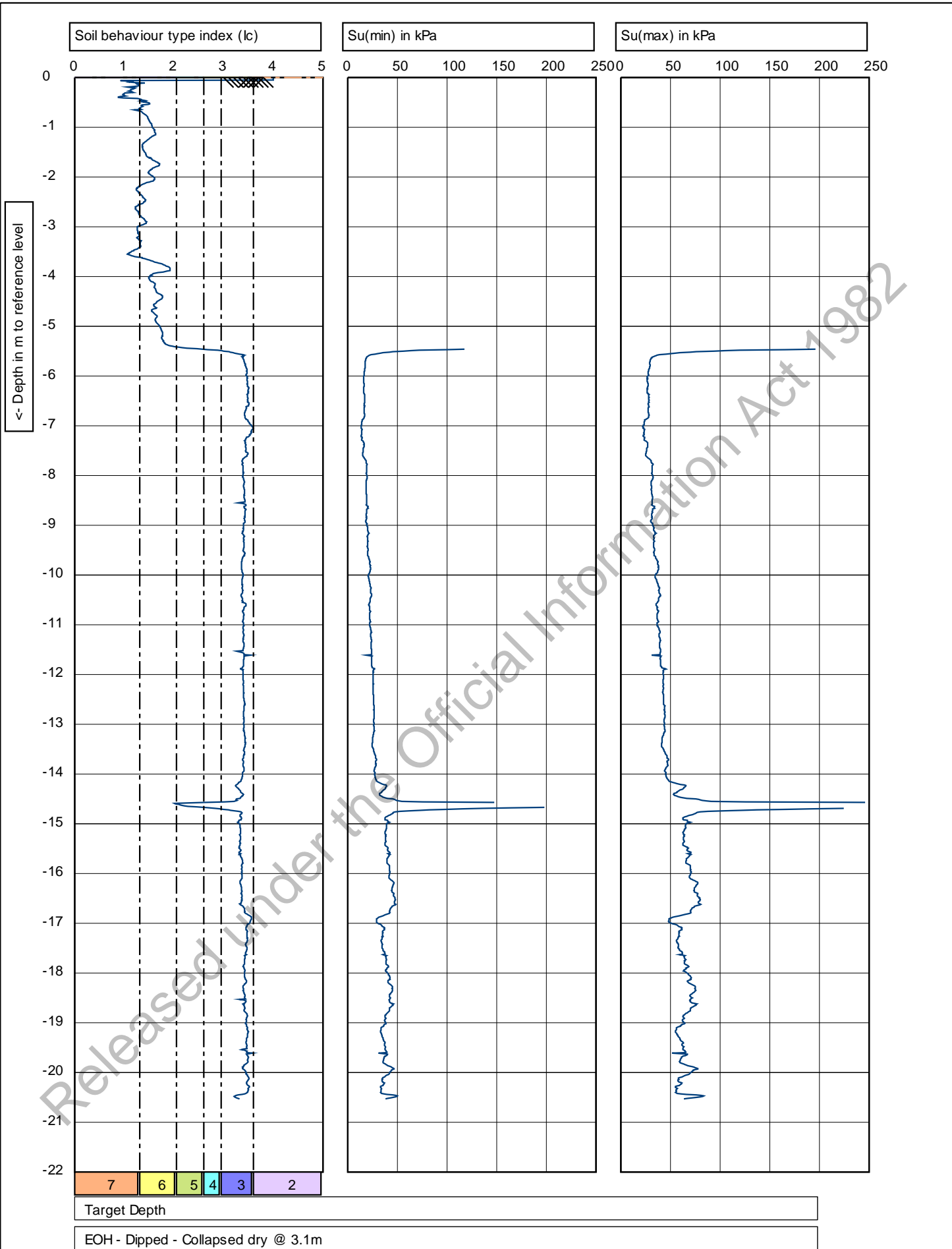


Target Depth [Empty field]  
 EOH - Dipped - Collapsed dry @ 3.1m



	Test according ASTM D5778-12 & ISO 22476-1:2012		Predrill: <b>0.00 m Predrilled</b>	
	G.L.: <b>0.00 m MSL</b>	W.L.: <b>-3.10 m</b>	Date: <b>18/12/2017</b>	
Project: <b>Mangapapa School</b>		Cone no.: <b>C10CFIP.C14427</b>		
Location: <b>5 Rua St - Gisborne</b>		Project no.: <b>2-68000.00_HA2212</b>		
Position: <b>2036942, 5710286 NZTM</b>		CPT no.: <b>S02</b>	<b>5/6</b>	



	Test according ASTM D5778-12 & ISO 22476-1:2012		Predrill: <b>0.00 m Predrilled</b>	
	G.L.: <b>0.00 m MSL</b>	W.L.: <b>-3.10 m</b>	Date: <b>18/12/2017</b>	
Project: <b>Mangapapa School</b>			Cone no.: <b>C10CFIP.C14427</b>	
Location: <b>5 Rua St - Gisborne</b>			Project no.: <b>2-68000.00_HA2212</b>	
Position: <b>2036942, 5710286 NZTM</b>			CPT no.: <b>S02</b>	<b>6/6</b>

**CPT  
TEST REPORT**



Client : **BCD Group Ltd**  
 Project : **Mangapapa School**  
 Location : **5 Rua St - Gisborne**  
 Hole Number: **4**  
 Tested by : **J Kavanaugh/ N Oosthuizen**  
 Date tested : **20/12/17**  
 Coordinates : **E: 2036953**  
                   **N: 5710315**  
                   **EL: 10m**  
 Water level : **EOH - Dipped - GWL @ 1.3m**

Project No :	<b>2-68000.00</b>
Lab Ref No :	<b>HA2212_04</b>
Client Ref No :	

Test Results	
Start Time	<b>07:39:00</b>
Time at penetration	<b>00:00:00</b>
End Time	<b>00:00:00</b>
Reference level	<b>0</b>
Ground level	<b>0</b>
Predrill	<b>0</b>
Penetration Depth	<b>30</b>
Remarks	<b>Target Depth</b>
GPS Type	<b>Garmin eTrex 20</b>
GPS Accuracy	<b>+ / - 3m</b>
GPS Reference Grid	<b>NZTM</b>
GPS Datum	<b>MSL</b>
Rig Type	<b>GeoMil Panther 100/ Flex 200</b>
Rig ID	<b>CPT03</b>
Reaction Force	<b>Dead weight 10/22 tonnes</b>
Data Acquisition ( Digitizer )	<b>GeoMil GME500</b>
Acquisition Program	<b>GeoMil CPTest</b>
Reporting Program	<b>GeoMil CPTask</b>
Cone Type	<b>C10 ( 10 Tonne Compression )</b>
Cross Sectional Area	<b>10cm<sup>2</sup></b>
Cone Area Ratio	<b>0.8</b>
Fluid Type	<b>Silicone Fluid</b>
Friction Reducer	<b>0.55m behind base of cone</b>
Application Class ( ISO 22476-1 )	<b>2</b>
Test Type ( ISO 22476-1 )	<b>TE2 ( Measured Cone and Sleeve )</b>
Back Fill Method	<b>Bentonite</b>
Observations During Testing	<b>None</b>

Date tested : 20/12/17  
 Date reported : 20/12/17

This report may only be reproduced in full, including corresponding calibration data, daily logs, and CPT graphs.

