelines (Issue 7) area are summarised in Table 1. The values in the table are based on a Class D soil type (deep or soft soils), which is considered appropriate for the site, and a design life of 50 years for the structure.

Table 1: Earthquake Design Parameters

Importance Level ⁽¹⁾ = 2	SLS ₁ ⁽²⁾	SLS ₂ ⁽²⁾	ULS ⁽³⁾
Moment Magnitude (M _w)	7.5	6.0	7.5
Annual Probability of Exceedance	1/25	1/25	1/500
Peak Ground Acceleration	0.13g	0.19g	0.35g

Notes:

- 1) Structure has been designed in terms of AS/NZS 1170 as Importance Level 2. These include normal structures, and structures not included in other importance levels.
- 2) SLS – Serviceability Limit State; two SLS cases must be considered.
- 3) ULS – Ultimate Limit State.

6.2 Review of PGA's

Recorded PGA's have been made publically available for the major earthquake events. The sites at 281-283 Innes Road and 272-274 Knowles Street are situated between three recording devices including Papanui High School, Resthaven and Shirley Public Library. The following PGA values were recorded during the Canterbury earthquake sequence:

Table 2: Peak Ground Accelerations

	Relative location to site	September 2010	February 2011	June 2011	December 2011
Papanui High school	2.95 km NW	0.28	0.22	0.13	0.14
Resthaven	2.65 km SW	0.28	0.72	0.34	0.34
Shirley Public Library	1.85 km SE	0.19	0.49	0.29	0.28

All in terms of gravity, (g)

Prior to the Darfield earthquake (4 September 2010), the design PGA for residential buildings in Christchurch was approximately 0.25g for ULS, deep soil sites with 50-year design life. The design SLS was 0.11g.

6.3 Liquefaction Risk Assessment

Liquefaction typically occurs in recent (i.e. typically less than 10,000 years old), normally consolidated silts and sands that lie beneath the groundwater table and is dependent on soil density, grain size, and soil composition. A liquefaction assessment has been completed in line with the latest update of the MBIE Guidelines (Issue 7) for liquefaction assessment using the Zhang, Robertson and Brachman, 2002, methods, with a magnitude 7.5 earthquake and the water table set at 1m.

A second assessment using a 6Mw earthquake event and an SLS PGA of 0.19g has also been considered, consistent with the MBIE Guidelines. Both assessments have been analysed with the worst case scenario discussed.

The analysis indicates that the soils are potentially liquefiable, under ULS and SLS seismic activity, to approximately 6m depth with the exception of the fine grained clay soils between 3m to approximately 5m depth. The analysis of some CPT's indicated that the dense soils between 6m and 8m depth are non-liquefiable. The calculated total and index settlements are presented in Table 3 below.

Table 3: Predicted Liquefaction Settlements

Test (Termination Depth ⁴)	Predicted Liquefaction Induced Settlements ¹ (mm)			
	Total		Index ²	
	ULS	SLS	ULS	SLS ³
CPT 1 (8m)	70	60	70	60
CPT 2 (9.5)	65	35	65	35
CPT 3 (8m)	75	50	75	50
CPT 4 (20m)	215	120	88	56
CPT 5 (6.5m)	80	60	80	60
CPT 6 (6.5m)	80	65	80	65
CPT 7 (7.5)	80	60	80	60
CPT 8 (6)	60	40	60	40

Notes:

- 1) Settlements were obtained through a liquefaction analysis using data obtained from on-site boreholes.
- 2) Index settlements are the estimated vertical settlement in the top 10m of soil under SLS and ULS loadings, as outlined in Part C the MBIE Guidelines.
- 3) SLS design level based on a Mw6, 0.19g earthquake event.
- 4) CPT's terminated between 6.5m and 8m depth on an inferred very dense gravel/sand layer. Settlements contributing from the soils from 6.5/8m to 10m depth are expected to be minor and the calculated index settlements are considered generally representative of the settlements of the soils to 10m depth.

A liquefaction analysis undertaken by Geoscience indicated the calculated index settlements straddle the limits of TC2/TC3 type land. Foundation recommendations by Geoscience included a TC2 enhanced slab supported on a gravel raft (i.e. TC2/TC3 Hybrid foundation). Notwithstanding that ULS index settlements are less than the TC2 threshold of 100mm, as SLS settlements are generally over the TC2 SLS settlement threshold of 50mm, we recommend that dwellings constructed on the proposed lots utilise foundations designed for TC3 type land.

6.4 Lateral Spread

As indicated above, given the absence of any topographical features or sloping ground and the absence of any ground cracking on-site, the sites could be classified as having a minor to moderate lateral spreading risk. This is the lowest classification in the MBIE Guidelines and corresponds to up to 200mm of lateral stretch across the building footprint.

7.0 Foundation Options

If a timber floor finish is desired, the proposed dwellings on Lots 3 and 4 could utilise a Type 1 surface structure foundation. A Type 1 surface structure, as outlined in Section 15.42 of the MBIE Guidelines, is intended for sites where the calculated SLS index settlements are less than 100mm. The surface structure is a modified NZS 3604 pile foundation that is capable of being re-levelled. The MBIE Guidelines indicate that surface structure must be supported on soils providing a geotechnical ultimate bearing capacity of 200kPa, or specific design is required.

As indicated previously, peat was encountered in HA4 and HA5 at 3m to 3.4m/3.6m depth in the proposed Lot 4 and Lot 1 (at the rear of existing dwelling). To reduce the potential for ongoing consolidation of the peat layer, it is important to ensure that the surcharge loading above this layer is not significant and that shallow foundations are adopted to enable the maximum distribution of foundation load above the peat. The existing 3m layer of soil overlying the peat will provide for good distribution of foundation loads, however, it is desirable that the proposed developments are of lightweight construction.

Driven piles in accordance with NZS 3604 may not be appropriate given the potential for pile tips to found within/close to the peat layer. Shallow piles encased in concrete pad foundations, as per Figure 15.16 of the MBIE Guidelines, founding below topsoil (i.e. at 0.6m depth) would be more appropriate. We note, testing within Lot 3 terminated at 2.6m depth (i.e. above the depth at which peat was encountered within Lot 4). Given the potential for peat to extend beneath Lot 3 it is considered prudent for Lot 3 to follow the recommendations given above.

If a concrete floor finish was desired, a re-levellable concrete surface structure could be considered. As outlined in Section 15.4.8 of the MBIE Guidelines (Part C), this foundation system is suitable to the sites as the SLS index settlement is less than 100mm. The system comprises of upper and lower slabs that can be jacked apart following differential settlement occurring to the foundation, allowing the house to be re-levelled. This foundation option is intended for sites where a minimum ultimate bearing capacity of 150kPa is provided. The soils below topsoil provide a geotechnical ultimate bearing capacity of 200kPa.

An alternative foundation option provided in the MBIE Guidelines is a TC2 enhanced slab supported on a densified crust to a minimum depth of 2m. This foundation system is only considered suitable for sites where liquefaction is limited to 10m depth. As CPT4 indicates that liquefaction may extend well beyond 10m depth this foundation system has been discounted.

8.0 General Considerations

Given the peat layer at depth, geotechnical input should be sought in the early stage of developing proposed foundation design details to confirm the preferred foundation system is consistent with this report.

It is recommended that the composition and strength of soils and the available bearing capacity is confirmed at the time of the construction. The strength of the materials located across the site and directly beneath the existing dwelling may vary from those indicated in the test locations.

Consideration should be given to the provision of lightweight materials, particularly for roof and cladding. In particular, timber surface structures and re-levellable concrete slabs are indicated in the MBIE Guidelines as only being applicable for timber or steel-framed structures with light roofing materials and lightweight cladding. These lightweight materials will reduce inertial loading on foundations, and can reduce settlement in future seismic events.

9.0 Limitation

This report has been prepared for Mr Robert Warner as our client, in accordance with the generally accepted practices and standards in use at the time and for the specific purpose of confirming the suitability of the MBIE Technical Category classification of the site and recommending a preliminary foundation option which meets the MBIE Guidelines. Riley Consultants Ltd accepts no liability to any other party who relies on this report or where this report is relied on for a purpose other than that noted above.

The interpretations as to likely subsurface conditions are based on data obtained from field investigations at discrete locations. No warranty is expressed or implied that the actual ground conditions encountered will conform exactly to the conditions described herein. Where conditions encountered at the site differ from those inferred in this report, Riley Consultants Ltd should be notified of such changes and given the opportunity to review the recommendations in the report.

