REPORT

Norwegian GeoTest Sites (NGTS)

FIELD AND LABORATORY TEST RESULTS FROM
NGTS SOFT CLAY SITE – ONSØY

DOC.NO. 20160154-10-R
REV.NO. 2 / 2019-12-02

Project

Project title:	Norwegian GeoTest Sites (NGTS)
Document title:	Field and Laboratory Test Results from NGTS soft clay site – Onsøy
Document no.:	20160154-10-R
Date:	2016-12-23
Revision no. /rev. date:	2 / 2019-12-02

Client

Client:	Research Council of Norway (RCN)
Client contact person:	Herman Fabrot
Contract reference:	RCN project number 245650

for NGTS

Project manager:	Jean-Sebastien L'Heureux
Prepared by:	Aleksander S. Gundersen, Ragnhild C. Hansen, Sarah Bazin, Cathinka Schaanning Forsberg
Reviewed by:	Stein Strandvik, Jean-Sebastien L'Heureux

Summary

In 2017, the Norwegian GeoTest Sites (NGTS) project established five research sites, one of which is the new Onsøy soft clay site located close to Fredrikstad city. This report contains all results from field and laboratory tests related to the NGTS soft clay test site to revision date. In-situ methods include electrical resistivity tomography, multichannel analysis of surface waves, total soundings, rotary pressure soundings, cone penetration testing with and without seismic and electrical resistivity measurements, dilatometer with seismic measurements, self-boring pressuremeter, electric piezometers, thermistor string, hydraulic fracture testing and earth pressure cells.

Soil samples were obtained using different sampling techniques such as Sherbrook Block sampler, in addition to 72 mm piston sampler and 54 mm combined piston sampler. Laboratory tests such as multi sensor core logging, index testing, cyclic and monotonic, consolidated and unconsolidated triaxial tests, bender element tests, oedometer tests with constant rate and incremental loading and direct simple shear tests have been drawn upon.

Different projects, other than NGTS as well, have been performing field tests, sampling and laboratory testing. However, all the field work and laboratory work have been combined to identify the new test site at Onsøy and characterize the clay at the new test site.

Contents

Tables

Tables – continued

Figures

Appendices

Review and reference page

1 Introduction

All onshore and offshore construction projects require reliable selection of geotechnical design parameters to evaluate and plan infrastructure developments. Lack of reliable geotechnical data may lead to oversized and costly infrastructure foundations, structure collapse or damage, geohazards and loss of human lives. There is a general agreement about the need for a better understanding of the behaviour of soils to improve on the geotechnical design. To do so, improvements of current, and development of new field and laboratory procedures, soil databases and correlations are needed.

This report describes the work related to the NGTS soft clay research site (Onsøy) up to revision date, as part of the RCN's infrastructure project "Norwegian GeoTest Sites (NGTS)". The report will be revised each year in order to update the document with recent developments.

Figure 1.1 shows a summary of the report structure for the NGTS project. This may be useful for tracking the reports generated during the NGTS project.

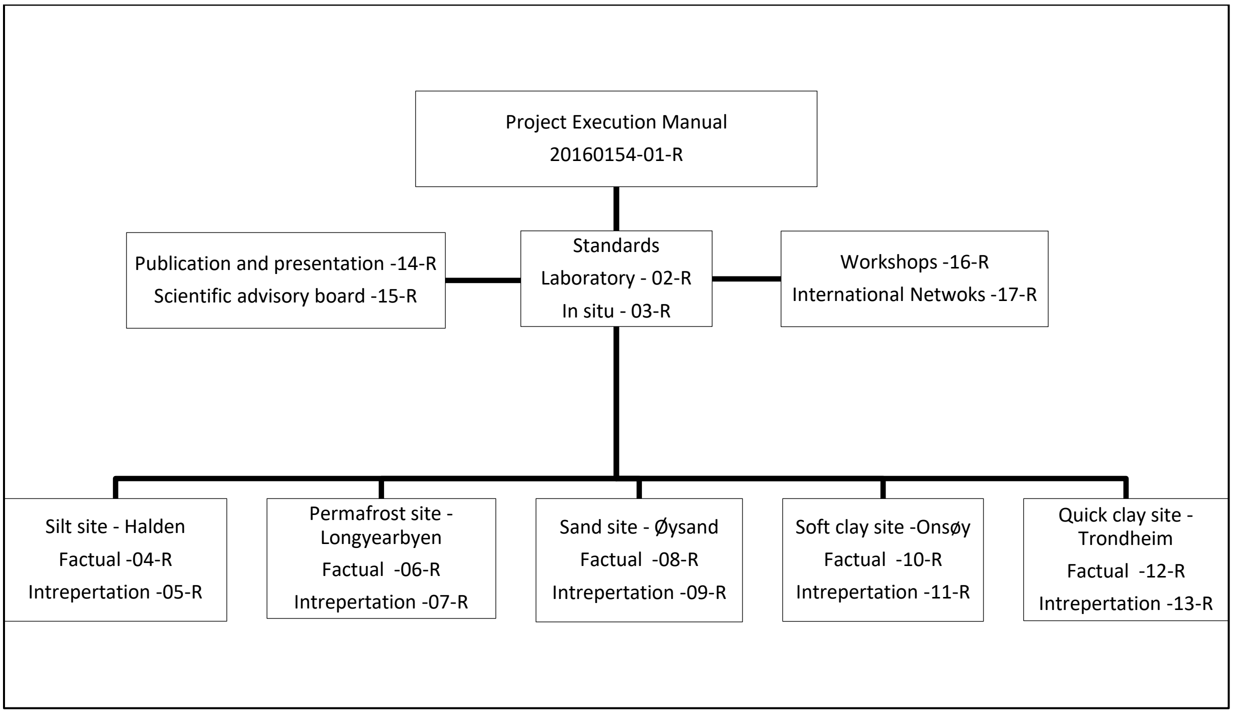


Figure 1.1 Structure and tracking of reports for NGTS

2 Location of Onsøy soft clay site

Due to the thickness of the clay deposit and its highly uniform nature, the Onsøy area has been used for research purposes by NGI for many years. Due to new regulations of the historical test sites at Onsøy, and the urban development of the area, NGI was forced to look for a new test site as part of the NGTS project. The new test site is located along the road Gamle Ålevei, 1.3 km southwest of the previous test site along Pancoveien, see Figure 2.1. The test site is located about 100 km from Oslo, just north of the town Fredrikstad. A screening study for potential backup site took place in 2018, the location of which is illustrated in Figure 2.1.

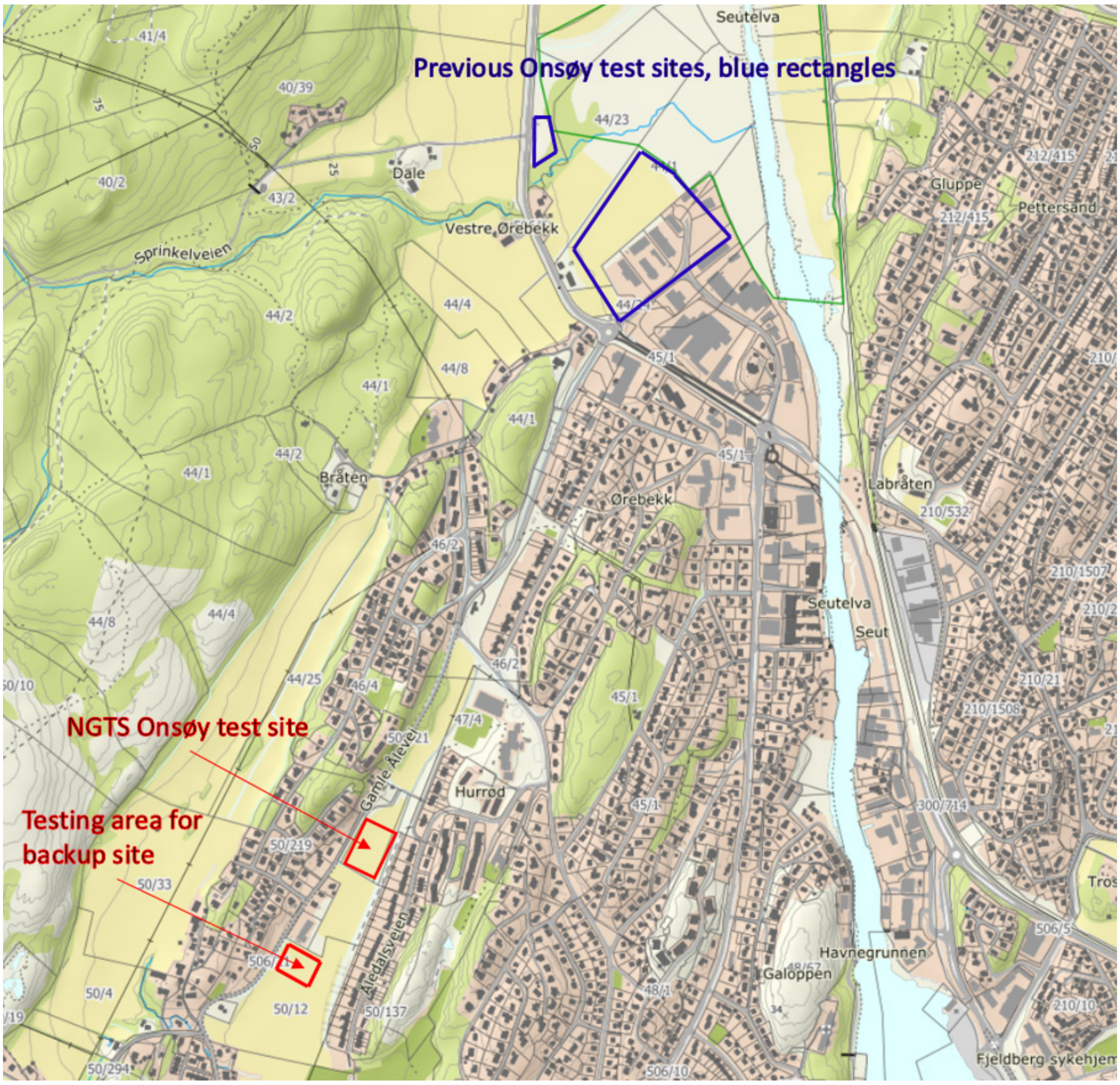


Figure 2.1 Overview map of the Onsøy area

The NGTS test site is approximately 50 m by 70 m with an option of extension up to 110 m in the northeast direction. A close-up map of the new test site is given in Figure 2.2.

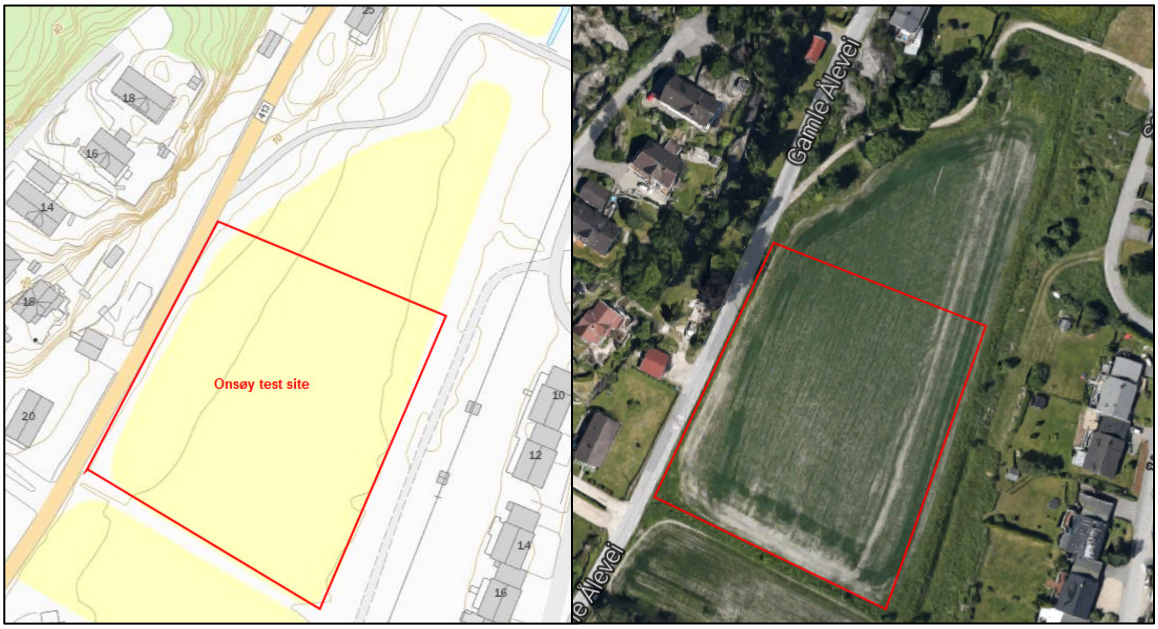


Figure 2.2 Close-up map of the new test area

Southeastern Norway, in which the Onsøy site is situated, has undergone significant isostatic uplift following the deglaciation of the region about 11 000 years ago. The highest post-glacial sea level in the region around the site was about 170 m above its present level (Sørensen, 1979). The depositional environment at the site has therefore changed from rapid deposition glacial marine clays during the deglaciation to more placid deposition in an estuarine environment during the early Holocene (post glacial period).

The upper part of the site may have been subjected to erosion and/or wetland depositional processes in shallow water, before being uplifted above sea level. Once above sea level sub aerial exposure has produced a weathered crust.

3 Summary of soil conditions

The soil from the surface down to more than 20 m depth has been divided into 4 different soil units. The soil units identified are summarized in Table 3-1. The depth to the different units are provided as a range based on the two main locations where samples have been obtained i.e. the south-central area and southeast corner as seen in Figures 4.1.2 and 4.1.3 respectively. The depth to the different units vary across the site and have therefore been provided as range in Table 3-1.

Table 3-1 Summary of soil units identified

Unit	Depth range to bottom of unit, m	Soil description
I	1.4	Dry crust, CLAY
II	8.5-11	CLAY, low to very low strength, occasional shell fragments, high plasticity
III	14-20	CLAY, low to medium strength, occasional gravel and shell fragments, a few pockets of sand
IV	24-26	CLAY, low to medium strength, occasional shell fragments, becoming more sensitive with depth
V	24-26	Bedrock, with some thin cover of sand and/or till

Figures 3.1 and 3.2 summarize geotechnical data from two different areas within the site i.e. south central and southeast corner respectively. The field test locations in south central area and southeast corner are illustrated in Figures 4.1.2 and 4.1.3 respectively. The ground water table is located approximately 1 m below ground level.

4 Field testing

4.1 General

As part of the site characterization, different field tests and sampling have been performed. Different projects, other than NGTS as well, have been performing these field tests and sampling. All field tests performed to revision date are summarized in Table 4.1-1. The abbreviations used for field testing is described in Table 4.1-2. Figures 4.1.1 to 4.1.5 show the locations of the field tests within the new test site. Figure 4.1.6 illustrates the locations of the tests carried out as part of screening for soft clay backup site.

4.2 Electrical resistivity tomography (ERT)

Two parallel profiles approximately 30 m apart, ONSER02 & ONSER03, were acquired on January 26th 2016. An additional profile approximately perpendicular to these lines, ONSER04, was investigated on May 26th 2017. Figures 4.1.1 to 4.1.5 indicate the location of the ERT lines. The electrode spacing was 2 m for all profiles. The length of the parallel profiles were 160 m and the length of the perpendicular profile was 60 m. The parallel profiles were extended towards the south on the property of Fredrikstad municipality in order to reach the maximum penetration depth in the area of interest.

Three layers are identified from the ERT results: dry crust, marine clay and resistive bedrock. The bedrock topography is however difficult to retrieve. The penetration depth would be sufficient, but the geometry of the valley makes it difficult for 2D profiling. For details on the ERT testing, reference is made to Appendix A.

4.3 Multichannel analysis of surface waves & passive seismic (MASW & PS)

A Multi-channel Analysis of Surface Waves (MASW) survey was conducted by NGI the 9th of March 2018 (ONSM01) in addition to passive seismic testing (ONSPS01). The tests were carried out within the south central area of the test site. The test location is indicated in Figure 4.1.2. The purpose of these tests was to establish a shear wave velocity profile and potentially estimate the depth to bedrock. Appendix B provides further details on the testing and results.

4.4 Field vane test (FVT)

To map the ground conditions and test new field equipment, field vane testing was performed at the new Onsøy test site. The field vane used measure the soil resistance at the location of the vane itself and represents an improvement compared to measuring at ground level. The field vane test is an easy and straightforward way of obtaining estimates of the undrained shear strength of clays. Two locations were cleared for testing, one preferred location ONSV01 and one backup location ONSV02. Testing was only conducted in location ONSV01. Pre-augering to 2 m below ground level was carried out at location ONSV02 as preparation. The locations are illustrated in Figure 4.1.3. The test was performed using a Geotech ElectricVane EVT2000 standard model manufactured by Geotech. The details of the test and results can be found in Appendix C. Figure C4.1 illustrates the intact and remolded shear strength from field vane testing.

4.5 Rotary pressure soundings (RPS)

Four rotary pressure soundings were performed on the 11th and 12th of February 2016 as part of the initial site screening. Results are illustrated in Figures D1.1 to D1.4, in Appendix D. Estimated depths to bedrock are summarised in Table 4.5-1. The depth to bedrock from rotary pressure soundings varies between approximately 20 m to 35 m below ground level across the site, generally increasing towards the south and east of the site. Appendix D presents the test results. Test locations are indicated in Figures 4.1.1 to 4.1.4.

Table 4.5-1 Summary of rotary pressure soundings

Location ID	Depth to bedrock, m	Comments
ONSRP01	28.8	More sensitive below 13 m
ONSRP02	24.8	More sensitive below 13 m
ONSRP03	34.7	More sensitive below 22 m
ONSRP04	19.4	Very low resistance, to be verified with CPTU

4.6 Total soundings (TS)

Four total soundings were initially carried out as part of the first site screening. Figures 4.1.1 to 4.1.5 illustrate the test locations. Figures E1.1 to E1.4 in Appendix E display the measured penetration resistance (kN), flush pressure (MPa) and penetration time (sec/m). In addition, five additional total soundings were carried out as part of the screening for a backup site in November 2018. The location of all soundings are illustrated in Figure 4.1.6. Table 4.6-1 provides the depth to bedrock from the total soundings.

Table 4.6-1 Summary of total soundings

Location ID	Depth to bedrock, m	Comments
ONSTS01	11.5	
ONSTS02	9.0	
ONSTS03	7.8	Low resistance compared to ONSTS01 & ONSTS02
ONSTS04	38.3	
ONSTS05	21.4	Backup site
ONSTS05	20.5	Backup site
ONSTS05	24.5	Backup site
ONSTS05	29.6	Backup site
ONSTS05	33.1	Backup site

4.7 Cone penetration testing (CPTU, SCPTU, RCPTU)

Thirty four cone penetration tests have been carried out at the Onsøy test site, four of which had seismic modules. One test included measurements of electrical resistivity. In addition, five tests were carried out as part of the screening for a backup site. The locations of the cone penetration tests within the test site are illustrated in Figures 4.1.1 to 4.1.5 and Figure 4.1.6 illustrates the locations of the tests at the backup site. Tests ONSC02 was carried out in the vicinity of borehole ONSB02. ONSC01 and ONSC03 to ONSC06 were performed in the vicinity of rotary pressure soundings and total soundings. The remaining tests were performed in the southeast corner of the site as part of a CPTU study. The findings from this study can be found in NGTS (2018a). Figures F1.1 to F1.34 in Appendix F show the measured cone resistance (q_c), sleeve friction (f_s) and pore pressure (u_2) with measured depth. Table 4.7-1 summarizes the cones used and the zero readings for each test, in addition to test specific comments. Table 4.1.1 documents the penetration depths of each CPTU sounding. Figure 4.7.1 and Figure 4.7.2 show two of the rigs used in cone penetration testing.

Figure 4.7.1 Geomil rig used for cone penetration testing

Figure 4.7.2 Pagani rig used for cone penetration testing

Table 4.7-1 Summary of CPTU tests

Test	Cone	Cone	Test	Change in zero readings, kPa			Rig	Comment
No.	**No.**	**Manuf.**	**date**	**Δq_c**	**Δf_s**	**Δu_2**		
ONSC01	20759	ENVI	2016-02-12	-8.0	-0.5	-6.9	NGI	
ONSC02	20759	ENVI	2016-02-12	12.0	-1.0	-19.2	NGI	
ONSC03	30451	ENVI	2017-03-05	52.0	-0,2	-12.0	NGI	
ONSC04	50660	ENVI	2017-02-13	42.0	-0.1	-1.4	NGI	
ONSC05	50660	ENVI	2017-02-03	40.0	0.5	8.5	NGI	
ONSC06	50660	ENVI	2017-02-03	138.0	-0.8	22.1	NGI	
ONSC07	MKj485	Pagani	2017-09-04	16.0	0.4	2.0	Pagani	Seismic tests
ONSC08	MKj485	Pagani	2017-09-04	21.0	0.2	3.0	Pagani	Seismic tests
ONSC09	MKj528	Pagani	2017-09-03	27.0	0.1	5.0	Pagani	
ONSC10	MKj528	Pagani	2017-09-03	22.0	0.2	0.4	Pagani	
ONSC11	C14251	Geomil	2017-09-18	-46.5	0.0	6.7	Geomil	
ONSC11A	C17010	Geomil	2017-09-18	-14.2	-0.7	7.0	Geomil	
ONSC11B	S17176	Geomil	2017-09-18	96.4	1.5	8.7	Geomil	Subtraction cone
ONSC12	C14251	Geomil	2017-09-18	-27.9	0.0	4.5	Geomil	
ONSC12A	C17010	Geomil	2017-09-18	19.0	0.9	4.8	Geomil	
ONSC12B	S17176	Geomil	2017-09-18	14.3	0.1	13.0	Geomil	Subtraction cone
ONSC13	C14251	Geomil	2017-09-18	-22.4	-0.1	6.1	Geomil	
ONSC13A	C17010	Geomil	2017-09-18	-16.3	-0.8	5.5	Geomil	
ONSC13B	C17010	Geomil	2017-09-18	-17.7	-0.8	5.1	Geomil	
ONSC14	C14251	Geomil	2017-09-18	-19.9	0.0	3.7	Geomil	
ONSC15	4866	Geotech	2017-10-16	68.7	0.1	1.0	NGI	
ONSC16	4866	Geotech	2017-10-16	2.8	-0.2	-4.1	NGI	
ONSC17	4866	Geotech	2017-10-16	11.8	0.0	-0.8	NGI	
ONSC18	4648	Geotech	2017-11-08	0.0	0.4	-0.4	NGI	Seismic tests
ONSC19	51706	ENVI	2017-11-13	2.0	0.5	5.2	NGI	
ONSC20	51706	ENVI	2017-11-13	-6.0	0.0	7.2	NGI	
ONSC21	51706	ENVI	2017-11-13	-10.0	0.0	1.3	NGI	
ONSC22	150912	APVB	2017-11-14	-64.5	-0.5	55.5	SVV	
ONSC23	150912	APVB	2017-11-13	9.9	-0.5	-6.4	SVV	Seismic tests
ONSC24	150928	APVB	2017-11-13	1.6	0.3	-7.3	SVV	Resistivity tests
ONSC25	150912	APVB	2017-11-14	30.8	-0.9	-5.5	SVV	
ONSC26	4936	Geotech	2017-11-17	-6.7	0.5	1.3	NGI	
ONSC27	4936	Geotech	2017-11-17	-19.6	0.3	2.4	NGI	
ONSC28	4936	Geotech	2017-11-17	NA	NA	NA	NGI	No zero readings available
ONSC29	4842	Geotech	2018-11-21	2.0	-0.8	0.0	Multionsult	Backup site
ONSC30	4842	Geotech	2018-11-21	22.0	-0.2	1.0	Multionsult	Backup site
ONSC31	4842	Geotech	2018-11-21	16.2	-0.4	-1.0	Multionsult	Backup site
ONSC32	4842	Geotech	2018-11-21	12.4	-0.1	1.0	Multionsult	Backup site
ONSC33	4842	Geotech	2018-11-21	-6.7	0.3	-1.1	Multionsult	Backup site

4.8 In situ pore pressure – piezometer (Piezo)

Four electric piezometers have been installed in two different areas within the site. The piezometer locations are illustrated in Figures 4.1.3 and 4.1.4. The sensors log pore pressures two times per day. Appendix G provides the details of the measurements. Figures G1.1 illustrates the measured in-situ pore pressure with time and depth respectively. Table 4.8-1 presents the summary of the piezometers including locations within the site, installation depths and comments.

Table 4.8-1 Summary of installed piezometers

Piezometer ID	Location on test site	Installation depth	Comments
ONSPI01	Southeast	5 m	
ONSPI02	Southeast	15 m	
ONSPI03	West	5 m	
ONSPI04	West	7.8 m	Installed to bedrock

4.9 Seismic dilatometer test (SDMT)

In 2016, NGI purchased a dilatometer with seismic module from Studio Prof. Marchetti. At Onsøy, one profile with standard dilatometer measurements, A and B readings, and seismic measurements were taken on the 21st of November 2017. A- and B-readings are the membrane lift-off pressure and 1.1 mm inflation pressure respectively. The tests were carried out in the south east corner of the test site. Figure 4.1.3 illustrates the location of the dilatometer test. The electric pneumatic cable snapped during hoisting of rods and hence no zero readings were taken after testing. Figure H1.1 in Appendix H illustrates the results with depth including the shear wave velocity.

4.10Hydraulic fracture (HFST)

Two hydraulic fracture standpipes were installed in 2016 to 6 m depth below ground surface. They were installed to the same depth for result comparison. Hydraulic fracturing on this depth was carried out on two occasions, the first in spring 2017 and the second during early summer 2018. For further testing the standpipes were pushed to 8 m depth bgl and new tests were carried out in October 2018. Appendix I presents the details of the three rounds of testing and the corresponding results. Figures I2.1 to I2.12 illustrate the pressure head during crack initiation and the measurements during the subsequent falling head tests. Different results can be observed at the same depth, the cause of which is not known to date.

4.11 Earth pressure cell tests (EPCT)

In 2017, it was decided to install earth pressure cells produced by Gløtzl. Three earth pressure cells are currently active at the Onsøy test site. The pressure cells have been installed to depths of 5, 6 and 8 m below ground surface. It should be noted that these cells were rather difficult to install because of their susceptibility to tilting and breaking. Each instrument consists of two pressure sensors, i.e. pore water pressure sensor and earth pressure sensor, as illustrated in Figure 4.11.1. Table 4.11-1 provides the overview of active earth pressure and pore pressure sensors. Four readings have been taken at each location and the results of the readings are summarized in Table 4.11-2. Appendix J provides the user manual and calibration sheets for the instrument.

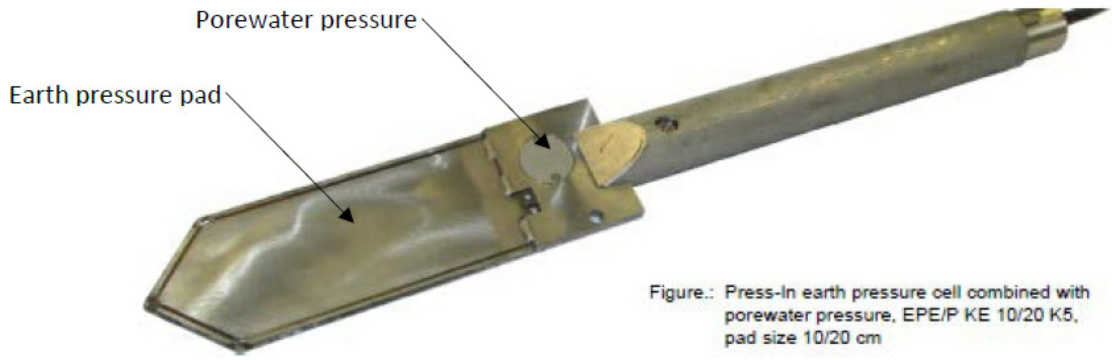


Figure 4.11.1 Overview of earth pressure cells from Gløtzl (from user manual)

Table 4.11-1 Calibration earth pressure cell tests.

Location ID	Depth	Earth Pressure Sensor		Pore Pressure Sensor	
	[m]	Sensor ID	Correlation	Sensor ID	Correlation
ONSEP01	5.00	EE24704	(R-8.66)/2.28571	PWD24703	(R-4)/3.2
ONSEP02	6.00	EE24700	(R-8.64)/2.28571	PWD24699	(R-4)/3.2
ONSEP03	8.00	EE24706	(R-8.81)/2.28571	PWD24705	(R-4)/3.2

Table 4.11-2 Summary of results – earth pressure cell tests

Location	Date	Earth pressure sensor			Pore pressure sensor			σ_{h0}'
		Raw	σ_{h0}	σ_{h0}	Raw	u_0	u_0	
		R (mA)	(bar)	(kPa)	R (mA)	(bar)	(kPa)	(kPa)
ONSEP01	31.03.2017	9.348	0.301	30.100	5.422	0.444	44.438	-14.337
ONSEP01	14.07.2017	9.606	0.414	41.388	5.38	0.431	43.125	-1.737
ONSEP01	15.11.2017	9.462	0.351	35.088	5.577	0.493	49.281	-14.194
ONSEP01	21.11.2017	9.459	0.350	34.956	5.569	0.490	49.031	-14.075
ONSEP02	09.11.2017	11.354	1.187	118.738	5.538	0.481	48.063	70.675
ONSEP02	15.11.2017	10.251	0.705	70.481	5.955	0.611	61.094	9.388
ONSEP02	15.11.2017	10.259	0.708	70.831	5.966	0.614	61.438	9.394
ONSEP02	21.11.2017	10.188	0.677	67.725	5.879	0.587	58.719	9.006
ONSEP03	13.11.2017	12.458	1.596	159.600	8.462	1.394	139.438	20.163
ONSEP03	15.11.2017	11.207	1.049	104.869	6.915	0.911	91.094	13.775
ONSEP03	15.11.2017	11.185	1.039	103.906	6.883	0.901	90.094	13.813
ONSEP03	21.11.2017	10.994	0.956	95.550	6.539	0.793	79.344	16.206

4.12 Self-boring pressure meter (SBP)

Self-boring pressure meter testing was carried out between the 20th and 23rd of September 2017. In Situ Site Investigation was responsible for the testing while NGI provided the drill rig and the rig operator. The tests are summarised in Table 4.12-1. This table is taken from the In Situ report which documents the field operations and test results with interpretation. The In Situ report is attached as Appendix K.

