

Earthquake Claims and Insurance Information

Property Address: 2/85 Trafalgar St, St Albans

EQC Dwelling Claim Information

1. Is there a claim/s with EQC for the property? ☒ YES ☐ NO

CLM / 2011 / 126312 Event Feb / 2011 ☒ Work Completed ☐ Work still pending
Proof of repairs/s: _____

CLM / 2010 / 086160 Event Sept / 2011 ☒ Work Completed ☐ Work still pending
Proof of repairs/s: _____

CLM / / Event / 20 ☐ Work Completed ☐ Work still pending
Proof of repairs/s: _____

CLM / / Event / 20 ☐ Work Completed ☐ Work still pending
Proof of repairs/s: _____

2. Did you lodge the claim(s) as owner of the property or was it assigned to you by a previous owner when you purchased the home?

☐ As owner ☒ Assigned to us

3. If you have received a cash payment(s), have the repairs the payment(s) were for been completed? ☐ YES ☐ NO

If **no**, please list amount of payment(s): \$ _____

If **no**, what do you intend to do? ☐ Transfer money to purchasers so they can complete repairs

☐ Complete the repairs before settlement ☐ Other, please state: _____

Insurance Company and Claim Information

1. Which company is your dwelling insurance with? ~~Tower~~ Vero Policy number: H00 BG 5258293

2. Was there a claim lodged with the insurance company who insured the property at the time of the earthquakes for earthquake damage?

☒ YES ☐ NO Drive away replacement completed - unknown

If **yes**, what was the claim for? _____ Claim number: _____

3. Have the repairs for your insurance claim been completed? ☐ YES ☐ NO

If **no**, have you been paid out by your insurance company? ☐ YES ☐ NO Amount of payment: \$ _____

4. If repairs haven't been completed, what do you intend to do? ☐ Transfer money to purchasers so they can complete repairs

☐ Complete the repairs before settlement ☐ Other, please state: _____

Declaration

I/We declare that the above information is true and correct to the best of our knowledge and dwelling insured at the time of events.
I/We give permission for a potential purchaser to contact our insurance company with our policy number, for the purpose of arranging their own insurance on this property.

Name Lois Dick Signed Lois Dick Date 16/11/23

The vendor warrants that the information/statements contained in this form to the best of their knowledge is true and correct, they further give permission for Metro Team Ltd (Ray White Metro) to provide this form in full to all interested parties and permission to include this form in the property information pack distributed to interested parties and their representatives

4 December 2023

Information request – CLM/2010/086160 - 2/85 Trafalgar Street, Saint Albans, Christchurch 8014

Thank you for your information request received on 15 November 2023. You asked for “EQC Info” in relation to 2/85 Trafalgar Street. Your request has been considered under the Official Information Act (OIA).

Please find the enclosed documentation in response to your request.

The above Toka Tū Ake EQC claim was paid out. If you require sign off or repair completion documents, they may be obtainable from the contractors who completed the substantive repairs at the property.

Claim Numbers associated with the property	Settlement Status	Notes
CLM/2010/086160* <i>Master</i>	Cash settled	Dwelling
CLM/2011/126312	Cash settled	Emergency works
CLM/2011/241662	Cash settled	Assessed and Settled under Master Claim
CLM/2016/024276	Cash settled	Dwelling

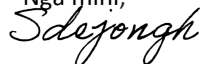
Toka Tū Ake EQC did not manage the repairs for this claim, therefore, I am unable to provide the repair documentation/sign off documents, as it does not exist as per section 18 (e) of the Official Information Act and section 53(a) of the Privacy Act.

In accordance with the provisions of section 31A of the Earthquake Commission Act, I have included Toka Tū Ake EQC documentation relating to the assessments and repairs carried out at the property, which contains information held on unassigned claim numbers. The claim owner has not provided authority for you to have access to the claims; however, as the real estate agent marketing the property you have an interest in understanding what assessments and repairs have been undertaken at the property.

To protect the privacy of the respective owners, I have withheld information relating to the previous homeowners, Toka Tū Ake EQC staff surnames, third parties and other neighbouring properties under section 9(2)(a) of the OIA and section 53(b) of the PA.

You have the option of approaching the Office of the Ombudsman and/or Privacy Commissioner should you wish. The Ombudsman can be contacted at P O Box 10 152, Wellington 6143, on Freephone 0800 802 602, or visit <http://www.ombudsman.parliament.nz>.

If you believe anything specific is missing, or if you have questions about the claim and would like an explanation of the information provided, please contact us so we can discuss your requirements.

Ngā mihi,


Sinead de Jongh
OIA Advisor

IN CONFIDENCE-CUSTOMER

Toka Tū Ake EQC
Level 11, Majestic Centre
100 Willis Street
Wellington 6011, New Zealand
Telephone: (04) 978-6400
Fax: (04) 978-6431

Corporate Mail: PO Box 790, Wellington 6140
Claims Mail: PO Box 311, Wellington 6140
www.eqc.govt.nz

CASH SETTLED CLAIM(S)

The following information contains documents relating to claim(s) that were cash settled for the property.



OFFICE USE ONLY - LOSS ADJUSTER TO COMPLETE

Date: 14/2/2011Claim Number: 2010/086160Loss Adjuster: Mark LamborneCosting Estimate

\$ 3300 ✓

Lounge

\$ \

Dining Room

\$ 2000 ✓

Kitchen

\$ \

Family Room

\$ 2200 ✓

Bed 1

\$ \

Ensuite

\$ 2000 ✓

Bed 2

\$ \

Bed 3

\$ \

Bed 4

\$ 1600 ✓

Bathroom

\$ \

Toilet 1

\$ \

Toilet 2

\$ \

Office/Study

\$ \

Rumpus

\$ \

Entry/Hall(s)

\$ 4500 ✓

Stairwell

\$ \

Laundry

\$ 300 ✓

Outbuildings/Garage

OFFICE USE ONLY - LOSS ADJUSTER TO COMPLETE

Date: 14/2/2011Claim Number: 2010/086660Loss Adjuster: MARK Lambourne\$ \$ \$ \$ \$ \$ \$ \$ \$

Column Totals:

\$ 11400\$ 2200\$ 2300Sub Total: \$ 15,900 - 00P&G, Margin, GST: \$ 5,822 - 58TOTAL: \$ 21,722 - 58



Statement of Claim Checklist / Repair Strategy

Date: 14/2/2011Author: Mark Lambourne

CLM/2010/086160

D JONKERS
2/85 TRAFALGAR STREET
SAINT ALBANS
CHRISTCHURCH 8014

H:

W:

M:

LA: Mark LambourneEstimator: Harold Brown

Room	Earthquake Damage Y/N	Walls ✓	Ceiling ✓	Floor ✓	Repair Strategy
Lounge	Y	✓	✓		CRACKS IN WALLS 1LM REMOVE PAPER GAP FILL - REHANG PAPER. REPAINT. 45.2M ² CRACK IN CEILING AND FILL & REPAINT. 20.25M ²
Dining Room	N				
Kitchen	Y	✓			CRACKS IN WALLS 1LM REMOVE PAPER & GAP FILL. REHANG PAPER. REPAINT WALLS TO 30.72M ²
Family Room	N/A				
Bedroom 1	Y	✓			CRACKS IN WALLS 2LM REMOVE PAPER & GAP FILL. REHANG PAPER & REPAINT 35.64M ²
Ensuite	N/A				
Bedroom 2	Y	✓			CRACKS IN WALLS 2LM REMOVE PAPER & GAP FILL. REHANG PAPER & REPAINT WALLS 32.4M ²
Bedroom 3	N/A				

HB
(Initials)

D JONKERS
2/85 TRAFALGAR STREET
SAINT ALBANS
CHRISTCHURCH 8014

H:

W:

M:

Repair Strategy

SOC / Repair Strategy - Page 2

Room	Earthquake Damage	Walls	Ceiling	Floor	
	Y/N	✓	✓	✓	
Bedroom 4	N/A	✓	✓	✓	
Bathroom	Y	✓	✓	✓	CRACK IN WALL. 2LM. REMOVE PAPER & GAB FILL. REHANG PAPER & REPAINT 27 M ²
Toilet 1	N				
Toilet 2	N/A	✓	✓	✓	
Office / Study	N/A	✓	✓	✓	
Rumpus	N/A	✓	✓	✓	
Entry / Hall(s)	N				
Stairwell HALL	Y	✓	✓	✓	CRACKS IN WALL ABOVE RAILING OUT & PLASTER. REPAINT / REHANG PAPER 4LM CRACK IN CEILING. GAB FILL & PAINT STROP & REPAINT 66.5 M ² - 12M CL-
Laundry	N				
Garage	Y	✓	✓	✓	JIB POPPED ALL 4 NBS FOR BUILDER TO REFIT JIB BOARD TO CEILING.
Other	N				

AD
(Initials)

2010/086160

Item		Event Damage	Repair Strategy
		Y / N	
Roof		N	
EXTERNAL WALLS	North	N	
	South	N	
	East	N	
	West	N	
Decks		N/A	
CHIMNEY	Base	N/A	
	Ceiling Cavity	N/A	
	Above Roof	N/A	
	Fireplace	N/A	

RA
.....
(Initials)

2010/086160

Item	Event Damage	Repair Strategy
	Y / N	
Foundations	N	
Piling	N/A	
Services	N	
Other Dwelling Items	N	
Outbuildings	N	
Land & Retaining Walls (Discuss with Supervisor)	N	

Supplementary Notes:

Full inspection carried out including full internal
& external walls, roof & ceiling cavity.
Signed by Estate Agent for Claimant.

I confirm the rooms and areas listed above have been inspected by an EQC representative.

Damage caused by the event has been noted and to my knowledge there are no other areas of damage resulting from the event.

Signature of Claimant

dated: 14.2.11

.....
(Initials)

NOTE: THIS FORM IS TO BE COMPLETED IN THE CLAIMANT'S PRESENCE.

EARTHQUAKE COMMISSION

Date:

Claim Number: 2010/

Estimator Name:

14/2/2010 2010 / 086160

Aaron Beaton

Dwelling Inspection Checklist: Show measurements indicate damage

4500

4500

- minor ceiling cracks
fill/point
- 5m wall cracks
C=20.25
W=43.2

Lounge

N/D

Dining Room

3200

3200

* Painted wallpaper
3m wall cracks
W=30.72

Kitchen

N/A

Family Room

3600

2700 stud
35.64 m²
2m wall cracks
* Painted paper

3000

Bed 1

N/A

Ensuite

3000

3000

* 2.7 m stud
32.4 m²
2m wall cracks
* Painted paper

Bed 2

N/A

Bed 3

N/A

Bed 4

2500

2500

2.7 Stud
27m²
2m wall crack
* Painted paper

Bathroom

N/D

Toilet 1

N/A

Toilet 2

N/A

Office/Study

N/A

Rumpus

N/D

Entry/Halls

Greg Webley

EQC
EARTHQUAKE COMMISSION

Date:

Claim Number: 2010/

Estimator Name:

14/2/2011

2010 / 086160

Aaron Brown

Dwelling Inspection Checklist: Show measurements indicate damage

8.000
3-5 STUD
4m ~~bracket~~ circles } we (6.5 m²)
strip / HALL / POINT
4m ceiling circles
(redo texture ceiling)
Lx (12m²)

Stairwell / HALL

N/D

Laundry

5000
UNPAINTED / UNPLASTERED
GIB BOARD
Reo Hoch gib board
sheets

Outbuilding/Garage

N/D

EXTERIOR

Roof
N/D

ST

Legend

—	Crack to ceiling (show length)
~	Crack to wall (show length)
X	External damage
O	Foundation damage

Greg Webley

Date:

Claim Number: 2010/

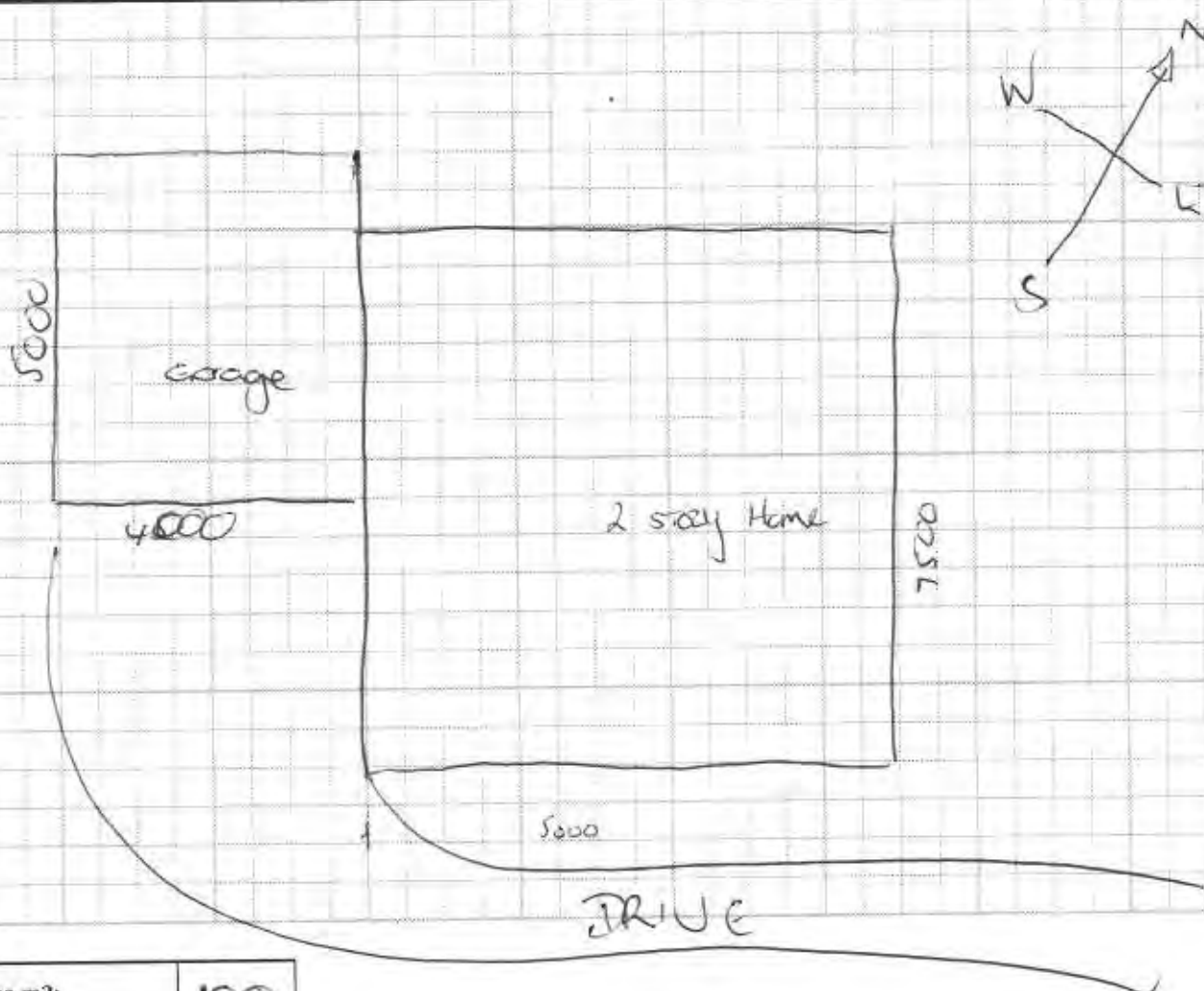
Estimator Name:

14/2/2011

2010/086160

Aaron Brown

Dwelling Inspection Checklist: Show measurements indicate damage



Area m2:	100		
Stud Heights:	2700-3500		
Wall Finish:	☒ Wallpaper	☒ Plastered	☐ Paint Finish
Other:			
Services:	Specify Damage: N/D		
Chimneys:	Construction Type: N/A Height: N/A Damage Description: Above Roof Below Roof Total Repair		
Foundations Damage:	Timber Concrete Ring ☒ Concrete Slab Other (Specify): Minor Moderate Severe N/D House Moved off Foundations? Concrete Slab Cracked? Crack Width: Crack Length:		
Roof:	☒ Framed ☐ Trussed Type: Clay Tiles Concrete Tiles Rolled Metal ☒ Other Damage: Decorative Tiles		
Cladding Type:	☒ Weatherboard + Brick Veneer Hardi Plank ☒ Other Block		

Greg Webley

35/01/08 8160 E

**Maincom NZ Limited**

Trustee to Maincom NZ Trust

79A Tallyho Street, Rotorua 3015

T: 0800 953 259

F: 07 348 4283

P: PO BOX 12206, Rotorua 3015

GST#: 98-243-127

Phone: 0800-953-259

Fax: 0800-893-865

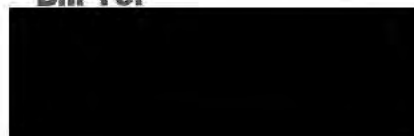
Tax Invoice

Invoice # INV10200039

Date 21/02/2011

Your Reference:

3021

Description2/85 Trafalgar Street, St Albans - Replace Damage Trellis
Fence**Bill To:**

Attn:

Item Code	Description	Total Price
	Labour	\$200.00
	Materials	\$70.46
Sale Amount		\$270.46
GST		\$40.57
Total Inc GST		\$311.03

Please make payments to: Maincom NZ Ltd. BNZ Account No: 02-0412-0055905-00

EARTHQUAKE COMMISSION

8 APR 2011

WELLINGTON

EQ. damage.
(Sept 2010).

Scope of Works



Customer: D JONKERS

Document explanatory note:

This document provides a summary of the earthquake damage identified by the EQC assessment team. Land, building and room by room damage is listed along with an indication of how this damage is to be repaired. A glossary of terms describing the type of damage that may be listed on your Scope of Works is provided at the end of this document.

Assessment of Property at 2/85 TRAFALGAR STREET, SAINT ALBANS, CHRISTCHURCH 8014 on 30/11/2011

Site

Element	Damage	Repair
Land (Exposed - Soil - 300.00 m2)		
Main Access (Drive - Concrete - 59.50 m2)		

Services

Element	Damage	Repair
Sewerage (Town Connection - PVC Pipe - 12.00 l/m)	No Earthquake Damage	
Water Supply (Town Connection - Plastic - 12.00 l/m)	No Earthquake Damage	

Main Building

Exterior

Elevation (North,)

Element	Damage	Repair
No Damage		

Elevation (North upper level,)

Element	Damage	Repair
No Damage		

Elevation (South, 3.0x2.4)

Element	Damage	Repair
No Damage		

Elevation (South upper level, 7.5x2.4)

Element	Damage	Repair
No Damage		

Elevation (East, 8.0x2.4)

Element	Damage	Repair
No Damage		

Elevation (East upper level, 4.6x2.4)

Element	Damage	Repair
No Damage		

Elevation (West, 8.0x2.4)

Element	Damage	Repair
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No Damage

Elevation (West upper level, 4.6x2.4)

Element	Damage	Repair
---------	--------	--------

No Damage

Foundations (Concrete slab, 58.0m2)

Element	Damage	Repair
---------	--------	--------

No Damage

Roof (Decromastic tile, 58 m2)

Element	Damage	Repair
---------	--------	--------

No Damage

Interior**Ground Floor - Lounge**

Room Size: 4.20 x 4.30 = 18.06 (length(m) x width(m) = Area Size(m2))

Stud Height: 2.40 m

Element	Damage	Repair
---------	--------	--------

Ceiling (Gib - Stipple - 18.06 m2)	No Earthquake Damage	
Door (External) (Sliding / Ranch sliding door - Aluminium - 1.00 No of)	No Earthquake Damage	
Door (Internal) (Single sliding - MDF - 1.00 No of)	No Earthquake Damage	
Floor (Concrete - Carpet - 18.06 m2)	No Earthquake Damage	
Wall covering (Gib - Wall paper / paint - 40.80 m2)	Cosmetic damage	Remove, dispose and replace wallpaper - paint 40.80 m2
Window (Aluminium Awning - Pane single glazed - 1.00 No of)	No Earthquake Damage	

Ground Floor - Kitchen

Room Size: 3.10 x 3.20 = 9.92 (length(m) x width(m) = Area Size(m2))

Stud Height: 2.40 m

Element	Damage	Repair
---------	--------	--------

Ceiling (Gib - Stipple - 9.92 m2)	No Earthquake Damage	
Door (Internal) (Single Hollow Core - MDF - 1.00 No of)	No Earthquake Damage	
Floor (Concrete - Tiles - 9.92 m2)	No Earthquake Damage	
Kitchen joinery (Medium Spec - MDF - 1.00 item)	No Earthquake Damage	
Range (Free standing oven) (Electric - Standard Electric - 1.00 item)	No Earthquake Damage	
Range Hood (Over Head - Standard spec - 1.00 item)	No Earthquake Damage	
Wall covering (Gib - Wall paper / paint - 30.24 m2)	Cosmetic damage	Remove, dispose and replace wallpaper - paint 30.24 m2
Window (Aluminium Awning - Pane single glazed - 1.00 No of)	No Earthquake Damage	
Work top (Kitchen work top - Laminate - 4.00 l/m)	No Earthquake Damage	

Ground Floor - Room (Other) (Under stairs cupboard)

Room Size: 1.10 x 1.50 = 1.65 (length(m) x width(m) = Area Size(m²))

Stud Height: 2.40 m

Element	Damage	Repair
No Damage		

Ground Floor - Stairwell

Room Size: 0.90 x 5.00 = 4.50 (length(m) x width(m) = Area Size(m²))

Stud Height: 4.10 m

Element	Damage	Repair
Ceiling (Gib - Stipple - 4.50 m ²)	No Earthquake Damage	
Floor (Timber - Bare floor boards - 4.50 m ²)	No Earthquake Damage	
Handrails (Bar - Timber - 5.00 l/m)	No Earthquake Damage	
Stairs (Internal) (Box - MDF - 5.00 l/m)	Impact damage	Gap fill and paint stringers 10.00 l/m
Wall covering (Gib - Wall paper / paint - 48.38 m ²)	Cosmetic damage	Remove, dispose and replace wallpaper - paint 48.38 m ²

Ground Floor - Entry

Room Size: 1.10 x 1.10 = 1.21 (length(m) x width(m) = Area Size(m²))

Stud Height: 2.40 m

Element	Damage	Repair
Ceiling (Gib - Stipple - 1.21 m ²)	No Earthquake Damage	
Door (External) (Single glass door - Timber - 1.00 No of)	No Earthquake Damage	
Floor (Concrete - Tiles - 1.21 m ²)	No Earthquake Damage	
Wall covering (Gib - Wall paper / paint - 10.56 m ²)	Cosmetic damage	Remove, dispose and replace wallpaper - paint 10.56 m ²

Ground Floor - Internal Garage (Integral garage)

Room Size: 3.90 x 5.40 = 21.06 (length(m) x width(m) = Area Size(m²))

Stud Height: 2.20 m

Element	Damage	Repair
No Damage		

First Floor - Hallway

Room Size: 0.90 x 2.00 = 1.80 (length(m) x width(m) = Area Size(m²))

Stud Height: 2.40 m

Element	Damage	Repair
Ceiling (Gib - Stipple - 1.80 m ²)	No Earthquake Damage	
Floor (Chipboard - Carpet - 1.80 m ²)	No Earthquake Damage	
Wall covering (Gib - Wall paper / paint - 13.92 m ²)	Cosmetic damage	Remove, dispose and replace wallpaper - paint 13.92 m ²

First Floor - Bedroom (Bedroom 1 on left of bathroom)

Room Size: 2.30 x 3.20 = 7.36 (length(m) x width(m) = Area Size(m²))

Stud Height: 2.40 m

Element	Damage	Repair
Ceiling (Gib - Stipple - 7.36 m ²)	No Earthquake Damage	
Door (Internal) (Single Hollow Core - MDF - 1.00 No of)	No Earthquake Damage	
Floor (Chipboard - Carpet - 7.36 m ²)	No Earthquake Damage	
Wall covering (Gib - Wall paper / paint - 26.40 m ²)	Cosmetic damage	Remove, dispose and replace wallpaper - paint 26.40 m ²

Window (Aluminium Awning - Pane single glazed - 1.00 No of) No Earthquake Damage

First Floor - Bathroom

Room Size: 1.90 x 2.20 = 4.18 (length(m) x width(m) = Area Size(m²))

Stud Height: 2.40 m

Element	Damage	Repair	
Bathroom Sink (Vanity single - Standard specification - 1.00 item)	No Earthquake Damage		
Ceiling (Gib - Paint - 4.18 m ²)	No Earthquake Damage		
Door (Internal) (Single Hollow Core - MDF - 1.00 No of)	No Earthquake Damage		
Floor (Chipboard - Vinyl - 4.18 m ²)	No Earthquake Damage		
Shower (Cubical shower unit - Acrylic shower - .81 m ²)	No Earthquake Damage		
Toilet (Standard - Standard Spec - 1.00 item)	No Earthquake Damage		
Wall covering (Gib - Lining paper / paint - 19.68 m ²)	Cosmetic damage	Remove, dispose and replace lining paper	19.68 m ²
	Cosmetic damage	Paint wall	19.68 m ²
Window (Aluminium Awning - Obscure glass - 1.00 No of)	No Earthquake Damage		

First Floor - Bedroom (Bedroom 2 to right of bathroom)

Room Size: 3.00 x 3.60 = 10.80 (length(m) x width(m) = Area Size(m²))

Stud Height: 2.40 m

Element	Damage	Repair	
Ceiling (Gib - Stipple - 10.80 m ²)	No Earthquake Damage		
Door (Internal) (Single Hollow Core - MDF - 1.00 No of)	Cosmetic damage	Realign door	1.00 No of
Floor (Chipboard - Carpet - 10.80 m ²)	Impact damage	Lift covering, screw / nail floor and relay covering	10.80 m ²
Wall covering (Gib - Lining paper / paint - 31.68 m ²)	Cosmetic damage	Remove, dispose and replace lining paper	17.28 m ²
	Cosmetic damage	Paint wall	31.68 m ²
Window (Aluminium Awning - Pane single glazed - 1.00 No of)	No Earthquake Damage		

Scope of Works - Glossary of Terms

Cosmetic Damage	Cosmetic damage is used to record repairs to an element that can be done in situ e.g. minor cracking to plasterboard. For example a repair strategy may state "rake, stop and paint" and this is carried out without needing to remove or replace the damaged element. Where the plasterboard for example needs to be removed and replaced, this will be recorded as 'structural damage'.
Impact Damage	Impact damage is where an element or part of a building sustains earthquake damage and then breaks away or collapses causing damage to another part of the building. An example is a chimney that has collapsed and caused damage to roof tiles.
Structural Damage	The term structural damage is used where a repair requires an element to be removed and replaced e.g. major cracking to plasterboard or external cladding that has been dislodged. This term does not relate to the structural integrity of the building as a whole, but to the individual element only.

Additional Information

Building Terms	The Department of Building and Housing website has a comprehensive list of common building terms: http://www.dbh.govt.nz/building-az-wxyz
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EQC Full Assessment Report

Claim Number: CLM/2011/126312
Claimant: D JONKERS
Property Address: 2/85 TRAFALGAR STREET
 SAINT ALBANS
 CHRISTCHURCH 8014

Assessment Date: 30/11/2011 15:35
Assessor: stander, marty
Estimator: Smith, Russell
Property Occupied By: Owner Occupied

Claimant Setup

Type	Name	Home Number	Mobile Number	Work Number	Email Address
Owner	D, JONKERS				
Owner					

Insurance & Mortgage Details

Insurance Details - From Claim Centre

Insurer	Policy Type	Policy Number	Insurance Sighted	Insurance Valid
IAG - ASB Bank Insurance Scheme	Dwelling		Yes	

Insurance Details - Added in COMET

Insurer	Policy Type	Policy Number	Insurance Sighted	Insurance Valid
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Insurance Details - Comments

Mortgage Details - From Claim Centre

Bank

Mortgage Details - Added in COMET

Bank

ASB BANK

Mortgage Details - Comments

Unknown

Opt Out

For repairs costing between \$10,000 and \$100,000 the claimant wishes to manage their own repairs? No

Hazards

Hazards: Nil**Property Sticker:** No Sticker

Building Configurations

Leaky Home Syndrome? No

Building Name	Number of floors	Building Finish	Age of house	Footprint	Area (m2)
Main Building	2	Standard	1961 - 1980	Rectangular	83.26

Full Assessment

Site

Element	Type	Material	Damages	Measure	Rate	Cost
Land	Exposed	Soil	No Earthquake Damage			
Main Access	Drive	Concrete	No Earthquake Damage			

General Comments:

Services

Element	Type	Material	Damages	Measure	Rate	Cost
Sewerage	Town Connection	PVC Pipe	No Earthquake Damage			
Water Supply	Town Connection	Plastic	No Earthquake Damage			

General Comments:

Main Building

Exterior

Elevation (North,)

Damage: No damage

Require Scaffolding? No

General Comments: Division wall between units.

Elevation (North upper level,)

Damage: No damage

Require Scaffolding? No

General Comments: Division wall between units.

Elevation (South, 3.0x2.4)

Damage: No damage

Require Scaffolding? No

General Comments: Painted shiplap timber. Remainder of wall inside garage.

Elevation (South upper level, 7.5x2.4)

Damage: Damage but not earthquake related

Require Scaffolding? No

Non Earthquake Notes: Paint peeling off shiplap cladding.

General Comments: Painted shiplap timber, timber fascia, PVC spouting.

Elevation (East, 8.0x2.4)

Damage: No damage

Require Scaffolding? No

General Comments: Painted shiplap timber, painted concrete block.

Elevation (East upper level, 4.6x2.4)

Damage: No damage

Require Scaffolding? No

General Comments: Painted shiplap timber, painted concrete block.

Elevation (West, 8.0x2.4)

Damage: No damage

Require Scaffolding? No

General Comments: Painted shiplap timber, painted concrete block.

Elevation (West upper level, 4.6x2.4)

Damage: No damage

Require Scaffolding? No

General Comments: Painted shiplap timber, painted concrete block.

Foundations (Concrete slab, 58.0m2)

Damage: No damage

Require Scaffolding? No

General Comments:

Roof (Decromastic tile, 58 m2)

Damage: No damage
Require Scaffolding? No
General Comments: Corrugated iron over garage.

Ground Floor - Lounge

Damage: Earthquake damage
Require Scaffolding? No

Element	Type	Material	Damages	Measure	Rate	Cost
Ceiling	Gib	Stipple	No Earthquake Damage			
Door (External)	Sliding / Ranch sliding door	Aluminium	No Earthquake Damage			
Door (Internal)	Single sliding	MDF	No Earthquake Damage			
Floor	Concrete	Carpet	No Earthquake Damage			
Wall covering	Gib	Wall paper / paint	Cosmetic damage			
			Remove, dispose and replace wallpaper - paint	40.80 m2	67.00	2,733.60
Window	Aluminium Awning	Pane single glazed	No Earthquake Damage			

General Comments:

Ground Floor - Kitchen

Damage: Earthquake damage
Require Scaffolding? No

Element	Type	Material	Damages	Measure	Rate	Cost
Ceiling	Gib	Stipple	No Earthquake Damage			
Door (Internal)	Single Hollow Core	MDF	No Earthquake Damage			
Floor	Concrete	Tiles	No Earthquake Damage			
Kitchen joinery	Medium Spec	MDF	No Earthquake Damage			
Range (Free standing oven)	Electric	Standard Electric	No Earthquake Damage			
Range Hood	Over Head	Standard spec	No Earthquake Damage			
Wall covering	Gib	Wall paper / paint	Cosmetic damage			
			Remove, dispose and replace wallpaper - paint	30.24 m2	67.00	2,026.08
Window	Aluminium Awning	Pane single glazed	No Earthquake Damage			
Work top	Kitchen work top	Laminate	No Earthquake Damage			

General Comments:

Ground Floor - Room (Other) (Under stairs cupboard)

Damage: No damage
Require Scaffolding? No
General Comments: Tile flooring, painted gib walls and ceiling, slider door and no damage.

Ground Floor - Stairwell

Damage: Earthquake damage
Require Scaffolding? No

Element	Type	Material	Damages	Measure	Rate	Cost
Ceiling	Gib	Stipple	No Earthquake Damage			
Floor	Timber	Bare floor boards	No Earthquake Damage			
Handrails	Bar	Timber	No Earthquake Damage			
Stairs (Internal)	Box	MDF	Impact damage			
			Gap fill and paint stringers	10.00 l/m	28.00	280.00
Wall covering	Gib	Wall paper / paint	Cosmetic damage			
			Remove, dispose and replace wallpaper - paint	48.38 m2	67.00	3,241.46

General Comments:

Ground Floor - Entry

Damage: Earthquake damage

Require Scaffolding? No

Element	Type	Material	Damages	Measure	Rate	Cost
Ceiling	Gib	Stipple	No Earthquake Damage			
Door (External)	Single glass door	Timber	No Earthquake Damage			
Floor	Concrete	Tiles	No Earthquake Damage			
Wall covering	Gib	Wall paper / paint	Cosmetic damage			
			Remove, dispose and replace wallpaper - paint	10.56 m2	67.00	707.52

General Comments:

Ground Floor - Internal Garage (Integral garage)

Damage: Damage but not earthquake related

Require Scaffolding? No

Non Earthquake Notes: Historic impact damage to walls and ceiling partially relined with new gib and screws pulled out right on edge of gib board.

General Comments: Painted concrete floor, painted gib walls and ceiling, one door metal tilt a door and no damage.

First Floor - Hallway

Damage: Earthquake damage

Require Scaffolding? No

Element	Type	Material	Damages	Measure	Rate	Cost
Ceiling	Gib	Stipple	No Earthquake Damage			
Floor	Chipboard	Carpet	No Earthquake Damage			
Wall covering	Gib	Wall paper / paint	Cosmetic damage			
			Remove, dispose and replace wallpaper - paint	13.92 m2	67.00	932.64

General Comments:

First Floor - Bedroom (Bedroom 1 on left of bathroom)

Damage: Earthquake damage

Require Scaffolding? No

Element	Type	Material	Damages	Measure	Rate	Cost
Ceiling	Gib	Stipple	No Earthquake Damage			
Door (Internal)	Single Hollow Core	MDF	No Earthquake Damage			
Floor	Chipboard	Carpet	No Earthquake Damage			
Wall covering	Gib	Wall paper / paint	Cosmetic damage			
			Remove, dispose and replace wallpaper - paint	26.40 m2	67.00	1,768.80

Window Aluminium Awning Pane single glazed No Earthquake Damage

General Comments:

First Floor - Bathroom

Damage: Earthquake damage

Require Scaffolding? No

Element	Type	Material	Damages	Measure	Rate	Cost
Bathroom Sink	Vanity single	Standard specification	No Earthquake Damage			
Ceiling	Gib	Paint	No Earthquake Damage			
Door (Internal)	Single Hollow Core	MDF	No Earthquake Damage			
Floor	Chipboard	Vinyl	No Earthquake Damage			
Shower	Cubical shower unit	Acrylic shower	No Earthquake Damage			
Toilet	Standard	Standard Spec	No Earthquake Damage			
Wall covering	Gib	Lining paper / paint	Cosmetic damage			
			Remove, dispose and replace lining paper	19.68 m2	30.00	590.40
			Cosmetic damage			
			Paint wall	19.68 m2	24.00	472.32
Window	Aluminium Awning	Obscure glass	No Earthquake Damage			

General Comments:

First Floor - Bedroom (Bedroom 2 to right of bathroom)**Damage:** Earthquake damage**Require Scaffolding?** No

Element	Type	Material	Damages	Measure	Rate	Cost
Ceiling	Gib	Stipple	No Earthquake Damage			
Door (Internal)	Single Hollow Core	MDF	Cosmetic damage			
			Realign door	1.00 No of	90.00	90.00
Floor	Chipboard	Carpet	Impact damage			
			Lift covering, screw / nail floor and relay covering	10.80 m2	66.00	712.80
Wall covering	Gib	Lining paper / paint	Cosmetic damage			
			Remove, dispose and replace lining paper	17.28 m2	30.00	518.40
			Cosmetic damage			
			Paint wall	31.68 m2	24.00	760.32
Window	Aluminium Awning	Pane single glazed	No Earthquake Damage			

General Comments:**Fees****Fees**

Name	Duration	Estimate
Contents movement fee	1.00	707.71
Small Job Fee	1.00	180.00

Overheads

Name	Estimate
Preliminary and general	1,186.75
Margin	1,690.88
GST	2,789.95

Scope Of Works Estimate

Property

Description	Estimate
Site	0.00
Services	0.00
	0.00

Main Building

Name	Description	Estimate
Exterior	Foundations (Concrete slab, 58.0m2)	0.00
	Roof (Decromastic tile, 58 m2)	0.00
	Elevation (East upper level, 4.6x2.4)	0.00
	Elevation (East, 8.0x2.4)	0.00
	Elevation (North upper level,)	0.00
	Elevation (North,)	0.00
	Elevation (South upper level, 7.5x2.4)	0.00
	Elevation (South, 3.0x2.4)	0.00
	Elevation (West upper level, 4.6x2.4)	0.00
	Elevation (West, 8.0x2.4)	0.00
		0.00

Floor	Description	Estimate
First Floor	Bathroom	1,062.72
	Bedroom (Bedroom 1 on left of bathroom)	1,768.80
	Bedroom (Bedroom 2 to right of bathroom)	2,081.52
	Hallway	932.64
		5,845.68
Ground Floor	Entry	707.52
	Internal Garage (Integral garage)	0.00
	Kitchen	2,026.08
	Lounge	2,733.60
	Room (Other) (Under stairs cupboard)	0.00
	Stairwell	3,521.46
		8,988.66
		14,834.34

Fees

Description	Estimate
Contents movement fee	707.71
Small Job Fee	180.00
	887.71

Overheads

Description	Estimate
Preliminary and general	1,186.75
Margin	1,690.88
GST	2,789.95
	5,667.58
Total Estimate	21,389.63

Inspection Sign Off

Description	Answer	comments
Contents Damage		
Has the contents schedule been left with claimant?	No	
Have the contents been sighted?	No	
Land Damage		
Is there land damage?	No	
Landslip damage has been assessed on paper	No	
Was a full inspection done?		
In roof space	Yes	
On roof?	No	Two storey over 3 metres
Under sub floor?	No	Concrete slab foundation
Decline Claim		
Recommend Declining Claim	No	
Next Action:		

Previous Claim Numbers (recorded manually in field)

- 2010/086160
- 2011/241662

File Notes

Date Created:	30/11/2011 15:40
Created :	stander, marty
Subject:	Property description
Note:	Double storey painted shiplap timber unit on concrete slab foundation with de romastic tile, minor interior and exterior damage. Weathertight and habitable. Restricted site access narrow drive.
Next Action:	
Date Created:	04/12/2011 03:07
Created :	Administrator, Alchemy
Subject:	COMET sent to EQR on 04/12/2011
Note:	COMET sent to EQR on 04/12/2011
Next Action:	

Urgent Works Items

TAX INVOICE/STATEMENT

(51) 2011 126 312 F

Gary Lee Electrical Ltd

3A MICHIGAN PLACE
CHRISTCHURCH 8083
TELEPHONE (03) 366 7686
FAX (03) 377 3727

fastpower**RECEIVED**

30 MAY 2011

BY:

WORKSHOP
7 ELMDALE LANE
CHCH 8011

GST Reg. No. 49-103-204

26/05/11

INVOICE NO. 096797

ORDER NO. 3485

Description**Value**

Re: 2/85 Trafalgar Street.

19/5 Resecured triple spot bar fitting to the ceiling in the lounge.

Fitted 2x lamps. Tested OK.

Materials.	6.00
Labour.	36.00
Travel.	12.00
Subtotal	54.00
GST	8.10
Total	\$ 62.10

EARTHQUAKE COMMISSION

03 JUN 2011

EQ. 22-2-11. SR.
TERMS NETT 21 DAYS.
NO CLAIM ACCEPTED UNLESS NOTIFIED WITHIN
7 DAYS OF INVOICE DATE.
OWNERSHIP OF THE SAID MATERIALS REMAIN
THE PROPERTY OF GARY LEE ELECTRICAL LTD
UNTIL SUCH TIME AS PAYMENT IS MADE IN FULL.

PLEASE DETACH HERE AND SEND WITH YOUR REMITTANCE TO:

Gary Lee Electrical Ltd

3A MICHIGAN PLACE
CHRISTCHURCH 8083
Direct Credit (BNZ) 020863-0093468-00

NETT \$ 62.10

INVOICE NO. 096797 of 26/05/11

Form 120G-V

We reserve the right to refer any unpaid accounts and dishonoured cheques to our Debt Collection Agency. Once the matter is referred to them, you will be liable for any and all collection fees including agency fees and commission we would have to pay for this service.

(CM) 000/12011/126312 E.U.

DCM roofing Ltd.TAX INVOICE

GST 99591668

To:		Date:	17/08/2011
		Invoice No:	807929
		Client Ref:	3643

Description	
2/85 Trafalger st	
inspected roof lifted sheets and re papered under corrugate materials, s/s paper fixings, sealant supply and fix	\$ 537.00
Feb - EQ. damage - emergency repair due to leak.	
Travel	
Sub	\$ 537.00
GST 15%	\$ 80.55
Total	\$ 617.55

Payment Appreciated within 7 days as per Our Terms and Conditions**DCMROOFING LTD.**

Client Name: _____

Client Address: _____

Invoice Number: Due Date: Amount Paid:

Thank you for your support.
westpac 03 1700 0411323 00



Email: dcmroofing@clear.net.nz
PO Box 24-164
Christchurch

Phone: 027 4455597
Phone: 03 9809571
Fax: 03 9809571

Scope of Works

Completed by	Chris Armitage 0823
Date	27-Feb-2014
Claim number	CLM-2011-126312



Assessment of Property at **2/85 TRAFALGAR STREET, SAINT ALBANS, CHRISTCHURCH 8014**

Document explanatory note:
This document provides a summary of the earthquake damage identified by the QC assessment team. Land building and room by room damage is listed along with an indication of how this damage is to be repaired.
A glossary of terms describing the type of damage that may be listed on your Scope of Works is provided at the end of this document.

Quote to: **Quote Date: 28/02/14**
Company: Clearwater painting **Quote #: 312**

GST number: 68-754-054
Contact Person: David
Address: 6 Famille Close
Phone: 349-4162
Email: clearwater.painting@gmail.com

Total Excl. GST	\$	17,654.00
Total GST	\$	2,648.10
Total Including GST:	\$	20,302.10

Opt Out Quote - Contractor to Complete

Line Items:					
Element	Damage	Repair	Size		
Site Element	Damage	Repair			
Land	No Earthquake Damage				
Main Access	No Earthquake Damage				
Services Element	Damage	Repair			
Water Supply	No Earthquake Damage				
Sewerage	No Earthquake Damage				
Main Building Exterior Element(s)					
Elevation (North) - No Damage					
Elevation (North upper level,) - No Damage					
Elevation (South, 3.0x2.4) - No Damage					
Elevation (South upper level, 7.5x2.4) - None Earthquake Damage					
Elevation (East, 8.0x2.4) - No Damage					
Elevation (East upper level, 4.6x2.4) - No Damage					
Elevation (West, 8.0x2.4) - No Damage					
Elevation (West upper level, 4.6x2.4) - No Damage					
Foundations (Concrete slab, 58.0m2) - No Damage					
Roof (Decromastic tile, 58 m2) - No Damage					
Ground Floor					
Lounge					
Element	Damage	Repair			
Ceiling	No Earthquake Damage				
Floor	No Earthquake Damage				
Wall covering	Cosmetic damage	- Remove, dispose and replace wallpaper- paint	40.80 m2		
Door (Internal)	No Earthquake Damage				
Window	No Earthquake Damage				
Door (External)	No Earthquake Damage				
Kitchen					
Element	Damage	Repair			
Ceiling	No Earthquake Damage				
Floor	No Earthquake Damage				
Wall covering	Cosmetic damage	- Remove, dispose and replace wallpaper- paint	30.24 m2		
Door (Internal)	No Earthquake Damage				
Work top	No Earthquake Damage				

[illegible]



2/85 Trafalgar Street, St Albans





Garage- Pre Kaikoura event damage



Garage- Pre Kaikoura event damage



1 (3)



1 (4)



No damage to paved area



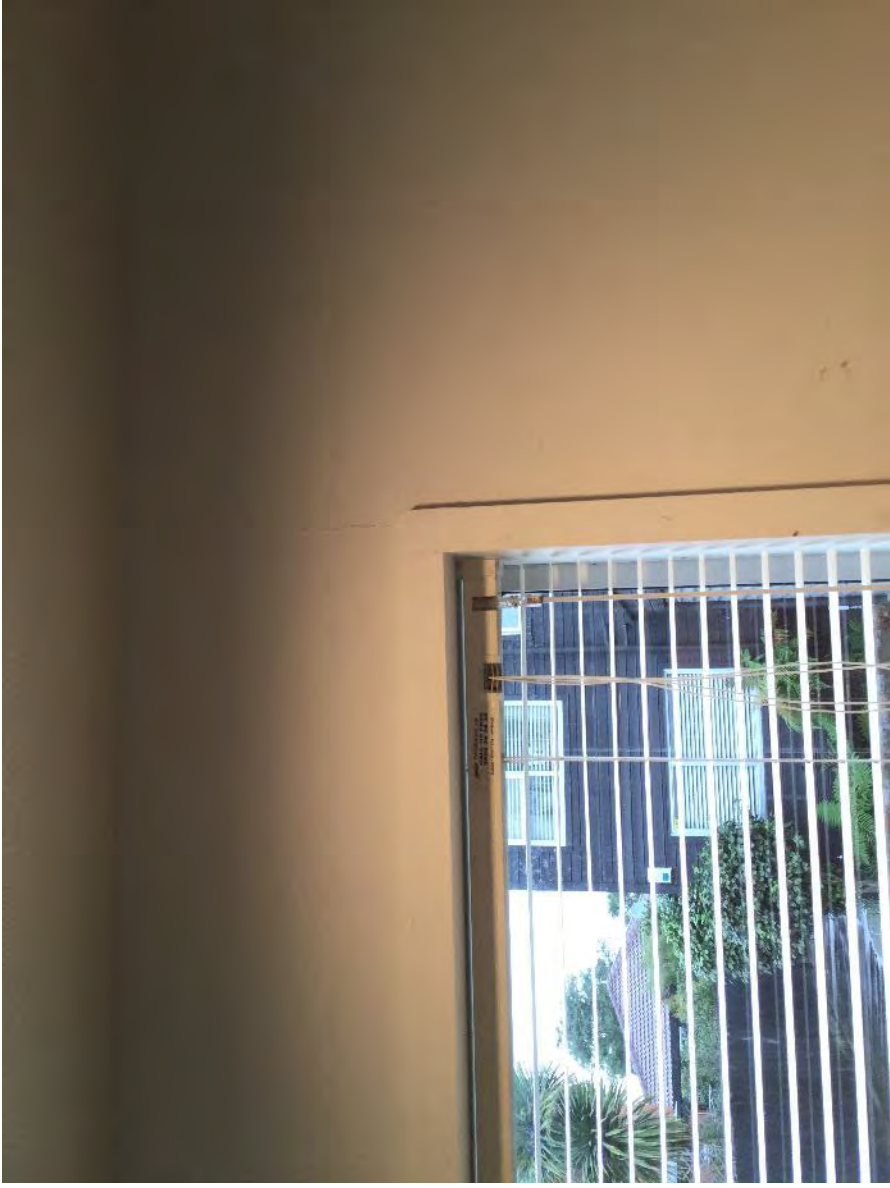
Water damage from shower – Not Kaikoura event damage



1 (7)



1 (8)



Kitchen - cracks



No damage to Exterior



No damage to Exterior



Glass slider – repaired with glass installed out of square

Dwelling Statistics – including attached garage and decking					
Foundation Type	Concrete		Chimney Type	n/a	
External Perimeter	33.86	m	Building Footprint	56.7	m2
Number of levels	2	nr	Gross int floor area	93.00	m2
Stud Height	2.4	m	Decking	0	m2
Approx Construction Date	1970s		Freestanding Dwelling	No	
External Inspection		Cladding Type	Timber ship lap weatherboard	Internal Inspection	yes
If No - Reason for not Inspecting					
Dwelling Type	Unit	Wall Finish	gib	Roof Construction	Rolled Iron
Quality of Fittings/ Finish	Standard	Ceiling Finish	gib		
Number of:					
Bedrooms	2	Living Areas	1	Bathrooms (incl ensuites)	1
Office	0	Garages	1	Attached	
Type of Heating system	Heat Pump	Carport	0	Drive Surface	asphalt
Detached structures					
Flooring					
Floor Construction Type	concrete		No Damage		
Type of Floor Displacement		Foundation Damage			
Change in height between High and Low points			mm		
Distance between high and low points			mm		
Slope of floor			%		
Dwelling Out of Plumb	No	Dwelling out of Level	No		
Initial Assessment	Repair				
Future Assessment Required	Zip Level floor levels taken (all floors)	No			
	Structural Engineering review	No			
	Geotechnical Survey Required	No			
Proposed Repair/Rebuild Strategy					
				Date	
Comments / Further Explanation / House Plan					
Dwelling has sustained minor EQ damage. Glass in the slider cracked as a result of the Kaikoura event					
The customer had the glass slider repaired. The slider frame sits within a aluminium channel. Currently the slider glass is preventing the entire unit to sit square in the channel					
The glass should be removed and reglazed with the frame positioned in the Square status.					
Claim manager for pass on information about the contractor that completed the glass repair.					
Minor EQC Repairs	Total (\$)		Minor Non EQC Repairs	Total (\$)	
Total	\$	-	Total	\$	-

Financial Summary of Building Inspection Report

Description	Total excl CAT 3	CAT 3	Total	Comments
Minor Works Repairs	\$ -	\$ -	\$ -	
Exterior to Building	\$ -	\$ -	\$ -	
Garage	\$ -	\$ -	\$ -	
Carport	\$ -	\$ -	\$ -	
CAT 3	\$ -	\$ -	\$ -	
Kitchen	\$ 297.00	\$ -	\$ 297.00	
Laundry-in garage - No Damage	\$ -	\$ -	\$ -	
Lounge - heatpump	\$ 1,782.00	\$ -	\$ 1,782.00	
Dining Room	\$ -	\$ -	\$ -	
Main Bathroom - No Damage	\$ -	\$ -	\$ -	
Stairwell and Entry	\$ 1,266.41	\$ -	\$ 1,266.41	
Toilet	\$ -	\$ -	\$ -	
Master Bedroom	\$ 710.25	\$ -	\$ 710.25	
Master Ensuite	\$ -	\$ -	\$ -	
Walk in Wardrobe	\$ -	\$ -	\$ -	
Bed 2	\$ 207.90	\$ -	\$ 207.90	
Bedroom 3	\$ -	\$ -	\$ -	
Bedroom 4	\$ -	\$ -	\$ -	
Staircase	\$ -	\$ -	\$ -	
Other 1	\$ -	\$ -	\$ -	
Other 2	\$ -	\$ -	\$ -	
Floor Protection	\$ 200.00	\$ -	\$ 200.00	
Electrical Allowance	\$ 260.00	\$ -	\$ 260.00	
	%			
P&G of Build Cost	9% \$ 425.12	\$ -	\$ 425.12	
Margin	10% \$ 514.87	\$ -	\$ 514.87	
Total excluding GST	\$ 5,663.55	\$ -	\$ 5,663.55	
GST	\$ 849.53	\$ -	\$ 849.53	
TOTAL inc GST	\$ 6,513.08	\$ -	\$ 6,513.08	

Notes (General Repair Strategy):

Produced by:NO QS INVOLVED.....