This report does not aim to describe all characteristics and properties of the site. Subsurface conditions and testing relevant to and during construction works must be undertaken by contractors as necessary for their own purposes. It is possible that the nature of the exposed subsoils may require further investigation and modification of the design based upon this report. Riley Consultants Ltd would be pleased to provide this service to Mr Robert Warner and believes that the project would benefit from such continuity.

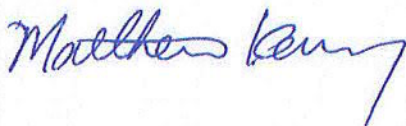
This report does not comment on stormwater management, flooding, root effects or aspects and land uses outside of the specific site, which may be required to be assessed to complete a foundation design for Building Consent application.

If you have any queries, please contact the undersigned.

Yours faithfully

RILEY CONSULTANTS LTD

Prepared by:



Matthew Kemmy
Civil Engineer, BEng, GIPENZ

Reviewed and approved for issue by:



Scott Vaughan
Managing Director, CPEng

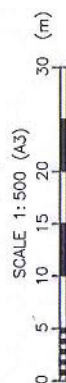
Enc: RILEY Dwg: 14863-1



HAND AUGER HOLE LOCATION
(CANTERBURY GEOTECHNICAL
DATABASE)

△ OPT01/OPT_1
CONE PENETRATION TEST
LOCATION (CANTERBURY
GEOTECHNICAL DATABASE)

PROPOSED PROPERTY
BOUNDARIES
(APPROXIMATE — BASED ON
INFORMATION WITHIN THE
GEOSCIENCE CONSULTING
REPORT)



1. PHOTO SOURCED FROM CHRISTCHURCH POST EARTHQUAKE AERIAL PHOTOS (24TH FEB 2011), LINZ
2. PARCELS SOURCED FROM QUICKMAP CANTERBURY (OCT 2012)

3. HOLE/TEST LOCATIONS ARE APPROXIMATE -- REFERENCED FROM CANTERBURY GEOTECHNICAL DATABASE

 RILEY CONSULTANTS	P.O. BOX 4355 CHRISTCHURCH TEL. 03-3794402 FAX. 03-394403	TITLE
---	--	-------

BOB WARNER

281-283 INNES ROAD & 272-274 KNOWLES STREET

GEOTECHNICAL INVESTIGATION LOCATION PLAN

CADFILE 14863-1 SCALES (A3) AS SHOWN	DRAWING No. 14863-1	REV. 1

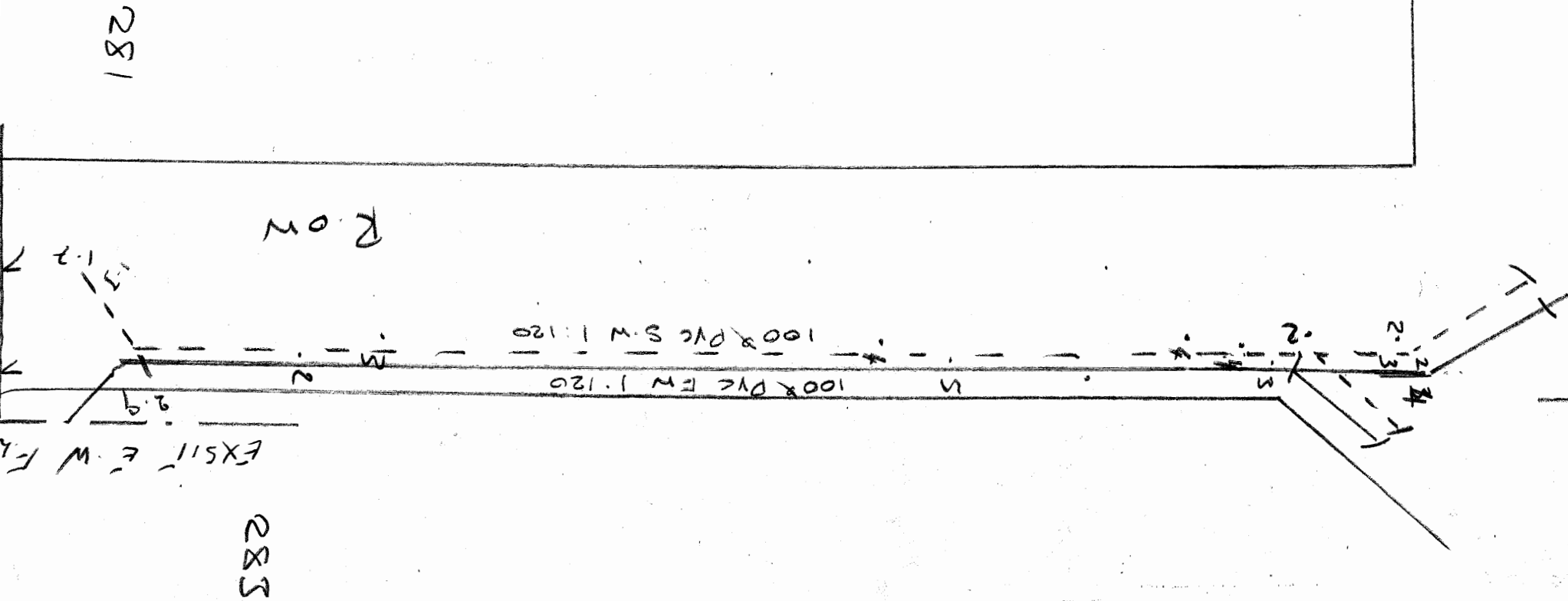


Address: 281+283 Innes Rd

Date:

Drainlayer: Rob Howk

15778
Inspector: Barry Light Brown



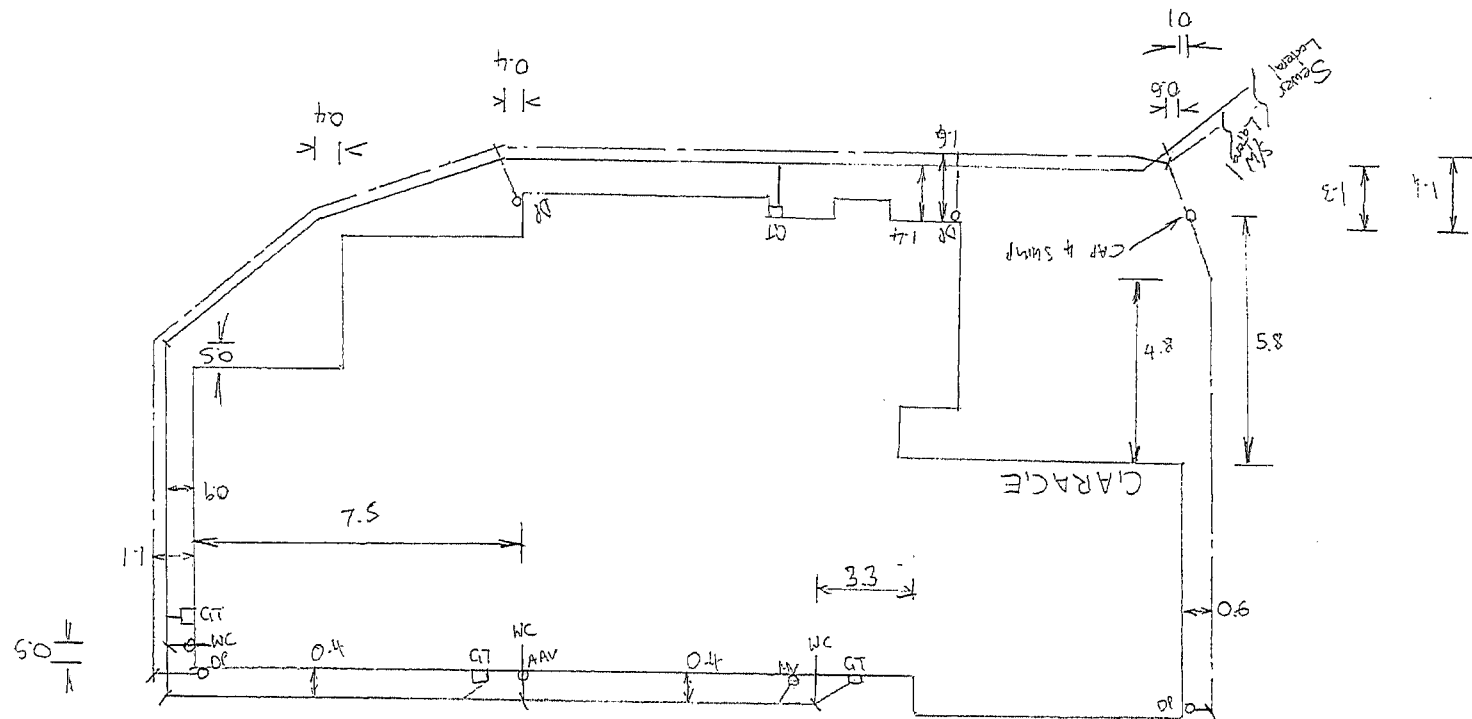
281a Innes Road / Consent: 2015/3290

Pipe Rite Drainage Ltd / Rego: 17121 Daniell Williams

Sewer Cirade - 1:120

S/W Cirade - 1:120

DATE: 30/06/15

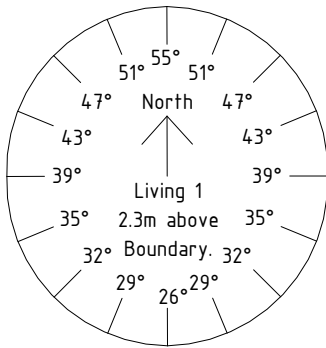
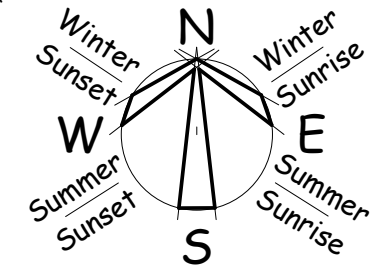
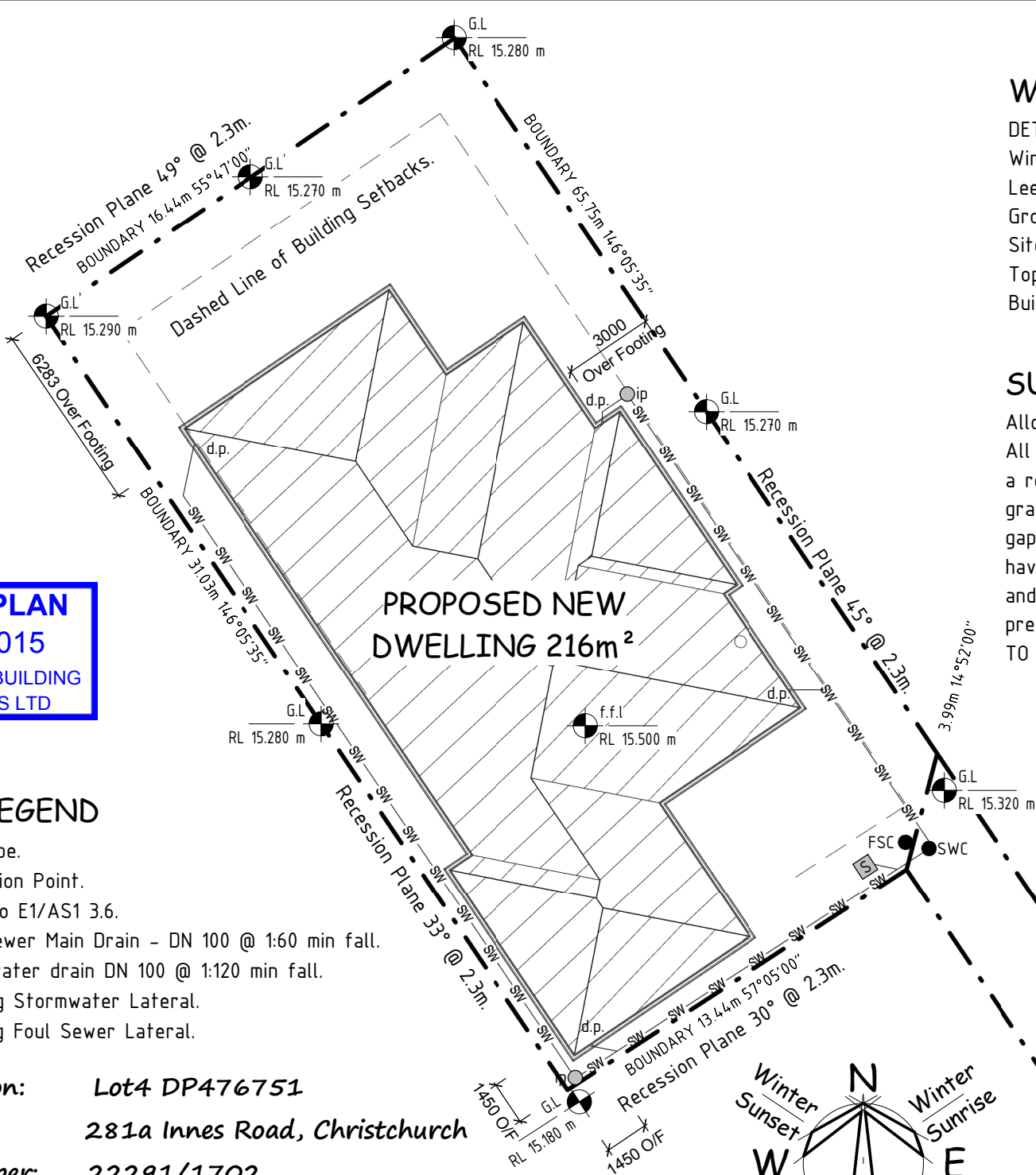


REVISED PLAN
20 May 2015
PROFESSIONAL BUILDING
CONSULTANTS LTD

DRAINAGE LEGEND

- d.p. Downpipe.
- ip Inspection Point.
- S Sump to E1/AS1 3.6.
- FS FS Foul Sewer Main Drain - DN 100 @ 1:60 min fall.
- SW SW Stormwater drain DN 100 @ 1:120 min fall.
- SWC Existing Stormwater Lateral.
- FSC Existing Foul Sewer Lateral.

Legal Description: Lot4 DP476751
Site Address: 281a Innes Road, Christchurch
Valuation Number: 22291/1702
Site Area: 616 m²
Zone: Living 1
Region: Christchurch City council
Wind Zone - High Wind Zone
Exposure Zone - C
Earthquake Zone - 2
Snow Zone - N4
Snow Loading - 1 kPa
Altitude - 8m - ASL



SITE & DRAINAGE PLAN
Scale 1:200

WIND ZONE CALCULATIONS.
DETERMINATION OF A WIND ZONE - Table 5.1 NZS3604:2011
Wind Region - A
Lee Zone - No
Ground roughness - Urban or Open
Site exposure - Sheltered or Exposed
Topography Class - T1 - Undulations<10m.
Building wind zone - H = Wind speed of 44 m/s

SURFACE WATER SUMP NOTES:
Allow for Surface water Sumps as noted on plans.
All surface water, except that collected directly from a roof, shall enter the drain via a sump which has a grating with at least 35% openings and 35max opening gaps, be hinged or removable for maintenance access, have a capacity at the bottom for settlement of silt and debris with a submerged (or trapped) outlet which prevents floatable solids entering the drain. REFER TO NZBC E1/AS1 figures 8 & 9.

Christchurch
City Council

BCN/2015/3290

Approved Building Consent Plan

20/05/2015

JOE NG

Page 3 of 29

Proposed NEW DWELLING for
Bob & Lorraine Warner.,
Address: 281a Innes Road, Christchurch

GENERAL SPECIFICATION NOTES:
All construction to comply with the current NZBC, NZS 3604:2011, NZ Metal Roof & Wall Cladding COP 2012, Other standards where relevant and the local territorial authority requirements.

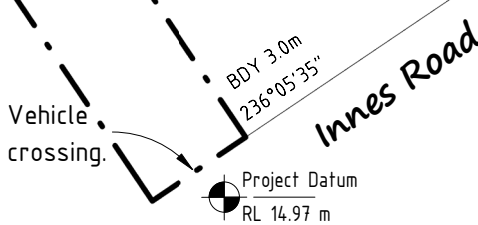
- Do not scale from these drawings.
- All timber to be SG8 unless noted otherwise.
 - All sheltered Wall and Roof framing to be H1.2 treated.
 - Timber cavity battens to be H3.1 treated.
 - All External finishing timbers to be H3.1 treated and sealed with a protective paint finish.

Where timber members are built up to achieve required thickness eg (2/140x45 to achieve 140x90mm member), they shall be nailed in accordance with NZS3604:2011 2.4.4.7.

Fibre cement external linings to have a protective paint finish. All Steel flashings to be 0.55mm Factory Painted Coloursteel, Proprietary Cladding systems with specialized flashings as specified by manufacturer to suit the project corrosion zone as noted on drawings.

NOTE : Impervious paint finish must be a quality paint system suitable for the material & environment of use, manufacturers specifications must be followed. Where a protective paint finish is required all surfaces including laps and end grains to be sealed by priming, followed by 2 coats of exterior grade paint to all exposed surfaces.