Table 4.12-1 Summary of self-boring pressuremeter tests

Borehole ID	Test ID	Date	Depth	Probe	Operator	Drilling time	Remarks
ONSP01	T01	20/09/2017	5.00 m	SBP Beatrice	D Lewins	3mins	Fish tail bit used
ONSP01	T02	20/09/2017	6.10 m	SBP Beatrice	D Lewins	1min	Drilled on from T01
ONSP01	T03	20/09/2017	7.10 m	SBP Beatrice	D Lewins	2mins	Drilled on from T02
ONSP01	T04	21/09/2017	8.00 m	SBP Beatrice	D Lewins	2mins	Fish tail bit used
ONSP01	T05	21/09/2017	9.10 m	SBP Beatrice	D Lewins	2mins	Drilled on from T04
ONSP01	T06	21/09/2017	10.20 m	SBP Beatrice	D Lewins	2mins	Drilled on from T05
ONSP01	T07	22/09/2017	12.10 m	SBP Beatrice	D Lewins	2mins	Fish tail bit used
ONSP01	T08	22/09/2017	14.00 m	SBP Beatrice	D Lewins	2mins	Drilled on from T07
ONSP01	T09	22/09/2017	16.30 m	SBP Beatrice	D Lewins	3mins	Drilled on from T08
ONSP01	T10	23/09/2017	18.00 m	SBP Beatrice	D Lewins	15mins	Fish tail bit used

4.13 Weather station

A weather station was installed in September 2018 and started logging the 12th of September 2018. Figure 4.13.1 shows a picture of the equipment. The list below gives the parameters which are logged by the weather station. The air temperature is corrected for elevation.

- Time
- Air pressure
- Precipitation
- Maximum, minimum and average air temperature (1 minute average)
- Maximum wind speed over a period of 10 and 60 minutes
- Wind direction
- Average wind speed over 10 minute's period.

Figure 4.13.2 shows the air pressure, average air temperature and average wind speed with time.

Figure 4.13.1 Weather station at Onsøy soft clay site

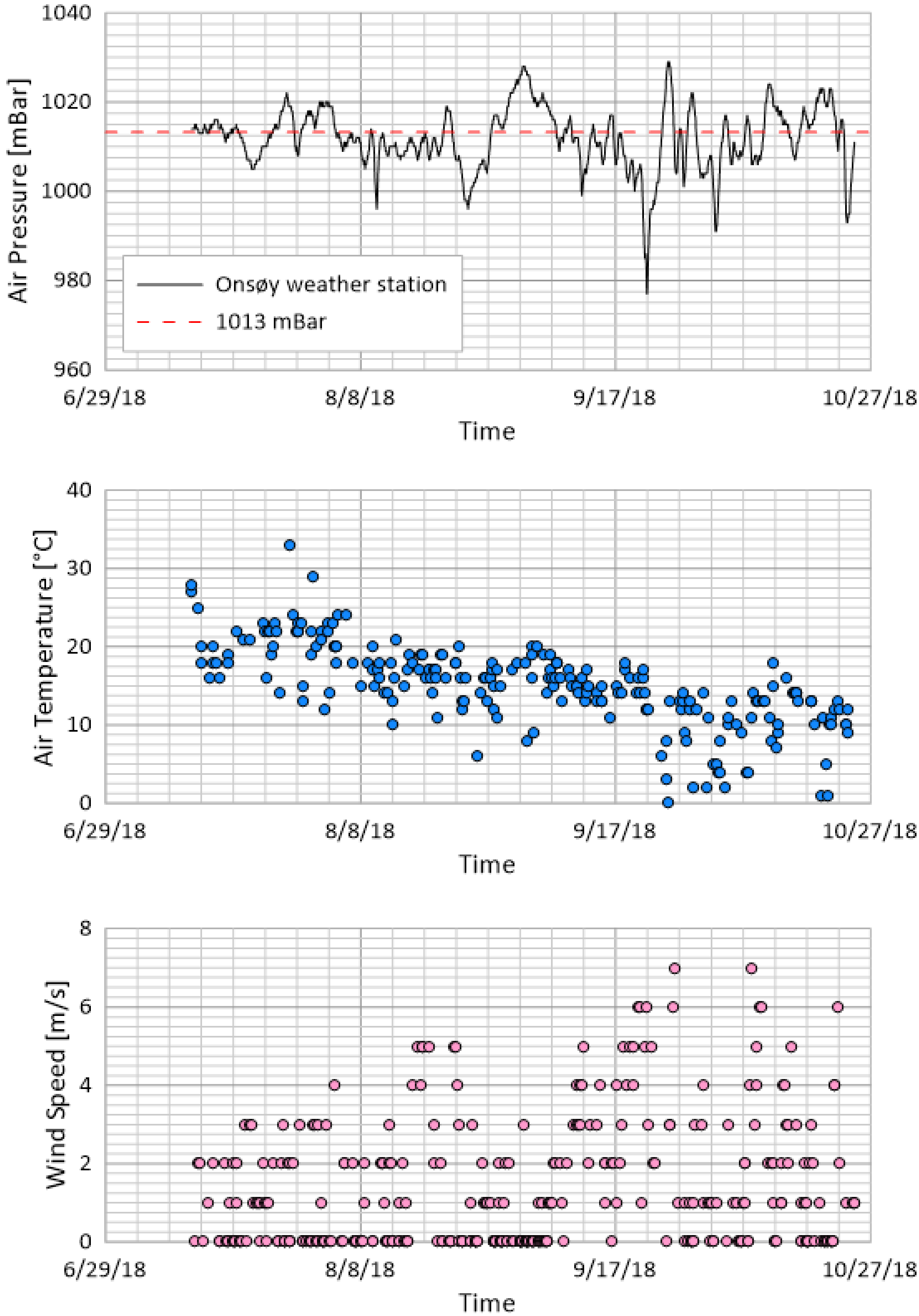


Figure 4.13.2 Air pressure, air temperature and wind speed from Onsøy weather station

4.14 Thermistor string

A thermistor string was installed in September 2018. During installation, the lower part of the string was accidentally cut and lost down into the borehole. Because of that, there are currently sensors down to 5.25 m below ground level. Figure 4.14.1 shows the temperature readings of each sensor from October 24th to November 7th 2018. It can be seen that the temperature at 5.25 m bgl is stable at around 8.5°C.

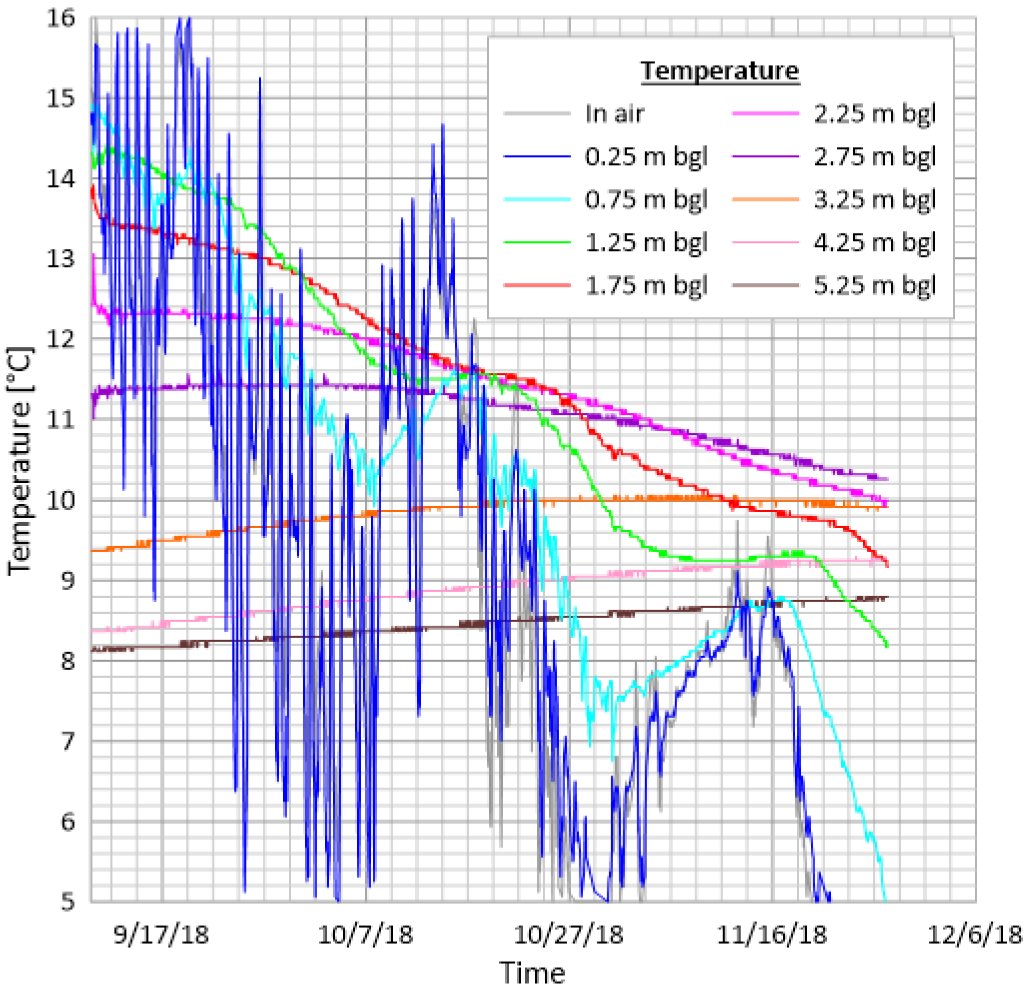


Figure 4.14.1 Temperature from thermistor strings. 0 to 5.25 m bgl

4.15 Sampling

Several projects, with different purposes, have initiated and carried out sampling at the NGTS soft clay site. Because of this, boreholes have multiple identification names. This report provides both to-be-used NGTS borehole IDs and old IDs used within each separate project. All testing relevant for the NGTS project is included in this report.

The first campaign took place in February 2016 using a 72 mm thin-walled piston sampler. Sherbrooke block sampler, 54 mm composite piston sampler and 76 mm long seabed sampler have also been used at the site. The following sections briefly describes the features of the different sampling campaigns. Table 4.15-1 provides the overview of sampling activities at the NGTS soft clay site.

4.15.1 Block sampling (ONSB01)

In early May 2016, NGI retrieved blocks of clay using the Sherbrooke block sampler. The samples were obtained from six different depths in one borehole. The current borehole ID is ONSB01 and the old ID was BL-1. The diameter of each block is 250 mm and height typically in the range of 350 mm to 390 mm. As can be seen from Table 4.15-1, different projects organized and financed the block sampling and the following laboratory testing.

To perform block sampling, NGI needs to elevate the drill rig 1 m above the terrain to have enough space underneath the drill rig base to handle the samples. A special built platform is used for this purpose as illustrated in Figure 4.15.1 on the right hand side.

Before sampling a 500 mm auger is used to pre-auger down to the desired sampling depth.

4.15.2 72 mm sampling (ONSB02 & ONSB41)

As part of NGI project 20140839, a 72 mm borehole (ONSB02) with continuous sampling from 1 m to 19.8 m below ground surface was performed in February 2016. A thin-walled piston-sampler K200 from Geonor A/S with inside diameter of 72 mm was used. NGI carried out the sampling using a Geotech rig. Old borehole ID was simply "borehole 2" or "72-2" while ONSB02 is used within the NGTS project. Figure 4.1.2 illustrates the location of this borehole relative to other test locations at the site. The figure shows that tests ONSC02 and ONSRP02, which were also part of project 20140839, were carried out in the close vicinity of this borehole.

In September 2017, another 72 mm borehole with continuous samples from 0 to 19.8 m was retrieved with the aim of establishing a full profile of index and engineering soil properties. This sampling campaign was carried out as part of the NGTS project and there is only one borehole ID – ONSB41. These samples were retrieved in the southeast corner of the site as illustrated in Figure 4.1.3.

4.15.3 54 mm sampling (ONSB03 & ONSB14)

As part of NGI project 20160386, some additional 54 mm samples (composite sampler) were obtained close by the block sampling location (ONSB01), to have additional samples with less quality to illustrate the effect of sampling disturbance. The borehole ID is ONSB03 and Figure 4.1.2 illustrates the sampling location.

Multi-sensor core logging has become a popular tool for estimating unit weight profile. With this purpose, the NGTS project carried out sampling in location ONSB14. This borehole is located close by borehole ONSB41 as illustrated in Figure 4.1.3.

4.15.476 mm sampling

The remaining sampling at the site has been carried out as part of NGI projects 20150530 and 20170642, where a new sampling device with 76 mm samples was tested. The locations of these boreholes are illustrated in Figures 4.1.2 to 4.1.4.

Figure 4.15.1 Left hand side: 76 mm sampling rig. Right hand side: block sampling setup

Table 4.15-1 Overview of soil sampling soft clay site

BH ID	Old BH ID	Sample No.	Subsample No.	Depth top, m	Depth base, m	Project No. /comment	Time of sampling
ONSB01	BL-1	1	-	6.80	7.15	20160154 (NGTS)	May 2016
ONSB01	BL-1	2	-	10.10	10.38	20160386	May 2016
ONSB01	BL-1	3	-	12.12	12.39	20160386	May 2016
ONSB01	BL-1	4	-	13.98	14.36	NGI lab project	May 2016
ONSB01	BL-1	5	-	14.36	14.75	20160154 (NGTS)	May 2016
ONSB01	BL-1	6	-	14.75	15.11	20160154 (NGTS)	May 2016
ONSB02	72-2	1,2,7,10,16	-	NA	NA	No testing	2016-02-10
ONSB02	72-2	3,4,5,6,9,11, 12,14,15,17	-	NA	NA	20140839	2016-02-10
ONSB02	72-2	8,13,18,19	-	NA	NA	20160116 (NGTS)	2016-02-10
ONSB03	54-2	1	-	NA	NA	20160386	May 2016
ONSB04	Piston1	1	1-3	NA	NA	20150530	2016-06-09
ONSB05	Push1	1	1-3	NA	NA	20150530	2016-06-09
ONSB06	BH1	1-2	1-3	5.50	10.25	20150530	2016-08-29
ONSB07	BH2	1-2	1-3	5.50	10.60	20150530	2016-08-29
ONSB08	BH3	1-2	1-3	5.50	11.08	20150530	2016-08-29
ONSB09	BH4	1-2	1-3	5.50	11.02	20150530	2016-08-29
ONSB10	BH5	1-2	1-3	5.50	10.62	20150530	2016-08-29
ONSB11	BH7	1-2	1-3	5.50	10.58	20150530	2016-11-08
ONSB12	BH8	1-2	1-3	5.60	11.03	20150530	2016-11-08
ONSB13	BH9	1-2	1-3	5.50	7.62	20150530	2016-11-08
ONSB14	54-1	1-21	-	1.00	19.80	20160154, MSCL	2017-02-13
ONSB15	ONSB15b	NA	NA	NA	NA	20170642, no testing	August 2017
ONSB16	ONSB16b	NA	NA	NA	NA	20170642, no testing	August 2017
ONSB17	ONSB17b	NA	NA	NA	NA	20170642, no testing	August 2017
ONSB18	ONSB18b	NA	NA	NA	NA	20170642, no testing	August 2017
ONSB19	ONSB19b	NA	NA	NA	NA	20170642, no testing	August 2017
ONSB20	ONSB20b	NA	NA	NA	NA	20170642, no testing	August 2017
ONSB21	ONSB21b	1-3	1-3	5.27	13.40	20170642	August 2017
ONSB22	ONSB22b	1-3	1-3	5.30	15.00	20170642	August 2017
ONSB23	ONSB23b	1-2	1-2	5.29	9.37	20170642, no testing	August 2017
ONSB24	ONSB24b	NA	NA	NA	NA	20170642, no testing	August 2017
ONSB25	ONSB25b	NA	NA	NA	NA	20170642	August 2017
ONSB26	ONSB26b	NA	NA	NA	NA	20170642, no testing	August 2017
ONSB27	ONSB27b	NA	NA	NA	NA	20170642	August 2017
ONSB28	ONSB28b	NA	NA	NA	NA	20170642	August 2017
ONSB29	ONSB29b	NA	NA	NA	NA	20170642	October 2017
ONSB30	ONSB30b	NA	NA	NA	NA	20170642, no testing	October 2017
ONSB31	ONSB31b	NA	NA	NA	NA	20170642	October 2017
ONSB32	ONSB32b	NA	NA	NA	NA	20170642	October 2017
ONSB33	ONSB33b	NA	NA	NA	NA	20170642	October 2017
ONSB34	ONSB34b	NA	NA	NA	NA	20170642	October 2017
ONSB41	ONSB41b	All	-	0.0	19.8	20160154 (NGTS)	2017-09-19

4.16 Installation of micro piles using sonic drill rig

In 2018, a micro pile was installed on the west side of the soft clay site in the vicinity of piezometers ONSPI03 and ONSPI04. The test location is illustrated in Figure 4.1.4. The pile was installed using the sonic drilling technique which combines high frequency vibration and pushing. The study was carried out to verify the installation method trying to reduce excess pore pressure in surrounding soil as result of pile installation. The details and results from the large scale field testing is provided in NGI (2018a).

5 Laboratory testing

Different projects, with different purposes, have carried out laboratory testing on NGTS soft clay samples from Onsøy. Table 5-1 provides the overview of summary tables for laboratory tests reproduced from the different projects and presented herein. The table also gives clients and test type.

Table 5-1 Overview of laboratory tests by different projects

Table Number	Test Type	NGI Project Number	NGI Project Name	Client
Table 5.1-1	Index	All projects	All projects	All clients
Table 5.2-2	Oedometer	20140839	Phase 2A, Factual report on geotechnical site investigation	Norwegian Deepwater Program
Table 5.2-3	Oedometer	20150530	Geotechnical Sampler Tool Development	IHC Mining B.V.
Table 5.2-4	Oedometer	20160154	Norwegian GeoTest Sites	The Research Council of Norway
Table 5.2-5	Oedometer	20170642	SWORD field testing Onsøy	Royal IHC
Table 5.3-1	UU triaxial	20160154	Norwegian GeoTest Sites	The Research Council of Norway
Table 5.3-2	CAU triaxial	20150530	Geotechnical Sampler Tool Development	IHC Mining B.V.
Table 5.3-3	CAU triaxial	20160154	Norwegian GeoTest Sites	The Research Council of Norway
Table 5.3-4	CAU triaxial	20160386	Effect of sample disturbance on cyclic shear strength	Statoil
Table 5.3-5	CAU triaxial	20170642	SWORD field testing Onsøy	Royal IHC
Table 5.4-1	DSS	20140839	Phase 2A, Factual report on geotechnical site investigation	Norwegian Deepwater Program
Table 5.4-2	DSS	20160154	Norwegian GeoTest Sites	The Research Council of Norway
Table 5.4-3	DSS	20160386	Effect of sample disturbance on cyclic shear strength	Statoil
Table 5.5-1	Gmax	20160154	Norwegian GeoTest Sites	The Research Council of Norway
Table 5.7-1	DSS & P-Y	20140839	Phase 2A, Factual report on geotechnical site investigation	Norwegian Deepwater Program

5.1 Classification tests

5.1.1 General

Classification tests have been performed in NGI's laboratory to obtain basic soil characteristics for different locations within the NGTS test site.

Table 5.1-1 shows summary of classification tests performed in the laboratory.

The test procedures for the individual tests are presented in NGTS (2016).

5.1.2 Water content

Water content (w) is the mass of water in the sample expressed as a percentage of the mass of solids. The method is described in detail in NS-EN ISO 17892-1:2014.

Water contents are measured on numerous sample tubes and on all advanced tests. The measured results are presented in Table 5.1-1 and in the borehole logs, Figure 3.1 and Figure 3.2.

A description of the laboratory test procedure is given in NGTS (2016).

5.1.3 Total unit weight

Total unit weight is measured on all advanced tests and NGTS (2016) describes the laboratory testing procedure. The unit weight is estimated from water content measurements using the formula below. A unit weight of solid particles of 27.1 kN/m^3 and 100 % saturation was assumed.

$$UW = \frac{\gamma_w \left(1 + \frac{w}{100}\right)}{\frac{\gamma_w}{\gamma_s} + \frac{w}{S_r}}$$

where	UW	Total unit weight (kN/m^3)
	γ_w	Unit weight of water (kN/m^3)
	γ_s	Unit weight of solid particles (kN/m^3)
	w	Water content (%)
	S_r	Saturation (S_r = 100 %, assumed fully saturated)

The unit weight of solid particles, γ_s, was measured on selected samples. A description of the laboratory test procedure is given in NGTS (2016). The individual results are presented in Table 5.1-1 and in the borehole logs, Figures 3.1 and 3.2.

5.1.4 Liquid and plastic limits

Liquid limit, w_L, and plastic limit, w_P, are the highest and lowest water contents, respectively, at which the remoulded soil material is in a plastic state. Standard method described in NS 8003 is used to determine w_P and standard method described in NS 8002 is used to determine w_L.

The liquid limit, w_L, and the plastic limit, w_P, have been determined on selected samples. The measured w_L and w_P together with the plasticity index $I_p = w_L - w_P$, are presented in the borehole logs (Figure 3.1 and Figure 3.2) and in Table 5.1-1.

The liquidity index, $I_L=(w-w_P)/I_p$, where the in-situ water content, w, is taken as the measured water content closest to the corresponding depth of the measured plastic limit are presented in Table 5.1-1.

A description of the laboratory test procedure is given in NGTS (2016).

5.1.5 Grain size distribution

The grain size distribution was determined on selected samples. Grain size distributions are found using the falling drop method (Moum, 1965) for the clay and silt fractions and by wet/dry sieving for the coarser fractions and reported in accordance with NS-EN ISO 17892-4:2016. See below for description of test procedure. Numerical values for the clay, silt and sand fractions are listed in Table 5.1-1.

The detailed grain size distribution curves are presented in Figures 5.1.1 to Figure 5.1.9. Values of D_{10} and D_{60}, which is the size such that 10 % or 60 % (by weight) of the sample consists of particles having a smaller nominal diameter, are also presented in the same figures. The soil description based on grain size distribution is according to NGF (2011).

A description of the laboratory test procedure is given in NGTS (2016).

5.1.6 Index shear strength and sensitivity

Index strength tests were carried out using fall cone. The measurements are presented in the borehole logs (Figure 3.1 and Figure 3.2) and listed in Table 5.1-1.

The sensitivity is taken as $S_t = s_u/s_{ur}$ where s_u and s_{ur} are the shear strengths found for the intact and the remoulded samples, respectively. The results based on fall cone measurements are presented in Table 5.1-1 as well as in the borehole logs (Figure 3.1 and Figure 3.2).

A description of the laboratory test procedure is given in NGTS (2016).

5.2 Oedometer tests

5.2.1 General

The main purpose of the oedometer tests is to obtain consolidation and settlement parameters and estimate the preconsolidation stress, p_c'. Oedometer test results can also be used to assess sample quality. All oedometer tests were carried out in the NGI laboratory.

A total of 4 Incremental Load (IL) tests and 60 Constant Rate of Strain Consolidation (CRSC) tests have been performed in the NGI laboratory on soft clay from the Onsøy test site. The tests were performed without, with one or with two unload-reload loops. The tests performed in NGI project 20170642 were carried out by unaccredited staff as part of a bachelor's degree.

5.2.2 Constant rate of strain

The CRSC tests have been performed on clay samples of low shear strength. Specimens with a cross-sectional area of 20 and 35 cm^2 were used.

The specimens were subjected to none, one or two unloading/reloading loops. The tests that were not subjected to any loops were loaded directly to approximately 9 times the estimated preconsolidation stress (or maximum of the equipment). The first unload reload loop was applied after loading the specimen to approximately 2 times the preconsolidation stress where the stress was kept constant for 16 to 24 hours before unloading to 50% of the stress applied before unloading, and the second loop was applied after loading the specimen to approximately 9 times the estimated preconsolidation stress, p_c' (or maximum of the equipment).

For all the tests, the permeability was continuously computed based on the pore pressure measurements in the bottom of the specimen, and the rate of strain.

The variation of the deformation modulus, M, with stress is included in the linear format figures together with the coefficient of consolidation, c_v. The c_v values shown are calculated on the basis of the deformation modulus and the straight-line interpretation of permeability based on the permeability computations (Sandbækken et al., 1986).

A detailed description of the laboratory test procedures is given in NGTS (2016).

5.2.3 Incremental loading

The equipment and the procedures are described by Sandbækken et al. (1986). Modifications have been implemented since this paper was issued. Tests are performed according to NS-ISO 17892-5 (2017).

The procedures summarized in Table 5.2-1 represents general practice at NGI. Further test details, e.g. load steps and sample saturation, are generally agreed upon with the client prior to testing. An unload loop at 2*p_c' was carried out. Load steps were maintained for 24 hours.

Table 5.2-1 Methods and procedures, IL

Methods and procedure	**Important notes:**
Specimen area equal 20 cm^2	Max. total stress 5000 kPa
Specimen height equal 20 mm	
Mounting with dry filter stones	
Seating pressure 5 kPa	
Saturation filter stones with specified chemical parameters	
Seating pressure (load) increases to prevent swelling	Ref.: ASTM D2435-04 (2011) and NS-ISO 17892-5 (2017). Prevention of swelling is the same in both standards.
Duration of increments equal 24 h	
Directly measured permeability (m/s)	If specified, has to be performed after 24h duration of a chosen increment
Correction for false deformation in equipment	Displacement reading corrected for false deformation. For particularly stiff soils false deformation will be determined for the actual loading/unloading sequence.
Presentation of parameters	1) Methods for estimation of pre-consolidation stress (Casagrande (1936), Becker (1987), Janbu (1963) and empirical correlation after Anderson et al. (1979) and Brooker and Ireland (1965). 2) Reporting ref NS-ISO 17892-5 3)Coefficient of secondary compression as in BS 1377 Part 5 :1990
Method to determine the coefficient of consolidation	NGI normally use k-line method to establish coefficient of consolidation. This method is well suited for unloading and reloading phases.

5.2.4 Consolidation test results

The summary of results are presented in Tables 5.2-2, 5.2-3, 5.2-4 and 5.2-5, and the results from each individual test are presented in Figures 5.2.1 to 5.2.192 on both semi-logarithmic and linear plots. The pore pressure divided by the total applied stress is also presented for each test.

The summary tables present values of constrained modulus, M, and coefficient of vertical consolidation, c_v, at various stress levels during the tests. M_0 and c_{v0} represent values at the in situ effective vertical stress, p_0', during the initial loading. M_1 and c_{v1}

represent average values during the first reloading. M_2 and c_{v2} represent average values during the second reloading.

The modulus number, m, and the reference stress, p_r', given in the tables represent the deformation characteristics of the soil in the stress range above the preconsolidation stress, p_c', when the following relationship is used:

$$M = m \cdot (p_v' - p_r').$$

Interpretation of preconsolidation stress, p_c', is found from the procedures proposed by Casagrande (1936) and Janbu (1963). The oedometer summary tables also show p_c' values computed from empirical correlations between s_u, σ_{v0}' and I_p as given by Andresen et al. (1979).

5.2.5 Evaluation of sample quality

For CRSC oedometer tests on clay, the quality of the undisturbed specimens has been evaluated based on change in void ratio (Δe), relative to initial void ratio when consolidating the specimens back to the best estimate of in-situ stresses according to the recommendations given by Lunne et al. (1998).

The oedometer summary tables show that block samples have in general "very good to excellent" quality. Tests on other sample types show varying quality.

Reference is made to NGTS (2016) for further details on sample quality assessment and the limitations of the method used herein.

5.3 Triaxial tests

5.3.1 General

The purpose of the triaxial tests is to determine triaxial stress-strain behaviour and soil strength properties. Triaxial test results can also be used to assess sample quality. This section summarises the results from triaxial testing on NGTS soft clay samples. The NGI laboratory have carried out all triaxial testing on NGTS soft clay samples.

Consolidation stresses were based on total unit weight profile in NGI (2016), ground water table located 1 m below ground level and K_0 profile reported for the historical Onsøy test sites (Lunne et al, 2003).

5.3.2 UU test results

Unconsolidated undrained (UU) triaxial tests have been performed on intact material. The test results are summarised in Table 5.3-1. The individual test results are presented in Figures 5.3.1 to 5.3.5. A detailed description of the laboratory test procedure is given in NGTS (2016).

The undrained shear strength (s_{uUU}) is taken as the shear stress at 10 % axial strain if no distinct peak occurred at lower strain levels.

Also included in the summary table are the interpreted values for s_{uUU} if peak occurs above 10% axial strain or at 15 % axial strain if no distinct peak is reached. The undrained shear strength at large strains is defined as the shear stress at 20% or end of test if the test was terminated before 20% strain was reached.

5.3.3 Monotonic CAU test results

All CAU tests were consolidated to a best estimate of the in-situ stress condition. The effective vertical in-situ stress (p_0') was derived from the total unit weight measured and presented in the borehole logs (Figures 3.1 and 3.2). A K_0 value of 0.6 was used for all CAU tests on the soft clay from new Onsøy site. Key parameters for each test are summarised in Tables 5.3-2, 5.3-3, 5.3-4 and 5.3-5. These summary tables provide details on the consolidation phase for each test. Individual test results of the static undrained triaxial test for the soft clay in Onsøy are given in Figures 5.3.6 - 5.3.275. It should be noted that tests on samples 11 and 13 from borehole ONSB41 are part of a study on different consolidation technique. The details of this study is reported in NGTS (2018).

The undrained shear strength (s_{uC} or s_{uE}) is defined as the shear stress at 10% axial strain if no distinct peak occurred at lower strain levels. The undrained shear strengths from the static tests are plotted on the borehole logs (Figures 3.1 and 3.2).

A detailed description of the laboratory test procedure is given in NGTS (2016).

5.3.4 Cyclic CAU test results

A total of 10 cyclic tests were performed. The tests were performed with various combinations of τ_{cy} and τ_a. the cyclic period was 10 seconds.

The cyclic stress level, τ_{cy}, and the average shear stress level, τ_a, were normalised with the axial consolidation stress, σ_{ac}', or undrained shear strength, s_{uC}, for each cyclic triaxial test.

γ_p (permanent shear strain) is equal to the shear strain at $\tau = \tau_a$ at the end of each cycle.