Date:

Project Manager:

Date:

Case Manager:

Date:

4

EXTERIOR LEFT SIDE OF PROPERTY				
		Comments	Quantity	Unit
Remove, dispose and replace 100mm thick Concrete path (inc hardfill and reinforcement)		No Damage		
Remove, dispose and replace asphalt driveway (inc hardfill and reinforcement)				
Remove, dispose and replace pavers (Inc base course)				
Remove and relay pavers (inc minor base replacement)				
Remove, dispose and replace timber fence (inc posts and foundation)				
Remove, dispose and replace blockwork garden wall (inc foundation)				

Notes & Sketches:

Please include damage assessment for all pools, tennis courts and any other hardstanding areas. Gravel surfaces (eg driveways) are not covered.

Notes & Sketches:

Walls - block and painted gib. Ceiling - gib. Floor - concrete painted. Damage - No Damage - cracking is historical and not consistent with seismic movement.

Page 13 of 26

Area: Main Bathroom - No Damage

Sheet Total

\$

Notes & Sketches:

Walls - painted gib. Ceiling - painted gib. Floor - vinyl. Damage - paint flake due to condensation not consistent with seismic movement.

Area: Stairwell and Entry

Sheet Total	\$	1,266,41
-------------	----	----------

Notes & Sketches:

Walls - painted gib. Ceiling - painted gib. Floor - carpet. Stairs - polished timber. Damage - cracks.

Notes & Sketches:

Notes & Sketches:

Walls - painted qib. Ceiling - painted qib. Floor - carpet. Damage - cracks to walls.

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Page 21 of 26

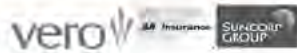
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Page 25 of 26

Loss Address:

2/85 Trafalgar Street St Albans Christchurch 8014



Dwelling Plan

Floor Plan of Dwelling & Site (only if required):

A large, empty rectangular box with a thin black border, intended for a floor plan or site diagram.

REMEDIAL DOCUMENTATION

The following documentation contains information relating to remedial claims against this property.

Remedial claims refer to concerns raised by homeowners following the settlement of their original Canterbury claim(s).

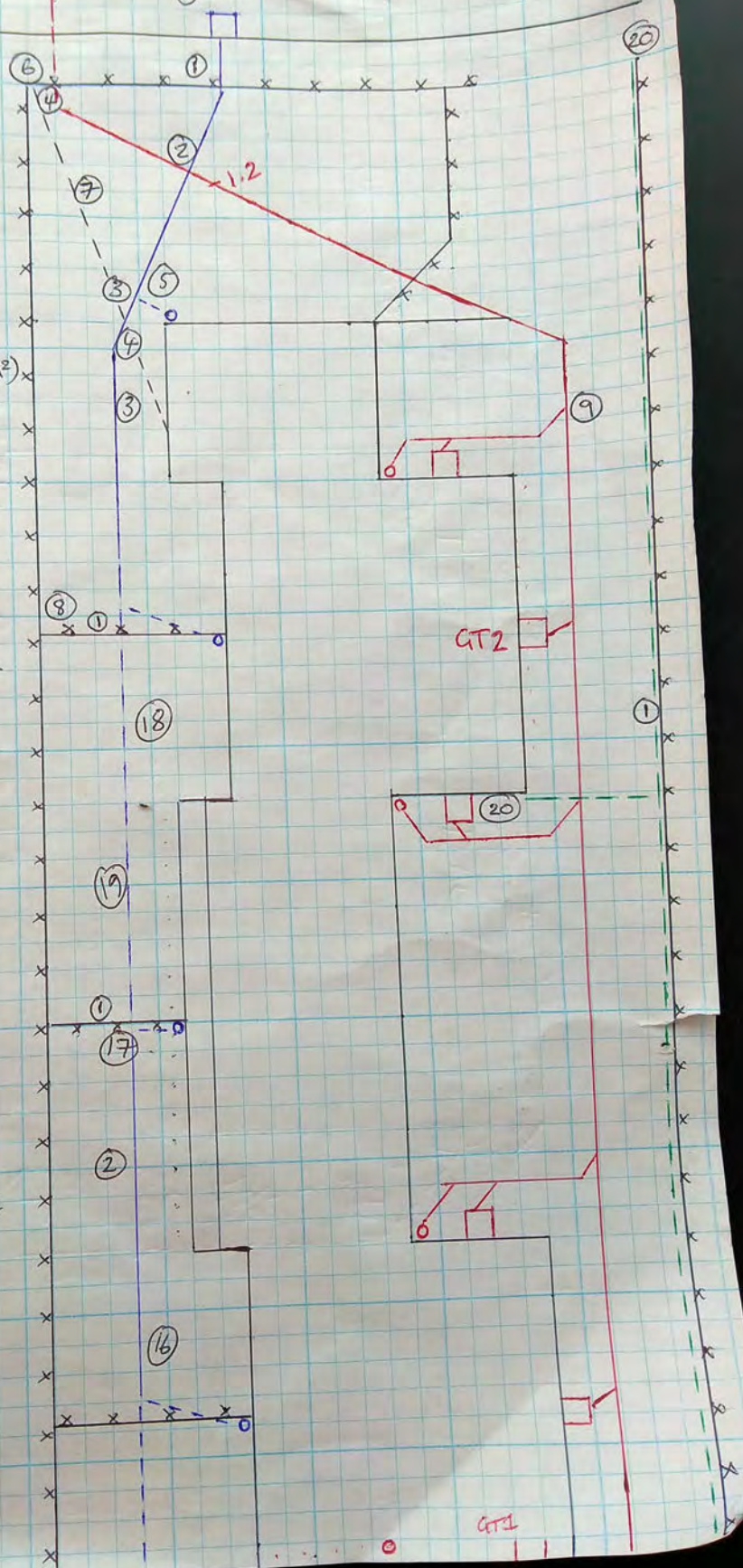
You might request a review of your building queries if you're concerned that:

- EQC's settlement did not include all earthquake damage
- EQC's repair work or repair strategy hasn't or won't repair the earthquake damage to the standard required by the EQC Act
- EQC's cash settlement wasn't or isn't sufficient to meet the reasonable costs of undertaking EQC's repair strategy



85 Trafalgar St.

- ① 1.8m w/ board fence.
- ② hydroseed
- ③ Large tree
- ④ Large tree stump.
- ⑤ Bricks on ~~concrete~~ dirt (20m²)
- ⑥ Powerpole
- ⑦ Overhead wires
- ⑧ Garden bed.
raised brick planter.
- ⑨ Concrete driveway
(190m²)
- ⑩ Bricks
~~pavers~~ on dirt.
(20m²)
- ⑪ Shrub hedge
- ⑫ Bricks on dirt
~~pavers~~ (20m²)
- ⑬ Pavers on concrete
(16m²)
- ⑭ Fibre - - - -





TAX INVOICE

Jonathan [REDACTED] c/o Earthquake Commission (Unit 1&2, 85 Trafalgar Street)

Invoice Date
30 Sep 2021

Invoice Number
INV-21174A

GST Number
101-817-881

PO Box 37174
Christchurch 8425
(03) 338 5387
admin@cephasrock.co.nz
www.cephasrock.co.nz

Description	Amount NZD
Additional Site Inspection for 1 & 2 85 Trafalgar Street	700.00
Subtotal	700.00
TOTAL GST 15%	105.00
TOTAL NZD	805.00

Due Date: 18 Oct 2021

Please pay on this invoice.

Any overdue accounts may incur interest (10% Accumulating per month) and/or debt collection fees. Thank you.

Please pay by cheque - Payable to Cephas Rock Limited

Or Direct internet banking to Bank Account

Details are as follows:

Account Name: Cephas Rock Limited

Account Number: 02-0874-0234115-00

Bank: Bank of New Zealand

Reference: Please indicate your Name & our Invoice Number



TAX INVOICE

Jonathan [REDACTED] c/o Earthquake Commission (Unit 1&2, 85 Trafalgar Street)

Invoice Date
30 Sep 2021

Invoice Number
INV-21190A

GST Number
101-817-881

PO Box 37174
Christchurch 8425
(03) 338 5387
admin@cephasrock.co.nz
www.cephasrock.co.nz

Description	Amount NZD
Additional EQC Site Meetinting on 23 June 2021	700.00
Subtotal	700.00
TOTAL GST 15%	105.00
TOTAL NZD	805.00

Due Date: 21 Oct 2021

Please pay on this invoice.

Any overdue accounts may incur interest (10% Accumulating per month) and/or debt collection fees. Thank you.

Please pay by cheque - Payable to Cephas Rock Limited

Or Direct internet banking to Bank Account

Details are as follows:

Account Name: Cephas Rock Limited

Account Number: 02-0874-0234115-00

Bank: Bank of New Zealand

Reference: Please indicate your Name & our Invoice Number

27 September 2021

Job No: 21-174 Rev-1

Earthquake Commission
 Attn: Jonathan [REDACTED]
 [REDACTED]@eqc.govt.nz

Dear Jonathan,

RE: STRUCTURAL ASSESSMENT – UNITS 1 & 2 / 85 TRAFALGAR STREET, SAINT ALBANS, CHRISTCHURCH.

We confirm that a structural damage assessment and geotechnical investigation was carried out by Cephas Rock Limited;

- 18/03/2021 - Structural damage assessment for Unit 2.
- 24/03/2021 - Structural damage assessment for Unit 1.
- 16/04/2021 - Deep Geotechnical investigation for Unit 1.
- 21/04/2021 - Deep and shallow Geotechnical investigation.
- 21/07/2021 - Joint meeting with EQC Engineers.

Our assessment included a visual inspection of the exterior and interior of the building to determine the extent of any structural damage caused by the earthquakes from September 2010 up to the inspection date.

This multi-unit property contains four units: 1/85, 2/85, 3/85 and 4/85 Trafalgar Street, and the units all have separate attached a garages. 1/85 and 2/85 units are structurally connected and share an intertenancy wall, while the attached slab-on-grade garages are physically connected, they are not considered to be structurally connected to the main building. It is therefore expected that the units 1/85 and 2/85 will be prone to behave as one structure when subjected to earthquake-induced lateral forces. It is recommended by the MBIE guidance that the whole structure (Unit 1 and 2) to be inspected. Cephas Rock has completed the inspection to both units.

BUILDING DESCRIPTION

The site contains 2 two-storey multi-unit buildings consisting of 4 adjacent flats and attached garages, situated on a flat site to the southwest of Trafalgar Street, in Saint Albans. The buildings are believed to have been built circa 1970 and have a concrete slab-on-grade foundations (Type C foundation as per the MBIE Guidance). The majority of the superstructure of the building is timber-framed, and the inter-tenancy wall (firewall) between units 1 and 2, and units 3 and 4 is constructed using concrete masonry blocks. The building is clad with a combination of light-weight timber weatherboards and heavy-weight concrete masonry blocks. The roof of the building is clad with heavy-weight concrete tiles.

The site is classified as “Green Zone, Technical Category 3, blue” area as given by the Ministry of Business, Innovation and Employment (MBIE). Specific Geotechnical investigation by Cephas Rock Ltd revealed that the site characteristics are consistent with “Technical Category 3”. MBIE stated that moderate to significant land damage from liquefaction is possible in future significant earthquakes.

EQC liquefaction and lateral spreading observations show no observation in the area after the September 2010 earthquakes and “no lateral spreading but minor to moderate quantities of ejected material” after February 2011 earthquake events.

Further to the site visit, we have received the following documentation and were referred where relevant.

- Cephas Rock Ltd (2021) Geotechnical Investigation Report 85 Trafalgar Street, Saint Albans, Christchurch (dated May 2021, Ref:21-190).
- Earthquake Commission (EQC) scope of works – Full Assessment Report at 2/85 Trafalgar Street, Saint Albans, Christchurch on 30/11/2011, (CLM/2011/126312).
- Earthquake Commission (EQC) Statement of Claim Checklist / Repair Strategy. (CLM/2010/086160, dated 14/2/2011).
- Builders report by Canterbury Property Reports (dated 27 July 2020).

OBSERVED DAMAGE - DWELLING

Exterior

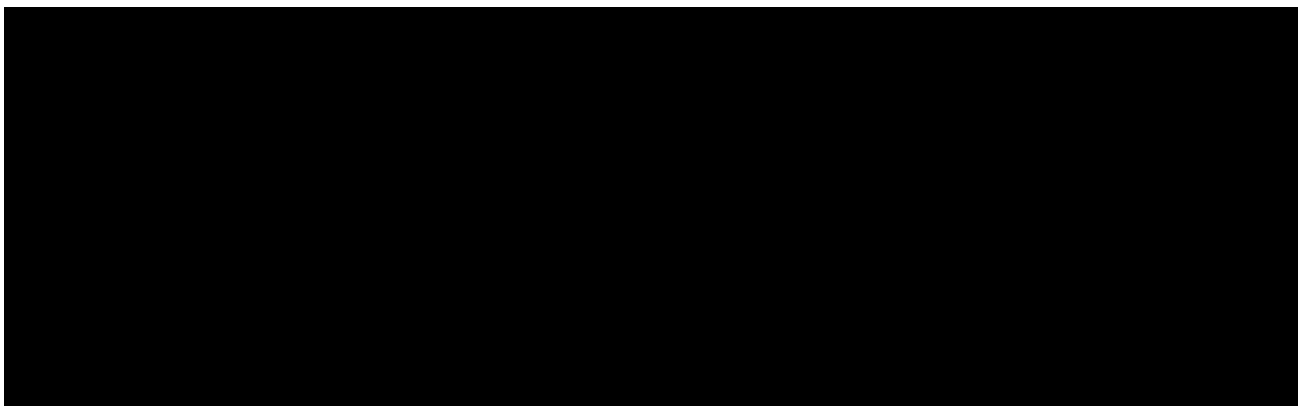
Evidence of ground movement was observed through cracking in the concrete driveway and undulations in the footpaths around the building.

It was noted that the repair works to the exterior of the dwelling had been partially completed prior to our site inspection. Due to the previous repair works, there was no significant structural damage observed to the external cladding. However, the weatherboards on the driveway elevation of both units 1 and 2 slope toward the firewall. Apart from that, the entry steps also slope toward the firewall.

Moderate horizontal cracking damage was observed to the concrete perimeter foundation wall besides the firewall at the front of unit 1. Minor horizontal cracking damage was observed to the concrete perimeter foundation wall at the rear of unit 1. The pattern of the cracking damage to the exterior were considered to be a typical result of the ground movement and/or settlement from the Canterbury Earthquake Sequence (CES). Therefore, Cephas Rock considers that the damage to the exterior of the building is attributed to the seismic events.

Interior

Unit-1



Signs of moderate water ingress were identified to unit 2. However, according to the owner, the water ingress issues are not directly related to the earthquake related movements.

Unit-2

We were informed that repairs to the unit-2 had been carried out prior to our inspection. No major cracking damage was observed to the plasterboard wall and ceiling linings throughout the unit-2 at the time of our inspection. However, minor bowing to the plasterboards identified at one location on the first floor.

Due to the completion of previous cosmetic repairs to the internal linings, the correlating damage to the wall and ceiling linings around the dwelling couldn't be inspected during our assessment. However, descriptions of wall lining cracks in the EQC scope of works indicates that the building has experienced earthquake-induced building movements.

Limited verticality measurements of the internal walls were taken and showed that the walls appeared to be in sound condition. Also, the verticality measurements (up to 6mm/m) to the inter-tenancy firewall showed that the firewall remained relatively plumb. Additionally, there was only minor cracking damage observed to the concrete masonry blocks. As such, Cephas Rock is of the opinion that the structural integrity of the firewall has unlikely been compromised but the firewall was likely settled along with the concrete floor as a result of the Canterbury Earthquake Sequence (CES). The repair to this area shall be carried out as per our "Conclusions and Remediations" section of this report.

Floor

A floor level survey using Zip-Level Pro-2000 instrument of a typical accuracy of $\pm 3\text{mm}$ was carried out during the inspection and is presented in the Floor Level Plan attached in this report. It should be noted that the purpose of the floor level survey is to provide assistance in determining possible structural damage of the building and therefore should be treated as indicative only. Where a high-level dependence and an accurate and credible presentation of the survey information are required, a registered professional surveyor should be engaged to carry out the survey.

The findings of the floor levels measured within each flat were summarised in Table 1 as follows:

Table 1. Summary of floor level survey for each unit.

Unit Number	Maximum Floor Level Variation (mm)		Floor Slope > 0.5%
	Ground Floor	First Floor	
1	30	40	Yes
2	20	28	Yes
Overall	36	N/A	Yes

The ground floor level variations are within the 50mm suggested threshold for "no foundation re-level considered necessary" set out in Table 2.3 of the MBIE Guidance. However, there was a few floor slope exceeding the MBIE tolerance for local floor slopes of 1:200 (0.5%) identified in the ground floor. As such, the building falls into the category of "foundation re-level indicated" as per the MBIE Guidance. Due to the presence of the floor coverings, any possible damage to the concrete slab of the main dwelling could not be investigated during our site inspection.

Table 2. Summary of floor level survey for each garage.

Garage Unit Number	Maximum Floor Level Variation (mm)	Floor Slope > 0.5%
1	30	Yes
2	20	No

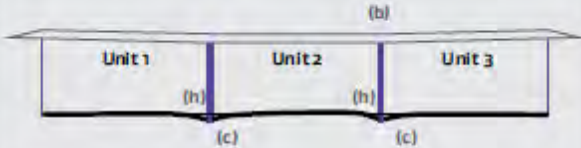
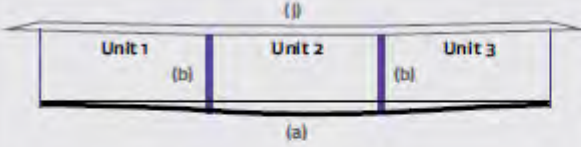
The attached garage concrete ground floor level variations are within the 50mm suggested threshold of "no foundation re-level considered necessary" set out in Table 2.3 of the MBIE Guidance. A minor local slope exceeding the MBIE tolerance for variation 1:200 (0.5%).

Table 2. Indicator criteria for floor / foundation re-level, repair, or rebuild in MUBs (Table 18.2 of the MBIE Guidance, 2012).

Column 1	Column 2	Column 3	Column 4	Column 5
Floor type	NO foundation relevel considered necessary [Note i]	Foundation relevel and/or repair indicated [Note j]	Foundation rebuild indicated for individual unit (partial rebuild)	Foundation rebuild indicated for whole building
Type C Timber-framed dwelling on concrete floor	The slope between any two points >2m apart is <0.5% (1 in 200) <i>within a single unit</i> [Note a and g] and The variation in the level over the floor plan is <50mm <i>in a single unit</i> and <i>The slope along the whole building is <0.5% (1 in 200) [Note d]</i> and There is no distress in floor coverings and Services are functioning and <i>Firewalls do not require repairs, refer to Table 18.3</i>	<i>The slope along the whole building is >0.5% (1 in 200) [Note d]</i> or The variation in floor level is >50mm and <150mm <i>within a single unit</i> or <i>1 or more firewalls require replacement – partial foundation replacement of individual unit</i>	The variation in floor level is >150mm <i>within a single unit</i> or There is irreparable damage to buried services <i>within a unit's footprint</i> or <i>The floor has stretched >20mm within a single unit [Note e]</i> or <i>>50% of the concrete slab within any single unit requires replacement [Note m]</i>	<i>This will relate to the degree of total damage and the number of unit foundations requiring replacement exceeding economic repairs [Note f and n]</i>

The floor levels measured across the entire building footprint (floor levels across the 2 units based on one datum) showed a maximum floor level variation of 36mm (-36, 0). The general trend of the floor level variations on the ground floor was sloping towards the middle of the building, indicating the foundation damage mechanism may be combination of case 5 and 6 ("Firewall settlement" and "Dishing (sagging)",) as per Table 18.4 of the MBIE Guidance, which is shown below, and the foundation re-level is also recommended in this table.

Table 3. Typical MUB foundation damage mechanisms (Table 18.4 of the MBIE Guidance, 2012).

Damage Mechanism	Analysis	Potential Solution
5. Firewall settlement  Typical indicators: (b) Distress in walls and ceiling (c) Cracking in ring beam (Type B) or concrete slab (Type C) (h) Localised settlement in floor	Check firewall verticality.	Relevel floor adjacent to firewall or for a small area breakout and replace (Type C). Relevel firewall, replace if more practical. It may be possible to leave the firewall in place and extend height to marry back in with the roof structure. Repair superstructure.
6. Dishing (sagging)  Typical indicators: (a) Evidence of foundation settlement relative to land or nett settlement (uniform settlement of a portion of the building) of the land that is more difficult to observe (b) Distress in walls and ceiling (j) Deformation of roofline	Unit 2 may not appear to exceed slope or differential settlement criteria; however it has a degree of uniform settlement relative to the original foundation level. [Note 1]	Relevel foundations of all units, as required, if outside the Table 18.2 criteria. If unit 2 has settled greater than 100mm or 150mm (Type A/B or C respectively) then unit 2 foundation may need to be replaced.

Roof Space

A limited visual assessment of the roof from the ground level identified no evidence of earthquake-related damage where readily visible. Most of the roof appears to have no structural damage, including deflection of the ridge, valley and hip lines.

DISCUSSION

It is understood that the building was constructed circa 1970's. Considering the type of construction, concrete foundation, steel reinforcement in the slab, and the age of the building, notable settlement from historical damage/ pre-existing conditions would not be expected.

Additional measurements were also taken during our inspection of the benchtop, and window levels, door head slopes, and wall verticalities. The measurements showed that the majority of the slopes were consistent with the floor settlement trend. In addition to this, the first-floor levels also somewhat correlate with the general ground floor settlement trend. Apart from the floor levels and additional measurements, we identified some shaking damage around the building (prior to the repairs), resulting in damage to the internal linings, door misalignments etc. Based on the statements from the owner of the unit 1, the sliding door on the northwest elevation is misaligned and it was not functioning properly as a result of the CES.

The kitchen bench levels on Unit 1 showed some inconsistency with the floor levels around that area, however the inspection on 27th of July, revealed that the carpet in that area is worn out due to the age of the carpet and that's affected the floor levels variation; hence this is not considered to be an indication of historical settlement.

The ceiling slopes were also measured during our site inspection, and the results showed some inconsistencies between the ceiling slopes and floor level variations. However, since the ceilings are stipple, some level inconsistencies are expected for the ceiling.

More importantly, specific Geotechnical investigation revealed that majority of the differential floor and firewall settlement is attributed to earthquake related actions. Therefore, considering all these factors, Cephas Rock concludes that majority of the damage the dwelling is attributed to the CES, however historical / construction related issues cannot be ruled out. Hence the damage repair shall be carried out as per our "Conclusions and Remediations" section of this report.

CONCLUSIONS AND REMEDIATIONS

It was observed that the building sustained minor to moderate structural damage, predominantly to the concrete perimeter foundation wall and floor levels. As per discussion in the previous sections of this report, the findings of our assessment indicate that the dwelling has sustained minor to moderate earthquake-related settlement. Although some of the floor level variations can be attributed to the construction related issued or historical settlement, hence we recommend the following structural repairs to the dwelling for continued long term occupancy and tenancy:

Foundation Repairs

- **Option 1:** Where the concrete perimeter foundation and firewalls have settled (dropped), the concrete perimeter foundation and firewalls can be re-levelled by mechanical lifting using portable jacks as per Option 1 of the MBIE Guidance: Part A, Appendix A1.1.3. The foundation re-levelling shall be designed, approved and monitored by a qualified structural engineer. The soil conditions need to be confirmed by a geotechnical engineer prior to any construction.
 - The internal concrete slab may be replaced as per specific engineering detail.
 - It is expected that the floor slopes of the timber floors on the first can be remediated by mechanically re-levelling the foundation on the ground floor. Some further local re-levelling works may be required to individually remediate the floor slopes of the timber floors.
- **Option-2:** Concrete floor and firewalls can be re-levelled by engineered resin as per option 3 of the MBIE Guidance: Part A, Appendix A1.1.3.
- It shall be understood that the foundation of this dwelling has suffered earthquake-related settlement and historical settlement. As such, the foundation re-levelling works should be performance based, which means:
 - Although every effort is made to re-level the dwelling to the required performance standard (to within the level variations of accepted tolerance), in many cases, it may be found impractical to achieve that, because to do so may cause undue and unnecessary additional stress upon the superstructure.
 - In practice, it is the building amenity performance, such as the door / window alignments, cabinetry, roof linings / levels etc., which will determine the as constructed floor levels of the building. During the re-levelling process, once consequential damage (i.e. non earthquake-related damage, such as misalignment of the existing windowsills) begins to exhibit, the engineer shall be called upon to provide direction regarding the future re-levelling works.

Other Repairs

- The floor coverings shall be removed, and the condition of the ground floor slab shall be inspected by a structural engineer for repair methodology confirmation prior to proceeding with any repair works.
- The cracking damage may be repaired by epoxy repairs (Sikadur 52 or equivalent approved) to concrete perimeter foundation and slab cracks (<5mm wide) or cementitious grout repairs (Ramset PoziLite HB/ PoziCote FR or equivalent approved) to concrete cracks (5~10mm wide). Surface preparation and application to interface shall be in accordance with manufacturer's instructions.
- Re-stopping to wall (Fibafuse) and ceiling plasterboard where diagonal cracks from the corners of openings are less than 50mm long and cracks or separation are typically vertical

along sheet joints. Installation of new fasteners is required around the plasterboard sheet perimeter where fasteners have pulled through or plaster bulges around fastener heads.

- Where diagonal cracks from corners of openings are exceeding 50mm length and panel fractured, replacement of wall and ceiling plasterboard with equivalent bracing elements (GIB Braceline) is recommended. Installation of new fasteners shall be in a bracing pattern around the plasterboard sheet perimeter in accordance with manufacturer's guidelines.
- Once the foundations have been re-levelled and repaired, the non-structural elements, such as doors, windows, driveway, external amenities etc., should be assessed and remediated by a suitably qualified person as required.
- Once the foundations have been re-build, all non-structural elements, such as doors, windows etc., should be assessed and remediated by a Licensed Building Practitioner as required.

It should be noted that this assessment was not intended to be a full scope of repairs and therefore should not be treated as such. The photos exhibited in the appendix do not necessarily constitute the entirety of the damage found upon inspection. As this is a qualitative report that provides general repair methods, the appendix merely exhibits an example of the types of damage found. It is up to the contractor to thoroughly inspect for all damage that requires repair.

The suitability for occupancy must be re-assessed by a structural engineer after any future significant earthquakes. It should be noted that this assessment was not intended to be a full scope of repairs and therefore should not be treated as such.

Inspection and Report by,



Abin E.N
 Structural Engineer
B.Tech (Civil), GD Prjct Mgt

Checked and verified by,



Joshua Wong
 Structural Engineer / Director
BEng(Hons) CPEng IntPE(NZ) CMEngNZ

Disclaimer:

1. This report has been prepared on behalf of and for the exclusive use of Earthquake Commission and is subject to and issued in accordance with the provisions of the contract between Cephas Rock Limited and Earthquake Commission. Cephas Rock accepts no liability or responsibility, whatsoever, for or in respect of any use or reliance upon this report by any third party.
2. This report is the copyright of Cephas Rock Limited. Except for the use of Earthquake Commission and subject to the conditions in the agreement, no part of this publication may be copied without the express permission in writing from Cephas Rock Limited.
3. The above report does not constitute our confirmation that the building is “safe”, “earthquake resistant” or similar. We have not checked the level of actual structural compliance with the current Building Code, nor assessed the level of actual past seismic activity at the particular site on which the building is situated. We have carried out visual non-destructive inspection of readily accessible areas and have used our professional judgement to assess the extent of structural earthquake damage (if any) sustained from 4 September 2010 to date. We are unable to predict the severity of any future seismic activity on your site, and how the building and site may perform in such an event, or series of events. If engaged to do so, we can carry out further structural investigation (which may include invasive methods) and desktop analysis work to ascertain level of structural compliance of the building in its current state, and identify structural vulnerabilities (if any) that may compromise the building’s structural performance in the future. No assessment relating to weathertightness has been made, and it should be performed by a weathertightness specialist if required.
4. The scope of any foundation re-levelling is to return the building foundations to as close to as reasonably practicable to its structural pre-earthquake condition (i.e. NZBC Section 112 repair). This clause states that the repair strategy does not have to improve the overall performance of the structure; rather it cannot be made any worse than it was prior to the earthquake sequence. The re-levelling of the foundations will not lead to any “betterment” of the existing foundation structure. Similar performance is likely to be observed, should we experience a further significant seismic event.

Reference

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- Canterbury Geotechnical Database. Earthquake Commission (EQC) Liquefaction interpreted from aerial photography. (data supplied by Tonkin and Taylor for Canterbury Earthquake Recovery Authority)
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- Earthquake Commission. (2011). Claim Assessment – scope of works – Assessment of Property at 85 Trafalgar Street, Saint Albans, Christchurch on 30/11/2011, (CLM/2011/126312)
- Ministry of Business, Innovation and Employment (MBIE). (2012). Repairing and rebuilding of houses affected by the Canterbury earthquakes – Technical Guidance (Part A). <http://www.dbh.govt.nz/guidance-on-repairs-after-earthquake> Wellington, New Zealand.
- Propertyvalue.co.nz. (2021). Property Details for 85 Trafalgar Street, Saint Albans, Christchurch. <https://www.propertyvalue.co.nz/canterbury/christchurch-city/st-albans-8014/1-85-trafalgar-street-st-albans-christchurch-8014-6078399>

Appendix



Photo 1. 85 Trafalgar Street, Saint Albans, Christchurch.



Photo 2. Elevation view of the flats from the southeast corner of the property.



Photo 3. EQC liquefaction and lateral spreading observations obtained from Canterbury Geotechnical Database show “No observations (uncoloured)” following the September 2010 and “No lateral spreading but minor to moderate quantities of ejected material” following the February 2011 earthquake events.



Photo 4. Cracking damage to the concrete perimeter foundation.



Photo 5. Undulation to the concrete pavers.



Photo 6. Cracking damage to the concrete driveway.

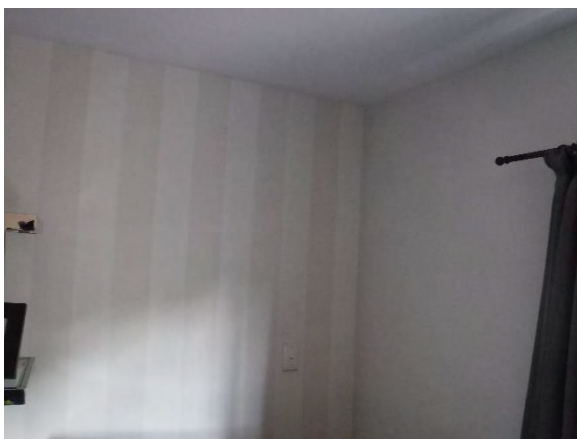


Photo 7. Internal view 1 (Unit -2).

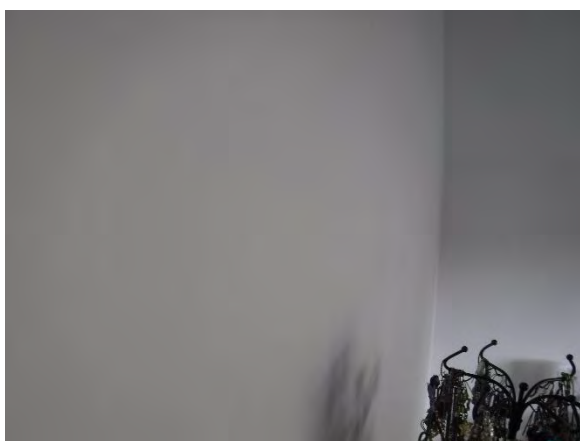


Photo 8. Internal view 2 – Minor bowing to the plasterboard linings (Unit -2).

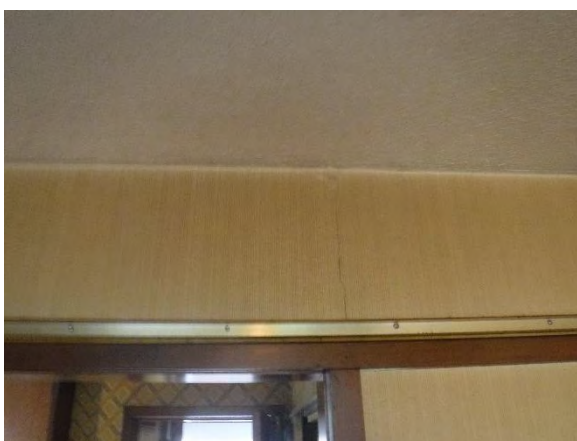


Photo 9. Cracking damage to the internal wall linings (Unit -1).



Photo 10. Water ingress identified to the unit 2.



Photo 11. Minor step cracking to the block wall.



Photo 12. Door misalignment view -1 (Unit -1).



Photo 13. Door misalignment view 2 (Unit -2).



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ADDRESS : 85 Trafalgar Street, Saint Albans, Christchurch

JOB NO : 21-174

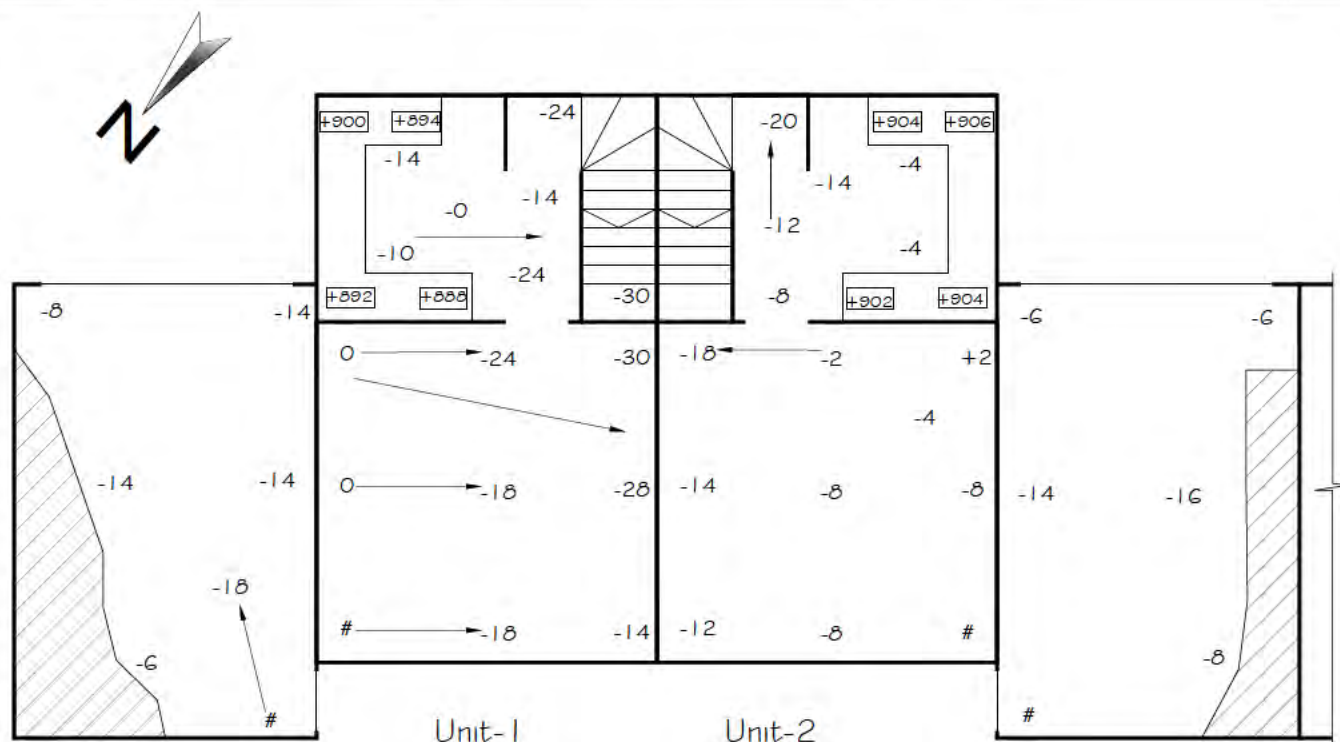
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GROUND FLOOR

FLOOR LEVEL SURVEY PLAN (NTS) (SEPARATE DATUM)

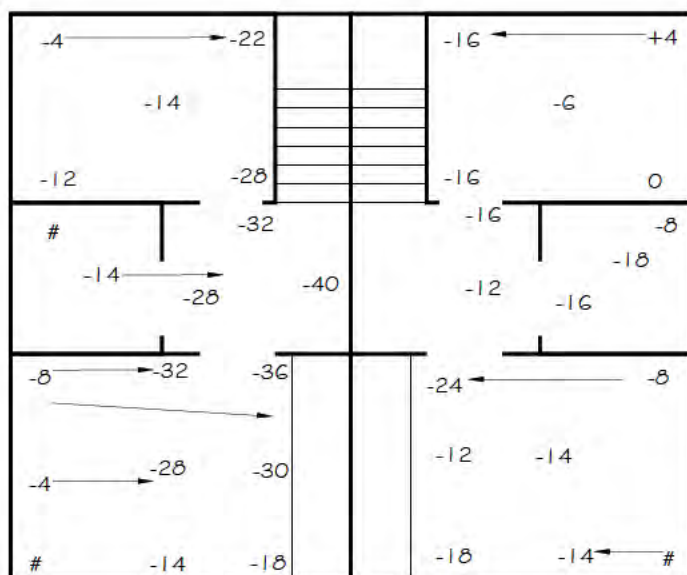
Note :

- 1) Measurements location are approximate and indicative only and not to scale.
- 2) Levels indicated are in millimeters.
- 3) Instrument used for measurement has a rated accuracy of +/- 3.0mm (ZIP level Pro 2000). Other sources of variation to the measurements can include construction tolerances, carpet, wear, and atmospheric temperature changes.
- 4) All measurements have been adjusted to the floor covering type at the datum.
- 5) Reference point zero millimeter denoted as "#".
- 7) Benchtop levels indicated as "+xxx".
- 8) The Floor slope exceeded 1/200 tolerance denoted as "—" (indicative only).
- 9) The relative floor level differences between the highest and lowest points are as follows:
Ground Floor Unit 1 : 30mm (-30, 00)
Ground Floor Unit 2 : 20mm (-20, 00)
First Floor Unit 1 : 40mm (-40, 00)
First Floor Unit 2 : 28mm (-24, +04)

Ground Floor overall : 36mm (-36, 00)

Garage Floor Unit 1 : 18mm (-18, 00)

Garage Floor Unit 2 : 16mm (-16, 00)



Unit-1

Unit-2

FIRST FLOOR

Garage Floor Unit 2 : 16mm (-16, 00)



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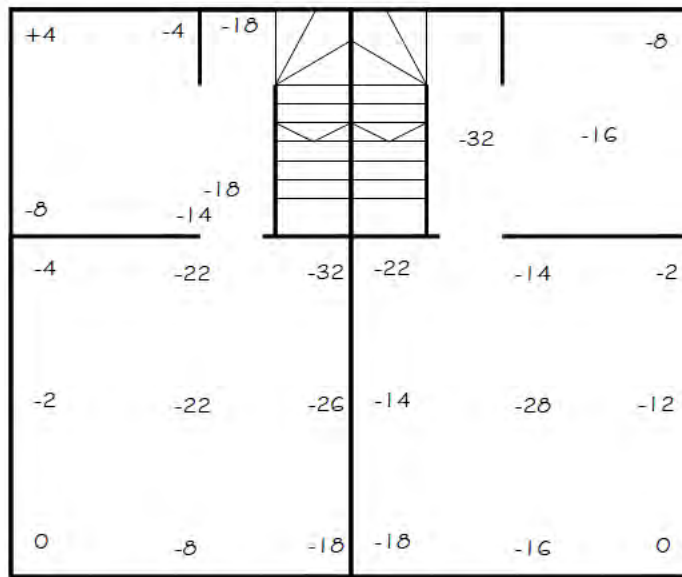
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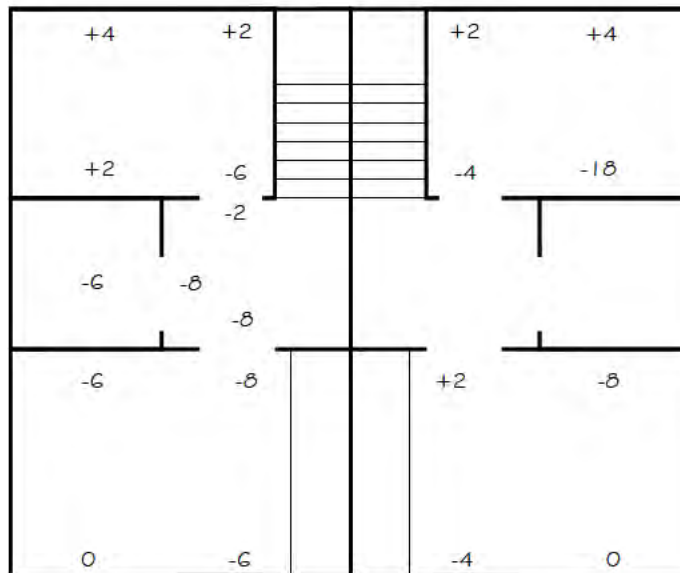
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Unit-1

Unit-2

GROUND FLOOR



Unit-1

Unit-2

FIRST FLOOR

CEILING LEVEL SURVEY PLAN (NTS)

Note :

- 1) Measurements location are approximate and indicative only and not to scale.
- 2) Levels indicated are in millimeters.
- 3) Instrument used for measurement has a rated accuracy of +/- 3.0mm (ZIP level Pro 2000). Other sources of variation to the measurements can include construction tolerances, carpet, wear, and atmospheric temperature changes.

- 1) Measurements location are approximate and indicative only and not to scale.
- 2) Levels indicated are in millimeters.
- 3) Instrument used for measurement has a rated accuracy of +/- 3.0mm (ZIP level Pro 2000). Other sources of variation to the measurements can include construction tolerances, carpet, wear, and atmospheric temperature changes.
- 4) Wall horizontal verticality displacements (mm/m) denoted as " $\uparrow\downarrow$ " (indicative only)
- 5) Doorhead slopes indicated as " $\frac{xx}{xx}$ ".
- 6) Windowsill levels (mm) from floor reference point (zero mm) denoted as " $\frac{xx}{xx}$ " (indicative only).
- 7) Benchtop levels indicated as " $\frac{\quad}{+xxx}$ ".



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LEGEND



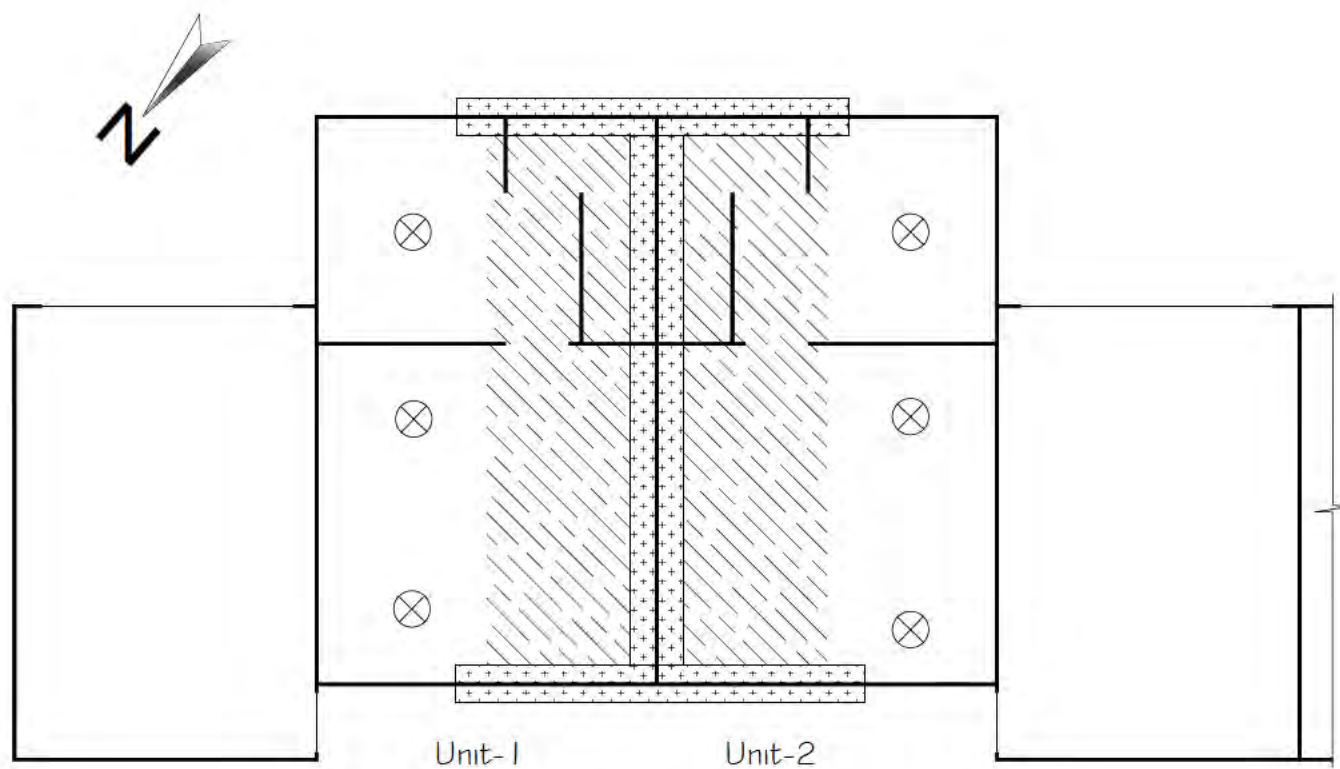
Approximate area for mechanical lifting.



