DANISH GEOTECHNICAL INSTITUTE

Anholt/Djursland Offshore Wind Farm
Geotechnical Investigations
Wind Farm Area
Geotechnical Report – Boreholes

GEO project no 32490
Report 1, rev. 1, 2009-10-14

Summary

Ramboll Wind has on behalf of Energinet.dk contracted GEO (Danish Geotechnical Institute) to conduct the geotechnical site investigations at the planned offshore wind farm between Anholt and Djursland.

The Anholt/Djursland Offshore Wind Farm worksite is located approximately 20 km off the coast of Djursland, north-east of the town Grenaa. The exact location of the farm is not yet established and several options are being assessed. The Anholt/Djursland Offshore Wind farm is planned as a 400 MW farm.

Power produced by the Wind Farm will be distributed via an approx. 20 km sea cable going to the shore of Djursland. The exact location of the cable is not yet established and therefore two options "Gjerrild Strand" and Grenaa Nord" are being assessed.

The boring campaign in the wind farm area includes in total 7 boreholes to 40 metre below seabed. In addition to the sampling, down the hole CPT tests were carried out in the boreholes. At the BH08 location the possible occurrence of gas was investigated.

For the cable corridors a total of 21 CPT tests and 21 vibrocores were executed to a planned depth of 3 m below seabed.

All samples and cores from the boreholes and vibrocores have been geological described onshore. Classification-, chemical- and strength tests have been executed on selected samples.

This report 1 summarizes the field- and laboratory work for the wind farm area and gives a general description of the geological and geotechnical variations over the area. In connection with revision 1 of this report part of the geological descriptions presented on the borehole profiles have been revised taking the new information from the consolidation tests (Report 3) and the seismic information into consideration

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1 INTRODUCTION AND SCOPE OF REPORT

1.1 Project and site location

On the instruction and under the supervision of Rambøll, acting on behalf of Energinet.dk a geotechnical investigation has been carried out by GEO at the location for the planned Anholt/Djursland Offshore Wind Farm.

The Anholt/Djursland Offshore Wind Farm is planned as a 400 MW farm. The exact location of the farm is not yet established and several options are being assessed. The worksite is located approximately 20 km off the coast of Djursland, north-east of the town Grenaa. The worksite is depicted (orange area) in Figure 1.1 and measures approximately 144 km^2. The water depth across the site generally ranges between 14 and 20 m.

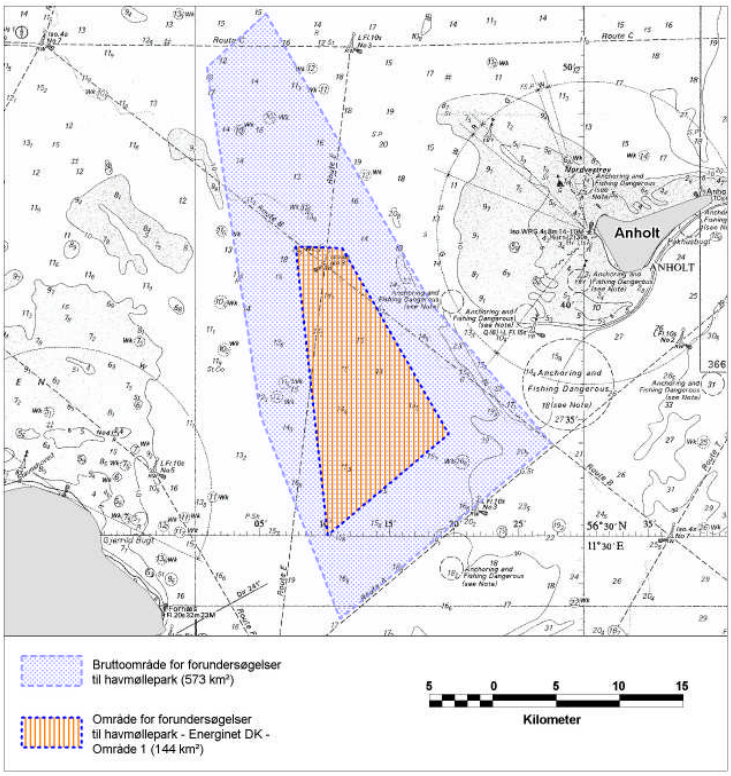

Figure 1.1 Location of Anholt/Djursland Offshore Wind Farm

Power produced by the Wind Farm will be distributed via an approx. 20 km sea cable going to the shore of Djursland. The exact location of the cable is not yet established and therefore two options are being assessed, a northern alignment. Gjerrild Strand and a southern alignment, Grenaa Nord.

The purpose of the geotechnical investigation is to gather adequate geological and geotechnical data for a preliminary technical assessment of the foundation conditions for the turbines. The geotechnical investigation follows a geophysical campaign and borehole and vibrocore locations have been selected by the Client based on the results of this survey.

1.2 Geotechnical reporting under the contract

The performed geotechnical works for the Anholt/Djursland project are presented in totally 2 reports. The overall content of the 2 reports are:

Report 1: Wind Farm Area - Geotechnical Report – Boreholes (borehole logs, CPT logs, laboratory results, soil conditions, summaries of work completed etc.).

Report 2: Cable Corridors **–** Geotechnical Report - CPTs and vibrocores (vibrocore logs, CPT logs, laboratory results, soil conditions, summaries of work completed etc.).

Report 3: Wind Farm Area **–** Geotechnical Report – Consolidation tests on 4 selected samples from borehole BH02, BH05, BH09 and BH10.

1.3 Content of this report

This report 1 summarizes the field- and laboratory work for the wind farm area and gives a general description of the geological and geotechnical variations over the area. In connection with revision 1 of this report part of the geological descriptions presented on the borehole profiles have been revised taking the new information from the consolidation tests (Report 3) and the seismic information into consideration

2 FIELD OPERATIONS

2.1 General

The geotechnical offshore fieldwork was performed between 16 May and 31 May 2009.

The following main activities were carried out:
Boreholes:

- 7 Nos. – approximately 40 m deep geotechnical boreholes with altering sampling and in-situ testing
- 93 Nos. down the hole CPT tests in the 7 boreholes
- Transit to and attempt to jack-up at 2 planned borehole positions (Borehole BH03 and BH06)
- Investigation of gas occurrence borehole (BH 08) (transit to and attempt to jack-up at the planned borehole position)

All test locations are shown on the location plan, Enclosure 1A.01 and listed on the summary sheets, Enclosures 1B.01 and 1B.02.

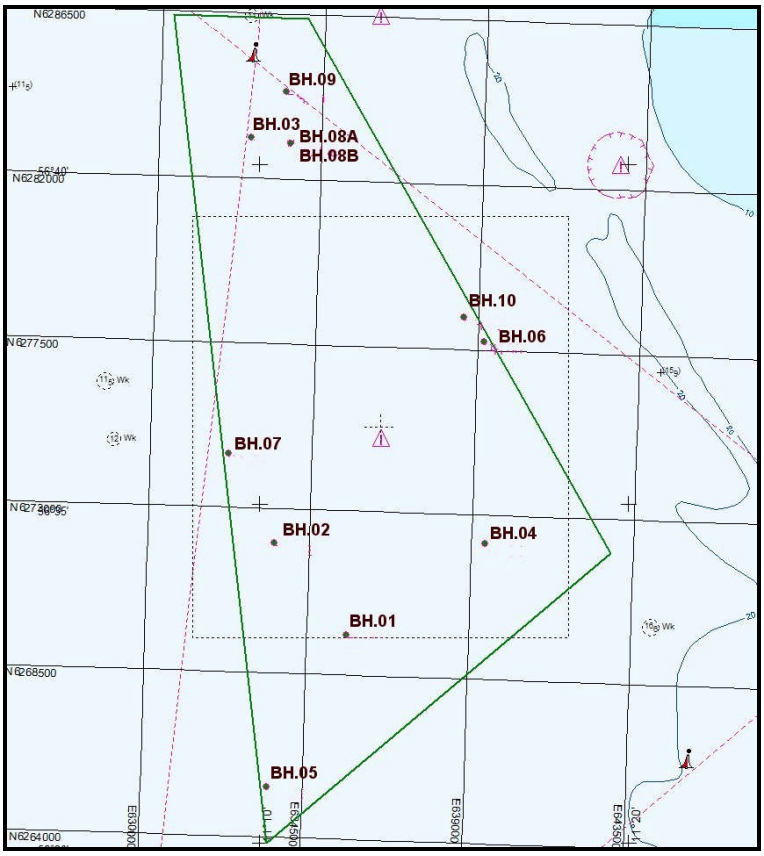

Figure 2.1 Schematic layout boreholes. Wind Farm Area

2.2 Marine equipment

The jack-up platform "Sound Prospector" was used during the drilling campaign. The tugboat "Sound Master" assisted it. Both the platform and the tugboat were subcontracted from SSE, Sweden.

Sound Prospector, which was built in 2007, has a deck area of 20 x 30 m^2 and is equipped with 50 m legs. The jack-up is depicted in Picture 2.1. Technical specifications for the Sound Prospector and Sound Master are given in Appendix 1.I.

Picture 2.1: Sound Prospector equipped with GEOs drilling rig on the Anholt Offshore Wind Farm project

2.3 Marine work

As part of the jacking-up procedure a preloading is performed in order to avoid a punch through accident. During the preloading 2 legs are retracted so the total weights of the platform (approx. 640 ton) rest on 2 legs. The preloading is hereby the double of the normal load of approx. 160 ton per leg. The legs have along the entire length a diameter of 1.42 m.

At the positions BH03, BH06 and BH08 it was not possible to jack up due to a considerable thickness of soft formations with insufficient bearing capacity. Considerable leg penetrations were obtained at loads below the actual weight of the platform (no preloading was applied).

The horizontal position for each leg and elevation for tip of each platform leg have been recorded at all positions including the positions were jacking-up was impossible. A summary of leg positions and penetration depths/levels for each position is presented in Enclosure 1B.03.

2.4 Geotechnical work

2.4.1 Drilling equipment and drilling methods

The drilling work was performed by one of GEOs land based hydraulic drilling rigs. The rig used was a Nordmeyer full hydraulic DSB 1/5 drilling rig. Drilling was performed through a ø 400 mm moon pool located approx. 5 m from the centre of the platform.

The technical specifications for the Nordmeyer DSB 1/5 drilling rig is presented in Appendix 1.II.

The following drilling methods have been used:

- Cased dry rotary drilling
- Percussion drilling
- Core drilling

In a majority of the boreholes, drilling was performed as dry rotary drilling or percussion drilling. In the stiff clay and in the clay stone core drilling has been done using the Geobor-S triple tube core system (OD ø146 mm and core ø102 mm).

2.4.2 Sampling

Sampling in soil have be preformed per 3 m with the following priorities:

1. Undisturbed sample with a piston sampler in stainless steel tubes (OD/ID = 75/70 mm) (Danish A-tubes) (in cohesive soil)
2. Sample with a push sampler in stainless steel tubes with core catcher (OD/ID = 75/70 mm) (in granular soil)
3. Hammer sample (in granular soil if sampling type 2 fails)
4. Bulk sample (disturbed sample) from augers, shell or bailer (in soil if soil sampling type 1 or 3 fails). Disturbed samples have further been taken been taken as necessary in order to describe the formations found. All disturbed samples have all been collected in plastic bags.

   Sampling in the soft rock and stiff clay has been done, by coring. All cores have been collected in PVC liners, which forms part of the Geobor-S core drilling system.

Both undisturbed samples, disturbed samples and cores were packed and preserved offshore. All samples where sent onshore for testing in GEOs laboratory in Lyngby.

Logs:
During drilling the field log "Offshore DTH Core Log" has been maintained by the drilling supervisor. In the drilling log the following key information have been recorded:

- Depth or depth intervals for all samples and in-situ tests
- Strata description
- Soil boundaries
- Drilling tool used
- Bit pressure
- Flushing rate
- Observations during drilling etc.

Sampling and core depths/intervals and the identification numbers are marked on the Borehole logs, Enclosure Nos. 1D.01 - 1D.07.

2.4.3 DTH-CPT testing

Down the hole CPTs (DTH-CPTs) have been performed with GEOs in house CPT equipment. With the equipment it is possible to apply up to 80 kN push force to perform a CPT test to a depth of maximum 2 m below bottom of the borehole. The cones used were of the Van den Berg Cones (60-degree type with cross sectional areas of 10 cm²). No friction reducers have been used.

A detailed description of the equipment, testing procedure, calibrations and termination criteria's are presented in Appendix 1.III.

On the summary sheet, Enclosure 1B.02 the DTH-CPT tests executed are summarised.

2.5 Navigation and positioning

2.5.1 Datum and coordinate system:

Co-ordinates for all positions are given according to WGS84, UTM Zone 32.

All depths refer to DVR 90.

2.5.2 General – Equipment and Procedures

A GPS RTK positioning system comprising an AD Navigation DC-200 RTK receiver has been used as the primary positioning system. The RTK positioning system utilises GPS measurement data from a stationary transmitter, that was placed on the lighthouse "Fornæs Fyr" placed on the coast of Djursland. The same stationary transmitter was also used during the geophysical investigations executed by another contractor ahead of the boring campaign.

The secondary positioning systems was an Ashtech GPS 1/MBX4 DGPS/receiver. The RCTM corrections have been received from selected base stations onshore.

A description of the positioning systems are given is given in Appendix 1.IV.

During positioning a navigation display showing the planned location (waypoint) and actual position for the borehole have been provided for both the platform- and tugboat helmsman to enable them to navigate the platform to the selected location.

When the platform was jacked up, the actual position was fixed and a "Final Positioning Report" was prepared in Navipac for each test location.

The seabed elevation for the individual borehole position has been monitored during the initial part of the drilling, when lowering of the drill casing to the seabed.

2.5.3 Verification of positioning systems

To verify the accuracy of the positioning systems on board Sound Prospector a number of position checks/calibrations have been performed both during the mobilisation in Malmoe and when mobilised to the wind farm site. The detailed data from these checks are maintained in GEOs files.

2.6 Comments to field work

- At the positions BH03, BH04 and BH08 it was not possible to jack up, due to soft formations to a considerable depth. Up to 14,5 m of penetration was recorded without obtaining the necessary bearing capacity. At the position BH 08, where one of the leg penetrated 14,5 m into the seabed, it was very difficult to retract the leg due to the considerable friction between leg and soil.
- Except for one CPT cone, that was lost at position BH10, 15,3 m below seabed, no consumables (rods, tools etc.) was lost in the ground.
- In the boreholes BH04, BH07, BH09 and BH10 stones were observed during drilling. The quantities of stones found in the boreholes have been as normally expected in the Scandinavian glacial deposits.

3 Investigation of occurrence of gas

During the seismic investigation (GEUS 2009 ref. /7/) free gas was identified in the northern part of the wind farm area. At the position BH 08 the free gas was identified at a depth of approx. 8 – 10 m below seabed. The gas was evaluated to be deep ground gas and not shallow gas as commonly found in the northern part of the Kattegat area.

In order to investigate the gas further, GEO was asked to design and manufacture specialized test equipment comprising of a gas probe, security valve etc. The gas probe, by which it was possible to take gas samples, was intended pushed down by the use of GEOs deck operated CPT jacking system. The jacking system was together with the probes, sampling equipment etc. mobilised to Sound Prospector by the end of the drilling campaign.

Ahead of moving to the planned investigation position (BH08) detailed procedures, risk assessments and emergency plans were prepared. The necessary hot work (to fix the CPT jacking system to the platform deck) was also executed prior to transit to BH08.

Sound Prospector was moved to location BH 08A on 2009-05-30. During the operation it was realised that, it was not possible to jack-up at the position due to a considerable thickness of soft formations with insufficient bearing capacity. 14,5 m penetration was registered for one leg at a load below the actual weight of the platform (no preloading was applied). The platform was moved to a second nearby position (BH08B), but also at this position jacking-up was impossible. A summary of leg positions and penetration depths/levels for each position is presented in Enclosure 1B.03.

When jacking down and moving from the position BH08A a minor air (gas?) emission was observed at the position for leg 1. (re.: picture 3.1). No emissions were observed for the other legs. The quantity/volume of gas emission was of a smaller magnitude than previously observed offshore by GEO, when working in areas with occurrence of shallow gas.

Picture 3.1: Position BH 08 – Leg 1. Air/gas emission from the 14,5 m deep "leg hole" after jacking down

4 Geological descriptions and logs

All samples and cores have been geologically described. The geological description follows the specifications in Bulletin No. 1 "A guide to engineering geological soil description" from Danish Geotechnical Society (DGF).

Soil encountered, stratification, soil classifications etc. in the individual borehole are given on the borehole logs, Enclosure 1D.01 - 1D.07.

Legend and Abbreviations, used on the profiles is enclosed as Enclosure 1C.00.

On the cores are performed an additional geological description including:

- Registration of fissuring, S
- Registration of induration, H
- Determination of Total Core Recovery, TCR
- Determination of Rock Quality Designation, RQD

The registration of fissures, S and registration of induration, H is also done in accordance with DGF Bulletin 1. The definition of S, H, TCR and RQD appear from the GEO-Standard "Legend and Abbreations" enclosed as Enclosure 1C.00.

S, H, TCR and RQD are given on the borehole logs, Enclosure 1D.01 - 1D.07.

Colour photos have been taken of all cores. The photos include the sample identification, a scale in centimetre, depth below seabed and a grey scale colour card. The colour photos are enclosed to this report on 1 No DVD.

5 LABORATORY WORK

5.1 Testing program and standards

All samples and cores have been sent to GEOs laboratory in Lyngby for testing.

Prior to commencing the onshore tests, GEOs suggested program for laboratory testing was commented on and accepted by Ramboll.

In Table 5.1 is listed the type of tests done on the project and standards used for the individual tests:

Type of test	**Test standard**
Natural moisture content	EN1997-2:2005(E) - BS1377
Particle size analysis (sieve & hydrometer analysis)	EN1997-2:2005(E) - BS1377
Liquid and plastic limit (Atterberg limits) – Falling Cone Method	EN1997-2:2005(E) DS/CEN ISO/TS 17892-12
Unit weight	EN1997-2:2005(E) - BS1377
Density of solid particles	EN1997-2:2005(E) - BS1377
Density index of granular soils (e_{min}/e_{max})	Etc 5 - Draft
Carbonate content	EN1997-2:2005(E) - BS1377
Loss of ignition (organic content)	ASTM D2974
Unconsolidated undrained (UU) triaxial compression test	DS/CEN ISO/TS 17892-8
Unconfined compression strength (UCS) test	DS/CEN ISO/TS 17892-7

Table 5.1 Reference to laboratory test standards

5.2 Soil Tests

5.2.1 Natural moisture content

Natural moisture content determination was made on regular intervals in cohesive formations. Natural moisture content is also determined on all samples, where Atterberg limits are determined.

The results of the natural moisture content determinations are given on the borehole logs, Enclosure Nos. 1D.01 - 1D.07. Natural moisture content determinations are also presented on Summary – Soil Classification Tests, Enclosure 1B.05.

5.2.2 Particle size analysis

Particle size analyses were undertaken on samples by sieving only or a combination of sieving and sedimentation.

The detailed results from the sieve- and sedimentation tests are presented on the Particle Size Distribution Curves, Enclosure 1G.01-1G.07. The percentage of clay (< 0,002 mm) is also presented in Summary - Soil Classification Tests, Enclosure 1B.05.

5.2.3 Liquid and plastic limit

Liquid and plastic limit determinations (Atterberg limits) were made on selected samples in order to classify the plasticity of the materials.

The results of the determinations are given on the borehole logs, Enclosure Nos. 1D.01 - 1D.07 and presented on Summary – Soil Classification Tests, Enclosure 1B.05.

The results of the liquid and plastic limit determinations are also presented on the Plasticity Chart, Enclosure 1B.07.

5.2.4 Unit weight, void ratio and density of solid particles

Unit weight, void and density of solid particles were made on selected samples or cores pieces. Results of the unit weight determination and the void ratios are presented on the borehole logs, Enclosure Nos. 1D.01 - 1D.07 and on the Summary – Soil Classification Tests, Enclosure 1B.05. Results of the solid particles determinations are presented in the Summary – Soil Classification Tests, Enclosure 1B.05.

5.2.5 Density index of granular soil e_{max}/e_{min}

The density index tests were made on selected samples of granular soil. The tests have been executed in accordance with the Danish practice presented in ETC 5 Draft Recommendation, ref. /9/.

Results of the density index tests are presented in the Summary – Soil Classification Tests, Enclosure 1B.05.

5.2.6 Carbonate content

Determination of the calcium carbonate content was done on both soil samples and the cores.

The results of the carbonate content determinations are given on the borehole logs, Enclosure Nos. 1D.01 - 1D.07, Summary of Soil Classification Tests, Enclosure 1B.05, Summary of Rock Classification Tests, Enclosure 1B.06.

5.2.7 Loss of ignition (organic content)

Determination of the loss of ignition of soil was done for selected soil samples.

The results of the determinations are given on Summary of Soil Classification Tests, Enclosure 1B.05.

5.2.8 Unconsolidated undrained (UU) triaxial compression test

Unconsolidated undrained (UU) triaxial compression tests were done on selected cohesive soil samples.

The detailed results are presented in Enclosure 1H.01 – 1H.07. The overall results are given in Summary of Soil Classification Tests, Enclosure 1B.05.

5.2.9 Unconfined compression strength (UCS) test

Unconfined compression strength (UCS) tests were done on selected cores (rock samples).

The detailed results are presented in Enclosure 1I.01 – 1I.02. Overall results are given in Summary of Rock Classification Tests, Enclosure 1B.06.

5.3 Comments to laboratory work

Laboratory tests have been performed as ordered in the extent possible. Due to local soil variations within the sample/core a few of the tests have been executed at slightly different depths than planned. A few of the planned tests had to be abandoned due to insufficient quantity of material or unsuitable material for the planned test

Effort has been made to ensure that geological descriptions are in agreement with results of classification tests, following the guidelines of the standards. All classification testing were carried out after the geological description. The descriptions of samples selected for classification testing were then compared with test results and adjusted, if necessary. Based on a geological evaluation, descriptions of samples close to the sample tested were sometimes also adjusted.

The results from the performed index test on sample 17 from borehole BH09 is doubtful due to the considerable content of fine sediments.

6 Measured CPT data

All measured data from DTH-CPTs are presented on the CPT Profiles, Enclosures 1E.01 - 1E.07. Results from the DTH-CPTs performed at various depths in a borehole are presented on the same enclosure (plot) to give an overview of the total strata. The following data are presented for each test:

- Cone resistance, q_c
- Sleeve friction, f_s
- Pore water pressure, u
- Friction ratio, R_f

An explanation of the abbreviations used in the processing is given below:

- q_c is the measured cone resistance. q_c is shown as two curves; one corresponds to a low range scale (e.g. 0-10 MPa) and one to a high range scale (e.g. 0-100 MPa)
- f_s is the measured sleeve friction
- u is the pore water pressure (relative to seabed level)
- R_f is the friction ratio. Friction ratio is the ratio between the measured sleeve friction and the measured cone resistance i.e., $R_f = (f_s/q_t)100$ %

Legend and definitions for the CPT logs are presented in Enclosure 1C.00.

The cone resistance, q_c is also presented on the borehole logs, Enclosure Nos. 1D.01 - 1D.07.

7 Inferred CPT data

7.1 General

On the basis of the measured CPT data are interpreted soil types and strength properties. The interpretations are "auto generated", which do not take the information from the laboratory work into consideration. The results of all inferred data from the CPTs are presented on the CPT Profiles, Enclosure Nos. 1F.01 - 1F.07. Legend and definitions for the logs are presented in Enclosure 1C.00.

The following data are presented for each test:
1. Corrected cone resistance, q_t
2. Corrected sleeve friction, f_t
3. Corrected friction ratio, R_{ft}
4. Pore pressure ratio, B_q
5. Normalised cone resistance, Q_t
6. Normalised friction ratio, F_r
7. The angle of internal friction φ
8. The undrained shear strength, c_u
9. Relative density, D_r

An explanation of the abbreviations used in the processing is given below:

- q_t is the corrected cone resistance. The values are shown in two scales, 0-10 MPa and 0-100 MPa. The corrected cone resistance is defined by $q_t = q_c + (1-a)\cdot u$ where a = 0.75
- f_t is the corrected sleeve friction
- R_{ft} is the corrected friction ratio. Friction ratio is the ratio between the measured sleeve friction and the corrected cone resistance i.e. where $R_{ft} = f_s/q_t$
- B_q is the pore pressure ratio. $B_q = \frac{u-u_0}{q_t - \gamma \cdot Z}$ where γ = 20kN/m^3
    - [u_0 is the insitu, hydrostatic pore pressure (relative to seabed level)]
- Q_t is the normalized cone resistance. The normalized cone resistance is defined by $Q_t = (q_t - \sigma_{vo}) / \sigma'_{vo}$ where σ'_{vo} = effective vertical stress

- $F_r = f_s / (q_t - \sigma_{vo})$

7.2 Interpretation of soil types

On basis of our general experience the interpretation of geotechnical soil types have been automatically generated based on the model presented in Figure 6.1.

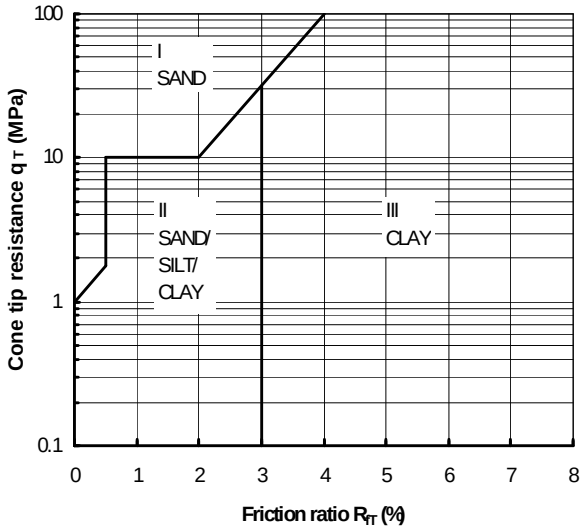

Figure 6.1 Empirical geological model for Anholt/Djursland Wind farm

The automatically generated soil types are not adjusted later with information obtained from boreholes, hence, the soil types included on the CPT profiles are based on the CPT data alone.

Interpretations of soil types for the different locations are presented on the CPT Profiles, Enclosure Nos. 1F.01 - 1F.07.

7.3 Strength Parameters

7.3.1 Undrained Shear strength:

The undrained shear strength have be determined from:

$c_u = (q_t - \sigma_{vo})/N_{kt}$

The undrained shear strength (c_u) have be calculated by the cone factor values N_{kt} 10 and 20 representative of the actual soil (both values are shown on the enclosures).

The undrained shear strength (c_u) is presented on the CPT Profiles, Enclosure Nos. 1F.01 - 1F.07.

7.3.2 Angle of internal friction:

The angle of internal friction φ' is determined from the relative density (D_r) determined from the CPT tests by the use of the expression:

$$\varphi' = \alpha \cdot D_r + \beta$$

where

α = 0.14° and β = 28.0° (D_r given in percent)

This equation yields the maximum value φ' = 42.0° for D_r = 100 %.

The equation is based upon Figure 5.53 for uniform fine sand (Schmertmann, 1978) in "Cone Penetration Testing in Geotechnical Practice", ref. /2/.

The internal friction φ' is presented on the CPT Profiles, Enclosure Nos. 1F.01 - 1F.07.

Relative Density:
The relative density (D_r) is estimated by the below expression, valid for normally and overconsolidated sands:

$$D_r = \frac{1}{C_2} \cdot \ln\left[\frac{q_c}{C_0 \cdot (\sigma'_{v0})^{C_1}}\right] \cdot 100\%$$ where q_c and σ'_{vo} is given in kPa

and C_0 = 181, C_1 = 0.55, C_2 = 2.61

The equation is based upon Figure 5.47 in "Cone Penetration Testing in Geotechnical Practice", ref. /2/.

The relative density (D_r) is presented on the CPT Profiles, Enclosure Nos. 1F.01 - 1F.07.

8 DESCRIPTION OF GEOLOGICAL AND GEOTECHNICAL CHARACTERISTICS ENCOUNTED

8.1 Geological characteristics

8.1.1 Background – summary of previous investigations

In a regional geological setting, the wind farm area is located in the NW-SE trending and about 50 km wide Sorgenfrei-Tornquist Zone that separates the Skagerrak-Kattegat Platform to the NE from the Danish Basin to the SW, ref. /3/. The Sorgenfrei-Tornquist Zone is characterized by large-scale faults, folds and flexures, mainly developed during Cretaceous time in connection with a tectonic uplift, or inversion, of the zone. This event is reflected in the distribution of formations at the base of the Quaternary, where the wind farm area displays gradually younger Prequaternary formations in SW-direction, see Figure 8.1.

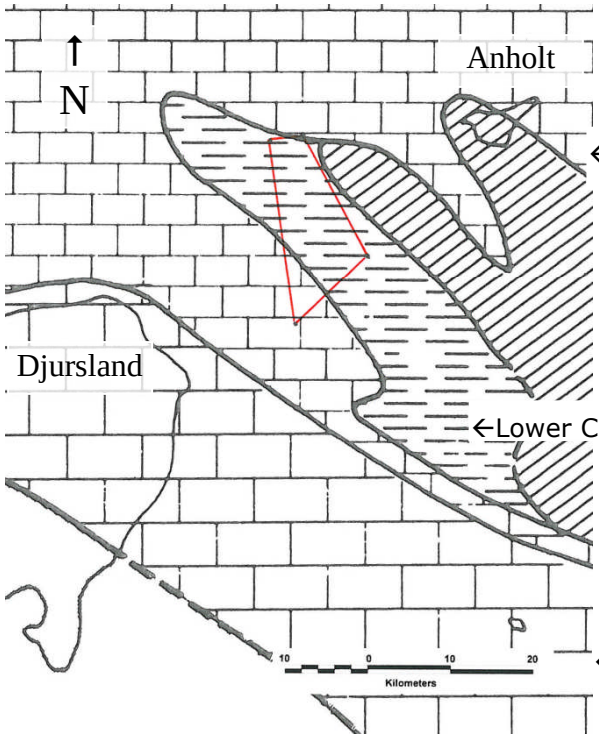

Figure 8.1 Formations at the base of Quaternary. Red trapezoid shows wind farm area. (From ref. /3/.)

According to unpublished data by H. Lykke-Andersen, the base of Quaternary deposits in the wind farm area varies between 75 m below sea level, in the SW and NE corners, and down to more than 125 m below sea level, in the central part of the wind farm. The area around Anholt is known from seismic investigations, ref. /4/, to display a number of NW-SE oriented valleys eroded down into the Prequaternary surface.

In a deep borehole carried out on the island of Anholt, 106 m of Quaternary deposits are underlain by thick Middle to Lower Jurassic sands and clays, refs. /4/ and /5/. Apart from 2 m of Middle Weichselian marine clay at 49-51 m below surface, referred to the Skærumhede series, all layers down to 70 m below surface, mainly sands and clays, are interpreted as fluvial non-marine Weichselian. At 70 m below surface, the Weichselian freshwater layers are underlain by marine Eemian clay, and Saalian meltwater deposits and tills.

In the Store Middelgrund – Rødebanke area SE of Anholt, the lower part of the Quaternary series can be seen from seismic profiles to contain gas. Moreover, this lower series is deformed, mainly by folding, either by glacial deformation or by gravitational processes, ref. /6/.

The Sorgenfrei-Tornquist Zone seems to have been tectonically active during Quaternary time, as also indicated by the occasional earthquakes in Kattegat.

8.1.2 Soil types of the present investigation

The seven boreholes display the following major soil types:

Table 8.1. Major soil types in the wind farm area.

Soil type	Characteristics	Geological environment and age code
Holocene sand	Poorly graded sand with shell fragments, seldomly organic or clayey; deposited during Holocene/Postglacial time	Ma Pg
Lateglacial clay	Medium to highly plastic clay, sometimes slightly organic, similar to but softer than Weichselian clay	MaFw Lg
Lateglacial or Weichselian sand and gravel	Poorly graded to well graded sand and/or gravel, sometimes with small organic content, or shell fragments; freshwater or marine deposit from Lateglacial or Weichsel glaciation	MaFw Lg or MaFw Gc
Till	Well graded sandy clay or clayey sand; deposited by glacier ice during Weichsel glaciation	Gl Gc
Weichselian clay	Medium to highly plastic clay, at places with small organic content; deposited in the Kattegat basin, when it was either a lake, or connected to the North Sea	MaFw Gc
Claystone	Weakly indurated calcareous slightly organic claystone with shell fragments; Lower Cretaceous marine deposit	Ma Ct

Claystone

The lower parts of BH01 and BH02 were core drilled, into Prequaternary weakly indurated claystone. The lithology of this claystone, with its slight organic content and abundant fossil remains, does not resemble any of the common Danish rock types. Micropaleontological datings at GEUS has revealed a Lower Cretaceous age, ref. /7/.

Weichselian clay

Also quite dominant i many boreholes are medium to highly plastic clay layers, at places with streaks of fine sand, sometimes with shell fragments or gravel grains, and seldomly with a slight organic content, in the form of iron sulphide stains or plant remains. This clay may probably be referred to the Skærumhede Series of marine deposits, known from many locations in North Jylland and Kattegat, ref. /8/.

Till

The two boreholes BH04 and especially BH07 are quite dominated by glacial till deposits. So, contrary to the belief of ref. /3/ that in this part of Kattegat, tills are rare and untypical, tills in significant thicknesses and with composition and appearance like in other places do occur in the area. Most tills are rather sandy, but clay till does occur. The tills were presumably laid down by Weichselian glaciers.

Weichselian gravel
Both claystone occurrences are capped by some metres of sandy, calcareous gravel, with stones. Such gravel also occurs, at roughly the same levels, in boreholes BH04, BH09 and BH10. BH01 and BH10 also show gravel layers at somewhat higher levels.

Lateglacial or Weichselian sand
Layers of poorly graded (well sorted) to well graded (poorly sorted to unsorted) sand with subordinate clay, silt and gravel, as well as sporadic shell fragments, iron sulphide stains and plant remains are very common in the wind farm area. Gravel-free and gravelly intervals occur more or less at random. In most places, the sand is calcareous, but some places show non-calcareous or slightly calcareous intervals, again seemingly at random. The sand is interpreted as fresh water or marine deposits from the Weichselian glaciation or from Lateglacial. However, gravelly intervals or intervals adjacent to tills are probably meltwater deposits.

Lateglacial clay
This clay is very similar to, in fact quite difficult to distinguish from, the underlying Weiselian clay, but it is normally softer, indicating a younger age. It is probably formed in much the same way as its underlying counterpart.

Holocene sand
Except for BH07, the seabed at all boreholes is composed of poorly graded sand with shell fragments, deposited during the Flandrian transgression of the Holocene.

8.1.3 Spacial distribution of soil types

To correlate the soil types and layers of the seven boreholes is not an easy job, because from a first look, the soil types almost seem to occur at random. However, a few fragments of a pattern can be seen.

The Lower Cretaceous claystone occurs at around level -50 around BH01 and BH02.

The gravel layer found in BH01, BH02, BH04, BH09 and BH10 at roughly the same levels may form a more or less continous layer over the wind farm area, with a slight southward slope.

The thick till sequences of BH07 and BH04 differ significantly from the other boreholes, as does the missing gravel layer in BH07. These two boreholes might indicate the location of one of the NW-SE trending erosion valleys known from the area around Anholt.

8.2 Geotechnical characteristics

For each investigation point the test results (both laboratory and CPT tests) have been listed and related to the corresponding geological soil type to form a "mini database" of the geotechnical parameter variation. From this database typical values or ranges of the geotechnical parameters have been identified and tabulated. The values extracted are presented in Table 7.2.

The form of presentation is not a statistical work up of all data in each of the selected point leading to determination of characteristic design values for each soil type, since that work up is beyond the scope of this contract. The presentation is meant as guide to get a quick overview of the geotechnical parameter variation for each geological soil type to be used only for initial engineering purposes.

	Unit	Sand, gravel and (silt) (Holocene)	Sand and gravel (Late glacial or Weichselian)	Till (Weichselian)	Clay, plastic – m. pl (Late glacial or Weichselian)	Claystone (Low Cretaceous)
Water content – w	%	na	na	9-14	11-42	11-20
Bulk density - γ_m	g/cm^3	22-23	20.5#[1]	22-23	20	20-23
Void ratio		0.2-0.3	0.5#[1]	0.2-0.4	0.5-0.6	0.3-0.5
Medium grain size - d_{50}	mm	0.01-0.29	0.02-18.5	0.05-2.14	0.001-0.07	na
Uniformity coef. – U		2-15	2-25 #[2]	17-97	na	na
Density index (e_{min} and e_{max})		0.4-0.6 and 0.8-1.1	0.3-0.7 and 0.6-1.5	na	na	na
Clay fraction (0.002 mm)	%	4-16	5-30	4-23	16-58	na
Liquid limit – w_L	%	na	na	19-24	21-62	na
Plastic limit - I_P	%	na	na	9-12	10-39	na
Undrained shear strength – cu (UU tests)	kpa	na	na	320 #[1]	29-105	na
Unconfined compression strength - σ_c	Mpa	na	na	na	na	1.4 – 8.7
Carbonate cont. – Ca	%	na	na	12-30	13-32	30-64
q_c (CPT)	MPa	0.5-35	10-80 locally 5	5-40 locally <5	0.5-10 locally 80	na
Friction angle - φ (Estimated by CPT)	Deg.	28-42	33-42 locally 28	28-40	na	na

Tabel 7.2. Soil types – Classification parameters and strength parameters

NOTE:
#[1]: Only one test
#[2]: Higher U values (58 and 132) recorded on two samples due to high gravel content

9 REFERENCES

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/9/ ETC 5, XI ECSMFE 1995, Workshop 2 "Standardisation of laboratory testing"

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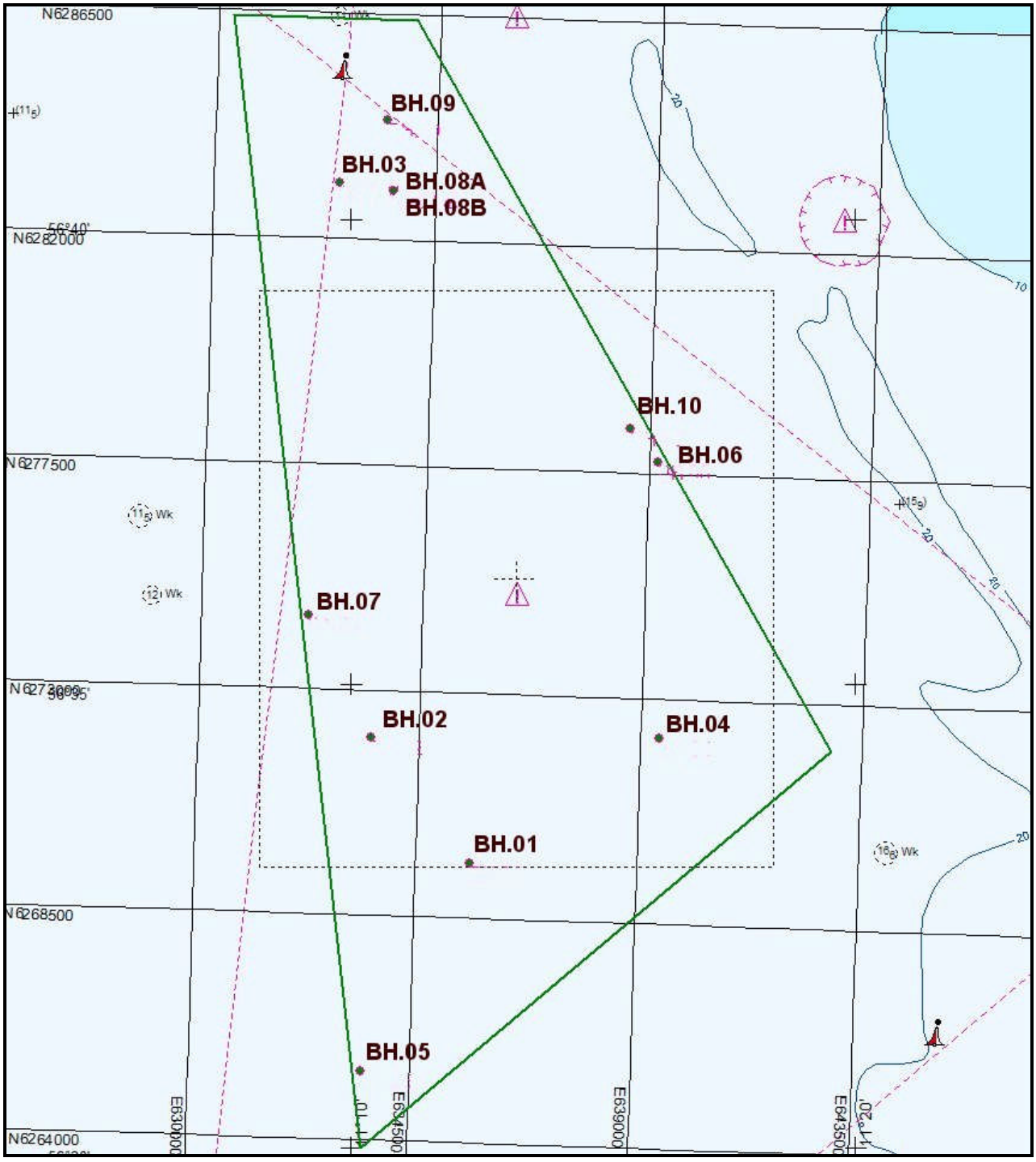
Enclosure 1A.00
Detailed Location Plan



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Projekt: 32490 Anholt / Djursland

Prepared	: LEJ	Date: 2009-06-29	Subject: Detailed Location Plan		
Controlled	: LAR	Date: 2009-06-29			Page 1 / 1
Approved	: JBC	Date: 2009-06-29	Report 1	Enclosure 1A.00	Rev.

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Enclosure 1B.01
Summary - Boreholes

Summary - Boreholes

Coordinates: UTM32/WGS84
Reference level: DVR 90

Sequence No	Borehole No	Position Easting (m)	Position Northing (m)	Seabed Level (m)	Drilling Depth (m)
3	BH.01	635615.9	6269608.8	-16.9	40.5
2	BH.02	633525.2	6272062.6	-17.0	40.1
7	BH.03	632554	6283105	#[1]	
4	BH.04	639384.7	6272218.5	-16.7	40.0
5	BH.05	633507.9	6265370.7	-18.1	40.0
6	BH.06	639180	6277731	#[1]	
1	BH.07	632181.6	6274469.2	-17.0	40.3
10	BH.08A BH.08B	633673.8 633653.6	6283005.2 6282977.3	#[1] #[2]	
8	BH.09	633473.5	6284376.7	-16,3	40.0
9	BH.10	638587.5	6278389.8	-18.8	40.3

#[1] No borehole executed at the location since it was not possible to jack up.
#[2] Location for Gas Probing

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Enclosure 1B.02
Summary – DTH-CPT tests

Summary - DTH-CPT tests

Reference level: DVR 90

No	CPT No	Seabed level	Start level	Penetration depth	Final stop reason	Cone Number	Remarks
		(m)	(m)	m			
1	BH01_1	-16.9	-17.2	2.00	Max depth	I080308	
2	BH01_2		-20.2	2.00	Max depth	I080308	
3	BH01_3		-23.2	2.00	Max depth	I080308	
4	BH01_4		-26.2	2.00	Max depth	I080308	
5	BH01_5		-29.2	2.00	Max depth	I080308	
6	BH01_6		-32.2	2.00	Max depth	I080308	
7	BH01_7		-35.2	2.00	Max depth	I080308	
8	BH01_8		-38.2	2.00	Max depth	I080308	
9	BH01_9		-41.2	1.47	Max thrust	I080308	
10	BH01_10		-44.2	1.00	Max thrust	I080308	
11	BH01_11		-47.2	1.55	Max thrust	I080308	
12	BH01_12		-50.2	1.40	Max thrust	I080308	
13	BH01_13		-53.2	0.15	Max thrust	I080308	
1	BH02_1	-17.0	-17.6	2.00	Max depth	I080308	
2	BH02_2		-20.6	2.00	Max depth	I080308	
3	BH02_3		-23.6	2.00	Max depth	I080308	
4	BH02_4		-26.6	2.00	Max depth	I080308	
5	BH02_5		-29.6	1.00	Sliding Packer	I080308	*1
6	BH02_6		-30.6	1.20	Max depth	I080308	
7	BH02_7		-32.6	1.48	Max thrust	I080308	
8	BH02_8		-35.6	1.42	Max thrust	I080308	
9	BH02_9		-38.6	1.20	Max thrust	I080308	
10	BH02_10		-41.6	0.78	Max thrust	I080308	
11	BH02_11		-44.6	1.95	Max thrust	I080308	
12	BH02_12		-47.6	0.47	Max tip/thrust	I080308	
13	BH02_13		-50.2	0.12	Max thrust	I080308	
1	BH04_1	-16.7	-17.1	2.00	Max depth	I080308	
2	BH04_2		-20.3	0.65	Max thrust	I080308	
3	BH04_3		-23.1	2.00	Max depth	I080308	
4	BH04_4		-26.1	2.00	Max depth	I080308	
5	BH04_5		-29.1	1.30	Max thrust	I080308	
6	BH04_6		-32.1	1.59	Max thrust	I080308	
7	BH04_7		-35.1	1.39	Max thrust	I080308	
8	BH04_8		-36.8	2.00	Max depth	I080308	
9	BH04_9		-41.1	0.45	Max thrust	I080308	
10	BH04_10		-44.1	1.01	Max thrust	I080308	
11	BH04_11		-47.1	0.96	Max thrust	I080308	
12	BH04_12		-50.1	0.56	Max thrust	I080308	
13	BH04_13		-53.1	0.87	Max thrust	I080308	
14	BH04_14		-56.1	0.56	Max thrust	I080308	

No	CPT No	Seabed level	Start level	Penetration depth	Final stop reason	Cone Number	Remarks
1	BH05_1		-18.6	2.00	Max depth	I080308	
2	BH05_2		-21.6	2.00	Max depth	I080308	
3	BH05_3		-24.6	2.00	Max depth	I080308	
4	BH05_4		-27.6	2.00	Max depth	I080308	
5	BH05_5		-30.6	2.00	Max depth	I080308	
6	BH05_6		-33.6	2.00	Max depth	I080308	
7	BH05_7		-36.8	2.00	Max depth	I080308	
8	BH05_8		-39.7	2.00	Max depth	I080308	
9	BH05_9		-42.7	2.00	Max depth	I080308	
10	BH05_10	-18.1	-45.6	2.00	Max depth	I080308	
11	BH05_11		-48.6	1.94	Max thrust	I080308	
12	BH05_12		-51.6	0.70	Max thrust	I080308	
13	BH05_13		-54.6	0.49	Max thrust	I080308	
14	BH05_13		-57.6	0.11	Max thrust	I080308	
1	BH07_1		-17.6	2.00	Max depth	I080308	
2	BH07_2		-20.6	2.00	Max depth	I080308	
3	BH07_3		-23.9	1.62	Max thrust	I080308	
4	BH07_4		-26.9	2.00	Max depth	I080308	
5	BH07_5		-29.9	1.51	Max thrust	I080308	
6	BH07_6		-32.9	1.42	Max thrust	I080308	
7	BH07_7	-17.0	-35.7	1.98	Max depth	I080308	
8	BH07_8		-38.7	2.00	Max depth	I080308	
9	BH07_9		-41.7	1.43	Max thrust	I080308	
10	BH07_10		-44.7	2.00	Max depth	I080308	
11	BH07_11		-47.9	2.00	Max depth	I080308	
12	BH07_12		-50.7	0.80	Max thrust	I080308	
13	BH07_13		-53.9	2.00	Max depth	I080308	
1	BH09_1		-16.8	2.00	Max depth	I080308	
2	BH09_2		-19.8	2.00	Max depth	I080308	
3	BH09_3		-22.8	2.00	Max depth	I080308	
4	BH09_4		-25.8	2.00	Max depth	I080308	
5	BH09_5		-29.0	2.00	Max depth	I080308	
6	BH09_6		-31.8	2.00	Max depth	I080308	
7	BH09_7	-16.3	-35.0	2.00	Max depth	I070518	
8	BH09_8		-38.0	2.00	Max depth	I070518	
9	BH09_9		-41.0	1.87	Sliding Packer	I070518	*2
10	BH09_10		-43.8	1.29	Max thrust	I080308	
11	BH09_11		-46.8	0.66	Max thrust	I080308	
12	BH09_12		-49.8	0.39	Max thrust	I080308	
13	BH09_13		-52.8	0.12	Max tip/thrust	I080308	
14	BH09_14		-55.8	0.38	Max tip/thrust	I080308	
1	BH10_1	-18.8	-19.1	2.00	Max depth	I080308	
2	BH10_2		-22.1	2.00	Max depth	I080308	
3	BH10_3		-25.1	1.89	Sliding Packer	I080308	*2
4	BH10_4		-28.1	2.00	Max depth	I080308	
5	BH10_5		-31.1	0.86	Max thrust	I080308	

No	CPT No	Seabed level	Start level	Penetration depth	Final stop reason	Cone Number	Remarks
6	BH10_6		-34.1	0.20	Broken cone	I080308	
7	BH10_7		-38.1	1.25	Max thrust	I080310	
8	BH10_8		-41.1	1.19	Max thrust	I080310	
9	BH10_9		-44.1	0.82	Max thrust	I080310	
10	BH10_10		-47.1	2.00	Max depth	I080310	
11	BH10_11		-50.1	2.00	Max depth	I080310	
12	BH10_12		-53.1	2.00	Max depth	I080310	
13	BH10_13		-56.1	2.00	Max depth	I080310	

Notes:

*1 CPT packer slide upwards in the casing during test. BH02_06 is done just below BH_05. On the CPT profiles the CPT tests BH02_05 and BH06 are shown as one test.

*2 Tests stopped before 2,0 m, in agreement with CR, due to sliding packer.

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Enclosure 1B.03
Summary – Jack-up legs, positions and penetration depths

Summary – Jack-up legs, positions and penetration depths

Coordinates: UTM32/WGS84
Reference level: DVR 90
Preload on each platform leg: Approx. 320 ton
Diameter platform leg = 1.42 m

No	Sequence No	Position	Leg	Position Easting (m)	Position Northing (m)	Tip level leg (DVR 90)	Penetration (mbs)
1	3	BH.01	1	635629	6269614	-19.2	2.3
			2	635625	6269590	-19.2	2.3
			3	635612	6269618	-18.7	1.8
			4	635608	6269593	-19.7	2.8
2	2	BH.02	1	633536	6272072	-25.6	8.6
			2	633539	6272048	-27.1	10.1
			3	633519	6272070	-25.1	8.1
			4	633522	6272046	-27.6	10.6
3	7	BH.03	1	632562	6283093	-26.0[2]	10[1]
			2	632537	6283093	-18.4[2]	2.4
			3	632562	6283110	-18.4[2]	2.4
			4	632537	6283110	-29.5[2]	13.5[1]
4	4	BH.04	1	639380	6272205	-19.1	2.4
			2	639365	6272224	-19.6	2.9
			3	639393	6272216	-18.6	1.9
			4	639378	6272235	-19.1	2.4
5	5	BH.05	1	633509	6265356	-20.6	2.5
			2	633488	6265368	-20.6	2.5
			3	633517	6265371	-20.6	2.5
			4	633496	6265383	-20.6	2.5
6	6	BH.06	1	639188	6277719	-28.0[2]	8.0
			2	639163	6277719	-28.0[2]	8.0
			3	639188	6277736	-33.5[2]	13.5[1]
			4	639163	6277736	-28.0[2]	8.0
7	1	BH.07	1	632188	6274482	-19.4	2.4
			2	632200	6274460	-20.4	3.4
			3	632173	6274474	-19.4	2.4
			4	632185	6274452	-19.7	2.7
8	10	BH.08 Gas	1	633681	6282993	-30.5[2]	14.5[1]
			2	633656	6282995	-19.0[2]	3.0
			3	633682	6283010	-19.0[2]	3.0
			4	633658	6283011	-20.0[2]	4.0
	10	BH.08 Gas Alt.	1	633640	6282974	-18.0[2]	2.0
			2	633648	6282997	-18.0[2]	2.0
			3	633656	6282968	-23.2[2]	7.2[1]
			4	633664	6282991	-18.0[2]	2.0

No	Sequence No	Position	Leg	Position Easting (m)	Position Northing (m)	Tip level leg (DVR 90)	Penetration (mbs)
9	8	BH.09	1	633481	6284364	-23.3	7.0
			2	633456	6284366	-26.3	10.0
			3	633482	6284381	-24.8	8.5
			4	633457	6284383	-26.3	10.0
10	9	BH.10	1	638580	6278402	-26.6	7.8
			2	638605	6278401	-26.6	7.8
			3	638579	6278385	-26.1	7.3
			4	638604	6278384	-26.1	7.3

mbs: metre below seabed

[1] Penetration obtained without reaching the necessary bearing capacity. Jacking up is not possible.

[2] Seabed level is estimated. Level measurements were not possible to perform because of umcompleted jacking up.

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Enclosure 1B.04
Summary – Daily Progress Reports

Summary – Daily Progress Reports

Date	Activity
2009-05-13	Mobilisation of equipment on Sound Prospector (SP) in Malmoe
2009-05-14	Mobilisation of equipment on SP in Malmoe
2009-05-15	Mobilisation of equipment on SP in Malmoe. Start transit to BH.07
2009-05-16	Transit of SP to BH07. Mob. Drillcrew to SP. Saftey tour and kick off. Performing BH.07. GEO Breakdown
2009-05-17	Performing BH.07
2009-05-18	BH.07 Completed. Transit to BH.02. Performing BH.02
2009-05-19	BH.02 Completed. Transit to BH.01. Performing BH.01
2009-05-20	Performing BH.01. WOW. Performing BH.01
2009-05-21	Performing BH.01. WOW. Performing BH.01
2009-05-22	BH.01 Completed. Transit to BH.04. Performing BH.04
2009-05-23	BH.04 Completed. Transit to BH.05. Performing BH.05
2009-05-24	Performing BH.05
2009-05-25	BH.05 Completed. Transit to BH.06, where jacking up is not possible. Transit to BH.03, where jacking up is not possible. Transit to BH.09. Performing BH.09
2009-05-26	Performing BH.09. WOW. Performing BH.09
2009-05-27	Performing BH.09. WOW
2009-05-28	WOW
2009-05-29	WOW. Transit to BH.10. Performing BH.10
2009-05-30	BH.10 Completed. Transit to BH.08, where jacking up is not possible. Transit to BH.08(2) impossible to jack up. Transit to safe position at BH.07
2009-05-31	Transit to safe position at BH.07. Sea fastening and prepare for transit. Demobilisation of drillcrew. Start transit of SP to Malmoe
2009-06-01	Transit of SP to Malmoe. Demob. of equipment from Sound Prospector in Malmoe

Abbreviations:
WOW: Waiting on Weather.

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Enclosure 1B.05
Summary – Soil Classification Tests

Summary – Soil Classification Tests

Borehole No	Sample No	Soil	Level	Natural Moisture Content	Bulk gravity	Void ratio	Medium grain size	Uniformity coefficient	Clay fraction, (< 0.002 mm)	Particle density (Specific gravity)	Liquid and plastic limits (Atterberg limits)			Loss on ignition (organic content)	Carbonate content	Void ration index test		Shear strength (UU test)
											WL	WP	IP			e_{max}	e_{min}	c_u
			m	w %	γ_m kN/m³	e	d_{50} mm	$U = d_{60}/d_{10}$	%	ρ_s 10^3 (kg/m³)	%	%	%	%	%			kPa
BH.01	1	SAND, medium - coarse	-17,2				0,695	10,1										
BH.01	2	SILT, clayey	-19,6				0,068	3,3	4,2									
BH.01	4	SAND, medium - coarse	-22,7				0,187	3,7								0,41	0,84	
BH.01	5	SILT, clayey	-25,4				0,014	15,8	12,1		24,9	16,5	8,4					
BH.01	8	SAND, medium - coarse	-31,7				0,292	6,4								0,42	0,81	
BH.01	15	SAND, fine - medium	-43,2				0,228	3,7								0,40	0,81	
BH.01	21	GRAVEL, sandy	-52,2				4,560	25,2								0,31	0,57	
BH.01	22	CLAYSTONE	-53,2	19,3	20,4	0,50				2,62					45,5			
BH.01	23	CLAYSTONE	-55,2	20,1	20,3	0,55												
BH.01	25	CLAYSTONE	-56,4	18,7	20,4	0,50				2,64					45,0			
BH.02	1	SAND, medium - coarse	-17,2				0,443	3,6										
BH.02	2	CLAY, v. silty	-18,6	34,5							42,9	17,1	25,8					
BH.02	3	CLAY, medium plastic	-20,1	28,8														41
BH.02	3	CLAY, medium plastic	-21,4	34,7														
BH.02	4	CLAY, sandy	-23,1	12,5														105
BH.02	4	CLAY, sandy	-24,3	11,4														
BH.02	6	CLAY, v. silty	-28,9	16,4			0,072		15,9		21,7	11,9	9,8					
BH.02	7	CLAY, silty	-29,1	21,5														
BH.02	8	CLAY, silty	-30,5	23,9														
BH.02	9	SAND, fine - medium	-32,5													0,61	1,11	
BH.02	11	SAND, fine - medium	-38,5													0,61	1,07	
BH.02	13	SAND, fine - medium	-41,4				0,096		15,2									
BH.02	16	GRAVEL, sandy	-46,6				16,500	132,1										
BH.02	17	CLAY	-47,5	42,1										3,3				
BH.02	18	CLAY, silty	-48,4	13,3			0,012		34,6									
BH.02	19	CLAYSTONE	-50,2	11,3	22,5	0,28				2,64					63,6			
BH.02	19	CLAYSTONE	-51,5	13,3	21,8	0,37				2,64					63,6			
BH.02	20	CLAYSTONE	-51,7	13,8	21,7	0,38				2,68					58,2			
BH.02	21	CLAYSTONE	-53,7	16,2	21,2	0,44												
BH.02	22	CLAYSTONE	-54,1	20,4	20,4	0,55				2,67					30,4			
BH.02	23	CLAYSTONE	-55,6	13,9	21,7	0,38				2,64					42,8			
BH.02	23	CLAYSTONE	-56,6	18,4	20,7	0,49				2,64					42,8			
BH.04	1	SAND, medium - coarse	-17,1				0,386	2,9						0,4				
BH.04	2	CLAY, silty	-18,1	14,4			0,172	103,3	9,9									
BH.04	4	SAND, clayey	-22,2	10,1	22,0	0,30				2,68								
BH.04	5	SAND, sl. clayey	-22,6				0,072		13,7									
BH.04	6	SAND, sl. clayey	-25,2	12,2						2,68								
BH.04	7	CLAY, silty	-26,1	12,1						2,70	23,2	11,7	11,5					
BH.04	8	CLAY, silty	-28,3	11,9														
BH.04	9	CLAY, silty	-30,6	13,8							24,3	12,5	11,8					
BH.04	10	CLAY, silty	-31,4	13,1														

Borehole No	Sample No	Soil	Level	Natural Moisture Content	Bulk gravity	Void ratio	Medium grain size	Uniformity coefficient	Clay fraction, (< 0.002 mm)	Particle density (Specific gravity)	Liquid and plastic limits (Atterberg limits)			Loss on ignition (organic content)	Carbonate content	Void ration index test		Shear strength (UU test)
											WL	WP	IP			e_{max}	e_{min}	c_u
			m	w %	γ_m kN/m^3	e	d_{50} mm	$U = d_{60}/d_{10}$	%	ρ_s 10^3 (kg/m^3)	%	%	%	%	%			kPa
BH.04	11	CLAY	-32,1	11,3						2,70	24,3	12,3	12,1					
BH.04	12	CLAY	-34,4	11,8														
BH.04	13	CLAY	-35,1	13,3						2,70								
BH.04	14	CLAY TILL, silty, sandy	-35,4	13,8														
BH.04	15	SAND, clayey	-38,1															
BH.04	16	SAND, medium - coarse	-40,1							2,67						0,41	0,79	
BH.04	20	SAND, fine - medium	-48,2							2,67								
BH.04	22	SAND, fine - medium	-50,1	23,8			0,019		29,7									
BH.04	23	SAND, medium - coarse	-51,1				0,360	3,1										
BH.04	26	GRAVEL, sandy	-56,7				3,730	19,9		2,60								
BH.05	1	SAND, medium - coarse	-18,6				0,312	2,3										
BH.05	2	SAND, fine - medium	-19,7				0,678	12,8										
BH.05	3	SAND, fine - medium	-21,6													0,62	1,06	
BH.05	3B	SAND, fine - medium	-22,1							2,67								
BH.05	7	SAND, fine	-28,6				0,119	2,0								0,00	1,03	
BH.05	9	SAND, fine	-32,9				0,105	3,8	5,5	2,67						0,63	1,17	
BH.05	11	CLAY, silty	-37,6	27,9														
BH.05	12	CLAY, highly plastic	-39,2	29,6														82
BH.05	12	CLAY, highly plastic	-39,3	39,2			0,050		25,5	2,69	28,1	13,3	14,7		20,8			
BH.05	13	CLAY, highly plastic	-42,3	30,8														
BH.05	14	CLAY, highly plastic	-43,7	33,5														
BH.05	15	CLAY, medium plastic	-44,9				0,002		49,0	2,73	48,0	19,0	28,9		31,7			
BH.05	17	SAND, coarse	-45,5															
BH.05	18	SAND, coarse	-47,6				0,846	4,2		2,67						0,35	0,62	
BH.05	22	SAND, fine - medium	-58,1				0,486	18,5								0,36	0,72	
BH.07	1	SAND, clayey	-18,0				0,157		16,2									
BH.07	2	SAND, clayey	-19,0				0,233	11,2	4,8									
BH.07	3	SAND, fine - medium	-19,8	11,1	22,9	0,26				2,67								
BH.07	5	SAND TILL, clayey.- v. clayey	-23,3	9,9	22,3	0,28				2,69								
BH.07	9	SAND, fine	-32,4	14,0	22,0	0,35	0,049	17,1	7,0	2,69					15,9			
BH.07	13	SAND TILL, clayey.- v. clayey	-41,4				0,114	86,9	10,8						12,5			
BH.07	14	SAND TILL, clayey.- v. clayey	-41,9				2,140	97,1	3,5									
BH.07	15	SAND TILL, clayey.- v. clayey	-44,7	11,5														
BH.07	16	SAND TILL, clayey.- v. clayey	-47,7	10,7														
BH.07	17	CLAY TILL, sandy, gravelly	-50,4	10,0	22,7	0,27				2,68	19,4	10,7	8,7					
BH.07	18	CLAY TILL, sandy, gravelly	-53,1	10,3														
BH.07	19	CLAY TILL, medium plastic	-53,9	9,5			0,050		23,0		22,3	10,6	11,6					
BH.07	20	CLAY TILL, sandy, gravelly	-56,2	10,7														320

Borehole No	Sample No	Soil	Level	Natural Moisture Content	Bulk gravity	Void ratio	Medium grain size	Uniformity coefficient	Clay fraction, (< 0.002 mm)	Particle density (Specific gravity)	Liquid and plastic limits (Atterberg limits)			Loss on ignition (organic content)	Carbonate content	Void ration index test		Shear strength (UU test)
											WL	WP	IP			e_{max}	e_{min}	c_u
			m	w %	γ_m kN/m^3	e	d_{50} mm	$U = d_{60}/d_{10}$	%	ρ_s 10^3 (kg/m^3)	%	%	%	%	%			kPa
BH.07	20	CLAY TILL, sandy, gravelly	-56,2	12,6	22,1	0,34				2,69					29,9			
BH.09	1	SAND, medium - coarse	-16,6				0,347	2,4								0,48	0,82	
BH.09	2	CLAY, medium plastic	-19,3	29,8														47
BH.09	2	CLAY, medium plastic	-19,6	25,1														
BH.09	3	CLAY, medium plastic	-22,2	30,0														50
BH.09	3	CLAY, medium plastic	-22,3	34,5			0,001		57,6	2,72	42,4	17,7	24,7					
BH.09	4	CLAY, medium plastic	-24,3	18,4														
BH.09	5	CLAY, highly plastic	-25,3	20,9														
BH.09	6	CLAY, highly plastic	-28,3	22,5														
BH.09	7	CLAY, highly plastic	-31,5	21,6											13,6			
BH.09	8	CLAY, medium - highly plastic	-32,6	24,4	19,9	0,63												
BH.09	9	CLAY, highly plastic	-34,2	21,5	20,3	0,56												
BH.09	10	CLAY, highly plastic	-35,2	22,1														
BH.09	10	CLAY, highly plastic	-36,2	21,9	20,4	0,55												
BH.09	11	CLAY, highly plastic	-37,2	22,0														
BH.09	12	CLAY, highly plastic	-38,0	22,5	20,1	0,58	0,001		56,0	2,72	40,2	19,3	20,9		13,5			
BH.09	13	CLAY, highly plastic	-39,6	23,9	19,9	0,62												
BH.09	14	SAND, coarse	-41,3				1,920	8,5								0,37	0,70	
BH.09	15	GRAVEL, sandy	-42,3				18,500	21,1										
BH.09	16	CLAY, medium plastic	-43,3	14,5			0,065		21,3	2,63	41,5	15,5	26,0	1,9				
BH.09	17	SAND, fine	-46,2							2,68						0,67	1,49	
BH.09	18	SAND, fine	-49,0	29,8														
BH.09	19	CLAY	-49,8	15,7														
BH.09	22	CLAY, highly plastic	-56,3	25,6						2,63				2,5				
BH.10	1	SAND, fine - medium	-19,1				0,350	3,0		2,67								
BH.10	2	CLAY, medium plastic	-21,6	33,7														29
BH.10	2	CLAY, medium plastic	-21,7	35,8						2,73								
BH.10	3	CLAY, medium plastic	-24,6	28,0														55
BH.10	3	CLAY, medium plastic	-24,6	31,9						2,73	50,6	19,3	31,3					
BH.10	4	SAND, fine - medium	-27,4	19,7	20,5	0,52	0,095	2,5	5,6	2,68								
BH.10	5	SAND, sl. clayey	-30,6							2,69								
BH.10	6	SAND, fine - medium	-32,1													0,42	0,88	
BH.10	9	CLAY, silty	-33,3	16,7						2,69	26,9	13,2	13,8					
BH.10	10	SILT, clayey	-36,8				0,003		46,3									
BH.10	11	SAND, fine - medium	-38,0							2,67						0,61	1,05	
BH.10	14	GRAVEL, sandy	-45,1				4,040	57,8										
BH.10	16	CLAY, highly plastic	-49,6	21,6	20,4	0,60				2,72	47,0	20,3	26,6					
BH.10	17	CLAY, highly plastic	-52,9	26,2														
BH.10	18	CLAY, highly plastic	-55,5	22,9	20,2	0,60					49,6	19,0	30,6		13,1			
BH.10	19	CLAY, silty	-58,6	21,5														
BH.10	20	CLAY, highly plastic	-59,1	27,0							61,6	22,7	39,0					

DANISH GEOTECHNICAL INSTITUTE

Enclosure 1B.06
Summary – Rock Classification Tests

Summary – Rock Classification Tests

Borehole No	Sample No	Description	Test Level	Natural Moisture Content	Bulk Gravity	Bulk Density	Void Ratio	Particle density (Specific gravity)	Carbonate Content	Uniaxial Compressive Strength (UCS)	Young's Modulus
				w	γ_m	ρ	e	ρ_s			E
-	-		m	%	kN/m³	g/cm³	-	10^3 (kg/m³)	%	MPa	MPa
BH.01	22	CLAYSTONE	-53.2	19.3	20.4		0.504	2.616	45.5		
BH.01	23	CLAYSTONE	-54.7	15.7		2.16				4.16	394
BH.01	23	CLAYSTONE	-55.2	20.1	20.3		0.552				
BH.01	24	CLAYSTONE	-56.2	20.0		2.05				1.40	86
BH.01	25	CLAYSTONE	-56.4	18.7	20.4		0.504	2.638	45.0		
BH.02	19	CLAYSTONE	-50.2	11.3	22.5		0.280	2.644	63.6		
BH.02	19	CLAYSTONE	-50.2	13.3	21.8		0.368	2.644	63.6		
BH.02	19A	CLAYSTONE	-50.3	11.5		2.27				8.74	1350
BH.02	19B	CLAYSTONE	-51.2	14.0		2.20				3.50	397
BH.02	20	CLAYSTONE	-51.7	13.8	21.7		0.380	2.682	58.2		
BH.02	20A	CLAYSTONE	-51.7	12.7		2.22				3.84	516
BH.02	20A	CLAYSTONE	-52.2	12.1		2.24				3.54	536
BH.02	21	CLAYSTONE	-53.2	13.3		2.19				3.18	318
BH.02	21	CLAYSTONE	-53.7	16.2	21.2		0.443				
BH.02	22	CLAYSTONE	-54.1	20.4	20.4		0.547	2.672	30.4		
BH.02	22	CLAYSTONE	-54.6	17.2	21.7	2.10	0.382	2.644	42.8	1.84	136
BH.02	23	CLAYSTONE	-55.6	13.9	21.7		0.382	2.644	42.8		
BH.02	23	CLAYSTONE	-55.6	18.4	20.7		0.488	2.644	42.8		
BH.02	23	CLAYSTONE	-55.8	15.7		2.14				4.67	446

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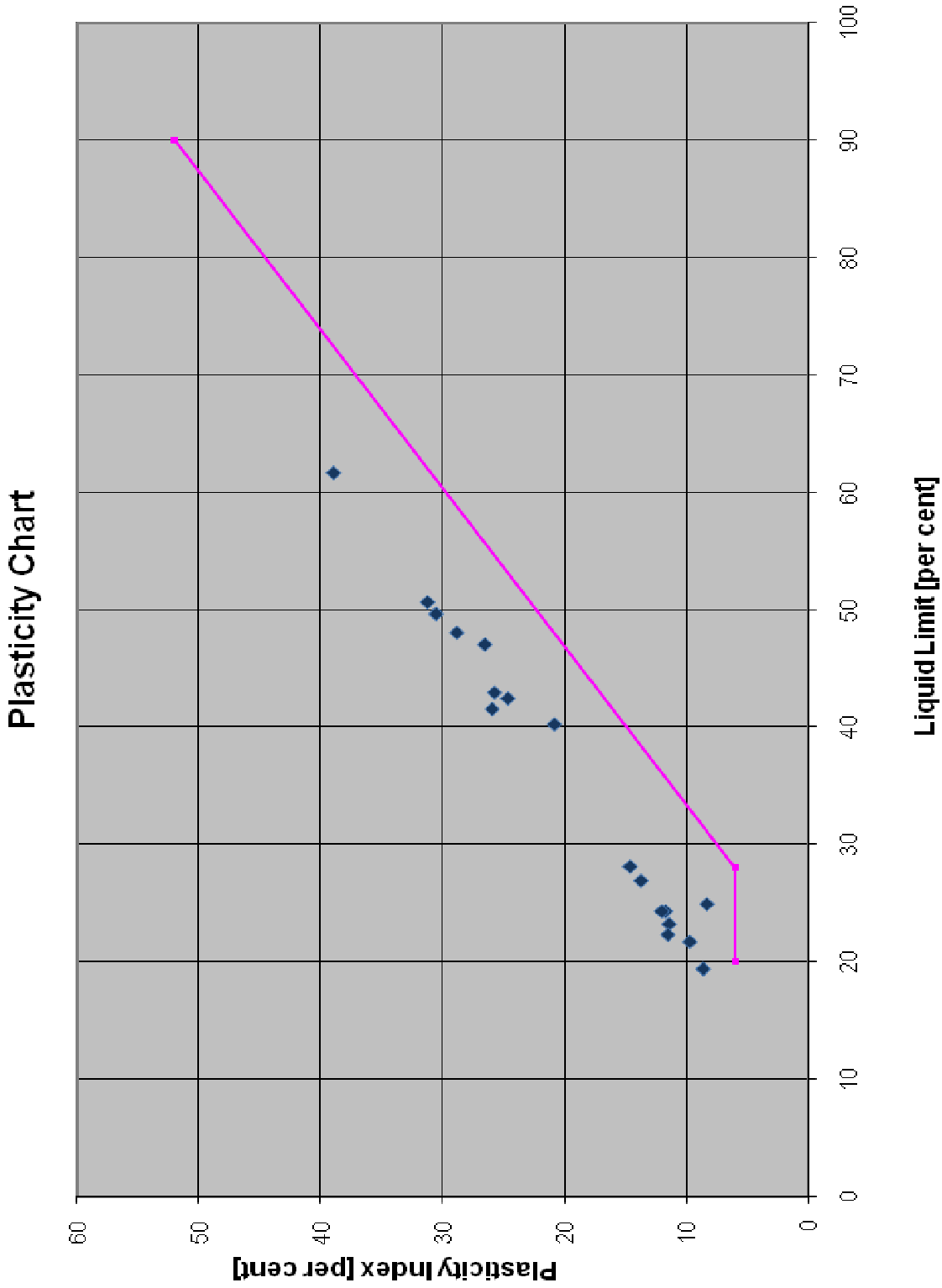
Enclosure 1B.07
Summary – Plasticity Chart



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Job: 32490 Anholt Offshore Wind Farm

Prepared	: MTM	Date: 2009-07-08	Subject: Plasticity Chart	
Controlled	: LAR	Date: 2009-07-08		Page 1 / 1
Approved	: JBC	Date: 2009-07-08	Report 1	Enclosure 1B.07

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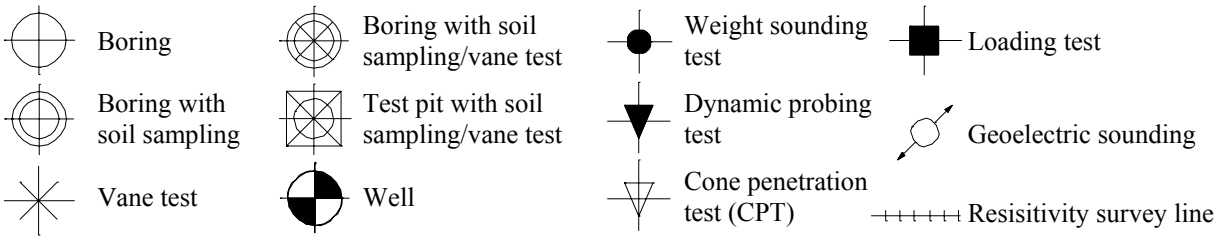
Enclosure 1C.00
Legend and Abbreviations

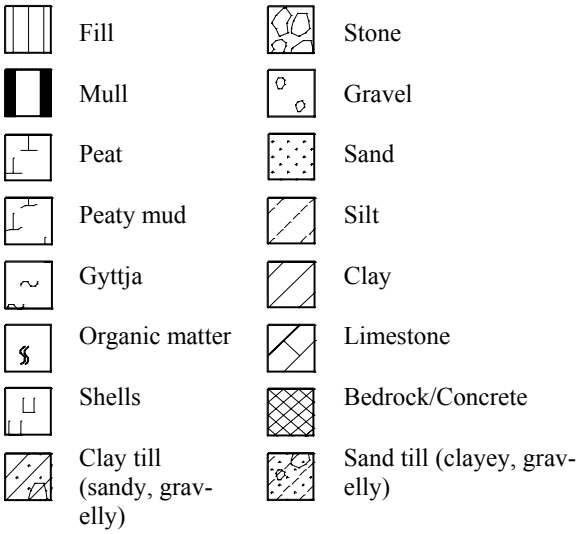
GEO-Standard: Legends and Abbreviations

Core drillings

Site plan

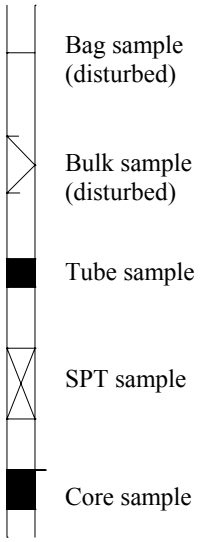


Soil types

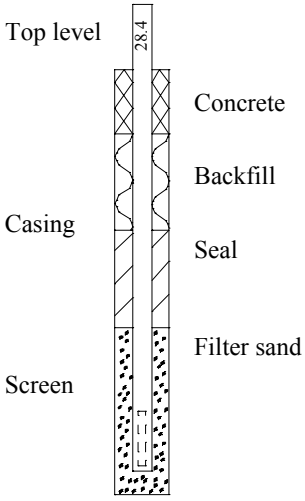


Note: In tills, a varying content of stones and blocks should be expected

Samples



Well installations



Geological age

Re	Recent
Pg	Postglacial
Sg	Lateglacial
Gc	Glacial
Ig	Interglacial
Te	Tertiary
Mi	Miocene
Ol	Oligocene
Eo	Eocene
Pl	Palaeocene
Se	Selandian
Da	Danian
Ct	Cretaceous
Ms	Maastrichtian

Environment

Ae	Aeolian (wind deposit)
Br	Brackish water deposit
Fi	Fill
Fw	Fresh water deposit
Gl	Glacier deposit
Ls	Landslide deposit
Ma	Marine deposit
Mw	Meltwater deposit
Ss	Solifluction soil
Ts	Topsoil
Wd	Wash down deposit

General abbraviations

sl.	slightly
v.	very
w.	with
lam.	lamina(e)
fragm.	fragments
biot.	bioturbation
bryo.	bryozoans
calc.	calcareous
glauc.	glauconite
T	top of sample
B	bottom of sample

Core samples

Recovery: Ratio in percentage between sample length and length of core run (Total Core Recovery, TCR). Value appears at top of core.

RQD: Rock Quality Designation. Ratio in percentage between total length of core pieces with length more than 100 mm, and length of core run. Value appears at top of core.

Fractures:

1 = S1	Unfractured		no fractures
2 = S2	Slightly fractured	10 cm	< fracture spacing
3 = S3	Fractured	6 cm	< fracture spacing < 10 cm
4 = S4	Very fractured	2 cm	< fracture spacing < 6 cm
5 = S5	Crushed		fracture spacing < 2 cm

Induration:

1 = H1	Unlithified	Can easily be shaped with fingers
2 = H2	Slightly indurated	Can easily be worked with knife
3 = H3	Indurated	Can be worked with knife
4 = H4	Strongly indurated	Can be scratched with knife
5 = H5	Very strongly indurated	Cannot be scratched with knife

Tests

c_v	Shear strength	(kN/m²)	Measured by vane test in undisturbed soil
c_{vr}	Shear strength	(kN/m²)	Measured by vane test in remoulded soil
c_l	Shear strength	(kN/m²)	Measured by laboratory vane
c_u	Shear strength	(kN/m²)	Measured by unconfined compression test or triaxial test
N	Standard Penetration Test (SPT)		Number of blows per 0.3 m penetration of Ø51 mm SPT probe by use of the energy h • G = 0.7 m • 0.635 kN
w	Water content	(%)	Ratio between weight of water and weight of grains
w_p	Plastic limit	(%)	Water content at the boundary between semisolid and plastic state; NP: Non plastic
w_L	Liquid limit	(%)	Water content at the boundary between plastic and liquid state
I_P	Plasticity index	(%)	$w_L - w_P$
γ	Unit weight	(kN/m³)	Ratio between total weight and total volume
e	Void ratio		Ratio between pore volume and grain volume
e_{max}	Void ratio, loosest state		Void ratio of very loose standard state
e_{min}	Void ratio, densest state		Void ratio of very dense standard state
I_D	Relative density		$(e_{max} - e)/ (e_{max} - e_{min})$
ka	Carbonate content	(%)	Ratio between weight of carbonate and total grain weight
gl	Organic content	(%)	Weight loss by prolonged glowing, in percent of total grain weight

vr.: Vane not penetrated to full depth
vd.: Test with defective vane
st.: Vane test influenced by stone

Supplementary tests

In situ tests:

PR	Pressiometer
FH	Falling Head
PP	Pumping
EL	Elastmeter
GA	Gammalog

Laboratory tests:

B	Brazil
C	Consolidation
D	Specific gravity
E	e_{max} and e_{min}
F	Photo
G	Grain size analysis
P	Point Load
S	Simple shear
T	Triaxial
U	Unconfined compression
V	Shear box
W	Vibration compaction
SP	Standard proctor test
MP	Modified proctor test

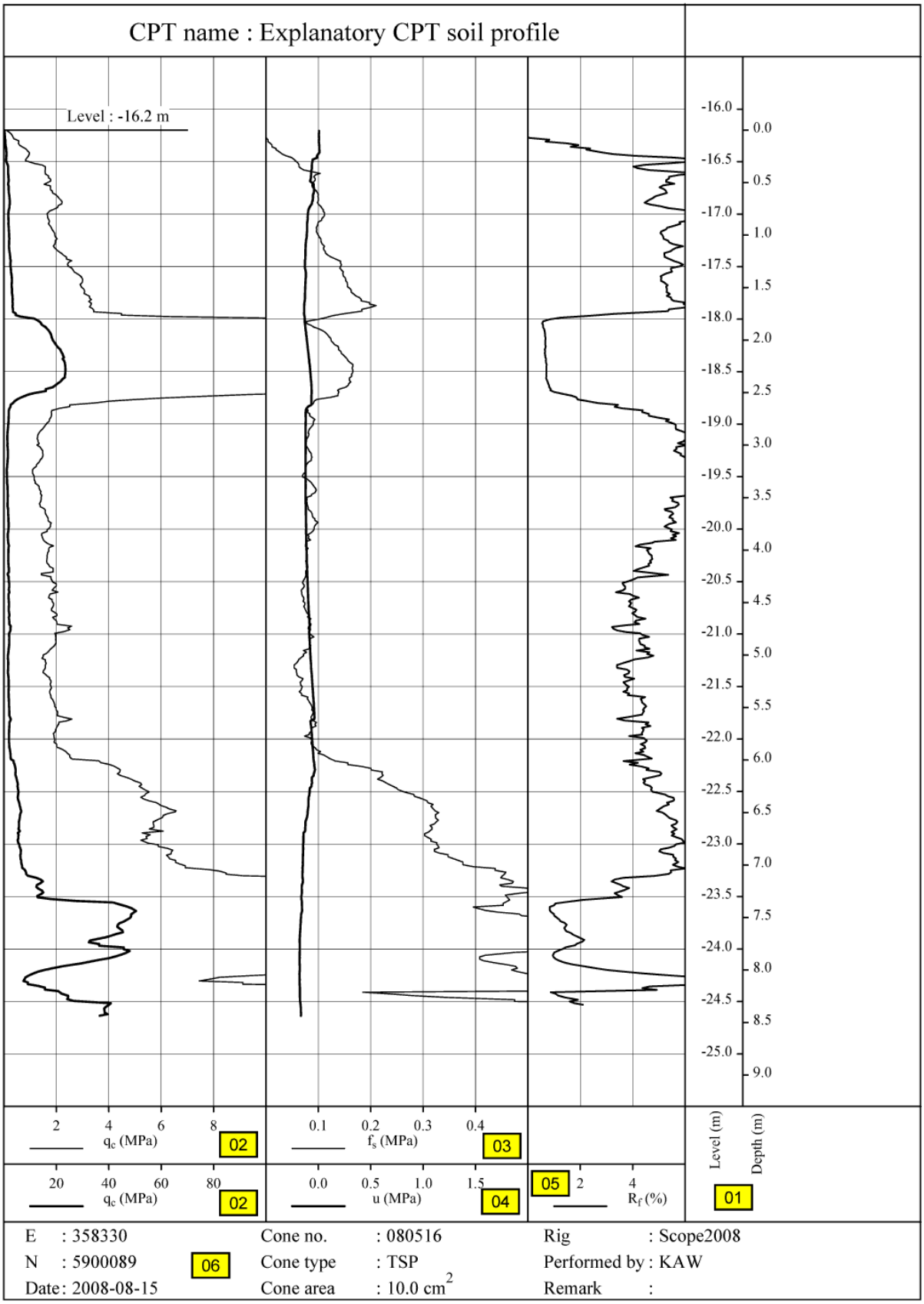
References

Dansk Standard:
"Norm for fundering (DS415)
(Code of practice for Foundation Engineers)

Danish Geotechnical Society:
"A guide to engineering geological soil description", 1995

Dansk Geoteknisk Forening:
"Markundersøgelsesmetoder", 1990
(Field investigation methods, in Danish)

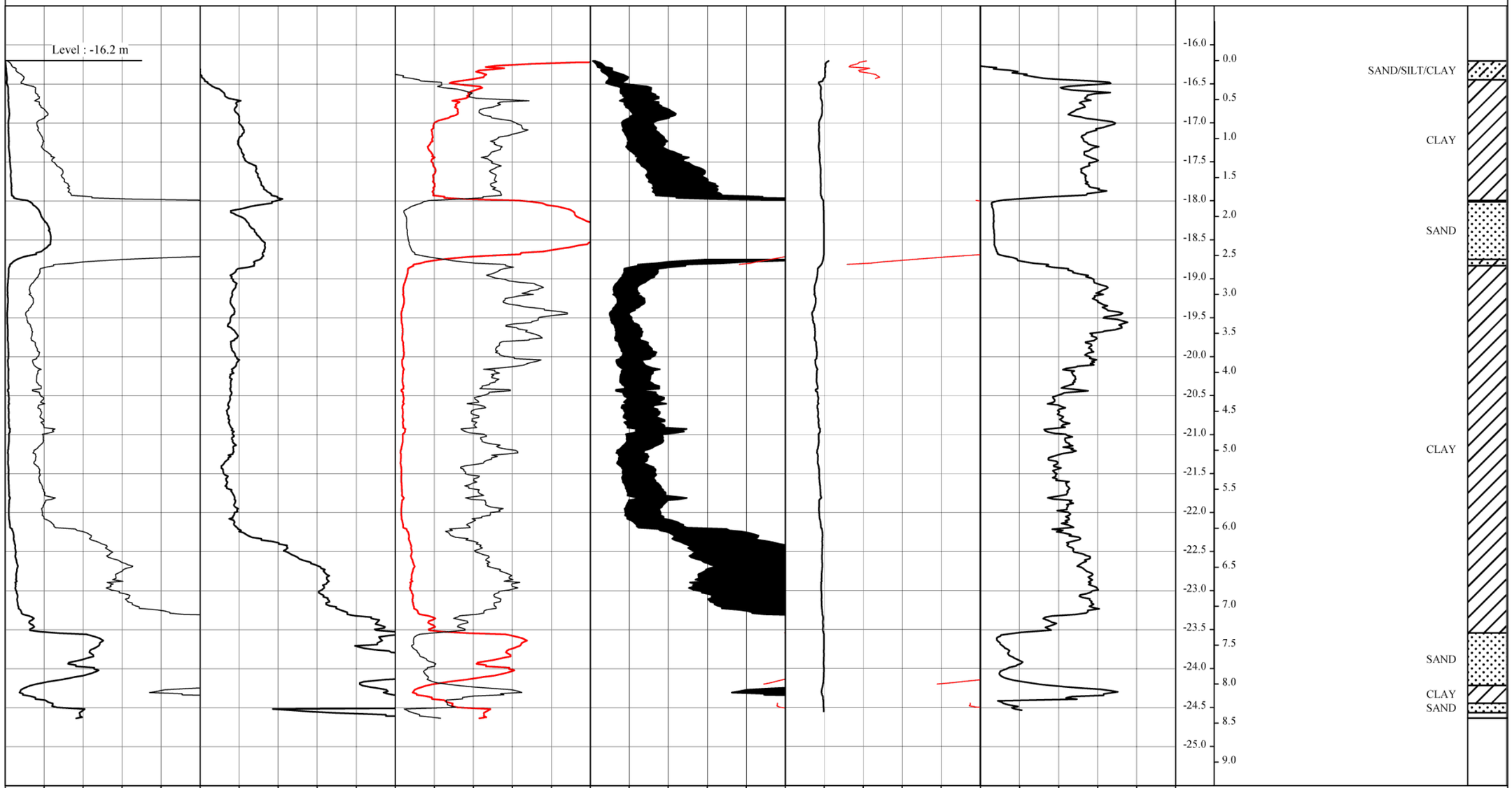
Vane tests are carried out and evaluated according to reference document, revision 3, August 1999 (in Danish), of the Danish Geotechnical Society. Conversion tables have been approximated by a straight line through the origin and the point corresponding to $\frac{2}{3} P_{max}$.