The cyclic loading was stopped when one of the following three criteria where reached:

1. The cyclic shear strain amplitude exceeds 15%, i.e.

$$\gamma_{cy} = \frac{\gamma_{max} - \gamma_{min}}{2} \geq 15\%$$

2. The average shear strain exceeds 15%, i.e.

$$\gamma_{a} = \frac{\gamma_{max} + \gamma_{min}}{2} \geq 15\%$$

3. Number of cycles passes 1500

The tests are presented with the static CAU results on Figures 5.3.240 – 5.3.254 and Figures 5.3.259 – 5.3.273. Key parameters for are summarised in Table 5.3-4. Each cyclic CAU test has been presented with figures showing

1. Shear stress, axial strain and pore pressure versus number of cycles. The dotted lines on the graphs for shear stress and axial strain versus number of cycles represent the magnitude of these two properties corresponding to the end of each cycle.

The specimen is mounted, consolidated and dismounted in the same manner as a static test, as described in NGTS (2016).

5.3.5 Evaluation of sample quality

For triaxial CAU tests on clay, the quality of the undisturbed specimens has been evaluated based on change in void ratio (Δe), relative to initial void ratio when consolidating the specimens back to the best estimate of in-situ stresses according to the recommendations given by Lunne et al. (1998).

As can be observed in Tables 5.3-2, 5.3-3, 5.3-4 and 5.3-5, the sample quality of the block sample are generally “very good to excellent”. The other samples, on the other hand, show varying quality.

Reference is made to NGTS (2016) for further details on sample quality assessment and the limitations of this method.

5.4 Direct simple shear tests

5.4.1 General

This part summarises the results from the direct simple shear tests. All tests were performed in NGI's laboratory.

The general purpose of the direct simple shear (DSS) tests is to provide horizontal shear strength parameters for engineering design of various foundations and consequently anisotropy ratios. A test can be performed drained (constant vertical load) or undrained (constant volume), static or cyclic.

5.4.2 Direct simple shear (DSS) tests

Consolidation

The DSS specimens had a cross sectional area of $35cm^2$ and a height of 16mm. The rate of shearing was approximately 5% shear strain/hour.

The effective vertical in situ stress ($p_0' = \sigma_{v0}'$) was estimated by assuming a hydrostatic pore water pressure and by using the total unit weight profile.

The clay specimens were consolidated to what was believed to be a low estimate of the preconsolidation stress, p_c', and then unloaded to the estimated in situ effective vertical stress, p_0', before shearing. This method was used to ensure complete contact between the specimen and the reinforced membrane and thus to develop representative lateral stresses on the specimen, and to some degree counteract the negative effect of stress release and other disturbance effects during sampling and extrusion.

The preconsolidation stress used for maximum vertical loading before unloading to p_0', was obtained from the relationship s_u/p_0', I_p, OCR presented by Andresen et al. (1979) using s_u values from index testing and the CPTUs.

The applied consolidation stresses are based on the best estimate at the time of testing.

The clay specimens at Onsøy are believed to have an OCR less than 1.5. Typically, clay specimens are consolidated to $0.8 \times p_c'$ and then unloaded to p_0' before shearing. For specimens with OCR below 1.5 the low estimate of the preconsolidation stress approaches the vertical in situ stress. One of the clay specimens were loaded directly to the estimated in situ effective vertical stress.

Details from the consolidation stage are presented in Table 5.4-1, Table 5.4-2 and Table 5.4-3. A detailed description of the laboratory test procedures is given in NGTS (2016).

Bender element tests for measurements of G_{max} were performed on 12 DSS tests.

Monotonic DSS tests

The undrained shear strength, s_{uD}, (i.e. τ_f) is taken at peak shear stress or at 15% shear strain if no peak occurred below this strain. The static strength values are presented in Table 5.4-1, Table 5.4-2 and Table 5.4-3. Static DSS results are presented as plots of horizontal shear stress and pore pressure versus shear strain and plots of effective stress paths in Figures 5.4.1 to 5.4.50.

5.5 Bender element tests

5.5.1 General

The purpose of the piezoceramic bender element test is to provide the maximum shear modulus at small strains, G_{max}, by measuring the shear wave velocity in the test specimen.

A total of 12 bender element tests were performed in connection with the static DSS tests. Figures for the bender element tests are presented in Figures 5.5.1 to 5.5.21

For the bender element tests performed in connection with static DSS tests, two determinations were made for 9 of the tests, one at the maximum vertical stress and one at the final consolidation stress, σ'_{min}. Three determinations was made for the DSS test loaded directly to the consolidation stress before shearing.

A detailed description of the laboratory test procedure is given in NGTS (2016).

5.5.2 Bender element test results

Shear wave velocity, v_s, was measured in the test specimens using the piezoceramic bender element technique. Measurements were performed on the clay material in the DSS tests and the test results are summarised in Table 5.5-1. The times given are referring to time after application of the load increment where G_{max} was measured.

The G_{max} value is calculated from the shear wave velocity and the sample density as explained in NGTS (2016).

5.6 Multi-sensor core logging (MSCL)

54 mm diameter sediment cores from borehole ONSB14 were sent to the Geological Survey of Norway (NGU) in Trondheim for multi sensor core logging (MSCL). The tests were performed in November 2016. Appendix L provides the details of the laboratory testing.

Twenty-one sediment cores with a total length of 16.8 m (Table 5.6-1) were logged at the NGU core logging facilities. The plastic tubes containing the sediment have an outer diameter of 5.8 cm and single wall thickness of 0.165cm. All cores contained a piston on top of the sediment and were sealed at top and bottom with plastic caps. The latter were secured with a pipe clamp. Prior core logging the piston inside the core was replaced by a Styrofoam plug to preserve the sediment surface. To avoid interference of the metal pipe clamp with magnetic susceptibility (MS) measurements of sample material, all pipe clamps were removed and the cap surfaces cleaned from visible rust contamination. The cores were stored for at least one day in the core logging facilities to allow for thermal equilibration with the laboratory temperature.

The resulting unit weight from gamma ray attenuation is illustrated in Figure 3.2.

Table 5.6-1 Summary of cores for multi sensor core logging – ONSB14

Location ID	Depth top, m	Depth bottom, m	Core ID
ONSB01	1.00	1.80	ONS14-1
ONSB02	1.80	2.60	ONS14-2
ONSB03	2.60	3.40	ONS14-3-62
ONSB04	3.40	4.20	ONS14-4-A14
ONSB05	4.20	5.00	ONS14-5-F51
ONSB06	5.00	5.80	ONS14-6-Z3
ONSB07	5.80	6.60	ONS14-7-1662
ONSB08	6.60	7.40	ONS14-8-2A
ONSB09	7.40	8.20	ONS14-9-B18
ONSB10	8.20	9.00	ONS14-10-F38
ONSB11	9.00	9.80	ONS14-11-Z30
ONSB12	9.80	10.60	ONS14-12-A11
ONSB13	11.00	11.80	ONS14-13-A653
ONSB14	12.00	12.80	ONS14-14-T372
ONSB15	13.00	13.80	ONS14-15-1390
ONSB16	14.00	14.80	ONS14-16-F14
ONSB17	15.00	15.80	ONS14-17-V74
ONSB18	16.00	16.80	ONS14-18-K90
ONSB19	17.00	17.80	ONS14-19-8
ONSB20	18.00	18.80	ONS14-20-1764
ONSB21	19.00	19.80	ONS14-21-53

5.7 P-y testing

The purpose of the apparatus is to assess cyclic p-y backbone curves and damping values for structural fatigue analysis of laterally-loaded pile-type foundations. Only translational displacements are considered, that means no rotation.

A detailed description of the laboratory test procedure is given in NGI (2016b).

The key results from the testing are summarized in Table 5.7-1. Three monotonic static DSS tests and two rapid DSS tests are included in the same table for reference. The results of the DSS and p-y tests are shown in Figures 5.7.1 – 5.7.21. Figure 5.7.22 shows the results of the normalized secant stiffness for the last cycle of each cyclic load package. The same values, but normalized by the normalized G-modulus $4G_{max}/s_u$ is plotted in Figure 5.7.23. The damping ratio is further normalized by the maximum theoretical damping ratio of 67% and is shown for the last cycle of each cyclic load package in Figure 5.7.24. Cyclic p-y curves derived from the secant stiffness values for the last cycle of each cyclic package are plotted in Figure 5.7.25. The normalized cyclic displacement amplitude *y/d* (one-way) in [%] is plotted on the abscissa, and the normalized pressure on the ordinate.

6 References

Andresen, A., T. Berre, A. Kleven and T. Lunne (1979). Procedures used to obtain soil parameters for foundation engineering in the North Sea. Marine Geotechnology, Vol. 3, No. 3, pp. 201-266. Also published in: Norwegian Geotechnical Institute, Publication, 129.

ASTM D2435/D2435M-11 Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading, ASTM International, West Conshohocken, PA, 2011, https://doi.org/10.1520/D2435_D2435M-11

ASTM, Special Technical Publication, 892, pp. 329-353.

Becker, D.E., J.H. Crooks, K. Been & M.G. Jefferies (1987). Work as a criterion for determining in situ and yield stresses in clay. Canadian Geotechnical Journal, Vol. 24, pp. 549.

Berre, T. (1982). Triaxial testing at the Norwegian Geotechnical Institute. Geotechnical Testing Journal, Vol. 5, No. 1/2 pp. 3-17. Also published in: Norwegian Geotechnical Institute. Publication, 134, 1981, pp. 7-23.

Bjerrum, L. and A. Landva (1966). Direct simple shear tests on a Norwegian quick clay. Geotechnique, Vol. 16, No. 1, pp. 1-20. Also published in: Norwegian Geotechnical Institute, Publication No. 70.

Brooker, E.W. & H.O. Ireland (1965). Earth pressures at rest related to stress history. Canadian Geotechnical Journal, Vol. 2, No. 1, pp. 1-15.

BS 1377-5 (1990). Methods of test for soils for civil engineering purposes. Compressibility, permeability and durability tests. British Standards Institution, London.

Casagrande, A. (1936). The determination of the preconsolidation load and its practical significance. International Conference on Soil Mechanics and Foundation Engineering, 1. Cambridge, Mass. 1936. Proceedings, Vol. 3, pp.60-64.

Dyvik, R. and C. Madshus (1985). Lab Measurements of Gmax Using Bender Elements. ASCE Annual Convention, Advances in the Art of Testing Soils Under Cyclic Conditions.

Dyvik, R. and T.S. Olsen (1989). Gmax measured in oedometer and DSS tests using bender elements. International Conference on Soil Mechanics and Foundation Engineering, 12. Rio de Janeiro 1989. Proceedings, Vol. 1, pp. 39-42. Also published in: NGI, Oslo. Publication, 181, 1991.

ISO 17892-5 (2017). Geotechnical investigation and testing. Laboratory testing of soil. Part 5: Incremental loading oedometer test (17892-5:2017).

Janbu, N. (1963). Soil compressibility as determined by oedometer and triaxial tests. European Conference on Soil Mechanics and Foundation Engineering, Wiesbaden, Proceedings, Vol. 1, pp. 19-25.

Lunne, T., P.K. Robertson and J.J.M. Powell (1997). Cone Penetration Testing in Geotechnical Practice. Blackie Academic & Professional. London, 1997.

Lunne, T., T. Berre and S. Strandvik (1998). Sample disturbance effects in deepwater soil investigations. SUT Conference on Soil Investigations and Foundation Behaviour. London Sept. 1998. Proceedings pp. 199-220.

Lunne, T., T. Berre, K.H. Andersen, S. Strandvik and M. Sjursen (2006). Effects of sample disturbance and consolidation procedures on measured shear strength of soft marine Norwegian clays. *Can. Geot. J.*, 43, 726-750.

Moum, J. (1965). Falling drop used for grain-size analysis of fine grained materials. Sedimentology, Vol. 5, No. 4, pp. 343-347. Also published in: Norwegian Geotechnical Institute. Publication, 70, 1966.

NGF (1989). Veiledning for utførelse av dreietrykksondering. Melding nr. 7. Norsk Geoteknisk Forening. Rev. nr. 1, 1989.

NGF (2010). Veiledning for utførelse av trykksondering. Melding nr. 5. Norsk Geoteknisk Forening. Rev. Nr. 3, 2010.

NGI (2000). Deep water sampling Phase 3. Analyses and recommendation report. Report No. 521676-9, dated 15 August 2000.

NGI (2016a). NDP – Conductor Field Testing. Phase 2A – Factual Report on Geotechnical Site Investigation and Standard Laboratory Testing. Report No. 20140839-02-R Rev. 1, dated 9th of May 2016.

NGI (2016b). NDP – Conductor Field Testing. Phase 2A –Report of advanced laboratory tests and tests done in P-Y apparatus. Report No. 20140839-03-R Rev. 4, dated 31st of October 2016.

NGI (2017). Testing of new samplers for SWORD. Evaluation of sample quality – phase 2 and 3. Report No. 20150530-02-R Rev. 1, dated 21st of April 2017.

NGI (2018). IHC SWORD field testing Onsøy. Laboratory test results and evaluation of sample quality – push samples, phase II, 2017. Report No. 20170642-02-R Rev. 0, dated 30th of January 2018.

NGI (2018a). Verification of sonic drilling for drilling of piles. Beskrivelse av utført feltarbeid og resultater. Report No. 20180053-01-R Rev. 0, dated 21st of December 2018.

NGTS (2016). Laboratory procedures and standards for the NGTS project. Report No. 20160154-02-R. Rev. 0, dated 6th of June 2016.

NGTS (2018). Interpretation Report Onsøy Soft Clay Site. Report No. 20160154-11-R. Draft, dated 30th of August 2018.

NGTS (2018a). Impact of cone penetrometer type on CPTU results at 4 NGTS sites. Silt, soft clay, sand and quick clay. Report No. 20160154-21-R, draft, dated 14th of December 2018.

Norges Byggstandardiseringsråd (NBR). (1982) NS 8002. Geotechnical testing - Laboratory methods - Fall cone liquid limit.

Norges Byggstandardiseringsråd (NBR). (1982) NS 8003. Geotechnical testing, Laboratory methods. Plastic limit.

Norges Byggstandardiseringsråd (NBR). (1990) NS 8005. Geotechnical testing - Laboratory methods - Grain-size analysis of soil samples.

Norges Byggstandardiseringsråd (NBR). (1982) NS 8012. Geotechnical testing, Laboratory methods. Density of solid particles.

Norges Byggstandardiseringsråd (NBR). (1988) NS 8015. Geotechnical testing, Laboratory methods. Determination of undrained shear strength by fall-cone testing.

Norges Byggstandardiseringsråd (NBR). (1993) NS 8018. Geotechnical testing - Laboratory methods - Determination of one – dimensional consolidation properties by oedometer testing. – Method using continuous loading.

Norwegian Geotechnical Society (NGF, 1982). Veiledning for symboler og definisjoner i geoteknikk. Identifisering og klassifisering av jord.

Norwegian Geotechnical Society (NGF, 2013). Announcement No. 11 Veiledning for prøvetaking.

Melding nr. 11, Norsk geoteknisk forening, Rev. 2, 2013.

NS-EN ISO 17892-1 (2014). Geotechnical investigation and testing. Laboratory testing of soil. Part 1: Determination of water content (ISO 17892-1:2014).

NS-EN ISO 17892-2 (2014). Geotechnical investigation and testing. Laboratory testing of soil. Part 2: Determination of bulk density (ISO 17892-2:2014).

NS-EN ISO 17892-4 (2016). Geotechnical investigation and testing. Laboratory testing of soil. Part 4: Determination of particle size distribution (ISO 17892-4:2016).

NS-EN ISO 17892-5 (2017). Geotechnical investigation and testing. Laboratory testing of soil. Part 5: Incremental loading oedometer test (ISO 17892-5:2017).

Sandbækken, G., T. Berre and S. Lacasse (1986). Oedometer testing at the Norwegian Geotechnical Institute. Consolidation of soils: testing and evaluation: a symposium.

Sørensen, R. (1979). Late Weichselian deglaciation in the Oslo fjord area, South Norway. Boreas, Vol. 8: 241-246.

PROJ_NAMI National GeoTest Sites (NGTS)
PROJ_LOC Onsoy (ONS)
PROJ_CLNT NGTS
PROJ_CONT NGI
PROJ_END NGI

NGTS

LOCA_ID-HOLE_ID	ABBR	UTM	Datum	CM	Northing	Easting	Elevation surface	NGI Project number (for reference)	HDOP	VDOP	Field Equipment ID	Cone factor (a)	Depth to end of test	Depth to bedrock	DATE
-	-	-	-	-	m	m	m	-	m	m	-	-	m	m	YYYY-MM-YY
ONSRP01	RPS	32	EUREF89	9°E	6566426,010	608300,148	6,23	20140839	0,007	0,009	GM100 GTT 2008	NA	28,80	28,80	2016-02-11
ONSRP02	RPS	32	EUREF89	9°E	6566441,465	608263,637	6,67	20140839	0,007	0,009	GM100 GTT 2008	NA	24,80	24,80	2016-02-11
ONSRP03	RPS	32	EUREF89	9°E	6566490,010	608320,581	6,06	20140839	0,007	0,001	GM100 GTT 2008	NA	34,68	34,68	2016-02-12
ONSRP04	RPS	32	EUREF89	9°E	6566493,780	608287,169	6,60	20140839	0,007	0,009	GM100 GTT 2008	NA	19,36	19,36	2016-02-12
ONSC01	CPTU	32	EUREF89	9°E	6566426,010	608300,148	6,23	20140839	0,007	0,009	20759	0,69	26,03	NA	2016-02-12
ONSC02	CPTU	32	EUREF89	9°E	6566441,465	608263,637	6,67	20140839	0,007	0,009	20759	0,69	22,10	NA	2016-02-12
ONSTS01	TS	32	EUREF89	9°E	6566466,360	608237,540	7,56	20140839	NA	NA	NA	NA	11,45	11,45	2017-02-02
ONSTS02	TS	32	EUREF89	9°E	6566508,603	608254,079	8,03	20140839	NA	NA	NA	NA	9,00	9,00	2017-02-02
ONSTS03	TS	32	EUREF89	9°E	6566537,974	608291,027	7,09	20140839	NA	NA	NA	NA	7,77	7,77	2017-02-02
ONSTS04	TS	32	EUREF89	9°E	6566536,021	608336,544	6,04	20140839	NA	NA	NA	NA	38,25	38,25	2017-02-03
ONSH01	HFST	32	EUREF89	9°E	6566425,792	608300,582	6,06	20160154	NA	NA	NA	NA	6,00	NA	2016-11-10
ONSH02	HFST	32	EUREF89	9°E	6566427,793	608301,742	6,11	20160154	NA	NA	NA	NA	6,00	NA	2016-11-10
ONSC03	CPTU	32	EUREF89	9°E	6566483,591	608322,848	6,04	20140839	NA	NA	30451	0,68	31,45	NA	2017-03-05
ONSC04	CPTU	32	EUREF89	9°E	6566489,091	608286,226	6,64	20140839	NA	NA	50660	0,69	18,96	NA	2017-02-13
ONSC05	CPTU	32	EUREF89	9°E	6566466,360	608237,540	7,09	NA	NA	NA	50660	0,69	10,00	NA	2017-02-03
ONSC06	CPTU	32	EUREF89	9°E	6566536,021	608336,544	6,04	NA	NA	NA	50660	0,69	35,36	NA	2017-02-03
ONSB01	BHSB	32	EUREF89	9°E	6566445,920	608263,260	7,07	20160386	NA	NA	NA	NA	NA	NA	May 2016
ONSB02	BH72	32	EUREF89	9°E	6566441,470	608263,640	6,67	NA	NA	NA	NA	NA	NA	NA	2016-02-10
ONSB03	BH54C	32	EUREF89	9°E	6566443,320	608267,440	6,77	20160386	NA	NA	NA	NA	NA	NA	May 2016
ONSB04	BH76	32	EUREF89	9°E	6566438,210	608264,080	6,52	20150530	NA	NA	SWORD sampler	NA	11,00	NA	2016-06-09
ONSB05	BH76	32	EUREF89	9°E	6566440,060	608264,930	6,56	20150530	NA	NA	SWORD sampler	NA	11,30	NA	2016-06-09
ONSB06	BH76	32	EUREF89	9°E	6566439,068	608262,236	6,50	20150530	NA	NA	SWORD sampler	NA	12,50	NA	2016-08-29
ONSB07	BH76	32	EUREF89	9°E	6566440,912	608263,085	6,54	20150530	NA	NA	SWORD sampler	NA	12,50	NA	2016-08-29
ONSB08	BH76	32	EUREF89	9°E	6566440,033	608260,431	6,51	20150530	NA	NA	SWORD sampler	NA	12,50	NA	2016-08-29
ONSB09	BH76	32	EUREF89	9°E	6566441,863	608261,373	6,57	20150530	NA	NA	SWORD sampler	NA	12,50	NA	2016-08-29
ONSB10	BH76	32	EUREF89	9°E	6566441,091	608258,656	6,57	20150530	NA	NA	SWORD sampler	NA	12,50	NA	2016-08-29
ONSB11	BH76	32	EUREF89	9°E	6566442,036	608256,768	6,60	20150530	NA	NA	SWORD sampler	NA	12,50	NA	2016-11-08
ONSB12	BH76	32	EUREF89	9°E	6566444,052	608257,747	6,60	20150530	NA	NA	SWORD sampler	NA	12,50	NA	2016-11-08

PROJ_NAMI National GeoTest Sites (NGTS)
PROJ_LOC Onsoy (ONS)
PROJ_CLNT NGTS
PROJ_CONT NGI
PROJ_END NGI

LOCA_ID-HOLE_ID	ABBR	UTM	Datum	CM	Northing	Easting	Elevation surface	NGI Project number (for reference)	HDOP	VDOP	Field Equipment ID	Cone factor (a)	Depth to end of test	Depth to bedrock	DATE
-	-	-	-	-	m	m	m	-	m	m	-	-	m	m	YYYY-MM-YY
ONSB13	BH76	32	EUREF89	9°E	6566443,157	608254,871	6,60	20150530	NA	NA	SWORD sampler	NA	12,50	NA	2016-11-08
ONSB14	BH54C	32	EUREF89	9°E	6566427,627	608299,170	6,20	20160154	NA	NA	NA	NA	19,80	NA	2017-02-13
ONSPI01	Piezo	32	EUREF89	9°E	6566423,433	608294,868	6,23	20160154	NA	NA	11082	NA	15,00	NA	2017-02-13
ONSPI02	Piezo	32	EUREF89	9°E	6566423,608	608294,116	6,23	20160154	NA	NA	11083	NA	5,00	NA	2017-02-13
ONSER02A	ERT	32	EUREF89	9°E	6566555,336	608297,658	5,95	20160154	NA	NA	Terrameter LS1	NA	20,00	NA	2016-01-26
ONSER02B	ERT	32	EUREF89	9°E	6566409,565	608232,238	6,42	20160154	NA	NA	Terrameter LS1	NA	20,00	NA	2016-01-26
ONSER03A	ERT	32	EUREF89	9°E	6566546,985	608322,311	5,75	20160154	NA	NA	Terrameter LS1	NA	20,00	NA	2016-01-26
ONSER03B	ERT	32	EUREF89	9°E	6566397,691	608265,205	5,90	20160154	NA	NA	Terrameter LS1	NA	20,00	NA	2016-01-26
ONSER04A	ERT	32	EUREF89	9°E	6566445,511	608252,829	6,07	20160154	NA	NA	Terrameter LS2	NA	12,50	NA	2017-05-26
ONSER04A	ERT	32	EUREF89	9°E	6566420,295	608307,281	5,04	20160154	NA	NA	Terrameter LS2	NA	12,50	NA	2017-05-26
ONSER05A	ERT	32	EUREF89	9°E	6566455,000	608314,000	6,00	20160154	NA	NA	Terrameter LS2	NA	14,50	NA	2019-06-14
ONSER05B	ERT	32	EUREF89	9°E	6566483,000	608242,000	6,00	20160154	NA	NA	Terrameter LS2	NA	14,50	NA	2019-06-14
ONSB15	BH76	32	EUREF89	9°E	6566436,939	608264,943	6,52	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB16	BH76	32	EUREF89	9°E	6566439,241	608264,934	6,55	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB17	BH76	32	EUREF89	9°E	6566439,063	608267,421	6,47	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB18	BH76	32	EUREF89	9°E	6566434,707	608265,533	6,25	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB19	BH76	32	EUREF89	9°E	6566439,233	608269,467	6,56	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB20	BH76	32	EUREF89	9°E	6566437,707	608269,764	6,41	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB21	BH76	32	EUREF89	9°E	6566437,523	608267,531	6,43	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB22	BH76	32	EUREF89	9°E	6566434,654	608269,552	6,44	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB23	BH76	32	EUREF89	9°E	6566434,277	608271,832	6,41	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB24	BH76	32	EUREF89	9°E	6566434,680	608274,351	6,38	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB25	BH76	32	EUREF89	9°E	6566437,190	608272,235	6,46	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB26	BH76	32	EUREF89	9°E	6566436,612	608274,264	6,53	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB27	BH76	32	EUREF89	9°E	6566439,392	608271,893	6,59	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSB28	BH76	32	EUREF89	9°E	6566439,196	608274,414	6,53	20170642	NA	NA	SWORD sampler	NA	NA	NA	August 2017
ONSC07	SCPTU	32	EUREF89	9°E	6566425,894	608293,808	6,15	20160154	NA	NA	MKj485	0,78	20,66	NA	2017-09-04
ONSC08	SCPTU	32	EUREF89	9°E	6566425,727	608295,317	6,30	20160154	NA	NA	MKj485	0,78	20,67	NA	2017-09-04

PROJ_NAME National GeoTest Sites (NGTS)
PROJ_LOC Onsoy (ONS)
PROJ_CLNT NGTS
PROJ_CONT NGI
PROJ_END NGI

LOCA_ID-HOLE_ID	ABBR	UTM	Datum	CM	Northing	Easting	Elevation surface	NGI Project number (for reference)	HDOP	VDOP	Field Equipment ID	Cone factor (a)	Depth to end of test	Depth to bedrock	DATE
-	-	-	-	-	m	m	m	-	m	m	-	-	m	m	YYYY-MM-YY
ONSC09	CPTU	32	EUREF89	9°E	6566425,628	608296,680	6,23	20160154	NA	NA	MKj528	0,79	19,94	NA	2017-09-03
ONSC10	CPTU	32	EUREF89	9°E	6566425,446	608298,406	6,22	20160154	NA	NA	MKj528	0,79	19,72	NA	2017-09-03
ONSC11	CPTU	32	EUREF89	9°E	6566426,882	608299,141	6,20	20160154	NA	NA	C14251	0,776	25,25	NA	2017-09-18
ONSC11A	CPTU	32	EUREF89	9°E	6566426,882	608299,141	6,20	20160154	NA	NA	C17010	0,771	25,29	NA	2017-09-18
ONSC11B	CPTU	32	EUREF89	9°E	6566426,882	608299,141	6,20	20160154	NA	NA	S17176	0,76	25,25	NA	2017-09-18
ONSC12	CPTU	32	EUREF89	9°E	6566427,510	608297,468	6,20	20160154	NA	NA	C14251	0,776	25,32	NA	2017-09-18
ONSC12A	CPTU	32	EUREF89	9°E	6566427,510	608297,468	6,20	20160154	NA	NA	C17010	0,771	25,33	NA	2017-09-18
ONSC12B	CPTU	32	EUREF89	9°E	6566427,510	608297,468	6,20	20160154	NA	NA	S17176	0,76	25,34	NA	2017-09-18
ONSC13	CPTU	32	EUREF89	9°E	6566428,403	608296,082	6,20	20160154	NA	NA	C14251	0,776	25,26	NA	2017-09-18
ONSC13A	CPTU	32	EUREF89	9°E	6566428,403	608296,082	6,20	20160154	NA	NA	C17010	0,771	25,19	NA	2017-09-18
ONSC13B	CPTU	32	EUREF89	9°E	6566428,403	608296,082	6,20	20160154	NA	NA	C17010	0,771	25,29	NA	2017-09-18
ONSC14	CPTU	32	EUREF89	9°E	6566429,439	608294,780	6,20	20160154	NA	NA	C14251	0,776	25,31	NA	2017-09-18
ONSP01	SBP	32	EUREF89	9°E	6566427,200	608290,900	6,20	20160154	NA	NA	NA	NA	18,00	NA	September 2017
ONSB29	BH76	32	EUREF89	9°E	6566433,200	608299,900	6,20	20170642	NA	NA	SWORD sampler	NA	NA	NA	October 2017
ONSC15	CPTU	32	EUREF89	9°E	6566427,253	608295,304	6,25	20160154	NA	NA	4866	0,826	26,38	NA	2017-10-16
ONSC16	CPTU	32	EUREF89	9°E	6566427,241	608293,892	6,29	20160154	NA	NA	4866	0,826	25,85	NA	2017-10-16
ONSC17	CPTU	32	EUREF89	9°E	6566426,899	608292,461	6,21	20160154	NA	NA	4866	0,826	25,84	NA	2017-10-16
ONSC18	SCPTU	32	EUREF89	9°E	6566428,591	608289,436	6,22	20160154	NA	NA	4648	0,861	19,89	NA	2017-11-08
ONSD01	SDMT	32	EUREF89	9°E	6566427,190	608289,380	6,20	20160154	NA	NA	NA	NA	20,00	NA	2017-11-21
ONSV01	FVT	32	EUREF89	9°E	6566428,708	608290,862	6,21	20160154	NA	NA	NA	NA	20,00	NA	2017-11-15
ONSC19	CPTU	32	EUREF89	9°E	6566428,654	608292,399	6,31	20160154	NA	NA	51706	0,69	24,61	NA	2017-11-13
ONSC20	CPTU	32	EUREF89	9°E	6566428,636	608293,755	6,27	20160154	NA	NA	51706	0,69	24,58	NA	2017-11-13
ONSC21	CPTU	32	EUREF89	9°E	6566430,180	608293,843	6,29	20160154	NA	NA	51706	0,69	24,60	NA	2017-11-13
ONSC22	CPTU	32	EUREF89	9°E	6566430,190	608289,380	6,20	20160154	NA	NA	150912	0,75	24,96	NA	2017-11-14
ONSC23	SCPTU	32	EUREF89	9°E	6566430,190	608286,380	6,20	20160154	NA	NA	150912	0,75	25,00	NA	2017-11-13
ONSC24	RCPTU	32	EUREF89	9°E	6566430,190	608287,880	6,20	20160154	NA	NA	150928	0,75	25,00	NA	2017-11-13
ONSC25	CPTU	32	EUREF89	9°E	6566431,648	608286,314	6,32	20160154	NA	NA	150912	0,75	25,02	NA	2017-11-14
ONSV02	FVT	32	EUREF89	9°E	6566431,551	608287,838	6,30	20160154	NA	NA	NA	NA	2,00	NA	2017-11-14