Partial cut out and replacement of concrete slab as per engineering details.



Internal lifting Point (If required)



GROUND FLOOR

APPROXIMATE REMEDIATION PLAN (FOR OPTION 1)

Note :

- 1) Location are approximate and indicative only and not to scale.
- 2) Not for construction

Geotechnical Drilling Data Disclaimer

Toka Tū Ake EQC has been carrying out geotechnical investigations on Canterbury Technical Category 3 (TC3) land in order to understand the local soil conditions. The geotechnical investigation data (the Data) is highly complex and is used by geotechnical and structural engineers, council officers, and other specialists, to assist them with the design of building foundations. The Data may also be used by Toka Tū Ake EQC when settling land claims but it cannot be relied upon for any other purpose. It is not a report on the status of the land on your property.

All Toka Tū Ake EQC drilling information is uploaded to the CERA operated Canterbury Geotechnical Database (CGD). Anyone who is registered on the CGD can access whatever Toka Tū Ake EQC drilling information is of interest to them without needing to request it from Toka Tū Ake EQC.

Access to the CGD is currently limited to technical users and consulting engineers as these are the people who are able to interpret the raw geotechnical data. The usual process would be for engineers to be engaged by Toka Tū Ake EQC, insurance companies or homeowners to provide advice as part of the repair/rebuild process. These engineers access the raw data and provide specialist interpretation and engineering recommendations based on that data.

Graphs contain a summary of the raw drilling data relating to your property. The data may not be directly from your property but will be the data from the closest drilling locations.

Toka Tū Ake EQC and its consulting geotechnical engineering firm, Tonkin & Taylor Ltd, make no representations or warranties regarding the accuracy, adequacy, or completeness of the Data, or the suitability of the Data for any other use. Toka Tū Ake EQC and Tonkin & Taylor Ltd do not accept any liability for the consequences of any other person using or relying on the Data in any way.

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Geotechnical Investigation Report Units 1 and 2, 85 Trafalgar Street, St. Albans



21-190

Rev 1

September 2021

EXECUTIVE SUMMARY

Cephas Rock Limited has been engaged to carry out a geotechnical assessment for the proposed foundation repair of the existing double storey dwelling units 1 and 2 at 85 Trafalgar Street, St. Albans. The purpose of our assessment was to evaluate the site's surface and subsurface conditions, estimate earthquake related vertical settlement and provide geotechnical recommendations for the existing dwelling's foundation repair or replacement works.

Our geotechnical findings and recommendations are summarised below.

Mapped MBIE Technical Category		TC ₃
MBIE Technical Category based on Site Geotechnical Assessment		TC ₃
Performance Category	Land Damage Type	Estimated maximum magnitude from three CPT and DPSH test results
SLS	Settlement	15 mm (TC ₂)
ULS	Settlement	85mm (TC ₂)
	Lateral Stretch	200-500mm (TC ₃ Major)
	Global Lateral Deformation	300- 500mm (TC ₃ Major)
Proposed foundation remediation options to re-level the dwelling floor	The following foundation remediation options may be considered to re-level the dwelling floor or for partial replacement of the foundation: • Option 1: Where the concrete perimeter foundation and firewalls have settled (dropped), the concrete perimeter foundation and firewalls can be re-levelled by mechanical lifting using portable jacks as per Option 1 of the MBIE Guidance: Part A, Appendix A1.1.3. The foundation re-levelling shall be designed, approved and monitored by a qualified structural engineer. The soil conditions need to be confirmed by a geotechnical engineer prior to any construction. ○ The internal concrete slab may be replaced as per specific engineering detail. ○ It is expected that the floor slopes of the timber floors on the first can be remediated by mechanically re-levelling the foundation on the ground floor. Some further local re-levelling works may be required to individually remediate the floor slopes of the timber floors. • Option-2: Concrete floor and firewalls can be re-levelled by engineered resin as per option 3 of the MBIE Guidance: Part A, Appendix A1.1.3. A Geotechnical Ultimate Bearing Capacity (UBC) of 200kPa may be inferred from 0.3m below ground level for foundation design/relevelling purposes.	

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1 INTRODUCTION

1.1 GENERAL

Cephas Rock Limited has been engaged to carry out a geotechnical assessment for the proposed foundation repair of the existing double storey multi dwelling units 1 and 2 at 85 Trafalgar Street, St. Albans. The purpose of our assessment was to evaluate the site's surface and subsurface conditions, estimate earthquake related vertical settlement and provide geotechnical recommendations for the existing dwelling's foundation repair or replacement works.

1.2 SCOPE OF WORK

An investigation methodology for the property has been specifically developed for the issues present at the site, and the particular constraints the site poses, as outlined below:

- Geotechnical desktop study of the site's publicly available information
- Geotechnical site walkover survey.
- Site-specific shallow ground investigations (Scala penetrometer tests and hand augers) and deep ground investigations (cone penetration test (CPT)).
- Liquefaction assessment based on available site-specific ground investigations.
- Historical settlement calculation due to the weight of the foundation
- Justification for the floor level variations due to the earthquake
- Provision of geotechnical characterisation of the site, and advice on foundation options.
- Reporting of investigation findings.

1.3 FACTUAL DATA

The factual data provided in this report includes:

- Engineering logs of scala penetrometer (DCP), and hand augers.
- Engineering summary logs of cone penetration test (CPT) results.

2 EXISTING INFORMATION

2.1 DESKTOP STUDY

A desktop review of available geotechnical information has been carried out and is summarised below.

- Christchurch City Council (CCC) Floor Levels

The site is located within the CCC Flood Management Area (FMA). The minimum finishing floor level (FFL) required for compliance with Clause E1 of the New Zealand Building code based on providing protection from a 1 in 50-year floor event with sea level rise allowance (0.45m or 0.5m) and 400mm freeboard. No specific FFL is required.

The average (mean) ground level is 16.74 above the Christchurch Drainage Datum.

- EQC Observed Ground Crack Location

The ground crack map indicated that there is 10mm ground crack identified in front of the property. In a 250m radius area from this site location, a number of more than 200mm and 50 to 200mm cracks are indicated in the ground crack map.

There are no immediate waterways or free edges to the site, however a small water stream (free edge) and the Avon River (free edge) run approximately 200m east of the site and 1450m southwest of the site respectively.

- EQC Vertical Ground Movement

Cumulative vertical ground movement obtained from EQC map indicated the site's elevation had settled by approximately 300mm to 400mm.

- EQC Horizontal Ground Movement

The local differences obtained from LiDAR observations and tectonic movements from the Canterbury earthquake sequence are less than 400mm.

3 SITE CONDITIONS

3.1 SITE DESCRIPTION

The site is located in a residential area in St Albans approximately 2.5 km north of Christchurch central business district (CBD), and has a legal description of "Flat 1 and 2 DP 37537 on RS 252". The site has a flat topography and had an existing double-storey dwelling multi-units building with attached single storey garage buildings on the section at the time of the investigation. The total site area is approximately 745 m². The site area is bound by fences to three boundaries and no indication for a boundary at the fourth side which has been opened to other unit sections.

It is understood that the existing dwelling units' foundation is going to be repaired and the dwelling floor re-levelled. Existing dwelling units 1 and 2 have a slab-on-grade concrete foundation. The site location is shown in Figure 1.



Figure 1. Aerial photograph & site layout.

3.2 SITE GEOLOGY

The geological map of the Christchurch urban area indicates that the site has surface geology consisting of "*Alluvial sand and silt of overbank deposits*".

The soils across the Canterbury Plains comprise of interbedded alluvial formations deposited by eastward flowing rivers emanating from the Southern Alps and draining towards the coast along Pegasus Bay. These alluvial soils, interlayered with marine deposits associated with previous fluctuations of sea level, comprise variable gravels, sand, silts and occasional peat, and can change markedly over relatively short distances, both horizontally and vertically. The sandy and silty soil types are considered susceptible to liquefaction, dependent upon grain size distribution, saturation, in-situ density, degree of plasticity and fines content.

3.3 MBIE LAND ZONING

The site is currently mapped as "Green Zone, Technical Category 3, blue" as defined by the Ministry of Business, Innovation and Employment (MBIE) Residential Technical Categories. This indicates that moderate to significant land damage from liquefaction is possible in future large earthquakes.

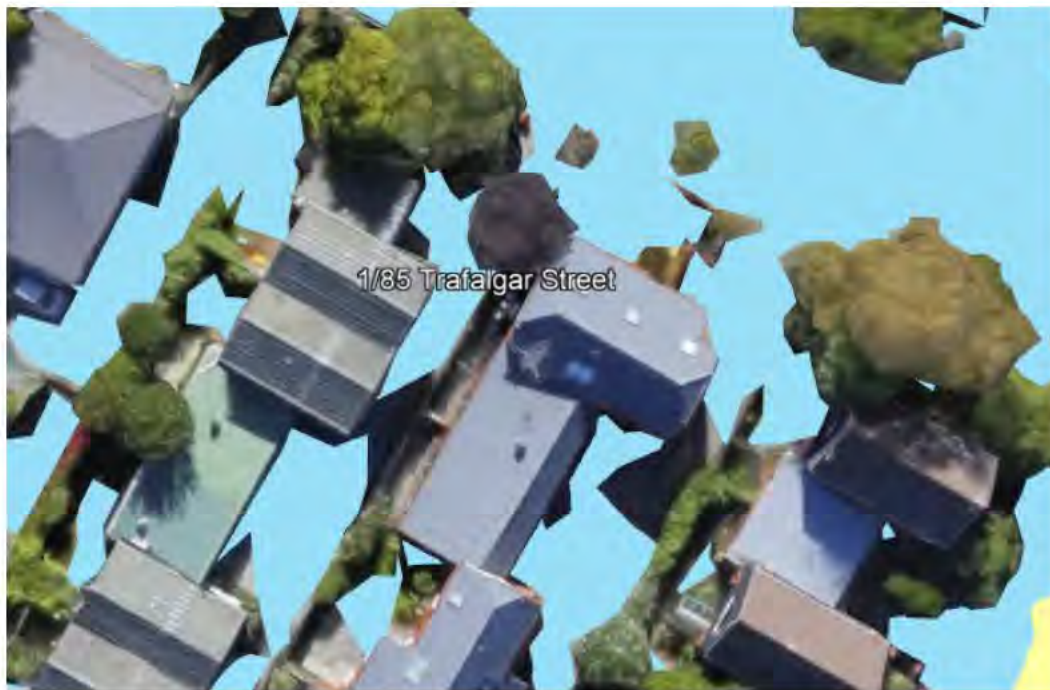


Figure 2. MBIE Technical Category Maps

3.4 EARTHQUAKE TEST

Conditional Peak Ground Acceleration (PGA) values, developed by Bradley Seismic Ltd and the University of Canterbury, are available on the CGD.

Using the MBIE and Bradley & Hughes (2012) procedures we have found that the site was “sufficiently tested” to the Serviceability Limit State (SLS) level of earthquake demand during previous earthquake events.

Table 1: Scaled Conditional PGA Values for the site

Earthquake Event	Moment Magnitude (Mw)	Conditional Median PGA (g)	Standard Deviation σ	PGA M=7.5 (g)	10th Percentile PGA M=7.5 (g)
4-Sep-10	7.1	0.21	0.3125	0.19	0.13
22-Feb-11	6.2	0.36	0.3375	0.26	0.17
13-Jun-11	6	0.2	0.35	0.13	0.09
23-Dec-11	5.9	0.22	0.3625	0.14	0.09

Considering the geological setting and the terrain at the site and taking into account the level of “test” experienced we can make important deductions about predicted earthquake-induced deformation that may occur in a design earthquake event. An SLS earthquake event is likely to cause less damage to the property than that the maximum previously experienced. However, under Ultimate Limit State (ULS) conditions the nature of land damage is likely to be severe to that already experienced.

4 FIELDWORK SUMMARY

4.1 GROUND INVESTIGATIONS

A deep ground investigation has been carried out by LandTest Limited (Mcmillan Drilling) on behalf of Cephas Rock Limited on 16 April 2021, comprised of three Cone Penetrometer Test (CPT) in conjunction with one Dynamic Probe Super Heavy (DPSH-B) test upon refusal met.

At CPT test location 1, CPT firstly met refusal at approximately 7.2m below ground level, where DPSH test was progressed to a termination depth of 9.9m below ground level. At CPT test location 2, CPT firstly met refusal at approximately 5.7m below ground level, where DPSH test was progressed to a termination depth of 9.9m below ground level. At CPT test location 3, CPT firstly met refusal at approximately 5.8m below ground level, where DPSH test was progressed to a termination depth of 9.9m below ground level.

In addition, a shallow ground investigation has been carried out by Cephas Rock Limited on 23 April 2021, comprising of 4 Dynamic Cone Penetrometers (DCPs) and 2 Hand Augered bore holes (HA).

The test locations are shown in Figure 3.

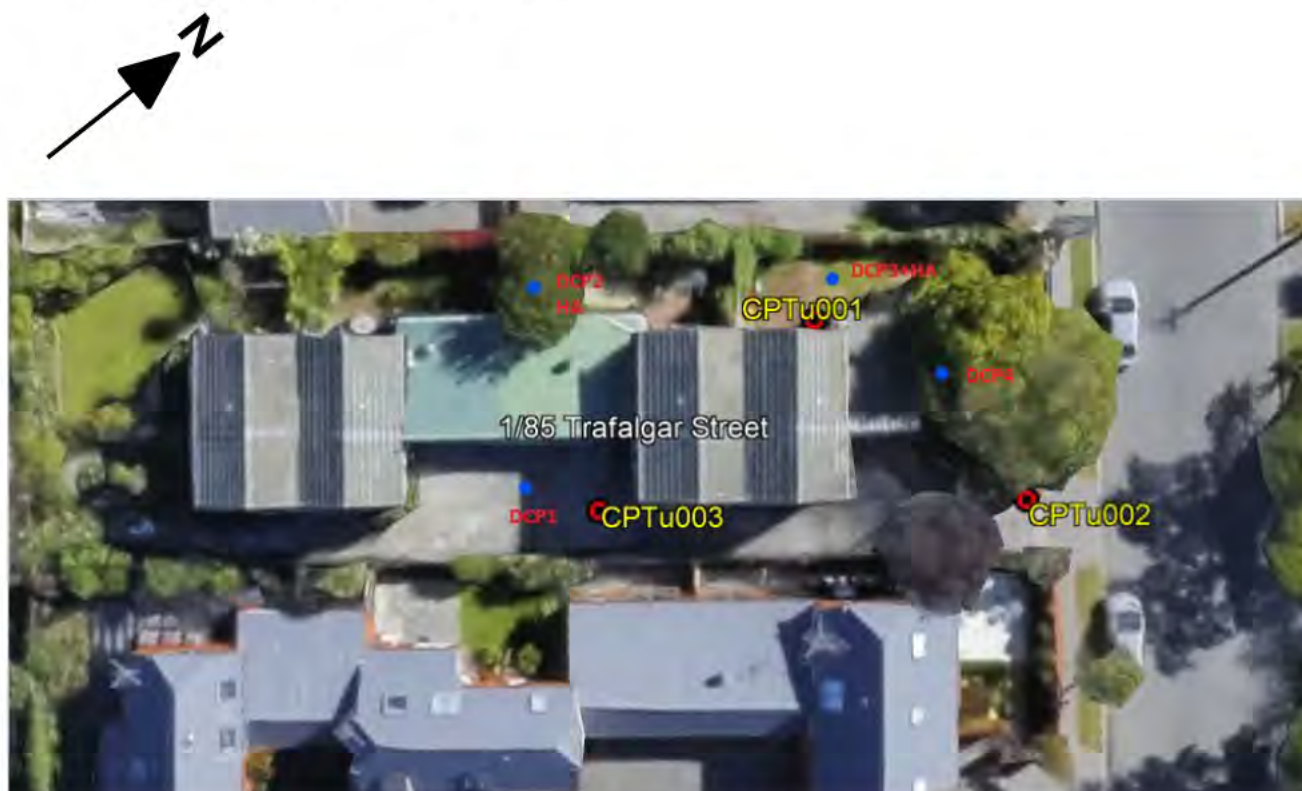


Figure 3. Test Location Plan.

4.2 GROUND CONDITIONS

The ground conditions encountered during the investigation have been interpreted from the shallow HA and deep CPTu results. The subsurface conditions encountered are generally consistent with the published geological information. The ground conditions were relatively consistent among the test positions and are summarised in Table 2.

Table 2: Ground conditions summary table – inferred from HA logs and CPT Soil Behaviour Type

Description	Depth to bottom of layer (mbgl)
TOPSOIL	0.3
Soft Silt and loose Silty Sand (inferred from CPT/HAs)	0.9
Firm Clay, Organic, Silty Clay, and dense Silty Sand (inferred from CPT/HAs)	1.5
Firm Clay (inferred from CPT)	2.7
Dense Sand and Silty Sand (inferred from CPT)	7.2

4.3 SITE WALKOVER

Cephas Rock Limited visited the site on 16 April 2021 and 23 April 2021, and have observed the following:

- There was an existing double storey multi dwelling units with attached single storey garage buildings at the section. It is understood that the foundation of existing units 1 and 2 is to be releveled.
- The existing dwelling is a timber-framed structure clad with lightweight timber weather board and heavyweight roof tiles. The dwelling units 1 and 2 have a slab-on-grade concrete foundation at ground level (MBIE Foundation Type C).
- Evidence of ground movement was observed through cracking in the concrete footpaths around the building. Minor to moderate cracks were observed to the perimeter concrete foundation wall.
- No signs of major ground settlement or lateral spreading was observed to the existing dwelling or nearby ancillary structures (kerbs, paths, fences etc).
- No obvious evidence of sand boils or ground movements were observed to the site ground surface during our site walkover.

4.4 GROUNDWATER

The site groundwater level was assessed as follows:

- “EQC Event Specific Groundwater Surface Elevations” indicate that the groundwater table in the site area has been recorded at variable depths generally ranging from 5.0m to 6.0m bgl.
- “GNS Science Median Groundwater Surface Elevations” map indicates that the median long-term groundwater level is approximately 5.0 to 6.0m bgl.
- Shallow HA results indicate that in-situ ground water level was not encountered during the day of the test.
- CPT logs indicate that in-situ ground water level was encountered at 1.0m bgl at CPT_001 location and 2.3m bgl at CPT_002 during the day of the test.

Based on the available groundwater information and taking into account expected seasonal fluctuations in water levels, for liquefaction assessment purposes we have adopted the groundwater level at 1.0m bgl.

4.5 SITE SUBSOIL CLASS

In accordance with NZS1170.5, Section 3.1.3, a site subsoil classification of “Class D – Deep or soft soil sites” may be assumed for this site.

5 DISCUSSION

5.1 EARTHQUAKE DESIGN SCENARIOS

Our liquefaction hazard assessment includes evaluations of earthquake-induced ground deformation for:

- The Serviceability Limit State (SLS₁) Mw 7.5, PGA 0.13 g
- The Serviceability Limit State (SLS₂) Mw 6.0, PGA 0.19 g
- The Ultimate Limit State (ULS) Mw 7.5, PGA 0.35 g

5.2 GROUND SURFACE SETTLEMENTS

Assessment of earthquake-induced ground deformation at the site has been carried out in using “CLiq v.3.0.2.4” software developed by Geologismiki, in accordance with Part C of the MBIE guidance (2012) for the CPT results, in conjunction with the cyclic stress method based on Boulanger and Idriss (2014) for the lower DPSH results. The results are presented in Table 3 for the total free-field reconsolidation settlement. A free-field site is where the site has no buildings present, so not subject to foundation loading, and not subject to lateral spreading.

Table 3: Estimated Total “Free-field” Ground Surface Settlements in the upper 10m at CPT test location 1

Earthquake Scenario	Magnitude (M)	Peak Ground Acceleration (PGA, (g))	Estimated Ground Surface Settlements (mm)
SLS ₁	7.5	0.13	5mm
SLS ₂	6.0	0.19	15mm
ULS IL ₂	7.5	0.35	90mm

Table 4: Estimated Total “Free-field” Ground Surface Settlements in the upper 10m at CPT test location 2

Earthquake Scenario	Magnitude (M)	Peak Ground Acceleration (PGA, (g))	Estimated Ground Surface Settlements (mm)
SLS ₁	7.5	0.13	5mm
SLS ₂	6.0	0.19	15mm
ULS IL ₂	7.5	0.35	55mm

Table 5: Estimated Total “Free-field” Ground Surface Settlements in the upper 10m at CPT test location 3

Earthquake Scenario	Magnitude (M)	Peak Ground Acceleration (PGA, (g))	Estimated Ground Surface Settlements (mm)
SLS ₁	7.5	0.13	5mm
SLS ₂	6.0	0.19	15mm
ULS IL ₂	7.5	0.35	75mm

Calculation for consolidated settlements at the site has been carried out using “CpeT-IT” software developed by Geologismiki. The consolidated settlements over a 50-year period have been calculated based on following assumptions at each test location.

Assumptions have been made based on site observation:

Perimeter foundation wall width = 250mm

Footing embedment depth = 400mm

The results are presented in Table 5 as follow.

Table 6: Predicted consolidated settlements over 50 years.

CPT Test Location	Cumulated settlement	Assumed footing pressure	Notes
Location 1	10mm	300 kPa	Considering masonry firewall weight and two units roof weight
Location 2	10mm	200 kPa	
Location 3	55mm	200 kPa	

Past settlements at locations 1, 2 and 3 can be assumed as approximately equal to the settlements calculated as shown in the Table 6 above.

At near to the CPT location 1, where it was previously observed to be the lowest point of the dwelling units (based on the Cephas Rock Limited's structural assessment report (ref 21-174)), the level different due to differential vertical settlement from past soil consolidation over 50 years, was calculated to have experienced less settlement comparing the settlements at other CPT locations (locations 2 and 3). This is considered to be relatively no floor level drop/very minor floor level drop at the area near the CPT location 1 due to consolidated vertical settlement over the past 50 years.

Tables 3, 4, and 5 shows that there is a certain differential settlement predicted due to the liquefaction following a ULS level earthquake scenario and the area near CPT location 1 is identified as a higher settlement area from other CPT locations. Hence, it is considered that the differential floor settlement at the firewall area of the units is occurred due to earthquake-related actions.

5.3 PREDICTED LATERAL DEFORMATION

Following the procedure outlined by the MBIE (2012) an assessment of the global lateral movement of the site and lateral stretch across the building footprint has been undertaken as follow.

From EQC horizontal ground movement measurements, the maximum local differences obtained from LiDAR observations and tectonic movements for combination of the 4 September 2010 and 22 February 2011 the Canterbury earthquake events are approximately 400mm. Hence, the site has been categorised within the major global lateral deformation category.

Based on EQC observed ground crack location, there is 10mm ground crack identified in front of the property. In a 250m radius area from this site location, a number of more than 200mm and 50 to 200mm cracks are indicated in the ground crack map.

The global lateral movement of the site and lateral stretch across the building footprint are categorised based on above assessments and outlined in Table 7.

Table 7: Assessed lateral deformation at the site.

Global lateral movement category of the site (at ULS)	TC ₃ (Major)
Lateral stretch of the ground across the building footprint (at ULS)	TC ₃ (Major)

5.4 GEOTECHNICAL ULTIMATE BEARING CAPACITY

With reference to the investigation data a geotechnical Ultimate Bearing Capacity (UBC) of 200kPa can be assumed below 0.3m bgl. A strength reduction factor of $\phi = 0.5$ should be applied to the Ultimate Bearing Capacity to obtain the Dependable Bearing Capacity, which should be equal to or greater than the factored Ultimate Foundation Bearing Pressures.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 SITE-SPECIFIC CATEGORISATION

The subsoil at the proposed site was assessed to have moderate land damage potential from future significant earthquakes and stands with the limits of Technical Category 3 (TC₃).

6.2 FOUNDATION REMEDIATION RECOMMENDATIONS

We understand that the dwelling timber floor foundations are proposed to be re-levelled to bring the floor levels to within MBIE recommended tolerance.

The dwelling foundation has been identified within the "foundation re-level indicated" category based on the floor level tolerance indicated in MBIE guidance, the following foundation remediation options may be considered to re-level the dwelling floor:

- **Option 1:** Where the concrete perimeter foundation and firewalls have settled (dropped), the concrete perimeter foundation and firewalls can be re-levelled by mechanical lifting using portable jacks as per Option 1 of the MBIE Guidance: Part A, Appendix A1.1.3. The foundation re-levelling shall be designed, approved and monitored by a qualified structural engineer. The soil conditions need to be confirmed by a geotechnical engineer prior to any construction.
 - The internal concrete slab may be replaced as per specific engineering detail.
 - It is expected that the floor slopes of the timber floors on the first can be remediated by mechanically re-levelling the foundation on the ground floor. Some further local re-levelling works may be required to individually remediate the floor slopes of the timber floors.
- **Option-2:** Concrete floor and firewalls can be re-levelled by engineered resin as per option 3 of the MBIE Guidance: Part A, Appendix A1.1.3.
- It shall be understood that the foundation of this dwelling has suffered earthquake-related settlement and historical settlement. As such, the foundation re-levelling works should be performance based, which means:

- o Although every effort is made to re-level the dwelling to the required performance standard (to within the level variations of accepted tolerance), in many cases, it may be found impractical to achieve that, because to do so may cause undue and unnecessary additional stress upon the superstructure.
 - o In practice, it is the building amenity performance, such as the door / window alignments, cabinetry, roof linings / levels etc., which will determine the as constructed floor levels of the building. During the re-levelling process, once consequential damage (i.e. non earthquake-related damage, such as misalignment of the existing windowsills) begins to exhibit, the engineer shall be called upon to provide direction regarding the future re-levelling works.
- If the site requires any partial replacement, concrete slab-on grade foundation (MBIE Type C) should be considered with engineering input.

7 REFERENCES

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8 LIMITATIONS

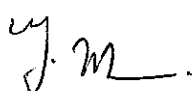
This report has been prepared on behalf of and for the exclusive use of Earthquake Commission (EQC) and its relevant building consent authority, and is subject to and issued in accordance with the provisions of the contract between Cephas Rock Limited and EQC. Cephas Rock accepts no liability or responsibility, whatsoever, for or in respect of any use or reliance upon this report by any third party. This report is the copyright of Cephas Rock Limited. Except for the use of EQC and subject to the conditions in the agreement, no part of this publication may be copied without the express permission in writing from Cephas Rock Limited.

Please note that the recommendations provided above are based on a limited number of tests and the nature and continuity of subsoil conditions is inferred. Subsurface ground conditions may vary between any two inspected, tested and sampled locations. Subsurface ground conditions may also change or be modified as a result of anthropogenic events (e.g. construction, failure of subsurface infrastructure, site contamination) and natural events (e.g. flooding, earthquakes, landslides, significant weather events). The geotechnical advice provided in this report is based on data available at the time of reporting, best engineering practice, judgement and experience. Where the actual ground condition deviates from the assumed condition, further geotechnical testing and assessment maybe warranted, which may also include supervision and auditing of site works by a qualified geotechnical engineer. This report is only intended for repair/relevel strategy with the existing dwelling.

It is recommended that all other parties seek professional geotechnical advice to satisfy themselves as to its on-going suitability for their intended use.

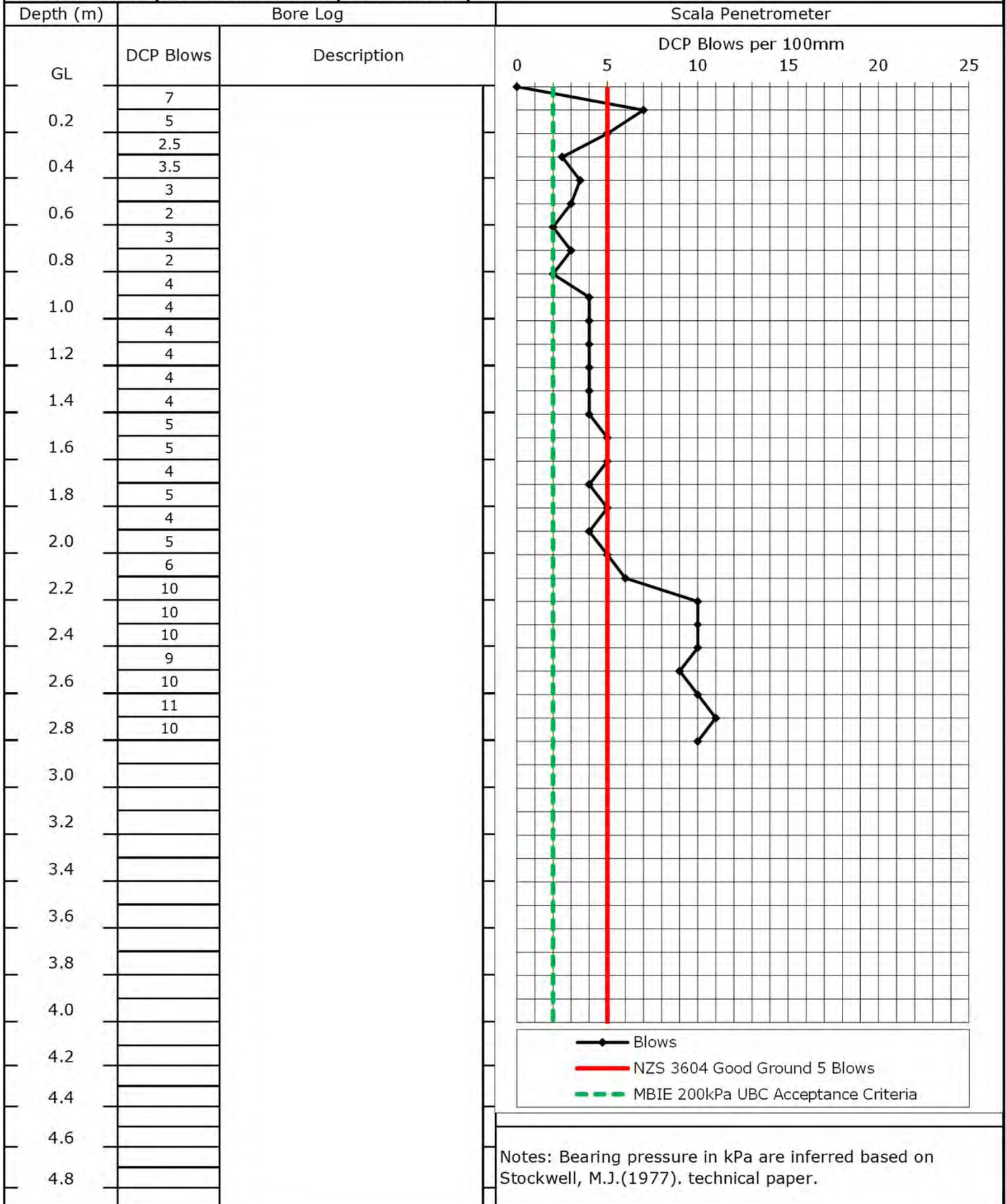
9 CLOSURE

If you have any queries or you require any further clarification on any aspects of this report, please do not hesitate to contact the undersigned.

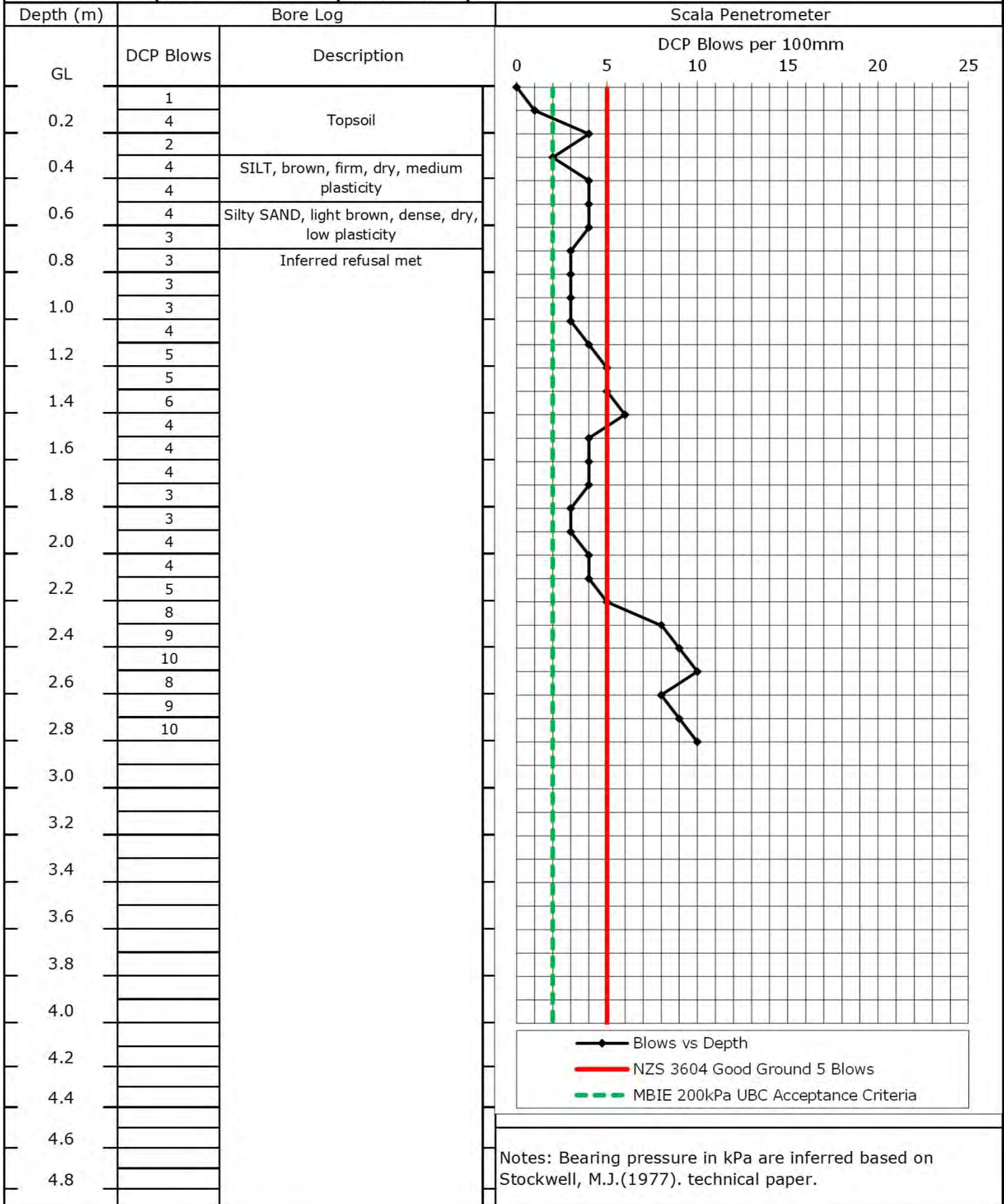
Action:	Name:	Signed:	Date:
Report Prepared:	Gulendrarajah Nerooshan B.Sc.Eng (Hons) MEngNZ Geotechnical/Structural Engineer Cephas Rock Limited		18/05/2021
Reviewed:	Ferry Haryono BEng. MEng CMEngNZ CPEng IntPE(NZ) Senior Geotechnical Engineer Cephas Rock Limited		18/05/2021
Approved:	Joshua Wong BEng (Hons) CMEngNZ CPEng IntPE(NZ) Structural Engineer/Director Cephas Rock Limited		18/05/2021

APPENDICES

- a) Investigation logs
- b) CLiq liquefaction analyses summary
- c) Cpet-IT settlement calculation

project Unit 1 nad 2, 85 Trafalgar Street**no.** 1**ref** 21-190**date** 23/04/2021**by** NR**checked** Joshua Wong**Test Location (Refer to attached site plan for location) 1**

Notes: Bearing pressure in kPa are inferred based on Stockwell, M.J.(1977). technical paper.

project Unit 1 nad 2, 85 Trafalgar Street**no.** 2**ref** 21-190**date** 23/04/2021**by** NR**checked** Joshua Wong**Test Location (Refer to attached site plan for location) 2**

Notes: Bearing pressure in kPa are inferred based on Stockwell, M.J.(1977). technical paper.



Cephas Rock Limited
Structural Consultant Engineers

project Unit 1 nad 2, 85 Trafalgar Street

no. 3

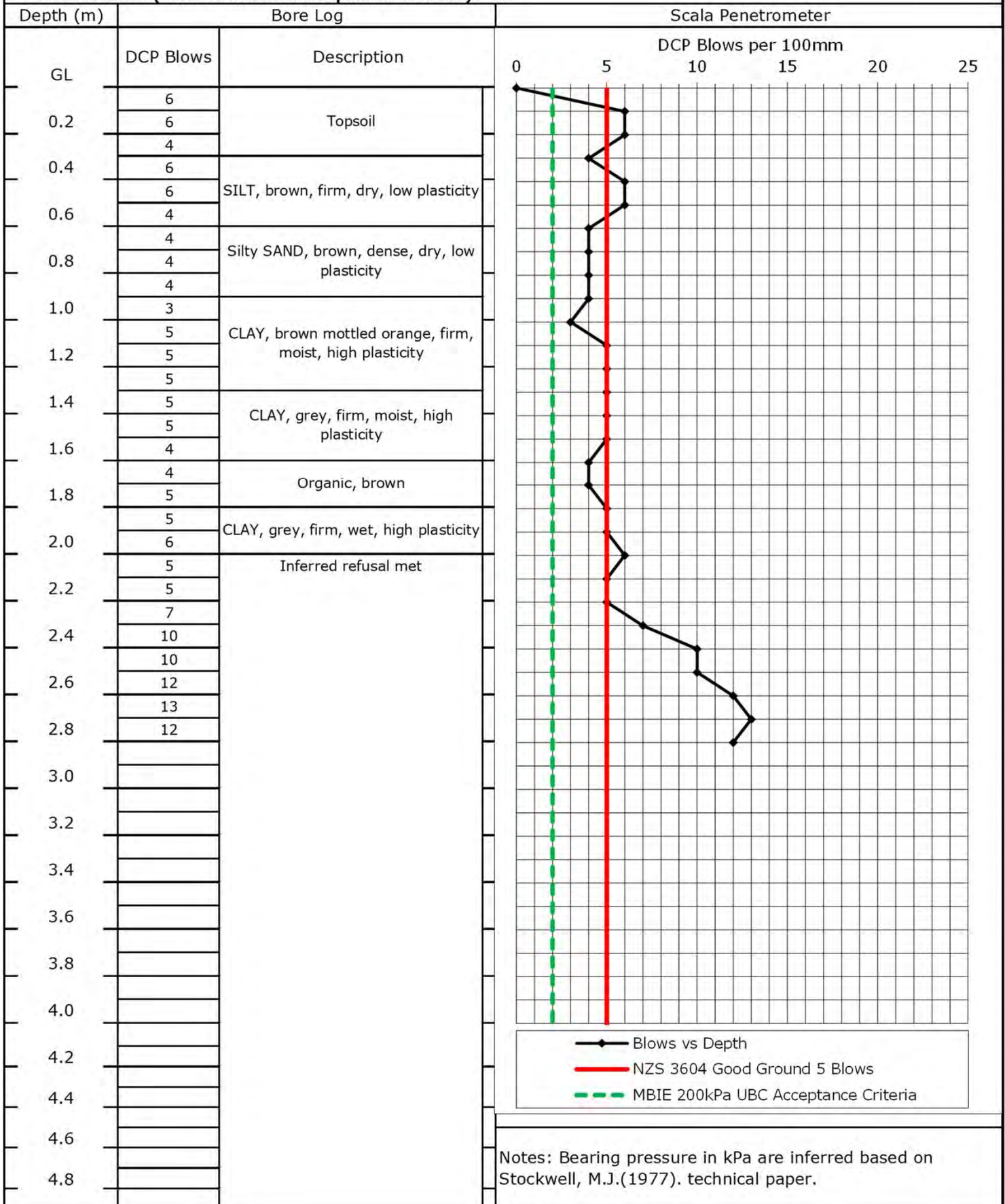
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date 23/04/2021

by NR

checked Joshua Wong

Test Location (Refer to attached site plan for location) 3



project Unit 1 nad 2, 85 Trafalgar Street

no. 4

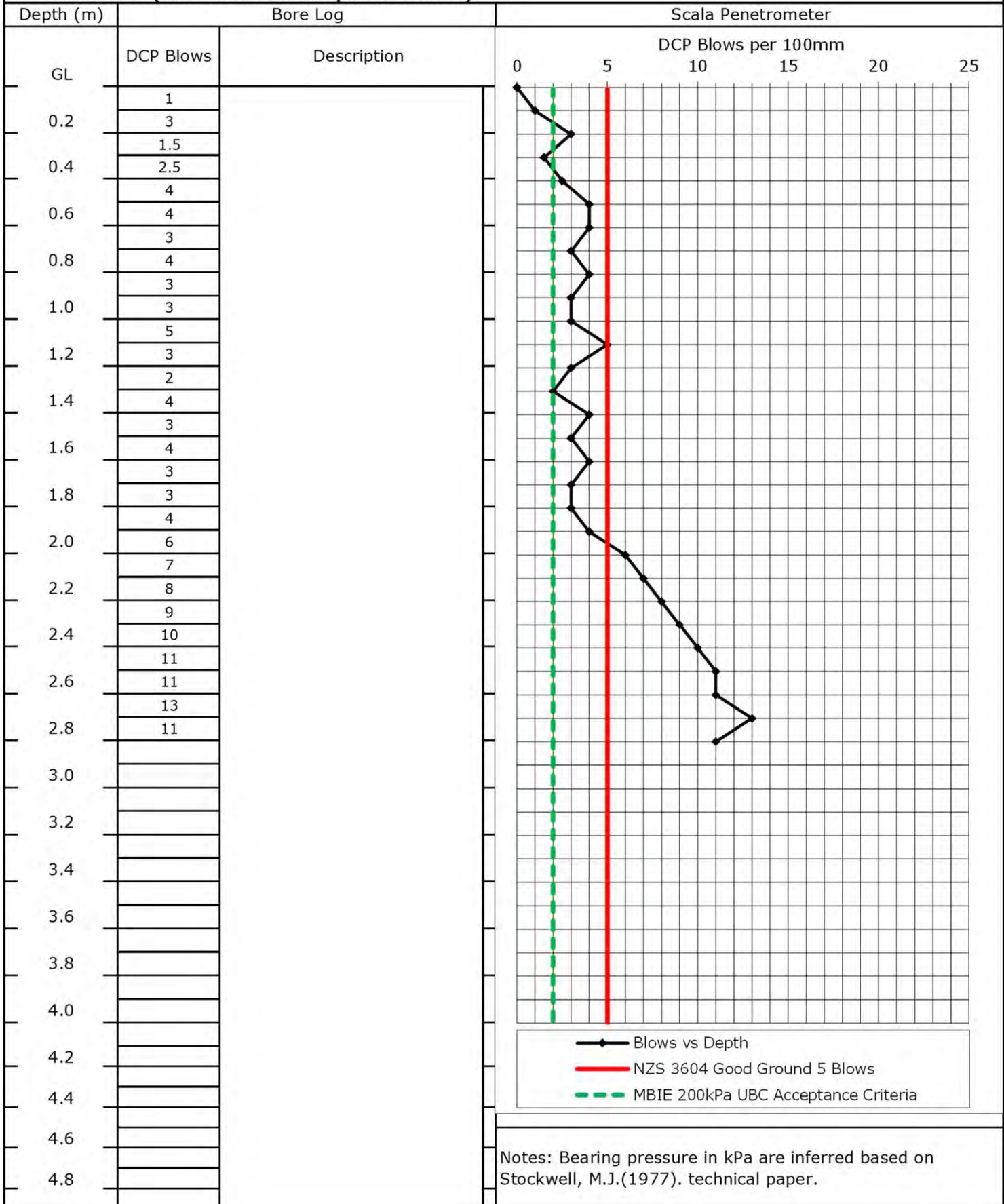
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date 23/04/2021

by NR

checked Joshua Wong

Test Location (Refer to attached site plan for location) 4



Client:	Cephas Rock Ltd	Bore No.:	CPTu001
Project:	85 Trafalgar Street, Christchurch	Job No.:	19805

Site Location: 85 Trafalgar Street, Christchurch

Date: 16/4/2021

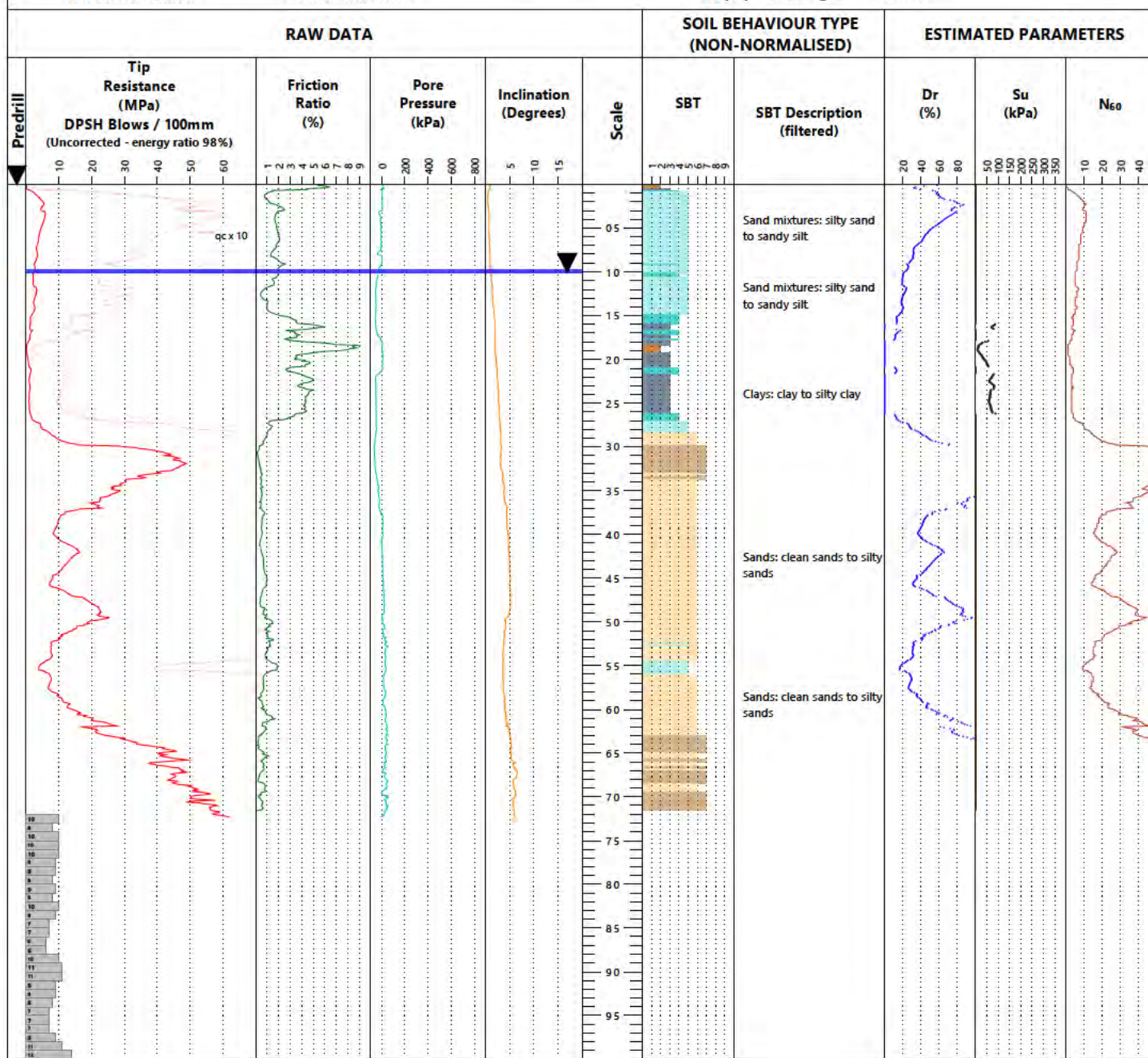
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Rig Operator: E. Diaz

Elevation: 0.00m

Datum: Ground

Equipment: Pagani TG63-150



EOH: 10m

Cone Type: Pagani Piezocone - Compression

Cone Reference: MKS328

Cone Area Ratio: 0.79

Standards: ISO 22476-1:2012

Zero load outputs (MPa)	Before test	After test
Tip Resistance	28.8843	28.7725
Local Friction	0.2435	0.2439
Pore Pressure	3.0093	3.0081