CPT name : Explanatory CPT soil profile
Level : -16.2 m
-16.0
-16.5
-17.0
-17.5
-18.0
-18.5
-19.0
-19.5
-20.0
-20.5
-21.0
-21.5
-22.0
-22.5
-23.0
-23.5
-24.0
-24.5
-25.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
2 4 6 8
q_c (MPa)
02
0.1 0.2 0.3 0.4
f_s (MPa)
03
20 40 60 80
q_c (MPa)
02
0.0 0.5 1.0 1.5
u (MPa)
04
05
2 4
R_f (%)
Level (m)
Depth (m)
01
E : 358330
N : 5900089
Date: 2008-08-15
06
Cone no. : 080516
Cone type : TSP
Cone area : 10.0 cm^2
Rig : Scope2008
Performed by : KAW
Remark :

Cone Penetration Tests

01	Depth:	Depth refers to the penetration depth below start of test level. The depth is not corrected for tool inclination
01	Level:	Level to penetration depth
02	q_c:	Tip resistance in two scales, 0 – 10 MPa and 0 – 100 MPa
03	f_s:	Sleeve friction in scale 0 – 0.5 Mpa. All measurements are referred back to the cone tip
04	u:	Pore water pressure relative to level at start of test in scale -0.5 – 2.0 MPa
05	R_f:	Friction ratio in scale 0 – 6 %
06	Other test information	
E and N:	Test location (E: Easting and N: Northing)	
Date:	Date of CPT testing	
Cone no:	Number of cone used in test	
Cone type:	Type of Cone – TSP. Tip resistance, Sleeve friction and Pore water pressure are measured in agreement with the ISOPT1 recommendations	
Cone area:	10.0 cm^2 in agreement with the ISOPT1 recommendations	
Rig:	Name of rig	
Performed by:	Initial of test operator	
Remarks:	Remarks to test (If any)	

CPT name : Explanatory CPT soil profile



E : 358330	Cone no.	: 080516	Rig : Scope2008
N : 5900089 (21)	Cone type	: TSP	Performed by : KAW
Date: 2008-08-15	Cone area	: 10.0 cm^2	Remark :

Cone Penetration Tests

10	Depth:	Depth refers to the penetration depth below start of test level. The depth is not-corrected for tool inclination
10	Level:	Level to penetration depth
11	q_t:	Corrected tip resistance in two scales, 0 – 10 MPa and 0 – 100 MPa
12	f_t:	Corrected sleeve friction in scale 0 – 0.5 MPa
13	Q_t:	Normalized cone restistance in scale 0 - 1000
14	F_r:	Normalized sleeve friction in scale 0 – 10 %
15	φ:	Angle of internal friction in scale 20 - 45°
16	c_u:	Undrained shear strength in scale 0 – 500 kPa
17	D_r:	Relative density in scale 0 – 100 %
18	B_q:	Pore pressure ratio in scale –0.5 – 2.0
19	R_{ft}:	Corrected friction ratio in scale 0 – 10 %
20		Main soil description interpreted from CPT results
21	Other test information:	
E and N:		Test location (E: Easting and N: Northing)
Date:		Date of CPT testing
Cone no.:		Number of cone
Cone type:		Type of Cone – TSP. Tip resistance, Sleeve friction and Pore water pressure are measured in agreement with the ISOPT1 recommendations
Cone area:		10 cm^2 in agreement with the ISOPT1 recommendations
Rig:		Name of rig – SCOPE2008
Performed by:		Initials of test operator
Remarks:		Remarks to test (if any)

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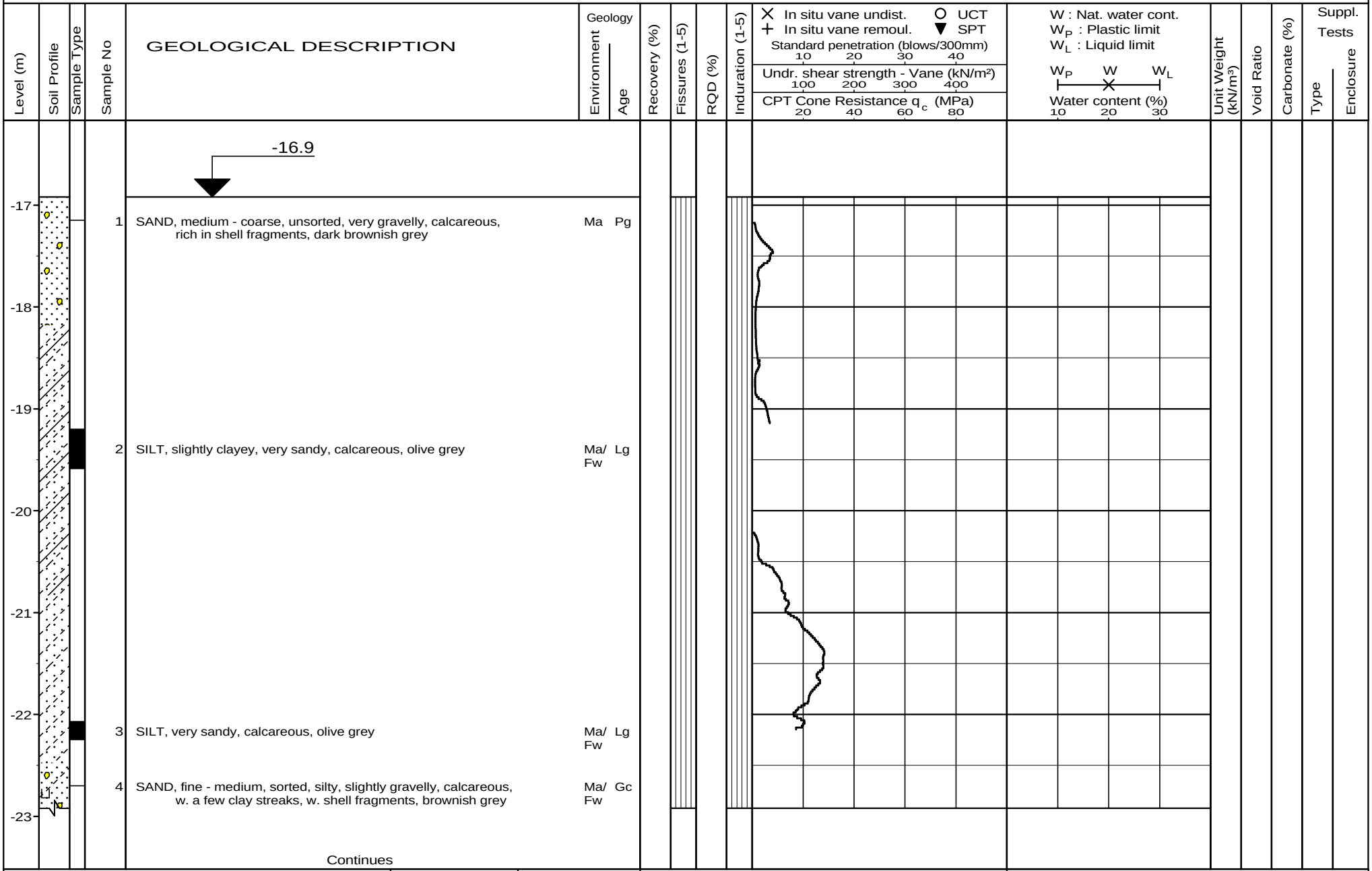
Enclosure 1D.01 - 1D.07
Borehole logs, borehole BH01-BH07

BORING NO. BH.01 Anholt. Djursland Wind Farm



Coordinates : E : 635616 (m) N : 6269609 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.01 Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: ID.01

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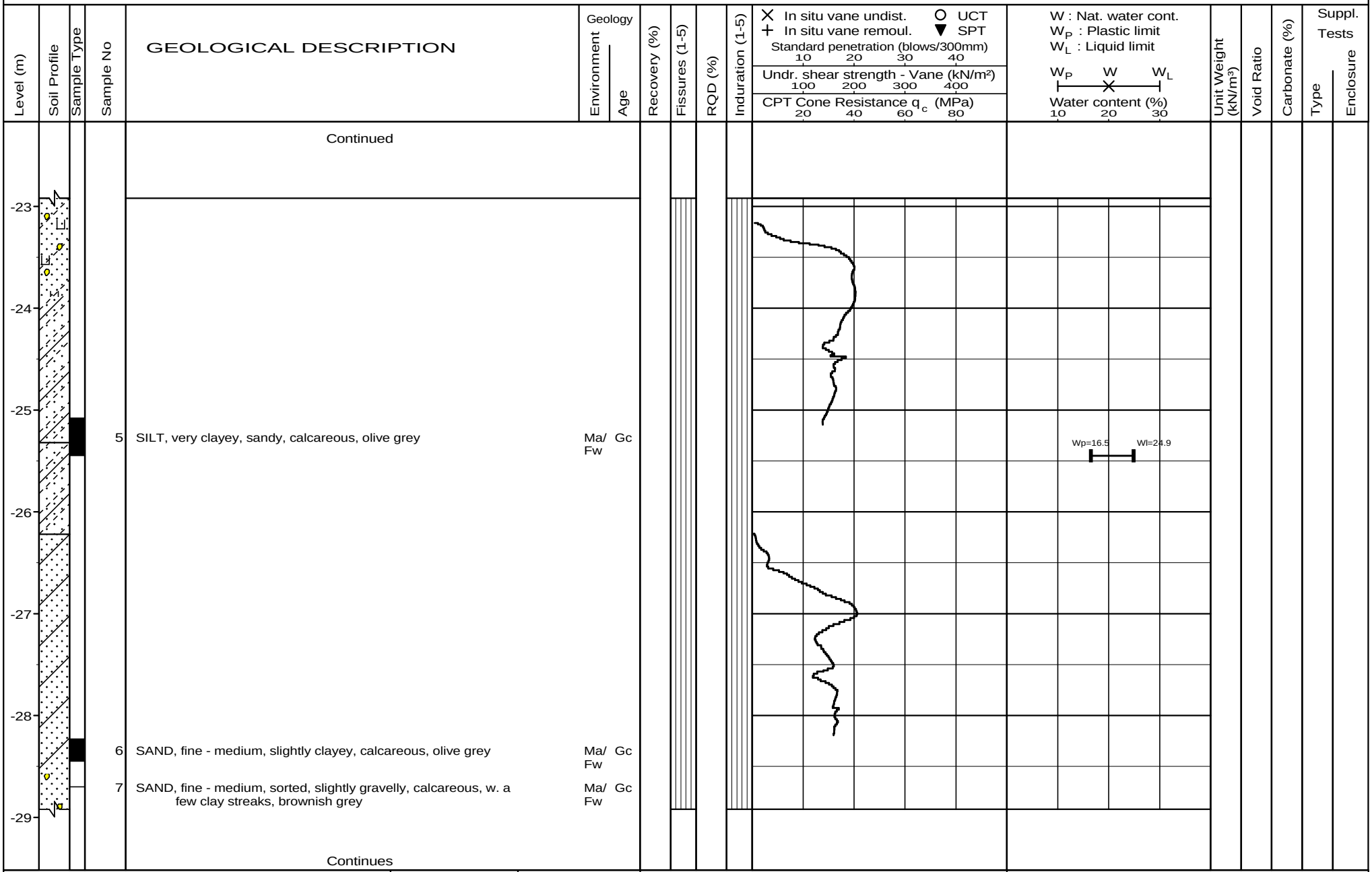
BORING NO. BH.01 Anholt. Djursland Wind Farm



Coordinates : E : 635616 (m) N : 6269609 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.01 Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: ID.01

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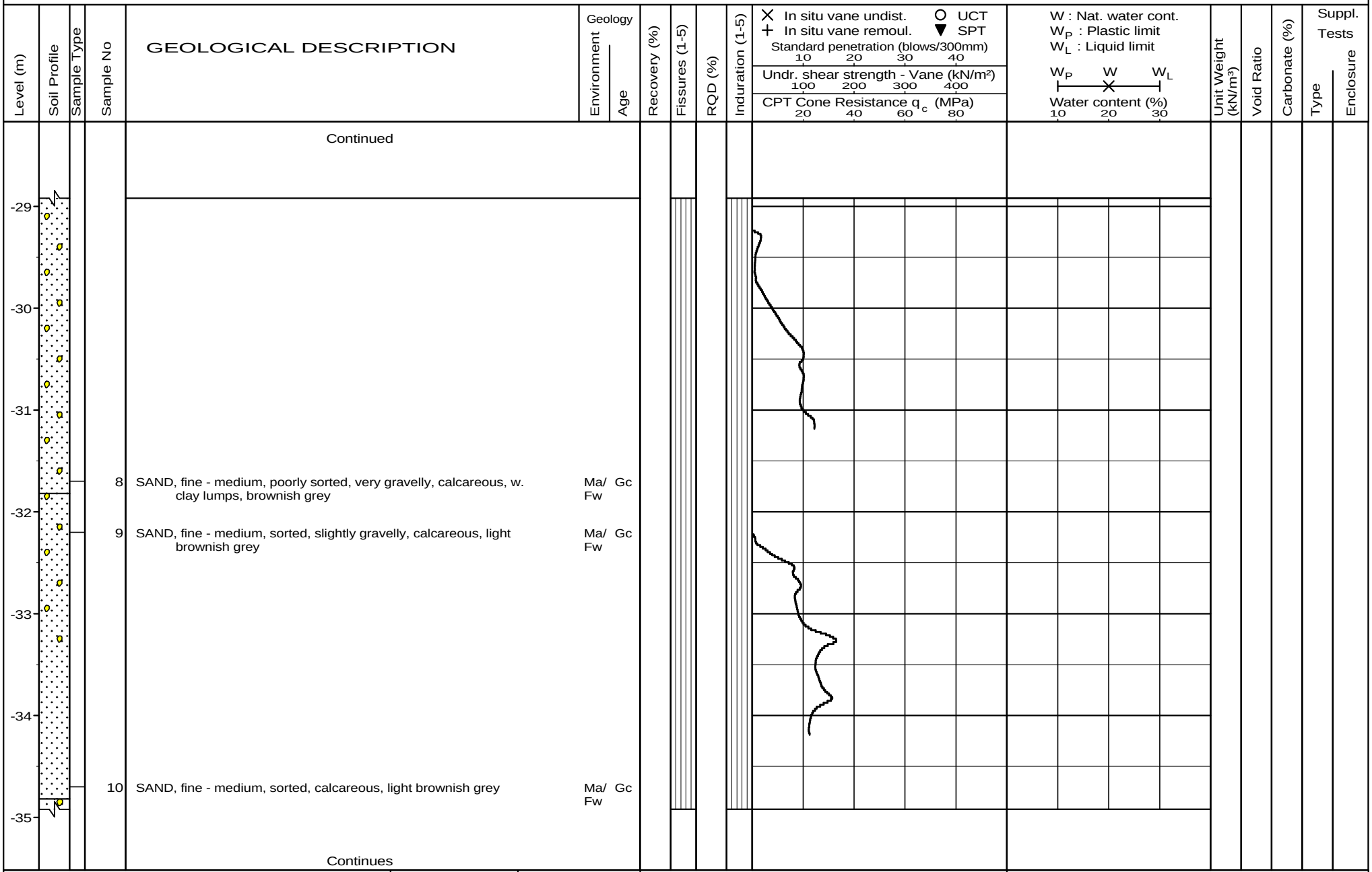
BORING NO. BH.01 — Anholt. Djursland Wind Farm



Coordinates : E : 635616 (m) N : 6269609 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.01 Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: ID.01

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BORING NO. BH.01 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age
			Continued		
18	-35	11	GRAVEL, very sandy, calcareous, light brownish grey	Ma/ Fw	Gc
19	-36				
20	-37	12	SAND, medium - coarse, sorted, very gravelly, brownish grey	Ma/ Fw	Gc
		13	SAND, medium - coarse, sorted, gravelly, calcareous, grey	Ma/ Fw	Gc
21	-38				
22	-39				
23	-40				
24	-41	14	SAND, medium, sorted, slightly gravelly, calcareous, w. bryozoans, grey	Ma/ Fw	Gc
			Continues		

Recovery (%) | Fissures (1-5) | RQD (%) | Induration (1-5)

In situ vane undist. ✕ | In situ vane remoul. + | UCT ○ | SPT ▼

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P W W_L

Water content (%) 10 20 30

Unit Weight (kN/m³) | Void Ratio | Carbonate (%) | Suppl. Tests: Type | Enclosure

Coordinates : E : 635616 (m) N : 6269609 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.01 — Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14	Report No.: 1 — Encl.No.: ID.01

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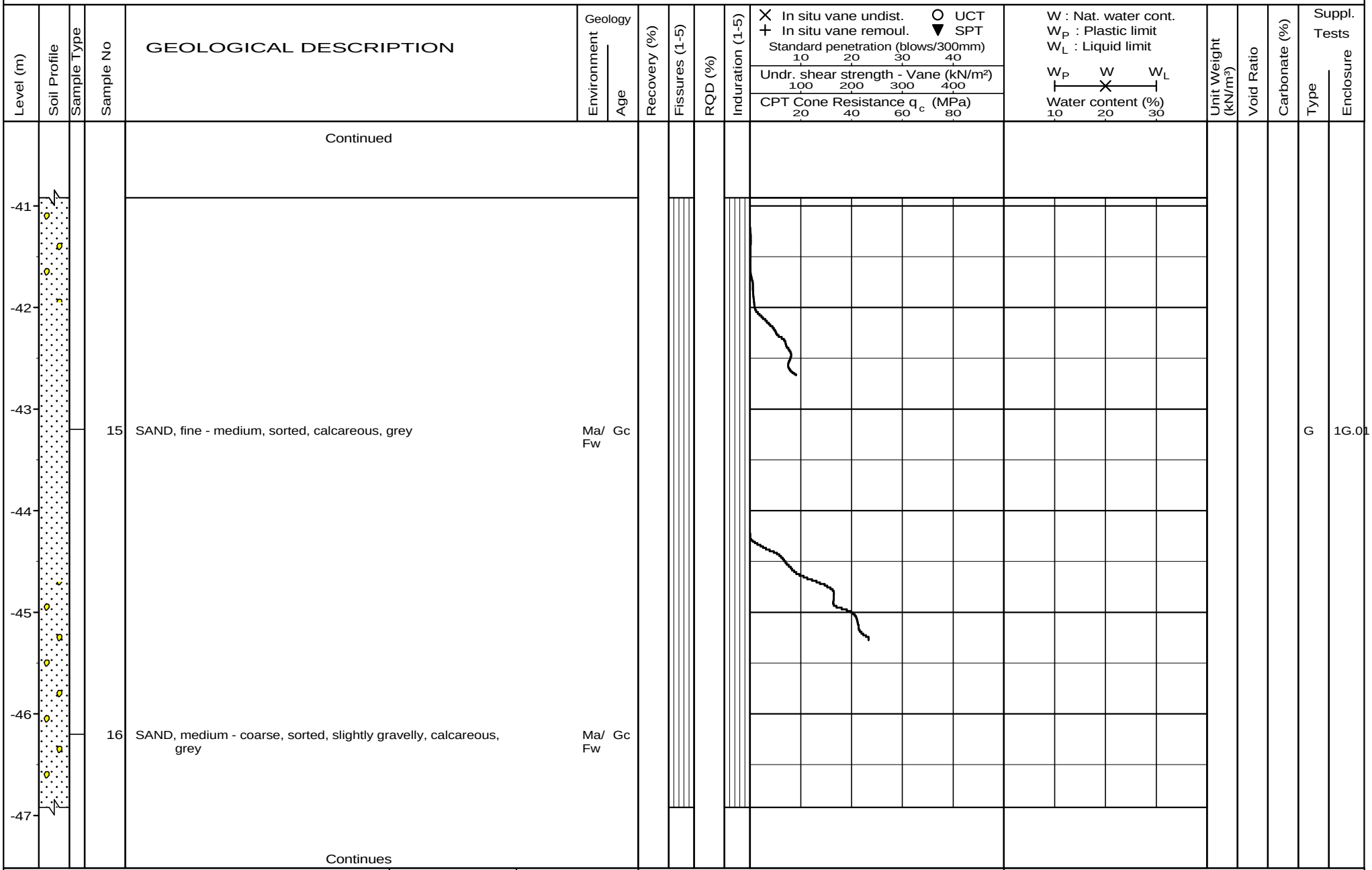
BORING NO. BH.01 Anholt. Djursland Wind Farm



Coordinates : E : 635616 (m) N : 6269609 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.01 Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: ID.01

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BORING NO. BH.01 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	GEOLOGICAL DESCRIPTION	Geology Environment	Geology Age
			Continued		
30	-47	17	SAND, medium - coarse, sorted, calcareous, grey	Ma/ Fw	Gc
31	-48				
32	-49				
33	-50				
		18	SAND, fine - medium, sorted, slightly gravelly. calcareous, grey	Ma/ Fw	Gc
34	-51	19	GRAVEL, sandy, calcareous, grey	Ma/ Mw	Gc
		20	GRAVEL, very sandy, calcareous, grey	Ma/ Mw	Gc
35	-52	21	GRAVEL, sandy, slightly stony, calcareous, dark grey	Ma/ Mw	Gc
36	-53		Continues		

Soil Profile | Sample Type | Recovery (%) | Fissures (1-5) | RQD (%) | Induration (1-5)

In situ vane undist. ✕ | In situ vane remoul. + | UCT ○ | SPT ▼

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P — W — W_L

Water content (%) 10 20 30

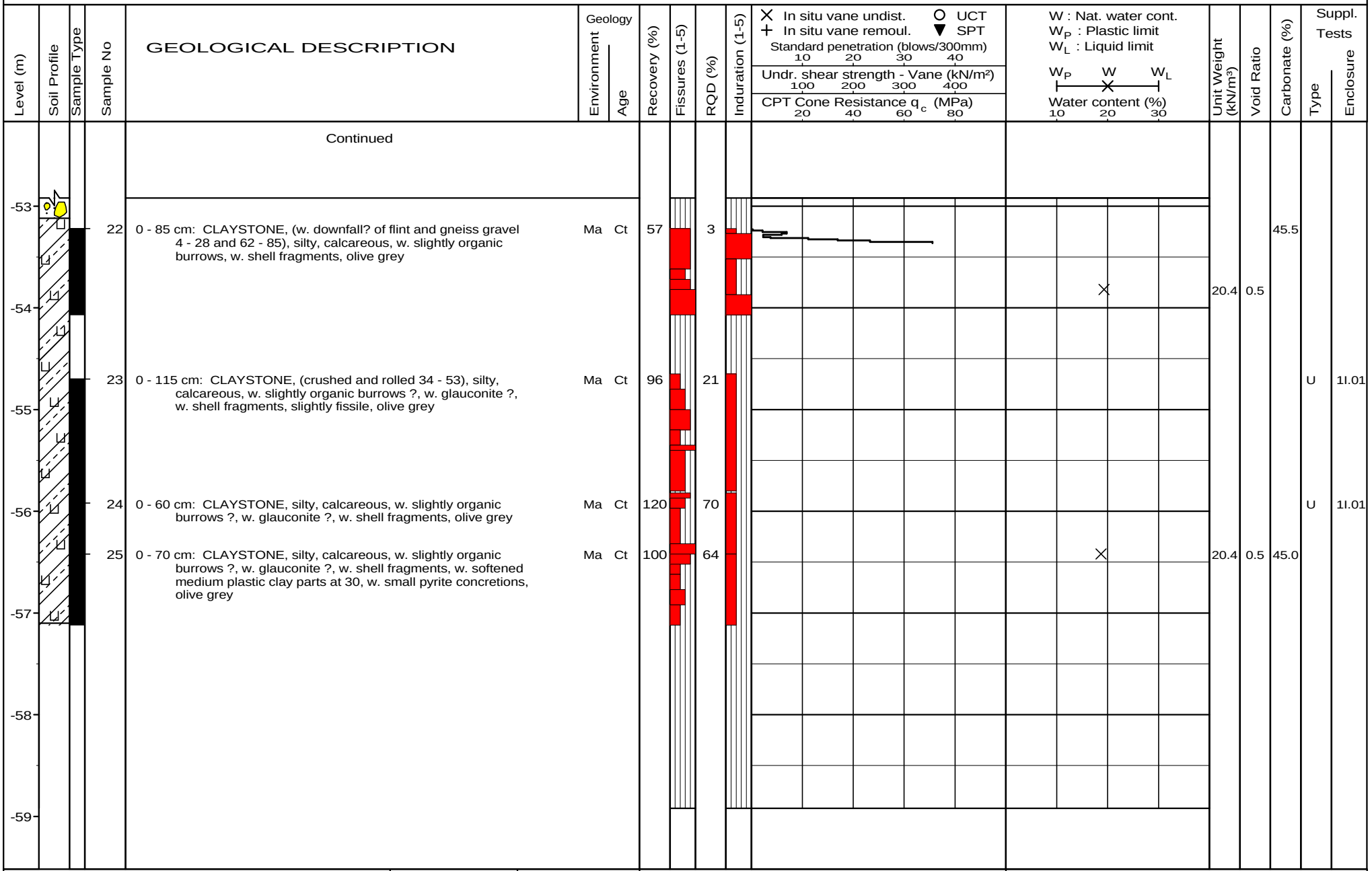
Unit Weight (kN/m³) | Void Ratio | Carbonate (%)

Suppl. Tests: Type | Enclosure

Type	Enclosure
G	1G.01

Coordinates : E : 635616 (m) N : 6269609 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12		Borehole No.: BH.01 — Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14		Report No.: 1 — Encl.No.: ID.01

BORING NO. BH.01 — Anholt. Djursland Wind Farm



Coordinates : E : 635616 (m) N : 6269609 (m)

Comments :

Prepared : VIJ/SAM	Date : 2009-06-08	
Checked : JNG	Date : 2009-10-12	
Approved : LAR	Date : 2009-10-14	

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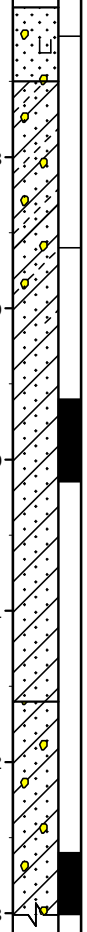
Job : 32490	Anholt. Djursland Wind Farm
Borehole No.: BH.01	Date : 2009-05-19
Report No.: 1	Encl.No.: ID.01

BORING NO. BH.02 — Anholt. Djursland Wind Farm

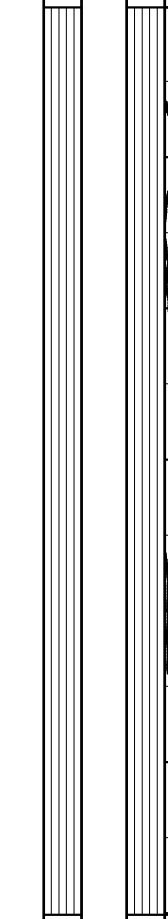
Depth (m)	Level (m)	Sample No	Geological description	Geology: Environment	Geology: Age	Suppl. Tests: Type	Suppl. Tests: Enclosure
			-17.0				
0		1	SAND, medium - coarse, sorted, gravelly, calcareous, w. shell fragments, brownish grey	Ma	Pg	G	1G.02
1	-18	2	CLAY, very silty, slightly sandy, slightly gravelly, calcareous, w. sand streaks, olive grey	Ma/ Fw	Lg		
2	-19						
3	-20	3	CLAY, medium plastic, slightsly sandy, calcareous, w. sand streaks, w. a few shell fragments, olive grey	Ma/ Fw	Lg	T	1H.01
4	-21						
5	-22						
6	-23	4	CLAY, sandy, gravelly, calcareous, grey	Gl?	Gc?	C T	3C.01 1H.02

Continues

Soil Profile / Sample Type



Recovery (%) / Fissures (1-5) / RQD (%) / Induration (1-5)



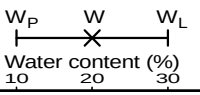
In situ vane undist. ✕ / In situ vane remoul. + / UCT ○ / SPT ▼

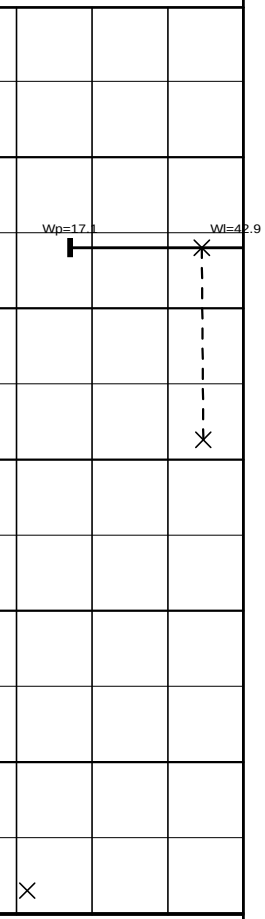
Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit





Unit Weight (kN/m³) / Void Ratio / Carbonate (%)

Coordinates :	E : 633525 (m)	N : 6272063 (m)	Prepared : SAM	Date : 2009-06-09
Comments :			Checked : JNG	Date : 2009-10-12
			Approved : LAR	Date : 2009-10-14

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Job : 32490	Anholt. Djursland Wind Farm	
Borehole No.: BH.02		Date : 2009-05-19
Report No.: 1		Encl.No.: 1D.02

BORING NO. BH.02 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests: Type	Suppl. Tests: Enclosure
					Continued											
6																
7	-24															
8	-25															
				5	SAND, fine - medium, slightly clayey, slightly gravelly, calcareous, w. plant remains, grey	Gl?	Gc?									
9	-26															
10	-27															
11	-28															
				6	CLAY, silty, sandy, slightly gravelly, calcareous, w. clay streaks, w. sand streaks, grey	Ma/ Fw	Gc								G	1G.02
12	-29															
					Continues											

In situ vane undist. ✕ / In situ vane remoul. + / UCT ○ / SPT ▼

Standard penetration (blows/300mm): 10 20 30 40

Undr. shear strength - Vane (kN/m²): 100 200 300 400

CPT Cone Resistance q_c (MPa): 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P — W — W_L

Water content (%): 10 20 30

Wp=11.9 Wl=21.7

Coordinates : E : 633525 (m) N : 6272063 (m)	Prepared : SAM	Date : 2009-06-09	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.02 Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.02

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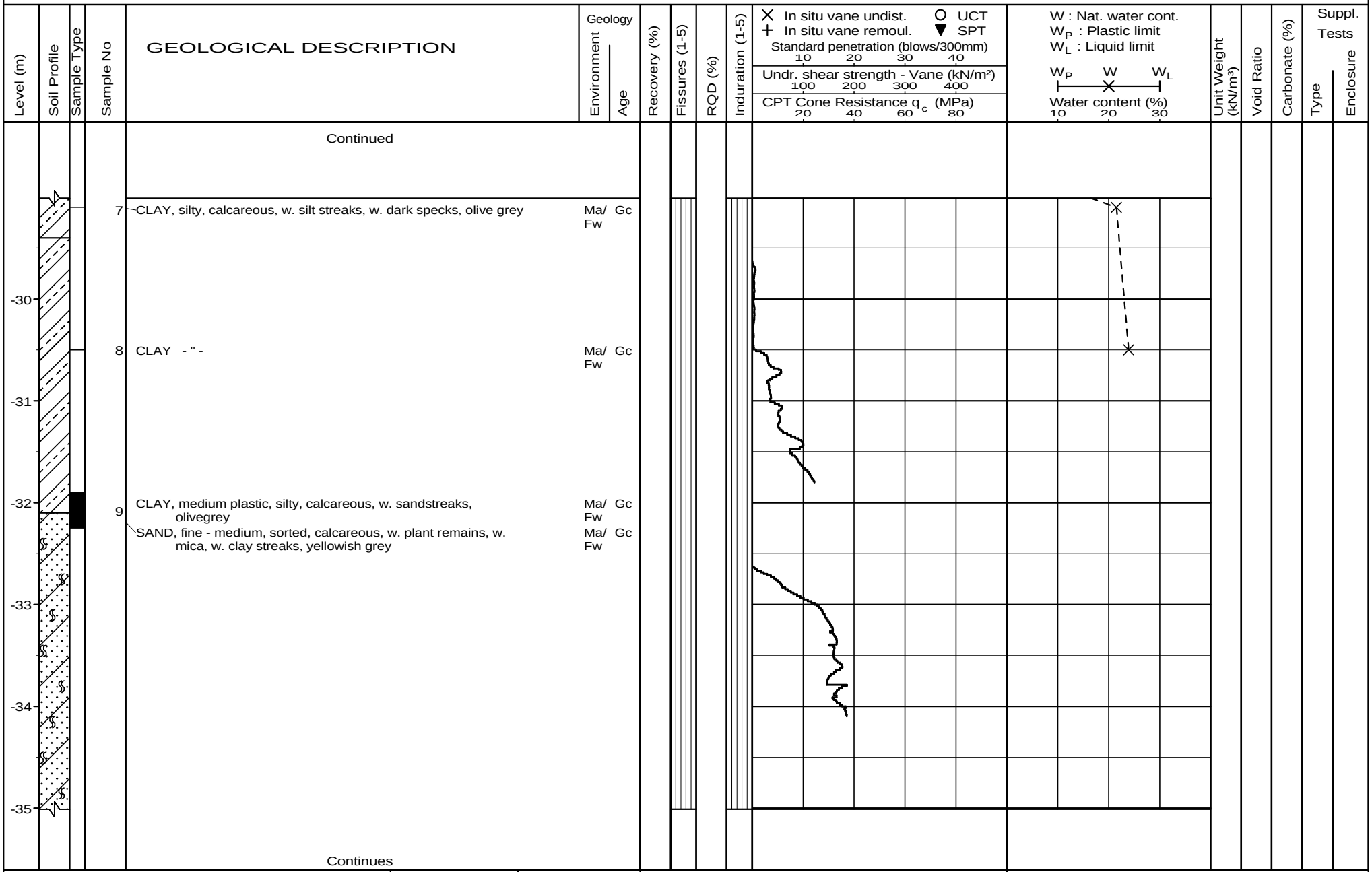
BORING NO. BH.02 Anholt. Djursland Wind Farm



Coordinates : E : 633525 (m) N : 6272063 (m)	Prepared : SAM	Date : 2009-06-09	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.02 Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.02

BORING NO. BH.02 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age
			Continued		
18		10	SAND, fine - medium, sorted, calcareous, w. plant remains, w. mica, w. clay streaks, yellowish grey	Ma/ Fw	Gc
19	-36				
20	-37				
21	-38	11	SAND, fine - medium, sorted, calcareous, w. plant remains, w. mica, yellowish grey	Ma/ Fw	Gc
22	-39				
23	-40	12	SAND - " -	Ma/ Fw	Gc
24	-41		Continues		

Soil Profile | Sample Type | Recovery (%) | Fissures (1-5) | RQD (%) | Induration (1-5)

× In situ vane undist. ○ UCT
\+ In situ vane remoul. ▼ SPT
Standard penetration (blows/300mm) 10 20 30 40
Undr. shear strength - Vane (kN/m²) 100 200 300 400
CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit
W_P W W_L
Water content (%) 10 20 30

Unit Weight (kN/m³) | Void Ratio | Carbonate (%) | Suppl. Tests: Type | Enclosure

Coordinates : E : 633525 (m) N : 6272063 (m)	Prepared : SAM	Date : 2009-06-09	GEO	Job : 32490	Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Borehole No.: BH.02	Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14		Report No.: 1	Encl.No.: 1D.02

BORING NO. BH.02 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age	Suppl. Tests: Type	Suppl. Tests: Enclosure
			Continued				
24		13	SAND, fine - medium, sorted, slightly gravelly, calcareous, w. clay lumps, yellowish grey	Ma/ Fw	Gc	G	1G.02
25	-42						
26	-43						
		14	SAND, fine - medium, sorted, slightly gravelly, calcareous, w. clay streaks, yellowish grey	Ma/ Fw	Gc		
27	-44	15	SAND - " -	Ma/ Fw	Gc		
28	-45						
29	-46						
		16	GRAVEL, sandy, stony, calcareous, brownish grey	Ma/ Mw	Gc	G	1G.02
30	-47		Continues				

Recovery (%) | Fissures (1-5) | RQD (%) | Induration (1-5)

In situ vane undist. ✕ | In situ vane remoul. + | UCT ○ | SPT ▼

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P W W_L

Water content (%) 10 20 30

Unit Weight (kN/m³) | Void Ratio | Carbonate (%)

Coordinates : E : 633525 (m) N : 6272063 (m)	Prepared : SAM	Date : 2009-06-09	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.02 — Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14	Report No.: 1 — Encl.No.: 1D.02

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BORING NO. BH.02 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	Geology: Environment	Geology: Age	GEOLOGICAL DESCRIPTION	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests: Type	Suppl. Tests: Enclosure
					Continued									
30		17	Ma	Ct	CLAY, in places medium? plastic, silty, slightly sandy, slightly gravelly, very calcareous, black									
31	-48	18	Ma	Ct	CLAY, silty, sandy, calcareous, w. sand streaks, olive grey								G	1G.02
32	-49													
33	-50	19	Ma	Ct	0 - 150 cm: CLAYSTONE, silty, slightly sandy, sandy 0 - 50, calcareous, w. slightly organic burrows, w. purite concretions, w. glauconite, w. few shell fragments, olive grey	100				22.5	0.28	63.6	U	1I.02
34	-51													
35	-52	20	Ma	Ct	0 - 90 cm: CLAYSTONE, silty, calcareous, w. slightly organic burrows, w. glauconite, w. few shell fragments, olive grey	100				21.8	0.37	58.2	U	1I.02
36	-53	21	Ma	Ct	0 - 140 cm: CLAYSTONE, silty, calcareous, w. slightly organic burrows, w. glauconite, w. few shell fragments, olive grey	93				21.7	0.38		U	1I.02
					Continues									

Soil Profile / Sample Type

In situ vane undist. ✕ / In situ vane remoul. + / UCT ○ / SPT ▼

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P W W_L

Water content (%) 10 20 30

W=42

Coordinates : E : 633525 (m) N : 6272063 (m)	Prepared : SAM	Date : 2009-06-09	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.02 Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.02

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BORING NO. BH.02 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Environment	Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests Type	Suppl. Tests Enclosure
				Continued											
36															
37	-54		22	0 - 150 cm: CLAYSTONE, silty, calcareous, w. slightly organic burrows, w. glauconite, w. few shell fragments, olive grey	Ma	Ct	100				21.2	0.44	30.4	U	1I.02
38	-55										20.4	0.55			
			23	0 - 145 cm: CLAYSTONE, silty, calcareous, w. slightly organic burrows, w. glauconite, w. shell fragments, olive grey	Ma	Ct	97						42.8	U	1I.02
39	-56										20.7	0.49			
40	-57										21.7	0.38			
41	-58														
42	-59														

Soil Profile

Geology: Environment | Age

In situ vane undist. ✕ | In situ vane remoul. + | UCT ○ | SPT ▼

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P W W_L

Water content (%) 10 20 30

Coordinates : E : 633525 (m) N : 6272063 (m)	Prepared : SAM	Date : 2009-06-09	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.02 Date : 2009-05-19
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.02

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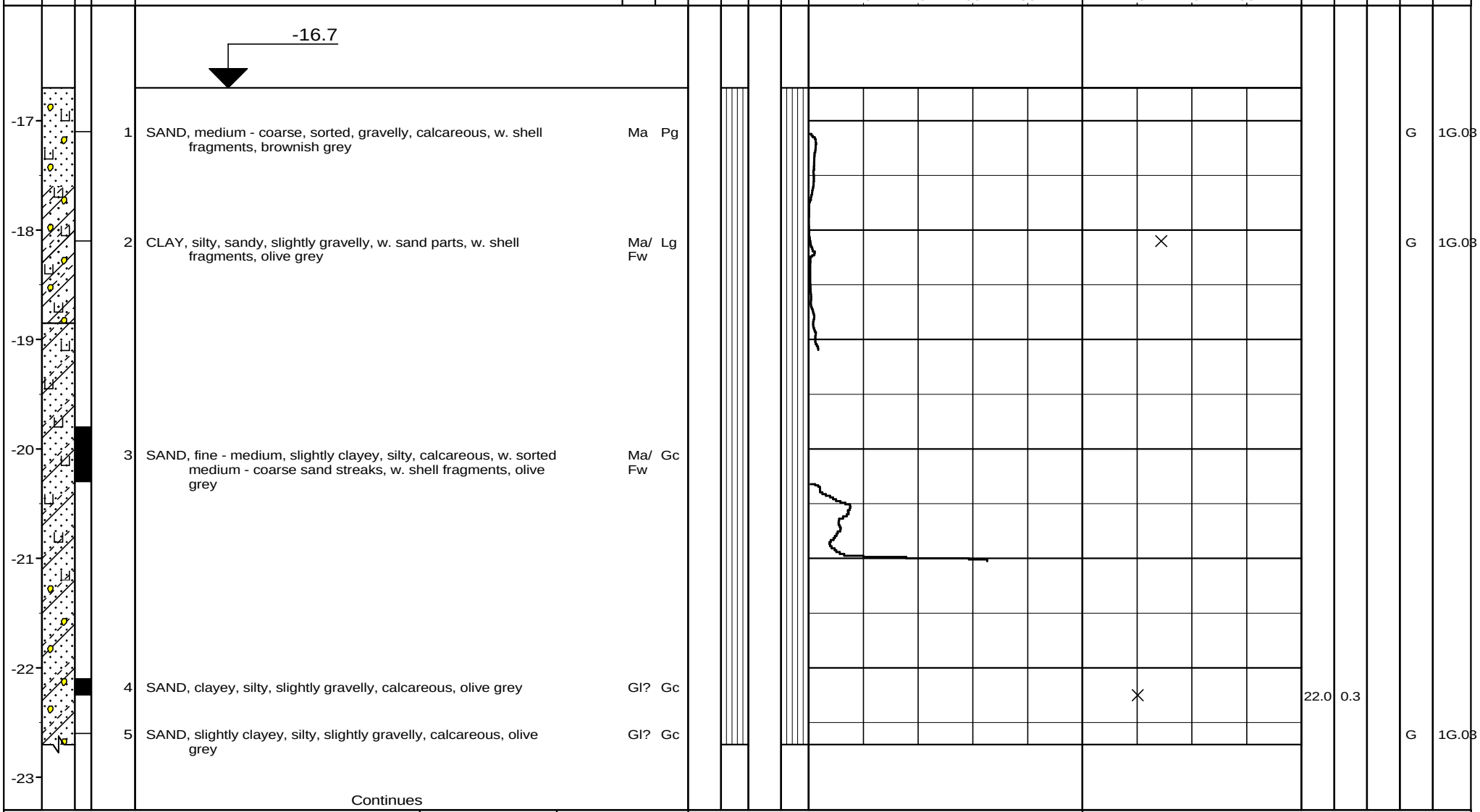
BORING NO. BH.04 — Anholt. Djursland Wind Farm



Coordinates : E : 639385 (m) N : 6272219 (m)	Prepared : SAM	Date : 2009-06-09	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.04 Date : 2009-05-23
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.03

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BORING NO. BH.04 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age
			Continued		
6	-23				
7	-24				
8	-25	6	SAND, slightly clayey, silty, slightly gravelly, calcareous, w. a few shell fragments, olive grey	Gl?	Gc
9	-26	7	CLAY, medium plastic, silty, sandy, slightly gravelly, calcareous, olive grey	Gl?	Gc
10	-27				
11	-28	8	CLAY - " -	Gl?	Gc
12	-29		Continues		

Soil Profile; Sample Type

Recovery (%); Fissures (1-5); RQD (%); Induration (1-5)

In situ vane undist. / In situ vane remoul. / UCT / SPT

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P W W_L

Water content (%) 10 20 30

Wp=11.7 Wl=23.2

Unit Weight (kN/m³); Void Ratio; Carbonate (%); Suppl. Tests: Type; Enclosure

Coordinates : E : 639385 (m) N : 6272219 (m)	Prepared : SAM	Date : 2009-06-09	GEO	Job : 32490	Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Borehole No.: BH.04	Date : 2009-05-23
	Approved : LAR	Date : 2009-10-14		Report No.: 1	Encl.No.: 1D.03

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BORING NO. BH.04 Anholt. Djursland Wind Farm

Depth (m) | Level (m) | Soil Profile | Sample Type | Sample No | GEOLOGICAL DESCRIPTION | Geology: Environment | Geology: Age | Recovery (%) | Fissures (1-5) | RQD (%) | Induration (1-5)

In situ vane undist. ○ UCT
+ In situ vane remoul. ▼ SPT
Standard penetration (blows/300mm) 10 20 30 40
Undr. shear strength - Vane (kN/m²) 100 200 300 400
CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit
W_P W W_L
Water content (%) 10 20 30

Unit Weight (kN/m³) | Void Ratio | Carbonate (%) | Suppl. Tests: Type | Enclosure

Continued

Sample No	Description	Geology: Environment	Geology: Age
9	CLAY, medium plastic, silty, sandy, slightly gravelly, calcareous, olive grey	Gl?	Gc
10	CLAY, medium plastic, silty, sandy, calcareous, w. sand streaks, olive grey	Gl?	Gc
11	CLAY, in places medium plastic, sandy, slightly gravelly, calcareous, w. sand streaks, olive grey	Gl?	Gc
12	CLAY - " -	Gl?	Gc

Depth (m): 12 13 14 15 16 17 18
Level (m): -29 -30 -31 -32 -33 -34 -35

Wp=12.5 Wl=24.3
Wp=12.3 Wl=24.3

Continues

Coordinates : E : 639385 (m) N : 6272219 (m)
Comments :

Prepared : SAM	Date : 2009-06-09	
Checked : JNG	Date : 2009-10-12	
Approved : LAR	Date : 2009-10-14	

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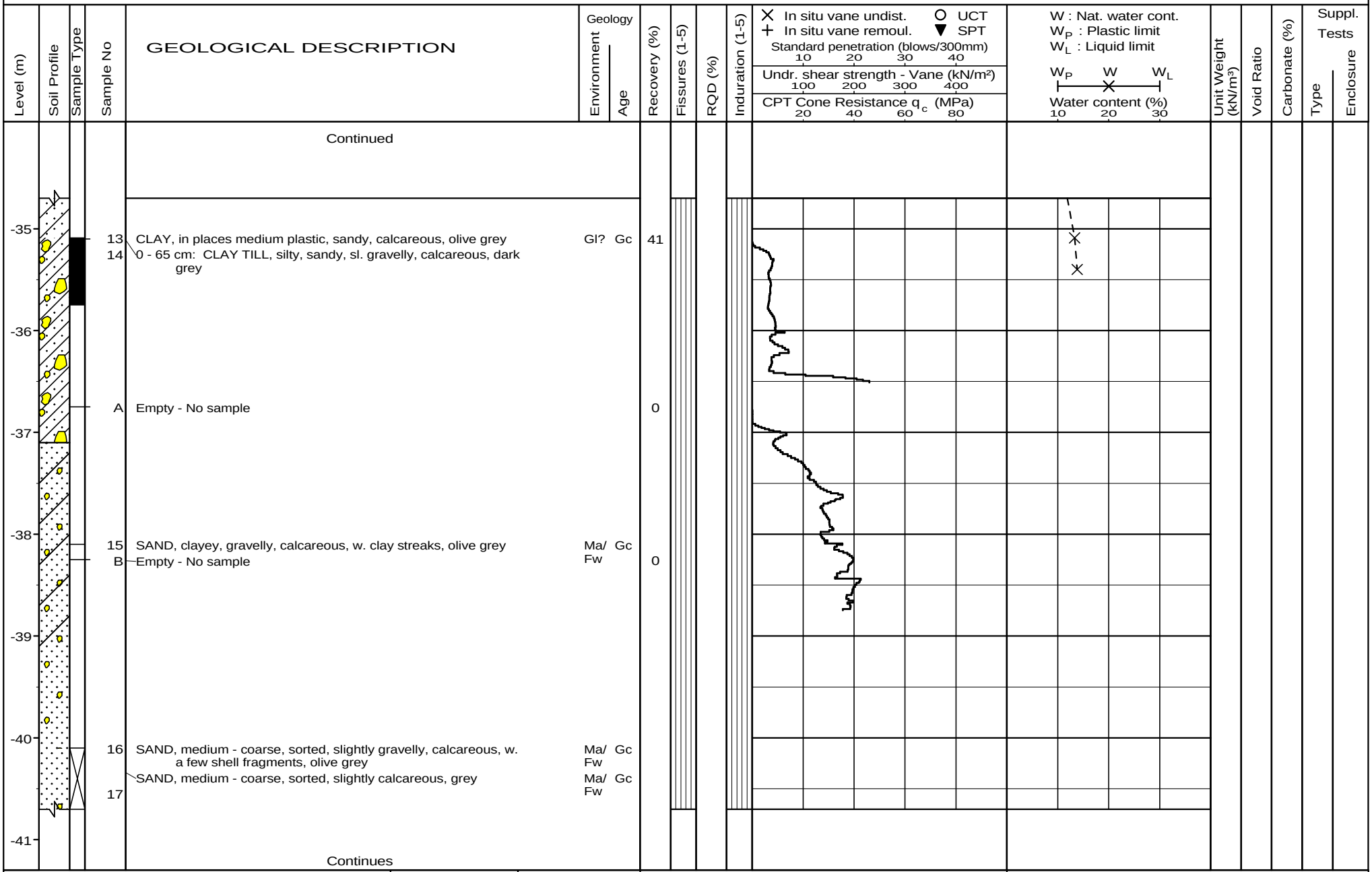
Job : 32490 Anholt. Djursland Wind Farm
Borehole No.: BH.04 Date : 2009-05-23
Report No.: 1 Encl.No.: 1D.03

BORING NO. BH.04 — Anholt. Djursland Wind Farm



Coordinates : E : 639385 (m) N : 6272219 (m)	Prepared : SAM	Date : 2009-06-09	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.04 Date : 2009-05-23
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.03

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BORING NO. BH.04 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age
			Continued		
24	-41		SAND, medium, sorted, gravelly, slightly calcareous, grey	Ma/ Fw	Gc
25	-42				
26	-43				
27	-44	18	SAND, fine - medium, sorted, slightly gravelly, slightly calcareous, w. clay lumps, w. black specks, grey	Ma/ Fw	Gc
28	-45				
29	-46	19	SAND, fine - medium, sorted, non calcareous, w. a few coal bits, grey	Ma/ Fw	Gc
30	-47		SAND, fine - medium, sorted, non calcareous, grey	Ma/ Fw	Gc
			Continues		

Recovery (%) | Fissures (1-5) | RQD (%) | Induration (1-5)

In situ vane undist. ✕ | In situ vane remoul. + | UCT ○ | SPT ▼

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P W W_L

Water content (%) 10 20 30

Unit Weight (kN/m³) | Void Ratio | Carbonate (%) | Suppl. Tests: Type | Enclosure

Coordinates : E : 639385 (m) N : 6272219 (m)	Prepared : SAM	Date : 2009-06-09	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.04 — Date : 2009-05-23
	Approved : LAR	Date : 2009-10-14	Report No.: 1 — Encl.No.: 1D.03

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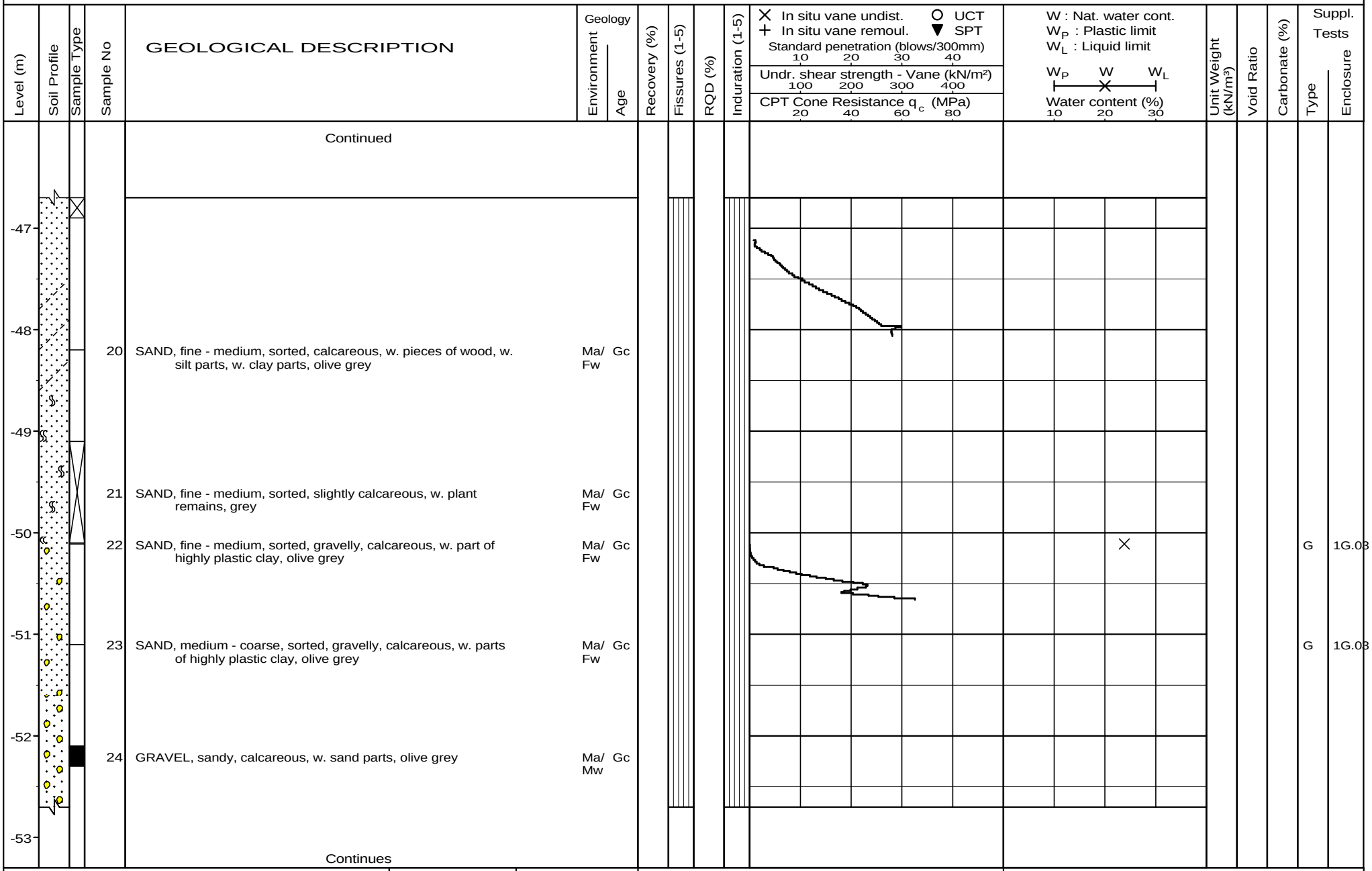
BORING NO. BH.04 Anholt. Djursland Wind Farm



Coordinates : E : 639385 (m) N : 6272219 (m)	Prepared : SAM	Date : 2009-06-09	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.04 Date : 2009-05-23
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.03

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BORING NO. BH.04 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)
					Continued						
36	-53										
37	-54										
38	-55			25	GRAVEL, sandy, calcareous, brownish grey	Ma/ Mw	Gc				
39	-56										
40	-57			26	GRAVEL, very sandy, slightly stony, calcareous, brownish grey	Ma/ Mw	Gc				
					Till deposits may contain cobbles and boulders						
41	-58										
42	-59										

In situ vane undist. (×) / In situ vane remoul. (+) / UCT (○) / SPT (▼)

Standard penetration (blows/300mm): 10 20 30 40

Undr. shear strength - Vane (kN/m²): 100 200 300 400

CPT Cone Resistance q_c (MPa): 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P W W_L

Water content (%): 10 20 30

Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests: Type	Suppl. Tests: Enclosure

Coordinates : E : 639385 (m) N : 6272219 (m)	Prepared : SAM	Date : 2009-06-09	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.04 — Date : 2009-05-23
	Approved : LAR	Date : 2009-10-14	Report No.: 1 — Encl.No.: 1D.03

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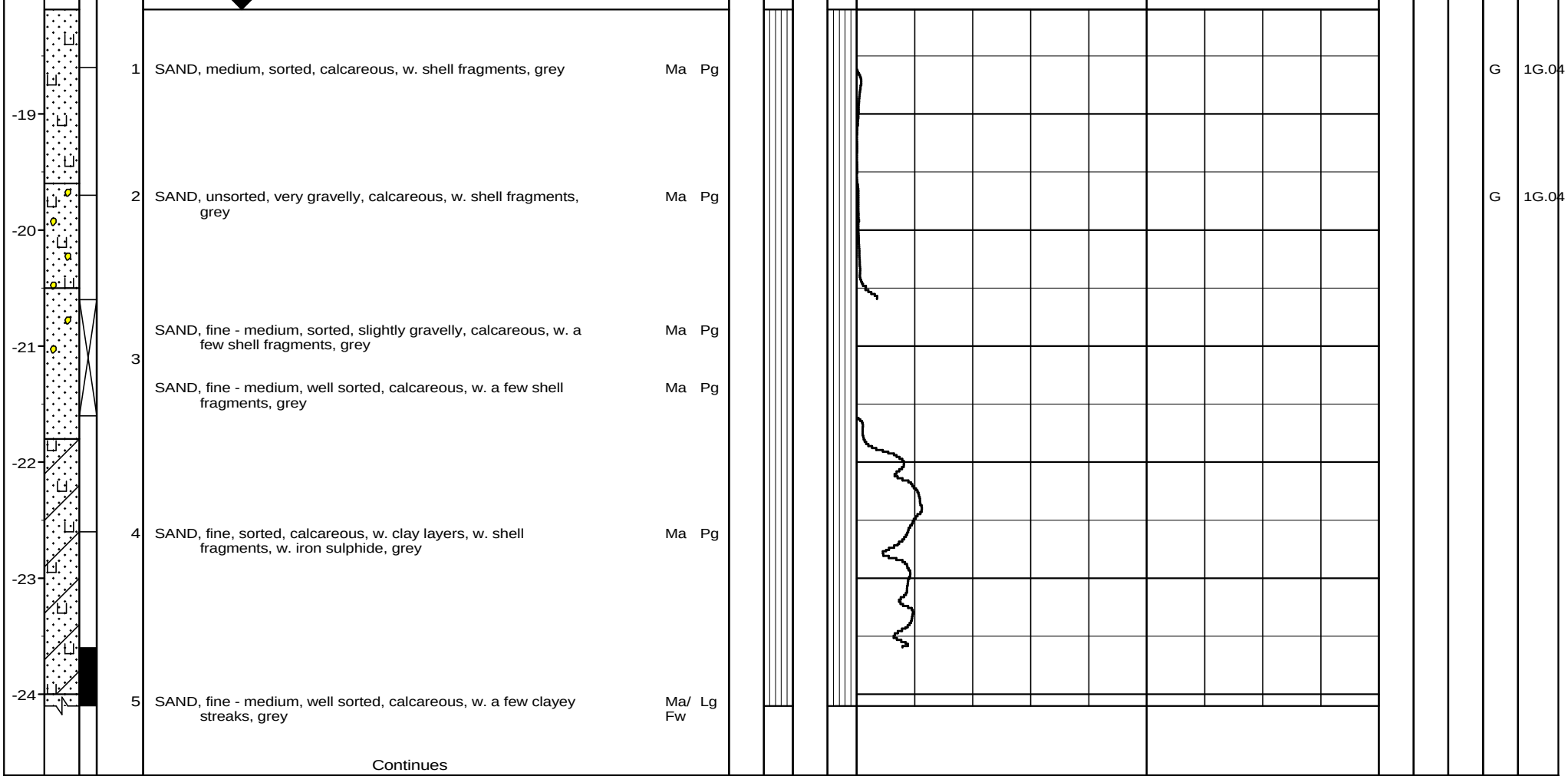

Coordinates : E : 633508 (m) N : 6265371 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.05 Date : 2009-05-25
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.04

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BORING NO. BH.05 Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology Environment	Geology Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	Suppl. Tests Type	Suppl. Tests Enclosure
					Continued								
6													
7	-25												
8	-26												
				6	SAND, fine, well sorted, calcareous, light brownish grey	Ma/ Fw	Lg						
9	-27												
10	-28												
				7	SAND - " -	Ma/ Fw	Lg					G	1G.04
11	-29												
				8	SAND, fine, poorly sorted, slightly silty, calcareous, light brownish grey	Ma/ Fw	Lg						
12	-30												
					Continues								

× In situ vane undist. ○ UCT
\+ In situ vane remoul. ▼ SPT
Standard penetration (blows/300mm) 10 20 30 40
Undr. shear strength - Vane (kN/m²) 100 200 300 400
CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit
W_P W W_L
Water content (%) 10 20 30

Unit Weight (kN/m³) | Void Ratio | Carbonate (%)

Coordinates : E : 633508 (m) N : 6265371 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.05 Date : 2009-05-25
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.04

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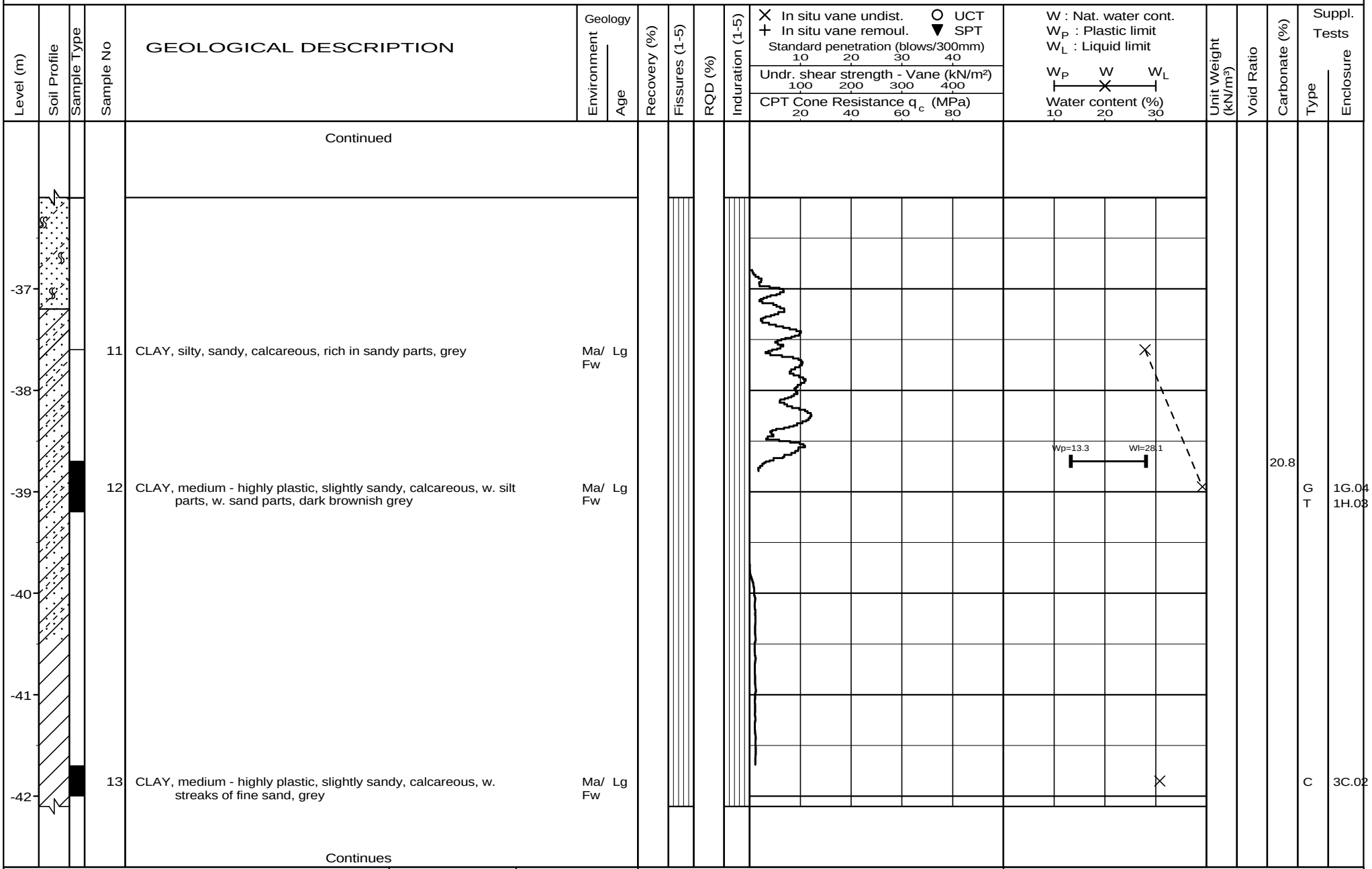
BORING NO. BH.05 Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology Environment	Geology Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	In situ vane undist. / In situ vane remoul. / UCT / SPT; Standard penetration (blows/300mm) 10 20 30 40; Undr. shear strength - Vane (kN/m²) 100 200 300 400; CPT Cone Resistance q_c (MPa) 20 40 60 80	W : Nat. water cont. W_P : Plastic limit W_L : Liquid limit; Water content (%) 10 20 30	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests Type	Suppl. Tests Enclosure
					Continued												
12																	
13	-31																
14	-32																
15	-33			9	SAND, fine, poorly sorted, very silty, calcareous, w. plant remains, light brownish grey	Ma/ Fw	Lg									G	1G.04
16	-34																
17	-35																
18	-36			10	SAND, fine, poorly sorted, silty, calcareous, w. plant remains, light brownish grey	Ma/ Fw	Lg										
					Continues												

Coordinates : E : 633508 (m) N : 6265371 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.05 Date : 2009-05-25
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.04

BORING NO. BH.05 Anholt. Djursland Wind Farm



Coordinates : E : 633508 (m) N : 6265371 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.05 Date : 2009-05-25
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.04

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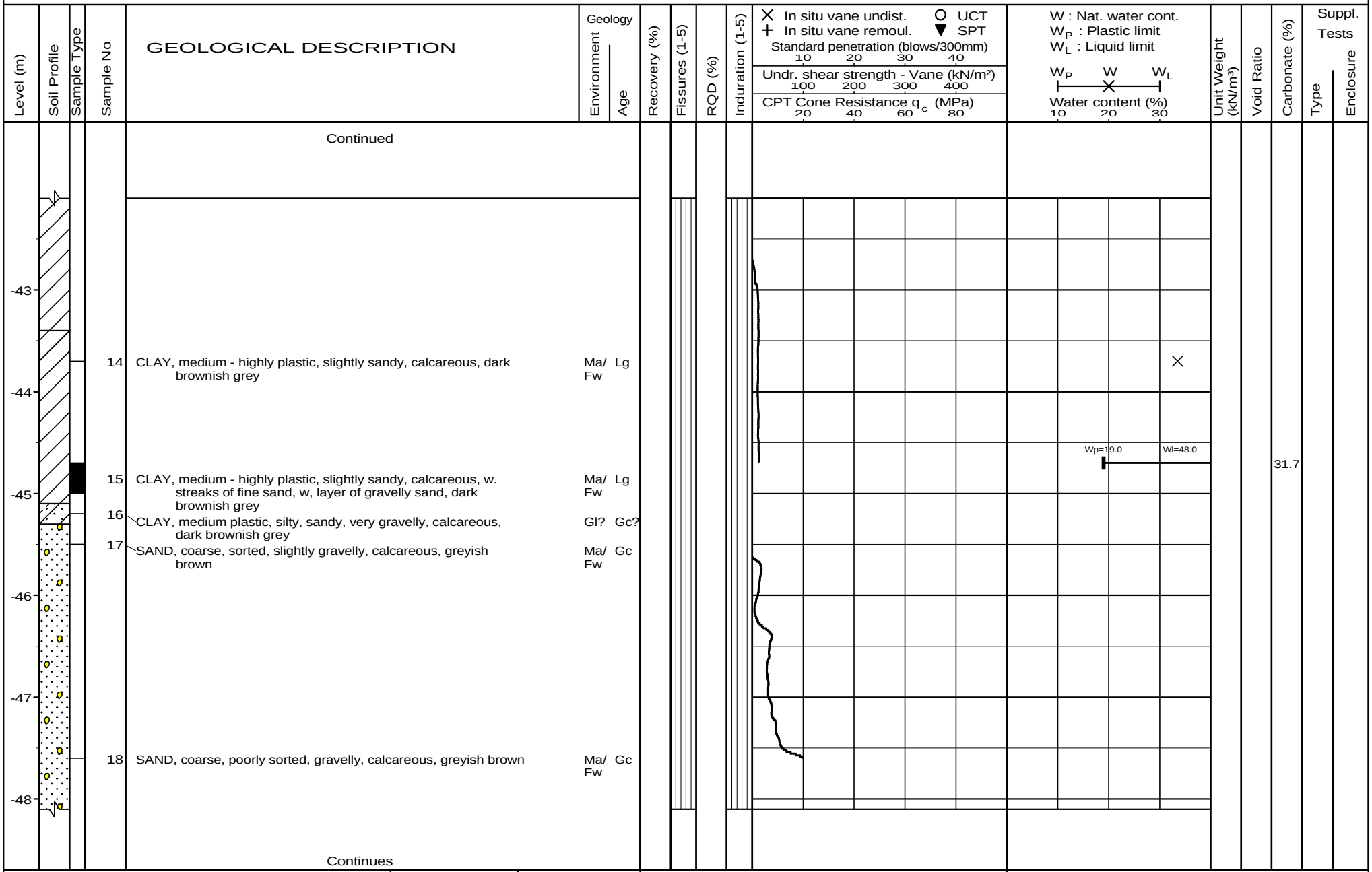

Coordinates : E : 633508 (m) N : 6265371 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.05 Date : 2009-05-25
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.04

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BORING NO. BH.05 Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology Environment	Geology Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)
					Continued						
30											
31	-49										
32	-50										
33	-51			19	SAND, fine, poorly sorted, silty, calcareous, grey	Ma/ Fw	Gc				
34	-52										
35	-53										
36	-54			20	SAND, fine - medium, sorted, slightly gravelly, calcareous, grey	Ma/ Fw	Gc				
					Continues						

In situ vane undist. ✕ / In situ vane remoul. + / UCT ○ / SPT ▼

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P W W_L

Water content (%) 10 20 30

Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests Type	Suppl. Tests Enclosure

Coordinates : E : 633508 (m) N : 6265371 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	GEO Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12		Borehole No.: BH.05 Date : 2009-05-25
	Approved : LAR	Date : 2009-10-14		Report No.: 1 Encl.No.: 1D.04

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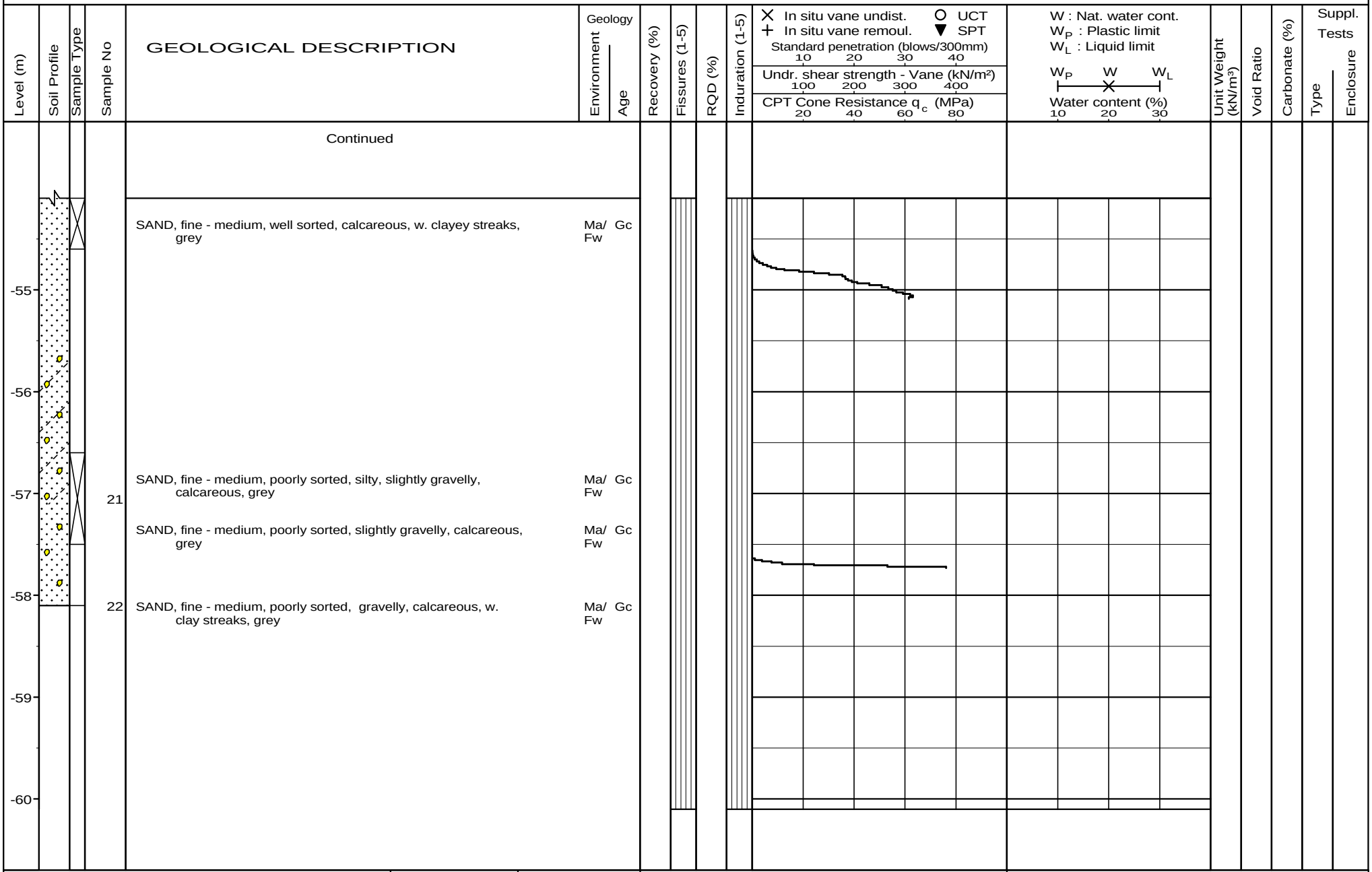
BORING NO. BH.05 Anholt. Djursland Wind Farm



Coordinates : E : 633508 (m) N : 6265371 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.05 Date : 2009-05-25
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.04

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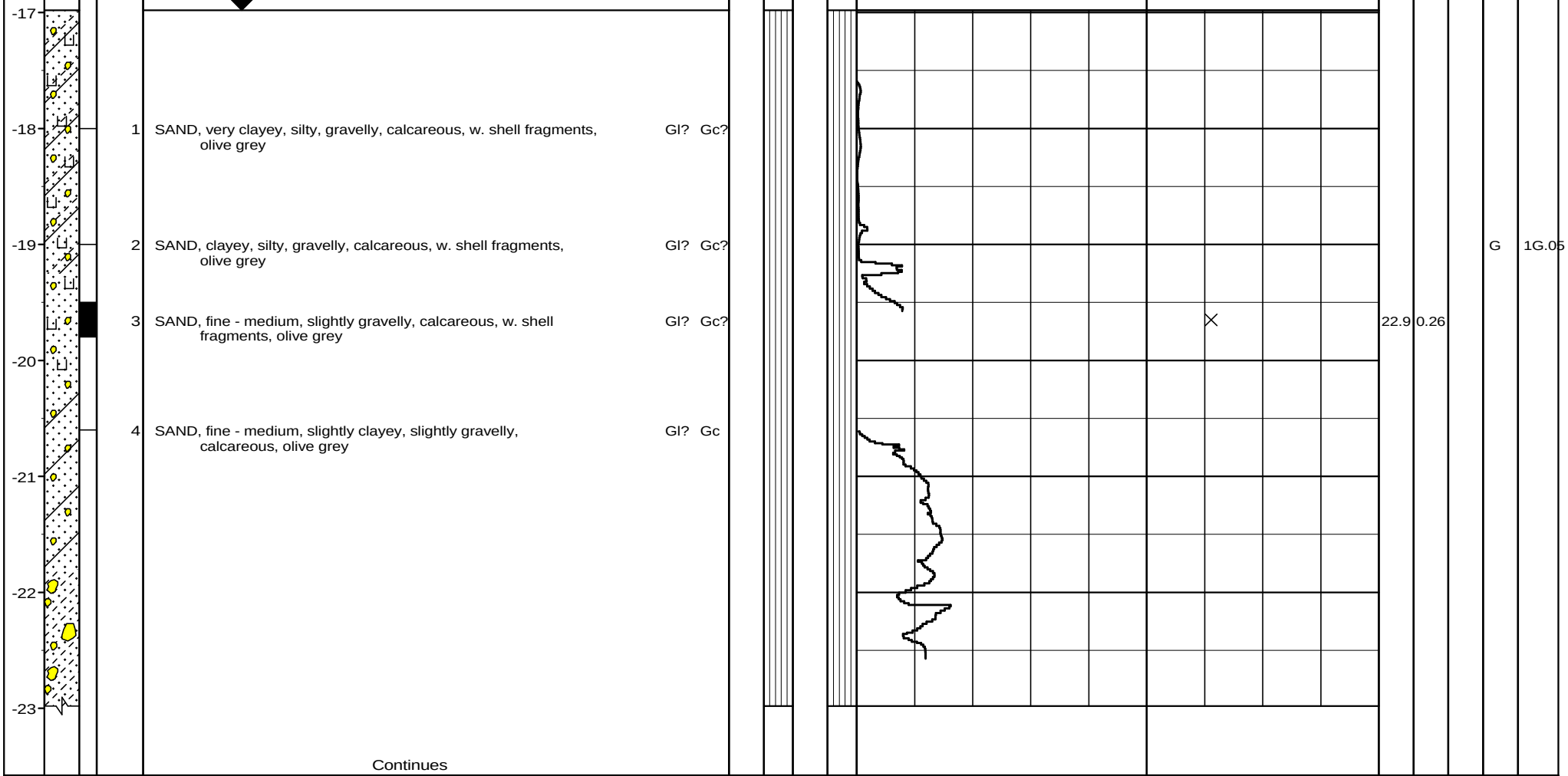

Sample No	GEOLOGICAL DESCRIPTION	Environment	Age
1	SAND, very clayey, silty, gravelly, calcareous, w. shell fragments, olive grey	Gl?	Gc?
2	SAND, clayey, silty, gravelly, calcareous, w. shell fragments, olive grey	Gl?	Gc?
3	SAND, fine - medium, slightly gravelly, calcareous, w. shell fragments, olive grey	Gl?	Gc?
4	SAND, fine - medium, slightly clayey, slightly gravelly, calcareous, olive grey	Gl?	Gc

Continues

Soil Profile | Sample Type | Recovery (%) | Fissures (1-5) | RQD (%) | Induration (1-5)

In situ vane undist. ○ UCT
+ In situ vane remoul. ▼ SPT
Standard penetration (blows/300mm) 10 20 30 40
Undr. shear strength - Vane (kN/m²) 100 200 300 400
CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit
Water content (%) 10 20 30

Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests Type	Suppl. Tests Enclosure
22.9	0.26		G	1G.05

Coordinates : E : 632182 (m) N : 6274469 (m)	Prepared : KS	Date : 2009-05-25	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.07 Date : 2009-05-17
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.05

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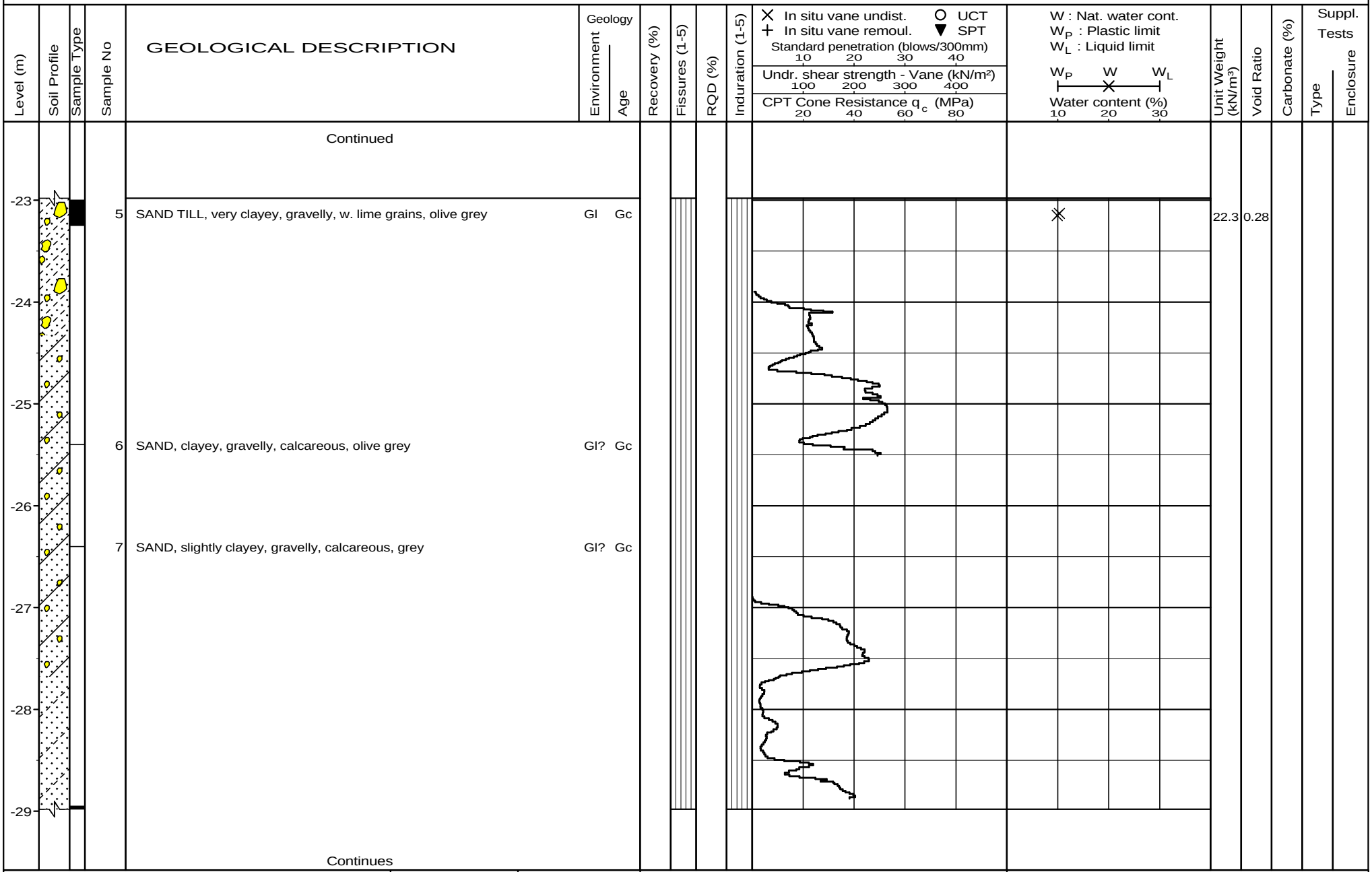
BORING NO. BH.07 — Anholt. Djursland Wind Farm



Coordinates : E : 632182 (m) N : 6274469 (m)	Prepared : KS	Date : 2009-05-25	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.07 Date : 2009-05-17
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.05

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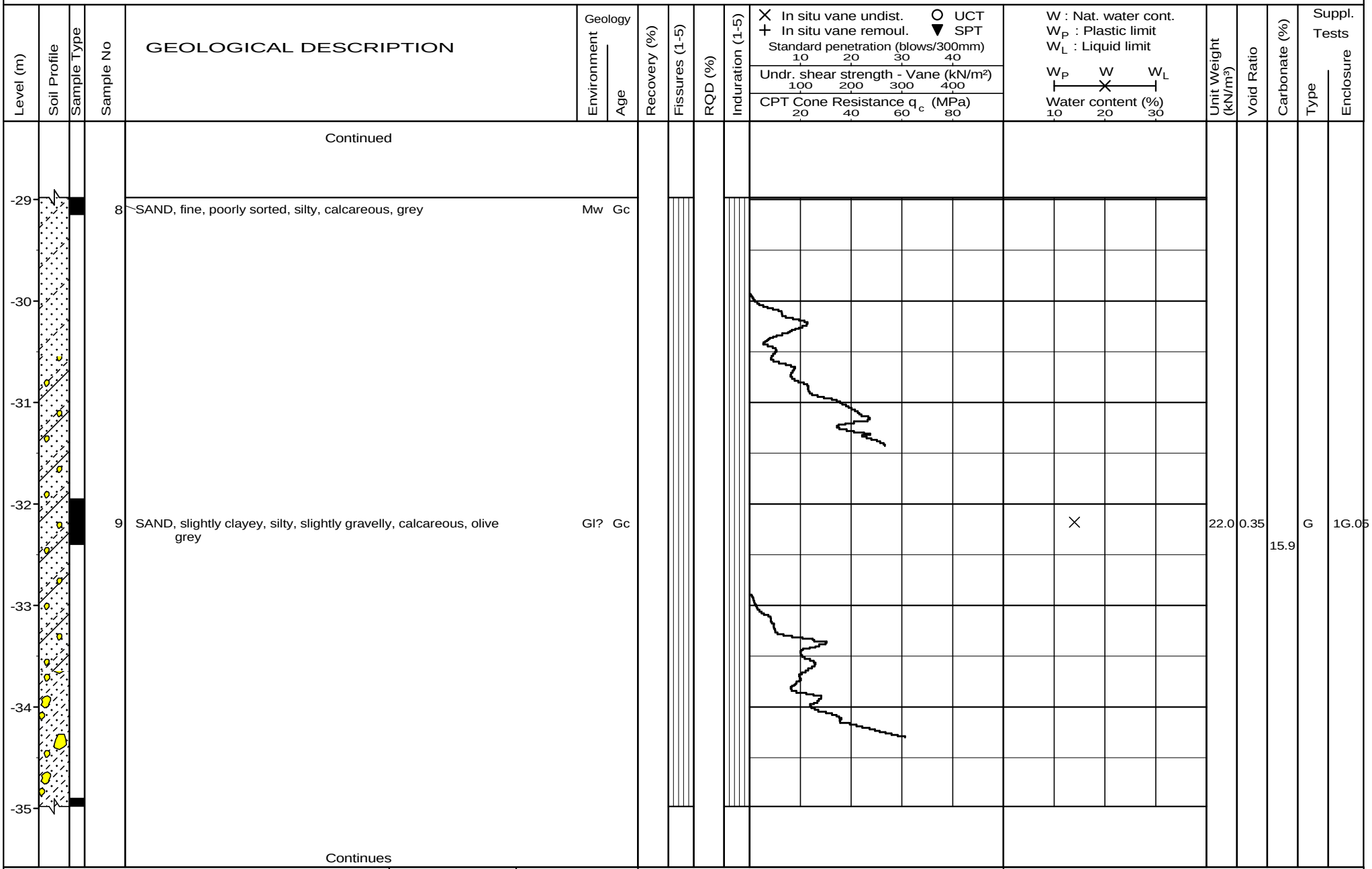
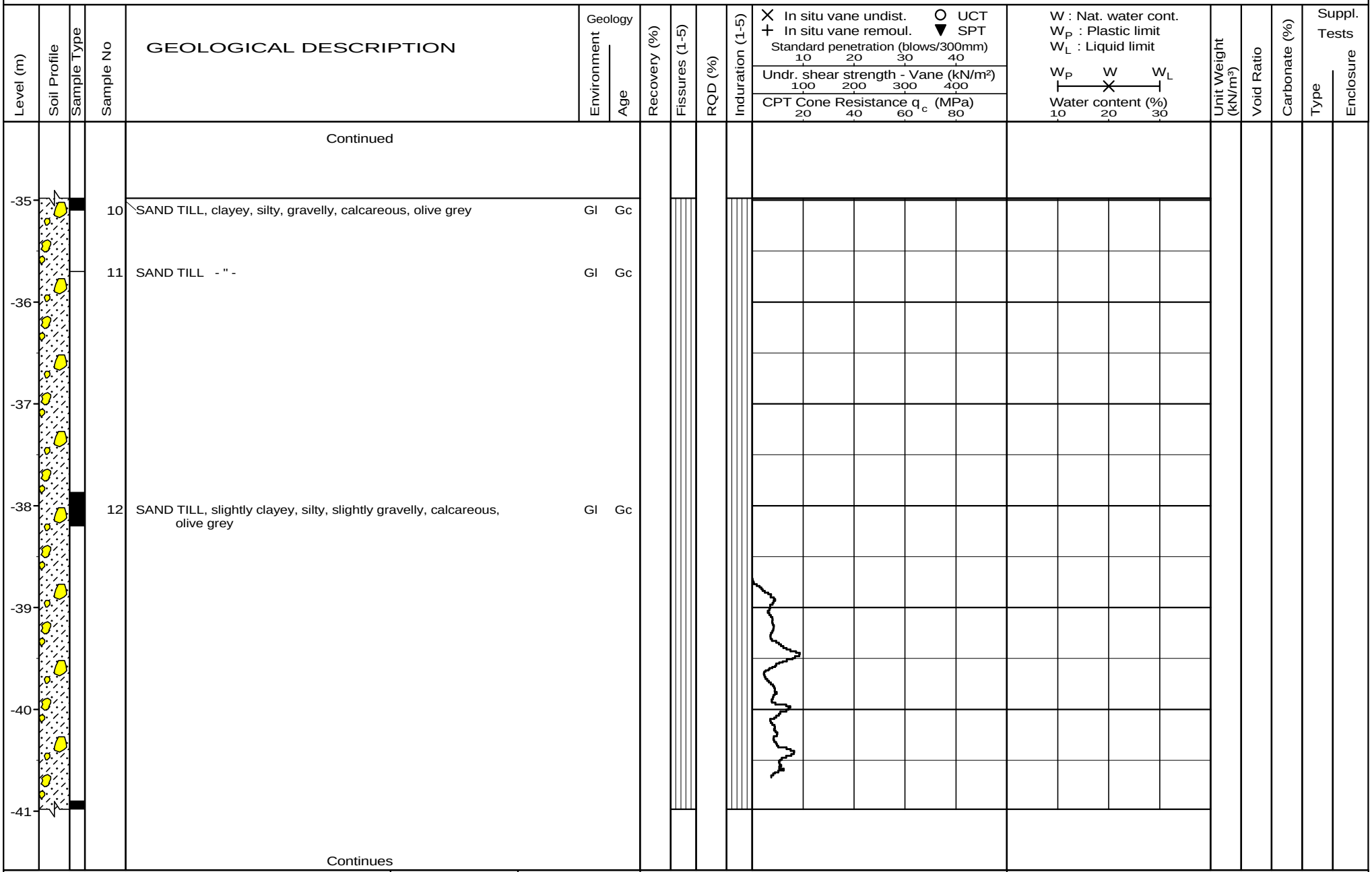


Coordinates : E : 632182 (m) N : 6274469 (m)	Prepared : KS	Date : 2009-05-25	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.07 Date : 2009-05-17
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.05

BORING NO. BH.07 Anholt. Djursland Wind Farm



Coordinates : E : 632182 (m) N : 6274469 (m)	Prepared : KS	Date : 2009-05-25	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.07 Date : 2009-05-17
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.05

BORING NO. BH.07 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age
					Continued		
24	-41			13	SAND TILL, clayey, slightly gravelly, calcareous, olive grey	Gl	Gc
25	-42			14	SAND TILL, clayey, very gravelly, calcareous, olive grey	Gl	Gc
26	-43						
27	-44			15	SAND TILL, clayey, gravelly, calcareous, olive grey	Gl	Gc
28	-45						
29	-46						
30	-47				Continues		

Recovery (%) | Fissures (1-5) | RQD (%) | Induration (1-5)

In situ vane undist. ✕ | In situ vane remoul. + | UCT ○ | SPT ▼
Standard penetration (blows/300mm) 10 20 30 40
Undr. shear strength - Vane (kN/m²) 100 200 300 400
CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit
W_P — W — W_L
Water content (%) 10 20 30

Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests: Type	Suppl. Tests: Enclosure
		12.5	G	1G.05
			G	1G.05

Coordinates : E : 632182 (m) N : 6274469 (m)	Prepared : KS	Date : 2009-05-25	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk
Comments :	Checked : JNG	Date : 2009-10-12		
	Approved : LAR	Date : 2009-10-14		

Job : 32490	Anholt. Djursland Wind Farm
Borehole No.: BH.07	Date : 2009-05-17
Report No.: 1	Encl.No.: 1D.05

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BORING NO. BH.07 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	Geological description	Geology: Environment	Geology: Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests: Type	Suppl. Tests: Enclosure
			Continued											
30	-47	16	SAND TILL, very clayey, gravelly, w. lime grains, olive grey	Gl	Gc									
31	-48													
32	-49													
33	-50	17	CLAY TILL, sandy, gravelly, w. lime grains, olive grey	Gl	Gc					22.7	0.27			
34	-51													
35	-52													
36	-53	18	CLAY TILL, sandy, gravelly, w. lime grains, grey	Gl	Gc									
			Continues											

Soil Profile / Sample Type

Induration (1-5): In situ vane undist. (×), In situ vane remoul. (+), UCT (○), SPT (▼)

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P W W_L

Water content (%) 10 20 30

Wp=10.7 Wl=19.4

Coordinates : E : 632182 (m) N : 6274469 (m)	Prepared : KS	Date : 2009-05-25	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.07 Date : 2009-05-17
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.05

GEO
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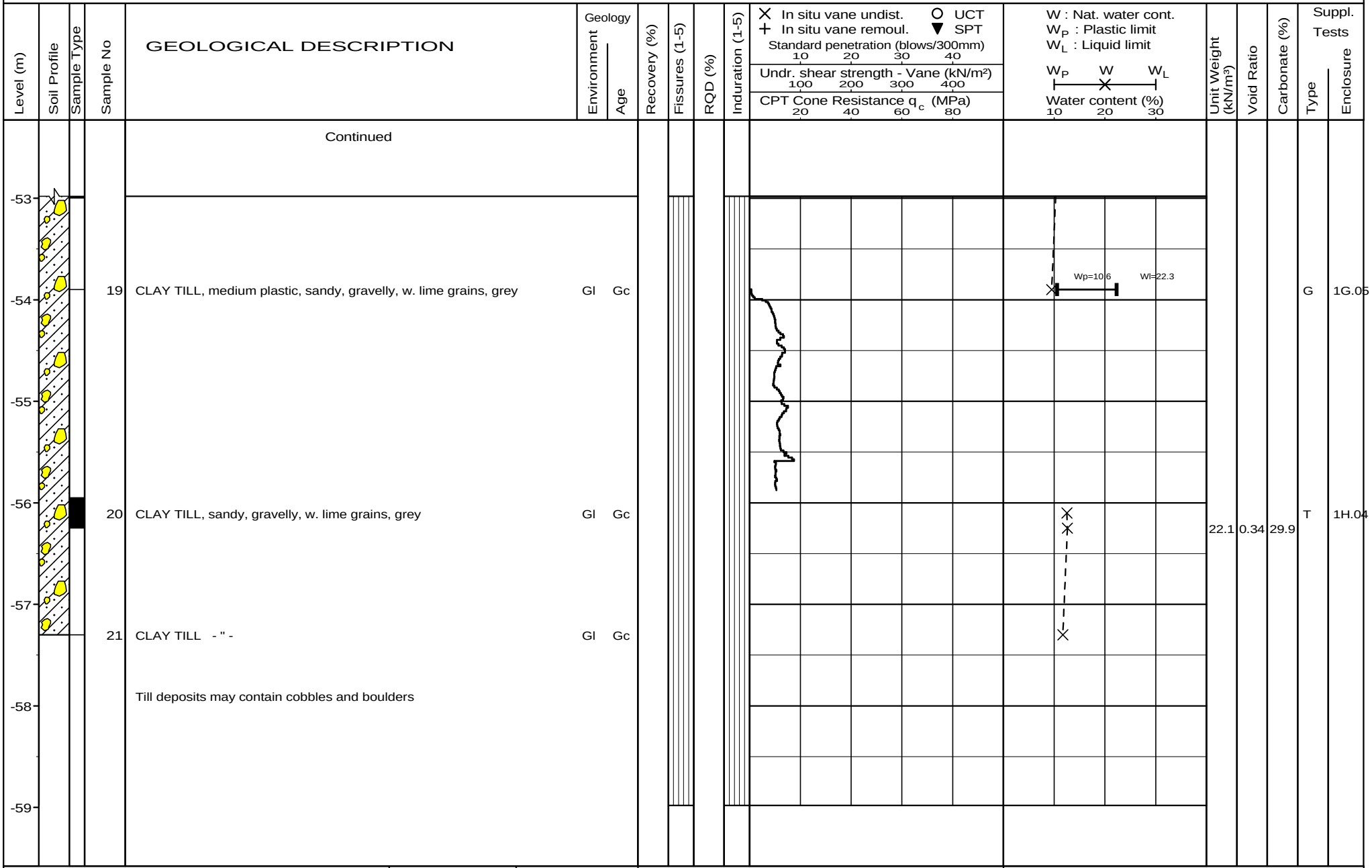
BORING NO. BH.07 Anholt. Djursland Wind Farm



Coordinates : E : 632182 (m) N : 6274469 (m)	Prepared : KS	Date : 2009-05-25	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.07 Date : 2009-05-17
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.05

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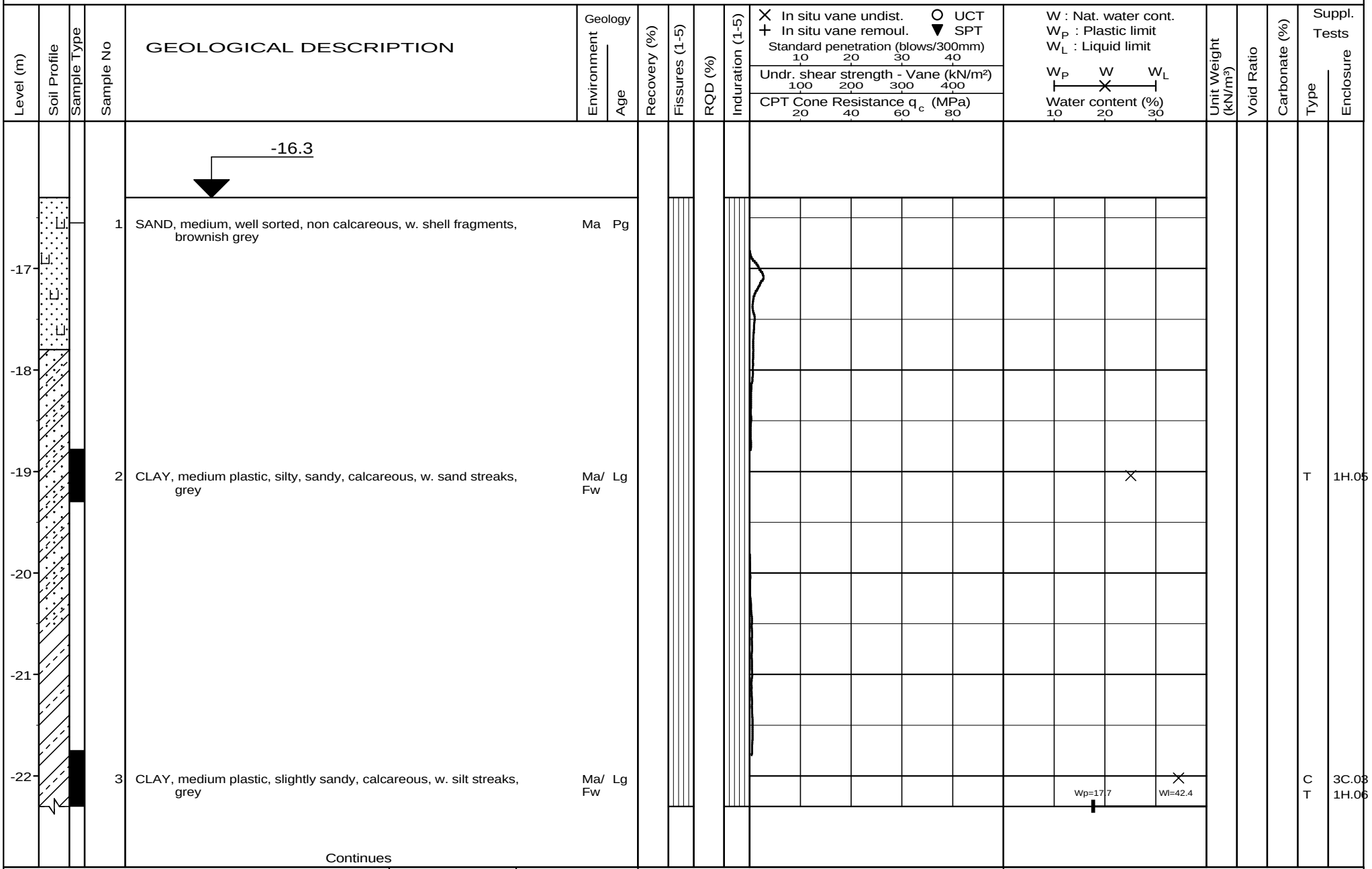
BORING NO. BH.09 Anholt. Djursland Wind Farm