**IANZ Approved Signatory**

Designation : *CPT North Island Manager*  
 Date : 20/12/17



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

**CPT  
TEST REPORT**



Client : **BCD Group Ltd**  
 Project : **Mangapapa School**  
 Location : **5 Rua St - Gisborne**  
 Hole Number: **S02**  
 Tested by : **J Kavanaugh/ N Oosthuizen**  
 Date tested : **18/12/17**  
 Coordinates : **E: 2036942**  
                   **N: 5710286**  
                   **EL: 12m**  
 Water level : **EOH - Dipped - Collapsed dry @ 3.1m**

Project No : **2-68000.00**  
 Lab Ref No : **HA2212\_S02**  
 Client Ref No :

Test Results	
Start Time	<b>13:51:00</b>
Time at penetration	<b>00:00:00</b>
End Time	<b>00:00:00</b>
Reference level	<b>0</b>
Ground level	<b>0</b>
Predrill	<b>0</b>
Penetration Depth	<b>20.6</b>
Remarks	<b>Target Depth</b>
GPS Type	<b>Garmin eTrex 20</b>
GPS Accuracy	<b>+ / - 3m</b>
GPS Reference Grid	<b>NZTM</b>
GPS Datum	<b>MSL</b>
Rig Type	<b>GeoMil Panther 100/ Flex 200</b>
Rig ID	<b>CPT03</b>
Reaction Force	<b>Dead weight 10/22 tonnes</b>
Data Acquisition ( Digitizer )	<b>GeoMil GME500</b>
Acquisition Program	<b>GeoMil CPTest</b>
Reporting Program	<b>GeoMil CPTask</b>
Cone Type	<b>C10 ( 10 Tonne Compression )</b>
Cross Sectional Area	<b>10cm<sup>2</sup></b>
Cone Area Ratio	<b>0.8</b>
Fluid Type	<b>Silicone Fluid</b>
Friction Reducer	<b>0.55m behind base of cone</b>
Application Class ( ISO 22476-1 )	<b>2</b>
Test Type ( ISO 22476-1 )	<b>TE2 ( Measured Cone and Sleeve )</b>
Back Fill Method	<b>Bentonite</b>
Observations During Testing	<b>None</b>

Date tested : 18/12/17  
 Date reported : 20/12/17

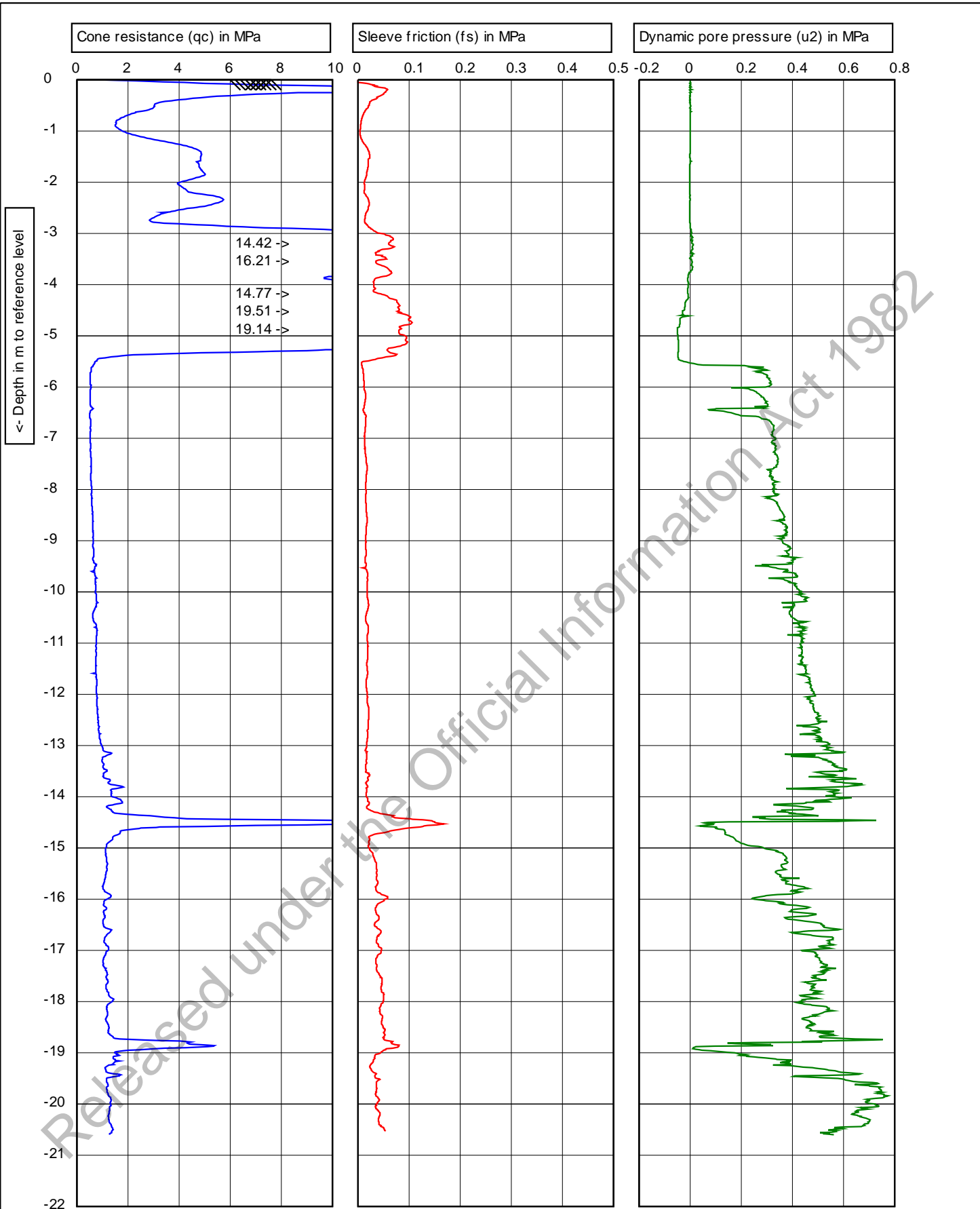
This report may only be reproduced in full, including corresponding calibration data, daily logs, and CPT graphs.