- NOTE:
- 1) Project Datumn - Masonry Anchor flush in top of kerb.
 - 2) Levels in terms of Christchurch Drainage Datumn (2014)



Drw Name : SITE & DRAINAGE		
Project : PROPOSED NEW DWELLING for		
Client : Bob & Lorraine Warner.		
Address : 281a Innes Road, Christchurch		
NOTE : do not scale from this drawing.		
DATE : APRIL 2015	JOB # : Lot4_Innes	
SCALE @ A3 Sht. As indicated	REV # B	DRW # 01

50mm 100mm Original Scale

DRAINAGE LEGEND

- ip Inspection Point.
- FSC Existing Foul Sewer Lateral.
- ▬ O.G.T Overflow relief Gully trap.
- ▬ G.T Gully trap.
- ⊙OV Open vent - DN 80.
- ⊙aav Air Admittance Valve.
- BD—BD— Foul sewer Branch Drain - DN 100 @ 1:60 min fall.
- FS—FS— Foul sewer Main Drain - DN 100 @ 1:60 min fall.
- Fixture discharge pipe - Refer to fixture legend for sizing.

Plan and details for
keeping pipes within
slab. Refer to detail 01

REVISED PLAN

18 May 2015

PROFESSIONAL BUILDING
CONSULTANTS LTD

ELECTRICAL LEGEND

- ☑ - Vent - Ceiling extracted.
- ☑ - Vent Grille - Soffit.
- - Ducting.

MECHANICAL VENTILATION NOTES:

Extractor fan / Vent. ☑-----☑

Install mechanical ventilation (Extractor fan) as specified.
Allow for air replacement inlet grill as required by the
manufacturers specification, fan to be controlled by infrared,
humidity sensor or switch with timer. NOTE : Mechanical
extraction is required to terminate to an external air space,
ie through Roof, External Wall or under Soffit.

AS 1668.2 Exhaust Rates.

Bathroom & Toilets - 25l/s per Room.

Laundry - 20l/s per Room.

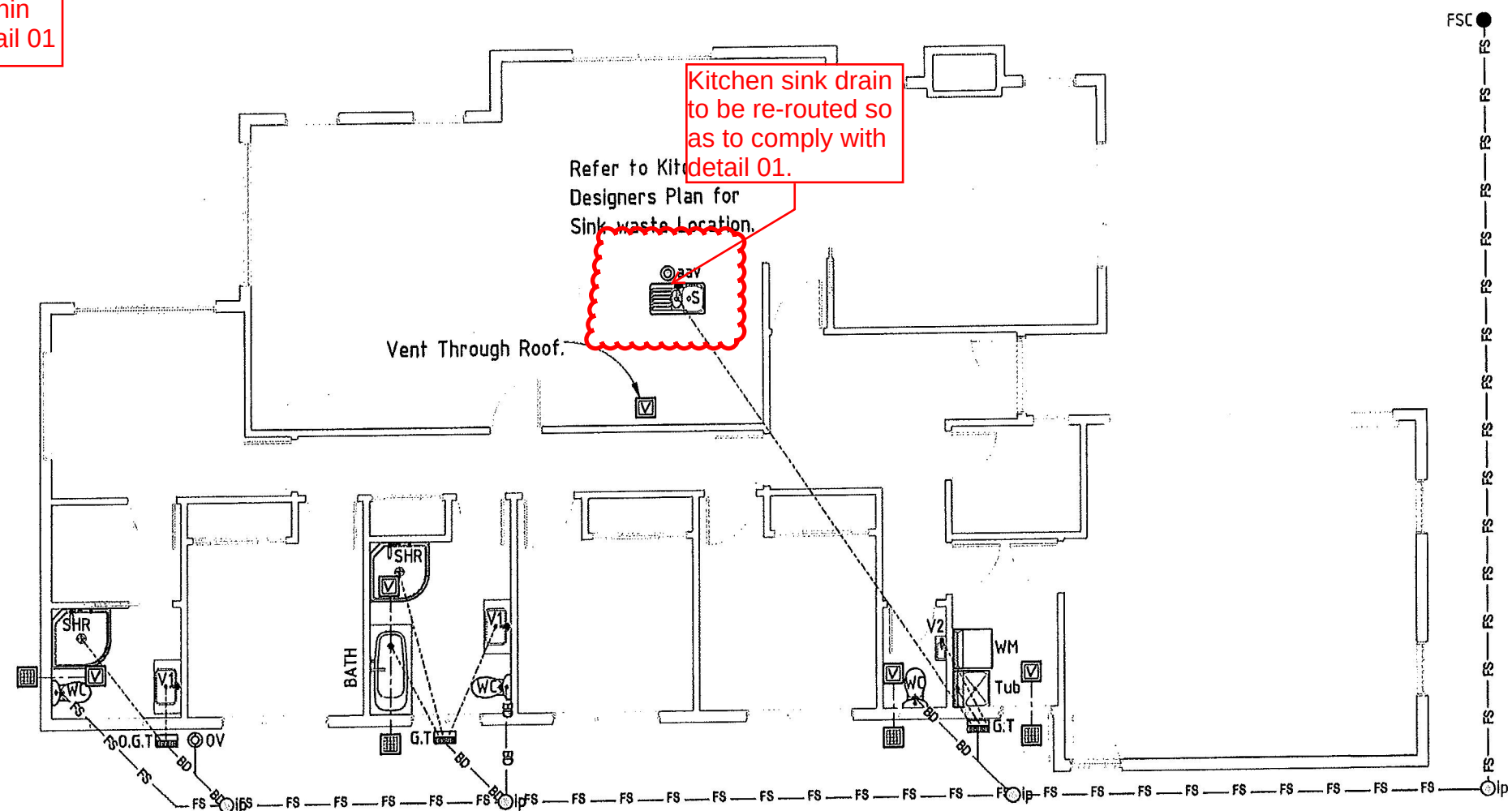
Kitchens - 50l/s per Room.

Ventilation to be provided via an in-line fan with min flow
rate as specified above.



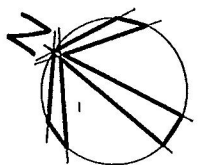
PLUMBING - FIXTURE LEGEND G13 - Mains Pressure										
Code	Description	Model	Fixture Construction Standards	Pipe DU's	Discharge Pipe Size G13/AS1	Gradient	Individual max unvented discharge pipe length	Min DN Fixture Vent Pipe	HW Pipe Ø	General Notes
BATH	Bath	1655x740	NZS 2023	4 DU's	DN 40	1:40	3.5m	DN 40	15mm*	*Based on 20max pipe run
S	Kitchen Sink	Proprietary	NZS 1730	3 DU's	DN 40	1:40	3.5m	DN 32	15mm*	*Based on 20max pipe run.
SHR	Acrylic shower	1000x1000mm	AS3588	2 DU's	DN 40	1:40	3.5m	DN 32	20mm*	*15mm for sepearate pipe from HWC to single outlet
Tub	Laundry Tub	Proprietary	NZBC G2/AS1	5 DU's	DN 40	1:40	3.5m	DN 32	15mm*	*Based on 20max pipe run.
V1	Vanity	900x400mm	NZS 1730	1 DU	DN 32	1:40	3.5m	DN 32	10mm*	*Based on 20max pipe run.
V2	Vanity	400x200mm	NZS 1730	1 DU	DN 32	1:40	3.5m	DN 32	10mm*	*Based on 20max pipe run.
WC	Toilet	S Trap	G1/AS1	4 DU's	DN 100	1:60	6m	DN 40	N/A	Cisten Flush
WM	Washing Machine	Proprietary	~	~	~	~	~	~	~	Discharge to Laundry Tub
Total Fixtures: 12										

Arthur 7/4/15
Warner 7/4/15



PLUMBING PLAN
Scale 1:100

Christchurch City Council
BCN/2015/3290
Approved Building Consent Plan
20/05/2015
JOE NG



Project : PROPOSED NEW DWELLING for Client : Bob & Lorraine Warner. Address : 281a Innes Road, Christchurch			JOB # : Lot4_Innes	Drw Name : PLUMBING PLAN		
Drawn By : LBP 113870			DATE : MARCH 2015	NOTE : do not scale from this drawing.	SCALE @ A3 Sht. As indicated	REV # B
						DRW # 09



ELECTRICAL CERTIFICATE OF COMPLIANCE AND ELECTRICAL SAFETY CERTIFICATE



Reference/Certificate ID No:

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.

