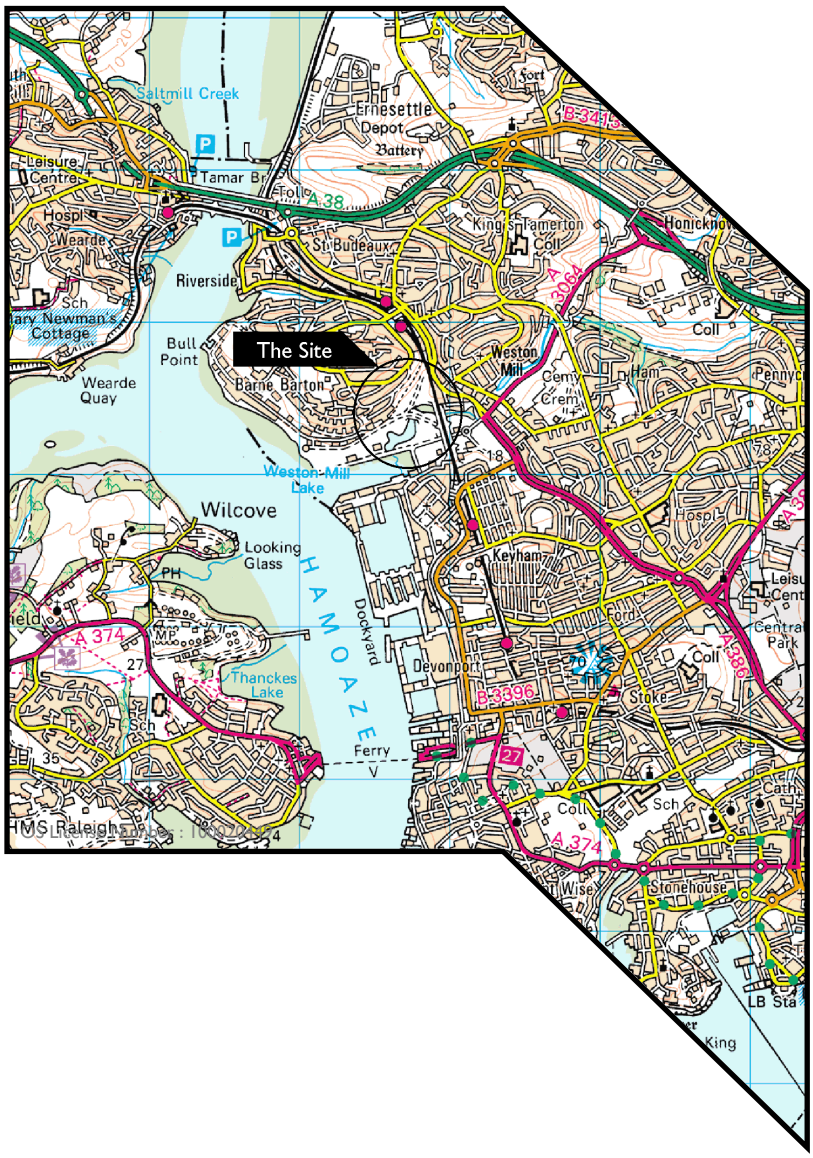


Ground Investigation
at

Proposed Energy from Waste Plant, Devonport, Plymouth.

Factual Report

for
MVV Umwelt GmbH

Engineer : GHA Livigunn Ltd

Project Number : PE100830

August 2010

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LIST OF CONTENTS

		Page No
1.0	INTRODUCTION	1
2.0	OBJECT AND SCOPE OF THE INVESTIGATION	1
3.0	PRESENTATION	1
4.0	THE SITE	1
	4.1 Location	1
	4.2 Description	1
5.0	PROCEDURE	1
	5.1 Commissioning	1
	5.2 General	2
	5.3 Explosive Ordnance Clearance	2
	5.4 Cable Percussion and Rotary Open Hole Boreholes	2
	5.4.1 Cable Percussion Drilling	2
	5.4.2 Excavator-Assisted Boreholes	2
	5.4.3 Rotary Open Hole Pre-Drilled Boreholes	2
	5.4.4 Borehole Sampling and In-situ Testing	3
	5.5 Rotary Cored Boreholes	3
	5.6 Trial Pits	3
	5.7 Static Cone Penetration Tests (CPTU)	4
	5.8 Instrumentation and Monitoring	4
6.0	LABORATORY TESTING	4
	6.1 Geotechnical	4
	6.2 Contamination	5
	6.2.1 Soil	5
	6.2.2 Leachate	5
	6.2.3 Water	5

CONTENTS

APPENDICES

APPENDIX 1	The Brief
APPENDIX 2	Site Location Plan
APPENDIX 3	Exploratory Hole Location Plan
APPENDIX 4	Cable Percussion and Rotary Open Hole Borehole Records
APPENDIX 5	Rotary Core Boreholes
APPENDIX 6	Core Photographs
APPENDIX 7	Trial Pit Records
APPENDIX 8	Trial Pit Photographs
APPENDIX 9	Static Cone Penetration Test Results
APPENDIX 10	Monitoring Results
APPENDIX 11	Laboratory Test Results - Geotechnical
APPENDIX 12	Laboratory Test Results - Contamination (Soil & Leachate)
APPENDIX 13	Investigation Techniques and General Notes

1.0 INTRODUCTION

A geotechnical investigation was undertaken by Geotechnics Ltd at the site of a proposed Energy From Waste (EFW) Plant at HMNB Devonport, Plymouth, South Devon. The investigation was carried out to the instructions of the Engineer, GHA Livigunn Ltd on behalf of the Client, MVV Umwelt GmbH. This report describes the work undertaken and presents the data obtained.

2.0 OBJECT AND SCOPE OF THE INVESTIGATION

The object of the investigation was to obtain information on the ground and groundwater conditions relating to the design of the proposed works within the limitations posed by trial hole numbers, locations, depths, methods adopted and the scope of approved in situ and laboratory testing. The Brief for the project is included in Appendix 1. The investigation comprised boreholes, trial pits, and static cone penetration tests, in situ and laboratory testing and reporting. A geotechnical interpretation and evaluation of the data obtained was not commissioned as part of the scope of works.

3.0 PRESENTATION

A description of the site and a summary of the procedures followed during the investigation process are presented in Sections 4 to 6. The factual data so obtained are presented in Appendices 2 to 12 of this report.

Attention is drawn to the General Notes and Investigation Procedures presented in Appendix 13 to aid an understanding of the procedures followed and the context in which the report should be read.

In addition, data in electronic format in accordance with "The Electronic Transfer of Geotechnical Data from Ground Investigations" (Third Edition) published by the AGS (the AGS Format) are presented separately on disk together with a copy of the report in electronic PDF format.

4.0 THE SITE

4.1 Location

The site is located to the north of Weston Mill Lake in HMNB Devonport in the western area of Plymouth, South Devon. The approximate Ordnance Survey National Grid Reference for the centre of the site is SX 447 573 and an extract from the relevant 1:50,000 Scale O.S. Map (Sheet No. 201) is included as Appendix 2.

4.2 Description

The site is irregular in shape and covers an area of approximately 5 hectares including "Blackie's Wood", "Weston Mill Tip" and "Table Top Mountain" which comprise a dismantled railway and waste grounds respectively. Access to Weston Mill Tip and Table Top Mountain is via Camels Head Gate. Blackie's Wood is accessed via an unnamed track off Barne Road to the north of the site.

Weston Mill Tip, Blackie's Wood and Table Top Mountain are all generally level however the Table Top Mountain and Blackie's Wood areas are approximately 4.00 and 5.00m above Weston Mill Tip respectively.

The site is bound to the east and south by Weston Mill Stream, to the north by Blackie's Wood and to the west by residential dwellings and Devonport Dock Yard facilities.

Large mounds of demolition material were stockpiled on the Weston Mill Tip area of the site which restricted some exploratory hole positions. Relocated borehole positions were agreed with the Engineer.

5.0 PROCEDURE

5.1 Commissioning

The work was awarded following submission of a tender for work designed by the Engineer for

ground investigation of the site in accordance with the Client's requirements (see Appendix 1).

5.2 General

The procedures followed in this site investigation are based on *BS 5930 (1999) - Code of Practice for Site Investigations*. The soils and rocks encountered have been described in accordance with Amendment 1 to BS5930, dated December 2007 and BS EN ISO 14688-1 (2002) and BS EN ISO 14689-1 (2003). The cable percussion boreholes, rotary cored boreholes and trial pit records are included in Appendices 4, 5 and 7 respectively and their approximate positions are shown on the Exploratory Hole Location Plan in Appendix 3.

The Exploratory Hole locations were specified by the Engineer. Levels shown on the Exploratory Hole Records were levelled via GPS/GPRS smartnet system and the depths quoted are in metres below ground level.

5.3 Explosive Ordnance Clearance

Historical information provided by the Engineer highlighted the potential risk of the presence of unexploded ordnance beneath the site. In order to reduce the risk of unexploded ordnance being found during drilling or excavation, each exploratory hole location was cleared by a Specialist Company, (EOD Contracts Ltd) before commencement of the ground investigation operations. The clearance works was carried out by an Explosive Ordnance Detection (EOD) Engineer. Observational methods, in conjunction with careful excavation and the use of a hand-held magnetometer were used for the trial pits. The boreholes were cleared progressively in 1.00m stages. A hand-held magnetometer was lowered down the borehole allowing a 1.00m zone below the base of the borehole to be cleared, thus allowing a further 1.00m advancement of the borehole followed by a repeat of the checking procedure. This continued until a depth was reached at which the EOD Engineer judged that the risk of ordnance being present was low and the drilling could continue in the usual manner to the scheduled depth.

5.4 Cable Percussion and Rotary Open Hole Boreholes

Twenty nine (29 No.) 150mm diameter cable percussion boreholes (numbered BH1 to BH15, BH1A, BH4A, BH6A, BH6B, BH8A, BH12A, BH17 to BH22, BH20A and BH20B) were sunk to depths varying between 0.50 and 22.50m below ground level. The work was carried out between the 28th June and 20th July 2010.

Due to the ground conditions encountered which included densely compacted fill with reinforced concrete, boulders and slabs, a number of different techniques were utilised to enable the boreholes to be completed.

5.4.1 Cable Percussion Drilling

Three of the cable percussion boreholes (numbered BH7, BH8 and BH8A) had an inspection pit excavated using hand tools to a depth of 1.20m below ground level to check for the presence of underground services prior to advancing to bedrock. The boreholes then progressed to completion, where BH7 and BH8A were continued using rotary coring techniques (see section 5.5). Borehole BH8 was backfilled with ballast.

Four (4 No.) of the cable percussion boreholes (numbered BH4 to BH6 and BH6A) commenced from ground level using cable percussion tool techniques. However, due to dense concrete fill the boreholes encountered obstructions and were either relocated and/or abandoned.

5.4.2 Excavator-Assisted Boreholes

Three (3 no.) of the cable percussion borehole inspection pits (numbered BH3, BH6B and BH10) were assisted by using a wheeled exactor to loosen the densely compacted fill to depths varying between 1.20 and 2.10m below ground level to enable the cable percussion drilling to be advanced through the fill to bedrock. On completion BH10 was backfilled with arisings and BH3 and BH6B were continued using rotary coring techniques (see section 5.5).

5.4.3 Rotary Open Hole Pre-Drilled Boreholes

Nineteen (19 No.) of the cable percussion boreholes (numbered BH1, BH1A, BH2, BH4A, BH9, BH11, BH12, BH12A, BH13 to BH15, BH17 to BH22, BH20A and BH20B) utilised rotary open hole drilling techniques to pre-drill through dense concrete fill using a 175mm open hole hammer and 200mm rock roller to depths varying between 6.00 and 13.00m below ground level.

The drilling equipment on this particular contract utilised air mist and foam as the flushing medium. The strata descriptions of the rotary open hole sections are the Drilling Foreman's and Geotechnics

Engineer's estimate based on sediment and chipping returns in the flushing medium. The rate of penetration is also used as an indicator of the type of material being drilled, particularly where there is loss of flush returns. Definitive classification in terms of geology or degree of disturbance is not usually possible from these sources.

On encountering softer drilling the open hole technique was terminated to allow the cable percussion casing to be advanced through the concrete fill and enable cable percussion drilling to commence once the underlying alluvium had been encountered.

Ten of the nineteen pre-drilled boreholes (numbered BH1A, BH2, BH12A, BH13 to BH15, BH17 to BH19 and BH22) were able to advance the cable percussion casing through the concrete fill to bedrock.

Six of the nineteen pre-drilled boreholes (numbered BH4A, BH9, BH11, BH12, BH20 and BH21) were unable to advance the casing through the concrete fill as the boreholes were susceptible to collapse. Therefore these boreholes were abandoned and backfilled with ballast, with the exception of BH21 which was advanced to bedrock using the Static Cone Penetration rig (see section 5.7 referred to as C21).

Three of the nineteen pre-drilled boreholes (numbered BH1, BH20A and BH20B) encountered obstructions and were either moved or abandoned. The positions were backfilled with ballast.

On completion standpipes were installed in Boreholes BH12A, BH15, BH17 to BH19 and BH22 (see Section 5.8). Boreholes BH1A, BH2, BH3, BH6B, BH7, BH8A and BH21 were continued by rotary coring (see Section 5.5). Boreholes BH4 to BH6, BH6A, BH8, BH10, BH13 and BH14 were backfilled with ballast.

5.4.4 Borehole Sampling and In-situ Testing

Representative disturbed (D and B) and undisturbed (U100) samples of the soils encountered were obtained at regular intervals and Standard Penetration Tests (SPTs) undertaken in appropriate deposits, in order to allow inspection and obtain a measure of the engineering properties of the proved strata. In addition, environmental samples (E) were recovered at the depths indicated on the Borehole Records which have been included as Appendices 4 and 5.

On encountering groundwater, boring operations were suspended for 20 minutes in order to record any rise in water level. Full details of groundwater observations during site work are included on the Borehole Records.

5.5 Rotary Cored Boreholes

Seven (7 No.) 120mm diameter boreholes (numbered BH1A, BH2, BH3, BH6B, BH7, BH8A and BH21) were sunk utilising rotary coring techniques to depths varying between 9.20 and 30.00m below ground level. The rotary coring (92mm) commenced at depths of between 4.20 and 21.70m below ground level through the base of the Cable Percussion Boreholes which had been left open and/or cased to facilitate coring as instructed by the Engineer. The work was carried out during the period between the 12th and 21st July 2010.

The drilling equipment on this particular contract utilised air mist as the flushing medium. Rock cores were extruded horizontally and placed into suitable core boxes. (Photographs of the individual core boxes are included in Appendix 6).

Groundwater observations are included on the Borehole Records where appropriate which have been included as Appendix 5.

On completion standpipes were installed in all seven boreholes (see Section 5.8).

5.6 Trial Pits

Three (3 No.) Trial Pits (numbered TP1 to TP3) were excavated to depths varying between 1.00 and 2.50m below ground level using a wheeled excavator on the 6th July 2010. This work was supervised on site by a geotechnical engineer.

The profiles of strata or other features were recorded as excavation proceeded and measurements taken from ground level. Representative samples were taken, where appropriate, for laboratory examination and analysis and in addition, Environmental samples (E) were recovered at the depths indicated on the Trial Pit Records. Samples were taken directly from excavated materials deposited at the surface. Groundwater observations and trench stability notes are included on the Trial Pit Records in Appendix 7. Photographs of the trial pits have been included in Appendix 8.

5.7 Static Cone Penetration Tests (CPTU)

Twenty (20 No.) Static Cone Penetration Tests (CPTU) (numbered C01 to C08, C09A, C12 to C18, C20A, C22, C28 and C21) were completed to depths varying between 1.82 and 21.32m below ground level by InSitu SI. The test locations were specified by the Engineer and the work was carried out between the 7th and 20th July 2010.

The static cone penetration tests were undertaken using a truck mounted twenty tonne capacity hydraulic penetrometer equipment, ballasted to provide a reaction weight of about eighteen tonnes. A 20 tonne capacity, 4.5cm^2 electric cone was used for each of the tests and measurements of local side friction were made in addition to cone end resistance. The tests were terminated at the depths at which refusal was reached based on the maximum safe thrust capacity of the equipment.

Sixteen (16 No.) of the CPTU positions (numbered C01 to C08, C09A, C12 to C14, C20A, C22 and C28) were pre-drilled through the fill using rotary odex/symetrix techniques which utilises simultaneous cased and open hole rotary drilling creating a 120mm diameter hole. This pre-drill technique enabled a 50mm pipe to be installed in the borehole to ensure the CPTU could be advanced through to the alluvium to prove bedrock.

C21 was pre-drilled through the fill utilising open hole drilling to a depth of 12.00m below ground level.

The four remaining CPTU positions (numbered C15 to C18) were assisted using a wheeled excavator to depths varying between 1.30 and 3.40m below ground level to loosen the fill.

The CPTU records together with an interpreted identification of the soils tested are presented in a report prepared by InSitu SI which is included in Appendix 9.

Nineteen of the twenty CPTU positions were backfilled with ballast on completion. Rotary coring commenced at C21 on completion of the CPTU test (referred to as BH21).

5.8 Instrumentation and Monitoring

Long term monitoring of the gas and groundwater levels was made possible by the installation of standpipes as follows:

Exploratory Hole	Standpipe Slotted pipe & Filter Zone (m)
BH1A	1.50 to 7.00 9.00 to 18.00
BH2	3.00 to 30.00
BH3	1.50 to 29.80
BH6B	1.50 to 30.00
BH7	1.50 to 18.00
BH8A	1.50 to 9.20
BH12A	1.50 to 22.50
BH15	1.50 to 8.30
BH17	1.50 to 15.30
BH18	1.50 to 16.00
BH19	1.50 to 17.00
BH21	1.50 to 29.80
BH22	1.50 to 10.00

Monitoring of the gas and groundwater levels at the site commenced on the 27th July 2010 with a further 5 No. visits on the 10th August 2010, 24th August 2010, 8th September 2010, 21st September 2010 and 5th October 2010.

At each position a record of the groundwater level in each instrument was taken.

In addition to the groundwater levels, the following parameters were measured and recorded in each standpipe using a Gas Data LMSxi Gas Analyser:

- Concentrations (% Vol) of CH_4, O_2, CO_2, N_2 along with (% LEL) CH_4, H_2S, and CO.
- Flow Rate
- Barometric Pressure

The results of the monitoring are presented in Appendix 10.

6.0 LABORATORY TESTING

6.1 Geotechnical

The laboratory testing schedule was specified by the Engineer in order to relate to the proposed development. The tests, where appropriate, conform *to BS 1377 - Methods of Test for Soils for Civil Engineering Purposes (1990)* and were carried out in Geotechnics Limited's UKAS accredited Laboratory (Testing No. 1365). Any descriptions, opinions and interpretations are outside the scope of UKAS accreditation.

The tests undertaken can be summarised as follows:

BS 1377 (1990)

Test No.		Test Description
Part 2		
3.2	53 No.	Moisture Content Determination
4.3 & 5.3	30 No.	Liquid and Plastic Limit Determination
9.2 & 9.3	25 No.	Mechanical Analysis - Sieving
9.4	24 No.	Mechanical Analysis - Sedimentation
Part 3		
5.2, 5.5	20 No.	Sulphate Analysis – 2:1 water/soil extract.
9.5	20 No.	pH Determination
Part 5		
3	9 No.	One-Dimensional Consolidation Properties Determination. Consolidation Test
Part 7		
9	9 No.	Shear Strength Measurement - 100mm diameter (Single Stage) Quick Undrained Triaxial Compression Test

The results of these tests are presented in Appendix 11.

6.2 Contamination

Selected samples of soil and groundwater were tested in at the laboratories of Derwentside Environmental Testing Services for a number of determinands in order to check on potential site contamination. The determinands were specified by the Engineer.

6.2.1 Soil

Samples selected by the Engineer were scheduled for analysis for a range of determinands including:

Arsenic
Cadmium
Total Chromium
Lead
Mercury
Selenium
Copper
Nickel
Zinc
Tin
Tributyl Tin
Monohydric Phenols
pH
Speciated Polyaromatic Hydrocarbons
Asbestos Screen
Total Organic Carbon
Speciated Total Petroleum Hydrocarbons
Volatile Organic Compounds (VOC)
Semi-Volatile Organic Compounds (SVOC)
Polychlorinated biphenyls
Free Cyanide
Total Cyanide

The results are presented in Appendix 12.

6.2.2 Leachate

Samples selected by the Engineer were scheduled for analysis for a range of determinands including:

Leachate Preparation BS-EN12457-1 (single batch 2:1)
Arsenic
Cadmium
Total Chromium
Lead
Mercury
Selenium
Copper
Nickel
Zinc
Tin
Tributyl Tin
Monohydric Phenols
pH
Speciated Polyaromatic Hydrocarbons
Asbestos Screen
Total Organic Carbon
Speciated Total Petroleum Hydrocarbons
Volatile Organic Compounds (VOC)
Semi-Volatile Organic Compounds (SVOC)
Polychlorinated biphenyls
Ammoniacal Nitrogen
Electrical Conductivity
Free Cyanide
Total Cyanide

The results are presented in Appendix 12.

6.2.3 Water

Samples selected by the Engineer for a range of

determinands including:

Arsenic Dissolved
Cadmium Dissolved
Chromium Dissolved
Copper Dissolved
Lead Dissolved
Mercury Dissolved
Nickel Dissolved
Selenium Dissolved
Tin Dissolved
Zinc Dissolved
Sulphate
Cyanide total
Conductivity
Hardness
Ammoniacal Nitrogen as N
Total Organic Carbon
pH
Speciated Total Petroleum Hydrocarbons
Volatile Organic Compounds (VOC)
Semi-Volatile Organic Compounds (SVOC)
Tributyl Tin

The results are presented in Appendix 12.

Signed for and on behalf of Geotechnics Limited.

pp Engineer : .....
Sophie Unsworth
Assistant Engineer
for GEOTECHNICS LIMITED - South West Office

Engineer : .....
Anne Simpson, BSc, MSc(Eng), CEng, MIMM, FGS
Regional Manager/ Principal Engineer
for GEOTECHNICS LIMITED - South West Office

APPENDIX I

The Brief

3. PREAMBLE TO SPECIFICATION

The shall generally be the Specification for Ground Investigation published by Thomas Telford Services Ltd in 1993, with information, amendments and additions as described in the Schedules.

3.1. Schedule 1: Information

Name of Contract	S1.1	Proposed Energy from Waste Plant, Devonport, Plymouth - Ground Investigation. Kier Contract Number E0788
Description of Site	S1.2	The area in question is located to the north of Weston Mill Lake in the Camel's Head area of Plymouth. It is understood that the site was formerly occupied by a tidal inlet (Weston Mill Lake) which was reclaimed in the 1980s. The Ordnance Survey national grid reference for the approximate centre of the site is SX 4472 5739. A site location drawing is included as drawing number C3793/01.
Main works proposed and purpose of this contract	S1.3	It has been proposed to investigate: The geotechnical parameters of the site (including quantitative computer based slope stability assessment) to provide quantitative design parameters for foundation, reinforcement and basement design. This will include an assessment of groundwater range and uplift pressures (including a full spring tidal cycle) together with inflow rates to help drainage design of basement and parameters for anchor design of the bunker basement and flue stack foundations. Contamination constraints on the proposed development including assessment of soil, surface water, groundwater and ground gas (with provision for undertaking a Detailed Quantitative Risk Assessment, if required).

Scope of Investigation	S1.4	The investigation shall comprise the following: • Approx. ten (number) window sample probeholes. • Approx. twenty four (number) mechanically excavated trial pits. • Twenty (number) light cable percussion boreholes. • Eight (number) rotary cored boreholes (following on from light cable percussion boreholes). • Three days CPTu probing, approx. 30 (number) probeholes. • Sediment sampling (at the direction of the Engineer) • Permeability testing (in situ) within proposed bunker basement excavation. All exploratory hole positions shall be subject to Explosive Ordnance Disposal (EOD) surveying and clearance prior to commencement.
The main Objectives of this investigation are as follows:		To identify the stability of existing slopes in the northwest and east of the site and to provide design parameters and recommendations for foundations together with remedial measures to deal with proven contamination (soils, water and gas). For the purposes of this contract, the following design issues are to be considered within the proposed investigation, together with general site coverage: 1. Parameters to enable anchor design for basement bunker and flue stack foundations. 2. Investigation of proposed new bridge, basement and ash treatment areas. 3. Basement construction. 4. Pile design. 5. Slope stability assessment. 6. Contaminated land assessment.
Geology and Ground Conditions	S1.5	Previous investigations (see S1.6) indicate the site to be underlain by variable composition made ground (c. 4.5m to 7.0m thick) overlying inter-tidal alluvial deposits noted as comprising soft, possibly organic, silts ranging in thickness between c. 2m and 7.0m. Solid geology underlying the site is noted as comprising Upper Devonian Shales of the Saltash Formation. Previous investigations note this strata as comprising weathered residual mudstone. Fresh slate was not identified during the previous investigation.

Schedule of drawings and documents	S1.6	C3793/01	Site Location Plan
		C3793/02	Proposed Exploratory Hole Location Plan
		A739/04 (Kier Engineering Services Drawing)	Proposed Layout (FFL = 10m)
		D127470	Scott Wilson 'Preliminary Geological Site Assessment'.
		ESG/10/004/F	Environmental Science Group 'Phase 1 Explosive Ordinance Risk Assessment, Weston Mill, HMND Devonport' (extract)

Particular Contract restrictions — S1.7

It is **considered essential** that the Contractor visits site to assess access requirements, particularly with regard to those exploratory holes located on the existing slopes. Arrangements for access to the site must be arranged in advance through GHA Livigunn at the following address:

Mr Nathan Woods
GHA Livigunn
The Studio
51 Brookfield Road
Cheadle
SK8 1ES

Tel: 0161 491 4600
Fax: 0161 491 4700
Email: nathan.woods@ghalivigunn.com

Particular general requirements (Section 3) — S1.8

Reinstatement of boreholes without wells will be by backfilling with arisings and reinstatement of hardstanding around boreholes will be with a 300mm concrete plug left flush with ground level.

Trial pit reinstatement will be by backfilling with the excavated soils in the approximate reverse order and the soils compacted in layers with the back of the excavator bucket, to the best of the ability of the machine and operator. Arisings are likely to be left proud of the surface (as with a fresh grave).

The Contractor shall provide full time professional attendance by a suitably qualified and experienced geoenvironmental engineer.

Particular exploratory hole requirements (Section 4)	S1.9	Each exploratory hole shall be confirmed as being free of buried services or utilities by means of appropriate cable locating tools. Each exploratory hole shall also be confirmed as being free of unexploded ordinance by specialist EOD surveying and clearance prior to commencement.
	S1.10 to S1.14	None.
Particular daily report requirements (Section 100)	S1.15	The Contractor shall provide the Engineer with draft exploratory hole record sheets, within 24 hours of the completion of each exploratory hole.
Particular laboratory testing requirements	S1.16	All geotechnical and contamination laboratory testing shall be undertaken at UKAS and, where appropriate, MCERTS accredited testing laboratories.
Particular reporting requirements	S1.17	The interpretative report shall, as a minimum, include discussion of the findings of the intrusive investigation, a generic semi-quantitative contamination risk assessment, slope stability assessment and a ground gas risk assessment. Recommendations will be given for: foundations, basements, inflow rates into basement excavation and calculation of uplift pressures, excavation stability, road pavement design parameters, contamination remediation measures, slope remedial measures and gas protection measures. In addition, the interpretative report shall include parameters to establish anchor designs for the flue stack foundation and secant pile wall within the proposed waste bunker basement area together with anchoring the bunker against uplift.

3.2. Schedule 2: Exploratory Holes

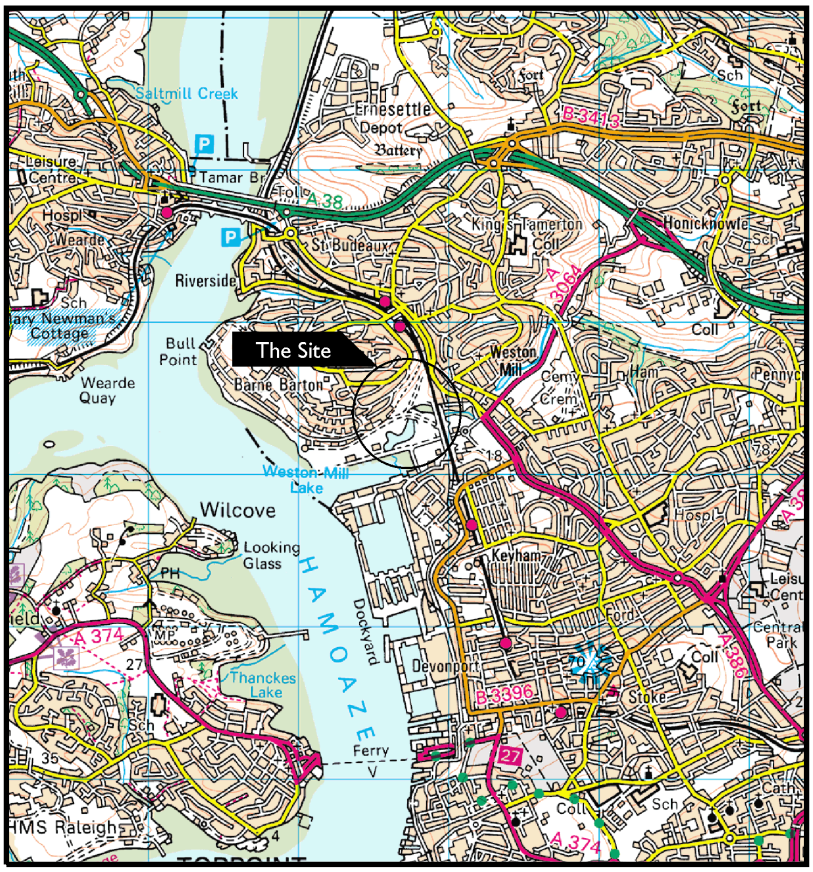
Exploratory Hole No's	Probable Depth (m)	Method
TP01 to TP24	4.5	Mechanically excavated trial pits
WS01 to WS06	5	Window sample probeholes - including 4 No. combined gas / groundwater installations to approx. 5m depth (slope area)
WS07 to WS10	5	Window sample probeholes - including 2 No. combined gas / groundwater installations to approx. 5m depth
BH01 to BH6	30	Light cable percussion boreholes to approx. 15m with rotary cored drilling follow on to approx. 30m (proposed plant area) - including 6 No. combined gas / groundwater installations to approx. 20m depth
BH07 and BH08	20	Light cable percussion boreholes to approx. 10m with rotary cored drilling follow on to approx. 20m (slope crest area - subject to access) - including 2 No. combined gas / groundwater installations to approx. 20m depth
BH09 to BH20	6 No. to 10 6 No. to 15	Light cable percussion boreholes - including 6 No. combined gas / groundwater installations to approx. 15m depth
C01 to C30	up to 10	CPTu probeholes measuring cone end resistance, sleeve friction and pore water pressure from ground level to refusal or as instructed by the Engineer

The exact location of each exploratory hole position will be agreed on site by the Contractor and the Engineer, subject to access, buried services / utilities, EOD clearance, site observations and ground conditions.

APPENDIX 2

Site Location Plan

SITE LOCATION PLAN



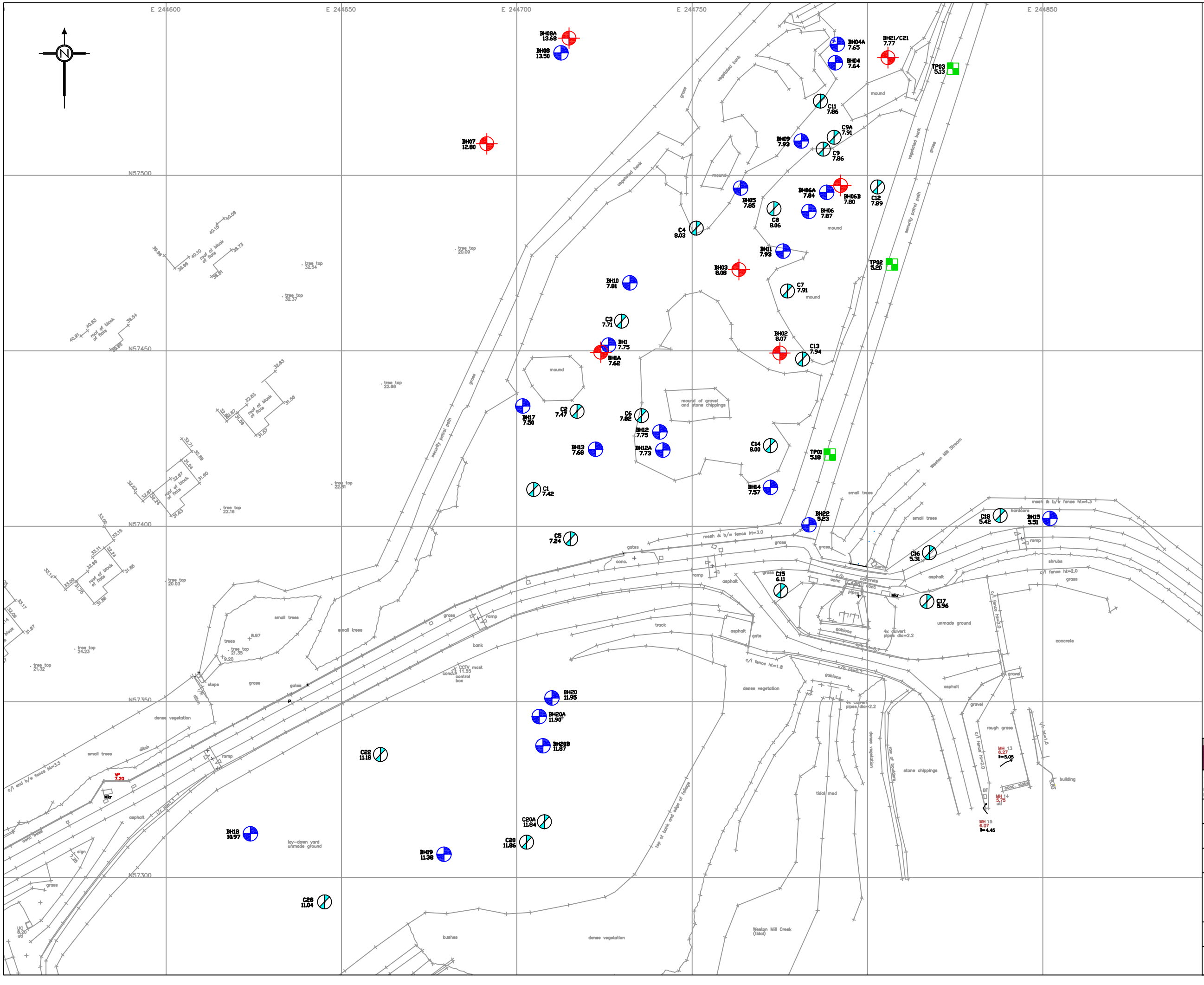
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Ground Investigation
at
Proposed Energy from Waste Plant, Devonport, Plymouth.
for
MVV Umwelt GmbH

geotechnics

APPENDIX 3

Exploratory Hole Location Plan



	Easting	Northing	Level
BH01	244726.18	57451.62	7.75
BH01A	244723.96	57449.59	7.62
BH02	244775.00	57449.36	8.07
BH03	244763.33	57473.13	8.08
BH04	244790.81	57532.05	7.64
BH04A	244791.40	57537.33	7.65
BH05	244763.80	57496.35	7.85
BH06	244783.28	57489.71	7.87
BH06A	244788.35	57495.15	7.84
BH06B	244792.35	57497.09	7.80
BH07	244691.44	57509.00	12.80
BH08	244712.61	57534.87	13.50
BH08A	244714.89	57539.07	13.68
BH09	244781.10	57509.75	7.93
BH10	244732.25	57469.35	7.81
BH11	244775.92	57478.39	7.93
BH12	244740.78	57426.87	7.75
BH12A	244741.65	57421.71	7.73
BH13	244722.47	57421.94	7.68
BH14	244772.33	5741 1.08	7.57
BH15	244851.99	57402.23	5.51
BH17	244701.70	57434.27	7.50
BH18	244624.05	57312.42	10.97
BH19	244679.25	57306.58	11.38
BH20	244710.03	57351.09	11.95
BH20A	244706.39	57345.79	11.90
BH20B	244707.47	57337.48	11.87
BH21	244805.82	57533.51	7.77
BH22	244783.32	57400.42	5.23
C1	244704.81	57410.48	7.42
C2	244717.18	57432.75	7.47
C3	244729.86	57458.44	7.71
C4	244751.18	57484.94	8.03
C5	244715.36	57396.43	7.24
C6	244735.58	57431.52	7.82
C7	244777.17	57467.03	7.91
C8	244773.34	57490.48	8.06
C9	244787.40	57507.48	7.86
C9A	244790.43	57510.94	7.91
C11	244786.57	57521.13	7.86
C12	244802.85	57496.67	7.89
C13	244781.48	57447.63	7.94
C14	244772.29	57422.98	8.00
C15	244775.28	57381.67	6.11
C16	244817.62	57392.48	5.31
C17	244816.93	57378.58	5.96
C18	244837.82	57403.08	5.42
C20	244702.81	57310.01	11.86
C20A	244707.87	57315.84	11.84
C22	244661.13	57334.99	11.18
C28	244645.19	57293.00	11.04
TP01	244789.24	57420.44	5.18
TP02	244806.95	57474.59	5.20
TP03	244824.36	57530.36	5.13

BOREHOLE

BOREHOLE - ROTARY FOLLOW ON

CONE PENETRATION TEST

TRIAL PIT

– BENCH MARK INFORMATION –

BM Attached to OSGB02 grid and level via GPS/GPRS Smartnet system.

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www.geotechnics.co.uk

Engineer:
GHA Livigunn Ltd

Client:
MVV Umwelt GmbH

Project:
Proposed Energy From Waste Plant, Devonport, Plymouth

Drawing Title:

Exploratory Hole Location Plan

Taken from a drawing supplied by the Client

Scale: 1:1000@A3	Date: August 2010
Project No: PE100830	File Name: PE100830D001-A

APPENDIX 4

Cable Percussion and Rotary Open Hole Borehole Records

DATA SHEET - Symbols and Abbreviations used on Records

Sample Types

B	Bulk disturbed sample
BLK	Block sample
C	Core sample
D	Small disturbed sample (tub/jar)
E	Environmental test sample
ES	Environmental soil sample
EW	Environmental water sample
G	Gas sample
L	Liner sample
P	Piston sample (PF - failed P sample)
TW	Thin walled push in sample
U	Open Tube - 102mm diameter with blows to take sample. (UF - failed U sample)
UT	Thin wall open drive tube sampler - 102mm diameter with blows to take sample. (UTF - failed UT sample)
V	Vial sample
W	Water sample
#	Sample Not Recovered

Insitu Testing / Properties

S	Standard Penetration Test (SPT)
C	SPT with cone
VN	Strength from Insitu Vane
HV	Strength from Hand Vane
PP	Strength from Pocket Penetrometer
(All other strengths from undrained triaxial testing)	
w%	Water content
N	SPT Result
-/-	Blows/penetration (mm) after 150mm seating.
-*/- (mm)	Total blows/penetration
( )	Extrapolated value

Rotary Core

RQD — Rock Quality Designation (% of intact core >100mm)

FRACTURE INDEX — Fractures/metre

FRACTURE SPACING (mm) — Maximum / Minimum

NI — Non-intact core

NR — No core recovery

(where core recovery is unknown it is assumed to be at the base of the run)

Groundwater

Water Strike

Depth Water Rose To

Instrumentation

Seal

Filter

Seal



Strata

Made Ground Type 1

Type 2

Topsoil

Cobbles and Boulders

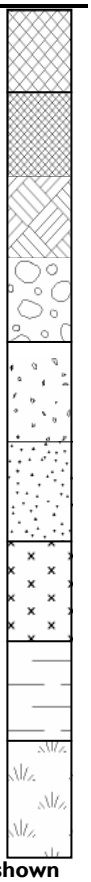
Gravel

Sand

Silt

Clay

Peat



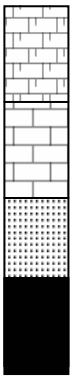
Note: Composite soil types shown by combined symbols

Chalk

Limestone

Sandstone

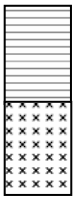
Coal



Strata, Continued

Mudstone

Siltstone

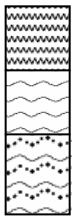


Metamorphic Rock

Fine Grained

Medium Grained

Coarse Grained

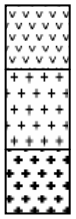


Igneous Rock

Fine Grained

Medium Grained

Coarse Grained



Backfill Materials

Arisings

Bentonite Seal

Concrete

Fine Gravel Filter

General Fill

Gravel Filter

Grout

Sand Filter

Tarmacadam



BOREHOLE RECORD – Rotary Open Hole

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH1
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244726.18 E 57451.62 N	Ground Level	7.75 m OD

Drilling | Properties/Sampling | Strata — Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	Description General	Description Detail	Depth	Legend	Level m OD
							G.L.		7.75
0.80	B				Light grey silty very sandy gravel with low cobble content. Gravel (fine to coarse) and cobbles are subangular brick, concrete, limestone, and flint. Metal, wood and plastic fragments. [MADE GROUND]				
1.00	D								
1.00	E								
2.00	D								
					End of Drillhole		2.30		5.45

Drilling

Depth	Hole Dia	Technique	Crew
2.30	0.20	Rotary Open Hole	ABOVO

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	01/07/10	08:00
2.30	-	-	01/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					Not encountered during drilling.

Remarks

AGS

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 2.30m.
The Borehole was terminated at a depth of 2.30m on the instruction of the Engineer due to the presence of an obstruction and the hole moved to BH1A.
Description based on fragmented chippings from open hole drilling and rate of progress.

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Figure 1 of 1

08/10/2010

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Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH4
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244790.81 E 57532.05 N	Ground Level	7.64 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							G.L.		7.64
0.20	E					Greyish brown sandy gravel with high cobble content. Sand is fine to medium. Gravel (fine to coarse) and cobbles are angular and subangular concrete and demolition material. [MADE GROUND]			
0.40- 0.80	B								
0.50	E								
1.00	D								
1.00	E								
1.20- 1.35	D	None (Dry)			S50/75		1.20		6.44
1.60- 1.90	B					Blackish grey clayey sandy gravel. Sand is fine to coarse. Gravel is angular and subangular slate, quartz and concrete [MADE GROUND]			
2.00- 2.15	D	None (Dry)			S50/75				
2.00	E								
2.50- 2.80	B								
2.90	D						2.90		4.74
3.00- 3.38	D	None (Dry)			S76/ 225	Greyish brown mottled orange clayey sandy gravel. Gravel is angular and subangular slate, quartz and concrete. [MADE GROUND]			
3.00	E								
3.50- 3.80	B								
3.90	D					At around 4.00m: Hydrocarbon odour.			
4.00- 4.45	D	1.50 (Dry)			S19				
4.00	E								
4.50- 4.80	B								
4.90	D						5.00		2.64
5.00- 5.45	D	3.00 (Dry)			S37	Dark grey clayey gravel. Gravel is angular and subangular fine to coarse slate. Some wood fragments. [MADE GROUND]			
5.00	E								
5.50- 5.80	B								
5.90	D								
6.50- 6.80	B								
6.50- 6.50		4.50 (Dry)			S50/0			▼	
6.70	W								
6.90	D						7.00	▽	0.64
7.00	E					Grey very clayey gravel. Gravel is subangular to subrounded fine to coarse slate and concrete. [MADE GROUND]			
7.00- 7.00		4.50 (6.70)			C50/0				
7.30	D								
7.50- 7.59		6.00 (6.70)			C50/10		7.50		0.14
						End of Borehole			

Boring

Depth	Hole Dia	Technique	Crew
7.50	0.15	Cable Percussion	PB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	28/06/10	08:00
5.00	3.00	Dry	28/06/10	18:00
5.00	3.00	Dry	29/06/10	08:00
7.50	6.00	6.70	29/06/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
7.00	5.00	6.70	20	Not	Slow.

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Monitoring for unexploded ordnance carried out during pauses in boring.
Borehole abandoned at 7.50m depth after SPT shoe snapped off and was lost at base of borehole. Borehole re-drilled (BH4A).
Chiselling: 1.00-1.40m for 60 minutes and 1.70-2.00m for 60 minutes and 7.20-7.50m for 60 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 1 of 1

08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH4A
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244791.40 E 57537.33 N	Ground Level	7.65 m OD

Scale 1:50

Sampling			Properties		Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	Description	Depth	Legend	Level m OD
						G.L.		7.65
					Dark greyish brown slightly silty sandy gravel. Gravel is subangular fine to coarse slate, brick, concrete and limestone. Occasional wood fragments. [MADE GROUND]			
1.00	D							
1.00	E							
2.00	D							
3.00	D							
3.00	E							
4.00	D							
5.00	D							
5.00	E							
6.00	D							
7.00	D							
					Soft drilling ** (Possible alluvium).	8.70		-1.05
					End of Borehole	9.00		-1.35

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.80	0.15	Cable Percussion	PB	G.L.	-	-	02/07/10	08:00						Not encountered during drilling.
6.00	0.15	Cable Percussion	JW	9.00	-	-	02/07/10	18:00						
9.00	0.20	Rotary Open Hole	ABOVO	9.00	-	-	05/07/10	08:00						
9.00	0.17	Rotary Open Hole	ABOVO	9.00	1.80	-	05/07/10	18:00						
				9.00	-	-	06/07/10	08:00						
				9.00	-	-	06/07/10	18:00						

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 9.00m.
Description based on fragmented chippings from open hole drilling and rate of progress.
** Drillers description.
Monitoring for unexploded ordnance carried out during pauses in boring.
Concrete obstruction at 1.80m required larger hammer due to cable percussion casing refusing. Casing then advanced to 6.0m before refusing again.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 1 of 2

08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH4A
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244791.40 E 57537.33 N	Ground Level	7.65 m OD

Scale 1:50

Sampling			Properties		Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	Description	Depth	Legend	Level m OD

Boring

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
9.00	-	-	07/07/10	08:00
9.00	6.00	-	07/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks **The Borehole was terminated on the instruction of the Engineer due to the presence of an obstruction and the hole moved to BH22.**

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Figure 2 of 2

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Cable Percussion

Project: PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH
Engineer: GHA LIVIGUNN
Borehole: BH5
Project No: PE100830
Client: MVV UMWELT GMBH
National Grid Coordinates: 244763.80 E, 57496.35 N
Ground Level: 7.85 m OD
Scale: 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							G.L.		7.85
0.30	D					Dark grey reinforced concrete gravel and cobbles. [MADE GROUND]			
0.50- 1.00	B								
1.00	E								
1.20- 1.65	D	None (Dry)			S15				
2.00	D			19					
2.20- 2.65	D	None (Dry)			S61				
2.60- 3.20	B						2.65		5.20
3.00	E					Greyish brown mottled orange clayey gravel. Gravel is angular and subangular fine to coarse slate and concrete. [MADE GROUND]			
3.20- 4.20	B								
3.20- 3.65	D	None (Dry)			S7				
4.20- 4.60	D	None (Dry)		15	S50/ 245				
4.70- 5.20	B					At 4.70m: Metal fragments.			
4.70	D						4.80		3.05
5.20- 5.47	D	4.80 (Dry)			S53/ 115	Greyish brown mottled orange slightly clayey sandy gravel. [MADE GROUND]			
							5.70		2.15
						End of Borehole			

Boring

Depth	Hole Dia	Technique	Crew
5.70	0.15	Cable Percussion	JW

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	28/06/10	08:00
2.20	-	Dry	28/06/10	18:00
2.20	-	Dry	29/06/10	08:00
5.70	4.80	Dry	29/06/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					Not encountered during boring.

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Monitoring for unexploded ordnance carried out during pauses in boring.
The Borehole was terminated at a depth of 5.70m upon encountering probable concrete obstruction and abandoned on the instructions of the Engineer.
Chiselling: 0.05-0.60m for 60 minutes and 4.70-4.80m for 60 minutes and 5.70-5.70m for 30 minutes.

Logged by: SU
Figure: 1 of 1
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH6
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244783.28 E 57489.71 N	Ground Level	7.87 m OD

Scale 1:50

Sampling			Properties		Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	Description	Depth	Legend	Level m OD
						G.L.		7.87
0.20	E				Dark grey reinforced concrete gravel and cobbles. [MADE GROUND]			
					End of Borehole	0.60		7.27

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
0.60	0.15	Cable Percussion	JW	G.L.	-	-	28/06/10	10:00						None encountered during boring.
				0.60	-	Dry	28/06/10	12:00						

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
The Borehole was terminated at a depth of 0.60m on the instruction of the Engineer due to the presence of an obstruction and the hole moved to BH6A.
Chiselling: 0.40-0.60m for 60 minutes.

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Figure 1 of 1

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH6A
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244788.35 E 57495.15 N	Ground Level	7.84 m OD

Scale 1:50

Sampling			Properties		Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	Description	Depth	Legend	Level m OD
					Dark grey reinforced concrete and brick gravel and cobbles. [MADE GROUND]	G.L.		7.84
					End of Borehole	0.50		7.34

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
0.50	0.15	Cable Percussion	JW	G.L.	-	-	28/06/10	12:00						None encountered during boring.
				0.50	-	Dry	28/06/10	14:00						

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
The Borehole was terminated at a depth of 0.50m on the instruction of the Engineer due to the presence of an obstruction and the hole moved to BH6B.
Chiselling: 0.10-0.50m for 60 minutes.

Logged by SU

Figure 1 of 1
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Cable Percussion

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH8**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244712.61** E **57534.87** N

Ground Level **13.50** m OD

Scale 1:50

Sampling Depth	Sample Type	Depth Cased & (to Water)	Properties Strength kPa	w %	SPT	Strata Description	Depth	Legend	Level m OD
						Railway hard core with black ash ** [MADE GROUND]	**G.L.**		**13.50**
							0.20		**13.30**
						Clay and slate **			
							0.60		**12.90**
1.00- 1.23	**D**	**None (Dry)**			**S50/75**	**Dark grey slightly sandy clayey gravel with low cobble content. Gravel (fine to coarse) and cobbles are angular to subangular slate.**			
1.20- 1.31	**D**	**None**			**S50/50**				
1.20	**D**	**(Dry)**				**Cobbles, gravel, sand and boulders ****	**1.20**		**12.30**
							4.40		**9.10**
						End of Borehole			

Boring

Depth	Hole Dia	Technique	Crew
0.60	**0.30**	**Inspection Pit**	**JW**
1.20	**0.15**	**Cable Percussion**	**JW**
4.40	**0.12**	**Rotary Core**	**JB**

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	**-**	**-**	**08/07/10**	**08:00**
0.60	**-**	**Dry**	**08/07/10**	**18:00**
1.20	**-**	**Dry**	**09/07/10**	**08:00**
1.20	**-**	**Dry**	**09/07/10**	**18:00**
1.20	**-**	**Dry**	**19/07/10**	**08:00**
4.40	**-**	**Dry**	**19/07/10**	**18:00**

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					None encountered during boring.

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. Inspection pit hand excavated to 0.60m depth.
The Borehole was terminated at a depth of 4.40m as not able to core. Borehole was moved to BH8A.
**** Drillers description.**
Chiselling: 1.00-1.20m for 30 minutes.

Logged by **SU**

Figure **1 of 1**
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

geotechnics

BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH9
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244781.10 E 57509.75 N	Ground Level	7.93 m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							G.L.		7.93
						Brownish grey slightly silty sandy gravel. Gravel is subangular fine to coarse slate, quartz, concrete and limestone. Occasional wood fragments. Rare metal fragments. [MADE GROUND]			
1.00	D								
1.00	E								
3.00	E								
4.00	D								
5.00	E								
7.00	D								
						Grey clay **	7.30		0.63
7.80- 7.84		7.80 (Dry)			S50/0	Concrete **	7.70		0.23
						Soft drilling ** (Possible alluvium)	8.00		-0.07

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
2.50	0.15	Cable Percussion	JW	G.L.	-	-	02/07/10	08:00						Not encountered during drilling.
7.50	0.18	Rotary Open Hole	ABOVO	7.50	-	-	02/07/10	18:00						
7.50	0.15	Cable Percussion	JW	7.50	-	Dry	05/07/10	08:00						
7.50	0.20	Rotary Open Hole	ABOVO	7.50	2.50	Dry	05/07/10	18:00						
7.80	0.15	Cable Percussion	JW	7.50	-	Dry	06/07/10	08:00						
10.30	0.20	Rotary Open Hole	ABOVO	7.50	-	Dry	06/07/10	18:00						

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Cable percussion boring refused at 2.50m so open hole drilling techniques used to advance borehole to 7.50m depth, whereupon softer ground was encountered. Cable percussion then re-set up but encountered concrete obstruction at 7.80m.
Borehole reamed out to 10.30m but cable percussion unable to advance casing beyond 7.80m.
Description based on fragmented chippings from open hole drilling and rate of progress.
** Drillers description.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by CE

Figure 1 of 2

08/10/2010

geotechnics

BOREHOLE RECORD – Cable Percussion

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH9**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244781.10** E **57509.75** N

Ground Level **7.93** m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							10.30		-2.37
						End of Borehole			

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
				7.50	-	Dry	07/07/10	08:00						
				7.80	7.80	Dry	07/07/10	18:00						
				7.80	-	Dry	07/07/10	08:00						
				10.30	-	Dry	07/07/10	18:00						
				10.30	-	Dry	08/07/10	08:00						
				10.30	7.80	Dry	08/07/10	18:00						

Remarks **Monitoring for unexploded ordnance carried out during pauses in boring.**
Chiselling: 7.70-7.80m for 30 minutes and 7.80-8.00m for 60 minutes.

Logged by **CE**

Figure **2 of 2**
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

geotechnics

BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH10
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244732.25 E 57469.35 N	Ground Level	7.81 m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
						Light grey slightly silty, locally silty gravelly sand. Sand is fine to coarse. Gravel is subangular fine to coarse slate, limestone, concrete and brick. Occasional shell fragments. [MADE GROUND]	G.L.		7.81
1.00	E								
						At 1.30m: Limestone cobble.			
1.30	D								
1.50- 1.80	B								
1.90	D			8.8		At 2.00m: Limestone cobble.			
2.00- 2.45	D	None (Dry)			S12				
2.50- 2.80	B								
2.90	D								
3.00- 3.45	D	None (Dry)			S16				
3.00	E								
3.50- 3.80	B								
3.90	D								
4.00- 4.38	D	None (Dry)		4.4	S64/ 225				
4.50- 4.80	B								
						Soft dark greyish brown slightly sandy slightly gravelly silt. Gravel is subangular fine to medium slate, concrete and brick. [MADE GROUND]	4.60		3.21
4.90	D								
5.00- 5.09	D	3.00 (Dry)			S50/10				
5.00	E								
						Soft to firm dark greyish brown slightly sandy slightly gravelly silt, becoming sandy, with a low cobble content. Gravel is subangular fine to coarse slate, granite, concrete and brick. Cobbles are subangular slate. [MADE GROUND]	5.20		2.61
5.50- 5.80	B								
5.90	D								
6.50- 6.80	B					Below 6.50m: Some wood fragments.			
6.50- 6.95	D	4.50 (Dry)			S14				
						At 6.90m: Occasional plastic fragments.		▼	
6.90	D								
6.90	W							▽	
7.00	E								
						Soft to firm dark grey slightly sandy slightly gravelly silt with some clay pockets. Gravel is subangular fine to coarse slate, limestone, concrete, brick and tarmac. Occasional wood and shell fragments. [MADE GROUND] :t 7.90m: Concrete cobble.	7.30		0.51
7.50- 7.80	B								
7.90	D						8.00		-0.19
8.00- 8.45	D	7.50 (Dry)			S4				
8.50- 8.80	B								
						Soft dark grey slightly sandy slightly gravelly SILT. Gravel is angular and subangular fine and medium slate. Abundant shell fragments. Occasional wood fragments and partially decomposed organic material.			
8.90	D								
9.00	E								
9.00	E								
9.00	E								
9.50- 9.80	B								
9.50- 9.95	UF26	8.00 (Dry)							
9.90	D			42					

Boring

Depth	Hole Dia	Technique	Crew
1.30	0.70	Inspection Pit	JCB
19.50	0.15	Cable Percussion	PB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	29/06/10	08:00
1.30	-	-	29/06/10	18:00
G.L.	-	-	30/06/10	08:00
12.50	11.80	9.90	30/06/10	18:00
12.50	11.80	9.50	01/07/10	08:00
19.50	19.50	7.60	01/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
7.20	5.00	6.90	20		

Remarks The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. Inspection pit machine excavated to 1.30m depth. Monitoring for unexploded ordnance carried out during pauses in boring. Chiselling: 4.70-5.00m for 60 minutes.

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Figure 1 of 2

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

geotechnics

BOREHOLE RECORD – Cable Percussion

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH10**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244732.25** E **57469.35** N

Ground Level **7.81** m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
10.50-10.80	B								
10.90	D								
11.00-11.45	D	10.00 (9.50)			S8				
11.50-11.80	B								
11.90	D			56					
12.50-12.95	U40	11.80 (9.90)	31	51		At 12.50m, low strength			
12.95	D								
13.00-13.50	B								
13.70	D								
14.00-14.50	B								
14.00-14.45	D	14.00 (10.50)		46	S4	Below 14.20m: Becomes orangish brown.			
14.70	D								
15.00-15.50	B						15.00		-7.19
						Medium Dense orangish brown very clayey GRAVEL. Gravel is angular and subangular fine to coarse slate.			
15.50-15.95	D	15.50 (7.60)			S18				
15.70	D								
16.00-16.50	B								
16.70	D								
17.00-17.50	B						17.00		-9.19
17.00-17.45	D	17.00 (8.00)			S29	Extremely weak greyish brown SLATE. Recovered as very clayey angular and subangular fine to coarse gravel.			
17.70	D								
18.00-18.50	B								
18.00-18.45	D	18.00 (8.00)			S32				
18.70	D								
19.00-19.50	B								
19.50-19.95	D	19.50 (7.60)			S58		19.50		-11.69
						End of Borehole			

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **2 of 2**
08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH11
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244775.92 E 57478.39 N	Ground Level	7.93 m OD

Scale 1:50

Sampling			Properties		Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	Description	Depth	Legend	Level m OD
					Dark grey gravelly fine to coarse sand. Gravel is fine to medium subangular slate, brick, concrete. Occasional wood fragments. Rare plastic. [MADE GROUND]	G.L.		7.93
1.00	E							
2.00	D							
3.00	E							
4.00	D							
5.00	E							
6.00	D							
7.00	D							
8.00	D							
					Soft drilling ** (Possible alluvium).	9.20		-1.27
					End of Borehole	10.00		-2.07

Boring

Depth	Hole Dia	Technique	Crew
7.50	0.15	Cable Percussion	JW
10.00	0.20	Rotary Open Hole	ABOVO

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	07/07/10	08:00
10.00	7.50	Dry	07/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					None encountered during drilling.

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 10.00m.
Description based on fragmented chippings from open hole drilling and rate of progress.
Cable percussion casing could not be advanced past 7.50m.
Monitoring for unexploded ordnance carried out during pauses in boring.
** Drillers description.
Chiselling: 7.50-7.50m for 120 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 1 of 1

08/10/2010

geotechnics

BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH12
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244740.78 E 57426.87 N	Ground Level	7.75 m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
						Dark brownish grey slightly silty gravelly sand. Sand is fine to coarse. Gravel is subangular fine to coarse brick, concrete, limestone, slate and wood. [MADE GROUND]	G.L.		7.75
1.00	E								
3.00	E								
5.00	E								
6.00	D					Firm dark grey slightly sandy gravelly silt. Gravel is angular to subangular fine to coarse concrete. [MADE GROUND]	5.80		1.95
7.00	W								
8.00- 8.22	D				S50/70	Reinforced concrete **	8.00		-0.25
						Soft drilling ** (Possible alluvium)	8.70		-0.95
						End of Borehole	9.00		-1.25

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
7.00	0.20	Rotary Open Hole	ABOVO	G.L.	-	-	12/07/10	08:00	5.40					Struck during open hole drilling.
8.00	0.15	Cable Percussion	JW	7.00	-	5.40	12/07/10	18:00						
9.00	0.20	Rotary Open Hole	ABOVO	G.L.	-	5.40	14/07/10	08:00						
				9.00	8.00	7.00	14/07/10	18:00						
				8.00	-	N R	14/07/10	08:00						
				9.00	-	N R	14/07/10	18:00						

Remarks AGS

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Rotary drilling used to open borehole through made ground. Unable to advance cable percussion casing past concrete at 8.00m. Rotary drilling used to open borehole through cable percussion borehole but the borehole was collapsing. Instructed to move and re-drill (see BH12A).
Description based on fragmented chippings from open hole drilling and rate of progress.
** Drillers description.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 1 of 2

08/10/2010

geotechnics

BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH12
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244740.78 E 57426.87 N	Ground Level	7.75 m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks AGS **Monitoring for unexploded ordnance carried out during pauses in boring.**
Chiselling: 8.00-8.00m for 30 minutes.

Logged by **SU**

Figure **2 of 2**
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH12A
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244741.65 E 57421.71 N	Ground Level	7.73 m OD

Scale 1:50

Sampling: Depth	Sample Type	Depth Cased & (to Water)	Properties: Strength kPa	w %	SPT	Strata: Description	Depth	Legend	Level m OD
						Dark brownish grey slightly silty gravelly sand. Sand is fine to coarse. Gravel is subangular fine to coarse brick, concrete, limestone, slate and wood. [MADE GROUND]	G.L.		7.73
						Reinforced concrete ** [MADE GROUND]	4.60		3.13
						Dark greyish brown slightly silty sandy gravel. Sand is fine to coarse. Gravel is angular to subangular fine to coarse brick, concrete, limestone, slate and wood. [MADE GROUND]	5.10		2.63
						Soft drilling ** (Probable alluvium as description below).	7.00		0.73
9.00- 9.45	D	9.00 (8.50)		51	S4	**Firm dark grey slightly sandy clayey SILT with shell fragments. Locally silty CLAY.**	9.00		-1.27
9.50-10.50	B								

Boring

Depth	Hole Dia	Technique	Crew
9.00	0.20	Rotary Open Hole	ABOVO
22.50	0.15	Cable Percussion	JW

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	13/07/10	08:00
4.00	-	-	13/07/10	18:00
4.00	-	-	14/07/10	08:00
17.00	16.50	15.50	14/07/10	18:00
17.00	16.50	12.80	15/07/10	08:00
22.50	21.00	15.50	15/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
7.40					

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 9.00m.
Description based on fragmented chippings from open hole drilling and rate of progress.
Monitoring for unexploded ordnance carried out during pauses in boring.
A 50mm standpipe was installed to 22.50m with a geowrapped slotted section from 1.50m to 22.50m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.50m, bentonite seal up to 0.30m, concrete up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 1 of 3

08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole / Project No	BH12A / PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244741.65 E, 57421.71 N	Ground Level	7.73 m OD

Sampling			Properties			Strata			Scale 1:50
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
10.50-10.95	U42	9.00 (8.50)	19	50		At 10.50m, very low strength			
10.95-11.00	D								
11.50	D								
12.00-12.45	D	10.50 (10.50)			S5				
13.00	D			50					
13.50	D								
13.50	E								
13.50-13.95	U45	10.50 (10.50)							
13.95-14.00	D								
14.00-15.00	B								
15.00-15.45	D	10.50			S7				
16.00	D								
16.50-17.00	B								
16.50	UF40	16.50 (NR)							
17.00-17.45	D	16.50 (13.00)		42	S4				
17.50-18.50	B								
18.50-18.95	D	16.50 (13.00)			S8				
19.00-20.00	B								
20.00-20.60	B								

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks AGS Chiselling: 22.30-22.50m for 30 minutes.

Logged by SU

Figure 2 of 3

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

geotechnics

BOREHOLE RECORD – Cable Percussion

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH12A**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244741.65** E **57421.71** N

Ground Level **7.73** m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
20.00	UF38	18.00 (13.00)							
21.00-21.45	D	18.00 (15.00)		45	S11				
21.50	W								
21.80	D								
22.00-22.39	D				S50/ 235				
22.50-22.86	D	21.00 (15.50)			S50/ 210	Extremely weak to very weak bluish grey SLATE recovered as a gravelly clay. Gravel is angular and subangular fine to coarse.	22.30		-14.57
						End of Borehole	22.50		-14.77

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **3 of 3**
08/10/2010

geotechnics

BOREHOLE RECORD – Cable Percussion

Project: PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH
Engineer: GHA LIVIGUNN
Borehole: BH13
Project No: PE100830
Client: MVV UMWELT GMBH
National Grid Coordinates: 244722.47 E, 57421.94 N
Ground Level: 7.68 m OD
Scale: 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							G.L.		7.68
						Grey slightly clayey sandy gravel with medium cobble content. Gravel is subangular to subrounded fine to coarse concrete, brick, slate, rebar. [MADE GROUND]			
1.00	E								
2.00	D								
3.00	E								
4.00	D								
5.00	E								
6.00	D								
7.00	D					Soft to firm dark grey silt with shell fragments. [POSSIBLE MADE GROUND]	6.80		0.88
7.50- 7.95	#	7.50			S10				
7.50- 8.00	B	(7.00)							
9.00- 9.50	B								
9.00- 9.45	D	9.00			S18				
9.00	W	(7.50)							
						Dark grey sandy slightly clayey gravel. Gravel is angular to subangular fine to coarse slate and quartz. [POSSIBLE MADE GROUND]	9.30		-1.62

Boring

Depth	Hole Dia	Technique	Crew
7.00	0.20	Rotary Open Hole	ABOVO
21.80	0.15	Cable Percussion	JW

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	05/07/10	08:00
15.00	13.50	12.50	05/07/10	18:00
15.00	13.50	12.50	06/07/10	08:00
21.80	21.00	18.00	06/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
7.00	7.00	7.00	20	Not	

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance borehole through fill prior to advancing cable percussion casing into the hole.
Description based on fragmented chippings from open hole drilling and rate of progress.
Monitoring for unexploded ordnance carried out during pauses in boring.
Chiselling: 21.50-21.80m for 30 minutes.

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Figure: 1 of 3
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

geotechnics

BOREHOLE RECORD – Cable Percussion

Project: PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH
Engineer: GHA LIVIGUNN
Borehole: BH13
Project No: PE100830
Client: MVV UMWELT GMBH
National Grid Coordinates: 244722.47 E, 57421.94 N
Ground Level: 7.68 m OD
Scale: 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							10.30		-2.62
10.50-10.95	D	10.50 (9.30)			S4	Soft to firm dark grey slightly gravelly clayey SILT. Gravel is angular to subangular fine to medium slate. Shell fragments.			
11.50	D			43					
12.00-12.45	U37	10.50 (9.00)	20	42		At 12.00m, very low strength			
12.45-12.50	D						12.50		-4.82
13.00-13.50	B					Soft to firm dark grey slightly sandy SILT.			
13.50-13.95	D	13.50 (12.30)			S4				
14.50	D								
15.00-15.45	U30	13.50 (12.50)							
15.45-15.50	D			48					
16.00-16.50	B								
16.50-16.95	D	16.50 (16.50)			S5				
17.50-18.00	B								
18.00-18.45	U37	16.50 (16.50)							
18.45-18.50	D			49					
19.00	D								
19.50-19.95	D	18.00 (19.50)			S8				

Boring

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by: SU

Figure: 2 of 3

08/10/2010

geotechnics

BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH13
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244722.47 E 57421.94 N	Ground Level	7.68 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							20.30		-12.62
20.50-20.95	#	18.00			S10	Soft to firm dark grey gravelly SILT. Gravel is angular fine to medium slate.	20.50		-12.82
20.50	D	(19.50)				Very weak greyish brown SLATE. Recovered as gravelly clay. Gravel is angular to subangular flat fine to coarse.			
21.50	D								
21.50-21.80	D	21.00 (18.00)			S50/ 145				
21.80-21.98	D	21.00 (18.00)			S50/60		21.80		-14.12
						End of Borehole			

Boring

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 3 of 3

08/10/2010

geotechnics

BOREHOLE RECORD – Cable Percussion

Project: PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH
Engineer: GHA LIVIGUNN
Borehole: BH14
Project No: PE100830
Client: MVV UMWELT GMBH
National Grid Coordinates: 244772.33 E, 57411.08 N
Ground Level: 7.57 m OD
Scale: 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							G.L.		7.57
0.30	D					Light greyish brown silty very sandy gravel with low cobble content. Gravel is subangular fine to coarse mixed lithologies including slate, hornfels, tarmac and concrete. Cobbles are subangular slate. [MADE GROUND]	0.60		6.97
1.00	B					Dark bluish grey sandy gravel with a low cobble content. Gravel is angular and subangular fine to coarse slate and brick. Cobbles are subangular slate. [MADE GROUND]			
1.00	E								
1.70	D								
2.10- 2.55	D	2.00 (Dry)			S23		2.10		5.47
2.50- 2.80	B					Blackish grey clayey gravel. Gravel is angular and subangular fine to coarse slate, concrete and brick. [MADE GROUND]			
2.90	D								
3.00- 3.38	D	2.00 (Dry)			S63/ 225				
3.00	E								
3.50- 3.80	B								
3.90	D								
4.00- 4.45	D	2.00 (Dry)			S10				
4.50- 4.80	B								
4.90	D								
5.00- 5.45	D	3.00 (Dry)			S7				
5.00	E								
5.50- 5.80	B								
5.80	D					At 5.90m: Concrete obstruction.			
6.00- 6.70	E								
6.00- 6.00		4.00 (Dry)			C50/0				
7.00- 7.45	D	7.00 (Dry)			S7				
7.50- 8.00	B								
7.60	W								
8.20	D								
8.50- 8.95	D	8.50 (Dry)			S32		8.50		-0.93
						End of Borehole			

Boring

Depth	Hole Dia	Technique	Crew
2.10	0.70	Inspection Pit	JCB
6.00	0.15	Cable Percussion	PB
7.00	0.20	Rotary Open Hole	ABOVO
8.50	0.15	Cable Percussion	PB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	29/06/10	08:00
6.00	4.00	Dry	29/06/10	18:00
6.00	-	Dry	05/07/10	08:00
6.70	-	Dry	05/07/10	18:00
6.70	-	Dry	06/07/10	08:00
8.00	8.00	Dry	06/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
8.50	8.50	7.60	20		Fast inflow

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. Inspection pit machine excavated to 2.10m.
Monitoring for unexploded ordnance carried out during pauses in boring.
The Borehole was terminated at a depth of 6.00m on the instruction of the Engineer due to the presence of an obstruction and the borehole reamed out to 7.00m using open hole drilling techniques.
Chiselling: 6.00-6.00m for 60 minutes and 7.60-8.00m for 60 minutes and 8.10-8.50m for 60 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.
All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by: SU
Figure: 1 of 2
08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH14**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244772.33** E **57411.08** N

Ground Level **7.57** m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD

Boring

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
8.00	**8.00**	**Dry**	**07/07/10**	**08:00**
8.50	**8.50**	**7.6**	**07/07/10**	**18:00**

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure **2 of 2**
08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project: PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH
Engineer: GHA LIVIGUNN
Borehole: BH15
Project No: PE100830
Client: MVV UMWELT GMBH
National Grid Coordinates: 244851.99 E, 57402.23 N
Ground Level: 5.51 m OD
Scale: 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							G.L.		5.51
0.50- 1.00	B					Greyish brown clayey sandy gravel and cobbles. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse quartz, slate and concrete. [MADE GROUND]			
0.50	D								
1.00- 1.45	D	1.00			S17				
1.00	E	(Dry)							
1.50- 2.00	B								
1.50	D								
2.00- 2.38	D	1.80 (Dry)		14	S57/ 225				
2.50- 2.60	B								
						Concrete.** [MADE GROUND]	2.60		2.91
						Grey silty sandy gravel with wood fragments. Gravel is angular fine to coarse concrete, brick and slate. Occasional re-bar. [MADE GROUND]	3.00		2.51
5.00	D			7.6		From 5.20m: Softer drilling.		▽	
						At 6.00m: Hydrocarbon odour.			
6.50- 7.50	B								
6.50- 6.95		6.00 (5.50)			S3/300				
							7.30		-1.79
7.50	E					Soft to firm dark grey sandy clayey SILT with shells and shell fragments.			
7.50	U30	7.50 (NR)							
7.95- 8.00	D			48					
8.20- 8.49	D	7.70 (7.50)			S50/ 135		8.20		-2.69
						Very weak bluish grey SLATE. Recovered as clayey angular to subangular fine to coarse flat gravel.	8.30		-2.79
8.20	D								
8.20	W								
8.30- 8.40	D	8.30 (7.00)			S50/40	End of Borehole			

Boring Progress

Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time
2.70	0.15	Cable Percussion	PB	G.L.	-	-	07/07/10	08:00
6.00	0.20	Rotary Open Hole	ABOVO	2.70	1.80	Dry	07/07/10	18:00
8.30	0.15	Cable Percussion	JW	2.80	-	Dry	12/07/10	08:00
				6.00	-	5.00	12/07/10	18:00
				3.80	-	3.70	14/07/10	08:00
				8.30	8.30	7.00	14/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
5.00					

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Cable Percussion was terminated at 2.70m depth due to refusal on concrete. Rotary open hole to 6.00m then cable percussion recommenced.
Description based on fragmented chippings from open hole drilling and rate of progress.
** Drillers description.
Monitoring for unexploded ordnance carried out during pauses in boring.
A 50mm standpipe was installed to 8.30m with a geowrapped slotted section from 1.50m to

Symbols and abbreviations are explained on the accompanying key sheet.
All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by: SU
Figure: 1 of 2
08/10/2010

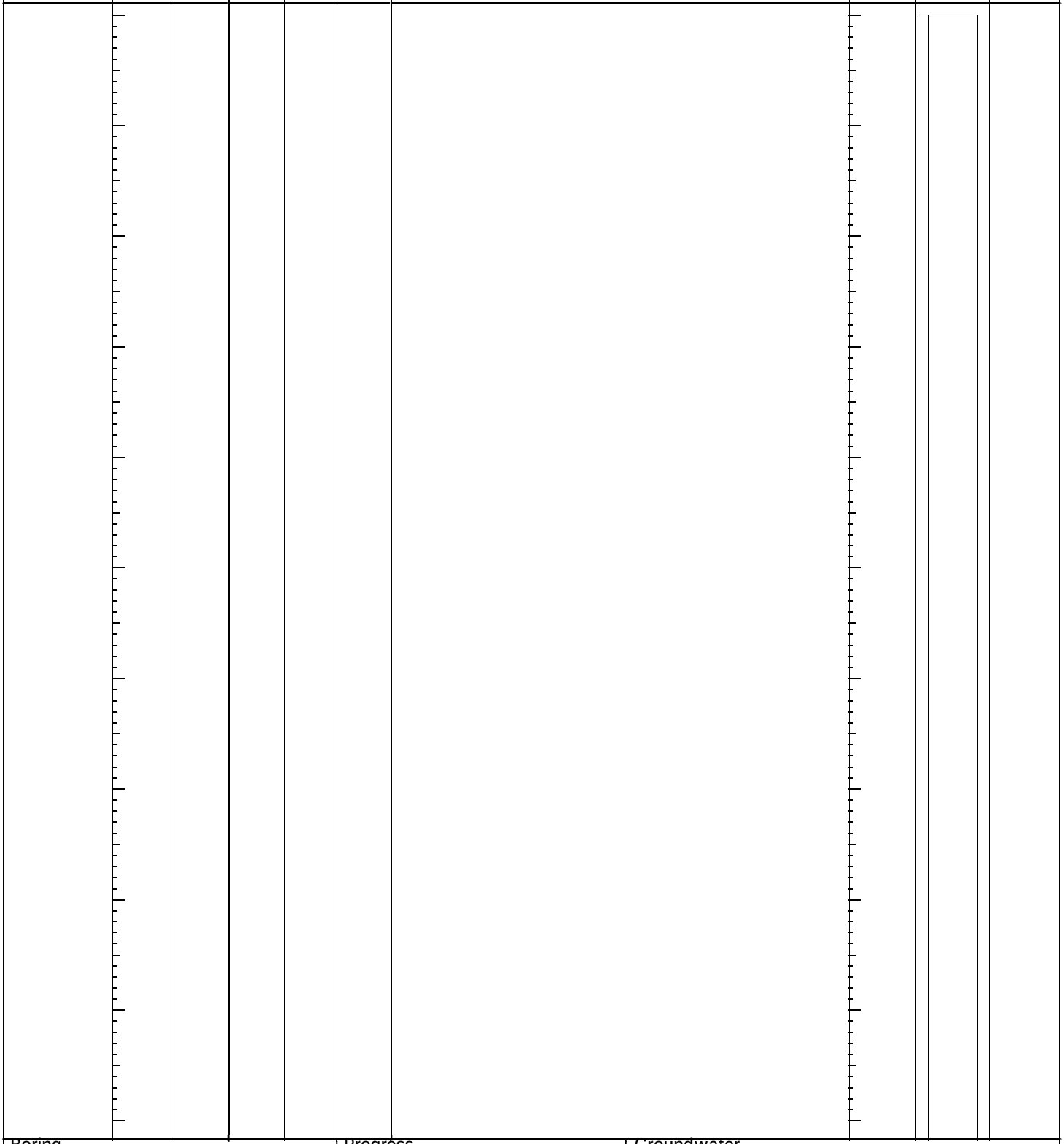
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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH15
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244851.99 E 57402.23 N	Ground Level	5.51 m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD



Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

8.30m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.50m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 2.60-2.70m for 30 minutes and 2.70-2.70m for 30 minutes and 8.20-8.30m for 30 minutes.

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Figure 2 of 2

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH17
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244701.7 E 57434.27 N	Ground Level	7.50 m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
						Grey slightly clayey sandy gravel with medium cobble and boulder content. Gravel is subangular to subrounded fine to coarse concrete, brick and slate. [MADE GROUND]	G.L.		7.50
1.00	D								
1.00	E								
2.00	D			10					
3.00	D								
3.00	E								
4.00	D			11					
5.00	D								
5.00	E								
6.00	D								
						Soft to firm dark grey SILT with some shell fragments.	6.60		0.90
7.50- 7.95	U100	7.50	11	65		At 7.50m, very low strength			
7.60	W	(Dry)							
7.95	D			47					
8.00- 8.50	B								
8.00	E								
8.70	D								
9.00- 9.45	D	9.00 (8.60)			S8				
						Soft to firm dark grey slightly sandy slightly gravelly SILT with shell fragments. Gravel is angular to subangular fine to medium slate.	9.20		-1.70
9.50-10.00	B								

Boring

Depth	Hole Dia	Technique	Crew
7.00	0.20	Rotary Open Hole	ABOVO
15.30	0.15	Cable Percussion	PB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	05/07/10	08:00
7.00	-	Dry	05/07/10	18:00
7.00	-	Dry	06/07/10	08:00
15.30	14.80	12.00	06/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
8.00	8.00	7.60	20		Slow.

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 7.00m.
Description based on fragmented chippings from open hole drilling and rate of progress.
Monitoring for unexploded ordnance carried out during pauses in boring.
A 50mm standpipe was installed to 15.30m with a geowrapped slotted section from 1.50m to 15.30m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.50m, bentonite seal up to 0.30m, concrete up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 1 of 2

08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH17
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244701.7 E 57434.27 N	Ground Level	7.50 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
10.20	D			37					
10.50-10.95	U20	10.50 (Dry)	23	36		At 10.50m, low strength			
10.95	D						11.00		-3.50
11.00-11.50	B					Soft to firm dark grey mottled dark brown slightly gravelly peaty SILT. Gravel is angular to subangular fine to medium slate. Occasional shells.			
12.00	D			45					
12.00-12.45	D	12.00 (Dry)			S14				
							12.30		-4.80
12.50-13.00	B					Greyish brown and grey very gravelly CLAY. Gravel is angular to subangular fine to coarse slate.			
13.20	D								
13.50-13.95	U35	13.50 (Dry)	28	15		At 13.50m, low strength			
							13.60		-6.10
14.00-14.50	B					Very weak light greyish brown SLATE. Recovered as clayey angular fine to coarse gravel.			
14.70	D								
14.80-14.95	D	14.80 (13.00)			S70*/ 150				
15.10	D								
15.30-15.43	D	14.80 (12.00)			S75*/ 130		15.30		-7.80
						End of Borehole			

Boring

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks AGS Chiselling: 15.10-15.30m for 30 minutes.

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Figure 2 of 2

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH18
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244624.05 E 57312.42 N	Ground Level	10.97 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
							G.L.		10.97
						Greyish brown clayey sandy gravel and cobbles. Gravel (fine to coarse) and cobbles are angular to subangular slate, brick, reinforced concrete and quartz. Occasional wood and plastic fragments. [MADE GROUND]			
0.40	D								
0.50- 1.00	B								
1.00	D								
1.00	E								
1.00- 1.15		1.00 (Dry)			S69*/ 150				
1.20- 1.80	B					At 1.40m: Obstruction encountered - chiselled to 1.80m			
2.00	D			12					
3.00	D								
3.00	E								
4.00	D			9.3					
5.00	D								
5.00	E								
6.00	D								
7.00	D								
7.80	W								
8.00	D								
9.00	D								
10.00	D								

Boring

Depth	Hole Dia	Technique	Crew
1.80	0.15	Cable Percussion	PB
13.00	0.20	Rotary Open Hole	ABOVO
16.00	0.15	Cable Percussion	PB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	07/07/10	08:00
1.80	1.00	Dry	07/07/10	18:00
1.80	-	Dry	08/07/10	08:00
16.00	15.30	11.00	08/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					Encountered during open hole drilling.

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Cable Percussion was terminated at 1.80m depth due to refusal on concrete. Rotary open hole to 13.00m then cable percussion recommenced.
Description based on fragmented chippings from open hole drilling and rate of progress.
** Drillers description.
Monitoring for unexploded ordnance carried out during pauses in boring.
A 50mm standpipe was installed to 16.00m with a geowrapped slotted section from 1.50m to

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 1 of 2

08/10/2010

geotechnics

BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH18
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244624.05 E 57312.42 N	Ground Level	10.97 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
11.00	D								
12.00	D								
						Soft drilling ** No Recovery. [MADE GROUND]	12.20		-1.23
13.00-13.45	D	13.00 (7.80)			S20	Firm friable greyish brown gravelly CLAY. Gravel is angular fine to coarse flat slate. (Probable weathered bedrock)	13.00		-2.03
13.50-14.00	B								
14.00	E								
14.30	D								
14.50-14.95	D	14.50			S46	At 14.50m: Becoming clayey gravel.			
14.60-15.00	B	(11.00)							
15.30	D						15.30		-4.33
15.60-16.00	B					Very weak grey SLATE. Recovered as slightly clayey slightly sandy gravel. Gravel is angular fine to coarse flat (very narrowly foliated) slate.			
16.00-16.15	D	15.30 (11.00)			S50/75	End of Borehole	16.00		-5.03

Boring

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks 16.00m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.50m, bentonite seal up to 0.30m, concrete up to ground level. Chiselling: 15.80-16.00m for 30 minutes.

Logged by CE

Figure 2 of 2

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH19
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244679.25 E 57306.58 N	Ground Level	11.38 m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
						Dark brownish grey gravelly sand. Gravel is subangular fine to coarse slate, concrete, brick, limestone and flint. [MADE GROUND]	G.L.		11.38
1.00	D								
1.00	E								
2.00	D			8.4					
3.00	D								
3.00	E								
4.00	D			10					
5.00	D								
5.00	E								
6.00	D								
7.00	D								
8.00	D					At 8.00m: Reinforced concrete slab.			
9.00	D								
10.00-12.00	B								

Boring

Depth	Hole Dia	Technique	Crew
11.80	0.20	Rotary Open Hole	ABOVO
17.00	0.15	Cable Percussion	JW

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	08/07/10	08:00
11.80	-	-	08/07/10	18:00
11.80	-	-	09/07/10	08:00
11.80	10.50	-	09/07/10	18:00
11.80	10.50	10.20	12/07/10	08:00
17.00	16.50	10.00	12/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					Encountered within open hole section and recorded at 10.20m.

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 11.80m.
Description based on fragmented chippings from open hole drilling and rate of progress.
Monitoring for unexploded ordnance carried out during pauses in boring.
A 50mm standpipe was installed to 17.00m with a geowrapped slotted section from 1.50m to 17.00m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.40m, bentonite seal up to 0.30m, concrete up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by CE

Figure 1 of 2

08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH19
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244679.25 E 57306.58 N	Ground Level	11.38 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
10.00 10.20	D W								
11.00	D								
12.00-12.45	D	12.00 (9.50)			S10				
						Firm dark grey silty CLAY with abundant shells. Sulphur smell.	12.20		-0.82
13.00-13.50	B					From 13.00m: Slightly gravelly. Gravel is angular to subangular flat fine and medium slate.			
13.50-13.95	U45	13.50 (9.50)		35					
13.95-14.00	D			31					
14.50	D								
15.50-15.95	D	15.00 (10.00)		27	S40				
						Stiff orangish brown slightly sandy gravelly clayey SILT. Gravel is subangular fine to coarse slate.	15.70		-4.32
16.50	D								
17.00-17.29	D	16.50 (10.00)			S50/ 135	Extremely to very weak bluish grey SLATE recovered as a slightly sandy clayey angular to subangular fine and medium flat gravel.	16.80 17.00		-5.42 -5.62
						End of Borehole			

Boring

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks AGS Chiselling: 16.80-17.00m for 30 minutes.

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Figure 2 of 2

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Rotary Open Hole

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH20
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244710.03 E 57351.09 N	Ground Level	11.95 m OD

Drilling | Properties/Sampling | Strata — Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	Description General	Description Detail	Depth	Legend	Level m OD
					Dark grey slightly silty gravelly fine to coarse sand. Gravel is subangular fine and medium slate, brick and concrete. [MADE GROUND]		G.L.		11.95
					End of Drillhole		10.00		1.95

Drilling

Depth	Hole Dia	Technique	Crew
8.50	0.20	Rotary Open Hole	ABOVO
8.50	0.15	Cable Percussion	JW

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	09/07/10	08:00
10.00	-	-	09/07/10	18:00
G.L.	-	-	13/07/10	08:00
8.50	8.50	-	13/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 8.50m.
Description based on fragmented chippings from open hole drilling and rate of progress.
Monitoring for unexploded ordnance carried out during pauses in boring.

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Figure 1 of 1
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Rotary Open Hole

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH20A
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244706.39 E 57345.79 N	Ground Level	11.90 m OD

Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	Description General	Description Detail	Depth	Legend	Level m OD
					Dark grey slightly sandy gravel. Gravel is subangular fine and medium slate, brick, concrete and limestone. Wood fragments. [MADE GROUND]		G.L.		11.90
1.00	D								
3.00	D					At 4.00m: Hydrocarbon odour.			
5.00	D								

Drilling

Depth	Hole Dia	Technique	Crew
14.00	0.20	Rotary Open Hole	ABOVO

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	14/07/10	08:00
14.00	-	-	14/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					None encountered during drilling.

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 13.50m.
Description based on fragmented chippings from open hole drilling and rate of progress.
Obstruction at 12.80m. Cable percussion did not set up on positions as wouldn't be able to advance casing beyond the obstruction. Position terminated and moved to BH20B.

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Figure 1 of 2

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD – Rotary Open Hole

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH20A**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244706.39** E **57345.79** N

Ground Level **11.90** m OD

Scale 1:50

Drilling		Properties/Sampling			Strata				
Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	Description General	Description Detail	Depth	Legend	Level m OD
					Soft drilling **		**13.10**		**-1.20**
					End of Drillhole		**14.00**		**-2.10**

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure **2 of 2**
08/10/2010

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BOREHOLE RECORD – Rotary Open Hole

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH20B
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244707.47 E 57337.48 N	Ground Level	11.87 m OD

Drilling | Properties/Sampling | Strata — Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	Description General	Description Detail	Depth	Legend	Level m OD
					Fill **		G.L.		11.87
					Concrete **		2.10		9.77
					Fill **		2.60		9.27

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
15.00	0.20	Rotary Open Hole	ABOVO	G.L. 15.00	- -	- -	16/07/10 16/07/10	08:00 18:00						Encountered with the open hole drilling

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 15.00m.
No samples taken as water flush and foam was used to open hole.
** Drillers description.
Cable percussion rig did not set up on borehole position as a large lump of concrete had bridged the hole approximately 2.00m below ground level.

Logged by CJ

Figure 1 of 2
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

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BOREHOLE RECORD – Rotary Open Hole

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH20B
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244707.47 E 57337.48 N	Ground Level	11.87 m OD

Drilling | Properties/Sampling | Strata — Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	Description General	Description Detail	Depth	Legend	Level m OD
					Wood and concrete **		11.40		0.47
					Soft drilling **		14.00		-2.13
					End of Drillhole		15.00		-3.13

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 2 of 2

08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project: PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH
Engineer: GHA LIVIGUNN
Borehole: BH22
Project No: PE100830
Client: MVV UMWELT GMBH
National Grid Coordinates: 244783.32 E, 57400.42 N
Ground Level: 5.23 m OD
Scale: 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
						Dark greyish brown slightly silty sandy gravel. Gravel is subangular fine and medium slate, limestone, concrete and brick. [MADE GROUND]	G.L.		5.23
1.00	D			8.6					
3.00	D								
5.00	D			6.3					
						Soft drilling ** (Probable alluvium as description below).	6.40		-1.17
7.50- 7.95	U30	7.50 (NR)				**Firm friable dark grey slightly sandy slightly gravelly SILT. Frequent shells and shell fragments. Partially decomposed wood.**	7.50		-2.27
7.95- 8.00	D								
8.00	E								
8.50	D			41					
9.00- 9.50	B								
9.00- 9.45	D	7.50 (6.50)			S4				
9.70- 9.92	D	9.50 (7.50)			S50/70		9.70		-4.47
10.00-10.11	D	9.50 (7.50)			S50/60	**Extremely weak to very weak bluish grey SLATE recovered as a clayey angular flat fine to coarse gravel.**	10.00		-4.77

Boring Progress

Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time
7.50	0.20	Rotary Open Hole	ABOVO	G.L.	-	-	15/07/10	08:00
10.00	0.15	Cable Percussion	JW	7.50	-	-	15/07/10	18:00
				4.50	-	4.80	19/07/10	08:00
				10.00	9.50	7.50	19/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
4.80					Inflow over night

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 7.50m.
Description based on fragmented chippings from open hole drilling and rate of progress.
Monitoring for unexploded ordnance carried out during pauses in boring.
** Drillers description.
A 50mm standpipe was installed to 10.00m with a geowrapped slotted section from 1.50m to 10.00m with flush lockable protective cover. Detail as follows from base of hole: gravel

Symbols and abbreviations are explained on the accompanying key sheet.
All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure: 1 of 2
08/10/2010

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BOREHOLE RECORD – Cable Percussion

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH22
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244783.32 E 57400.42 N	Ground Level	5.23 m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend	Level m OD
						End of Borehole	10.00		-4.77

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks AGS filter up to 1.50m, bentonite seal up to 0.30m, concrete up to ground level.
Chiselling: 9.70-10.00m for 30 minutes.

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Figure 2 of 2
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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APPENDIX 5

Rotary Core Boreholes

BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH1A**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244723.96** E **577449.59** N

Ground Level **7.62** m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description	Depth	Legend	Level m OD
						Grey slightly clayey sandy gravel with medium cobble content and a low boulder content. Gravel is angular and subangular fine to coarse concrete, brick and slate. Some wood fragments and ash. [MADE GROUND] At 0.50m: Concrete boulder.	G.L.		7.62
						Soft drilling ** (Probable alluvium as description below)	7.00		0.62
7.50- 7.95	U35	7.50 (Dry)				**Soft to firm dark grey slightly sandy silty CLAY. Abundant shell fragments and partially decomposed wood.**	7.30		0.32
7.95- 8.00	D			43					
8.00- 9.00	B								
9.00- 9.45	U38	7.50 (Dry)	11	39		**At 9.00m, very low strength**			
9.45- 9.50	D					**From 9.50m: Becoming sandy with a slight organic/hydrocarbon odour.**			
10.00-10.50	B								

Boring

Depth	Hole Dia	Technique	Crew
7.30	0.20	Rotary Open Hole	ABOVO
18.30	0.15	Cable Percussion	JW
29.70	0.12	Rotary Core	ABOVO

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	01/07/10	08:00
6.00	-	Dry	01/07/10	18:00
6.00	-	Dry	02/07/10	08:00
9.50	9.50	Dry	02/07/10	18:00
9.50	9.50	9.20	05/07/10	08:00
18.30	18.00	15.00	05/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
9.20					Inflow overnight
16.50		14.90	20		

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 7.30m.
Description based on fragmented chippings from open hole drilling and rate of progress.
**** Drillers description.**
Monitoring for unexploded ordnance carried out during pauses in boring.
At 0.50m Concrete boulder lodged in side of borehole which required digging out to enable cable percussion casing to be installed.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure **1 of 4**
08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project: PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH
Engineer: GHA LIVIGUNN
Borehole: BH1A
Project No: PE100830
Client: MVV UMWELT GMBH
National Grid Coordinates: 244723.96 E, 577449.59 N
Ground Level: 7.62 m OD
Scale: 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description	Depth	Legend	Level m OD
10.50-10.95	D	9.00 (Dry)			S4				
11.00-12.00	B								
12.00-12.45	U30	9.00 (Dry)	13	43		At 12.00m, very low strength			
12.45-12.50	D			46		Around 12.45m: Primarily SILT.			
13.00	D								
13.50-13.95	D	13.50 (Dry)			S4				
14.00-15.00	B								
15.00-15.45	U28	15.00 (Dry)							
15.45-15.50	D								
16.00-16.50	B								
16.50-16.95	D	16.90		25	S11	Medium dense brown very clayey SAND and GRAVEL. Gravel is angular to subangular fine to coarse flat slate.	16.30		-8.68
16.50	W	(14.90)							
17.50-18.00	B								
18.00-18.27	D	18.00 (15.00)			S50/ 115	Very weak greyish brown SLATE recovered as a clayey angular to subangular fine to coarse gravel.	18.00		-10.38
18.30-18.52	D	18.00 (15.00)			S50/70		18.30		-10.68

Core Run Core Dia	Depth Cased	TCR/SCR %	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General	Detail
18.30-19.50 (92mm)	18.30	79 70		0	(14)	Very weak narrowly foliated greyish brown SLATE. Discontinuities 1) dip subvertically extremely closely spaced smooth undulating and locally stepped surface discoloured orangish brown with silty	
19.50-20.20 (92mm)	18.30	100 85		0	(NI)		From 19.80m: Drilling induced fractures dip 45 degrees and are closely spaced.

Boring

Depth	Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
18.30	-	NR	12/07/10	08:00
29.70	18.30	NR	12/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

A 50mm standpipe was installed to 7.00m with a geowrapped slotted section from 1.50m to 7.00m with flush lockable protective cover and a 50mm standpipe was installed to 18.00m with a geowrapped slotted section from 9.00m to 18.00m with flush lockable protective cover. Detail as follows from base of hole: bentonite seal up to 18.00m, gravel filter up to 8.00m, bentonite seal up to 7.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.
Chiselling: 18.00-18.40m for 60 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

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Figure: 2 of 4

08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH1A**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244723.96** E **577449.59** N

Ground Level **7.62** m OD

Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT (FI)	Description General	Description Detail	Depth	Legend	Level m OD
						infilling 2) dip sub horizontally to 20 degrees closely spaced rough stepped surface discoloured orangish brown with silty infilling.				
20.20-21.40 (92mm)	18.30	100 100		40	(28)					
21.40-22.90 (92mm)	18.30	100 90		15	(NI) (15) (NI)		From 22.20m: Occasional quartz veins.			
22.90-24.20 (92mm)	18.30	100 100		70	(5)		Between 22.90-23.00m: Sub vertical fracture rough stepped surface discoloured brown.	23.20		-15.58
24.20-25.40 (92mm)	18.30	100 100		82	(NI) (7)	Weak to medium strong narrowly foliated greyish brown SLATE. Discontinuities 1) dip subvertically extremely closely spaced smooth undulating and locally stepped surface discoloured orangish brown with silty infilling 2) dip sub horizontally to 20 degrees closely spaced rough stepped surface discoloured orangish brown with silty infilling.				
25.40-26.80 (92mm)	18.30	100 57		43	(NI) (20) (NI) (5)		From 25.40m: Becoming dark grey with occasional pyrite.			
26.80-28.20 (92mm)	18.30	100 67		40	(7)		Between 27.60-27.80m: Weak to medium strong light greenish grey phyllite.			
28.20-29.70 (92mm)	18.30	100 87		41	(30) (NI) (4)		From 28.70m: Light pink quartz. Between 28.70-28.80m: Weak to medium strong light greenish grey phyllite. Between 28.85-29.20m: Very weak light greyish green altered slate. Between 28.95-29.05m: Non intact - drilling induced.	29.70		-22.08

Drilling

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure **3 of 4**
08/10/2010

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BOREHOLE RECORD – Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH1A**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244723.96** E **577449.59** N

Ground Level **7.62** m OD

Drilling | Properties/Sampling | Strata — Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT (FI)	Description General	Description Detail	Depth	Legend	Level m OD
						End of Borehole				

Drilling | Progress | Groundwater

Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **4 of 4**
08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH2
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244775.00 E 57449.36 N	Ground Level	8.07 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description	Depth	Legend	Level m OD
						Dark greyish brown silty very sandy gravel with a medium cobble content. Sand is fine to coarse. Gravel (fine to coarse) and cobbles are subangular and subrounded reinforced concrete, slate, brick and timber. [MADE GROUND]	G.L.		8.07
1.00	D								
1.00	E								
2.00	D			6.6					
3.00	D								
3.00	E								
4.00	D			6.1					
5.00	D								
5.00	E								
6.00	D								
7.00	E								
7.80- 8.00	B								
8.00- 8.45	D	7.80 (Dry)			S15				
8.40	D								
8.60	W								
8.70- 9.00	B					Soft to firm dark grey gravelly CLAY/SILT. Gravel is angular and subangular fine to coarse slate.	8.70		-0.63
9.40	D								
9.50- 9.95	U14	9.50							
9.70-10.00	B	(Dry)				Grey slightly silty sandy GRAVEL. Gravel is angular and subangular fine to coarse slate. A slight hydrocarbon odour and sheen.	9.70		-1.63

Boring

Depth	Hole Dia	Technique	Crew
1.20	0.70	Inspection Pit	JCB
8.00	0.14	Rotary Open Hole	ABOVO
21.70	0.15	Cable Percussion	PB
30.00	0.12	Rotary Core	JB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	29/06/10	08:00
1.20	-	-	29/06/10	18:00
G.L.	-	-	01/07/10	08:00
8.00	8.00	Dry	01/07/10	18:00
8.00	8.00	Dry	02/07/10	08:00
18.00	18.00	7.70	02/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
8.50	8.50	7.30	20	8.60	

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. Inspection pit machine excavated to 1.20m depth.
Open hole drilling techniques used to advance through fill to 7.80m. Borehole collapsed to 3.50m and redrilled with cable percussion techniques prior to advancing to bedrock.
Description based on fragmented chippings from open hole drilling and rate of progress.
Monitoring for unexploded ordnance carried out during pauses in boring.
A 50mm standpipe was installed to 30.00m with a geowrapped slotted section from 3.00m to 30.00m with flush lockable protective cover. Detail as follows from base of hole: gravel

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 1 of 4

08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH2
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244775.00 E 57449.36 N	Ground Level	8.07 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description	Depth	Legend	Level m OD
10.40	D								
10.70-11.00	B								
11.00-11.45	D	11.00 (8.00)			S20				
11.40	D								
11.70-12.00	B								
							12.00		-3.93
						Firm dark grey slightly sandy clayey SILT. Slight hydrocarbon odour. Locally silty CLAY.			
12.40	D			39					
12.50-12.80	UF150	12.50 (8.60)							
13.00	E								
13.40	D								
13.70-14.00	B								
14.00-14.45	D	14.00 (7.70)		51	S6				
14.40	D								
14.70-15.00	B								
15.40	D						15.50		-7.43
15.50-15.95	D	15.50 (7.70)			S15	Firm dark grey slightly sandy slightly gravelly clayey SILT. Gravel is angular and subangular fine to coarse slate. Locally silty CLAY.			
15.70-16.00	B								
16.40	D			50					
16.70-17.00	B								
17.00-17.45	D	17.00 (7.70)			S9				
17.40	D								
17.70-18.00	B								
18.40	D			83					
18.50-18.95	D	18.50 (6.50)			S10				
18.60-19.00	B								
19.40	D								
19.60-20.00	B								
20.00-20.40	UF150	20.00 (6.50)							

Boring

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
18.00	18.00	6.50	05/07/10	08:00
21.70	21.20	6.50	05/07/10	18:00
21.70	21.20	NR	13/07/10	08:00
30.00	21.70	NR	13/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks filter up to 3.00m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 11.60-12.00m for 60 minutes and 21.50-21.70m for 30 minutes.

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Figure 2 of 4

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH2**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244775.00** E **57449.36** N

Ground Level **8.07** m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description	Depth	Legend	Level m OD
20.40	D								
20.60-21.00	B								
							21.00		-12.93
21.20	D					Very weak grey mottled orangish brown SLATE recovered as a very clayey angular to subangular fine and medium gravel.			
21.20-21.65	D	21.20			S38				
21.50	D	(6.50)							
21.70-21.93	D	21.20 (6.50)			S50/75		21.70		-13.63

Core Run Core Dia	Depth Cased	TCR/SCR %	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General	Detail		
21.70-22.50 (92mm)	21.70	0				No recovery due to concrete cobble jammed in the drilling bit from overlying Made Ground.			
22.50-24.00 (92mm)	21.70	6 0		0	(NR)				
					(NI)			24.00	-15.93
24.00-25.50 (92mm)	21.70	60 13		0	(>50)	Weak narrowly foliated dark grey SLATE with quartz veins. Discontinuities 1) dip approximately 45 degrees extremely close to very closely spaced smooth undulating and stepped surface with occasional light creamish brown discolouration. 2) approximately sub horizontal medium spaced rough undulating surface with slight silty infilling. 3) occasional sub vertical smooth planar and undulating surfaces.			
25.50-27.00 (92mm)	21.70	83 49		20	(0)			25.50	-17.43
27.00-28.50 (92mm)	21.70	100 63		53	(1)	Weak to medium strong narrowly foliated dark grey SLATE with quartz veins. Discontinuities 1) dip approximately 45 degrees extremely close to very closely spaced smooth undulating and stepped surface with occasional light creamish brown discolouration. 2) approximately sub horizontal medium spaced rough undulating surface with slight silty infilling. 3) occasional sub vertical smooth planar and undulating surfaces.	Between 27.10-27.30m: Non intact - drilling induced. Between 28.00-28.05m: Weak to medium strong light greenish grey phyllite. Between 28.00-28.80m: Weak to medium strong light greenish grey phyllite. Between 29.55-29.60m: Weak to medium strong greyish green altered slate. Between 29.60-29.90m: Abundant quartz veins.		
28.50-30.00 (92mm)	21.70	67 27		9	(0)			30.00	-21.93

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure **3 of 4**

08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project	**PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**	Engineer	**GHA LIVIGUNN**	**Borehole**	**BH2**
				Project No	**PE100830**
Client	**MVV UMWELT GMBH**	National Grid Coordinates	**244775.00** E **57449.36** N	Ground Level	**8.07** m OD

Drilling | Properties/Sampling | Strata — Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT (FI)	Description General	Description Detail	Depth	Legend	Level m OD
							Between 29.90-30.00m: Weak to medium strong light greenish grey phyllite.	**30.00**		**-21.93**
						End of Borehole				

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure **4 of 4**

08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project: PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH
Engineer: GHA LIVIGUNN
Borehole: BH3
Project No: PE100830
Client: MVV UMWELT GMBH
National Grid Coordinates: 244763.33 E, 57473.13 N
Ground Level: 8.08 m OD
Scale: 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description	Depth	Legend	Level m OD
							G.L.		8.08
0.50- 1.50	B					Greyish orangish brown sandy very clayey gravel. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse slate, siltstone, brick and reinforced concrete. [MADE GROUND]			
1.00	E								
1.50- 2.50	B								
1.50- 1.95	D	1.50 (Dry)		12	S15				
2.50- 2.95	D	1.80 (Dry)			S22				
3.00	E								
3.30	D			15					
3.50- 4.50	B								
3.50- 3.95	D								
3.50- 3.95		3.30 (Dry)			C18				
4.50- 4.95	D	4.50 (Dry)			S20				
5.00	E								
5.50	D								
6.00- 6.45	D	6.00 (Dry)			S18				
7.00- 7.50	B								
7.50- 7.95	D	6.00 (Dry)			S34				
7.60	W								
8.50- 9.00	B								
9.00- 9.45	D	9.00 (8.00)			S15	At 9.00m: Plastic sheeting fragment and concrete.			
9.50	E								
10.00-10.50	B								

Boring

Depth	Hole Dia	Technique	Crew
1.20	0.70	Inspection Pit	JCB
21.30	0.15	Cable Percussion	JW
29.80	0.12	Rotary Core	ABOVO

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
29.80	-	-	29/06/10	08:00
1.20	-	-	29/06/10	18:00
G.L.	-	-	01/07/10	08:00
21.30	10.50	15.00	01/07/10	18:00
21.30	-	NR	19/07/10	08:00
29.80	21.50	NR	19/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
7.80	7.00	7.60	20		
21.00	10.50	15.30	20		

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. Inspection pit machine excavated to 1.20m depth.
Monitoring for unexploded ordnance carried out during pauses in boring.
A 50mm standpipe was installed to 29.80m with a geowrapped slotted section from 1.50m to 29.80m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.50m, bentonite seal up to 0.30m, concrete up to ground level.
Chiselling: 21.00-21.30m for 30 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure: 1 of 3

08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH3**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244763.33** E **57473.13** N

Ground Level **8.08** m OD

Scale 1:50

Sampling Depth	Sample Type	Depth Cased & (to Water)	Properties Strength kPa	w %	SPT (FI)	Strata Description	Depth	Legend	Level m OD
10.50-10.95	D	10.50 (9.50)			S9				
							11.30		-3.22
11.50-12.50	B					Firm grey slightly sandy SILT with shells.			
12.00-12.45	U35	10.50 (Dry)	47	41		At 12.00m, medium strength			
12.45-12.50	D			43					
13.00	D						13.00		-4.92
						Firm grey slightly sandy clayey SILT with occasional shells and partially decomposed wood fragments.			
13.50-13.95	U40	10.50 (Dry)							
13.95-14.00	D								
14.00-15.00	B								
15.00-15.45	U38	10.50 (Dry)							
15.45-15.50	D			46					
16.00	D								
16.50-16.95	U30	10.50 (Dry)							
16.95-17.00	D								
17.50	D								
18.00-18.45	U25	10.50 (Dry)							
18.45-18.50	D			43					
19.00	D								
19.50-19.95	D	10.50 (Dry)			S11				

Boring

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure **2 of 3**
08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH3**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244763.33** E **57473.13** N

Ground Level **8.08** m OD

Scale 1:50

Sampling			Properties			Strata				
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description		Depth	Legend	Level m OD
21.00-21.22	D	10.50 (15.30)			S50/70	Very weak dark grey mottled brown SLATE. Recovered as a clayey angular to subangular fine to coarse gravel.		21.00		-12.92
21.30-21.40	D	10.50 (15.00)			S50/40			21.30		-13.22
						Open hole drilling - No recovery.		21.50		-13.42
Core Run Core Dia	Depth Cased	TCR/SCR %	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General	Detail			
21.50-22.50 (92mm)	21.50	100 22		22		Very weak narrowly foliated dark grey SLATE with quartz veins. Discontinuities dip approximately 45 degrees extremely close to very closely spaced smooth planar surface with slight silt infilling.	From 22.70m: Discontinuities are extremely close to closely spaced. From 22.80m: Quartz veins.			
22.50-23.90 (92mm)	21.50	100 57		50						
23.90-25.30 (92mm)	21.50	86 12		11						
						Weak narrowly foliated dark grey SLATE with quartz veins. Discontinuities dip approximately 45 degrees extremely close to very closely spaced smooth planar surface with slight silt infilling.		24.50		-16.42
25.30-26.80 (92mm)	21.50	89 53		50	(>50)					
26.80-28.30 (92mm)	21.50	100 13		8						
						Firm to stiff dark grey CLAY with slate and quartz lithorelicts.		27.20		-19.12
								28.10		-20.02
28.30-29.80 (92mm)	21.50	100 33		28		Weak narrowly foliated dark grey SLATE with quartz veins. Discontinuities dip approximately 45 degrees extremely close to closely spaced smooth planar surface with slight silt infilling.				
						End of Borehole		29.80		-21.72

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **3 of 3**

08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH6B
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244792.35 E 57497.09 N	Ground Level	7.80 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description	Depth	Legend	Level m OD
							G.L.		7.80
						Grey silty very sandy gravel. Gravel is subangular fine to coarse concrete and brick. Some re-bar. [MADE GROUND]	0.25		7.55
1.00	E					Dark grey silty sandy gravel and cobbles. Gravel (fine to coarse) and cobbles are angular and subangular mixed lithologies including limestone, brick, concrete, siltstone. Some wood, metal and plastic fragments. [MADE GROUND] At 0.50m: 75mm thick re-bar. At 1.40m: Some concrete boulders.			
1.20	D								
1.80- 2.80	B						1.80		6.00
1.80- 1.90	D	None (Dry)		11	S50/40	Dark greyish brown ashy sandy very silty gravel. Gravel is subangular fine to coarse mixed lithologies including slate, concrete and brick. Some wood and occasional fragments of plastic. [MADE GROUND]			
2.80- 3.25	D	2.80 (Dry)			S25				
3.00	E								
3.10	D								
3.80- 4.25	D	3.20 (Dry)			S29				
4.50	D			16					
4.80- 5.25	D	4.50 (Dry)			S17				
5.00	E								
6.00	D								
6.50- 6.95	D	6.00 (Dry)			S8	At 6.50m: Bitumen fragments.			
6.70	W								
7.00- 7.50	B					Dark greyish brown slightly sandy slightly gravelly silt. Gravel is subangular fine to coarse slate with concrete, wood and brick. Occasional fragments of shell. [MADE GROUND]	6.80		1.00
7.70	D								
8.00- 8.45	D	7.70 (Dry)			S10				
9.00	D								
9.50- 9.95	D	7.70 (Dry)			S20				
10.00-10.50	B								

Boring

Depth	Hole Dia	Technique	Crew
1.80	0.70	Inspection Pit	JCB
19.20	0.15	Cable Percussion	JW
30.00	0.12	Rotary Core	JB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	29/06/10	08:00
10.00	7.70	Dry	29/06/10	18:00
10.00	7.70	6.00	30/06/10	08:00
19.20	14.00	10.00	30/06/10	18:00
19.20	19.20	NR	15/07/10	08:00
27.00	19.60	NR	15/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
10.00					Inflow overnight

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. Inspection pit machine excavated to 1.80m depth.
Water was added to assist boring between 1.80 and 10.00m.
Monitoring for unexploded ordnance carried out during pauses in boring.
A 50mm standpipe was installed to 30.00m with a geowrapped slotted section from 1.50m to 30.00m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.50m, bentonite seal up to 0.20m, concrete up to ground level.
Chiselling: 4.00-4.30m for 30 minutes and 11.50-11.60m for 30 minutes and 19.00-19.10m for

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure 1 of 3

08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project: **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**
Engineer: **GHA LIVIGUNN**
Borehole **BH6B**
Project No **PE100830**
Client: **MVV UMWELT GMBH**
National Grid Coordinates **244792.35** E **57497.09** N
Ground Level **7.80** m OD
Scale 1:50

Sampling: Depth	Sample Type	Depth Cased & (to Water)	Properties: Strength kPa	w %	SPT (FI)	Strata: Description	Depth	Legend	Level m OD
10.70-11.15	D	10.50 (10.00)			S13				
11.50	D					At 11.50m: Concrete cobble with re-bar.			
11.50-11.95		11.50 (10.50)			S20		11.60		-3.80
						Medium dense dark grey sandy very clayey GRAVEL. Gravel is subangular fine to coarse slate. Occasional shell fragments. Some partially decomposed organic material. Organic odour. Local pockets/lenses of slightly sandy slightly gravelly SILT/CLAY.			
12.50-13.00	B								
13.00-13.45	D	12.30 (9.80)		19	S12				
14.00-14.50	B								
14.50-14.95	D	13.30 (10.00)			S12				
15.50	D			43					
16.00-16.45	D	14.00 (10.00)			S7	Around 16.00m: Loose.			
17.00-17.50	B					Below around 17.00m: Becoming slightly sandy slightly gravelly SILT.			
17.50-17.95	D	14.00 (10.00)			S11				
18.50	D			51					
19.00-19.29	D	14.00 (10.00)			S50/ 135	Extremely weak dark grey discoloured light brown SLATE. Recovered as a silty gravelly sand.	19.00		-11.20
19.20-19.40	D	14.00 (10.00)			S50/75		19.20		-11.40
						Open hole drilling - no recovery.	19.60		-11.80

Core Run / Core Dia	Depth Cased	TCR/SCR %	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General	Detail

Boring

Depth	Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
27.00	19.60	NR	16/07/10	08:00
30.00	19.60	NR	16/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

30 minutes.

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **2 of 3**

08/10/2010

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH6B**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244792.35** E **57497.09** N

Ground Level **7.80** m OD

Drilling | Properties/Sampling | Strata — Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT (FI)	Description General	Description Detail	Depth	Legend	Level m OD
19.60-20.00 (92mm)	19.60	0				Extremely to very weak narrowly foliated dark grey SLATE. Discontinuities dip approximately 45 degrees extremely closely spaced smooth planar surface discoloured orangish brown with sight silty infilling.				
20.00-21.00 (92mm)	19.60	50 6		0	(>50)					
21.00-22.50 (92mm)	19.60	87 67		45	(14)			21.20		-13.40
22.50-24.00 (92mm)	19.60	80 47		31	(0)	Very weak to weak narrowly foliated dark grey SLATE quartz veins. Discontinuities 1) dip approximately 45 degrees extremely close to very closely spaced smooth planar and undulating surface with occasional orangish brown discolouration. 2) Occasional sub vertical smooth undulating surface. 3) occasional sub horizontal rough undulating surface.	From 22.00m: No discolouration. Between 22.70-22.90m: Non intact - drilling induced. Between 23.10-23.20m: Non intact - drilling induced.			
24.00-25.50 (92mm)	19.60	100 77		63	(1)	Weak to medium strong narrowly foliated dark grey SLATE with quartz veins. Discontinuities 1) dip approximately 45 degrees very close to closely spaced smooth planar and undulating surface with occasional orangish brown discolouration. 2) occasional sub vertical smooth undulating surface. 3) occasional sub horizontal rough undulating surface.		24.00		-16.20
25.50-27.00 (92mm)	19.60	100 87		77						
27.00-28.50 (92mm)	19.60	100 93		87	(0)					
28.50-30.00 (92mm)	19.60	87 80		67						
						End of Borehole		30.00		-22.20

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **3 of 3**
08/10/2010

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH7**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244691.44** E **57509.00** N

Ground Level **12.80** m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description	Depth	Legend	Level m OD
							G.L.		12.80
						Dark brown slightly silty sandy gravel. Gravel is angular to subangular fine to coarse limestone. Occasional rootlets. Rare slag.			
0.40	D					[MADE GROUND]	0.40		12.40
						Firm dark brown slightly sandy slightly gravelly clay/silt. Occasional wood fragments. [MADE GROUND]			
1.20- 2.20	B								
1.20	D								
1.20- 1.65	D	None (Dry)			S11				
2.20- 2.65	D	1.80 (Dry)			S16				
3.00	D								
3.20- 4.20	B								
3.20- 3.65	D	1.80 (Dry)			S13				
4.20- 4.65	D	1.80 (Dry)			S19				
5.00	D								
5.00- 5.42	D	1.80 (Dry)			S50/ 265				
6.00- 6.50	B								
6.50- 6.95	D	1.80 (Dry)			S25				
7.50	D						7.50		5.30
						Friable light grey slightly sandy CLAY with gravel size slate lithorelicts.			
8.00- 8.45	D	1.80 (Dry)			S11				
							8.45		4.35
						Extremely weak greyish brown SLATE. Recovered as clayey angular fine to coarse flat gravel.			
9.00- 9.50	B								
9.50- 9.95	U65	1.80 (Dry)							
9.95-10.00	D					At 10.00m: Subvertical foliations visible.			

Boring

Depth	Hole Dia	Technique	Crew
1.20	0.30	Inspection Pit	JW
11.50	0.15	Cable Percussion	JW
18.00	0.12	Rotary Core	JB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	07/07/10	08:00
1.20	-	-	07/07/10	18:00
G.L.	-	-	08/07/10	08:00
8.45	1.80	Dry	08/07/10	18:00
8.45	1.80	Dry	09/07/10	08:00
11.50	1.80	Dry	09/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					Not encountered during drilling.

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. Inspection pit hand excavated to 1.20m depth.
Monitoring for unexploded ordnance carried out during pauses in boring.
Water was added to assist boring between 1.20 and 8.00m.
A 50mm standpipe was installed to 18.00m with a geowrapped slotted section from 1.50m to 18.00m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.50m, bentonite seal up to 0.20m, concrete up to ground level.
Chiselling: 11.30-11.50m for 30 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **1 of 3**
08/10/2010

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH7**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244691.44** E **57509.00** N

Ground Level **12.80** m OD

Scale 1:50

Sampling			Properties			Strata			
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT (FI)	Description	Depth	Legend	Level m OD
10.50	D					At 10.50m: Becoming slightly clayey.			
11.00-11.36	D	1.80 (Dry)			S50/ 210				
11.50-11.80	D	1.80 (Dry)			S50/ 145		11.50		1.30
Core Run / Core Dia	Depth Cased	TCR/SCR %	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General	Detail		
11.50-12.50 (92mm)	11.50	47 25		11	(10)	Strong light grey TUFF with quartz veins and stringers. Discontinuities 1) approximately sub horizontal close to medium spaced smooth undulating surface brown discolouration. 2) Dip approximately 45 degrees close to medium spaced rough undulating surface brown discolouration with slight silt infilling.	At 11.50m: Becomes very weak, grey, with a little quartz.		
12.50-13.50 (92mm)	12.00	90 68		68					
13.50-15.00 (92mm)	12.00	91 73		73	(6)				
15.00-16.50 (92mm)	12.00	93 58		17	(18)				
					(NI)	Weak to medium strong dark grey SLATE with quartz veins and stringers.	15.50 15.65		-2.70 -2.85
					(12)		16.00		-3.20
16.50-18.00 (92mm)	12.00	44 20		8	(NI)	Strong light grey TUFF with quartz veins and stringers. Discontinuities 1) approximately sub horizontal close to medium spaced smooth undulating surface brown discolouration. 2) Dip approximately 45 degrees close to medium spaced rough undulating surface brown discolouration with slight silt infilling.	16.45		-3.65
					(12)				
						Medium strong dark grey SLATE with quartz veins and stringers. Discontinuities dip approximately 45 degrees close to very closely spaced smooth undulating surface with gravelly silt infilling.	18.00		-5.20
						Strong light grey PHYLLITE with quartz veins and stringers. Discontinuities 1) approximately sub horizontal closely spaced			

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
				11.50	-	Dry	20/07/10	08:00						
				18.00	11.50	Dry	20/07/10	18:00						

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **2 of 3**

08/10/2010

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH7
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244691.44 E 57509.00 N	Ground Level	12.80 m OD

Drilling | Properties/Sampling | Strata — Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT (FI)	Description General	Description Detail	Depth	Legend	Level m OD
						smooth stepped surface with orangish brown discolouration. 2) dip approximately 45 degrees medium spaced rough undulating surface with brownish orange discolouration.				
						End of Borehole				

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by SU

Figure 3 of 3

08/10/2010

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH8A**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244714.89** E **57539.07** N

Ground Level **13.68** m OD

Scale 1:50

Sampling Depth	Sample Type	Depth Cased & (to Water)	Properties Strength kPa	w %	SPT (FI)	Strata Description	Depth	Legend	Level m OD
						Railway hard core ** [MADE GROUND]	**G.L.**		**13.68**
0.50- 1.00	**B**					**Medium dense dark yellowish brown slightly silty sandy GRAVEL. Gravel is subangular fine to coarse slate.**	**0.30**		**13.38**
1.00	**E**								
1.20- 1.65	**D**	**None (Dry)**			**S16**				
2.00	**D**								
2.20- 3.20	**B**								
2.20- 2.65	**D**	**1.80 (Dry)**			**S24**				
						Extremely weak brownish grey SLATE recovered as a slightly sandy silty angular to subangular fine to coarse gravel.	**2.70**		**10.98**
3.20- 4.20	**B**								
3.20- 3.58	**D**	**1.80 (Dry)**			**S48/ 230**				
4.20- 4.46	**D**	**1.80 (Dry)**			**S50/ 125**		**4.20**		**9.48**

Core Run Core Dia	Depth Cased	TCR/SCR %	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General	Detail
4.20- 4.70 (92mm)	**4.20**	**0**			**(NR)** (10)	**Extremely weak to very weak narrowly foliated brown SLATE. Discontinuities 1) dip approximately 45 degrees extremely close to very closely spaced smooth stepped surface orangish brown discolouration with gravelly silt infilling. 2) sub horizontal very close to closely spaced rough undulating surface orangish brown discolouration and slight silt infilling.**	
4.70- 5.70 (92mm)	**4.20**	**100 48**		**34**	**(NI)** (43)		
5.70- 7.20 (92mm)	**5.00**	**67 27**		**0**	**(NI)** (20)		
7.20- 7.80 (92mm)	**5.00**	**100 50**		**0**	**(NI)** (33)	**Very weak to weak narrowly foliated brown SLATE. Discontinuities 1) dip approximately 45 degrees extremely close to very closely spaced smooth stepped surface orangish brown discolouration with gravelly silt infilling. 2) sub horizontal very close to closely spaced rough undulating surface orangish brown discolouration and slight silt infilling.**	
7.80- 8.60 (92mm)	**5.00**	**50 0**		**0**	**(NI)**		
8.60- 9.20 (92mm)	**5.00**	**100 67**		**33**	**(17)**	**Strong light grey speckled cream TUFF. Discontinuities 1) dip approximately 45 degrees smooth stepped surface very close to closely spaced dark orangish brown discolouration with**	

Depth	Level m OD
5.30	**8.38**
7.80	**5.88**
9.20	**4.48**

Boring

Depth	Dia	Technique	Crew
1.20	**0.30**	**Inspection Pit**	**JW**
4.20	**0.15**	**Cable Percussion**	**JW**
9.20	**0.12**	**Rotary Core**	**JB**

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	**-**	**-**	**20/07/10**	**08:00**
4.20	**1.80**	**Dry**	**20/07/10**	**18:00**
4.20	**4.20**	**Dry**	**21/07/10**	**08:00**
9.20	**4.20**	**Dry**	**21/07/10**	**18:00**

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					None encountered during drilling.