**IANZ Approved Signatory**

Designation : *CPT North Island Manager*  
 Date : 20/12/17





Tests indicated as not accredited are outside the scope of the laboratory's accreditation

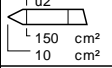


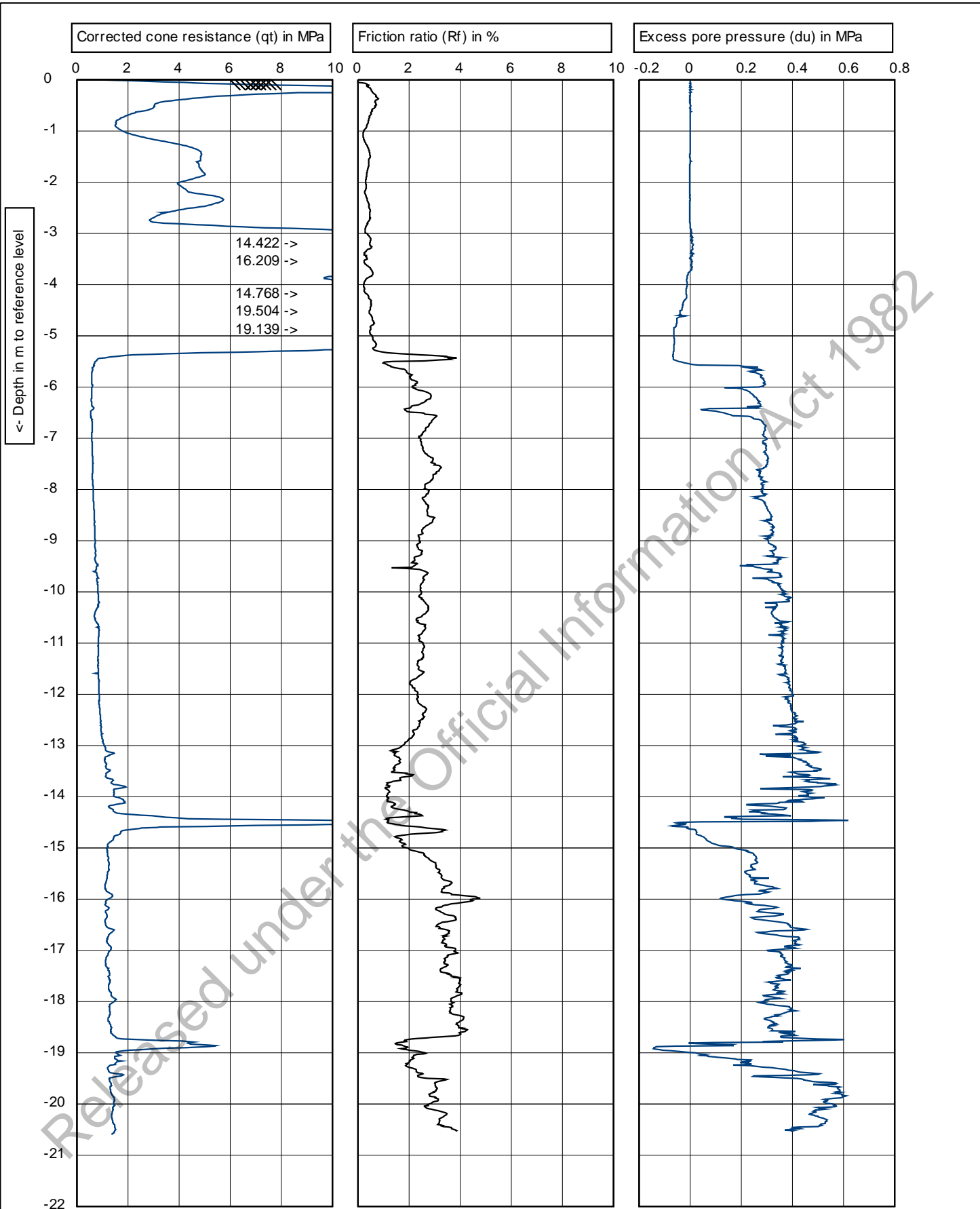
Target Depth

EOH - Dipped - Collapsed dry @ 3.5m

Graphs indicated as not accredited are outside the scope of the laboratory's accreditation

	Test according ASTM D5778-12 & ISO 22476-1:2012		Predrill: <b>0.00 m Predrilled</b>	
	G.L.: <b>0.00 m MSL</b>	W.L.: <b>-3.50 m</b>	Date: <b>18/12/2017</b>	
Project: <b>Mangapapa School</b>	Location: <b>5 Rua St - Gisborne</b>		Cone no.: <b>C10CFIP.C14427</b>	
Position: <b>2036865, 5710335 NZTM</b>	CPT no.: <b>S03</b>		1/6	