Location Details:

Contact Details:
(Name and address)

Name of
Electrical worker:

Registration/Practising
licence number:

Organisation/company:

Phone and email:

Name of person(s)
supervised:

CoC

Type of work:

☐ Additions ☐ Alterations ☐ New work

The prescribed electrical work is:

☐ Low risk ☐ General ☒ High risk (Specify):

Reference Standards:

☒ Part 1 of AS/NZS 3000 ☐ Part 2 of AS/NZS 3000

☐ Additional Standards:

Description of Work: (including date/s of work and type of supply system)

1x Generator Switch - 1x Oven - 1x HWC - 52 Lights - 4x P1-6 TV - 8x up/down lights - 3x outside socket 2x Pairs - 2x fan Heater (1x for AVR 240V Heat pump) 2x Underfloor Heat (2x for 1x Alarm)

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

Select those that apply:

- ☐ Has been installed in accordance with the specified certified design¹
☒ Has an earthing system that is correctly rated (where applicable)
☒ Contains fittings that are safe to connect to a power supply
☒ Relies on a supplier Declaration of Conformity¹
☒ Relies on a manufacturer's instructions¹
☒ Has been satisfactorily tested in accordance with the Electricity (Safety) Regulations 2010
☐ Is safe to connect

Electronic/Other reference:

Certifier's signature:

Test Results

Polarity (Independent earth):	
Insulation resistance:	20 MΩ
Earth Continuity:	0.01 Ω
Bonding:	0.01 Ω
Fault Loop impedance	
Other (specify):	

Date:

¹ Attach or reference. If it is impractical to attach a copy of a particular manufacturer's instructions, or of any certified design or supplier declaration of conformity, provide a reference to where the documents can be found, in a readily accessible format, by electronic means.

ESC

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

Certifier's
name:

Registration/Practising
licence number:

Certifier's
signature:

Certificate
Issue Date:

Connection
Date:



ELECTRICAL CERTIFICATE OF COMPLIANCE AND ELECTRICAL SAFETY CERTIFICATE



Reference/Certificate ID No:

E2173967

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.

Location Details:

281 INNES RD

Contact Details:
(Name and address)

Trident Homes

Name of
Electrical worker:

GRAHAM FLECK

Registration/Practising
licence number:

E2936

Organisation/company:

EZIBREEZE LTD

Phone and email:

info@ezibreeze.co.nz

Name of person(s)
supervised:

CoC

Type of work:

☐ Additions

☐ Alterations

☐ New work

The prescribed electrical work is:

☐ Low risk

☐ General

☒ High risk (Specify):

Reference Standards:

☒ Part 1 of AS/NZS 3000

☐ Part 2 of AS/NZS 3000

☐ Additional Standards:

Description of Work: (including date/s of work and type of supply system)

1x Generator Switch - 1x oven - 1x HWC - 52 Lights - Plugs (41)
4x PH-6TV - 8x updown lights 3x outside socket 2x Rado - 2x fan heaters
(1x lights in AS9241 heat pump) 2x under floor heat 4x Extract Fan 1x Alarm

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

Select those that apply:

☒ Has been installed in accordance with the specified certified design¹

☒ Has an earthing system that is correctly rated (where applicable)

☒ Contains fittings that are safe to connect to a power supply

☒ Relies on a supplier Declaration of Conformity¹

☒ Relies on a manufacturer's instructions¹

☒ Has been satisfactorily tested in accordance with the Electricity (Safety) Regulations 2010

☐ Is safe to connect

Electronic/Other reference:

Certifier's signature:

Test Results

Polarity (Independent earth):	
Insulation resistance:	20MΩ
Earth Continuity:	0.001m
Bonding:	0.01m
Fault Loop impedance	
Other (specify):	

Date:

17.9.15

¹ Attach or reference. If it is impractical to attach a copy of a particular manufacturer's instructions, or of any certified design or supplier declaration of conformity, provide a reference to where the documents can be found, in a readily accessible format, by electronic means.

ESC

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

Certifier's
name:

Registration/Practising
licence number:

Certifier's
signature:

Certificate
Issue Date:

Connection
Date:



ELECTRICAL CERTIFICATE OF COMPLIANCE & ELECTRICAL SAFETY CERTIFICATE

REFERENCE/CERTIFICATE ID No.: TRH281

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.

Location Details:

281A Innes Road, Mairehau

Contact Details:
(Name and address)

Trident Homes

Name of Electrical worker:

Steve Suttle

Registration/Practising licence number:

E9527

Organisation/company:

M&J Complete services 2014 LTD

Phone & email:

admin@mjcompleteservices.co.nz PH: 0800 945 797

Name of person(s) supervised:

CoC

Type of work:

☐ Additions

☐ Alterations

☒ New work

The prescribed electrical work is:

☐ Low risk

☒ General

☒ High-risk (Specify):

Reference Standards:

☐ Part 1 of AS/NZS 3000

☒ Part 2 of AS/NZS 3000

☐ Additional Standards:

Description of Work (including date/s of work and type of supply system):

Lay New Mains in conduit laid by others.
Cable size = 35 mm 1 core N/S

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

Select those that apply:

- ☐ Has been installed in accordance with the specified certified design¹
- ☐ Has an earthing system that is correctly rated (where applicable)
- ☐ Contains fittings that are safe to connect to a power supply
- ☐ Relies on a supplier Declaration of Conformity¹
- ☐ Relies on a manufacturer's instructions¹
- ☐ Has been satisfactorily tested in accordance with the Electricity (Safety) Regulations 2010
- ☐ Is safe to connect

Electronic/Other reference:

Certifier's signature:

Test Results	
Polarity (Independent earth):	
Insulation resistance:	
Earth Continuity:	
Bonding:	
Fault Loop Impedance	
Other (specify):	

Date:

16/06/2015

¹ Attach or reference. If it is impractical to attach a copy of a particular manufacturer's instructions, or of any certified design or supplier declaration of conformity, provide a reference to where the documents can be found, in a readily accessible format, by electronic means.

ESC

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

Certifier's name:

Registration/Practising licence number:

Certifier's signature:

Certificate Issue Date:

Connection Date:

CUSTOMER COPY - THIS IS AN IMPORTANT DOCUMENT AND SHOULD BE RETAINED FOR A MINIMUM OF 7 YEARS

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 2004.

GASFITTING CERTIFICATE OF COMPLIANCE



Client Name: Trident Homes

Reference or Job #: Warner ICP (if known):

Address of work: 281 Innes Rd

Suburb: Mairehau Town / City: Christchurch

Description of gasfitting work: (If different gasfitting work was done by different people, state who did what gasfitting.)

Installed one Rinnai Evolve gas fire.
Installed one Rinnai VT26 gas water heater.
Installed one Fisher & Paykel CGG04DX.
Installed gas pipe.
Installed one 2 x bottle station.

Gas supply pressure 3 kPa Risk classification (tick one) ☐ Low-Risk ☒ General ☐ High-risk

Gas type (tick one) ☐ Natural gas ☒ LPG ☐ Biogas ☐ Other (specify)

The work has been done in accordance with a certified design: ☐ Yes ☒ No

☐ Copy of certified design attached. (Or provide reference to readily accessible format, eg Internet link)

The work relies on manufacturer's instructions: ☐ Yes ☒ No

☐ Copy of manufacturer's instructions attached. (Or provide reference to readily accessible format, eg Internet link)

The work has been done in accordance with means of compliance (specify):

☒ Yes – AS/NZS 5601.1 sections 3 to 6 ☐ Yes – AS/NZS 5601.2 sections 3 to 9 ☐ No

Were any other standards required for compliance?

☐ Yes (specify) ☒ No

Parts of the gas installation that are safe to connect to a gas supply?

☒ All ☐ Parts (specify)

Date(s) on which the work was done (if different from date of certifying gasfitting):

17/9/2015

Name and registration number of anyone who carried out work under supervision:

Martin Miltner 2501

☒ I confirm that I am satisfied that the work described in this certificate of compliance has been done lawfully and safely, and that the information on this certificate is correct.

Certifier name: Grant Williams

Registration number: 16469 Certificate Issue Date: 18/9/2015

Signature:

Outline any additional information attached:

281A Innes Road Land Use Consents



**281A Innes Road
Subdivision Consents**

Unit title
Application

Land Use Resource Consents within 100 metres of 281A Innes Road

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

1/268 Knowles Street

RMA/2019/2876

Minimum Floor Level Certificate

Processing complete

Applied 10/12/2019

Certificate issued 16/12/2019

RMA/2020/522

To establish a social housing complex consisting of eight, one-bedroom residential units.