Predrill: -

Water Level: 1m

Collapse: 2.8m

Termination

Target Depth:

Effective Refusal

Tip: ☒Gauge: ☐Inclinometer: ☐

Soil Behaviour Type (SBT) - Robertson et al. 1986

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine-grained	6	Sands: clean sands to silty sands
2	Clay - organic soil	7	Dense sand to gravelly sand
3	Clays: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff fine-grained

Notes & Limitations

Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P. K. Robertson and K.L. Cabal (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 4th Edition. The interpretations are presented only as a guide for geotechnical use, and should be carefully reviewed by the user. No warranty is provided as to the correctness or the applicability of any of the geotechnical soil and design parameters shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Remarks

Client:	Cephas Rock Ltd	Bore No.:	CPTu002
Project:	85 Trafalgar Street, Christchurch	Job No.:	19805

Site Location: 85 Trafalgar Street, Christchurch

Date: 16/4/2021

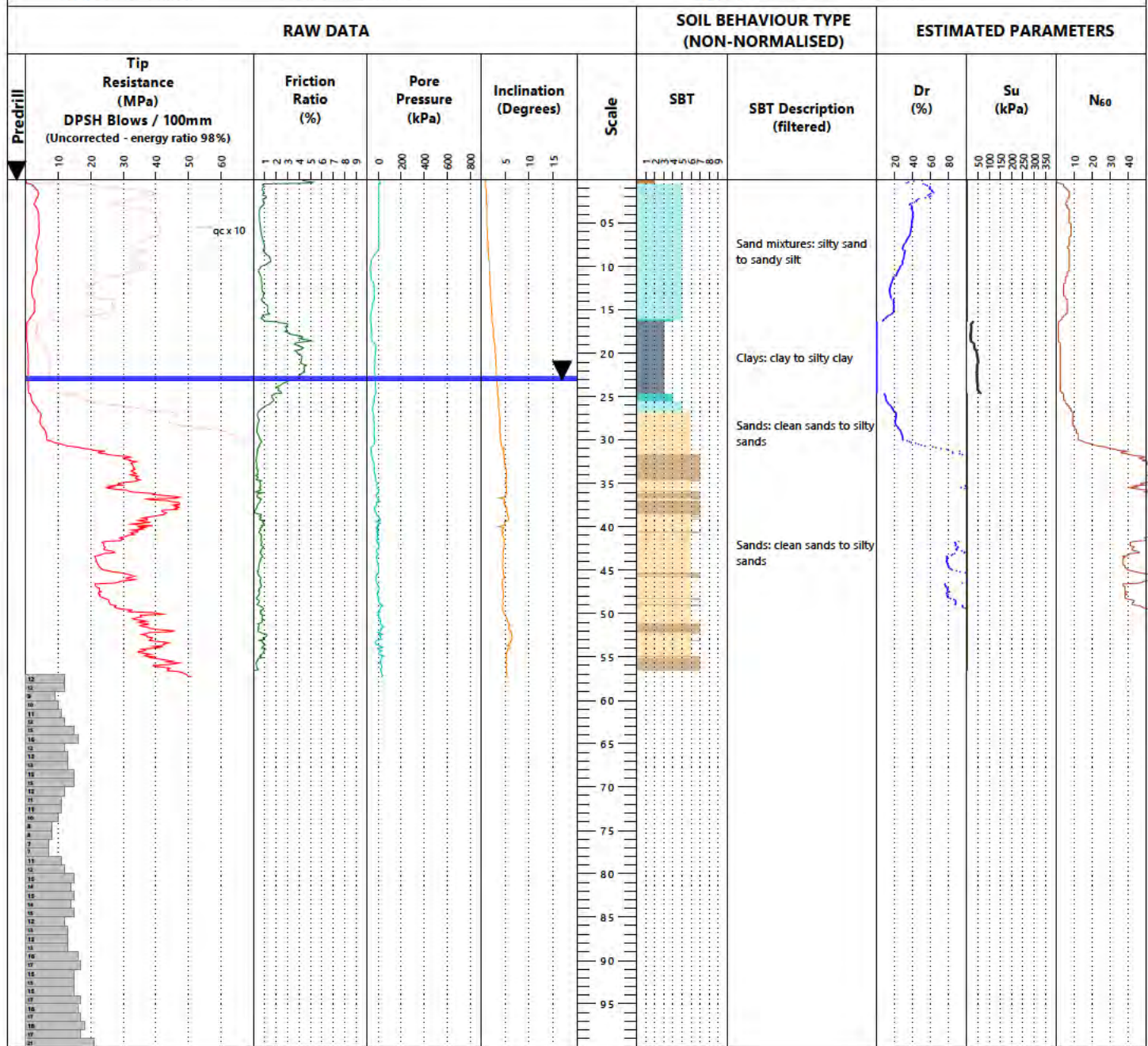
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Rig Operator: E. Diaz

Elevation: 0.00m

Datum: Ground

Equipment: Pagani TG63-150



EOH: 10m

Cone Type: Pagani Piezocone - Compression

Cone Reference: MKS328

Cone Area Ratio: 0.79

Standards: ISO 22476-1:2012

Zero load outputs (MPa)	Before test	After test
Tip Resistance	28.9097	28.7268
Local Friction	0.2449	0.2445
Pore Pressure	3.0104	3.0079

Predrill: -

Water Level: 2.3m

Collapse: 4.2m

Termination

Target Depth:

Effective Refusal

Tip: ☒Gauge: ☐Inclinometer: ☐

Soil Behaviour Type (SBT) - Robertson et al. 1986

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine-grained	6	Sands: clean sands to silty sands
2	Clay - organic soil	7	Dense sand to gravelly sand
3	Clays: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff fine-grained

Notes & Limitations

Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P. K. Robertson and K.L. Cabal (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 4th Edition. The interpretations are presented only as a guide for geotechnical use, and should be carefully reviewed by the user. No warranty is provided as to the correctness or the applicability of any of the geotechnical soil and design parameters shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Remarks

Client:

Cephas Rock Ltd

Bore No.:

CPTu003

Project:

85 Trafalgar Street, Christchurch

Job No.:

19805

Site Location: 85 Trafalgar Street, Christchurch

Date: 23/4/2021

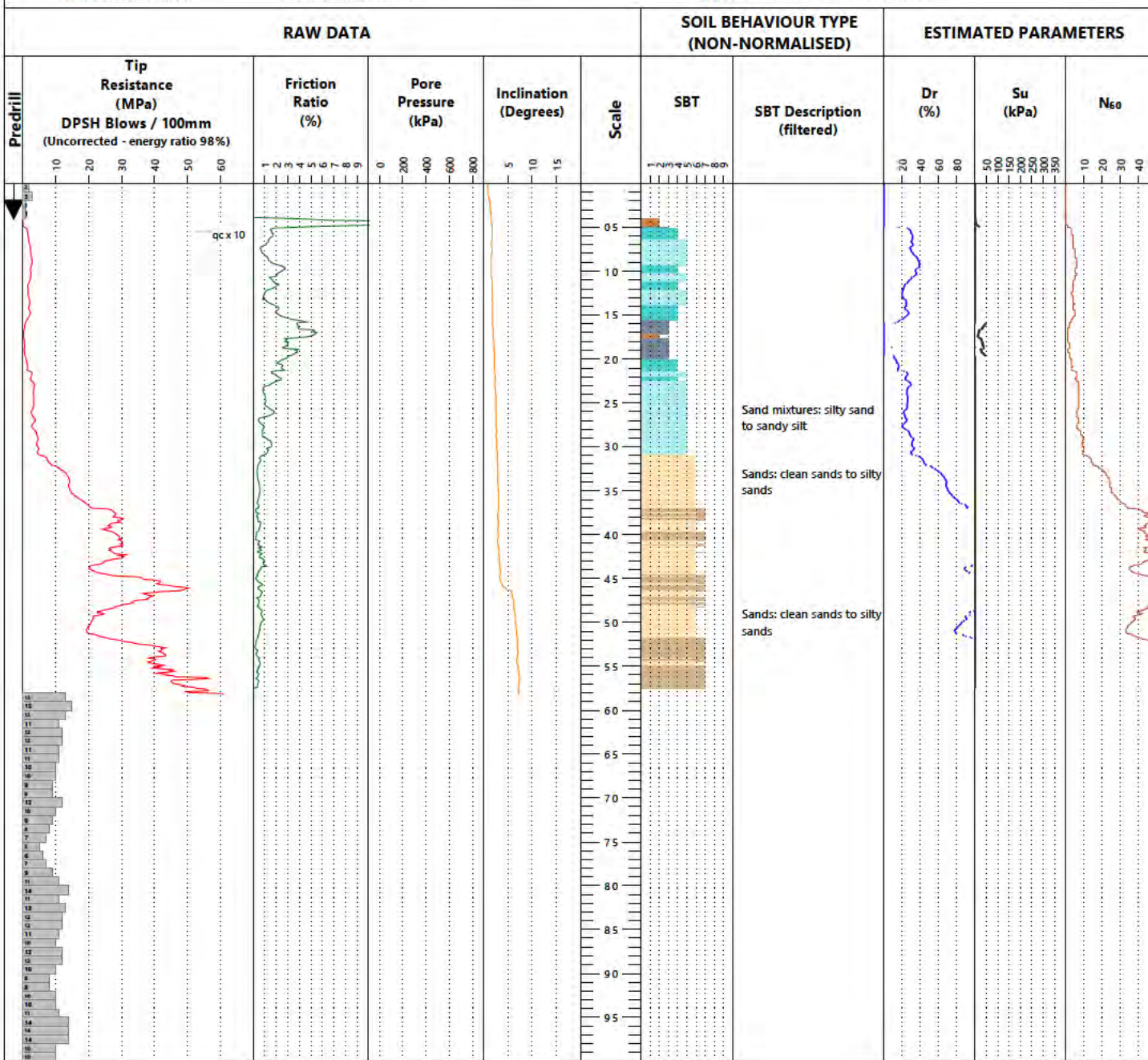
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Rig Operator: G. Cossar

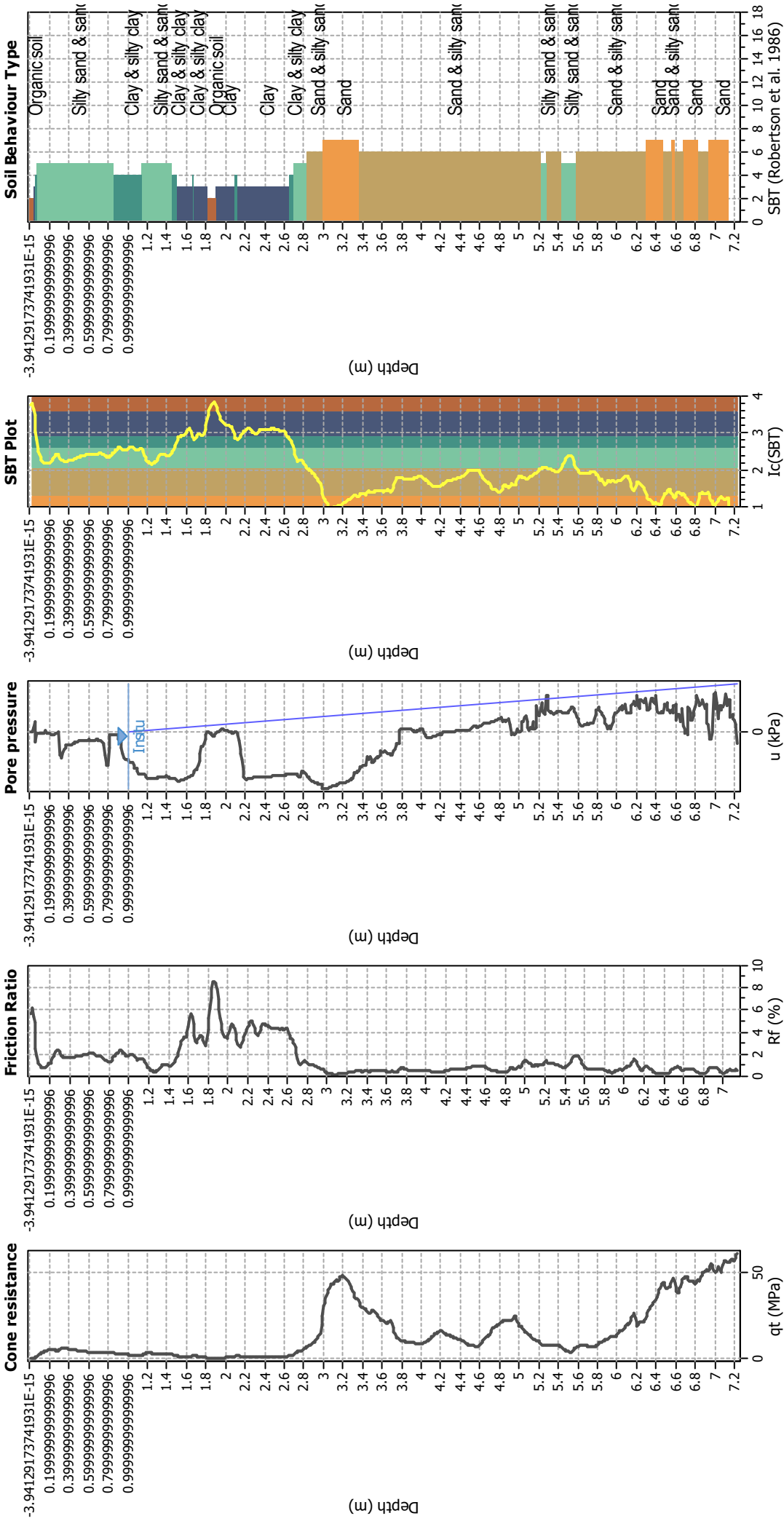
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Datum: Ground

Equipment: Pagani TG63-150



CPT basic interpretation plots



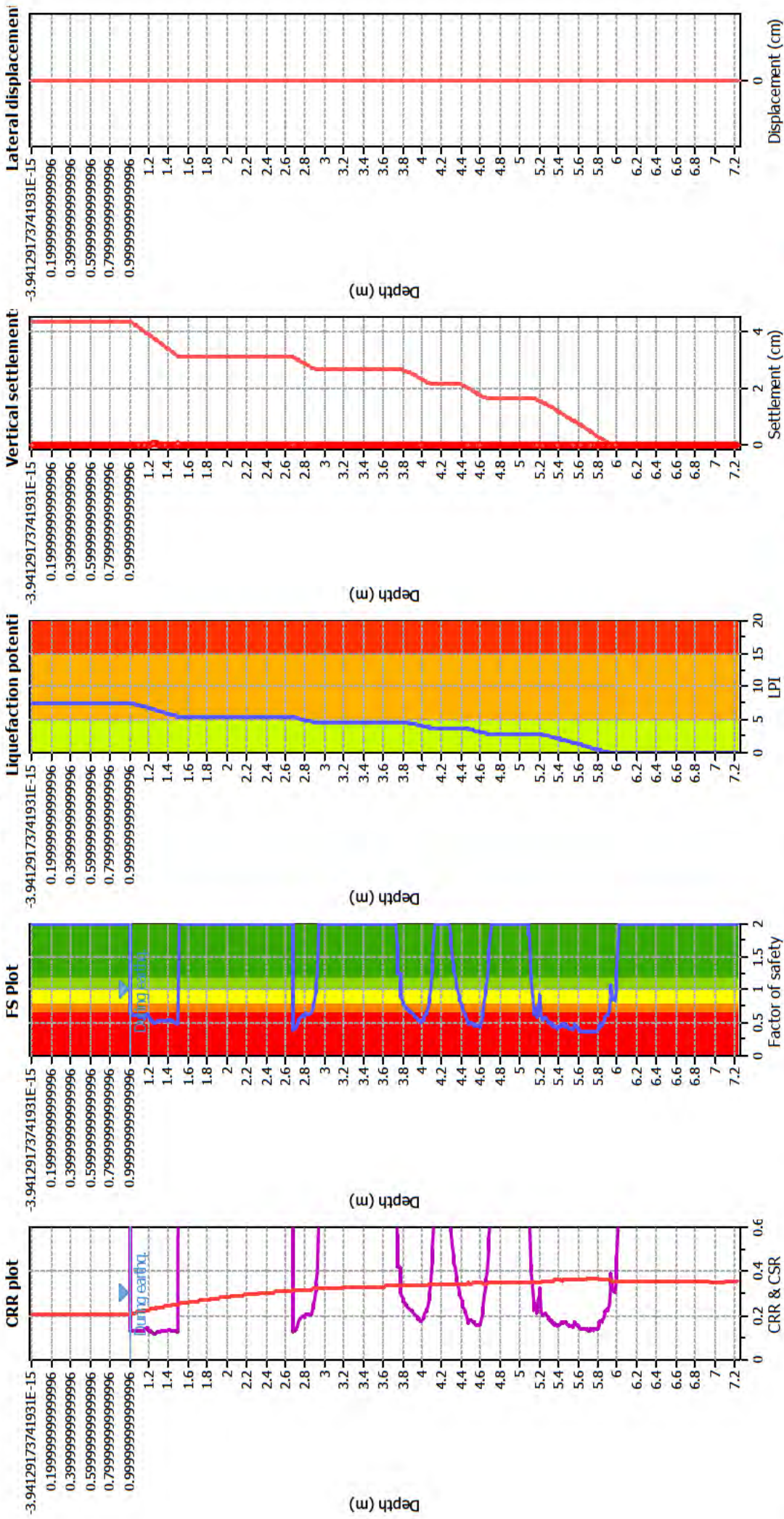
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Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _s applied:	Yes
Earthquake magnitude M _w :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	1.00 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

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

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method: B&I (2014)
Fines correction method: B&I (2014)
Points to test: Based on Ic value
Earthquake magnitude M_w : 7.50
Peak ground acceleration: 0.35
Depth to water table (insitu): 1.00 m

Depth to GWT (earth): 1.00 m
Average results interval: 3
Ic 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_{σ} applied: Yes
Clay like behavior applied: Sands only
Limit depth applied: Yes
Limit depth: 10.00 m

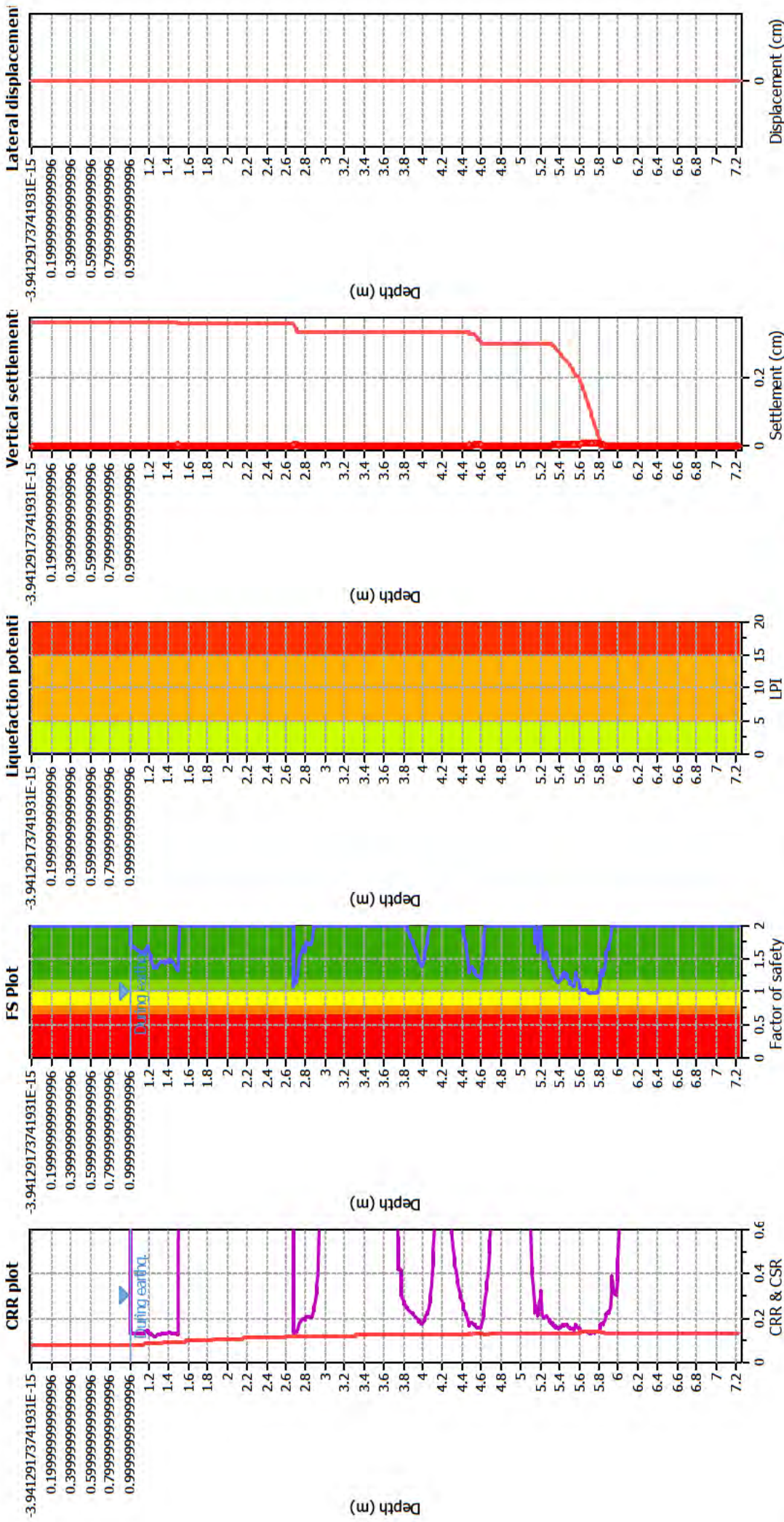
F.S. color scheme

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

LPI color scheme

Very high risk
High risk
Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method: B&I (2014)
Fines correction method: B&I (2014)
Points to test: Based on Ic value
Earthquake magnitude M_w : 7.50
Peak ground acceleration: 0.13
Depth to water table (insitu): 1.00 m

Depth to GWT (earthq.): 1.00 m
Average results interval: 3
Ic 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_{σ} applied: Yes
Clay like behavior applied: Sands only
Limit depth applied: Yes
Limit depth: 10.00 m

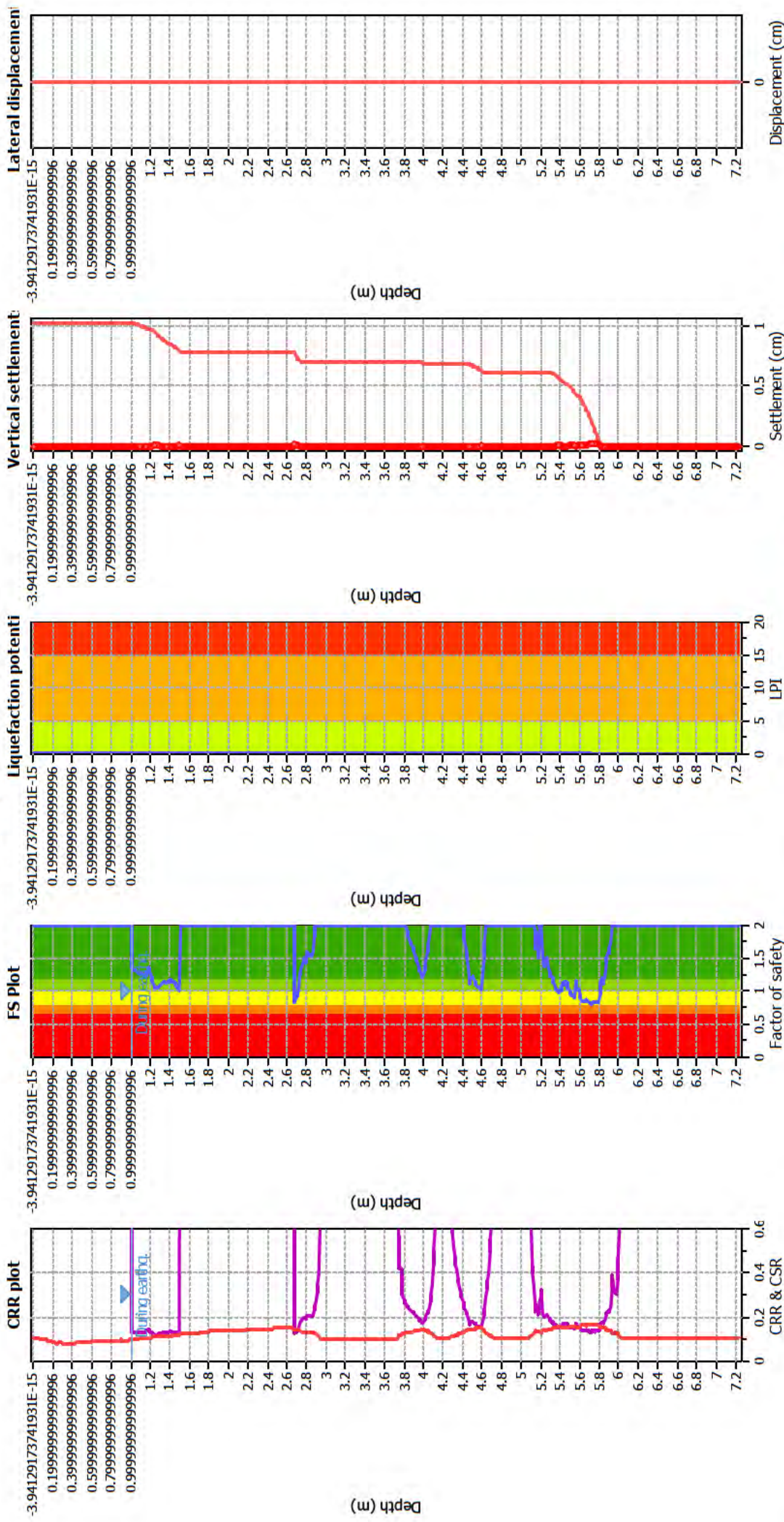
F.S. color scheme

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

LPI color scheme

Very high risk
High risk
Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)
Fines correction method:	B&I (2014)
Points to test:	Based on Ic value
Earthquake magnitude M_w :	6.00
Peak ground acceleration:	0.19
Depth to water table (insitu):	1.00 m

Depth to GWT (earthq.):	1.00 m
Average results interval:	3
Ic 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_{σ} applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	Yes
Limit depth:	10.00 m

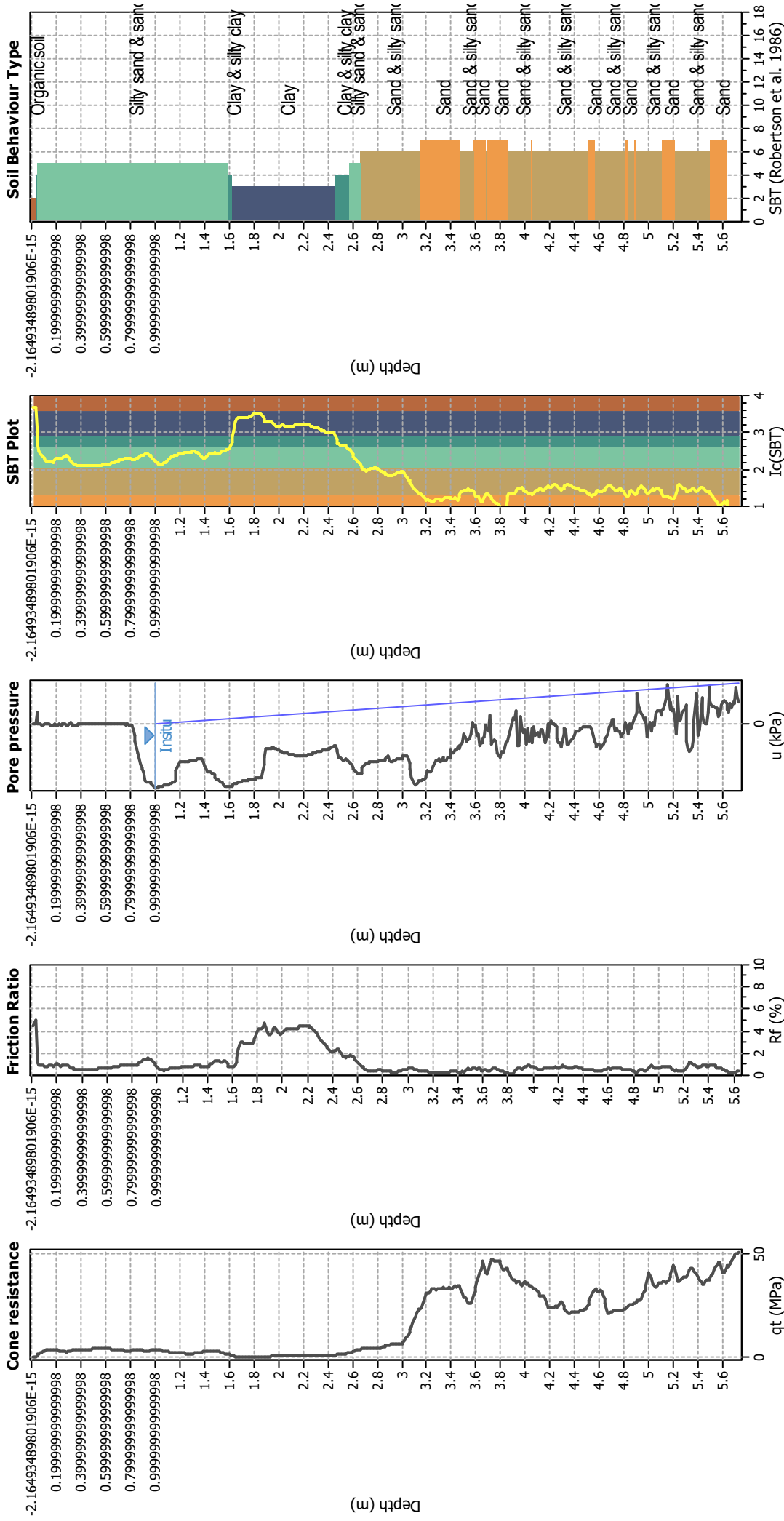
F.S. color scheme

Almost certain it will liquefy	Very high risk
Very likely to liquefy	High risk
Liquefaction and no liq. are equally likely	Low risk
Unlikely to liquefy	
Almost certain it will not liquefy	

LPI color scheme

Very high risk	
High risk	
Low risk	

CPT basic interpretation plots



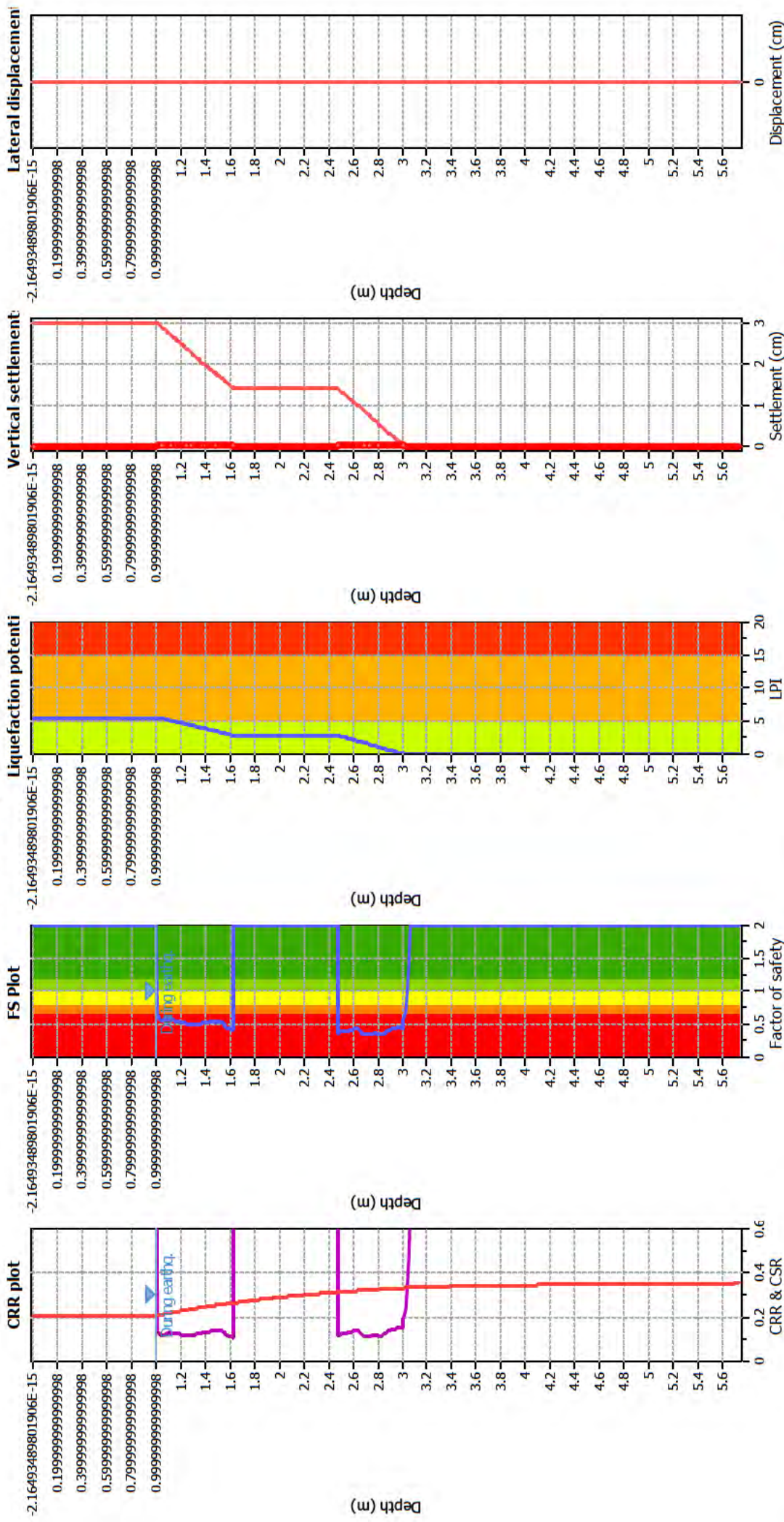
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_a applied:	Yes
Earthquake magnitude M_w :	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	1.00 m	Fill height:	N/A	Limit depth:	10.00 m

SBT legend

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

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)
Fines correction method:	B&I (2014)
Points to test:	Based on Ic value
Earthquake magnitude M_w :	7.50
Peak ground acceleration:	0.35
Depth to water table (insitu):	1.00 m

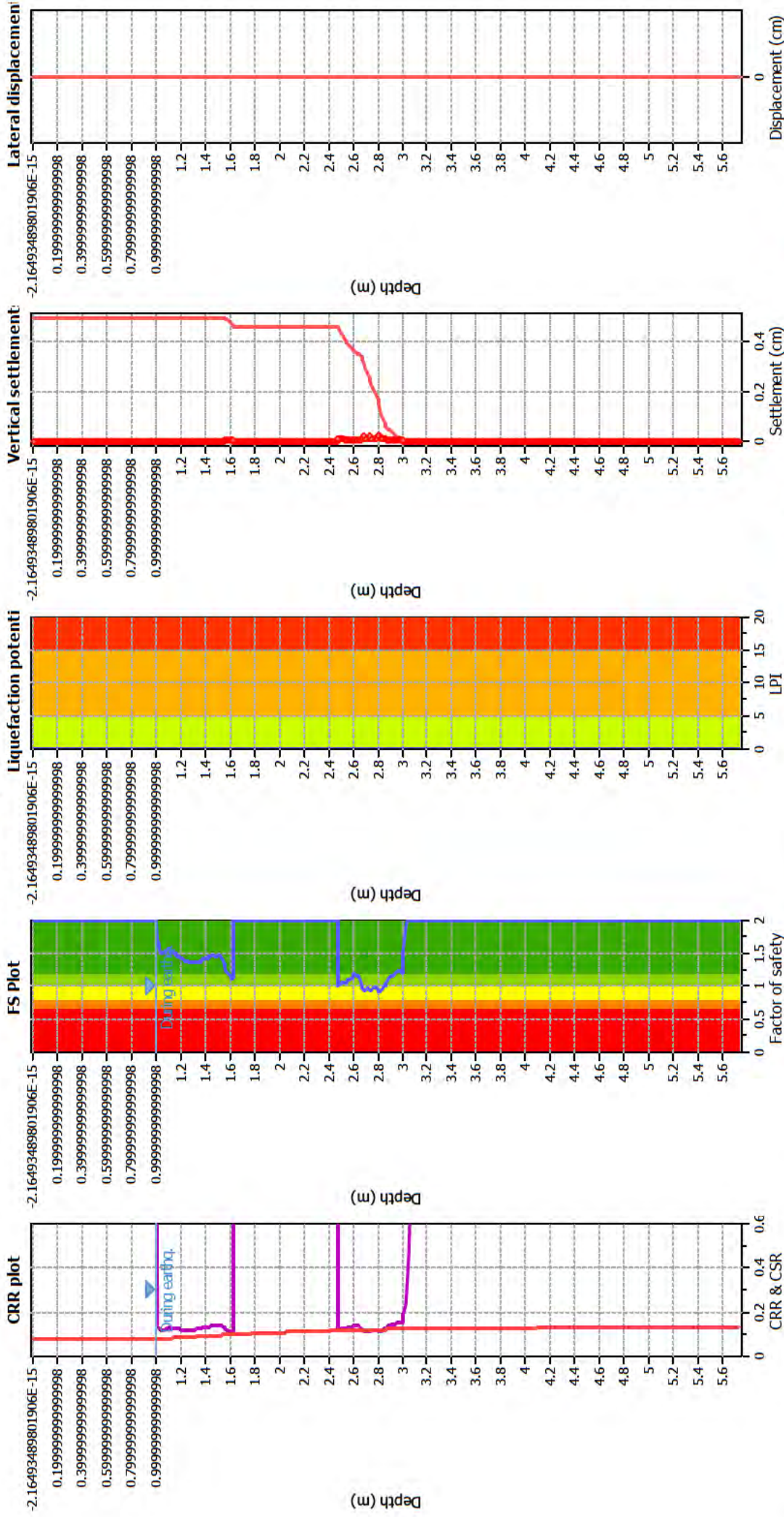
F.S. color scheme

Almost certain it will liquefy	Very high risk
Very likely to liquefy	High risk
Liquefaction and no liq. are equally likely	Low risk
Unlikely to liquefy	
Almost certain it will not liquefy	

LPI color scheme

Very high risk
High risk
Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)
Fines correction method:	B&I (2014)
Points to test:	Based on Ic value
Earthquake magnitude M_w :	7.50
Peak ground acceleration:	0.13
Depth to water table (insitu):	1.00 m

Depth to GWT (earthq.):	1.00 m
Average results interval:	3
Ic 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_{α} applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	Yes
Limit depth:	10.00 m

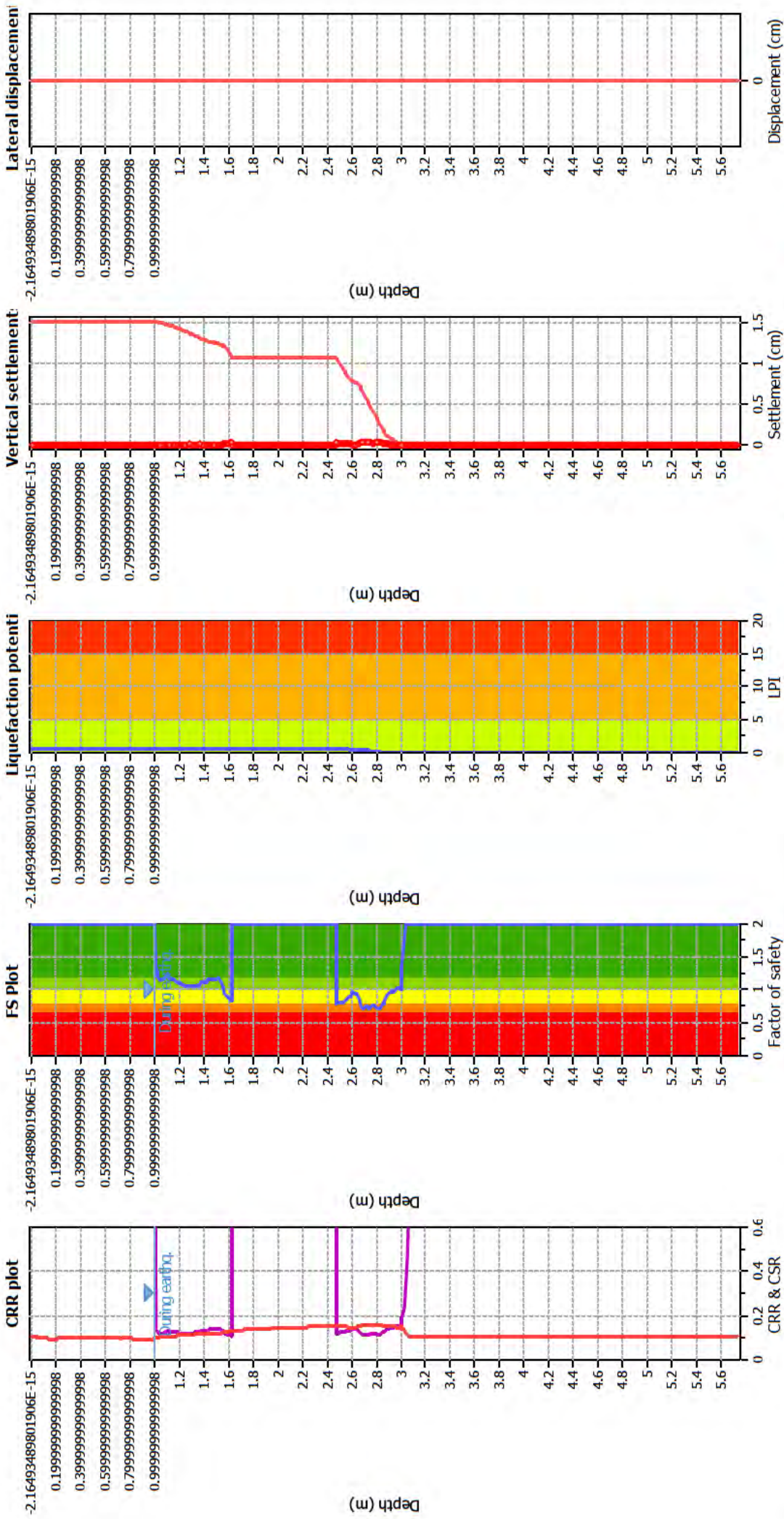
F.S. color scheme

Almost certain it will liquefy	Very high risk
Very likely to liquefy	High risk
Liquefaction and no liq. are equally likely	Low risk
Unlikely to liquefy	
Almost certain it will not liquefy	

LPI color scheme

Very high risk	
High risk	
Low risk	

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method: B&I (2014)
Fines correction method: B&I (2014)
Points to test: Based on Ic value
Earthquake magnitude M_w : 6.00
Peak ground acceleration: 0.19
Depth to water table (insitu): 1.00 m

Depth to GWT (earthq.): 1.00 m
Average results interval: 3
Ic 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_{σ} applied: Yes
Clay like behavior applied: Sands only
Limit depth applied: Yes
Limit depth: 10.00 m