Depth in m to reference level

14.422 ->  
16.209 ->  
14.768 ->  
19.504 ->  
19.139 ->

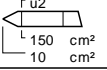
Target Depth

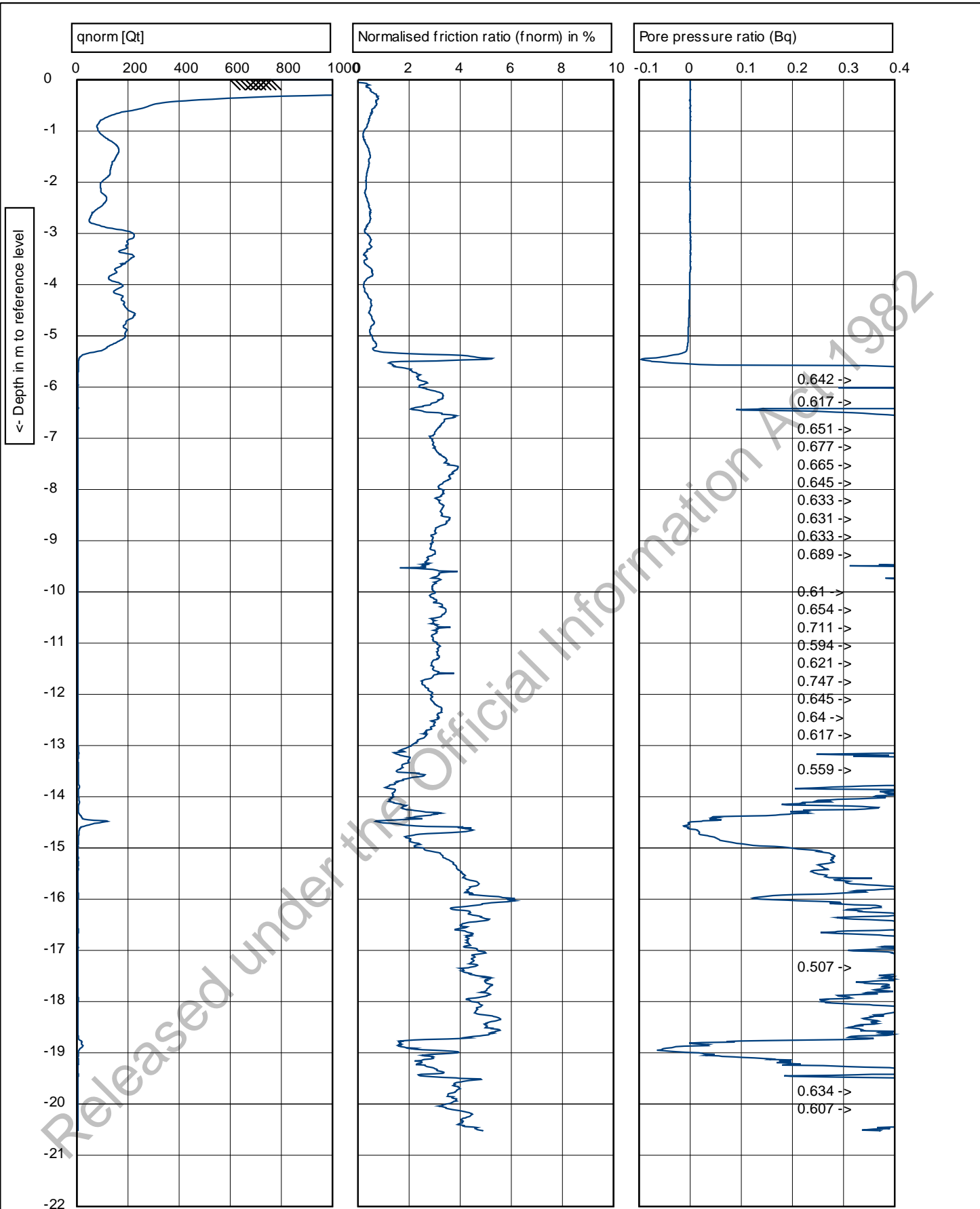
EOH - Dipped - Collapsed dry @ 3.5m



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1.44  
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	Test according ASTM D5778-12 & ISO 22476-1:2012		Predrill: <b>0.00 m Predrilled</b>	
	G.L.: <b>0.00 m MSL</b>	W.L.: <b>-3.50 m</b>	Date: <b>18/12/2017</b>	
Project: <b>Mangapapa School</b>		Cone no.: <b>C10CFIIP.C14427</b>		
Location: <b>5 Rua St - Gisborne</b>		Project no.: <b>2-68000.00_HA2212</b>		
Position: <b>2036865, 5710335 NZTM</b>		CPT no.: <b>S03</b>	<b>2/6</b>	



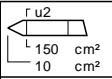
Target Depth

EOH - Dipped - Collapsed dry @ 3.5m



**OPUS**

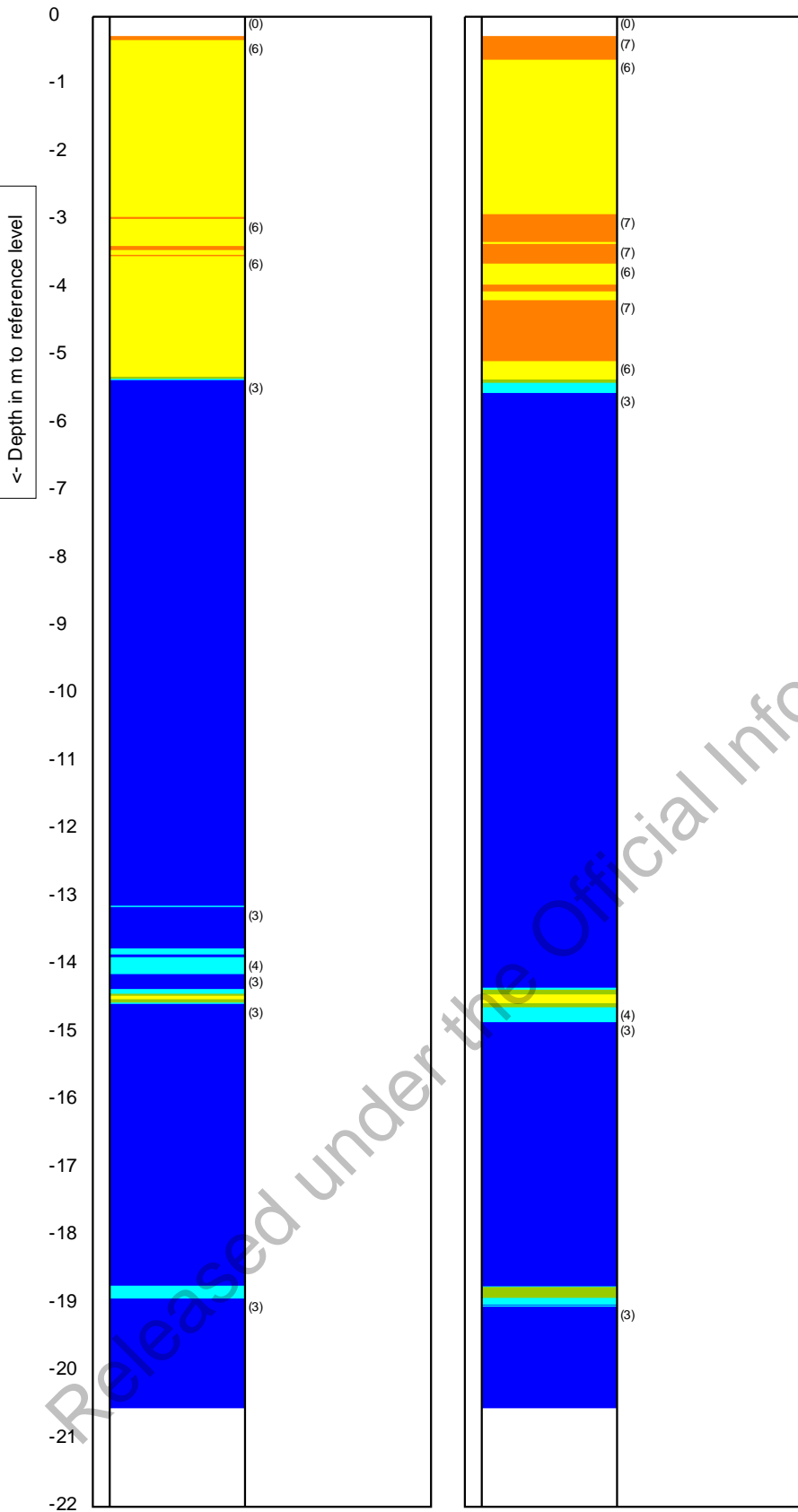
Graphs on this page are not IANZ accredited



Test according ASTM D5778-12 & ISO 22476-1:2012		Predrill: <b>0.00 m Predrilled</b>	
G.L.: <b>0.00 m MSL</b>	W.L.: <b>-3.50 m</b>	Date:	<b>18/12/2017</b>
Project: <b>Mangapapa School</b>		Cone no.:	<b>C10CFIIP.C14427</b>
Location: <b>5 Rua St - Gisborne</b>		Project no.:	<b>2-68000.00_HA2212</b>
Position: <b>2036865, 5710335 NZTM</b>		CPT no.:	<b>S03</b>
			<b>3/6</b>

Soil Classification (using Fr)

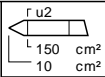
Soil Classification (using Bq)



- (0) Not defined
- (1) Sensitive, fine grained
- (2) Organic soils-peats
- (3) Clays-clay to silty clay
- (4) Clayey silt to silty clay
- (5) Sand mixtures
- (6) Sands
- (7) Gravelly sand to sand
- (8) Very stiff sand to clayey sand
- (9) Very stiff fine grained



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Test according ASTM D5778-12 & ISO 22476-1:2012