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. Inspection pit hand excavated to 1.20m depth.
Monitoring for unexploded ordnance carried out during pauses in boring.
**** Drillers description.**
A 50mm standpipe was installed to 9.20m with a geowrapped slotted section from 1.50m to 9.20m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.50m, bentonite seal up to 0.20m, concrete up to ground level.
Chiselling: 4.00-4.20m for 30 minutes.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **1 of 2**

08/10/2010

geotechnics

BOREHOLE RECORD – Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH8A**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244714.89** E **57539.07** N

Ground Level **13.68** m OD

Drilling | Properties/Sampling | Strata — Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT (FI)	Description General	Description Detail	Depth	Legend	Level m OD
						silty infilling. 2) occasional approximately 45 degrees intersecting rough undulating surface.				
						End of Borehole				

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **2 of 2**
08/10/2010

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Borehole	BH21
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244805.82 E 57533.51 N	Ground Level	7.77 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	(FI)	Description	Depth	Legend	Level m OD
						Grey slightly clayey sandy gravel. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse concrete, chert, slate and quartz. [MADE GROUND]	G.L.		7.77
1.00	E								
2.00	D								
3.00	E								
4.00	D					Between 4.00-6.00m: Some wood fragments.			
5.00	E								
6.00	D					Light grey sandy gravel. Gravel is subangular and subrounded fine to coarse concrete. [MADE GROUND]	6.00		1.77
						Soft drilling ** No recovery	7.50		0.27

Boring

Depth	Hole Dia	Technique	Crew
7.00	0.15	Cable Percussion	JW
12.00	0.20	Rotary Open Hole	ABOVO
17.00	0.05	Static Cone Penetrom	InSitu
29.80	0.14	Rotary Core	ABOVO

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.	-	-	14/07/10	08:00
12.00	-	-	14/07/10	18:00
12.00	-	-	15/07/10	08:00
12.00	7.00	-	15/07/10	18:00
12.00	-	-	20/07/10	08:00
17.00	-	-	20/07/10	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					Not recorded

Remarks

The Borehole area was set out by Geotechnics Limited and the area was CAT scanned prior to intrusive works. No inspection pit excavated due to the nature of the ground.
Open hole drilling techniques used to advance through fill to 12.00m.
Description based on fragmented chippings from open hole drilling and rate of progress.
Cable percussion unable to advance casing beyond 7.00m. CPT rig set up over borehole position to prove bedrock prior to coring commencing.
** Drillers description.
A 50mm standpipe was installed to 29.80m with a geowrapped slotted section from 1.50m to

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by SU

Figure 1 of 3

08/10/2010

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BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH21**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244805.82** E **57533.51** N

Ground Level **7.77** m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	(FI)	Description	Depth	Legend	Level m OD
						CPT probe	**12.00**		**-4.23**
						Open hole drilling - No recovery.	**17.00**		**-9.23**
							18.00		**-10.23**

Core Run / Core Dia	Depth Cased	TCR/SCR %	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General	Detail
18.00-19.50 (92mm)	**18.00**	**86 48**		**0**	**(NI) (>50)**	**Very weak to weak narrowly foliated dark grey SLATE. discontinuities 1) dip approximately 45 degrees very closely to closely spaced smooth undulating surface orangish brown discolouration with slightly silty infilling 2) occasional sub vertical discontinuities smooth stepped surface and orangish brown**	**From 19.00m: Becoming very closely spaced.**
19.50-21.00 (92mm)	**18.00**	**83 57**		**18**			

Boring

Depth	Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
17.00	**-**	**-**	**21/07/10**	**08:00**
29.50	**18.00**	**-**	**21/07/10**	**18:00**

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

29.80m with flush lockable protective cover. Detail as follows from base of hole: gravel filter up to 1.50m, bentonite seal up to 0.30m, concrete up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

Logged by **SU**

Figure **2 of 3**
08/10/2010

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Engineer **GHA LIVIGUNN**

Borehole **BH21**
Project No **PE100830**

Client **MVV UMWELT GMBH**

National Grid Coordinates **244805.82** E **57533.51** N

Ground Level **7.77** m OD

Scale 1:50

Core Run/Depth (Core Dia)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	(FI)	Description General	Description Detail	Depth	Legend	Level m OD
					(34)	discolouration.	From 19.70m: 3) occasional 45 degree intersecting discontinuities rough undulating surface with orangish brown discolouration.	21.00		-13.23
21.00-22.50 (92mm)	18.00	100 85		70	(2)	Weak narrowly foliated dark grey SLATE with quartz veins. Discontinuities 1) dip approximately 45 degrees extremely closely spaced smooth undulating surface 2) occasional sub vertical discontinuities smooth stepped surface 3) occasional 45 degree intersecting discontinuities rough undulating surface.				
22.50-23.80 (92mm)	18.00	100 77		77	(NI) (0)		From 22.80m: Quartz veins.			
23.80-25.30 (92mm)	18.00	100 55		49	(NI) (0) (NI) (0)		Between 23.80-24.15m: Non intact - drilling induced.			
25.30-26.80 (92mm)	18.00	100 70		63	(NI) (0) (NI)	Weak to medium strong SLATE with quartz veins. Discontinuities 1) dip approximately 45 degrees very close to medium spaced smooth undulating surface 2) occasional sub vertical discontinuities smooth stepped surface 3) occasional 45 degree intersecting discontinuities rough undulating surface.	Between 25.95-26.00m: Non intact - drilling induced.	25.40		-17.63
26.80-28.30 (92mm)	18.00	100 50		47	(0)					
28.30-29.80 (92mm)	18.00	100 60		53	(6)					
						End of Borehole		29.80		-22.03

Drilling

Depth	Hole Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

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Figure **3 of 3**
08/10/2010

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APPENDIX 6

Core Photographs

Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



BH1A 18.30 - 21.40



BH1A 21.40 - 24.20

Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



BH1A 24.20 - 26.80



BH1A 26.80 - 29.70

Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



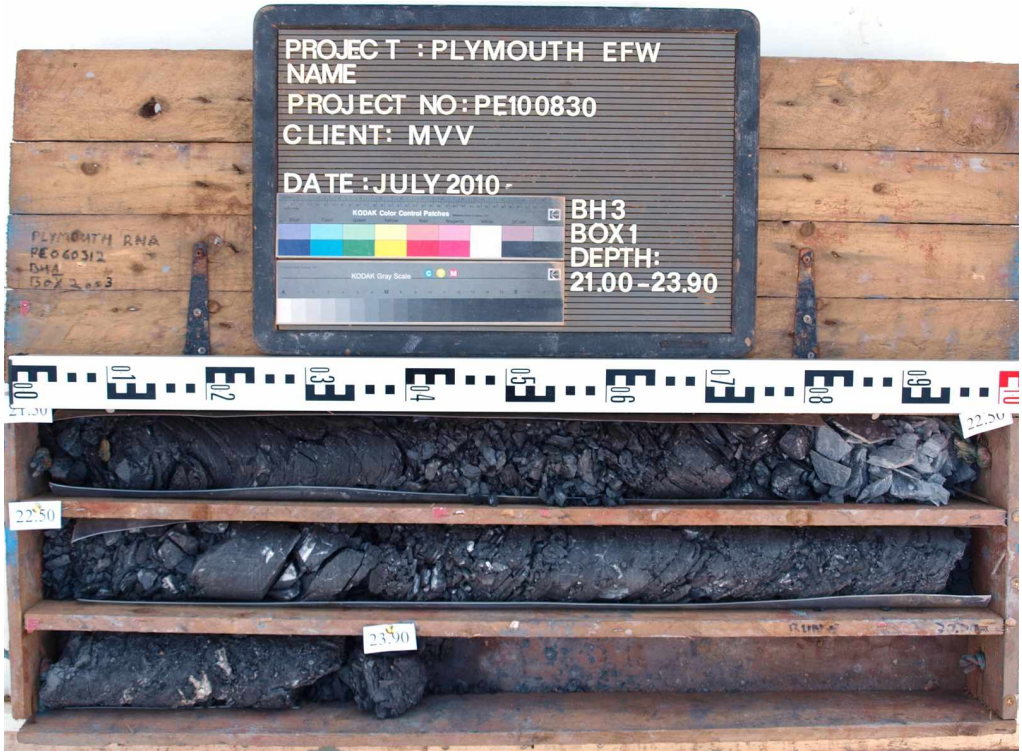
BH2 21.70 - 27.60



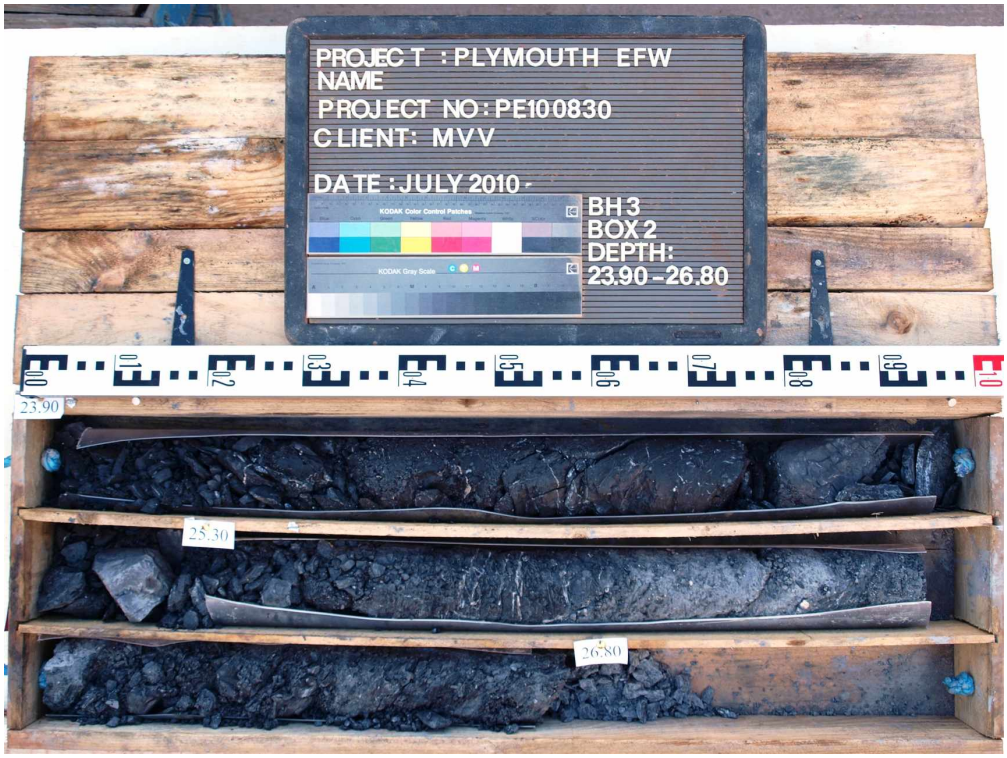
BH2 27.80 - 30.00

Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



BH3 21.00 - 23.90

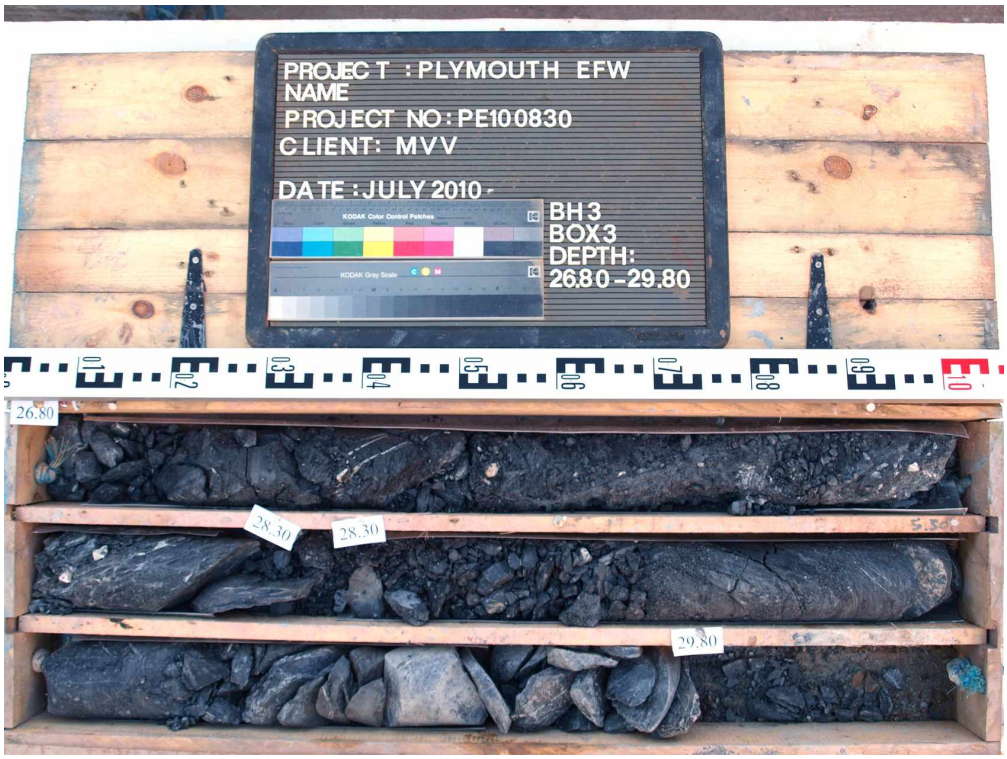


BH3 23.90 - 26.80

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Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



BH3 26.80 - 29.80



BH6B 20.00 - 24.00

Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



BH6B 24.00 - 27.00



BH6B 27.00 - 30.00

Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



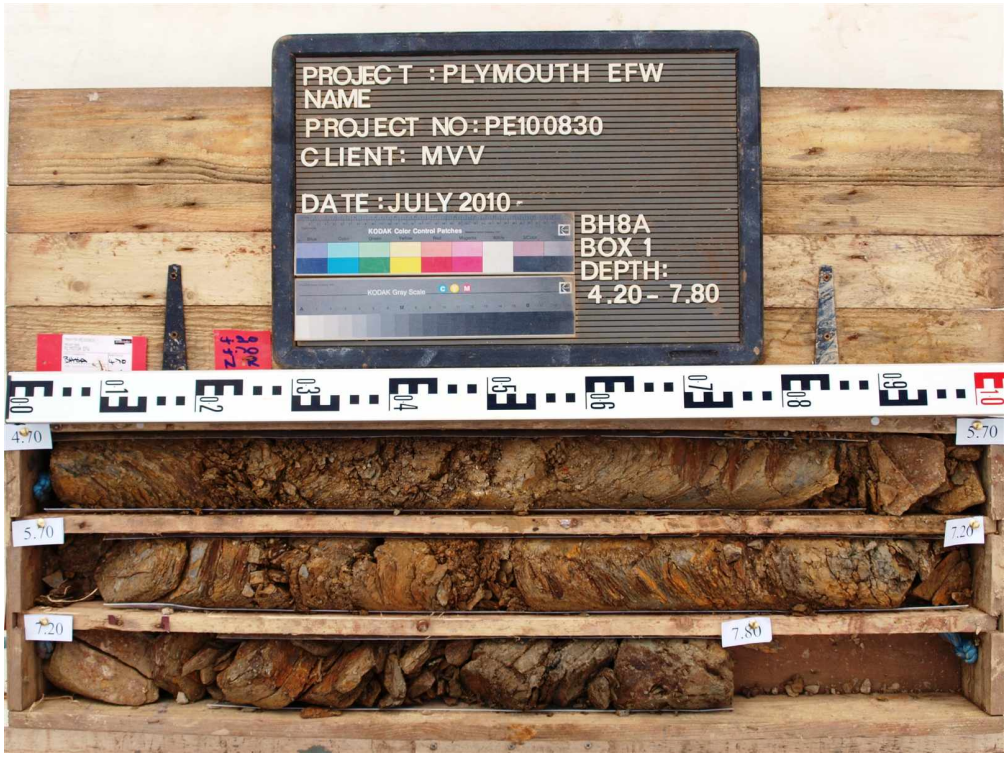
BH7 11.50 - 15.00



BH7 15.00 - 18.00

Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



BH8A 4.20 - 7.80



BH8A 7.80 - 9.20

Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



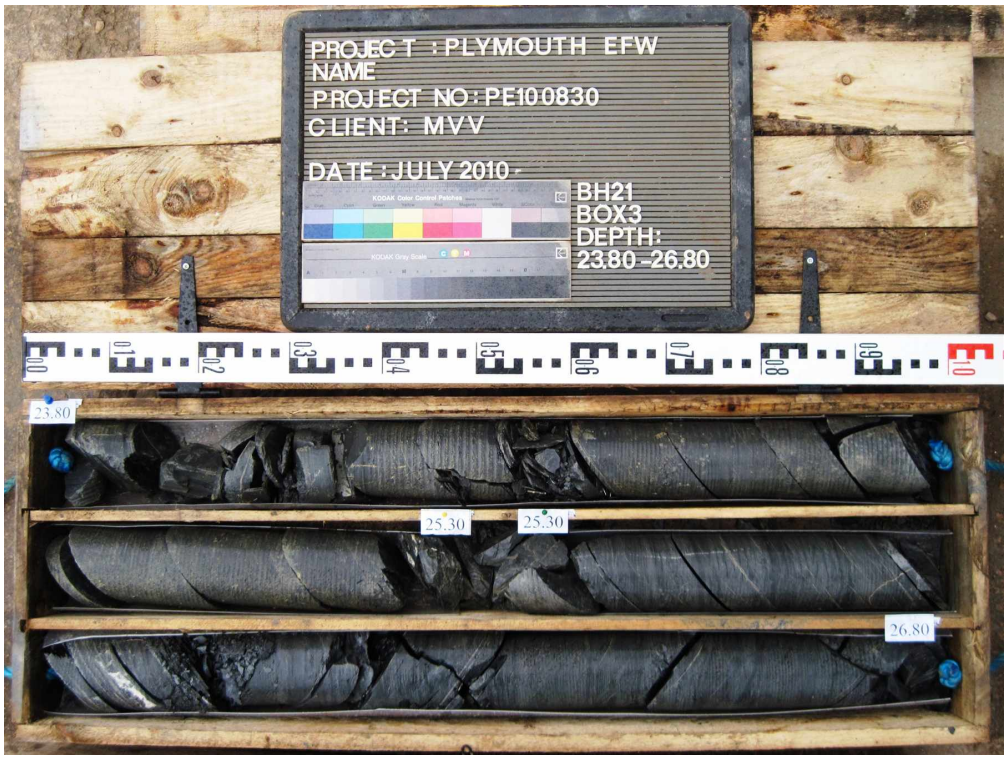
BH21 18.00 - 21.00



BH21 21.00 - 23.80

Project Number : PE100830

Project : Energy from Waste Plant, Devonport, Plymouth



BH21 23.80 - 26.80



BH21 26.80 - 29.80

APPENDIX 7

Trial Pit Records

TRIAL PIT RECORD — Trial Pit

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Trial Pit	TP1
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244789.24 E 57420.44 N	Ground Level	5.18 m OD

Scale 1:50

Samples and Tests				Strata			
Depth	Type	Stratum No	Results	Description	Depth	Legend	Level m OD
					G.L.		5.18
				Light greyish brown angular fine to coarse limestone gravel. [MADE GROUND]	0.25		4.93
0.40	D			Dark greyish brown silty sandy gravel with a low cobble content. Gravel is subangular fine to coarse slate, limestone and concrete. Some wire fragments. [MADE GROUND]	0.60		4.58
1.00	B						
1.00	E			At 0.50m: Slate boulder.			
1.40	D			Light greyish brown silty gravel and cobbles with occasional slate boulders. Gravel (fine to coarse) and cobbles are subangular brick and concrete. [MADE GROUND]	1.40		3.78
				At 1.10m: 0.05m tarmac layer.			
				At 1.30m: Cast iron fire grate.			
				At 1.40m: 2cm thick stainless steel sheet.			
				End of Excavation			

Excavation

Plant	JCB 3CX	Width (B)	0.70
Date	06/07/2010	Length (C)	2.10
Shoring	None.	Date Backfilled	06/07/2010
Stability	Some instability during excavation.		

Groundwater

Depth Observed	Depth of Pit	Details
		None encountered during excavation.

Remarks Trial pit set out by Geotechnics Limited and the area was CAT scanned prior to excavation. The Trial Pit was terminated at a depth of 1.40m due to the presence of an obstruction. On completion the trial pit was backfilled in compacted layers of arisings.

Logged by GMSL

Figure 1 of 1

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

geotechnics

TRIAL PIT RECORD — Trial Pit

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Trial Pit	TP2
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244806.95 E 57474.59 N	Ground Level	5.20 m OD

Scale 1:50

Samples and Tests				Strata			
Depth	Type	Stratum No	Results	Description	Depth	Legend	Level m OD
					G.L.		5.20
				Light greyish brown angular fine to coarse limestone gravel. [MADE GROUND]	0.30		4.90
0.40	D			Dark greyish brown slightly sandy silty gravel with a medium cobble content. Gravel (fine to coarse) and cobbles are angular and subangular slate with some brick and concrete and a little limestone. Some wood fragments. [MADE GROUND]	1.00		4.20
0.90	D						
1.00	B						
1.00	E			At 1.00m: Fragment of cemented asbestos encountered.			
				End of Excavation			

Excavation

Plant	JCB 3CX	Width (B)	0.70
Date	06/07/2010	Length (C)	2.10
Shoring	None.	Date Backfilled	06/07/2010
Stability	Stable during excavation.		

Groundwater

Depth Observed	Depth of Pit	Details
		None encountered during excavation.

Remarks Trial pit set out by Geotechnics Limited and the area was CAT scanned prior to excavation. The Trial Pit was terminated at a depth of 1.00m due to the presence of asbestos. On completion the trial pit was backfilled in compacted layers of arisings.

Logged by GMSL

Figure 1 of 1

08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

geotechnics

TRIAL PIT RECORD — Trial Pit

Project	PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH	Engineer	GHA LIVIGUNN	Trial Pit	TP3
				Project No	PE100830
Client	MVV UMWELT GMBH	National Grid Coordinates	244824.36 E 57530.36 N	Ground Level	5.13 m OD

Scale 1:50

Samples and Tests				Strata			
Depth	Type	Stratum No	Results	Description	Depth	Legend	Level m OD
					G.L.		5.13
				Light greyish brown angular fine to coarse limestone gravel. [MADE GROUND]	0.30		4.83
0.40	D			Dark greyish brown silty sandy gravel and cobbles. Gravel (fine to coarse) and cobbles are angular and subangular limestone, concrete, brick and tarmac. Some metal and plastic fragments. [MADE GROUND]			
1.00	B						
1.00	E			At 0.80m: 0.05m tarmac layer.			
1.40	D			At 1.60m: Becoming ashy.			
1.90	B			At 1.90m: Some concrete boulders.			
2.30	D			At 2.00m: Some household refuse and a slight refuse odour.			
				At 2.40m: Boulders	2.50		2.63
				End of Excavation			

Excavation

Plant	JCB 3CX	Width (B)	1.00
Date	06/07/2010	Length (C)	2.60
Shoring	None.	Date Backfilled	06/07/2010
Stability	Unstable during excavation.		

Groundwater

Depth Observed	Depth of Pit	Details
		None encountered during excavation.

Remarks

Trial pit set out by Geotechnics Limited and the area was CAT scanned prior to excavation.
The Trial Pit was terminated at a depth of 2.50m due to the presence of an obstruction.
On completion the trial pit was backfilled in compacted layers of arisings.

Logged by GMSL

Figure 1 of 1
08/10/2010

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with Amendment 1 published December 2007 to BS5930:1999

geotechnics

APPENDIX 8

Trial Pit Photographs

Project Number : PE100830

Project : Proposed Energy from Waste Plant, Devonport, Plymouth.



TP1 (1)



TP1 (2)

Project Number : PE100830

Project : Proposed Energy from Waste Plant, Devonport, Plymouth.



TP1 (3)



TP1 (4)

PHOTOGRAPHS

Project Number : PE100830

Project : Proposed Energy from Waste Plant, Devonport, Plymouth.



TP1 (5)



TP2 (1)

Project Number : PE100830

Project : Proposed Energy from Waste Plant, Devonport, Plymouth.



TP2 (2)



TP2 (3)

Project Number : PE100830

Project : Proposed Energy from Waste Plant, Devonport, Plymouth.



TP2 (4)



TP3 (1)

Project Number : PE100830

Project : Proposed Energy from Waste Plant, Devonport, Plymouth.



TP3 (2)



TP3 (3)

Project Number : PE100830

Project : Proposed Energy from Waste Plant, Devonport, Plymouth.



TP3 (4)



TP3 (5)

APPENDIX 9

Static Cone Penetration Test Results

PROJECT: DEVONPORT

STATIC CONE PENETRATION TESTING

FACTUAL REPORT

CLIENT: GEOTECHNICS

CONTRACT No.: AUTH-OE5664






Issue	Date	Description	Prepared	Checked	Approved
01	30/07/10	Final	CR	CD	DW

Date: 30th July 2010
Our Ref: 1100127

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Fax: 0845 862 0559
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www.insitusi.com
Company Reg No.: 6339499
VAT No.: 922 3561 41

Attention: Mr Matthew Yates

Dear Matthew,

STATIC CONE PENETRATION TESTING
AT DEVONPORT

We have pleasure in providing a digital copy of our report and data in AGS format for the above project.

We hope that you are satisfied with the performance of our staff, equipment and reporting on this project. If you should have any queries about any aspect of the works carried out, please do not hesitate to contact us. We look forward to being of service to you in the future.

Yours faithfully,
In Situ Site Investigation Limited



Darren Ward
Director

Contents

1.0 INTRODUCTION 5
2.0 FIELDWORK 6
2.1 CPT RIG 6
2.2 CPTU CONE 6
2.3 TEST PROCEDURE 6
2.5 POSITIONING 7
3.0 CONE PENETRATION TEST RESULTS 8
3.1 ESTIMATED SOIL BEHAVIOUR TYPE PLOT (FORM CPT0001) 8
3.1.1 Estimated Soil Behaviour Type 8
3.1.2 Friction Ratio (R_f) 9
3.1.3 Depth Correction 9
3.2 MEASURED PORE PRESSURE PLOT (CPT0002) 10
3.2.1 Pore Pressure Results (u_2) 10
3.2.2 Corrected Cone Resistance (q_t) 10
3.2.3 Pore Pressure Ratio (B_q) 11
3.2.4 Soil Unit Weight 11
3.2.5 In Situ Pore Pressure 12
4.0 GEOTECHNICAL PARAMETERS 13
4.1 SOIL BEHAVIOUR TYPE INDEX 13
4.2 STANDARD PENETRATION TEST (SPT) N VALUE 14
4.3 SHEAR STRENGTH 15
4.4 RELATIVE DENSITY (D_r) 15
4.5 FRICTION ANGLE 16
4.6 FINES CONTENT (FC) 17
5.0 REFERENCES 18

APPENDIX A....20
SITE LOCATION PLAN....21
CPT PROJECT SUMMARY SHEET....22
DEPTH ENCODER CALIBRATION CERTIFICATE....23
SOIL DESCRIPTION TABLES....25
EXPLANATION OF SYMBOLS....26
APPENDIX B....27
APPENDIX C....86

1.0 INTRODUCTION

At the request of Geotechnics (The Client), In Situ Site Investigation Limited (In Situ S.I.) carried out a soils investigation at Devonport.

The investigation consisted of performing Static Cone Penetration Tests (CPTs). All tests were performed at locations set out by the Client.

The fieldwork details are shown below in figure 1.1 and figure 1.2.

Fieldwork Summary	
CPT Rig Used	21 tonne truck mounted CPT rig (CPT001)
Operators	Darren Hughes, Ian Musson, Darren Ward
Date Started	08/07/2010
Date Finished	20/07/2010
In Situ S.I. Project Manager	Darren Ward
Main Contractor's Site Manager	Sophie Unsworth

Figure 1.1: Table showing the fieldwork summary details.

Completed Fieldwork Summary
20 Static Cone Penetration Tests (CPTs) to a maximum depth of 22.32m or refusal. Each test measured Cone Resistance (q_c), Sleeve fiction (f_s), Measured Pore Pressure in the shoulder position (u_2), inclination in X and Y planes.
Provision of factual report with estimated soil type, geotechnical parameters and AGS data.

Figure 1.2: Table showing the completed fieldwork summary details.

2.0 FIELDWORK

2.1 CPT RIG

All works were performed with a 21 tonne truck mounted CPT Rig (CPT001) equipped with a 20 tonne capacity hydraulic ram set. A full data sheet for this rig is presented in Appendix A.

2.2 CPTU CONE

A single electric CPTU cone was used (4579.112xx) of a type conforming to the requirements of Application Class 1 of Eurocode 7 (2007). The cones measured parameters are shown in figure 1.2. The cone had a cross-sectional area of 15cm^2. The piezo filter was mounted in the shoulder (u_2) position (see figure 3.2). A full datasheet of the cones used is shown in Appendix A.

2.3 TEST PROCEDURE

The tests are carried out in accordance with Eurocode 7 (Geotechnical design, Ground Investigation and testing).

The final depth of the tests were determined by either completion to the specified test depth or when the maximum safe capacity of the equipment was reached. A schedule of the tests performed is shown in Appendix A which has been compiled from the operator's daily progress reports.

The data is transmitted from the digital CPTU through an umbilical cable that runs through the push rods to the data acquisition system.

The rate of penetration is kept constant at 2cm/s ±10% except when penetrating very dense or hard strata. A copy of the depth encoder calibration certificate is shown in Appendix A. Results are displayed instantaneously on the computer logging screen. The results are recorded on the computer hard disc.

Before each test is carried out zero values are taken of the cone to check to see if it is within calibration. At the end of each test, zero values are taken again to see if there has been any drift during the test. These values are inspected during the post processing stage. This is a quality check on the data and the testing procedure. Individual test zero values are shown on their corresponding test results on form CPT0001 in Appendix B.

2.5 POSITIONING

All positions were set out by the Client on site.

3.0 CONE PENETRATION TEST RESULTS

All tests carried with the CPTU cone are shown in Appendix B and displays all results as described in section 3.1 and 3.2. Two graphs are shown for each test. The first graph (form CPT0001 Estimated Soil Behaviour Type Plot) shows the measured readings from the cone and the estimated soil description, these are plotted at a 0-20MPa scale for the cone resistance. The second graph (form CPT0002 Measured Pore Pressure Plot) shows derived and corrected values along with the pore pressure results; these are plotted at a 0-80MPa scale for the cone resistance.

3.1 ESTIMATED SOIL BEHAVIOUR TYPE PLOT (FORM CPT0001)

The estimated soil behaviour type plot presented in Appendix B details the following:

- Measured cone end resistance (q_c) and sleeve friction (f_s);
- Friction ratio (R_f);
- Inclination, X and Y axis;
- Estimated behaviour soil type log (Robertson *et.al* 1986, friction ratio chart)
- Legend indicating soil log (BS5930:1999 legend)

3.1.1 Estimated Soil Behaviour Type

The estimation of soil behaviour type using measurements of cone and friction is based upon the variation of the friction ratio in respect to the cone resistance. The friction ratio varies depending upon whether the soil is cohesive or granular. The cone resistance varies depending on the strength and densities of the soil.

The interpretation is based on Robertson *et. al*. (1986) (Friction ratio chart) which is shown below (figure 3.1).

The density and stiffness values descriptions are based on derived N60 (Robertson *et. al*. (1986)) and S_u (Lunne and Kleven (1981)) values from the cone resistance in accordance to BS5930:1999. A list of these values are presented in Appendix A.

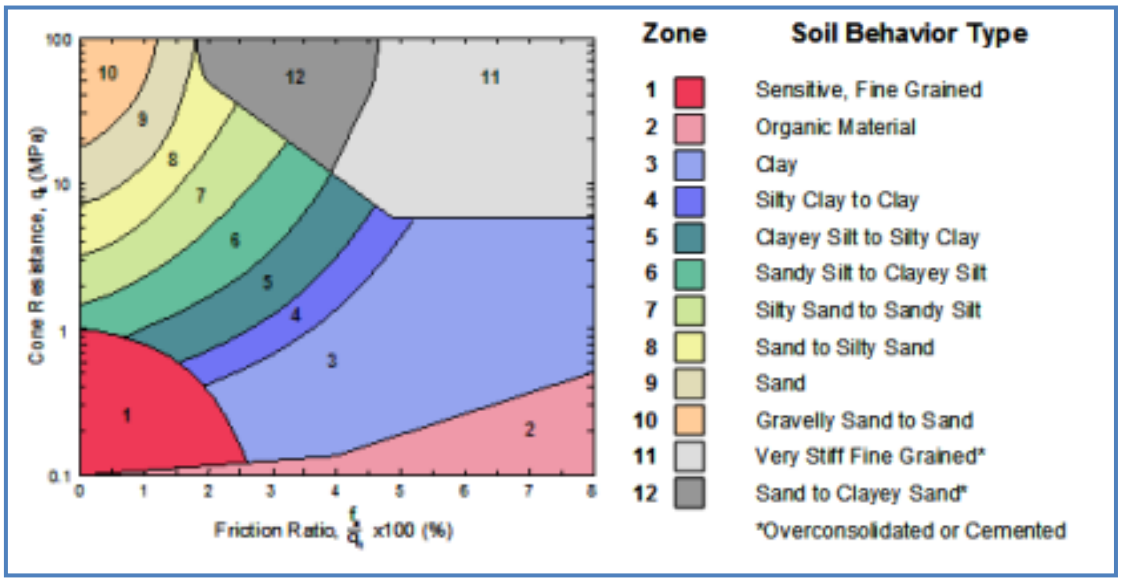


Figure 3.1: Robertson *et al.*, 1986 soil behaviour type chart.

3.1.2 Friction Ratio (R_f)

The friction ratio (R_f) is the ratio between the sleeve friction and the cone resistance. This is a very useful parameter for carrying out soil interpretation

$$\boldsymbol{Fricton\ Ratio}\ (\boldsymbol{R_f}) = \left(\frac{\boldsymbol{Sleeve\ Friction}\ (\boldsymbol{f_s})}{\boldsymbol{Tip\ Resistance}\ (\boldsymbol{q_c})}\right) \times \mathbf{100}$$ (Lunne *et al.*, 1997)

3.1.3 Depth Correction

All tests in the report have been corrected for depth difference caused by inclination. This has been calculated using the method described in the International Reference Test Procedure (2001).

To calculate the corrected depth the following formula is used:

$$z = \int_0^l C_h \cdot dl$$

where:

z = penetration depth, in m;
l = penetration length, in m;
C_h = correction factor for the effect of the inclination of the CPTU relative to the vertical axis.

The equation for calculating the correction factor for the influence of the inclination for a bi-axial inclinometer is:

$$C_h = (1 + tan^2 \propto + tan^2 \beta)^{-1/2}$$

3.2 MEASURED PORE PRESSURE PLOT (CPT0002)

Behind each estimated soil type plots in Appendix B is a second plot showing the pore pressure results as well as corrected and derived parameters. These logs detail the following:

- Measured Pore pressure (u_2),
- Corrected cone resistance (q_t);
- Pore pressure ratio (B_q)
- Sleeve friction (f_s)

3.2.1 Pore Pressure Results (u_2)

The CPTU measured the pore pressure during penetration. If the material is free draining and saturation is maintained it will normally measure hydrostatic pore pressure. In material that is not free draining it will record the total pore pressure (hydrostatic plus any excess pore pressures generated) created by the cone penetrating through this material

The filter element can be mounted in one of three positions. For the tests carried out in this report the filter was mounted in the u_2, or shoulder position (see figure 3.2)

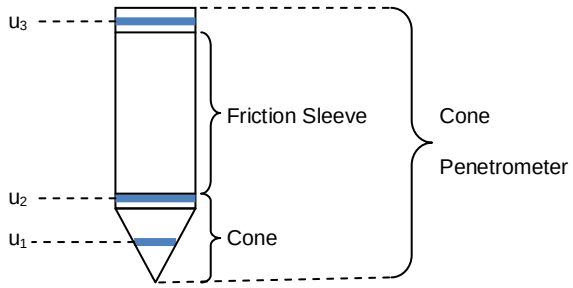


Figure 3.2: Diagram showing pore pressure filter locations (after Lunne *et al.*, 1997)

3.2.2 Corrected Cone Resistance (q_t)

For each penetration test, the measured Cone Resistance, q_c, can be corrected for the 'unequal area effect' due to the influence of the ambient pore water pressure acting on the cone.

The corrections have been applied using the following equation:

$$q_t = q_c + [u_2.(1 - \alpha)]$$ (Lunne *et al.*, 1997)

Where α is the cone area ratio, which is **0.869** for the cone used on this project (This value is geometrically measured).

3.2.3 Pore Pressure Ratio (B_q)

Pore pressure ratio is the ratio between the measured pore pressure generated during penetration and the corrected cone resistance minus the total overburden stress.

Pore pressure ratio as defined by Senneset and Janbu (1985) is defined as:

$$B_q = \frac{u_2 - u_0}{q_t - \sigma_{vo}}$$

where:

u_2 = pore pressure measured between the cone and the friction sleeve
u_0 = equilibrium pore pressure
σ_{vo} = total overburden stress
q_t = cone resistance corrected for unequal end area effects

3.2.4 Soil Unit Weight

For calculations involving the total overburden stress, an estimate of the soil unit weight has to be made. For all calculations in this report, an approximate unit weight is assigned to each soil classification zone from the Robertson *et al.*, 1986 chart.

Figure 3.3 below lists the approximate unit weight for each zone from Lunne *et al*., 1997.

Zone	Approximate unit weight (kN/m^3)
1	17.5
2	12.5
3	17.5
4	18
5	18
6	18
7	18.5
8	19
9	19.5
10	20
11	20.5
12	19

Figure 3.3: Estimate of unit weights based on the Robertson *et al*.,(1986) friction ratio chart (Lunne *et al*., 1997).

3.2.5 In Situ Pore Pressure

On the pore pressure plot is a second line (in red) showing the inferred in situ or hydrostatic pore pressure, u_0. This is calculated from a known or estimated water table level.

In the report, the water table has been inferred at 2.5m below ground level.

4.0 GEOTECHNICAL PARAMETERS

A number of empirical correlations can be carried out to derive geotechnical parameters from CPT data. This report includes a number of these parameters which are described in this section. For the CPT data only soil behaviour type, SPT values, shear strength and relative density are derived and are shown in Appendix C. For the CPTU data all the derived parameters described in the section are derived and displayed in Appendix C.

Please note that a number of the correlations are derived for a certain type of soil, and may not be appropriate for all the soil types encountered on this project.

4.1 SOIL BEHAVIOUR TYPE INDEX

The soil behaviour type index was derived by Jefferies and Davies (1991). It was created to allow a continuous variation of $(q_c/p_a)/N_{60}$ with soil type, which was an improvement on the discontinuous nature of an earlier conversion by Robertson *et al.* (1986).

This approach has been modified for use with the Robertson (1990) normalised CPT soil classification chart. The boundaries between soil behaviour type zones (2 to 7) can be approximated as concentric circles, and the radius of each circle can be used as a soil behaviour type index (Lunne *et al.,* 1997).

The soil behaviour type index, I_c, can then be defined as:

$$\boldsymbol{I_c = ((3.47 - logQ_t)^2 + (logF_r + 1.22)^2)^{0.5}}$$

The boundaries of soil behaviour type are then given in terms of the index, I_c. See figure 4.1 for the table of soil behaviour types.

Soil Behaviour Type Index, I_c	Zone (from Robertson 1990 normalised chart)	Soil Behaviour Type
I_c < 1.31	7	Gravelly sand to dense sand
1.31 < I_c < 2.05	6	Sands – clean sand to silty sand
2.05 < I_c < 2.60	5	Sand mixtures – silty sand to sandy silts
2.60 < I_c < 2.95	4	Silt mixtures – clayey silt to silty clay
2.95 < I_c < 3.60	3	Clays: silty clay to clay
I_c > 3.60	2	Organic soils - peats

Figure 4.1: Boundaries of soil behaviour type index, I_c.

4.2 STANDARD PENETRATION TEST (SPT) N VALUE

The SPT N value can be derived using differing ratios of the relationship between q_c and N_{60}. These ratios were suggested by Robertson *et al.* (1986) and are shown in figure 4.2.

Zone	Soil Behaviour Type	$(q_c/p_a)/N_{60}$
1	Sensitive fine grained	2
2	Organic material	1
3	CLAY	1
4	Silty CLAY to CLAY	1.5
5	Clayey SILT to silty CLAY	2
6	Sandy SILT to clayey SILT	2.5
7	Silty SAND to sandy SILT	3
8	SAND to silty SAND	4
9	SAND	5
10	Gravely SAND to SAND	6
11	Very stiff fine grained	1
12	SAND to clayey SAND	2

Figure 4.2: SPT N value ratios from Robertson *et al.*, 1986.

For the best results for the calculation of N_{60} it is recommended to use the soil behaviour type index, I_c. This is the method used in this report.

The relationship between N_{60} and I_c is defined as:

$$\frac{(\frac{q_c}{p_a})}{N_{60}} = 8.5(1 - \frac{I_c}{4.6})$$ (Lunne *et al.*, 1997)

It is suggested (Jefferies and Davies, 1991) that this method provides a better estimate of the SPT N values than the actual SPT test due to poor repeatability of the SPT.

4.3 SHEAR STRENGTH

Estimation of s_u from CPTUs using corrected cone resistance is made from the following equation:

$$s_u = \frac{(q_t - \sigma_{vo})}{N_{kt}}$$ (Lunne *et al.*, 1981)

where:

N_{kt} = empirical cone factor
σ_{vo} = total overburden stress.

Research has shown that the cone factor N_{kt} varies between 11 and 30 with an average value of 15. We present an upper bound s_u value with an N_{kt} value of 15 and a lower bound s_u value with an N_{kt} value of 20. This report only presents this data on soils with a soil behaviour type index (I_c) of greater than 2.60.

4.4 RELATIVE DENSITY (D_r)

Relative density has been derived using a method by Jamiolkowski *et al.*, 1985 (see figure 4.3). This correlation was derived from five predominantly silica sands under controlled laboratory conditions. The sands were normally consolidated, un-cemented, un-aged and predominantly quartz. It is noted that field cases are likely to show more variability than that demonstrated in figure 4.3.

The correlation in this report is calculated on soil with a soil behaviour type index (I_r) of less than 2.60. The formula for calculating relative density (D_r) is:

$$D_r = -98 + 66\ log_{10} \frac{q_c}{[\sigma'_{vo}]^{0.5}}$$

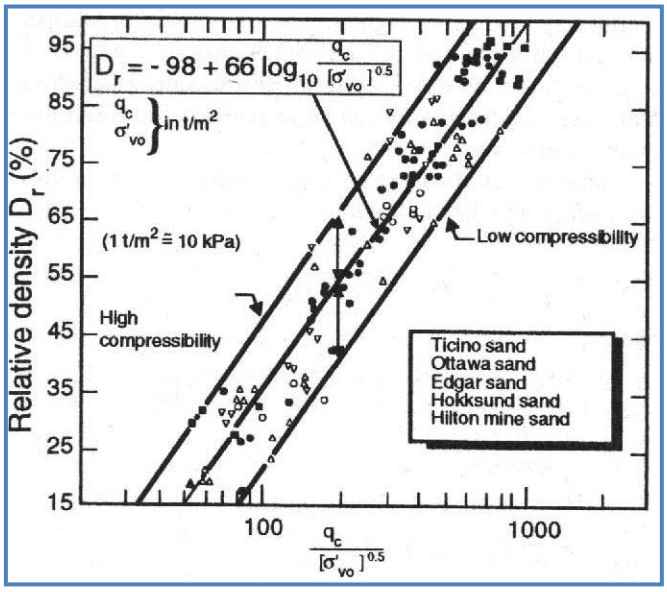


Figure 4.3: Correlation between q_c and relative density (after Jamiolkowski *et al.*, 1985)

4.5 FRICTION ANGLE

Friction angle is derived using the Robertson and Campanella (1983) method from their work looking at calibration test data (see figure 4.6). The correlation is based on un-aged un-cemented quartz sand. The formula for peak *Φ'* from CPTU is:

$$\Phi' = arctan\left[0.1 + 0.38 \log\left(q_t / \sigma_{vo}'\right)\right]$$

The correlation in this report is calculated on soil with a soil behaviour type index (I_c) of less than 2.60.

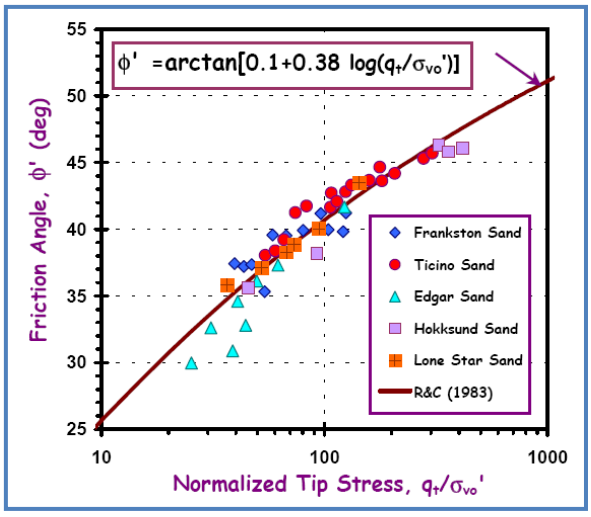


Figure 4.6: Peak friction angle of clean quartz sands from CPTU (after Robertson & Campanella, 1983).

4.6 FINES CONTENT (*FC*)

It is possible to estimate fines content from the friction ratio of sandy soils. Suzuki *et al*., (1995) demonstrated how friction ratio (R_f) varies with fines content (*FC*) (see figure 4.7)

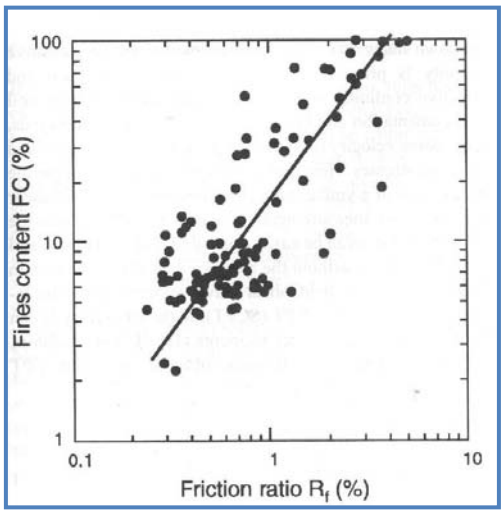


Figure 4.7: Variation of fines content with friction ratio (Suzuki *et al*., 1995)

Robertson and Fear (1995) used this relationship and integrated it with the soil behaviour type index (I_c), this was later updated in 1998. This relationship is shown below:

$$\boldsymbol{if\ I_c} < 126\ apparent\ fines\ content\ FC\ (\%) = \mathbf{0}$$

$$\boldsymbol{if\ 126 \leq I_c\ \leq 35\ apparent\ fines\ content\ FC}\ (\%) = \mathbf{1.75\ I_c^3 - 3.7}$$

$$\boldsymbol{if\ I_c} > 35\ apparent\ fines\ content\ FC\ (\%) = \mathbf{100}$$

5.0 REFERENCES

British Standard BS5930:1999, “Code of practice for site investigations”. BSI, 1999.

BS EN 1997-2:2007 Eurocode 7. Geotechnical design. Ground investigation and testing.

Jamiolkowski, M., Ladd, C.C., Germaine, J.T. and Lancellotta, R. (1985) “New developments in field and laboratory testing of soils”. State-of-the art report. Proceedings of the 11th International Conference on Soil Mechanics and Foundation Engineering, San Francisco, 1, 57-153, Balkema Pub., Rotterdam.

Jefferies, M.G. and Davies, M.P. (1991) “Soil classification by the cone penetration test”: Discussion. Canadian Geotechnical Journal, 28(1), 173-6.

Jones, G.A. and Rust, E. (1995) “Piezocone settlement prediction parameters for embankments on alluvium”. Proceedings of the International Symposium on Cone Penetration Testing, CPT ’95, Linköping, Sweden, 2, 501-8, Swedish Geotechnical Society

Kulhawy, F.H. and Mayne, P.H. (1990) “Manual on estimating soil properties for foundation design”. Electric Power Research Institute, EPRI, August, 1990.

Lord, J.A., Clayton, C.R.I., and Mortimore, R.N. (2002) “Engineering in chalk”. Ciria Guide C574.

Lunne, T. And Kleven, A. (1981) “Role of CPT in North Sea foundation engineering”. Session at the ASCE National Convention: Cone Penetration Testing and Materials, St. Louis, 76-107, American Society of Engineers (ASCE).

Lunne, T. And Christophersen, H.P. (1983) “Interpretation of cone penetrometer data for offshore sands”. Proceedings of the Offshore Technology conference, Richardson, Texas, Paper No. 4464.

Lunne, T., Robertson, P. K. And Powell, J. J. M. (1997) “Cone Penetration testing in Geotechnical Practice”. Blackie.

Mitchell, J.K. and Gardner, W.S. (1975) “In situ measurement of volume change characteristics”. Proceedings of the ASCE Specialty Conference on In Situ Measurements os Soil Properties, Raleigh, North Carolina, 2, 279-345, American Society of Engineers (ASCE).

Robertson, P.K. (1990) “Soil classification using the cone penetration test”. Canadian Geotechnical Journal, 27(1), 151.

Robertson, P.K. and Campanella, R.G. (1983) “Interpretation of cone penetrometer test: Part

1: Sand". Canadian Geotechnical Journal, 20(4), 718-33.

Robertson, P.K. and Fear, C.E. (1995) "Liquefaction of sands and its evaluation. IS TOKYO '95". First International Conference on Earthquake Geotechnical Engineering, Keynote Lecture, November, 1995.

Robertson, P.K. and Wride (Fear), C.E. (1998) "Evaluating cyclic liquefaction potential using the cone penetration test". Can. Geotech. J. Vol. 35.

Robertson, P.K., Campanella, R.G., Gillespie, D. And Greig, J (1986) "Use of piezometer cone data". Proceedings of the ASCE Specialty Conference In Situ '86: Use of In Situ Tests in Geotechnical Engineering, Blacksburg, 1263-80, American Society of Engineers (ACE).

Senneset K. And Janbu, N. (1985) "Shear strength parameters obtained from static cone penetration tests. Strength Testing of Marine Sediments; Laboratory and In Situ Measurements". Symposium, San Diego, 1984, ASTM Special technical publication, STP 883, 41-54.

Senneset, K., Sandven, R. And Janbu, N. (1989) "The evaluation of soil parameters from piezocone tests". Transportation Research Record, No. 1235, 24-37.

Suzuki, Y., Tokimatsu, K., Taya, Y. And Kubota, Y. (1995) "Correlation between CPT data and dynamc properties of in situ frozen samples". Proceedings of the Third International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, St. Louis, 1, 249-52, University of Missouri Rolla.

Topp, G.C., Davis, J.L. and Anna, A.P. (1980). "Electromagnetic determination of soil water content: Measurements in coaxial transmission lines". Water Resiur. Res., 16, 574-582.

Waltham, A.C., 2002. "Foundations of Engineering Geology". Blackie Academic and Professional, 2002.

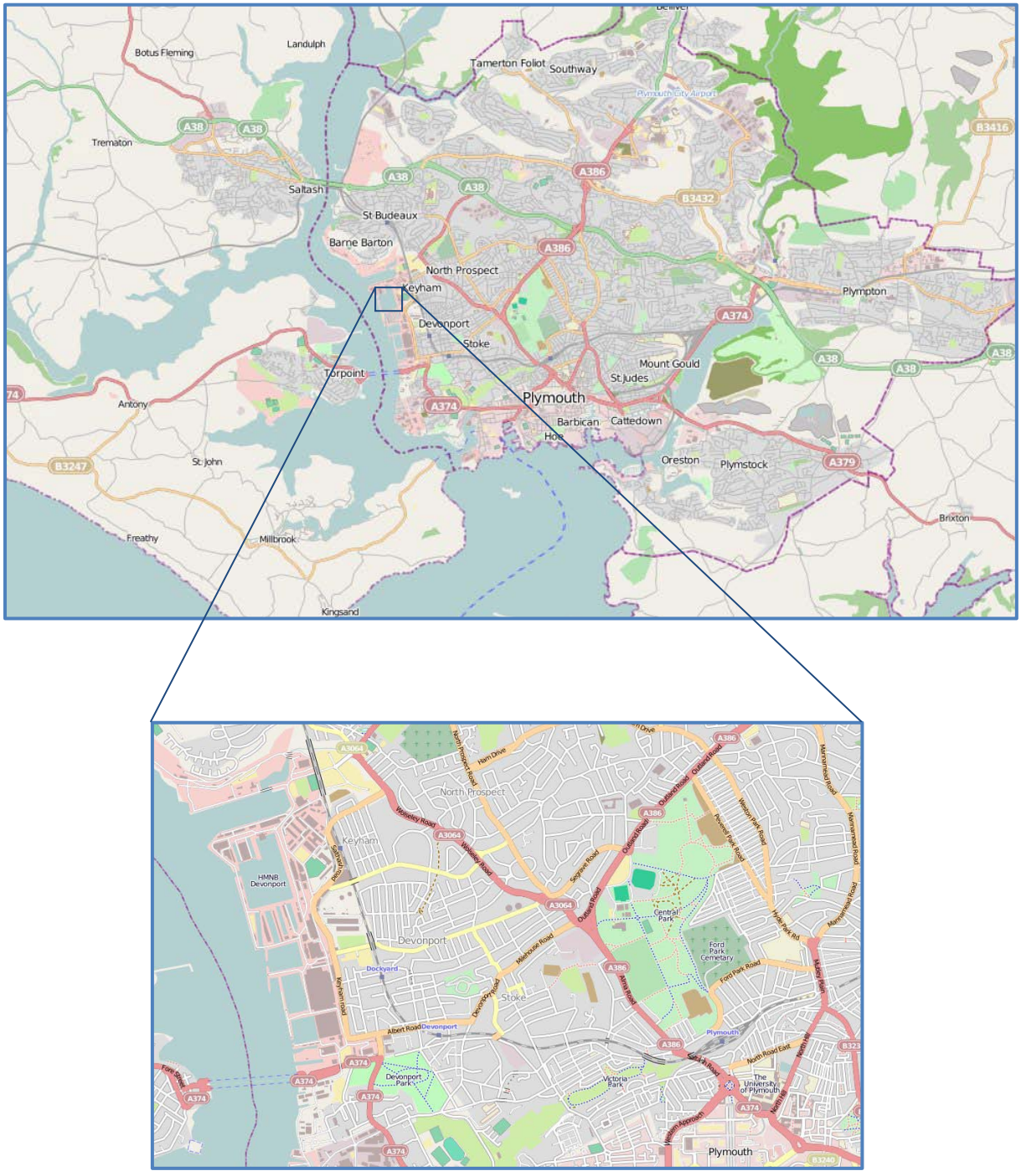
APPENDIX A

GENERAL INFORMATION

LIST OF FIGURES

Description	Pages Included
Site Location Plan	1
CPT Project Summary Sheet	1
Depth Encoder Calibration Certificate	1
21 Tonne Truck Mounted CPT Rig (CPT001) Datasheet	1
CPT Soil Description Table	1
Explanation of Symbols	1

SITE LOCATION PLAN

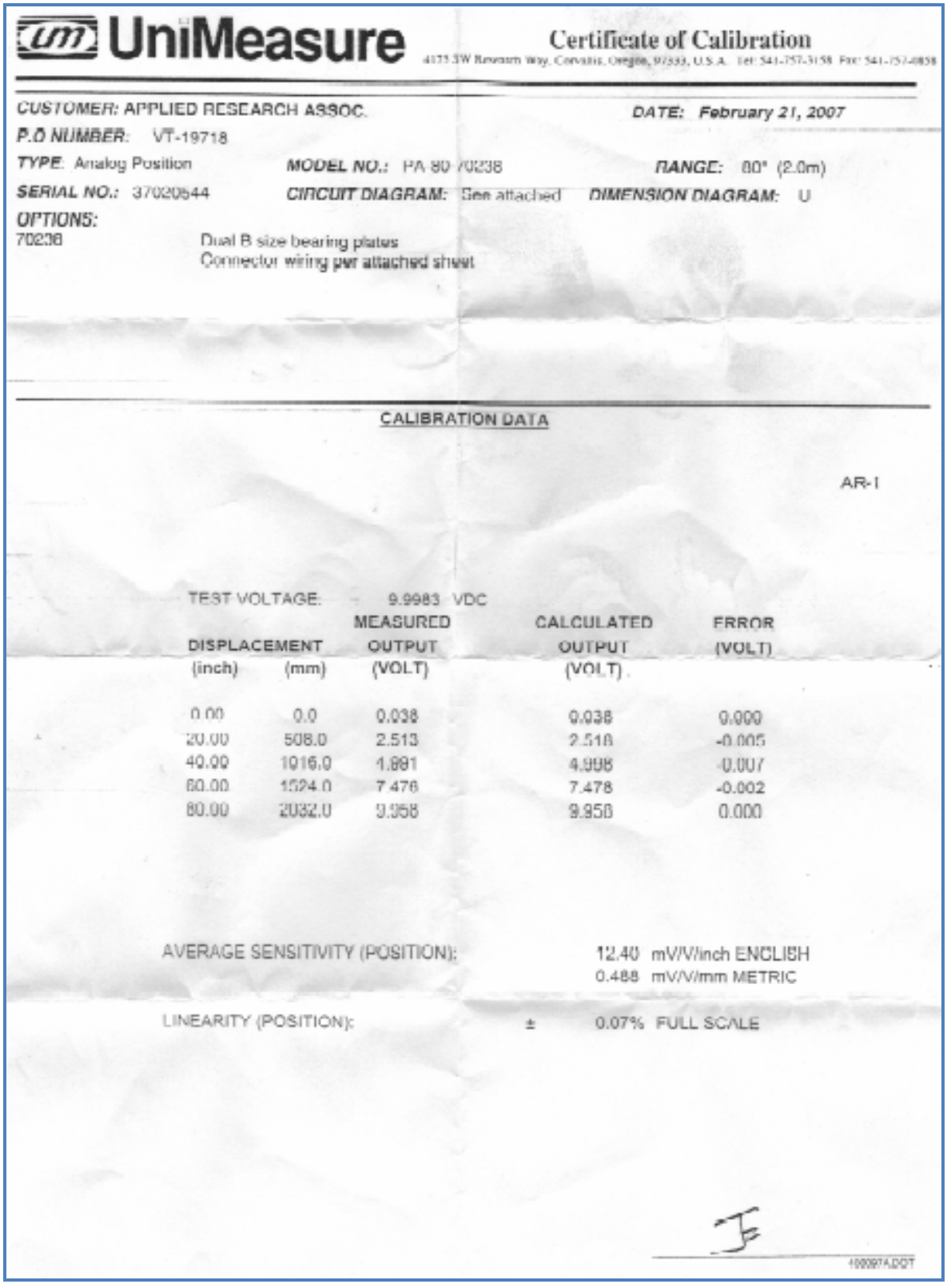


(Maps from Open Street Map)

CPT PROJECT SUMMARY SHEET

HOLE	Final Depth of Test (m)	Date of Test	Cone Used	Test Remarks
C01	20.59m	09/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C02	13.51m	09/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C03	19.09m	08/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C04	10.85m	08/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C05	22.32m	14/07/2010	S15.CFIP.C74	Test Refused on Total Pressure
C06	21.32m	20/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C07	12.54m	20/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C08	19.18m	08/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C09A	18.89m	13/07/2010	S15.CFIP.C74	Test Refused on Total Pressure
C12	10.58m	08/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C13	12.13m	15/07/2010	S15.CFIP.C35	Test Refused on Total Pressure
C14	15.90m	13/07/2010	S15.CFIP.C74	Test Refused on Total Pressure
C15	2.94m	13/07/2010	S15.CFIP.C74	Test Refused on Total Pressure
C16	1.82m	13/07/2010	S15.CFIP.C74	Test Refused on Total Pressure
C17	4.17m	13/07/2010	S15.CFIP.C74	Test Refused on Total Pressure
C18	1.98m	13/07/2010	S15.CFIP.C74	Test Refused on Total Pressure
C20A	18.78m	20/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C21	17.00m	20/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C22	14.91m	20/07/2010	S15.CFIP.D42	Test Refused on Total Pressure
C28	11.78m	20/07/2010	S15.CFIP.D42	Test Refused on Total Pressure

DEPTH ENCODER CALIBRATION CERTIFICATE



UniMeasure

Certificate of Calibration

4173 SW Reservoir Way, Corvallis, Oregon, 97333, U.S.A. Tel: 541-757-3158 Fax: 541-757-4858

CUSTOMER: APPLIED RESEARCH ASSOC. DATE: February 21, 2007

P.O NUMBER: VT-19718

TYPE: Analog Position MODEL NO.: PA 80 70238 RANGE: 80" (2.0m)

SERIAL NO.: 37020544 CIRCUIT DIAGRAM: See attached DIMENSION DIAGRAM: U

OPTIONS:

70238 Dual B size bearing plates
Connector wiring per attached sheet

CALIBRATION DATA

AR-1

TEST VOLTAGE: 9.9983 VDC

DISPLACEMENT (inch)	DISPLACEMENT (mm)	MEASURED OUTPUT (VOLT)	CALCULATED OUTPUT (VOLT)	ERROR (VOLT)
0.00	0.0	0.038	0.038	0.000
20.00	508.0	2.513	2.518	-0.005
40.00	1016.0	4.991	4.998	-0.007
60.00	1524.0	7.476	7.478	-0.002
80.00	2032.0	9.958	9.958	0.000

AVERAGE SENSITIVITY (POSITION): 12.40 mV/V/inch ENGLISH
0.488 mV/V/mm METRIC

LINEARITY (POSITION): ± 0.07% FULL SCALE

100097A.DOT

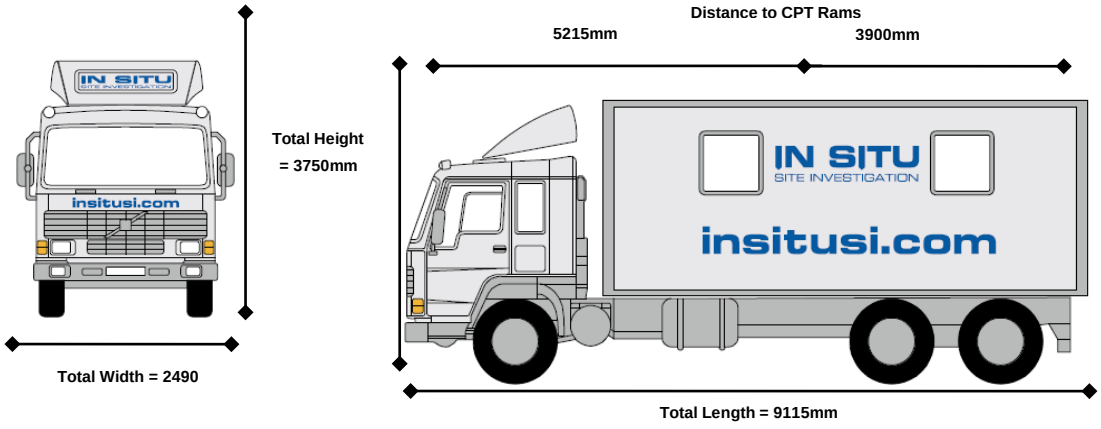
20 TONNE CPT TRUCK MOUNTED RIG

CPT Rig Details	
Drive System	6x4 Wheel Drive
Total Weight	21 Tonnes
Ground Bearing Pressure	75kPa
CPT Ram Thrust Capacity	20 Tonnes
Maximum Penetration	30-40m depending on the ground conditions.
Performance Rates	100-150m of testing in a day depending on access to positions.
Typical Sites for this Rig	Hard standing sites, e.g. Roads, car parks. Dry non hard standing sites.





Truck Dimensions



SOIL DESCRIPTION TABLES

GRANULAR SOILS (Sands and Gravels)

Description	Cone Resistance (*qc*) (MPa)
Very Loose	0 – 2
Loose	2 – 4
Medium Dense	4 – 12
Dense	12 – 20
Very Dense	>20

COHESIVE SOILS (Clays)

Description	Cone Resistance (q_c) (MPa)	Equivalent S_u value from q_c (kPa)
Very Soft	0 – 0.3	0 –20
Soft	0.3 – 0.5	20 – 40
Firm	0.5 – 1.0	40 – 75
Stiff	1.0 – 2.0	75 – 150
Very stiff	2.0-4.0	150-300
Hard	>4.0	>300

(from Waltham, 2002)

EXPLANATION OF SYMBOLS

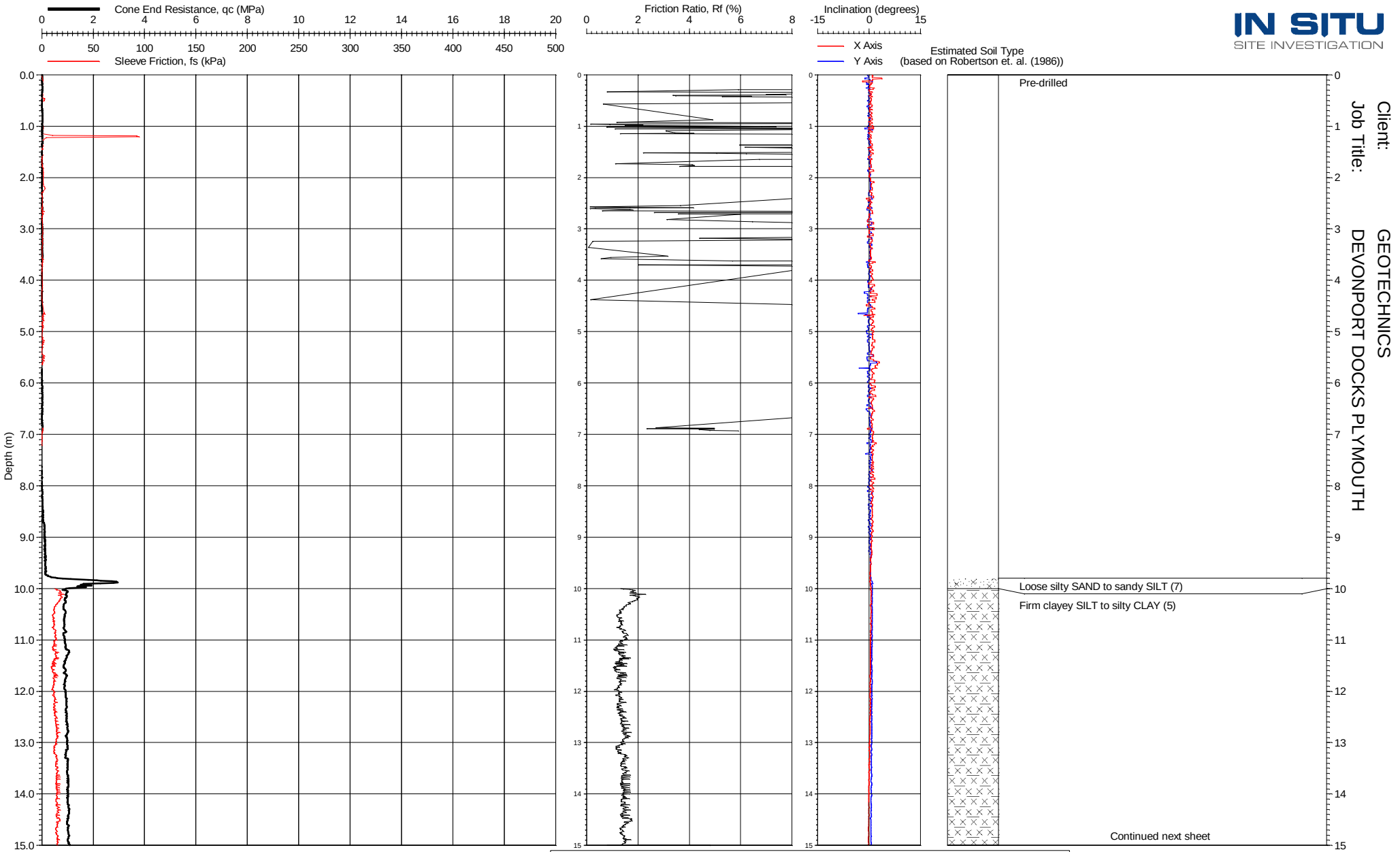
a (α) = area ratio of the cone ($=A_n/A_c$)
A_c = projected area of the cone
A_n = cross-sectional area of shaft
B_q = pore pressure parameter ($=(u_2-u_0)/(q_t-\sigma_{vo})$)
c_h = horizontal coefficient of consolidation
Dr = relative density $\left(D_r = \frac{e_{max} - e}{e_{max} - e_{min}} \times 100\%\right)$
e = void ratio
e_o = initial void ratio
e_{max} = maximum void ratio
e_{min} = minimum void ratio
f_s = unit sleeve friction
FC = fines content
I_c = soil behaviour type index
I_r = rigidity index = G/s_u
m_v = coefficient of volume change
M = constrained deformation modulus
N = no. Of blows in the SPT
N_k or N_{kt} cone factor
N_{60} = SPT energy ratio
q_c = measured cone resistance
q_e = effective cone resistance = (q_t-u_2)
q_n = net cone resistance = $(q_t-\sigma_{vo})$
q_t = corrected cone resistance = $q_c+(1-a)u_2$
Q_t = normalised cone resistance = $(q_t-\sigma_{vo})/\sigma'_{vo}$
R_f = friction ratio ($=(f_s/q_c)\times100\%$)
s_u = undrained shear strength
t_{50} = time for 50% dissipation of measured pore pressure
u_0 = in situ pore pressure
u_1 = pore pressure measured on the cone
u_2 = pore pressure measured behind the cone
Δu = measured pore water pressure
φ = total friction ratio

APPENDIX B

CPT RESULTS

LIST OF FIGURES

Description	Pages Included
CPT C01 – CPT C28 (Printed on Form CPT0001) Estimated Soil Behaviour Type Plot	29
CPT C01 – CPT C28 (Printed on Form CPT0002) Measured Pore Pressure Plot	29



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	09/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C01
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

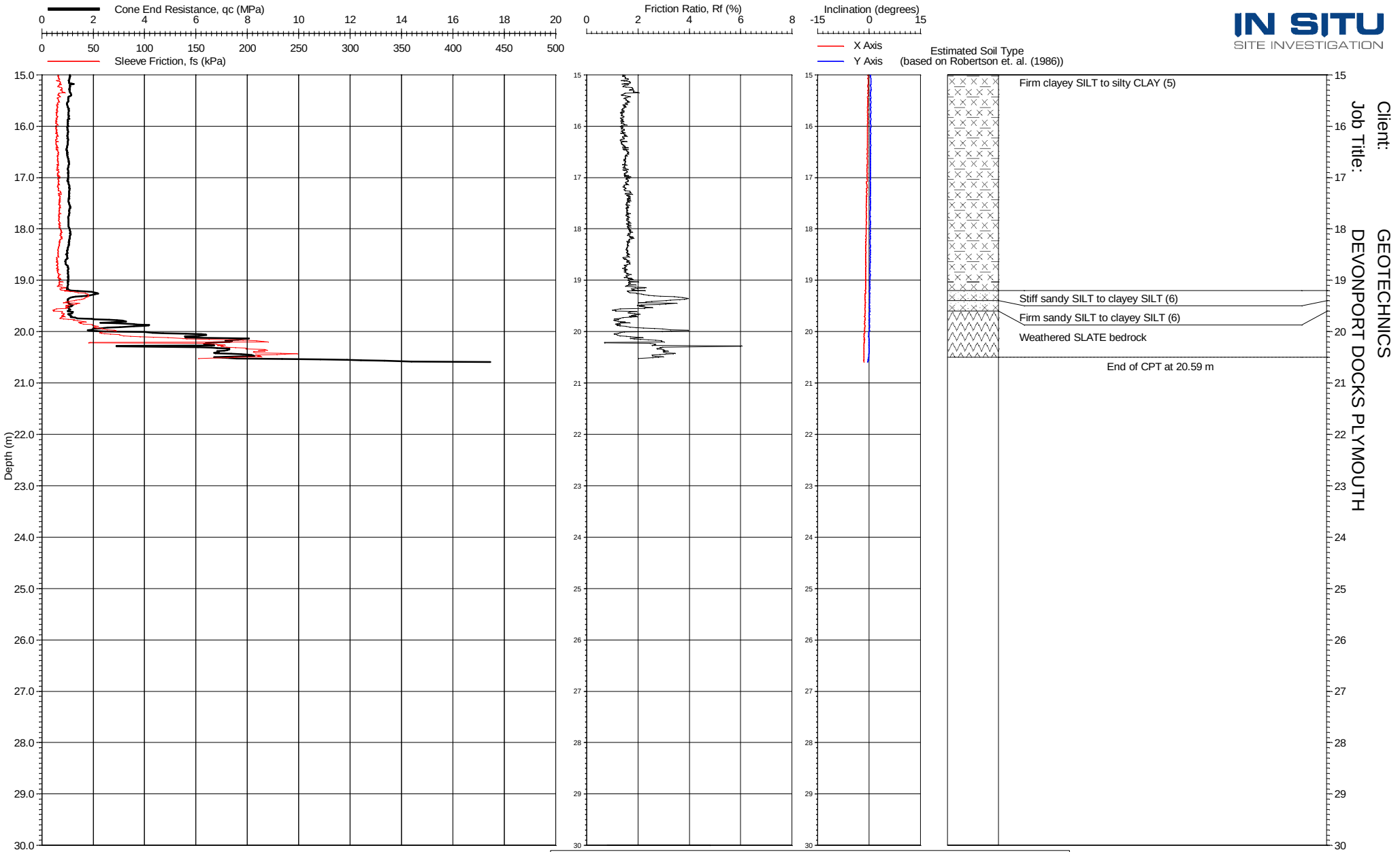
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Sleeve Zero Pre:	120.5000 mV	Sleeve Zero Post:	120.5000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	219.7000 mV	Pore Pressure Zero Post:	219.7000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C01

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	09/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C01
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

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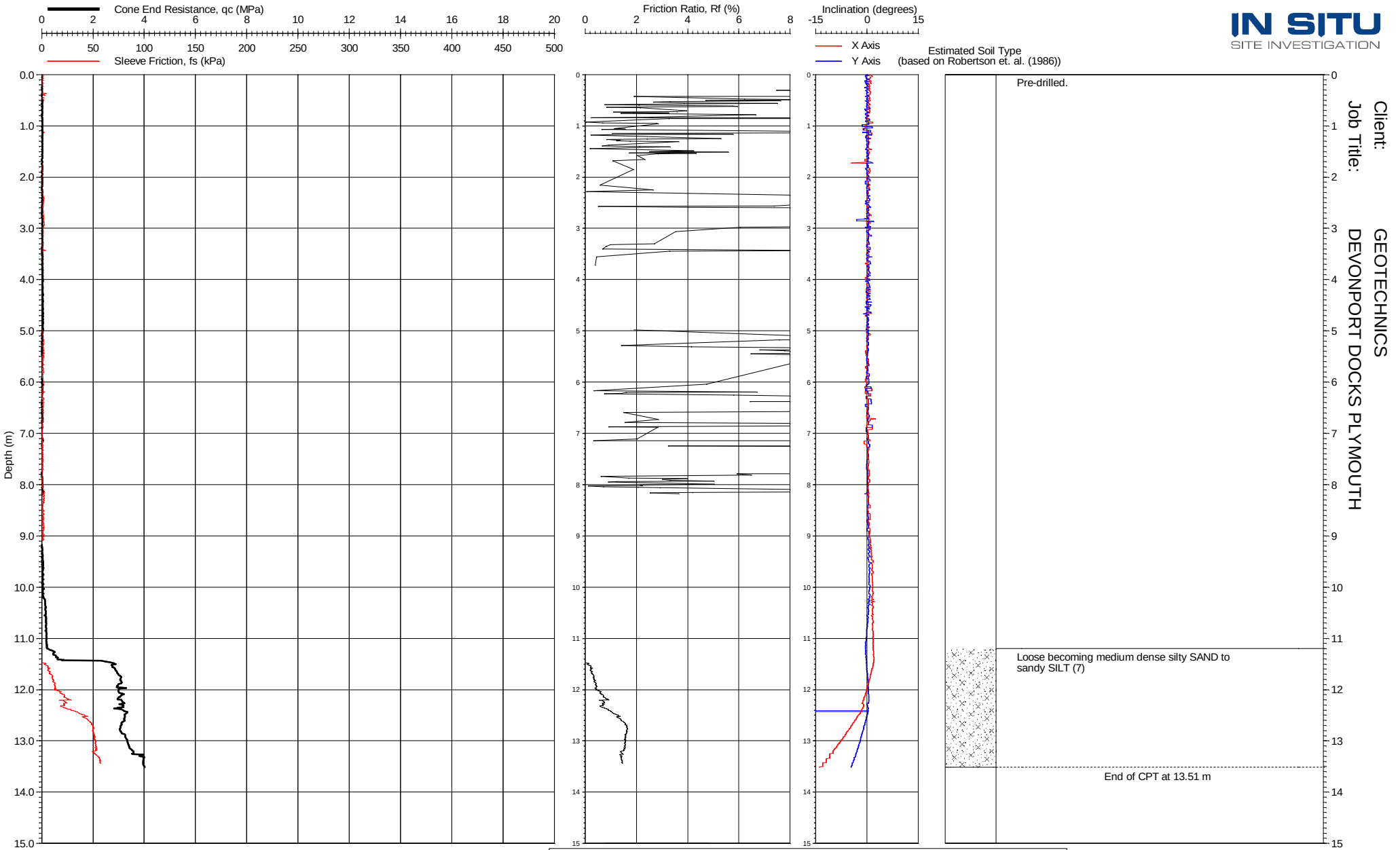
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Sleeve Zero Pre:	120.5000 mV	Sleeve Zero Post:	120.5000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	219.7000 mV	Pore Pressure Zero Post:	219.7000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C01

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	09/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C02
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

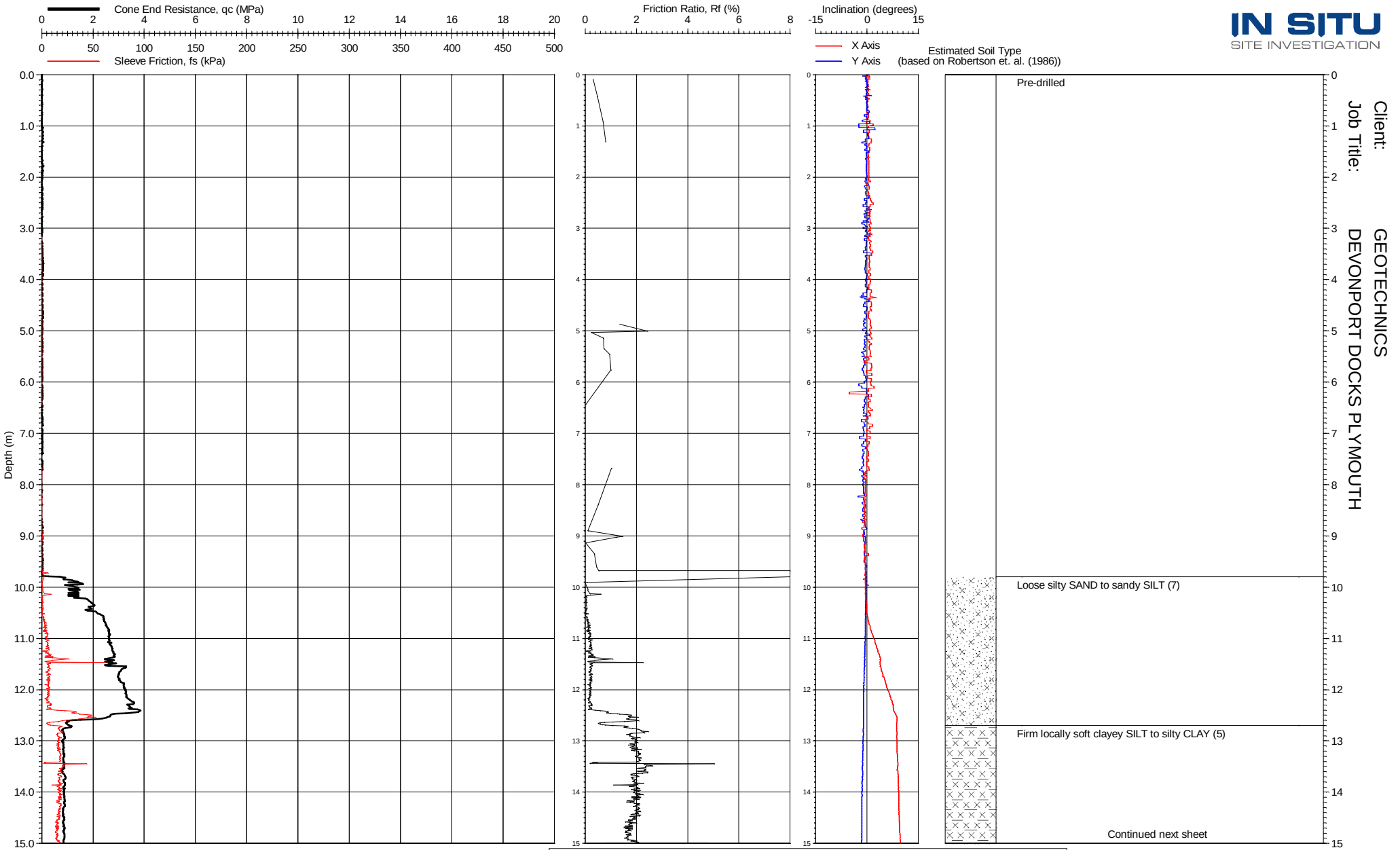
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Pore Pressure Zero Pre:	300.5000 mV	Pore Pressure Zero Post:	300.5000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C02

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	08/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C03
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

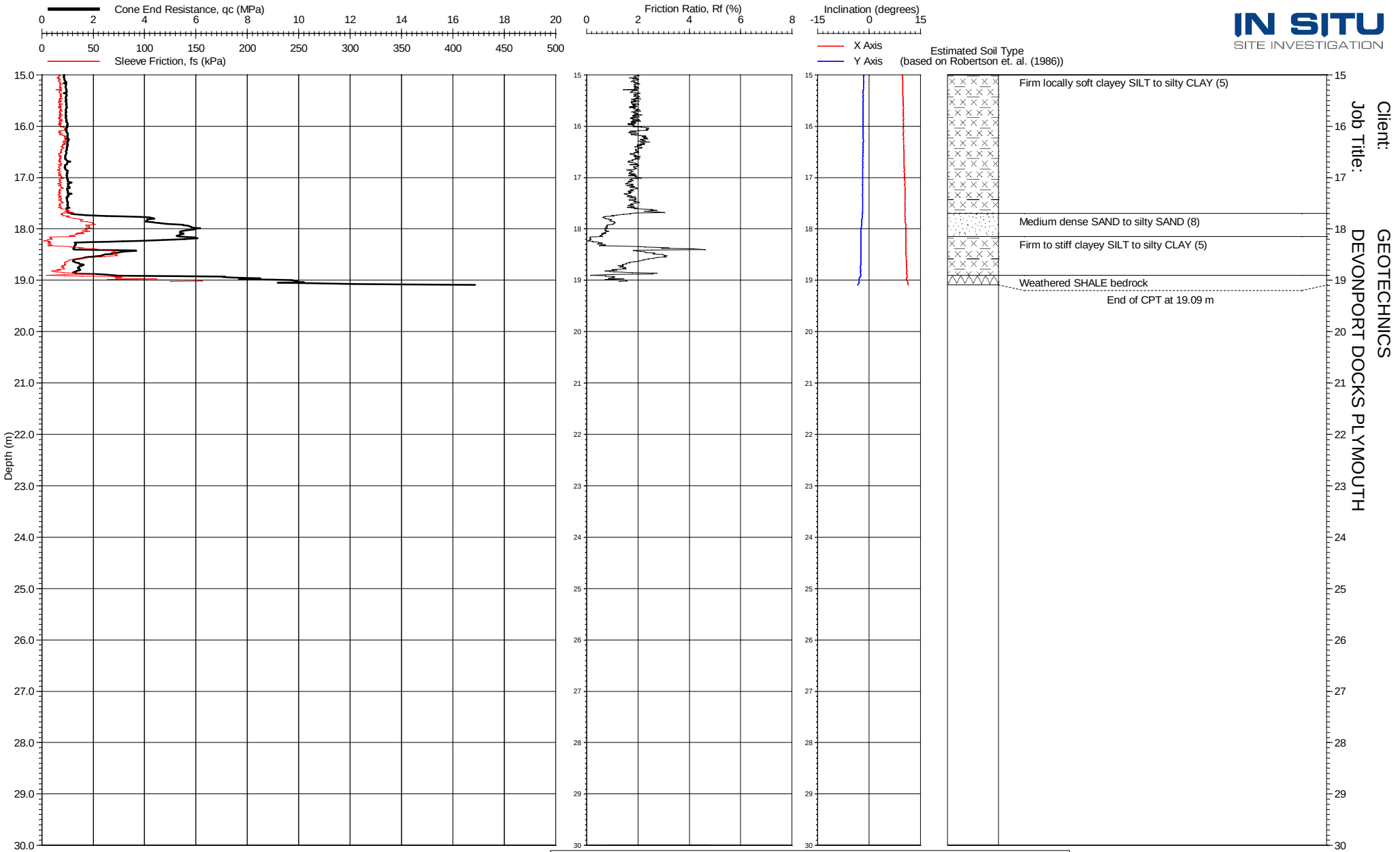
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Sleeve Zero Pre:	120.5000 mV	Sleeve Zero Post:	120.5000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	219.7000 mV	Pore Pressure Zero Post:	219.7000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C03

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	08/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C03
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

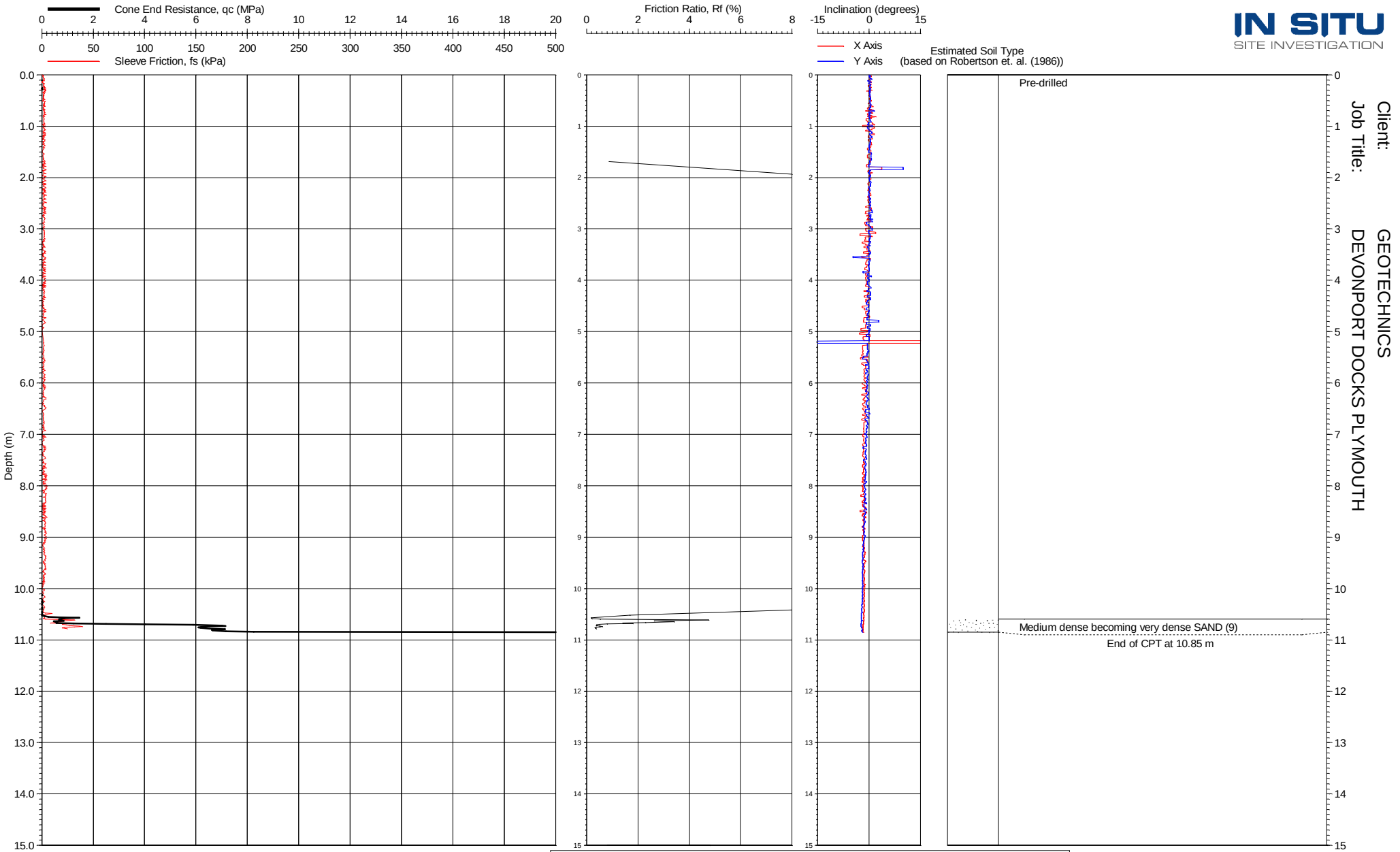
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Sleeve Zero Pre:	120.5000 mV	Sleeve Zero Post:	120.5000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	219.7000 mV	Pore Pressure Zero Post:	219.7000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C03

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	08/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C04
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Remarks:	Test refused on total pressure.		

PCPT Zero Values

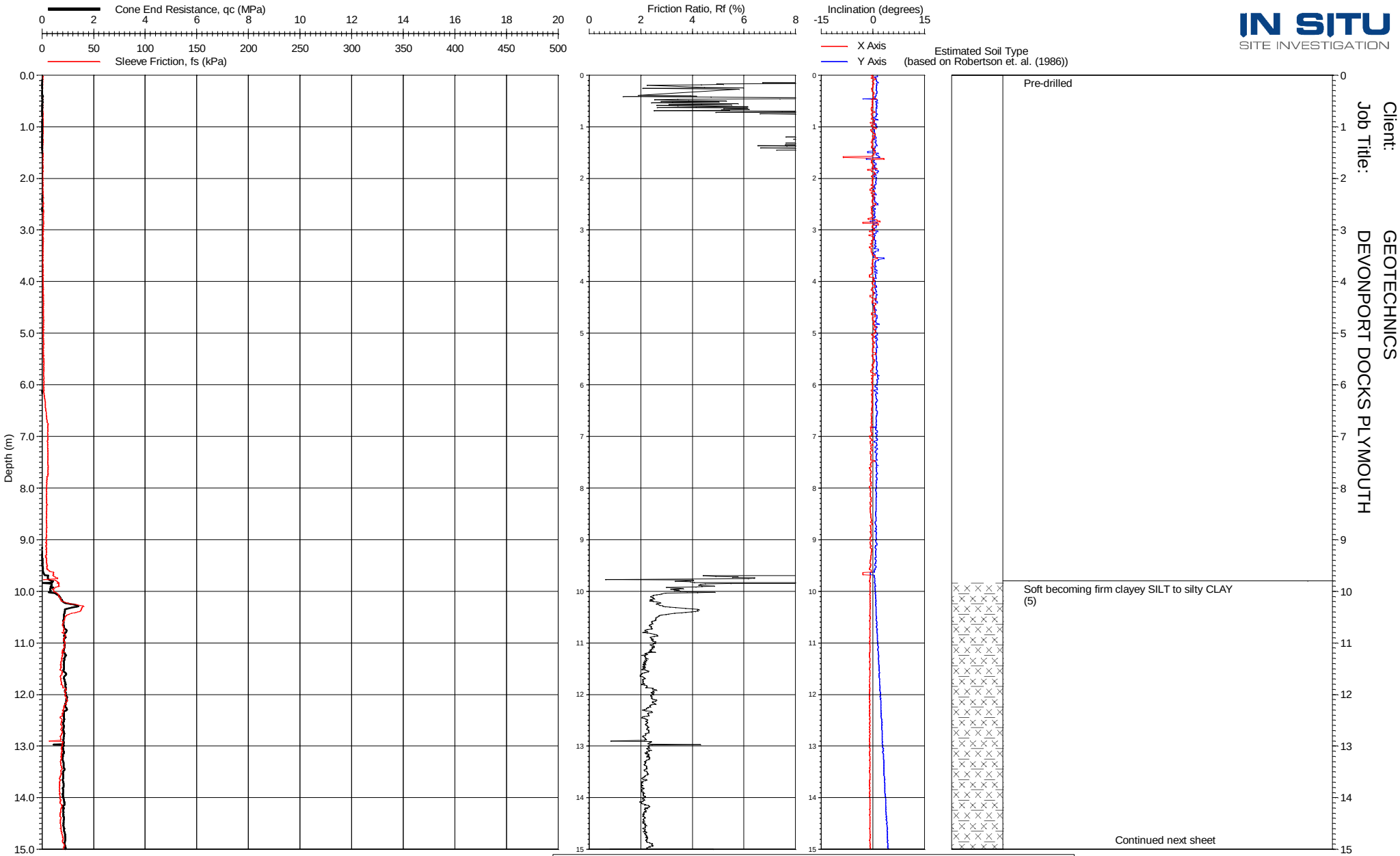
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Pore Pressure Zero Pre:	219.6000 mV	Pore Pressure Zero Post:	219.6000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C04

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	14/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C05
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

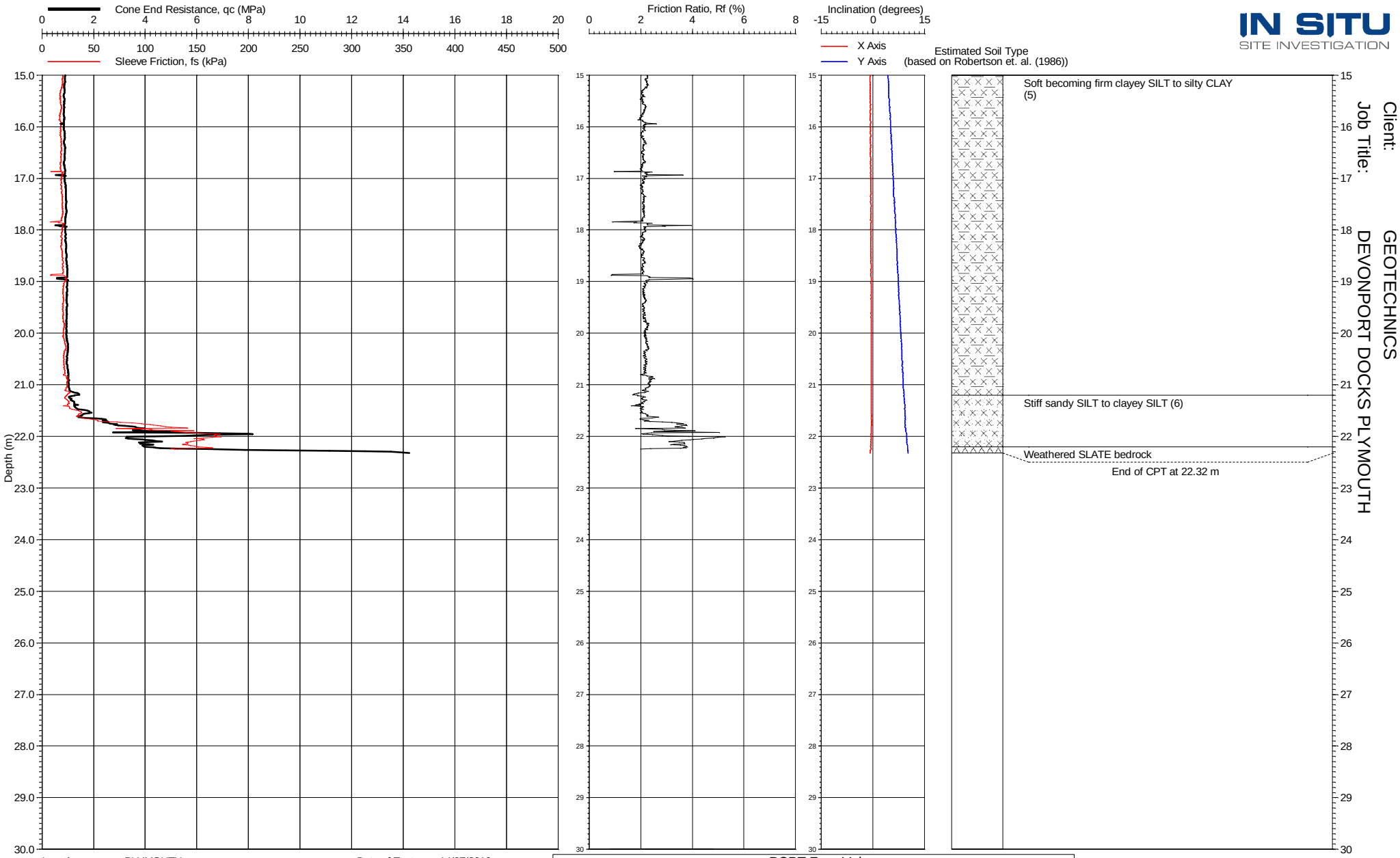
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Sleeve Zero Pre:	157.9000 mV	Sleeve Zero Post:	167.1000 mV	Sleeve Zero Difference:	-5.5057 %
Pore Pressure Zero Pre:	236.6000 mV	Pore Pressure Zero Post:	48.9000 mV	Pore Pressure Zero Difference:	383.8446 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C05

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	14/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C05
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

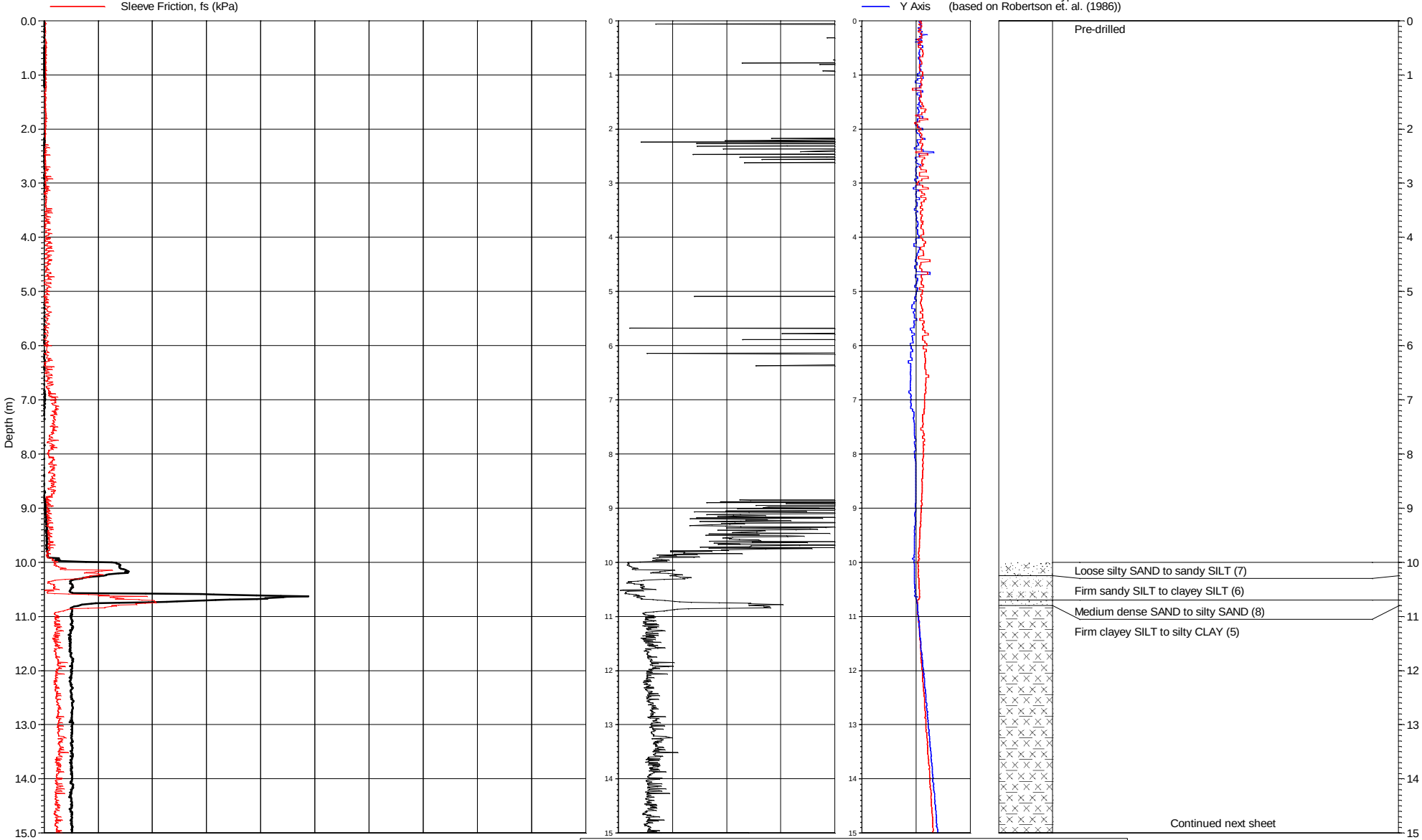
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Sleeve Zero Pre:	157.9000 mV	Sleeve Zero Post:	167.1000 mV	Sleeve Zero Difference:	-5.5057 %
Pore Pressure Zero Pre:	236.6000 mV	Pore Pressure Zero Post:	48.9000 mV	Pore Pressure Zero Difference:	383.8446 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C05

insitusi.com

Form: CPT0001



IN SITU SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C06
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

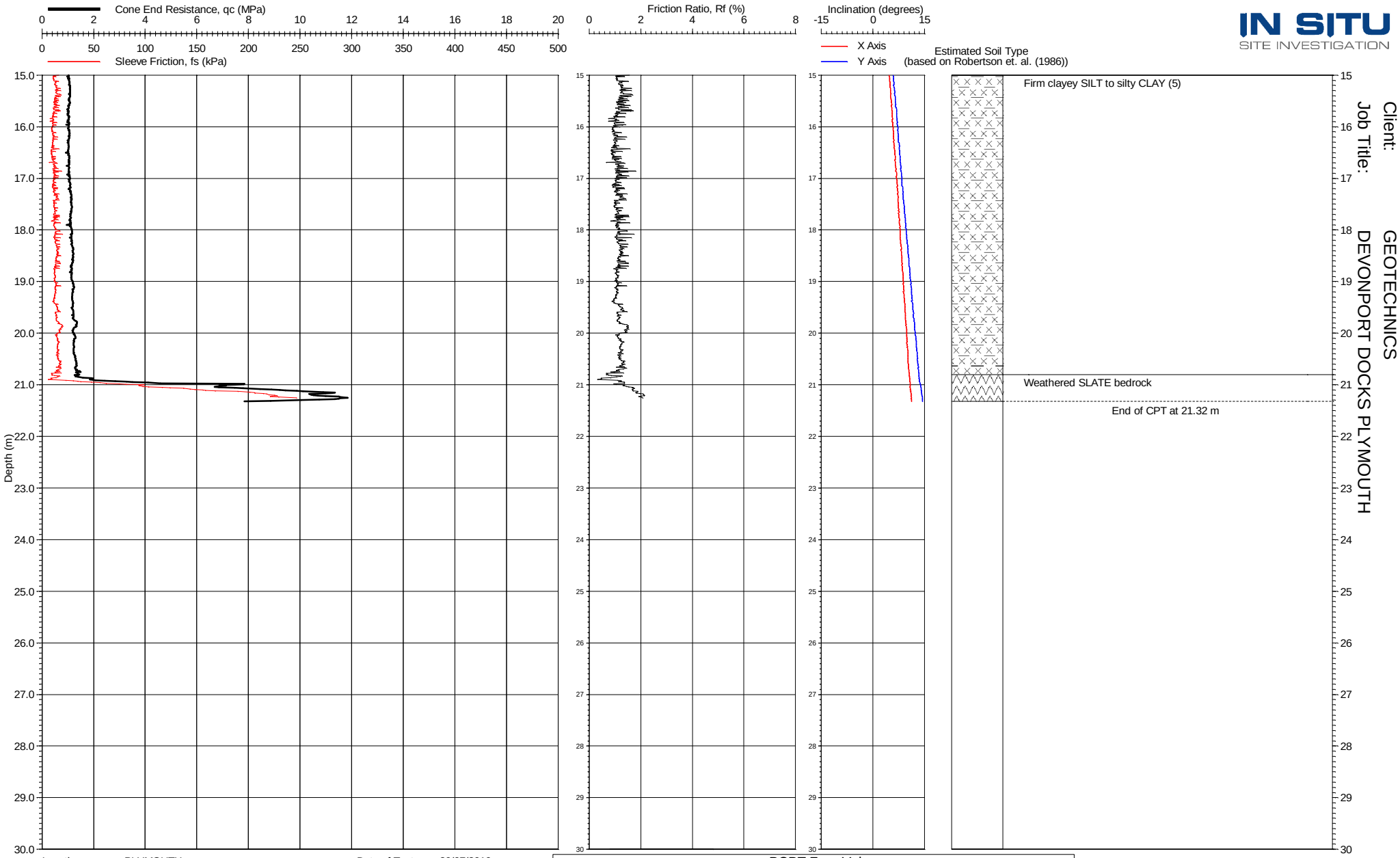
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Sleeve Zero Pre:	114.4000 mV	Sleeve Zero Post:	116.5000 mV	Sleeve Zero Difference:	-1.8026 %
Pore Pressure Zero Pre:	295.0000 mV	Pore Pressure Zero Post:	303.8000 mV	Pore Pressure Difference:	-2.8966 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C06

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client:
Job Title: GEOTECHNICS DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C06
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

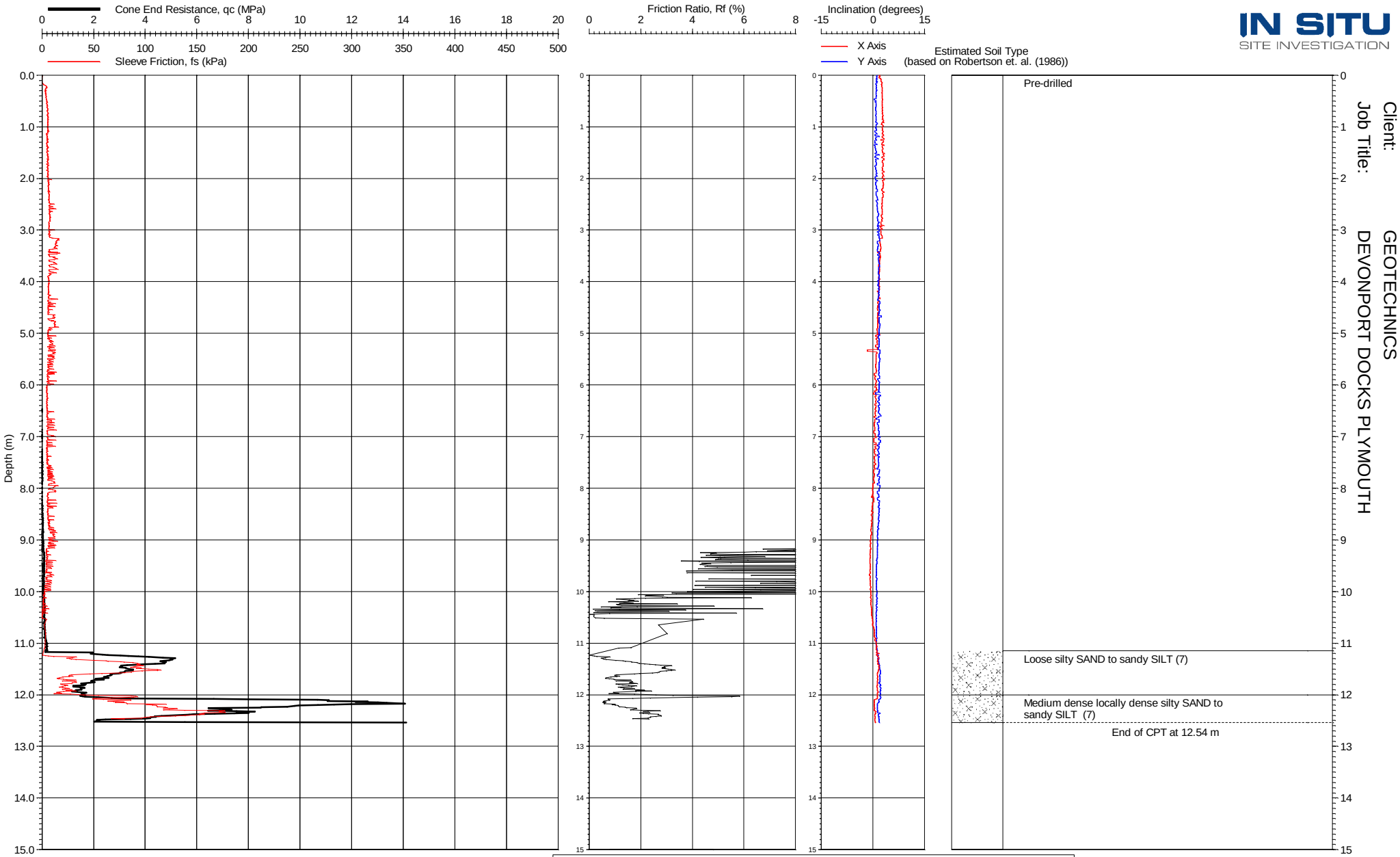
Tip Zero Pre:	192.5000 mV	Tip Zero Post:	195.4000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	114.4000 mV	Sleeve Zero Post:	116.5000 mV	Sleeve Zero Difference:	-1.8026 %
Pore Pressure Zero Pre:	295.0000 mV	Pore Pressure Zero Post:	303.8000 mV	Pore Pressure Difference:	-2.8966 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C06

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C07
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

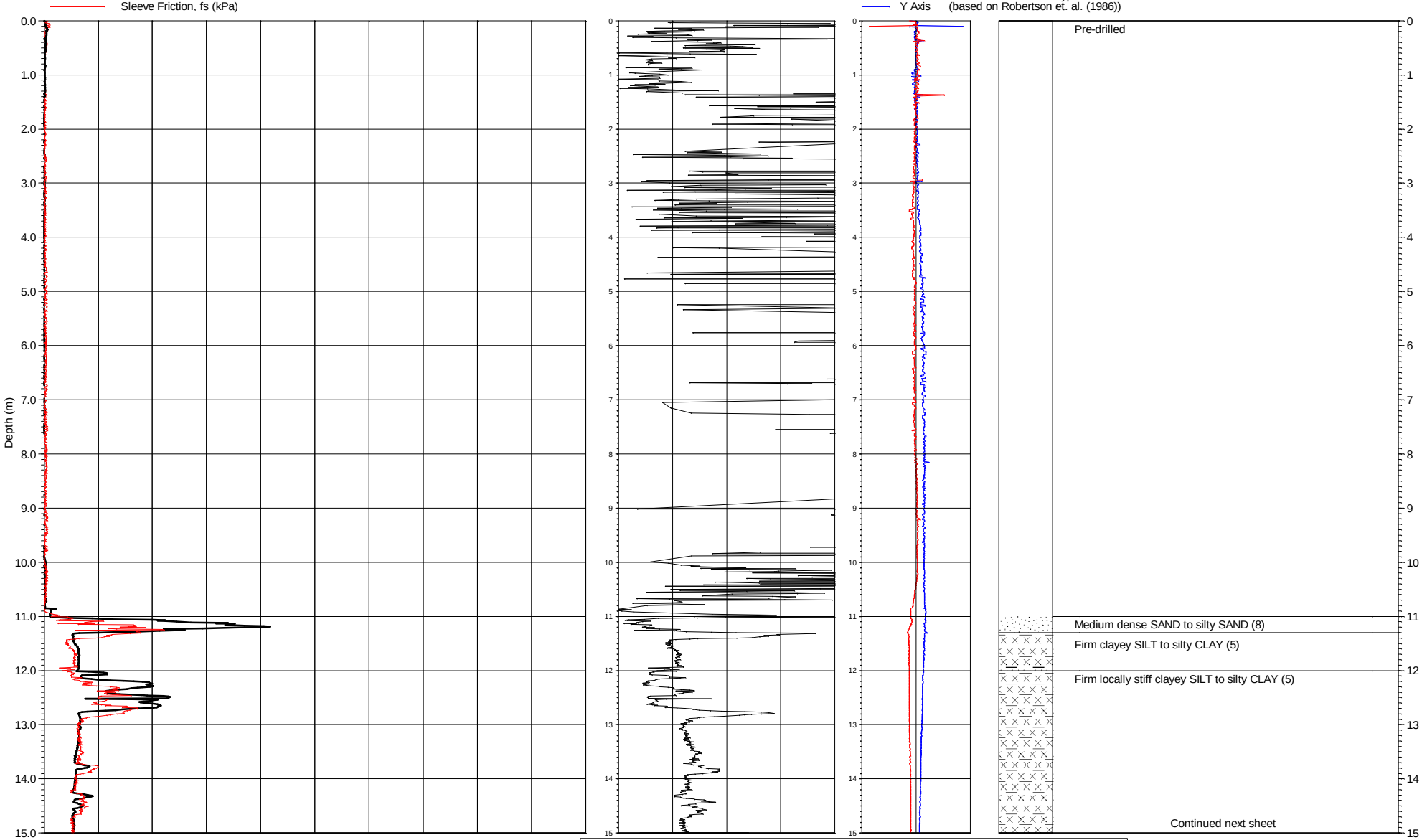
Tip Zero Pre:	195.6000 mV	Tip Zero Post:	196.7000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	112.9000 mV	Sleeve Zero Post:	120.1000 mV	Sleeve Zero Difference:	-5.9950 %
Pore Pressure Zero Pre:	303.4000 mV	Pore Pressure Zero Post:	278.8000 mV	Pore Pressure Difference:	8.8235 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C07

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	08/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C08
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

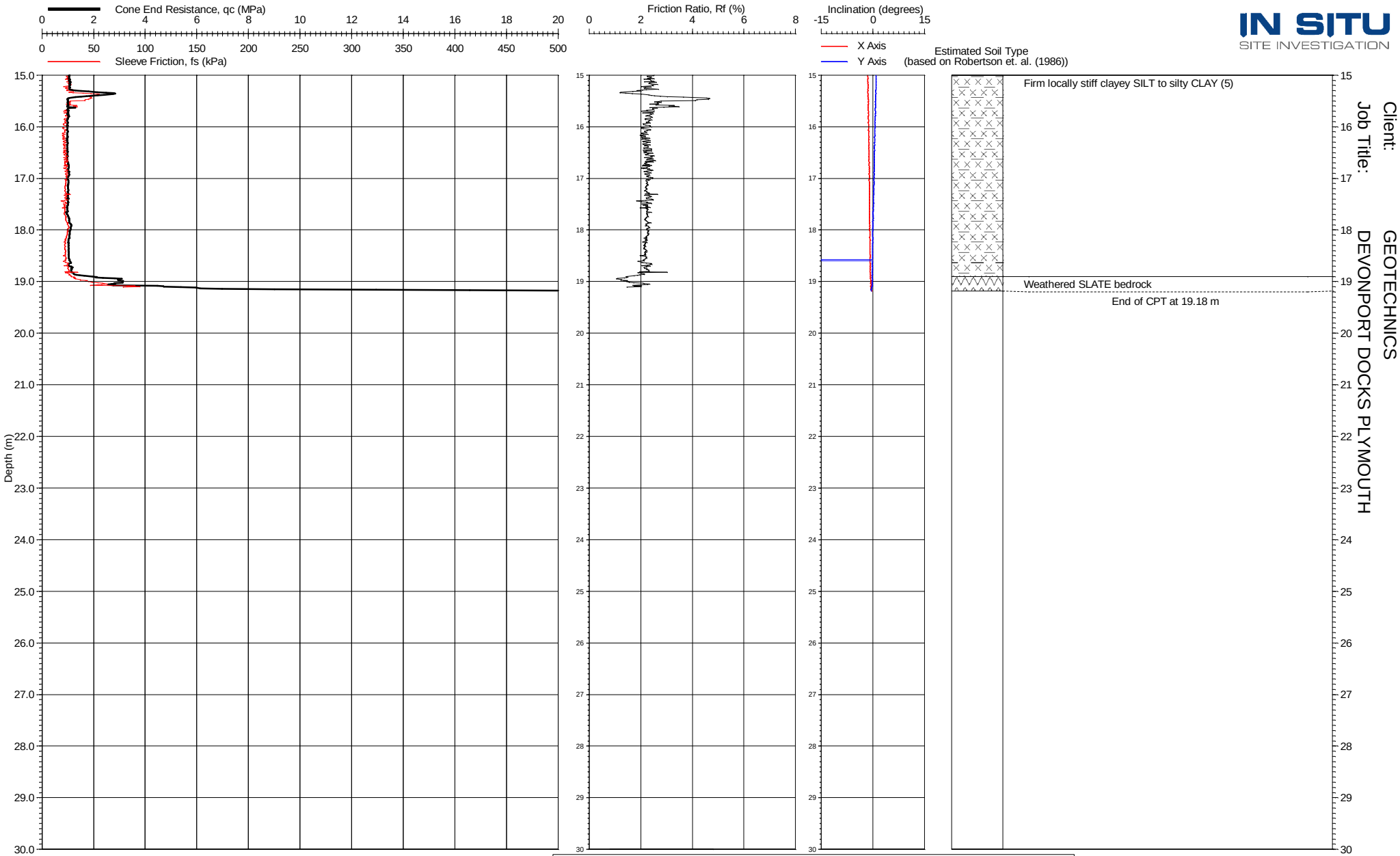
Tip Zero Pre:	190.1000 mV	Tip Zero Post:	190.1000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	110.6000 mV	Sleeve Zero Post:	110.6000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	222.2000 mV	Pore Pressure Zero Post:	222.2000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C08

insitusi.com

Form: CPT0001



IN SITU SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	08/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C08
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

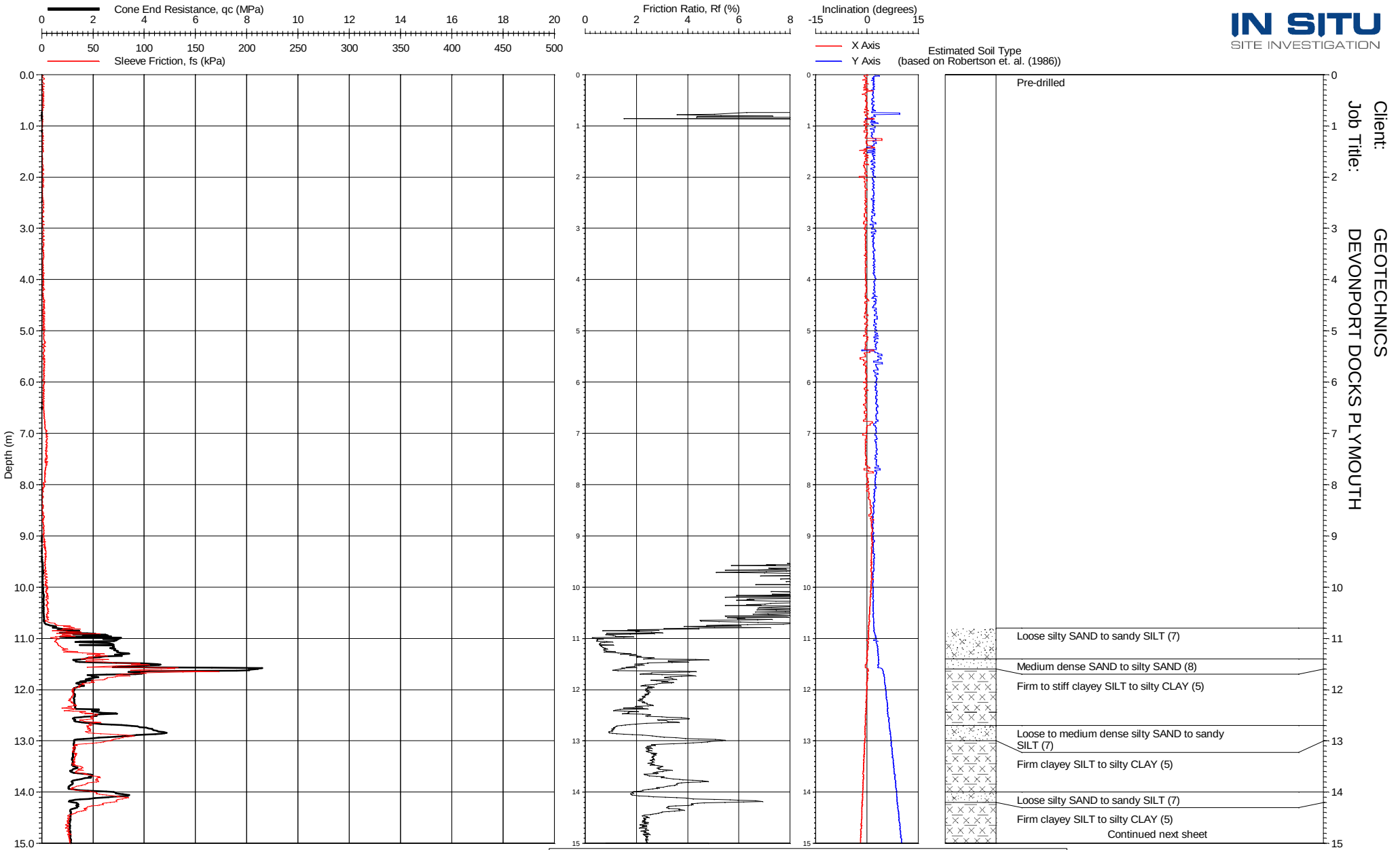
Tip Zero Pre:	190.1000 mV	Tip Zero Post:	190.1000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	110.6000 mV	Sleeve Zero Post:	110.6000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	222.2000 mV	Pore Pressure Zero Post:	222.2000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C08

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	13/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C09A
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

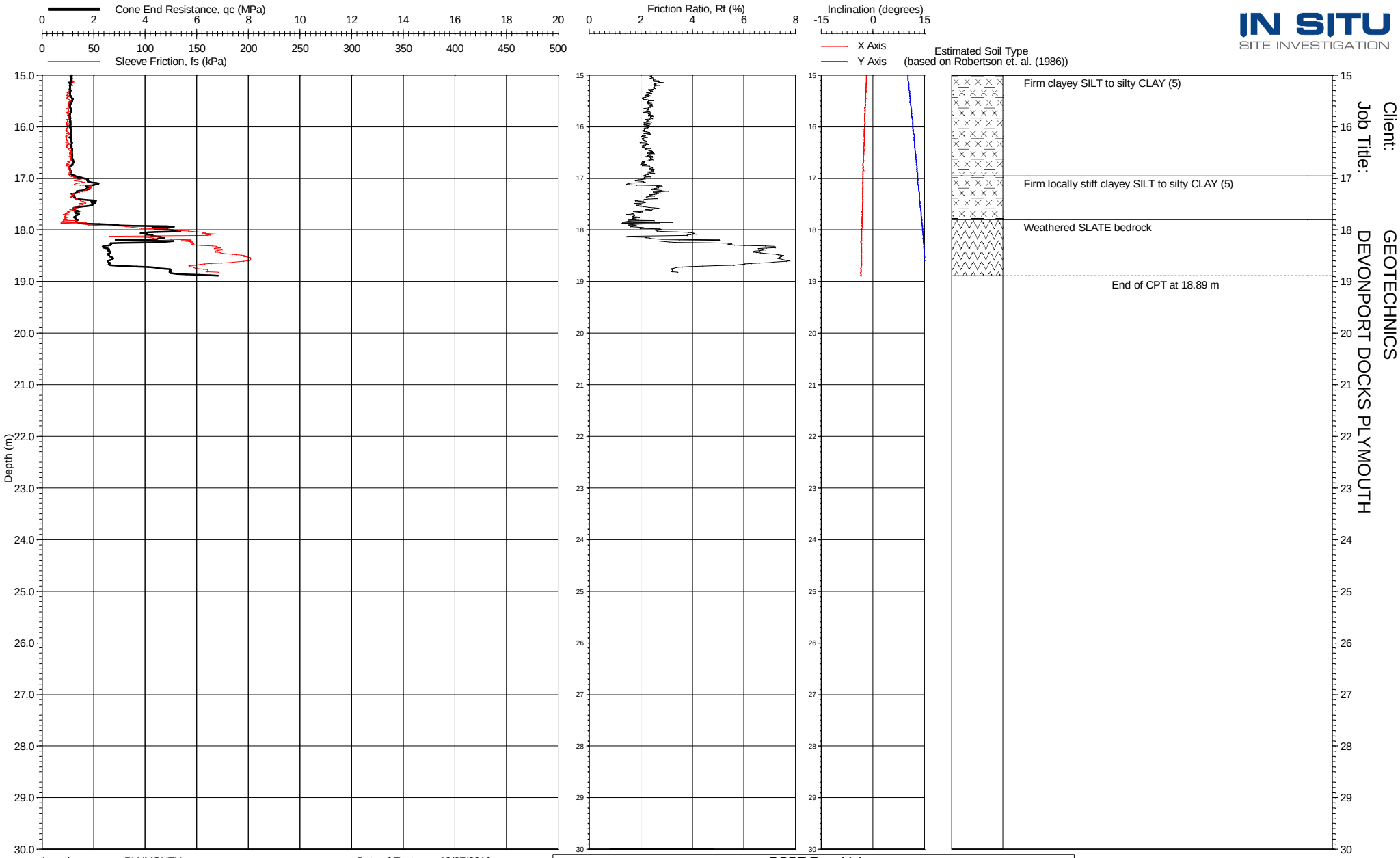
Tip Zero Pre:	198.1000 mV	Tip Zero Post:	198.9000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	163.1000 mV	Sleeve Zero Post:	163.5000 mV	Sleeve Zero Difference:	-0.2446 %
Pore Pressure Zero Pre:	245.2000 mV	Pore Pressure Zero Post:	258.1000 mV	Pore Pressure Difference:	-4.9981 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C09A

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client:

Job Title: GEOTECHNICS
DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	13/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C09A
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

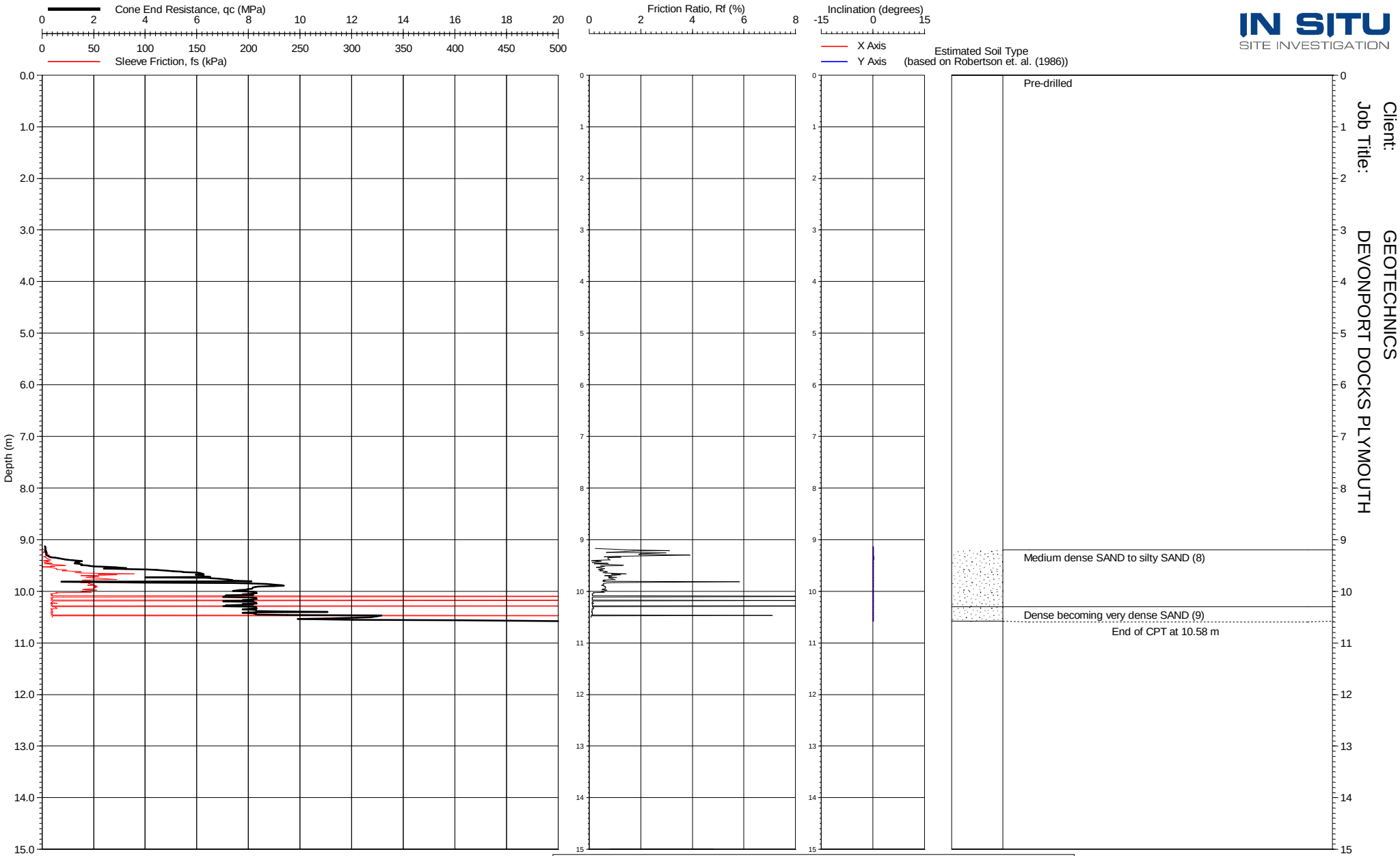
Tip Zero Pre:	198.1000 mV	Tip Zero Post:	198.9000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	163.1000 mV	Sleeve Zero Post:	163.5000 mV	Sleeve Zero Difference:	-0.2446 %
Pore Pressure Zero Pre:	245.2000 mV	Pore Pressure Zero Post:	258.1000 mV	Pore Pressure Difference:	-4.9981 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C09A

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	08/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C12
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

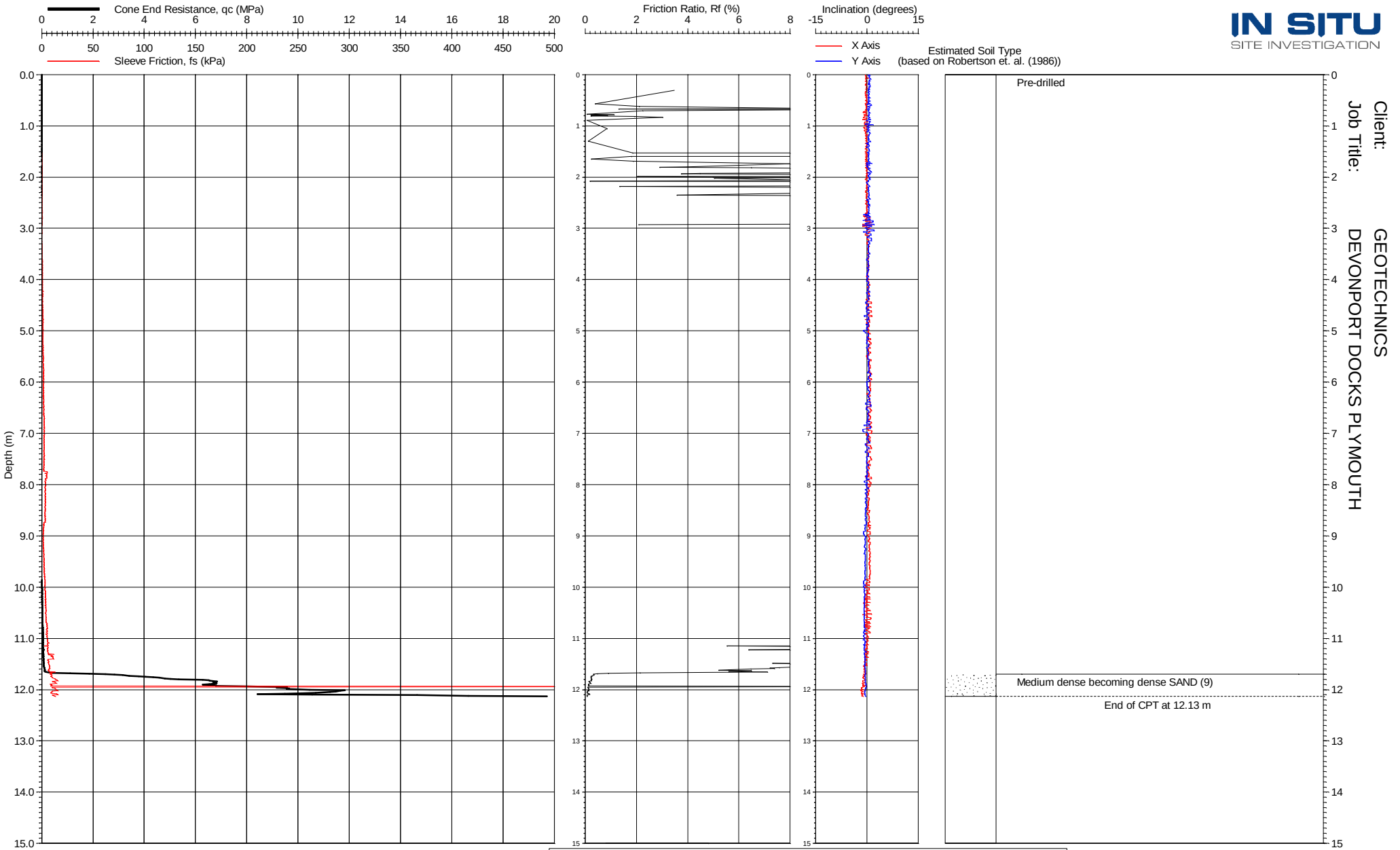
Tip Zero Pre:	189.8000 mV	Tip Zero Post:	189.8000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	120.5000 mV	Sleeve Zero Post:	120.5000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	219.7000 mV	Pore Pressure Zero Post:	219.7000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C12

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	15/07/2010
Coordinates:	0.000E - 0.000N	Date of Plot:	30/07/2010
Ground Level:	0.00 m	File Name:	1100127 - C13
Cone & Rig Used:	S15CFIIP.C35 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