PROJ_NAMI National GeoTest Sites (NGTS)
PROJ_LOC Onsoy (ONS)
PROJ_CLNT NGTS
PROJ_CONT NGI
PROJ_END NGI

LOCA_ID-HOLE_ID	ABBR	UTM	Datum	CM	Northing	Easting	Elevation surface	NGI Project number (for reference)	HDOP	VDOP	Field Equipment ID	Cone factor (a)	Depth to end of test	Depth to bedrock	DATE
-	-	-	-	-	m	m	m	-	m	m	-	-	m	m	YYYY-MM-YY
ONSC26	CPTU	32	EUREF89	9°E	6566430,182	608292,439	6,34	20160154	NA	NA	4936	0,828	25,05	NA	2017-11-17
ONSC27	CPTU	32	EUREF89	9°E	6566430,195	608290,851	6,33	20160154	NA	NA	4936	0,828	25,05	NA	2017-11-17
ONSC28	CPTU	32	EUREF89	9°E	6566431,599	608292,382	6,34	20160154	NA	NA	4936	0,828	25,04	NA	2017-11-17
ONSEP02	EPCT	32	EUREF89	9°E	6566424,453	608300,146	6,12	20160154	NA	NA	NA	NA	6,00	NA	November 2017
ONSEP03	EPCT	32	EUREF89	9°E	6566423,569	608299,662	6,11	20160154	NA	NA	NA	NA	8,00	NA	November 2017
ONSEP01	EPCT	32	EUREF89	9°E	6566423,569	608299,662	6,11	20160154	NA	NA	NA	NA	5,00	NA	November 2017
ONSB30	BH76	32	EUREF89	9°E	6566437,700	608301,400	6,20	20170642	NA	NA	SWORD sampler	NA	NA	NA	October 2017
ONSB31	BH76	32	EUREF89	9°E	6566442,200	608302,900	6,20	20170642	NA	NA	SWORD sampler	NA	NA	NA	October 2017
ONSB32	BH76	32	EUREF89	9°E	6566446,700	608304,400	6,20	20170642	NA	NA	SWORD sampler	NA	NA	NA	October 2017
ONSB33	BH76	32	EUREF89	9°E	6566451,200	608305,900	6,20	20170642	NA	NA	SWORD sampler	NA	NA	NA	October 2017
ONSB34	BH76	32	EUREF89	9°E	6566455,688	608307,375	6,20	20170642	NA	NA	SWORD sampler	NA	NA	NA	October 2017
ONSB41	BH72	32	EUREF89	9°E	6566428,690	608298,380	6,20	20160154	NA	NA	NA	NA	19,80	NA	2017-09-19
ONSM01	MASW	32	EUREF89	9°E	6566439,000	608271,000	6,50	20160154	NA	NA	NA	NA	NA	NA	2018-03-09
ONSPS01	PS	32	EUREF89	9°E	6566439,000	608271,000	6,50	20160154	NA	NA	NA	NA	NA	NA	2018-03-07
ONSPS02	PS	32	EUREF89	9°E	6567655,000	608673,000	6,50	20160154	NA	NA	NA	NA	NA	NA	2018-03-07
ONSPI04	Piezo	32	EUREF89	9°E	6566515,094	608256,168	7,96	20160154	NA	NA	13382	NA	7,80	7,80	2018-05-15
ONSPI03	Piezo	32	EUREF89	9°E	6566517,084	608256,800	8,03	20160154	NA	NA	11688	NA	5,00	NA	2018-05-15
ONSB42	BH54C	32	EUREF89	9°E	6566518,769	608258,765	8,29	20160154	NA	NA	NA	NA	NA	NA	May 2018
ONSTH01	THS	32	EUREF89	9°E	6566422,690	608296,880	6,20	20160154	NA	NA	NA	NA	6,00	27,20	2018-08-31
ONSC29	CPTU	32	EUREF89	9°E	6566270,236	608158,568	7,52	20160154	NA	NA	4842	0,832	20,30	NA	2018-11-21
ONSC30	CPTU	32	EUREF89	9°E	6566206,553	608134,820	7,63	20160154	NA	NA	4842	0,832	17,90	NA	2018-11-21
ONSC31	CPTU	32	EUREF89	9°E	6566233,626	608171,446	6,83	20160154	NA	NA	4842	0,832	23,40	NA	2018-11-21
ONSC32	CPTU	32	EUREF89	9°E	6566192,476	608181,330	6,57	20160154	NA	NA	4842	0,832	27,10	NA	2018-11-21
ONSC33	CPTU	32	EUREF89	9°E	6566254,168	608200,321	6,51	20160154	NA	NA	4842	0,832	29,90	NA	2018-11-21
ONSTS05	TS	32	EUREF89	9°E	6566269,690	608159,756	7,44	20160154	NA	NA	NA	NA	21,4	21,4	2018-11-20
ONSTS06	TS	32	EUREF89	9°E	6566206,402	608135,619	7,63	20160154	NA	NA	NA	NA	20,5	20,5	2018-11-20
ONSTS07	TS	32	EUREF89	9°E	6566233,973	608172,444	6,78	20160154	NA	NA	NA	NA	24,5	24,5	2018-11-20
ONSTS08	TS	32	EUREF89	9°E	6566191,976	608181,904	6,50	20160154	NA	NA	NA	NA	29,6	29,6	2018-11-20

PROJ_NAMI National GeoTest Sites (NGTS)
PROJ_LOC Onsoy (ONS)
PROJ_CLNT NGTS
PROJ_CONT NGI
PROJ_END NGI

LOCA_ID-HOLE_ID	ABBR	UTM	Datum	CM	Northing	Easting	Elevation surface	NGI Project number (for reference)	HDOP	VDOP	Field Equipment ID	Cone factor (a)	Depth to end of test	Depth to bedrock	DATE
-	-	-	-	-	m	m	m	-	m	m	-	-	m	m	YYYY-MM-YY
ONSTS09	TS	32	EUREF89	9°E	6566253,535	608201,122	6,46	20160154	NA	NA	NA	NA	33,1	33,1	2018-11-20
ONSB43	BHSBm	32	EUREF89	9°E	6566431,690	608289,380	6,40	20160154	NA	NA	NA	NA	3,50	NA	2019-06-14

Table 4.1-2 List of abbreviations for field investigations

ABBR/Group Name	Abbreviation definition Sampler & In situ test	Term in LOCA_ID-HOLE_ID
BH54C	54 mm composite sample borehole (with liner)	B
BH54	54 mm sample borehole (no liner)	B
BH72	72 mm sample borehole (no liner)	B
BH76	76 mm sample borehole (with liner)	B
BHSB	Sherbrooke block sample borehole (large)	B
BHSBm	Mini Sherbrooke block sample borehole	B
BHGPTr	Gel push Triple tube sampler	B
BHGPS	Gel push Static penetration	B
BG	Bag sample (unrelated to a BH)	BG
NA	Attempted test - no results reported	-
SCPTU-DIS	Seismic cone penetration tests with dissipation	C
CPTU-DIS	Cone penetration test with dissipation	C
RCPTU-DIS	Resistivity cone penetration test with dissipation	C
CPTU	Cone penetration test with pore pressure measurements	C
CPT	Cone penetration test **without** pore pressure measurements	C
RCPTU	Resistivity cone penetration test	C
SCPTU	Seismic cone penetration tests	C
SDMT	Seismic dilatometer test	D
DMT	Dilatometer test	D
ERT	Electrical resistivity tomography	ER
MASW	Multichannel analysis of surface waves	M
SRefra	Seismic refraction	SRR
VSP	vertical seismic profiling	VP
SBP	Self boring pressuremeter test	P
EPCT	Earth pressure cell test (hydraulic, Glötzl)	EP
HFST	Hydraulic fracture stress test	H
FVT	Field vane	V
INC	Inclinometer	I
Piezo	Piezometer	PI
StandP	Stand pipe	S
THS	Thermistor string	TH
RWS	Rotary weight sounding	RW
RCD	Rock control drilling	RC
SS	Simple Sounding	SS
RPS	Rotary pressure sounding	RP
TS	Total sounding	TS
SLU	Slug test	SL
PAC	Pack test	PA
XBseism	Crosshole seismic	XS
XBGPR	Crosshole GPR	XG
XBERT	Crosshole ERT	XE
DBseism	Downhole seismic	DS
DBGPR	Downhole GPR	DG
DBERT	Downhole ERT	DE
GPR	Ground penetrating radar	G
EM	Electromagnetic	E
SP	Self polarisation	SP
SRefle	Seismic reflection	SRL
PS	Passive seismic	PS

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m³	kN/m³	kN/m³	kPa	kPa	-	%	%	%	%	%	%
ONSB01	6,85				27,08	17	3,2	5,3	26,7	71,6	44,9	65,13	97,71	100
ONSB01	6,87	65,8	15,92	16,14										
ONSB01	6,96	64,5	16,11	16,22										
ONSB01	6,96	65,5	16,04	16,16										
ONSB01	10,22	42,7	17,95	17,93					28,8	42,1	13,3			
ONSB01	10,24	43,6	17,58	17,84					20,2	46,8	26,6			
ONSB01	10,24	41,6	17,63	18,04										
ONSB01	10,24	44,2	17,55	17,78										
ONSB01	10,24	41,9	17,74	18,01										
ONSB01	10,24	43,5	17,62	17,85										
ONSB01	10,24	42,2	17,79	17,98										
ONSB01	10,24	45,5	17,58	17,66										
ONSB01	12,22	46,0	17,32	17,61										
ONSB01	12,27	45,3	17,20	17,68										
ONSB01	12,32	46,3	17,30	17,58										
ONSB01	14,10	70,4	15,59	15,88										
ONSB01	14,14	71,4	15,78	15,83	26,94									
ONSB01	14,14	73,0	15,78	15,74		22	1,3	16,9						
ONSB01	14,43	68,1	15,47	16,01	27,14	25	0,8	31,3	27,4	63,7	36,3	55,56	99,11	100
ONSB01	14,52	70,2	15,66	15,89										
ONSB01	14,52	67,5	15,87	16,04										
ONSB01	14,52	68,1	15,85	16,01										
ONSB01	14,82	67,6	15,44	16,04	26,69	25	1,5	16,7	26,7	55,3	28,6	58,08	98,36	100
ONSB01	14,89	62,7	16,16	16,34										
ONSB01	14,89	63,2	15,91	16,30										
ONSB02	3,03								30,3	74,9	44,6			
ONSB02	3,08											75,5	99	100
ONSB02	3,09	72,6	15,49	15,76										
ONSB02	3,13	70,6	15,28	15,87										
ONSB02	3,15					15	2,4	6,3						
ONSB02	3,23	71,7	15,48	15,81										
ONSB02	4,03								29,5	76,4	46,9			
ONSB02	4,08											66,6	99	100
ONSB02	4,09	70,3	15,63	15,89										
ONSB02	4,33	69,3	15,03	15,94										
ONSB02	4,35					17	2,9	5,9						
ONSB02	5,04								28,5	73,6	45,1			
ONSB02	5,10											71,8	97	100
ONSB02	5,11	67,3	15,70	16,06										
ONSB02	5,13					17	2,6	6,5						
ONSB02	5,20	68,1	15,32	16,01										
ONSB02	5,25	71,1	16,01	15,84										
ONSB02	5,30	68,0		16,02										
ONSB02	5,35	64,1		16,25										
ONSB02	5,40	65,1		16,19										
ONSB02	5,45	67,7		16,03										
ONSB02	5,60	66,1		16,13										
ONSB02	5,63	62,2		16,37										

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m^3	kN/m^3	kN/m^3	kPa	kPa	-	%	%	%	%	%	%
ONSB02	5,68	63,7		16,27										
ONSB02	5,72	62,1		16,37										
ONSB02	6,05				27,09				27,6	73,5	45,9	68,4	99	100
ONSB02	6,15	67,6		16,04										
ONSB02	6,30	64,9		16,20										
ONSB02	6,40	64,7	16,01	16,21										
ONSB02	8,10	52,9	17,30	17,03										
ONSB02	8,11	52,9		17,02										
ONSB02	8,15					16	4,4	3,6						
ONSB02	8,20											50,2	96	100
ONSB02	8,60											45,4	97	100
ONSB02	8,65					24	4,2	5,7						
ONSB02	8,70	43,9		17,81										
ONSB02	8,70	43,9		17,81										
ONSB02	9,04								20,7	47,0	26,3			
ONSB02	9,08											58,8	90	100
ONSB02	9,09	44,3	16,84	17,77										
ONSB02	9,10	42,9		17,91		31	4,5	6,9						
ONSB02	9,25	43,0	17,59	17,90										
ONSB02	9,40	39,8		18,23										
ONSB02	9,50	41,1		18,09										
ONSB02	10,10	42,9		17,91										
ONSB02	11,05		16,98						22,3	49,7	27,4			
ONSB02	11,10	46,9	16,88	17,53										
ONSB02	11,13								20,8	49,4	28,6	49,3	94	100
ONSB02	11,20	45,7		17,64										
ONSB02	11,40	42,7		17,93										
ONSB02	11,50	43,8		17,82										
ONSB02	11,53	43,8	17,41	17,82										
ONSB02	11,75	40,8		18,12										
ONSB02	12,05		17,73						20,0	44,7	24,7			
ONSB02	12,77	46,2		17,59										
ONSB02	13,10	60,3	16,10	16,49										
ONSB02	13,11	60,3		16,49										
ONSB02	13,15					34	3,1	11,0						
ONSB02	13,20											60,2	100	100
ONSB02	13,65		16,27			30	2,1	14,3				60	100	100
ONSB02	13,68	67,1		16,07										
ONSB02	13,70	67,1		16,07										
ONSB02	14,05		15,91						28,3	68,3	40,0			
ONSB02	14,14				26,94	22	1,3	16,9	29,1	70,7	41,6	56,91	99,02	100
ONSB02	14,77	66,9		16,08										
ONSB02	15,05		15,09						27,2	65,5	38,3			
ONSB02	15,77	66,3		16,11										
ONSB02	17,05		16,12						25,8	52,3	26,5			
ONSB02	17,75	60,6		16,47										
ONSB02	18,11	59,3		16,56										
ONSB02	18,16					21	0,9	23,3						

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m³	kN/m³	kN/m³	kPa	kPa	-	%	%	%	%	%	%
ONSB02	18,48											41	94,96	99,32
ONSB02	18,63					27	1	27,0						
ONSB02	18,69	58,6		16,61										
ONSB02	19,11	52,0		17,10										
ONSB02	19,20											48,1	95,02	99,21
ONSB02	19,40					32	0,7	45,7						
ONSB02	19,63					28	0,6	46,7						
ONSB02	19,67	55,8		16,81										
ONSB03	10,11	45,6	17,45	17,65										
ONSB03	10,23	42,3	17,78	17,97										
ONSB03	10,34	41,4	17,89	18,06										
ONSB03	10,48	42,4	17,86	17,96										
ONSB03	10,60	41,1	17,96	18,09										
ONSB03	12,13	43,0	17,78	17,90										
ONSB03	12,25	44,4	17,63	17,76										
ONSB03	12,34	45,4	17,29	17,67										
ONSB03	12,38	45,2	17,31	17,69										
ONSB03	12,44	45,3	17,52	17,68										
ONSB04	8,42	63,8	16,55	16,27										
ONSB04	8,52		17,94											
ONSB04	9,02	44,5	17,90	17,75										
ONSB04	9,08	43,2	17,75	17,88										
ONSB04	10,02	42,7	17,93	17,93										
ONSB04	10,13	42,1	17,92	17,99										
ONSB05	8,97	53,1	17,09	17,01										
ONSB05	9,07	46,5	17,47	17,57										
ONSB05	9,97	44,3	17,60	17,77										
ONSB05	10,07	41,9	17,82	18,01										
ONSB05	10,97	39,8	18,27	18,23										
ONSB05	11,07	39,2	18,13	18,29										
ONSB06	5,67	69,3	16,29	15,94										
ONSB06	6,30	69,5	16,03	15,93										
ONSB06	6,40	66,4	16,22	16,11										
ONSB06	7,20	61,2	16,48	16,43										
ONSB06	7,30	59,8	16,39	16,53										
ONSB06	8,67	45,6	17,40	17,65										
ONSB06	8,78	45,2	17,58	17,69										
ONSB07	5,65	69,0	15,99	15,96										
ONSB07	5,78	68,5	15,84	15,99										
ONSB07	6,27	67,5	15,99	16,04										
ONSB07	6,37	67,1	16,00	16,07										
ONSB07	7,27	59,4	16,21	16,55										
ONSB07	7,37	59,8	16,33	16,53										
ONSB07	8,67	51,4	17,19	17,15										
ONSB07	8,78	51,0	17,25	17,18										
ONSB08	6,60	69,3	15,71	15,94										
ONSB08	6,73	68,2	16,69	16,00										
ONSB08	9,59	41,7	17,65	18,03										

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m^3	kN/m^3	kN/m^3	kPa	kPa	-	%	%	%	%	%	%
ONSB08	9,70	41,7	17,84	18,03										
ONSB09	8,67	45,7	17,48	17,64										
ONSB09	8,78	45,7	17,42	17,64										
ONSB09	9,63	42,3	17,92	17,97										
ONSB09	9,73	41,7	17,85	18,03										
ONSB09	10,57	42,9	17,92	17,91										
ONSB09	10,73	42,4	17,84	17,96										
ONSB09					26,8									
ONSB10	5,67	67,5	16,10	16,04										
ONSB10	5,78	68,1	16,00	16,01										
ONSB10	8,67	43,2	17,86	17,88										
ONSB10	8,78	43,5	17,62	17,85										
ONSB11	6,19	65,3	16,22	16,17										
ONSB11	6,30	65,0	16,14	16,19										
ONSB11	8,93	44,9	17,34	17,71										
ONSB11	9,06	43,6	17,60	17,84										
ONSB12	6,17	65,7	16,20	16,15										
ONSB12	6,28	64,7	16,14	16,21										
ONSB12	9,25	44,4	17,55	17,76										
ONSB12	9,37	43,0	17,72	17,90										
ONSB13	5,98	64,8	16,20	16,20										
ONSB13	6,10	67,0	16,03	16,07										
ONSB17	4,60											48		
ONSB21	11,55	44,6		17,74										
ONSB21	11,58					10	3,6	2,8						
ONSB21	11,70	47,5	16,93	17,48										
ONSB21	11,81					21	3,6	5,8						
ONSB21	11,96					24	3,3	7,3						
ONSB21	12,04					24	3,7	6,5						
ONSB21	12,14					28	4,3	6,5						
ONSB21	12,30	47,7		17,46										
ONSB21	12,32					29	3,7	7,8						
ONSB21	12,51	46,1		17,60										
ONSB21	12,58					25	3,7	6,8						
ONSB21	12,65								21,9	47,0	25,0			
ONSB21	12,80					26	4,1	6,3						
ONSB21	12,90	44,8	17,41	17,73										
ONSB21	13,02					30	5,1	5,9						
ONSB21	13,13					26	3,6	7,2						
ONSB21	13,18					17	2,7	6,3						
ONSB21	13,26					25	3,3	7,6						
ONSB21	13,29	45,4		17,66										
ONSB21	13,51	38,5		18,36										
ONSB21	13,55					17	2,7	6,3						
ONSB21	13,75	61,9	15,86	16,39										
ONSB21	13,88					38	3,7	10,3						
ONSB21	13,98					42	7,3	5,8						

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m³	kN/m³	kN/m³	kPa	kPa	-	%	%	%	%	%	%
ONSB21	14,01	62,0		16,38										
ONSB22	5,42	72,5		15,77										
ONSB22	5,48					11	2,5	4,4						
ONSB22	5,58					10	3,0	3,3						
ONSB22	5,78	69,3	15,75	15,94										
ONSB22	5,92					17	3,1	5,5						
ONSB22	6,02					18	3,2	5,6						
ONSB22	6,12					17	2,9	5,9						
ONSB22	6,18	70,6		15,87										
ONSB22	6,42	70,3		15,89										
ONSB22	6,48					22	2,8	7,9						
ONSB22	6,58					18	3,6	5,0						
ONSB22	6,68					16	3,3	4,8						
ONSB22	6,78					17	3,9	4,4						
ONSB22	6,98	66,9	15,93	16,08										
ONSB22	7,12					18	3,7	4,9						
ONSB22	7,42	65,1		16,19										
ONSB22	7,53	64,6	15,99	16,22										
ONSB22	7,68					18	3,7	4,9						
ONSB22	7,78					21	3,9	5,4						
ONSB22	7,88	64,3		16,24										
ONSB22	7,88					20	3,7	5,4						
ONSB22	13,11	46,0		17,61										
ONSB22	13,22					8	3,3	2,5						
ONSB22	13,28					8	3,2	2,4						
ONSB22	13,38					17	3,0	5,7						
ONSB22	13,47					23	2,7	8,5						
ONSB22	13,58					19	2,4	7,9						
ONSB22	13,78	44,3	17,54	17,77										
ONSB22	13,86	41,1		18,09										
ONSB22	14,11	60,1		16,51										
ONSB22	14,22					28	3,4	8,2						
ONSB22	14,38					48	8,1	5,9						
ONSB22	14,58	61,0	16,16	16,45										
ONSB22	14,66	60,1		16,51										
ONSB22	14,72					39	3,9	10,0						
ONSB22	14,82					36	3,6	10,0						
ONSB22	15,11	63,8		16,27										
ONSB22	15,28	69,8	15,80	15,91										
ONSB22	15,48					34	2,1	16,2						
ONSB22	15,58					27	1,9	14,2						
ONSB22	15,61	59,4		16,56										
ONSB25	8,58					7	2,9	2,3						
ONSB25	8,98	56,0	16,53	16,79										
ONSB25	9,18	53,4	16,67	16,99										
ONSB25	9,28	51,5		17,14										
ONSB25	9,57	50,7		17,20										
ONSB25	9,64					27	4,5	6,0						

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m^3	kN/m^3	kN/m^3	kPa	kPa	-	%	%	%	%	%	%
ONSB25	9,74					24	4,4	5,5						
ONSB25	9,84					25	3,8	6,6						
ONSB25	9,94					17	3,9	4,4						
ONSB25	10,14	47,0	17,31	17,52										
ONSB25	10,28					22	3,8	5,8						
ONSB25	10,32	44,5		17,76										
ONSB25	10,57	43,6		17,84										
ONSB25	10,79	42,3	17,67	17,96										
ONSB27	8,52	57,8		16,66										
ONSB27	8,59					11	4,5	2,4						
ONSB27	8,78	57,2	16,51	16,71										
ONSB27	8,93					24	4,5	5,3						
ONSB27	9,04					19	4,2	4,5						
ONSB27	9,13					10	4,6	2,1						
ONSB27	9,23					25	4,6	5,4						
ONSB27	9,28	53,3		17,00										
ONSB27	9,53	49,9		17,27										
ONSB27	9,59					26	4,1	6,3						
ONSB27	9,63					30	4,1	7,3						
ONSB27	9,79					26	4,6	5,7						
ONSB27	9,99					24	3,3	7,3						
ONSB27	10,18	45,1	17,46	17,70										
ONSB27	10,29					24	5,2	4,6						
ONSB27	10,53	45,8		17,63										
ONSB27	10,65	42,3	17,77	17,97										
ONSB27	10,83					20	4,1	4,9						
ONSB27	10,89	42,0		17,99										
ONSB27	10,93					25	3,7	6,8						
ONSB27	11,55	40,7	17,86	18,13										
ONSB27	11,71	41,5	17,73	18,04										
ONSB27	11,87	40,6	17,88	18,14										
ONSB27	11,96	38,5		18,36										
ONSB27	12,10	43,0		17,89										
ONSB27	12,25	44,0		17,80										
ONSB27	12,57	47,3		17,49										
ONSB27	12,73	45,6	17,44	17,65										
ONSB27	12,87					24	3,7	6,5						
ONSB27	12,97					24	4,1	5,9						
ONSB27	13,07					26	4,6	5,7						
ONSB27	13,17					28	4,1	6,8						
ONSB27	13,32	45,7		17,64										
ONSB27	13,57	43,8	17,68	17,81										
ONSB27	13,77					18	3,2	5,6						
ONSB27	13,97					24	3,1	7,7						
ONSB27	14,02	64,6		16,21										
ONSB28	8,40	59,7		16,53										
ONSB28	8,42					7	3,4	2,1						
ONSB28	8,54	60,0	16,34	16,51										

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m^3	kN/m^3	kN/m^3	kPa	kPa	-	%	%	%	%	%	%
ONSB28	8,63	59,9		16,52										
ONSB28	8,72					22	3,9	5,6						
ONSB28	8,82					14	3,6	3,9						
ONSB28	8,96					20	3,7	5,4						
ONSB28	9,09	54,1		16,93										
ONSB28	9,42	54,6		16,90										
ONSB28	9,48					14	3,8	3,7						
ONSB28	9,58					24	4,3	5,6						
ONSB28	9,73	50,4	17,07	17,23										
ONSB28	9,82	45,9		17,62										
ONSB28	9,92					24	3,8	6,3						
ONSB28	10,02					19	4,5	4,2						
ONSB28	10,12					21	4,5	4,7						
ONSB28	10,43	43,5		17,85										
ONSB28	10,48					28	4,5	6,2						
ONSB28	10,67	43,0	17,63	17,89										
ONSB28	10,78	41,7		18,03										
ONSB29	6,57	75,5		15,61										
ONSB29	6,61					14	2,5	5,6						
ONSB29	6,71					15	3,7	4,1						
ONSB29	6,90	70,5	15,75	15,88										
ONSB29	7,00	70,7		15,86										
ONSB29	7,04					18	3,7	4,9						
ONSB29	7,14					18	3,6	5,0						
ONSB29	7,26	72,1		15,79										
ONSB29	9,65	75,0		15,64										
ONSB29	9,69					4	2	1,8						
ONSB29	9,79					13	4	3,3						
ONSB29	9,96	67,7	15,87	16,03										
ONSB29	10,00					18	4,1	4,4						
ONSB29	10,09	66,0		16,13										
ONSB29	10,10					20	5,1	3,9						
ONSB29	10,23	66,3		16,11										
ONSB31	6,42	75,5		15,61										
ONSB31	6,47					16	2,8	5,7						
ONSB31	6,57					16	2,8	5,7						
ONSB31	6,77	57,0	15,56	16,72										
ONSB31	6,86	72,3		15,78										
ONSB31	6,90					18	2,8	6,4						
ONSB31	7,00					16	2,9	5,5						
ONSB31	7,13	70,9		15,86										
ONSB31	9,48	66,5		16,10										
ONSB31	9,52					20	4,2	4,8						
ONSB31	9,62					22	4,1	5,4						
ONSB31	9,82	64,1	15,97	16,25										
ONSB31	9,90	63,8		16,26										
ONSB31	9,95					28	4,3	6,5						
ONSB31	10,05					22	4,2	5,2						

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m^3	kN/m^3	kN/m^3	kPa	kPa	-	%	%	%	%	%	%
ONSB31	10,18	63,5		16,28										
ONSB31	18,47	49,1	17,37	17,34										
ONSB32	5,92	81,2	15,11	15,34										
ONSB32	6,48	76,3		15,57										
ONSB32	6,52					19	2,3	8,3						
ONSB32	6,62					17	2,3	7,4						
ONSB32	6,82	77,2	15,45	15,53										
ONSB32	6,92	76,8		15,55										
ONSB32	6,95					18	2,2	8,2						
ONSB32	7,05					20	2,3	8,7						
ONSB32	7,17	70,8		15,86										
ONSB32	7,62	70,9	15,70	15,86										
ONSB32	9,53	67,5		16,04										
ONSB32	9,57					23	3,8	6,1						
ONSB32	9,70					21	3,7	5,7						
ONSB32	9,92	65,1	16,01	16,19										
ONSB32	10,00	64,6		16,22										
ONSB32	10,04					25	3,5	7,1						
ONSB32	10,14					25	3,8	6,6						
ONSB32	10,22	64,3		16,24										
ONSB32	12,57	43,9	17,54	17,81										
ONSB32	15,63	50,1		17,25										
ONSB32	15,67					26	1,9	13,7						
ONSB32	15,80					27	1,9	14,2						
ONSB32	15,97	47,7	17,43	17,46										
ONSB32	16,08	36,5		18,59										
ONSB32	16,12					31	2,9	10,7						
ONSB32	16,22					37	5,4	6,9						
ONSB32	16,32	44,4		17,76										
ONSB32	18,68	47,7		17,46										
ONSB32	19,02	44,4	17,72	17,76										
ONSB32	19,11	43,0		17,90										
ONSB32	19,38	40,0		18,20										
ONSB32	19,72					34	6,4	5,3						
ONSB32	19,85					31	4,4	7,0						
ONSB32	20,15					39	7,3	5,3						
ONSB32	20,21	61,8	16,13	16,39										
ONSB32	20,30					27	4,5	6,0						
ONSB33	6,71	75,7	15,41	15,60										
ONSB33	8,77	67,4		16,05										
ONSB33	8,81					9	2,9	3,2						
ONSB33	9,16	67,7	15,82	16,03										
ONSB33	9,51					24	4,6	5,2						
ONSB33	9,55	66,7		16,09										
ONSB33	9,76	66,8	15,93	16,08										
ONSB33	10,68	63,4		16,29										
ONSB33	10,70					24	4,4	5,5						
ONSB33	10,80	62,6	16,11	16,34										