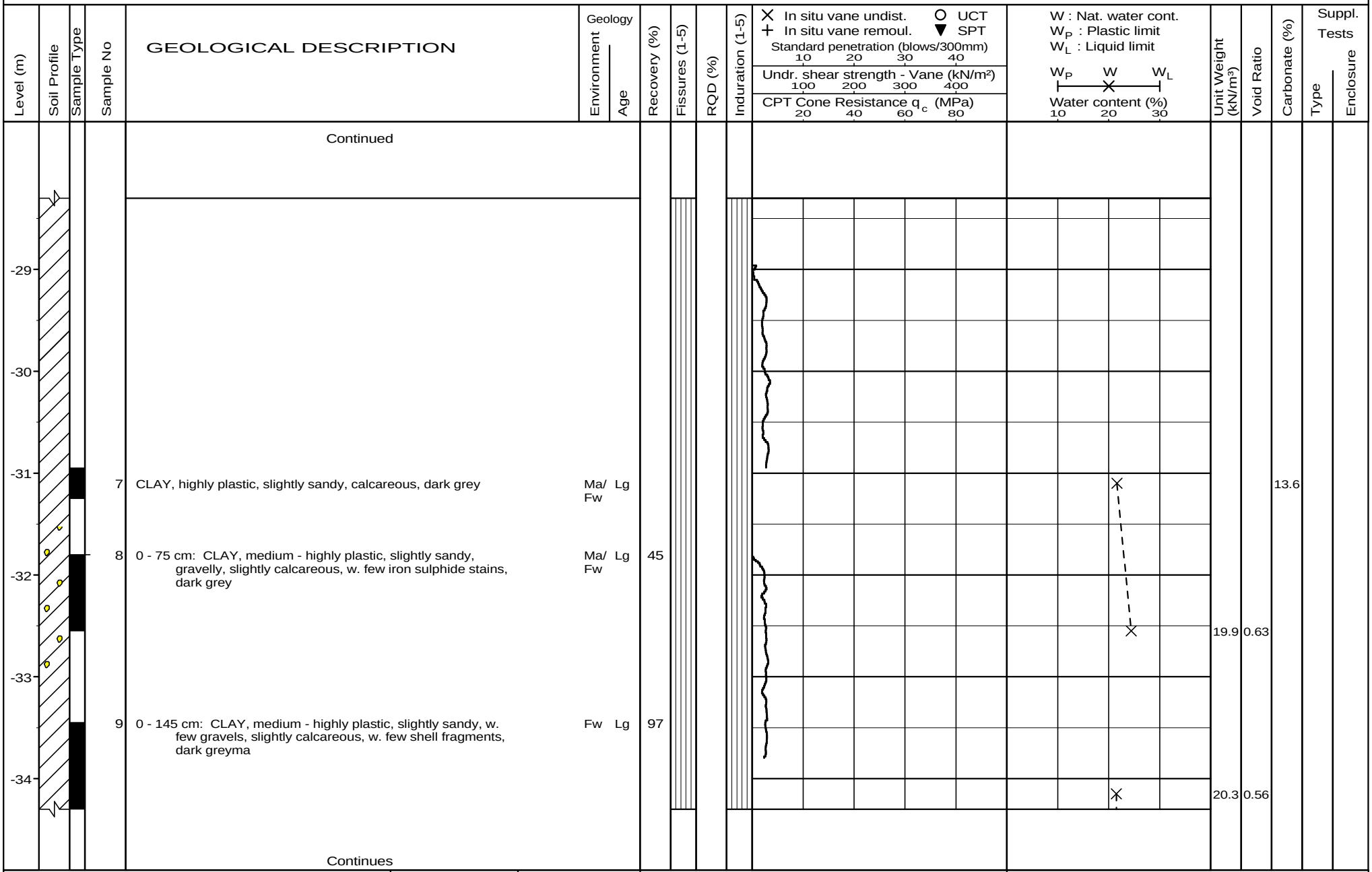
Coordinates : E : 633474 (m) N : 6284377 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	GEO Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490	Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12		Borehole No.: BH.09	Date : 2009-05-27
	Approved : LAR	Date : 2009-10-14		Report No.: 1	Encl.No.: 1D.06

BORING NO. BH.09 Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology Environment	Geology Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	In situ vane undist. / In situ vane remoul. / UCT / SPT; Standard penetration (blows/300mm) 10 20 30 40; Undr. shear strength - Vane (kN/m²) 100 200 300 400; CPT Cone Resistance q_c (MPa) 20 40 60 80	W : Nat. water cont. W_P : Plastic limit W_L : Liquid limit; W_P W W_L; Water content (%) 10 20 30	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests Type	Suppl. Tests Enclosure
					Continued													
6	-23																	
7																		
	-24																	
8				4	CLAY, medium plastic, sandy, w. lime grains, very dark grey	Ma/ Fw	Lg											
	-25			5	CLAY, highly plastic, slightly sandy, calcareous, very dark grey	Ma/ Fw	Lg											
9																		
	-26																	
10																		
	-27																	
11																		
	-28			6	CLAY - " -	Ma/ Fw	Lg											
12					Continues													

Coordinates : E : 633474 (m) N : 6284377 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.09 Date : 2009-05-27
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.06

BORING NO. BH.09 Anholt. Djursland Wind Farm



Coordinates : E : 633474 (m) N : 6284377 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.09 Date : 2009-05-27
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.06

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BORING NO. BH.09 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests: Type	Suppl. Tests: Enclosure
					Continued											
18																
	-35			10	0 - 150 cm: CLAY, medium - highly plastic, slightly sandy, slightly gravelly, slightly calcareous, w. few shell fragments, dark grey	Ma/ Fw	Lg	100								
19																
	-36															
20				11	0 - 75 cm: CLAY, medium - highly plastic, slightly sandy, slightly gravelly, slightly calcareous, w. few shell fragments, dark grey	Ma/ Fw	Lg	50				20.4	0.55			
	-37															
21																
	-38			12	0 - 85 cm: CLAY, medium - highly plastic, slightly sandy, w. few gravels, slightly calcareous, w. iron sulphide streaks 50 - 52, dark grey	Ma/ Fw	Lg	57							13.5	
22												20.1	0.58			
	-39															
23				13	0 - 85 cm: CLAY, medium - highly plastic, slightly sandy, w. few gravels, very gravelly 85 - 90, calcareous, dark grey	Ma/ Fw	Lg	57				19.9	0.62			
	-40															
24					Continues											

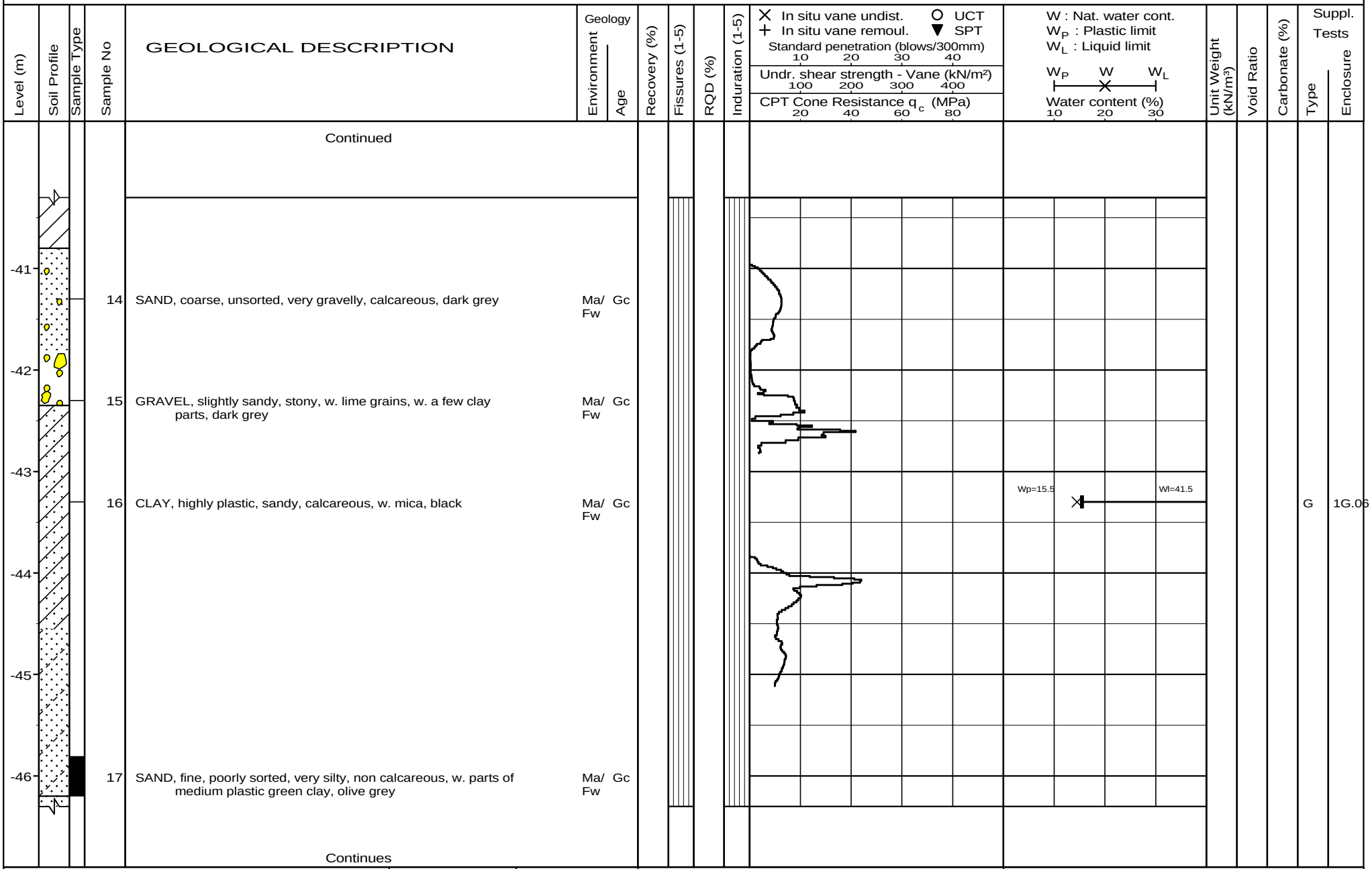
Induration (1-5): In situ vane undist. (×) / In situ vane remoul. (+); UCT (○) / SPT (▼)
Standard penetration (blows/300mm): 10 20 30 40
Undr. shear strength - Vane (kN/m²): 100 200 300 400
CPT Cone Resistance q_c (MPa): 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit
W_P W W_L
Water content (%): 10 20 30

Wp=19.8 Wl=40.2

Coordinates : E : 633474 (m) N : 6284377 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.09 Date : 2009-05-27
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.06

BORING NO. BH.09 Anholt. Djursland Wind Farm



Coordinates : E : 633474 (m) N : 6284377 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.09 Date : 2009-05-27
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.06

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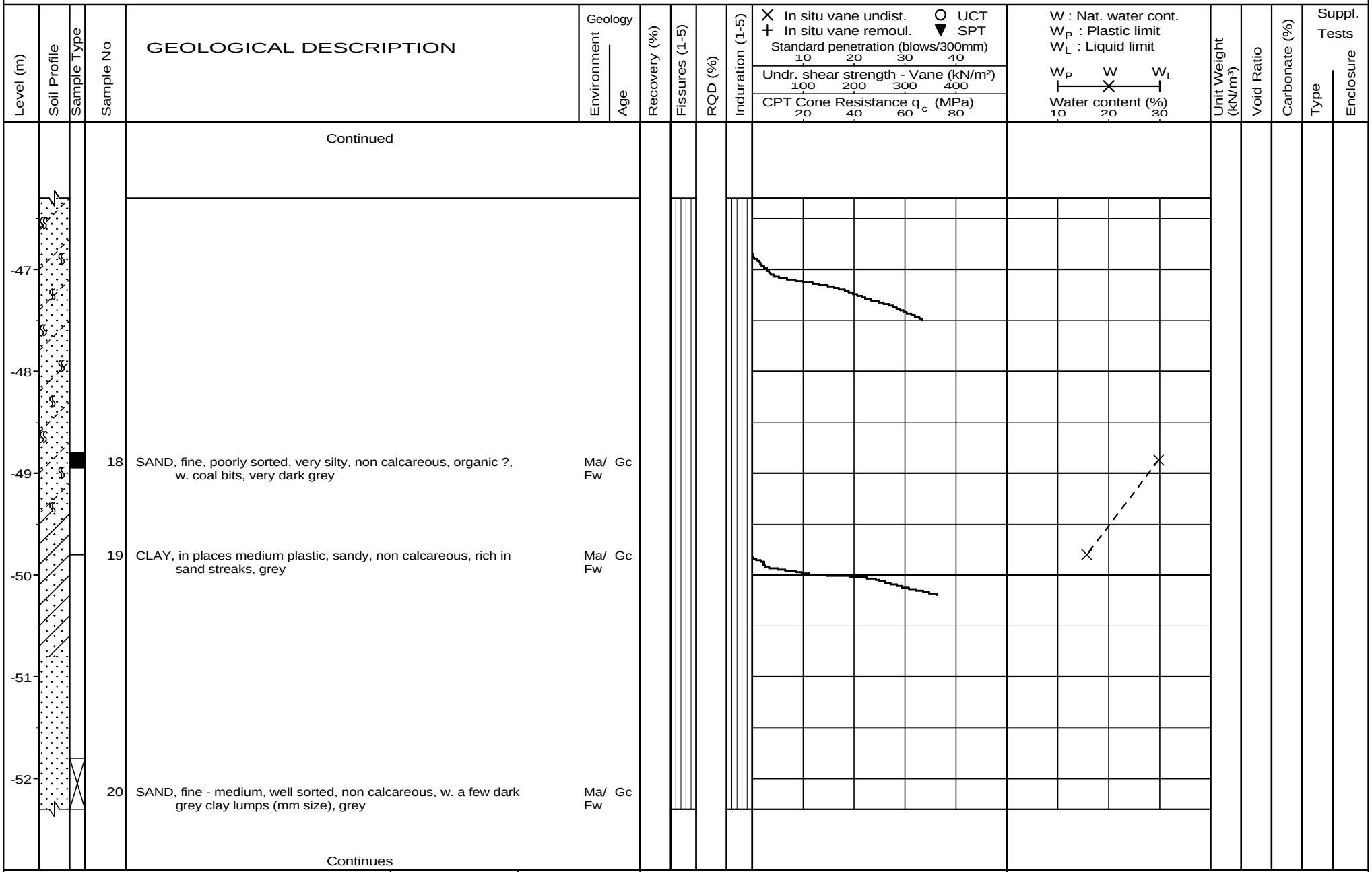
BORING NO. BH.09 Anholt. Djursland Wind Farm



Coordinates : E : 633474 (m) N : 6284377 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.09 Date : 2009-05-27
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.06

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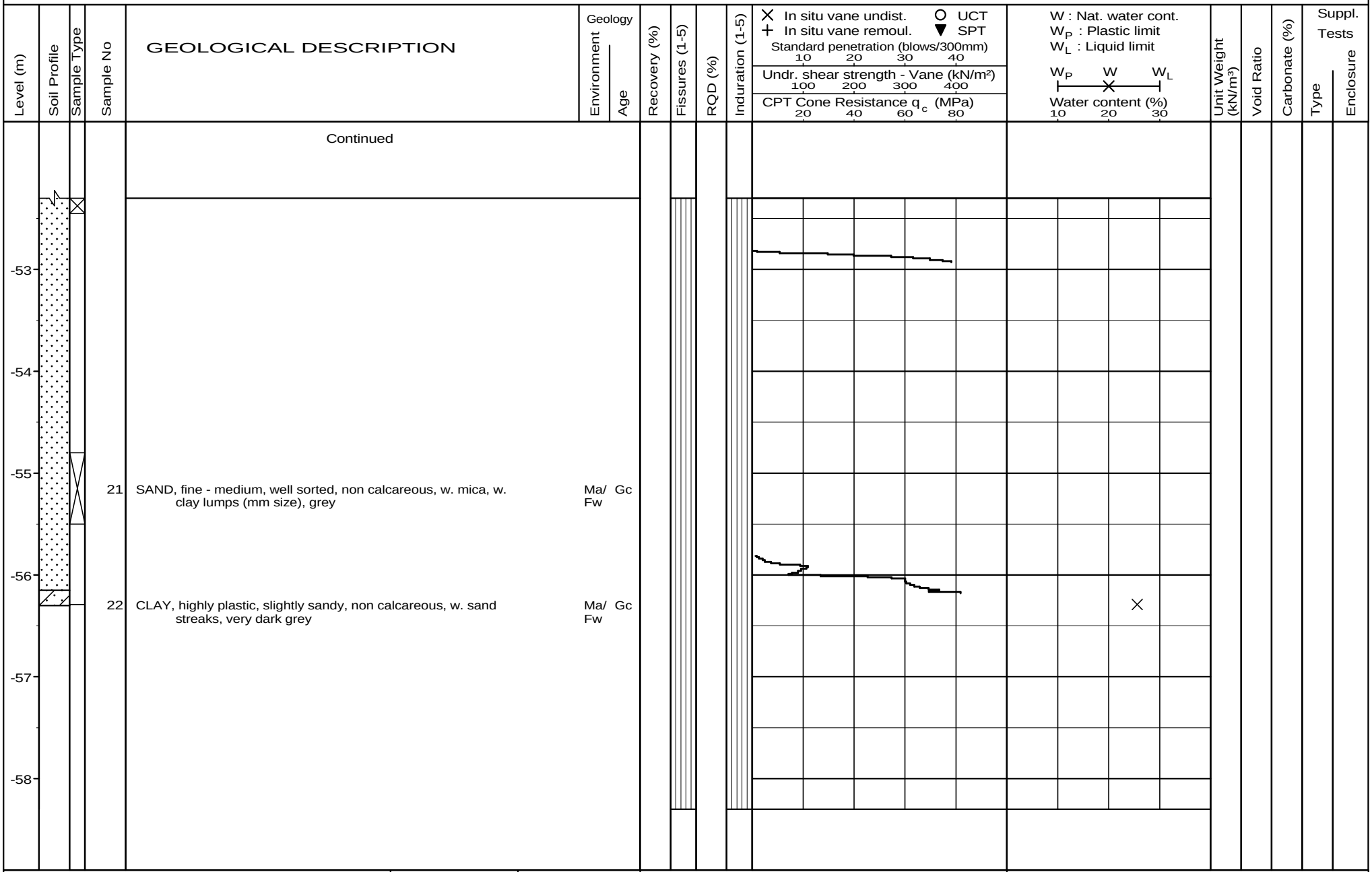
BORING NO. BH.09 Anholt. Djursland Wind Farm



Coordinates : E : 633474 (m) N : 6284377 (m)	Prepared : VIJ/SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.09 Date : 2009-05-27
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.06

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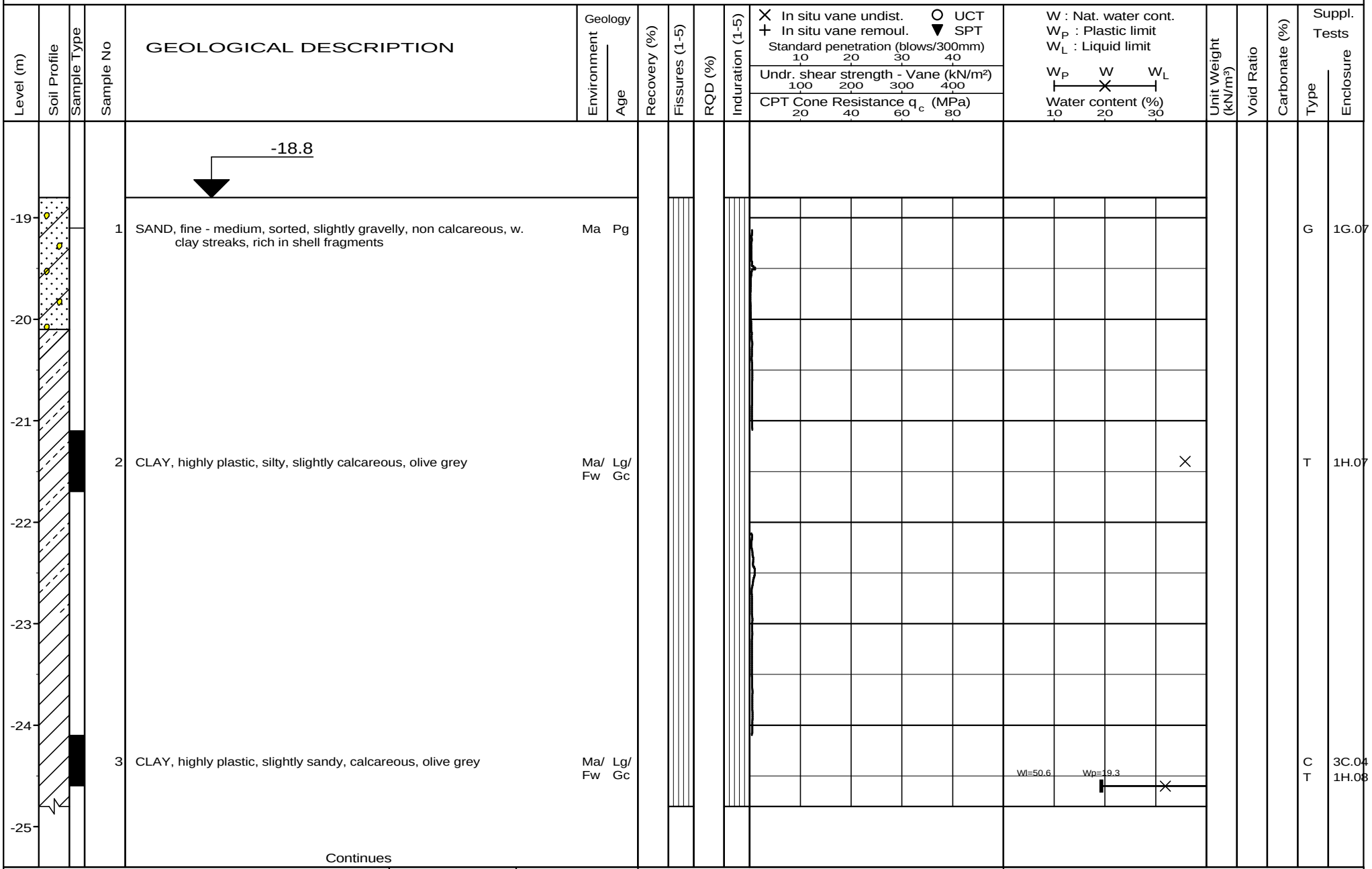
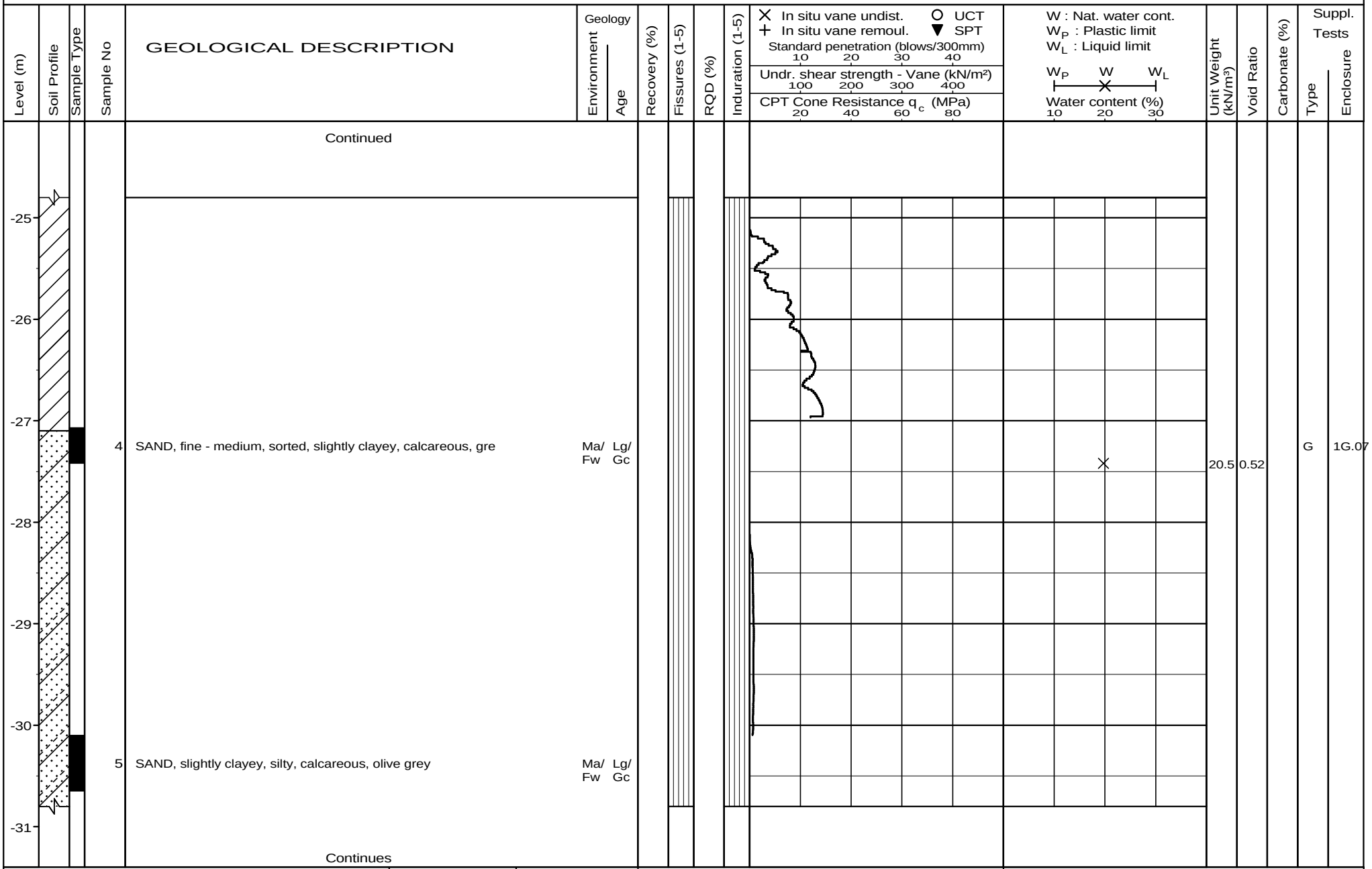
BORING NO. BH.10 Anholt. Djursland Wind Farm



Coordinates : E : 638588 (m) N : 6278390 (m)	Prepared : SAM	Date : 2009-06-08	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.10 Date : 2009-05-30
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.07

BORING NO. BH.10 Anholt. Djursland Wind Farm



Coordinates : E : 638588 (m) N : 6278390 (m)	Prepared : SAM	Date : 2009-06-08	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12	Borehole No.: BH.10 Date : 2009-05-30
	Approved : LAR	Date : 2009-10-14	Report No.: 1 Encl.No.: 1D.07

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BORING NO. BH.10 Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	GEOLOGICAL DESCRIPTION	Geology Environment	Geology Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests Type	Suppl. Tests Enclosure
			Continued											
12	-31													
13	-32	6	SAND, fine - medium, clayey, slightly gravelly, calcareous, grey	Ma/ Fw	Lg/ Gc									
		7	GRAVEL, slightly clayey, sandy, calcareous, grey	Ma/ Fw	Lg/ Gc									
14	-33	8	CLAY, medium plastic, silty, sandy, gravelly, calcareous, olive grey	Ma/ Fw	Lg/ Gc									
		9	CLAY, medium plastic, silty, sandy, calcareous, w. shell fragments, grey	Ma/ Fw	Lg/ Gc									
15	-34													
16	-35													
17	-36	10	CLAY, silty, slightly sandy, calcareous, w. sand streaks, olive grey	Ma/ Fw	Lg/ Gc								G	1G.07
18	-37		Continues											

In situ vane undist. ✕ / In situ vane remoul. + / UCT ○ / SPT ▼
Standard penetration (blows/300mm) 10 20 30 40
Undr. shear strength - Vane (kN/m²) 100 200 300 400
CPT Cone Resistance q_c (MPa) 20 40 60 80

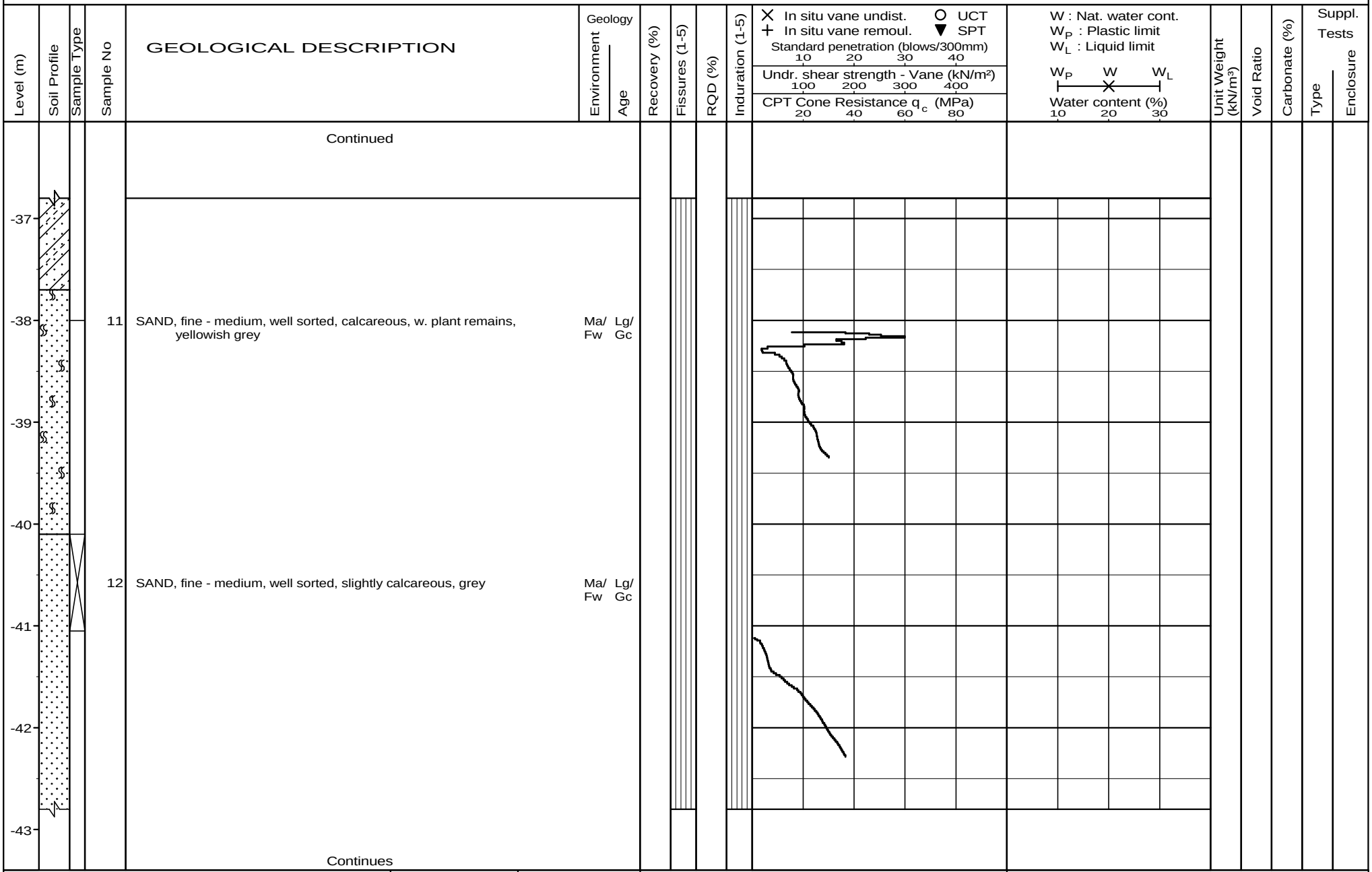
W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit
Water content (%) 10 20 30

Wp=13.2 ✕ Wl=26.9

Coordinates : E : 638588 (m) N : 6278390 (m)	Prepared : SAM	Date : 2009-06-08	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk
Comments :	Checked : JNG	Date : 2009-10-12		
	Approved : LAR	Date : 2009-10-14		

Job : 32490	Anholt. Djursland Wind Farm		
Borehole No.: BH.10		Date : 2009-05-30	
Report No.: 1		Encl.No.: 1D.07	

BORING NO. BH.10 Anholt. Djursland Wind Farm



Coordinates : E : 638588 (m) N : 6278390 (m)	Prepared : SAM	Date : 2009-06-08	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.10 Date : 2009-05-30
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.07

BORING NO. BH.10 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Sample No	GEOLOGICAL DESCRIPTION	Geology Environment	Geology Age
			Continued		
24	-43				
		13	SAND, fine - medium, sorted, slightly calcareous, grey	Ma/ Fw	Lg/ Gc
25	-44		SAND, fine - medium, poorly sorted, slightly silty, gravelly, calcareous, w. plant remains, grey	Ma/ Fw	Lg/ Gc
26	-45	14	GRAVEL, very sandy, calcareous, brownish grey	Ma/ Mw	Gc
27	-46				
		15	SAND, fine - medium, sorted, calcareous, grey	Ma/ Mw	Gc
			SAND, medium, sorted, gravelly, calcareous, grey	Ma/ Mw	Gc
28	-47				
			CLAY TILL, grey, according to drilling leader		
29	-48				
30	-49		Continues		

Soil Profile | Sample Type

Recovery (%) | Fissures (1-5) | RQD (%) | Induration (1-5)

In situ vane undist. ✕ | In situ vane remoul. + | UCT ○ | SPT ▼

Standard penetration (blows/300mm) 10 20 30 40

Undr. shear strength - Vane (kN/m²) 100 200 300 400

CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

W_P — W — W_L

Water content (%) 10 20 30

Unit Weight (kN/m³) | Void Ratio | Carbonate (%)

Suppl. Tests: Type | Enclosure

Type	Enclosure
G	1G.07

Coordinates : E : 638588 (m) N : 6278390 (m)	Prepared : SAM	Date : 2009-06-08	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk
Comments :	Checked : JNG	Date : 2009-10-12		
	Approved : LAR	Date : 2009-10-14		

Job : 32490 Anholt. Djursland Wind Farm	
Borehole No.: BH.10	Date : 2009-05-30
Report No.: 1	Encl.No.: 1D.07

BORING NO. BH.10 Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests: Type	Suppl. Tests: Enclosure
					Continued											
30	-49			16	CLAY, highly plastic, slightly sandy, calcareous, w. sandy streaks, grey	Ma/ Fw	Gc					20.4	0.6			
31	-50															
32	-51															
33	-52			17	CLAY, highly plastic, slightly sandy, calcareous, w. sand streaks, grey	Ma/ Fw	Gc									
34	-53															
35	-54															
36	-55				Continues											

Induration (1-5): × In situ vane undist. ○ UCT; + In situ vane remoul. ▼ SPT
Standard penetration (blows/300mm) 10 20 30 40
Undr. shear strength - Vane (kN/m²) 100 200 300 400
CPT Cone Resistance q_c (MPa) 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit
W_P W W_L
Water content (%) 10 20 30

Wp=20.3 Wl=47.0

Coordinates : E : 638588 (m) N : 6278390 (m)	Prepared : SAM	Date : 2009-06-08	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.10 Date : 2009-05-30
	Approved : LAR	Date : 2009-10-14			Report No.: 1 Encl.No.: 1D.07

BORING NO. BH.10 — Anholt. Djursland Wind Farm

Depth (m)	Level (m)	Soil Profile	Sample Type	Sample No	GEOLOGICAL DESCRIPTION	Geology: Environment	Geology: Age	Recovery (%)	Fissures (1-5)	RQD (%)	Induration (1-5)	Unit Weight (kN/m³)	Void Ratio	Carbonate (%)	Suppl. Tests: Type	Suppl. Tests: Enclosure
					Continued											
36	-55			18	CLAY, highly plastic, slightly sandy, grey	Ma/ Fw	Gc					20.2	0.6	13.1		
37	-56															
38	-57															
39	-58			19	CLAY, silty, slightly gravelly, calcareous, grey	Ma/ Fw	Gc									
40	-59			20	CLAY, highly plastic, w. sand streaks, calcareous, olive grey	Ma/ Fw	Gc									
41	-60															
42	-61															

Standard penetration (blows/300mm): 10 20 30 40 — In situ vane undist. (×) / In situ vane remoul. (+) / UCT (○) / SPT (▼)

Undr. shear strength - Vane (kN/m²): 100 200 300 400

CPT Cone Resistance q_c (MPa): 20 40 60 80

W : Nat. water cont.
W_P : Plastic limit
W_L : Liquid limit

Water content (%): 10 20 30

Wp=19.0 Wl=49.6

Wl=61.6 Wp=22.7

Coordinates : E : 638588 (m) N : 6278390 (m)	Prepared : SAM	Date : 2009-06-08	GEO	Maglebjergvej 1 DK2800 Lyngby tlf +45 4588 4444 www.geo.dk	Job : 32490 Anholt. Djursland Wind Farm
Comments :	Checked : JNG	Date : 2009-10-12			Borehole No.: BH.10 — Date : 2009-05-30
	Approved : LAR	Date : 2009-10-14			Report No.: 1 — Encl.No.: 1D.07

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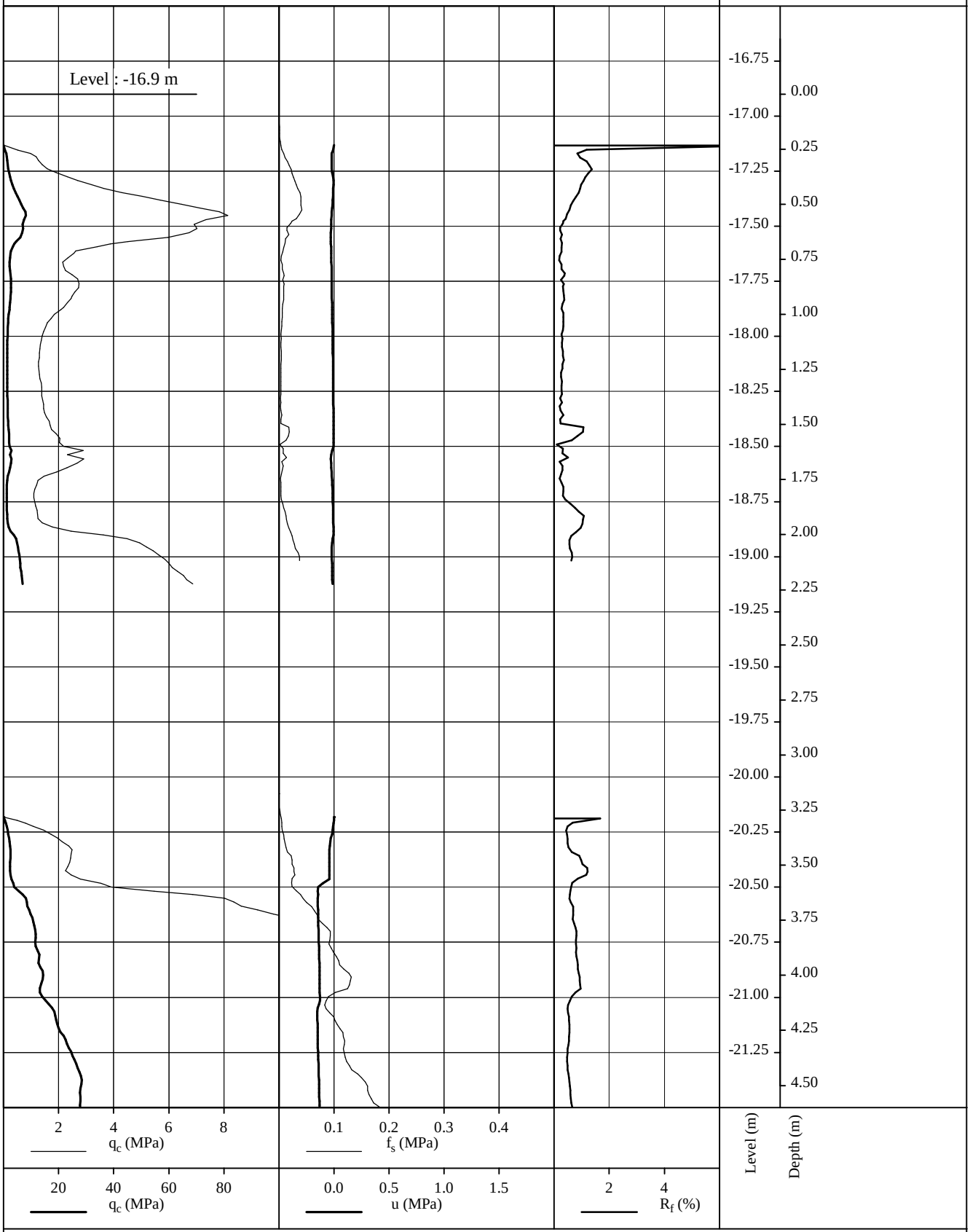
Enclosure 1E.01 – 1E.07
CPT Profiles with q_c, f_s, u and R_f

CPT name : BH01



E	: 635616	Cone no.	: Icone080308	Rig	: DTH
N	: 6269609	Cone type	: TSP	Performed by	: LOC
Date	: 2009-05-20	Cone area	: 10.0 cm^2	Remark	:

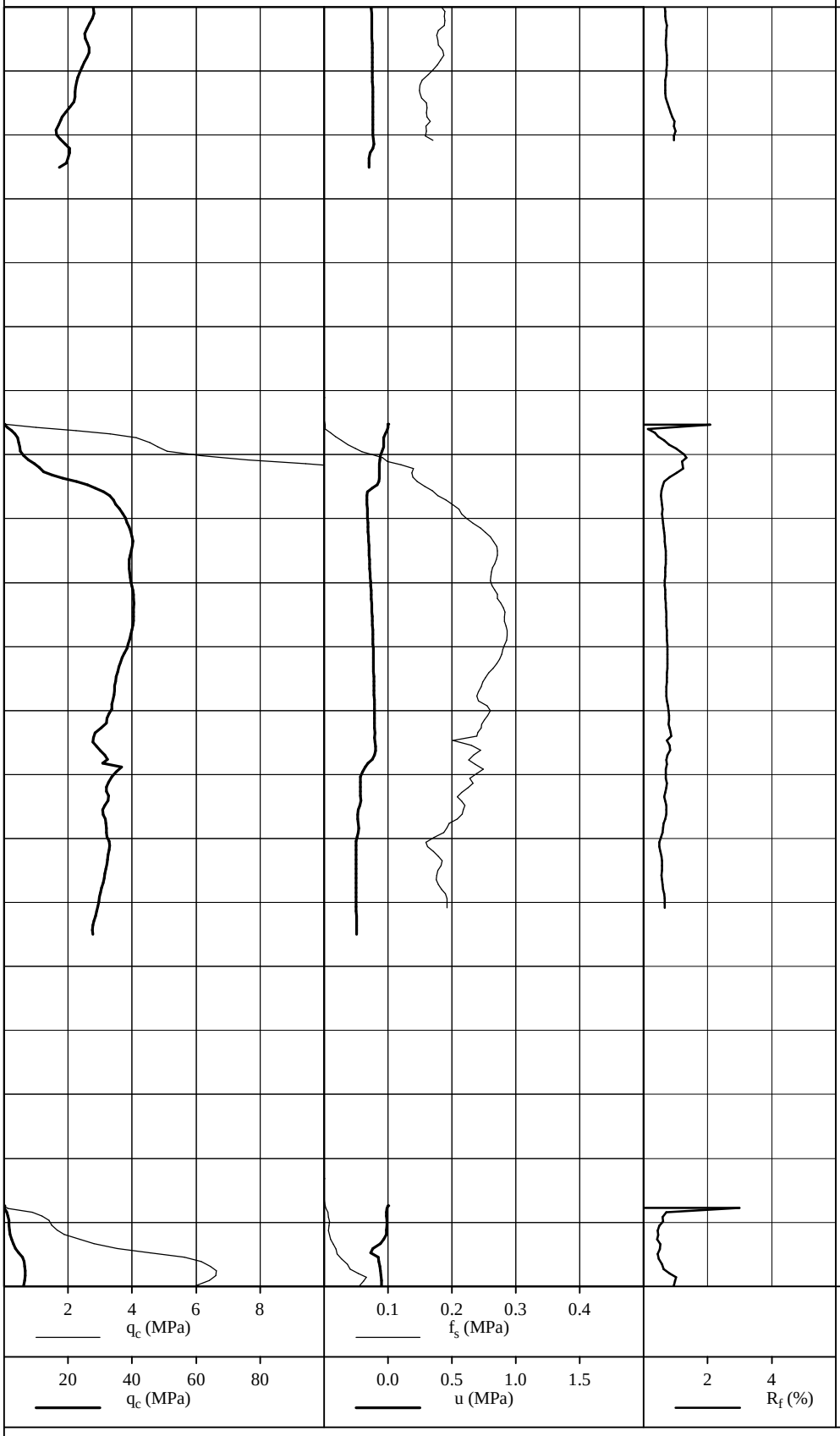
Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-22	Subject: DTH-CPT BH01		
Checked	: LAR	Date: 2009-06-22			Page 1 / 8
Approved	: JBC	Date: 2009-06-22	Report 1	Enclosure: 1E.01	Rev.

Printed 2009-06-22 14:52:00

CPT name : BH01



E	: 635616	Cone no.	: Icone080308	Rig	: DTH
N	: 6269609	Cone type	: TSP	Performed by	: LOC
Date	: 2009-05-20	Cone area	: 10.0 cm^2	Remark	:

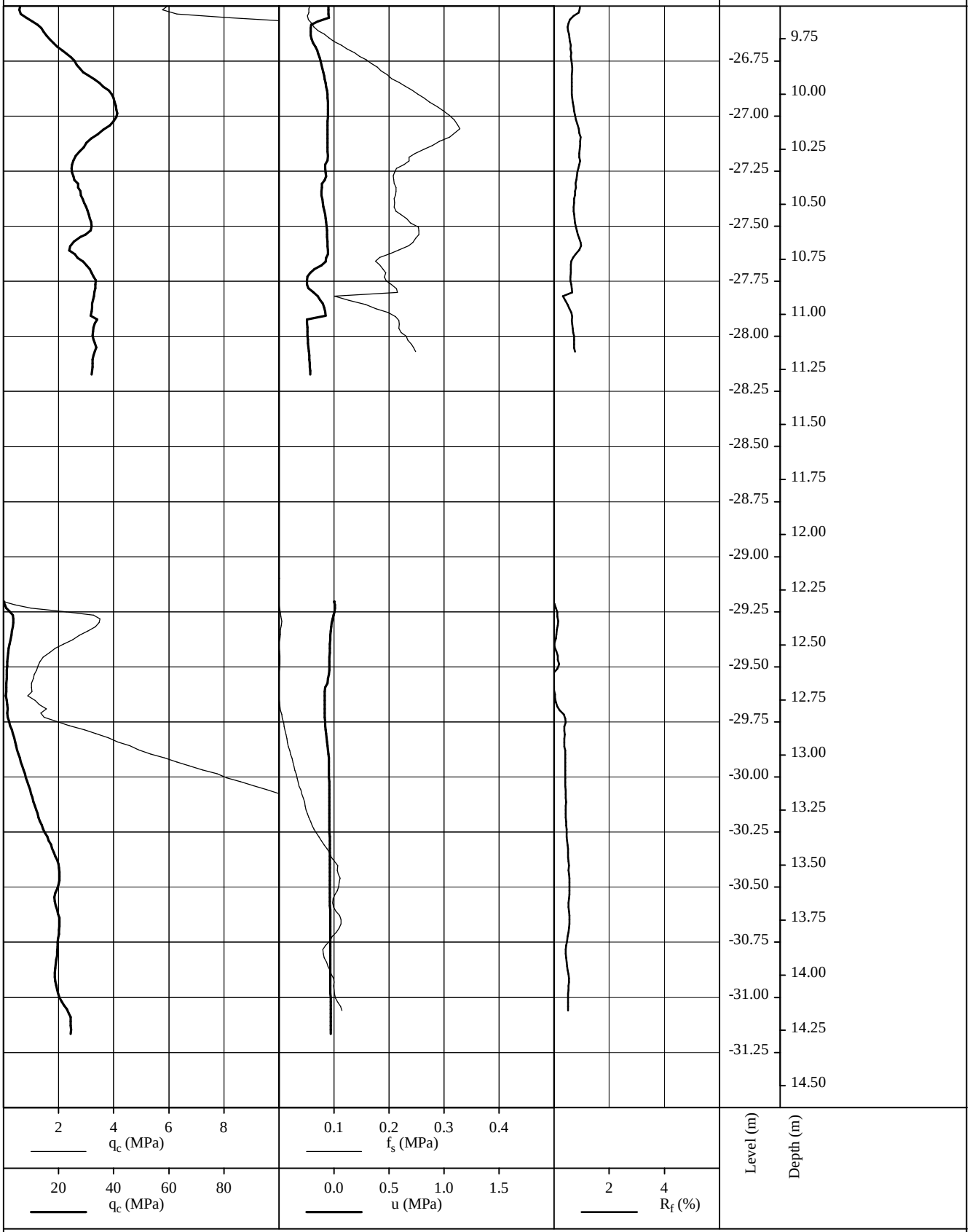
Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-22	Subject: DTH-CPT BH01	
Checked	: LAR	Date: 2009-06-22		Page 2 / 8
Approved	: JBC	Date: 2009-06-22	Report 1 Enclosure: 1E.01	Rev.

Printed 2009-06-22 14:52:01

CPT name : BH01



E	: 635616	Cone no.	: Icone080308	Rig	: DTH
N	: 6269609	Cone type	: TSP	Performed by	: LOC
Date	: 2009-05-20	Cone area	: 10.0 cm^2	Remark	:

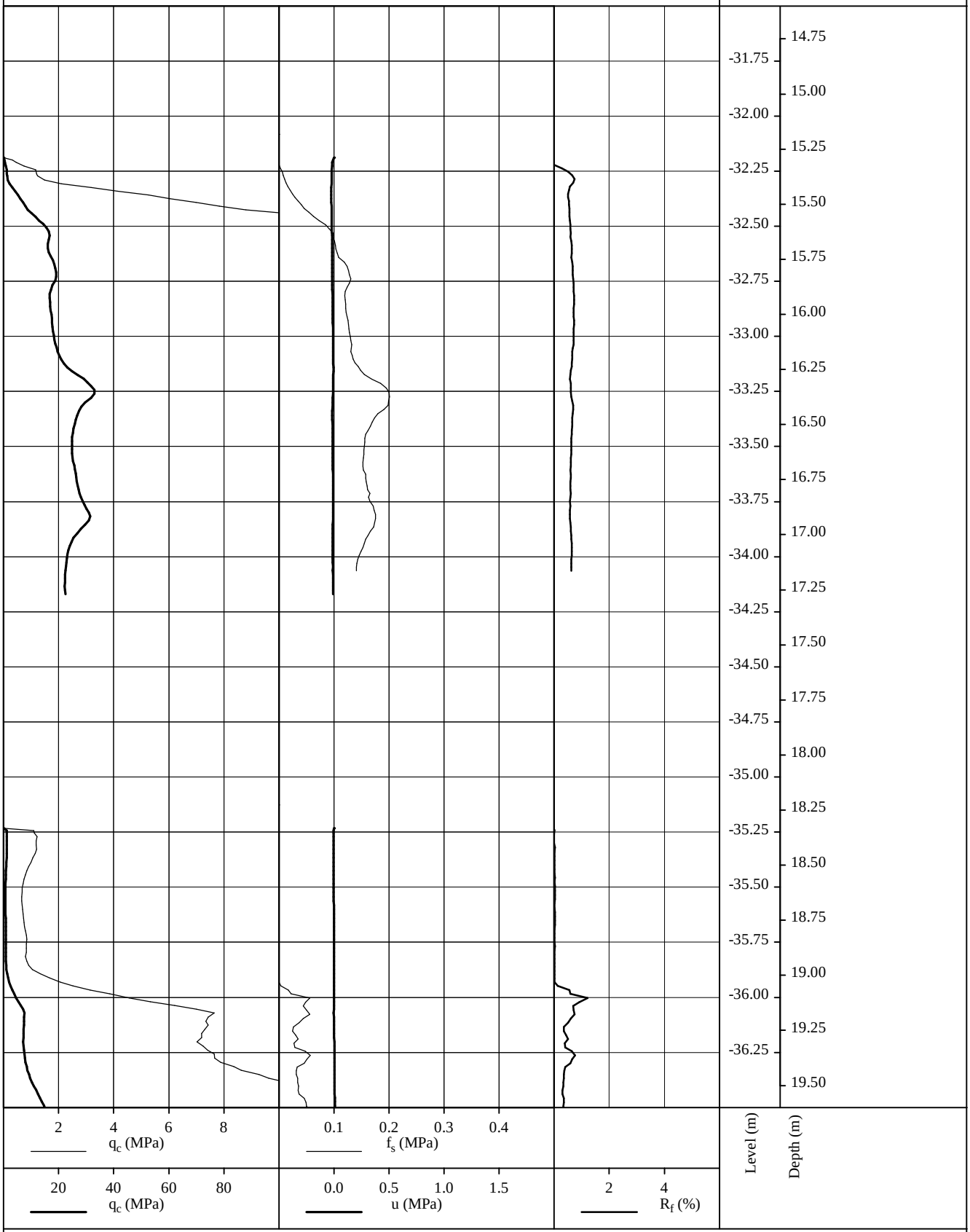
Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-22	Subject: DTH-CPT BH01	
Checked	: LAR	Date: 2009-06-22		Page 3 / 8
Approved	: JBC	Date: 2009-06-22	Report 1 Enclosure: 1E.01	Rev.

Printed 2009-06-22 14:52:01

CPT name : BH01



E	: 635616	Cone no.	: Icone080308	Rig	: DTH
N	: 6269609	Cone type	: TSP	Performed by	: LOC
Date	: 2009-05-20	Cone area	: 10.0 cm^2	Remark	:

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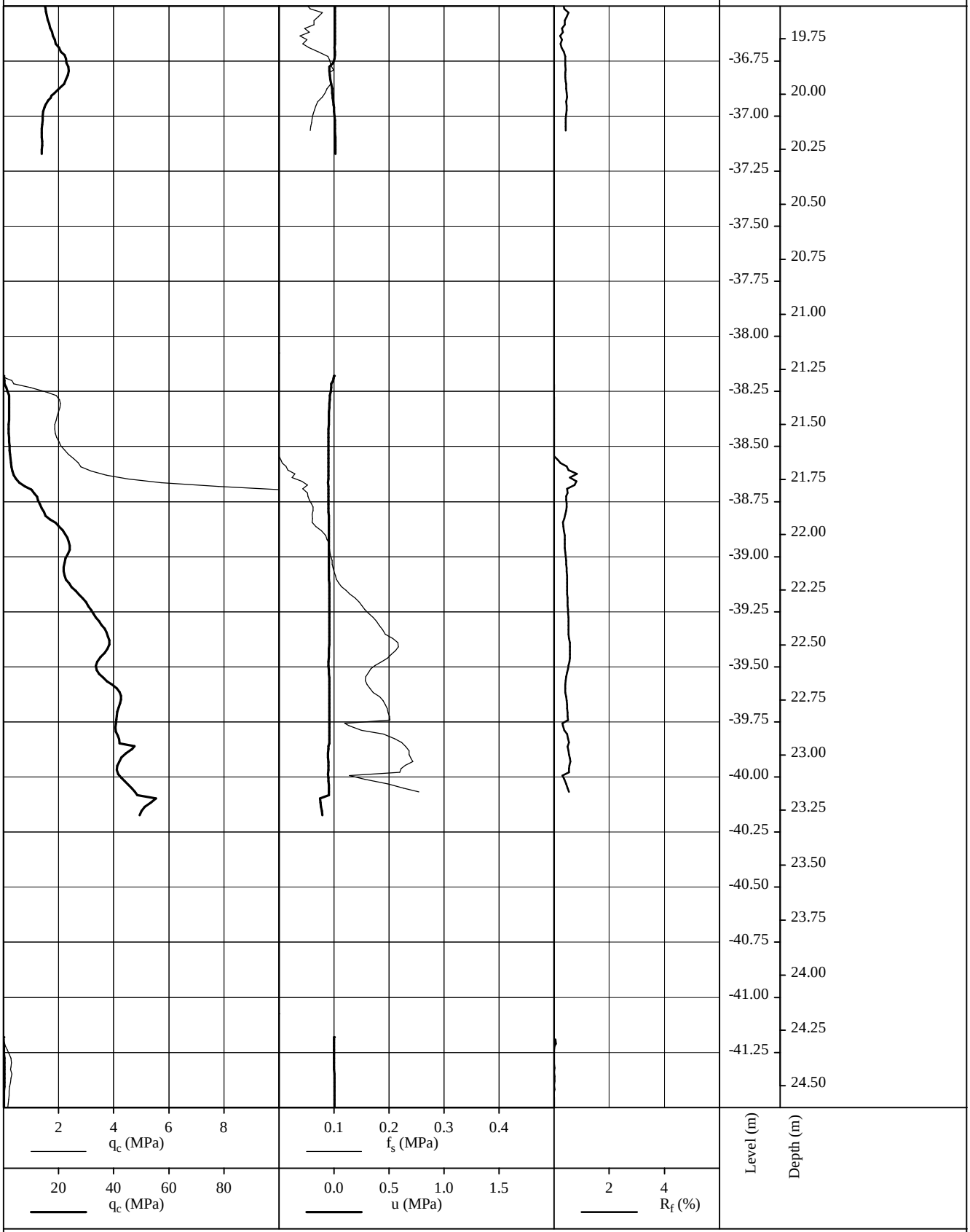

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Date	: 2009-05-20	Cone area	: 10.0 cm^2	Remark	:

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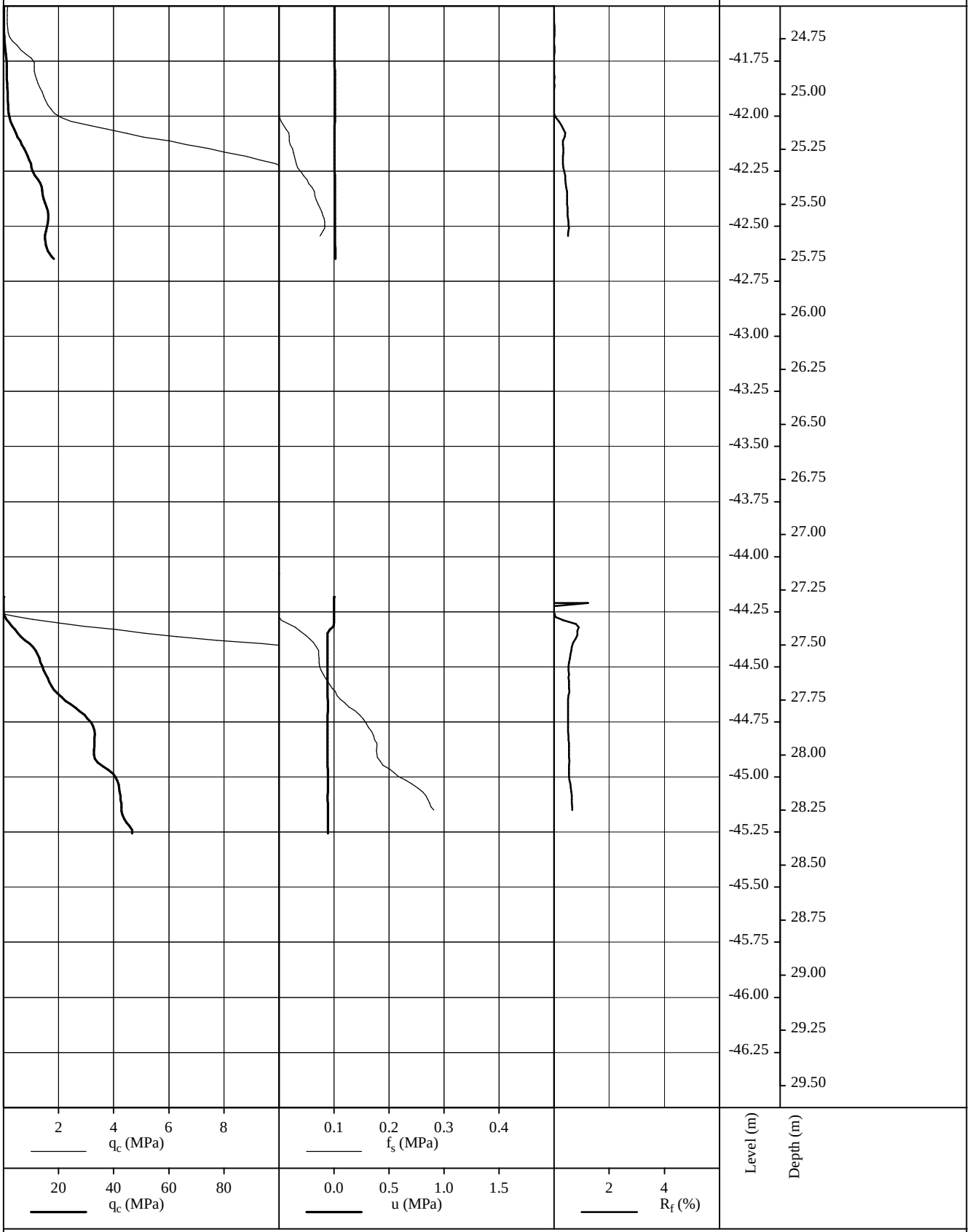

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Danish Geotechnical Institute

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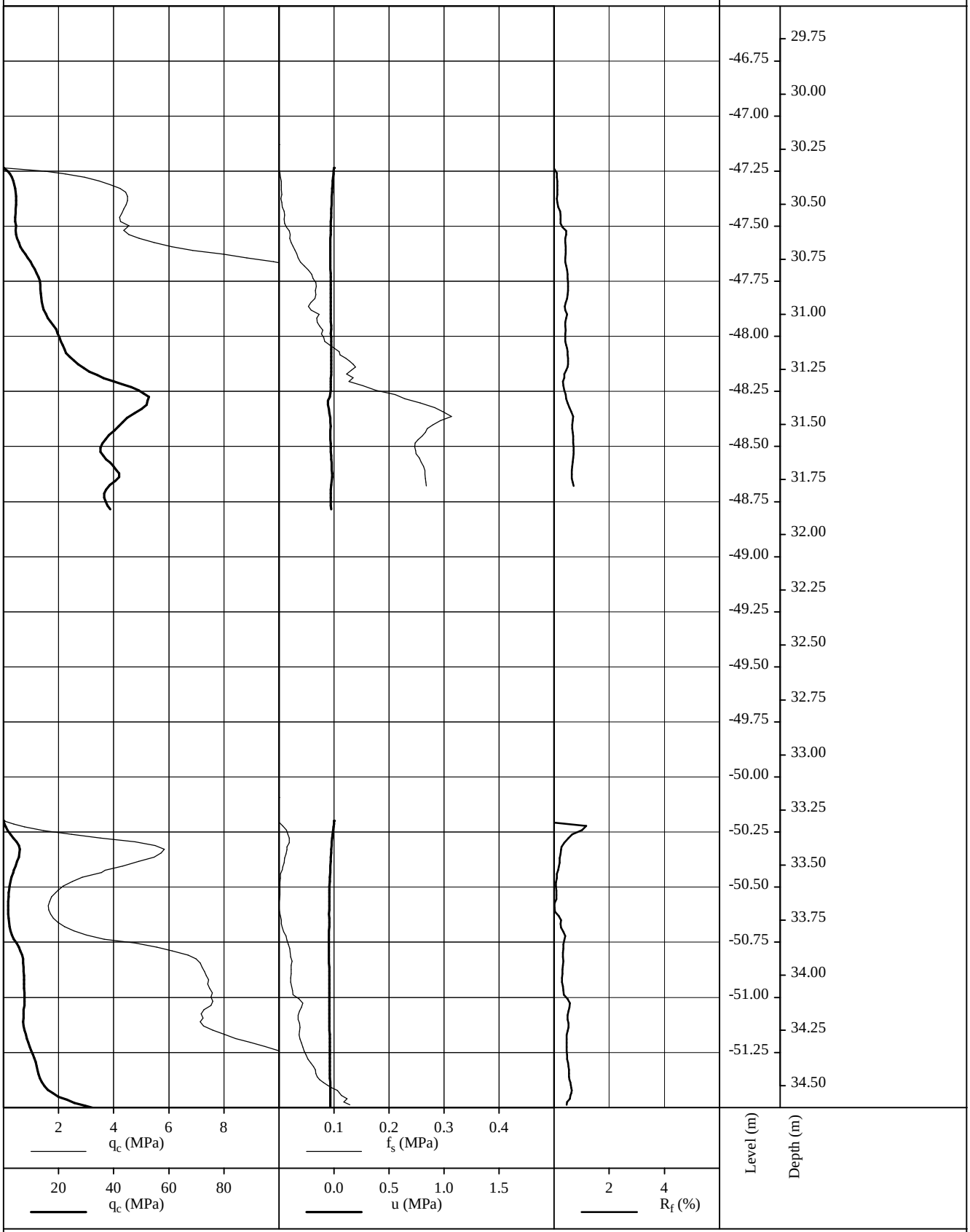

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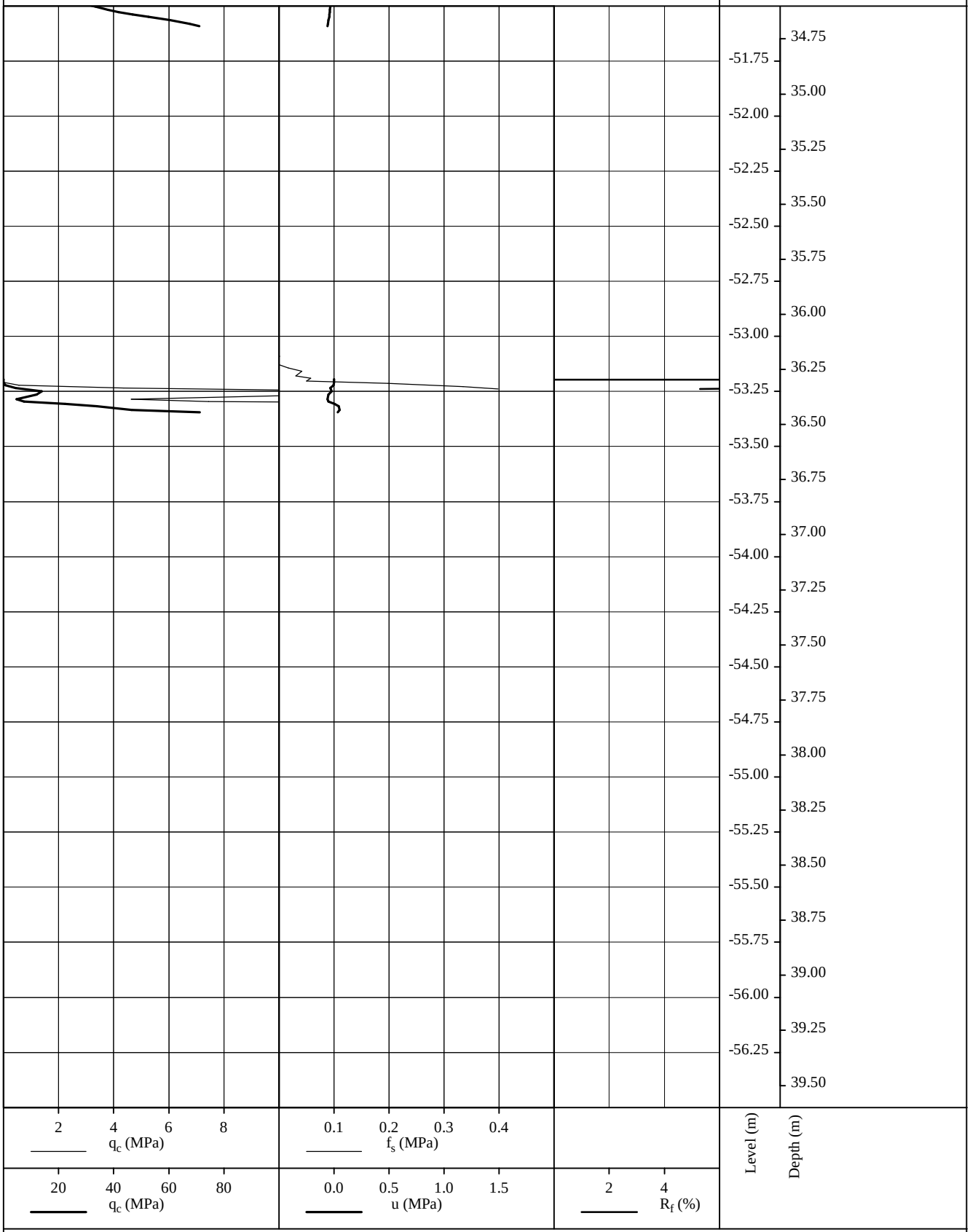

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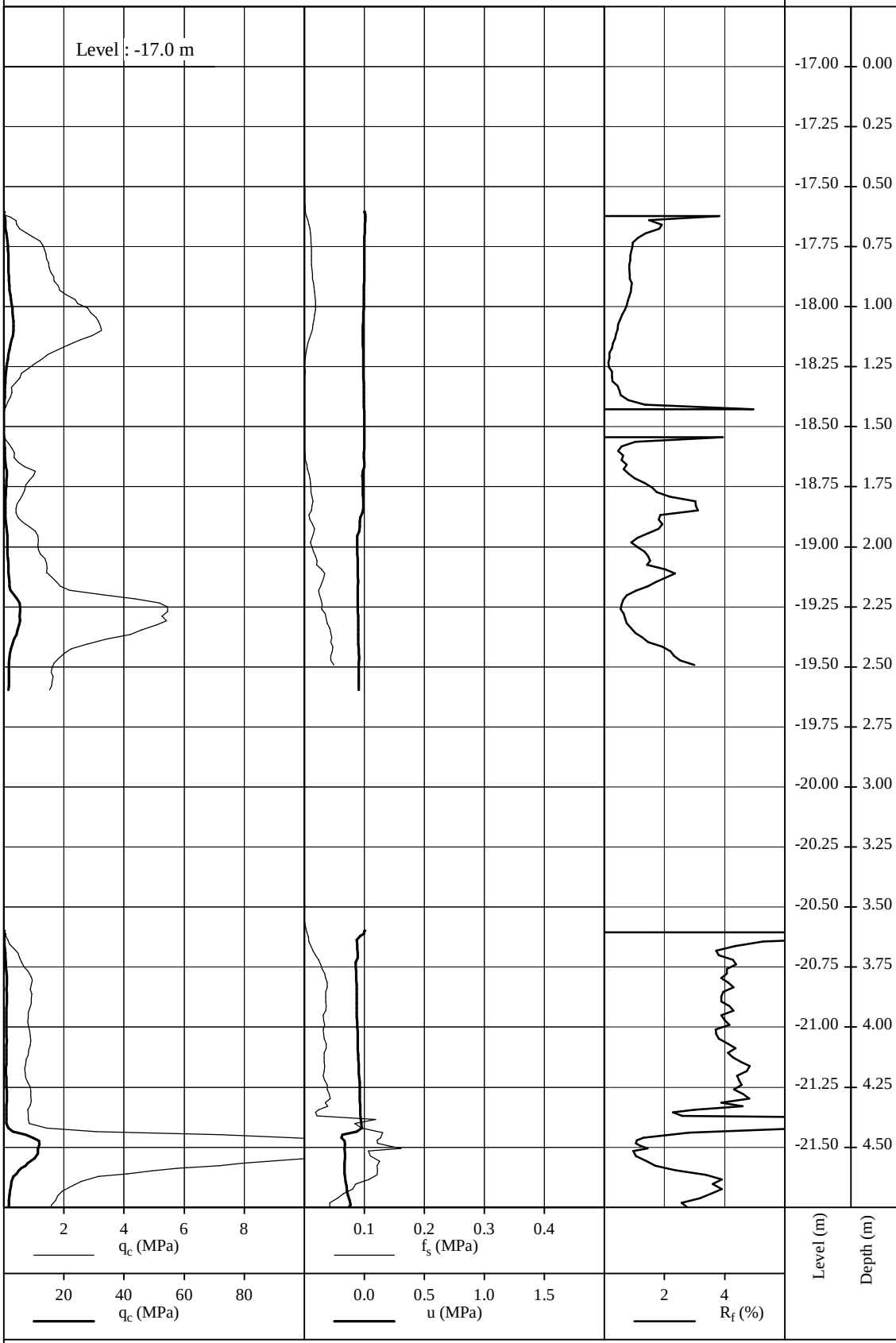

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Date	: 2009-05-19	Cone area	: 10.0 cm^2	Remark	:

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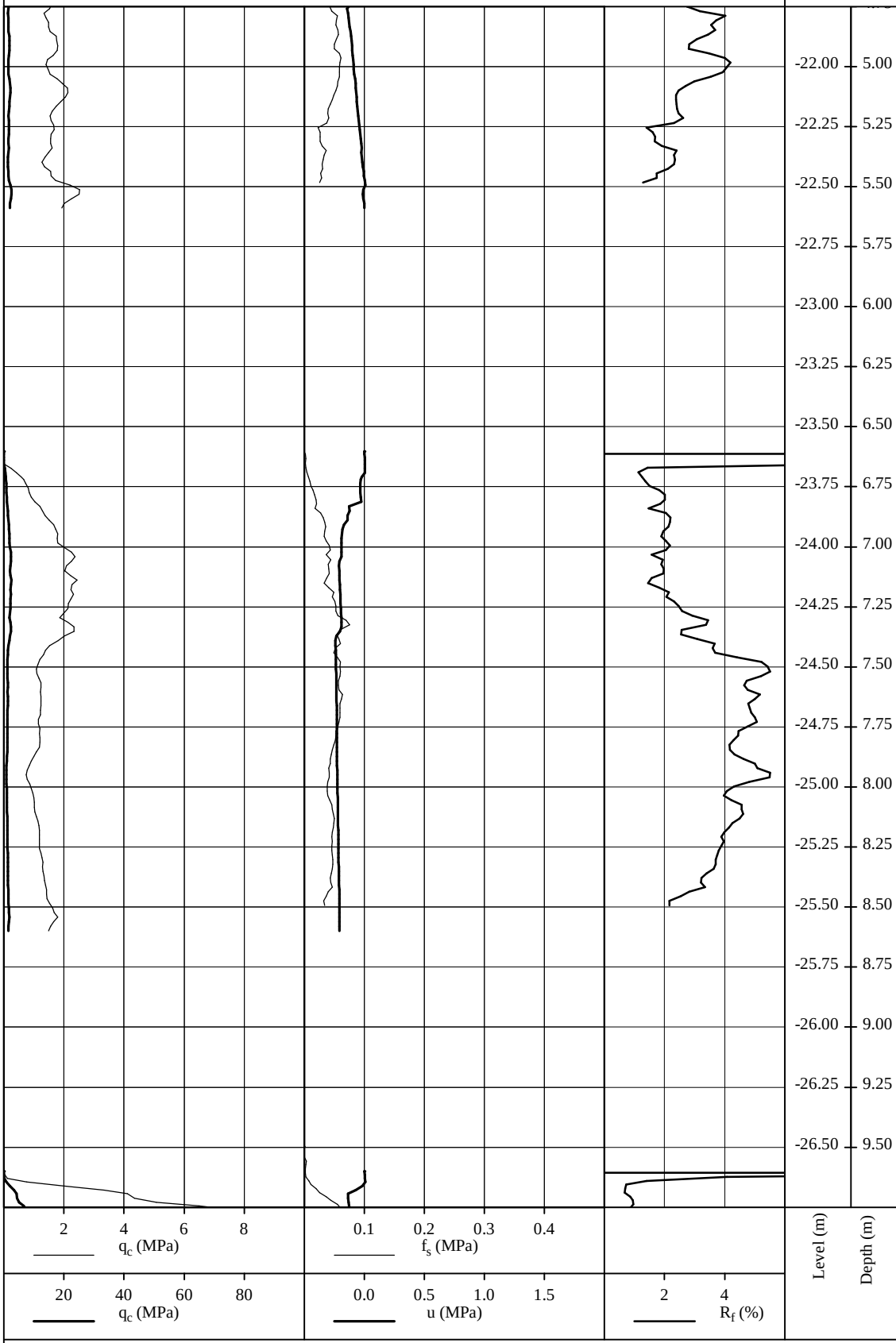

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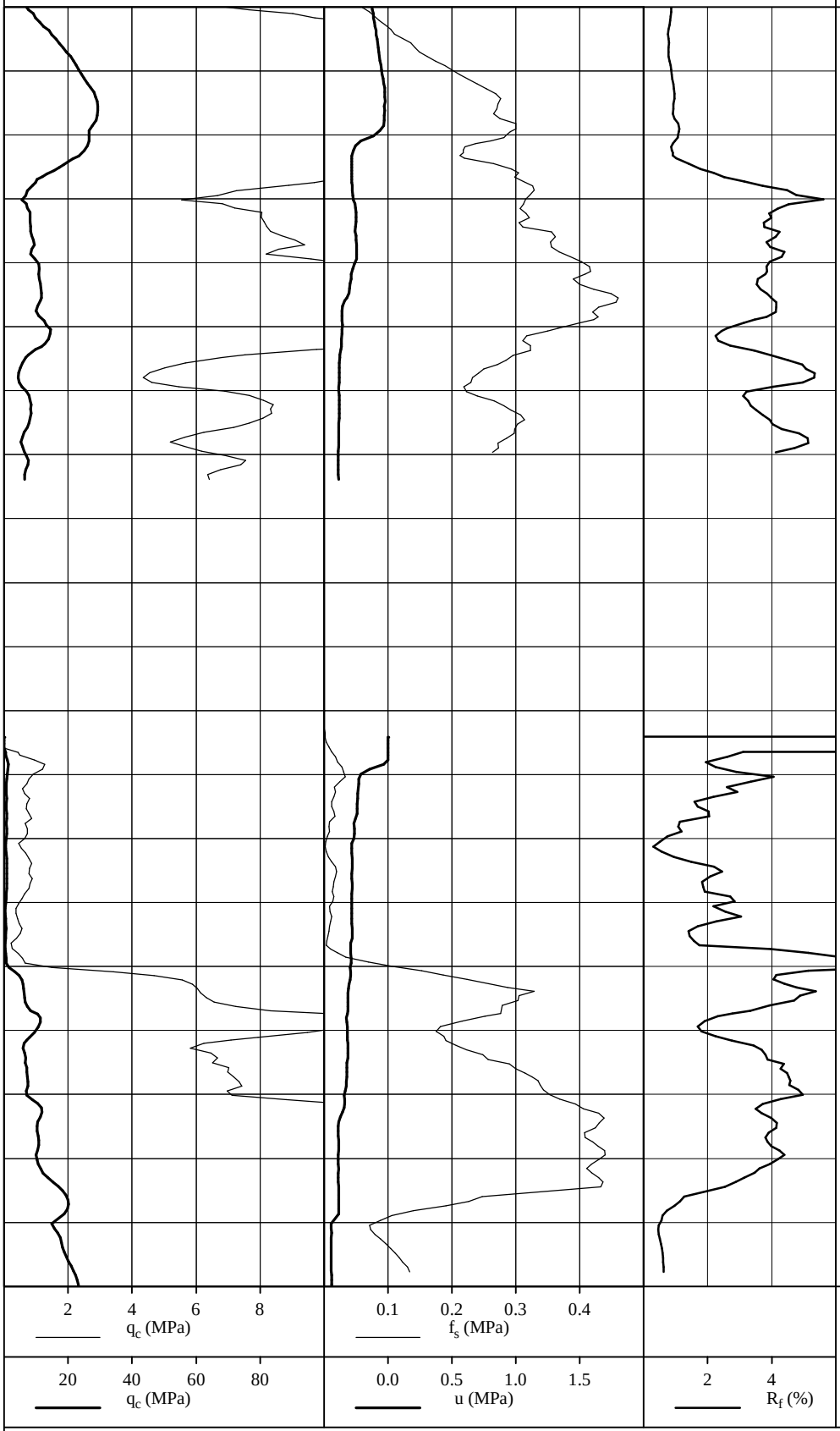

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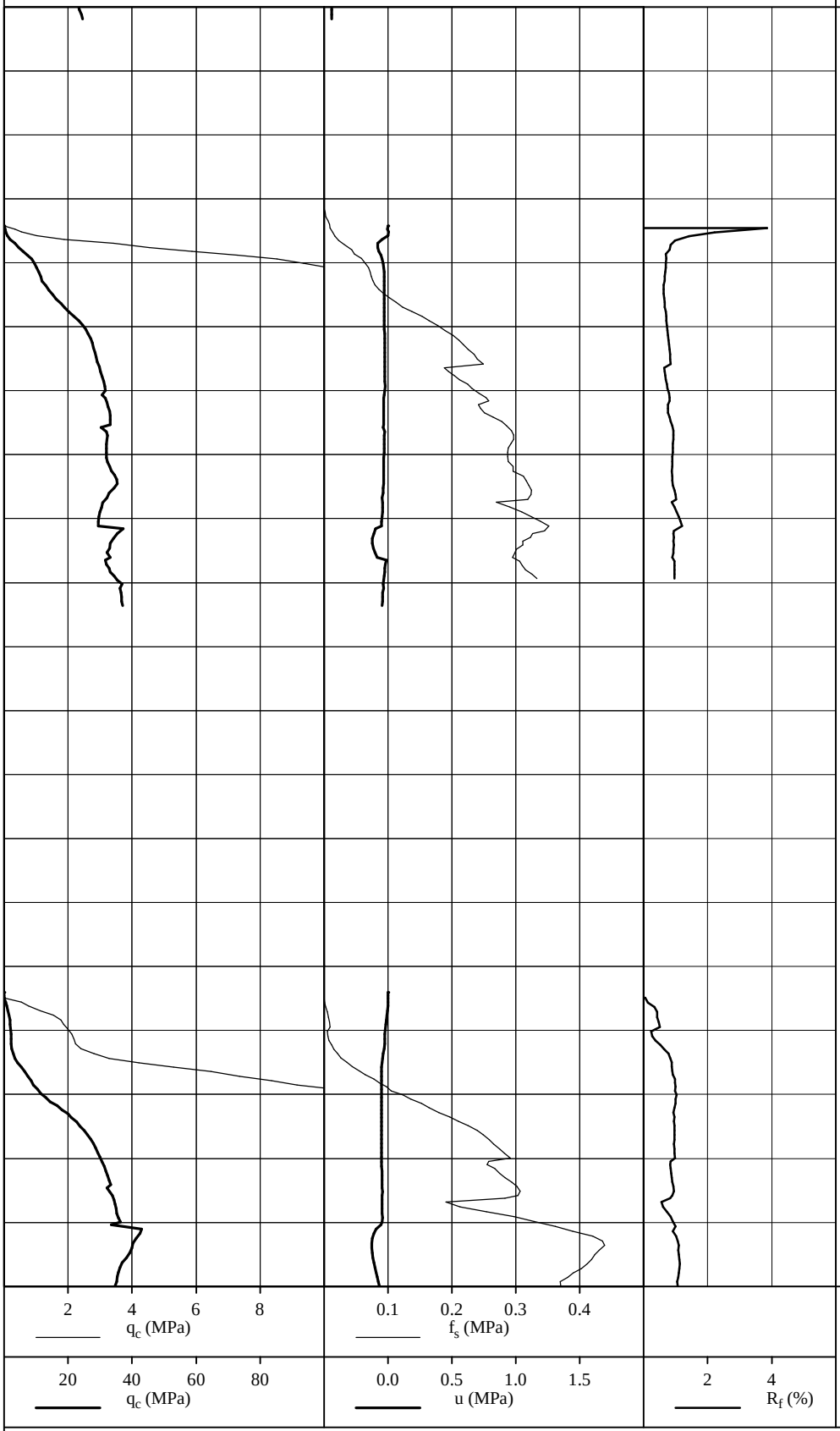

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Date	: 2009-05-19	Cone area	: 10.0 cm^2	Remark	:

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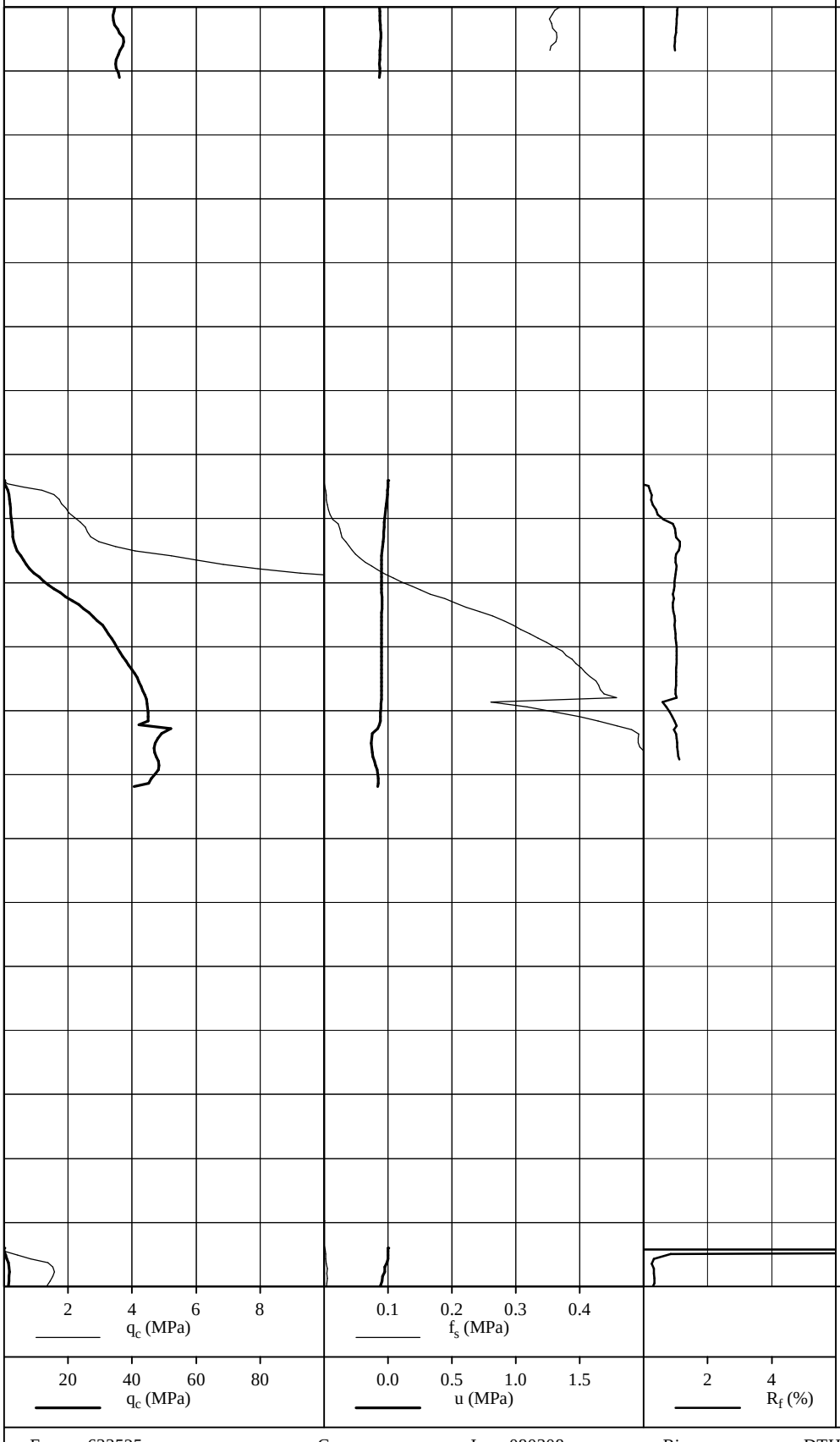

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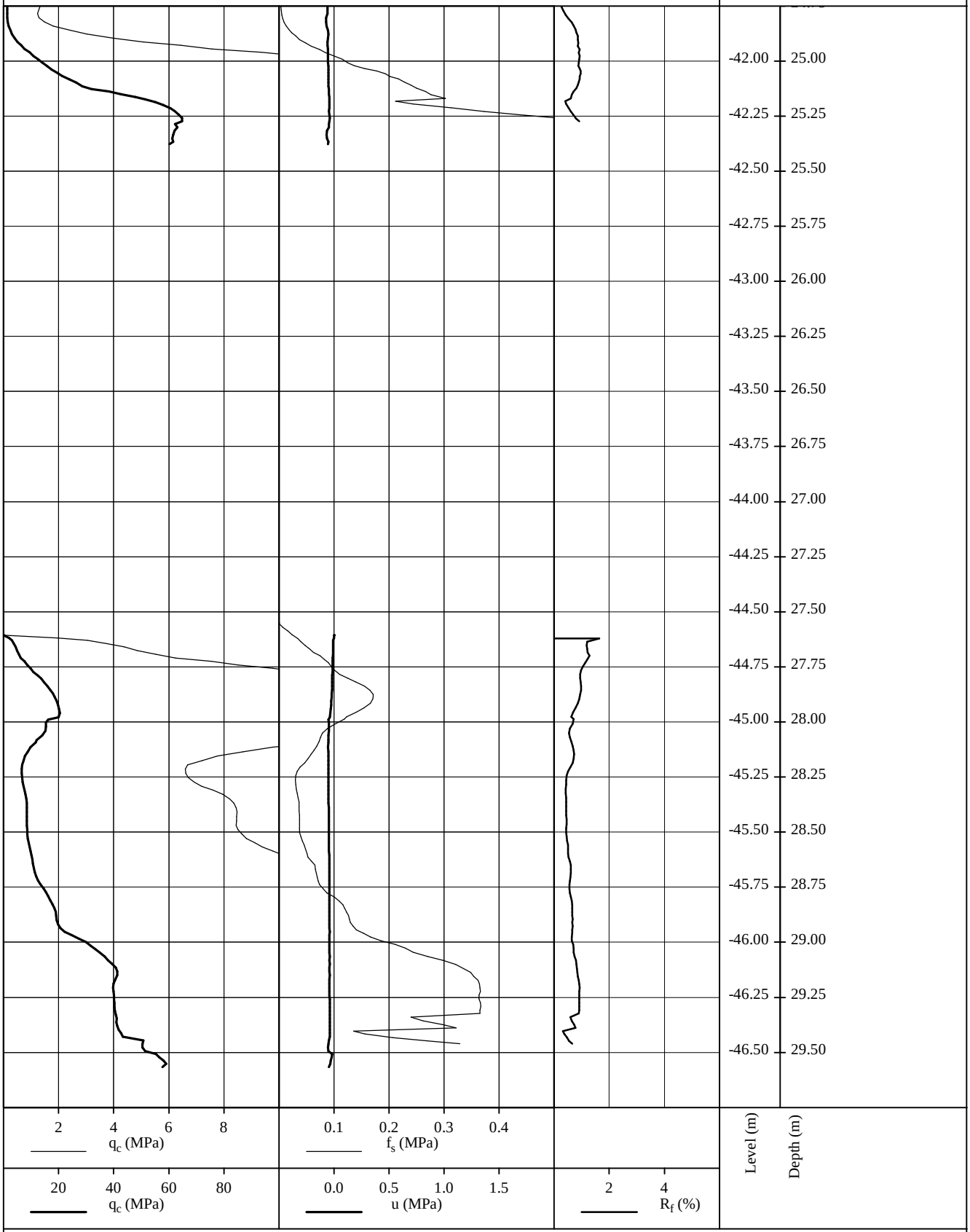

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Date	: 2009-05-19	Cone area	: 10.0 cm^2	Remark	:

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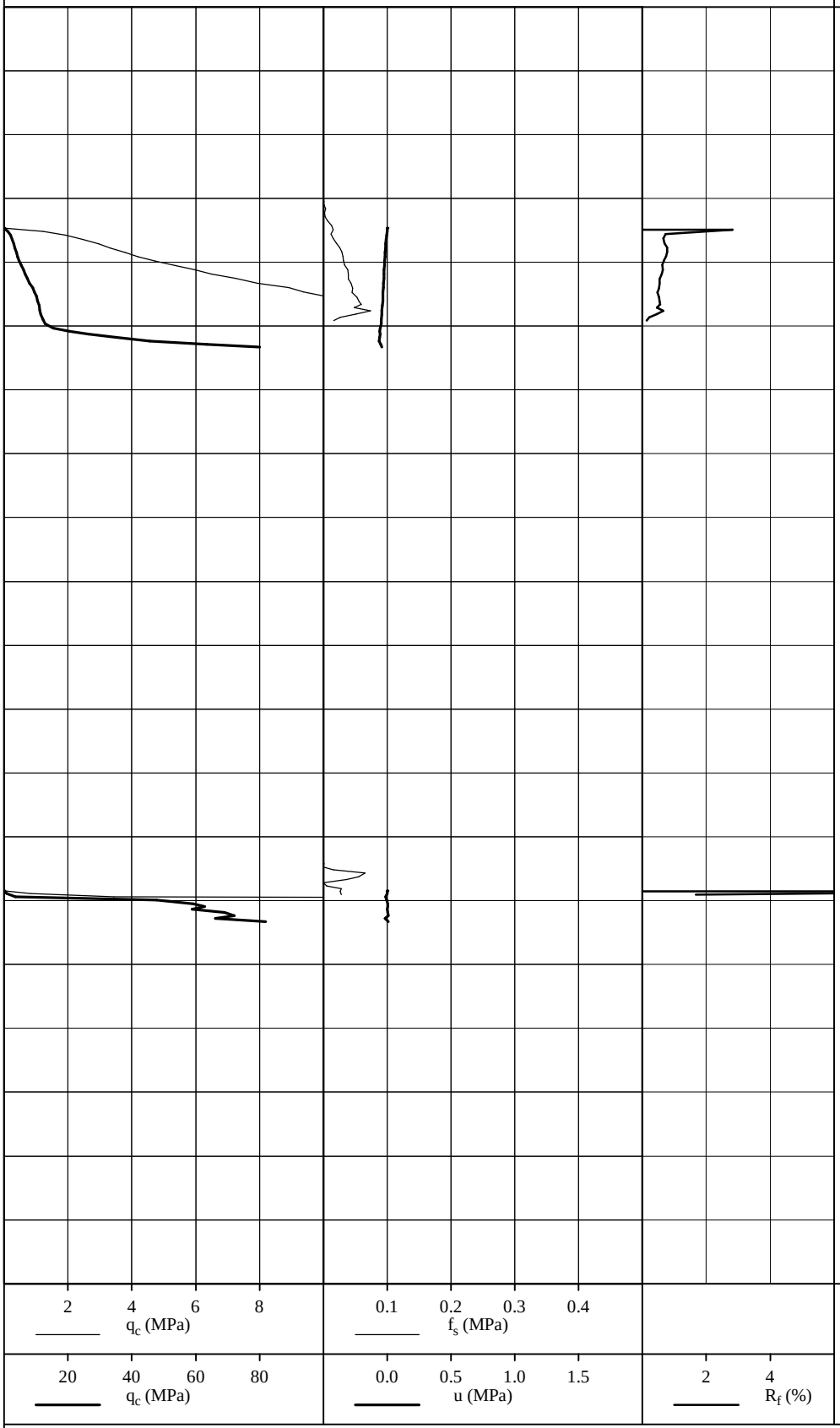