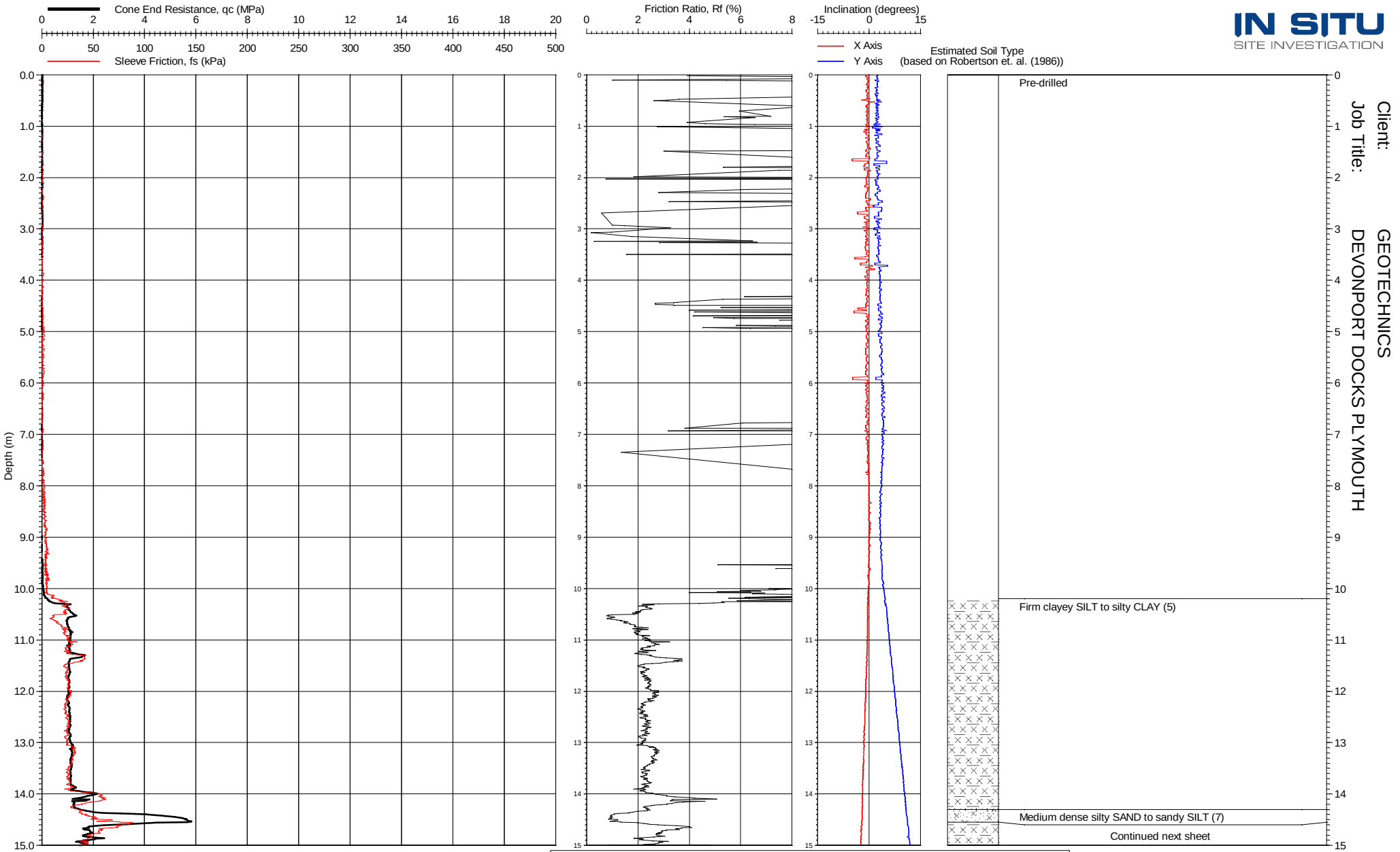
Tip Zero Pre:	199.2000 mV	Tip Zero Post:	175.9000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	216.9000 mV	Sleeve Zero Post:	2500.9000 mV	Sleeve Zero Difference:	-91.3271 %
Pore Pressure Zero Pre:	261.0000 mV	Pore Pressure Zero Post:	272.1000 mV	Pore Pressure Difference:	-4.0794 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C13

insitusi.com

Form: CPT0001



IN SITU SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	13/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C14
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

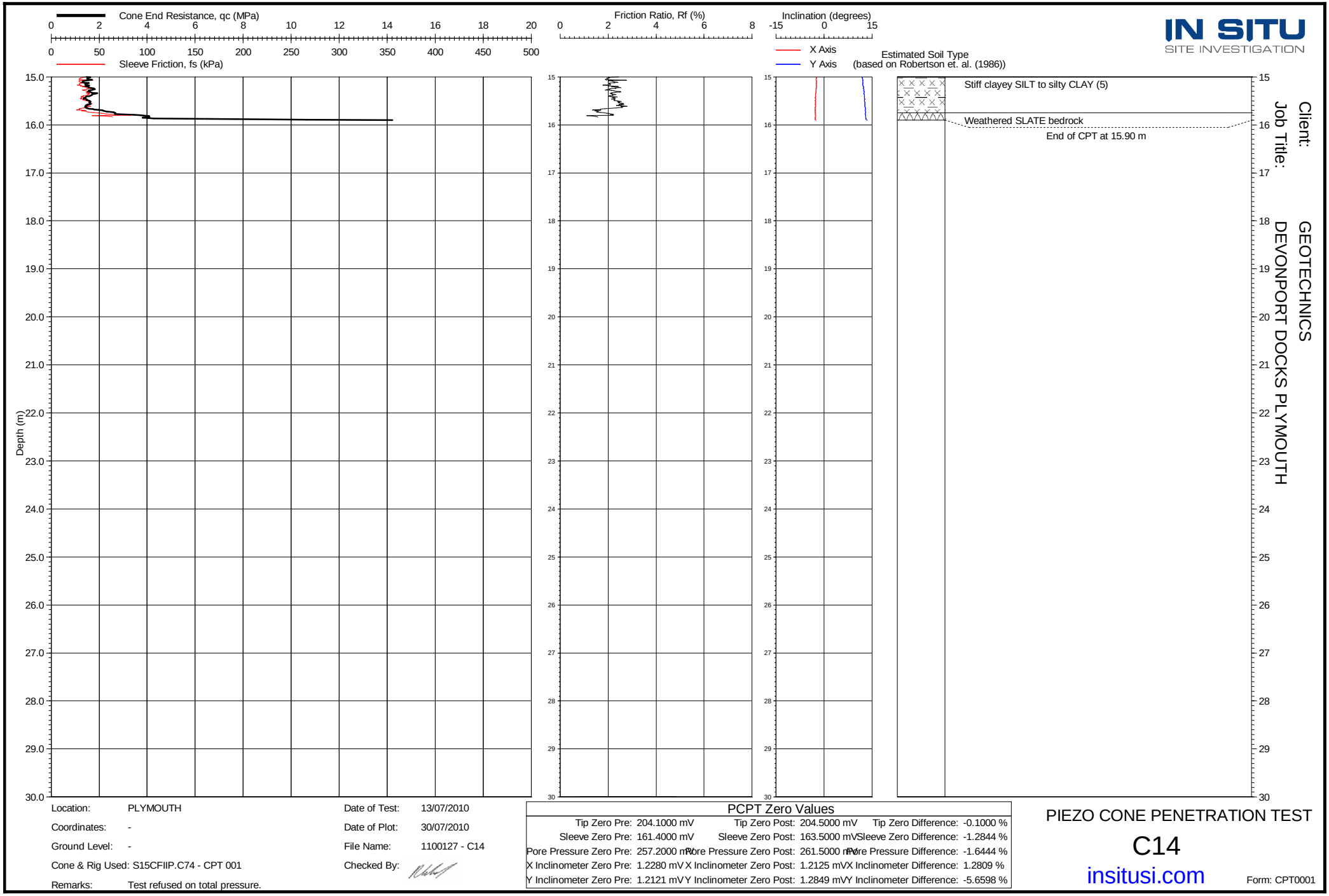
Tip Zero Pre:	204.1000 mV	Tip Zero Post:	204.5000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	161.4000 mV	Sleeve Zero Post:	163.5000 mV	Sleeve Zero Difference:	-1.2844 %
Pore Pressure Zero Pre:	257.2000 mV	Pore Pressure Zero Post:	261.5000 mV	Pore Pressure Difference:	-1.6444 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C14

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	13/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C14
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

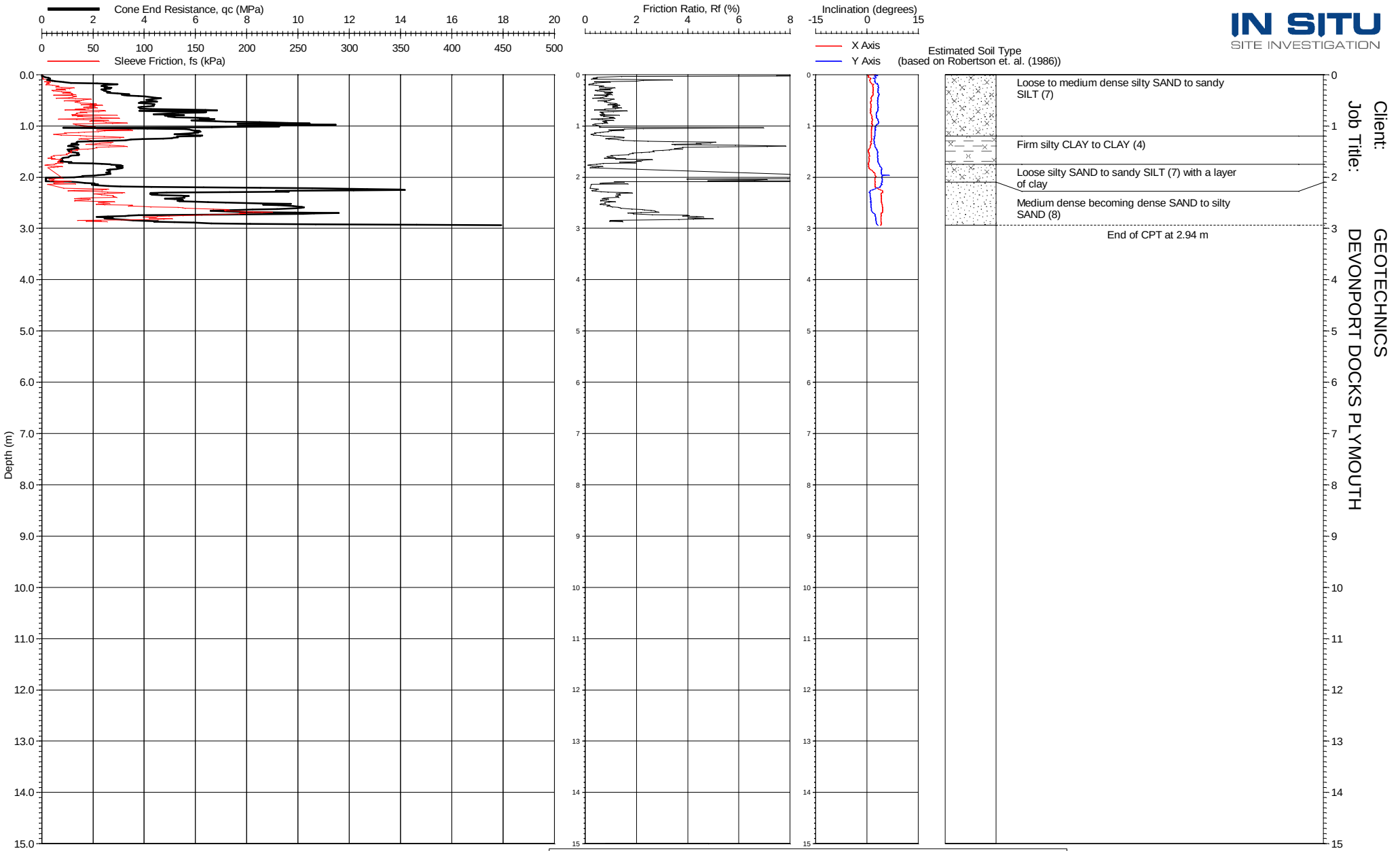
Tip Zero Pre:	204.1000 mV	Tip Zero Post:	204.5000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	161.4000 mV	Sleeve Zero Post:	163.5000 mV	Sleeve Zero Difference:	-1.2844 %
Pore Pressure Zero Pre:	257.2000 mV	Pore Pressure Zero Post:	261.5000 mV	Pore Pressure Difference:	-1.6444 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C14

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	13/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C15
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

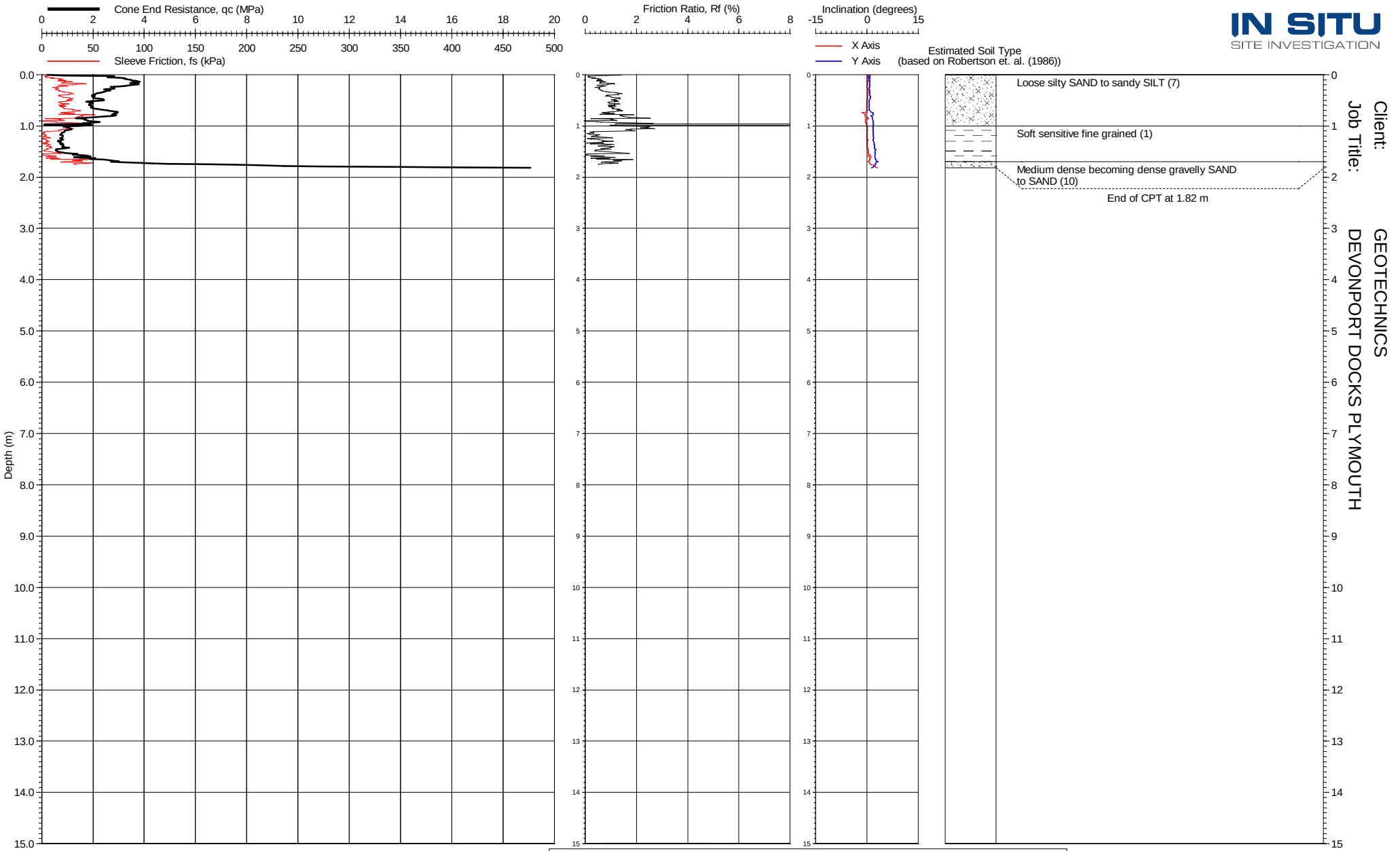
Tip Zero Pre:	202.8000 mV	Tip Zero Post:	199.8000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	158.5000 mV	Sleeve Zero Post:	155.6000 mV	Sleeve Zero Difference:	1.8638 %
Pore Pressure Zero Pre:	248.5000 mV	Pore Pressure Zero Post:	242.6000 mV	Pore Pressure Difference:	2.4320 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C15

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client:

Job Title: GEOTECHNICS
DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	13/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C16
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

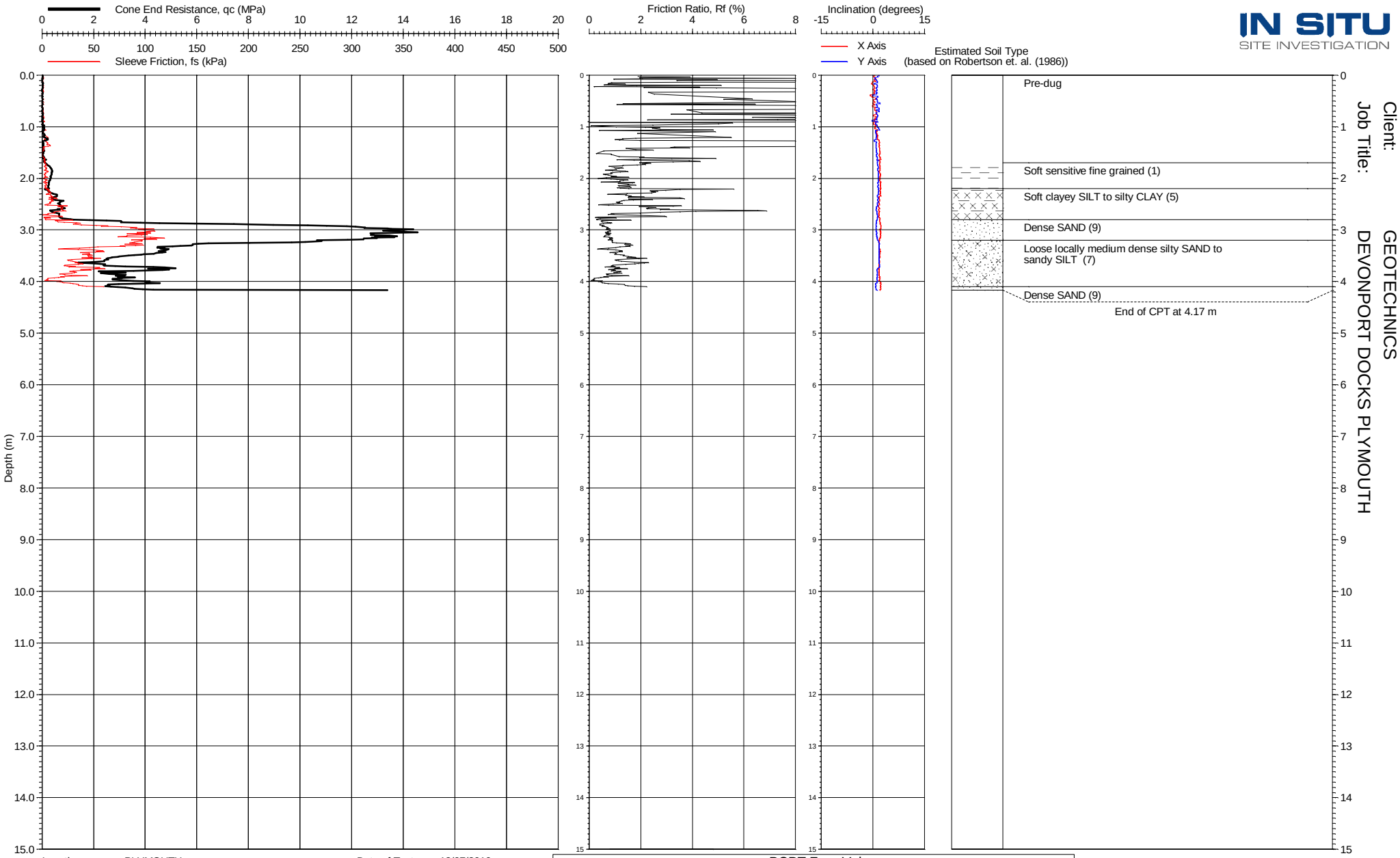
Tip Zero Pre:	200.1000 mV	Tip Zero Post:	194.7000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	154.8000 mV	Sleeve Zero Post:	152.7000 mV	Sleeve Zero Difference:	1.3752 %
Pore Pressure Zero Pre:	231.1000 mV	Pore Pressure Zero Post:	224.4000 mV	Pore Pressure Difference:	2.9857 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C16

insitusi.com

Form: CPT0001



IN SITU SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	13/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C17
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

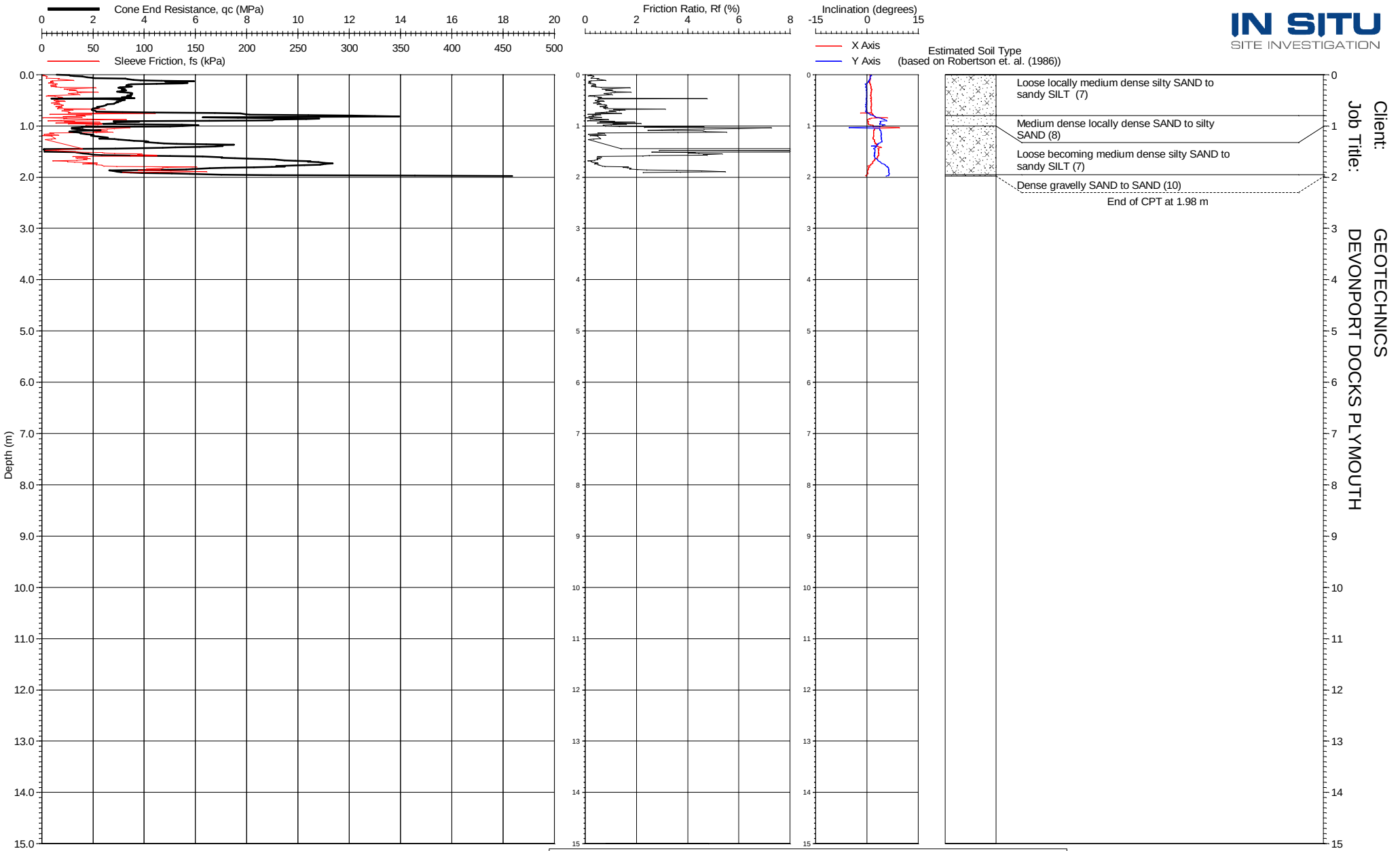
Tip Zero Pre:	200.3000 mV	Tip Zero Post:	203.2000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	156.9000 mV	Sleeve Zero Post:	163.7000 mV	Sleeve Zero Difference:	-4.1539 %
Pore Pressure Zero Pre:	252.5000 mV	Pore Pressure Zero Post:	253.2000 mV	Pore Pressure Difference:	-0.2765 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C17

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	13/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C18
Cone & Rig Used:	S15CFIIP.C74 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

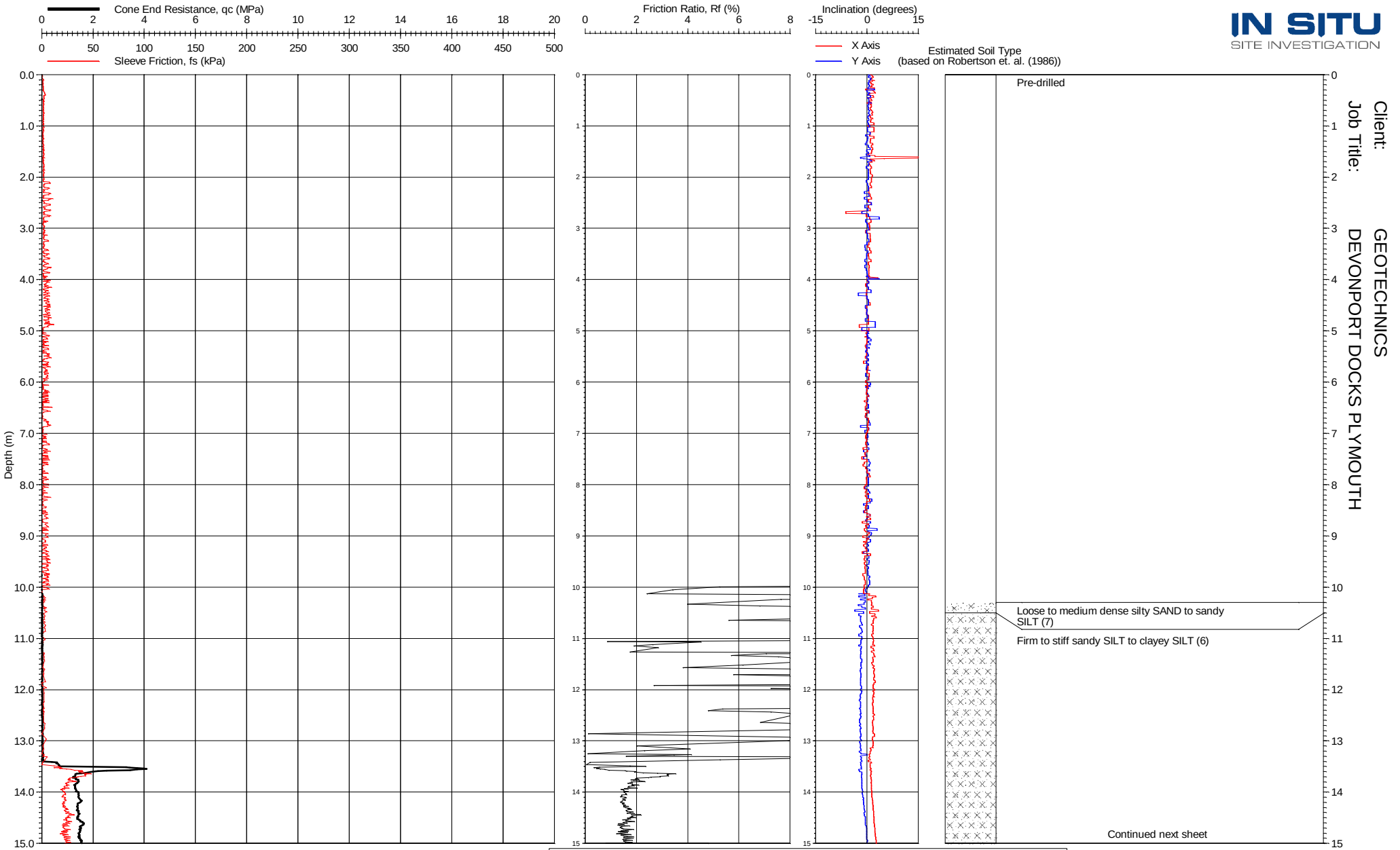
Tip Zero Pre:	204.6000 mV	Tip Zero Post:	204.6000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	195.2000 mV	Sleeve Zero Post:	195.2000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	250.7000 mV	Pore Pressure Zero Post:	250.7000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C18

insitusi.com

Form: CPT0001



IN SITU SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C20A
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

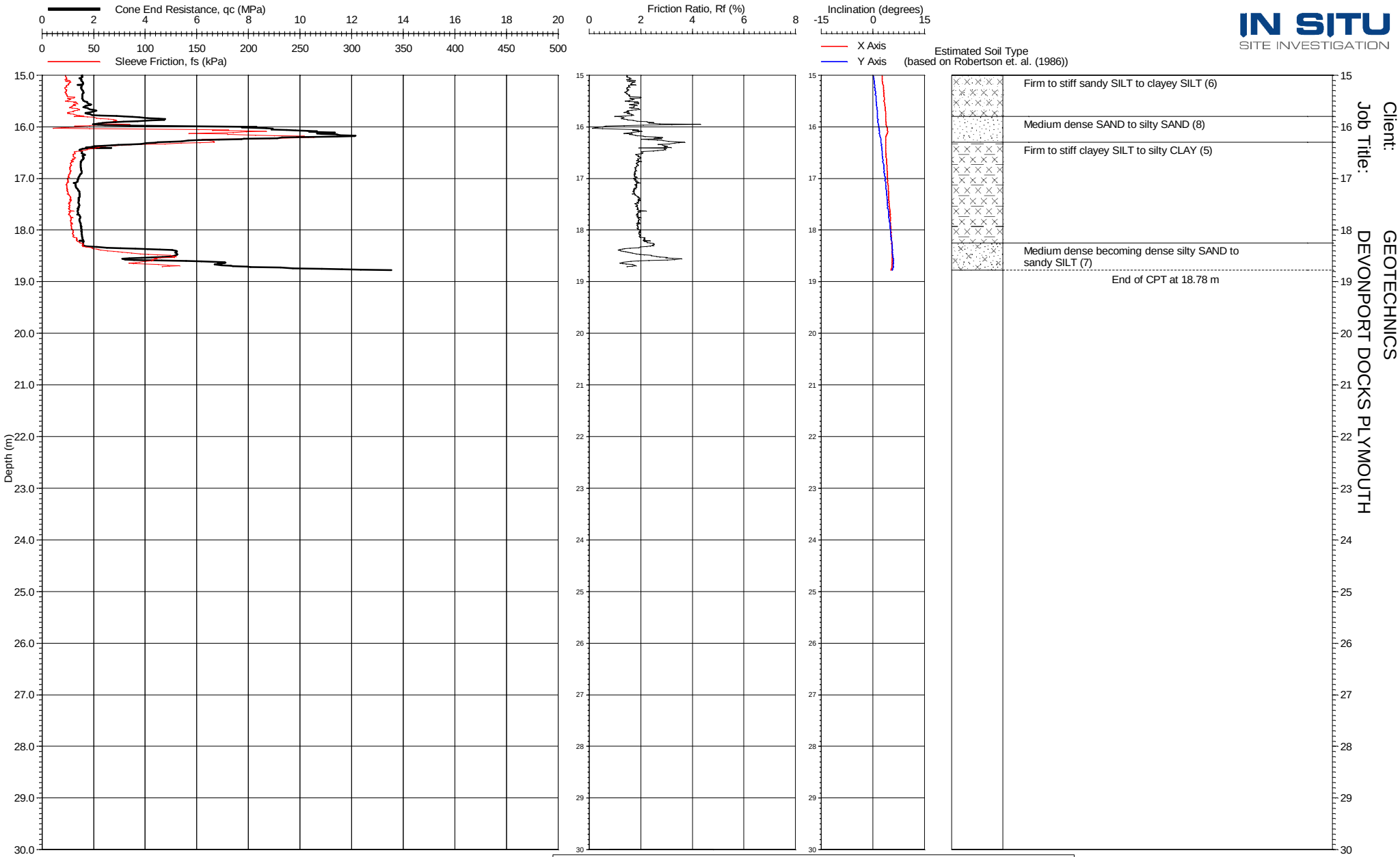
Tip Zero Pre:	191.6000 mV	Tip Zero Post:	191.6000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	110.1000 mV	Sleeve Zero Post:	110.1000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	296.0000 mV	Pore Pressure Zero Post:	296.0000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C20A

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C20A
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

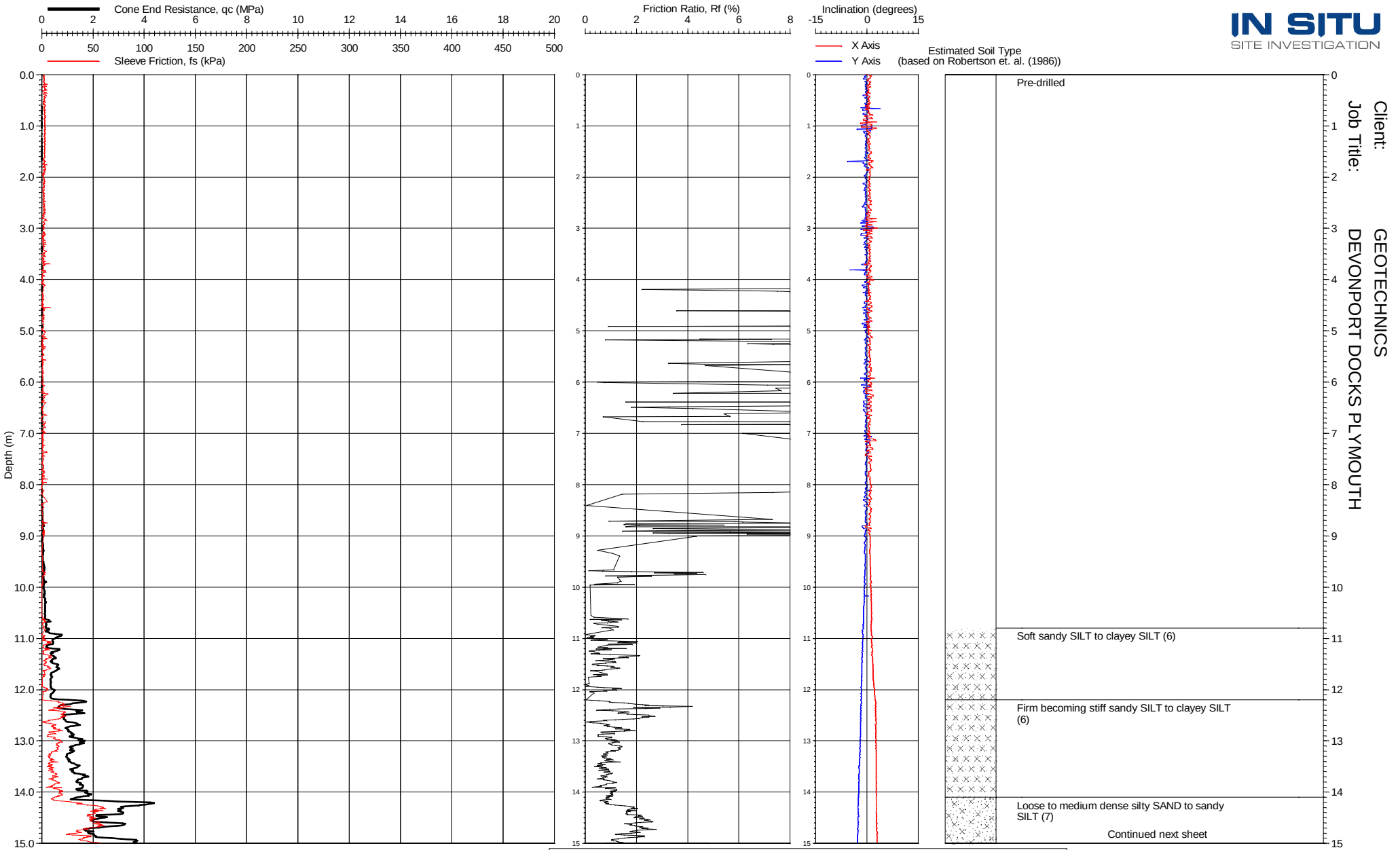
Tip Zero Pre:	191.6000 mV	Tip Zero Post:	191.6000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	110.1000 mV	Sleeve Zero Post:	110.1000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	296.0000 mV	Pore Pressure Zero Post:	296.0000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C20A

insitusi.com

Form: CPT0001



IN SITU SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C21
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

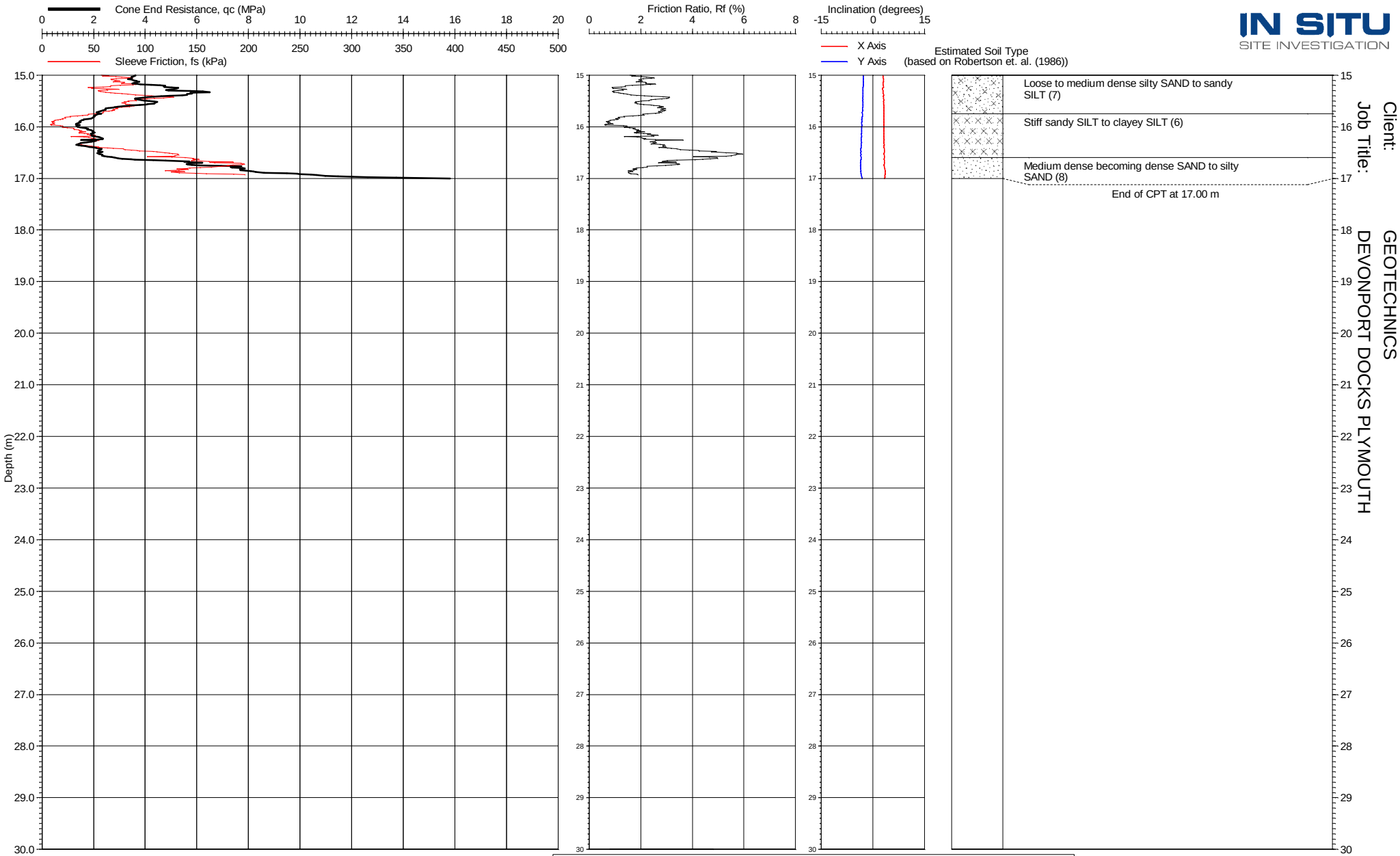
Tip Zero Pre:	192.7000 mV	Tip Zero Post:	192.7000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	145.3000 mV	Sleeve Zero Post:	145.3000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	293.7000 mV	Pore Pressure Zero Post:	293.7000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C21

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client:

Job Title: GEOTECHNICS
DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C21
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

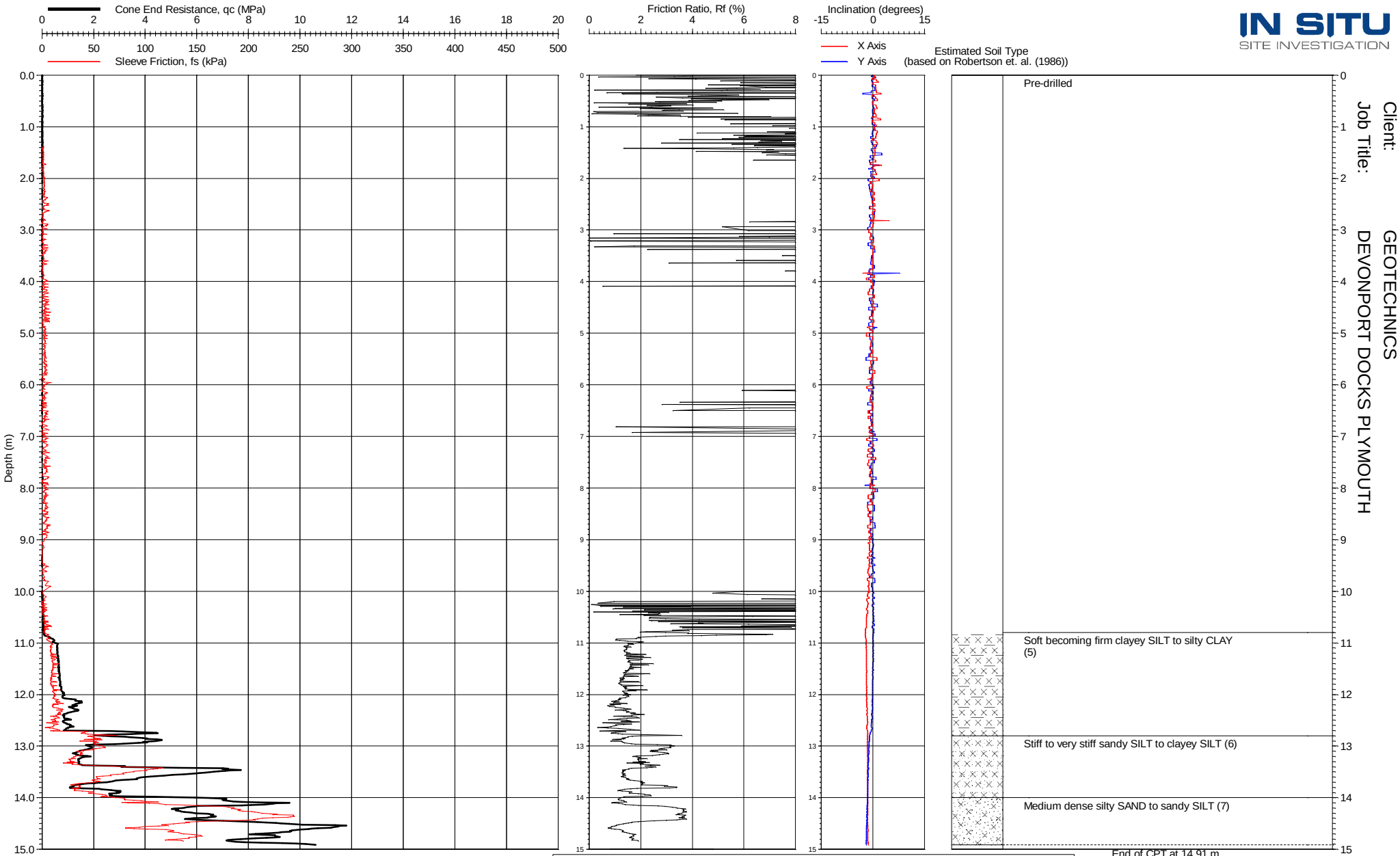
Tip Zero Pre:	192.7000 mV	Tip Zero Post:	192.7000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	145.3000 mV	Sleeve Zero Post:	145.3000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	293.7000 mV	Pore Pressure Zero Post:	293.7000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C21

insitusi.com

Form: CPT0001



IN SITU
SITE INVESTIGATION

Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C22
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

Tip Zero Pre:	197.1000 mV	Tip Zero Post:	197.1000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	146.4000 mV	Sleeve Zero Post:	146.4000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	290.5000 mV	Pore Pressure Zero Post:	290.5000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

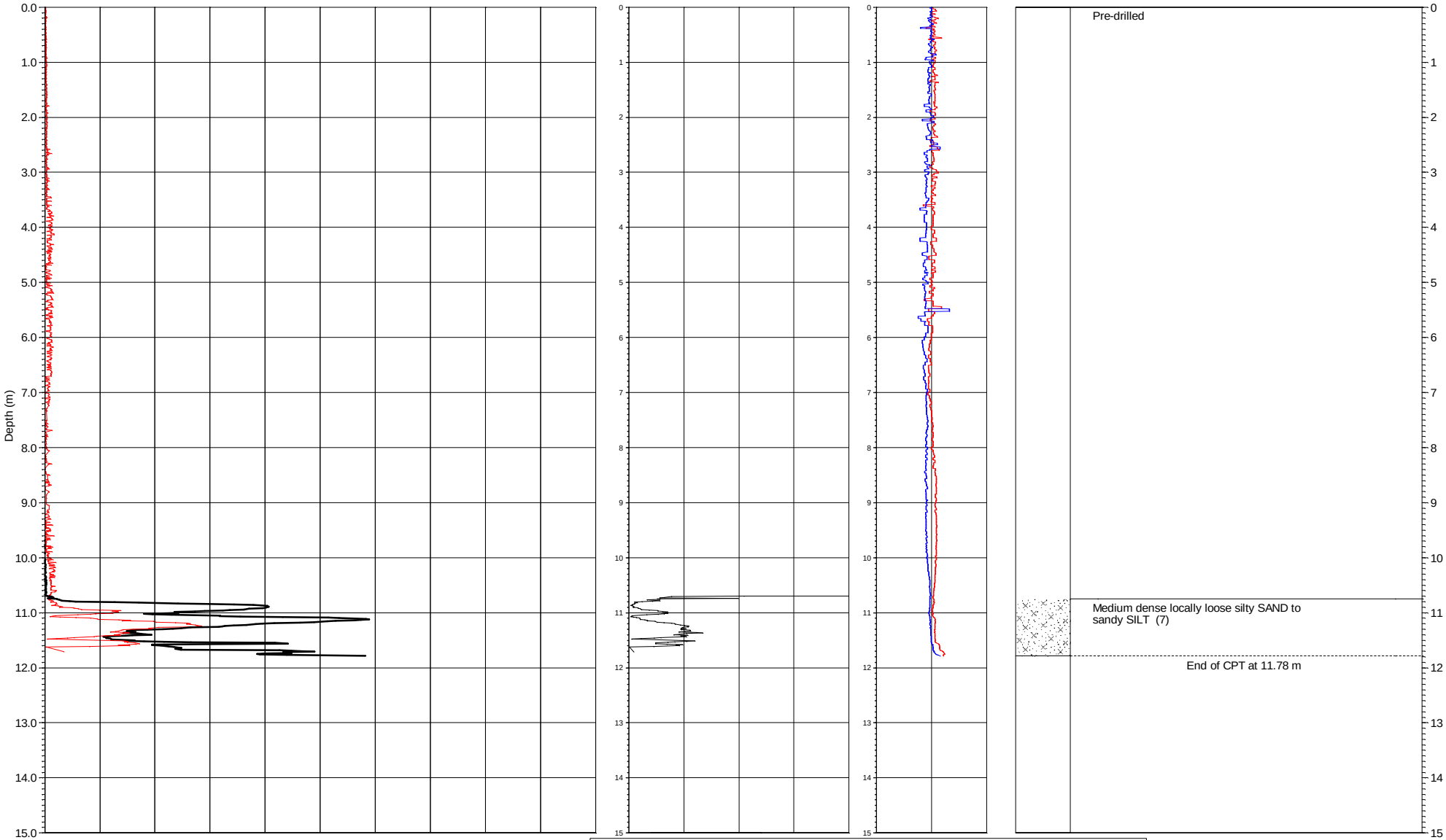
C22

insitusi.com

Form: CPT0001

IN SITU
SITE INVESTIGATION

Cone End Resistance, qc (MPa)
Sleeve Friction, fs (kPa)
Friction Ratio, Rf (%)
Inclination (degrees)
X Axis
Y Axis
Estimated Soil Type
(based on Robertson et. al. (1986))



Client: GEOTECHNICS
Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C28
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

PCPT Zero Values

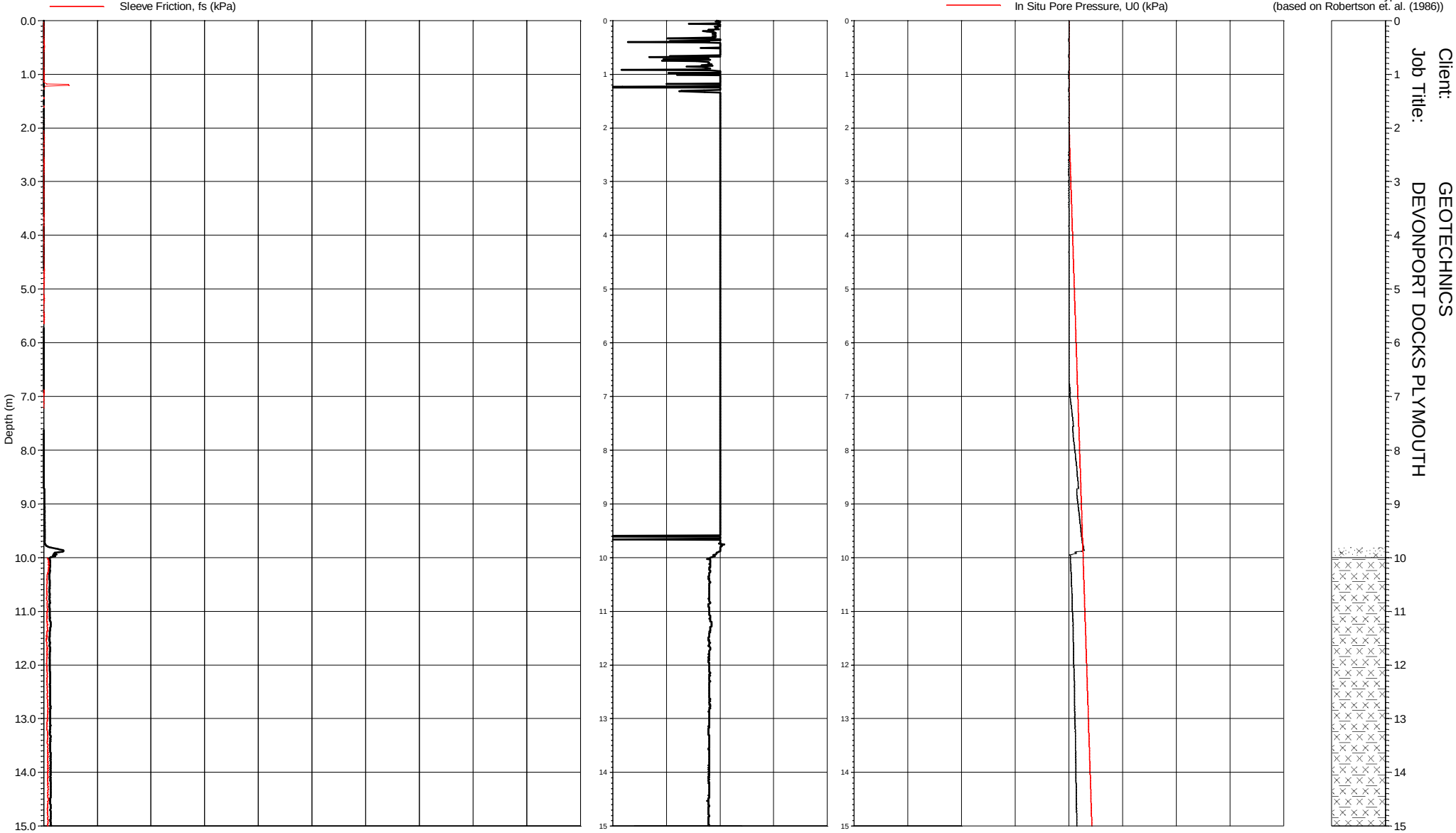
Tip Zero Pre:	201.2000 mV	Tip Zero Post:	201.2000 mV	Tip Zero Difference:	-0.1000 %
Sleeve Zero Pre:	147.5000 mV	Sleeve Zero Post:	147.5000 mV	Sleeve Zero Difference:	0.0000 %
Pore Pressure Zero Pre:	305.3000 mV	Pore Pressure Zero Post:	305.3000 mV	Pore Pressure Difference:	0.0000 %
X Inclinometer Zero Pre:	1.2280 mV	X Inclinometer Zero Post:	1.2125 mV	X Inclinometer Difference:	1.2809 %
Y Inclinometer Zero Pre:	1.2121 mV	Y Inclinometer Zero Post:	1.2849 mV	Y Inclinometer Difference:	-5.6598 %

PIEZO CONE PENETRATION TEST

C28

insitusi.com

Form: CPT0001



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C01

Checked By:

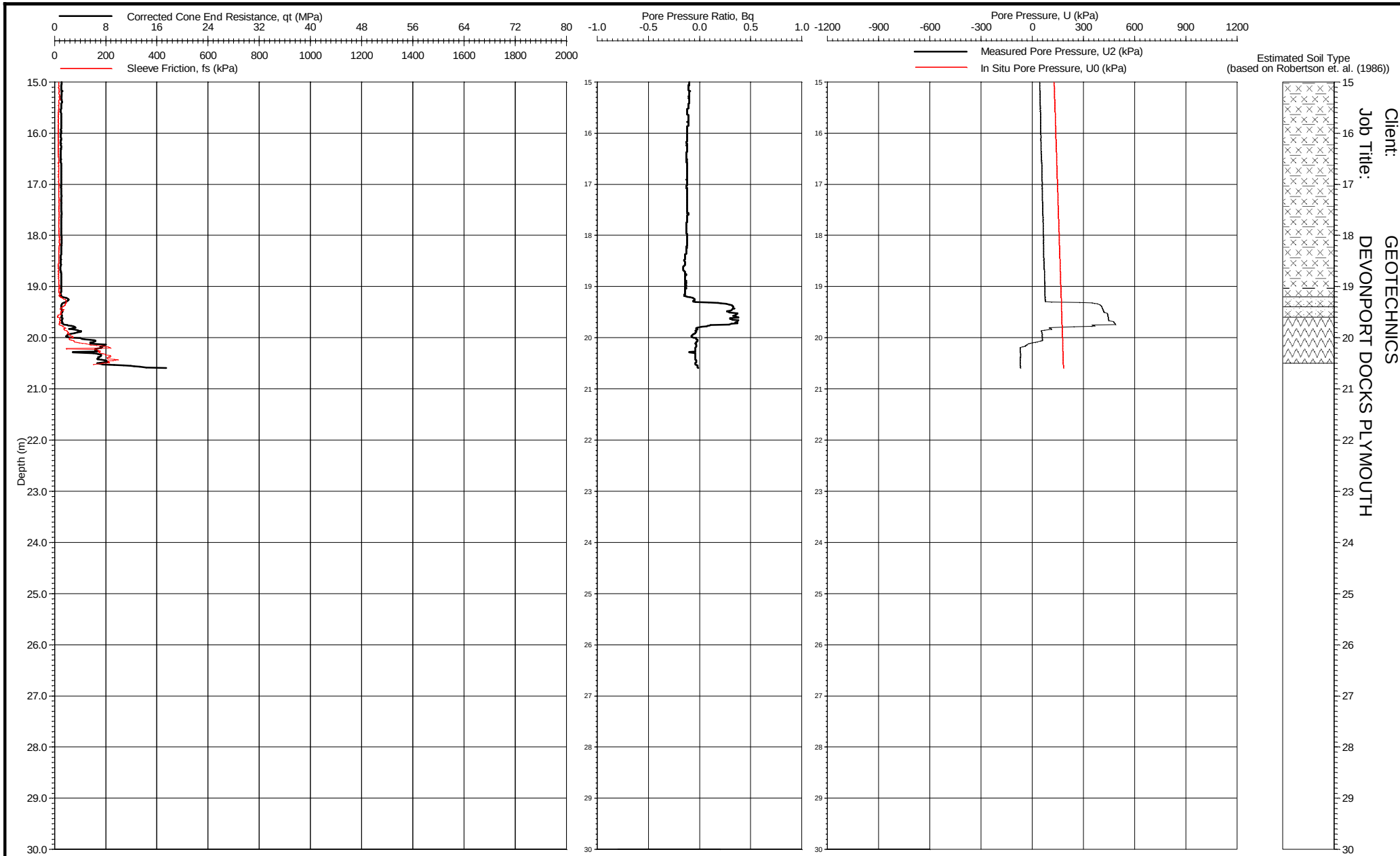
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C01

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C01

Checked By:

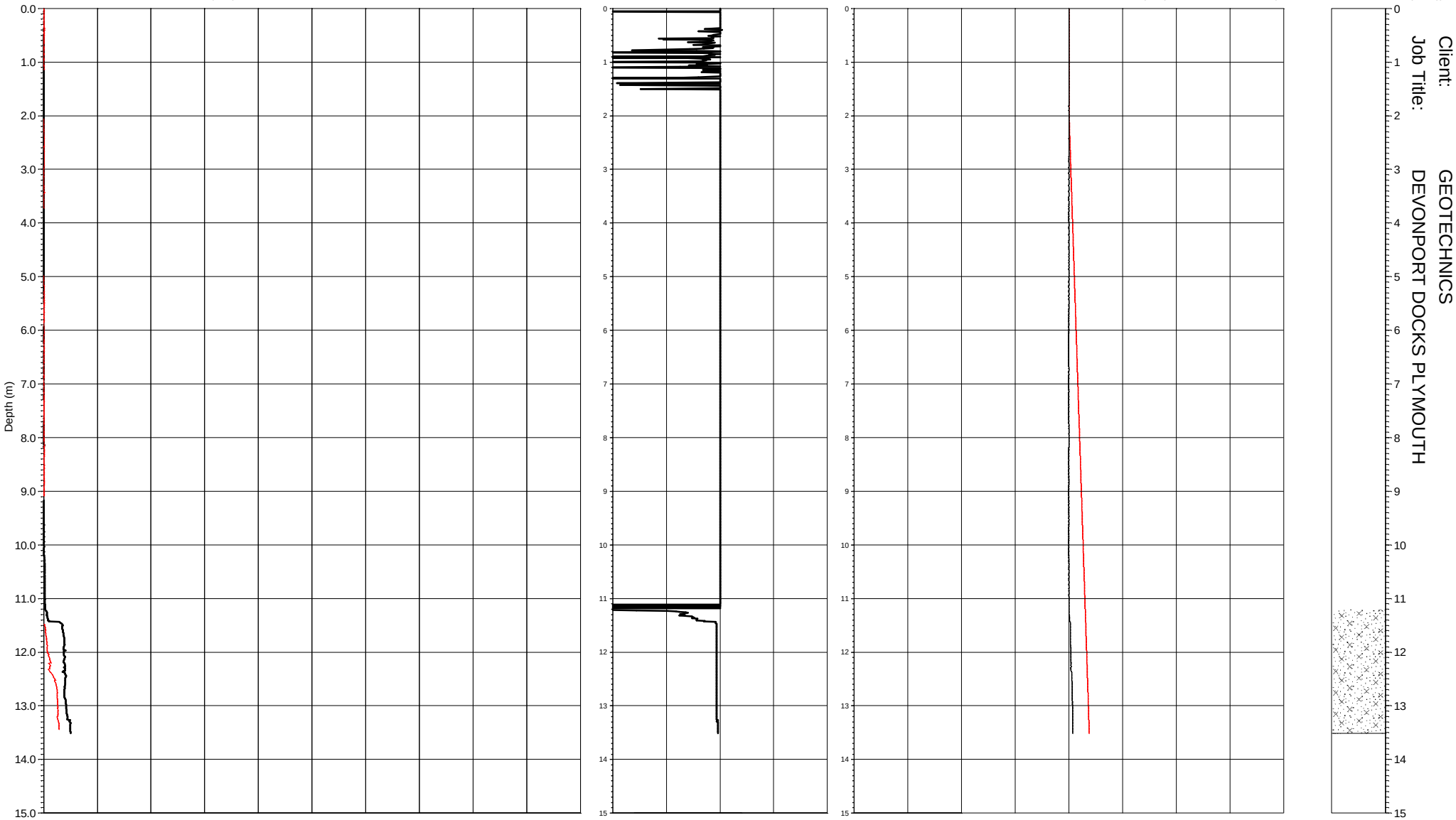
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C01

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C02

Checked By:

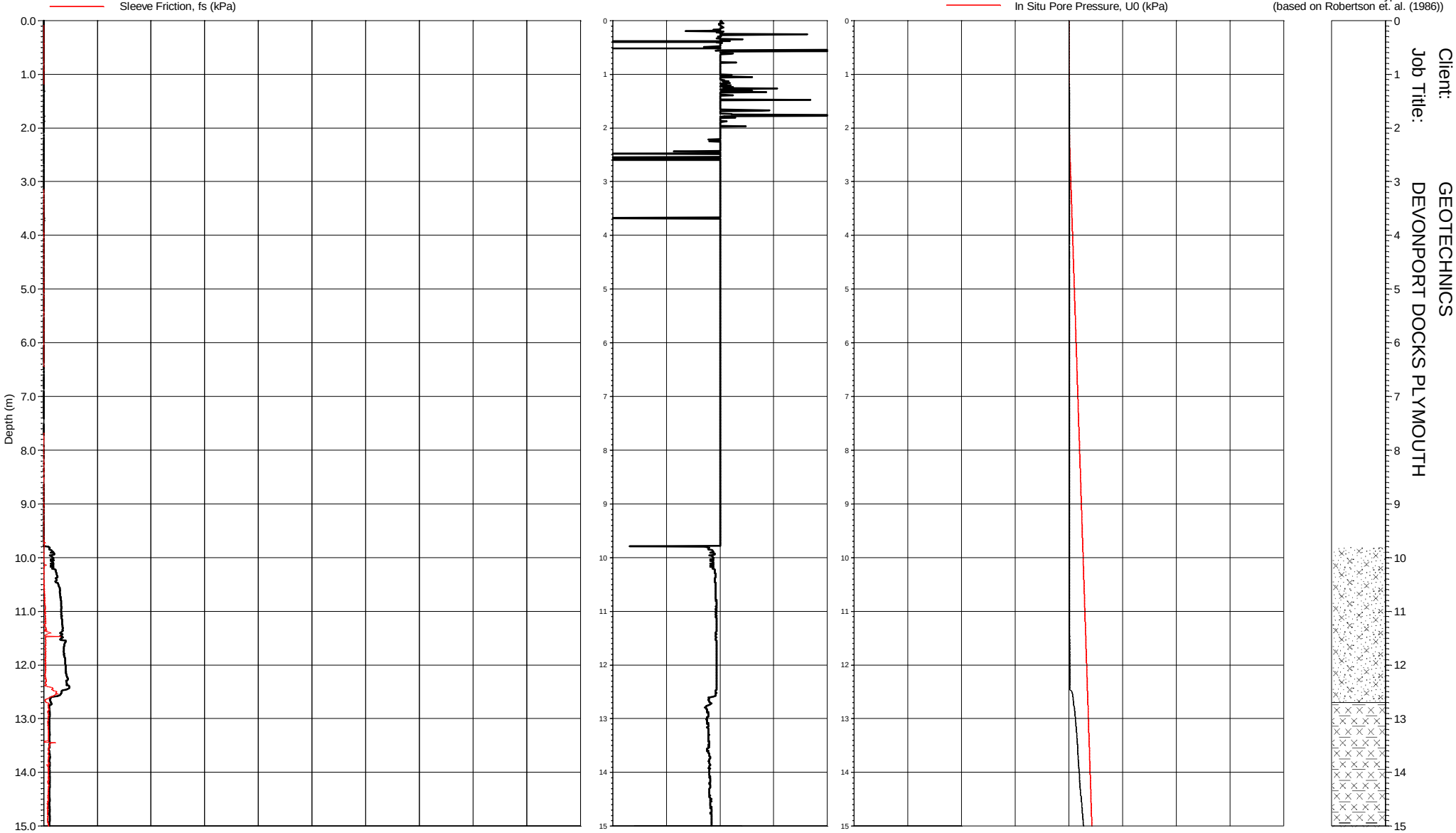
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C02

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C03

Checked By:

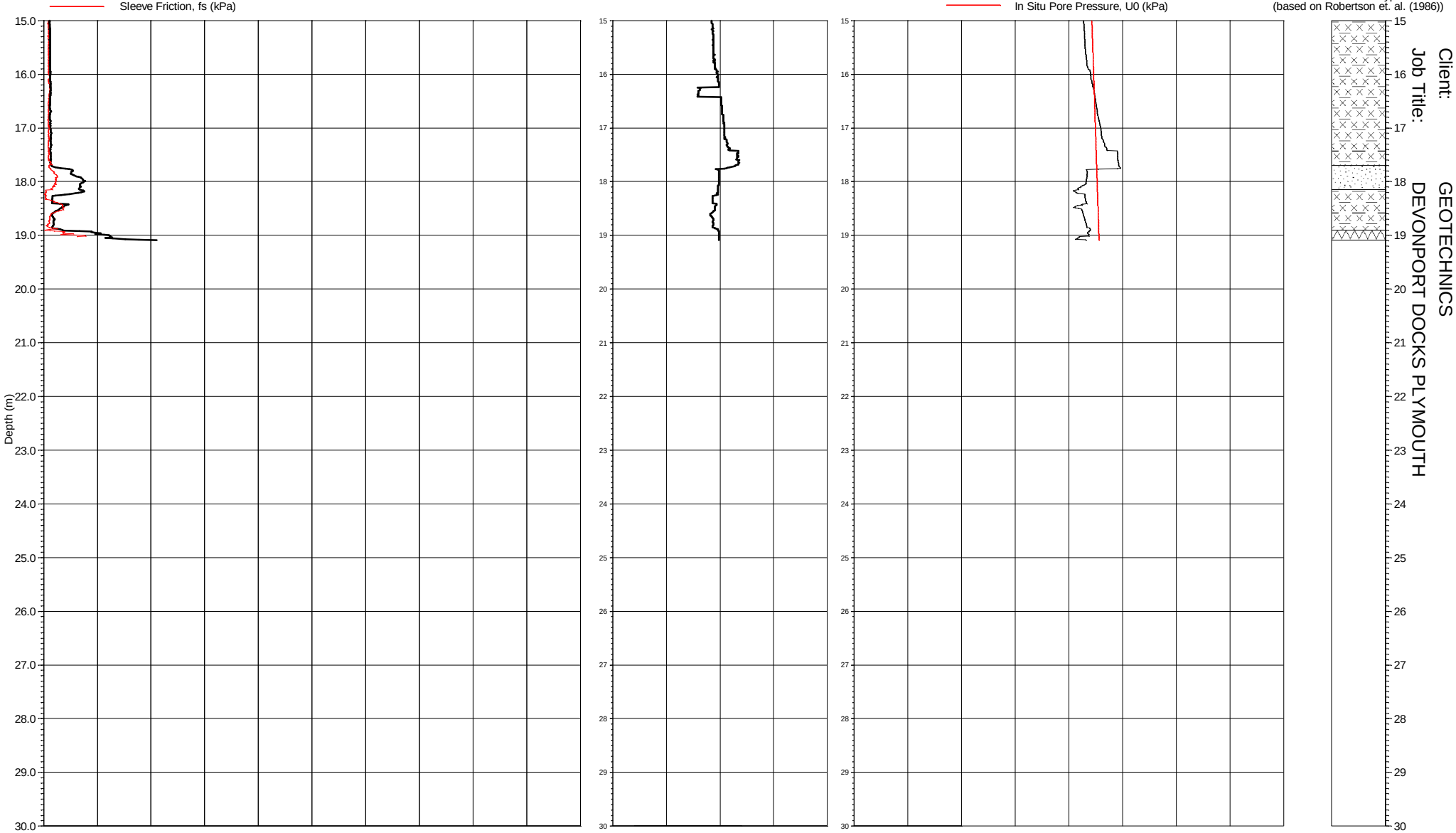
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C03

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C03

Checked By:

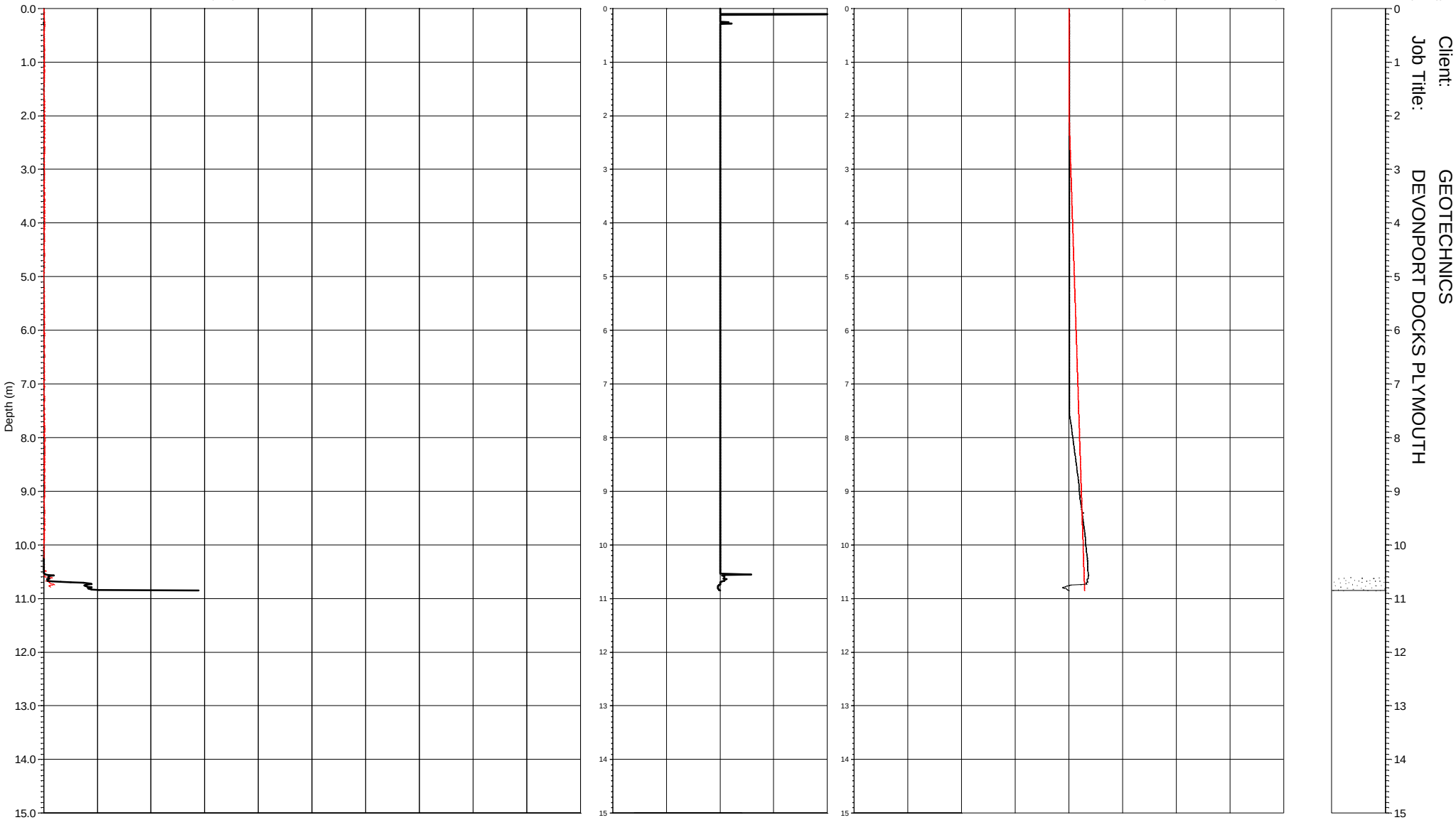
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C03

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C04

Checked By:

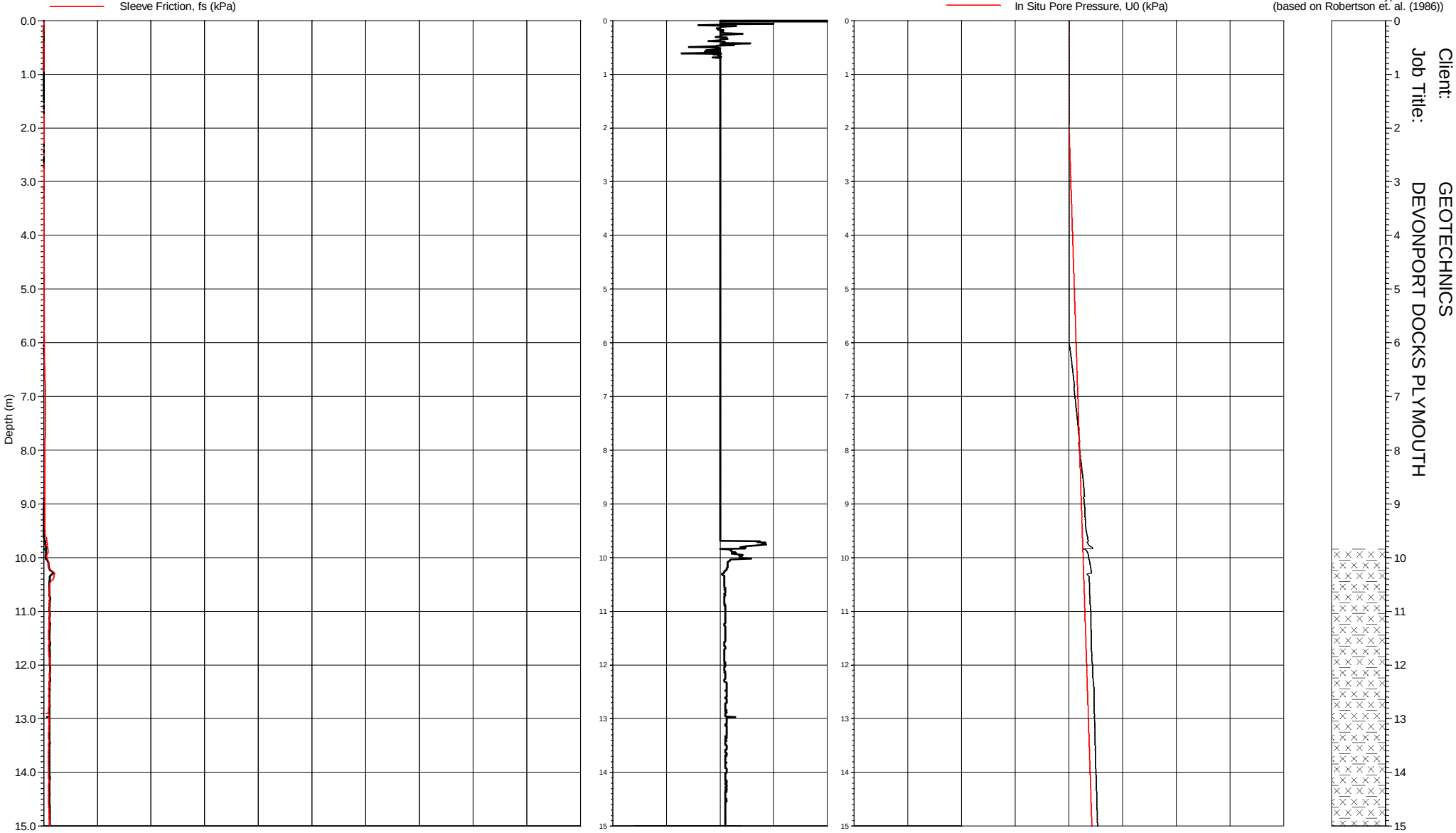
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C04

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 14/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C05

Checked By:

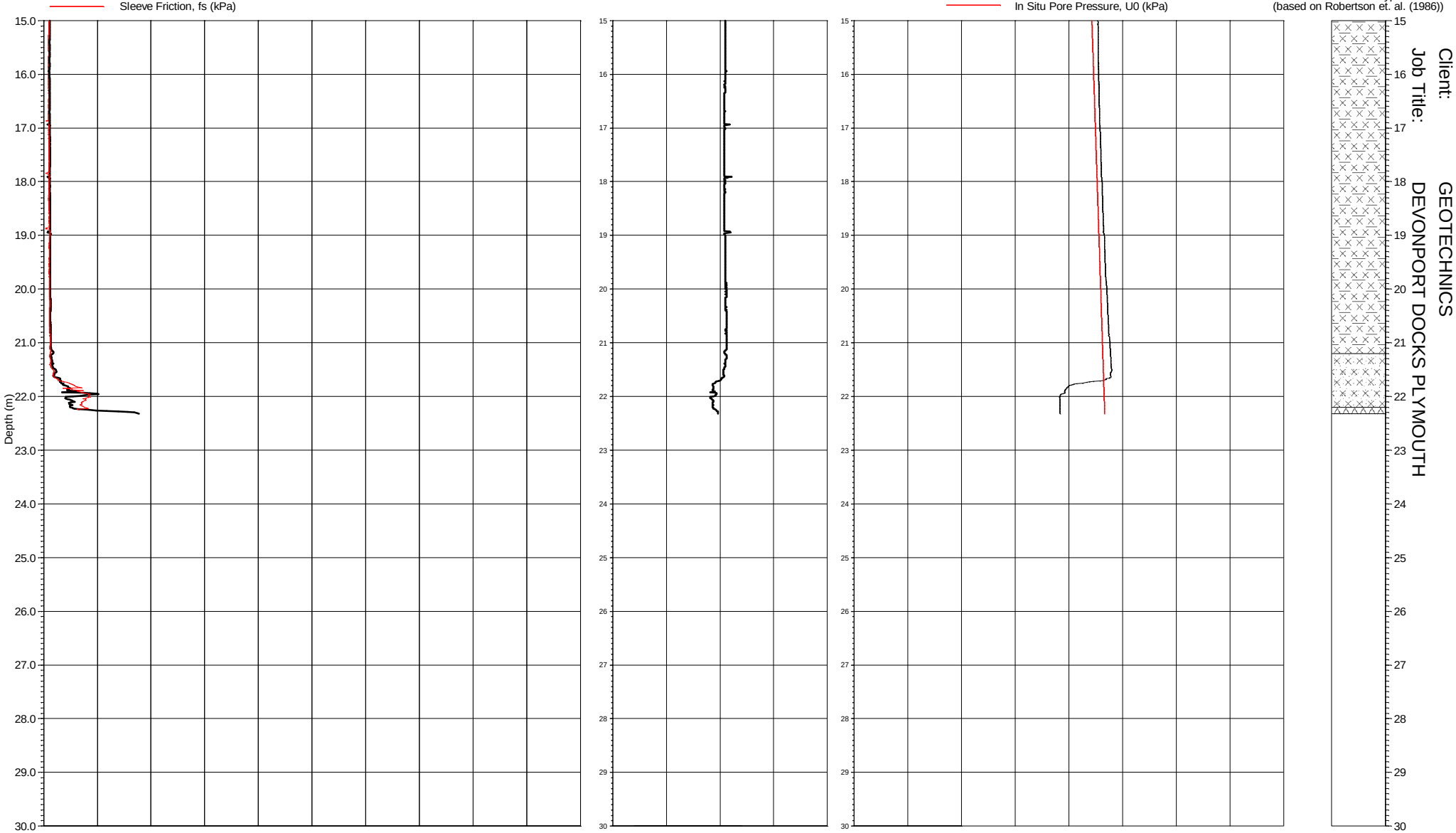
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C05

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 14/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C05

Checked By:

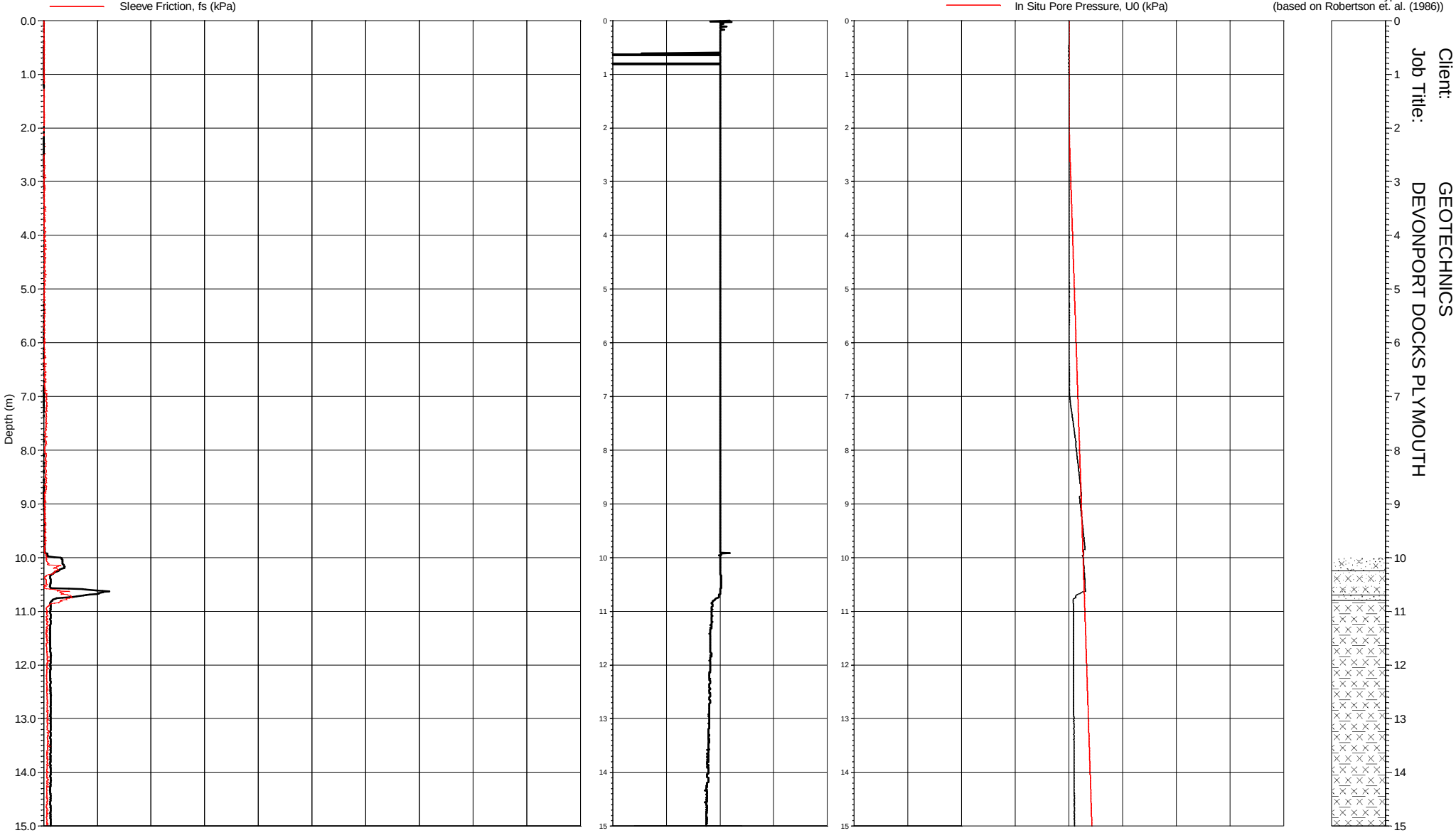
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C05

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C06

Checked By:

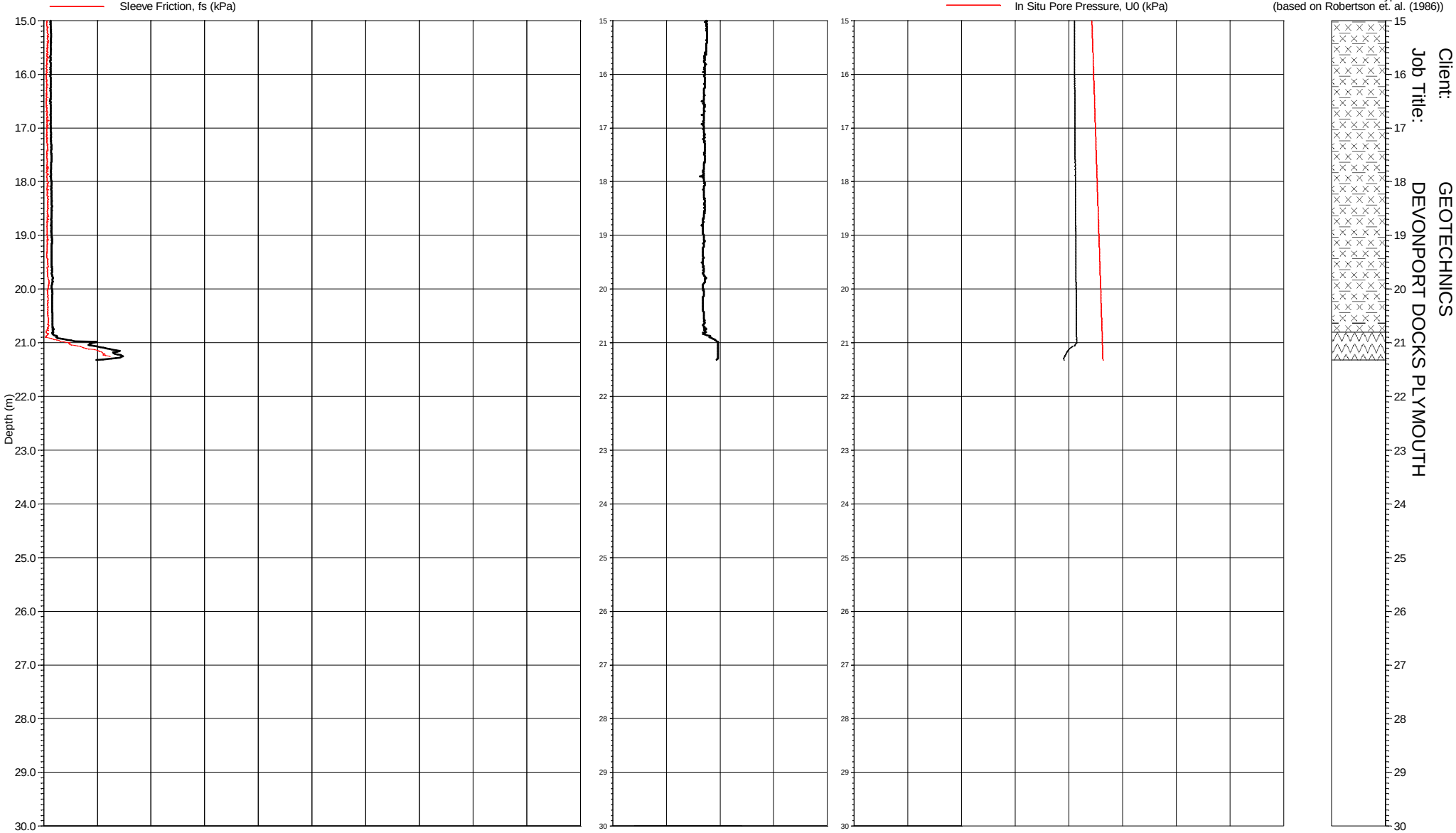
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C06

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C06

Checked By:

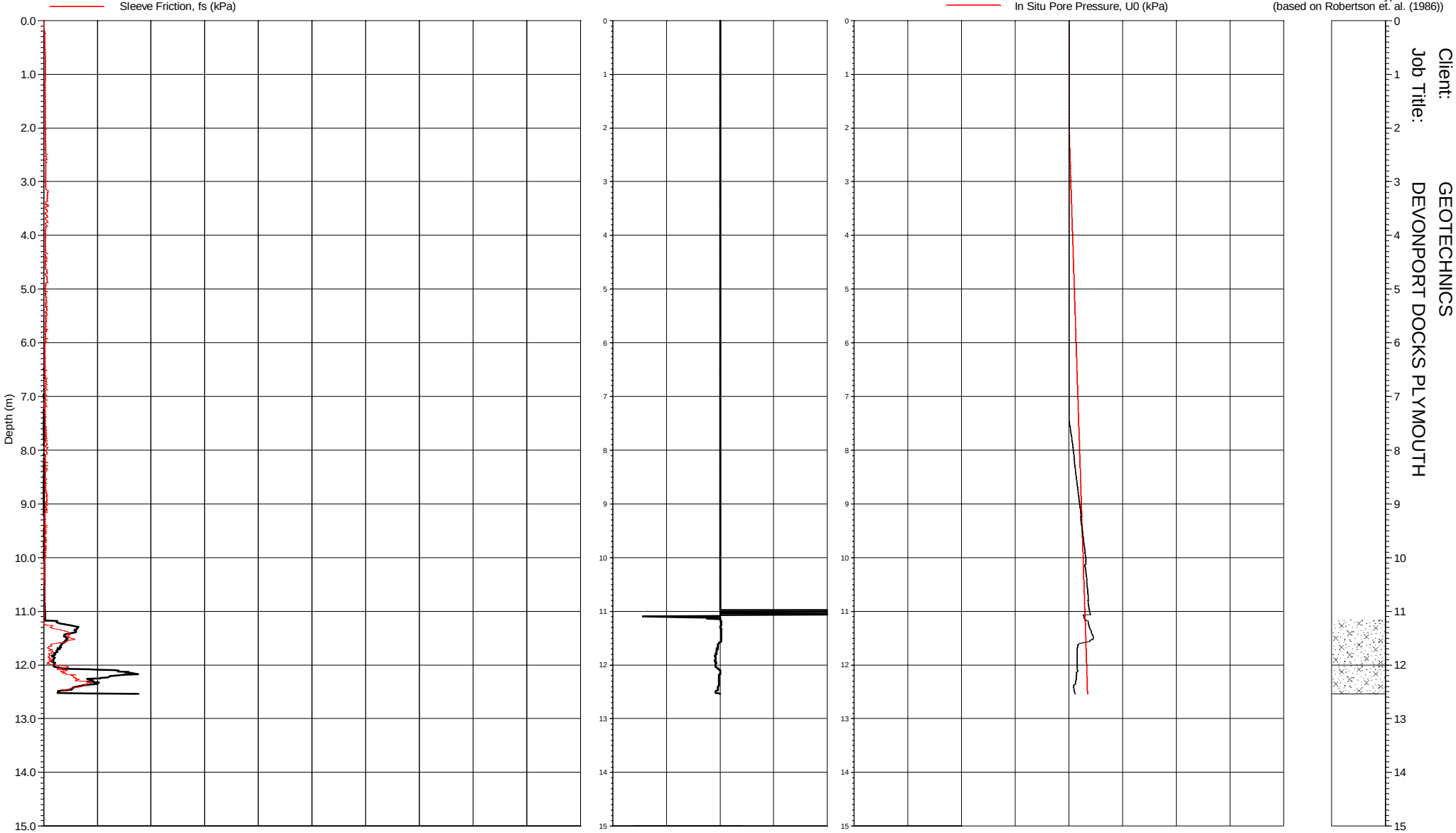
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C06

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C07

Checked By:

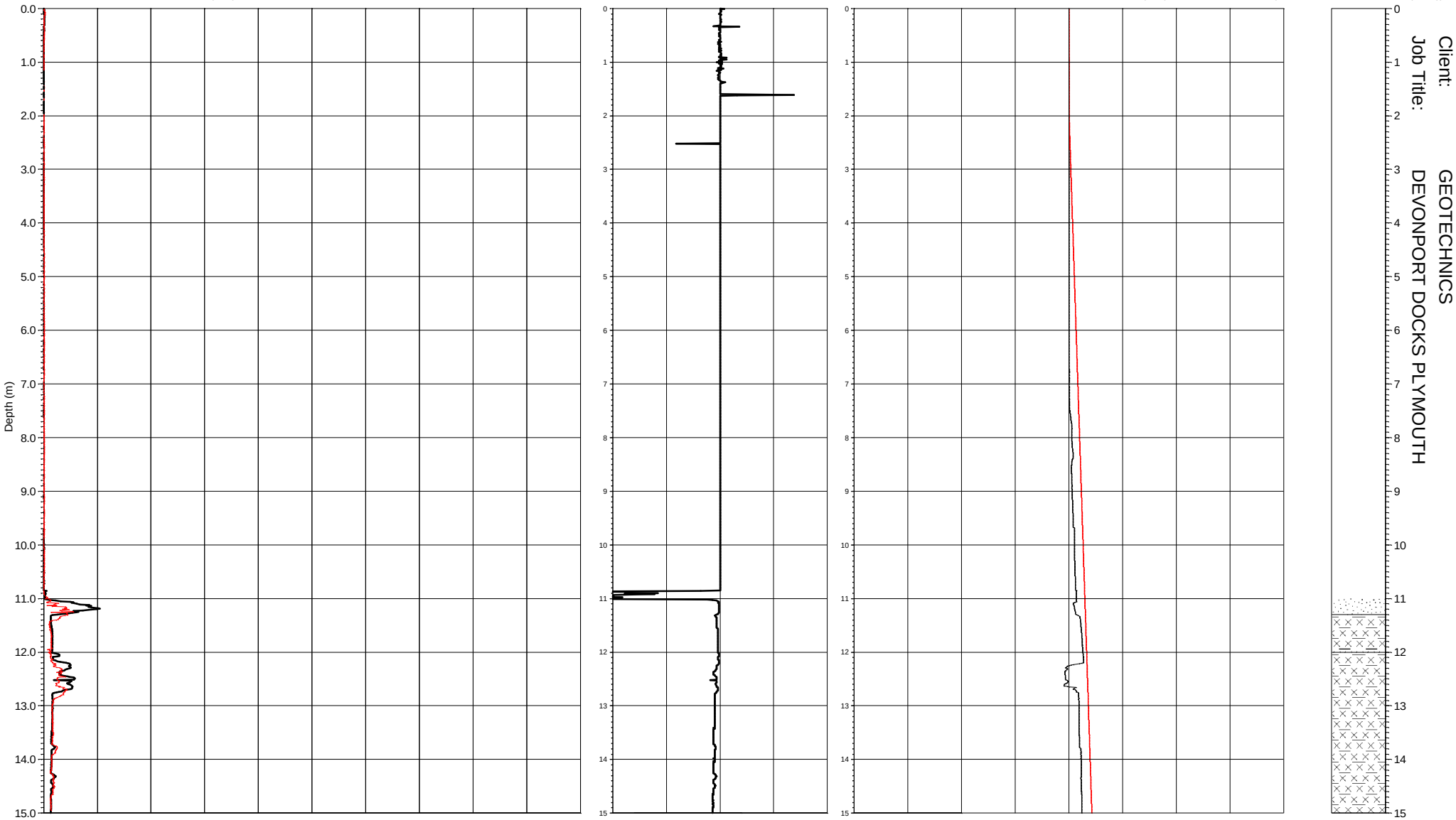
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C07

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C08

Checked By:

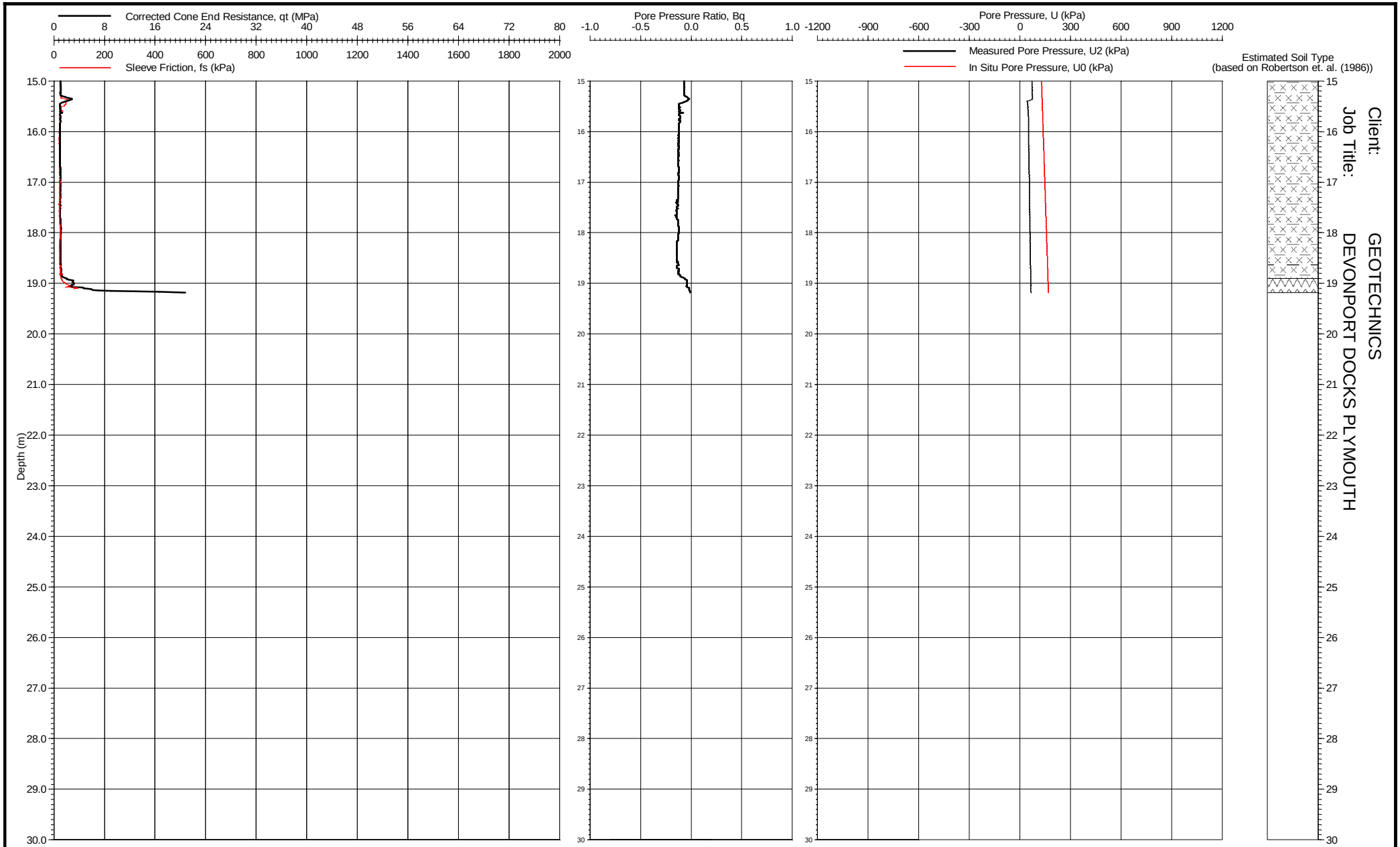
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C08

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C08

Checked By:

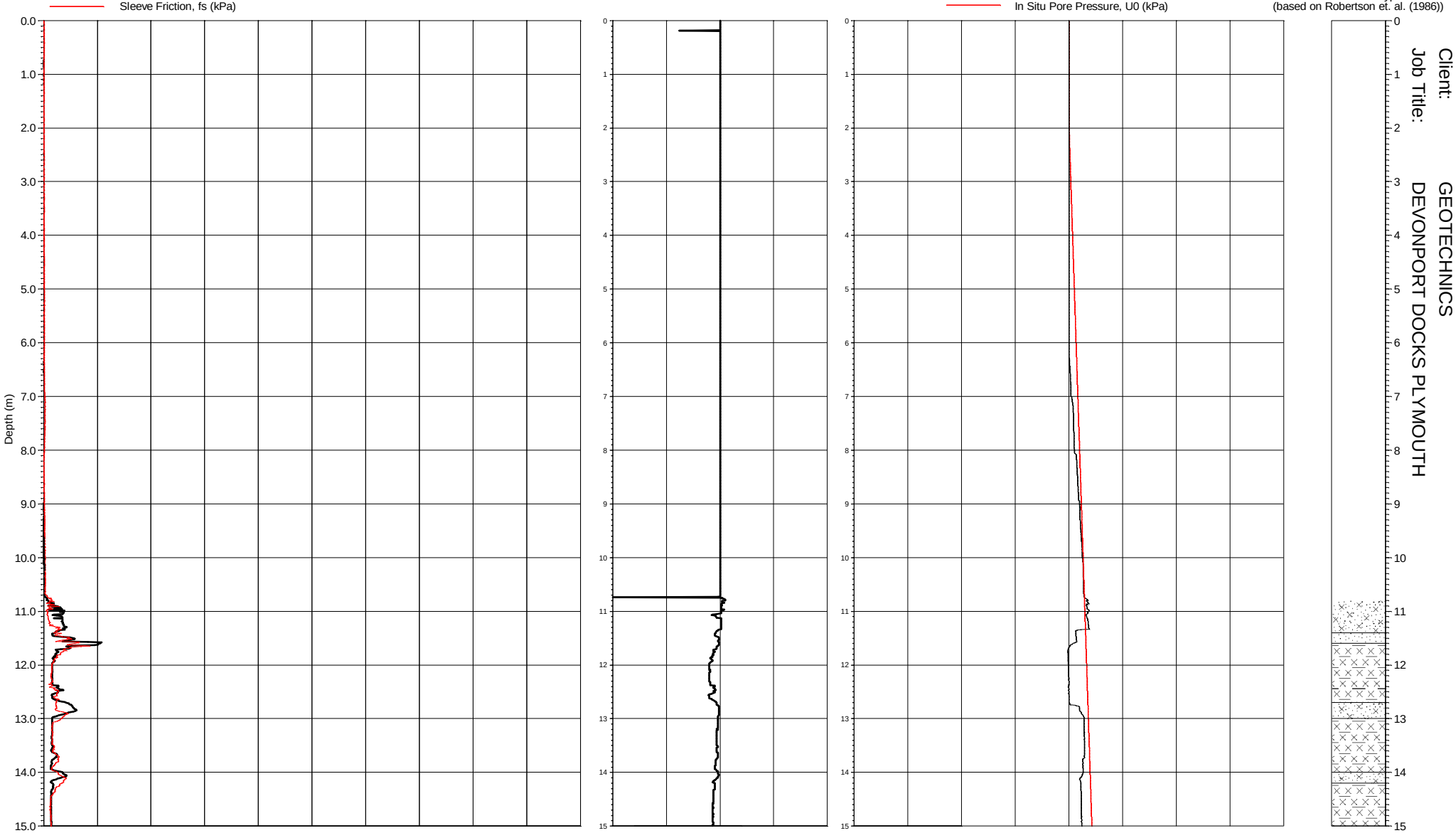
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C08

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C09A

Checked By:

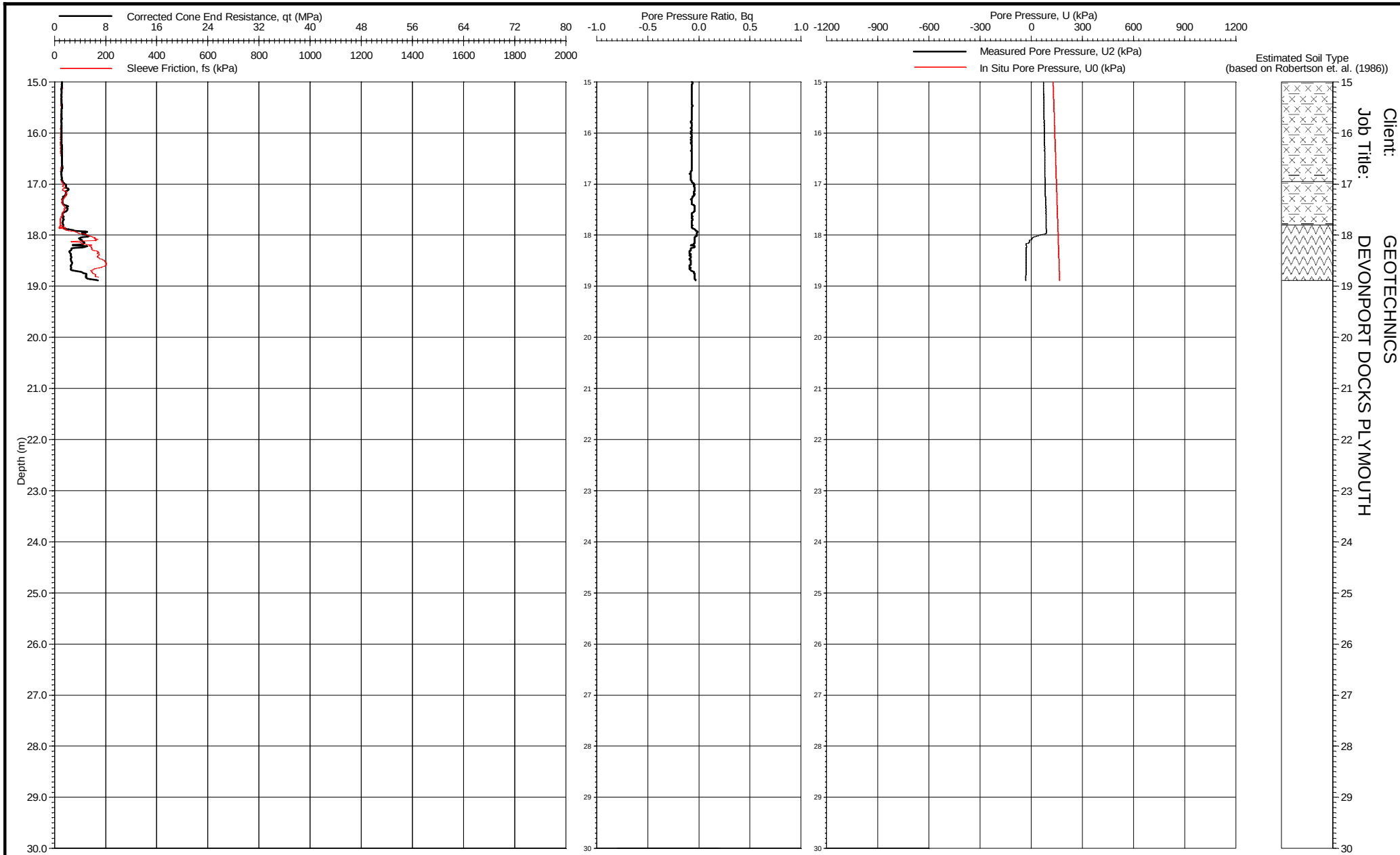
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C09A

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C09A

Checked By:

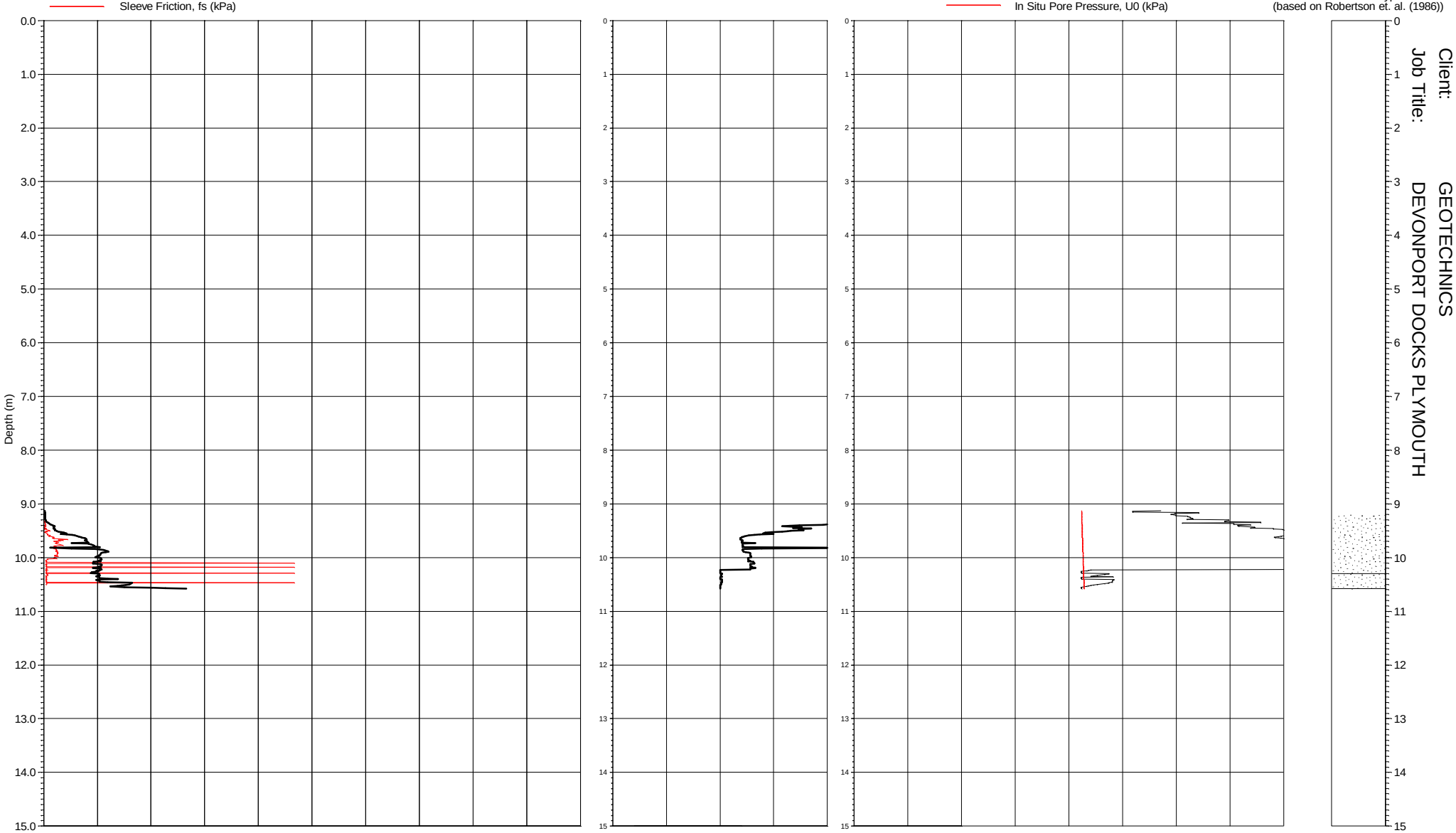
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C09A

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C12

Checked By:

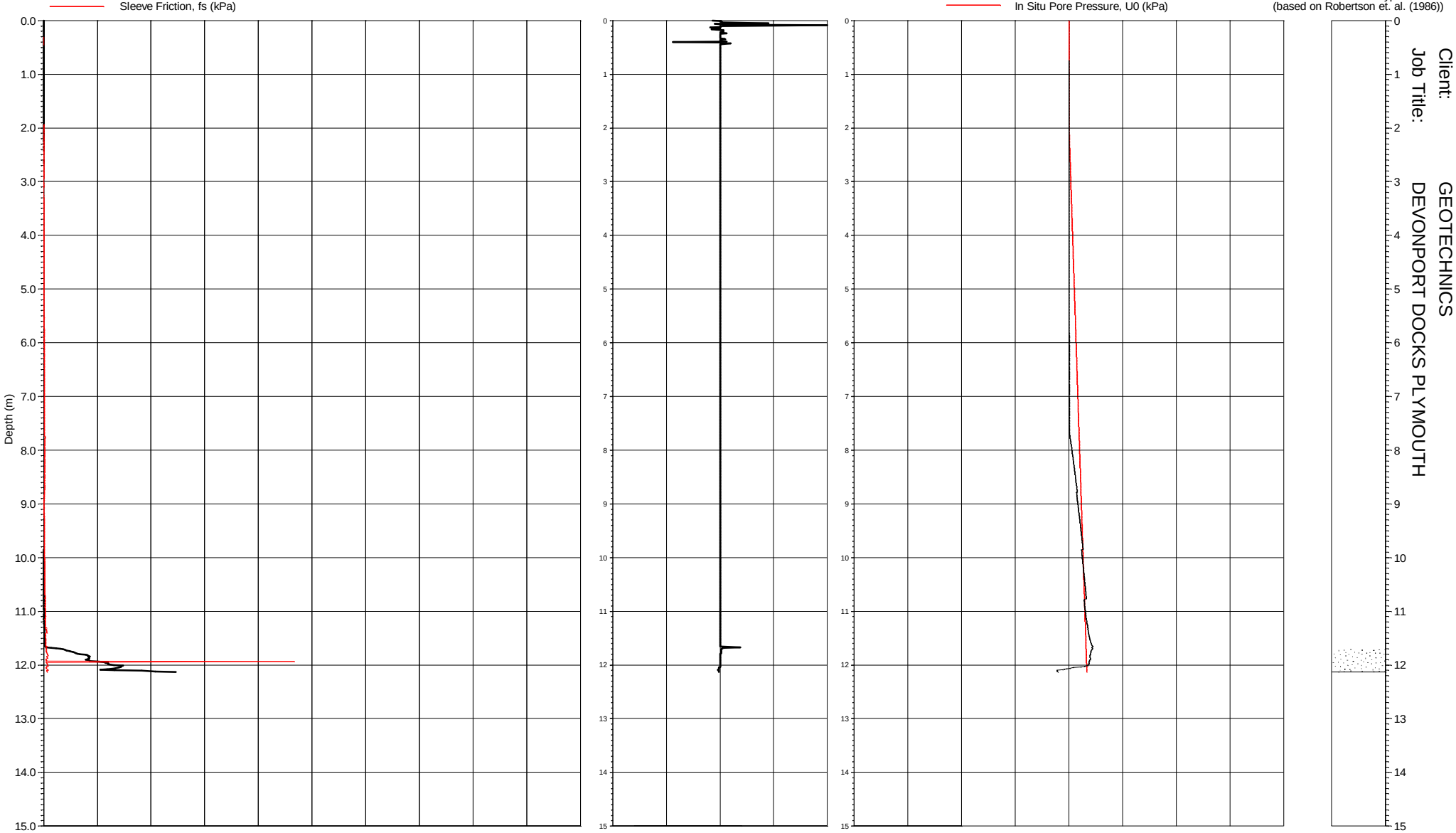
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C12

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: 0.000E - 0.000N

Ground Level: 0.00 m msl

Cone & Rig Used: S15CFIIP.C35 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 15/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C13

Checked By:

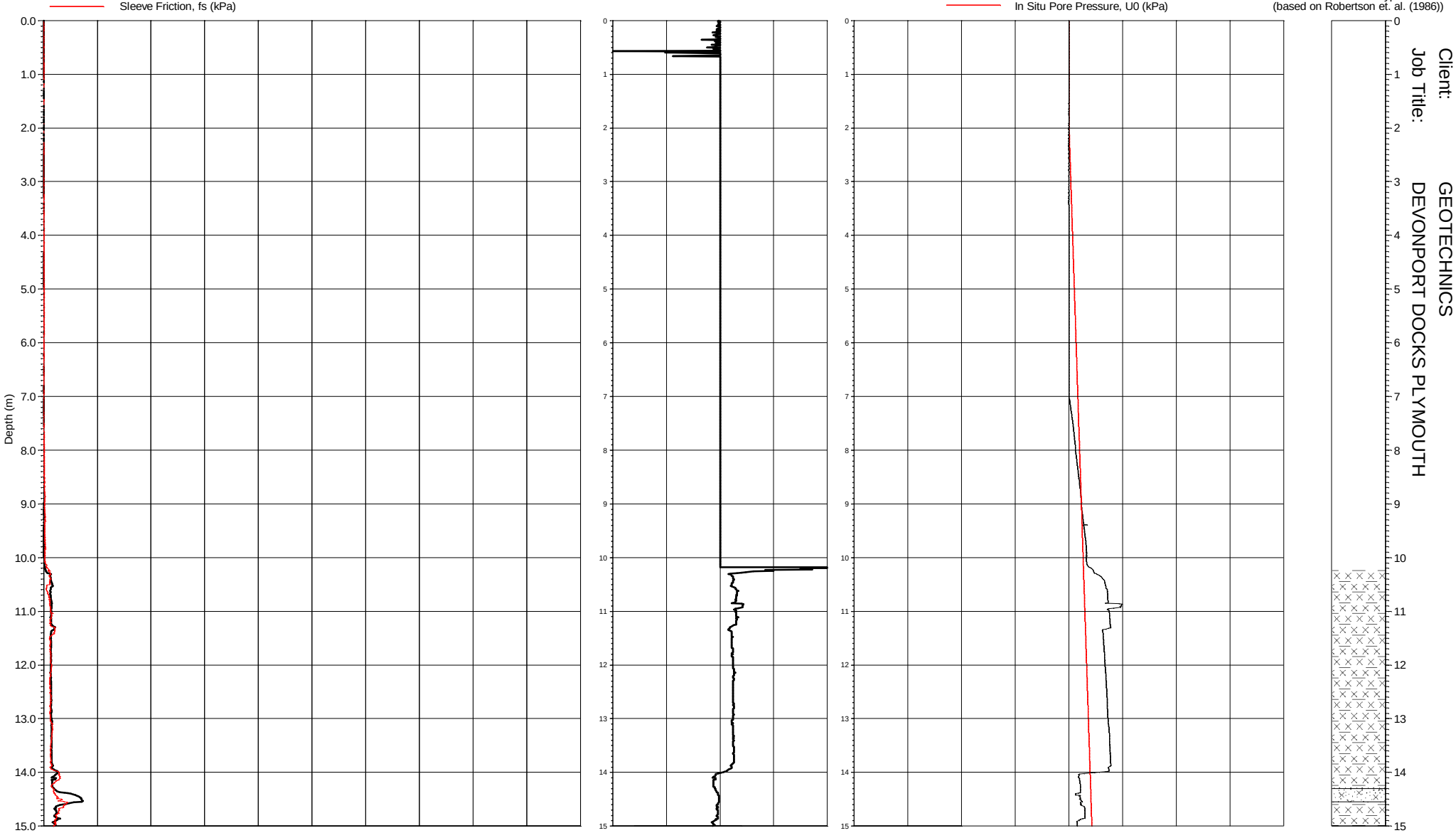
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C13

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C14

Checked By:

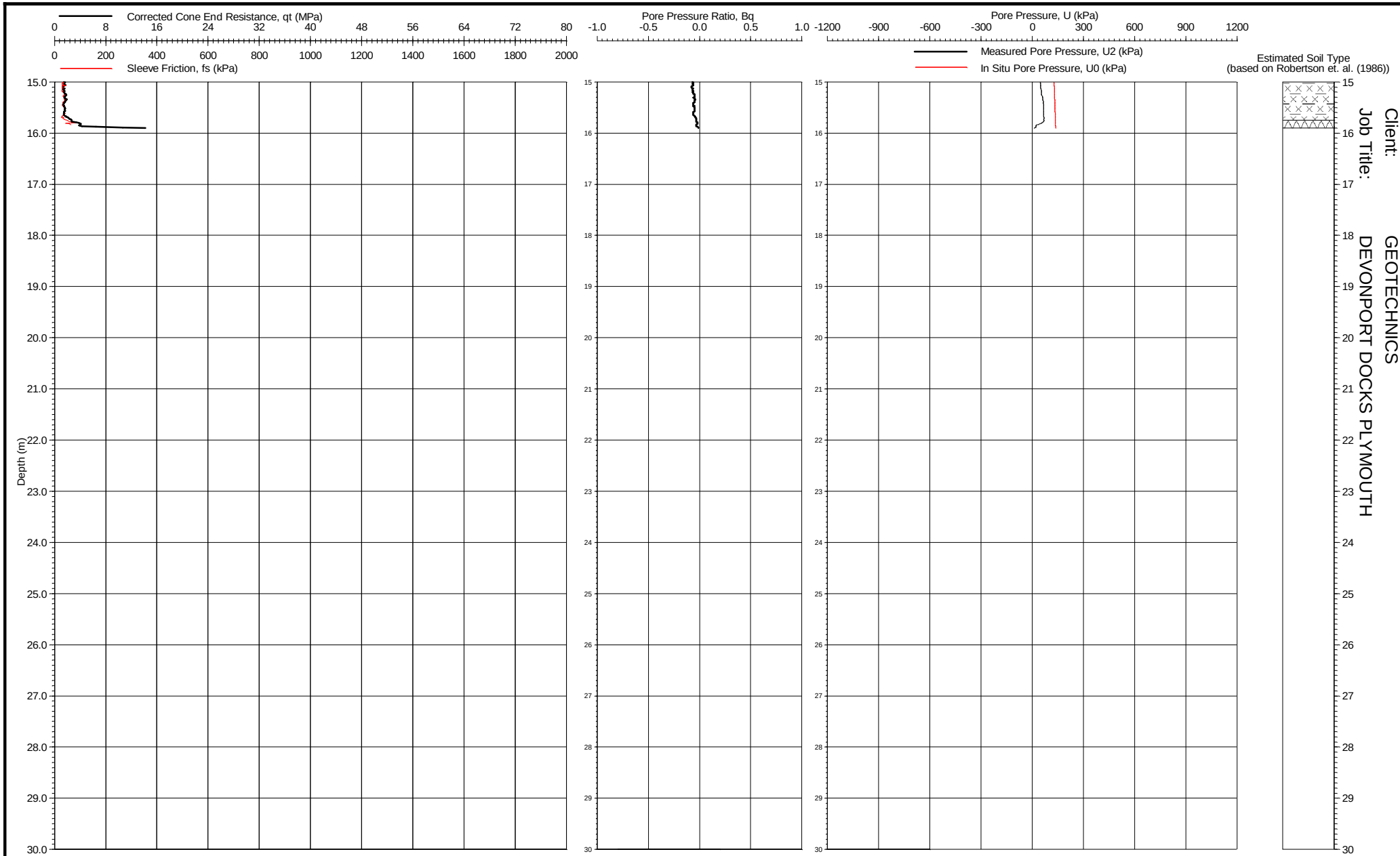
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C14

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C14

Checked By:

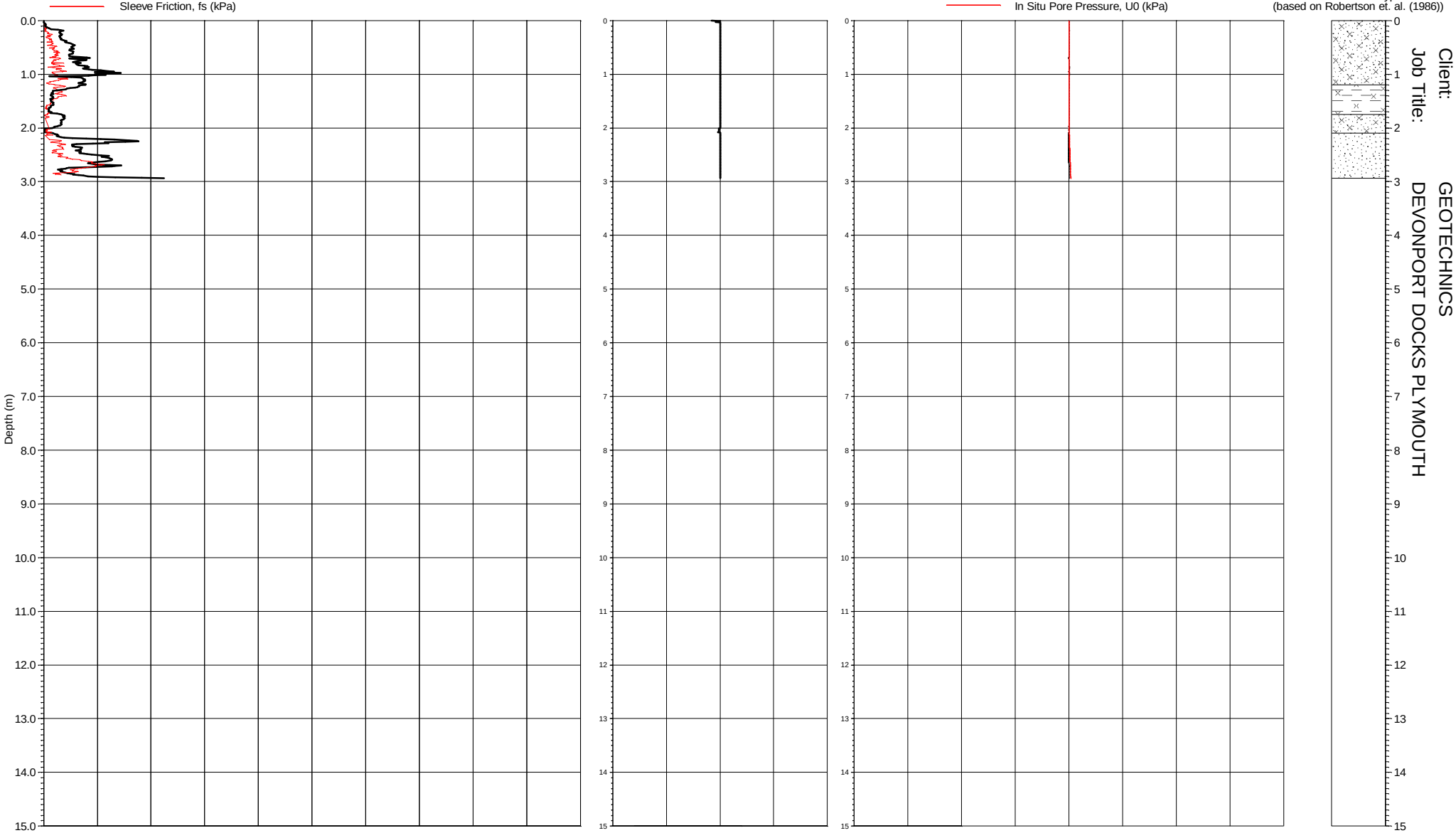
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C14

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C15

Checked By:

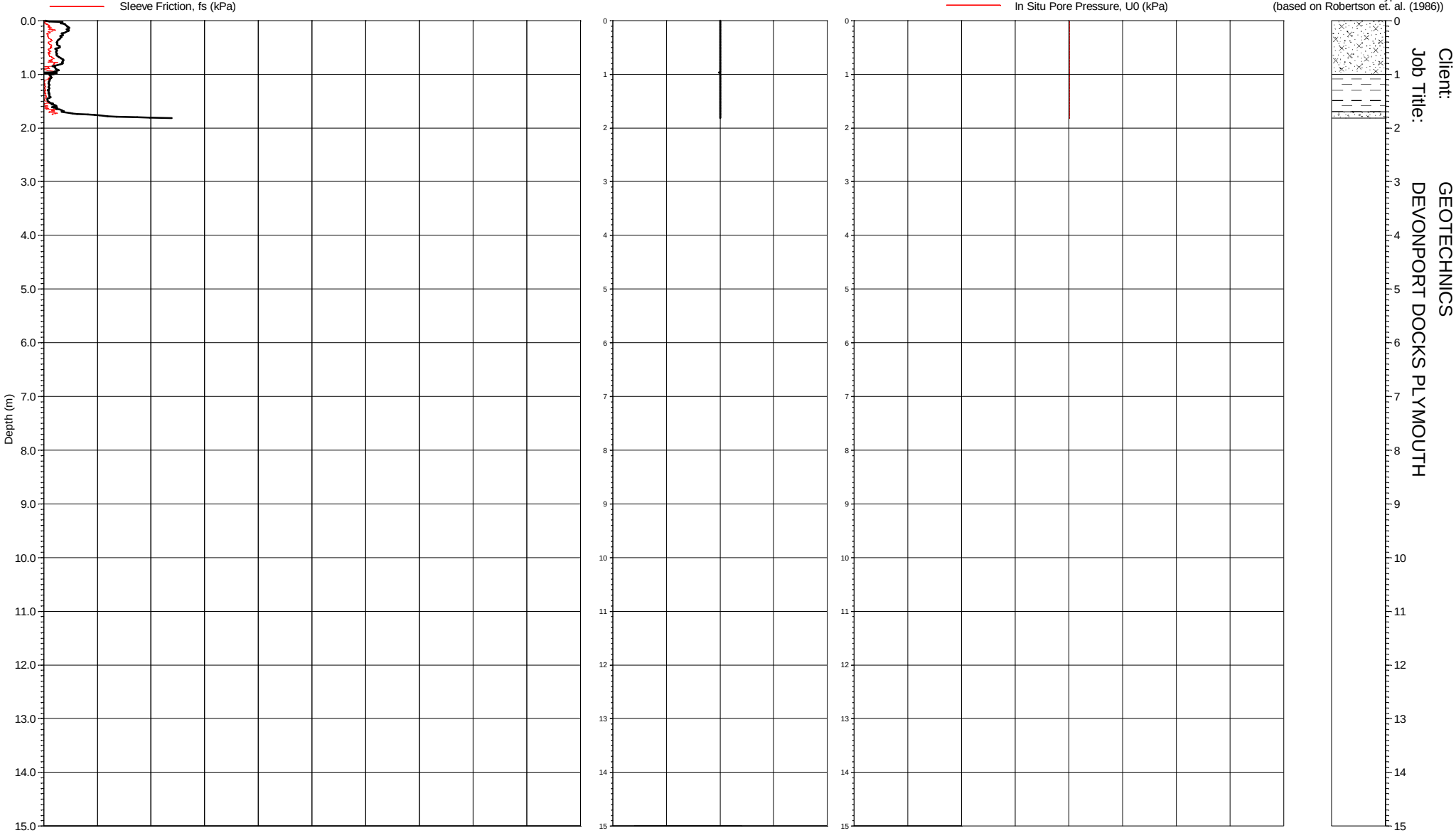
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C15

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C16

Checked By:

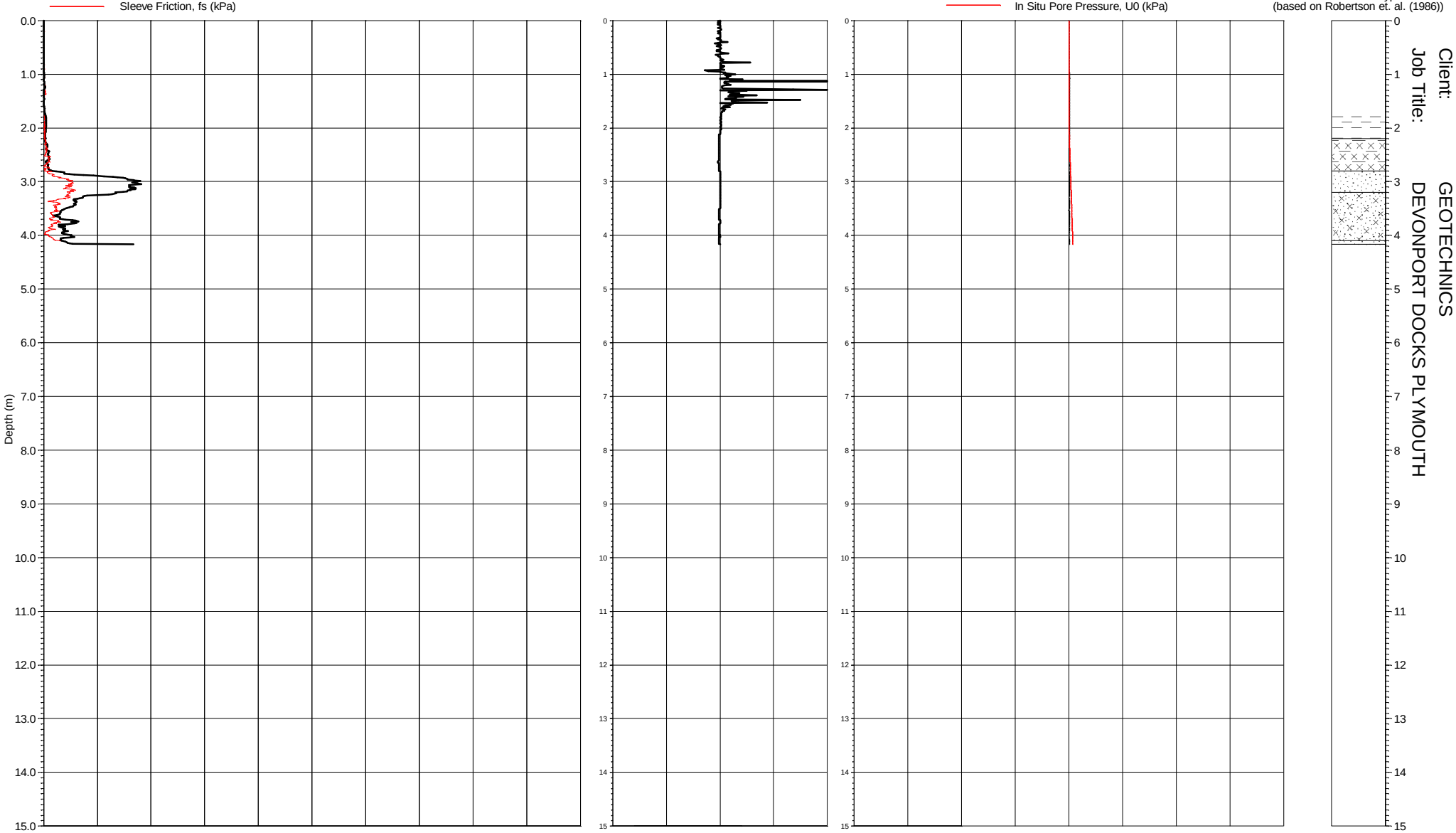
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C16

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C17

Checked By:

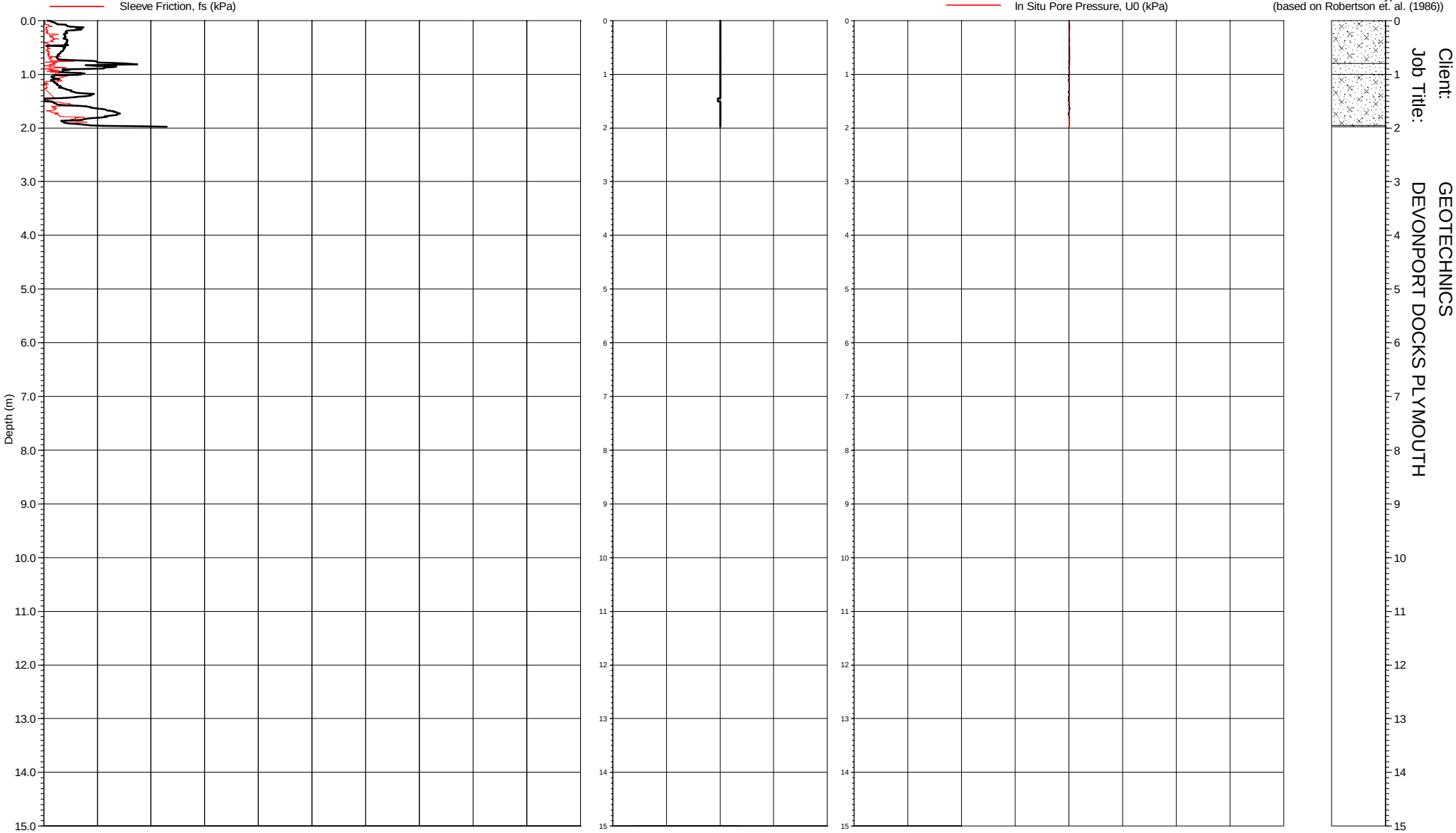
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C17

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C18

Checked By:

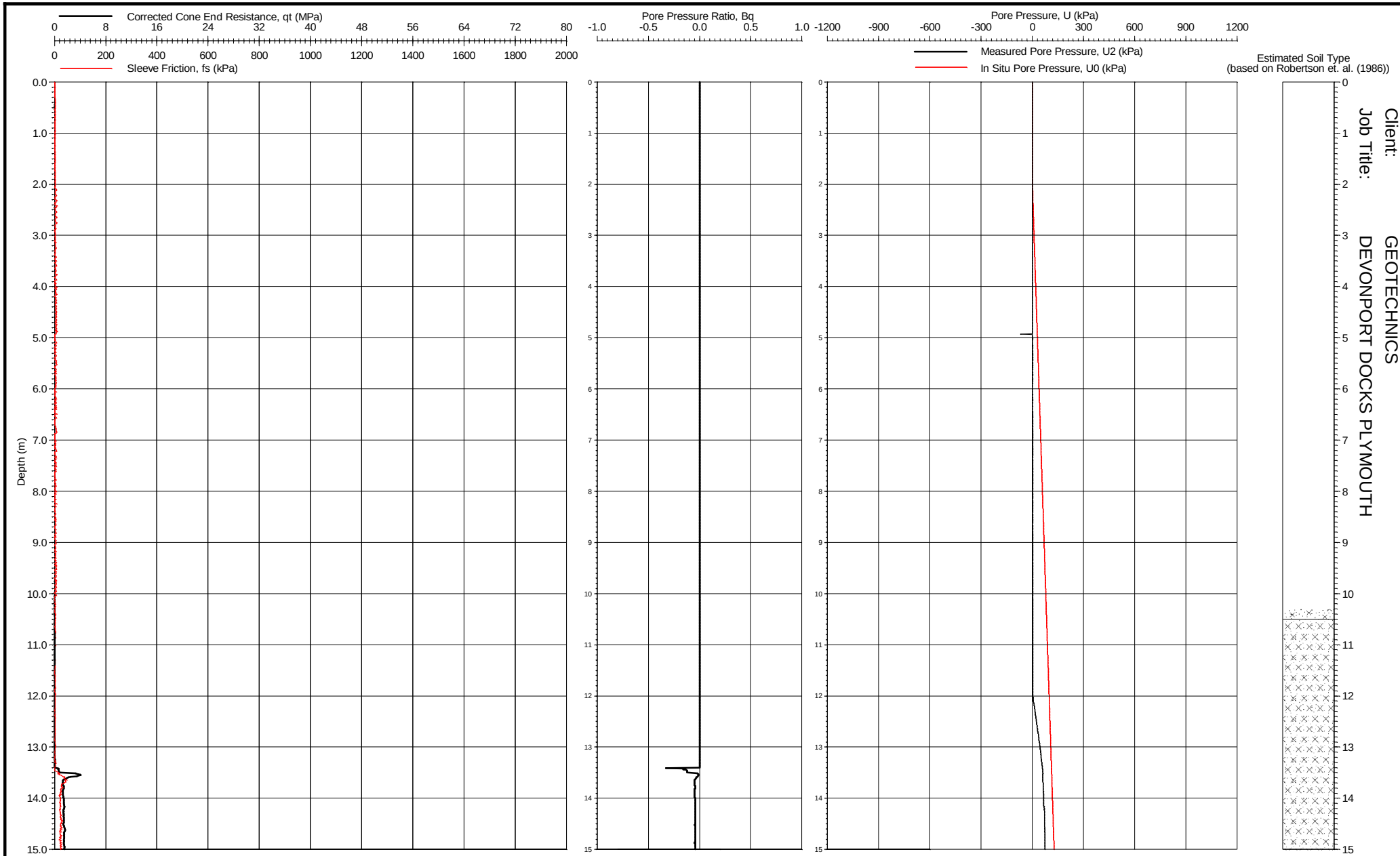
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C18

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C20A

Checked By:

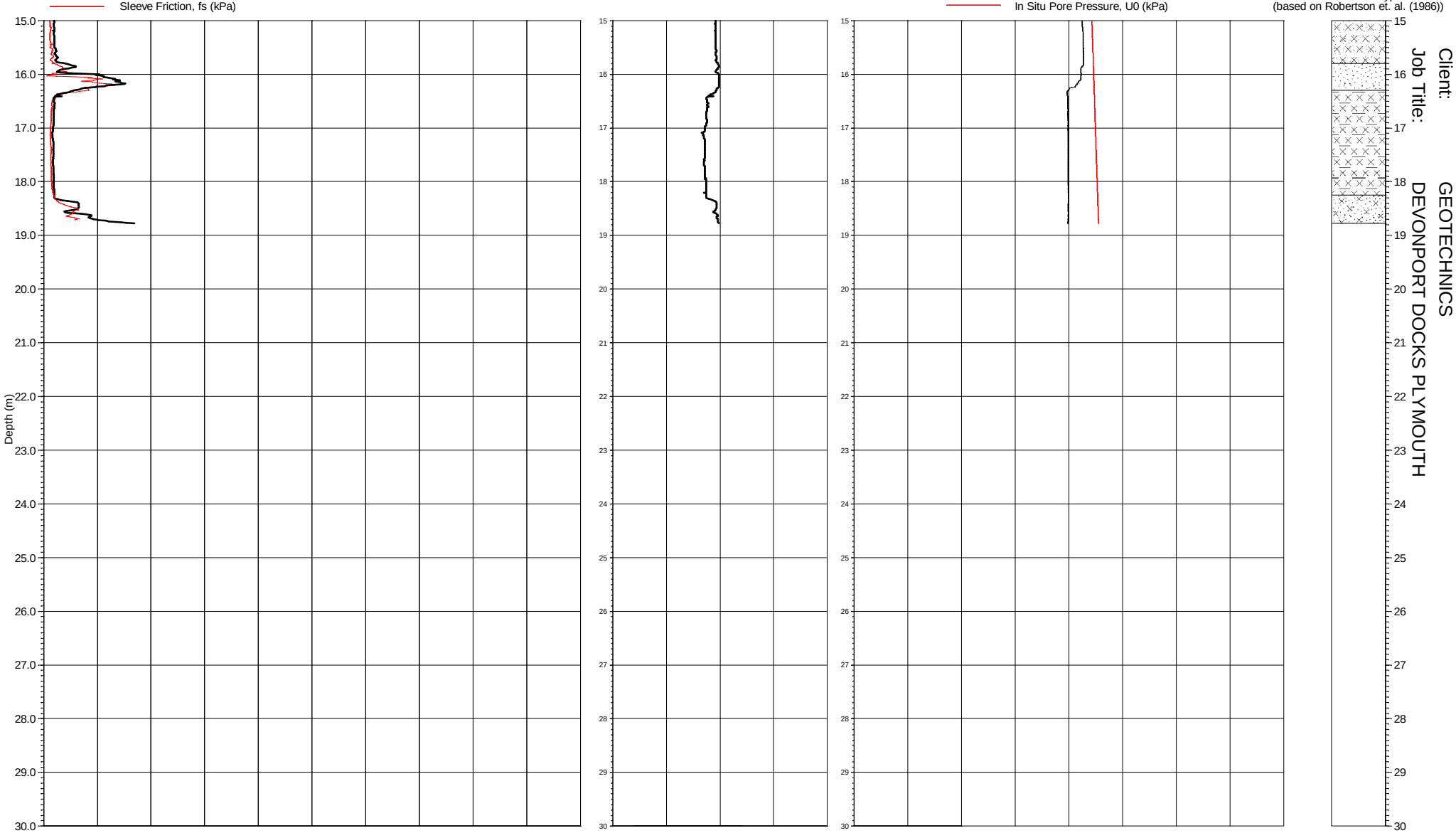
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C20A

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C20A

Checked By:

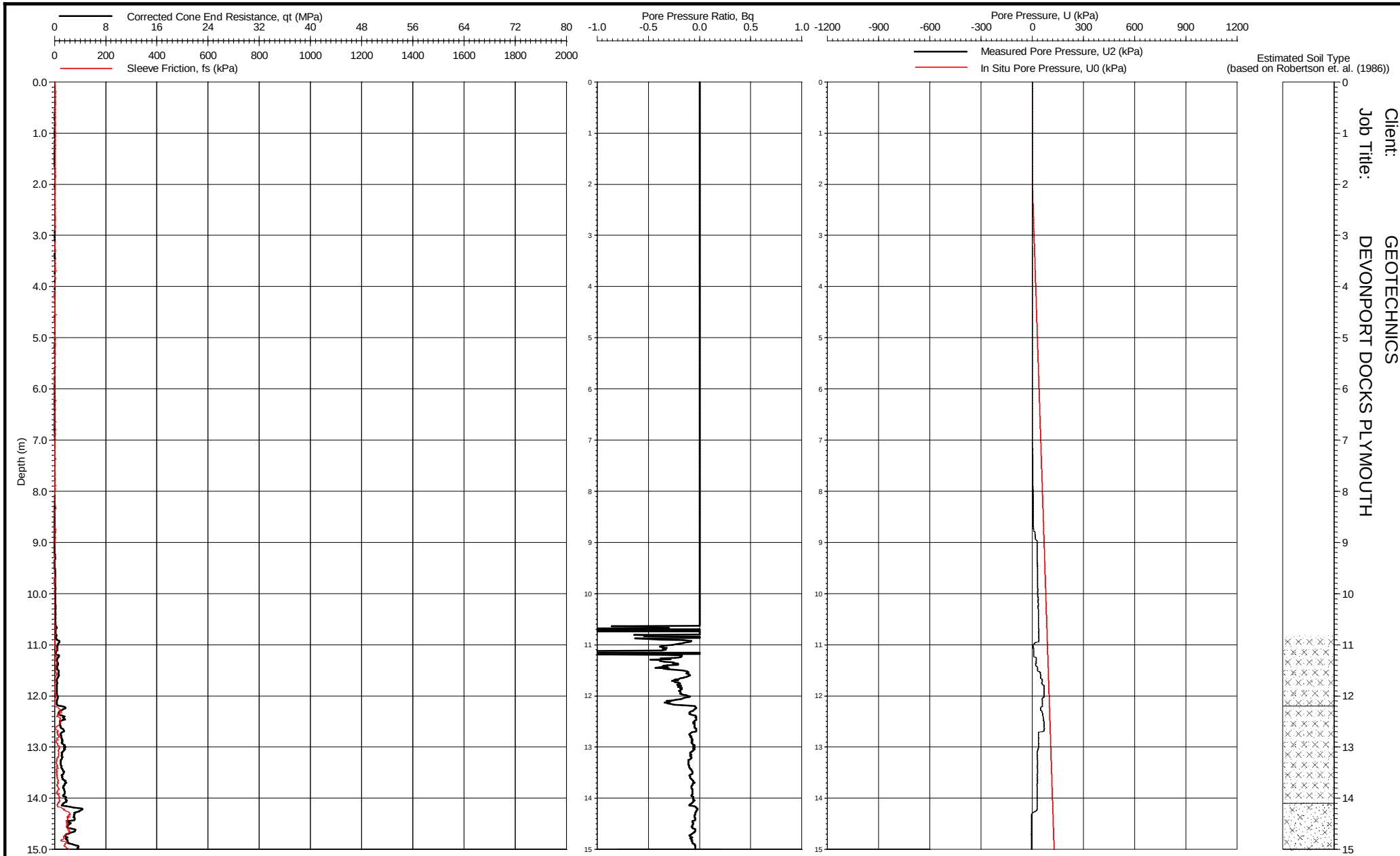
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C20A

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C21

Checked By:

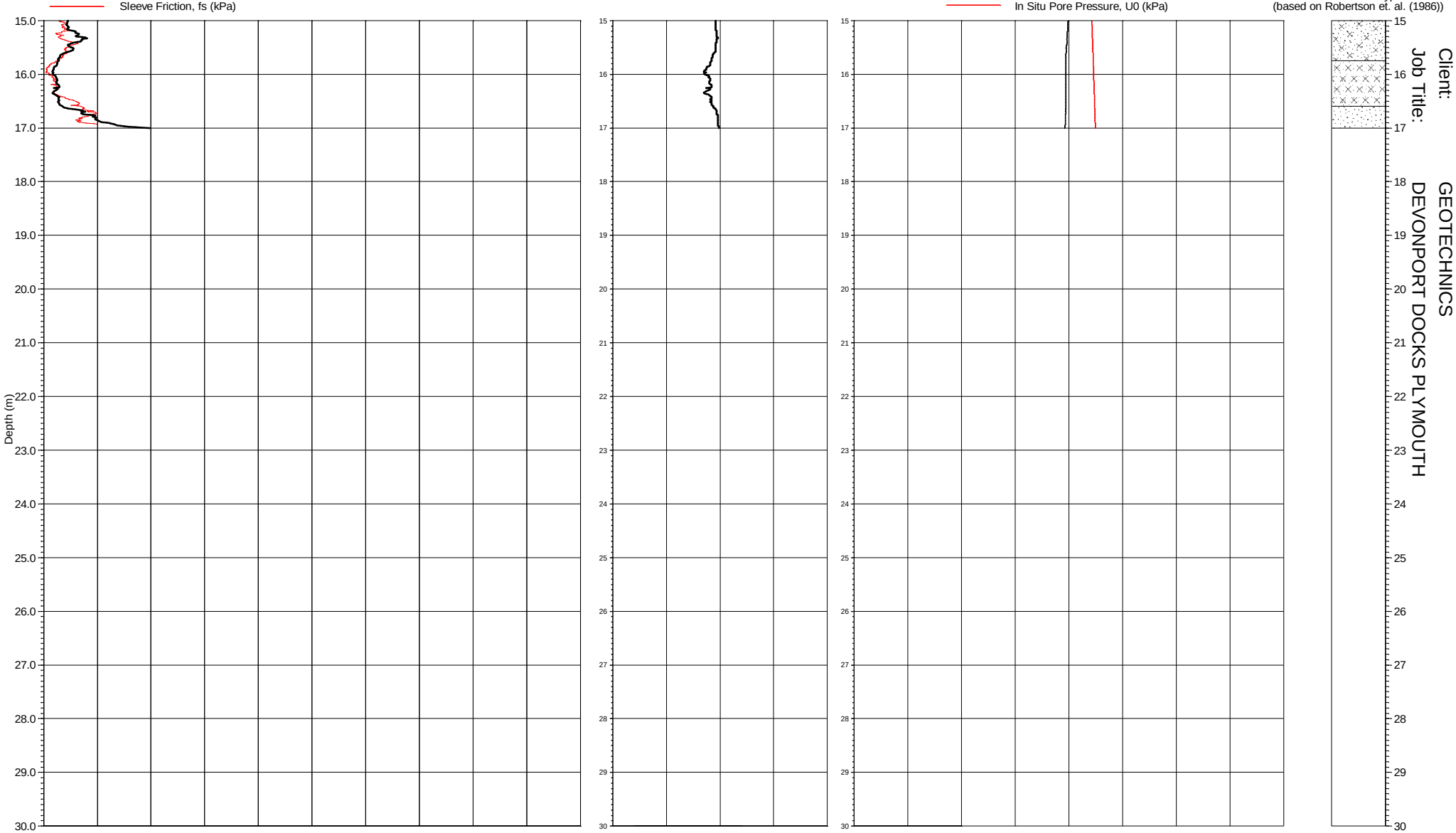
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C21

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C21

Checked By:

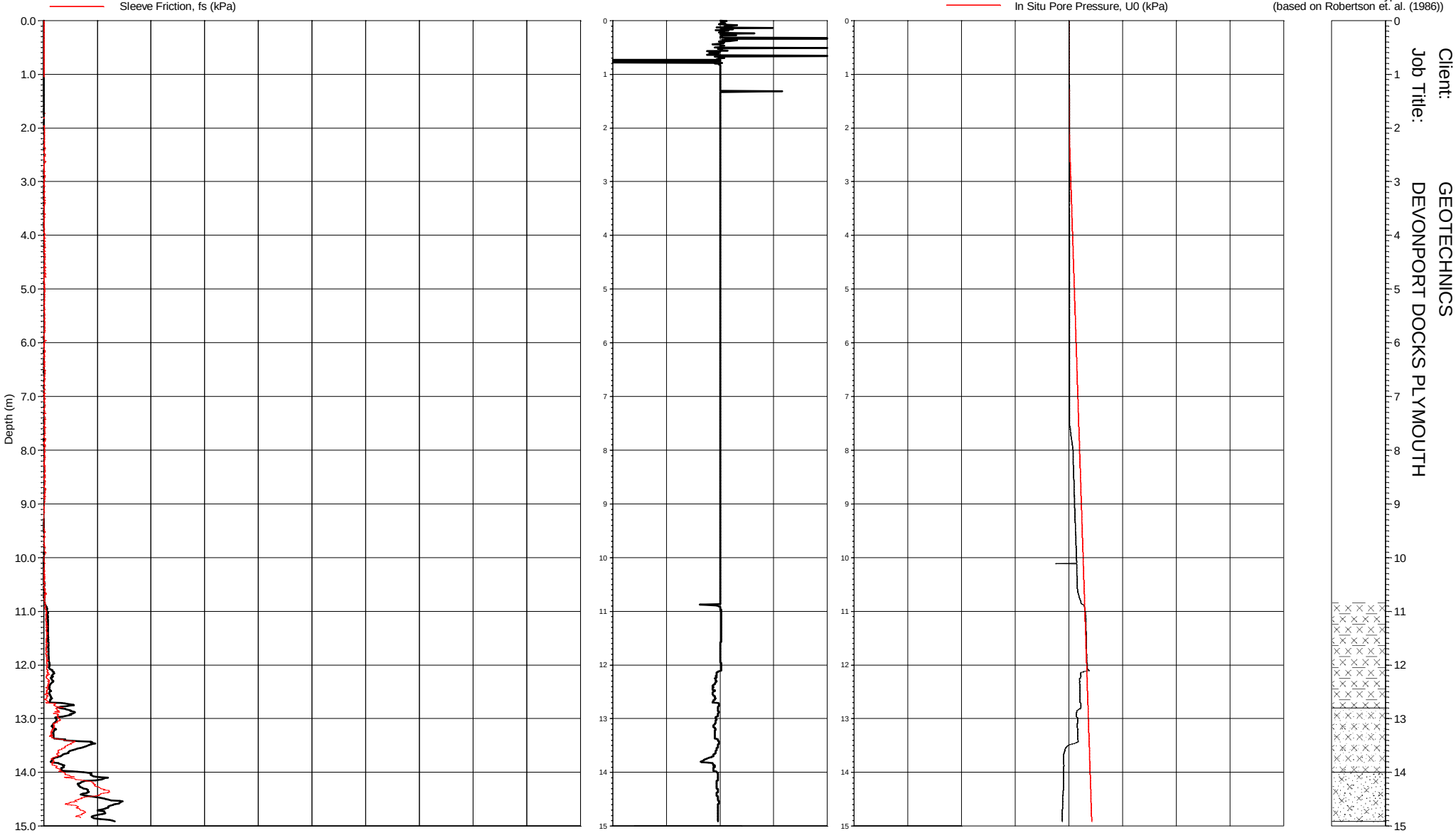
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C21

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C22

Checked By:

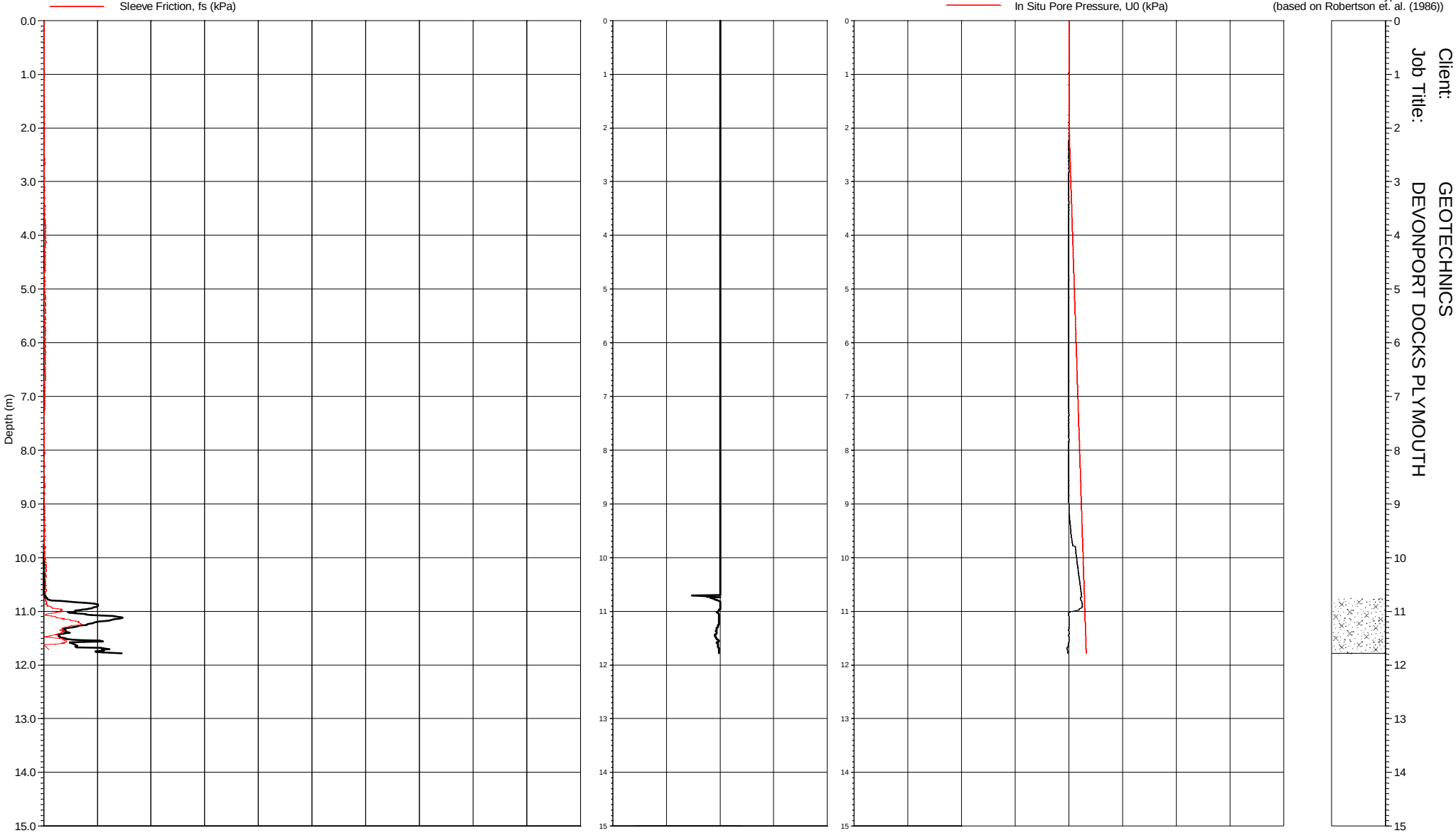
IN SITU SITE INVESTIGATION

nsitusi.com

PIEZO CONE PENETRATION TEST

C22

Form: CPT0002



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C28

Checked By:

IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C28

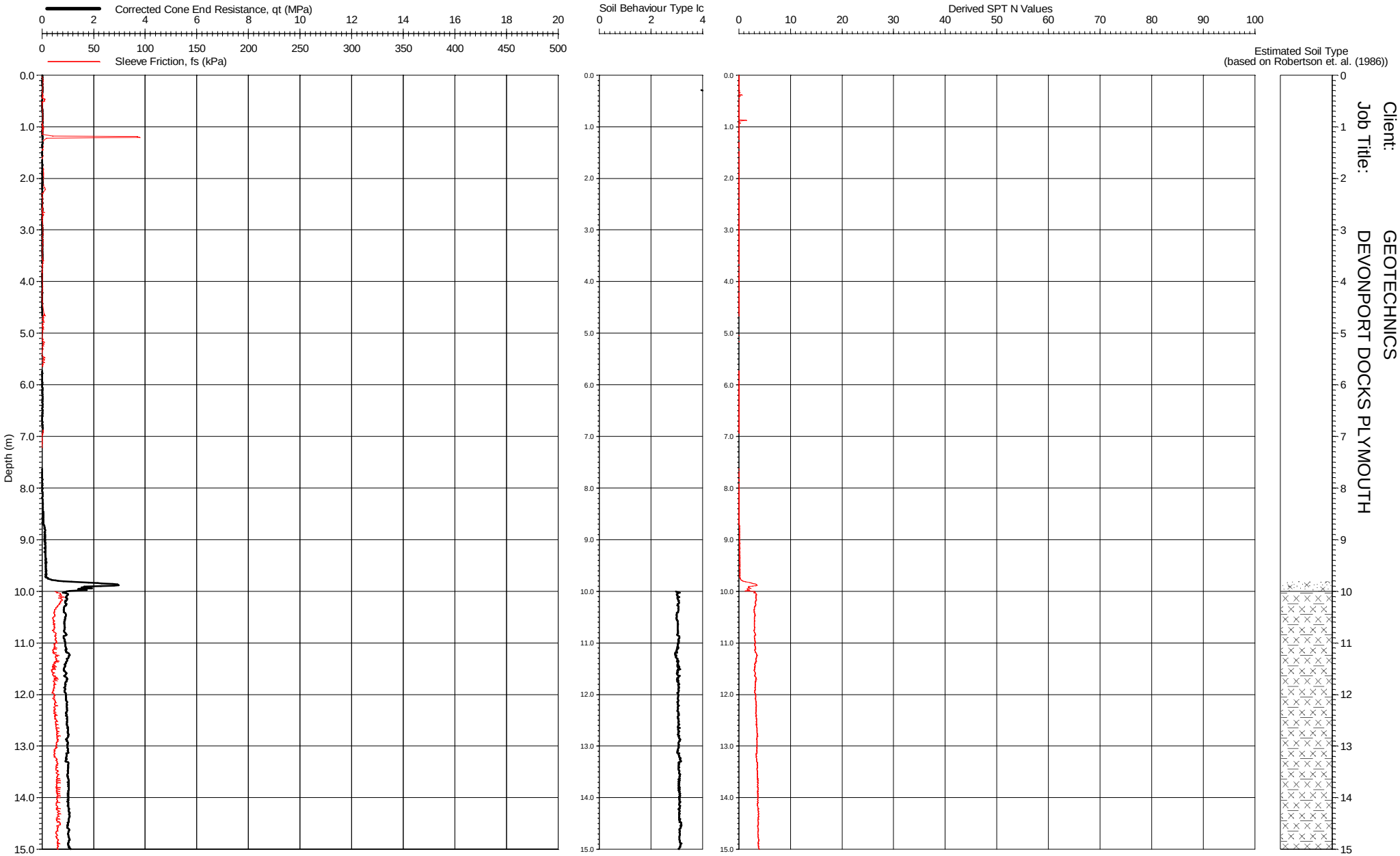
Form: CPT0002

APPENDIX C

CPT DERIVED GEOTECHNICAL PARAMETERS

LIST OF FIGURES

Description	Pages Included
CPT 01 – CPT 08 (Printed on Form CPT0003) Soil Behaviour Type and N Value	29
CPT 01 – CPT 08 (Printed on Form CPT0004) Relative Density and Shear Strength	29
CPT 01 – CPT 08 (Printed on Form CPT0006) Fines Content and Friction Angle	29



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C01

Checked By:

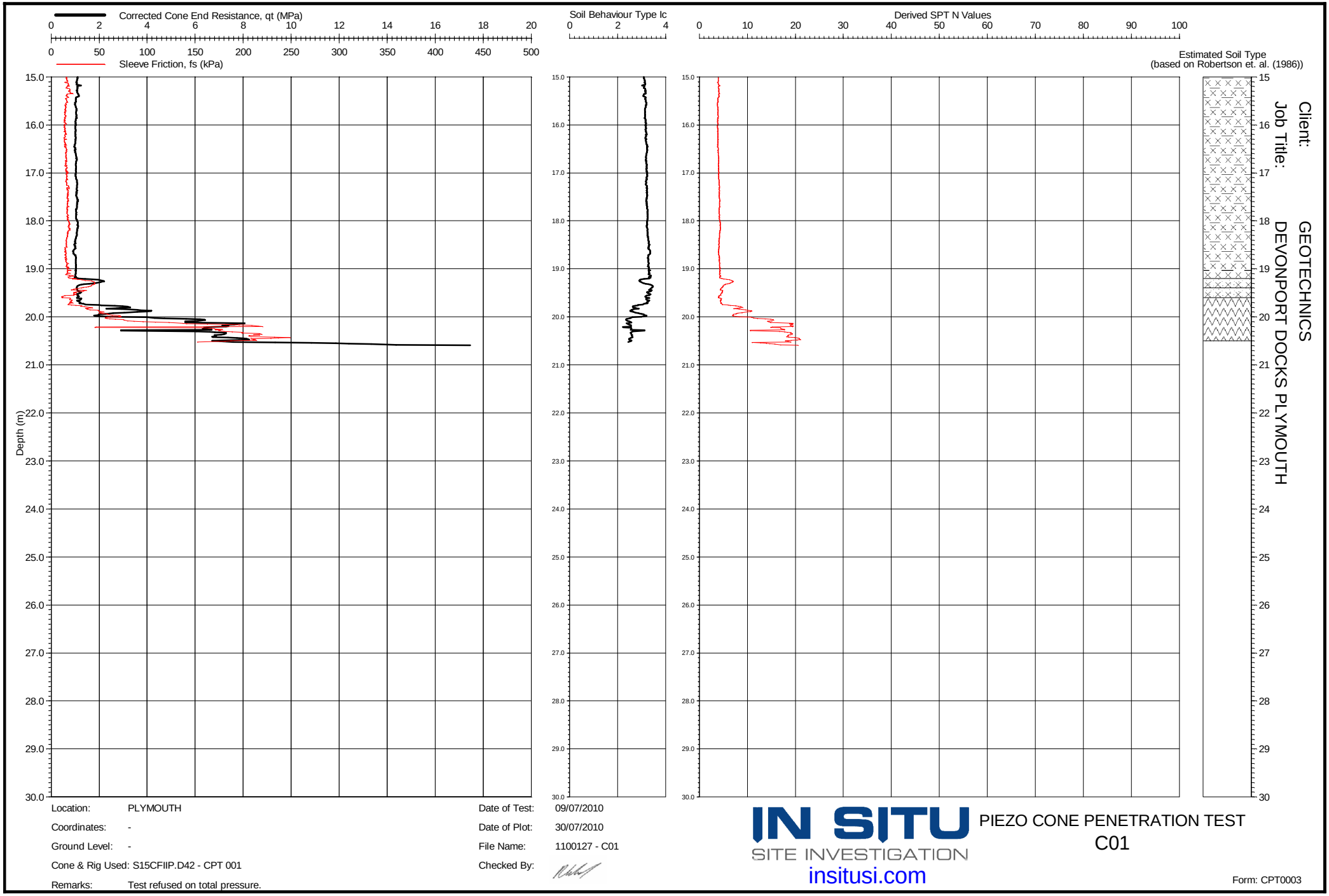
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C01

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C01

Checked By:

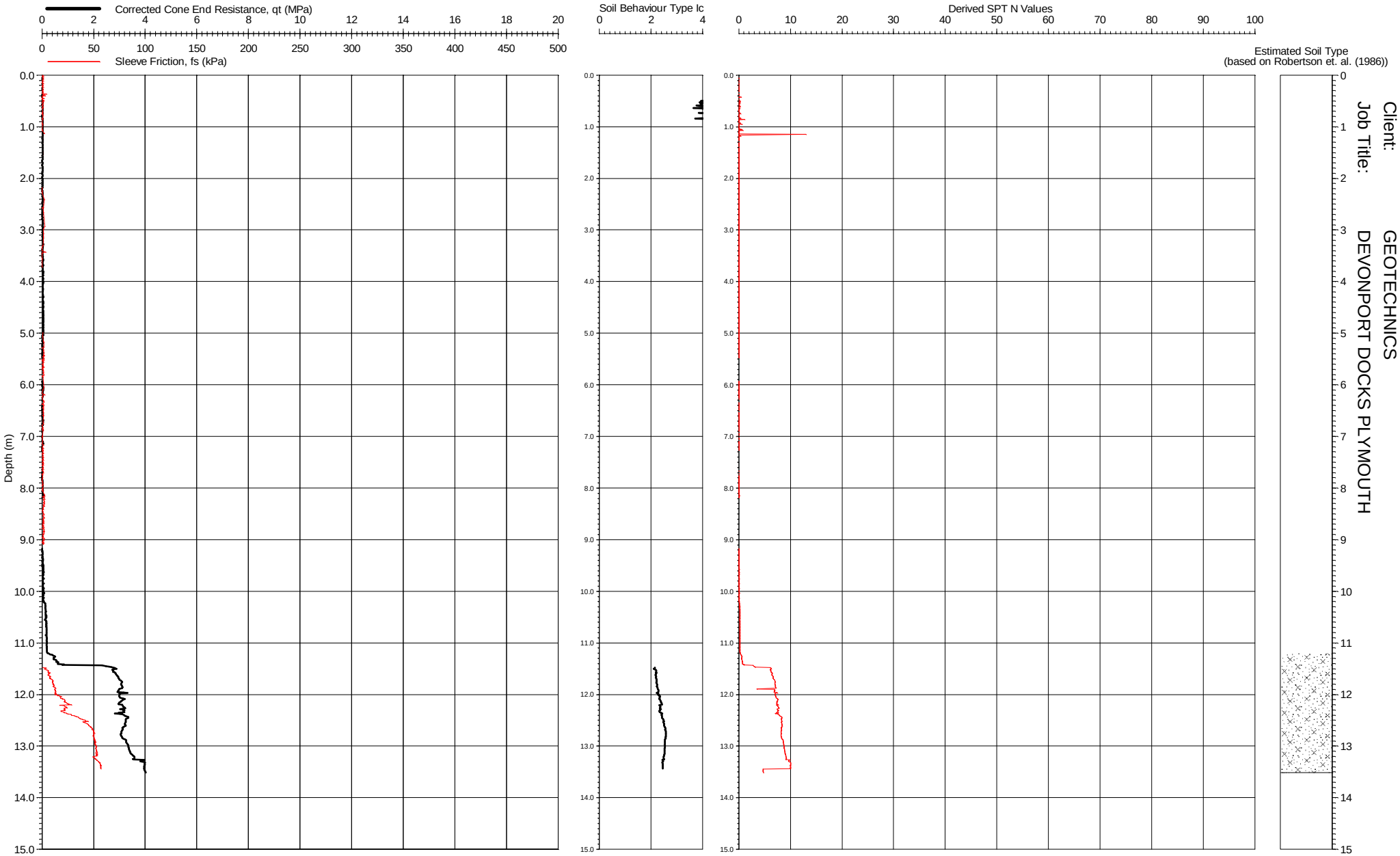
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C01

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C02

Checked By:

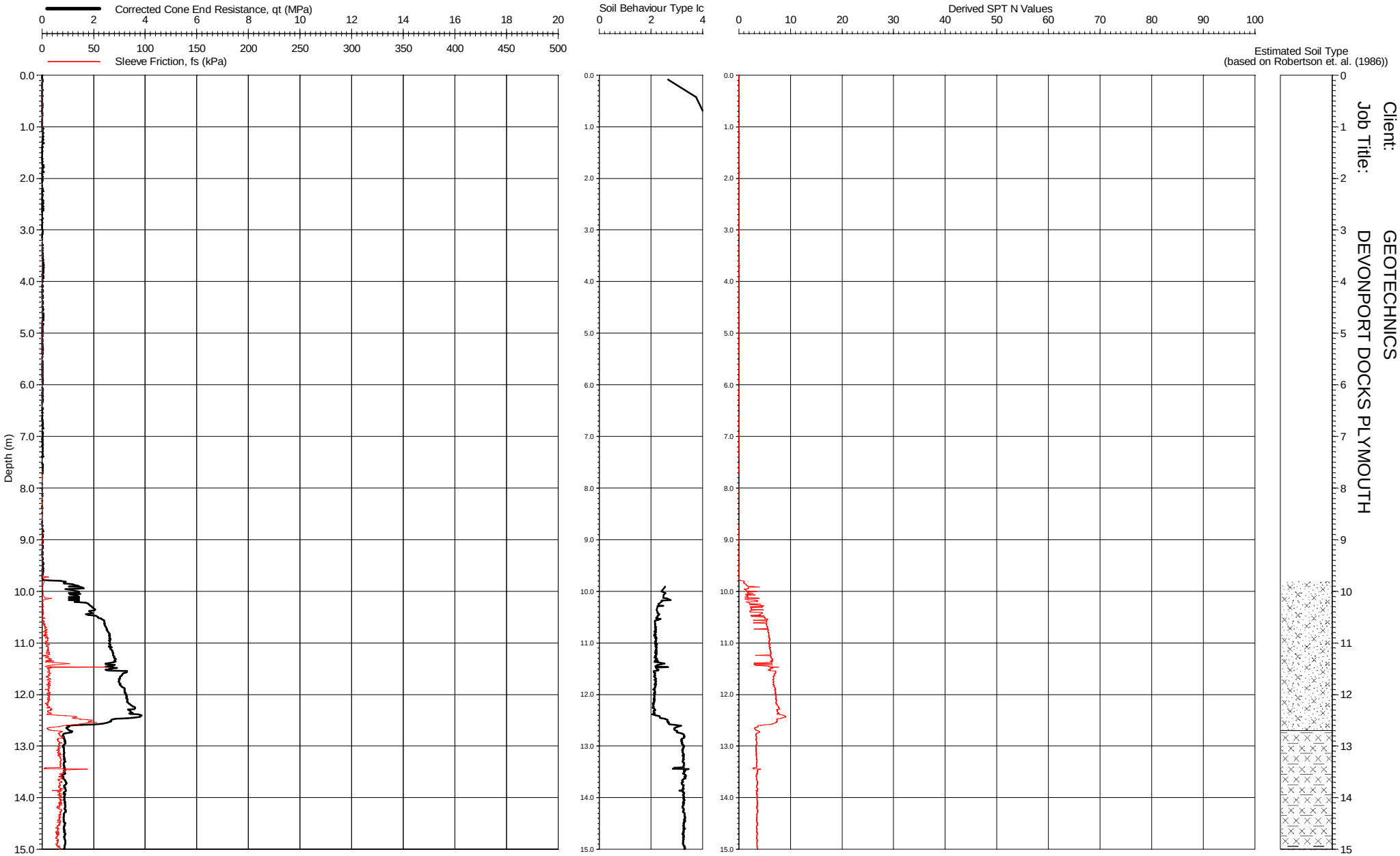
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C02

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C03

Checked By:

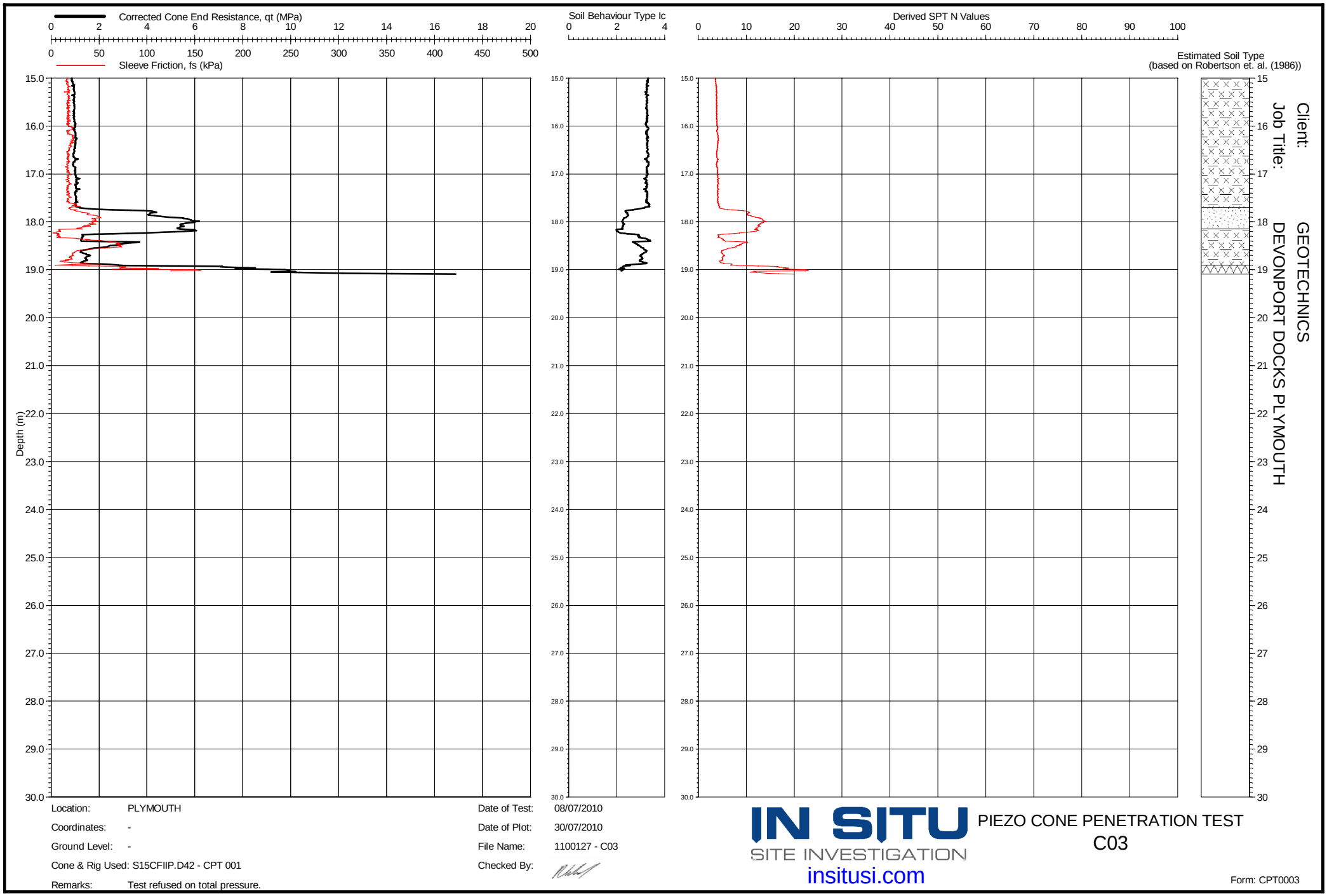
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PIEZO CONE PENETRATION TEST

C03

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C03

Checked By:

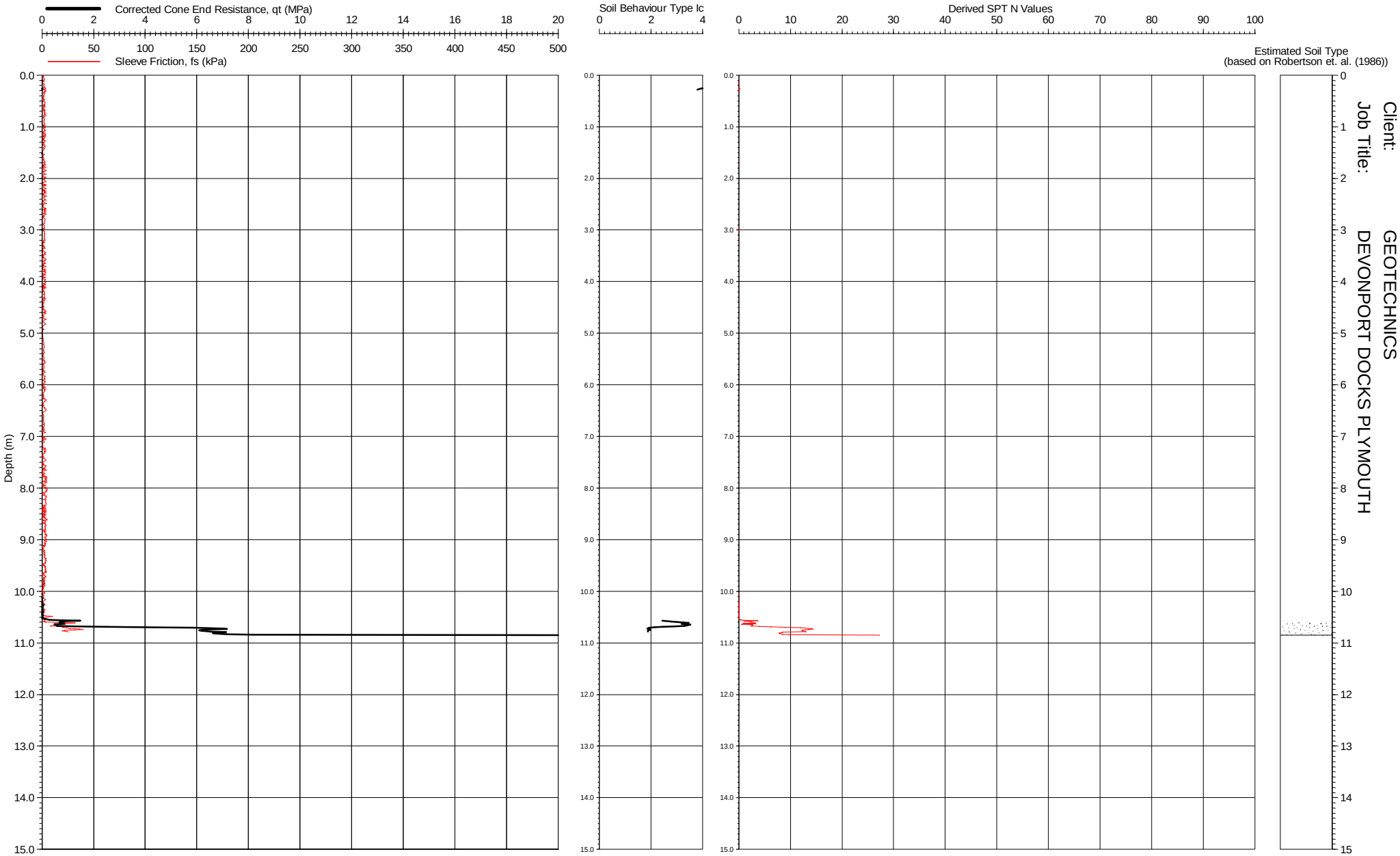
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insitusi.com

PIEZO CONE PENETRATION TEST

C03

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C04

Checked By:

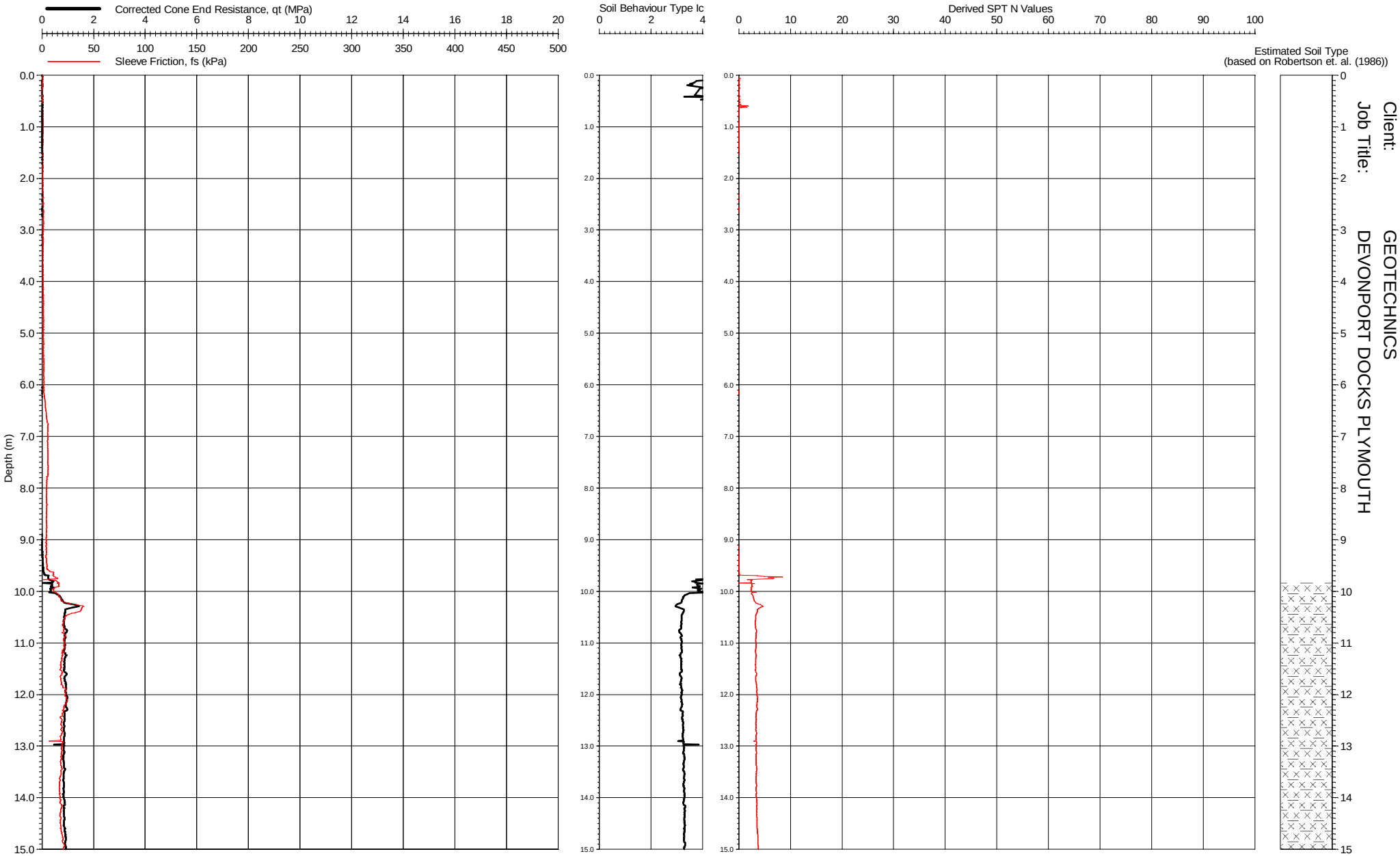
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C04

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 14/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C05

Checked By:

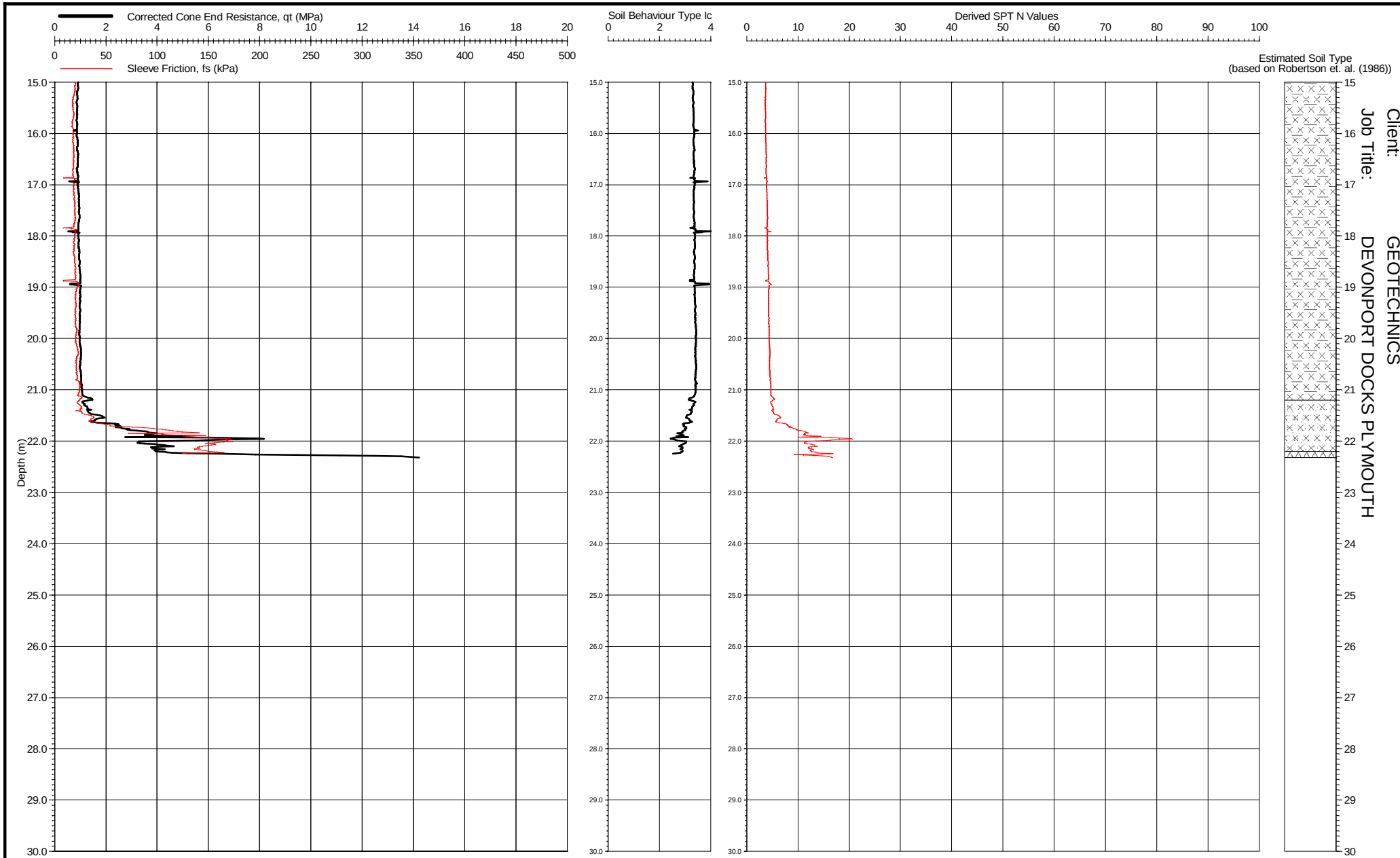
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PIEZO CONE PENETRATION TEST

C05

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 14/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C05

Checked By:

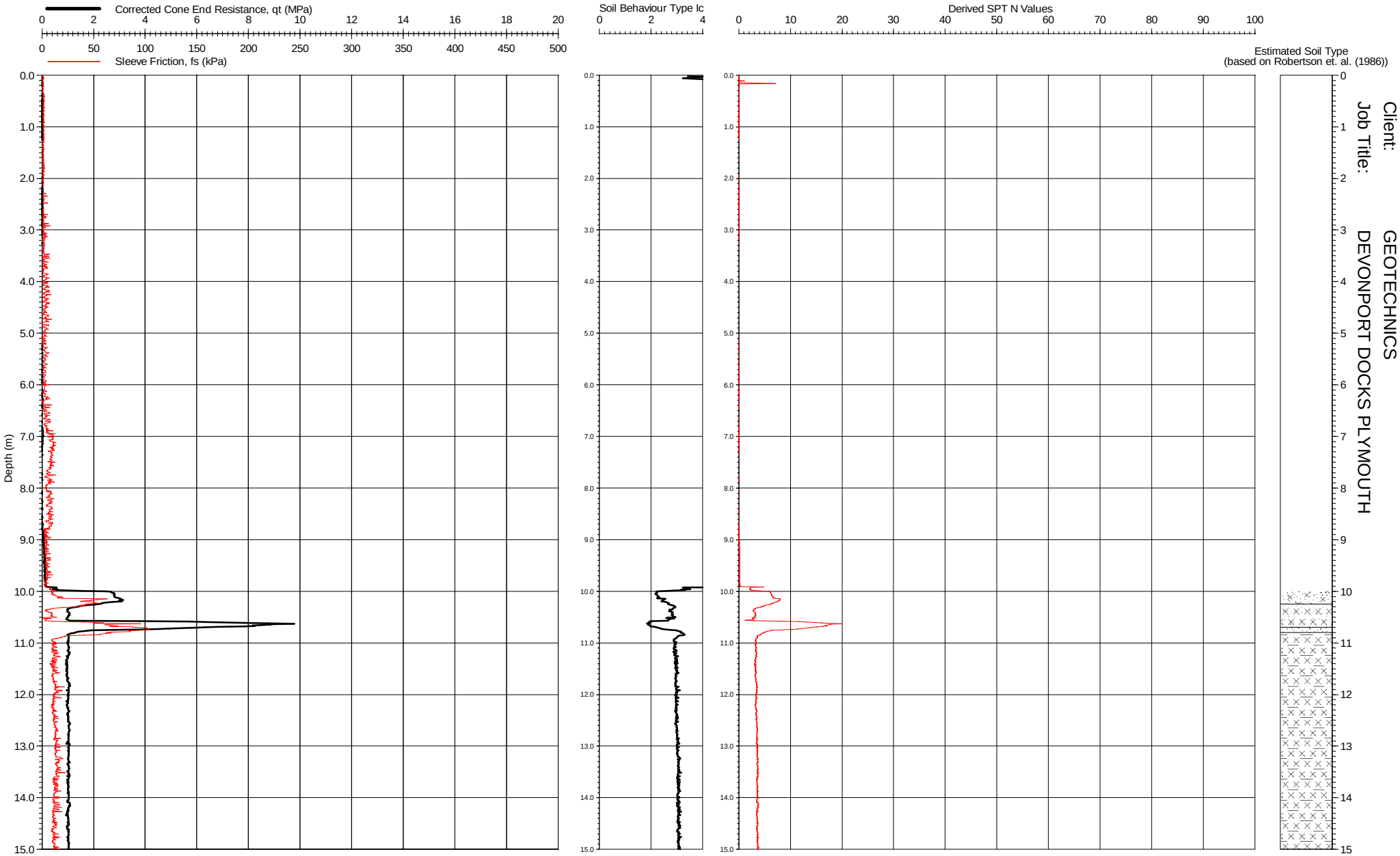
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C05

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C06

Checked By:

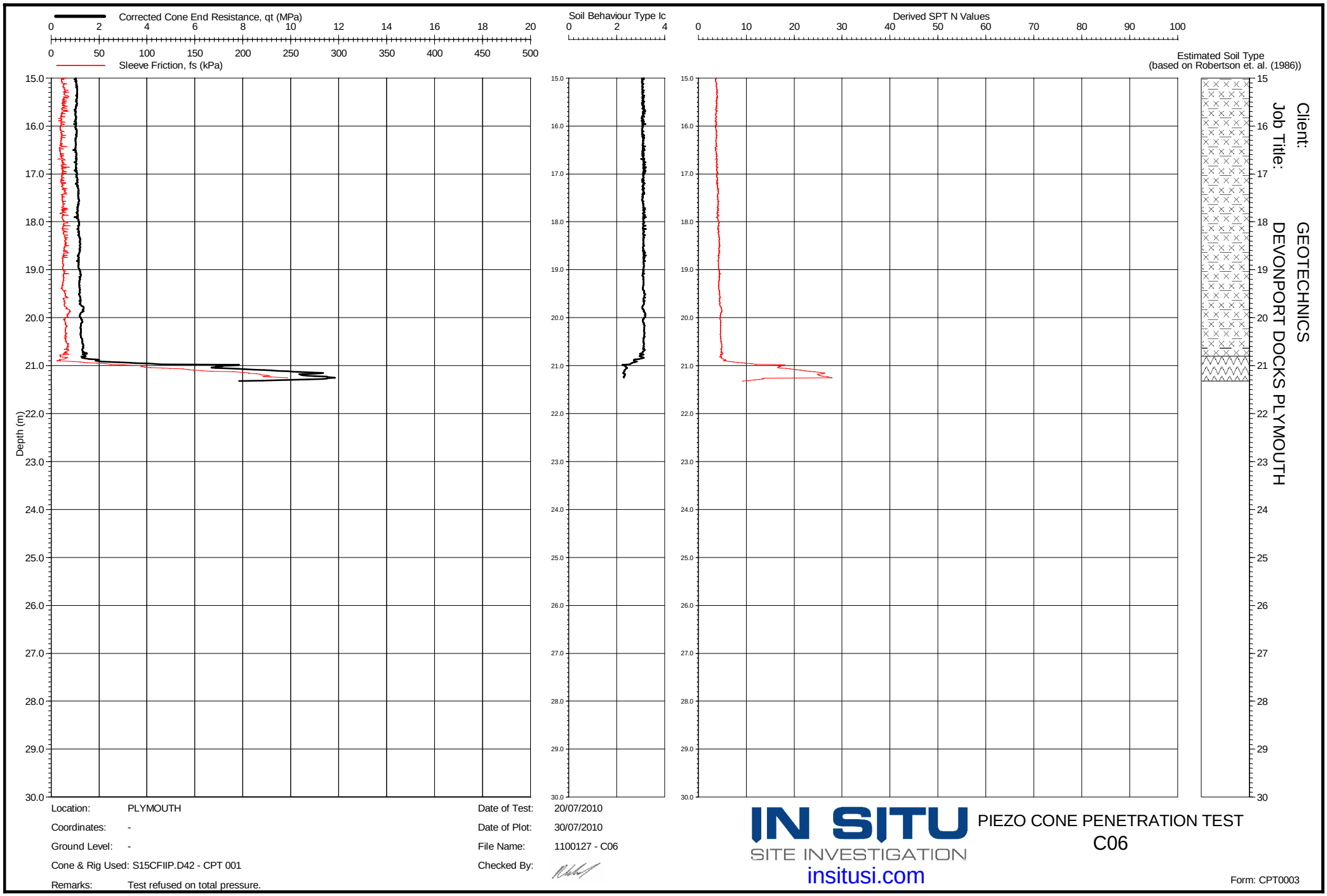
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C06

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C06

Checked By:

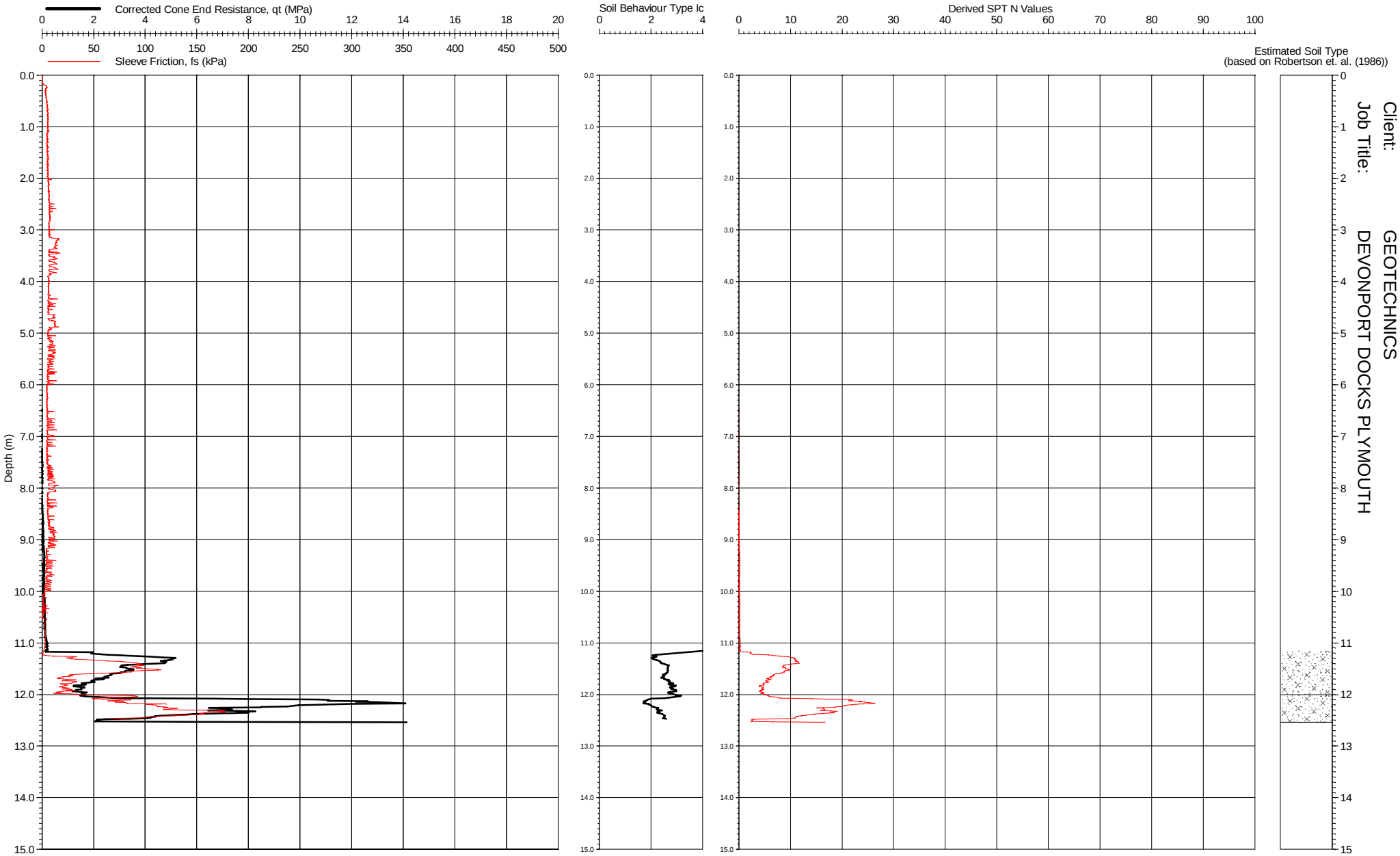
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C06

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C07

Checked By:

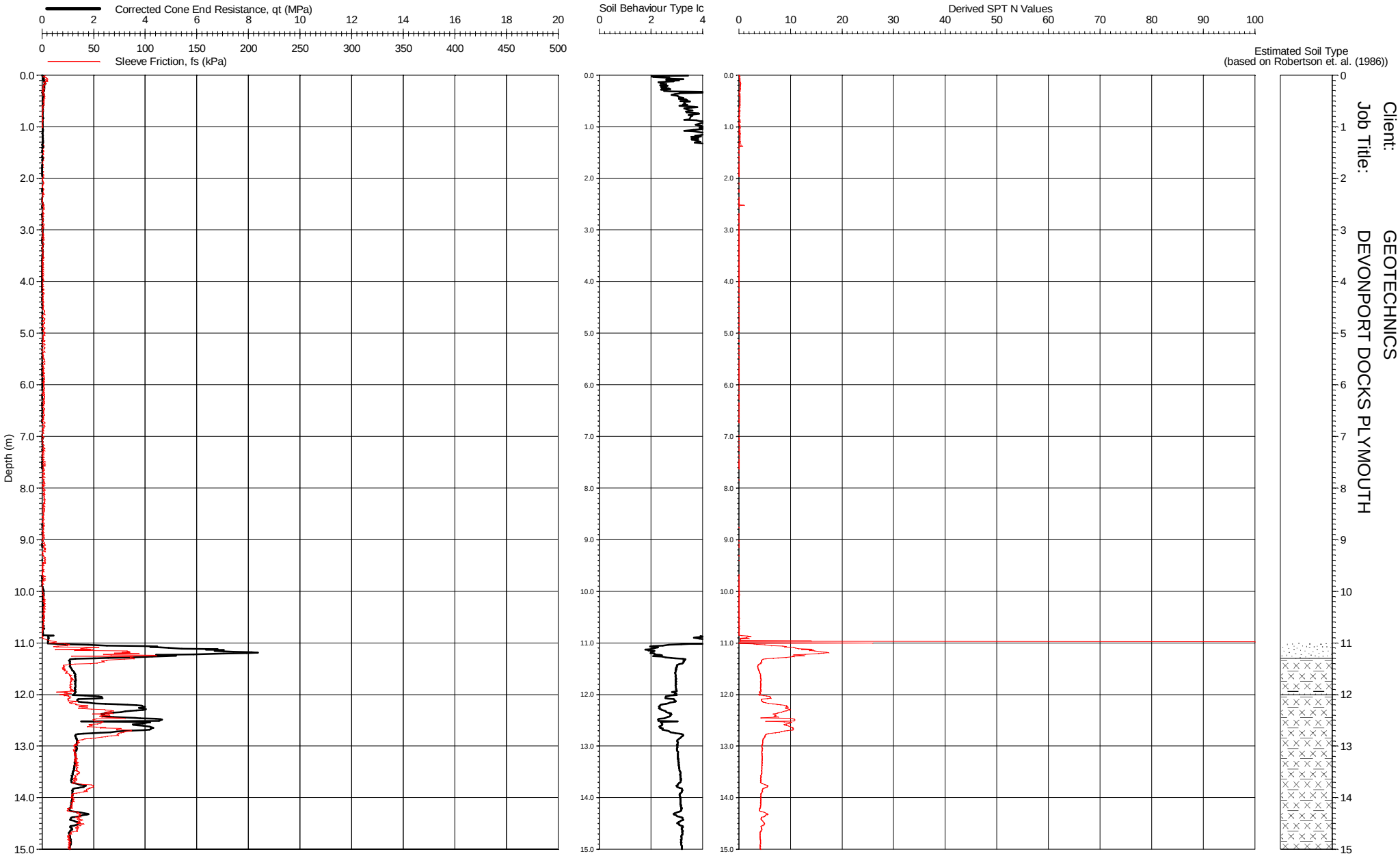
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C07

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C08

Checked By:

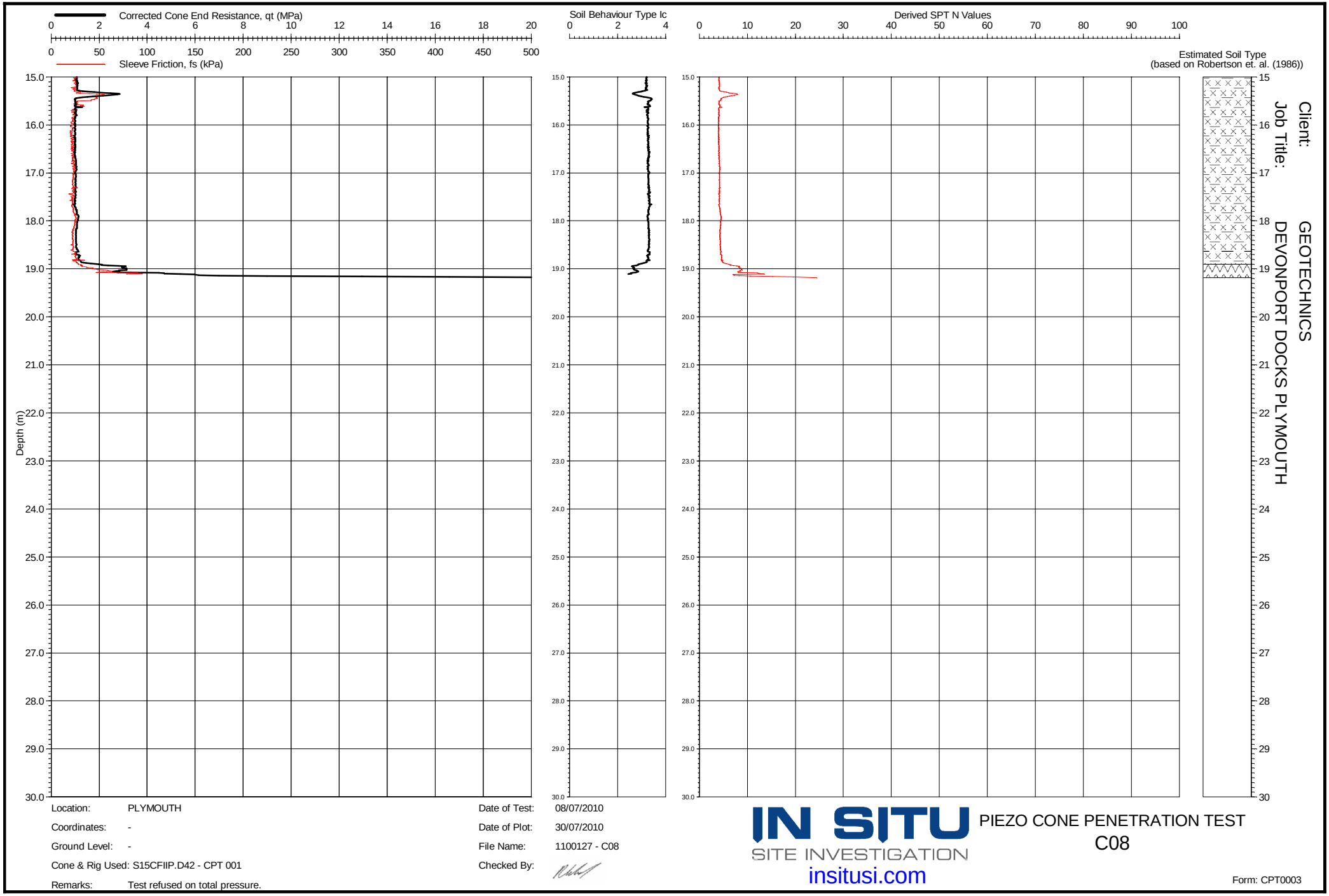
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C08

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C08

Checked By:

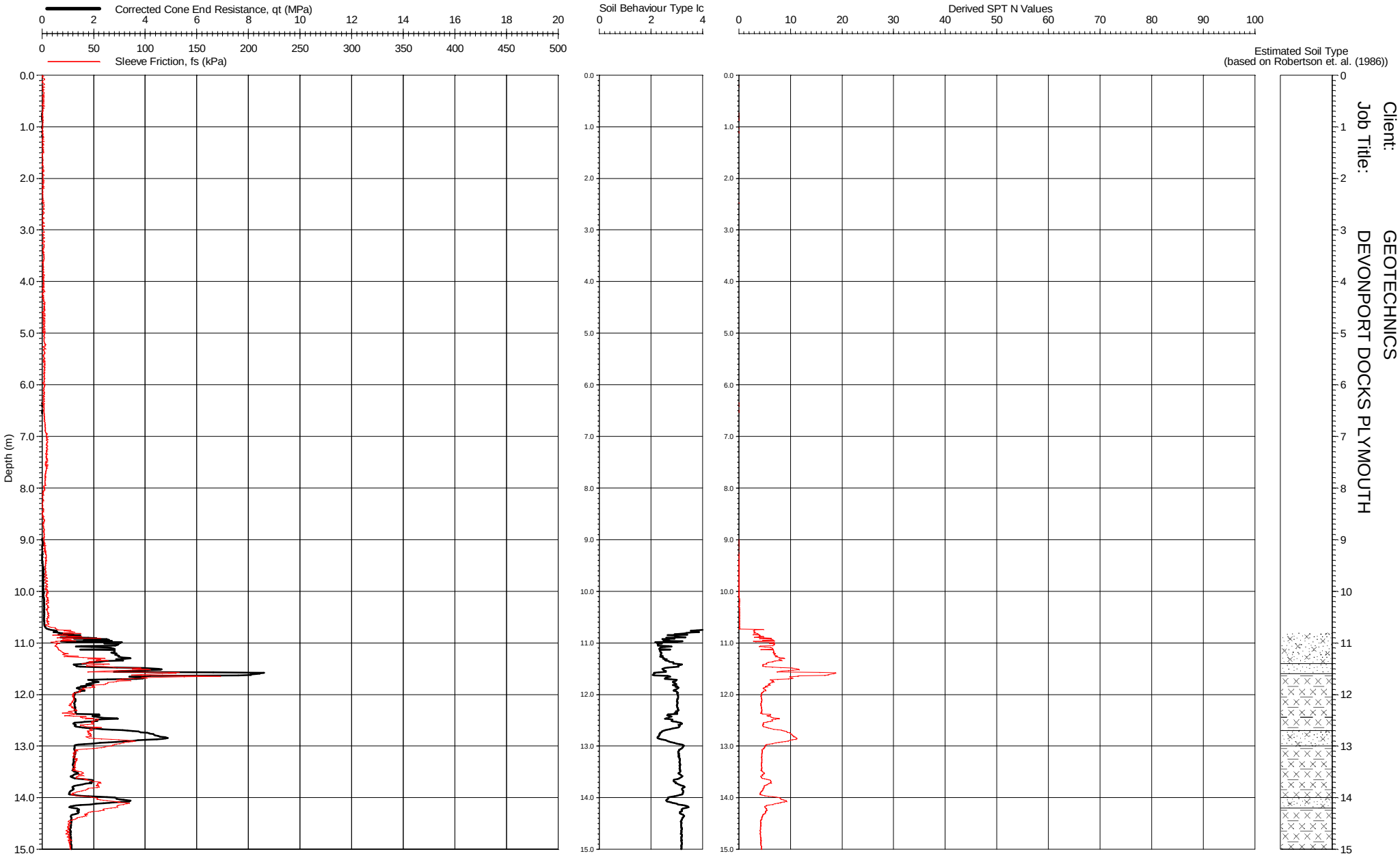
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C08

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C09A

Checked By:

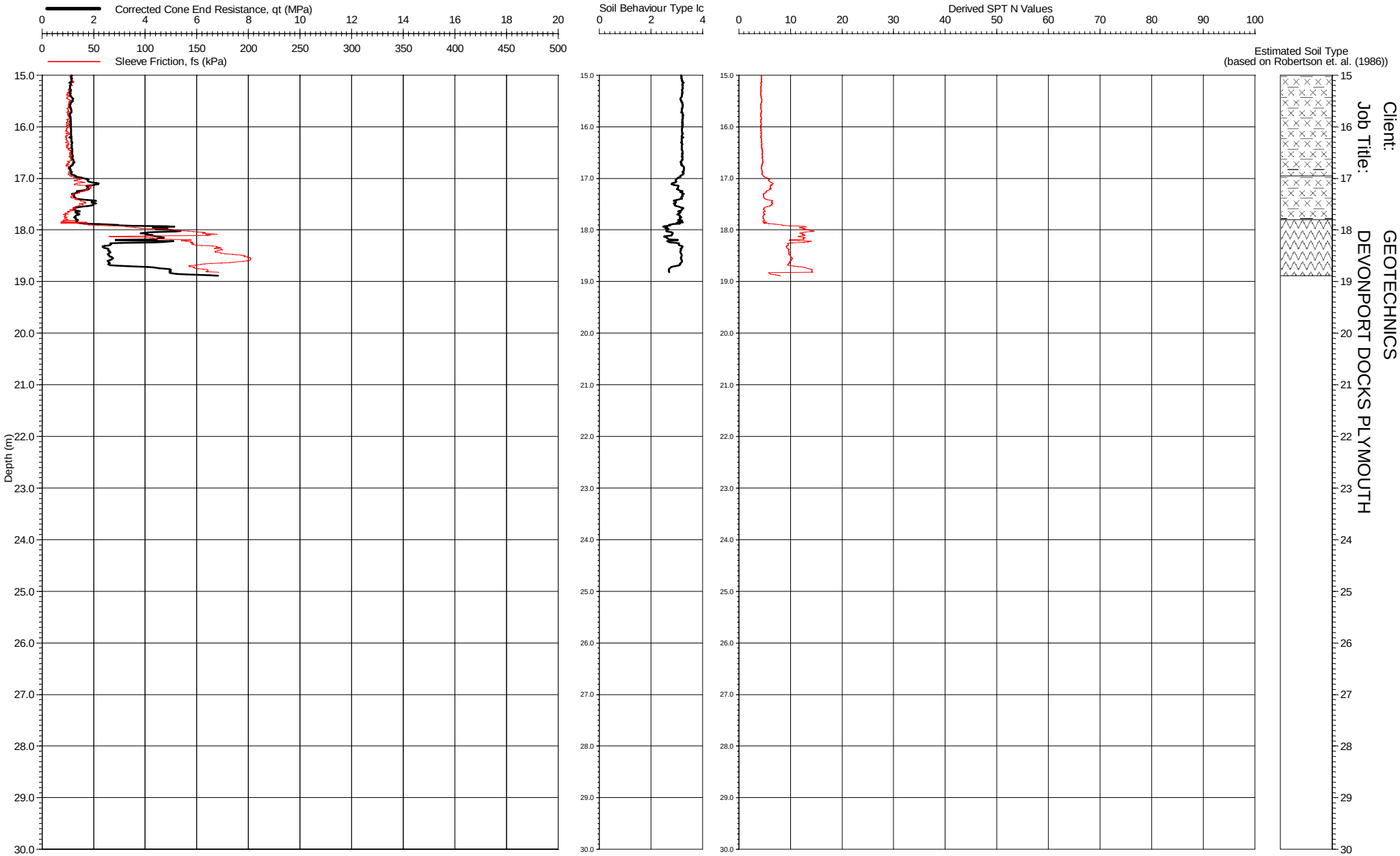
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insitusi.com

PIEZO CONE PENETRATION TEST

C09A

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C09A

Checked By:

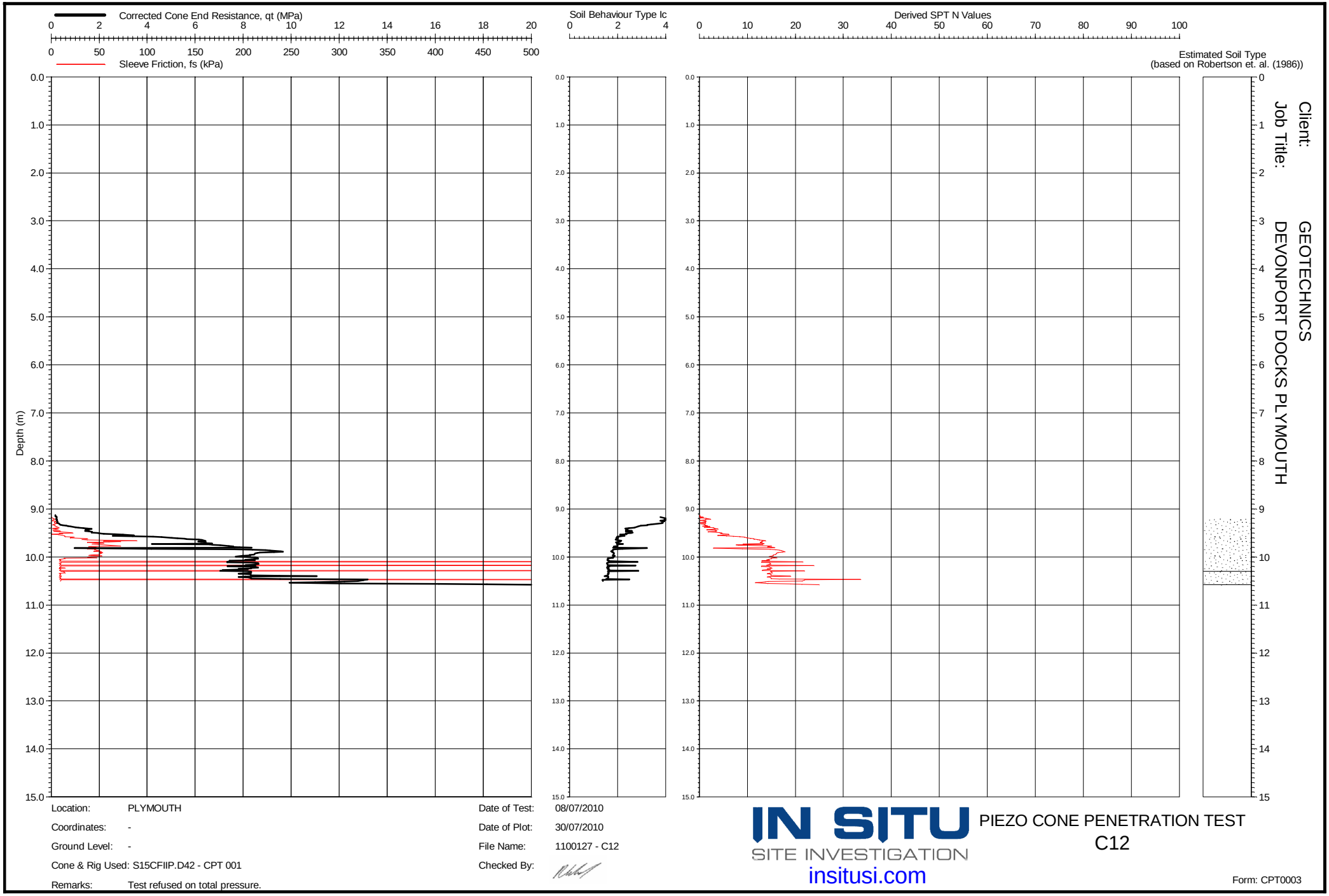
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C09A

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C12

Checked By:

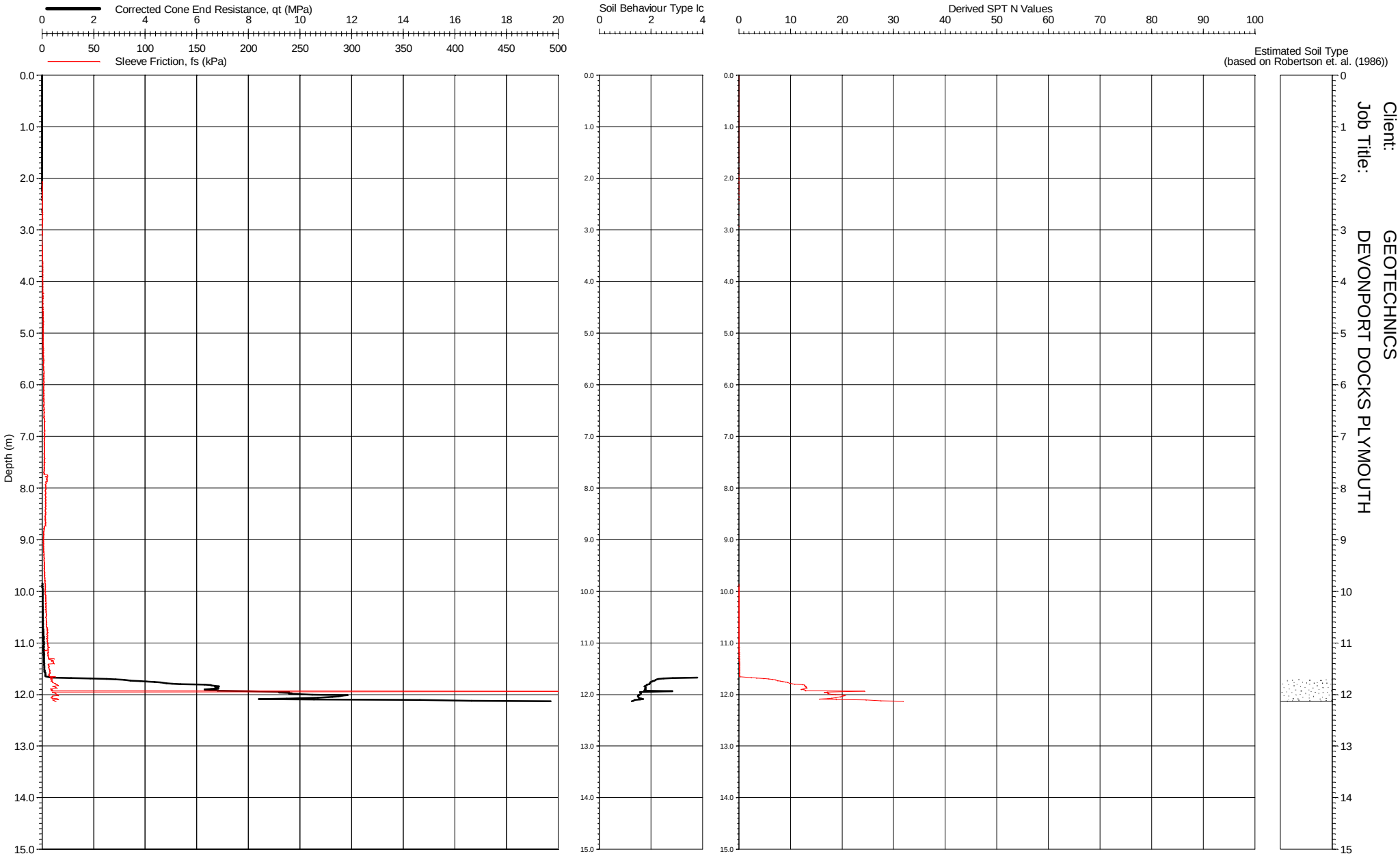
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C12

Form: CPT0003



Client: GEOTECHNICS

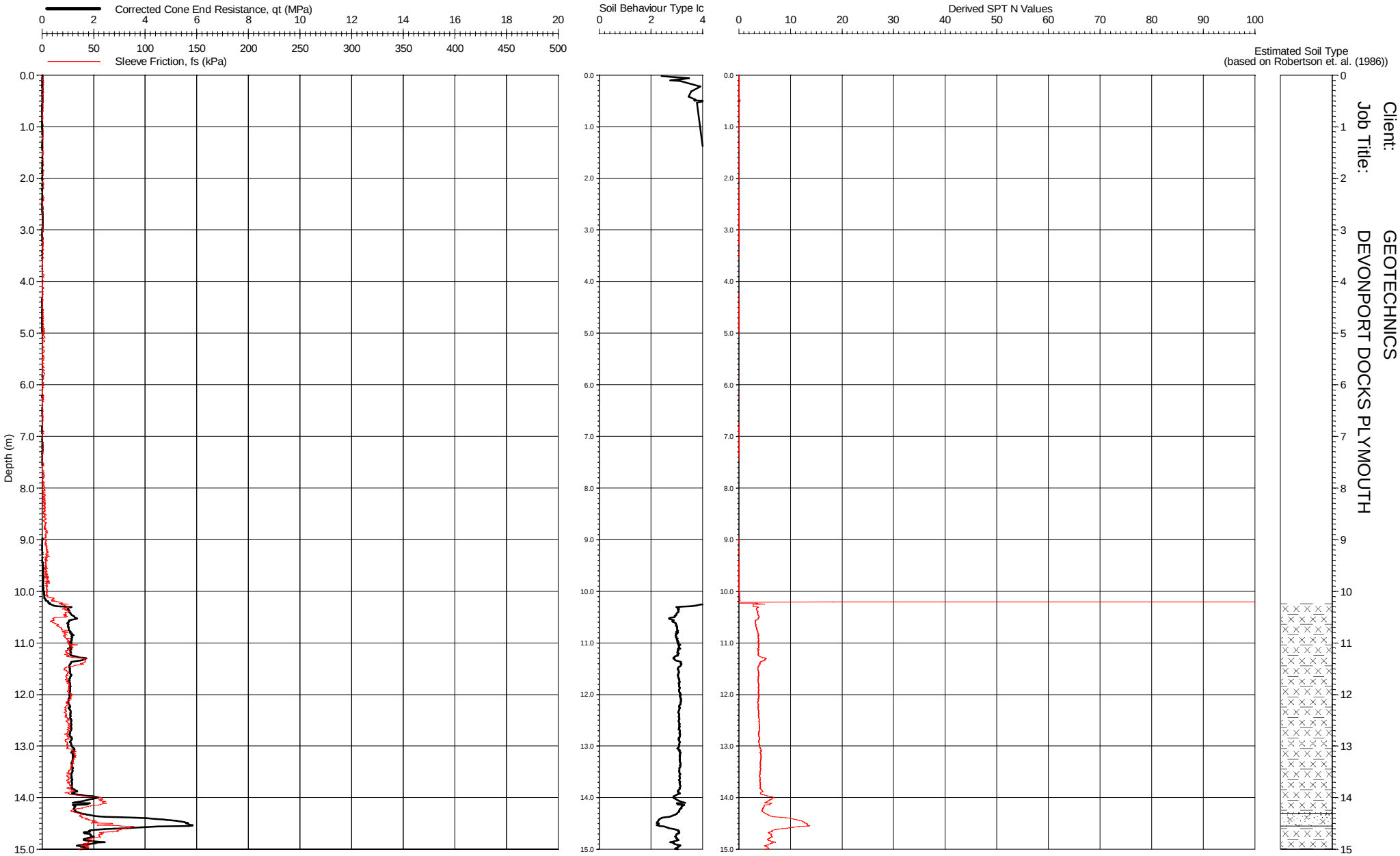
Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	15/07/2010
Coordinates:	0.000E - 0.000N	Date of Plot:	30/07/2010
Ground Level:	0.00 m msl	File Name:	1100127 - C13
Cone & Rig Used:	S15CFIIP.C35 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

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PIEZO CONE PENETRATION TEST
C13

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C14

Checked By:

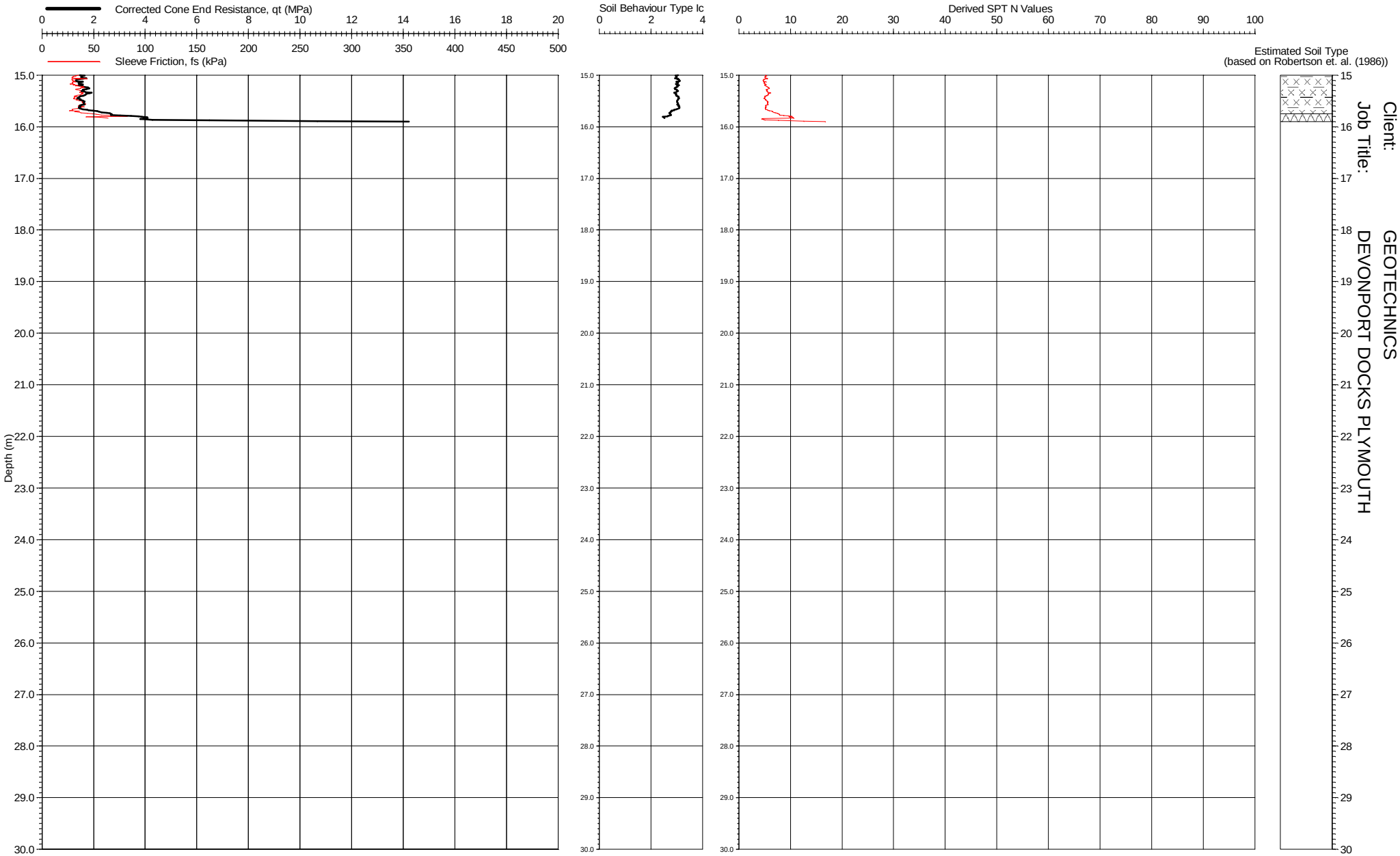
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C14

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C14

Checked By:

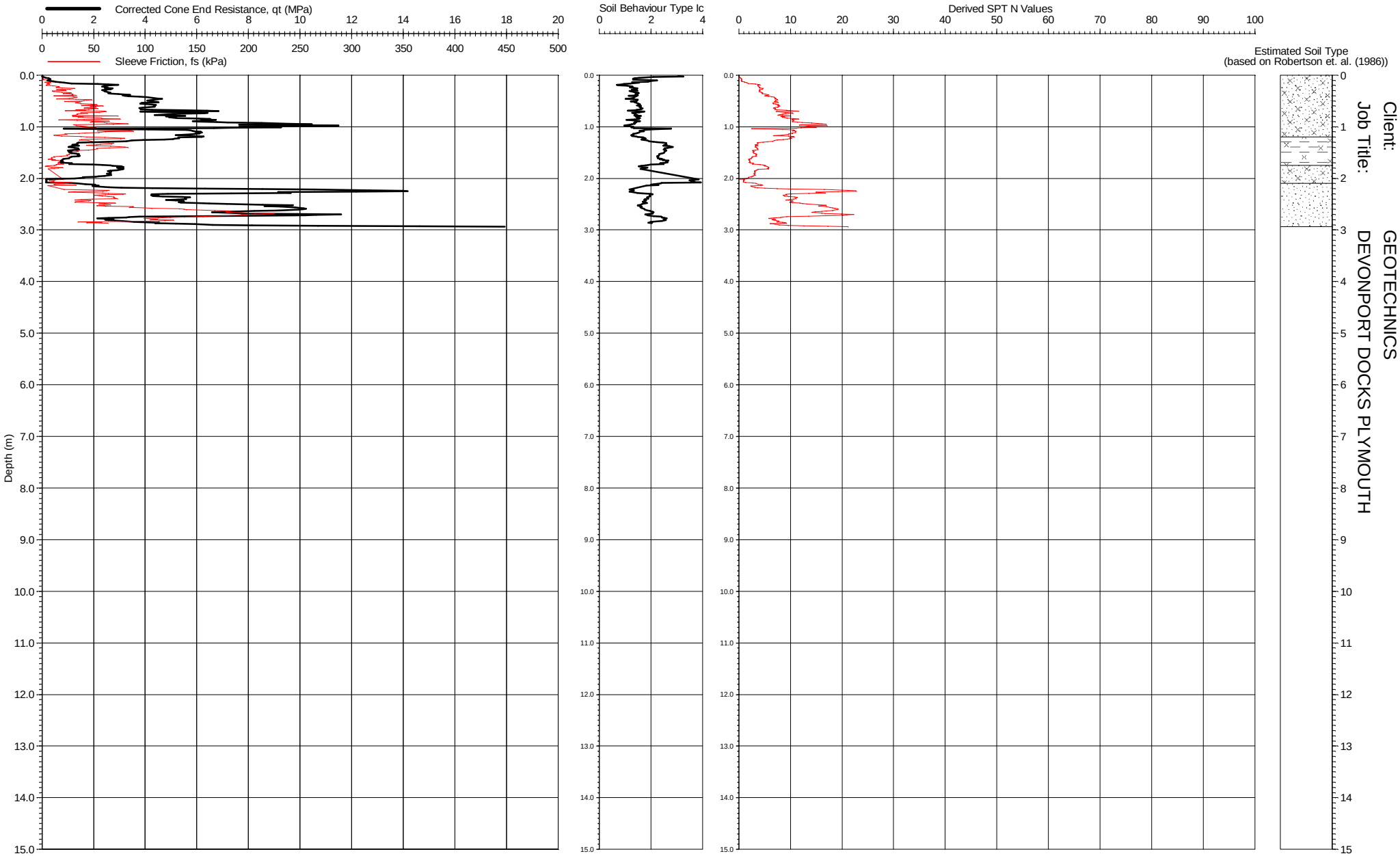
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C14

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C15

Checked By:

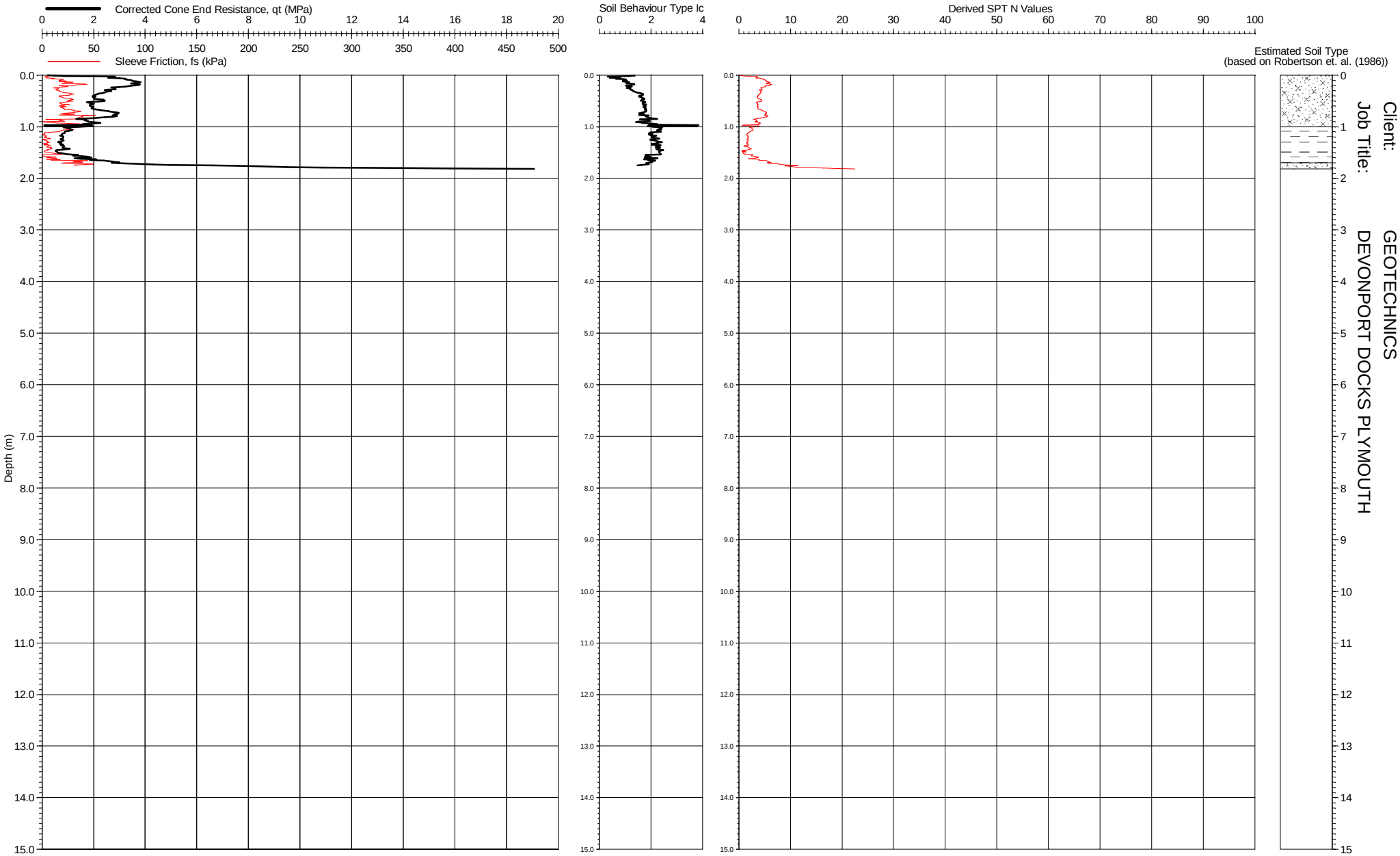
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C15

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C16

Checked By:

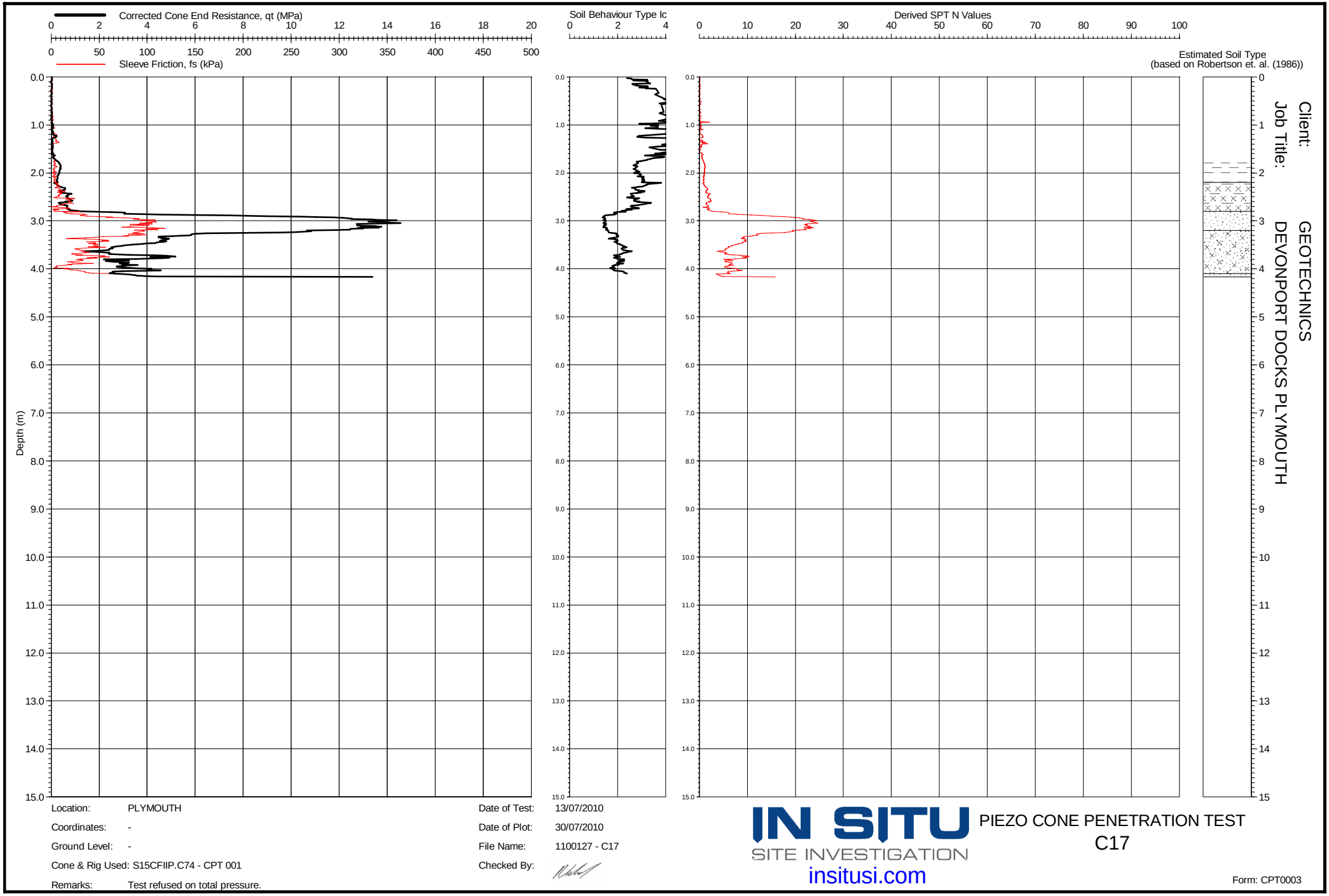
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C16

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C17

Checked By:

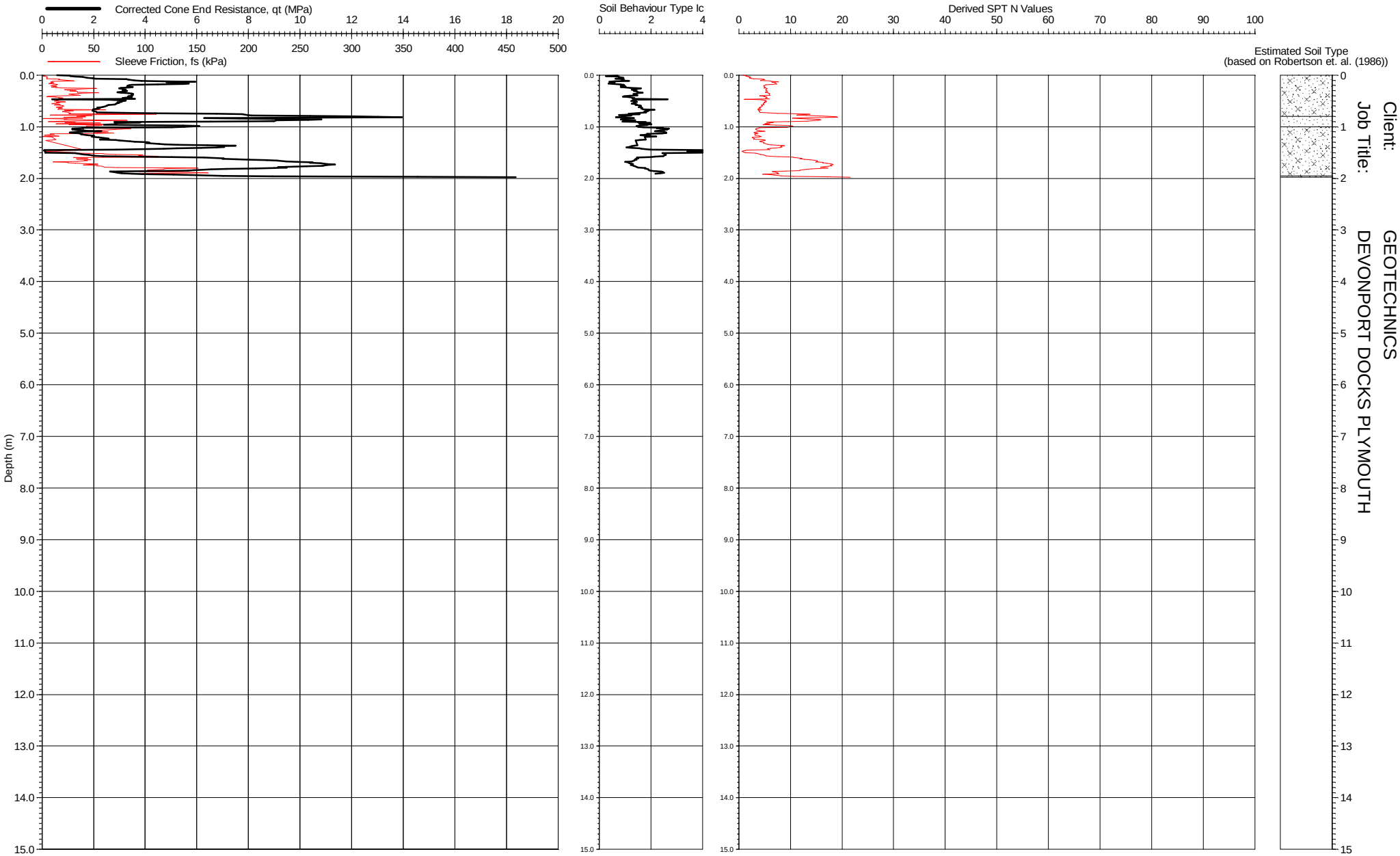
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C17

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C18

Checked By:

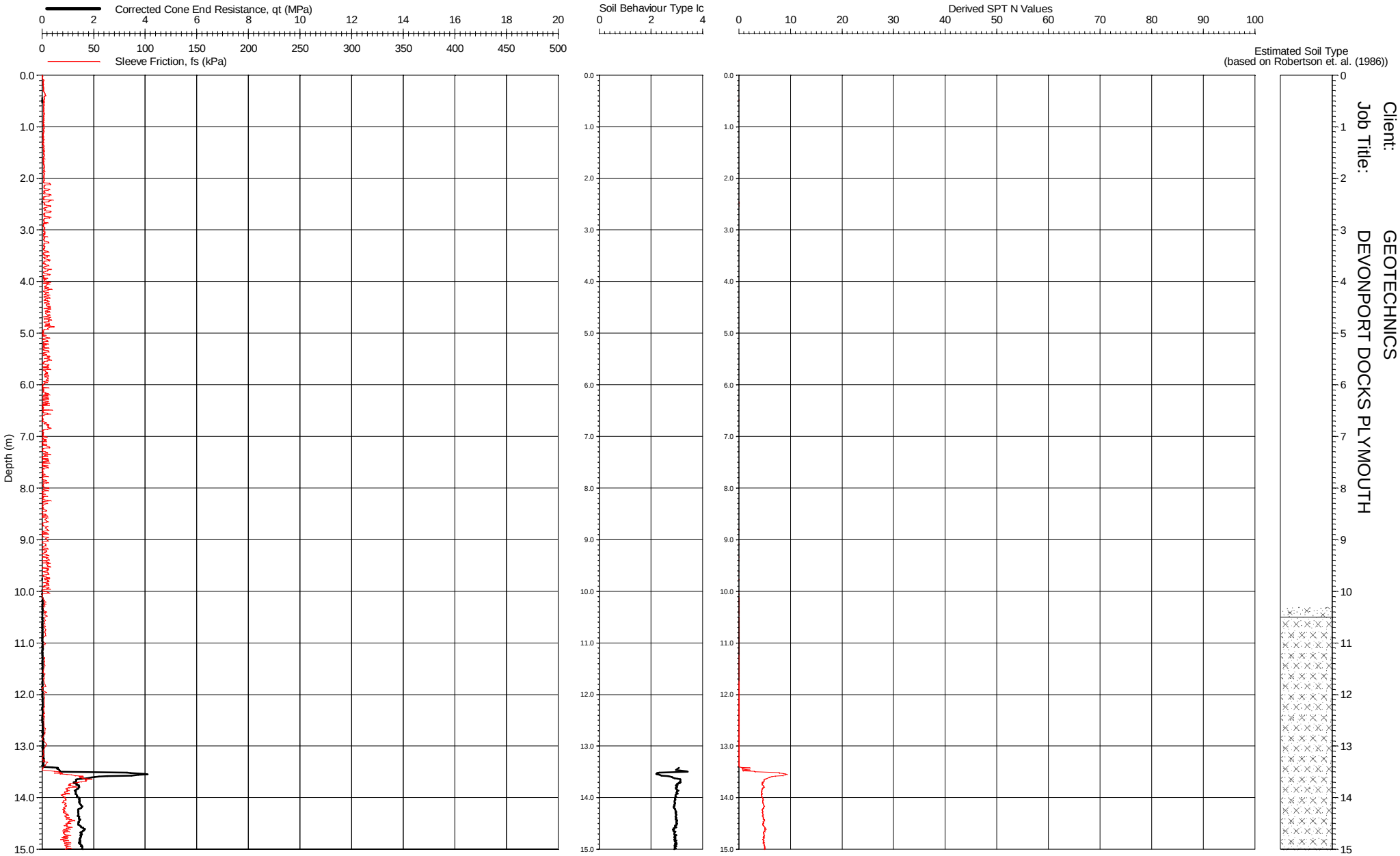
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C18

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C20A

Checked By:

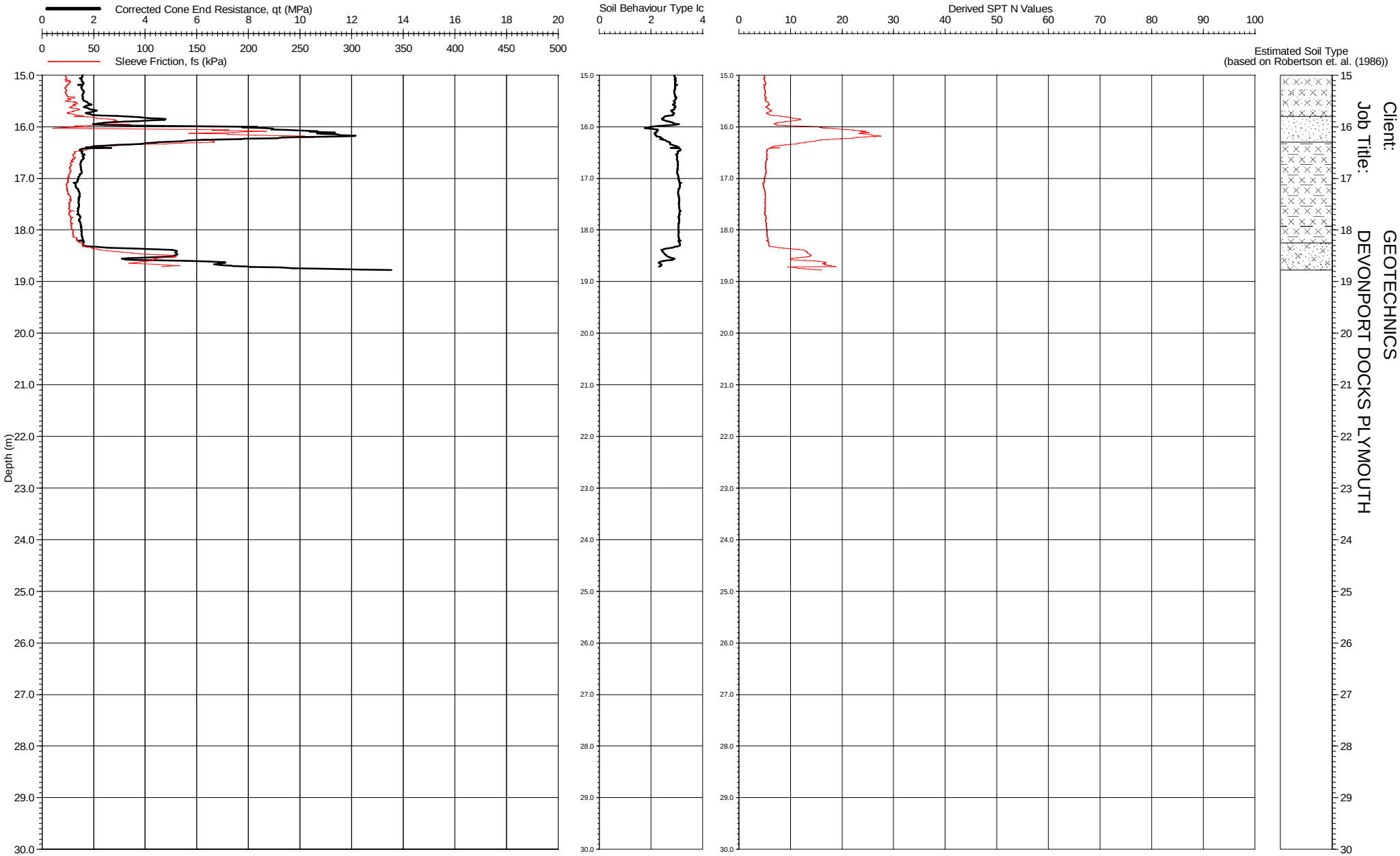
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C20A

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C20A

Checked By:

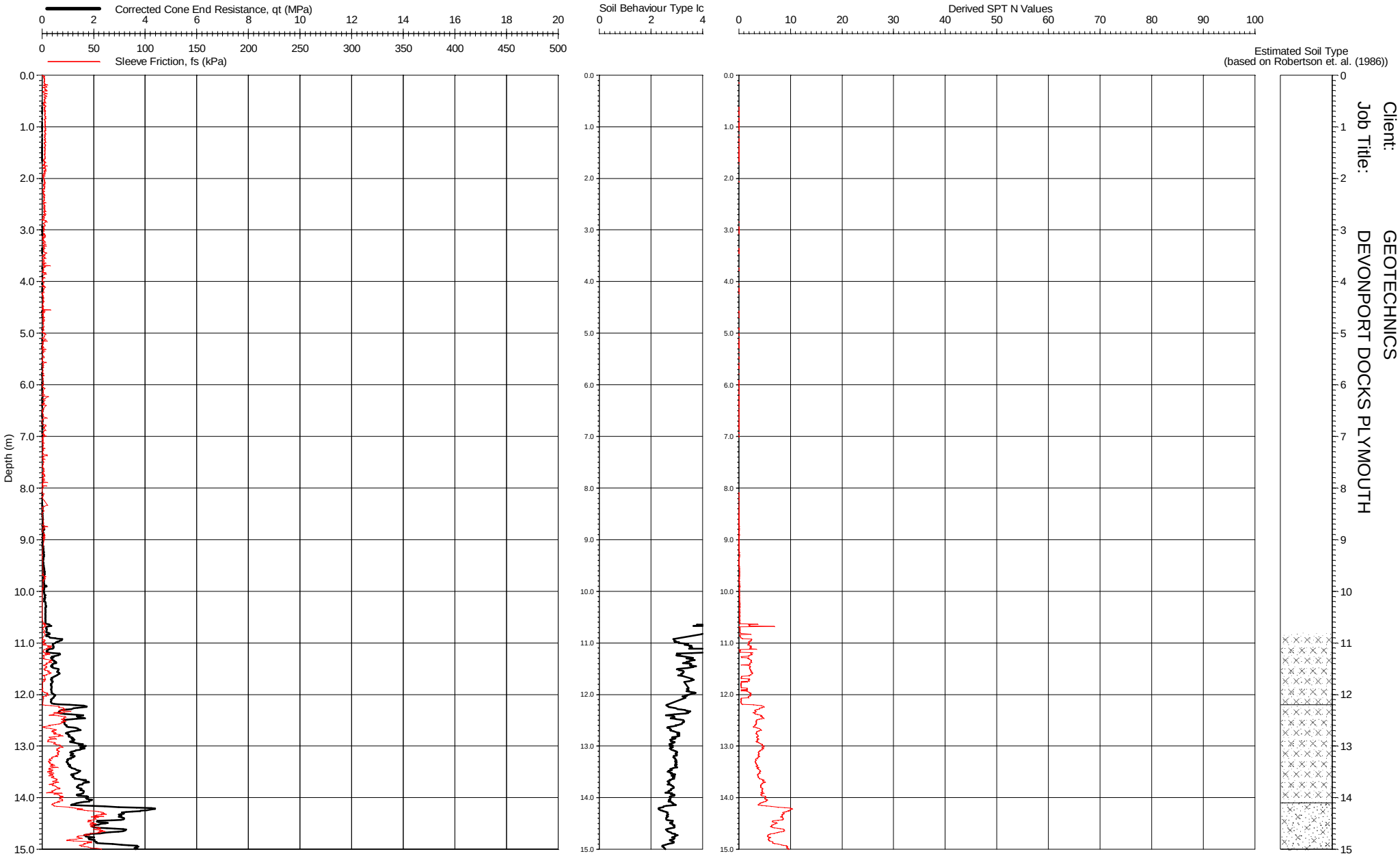
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C20A

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C21

Checked By:

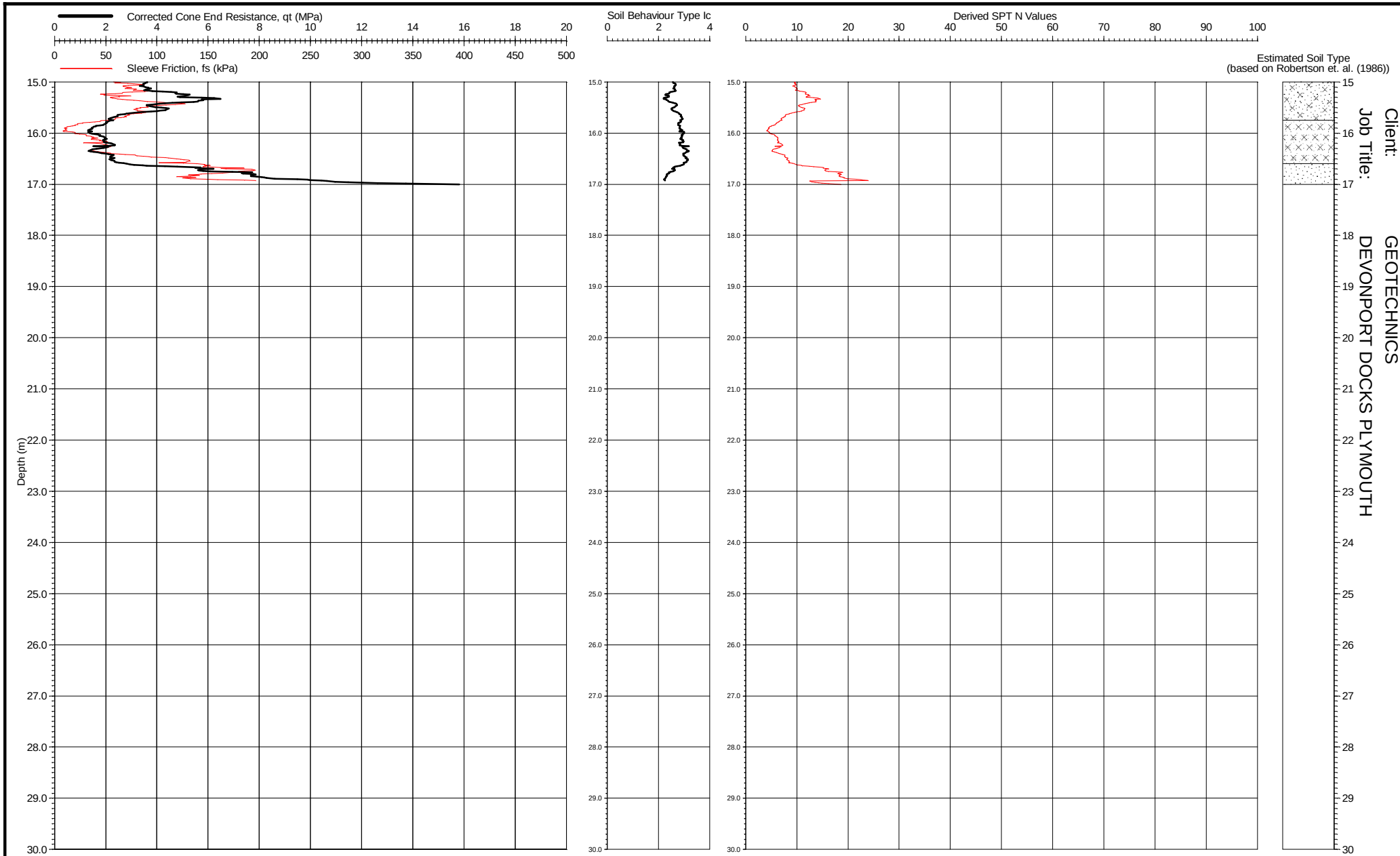
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C21

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C21

Checked By:

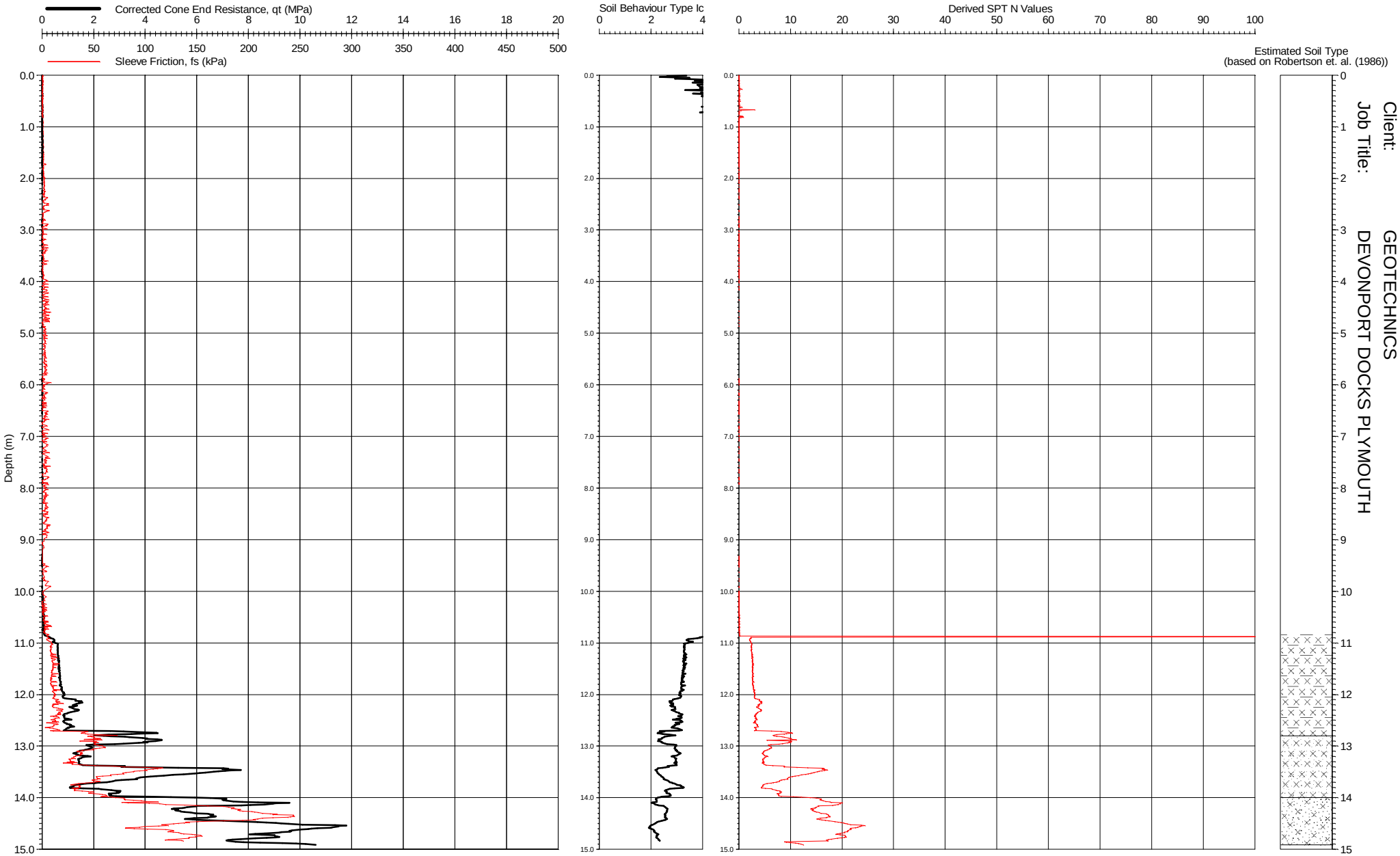
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C21

Form: CPT0003



Client: GEOTECHNICS

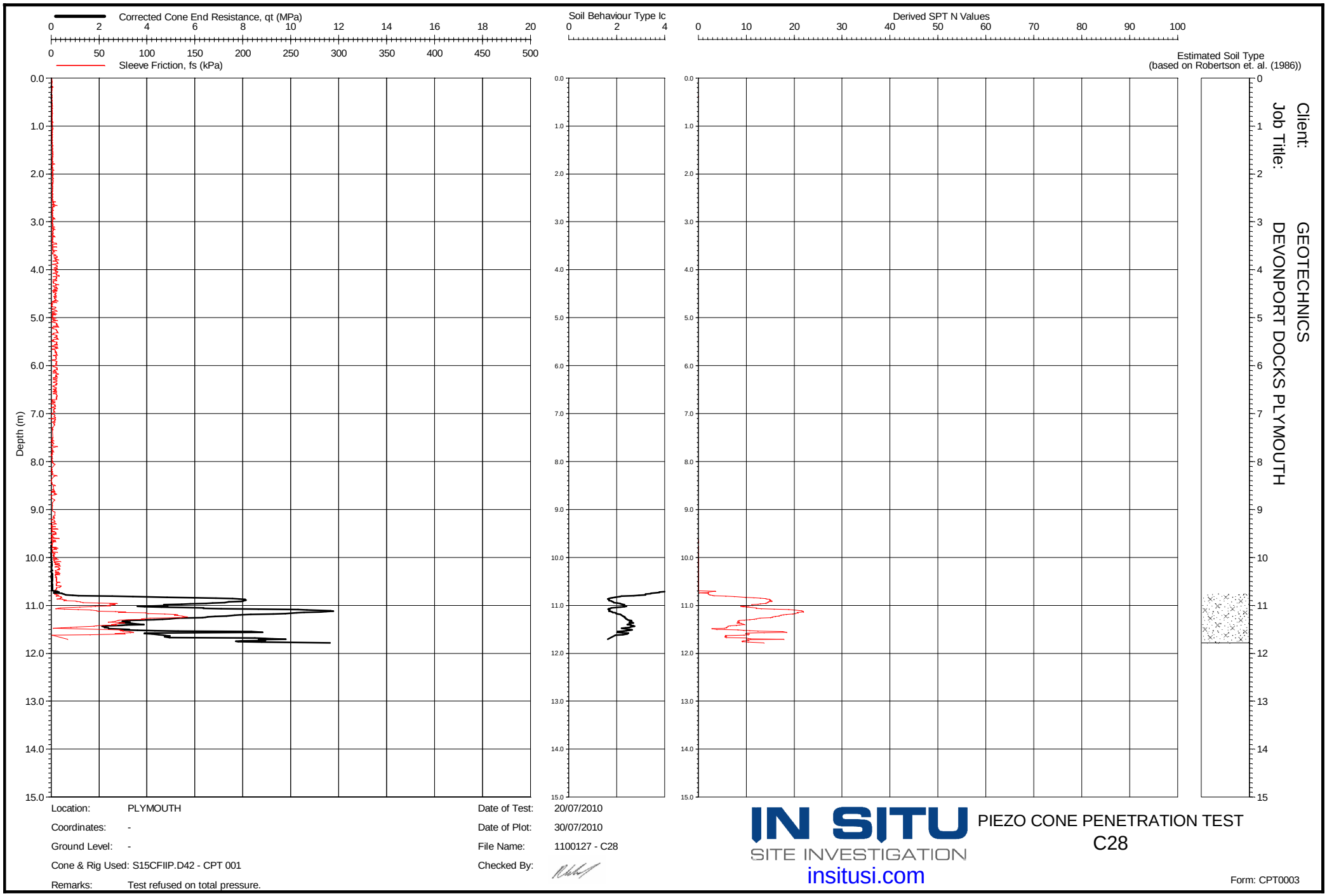
Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	20/07/2010
Coordinates:	-	Date of Plot:	30/07/2010
Ground Level:	-	File Name:	1100127 - C22
Cone & Rig Used:	S15CFIIP.D42 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

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insitusi.com

PIEZO CONE PENETRATION TEST
C22

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C28

Checked By:

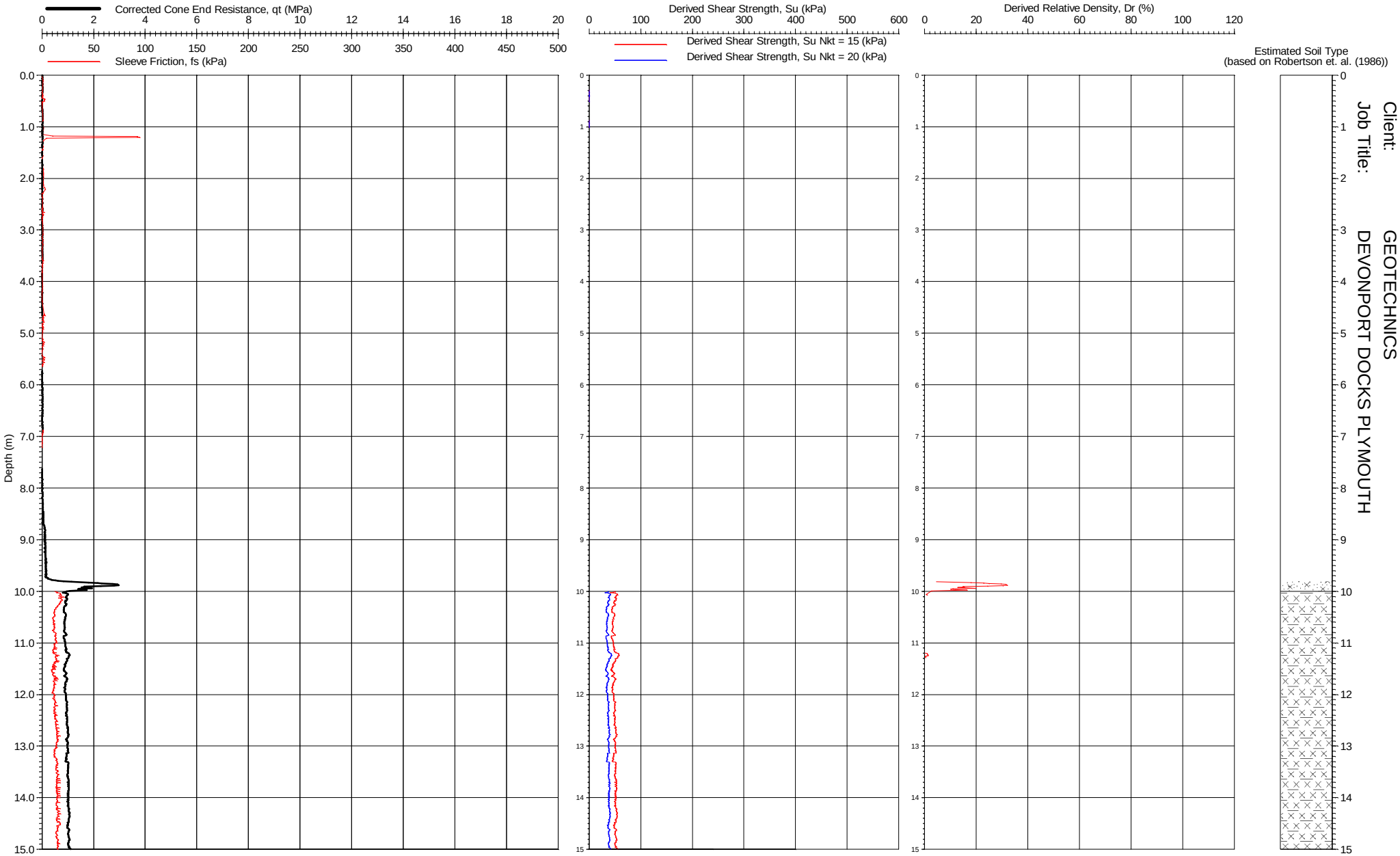
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C28

Form: CPT0003



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C01

Checked By:

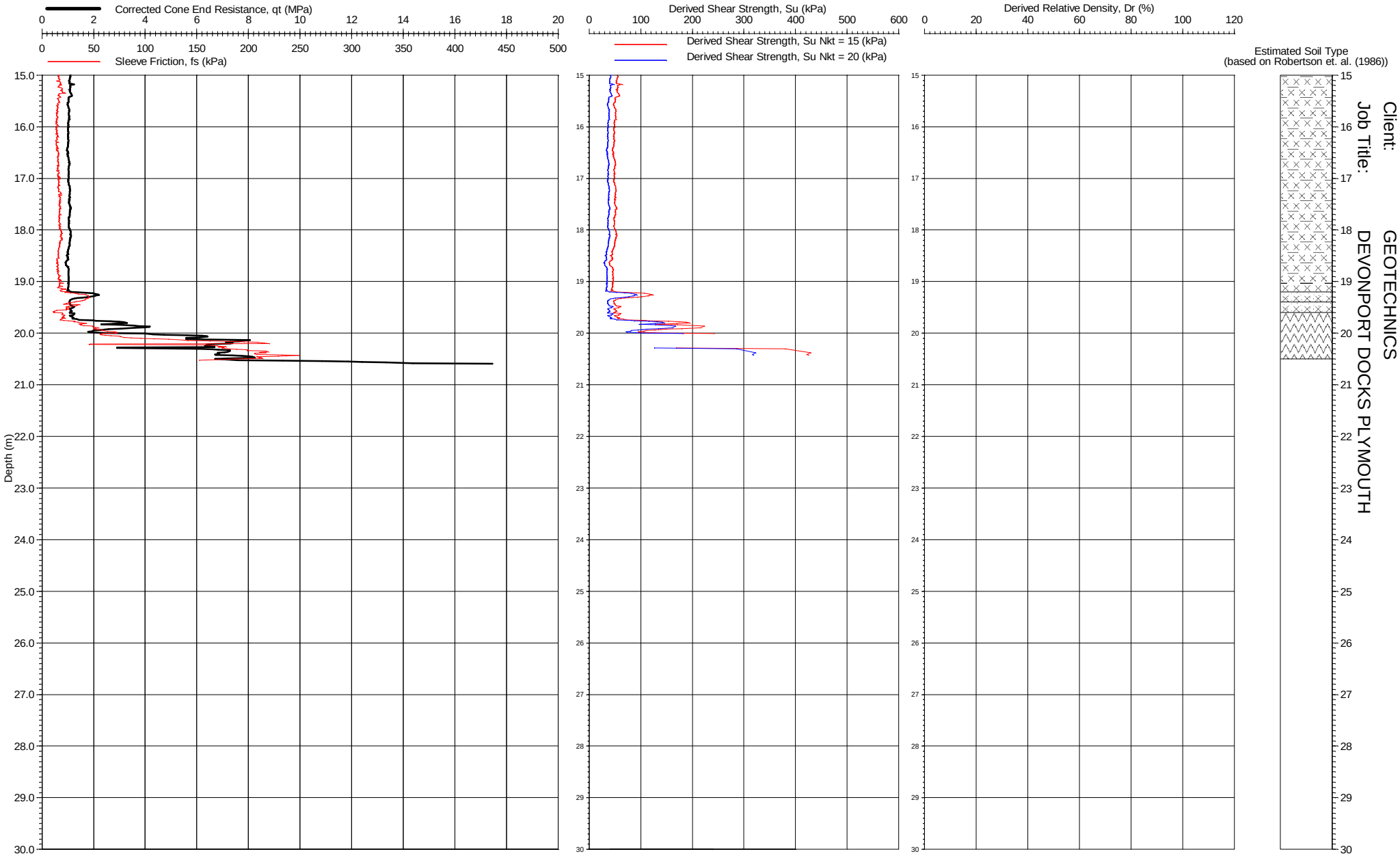
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C01

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C01

Checked By:

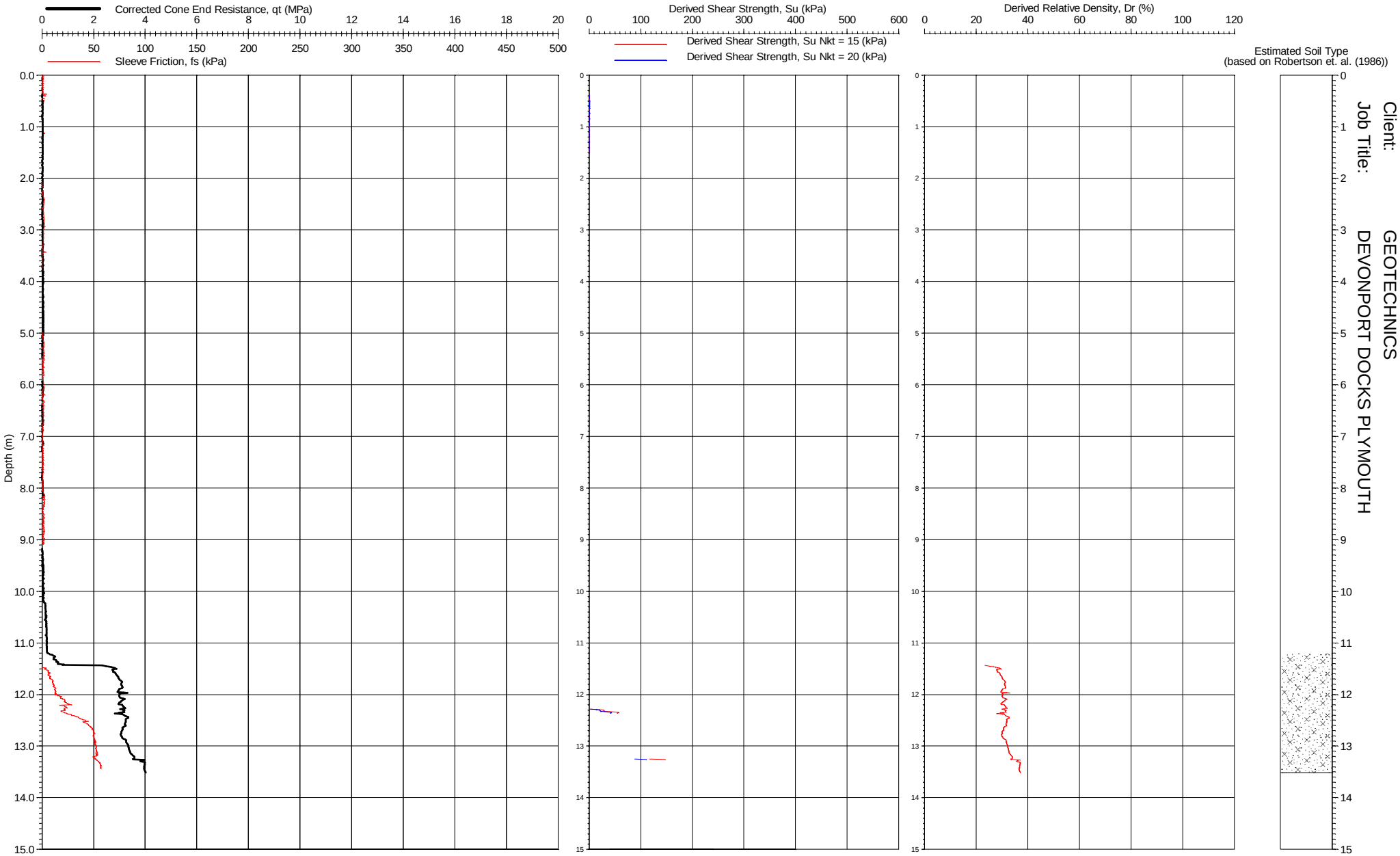
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C01

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C02

Checked By:

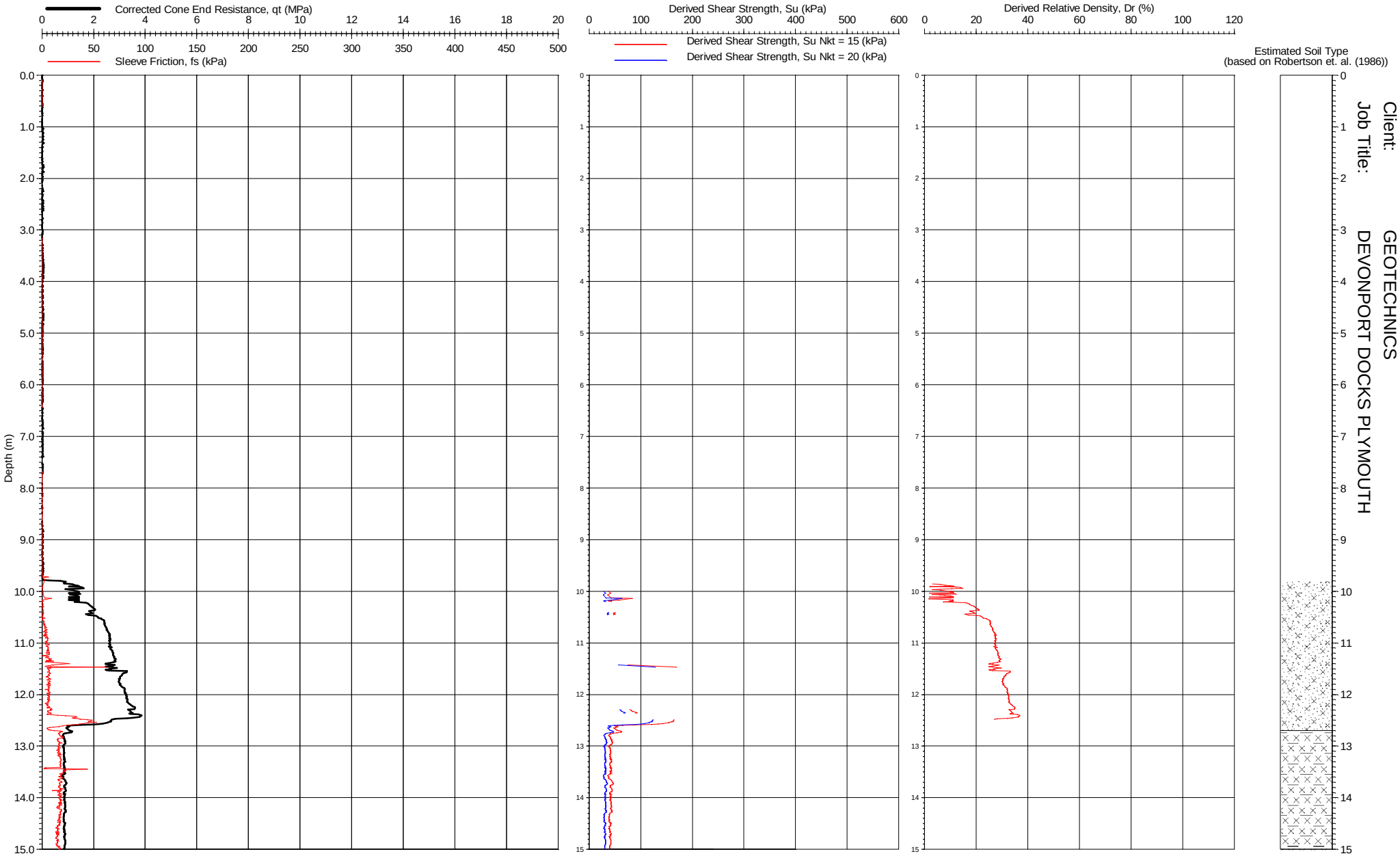
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C02

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C03

Checked By:

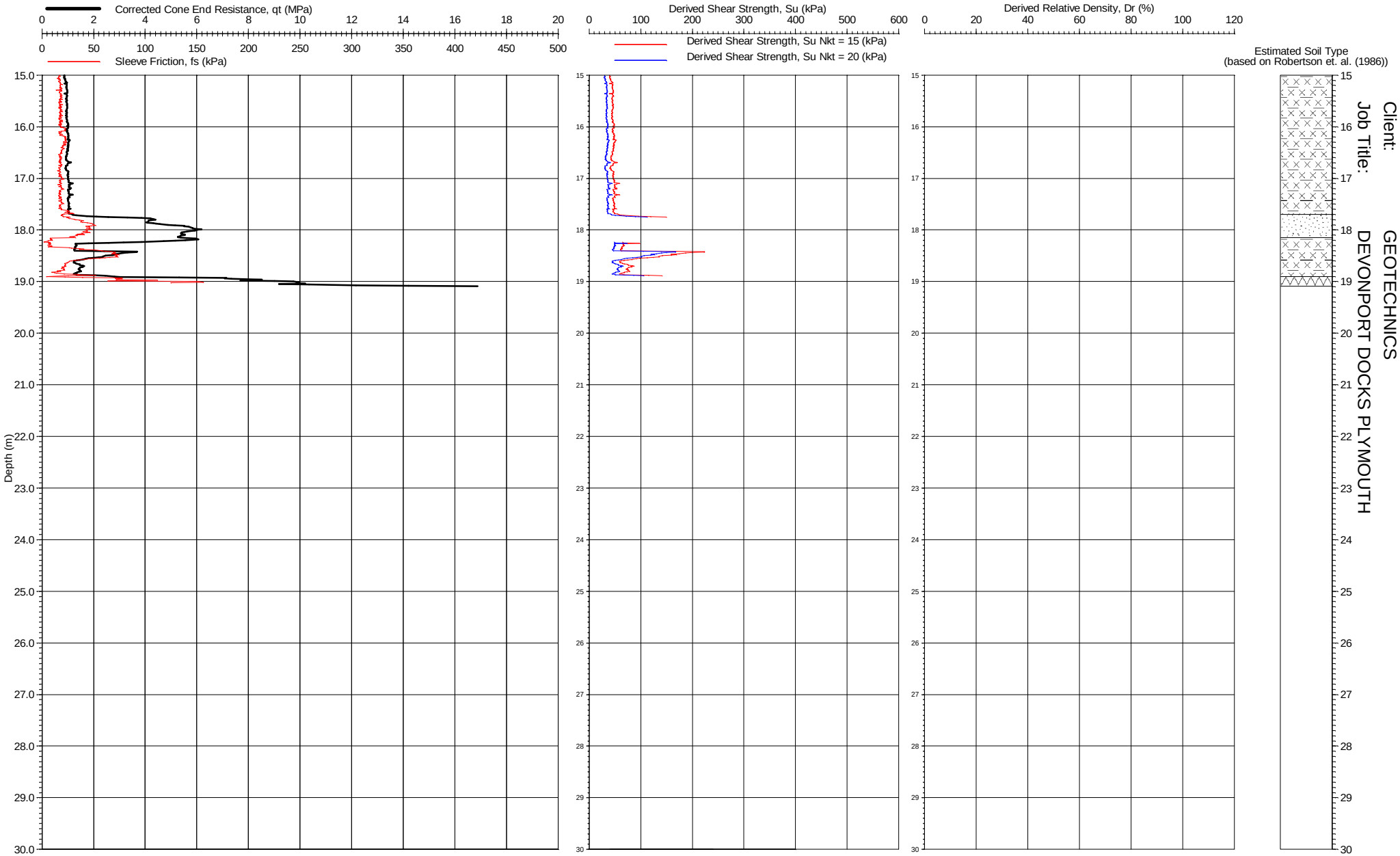
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C03

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C03

Checked By:

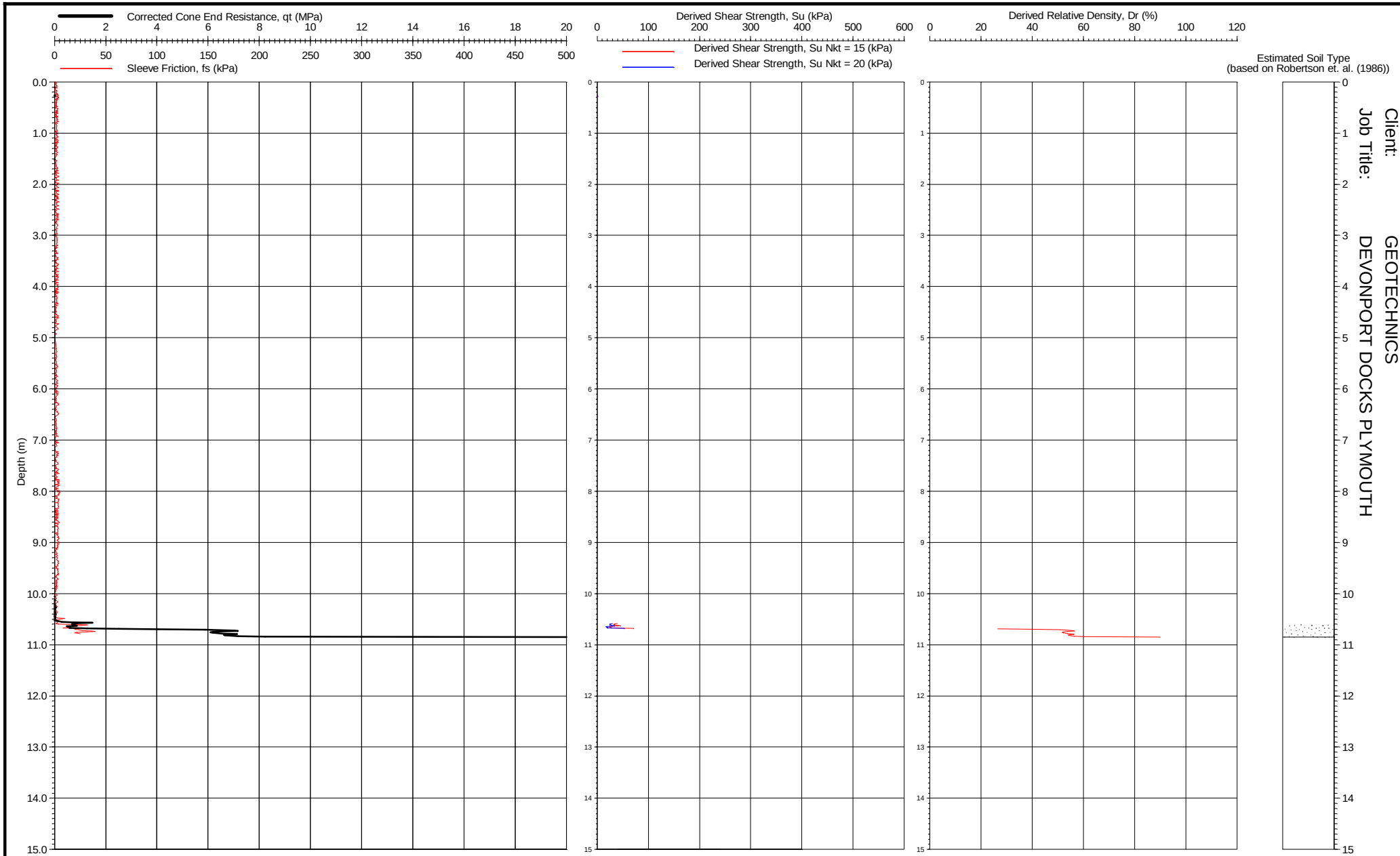
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C03

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C04

Checked By:

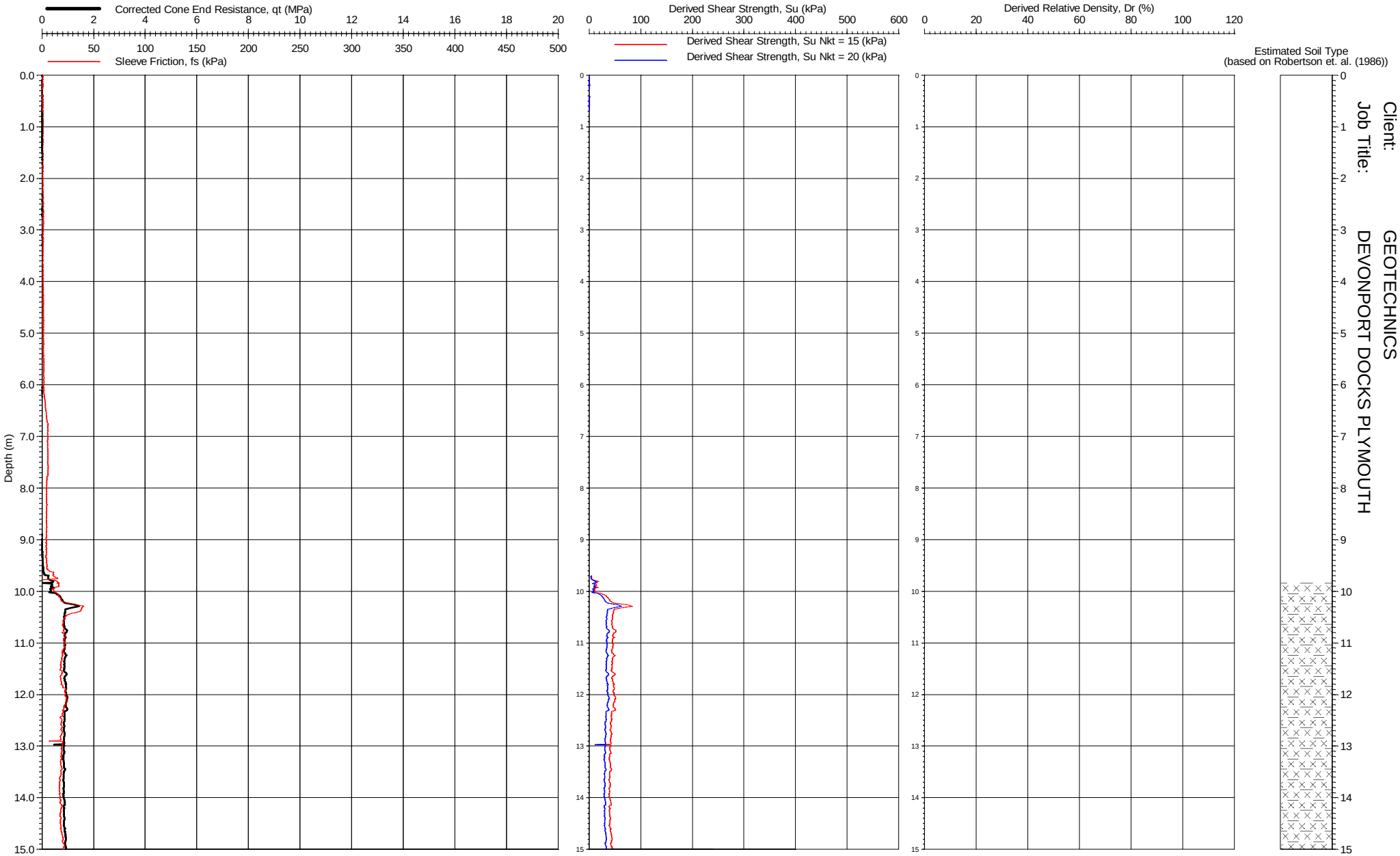
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C04

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 14/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C05

Checked By:

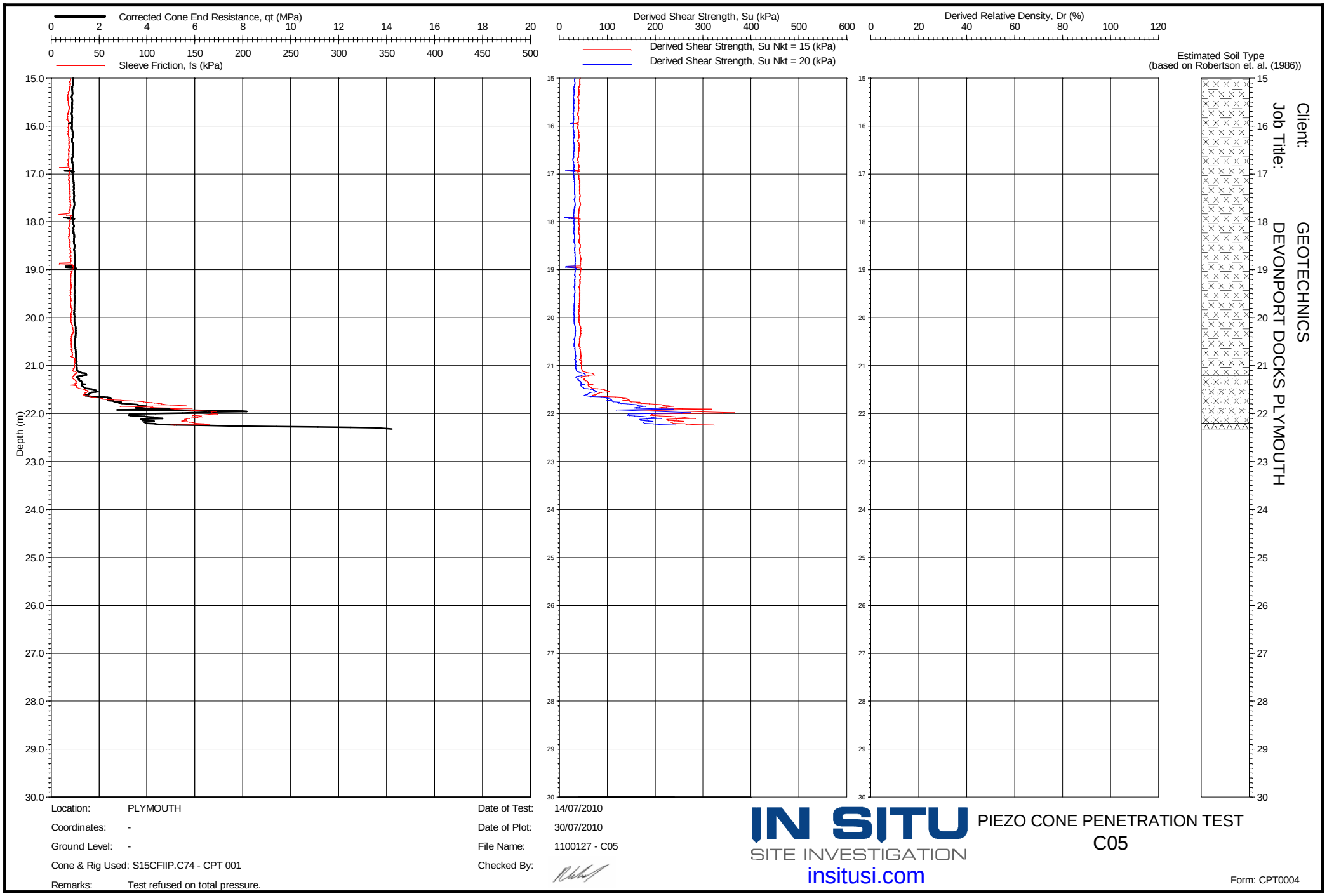
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C05

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 14/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C05

Checked By:

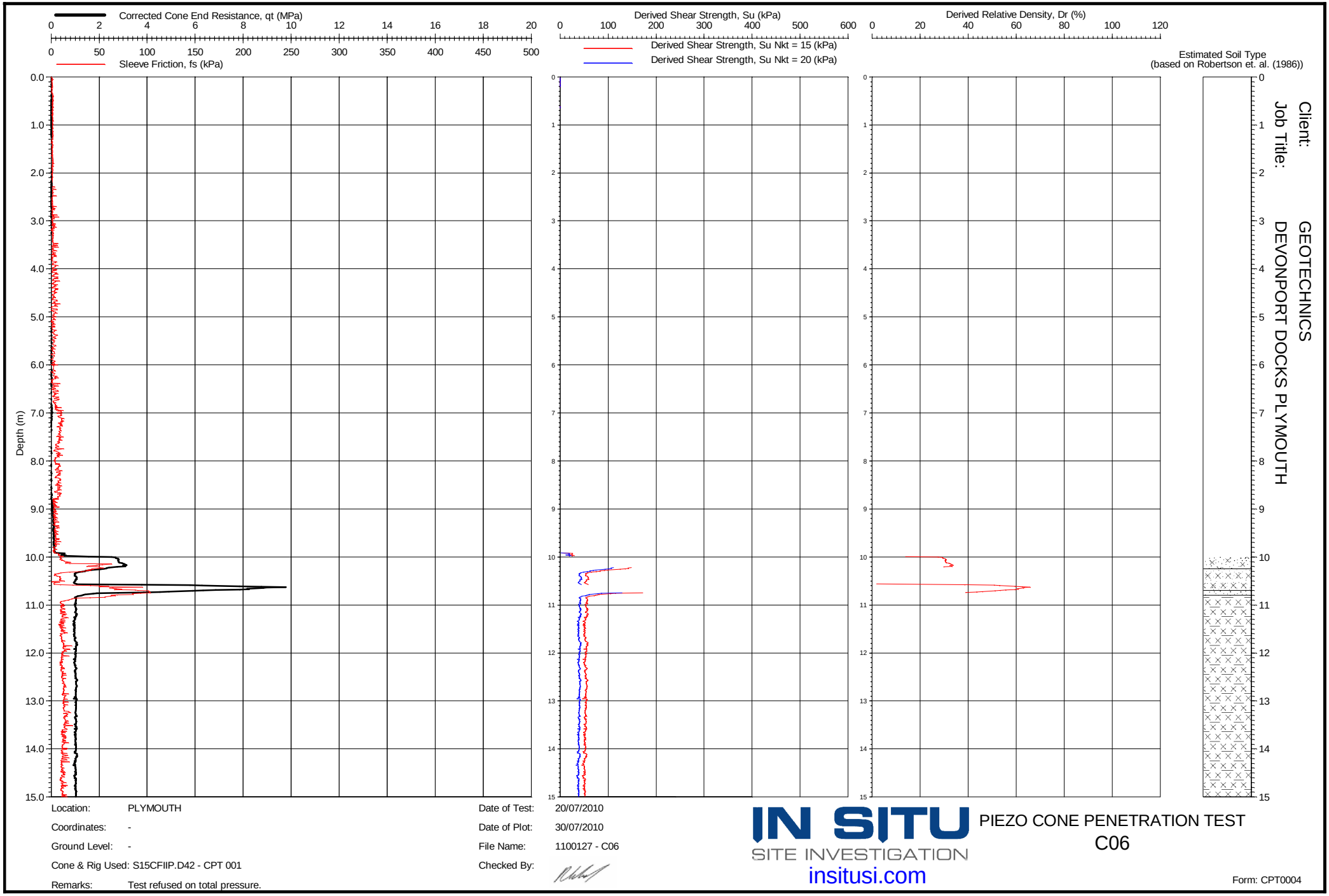
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C05

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C06

Checked By:

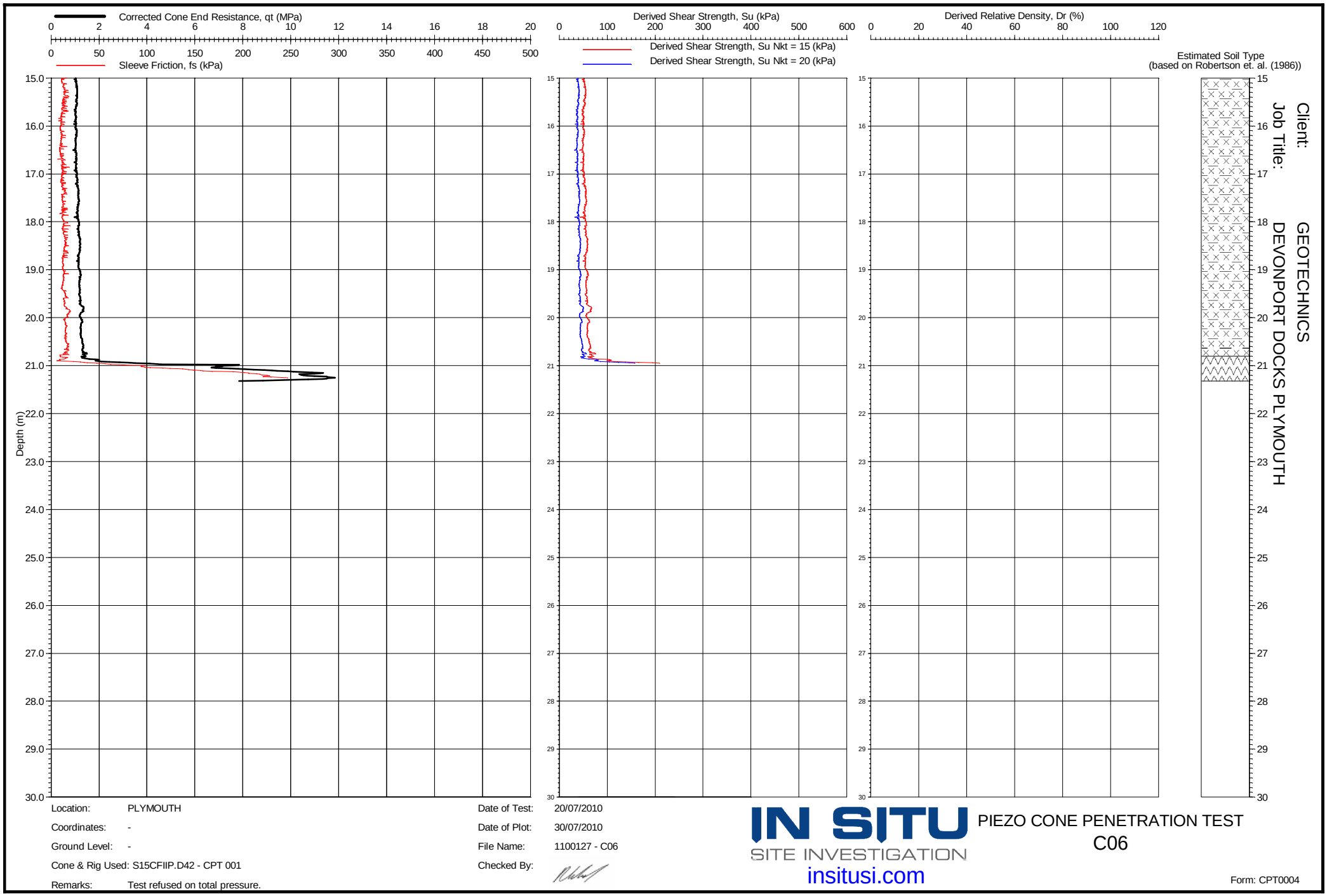
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C06

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C06

Checked By:

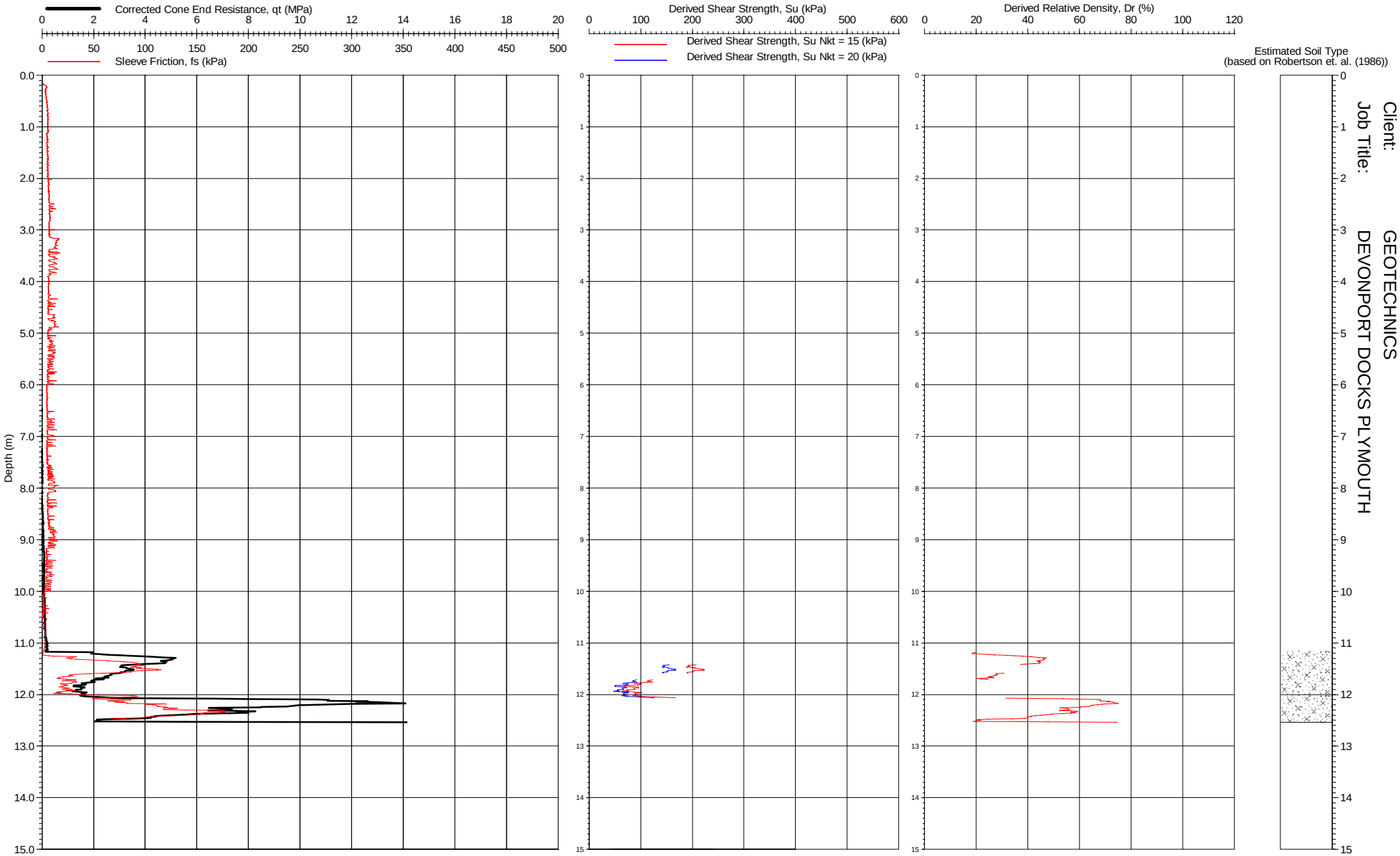
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C06

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C07

Checked By:

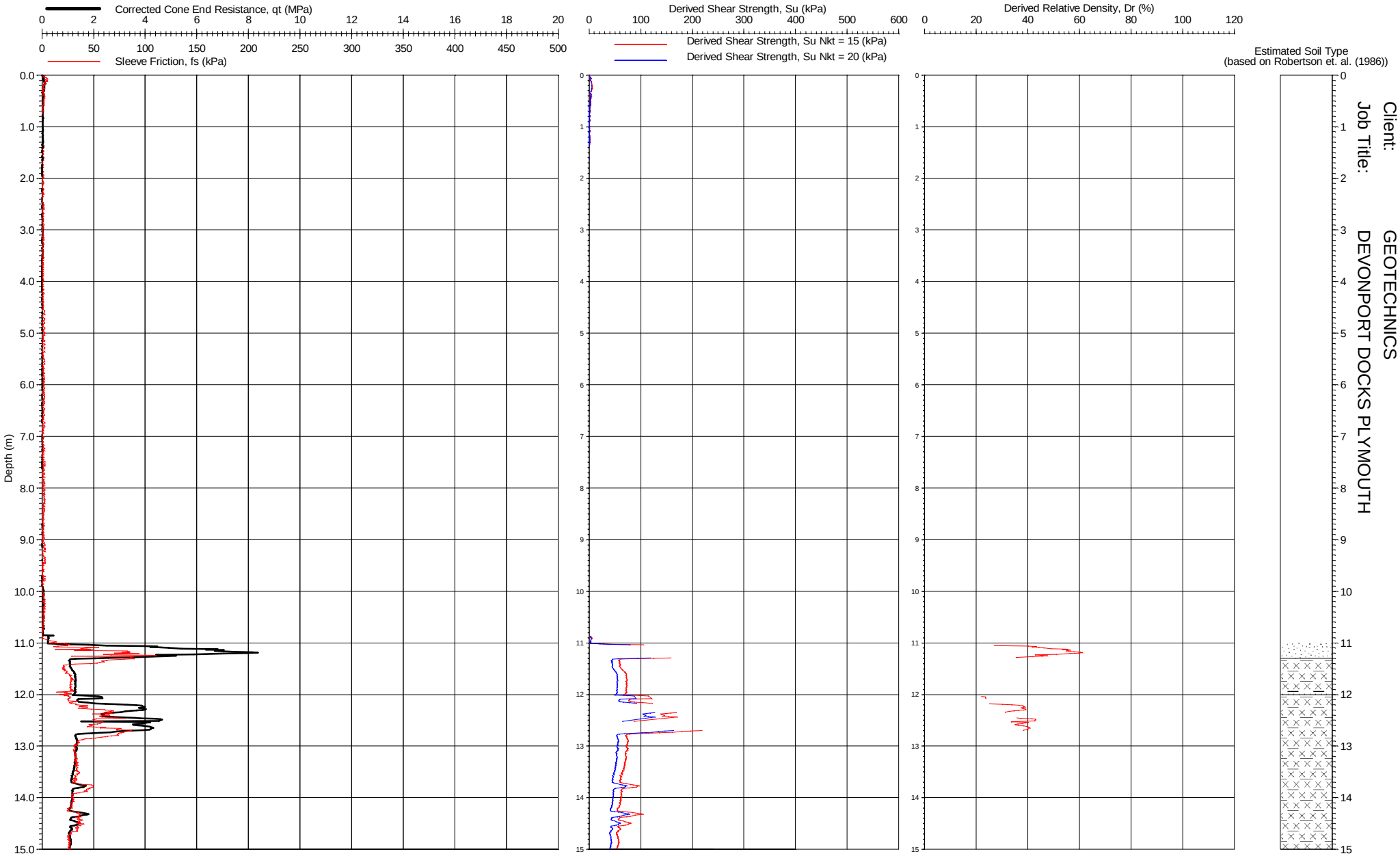
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C07

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

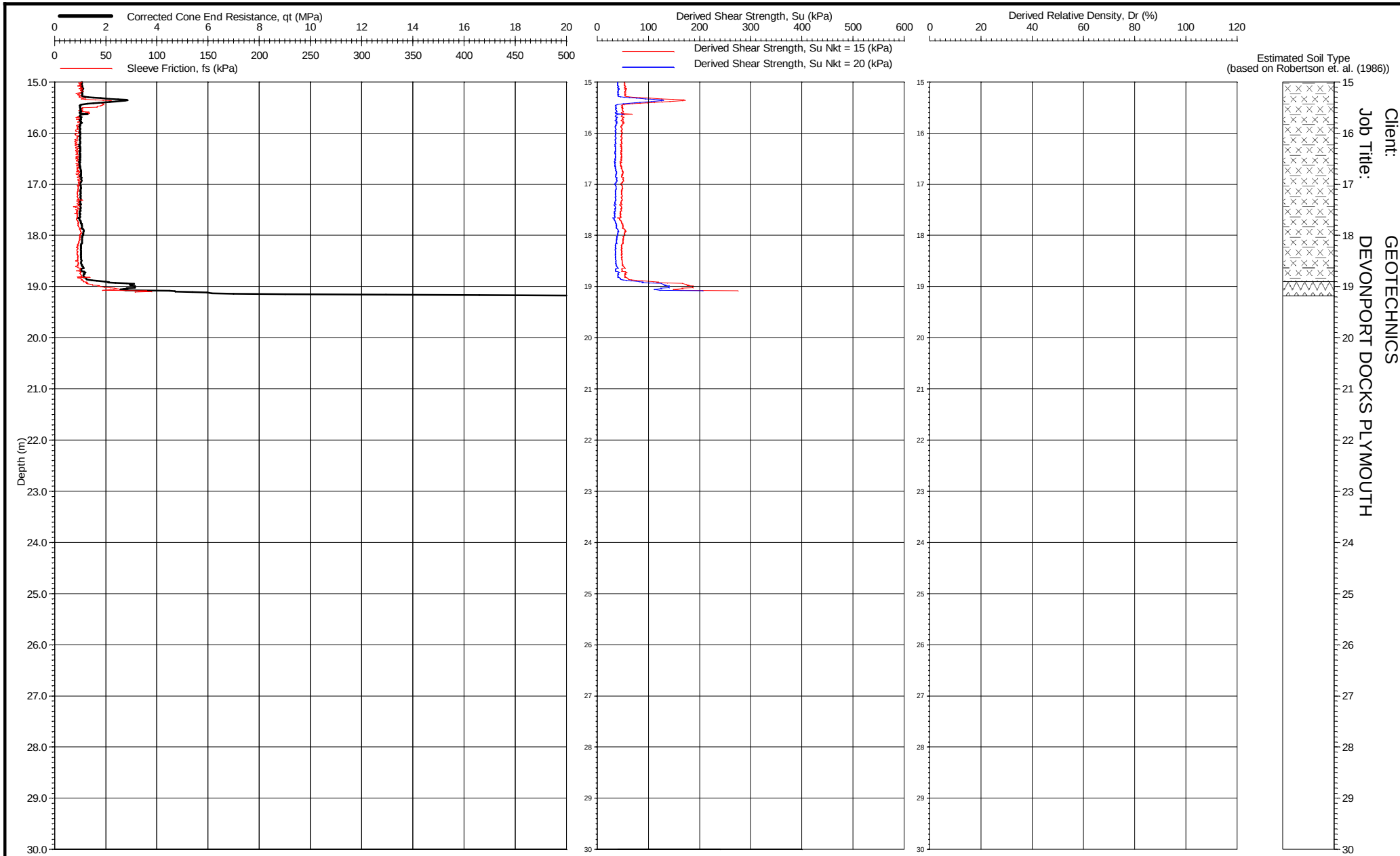
File Name: 1100127 - C08

Checked By:

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PIEZO CONE PENETRATION TEST
C08

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C08

Checked By:

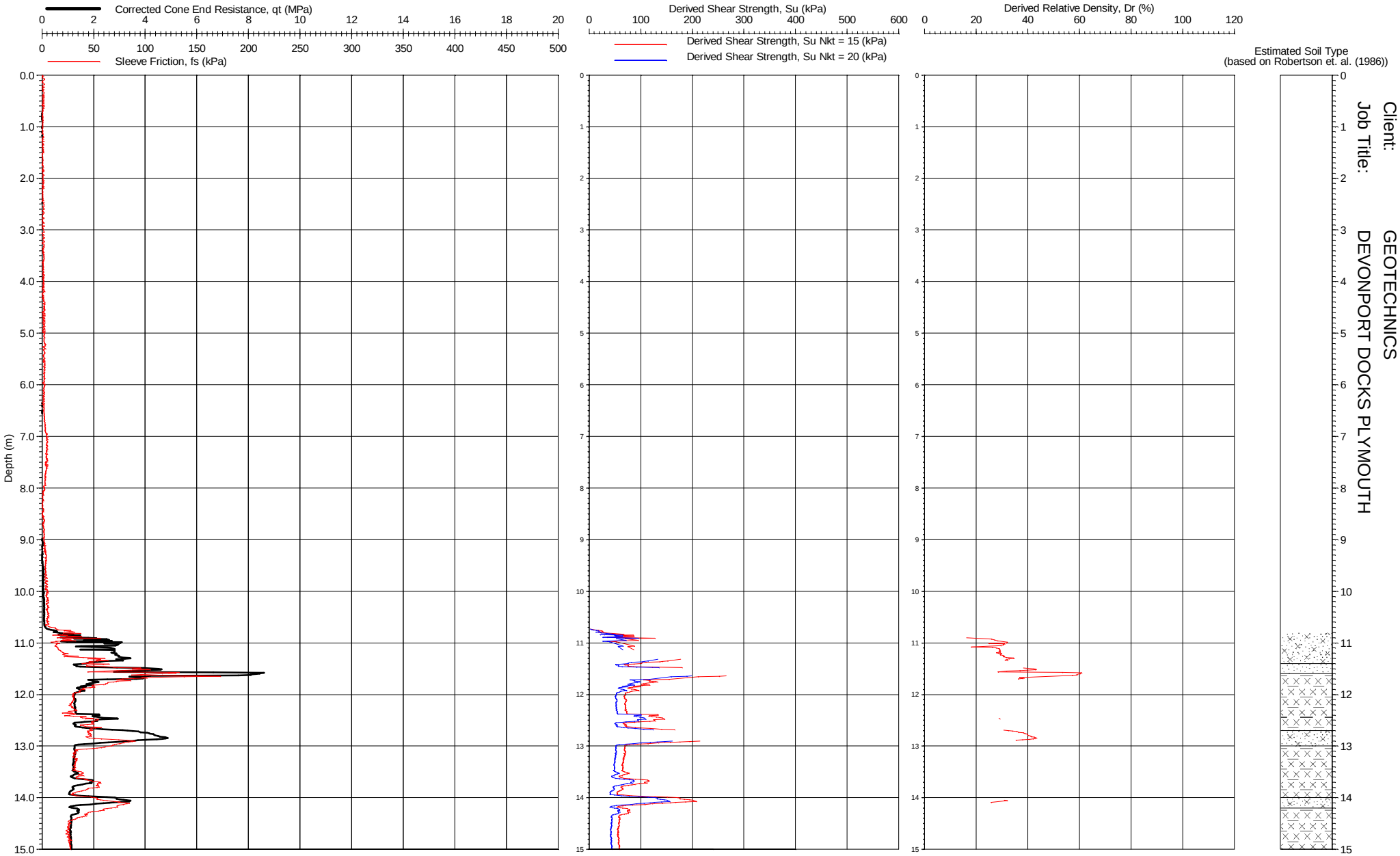
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C08

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C09A

Checked By:

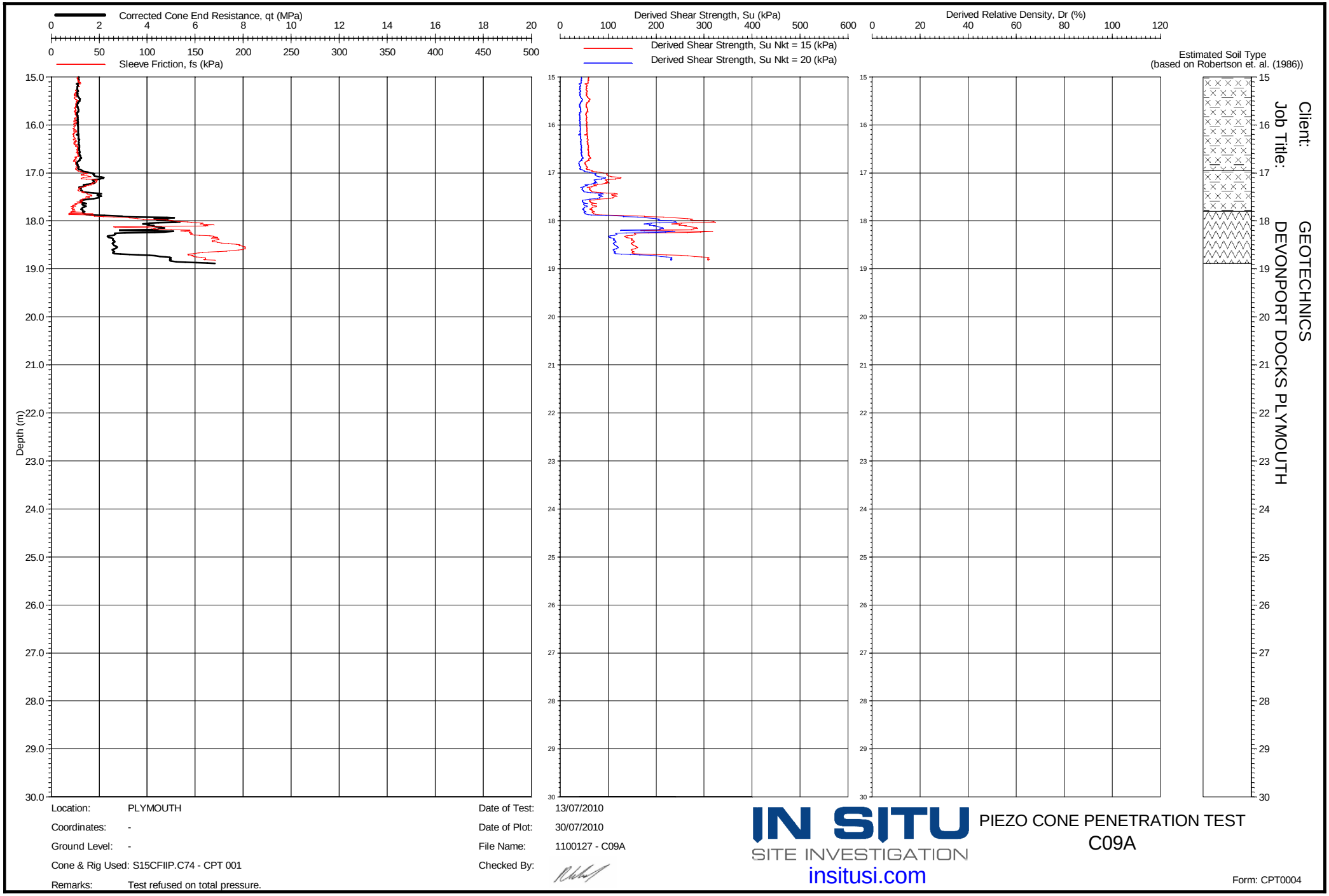
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C09A

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C09A

Checked By:

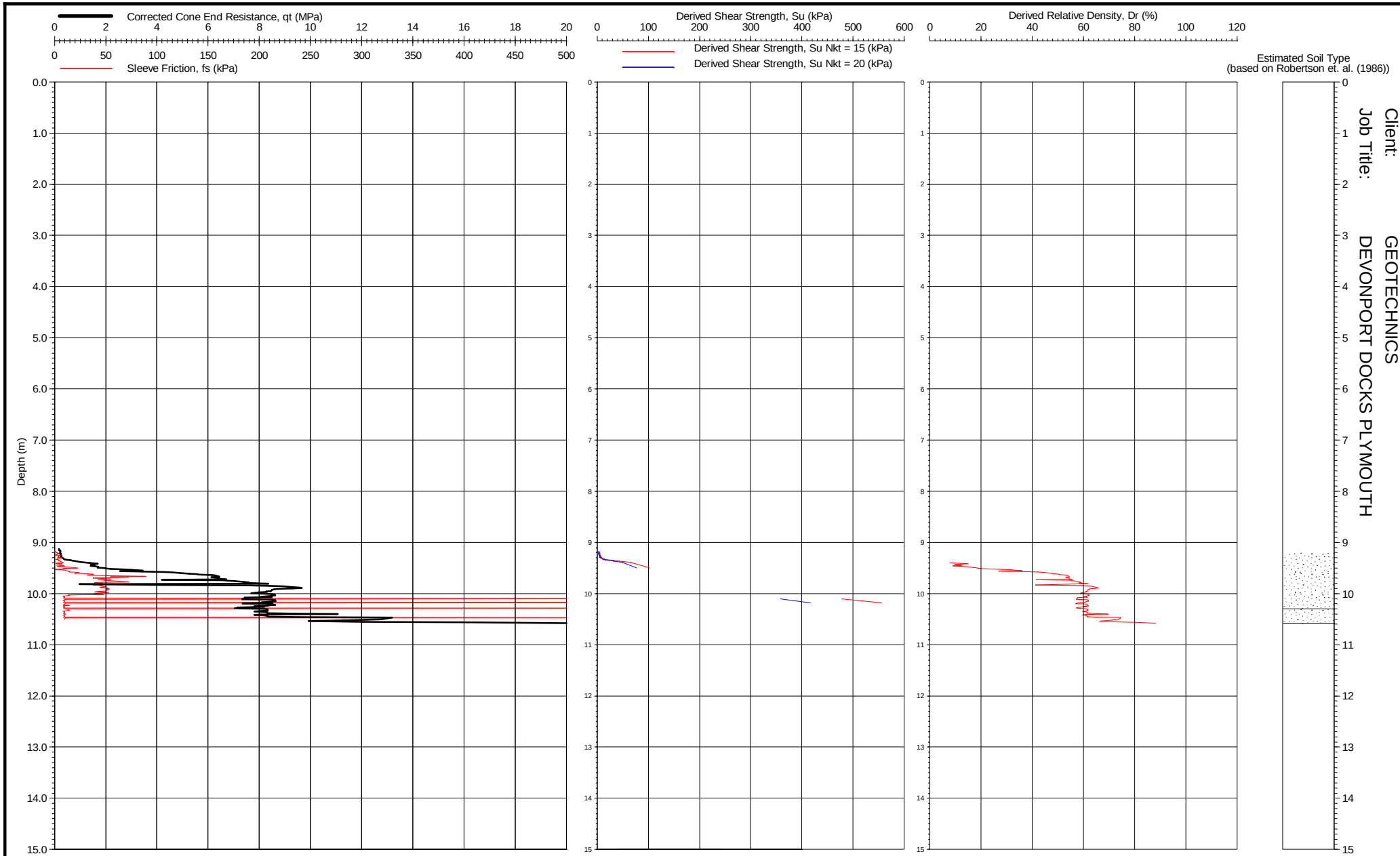
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PIEZO CONE PENETRATION TEST

C09A

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C12

Checked By:

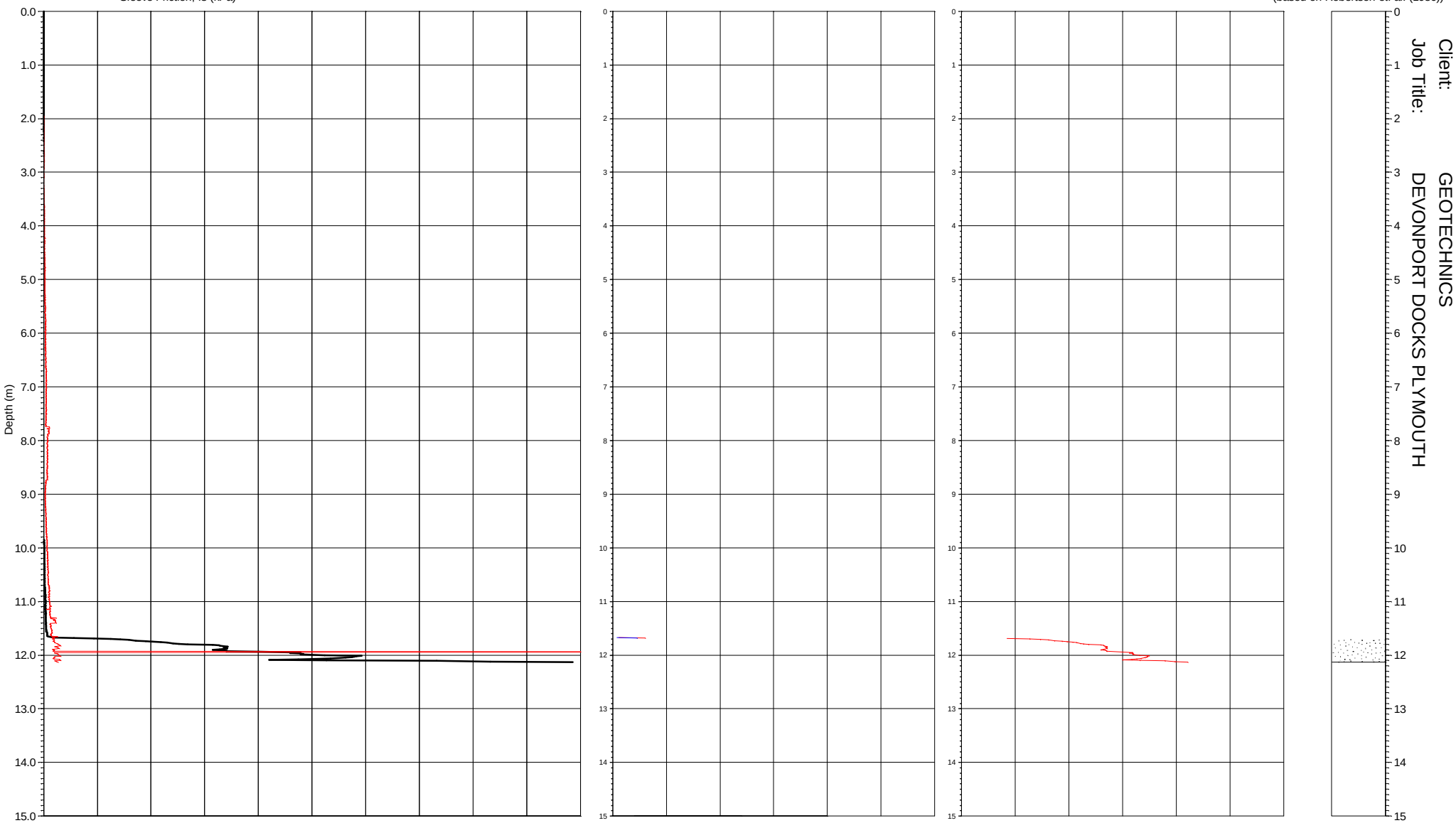
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C12

Form: CPT0004



Client: GEOTECHNICS

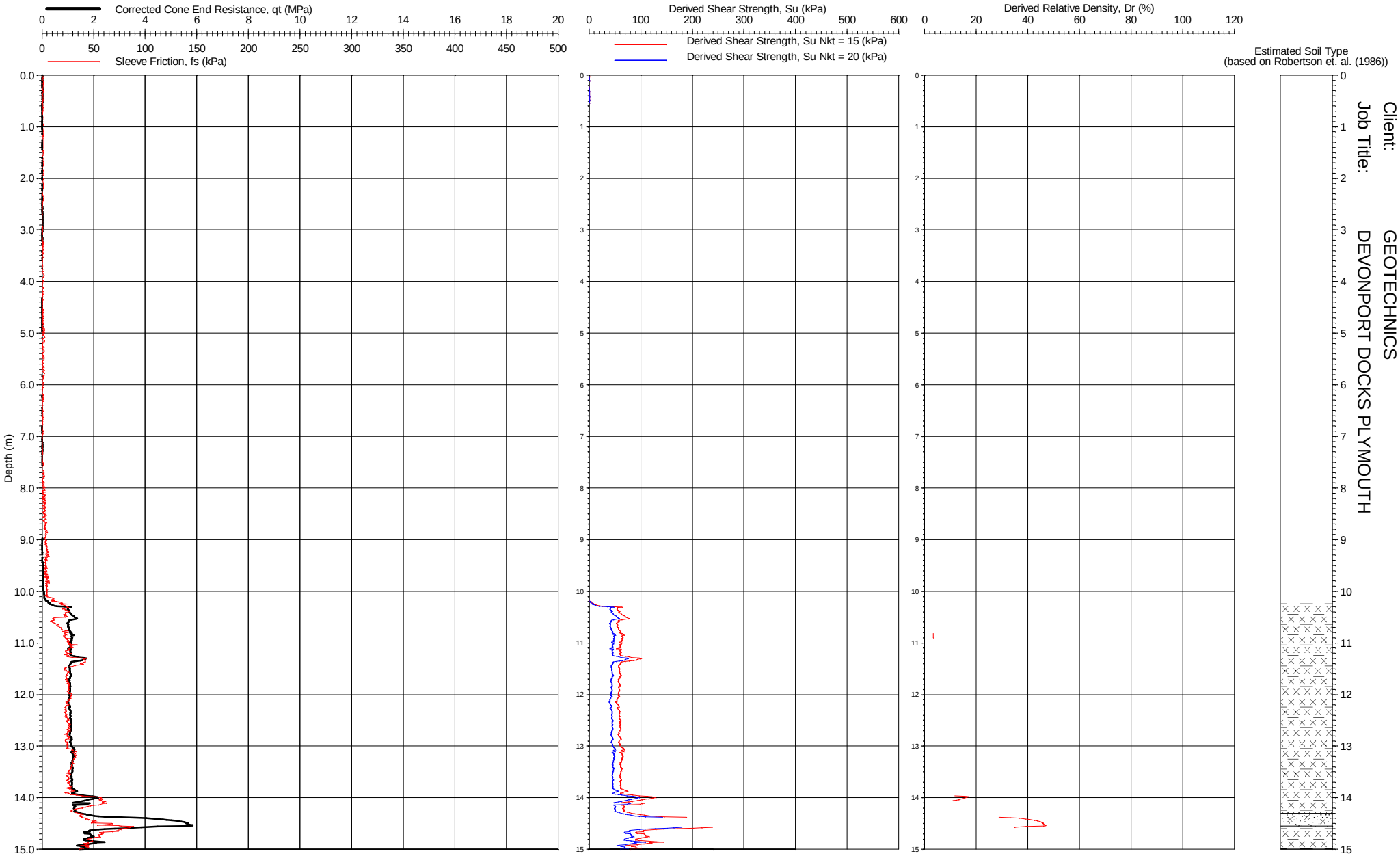
Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	15/07/2010
Coordinates:	0.000E - 0.000N	Date of Plot:	30/07/2010
Ground Level:	0.00 m msl	File Name:	1100127 - C13
Cone & Rig Used:	S15CFIIP.C35 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

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PIEZO CONE PENETRATION TEST
C13

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C14

Checked By:

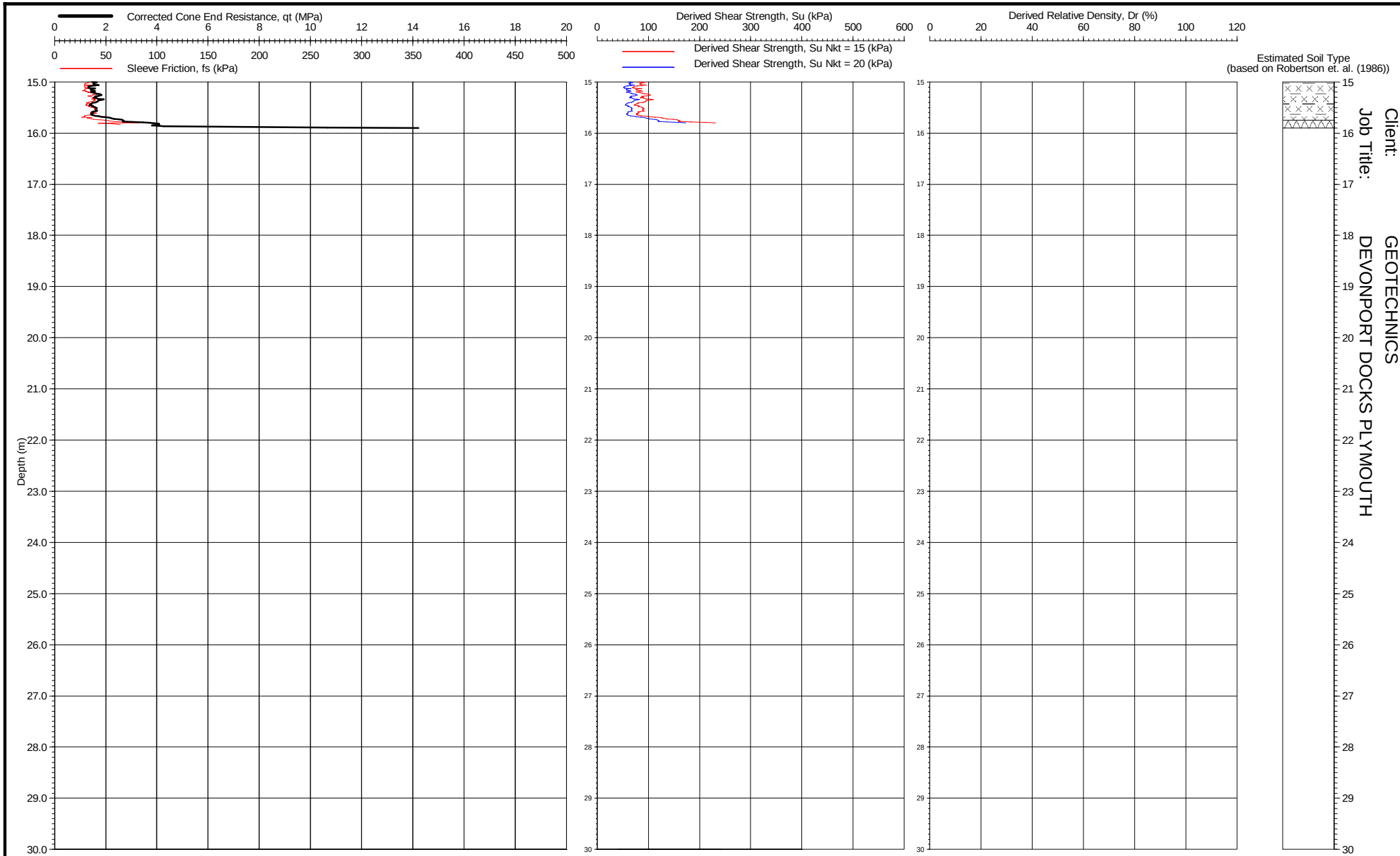
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C14

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C14

Checked By:

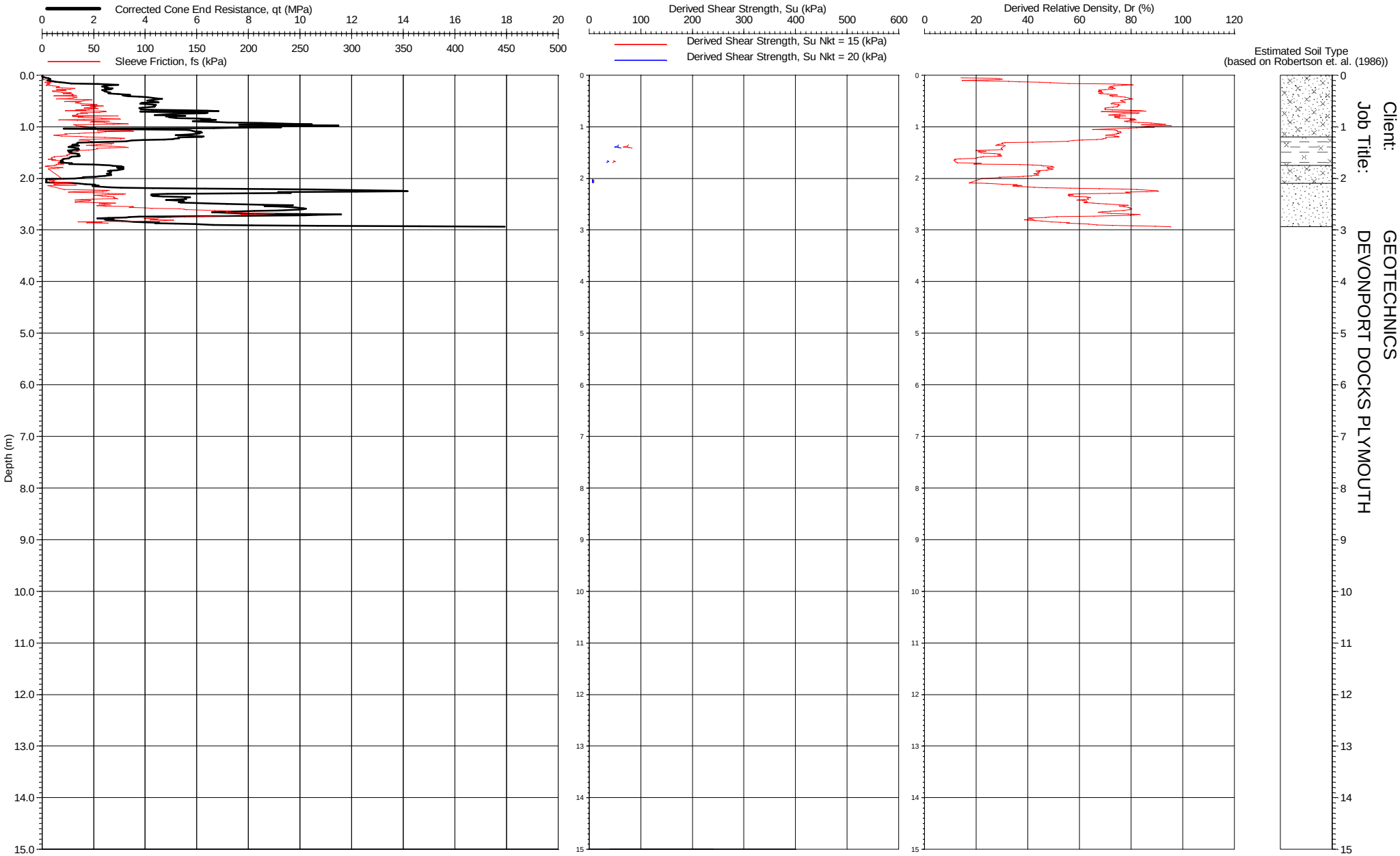
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C14

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C15

Checked By:

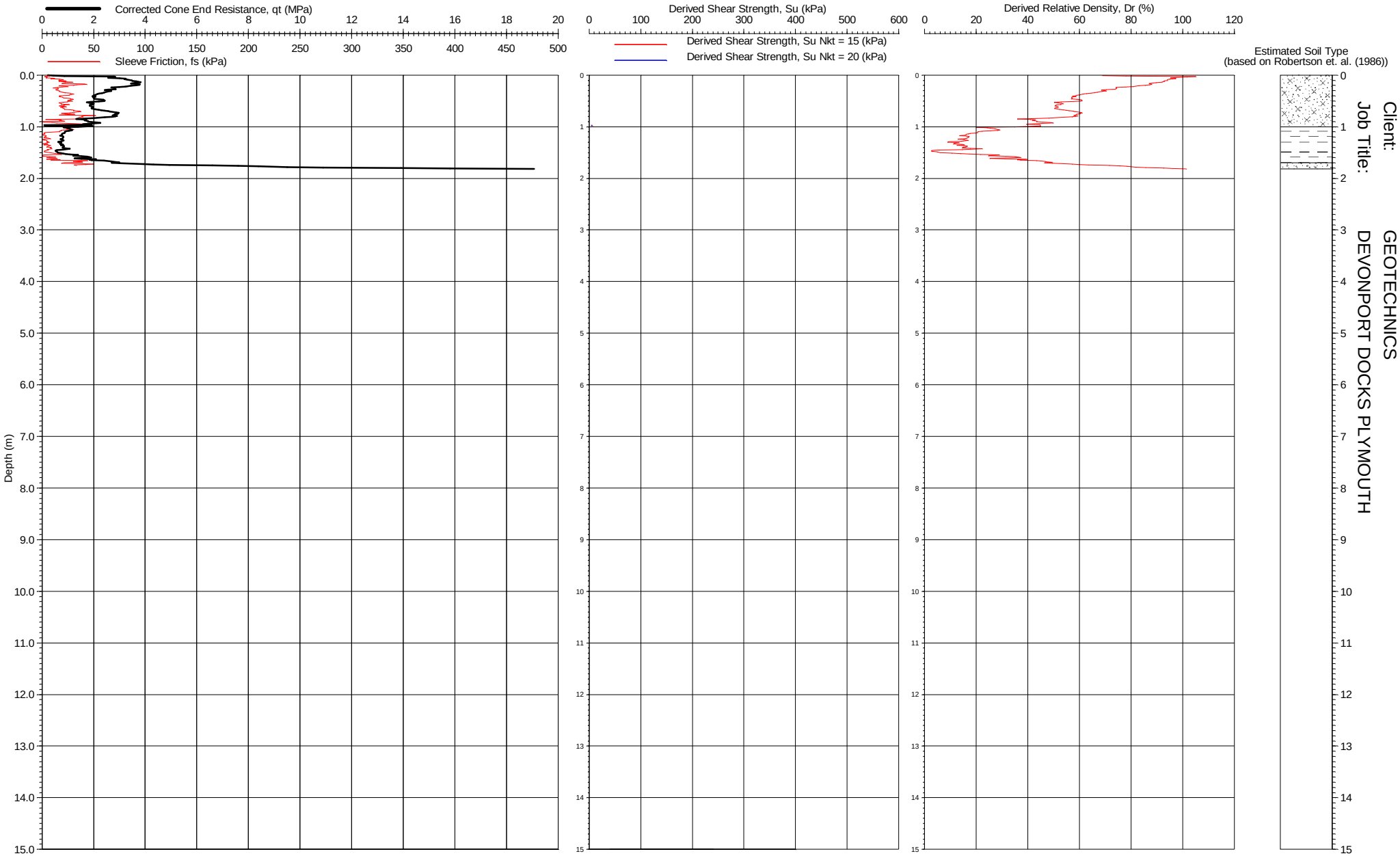
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C15

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C16

Checked By:

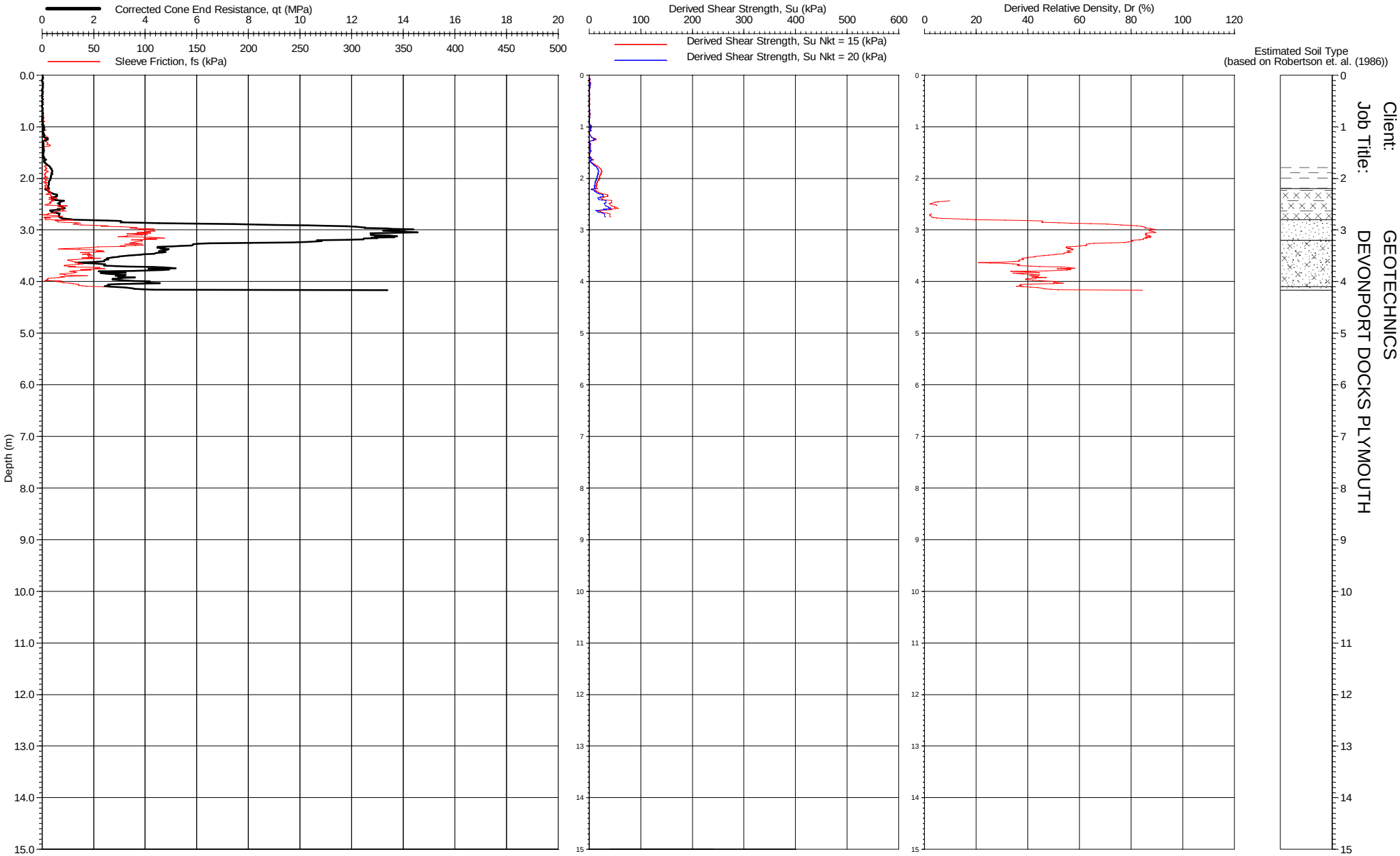
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C16

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C17

Checked By:

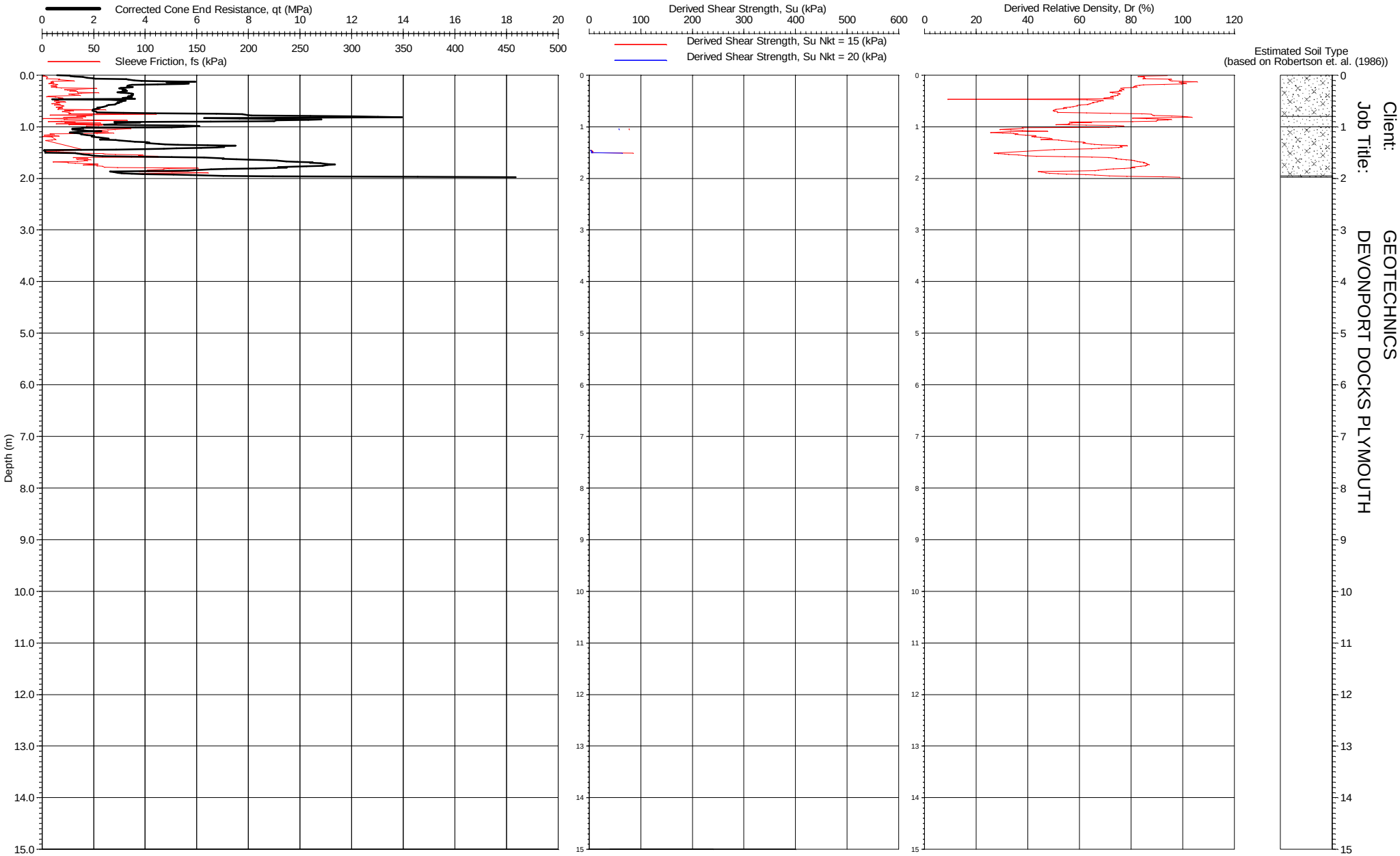
IN SITU SITE INVESTIGATION

insitusi.com

PIEZO CONE PENETRATION TEST

C17

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C18

Checked By:

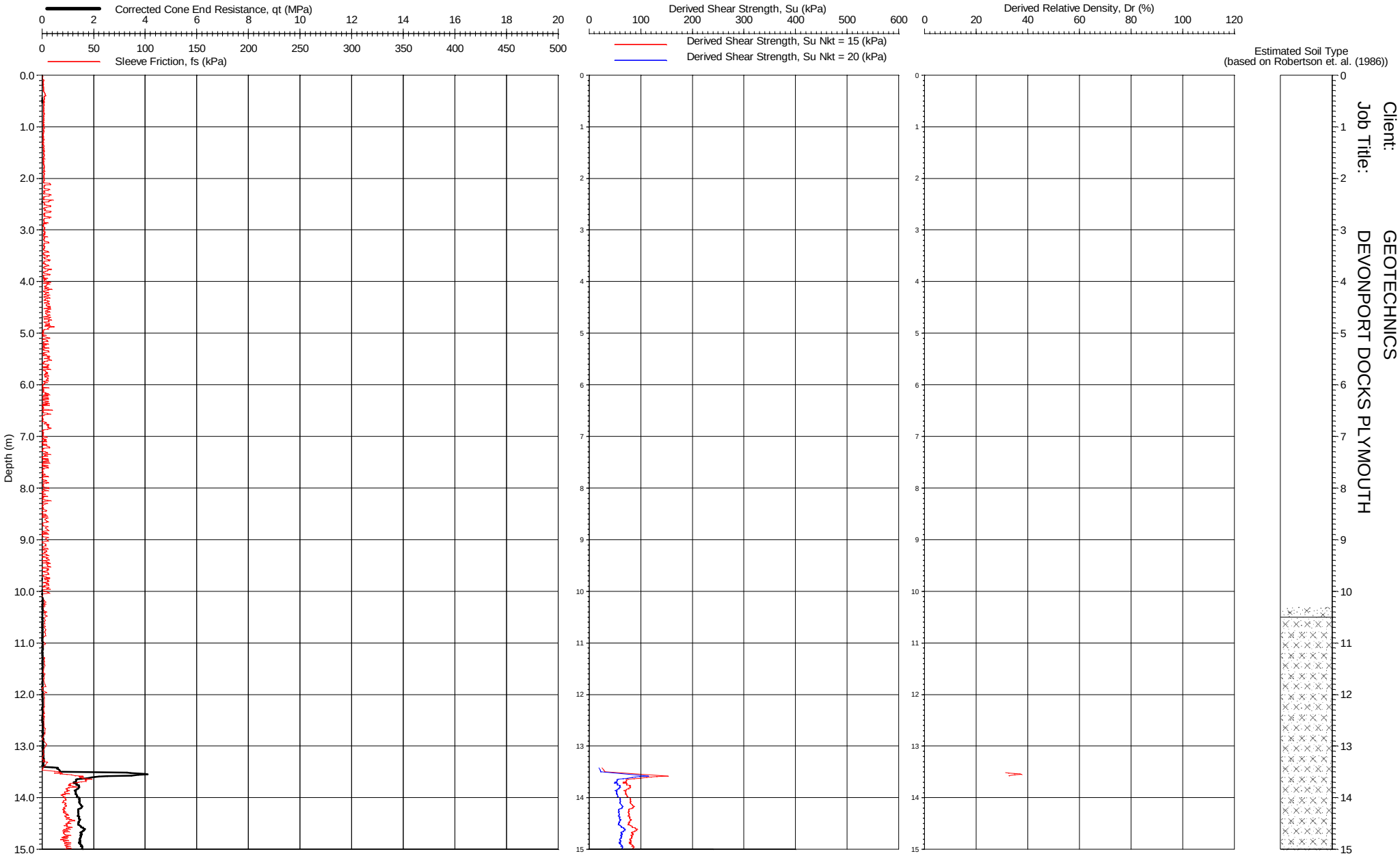
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C18

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C20A

Checked By:

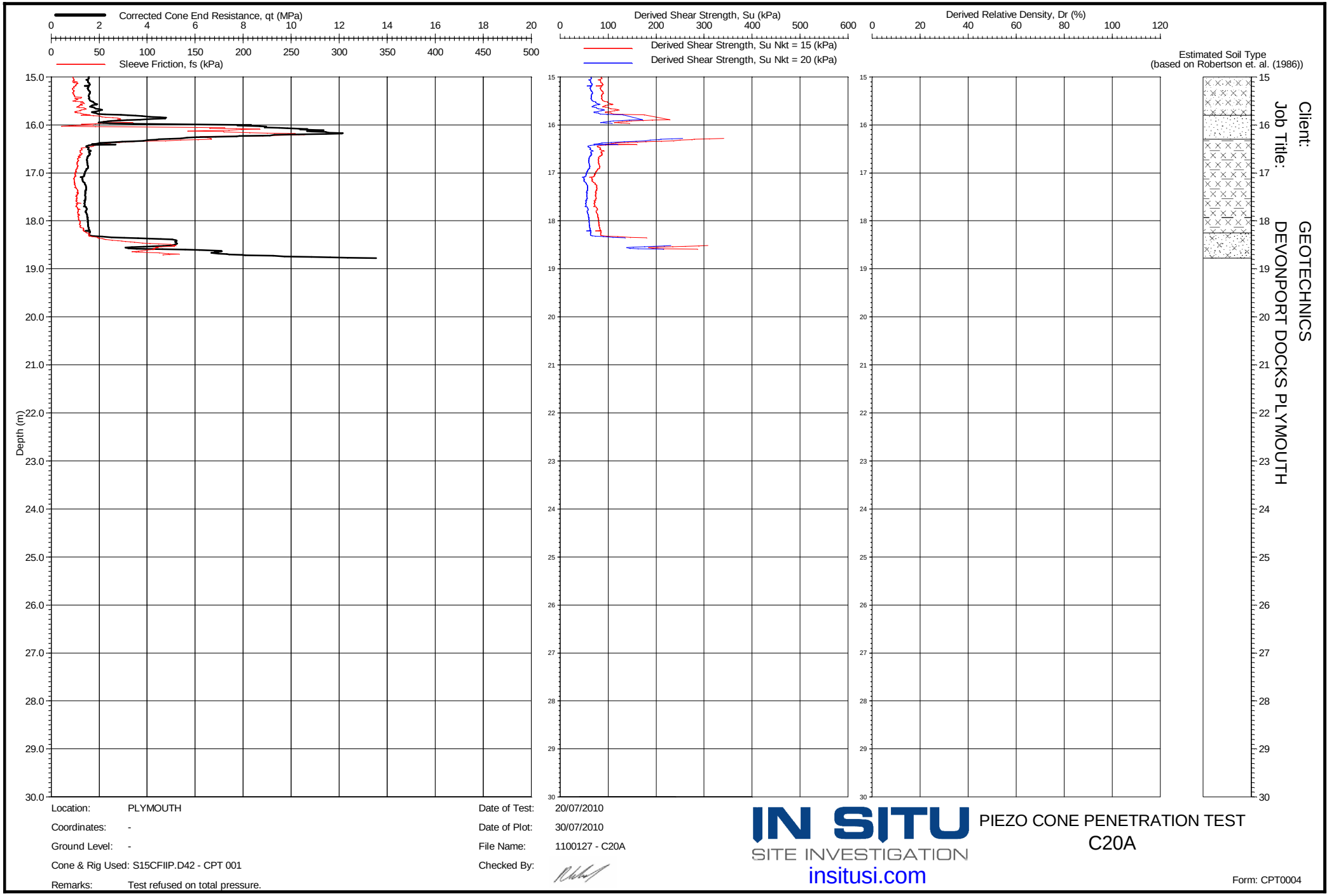
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C20A

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C20A

Checked By:

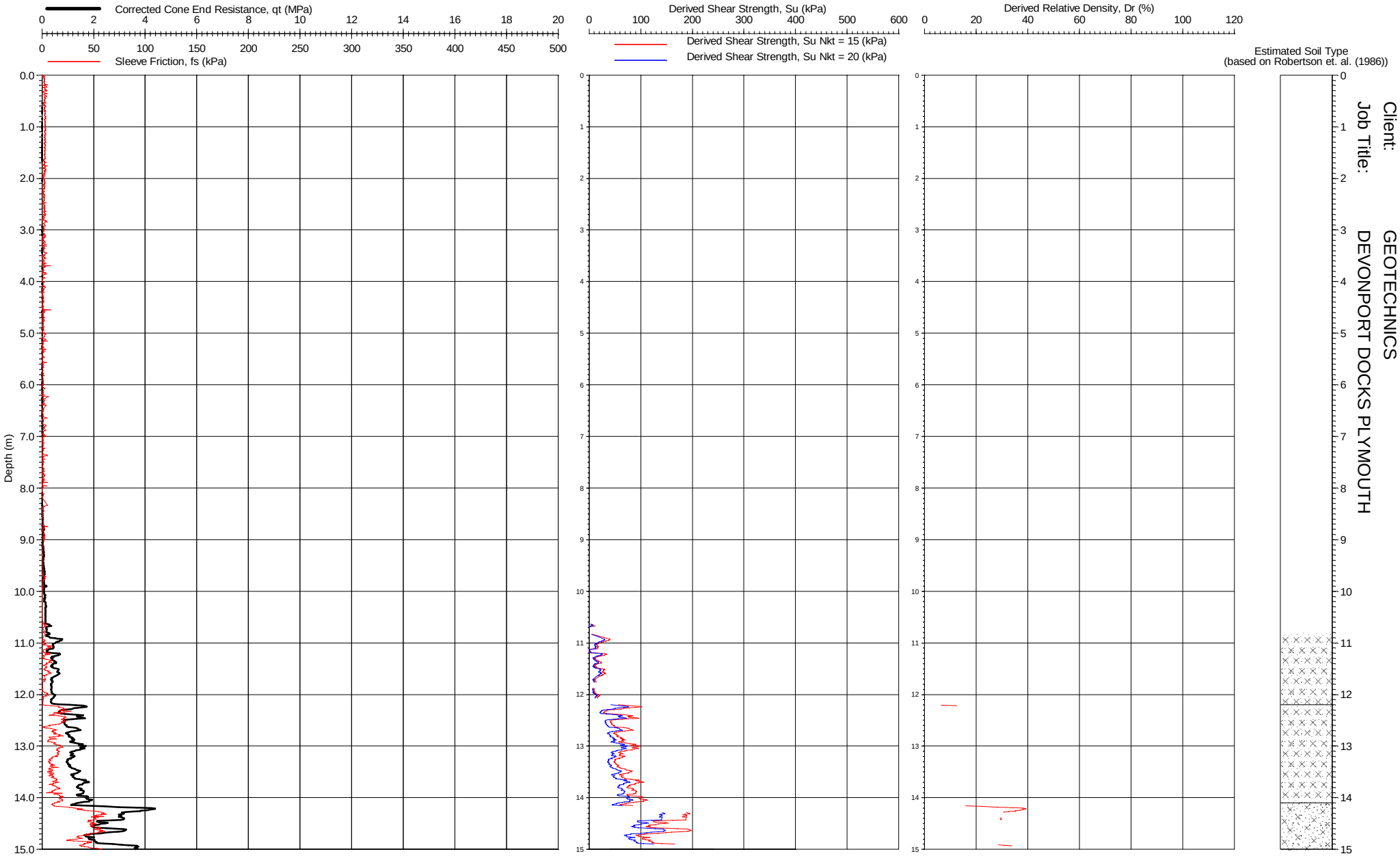
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PIEZO CONE PENETRATION TEST

C20A

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C21

Checked By:

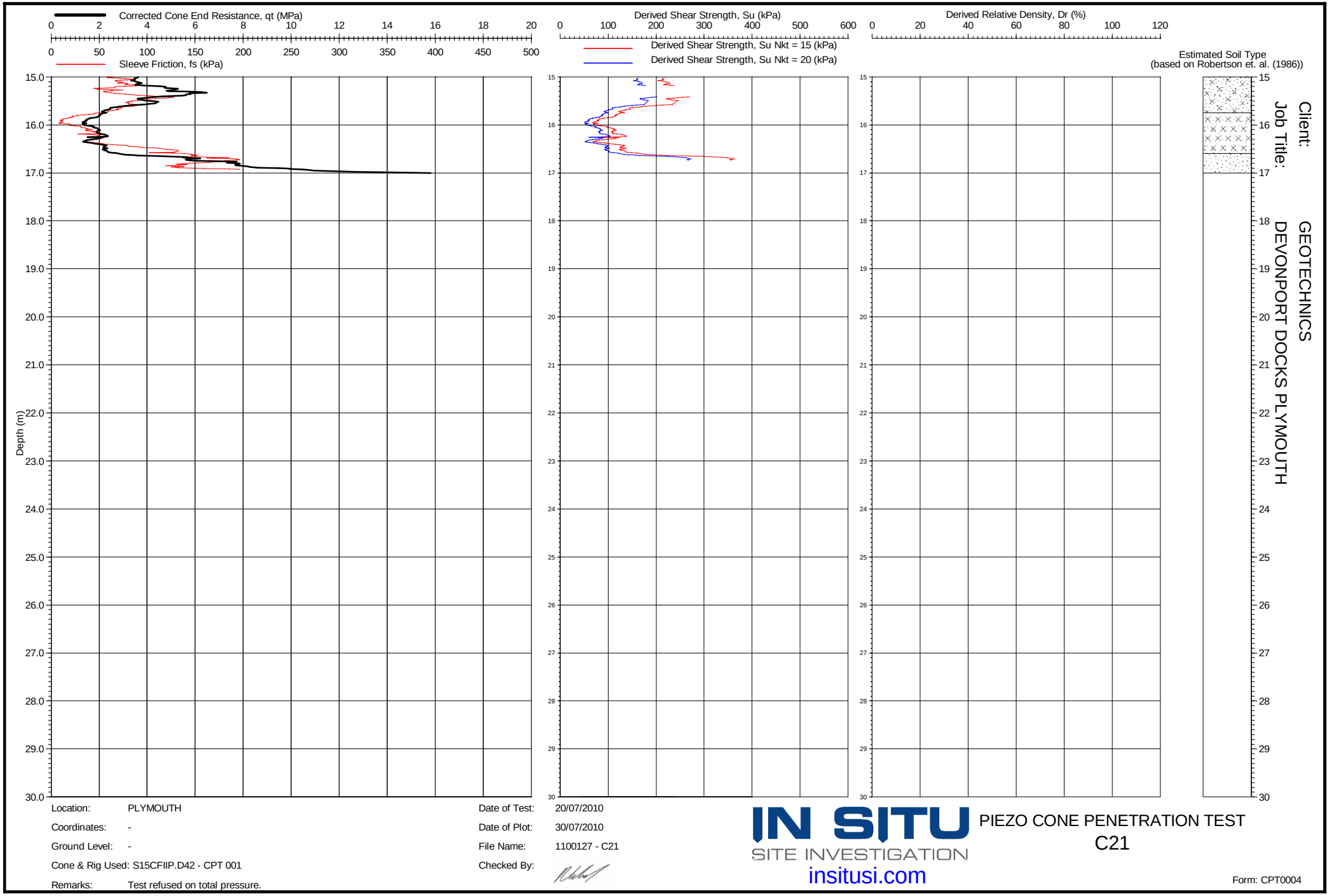
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C21

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C21

Checked By:

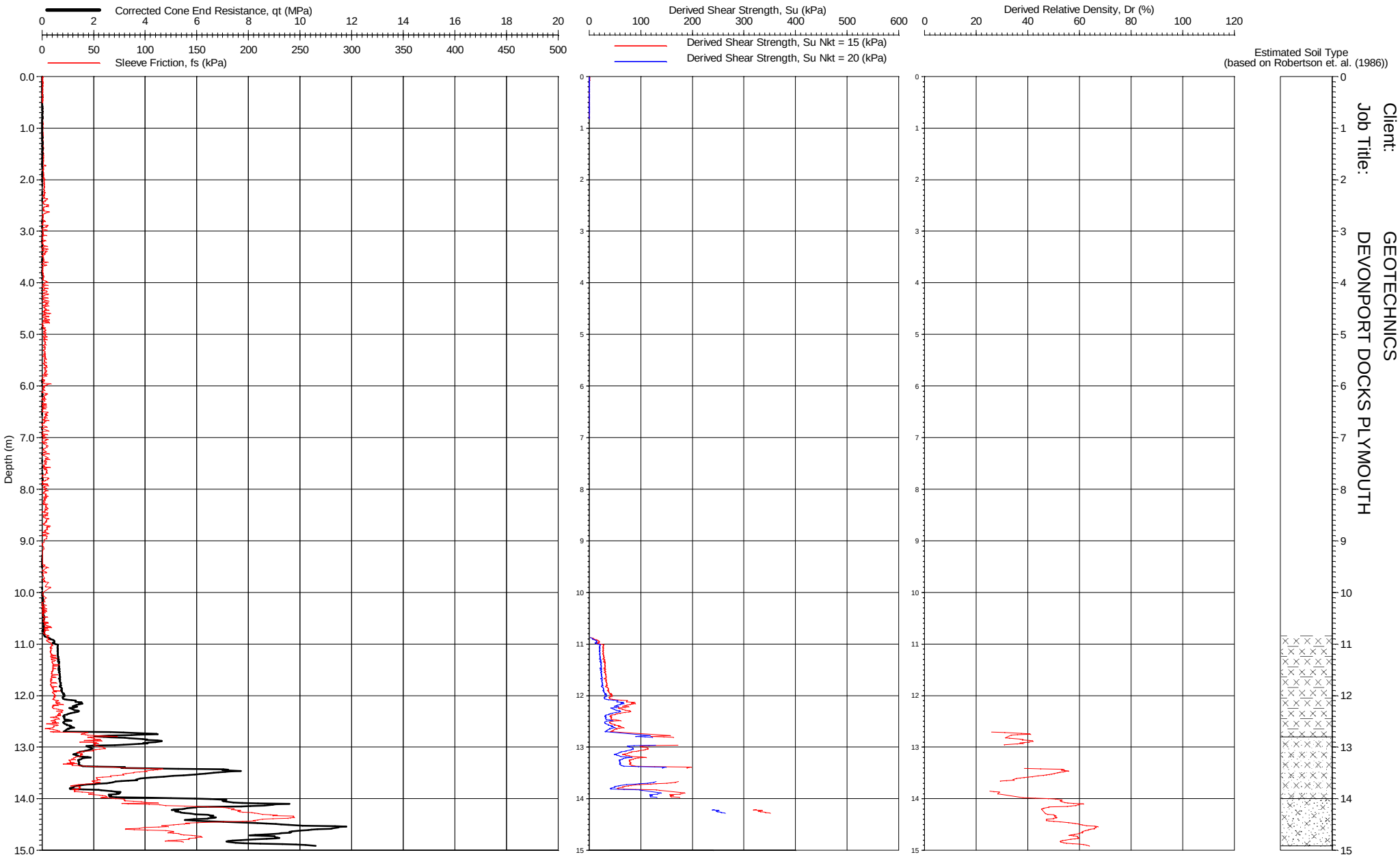
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C21

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C22

Checked By:

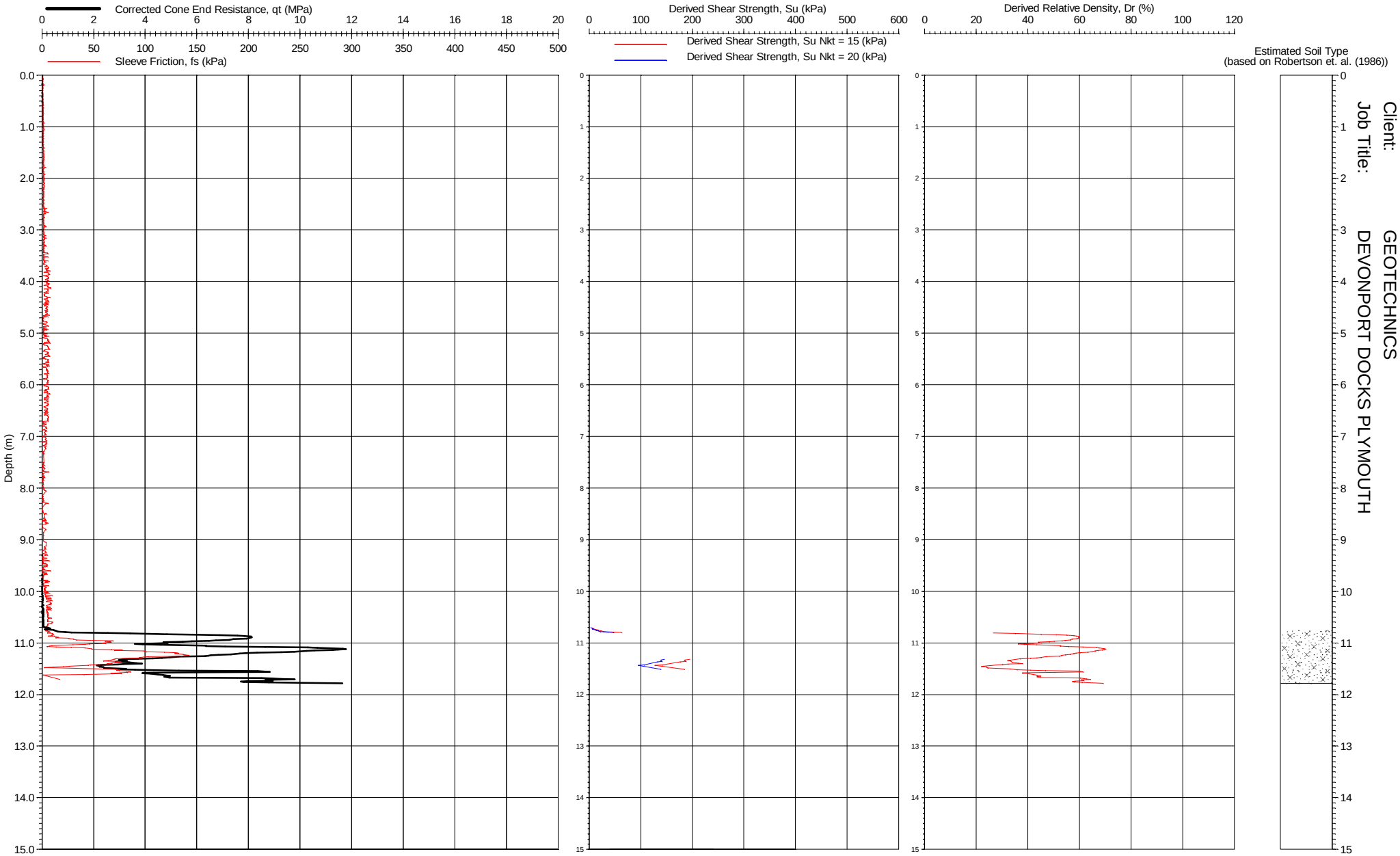
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PIEZO CONE PENETRATION TEST

C22

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C28

Checked By:

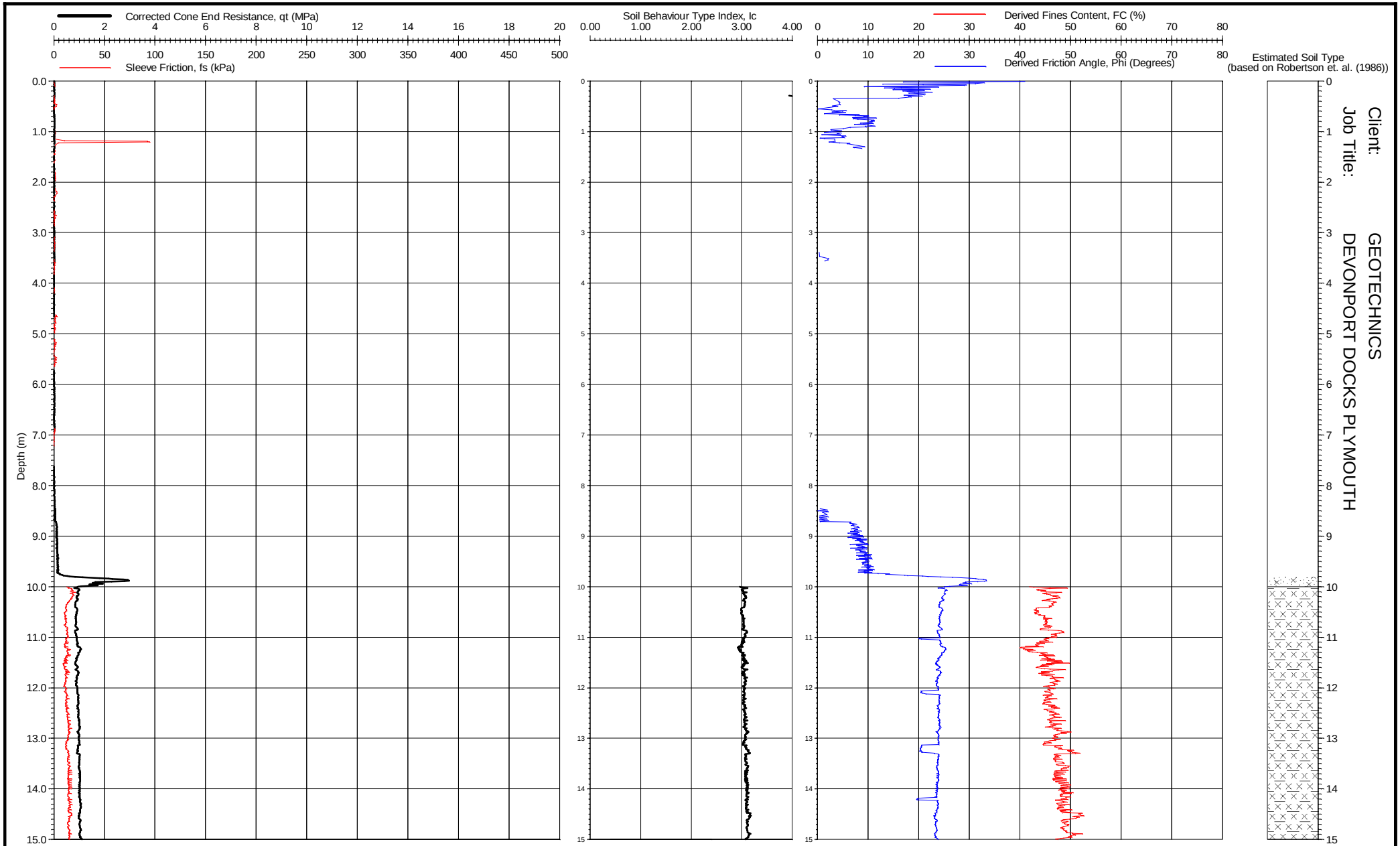
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PIEZO CONE PENETRATION TEST

C28

Form: CPT0004



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C01

Checked By:

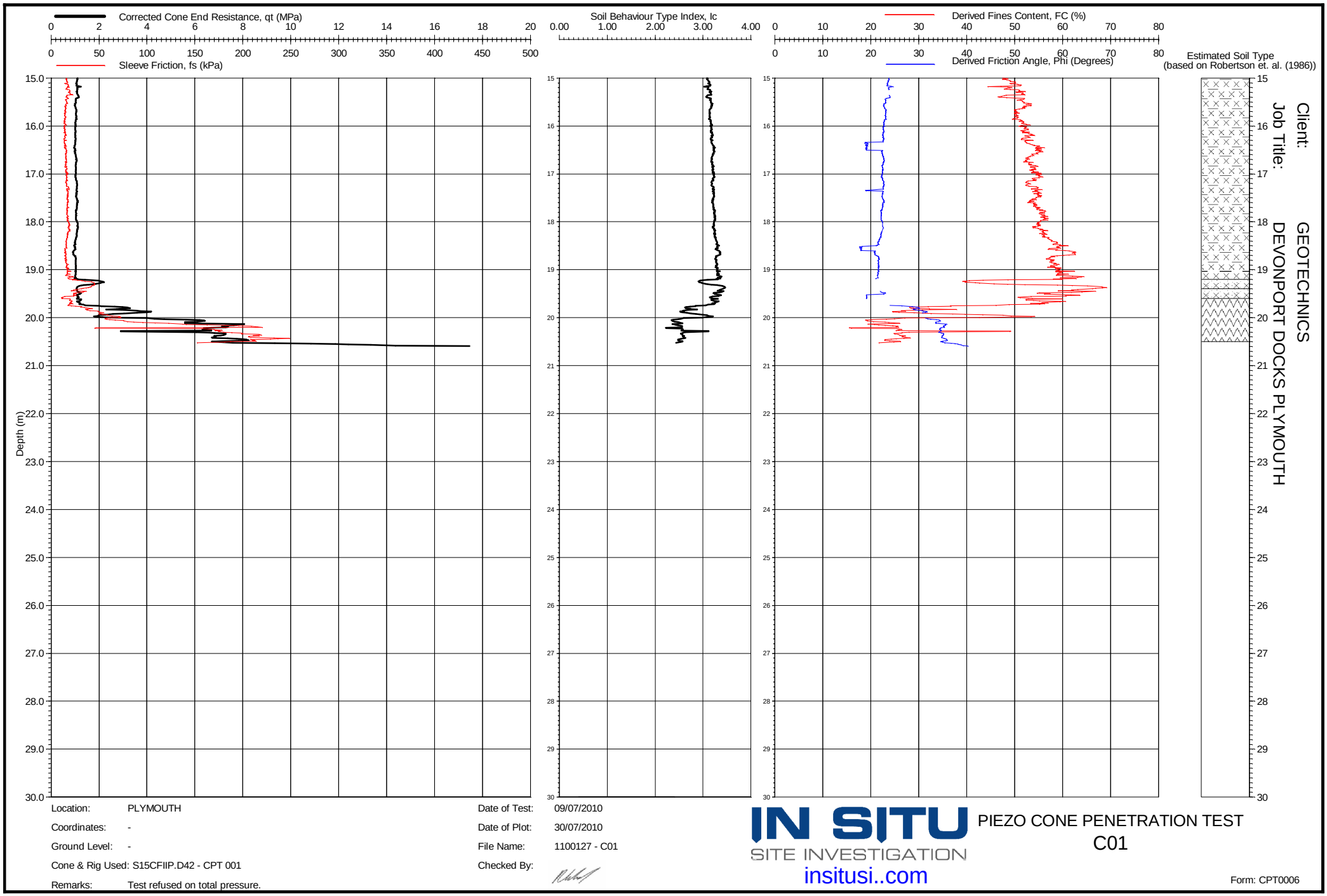
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PIEZO CONE PENETRATION TEST

C01

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C01

Checked By:

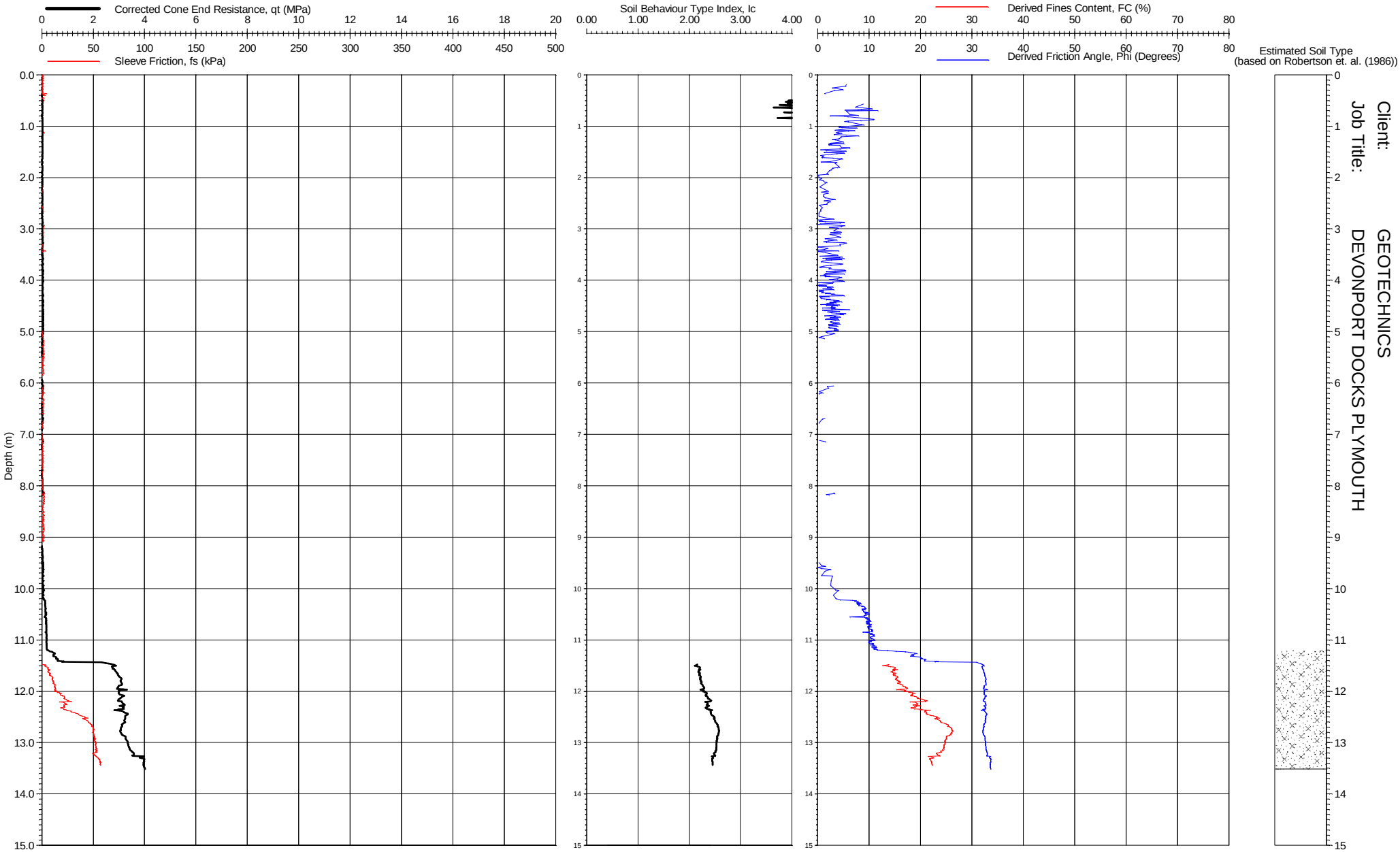
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PIEZO CONE PENETRATION TEST

C01

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 09/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C02

Checked By:

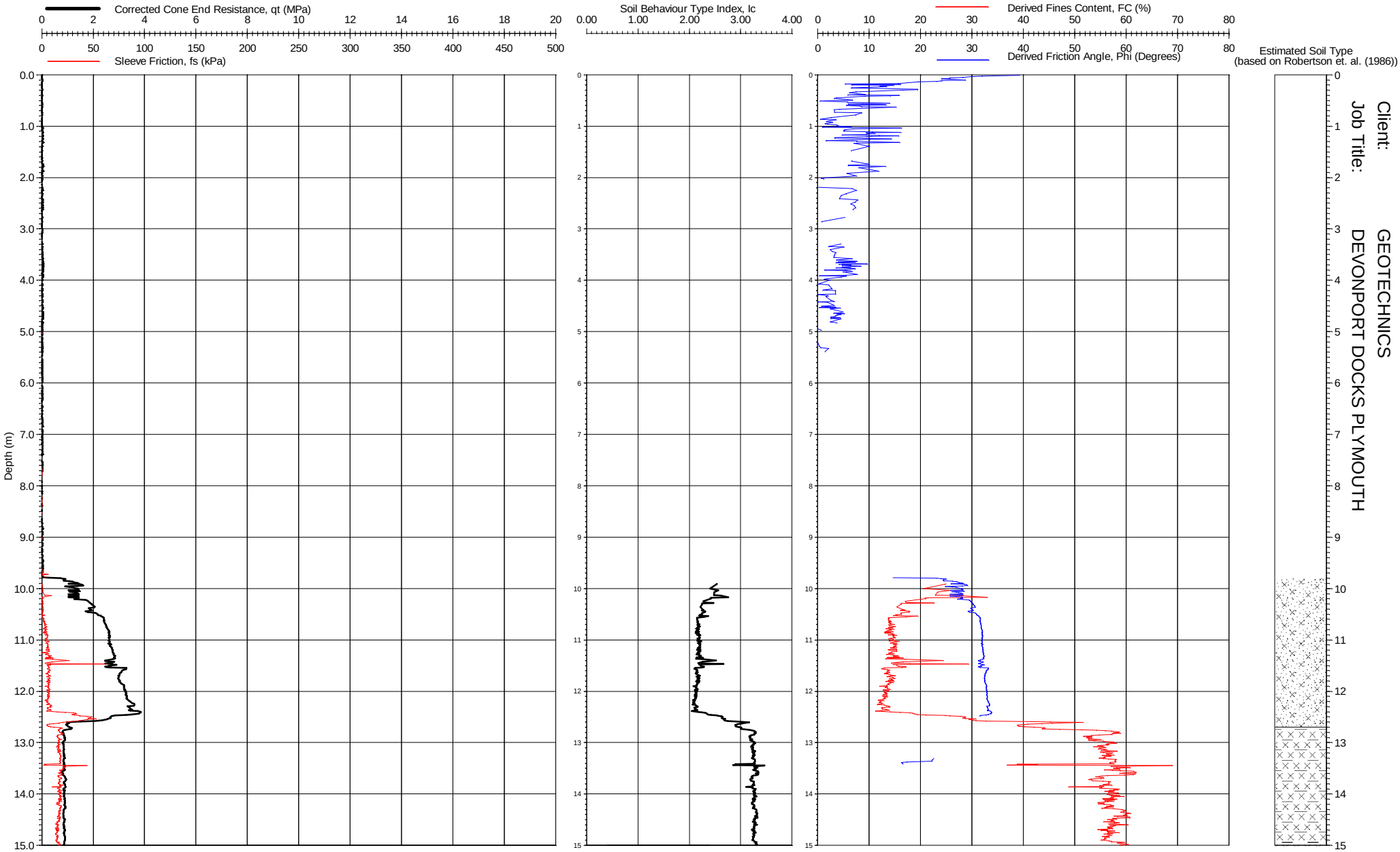
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PIEZO CONE PENETRATION TEST

C02

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C03

Checked By:

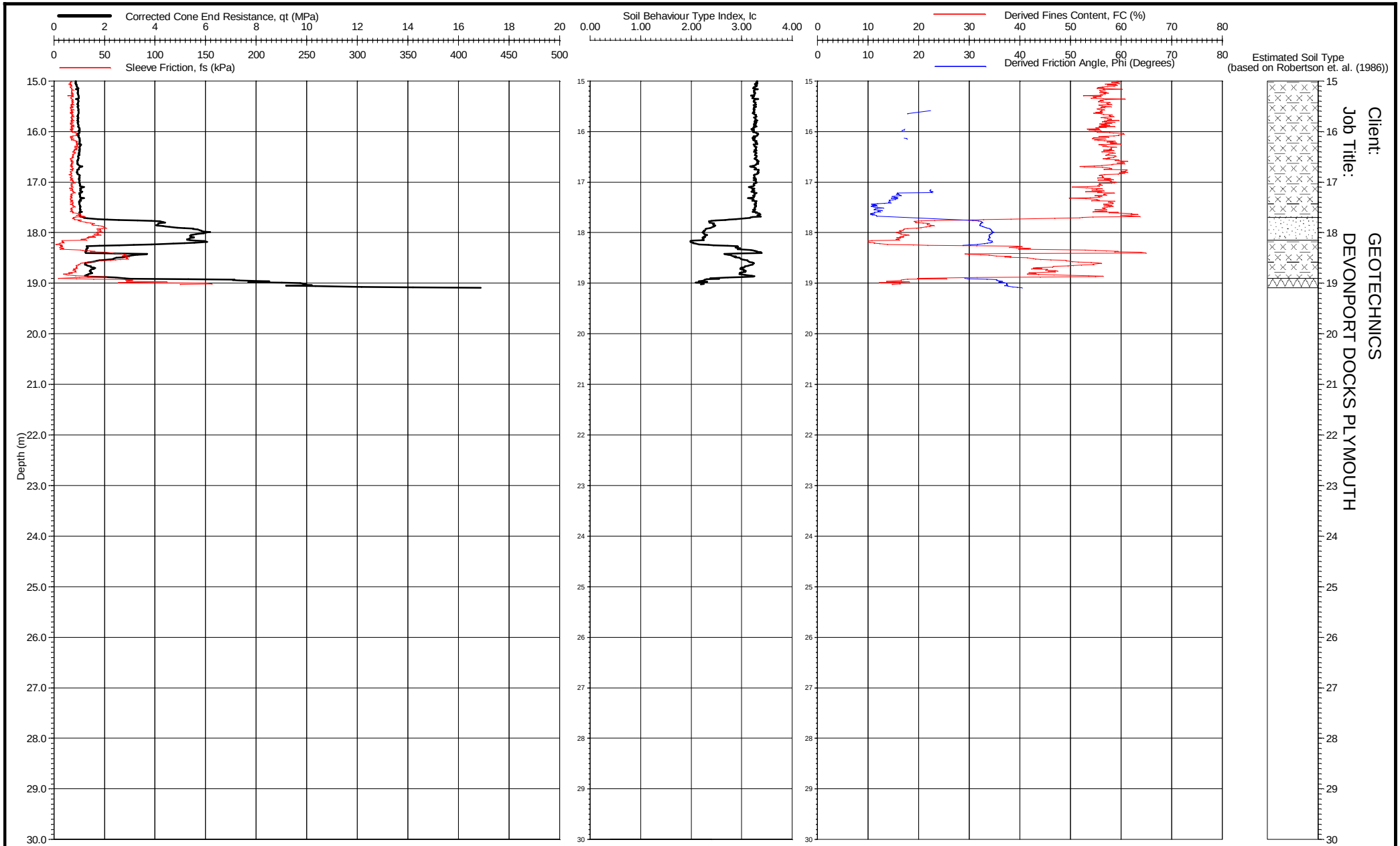
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PIEZO CONE PENETRATION TEST

C03

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C03

Checked By:

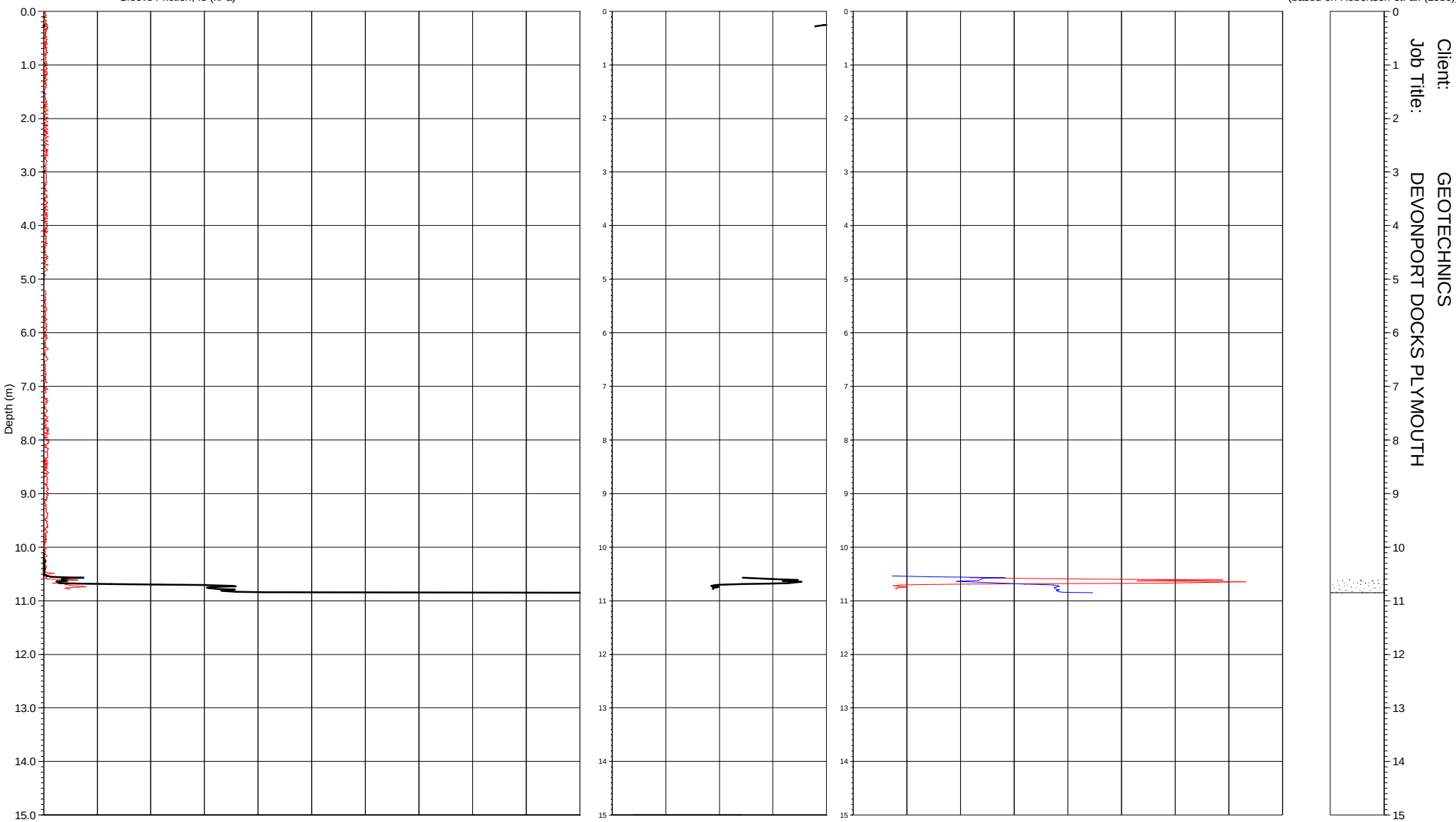
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PIEZO CONE PENETRATION TEST

C03

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C04

Checked By:

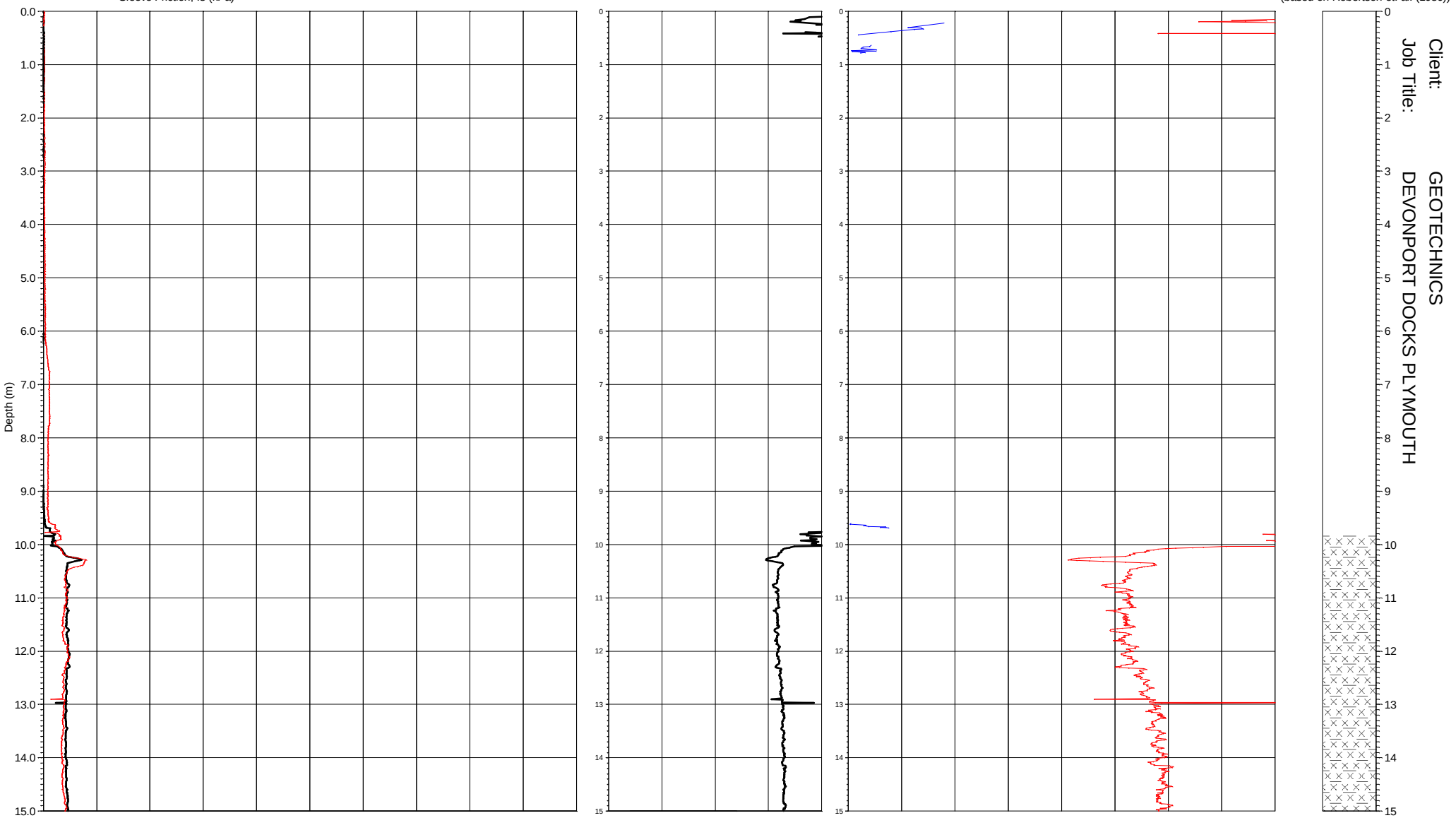
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PIEZO CONE PENETRATION TEST

C04

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 14/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C05

Checked By:

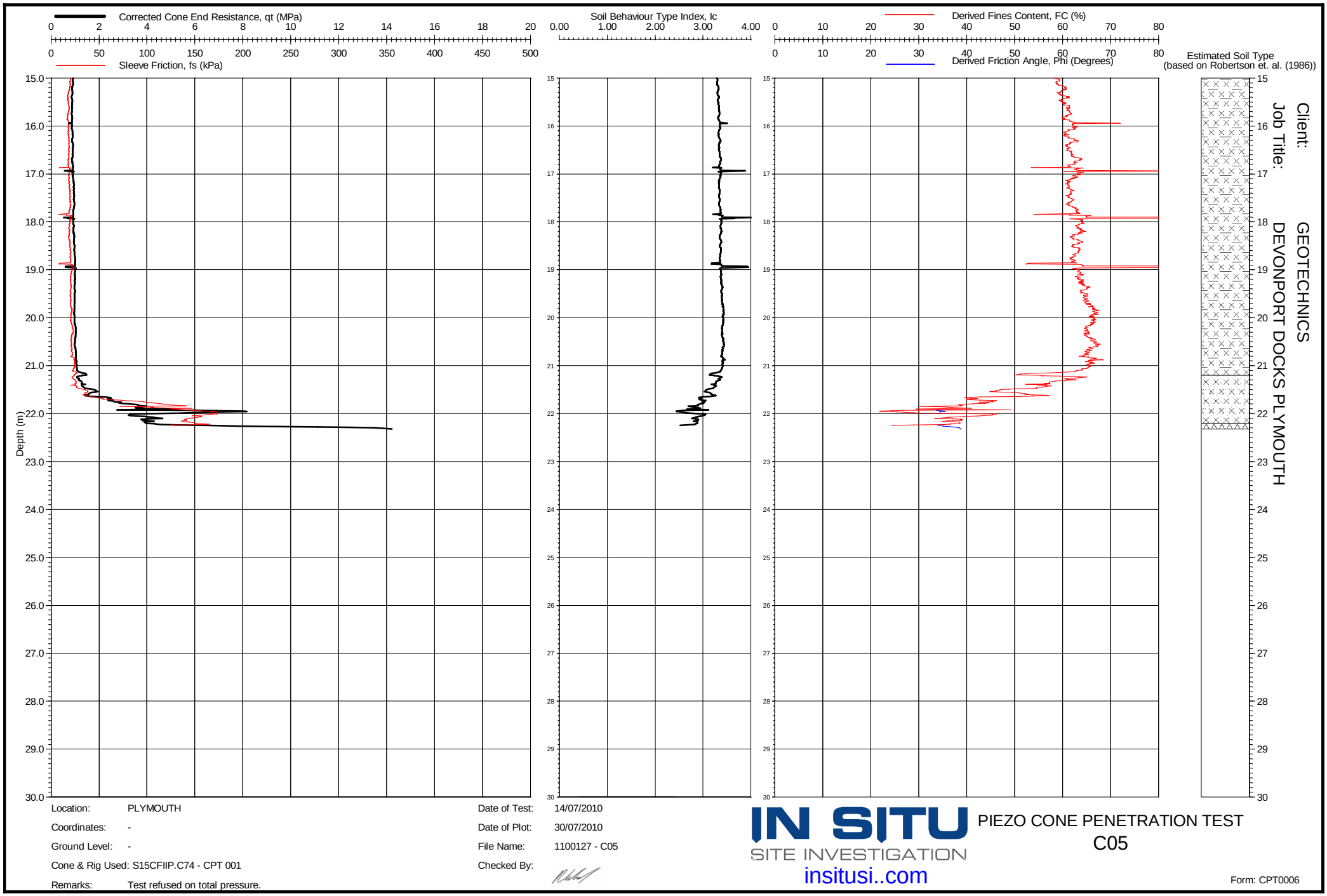
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PIEZO CONE PENETRATION TEST

C05

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 14/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C05

Checked By:

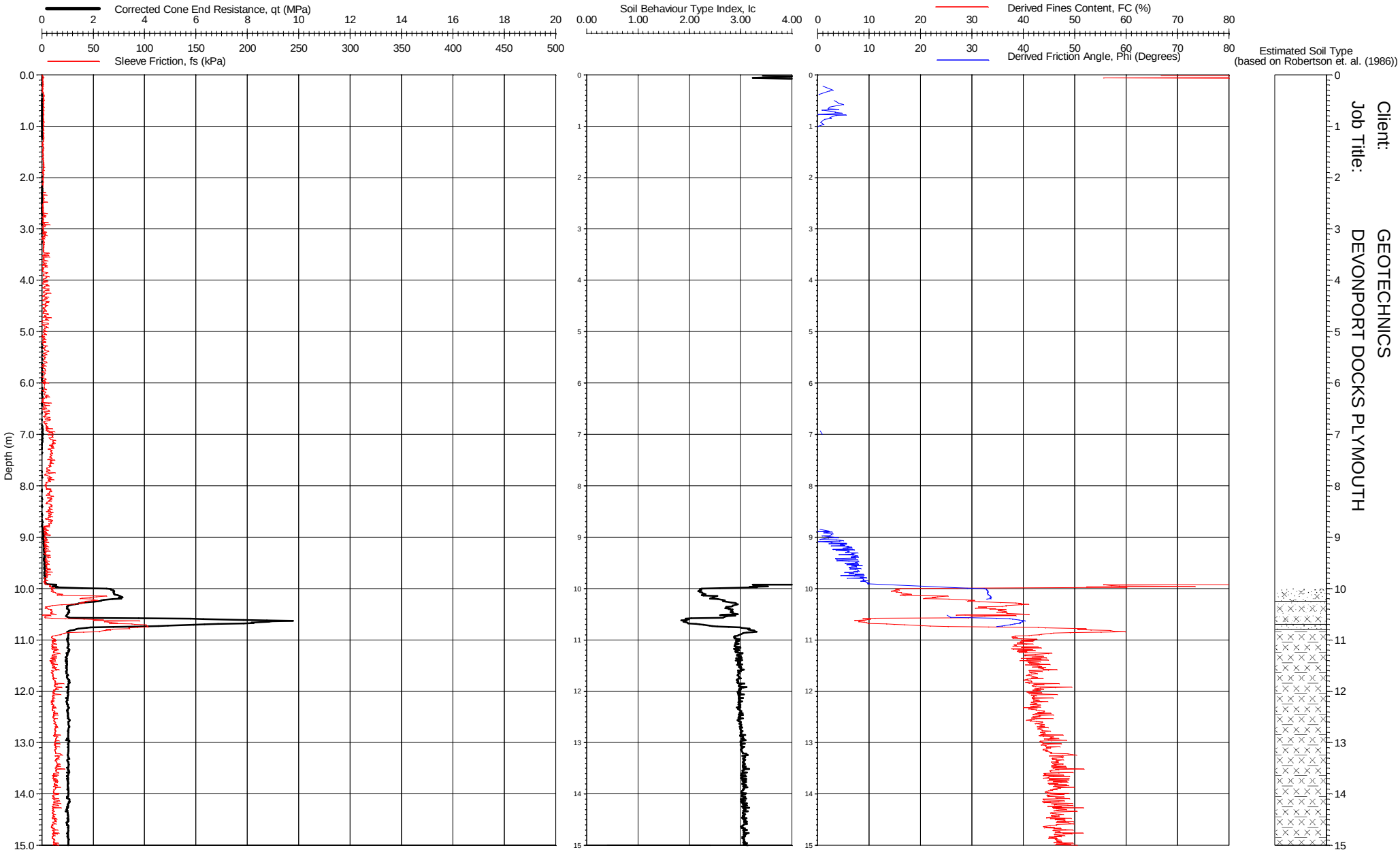
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PIEZO CONE PENETRATION TEST

C05

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C06

Checked By:

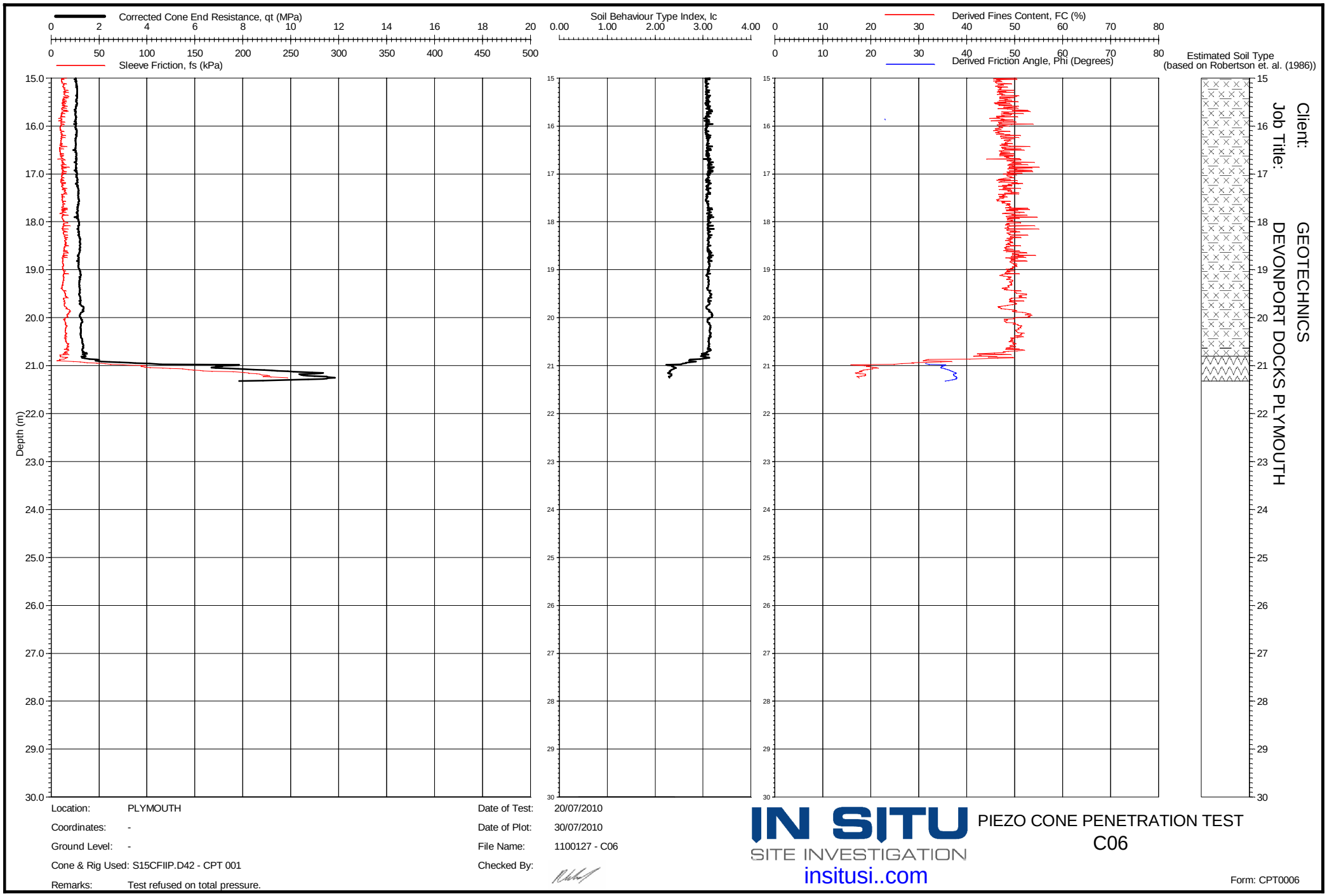
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PIEZO CONE PENETRATION TEST

C06

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C06

Checked By:

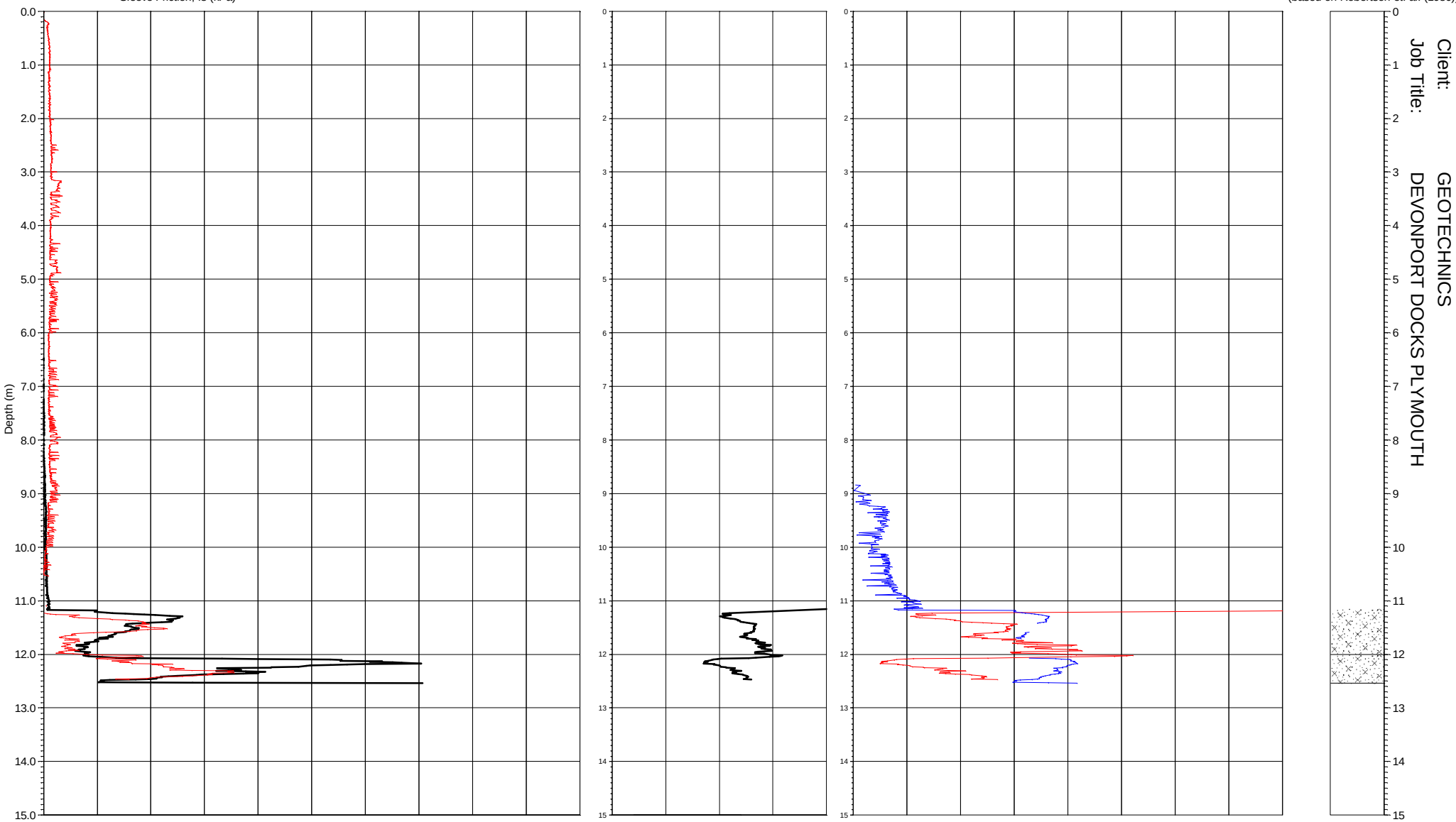
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PIEZO CONE PENETRATION TEST

C06

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C07

Checked By:

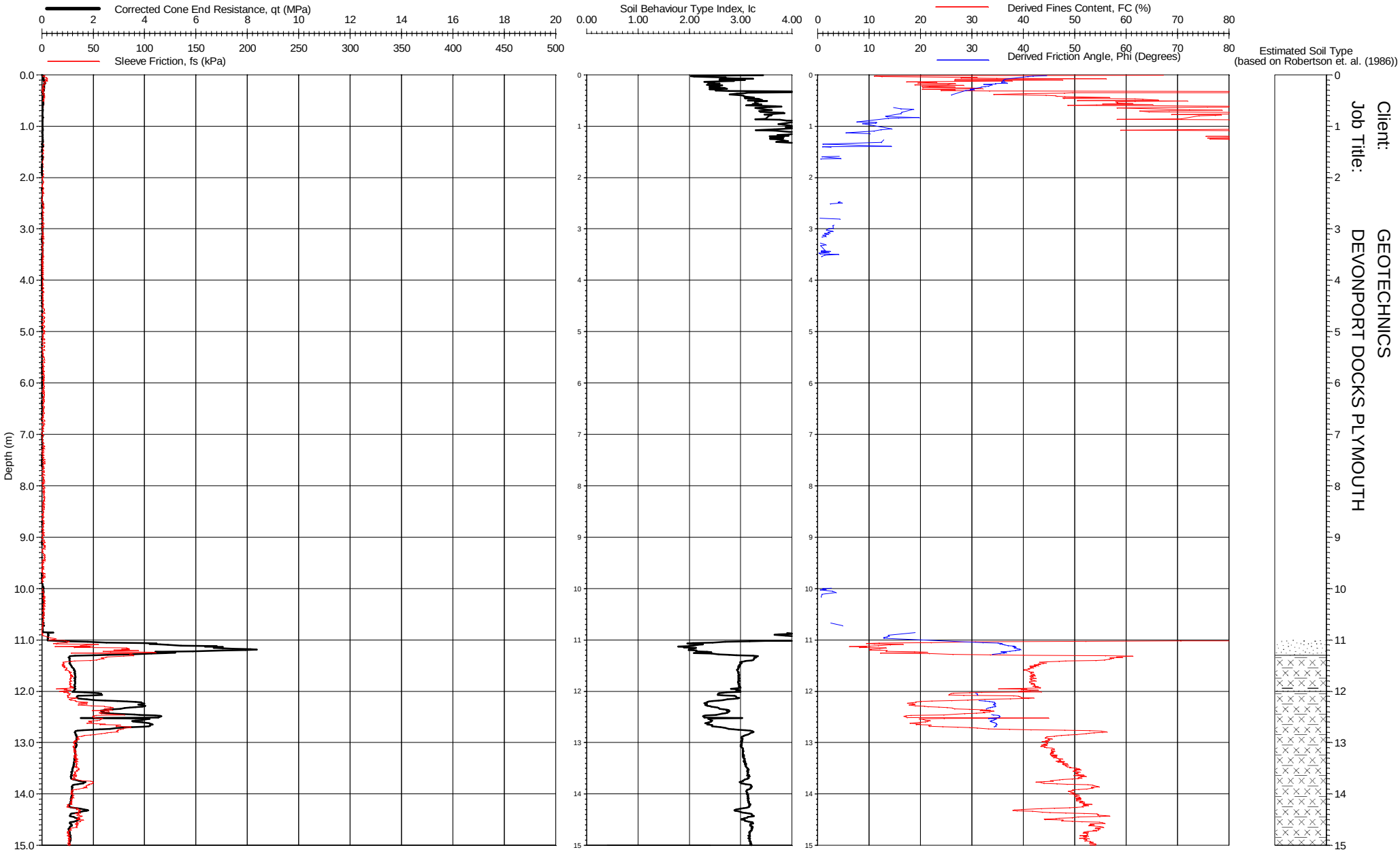
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PIEZO CONE PENETRATION TEST

C07

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C08

Checked By:

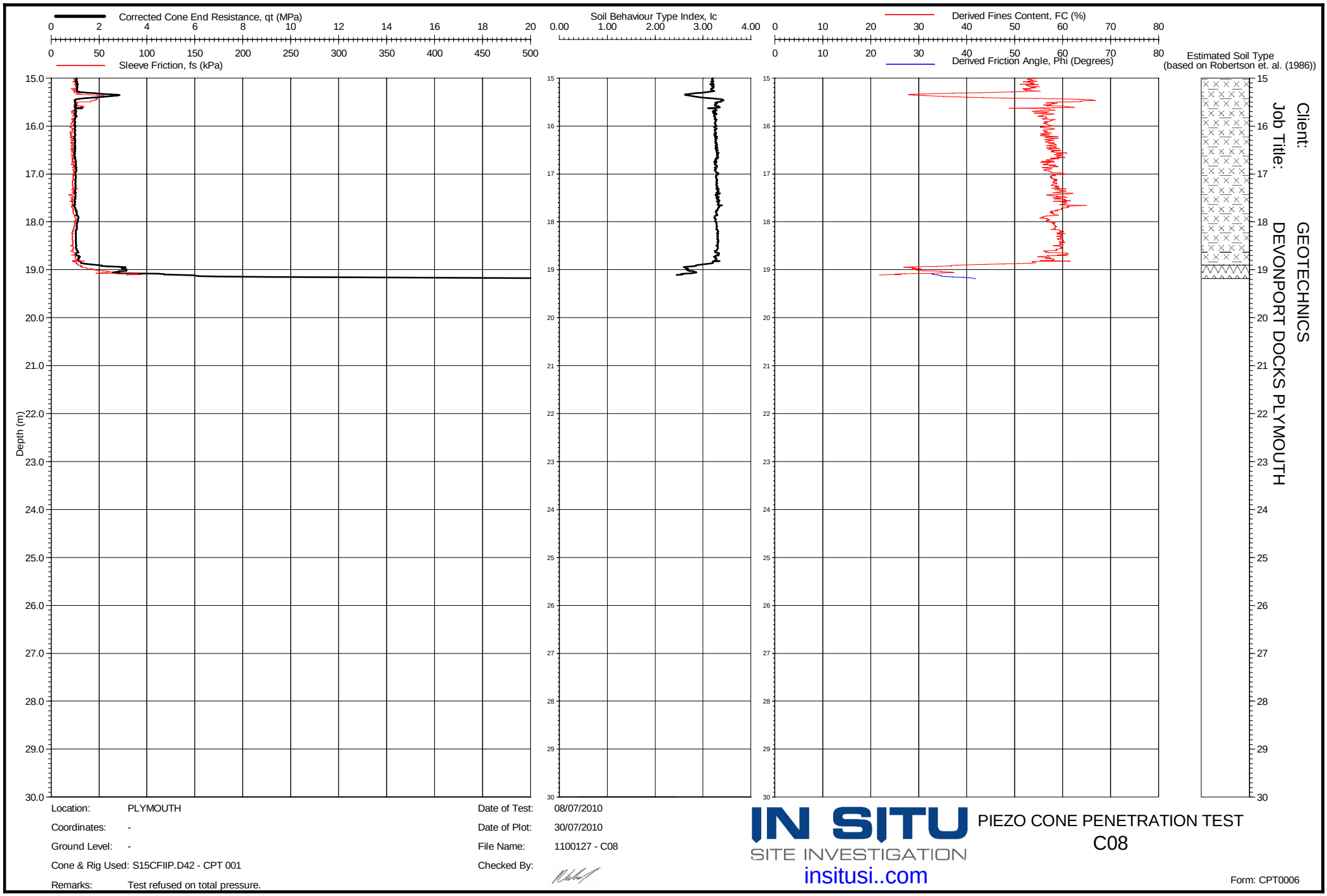
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PIEZO CONE PENETRATION TEST

C08

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C08

Checked By:

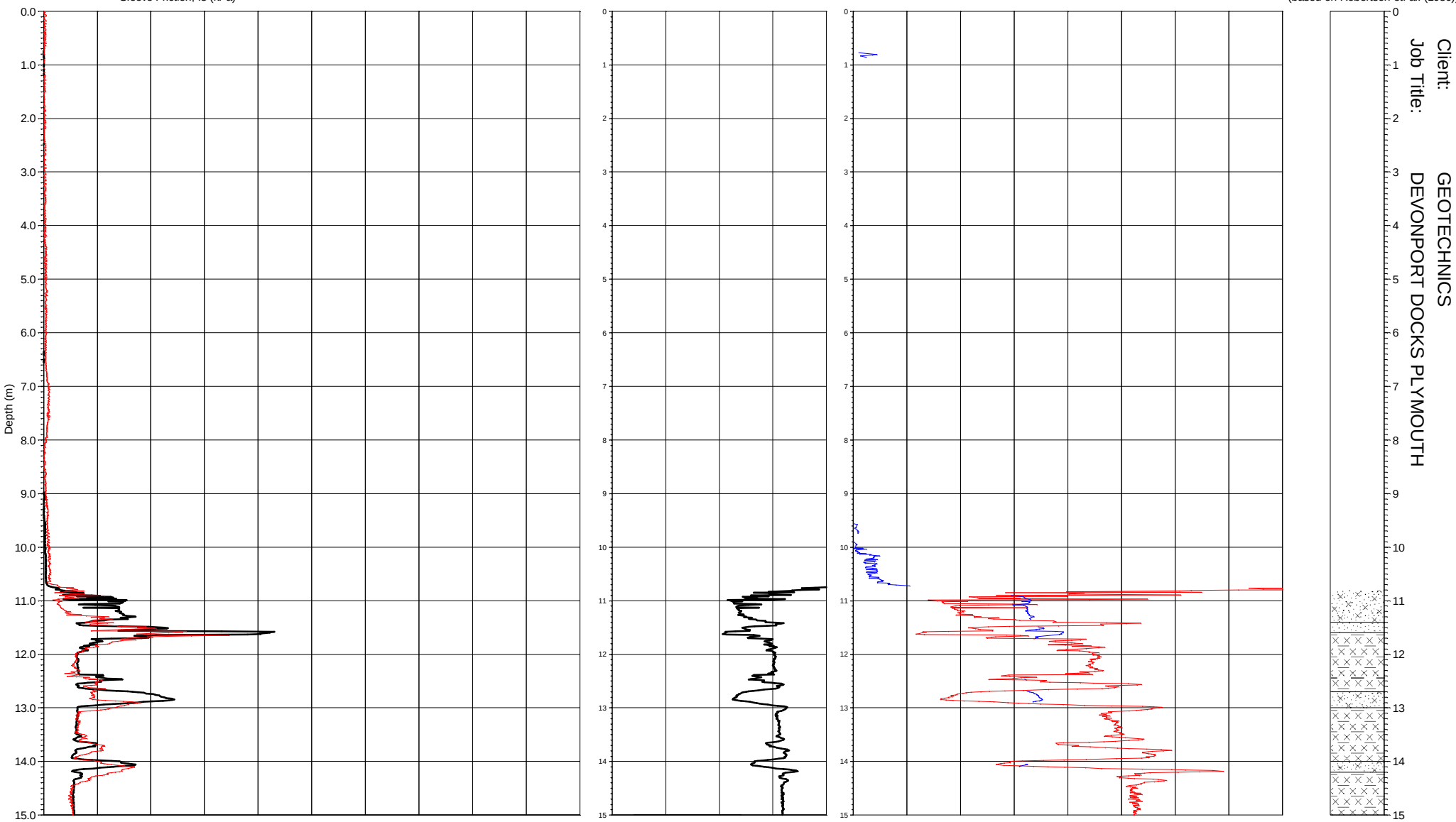
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PIEZO CONE PENETRATION TEST

C08

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C09A

Checked By:

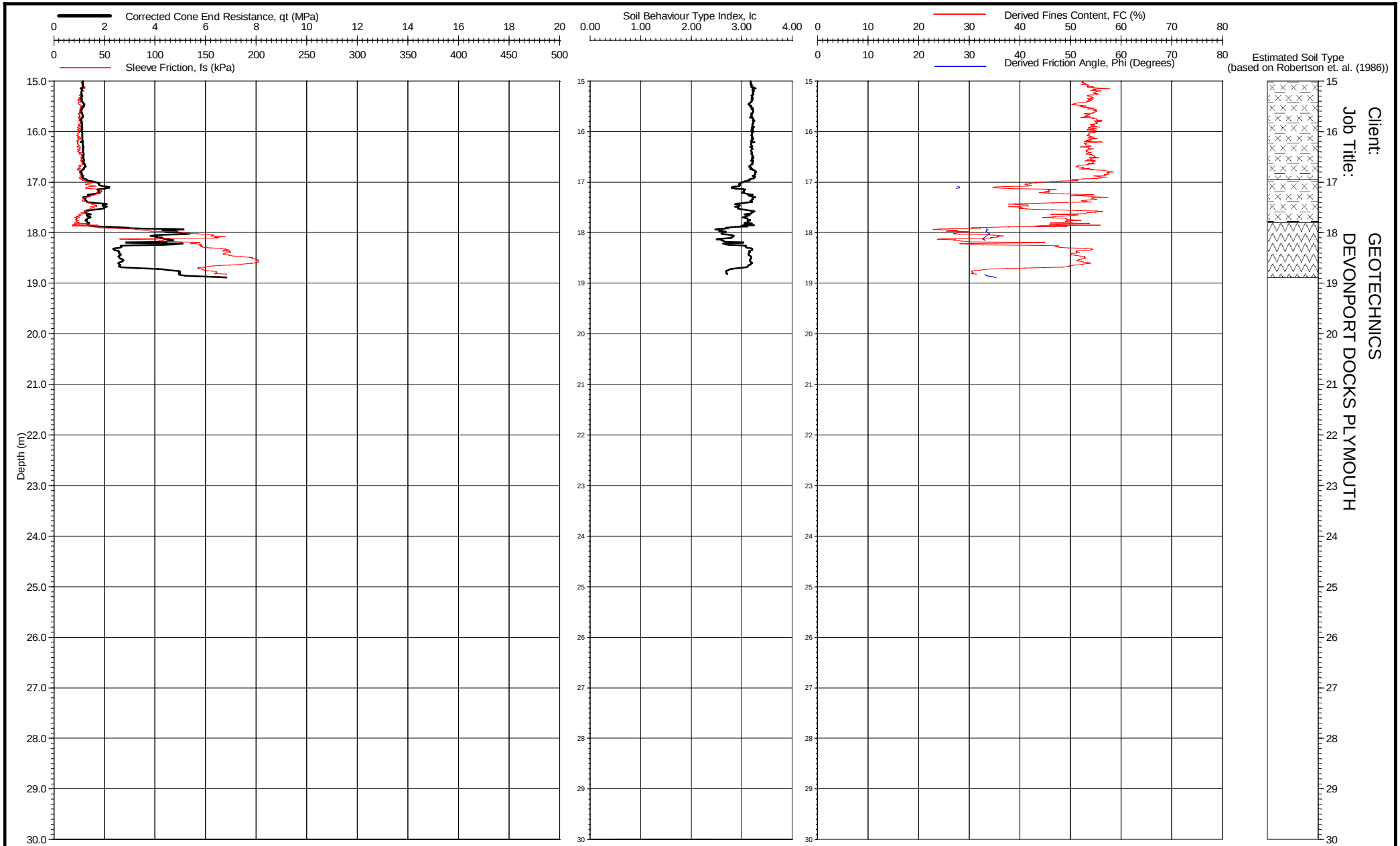
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PIEZO CONE PENETRATION TEST

C09A

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C09A

Checked By:

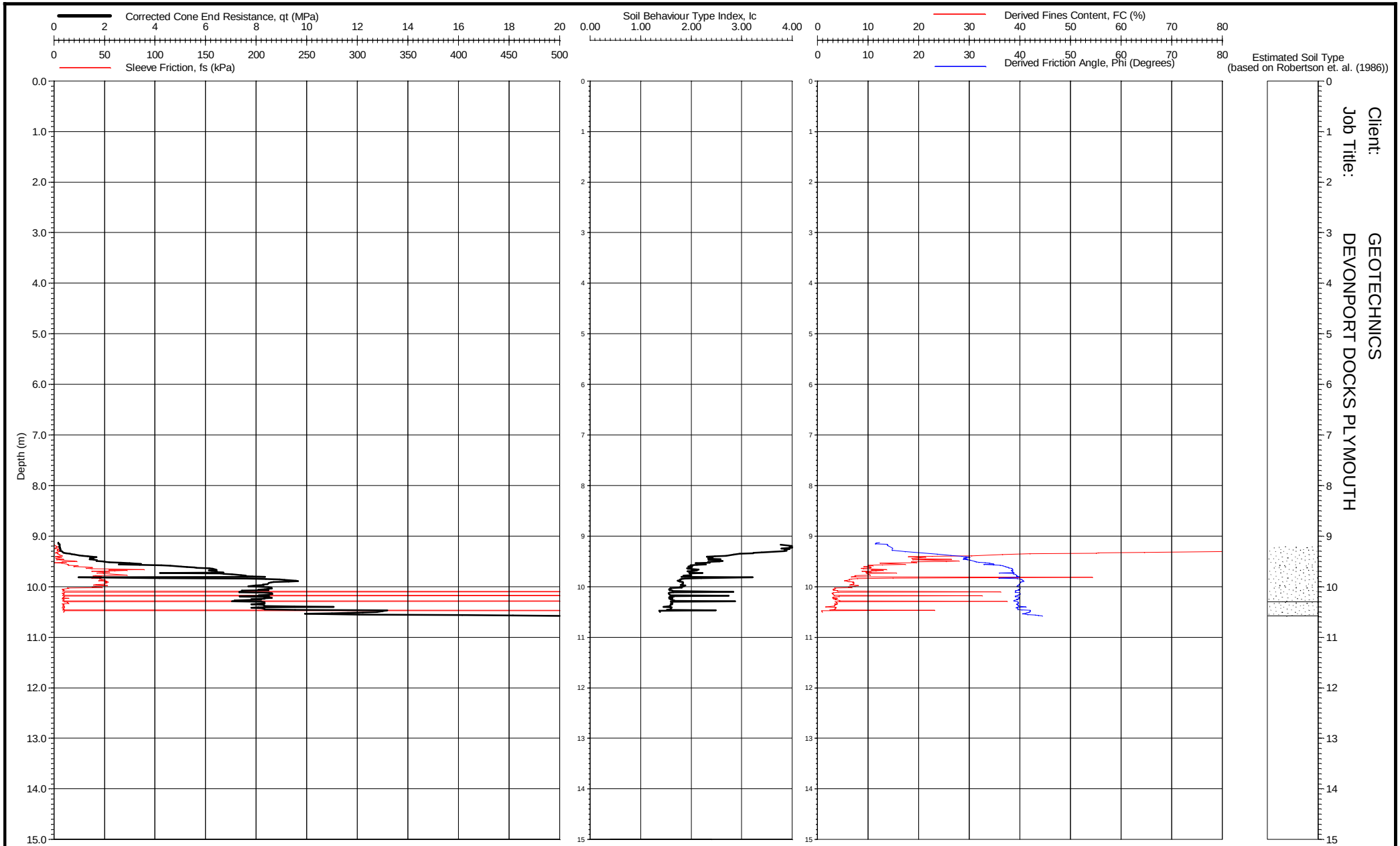
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PIEZO CONE PENETRATION TEST

C09A

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 08/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C12

Checked By:

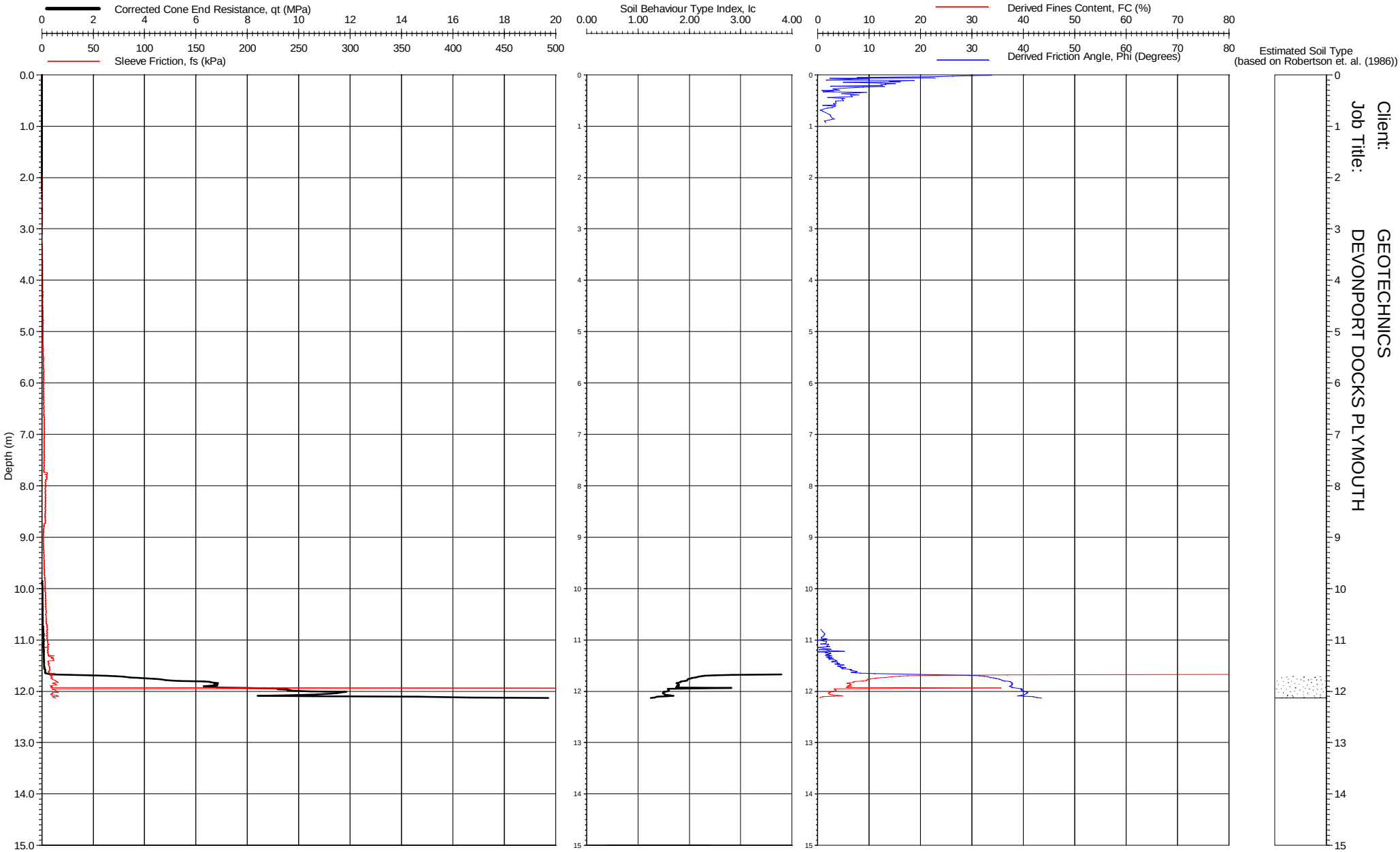
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PIEZO CONE PENETRATION TEST

C12

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location:	PLYMOUTH	Date of Test:	15/07/2010
Coordinates:	0.000E - 0.000N	Date of Plot:	30/07/2010
Ground Level:	0.00 m msl	File Name:	1100127 - C13
Cone & Rig Used:	S15CFIIP.C35 - CPT 001	Checked By:	
Remarks:	Test refused on total pressure.		

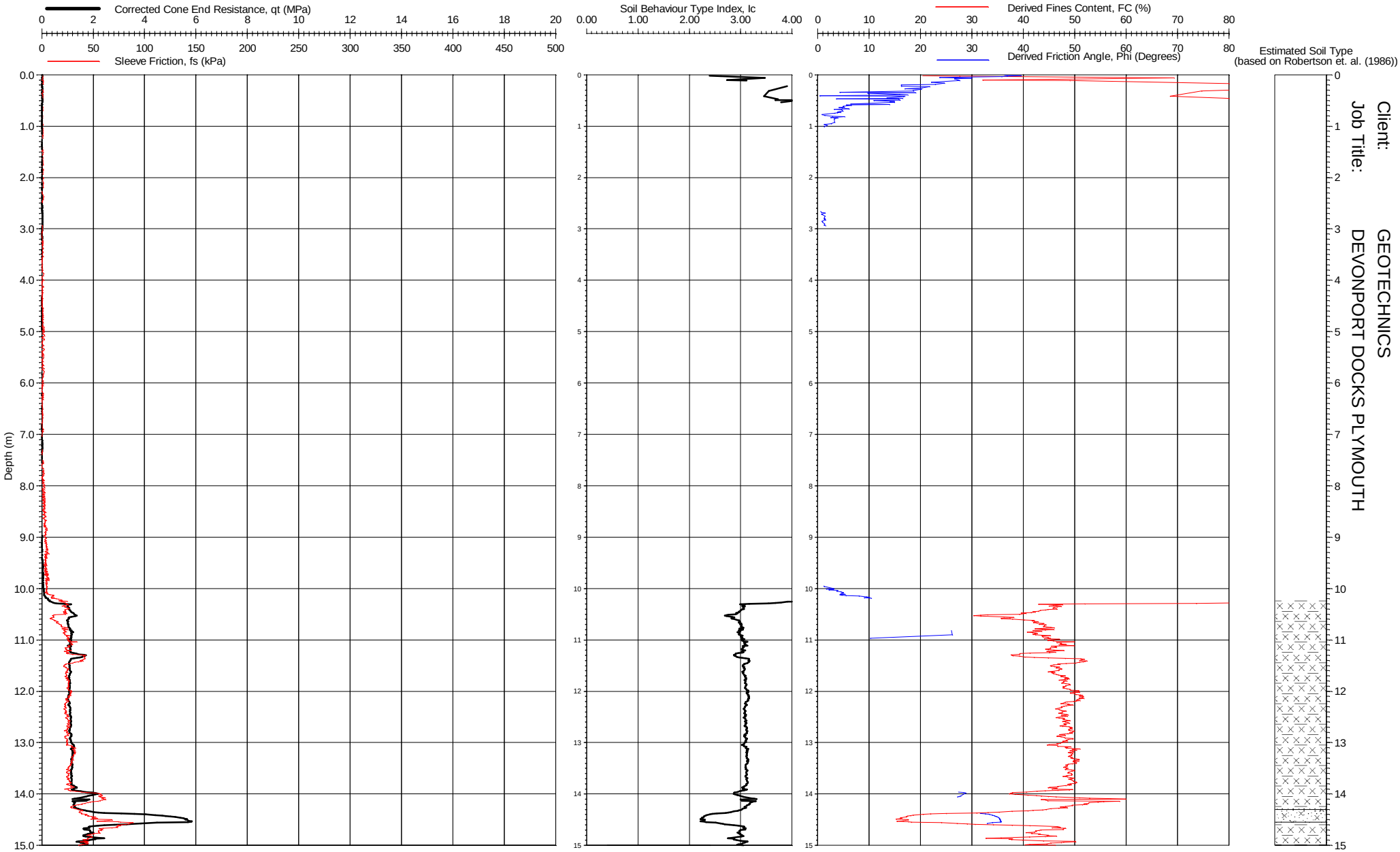
IN SITU SITE INVESTIGATION

insitusi..com

PIEZO CONE PENETRATION TEST

C13

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C14

Checked By:

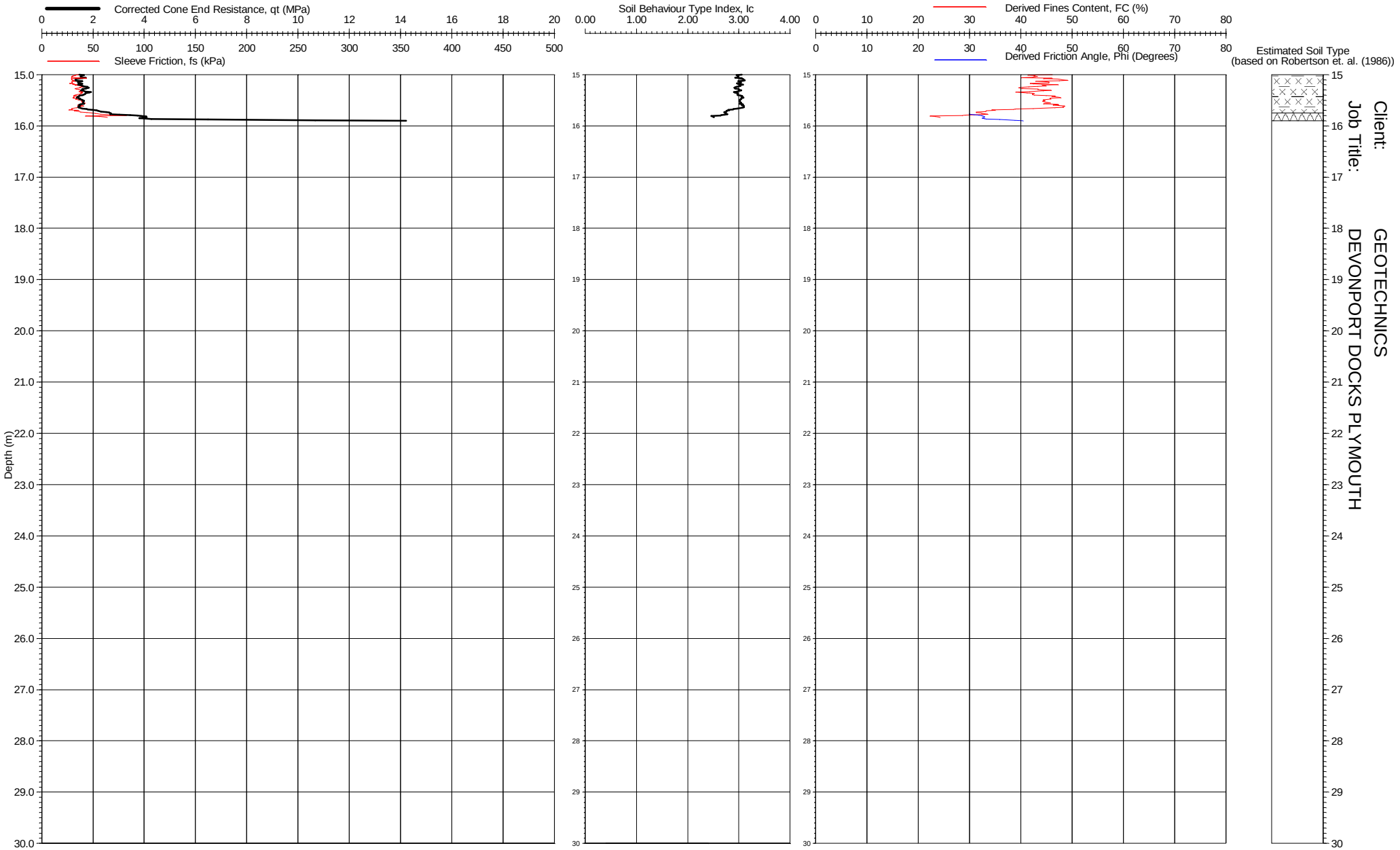
IN SITU SITE INVESTIGATION

insitusi..com

PIEZO CONE PENETRATION TEST

C14

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C14

Checked By:

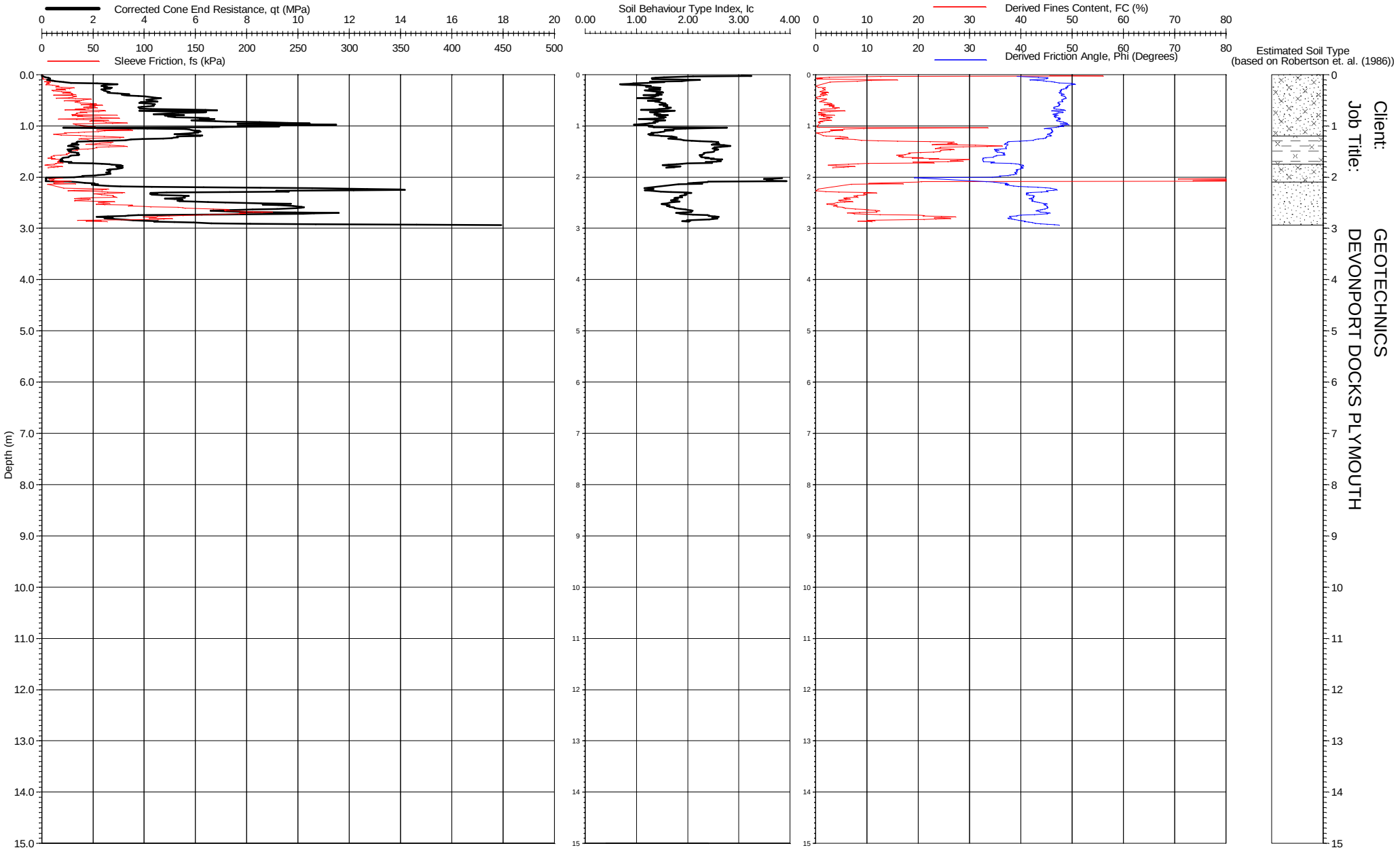
IN SITU SITE INVESTIGATION

insitusi..com

PIEZO CONE PENETRATION TEST

C14

Form: CPT0006



Client:

Job Title: GEOTECHNICS

DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C15

Checked By:

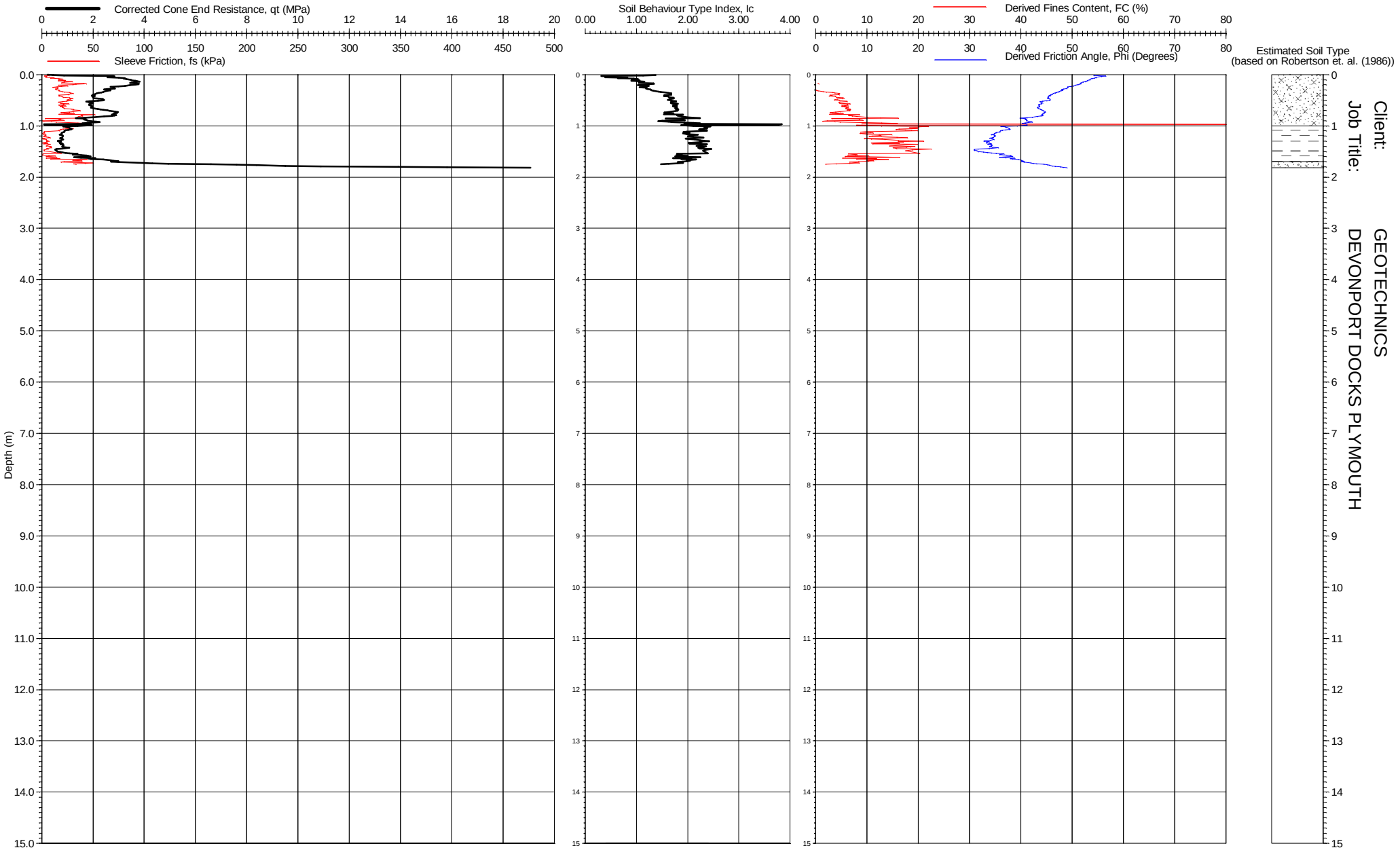
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PIEZO CONE PENETRATION TEST

C15

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C16

Checked By:

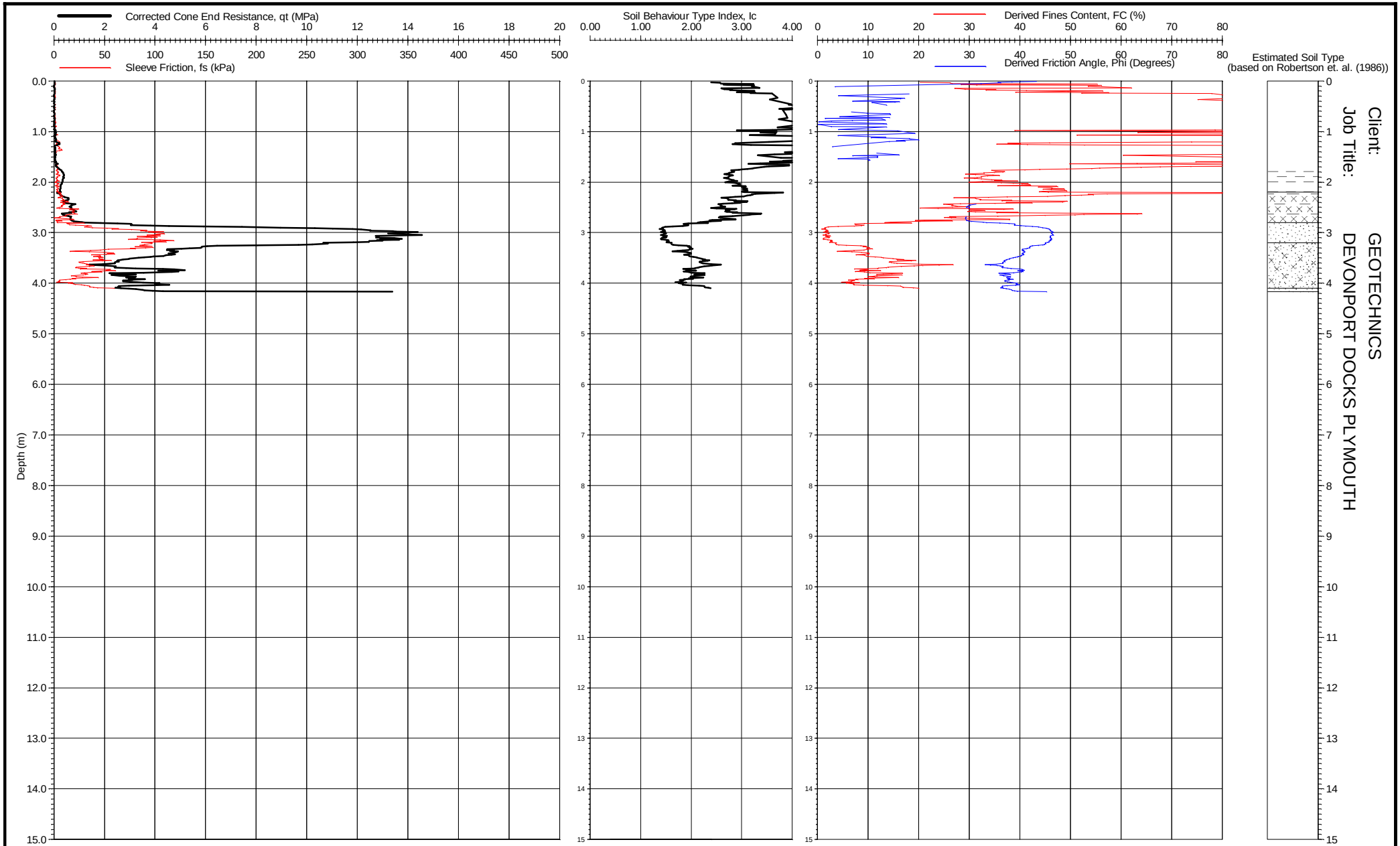
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PIEZO CONE PENETRATION TEST

C16

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C17

Checked By:

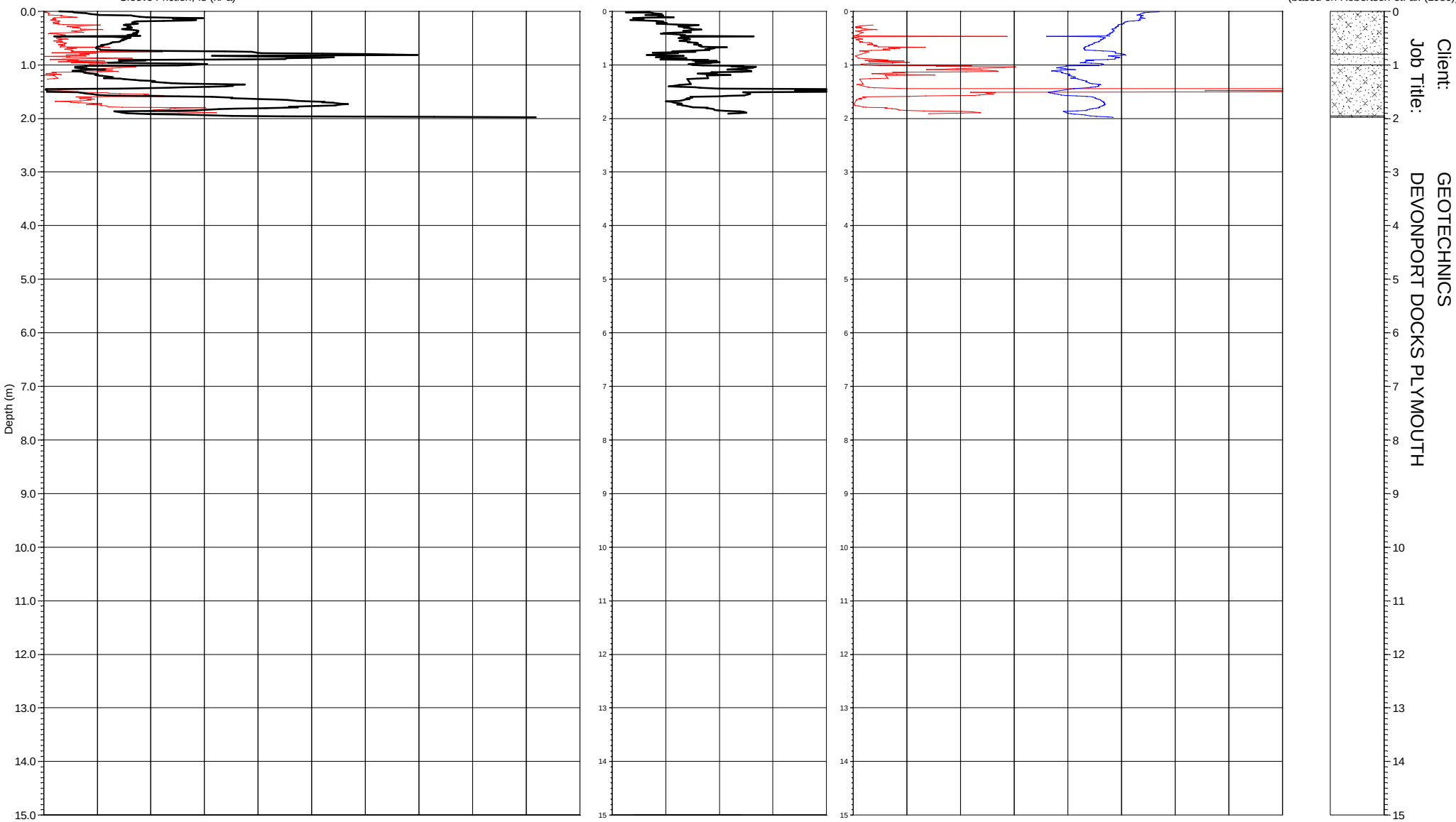
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PIEZO CONE PENETRATION TEST

C17

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.C74 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 13/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C18

Checked By:

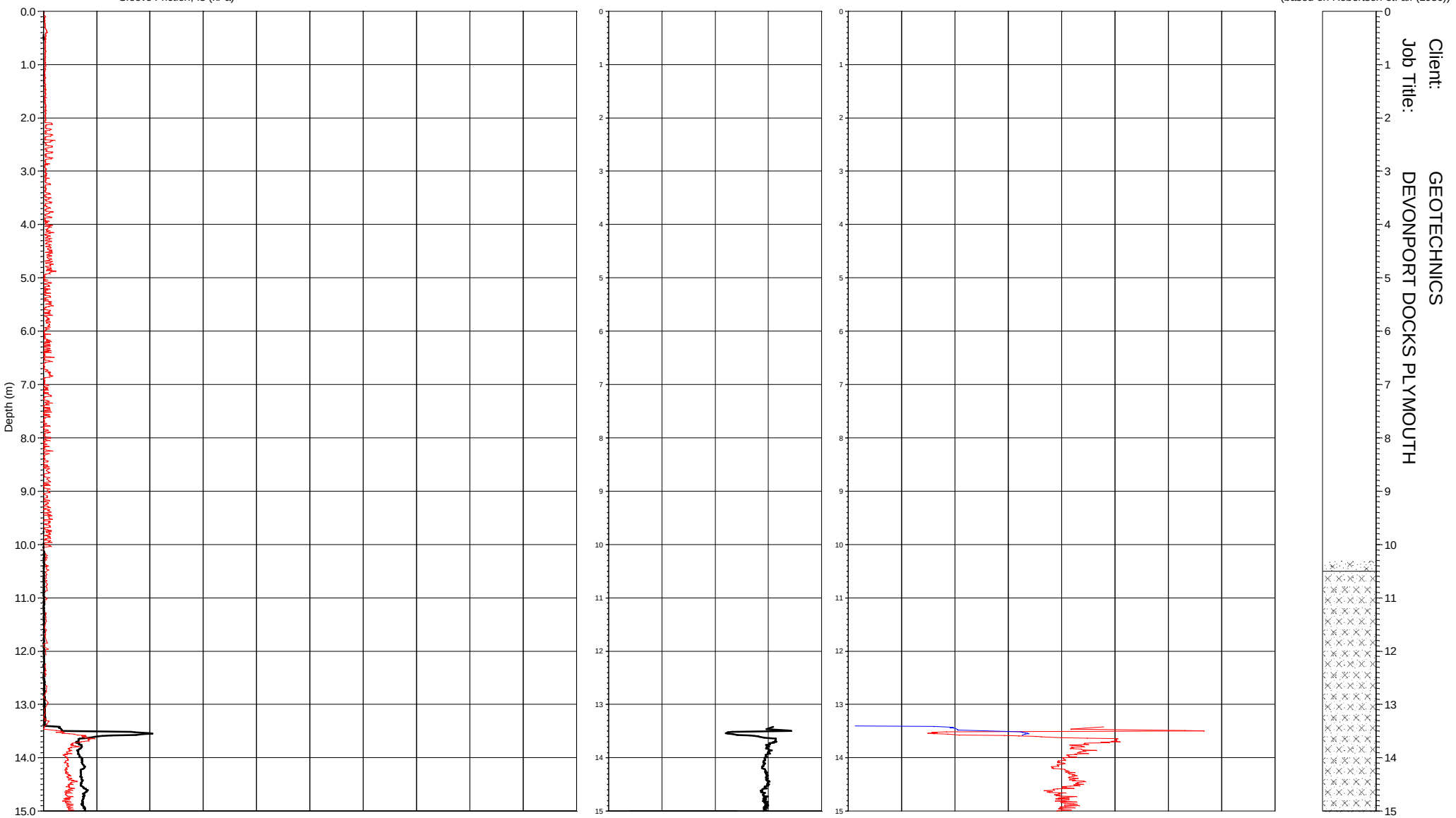
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PIEZO CONE PENETRATION TEST

C18

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C20A

Checked By:

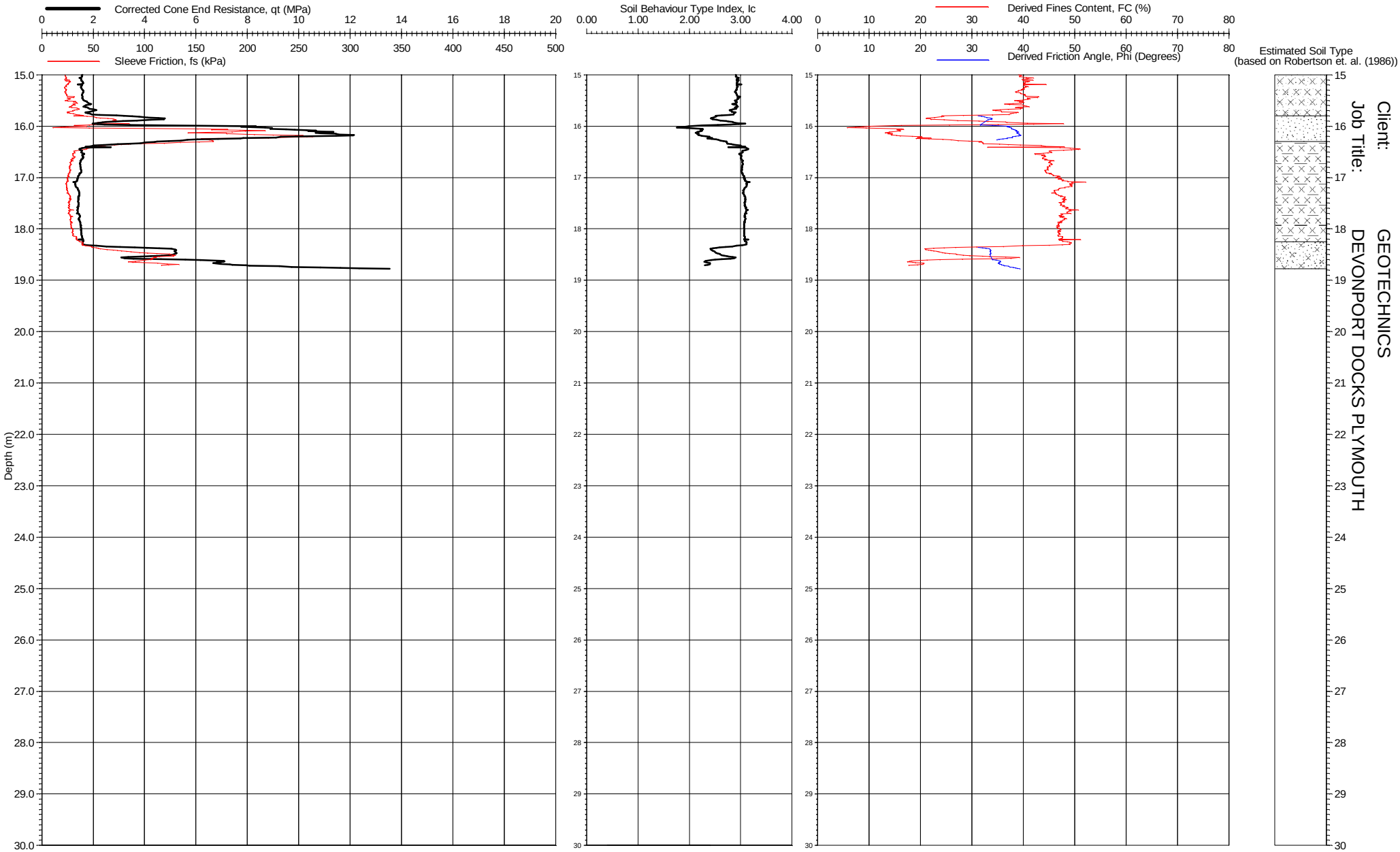
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PIEZO CONE PENETRATION TEST

C20A

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C20A

Checked By:

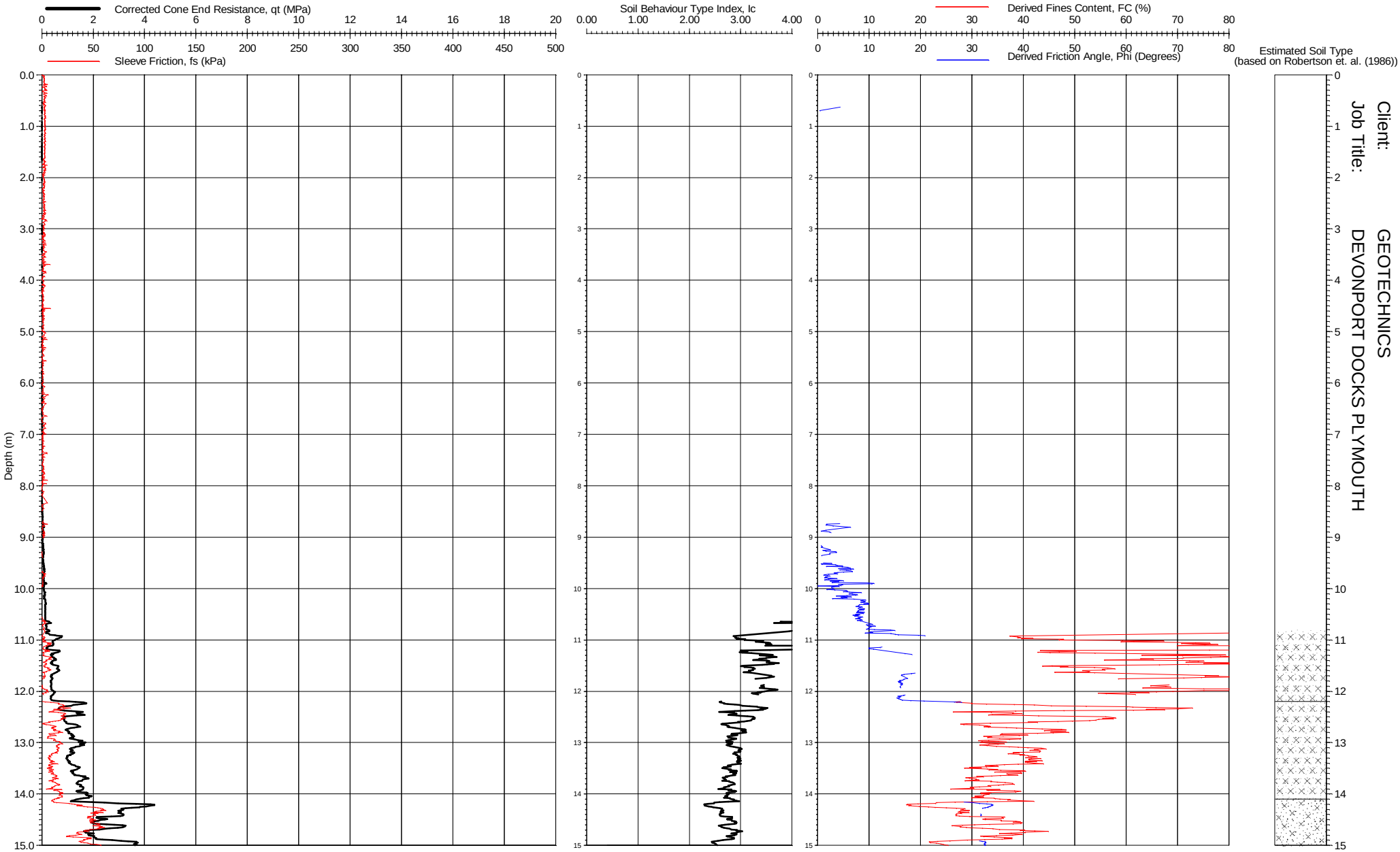
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PIEZO CONE PENETRATION TEST

C20A

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C21

Checked By:

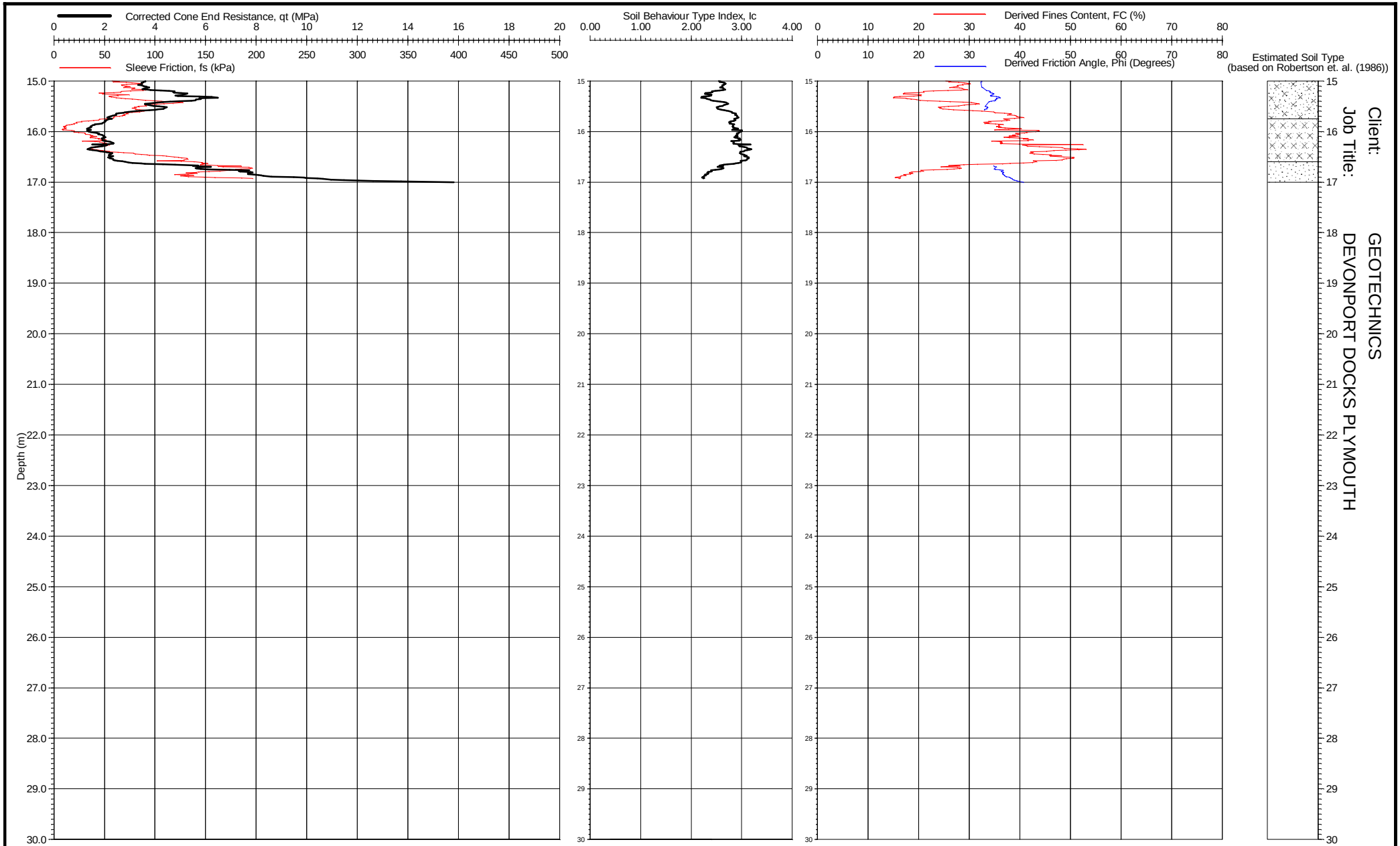
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PIEZO CONE PENETRATION TEST

C21

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C21

Checked By:

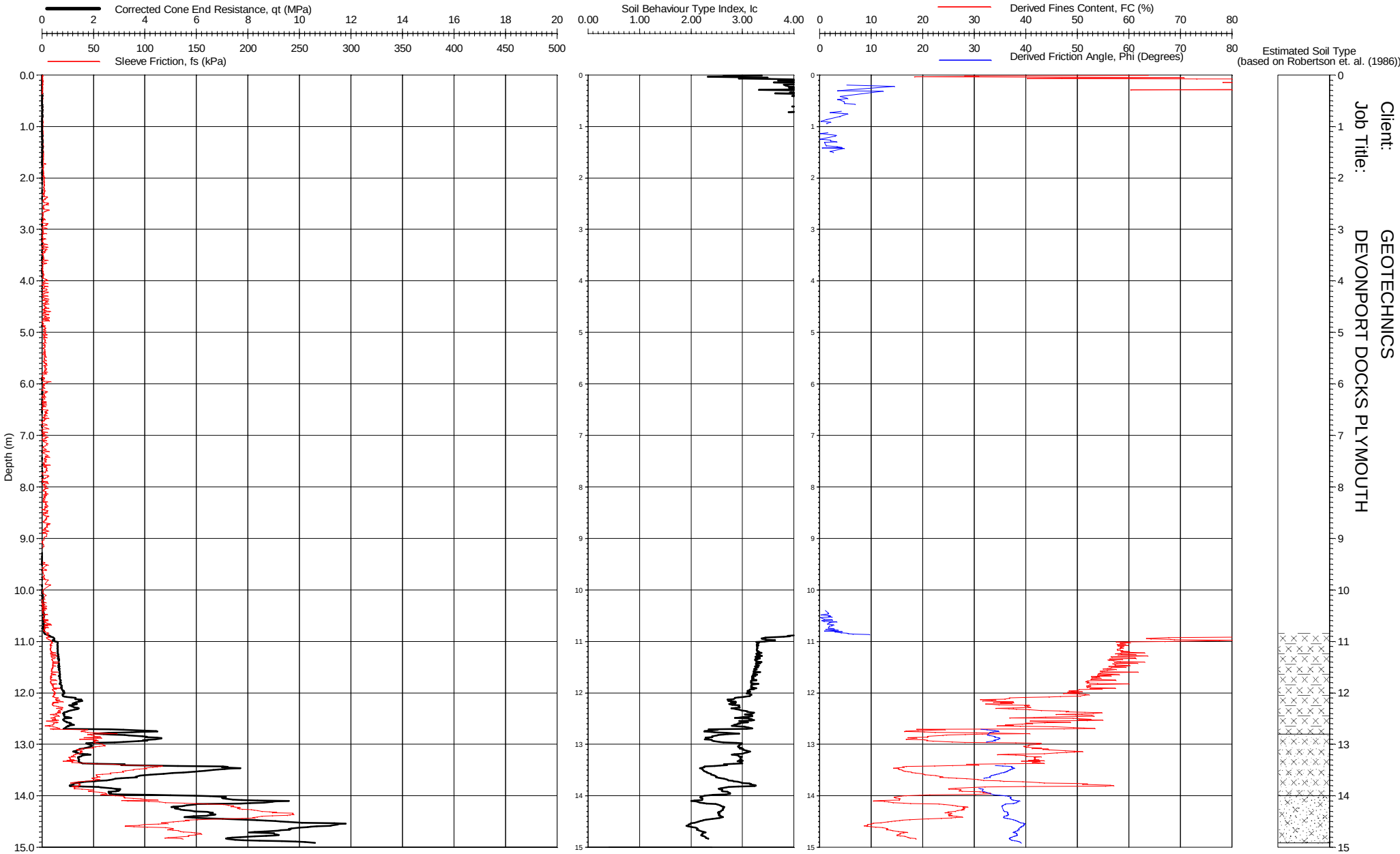
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C21

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C22

Checked By:

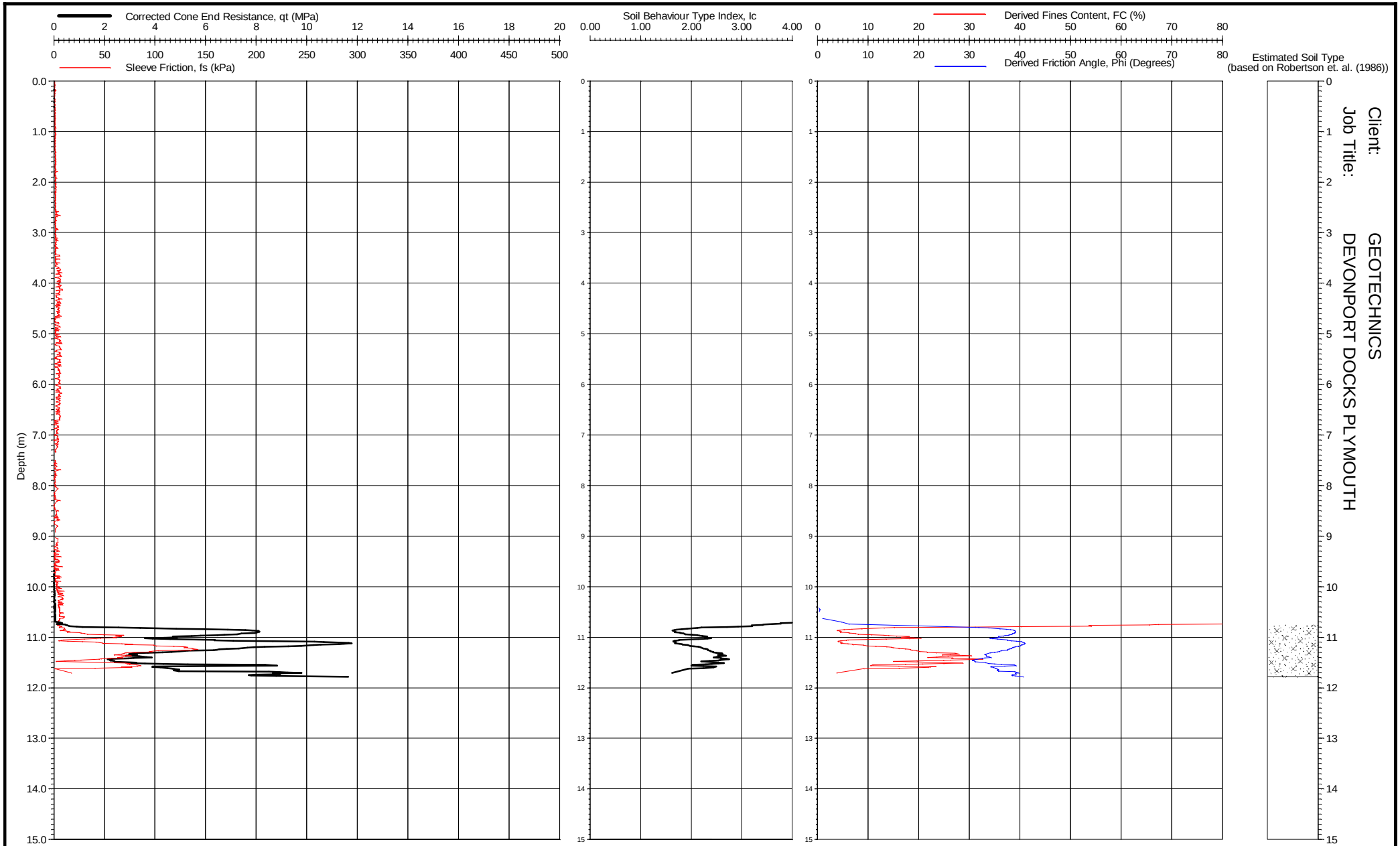
IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C22

Form: CPT0006



Client: GEOTECHNICS

Job Title: DEVONPORT DOCKS PLYMOUTH

Location: PLYMOUTH

Coordinates: -

Ground Level: -

Cone & Rig Used: S15CFIIP.D42 - CPT 001

Remarks: Test refused on total pressure.

Date of Test: 20/07/2010

Date of Plot: 30/07/2010

File Name: 1100127 - C28

Checked By:

IN SITU SITE INVESTIGATION

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PIEZO CONE PENETRATION TEST

C28

Form: CPT0006

APPENDIX 10

Monitoring Results

FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH1A (P1)**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**7.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 7.00m**	Ground Level	**7.62 m OD**
Date Installed	**13 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**5.76**	**0.0**	**3.8**	**0.0**	**20.4**	**79.5**	**0**	**LEL dropped to zero after 30 seconds**
11-Aug-2010		**5.95**	**0.0**	**6.0**	**0.0**	**20.7**	**79.2**	**0**	**LEL dropped to zero after 10 seconds.**
24-Aug-2010		**5.71**	**1.1**	**5.0**	**0.0**	**19.6**	**80.3**	**0**	**LEL & CH4 Vol dropped to zero after 30seconds.**
8-Sep-2010		**5.83**	**0.0**	**0.0**	**0.0**	**20.2**	**79.2**	**0**	
21-Sep-2010		**5.89**	**0.0**	**0.0**	**0.0**	**20.4**	**79.5**	**0**	
5-Oct-2010		**5.81**	**1.2**	**2.5**	**0.0**	**20.8**	**79.2**	**0**	**LEL dropped to zero after 30 seconds**

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH1A (P1)**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**7.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 7.00m**	Ground Level	**7.62 m OD**
Date Installed	**13 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1024**	**0.0**	
11-Aug-2010		**0**	**1016**	**4.5/0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.1**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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Form 003/1

FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH1A (P2)**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**18.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**9.00 - 18.00m**	Ground Level	**7.62 m OD**
Date Installed	**13 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**5.34**	**76.0**	**>>>>**	**0.9**	**3.5**	**25.5**	**0**	
11-Aug-2010		**5.28**	**86.0**	**>>>>**	**0.8**	**2.5**	**20.6**	**0**	**CH4 VOL dropped to 76.0 after 1.5 minutes.**
24-Aug-2010		**5.22**	**11.0**	**>>>>**	**0.3**	**16.7**	**71.9**	**0**	
8-Sep-2010		**5.07**	**78.0**	**>>>>**	**0.6**	**4.1**	**30.3**	**0**	
21-Sep-2010		**5.40**	**50.0**	**>>>>**	**0.5**	**7.4**	**42.0**	**0**	
5-Oct-2010		**4.85**	**44.0**	**>>>>**	**1.1**	**8.3**	**50.9**	**0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH1A (P2)**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**18.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**9.00 - 18.00m**	Ground Level	**7.62 m OD**
Date Installed	**13 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1024**	**0.0**	
11-Aug-2010		**0**	**1016**	**4.5/0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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Form 003/1

FIELDWORK *- Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH2**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**30.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**3.00 - 30.00m**	Ground Level	**8.07 m OD**
Date Installed	**13 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**6.98**	**0.0**	**0.0**	**0.6**	**15.2**	**84.1**	**0**	
11-Aug-2010		**6.71**	**0.0**	**0.0**	**1.1**	**12.6**	**86.2**	**0**	
24-Aug-2010		**6.91**	**0.0**	**0.0**	**1.6**	**12.6**	**85.7**	**0**	
8-Sep-2010		**6.82**	**0.0**	**0.0**	**0.8**	**6.8**	**92.3**	**0**	
21-Sep-2010			**0.0**	**0.0**	**0.3**	**7.0**	**92.6**	**0**	
5-Oct-2010		**6.88**	**0.0**	**0.0**	**0.3**	**1.9**	**97.8**	**0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH2**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**30.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**3.00 - 30.00m**	Ground Level	**8.07 m OD**
Date Installed	**13 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1023**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH3**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type **Standpipe**
Depth to Base **29.80m**
Filter Zone **1.50 - 29.80m**
Date Installed **19 July 2010**

Diameter **50mm**
Cover Type **Flush lockable protective cover**
Ground Level **8.08 m OD**

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		7.02	0.0	0.0	0.6	16.9	82.4	0	
11-Aug-2010		6.75	0.0	0.0	0.3	18.9	80.7	0	
24-Aug-2010		7.02	0.1	0.4	3.1	9.8	87.0	0	CH4 Vol dropped to zero after 30 seconds.
8-Sep-2010		6.50	21	>>>>	1.3	14.1	83.9	0	CH4 Vol & LEL dropped to zero after 30 seconds
21-Sep-2010		7.09	0.0	0.0	1.6	13.0	85.3	0	
5-Oct-2010		6.81	0.0	0.0	2.4	10.8	86.7	0	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH3**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**29.80m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 29.80m**	Ground Level	**8.08 m OD**
Date Installed	**19 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1023**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**-0.1**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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Form 003/1

FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH6B**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type **Standpipe**
Depth to Base **30.00m**
Filter Zone **1.50 - 30.00m**
Date Installed **16 July 2010**

Diameter **50mm**
Cover Type **Flush lockable protective cover**
Ground Level **7.80 m OD**

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		6.31	0.0	0.0	0.0	20.6	79.3	0	Had to remove bung to allow water to drain off
11-Aug-2010		6.04	0.0	0.0	1.1	11.1	87.7	0	
24-Aug-2010		6.32	0.0	0.0	1.2	10.9	87.8	0	
8-Sep-2010		5.80	0.0	0.0	0.0	9.5	90.6	0	Had to remove bung to allow water to drain.
21-Sep-2010		6.55	0.0	0.0	1.4	13.5	85.0	0	
5-Oct-2010		6.13	0.0	0.0	0.0	12.7	87.3	0	Had to remove bung to allow water to drain off

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH6B**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**30.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 30.00m**	Ground Level	**7.80 m OD**
Date Installed	**16 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1023**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH7**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**18.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 18.00m**	Ground Level	**12.80 m OD**
Date Installed	**20 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**8.70**	**0.0**	**0.0**	**0.3**	**20.2**	**79.4**	**0**	
11-Aug-2010		**8.66**	**0.0**	**0.0**	**1.9**	**18.6**	**79.4**	**0**	
24-Aug-2010		**8.53**	**0.0**	**0.0**	**1.9**	**17.0**	**81.0**	**0**	
8-Sep-2010		**8.30**	**0.0**	**0.0**	**0.3**	**19.5**	**79.8**	**0**	
21-Sep-2010		**8.60**	**0.0**	**0.0**	**1.2**	**19.2**	**79.5**	**0**	
5-Oct-2010			**0.0**	**0.0**	**1.9**	**17.7**	**80.3**	**0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH7**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**18.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 18.00m**	Ground Level	**12.80 m OD**
Date Installed	**20 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1022**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH8A**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**9.20m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 9.20m**	Ground Level	**13.68 m OD**
Date Installed	**21 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**5.02**	**0.0**	**0.0**	**0.3**	**19.9**	**79.7**	**0**	

Remarks

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Form 003/1

FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH8A**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**9.20m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 9.20m**	Ground Level	**13.68 m OD**
Date Installed	**21 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1021**	**0.0**	

Remarks

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Form 003/1

FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH12A**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**22.50m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 22.50m**	Ground Level	**7.73 m OD**
Date Installed	**17 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**4.83**	**0.0**	**0.0**	**0.0**	**20.1**	**79.8**	**0**	**Had to remove bung to allow water to drain off**
11-Aug-2010		**5.52**	**0.0**	**0.0**	**2.9**	**2.6**	**94.4**	**0**	
24-Aug-2010		**5.41**	**0.0**	**0.0**	**0.6**	**17.2**	**82.1**	**0**	**Had to remove bung to allow water to drain off.**
8-Sep-2010		**4.57**	**0.0**	**0.0**	**0.0**	**20.4**	**79.5**	**0**	**Had to remove bung to allow water to drain.**
21-Sep-2010		**4.85**	**0.0**	**0.0**	**1.8**	**14.7**	**83.5**	**0**	
5-Oct-2010		**4.35**	**0.0**	**0.0**	**3.0**	**5.5**	**91.4**	**0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH12A**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**22.50m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 22.50m**	Ground Level	**7.73 m OD**
Date Installed	**17 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1024**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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Form 003/1

FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH15**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**8.30m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 8.30m**	Ground Level	**5.51 m OD**
Date Installed	**14 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**4.48**	**0.0**	**0.0**	**0.0**	**20.3**	**79.6**	**0**	**Had to remove bung to clear blockage**
11-Aug-2010		**4.21**	**0.0**	**0.0**	**1.9**	**18.6**	**79.4**	**0**	
24-Aug-2010		**4.37**	**0.0**	**0.0**	**0.4**	**17.3**	**82.2**	**0**	
8-Sep-2010		**4.15**	**0.0**	**0.0**	**0.4**	**16.4**	**83.1**	**0**	
21-Sep-2010		**4.58**	**0.0**	**0.0**	**0.4**	**17.8**	**81.7**	**0**	
5-Oct-2010		**4.57**	**0.0**	**0.0**	**0.5**	**17.4**	**82.0**	**0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH15**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**8.30m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 8.30m**	Ground Level	**5.51 m OD**
Date Installed	**14 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1025**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**-0.1**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH17**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**15.30m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 15.30m**	Ground Level	**7.50 m OD**
Date Installed	**6 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**5.47**	**0.0**	**0.0**	**0.0**	**20.2**	**79.7**	**0**	
11-Aug-2010		**5.46**	**0.0**	**0.0**	**2.7**	**11.7**	**85.5**	**0**	
24-Aug-2010		**5.53**	**0.0**	**0.0**	**4.9**	**7.8**	**87.2**	**0**	
8-Sep-2010			**0.0**	**0.0**	**2.7**	**9.2**	**88.0**	**0**	
21-Sep-2010		**5.45**	**0.0**	**0.0**	**0.0**	**20.7**	**79.2**	**0**	
5-Oct-2010		**5.39**	**0.0**	**0.0**	**0.0**	**20.7**	**79.2**	**0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH17**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**15.30m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 15.30m**	Ground Level	**7.50 m OD**
Date Installed	**6 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1024**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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FIELDWORK **-** *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH18**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**16.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 16.00m**	Ground Level	**10.97 m OD**
Date Installed	**8 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**9.71**	**0.0**	**0.0**	**0.0**	**5.8**	**94.1**	**0**	
11-Aug-2010		**9.55**	**0.0**	**0.0**	**0.2**	**8.1**	**91.6**	**0**	
24-Aug-2010		**9.70**	**0.0**	**0.0**	**0.6**	**7.7**	**91.6**	**0**	
8-Sep-2010		**9.37**	**0.0**	**0.0**	**0.6**	**8.0**	**90.7**	**0**	**Had to remove bung to allow water to drain.**
21-Sep-2010		**9.74**	**0.0**	**0.0**	**0.4**	**10.2**	**89.3**	**0**	
5-Oct-2010		**9.69**	**0.0**	**0.0**	**1.0**	**10.2**	**88.7**	**0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH18**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**16.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 16.00m**	Ground Level	**10.97 m OD**
Date Installed	**8 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1025**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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Form 003/1

FIELDWORK **-** *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH19**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**17.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 17.00m**	Ground Level	**11.38 m OD**
Date Installed	**12 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**10.36**	**0.0**	**0.0**	**0.0**	**17.9**	**82.0**	**0**	**Bung left open**
11-Aug-2010		**10.08**	**0.0**	**0.0**	**0.0**	**20.3**	**79.6**	**0**	**Had to remove bung to allow water to drain.**
24-Aug-2010		**10.38**	**0.0**	**0.0**	**0.4**	**15.2**	**84.3**	**0**	**Had to remove bung to allow water to drain**
8-Sep-2010		**10.37**	**0.0**	**0.0**	**0.0**	**20.6**	**79.3**	**0**	**Had to remove bung to allow water to drain.**
21-Sep-2010		**10.50**	**0.0**	**0.0**	**0.6**	**12.4**	**86.9**	**0**	
5-Oct-2010		**10.38**	**0.0**	**0.0**	**0.0**	**20.7**	**79.2**	**0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH19**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**17.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 17.00m**	Ground Level	**11.38 m OD**
Date Installed	**12 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1025**	**-0.2**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**-0.1**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

geotechnics

Form 003/1

FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH21**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**29.80m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 29.80m**	Ground Level	**7.77 m OD**
Date Installed	**21 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**6.34**	**0.0**	**0.0**	**0.0**	**21.1**	**78.8**	**0**	
11-Aug-2010		**6.29**	**0.2**	**0.3**	**0.0**	**20.6**	**79.3**	**0**	**CH4 VOL and LEL dropped to zero in 10 seconds.**
24-Aug-2010		**6.32**	**0.0**	**0.0**	**0.2**	**19.6**	**80.1**	**0**	
8-Sep-2010		**6.34**	**0.0**	**0.0**	**0.0**	**19.9**	**80.0**	**0**	
21-Sep-2010		**6.36**	**0.0**	**0.0**	**0.0**	**20.7**	**79.2**	**0**	
5-Oct-2010		**6.27**	**0.0**	**0.0**	**0.0**	**21.0**	**79.0**	**0**	

Remarks

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FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH21**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**29.80m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 29.80m**	Ground Level	**7.77 m OD**
Date Installed	**21 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1023**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

geotechnics

Form 003/1

FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH22**

Sheet No. **1 (1 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**10.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 10.00m**	Ground Level	**5.23 m OD**
Date Installed	**19 July 2010**		

Date	Time	Depth to Water (m bgl)	Methane CH4 (% VOL)	Methane CH4 (% LEL)	CO2 (Steady Reading) (% VOL)	O2 (Steady Reading) (% VOL)	N2 (Steady Reading) (% VOL)	H2S (Steady Reading) (ppm)	Remarks
27-Jul-2010		**4.58**	**1.1**	**21.4**	**0.2**	**16.4**	**82.2**	**0**	
11-Aug-2010		**4.52**	**0.0**	**0.0**	**0.3**	**17.8**	**81.8**	**0**	
24-Aug-2010		**4.17**	**0.0**	**0.0**	**0.4**	**17.6**	**81.9**	**0**	
8-Sep-2010		**4.50**	**0.0**	**0.0**	**0.4**	**20.1**	**79.8**	**0**	**CO2 dropped to zero after 30 seconds.**
21-Sep-2010		**4.55**	**0.0**	**0.0**	**0.4**	**17.9**	**81.7**	**0**	
5-Oct-2010		**4.50**	**0.0**	**0.0**	**0.4**	**17.5**	**82.0**	**0**	

Remarks

geotechnics

Form 003/1

FIELDWORK - *Insitu Gas Monitoring - Instrument Record*

Project **PROPOSED ENERGY FROM WASTE PLANT, DEVONPORT, PLYMOUTH**

Client **MVV UMWELT GMBH**

Project No **PE100830**

Borehole **BH22**

Sheet No. **1 (2 of 2)**

Installation Details

Installation Type	**Standpipe**	Diameter	**50mm**
Depth to Base	**10.00m**	Cover Type	**Flush lockable protective cover**
Filter Zone	**1.50 - 10.00m**	Ground Level	**5.23 m OD**
Date Installed	**19 July 2010**		

Date	Time	CO (Steady Reading) (ppm)	Barometric Pressure (mBars)	Flow Rate (Peak/Stable) (l/hr)	Remarks
27-Jul-2010		**0**	**1025**	**0.0**	
11-Aug-2010		**0**	**1016**	**0.0**	
24-Aug-2010		**0**	**1010**	**0.0**	
8-Sep-2010		**0**	**1004**	**0.0**	
21-Sep-2010		**0**	**1018**	**0.0**	
5-Oct-2010		**0**	**997**	**0.0**	

Remarks

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Form 003/1

APPENDIX II

Laboratory Test Results - Geotechnical

Classification and Strength

Symbol	**C - Clay**	**M - Silt**
	(0 - containing organic matter)	
	Plasticity	L - Low
		I - Intermediate
		H - High
		V - Very High
		E - Extremely High
Ip	Plasticity Index	
%	% Retained on 425 µm sieve, shown under Ip value	
w_L	Liquid Limit	
w_P	Plastic Limit	
NP	Non-Plastic	
NAT	Sample tested in natural state	
w	Moisture Content	
P_d	Particle Density	
Test	**Quick undrained triaxial tests**	
	SS	Single stage - 102mm diameter.
	S3	Single stage - set of 3 38mm diameter.
	MS	Multistage - 102mm diameter.
	D	Drained Test
	HV	Hand Vane
	PP	Pocket Penetrometer (kg/cm²)
	UT	Unsuitable for Test
γ_b	Bulk Density	
σ_3	Triaxial Cell Pressure	
$\sigma_1 - \sigma_3$	Deviator Stress	
##	Excessive Strain	
c_u	Undrained Cohesion	
c	Cohesion Intercept	
ϕ	Angle of Shearing Resistance	
Linear Shrink	Linear Shrinkage	

Consolidation

m_v	Coefficient of Volume Compressibility
c_{v50}	Coefficient of Consolidation - Log t
c_{v90}	Coefficient of Consolidation - $\sqrt{t}$

Rock

UF	Unacceptable Failure

Chemical Analysis

Acid Soluble	Total sulphate in specimen, expressed as SO_3 %, value in brackets expressed as SO_4 %
Water Soluble	Soluble sulphate in 2:1 water : soil extract, expressed as SO_3 g/l, value in brackets expressed as SO_4 g/l
In Water	Sulphate content of groundwater, expressed as SO_3 g/l, value in brackets expressed as SO_4 g/l
pH	pH value
Organic content	Organic content expressed as a percentage of dry weight
Chloride	Chloride Ion content expressed as a percentage of dry weight

MCV, Compaction, CBR

MCV	Moisture Condition Value at natural moisture content
MCC	Moisture Condition Calibration
CCV	Chalk Crushing Value

Compaction

Type	2.5	=	BS 2.5 kg Rammer
	4.5	=	BS 4.5 kg Rammer
	V	=	BS Vibrating Hammer
γ_b	Bulk Density		
γ_d	Dry Density		

CBR California Bearing Ratio

Type	2.5	=	Test on Specimen Recompacted using BS 2.5 kg Rammer
	4.5	=	As above but using BS 4.5 kg Rammer
	V	=	As above but using BS Vibrating Hammer
	M	=	Test on open drive mould specimen cut in field
	S	=	Soaked Specimen
Top	CBR at top of mould		
Bottom	CBR at bottom of mould		
ND	None Detected		

All tests performed in accordance with BS 1377 : Parts 1-9 : 1990 incorporating amendments where appropriate.