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m^3	kN/m^3	kN/m^3	kPa	kPa	-	%	%	%	%	%	%
ONSB33	10,98					24	4,4	5,5						
ONSB33	11,02	60,0		16,51										
ONSB33	15,70					25	2,7	9,3						
ONSB33	15,71	44,8		17,72										
ONSB33	15,80					24	3,1	7,7						
ONSB33	15,95	46,0	17,34	17,61										
ONSB33	16,05	46,1		17,60										
ONSB33	16,07					22	2,8	7,9						
ONSB33	16,17					27	2,5	10,8						
ONSB33	16,21	42,1		17,98										
ONSB33	18,80	44,3	17,51	17,78										
ONSB34	5,56	88,6		15,03										
ONSB34	5,65					7	1,6	4,6						
ONSB34	5,85	80,1	15,14	15,39										
ONSB34	5,98					15	2,3	6,5						
ONSB34	6,17	81,4		15,33										
ONSB34	6,38	76,2	15,34	15,58										
ONSB34	6,59	77,7		15,51										
ONSB34	6,62					12	2,1	5,7						
ONSB34	6,84	75,6	15,20	15,61										
ONSB34	7,21					15	3,2	4,7						
ONSB34	7,24	70,5		15,87										
ONSB34	9,45	70,5	15,77	15,88										
ONSB34	12,50	49,8	17,02	17,28										
ONSB34	14,66	44,1		17,79										
ONSB34	14,77					9	2,6	3,6						
ONSB34	15,00	46,6	17,56	17,56										
ONSB34	15,27					30	3,5	8,6						
ONSB34	15,32	32,5		19,10										
ONSB34	15,54	48,0	17,40	17,43										
ONSB34	15,78	46,2		17,59										
ONSB34	15,83					32	5,1	6,3						
ONSB34	16,25	45,3	17,48	17,68										
ONSB34	16,52					28	5,1	5,5						
ONSB34	16,56	46,8		17,54										
ONSB34	18,61	48,3		17,40										
ONSB34	18,65					28	5,8	4,8						
ONSB34	18,77					26	3,8	6,8						
ONSB34	18,95	46,6	17,54	17,56										
ONSB34	19,05	44,6		17,74										
ONSB34	19,08					25	6,6	3,8						
ONSB34	19,22					25	3,9	6,4						
ONSB34	19,31	44,5		17,75										
ONSB34	21,35	61,4		16,42										
ONSB34	21,39					30	2,5	12,0						
ONSB34	21,52					31	2,5	12,4						
ONSB34	21,69	64,4	16,04	16,23										
ONSB34	21,79	64,0		16,26										

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m³	kN/m³	kN/m³	kPa	kPa	-	%	%	%	%	%	%
ONSB34	21,84					27	2,5	10,8						
ONSB34	21,96					30	2,4	12,5						
ONSB34	22,04	52,7		17,04										
ONSB34	24,71	46,0		17,61										
ONSB34	24,75					28	1,4	20,0						
ONSB34	24,88					30	1,9	15,8						
ONSB34	25,05	38,3	18,26	18,39										
ONSB34	25,14	37,0		18,54										
ONSB34	25,18					30	1,5	20,0						
ONSB34	25,28	45,3		17,68										
ONSB34	25,28					30	1,7	17,6						
ONSB34	26,42	41,9		18,01										
ONSB34	26,46					29	2,1	13,8						
ONSB34	26,56	42,7	17,92	17,93										
ONSB34	26,68					30	1,8	16,7						
ONSB34	26,71	42,4		17,95										
ONSB41	0,12					170	89	1,9						
ONSB41	0,53					140	60	2,3						
ONSB41	1,15					38	9	4,2						
ONSB41	1,57								28,0	68,0	40,0			
ONSB41	1,65					22	6,6	3,3						
ONSB41	2,15					24	3,7	6,5						
ONSB41	2,15								28,0	71,0	43,0			
ONSB41	2,60					23	3,7	6,2						
ONSB41	3,34	66,1		16,13										
ONSB41	3,34		15,94											
ONSB41	3,48	68,6		15,98										
ONSB41	3,48		15,81											
ONSB41	3,76					10	3	3,3	29,3	75,3	46,0			
ONSB41	3,76								29,3	75,3	46,0			
ONSB41	3,76					10	3	3,3						
ONSB41	3,78											61,48	100	100
ONSB41	5,42					16	2,5	6,4						
ONSB41	5,47	76,4		15,57					28,9	75,5	46,6	66,81	100	100
ONSB41	5,47		15,44											
ONSB41	5,47								28,9	75,5	46,6			
ONSB41	5,63	79,7		15,41										
ONSB41	5,63		15,39											
ONSB41	6,84	70,4		15,88										
ONSB41	6,84		15,71											
ONSB41	6,97	72,2		15,78										
ONSB41	6,97		15,73											
ONSB41	8,82					19	4,8	4,0						
ONSB41	8,87	65,0		16,19					28,9	77,3	48,4	63	99,36	100
ONSB41	8,87		16,13											
ONSB41	8,87								28,9	77,3	48,4			
ONSB41	9,02	62,4		16,35										
ONSB41	9,02		16,43											

Table 5.1-1 SUMMARY OF CLASSIFICATION TESTS

Location ID	Depth	Water content	Unit weight of soil		Unit weight of solid particles	Index strength from fall cone			Plasticity data			Grain size distribution		
									Plastic limit	Liquid limit	Plasticity index	clay	Clay+silt	Clay+silt+sand
		wc	γ (dim)	γ (wc)	γ_s	s_u	$s_{u,rem}$	S_t	w_P	w_L	I_p	< 2μm	< 0.063 mm	< 2mm
	m	%	kN/m³	kN/m³	kN/m³	kPa	kPa	-	%	%	%	%	%	%
ONSB41	10,18	59,6		16,54										
ONSB41	10,18		16,44											
ONSB41	10,32	55,0		16,87										
ONSB41	10,32		16,60											
ONSB41	10,45					22	4,5	4,9						
ONSB41	10,45					22	4,5	4,9						
ONSB41	10,70				27,05									
ONSB41	10,74											54,72	96,88	100
ONSB41	11,37	47,7		17,45										
ONSB41	11,37		17,28											
ONSB41	11,50	45,7		17,64										
ONSB41	11,50		17,33											
ONSB41	12,58					27	3,8	7,1						
ONSB41	12,58					27	3,7	7,3						
ONSB41	12,63								21,6	63,2	41,6			
ONSB41	12,63								21,6	63,2	41,6			
ONSB41	12,71											53,39	98,11	100
ONSB41	14,37								23,0	51,0	28,0			
ONSB41	14,50	33,2		19,00										
ONSB41	14,50		18,53											
ONSB41	14,63	48,0		17,43										
ONSB41	14,63		17,23											
ONSB41	16,40	46,9		17,53										
ONSB41	16,40		17,28											
ONSB41	16,54	47,8		17,45								55,35	97,55	100
ONSB41	16,54		17,25											
ONSB41	16,54								22,7	49,1	26,5			
ONSB41	19,03				27,25									
ONSB41	19,08											43,42	99,61	100
ONSB41	19,36	40,6		18,14								52,08	99,07	100
ONSB41	19,36		17,90											
ONSB41	19,36								21,4	46,1	24,7			
ONSB41	19,45					35	4,9	7,1						
ONSB41	19,52	39,6		18,24										
ONSB41	19,52		17,97											
ONSB41	40,47								25,7	64,5	38,8			

TABLE 5.2-2 SUMMARY OF CRSC OEDOMETER TESTS, 20140839

Boring No.	Tube part test	Depth m	Sample area cm^2	INDEX PROPERTIES: Water content w_i %	w_f %	I_p %	Clay cont. %	Unit weight kN/m^3	LOADING PROCEDURE: Estim. σ_{v0}' kPa	Start 1. unload, p_1' kPa	Start re-load, p_2' kPa	Start 2. unload, p_3' kPa	Start re-load, p_4' kPa	DEFORMATION PARAMETERS: Loading M_0 MPa	M_1 MPa	M_2 MPa	m -	p_r' kPa	COEFF. OF CONS.: Loading c_{v0} $m^2/s*10^{-7}$	c_{v1} $m^2/s*10^{-7}$	c_{v2} $m^2/s*10^{-7}$	PERM. k 1) $m/s * 10^{-10}$	ESTIM. PRECONS. PRESSURE p_c' 2) kPa	p_c' 3) kPa	p_c' 4) kPa	$\Delta V/V$ at p_0' %	$\Delta e/e_i$ 5) -	Sample quality 6)	COMMENTS	FIGURE REFERENCE
ONSB02	3-D-1	3.23	20	71.7	51.0	45	75	15.58	29.8	81.4	41.3	373.7	187.5	1.3	12	48	13.5	30	1.0	4.8	7.0	9.0	57	41	53	2.26	0.034	1		5.2.1 - 5.2.3
ONSB02	5-D-1	5.25	35	71.1	42.5	45	72	16.01	41.3	115	59	519	262	0.7	15	60	13.5	30	0.6	4.0	6.0	9.0	44	58	44	2.56	0.039	1		5.2.4 - 5.2.6

CLIENT: Norwegian Deepwater Program

PROJECT: Phase 2A
Factual Report on Geotechnical Site
Investigation and Standard Laboratory Testing

Document No. 20160154-10-R

NGI's criteria for sample quality				
OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
4-6	<0.02	0.02-0.035	0.035-0.07	>0.07
Quality	1	2	3	4

LEGEND:

M_0, c_{v0} = at p_0' (tangent module)
M_1, c_{v1} = average from p_2' to p_1', reloading
M_2, c_{v2} = average from p_4' to p_3', reloading

NA = Not applicable
NAD = Not able to derive

1) k = coefficient of permeability at zero axial strain
2) Using the Casagrande interpretation
3) Using empirical relationships between s_u, I_p, p_0' and p_c' where s_u is determined in triaxial compression tests (CAUc)
4) Using the Janbu interpretation
5) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol}(1+e_i)$ and $e_i = 2.75 * w_i$
6) 1 - very good to excellent, 2 - good to fair, 3 - poor, 4 - very poor (Ref. Lunne et al. 1998)

TABLE 5.2-3 SUMMARY OF CRSC OEDOMETER TESTS, 20150530

Boring No.	Tube part test	Depth m	Sample area cm^2	INDEX PROPERTIES: Water content w_i %	Water content w_f %	I_p %	Clay cont. %	Unit weight kN/m^3	LOADING PROCEDURE: Estim. σ_{v0}' kPa	Start 1. unload, p_1' kPa	Start re-load, p_2' kPa	DEFORMATION PARAMETERS: Loading M_0 MPa	Loading M_1 MPa	m -	p_r' kPa	COEFF. OF CONS. Loading c_{v0} $m^2/s*10^{-7}$	c_{v1} $m^2/s*10^{-7}$	PERM. k 1) $m/s * 10^{-10}$	ESTIM. PRECONS. PRESSURE p_c' 2) kPa	p_c' 3) kPa	p_c' 4) kPa	ΔV/V at p_0' %	$\Delta e/e_i$ 5) -	Sample quality 6)	COMMENTS	FIGURE REFERENCE
ONSB04	1-B-1	8.42	35	63.8	62.3			16.55	52.5	159	81	0.7	0.8	18.3	20	0.25	0.25	12	NAD		NAD	13.63	0.214	4		5.2.7 - 5.2.9
ONSB04	2-B-1	9.02	35	44.5	43.7			17.90	57.6	168	86	1.3	1.3	16.2	20	0.5	0.4	8	63		80	4.49	0.082	3		5.2.10 - 5.2.12
ONSB04	3-B-1	10.02	35	42.7	41.9			17.93	64.1	198	101	1.6	1.5	13.8	15	1.4	1.2	13	72		72	5.40	0.100	3		5.2.13 - 5.2.15
ONSB05	2-B-1	8.97	35	53.1	52.0			17.09	56.5	169	86	1.0	1.1	14.5	-10	0.3	0.3	8	NAD		NAD	9.95	0.168	4		5.2.16 - 5.1.18
ONSB05	3-B-1	9.97	35	44.3	43.6			17.60	63.8	189	96	1.6	1.5	13.8	20	0.8	0.7	8	81		85	4.04	0.074	3		5.2.19 - 5.2.21
ONSB05	4-B-1	10.97	35	39.8	39.2			18.27	71.1	218	111	1.8	2	14.2	20	0.8	0.7	8	83		90	4.48	0.086	3	Cutting shoe	5.2.22 - 5.2.24
ONSB06	1-1-B-1	5.67	35	69.3	40.6	40		16.29	32.4	-	-	0.5	0.5	13.5	10	0.5	0.5	10	NAD	NAD	40	8.64	0.132	3	Piston, coating	5.2.25 - 5.2.27
ONSB06	1-2-B-1	6.30	35	69.5	43.5	40		16.03	37.0	-	-	1.3	1.0	13.3	45	1.1	0.8	11	62	47	58	2.43	0.037	1	Piston, coating	5.2.28 - 5.2.30
ONSB06	1-3-B-1	7.20	35	61.2	38.0	40		16.48	43.6	-	-	1.6	1.3	13.3	45	1.2	0.9	10	72	0	71	2.28	0.036	1	Piston, coating	5.2.31 - 5.2.33
ONSB06	2-1-B-1	8.67	35	45.6	27.5	30		17.40	54.3	-	-	0.9	1.1	17.5	8	0.3	0.35	8	NAD	79	NAD	10.40	0.187	4	Push, coating	5.2.34 - 5.2.36
ONSB07	1-1-B-1	5.65	35	69.0	41.2	40		15.99	32.2	-	-	0.5	0.6	13.4	-4	1.8	1.9	50	NAD	0	NAD	9.68	0.148	4	Piston, no coating	5.2.37 - 5.2.39
ONSB07	1-2-B-1	6.27	35	67.5	41.9	40		15.99	36.8	-	-	1.2	0.9	12.7	37	1.2	0.9	13	55	52	56	2.83	0.044	2	Piston, no coating	5.2.40 - 5.2.42
ONSB07	1-3-B-1	7.27	35	59.4	38.4	40		16.21	44.1	-	-	1.2	1.0	14.2	40	0.9	0.7	9	56	0	53	2.76	0.044	2	Piston, no coating	5.2.43 - 5.2.45
ONSB07	2-1-B-1	8.67	35	51.4	32.0	30		17.19	54.3	-	-	1.0	1.1	14.0	-15	0.5	0.5	9	NAD	74	NAD	8.75	0.149	4	Push, coating	5.2.46 - 5.2.48
ONSB08	1-2-B-1	6.60	35	69.3	43.5	40		15.71	39.2	-	-	0.6	0.7	13.2	25	0.3	0.3	12	40	51	55	6.07	0.093	3	Push, no coating	5.2.49 - 5.2.51
ONSB08	2-2-B-1	9.59	35	41.7	26.2	30		17.65	61.0	-	-	1.3	1.3	15.4	25	0.8	0.7	10	70	77	70	4.30	0.080	3	Piston, steel pipe	5.2.52 - 5.2.54
ONSB09	2-1-B-1	8.67	35	45.7	29.3	30		17.48	54.3	-	-	1.1	1.2	13.5	-20	0.4	0.4	7	NAD	0	NAD	7.03	0.126	3	Piston, coating	5.2.55 - 5.2.57
ONSB09	2-2-B-1	9.63	35	42.3	25.9	30		17.92	61.3	-	-	2.0	1.7	16.8	75	1.4	1.2	9	90	86	90	2.79	0.052	2	Piston, coating	5.2.58 - 5.2.60
ONSB09	2-3-B-1	10.57	35	42.9	25.7	30		17.92	68.2	-	-	1.0	1.2	16.7	20	0.5	0.5	8	NAD	0	NAD	6.92	0.128	3	Piston, coating	5.2.61 - 5.2.63
ONSB10	1-1-B-1	5.67	35	67.5	39.4	40		16.10	32.9	-	-	0.6	0.7	12.4	-15	0.3	0.35	9	NAD	39	NAD	7.51	0.116	3	Push, coating	5.2.64 - 5.2.66
ONSB10	2-1-B-1	8.67	35	43.2	25.0	30		17.86	54.3	-	-	1.0	1.1	16.9	-5	0.8	0.85	9	NAD	67	NAD	8.60	0.158	4	Push, coating	5.2.67 - 5.2.69
ONSB11	1-2-A-1	6.19	35	65.3	41.6	40		16.22	36.2	-	-	1.6	1.4	12.8	30	1.5	1.3	13	80	0	68	2.47	0.038	1	Push, no coating	5.2.70 - 5.2.72
ONSB11	2-2-A-1	8.93	35	44.9	27.6	30		17.34	56.2	-	-	1.3	1.2	15.0	40	0.9	0.8	9	65	0	57	3.57	0.065	2	Push, anodized	5.2.73 - 5.2.75
ONSB12	1-2-A-1	6.17	35	65.7	40.6	40		16.20	36.0	-	-	0.7	0.7	14.6	40	0.6	0.5	12	55	0	72	4.24	0.066	2	Push, anodized	5.2.76 - 5.2.78
ONSB12	2-2-A-1	9.25	35	44.4	26.0	30		17.55	58.5	-	-	1.7	1.4	14.2	40	1.3	1.1	13	76	0	74	4.35	0.079	3	Push, no coating	5.2.79 - 5.2.81
ONSB12	1-2-A-1	5.98	35	64.8	39.6	40		16.20	34.7	-	-	0.9	0.8	14.6	40	0.5	0.40	8	50	0	49	3.50	0.055	2	Push, anodized	5.2.82 - 5.2.84

CLIENT: IHC Mining B.V.

PROJECT: Geotechnical Sampler Tool Development

Document No.: 20160154-10-R

NGI's criteria for sample quality

OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
4-6	<0.02	0.02-0.035	0.035-0.07	>0.07
Quality	1	2	3	4

LEGEND:

M_0, c_{v0} = at p_0' (tangent module)
M_1, c_{v1} = average from p_2' to p_1', reloading
M_2, c_{v2} = average from p_4' to p_3', reloading

NA = Not applicable
NAD = Not able to derive

1) k = coefficient of permeability at zero axial strain
2) Using the Casagrande interpretation
3) Using empirical relationships between s_u, I_p, p_0' and p_c' where s_u is determined in triaxial compression tests (CAUc)
4) Using the Janbu interpretation
5) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol}(1+e_i)$ and $e_i = 2.75 * w_i$
6) 1 - very good to excellent, 2 - good to fair, 3 - poor, 4 - very poor (Ref. Lunne et al. 1998)

Table 5.2-4 SUMMARY OF CRSC OEDOMETER AND IL TESTS, 20160154

Boring No.	Tube part test	Depth (m)	Sample area (cm^2)	INDEX PROPERTIES: Water content w_i (%)	Water content w_f (%)	I_p (%)	Clay cont. (%)	Unit weight (kN/m^3)	LOADING PROCEDURE: Estim. σ_{v0}' (kPa)	Start 1. unload, p_1' (kPa)	Start re-load, p_2' (kPa)	Start 2. unload, p_3' (kPa)	Start re-load, p_4' (kPa)	DEFORMATION PARAMETERS: Loading M_0 (MPa)	Loading M_1 (MPa)	m (-)	p_r' (kPa)	COEFF. OF CONS. Loading: c_{v0} ($m^2/s*10^{-7}$)	c_{v1} ($m^2/s*10^{-7}$)	PERM. k 1) ($m/s * 10^{-10}$)	ESTIM. PRECONS. PRESSURE: p_c' 2) (kPa)	p_c' 3) (kPa)	p_c' 4) (kPa)	p_c' 5) (kPa)	$\Delta V/V$ at p_0' (%)	$\Delta e/e_i$ 6) (-)	Sample quality 7)	COMMENTS	FIGURE REFERENCE
ONSB01	1-A-1	6.87	35	63.8	40.3	45.0	65.1	16.46	41.2	129	66	-	-	1.3	1.1	14.8	60	1.1	0.9	9.5	80		64	80	1.75	0.028	1		5.2.85 - 5.2.87
ONSB01	2-A-1	10.22	35	42.1	28.8	27	-	17.95	65.6	173	88	-	-	3.0	2.0	17.9	75	1.8	1.1	8	100		100	102	2.62	0.049	2		5.2.88 - 5.2.90
ONSB01	3-A-1	12.22	35	46.1	28.6	25	-	17.46	80.2	247	131	-	-	3.7	2.3	17.6	100	2.0	1.4	8	128		NAD	130	3.99	0.071	3		5.2.91 - 5.2.93
ONSB01	4-A-1	14.14	35	71.1	38.5	40	56.9	15.78	94.0	249	127	-	-	2.9	1.6	16.9	120	2.4	1.5	12	123		141	122	4.34	0.066	2		5.2.94 - 5.2.96
ONSB01	5-A-1	14.43	35	68.9	41.0	40	55.6	16.10	95.8	249	126	-	-	2.3	1,5	15.6	100	2.7	1.7	16	113		144	111	3.54	0.054	2		5.2.97 - 5.2.99
ONSB01	6-A-1	14.82	35	63.9	38.2	38	58.1	16.46	98.1	258	133	-	-	3.8	2	15.0	120	3.2	1.7	12	135		157	140	3.79	0.059	2		5.2.100 - 5.2.102
ONSB41	6-A-1	5.12	35	78.1	46.9			15.62	28.4	118	61	-	-	0.9	19	10.8	24	0.8	6.3	10	45			39	2.45	0.036	2	CRSC	5.2.103 - 5.2.106
ONSB41	6-B-1	5.27	35	80.2				15.54	28.8	119	28	-	-	0.5	5	12.3	22	0.9	3.4	12	29			35	3.56	0.052	NA	IL	5.2.107 - 5.2.108
ONSB41	10-A-1	8.62	35	67.1	39.2			16.03	54.0	189	96	-	-	1.4	23	10.1	21	1.2	5.1	11	69			67	1.68	0.026	1	CRSC	5.2.109 - 5.2.112
ONSB41	10-B-1	8.67	35	66.2				16.31	54.3	185	56	-	-	1.0	11	12.1	26	0.3	3.4	13	58			65	5.15	0.080	NA	IL	5.2.113 - 5.2.114
ONSB41	17-A-1	16.12	35	48.5	31.0			17.48	108.7	289	146	-	-	1.9	39	14.5	75	1.1	7	9	120			116	4.27	0.075	3	CRSC	5.2.115 - 5.2.118
ONSB41	17-B-1	16.17	35	47.5				17.48	109.1	286	112	-	-	1.9	24	13.4	75	3.3	5.5	10	110			115	3.02	0.053	NA	IL	5.2.119 - 5.2.120
ONSB41	20-A-1	19.12	35	43.5	29.2			17.75	130.6	338	170	-	-	3.1	45	15.3	75	1.6	11	7	160			175	3.91	0.072	3	CRSC	5.2.121 - 5.2.124
ONSB41	20-B-1	19.17	35	42.0				18.06	131.0	342	129	-	-	3.9	26	15.5	75	5.6	7	10	140			145	2.78	0.052	NA	IL	5.2.125 - 5.2.126
ONSB43	2-C-1	3.05	35	69.5	40.1			16.03	27.8	-	-	-	-	1.4	-	12.9	40	1.5	-	12	58		54	65	1.75	0.027	1	CRSC	5.2.190 - 5.2.192

CLIENT: NRC

PROJECT: Norwegian GeoTest Sites Onsøy

Document No.: 20160154-10-R

NGI's criteria for sample quality				
OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
4-6	<0.02	0.02-0.035	0.035-0.07	>0.07
Quality	1	2	3	4

LEGEND:

M_0, c_{v0} = at p_0' (tangent module)

M_1, c_{v1} = average from p_2' to p_1', reloading

NA = Not applicable

NAD = Not able to derive

1) k = coefficient of permeability at zero axial strain

2) Using the Casagrande interpretation

3) Using the Becker interpretation

4) Using empirical relationships between s_u, I_p, p_0' and p_c'
where s_u is determined in triaxial compression tests (CAUc)

5) Using the Janbu interpretation

6) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol} (1+e_i)$ and $e_i = 2.75 * w_i$

7) 1 - very good to excellent, 2 - good to fair, 3 - poor, 4 - very poor (Ref. Lunne et al. 1998)

TABLE 5.2-5 SUMMARY OF CRSC OEDOMETER TESTS, 20170642

Boring No.	Tube part test	Depth m	Sample area cm^2	INDEX PROPERTIES: Water content w_i %	Water content w_f %	I_p %	Clay cont. %	Unit weight kN/m^3	LOADING PROCEDURE: Estim. σ_{v0}' kPa	Start 1. unload, p_1' kPa	Start re-load, p_2' kPa	DEFORMATION PARAMETERS: Loading M_0 MPa	Loading M_1 MPa	m -	p_r' kPa	COEFF. OF CONS.: Loading c_{v0} $m^2/s*10^{-7}$	Loading c_{v1} $m^2/s*10^{-7}$	PERM. k 1) m/s * 10^{-10}	ESTIM. PRECONS. PRESSURE: p_c' 2) kPa	OCR 2) -	p_c' 5) kPa	OCR 5) -	$\Delta V/V$ at p_0' %	$\Delta e/e_i$ 6) -	Sample quality 7) -	COMMENTS	Sampler Type	FIGURE REFERENCE
ONSB22	1-1-2	5.70	35.00	71.0	45.9	-	-	15.92	37	-	-	1.0	-	15	30	0.8	-	10.5	49	1.339	59	1.612	3.91	0.059	2	gap, shell, patching	76mmAL	5.2.145 - 5.2.147
ONSB22	1-2-2	6.90	35.00	68.6	41.4	-	-	16.08	44	-	-	1.2	-	13	32	1.1	-	8	62	1.396	70	1.577	2.99	0.046	2		76mmAL	5.2.148 - 5.2.150
ONSB25	2-1-2	8.91	35.00	60.0	31.2	-	-	16.67	57	-	-	0.9	-	17	52	0.6	-	10	62	1.082	66	1.152	4.39	0.071	2	cracks, remoulded, patching	102mmSh	5.2.163 - 5.2.165
ONSB21	3-1-2	11.83	35.00	47.7	27.5	-	-	17.47	76	-	-	1.5	-	16	62	1.0	-	11	95	1.25	100	1.316	6.39	0.113	3		76mmPVC	5.2.136 - 5.2.138
ONSB21	3-2-2	12.83	35.00	46.2	29.2	-	-	17.53	82	-	-	2.7	-	16	62	1.7	-	8	105	1.274	110	1.334	2.91	0.052	2		76mmPVC	5.2.139 - 5.2.141
ONSB21	3-3-2	13.83	35.00	63.6	38.5	-	-	16.25	89	-	-	4.3	-	12	110	2.5	-	7.1	173	1.947	174	1.958	2.15	0.034	1		76mmPVC	5.2.142 - 5.2.144
ONSB22	1-3-2	7.65	35.00	60.0	38.8	-	-	15.45	49	-	-	1.4	-	15	49	1.2	-	10	68	1.382	70	1.423	3.52	0.057	2		76mmAL	5.2.151 - 5.2.153
ONSB22	3-1-2	13.70	35.00	45.1	29.9	-	-	17.74	88	-	-	2.9	-	16	80	2.0	-	9.8	127	1.443	130	1.477	3.69	0.067	2		76mmAL	5.2.154 - 5.2.156
ONSB22	3-2-2	14.45	35.00	65.2	39.1	-	-	16.15	93	-	-	3.5	-	13	115	1.8	-	6.1	166	1.788	165	1.777	3.03	0.047	2		76mmAL	5.2.157 - 5.2.159
ONSB22	3-3-2	15.35	35.00	71.2	39.4	-	-	15.66	99	-	-	3.0	-	14	115	2.5	-	10	146	1.48	149	1.511	2.78	0.042	2	shells	76mmAL	5.2.160 - 5.2.162
ONSB25	2-2-2	10.16	35.00	46.3	29.9	-	-	17.69	65	-	-	1.3	-	15	25	0.7	-	9	75	1.149	99	1.516	5.74	0.102	3	gap, crack, patching	102mmSh	5.2.166 - 5.2.168
ONSB25	2-3-2	10.66	35.00	42.3	27.4	-	-	18.03	69	-	-	3.0	-	16	65	1.9	-	8	113	1.65	119	1.737	2.39	0.044	2		102mmSh	5.2.169 - 5.2.171
ONSB27	2-1-2	8.70	35.00	58.8	32.9	-	-	16.83	56	-	-	0.8	-	13	3	0.4	-	10.5	41	0.733	49	0.877	7.89	0.128	3	gaps, shells, remoulded, patching	76mmPVC	5.2.172 - 5.2.174
ONSB27	2-2-2	10.10	35.00	45.3	21.4	-	-	17.67	65	-	-	1.1	-	15	30	0.7	-	10	68	1.048	60	0.924	4.75	0.086	3	shells	76mmPVC	5.2.175 - 5.2.177
ONSB27	2-3-2	10.76	35.00	43.2	27.3	-	-	17.78	69	-	-	1.5	-	13	35	1.0	-	10	85	1.229	99	1.432	4.13	0.076	3		76mmPVC	5.2.178 - 5.2.180
ONSB28	2-1-2	8.70	35.00	59.9	35.6	-	-	16.56	56	-	-	0.8	-	14	26	0.5	-	10	58	1.038	69	1.234	5.92	0.095	3	crack, shells, patching	76mmAL	5.2.181 - 5.2.183
ONSB28	2-2-2	9.65	35.00	50.6	30.5	-	-	17.13	62	-	-	2.2	-	14	53	1.4	-	8.3	95	1.532	102	1.645	2.59	0.045	2	shell, patching	76mmAL	5.2.184 - 5.2.186
ONSB28	2-3-2	10.65	35.00	43.3	26.4	-	-	17.95	68	-	-	1.5	-	14	48	0.8	-	7.8	85	1.243	100	1.462	3.98	0.073	3	gap, paching	76mmAL	5.2.187 - 5.2.189
ONSB10	10-1-2	8.60	20.00	66.5	40.6	-	-	16.15	55	-	-	1.2	-	14	45	0.4	-	7.8	66	1.193	85	1.537	7.05	0.109	3	gap, sehll, patching	NGI54mm	5.2.127 - 5.2.129
ONSB11	11-1-2	9.50	20.00	64.6	35.8	-	-	16.17	61	-	-	1.0	-	14	42	1.4	-		47	0.77	63	1.033	8.66	0.135	3		NGI54mm	5.2.130 - 5.2.132
ONSB14	14-1-2	12.34	20.00	43.0	26.9	-	-	17.64	79	-	-	1.7	-	17	65	0.9	-	8	98	1.236	90	1.135	4.37	0.081	3		NGI54mm	5.2.133 - 5.2.135

CLIENT: IHC

PROJECT: SWORD field testing Onsøy

Document No.: 20160154-10-R

NGI's criteria for sample quality				
OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
4-6	<0.02	0.02-0.035	0.035-0.07	>0.07
Quality	1	2	3	4

LEGEND:

M_0, c_{v0} = at p_0' (tangent module)

M_1, c_{v1} = average from p_2' to p_1', reloading

M_2, c_{v2} = average from p_4' to p_3', reloading

NA = Not applicable

NAD = Not able to derive

1) k = coefficient of permeability at zero axial strain

2) Using the Casagrande interpretation

3) Using empirical relationships between s_u, I_p, p_0' and p_c'
where s_u is determined in triaxial compression tests (CAUc)

4) Using the Janbu interpretation

5) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol}$ (1+e_i) and e_i = 2.75 * w_i

6) 1 - very good to excellent, 2 - good to fair, 3 - poor, 4 - very poor(Ref. Lunne et al. 1998)