G.L.: 0.00 m MSL

W.L.: -3.50 m

Predrill: 0.00 m Predrilled

Date: 18/12/2017

Project: Mangapapa School

Location: 5 Rua St - Gisborne

Position: 2036865, 5710335 NZTM

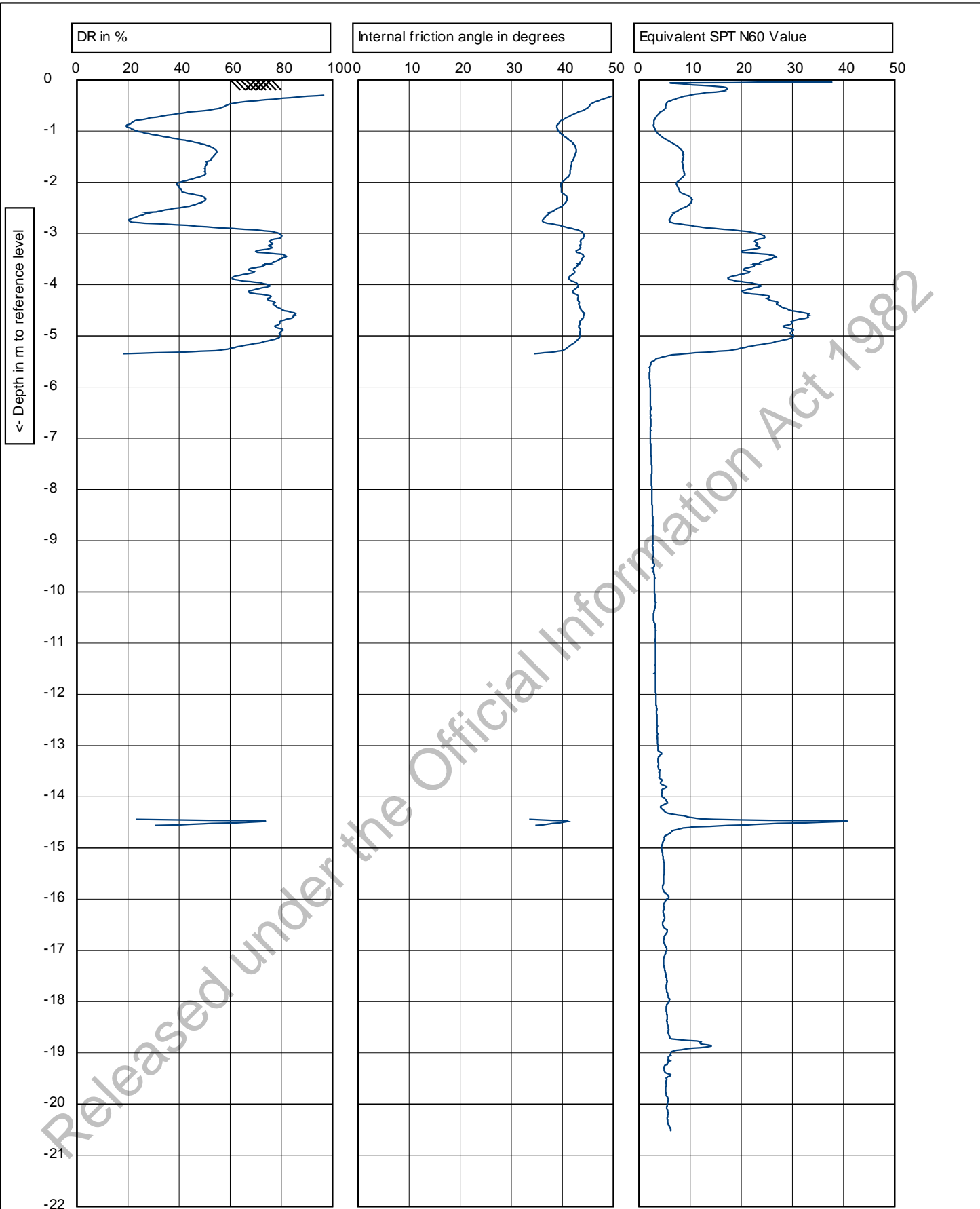
Cone no.: C10CFIP.C14427

Project no.: 2-68000.00\_HA2212

CPT no.: S03

4/6





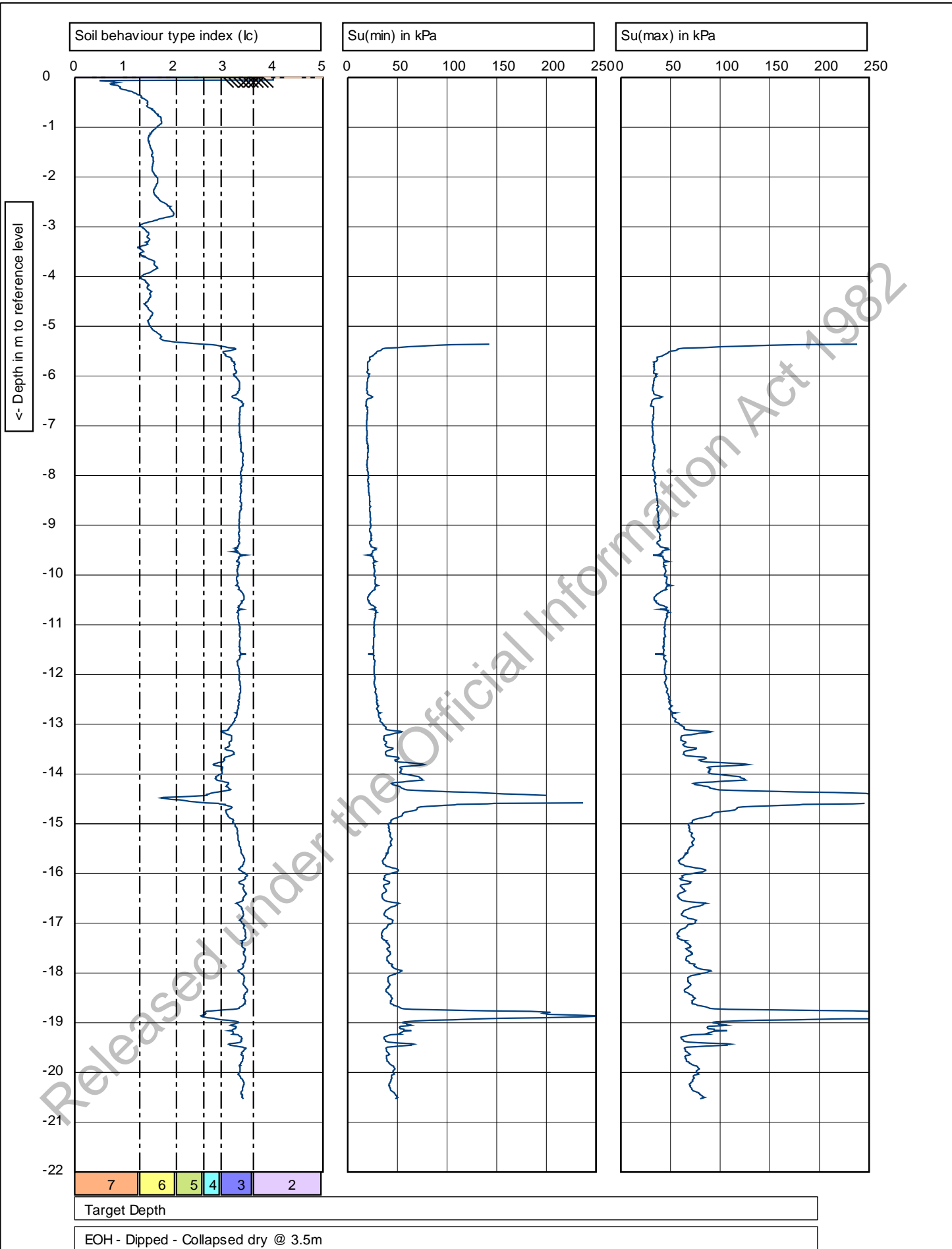
Target Depth

EOH - Dipped - Collapsed dry @ 3.5m

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 $\frac{r}{u^2}$ 150 cm <sup>2</sup> 10 cm <sup>2</sup>	Test according ASTM D5778-12 & ISO 22476-1:2012		Predrill: <b>0.00 m Predrilled</b>	
	G.L.: <b>0.00 m MSL</b>	W.L.: <b>-3.50 m</b>	Date: <b>18/12/2017</b>	
Project: <b>Mangapapa School</b>		Cone no.: <b>C10CFIP.C14427</b>		
Location: <b>5 Rua St - Gisborne</b>		Project no.: <b>2-68000.00_HA2212</b>		
Position: <b>2036865, 5710335 NZTM</b>		CPT no.: <b>S03</b>	<b>5/6</b>	



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$\frac{\tau}{\sigma_2}$ $\frac{150}{10} \frac{\text{cm}^2}{\text{cm}^2}$		Test according to ASTM D5778-12 & ISO 22476-1:2012	Predrill: <b>0.00 m Predrilled</b>
G.L.: <b>0.00 m MSL</b>	W.L.: <b>-3.50 m</b>	Date: <b>18/12/2017</b>	Cone no.: <b>C10CFIP.C14427</b>
Project: <b>Mangapapa School</b>	Location: <b>5 Rua St - Gisborne</b>	Project no.: <b>2-68000.00_HA2212</b>	CPT no.: <b>S03</b>
Position: <b>2036865, 5710335 NZTM</b>			<b>6/6</b>

**CPT  
TEST REPORT**



Client : **BCD Group Ltd**  
 Project : **Mangapapa School**  
 Location : **5 Rua St - Gisborne**  