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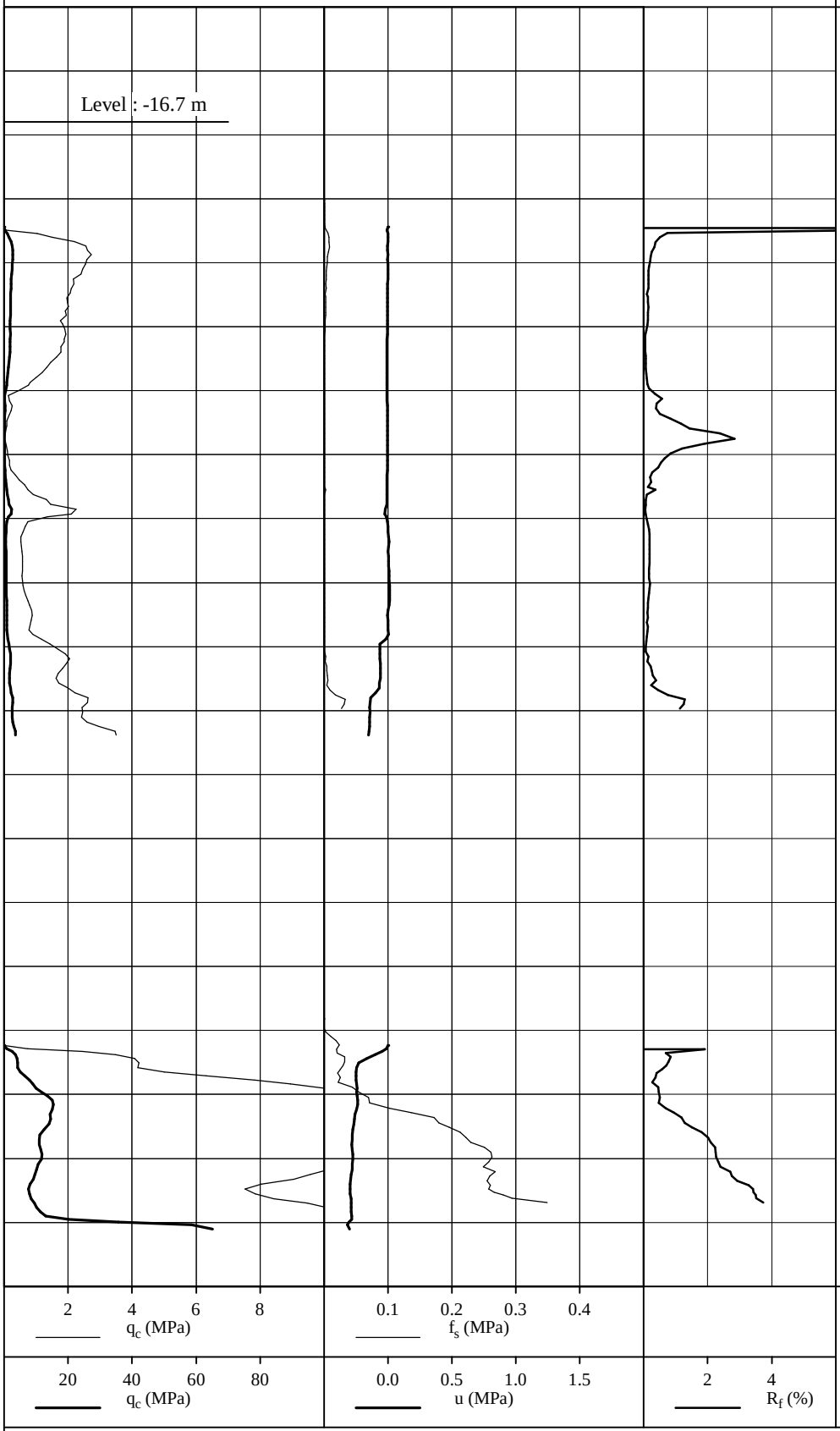

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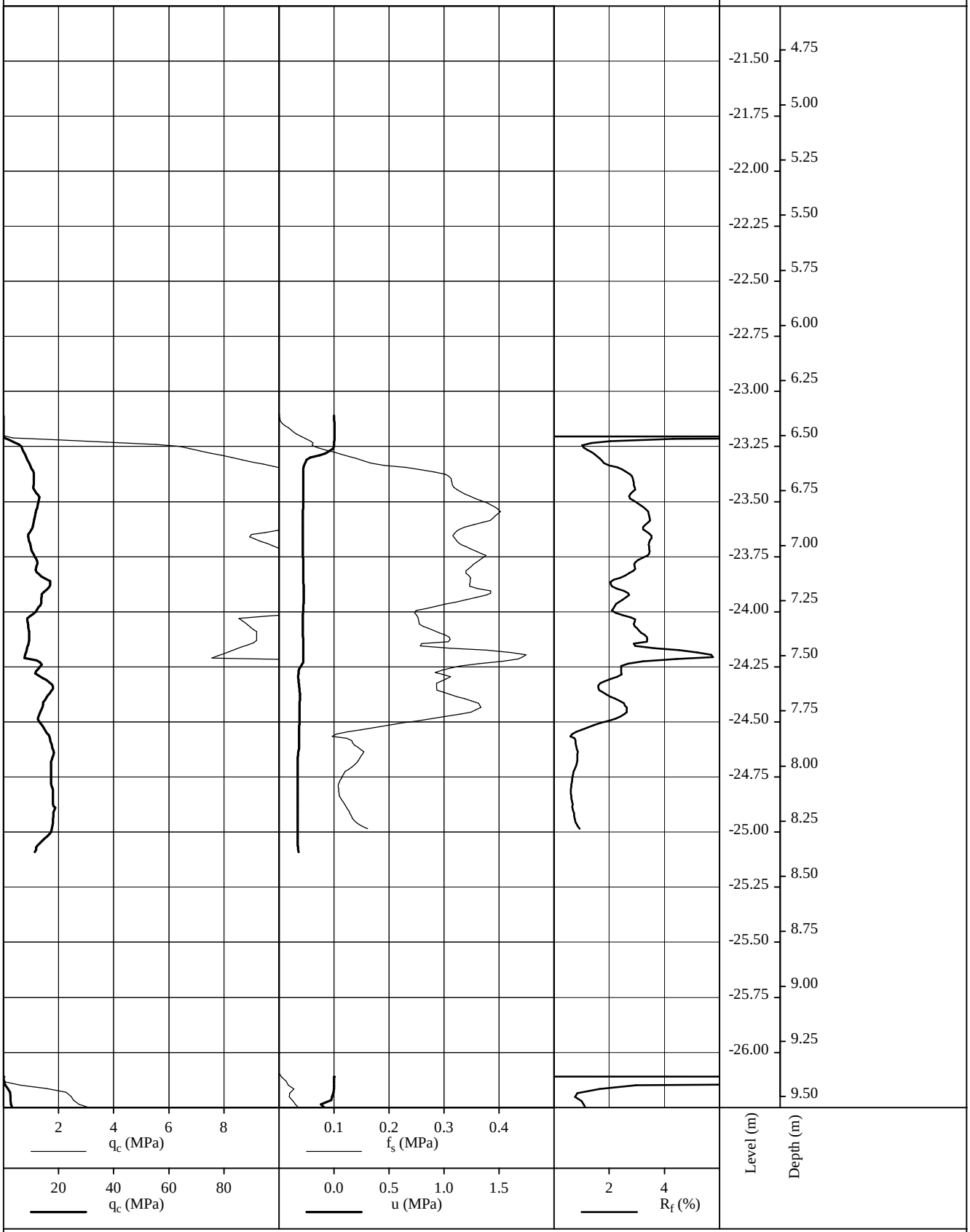

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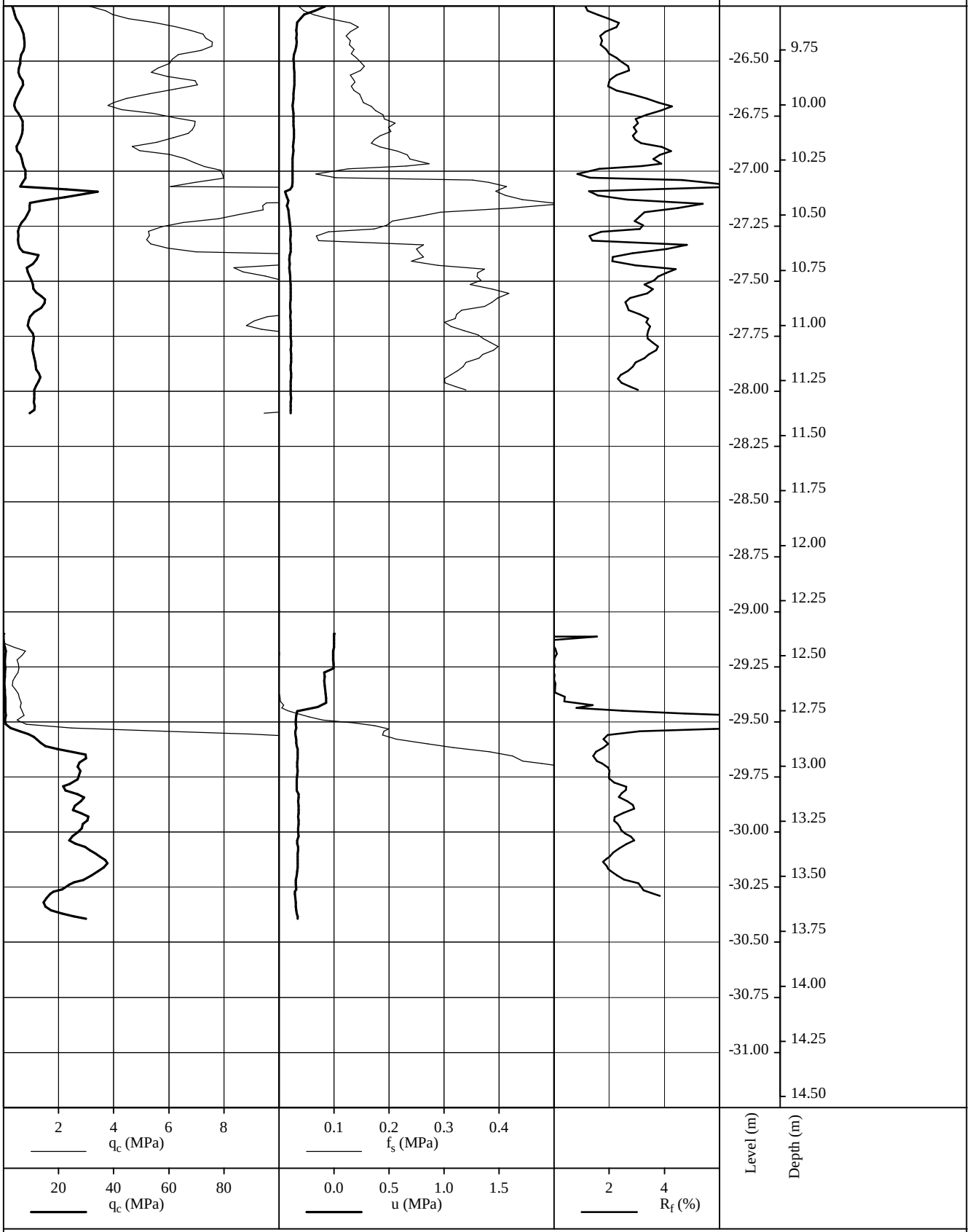

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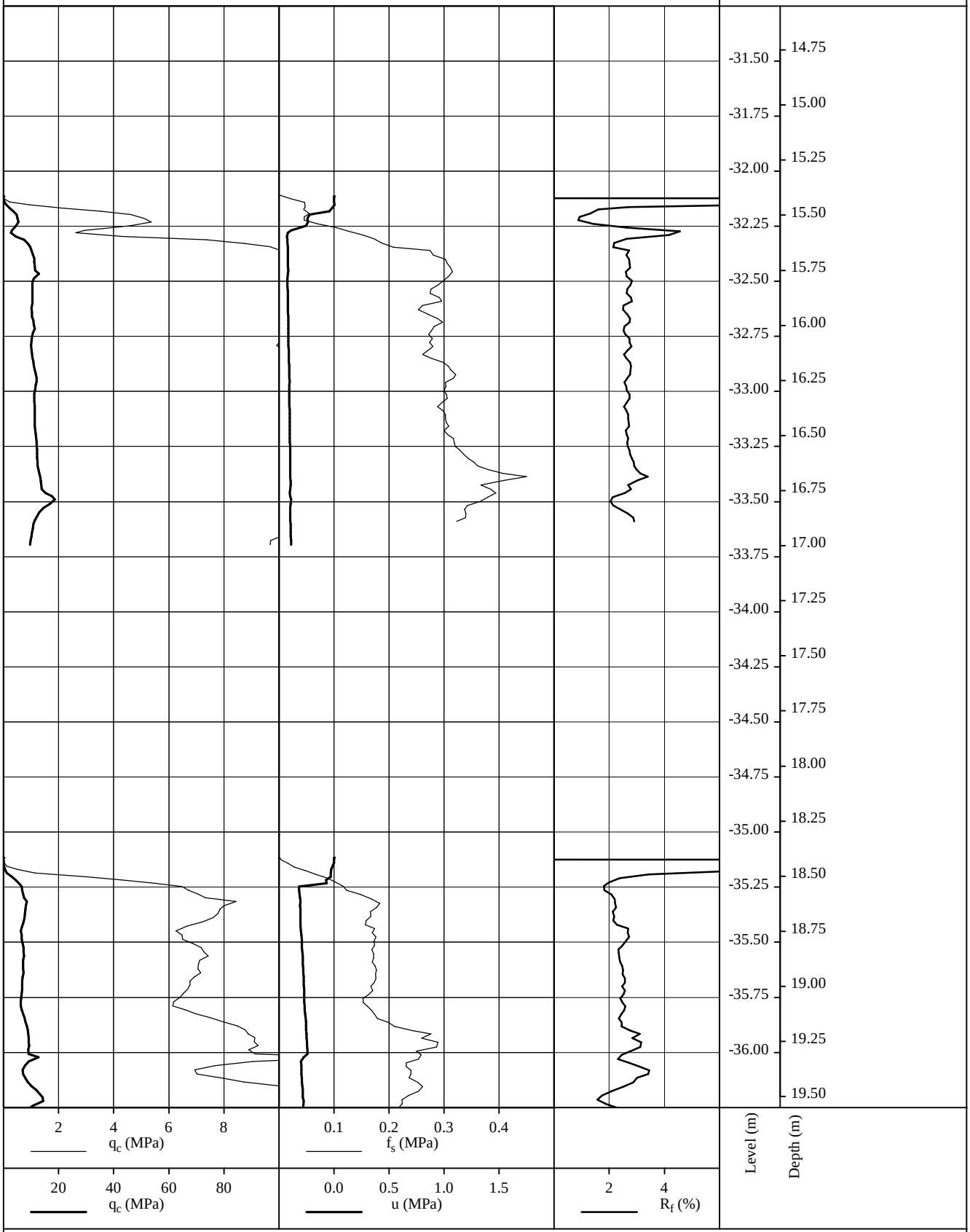

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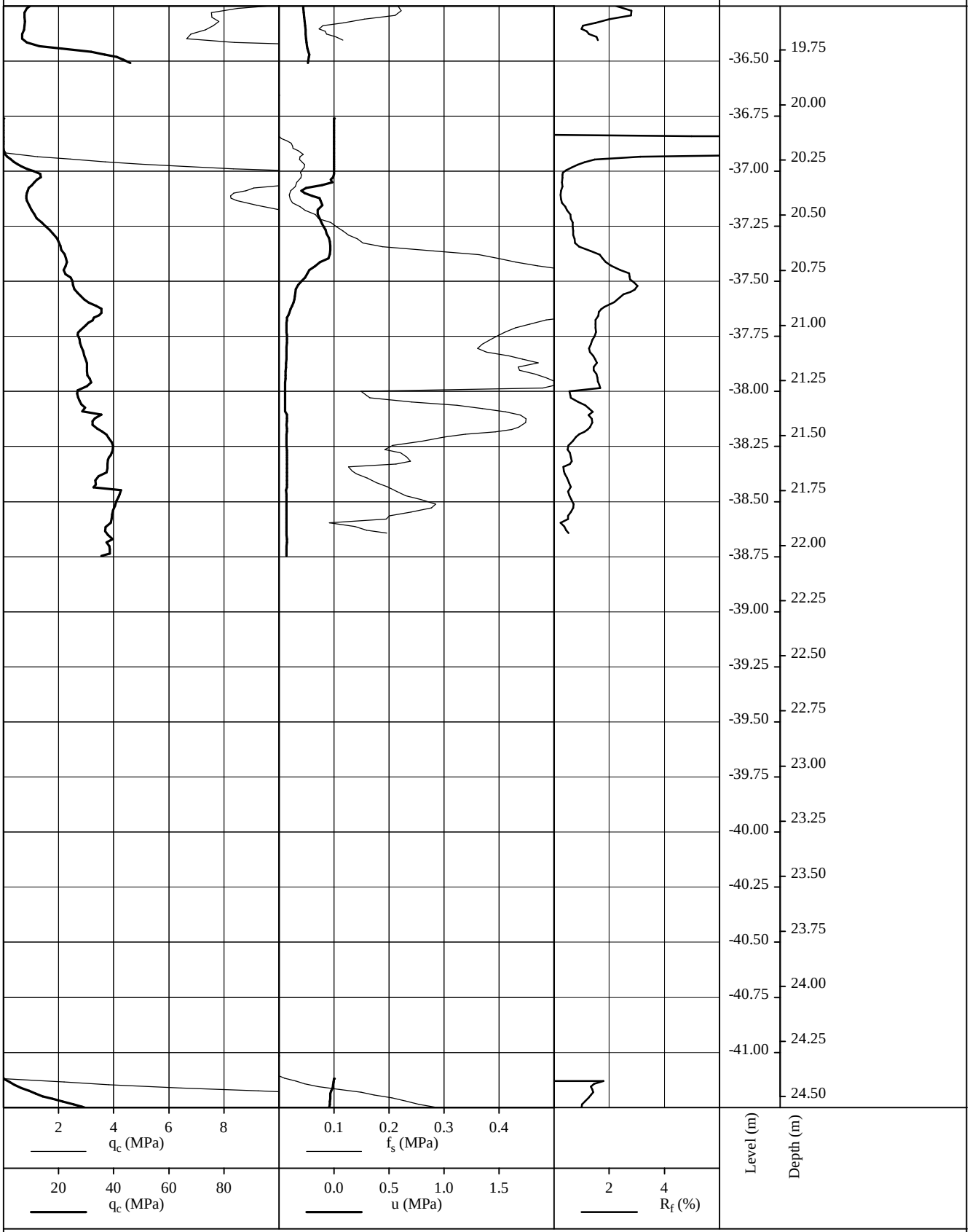

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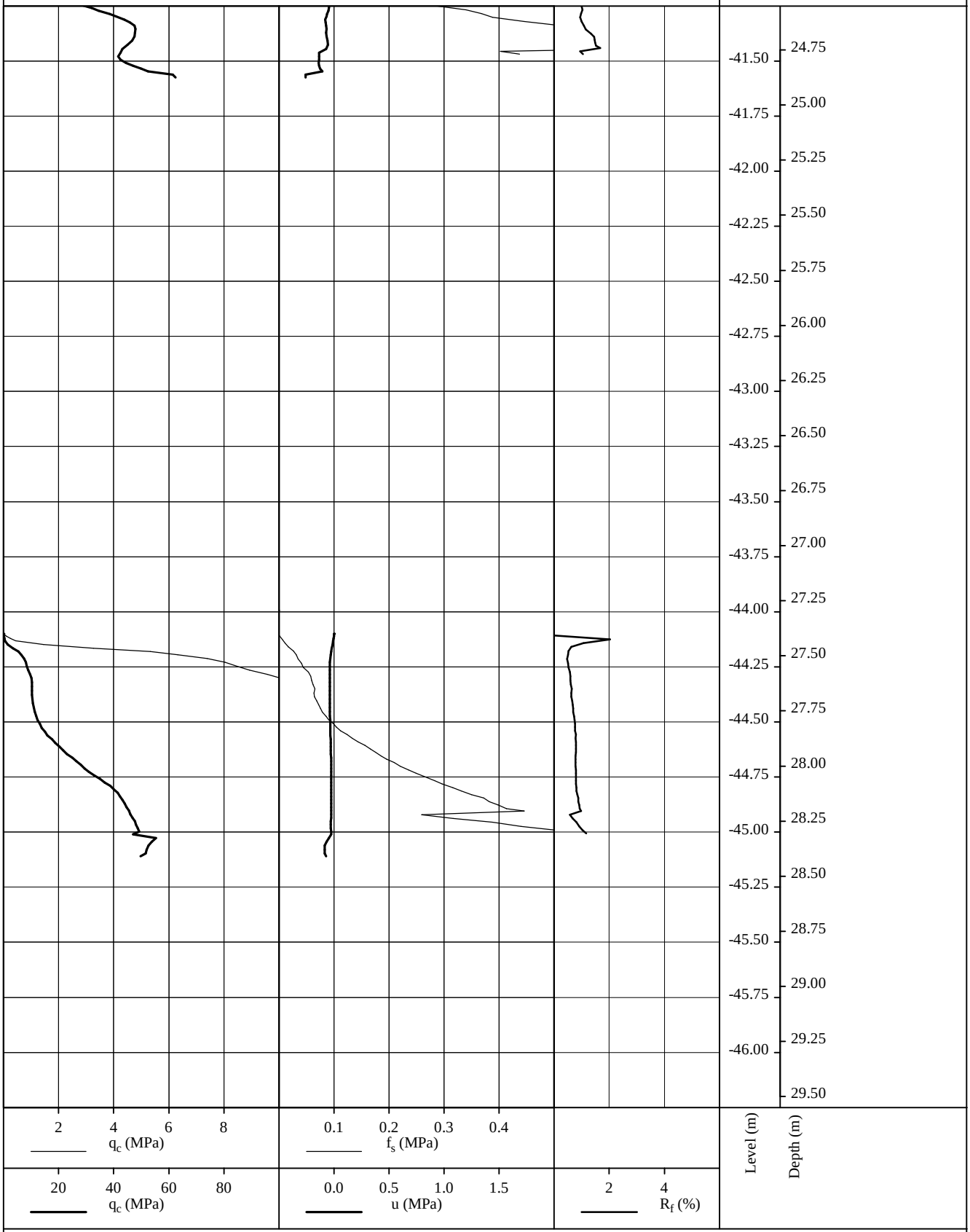

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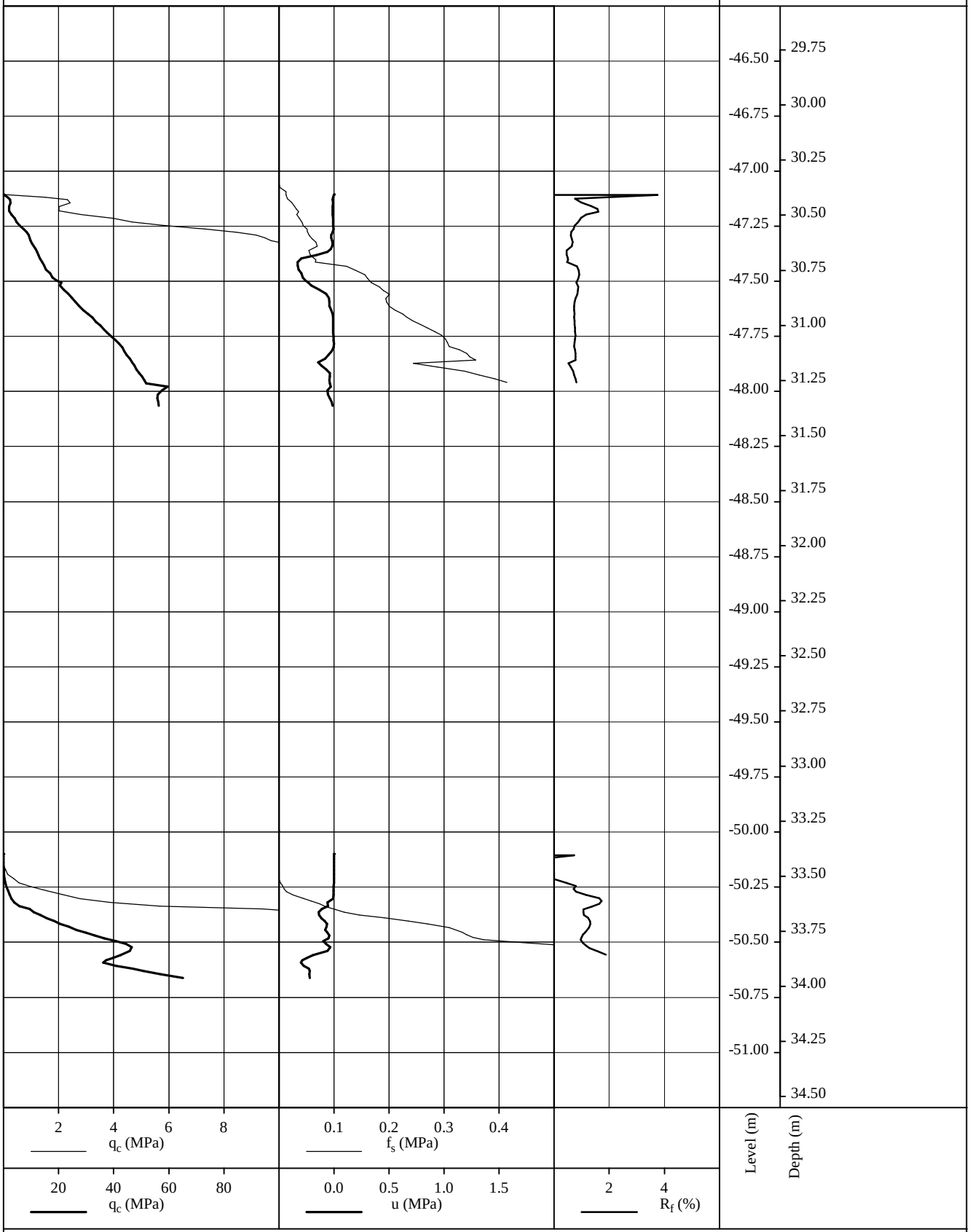

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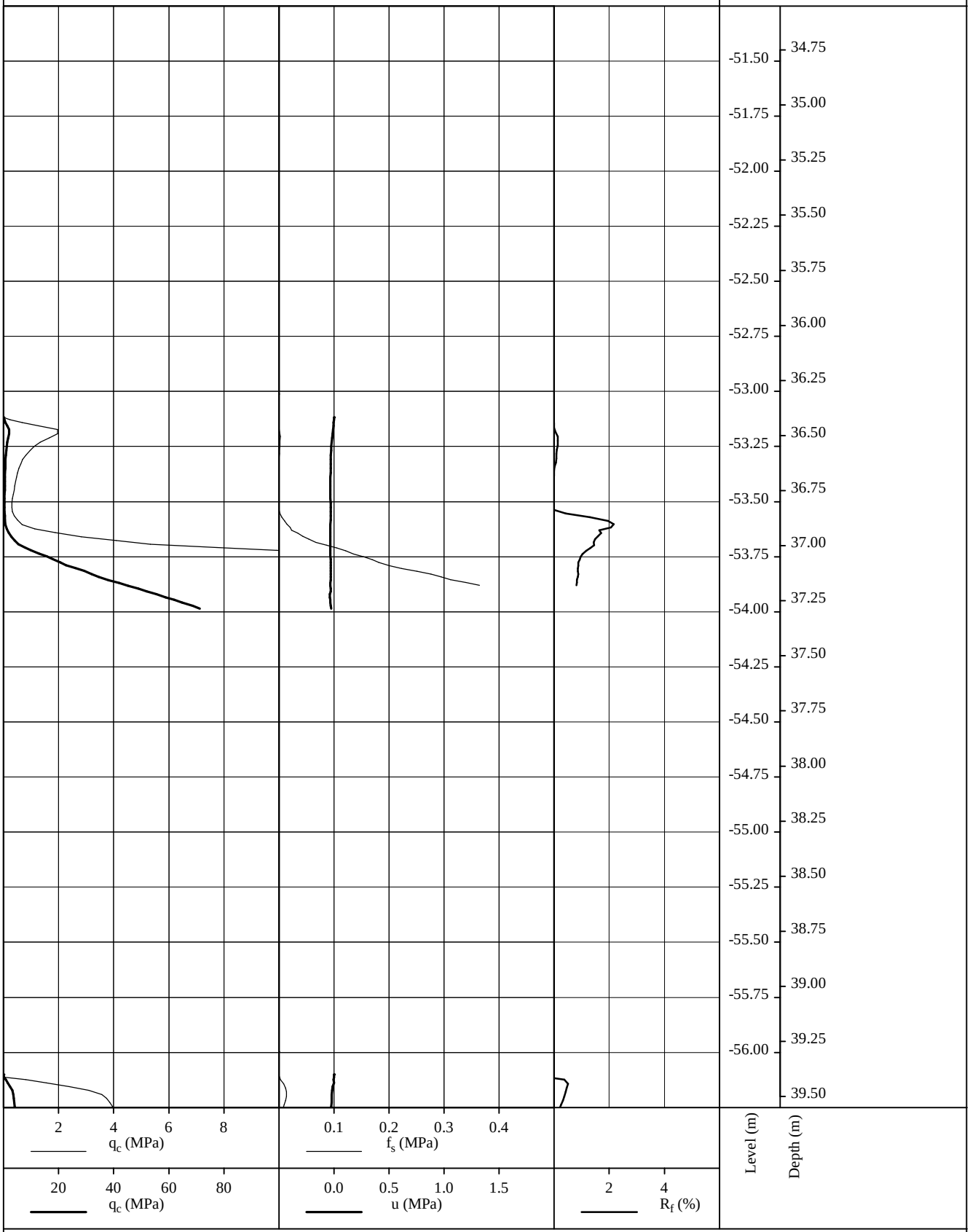

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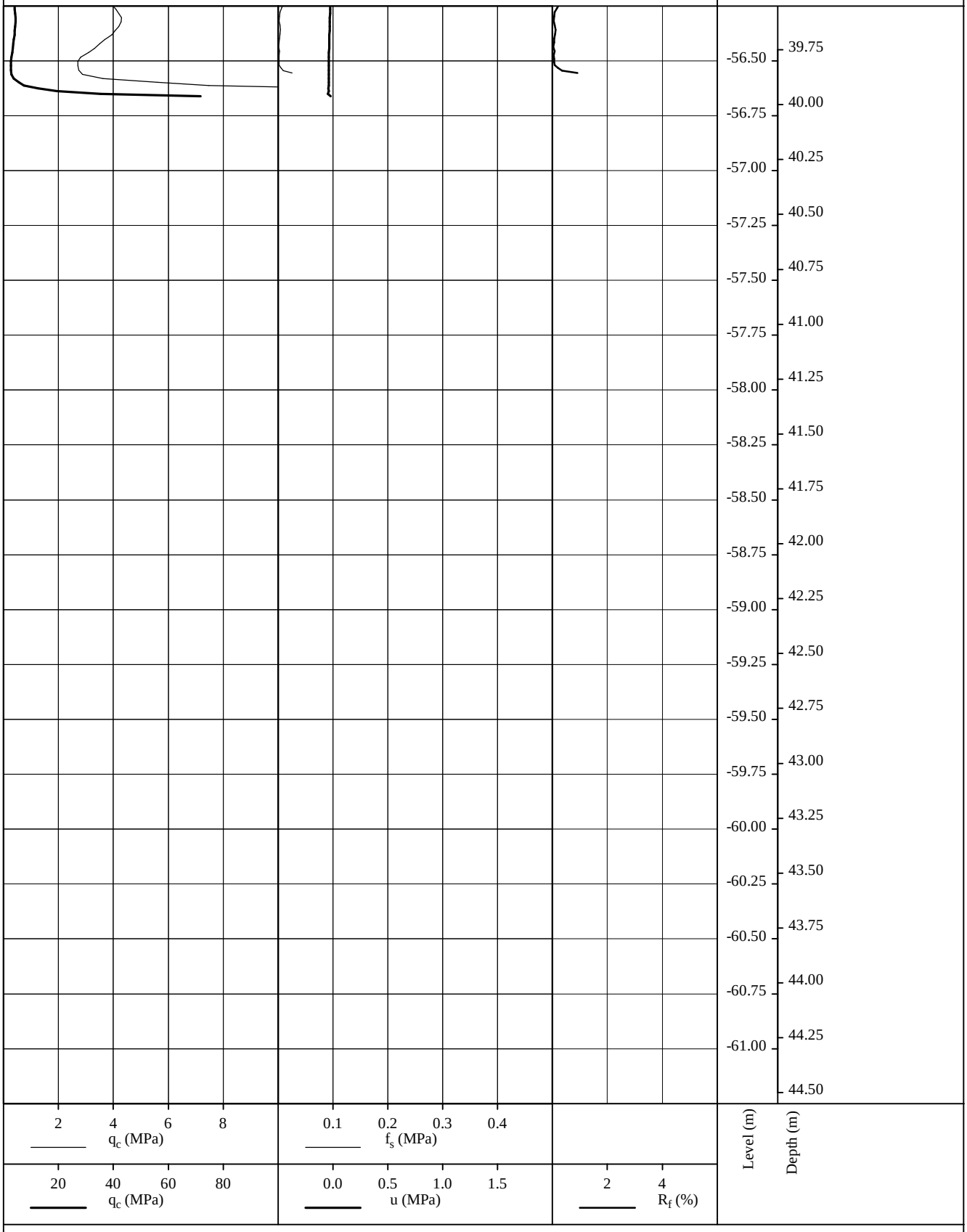

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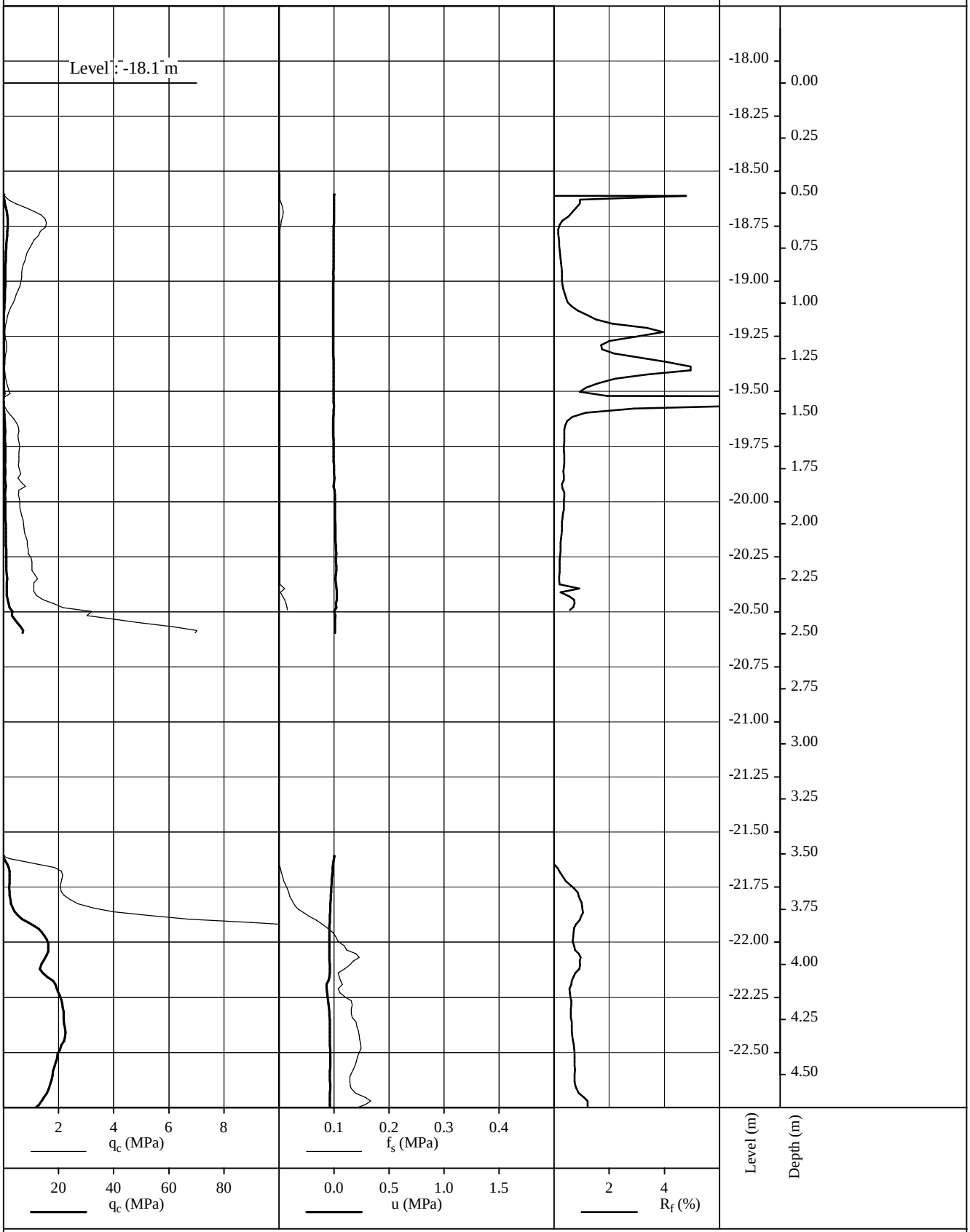

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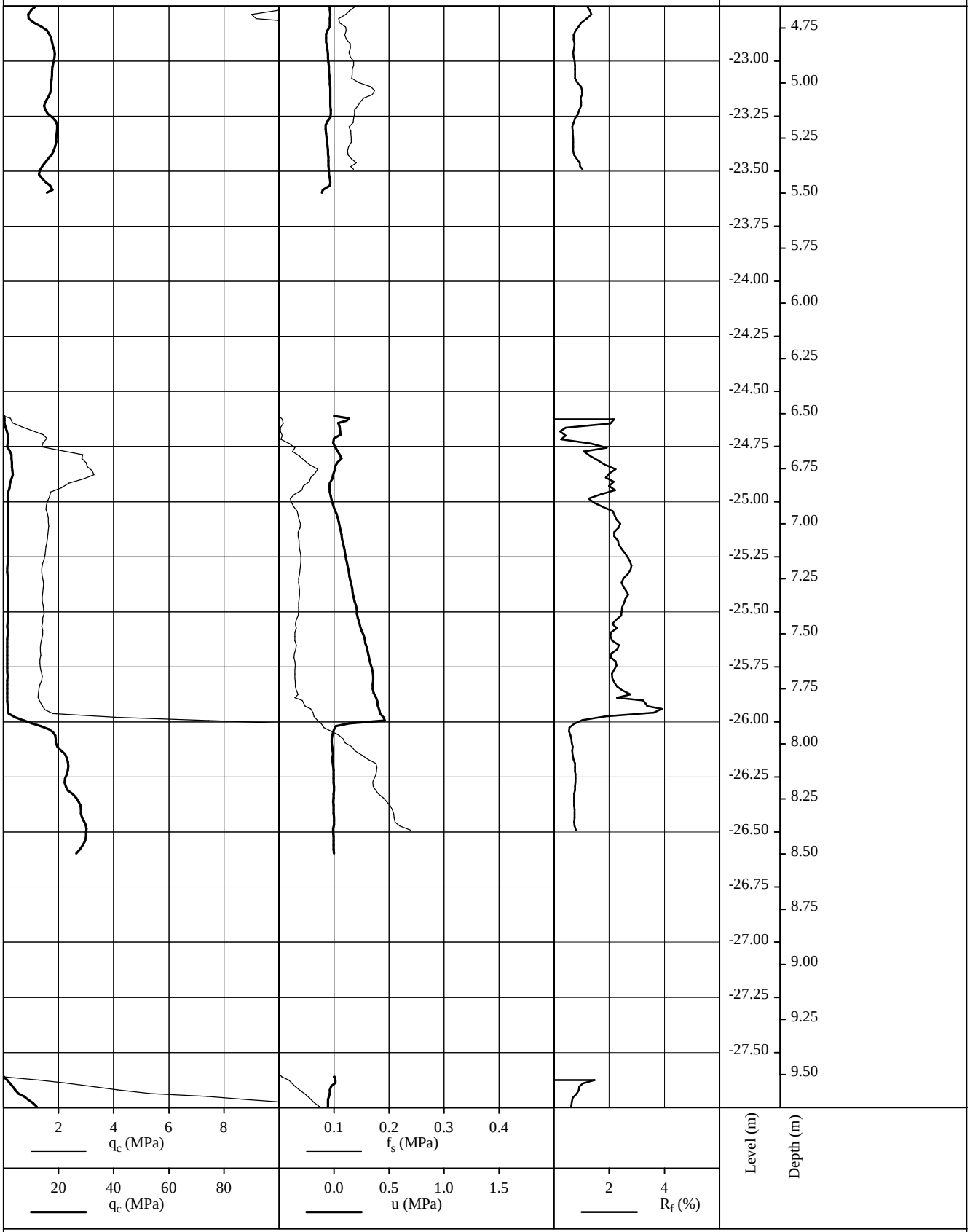

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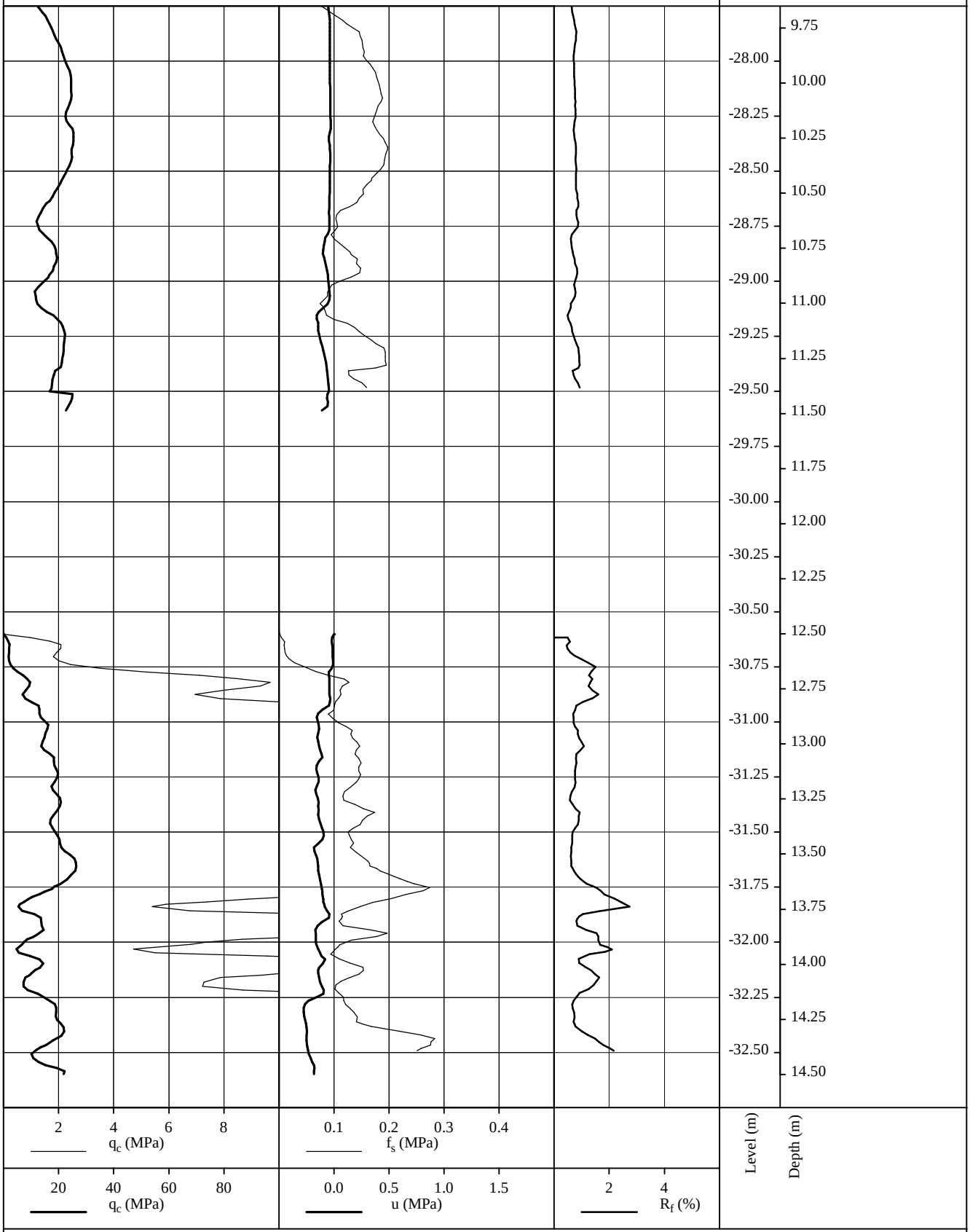

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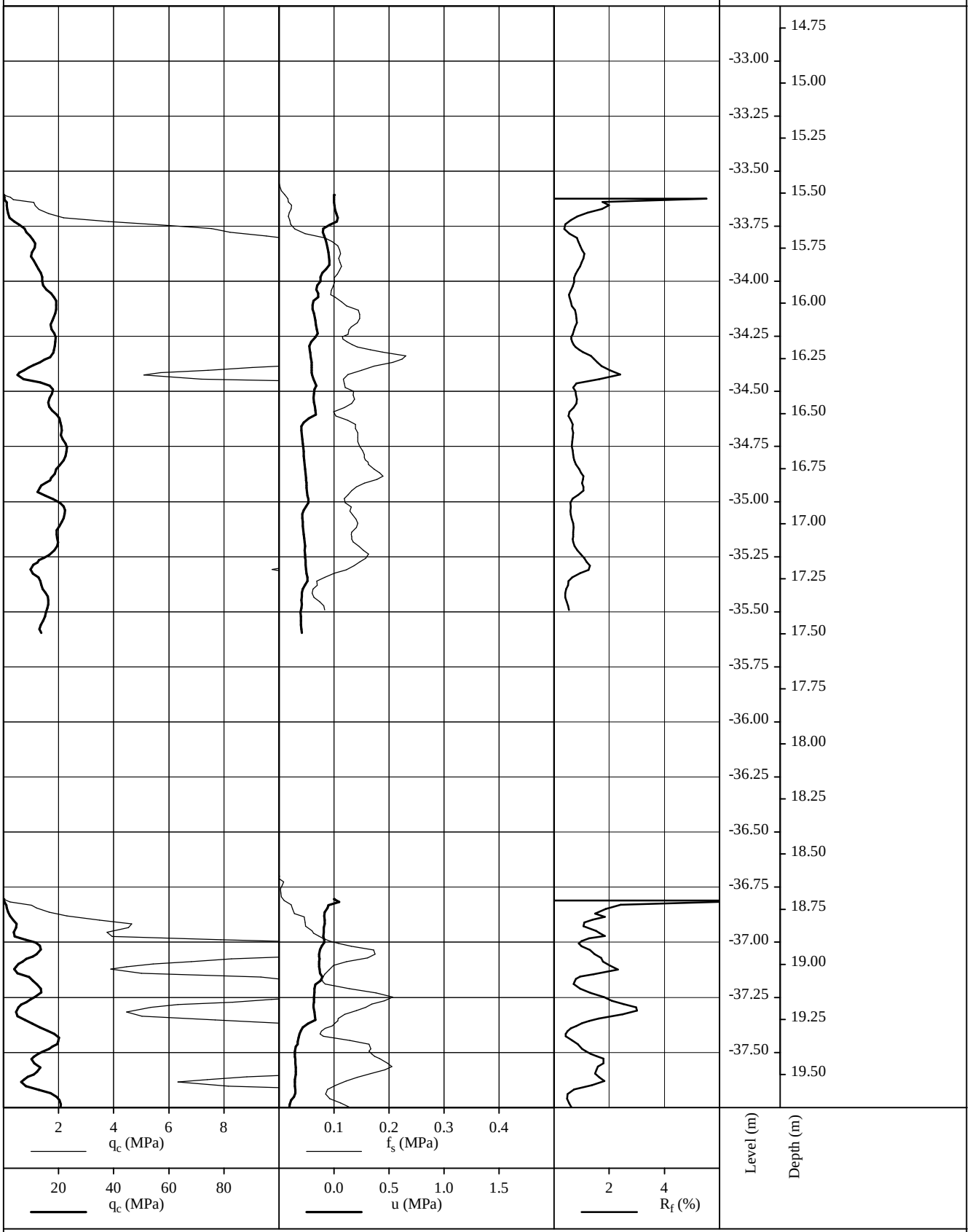

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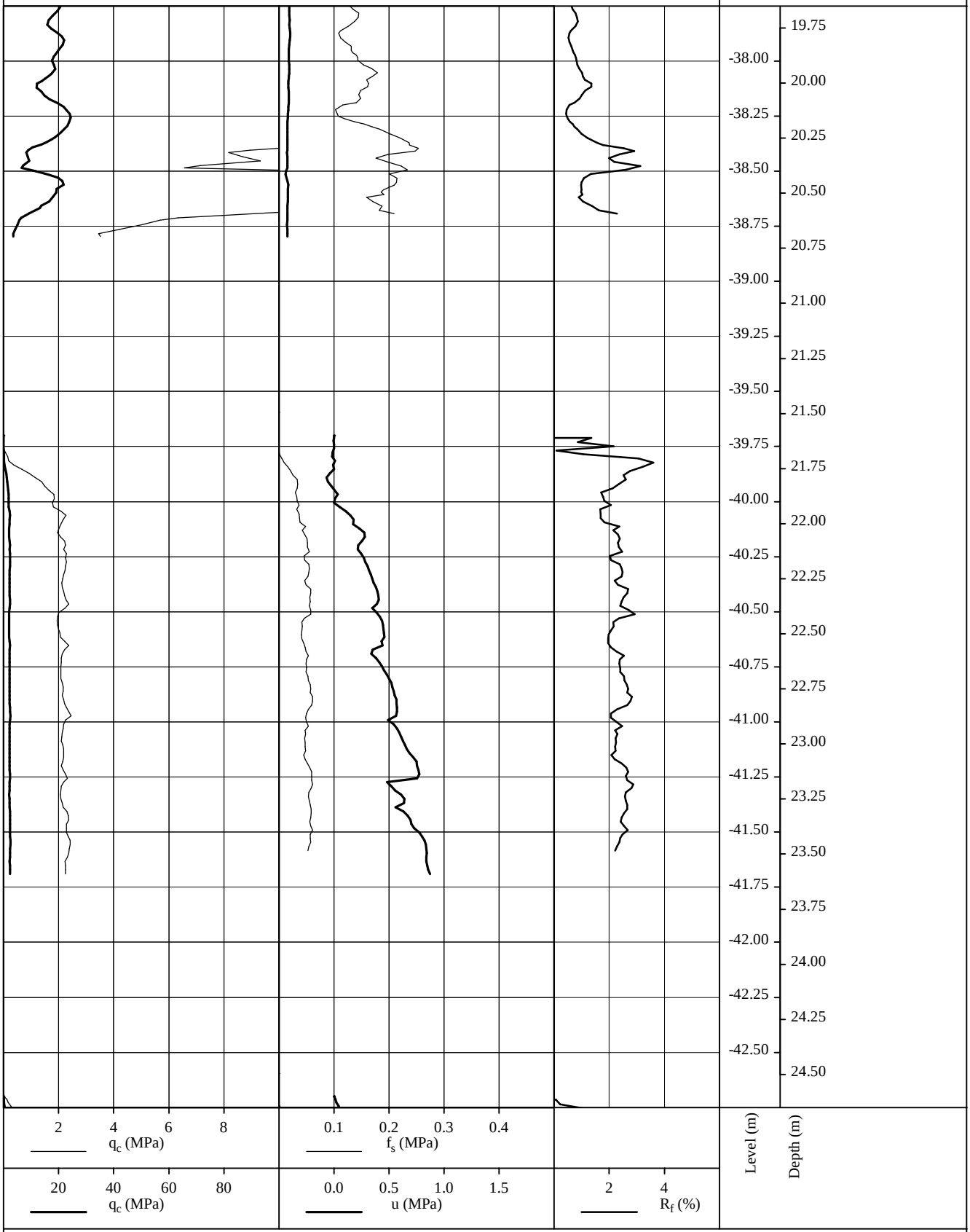

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Date	: 2009-05-24	Cone area	: 10.0 cm^2	Remark	:

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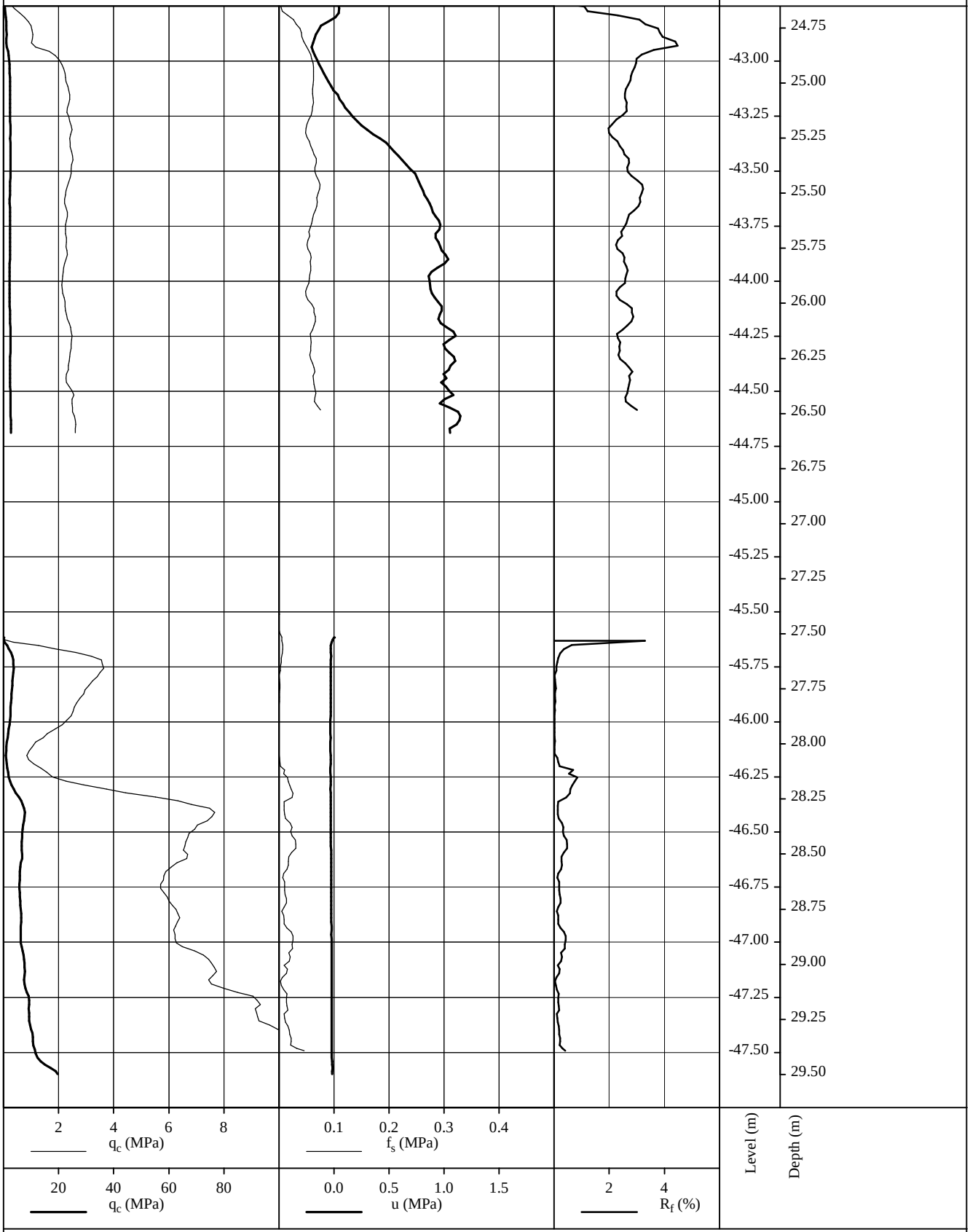

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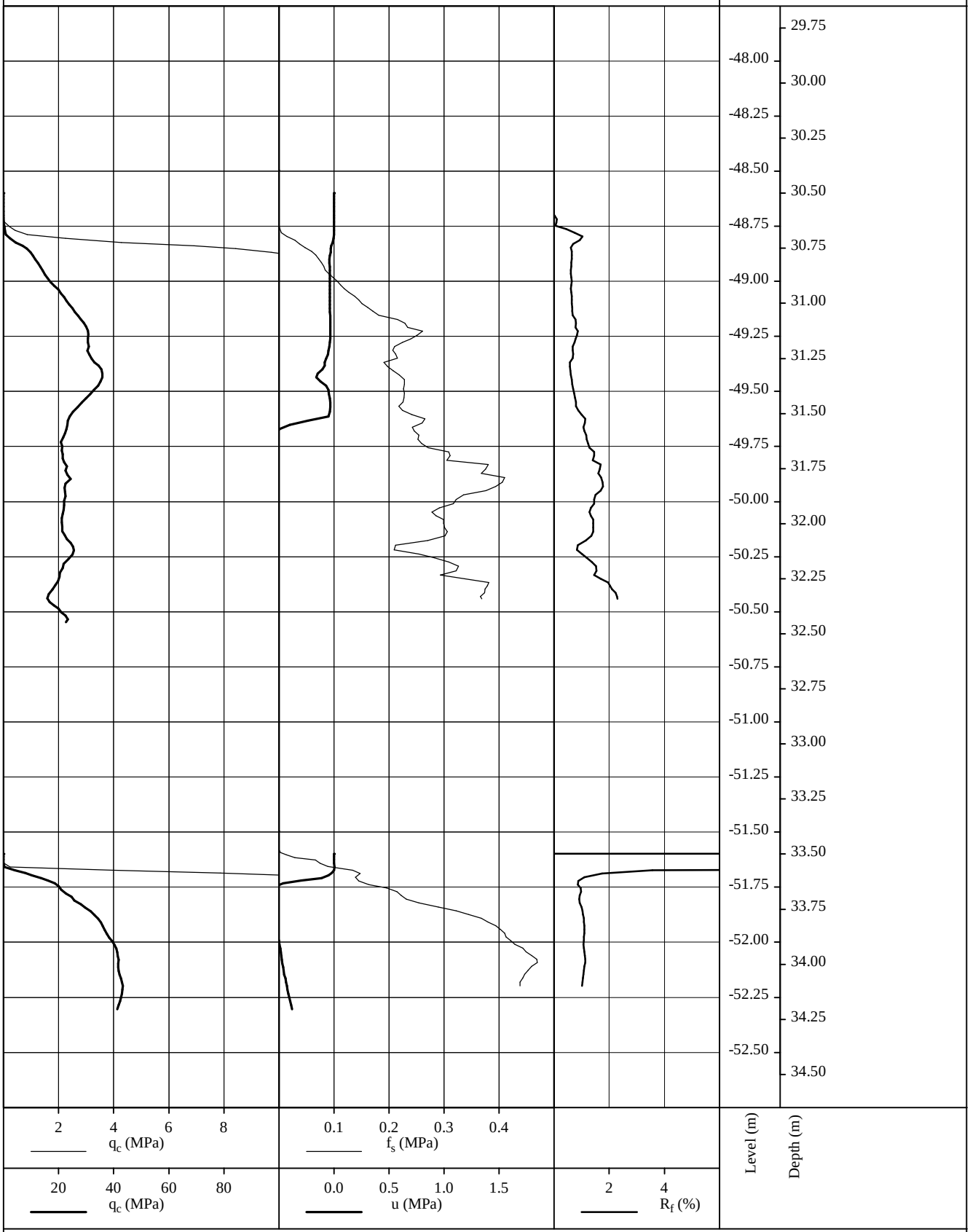

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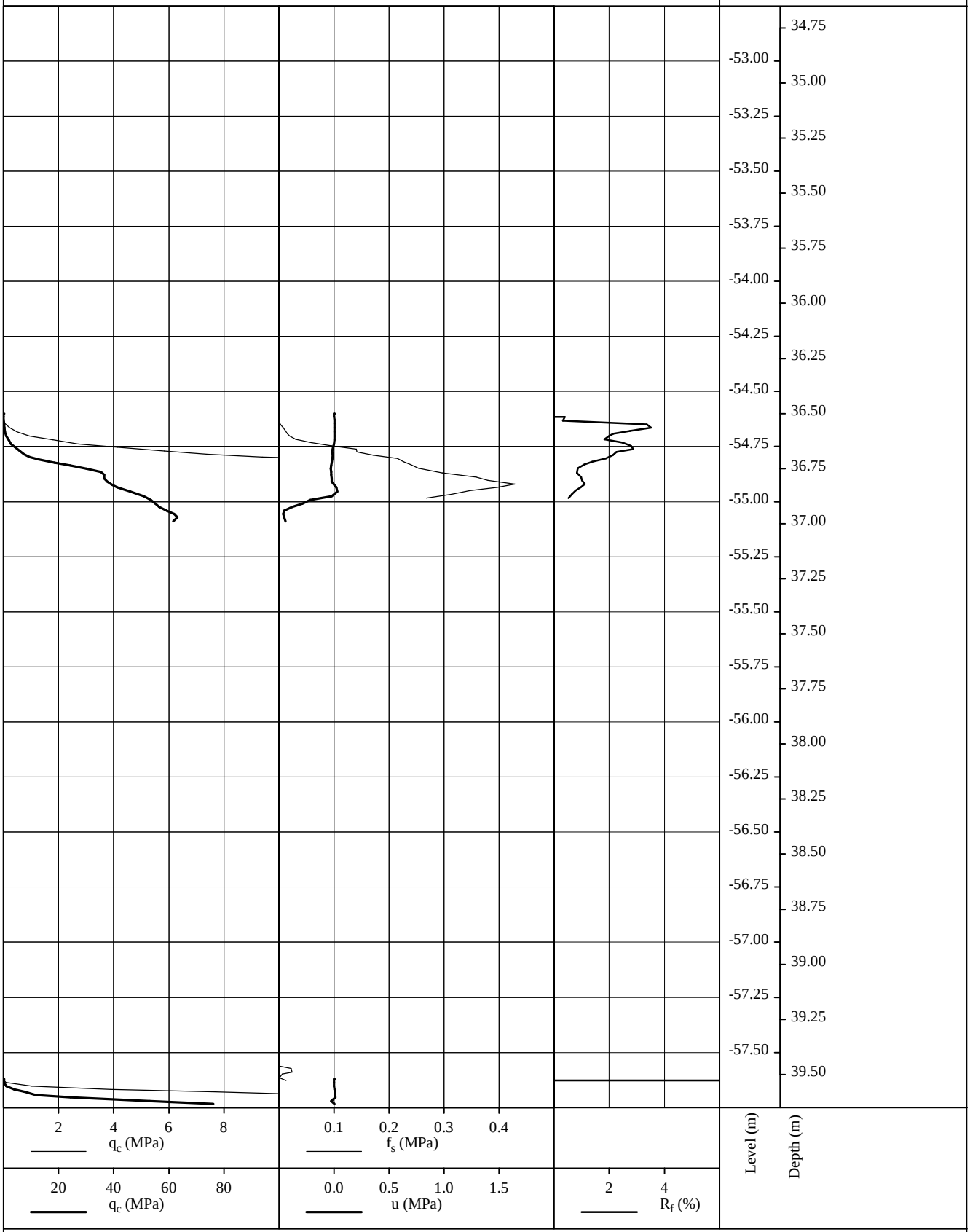

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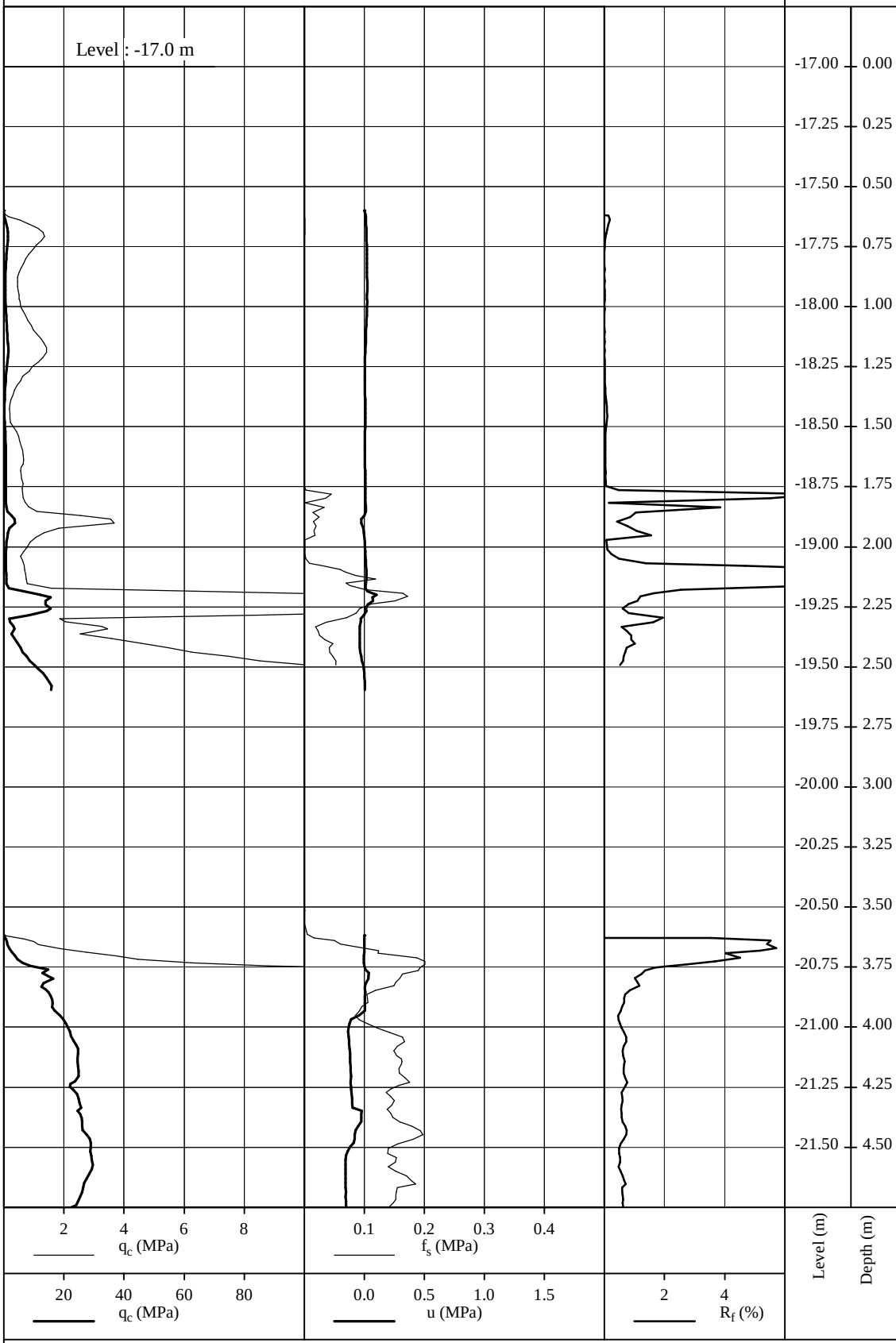

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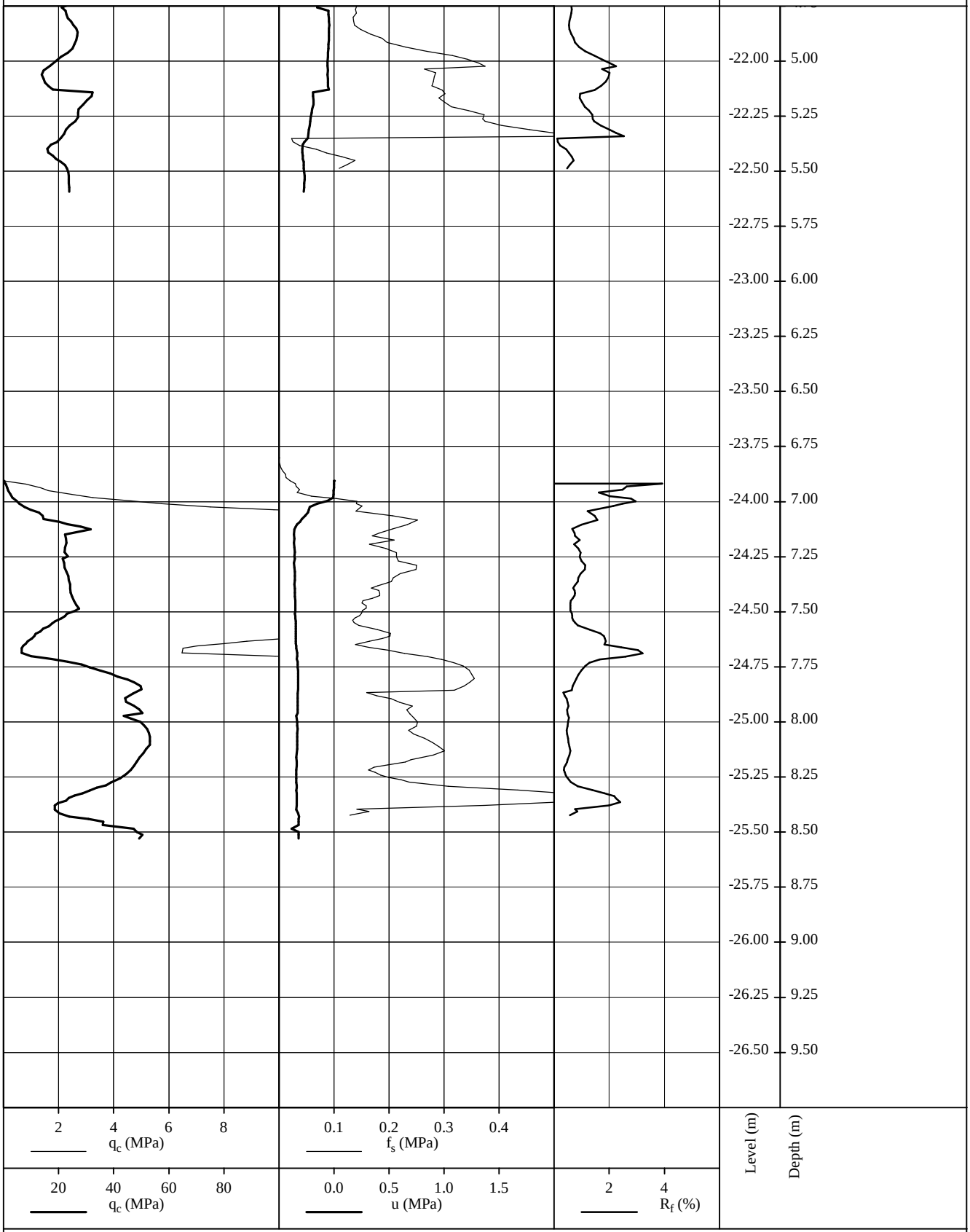
CPT name : BH07



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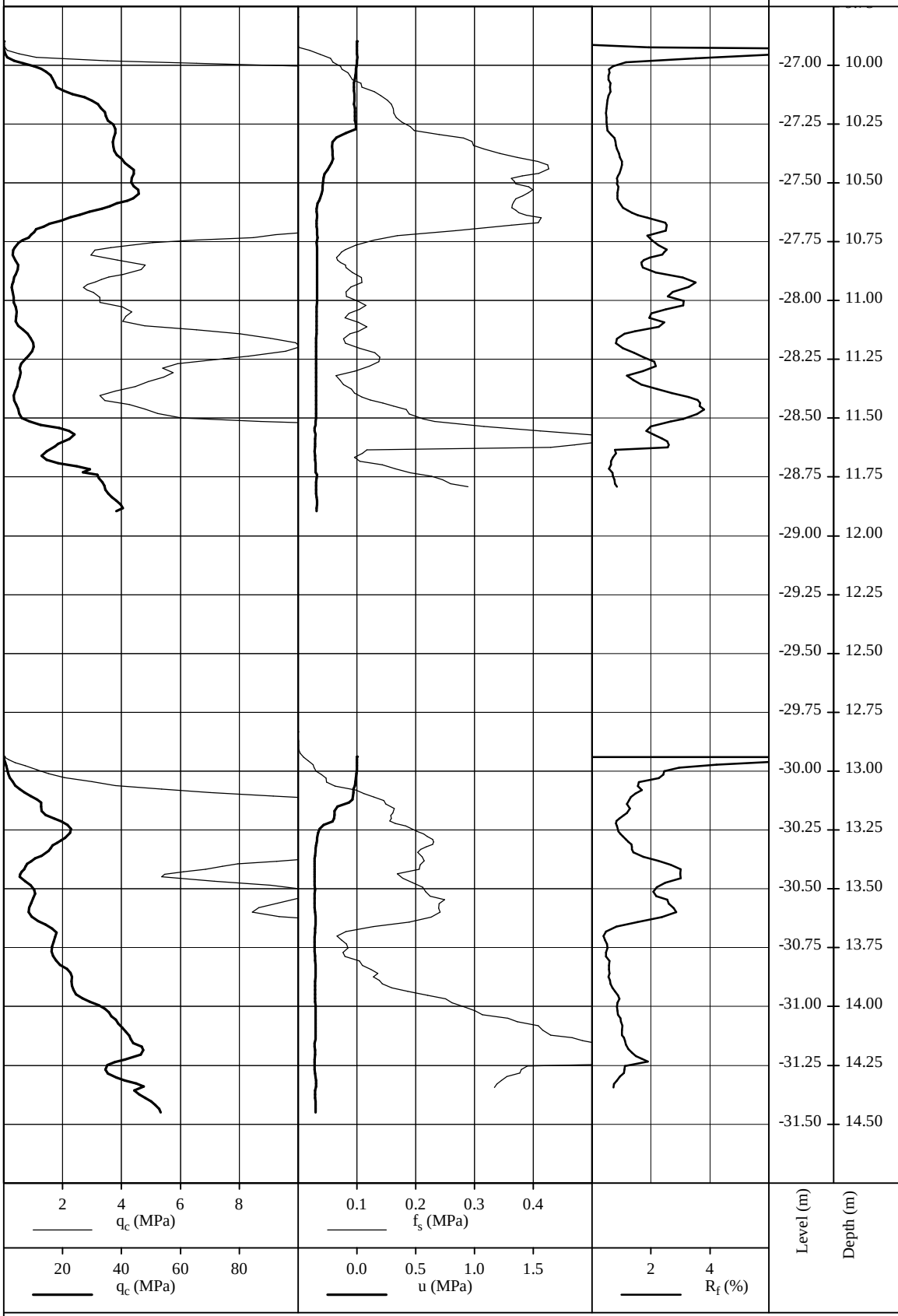

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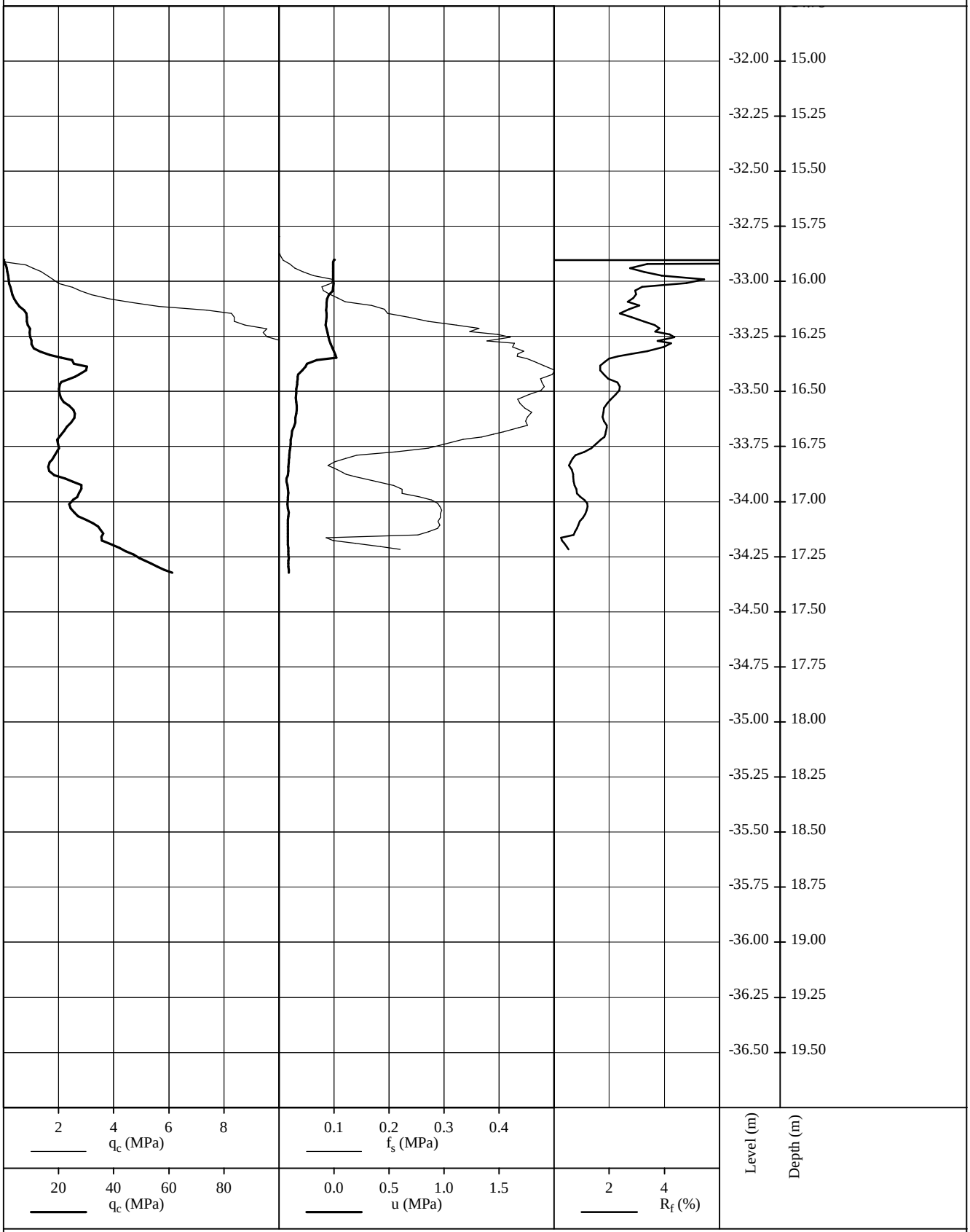

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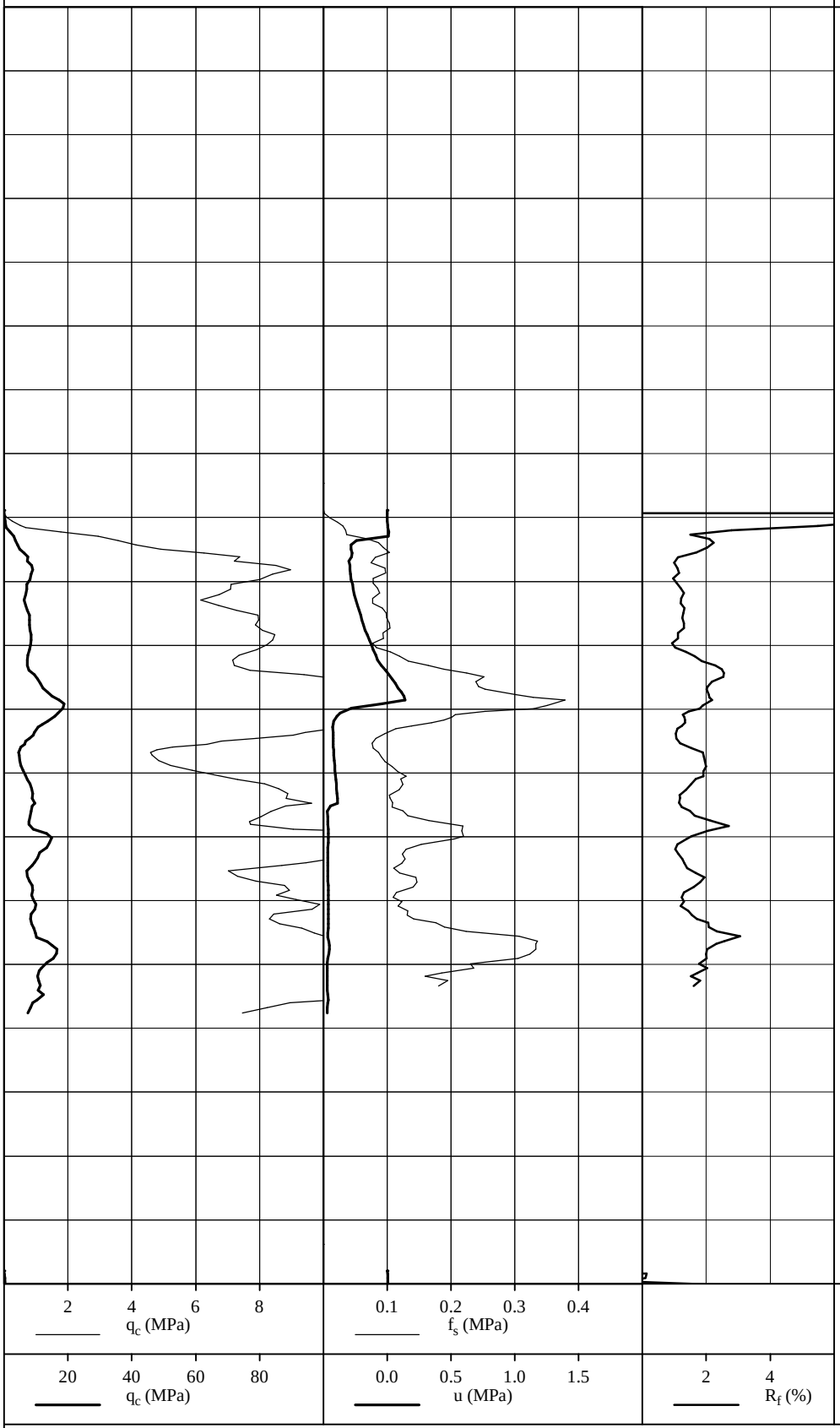

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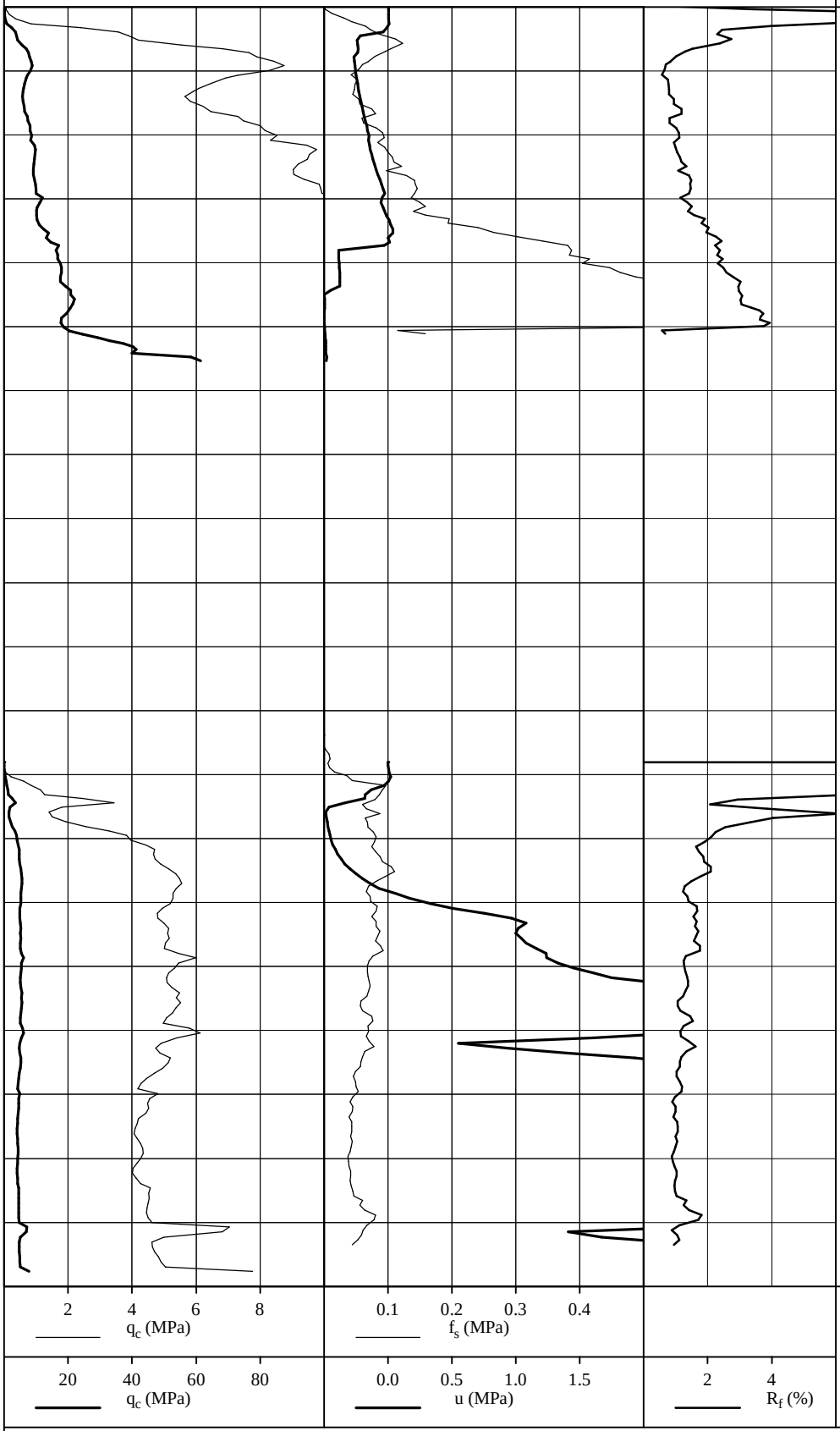

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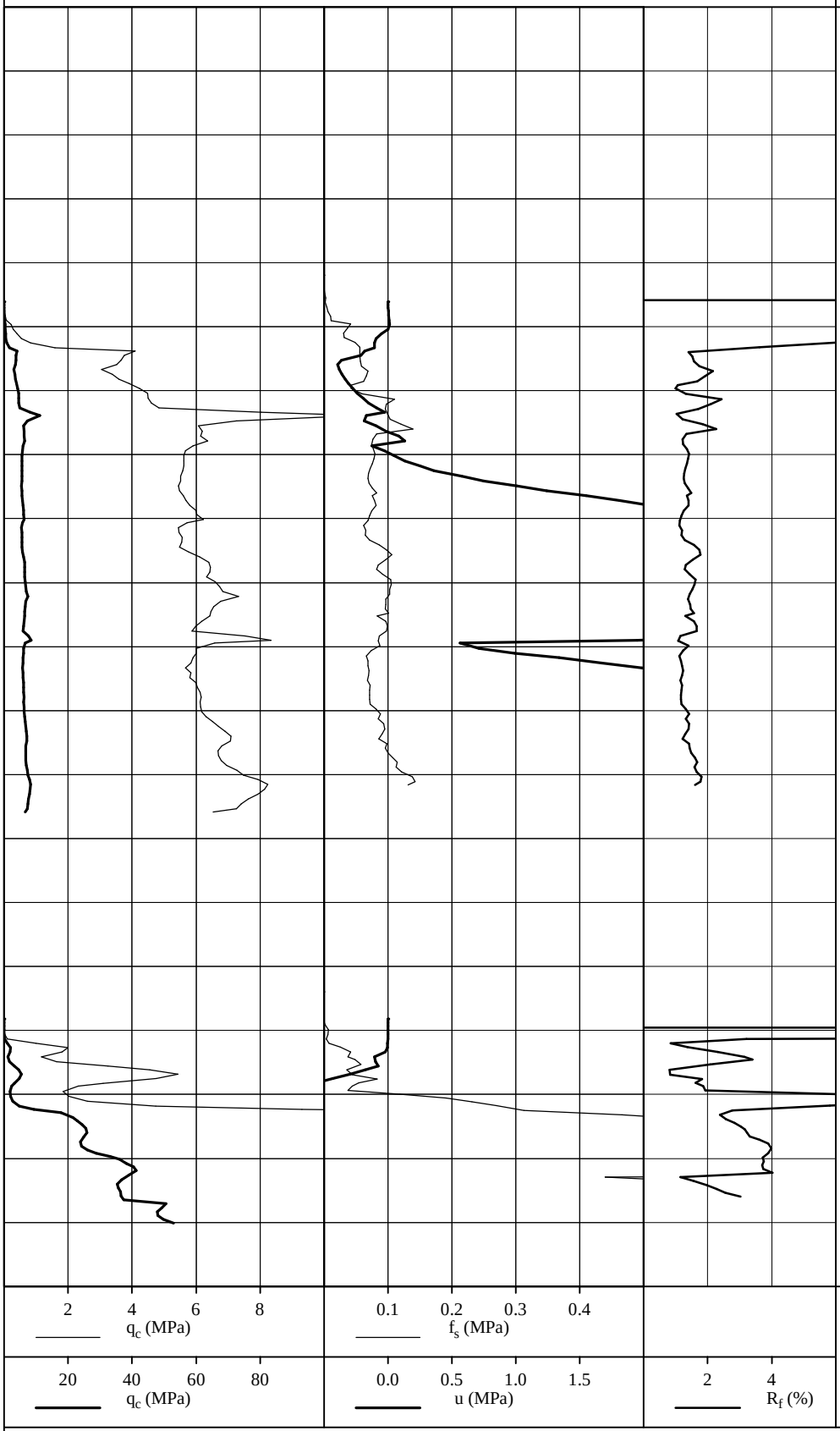

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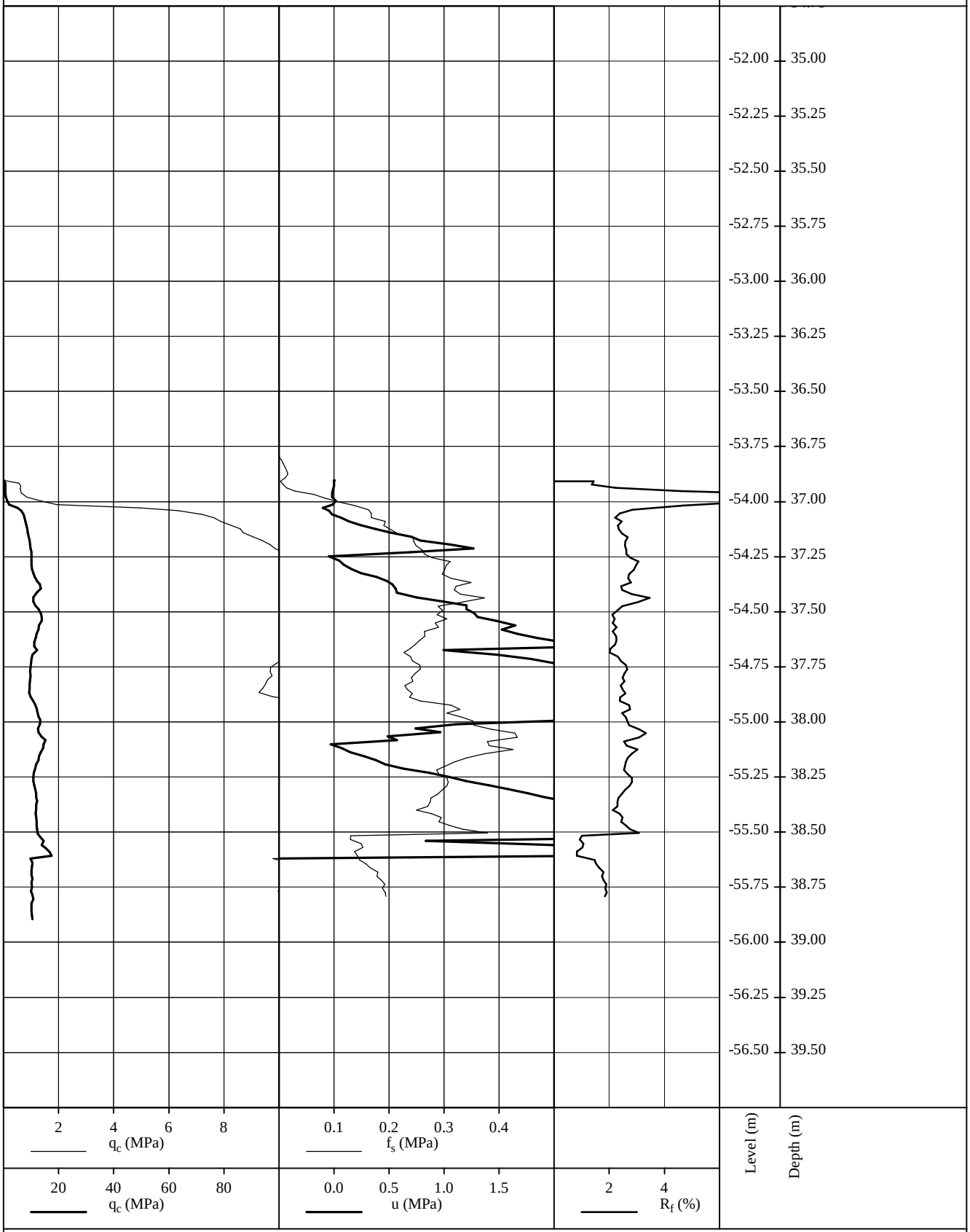