LABORATORY RESULTS - Classification and Strength

Project PLYMOUTH EFW **Project No:** PE100830

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH1A	7.95-8.00 (7.95)	D	E67155	Grey slightly sandy silty CLAY with shell fragments.	CI	22 (11%)	49	27	43						
BH1A	9.00-9.45 (9.00)	U	E67076	Grey slightly sandy silty CLAY with shell fragments.pp = 1.0,1.0,0					39	SS	1.90	180	21	11	11
BH1A	12.00-12.45 (12.00)	U	E67077	Grey slightly sandy silty CLAY with shell fragments.pp = 0.5,0					43	SS	1.78	240	25	13 ##	13
BH1A	12.45-12.50 (12.45)	D	E67158	Grey sandy organic SILT with shell fragments.	MI	20 (9%)	49	29	46						
BH1A	16.50-16.95 (16.50)	D	E67162	Brown very clayey SAND and GRAVEL.	CI	16 (69%)	37	21	25						
BH2	2.00 (2.00)	D	E67148	Brown silty very sandy gravel. (MADE GROUND).					6.6						
BH2	4.00 (4.00)	D	E67149	Brown silty very sandy gravel (MADE GROUND).					6.1						
BH2	12.40 (12.40)	D	E67166	Grey slightly sandy SILT with shell fragments.	MI	18 (14%)	45	27	39						
BH2	14.00-14.45 (14.00)	D	E67167	Brown slightly sandy silty CLAY.	CH	29 (3%)	59	30	51						
BH2	16.40 (16.40)	D	E67169	Brown slightly sandy slighty gravelly clayey SILT.	MI	16 (17%)	44	28	50						
BH2	18.40 (18.40)	D	E67172	Grey slightly sandy slightly gravelly silty CLAY.	CI	23 (NAT 0%)	50	27	83						
BH3	1.50-1.95 (1.50)	D	E67185	Brown sandy clayey gravel. (MADE GROUND).					12						
BH3	3.30 (3.30)	D	E67186	Brown sandy clayey gravel. (MADE GROUND).					15						
BH3	12.00-12.45 (12.00)	U	E67084	Grey slightly sandy clayey silt with shell fragments.pp = 1.75,1.75,2.0					41	SS	1.80	240	93	47 ##	47
BH3	12.45-12.50 (12.45)	D	E67190	Brown grey slightly sandy clayey SILT with shell fragments.	MH	23 (9%)	52	29	43						
BH3	15.45-15.50 (15.45)	D	E67192	Grey slightly sandy clayey SILT.	MH	33 (NAT 0%)	70	37	46						

Remarks AGS Tests performed in accordance with BS 1377: 1990

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LABORATORY RESULTS - Classification and Strength

Project PLYMOUTH EFW **Project No:** PE100830

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH3	18.45-18.50 (18.45)	D	E67194	Grey slightly sandy clayey SILT.	MH	27 (NAT 0%)	60	33	43						
BH5	2.00 (2.00)	D	E67150	Brown sandy gravel and cobbles. (MADE GROUND).					19						
BH5	4.20-4.60 (4.20)	D	E67151	Brown clayey gravel. (MADE GROUND).					15						
BH6B	1.80-1.90 (1.80)	D	E67139	Brown sandy very silty gravel. (MADE GROUND).					11						
BH6B	4.50 (4.50)	D	E67141	Brown sandy very silty gravel. (MADE GROUND).					16						
BH6B	13.00-13.45 (13.00)	D	E67143	Grey clayey sandy GRAVEL.	CI	18 (58%)	44	26	19						
BH6B	15.50 (15.50)	D	E67145	Grey slightly sandy slightly gravelly clayey SILT.	MH	22 (14%)	51	29	43						
BH6B	18.50 (18.50)	D	E67147	Grey slightly sandy slightly gravelly silty CLAY.	CI	22 (12%)	49	27	51						
BH10	1.90 (1.90)	D	E67130	Brown silty gravelly sand. (MADE GROUND).					8.8						
BH10	4.00-4.38 (4.00)	D	E67131	Brown silty gravelly sand. (MADE GROUND).					4.4						
BH10	9.90 (9.90)	D	E67133	Grey slightly sandy slightly gravelly silty CLAY.	CI	25 (20%)	50	25	42						
BH10	11.90 (11.90)	D	E67135	Grey slightly sandy slightly gravelly clayey SILT.	MI	16 (6%)	46	30	56						
BH10	12.50-12.95 (12.50)	U	E67079	Grey slightly sandy slightly gravelly clayey SILT.PP = 1.25,1.75,0					51	SS	1.70	250	62	31 ##	31
BH10	14.00-14.45 (14.00)	D	E67137	Grey clayey SILT.	MH	36 (NAT 0%)	70	34	46						
BH12A	9.00-9.45 (9.00)	D	E67221	Grey slightly sandy clayey SILT.	MH	26 (25%)	56	30	51						
BH12A	10.50-10.95 (10.50)	U	E67095	Grey slightly sandy clayey SILT with shell fragments.PP = 0.5,0.75,1.5					50	SS	1.65	210	38	19 ##	19

Remarks AGS Tests performed in accordance with BS 1377: 1990

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LABORATORY RESULTS - Classification and Strength

Project PLYMOUTH EFW **Project No:** PE100830

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH12A	13.00 (13.00)	D	E67224	Grey slightly sandy silty CLAY.	CI	20 (3%)	45	25	50						
BH12A	17.00-17.45 (17.00)	D	E67226	Grey slightly sandy silty CLAY.	CH	26 (NAT 0%)	52	26	42						
BH12A	21.00-21.45 (21.00)	D	E67229	Grey slightly sandy clayey SILT.	MH	28 (NAT 0%)	61	33	45						
BH13	11.50 (11.50)	D	E67173	Grey slightly gravelly clayey SILT.	MI	21 (15%)	49	28	43						
BH13	12.00-12.45 (12.00)	U	E67081	Grey slightly gravelly clayey SILT with shell fragments.PP = 1.25,1.0,1.0					42	SS	1.84	240	41	20 ##	20
BH13	15.45-15.50 (15.45)	D	E67176	Grey sandy SILT.	MH	32 (0%)	67	35	48						
BH13	18.45-18.50 (18.45)	D	E67179	Grey sandy SILT.	MH	34 (NAT 0%)	67	33	49						
BH15	2.00-2.38 (2.00)	D	E67182	Brown clayey sandy gravel and cobbles. (MADE GROUND).					14						
BH15	5.00 (5.00)	D	E67214	Brown silty sandy gravel. (MADE GROUND).					7.6						
BH15	7.95-8.00 (7.95)	D	E67213	Grey sandy SILT.	MI	18 (18%)	46	28	48						
BH17	2.00 (2.00)	D	E67183	Grey clayey sandy gravel. (MADE GROUND).					10						
BH17	4.00 (4.00)	D	E67184	Grey clayey sandy gravel. (MADE GROUND).					11						
BH17	7.50-7.95 (7.50)	U	E67089	Grey slightly sandy SILT with shell fragments.PP = 1.75,1.25,2.25					65	SS	1.68	150	21	11 ##	11
BH17	7.95 (7.95)	D	E67201	Grey slightly sandy SILT.	MI	16 (4%)	42	26	47						
BH17	10.20 (10.20)	D	E67206	Grey slightly sandy slightly gravelly SILT.		(14%)	38	NP	37						
BH17	10.50-10.95 (10.50)	U	E67090	Grey slightly sandy slightly gravelly SILT with shell fragments.PP = 1.5,.25					36	SS	1.86	210	46	23 ##	23

Remarks AGS Tests performed in accordance with BS 1377: 1990

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LABORATORY RESULTS - *Classification and Strength*

Project PLYMOUTH EFW **Project No:** PE100830

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH17	12.00 (12.00)	D	E67204	Brown grey slightly gravelly peaty SILT.	MI	21 (21%)	50	29	45						
BH17	13.50-13.95 (13.50)	U	E67091	Brown very gravelly CLAY.PP - 2.75,.75,2.0					15	SS	2.16	270	56	28 ##	28
BH18	2.00 (2.00)	D	E67195	Brown clayey sandy gravel and cobbles. (MADE GROUND).					12						
BH18	4.00 (4.00)	D	E67196	Brown clayey sandy gravel and cobbles. (MADE GROUND).					9.3						
BH19	2.00 (2.00)	D	E67198	Brown gravelly sand. (MADE GROUND).					8.4						
BH19	4.00 (4.00)	D	E67199	Brown gravelly sand. (MADE GROUND).					10						
BH19	13.50-13.95 (13.50)	U	E67093	Brown slightly gravelly silty CLAY with shell fragments.pp = 1.5,2.25,2.0 (See Test Remarks Sheet for further information)					35	SS	UT	270	UT		
BH19	13.95-14.00 (13.95)	D	E67209	Grey slightly gravelly silty CLAY.	CI	15 (40%)	39	24	31						
BH19	15.50-15.95 (15.50)	D	E67211	Grey slightly gravelly silty CLAY.	CI	16 (57%)	37	21	27						
BH20A	1.00 (1.00)	D	E67215	Brown slightly sandy gravel. (MADE GROUND).					9.4						
BH20A	5.00 (5.00)	D	E67216	Brown slightly sandy gravel. (MADE GROUND).					11						
BH22	1.00 (1.00)	D	E67218	Brown slightly silty sand and gravel. (MADE GROUND).					8.6						
BH22	5.00 (5.00)	D	E67220	Brown slightly silty sand and gravel. (MADE GROUND).					6.3						
BH22	8.50 (8.50)	D	E67231	Grey slightly sandy slightly gravelly SILT.	MI	17 (19%)	47	30	41						

Remarks AGS Tests performed in accordance with BS 1377: 1990

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LABORATORY RESULTS - Chemical Analysis

Project PLYMOUTH EFW **Project No:** PE100830

Sample					Sulphate			pH	Organic Content	Loss on Ignition	Chloride		
					In Soil						In Soil		
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Acid Soluble %	Water Soluble g/l	In Water g/l		%	%	Acid Soluble %	Water Soluble g/l	In Water g/l
BH1A	8.00-9.00 (8.00-9.00)	B	E67153	Dark grey slightly sandy silty CLAY with shell fragments.		1.703 (2.04)		6.99					
BH1A	13.50-13.95 (13.50-13.95)	D	E67159	Grey sandy SILT.		1.519 (1.82)		7.72					
BH2	7.80-8.00 (7.80-8.00)	B	E67163	Brown silty very sandy gravel. (MADE GROUND).		0.721 (0.87)		9.74					
BH2	16.70-17.00 (16.70-17.00)	B	E67170	Grey slightly sandy slightly gravelly clayey SILT.		0.775 (0.93)		7.71					
BH3	3.50-4.50 (3.50-4.50)	B	E67187	Brown clayey sandy gravel. (MADE GROUND).		0.237 (0.28)		9.76					
BH3	14.00-15.00 (14.00-15.00)	B	E67191	Grey slightly sandy clayey SILT with shell and wood fragments.		2.461 (2.95)		7.42					
BH4	1.60-1.90 (1.60-1.90)	B	E67129	Dark grey clayey sandy gravel. (MADE GROUND).		0.038 (0.05)		11.17					
BH5	4.70-5.20 (4.70-5.20)	B	E67152	Brown clayey gravel. (MADE GROUND).		0.070 (0.08)		11.01					
BH6B	1.80-2.80 (1.80-2.80)	B	E67140	Brown sandy very silty gravel. (MADE GROUND).		0.176 (0.21)		11.22					
BH6B	17.00-17.50 (17.00-17.50)	B	E67146	Grey slightly sandy slightly gravelly SILT.		1.371 (1.65)		7.57					

Remarks AGS Tests performed in accordance with BS 1377: Part 3: 1990
Sulphate reported as SO3, results in brackets reported as SO4

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LABORATORY RESULTS - Chemical Analysis

Project PLYMOUTH EFW **Project No:** PE100830

Sample					Sulphate			pH	Organic Content	Loss on Ignition	Chloride		
					In Soil						In Soil		
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Acid Soluble %	Water Soluble g/l	In Water g/l		%	%	Acid Soluble %	Water Soluble g/l	In Water g/l
BH12A	9.50-10.50 (9.50-10.50)	B	E67222	Grey slightly sandy clayey SILT with shell fragments.		2.055 (2.47)		7.31					
BH12A	17.50-18.50 (17.50-18.50)	B	E67227	Grey slightly sandy clayey SILT.		0.850 (1.02)		7.87					
BH13	4.00 (4.00)	D	E67180	Brown slightly clayey sand and gravel. (MADE GROUND).		0.354 (0.42)		9.81					
BH13	16.00-16.50 (16.00-16.50)	B	E67177	Grey slightly sandy SILT.		0.615 (0.74)		7.58					
BH15	1.00-1.45 (1.00-1.45)	D	E67181	Brown clayey sandy gravel and cobbles. (MADE GROUND).		0.446 (0.54)		8.76					
BH18	0.50-1.00 (0.50-1.00)	B	E67233	Brown clayey sandy gravel and cobbles. (MADE GROUND).		0.360 (0.43)		10.50					
BH19	1.00 (1.00)	D	E67197	Brown gravelly sand. (MADE GROUND).		0.014 (0.02)		11.51					
BH20A	1.00 (1.00)	D	E67215	Brown slightly sandy gravel. (MADE GROUND).		0.075 (0.09)		11.02					
BH21	4.00 (4.00)	D	E67217	Grey slightly clayey sandy gravel. (MADE GROUND).		0.426 (0.51)		10.38					
BH22	3.00 (3.00)	D	E67219	Grey slightly silty sand and gravel. (MADE GROUND).		0.353 (0.42)		9.05					

Remarks Tests performed in accordance with BS 1377: Part 3: 1990
Sulphate reported as SO3, results in brackets reported as SO4

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LABORATORY RESULTS - *Particle Size Distribution*

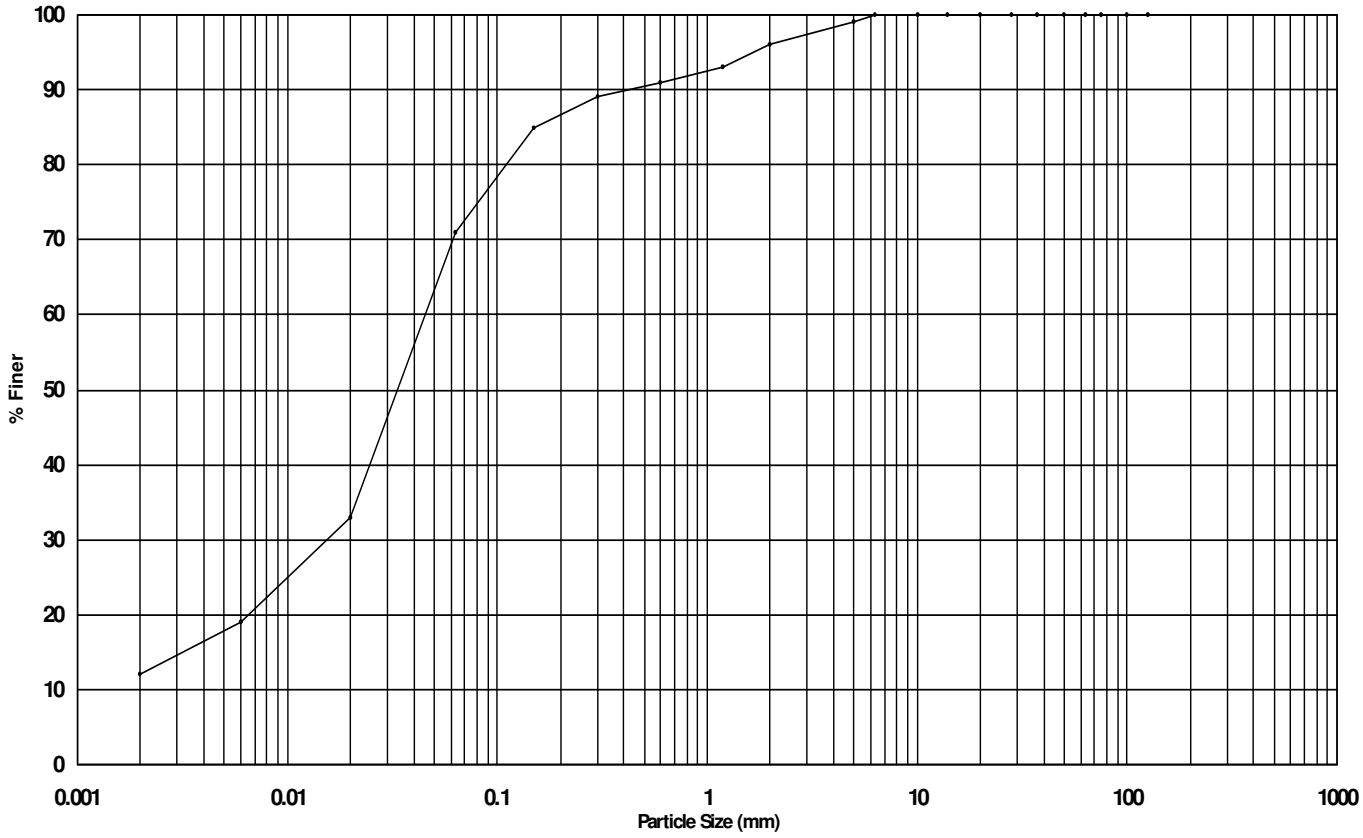
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH1A
Sample Depth 8.00-9.00m
Sample Type B
Sample Ref E67153

Sample Description

Dark grey slightly sandy silty CLAY with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	12
SILT	59
SAND	25
GRAVEL	4
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	99
3.35mm	-

Size	Percentage Finer
2mm	96
1.18mm	93
600μm	91
425μm	-
300μm	89
212μm	-
150μm	85
75μm	-
63μm	71
20μm	33
6μm	19
2μm	12

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	1.85
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

09/09/2010

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LABORATORY RESULTS - *Particle Size Distribution*

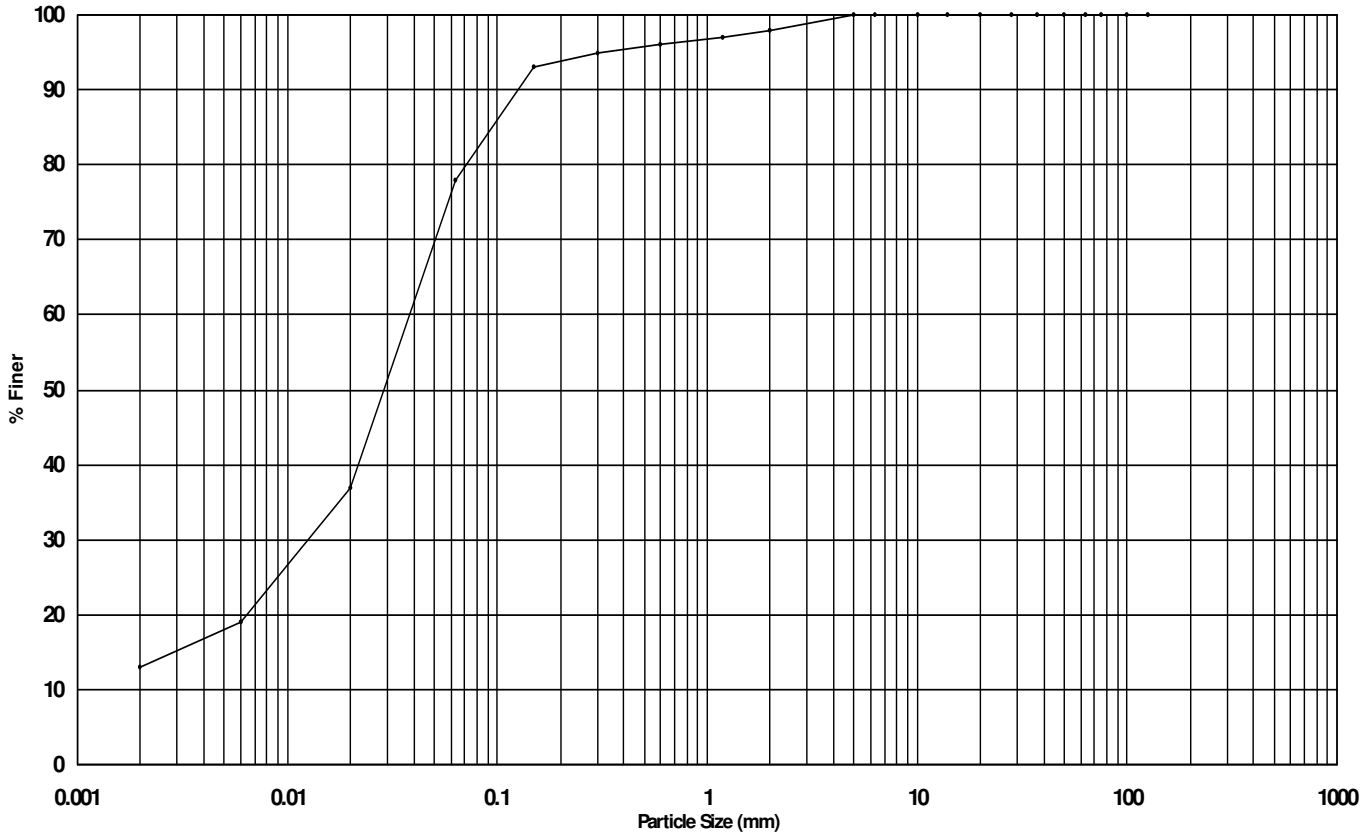
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH1A
Sample Depth 11.00-12.00m
Sample Type B
Sample Ref E67156

Sample Description

Dark grey slightly sandy silty CLAY with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	13
SILT	65
SAND	20
GRAVEL	2
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	100
3.35mm	100

Size	Percentage Finer
2mm	98
1.18mm	97
600µm	96
425µm	-
300µm	95
212µm	-
150µm	93
75µm	-
63µm	78
20µm	37
6µm	19
2µm	13

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	2.28
Particle Density	2.65 (Assumed)

Remarks AGS Test performed in accordance with BS 1377: Part 2: 1990

09/09/2010

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LABORATORY RESULTS - Particle Size Distribution

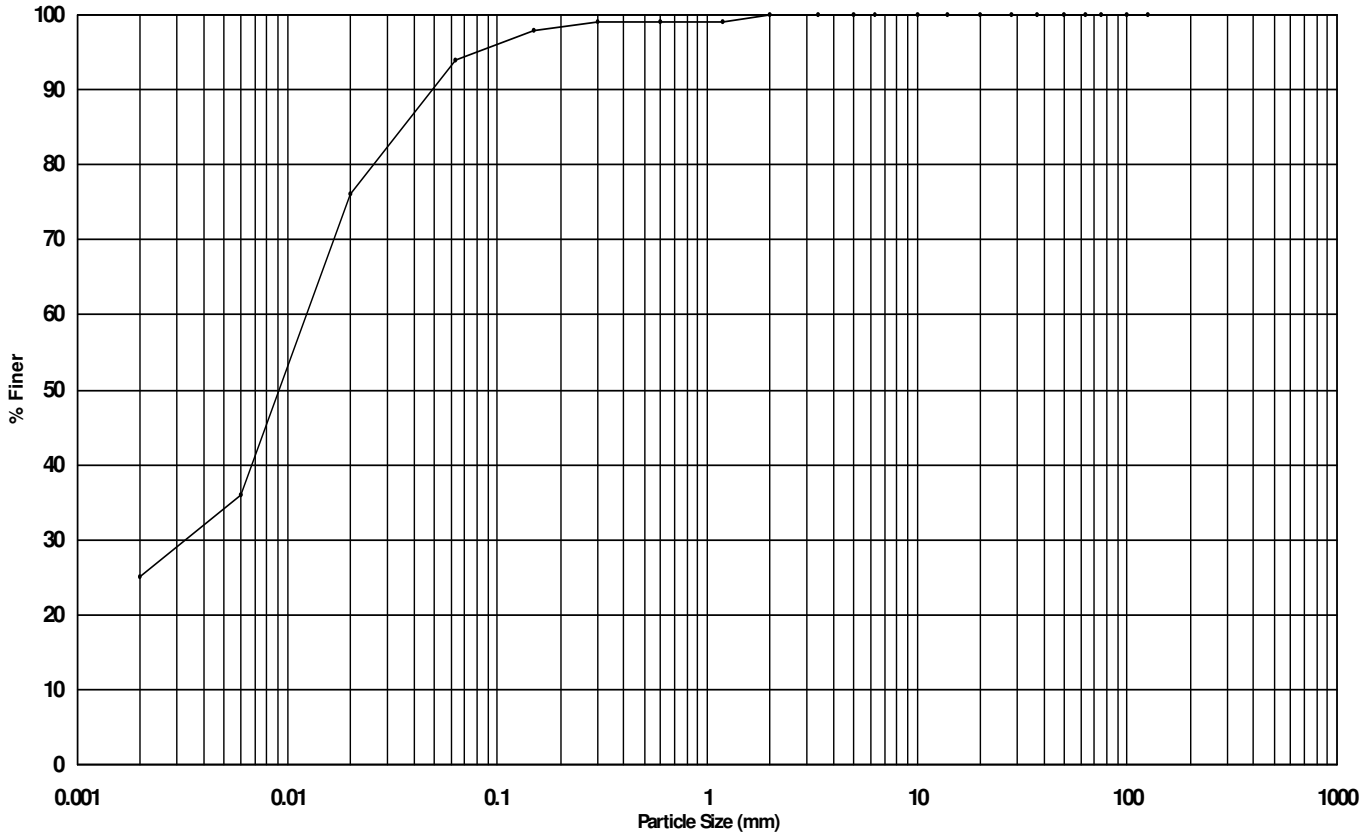
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH1A
Sample Depth 14.00-15.00m
Sample Type B
Sample Ref E67160

Sample Description

Dark grey slightly sandy silty CLAY with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	25
SILT	69
SAND	6
GRAVEL	0
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	100
3.35mm	100

Size	Percentage Finer
2mm	100
1.18mm	99
600μm	99
425μm	-
300μm	99
212μm	-
150μm	98
75μm	-
63μm	94
20μm	76
6μm	36
2μm	25

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.14
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

09/09/2010

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LABORATORY RESULTS - Particle Size Distribution

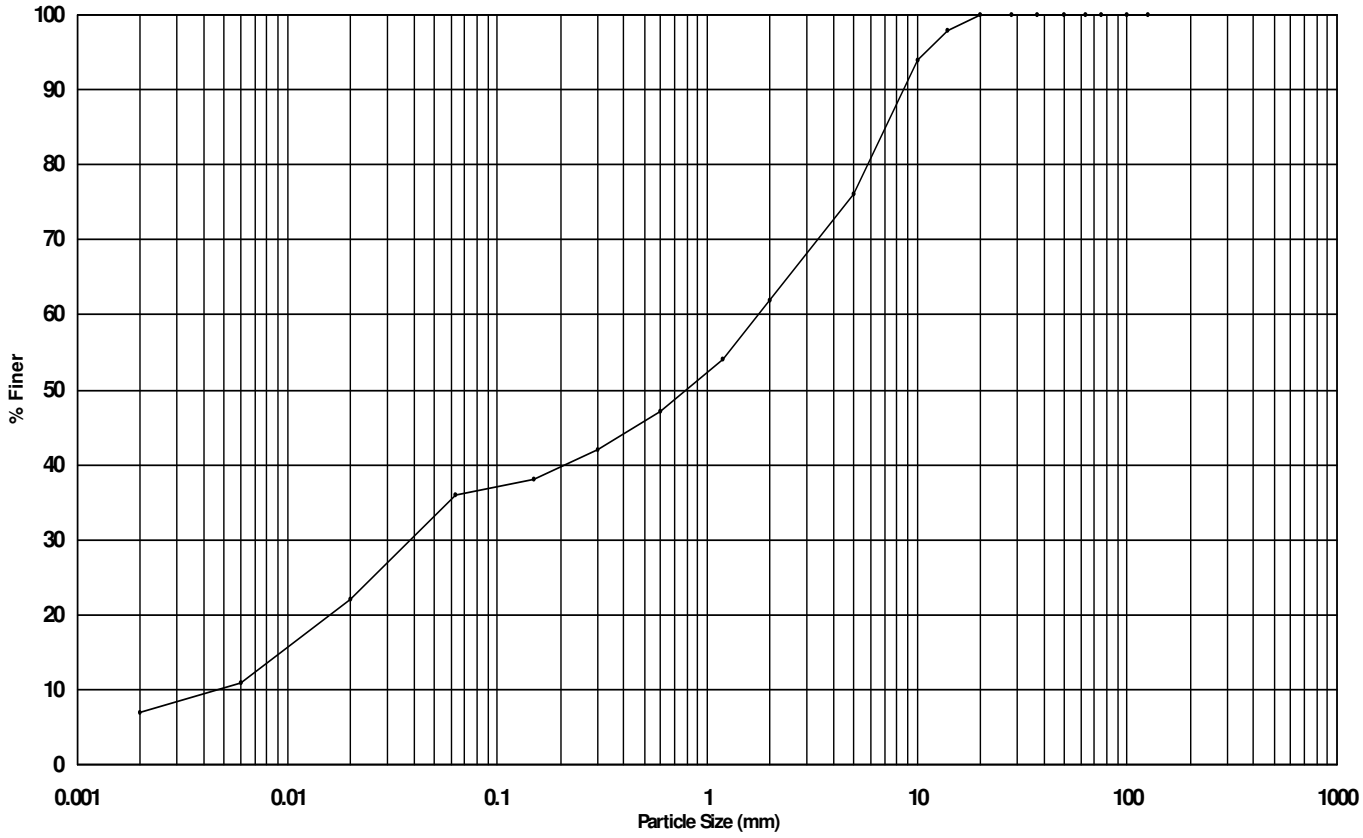
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH1A
Sample Depth 16.00-16.50m
Sample Type B
Sample Ref E67161

Sample Description

Brown very clayey SAND and GRAVEL.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	7
SILT	29
SAND	26
GRAVEL	38
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	98
10mm	94
6.3mm	-
5mm	76
3.35mm	-

Size	Percentage Finer
2mm	62
1.18mm	54
600μm	47
425μm	-
300μm	42
212μm	-
150μm	38
75μm	-
63μm	36
20μm	22
6μm	11
2μm	7

Uniformity Coefficient
378.87

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	-0.14
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - *Particle Size Distribution*

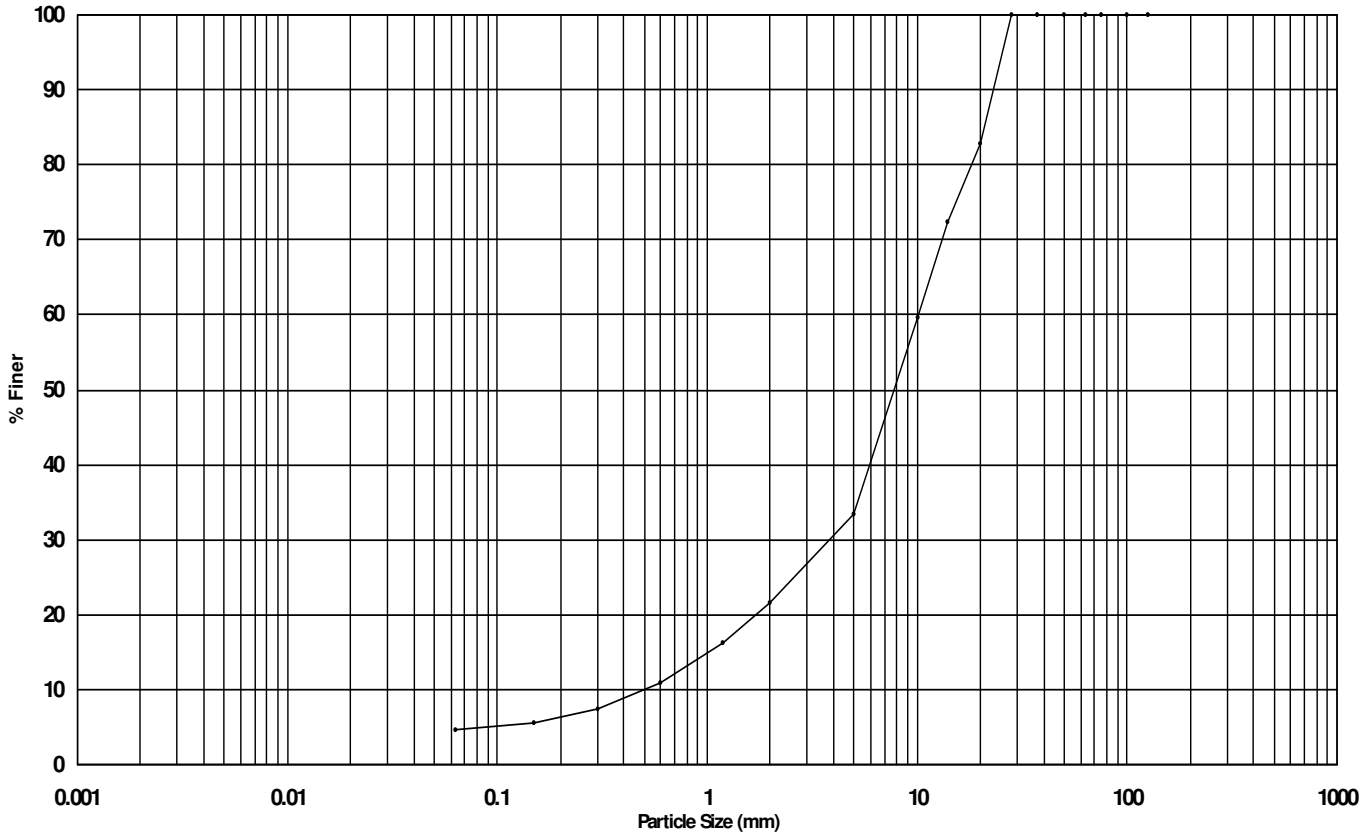
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH2
Sample Depth 11.70-12.00m
Sample Type B
Sample Ref E67165

Sample Description

Grey silty sandy gravel. (MADE GROUND).



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
SILT (including CLAY)	5
SAND	17
GRAVEL	78
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	83
14mm	72
10mm	60
6.3mm	-
5mm	34
3.35mm	-

Size	Percentage Finer
2mm	22
1.18mm	16
600μm	11
425μm	-
300μm	7
212μm	-
150μm	6
75μm	-
63μm	5
20μm	-
6μm	-
2μm	-

Uniformity Coefficient	
20.32	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

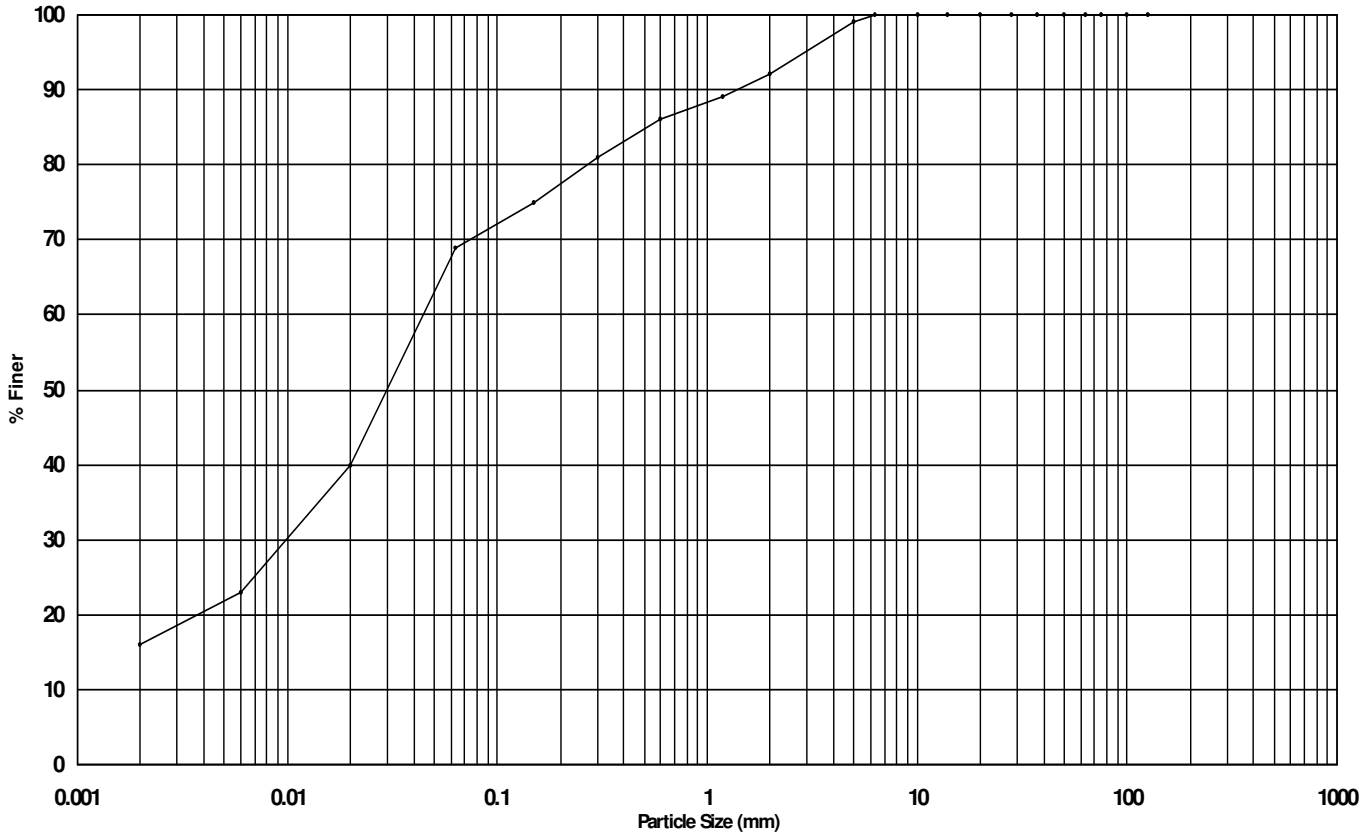
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH2
Sample Depth 14.70-15.00m
Sample Type B
Sample Ref E67168

Sample Description

Grey slightly sandy clayey SILT.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	16
SILT	53
SAND	23
GRAVEL	8
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	99
3.35mm	-

Size	Percentage Finer
2mm	92
1.18mm	89
600μm	86
425μm	-
300μm	81
212μm	-
150μm	75
75μm	-
63μm	69
20μm	40
6μm	23
2μm	16

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	4.14
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

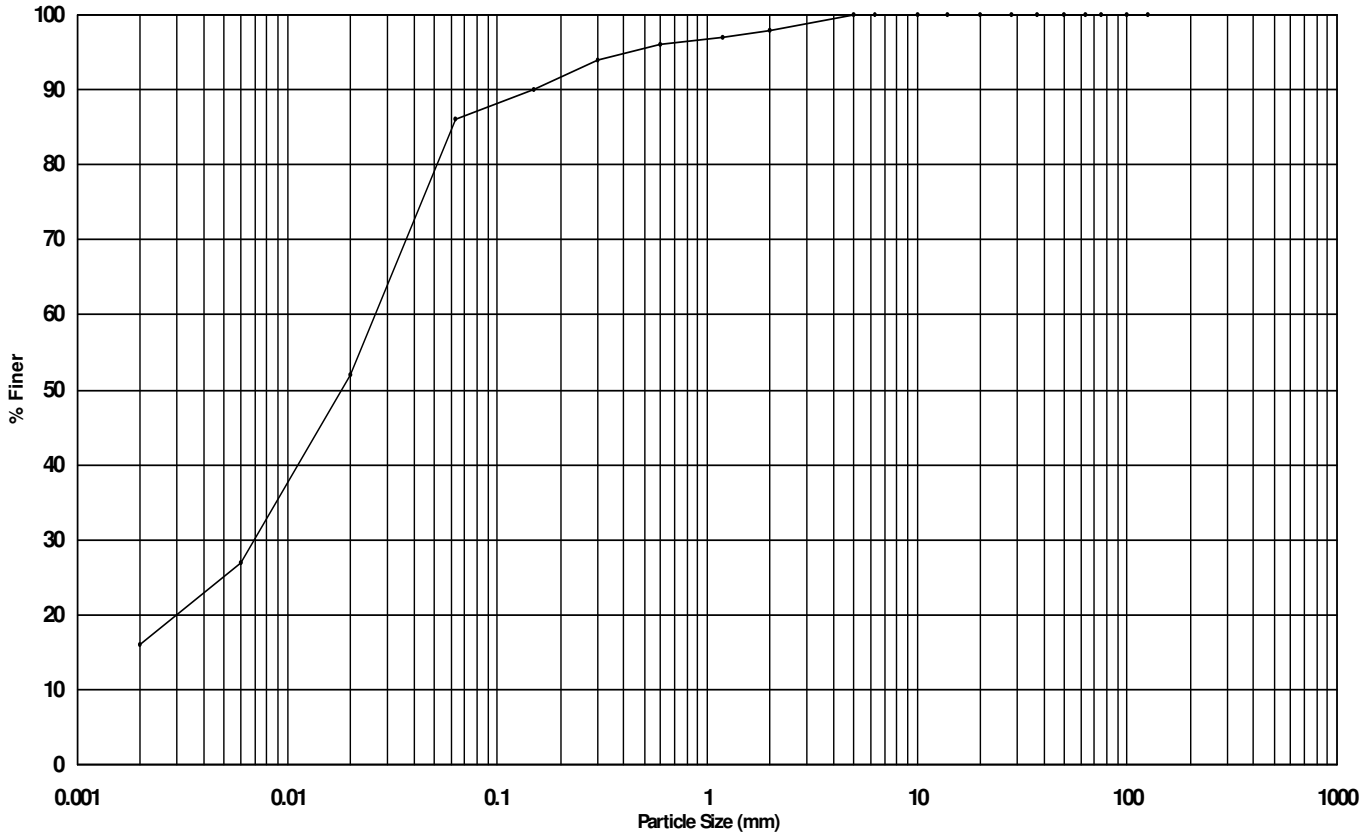
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH2
Sample Depth 17.70-18.00m
Sample Type B
Sample Ref E67171

Sample Description

Grey slightly sandy slightly gravelly clayey SILT.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	16
SILT	70
SAND	12
GRAVEL	2
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	100
3.35mm	100

Size	Percentage Finer
2mm	98
1.18mm	97
600μm	96
425μm	-
300μm	94
212μm	-
150μm	90
75μm	-
63μm	86
20μm	52
6μm	27
2μm	16

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	12.67
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

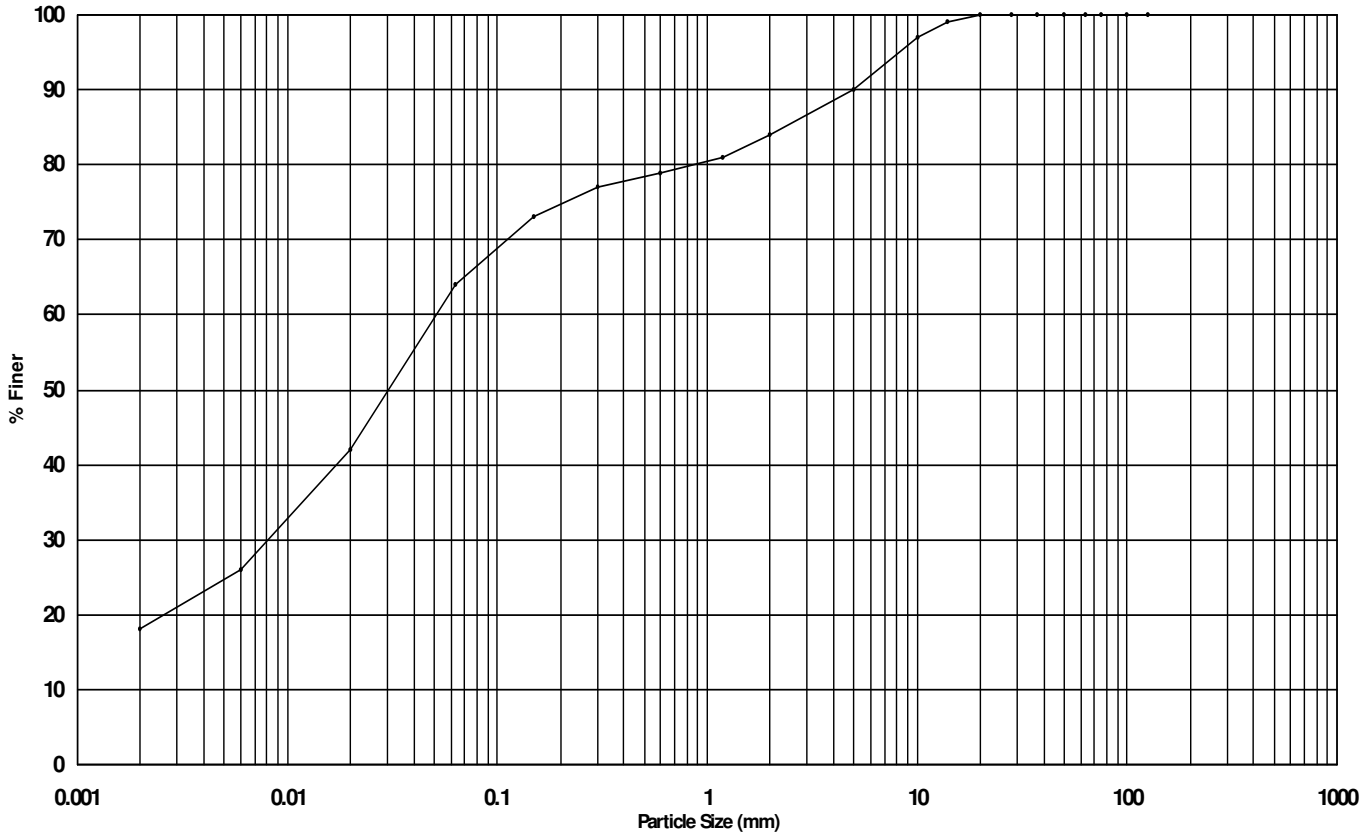
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH3
Sample Depth 11.50-12.50m
Sample Type B
Sample Ref E67188

Sample Description

Grey slightly sandy clayey SILT with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	18
SILT	46
SAND	20
GRAVEL	16
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	99
10mm	97
6.3mm	-
5mm	90
3.35mm	-

Size	Percentage Finer
2mm	84
1.18mm	81
600μm	79
425μm	-
300μm	77
212μm	-
150μm	73
75μm	-
63μm	64
20μm	42
6μm	26
2μm	18

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	1.12
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

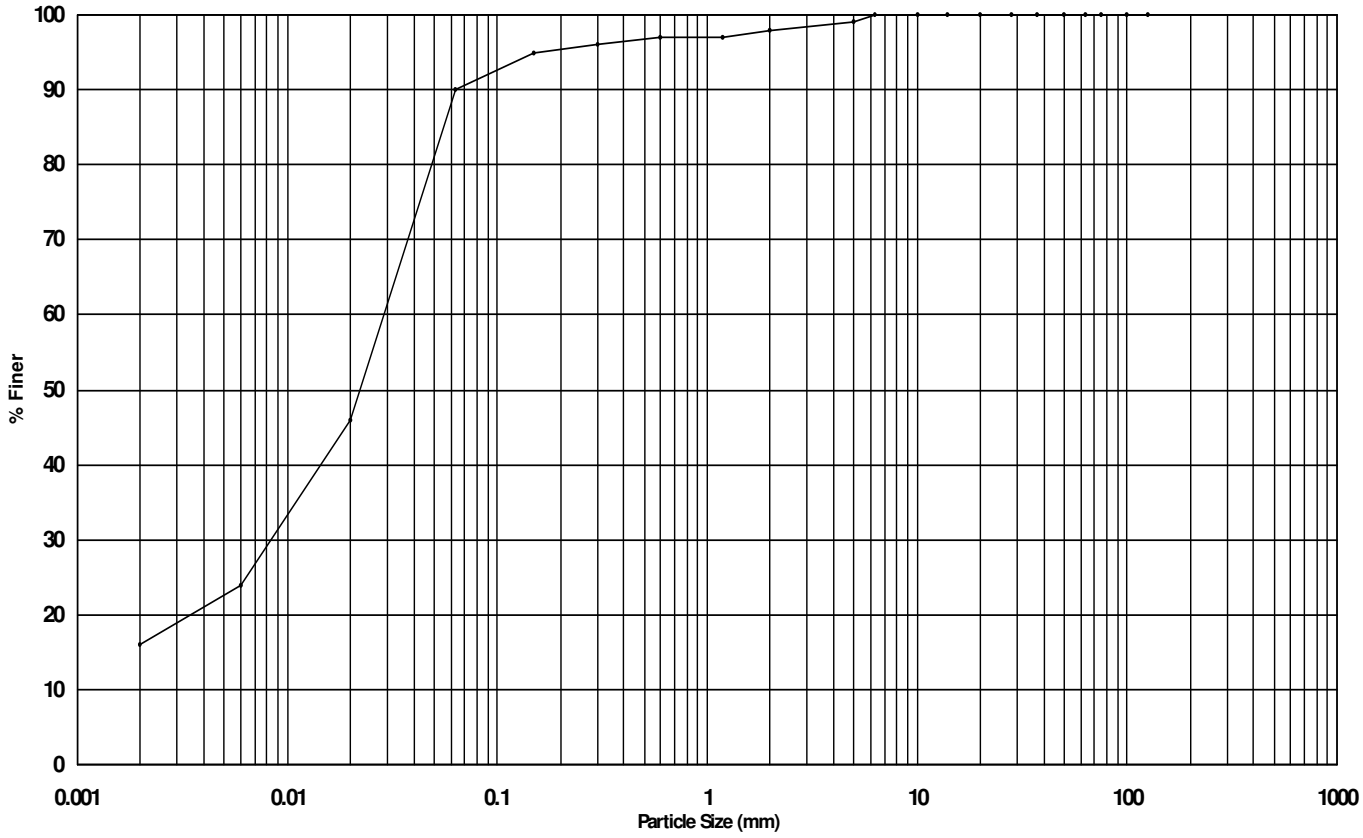
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH3
Sample Depth 14.00-15.00m
Sample Type B
Sample Ref E67191

Sample Description

Grey slightly sandy clayey SILT with shell and wood fragments.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	16
SILT	74
SAND	8
GRAVEL	2
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	99
3.35mm	-

Size	Percentage Finer
2mm	98
1.18mm	97
600µm	97
425µm	-
300µm	96
212µm	-
150µm	95
75µm	-
63µm	90
20µm	46
6µm	24
2µm	16

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	3.30
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

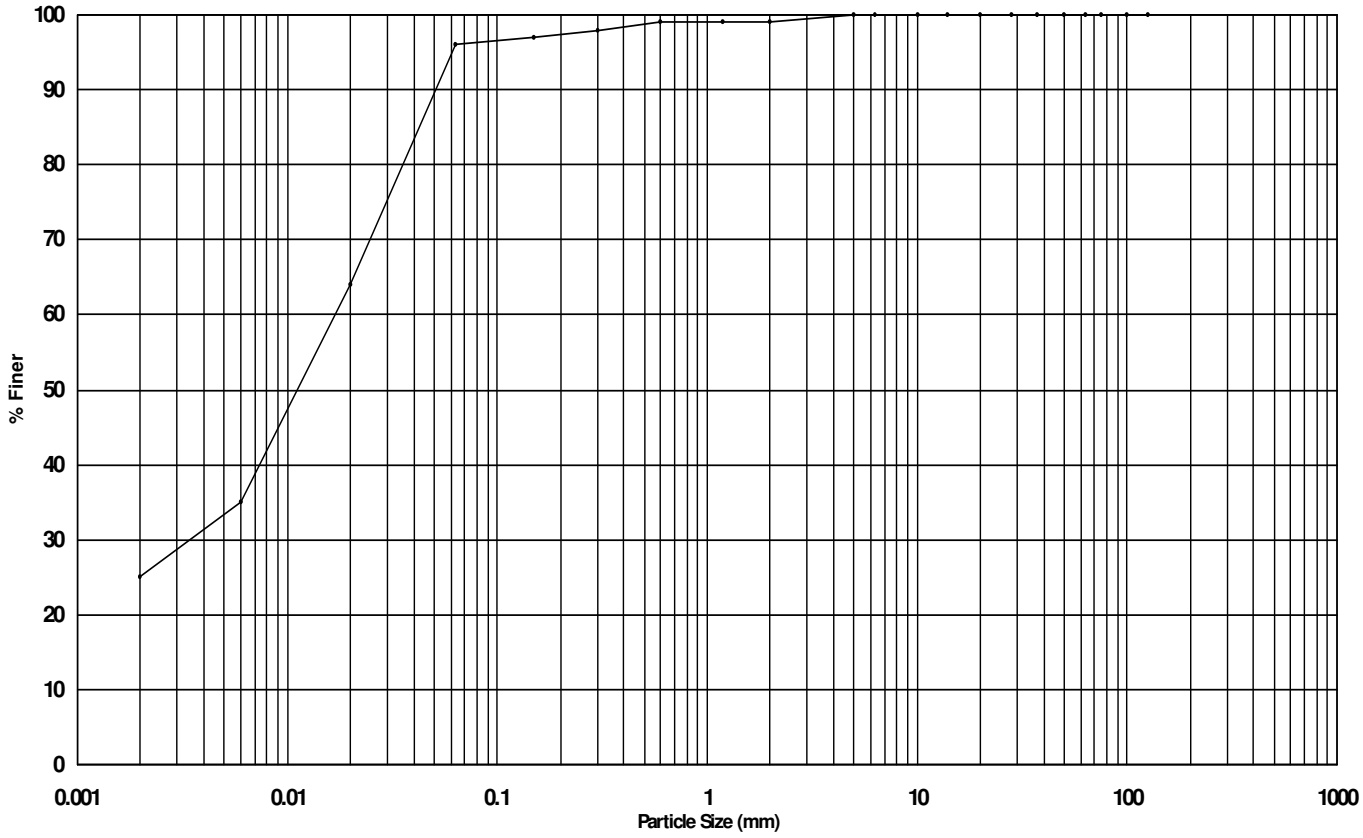
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH3
Sample Depth 17.50m
Sample Type D
Sample Ref E67193

Sample Description

Grey slightly sandy clayey SILT with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	25
SILT	71
SAND	3
GRAVEL	1
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	100
3.35mm	100

Size	Percentage Finer
2mm	99
1.18mm	99
600μm	99
425μm	-
300μm	98
212μm	-
150μm	97
75μm	-
63μm	96
20μm	64
6μm	35
2μm	25

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	11.39
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

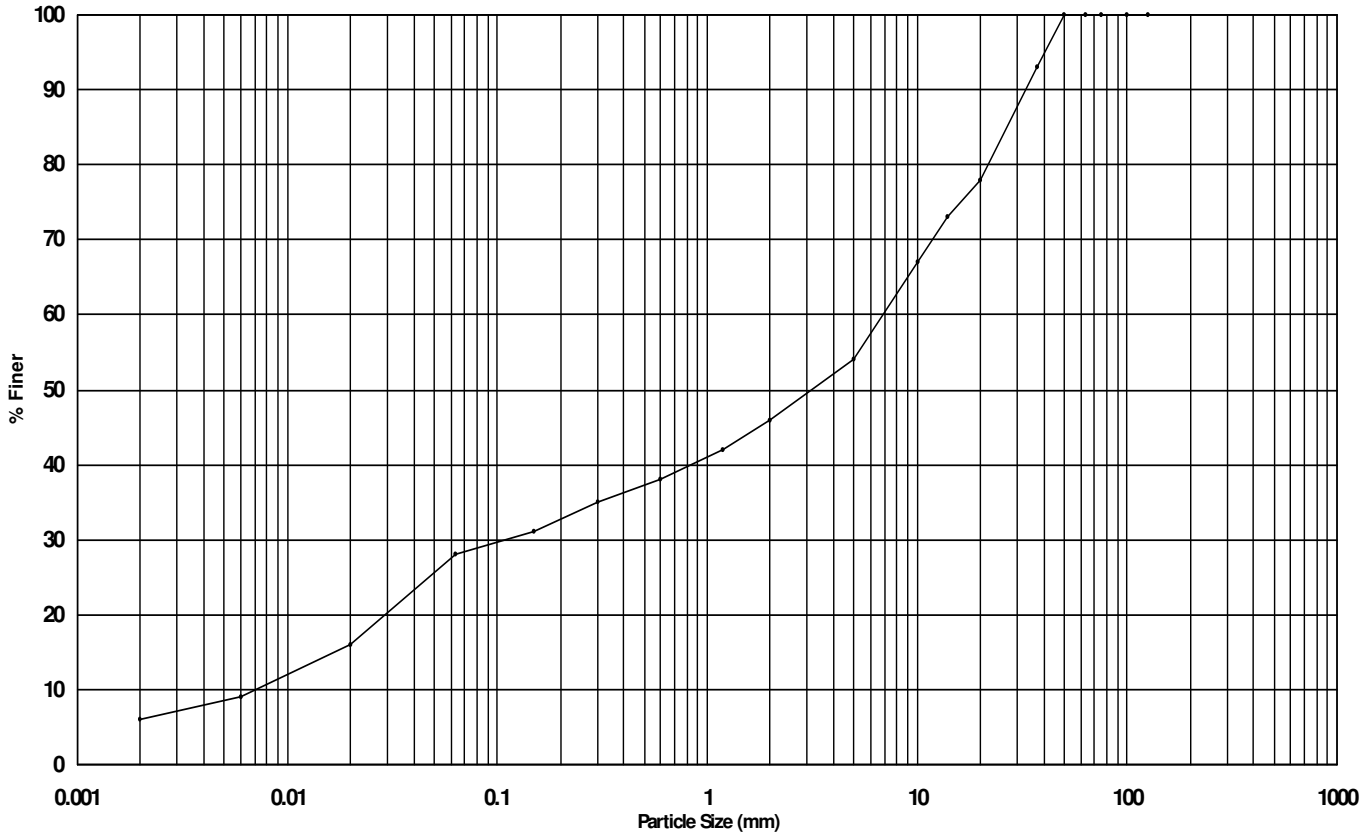
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH6B
Sample Depth 12.50-13.00m
Sample Type B
Sample Ref E67142

Sample Description

Grey sandy very silty GRAVEL.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	6
SILT	22
SAND	18
GRAVEL	54
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	93
28mm	-
20mm	78
14mm	73
10mm	67
6.3mm	-
5mm	54
3.35mm	-

Size	Percentage Finer
2mm	46
1.18mm	42
600μm	38
425μm	-
300μm	35
212μm	-
150μm	31
75μm	-
63μm	28
20μm	16
6μm	9
2μm	6

Uniformity Coefficient
1005.28

Sieving Method
Wet sieve

Fine Particle Analysis

Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	3.45
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

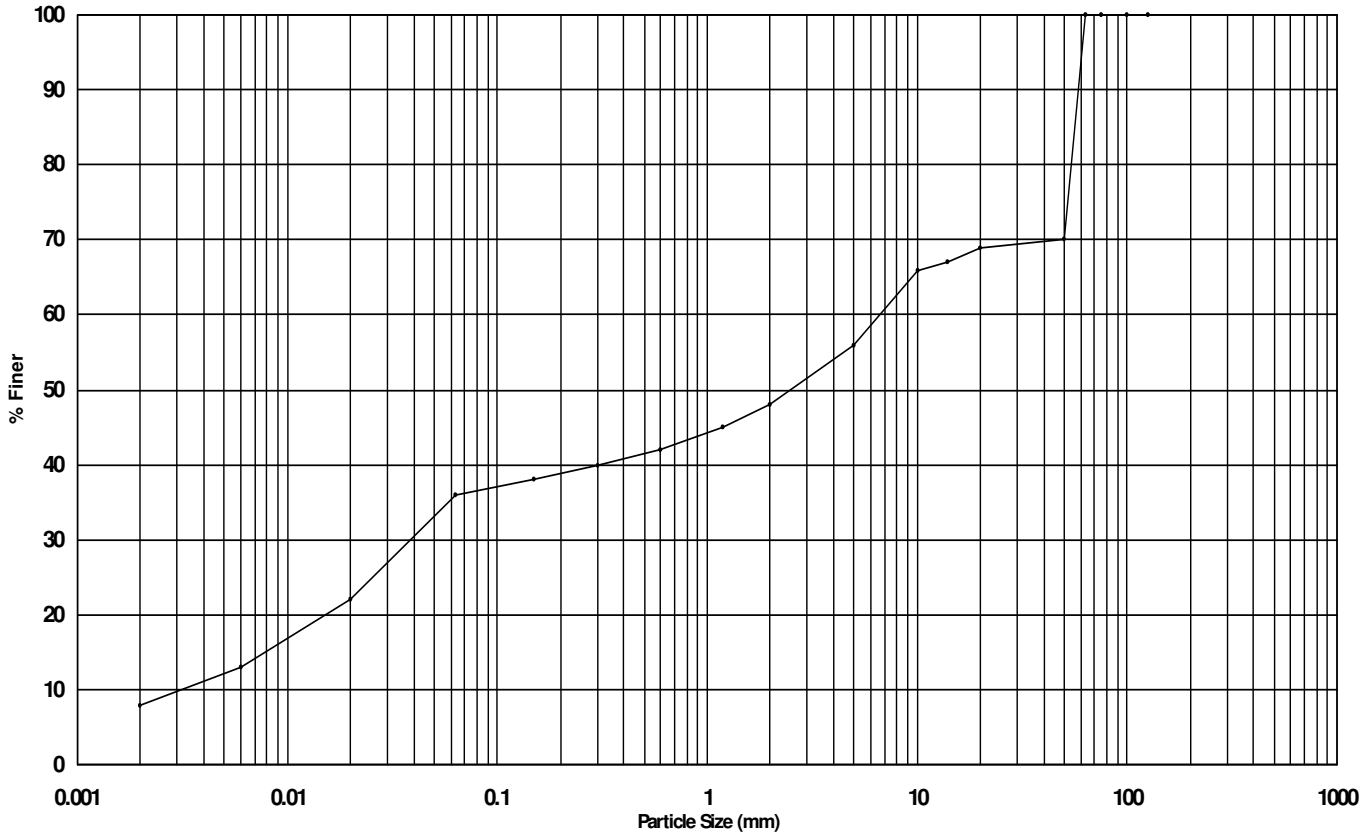
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH6B
Sample Depth 14.00-14.50m
Sample Type B
Sample Ref E67144

Sample Description

Grey sandy very silty GRAVEL with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	8
SILT	28
SAND	12
GRAVEL	52
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	70
37.5mm	-
28mm	-
20mm	69
14mm	67
10mm	66
6.3mm	-
5mm	56
3.35mm	-

Size	Percentage Finer
2mm	48
1.18mm	45
600μm	42
425μm	-
300μm	40
212μm	-
150μm	38
75μm	-
63μm	36
20μm	22
6μm	13
2μm	8

Uniformity Coefficient
2209.58

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.18
Particle Density	2.65 (Assumed)

Remarks AGS Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

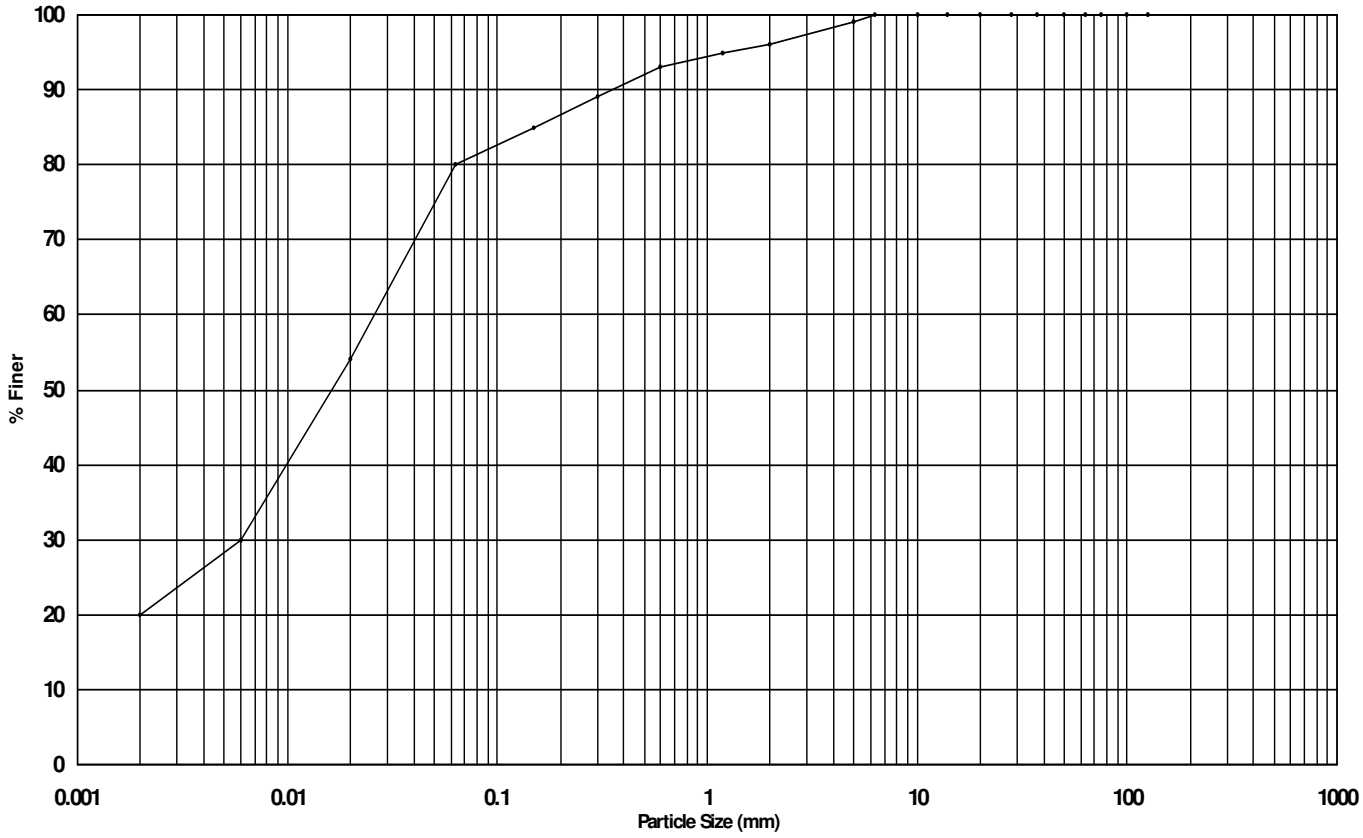
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH6B
Sample Depth 17.00-17.50m
Sample Type B
Sample Ref E67146

Sample Description

Grey slightly sandy slightly gravelly SILT.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	20
SILT	60
SAND	16
GRAVEL	4
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	99
3.35mm	-

Size	Percentage Finer
2mm	96
1.18mm	95
600μm	93
425μm	-
300μm	89
212μm	-
150μm	85
75μm	-
63μm	80
20μm	54
6μm	30
2μm	20

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.28
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - *Particle Size Distribution*

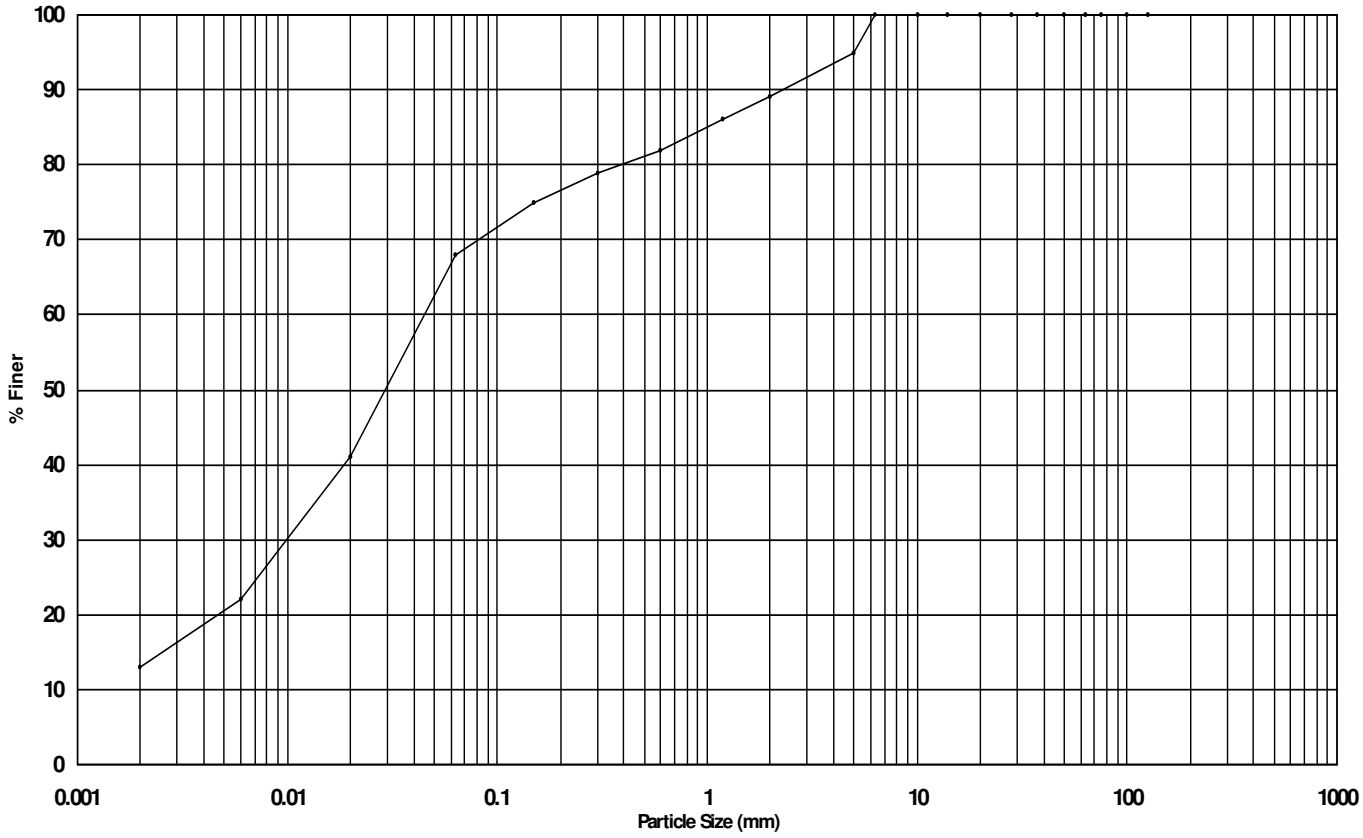
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH10
Sample Depth 9.50-9.80m
Sample Type B
Sample Ref E67132

Sample Description

Grey slightly sandy slightly gravelly silty CLAY with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	13
SILT	55
SAND	21
GRAVEL	11
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	95
3.35mm	-

Size	Percentage Finer
2mm	89
1.18mm	86
600μm	82
425μm	-
300μm	79
212μm	-
150μm	75
75μm	-
63μm	68
20μm	41
6μm	22
2μm	13

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.10
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

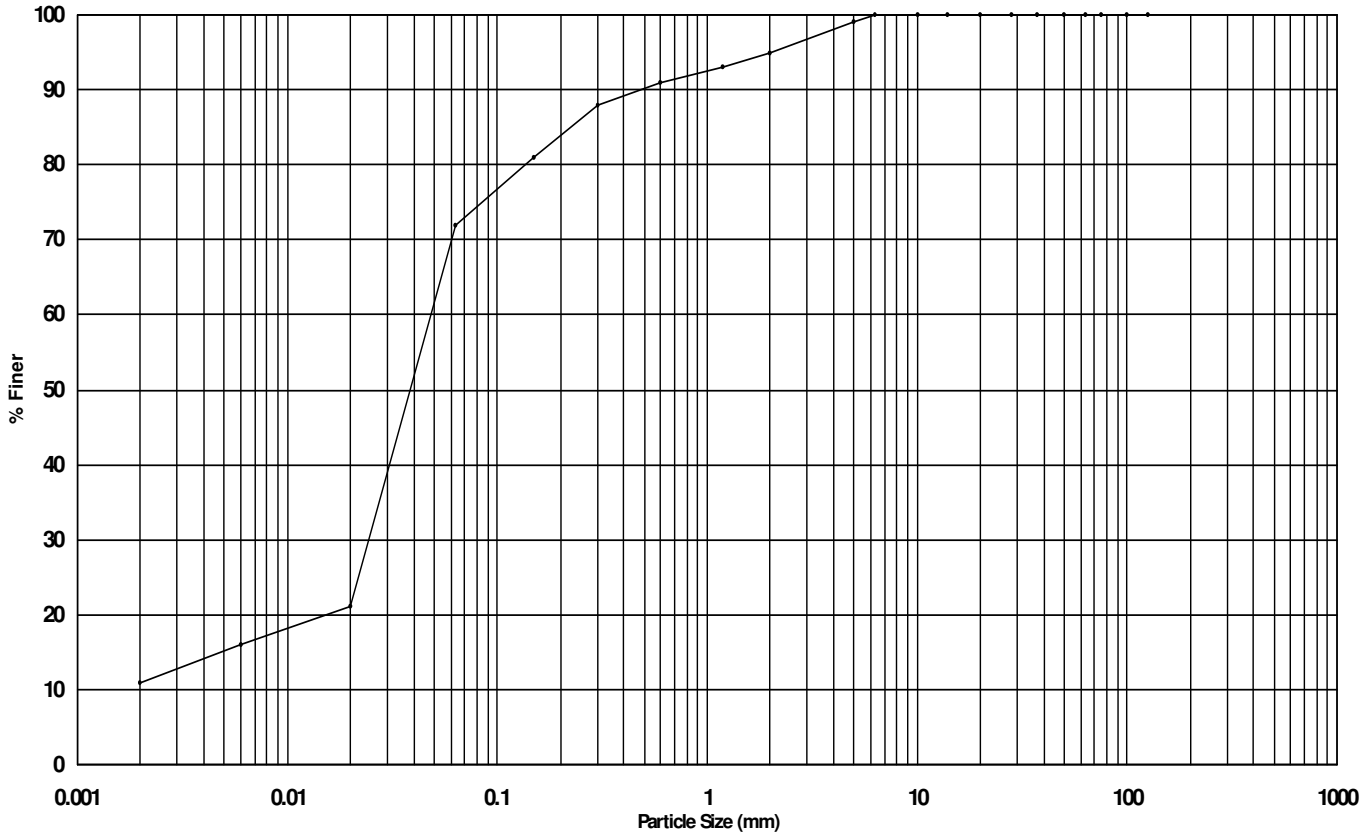
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH10
Sample Depth 11.50-11.80m
Sample Type B
Sample Ref E67134

Sample Description

Grey slightly sandy slightly gravelly clayey SILT.



Classification	CLAY	SILT			SAND			Gravel			Cobbles	Boulders
		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		

Classification	% of each
CLAY	11
SILT	61
SAND	23
GRAVEL	5
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	99
3.35mm	-

Size	Percentage Finer
2mm	95
1.18mm	93
600µm	91
425µm	-
300µm	88
212µm	-
150µm	81
75µm	-
63µm	72
20µm	21
6µm	16
2µm	11

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	2.36
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

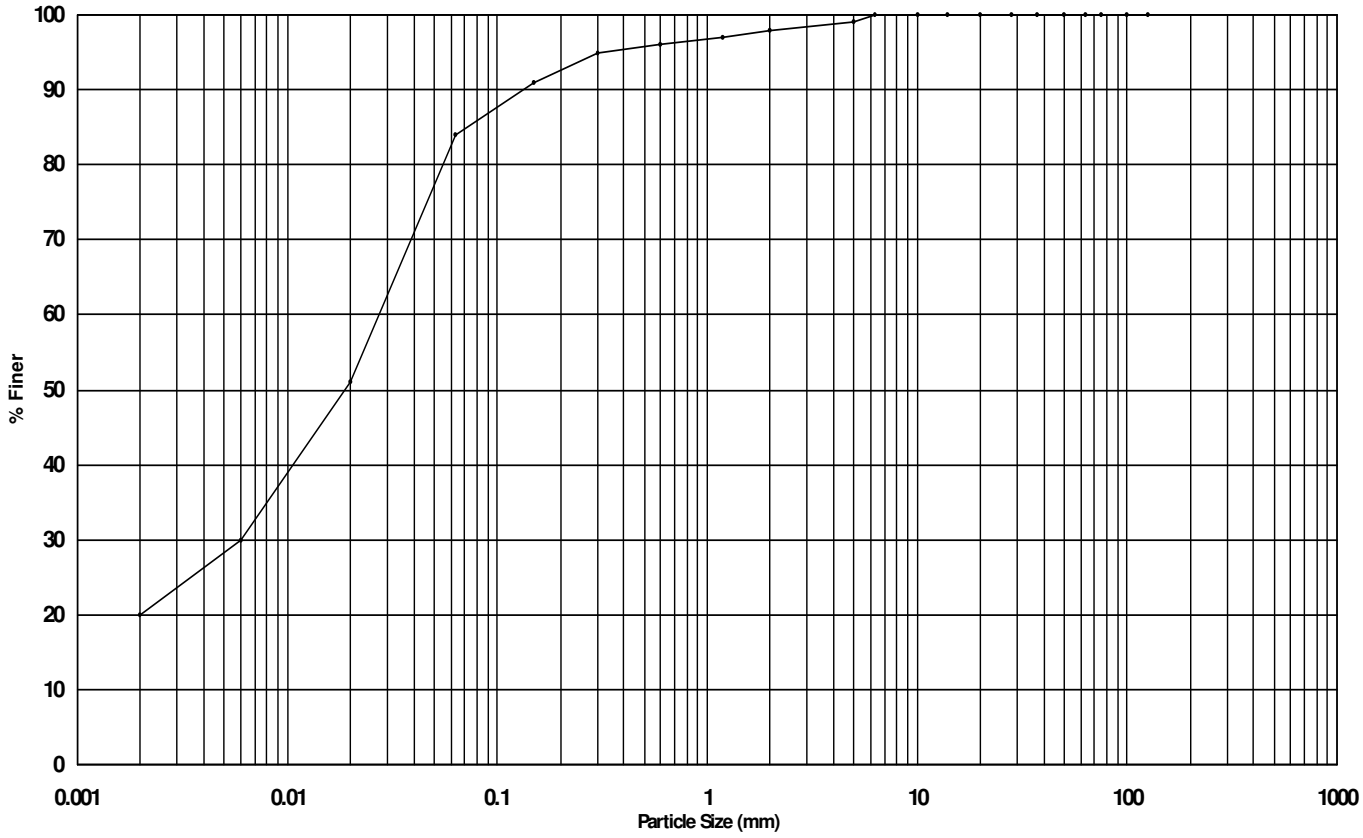
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH10
Sample Depth 14.00-14.50m
Sample Type B
Sample Ref E67138

Sample Description

Grey slightly sandy slightly gravelly clayey SILT.



Classification	CLAY	SILT			SAND			Gravel			Cobbles	Boulders
		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		

Classification	% of each
CLAY	20
SILT	64
SAND	14
GRAVEL	2
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	99
3.35mm	-

Size	Percentage Finer
2mm	98
1.18mm	97
600μm	96
425μm	-
300μm	95
212μm	-
150μm	91
75μm	-
63μm	84
20μm	51
6μm	30
2μm	20

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	1.58
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

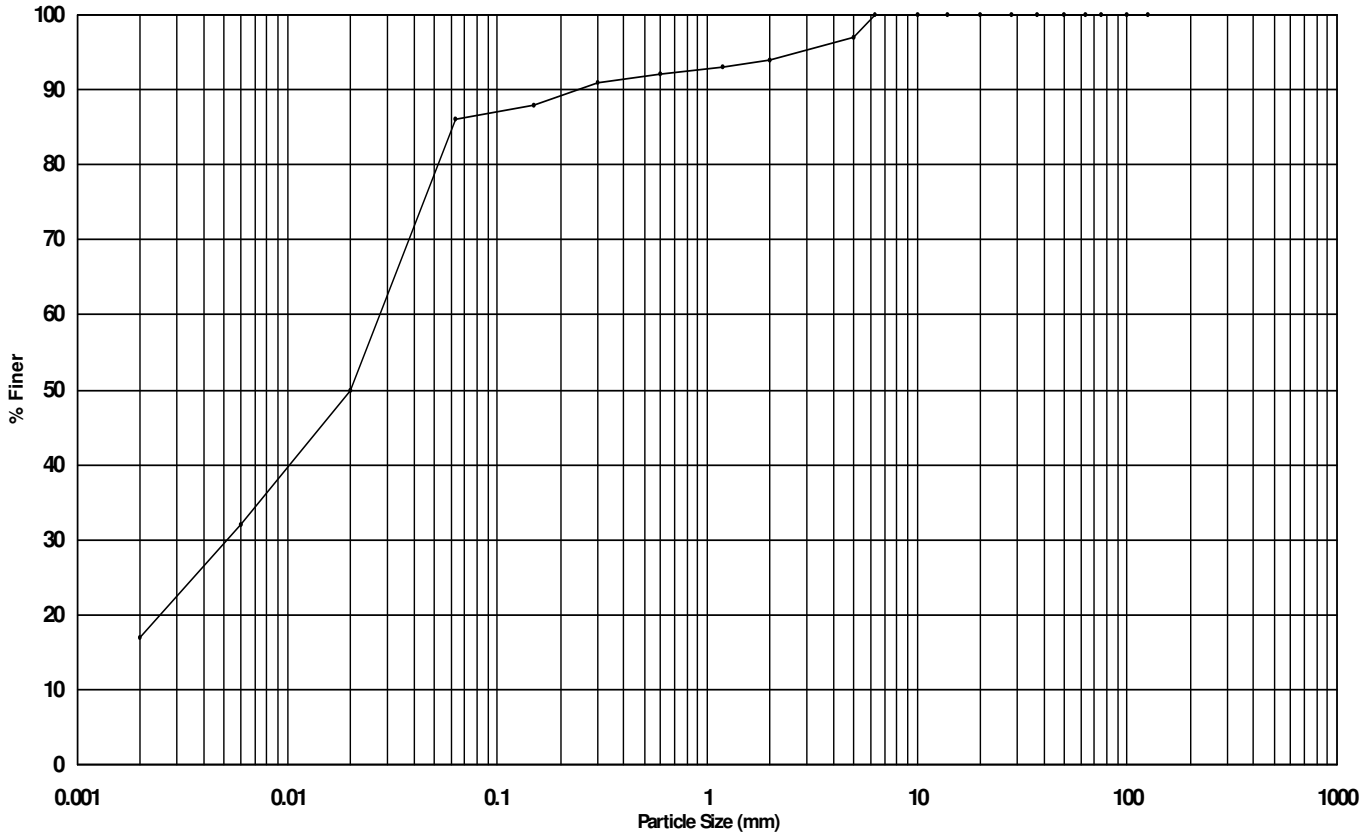
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH12A
Sample Depth 9.50-10.50m
Sample Type B
Sample Ref E67222

Sample Description

Grey slightly sandy clayey SILT with shell fragments.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	17
SILT	69
SAND	8
GRAVEL	6
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	97
3.35mm	-

Size	Percentage Finer
2mm	94
1.18mm	93
600µm	92
425µm	-
300µm	91
212µm	-
150µm	88
75µm	-
63µm	86
20µm	50
6µm	32
2µm	17

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	2.48
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

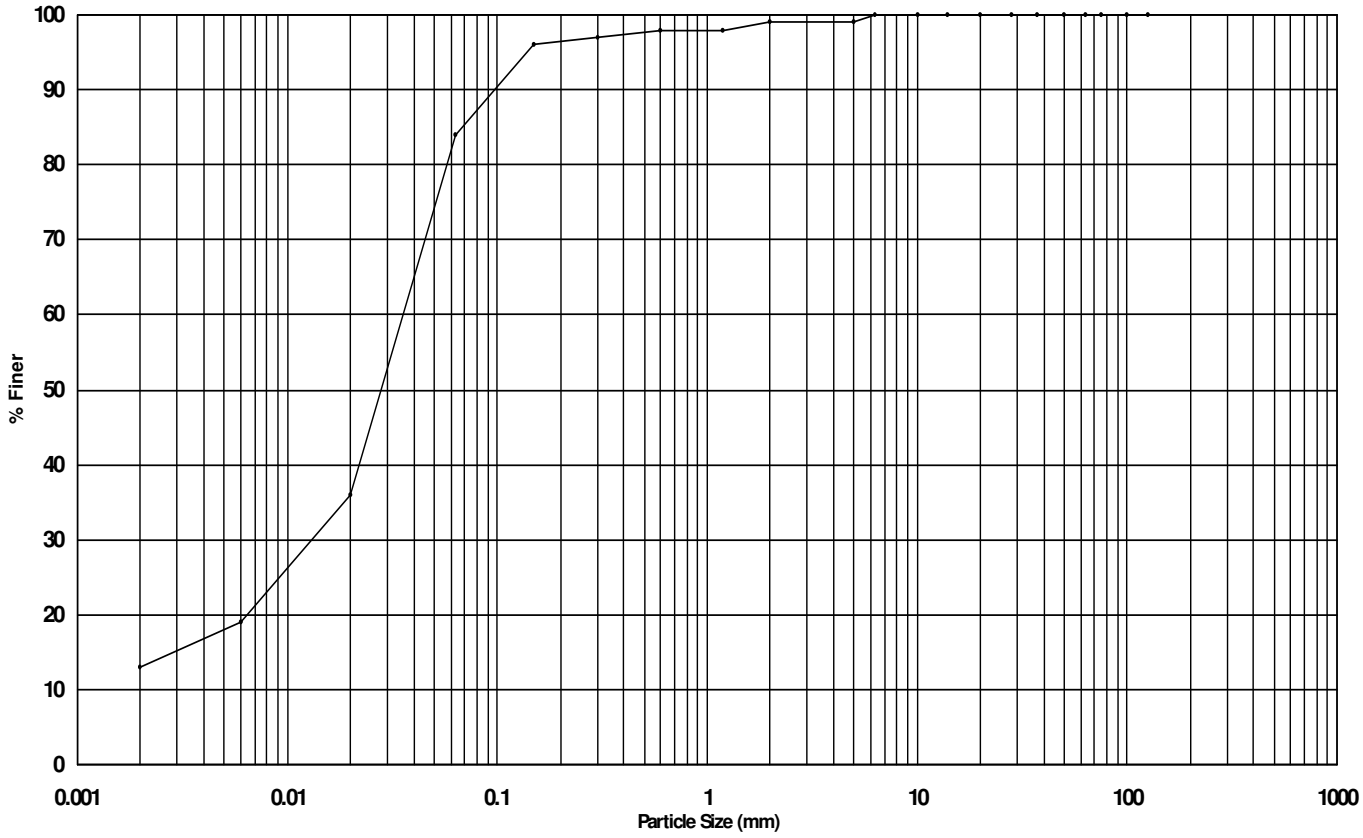
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH12A
Sample Depth 14.00-15.00m
Sample Type B
Sample Ref E67225

Sample Description

Grey slightly sandy clayey SILT with shell fragments.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	13
SILT	71
SAND	15
GRAVEL	1
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	99
3.35mm	-

Size	Percentage Finer
2mm	99
1.18mm	98
600μm	98
425μm	-
300μm	97
212μm	-
150μm	96
75μm	-
63μm	84
20μm	36
6μm	19
2μm	13

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	2.68
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

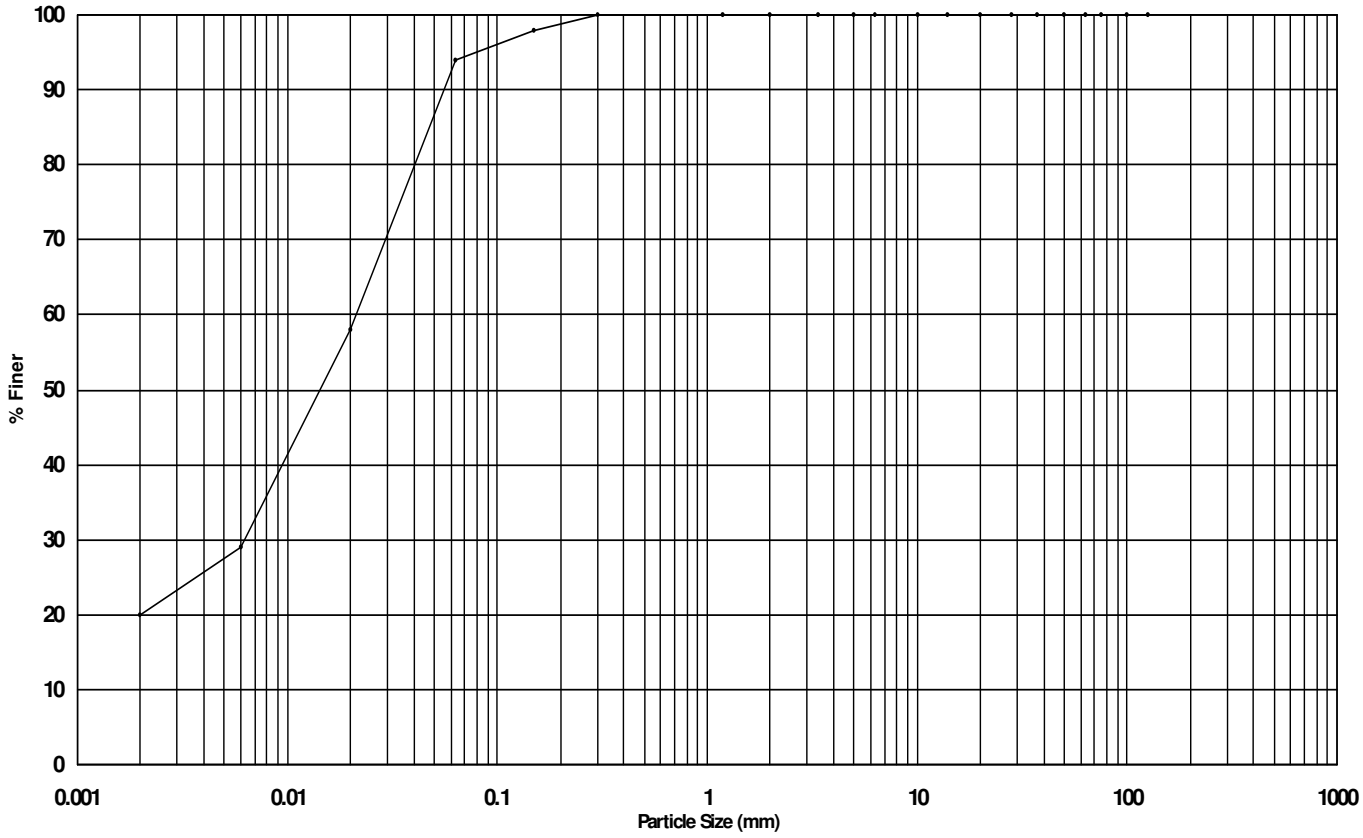
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH12A
Sample Depth 19.00-20.00m
Sample Type B
Sample Ref E67228

Sample Description

Grey slightly sandy SILT.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	20
SILT	74
SAND	6
GRAVEL	0
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	100
3.35mm	100

Size	Percentage Finer
2mm	100
1.18mm	100
600μm	100
425μm	100
300μm	100
212μm	100
150μm	98
75μm	-
63μm	94
20μm	58
6μm	29
2μm	20

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	2.74
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

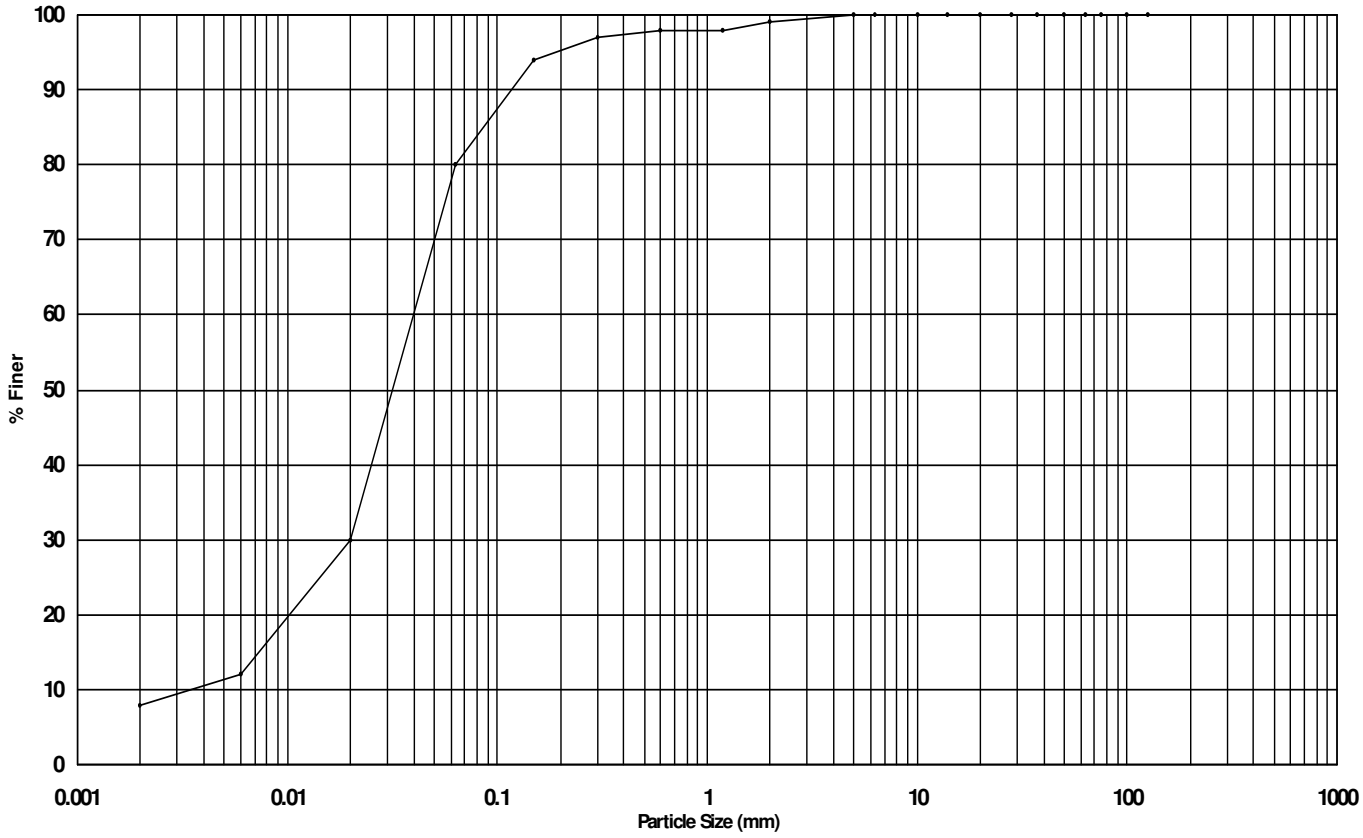
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH13
Sample Depth 13.00-13.50m
Sample Type B
Sample Ref E67175

Sample Description

Grey slightly sandy slightly gravelly SILT.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	8
SILT	72
SAND	19
GRAVEL	1
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	100
3.35mm	100

Size	Percentage Finer
2mm	99
1.18mm	98
600μm	98
425μm	-
300μm	97
212μm	-
150μm	94
75μm	-
63μm	80
20μm	30
6μm	12
2μm	8

Uniformity Coefficient
11.40

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.14
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

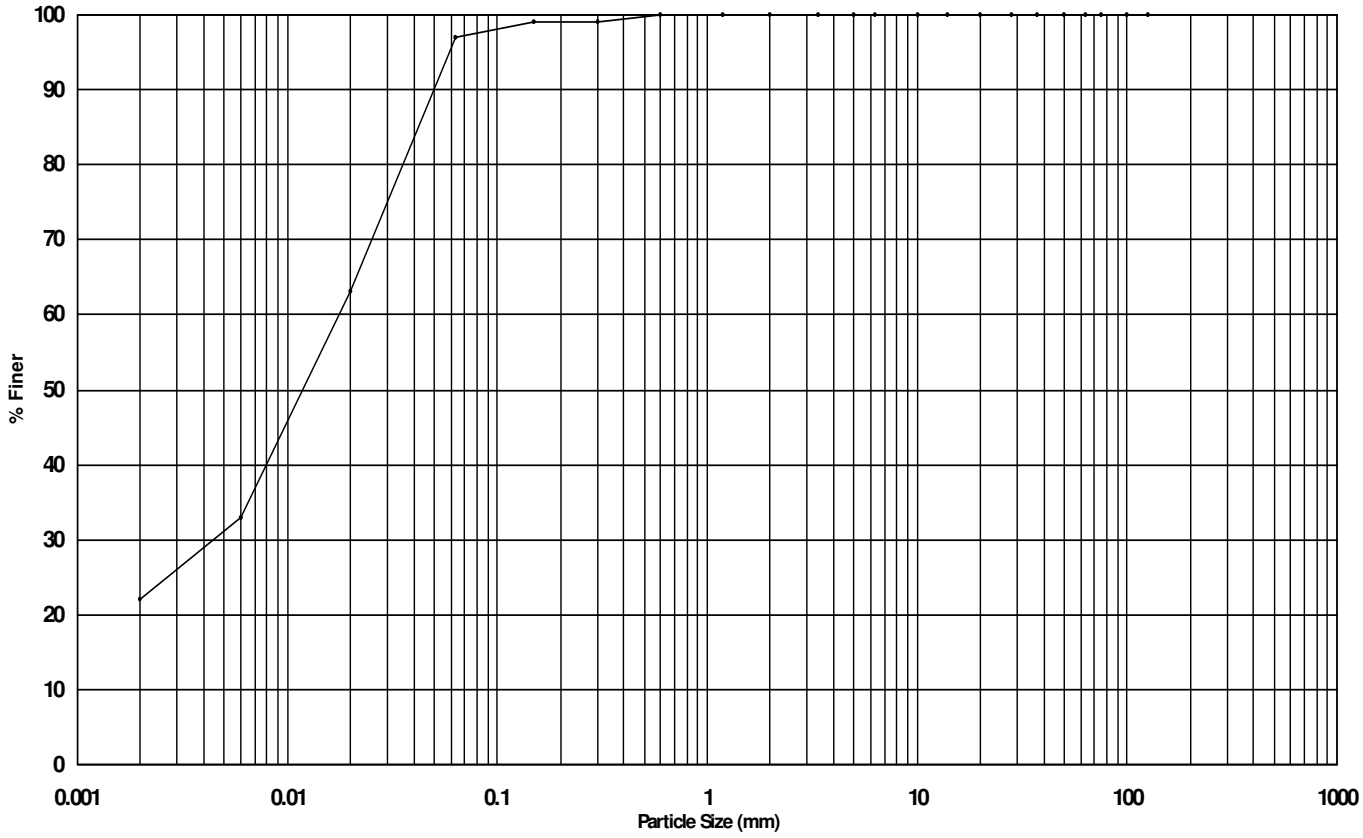
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH13
Sample Depth 17.50-18.00m
Sample Type B
Sample Ref E67178

Sample Description

Grey slightly sandy SILT.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	22
SILT	75
SAND	3
GRAVEL	0
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	100
3.35mm	100

Size	Percentage Finer
2mm	100
1.18mm	100
600μm	100
425μm	100
300μm	99
212μm	-
150μm	99
75μm	-
63μm	97
20μm	63
6μm	33
2μm	22

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	-0.02
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

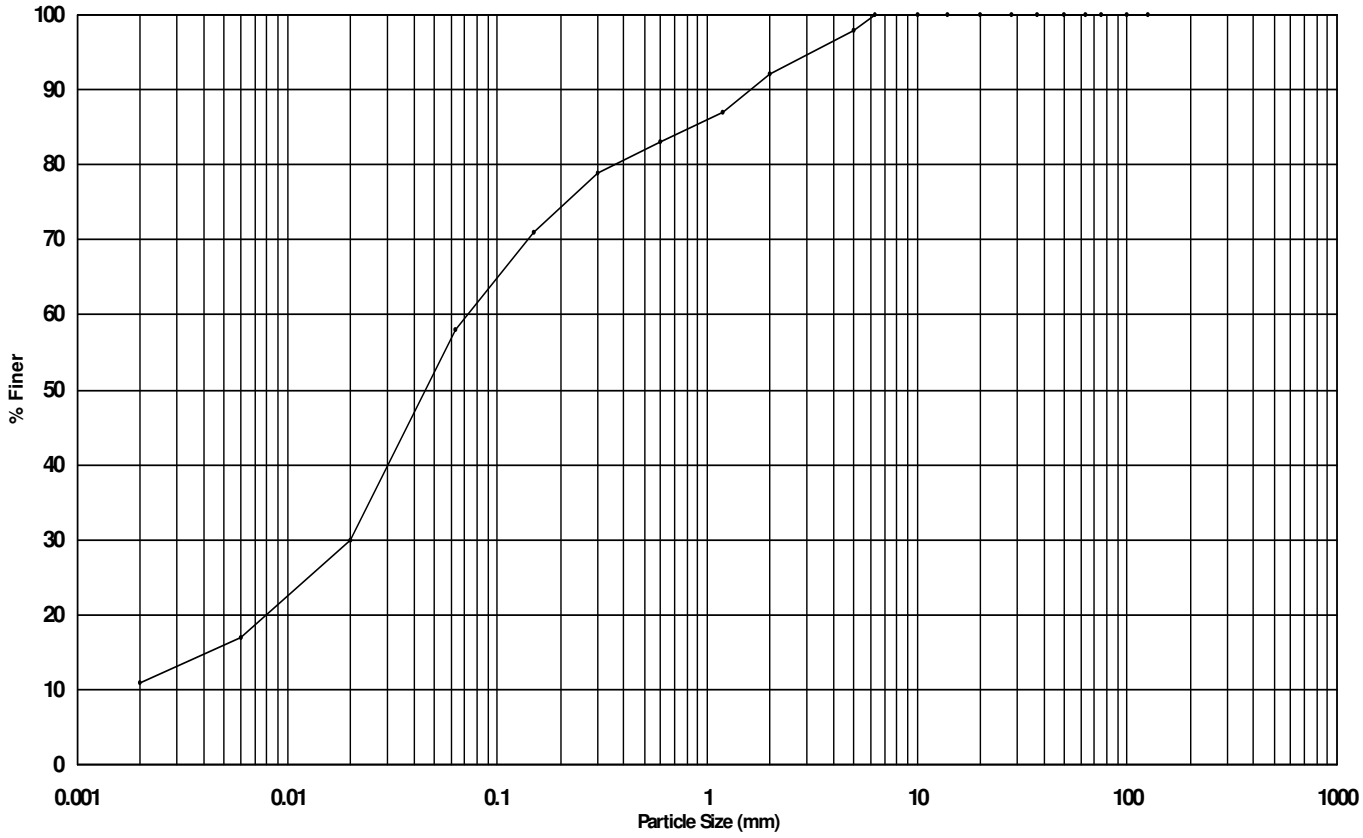
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH17
Sample Depth 9.50-10.00m
Sample Type B
Sample Ref E67202

Sample Description

Grey slightly sandy slightly gravelly SILT with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	11
SILT	47
SAND	34
GRAVEL	8
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	98
3.35mm	-

Size	Percentage Finer
2mm	92
1.18mm	87
600μm	83
425μm	-
300μm	79
212μm	-
150μm	71
75μm	-
63μm	58
20μm	30
6μm	17
2μm	11

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

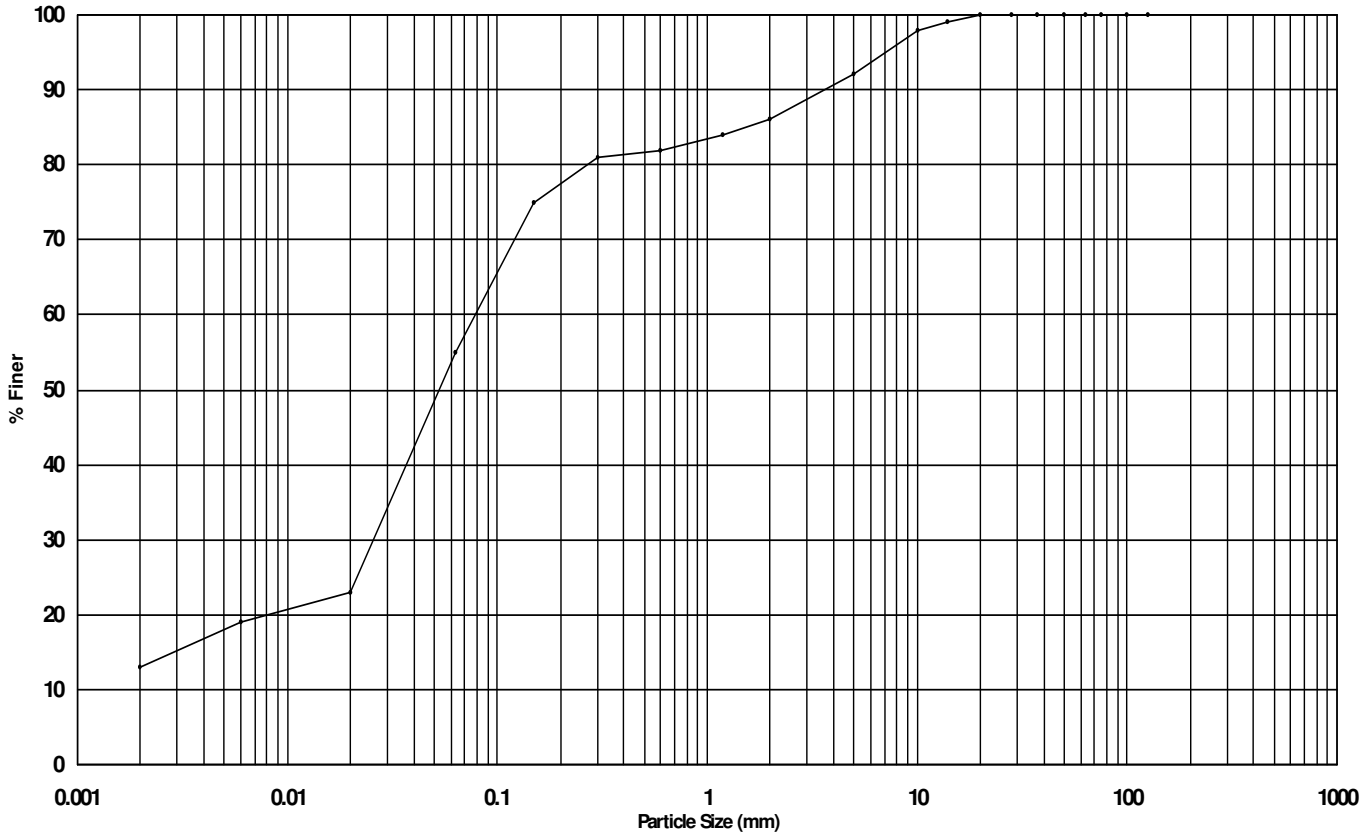
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH19
Sample Depth 13.00-13.50m
Sample Type B
Sample Ref E67207

Sample Description

Grey slightly sandy slightly gravelly silty CLAY with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	13
SILT	42
SAND	31
GRAVEL	14
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	99
10mm	98
6.3mm	-
5mm	92
3.35mm	-

Size	Percentage Finer
2mm	86
1.18mm	84
600µm	82
425µm	-
300µm	81
212µm	-
150µm	75
75µm	-
63µm	55
20µm	23
6µm	19
2µm	13

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	1.76
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - *Particle Size Distribution*

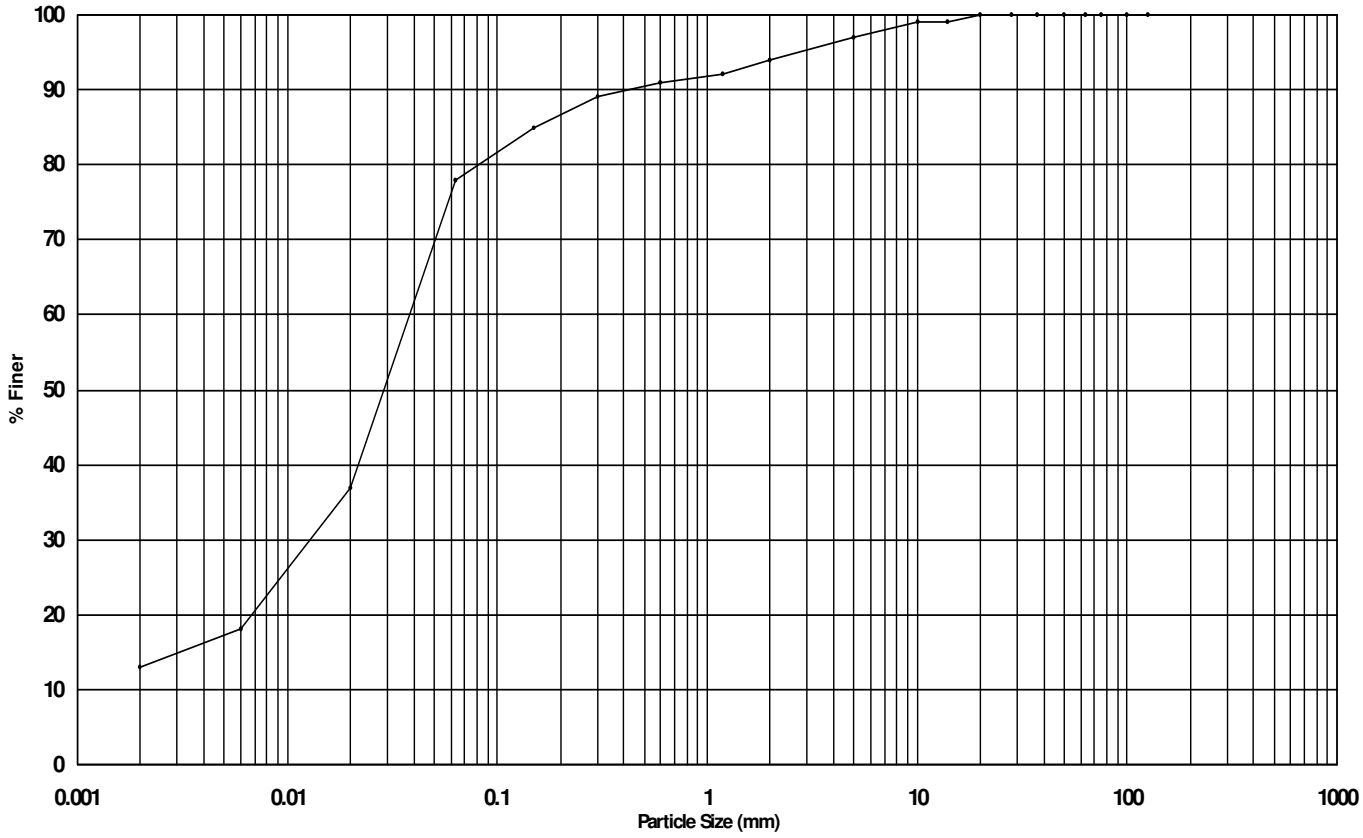
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH19
Sample Depth 14.50m
Sample Type D
Sample Ref E67210

Sample Description

Grey slightly sandy silty CLAY with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	13
SILT	65
SAND	16
GRAVEL	6
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	99
10mm	99
6.3mm	-
5mm	97
3.35mm	-

Size	Percentage Finer
2mm	94
1.18mm	92
600µm	91
425µm	-
300µm	89
212µm	-
150µm	85
75µm	-
63µm	78
20µm	37
6µm	18
2µm	13

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	1.71
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - Particle Size Distribution

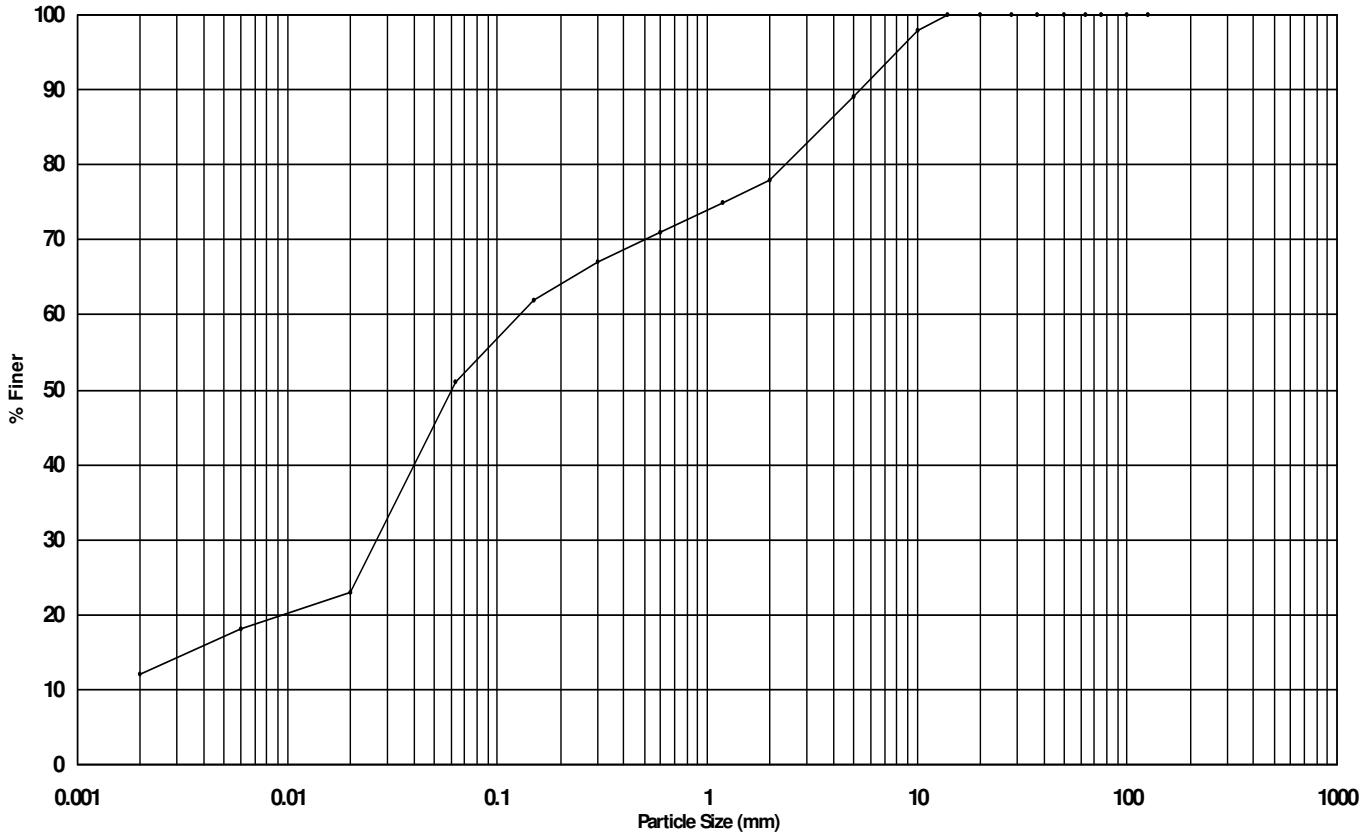
Project: PLYMOUTH EFW

Project No: PE100830

Hole BH22
Sample Depth 9.00-9.50m
Sample Type B
Sample Ref E67232

Sample Description

Grey slightly sandy slightly gravelly SILT with shell fragments.



Classification		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
	CLAY	SILT			SAND			Gravel				

Classification	% of each
CLAY	12
SILT	39
SAND	27
GRAVEL	22
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	98
6.3mm	-
5mm	89
3.35mm	-

Size	Percentage Finer
2mm	78
1.18mm	75
600μm	71
425μm	-
300μm	67
212μm	-
150μm	62
75μm	-
63μm	51
20μm	23
6μm	18
2μm	12

Uniformity Coefficient
Not Available

Sieving Method
Wet sieve

Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.15
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

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LABORATORY RESULTS - *Consolidation e/logp Plot*

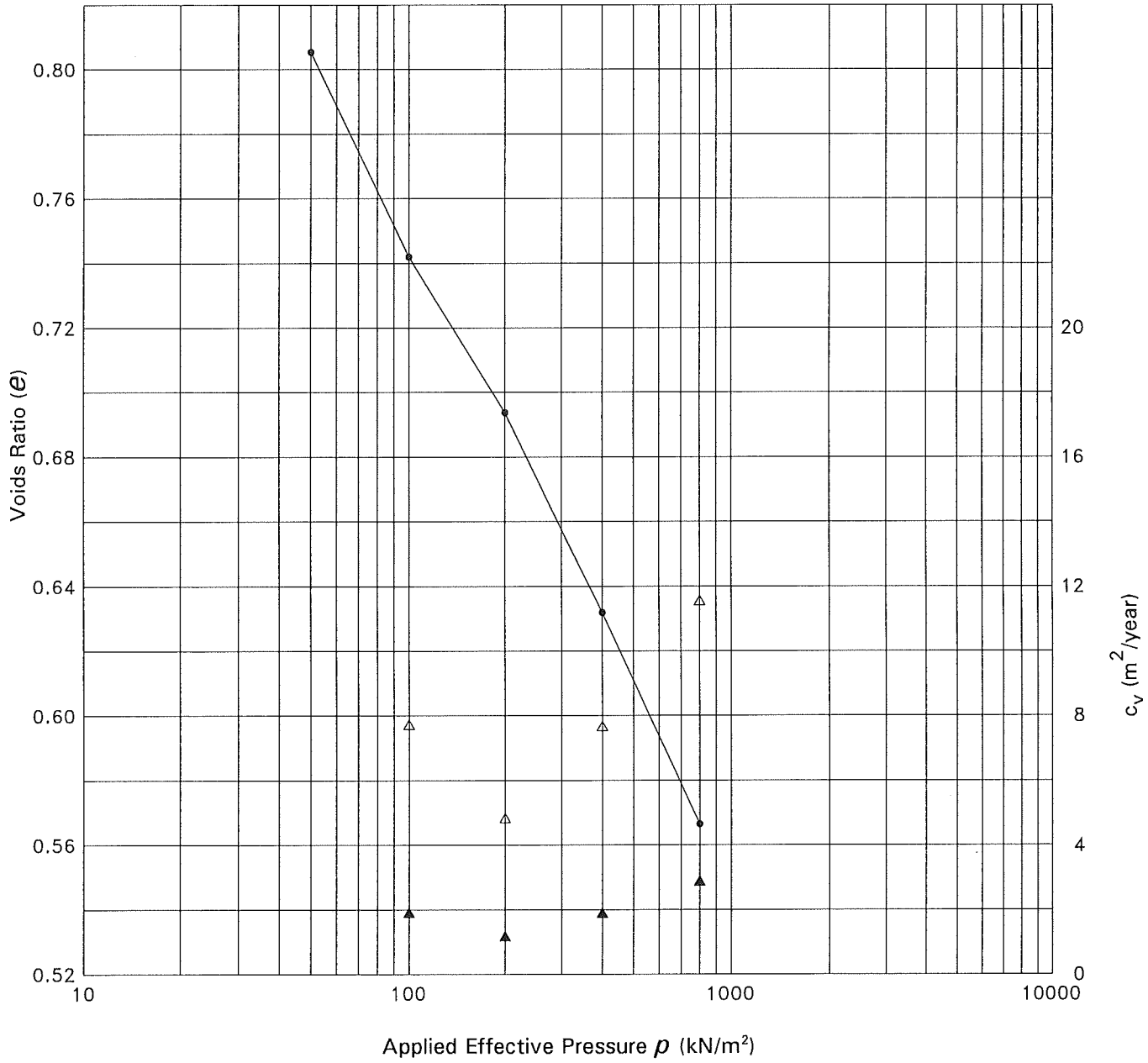
Project PLYMOUTH EFW

Client

Project No PE100830
Borehole BH1A
Sample Depth 9.00 - 9.45 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m²	0-50	50-100	100-200	200-400	400-800					
m_v m^2/MN	1.77	0.70	0.28	0.18	0.10					
c_{v50} Log Time m^2/yr	-	1.91	1.18	1.90	2.89					
c_{v90} Root Time m^2/yr	-	7.72	4.84	7.67	11.56					
Voids Ratio	0.805	0.742	0.694	0.632	0.567					

Description
E67076 Grey slightly sandy silty CLAY with shell fragments.

Specimen Diameter	74.620	mm
Initial Height	19.000	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	0.981	

Initial Water Content	32.99	%
Final Water Content	27.12	%
Initial Saturation	89.16	%
Initial Bulk Density	1.78	Mg/m^3
Initial Dry Density	1.34	Mg/m^3

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample

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LABORATORY RESULTS - *Consolidation e/logp Plot*

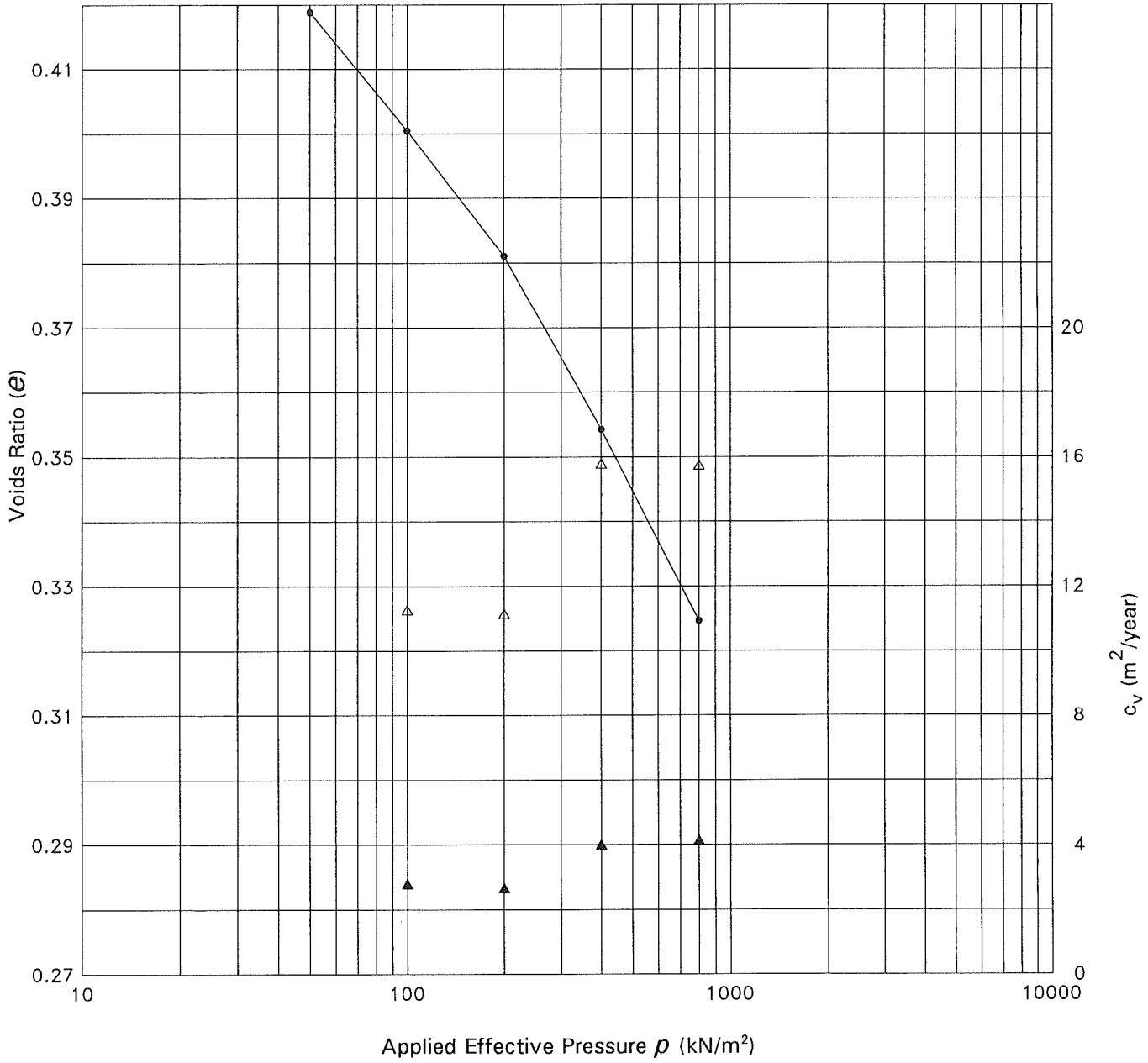
Project PLYMOUTH EFW

Client

Project No PE100830
Borehole BH2
Sample Depth 9.50 - 9.95 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m²	0-50	50-100	100-200	200-400	400-800					
m_v m^2/MN	0.72	0.26	0.14	0.10	0.05					
c_{v50} Log Time m^2/yr	-	2.79	2.66	4.00	4.14					
c_{v90} Root Time m^2/yr	-	11.27	11.15	15.79	15.74					
Voids Ratio	0.419	0.400	0.381	0.354	0.325					

Description
E67080 Grey gravelly CLAY/SILT.

Specimen Diameter	75.160	mm
Initial Height	18.550	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	0.472	

Initial Water Content	19.79	%
Final Water Content	15.30	%
Initial Saturation	100	%
Initial Bulk Density	2.16	Mg/m^3
Initial Dry Density	1.80	Mg/m^3

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample
Small inclusions removed

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LABORATORY RESULTS - *Consolidation e/logp Plot*

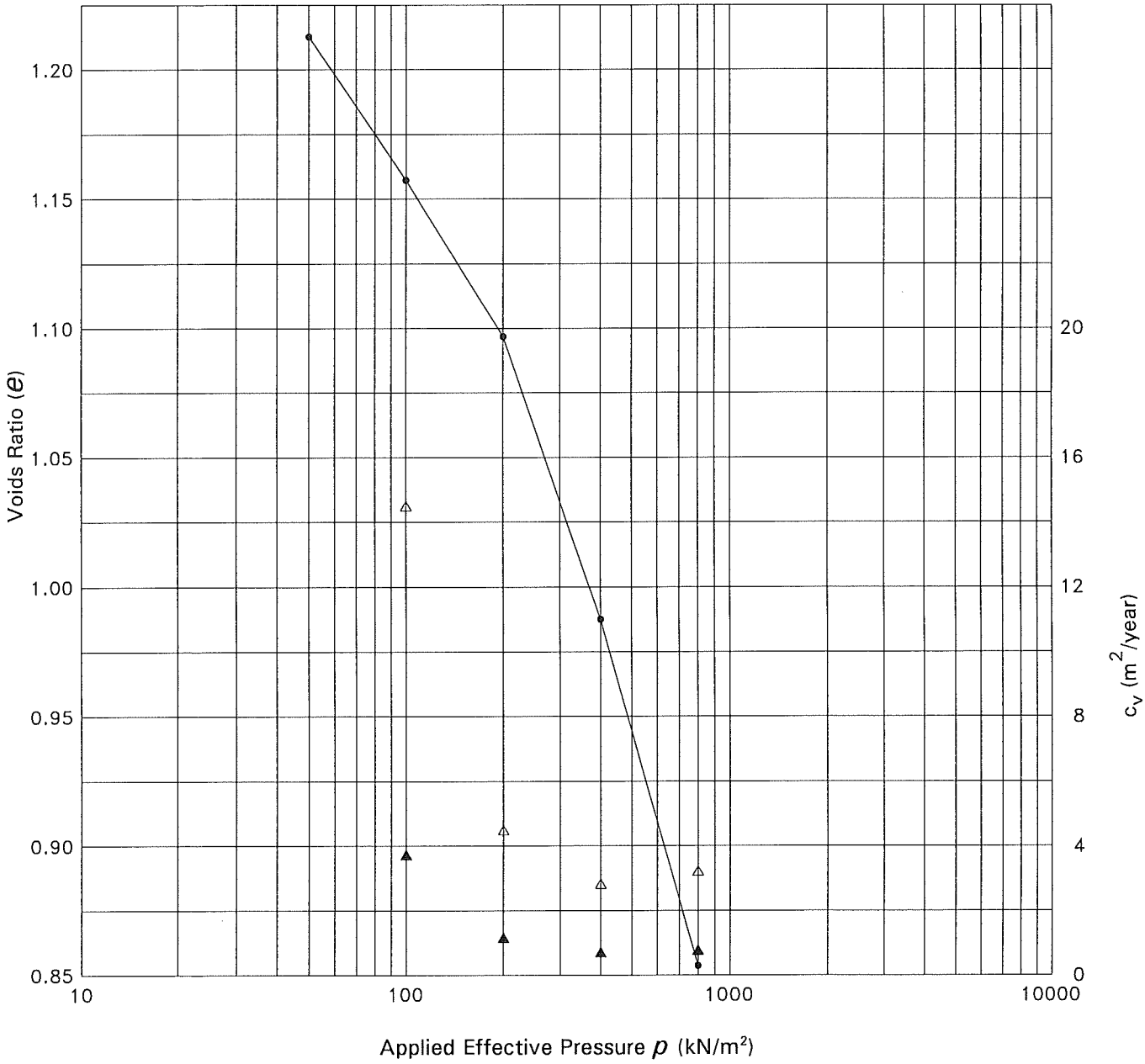
Project PLYMOUTH EFW

Client

Project No PE100830
Borehole BH3
Sample Depth 12.00 - 12.45 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m^2	0-50	50-100	100-200	200-400	400-800					
m_v m^2/MN	0.63	0.50	0.28	0.26	0.17					
c_{v50} Log Time m^2/yr	-	3.73	1.16	0.70	0.77					
c_{v90} Root Time m^2/yr	-	14.50	4.49	2.83	3.22					
Voids Ratio	1.213	1.157	1.097	0.988	0.854					

Description
E67084 Grey slightly sandy clayey SILT with shell fragments.

Specimen Diameter	74.720	mm
Initial Height	18.820	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	1.285	

Initial Water Content	42.46	%
Final Water Content	38.36	%
Initial Saturation	87.58	%
Initial Bulk Density	1.65	Mg/m^3
Initial Dry Density	1.16	Mg/m^3

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample

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LABORATORY RESULTS - *Consolidation e/logp Plot*

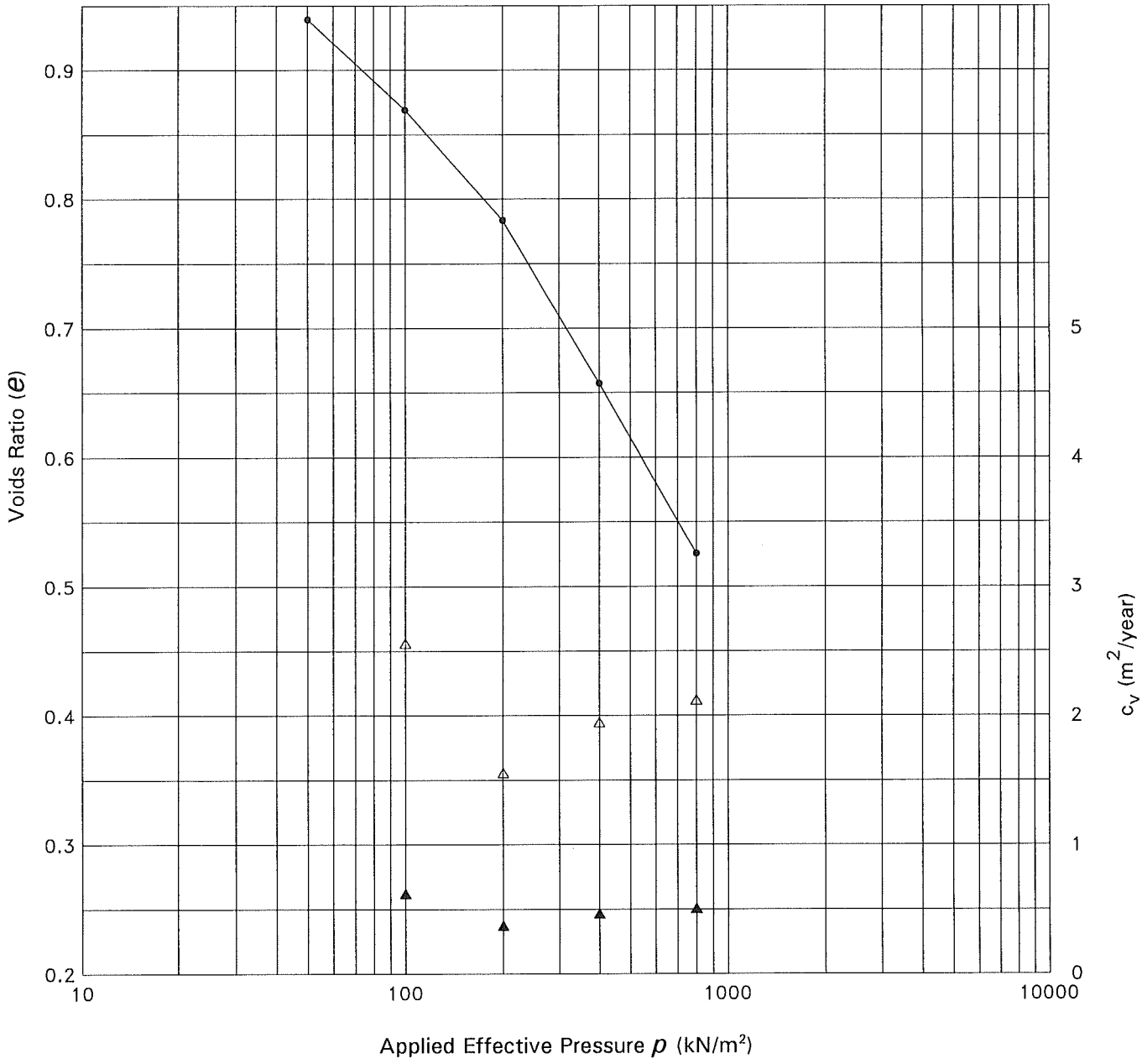
Project PLYMOUTH EFW

Client

Project No PE100830
Borehole BH12A
Sample Depth 10.50 - 10.95 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m^2	0-50	50-100	100-200	200-400	400-800					
m_v m^2/MN	0.94	0.72	0.46	0.35	0.20					
c_{v50} Log Time m^2/yr	-	0.62	0.37	0.46	0.51					
c_{v90} Root Time m^2/yr	-	2.56	1.56	1.95	2.12					
Voids Ratio	0.939	0.869	0.783	0.657	0.526					

Description
E67095 Grey slightly sandy clayey SILT with shell fragments.

Specimen Diameter	74.590	mm
Initial Height	18.780	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	1.035	

Initial Water Content	25.11	%
Final Water Content	12.35	%
Initial Saturation	64.28	%
Initial Bulk Density	1.63	Mg/m^3
Initial Dry Density	1.30	Mg/m^3

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample

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LABORATORY RESULTS - *Consolidation e/logp Plot*

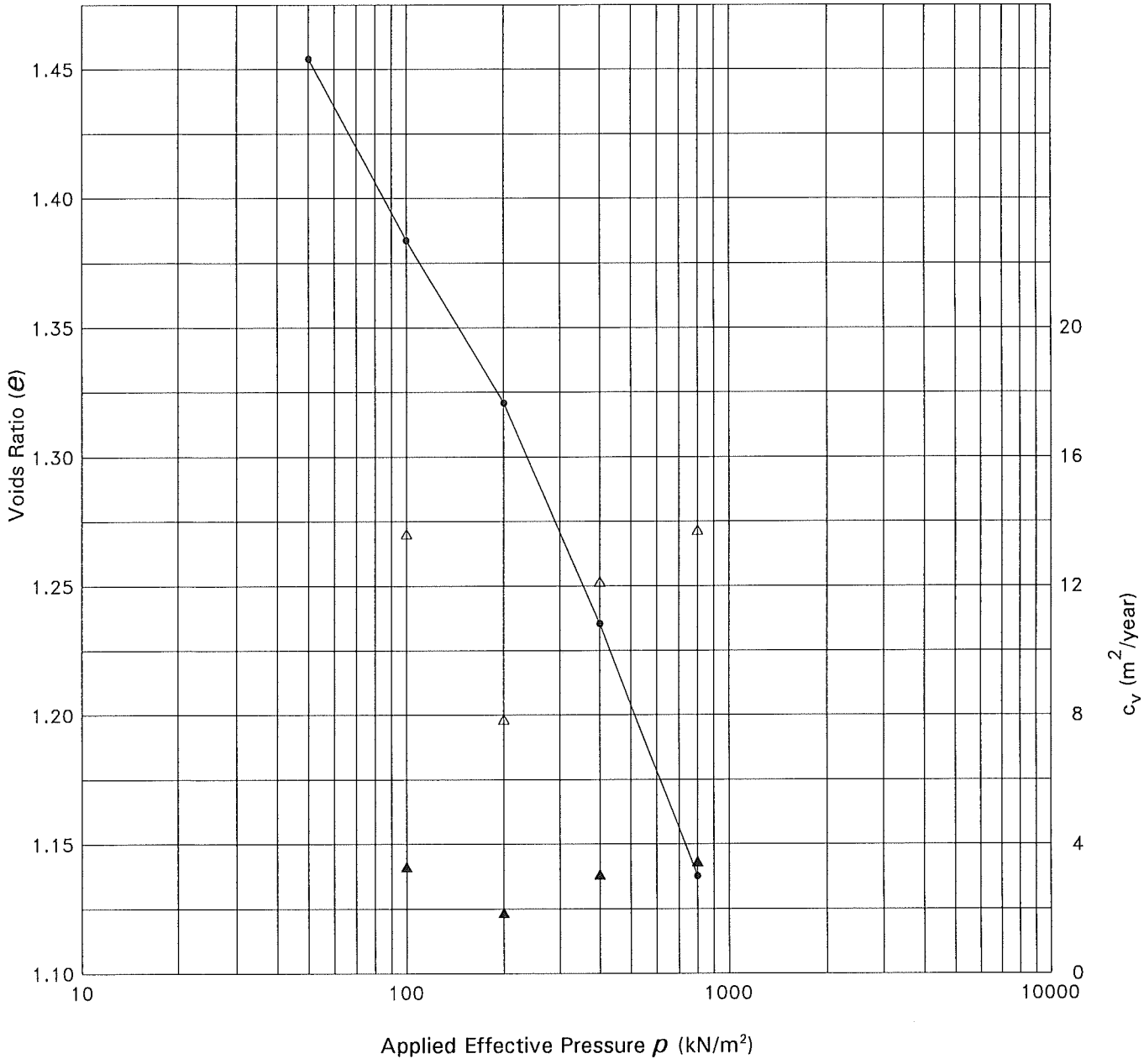
Project PLYMOUTH EFW

Client

Project No PE100830
Borehole BH13
Sample Depth 12.00 - 12.45 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m²	0-50	50-100	100-200	200-400	400-800					
m_v m²/MN	1.13	0.57	0.26	0.18	0.11					
c_{v50} Log Time m²/yr	-	3.30	1.87	3.05	3.46					
c_{v90} Root Time m²/yr	-	13.62	7.87	12.13	13.73					
Voids Ratio	1.454	1.384	1.321	1.235	1.138					

Description
E67081 Grey slightly gravelly clayey SILT with occasional shell fragments.