 Hole Number: **S03**  
 Tested by : **J Kavanaugh/ N Oosthuizen**  
 Date tested : **18/12/17**  
 Coordinates : **E: 2036865**  
                   **N: 5710335**  
                   **EL: 11m**  
 Water level : **EOH - Dipped - Collapsed dry @ 3.5m**

Project No : **2-68000.00**  
 Lab Ref No : **HA2212\_S03**  
 Client Ref No :

Test Results	
Start Time	<b>11:54:00</b>
Time at penetration	<b>00:00:00</b>
End Time	<b>00:00:00</b>
Reference level	<b>0</b>
Ground level	<b>0</b>
Predrill	<b>0</b>
Penetration Depth	<b>20.6</b>
Remarks	<b>Target Depth</b>
GPS Type	<b>Garmin eTrex 20</b>
GPS Accuracy	<b>+ / - 3m</b>
GPS Reference Grid	<b>NZTM</b>
GPS Datum	<b>MSL</b>
Rig Type	<b>GeoMil Panther 100/ Flex 200</b>
Rig ID	<b>CPT03</b>
Reaction Force	<b>Dead weight 10/22 tonnes</b>
Data Acquisition ( Digitizer )	<b>GeoMil GME500</b>
Acquisition Program	<b>GeoMil CPTest</b>
Reporting Program	<b>GeoMil CPTask</b>
Cone Type	<b>C10 ( 10 Tonne Compression )</b>
Cross Sectional Area	<b>10cm2</b>
Cone Area Ratio	<b>0.8</b>
Fluid Type	<b>Silicone Fluid</b>
Friction Reducer	<b>0.55m behind base of cone</b>
Application Class ( ISO 22476-1 )	<b>2</b>
Test Type ( ISO 22476-1 )	<b>TE2 ( Measured Cone and Sleeve )</b>
Back Fill Method	<b>Bentonite</b>
Observations During Testing	<b>None</b>

Date tested : 18/12/17  
 Date reported : 20/12/17

This report may only be reproduced in full, including corresponding calibration data, daily logs, and CPT graphs.