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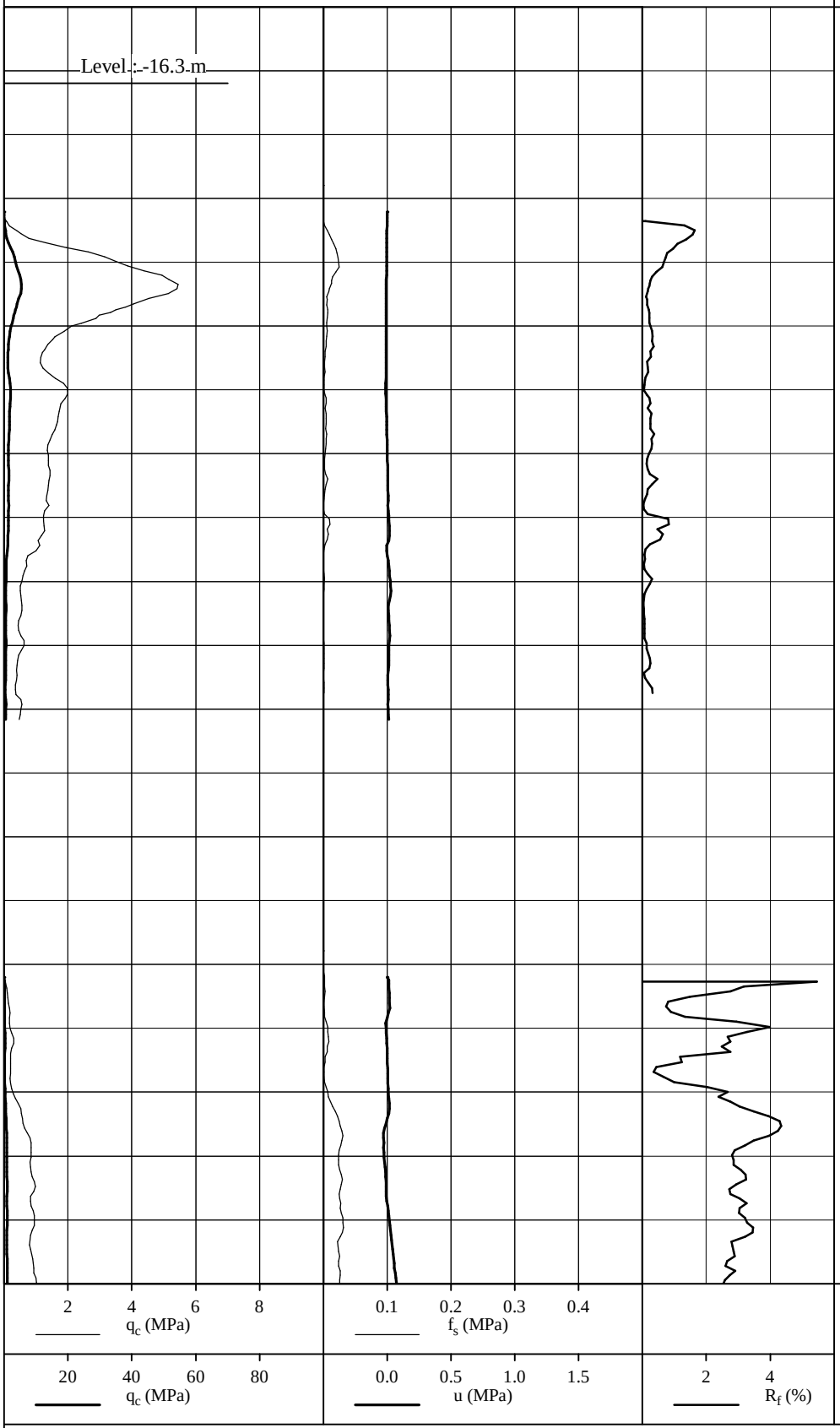

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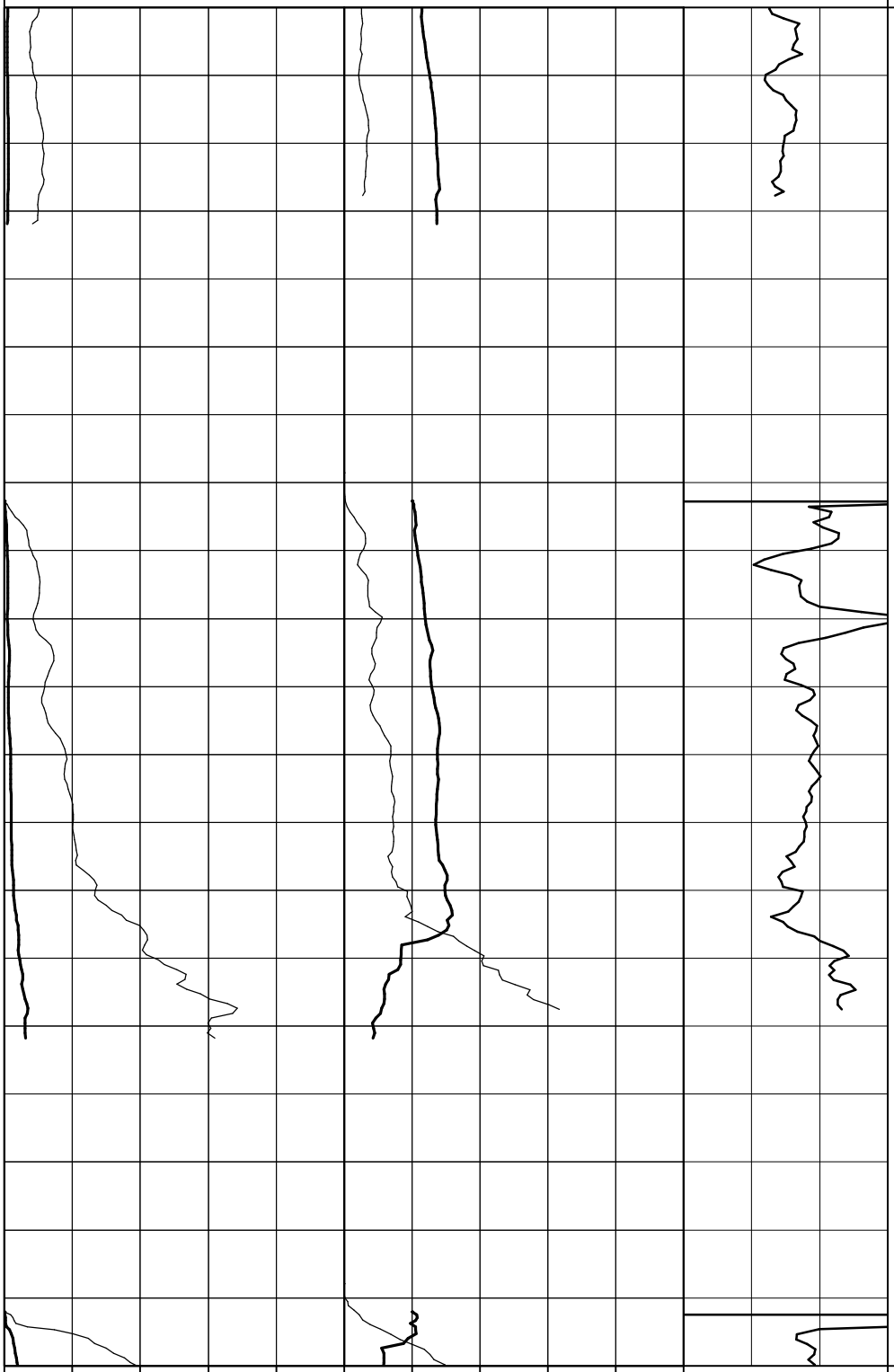

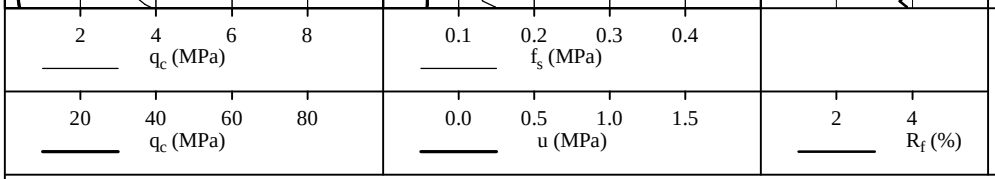

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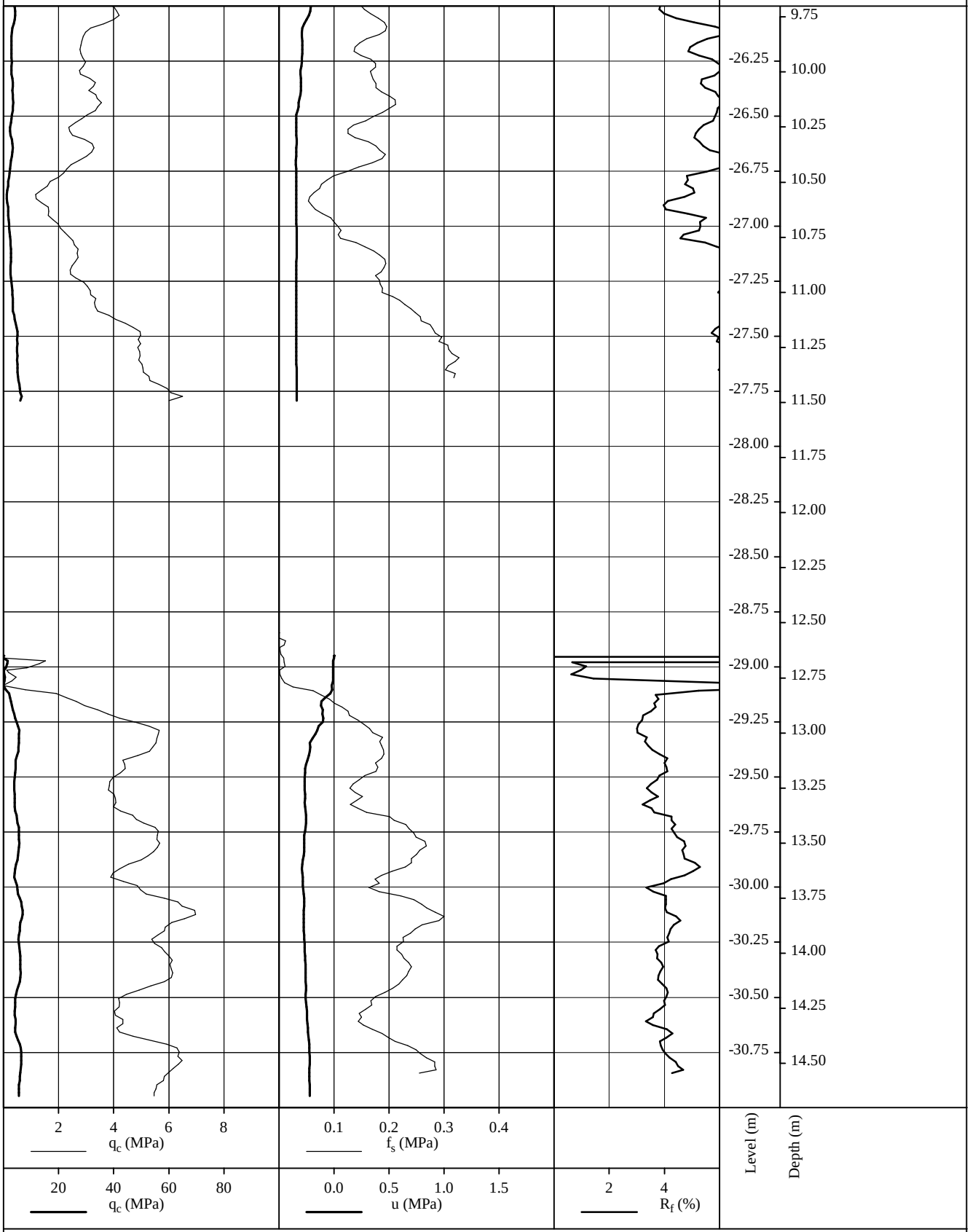

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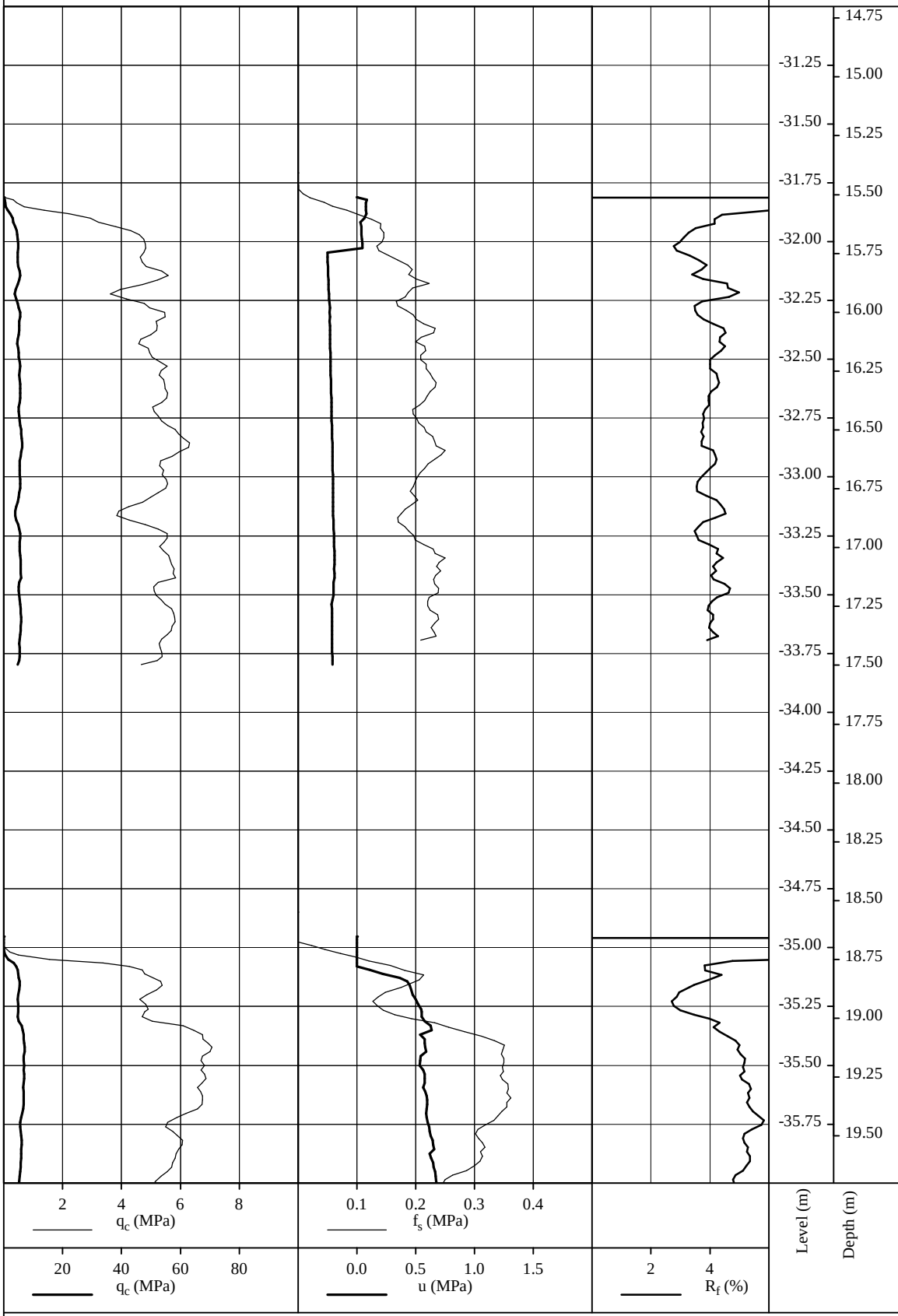

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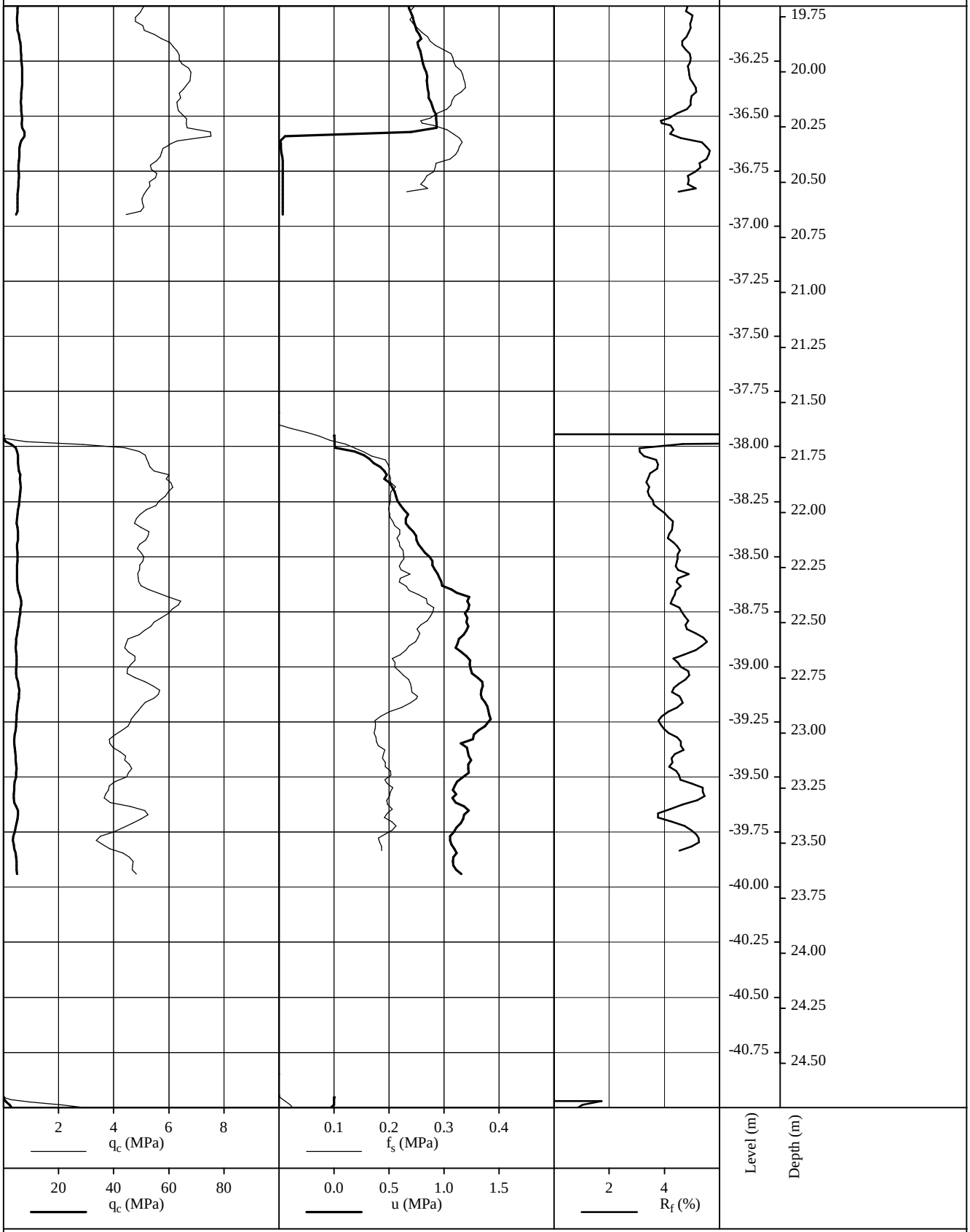

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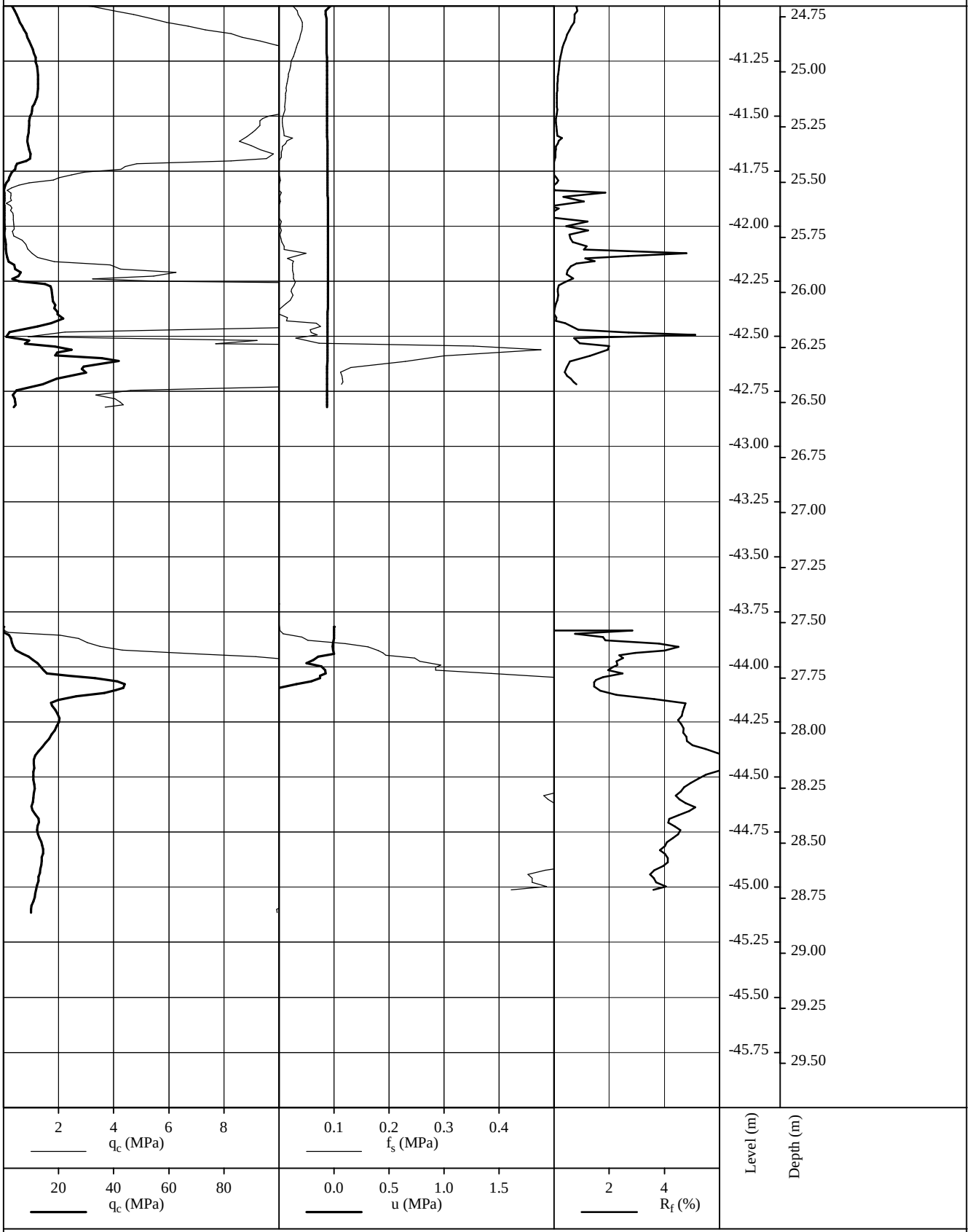

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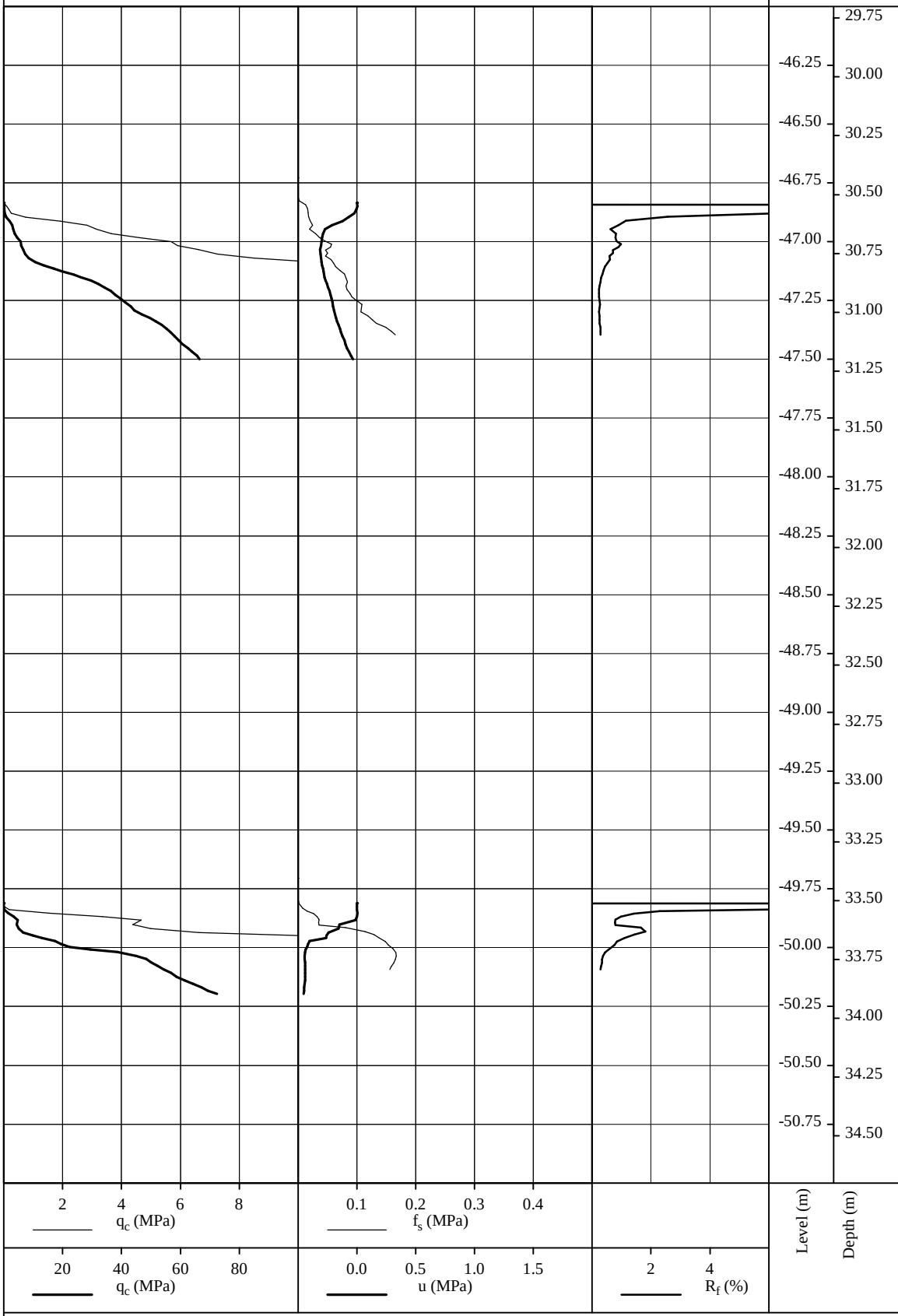

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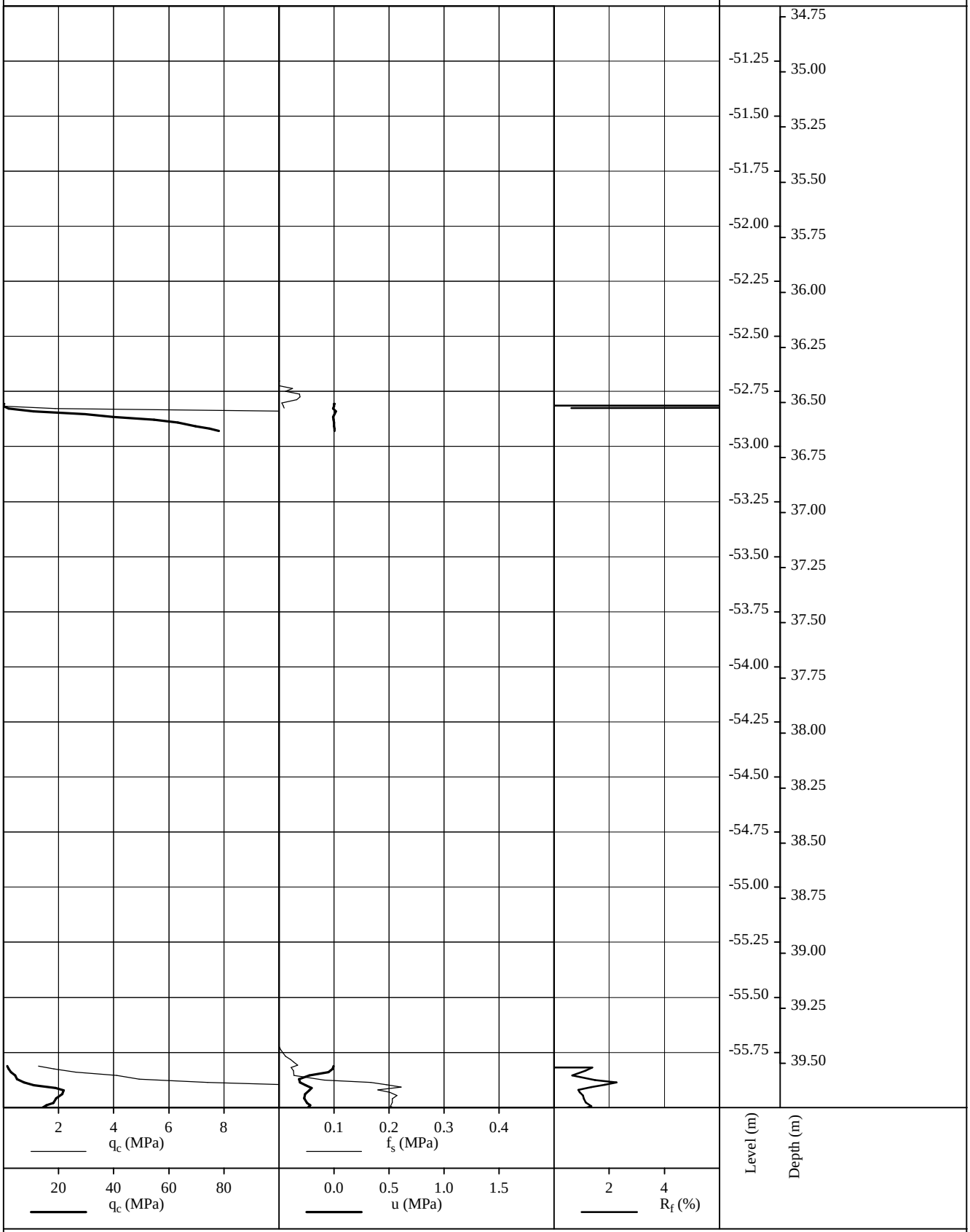

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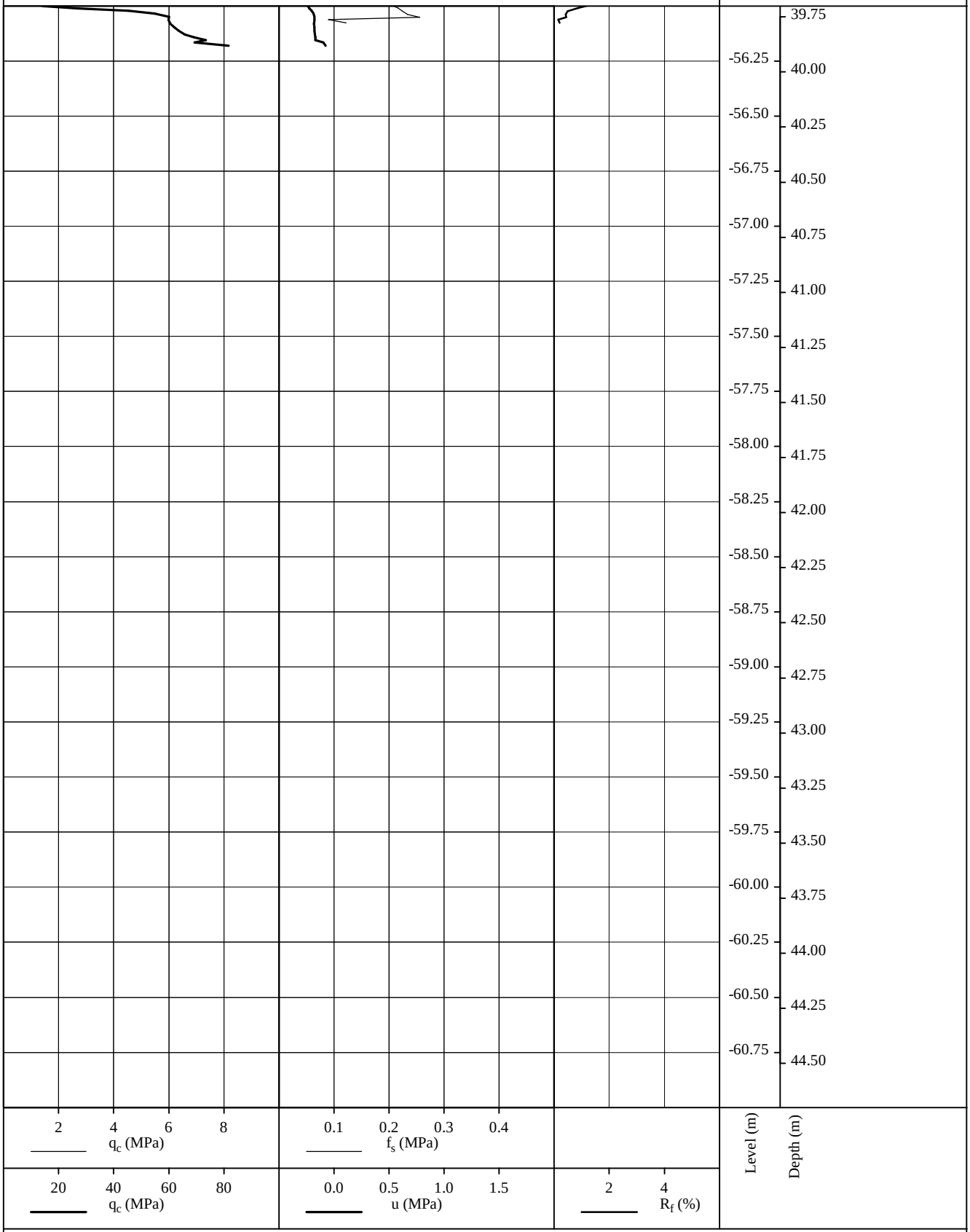

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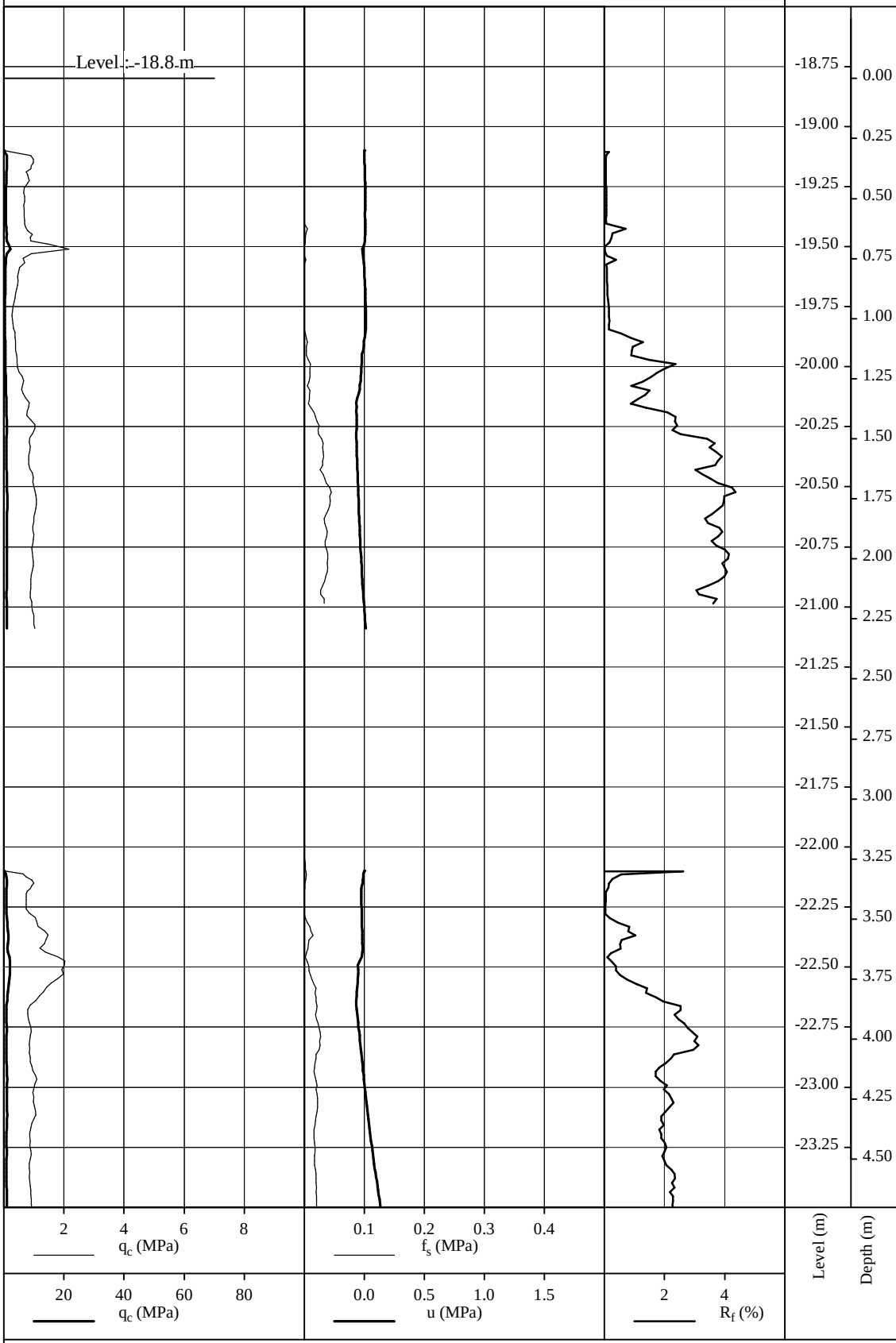

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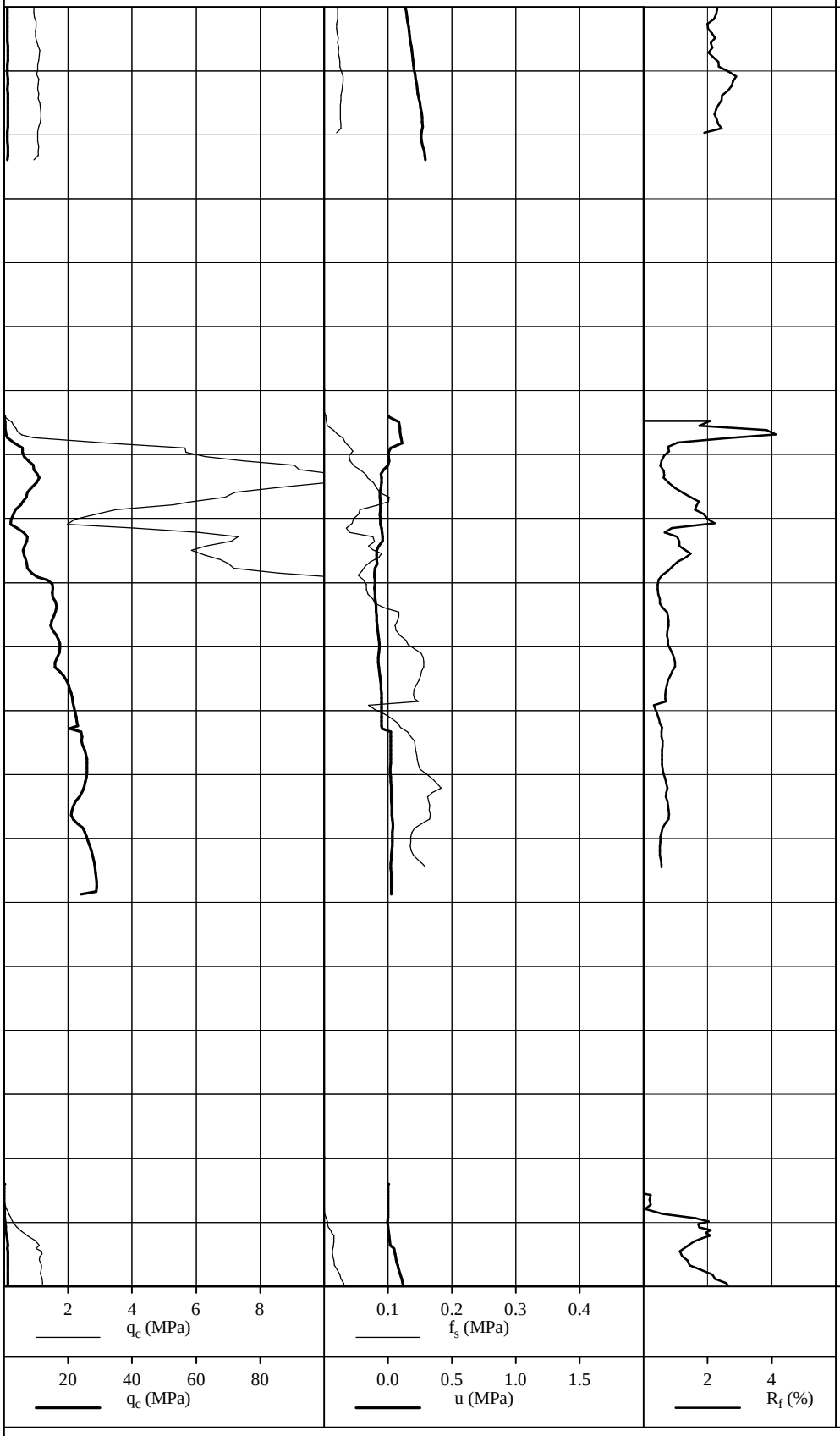

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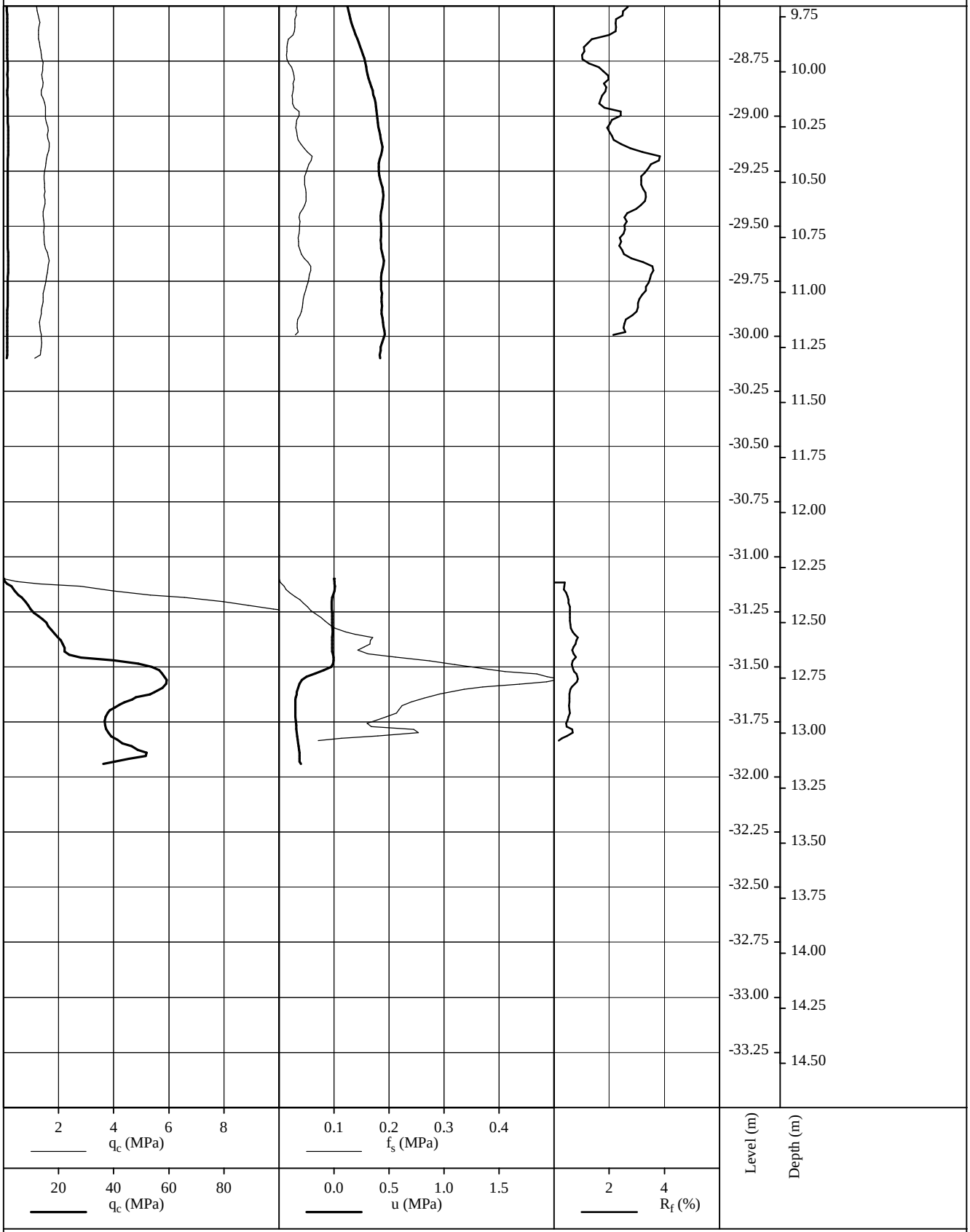

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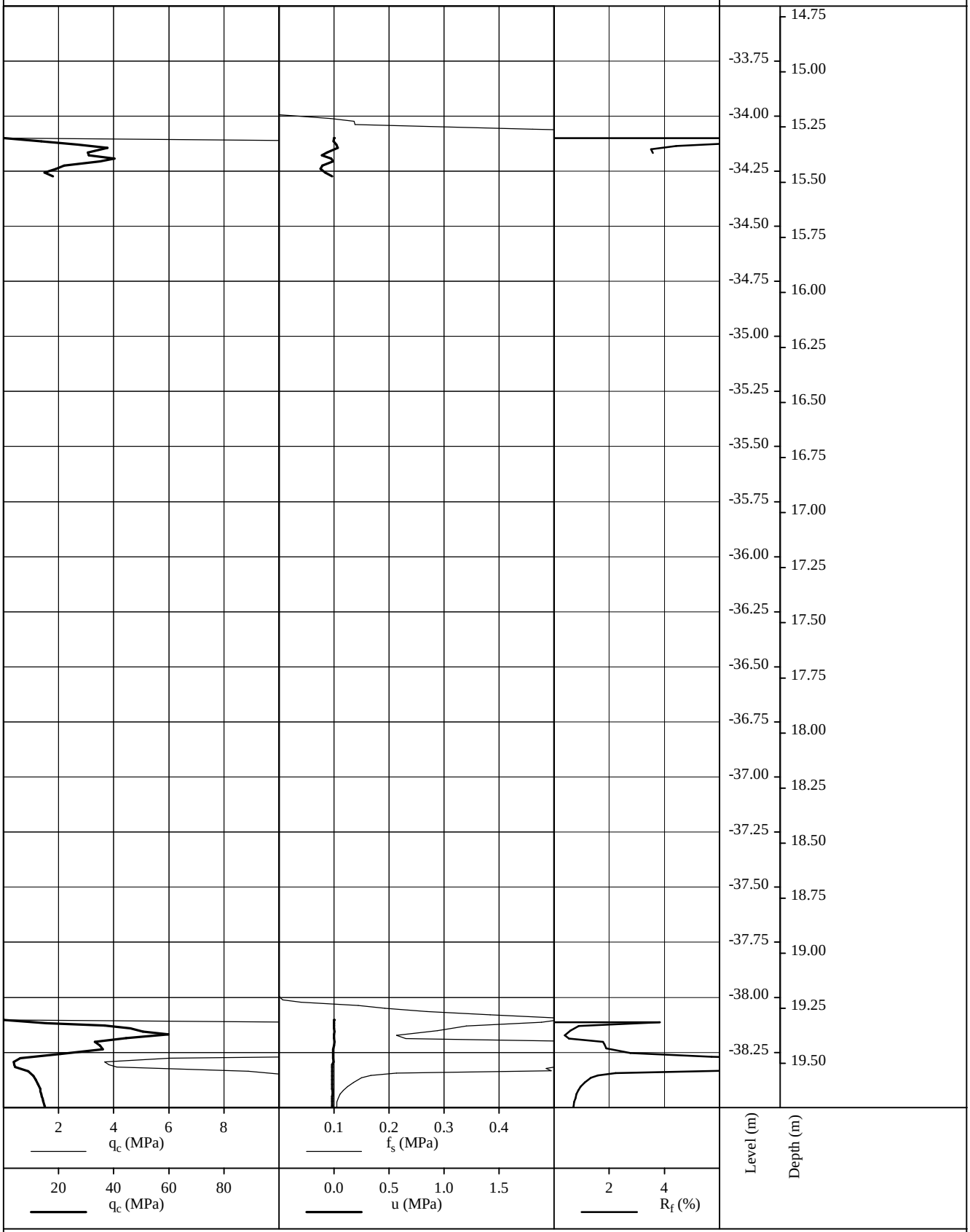

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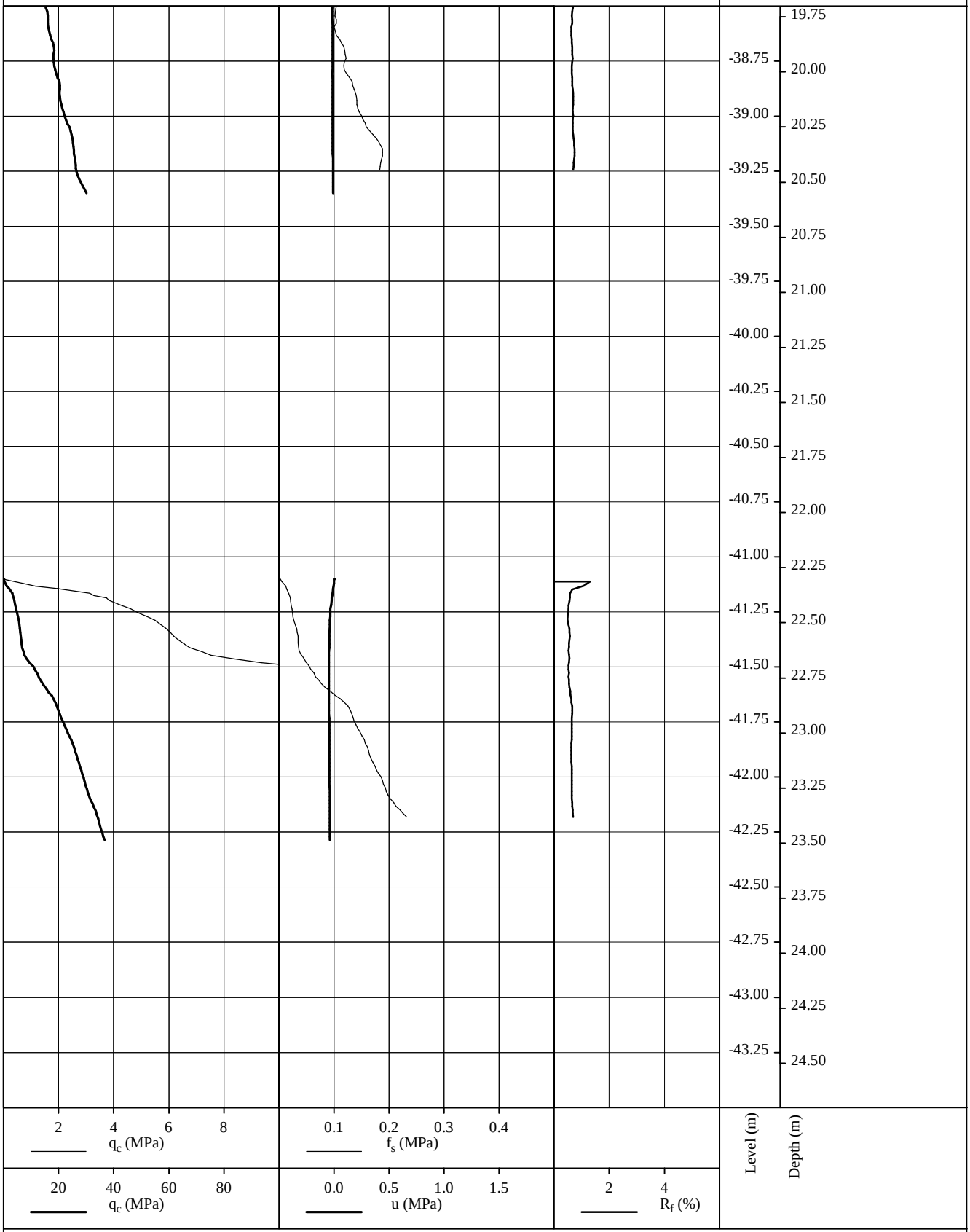
Printed 2009-07-09 11:16:10

CPT name : BH10



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N	: 6278390	Cone type	: TSP	Performed by	: JFP
Date	: 2009-05-30	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

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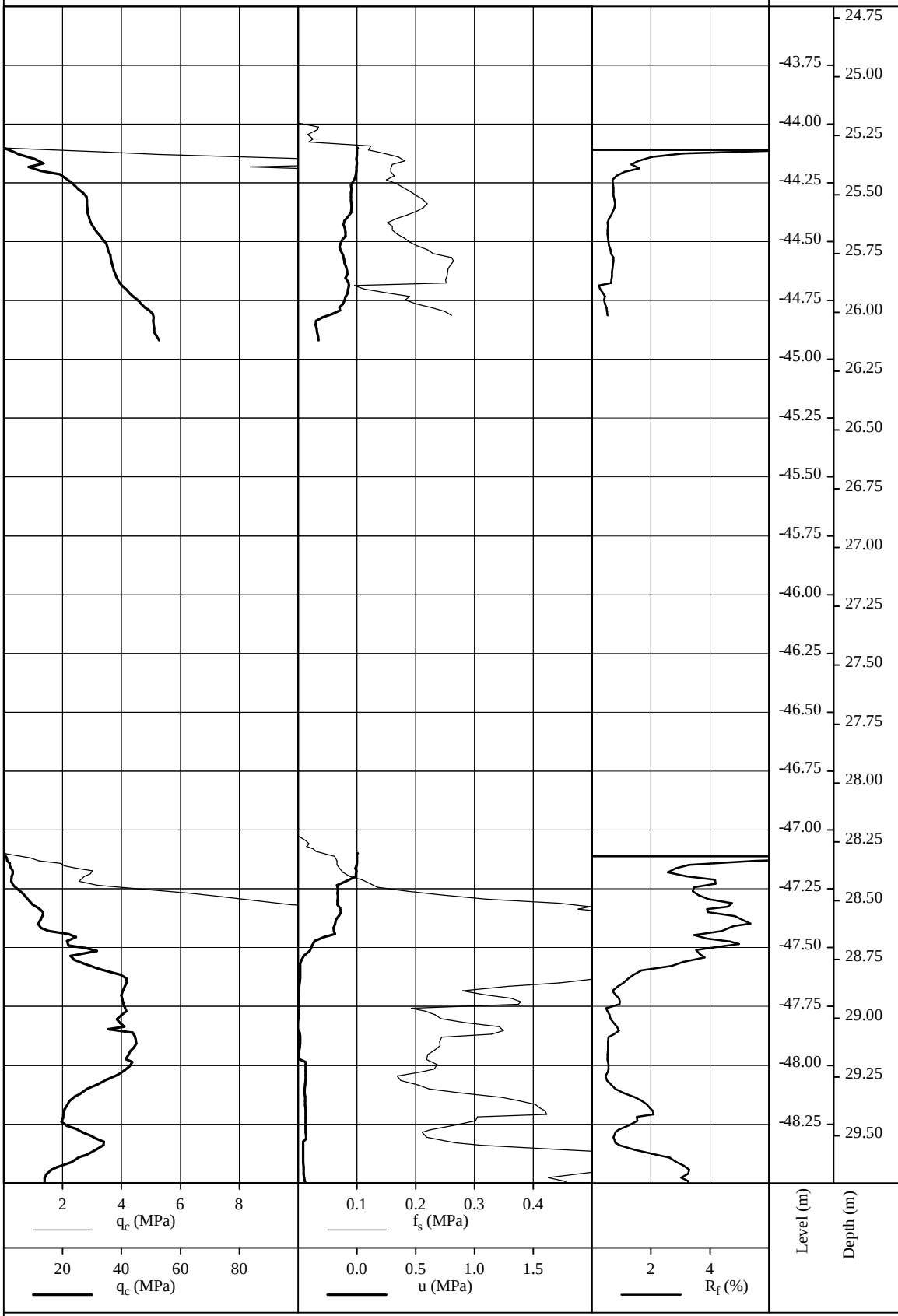
CPT name : BH10



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N	: 6278390	Cone type	: TSP	Performed by	: JFP
Date	: 2009-05-30	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

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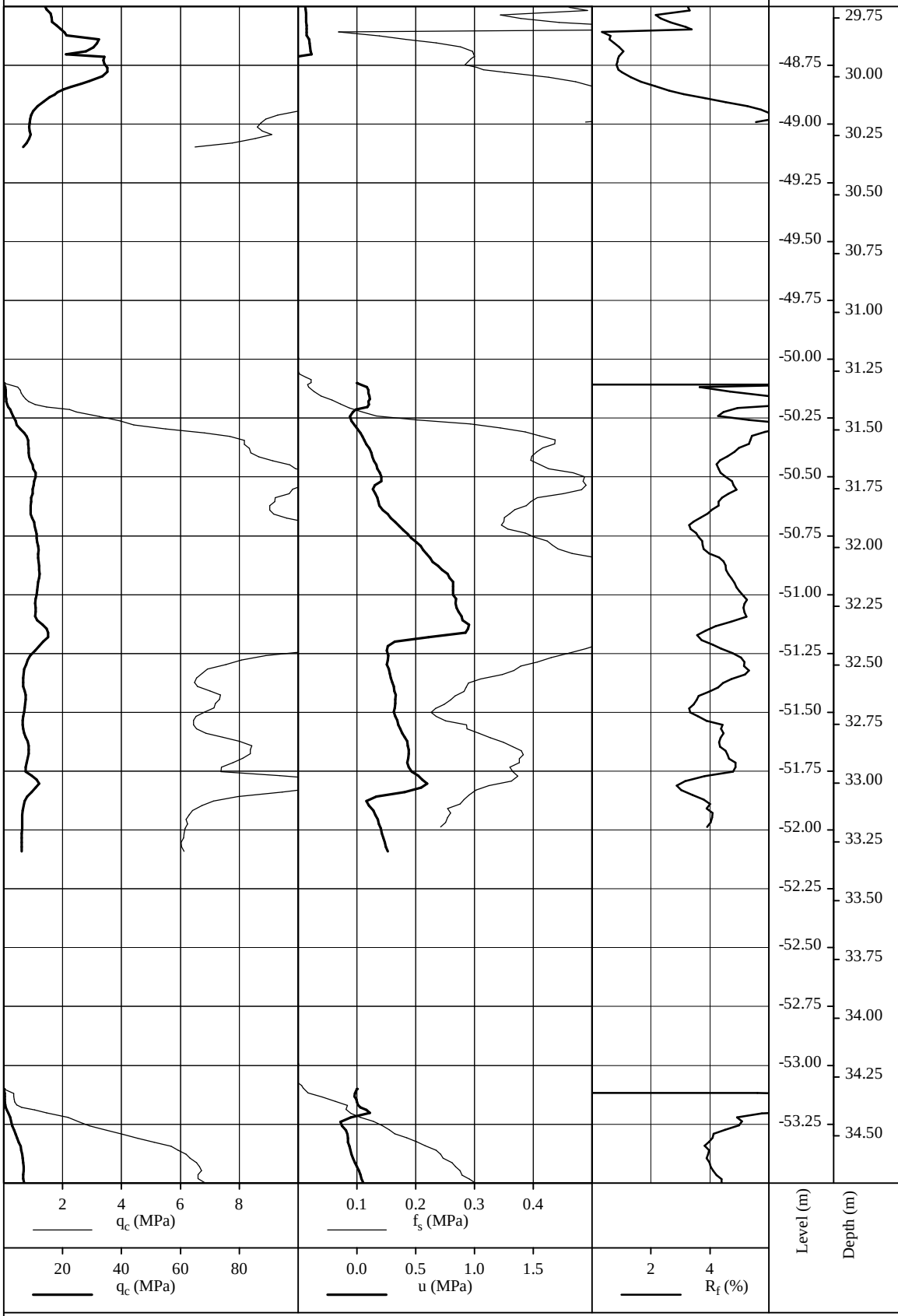
CPT name : BH10



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Date	: 2009-05-30	Cone area	: 10.0 cm^2	Remark	:

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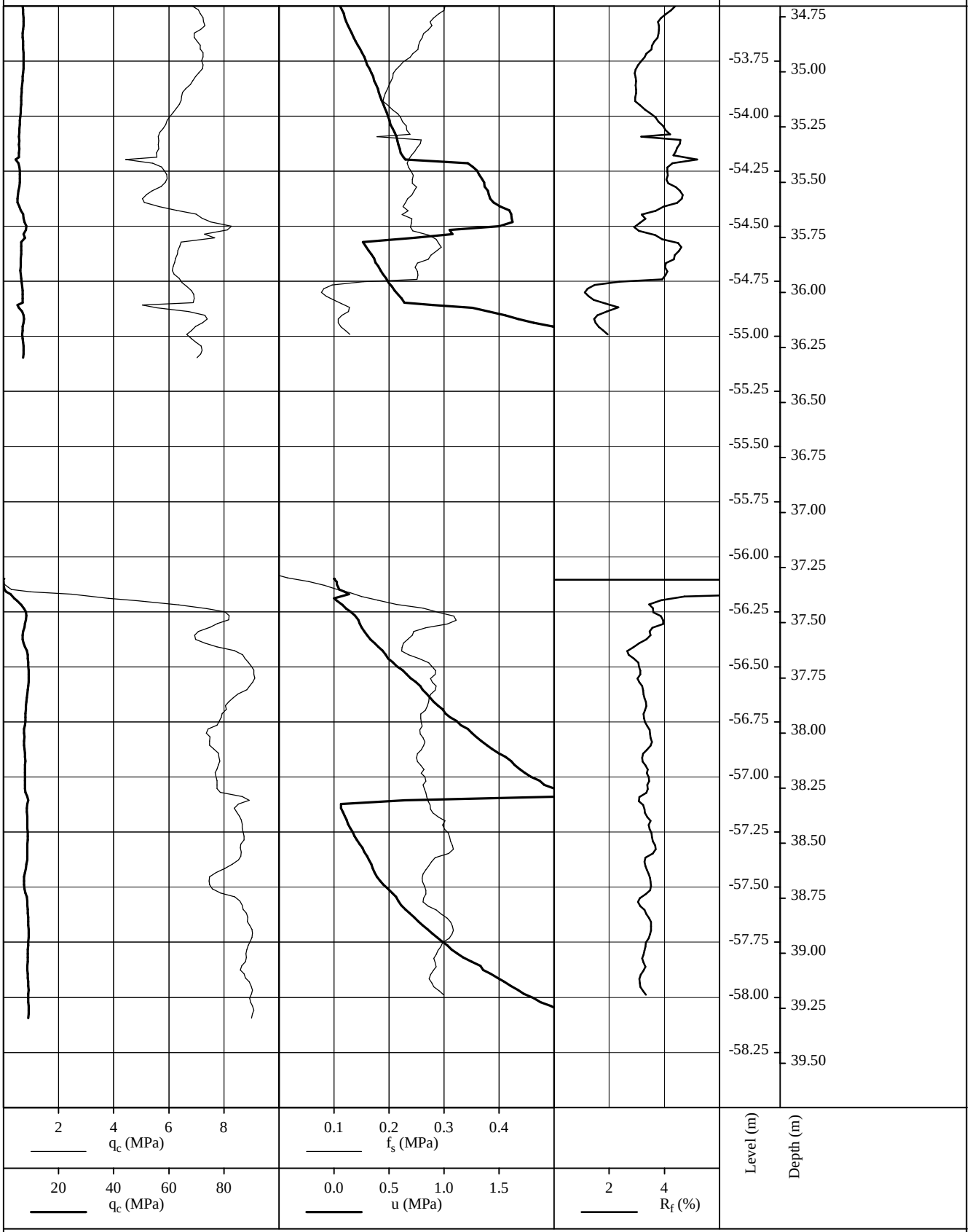
CPT name : BH10



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Date	: 2009-05-30	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute

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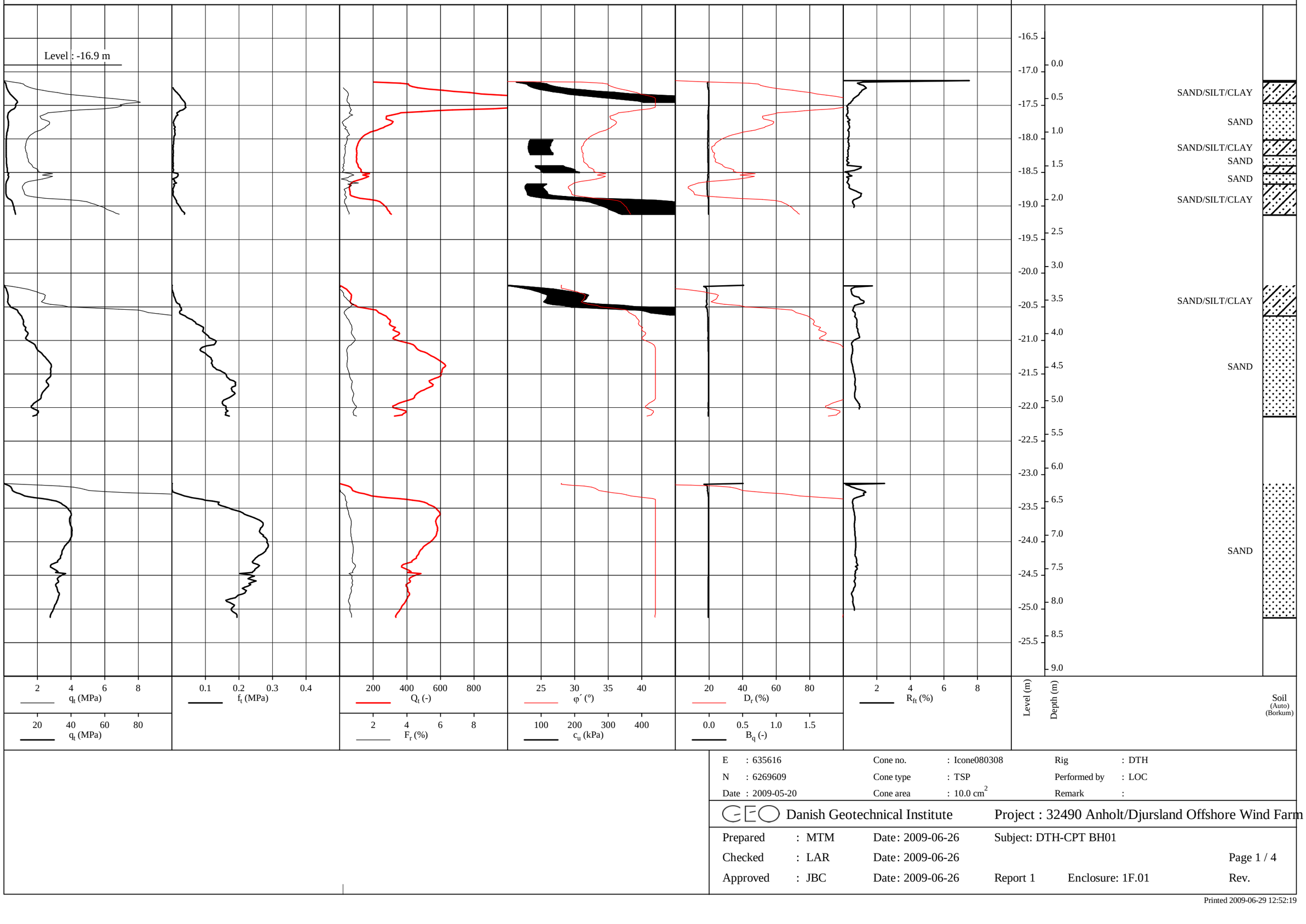
Enclosure 1F.01 – 1F.07

CPT profiles with q_t, f_t, B_q, R_{ft}, Q_t, F_r, φ, D_r and c_u

CPT name : BH01

Level : -16.9 m



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Date	: 2009-05-20	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

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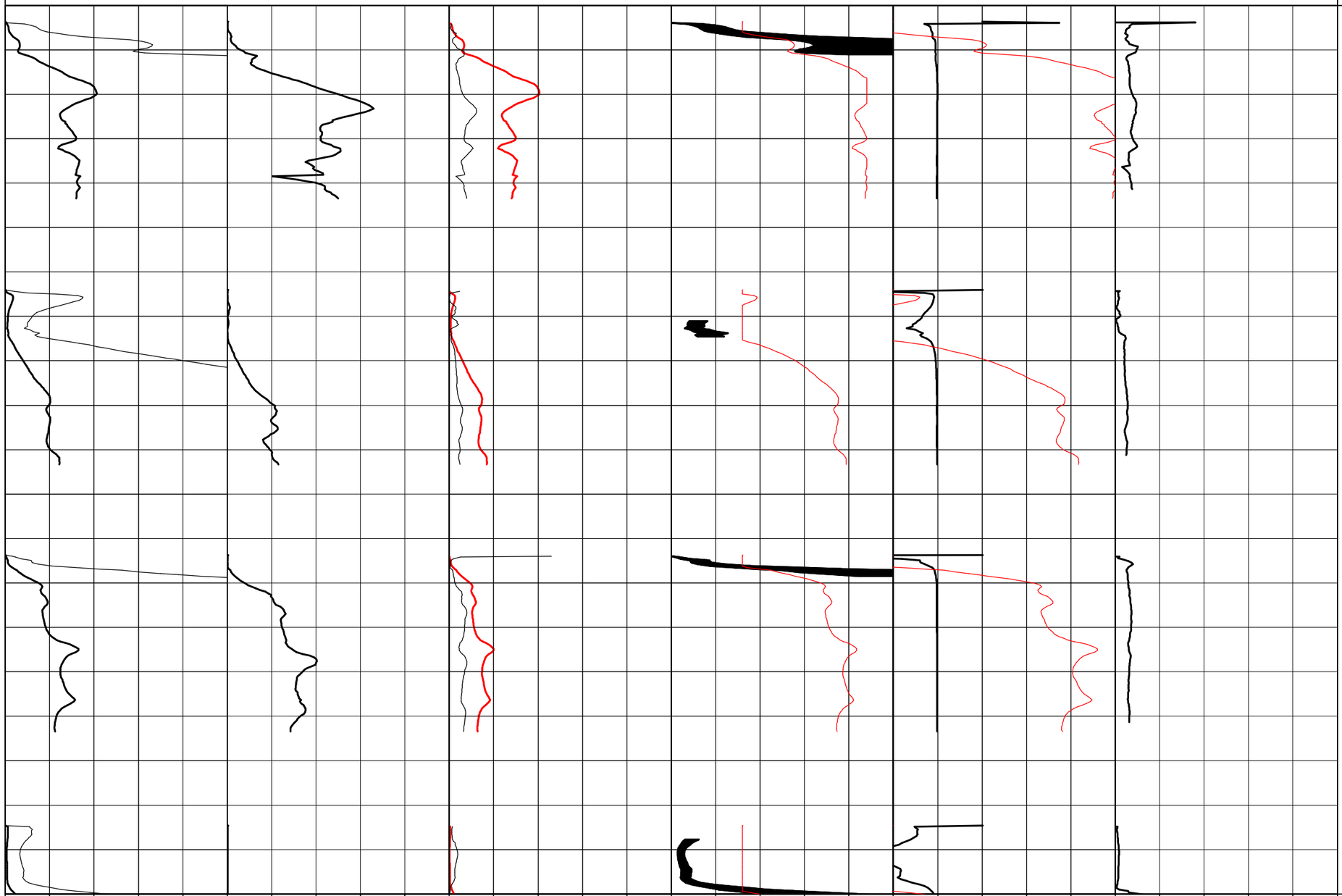
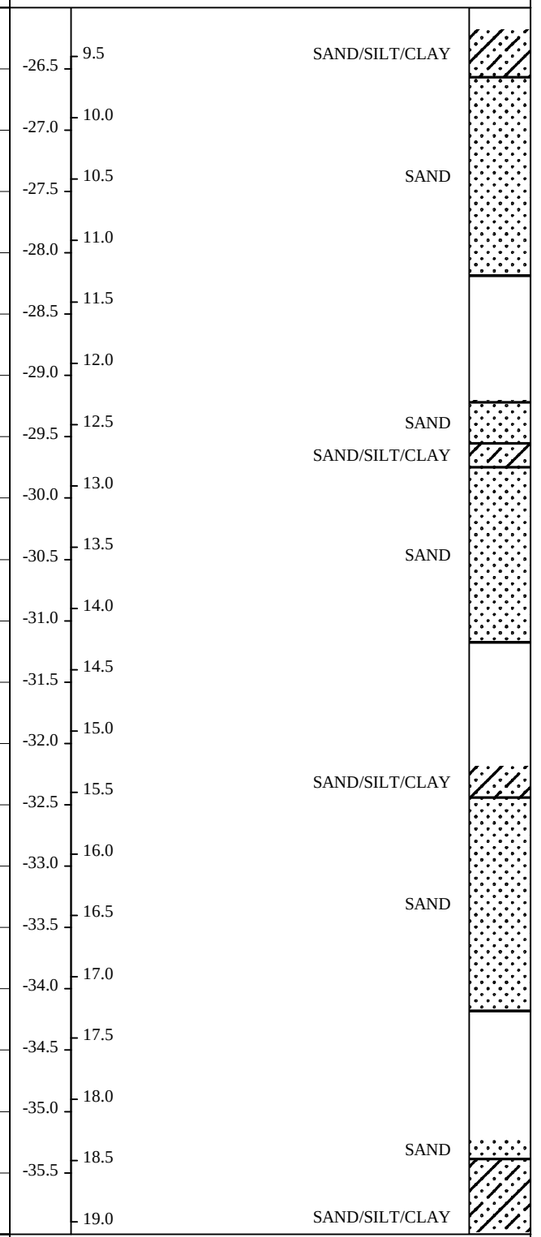
CPT name : BH01





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Date	: 2009-05-20	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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Approved	: JBC	Date: 2009-06-26	Report 1	Enclosure: 1F.01	Rev.

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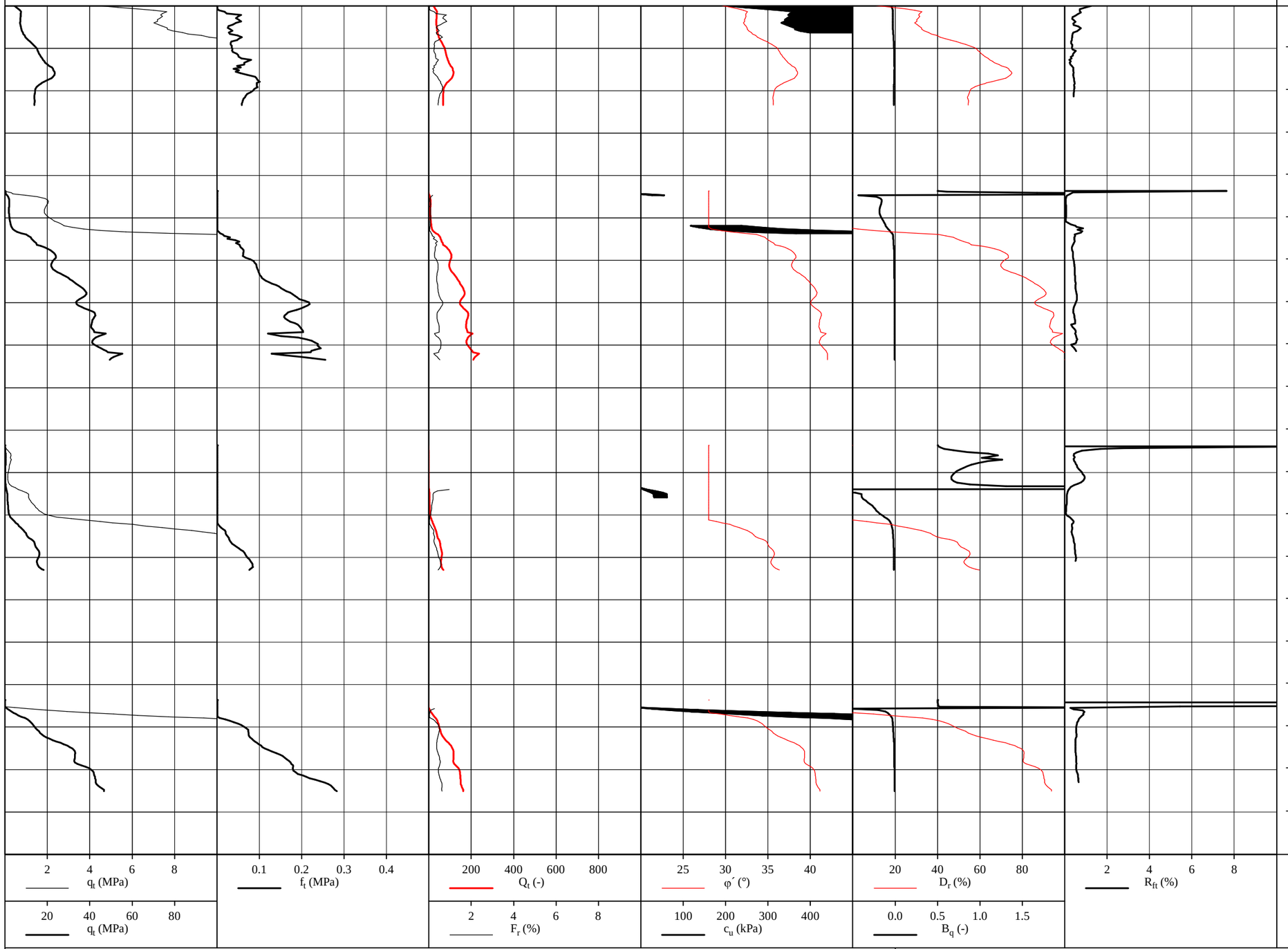

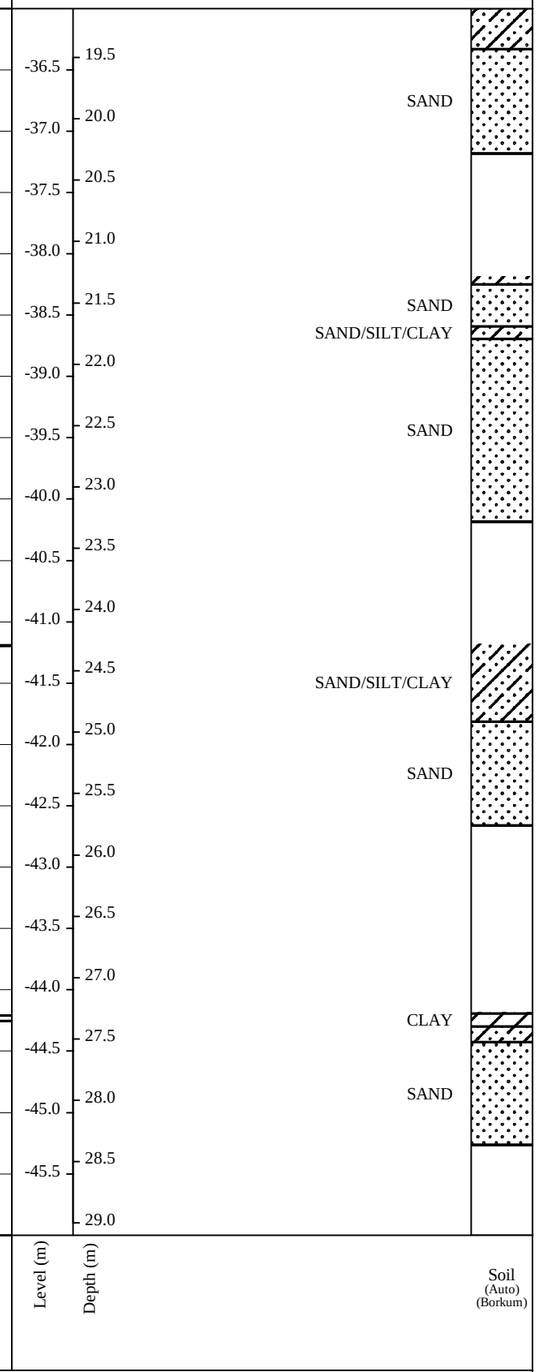

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Date	: 2009-05-20	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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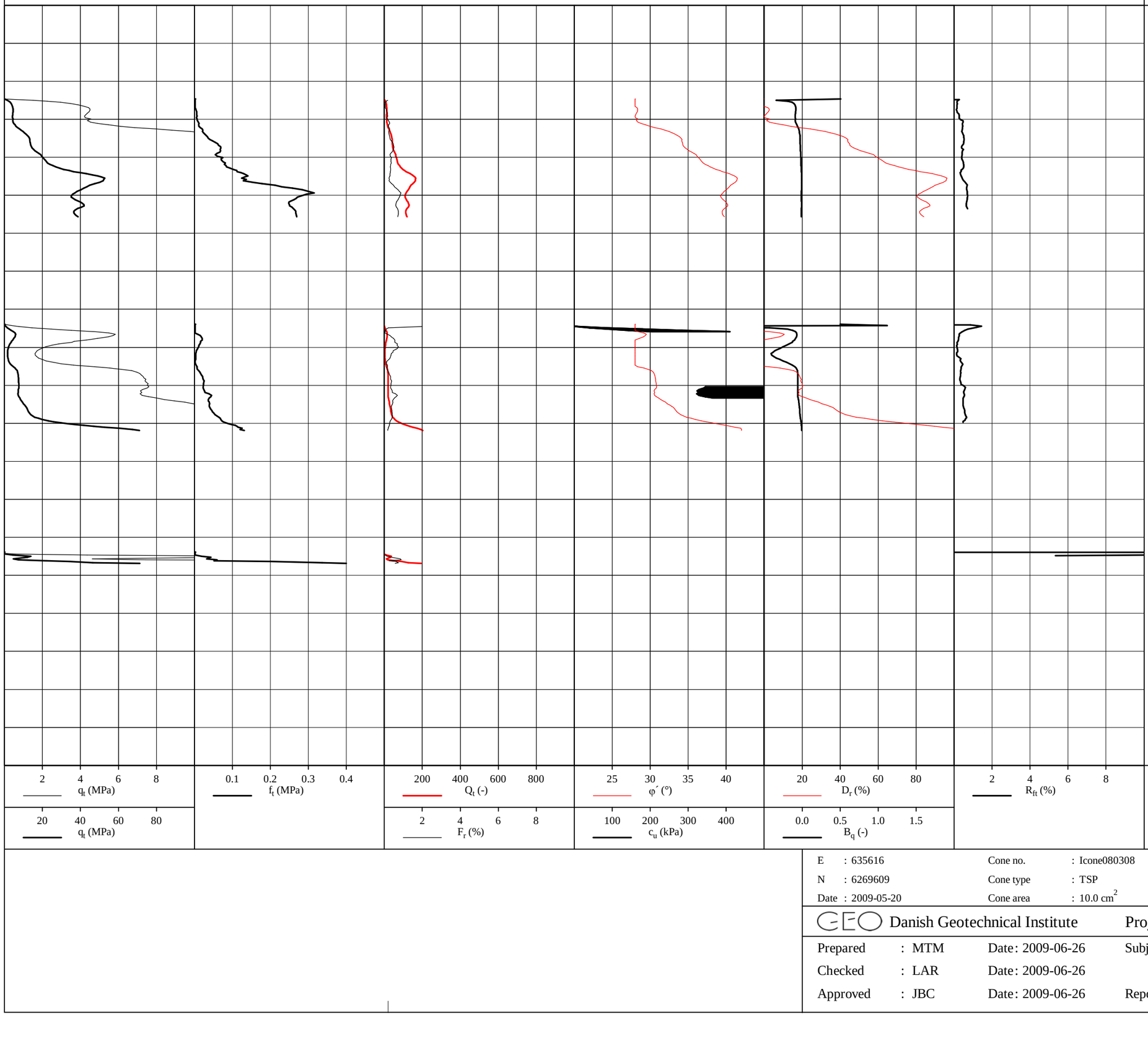
CPT name : BH01



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GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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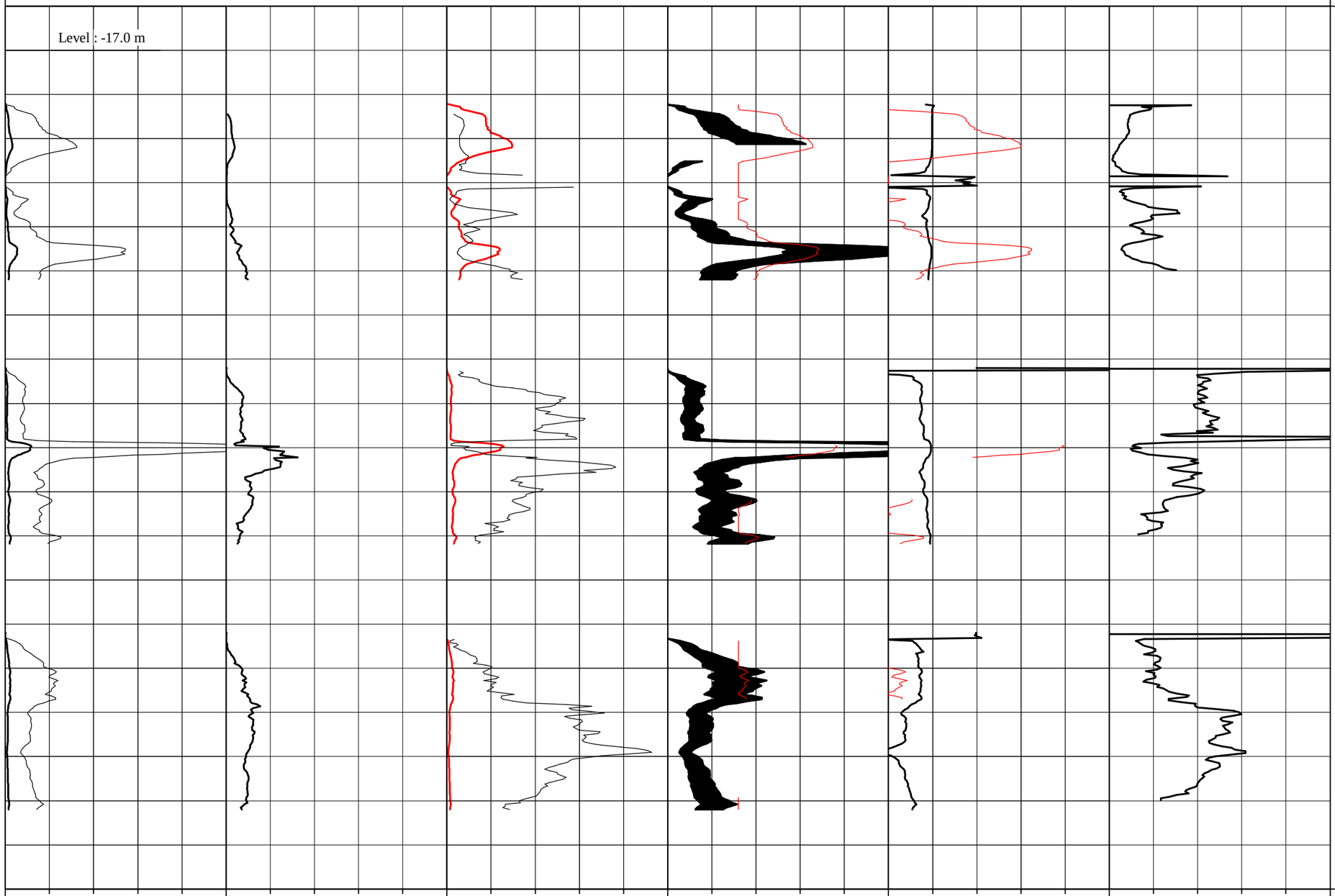
CPT name : BH02

Level : -17.0 m



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Date	: 2009-05-19	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute

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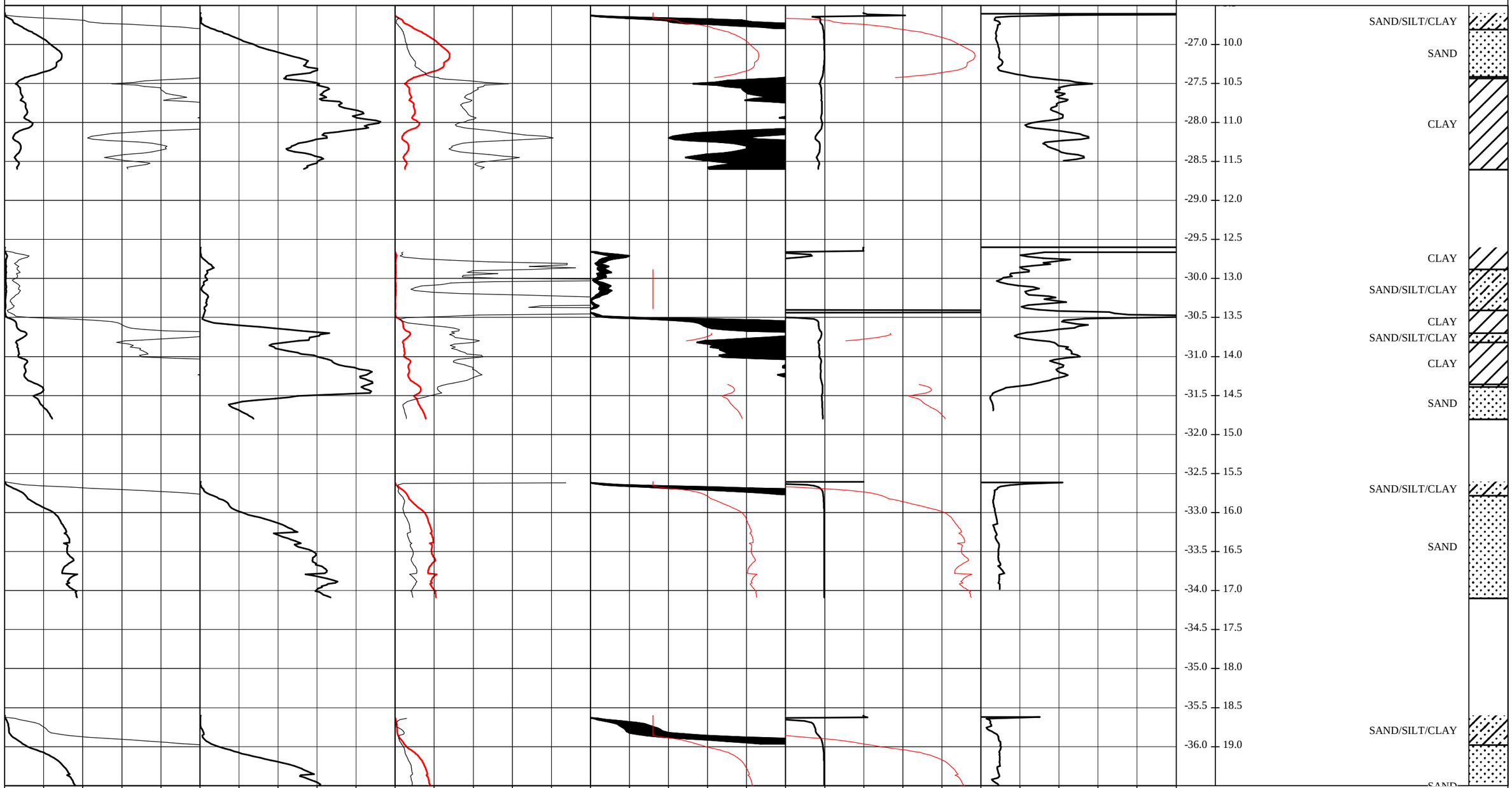
CPT name : BH02



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Date	: 2009-05-19	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

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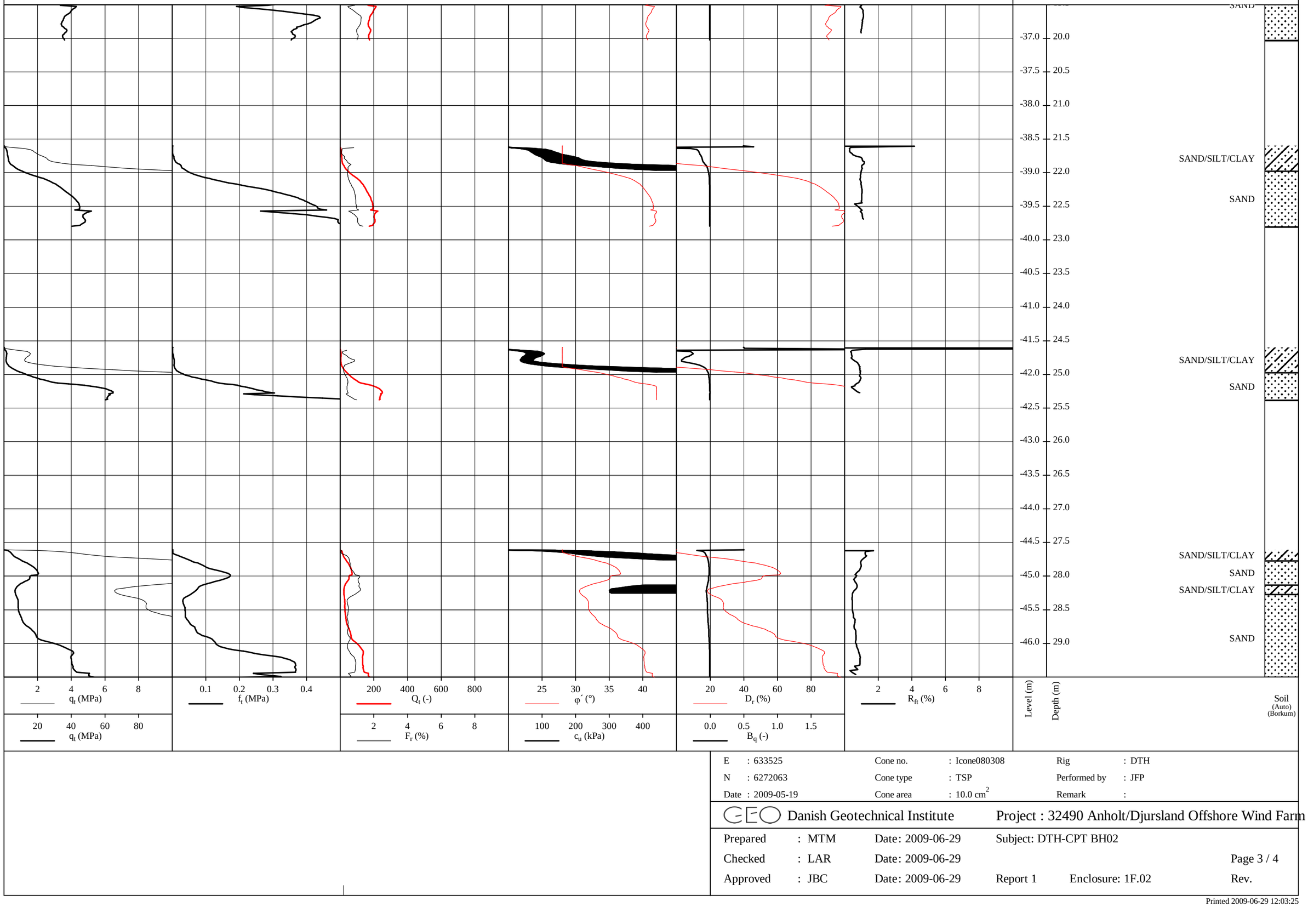
CPT name : BH02