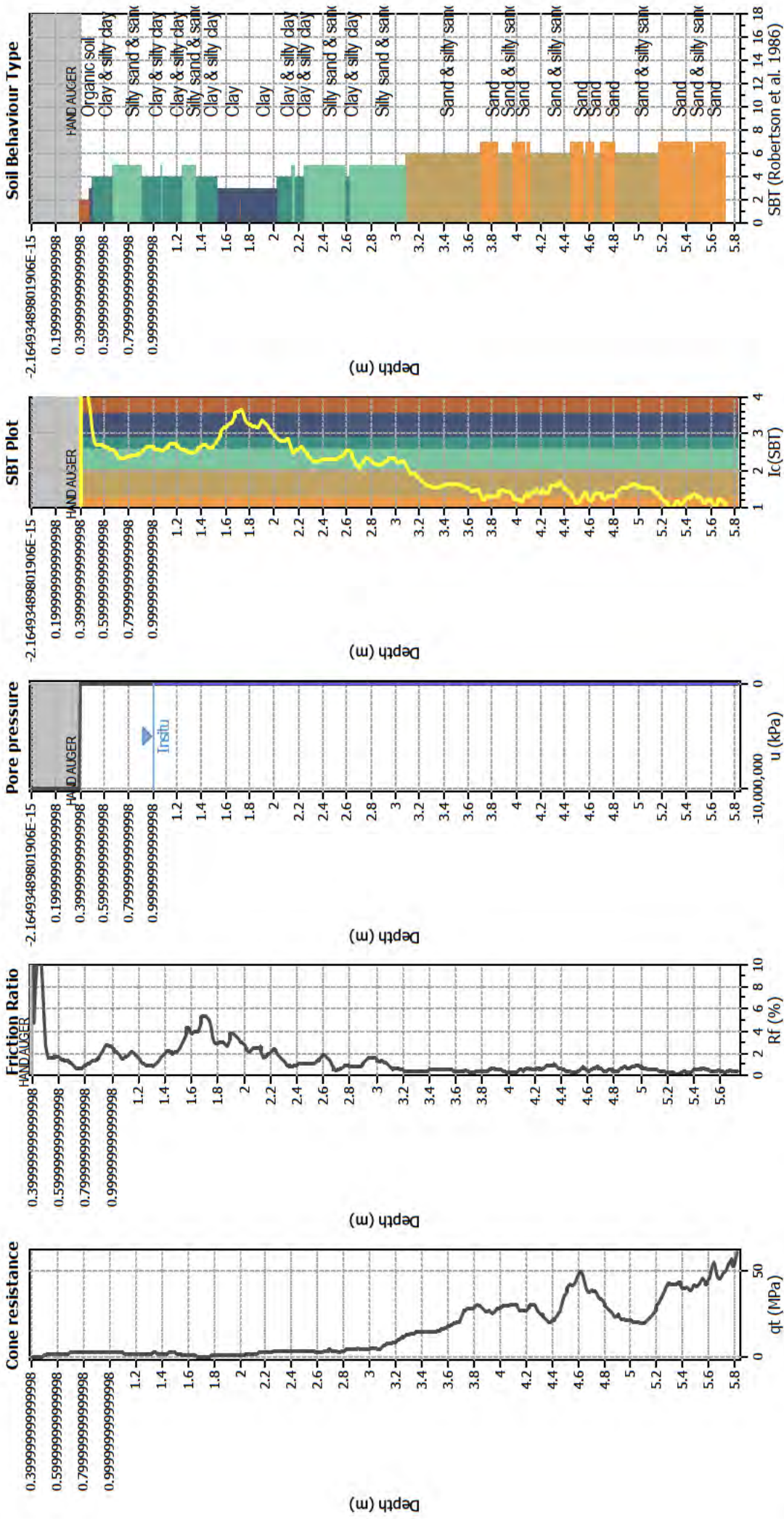
F.S. color scheme

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

LPI color scheme

Very high risk
High risk
Low risk

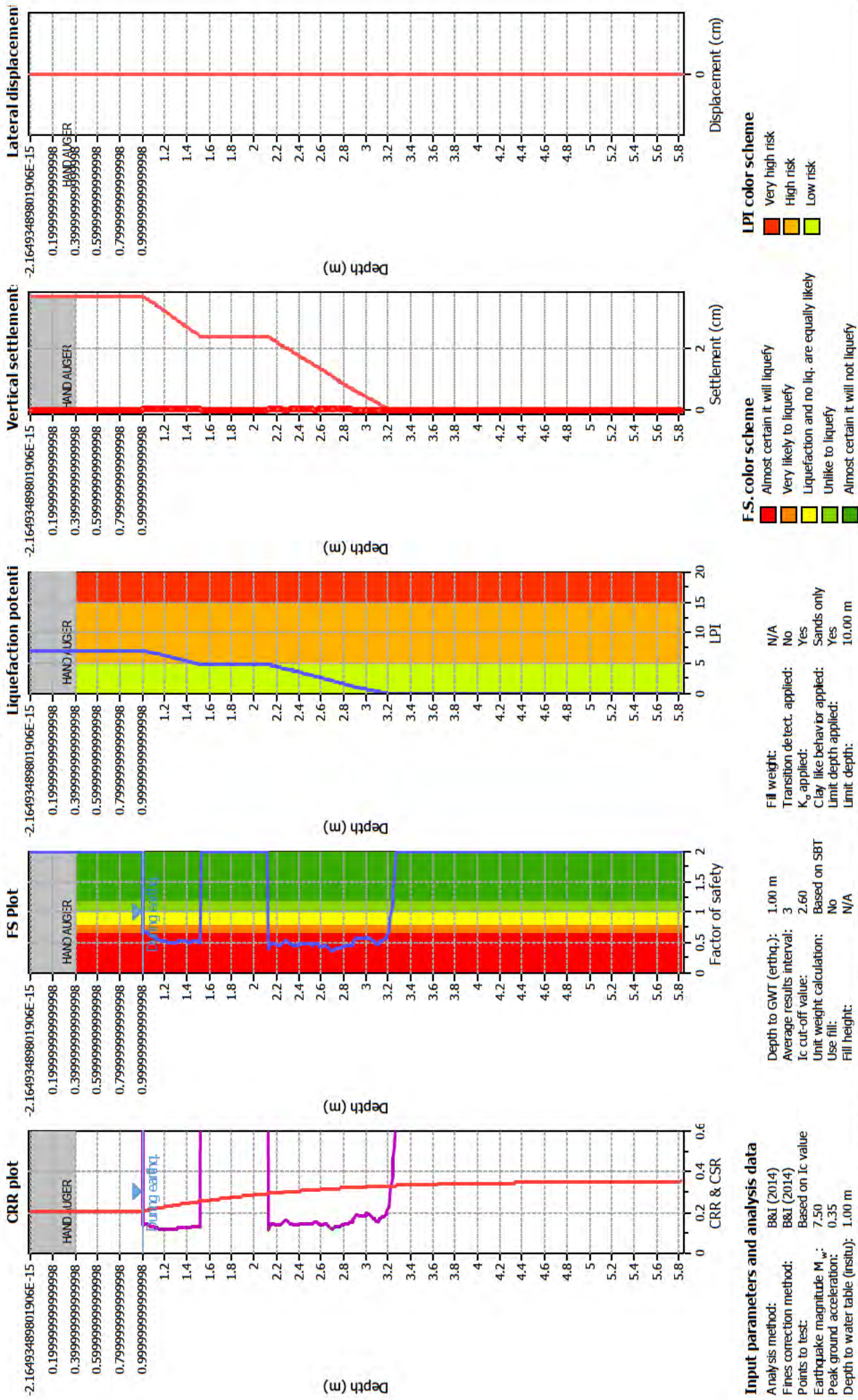
CPT basic interpretation plots



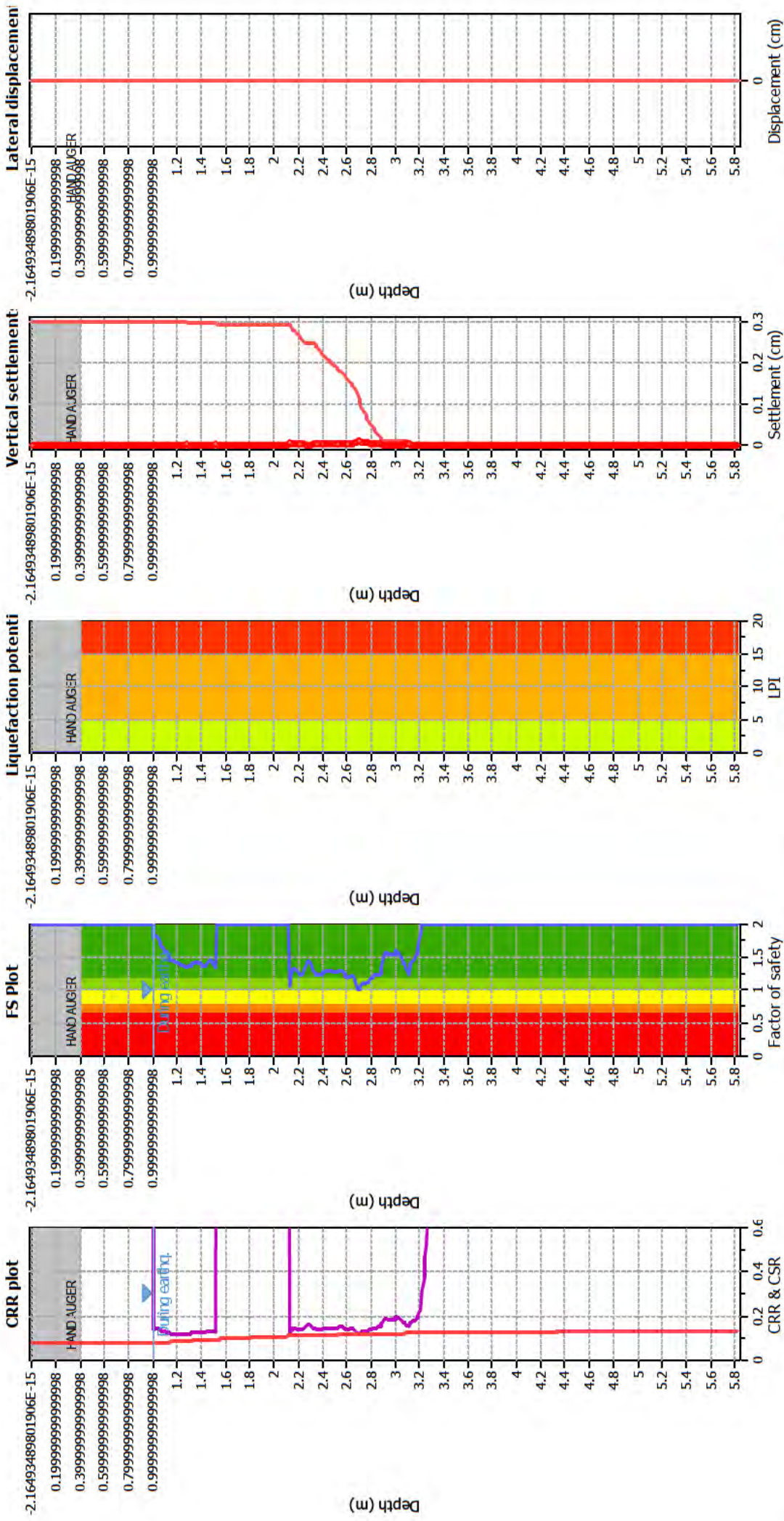
Input parameters and analysis data

Analysis method:	B&I (2014)	Fill weight:	N/A
Fines correction method:	B&I (2014)	Transition detect. applied:	No
Points to test:	Based on Ic value	K _u applied:	Yes
Earthquake magnitude M _w :	7.50	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.35	Unit depth applied:	Yes
Depth to water table (insitu):	1.00 m	Limit depth:	10.00 m

Liquefaction analysis overall plots



Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method: B&I (2014)
Fines correction method: B&I (2014)
Points to test: Based on Ic value
Earthquake magnitude M_w : 7.50
Peak ground acceleration: 0.13
Depth to water table (insitu): 1.00 m

Depth to GWT (earth): 1.00 m
Average results interval: 3
Ic 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_{σ} applied: Yes
Clay like behavior applied: Sands only
Limit depth applied: Yes
Limit depth: 10.00 m

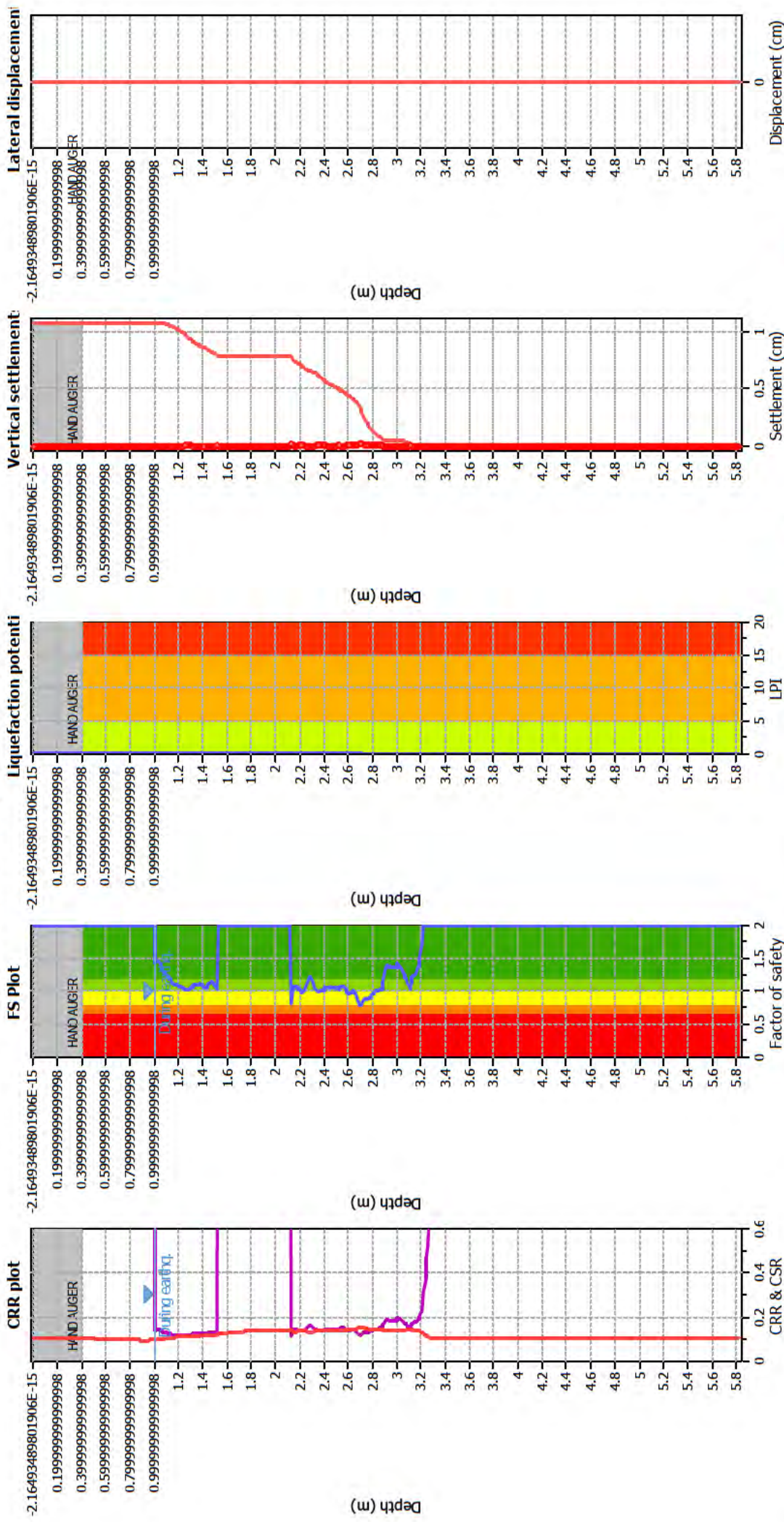
F.S. color scheme

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

LPI color scheme

Very high risk
High risk
Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)
Fines correction method:	B&I (2014)
Points to test:	Based on Ic value
Earthquake magnitude M_w :	6.00
Peak ground acceleration:	0.19
Depth to water table (insitu):	1.00 m

Depth to GWT (earthq.):	1.00 m
Average results interval:	3
Ic 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_{σ} applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	Yes
Limit depth:	10.00 m

F.S. color scheme	LPI color scheme
Almost certain it will liquefy	Very high risk
Very likely to liquefy	High risk
Liquefaction and no liq. are equally likely	Low risk
Unlike to liquefy	
Almost certain it will not liquefy	

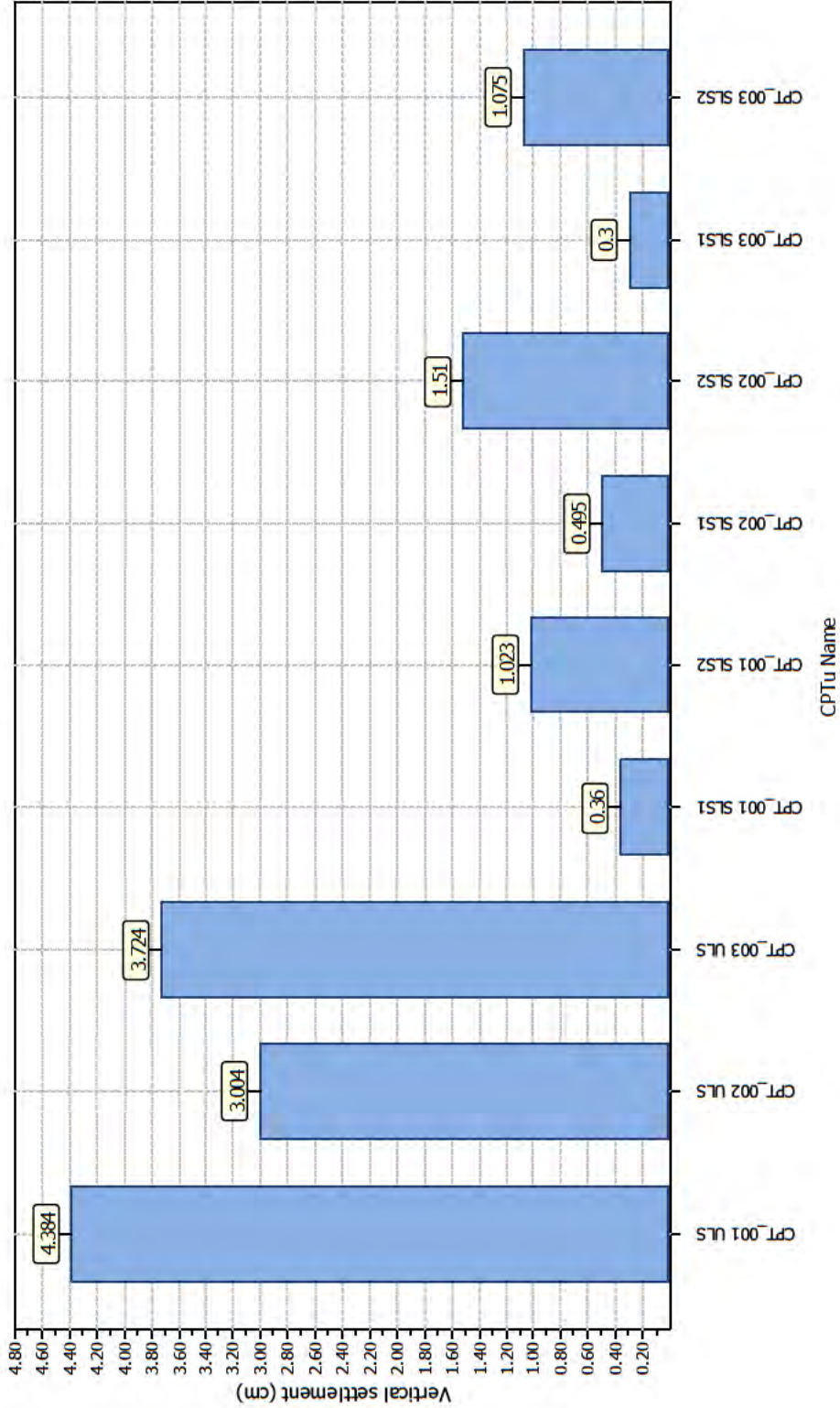
Cephas Rock Limited



Project title : Deep Geotechnical Investigation

Location : Unit 1 & 2 85 Trafalgar Street

Overall vertical settlements report



SPT based settlement Calculation

ULS

Peak Ground accel (g) = **0.350**Earthquake magnitude, M = **7.50**Water table depth (m) = **2.0**Average γ above water table (kN/m^3) = **17.4**Average γ below water table (kN/m^3) = **18.8**Borehole diameter (mm) = **50.5**

Requires correction for sample liners (YES/NO):

NO

Total settlement from 7.2-9.9m = **0.042 m**

SPT sample number	Depth (m)	Measured N	Top of Layer (m)	Bottom of Layer (m)	Flag "Clay" "Unsaturated" "Unreliable"	Fines content (%)	(N ₁) _{60-CS}	FS	Settlement						Δs_i (m)
									Limiting shear strain	Parameter	Max shear strain	ΔH_i	$\Delta L D_i$	Vertical reconsol Strain	
									γ_{lim}	F_α	γ_{max}	(m)	(m)	ϵ_v	(m)
1	7.2	21.0	7.2	7.5		50	26.00	0.87	0.078	0.170	0.047	0.300	0.014	0.011	0.003
2	7.5	21.0	7.5	7.8		50	26.00	0.86	0.078	0.170	0.048	0.300	0.014	0.011	0.003
3	7.8	20.0	7.8	8.1		50	25.00	0.78	0.089	0.232	0.060	0.300	0.018	0.014	0.004
4	8.1	20.0	8.1	8.4		50	24.00	0.72	0.100	0.292	0.074	0.300	0.022	0.018	0.005
5	8.4	17.0	8.4	8.7		50	22.00	0.62	0.127	0.408	0.127	0.300	0.038	0.021	0.006
6	8.7	20.0	8.7	9.0		50	25.00	0.77	0.089	0.232	0.061	0.300	0.018	0.015	0.004
7	9.0	21.0	9.0	9.3		50	26.00	0.84	0.078	0.170	0.050	0.300	0.015	0.011	0.003
8	9.3	18.0	9.3	9.6		50	22.00	0.61	0.127	0.408	0.127	0.300	0.038	0.021	0.006
9	9.6	20.0	9.6	9.9		50	24.00	0.71	0.100	0.292	0.076	0.300	0.023	0.019	0.006

[illegible]

SPT based settlement Calculation

SLS2

Peak Ground accel (g) = 0.190

Earthquake magnitude, $M = 6.00$

Water table depth (m) = 2.0

Average γ above water table (kN/m^3) = 17.4

Average γ below water table (kN/m^3) = 18.8

Borehole diameter (mm) = 50.5

Requires correction for sample liners

(YES/NO):

NO

Total settlement from 7.2-9.9m	=	0.001	m
--------------------------------	---	-------	---

									Settlement							
SPT sample number	Depth (m)	Measured N	Top of Layer (m)	Bottom of Layer (m)	Flag "Clay" "Unsaturated" "Unreliable"	Fines content (%)	(N ₁) _{60-cs}	FS	Limiting shear strain	Parameter	Max shear strain	ΔH _i	ΔLDI _i	Vertical reconsol Strain	Δs _i	
									γ _{lim}	F _α	γ _{max}	(m)	(m)	ε _v	(m)	
1	7.2	21.0	7.2	7.5		50	26.00	2.00	0.078	0.170	0.000	0.300	0.000	0.000	0.000	
2	7.5	21.0	7.5	7.8		50	26.00	2.00	0.078	0.170	0.000	0.300	0.000	0.000	0.000	
3	7.8	20.0	7.8	8.1		50	25.00	2.00	0.089	0.232	0.000	0.300	0.000	0.000	0.000	
4	8.1	20.0	8.1	8.4		50	24.00	2.00	0.100	0.292	0.000	0.300	0.000	0.000	0.000	
5	8.4	17.0	8.4	8.7		50	22.00	1.69	0.127	0.408	0.005	0.300	0.002	0.001	0.000	
6	8.7	20.0	8.7	9.0		50	25.00	2.00	0.089	0.232	0.000	0.300	0.000	0.000	0.000	
7	9.0	21.0	9.0	9.3		50	26.00	2.00	0.078	0.170	0.000	0.300	0.000	0.000	0.000	
8	9.3	18.0	9.3	9.6		50	22.00	1.69	0.127	0.408	0.005	0.300	0.002	0.001	0.000	
9	9.6	20.0	9.6	9.9		50	24.00	2.00	0.100	0.292	0.000	0.300	0.000	0.000	0.000	

SPT based settlement Calculation

ULS

Peak Ground accel (g) = **0.350**Earthquake magnitude, M = **7.50**

Water table depth (m) = 2.0

Average γ above water table (kN/m^3) = 17.4Average γ below water table (kN/m^3) = 18.8

Borehole diameter (mm) = 50.5

Requires correction for sample liners

(YES/NO):

NO

Total settlement from 5.7-9.9m = 0.022 m

SPT sample number	Depth (m)	Measured N	Top of Layer (m)	Bottom of Layer (m)	Flag "Clay" "Unsaturated" "Unreliable"	Fines content (%)	(N ₁) _{60-CS}	FS	Settlement						
									Limiting shear strain	Parameter	Max shear strain	ΔH _i	ΔLD _i	Vertical reconsol Strain	Δs _i
									γ _{lim}	F _α	γ _{max}	(m)	(m)	ε _v	(m)
1	5.7	23.0	5.7	6.0		50	30.00	1.41	0.046	-0.089	0.015	0.300	0.005	0.003	0.001
2	6.0	23.0	6.0	6.3		50	30.00	1.39	0.046	-0.089	0.016	0.300	0.005	0.003	0.001
3	6.3	26.0	6.3	6.6		50	31.00	1.58	0.040	-0.156	0.010	0.300	0.003	0.002	0.001
4	6.6	25.0	6.6	6.9		50	30.00	1.36	0.046	-0.089	0.017	0.300	0.005	0.003	0.001
5	6.9	24.0	6.9	7.2		50	30.00	1.35	0.046	-0.089	0.017	0.300	0.005	0.003	0.001
6	7.2	21.0	7.2	7.5		50	26.00	0.87	0.078	0.170	0.047	0.300	0.014	0.011	0.003
7	7.5	18.0	7.5	7.8		50	23.00	0.68	0.113	0.351	0.091	0.300	0.027	0.020	0.006
8	7.8	24.0	7.8	8.1		50	29.00	1.17	0.053	-0.022	0.025	0.300	0.007	0.005	0.002
9	8.1	26.0	8.1	8.4		50	30.00	1.31	0.046	-0.089	0.019	0.300	0.006	0.004	0.001
10	8.4	25.0	8.4	8.7		50	28.00	1.03	0.061	0.043	0.033	0.300	0.010	0.007	0.002
11	8.7	26.0	8.7	9.0		50	30.00	1.30	0.046	-0.089	0.019	0.300	0.006	0.004	0.001
12	9.0	27.0	9.0	9.3		50	31.00	1.48	0.040	-0.156	0.013	0.300	0.004	0.002	0.001
13	9.3	27.0	9.3	9.6		50	31.00	1.47	0.040	-0.156	0.013	0.300	0.004	0.003	0.001
14	9.6	28.0	9.6	9.9		50	31.00	1.46	0.040	-0.156	0.014	0.300	0.004	0.003	0.001

SPT based settlement Calculation

SLS1

0.130

Peak Ground accel (g) =

7.50

Earthquake magnitude, M =

2.0

Water table depth (m) =

17.4

Average γ above water table (kN/m³) =

18.8

Average γ below water table (kN/m³) =

50.5

Borehole diameter (mm) =

NO

Requires correction for sample liners

(YES/NO):

Total settlement from 5.7-9.9m = 0.000 m

SPT sample number	Depth (m)	Measured N	Top of Layer (m)	Bottom of Layer (m)	Flag "Clay" "Unsaturated" "Unreliable"	Fines content (%)	(N ₁) _{60-CS}	FS	Settlement						Δs_i
									Limiting shear strain	Parameter	Max shear strain	ΔH_i	ΔLD_i	Vertical reconsol Strain	
									γ_{lim}	F_α	γ_{max}	(m)	(m)	ϵ_v	(m)
1	5.7	23.0	5.7	6.0		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000
2	6.0	23.0	6.0	6.3		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000
3	6.3	26.0	6.3	6.6		50	31.00	2.00	0.040	-0.156	0.000	0.300	0.000	0.000	0.000
4	6.6	25.0	6.6	6.9		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000
5	6.9	24.0	6.9	7.2		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000
6	7.2	21.0	7.2	7.5		50	26.00	2.00	0.078	0.170	0.000	0.300	0.000	0.000	0.000
7	7.5	18.0	7.5	7.8		50	23.00	1.82	0.113	0.351	0.003	0.300	0.001	0.001	0.000
8	7.8	24.0	7.8	8.1		50	29.00	2.00	0.053	-0.022	0.000	0.300	0.000	0.000	0.000
9	8.1	26.0	8.1	8.4		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000
10	8.4	25.0	8.4	8.7		50	28.00	2.00	0.061	0.043	0.000	0.300	0.000	0.000	0.000
11	8.7	26.0	8.7	9.0		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000
12	9.0	27.0	9.0	9.3		50	31.00	2.00	0.040	-0.156	0.000	0.300	0.000	0.000	0.000
13	9.3	27.0	9.3	9.6		50	31.00	2.00	0.040	-0.156	0.000	0.300	0.000	0.000	0.000
14	9.6	28.0	9.6	9.9		50	31.00	2.00	0.040	-0.156	0.000	0.300	0.000	0.000	0.000

SLS2

Peak Ground accel (g) = **0.190**Earthquake magnitude, $M = 6.00$

Water table depth (m) = 2.0

Average γ above water table (kN/m^3) = 17.4Average γ below water table (kN/m^3) = 18.8

18.8

Borehole diameter

Requires correction for sample liners

ON

Total settlement from 5.7-9.9m

										Settlement							
SPT sample number	Depth (m)	Measured N	Top of Layer (m)	Bottom of Layer (m)	Flag "Clay" "Unsaturated" "Unreliable"	Fines content (%)	(N ₁) _{60-cs}	FS	Limiting shear strain	Parameter	Max shear strain	ΔH _i	ΔLD _i	Vertical reconsol Strain	Δs _i		
									γ _{lim}	F _α	γ _{max}	(m)	(m)	ε _v	(m)		
1	5.7	23.0	5.7	6.0		50	31.00	2.00	0.040	-0.156	0.000	0.300	0.000	0.000	0.000		
2	6.0	23.0	6.0	6.3		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000		
3	6.3	26.0	6.3	6.6		50	32.00	2.00	0.035	-0.225	0.000	0.300	0.000	0.000	0.000		
4	6.6	25.0	6.6	6.9		50	31.00	2.00	0.040	-0.156	0.000	0.300	0.000	0.000	0.000		
5	6.9	24.0	6.9	7.2		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000		
6	7.2	21.0	7.2	7.5		50	27.00	2.00	0.069	0.107	0.000	0.300	0.000	0.000	0.000		
7	7.5	18.0	7.5	7.8		50	23.00	1.79	0.113	0.351	0.003	0.300	0.001	0.001	0.000		
8	7.8	24.0	7.8	8.1		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000		
9	8.1	26.0	8.1	8.4		50	30.00	2.00	0.046	-0.089	0.000	0.300	0.000	0.000	0.000		
10	8.4	25.0	8.4	8.7		50	29.00	2.00	0.053	-0.022	0.000	0.300	0.000	0.000	0.000		
11	8.7	26.0	8.7	9.0		50	31.00	2.00	0.040	-0.156	0.000	0.300	0.000	0.000	0.000		
12	9.0	27.0	9.0	9.3		50	32.00	2.00	0.035	-0.225	0.000	0.300	0.000	0.000	0.000		
13	9.3	27.0	9.3	9.6		50	31.00	2.00	0.040	-0.156	0.000	0.300	0.000	0.000	0.000		
14	9.6	28.0	9.6	9.9		50	32.00	2.00	0.035	-0.225	0.000	0.300	0.000	0.000	0.000		

0.350

7.50

2.0

171

100

0.9T

50.5

for sample liners

(YES/NO):

NO

Total settlement from 5.7-9.9m	=	0.038	m
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									Settlement								
SPT sample number	Depth (m)	Measured N	Top of Layer (m)	Bottom of Layer (m)	Flag "Clay" "Unsaturated" "Unreliable"	Fines content (%)	(N ₁) _{60-CS}	FS	Limiting shear strain	Parameter	Max shear strain	ΔH _i	ΔD _i	Vertical reconsol Strain	Δs _i		
									γ _{lim}	F _α	γ _{max}	(m)	(m)	ε _v	(m)		
1	5.8	25.0	5.8	6.1		50	31.00	1.62	0.040	-0.156	0.009	0.300	0.003	0.002	0.000		
2	6.1	23.0	6.1	6.4		50	29.00	1.22	0.053	-0.022	0.022	0.300	0.007	0.005	0.001		
3	6.4	22.0	6.4	6.7		50	28.00	1.08	0.061	0.043	0.030	0.300	0.009	0.006	0.002		
4	6.7	21.0	6.7	7.0		50	27.00	0.96	0.069	0.107	0.038	0.300	0.011	0.008	0.003		
5	7.0	22.0	7.0	7.3		50	27.00	0.96	0.069	0.107	0.038	0.300	0.011	0.008	0.003		
6	7.3	17.0	7.3	7.6		50	23.00	0.68	0.113	0.351	0.091	0.300	0.027	0.020	0.006		
7	7.6	18.0	7.6	7.9		50	23.00	0.67	0.113	0.351	0.095	0.300	0.028	0.020	0.006		
8	7.9	24.0	7.9	8.2		50	29.00	1.16	0.053	-0.022	0.025	0.300	0.008	0.005	0.002		
9	8.2	24.0	8.2	8.5		50	28.00	1.03	0.061	0.043	0.033	0.300	0.010	0.007	0.002		
10	8.5	23.0	8.5	8.8		50	28.00	1.03	0.061	0.043	0.033	0.300	0.010	0.007	0.002		
11	8.8	21.0	8.8	9.1		50	26.00	0.84	0.078	0.170	0.050	0.300	0.015	0.011	0.003		
12	9.1	21.0	9.1	9.4		50	26.00	0.84	0.078	0.170	0.050	0.300	0.015	0.011	0.003		
13	9.4	25.0	9.4	9.7		50	28.00	1.01	0.061	0.043	0.034	0.300	0.010	0.007	0.002		
14	9.7	23.0	9.7	9.9		50	27.00	0.91	0.069	0.107	0.042	0.200	0.008	0.009	0.002		

SPT based settlement Calculation

Peak Ground accel (g) = **0.130** **SLS1**Earthquake magnitude, M = **7.50**Water table depth (m) = **2.0**Average γ above water table (kN/m^3) = **17.4**Average γ below water table (kN/m^3) = **18.8**Borehole diameter (mm) = **50.5**

Requires correction for sample liners

(YES/NO):

NOTotal settlement from 5.7-9.9m = **0.000** m

										Settlement						
SPT sample number	Depth (m)	Measured N	Top of Layer (m)	Bottom of Layer (m)	Flag "Clay" "Unsaturated" "Unreliable"	Fines content (%)	(N ₁) _{60-CS}	FS	Limiting shear strain	Parameter	Max shear strain	ΔH _i	ΔDL _i	Vertical reconsol Strain	Δs _i	
									γ _{lim}	F _α	γ _{max}	(m)	(m)	ε _v	(m)	
1	5.8	25.0	5.8	6.1		50	32.00	2.00	0.035	-0.225	0.000	0.300	0.000	0.000	0.000	
2	6.1	23.0	6.1	6.4		50	29.00	2.00	0.053	-0.022	0.000	0.300	0.000	0.000	0.000	
3	6.4	22.0	6.4	6.7		50	28.00	2.00	0.061	0.043	0.000	0.300	0.000	0.000	0.000	
4	6.7	21.0	6.7	7.0		50	27.00	2.00	0.069	0.107	0.000	0.300	0.000	0.000	0.000	
5	7.0	22.0	7.0	7.3		50	27.00	2.00	0.069	0.107	0.000	0.300	0.000	0.000	0.000	
6	7.3	17.0	7.3	7.6		50	23.00	1.81	0.113	0.351	0.003	0.300	0.001	0.001	0.000	
7	7.6	18.0	7.6	7.9		50	23.00	1.80	0.113	0.351	0.003	0.300	0.001	0.001	0.000	
8	7.9	24.0	7.9	8.2		50	28.00	2.00	0.061	0.043	0.000	0.300	0.000	0.000	0.000	
9	8.2	24.0	8.2	8.5		50	28.00	2.00	0.061	0.043	0.000	0.300	0.000	0.000	0.000	
10	8.5	23.0	8.5	8.8		50	28.00	2.00	0.061	0.043	0.000	0.300	0.000	0.000	0.000	
11	8.8	21.0	8.8	9.1		50	26.00	2.00	0.078	0.170	0.000	0.300	0.000	0.000	0.000	
12	9.1	21.0	9.1	9.4		50	26.00	2.00	0.078	0.170	0.000	0.300	0.000	0.000	0.000	
13	9.4	25.0	9.4	9.7		50	29.00	2.00	0.053	-0.022	0.000	0.300	0.000	0.000	0.000	
14	9.7	23.0	9.7	9.9		50	27.00	2.00	0.069	0.107	0.000	0.200	0.000	0.000	0.000	

Peak Ground accel (g) = 0.190 SLS2

Peak Ground accel (g) = 0.190

Earthquake magnitude, $M = 6.00$

Water table depth (m) = 2.0

Average value of water table (kN/m^3) = 17.4Average γ below water table (kN/m^3) = 18.0

Borehole diameter (mm) = 50.5

Requires correction for sample liners

(YES/NO):

ON

SLS2

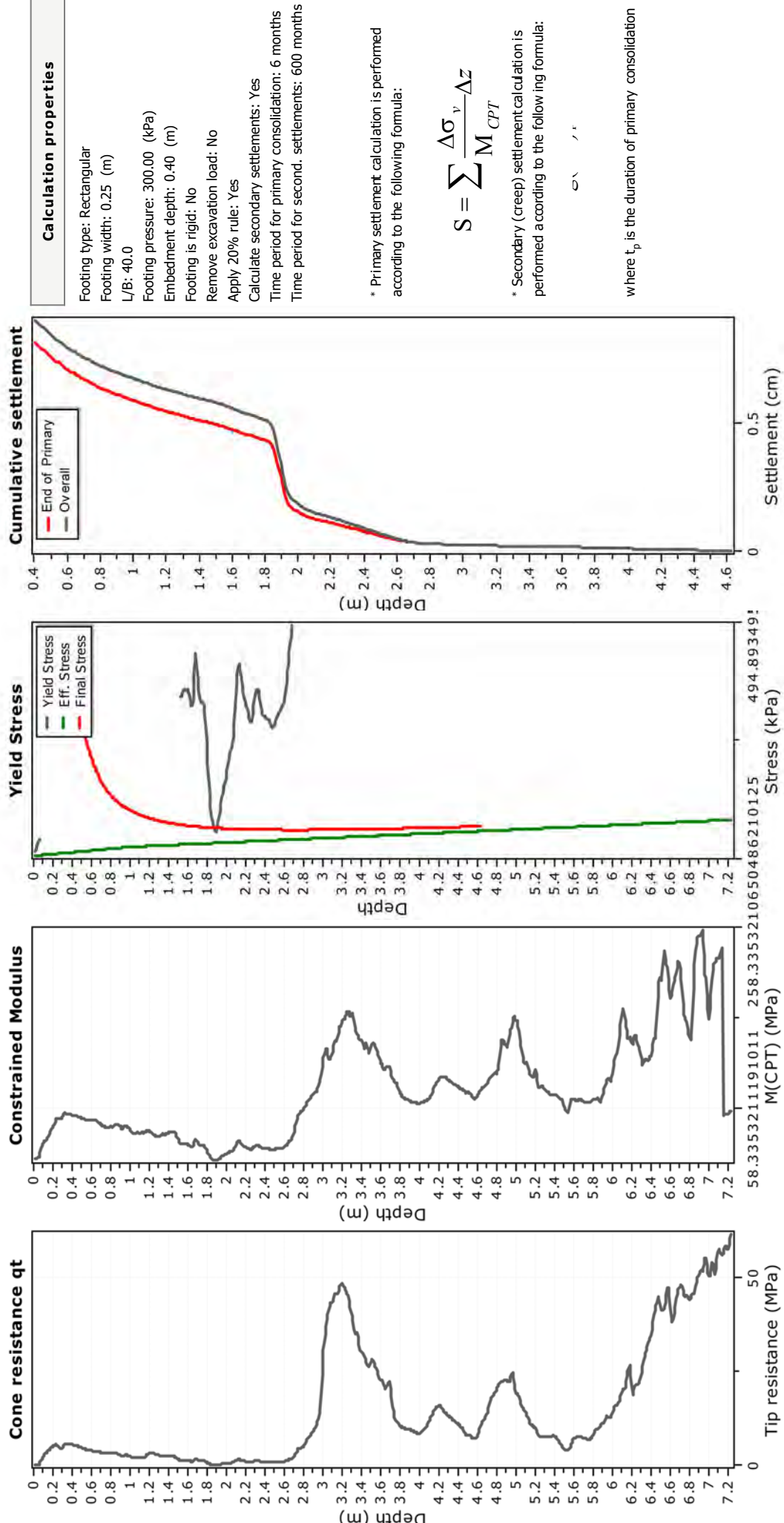
Total settlement from 5.7-9.9m	=	0.000	m
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										Settlement							
SPT sample number	Depth (m)	Measured N	Top of Layer (m)	Bottom of Layer (m)	Flag "Clay" "Unsaturated" "Unreliable"	Fines content (%)	(N ₁) _{60-CS}	FS	Limiting shear strain	Parameter	Max shear strain	ΔH _i	ΔLDI _i	Vertical reconsol Strain	Δs _i		
									γ _{lim}	F _α	γ _{max}	(m)	(m)	ε _v	(m)		
1	5.8	25.0	5.8	6.1		50	31.00	2.00	0.040	-0.156	0.000	0.300	0.000	0.000	0.000		
2	6.1	23.0	6.1	6.4		50	29.00	2.00	0.053	-0.022	0.000	0.300	0.000	0.000	0.000		
3	6.4	22.0	6.4	6.7		50	28.00	2.00	0.061	0.043	0.000	0.300	0.000	0.000	0.000		
4	6.7	21.0	6.7	7.0		50	27.00	2.00	0.069	0.107	0.000	0.300	0.000	0.000	0.000		
5	7.0	22.0	7.0	7.3		50	27.00	2.00	0.069	0.107	0.000	0.300	0.000	0.000	0.000		
6	7.3	17.0	7.3	7.6		50	23.00	1.85	0.113	0.351	0.002	0.300	0.001	0.001	0.000		
7	7.6	18.0	7.6	7.9		50	23.00	1.85	0.113	0.351	0.002	0.300	0.001	0.001	0.000		
8	7.9	24.0	7.9	8.2		50	29.00	2.00	0.053	-0.022	0.000	0.300	0.000	0.000	0.000		
9	8.2	24.0	8.2	8.5		50	28.00	2.00	0.061	0.043	0.000	0.300	0.000	0.000	0.000		
10	8.5	23.0	8.5	8.8		50	28.00	2.00	0.061	0.043	0.000	0.300	0.000	0.000	0.000		
11	8.8	21.0	8.8	9.1		50	26.00	2.00	0.078	0.170	0.000	0.300	0.000	0.000	0.000		
12	9.1	21.0	9.1	9.4		50	26.00	2.00	0.078	0.170	0.000	0.300	0.000	0.000	0.000		
13	9.4	25.0	9.4	9.7		50	28.00	2.00	0.061	0.043	0.000	0.300	0.000	0.000	0.000		
14	9.7	23.0	9.7	9.9		50	27.00	2.00	0.069	0.107	0.000	0.200	0.000	0.000	0.000		

Project: Deep Geotechnical Investigation
Location: Unit 1&2, 85 Trafalgar St

CPT: CPT_001
Total depth: 7.23 m, Date: 16/04/2021
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Settlements calculation according to theory of elasticity *



:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
1	0.40	0.41	0.01	0.01	299.99	50.30	1.00	0.006	0.000	0.006
2	0.41	0.42	0.01	0.02	299.78	50.06	1.00	0.006	0.000	0.006
3	0.42	0.43	0.01	0.03	299.03	49.92	1.00	0.006	0.000	0.006
4	0.43	0.44	0.01	0.04	297.45	49.72	0.99	0.006	0.000	0.006
5	0.44	0.45	0.01	0.05	294.87	49.51	0.98	0.006	0.000	0.006
6	0.45	0.46	0.01	0.06	291.24	49.21	0.97	0.006	0.000	0.006
7	0.46	0.47	0.01	0.06	286.59	48.84	0.96	0.006	0.000	0.006
8	0.47	0.48	0.01	0.08	281.05	48.47	0.94	0.006	0.000	0.006
9	0.48	0.49	0.01	0.09	274.75	47.89	0.92	0.006	0.000	0.006
10	0.49	0.50	0.01	0.10	267.89	47.40	0.89	0.006	0.000	0.006
11	0.50	0.51	0.01	0.11	260.63	46.78	0.87	0.006	0.000	0.006
12	0.51	0.52	0.01	0.12	253.12	46.40	0.84	0.005	0.000	0.005
13	0.52	0.53	0.01	0.13	245.49	46.10	0.82	0.005	0.000	0.005
14	0.53	0.54	0.01	0.14	237.87	45.94	0.79	0.005	0.000	0.005
15	0.54	0.55	0.01	0.15	230.33	45.76	0.77	0.005	0.000	0.005
16	0.55	0.56	0.01	0.16	222.94	45.62	0.74	0.005	0.000	0.005
17	0.56	0.57	0.01	0.17	215.75	45.33	0.72	0.005	0.000	0.005
18	0.57	0.58	0.01	0.18	208.79	45.11	0.70	0.005	0.000	0.005
19	0.58	0.59	0.01	0.19	202.08	44.85	0.67	0.005	0.000	0.005
20	0.59	0.60	0.01	0.20	195.64	44.81	0.65	0.004	0.000	0.004
21	0.60	0.61	0.01	0.21	189.47	44.80	0.63	0.004	0.000	0.004
22	0.61	0.62	0.01	0.22	183.57	44.81	0.61	0.004	0.000	0.004
23	0.62	0.63	0.01	0.23	177.93	44.70	0.59	0.004	0.000	0.004
24	0.63	0.64	0.01	0.24	172.55	44.56	0.58	0.004	0.000	0.004
25	0.64	0.65	0.01	0.25	167.42	44.44	0.56	0.004	0.000	0.004
26	0.65	0.66	0.01	0.26	162.53	44.17	0.54	0.004	0.000	0.004
27	0.66	0.67	0.01	0.27	157.87	43.50	0.53	0.004	0.000	0.004
28	0.67	0.68	0.01	0.28	153.43	42.47	0.51	0.004	0.000	0.004
29	0.68	0.69	0.01	0.28	149.19	41.46	0.50	0.004	0.000	0.004
30	0.69	0.70	0.01	0.30	145.15	40.60	0.48	0.004	0.000	0.004
31	0.70	0.71	0.01	0.31	141.30	39.78	0.47	0.004	0.000	0.004
32	0.71	0.72	0.01	0.32	137.62	39.05	0.46	0.004	0.000	0.004
33	0.72	0.73	0.01	0.33	134.11	38.48	0.45	0.003	0.000	0.003
34	0.73	0.74	0.01	0.34	130.76	38.02	0.44	0.003	0.000	0.003
35	0.74	0.75	0.01	0.35	127.55	37.68	0.43	0.003	0.000	0.003
36	0.75	0.76	0.01	0.36	124.49	37.42	0.41	0.003	0.000	0.003
37	0.76	0.77	0.01	0.37	121.55	37.43	0.41	0.003	0.000	0.003
38	0.77	0.78	0.01	0.38	118.74	37.57	0.40	0.003	0.000	0.003
39	0.78	0.79	0.01	0.39	116.05	37.76	0.39	0.003	0.000	0.003
40	0.79	0.80	0.01	0.40	113.47	37.89	0.38	0.003	0.000	0.003
41	0.80	0.81	0.01	0.41	110.99	37.85	0.37	0.003	0.000	0.003
42	0.81	0.82	0.01	0.42	108.61	37.77	0.36	0.003	0.000	0.003
43	0.82	0.83	0.01	0.43	106.33	38.18	0.35	0.003	0.000	0.003
44	0.83	0.84	0.01	0.44	104.13	39.01	0.35	0.003	0.000	0.003
45	0.84	0.85	0.01	0.45	102.02	39.83	0.34	0.003	0.000	0.003
46	0.85	0.86	0.01	0.46	99.99	40.06	0.33	0.002	0.000	0.002

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
47	0.86	0.87	0.01	0.47	98.03	39.86	0.33	0.002	0.000	0.002
48	0.87	0.88	0.01	0.48	96.15	39.60	0.32	0.002	0.000	0.002
49	0.88	0.89	0.01	0.49	94.33	39.38	0.31	0.002	0.000	0.002
50	0.89	0.90	0.01	0.50	92.58	39.14	0.31	0.002	0.000	0.002
51	0.90	0.91	0.01	0.51	90.88	38.49	0.30	0.002	0.000	0.002
52	0.91	0.92	0.01	0.52	89.25	35.86	0.30	0.002	0.000	0.002
53	0.92	0.93	0.01	0.53	87.67	35.57	0.29	0.002	0.000	0.002
54	0.93	0.94	0.01	0.54	86.15	38.28	0.29	0.002	0.000	0.002
55	0.94	0.95	0.01	0.55	84.67	38.36	0.28	0.002	0.000	0.002
56	0.95	0.96	0.01	0.56	83.24	38.21	0.28	0.002	0.000	0.002
57	0.96	0.97	0.01	0.56	81.86	37.86	0.27	0.002	0.000	0.002
58	0.97	0.98	0.01	0.57	80.52	37.16	0.27	0.002	0.000	0.002
59	0.98	0.99	0.01	0.59	79.23	36.39	0.26	0.002	0.000	0.002
60	0.99	1.00	0.01	0.60	77.97	35.38	0.26	0.002	0.000	0.002
61	1.00	1.01	0.01	0.61	76.75	34.42	0.26	0.002	0.000	0.002
62	1.01	1.02	0.01	0.62	75.57	31.83	0.25	0.002	0.000	0.002
63	1.02	1.03	0.01	0.63	74.42	30.61	0.25	0.002	0.000	0.002
64	1.03	1.04	0.01	0.64	73.31	30.28	0.24	0.002	0.000	0.002
65	1.04	1.05	0.01	0.65	72.23	30.27	0.24	0.002	0.000	0.002
66	1.05	1.06	0.01	0.66	71.17	30.27	0.24	0.002	0.000	0.002
67	1.06	1.07	0.01	0.67	70.15	30.31	0.23	0.002	0.000	0.002
68	1.07	1.08	0.01	0.68	69.16	31.29	0.23	0.002	0.000	0.002
69	1.08	1.09	0.01	0.69	68.19	30.82	0.23	0.002	0.000	0.002
70	1.09	1.10	0.01	0.70	67.25	30.54	0.22	0.002	0.000	0.002
71	1.10	1.11	0.01	0.71	66.34	30.87	0.22	0.002	0.000	0.002
72	1.11	1.12	0.01	0.72	65.44	31.18	0.22	0.002	0.000	0.002
73	1.12	1.13	0.01	0.73	64.58	31.27	0.22	0.002	0.000	0.002
74	1.13	1.14	0.01	0.74	63.73	31.25	0.21	0.002	0.000	0.002
75	1.14	1.15	0.01	0.75	62.90	31.15	0.21	0.002	0.000	0.002
76	1.15	1.16	0.01	0.76	62.10	31.51	0.21	0.002	0.000	0.002
77	1.16	1.17	0.01	0.77	61.32	32.18	0.20	0.002	0.000	0.002
78	1.17	1.18	0.01	0.78	60.55	33.27	0.20	0.002	0.000	0.002
79	1.18	1.19	0.01	0.79	59.80	33.61	0.20	0.002	0.000	0.002
80	1.19	1.20	0.01	0.80	59.08	33.44	0.20	0.002	0.000	0.002
81	1.20	1.21	0.01	0.81	58.36	32.64	0.19	0.002	0.000	0.002
82	1.21	1.22	0.01	0.82	57.67	31.89	0.19	0.002	0.000	0.002
83	1.22	1.23	0.01	0.83	56.99	30.89	0.19	0.002	0.000	0.002
84	1.23	1.24	0.01	0.84	56.33	29.85	0.19	0.002	0.000	0.002
85	1.24	1.25	0.01	0.85	55.68	28.84	0.19	0.002	0.000	0.002
86	1.25	1.26	0.01	0.86	55.05	28.23	0.18	0.002	0.000	0.002
87	1.26	1.27	0.01	0.87	54.43	27.77	0.18	0.002	0.000	0.002
88	1.27	1.28	0.01	0.88	53.82	27.47	0.18	0.002	0.000	0.002
89	1.28	1.29	0.01	0.89	53.23	27.31	0.18	0.002	0.000	0.002
90	1.29	1.30	0.01	0.90	52.65	27.45	0.18	0.002	0.000	0.002
91	1.30	1.31	0.01	0.91	52.08	27.58	0.17	0.002	0.000	0.002
92	1.31	1.32	0.01	0.92	51.52	27.74	0.17	0.002	0.000	0.002