**IANZ Approved Signatory**

Designation : *CPT North Island Manager*  
 Date : 20/12/17



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

# calibration certificate

GC10CFIIP.C14434 / 006

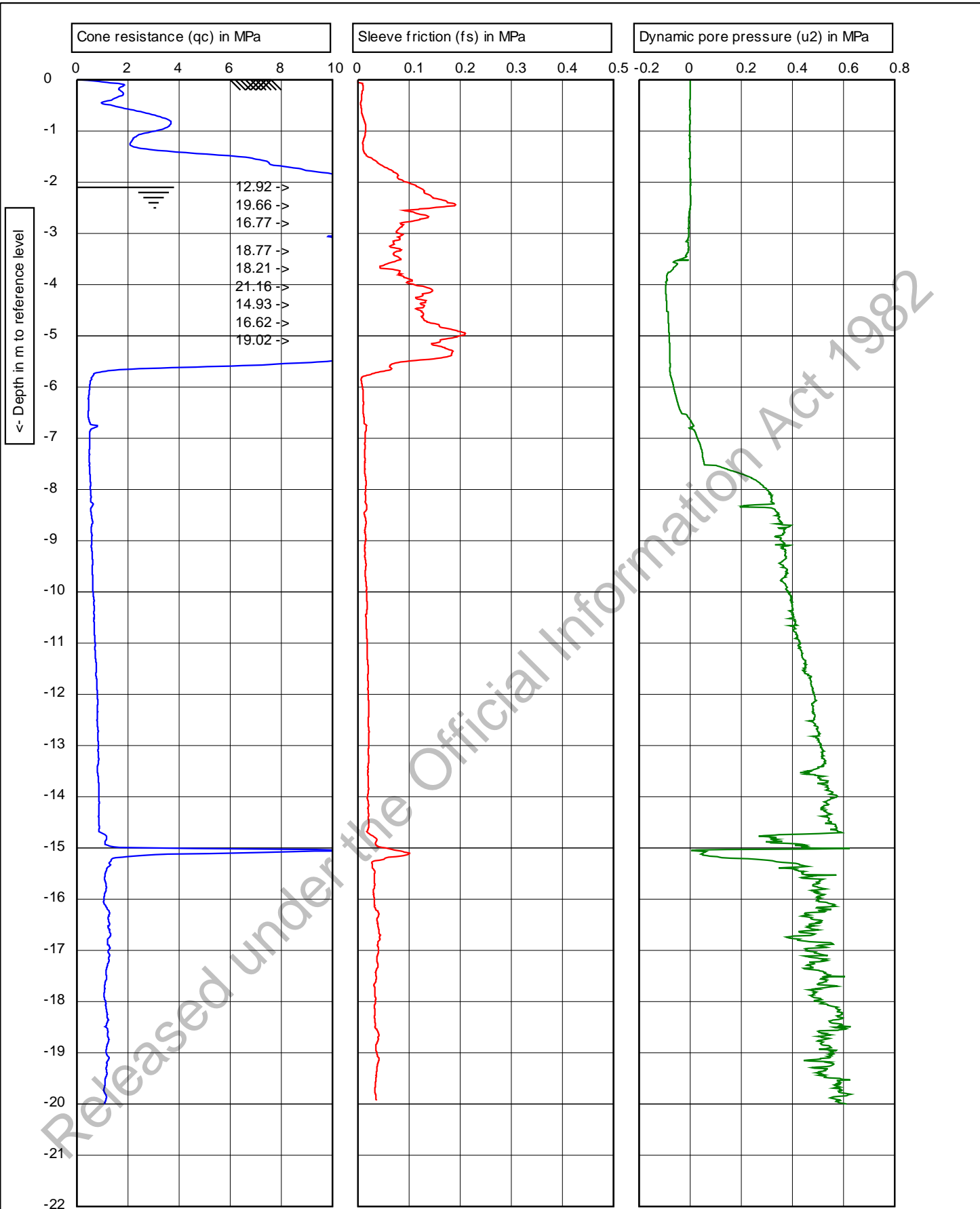


World's first manufacturer of CPT equipment

<b>Cone number</b>	GC10CFIIP.C14434	<b>Client</b>	Opus International Consultants Ltd - Hamilton
<b>Kind of cone</b>	Compression		4 Fox Street
<b>Calibration date</b>	02-Aug-2017		3216 Hamilton
<b>Print date</b>	02-Aug-2017		New Zealand

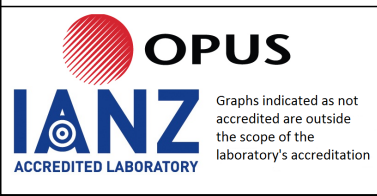
Channel 1			Channel 2			Channel 3		
Cone resistance ( $q_c$ )			Local sleeve friction ( $f_s$ )			Pore pressure ( $u$ )		
$q_c = Q_c / A_c$			$f_s = F_s / A_s$					
<b>Range</b>	0 ... 100 kN		<b>Range</b>	0 ... 22.5 kN		<b>Range</b>	0 ... 50 bar	
<b><math>A_c</math></b>	1000 mm <sup>2</sup>		<b><math>A_s</math></b>	15000 mm <sup>2</sup>		<b>Zero load reading</b>	223 mV	
<b>Zero load reading</b>	189 mV		<b>Zero load reading</b>	202 mV				
<b>a-factor</b>	0.8		<b>b-factor</b>	0				
			<b>Offset</b>	80 mm				
$Q_c$ Load (kN)	Eqv. $q_c$ (MPa)	Output (mV)	$F_s$ Load (kN)	Eqv. $f_s$ (MPa)	Output (mV)	Pressure (bar)	Eqv. $u$ (MPa)	Output (mV)
0	0	0	0.00	0.00	0	0	0.0	0
10	10	852	2.25	0.15	816	5	0.5	867
20	20	1704	4.50	0.30	1639	10	1.0	1735
30	30	2553	6.75	0.45	2468	15	1.5	2601
40	40	3399	9.00	0.60	3290	20	2.0	3462
50	50	4248	11.25	0.75	4107	25	2.5	4327
60	60	5095	13.50	0.90	4929	30	3.0	5190
70	70	5940	18.00	1.20	6573	35	3.5	6047
80	80	6783	20.25	1.35	7399	40	4.0	6905
90	90	7627	22.50	1.50	8220	45	4.5	7749
100	100	8469	20.25	1.35	7419	50	5.0	8608
90	90	7626	18.00	1.20	6604			
80	80	6784	13.50	0.90	4972			
70	70	5942	11.25	0.75	4153			
60	60	5095	9.00	0.60	3331			
50	50	4250	6.75	0.45	2502			
40	40	3403	4.50	0.30	1663			
30	30	2555	2.25	0.15	839			
20	20	1706	0.00	0.00	2			
10	10	854						
0	0	0						
<b>Zero load error</b>	0.00 %		<b>Zero load error</b>	0.02 %		<b>Zero load error</b>	0.02 %	
<b>Max. linearity</b>	0.18 %		<b>Max. linearity</b>	0.52 %		<b>Max. linearity</b>	0.29 %	
<b>Max. hysteresis</b>	0.05 %		<b>Max. hysteresis</b>	0.56 %				