Processing complete

Applied 10/03/2020

Decision issued 04/05/2020

Granted 04/05/2020

RMA/2021/3978

Fee simple subdivision - eight lots with access lot amalgamation and land use

Processing complete

Applied 29/11/2021

Decision issued 27/01/2022

Granted 27/01/2022

s223 Certificate issued 15/09/2023

s224 Certificate issued 15/09/2023

1/270 Knowles Street

RMA/2019/2876

Minimum Floor Level Certificate

Processing complete

Applied 10/12/2019

Certificate issued 16/12/2019

RMA/2020/522

To establish a social housing complex consisting of eight, one-bedroom residential units.

Processing complete

Applied 10/03/2020

Decision issued 04/05/2020

Granted 04/05/2020

RMA/2021/3978

Fee simple subdivision - eight lots with access lot amalgamation and land use

Processing complete

Applied 29/11/2021

Granted 27/01/2022

s223 Certificate issued 15/09/2023

s224 Certificate issued 15/09/2023

Decision issued 27/01/2022

1/271 Innes Road

RMA/2021/2097

Construct six elderly persons housing units

Processing complete

Applied 06/07/2021

Decision issued 27/09/2021

Granted 27/09/2021

Within scope amendment accepted 13/06/2023

Within scope amendment decision issued 13/06/2023

RMA/2021/2454

Request for encumbrance for older persons' housing units

Processing complete

Applied 28/07/2021

Encumbrance registered 06/09/2021

RMA/2021/3086

Minimum Floor Level Certificate

Processing complete

Applied 17/09/2021

Certificate issued 17/09/2021

RMA/2021/37

Construct four EPH units

Withdrawn

Applied 13/01/2021

RMA/2021/563

Encumbrance for four OPH units

Processing complete

Applied 09/03/2021

Encumbrance registered 15/04/2021

RMA/2022/2076

Change of use from OPH units to multi-use residential complex

Processing complete

Applied 23/06/2022

Decision issued 04/08/2022

Granted 04/08/2022

RMA/2022/2732

Discharge of six OPH units

Processing complete

Applied 24/08/2022

Encumbrance discharged 07/10/2022

RMA/2023/761

Subdivision - Fee Simple - 6 lots and associated land use

Processing complete

Applied 29/03/2023

Decision issued 28/04/2023

Granted 27/04/2023

s223 Certificate issued 05/07/2023

s224 Certificate issued 13/02/2024

1/273 Innes Road

RMA/2021/2097

Construct six elderly persons housing units

Processing complete

Applied 06/07/2021

Decision issued 27/09/2021

Granted 27/09/2021

Within scope amendment accepted 13/06/2023

Within scope amendment decision issued 13/06/2023

RMA/2021/2454

Request for encumbrance for older persons' housing units

Processing complete

Applied 28/07/2021

Encumbrance registered 06/09/2021

RMA/2021/3086

Minimum Floor Level Certificate

Processing complete

Applied 17/09/2021

Certificate issued 17/09/2021

RMA/2021/37

Construct four EPH units

Withdrawn

Applied 13/01/2021

RMA/2021/563

Encumbrance for four OPH units

Processing complete

Applied 09/03/2021

Encumbrance registered 15/04/2021

RMA/2022/2076

Change of use from OPH units to multi-use residential complex

Processing complete

Applied 23/06/2022

Decision issued 04/08/2022

Granted 04/08/2022

RMA/2022/2732

Discharge of six OPH units

Processing complete

Applied 24/08/2022

Encumbrance discharged 07/10/2022

RMA/2023/761

Subdivision - Fee Simple - 6 lots and associated land use

Processing complete

Applied 29/03/2023

s223 Certificate issued 05/07/2023

s224 Certificate issued 13/02/2024

Decision issued 28/04/2023

Granted 27/04/2023

1/279 Innes Road

RMA/2014/43

TEMPORARY ACCOMMODATION - Office - Historical Reference RMA92024638

Expired

Applied 13/01/2014

Decision issued 23/01/2014

Granted 22/01/2014

1/376 Innes Road

RMA/2025/2364

To construct 12 Older Persons Housing units

Processing complete

Applied 18/07/2025

Decision issued 08/09/2025

Granted 08/09/2025

RMA/2025/2521

Minimum Floor Level Certificate

Processing complete

Applied 05/08/2025

Certificate issued 06/08/2025

RMA/2026/190

Request for Encumbrance - Twelve (12) OPH units

Processing

Applied 27/01/2026

1/378 Innes Road

RMA/2025/2364

To construct 12 Older Persons Housing units

Processing complete

Applied 18/07/2025

Decision issued 08/09/2025

Granted 08/09/2025

RMA/2025/2521

Minimum Floor Level Certificate

Processing complete

Applied 05/08/2025

Certificate issued 06/08/2025

RMA/2026/190

Request for Encumbrance - Twelve (12) OPH units

Processing

Applied 27/01/2026

2/268 Knowles Street

RMA/2019/2876

Minimum Floor Level Certificate

Processing complete

Applied 10/12/2019

Certificate issued 16/12/2019

RMA/2020/522

To establish a social housing complex consisting of eight, one-bedroom residential units.

Processing complete

Applied 10/03/2020

Decision issued 04/05/2020

Granted 04/05/2020

RMA/2021/3978

Fee simple subdivision - eight lots with access lot amalgamation and land use

Processing complete

Applied 29/11/2021

s223 Certificate issued 15/09/2023

s224 Certificate issued 15/09/2023

Decision issued 27/01/2022

Granted 27/01/2022

2/270 Knowles Street

RMA/2019/2876

Minimum Floor Level Certificate

Processing complete

Applied 10/12/2019

Certificate issued 16/12/2019

RMA/2020/522

To establish a social housing complex consisting of eight, one-bedroom residential units.

Processing complete

Applied 10/03/2020

Decision issued 04/05/2020

Granted 04/05/2020

RMA/2021/3978

Fee simple subdivision - eight lots with access lot amalgamation and land use

Processing complete

Applied 29/11/2021

s223 Certificate issued 15/09/2023

s224 Certificate issued 15/09/2023

Decision issued 27/01/2022

Granted 27/01/2022

2/271 Innes Road

RMA/2021/2097

Construct six elderly persons housing units

Processing complete

Applied 06/07/2021

Decision issued 27/09/2021

Granted 27/09/2021

Within scope amendment accepted 13/06/2023

Within scope amendment decision issued 13/06/2023

RMA/2021/2454

Request for encumbrance for older persons' housing units

Processing complete

Applied 28/07/2021

Encumbrance registered 06/09/2021

RMA/2021/3086

Minimum Floor Level Certificate

Processing complete

Applied 17/09/2021

Certificate issued 17/09/2021

RMA/2021/37

Construct four EPH units

Withdrawn

Applied 13/01/2021

RMA/2021/563

Encumbrance for four OPH units

Processing complete

Applied 09/03/2021

Encumbrance registered 15/04/2021

RMA/2022/2076

Change of use from OPH units to multi-use residential complex

Processing complete

Applied 23/06/2022

Decision issued 04/08/2022

Granted 04/08/2022

RMA/2022/2732

Discharge of six OPH units

Processing complete

Applied 24/08/2022

Encumbrance discharged 07/10/2022

RMA/2023/761

Subdivision - Fee Simple - 6 lots and associated land use

Processing complete

Applied 29/03/2023

s223 Certificate issued 05/07/2023

s224 Certificate issued 13/02/2024

Decision issued 28/04/2023

Granted 27/04/2023

2/273 Innes Road

RMA/2021/2097

Construct six elderly persons housing units

Processing complete

Applied 06/07/2021

Decision issued 27/09/2021

Granted 27/09/2021

Within scope amendment accepted 13/06/2023

Within scope amendment decision issued 13/06/2023

RMA/2021/2454

Request for encumbrance for older persons' housing units

Processing complete

Applied 28/07/2021

Encumbrance registered 06/09/2021

RMA/2021/3086

Minimum Floor Level Certificate

Processing complete

Applied 17/09/2021

Certificate issued 17/09/2021

RMA/2021/37

Construct four EPH units

Withdrawn

Applied 13/01/2021

RMA/2021/563

Encumbrance for four OPH units

Processing complete

Applied 09/03/2021

Encumbrance registered 15/04/2021

RMA/2022/2076

Change of use from OPH units to multi-use residential complex

Processing complete

Applied 23/06/2022

Decision issued 04/08/2022

Granted 04/08/2022

RMA/2022/2732

Discharge of six OPH units

Processing complete

Applied 24/08/2022

Encumbrance discharged 07/10/2022

RMA/2023/761

Subdivision - Fee Simple - 6 lots and associated land use

Processing complete

Applied 29/03/2023

s223 Certificate issued 05/07/2023

s224 Certificate issued 13/02/2024

Decision issued 28/04/2023

Granted 27/04/2023

262 Knowles Street

RMA/2006/1340

utilise a residential dwelling for office & community work use - Historical Reference RMA92005393