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GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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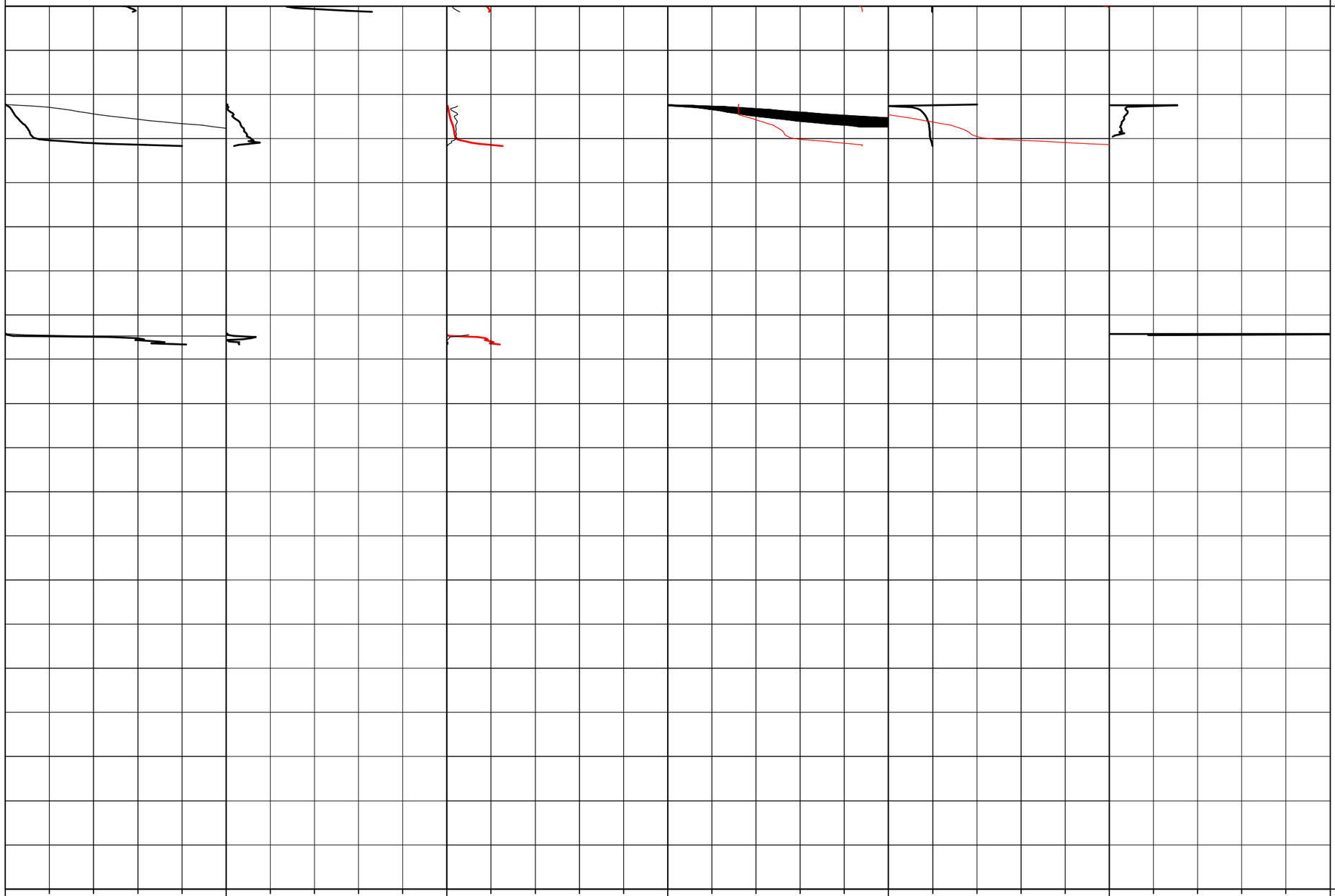
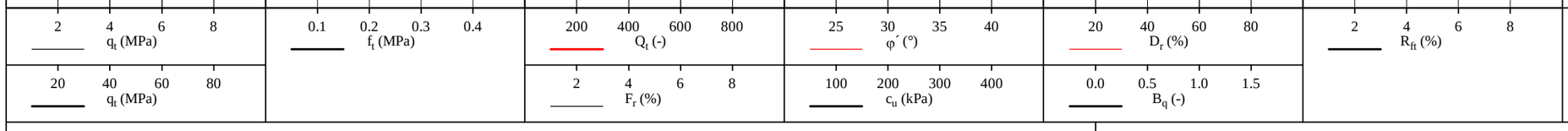
CPT name : BH02





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Date	: 2009-05-19	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

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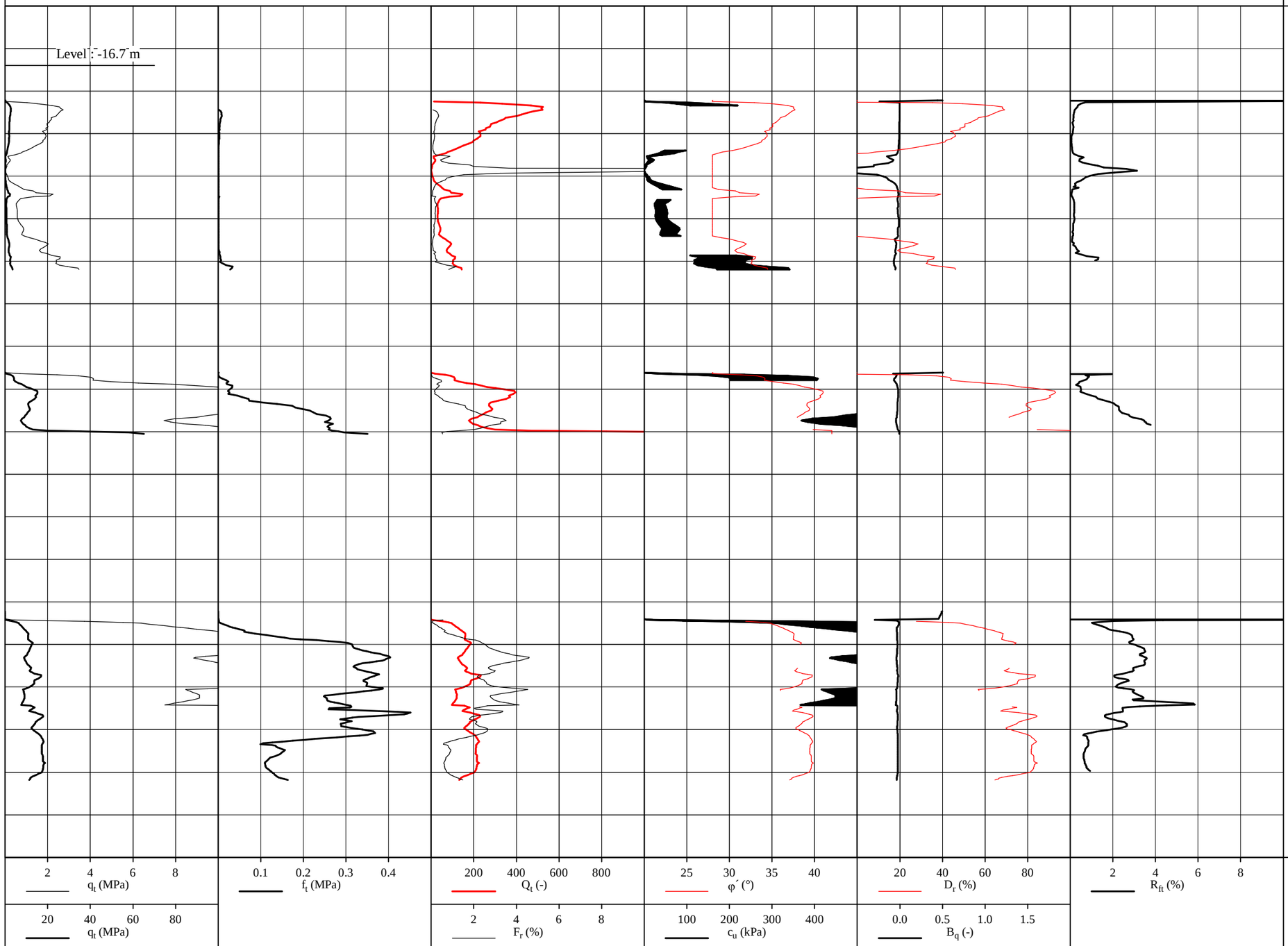
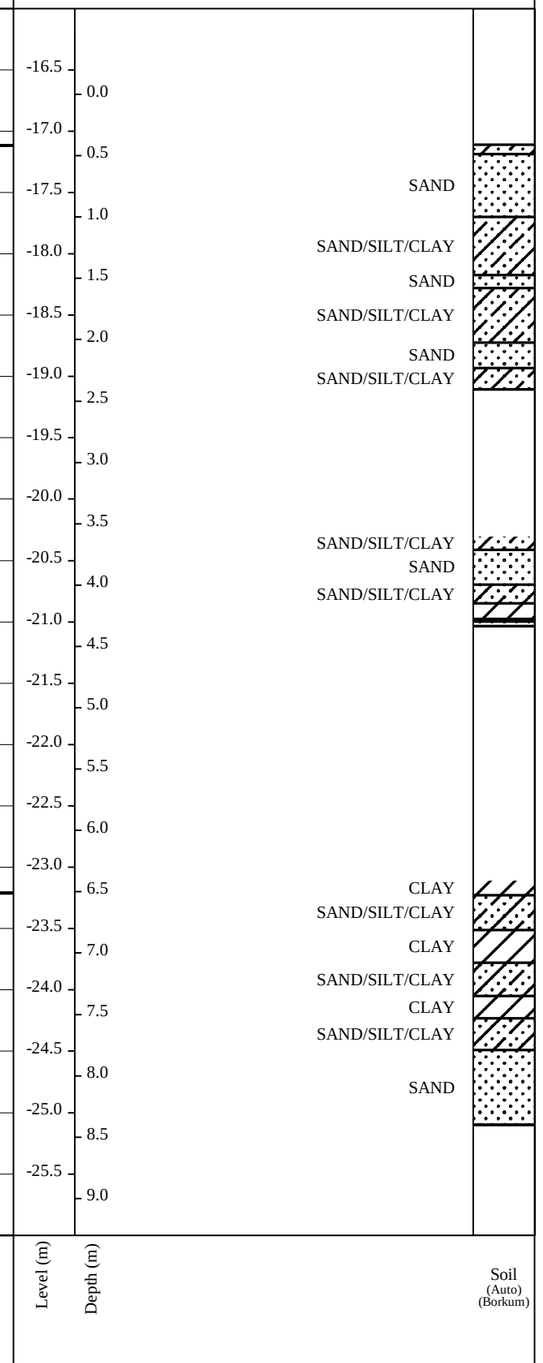
CPT name : BH04

Level : -16.7 m





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Date	: 2009-05-23	Cone area	: 10.0 cm^2	Remark	:

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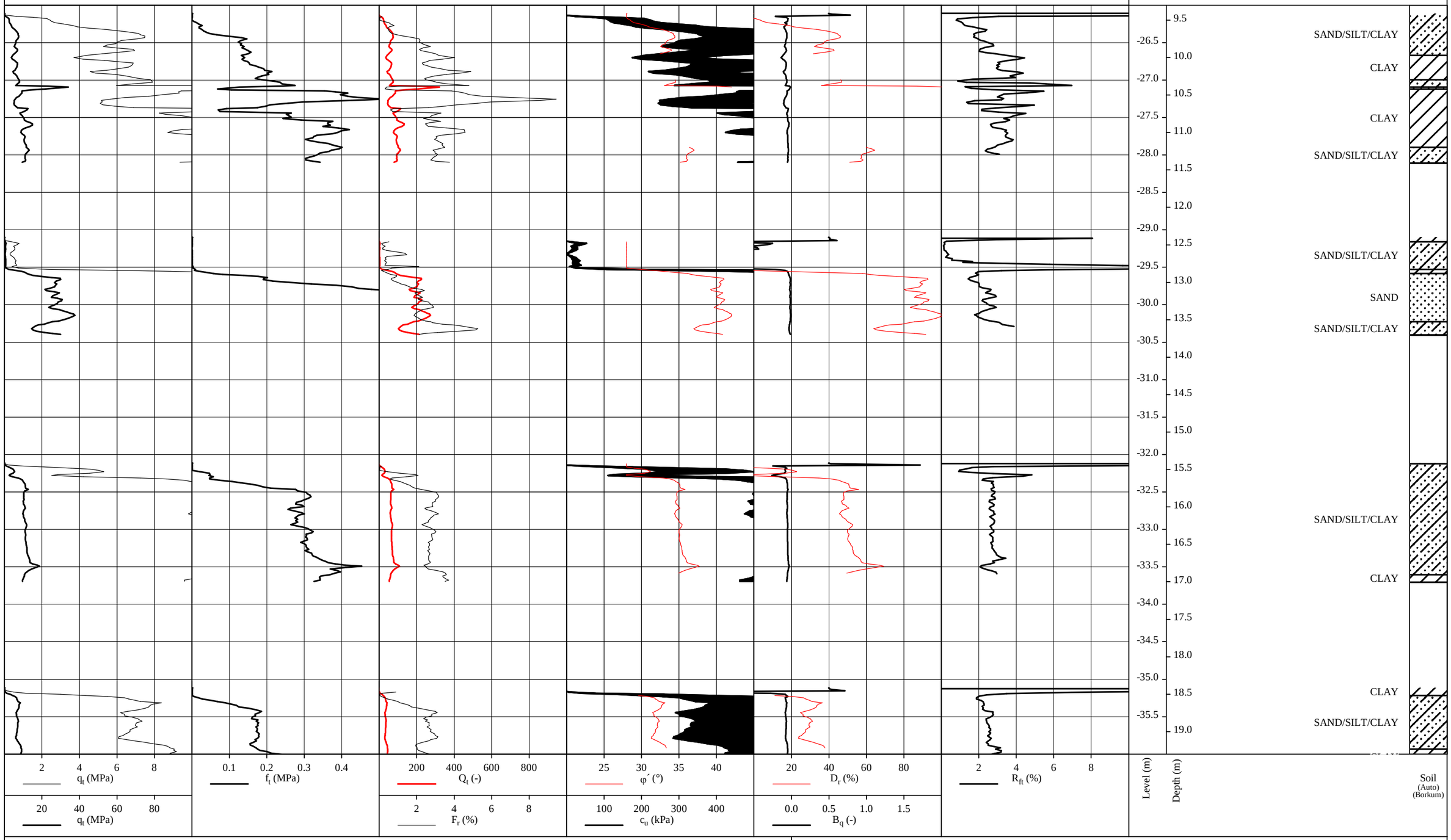
CPT name : BH04



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Date	: 2009-05-23	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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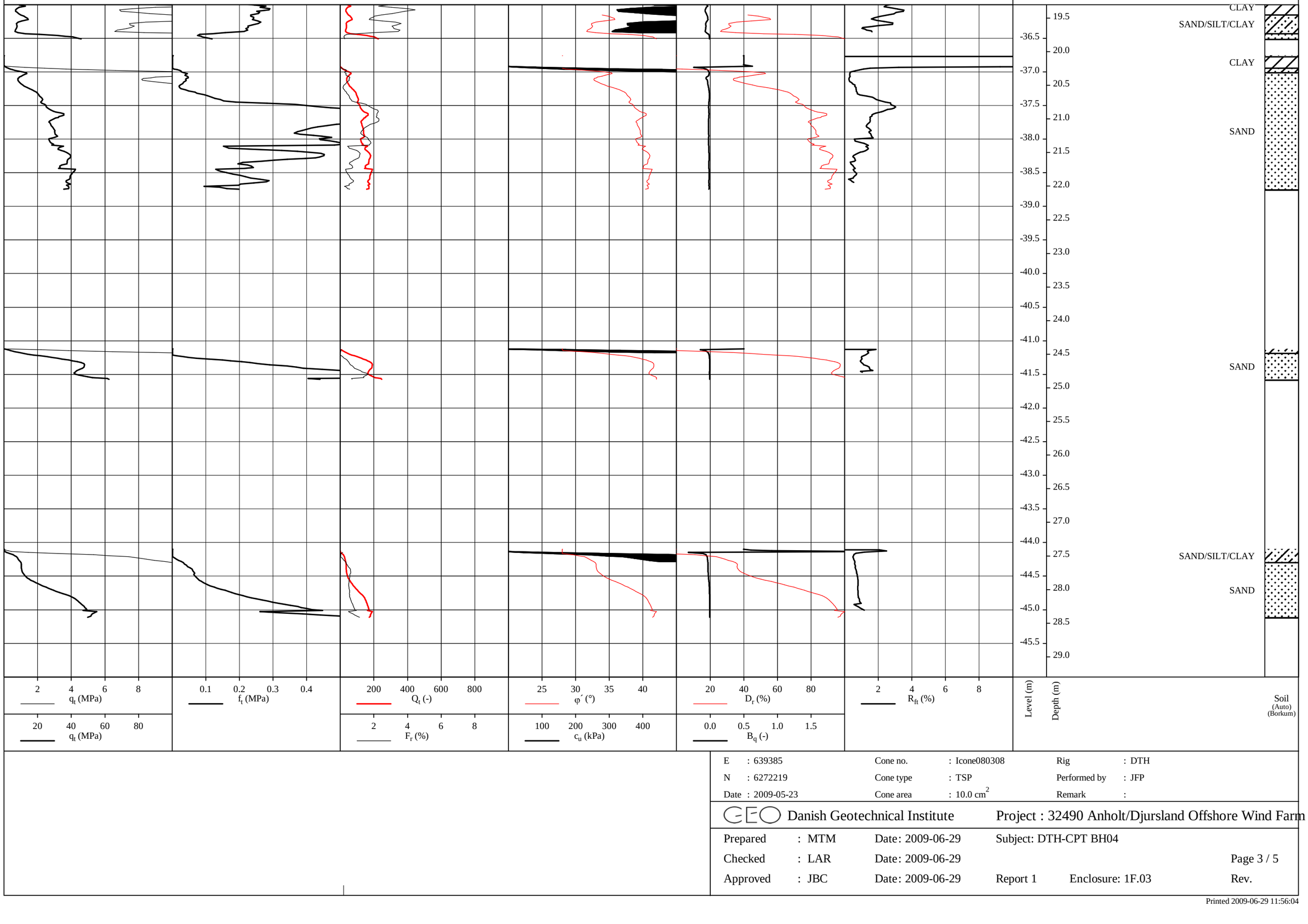
CPT name : BH04



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N : 6272219 | Cone type : TSP | Performed by : JFP

Date : 2009-05-23 | Cone area : 10.0 cm^2 | Remark :

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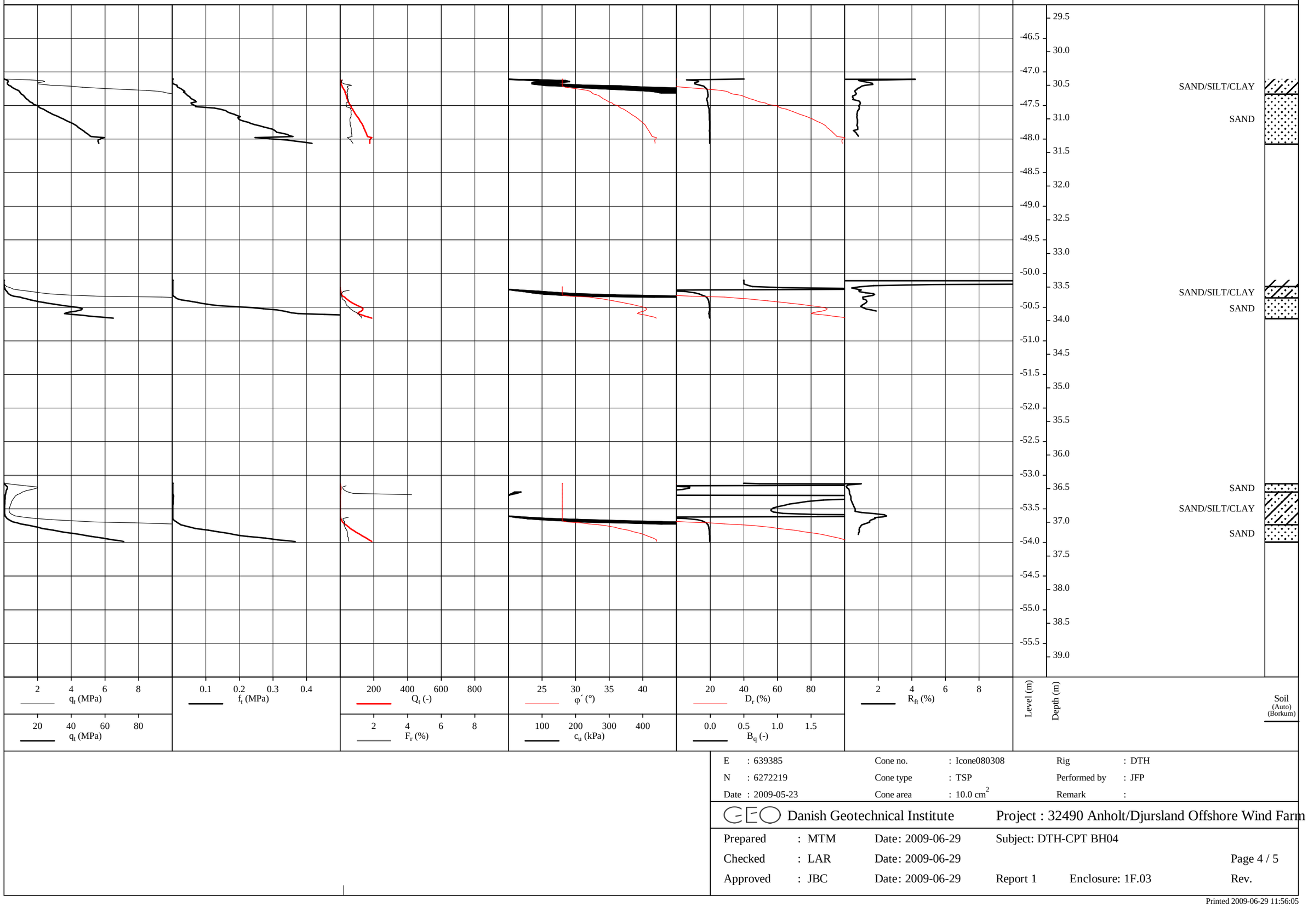
CPT name : BH04



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Date	: 2009-05-23	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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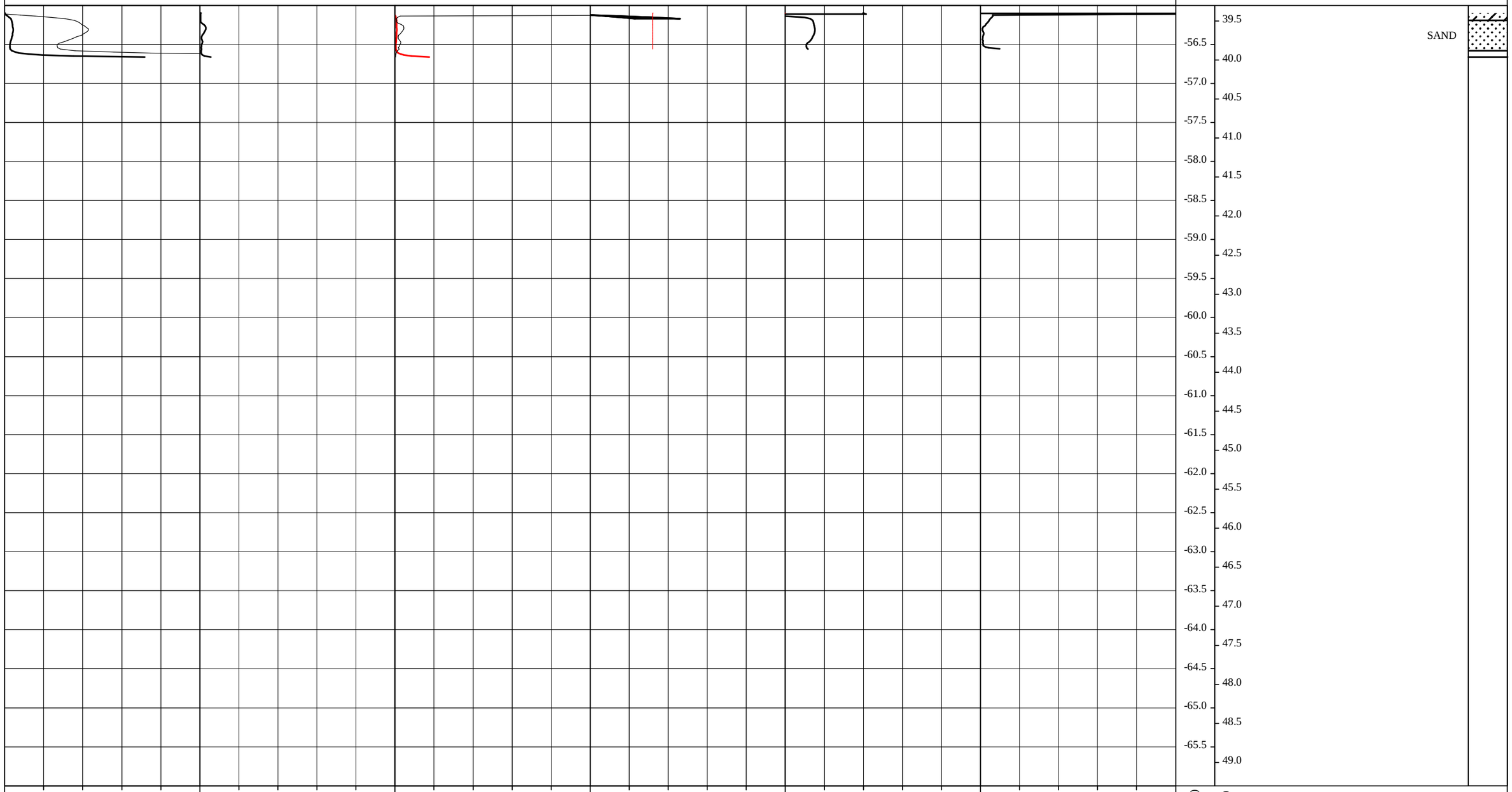
CPT name : BH04



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GEO Danish Geotechnical Institute

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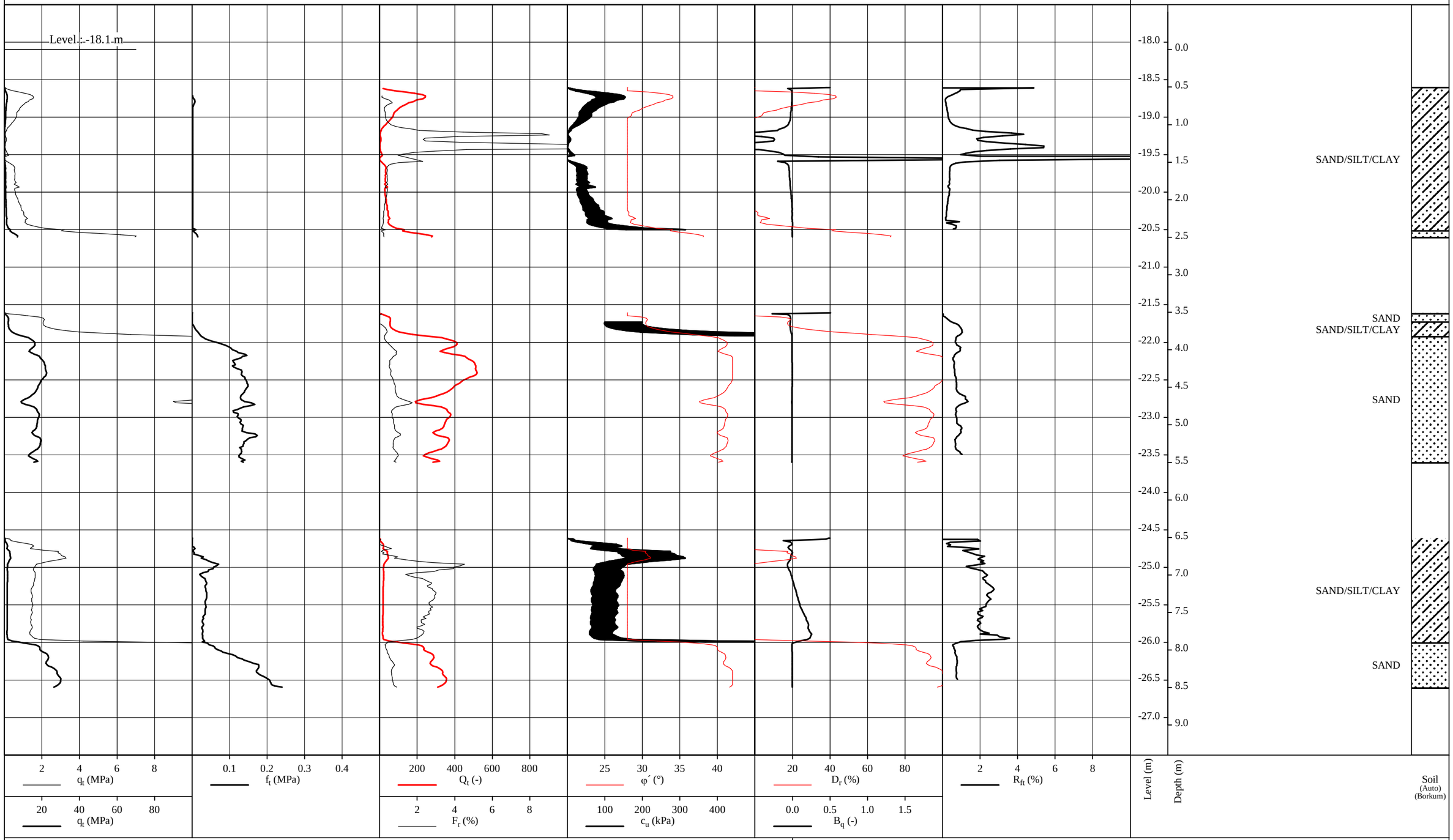
CPT name : BH05



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Date	: 2009-05-24	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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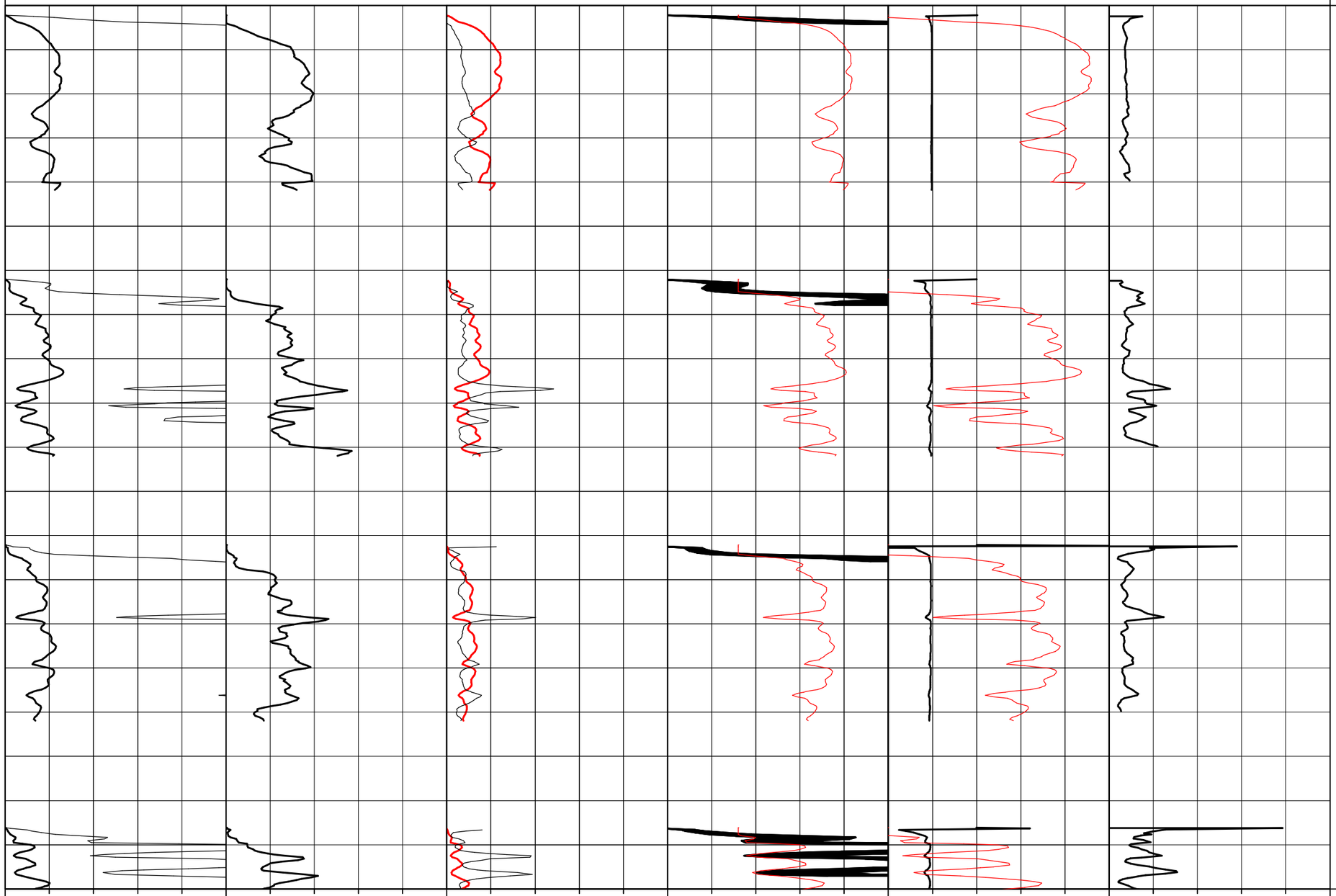
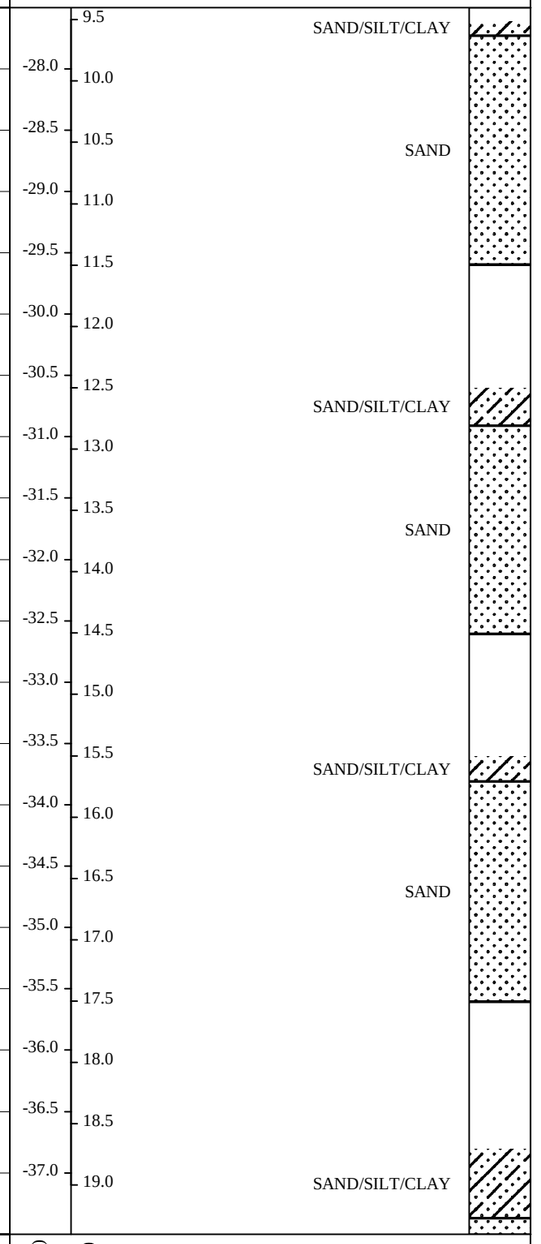
CPT name : BH05





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Date	: 2009-05-24	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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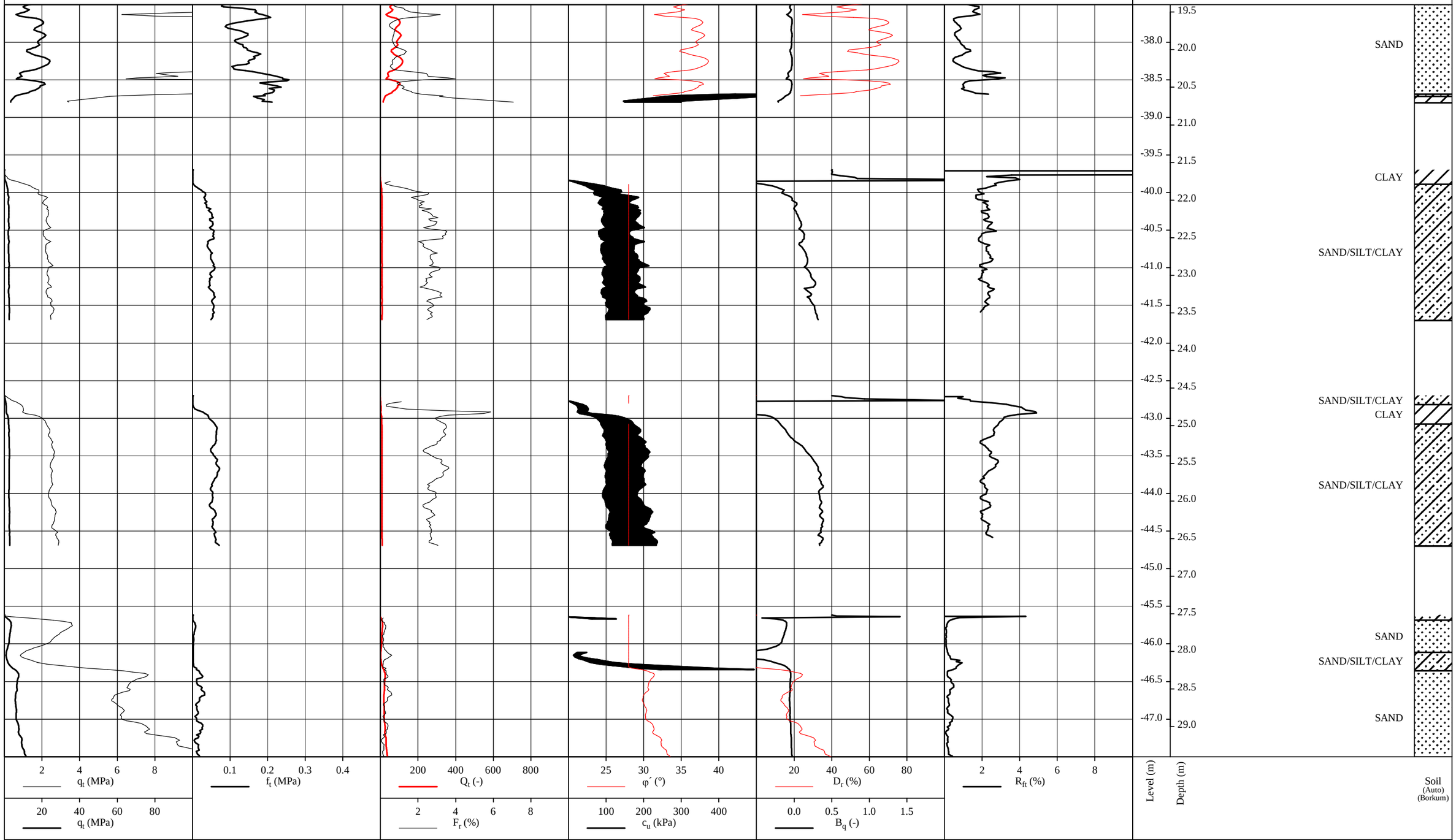

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Date	: 2009-05-24	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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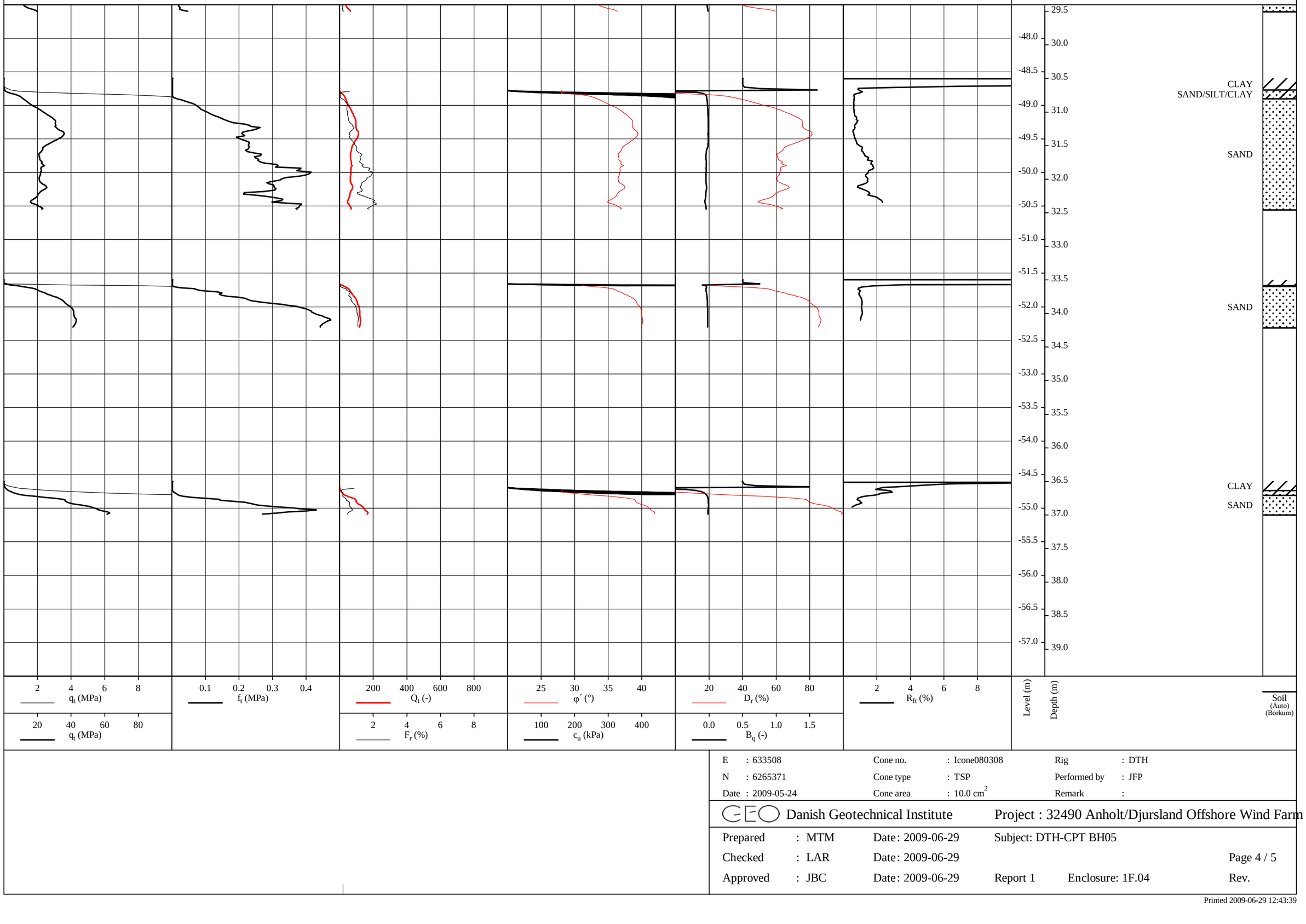
CPT name : BH05



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GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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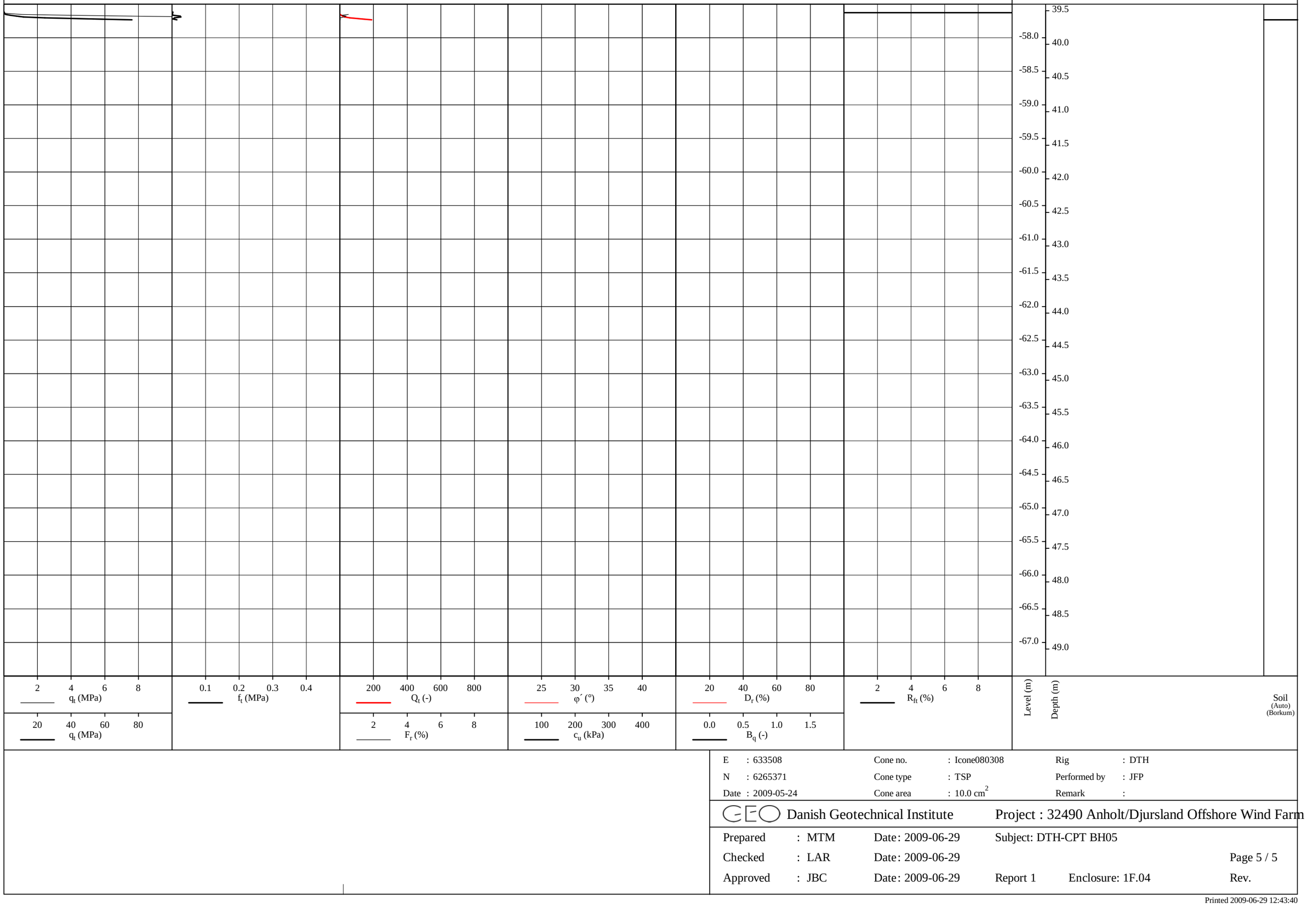

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GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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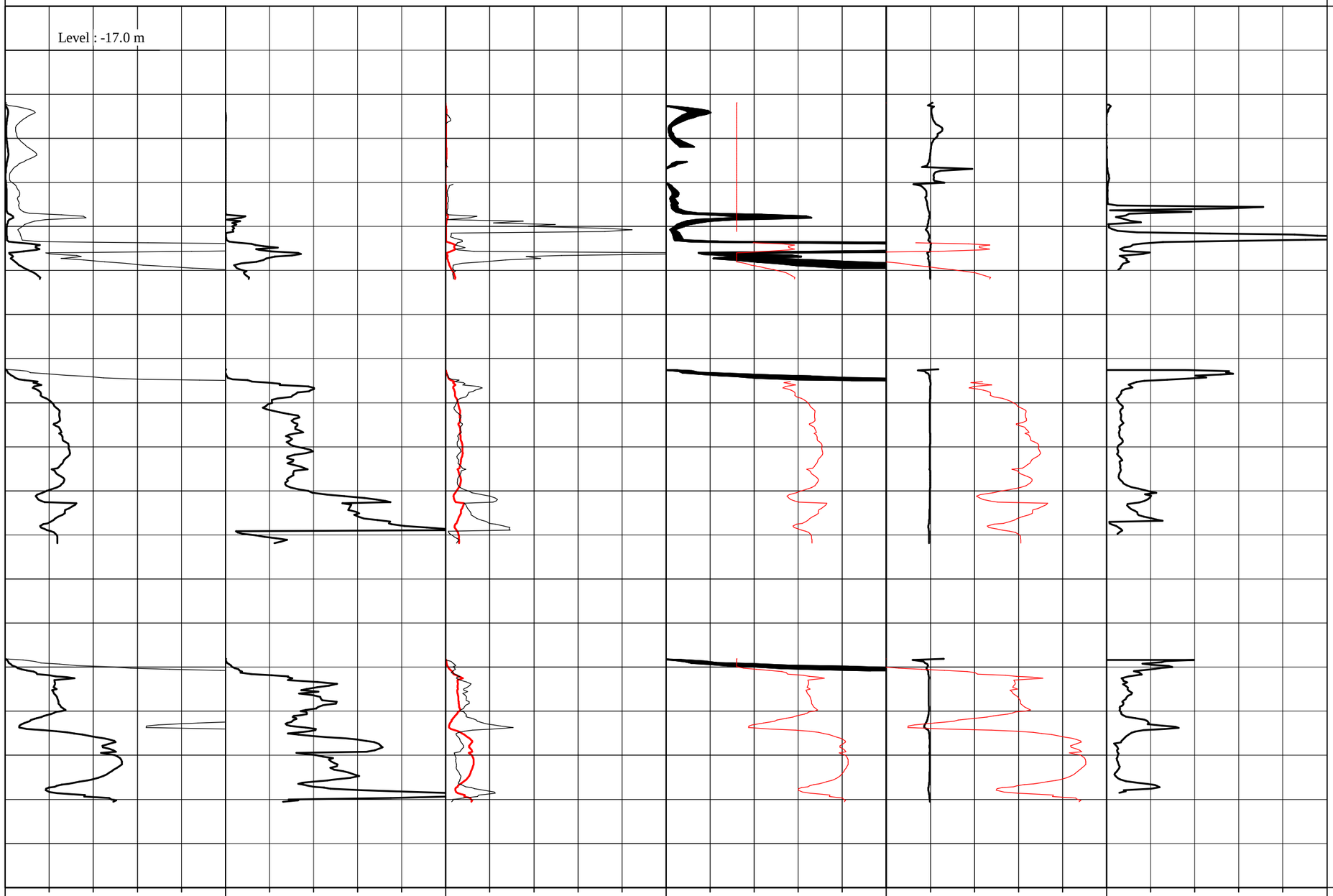
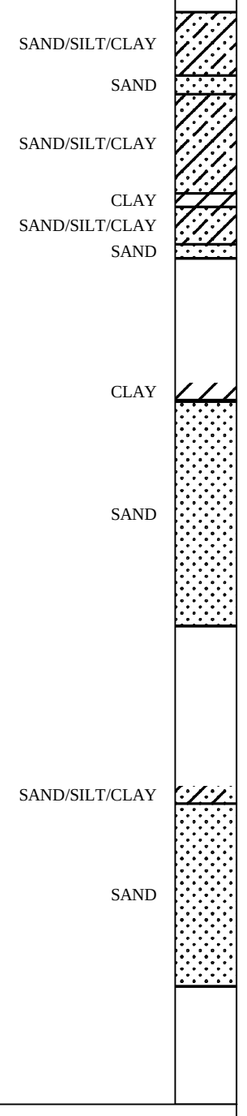
Printed 2009-06-29 12:43:40

CPT name : BH07

Level : -17.0 m



Level (m)	Depth (m)
-17.0	0.0
-17.5	0.5
-18.0	1.0
-18.5	1.5
-19.0	2.0
-19.5	2.5
-20.0	3.0
-20.5	3.5
-21.0	4.0
-21.5	4.5
-22.0	5.0
-22.5	5.5
-23.0	6.0
-23.5	6.5
-24.0	7.0
-24.5	7.5
-25.0	8.0
-25.5	8.5
-26.0	9.0



Soil (Auto) (Borkum)

E	: 632182	Cone no.	: Icone080308	Rig	: DTH
N	: 6274469	Cone type	: TSP	Performed by	: ALJ
Date	: 2009-05-18	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-26	Subject: DTH-CPT BH07	
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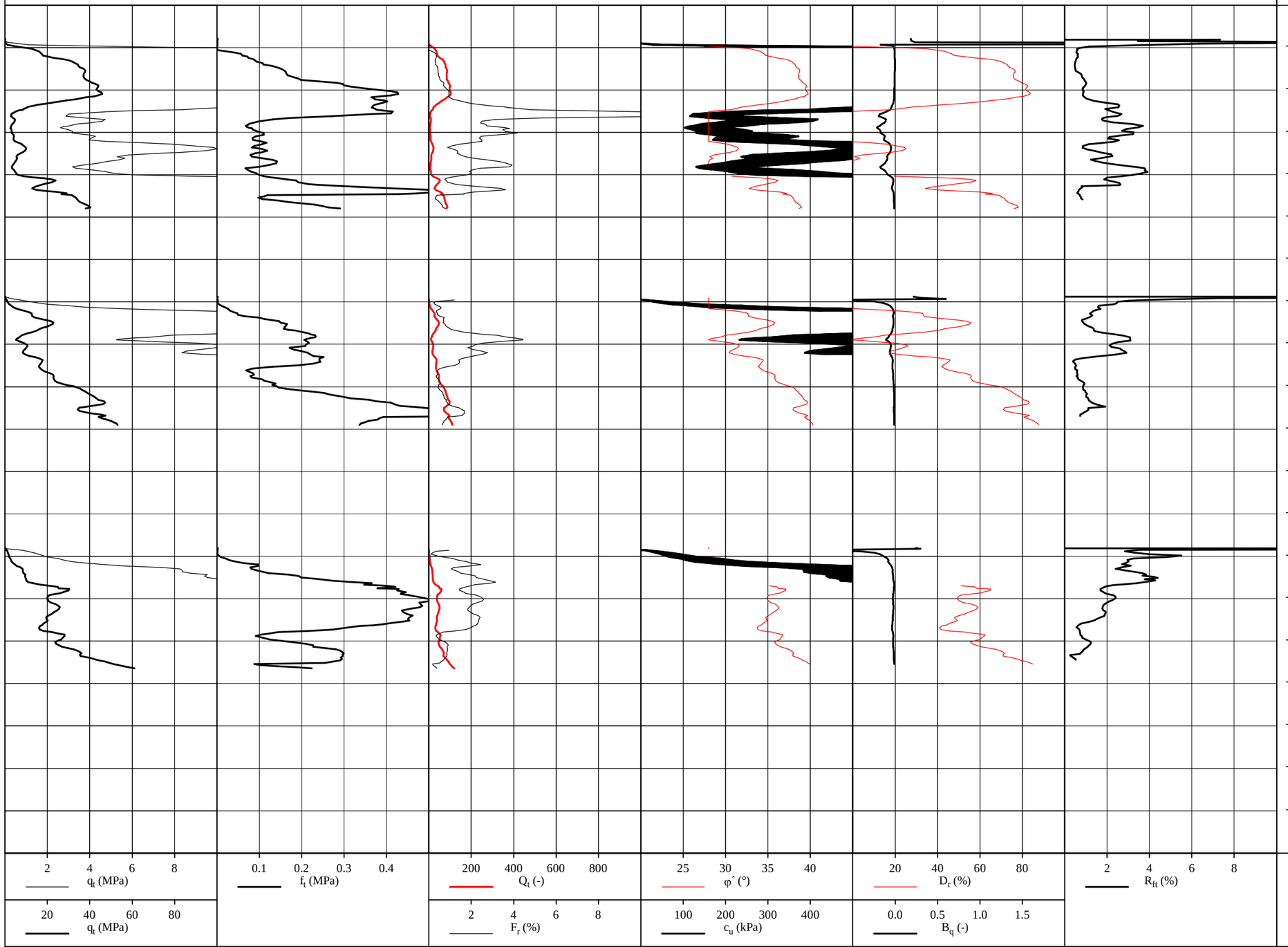
Printed 2009-06-29 12:46:57

CPT name : BH07



E	: 632182	Cone no.	: Icone080308	Rig	: DTH
N	: 6274469	Cone type	: TSP	Performed by	: ALJ
Date	: 2009-05-18	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-26	Subject: DTH-CPT BH07		
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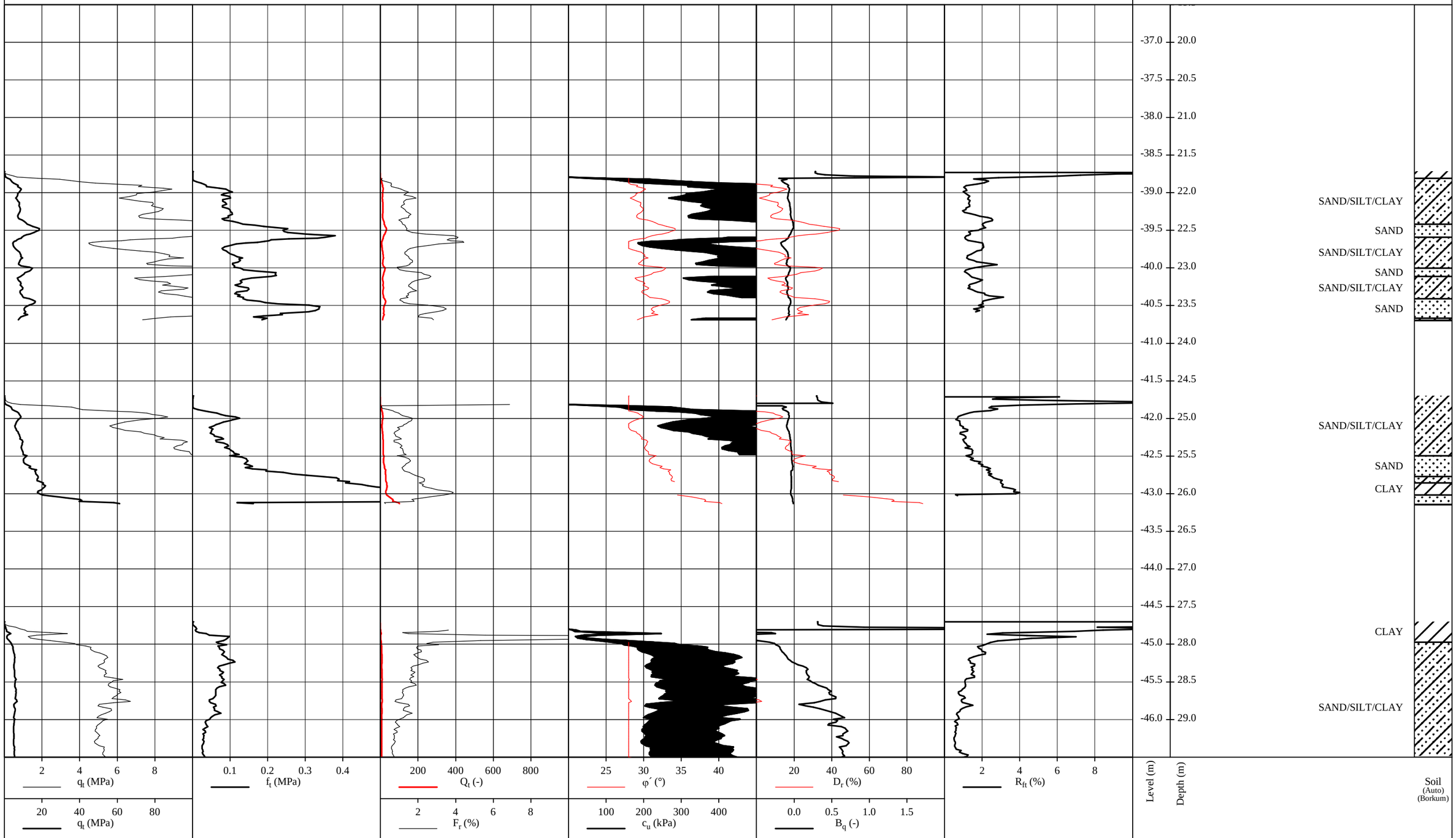
Printed 2009-06-29 12:46:58

CPT name : BH07



E	: 632182	Cone no.	: Icone080308	Rig	: DTH
N	: 6274469	Cone type	: TSP	Performed by	: ALJ
Date	: 2009-05-18	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-26	Subject: DTH-CPT BH07		
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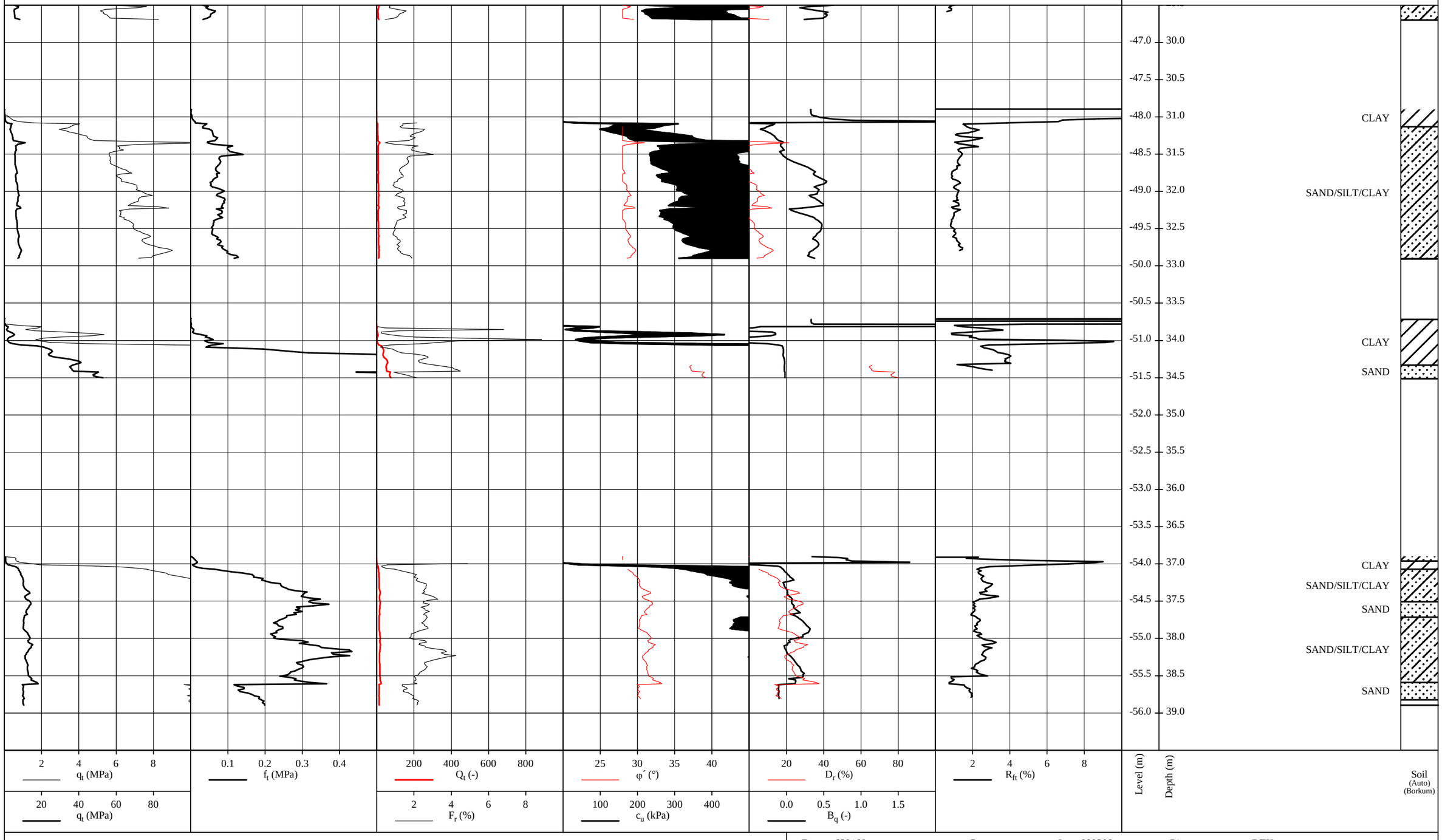
Approved	: JBC	Date: 2009-06-26	Report 1	Enclosure: 1F.05	Rev.

Printed 2009-06-29 12:46:59

CPT name : BH07



E	: 632182	Cone no.	: Icone080308	Rig	: DTH
N	: 6274469	Cone type	: TSP	Performed by	: ALJ
Date	: 2009-05-18	Cone area	: 10.0 cm^2	Remark	:

GEO Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-26	Subject: DTH-CPT BH07		
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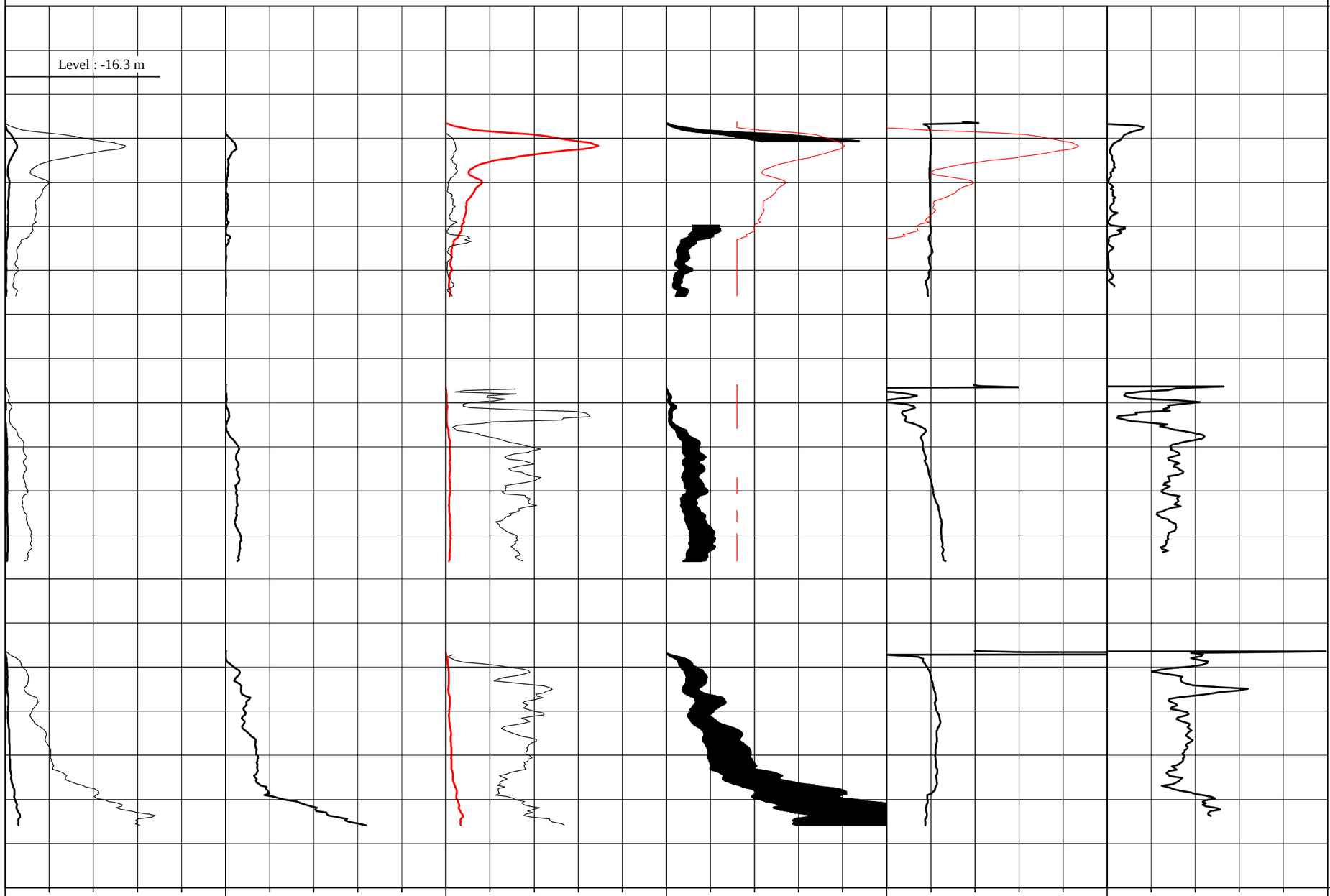
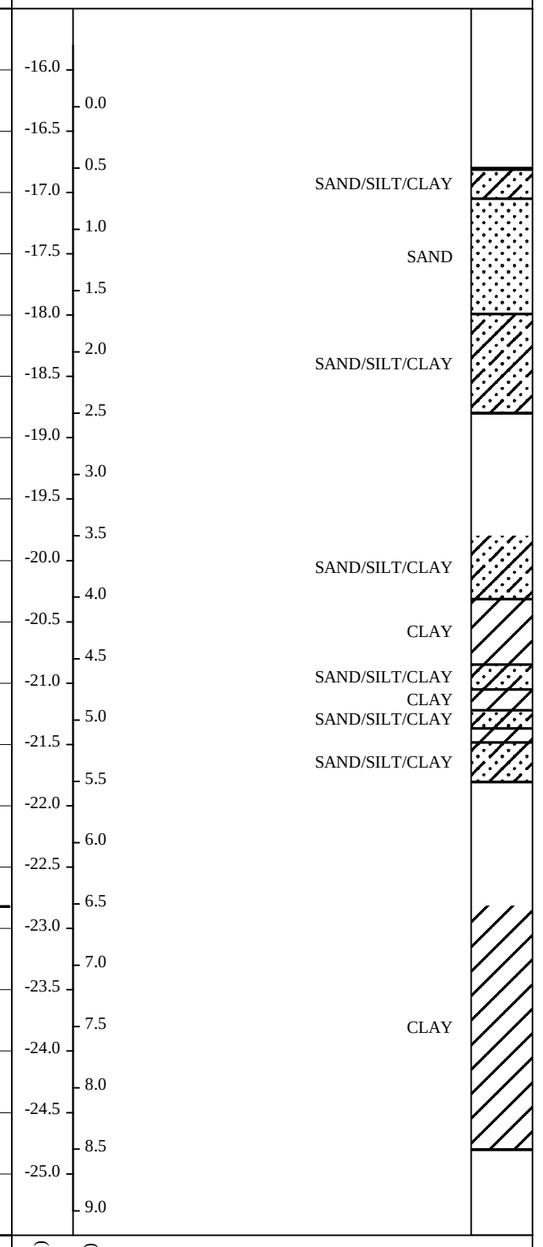
CPT name : BH09

Level : -16.3 m





E	: 633474	Cone no.	: Unknow Tip	Rig	: DTH
N	: 6284377	Cone type	: TSP	Performed by	: LOC
Date	: 2009-05-27	Cone area	: 10.0 cm^2	Remark	:

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Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-29	Subject: DTH-CPT BH09		
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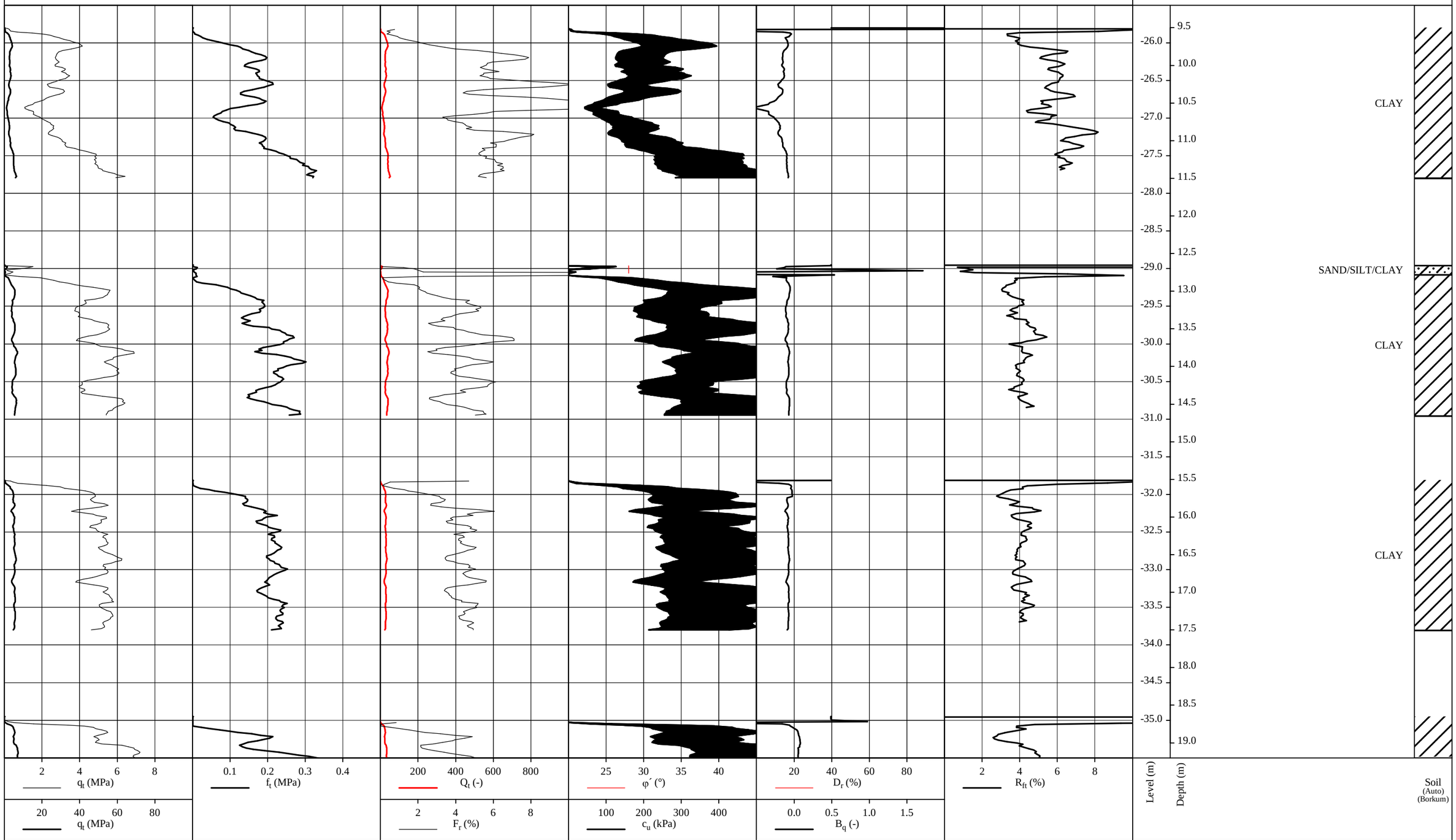
Approved	: JBC	Date: 2009-06-29	Report 1	Enclosure: 1F.06	Rev.

Printed 2009-06-29 12:48:30

CPT name : BH09



E	: 633474	Cone no.	: Unknow Tip	Rig	: DTH
N	: 6284377	Cone type	: TSP	Performed by	: LOC
Date	: 2009-05-27	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-29	Subject: DTH-CPT BH09		
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Approved	: JBC	Date: 2009-06-29	Report 1	Enclosure: 1F.06	Rev.

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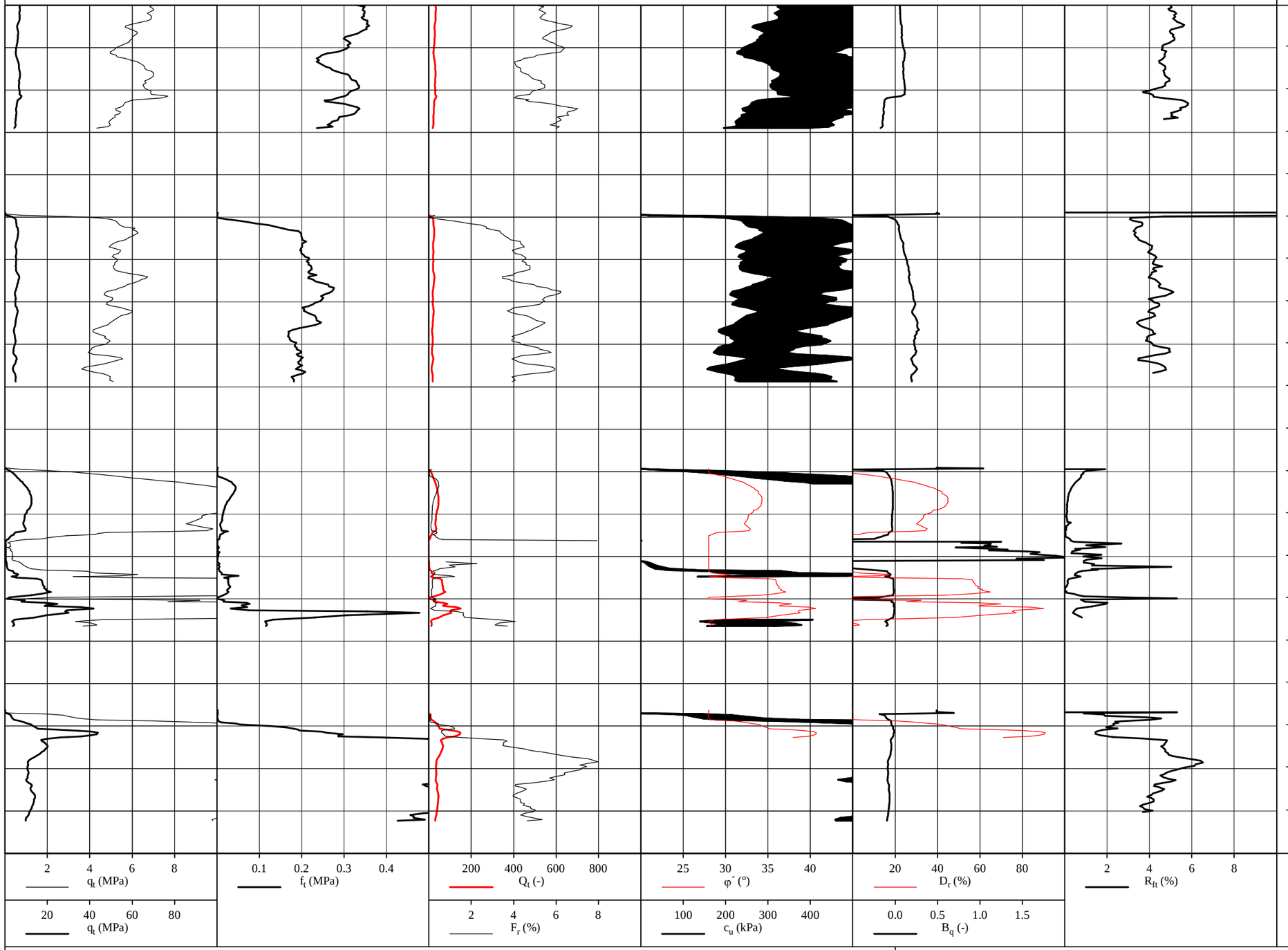
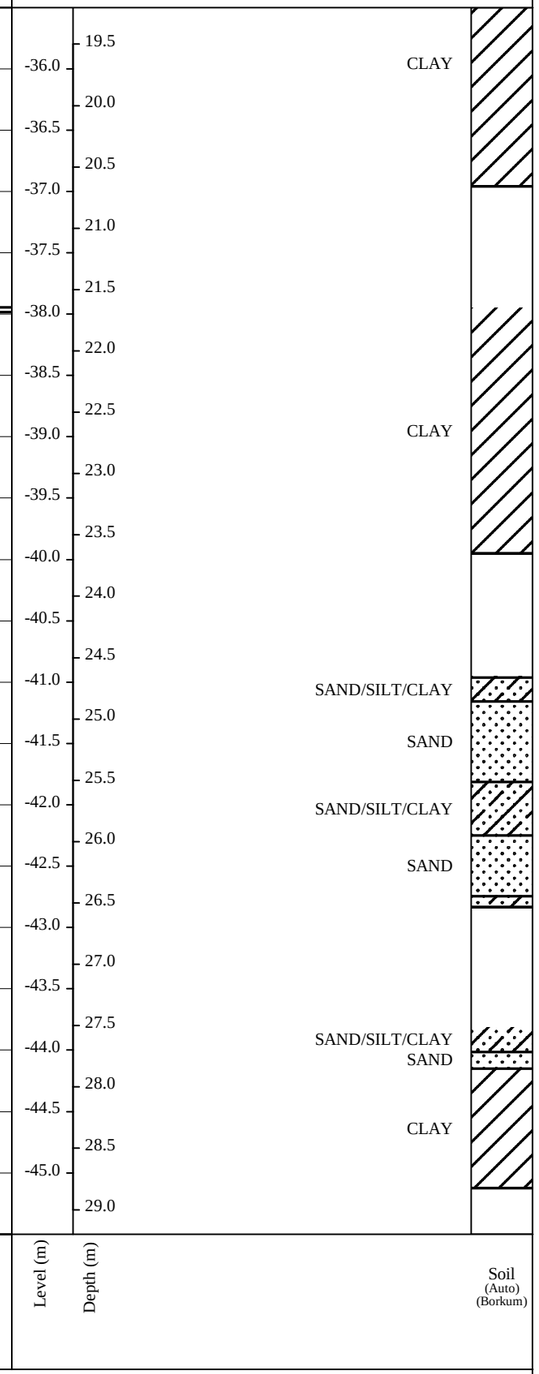
CPT name : BH09





E	: 633474	Cone no.	: Unknow Tip	Rig	: DTH
N	: 6284377	Cone type	: TSP	Performed by	: LOC
Date	: 2009-05-27	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-29	Subject: DTH-CPT BH09		
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Approved	: JBC	Date: 2009-06-29	Report 1	Enclosure: 1F.06	Rev.