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
93	1.32	1.33	0.01	0.93	50.98	28.46	0.17	0.002	0.000	0.002
94	1.33	1.34	0.01	0.94	50.44	29.10	0.17	0.002	0.000	0.002
95	1.34	1.35	0.01	0.95	49.92	29.61	0.17	0.002	0.000	0.002
96	1.35	1.36	0.01	0.96	49.41	29.49	0.16	0.002	0.000	0.002
97	1.36	1.37	0.01	0.97	48.91	29.48	0.16	0.002	0.000	0.002
98	1.37	1.38	0.01	0.98	48.42	29.71	0.16	0.002	0.000	0.002
99	1.38	1.39	0.01	0.99	47.93	30.19	0.16	0.002	0.000	0.002
100	1.39	1.40	0.01	1.00	47.46	30.91	0.16	0.002	0.000	0.002
101	1.40	1.41	0.01	1.00	47.00	31.70	0.16	0.001	0.000	0.001
102	1.41	1.42	0.01	1.01	46.54	32.02	0.16	0.001	0.000	0.001
103	1.42	1.43	0.01	1.02	46.10	31.85	0.15	0.001	0.000	0.001
104	1.43	1.44	0.01	1.04	45.66	31.42	0.15	0.001	0.000	0.001
105	1.44	1.45	0.01	1.05	45.23	31.26	0.15	0.001	0.000	0.001
106	1.45	1.46	0.01	1.06	44.81	31.39	0.15	0.001	0.000	0.001
107	1.46	1.47	0.01	1.07	44.39	31.30	0.15	0.001	0.000	0.001
108	1.47	1.48	0.01	1.08	43.99	31.10	0.15	0.001	0.000	0.001
109	1.48	1.49	0.01	1.09	43.59	27.82	0.15	0.002	0.000	0.002
110	1.49	1.50	0.01	1.10	43.19	25.76	0.14	0.002	0.000	0.002
111	1.50	1.51	0.01	1.11	42.81	23.05	0.14	0.002	0.000	0.002
112	1.51	1.52	0.01	1.12	42.43	20.57	0.14	0.002	0.000	0.002
113	1.52	1.53	0.01	1.13	42.06	18.87	0.14	0.002	0.000	0.002
114	1.53	1.54	0.01	1.14	41.69	18.55	0.14	0.002	0.000	0.003
115	1.54	1.55	0.01	1.15	41.33	18.79	0.14	0.002	0.000	0.002
116	1.55	1.56	0.01	1.16	40.98	19.03	0.14	0.002	0.000	0.002
117	1.56	1.57	0.01	1.17	40.63	19.11	0.14	0.002	0.000	0.002
118	1.57	1.58	0.01	1.18	40.29	19.11	0.13	0.002	0.000	0.002
119	1.58	1.59	0.01	1.19	39.95	18.83	0.13	0.002	0.000	0.002
120	1.59	1.60	0.01	1.20	39.62	18.55	0.13	0.002	0.000	0.002
121	1.60	1.61	0.01	1.21	39.30	17.94	0.13	0.002	0.000	0.002
122	1.61	1.62	0.01	1.22	38.98	17.10	0.13	0.002	0.000	0.003
123	1.62	1.63	0.01	1.23	38.66	16.07	0.13	0.002	0.000	0.003
124	1.63	1.64	0.01	1.24	38.35	15.42	0.13	0.002	0.000	0.003
125	1.64	1.65	0.01	1.25	38.05	15.65	0.13	0.002	0.000	0.003
126	1.65	1.66	0.01	1.25	37.74	16.58	0.13	0.002	0.000	0.003
127	1.66	1.67	0.01	1.26	37.45	20.83	0.12	0.002	0.000	0.002
128	1.67	1.68	0.01	1.27	37.16	23.07	0.12	0.002	0.000	0.002
129	1.68	1.69	0.01	1.29	36.87	24.20	0.12	0.002	0.000	0.002
130	1.69	1.70	0.01	1.30	36.59	21.72	0.12	0.002	0.000	0.002
131	1.70	1.71	0.01	1.31	36.31	20.18	0.12	0.002	0.000	0.002
132	1.71	1.72	0.01	1.32	36.03	18.60	0.12	0.002	0.000	0.002
133	1.72	1.73	0.01	1.33	35.76	17.39	0.12	0.002	0.000	0.002
134	1.73	1.74	0.01	1.34	35.50	16.80	0.12	0.002	0.000	0.002
135	1.74	1.75	0.01	1.35	35.23	17.01	0.12	0.002	0.000	0.002
136	1.75	1.76	0.01	1.36	34.98	17.07	0.12	0.002	0.000	0.002
137	1.76	1.77	0.01	1.37	34.72	17.12	0.12	0.002	0.000	0.002
138	1.77	1.78	0.01	1.38	34.47	16.24	0.11	0.002	0.000	0.002

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
139	1.78	1.79	0.01	1.39	34.22	14.47	0.11	0.002	0.000	0.003
140	1.79	1.80	0.01	1.40	33.98	11.82	0.11	0.003	0.000	0.003
141	1.80	1.81	0.01	1.41	33.74	9.17	0.11	0.004	0.001	0.004
142	1.81	1.82	0.01	1.42	33.50	7.08	0.11	0.005	0.001	0.005
143	1.82	1.83	0.01	1.43	33.26	5.44	0.11	0.006	0.001	0.007
144	1.83	1.84	0.01	1.44	33.03	3.50	0.11	0.009	0.002	0.011
145	1.84	1.85	0.01	1.45	32.80	2.24	0.11	0.015	0.002	0.017
146	1.85	1.86	0.01	1.46	32.58	1.66	0.11	0.020	0.003	0.023
147	1.86	1.87	0.01	1.47	32.36	1.45	0.11	0.022	0.004	0.026
148	1.87	1.88	0.01	1.48	32.14	1.16	0.11	0.028	0.005	0.032
149	1.88	1.89	0.01	1.49	31.92	0.95	0.11	0.034	0.006	0.039
150	1.89	1.90	0.01	1.50	31.71	0.90	0.11	0.035	0.006	0.041
151	1.90	1.91	0.01	1.51	31.50	1.15	0.10	0.027	0.005	0.032
152	1.91	1.92	0.01	1.52	31.29	1.56	0.10	0.020	0.004	0.023
153	1.92	1.93	0.01	1.53	31.08	2.22	0.10	0.014	0.002	0.016
154	1.93	1.94	0.01	1.54	30.88	2.92	0.10	0.011	0.002	0.012
155	1.94	1.95	0.01	1.55	30.68	4.02	0.10	0.008	0.001	0.009
156	1.95	1.96	0.01	1.56	30.48	5.17	0.10	0.006	0.001	0.007
157	1.96	1.97	0.01	1.57	30.29	5.93	0.10	0.005	0.001	0.006
158	1.97	1.98	0.01	1.58	30.09	6.35	0.10	0.005	0.001	0.006
159	1.98	1.99	0.01	1.59	29.90	6.86	0.10	0.004	0.001	0.005
160	1.99	2.00	0.01	1.60	29.71	7.37	0.10	0.004	0.001	0.005
161	2.00	2.01	0.01	1.61	29.53	8.06	0.10	0.004	0.001	0.004
162	2.01	2.02	0.01	1.62	29.34	8.81	0.10	0.003	0.001	0.004
163	2.02	2.03	0.01	1.63	29.16	9.50	0.10	0.003	0.001	0.004
164	2.03	2.04	0.01	1.64	28.98	9.96	0.10	0.003	0.001	0.003
165	2.04	2.05	0.01	1.65	28.81	10.24	0.10	0.003	0.001	0.003
166	2.05	2.06	0.01	1.66	28.63	10.66	0.10	0.003	0.001	0.003
167	2.06	2.07	0.01	1.67	28.46	11.12	0.09	0.003	0.001	0.003
168	2.07	2.08	0.01	1.68	28.29	11.58	0.09	0.002	0.000	0.003
169	2.08	2.09	0.01	1.69	28.12	13.68	0.09	0.002	0.000	0.002
170	2.09	2.10	0.01	1.70	27.95	16.06	0.09	0.002	0.000	0.002
171	2.10	2.11	0.01	1.71	27.79	19.00	0.09	0.001	0.000	0.002
172	2.11	2.12	0.01	1.72	27.62	20.39	0.09	0.001	0.000	0.002
173	2.12	2.13	0.01	1.73	27.46	21.46	0.09	0.001	0.000	0.002
174	2.13	2.14	0.01	1.74	27.30	21.68	0.09	0.001	0.000	0.002
175	2.14	2.15	0.01	1.75	27.14	20.82	0.09	0.001	0.000	0.002
176	2.15	2.16	0.01	1.76	26.99	19.49	0.09	0.001	0.000	0.002
177	2.16	2.17	0.01	1.77	26.83	18.02	0.09	0.001	0.000	0.002
178	2.17	2.18	0.01	1.78	26.68	17.10	0.09	0.002	0.000	0.002
179	2.18	2.19	0.01	1.79	26.53	16.32	0.09	0.002	0.000	0.002
180	2.19	2.20	0.01	1.80	26.38	15.74	0.09	0.002	0.000	0.002
181	2.20	2.21	0.01	1.81	26.23	15.26	0.09	0.002	0.000	0.002
182	2.21	2.22	0.01	1.82	26.08	14.79	0.09	0.002	0.000	0.002
183	2.22	2.23	0.01	1.83	25.94	14.18	0.09	0.002	0.000	0.002
184	2.23	2.24	0.01	1.84	25.80	13.57	0.09	0.002	0.000	0.002

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
185	2.24	2.25	0.01	1.85	25.65	13.15	0.09	0.002	0.000	0.002
186	2.25	2.26	0.01	1.86	25.51	13.05	0.09	0.002	0.000	0.002
187	2.26	2.27	0.01	1.87	25.38	13.47	0.08	0.002	0.000	0.002
188	2.27	2.28	0.01	1.88	25.24	14.21	0.08	0.002	0.000	0.002
189	2.28	2.29	0.01	1.89	25.10	15.29	0.08	0.002	0.000	0.002
190	2.29	2.30	0.01	1.90	24.97	16.26	0.08	0.002	0.000	0.002
191	2.30	2.31	0.01	1.91	24.83	17.01	0.08	0.001	0.000	0.002
192	2.31	2.32	0.01	1.92	24.70	17.29	0.08	0.001	0.000	0.002
193	2.32	2.33	0.01	1.93	24.57	17.19	0.08	0.001	0.000	0.002
194	2.33	2.34	0.01	1.94	24.44	17.00	0.08	0.001	0.000	0.002
195	2.34	2.35	0.01	1.95	24.31	16.11	0.08	0.002	0.000	0.002
196	2.35	2.36	0.01	1.96	24.19	15.17	0.08	0.002	0.000	0.002
197	2.36	2.37	0.01	1.97	24.06	14.15	0.08	0.002	0.000	0.002
198	2.37	2.38	0.01	1.98	23.94	13.91	0.08	0.002	0.000	0.002
199	2.38	2.39	0.01	1.99	23.81	13.81	0.08	0.002	0.000	0.002
200	2.39	2.40	0.01	2.00	23.69	13.81	0.08	0.002	0.000	0.002
201	2.40	2.41	0.01	2.01	23.57	13.67	0.08	0.002	0.000	0.002
202	2.41	2.42	0.01	2.02	23.45	13.48	0.08	0.002	0.000	0.002
203	2.42	2.43	0.01	2.03	23.33	13.43	0.08	0.002	0.000	0.002
204	2.43	2.44	0.01	2.04	23.22	13.43	0.08	0.002	0.000	0.002
205	2.44	2.45	0.01	2.05	23.10	13.33	0.08	0.002	0.000	0.002
206	2.45	2.46	0.01	2.06	22.99	13.05	0.08	0.002	0.000	0.002
207	2.46	2.47	0.01	2.07	22.87	12.77	0.08	0.002	0.001	0.002
208	2.47	2.48	0.01	2.08	22.76	12.53	0.08	0.002	0.001	0.002
209	2.48	2.49	0.01	2.09	22.65	12.49	0.08	0.002	0.001	0.002
210	2.49	2.50	0.01	2.10	22.54	12.62	0.08	0.002	0.001	0.002
211	2.50	2.51	0.01	2.11	22.43	12.90	0.07	0.002	0.001	0.002
212	2.51	2.52	0.01	2.12	22.32	13.27	0.07	0.002	0.000	0.002
213	2.52	2.53	0.01	2.13	22.21	13.60	0.07	0.002	0.000	0.002
214	2.53	2.54	0.01	2.13	22.10	13.87	0.07	0.002	0.000	0.002
215	2.54	2.55	0.01	2.15	22.00	14.06	0.07	0.002	0.000	0.002
216	2.55	2.56	0.01	2.15	21.89	14.29	0.07	0.002	0.000	0.002
217	2.56	2.57	0.01	2.17	21.79	14.52	0.07	0.002	0.000	0.002
218	2.57	2.58	0.01	2.17	21.68	14.66	0.07	0.001	0.000	0.002
219	2.58	2.59	0.01	2.19	21.58	14.79	0.07	0.001	0.000	0.002
220	2.59	2.60	0.01	2.20	21.48	15.12	0.07	0.001	0.000	0.002
221	2.60	2.61	0.01	2.21	21.38	15.44	0.07	0.001	0.000	0.002
222	2.61	2.62	0.01	2.22	21.28	16.66	0.07	0.001	0.000	0.002
223	2.62	2.63	0.01	2.23	21.18	17.82	0.07	0.001	0.000	0.002
224	2.63	2.64	0.01	2.24	21.08	19.31	0.07	0.001	0.000	0.001
225	2.64	2.65	0.01	2.25	20.99	20.20	0.07	0.001	0.000	0.001
226	2.65	2.66	0.01	2.26	20.89	21.64	0.07	0.001	0.000	0.001
227	2.66	2.67	0.01	2.27	20.79	22.90	0.07	0.001	0.000	0.001
228	2.67	2.68	0.01	2.28	20.70	23.88	0.07	0.001	0.000	0.001
229	2.68	2.69	0.01	2.29	20.61	25.51	0.07	0.001	0.000	0.001
230	2.69	2.70	0.01	2.30	20.51	28.35	0.07	0.001	0.000	0.001

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
231	2.70	2.71	0.01	2.31	20.42	32.88	0.07	0.001	0.000	0.001
232	2.71	2.72	0.01	2.32	20.33	38.22	0.07	0.001	0.000	0.001
233	2.72	2.73	0.01	2.33	20.24	42.13	0.07	0.000	0.000	0.000
234	2.73	2.74	0.01	2.34	20.15	46.03	0.07	0.000	0.000	0.000
235	2.74	2.75	0.01	2.35	20.06	49.43	0.07	0.000	0.000	0.000
236	2.75	2.76	0.01	2.36	19.97	51.84	0.07	0.000	0.000	0.000
237	2.76	2.77	0.01	2.37	19.88	53.57	0.07	0.000	0.000	0.000
238	2.77	2.78	0.01	2.38	19.79	54.95	0.07	0.000	0.000	0.000
239	2.78	2.79	0.01	2.38	19.71	55.44	0.07	0.000	0.000	0.000
240	2.79	2.80	0.01	2.40	19.62	56.08	0.07	0.000	0.000	0.000
241	2.80	2.81	0.01	2.40	19.54	57.48	0.07	0.000	0.000	0.000
242	2.81	2.82	0.01	2.42	19.45	59.55	0.06	0.000	0.000	0.000
243	2.82	2.83	0.01	2.42	19.37	62.11	0.06	0.000	0.000	0.000
244	2.83	2.84	0.01	2.44	19.28	64.19	0.06	0.000	0.000	0.000
245	2.84	2.85	0.01	2.45	19.20	65.80	0.06	0.000	0.000	0.000
246	2.85	2.86	0.01	2.46	19.12	67.30	0.06	0.000	0.000	0.000
247	2.86	2.87	0.01	2.47	19.04	68.73	0.06	0.000	0.000	0.000
248	2.87	2.88	0.01	2.48	18.96	70.56	0.06	0.000	0.000	0.000
249	2.88	2.89	0.01	2.49	18.88	71.97	0.06	0.000	0.000	0.000
250	2.89	2.90	0.01	2.50	18.80	73.16	0.06	0.000	0.000	0.000
251	2.90	2.91	0.01	2.51	18.72	74.05	0.06	0.000	0.000	0.000
252	2.91	2.92	0.01	2.52	18.64	74.83	0.06	0.000	0.000	0.000
253	2.92	2.93	0.01	2.53	18.56	75.66	0.06	0.000	0.000	0.000
254	2.93	2.94	0.01	2.54	18.49	76.68	0.06	0.000	0.000	0.000
255	2.94	2.95	0.01	2.55	18.41	78.99	0.06	0.000	0.000	0.000
256	2.95	2.96	0.01	2.56	18.33	82.65	0.06	0.000	0.000	0.000
257	2.96	2.97	0.01	2.57	18.26	87.24	0.06	0.000	0.000	0.000
258	2.97	2.98	0.01	2.58	18.18	89.19	0.06	0.000	0.000	0.000
259	2.98	2.99	0.01	2.59	18.11	95.85	0.06	0.000	0.000	0.000
260	2.99	3.00	0.01	2.60	18.04	103.39	0.06	0.000	0.000	0.000
261	3.00	3.01	0.01	2.61	17.96	113.42	0.06	0.000	0.000	0.000
262	3.01	3.02	0.01	2.62	17.89	117.82	0.06	0.000	0.000	0.000
263	3.02	3.03	0.01	2.63	17.82	121.64	0.06	0.000	0.000	0.000
264	3.03	3.04	0.01	2.63	17.75	123.60	0.06	0.000	0.000	0.000
265	3.04	3.05	0.01	2.65	17.67	123.74	0.06	0.000	0.000	0.000
266	3.05	3.06	0.01	2.65	17.60	117.76	0.06	0.000	0.000	0.000
267	3.06	3.07	0.01	2.67	17.53	112.28	0.06	0.000	0.000	0.000
268	3.07	3.08	0.01	2.67	17.46	112.52	0.06	0.000	0.000	0.000
269	3.08	3.09	0.01	2.69	17.39	114.20	0.06	0.000	0.000	0.000
270	3.09	3.10	0.01	2.70	17.33	118.10	0.06	0.000	0.000	0.000
271	3.10	3.11	0.01	2.71	17.26	120.31	0.06	0.000	0.000	0.000
272	3.11	3.12	0.01	2.72	17.19	127.40	0.06	0.000	0.000	0.000
273	3.12	3.13	0.01	2.73	17.12	132.33	0.06	0.000	0.000	0.000
274	3.13	3.14	0.01	2.74	17.06	134.51	0.06	0.000	0.000	0.000
275	3.14	3.15	0.01	2.75	16.99	132.22	0.06	0.000	0.000	0.000
276	3.15	3.16	0.01	2.76	16.92	136.26	0.06	0.000	0.000	0.000

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
277	3.16	3.17	0.01	2.77	16.86	141.68	0.06	0.000	0.000	0.000
278	3.17	3.18	0.01	2.78	16.79	148.48	0.06	0.000	0.000	0.000
279	3.18	3.19	0.01	2.79	16.73	149.27	0.06	0.000	0.000	0.000
280	3.19	3.20	0.01	2.80	16.66	153.55	0.06	0.000	0.000	0.000
281	3.20	3.21	0.01	2.81	16.60	155.18	0.06	0.000	0.000	0.000
282	3.21	3.22	0.01	2.82	16.54	156.95	0.06	0.000	0.000	0.000
283	3.22	3.23	0.01	2.83	16.47	155.99	0.05	0.000	0.000	0.000
284	3.23	3.24	0.01	2.84	16.41	159.45	0.05	0.000	0.000	0.000
285	3.24	3.25	0.01	2.85	16.35	160.86	0.05	0.000	0.000	0.000
286	3.25	3.26	0.01	2.86	16.29	164.95	0.05	0.000	0.000	0.000
287	3.26	3.27	0.01	2.87	16.23	165.62	0.05	0.000	0.000	0.000
288	3.27	3.28	0.01	2.88	16.16	165.21	0.05	0.000	0.000	0.000
289	3.28	3.29	0.01	2.89	16.10	160.33	0.05	0.000	0.000	0.000
290	3.29	3.30	0.01	2.90	16.04	159.75	0.05	0.000	0.000	0.000
291	3.30	3.31	0.01	2.91	15.98	162.87	0.05	0.000	0.000	0.000
292	3.31	3.32	0.01	2.92	15.93	160.88	0.05	0.000	0.000	0.000
293	3.32	3.33	0.01	2.93	15.87	155.72	0.05	0.000	0.000	0.000
294	3.33	3.34	0.01	2.94	15.81	146.40	0.05	0.000	0.000	0.000
295	3.34	3.35	0.01	2.95	15.75	143.86	0.05	0.000	0.000	0.000
296	3.35	3.36	0.01	2.96	15.69	139.75	0.05	0.000	0.000	0.000
297	3.36	3.37	0.01	2.97	15.63	139.09	0.05	0.000	0.000	0.000
298	3.37	3.38	0.01	2.98	15.58	135.47	0.05	0.000	0.000	0.000
299	3.38	3.39	0.01	2.99	15.52	134.23	0.05	0.000	0.000	0.000
300	3.39	3.40	0.01	3.00	15.46	133.00	0.05	0.000	0.000	0.000
301	3.40	3.41	0.01	3.01	15.41	132.96	0.05	0.000	0.000	0.000
302	3.41	3.42	0.01	3.02	15.35	130.14	0.05	0.000	0.000	0.000
303	3.42	3.43	0.01	3.03	15.30	125.85	0.05	0.000	0.000	0.000
304	3.43	3.44	0.01	3.04	15.24	124.40	0.05	0.000	0.000	0.000
305	3.44	3.45	0.01	3.05	15.19	126.19	0.05	0.000	0.000	0.000
306	3.45	3.46	0.01	3.06	15.13	129.89	0.05	0.000	0.000	0.000
307	3.46	3.47	0.01	3.07	15.08	126.12	0.05	0.000	0.000	0.000
308	3.47	3.48	0.01	3.08	15.02	122.01	0.05	0.000	0.000	0.000
309	3.48	3.49	0.01	3.09	14.97	119.54	0.05	0.000	0.000	0.000
310	3.49	3.50	0.01	3.10	14.92	123.95	0.05	0.000	0.000	0.000
311	3.50	3.51	0.01	3.11	14.86	128.07	0.05	0.000	0.000	0.000
312	3.51	3.52	0.01	3.12	14.81	129.29	0.05	0.000	0.000	0.000
313	3.52	3.53	0.01	3.13	14.76	129.66	0.05	0.000	0.000	0.000
314	3.53	3.54	0.01	3.14	14.71	128.29	0.05	0.000	0.000	0.000
315	3.54	3.55	0.01	3.15	14.66	127.00	0.05	0.000	0.000	0.000
316	3.55	3.56	0.01	3.16	14.61	123.51	0.05	0.000	0.000	0.000
317	3.56	3.57	0.01	3.17	14.55	120.82	0.05	0.000	0.000	0.000
318	3.57	3.58	0.01	3.18	14.50	117.01	0.05	0.000	0.000	0.000
319	3.58	3.59	0.01	3.19	14.45	113.39	0.05	0.000	0.000	0.000
320	3.59	3.60	0.01	3.20	14.40	110.01	0.05	0.000	0.000	0.000
321	3.60	3.61	0.01	3.21	14.35	107.68	0.05	0.000	0.000	0.000
322	3.61	3.62	0.01	3.22	14.30	107.08	0.05	0.000	0.000	0.000

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
323	3.62	3.63	0.01	3.23	14.25	103.83	0.05	0.000	0.000	0.000
324	3.63	3.64	0.01	3.24	14.21	101.23	0.05	0.000	0.000	0.000
325	3.64	3.65	0.01	3.25	14.16	100.44	0.05	0.000	0.000	0.000
326	3.65	3.66	0.01	3.26	14.11	102.97	0.05	0.000	0.000	0.000
327	3.66	3.67	0.01	3.27	14.06	104.86	0.05	0.000	0.000	0.000
328	3.67	3.68	0.01	3.28	14.01	104.98	0.05	0.000	0.000	0.000
329	3.68	3.69	0.01	3.29	13.96	104.88	0.05	0.000	0.000	0.000
330	3.69	3.70	0.01	3.30	13.92	103.52	0.05	0.000	0.000	0.000
331	3.70	3.71	0.01	3.31	13.87	99.26	0.05	0.000	0.000	0.000
332	3.71	3.72	0.01	3.32	13.82	95.18	0.05	0.000	0.000	0.000
333	3.72	3.73	0.01	3.33	13.78	91.21	0.05	0.000	0.000	0.000
334	3.73	3.74	0.01	3.34	13.73	89.79	0.05	0.000	0.000	0.000
335	3.74	3.75	0.01	3.35	13.68	87.71	0.05	0.000	0.000	0.000
336	3.75	3.76	0.01	3.36	13.64	86.48	0.05	0.000	0.000	0.000
337	3.76	3.77	0.01	3.37	13.59	86.11	0.05	0.000	0.000	0.000
338	3.77	3.78	0.01	3.38	13.55	83.06	0.05	0.000	0.000	0.000
339	3.78	3.79	0.01	3.39	13.50	79.57	0.05	0.000	0.000	0.000
340	3.79	3.80	0.01	3.40	13.46	75.62	0.04	0.000	0.000	0.000
341	3.80	3.81	0.01	3.41	13.41	74.37	0.04	0.000	0.000	0.000
342	3.81	3.82	0.01	3.42	13.37	72.54	0.04	0.000	0.000	0.000
343	3.82	3.83	0.01	3.43	13.33	70.77	0.04	0.000	0.000	0.000
344	3.83	3.84	0.01	3.44	13.28	69.47	0.04	0.000	0.000	0.000
345	3.84	3.85	0.01	3.45	13.24	69.02	0.04	0.000	0.000	0.000
346	3.85	3.86	0.01	3.46	13.19	68.91	0.04	0.000	0.000	0.000
347	3.86	3.87	0.01	3.47	13.15	68.63	0.04	0.000	0.000	0.000
348	3.87	3.88	0.01	3.48	13.11	68.28	0.04	0.000	0.000	0.000
349	3.88	3.89	0.01	3.49	13.07	67.93	0.04	0.000	0.000	0.000
350	3.89	3.90	0.01	3.50	13.02	67.19	0.04	0.000	0.000	0.000
351	3.90	3.91	0.01	3.51	12.98	66.34	0.04	0.000	0.000	0.000
352	3.91	3.92	0.01	3.52	12.94	65.38	0.04	0.000	0.000	0.000
353	3.92	3.93	0.01	3.53	12.90	64.86	0.04	0.000	0.000	0.000
354	3.93	3.94	0.01	3.54	12.86	64.49	0.04	0.000	0.000	0.000
355	3.94	3.95	0.01	3.55	12.81	64.28	0.04	0.000	0.000	0.000
356	3.95	3.96	0.01	3.56	12.77	64.21	0.04	0.000	0.000	0.000
357	3.96	3.97	0.01	3.57	12.73	64.15	0.04	0.000	0.000	0.000
358	3.97	3.98	0.01	3.58	12.69	63.92	0.04	0.000	0.000	0.000
359	3.98	3.99	0.01	3.59	12.65	63.65	0.04	0.000	0.000	0.000
360	3.99	4.00	0.01	3.60	12.61	63.48	0.04	0.000	0.000	0.000
361	4.00	4.01	0.01	3.61	12.57	63.78	0.04	0.000	0.000	0.000
362	4.01	4.02	0.01	3.62	12.53	64.16	0.04	0.000	0.000	0.000
363	4.02	4.03	0.01	3.63	12.49	64.72	0.04	0.000	0.000	0.000
364	4.03	4.04	0.01	3.64	12.45	65.15	0.04	0.000	0.000	0.000
365	4.04	4.05	0.01	3.65	12.41	65.60	0.04	0.000	0.000	0.000
366	4.05	4.06	0.01	3.66	12.37	65.88	0.04	0.000	0.000	0.000
367	4.06	4.07	0.01	3.67	12.33	66.35	0.04	0.000	0.000	0.000
368	4.07	4.08	0.01	3.68	12.29	66.92	0.04	0.000	0.000	0.000

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
369	4.08	4.09	0.01	3.69	12.26	67.66	0.04	0.000	0.000	0.000
370	4.09	4.10	0.01	3.70	12.22	68.82	0.04	0.000	0.000	0.000
371	4.10	4.11	0.01	3.71	12.18	70.08	0.04	0.000	0.000	0.000
372	4.11	4.12	0.01	3.72	12.14	71.50	0.04	0.000	0.000	0.000
373	4.12	4.13	0.01	3.73	12.10	72.88	0.04	0.000	0.000	0.000
374	4.13	4.14	0.01	3.74	12.07	76.50	0.04	0.000	0.000	0.000
375	4.14	4.15	0.01	3.75	12.03	79.94	0.04	0.000	0.000	0.000
376	4.15	4.16	0.01	3.76	11.99	83.07	0.04	0.000	0.000	0.000
377	4.16	4.17	0.01	3.77	11.95	84.53	0.04	0.000	0.000	0.000
378	4.17	4.18	0.01	3.78	11.92	86.16	0.04	0.000	0.000	0.000
379	4.18	4.19	0.01	3.79	11.88	87.78	0.04	0.000	0.000	0.000
380	4.19	4.20	0.01	3.80	11.84	89.47	0.04	0.000	0.000	0.000
381	4.20	4.21	0.01	3.81	11.81	91.00	0.04	0.000	0.000	0.000
382	4.21	4.22	0.01	3.82	11.77	91.92	0.04	0.000	0.000	0.000
383	4.22	4.23	0.01	3.83	11.74	92.27	0.04	0.000	0.000	0.000
384	4.23	4.24	0.01	3.84	11.70	92.26	0.04	0.000	0.000	0.000
385	4.24	4.25	0.01	3.85	11.66	92.42	0.04	0.000	0.000	0.000
386	4.25	4.26	0.01	3.86	11.63	92.57	0.04	0.000	0.000	0.000
387	4.26	4.27	0.01	3.87	11.59	92.38	0.04	0.000	0.000	0.000
388	4.27	4.28	0.01	3.88	11.56	91.99	0.04	0.000	0.000	0.000
389	4.28	4.29	0.01	3.89	11.52	90.90	0.04	0.000	0.000	0.000
390	4.29	4.30	0.01	3.90	11.49	89.87	0.04	0.000	0.000	0.000
391	4.30	4.31	0.01	3.91	11.45	88.90	0.04	0.000	0.000	0.000
392	4.31	4.32	0.01	3.92	11.42	88.22	0.04	0.000	0.000	0.000
393	4.32	4.33	0.01	3.93	11.38	87.68	0.04	0.000	0.000	0.000
394	4.33	4.34	0.01	3.94	11.35	86.94	0.04	0.000	0.000	0.000
395	4.34	4.35	0.01	3.95	11.32	86.10	0.04	0.000	0.000	0.000
396	4.35	4.36	0.01	3.96	11.28	85.31	0.04	0.000	0.000	0.000
397	4.36	4.37	0.01	3.97	11.25	84.70	0.04	0.000	0.000	0.000
398	4.37	4.38	0.01	3.98	11.22	84.02	0.04	0.000	0.000	0.000
399	4.38	4.39	0.01	3.99	11.18	83.11	0.04	0.000	0.000	0.000
400	4.39	4.40	0.01	4.00	11.15	82.27	0.04	0.000	0.000	0.000
401	4.40	4.41	0.01	4.01	11.12	81.65	0.04	0.000	0.000	0.000
402	4.41	4.42	0.01	4.02	11.08	81.06	0.04	0.000	0.000	0.000
403	4.42	4.43	0.01	4.03	11.05	80.33	0.04	0.000	0.000	0.000
404	4.43	4.44	0.01	4.04	11.02	79.74	0.04	0.000	0.000	0.000
405	4.44	4.45	0.01	4.05	10.98	79.25	0.04	0.000	0.000	0.000
406	4.45	4.46	0.01	4.06	10.95	78.62	0.04	0.000	0.000	0.000
407	4.46	4.47	0.01	4.07	10.92	77.21	0.04	0.000	0.000	0.000
408	4.47	4.48	0.01	4.08	10.89	76.08	0.04	0.000	0.000	0.000
409	4.48	4.49	0.01	4.09	10.86	75.46	0.04	0.000	0.000	0.000
410	4.49	4.50	0.01	4.10	10.82	75.72	0.04	0.000	0.000	0.000
411	4.50	4.51	0.01	4.11	10.79	75.81	0.04	0.000	0.000	0.000
412	4.51	4.52	0.01	4.12	10.76	75.34	0.04	0.000	0.000	0.000
413	4.52	4.53	0.01	4.13	10.73	74.15	0.04	0.000	0.000	0.000
414	4.53	4.54	0.01	4.14	10.70	72.56	0.04	0.000	0.000	0.000

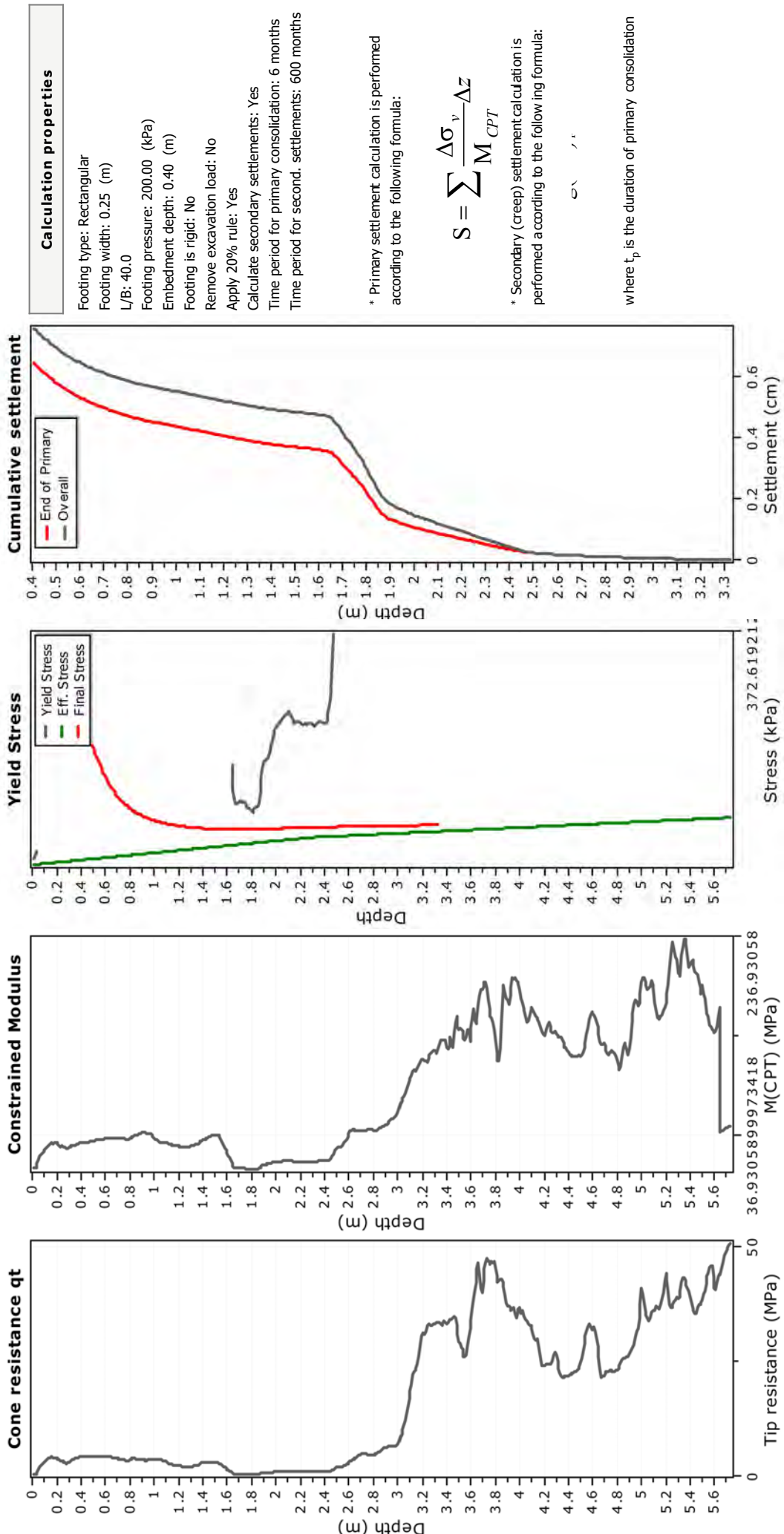
:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	$M_{(CPT)}$ (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
415	4.54	4.55	0.01	4.14	10.67	70.88	0.04	0.000	0.000	0.000
416	4.55	4.56	0.01	4.16	10.64	69.59	0.04	0.000	0.000	0.000
417	4.56	4.57	0.01	4.17	10.61	68.92	0.04	0.000	0.000	0.000
418	4.57	4.58	0.01	4.18	10.57	69.13	0.04	0.000	0.000	0.000
419	4.58	4.59	0.01	4.18	10.54	69.90	0.04	0.000	0.000	0.000
420	4.59	4.60	0.01	4.20	10.51	70.92	0.04	0.000	0.000	0.000
421	4.60	4.61	0.01	4.21	10.48	72.58	0.03	0.000	0.000	0.000
422	4.61	4.62	0.01	4.22	10.45	74.24	0.03	0.000	0.000	0.000
423	4.62	4.63	0.01	4.22	10.42	75.60	0.03	0.000	0.000	0.000

Total primary settlement: 0.82**Total secondary settlement: 0.09****Total calculated settlement: 0.90****Abbreviations**

Start depth:	Start depth of soil layer (penetration depth measured from ground free surface)
End depth:	End depth of soil layer (penetration depth measured from ground free surface)
Thickness:	Thickness of soil layer
Relative depth:	Depth of calculation relative to footing
Iz:	Stress influence factor
Delta P:	Footing imposed stress:
Eff. stress:	Effective stress
$M_{(CPT)}$:	Constrained modulus from CPT
Settlement:	Primary settlement
Second. settlement:	Secondary settlements due to creep

Settlements calculation according to theory of elasticity *



:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
1	0.40	0.41	0.01	0.01	199.99	28.56	1.00	0.007	0.000	0.007
2	0.41	0.42	0.01	0.02	199.86	28.83	1.00	0.007	0.000	0.007
3	0.42	0.43	0.01	0.03	199.35	29.00	1.00	0.007	0.000	0.007
4	0.43	0.44	0.01	0.04	198.30	29.14	0.99	0.007	0.000	0.007
5	0.44	0.45	0.01	0.05	196.58	29.24	0.98	0.007	0.000	0.007
6	0.45	0.46	0.01	0.06	194.16	29.36	0.97	0.007	0.000	0.007
7	0.46	0.47	0.01	0.06	191.06	29.50	0.96	0.006	0.000	0.006
8	0.47	0.48	0.01	0.08	187.36	29.65	0.94	0.006	0.000	0.006
9	0.48	0.49	0.01	0.09	183.17	29.87	0.92	0.006	0.000	0.006
10	0.49	0.50	0.01	0.10	178.59	30.19	0.89	0.006	0.000	0.006
11	0.50	0.51	0.01	0.11	173.75	30.52	0.87	0.006	0.000	0.006
12	0.51	0.52	0.01	0.12	168.74	30.83	0.84	0.005	0.000	0.005
13	0.52	0.53	0.01	0.13	163.66	31.09	0.82	0.005	0.000	0.005
14	0.53	0.54	0.01	0.14	158.58	31.37	0.79	0.005	0.000	0.005
15	0.54	0.55	0.01	0.15	153.55	31.61	0.77	0.005	0.000	0.005
16	0.55	0.56	0.01	0.16	148.63	31.84	0.74	0.005	0.000	0.005
17	0.56	0.57	0.01	0.17	143.83	32.06	0.72	0.004	0.000	0.004
18	0.57	0.58	0.01	0.18	139.19	32.31	0.70	0.004	0.000	0.004
19	0.58	0.59	0.01	0.19	134.72	32.55	0.67	0.004	0.000	0.004
20	0.59	0.60	0.01	0.20	130.43	32.77	0.65	0.004	0.000	0.004
21	0.60	0.61	0.01	0.21	126.31	32.96	0.63	0.004	0.000	0.004
22	0.61	0.62	0.01	0.22	122.38	33.19	0.61	0.004	0.000	0.004
23	0.62	0.63	0.01	0.23	118.62	33.40	0.59	0.004	0.000	0.004
24	0.63	0.64	0.01	0.24	115.03	33.58	0.58	0.003	0.000	0.003
25	0.64	0.65	0.01	0.25	111.61	33.65	0.56	0.003	0.000	0.003
26	0.65	0.66	0.01	0.26	108.35	33.61	0.54	0.003	0.000	0.003
27	0.66	0.67	0.01	0.27	105.25	33.51	0.53	0.003	0.000	0.003
28	0.67	0.68	0.01	0.28	102.28	33.40	0.51	0.003	0.000	0.003
29	0.68	0.69	0.01	0.28	99.46	33.34	0.50	0.003	0.000	0.003
30	0.69	0.70	0.01	0.30	96.77	33.18	0.48	0.003	0.000	0.003
31	0.70	0.71	0.01	0.31	94.20	33.11	0.47	0.003	0.000	0.003
32	0.71	0.72	0.01	0.32	91.75	33.07	0.46	0.003	0.000	0.003
33	0.72	0.73	0.01	0.33	89.41	33.10	0.45	0.003	0.000	0.003
34	0.73	0.74	0.01	0.34	87.17	33.10	0.44	0.003	0.000	0.003
35	0.74	0.75	0.01	0.35	85.04	33.01	0.43	0.003	0.000	0.003
36	0.75	0.76	0.01	0.36	82.99	32.85	0.41	0.003	0.000	0.003
37	0.76	0.77	0.01	0.37	81.04	32.67	0.41	0.002	0.000	0.002
38	0.77	0.78	0.01	0.38	79.16	32.52	0.40	0.002	0.000	0.002
39	0.78	0.79	0.01	0.39	77.37	32.44	0.39	0.002	0.000	0.002
40	0.79	0.80	0.01	0.40	75.65	32.45	0.38	0.002	0.000	0.002
41	0.80	0.81	0.01	0.41	73.99	32.75	0.37	0.002	0.000	0.002
42	0.81	0.82	0.01	0.42	72.41	33.65	0.36	0.002	0.000	0.002
43	0.82	0.83	0.01	0.43	70.89	34.62	0.35	0.002	0.000	0.002
44	0.83	0.84	0.01	0.44	69.42	35.47	0.35	0.002	0.000	0.002
45	0.84	0.85	0.01	0.45	68.01	35.82	0.34	0.002	0.000	0.002
46	0.85	0.86	0.01	0.46	66.66	36.18	0.33	0.002	0.000	0.002

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
47	0.86	0.87	0.01	0.47	65.35	36.59	0.33	0.002	0.000	0.002
48	0.87	0.88	0.01	0.48	64.10	37.24	0.32	0.002	0.000	0.002
49	0.88	0.89	0.01	0.49	62.89	37.86	0.31	0.002	0.000	0.002
50	0.89	0.90	0.01	0.50	61.72	38.36	0.31	0.002	0.000	0.002
51	0.90	0.91	0.01	0.51	60.59	38.56	0.30	0.002	0.000	0.002
52	0.91	0.92	0.01	0.52	59.50	38.63	0.30	0.002	0.000	0.002
53	0.92	0.93	0.01	0.53	58.45	38.63	0.29	0.002	0.000	0.002
54	0.93	0.94	0.01	0.54	57.43	38.60	0.29	0.001	0.000	0.001
55	0.94	0.95	0.01	0.55	56.45	38.49	0.28	0.001	0.000	0.001
56	0.95	0.96	0.01	0.56	55.49	38.44	0.28	0.001	0.000	0.001
57	0.96	0.97	0.01	0.56	54.57	38.16	0.27	0.001	0.000	0.001
58	0.97	0.98	0.01	0.57	53.68	37.74	0.27	0.001	0.000	0.001
59	0.98	0.99	0.01	0.59	52.82	36.40	0.26	0.001	0.000	0.001
60	0.99	1.00	0.01	0.60	51.98	34.80	0.26	0.001	0.000	0.001
61	1.00	1.01	0.01	0.61	51.17	33.08	0.26	0.002	0.000	0.002
62	1.01	1.02	0.01	0.62	50.38	32.16	0.25	0.002	0.000	0.002
63	1.02	1.03	0.01	0.63	49.61	31.51	0.25	0.002	0.000	0.002
64	1.03	1.04	0.01	0.64	48.87	30.69	0.24	0.002	0.000	0.002
65	1.04	1.05	0.01	0.65	48.15	29.99	0.24	0.002	0.000	0.002
66	1.05	1.06	0.01	0.66	47.45	29.46	0.24	0.002	0.000	0.002
67	1.06	1.07	0.01	0.67	46.77	29.34	0.23	0.002	0.000	0.002
68	1.07	1.08	0.01	0.68	46.11	29.22	0.23	0.002	0.000	0.002
69	1.08	1.09	0.01	0.69	45.46	29.22	0.23	0.002	0.000	0.002
70	1.09	1.10	0.01	0.70	44.83	29.28	0.22	0.002	0.000	0.002
71	1.10	1.11	0.01	0.71	44.22	29.27	0.22	0.002	0.000	0.002
72	1.11	1.12	0.01	0.72	43.63	28.62	0.22	0.002	0.000	0.002
73	1.12	1.13	0.01	0.73	43.05	27.86	0.22	0.002	0.000	0.002
74	1.13	1.14	0.01	0.74	42.49	27.06	0.21	0.002	0.000	0.002
75	1.14	1.15	0.01	0.75	41.94	26.75	0.21	0.002	0.000	0.002
76	1.15	1.16	0.01	0.76	41.40	26.49	0.21	0.002	0.000	0.002
77	1.16	1.17	0.01	0.77	40.88	26.18	0.20	0.002	0.000	0.002
78	1.17	1.18	0.01	0.78	40.37	25.92	0.20	0.002	0.000	0.002
79	1.18	1.19	0.01	0.79	39.87	25.66	0.20	0.002	0.000	0.002
80	1.19	1.20	0.01	0.80	39.38	25.44	0.20	0.002	0.000	0.002
81	1.20	1.21	0.01	0.81	38.91	25.21	0.19	0.002	0.000	0.002
82	1.21	1.22	0.01	0.82	38.45	24.95	0.19	0.002	0.000	0.002
83	1.22	1.23	0.01	0.83	37.99	24.75	0.19	0.002	0.000	0.002
84	1.23	1.24	0.01	0.84	37.55	24.57	0.19	0.002	0.000	0.002
85	1.24	1.25	0.01	0.85	37.12	24.37	0.19	0.002	0.000	0.002
86	1.25	1.26	0.01	0.86	36.70	24.22	0.18	0.002	0.000	0.002
87	1.26	1.27	0.01	0.87	36.28	24.15	0.18	0.002	0.000	0.002
88	1.27	1.28	0.01	0.88	35.88	24.20	0.18	0.001	0.000	0.001
89	1.28	1.29	0.01	0.89	35.48	24.33	0.18	0.001	0.000	0.001
90	1.29	1.30	0.01	0.90	35.10	24.75	0.18	0.001	0.000	0.001
91	1.30	1.31	0.01	0.91	34.72	25.24	0.17	0.001	0.000	0.001
92	1.31	1.32	0.01	0.92	34.35	25.73	0.17	0.001	0.000	0.001