Processing complete

Applied 14/06/2006

Decision issued 26/07/2006

Granted 26/07/2006

264 Knowles Street

RMA/2006/2265

Additions to dwelling that intrude the 1.8m internal setback - Historical Reference RMA92006350

Processing complete

Applied 25/09/2006

Decision issued 16/10/2006

Granted 16/10/2006

269 Innes Road

RMA/2002/2046

To make additions to an existing dwelling that exceeds maximum length of a building permitted. - Historical Reference RMA20011073

Processing complete

Applied 21/08/2002

Decision issued 03/09/2002

Granted 30/08/2002

273A Innes Road

RMA/2006/362

Application to erect a dwelling with an attached garage on the new proposed Lot 2 - Historical Reference RMA20022253

Processing complete

Applied 28/02/2006

Decision issued 24/03/2006

Granted 24/03/2006

RMA/2022/2076

Change of use from OPH units to multi-use residential complex

Processing complete

Applied 23/06/2022

Decision issued 04/08/2022

Granted 04/08/2022

275 Knowles Street

RMA/1991/978

Erect a garage of 10.2m length (exceeds 9m) and 0.9m from boundary in lieu of 1.8m. Neighbours consent - Historical Reference RES9217795

Processing complete

Applied 29/10/1991

Decision issued 21/11/1991

Granted 21/11/1991

275A Innes Road

RMA/1996/989

To erect a dwelling which contains a length of wall exceeding 20m without a 2.4m step in Plan. - Historical Reference RES961155

Processing complete

Applied 16/05/1996

Decision issued 28/05/1996

Granted 28/05/1996

276 Knowles Street

RMA/1992/850

Consent to build garage/ sleepout exceeding 9m in length within 1.8m of boundary. Neighbours consent - Historical Reference RES9218302

Processing complete

Applied 05/03/1992

Decision issued 11/03/1992

Granted 11/03/1992

RMA/2004/2508

Extension to living area of existing dwelling that is within 1.8 metres of an internal boundary. - Historical Reference RMA20018154

Processing complete

Applied 30/09/2004

Decision issued 01/10/2004

Granted 01/10/2004

279 Knowles Street

RMA/1988/495

Dispensation to erect a garage with a setback of 5m from the vehicle crossing in lieu of the 6m required. - Historical Reference RES9211427

Processing complete

Applied 01/03/1988

Decision issued 17/03/1988

Granted 17/03/1988

RMA/2000/2382

Change of use from a garage to games room with setback 2m from the road boundary. - Historical Reference RMA20003131

Processing complete

Applied 18/09/2000

Decision issued 19/10/2000

Granted 18/10/2000

283A Innes Road

RMA/2018/787

Minimum Floor Level Certificate

Processing complete

Applied 29/03/2018

Certificate issued 03/04/2018

RMA/2018/996

New four bedroom dwelling with attached double garage

Processing complete

Applied 26/04/2018

Decision issued 01/06/2018

Granted 01/06/2018

3/268 Knowles Street

RMA/2019/2876

Minimum Floor Level Certificate

Processing complete

Applied 10/12/2019

Certificate issued 16/12/2019

RMA/2020/522

To establish a social housing complex consisting of eight, one-bedroom residential units.

Processing complete

Applied 10/03/2020

Decision issued 04/05/2020

Granted 04/05/2020

RMA/2021/3978

Fee simple subdivision - eight lots with access lot amalgamation and land use

Processing complete

Applied 29/11/2021

s223 Certificate issued 15/09/2023

s224 Certificate issued 15/09/2023

Decision issued 27/01/2022

Granted 27/01/2022

3/270 Knowles Street

RMA/2019/2876

Minimum Floor Level Certificate

Processing complete

Applied 10/12/2019

Certificate issued 16/12/2019

RMA/2020/522

To establish a social housing complex consisting of eight, one-bedroom residential units.

Processing complete

Applied 10/03/2020

Decision issued 04/05/2020

Granted 04/05/2020

RMA/2021/3978

Fee simple subdivision - eight lots with access lot amalgamation and land use

Processing complete

Applied 29/11/2021

s223 Certificate issued 15/09/2023

s224 Certificate issued 15/09/2023

Decision issued 27/01/2022

Granted 27/01/2022

3/271 Innes Road

RMA/2021/2097

Construct six elderly persons housing units

Processing complete

Applied 06/07/2021

Decision issued 27/09/2021

Granted 27/09/2021

Within scope amendment accepted 13/06/2023

Within scope amendment decision issued 13/06/2023

RMA/2021/2454

Request for encumbrance for older persons' housing units

Processing complete

Applied 28/07/2021

Encumbrance registered 06/09/2021

RMA/2021/3086

Minimum Floor Level Certificate

Processing complete

Applied 17/09/2021

Certificate issued 17/09/2021

RMA/2021/37

Construct four EPH units

Withdrawn

Applied 13/01/2021

RMA/2021/563

Encumbrance for four OPH units

Processing complete

Applied 09/03/2021

Encumbrance registered 15/04/2021

RMA/2022/2076

Change of use from OPH units to multi-use residential complex

Processing complete

Applied 23/06/2022

Decision issued 04/08/2022

Granted 04/08/2022

RMA/2022/2732

Discharge of six OPH units

Processing complete

Applied 24/08/2022

Encumbrance discharged 07/10/2022

RMA/2023/761

Subdivision - Fee Simple - 6 lots and associated land use

Processing complete

Applied 29/03/2023

s223 Certificate issued 05/07/2023

s224 Certificate issued 13/02/2024

Decision issued 28/04/2023

Granted 27/04/2023

36 Nancy Avenue

RMA/2014/3030

Rebuild Church Facilities - Historical Reference RMA92027729

Processing complete

Applied 19/11/2014

Decision issued 16/02/2015

Granted 16/02/2015

370 Innes Road

RMA/1987/572

Dispensation to reposition one vehicle crossing and for joint use of carparking with the school. - Historical Reference RES9212024

Processing complete

Applied 02/09/1987

Decision issued 16/09/1987

Granted 16/09/1987

RMA/1997/2936

The new classroom is to be located 4m from the northern boundary instead of the required 6m. - Historical Reference RES973387

Processing complete

Applied 24/11/1997

Decision issued 01/01/1999

Granted 01/01/1999

RMA/1998/2962

To undertake minor stream bank recontouring (excavation and filling) and stream side planting within the 5 metre waterway setback of th - Historical Reference RES983386

Processing complete

Applied 15/12/1998

Decision issued 01/01/1999

Granted 01/01/1999

RMA/1998/3881

Waterway enhancement of Tay Drain. - Historical Reference RMA674

Withdrawn

Applied 26/05/1998

RMA/2000/1120

Enhance and naturalisation of Tay Drain. - Historical Reference RMA20001812

Withdrawn

Applied 28/04/2000

RMA/2005/2080

New classroom. - Historical Reference RMA20020958

Processing complete

Applied 08/09/2005

Decision issued 19/10/2005

Granted 19/10/2005

RMA/2013/2608

Temporary Accommodation - Church Hall - Historical Reference RMA92024334

Processing complete

Applied 04/12/2013

Granted 09/12/2013

Decision issued 09/12/2013

RMA/2014/2034

Earthworks Contaminated Soil - Historical Reference RMA92026715

Processing complete

Applied 08/08/2014

Decision issued 29/08/2014

Granted 29/08/2014

RMA/2014/715

Establish, operate and maintain two new classroom block and associated car parking - Historical Reference RMA92025343

Processing complete

Applied 28/03/2014

Decision issued 28/05/2014

Granted 27/05/2014

RMA/2015/1888

Within Scope Amendment [RMA92025343] - Historical Reference RMA92030176

Processing complete

Applied 13/07/2015

Decision issued 23/07/2015

Granted 23/07/2015

RMA/2015/695

Notice of Requirement - Mairehau Catholic Primary school Incorporated into Stage 3 of the District Plan Review -
Historical Reference RMA92028925

Withdrawn

Applied 16/03/2015

RMA/2017/1715

Minimum Floor Level Certificate

Processing complete

Applied 18/07/2017

Certificate issued 31/08/2017

RMA/2017/2092

Soil disturbance associated with the construction of the school hall at 370 Innes Road, Mairehau (St Francis of Assisi School) on land where an activity identified on the Hazardous Activities and Industries List (HAIL) has been undertaken.