Specimen Diameter	74.620	mm
Initial Height	18.760	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	1.602	

Initial Water Content	78.28	%
Final Water Content	67.36	%
Initial Saturation	100	%
Initial Bulk Density	1.82	Mg/m³
Initial Dry Density	1.02	Mg/m³

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample

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LABORATORY RESULTS - *Consolidation e/logp Plot*

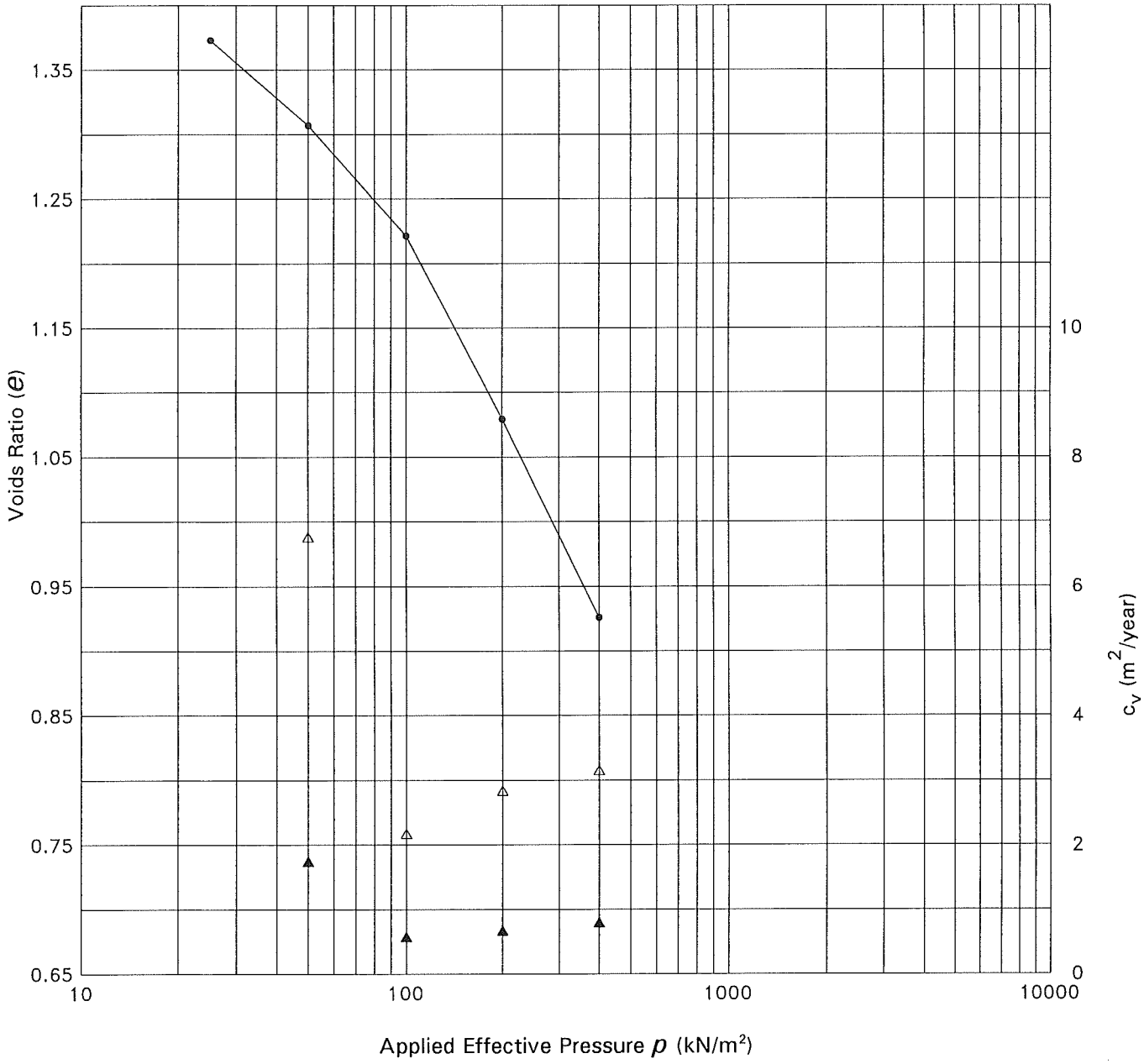
Project PLYMOUTH EFW

Client

Project No PE100830
Borehole BH15
Sample Depth 7.50 - 7.95 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio ●, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m²	0-25	25-50	50-100	100-200	200-400					
m_v m^2/MN	1.48	1.11	0.74	0.64	0.37					
c_{v50} Log Time m^2/yr	-	1.74	0.57	0.67	0.79					
c_{v90} Root Time m^2/yr	-	6.76	2.17	2.84	3.15					
Voids Ratio	1.373	1.307	1.221	1.079	0.926					

Description
E60794 Grey sandy clayey SILT with occassional shell fragments and gypsum crystals

Specimen Diameter	74.650	mm
Initial Height	18.980	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	1.464	

Initial Water Content	55.38	%
Final Water Content	42.35	%
Initial Saturation	100	%
Initial Bulk Density	1.67	Mg/m^3
Initial Dry Density	1.08	Mg/m^3

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample

geotechnics

LABORATORY RESULTS - *Consolidation e/logp Plot*

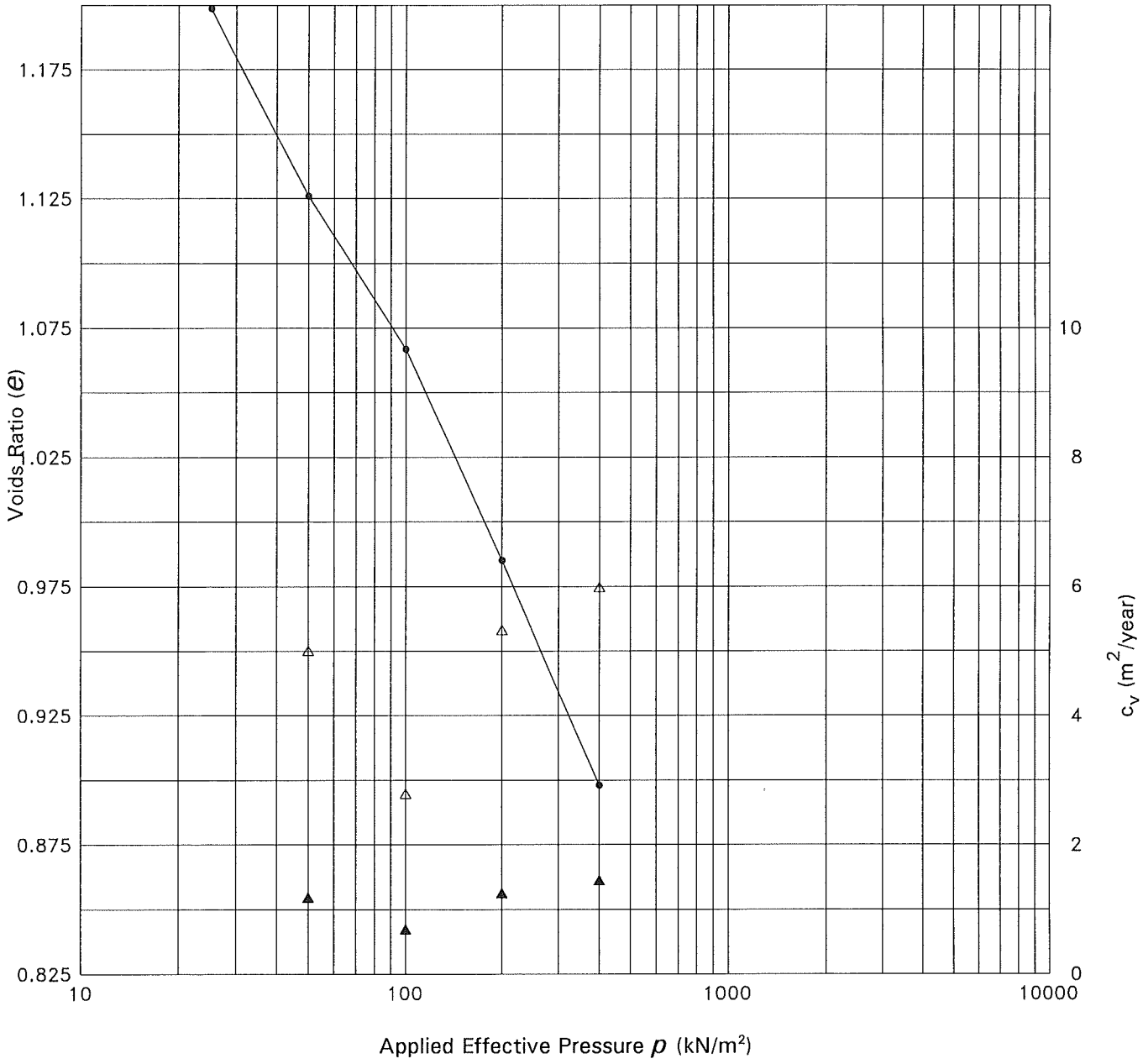
Project PLYMOUTH EFW

Client

Project No PE100830
Borehole BH17
Sample Depth 7.50 - 7.95 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m²	0-25	25-50	50-100	100-200	200-400					
m_v m²/MN	2.32	1.32	0.56	0.40	0.22					
c_{v50} Log Time m²/yr	-	1.18	0.69	1.25	1.45					
c_{v90} Root Time m²/yr	-	5.01	2.79	5.32	5.99					
Voids Ratio	1.199	1.126	1.067	0.985	0.898					

Description
E67089 Grey slightly sandy SILT.

Specimen Diameter	74.560	mm
Initial Height	19.000	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	1.334	

Initial Water Content	50.80	%
Final Water Content	37.70	%
Initial Saturation	100	%
Initial Bulk Density	1.71	Mg/m³
Initial Dry Density	1.14	Mg/m³

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample
Small inclusions removed

geotechnics

LABORATORY RESULTS - *Consolidation e/logp Plot*

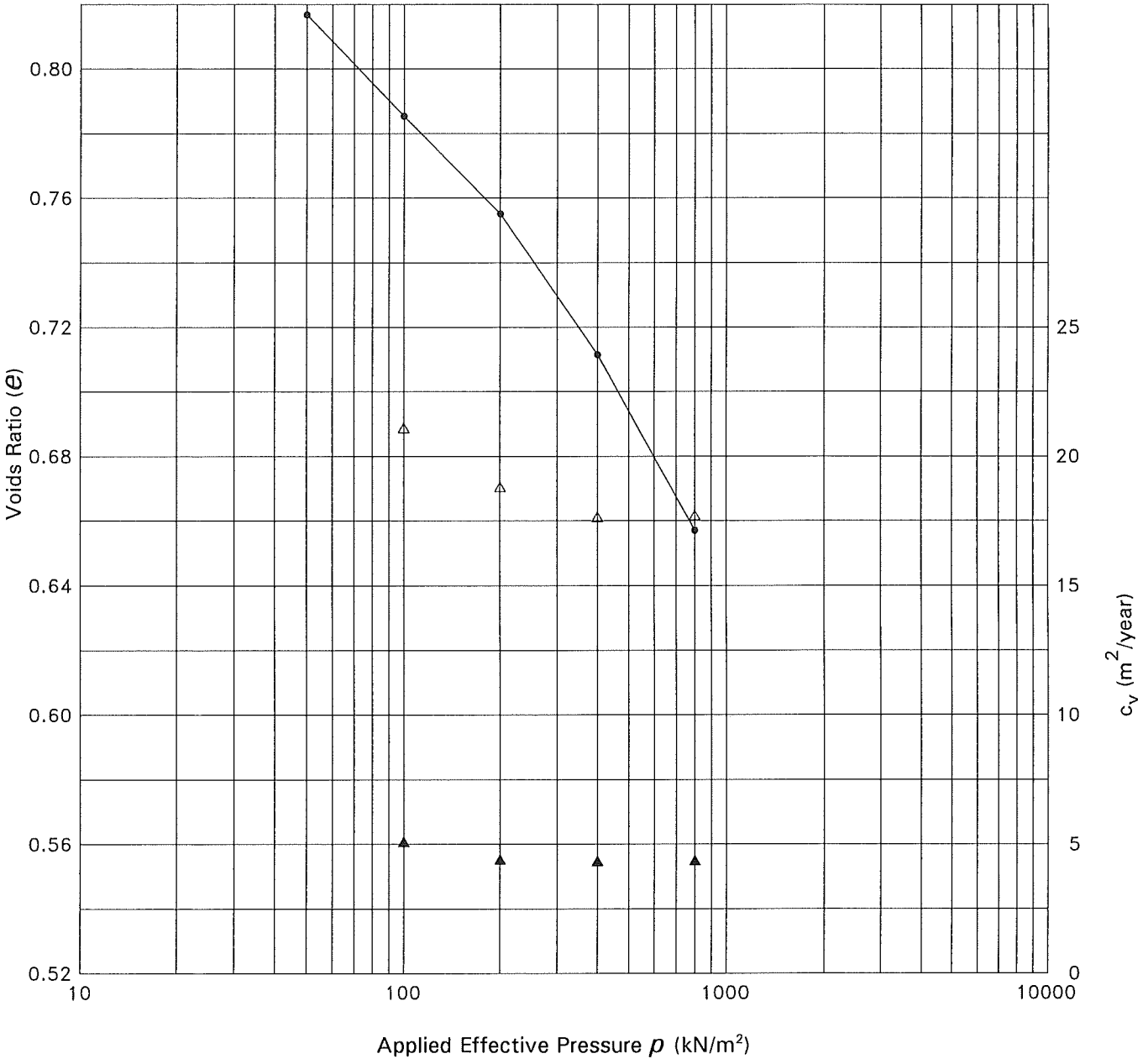
Project PLYMOUTH EFW

Client

Project No PE100830
Borehole BH19
Sample Depth 13.50 - 13.95 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m²	0-50	50-100	100-200	200-400	400-800					
m_v m²/MN	0.75	0.35	0.17	0.12	0.08					
c_{v50} Log Time m²/yr	-	5.09	4.41	4.34	4.37					
c_{v90} Root Time m²/yr	-	21.09	18.81	17.65	17.71					
Voids Ratio	0.817	0.785	0.755	0.711	0.657					

Description
E67093 Brown slightly gravelly silty CLAY with occasional shell fragments.

Specimen Diameter	74.600	mm
Initial Height	18.730	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	0.888	

Initial Water Content	34.24	%
Final Water Content	29.01	%
Initial Saturation	100	%
Initial Bulk Density	1.88	Mg/m³
Initial Dry Density	1.40	Mg/m³

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample

geotechnics

LABORATORY RESULTS - *Consolidation e/logp Plot*

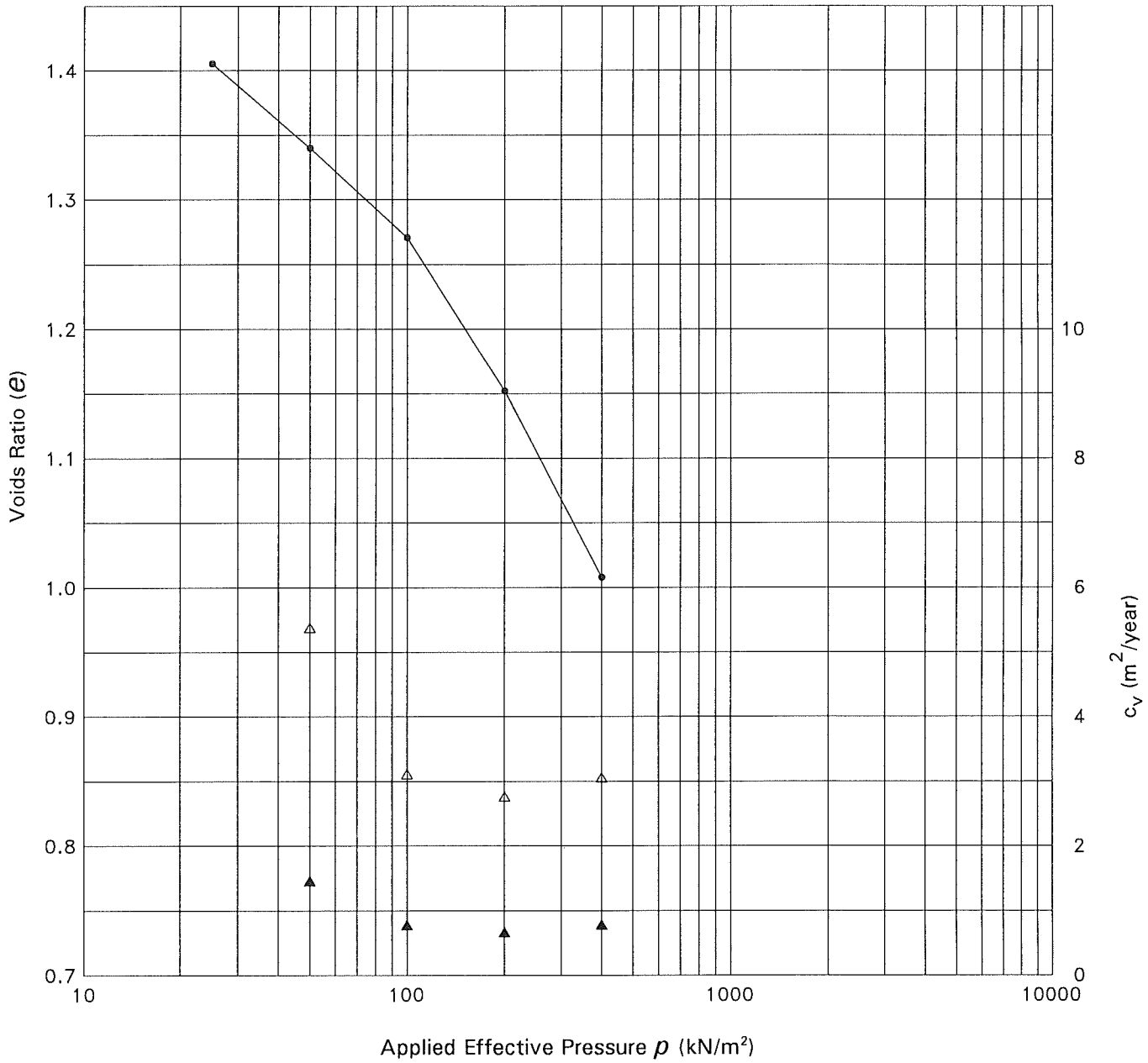
Project PLYMOUTH EFW

Client

Project No PE100830
Borehole BH22
Sample Depth 7.50 - 7.95 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m²	0-25	25-50	50-100	100-200	200-400					
m_v m²/MN	1.07	1.09	0.59	0.52	0.34					
c_{v50} Log Time m²/yr	-	1.46	0.78	0.66	0.78					
c_{v90} Root Time m²/yr	-	5.38	3.11	2.76	3.05					
Voids Ratio	1.405	1.340	1.271	1.152	1.008					

Description
E67097 Grey slightly sandy slightly gravelly clayey SILT.

Specimen Diameter	75.080	mm
Initial Height	18.950	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	1.472	

Initial Water Content	52.50	%
Final Water Content	44.52	%
Initial Saturation	94.53	%
Initial Bulk Density	1.63	Mg/m³
Initial Dry Density	1.07	Mg/m³

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample

geotechnics

LABORATORY RESULTS - Test Remarks

Project PLYMOUTH EFW **Project No:** PE100830

Sample				Laboratory Remark
Hole	Depth (Specimen Depth) m	Type	Sample Ref	
BH19	13.50-13.95 (13.50-13.95)	U	E67093	Quick Undrained Triaxial Test - UT= Sample too fissured

Remarks

geotechnics

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 8:1990

Borehole : **BH22** Sample Ref : Sample Type : **U** Depth (m) : **7.57**

Sample Diameter (mm) : **102.01** Sample Height (mm) : **205.15**

Drainage : **Radial + 1 End** Sample Condition : **Undisturbed**

Description : **Grey CLAY**

	STAGE NUMBER	1	2	3
PROPERTIES	Initial Moisture Content (%)	**52**		
	Initial Bulk Density (Mg/m^3)	**1.67**		
	Initial Dry Density (Mg/m^3)	**1.10**		
	Final Moisture Content (%)	**33**		
	Final Bulk Density (Mg/m^3)	**1.81**		
	Final Dry Density (Mg/m^3)	**1.36**		
SATURATION	Final Back Pressure (kPa)	**290**		
	Cell Pressure Increment (kPa)	**75**		
	Pore Pressure Increment (kPa)	**74.1**		
	Final Pore Pressure Ratio - B Value	**0.99**		
CONSOLIDATION	Cell Pressure (kPa)	**425**	**550**	**800**
	Back Pressure (kPa)	**300**	**300**	**300**
	Effective Cell Pressure (kPa)	**125**	**250**	**500**
	Initial Volume (cm^3)	**1676.52**	**1478.26**	**1406.46**
	Final Volume (cm^3)	**1478.26**	**1406.46**	**1348.22**
	Change in Volume (cm^3)	**198.26**	**71.80**	**58.24**
COMPRESSION	Cell Pressure (kPa)	**425**	**550**	**800**
	Initial Pore Water Pressure (kPa)	**302.0**	**303.3**	**321.8**
	Strain Rate (mm/min)	**0.0092**	**0.0073**	**0.0089**
	Axial Strain at Failure (%)	**8.00**	**14.05**	**20.39**
	Time to Failure (hrs)	**28.5**	**24.7**	**19.7**
	Deviator Stress at Failure (kPa)	**107.3**	**205.1**	**373.6**
	Pore Pressure at Failure (kPa)	**379.2**	**465.1**	**632.6**
	Effective Major Principal Stress (kPa)	**153.2**	**290.0**	**541.0**
	Effective Minor Principal Stress (kPa)	**45.8**	**84.9**	**167.4**
	Effective Principal Stress Ratio	**3.34**	**3.42**	**3.23**
	Pore Pressure Coefficient - A_f	**0.72**	**0.79**	**0.83**

Effective Cohesion (kPa) : **5** Angle of Shear Resistance (degs) : **31.5**

Approved Signatories: D. TROWBRIDGE A. FROST F. HAMILTON M. STOKES

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By	Date	Checked By	Date
A.D. Frost	29/9/10		

Contract: **Plymouth EFW**

Job No: **741594**

Sheet: of

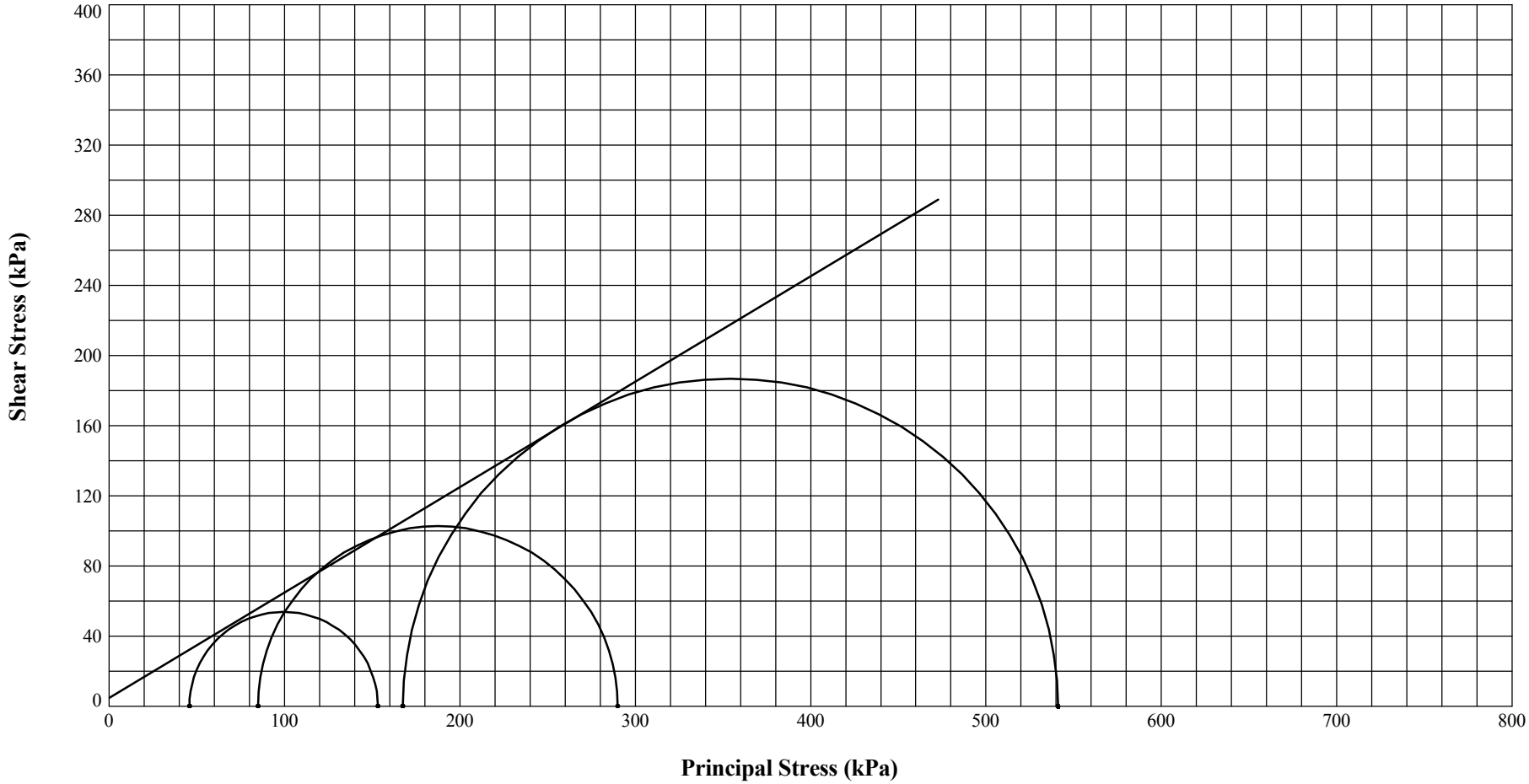
AGS

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CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION - MOHR CIRCLES

In accordance with BS1377:Part 8:1990

Borehole : **BH22** Sample Ref : Sample Type : **U** Depth (m) : **7.57**



Approved Signatories: D. TROWBRIDGE A. FROST F. HAMILTON M. STOKES

STRUCTURAL SOILS 1a Princess Street Bedminster Bristol BS3 4AG	Compiled By	Date	Contract Ref:
	A.D. Frost **ALAN FROST**	**29.9.10**	**741594**
	Contract **Plymouth EFW**		of

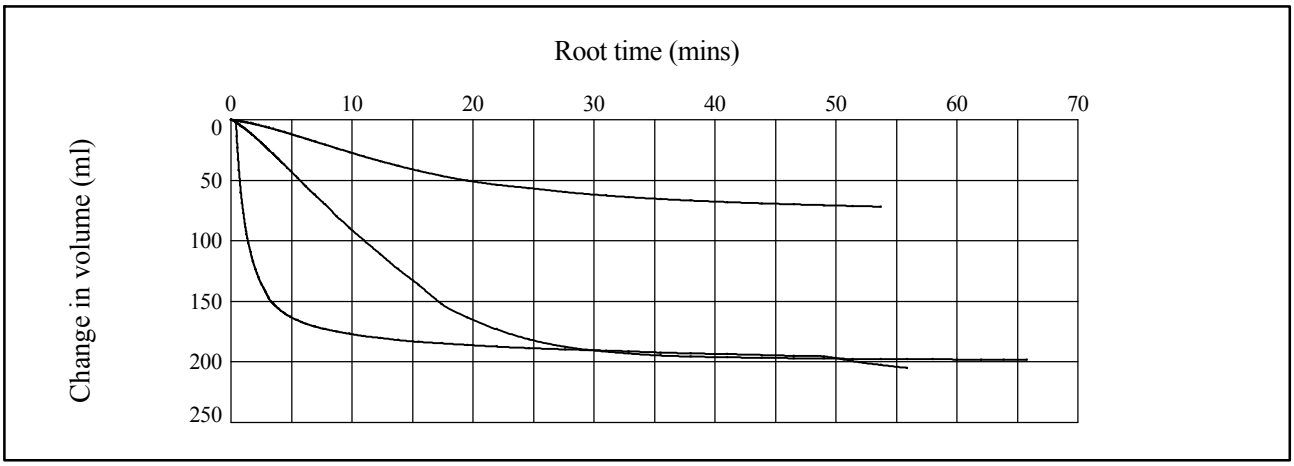
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CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

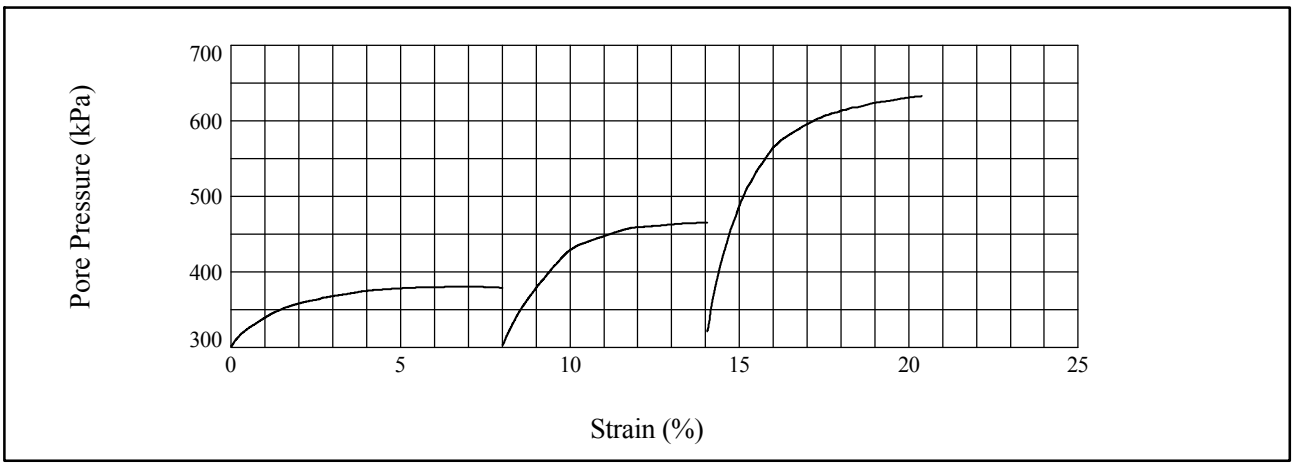
In accordance with BS1377:Part 8:1990

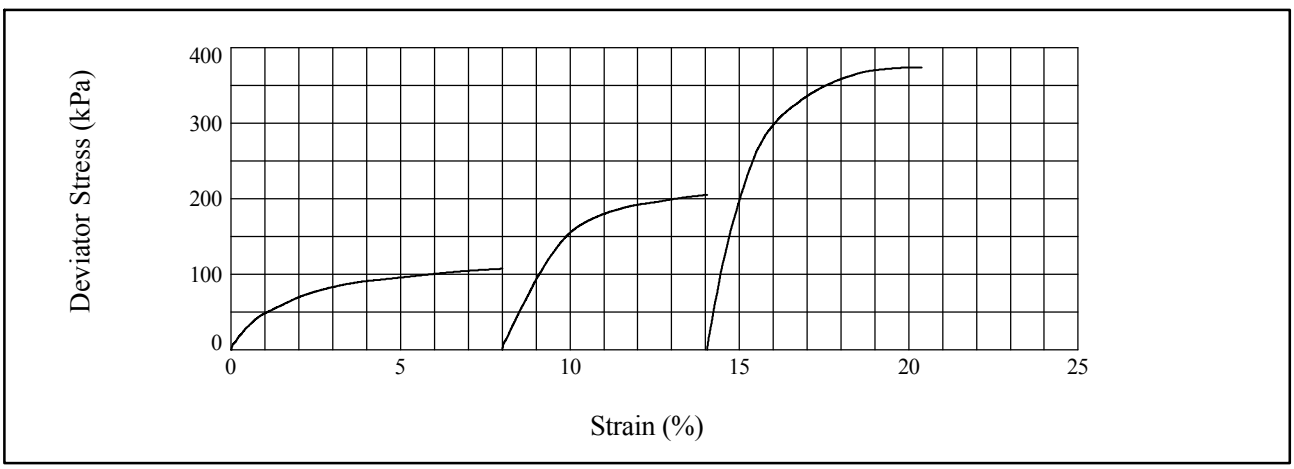
Borehole : **BH22** Sample Ref: Sample Type: **U** Depth (m): **7.57**

CONSOLIDATION STAGE



SHEAR STAGE





Approved Signatories: D. TROWBRIDGE A. FROST F. HAMILTON M. STOKES

STRUCTURAL SOILS 1a Princess Street Bedminster Bristol BS3 4AG	Compiled By		Date
	A.D. Frost	**ALAN FROST**	**29/9/10**
	Contract **Plymouth EFW**	Contract Ref: **741594**	
		Page of	

GINT_LIBRARY_V8_03.GLB|L - EFFECTIVE STRESS 3.3 CU | LAB_741594.GPJ - v8_03 | 29/9/10 - 13:40 | AF.

APPENDIX 12

Laboratory Test Results - Contamination (Soil & Leachate)

Certificate of Analysis

2139

Date: 05/08/2010

Certificate Number: 10-40084

Client:

Geotechnics Ltd
7 Pinbrooks Unit
Venny Bridge
Exeter
EX4 8JQ

Our Reference: 10-40084

Client Reference: PE100830

Contract Title: Plymouth EFW

Description: 8 leachate samples, 26 soil samples

Date Received: 27/07/2010

Date Started: 27/07/2010

Date Completed: 05/08/2010

Test Procedures: Identified by prefix DETSn, details available upon request.

Notes: Observations and interpretations are outside the scope of UKAS accreditation
* denotes test not included in laboratory scope of accreditation
# denotes test that holds MCERT accreditation, however, MCERTS accreditation is only implied if the report carries the MCERTS logo
$ denotes tests completed by an approved subcontractor
I/S denotes insufficient sample to carry out test
U/S denotes that the sample is not suitable for testing
DETSM denotes tests carried out by DETS Midlands laboratory
Solid samples will be disposed 1 month and liquids 2 weeks after the date of issue of this test certificate
Asbestos subsamples will be kept for 6 months

Approved By:



Authorised Signatories: Neil Dobinson
Process Development Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272773	272774	272775	272776	272777
		Sample Ref	BH11	BH12	BH15	BH20A	BH20A
		Depth	5.00	1.00	5.00	1.00	5.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Arsenic	mg/kg	DETS 042#	24	19	28	15	18
Cadmium	mg/kg	DETS 042#	0.5	0.6	0.6	0.3	0.4
Chromium	mg/kg	DETS 042#	30	19	34	20	18
Copper	mg/kg	DETS 042#	57	62	55	49	34
Lead	mg/kg	DETS 042#	140	57	150	100	57
Mercury	mg/kg	DETS 081#	0.26	0.11	0.53	0.19	0.13
Nickel	mg/kg	DETS 042#	42	24	39	24	27
Selenium	mg/kg	DETS 042#	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tin	mg/kg	DETS 042*	3	2	2	< 1	2
Zinc	mg/kg	DETS 042#	170	130	160	100	99
Cyanide total	mg/kg	DETS 067#		< 0.1	< 0.1	< 0.1	< 0.1
Cyanide free	mg/kg	DETS 067#		< 0.1	< 0.1	< 0.1	< 0.1
Total Organic Carbon	%	DETS 002		0.6	1.0	0.8	1
pH		DETS 008#		10.5	10.4	11.5	10.9
Aliphatic C5-C6	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	2.4	6.1	4.5	15	9
Aliphatic C16-C21	mg/kg	DETS 072#	11	28	63	140	28
Aliphatic C21-C35	mg/kg	DETS 072#	48	75	550	1100	100
Aromatic C5-C7	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	< 0.5	< 0.5	< 0.5	< 0.5	2.4
Aromatic C16-C21	mg/kg	DETS 072#	4.5	5.4	1.7	1.5	9.9
Aromatic C21-C35	mg/kg	DETS 072#	7	9.2	3.1	2.7	8.8
Aliphatic C5-C35	mg/kg	DETS 072*	62	110	620	1200	140
Aromatic C5-C35	mg/kg	DETS 072*	11	15	< 10	< 10	21
TPH Ali/Aro	mg/kg	DETS 072*	74	120	630	1200	160
Acenaphthene	mg/kg	DETS 050	< 0.1				
Acenaphthylene	mg/kg	DETS 050	< 0.1				
Anthracene	mg/kg	DETS 050	< 0.1				
Benzo(a)anthracene	mg/kg	DETS 050	0.3				
Benzo(a)pyrene	mg/kg	DETS 050	0.3				
Benzo(b)fluoranthene	mg/kg	DETS 050	0.3				
Benzo(k)fluoranthene	mg/kg	DETS 050	0.1				
Benzo(g,h,i)perylene	mg/kg	DETS 050	0.3				
Chrysene	mg/kg	DETS 050	0.3				
Dibenzo(a,h)anthracene	mg/kg	DETS 050	< 0.1				
Fluoranthene	mg/kg	DETS 050	1				
Fluorene	mg/kg	DETS 050	< 0.1				
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	0.2				
Naphthalene	mg/kg	DETS 050	< 0.1				

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272773	272774	272775	272776	272777
		Sample Ref	BH11	BH12	BH15	BH20A	BH20A
		Depth	5.00	1.00	5.00	1.00	5.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Phenanthrene	mg/kg	DETS 050	0.2				
Pyrene	mg/kg	DETS 050	0.6				
PAH	mg/kg	DETS 050	3.6				
Phenol - Monohydric	mg/kg	DETS 067#	0.4				

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272778	272779	272780	272781	272782
		Sample Ref	BH21	BH22	TP1	TP2	TP3
		Depth	3.00	3.00	1.00	1.00	1.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Arsenic	mg/kg	DETS 042#	13	25	7	27	30
Cadmium	mg/kg	DETS 042#	0.3	0.5	0.3	0.8	1.9
Chromium	mg/kg	DETS 042#	15	18	22	48	28
Copper	mg/kg	DETS 042#	44	44	31	110	160
Lead	mg/kg	DETS 042#	110	93	42	150	990
Mercury	mg/kg	DETS 081#	0.29	0.22	0.1	0.79	5.2
Nickel	mg/kg	DETS 042#	19	25	17	55	27
Selenium	mg/kg	DETS 042#	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tin	mg/kg	DETS 042*	2	1	< 1	12	13
Zinc	mg/kg	DETS 042#	160	140	90	430	560
Cyanide total	mg/kg	DETS 067#				< 0.1	0.2
Cyanide free	mg/kg	DETS 067#				< 0.1	< 0.1
Total Organic Carbon	%	DETS 002				0.9	1.2
pH		DETS 008#				10.6	9.5
Aliphatic C5-C6	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	< 1.5	2.1	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	10	20	< 1.2	< 1.2	2.1
Aliphatic C16-C21	mg/kg	DETS 072#	27	44	< 1.5	< 1.5	17
Aliphatic C21-C35	mg/kg	DETS 072#	99	82	< 3.4	< 3.4	61
Aromatic C5-C7	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	2.1	1.3	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#	11	49	7.1	3.9	2.6
Aromatic C21-C35	mg/kg	DETS 072#	11	42	7.5	9.4	6.6
Aliphatic C5-C35	mg/kg	DETS 072*	140	150	< 10	< 10	80
Aromatic C5-C35	mg/kg	DETS 072*	24	92	15	13	< 10
TPH Ali/Aro	mg/kg	DETS 072*	160	240	15	13	90
Acenaphthene	mg/kg	DETS 050	2.4	< 0.1	< 0.1		
Acenaphthylene	mg/kg	DETS 050	0.4	< 0.1	< 0.1		
Anthracene	mg/kg	DETS 050	4.1	0.4	< 0.1		
Benzo(a)anthracene	mg/kg	DETS 050	6.2	0.8	< 0.1		
Benzo(a)pyrene	mg/kg	DETS 050	4.8	0.9	0.2		
Benzo(b)fluoranthene	mg/kg	DETS 050	3.9	0.7	< 0.1		
Benzo(k)fluoranthene	mg/kg	DETS 050	2.1	0.3	< 0.1		
Benzo(g,h,i)perylene	mg/kg	DETS 050	4.8	0.8	0.5		
Chrysene	mg/kg	DETS 050	6.4	1.1	< 0.1		
Dibenzo(a,h)anthracene	mg/kg	DETS 050	0.6	0.1	< 0.1		
Fluoranthene	mg/kg	DETS 050	18	2.9	0.2		
Fluorene	mg/kg	DETS 050	2.8	< 0.1	< 0.1		
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	3.7	0.7	0.2		
Naphthalene	mg/kg	DETS 050	1.3	< 0.1	< 0.1		

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272778	272779	272780	272781	272782
		Sample Ref	BH21	BH22	TP1	TP2	TP3
		Depth	3.00	3.00	1.00	1.00	1.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Phenanthrene	mg/kg	DETS 050	12	0.8	< 0.1		
Pyrene	mg/kg	DETS 050	13	1.7	0.2		
PAH	mg/kg	DETS 050	85	11	< 1.6		
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3	< 0.3	< 0.3		

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272783	272784	272785	272786	272787
		Sample Ref	BH17	BH4	BH5	BH10	BH10
		Depth	8.00	4.00	3.00	1.00	7.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Arsenic	mg/kg	DETS 042#	12	22	15	20	150
Cadmium	mg/kg	DETS 042#	0.3	0.7	0.3	0.4	0.4
Chromium	mg/kg	DETS 042#	15	26	16	28	18
Copper	mg/kg	DETS 042#	13	100	50	55	120
Lead	mg/kg	DETS 042#	18	290	43	64	160
Mercury	mg/kg	DETS 081#	0.06	0.48	0.15	0.15	0.57
Nickel	mg/kg	DETS 042#	21	37	23	38	19
Selenium	mg/kg	DETS 042#	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tin	mg/kg	DETS 042*	< 1	6	< 1	< 1	7
Zinc	mg/kg	DETS 042#	73	200	83	110	150
Cyanide total	mg/kg	DETS 067#	< 0.1	0.1	< 0.1		< 0.1
Cyanide free	mg/kg	DETS 067#	< 0.1	< 0.1	< 0.1		< 0.1
Total Organic Carbon	%	DETS 002	2.4	1.6	0.6		0.6
pH		DETS 008#	8.7	9.6	11.2		10.5
Aliphatic C5-C6	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	< 1.5	17	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	< 1.2	72	< 1.2	2.3	1.5
Aliphatic C16-C21	mg/kg	DETS 072#	< 1.5	81	< 1.5	12	5.9
Aliphatic C21-C35	mg/kg	DETS 072#	< 3.4	130	< 3.4	38	13
Aromatic C5-C7	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	< 0.5	9.1	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#	< 0.6	59	1.3	2.7	3.9
Aromatic C21-C35	mg/kg	DETS 072#	< 1.4	47	1.7	2.9	4.9
Aliphatic C5-C35	mg/kg	DETS 072*	< 10	300	< 10	53	21
Aromatic C5-C35	mg/kg	DETS 072*	< 10	120	< 10	< 10	< 10
TPH Ali/Aro	mg/kg	DETS 072*	< 10	410	< 10	58	29
Acenaphthene	mg/kg	DETS 050				< 0.1	
Acenaphthylene	mg/kg	DETS 050				< 0.1	
Anthracene	mg/kg	DETS 050				< 0.1	
Benzo(a)anthracene	mg/kg	DETS 050				< 0.1	
Benzo(a)pyrene	mg/kg	DETS 050				< 0.1	
Benzo(b)fluoranthene	mg/kg	DETS 050				< 0.1	
Benzo(k)fluoranthene	mg/kg	DETS 050				< 0.1	
Benzo(g,h,i)perylene	mg/kg	DETS 050				< 0.1	
Chrysene	mg/kg	DETS 050				< 0.1	
Dibenzo(a,h)anthracene	mg/kg	DETS 050				< 0.1	
Fluoranthene	mg/kg	DETS 050				< 0.1	
Fluorene	mg/kg	DETS 050				< 0.1	
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050				< 0.1	
Naphthalene	mg/kg	DETS 050				< 0.1	

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272783	272784	272785	272786	272787
		Sample Ref	BH17	BH4	BH5	BH10	BH10
		Depth	8.00	4.00	3.00	1.00	7.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Phenanthrene	mg/kg	DETS 050				< 0.1	
Pyrene	mg/kg	DETS 050				< 0.1	
PAH	mg/kg	DETS 050				< 1.6	
Phenol - Monohydric	mg/kg	DETS 067#				< 0.3	

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272788	272789	272790	272791	272792
		Sample Ref	BH1	BH2	BH2	BH3	BH9
		Depth	1.00	3.00	13.00	5.00	1.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Arsenic	mg/kg	DETS 042#	33	13	12	26	5.7
Cadmium	mg/kg	DETS 042#	0.2	0.6	0.3	0.5	0.1
Chromium	mg/kg	DETS 042#	14	21	15	30	7
Copper	mg/kg	DETS 042#	32	77	9	100	15
Lead	mg/kg	DETS 042#	55	370	13	140	17
Mercury	mg/kg	DETS 081#	0.06	0.33	0.06	0.59	0.07
Nickel	mg/kg	DETS 042#	15	29	18	42	7
Selenium	mg/kg	DETS 042#	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tin	mg/kg	DETS 042*	2	4	< 1	3	< 1
Zinc	mg/kg	DETS 042#	92	200	59	150	43
Cyanide total	mg/kg	DETS 067#	0.2	0.1	< 0.1		
Cyanide free	mg/kg	DETS 067#	< 0.1	< 0.1	< 0.1		
Total Organic Carbon	%	DETS 002	0.6	1.1	3.5		
pH		DETS 008#	11	10.6	8.9		
Aliphatic C5-C6	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	< 1.5	< 1.5	< 1.5	< 1.5	5.9
Aliphatic C12-C16	mg/kg	DETS 072#	3.6	8.4	< 1.2	2	110
Aliphatic C16-C21	mg/kg	DETS 072#	9.9	24	< 1.5	11	190
Aliphatic C21-C35	mg/kg	DETS 072#	54	110	< 3.4	62	110
Aromatic C5-C7	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	1.3	< 0.5	< 0.5	< 0.5	5
Aromatic C16-C21	mg/kg	DETS 072#	4.9	6	< 0.6	8	6.3
Aromatic C21-C35	mg/kg	DETS 072#	6.9	9.9	< 1.4	13	1.7
Aliphatic C5-C35	mg/kg	DETS 072*	67	140	< 10	75	420
Aromatic C5-C35	mg/kg	DETS 072*	13	16	< 10	21	13
TPH Ali/Aro	mg/kg	DETS 072*	80	160	< 10	96	430
Acenaphthene	mg/kg	DETS 050				< 0.1	0.9
Acenaphthylene	mg/kg	DETS 050				0.1	1.3
Anthracene	mg/kg	DETS 050				0.5	0.1
Benzo(a)anthracene	mg/kg	DETS 050				1.0	0.2
Benzo(a)pyrene	mg/kg	DETS 050				1.3	0.2
Benzo(b)fluoranthene	mg/kg	DETS 050				0.9	0.2
Benzo(k)fluoranthene	mg/kg	DETS 050				0.5	< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050				1.1	< 0.1
Chrysene	mg/kg	DETS 050				1.0	0.2
Dibenzo(a,h)anthracene	mg/kg	DETS 050				0.2	< 0.1
Fluoranthene	mg/kg	DETS 050				3.8	1.1
Fluorene	mg/kg	DETS 050				0.1	0.9
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050				0.8	< 0.1
Naphthalene	mg/kg	DETS 050				< 0.1	0.1

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272788	272789	272790	272791	272792
		Sample Ref	BH1	BH2	BH2	BH3	BH9
		Depth	1.00	3.00	13.00	5.00	1.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Phenanthrene	mg/kg	DETS 050				2.1	0.3
Pyrene	mg/kg	DETS 050				2.5	0.6
PAH	mg/kg	DETS 050				16	6.2
Phenol - Monohydric	mg/kg	DETS 067#				< 0.3	< 0.3

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272793	272794	272795	272796
		Sample Ref	BH13	BH17	BH12A	BH15
		Depth	5.00	3.00	13.50	7.50
		Other Ref				
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Arsenic	mg/kg	DETS 042#	19	22	11	12
Cadmium	mg/kg	DETS 042#	0.5	0.6	0.3	0.3
Chromium	mg/kg	DETS 042#	24	17	16	18
Copper	mg/kg	DETS 042#	170	38	7	8
Lead	mg/kg	DETS 042#	98	120	9	10
Mercury	mg/kg	DETS 081#	0.2	0.35	< 0.05	< 0.05
Nickel	mg/kg	DETS 042#	44	27	19	20
Selenium	mg/kg	DETS 042#	< 0.5	< 0.5	< 0.5	< 0.5
Tin	mg/kg	DETS 042*	7	12	< 1	3
Zinc	mg/kg	DETS 042#	190	120	61	66
Cyanide total	mg/kg	DETS 067#				0.8
Cyanide free	mg/kg	DETS 067#				0.7
Total Organic Carbon	%	DETS 002				3.2
pH		DETS 008#				8.5
Aliphatic C5-C6	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	5.7	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	450	5.9	< 1.2	< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#	810	21	< 1.5	< 1.5
Aliphatic C21-C35	mg/kg	DETS 072#	290	74	< 3.4	< 3.4
Aromatic C5-C7	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	7.0	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#	31	3.2	< 0.6	< 0.6
Aromatic C21-C35	mg/kg	DETS 072#	27	6.1	< 1.4	< 1.4
Aliphatic C5-C35	mg/kg	DETS 072*	1600	100	< 10	< 10
Aromatic C5-C35	mg/kg	DETS 072*	65	< 10	< 10	< 10
TPH Ali/Aro	mg/kg	DETS 072*	1600	110	< 10	< 10
Acenaphthene	mg/kg	DETS 050	54	< 0.1	< 0.1	
Acenaphthylene	mg/kg	DETS 050	53	< 0.1	< 0.1	
Anthracene	mg/kg	DETS 050	15	< 0.1	< 0.1	
Benzo(a)anthracene	mg/kg	DETS 050	5.7	0.2	< 0.1	
Benzo(a)pyrene	mg/kg	DETS 050	3.6	0.4	< 0.1	
Benzo(b)fluoranthene	mg/kg	DETS 050	2.9	0.3	< 0.1	
Benzo(k)fluoranthene	mg/kg	DETS 050	1.6	0.2	< 0.1	
Benzo(g,h,i)perylene	mg/kg	DETS 050	3.9	0.3	< 0.1	
Chrysene	mg/kg	DETS 050	5.8	0.3	< 0.1	
Dibenzo(a,h)anthracene	mg/kg	DETS 050	1.1	< 0.1	< 0.1	
Fluoranthene	mg/kg	DETS 050	20	0.7	< 0.1	
Fluorene	mg/kg	DETS 050	58	< 0.1	< 0.1	
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	3.2	0.3	< 0.1	
Naphthalene	mg/kg	DETS 050	7.5	< 0.1	< 0.1	

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272793	272794	272795	272796
		Sample Ref	BH13	BH17	BH12A	BH15
		Depth	5.00	3.00	13.50	7.50
		Other Ref				
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Phenanthrene	mg/kg	DETS 050	18	0.2	< 0.1	
Pyrene	mg/kg	DETS 050	13	0.6	< 0.1	
PAH	mg/kg	DETS 050	270	3.5	< 1.6	
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3	< 0.3	< 0.3	

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	273045	273046
		Sample Ref	BH14	BH6B
		Depth	5.00	1.00
		Other Ref		
		Sample Type	Soil	Soil
Test	**Units**	**DETSxx**		
Arsenic	mg/kg	DETS 042#	26	12
Cadmium	mg/kg	DETS 042#	0.7	0.1
Chromium	mg/kg	DETS 042#	33	13
Copper	mg/kg	DETS 042#	85	26
Lead	mg/kg	DETS 042#	250	49
Mercury	mg/kg	DETS 081#	1.1	0.17
Nickel	mg/kg	DETS 042#	35	12
Selenium	mg/kg	DETS 042#	0.7	< 0.5
Tin	mg/kg	DETS 042*	8	3
Zinc	mg/kg	DETS 042#	270	61
Cyanide total	mg/kg	DETS 067#	0.3	
Cyanide free	mg/kg	DETS 067#	< 0.1	
Total Organic Carbon	%	DETS 002	1.7	
pH		DETS 008#	8.1	
Aliphatic C5-C6	mg/kg	DETS 072*	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	7.9	5.1
Aliphatic C16-C21	mg/kg	DETS 072#	17	20
Aliphatic C21-C35	mg/kg	DETS 072#	28	68
Aromatic C5-C7	mg/kg	DETS 072*	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	< 0.5	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#	24	2.2
Aromatic C21-C35	mg/kg	DETS 072#	33	3.3
Aliphatic C5-C35	mg/kg	DETS 072*	53	93
Aromatic C5-C35	mg/kg	DETS 072*	57	< 10
TPH Ali/Aro	mg/kg	DETS 072*	110	99
Acenaphthene	mg/kg	DETS 050		< 0.1
Acenaphthylene	mg/kg	DETS 050		< 0.1
Anthracene	mg/kg	DETS 050		< 0.1
Benzo(a)anthracene	mg/kg	DETS 050		< 0.1
Benzo(a)pyrene	mg/kg	DETS 050		< 0.1
Benzo(b)fluoranthene	mg/kg	DETS 050		< 0.1
Benzo(k)fluoranthene	mg/kg	DETS 050		< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050		< 0.1
Chrysene	mg/kg	DETS 050		< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETS 050		< 0.1
Fluoranthene	mg/kg	DETS 050		< 0.1
Fluorene	mg/kg	DETS 050		< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050		< 0.1
Naphthalene	mg/kg	DETS 050		< 0.1

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	273045	273046
		Sample Ref	BH14	BH6B
		Depth	5.00	1.00
		Other Ref		
		Sample Type	Soil	Soil
Test	**Units**	**DETSxx**		
Phenanthrene	mg/kg	DETS 050		< 0.1
Pyrene	mg/kg	DETS 050		< 0.1
PAH	mg/kg	DETS 050		< 1.6
Phenol - Monohydric	mg/kg	DETS 067#		< 0.3

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272774	272775	272776	272777	272781
		Sample Ref	BH12	BH15	BH20A	BH20A	TP2
		Depth	1.00	5.00	1.00	5.00	1.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Total VOC's	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	0.4	< 0.01
1,1 Dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Methylene Chloride	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Methylene Chloride	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichlororopane+1,2-dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
sec-butylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272774	272775	272776	272777	272781
		Sample Ref	BH12	BH15	BH20A	BH20A	TP2
		Depth	1.00	5.00	1.00	5.00	1.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
p-isopropyltoluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	0.4	< 0.01
1,2,3-trichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272782	272783	272784	272785	272787
		Sample Ref	TP3	BH17	BH4	BH5	BH10
		Depth	1.00	8.00	4.00	3.00	7.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
Total VOC's	mg/kg	DETS 068*	< 0.01	< 0.01	0.26	0.14	< 0.01
1,1 Dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Methylene Chloride	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Methylene Chloride	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichlororopane+1,2-dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
sec-butylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272782	272783	272784	272785	272787
		Sample Ref	TP3	BH17	BH4	BH5	BH10
		Depth	1.00	8.00	4.00	3.00	7.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
p-isopropyltoluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	mg/kg	DETS 068*	< 0.01	< 0.01	0.26	0.14	< 0.01
1,2,3-trichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272788	272789	272790	272796
		Sample Ref	BH1	BH2	BH2	BH15
		Depth	1.00	3.00	13.00	7.50
		Other Ref				
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Total VOC's	mg/kg	DETS 068*	0.06	0.25	< 0.01	< 0.01
1,1 Dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Methylene Chloride	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Methylene Chloride	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichlororopane+1,2-dichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
sec-butylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272788	272789	272790	272796
		Sample Ref	BH1	BH2	BH2	BH15
		Depth	1.00	3.00	13.00	7.50
		Other Ref				
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
p-isopropyltoluene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	mg/kg	DETS 068*	< 0.01	0.08	< 0.01	< 0.01
n-butylbenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	mg/kg	DETS 068*	0.06	0.17	< 0.01	< 0.01
1,2,3-trichlorobenzene	mg/kg	DETS 068*	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	273045
		Sample Ref	BH14
		Depth	5.00
		Other Ref	
		Sample Type	Soil
Test	**Units**	**DETSxx**	
Total VOC's	mg/kg	DETS 068*	0.07
1,1 Dichloroethylene	mg/kg	DETS 068*	< 0.01
1,1 Dichloroethylene	mg/kg	DETS 068*	< 0.01
Methylene Chloride	mg/kg	DETS 068*	< 0.01
Methylene Chloride	mg/kg	DETS 068*	< 0.01
Trans-1,2-dichloroethylene	mg/kg	DETS 068*	< 0.01
1,1-dichloroethane	mg/kg	DETS 068*	< 0.01
2,2-dichlororopane+1,2-dichloroethylene	mg/kg	DETS 068*	< 0.01
Bromochloromethane	mg/kg	DETS 068*	< 0.01
Chloroform	mg/kg	DETS 068*	< 0.01
1,1,1-trichloroethane	mg/kg	DETS 068*	< 0.01
Carbon tetrachloride	mg/kg	DETS 068*	< 0.01
1,1-dichloropropene	mg/kg	DETS 068*	< 0.01
Benzene	mg/kg	DETS 068*	< 0.01
1,2-dichloroethane	mg/kg	DETS 068*	< 0.01
Trichloroethylene	mg/kg	DETS 068*	< 0.01
1,2-dichloropropane	mg/kg	DETS 068*	< 0.01
Dibromomethane	mg/kg	DETS 068*	< 0.01
Bromodichloromethane	mg/kg	DETS 068*	< 0.01
cis-1,3-dichloropropene	mg/kg	DETS 068*	< 0.01
Toluene	mg/kg	DETS 068*	< 0.01
trans-1,3-dichloropropene	mg/kg	DETS 068*	< 0.01
1,1,2-trichloroethane	mg/kg	DETS 068*	< 0.01
Tetrachloroethylene	mg/kg	DETS 068*	< 0.01
1,3-dichloropropane	mg/kg	DETS 068*	< 0.01
Dibromochloromethane	mg/kg	DETS 068*	< 0.01
1,2-dibromoethane	mg/kg	DETS 068*	< 0.01
Chlorobenzene	mg/kg	DETS 068*	< 0.01
1,1,1,2-tetrachloroethane	mg/kg	DETS 068*	< 0.01
Ethylbenzene	mg/kg	DETS 068*	< 0.01
m+p-Xylene	mg/kg	DETS 068*	< 0.01
o-Xylene	mg/kg	DETS 068*	< 0.01
Styrene	mg/kg	DETS 068*	< 0.01
Bromoform	mg/kg	DETS 068*	< 0.01
Isopropylbenzene	mg/kg	DETS 068*	< 0.01
Bromobenzene	mg/kg	DETS 068*	< 0.01
1,2,3-trichloropropane	mg/kg	DETS 068*	< 0.01
n-propylbenzene	mg/kg	DETS 068*	< 0.01
2-chlorotoluene	mg/kg	DETS 068*	< 0.01
1,3,5-trimethylbenzene	mg/kg	DETS 068*	< 0.01
4-chlorotoluene	mg/kg	DETS 068*	< 0.01
Tert-butylbenzene	mg/kg	DETS 068*	< 0.01
1,2,4-trimethylbenzene	mg/kg	DETS 068*	< 0.01
sec-butylbenzene	mg/kg	DETS 068*	< 0.01
1,3-dichlorobenzene	mg/kg	DETS 068*	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	273045
		Sample Ref	BH14
		Depth	5.00
		Other Ref	
		Sample Type	Soil
Test	**Units**	**DETSxx**	
p-isopropyltoluene	mg/kg	DETS 068*	< 0.01
1,4-dichlorobenzene	mg/kg	DETS 068*	< 0.01
n-butylbenzene	mg/kg	DETS 068*	< 0.01
1,2-dichlorobenzene	mg/kg	DETS 068*	< 0.01
1,2-dibromo-3-chloropropane	mg/kg	DETS 068*	< 0.01
1,2,4-trichlorobenzene	mg/kg	DETS 068*	< 0.01
Hexachlorobutadiene	mg/kg	DETS 068*	< 0.01
Naphthalene	mg/kg	DETS 068*	0.07
1,2,3-trichlorobenzene	mg/kg	DETS 068*	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272774	272775	272776	272784	272785
		Sample Ref	BH12	BH15	BH20A	BH4	BH5
		Depth	1.00	5.00	1.00	4.00	3.00
		Other Ref					
		Sample Type	Soil	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**					
PCB 126	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 156	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 157	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 167	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 169	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 189	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 77	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 81	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 123	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 126	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 156	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 157	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 167	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 169	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 189	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 118	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 114	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 105	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 81	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 123	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 77	mg/kg	DETS 052*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272789	272796
		Sample Ref	BH2	BH15
		Depth	3.00	7.50
		Other Ref		
		Sample Type	Soil	Soil
Test	**Units**	**DETSxx**		
PCB 126	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 156	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 157	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 167	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 169	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 189	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 77	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 81	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 123	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 126	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 156	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 157	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 167	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 169	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 189	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 118	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 114	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 105	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 81	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 123	mg/kg	DETS 052*	< 0.01	< 0.01
PCB 77	mg/kg	DETS 052*	< 0.01	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	2	3	4	5
		Sample Ref	272774	272775	272776	272777
		Depth	1.00	5.00	1.00	5.00
		Other Ref	BH12	BH15	BH20A	BH20A
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Aniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Bis(2-chloroethyl)ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Phenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Chlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Benzyl Alcohol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
3& 4-Methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4-dimethylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Bis-(dichloroethoxy)methane	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4-Dichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Naphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.29
4-Chloro-3-methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.16
Hexachlorocyclopentadiene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4,6 Trichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4,5 Trichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Chloronaphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,4-dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Dimethyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,3-dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,6-Dinitrotoluene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,2-Dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
3-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	DETSM-134*	0.13	<0.10	<0.10	1.20
Dibenzofuran	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.28
2,4-Dinitrotoluene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
4-Nitrophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,3,4,6-Tetrachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,3,5,6-Tetrachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Diethylphthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.52
4-Chlorophenyl phenyl ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
4-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Diphenylamine/4,6-Dinitro-2-methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Azobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
4-Bromophenyl phenyl ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Hexachlorobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Pentachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	DETSM-134*	0.54	0.31	0.24	1.4
Anthracene	mg/kg	DETSM-134*	0.18	0.11	<0.10	0.60
Carbazole	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Di-n-butylphthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Benzyl butyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Bis(2-ethylhexyl)ester	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	DETSM-134*	0.81	0.48	0.39	1.5
Pyrene	mg/kg	DETSM-134*	0.70	0.42	0.45	1.1
Benzo(a)anthracene	mg/kg	DETSM-134*	0.30	0.18	0.19	0.44
Chrysene	mg/kg	DETSM-134*	0.40	0.25	0.26	0.55
Di-n-octyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	2	3	4	5
		Sample Ref	272774	272775	272776	272777
		Depth	1.00	5.00	1.00	5.00
		Other Ref	BH12	BH15	BH20A	BH20A
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Benzo(b)fluoranthene	mg/kg	DETSM-134*	0.37	0.19	0.22	0.50
Benzo(k)fluoranthene	mg/kg	DETSM-134*	0.36	0.18	0.17	0.42
Benzo(a)pyrene	mg/kg	DETSM-134*	0.44	0.21	0.21	0.54
Indeno(1,2,3-cd)pyrene	mg/kg	DETSM-134*	0.25	0.11	0.12	0.28
Dibenz(a,h)anthracene	mg/kg	DETSM-134*	0.13	<0.10	<0.10	<0.10
Benzo(ghi)pyrelene	mg/kg	DETSM-134*	0.28	0.13	0.14	0.32

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	9	10	11	12
		Sample Ref	272781	272782	272783	272784
		Depth	1.00	1.00	8.00	4.00
		Other Ref	TP2	TP3	BH17	BH4
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Aniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Bis(2-chloroethyl)ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Phenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Chlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Benzyl Alcohol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
3& 4-Methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4-dimethylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Bis-(dichloroethoxy)methane	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4-Dichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Naphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.31
4-Chloro-3-methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Hexachlorocyclopentadiene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4,6 Trichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4,5 Trichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Chloronaphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,4-dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Dimethyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,3-dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.32
2,6-Dinitrotoluene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,2-Dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
3-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.38
Dibenzofuran	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.39
2,4-Dinitrotoluene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
4-Nitrophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,3,4,6-Tetrachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,3,5,6-Tetrachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Diethylphthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.51
4-Chlorophenyl phenyl ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
4-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Diphenylamine/4,6-Dinitro-2-methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Azobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
4-Bromophenyl phenyl ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Hexachlorobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Pentachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	DETSM-134*	0.27	0.55	<0.10	4.0
Anthracene	mg/kg	DETSM-134*	<0.10	0.18	<0.10	1.3
Carbazole	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	0.28
Di-n-butylphthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Benzyl butyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Bis(2-ethylhexyl)ester	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	DETSM-134*	0.75	1.1	<0.10	5.0
Pyrene	mg/kg	DETSM-134*	0.64	0.94	<0.10	4.4
Benzo(a)anthracene	mg/kg	DETSM-134*	0.35	0.48	<0.10	1.8
Chrysene	mg/kg	DETSM-134*	0.42	0.59	<0.10	2.1
Di-n-octyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	9	10	11	12
		Sample Ref	272781	272782	272783	272784
		Depth	1.00	1.00	8.00	4.00
		Other Ref	TP2	TP3	BH17	BH4
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Benzo(b)fluoranthene	mg/kg	DETSM-134*	0.44	0.47	<0.10	1.9
Benzo(k)fluoranthene	mg/kg	DETSM-134*	0.42	0.59	<0.10	1.5
Benzo(a)pyrene	mg/kg	DETSM-134*	0.51	0.63	<0.10	2.2
Indeno(1,2,3-cd)pyrene	mg/kg	DETSM-134*	0.32	0.38	<0.10	1.0
Dibenz(a,h)anthracene	mg/kg	DETSM-134*	0.11	0.13	<0.10	0.29
Benzo(ghi)pyrelene	mg/kg	DETSM-134*	0.38	0.48	<0.10	1.2

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	13	15	16	17
		Sample Ref	272785	272787	272788	272789
		Depth	3.00	7.00	1.00	3.00
		Other Ref	BH5	BH10	BH1	BH2
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Aniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Bis(2-chloroethyl)ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Phenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Chlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Benzyl Alcohol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
3& 4-Methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4-dimethylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Bis-(dichloroethoxy)methane	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4-Dichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Naphthalene	mg/kg	DETSM-134*	0.15	<0.10	0.25	0.16
4-Chloro-3-methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Hexachlorocyclopentadiene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4,6 Trichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,4,5 Trichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Chloronaphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,4-dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Dimethyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,3-dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,6-Dinitrotoluene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
1,2-Dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
3-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	DETSM-134*	<0.10	<0.10	0.19	0.23
Dibenzofuran	mg/kg	DETSM-134*	<0.10	<0.10	0.12	0.14
2,4-Dinitrotoluene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
4-Nitrophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,3,4,6-Tetrachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
2,3,5,6-Tetrachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Diethylphthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	DETSM-134*	<0.10	<0.10	0.11	0.17
4-Chlorophenyl phenyl ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
4-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Diphenylamine/4,6-Dinitro-2-methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Azobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
4-Bromophenyl phenyl ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Hexachlorobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Pentachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	DETSM-134*	0.16	0.39	1.3	1.7
Anthracene	mg/kg	DETSM-134*	<0.10	0.15	0.36	1.6
Carbazole	mg/kg	DETSM-134*	<0.10	<0.10	0.14	0.18
Di-n-butylphthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Benzyl butyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	0.68	<0.10
Bis(2-ethylhexyl)ester	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	DETSM-134*	0.25	0.78	1.7	2.3
Pyrene	mg/kg	DETSM-134*	0.21	0.64	1.4	1.8
Benzo(a)anthracene	mg/kg	DETSM-134*	0.11	0.28	0.66	0.69
Chrysene	mg/kg	DETSM-134*	0.13	0.34	0.81	0.77
Di-n-octyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10	<0.10

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	13	15	16	17
		Sample Ref	272785	272787	272788	272789
		Depth	3.00	7.00	1.00	3.00
		Other Ref	BH5	BH10	BH1	BH2
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Benzo(b)fluoranthene	mg/kg	DETSM-134*	0.11	0.31	0.64	0.67
Benzo(k)fluoranthene	mg/kg	DETSM-134*	0.12	0.28	0.62	0.57
Benzo(a)pyrene	mg/kg	DETSM-134*	0.13	0.33	0.72	0.71
Indeno(1,2,3-cd)pyrene	mg/kg	DETSM-134*	<0.10	0.17	0.34	0.35
Dibenz(a,h)anthracene	mg/kg	DETSM-134*	<0.10	<0.10	0.13	0.12
Benzo(ghi)pyrelene	mg/kg	DETSM-134*	<0.10	0.19	0.39	0.39

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	18	24	25
		Sample Ref	272790	272796	273045
		Depth	13.00	7.50	5.00
		Other Ref	BH2	BH15	BH14
		Sample Type	Soil	Soil	Soil
Test	**Units**	**DETSxx**			
Aniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Bis(2-chloroethyl)ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Phenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2-Chlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Benzyl Alcohol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2-Methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
3& 4-Methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2,4-dimethylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Bis-(dichloroethoxy)methane	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2,4-Dichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Naphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
4-Chloro-3-methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Hexachlorocyclopentadiene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2,4,6 Trichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2,4,5 Trichlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2-Chloronaphthalene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
1,4-dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Dimethyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
1,3-dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2,6-Dinitrotoluene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
1,2-Dinitrobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
3-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Dibenzofuran	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2,4-Dinitrotoluene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
4-Nitrophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2,3,4,6-Tetrachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
2,3,5,6-Tetrachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Diethylphthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Fluorene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
4-Chlorophenyl phenyl ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
4-Nitroaniline	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Diphenylamine/4,6-Dinitro-2-methylphenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Azobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
4-Bromophenyl phenyl ether	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Hexachlorobenzene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Pentachlorophenol	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Anthracene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Carbazole	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Di-n-butylphthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Benzyl butyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Bis(2-ethylhexyl)ester	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Pyrene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Benzo(a)anthracene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Chrysene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Di-n-octyl phthalate	mg/kg	DETSM-134*	<0.10	<0.10	<0.10

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	18	24	25
		Sample Ref	272790	272796	273045
		Depth	13.00	7.50	5.00
		Other Ref	BH2	BH15	BH14
		Sample Type	Soil	Soil	Soil
Test	**Units**	**DETSxx**			
Benzo(b)fluoranthene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Benzo(k)fluoranthene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Benzo(a)pyrene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Indeno(1,2,3-cd)pyrene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Dibenz(a,h)anthracene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10
Benzo(ghi)pyrelene	mg/kg	DETSM-134*	<0.10	<0.10	<0.10

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	1	2	3	4
		Sample Ref	272773	272774	272775	272776
		Depth	5.00	1.00	5.00	1.00
		Other Ref	BH11	BH12	BH15	BH20A
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Tributyltin	mg/kg	DETSM-151*	<0.020	<0.020	<0.020	<0.020

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	5	6	7	8
		Sample Ref	272777	272778	272779	272780
		Depth	5.00	3.00	3.00	1.00
		Other Ref	BH20A	BH21	BH22	TP1
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Tributyltin	mg/kg	DETSM-151*	<0.020	<0.020	<0.020	<0.020

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	9	10	11	12
		Sample Ref	272781	272782	272783	272784
		Depth	1.00	1.00	8.00	4.00
		Other Ref	TP2	TP3	BH17	BH4
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Tributyltin	mg/kg	DETSM-151*	<0.020	<0.020	<0.020	<0.020

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	13	14	15	16
		Sample Ref	272785	272786	272787	272788
		Depth	3.00	1.00	7.00	1.00
		Other Ref	BH5	BH10	BH10	BH1
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Tributyltin	mg/kg	DETSM-151*	<0.020	<0.020	<0.020	<0.020

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	17	18	19	20
		Sample Ref	272789	272790	272791	272792
		Depth	3.00	13.00	5.00	1.00
		Other Ref	BH2	BH2	BH3	BH9
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Tributyltin	mg/kg	DETSM-151*	<0.020	<0.020	<0.020	<0.020

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	21	22	23	24
		Sample Ref	272793	272794	272795	272796
		Depth	5.00	3.00	13.50	7.50
		Other Ref	BH13	BH17	BH12A	BH15
		Sample Type	Soil	Soil	Soil	Soil
Test	**Units**	**DETSxx**				
Tributyltin	mg/kg	DETSM-151*	<0.020	<0.020	<0.020	<0.020

Summary of Chemical Analysis
Soil Samples

Our Ref: 10-84316
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	25	26
		Sample Ref	273045	273046
		Depth	5.00	1.00
		Other Ref	BH14	BH6B
		Sample Type	Soil	Soil
Test	**Units**	**DETSxx**		
Tributyltin	mg/kg	DETSM-151*	<0.020	<0.020

Summary of Asbestos Analysis
Soil Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

Laboratory Number	Sample Ref	Depth	Other Ref	Material	Result
272781	TP2	1.00		Soil	Chrysotile

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos
NAD = No Asbestos Detected. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos

Samples are analysed by DETS 082 using polarised light microscopy in accordance with HSG248 and documented in-house methods. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'.

Summary of Chemical Analysis
Leachate Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272797	272798	272799	272800	272801
		Sample Ref	BH12	BH15	BH20A	TP2	BH17
		Depth	1.00	5.00	5.00	1.00	8.00
		Other Ref					
		Sample Type	Leachate	Leachate	Leachate	Leachate	Leachate
Test	**Units**	**DETSxx**					
Arsenic Dissolved	ug/l	DETS 2326*	4	4	3	6	< 1
Cadmium Dissolved	ug/l	DETS 042	< 2	< 2	< 2	< 2	< 2
Chromium Dissolved	ug/l	DETS 042	< 5	< 5	< 5	< 5	< 5
Copper Dissolved	ug/l	DETS 042	4	2	5	2	< 2
Lead Dissolved	ug/l	DETS 042	< 4	< 4	< 4	< 4	< 4
Mercury Dissolved	ug/l	DETS 078	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel Dissolved	ug/l	DETS 042	< 10	< 10	< 10	< 10	< 10
Selenium Dissolved	ug/l	DETS 017	< 3	< 3	< 3	< 3	< 3
Zinc Dissolved	ug/l	DETS 042	< 1	< 1	2	< 1	2
Tin Dissolved	ug/l	DETS 042*	< 10	13	< 10	15	< 10
Cyanide total	ug/l	DETS 067	< 40	< 40	< 40	< 40	< 40
Cyanide free	ug/l	DETS 067	< 20	< 20	< 20	< 20	< 20
Conductivity	uS/cm	DETS 009	86	143	107	55	269
Ammoniacal Nitrogen as N	mg/l	DETSC2207	0.11	0.12	0.36	1.1	0.6
Total Organic Carbon	mg/l	DETS 033	< 2.0	< 2.0	6.5	< 2.0	< 2.0
pH		DETS 008	9.2	9.5	9.2	7.7	7.3
Aliphatic C5-C6	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	ug/l	DETS 072*	< 1	< 1	4	< 1	< 1
Aliphatic C12-C16	ug/l	DETS 072*	< 1	< 1	26	< 1	< 1
Aliphatic C16-C21	ug/l	DETS 072*	< 1	< 1	1	< 1	< 1
Aliphatic C21-C35	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aromatic C5-C7	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	ug/l	DETS 072*	< 1	< 1	5	< 1	< 1
Aromatic C12-C16	ug/l	DETS 072*	< 1	< 1	49	< 1	< 1
Aromatic C16-C21	ug/l	DETS 072*	< 1	< 1	48	< 1	< 1
Aromatic C21-C35	ug/l	DETS 072*	< 1	< 1	4	< 1	< 1
Aliphatic C5-C35	ug/l	DETS 072*	< 10	< 10	31	< 10	< 10
Aromatic C5-C35	ug/l	DETS 072*	< 10	< 10	110	< 10	< 10
TPH Ali/Aro	ug/l	DETS 072*	< 10	< 10	140	< 10	< 10

Summary of Chemical Analysis
Leachate Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272802	272803	272804
		Sample Ref	BH4	BH5	BH2
		Depth	4.00	3.00	3.00
		Other Ref			
		Sample Type	Leachate	Leachate	Leachate
Test	**Units**	**DETSxx**			
Arsenic Dissolved	ug/l	DETS 2326*	3	3	6
Cadmium Dissolved	ug/l	DETS 042	< 2	< 2	< 2
Chromium Dissolved	ug/l	DETS 042	< 5	< 5	< 5
Copper Dissolved	ug/l	DETS 042	6	6	24
Lead Dissolved	ug/l	DETS 042	< 4	< 4	< 4
Mercury Dissolved	ug/l	DETS 078	< 0.05	< 0.05	< 0.05
Nickel Dissolved	ug/l	DETS 042	< 10	< 10	< 10
Selenium Dissolved	ug/l	DETS 017	< 3	< 3	< 3
Zinc Dissolved	ug/l	DETS 042	< 1	< 1	< 1
Tin Dissolved	ug/l	DETS 042*	< 10	11	13
Cyanide total	ug/l	DETS 067	< 40	< 40	< 40
Cyanide free	ug/l	DETS 067	< 20	< 20	< 20
Conductivity	uS/cm	DETS 009	114	154	100
Ammoniacal Nitrogen as N	mg/l	DETSC2207	0.28	0.11	0.87
Total Organic Carbon	mg/l	DETS 033	< 2.0	< 2.0	4.1
pH		DETS 008	7.9	10.5	9.5
Aliphatic C5-C6	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	ug/l	DETS 072*	< 1	< 1	< 1
Aliphatic C12-C16	ug/l	DETS 072*	< 1	< 1	< 1
Aliphatic C16-C21	ug/l	DETS 072*	< 1	< 1	< 1
Aliphatic C21-C35	ug/l	DETS 072*	< 1	< 1	< 1
Aromatic C5-C7	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	ug/l	DETS 072*	< 1	< 1	< 1
Aromatic C12-C16	ug/l	DETS 072*	< 1	< 1	< 1
Aromatic C16-C21	ug/l	DETS 072*	< 1	< 1	< 1
Aromatic C21-C35	ug/l	DETS 072*	< 1	< 1	< 1
Aliphatic C5-C35	ug/l	DETS 072*	< 10	< 10	< 10
Aromatic C5-C35	ug/l	DETS 072*	< 10	< 10	< 10
TPH Ali/Aro	ug/l	DETS 072*	< 10	< 10	< 10

Summary of Chemical Analysis
Leachate Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272797	272798	272799	272800	272801
		Sample Ref	BH12	BH15	BH20A	TP2	BH17
		Depth	1.00	5.00	5.00	1.00	8.00
		Other Ref					
		Sample Type	Leachate	Leachate	Leachate	Leachate	Leachate
Test	**Units**	**DETSxx**					
Total VOC's	ug/l	DETS 068*	< 1	< 1	10	< 1	< 1
1,1 Dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Trans-1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
2,2-dichlororopane+1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromochloromethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Chloroform	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Benzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Dibromomethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
cis-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Toluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
o-Xylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Styrene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromoform	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,3-trichloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,4-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1

Summary of Chemical Analysis
Leachate Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272797	272798	272799	272800	272801
		Sample Ref	BH12	BH15	BH20A	TP2	BH17
		Depth	1.00	5.00	5.00	1.00	8.00
		Other Ref					
		Sample Type	Leachate	Leachate	Leachate	Leachate	Leachate
Test	**Units**	**DETSxx**					
n-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Naphthalene	ug/l	DETS 068*	< 1	< 1	10	< 1	< 1
1,2,3-trichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1

Summary of Chemical Analysis
Leachate Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272802	272803	272804
		Sample Ref	BH4	BH5	BH2
		Depth	4.00	3.00	3.00
		Other Ref			
		Sample Type	Leachate	Leachate	Leachate
Test	**Units**	**DETSxx**			
Total VOC's	ug/l	DETS 068*	< 1	< 1	< 1
1,1 Dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1
Methylene Chloride	ug/l	DETS 068*	< 1	< 1	< 1
Trans-1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1
1,1-dichloroethane	ug/l	DETS 068*	< 1	< 1	< 1
2,2-dichlororopane+1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1
Bromochloromethane	ug/l	DETS 068*	< 1	< 1	< 1
Chloroform	ug/l	DETS 068*	< 1	< 1	< 1
1,1,1-trichloroethane	ug/l	DETS 068*	< 1	< 1	< 1
1,1-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1
Carbon tetrachloride	ug/l	DETS 068*	< 1	< 1	< 1
Benzene	ug/l	DETS 068*	< 1	< 1	< 1
1,2-dichloroethane	ug/l	DETS 068*	< 1	< 1	< 1
Trichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1
1,2-dichloropropane	ug/l	DETS 068*	< 1	< 1	< 1
Dibromomethane	ug/l	DETS 068*	< 1	< 1	< 1
Bromodichloromethane	ug/l	DETS 068*	< 1	< 1	< 1
cis-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1
Toluene	ug/l	DETS 068*	< 1	< 1	< 1
trans-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1
1,1,2-trichloroethane	ug/l	DETS 068*	< 1	< 1	< 1
Tetrachloroethylene	ug/l	DETS 068*	< 1	< 1	< 1
1,3-dichloropropane	ug/l	DETS 068*	< 1	< 1	< 1
Dibromochloromethane	ug/l	DETS 068*	< 1	< 1	< 1
1,2-dibromoethane	ug/l	DETS 068*	< 1	< 1	< 1
Chlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1
Ethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	ug/l	DETS 068*	< 1	< 1	< 1
m+p-Xylene	ug/l	DETS 068*	< 1	< 1	< 1
o-Xylene	ug/l	DETS 068*	< 1	< 1	< 1
Styrene	ug/l	DETS 068*	< 1	< 1	< 1
Bromoform	ug/l	DETS 068*	< 1	< 1	< 1
Isopropylbenzene	ug/l	DETS 068*	< 1	< 1	< 1
Bromobenzene	ug/l	DETS 068*	< 1	< 1	< 1
1,2,3-trichloropropane	ug/l	DETS 068*	< 1	< 1	< 1
n-propylbenzene	ug/l	DETS 068*	< 1	< 1	< 1
2-chlorotoluene	ug/l	DETS 068*	< 1	< 1	< 1
1,3,5-trimethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1
4-chlorotoluene	ug/l	DETS 068*	< 1	< 1	< 1
Tert-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1
1,2,4-trimethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1
sec-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1
1,3-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1
p-isopropyltoluene	ug/l	DETS 068*	< 1	< 1	< 1
1,4-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1

Summary of Chemical Analysis
Leachate Samples

Our Ref: 10-40084
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	272802	272803	272804
		Sample Ref	BH4	BH5	BH2
		Depth	4.00	3.00	3.00
		Other Ref			
		Sample Type	Leachate	Leachate	Leachate
Test	**Units**	**DETSxx**			
n-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1
1,2-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	ug/l	DETS 068*	< 1	< 1	< 1
1,2,4-trichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1
Hexachlorobutadiene	ug/l	DETS 068*	< 1	< 1	< 1
Naphthalene	ug/l	DETS 068*	< 1	< 1	< 1
1,2,3-trichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1

Summary of Chemical Analysis
Leach Samples

Our Ref: 10-84318
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	1	2	3	4
		Sample Ref	272797	272798	272799	272800
		Depth	1.00	5.00	5.00	1.00
		Other Ref	BH12	BH15	BH20A	TP2
		Sample Type	Leach	Leach	Leach	Leach
Test	**Units**	**DETSxx**				
Aniline	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Bis(2-chloroethyl)ether	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Phenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzyl Alcohol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
3& 4-Methylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4-dimethylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Bis-(dichloroethoxy)methane	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Naphthalene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Methylnaphthalene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Hexachlorocyclopentadiene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4,6 Trichlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4,5 Trichlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Chloronaphthalene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Nitroaniline	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
1,4-dinitrobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Dimethyl phthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
1,3-dinitrobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,6-Dinitrotoluene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
1,2-Dinitrobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
3-Nitroaniline	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Acenaphthene	ug/l	DETSM-334*	<1.0	<1.0	6.2	<1.0
Dibenzofuran	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4-Dinitrotoluene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
4-Nitrophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,3,4,6-Tetrachlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,3,5,6-Tetrachlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Diethylphthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Fluorene	ug/l	DETSM-334*	<1.0	<1.0	2.0	<1.0
4-Chlorophenyl phenyl ether	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
4-Nitroaniline	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Diphenylamine/4,6-Dinitro-2-methylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Azobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
4-Bromophenyl phenyl ether	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Phenanthrene	ug/l	DETSM-334*	<1.0	<1.0	1.4	<1.0
Anthracene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Carbazole	ug/l	DETSM-334*	<1.0	<1.0	1.9	<1.0
Di-n-butylphthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzyl butyl phthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Bis(2-ethylhexyl)ester	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Fluoranthene	ug/l	DETSM-334*	<1.0	<1.0	1.3	<1.0
Pyrene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzo(a)anthracene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Chrysene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Di-n-octyl phthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0

Summary of Chemical Analysis
Leach Samples

Our Ref: 10-84318
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	1	2	3	4
		Sample Ref	272797	272798	272799	272800
		Depth	1.00	5.00	5.00	1.00
		Other Ref	BH12	BH15	BH20A	TP2
		Sample Type	Leach	Leach	Leach	Leach
Test	**Units**	**DETSxx**				
Benzo(b)fluoranthene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Indeno(1,2,3-cd)pyrene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzo(ghi)pyrelene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0

Summary of Chemical Analysis
Leach Samples

Our Ref: 10-84318
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	5	6	7	8
		Sample Ref	272801	272802	272803	272804
		Depth	8.00	4.00	3.00	3.00
		Other Ref	BH17	BH4	BH5	BH2
		Sample Type	Leach	Leach	Leach	Leach
Test	**Units**	**DETSxx**				
Aniline	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Bis(2-chloroethyl)ether	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Phenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzyl Alcohol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
3& 4-Methylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4-dimethylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Bis-(dichloroethoxy)methane	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Naphthalene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Methylnaphthalene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Hexachlorocyclopentadiene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4,6 Trichlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4,5 Trichlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Chloronaphthalene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2-Nitroaniline	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
1,4-dinitrobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Dimethyl phthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
1,3-dinitrobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,6-Dinitrotoluene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
1,2-Dinitrobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
3-Nitroaniline	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Acenaphthene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Dibenzofuran	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,4-Dinitrotoluene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
4-Nitrophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,3,4,6-Tetrachlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
2,3,5,6-Tetrachlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Diethylphthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Fluorene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
4-Chlorophenyl phenyl ether	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
4-Nitroaniline	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Diphenylamine/4,6-Dinitro-2-methylphenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Azobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
4-Bromophenyl phenyl ether	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Phenanthrene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Anthracene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Carbazole	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Di-n-butylphthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzyl butyl phthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Bis(2-ethylhexyl)ester	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Fluoranthene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Pyrene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzo(a)anthracene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Chrysene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Di-n-octyl phthalate	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0

Summary of Chemical Analysis
Leach Samples

Our Ref: 10-84318
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	5	6	7	8
		Sample Ref	272801	272802	272803	272804
		Depth	8.00	4.00	3.00	3.00
		Other Ref	BH17	BH4	BH5	BH2
		Sample Type	Leach	Leach	Leach	Leach
Test	**Units**	**DETSxx**				
Benzo(b)fluoranthene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Indeno(1,2,3-cd)pyrene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0
Benzo(ghi)pyrelene	ug/l	DETSM-334*	<1.0	<1.0	<1.0	<1.0

Summary of Chemical Analysis
Leach Samples

Our Ref: 10-84318
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	1	2	3	4
		Sample Ref	272797	272798	272799	272800
		Depth	1.00	5.00	5.00	1.00
		Other Ref	BH12	BH15	BH20A	TP2
		Sample Type	Leach	Leach	Leach	Leach
Test	**Units**	**DETSxx**				
Tributyltin	µg/l	DETSM-351*	<0.020	<0.020	<0.020	<0.020

Summary of Chemical Analysis
Leach Samples

Our Ref: 10-84318
Client Ref: 10-40084
Contract Title: Plymouth EFW

		Lab No.	5	6	7	8
		Sample Ref	272801	272802	272803	272804
		Depth	8.00	4.00	3.00	3.00
		Other Ref	BH17	BH4	BH5	BH2
		Sample Type	Leach	Leach	Leach	Leach
Test	**Units**	**DETSxx**				
Tributyltin	µg/l	DETSM-351*	<0.020	<0.020	<0.020	<0.020

Certificate of Analysis

Date: 07/09/2010

2139

Certificate Number: 10-40974

Client: Geotechnics Ltd
7 Pinbrooks Unit
Venny Bridge
Exeter
EX4 8JQ

Our Reference: 10-40974

Client Reference: PE100830

Contract Title: Plymouth EFW

Description: 1 leachate sample

Date Received: 26/08/2010

Date Started: 26/08/2010

Date Completed: 07/09/2010

Test Procedures: Identified by prefix DETSn, details available upon request.

Notes: Observations and interpretations are outside the scope of UKAS accreditation
* denotes test not included in laboratory scope of accreditation
# denotes test that holds MCERT accreditation, however, MCERTS accreditation is only implied if the report carries the MCERTS logo
$ denotes tests completed by an approved subcontractor
I/S denotes insufficient sample to carry out test
U/S denotes that the sample is not suitable for testing
DETSM denotes tests carried out by DETS Midlands laboratory
Solid samples will be disposed 1 month and liquids 2 weeks after the date of issue of this test certificate
Asbestos subsamples will be kept for 6 months

Approved By:



Authorised Signatories: Rob Brown
Business Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Summary of Chemical Analysis
Leachate Samples

Our Ref: 10-40974
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278228
		Sample ID	BH13
		Depth	5.00
		Sample Ref	
		Sample Type	
Test	**Units**	**DETSxx**	
Arsenic Dissolved	ug/l	DETS 2326*	< 1
Cadmium Dissolved	ug/l	DETS 042	< 2
Chromium Dissolved	ug/l	DETS 042	< 5
Copper Dissolved	ug/l	DETS 042	7
Lead Dissolved	ug/l	DETS 042	< 4
Mercury Dissolved	ug/l	DETS 078	< 0.05
Nickel Dissolved	ug/l	DETS 042	< 10
Selenium Dissolved	ug/l	DETS 017	< 3
Tin Dissolved	ug/l	DETS 042*	67
Zinc Dissolved	ug/l	DETS 042	1
Cyanide total	ug/l	DETS 067	< 40
Cyanide free	ug/l	DETS 067	< 20
Conductivity	uS/cm	DETS 009	133
Ammoniacal Nitrogen as N	mg/l	DETSC2207	0.3
Total Organic Carbon	mg/l	DETS 033	7.6
pH		DETS 008	10.0
Aliphatic C5-C6	ug/l	DETS 072*	4.3
Aliphatic C6-C8	ug/l	DETS 072*	2
Aliphatic C8-C10	ug/l	DETS 072*	< 0.1
Aliphatic C10-C12	ug/l	DETS 072*	< 1
Aliphatic C12-C16	ug/l	DETS 072*	< 1
Aliphatic C16-C21	ug/l	DETS 072*	< 1
Aliphatic C21-C35	ug/l	DETS 072*	< 1
Aromatic C5-C7	ug/l	DETS 072*	0.4
Aromatic C7-C8	ug/l	DETS 072*	< 0.1
Aromatic C8-C10	ug/l	DETS 072*	< 0.1
Aromatic C10-C12	ug/l	DETS 072*	< 1
Aromatic C12-C16	ug/l	DETS 072*	69
Aromatic C16-C21	ug/l	DETS 072*	160
Aromatic C21-C35	ug/l	DETS 072*	35
Aliphatic C5-C35	ug/l	DETS 072*	< 10
Aromatic C5-C35	ug/l	DETS 072*	270
TPH Ali/Aro	ug/l	DETS 072*	270
Tributyltin	ug/l	DETSM-351*	<0.020
BS EN 12457 2:1		DETS 036*	

Summary of Chemical Analysis
Leachate Samples

Our Ref: 10-40974
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278228
		Sample ID	BH13
		Depth	5.00
		Sample Ref	
		Sample Type	
Test	**Units**	**DETSxx**	
Total VOC's	ug/l	DETS 068*	10
1,1 Dichloroethylene	ug/l	DETS 068*	< 1
Methylene Chloride	ug/l	DETS 068*	< 1
Trans-1,2-dichloroethylene	ug/l	DETS 068*	< 1
1,1-dichloroethane	ug/l	DETS 068*	< 1
2,2-dichlororopane+1,2-dichloroethylene	ug/l	DETS 068*	< 1
Bromochloromethane	ug/l	DETS 068*	< 1
Chloroform	ug/l	DETS 068*	< 1
1,1,1-trichloroethane	ug/l	DETS 068*	< 1
1,1-dichloropropene	ug/l	DETS 068*	< 1
Carbon tetrachloride	ug/l	DETS 068*	< 1
Benzene	ug/l	DETS 068*	< 1
1,2-dichloroethane	ug/l	DETS 068*	< 1
Trichloroethylene	ug/l	DETS 068*	< 1
1,2-dichloropropane	ug/l	DETS 068*	< 1
Dibromomethane	ug/l	DETS 068*	< 1
Bromodichloromethane	ug/l	DETS 068*	< 1
cis-1,3-dichloropropene	ug/l	DETS 068*	< 1
Toluene	ug/l	DETS 068*	< 1
trans-1,3-dichloropropene	ug/l	DETS 068*	< 1
1,1,2-trichloroethane	ug/l	DETS 068*	< 1
Tetrachloroethylene	ug/l	DETS 068*	< 1
1,3-dichloropropane	ug/l	DETS 068*	< 1
Dibromochloromethane	ug/l	DETS 068*	< 1
1,2-dibromoethane	ug/l	DETS 068*	< 1
Chlorobenzene	ug/l	DETS 068*	< 1
Ethylbenzene	ug/l	DETS 068*	< 1
1,1,1,2-tetrachloroethane	ug/l	DETS 068*	< 1
m+p-Xylene	ug/l	DETS 068*	< 1
o-Xylene	ug/l	DETS 068*	< 1
Styrene	ug/l	DETS 068*	< 1
Bromoform	ug/l	DETS 068*	< 1
Isopropylbenzene	ug/l	DETS 068*	< 1
Bromobenzene	ug/l	DETS 068*	< 1
1,2,3-trichloropropane	ug/l	DETS 068*	< 1
n-propylbenzene	ug/l	DETS 068*	< 1
2-chlorotoluene	ug/l	DETS 068*	< 1
1,3,5-trimethylbenzene	ug/l	DETS 068*	< 1
4-chlorotoluene	ug/l	DETS 068*	< 1
Tert-butylbenzene	ug/l	DETS 068*	< 1
1,2,4-trimethylbenzene	ug/l	DETS 068*	< 1
sec-butylbenzene	ug/l	DETS 068*	< 1
p-isopropyltoluene	ug/l	DETS 068*	< 1
1,3-dichlorobenzene	ug/l	DETS 068*	< 1
1,4-dichlorobenzene	ug/l	DETS 068*	< 1

Summary of Chemical Analysis
Leachate Samples

Our Ref: 10-40974
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278228
		Sample ID	BH13
		Depth	5.00
		Sample Ref	
		Sample Type	
Test	**Units**	**DETSxx**	
n-butylbenzene	ug/l	DETS 068*	< 1
1,2-dichlorobenzene	ug/l	DETS 068*	< 1
1,2-dibromo-3-chloropropane	ug/l	DETS 068*	< 1
1,2,4-trichlorobenzene	ug/l	DETS 068*	< 1
Hexachlorobutadiene	ug/l	DETS 068*	< 1
Naphthalene	ug/l	DETS 068*	10
1,2,3-trichlorobenzene	ug/l	DETS 068*	< 1

Summary of Chemical Analysis
Leach Samples

Our Ref: 10-40974
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278228
		Sample Ref	BH13
		Depth	5.00
		Other Ref	
		Sample Type	
Test	**Units**	**DETSxx**	
Aniline	ug/l	DETSM-334*	<1.0
Bis(2-chloroethyl)ether	ug/l	DETSM-334*	<1.0
Phenol	ug/l	DETSM-334*	<1.0
2-Chlorophenol	ug/l	DETSM-334*	<1.0
Benzyl Alcohol	ug/l	DETSM-334*	<1.0
2-Methylphenol	ug/l	DETSM-334*	<1.0
3& 4-Methylphenol	ug/l	DETSM-334*	<1.0
2,4-dimethylphenol	ug/l	DETSM-334*	<1.0
Bis-(dichloroethoxy)methane	ug/l	DETSM-334*	<1.0
2,4-Dichlorophenol	ug/l	DETSM-334*	<1.0
1,2,4-Trichlorobenzene	ug/l	DETSM-334*	<1.0
Naphthalene	ug/l	DETSM-334*	3.6
4-Chloro-3-methylphenol	ug/l	DETSM-334*	<1.0
2-Methylnaphthalene	ug/l	DETSM-334*	1.0
Hexachlorocyclopentadiene	ug/l	DETSM-334*	<1.0
2,4,6 Trichlorophenol	ug/l	DETSM-334*	<1.0
2,4,5 Trichlorophenol	ug/l	DETSM-334*	<1.0
2-Chloronaphthalene	ug/l	DETSM-334*	<1.0
2-Nitroaniline	ug/l	DETSM-334*	<1.0
1,4-dinitrobenzene	ug/l	DETSM-334*	<1.0
Dimethyl phthalate	ug/l	DETSM-334*	<1.0
1,3-dinitrobenzene	ug/l	DETSM-334*	<1.0
Acenaphthylene	ug/l	DETSM-334*	<1.0
2,6-Dinitrotoluene	ug/l	DETSM-334*	<1.0
1,2-Dinitrobenzene	ug/l	DETSM-334*	<1.0
3-Nitroaniline	ug/l	DETSM-334*	<1.0
Acenaphthene	ug/l	DETSM-334*	<1.0
Dibenzofuran	ug/l	DETSM-334*	<1.0
2,4-Dinitrotoluene	ug/l	DETSM-334*	<1.0
4-Nitrophenol	ug/l	DETSM-334*	<1.0
2,3,4,6-Tetrachlorophenol	ug/l	DETSM-334*	<1.0
2,3,5,6-Tetrachlorophenol	ug/l	DETSM-334*	<1.0
Diethylphthalate	ug/l	DETSM-334*	<1.0
Fluorene	ug/l	DETSM-334*	1.5
4-Chlorophenyl phenyl ether	ug/l	DETSM-334*	<1.0
4-Nitroaniline	ug/l	DETSM-334*	<1.0
Diphenylamine/4,6-Dinitro-2-	ug/l	DETSM-334*	<1.0
Azobenzene	ug/l	DETSM-334*	<1.0
4-Bromophenyl phenyl ether	ug/l	DETSM-334*	<1.0
Hexachlorobenzene	ug/l	DETSM-334*	<1.0
Pentachlorophenol	ug/l	DETSM-334*	<1.0
Phenanthrene	ug/l	DETSM-334*	3.8
Anthracene	ug/l	DETSM-334*	<1.0
Carbazole	ug/l	DETSM-334*	3.5
Di-n-butylphthalate	ug/l	DETSM-334*	<1.0
Benzyl butyl phthalate	ug/l	DETSM-334*	<1.0
Bis(2-ethylhexyl)ester	ug/l	DETSM-334*	<1.0
Fluoranthene	ug/l	DETSM-334*	1.0
Pyrene	ug/l	DETSM-334*	<1.0
Benzo(a)anthracene	ug/l	DETSM-334*	<1.0
Chrysene	ug/l	DETSM-334*	<1.0
Di-n-octyl phthalate	ug/l	DETSM-334*	<1.0

Summary of Chemical Analysis
Leach Samples

Our Ref: 10-40974
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278228
		Sample Ref	BH13
		Depth	5.00
		Other Ref	
		Sample Type	
Test	**Units**	**DETSxx**	
Benzo(b)fluoranthene	ug/l	DETSM-334*	<1.0
Benzo(k)fluoranthene	ug/l	DETSM-334*	<1.0
Benzo(a)pyrene	ug/l	DETSM-334*	<1.0
Indeno(1,2,3-cd)pyrene	ug/l	DETSM-334*	<1.0
Dibenz(a,h)anthracene	ug/l	DETSM-334*	<1.0
Benzo(ghi)pyrelene	ug/l	DETSM-334*	<1.0

Derwentside Environmental Testing Services

2139

Certificate of Analysis

Date: 06/09/2010

Certificate Number: 10-40952

Client:
Geotechnics Ltd
7 Pinbrooks Unit
Venny Bridge
Exeter
EX4 8JQ

Our Reference: 10-40952

Client Reference: PE100830

Contract Title: Plymouth EFW

Description: 12 water samples

Date Received: 26/08/2010

Date Started: 26/08/2010

Date Completed: 06/09/2010

Test Procedures: Identified by prefix DETSn, details available upon request.

Notes:
Observations and interpretations are outside the scope of UKAS accreditation
* denotes test not included in laboratory scope of accreditation
# denotes test that holds MCERT accreditation, however, MCERTS accreditation is only implied if the report carries the MCERTS logo
$ denotes tests completed by an approved subcontractor
I/S denotes insufficient sample to carry out test
U/S denotes that the sample is not suitable for testing
DETSM denotes tests carried out by DETS Midlands laboratory
Solid samples will be disposed 1 month and liquids 2 weeks after the date of issue of this test certificate
Asbestos subsamples will be kept for 6 months

Approved By:

Authorised Signatories: Rob Brown
Business Manager

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Derwentside Environmental Testing Services Limited
Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY
Tel: 01207 582333 • Fax 01207 582444 • email: info@dets.co.uk • www.dets.co.uk

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278119	278120	278121	278122	278123
		Sample ID	BH1A	BH2	BH3	BH6b	BH7
		Depth	deep pipe				
		Sample Ref					
		Sample Type					
Test	**Units**	**DETSxx**					
Arsenic Dissolved	ug/l	DETS 2326*	4	3	1	25	< 1
Cadmium Dissolved	ug/l	DETS 042	< 2	< 2	< 2	< 2	< 2
Chromium Dissolved	ug/l	DETS 042	< 5	< 5	< 5	19	< 5
Copper Dissolved	ug/l	DETS 042	< 2	< 2	< 2	38	3
Lead Dissolved	ug/l	DETS 042	< 4	< 4	< 4	< 4	< 4
Mercury Dissolved	ug/l	DETS 078	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel Dissolved	ug/l	DETS 042	< 10	< 10	< 10	< 10	< 10
Selenium Dissolved	ug/l	DETS 017	< 3	< 3	< 3	< 3	< 3
Tin Dissolved	ug/l	DETS 042*	26	38	24	14	20
Zinc Dissolved	ug/l	DETS 042	3	2	6	3	2
Sulphate	mg/l	DETS 055	29	38	540	560	52
Cyanide total	ug/l	DETS 067	< 40	< 40	< 40	< 40	< 40
Conductivity	uS/cm	DETS 009	809	3220	8610	4340	6470
Hardness	mg/l	DETS 043*	230	410	1300	2.7	250
Ammoniacal Nitrogen as N	mg/l	DETSC2207	3.9	8.9	3.8	3.8	2.2
Total Organic Carbon	mg/l	DETS 033	3	< 2.0	5.9	14	3.7
pH		DETS 008	7.6	7.7	7.7	9.1	7.7
Aliphatic C5-C6	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aliphatic C12-C16	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aliphatic C16-C21	ug/l	DETS 072*	< 1	< 1	< 1	< 1	67
Aliphatic C21-C35	ug/l	DETS 072*	< 1	< 1	< 1	< 1	1400
Aromatic C5-C7	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aromatic C12-C16	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aromatic C16-C21	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aromatic C21-C35	ug/l	DETS 072*	< 1	< 1	< 1	< 1	3
Aliphatic C5-C35	ug/l	DETS 072*	< 10	< 10	< 10	< 10	1400
Aromatic C5-C35	ug/l	DETS 072*	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro	ug/l	DETS 072*	< 10	< 10	< 10	< 10	1400
Tributyltin	ug/l	DETSM-351*	<0.020	<0.020	<0.020	<0.020	<0.020

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278124	278125	278126	278127	278128
		Sample ID	BH12a	BH15	BH17	BH18	BH19
		Depth					
		Sample Ref					
		Sample Type					
Test	**Units**	**DETSxx**					
Arsenic Dissolved	ug/l	DETS 2326*	4	3	< 1	3	6
Cadmium Dissolved	ug/l	DETS 042	< 2	< 2	< 2	< 2	< 2
Chromium Dissolved	ug/l	DETS 042	< 5	< 5	< 5	< 5	5
Copper Dissolved	ug/l	DETS 042	7	< 2	< 2	2	2
Lead Dissolved	ug/l	DETS 042	< 4	< 4	< 4	< 4	< 4
Mercury Dissolved	ug/l	DETS 078	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel Dissolved	ug/l	DETS 042	< 10	< 10	< 10	< 10	< 10
Selenium Dissolved	ug/l	DETS 017	< 3	< 3	< 3	< 3	< 3
Tin Dissolved	ug/l	DETS 042*	22	16	< 10	23	23
Zinc Dissolved	ug/l	DETS 042	1	2	< 1	< 1	25
Sulphate	mg/l	DETS 055	370	2300	23	1200	1500
Cyanide total	ug/l	DETS 067	< 40	< 40	< 40	< 40	< 40
Conductivity	uS/cm	DETS 009	3710	41000	660	21700	27800
Hardness	mg/l	DETS 043*	750	4200	430	2.6	3400
Ammoniacal Nitrogen as N	mg/l	DETSC2207	0.074	0.055	0.73	1.1	0.56
Total Organic Carbon	mg/l	DETS 033	24	250	< 2.0	200	57
pH		DETS 008	7.6	7.8	8.1	7.8	7.7
Aliphatic C5-C6	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	5.9	6.1
Aliphatic C6-C8	ug/l	DETS 072*	< 0.1	2	< 0.1	2.2	2.3
Aliphatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aliphatic C12-C16	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aliphatic C16-C21	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aliphatic C21-C35	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aromatic C5-C7	ug/l	DETS 072*	< 0.1	0.4	< 0.1	0.5	0.5
Aromatic C7-C8	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aromatic C12-C16	ug/l	DETS 072*	5	3	3	3	< 1
Aromatic C16-C21	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aromatic C21-C35	ug/l	DETS 072*	< 1	< 1	< 1	< 1	< 1
Aliphatic C5-C35	ug/l	DETS 072*	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C35	ug/l	DETS 072*	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro	ug/l	DETS 072*	< 10	< 10	< 10	12	< 10
Tributyltin	ug/l	DETSM-351*	<0.020	<0.020	<0.020	<0.020	<0.020

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278129	278130
		Sample ID	BH121	BH22
		Depth		
		Sample Ref		
		Sample Type		
Test	**Units**	**DETSxx**		
Arsenic Dissolved	ug/l	DETS 2326*	2	3
Cadmium Dissolved	ug/l	DETS 042	< 2	< 2
Chromium Dissolved	ug/l	DETS 042	< 5	< 5
Copper Dissolved	ug/l	DETS 042	2	< 2
Lead Dissolved	ug/l	DETS 042	< 4	< 4
Mercury Dissolved	ug/l	DETS 078	< 0.05	< 0.05
Nickel Dissolved	ug/l	DETS 042	< 10	< 10
Selenium Dissolved	ug/l	DETS 017	< 3	< 3
Tin Dissolved	ug/l	DETS 042*	< 10	10
Zinc Dissolved	ug/l	DETS 042	9	10
Sulphate	mg/l	DETS 055	1600	2200
Cyanide total	ug/l	DETS 067	< 40	< 40
Conductivity	uS/cm	DETS 009	31500	39700
Hardness	mg/l	DETS 043*	3700	4300
Ammoniacal Nitrogen as N	mg/l	DETSC2207	0.56	0.72
Total Organic Carbon	mg/l	DETS 033	110	400
pH		DETS 008	7.8	7.7
Aliphatic C5-C6	ug/l	DETS 072*	5.6	< 0.1
Aliphatic C6-C8	ug/l	DETS 072*	2.2	< 0.1
Aliphatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1
Aliphatic C10-C12	ug/l	DETS 072*	< 1	< 1
Aliphatic C12-C16	ug/l	DETS 072*	< 1	< 1
Aliphatic C16-C21	ug/l	DETS 072*	< 1	< 1
Aliphatic C21-C35	ug/l	DETS 072*	< 1	< 1
Aromatic C5-C7	ug/l	DETS 072*	0.4	< 0.1
Aromatic C7-C8	ug/l	DETS 072*	< 0.1	< 0.1
Aromatic C8-C10	ug/l	DETS 072*	< 0.1	< 0.1
Aromatic C10-C12	ug/l	DETS 072*	< 1	< 1
Aromatic C12-C16	ug/l	DETS 072*	< 1	< 1
Aromatic C16-C21	ug/l	DETS 072*	< 1	< 1
Aromatic C21-C35	ug/l	DETS 072*	< 1	< 1
Aliphatic C5-C35	ug/l	DETS 072*	< 10	< 10
Aromatic C5-C35	ug/l	DETS 072*	< 10	< 10
TPH Ali/Aro	ug/l	DETS 072*	< 10	< 10
Tributyltin	ug/l	DETSM-351*	<0.020	<0.020

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278119	278120	278121	278122	278123
		Sample ID	BH1A	BH2	BH3	BH6b	BH7
		Depth	deep pipe				
		Sample Ref					
		Sample Type					
Test	**Units**	**DETSxx**					
Total VOC's	ug/l	DETS 068*	< 1	< 1	< 1	1	< 1
1,1 Dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Trans-1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
2,2-dichlororopane+1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromochloromethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Chloroform	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Benzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Dibromomethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
cis-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Toluene	ug/l	DETS 068*	< 1	< 1	< 1	1	< 1
trans-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
o-Xylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Styrene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromoform	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,3-trichloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,4-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278119	278120	278121	278122	278123
		Sample ID	BH1A	BH2	BH3	BH6b	BH7
		Depth	deep pipe				
		Sample Ref					
		Sample Type					
Test	**Units**	**DETSxx**					
n-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Naphthalene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278124	278125	278126	278127	278128
		Sample ID	BH12a	BH15	BH17	BH18	BH19
		Depth					
		Sample Ref					
		Sample Type					
Test	**Units**	**DETSxx**					
Total VOC's	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1 Dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Trans-1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
2,2-dichlororopane+1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromochloromethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Chloroform	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Benzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Dibromomethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
cis-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Toluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
o-Xylene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Styrene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromoform	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Bromobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,3-trichloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,4-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278124	278125	278126	278127	278128
		Sample ID	BH12a	BH15	BH17	BH18	BH19
		Depth					
		Sample Ref					
		Sample Type					
Test	**Units**	**DETSxx**					
n-butylbenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
Naphthalene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	ug/l	DETS 068*	< 1	< 1	< 1	< 1	< 1

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278129	278130
		Sample ID	BH121	BH22
		Depth		
		Sample Ref		
		Sample Type		
Test	**Units**	**DETSxx**		
Total VOC's	ug/l	DETS 068*	< 1	< 1
1,1 Dichloroethylene	ug/l	DETS 068*	< 1	< 1
Methylene Chloride	ug/l	DETS 068*	< 1	< 1
Trans-1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1
1,1-dichloroethane	ug/l	DETS 068*	< 1	< 1
2,2-dichlororopane+1,2-dichloroethylene	ug/l	DETS 068*	< 1	< 1
Bromochloromethane	ug/l	DETS 068*	< 1	< 1
Chloroform	ug/l	DETS 068*	< 1	< 1
1,1,1-trichloroethane	ug/l	DETS 068*	< 1	< 1
Carbon tetrachloride	ug/l	DETS 068*	< 1	< 1
1,1-dichloropropene	ug/l	DETS 068*	< 1	< 1
Benzene	ug/l	DETS 068*	< 1	< 1
1,2-dichloroethane	ug/l	DETS 068*	< 1	< 1
Trichloroethylene	ug/l	DETS 068*	< 1	< 1
1,2-dichloropropane	ug/l	DETS 068*	< 1	< 1
Dibromomethane	ug/l	DETS 068*	< 1	< 1
Bromodichloromethane	ug/l	DETS 068*	< 1	< 1
cis-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1
Toluene	ug/l	DETS 068*	< 1	< 1
trans-1,3-dichloropropene	ug/l	DETS 068*	< 1	< 1
1,1,2-trichloroethane	ug/l	DETS 068*	< 1	< 1
Tetrachloroethylene	ug/l	DETS 068*	< 1	< 1
1,3-dichloropropane	ug/l	DETS 068*	< 1	< 1
Dibromochloromethane	ug/l	DETS 068*	< 1	< 1
1,2-dibromoethane	ug/l	DETS 068*	< 1	< 1
Chlorobenzene	ug/l	DETS 068*	< 1	< 1
Ethylbenzene	ug/l	DETS 068*	< 1	< 1
1,1,1,2-tetrachloroethane	ug/l	DETS 068*	< 1	< 1
m+p-Xylene	ug/l	DETS 068*	< 1	< 1
o-Xylene	ug/l	DETS 068*	< 1	< 1
Styrene	ug/l	DETS 068*	< 1	< 1
Bromoform	ug/l	DETS 068*	< 1	< 1
Isopropylbenzene	ug/l	DETS 068*	< 1	< 1
Bromobenzene	ug/l	DETS 068*	< 1	< 1
1,2,3-trichloropropane	ug/l	DETS 068*	< 1	< 1
n-propylbenzene	ug/l	DETS 068*	< 1	< 1
2-chlorotoluene	ug/l	DETS 068*	< 1	< 1
1,3,5-trimethylbenzene	ug/l	DETS 068*	< 1	< 1
4-chlorotoluene	ug/l	DETS 068*	< 1	< 1
Tert-butylbenzene	ug/l	DETS 068*	< 1	< 1
1,2,4-trimethylbenzene	ug/l	DETS 068*	< 1	< 1
sec-butylbenzene	ug/l	DETS 068*	< 1	< 1
p-isopropyltoluene	ug/l	DETS 068*	< 1	< 1
1,3-dichlorobenzene	ug/l	DETS 068*	< 1	< 1
1,4-dichlorobenzene	ug/l	DETS 068*	< 1	< 1

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278129	278130
		Sample ID	BH121	BH22
		Depth		
		Sample Ref		
		Sample Type		
Test	**Units**	**DETSxx**		
n-butylbenzene	ug/l	DETS 068*	< 1	< 1
1,2-dichlorobenzene	ug/l	DETS 068*	< 1	< 1
1,2-dibromo-3-chloropropane	ug/l	DETS 068*	< 1	< 1
1,2,4-trichlorobenzene	ug/l	DETS 068*	< 1	< 1
Hexachlorobutadiene	ug/l	DETS 068*	< 1	< 1
Naphthalene	ug/l	DETS 068*	< 1	< 1
1,2,3-trichlorobenzene	ug/l	DETS 068*	< 1	< 1

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278119	278120	278121	278122	278123	278124
		Sample Ref	BH1A	BH2	BH3	BH6b	BH7	BH12a
		Depth	deep pipe					
		Other Ref						
		Sample Type						
Test	**Units**	**DETSxx**						
Aniline	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bis(2-chloroethyl)ether	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzyl Alcohol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
3& 4-Methylphenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-dimethylphenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bis-(dichloroethoxy)methane	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylnaphthalene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorocyclopentadiene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6 Trichlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5 Trichlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chloronaphthalene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Nitroaniline	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-dinitrobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dimethyl phthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dinitrobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dinitrotoluene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dinitrobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
3-Nitroaniline	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenzofuran	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dinitrotoluene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Nitrophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,3,4,6-Tetrachlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,3,5,6-Tetrachlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Diethylphthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chlorophenyl phenyl ether	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Nitroaniline	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Diphenylamine/4,6-Dinitro-2-	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Azobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Bromophenyl phenyl ether	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbazole	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Di-n-butylphthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzyl butyl phthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bis(2-ethylhexyl)ester	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)anthracene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Di-n-octyl phthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278119	278120	278121	278122	278123	278124
		Sample Ref	BH1A	BH2	BH3	BH6b	BH7	BH12a
		Depth	deep pipe					
		Other Ref						
		Sample Type						
Test	**Units**	**DETSxx**						
Benzo(b)fluoranthene	ug/l	DETSM-334[a]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	ug/l	DETSM-334[a]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	ug/l	DETSM-334[a]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Indeno(1,2,3-cd)pyrene	ug/l	DETSM-334[a]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	ug/l	DETSM-334[a]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(ghi)pyrelene	ug/l	DETSM-334[a]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

		Lab No.	278125	278126	278127	278128	278129	278130
		Sample Ref	BH15	BH17	BH18	BH19	BH121	BH22
		Depth						
		Other Ref						
		Sample Type						
Test	**Units**	**DETSxx**						
Aniline	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bis(2-chloroethyl)ether	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzyl Alcohol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
3& 4-Methylphenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-dimethylphenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bis-(dichloroethoxy)methane	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylnaphthalene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorocyclopentadiene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6 Trichlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5 Trichlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chloronaphthalene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Nitroaniline	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-dinitrobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dimethyl phthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dinitrobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dinitrotoluene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dinitrobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
3-Nitroaniline	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenzofuran	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dinitrotoluene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Nitrophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,3,4,6-Tetrachlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,3,5,6-Tetrachlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Diethylphthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chlorophenyl phenyl ether	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Nitroaniline	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Diphenylamine/4,6-Dinitro-2-	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Azobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Bromophenyl phenyl ether	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbazole	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Di-n-butylphthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzyl butyl phthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bis(2-ethylhexyl)ester	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)anthracene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Di-n-octyl phthalate	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Summary of Chemical Analysis
Water Samples

Our Ref: 10-40952
Client Ref: PE100830
Contract Title: Plymouth EFW

	Lab No.	278125	278126	278127	278128	278129	278130
	Sample Ref	BH15	BH17	BH18	BH19	BH121	BH22
	Depth						
	Other Ref						
	Sample Type						
Test	**Units**	**DETSxx**					
Benzo(b)fluoranthene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Indeno(1,2,3-cd)pyrene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(ghi)pyrelene	ug/l	DETSM-334ª	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

APPENDIX 13

Investigation Techniques and General Notes

INVESTIGATION TECHNIQUES

INTRODUCTION

The following brief review of Ground Investigation techniques, generally used as part of most Site Investigations in the UK, summarises their methodology, advantages and limitations. Detailed descriptions of the techniques are available and can be provided on request. This review should be read in conjunction with the accompanying General Notes.

TRIAL PITS

The trial pit is amongst the most simple yet effective means of identifying shallow ground conditions on a site. Its advantages include simplicity, speed, potential accuracy and cost-effectiveness. The trial pit is most commonly formed using a backacting excavator which can typically determine ground conditions to some 4 metres below ground level. Hand excavation is often used to locate, expose and detail existing foundations, features or services. In general, it is difficult to extend pits significantly below the water table in predominantly granular soils, where flows can cause instability. Unless otherwise stated, the trial pits will not have been provided with temporary side support during their construction. Under such circumstances ground conditions to some 1.20 metres can be closely inspected, subject to stability assessment, but below this depth, entrance into the pit is not permitted in the absence of shoring and hence observations will have been made from ground surface and samples taken from the excavator bucket.

Trends in strata type, level and thickness can be determined, shear surfaces identified and the behaviour of plant, excavation sides and excavated materials can be related to the construction process. They are particularly valuable in land slip investigations. Some types of insitu test can be undertaken in such pits and large disturbed or block samples obtained.

CABLE PERCUSSION BORING

The light Cable Percussion technique of soft ground boring, typically at a diameter of 150mm, is a well established simple and flexible method of boring vertical holes and generally allows data to be obtained in respect of strata conditions other than rock. A tubular cutter (for cohesive soils) or shell with a flap valve (for granular soils) is repeatedly lifted and dropped using a winch and rope operating from an "A" frame. Soil which enters these tools is regularly removed and either sampled for subsequent examination or test, or laid to one side for backfilling. Steel casing will have been used to prevent collapse of the borehole sides where necessary. A degree of disturbance of soil and mixing of layers is inevitable and the presence of very thin layers of different soils within a particular stratum may not be identified. Changes in strata type can only be detected on recognition of a change in soil samples at surface, after the interface has been passed. For the foregoing reasons, depth measurements should not be considered to be more accurate than 0.10 metre.

In cohesive soils cylindrical samples are retrieved by driving or pushing in 100mm nominal diameter tubes. In soft soils, piston sampling or vane testing may be undertaken. In granular soils and often in cohesive materials, insitu Standard Penetration Tests (SPT's) are performed. The SPT records the number of standard blows required to drive a 50mm diameter open or cone ended probe for 300mm after an initial 150mm penetration. A modified method of recording is used in more dense strata. Small disturbed samples are obtained throughout.

The technique can determine ground conditions to depths in excess of 30 metres under suitable circumstances and usually causes less surface disturbance than trial pitting.

ROTARY DRILLING

Rotary Drilling to produce cores by rotating an annular diamond-impregnated tube or barrel into the ground is the technique most appropriate to the forming of site investigation boreholes through rock or other hard strata. It has the advantage of being able to be used vertically or at an angle. Core diameters of less than 100mm are most common for site investigation purposes. Core is normally retrieved in plastic lining tubes. A flushing fluid such as air, water or foam is used to cool the bit and carry cuttings to the surface.

Examination of cores allows detailed rock description and generally enables angled discontinuity surfaces to be observed. However, vertical holes do not necessarily reveal the presence of vertical or near-vertical fissures or joint discontinuities. The core type and/or techniques used. Where open hole rotary drilling is employed, descriptions of strata result from examination at surface of small particles ejected from the borehole in the flushing medium. In consequence, no indication of fissuring, bedding, consistency or degree of weathering can be obtained. Small scale plant can be used for auger drilling to limited depths where access is constrained.

Depths in excess of 60 metres can be achieved under suitable circumstances using rotary techniques, with minimal surface disturbance.

WINDOW SAMPLING

This technique involves the driving of an open-ended tube into the ground and retrieval of the soil which enters the tube. The term "window sample" arose from the original device which had a "window" or slot cut into the side of the tube through which samples were taken. This has now been superseded by the use of a thin-walled plastic liner within a sampler which has a solid wall. Diameters range from 36 to 86mm. Such samples can be used for qualitative logging, selection of samples for classification and chemical analysis and for obtaining a rudimentary assessment of strength.

Driving devices can be hand-held or machine mounted and the drive tubes are typically in 1m lengths. The hole formed is not cased, however, and hence the success of this technique is limited when soils and groundwater conditions are such that the sides of the hole collapse on withdrawal of the sampler. Obstructions within the ground, the density of the material or its strength can also limit the depth and rate of penetration of this light-weight investigation technique. Nevertheless, it is a valuable tool where access is constrained such as within buildings or on embankments. Depths of up to 8m can be achieved in suitable circumstances but depths of 4m to 6m are more common.

EXPLORATORY HOLE RECORDS

The data obtained by these techniques are generally presented on Trial Pit, Borehole, Drillhole or Window Sample Records. The descriptions of strata result from information gathered from a number of sources which may include published geological data, preliminary field observations and descriptions, insitu test results, laboratory test results and specimen descriptions. A key to the symbols and abbreviations used accompanies the records. The descriptions on the exploratory hole records accommodate but may not necessarily be identical to those on any preliminary records or the laboratory summaries.

The records show ground conditions at the exploratory hole locations. The degree to which they can be used to represent conditions between or beyond such holes, however, is a matter for geological interpretation rather than factual reporting and the associated uncertainties must be recognised.

DYNAMIC PROBING

This technique typically measures the number of blows of a standard weight falling over a standard height to advance a cone-ended rod over sequential standard distances (typically 100mm). Some devices measure the penetration of the probe per standard blow. It is essentially a profiling tool and is best used in conjunction with other investigation techniques where site-specific correlation can be used to delineate the distribution of soft or loose soils or the upper horizon of a dense or strong layer such as rock.

Both machine-driven and hand-driven equipment is available, the selection depending upon access restrictions and the depth of penetration required. It is particularly useful where access for larger equipment is not available, disturbance is to be minimised or where there are cost constraints. No samples are recovered and some techniques leave a sacrificial cone head in the ground. As with other lightweight techniques, progress is limited in strong or dense soils. The results are presented both numerically and graphically. Depths of up to 10m are commonly achieved in suitable circumstances.

The hand-driven DCP probing device has been calibrated by the TRL to provide a profile of CBR values over a range of depths of up to 1.50m.

INSTRUMENTATION

The most common form of instrument used in site investigation is either the standpipe or else the standpipe piezometer which can be installed in investigation holes. They are used to facilitate monitoring of groundwater levels and water sampling over a period of time following site work. Normally a standpipe would be formed using rigid plastic tubing which has been perforated or slotted over much of its length whilst a standpipe piezometer would have a filter tip which would be placed at a selected level and the hole sealed above and sometimes below to isolate the zone of interest. Groundwater levels are determined using an electronic "dipmeter" to measure the depth to the water surface from ground level. Piezometers can also be used to measure permeability. They are simple and inexpensive instruments for long term monitoring but response times can limit their use in tidal areas and access to the ground surface at each instrument is necessary. Remote reading requires more sophisticated hydraulic, electronic or pneumatic equipment.

Settlement can be monitored using surface or buried target plates whilst lateral movement over a range of depths is monitored using slip indicator or inclinometer equipment.

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GENERAL NOTES

1. *The report is prepared for the exclusive use of the Client named in the document and copyright subsists with Geotechnics Limited. Prior written permission must be obtained to reproduce all or part of the report. It is prepared on the understanding that its contents are only disclosed to parties directly involved in the current investigation, preparation and development of the site.*

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4. *The assessment of the significance of the factual data, where called for, is provided to assist the Client and his Engineer and/or Advisers in the preparation of their designs.*

5. *The report is based on the ground conditions encountered in the exploratory holes together with the results of field and laboratory testing in the context of the proposed development. The data from any commissioned desk study and site reconnaissance are also drawn upon. There may be special conditions appertaining to the site, however, which are not revealed by the investigation and which may not be taken into account in the report.*

6. *Methods of construction and/or design other than those proposed by the designers or referred to in the report may require consideration during the evolution of the proposals and further assessment of the geotechnical and any geoenvironmental data would be required to provide discussion and evaluations appropriate to these methods.*

7. *The accuracy of results reported depends upon the technique of measurement, investigation and test used and these values should not be regarded necessarily as characteristics of the strata as a whole (see accompanying notes on Investigation Techniques). Where such measurements are critical, the technique of investigation will need to be reviewed and supplementary investigation undertaken in accordance with the advice of the Company where necessary.*

8. *The samples selected for laboratory test are prepared and tested in accordance with the relevant Clauses of BS 1377 Parts 1 to 8, where appropriate, in Geotechnics Limited's UKAS accredited Laboratory, where possible. A list of tests is given.*

9. *Tests requiring the use of another laboratory having UKAS accreditation where possible are identified.*

10. *Any unavoidable variations from specified procedures are identified in the report.*

11. *Specimens are cut vertically, where this is relevant and can be identified, unless otherwise stated.*

12. *All the data required by the test procedures are recorded on individual test sheets but the results in the report are presented in summary form to aid understanding and assimilation for design purposes. Where all details are required, these can be made available.*

13. *Whilst the report may express an opinion on possible configurations of strata between or beyond exploratory holes, or on the possible presence of features based on either visual, verbal, written, cartographical, photographic or published evidence, this is for guidance only and no liability can be accepted for its accuracy.*

14. *Classification of materials as Made Ground is based on the inspection of retrieved samples or exposed excavations. Where it is obvious that foreign matter such as paper, plastic or metal is present, classification is clear. Frequently, however, for fill materials that arise from the adjacent ground or from the backfilling of excavations, their visual characteristics can closely resemble those of undisturbed ground. Other evidence such as site history, exploratory hole location or other tests may need to be drawn upon to provide clarification. For these reasons, classification of soils on the exploratory hole records as either Made Ground or naturally occurring strata, the boundary between them and any interpretation that this gives rise to should be regarded as provisional and subject to re-evaluation in the light of further data.*

15. *The classification of materials as Topsoil is generally based on visual description and should not be interpreted to mean that the material so described complies with the criteria for Topsoil used in BS 3882 (2007). Specific testing would be necessary where such definition is a requirement.*

16. *Ground conditions should be monitored during the construction of the works and the report should be re-evaluated in the light of these data by the supervising geotechnical engineers.*

17. *Any comments on groundwater conditions are based on observations made at the time of the investigation, unless specifically stated otherwise. It should be noted, however, that the observations are subject to the method and speed of boring, drilling or excavation and that groundwater levels will vary due to seasonal or other effects.*

18. *Any bearing capacities for conventional spread foundations which are given in the report and interpreted from the investigation are for bases at a minimum depth of 1m below finished ground level in naturally occurring strata and at broadly similar levels throughout individual structures, unless otherwise stated. The foundations should be designed in accordance with the good practice embodied in BS 8004:1986 - Foundations, supplemented for housing by NHBC Standards. Foundation design is an iterative process and bearing pressures may need adjustment or other measures may need to be taken in the context of final layouts and levels prior to finalisation of proposals.*

19. *Unless specifically stated, the investigation does not take account of the possible effects of mineral extraction or of gases from fill or natural sources within, below or outside the site.*

20. *The costs or economic viability of the proposals referred to in the report, or of the solutions put forward to any problems encountered, will depend on very many factors in addition to geotechnical or geoenvironmental considerations and hence their evaluation is outside the scope of the report.*