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
93	1.32	1.33	0.01	0.93	33.99	26.01	0.17	0.001	0.000	0.001
94	1.33	1.34	0.01	0.94	33.63	26.25	0.17	0.001	0.000	0.001
95	1.34	1.35	0.01	0.95	33.28	26.56	0.17	0.001	0.000	0.001
96	1.35	1.36	0.01	0.96	32.94	26.97	0.16	0.001	0.000	0.001
97	1.36	1.37	0.01	0.97	32.61	27.40	0.16	0.001	0.000	0.001
98	1.37	1.38	0.01	0.98	32.28	28.56	0.16	0.001	0.000	0.001
99	1.38	1.39	0.01	0.99	31.96	29.66	0.16	0.001	0.000	0.001
100	1.39	1.40	0.01	1.00	31.64	30.74	0.16	0.001	0.000	0.001
101	1.40	1.41	0.01	1.00	31.33	31.19	0.16	0.001	0.000	0.001
102	1.41	1.42	0.01	1.01	31.03	31.62	0.16	0.001	0.000	0.001
103	1.42	1.43	0.01	1.02	30.73	32.23	0.15	0.001	0.000	0.001
104	1.43	1.44	0.01	1.04	30.44	32.97	0.15	0.001	0.000	0.001
105	1.44	1.45	0.01	1.05	30.15	34.01	0.15	0.001	0.000	0.001
106	1.45	1.46	0.01	1.06	29.87	34.89	0.15	0.001	0.000	0.001
107	1.46	1.47	0.01	1.07	29.60	35.50	0.15	0.001	0.000	0.001
108	1.47	1.48	0.01	1.08	29.32	35.63	0.15	0.001	0.000	0.001
109	1.48	1.49	0.01	1.09	29.06	35.62	0.15	0.001	0.000	0.001
110	1.49	1.50	0.01	1.10	28.80	35.68	0.14	0.001	0.000	0.001
111	1.50	1.51	0.01	1.11	28.54	35.90	0.14	0.001	0.000	0.001
112	1.51	1.52	0.01	1.12	28.29	36.25	0.14	0.001	0.000	0.001
113	1.52	1.53	0.01	1.13	28.04	36.21	0.14	0.001	0.000	0.001
114	1.53	1.54	0.01	1.14	27.79	35.81	0.14	0.001	0.000	0.001
115	1.54	1.55	0.01	1.15	27.56	34.93	0.14	0.001	0.000	0.001
116	1.55	1.56	0.01	1.16	27.32	32.50	0.14	0.001	0.000	0.001
117	1.56	1.57	0.01	1.17	27.09	29.43	0.14	0.001	0.000	0.001
118	1.57	1.58	0.01	1.18	26.86	25.96	0.13	0.001	0.000	0.001
119	1.58	1.59	0.01	1.19	26.64	22.90	0.13	0.001	0.000	0.001
120	1.59	1.60	0.01	1.20	26.41	20.89	0.13	0.001	0.000	0.001
121	1.60	1.61	0.01	1.21	26.20	18.18	0.13	0.001	0.000	0.001
122	1.61	1.62	0.01	1.22	25.98	15.65	0.13	0.002	0.000	0.002
123	1.62	1.63	0.01	1.23	25.77	13.23	0.13	0.002	0.000	0.002
124	1.63	1.64	0.01	1.24	25.57	10.29	0.13	0.002	0.000	0.002
125	1.64	1.65	0.01	1.25	25.36	7.67	0.13	0.003	0.001	0.004
126	1.65	1.66	0.01	1.25	25.16	4.20	0.13	0.006	0.001	0.007
127	1.66	1.67	0.01	1.26	24.97	3.34	0.12	0.007	0.002	0.009
128	1.67	1.68	0.01	1.27	24.77	2.73	0.12	0.009	0.002	0.011
129	1.68	1.69	0.01	1.29	24.58	2.72	0.12	0.009	0.002	0.011
130	1.69	1.70	0.01	1.30	24.39	2.82	0.12	0.009	0.002	0.011
131	1.70	1.71	0.01	1.31	24.21	2.86	0.12	0.008	0.002	0.011
132	1.71	1.72	0.01	1.32	24.02	2.91	0.12	0.008	0.002	0.011
133	1.72	1.73	0.01	1.33	23.84	2.83	0.12	0.008	0.002	0.011
134	1.73	1.74	0.01	1.34	23.66	2.75	0.12	0.009	0.002	0.011
135	1.74	1.75	0.01	1.35	23.49	2.73	0.12	0.009	0.002	0.011
136	1.75	1.76	0.01	1.36	23.32	2.59	0.12	0.009	0.003	0.012
137	1.76	1.77	0.01	1.37	23.15	2.46	0.12	0.009	0.003	0.012
138	1.77	1.78	0.01	1.38	22.98	2.28	0.11	0.010	0.003	0.013

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
139	1.78	1.79	0.01	1.39	22.81	2.15	0.11	0.011	0.003	0.014
140	1.79	1.80	0.01	1.40	22.65	2.04	0.11	0.011	0.003	0.014
141	1.80	1.81	0.01	1.41	22.49	1.92	0.11	0.012	0.004	0.015
142	1.81	1.82	0.01	1.42	22.33	1.86	0.11	0.012	0.004	0.016
143	1.82	1.83	0.01	1.43	22.18	2.00	0.11	0.011	0.003	0.015
144	1.83	1.84	0.01	1.44	22.02	2.14	0.11	0.010	0.003	0.014
145	1.84	1.85	0.01	1.45	21.87	2.28	0.11	0.010	0.003	0.013
146	1.85	1.86	0.01	1.46	21.72	2.27	0.11	0.010	0.003	0.013
147	1.86	1.87	0.01	1.47	21.57	2.63	0.11	0.008	0.003	0.011
148	1.87	1.88	0.01	1.48	21.42	3.45	0.11	0.006	0.002	0.008
149	1.88	1.89	0.01	1.49	21.28	4.89	0.11	0.004	0.001	0.006
150	1.89	1.90	0.01	1.50	21.14	6.17	0.11	0.003	0.001	0.005
151	1.90	1.91	0.01	1.51	21.00	6.90	0.10	0.003	0.001	0.004
152	1.91	1.92	0.01	1.52	20.86	7.07	0.10	0.003	0.001	0.004
153	1.92	1.93	0.01	1.53	20.72	7.06	0.10	0.003	0.001	0.004
154	1.93	1.94	0.01	1.54	20.59	7.12	0.10	0.003	0.001	0.004
155	1.94	1.95	0.01	1.55	20.45	7.29	0.10	0.003	0.001	0.004
156	1.95	1.96	0.01	1.56	20.32	7.52	0.10	0.003	0.001	0.004
157	1.96	1.97	0.01	1.57	20.19	8.13	0.10	0.002	0.001	0.003
158	1.97	1.98	0.01	1.58	20.06	8.68	0.10	0.002	0.001	0.003
159	1.98	1.99	0.01	1.59	19.94	9.19	0.10	0.002	0.001	0.003
160	1.99	2.00	0.01	1.60	19.81	9.32	0.10	0.002	0.001	0.003
161	2.00	2.01	0.01	1.61	19.69	9.51	0.10	0.002	0.001	0.003
162	2.01	2.02	0.01	1.62	19.56	9.64	0.10	0.002	0.001	0.003
163	2.02	2.03	0.01	1.63	19.44	9.78	0.10	0.002	0.001	0.003
164	2.03	2.04	0.01	1.64	19.32	9.82	0.10	0.002	0.001	0.003
165	2.04	2.05	0.01	1.65	19.20	9.91	0.10	0.002	0.001	0.003
166	2.05	2.06	0.01	1.66	19.09	10.05	0.10	0.002	0.001	0.003
167	2.06	2.07	0.01	1.67	18.97	10.23	0.09	0.002	0.001	0.003
168	2.07	2.08	0.01	1.68	18.86	10.36	0.09	0.002	0.001	0.003
169	2.08	2.09	0.01	1.69	18.75	10.41	0.09	0.002	0.001	0.003
170	2.09	2.10	0.01	1.70	18.63	10.50	0.09	0.002	0.001	0.003
171	2.10	2.11	0.01	1.71	18.52	10.59	0.09	0.002	0.001	0.003
172	2.11	2.12	0.01	1.72	18.41	10.63	0.09	0.002	0.001	0.002
173	2.12	2.13	0.01	1.73	18.31	10.44	0.09	0.002	0.001	0.003
174	2.13	2.14	0.01	1.74	18.20	10.11	0.09	0.002	0.001	0.003
175	2.14	2.15	0.01	1.75	18.10	9.83	0.09	0.002	0.001	0.003
176	2.15	2.16	0.01	1.76	17.99	9.68	0.09	0.002	0.001	0.003
177	2.16	2.17	0.01	1.77	17.89	9.68	0.09	0.002	0.001	0.003
178	2.17	2.18	0.01	1.78	17.79	9.72	0.09	0.002	0.001	0.003
179	2.18	2.19	0.01	1.79	17.69	9.72	0.09	0.002	0.001	0.003
180	2.19	2.20	0.01	1.80	17.59	9.72	0.09	0.002	0.001	0.003
181	2.20	2.21	0.01	1.81	17.49	9.67	0.09	0.002	0.001	0.003
182	2.21	2.22	0.01	1.82	17.39	9.57	0.09	0.002	0.001	0.003
183	2.22	2.23	0.01	1.83	17.29	9.57	0.09	0.002	0.001	0.003
184	2.23	2.24	0.01	1.84	17.20	9.57	0.09	0.002	0.001	0.003

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
185	2.24	2.25	0.01	1.85	17.10	9.61	0.09	0.002	0.001	0.003
186	2.25	2.26	0.01	1.86	17.01	9.57	0.09	0.002	0.001	0.003
187	2.26	2.27	0.01	1.87	16.92	9.61	0.08	0.002	0.001	0.003
188	2.27	2.28	0.01	1.88	16.83	9.70	0.08	0.002	0.001	0.003
189	2.28	2.29	0.01	1.89	16.73	9.80	0.08	0.002	0.001	0.003
190	2.29	2.30	0.01	1.90	16.65	9.80	0.08	0.002	0.001	0.003
191	2.30	2.31	0.01	1.91	16.56	9.75	0.08	0.002	0.001	0.003
192	2.31	2.32	0.01	1.92	16.47	9.70	0.08	0.002	0.001	0.003
193	2.32	2.33	0.01	1.93	16.38	9.65	0.08	0.002	0.001	0.003
194	2.33	2.34	0.01	1.94	16.29	9.79	0.08	0.002	0.001	0.003
195	2.34	2.35	0.01	1.95	16.21	9.97	0.08	0.002	0.001	0.003
196	2.35	2.36	0.01	1.96	16.13	10.11	0.08	0.002	0.001	0.002
197	2.36	2.37	0.01	1.97	16.04	10.16	0.08	0.002	0.001	0.002
198	2.37	2.38	0.01	1.98	15.96	10.16	0.08	0.002	0.001	0.002
199	2.38	2.39	0.01	1.99	15.88	10.20	0.08	0.002	0.001	0.002
200	2.39	2.40	0.01	2.00	15.80	10.15	0.08	0.002	0.001	0.002
201	2.40	2.41	0.01	2.01	15.71	10.10	0.08	0.002	0.001	0.002
202	2.41	2.42	0.01	2.02	15.64	10.10	0.08	0.002	0.001	0.002
203	2.42	2.43	0.01	2.03	15.56	10.34	0.08	0.002	0.001	0.002
204	2.43	2.44	0.01	2.04	15.48	10.75	0.08	0.001	0.001	0.002
205	2.44	2.45	0.01	2.05	15.40	11.36	0.08	0.001	0.001	0.002
206	2.45	2.46	0.01	2.06	15.32	12.06	0.08	0.001	0.001	0.002
207	2.46	2.47	0.01	2.07	15.25	14.76	0.08	0.001	0.001	0.002
208	2.47	2.48	0.01	2.08	15.17	17.55	0.08	0.001	0.001	0.001
209	2.48	2.49	0.01	2.09	15.10	20.71	0.08	0.001	0.000	0.001
210	2.49	2.50	0.01	2.10	15.02	22.01	0.08	0.001	0.000	0.001
211	2.50	2.51	0.01	2.11	14.95	23.12	0.07	0.001	0.000	0.001
212	2.51	2.52	0.01	2.12	14.88	23.72	0.07	0.001	0.000	0.001
213	2.52	2.53	0.01	2.13	14.81	24.04	0.07	0.001	0.000	0.001
214	2.53	2.54	0.01	2.13	14.73	24.36	0.07	0.001	0.000	0.001
215	2.54	2.55	0.01	2.15	14.66	24.78	0.07	0.001	0.000	0.001
216	2.55	2.56	0.01	2.15	14.59	26.18	0.07	0.001	0.000	0.001
217	2.56	2.57	0.01	2.17	14.52	28.09	0.07	0.001	0.000	0.001
218	2.57	2.58	0.01	2.17	14.46	30.32	0.07	0.000	0.000	0.000
219	2.58	2.59	0.01	2.19	14.39	32.04	0.07	0.000	0.000	0.000
220	2.59	2.60	0.01	2.20	14.32	34.88	0.07	0.000	0.000	0.000
221	2.60	2.61	0.01	2.21	14.25	37.99	0.07	0.000	0.000	0.000
222	2.61	2.62	0.01	2.22	14.19	41.28	0.07	0.000	0.000	0.000
223	2.62	2.63	0.01	2.23	14.12	41.51	0.07	0.000	0.000	0.000
224	2.63	2.64	0.01	2.24	14.06	41.64	0.07	0.000	0.000	0.000
225	2.64	2.65	0.01	2.25	13.99	41.59	0.07	0.000	0.000	0.000
226	2.65	2.66	0.01	2.26	13.93	41.06	0.07	0.000	0.000	0.000
227	2.66	2.67	0.01	2.27	13.86	40.31	0.07	0.000	0.000	0.000
228	2.67	2.68	0.01	2.28	13.80	40.27	0.07	0.000	0.000	0.000
229	2.68	2.69	0.01	2.29	13.74	40.57	0.07	0.000	0.000	0.000
230	2.69	2.70	0.01	2.30	13.67	40.92	0.07	0.000	0.000	0.000

:: Tabular results ::										
Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
231	2.70	2.71	0.01	2.31	13.61	40.85	0.07	0.000	0.000	0.000
232	2.71	2.72	0.01	2.32	13.55	40.89	0.07	0.000	0.000	0.000
233	2.72	2.73	0.01	2.33	13.49	41.06	0.07	0.000	0.000	0.000
234	2.73	2.74	0.01	2.34	13.43	41.21	0.07	0.000	0.000	0.000
235	2.74	2.75	0.01	2.35	13.37	41.45	0.07	0.000	0.000	0.000
236	2.75	2.76	0.01	2.36	13.31	41.79	0.07	0.000	0.000	0.000
237	2.76	2.77	0.01	2.37	13.25	42.38	0.07	0.000	0.000	0.000
238	2.77	2.78	0.01	2.38	13.20	42.79	0.07	0.000	0.000	0.000
239	2.78	2.79	0.01	2.38	13.14	42.75	0.07	0.000	0.000	0.000
240	2.79	2.80	0.01	2.40	13.08	42.21	0.07	0.000	0.000	0.000
241	2.80	2.81	0.01	2.40	13.02	41.49	0.07	0.000	0.000	0.000
242	2.81	2.82	0.01	2.42	12.97	41.00	0.06	0.000	0.000	0.000
243	2.82	2.83	0.01	2.42	12.91	41.05	0.06	0.000	0.000	0.000
244	2.83	2.84	0.01	2.44	12.86	41.53	0.06	0.000	0.000	0.000
245	2.84	2.85	0.01	2.45	12.80	42.46	0.06	0.000	0.000	0.000
246	2.85	2.86	0.01	2.46	12.75	43.08	0.06	0.000	0.000	0.000
247	2.86	2.87	0.01	2.47	12.69	43.64	0.06	0.000	0.000	0.000
248	2.87	2.88	0.01	2.48	12.64	44.12	0.06	0.000	0.000	0.000
249	2.88	2.89	0.01	2.49	12.59	44.89	0.06	0.000	0.000	0.000
250	2.89	2.90	0.01	2.50	12.53	45.68	0.06	0.000	0.000	0.000
251	2.90	2.91	0.01	2.51	12.48	46.20	0.06	0.000	0.000	0.000
252	2.91	2.92	0.01	2.52	12.43	46.65	0.06	0.000	0.000	0.000
253	2.92	2.93	0.01	2.53	12.38	47.96	0.06	0.000	0.000	0.000
254	2.93	2.94	0.01	2.54	12.32	49.46	0.06	0.000	0.000	0.000
255	2.94	2.95	0.01	2.55	12.27	51.00	0.06	0.000	0.000	0.000
256	2.95	2.96	0.01	2.56	12.22	52.19	0.06	0.000	0.000	0.000
257	2.96	2.97	0.01	2.57	12.17	53.33	0.06	0.000	0.000	0.000
258	2.97	2.98	0.01	2.58	12.12	54.23	0.06	0.000	0.000	0.000
259	2.98	2.99	0.01	2.59	12.07	55.02	0.06	0.000	0.000	0.000
260	2.99	3.00	0.01	2.60	12.02	56.22	0.06	0.000	0.000	0.000
261	3.00	3.01	0.01	2.61	11.97	59.19	0.06	0.000	0.000	0.000
262	3.01	3.02	0.01	2.62	11.93	63.55	0.06	0.000	0.000	0.000
263	3.02	3.03	0.01	2.63	11.88	67.67	0.06	0.000	0.000	0.000
264	3.03	3.04	0.01	2.63	11.83	71.10	0.06	0.000	0.000	0.000
265	3.04	3.05	0.01	2.65	11.78	73.19	0.06	0.000	0.000	0.000
266	3.05	3.06	0.01	2.65	11.74	75.42	0.06	0.000	0.000	0.000
267	3.06	3.07	0.01	2.67	11.69	78.88	0.06	0.000	0.000	0.000
268	3.07	3.08	0.01	2.67	11.64	83.34	0.06	0.000	0.000	0.000
269	3.08	3.09	0.01	2.69	11.60	87.47	0.06	0.000	0.000	0.000
270	3.09	3.10	0.01	2.70	11.55	91.02	0.06	0.000	0.000	0.000
271	3.10	3.11	0.01	2.71	11.50	92.74	0.06	0.000	0.000	0.000
272	3.11	3.12	0.01	2.72	11.46	96.25	0.06	0.000	0.000	0.000
273	3.12	3.13	0.01	2.73	11.41	100.55	0.06	0.000	0.000	0.000
274	3.13	3.14	0.01	2.74	11.37	102.01	0.06	0.000	0.000	0.000
275	3.14	3.15	0.01	2.75	11.33	101.83	0.06	0.000	0.000	0.000
276	3.15	3.16	0.01	2.76	11.28	101.32	0.06	0.000	0.000	0.000

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	$M_{(CPT)}$ (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
277	3.16	3.17	0.01	2.77	11.24	104.17	0.06	0.000	0.000	0.000
278	3.17	3.18	0.01	2.78	11.19	106.92	0.06	0.000	0.000	0.000
279	3.18	3.19	0.01	2.79	11.15	109.97	0.06	0.000	0.000	0.000
280	3.19	3.20	0.01	2.80	11.11	112.05	0.06	0.000	0.000	0.000
281	3.20	3.21	0.01	2.81	11.07	113.10	0.06	0.000	0.000	0.000
282	3.21	3.22	0.01	2.82	11.02	112.64	0.06	0.000	0.000	0.000
283	3.22	3.23	0.01	2.83	10.98	111.56	0.05	0.000	0.000	0.000
284	3.23	3.24	0.01	2.84	10.94	110.44	0.05	0.000	0.000	0.000
285	3.24	3.25	0.01	2.85	10.90	110.33	0.05	0.000	0.000	0.000
286	3.25	3.26	0.01	2.86	10.86	113.92	0.05	0.000	0.000	0.000
287	3.26	3.27	0.01	2.87	10.82	117.62	0.05	0.000	0.000	0.000
288	3.27	3.28	0.01	2.88	10.78	119.15	0.05	0.000	0.000	0.000
289	3.28	3.29	0.01	2.89	10.74	120.52	0.05	0.000	0.000	0.000
290	3.29	3.30	0.01	2.90	10.70	120.97	0.05	0.000	0.000	0.000
291	3.30	3.31	0.01	2.91	10.66	122.21	0.05	0.000	0.000	0.000
292	3.31	3.32	0.01	2.92	10.62	119.57	0.05	0.000	0.000	0.000
293	3.32	3.33	0.01	2.93	10.58	119.18	0.05	0.000	0.000	0.000

Total primary settlement: 0.64
Total secondary settlement: 0.11

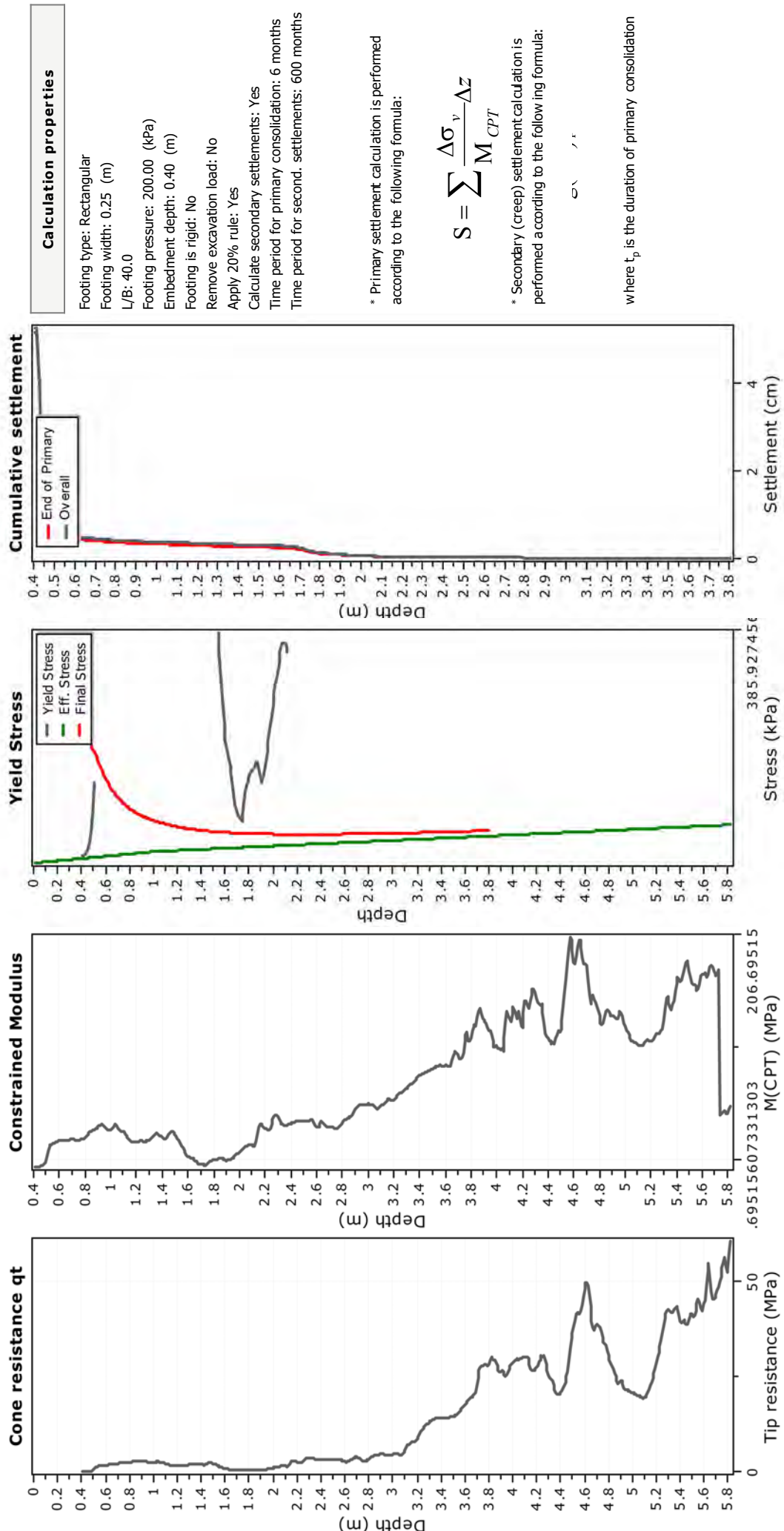
Total calculated settlement: 0.76

Abbreviations

Start depth:	Start depth of soil layer (penetration depth measured from ground free surface)
End depth:	End depth of soil layer (penetration depth measured from ground free surface)
Thickness:	Thickness of soil layer
Relative depth:	Depth of calculation relative to footing
Iz:	Stress influence factor
Delta P:	Footing imposed stress:
Eff. stress:	Effective stress
$M_{(CPT)}$:	Constrained modulus from CPT
Settlement:	Primary settlement
Second. settlement:	Secondary settlements due to creep

Project: Deep Geotechnical Investigation
Location: Unit 1&2, 85 Trafalgar St

Settlements calculation according to theory of elasticity *



:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
1	0.40	0.41	0.01	0.01	199.99	0.00	1.00	0.000	0.000	0.000
2	0.41	0.42	0.01	0.02	199.86	0.16	1.00	1.248	0.010	1.258
3	0.42	0.43	0.01	0.03	199.35	0.16	1.00	1.286	0.010	1.296
4	0.43	0.44	0.01	0.04	198.30	0.25	0.99	0.799	0.007	0.805
5	0.44	0.45	0.01	0.05	196.58	0.41	0.98	0.485	0.004	0.489
6	0.45	0.46	0.01	0.06	194.16	0.60	0.97	0.326	0.003	0.329
7	0.46	0.47	0.01	0.06	191.06	0.75	0.96	0.253	0.002	0.255
8	0.47	0.48	0.01	0.08	187.36	1.38	0.94	0.136	0.001	0.137
9	0.48	0.49	0.01	0.09	183.17	2.44	0.92	0.075	0.001	0.076
10	0.49	0.50	0.01	0.10	178.59	4.35	0.89	0.041	0.000	0.041
11	0.50	0.51	0.01	0.11	173.75	8.97	0.87	0.019	0.000	0.020
12	0.51	0.52	0.01	0.12	168.74	13.88	0.84	0.012	0.000	0.012
13	0.52	0.53	0.01	0.13	163.66	18.67	0.82	0.009	0.000	0.009
14	0.53	0.54	0.01	0.14	158.58	19.56	0.79	0.008	0.000	0.008
15	0.54	0.55	0.01	0.15	153.55	20.24	0.77	0.008	0.000	0.008
16	0.55	0.56	0.01	0.16	148.63	20.79	0.74	0.007	0.000	0.007
17	0.56	0.57	0.01	0.17	143.83	21.22	0.72	0.007	0.000	0.007
18	0.57	0.58	0.01	0.18	139.19	21.76	0.70	0.006	0.000	0.006
19	0.58	0.59	0.01	0.19	134.72	22.43	0.67	0.006	0.000	0.006
20	0.59	0.60	0.01	0.20	130.43	23.06	0.65	0.006	0.000	0.006
21	0.60	0.61	0.01	0.21	126.31	23.40	0.63	0.005	0.000	0.005
22	0.61	0.62	0.01	0.22	122.38	23.56	0.61	0.005	0.000	0.005
23	0.62	0.63	0.01	0.23	118.62	23.58	0.59	0.005	0.000	0.005
24	0.63	0.64	0.01	0.24	115.03	23.63	0.58	0.005	0.000	0.005
25	0.64	0.65	0.01	0.25	111.61	23.57	0.56	0.005	0.000	0.005
26	0.65	0.66	0.01	0.26	108.35	23.47	0.54	0.005	0.000	0.005
27	0.66	0.67	0.01	0.27	105.25	23.39	0.53	0.004	0.000	0.004
28	0.67	0.68	0.01	0.28	102.28	23.68	0.51	0.004	0.000	0.004
29	0.68	0.69	0.01	0.28	99.46	24.16	0.50	0.004	0.000	0.004
30	0.69	0.70	0.01	0.30	96.77	24.71	0.48	0.004	0.000	0.004
31	0.70	0.71	0.01	0.31	94.20	24.82	0.47	0.004	0.000	0.004
32	0.71	0.72	0.01	0.32	91.75	24.53	0.46	0.004	0.000	0.004
33	0.72	0.73	0.01	0.33	89.41	23.89	0.45	0.004	0.000	0.004
34	0.73	0.74	0.01	0.34	87.17	23.35	0.44	0.004	0.000	0.004
35	0.74	0.75	0.01	0.35	85.04	23.37	0.43	0.004	0.000	0.004
36	0.75	0.76	0.01	0.36	82.99	23.84	0.41	0.003	0.000	0.003
37	0.76	0.77	0.01	0.37	81.04	24.33	0.41	0.003	0.000	0.003
38	0.77	0.78	0.01	0.38	79.16	24.65	0.40	0.003	0.000	0.003
39	0.78	0.79	0.01	0.39	77.37	25.01	0.39	0.003	0.000	0.003
40	0.79	0.80	0.01	0.40	75.65	25.60	0.38	0.003	0.000	0.003
41	0.80	0.81	0.01	0.41	73.99	26.38	0.37	0.003	0.000	0.003
42	0.81	0.82	0.01	0.42	72.41	27.33	0.36	0.003	0.000	0.003
43	0.82	0.83	0.01	0.43	70.89	28.56	0.35	0.002	0.000	0.002
44	0.83	0.84	0.01	0.44	69.42	29.86	0.35	0.002	0.000	0.002
45	0.84	0.85	0.01	0.45	68.01	31.03	0.34	0.002	0.000	0.002
46	0.85	0.86	0.01	0.46	66.66	31.85	0.33	0.002	0.000	0.002

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
47	0.86	0.87	0.01	0.47	65.35	32.50	0.33	0.002	0.000	0.002
48	0.87	0.88	0.01	0.48	64.10	33.10	0.32	0.002	0.000	0.002
49	0.88	0.89	0.01	0.49	62.89	33.81	0.31	0.002	0.000	0.002
50	0.89	0.90	0.01	0.50	61.72	34.60	0.31	0.002	0.000	0.002
51	0.90	0.91	0.01	0.51	60.59	35.50	0.30	0.002	0.000	0.002
52	0.91	0.92	0.01	0.52	59.50	36.41	0.30	0.002	0.000	0.002
53	0.92	0.93	0.01	0.53	58.45	37.36	0.29	0.002	0.000	0.002
54	0.93	0.94	0.01	0.54	57.43	38.14	0.29	0.002	0.000	0.002
55	0.94	0.95	0.01	0.55	56.45	36.60	0.28	0.002	0.000	0.002
56	0.95	0.96	0.01	0.56	55.49	35.90	0.28	0.002	0.000	0.002
57	0.96	0.97	0.01	0.56	54.57	34.77	0.27	0.002	0.000	0.002
58	0.97	0.98	0.01	0.57	53.68	33.56	0.27	0.002	0.000	0.002
59	0.98	0.99	0.01	0.59	52.82	32.48	0.26	0.002	0.000	0.002
60	0.99	1.00	0.01	0.60	51.98	32.34	0.26	0.002	0.000	0.002
61	1.00	1.01	0.01	0.61	51.17	32.93	0.26	0.002	0.000	0.002
62	1.01	1.02	0.01	0.62	50.38	34.04	0.25	0.001	0.000	0.001
63	1.02	1.03	0.01	0.63	49.61	35.37	0.25	0.001	0.000	0.001
64	1.03	1.04	0.01	0.64	48.87	37.63	0.24	0.001	0.000	0.001
65	1.04	1.05	0.01	0.65	48.15	37.28	0.24	0.001	0.000	0.001
66	1.05	1.06	0.01	0.66	47.45	36.43	0.24	0.001	0.000	0.001
67	1.06	1.07	0.01	0.67	46.77	34.50	0.23	0.001	0.000	0.001
68	1.07	1.08	0.01	0.68	46.11	32.90	0.23	0.001	0.000	0.001
69	1.08	1.09	0.01	0.69	45.46	31.62	0.23	0.001	0.000	0.001
70	1.09	1.10	0.01	0.70	44.83	31.34	0.22	0.001	0.000	0.001
71	1.10	1.11	0.01	0.71	44.22	30.94	0.22	0.001	0.000	0.001
72	1.11	1.12	0.01	0.72	43.63	28.63	0.22	0.002	0.000	0.002
73	1.12	1.13	0.01	0.73	43.05	27.60	0.22	0.002	0.000	0.002
74	1.13	1.14	0.01	0.74	42.49	26.57	0.21	0.002	0.000	0.002
75	1.14	1.15	0.01	0.75	41.94	24.70	0.21	0.002	0.000	0.002
76	1.15	1.16	0.01	0.76	41.40	23.29	0.21	0.002	0.000	0.002
77	1.16	1.17	0.01	0.77	40.88	22.06	0.20	0.002	0.000	0.002
78	1.17	1.18	0.01	0.78	40.37	22.00	0.20	0.002	0.000	0.002
79	1.18	1.19	0.01	0.79	39.87	22.04	0.20	0.002	0.000	0.002
80	1.19	1.20	0.01	0.80	39.38	22.22	0.20	0.002	0.000	0.002
81	1.20	1.21	0.01	0.81	38.91	22.45	0.19	0.002	0.000	0.002
82	1.21	1.22	0.01	0.82	38.45	22.64	0.19	0.002	0.000	0.002
83	1.22	1.23	0.01	0.83	37.99	22.73	0.19	0.002	0.000	0.002
84	1.23	1.24	0.01	0.84	37.55	23.52	0.19	0.002	0.000	0.002
85	1.24	1.25	0.01	0.85	37.12	23.15	0.19	0.002	0.000	0.002
86	1.25	1.26	0.01	0.86	36.70	22.90	0.18	0.002	0.000	0.002
87	1.26	1.27	0.01	0.87	36.28	22.85	0.18	0.002	0.000	0.002
88	1.27	1.28	0.01	0.88	35.88	22.90	0.18	0.002	0.000	0.002
89	1.28	1.29	0.01	0.89	35.48	23.13	0.18	0.002	0.000	0.002
90	1.29	1.30	0.01	0.90	35.10	23.48	0.18	0.001	0.000	0.001
91	1.30	1.31	0.01	0.91	34.72	24.06	0.17	0.001	0.000	0.001
92	1.31	1.32	0.01	0.92	34.35	24.66	0.17	0.001	0.000	0.001

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
93	1.32	1.33	0.01	0.93	33.99	25.97	0.17	0.001	0.000	0.001
94	1.33	1.34	0.01	0.94	33.63	27.21	0.17	0.001	0.000	0.001
95	1.34	1.35	0.01	0.95	33.28	28.39	0.17	0.001	0.000	0.001
96	1.35	1.36	0.01	0.96	32.94	28.95	0.16	0.001	0.000	0.001
97	1.36	1.37	0.01	0.97	32.61	29.71	0.16	0.001	0.000	0.001
98	1.37	1.38	0.01	0.98	32.28	28.88	0.16	0.001	0.000	0.001
99	1.38	1.39	0.01	0.99	31.96	28.26	0.16	0.001	0.000	0.001
100	1.39	1.40	0.01	1.00	31.64	27.74	0.16	0.001	0.000	0.001
101	1.40	1.41	0.01	1.00	31.33	26.46	0.16	0.001	0.000	0.001
102	1.41	1.42	0.01	1.01	31.03	25.52	0.16	0.001	0.000	0.001
103	1.42	1.43	0.01	1.02	30.73	24.80	0.15	0.001	0.000	0.001
104	1.43	1.44	0.01	1.04	30.44	25.35	0.15	0.001	0.000	0.001
105	1.44	1.45	0.01	1.05	30.15	26.94	0.15	0.001	0.000	0.001
106	1.45	1.46	0.01	1.06	29.87	28.80	0.15	0.001	0.000	0.001
107	1.46	1.47	0.01	1.07	29.60	30.71	0.15	0.001	0.000	0.001
108	1.47	1.48	0.01	1.08	29.32	31.63	0.15	0.001	0.000	0.001
109	1.48	1.49	0.01	1.09	29.06	31.66	0.15	0.001	0.000	0.001
110	1.49	1.50	0.01	1.10	28.80	30.81	0.14	0.001	0.000	0.001
111	1.50	1.51	0.01	1.11	28.54	29.45	0.14	0.001	0.000	0.001
112	1.51	1.52	0.01	1.12	28.29	27.53	0.14	0.001	0.000	0.001
113	1.52	1.53	0.01	1.13	28.04	25.51	0.14	0.001	0.000	0.001
114	1.53	1.54	0.01	1.14	27.79	23.31	0.14	0.001	0.000	0.001
115	1.54	1.55	0.01	1.15	27.56	21.40	0.14	0.001	0.000	0.002
116	1.55	1.56	0.01	1.16	27.32	18.87	0.14	0.001	0.000	0.002
117	1.56	1.57	0.01	1.17	27.09	16.54	0.14	0.002	0.000	0.002
118	1.57	1.58	0.01	1.18	26.86	14.39	0.13	0.002	0.000	0.002
119	1.58	1.59	0.01	1.19	26.64	12.66	0.13	0.002	0.000	0.002
120	1.59	1.60	0.01	1.20	26.41	11.11	0.13	0.002	0.000	0.003
121	1.60	1.61	0.01	1.21	26.20	9.85	0.13	0.003	0.000	0.003
122	1.61	1.62	0.01	1.22	25.98	9.19	0.13	0.003	0.001	0.003
123	1.62	1.63	0.01	1.23	25.77	8.54	0.13	0.003	0.001	0.004
124	1.63	1.64	0.01	1.24	25.57	7.88	0.13	0.003	0.001	0.004
125	1.64	1.65	0.01	1.25	25.36	7.27	0.13	0.003	0.001	0.004
126	1.65	1.66	0.01	1.25	25.16	6.81	0.13	0.004	0.001	0.004
127	1.66	1.67	0.01	1.26	24.97	5.78	0.12	0.004	0.001	0.005
128	1.67	1.68	0.01	1.27	24.77	4.66	0.12	0.005	0.001	0.006
129	1.68	1.69	0.01	1.29	24.58	3.16	0.12	0.008	0.002	0.009
130	1.69	1.70	0.01	1.30	24.39	2.85	0.12	0.009	0.002	0.010
131	1.70	1.71	0.01	1.31	24.21	2.63	0.12	0.009	0.002	0.011
132	1.71	1.72	0.01	1.32	24.02	2.29	0.12	0.010	0.002	0.013
133	1.72	1.73	0.01	1.33	23.84	2.04	0.12	0.012	0.003	0.014
134	1.73	1.74	0.01	1.34	23.66	1.80	0.12	0.013	0.003	0.016
135	1.74	1.75	0.01	1.35	23.49	1.73	0.12	0.014	0.003	0.017
136	1.75	1.76	0.01	1.36	23.32	2.25	0.12	0.010	0.002	0.013
137	1.76	1.77	0.01	1.37	23.15	3.72	0.12	0.006	0.001	0.008
138	1.77	1.78	0.01	1.38	22.98	5.26	0.11	0.004	0.001	0.005

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
139	1.78	1.79	0.01	1.39	22.81	5.91	0.11	0.004	0.001	0.005
140	1.79	1.80	0.01	1.40	22.65	6.15	0.11	0.004	0.001	0.005
141	1.80	1.81	0.01	1.41	22.49	6.50	0.11	0.003	0.001	0.004
142	1.81	1.82	0.01	1.42	22.33	6.85	0.11	0.003	0.001	0.004
143	1.82	1.83	0.01	1.43	22.18	7.04	0.11	0.003	0.001	0.004
144	1.83	1.84	0.01	1.44	22.02	7.20	0.11	0.003	0.001	0.004
145	1.84	1.85	0.01	1.45	21.87	7.34	0.11	0.003	0.001	0.004
146	1.85	1.86	0.01	1.46	21.72	7.61	0.11	0.003	0.001	0.004
147	1.86	1.87	0.01	1.47	21.57	7.89	0.11	0.003	0.001	0.003
148	1.87	1.88	0.01	1.48	21.42	7.98	0.11	0.003	0.001	0.003
149	1.88	1.89	0.01	1.49	21.28	7.14	0.11	0.003	0.001	0.004
150	1.89	1.90	0.01	1.50	21.14	6.39	0.11	0.003	0.001	0.004
151	1.90	1.91	0.01	1.51	21.00	5.74	0.10	0.004	0.001	0.005
152	1.91	1.92	0.01	1.52	20.86	5.97	0.10	0.003	0.001	0.004
153	1.92	1.93	0.01	1.53	20.72	6.30	0.10	0.003	0.001	0.004
154	1.93	1.94	0.01	1.54	20.59	6.90	0.10	0.003	0.001	0.004
155	1.94	1.95	0.01	1.55	20.45	7.74	0.10	0.003	0.001	0.003
156	1.95	1.96	0.01	1.56	20.32	8.53	0.10	0.002	0.001	0.003
157	1.96	1.97	0.01	1.57	20.19	9.55	0.10	0.002	0.001	0.003
158	1.97	1.98	0.01	1.58	20.06	10.49	0.10	0.002	0.001	0.002
159	1.98	1.99	0.01	1.59	19.94	11.32	0.10	0.002	0.000	0.002
160	1.99	2.00	0.01	1.60	19.81	12.16	0.10	0.002	0.000	0.002
161	2.00	2.01	0.01	1.61	19.69	13.28	0.10	0.001	0.000	0.002
162	2.01	2.02	0.01	1.62	19.56	14.49	0.10	0.001	0.000	0.002
163	2.02	2.03	0.01	1.63	19.44	15.47	0.10	0.001	0.000	0.002
164	2.03	2.04	0.01	1.64	19.32	16.16	0.10	0.001	0.000	0.002
165	2.04	2.05	0.01	1.65	19.20	17.00	0.10	0.001	0.000	0.001
166	2.05	2.06	0.01	1.66	19.09	17.93	0.10	0.001	0.000	0.001
167	2.06	2.07	0.01	1.67	18.97	18.77	0.09	0.001	0.000	0.001
168	2.07	2.08	0.01	1.68	18.86	19.28	0.09	0.001	0.000	0.001
169	2.08	2.09	0.01	1.69	18.75	19.51	0.09	0.001	0.000	0.001
170	2.09	2.10	0.01	1.70	18.63	19.55	0.09	0.001	0.000	0.001
171	2.10	2.11	0.01	1.71	18.52	19.41	0.09	0.001	0.000	0.001
172	2.11	2.12	0.01	1.72	18.41	18.89	0.09	0.001	0.000	0.001
173	2.12	2.13	0.01	1.73	18.31	18.37	0.09	0.001	0.000	0.001
174	2.13	2.14	0.01	1.74	18.20	22.47	0.09	0.001	0.000	0.001
175	2.14	2.15	0.01	1.75	18.10	28.73	0.09	0.001	0.000	0.001
176	2.15	2.16	0.01	1.76	17.99	35.63	0.09	0.001	0.000	0.001
177	2.16	2.17	0.01	1.77	17.89	38.10	0.09	0.000	0.000	0.000
178	2.17	2.18	0.01	1.78	17.79	38.37	0.09	0.000	0.000	0.000
179	2.18	2.19	0.01	1.79	17.69	37.47	0.09	0.000	0.000	0.000
180	2.19	2.20	0.01	1.80	17.59	36.16	0.09	0.000	0.000	0.000
181	2.20	2.21	0.01	1.81	17.49	34.85	0.09	0.001	0.000	0.001
182	2.21	2.22	0.01	1.82	17.39	33.68	0.09	0.001	0.000	0.001
183	2.22	2.23	0.01	1.83	17.29	32.88	0.09	0.001	0.000	0.001
184	2.23	2.24	0.01	1.84	17.20	32.74	0.09	0.001	0.000	0.001

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
185	2.24	2.25	0.01	1.85	17.10	34.74	0.09	0.000	0.000	0.000
186	2.25	2.26	0.01	1.86	17.01	37.82	0.09	0.000	0.000	0.000
187	2.26	2.27	0.01	1.87	16.92	41.60	0.08	0.000	0.000	0.000
188	2.27	2.28	0.01	1.88	16.83	45.18	0.08	0.000	0.000	0.000
189	2.28	2.29	0.01	1.89	16.73	45.56	0.08	0.000	0.000	0.000
190	2.29	2.30	0.01	1.90	16.65	45.52	0.08	0.000	0.000	0.000
191	2.30	2.31	0.01	1.91	16.56	44.11	0.08	0.000	0.000	0.000
192	2.31	2.32	0.01	1.92	16.47	42.15	0.08	0.000	0.000	0.000
193	2.32	2.33	0.01	1.93	16.38	39.78	0.08	0.000	0.000	0.000
194	2.33	2.34	0.01	1.94	16.29	38.76	0.08	0.000	0.000	0.000
195	2.34	2.35	0.01	1.95	16.21	37.92	0.08	0.000	0.000	0.000
196	2.35	2.36	0.01	1.96	16.13	37.44	0.08	0.000	0.000	0.000
197	2.36	2.37	0.01	1.97	16.04	37.34	0.08	0.000	0.000	0.000
198	2.37	2.38	0.01	1.98	15.96	37.42	0.08	0.000	0.000	0.000
199	2.38	2.39	0.01	1.99	15.88	37.54	0.08	0.000	0.000	0.000
200	2.39	2.40	0.01	2.00	15.80	37.97	0.08	0.000	0.000	0.000
201	2.40	2.41	0.01	2.01	15.71	38.50	0.08	0.000	0.000	0.000
202	2.41	2.42	0.01	2.02	15.64	39.17	0.08	0.000	0.000	0.000
203	2.42	2.43	0.01	2.03	15.56	39.65	0.08	0.000	0.000	0.000
204	2.43	2.44	0.01	2.04	15.48	40.08	0.08	0.000	0.000	0.000
205	2.44	2.45	0.01	2.05	15.40	40.41	0.08	0.000	0.000	0.000
206	2.45	2.46	0.01	2.06	15.32	40.58	0.08	0.000	0.000	0.000
207	2.46	2.47	0.01	2.07	15.25	40.66	0.08	0.000	0.000	0.000
208	2.47	2.48	0.01	2.08	15.17	40.68	0.08	0.000	0.000	0.000
209	2.48	2.49	0.01	2.09	15.10	40.66	0.08	0.000	0.000	0.000
210	2.49	2.50	0.01	2.10	15.02	40.57	0.08	0.000	0.000	0.000
211	2.50	2.51	0.01	2.11	14.95	40.37	0.07	0.000	0.000	0.000
212	2.51	2.52	0.01	2.12	14.88	40.25	0.07	0.000	0.000	0.000
213	2.52	2.53	0.01	2.13	14.81	40.24	0.07	0.000	0.000	0.000
214	2.53	2.54	0.01	2.13	14.73	40.65	0.07	0.000	0.000	0.000
215	2.54	2.55	0.01	2.15	14.66	41.20	0.07	0.000	0.000	0.000
216	2.55	2.56	0.01	2.15	14.59	41.85	0.07	0.000	0.000	0.000
217	2.56	2.57	0.01	2.17	14.52	42.17	0.07	0.000	0.000	0.000
218	2.57	2.58	0.01	2.17	14.46	42.19	0.07	0.000	0.000	0.000
219	2.58	2.59	0.01	2.19	14.39	39.30	0.07	0.000	0.000	0.000
220	2.59	2.60	0.01	2.20	14.32	37.20	0.07	0.000	0.000	0.000
221	2.60	2.61	0.01	2.21	14.25	35.52	0.07	0.000	0.000	0.000
222	2.61	2.62	0.01	2.22	14.19	35.44	0.07	0.000	0.000	0.000
223	2.62	2.63	0.01	2.23	14.12	36.12	0.07	0.000	0.000	0.000
224	2.63	2.64	0.01	2.24	14.06	37.56	0.07	0.000	0.000	0.000
225	2.64	2.65	0.01	2.25	13.99	40.48	0.07	0.000	0.000	0.000
226	2.65	2.66	0.01	2.26	13.93	39.89	0.07	0.000	0.000	0.000
227	2.66	2.67	0.01	2.27	13.86	38.41	0.07	0.000	0.000	0.000
228	2.67	2.68	0.01	2.28	13.80	37.06	0.07	0.000	0.000	0.000
229	2.68	2.69	0.01	2.29	13.74	35.79	0.07	0.000	0.000	0.000
230	2.69	2.70	0.01	2.30	13.67	35.72	0.07	0.000	0.000	0.000