Processing complete

Applied 31/08/2017

Decision issued 05/10/2017

Granted 05/10/2017

RMA/2017/2094

Outline plan for new school hall

Processing complete

Applied 31/08/2017

Decision issued 05/10/2017

Outline plan accepted 05/10/2017

374 Innes Road

RMA/2025/2364

To construct 12 Older Persons Housing units

Processing complete

Applied 18/07/2025

Decision issued 08/09/2025

Granted 08/09/2025

RMA/2025/2521

Minimum Floor Level Certificate

Processing complete

Applied 05/08/2025

Certificate issued 06/08/2025

RMA/2026/190

Request for Encumbrance - Twelve (12) OPH units

Processing

Applied 27/01/2026

376 Innes Road

RMA/2025/2364

To construct 12 Older Persons Housing units

Processing complete

Applied 18/07/2025

Decision issued 08/09/2025

Granted 08/09/2025

RMA/2025/2521

Minimum Floor Level Certificate

Processing complete

Applied 05/08/2025

Certificate issued 06/08/2025

RMA/2026/190

Request for Encumbrance - Twelve (12) OPH units

Processing

Applied 27/01/2026

378 Innes Road

RMA/2025/2364

To construct 12 Older Persons Housing units

Processing complete

Applied 18/07/2025

Decision issued 08/09/2025

Granted 08/09/2025

RMA/2025/2521

Minimum Floor Level Certificate

Processing complete

Applied 05/08/2025

Certificate issued 06/08/2025

RMA/2026/190

Request for Encumbrance - Twelve (12) OPH units

Processing

Applied 27/01/2026

395 Innes Road

RMA/1991/967

Erect a garage 1m from road boundary. Neighbours consent - Historical Reference RES9217676

Processing complete

Applied 16/12/1991

Decision issued 24/12/1991

Granted 24/12/1991

396 Innes Road

RMA/1977/216

Dispensation to use dwelling as a medical practice, with a side yard of 1.37m in lieu of 1.8m. - Historical Reference RES9212025

Processing complete

Applied 15/07/1977

Decision issued 20/07/1977

Granted 20/07/1977

RMA/2004/1787

Erect a garage within setback from drain that also intrudes the recession plane - Historical Reference RMA20017408

Processing complete

Applied 12/07/2004

Decision issued 01/09/2004

Granted 01/09/2004

4/268 Knowles Street

RMA/2019/2876

Minimum Floor Level Certificate

Processing complete

Applied 10/12/2019

Certificate issued 16/12/2019

RMA/2020/522

To establish a social housing complex consisting of eight, one-bedroom residential units.

Processing complete

Applied 10/03/2020

Decision issued 04/05/2020

Granted 04/05/2020

RMA/2021/3978

Fee simple subdivision - eight lots with access lot amalgamation and land use

Processing complete

Applied 29/11/2021

s223 Certificate issued 15/09/2023

s224 Certificate issued 15/09/2023

Decision issued 27/01/2022

Granted 27/01/2022

4/270 Knowles Street

RMA/2019/2876

Minimum Floor Level Certificate

Processing complete

Applied 10/12/2019

Certificate issued 16/12/2019

RMA/2020/522

To establish a social housing complex consisting of eight, one-bedroom residential units.

Processing complete

Applied 10/03/2020

Decision issued 04/05/2020

Granted 04/05/2020

RMA/2021/3978

Fee simple subdivision - eight lots with access lot amalgamation and land use

Processing complete

Applied 29/11/2021

s223 Certificate issued 15/09/2023

s224 Certificate issued 15/09/2023

Decision issued 27/01/2022

Granted 27/01/2022

4/271 Innes Road

RMA/2021/2097

Construct six elderly persons housing units

Processing complete

Applied 06/07/2021

Decision issued 27/09/2021

Granted 27/09/2021

Within scope amendment accepted 13/06/2023

Within scope amendment decision issued 13/06/2023

RMA/2021/2454

Request for encumbrance for older persons' housing units

Processing complete

Applied 28/07/2021

Encumbrance registered 06/09/2021

RMA/2021/3086

Minimum Floor Level Certificate

Processing complete

Applied 17/09/2021

Certificate issued 17/09/2021

RMA/2021/37

Construct four EPH units

Withdrawn

Applied 13/01/2021

RMA/2021/563

Encumbrance for four OPH units

Processing complete

Applied 09/03/2021

Encumbrance registered 15/04/2021

RMA/2022/2076

Change of use from OPH units to multi-use residential complex

Processing complete

Applied 23/06/2022

Decision issued 04/08/2022

Granted 04/08/2022

RMA/2022/2732

Discharge of six OPH units

Processing complete

Applied 24/08/2022

Encumbrance discharged 07/10/2022

RMA/2023/761

Subdivision - Fee Simple - 6 lots and associated land use

Processing complete

Applied 29/03/2023

s223 Certificate issued 05/07/2023

s224 Certificate issued 13/02/2024

Decision issued 28/04/2023

Granted 27/04/2023

63 Kensington Avenue

RMA/1987/572

Dispensation to reposition one vehicle crossing and for joint use of carparking with the school. - Historical Reference RES9212024

Processing complete

Applied 02/09/1987

Decision issued 16/09/1987

Granted 16/09/1987

RMA/1997/2936

The new classroom is to be located 4m from the northern boundary instead of the required 6m. - Historical Reference RES973387

Processing complete

Applied 24/11/1997

Decision issued 01/01/1999

Granted 01/01/1999

RMA/1998/2962

To undertake minor stream bank recontouring (excavation and filling) and stream side planting within the 5 metre waterway setback of th - Historical Reference RES983386

Processing complete

Applied 15/12/1998

Decision issued 01/01/1999

Granted 01/01/1999

RMA/1998/3881

Waterway enhancement of Tay Drain. - Historical Reference RMA674

Withdrawn

Applied 26/05/1998

RMA/2000/1120

Enhance and naturalisation of Tay Drain. - Historical Reference RMA20001812

Withdrawn

Applied 28/04/2000

RMA/2005/2080

New classroom. - Historical Reference RMA20020958

Processing complete

Applied 08/09/2005

Decision issued 19/10/2005

Granted 19/10/2005

RMA/2013/2608

Temporary Accommodation - Church Hall - Historical Reference RMA92024334

Processing complete

Applied 04/12/2013

Decision issued 09/12/2013

Granted 09/12/2013

RMA/2014/2034

Earthworks Contaminated Soil - Historical Reference RMA92026715

Processing complete

Applied 08/08/2014

Decision issued 29/08/2014

Granted 29/08/2014

RMA/2014/715

Establish, operate and maintain two new classroom block and associated car parking - Historical Reference RMA92025343

Processing complete

Applied 28/03/2014

Decision issued 28/05/2014

Granted 27/05/2014

RMA/2015/1888

Within Scope Amendment [RMA92025343] - Historical Reference RMA92030176

Processing complete

Applied 13/07/2015

Decision issued 23/07/2015

Granted 23/07/2015

RMA/2015/695

Notice of Requirement - Mairehau Catholic Primary school Incorporated into Stage 3 of the District Plan Review - Historical Reference RMA92028925

Withdrawn

Applied 16/03/2015

RMA/2017/1715

Minimum Floor Level Certificate

Processing complete

Applied 18/07/2017

Certificate issued 31/08/2017

RMA/2017/2092

Soil disturbance associated with the construction of the school hall at 370 Innes Road, Mairehau (St Francis of Assisi School) on land where an activity identified on the Hazardous Activities and Industries List (HAIL) has been undertaken.

Processing complete

Applied 31/08/2017

Decision issued 05/10/2017

Granted 05/10/2017

RMA/2017/2094

Outline plan for new school hall

Processing complete

Applied 31/08/2017

Decision issued 05/10/2017

Outline plan accepted 05/10/2017

RMA/2018/288

New residential dwelling with attached garage

Processing complete

Applied 13/02/2018

Permitted activity notice issued 08/03/2018

RMA/2022/1904

Notice of requirement for alteration of a designation

Processing complete

Applied 08/06/2022

Decision issued 21/07/2022

NOR accepted 21/07/2022

RMA/2023/1084

16 Unit - Multi-Unit Residential Development of 2-storey residential dwellings

On hold - processing suspended by applicant

Applied 08/05/2023

RMA/2025/2364

To construct 12 Older Persons Housing units

Processing complete

Applied 18/07/2025

Decision issued 08/09/2025

Granted 08/09/2025

RMA/2025/2521

Minimum Floor Level Certificate

Processing complete

Applied 05/08/2025

Certificate issued 06/08/2025

RMA/2026/190

Request for Encumbrance - Twelve (12) OPH units

Processing

Applied 27/01/2026

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