TABLE 5.3-1 SUMMARY OF UU TRIAXIAL TESTS

Boring No.	Tube part test	Depth m	Estim. p_0' kPa	INDEX PROPERTIES: Water content %	I_p %	Clay cont. %	Unit weight kN/m^3	Type of test	Cell pressure kPa	UNDISTURBED: s_{uUU} at peak or max. for axial strain: ε= max. 10 % kPa	ε_f %	ε_{50} %	s_{uUU} at peak or max. for axial strain: ε= 10% - 15 % kPa	ε_f %	ε_{50} %	s_u^{UU} at large strains kPa	ε_f large strains %	COMMENTS	FIGURE REFERENCE
ONSB41	4-D-1	3.66	16.7	69.5			15.71	UU	500	13.3	6.0	0.5	12.4	10.0	0.5	9.5	19.6		5.3.1
ONSB41	8-D-1	7.14	42.3	69.4			15.84	UU	500	18.2	2.7	0.3	13.5	10.0	0.2	8.7	22.8		5.3.2
ONSB41	12-D-1	11.66	75.1	44.3			17.45	UU	500	18.6	3.5	0.4	15.0	10.0	0.3	13.2	21.9		5.3.3
ONSB41	15-D-1	14.37	97.0	41.5			17.47	UU	500	30.3	2.2	0.5	23.0	10.0	0.3	18.7	18.7		5.3.4
ONSB41	20-1-UU	19.37	-	41.6			17.42	UU	1000	23.0	9.1	2.2	22.8	10.0	2.2	18.2	24.0		5.3.5

CLIENT: NRC

PROJECT: Norwegian GeoTest Sites
Onsøy

Document No.: 20160154-10-R

Table 5.3-2 Summary of CAU triaxial tests - NGI project 20150530

Boring No.	Tube part test	Depth	INDEX PROPERTIES: Water content w_i	w_c	I_p	Clay cont.	Unit weight	Type of test 1)	CONSOLIDATION: Estim. p_o'	σ_a' final	σ_r' final	ε_{vol}	ε_{ac}	B	Perm k	UNDRAINED. STATIC TESTING: s_u	U_f	ε_f	s_u/σ'_{ac}	$\Delta e/e_i$ 2)	Sample quality 3)	COMMENTS	FIGURE REFERENCE
		m	%	%	%	%	kN/m³		kPa	kPa	kPa	%	%	%	m/s * 10⁻⁹	kPa	kPa	%	-	-	-		
ONSB04	1-C-1	8,52	42,1	NAD			17,94	CAUC	53,2	52,9	31,7	9,53	6,80	99,0		NAD	NAD	NAD	NAD	0,178	4	failed applying back pressure, assumed initial water content	-
ONSB04	2-C-1	9,08	43,2	40,0			17,75	CAUC	58,3	57,1	34,3	4,12	2,78	99,4		24,1	16,3	3,9	0,42	0,076	3		5.3.6 - 5.37
ONSB04	3-C-1	10,13	42,1	39,2			17,92	CAUC	65,6	65,5	39,4	3,88	2,13	99,4		25,3	18,3	2,0	0,39	0,072	3		5.3.8 - 5.3.9
ONSB05	2-C-1	9,07	46,5	40,9			17,47	CAUC	57,2	57,1	34,3	6,95	4,17	99,4		24,9	18,2	9,5	0,44	0,124	3		5.3.10 - 5.3.11
ONSB05	3-C-1	10,07	41,9	39,3			17,82	CAUC	64,5	64,4	38,7	3,38	2,32	98,2		26,4	18,3	3,1	0,41	0,063	2		5.3.12 - 5.3.13
ONSB05	4-C-1	11,07	39,2	36,3			18,13	CAUC	71,8	71,6	43,0	3,86	2,19	99,6		25,9	20,2	2,5	0,36	0,074	3		5.3.14 - 5.3.15
ONSB06	1-1-C-1	5,78						~~CAUC~~	~~33,2~~													Cancelled, too soft due to disturbanc	-
ONSB06	1-2-C-1	6,40	66,4	63,7			16,22	CAUC	37,7	37,6	22,6	2,77	1,35	100,0		14,8	8,9	1,3	0,39	0,043	2	Piston, coating	5.3.16 - 5.3.17
ONSB06	1-3-C-1	7,30	59,8	57,9			16,39	CAUC	44,3	44,2	26,6	1,98	1,52	97,4		17,2	13,1	2,5	0,39	0,032	1	Piston, coating	5.3.18 - 5.3.19
ONSB06	2-1-C-1	8,78	45,2	40,6			17,58	CAUC	55,1	54,0	32,9	5,53	3,33	100,0		22,6	17,5	6,4	0,42	0,100	3	Push, coating	5.3.20 - 5.3.21
ONSB07	1-1-C-1	5,78	68,5	63,6			15,84	CAUC	33,2	33,3	19,9	4,84	2,58	99,0		13,5	8,8	2,9	0,41	0,074	3	Piston, no coating	5.3.22 - 5.3.23
ONSB07	1-2-C-1	6,37	67,1	65,0			16,00	CAUC	37,5	37,4	22,6	2,06	1,07	99,4		16,1	9,3	1,4	0,43	0,032	1	Piston, no coating	5.3.24 - 5.3.25
ONSB07	1-3-C-1	7,37	59,8	58,1			16,33	CAUC	44,8	44,7	26,9	1,79	1,27	98,8		17,1	11,0	1,5	0,38	0,029	1	Piston, no coating	5.3.26 - 5.3.27
ONSB07	2-1-C-1	8,78	51,0	46,4			17,25	CAUC	55,1	55,0	33,1	5,53	3,67	99,5		21,4	17,5	3,9	0,39	0,095	3	Push, coating	5.3.28 - 5.3.29
ONSB08	1-2-C-1	6,73	68,2	62,5			16,69	CAUC	40,1	40,0	24,0	5,93	1,93	99,0		16,0	12,4	2,5	0,40	0,091	3	Push, no coating	5.3.30 - 5.3.31
ONSB08	2-2-C-1	9,70	41,7	38,7			17,84	CAUC	61,8	61,7	37,0	3,89	2,29	98,6		22,8	19,0	3,1	0,37	0,073	3	Piston, steel pipe	5.3.32 - 5.3.33
ONSB09	2-1-C-1	8,78	45,7	40,8			17,42	CAUC	55,1	55,1	33,2	6,09	3,34	99,0		21,4	18,0	5,4	0,39	0,109	3	Piston, coating	5.3.34 - 5.3.35
ONSB09	2-2-C-1	9,73	41,7	39,6			17,85	CAUC	62,0	61,9	37,2	2,71	1,44	96,9		24,7	16,4	2,0	0,40	0,051	2	Piston, coating	5.3.36 - 5.3.37
ONSB09	2-3-C-1	10,68	42,4	37,2			17,84	CAUC	69,3	69,2	41,6	6,76	3,97	98,6		25,6	22,3	6,3	0,37	0,126	3	Piston, coating	5.3.38 - 5.3.39
ONSB10	1-1-C-1	5,78	68,1	61,1			16,00	CAUC	33,5	33,4	20,0	7,07	4,60	98,6		12,5	11,3	10,0	0,37	0,108	3	Push, coating	5.3.40 - 5.3.41
ONSB10	2-1-C-1	8,78	43,5	40,4			17,62	CAUC	55,1	55,0	33,0	3,91	2,18	99,0		19,8	14,4	1,5	0,36	0,072	3	Push, coating	5.3.42 - 5.3.43
ONSB11	1-1-A-1	5,87	66,3	57,4			16,26	CAUC	33,9	33,8	20,3	9,13	5,40	97,2		12,7	11,7	10,0	0,38	0,141	4	Push, no coating	5.3.44 - 5.3.45
ONSB11	1-2-B-1	6,30	64,7	63,4			16,14	CAUC	37,0	36,9	22,3	1,40	1,33	99,3		15,4	9,6	1,5	0,42	0,022	1	Push, no coating	5.3.46 - 5.3.47
ONSB11	2-2-B-1	9,06	43,6	40,9			17,60	CAUC	57,0	56,7	33,9	3,46	2,42	99,1		21,6	13,1	1,6	0,38	0,063	2	Push, anodized	5.3.48 - 5.3.49
ONSB12	1-2-B-1	6,28	64,7	61,8			16,14	CAUC	36,7	36,5	21,8	3,01	1,63	99,8		16,3	10,4	2,3	0,45	0,047	2	Push, anodized	5.3.50 - 5.3.51
ONSB12	2-2-B-1	9,37	43,5	40,9			17,72	CAUC	59,2	59,2	35,5	3,35	2,04	99,1		21,2	15,5	1,9	0,36	0,062	2	Push, no coating	5.3.52 - 5.3.53
ONSB13	1-2-B-1	6,10	64,2	62,5			16,03	CAUC	35,4	35,3	21,1	1,73	1,31	99,1		13,8	8,6	1,4	0,39	0,027	1	Push, anodized	5.3.54 - 5.3.55
ONSB13	1-3-A-1	7,04	54,9	51,6			16,73	CAUC	42,4	42,3	26,4	3,67	1,86	98,4		16,3	12,7	2,2	0,39	0,061	2	Push, anodized	5.3.56 - 5.3.57

CLIENT: IHC Mining B.V.

PROJECT: Norwegian GeoTest Sites

Document No.: 20160154-10-R

NGI's criteria for sample quality

OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
4-6	<0.02	0.02-0.035	0.035-0.07	>0.07
Quality:	1	2	3	4

LEGEND) CAUC = Consolidated Anisotropic Undrained test in Compression
CAUE = Consolidated Anisotropic Undrained test in Extension

2) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol}$ $(1+e_i)$ and $e_i = 2.75 * w_i$

3) 1 - very good to excellent, 2 - good to fair,
3 - poor, 4 - very poor (Ref. Lunne et al., 1998).

Table 5.3-3 SUMMARY OF CAU TRIAXIAL TESTS, 20160154

Boring No.	Tube part test	Depth (m)	INDEX PROPERTIES: Water content w_l (%)	Water content w_c (%)	I_p (%)	Clay cont. (%)	Unit weight (kN/m³)	Type of test 1)	CONSOLIDATION: Estim. p_o' (kPa)	σ_a' final (kPa)	σ_r' final (kPa)	ε_{vol} (%)	ε_{ac} (%)	B (%)	UNDRAINED. STATIC TESTING: s_u (kPa)	U_f (kPa)	ε_f (%)	s_u/σ'_{ac} (-)	$\Delta e/e_i$ 2) (-)	Sample quality 3) (-)	COMMENTS	FIGURE REFERENCE
ONSB01	1-B-1	6.96	64.6	64.0	45	65.1	16.11	CAUC	42.1	42.2	25.3	0.59	0.57	99.3	19.5	11.0	0.6	0.46	0.009	1	Block (BL-1)	5.3.58 - 5.3.59
ONSB01	1-B-2	6.96	65.5	64.8	45	65.1	16.04	CAUE	42.1	42.1	25.3	0.71	0.65	99.2	9.0	-1.4	1.8	0.21	0.011	1	Block (BL-1)	5.3.60 - 5.3.61
ONSB01	2-B-1	10.24	43.6	43.0	27		17.58	CAUC	65.8	65.7	39.5	0.71	0.56	99.0	28.5	14.7	0.6	0.43	0.013	1	Block (BL-1)	5.3.236 - 5.3.237
ONSB01	2-B-2	10.24	41.6	40.8	27		17.63	CAUE	65.8	65.8	39.5	1.16	0.74	98.6	11.6	1.0	1.8	0.18	0.022	1	Block (BL-1)	5.3.238 - 5.3.239
ONSB01	3-B-1	12.10	46.1	45.5	25		17.35	CAUC	79.3	79.3	47.6	0.68	0.62	97.9	32.7	14.9	0.7	0.41	0.012	1	Block (BL-1)	5.3.62 - 5.3.63
ONSB01	3-B-2	12.10	45.3	44.8	25		17.45	CAUE	79.3	79.2	47.6	0.63	0.53	99.0	15.2	1.0	1.9	0.19	0.011	1	Block (BL-1)	5.3.64 - 5.3.65
ONSB01	4-B-1	14.10	70.4	68.6	40	56.9	15.59	CAUC	93.8	93.9	56.2	1.65	1.01	99.2	43.4	26.2	0.7	0.46	0.025	1	Block (BL-1)	5.3.66 - 5.3.67
ONSB01	5-B-1	14.52	70.2	60.2	40	55.6	15.66	CAUC	96.6	96.0	57.8	9.65	6.10	99.6	32.3	17.2	0.6	0.34	0.146	4	Block (BL-1), disturbed?	5.3.68 - 5.3.69
ONSB01	5-B-2	14.52	67.5	65.4	40	55.6	15.87	CAUE	96.6	96.5	58.0	2.13	1.04	98.4	18.7	2.8	1.7	0.19	0.033	1	Block (BL-1)	5.3.70 - 5.3.71
ONSB01	5-B-3	14.52	68.1	66.3	40	55.6	15.85	CAUC	96.6	97.1	58.0	1.76	1.04	97.3	43.7	23.1	0.6	0.45	0.027	1	Block (BL-1)	5.3.72 - 5.3.73
ONSB01	6-B-1	14.89	62.7	61.5	38	58.1	16.16	CAUC	98.9	98.9	59.3	1.22	0.84	99.2	47.2	25.4	0.4	0.48	0.019	1	Block (BL-1)	5.3.74 - 5.3.75
ONSB01	6-B-2	14.89	63.2	62.0	38	58.1	15.91	CAUE	98.9	98.9	59.2	1.16	0.79	98.6	20.9	-1.6	1.5	0.21	0.018	1	Block (BL-1)	5.3.76 - 5.3.77
ONSB41	4-B-1	3.34	66.1	65.6	46	61.5	15.94	CAUC	15.0	15.0	9.0	0.51	0.34	99.8	11.8	3.0	3.3	0.79	0.008	1		5.3.192 - 5.3.193
ONSB41	4-C-1	3.48	68.6	68.0	46	61.5	15.81	CAUE	16.1	16.2	9.7	0.59	0.38	99.6	7.3	-6.5	15.0	0.45	0.009	1		5.3.194 - 5.3.195
ONSB41	6-D-1	5.47	76.4	72.0	47	66.8	15.44	CAUC	30.7	30.7	18.3	3.96	1.47	100.0	11.9	7.2	1.6	0.39	0.058	2		5.3.196 - 5.3.197
ONSB41	6-E-1	5.63	79.7	75.0	47	66.8	15.39	CAUE	31.9	31.7	19.1	4.14	1.63	99.3	7.1	0.4	5.5	0.22	0.060	2		5.3.198 - 5.3.199
ONSB41	8-B-1	6.84	70.4	68.2			15.71	CAUC	40.8	40.8	24.5	2.06	1.09	99.6	16.2	10.2	1.3	0.40	0.031	1		5.3.200 - 5.3.201
ONSB41	8-C-1	6.97	72.2	68.5			15.73	CAUE	41.9	41.8	25.1	3.47	1.57	99.3	9.4	1.5	4.3	0.23	0.052	2		5.3.202 - 5.3.203
ONSB41	10-D-1	8.87	65.0	63.1	48	63.0	16.13	CAUC	55.4	55.4	33.3	1.97	1.20	98.2	20.3	11.7	1.0	0.37	0.031	1		5.3.204 - 5.3.205
ONSB41	10-E-1	9.02	62.4	58.1	48	63.0	16.43	CAUE	56.5	56.4	33.9	4.59	2.14	99.0	12.4	1.0	7.0	0.22	0.073	3		5.3.206 - 5.3.207
ONSB41	11-A-1	10.18	59.6	56.1		54.7	16.44	CAUC	65.3	65.2	39.1	3.83	2.22	95.8	22.8	13.7	1.0	0.35	0.062	2	Consolidation procedure	5.3.208 - 5.3.209
ONSB41	11-B-1	10.32	55.0	52.7		54.7	16.60	CAUC	66.4	67.3	40.4	2.55	1.63	97.1	25.2	16.2	0.9	0.37	0.042	2	Consolidation procedure	5.3.210 - 5.3.211
ONSB41	11-C-1	10.48	53.8	52.2		54.7	17.28	CAUC	67.5	67.1	40.3	1.84	1.26	98.1	26.3	18.0	1.1	0.39	0.031	1	Consolidation procedure	5.3.212 - 5.3.213
ONSB41	12-B-1	11.37	47.7	44.7			17.28	CAUC	73.9	73.9	44.3	3.68	1.92	99.6	25.7	16.4	0.9	0.35	0.065	2		5.3.214 - 5.3.215
ONSB41	12-C-1	11.50	45.7	42.0			17.33	CAUE	74.9	74.9	44.9	4.53	2.14	99.7	17.0	3.8	11.3	0.23	0.081	3		5.3.216 - 5.3.217
ONSB41	13-A-1	12.18	43.7	40.4	42	53.4	17.59	CAUC	79.9	79.5	47.7	4.22	2.93	99.8	28.9	19.0	0.9	0.36	0.077	3	Consolidation procedure	5.3.218 - 5.3.219
ONSB41	13-B-1	12.32	43.8	41.3	42	53.4	17.66	CAUC	81.0	80.9	48.3	3.16	2.26	97.1	27.6	19.0	1.1	0.34	0.058	2	Consolidation procedure	5.3.220 - 5.3.221
ONSB41	13-C-1	12.48	41.2	39.6	42	53.4	17.79	CAUC	82.1	81.9	49.3	2.04	1.76	97.8	28.0	18.5	1.0	0.34	0.038	1	Consolidation procedure	5.3.222 - 5.3.223
ONSB41	15-B-1	14.50	33.2	30.7			18.53	CAUE	96.8	96.8	58.1	3.73	1.89	99.6	22.0	1.4	2.3	0.23	0.078	3		5.3.224 - 5.3.225
ONSB41	15-C-1	14.63	48.0	44.8			17.23	CAUC	97.5	97.3	58.5	3.85	1.84	99.4	34.5	23.8	0.9	0.35	0.068	2		5.3.226 - 5.3.227
ONSB41	17-D-1	16.40	46.9	44.6	27	55.4	17.28	CAUC	110.2	110.3	66.1	2.81	1.39	97.4	38.0	23.0	0.7	0.34	0.050	2		5.3.228 - 5.3.229
ONSB41	17-E-1	16.54	47.8	45.5	27	55.4	17.25	CAUE	111.8	111.7	67.0	2.80	1.60	98.6	19.9	8.8	3.8	0.18	0.049	2		5.3.230 - 5.3.231
ONSB41	20-D-1	19.36	40.6	38.6	25	43.4	17.90	CAUC	132.1	131.9	79.0	2.71	1.44	98.9	42.7	27.4	0.7	0.32	0.051	2		5.3.232 - 5.3.233
ONSB41	20-E-1	19.52	39.6	38.2	25	43.4	17.97	CAUE	133.2	132.8	79.9	1.98	1.50	98.6	21.9	21.6	10.1	0.16	0.038	1		5.3.234 - 5.3.235
ONSB43	2-B-1	2.95	70.8	70.6			15.88	CAUC	26.7	26.7	17.4	0.20	0.32	100.0	16.4	7.4	1.4	0.61	0.003	1		5.3.274 - 5.3.275

CLIENT: NRC

PROJECT: Norwegian GeoTest Sites Onsøy

Document No.: 20160154-10-R

NGI's criteria for sample quality

OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
Quality:	1	2	3	4

LEGEND
1) CAUC = Consolidated Anisotropic Undrained test in Compression
CAUE = Consolidated Anisotropic Undrained test in Extension

2) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol}\ (1+e_i)$ and $e_i = 2.75 * w_i$
3) 1 - very good to excellent, 2 - good to fair, 3 - poor, 4 - very poor (Ref. Lunne et al., 1998).

\\xfil1\ProData$\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Tables\All\Table 5.3-3 20160154 Summary of undrained triaxial tests.xlsx

Table 5.3-4 Summary of CAU triaxial tests, NGI project 20160386

Boring No.	Tube	part test	Depth (m)	INDEX PROPERTIES: Water content w_i (%)	INDEX PROPERTIES: Water content w_f (%)	INDEX PROPERTIES: Unit weight (kN/m³)	Soil type	Type of test 1)	CONSOLIDATION: Estim. σ_{vo}' (kPa)	CONSOLIDATION: σ_{vc}' final (kPa)	CONSOLIDATION: σ_{hc}' final (kPa)	CONSOLIDATION: ε_{vol} (%)	CONSOLIDATION: ε_{ac} (%)	CONSOLIDATION: B (%)	UNDR. STATIC TESTING: s_u (kPa)	UNDR. STATIC TESTING: U_f (kPa)	UNDR. STATIC TESTING: ε_f (%)	UNDR. STATIC TESTING: s_u/σ'_{ac} (-)	Cyclic testing: τ_a (kPa)	Cyclic testing: τ_{cy} (kPa)	Cyclic testing: τ_a/s_{uC} (-)	Cyclic testing: τ_{cy}/s_{uC} (-)	Cyclic testing: N (-)	Cyclic testing: γ_a (%)	Cyclic testing: γ_p (%)	Cyclic testing: γ_{cy} (%)	Cyclic testing: U_f (kPa)	$\Delta e/e_i$ 2) (-)	Sample quality 3)	COMMENTS	FIGURE REFERENCE
ONSB01	2	1-T1	10.24	43.6	43.0	17.58	CLAY	CAUC	66	65.7	39.5	0.71	0.56	99.0	28.5	14.7	0.6	0.43										0.013	1		5.3.236 - 5.3.237
ONSB01	2	1-T2	10.24	41.6	40.8	17.63	CLAY	CAUE	66	65.8	39.5	1.16	0.74	98.6	11.6	1.0	-1.8	0.18										0.022	1		5.3.238 - 5.3.239
ONSB01	2	1-Tcy1	10.24	44.2	43.8	17.55	CLAY	CAUcy	66	65.7	39.5	0.55	0.69	99.8					20.1	9.1	0.71	0.32	87	15.0	18.0	6.0	14.5	0.010	1		5.3.240 - 5.3.242
ONSB01	2	1-Tcy2	10.24	41.9	41.3	17.74	CLAY	CAUcy	66	65.8	39.5	0.88	0.49	100.0					-2.8	9.1	-0.10	0.32	272	-15.0	-11.0	8.5	18.8	0.017	1		5.3.243 - 5.3.245
ONSB01	2	1-Tcy3	10.24	43.5	43.1	17.62	CLAY	CAUcy	65.8	65.7	39.5	0.61	0.58	98.8					6.4	14.7	0.22	0.52	96	15.0	15.5	8.5	21.7	0.011	1		5.3.246 - 5.3.248
ONSB01	2	1-Tcy4	10.24	42.2	41.7	17.79	CLAY	CAUcy	65.8	65.7	39.5	0.71	0.54	99.2					6.4	15.8	0.22	0.55	75	15.0	12.0	12.4	27.9	0.013	1		5.3.249 - 5.3.251
ONSB01	2	1-Tcy5	10.24	45.5	43.8	17.58	CLAY	CAUcy	65.8	65.7	39.6	2.13	1.04	99.7					6.4	8.8	0.22	0.31	1076	15.0	15.6	2.3	23.7	0.038	1		5.3.252 - 5.3.254
ONSB03	54Tube2016	1-T1	10.60	41.1	38.9	17.96	CLAY	CAUC	68	68.2	41.0	2.92	1.71	98.9	26.1	17.4	1.8	0.38										0.055	2		5.3.255 - 5.3.256
ONSB03	54Tube2016	1-T2	10.48	42.3	40.5	17.86	CLAY	CAUE	68	67.5	40.5	2.3	1.8	98.8	16.0	2.4	-10.0	0.24										0.043	2		5.3.257 - 5.3.258
ONSB03	54Tube2016	1-Tcy1	10.34	41.4	39.1	17.89	CLAY	CAUcy	66.5	66.3	39.9	3.01	1.68	99.8					17.9	8.1	0.71	0.32	306	15.0	15.0	0.2	24.5	0.056	2		5.3.259 - 5.3.261
ONSB03	54Tube2016	1-Tcy2	10.23	42.3	40.2	17.78	CLAY	CAUcy	65.7	65.7	39.4	2.75	1.91	99.7					-2.5	8.0	-0.10	0.32	388	-15.0	-12.5	7.4	21.7	0.051	2		5.3.262 - 5.3.264
ONSB03	54Tube2016	1-Tcy3	10.11	45.6	40.9	17.45	CLAY	CAUcy	64.8	64.8	38.9	5.96	3.81	98.6					5.6	12.8	0.23	0.52	120	15.0	17.0	7.0	24.8	0.107	3		5.3.265 - 5.3.267
ONSB03	54Tube2016	1-Tcy4	12.13	43.0	41.1	17.78	CLAY	CAUcy	79.4	79.4	47.6	2.42	1.55	99.7					6.8	16.9	0.22	0.56	41	15.0	19.0	13.0	29.4	0.045	2		5.3.268 - 5.3.270
ONSB03	54Tube2016	1-Tcy5	12.25	44.4	42.3	17.63	CLAY	CAUcy	80.3	80.2	48.2	2.61	1.42	99.8					6.9	9.5	0.22	0.31	6695	15.0	17.0	3.7	40.1	0.047	2		5.3.271 - 5.3.273

CLIENT: Statoil

PROJECT: Norwegian GeoTest Sites

Document No.: 20160154-10-R

NGI's criteria for sample quality				
OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
4-6	<0.02	0.02-0.035	0.035-0.07	>0.07
Quality:	1	2	3	4

LEGEND

1) CAUC = Consolidated Anisotropic Undrained test in Compression

CAUE = Consolidated Anisotropic Undrained test in Extension

CAUcy = Consolidated Anisotropic Undrained test, cyclic test

2) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol}\ (1+e_i)$ and $e_i = 2.75 * w_i$

3) 1 - very good to excellent, 2 - good to fair,
3 - poor, 4 - very poor (Ref. Lunne et al., 1998).

TABLE 5.3-5 SUMMARY OF CAU TRIAXIAL TESTS, 20170642

Boring No.	Tube part test	Depth	INDEX PROPERTIES					Type of test 1)	CONSOLIDATION						UNDRAINED. STATIC TESTING				$\Delta e/e_i$ 2)	Sample quality 3)	COMMENTS	FIGURE REFERENCE
			Water content		I_p	Clay cont.	Unit weight		Estim. p_o'	σ_a' final	σ_r' final	ε_{vol}	ε_{ac}	B	s_u	U_f	ε_f	s_u/σ'_{ac}				
			w_i	w_c																		
		m	%	%	%	%	kN/m^3		kPa	kPa	kPa	%	%	%	kPa	kPa	%	-	-	-		
ONSB21	S3-1-1	11.70	47.5	43.1			16.93	CAUC	75.1	75.1	45.0	5.34	3.18	95.6	26.3	17.5	1.0	0.35	0.094	3	PVC 76 mm	5.3.78 - 5.3.79
ONSB21	S3-2-1	12.90	44.8	43.2			17.41	CAUC	82.9	82.8	49.8	1.97	1.49	98.6	33.5	19.0	1.4	0.40	0.036	1	PVC 76 mm	5.3.79 - 5.3.80
ONSB21	S3-3-1	13.75	61.9	59.7			15.86	CAUC	88.3	88.3	53.0	2.29	1.41	99.7	36.3	22.4	1.3	0.41	0.036	1	PVC 76 mm	5.3.82 - 5.3.83
ONSB27	S2-1-1	8.78	57.2	52.0			16.51	CAUC	55.1	55.1	33.0	5.7	3.8	99.5	18.9	11.9	0.9	0.34	0.094	3	PVC 76 mm	5.3.104 - 5.3.105
ONSB27	S2-2-1	10.18	45.1	41.7			17.46	CAUC	65.4	65.3	39.3	4.3	2.4	99.1	22.7	18.6	1.9	0.348062618	0	3	PVC 76 mm	5.3.106 - 5.3.107
ONSB27	S2-3-1	10.65	42.3	39.6			17.77	CAUC	68.6	68.7	41.2	3.6	2.1	99.0	24.9	18.5	1.8	0.36	0.067	2	PVC 76 mm	5.3.108 - 5.3.109
ONSB22	S3-1-1	13.78	44.3	41.6			17.54	CAUC	92.0	96.4	55.3	3.32	2.02	99.4	32.2	19.9	0.9	0.33	0.061	2	AL 76 mm	5.3.90 - 5.3.91
ONSB22	S3-2-1	14.58	61.0	59.2			16.16	CAUC	96.6	96.6	58.0	1.88	1.35	99.1	42.0	22.1	1.2	0.43	0.030	1	AL 76 mm	5.3.92 - 5.3.93
ONSB22	S3-3-1	15.28	69.8	67.0			15.80	CAUC	100.8	100.8	60.6	2.74	1.87	98.6	38.6	24.9	1.1	0.38	0.042	1-2	AL 76 mm	5.3.94 - 5.3.95
ONSB28	S2-1-1	8.54	60.0	53.2			16.34	CAUC	55.1	55.1	33.1	7.32	4.62	99.8	19.3	12.7	1.0	0.35	0.117	3	AL 76 mm	5.3.120 - 5.3.121
ONSB28	S2-2-1	9.73	50.4	47.4			17.07	CAUC	62.0	61.9	37.2	3.56	2.10	99.4	22.5	13.9	1.0	0.36	0.061	2	AL 76 mm	5.3.122 - 5.3.123
ONSB28	S2-3-1	10.67	43.0	40.2			17.63	CAUC	68.6	68.6	41.1	3.58	2.28	99.3	24.7	17.8	1.7	0.36	0.066	2	AL 76 mm	5.3.124 - 5.3.125
ONSB27	S3-1-1	11.55	40.7	32.4			17.86	CAUC	75.5	77.0	44.8	11.03	7.91	98.0	26.7	16.0	0.8	0.35	0.209	4	PVC 76 mm	5.3.110 - 5.3.111
ONSB27	S3-1-2	11.71	41.5	37.7			17.73	CAUC	76.7	76.7	46.0	5.07	2.68	99.0	28.4	20.0	1.5	0.37	0.095	3	PVC 76 mm	5.3.112 - 5.3.113
ONSB27	S3-1-3	11.87	40.6	37.5			17.88	CAUC	77.8	77.8	46.7	4.16	2.27	98.7	28.2	18.6	1.3	0.36	0.079	3	PVC 76 mm	5.3.114 - 5.3.115
ONSB27	S3-2-1	12.73	45.6	43.7			17.44	CAUC	83.7	83.7	50.2	2.32	1.63	99.3	30.4	20.0	1.1	0.36	0.042	1-2	PVC 76 mm	5.3.116 - 5.3.117
ONSB27	S3-3-1	13.57	43.8	41.4			17.68	CAUC	92.7	92.6	55.6	3.15	1.88	99.2	32.1	20.7	1.0	0.35	0.058	2	PVC 76 mm	5.3.118 - 5.3.119
ONSB22	S1-1-1	5.78	69.3	65.2			15.75	CAUC	33.2	33.2	19.9	3.99	2.67	99.7	12.9	9.4	2.0	0.39	0.061	2	AL 76 mm	5.3.84 - 5.3.85
ONSB22	S1-2-1	6.98	66.9	64.0			15.93	CAUC	42.2	42.1	25.3	2.88	1.80	99.5	16.0	11.2	1.5	0.38	0.044	1-2	AL 76 mm	5.3.86 - 5.3.87
ONSB22	S1-3-1	7.53	64.6	61.7			15.99	CAUC	45.7	45.7	27.4	2.99	1.84	99.4	17.0	12.2	1.5	0.37	0.047	2	AL 76 mm	5.3.88 - 5.3.89
ONSB25	S2-1-1																				NA - Vertical cut throughout spec	-
ONSB25	S2-1-2	8.98	56.0	52.7			16.53	CAUC	56.6	56.6	34.0	3.69	1.67	99.7	21.5	13.2	1.0	0.38	0.061	2	Shelby 102mm	5.3.96 - 5.3.97
ONSB25	S2-1-3	9.18	53.4	50.4			16.67	CAUC	57.9	57.8	34.8	3.44	1.65	99.2	21.1	12.8	0.9	0.36	0.058	2	Shelby 102mm	5.3.98 - 5.3.99
ONSB25	S2-2-1	10.14	47.0	41.7			17.31	CAUC	65.1	65.1	39.1	6.41	3.69	99.0	22.8	17.3	2.0	0.35	0.114	3	Shelby 102 mm, Shell fragments	5.3.100 - 5.3.101
ONSB25	S2-3-1	10.79	42.3	40.3			17.67	CAUC	69.7	69.7	41.8	2.7	1.3	99.3	26.2	14.2	1.0	0.38	0.049	2	Shelby 102mm	5.3.102 - 5.3.103
ONSB29	S1-2-1	6.90	70.5	67.5			15.75	CAUC	41.7	41.7	25.0	2.9	1.7	99.6	16.7	10.7	1.6	0.399688249	0	2	Piston	5.3.126 - 5.3.127
ONSB29	S2-2-1	9.96	67.7	58.9			15.87	CAUC	64.0	64.0	38.4	8.7	4.7	99.2	21.4	13.9	1.4	0.33	0.134	3	Piston	5.3.128 - 5.3.129
ONSB31	S1-2-1	6.77	57.0	54.0			15.56	CAUC	41.0	41.0	24.6	3.03	1.73	99.7	16.1	10.8	1.6	0.39	0.050	2	Piston	5.3.130 - 5.3.131
ONSB31	S2-2-1	9.82	64.1	59.7			15.97	CAUC	63.1	62.9	37.8	4.50	2.88	99.2	22.8	13.7	1.0	0.36	0.070	3	Piston	5.3.132 - 5.3.133
ONSB31	S5-2-1	18.47	49.1	41.3			17.37	CAUC	123.6	122.3	74.2	9.46	7.33	99.2	37.9	16.0	0.5	0.31	0.165	4	Push	5.3.134 - 5.3.135
ONSB32	S1-1-1	5.92	81.2	78.6			15.11	CAUC	35.8	35.6	21.4	2.30	1.43	99.7	14.6	8.5	1.1	0.41	0.033	1	Piston	5.3.136 - 5.3.137
ONSB32	S1-2-1	6.82	77.2	74.5			15.45	CAUC	41.3	41.2	24.8	2.48	1.44	99.8	16.7	10.7	1.2	0.41	0.036	1	Piston	5.3.138 - 5.3.139
ONSB32	S1-3-1	7.62	70.9	68.2			15.70	CAUC	46.3	46.1	27.7	2.56	1.54	99.3	16.7	9.7	1.0	0.36	0.039	1	Piston	5.3.140 - 5.3.141
ONSB32	S2-2-1	9.92	65.1	60.8			16.01	CAUC	63.7	63.7	38.2	4.37	2.68	98.4	22.5	13.0	1.1	0.35	0.068	2	Piston	5.3.142 - 5.3.143