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
231	2.70	2.71	0.01	2.31	13.61	35.68	0.07	0.000	0.000	0.000
232	2.71	2.72	0.01	2.32	13.55	35.69	0.07	0.000	0.000	0.000
233	2.72	2.73	0.01	2.33	13.49	35.51	0.07	0.000	0.000	0.000
234	2.73	2.74	0.01	2.34	13.43	35.21	0.07	0.000	0.000	0.000
235	2.74	2.75	0.01	2.35	13.37	34.76	0.07	0.000	0.000	0.000
236	2.75	2.76	0.01	2.36	13.31	34.50	0.07	0.000	0.000	0.000
237	2.76	2.77	0.01	2.37	13.25	34.52	0.07	0.000	0.000	0.000
238	2.77	2.78	0.01	2.38	13.20	34.91	0.07	0.000	0.000	0.000
239	2.78	2.79	0.01	2.38	13.14	35.77	0.07	0.000	0.000	0.000
240	2.79	2.80	0.01	2.40	13.08	36.98	0.07	0.000	0.000	0.000
241	2.80	2.81	0.01	2.40	13.02	38.67	0.07	0.000	0.000	0.000
242	2.81	2.82	0.01	2.42	12.97	40.30	0.06	0.000	0.000	0.000
243	2.82	2.83	0.01	2.42	12.91	41.74	0.06	0.000	0.000	0.000
244	2.83	2.84	0.01	2.44	12.86	42.76	0.06	0.000	0.000	0.000
245	2.84	2.85	0.01	2.45	12.80	43.46	0.06	0.000	0.000	0.000
246	2.85	2.86	0.01	2.46	12.75	43.98	0.06	0.000	0.000	0.000
247	2.86	2.87	0.01	2.47	12.69	44.41	0.06	0.000	0.000	0.000
248	2.87	2.88	0.01	2.48	12.64	44.92	0.06	0.000	0.000	0.000
249	2.88	2.89	0.01	2.49	12.59	45.70	0.06	0.000	0.000	0.000
250	2.89	2.90	0.01	2.50	12.53	48.29	0.06	0.000	0.000	0.000
251	2.90	2.91	0.01	2.51	12.48	50.91	0.06	0.000	0.000	0.000
252	2.91	2.92	0.01	2.52	12.43	53.26	0.06	0.000	0.000	0.000
253	2.92	2.93	0.01	2.53	12.38	54.11	0.06	0.000	0.000	0.000
254	2.93	2.94	0.01	2.54	12.32	54.63	0.06	0.000	0.000	0.000
255	2.94	2.95	0.01	2.55	12.27	54.89	0.06	0.000	0.000	0.000
256	2.95	2.96	0.01	2.56	12.22	54.90	0.06	0.000	0.000	0.000
257	2.96	2.97	0.01	2.57	12.17	54.93	0.06	0.000	0.000	0.000
258	2.97	2.98	0.01	2.58	12.12	55.05	0.06	0.000	0.000	0.000
259	2.98	2.99	0.01	2.59	12.07	55.31	0.06	0.000	0.000	0.000
260	2.99	3.00	0.01	2.60	12.02	55.62	0.06	0.000	0.000	0.000
261	3.00	3.01	0.01	2.61	11.97	56.06	0.06	0.000	0.000	0.000
262	3.01	3.02	0.01	2.62	11.93	55.84	0.06	0.000	0.000	0.000
263	3.02	3.03	0.01	2.63	11.88	55.59	0.06	0.000	0.000	0.000
264	3.03	3.04	0.01	2.63	11.83	55.21	0.06	0.000	0.000	0.000
265	3.04	3.05	0.01	2.65	11.78	54.76	0.06	0.000	0.000	0.000
266	3.05	3.06	0.01	2.65	11.74	53.68	0.06	0.000	0.000	0.000
267	3.06	3.07	0.01	2.67	11.69	52.33	0.06	0.000	0.000	0.000
268	3.07	3.08	0.01	2.67	11.64	51.66	0.06	0.000	0.000	0.000
269	3.08	3.09	0.01	2.69	11.60	51.50	0.06	0.000	0.000	0.000
270	3.09	3.10	0.01	2.70	11.55	52.42	0.06	0.000	0.000	0.000
271	3.10	3.11	0.01	2.71	11.50	53.67	0.06	0.000	0.000	0.000
272	3.11	3.12	0.01	2.72	11.46	54.94	0.06	0.000	0.000	0.000
273	3.12	3.13	0.01	2.73	11.41	55.63	0.06	0.000	0.000	0.000
274	3.13	3.14	0.01	2.74	11.37	56.97	0.06	0.000	0.000	0.000
275	3.14	3.15	0.01	2.75	11.33	58.45	0.06	0.000	0.000	0.000
276	3.15	3.16	0.01	2.76	11.28	59.78	0.06	0.000	0.000	0.000

:: Tabular results ::

Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
277	3.16	3.17	0.01	2.77	11.24	60.15	0.06	0.000	0.000	0.000
278	3.17	3.18	0.01	2.78	11.19	60.14	0.06	0.000	0.000	0.000
279	3.18	3.19	0.01	2.79	11.15	59.69	0.06	0.000	0.000	0.000
280	3.19	3.20	0.01	2.80	11.11	59.25	0.06	0.000	0.000	0.000
281	3.20	3.21	0.01	2.81	11.07	59.04	0.06	0.000	0.000	0.000
282	3.21	3.22	0.01	2.82	11.02	60.14	0.06	0.000	0.000	0.000
283	3.22	3.23	0.01	2.83	10.98	61.49	0.05	0.000	0.000	0.000
284	3.23	3.24	0.01	2.84	10.94	63.04	0.05	0.000	0.000	0.000
285	3.24	3.25	0.01	2.85	10.90	64.19	0.05	0.000	0.000	0.000
286	3.25	3.26	0.01	2.86	10.86	65.28	0.05	0.000	0.000	0.000
287	3.26	3.27	0.01	2.87	10.82	66.38	0.05	0.000	0.000	0.000
288	3.27	3.28	0.01	2.88	10.78	67.16	0.05	0.000	0.000	0.000
289	3.28	3.29	0.01	2.89	10.74	68.14	0.05	0.000	0.000	0.000
290	3.29	3.30	0.01	2.90	10.70	69.23	0.05	0.000	0.000	0.000
291	3.30	3.31	0.01	2.91	10.66	70.42	0.05	0.000	0.000	0.000
292	3.31	3.32	0.01	2.92	10.62	71.58	0.05	0.000	0.000	0.000
293	3.32	3.33	0.01	2.93	10.58	72.55	0.05	0.000	0.000	0.000
294	3.33	3.34	0.01	2.94	10.54	73.54	0.05	0.000	0.000	0.000
295	3.34	3.35	0.01	2.95	10.50	74.35	0.05	0.000	0.000	0.000
296	3.35	3.36	0.01	2.96	10.46	75.37	0.05	0.000	0.000	0.000
297	3.36	3.37	0.01	2.97	10.42	76.29	0.05	0.000	0.000	0.000
298	3.37	3.38	0.01	2.98	10.38	77.11	0.05	0.000	0.000	0.000
299	3.38	3.39	0.01	2.99	10.35	78.51	0.05	0.000	0.000	0.000
300	3.39	3.40	0.01	3.00	10.31	80.00	0.05	0.000	0.000	0.000
301	3.40	3.41	0.01	3.01	10.27	81.48	0.05	0.000	0.000	0.000
302	3.41	3.42	0.01	3.02	10.23	81.98	0.05	0.000	0.000	0.000
303	3.42	3.43	0.01	3.03	10.20	82.49	0.05	0.000	0.000	0.000
304	3.43	3.44	0.01	3.04	10.16	83.02	0.05	0.000	0.000	0.000
305	3.44	3.45	0.01	3.05	10.12	83.62	0.05	0.000	0.000	0.000
306	3.45	3.46	0.01	3.06	10.09	84.19	0.05	0.000	0.000	0.000
307	3.46	3.47	0.01	3.07	10.05	84.87	0.05	0.000	0.000	0.000
308	3.47	3.48	0.01	3.08	10.02	85.59	0.05	0.000	0.000	0.000
309	3.48	3.49	0.01	3.09	9.98	86.13	0.05	0.000	0.000	0.000
310	3.49	3.50	0.01	3.10	9.95	86.60	0.05	0.000	0.000	0.000
311	3.50	3.51	0.01	3.11	9.91	87.39	0.05	0.000	0.000	0.000
312	3.51	3.52	0.01	3.12	9.87	88.09	0.05	0.000	0.000	0.000
313	3.52	3.53	0.01	3.13	9.84	88.72	0.05	0.000	0.000	0.000
314	3.53	3.54	0.01	3.14	9.81	89.26	0.05	0.000	0.000	0.000
315	3.54	3.55	0.01	3.15	9.77	89.76	0.05	0.000	0.000	0.000
316	3.55	3.56	0.01	3.16	9.74	90.10	0.05	0.000	0.000	0.000
317	3.56	3.57	0.01	3.17	9.70	90.22	0.05	0.000	0.000	0.000
318	3.57	3.58	0.01	3.18	9.67	90.12	0.05	0.000	0.000	0.000
319	3.58	3.59	0.01	3.19	9.64	90.06	0.05	0.000	0.000	0.000
320	3.59	3.60	0.01	3.20	9.60	90.12	0.05	0.000	0.000	0.000
321	3.60	3.61	0.01	3.21	9.57	90.42	0.05	0.000	0.000	0.000
322	3.61	3.62	0.01	3.22	9.54	90.75	0.05	0.000	0.000	0.000

:: Tabular results ::

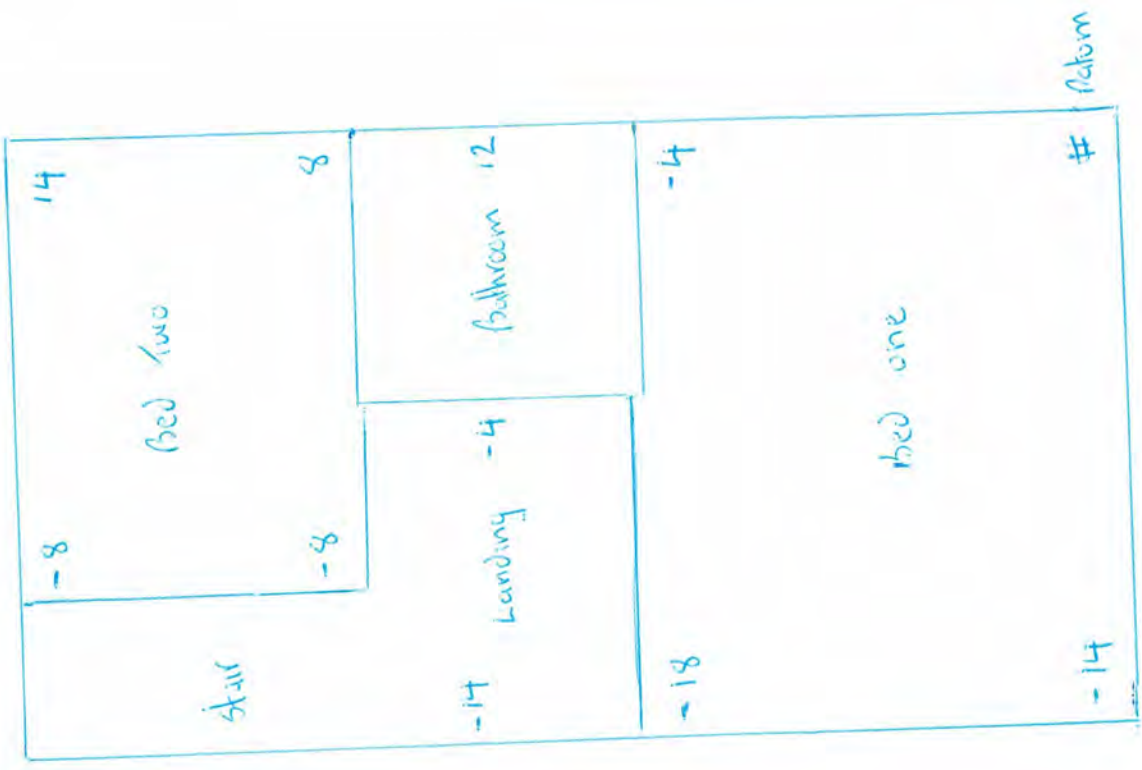
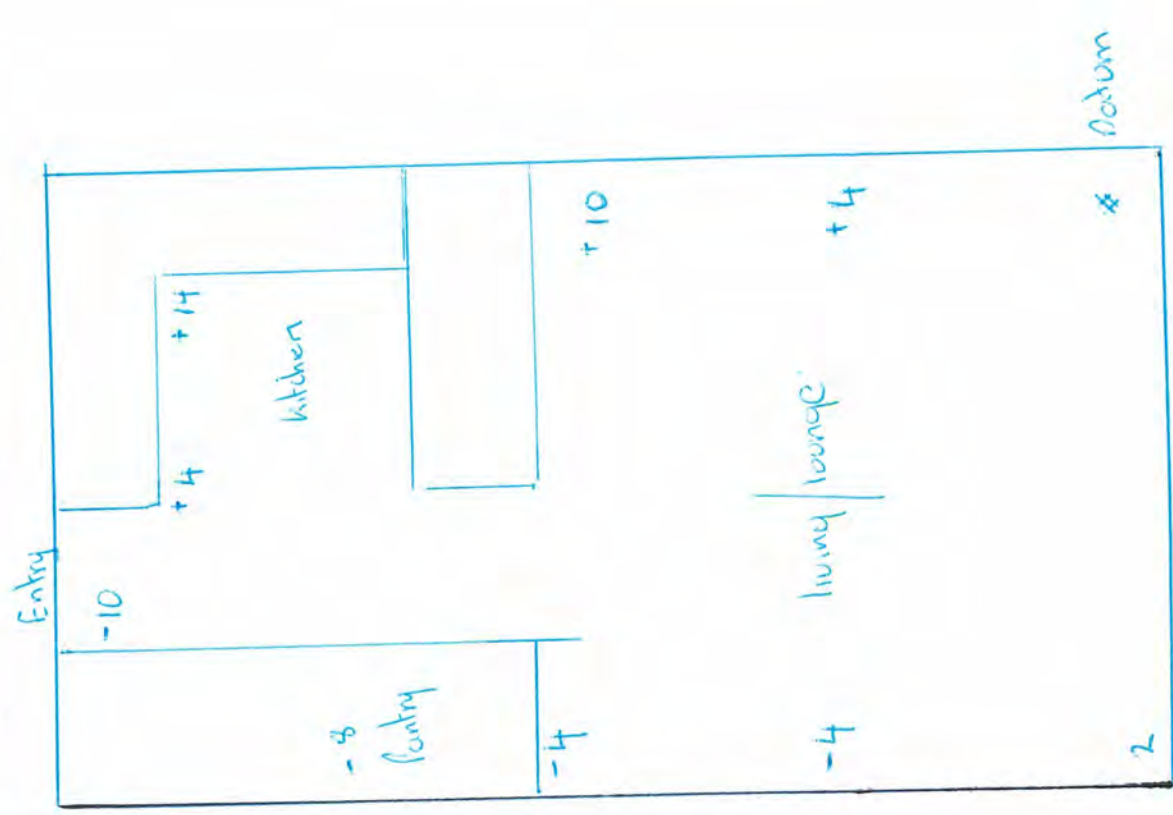
Point No	Start depth (m)	End depth (m)	Thickness (m)	Relative depth (m)	Delta P (kPa)	M _(CPT) (MPa)	Iz	Settlement (cm)	Second. settlement (cm)	Overall settlement (cm)
323	3.62	3.63	0.01	3.23	9.50	89.98	0.05	0.000	0.000	0.000
324	3.63	3.64	0.01	3.24	9.47	89.33	0.05	0.000	0.000	0.000
325	3.64	3.65	0.01	3.25	9.44	89.94	0.05	0.000	0.000	0.000
326	3.65	3.66	0.01	3.26	9.41	94.18	0.05	0.000	0.000	0.000
327	3.66	3.67	0.01	3.27	9.37	98.60	0.05	0.000	0.000	0.000
328	3.67	3.68	0.01	3.28	9.34	101.98	0.05	0.000	0.000	0.000
329	3.68	3.69	0.01	3.29	9.31	103.01	0.05	0.000	0.000	0.000
330	3.69	3.70	0.01	3.30	9.28	101.71	0.05	0.000	0.000	0.000
331	3.70	3.71	0.01	3.31	9.25	100.32	0.05	0.000	0.000	0.000
332	3.71	3.72	0.01	3.32	9.22	96.34	0.05	0.000	0.000	0.000
333	3.72	3.73	0.01	3.33	9.18	96.64	0.05	0.000	0.000	0.000
334	3.73	3.74	0.01	3.34	9.15	97.34	0.05	0.000	0.000	0.000
335	3.74	3.75	0.01	3.35	9.12	100.76	0.05	0.000	0.000	0.000
336	3.75	3.76	0.01	3.36	9.09	111.56	0.05	0.000	0.000	0.000
337	3.76	3.77	0.01	3.37	9.06	116.55	0.05	0.000	0.000	0.000
338	3.77	3.78	0.01	3.38	9.03	119.78	0.05	0.000	0.000	0.000
339	3.78	3.79	0.01	3.39	9.00	111.47	0.05	0.000	0.000	0.000
340	3.79	3.80	0.01	3.40	8.97	112.06	0.04	0.000	0.000	0.000
341	3.80	3.81	0.01	3.41	8.94	114.59	0.04	0.000	0.000	0.000

Total primary settlement: 5.19
Total secondary settlement: 0.09

Total calculated settlement: 5.27

Abbreviations

Start depth:	Start depth of soil layer (penetration depth measured from ground free surface)
End depth:	End depth of soil layer (penetration depth measured from ground free surface)
Thickness:	Thickness of soil layer
Relative depth:	Depth of calculation relative to footing
Iz:	Stress influence factor
Delta P:	Footing imposed stress:
Eff. stress:	Effective stress
M _(CPT) :	Constrained modulus from CPT
Settlement:	Primary settlement
Second. settlement:	Secondary settlements due to creep



levels taken using 2.8 level

Date 3/1/20 2/85 Trafalgar St.

Working Document - Building

Completed By:	Shawn Feng	Claim Number:	CLM/2010/086160
Role:	ESTIMATOR	Customer Name:	
Date:	05/10/2021	Address:	2/85 Trafalga Street St Albans Christchurch

Description	High Level Desktop Costing based on Cephas Rock Engineer report 01/06/2021
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Page 1 of 3					
Element:	Description	Units	Qty	Rate	Cost
Building Type	Main Dwelling				
Fees	Preliminary and General - site specific item				
Fees	Engineers - fees associated with design/plans/specifications/monitoring required to complete works.	Sum	1	\$3,000.00	\$3,000.00
Fees	Council - Costs associated with consents required to complete works.	Sum	1	\$1,500.00	\$1,500.00
Fees	Drainage - Disconnect and reconnect	Sum	1	\$1,000.00	\$1,000.00
Fees	Asbestos test	Sum	1	\$2,000.00	\$2,000.00
Fees	Specialist - Electrician - Remove reinstate lights etc, set up isolated power supply	Hr	30	\$65.00	\$1,950.00
Fees	Specialist Tradesman - Plumber - Remove reinstate fittings etc	Hr	30	\$65.00	\$1,950.00
Fees	Scaffold wall face inc erect & dismantle (Double story m2)	m2	86	\$24.00	\$2,064.00
Fees	Scaffold weekly rental (m2) - Two weeks	Sum	86	\$6.00	\$516.00
Fees	Health and Safety checks and tagging	No	2	\$90.00	\$180.00
External Element	Foundation				
Slab Foundation	Foundation relevel as per Cephas Rock Ltd Engineer report option 2 - Resin injection method	m2	34	\$450.00	\$15,300.00
Ring Foundation	Solid plaster repair	m2	4.6	\$112.00	\$515.20
Slab Foundation	Grind out and epoxy concrete floor cracks 0-4mm wide (PC Sum)	m	15	\$125.50	\$1,882.50
External Element	Cladding and external repairs				
Wall Cladding	Gap fill, sand and paint weatherboards to manufacturers specifications	m2	86	\$43.00	\$3,698.00
Stairs External	Remove dispose supply install entry steps	Sum	1	\$350.00	\$350.00
Main Access	Uplift and reply pavers	Sum	1	\$350.00	\$350.00
Landscaping	Remove and reinstate fence	Sum	1	\$300.00	\$300.00
Wall Cladding	Repaint block wall	m2	4.8	\$35.00	\$168.00
Interior Room	Joinery and trim			Element Cost	\$2,300.00
Trim	PC Sum to gap fill and paint trim as required	Sum	1	\$1,500.00	\$1,500.00
Window	Allow to adjust windows and doors as required	Hr	16	\$50.00	\$800.00
Working document, for internal purposes only, subject to change upon review.				Page Sub Total	\$39,023.70
				Page Preliminaries & General	\$1,989.10
				Page Margin	\$4,101.28
				Page GST	\$6,767.11
				PAGE TOTAL	\$51,881.19



Page 2 of 3

Element:	Description	Units	Qty	Rate	Cost
Floor Number	Ground Floor				
Interior Room	Kitchen			Element Cost	\$4,356.82
Ceiling	Rake out and stop plasterboard joint cracks and paint	m2	9.92	\$36.40	\$361.09
Wall Covering	Rake out & stop plasterboard joint cracks & paint	m2	30.24	\$32.90	\$994.90
Floor	Remove dispose supply install vinyl planking	m2	9.92	\$114.50	\$1,135.84
Kitchen Joinery	Remove and reinstall kitchen	No	1	\$1,365.00	\$1,365.00
Kitchen Joinery	Remove, dispose and replace toe kick	Sum	1	\$500.00	\$500.00
Interior Room	Lounge			Element Cost	\$2,433.14
Ceiling	Rake out and stop plasterboard joint cracks and paint	m2	18.06	\$36.40	\$657.38
Wall Covering	Rake out & stop plasterboard joint cracks & paint	m2	40.8	\$32.90	\$1,342.32
Floor	Remove set aside and relay carpet	m2	18.06	\$24.00	\$433.44
Interior Room	Understair cupboard			Element Cost	\$533.94
Ceiling	Rake out and stop plasterboard joint cracks and paint	m2	1.65	\$36.40	\$60.06
Wall Covering	Rake out & stop plasterboard joint cracks & paint	m2	13.2	\$32.90	\$434.28
Floor	Remove set aside and relay carpet	m2	1.65	\$24.00	\$39.60
Interior Room	Stairwell			Element Cost	\$2,955.50
Ceiling	Rake out and stop plasterboard joint cracks and paint	m2	4.5	\$36.40	\$163.80
Wall Covering	Rake out & stop plasterboard joint cracks & paint	m2	48.38	\$32.90	\$1,591.70
Fees	Scaffolding internal stairwell	No	1	\$1,200.00	\$1,200.00
Interior Room	Entry			Element Cost	\$530.01
Ceiling	Rake out and stop plasterboard joint cracks and paint	m2	1.21	\$36.40	\$44.04
Wall Covering	Rake out & stop plasterboard joint cracks & paint	m2	10.56	\$32.90	\$347.42
Floor	Remove dispose supply install vinyl planking	m2	1.21	\$114.50	\$138.55
Interior Room	Intertenancy Firewall			Element Cost	\$1,969.20
Wall Framing	Grind out and repoint mortar joints - PC Sum	m	20	\$49.50	\$990.00
Wall Framing	Paint wall (Framing)	m2	36	\$27.20	\$979.20
Working document, for internal purposes only, subject to change upon review.				Page Sub Total	\$12,778.62
				Page Preliminaries & General	\$926.29
				Page Margin	\$1,370.49
				Page GST	\$2,261.31
				PAGE TOTAL	\$17,336.71

[illegible]

Working Document - Building

Completed By:	Shawn Feng	Claim Number:	CLM/2010/086160
Role:	ESTIMATOR	Customer Name:	
Date:	05/10/2021	Address:	2/85 Trafalga Street St Albans Christchurch

High Level Desktop Costing based on Cephas Rock Engineer report 01/06/2021

Summary Page

	Elements	P&G	Margin	GST	Totals
Page 1 total	\$39,023.70	\$1,989.10	\$4,101.28	\$6,767.11	\$51,881.19
Page 2 total	\$12,778.62	\$926.29	\$1,370.49	\$2,261.31	\$17,336.71
Page 3 total	\$3,894.97	\$311.60	\$420.66	\$694.08	\$5,321.31
Page 4 total					
Page 5 total					
Page 6 total					
Grand total	\$55,697.29	\$3,226.98	\$5,892.43	\$9,722.51	\$74,539.21

Working document, for internal purposes only, subject to change upon review.

Drainage Assessment Report

Customer 1- [REDACTED]
2- To be advised
3- [REDACTED]
4- [REDACTED]

Address 1-4/85 Trafalgar Street

St Albans

Prepared By Enviroflo (0277151674)

Date 13 May 2022

Certified Drainlayer Hayden Greig 23347

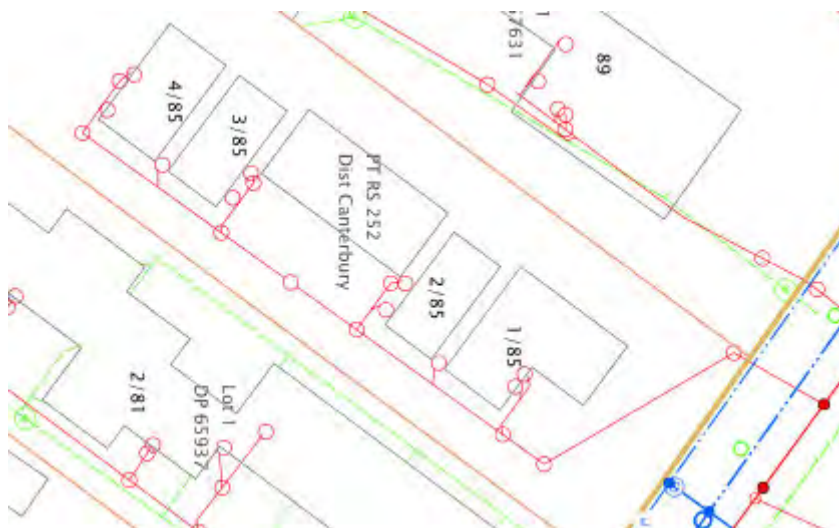
Signed Hayden Greig

After a recent survey of the existing private sewer and stormwater systems at the above address, on 0/11/2021 this report was prepared by Enviroflo for EQC.

Copies of the following documents have been provided with this report:

- As-Built Sketch – a diagram of the existing sewerage and stormwater systems indicating where damage was identified
- Proposed Repair Strategy Sketch – a diagram of the existing systems revised to reflect any changes made as part of the repair (i.e. component relocations, rerouting of lines, etc.)
- Enviroflo Quote
- Video footage
- Photographs

Any questions regarding this report should be directed in the first instance to Enviroflo



Property Overview

Four ownership flats built in 1970s. Hard surfaces are shared concrete driveway, bricks on dirt and pavers on concrete. The concrete is in various states of repair. Most is in excellent condition with some in poor condition in front of the garages.

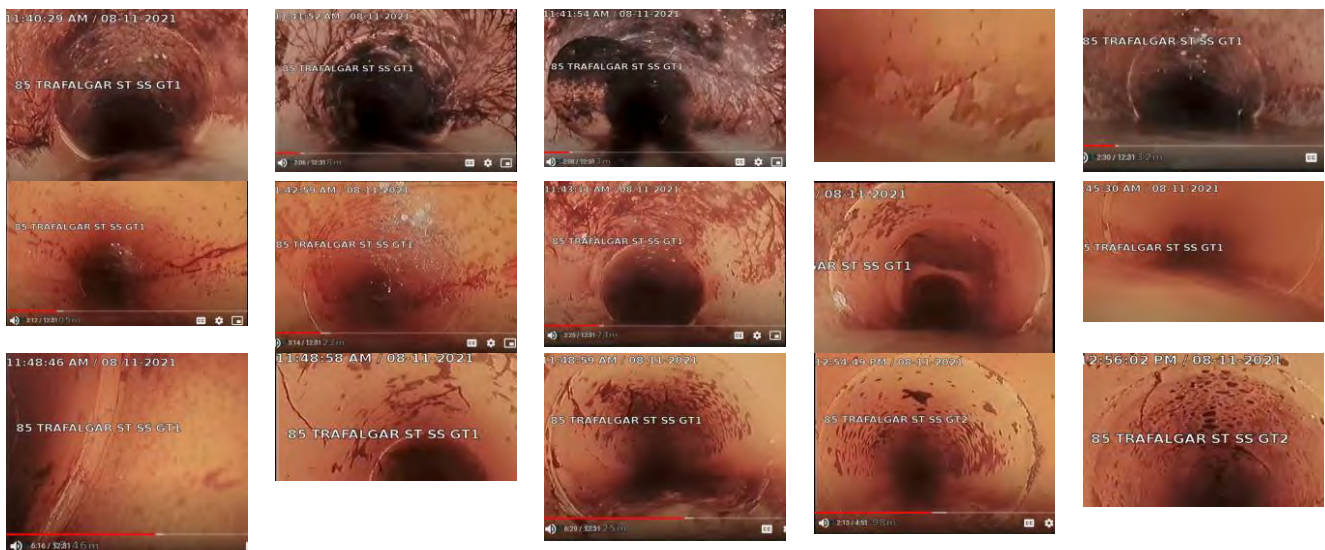
Report – Sanitary Sewer

Overview of Identified Damage

Sewer line is earthenware. Camera access Gully Trap (GT)1 at rear of unit – 4/85. Damage noted: mosaic like cracking from 5.4m; cracked lateral connections; longitudinal cracking from 11m; undulations from 12.3m; chipping off most collars; displaced joins from 34.5m. There is one lateral connection at 29.3m which is not cracked or broken.

Camera access from GT2. Damage noted: chipping off collars; cracking.

All damage noted is result of the Canterbury sequence of earthquakes. The sewer line needs repair.



Included in Repair Strategy

Notes on Apportionment for drainage repairs and EQC

All sewer lines are apportioned as a % of however many units use that particular line and from where they join the line. Thus Unit 4 is apportioned at 100% until Unit 3 enters the line.

Above ground reinstatement is apportioned in exactly the same way to reflect below ground use. Thus the lawn reinstatement – hydroseeding – in the front of Unit 1 is apportioned equally to all units.

<u>1/85 Trafalgar</u> 100% share 6m PVC to replace damaged earthenware laterals 2x Gully traps to replace damaged 1x WC cut in 25% share 16m PVC to replace damaged earthenware 65m2 concrete driveway – uplift, dispose and reinstate after repairs 2m Fence – remove for access & replace after repairs Hydroseed above trench lines	<u>2/85 Trafalgar</u> 100% share 6m PVC to replace damaged earthenware laterals 1x Gully traps to replace damaged 1x WC cut in 33% share 12m PVC to replace damaged earthenware 35m2 concrete – uplift, dispose and reinstate after repairs 25% share 16m PVC to replace damaged earthenware 65m2 concrete driveway – uplift, dispose and reinstate after repairs 2m Fence – remove for access & replace after repairs
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	Hydroseed above trench lines
<u>3/85 Trafalgar</u> 100% share 6m PVC to replace damaged earthenware laterals 1x Gully trap to replace damaged 1x WC cut in 50% share 10m PVC to replace damaged earthenware 60m2 concrete – uplift, dispose and reinstate after repairs 33% share 12m PVC to replace damaged earthenware 35m2 concrete – uplift, dispose and reinstate after repairs 25% share 16m PVC to replace damaged earthenware 65m2 concrete driveway – uplift, dispose and reinstate after repairs 2m Fence – remove for access & replace after repairs Hydroseed above trench lines	<u>4/85 Trafalgar</u> 100% share 15m PVC to replace damaged earthenware – includes laterals 2x Gully traps to replace damaged 1x TV & 1x WC cut ins 1x metal fence/gate – remove and replace after repairs 30m2 concrete driveway – uplift, dispose and reinstate after repairs 50% share 10m PVC to replace damaged earthenware 60m2 concrete – uplift, dispose and reinstate after repairs 33% share 12m PVC to replace damaged earthenware 35m2 concrete – uplift, dispose and reinstate after repairs 25% share 16m PVC to replace damaged earthenware 65m2 concrete driveway – uplift, dispose and reinstate after repairs 2m Fence – remove for access & replace after repairs Hydroseed above trench lines

Excluded from Repair Strategy

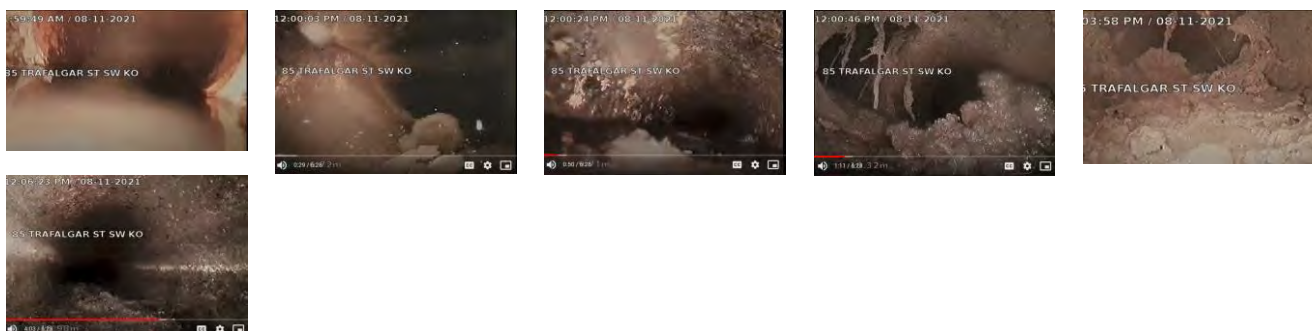
N/A

Report – Stormwater

Summary of Identified Damage

Stormwater is earthenware. Camera access is via the kerb outlet. Damage noted: displaced joints with silt and/or root intrusion; holding water up to 100% in first 10m from kerb; root intrusion at LH lateral connection from DP1 - 10.3m; cracking in pipe - seen in silt patterns in the walls of pipe; signs of blockages with high tide lines and silt inside the whole pipe. We could only view the first 18m because of the silt in the line.

All damage is from the Canterbury sequence of earthquakes. Based on what we could see and the condition of the sewer line, we believe the entire stormwater will need repair.



Included in Repair Strategy

<u>1/85 Trafalgar</u> 100% share 1m PVC to replace damaged earthenware lateral 25% share DP3 lateral is shared equally as it services the garages 11m damaged earthenware to repair 8m PVC to replace damaged earthenware 2m Pipe line under tree 1m PVC - DP3 lateral 1x Bubble up sump 20m2 bricks on dirt – uplift, store on site and reinstate after repairs Hydroseeding above trench line	<u>2/85 Trafalgar</u> 100% share 3m PVC to replace damaged earthenware lateral 33% share 9m PVC to replace damaged earthenware – DP2 to DP1, divert line to avoid large tree & stump 2m Fence – remove for access and reinstate after repairs 25% share DP3 lateral is shared equally as it services the garages 11m damaged earthenware to repair 8m PVC to replace damaged earthenware 2m Pipe line under tree 1m PVC - DP3 lateral 1x Bubble up sump 20m2 bricks on dirt – uplift, store on site and reinstate after repairs Hydroseeding above trench line
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<u>3/85 Trafalgar</u> 100% share 1m PVC to replace damaged earthenware lateral 50% share 20m damaged earthenware DP4 – DP2 to repair 18m PVC to replace damaged earthenware 2m Pipe line under fence & hedge 16m2 pavers set in concrete – remove, dispose, replace after repairs 10m2 bricks on dirt above trench line – uplift, relay after repairs Hydroseeding – Covered in sewer costing. One charge per entire property 33% share 9m PVC to replace damaged earthenware – DP2 to DP1, divert line to avoid large tree & stump 2m Fence – remove for access and reinstate after repairs 25% share DP3 lateral is shared equally as it services the garages 11m damaged earthenware to repair 8m PVC to replace damaged earthenware 2m Pipe line under tree 1m PVC - DP3 lateral 1x Bubble up sump 20m2 bricks on dirt – uplift, store on site and reinstate after repairs Hydroseeding above trench line	<u>4/85 Trafalgar</u> 100% share 6m PVC to replace damaged earthenware DP5-DP4 16m2 pavers – uplift, store on site and relay after repairs Fence – remove and reinstate after repairs 50% share 20m damaged earthenware DP4 – DP2 to repair 18m PVC to replace damaged earthenware 2m Pipe line under fence & hedge 16m2 pavers set in concrete – remove, dispose, replace after repairs 10m2 bricks on dirt above trench line – uplift, relay after repairs Hydroseeding – Covered in sewer costing. One charge per entire property 33% share 9m PVC to replace damaged earthenware – DP2 to DP1, divert line to avoid large tree & stump 2m Fence – remove for access and reinstate after repairs 25% share DP3 lateral is shared equally as it services the garages 11m damaged earthenware to repair 8m PVC to replace damaged earthenware 1m PVC - DP3 lateral 2m Pipe line under tree 1x Bubble up sump 20m2 bricks on dirt – uplift, store on site and reinstate after repairs Hydroseeding above trench line

Excluded from Repair Strategy

N/A

SEWER

85 Trafalgar St.

● ① 1.8m w/ board fence.

● ② hydroseed

● ③ Large tree

● ④ Large tree stump.

● ⑤ Bricks on ~~concrete~~ dirt (20m²)

● ⑥ Powerpole

● ⑦ Overhead wires

● ⑧ Garden bed.
raised brick planter.● ⑨ Concrete driveway
(190m²)● ⑩ Bricks
~~pavers~~ on dirt.
(20m²)

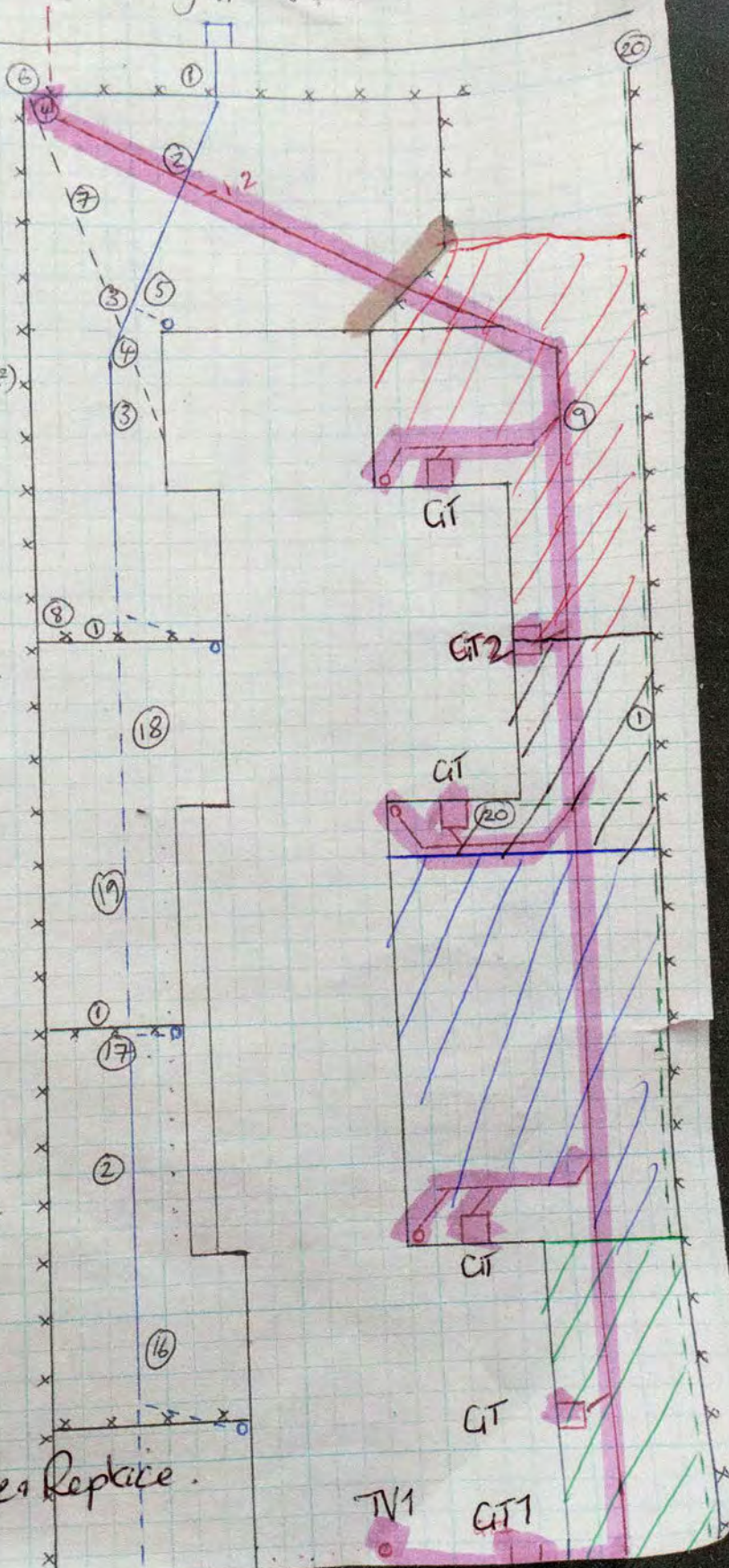
● ⑪ Shrub hedge

● ⑫ Bricks on dirt
~~pavers~~ (20m²)● ⑬ Pavers on concrete
(16m²)

● ⑭ Lane - - - -

SS Repair

Fence-Remove & Replace.



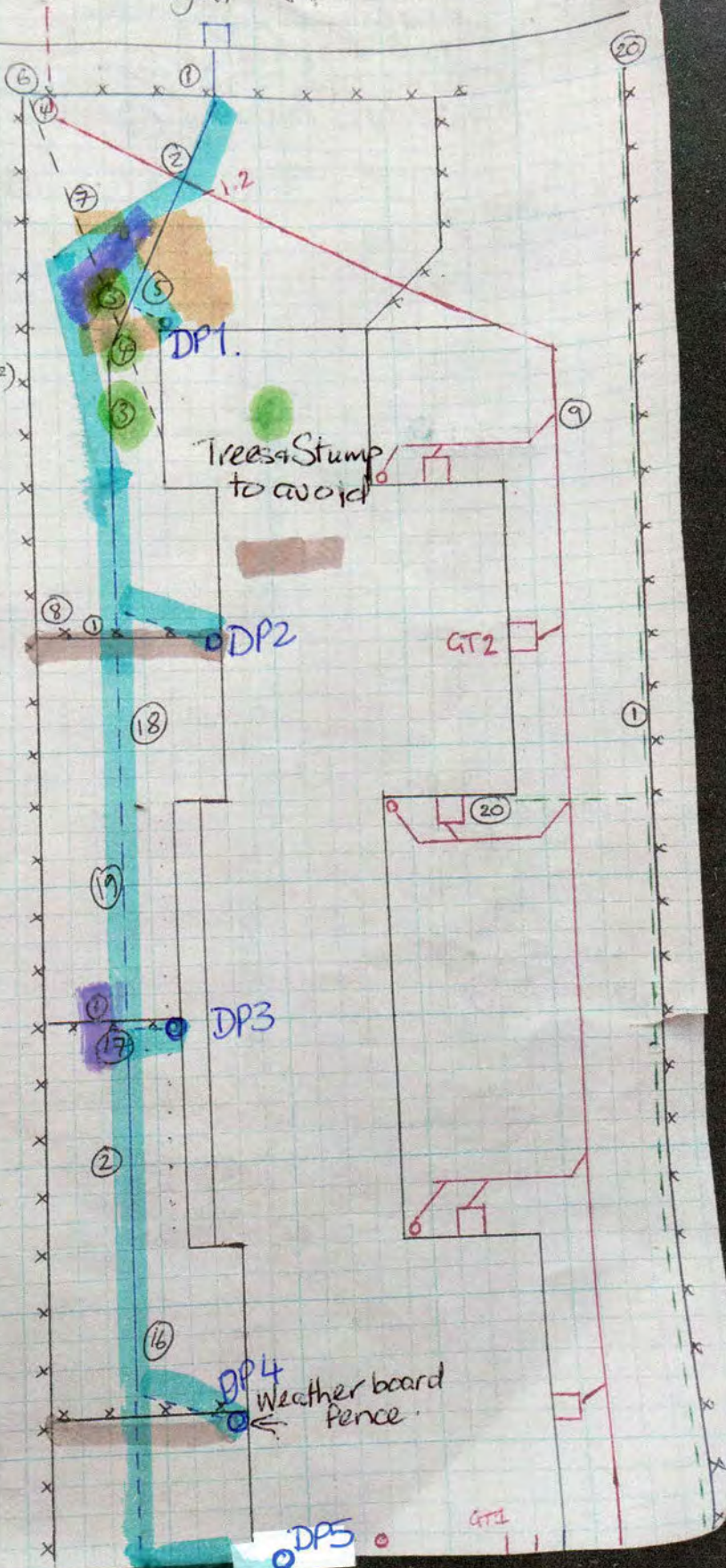
/// Drive 30m². 100% Unit 4
 /// Drive 60m² 50% 4 + 3.

/// Drive 35m² 33% 4, 3, 2
 /// Drive 65m² 25% 4, 3, 2, 1

Stormwater

85 Trafalgar St.

- ① 1.8m w/ board fence.
- ② hydroseed
- ③ Large tree
- ④ Large tree stump.
- ⑤ Bricks on ~~concrete~~ dirt (20m²)
- ⑥ Powerpole
- ⑦ Overhead wires
- ⑧ Garden bed.
raised brick planter.
- ⑨ Concrete driveway (190m²)
- ⑩ Bricks on dirt. (20m²)
- ⑪ Shrub hedge
- ⑫ Bricks on dirt (20m²)
- ⑬ Pavers on concrete (16m²)
- ⑭ Fibre - - - -



fences to remove
Pipeline

SW to Repair

Enviroflow Limited Trading as
Enviroflo
GST # 127380880



QUOTATION NO. 10769

Owner 2/85
2/85 Trafalgar Street
St Albans
Canterbury 8014

Quote No: 10769
Site: 2/85 Trafalgar Street St Albans
Created Date: 12/05/2022

Description

We are pleased to submit our quotation for drainage repairs to your property. Our quote remains valid for 2 years and is presented on the basis of offer and acceptance. All materials purchased by Enviroflo Ltd remain the property of Enviroflo Ltd until paid for in full. An acceptance of this quote means our terms and conditions including the exclusions and clarifications have been fully read and understood and that there is an agreement under these terms. If you require any further information or clarification, please do not hesitate to contact us.

Exclusions and Clarifications:

- A variation would be required for any additional works or for any excavation beyond the depth of 1.4 meters.
- It is assumed any existing drainage lateral will be in a sound condition.
- All trenches are to be back filled and compacted with materials on site unless specified otherwise.
- We have made no allowances for isolating power or telecommunication services if required.
- No allowance has been made for the replacement of the WC riser pipes.
- We expect the site to clear of obstructions before our start date.
- No allowance has been made for the removal of any obstructions in the path of the drainage trenches.
- We have made no allowances for any de-watering if required.
- We will take all possible precautions to avoid striking services but in the unlikely event that an unmarked service is struck we will not be liable for repairs or replacement

Drainage

Item	Quantity	Unit Price	Total
Site Establishment - 25%	1.00	\$183.75	\$183.75
Service Location -- 50% shared	1.00	\$118.13	\$118.13
Remove and replace sewer per metre	6.00	\$204.75	\$1,228.50
Remove and dispose existing gully. Supply and install new gully trap and dish	1.00	\$367.50	\$367.50
Cut in connection to toilet / soil stack	1.00	\$189.00	\$189.00
Spoil Out - includes truck and dumping fees	0.50	\$892.50	\$446.25
Remove and replace sewer per metre - 33% Shared	12.00	\$68.25	\$819.00
Remove and replace plain concrete driveway per m2 33% Shared	35.00	\$56.00	\$1,960.00
Remove and replace sewer per metre - 25% Shared	16.00	\$51.19	\$819.04
Remove and replace plain concrete driveway per m2 --25% Shared	65.00	\$42.00	\$2,730.00
Fence - remove and reinstate fence (replace if necessary) per m -25% Shared	2.00	\$68.25	\$136.50
Supply and compact soil, level, hydroseed above trench lines - 25% Shared	1.00	\$131.25	\$131.25
CCTV, PS3 (Drainage Producer Statement) and As Built after repairs completed	0.25	\$367.50	\$91.87
Remove and replace stormwater per m	3.00	\$173.25	\$519.75
Remove and replace stormwater per m - 33% shared	9.00	\$56.00	\$504.00
Fence - remove and reinstate fence (replace if necessary) per m --33% Shared	2.00	\$91.00	\$182.00
Remove and replace stormwater per m - 25% Shared	9.00	\$42.00	\$378.00
Pipe lining patch repair up to 3m	0.25	\$3,488.10	\$872.03

Enviroflow Limited Trading as
Enviroflo
GST # 127380880



QUOTATION NO. 10769

Drainage

Item	Quantity	Unit Price	Total
Supply and install bubble up sump	0.25	\$577.50	\$144.38
Remove and replace brick paving not set in concrete per m2 --25% Shared	20.00	\$47.25	\$945.00
Sub-Total ex GST			\$12,765.95
GST			\$1,914.89
Total inc GST			\$14,680.84

Thank you!

Sub-Total ex GST \$12,765.95
GST \$1,914.89
Total inc GST \$14,680.84

How To Pay

QUOTATION NO. 10769



Direct Credit

Bank **ANZ**
 Acc. Name **Enviroflow Limited**
 Bank Code
 Acc. No. **06-0821-0955-226-00**

Customer Reference: **1412** Customer Name: **Owner 2/85**