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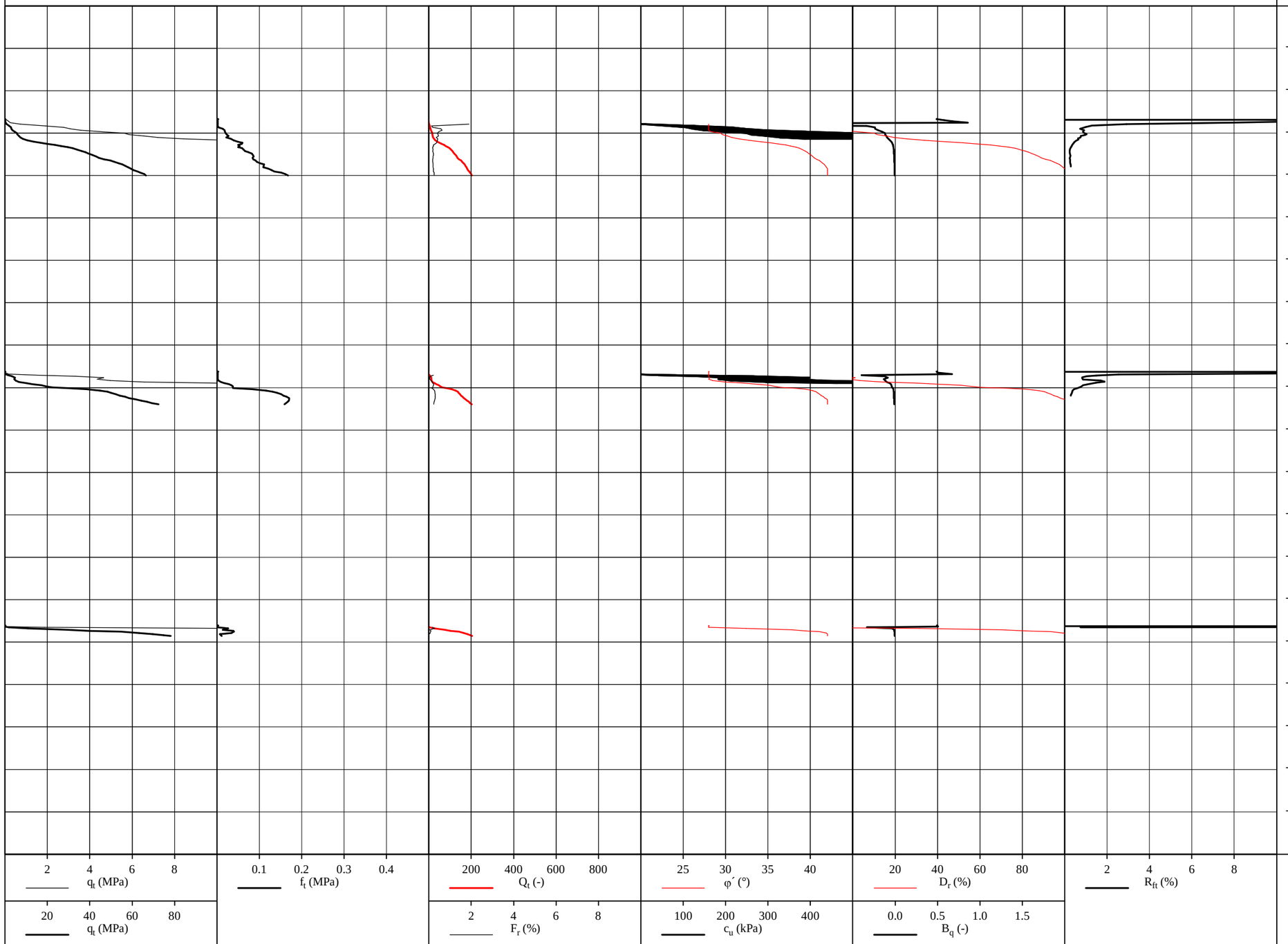
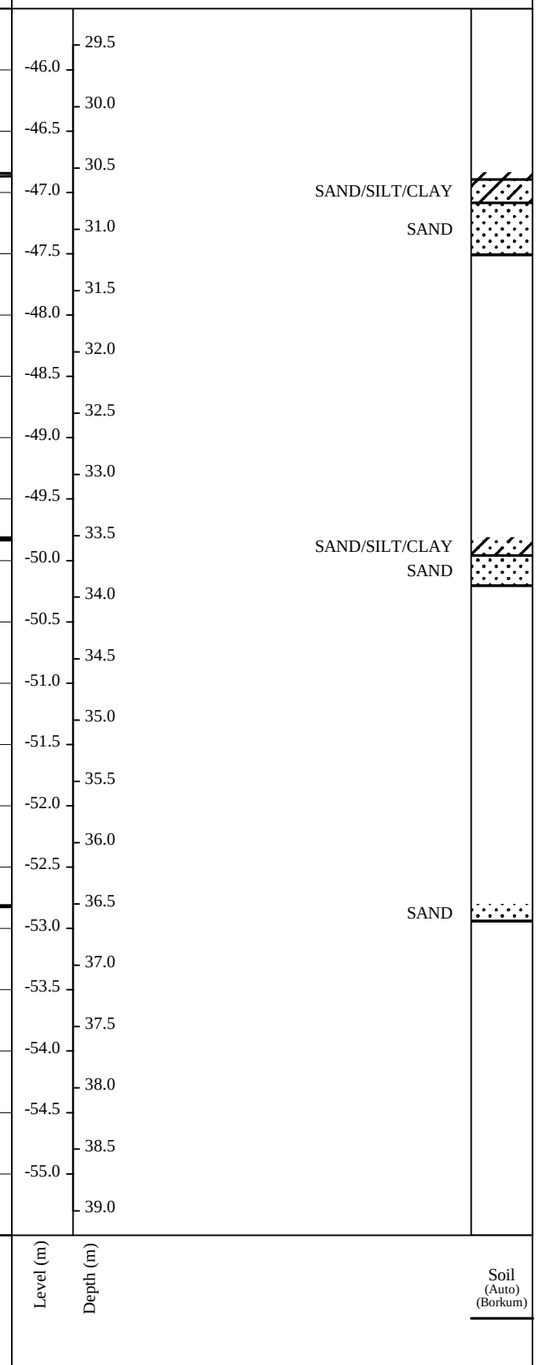
CPT name : BH09





E	: 633474	Cone no.	: Unknow Tip	Rig	: DTH
N	: 6284377	Cone type	: TSP	Performed by	: LOC
Date	: 2009-05-27	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

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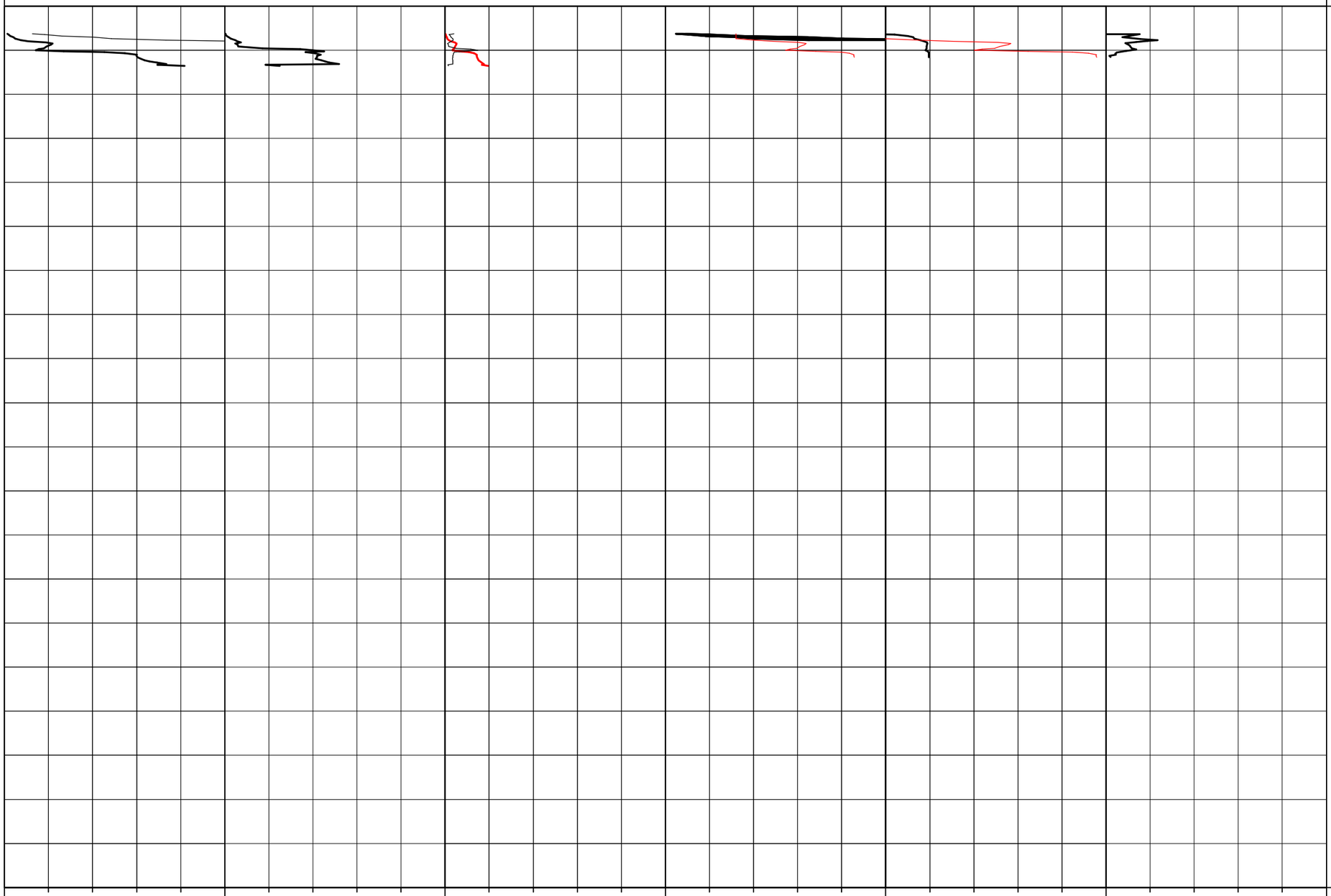
CPT name : BH09



Level (m)	Depth (m)	Soil (Auto) (Borkum)
-56.0	39.5	SAND
-56.5	40.0	
-57.0	40.5	
-57.5	41.0	
-58.0	41.5	
-58.5	42.0	
-59.0	42.5	
-59.5	43.0	
-60.0	43.5	
-60.5	44.0	
-61.0	44.5	
-61.5	45.0	
-62.0	45.5	
-62.5	46.0	
-63.0	46.5	
-63.5	47.0	
-64.0	47.5	
-64.5	48.0	
-65.0	48.5	
	49.0	

2 4 6 8 q_t (MPa)

20 40 60 80 q_t (MPa)

0.1 0.2 0.3 0.4 f_t (MPa)

200 400 600 800 Q_t (-)

2 4 6 8 F_r (%)

25 30 35 40 φ´ (°)

100 200 300 400 c_u (kPa)

20 40 60 80 D_r (%)

0.0 0.5 1.0 1.5 B_q (-)

2 4 6 8 R_{ft} (%)

E	: 633474	Cone no.	: Unknow Tip	Rig	: DTH
N	: 6284377	Cone type	: TSP	Performed by	: LOC
Date	: 2009-05-27	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

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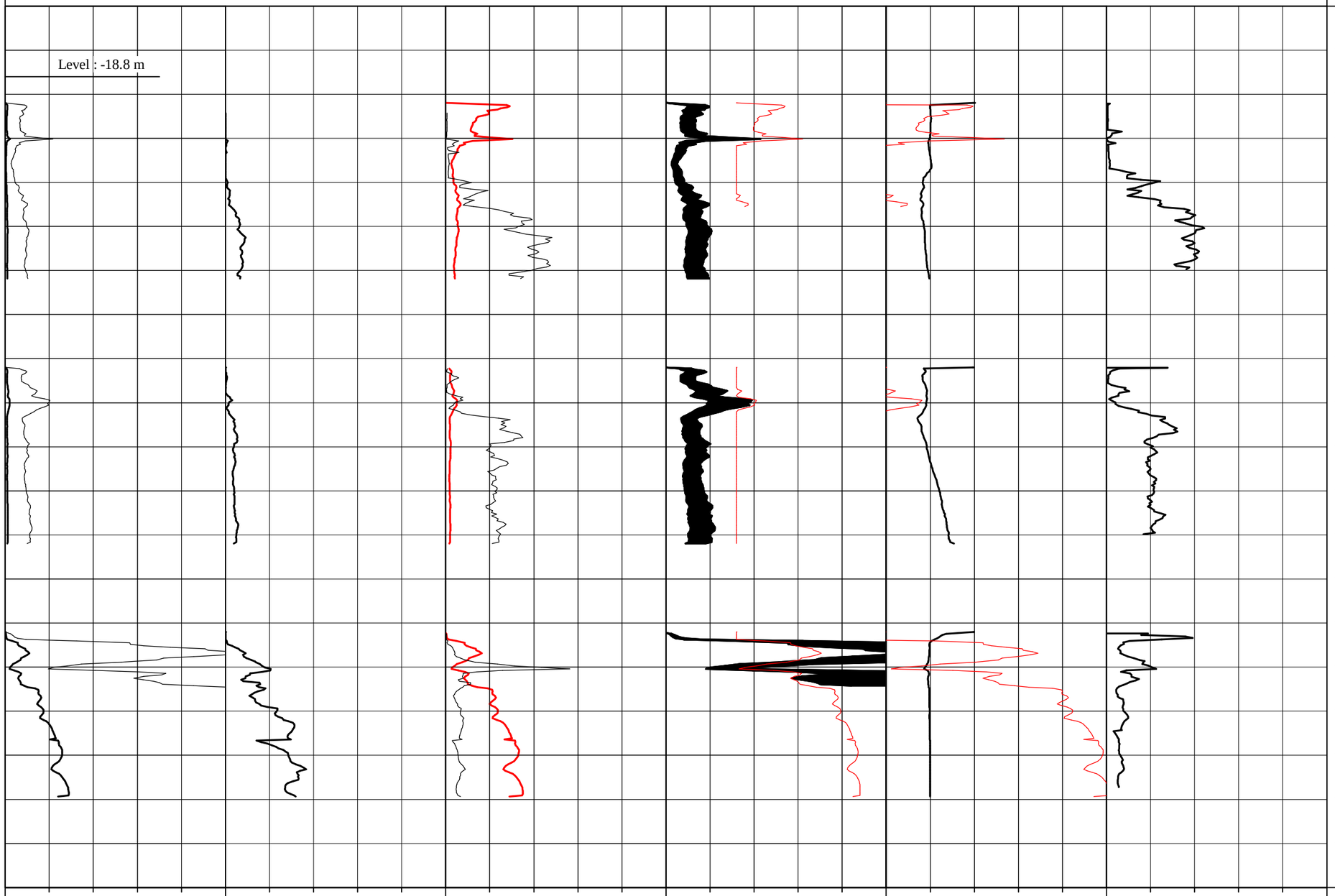
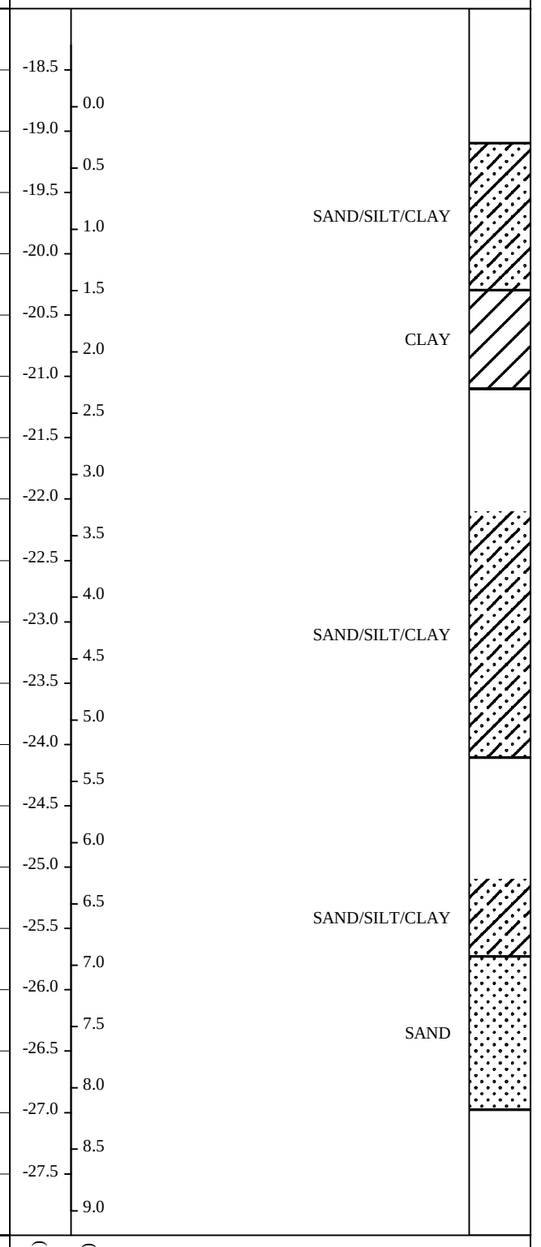
CPT name : BH10

Level : -18.8 m





E	: 638588	Cone no.	: Icone080310	Rig	: DTH
N	: 6278390	Cone type	: TSP	Performed by	: JFP
Date	: 2009-05-30	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

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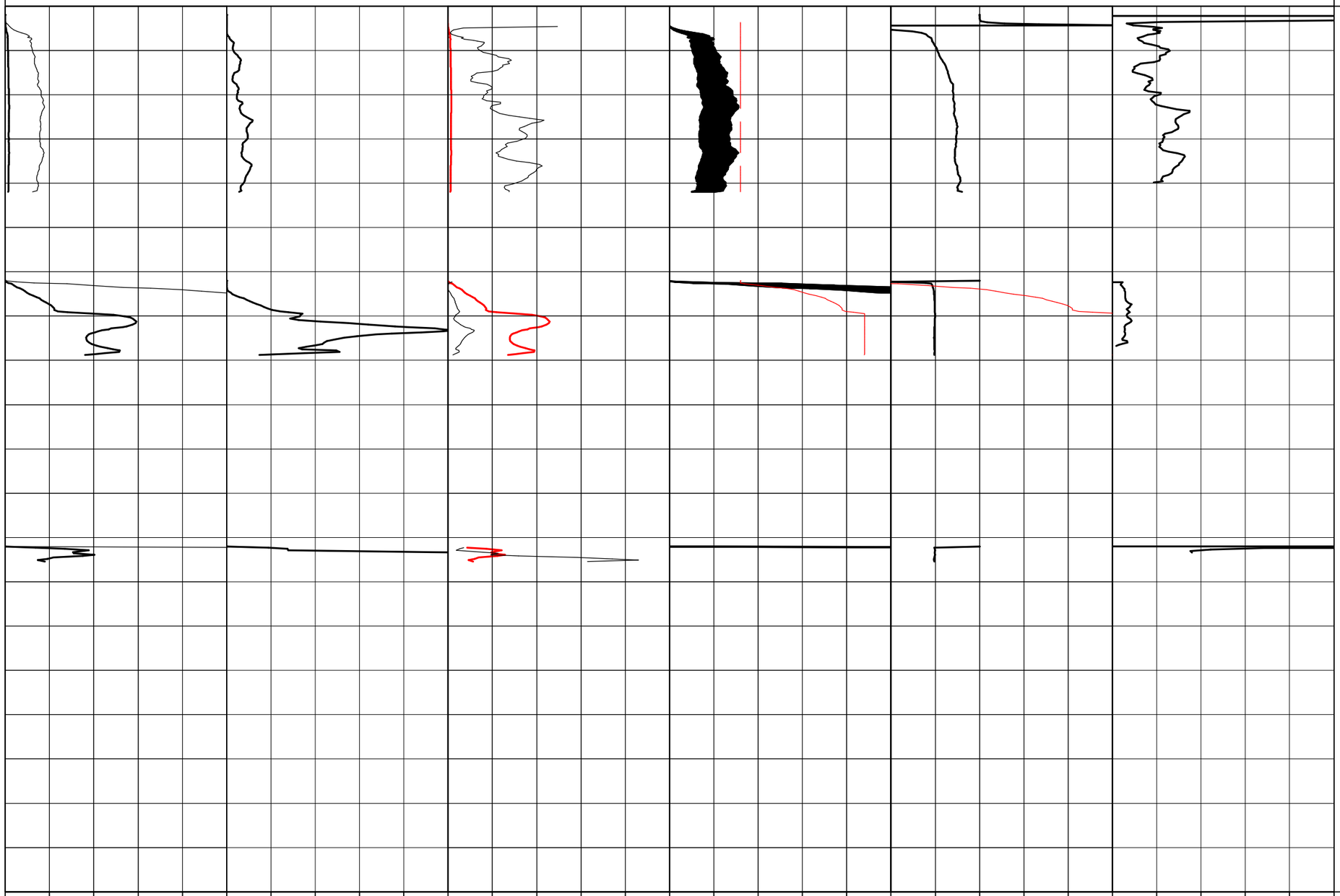
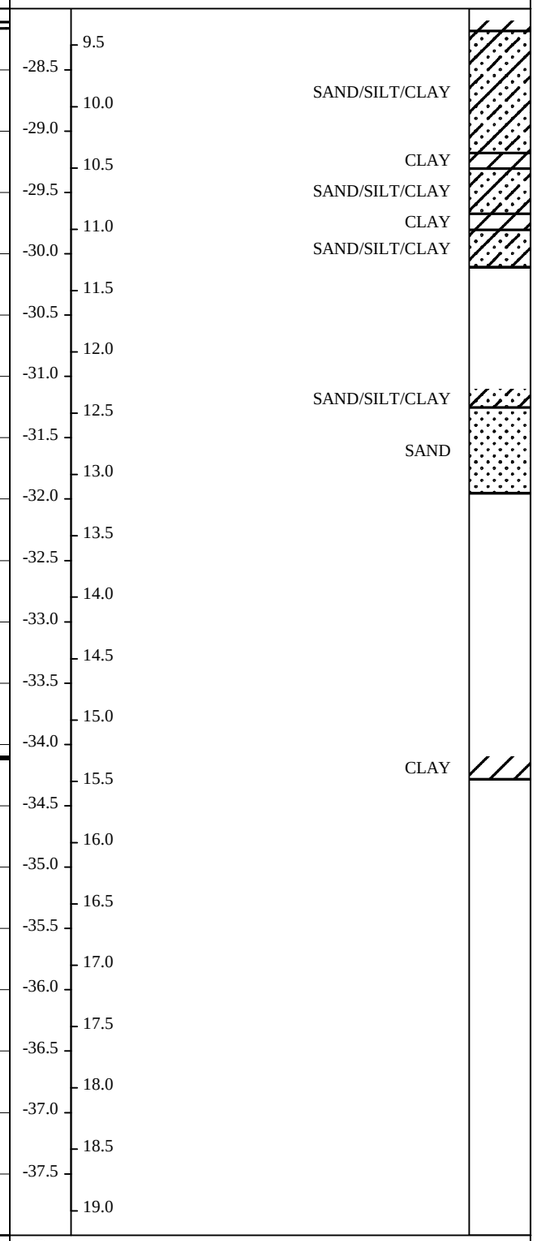
CPT name : BH10





E	: 638588	Cone no.	: Icone080310	Rig	: DTH
N	: 6278390	Cone type	: TSP	Performed by	: JFP
Date	: 2009-05-30	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

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Approved	: JBC	Date: 2009-06-29	Report 1 Enclosure: 1F.07	Rev.

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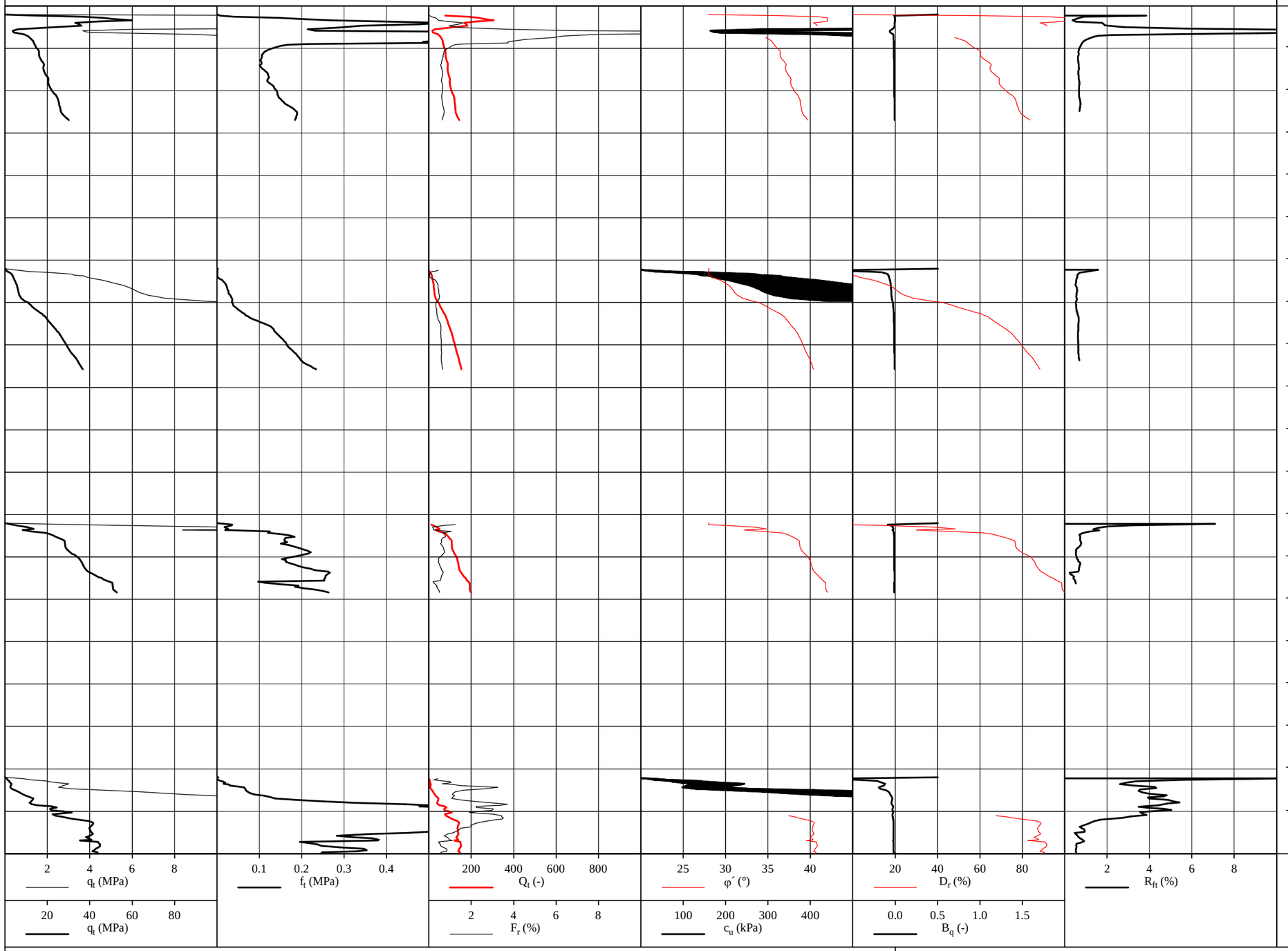
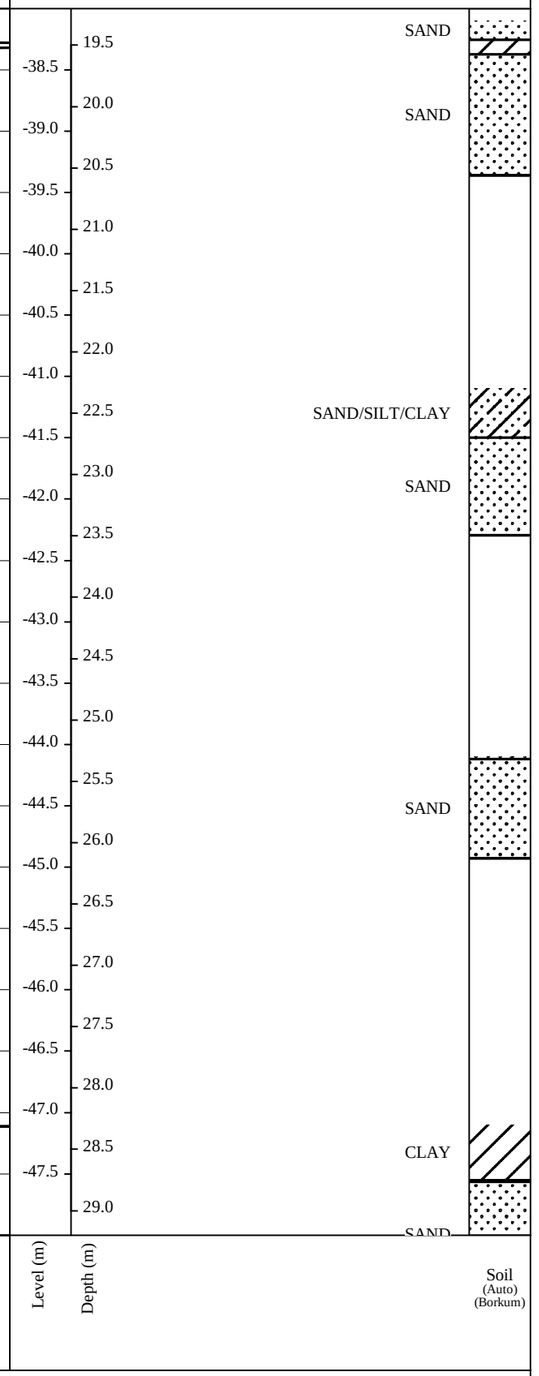
CPT name : BH10





E	: 638588	Cone no.	: Icone080310	Rig	: DTH
N	: 6278390	Cone type	: TSP	Performed by	: JFP
Date	: 2009-05-30	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute

Project : 32490 Anholt/Djursland Offshore Wind Farm

Prepared	: MTM	Date: 2009-06-29	Subject: DTH-CPT BH10		
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Approved	: JBC	Date: 2009-06-29	Report 1	Enclosure: 1F.07	Rev.

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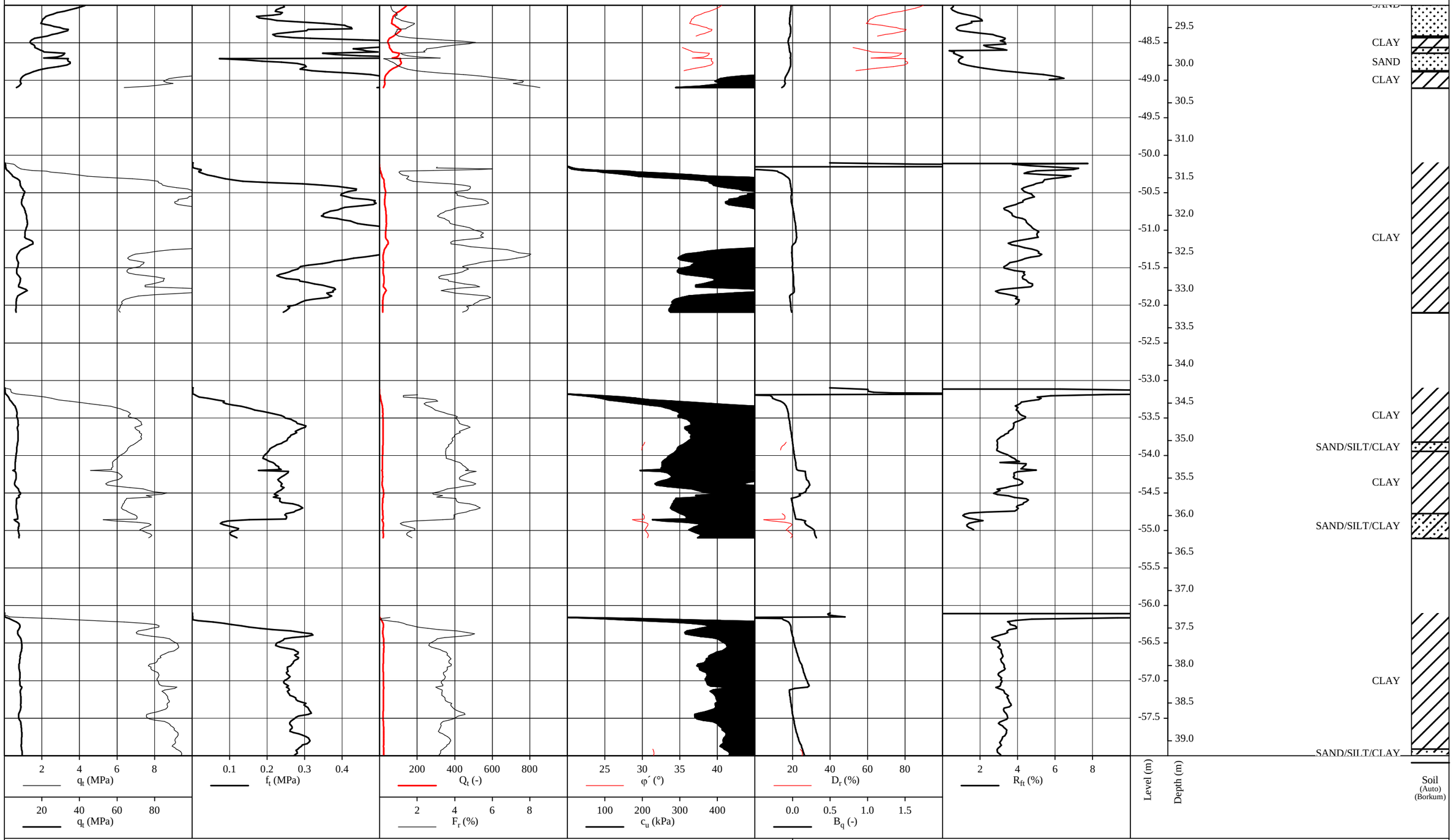
CPT name : BH10



E	: 638588	Cone no.	: Icone080310	Rig	: DTH
N	: 6278390	Cone type	: TSP	Performed by	: JFP
Date	: 2009-05-30	Cone area	: 10.0 cm^2	Remark	:

Danish Geotechnical Institute — Project : 32490 Anholt/Djursland Offshore Wind Farm

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DANISH GEOTECHNICAL INSTITUTE

Enclosure 1G.01 – 1G.07
Particle Size Distribution Curves

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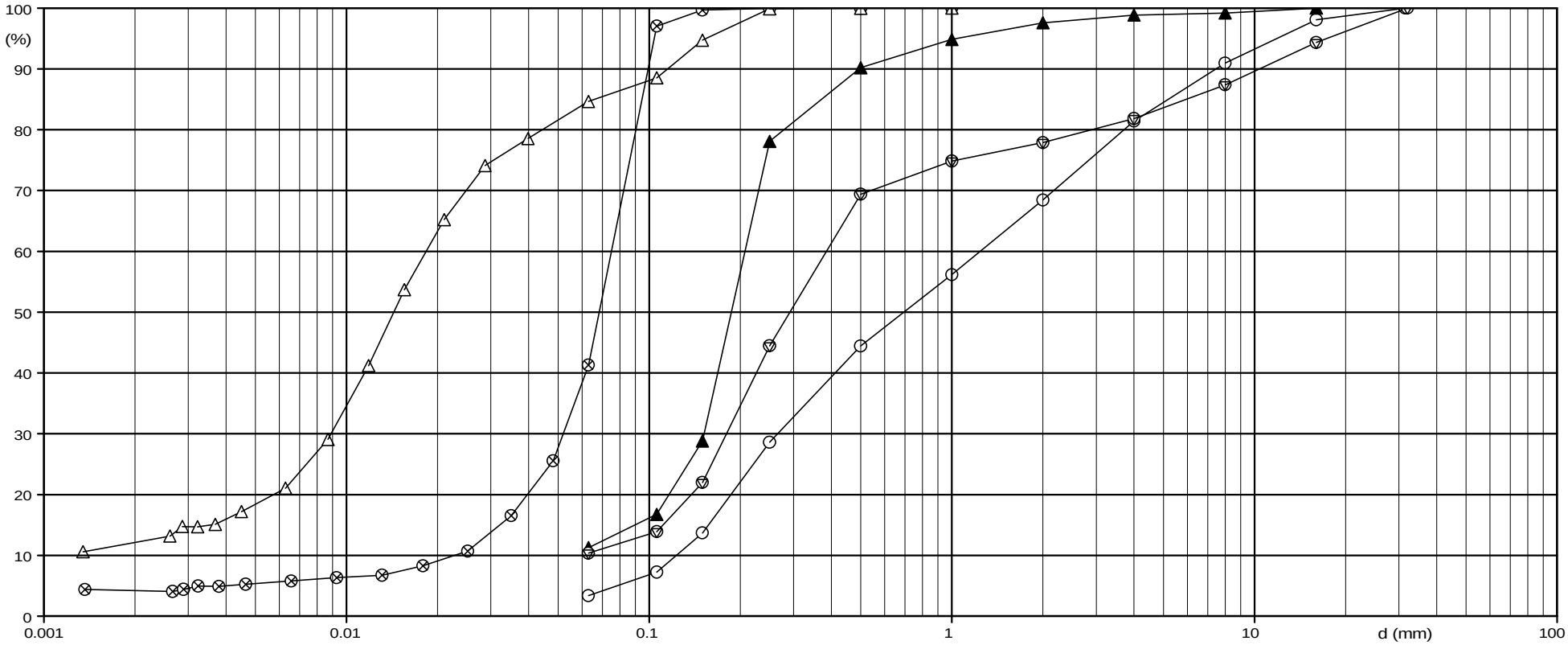
Performed : LIV Date : 2009-06-19
Checked : RIM Date : 2009-07-07
Approved : JLC Date : 2009-07-07

Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.01 / 1	BH.01 / 2	BH.01 / 4	BH.01 / 5	BH.01 / 8
Curve	○	⊗	▲	△	▽
Geology	SAND	SILT	SAND	SILT	SAND
Medium grain size d_{50} (mm)	0.695	0.0683	0.187	0.0143	0.292
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	1.24 / 0.123 = 10.08	0.075 / 0.0228 = 3.29	0.207 / 0.0559 = 3.7	0.0183 / 0.0012 = 15.78	0.385 / 0.0597 = 6.45
Plasticity index W_L - W_P = I_P (%)	- =	- =	- =	24.9 - 16.5 = 8.4	- =
Activity I_P (%) / Ier(%) = I_A	/ =	/ 4.2 =	/ =	8.4 / 12.1 = 0.69	/ =
$CaCO_3$ (%)					
Specific gravity d_S					
Note					

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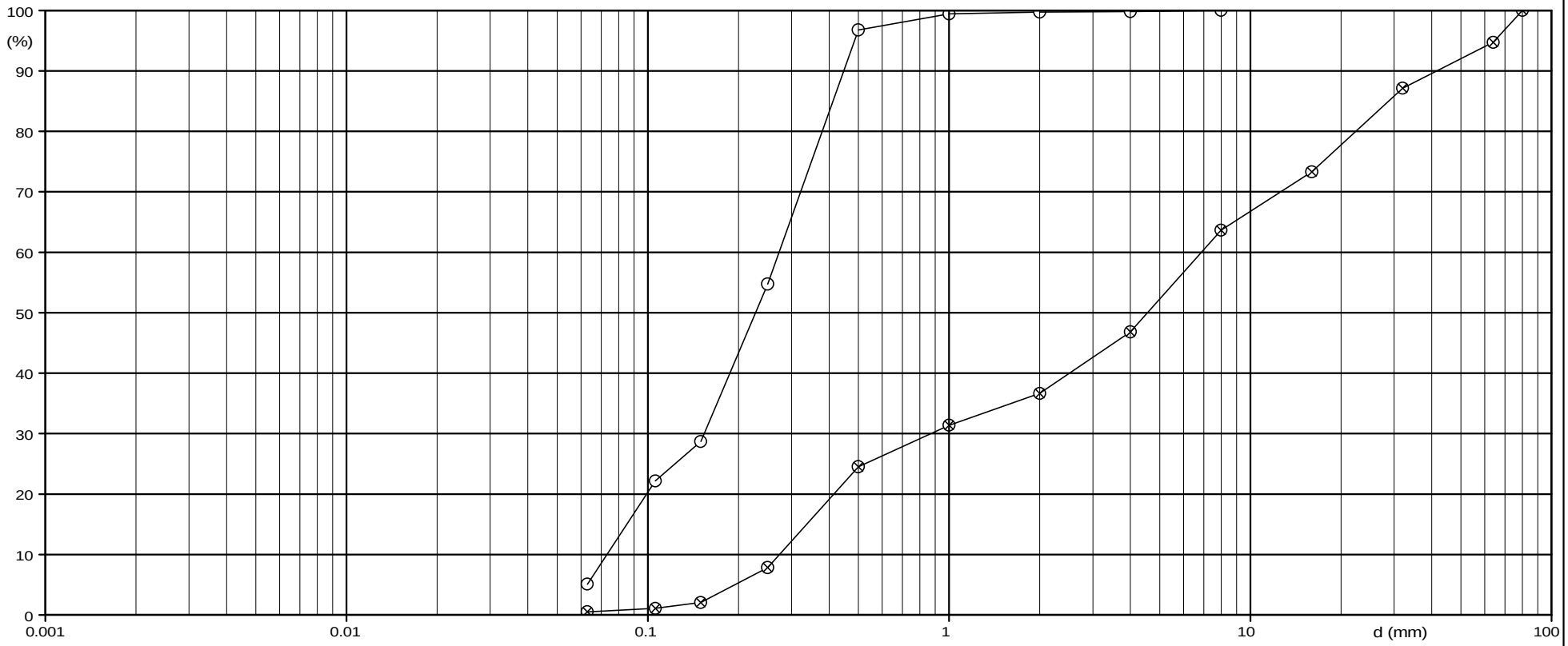
Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.01 / 15	BH.01 / 21	/	/	/
Curve	○	⊗			
Geology	SAND	GRAVEL			
Medium grain size d_{50} (mm)	0.228	4.56			
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.273 / 0.0731 = 3.73	6.88 / 0.273 = 25.2	/ =	/ =	/ =
Plasticity index W_L - W_P = I_P (%)	- =	- =	- =	- =	- =
Activity I_P (%) / Ier(%) = I_A	/ =	/ =	/ =	/ =	/ =
$CaCO_3$ (%)					
Specific gravity d_S					
Note					

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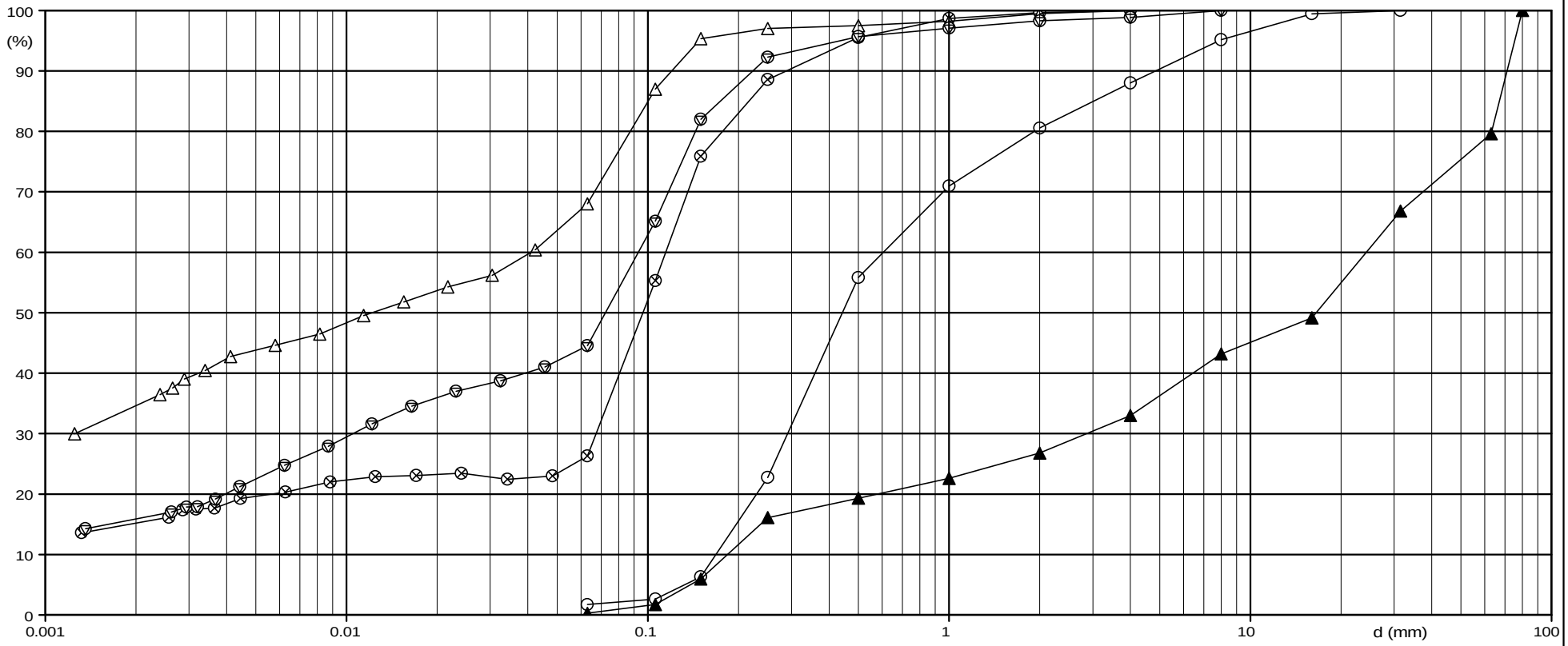
Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.02 / 1	BH.02 / 13	BH.02 / 16	BH.02 / 18	BH.02 / 6
Curve	○	⊗	▲	△	▽
Geology	SAND	SAND	GRAVEL	CLAY	CLAY
Medium grain size d_{50} (mm)	0.443	0.0964	16.5	0.0121	0.0723
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.605 / 0.168 = 3.6	0.115 / =	24.3 / 0.184 = 132.07	0.041 / =	0.0931 / =
Plasticity index $W_L - W_P = I_P$ (%)	- =	- =	- =	- =	21.7 - 11.9 = 9.8
Activity I_P (%) / Ier(%) = I_A	/ =	/ 15.2 =	/ =	/ 34.6 =	9.8 / 15.9 = 0.62
$CaCO_3$ (%)					
Specific gravity d_S					
Note					

Encl. No : 1G.02

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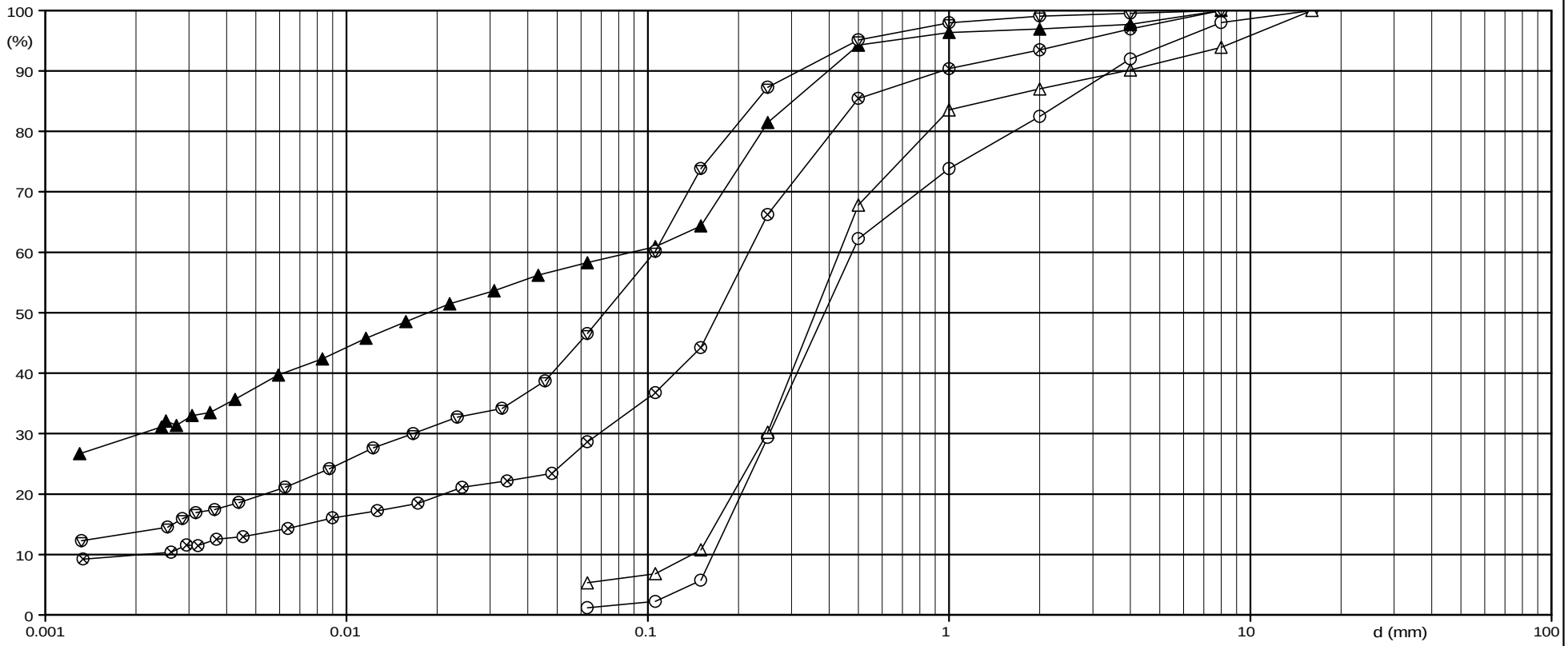
Approved : JLC Date : 2009-07-07

Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.04 / 1	BH.04 / 2	BH.04 / 22	BH.04 / 23	BH.04 / 5
Curve	○	⊗	▲	△	▽
Geology	SAND	CLAY	SAND	SAND	SAND
Medium grain size d_{50} (mm)	0.386	0.172	0.0186	0.36	0.0719
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.477 / 0.164 = 2.91	0.216 / 0.0021 = 103.35	0.0883 / =	0.433 / 0.14 = 3.09	0.105 / =
Plasticity index W_L - W_P = I_P (%)	- =	- =	- =	- =	- =
Activity I_P (%) / Ier(%) = I_A	/ =	/ 9.9 =	/ 29.7 =	/ =	/ 13.7 =
$CaCO_3$ (%)					
Specific gravity d_S					
Note					

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Performed : LIV Date : 2009-06-19
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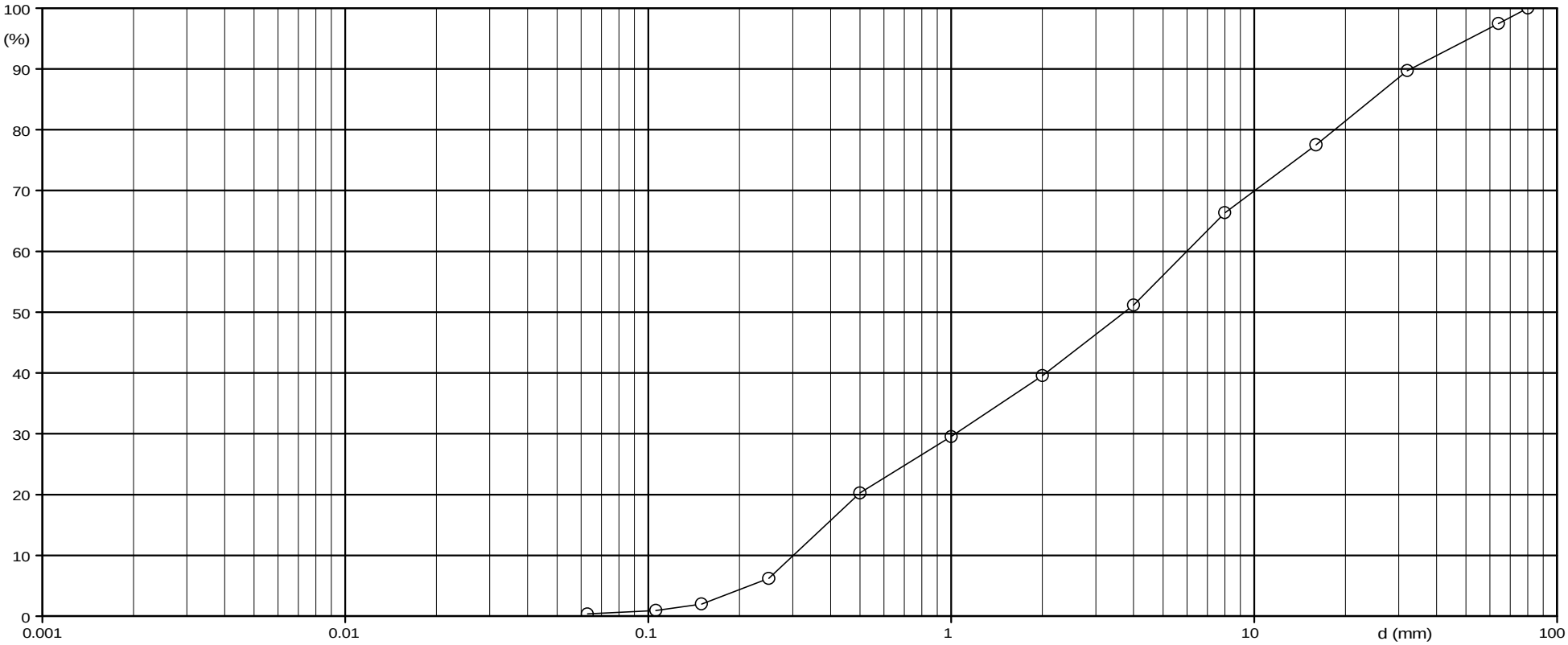
Grain Size Distribution

Job : 32490 Anholt. Djursland Wind Farm



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.04 / 26	/	/	/	/
Curve	○				
Geology	GRAVEL				
Medium grain size d_{50} (mm)	3.73				
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	5.99 / 0.301 = 19.9	/ =	/ =	/ =	/ =
Plasticity index W_L - W_P = I_P (%)	- =	- =	- =	- =	- =
Activity I_P (%) / Ier(%) = I_A	/ =	/ =	/ =	/ =	/ =
$CaCO_3$ (%)					
Specific gravity d_S	2.60				
Note					

Encl. No : 1G.03

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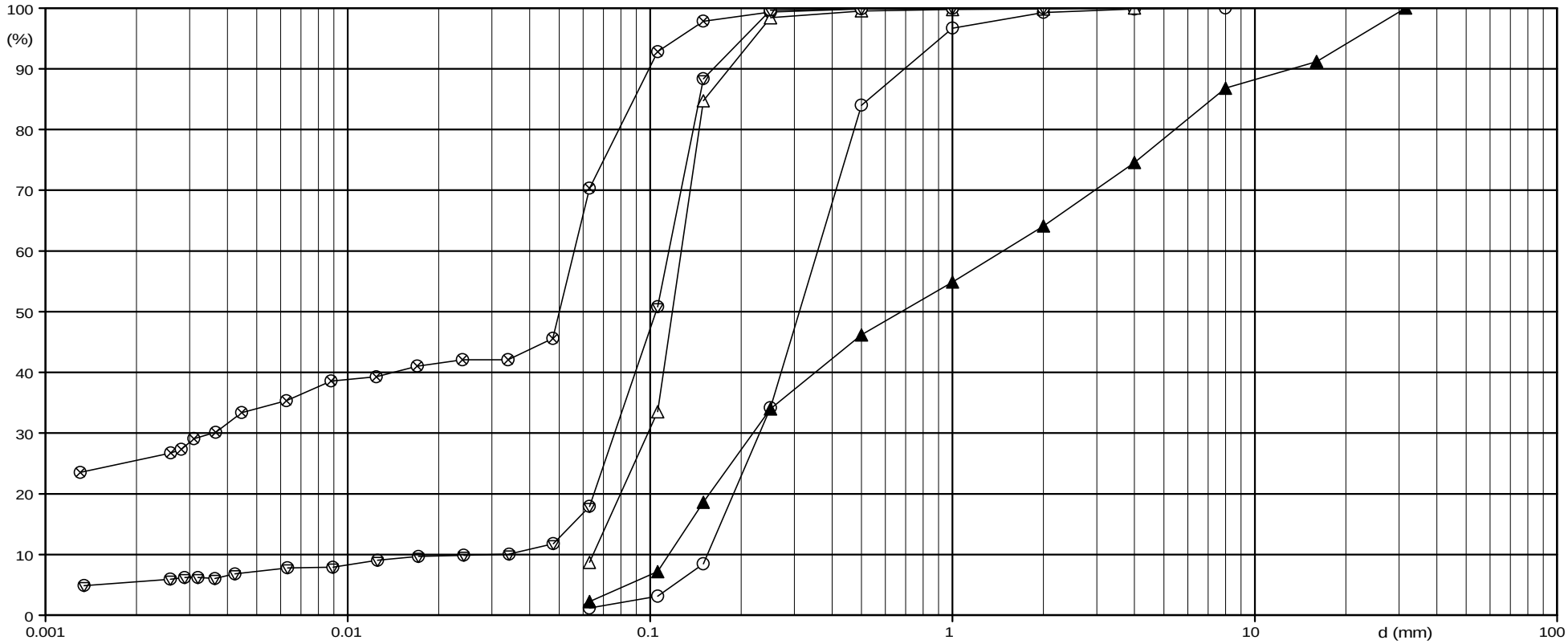
Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.05 / 1	BH.05 / 12	BH.05 / 2	BH.05 / 7	BH.05 / 9
Curve	○	⊗	▲	△	▽
Geology	SAND	CLAY	SAND	SAND	SAND
Medium grain size d_{50} (mm)	0.312	0.0501	0.678	0.119	0.105
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.358 / 0.155 = 2.31	0.0561 / =	1.47 / 0.115 = 12.78	0.127 / 0.0647 = 1.96	0.115 / 0.0301 = 3.82
Plasticity index W_L - W_P = I_P (%)	- =	28.1 - 13.3 = 14.8	- =	- =	- =
Activity I_P (%) / Ier(%) = I_A	/ =	14.8 / 25.5 = 0.58	/ =	/ =	/ 5.5 =
$CaCO_3$ (%)		20.82			
Specific gravity d_S		2.69			2.67
Note					

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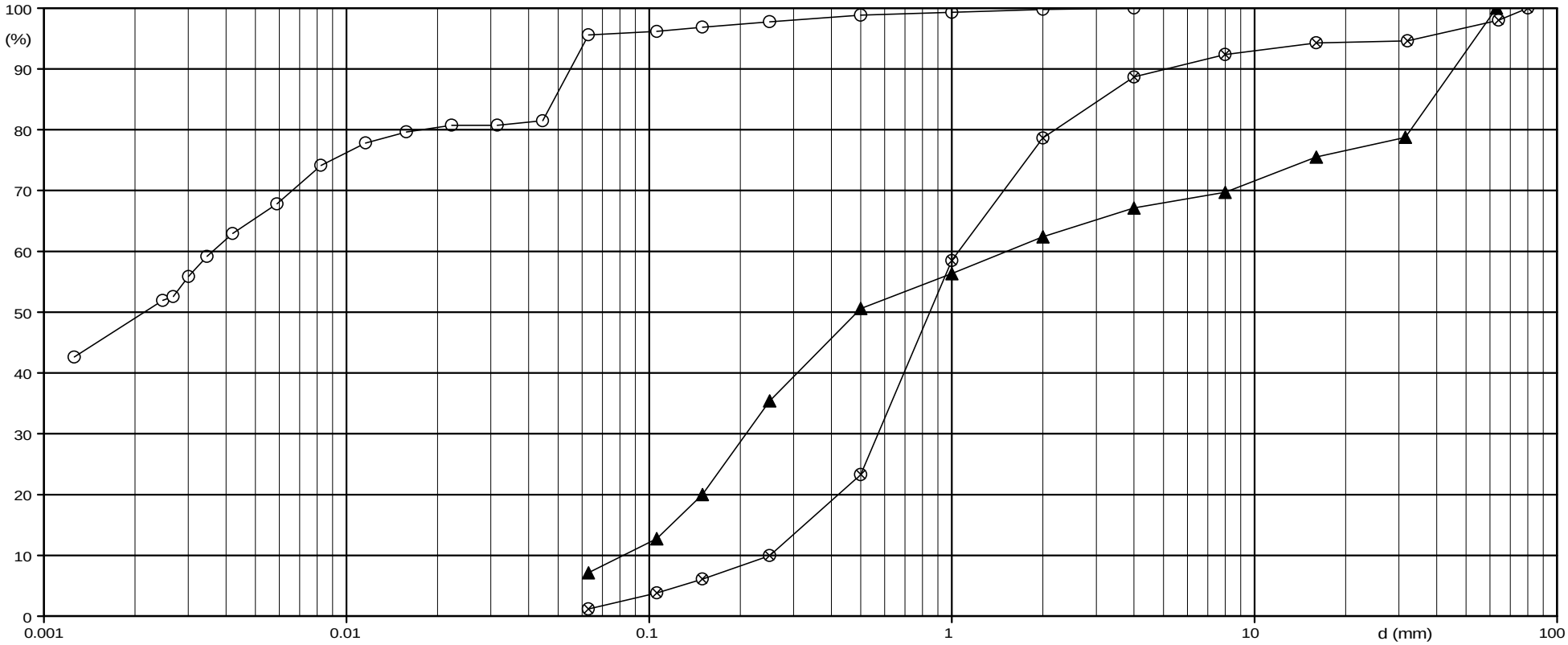
Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.05 / 15	BH.05 / 18	BH.05 / 22	/	/
Curve	○	⊗	▲		
Geology	CLAY	SAND	SAND		
Medium grain size d_{50} (mm)	0.0022	0.846	0.486		
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.0036 / =	1.05 / 0.25 = 4.2	1.52 / 0.0821 = 18.51	/ =	/ =
Plasticity index W_L - W_P = I_P (%)	48.0 - 19.0 = 29.0	- =	- =	- =	- =
Activity I_P (%) / Ier(%) = I_A	29.0 / 49.0 = 0.59	/ =	/ =	/ =	/ =
$CaCO_3$ (%)	31.71				
Specific gravity d_S	2.73	2.67			
Note					

Encl. No : 1G.04

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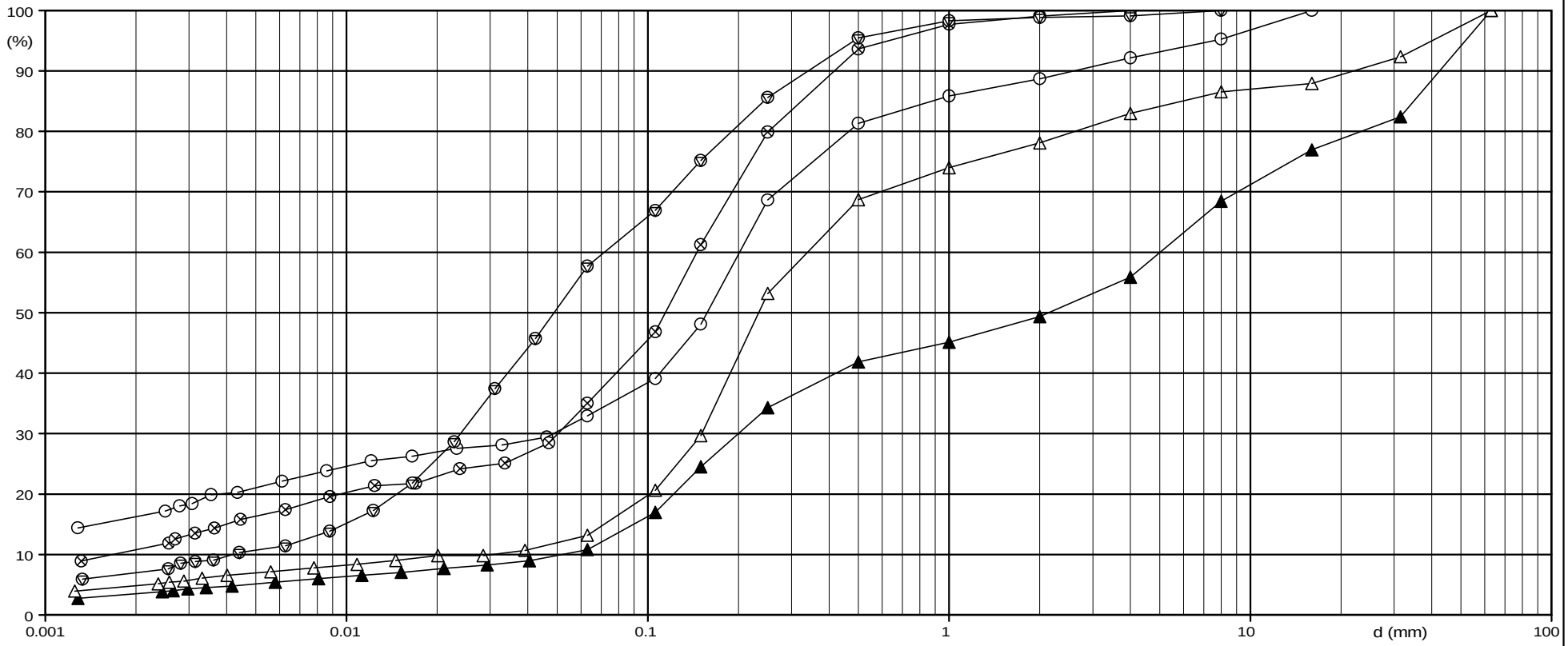
Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.07 / 1	BH.07 / 13	BH.07 / 14	BH.07 / 2	BH.07 / 9
Curve	○	⊗	▲	△	▽
Geology	SAND	SAND TILL	SAND TILL	SAND	SAND
Medium grain size d_{50} (mm)	0.157	0.114	2.14	0.233	0.0488
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.202 / =	0.146 / 0.0017 = 86.9	5.02 / 0.0517 = 97.1	0.339 / 0.0303 = 11.19	0.0717 / 0.0042 = 17.11
Plasticity index W_L - W_P = I_P (%)	- =	- =	- =	- =	- =
Activity I_P (%) / Ier(%) = I_A	/ 16.2 =	/ 10.8 =	/ 3.5 =	/ 4.8 =	/ 7.0 =
$CaCO_3$ (%)		12.48			15.9
Specific gravity d_S					2.69
Note					

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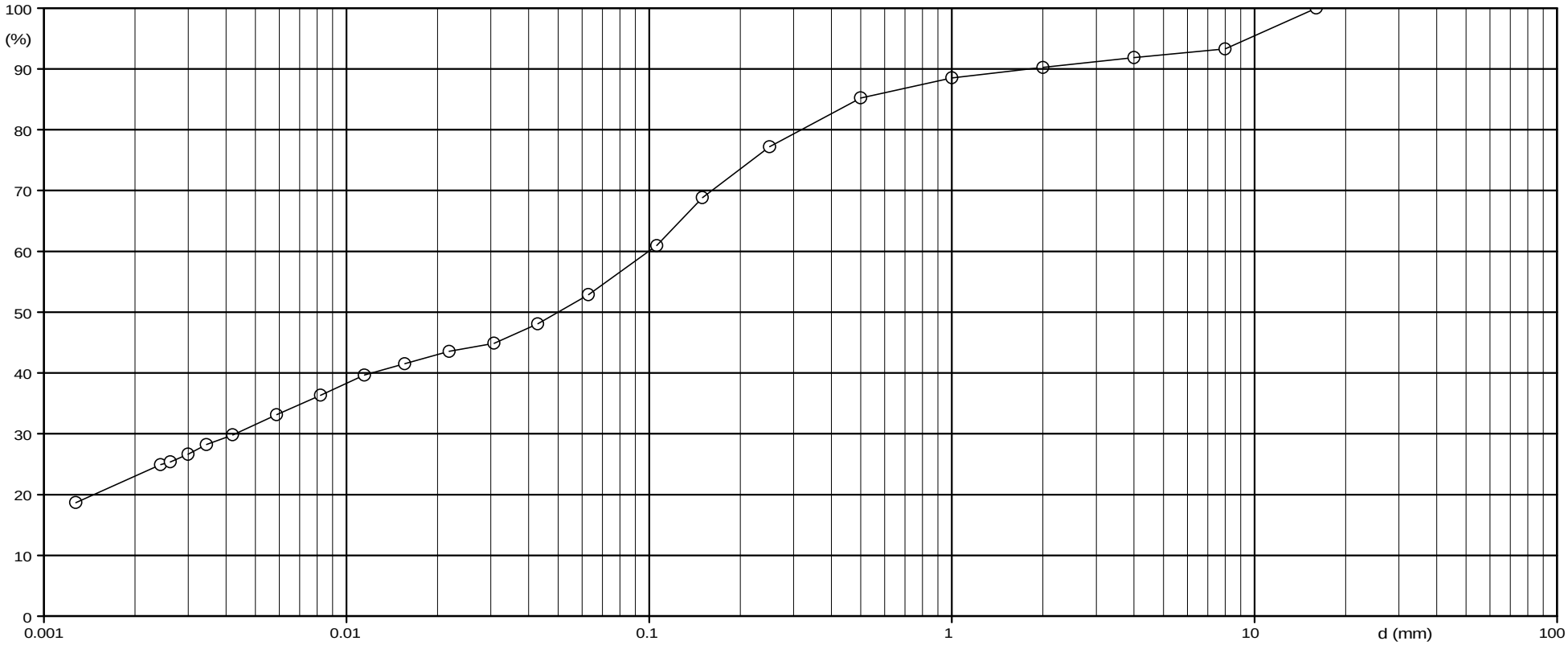
Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.07 / 19	/	/	/	/
Curve	○				
Geology	CLAY TILL				
Medium grain size d_{50} (mm)	0.05				
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.0998 / =	/ =	/ =	/ =	/ =
Plasticity index $W_L - W_P = I_P$ (%)	22.3 - 10.6 = 11.7	- =	- =	- =	- =
Activity I_P (%) / Ier(%) = I_A	11.7 / 23.0 = 0.51	/ =	/ =	/ =	/ =
$CaCO_3$ (%)					
Specific gravity d_S					
Note					

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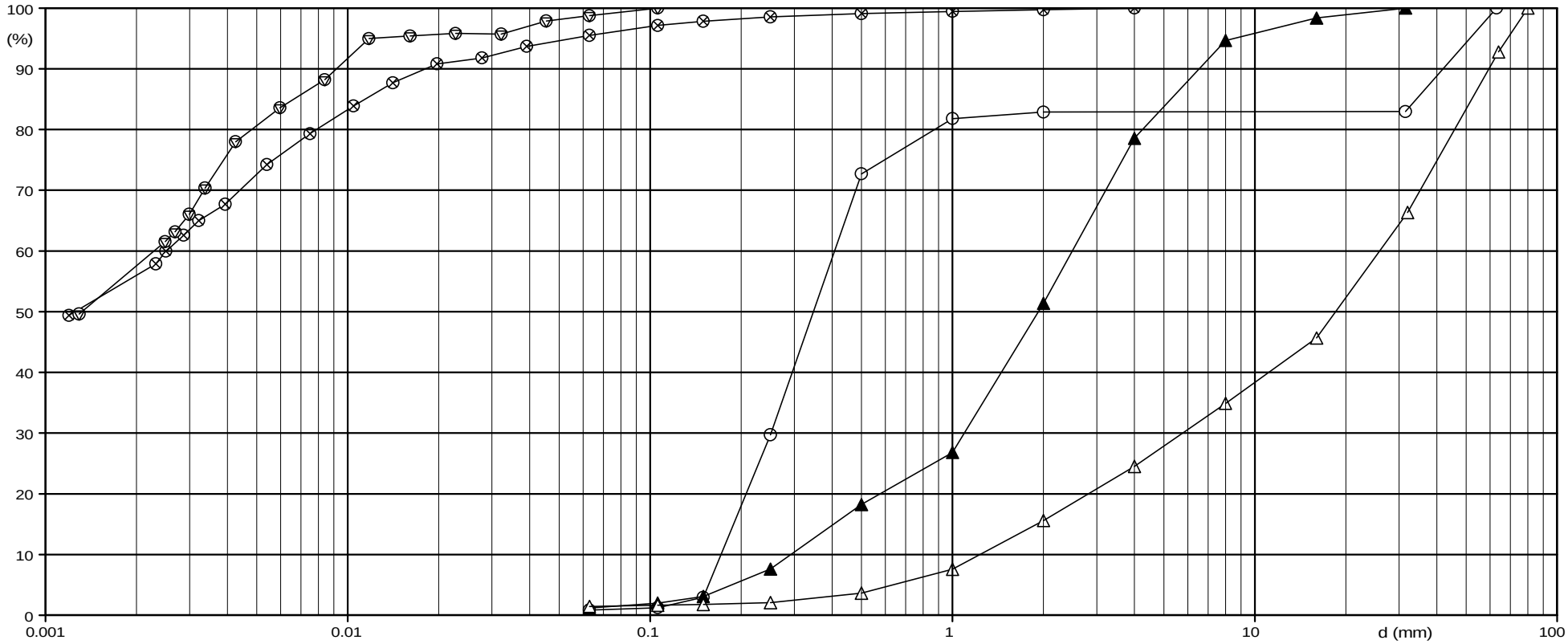
Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.09 / 1	BH.09 / 12	BH.09 / 14	BH.09 / 15	BH.09 / 3
Curve	○	⊗	▲	△	▽
Geology	SAND	CLAY	SAND	GRAVEL	CLAY
Medium grain size d_{50} (mm)	0.347	0.0013	1.92	18.5	0.0013
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.407 / 0.172 = 2.37	0.0025 / =	2.49 / 0.292 = 8.53	25.9 / 1.23 = 21.06	0.0023 / =
Plasticity index $W_L - W_P = I_P$ (%)	- =	40.2 - 19.3 = 20.9	- =	- =	42.4 - 17.7 = 24.7
Activity I_P (%) / Ier(%) = I_A	/ =	20.9 / 56.0 = 0.37	/ =	/ =	24.7 / 57.6 = 0.43
$CaCO_3$ (%)		13.47			
Specific gravity d_S		2.72			2.72
Note					

Encl. No : 1G.06

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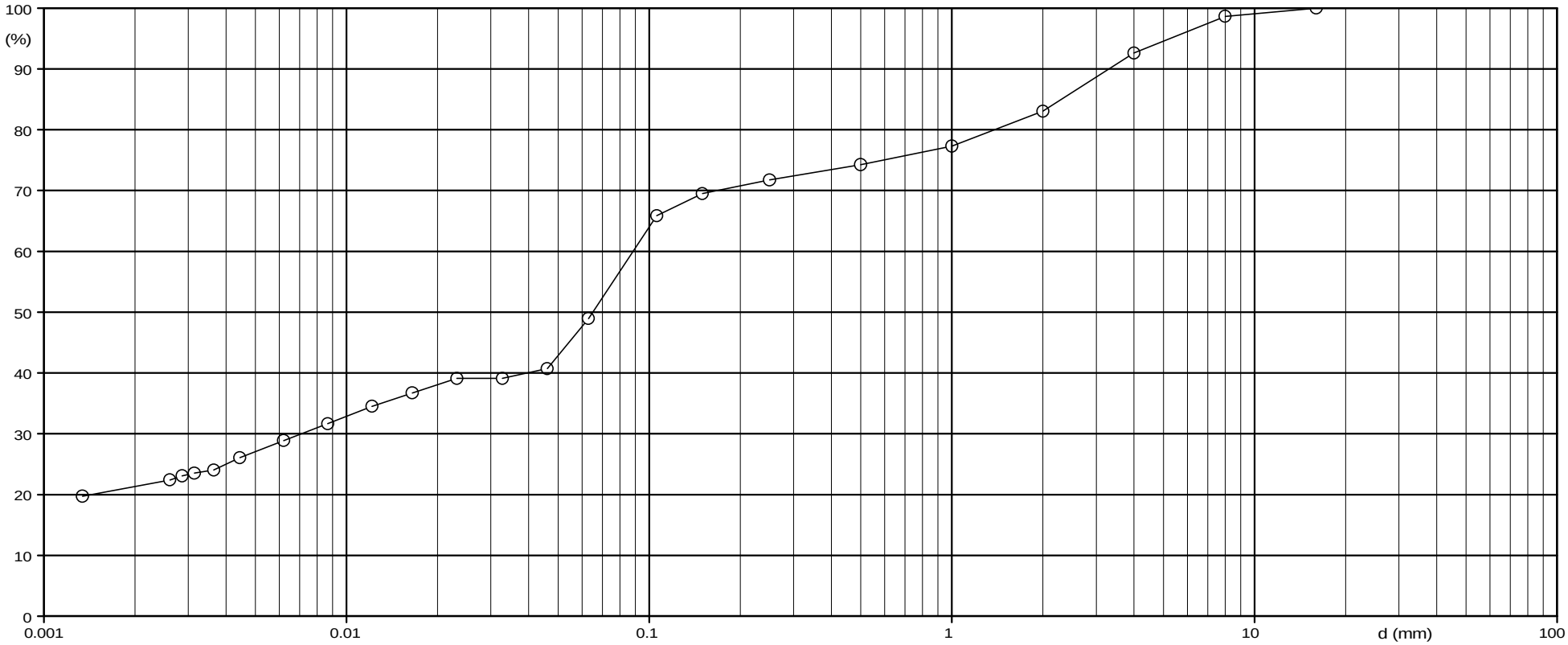
Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.09 / 16	/	/	/	/
Curve	○				
Geology	CLAY				
Medium grain size d_{50} (mm)	0.0651				
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.0885 / =	/ =	/ =	/ =	/ =
Plasticity index $W_L - W_P = I_P$ (%)	41.5 - 15.5 = 26.0	- =	- =	- =	- =
Activity I_P (%) / Ier(%) = I_A	26.0 / 21.3 = 1.22	/ =	/ =	/ =	/ =
$CaCO_3$ (%)					
Specific gravity d_S	2.64				
Note					

Encl. No : 1G.06

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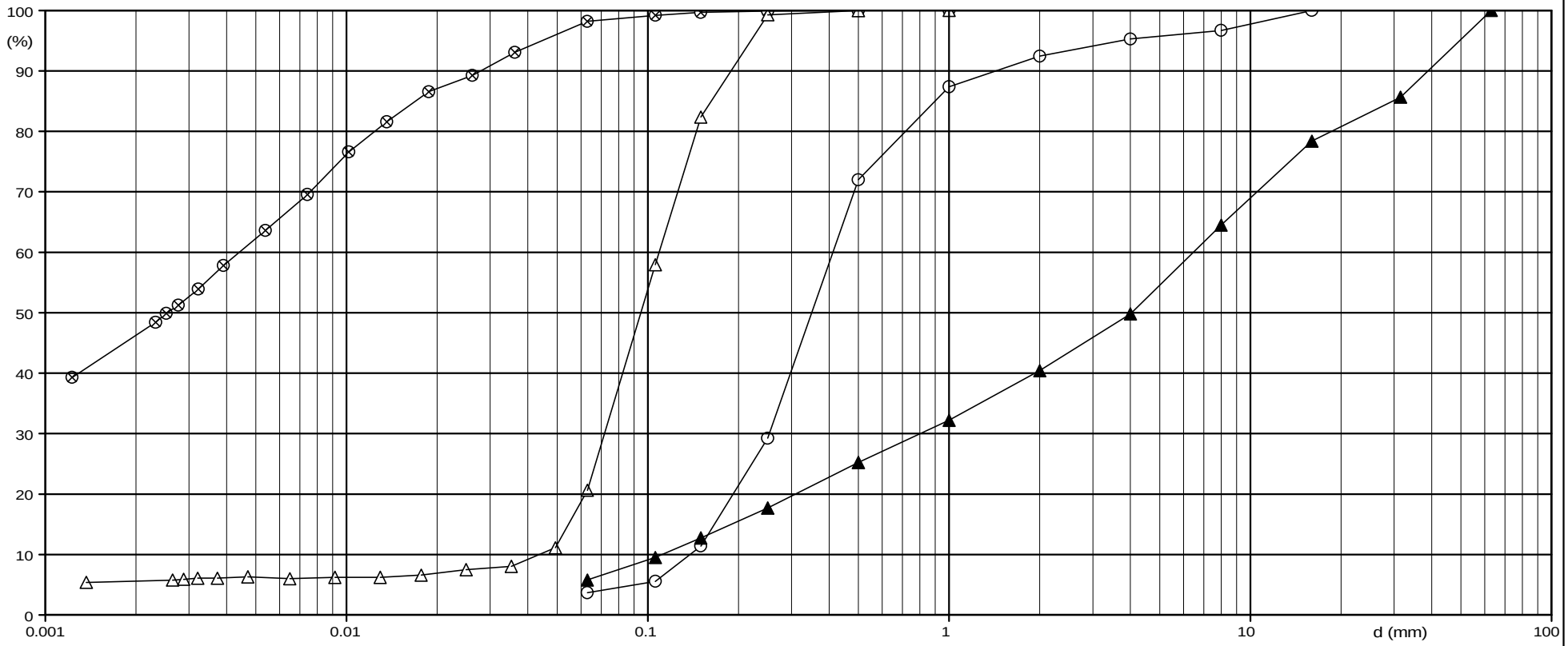
Job : 32490 Anholt. Djursland Wind Farm

Grain Size Distribution



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			STONE

Boring/Sample No. :	BH.10 / 1	BH.10 / 10	BH.10 / 14	BH.10 / 4	/
Curve	○	⊗	▲	△	
Geology	SAND	SILT	GRAVEL	SAND	
Medium grain size d_{50} (mm)	0.35	0.0025	4.04	0.0949	
Uniformity coeff. d_{60} (mm) / d_{10} (mm)	0.412 / 0.138 = 2.99	0.0044 / =	6.47 / 0.112 = 57.77	0.109 / 0.0436 = 2.5	/ =
Plasticity index W_L - W_P = I_P (%)	- =	- =	- =	- =	- =
Activity I_P (%) / Ier(%) = I_A	/ =	/ 46.3 =	/ =	/ 5.6 =	/ =
$CaCO_3$ (%)					
Specific gravity d_S	2.67			2.68	
Note					

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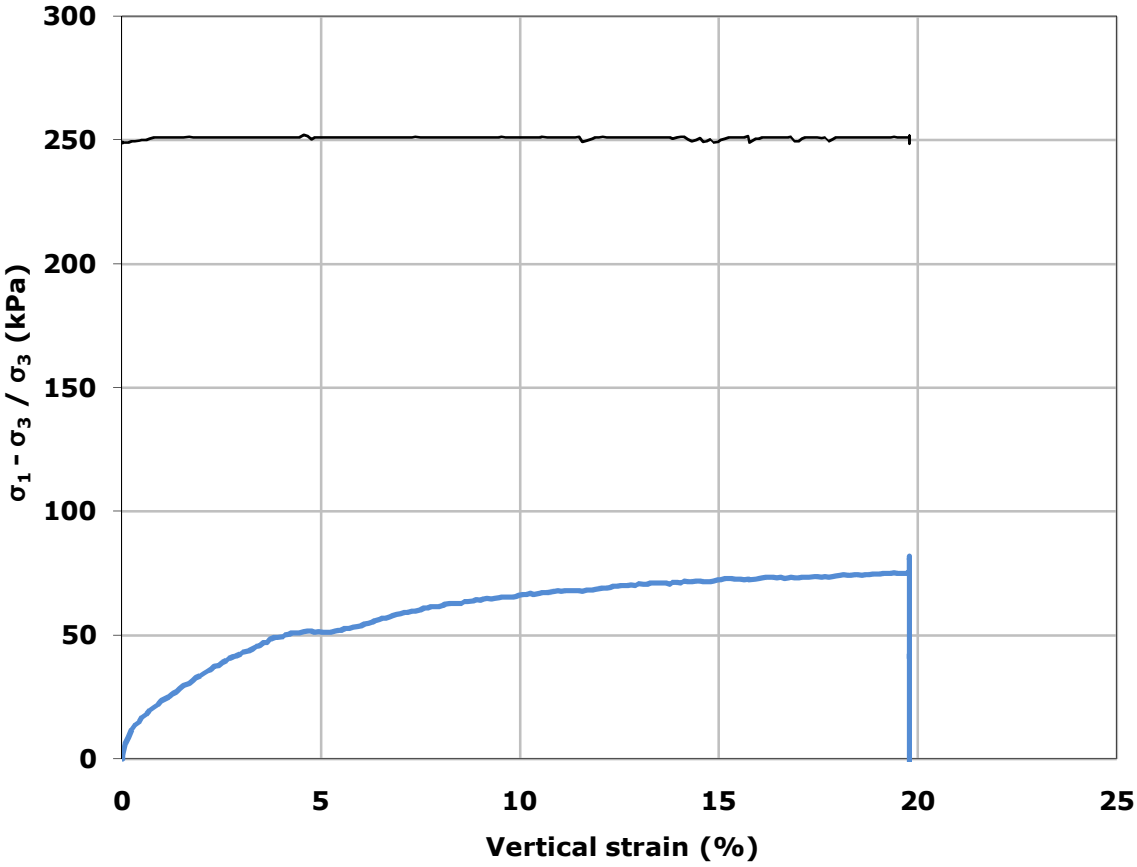
Enclosure 1H.01 – 1H.08
Unconsolidated Undrained (UU) Triaxial Compression Tests



Geology: CLAY, medium plastic in places, silty, sandy, calcareous, w. sandstreaks, olive grey					
Sample dia.	70	mm	Cell Pressure	251	(kPa)
Sample height	70	mm	Rate of strain	1.0	%/min
e	0.8		Strain at failure	20	(%)
ρ	1.92	g/cm^3	Max. deviator stress	82	(kPa)
w	28.8	%	Shear strength c_u	41	(kPa)
ρ_s	2.68	g/cm^3	S_0	97	%

Depth	3.05	m	Bor. No.	BH02
Level	-20.05	m	Lab. No.	3

The test is carried out in accordance with BS 1377:Part 7: 1990 Method 8

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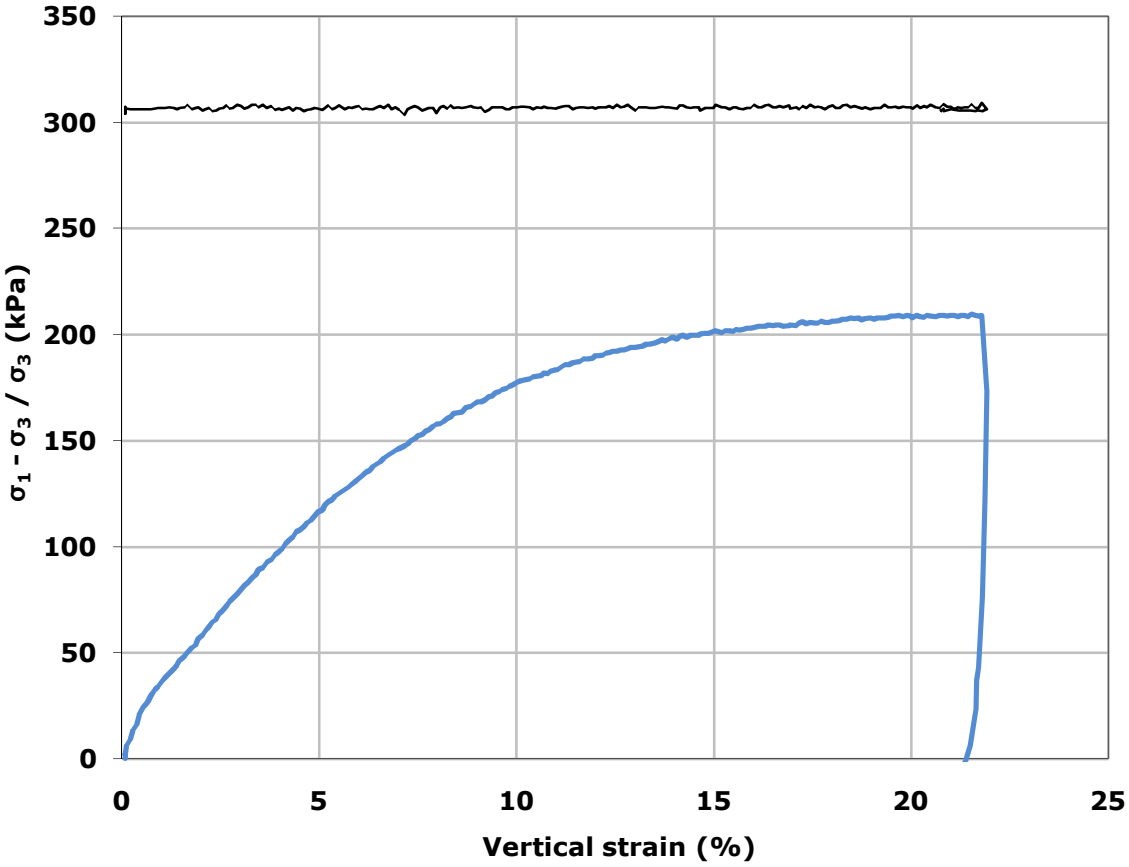
Project: 32490 Anholt Offshore Wind Farm

Prepared:	LFJ	Date : 2009-06-24	Subject: UU Triaxial Test, lab. 3 (BH02)
Controlled:	JLC	Date : 2009-07-02	
Approved:	HFC	Date : 2009-07-02	Report 1 Encl. No. 1H.01



Geology: CLAY, silty, sandy, calcareous, olive grey					
Sample dia.	70	mm	Cell Pressure	306	(kPa)
Sample height	70	mm	Rate of strain	1.0	%/min
e	0.349		Strain at failure	22	(%)
ρ	2.23	g/cm^3	Max. deviator stress	210	(kPa)
w	12.5	%	Shear strength c_u	105	(kPa)
ρ_s	2.68	g/cm^3	S_0	96	%

Depth	6.05	m	Bor. No.	BH02
Level	-23.05	m	Lab. No.	4

The test is carried out in accordance with BS 1377:Part 7: 1990 Method 8

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Project: 32490 Anholt Offshore Wind Farm

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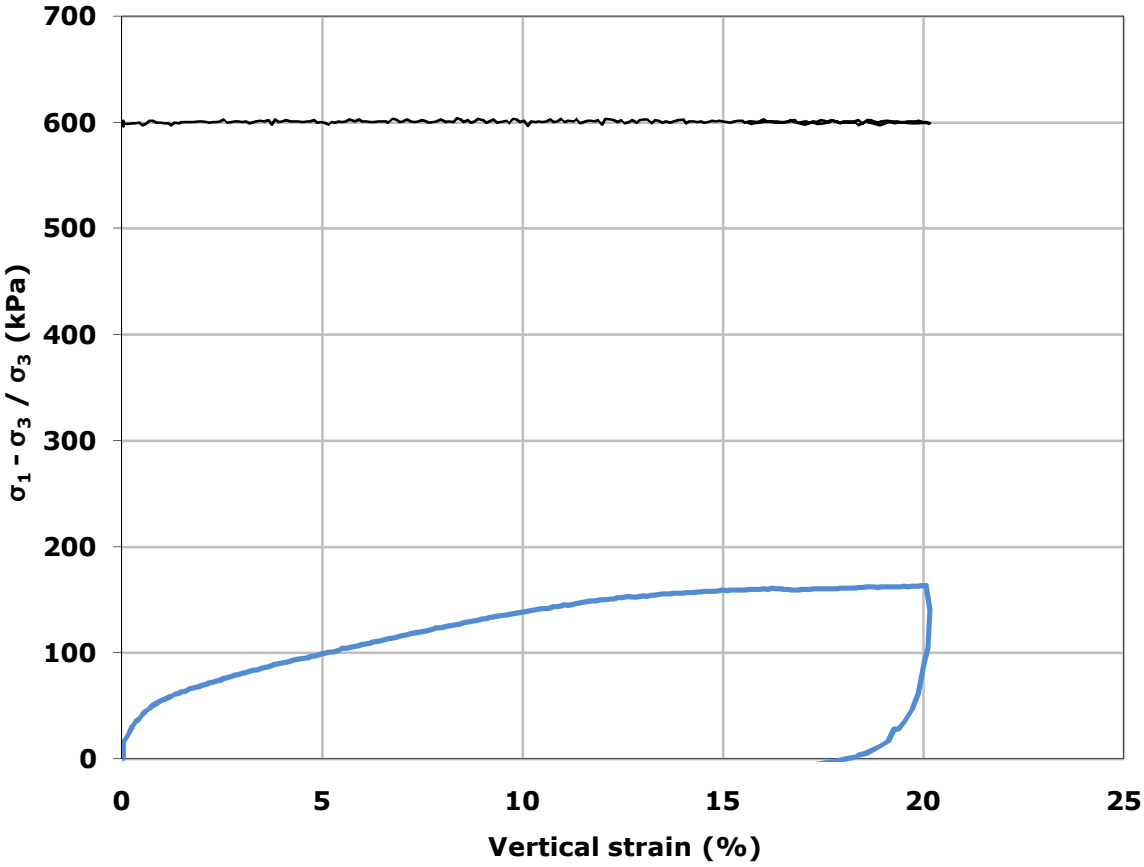

Geology: CLAY, medium plastic, silty, sl. sandy, calcareous, w. silt streaks, olive grey					
Sample dia.	70	mm	Cell Pressure	600	(kPa)
Sample height	70	mm	Rate of strain	1.0	%/min
e	0.812		Strain at failure	20	(%)
ρ	1.92	g/cm^3	Max. deviator stress	163	(kPa)
w	29.6	%	Shear strength c_u	82	(kPa)
ρ_s	2.68	g/cm^3	S_0	98	%

Depth	21.1	m	Bor. No.	BH05
Level	-39.2	m	Lab. No.	12

The test is carried out in accordance with BS 1377:Part 7: 1990 Method 8

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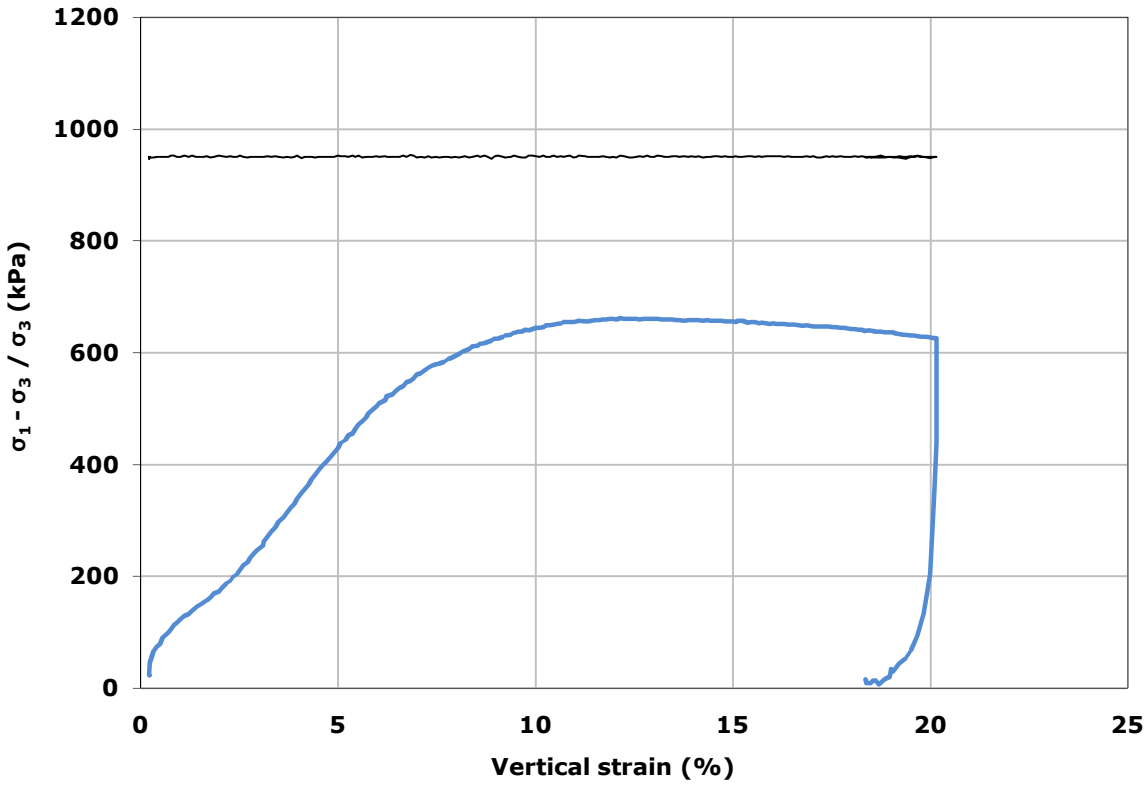
Project: 32490 Anholt Offshore Wind Farm

Prepared:	LFJ	Date : 2009-06-29	Subject: UU Triaxial Test, lab. 12 (BH05)	
Controlled:	JLC	Date : 2009-07-02		
Approved:	HFC	Date : 2009-07-02	Report 1	Encl. No. 1H.03



Geology: CLAYTILL, sandy, sl. gravelly, calcareous, grey					
Sample dia.	70	mm	Cell Pressure	950	(kPa)
Sample height	70	mm	Rate of strain	1.0	%/min
e	0.316		Strain at failure	20	(%)
ρ	2.25	g/cm^3	Max. deviator stress	639	(kPa)
w	10.7	%	Shear strength c_u	320	(kPa)
ρ_s	2.68	g/cm^3	S_0	91	%

Depth	39.2	m	Bor. No.	BH07
Level	-56.2	m	Lab. No.	20

The test is carried out in accordance with BS 1377:Part 7: 1990 Method 8

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Project: 32490 Anholt Offshore Wind Farm

Prepared:	KRS	Date : 2009-06-30	Subject: UU Triaxial Test, lab. 20 (BH07)	
Controlled:	JLC	Date : 2009-07-02		
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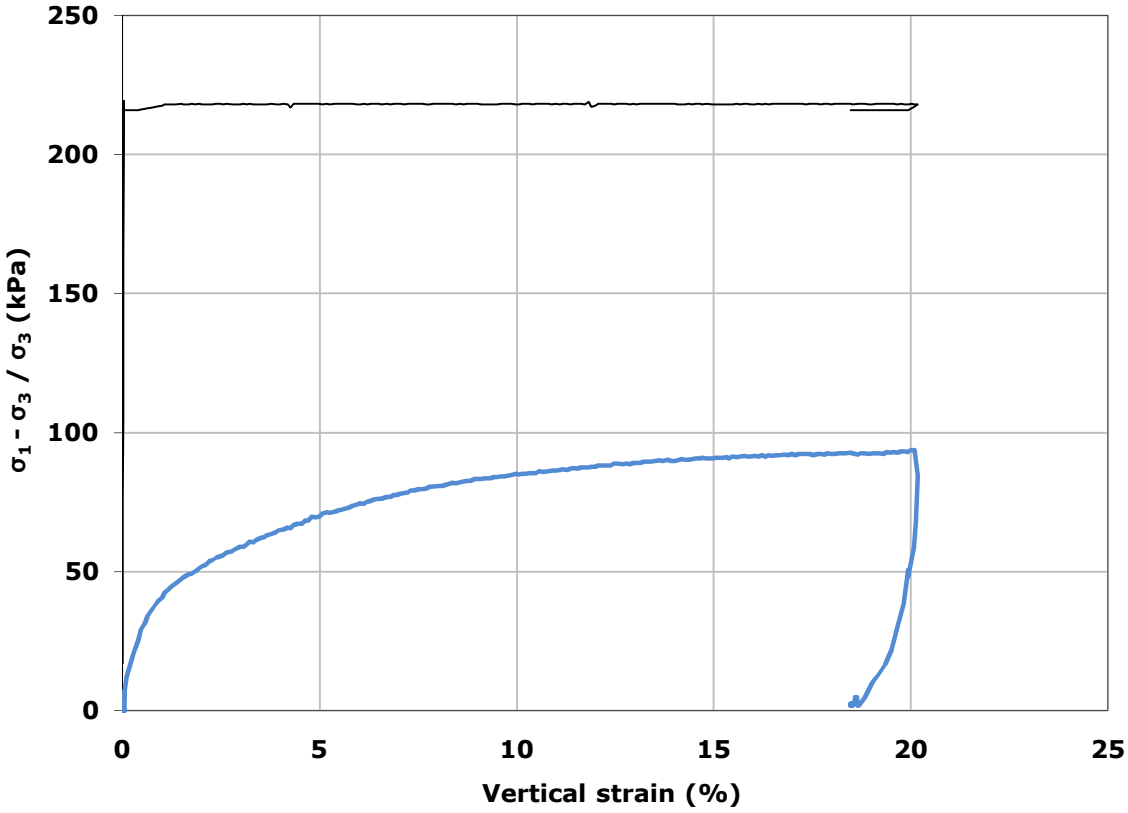

Geology: CLAY, v. silty, sl. sandy, calcareous, olive grey					
Sample dia.	70	mm	Cell Pressure	218	(kPa)
Sample height	70	mm	Rate of strain	1.0	%/min
e	0.884		Strain at failure	20	(%)
ρ	1.85	g/cm^3	Max. deviator stress	94	(kPa)
w	29.8	%	Shear strength c_u	47	(kPa)
ρ_s	2.68	g/cm^3	S_0	90	%

Depth	2.95	m	Bor. No.	BH09
Level	-19.25	m	Lab. No.	2

The test is carried out in accordance with BS 1377:Part 7: 1990 Method 8

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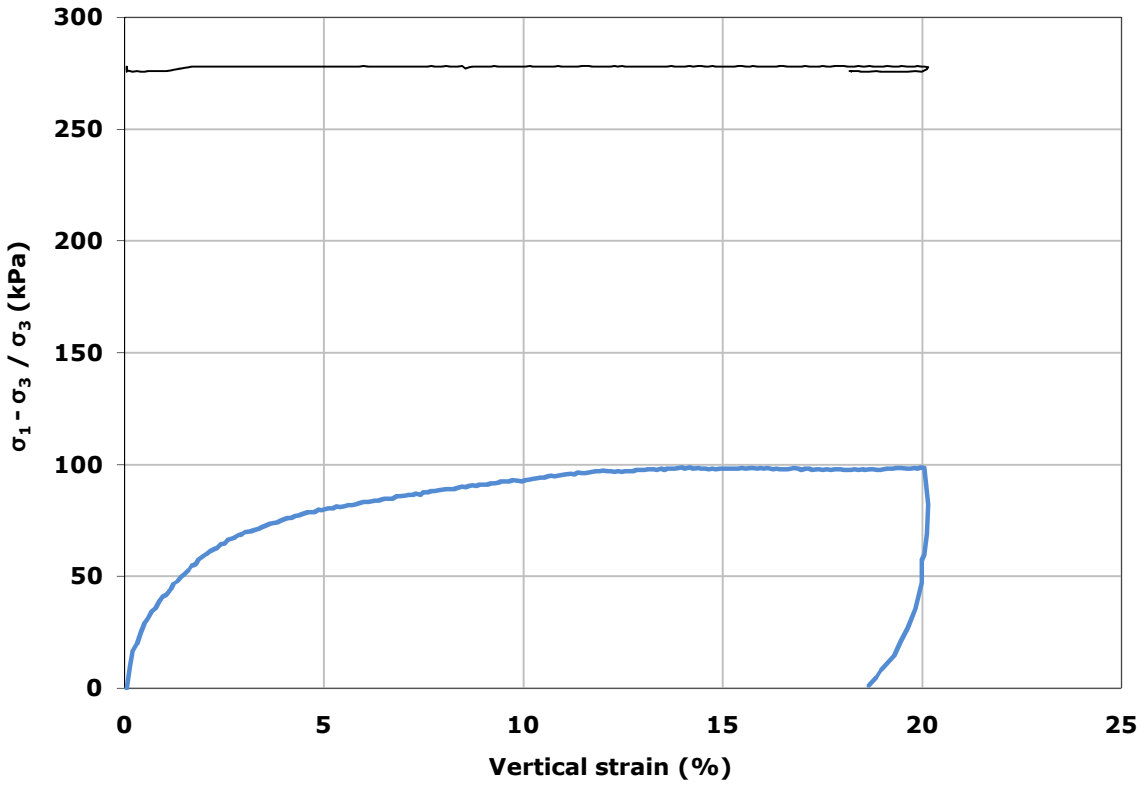
Project: 32490 Anholdt

Prepared:	LFJ	Date : 2009-06-24	Subject: UU Triaxial Test, lab. 2 (BH09)
Controlled:	JLC	Date : 2009-07-02	
Approved:	HFC	Date : 2009-07-02	Report 1 Encl. No. 1H.05



Geology: CLAY, highly plastic, sl. sandy, calcareous, w. iron sulphides, olivegrey					
Sample dia.	70	mm	Cell Pressure	277	(kPa)
Sample height	70	mm	Rate of strain	1.0	%/min
e	0.904		Strain at failure	20	(%)
ρ	1.83	g/cm^3	Max. deviator stress	99	(kPa)
w	30.0	%	Shear strength c_u	50	(kPa)
ρ_s	2.68	g/cm^3	S_0	89	%

Depth	5.9	m	Bor. No.	BH09
Level	-22.2	m	Lab. No.	3

The test is carried out in accordance with BS 1377:Part 7: 1990 Method 8

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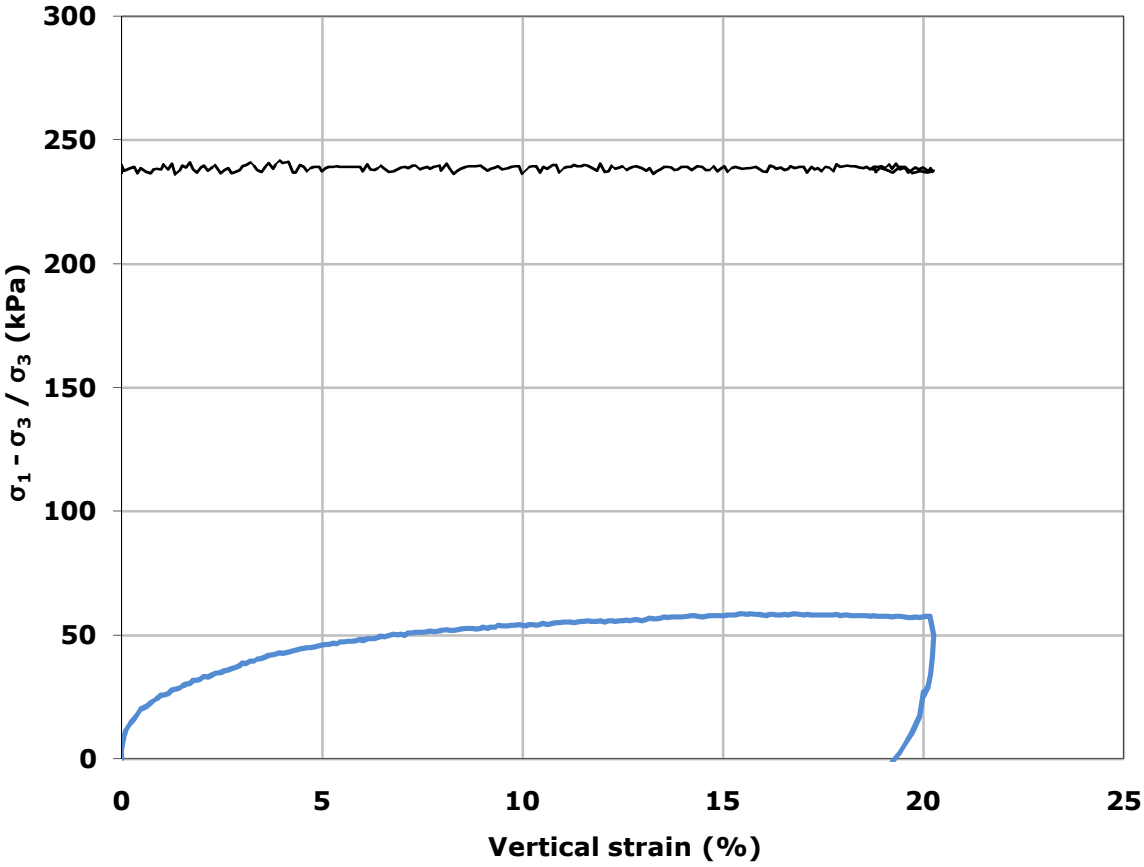
Project: 32490 Anholt/Djursland Offshore Wind Farm

Prepared:	KRS	Date : 2009-06-30	Subject: UU Triaxial Test, lab. 3 (BH09)	
Controlled:	JLC	Date : 2009-07-02		
Approved:	HFC	Date : 2009-07-02	Report 1	Encl. No. 1H.06



Geology: CLAY, medium plastic, sl. sandy, calcareous, w. sand streaks, olive grey					
Sample dia.	70	mm	Cell Pressure	239	(kPa)
Sample height	70	mm	Rate of strain	1.0	%/min
e	0.939		Strain at failure	20	(%)
ρ	1.85	g/cm^3	Max. deviator stress	58	(kPa)
w	33.7	%	Shear strength c_u	29	(kPa)
ρ_s	2.68	g/cm^3	S_0	96	%

Depth	2.77	m	Bor. No.	BH10
Level	-21.57	m	Lab. No.	2

The test is carried out in accordance with BS 1377:Part 7: 1990 Method 8

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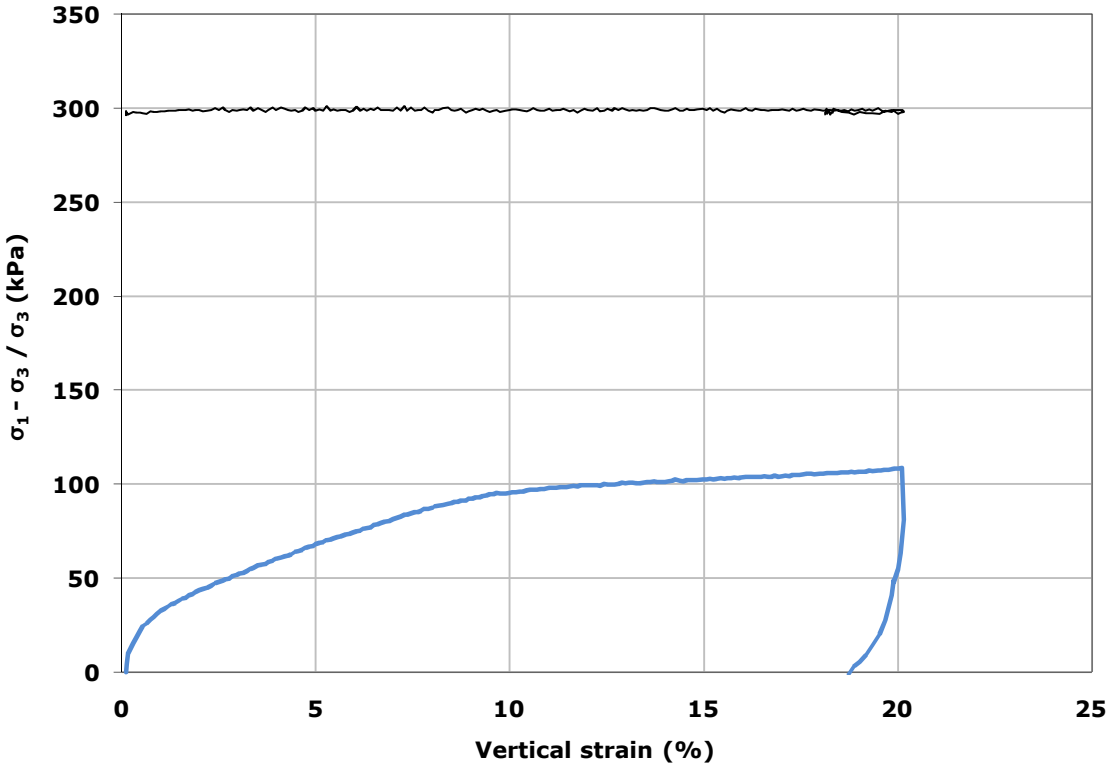
Project: 32490 Anholt Offshore Wind Farm

Prepared:	LFJ	Date : 2009-06-24	Subject: UU Triaxial Test, lab. 2 (BH10)	
Controlled:	JLC	Date : 2009-07-02		
Approved:	HFC	Date : 2009-07-02	Report 1	Encl. No. 1H.07



Geology: CLAY, highly plastic, sl. sandy, calcareous, w. sandstreaks, w. iron sulfides, olivegrey					
Sample dia.	70	mm	Cell Pressure	298	(kPa)
Sample height	70	mm	Rate of strain	1.0	%/min
e	0.804		Strain at failure	20	(%)
ρ	1.90	g/cm^3	Max. deviator stress	109	(kPa)
w	28.0	%	Shear strength c_u	55	(kPa)
ρ_s	2.68	g/cm^3	S_0	93	%

Depth	5.8	m	Bor. No.	BH10
Level	-24.6	m	Lab. No.	3

The test is carried out in accordance with BS 1377:Part 7: 1990 Method 8

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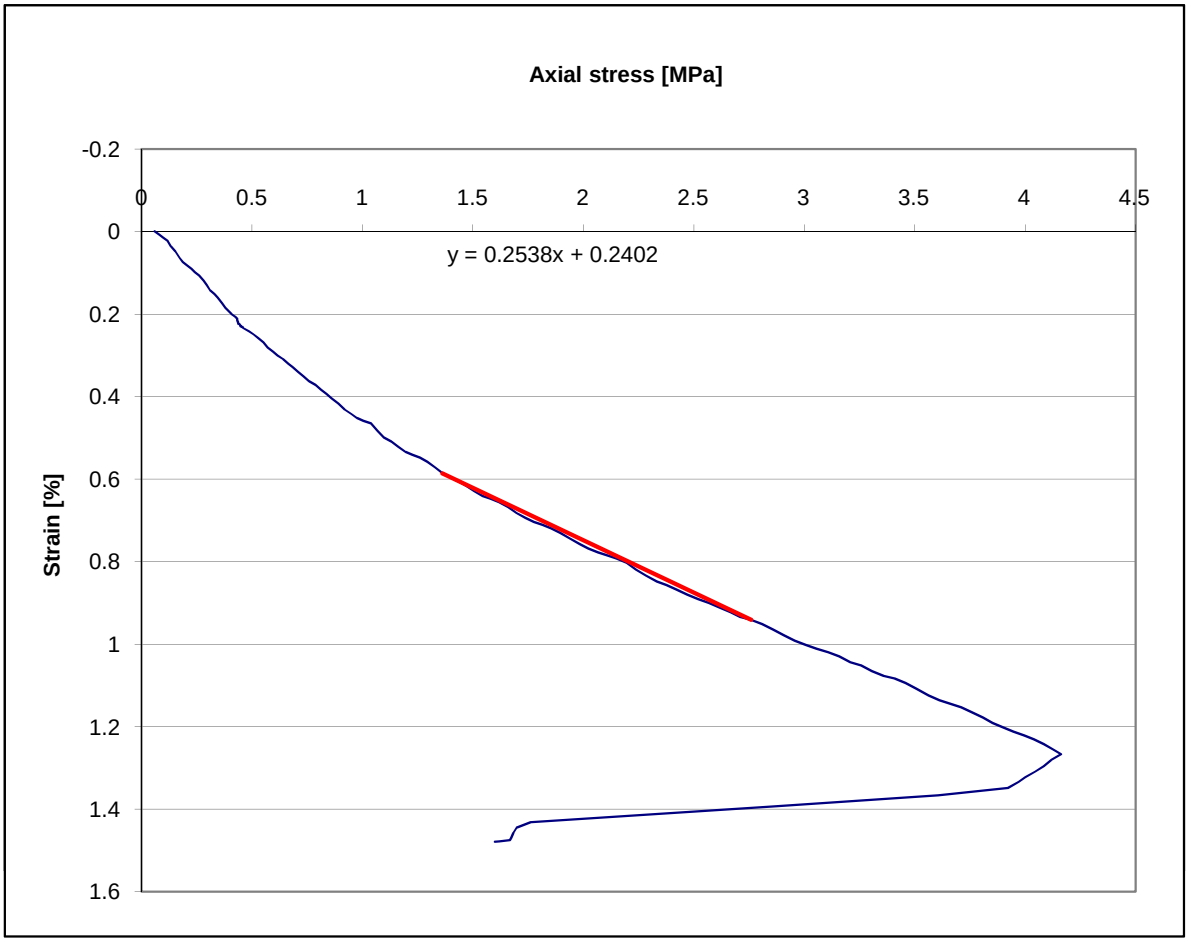
Enclosure 1H.01 – 1H.02
Unconfined Compression Strength (UCS) Tests

Unconfined Compression Test - UCS - Table of measurements

No.	Bore No.	Lab No.	Depth		Geology	Induration	Strain rate	Diameter	Height	Volume	Tara	Weight before test, incl. tara	Wet weight after test, incl. tara	Dry weight after test, incl. tara	Bulk Density, ρ	Moisture content	Compression Strength, σc	Young's Modulus, E
	-	-	m	-	-	-	mm/min	cm	cm	cm3	g	g	g	g	g/cm3	%	MPa	MPa
1	BH01	23	37.76		CLAYSTONE		0.20	7.438	14.308	621.7	27.69	1372.1	1368.6	1186.5	2.16	15.7	4.16	394
2	BH01	24	39.25		CLAYSTONE		0.15	7.482	15.333	674.1	27.86	1406.7	1405.1	1175.9	2.05	20.0	1.40	86
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Young's modulus, E is defined as the Tangent Young's modulus at half the failure stress, hence E_{50}.