TABLE 5.3-5 SUMMARY OF CAU TRIAXIAL TESTS, 20170642

ONSB32	S3-2-1	12.57	43.9	40.1			17.54	CAUC	83.6	83.6	50.1	4.77	3.02	99.4	29.2	21.6	1.9	0.35	0.087	3	Piston	5.3.144 - 5.3.145
ONSB32	S4-2-1	15.97	47.7	44.3			17.43	CAUC	106.1	106.1	63.6	4.14	2.75	96.7	35.1	19.1	0.5	0.33	0.073	3	Push	5.3.146 - 5.3.147
ONSB32	S5-2-1	19.02	44.4	41.5			17.72	CAUC	121.0	120.9	72.5	3.8	1.9	97.6	44.3	29.4	1.7	0.37	0.068	2	Push	5.3.148 - 5.3.149
ONSB32	S5-4-1	20.21	61.8	56.4			16.13	CAUC	131.9	131.5	79.1	5.7	3.3	99.6	44.5	31.7	1.4	0.34	0.090	3	Push, cutting shoe	5.3.150 - 5.3.151
ONSB33	S1-1-2	6.40	74.5	72.6			15.48	CAUC	39.1	39.0	23.4	1.8	1.4	99.4	15.9	10.7	1.8	0.41	0.027	1	Piston	5.3.152 - 5.3.153
ONSB33	S1-2-1	6.71	75.7	73.5			15.41	CAUC	40.6	40.6	24.3	2.0	1.5	98.8	15.6	10.6	1.4	0.38	0.030	1	Piston	5.3.154 - 5.3.155
ONSB33	S1-3-1	7.75	71.3	68.0			15.67	CAUC	46.6	46.5	28.0	3.19	2.00	99.6	17.7	12.2	1.9	0.38	0.048	2	Piston	5.3.156 - 5.3.157
ONSB33	S2-1-1	9.16	67.7	64.3			15.82	CAUC	58.9	58.7	35.2	3.33	2.04	99.0	21.8	14.1	1.4	0.37	0.051	2	Piston	5.3.158 - 5.3.159
ONSB33	S2-2-1	9.76	66.8	63.7			15.93	CAUC	62.7	62.7	37.6	3.15	2.08	99.4	22.2	14.3	1.2	0.35	0.049	2	Piston	5.3.160 - 5.3.161
ONSB33	S2-3-1	10.80	62.6	58.9			16.11	CAUC	69.4	69.2	41.5	3.80	2.25	99.3	24.1	17.0	1.2	0.35	0.060	2	Piston	5.3.162 - 5.3.163
ONSB33	S4-2-1	15.95	46.0	42.1			17.34	CAUC	105.9	105.8	63.7	4.79	3.35	98.9	35.2	18.7	0.5	0.33	0.086	3	Piston	5.3.164 - 5.3.165
ONSB33	S5-2-1	18.80	44.3	39.7			17.51	CAUC	121.3	121.3	72.8	5.76	3.06	98.4	40.5	30.3	1.8	0.33	0.105	3	Piston	5.3.166 - 5.3.167
ONSB34	S1-1-1	5.85	80.1	76.3			15.14	CAUC	35.4	35.1	21.2	3.36	2.45	99.6	13.3	10.4	2.2	0.38	0.049	2	Push	5.3.168 - 5.3.169
ONSB34	S1-2-1	6.38	76.2	72.1			15.34	CAUC	38.9	38.8	23.3	3.75	2.24	99.4	14.9	8.6	1.0	0.38	0.055	2	Push	5.3.170 - 5.3.171
ONSB34	S1-2-2	6.84	75.6	68.5			15.20	CAUC	41.2	41.2	24.8	6.51	3.67	99.4	14.2	10.2	1.4	0.34	0.096	3	Push	5.3.172 - 5.3.173
ONSB34	S2-2-1	9.45	70.5	62.9			15.77	CAUC	60.9	60.8	36.6	7.41	4.15	99.5	20.0	14.7	1.1	0.33	0.112	3	Push	5.3.174 - 5.3.175
ONSB34	S3-2-1	12.50	49.8	46.3			17.02	CAUC	80.7	80.6	48.4	4.12	2.50	98.5	27.0	20.1	1.5	0.33	0.071	3	Push	5.3.176 - 5.3.177
ONSB34	S4-1-1	15.00	46.6	42.4			17.56	CAUC	99.6	99.3	59.7	5.24	3.16	99.3	31.0	18.6	0.7	0.31	0.093	3	Push	5.3.178 - 5.3.179
ONSB34	S4-2-1	15.54	48.0	45.2			17.40	CAUC	102.5	102.3	61.4	3.45	1.88	98.5	36.8	22.5	1.1	0.36	0.061	2	Push	5.3.180 - 5.3.181
ONSB34	S4-2-2	16.25	45.3	40.0			17.48	CAUC	106.3	106.3	63.8	6.65	3.53	98.8	36.1	27.5	1.9	0.34	0.120	3	Push	5.3.182 - 5.3.183
ONSB34	S5-2-1	18.95	46.6	41.5			17.54	CAUC	120.6	120.5	72.3	6.32	3.80	99.3	41.3	23.3	0.8	0.34	0.113	3	Push	5.3.184 - 5.3.185
ONSB34	S6-2-1	21.69	64.4	59.1			16.04	CAUC	136.3	136.2	81.7	5.51	3.45	99.1	45.9	26.7	0.7	0.34	0.086	3	Push	5.3.186 - 5.3.187
ONSB34	S7-2-1	25.05	38.3	34.1			18.26	CAUC	155.8	155.9	93.5	5.75	3.53	98.6	52.3	27.8	0.6	0.34	0.112	3	Push	5.3.188 - 5.3.189
ONSB34	S7-4-1	26.56	42.7	38.0			17.92	CAUC	193.4	193.3	116.1	6.22	3.84	99.2	62.0	38.5	0.8	0.32	0.115	3	Push, cutting shoe	5.3.190 - 5.3.191

CLIENT: IHC

PROJECT: SWORD field testing Onsøy

Document No.: 20170642-02-R

NGI's criteria for sample quality				
OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
Quality:	1	2	3	4

LEGEND
1) CAUC = Consolidated Anisotropic Undrained test in Compression
CAUE = Consolidated Anisotropic Undrained test in Extension
CAUcy = Consolidated Anisotropic Undrained test, cyclic test
2) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol}(1+e_i)$ and $e_i = 2.75 * w_i$
3) 1 - very good to excellent, 2 - good to fair,
3 - poor, 4 - very poor (Ref. Lunne et al., 1998).

TABLE 5.4-2 SUMMARY OF DSS TESTS, 20140839

			INDEX PROPERTIES						CONSOLIDATION			BENDER ELEMENT TEST				STATIC TESTING									FIGURE
Boring No.	Tube part test	Depth	Water content w_i	w_c	I_p	Clay cont.	Unit weight	Type of test	Estim. p_0'	σ'_{vc}	ε_{ac}	Time	G_{max} at σ'_{vc}	G_{max}/σ'_{vc}	G_{max}/s_{uD}	s_{uD}	γ_D	u_D	s_{uD}/σ'_{vc}	$s_{uD,res}$	$\gamma_{D,res}$	$u_{D,res}$	$s_{uD,res}/\sigma'_{vc}$	COMMENTS	REFERENCE
		m	%	%	%	%	kN/m^3		kPa	kPa	%	min	MPa	-	-	kPa	%	kPa	-	kPa	%	kPa	-		
ONSB02	3-C-1	3.1	70.6	59.7	44.0	75.5	15.28	DSSu	29.5	66.0	10.14	1275	13.9	0.21	0.87	15.9	6.4	31.0	0.24	14.2	20.1	43.5	0.22		5.4.1 - 5.4.2
ONSB02	4-C-1	4.3	69.3	60.2	46.0	66.6	15.03	DSSu	35.3	65.9	8.61	1033	10.3	0.16	0.64	16.2	4.4	28.2	0.25	14.5	20.0	44.4	0.22		5.4.3 - 5.4.4
ONSB02	5-C-1	5.2	68.1	58.1	45.1	71.8	15.32	DSSu	41.0	66.0	9.51	1280	17.0	0.26	1.08	15.7	5.8	30.2	0.24	13.5	20.1	44.2	0.20	To be used with p-y test *2015_Onsøy_66_Mono_001*	5.4.5 - 5.4.6
ONSB02	9-C-1	9.2	44.4	39.3	26.3	58.8	17.02	DSSu	64.0	90.0	6.32	1226	19.5	0.22	0.84	23.3	4.0	35.4	0.26	19.7	19.9	57.7	0.22		5.4.7 - 5.4.8

CLIENT: Norwegian Deepwater Program

PROJECT: 20160154-10-R

Document No.: Phase 2A
Factual Report of Advanced Laboratory Tests

LEGEND
DSSu = Direct Simple Shear, static test

NOTE: The final water content, w_c, is calculated from w_i and ε_{ac}

TABLE 5.4-2 SUMMARY OF DSS TESTS, 20160154

Boring No.	Tube part test	Depth m	INDEX PROPERTIES: Water content w_i %	Water content w_c %	I_p %	Clay cont. %	Unit weight kN/m^3	Type of test	CONSOLIDATION: Estim. p_0' kPa	$\sigma'_{a\,max}$ kPa	$\sigma'_{a\,min} = \sigma'_{ac}$ kPa	ε_{ac} %	STATIC TESTING: τ_f kPa	U_f kPa	γ_f %	s_{uD}/σ'_{ac} -	$\Delta e/e_i$ 2)	Sample quality 3)	COMMENTS	FIGURE REFERENCE
ONSB01	1-A-2	6.87	65.8	60.5	45	65.1	15.92	DSS	41.2	47.8	41.1	5.13	12.8	12.2	3.6	0.31	0.080	NA	BL-1	5.4.9 - 5.4.10
ONSB01	3-B-1	12.22	46.0	44.1	25	-	17.32	DSS	80.2	80.2	80.2	2.31	23.8	25.5	2.4	0.30	0.041	2	BL-1	5.4.11 - 5.4.12
ONSB01	4-A-2	14.14	71.4	64.9	40	56.9	15.78	DSS	93.8	99.5	93.6	6.02	27.6	34.6	3.9	0.29	0.091	NA	BL-1	5.4.13 - 5.4.14
ONSB01	5-A-2	14.43	68.1	61.5	40	55.6	15.47	DSS	95.8	100.6	96.1	6.03	29.8	29.6	2.8	0.31	0.092	NA	BL-1	5.4.15 - 5.4.16
ONSB01	6-A-2	14.82	67.6	58.9	38	58.1	15.44	DSS	98.1	103.0	98.1	8.06	26.8	40.3	4.0	0.27	0.124	NA	BL-1	5.4.17 - 5.4.18
ONSB41	4-A-1	3.12	65.3	62.5			15.80	DSS	13.8	28.7	13.8	2.70	11.3	-1.0	11.0	0.82	0.042	NA	Assumed OCR=2.6	5.4.19 - 5.4.20
ONSB41	6-C-1	5.22	78.4	71.2			15.30	DSS	29.1	37.2	29.1	6.19	9.6	8.8	3.5	0.33	0.091	NA	Assumed OCR=1.6	5.4.21 - 5.4.22
ONSB41	8-A-1	6.62	70.1	65.5			15.49	DSS	39.4	47.3	39.4	4.14	13.4	11.6	3.8	0.34	0.063	NA	Assumed OCR=1.9	5.4.23 - 5.4.24
ONSB41	10-C-1	8.72	65.6	60.6			15.59	DSS	54.7	60.0	54.7	4.73	15.9	23.6	6.1	0.29	0.073	NA	Assumed OCR=1.7	5.4.25 - 5.4.26
ONSB41	12-A-1	11.12	51.2	44.6			16.78	DSS	72.2	77.0	72.2	7.32	22.8	29.1	7.7	0.32	0.125	NA	Assumed OCR=1.45	5.4.27 - 5.4.28
ONSB41	15-A-1	14.12	48.8	40.2			17.01	DSS	94.1	94.1	94.1	9.88	27.0	42.8	6.2	0.29	0.172	4	Assumed OCR=1.3	5.4.29 - 5.4.30
ONSB41	17-C-1	16.22	46.6	43.1			17.13	DSS	109.4	109.4	109.4	4.12	30.7	43.2	4.7	0.28	0.073	3	Assumed OCR=1.25	5.4.31 - 5.4.32
ONSB41	20-C-1	19.22	43.0	40.1			17.91	DSS	131.3	131.3	131.3	3.62	31.6	61.5	5.0	0.24	0.067	2	Assumed OCR=1.15	5.4.33 - 5.4.34

CLIENT: NRC

PROJECT: Norwegian GeoTest Sites Onsøy

Document No.: 20160154-10-R

LEGEND

DSS = Direct Simple Shear, static test

NOTE: The final water content, w_c, is calculated from w_i og ε_{ac}

NGI's criteria for sample quality

OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
4-6	<0.02	0.02-0.035	0.035-0.07	>0.07
Quality:	1	2	3	4

2) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol}\,(1+e_i)$ and $e_i = 2.75 * w_i$

3) 1 - very good to excellent, 2 - good to fair, 3 - poor, 4 - very poor (Ref. Lunne et al., 2006).

TABLE 5.4-3 SUMMARY OF DSS TESTS, 20160386

Boring No.	Tube	part test	Depth m	INDEX PROPERTIES: Water content w_i %	w_f %	I_p %	Clay cont. %	Unit weight kN/m^3	Type of test 1)	CONSOLIDATION: Estim. p_0' kPa	$\sigma'_{a\,max}$ kPa	$\sigma'_{a\,min} = \sigma'_{ac}$ kPa	ε_{ac} %	STATIC TESTING: s_{uD} kPa	U_f kPa	γ_f %	s_{uD}/σ'_{ac} -	CYCLIC TESTING: τ_a kPa	τ_{cy} kPa	τ_a/s_{uD} -	τ_{cy}/s_{uD} -	N -	γ_a %	γ_p %	γ_{cy} %	U_f kPa	$\Delta e/e_i$ 2)	Sample quality 3)	COMMENTS	FIGURE REFERENCE
ONSB03	54tube2016	1-DSSs1	12.44	45.3	43.9	23.6		17.52	DSS	81.8	81.8	81.8	5.40	22.0	30.0	3.7	0.27										0.097	3		5.4.35 - 5.4.36
ONSB01	Block2016	2-DSSs1	12.22	46.0	45.4	23.6		17.32	DSS	80.2	80.2	80.2	2.31	23.8	25.5	2.4	0.30										0.041	2		5.4.37 - 5.4.38
ONSB03	54tube2016	1-DSScy1	12.34	45.4	44.1	23.6		17.29	DSScy	81.2	81.2	81.2	4.91					16.4	9.9	0.75	0.45	36.0	15.0	15.0	0.9	59.3	0.088	3		5.4.39 - 5.4.41
ONSB03	54tube2016	1-DSScy2	12.38	45.2	44.3	23.6		17.31	DSScy	81.4	81.4	81.4	3.46					0.0	17.6	0.00	0.80	34.0	-2.2	-15.0	15.0	75.7	0.062	2		5.4.42 - 5.4.44
ONSB01	Block2016	2-DSScy2	12.32	45.3	44.6	23.6		17.20	DSScy	80.9	80.9	80.9	2.45					0.0	19.4	0.00	0.81	39.0	0.1	-13.0	15.0	66.3	0.044	2		5.4.45 - 5.4.47
ONSB01	Block2016	2-DSScy1a	12.27	46.3	45.6	23.6		17.30	DSScy	80.6	80.6	80.6	2.65					18.2	10.9	0.76	0.46	11.0	15.0	17.0	2.2	56.4	0.047	2		5.4.48 - 5.4.50

CLIENT: EQUINOR

PROJECT: Effect of sample disturbance on cyclic shear strength of clay

Document No.: 20160154-10-R

LEGEND

DSS = Direct Simple Shear, static test

DSScy = Direct Simple Shear, cyclic test

NGI's criteria for sample quality				
OCR	$\Delta e/e_i$			
1-2	<0.04	0.04-0.07	0.07-0.14	>0.14
2-4	<0.03	0.03-0.05	0.05-0.10	>0.10
4-6	<0.02	0.02-0.035	0.035-0.07	>0.07
Quality:	1	2	3	4

2) $\Delta e/e_i$, where $\Delta e = \varepsilon_{vol}\,(1+e_i)$ and $e_i = 2.75 * w_i$

3) 1 - very good to excellent, 2 - good to fair,
3 - poor, 4 - very poor (Ref. Lunne et al., 2006).

TABLE 5.5-1 SUMMARY OF G_{max} MEASUREMENTS

Boring No.	Tube part test	Depth m	I_p %	Type of test	Time (at $\sigma'_{vc\,max}$ or σ'_{vc}) min	G_{max} at $\sigma'_{vc\,max}$ MPa	G_{max} at σ'_{vc} MPa	Shear wave velocity m/s	σ'_{vc} kPa	s_{uD} kPa	G_{max}/σ'_{vc} -	G_{max}/s_{uD} -	COMMENTS	Figure reference
ONSB01	1-A-2	6.87	45	DSS	1360 / 1132	4.2	4.2	50 / 50	41.2	12.8	102	328		5.5.1 - 5.5.2
ONSB01	4-A-2	14.14	40	DSS	1481 / 1147	15.5	15.9	97 / 98	93.6	27.6	170	576		5.5.3 - 5.5.4
ONSB01	5-A-2	14.43	40	DSS	1494 / 1125	11.8	12.2	86 / 87	96.1	29.8	127	409		5.5.5 - 5.5.6
ONSB01	6-A-2	14.82	38	DSS	1290 / 1118	16.6	17.6	101 / 104	98.1	26.8	179	657		5.5.7 - 5.5.8
ONSB41	4-A-1	3.12	46	DSS	1372 / 1121	4.6	4.1	50 / 53	13.8	11.3	297	363		5.5.9 - 5.5.10
ONSB41	6-C-1	5.22	47	DSS	1468 / 1214	7.4	7.4	68 /68	29.1	9.6	254	771		5.5.11 - 5.5.12
ONSB41	8-A-1	6.62		DSS	1471 / 1309	8.8	8.8	74 /74	39.4	13.4	223	657		5.5.13 - 5.5.14
ONSB41	10-C-1	8.72	48	DSS	1422 / 1216	9.2	9.3	75 / 76	54.7	15.9	170	585		5.5.15 - 5.5.16
ONSB41	12-A-1	11.12		DSS	1341 / 1245	22	22.5	112 / 113	72.2	22.8	312	987		5.5.17 - 5.5.18
ONSB41	15-A-1	14.12		DSS	1343	-	12	82	94.1	27	128	444		5.5.19
ONSB41	17-C-1	16.22	27	DSS	1413	-	22.8	113	109.4	30.7	208	743		5.5.20
ONSB41	20-C-1	19.22	25	DSS	1336	-	4.3	48	131.3	31.6	33	136		5.5.21

CLIENT: NRC

PROJECT: Norwegian GeoTest Sites
Onsøy

Document No.: 20160154-10-R

LEGEND
DSS = Direct Simple Shear, static test

TABLE 5.7-1 SUMMARY OF DSS AND P-Y TESTS

Boring No.	Tube No.	Depth From (m)	Depth To (m)	Type of test	Test ID	ESTIM. IN-SITU σ'_{vc} (kPa)	INDEX PROPERTIES – Water contents[1)] DSS and p-y, w_i (%)	DSS, w_f (%)	p-y, left side (%)	p-y, middle (%)	p-y, right side (%)
2	6-B-1	6.10	6.25	Monotonic p-y	2015_Onsøy_48_Mono_001	46.8	67.6	-	60.5	63.5	61.4
2	6-C-1	6.25	6.40	Cyclic p-y	2015_Onsøy_48_Cyclic_001	47.6	64.9	-	59.4	59.9	59.0
2	6-D-1	6.40	6.45	DSS + Bender Element		48.2	64.7	61.7			
2	9-B-1	9.10	9.25	Monotonic p-y	2015_Onsøy_65_Mono_002	64.0	42.9	-	40.8	41.2	39.8
2	9-C-1	9.25	9.30	DSS + Bender Element		64.6	43.0	41.8			
2	9-D-1	9.30	9.45	Cyclic p-y	2015_Onsøy_65_Cyclic_002	65.2	39.8	-	39.2	39.6	39.5
2	11-B-1	11.10	11.15	DSS + Bender Element		75.2	46.9	42.7			
2	11-C-1	11.15	11.30	Monotonic p-y	2015_Onsøy_76_Mono_003	75.8	45.7	-	44.2	44.1	42.7
2	11-D-1	11.30	11.45	Cyclic p-y	2015_Onsøy_76_Cyclic_003	76.7	42.7	-	42.4	45.2	44.2
2	11-B-2	11.50	11.55	Rapid DSS test		76.0	43.8	37.7			
2	9-F-1	9.50	9.65	Monotonic p-y	2015_Onsøy_65_Mono_004	66.4	41.1	-	39.8	40.4	40.0
2	10-A-1	10.10	10.15	Rapid DSS test		65.0	42.9	37.5			

Tube No.	Plasticity[2)] LL (%)	PL (%)	IP (%)	LI (-)	γ_s (kN/m³)	Clay cont. [1)] (%)	Unit weight (kN/m³)	CONSOLIDATION $\sigma'_{a\,max}$ (kPa)	$\sigma'_{a\,min} = \sigma'_{ac}$ (kPa)	ε_{ac} (%)	STATIC TESTING s_{uD} (kPa)	U_f (kPa)	γ_f (%)	$s_{uD,res}$ 3) (kPa)	$\gamma_{D,res}$ 3) (%)	Rate effect 4) (%)	BENDER ELEMENT G_{max} at σ'_{vc} (MPa)	G_{max}/σ'_{vc} (-)	G_{max}/s_{uD} (-)
6-B-1	-	-	-	-	-	-	-	46.8	46.8	1.84									
6-C-1	-	-	-	-	-	-	-	47.6	47.6	2.31									
6-D-1	73.5	27.6	45.9	0.81	27.1	68.4	16.01	48.2	48.2	2.83	12.9	24.4	6.17	10.2	20		5.1	106	396
9-B-1	-	-	-	-	-	-	-	64.0	64.0	2.82									
9-C-1	47.0	20.7	26.3	0.85	-	58.8	17.59	65.0	65.0	4.79	17.8	31.4	7.22	14.4	20		10.9	168	614
9-D-1	-	-	-	-	-	-	-	65.2	65.2	2.15									
11-B-1	49.7	22.3	27.4	0.90	-	-	16.88	76.0	76.0	6.84	19.7	34.3	5.35	16.1	20		9.4	124	477
11-C-1	-	-	-	-	-	-	-	75.8	75.8	2.27									
11-D-1	-	-	-	-	-	-	-	76.7	76.7	2.21									
11-B-2	-	-	-	-	-	-	17.41	76.0	76.0	6.50	31.1	44.2	14.183			1.577			
9-F-1	-	-	-	-	-	-	-	66.4	66.4	1.99									
10-A-1	-	-	-	-	-	-	17.49	65.0	65.0	5.23	27.94	1.7	14.028			1.574			

DATA PERTAINING TO P-Y TESTING

Tube No.	GEOMETRICAL PROPERTIES Sample height h_0 (mm)	h_c (mm)	Loading-arm distance (mm)	MONOTONIC p-y At peak p (kPa)	s/d (%)	N_c[5)] (-)	CYCLIC p-y[6)] Cyclic load package no 1 $(y/d)_{av}$ (%)	N	y/d (%)	K_{sec} (MPa)	D (%)	Cyclic load package no 2 $(y/d)_{av}$ (%)	N	y/d (%)	K_{sec} (MPa)	D (%)
6-B-1	100	98.16	191	318	18.32	15.73										
6-C-1	100	97.69	191				0.02	1000	0.02	35.1	11.04	0.05	1000	0.07	29.8	7.04
6-D-1																
9-B-1	100	97.18	191	494.1	26.58	17.69										
9-C-1																
9-D-1	100	97.85	191				0.01	1000	0.01	151.5	18.35	0.03	1000	0.03	107.1	16.29
11-B-1																
11-C-1	100	97.73	191	369.3	19.42	11.91										
11-D-1	100	97.79	191				0.01	1000	0.02	56.6	11.56	0.03	1000	0.06	48.0	11.54
11-B-2																
9-F-1	100	98.01	191	406.7	25.77	14.60										
10-A-1																

Tube No.	Cyclic load package no 3 $(y/d)_{av}$ (%)	N	y/d (%)	K_{sec} (MPa)	D (%)	Cyclic load package no 4 $(y/d)_{av}$ (%)	N	y/d (%)	K_{sec} (MPa)	D (%)	Cyclic load package no 5 $(y/d)_{av}$ (%)	N	y/d (%)	K_{sec} (MPa)	D (%)
6-B-1															
6-C-1	0.09	1000	0.14	27.6	5.94	0.24	1000	0.34	20.5	9.58	1.30	1000	1.50	4.2	10.90
6-D-1															
9-B-1															
9-C-1															
9-D-1	0.06	1000	0.06	79.1	12.94	0.18	1000	0.19	44.5	14.03	0.79	1000	0.88	12.4	16.63
11-B-1															
11-C-1															
11-D-1	0.07	1000	0.13	39.0	9.04	0.22	1000	0.31	26.8	10.17	0.91	1000	1.12	9.6	14.36
11-B-2															
9-F-1															
10-A-1															

Tube No.	Cyclic load package no 6 $(y/d)_{av}$ (%)	N	y/d (%)	K_{sec} (MPa)	D (%)	Cyclic load package no 7 $(y/d)_{av}$ (%)	N	y/d (%)	K_{sec} (MPa)	D (%)	Comments	Figure reference
6-B-1												5.7.1
6-C-1	3.29	1000	3.49	1.8	9.17	7.39	1000	7.62	0.6	18.83		5.7.2 - 5.7.5
6-D-1												5.7.6 - 5.7.7
9-B-1											Test 2015_Onsøy_65_Mono_002 was repeated in test 2015_Onsøy_65_Mono_004 with adjusted consolidation stress, as the measurements of the original test appeared to be not representative, which may be due to significant silt content.	5.7.8
9-C-1												5.7.9 - 5.7.10
9-D-1	2.41	1000	2.55	5.2	14.61	6.57	1000	6.84	1.6	23.64		5.7.11 - 5.7.14
11-B-1												5.7.15 - 5.7.16
11-C-1												5.7.17
11-D-1	3.54	1000	3.76	0.9	36.69	7.55	1000	7.66	0.5	42.79		5.7.18 - 5.7.21
11-B-2												5.7.22 - 5.7.23
9-F-1											Test 2015_Onsøy_65_Mono_002 was repeated in test 2015_Onsøy_65_Mono_004 with adjusted consolidation stress, as the measurements of the original test appeared to be not representative, which may be due to significant silt content.	5.7.24
10-A-1												5.7.25