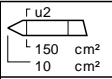


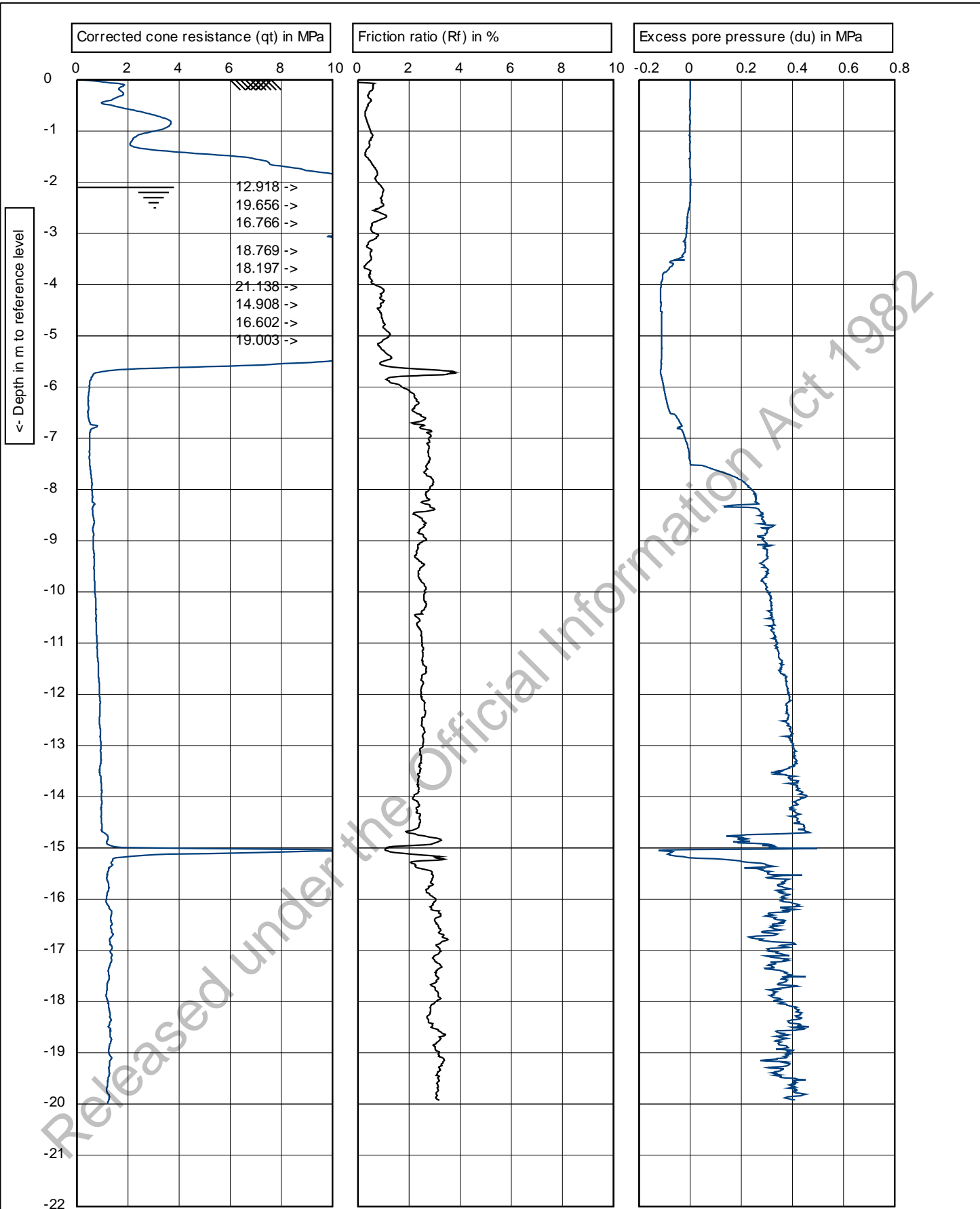


Target Depth

EOH - Dipped - GWL @ 2.1m



	Test according ASTM D5778-12 & ISO 22476-1:2012		Predrill: <b>0.00 m Predrilled</b>	
	G.L.: <b>0.00 m MSL</b>	W.L.: <b>-2.10 m</b>	Date: <b>20/12/2017</b>	Cone no.: <b>C10CFIIP.C14434</b>
Project: <b>Mangapapa School</b>	Location: <b>5 Rua St - Gisborne</b>		Project no.: <b>2-68000.00_HA2212</b>	
Position: <b>2036898, 5710289 NZTM</b>	CPT no.: <b>01</b>	1/6		



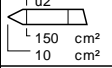
Target Depth

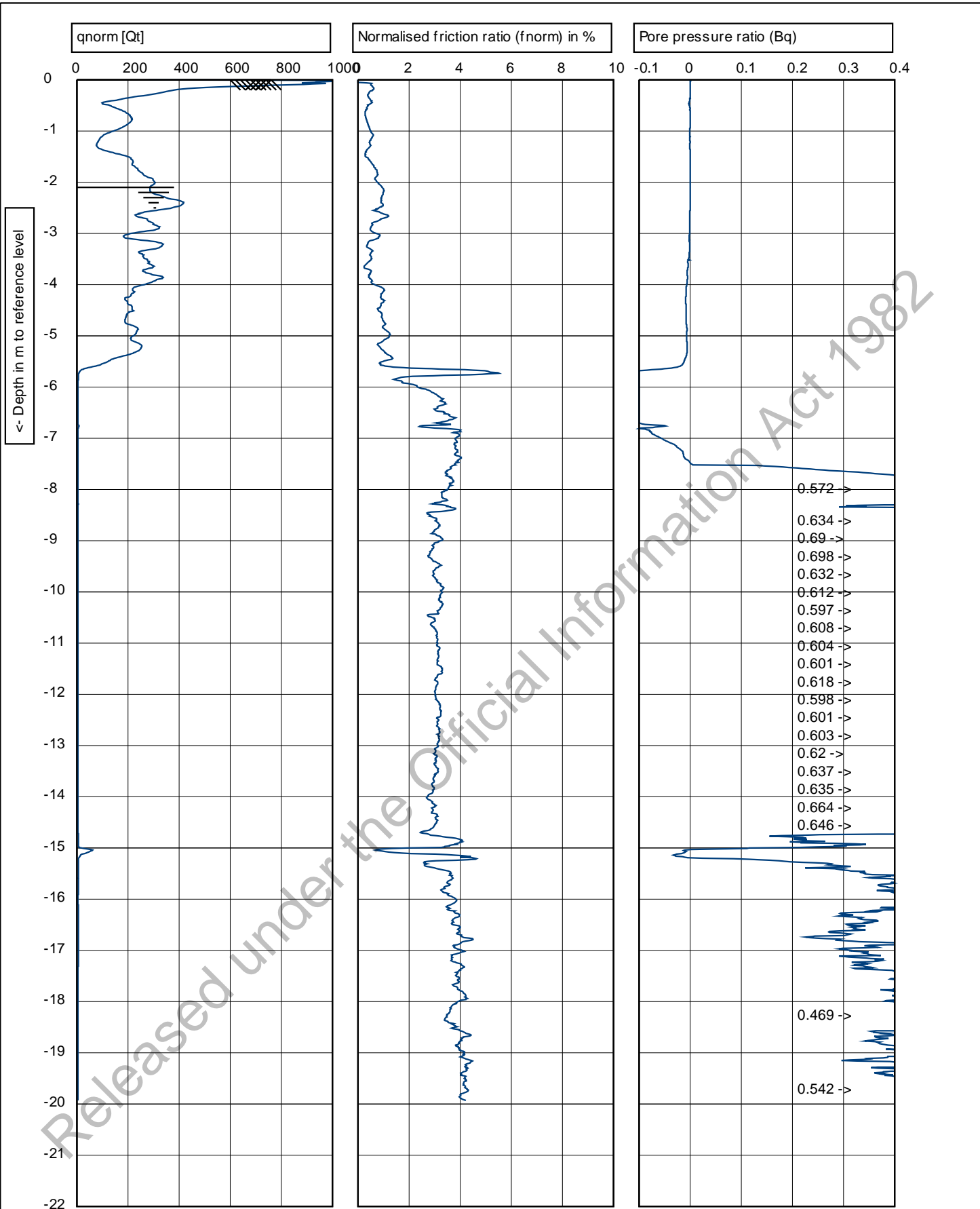
EOH - Dipped - GWL @ 2.1m



**OPUS**

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	Test according ASTM D5778-12 & ISO 22476-1:2012		Predrill: <b>0.00 m Predrilled</b>	
	G.L.: <b>0.00 m MSL</b>	W.L.: <b>-2.10 m</b>	Date: <b>20/12/2017</b>	Cone no.: <b>C10CFIIP.C14434</b>
Project: <b>Mangapapa School</b>	Location: <b>5 Rua St - Gisborne</b>		Project no.: <b>2-68000.00_HA2212</b>	
Position: <b>2036898, 5710289 NZTM</b>	CPT no.: <b>01</b>	2/6		

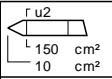


Target Depth

EOH - Dipped - GWL @ 2.1m

OPUS

1.44  
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Test according ASTM D5778-12 & ISO 22476-1:2012

G.L.: 0.00 m MSL      W.L.: -2.10 m

Predrill:	0.00 m Predrilled
Date:	20/12/2017
Cone no.:	C10CFIIP.C14434
Project no.:	2-68000.00_HA2212
CPT no.:	01
	3/6

Project: Mangapapa School  
 Location: 5 Rua St - Gisborne  
 Position: 2036898, 5710289 NZTM