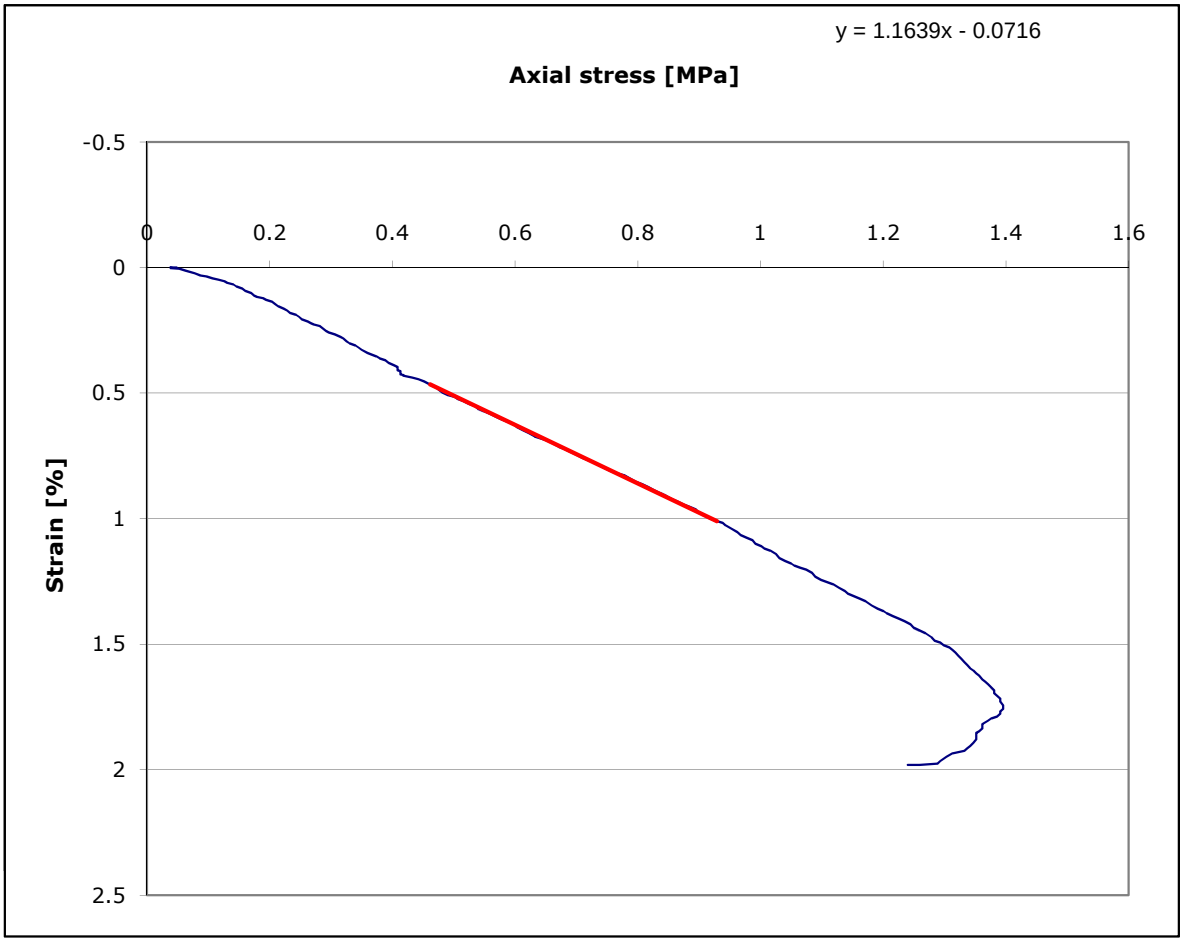
Unconfined Compression Test - UCS



Geology:	CLAYSTONE		
Induration:			
Sample diameter	7.438 cm	Test duration	00:10:45 min.
Sample height	14.308 cm	Rate of strain	0.20 mm/min
Density, ρ	2.16 g/cm3		
		Comp. Strength, σ_c	4.16 MPa
Water cont., w_{after}	15.7 %	Young's modul., E	394 MPa
Specimen orientation:	Parallel to core		
Depth	37.76 m	Bor. No.	BH01
Level	-54.68 m	Lab. No.	23

Test is performed in accordance with ISRM, Suggested Method, part 1 and part 2, pp.153 (2007)

Unconfined Compression Test - UCS



Geology:	CLAYSTONE		
Induration:			
Sample diameter	7.482 cm	Test duration	00:15:35 min.
Sample height	15.333 cm	Rate of strain	0.15 mm/min
Density, ρ	2.05 g/cm3		
		Comp. Strength, σ_c	1.40 MPa
Water cont., w_{after}	20.0 %	Young's modul., E	86 MPa
Specimen orientation:	Parallel to core		
Depth	39.25 m	Bor. No.	BH01
Level	-56.15 m	Lab. No.	24

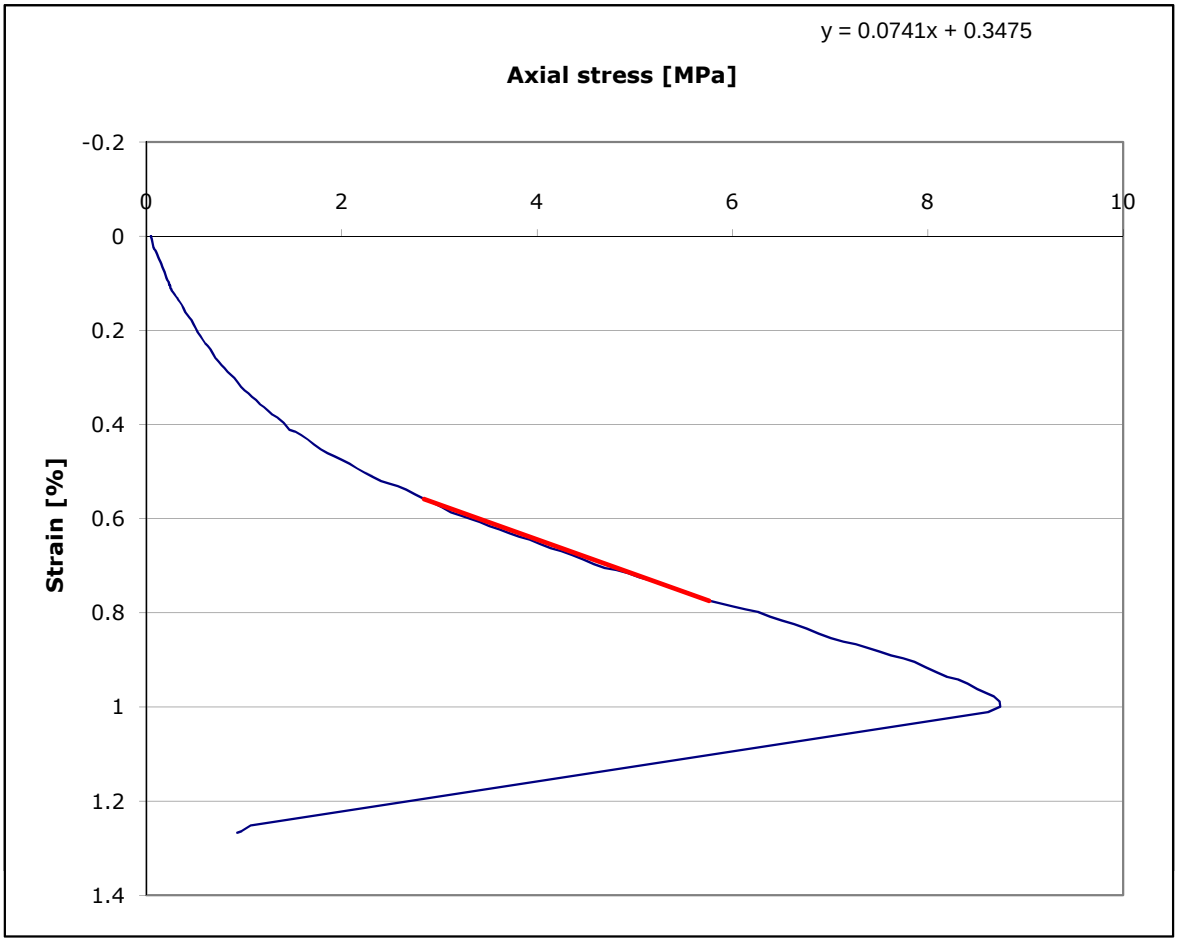
Test is performed in accordance with ISRM, Suggested Method, part 1 and part 2, pp.153 (2007)

Unconfined Compression Test - UCS - Table of measurements

No.	Bore No.	Lab No.	Depth		Geology	Induration	Strain rate	Diameter	Height	Volume	Tara	Weight before test, incl. tara	Wet weight after test, incl. tara	Dry weight after test, incl. tara	Bulk Density, ρ	Moisture content	Compression Strength, σc	Young's Modulus, E
	-	-	m	-	-	-	mm/min	cm	cm	cm3	g	g	g	g	g/cm3	%	MPa	MPa
1	BH02	19A	33.32		CLAYSTONE		0.20	10.069	18.856	1501.5	27.70	3431.0	3427.0	3077.0	2.27	11.5	8.74	1350
2	BH02	19B	34.21		CLAYSTONE		0.10	10.076	20.090	1601.9	26.65	3547.0	3545.0	3112.0	2.20	14.0	3.50	397
3	BH02	20A	34.71		CLAYSTONE		0.20	10.005	20.568	1617.0	27.20	3614.0	3613.0	3208.0	2.22	12.7	3.84	516
4	BH02	20B	35.15		CLAYSTONE		0.20	7.502	14.499	640.9	27.78	1465.0	1464.3	1308.7	2.24	12.1	3.54	536
5	BH02	21	36.17		CLAYSTONE		0.20	10.076	20.407	1627.2	27.90	3585.0	3582.0	3165.0	2.19	13.3	3.18	318
6	BH02	22	37.61		CLAYSTONE		0.20	10.121	20.088	1616.1	27.20	3420.0	3394.0	2901.0	2.10	17.2	1.84	136
7	BH02	23	38.75		CLAYSTONE		0.20	7.512	14.996	664.6	27.30	1451.2	1450.4	1256.9	2.14	15.7	4.67	446
8																		
9																		
10																		

Young's modulus, E is defined as the Tangent Young's modulus at half the failure stress, hence E_{50}.

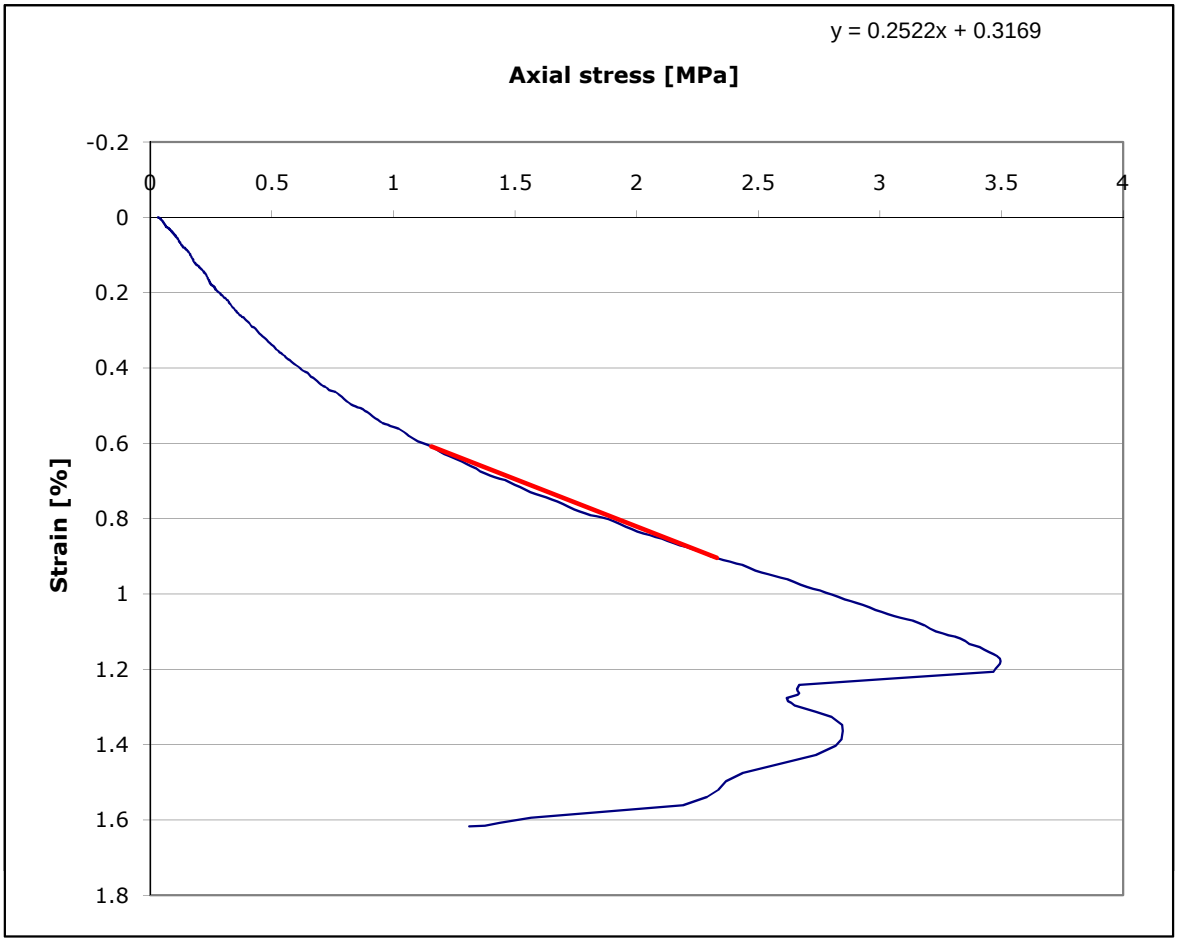
Unconfined Compression Test - UCS



Geology:	CLAYSTONE		
Induration:			
Sample diameter	10.069 cm	Test duration	00:12:45 min.
Sample height	18.856 cm	Rate of strain	0.20 mm/min
Density, ρ	2.27 g/cm3		
		Comp. Strength, σ_c	8.74 MPa
Water cont., w_{after}	11.5 %	Young's modul., E	1350 MPa
Specimen orientation:	Parallel to core		
Depth	33.32 m	Bor. No.	BH02
Level	-50.33 m	Lab. No.	19A

Test is performed in accordance with ISRM, Suggested Method, part 1 and part 2, pp.153 (2007)

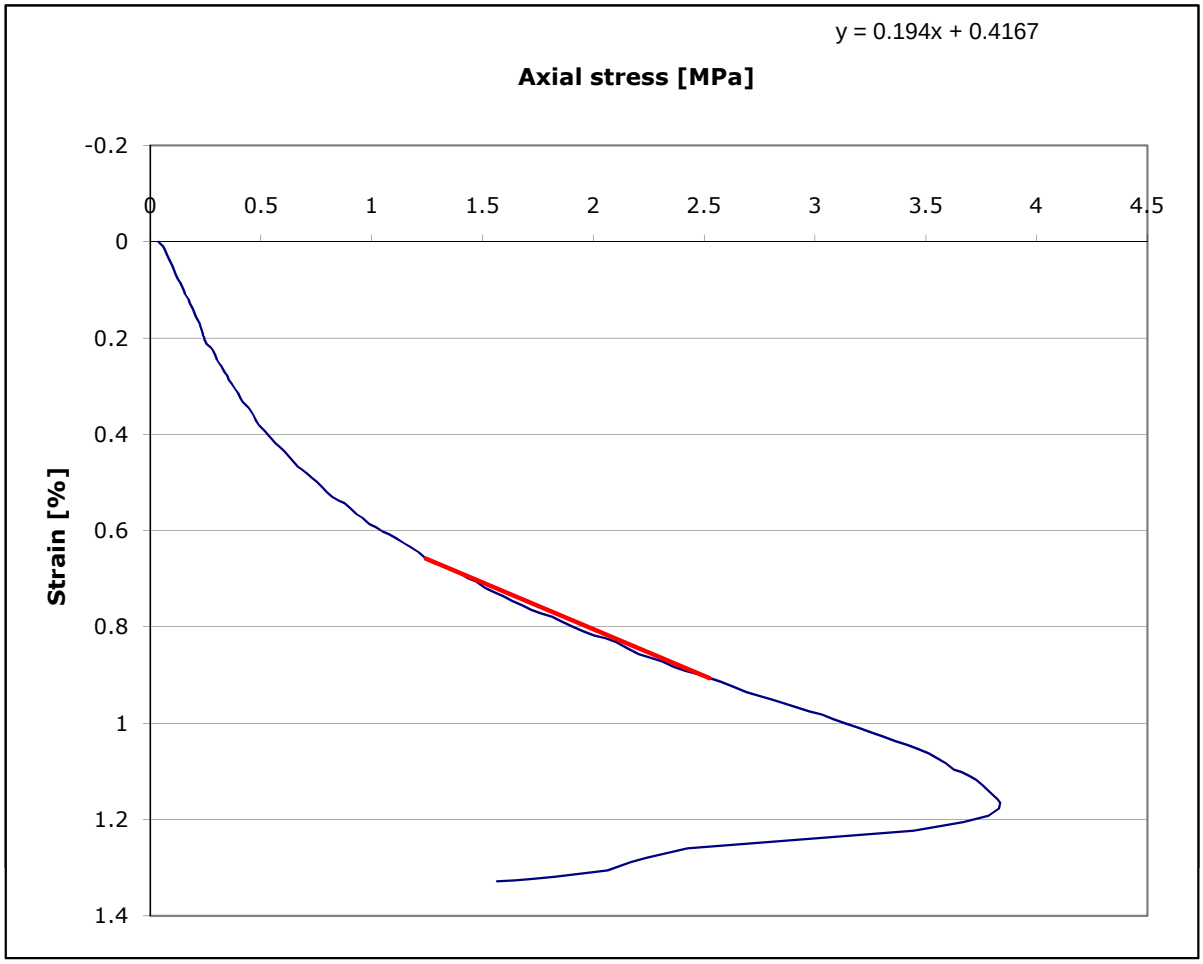
Unconfined Compression Test - UCS



Geology:	CLAYSTONE		
Induration:			
Sample diameter	10.076 cm	Test duration	00:31:50 min.
Sample height	20.090 cm	Rate of strain	0.10 mm/min
Density, ρ	2.20 g/cm3		
		Comp. Strength, σ_c	3.50 MPa
Water cont., w_{after}	14.0 %	Young's modul., E	397 MPa
Specimen orientation:	Parallel to core		
Depth	34.21 m	Bor. No.	BH02
Level	-51.22 m	Lab. No.	19B

Test is performed in accordance with ISRM, Suggested Method, part 1 and part 2, pp.153 (2007)

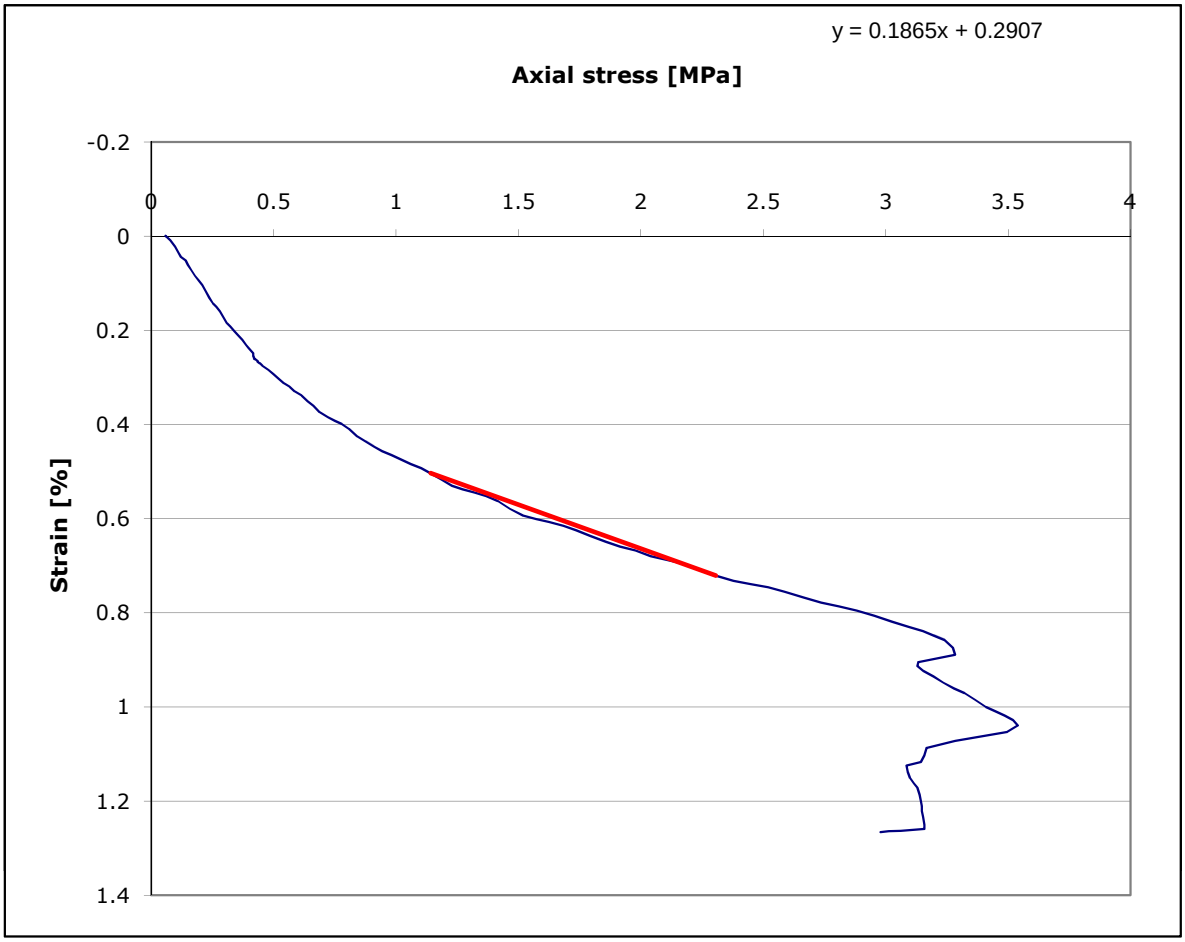
Unconfined Compression Test - UCS



Geology:	CLAYSTONE		
Induration:			
Sample diameter	10.005 cm	Test duration	00:12:35 min.
Sample height	20.568 cm	Rate of strain	0.20 mm/min
Density, ρ	2.22 g/cm3		
		Comp. Strength, σ_c	3.84 MPa
Water cont., w_{after}	12.7 %	Young's modul., E	516 MPa
Specimen orientation:	Parallel to core		
Depth	34.71 m	Bor. No.	BH02
Level	-51.72 m	Lab. No.	20A

Test is performed in accordance with ISRM, Suggested Method, part 1 and part 2, pp.153 (2007)

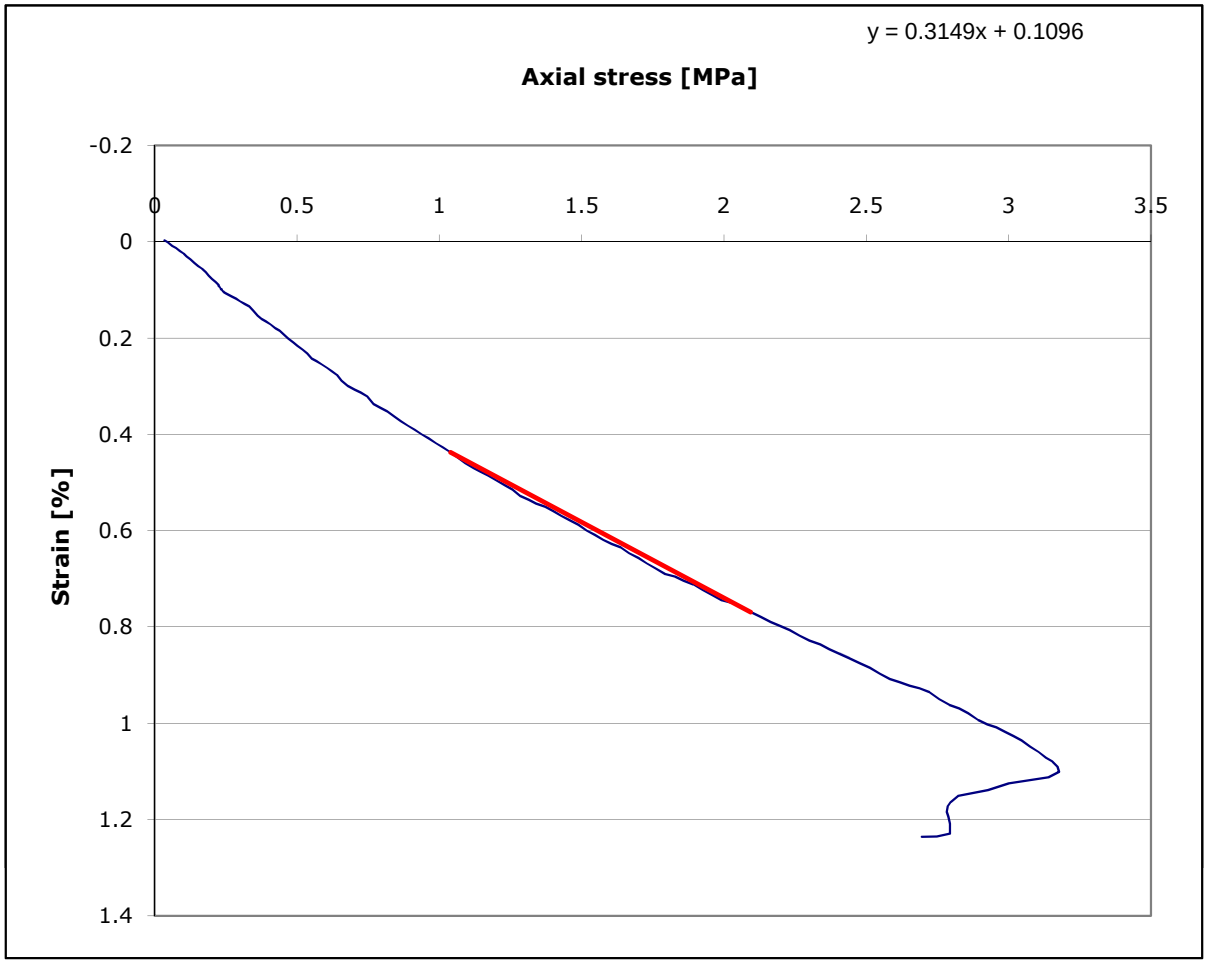
Unconfined Compression Test - UCS



Geology:	CLAYSTONE		
Induration:			
Sample diameter	7.502 cm	Test duration	00:09:15 min.
Sample height	14.499 cm	Rate of strain	0.20 mm/min
Density, ρ	2.24 g/cm3		
		Comp. Strength, σ_c	3.54 MPa
Water cont., w_{after}	12.1 %	Young's modul., E	536 MPa
Specimen orientation:	Parallel to core		
Depth	35.15 m	Bor. No.	BH02
Level	-52.16 m	Lab. No.	20B

Test is performed in accordance with ISRM, Suggested Method, part 1 and part 2, pp.153 (2007)

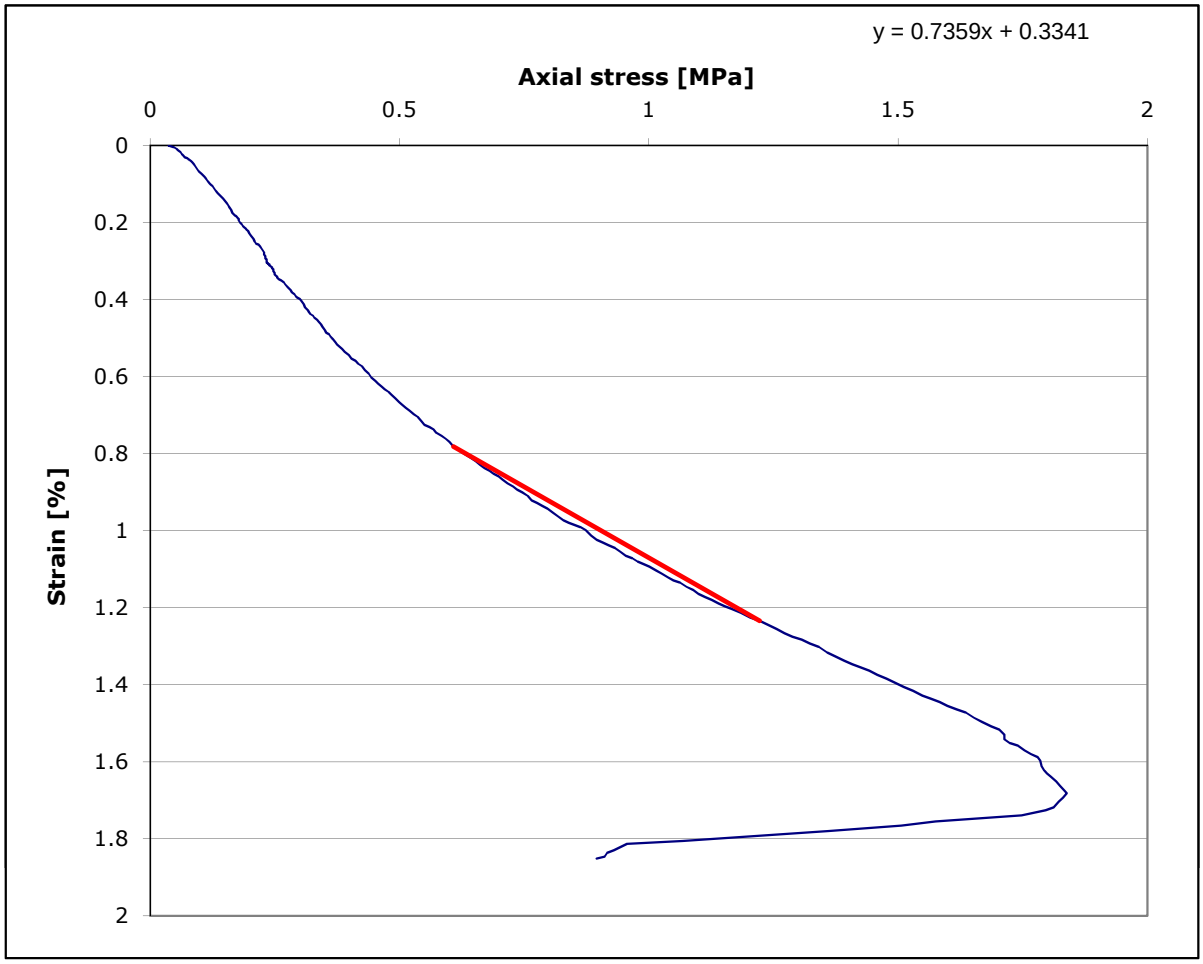
Unconfined Compression Test - UCS



Geology:	CLAYSTONE		
Induration:			
Sample diameter	10.076 cm	Test duration	00:11:35 min.
Sample height	20.407 cm	Rate of strain	0.20 mm/min
Density, ρ	2.19 g/cm3		
		Comp. Strength, σ_c	3.18 MPa
Water cont., w_{after}	13.3 %	Young's modul., E	318 MPa
Specimen orientation:	Parallel to core		
Depth	36.17 m	Bor. No.	BH02
Level	-53.18 m	Lab. No.	21

Test is performed in accordance with ISRM, Suggested Method, part 1 and part 2, pp.153 (2007)

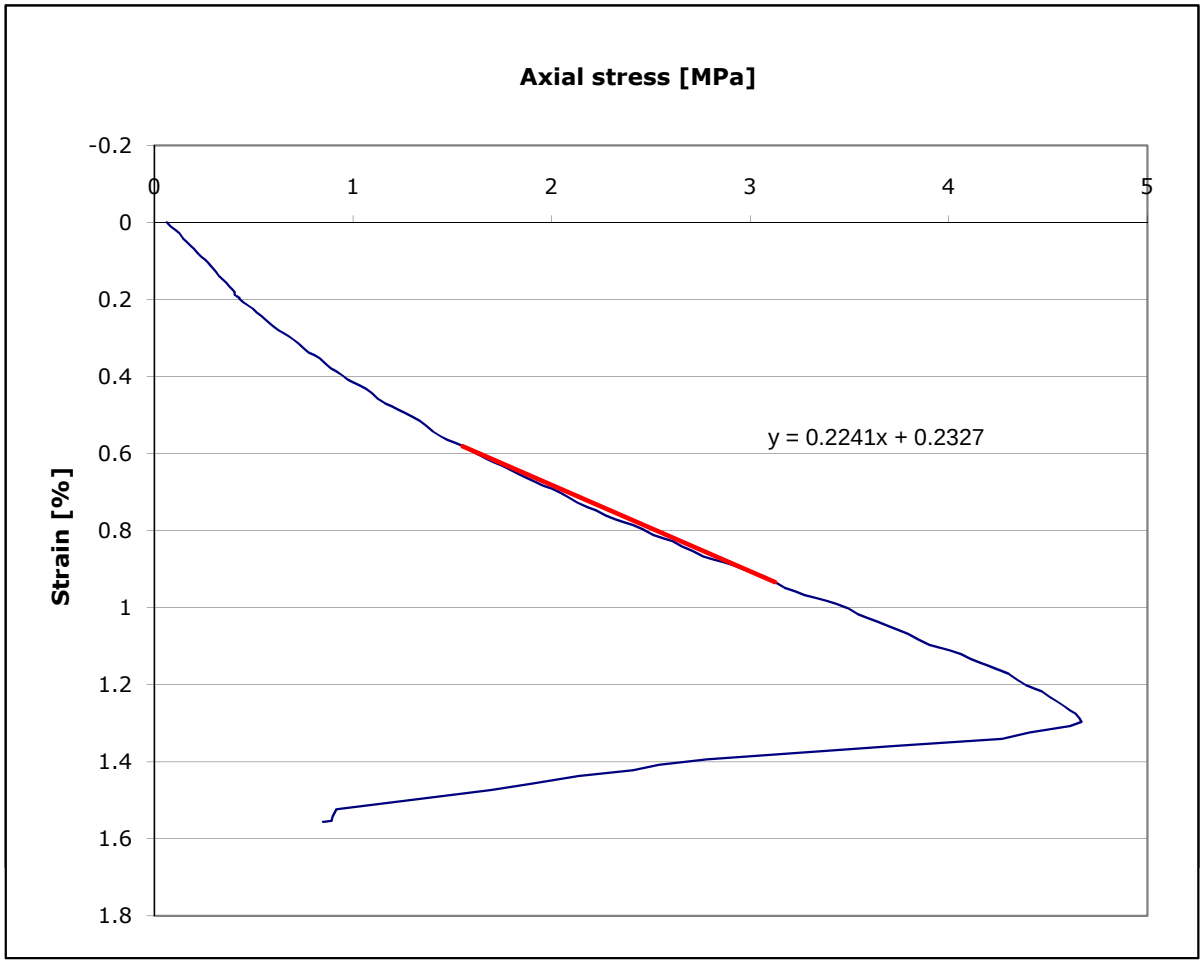
Unconfined Compression Test - UCS



Geology:	CLAYSTONE				
Induration:					
Sample diameter	10.121	cm	Test duration	00:20:50	min.
Sample height	20.088	cm	Rate of strain	0.20	mm/min
Density, ρ	2.10	g/cm3			
			Comp. Strength, σ_c	1.84	MPa
Water cont., w_{after}	17.2	%	Young's modul., E	136	MPa
Specimen orientation:	Parallel to core				
Depth	37.61	m	Bor. No.	BH02	
Level	-54.62	m	Lab. No.	22	

Test is performed in accordance with ISRM, Suggested Method, part 1 and part 2, pp.153 (2007)

Unconfined Compression Test - UCS



Geology:	CLAYSTONE		
Induration:			
Sample diameter	7.512 cm	Test duration	00:11:35 min.
Sample height	14.996 cm	Rate of strain	0.20 mm/min
Density, ρ	2.14 g/cm3		
		Comp. Strength, σ_c	4.67 MPa
Water cont., w_{after}	15.7 %	Young's modul., E	446 MPa
Specimen orientation:	Parallel to core		
Depth	38.75 m	Bor. No.	BH02
Level	-55.76 m	Lab. No.	23

Test is performed in accordance with ISRM, Suggested Method, part 1 and part 2, pp.153 (2007)

DANISH GEOTECHNICAL INSTITUTE

Appendix 1.I
Datasheet - Sound Prospector and Sound Master

(2 pages)

SOUND MASTER

Sound Master is an icebreaking tug and a ideal vessel capable of working safely in both confined inter-tidal areas and exposed open seas, where swift accurate manoeuvring is required. Sound Master is operated and maintained exclusively by trained and experienced crew.

Technical specifications

Vessel name		**Sound Master**
Type		Icebreaking tug
Built		1959, Åmål Sweden, Rebuild
Operator		Svensk Sjöentreprenad AB - SSE
Port of reg / flag		Malmö, Sweden
Call sign		SBDV
Certificate		International trade, A1
Length overall		29,01 m
Beam		8,10 m
Draught (loaded)		4,70 m
Bollard pull measured		Approx 25 ton
Total output main engine		2400 hp
Free running speed		12 knots, 10 knots
Working deck		Admitted load 6 ton / m^2
Bow thruster		400 hp , ø 1350 mm
Winch		50 ton at 6 m/min at low speed—17 ton at 18 m/min at HS
Other		Pushing piller
Engines		Wärtsilä 12V22
Electrical power		24 V DC, 220 V AC 50 Hz, 380 V, 3 ph, 50 Hz
Navigation aids		Satellitephone, GSM, email, 2 No DGPS, Radar, 3 x VHF, Navtext, AIS,
Accommodation		6 cabins - 12 beds, galley, mess room, shower, toilet

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Oljevägen 14
211 24 Malmö
040 – 93 30 00

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Hamngatan 1
294 31 Sölvesborg
0456 – 141 66

Ängelholm
Box 1129
262 22 Ängelholm
0431 – 256 20

Stockholm
Bergsgatan 53
112 53 Stockholm
08 – 650 71 14

Org.nummer
556223-2172
Internet
www.sse-ab.se

SOUND PROSPECTOR

Sound Prospector is a Jack Up Barge and a ideal plattform capable of working safely in both confined inter-tidal areas and exposed open seas,

Sound Prospector is operated and maintained exclusively by trained and experienced crew.

Technical specifications

Vessel name		**Sound Prospector**
Type		Jack up barge
Built		2007, Holland
Operator		Svensk Sjöentreprenad AB - SSE
Port of reg / flag		Malmö, Sweden
Call sign		SDKF
Certificate		+100 A5 K (+) A—MC
Length overall		31,85 m
Beam		20,00 m
Draught (loaded)		2,98 m
Jack house		3,450 m x 3,00 m x 6,340 m
Light shipweight		535 tonnes
Jacking system		4 no legs, with a length of 50,6 m each
Maximum payload		400 tonnes
Maximum jacking capacity		935 tonnes
Winches		Anchor system of 4 no of anchors on hydraulic winches
Max active preload force		450 tonnes on each leg
Engines		2 nogenerators 270 Kva each and 1 generator 77 kva
Hydraulic pump capacity		4 x 75 kW
Navigation aids		Satellitephone, GSMl, 2 No DGPS, Radar, 3 x VHF, Navtext, AIS,
Accommodation		4 cabins - 8 beds, galley, mess room, shower, toilet

Malmö	**Sölvesborg**	**Ängelholm**	**Stockholm**	**Org.nummer**
Oljevägen 14	Hamngatan 1	Box 1129	Bergsgatan 53	556223-2172
211 24 Malmö	294 31 Sölvesborg	262 22 Ängelholm	112 53 Stockholm	**Internet**
040 – 93 30 00	0456 – 141 66	0431 – 256 20	08 – 650 71 14	www.sse-ab.se

DANISH GEOTECHNICAL INSTITUTE

Appendix 1.II
Datasheet – Nordmeyer DSB drill rig (GEOFRIGG)

(2 pages)

GEOFRIGG

E-DA-UK-012-01

Data sheet, truck	
Manufacturer	Mercedes
Year	2008
Model	ACTROS 1832
Type	4x4 WD
Weight incl. drill rig [ton/lbs]	
Motor type [Euronorm]	V
Fuel	Diesel
Tow-bar (trailer hitch)	Ball
Wheel base [m/UK feet]	
Measures during transport H/L/W [m/UK feet]	4,0/11,0/2,5 13.1/36.1/8.2
Axle load [ton/lbs]	
Water tank [liter/UK gallon]	800/176
Noise 5m from truck (dB A]	Unknown

Data sheet, drill rig	
Manufacturer	Nordmeyer
Year	2008
Type	DSB 1/5
Crew	2
Sample types	Vane test, SPT, shelby tubes
Cable percussion	Yes
Fuel	Diesel
Drilling dimensions [in]	(6), 8, 10, 12
Drilling methods	Dry, rotary, DTH, core
Wire lines [pcs./ton (lbs)]	3/3,3 (7,275)
Measures during drilling H/L/W [m/UK feet]	11,0/8,0/2,5 36.0/26.2/8.2
Work space L_1xW_1 [m/UK feet]	14,0/4,5 45.9/14.8
Work space L_2xW_2 [m/UK feet]	20,0/7,5 65.6/24.6
Drilling depth [m/UK feet]	400/1.312
Drilling meters pr. day [m/UK feet]	10/100 38.8/328
Rotary table	Yes
Noise 5m from rig (dB A]	Unknown

Drill rig

Normal work space (L_1x W_1)

Ekstra work space (L_2x W_2)

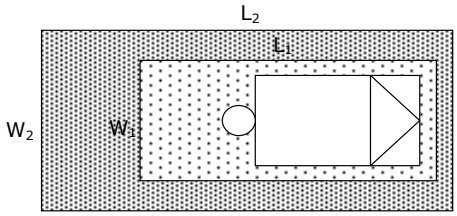

Figure 1

QS by: JWJ and MTM, GEO 2008-08-05

GEO is a Danish company. Founded in 1943 as a traditional soil and foundation engineering company, GEO has evolved into a multidisciplinary firm providing clients with offshore and onshore geotechnical services. GEO is owned by an autonomous foundation which entails that all profits are reinvested in the company.
About 220 highly specialised engineers and our use of advanced technologies enable us to assist our clients in their investigations of either the earth's surface or the seabed.
GEO's primary strenghts are our high standard of service, our dedicated staff and our technical innovation.

GEO
w w w • g e o • d k

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DANISH GEOTECHNICAL INSTITUTE

Appendix 1.III
Datasheet - DTH-CPT equipment and cone calibration data

(10 pages)

GEOriis

Down the hole tool system
"GEOriis" is GEO's dedicated tool for in-situ geotechnical testing and sampling in boreholes.

With "GEOriis" GEO offers a cost effective method for geotechnical site investigations for offshore wind farms and oil- and gas installations.

Description:
GEO has developed the DTH system GEOriis for a faster and more economical test and sampling procedure during offshore operations, where the daily costs are high.

The system is operated with a single umbilical cable and reduces the deployment time significantly compared to systems mounted on drill pipes.

The umbilical cable provides both control- and data transmission, hydraulic power and the lifting power for the DTH tools.

The tools for sampling and testing are lowered to the desired position and locked in the drill string/casing with a hydraulic packer system integrated on the tool. The tools have a maximum diameter of 115 mm.

GEOriis can be operated to a depth of 100m in conjunction with different drilling systems and casings in the 4-8 inch range.

Instrumentation

The DTH system has instruments and sensors for monitoring of the tool position, packer data, total thrust, penetration depth and penetration speed.

Currently the system can equipped with dedicated tools for sampling with Shelby tubes, hammer sampling, CPT and SPT.

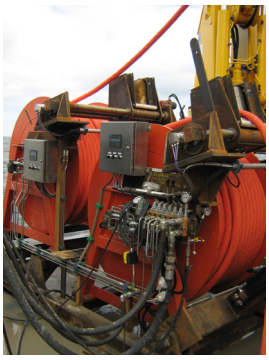
The cone penetration tests, CPT are performed in accordance with IRTP standard and operates with 10 cm2 digital cones. It has a thrust capacity of 80 kN and a stroke of 2 m, allowing operation in stiff and hard soil types, such the glacial tills in the Baltic area.

During the tests all data are logged continuously and monitored online with GEO's dedicated software. The CPT data include tip- and sleeve pressure, inclination and pore pressure.

Sampling with Shelby tubes guarantees high quality undisturbed samples for further geotechnical tests. The tool is capable of obtaining samples up to 74 mm in diameter and up to 700 mm length.

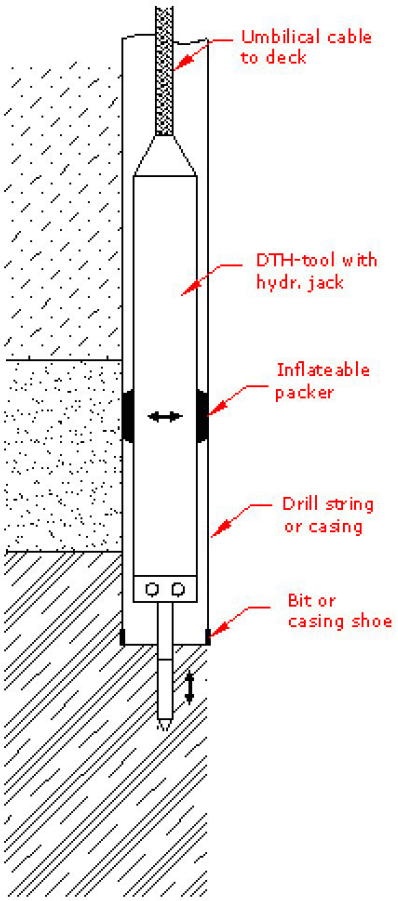
Penetration depth and trust on the sampling tube can be fully controlled. A range of sampling tubes is available for different soil conditions.

CPT testing with GEOriis



Umbilical winch

Down the hole CPT test



CPT tests are performed in accordance with IRTP standard. The CPT tool operates with 10 cm2 digital cones. It has a thrust capacity of 80 kN and a stroke of max. 2 m. All monitored data from the test are shown online.

GEOriis 2009-06-29

GEO is a Danish engineering consultant and contractor. More than 200 employees offer Denmark's most comprehensive expertise concerning soil and water.

The company's core competences are within geotechnical site investigations, both onshore and offshore. GEO also specializes in geotechnical engineering and laboratory testing.

GEO offers a wide range of services for offshore structure installations. They include geophysical surveying and site investigations based on in-house developed equipment, the related laboratory work and consulting.

GEO
w w w • g e o • d k

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Danalien 1
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Phone: +45 9818 9144
Fax: +45 4588 1240

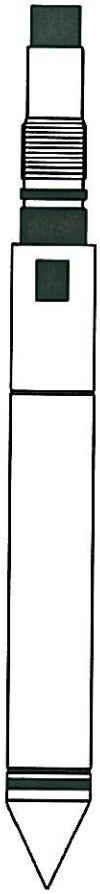
geo@geo.dk
www.geo.dk

Kalibreringscertifikat

Type	: Icone (TSPI)
Fabrikat	: A.P. Van den Berg
Serienummer	: Icone080308

Spidstryk

Dato for kalibrering	:	2009-05-06	
Hældningskoefficient	:	10.085	kN/VdB
Skæringspunkt på y-aksen	:	-0.804	kN
Areal	:	10	cm²
Nominel belastning	:	75.000	MPa
Maksimum belastning	:	150.000	MPa



Kappemodstand

Dato for kalibrering	:	2009-05-07	
Hældningskoefficient	:	1.917	kN/VdB
Skæringspunkt på y-aksen	:	-0.155	kN
Areal	:	150	cm²
Nominel belastning	:	1.000	MPa
Maksimum belastning	:	1.500	MPa

Poretryk

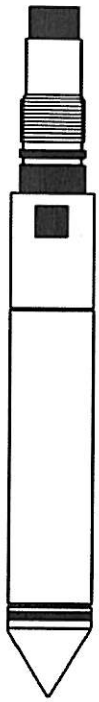
Dato for kalibrering	:	2009-05-07	
Hældningskoefficient	:	3.230	MPa/VdB
Skæringspunkt på y-aksen	:	-2.452	MPa
Nominel belastning	:	10.000	MPa
Maksimum belastning	:	15.000	MPa

GEO

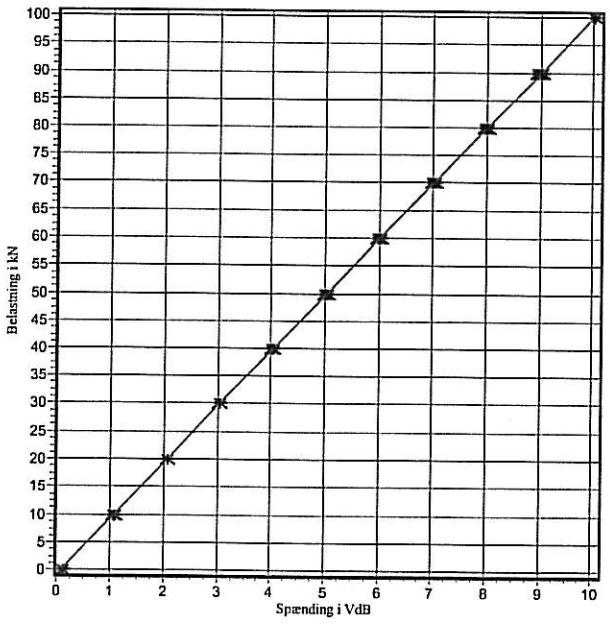
Udført	: ELI	Dato	: 2009-05-06
Kontrolleret	: BON	Dato	: 20090507
Godkendt	: JBL	Dato	: 20090507

Kalibreringsbilag

Kalibreringstype	: **Spids**	
Dato & tid for kalibrering	: 2009-05-06 10:14:54	
Udført af	: ELI	
Type	: Icone (TSPI)	
Fabrikat	: A.P. Van den Berg	
Serienummer	: **Icone080308**	
Reference :		
Serienummer	: 11975-2009	
Spænding	: 11.9985	V
Nulpunktsforskydning	: 0.5462	mV
Kabel :		
Zero	: 0.0000	V
Gain	: 0.0000	V
Kalibreringsværdier :		
Hældningskoefficient	: 10.085	kN/VdB
Skæringspunkt på y-aksen	: -0.804	kN
Delta	: 0.185	kN
Kontrolværdier :		
Største afvigelse	: 0.463	kN
Residualvarians	: 0.045	kN²
Std. afv. på residualvarians	: 0.213	kN
Data læst fra icone, under kalibrering	: 0	
Antal fejl fra icone, under kalibrering	: 0	



Tryk	Belastning		Aflastning		Belastning		Aflastning		Belastning		Aflastning	
(kN)	(kN)	(VdB)	(kN)	(VdB)	(kN)	(VdB)	(kN)	(VdB)	(kN)	(VdB)	(kN)	(VdB)
0.000	0.07	0.101	0.07	0.098	0.07	0.098	0.07	0.098	0.07	0.097	0.07	0.096
10.000	10.00	1.075	10.03	1.079	9.96	1.071	9.96	1.063	9.97	1.072	9.99	1.077
20.000	19.99	2.070	20.04	2.064	20.04	2.072	20.04	2.066	19.96	2.062	19.96	2.057
30.000	29.99	3.061	30.04	3.043	30.02	3.061	29.98	3.038	30.01	3.058	30.03	3.047
40.000	39.98	4.050	40.04	4.030	39.96	4.047	40.03	4.031	39.96	4.050	39.99	4.025
50.000	50.00	5.053	50.01	5.016	50.01	5.053	50.04	5.022	49.96	5.045	50.04	5.017
60.000	59.97	6.044	59.96	5.996	59.96	6.042	60.03	6.010	59.99	6.053	60.04	6.005
70.000	69.97	7.041	70.03	6.997	69.96	7.026	69.99	6.988	69.99	7.037	70.02	6.989
80.000	79.96	8.035	80.04	7.978	79.98	8.034	79.98	7.979	79.99	8.011	80.04	7.982
90.000	89.99	9.013	90.04	8.961	89.97	9.035	90.02	8.963	89.99	9.030	89.99	8.959
100.000	100.00	10.024	99.98	10.024	99.99	10.019	100.02	10.020	100.02	10.024	99.97	10.023

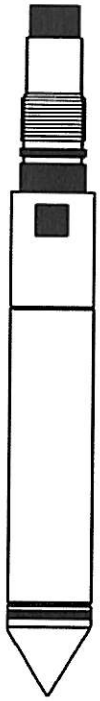


Kontrolberegninger :

Tryk (kN)	Gennemsnit (VdB)	Beregnet (kN)	Diff. (kN)
0.000	0.098	0.185	-0.185
10.000	1.073	10.015	-0.015
20.000	2.065	20.021	-0.021
30.000	3.051	29.971	0.029
40.000	4.039	39.928	0.072
50.000	5.034	49.968	0.032
60.000	6.025	59.960	0.040
70.000	7.013	69.923	0.077
80.000	8.003	79.910	0.090
90.000	8.993	89.898	0.102
100.000	10.022	100.273	-0.273

Kalibreringsbilag

Kalibreringstype	: **Kappe**
Dato & tid for kalibrering	: 2009-05-07 09:48:48
Udført af	: ELI
Type	: Icone (TSPI)
Fabrikat	: A.P. Van den Berg
Serienummer	: **Icone080308**



Reference :

Serienummer	: 21129-2009		
Spænding	:	11.9985	V
Nulpunktsforskydning	:	140.8597	mV

Kabel :

Zero	:	0.0000	V
Gain	:	0.0000	V

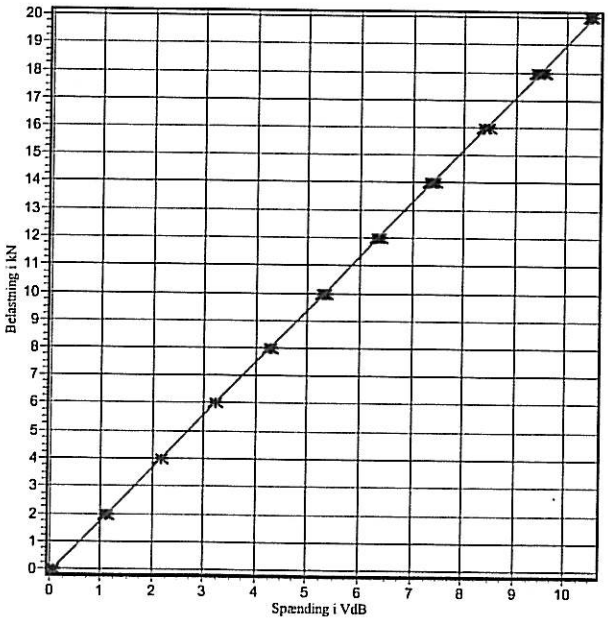
Kalibreringsværdier :

Hældningskoefficient	:	1.917	kN/VdB
Skæringspunkt på y-aksen	:	-0.155	kN
Delta	:	-0.004	kN

Kontrolværdier :

Største afvigelse	:	0.154	kN
Residualvarians	:	0.005	kN²
Std. afv. på residualvarians	:	0.071	kN
Data læst fra icone, under kalibrering	:	0	
Antal fejl fra icone, under kalibrering	:	0	

Tryk (kN)	Belastning (kN)	(VdB)	Aflastning (kN)	(VdB)	Belastning (kN)	(VdB)	Aflastning (kN)	(VdB)	Belastning (kN)	(VdB)	Aflastning (kN)	(VdB)
0.000	0.03	0.076	0.03	0.080	0.03	0.079	0.03	0.080	0.03	0.079	0.03	0.080
2.000	1.99	1.111	2.01	1.104	1.99	1.108	2.01	1.104	2.00	1.109	1.99	1.108
4.000	4.00	2.161	4.00	2.162	3.99	2.163	4.00	2.173	3.99	2.159	4.01	2.177
6.000	6.00	3.209	6.00	3.226	6.01	3.218	6.00	3.217	6.00	3.210	6.01	3.233
8.000	7.99	4.248	8.01	4.286	7.99	4.255	7.99	4.279	7.99	4.261	8.00	4.278
10.000	10.00	5.292	10.01	5.333	10.00	5.304	10.00	5.338	10.00	5.290	9.99	5.325
12.000	12.00	6.332	12.01	6.387	12.00	6.337	12.01	6.393	12.00	6.318	12.01	6.394
14.000	13.99	7.353	14.01	7.448	13.99	7.367	14.01	7.453	14.00	7.358	14.00	7.441
16.000	16.00	8.390	16.01	8.502	16.00	8.394	16.01	8.496	15.99	8.381	16.01	8.497
18.000	18.00	9.419	18.01	9.556	18.00	9.434	18.00	9.532	17.99	9.416	18.00	9.546
20.000	20.01	10.457	20.00	10.458	20.00	10.459	19.99	10.481	19.99	10.441	20.00	10.450

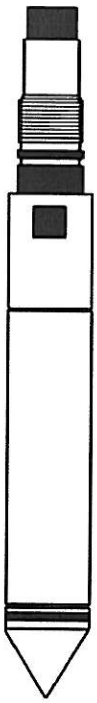


Kontrolberegninger :

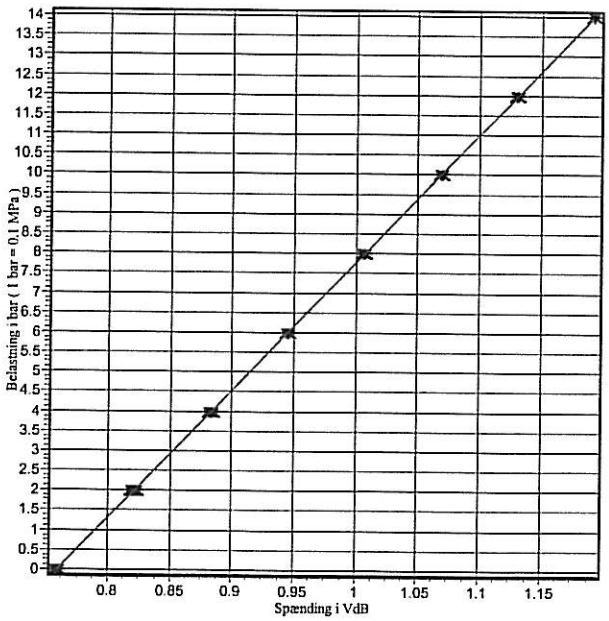
Tryk (kN)	Gennemsnit (VdB)	Beregnet (kN)	Diff. (kN)
0.000	0.079	-0.004	0.004
2.000	1.107	1.967	0.033
4.000	2.166	3.996	0.004
6.000	3.219	6.014	-0.014
8.000	4.268	8.025	-0.025
10.000	5.314	10.029	-0.029
12.000	6.360	12.035	-0.035
14.000	7.403	14.034	-0.034
16.000	8.443	16.028	-0.028
18.000	9.484	18.022	-0.022
20.000	10.458	19.889	0.111

Kalibreringsbilag

Kalibreringstype	: **Pore**	
Dato & tid for kalibrering	: 2009-05-07 10:51:22	
Udført af	: ELI	
Type	: Icone (TSPI)	
Fabrikat	: A.P. Van den Berg	
Serienummer	: **Icone080308**	
Reference :		
Serienummer	: 20056/279	
Spænding	: 11.9985	V
Nulpunktsforskydning	: 140.8634	mV
Kabel :		
Zero	: 0.0000	V
Gain	: 0.0000	V
Kalibreringsværdier :		
Hældningskoefficient	: 3.230	MPa/VdB
Skæringspunkt på y-aksen	: -2.452	MPa
Delta	: 0.000	MPa
Kontrolværdier :		
Største afvigelse	: 0.055	MPa
Residualvarians	: 0.001	MPa^2
Std. afv. på residualvarians	: 0.025	MPa
Data læst fra icone, under kalibrering	: 0	
Antal fejl fra icone, under kalibrering	: 0	



Tryk bar	Belastning (VdB)	Aflastning (VdB)	Belastning (VdB)	Aflastning (VdB)	Belastning (VdB)	Aflastning (VdB)
0.000	0.758	0.760	0.759	0.760	0.760	0.759
2.000	0.819	0.822	0.820	0.823	0.820	0.822
4.000	0.882	0.884	0.882	0.883	0.882	0.884
6.000	0.944	0.946	0.944	0.946	0.945	0.946
8.000	1.006	1.008	1.006	1.008	1.007	1.008
10.000	1.068	1.069	1.068	1.069	1.068	1.070
12.000	1.130	1.131	1.131	1.131	1.131	1.132
14.000	1.192	1.192	1.192	1.192	1.192	1.192



Kontrolberegninger :

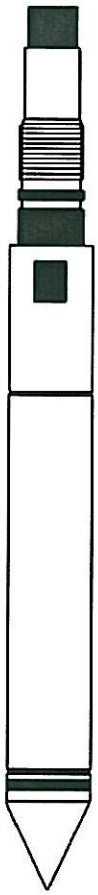
Tryk bar	Gennemsnit (VdB)	Beregnet bar	Diff. bar
0.000	0.759	-0.003	0.003
2.000	0.821	1.999	0.001
4.000	0.883	3.997	0.003
6.000	0.945	6.008	-0.008
8.000	1.007	8.002	-0.002
10.000	1.069	10.002	-0.002
12.000	1.131	12.006	-0.006
14.000	1.192	13.989	0.011

Kalibreringscertifikat

Type	: Icone (TSPI)
Fabrikat	: A.P. Van den Berg
Serienummer	: Icone080310

Spidstryk

Dato for kalibrering	:	2009-05-06	
Hældningskoefficient	:	10.065	kN/VdB
Skæringspunkt på y-aksen	:	-1.599	kN
Areal	:	10	cm²
Nominel belastning	:	75.000	MPa
Maksimum belastning	:	150.000	MPa



Kappemodstand

Dato for kalibrering	:	2009-05-07	
Hældningskoefficient	:	1.946	kN/VdB
Skæringspunkt på y-aksen	:	-0.255	kN
Areal	:	150	cm²
Nominel belastning	:	1.000	MPa
Maksimum belastning	:	1.500	MPa

Poretryk

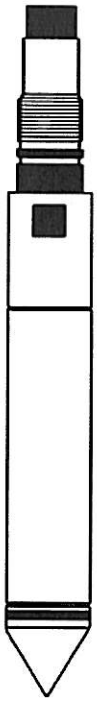
Dato for kalibrering	:	2009-05-07	
Hældningskoefficient	:	3.318	MPa/VdB
Skæringspunkt på y-aksen	:	-2.666	MPa
Nominel belastning	:	10.000	MPa
Maksimum belastning	:	15.000	MPa

GEO

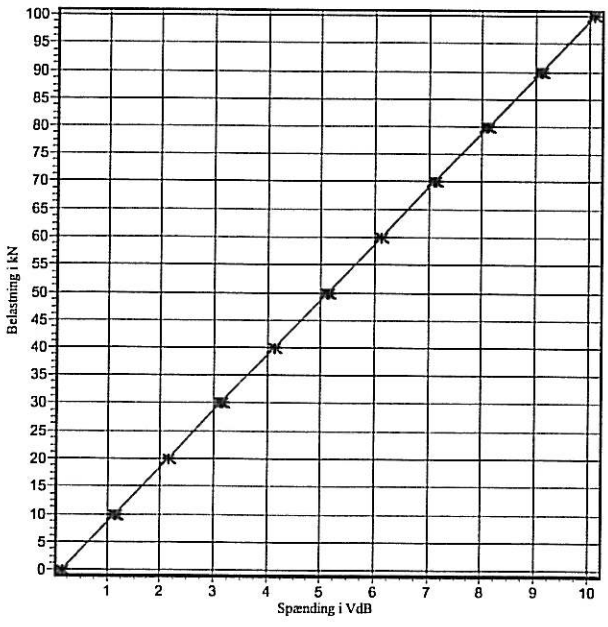
Udført	: ELI	Dato	: 2009-05-06
Kontrolleret	: BON	Dato	: 2009 05 07
Godkendt	:	Dato	: 2009 05 07

Kalibreringsbilag

Kalibreringstype	: **Spids**	
Dato & tid for kalibrering	: 2009-05-06 12:59:37	
Udført af	: ELI	
Type	: Icone (TSPI)	
Fabrikat	: A.P. Van den Berg	
Serienummer	: **Icone080310**	
Reference :		
Serienummer	: 11975-2009	
Spænding	: 11.9983	V
Nulpunktsforskydning	: 0.5446	mV
Kabel :		
Zero	: 0.0000	V
Gain	: 0.0000	V
Kalibreringsværdier :		
Hældningskoefficient	: 10.065	kN/VdB
Skæringspunkt på y-aksen	: -1.599	kN
Delta	: 0.043	kN
Kontrolværdier :		
Største afvigelse	: 0.281	kN
Residualvarians	: 0.006	kN²
Std. afv. på residualvarians	: 0.077	kN
Data læst fra icone, under kalibrering	: 0	
Antal fejl fra icone, under kalibrering	: 0	



Tryk (kN)	Belastning (kN)	(VdB)	Aflastning (kN)	(VdB)	Belastning (kN)	(VdB)	Aflastning (kN)	(VdB)	Belastning (kN)	(VdB)	Aflastning (kN)	(VdB)
0.000	0.08	0.166	0.07	0.164	0.07	0.164	0.07	0.162	0.07	0.161	0.07	0.161
10.000	9.97	1.152	10.04	1.161	9.97	1.148	10.04	1.158	9.95	1.148	10.02	1.157
20.000	20.03	2.151	20.04	2.153	19.98	2.145	20.03	2.151	19.96	2.142	20.04	2.151
30.000	30.03	3.145	30.03	3.142	29.97	3.135	29.99	3.139	29.97	3.138	30.02	3.140
40.000	39.97	4.131	40.04	4.135	40.04	4.138	40.03	4.131	39.96	4.130	40.03	4.130
50.000	49.97	5.132	50.04	5.126	49.98	5.130	50.02	5.124	50.01	5.133	50.02	5.124
60.000	60.00	6.131	60.01	6.116	59.99	6.120	60.03	6.118	59.96	6.131	60.03	6.118
70.000	69.95	7.122	69.98	7.105	69.96	7.123	70.04	7.108	70.02	7.131	69.96	7.108
80.000	80.04	8.120	80.02	8.082	79.99	8.115	80.03	8.099	80.01	8.121	80.04	8.099
90.000	89.99	9.105	90.02	9.086	90.01	9.102	90.03	9.087	89.99	9.109	89.99	9.085
100.000	99.98	10.095	99.99	10.097	99.96	10.096	100.03	10.102	99.97	10.094	100.04	10.101

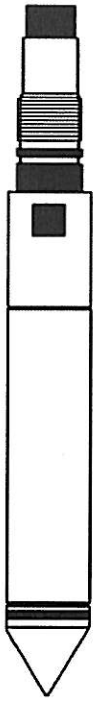


Kontrolberegninger :

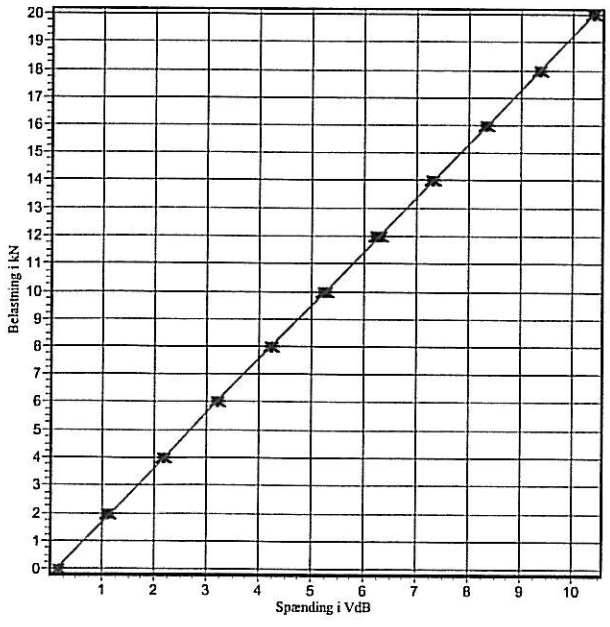
Tryk (kN)	Gennemsnit (VdB)	Beregnet (kN)	Diff. (kN)
0.000	0.163	0.043	-0.043
10.000	1.154	10.015	-0.015
20.000	2.149	20.028	-0.028
30.000	3.140	30.004	-0.004
40.000	4.132	39.994	0.006
50.000	5.128	50.016	-0.016
60.000	6.122	60.019	-0.019
70.000	7.116	70.023	-0.023
80.000	8.106	79.987	0.013
90.000	9.096	89.949	0.051
100.000	10.098	100.032	-0.032

Kalibreringsbilag

Kalibreringstype	: **Kappe**	
Dato & tid for kalibrering	: 2009-05-07 10:05:22	
Udført af	: ELI	
Type	: Icone (TSPI)	
Fabrikat	: A.P. Van den Berg	
Serienummer	: **Icone080310**	
Reference :		
Serienummer	: 21129-2009	
Spænding	: 11.9985	V
Nulpunktsforskydning	: 140.8634	mV
Kabel :		
Zero	: 0.0000	V
Gain	: 0.0000	V
Kalibreringsværdier :		
Hældningskoefficient	: 1.946	kN/VdB
Skæringspunkt på y-aksen	: -0.255	kN
Delta	: 0.078	kN
Kontrolværdier :		
Største afvigelse	: 0.104	kN
Residualvarians	: 0.002	kN²
Std. afv. på residualvarians	: 0.040	kN
Data læst fra icone, under kalibrering	: 0	
Antal fejl fra icone, under kalibrering	: 0	



Tryk	Belastning		Aflastning		Belastning		Aflastning		Belastning		Aflastning	
(kN)	(kN)	(VdB)	(kN)	(VdB)	(kN)	(VdB)	(kN)	(VdB)	(kN)	(VdB)	(kN)	(VdB)
0.000	0.03	0.167	0.03	0.170	0.03	0.170	0.03	0.172	0.03	0.172	0.03	0.174
2.000	2.00	1.139	2.00	1.146	1.99	1.138	2.01	1.109	1.99	1.130	2.01	1.111
4.000	4.00	2.186	4.00	2.192	4.00	2.180	4.00	2.190	3.99	2.151	4.01	2.200
6.000	6.00	3.224	6.01	3.226	5.99	3.222	6.01	3.209	5.99	3.229	6.01	3.217
8.000	8.00	4.267	8.01	4.245	7.99	4.263	8.01	4.247	8.01	4.271	8.01	4.232
10.000	10.00	5.297	10.01	5.276	10.00	5.297	10.00	5.251	10.00	5.292	10.01	5.244
12.000	12.00	6.323	11.99	6.291	12.00	6.318	11.99	6.261	12.01	6.303	12.00	6.248
14.000	14.00	7.339	14.00	7.335	13.99	7.336	14.01	7.291	14.00	7.332	14.01	7.290
16.000	15.99	8.355	16.00	8.361	15.99	8.358	16.00	8.348	16.00	8.362	16.00	8.328
18.000	18.00	9.384	18.00	9.398	17.99	9.386	18.00	9.396	17.99	9.381	18.01	9.374
20.000	19.99	10.404	20.00	10.406	20.00	10.412	20.00	10.432	20.01	10.407	20.00	10.407

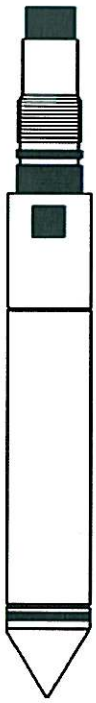


Kontrolberegninger :

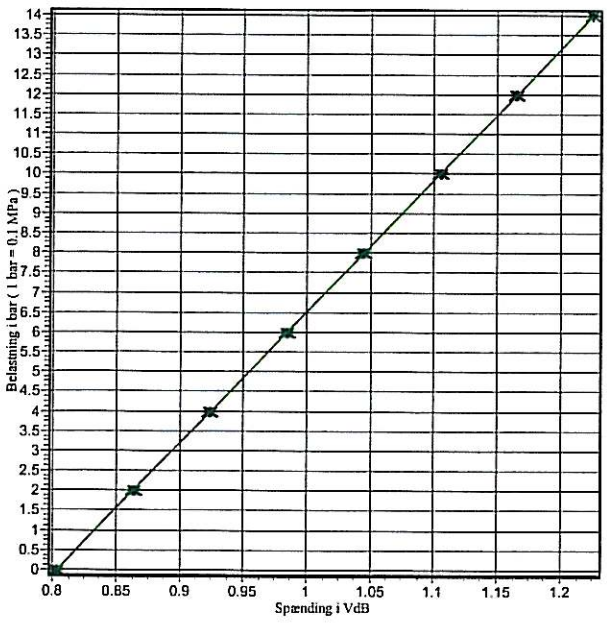
Tryk (kN)	Gennemsnit (VdB)	Beregnet (kN)	Diff. (kN)
0.000	0.171	0.078	-0.078
2.000	1.129	1.941	0.059
4.000	2.183	3.993	0.007
6.000	3.221	6.012	-0.012
8.000	4.254	8.022	-0.022
10.000	5.276	10.011	-0.011
12.000	6.291	11.985	0.015
14.000	7.321	13.989	0.011
16.000	8.352	15.996	0.004
18.000	9.386	18.008	-0.008
20.000	10.412	20.003	-0.003

Kalibreringsbilag

Kalibreringstype	: **Pore**	
Dato & tid for kalibrering	: 2009-05-07 10:34:49	
Udført af	: ELI	
Type	: Icone (TSPI)	
Fabrikat	: A.P. Van den Berg	
Serienummer	: **Icone080310**	
Reference :		
Serienummer	: 20056/279	
Spænding	: 11.9985	V
Nulpunktsforskydning	: 140.8634	mV
Kabel :		
Zero	: 0.0000	V
Gain	: 0.0000	V
Kalibreringsværdier :		
Hældningskoefficient	: 3.318	MPa/VdB
Skæringspunkt på y-aksen	: -2.666	MPa
Delta	: 0.000	MPa
Kontrolværdier :		
Største afvigelse	: 0.045	MPa
Residualvarians	: 0.000	MPa²
Std. afv. på residualvarians	: 0.016	MPa
Data læst fra icone, under kalibrering	: 0	
Antal fejl fra icone, under kalibrering	: 0	



Tryk bar	Belastning (VdB)	Aflastning (VdB)	Belastning (VdB)	Aflastning (VdB)	Belastning (VdB)	Aflastning (VdB)
0.000	0.802	0.804	0.804	0.804	0.804	0.804
2.000	0.863	0.865	0.863	0.864	0.863	0.865
4.000	0.924	0.925	0.924	0.925	0.924	0.925
6.000	0.984	0.985	0.984	0.985	0.984	0.985
8.000	1.044	1.045	1.045	1.045	1.044	1.045
10.000	1.105	1.106	1.105	1.106	1.105	1.106
12.000	1.165	1.166	1.165	1.166	1.165	1.166
14.000	1.225	1.225	1.225	1.225	1.225	1.225



Kontrolberegninger :

Tryk bar	Gennemsnit (VdB)	Beregnet bar	Diff. bar
0.000	0.804	-0.004	0.004
2.000	0.864	1.998	0.002
4.000	0.924	4.003	-0.003
6.000	0.985	6.001	-0.001
8.000	1.045	8.005	-0.005
10.000	1.105	10.005	-0.005
12.000	1.165	12.003	-0.003
14.000	1.225	13.990	0.010

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Appendix 1.III
Datasheet - Positioning system

(4 pages)

AD Navigation DC201

Main features:

- GPS/GLONASS L1/L2 Tracking
- 5Hz Update Rate (20 Hz optional)
- Precise Heading Option
- Integrated UHF with Diversity Reception
- WAAS/EGNOS Capability
- Integrated PPS with TTL Pulse, RS232
- 4x DB9 Com Ports
- 19" Mounting Rack System

Technical specifications

Tracking	20 Channel Dual Constellation (DC) GPS/GLONASS L1/L2
Update Rate	Positioning: 5Hz (DC201/202) 20Hz Optional Heading: 10Hz (DC202 Only) 20Hz Optional
Timing:	External PPS Output PPS to TTL converted to RS232 Interrupt Signal
RTK Initialisation	Typically 10-30 seconds
Operating Range	Up to 80 km
RTK Positioning Accuracies	Horizontal: 1 cm + 0.15 ppm RMS Vertical: 1.5 cm + 0.15 ppm RMS
Heading Accuracies:	0.01 degrees RMS (Antenna separation > 10 meter)
Built-in UHF Radio Modem:	Frequency Range: 380-470 MHz 25 Khz Channel Separation 19,200 bps on Air Transmission Diversity Reception (Dual Antenna System)
Output formats:	GPS based NMEA-0183 Messages Proprietary ASCII and Binary Output Formats CMR/RTCM, Differential Corrections
Input Formats:	CMR/RTCM, Differential Corrections
Size:	2U 19" rack unit, 254 mm (d), 89 mm (h)
Weight:	4.8 Kg
Supply Voltage	12-28 VDC or 110-230 AC
Environmental:	Vibration, EMI: EN 60945
Temperature:	Operation: -20 to 55°C Storage: -40 to 70°C

ACCESSORIES

Communications:	4 x RS232 com ports, DB9, 115,200 bps 1 x RS232 TTL , DB9 1 x PPS output, BNC-F 1 x GPS antenna input, TNC-F 2 x UHF antenna input, TNC-F

GEO is a Danish, knowledge based company. More than 150 employees offer the country's most extensive expertise concerning soil, water and environmental consulting.

The company consults on both large- and small-scale assignments for a wide range of customers. GEO offers comprehensive consulting, drilling and core sampling, plus groundwater, environmental and seabed investigations as well as laboratory work.
GEOs core competence is within geotechnics, drilling, hydrogeology and environmental geotechnology. We also specialize in offshore surveying, rock mechanics, rock/soil testing and modeling.

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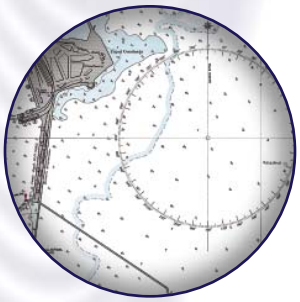
MBX-4

Reliable Auto-Tracking Differential Beacon Receiver



Provide a reliable source of free differential corrections with the MBX-4 Differential Beacon Receiver that augments a separate GPS receiver with free accuracy-improving correction data from networks of beacon stations located throughout the world. With automatic dual-channel tracking, the MBX-4 ensures the best beacon station is always being decoded. Beacon stations are automatically tracked based on signal strength or station distance and can also be manually selected.

Hemisphere GPS' MBX-4 has been optimized for high performance reception and proves reliable even in noisy environments. It outputs the industry standard RTCM SC-104 format accepted by differential-ready GPS receivers and can be configured and monitored with NMEA 0183 protocol. Hemisphere GPS' MBX-4 receiver kit includes an integrated GPS and beacon antenna.

Key MBX-4 Advantages

- Supplements GPS systems with free beacon differential corrections, capable of sub-meter accuracy (depending on GPS receiver quality)
- Dual-channel design allows strongest signal or closest station selection
- Integrated signal splitter outputs GPS signal from combined GPS / differential antenna
- Simple to monitor and configure through menu system and display
- Patented ceramic filter blocks out-of-band signals, optimizing reception

MBX-4 Beacon Receiver

Receiver Specifications

Channels:	2-channel, parallel tracking
Channel Spacing:	500 Hz
Frequency Range:	283.5 to 325.0 Hz
MSK Bit Rates:	50, 100, 200 bps
Operating Modes:	Manual, Automatic and Database
Cold Start Time:	<1 min
Warm Start Time:	<2 seconds
Demodulation:	Minimum Shift Keying (MSK)
Sensitivity:	2.5 µV/m for 6 dB SNR
Dynamic Range:	100 dB
Frequency Offset:	±8 Hz (27 ppm)
Adjacent Channel Rejection:	61 dB @ ± 400 Hz
Correction Output Protocol:	RTCM SC-104
Input Status Protocol:	NMEA 0183

Communications

Interface:	RS-232C or RS-422
Baud Rates:	2400, 4800, 9600

Environmental Specifications

Operating Temperature:	-30°C to +70°C (-22°F to 158°F)
Storage Temperature:	-40°C to +80°C (-40°F to 176°F)
Humidity:	95% non-condensing
EMC:	CISPR22 EN 61000-6-1 CE

Power Specifications

Input Voltage Range:	9 to 40 VDC
Nominal Power:	2.5 W
Nominal Current:	210 mA @ 12 VDC
Antenna Voltage Output:	10 VDC (5 VDC optional)
Antenna Input Impedance:	50

Mechanical Specifications

Dimensions:	150 mm L x 125 mm W x 51 mm H (5.9 L x 4.9 W x 2.0 H inches)
Weight:	0.64 kg (1.4 lb)
Display:	2-line x 16-character LCD
Keypad:	3-key switch membrane
Power Connector:	2-pin circular locking
Data Connector:	DB9-S
Antenna Connector:	BNC-S
Optional GPS Output Port:	TNC-S

NMEA 0183 I/O

- Receiver Automatic, Database and Manual tune command
- Frequency and data rate query
- Receiver performance and operating status queries
- Automatic search almanac queries (proprietary)
- Baud rate selection command
- Receiver tune command
- Force cold start command (proprietary)
- Software upgrade command (proprietary)
- Configuration up-load command (proprietary)

Back Panel Configuration

Authorized Distributor:

HEMISPHERE GPS
4110 - 9th Street S.E.
Calgary, AB T2G 3C4
Canada

Phone: 403.259.3311
Fax: 403.259.8866
Toll Free: 800.274.9190
precision@hemispheregps.com
www.hemispheregps.com

Ashtech Z12 GPS

Main features:

- GPS L1/L2 Tracking
- Water Proof
- Internal RAM data recorder
- 4 RS-232 ports (115,200 baud max)
- Waypoint Navigation

Technical specifications

Tracking	12 Channel GPS L1/L2
Timing:	External PPS Output
Real-time Differential Position accuracy	<1 m (PDOP <4)
Real-time Z Kinematic Position accuracy	Horizontal 3 cm Vertical 5 cm
Output formats:	GPS based NMEA-0183 Messages RTCM, Differential Corrections
Input Formats:	RTCM, Differential Corrections
Size:	216(W) x 99(H) x 203(D) mm
Weight:	4.5 Kg
Supply Voltage	10-32 VDC
Temperature:	Operation: -20 to 55°C Storage: -30 to 75°C

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