CLIENT: Norwegian Deepwater Program

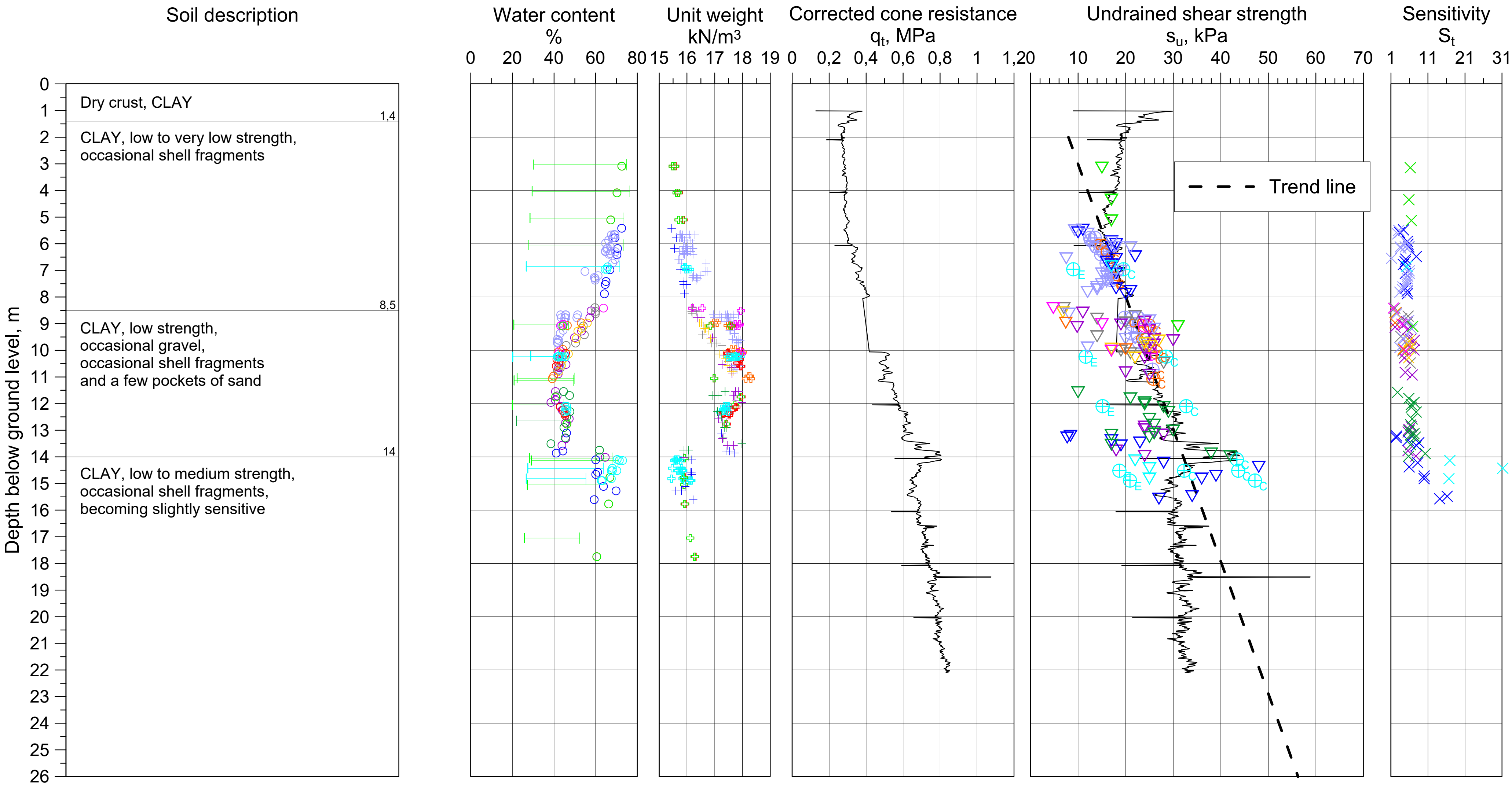
PROJECT: 20140839-03-R

Document No.: Phase 2A
Factual Report of Advanced Laboratory Tests

1) Water content measurements
DSS tests: Measured before (wi) and after testing (wf)
p-y tests: Measured before testing (wi). Measured after testing at both ends and middle of the sample
2) Plasticity, grain size performed on one sample from each tube
3) For standard static DSS: Strength at end of test.
4) Rate effect from rapid test = $s_{uD,rapidDSS}/s_{uD,standardDSS}$

5) Nc= P/(s_{uD}*rate effect)

6) The tabulated data are from the end of each of the 7 load packages
$(y/d)_{av}$ = Average normalised displacement amplitude over all applied load cycles
N = Number of cycles applied in the load package
y/d = Normalised displacement amplitude of the last load cycle
G = Shear modulues of the last load cycle
D = Damping ratio of the last load cycle



NOTE: q_t is used for interpretation of CPTU using N_{kt}= 12

Trend line: s_u = 0.35 * p_0', where p_0' = 11.25+5.75*z

■ / □ Pocket Penetrometer (offshore/onshore)

▲ / △ Fall cone (offshore/onshore)

Torvane (offshore/onshore)

Vane (lab offshore/in situ)

⊕C CAUC/CIUC

⊕E CAUE/CIUE

⊞ DSS test

◆ / ◇ UU (offshore/onshore)

γ_t (Based on water content)

● / ○ Water content, w (offshore/onshore)

✚ / + Total unit weight, γ_t (offshore/onshore)

✖ / × Sensitivity, fall cone (offshore/onshore)

Sensitivity, vane (lab offshore/in situ)

Plasticity index, I_p

Norwegian GeoTest Sites - Onsøy

Borehole log and classification test results. South central area.

Borehole	Easting	Northing	Water Table
ONSC02	608 263.6 mE	6 566 441.5 mN	1 m bgl
ONSB01, ONSB02, ONSB03, ONSB04, ONSB05, ONSB06-ONSB13, ONSB21, ONSB22, ONSB25, ONSB27, ONSB28			

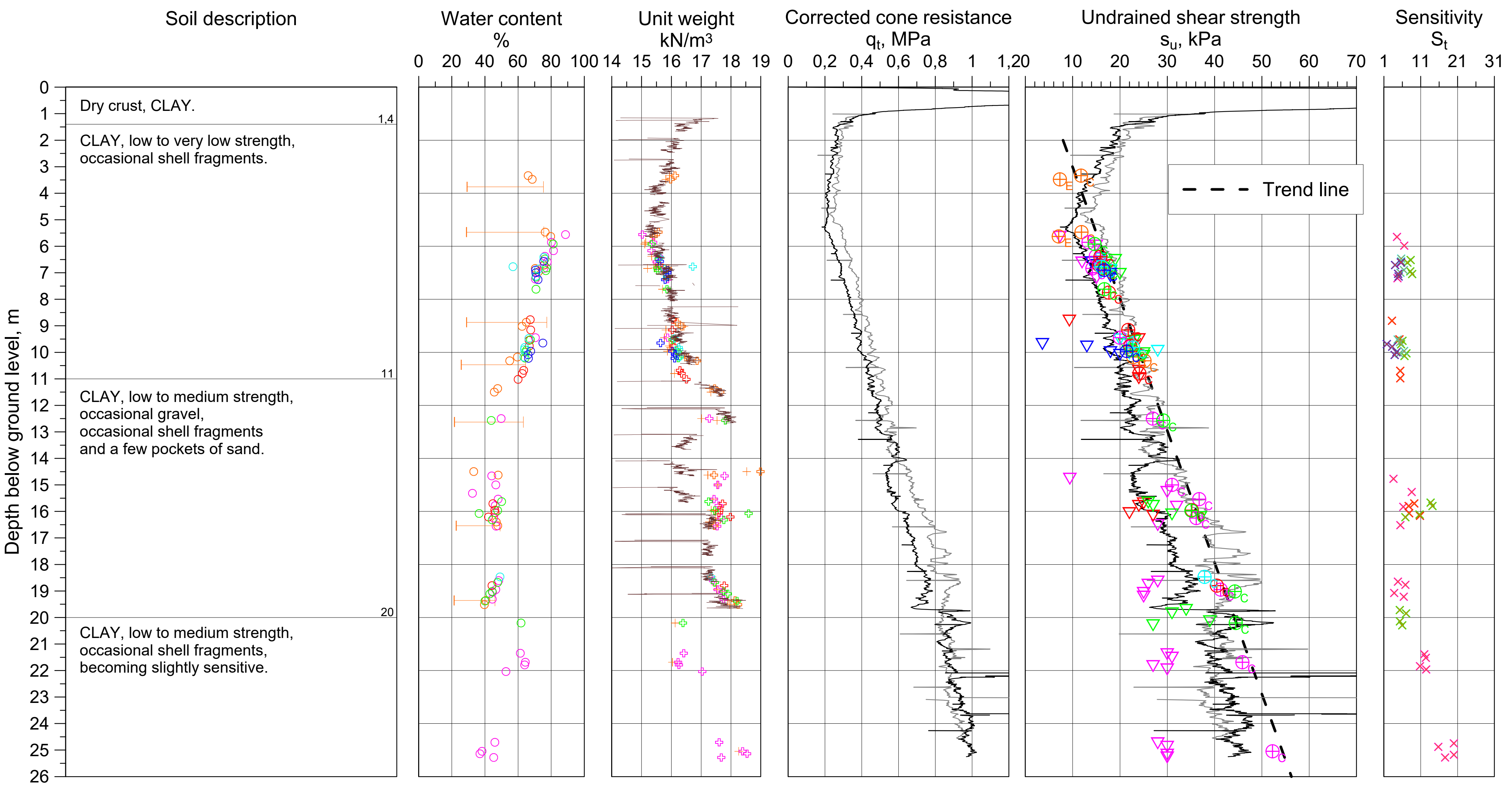
Coordinate system: UTM 32 NN 2000

Document No. 20160154-10-R

Figure No. 3.1

Date 2018-12-10

Drawn by CFo



NOTE: q_t is used for interpretation of CPTU using N_{kt} = 12
Trend line: $s_u = 0.35 * p_0'$, where $p_0' = 11.25+5.75*z$

■ / □ Pocket Penetrometer (offshore/onshore)
▲ / △ Fall cone (offshore/onshore)
Torvane (offshore/onshore)
Vane (lab offshore/in situ)
⊕C CAUC/CIUC
⊕E CAUE/CIUE
⊞ DSS test
◆ / ◇ UU (offshore/onshore)
γt (Based on water content)
● / ○ Water content, w (offshore/onshore)
✚ / + Total unit weight, γ_t (offshore/onshore)
✖ / × Sensitivity, fall cone (offshore/onshore)
Sensitivity, vane (lab offshore/in situ)
Plasticity index, I_p

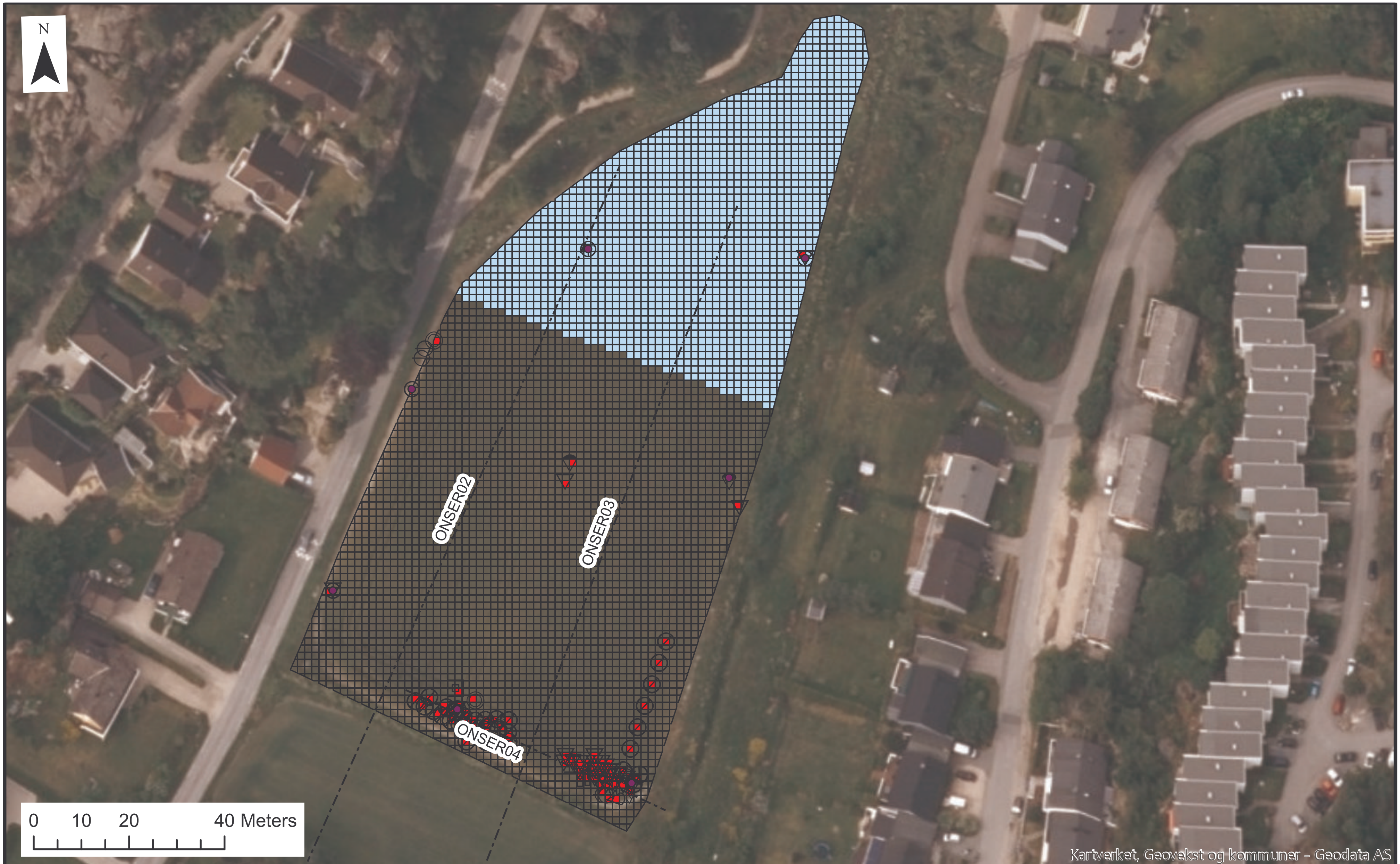
Norwegian GeoTest Sites - Onsøy

Borehole log and classification test results. South east corner.

Boreholes	Easting	Northing	Water Depth
ONSC11	608299.14 mE	6566426.88 mN	-1 m
ONSC19	608292.40 mE	6566428.65 mN	-1 m
ONSB14, ONSB29, ONSB31			
ONSB32, ONSB33, ONSB34			
ONSB41			

Coordinate system: UTM 32 NN 2000

Document No. 20160154-10-R
Figure No. 3.2
Date 2018-12-10
Drawn by StS/AGu



Site grid status cells

- Unauthorised
- Used
- Planned
- Available
- ERT_Lines

Norwegian GeoTest Sites - Onsøy

Administration overview grid Onsøy - aerial view
Grid 1.5 x 1.5
Site area: 10200sqm
Available cells: 3057

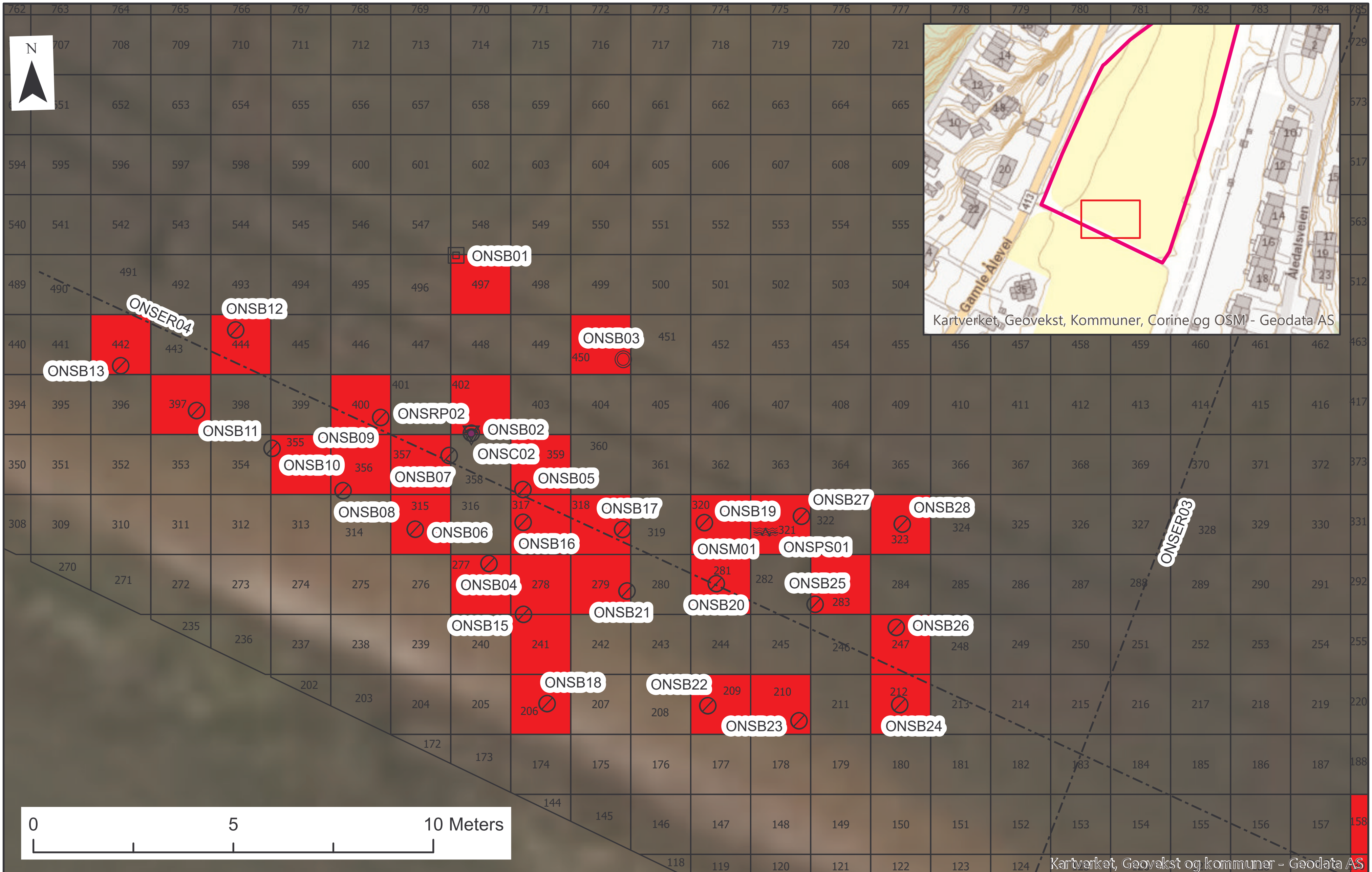
Spatial Reference:
ETRS 1989 UTM Zone 32N

Area:
Whole site

Document No.	
20160154-10-R	
Figure No.	
4.1.1	
Date	Drawn by
10.07.2017	**HCS/RCa**

NGTS

P:\2016\01\20160154\Kart\Onsoy\Figures\2016-Draft maps\GridMap_AP.pdf



SiteAdmin
Site grid
ERT_Lines
EM_Lines
MASW_Lines
GPR_Lines
Site grid status cells
Unauthorised

Used
Planned
Available

Groundinvestigations
BG
BH54
BH54C
BH72
BH75

BHGPS
BHGPTr
BHSB
BHSBm
CPT
CPTU
CPTU-DIS
RCPTU
RCPTU-DIS
SCPTU

SCPTU-DIS
DBERT
DBGPR
DBseism
FVT
EPCT
HFST
INC
PAC
Piezo

RCD
RPS
RWS
SBP
SDMT
SLU
SP
SS
THS
TS

VSP
XBERT
XBGPR
XBseism
NA
StandP
MASW
PS

Norwegian GeoTest Sites - Onsøy

Detailed grid with tests Onsøy - topography view
Grid 1.5 x 1.5
Site area: 10200sqm
Available cells: 3057

Spatial Reference:
ETRS 1989 UTM Zone 32N

Area:
South centre

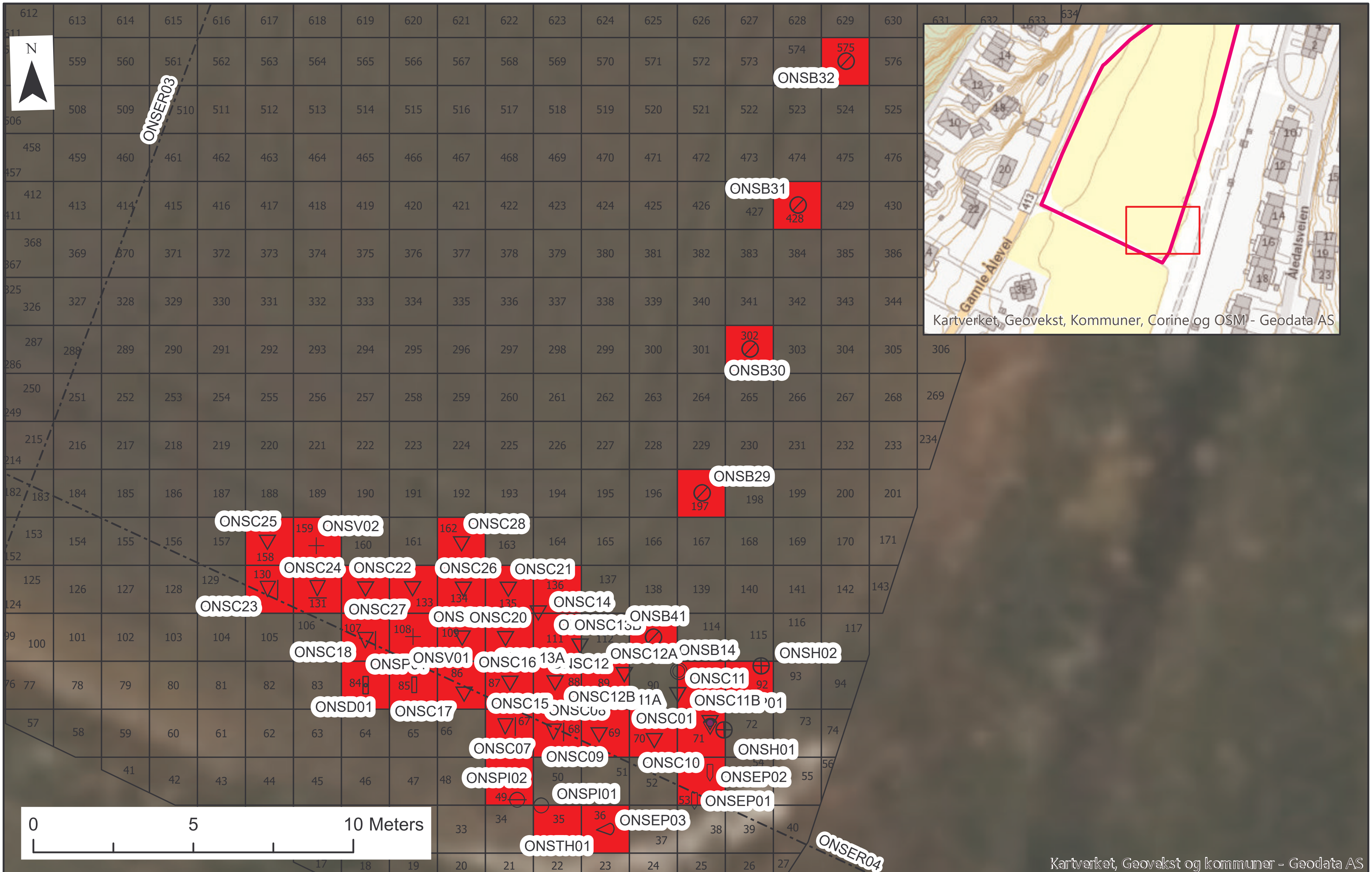
Document No.
20160154-10-R

Figure No.
4.1.2

Date	Drawn by
2017-07-10	**HCS/RCa**

NGTS

P:\2016\01\20160154\Kart\Onsoy\Figures\2017-07-10\GridMapDetail_TP(2).pdf



- ERT_Lines
- EM_Lines
- MASW_Lines
- GPR_Lines

Site grid status cells

- Unauthorised
- Used
- Planned
- Available

Groundinvestigations

BG, BH54, BH54C, BH72, BH75, BHGPS, BHGPTr, BHSB, BHSBm, CPT, CPTU, CPTU-DIS, RCPTU, RCPTU-DIS, SCPTU, SCPTU-DIS, DBERT, DBGPR, DBseism, FVT, EPCT, HFST, INC, PAC, Piezo, RCD, RPS, RWS, SBP, SDMT, SLU, SP, SS, THS, TS, VSP, XBERT, XBGPR, XBseism, NA, StandP, MASW, PS

Norwegian GeoTest Sites - Onsøy

Detailed grid with tests Onsøy - topography view
Grid 1.5 x 1.5
Site area: 10200sqm
Available cells: 3057

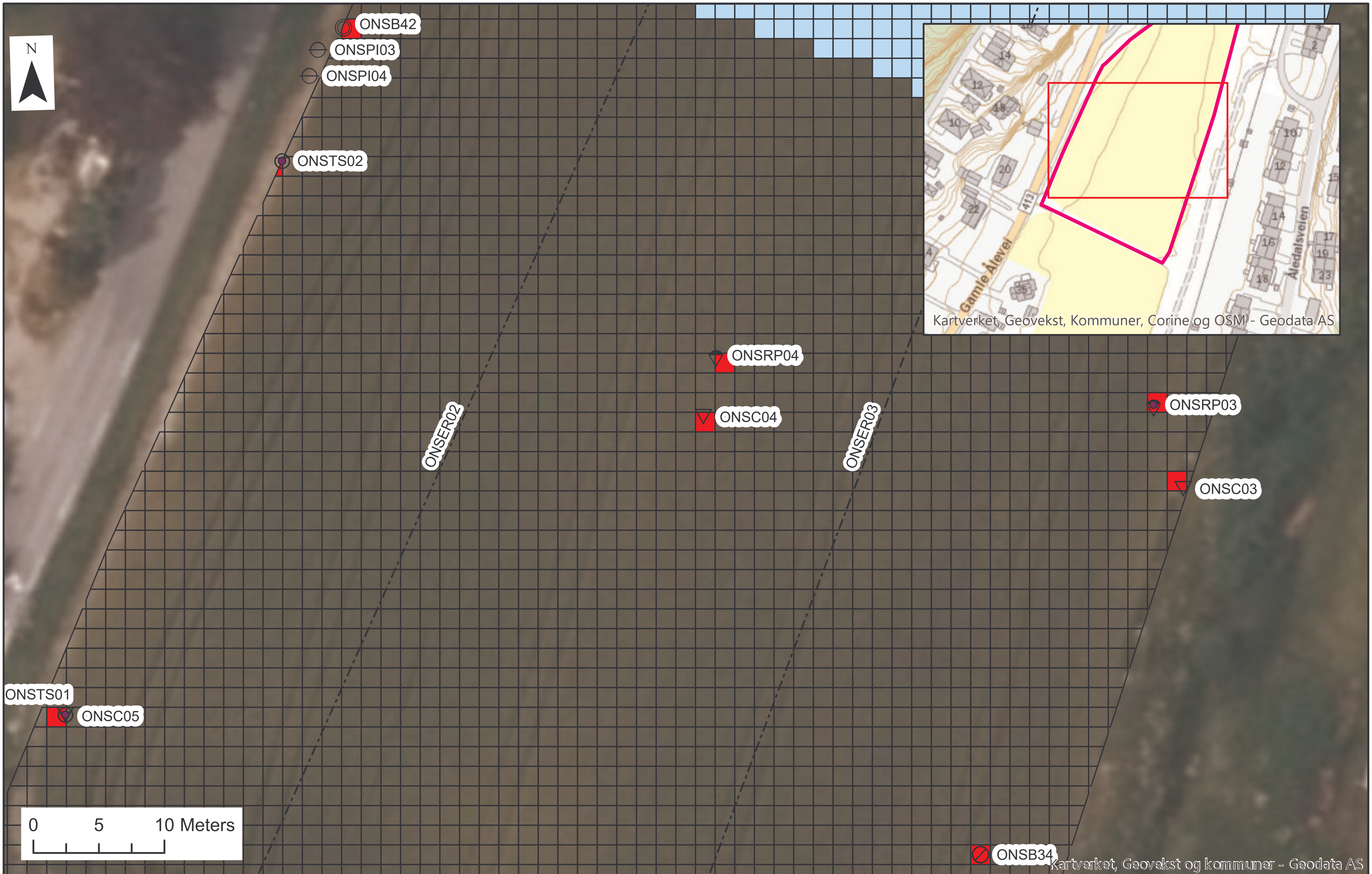
Spatial Reference:
ETRS 1989 UTM Zone 32N

Area:
Southeast corner

Document No.	
20160154-10-R	
Figure No.	
4.1.3	
Date	Drawn by
2017-07-10	**HCS/RCa**

NGTS

P:\2016\01\20160154\Kart\Onsoy\Figures\2017-07-10\GridMapDetail_TP(1).pdf



- - - ERT_Lines
EM_Lines
MASW_Lines
GPR_Lines

Site grid status cells
Unauthorised
Used
Planned
Available

Groundinvestigations

BG, BH54, BH54C, BH72, BH75, BHGPS, BHGPTr, BHSB, BHSBm, CPT, CPTU, CPTU-DIS, RCPTU, RCPTU-DIS, SCPTU, SCPTU-DIS, DBERT, DBGPR, DBseism, FVT, EPCT, HFST, INC, PAC, Piezo, RCD, RPS, RWS, SBP, SDMT, SLU, SP, SS, THS, TS, VSP, XBERT, XBGPR, XBseism, NA, StandP, MASW, PS

Norwegian GeoTest Sites - Onsøy

Detailed grid with tests Onsøy - topography view
Grid 1.5 x 1.5
Site area: 10200sqm
Available cells: 3057

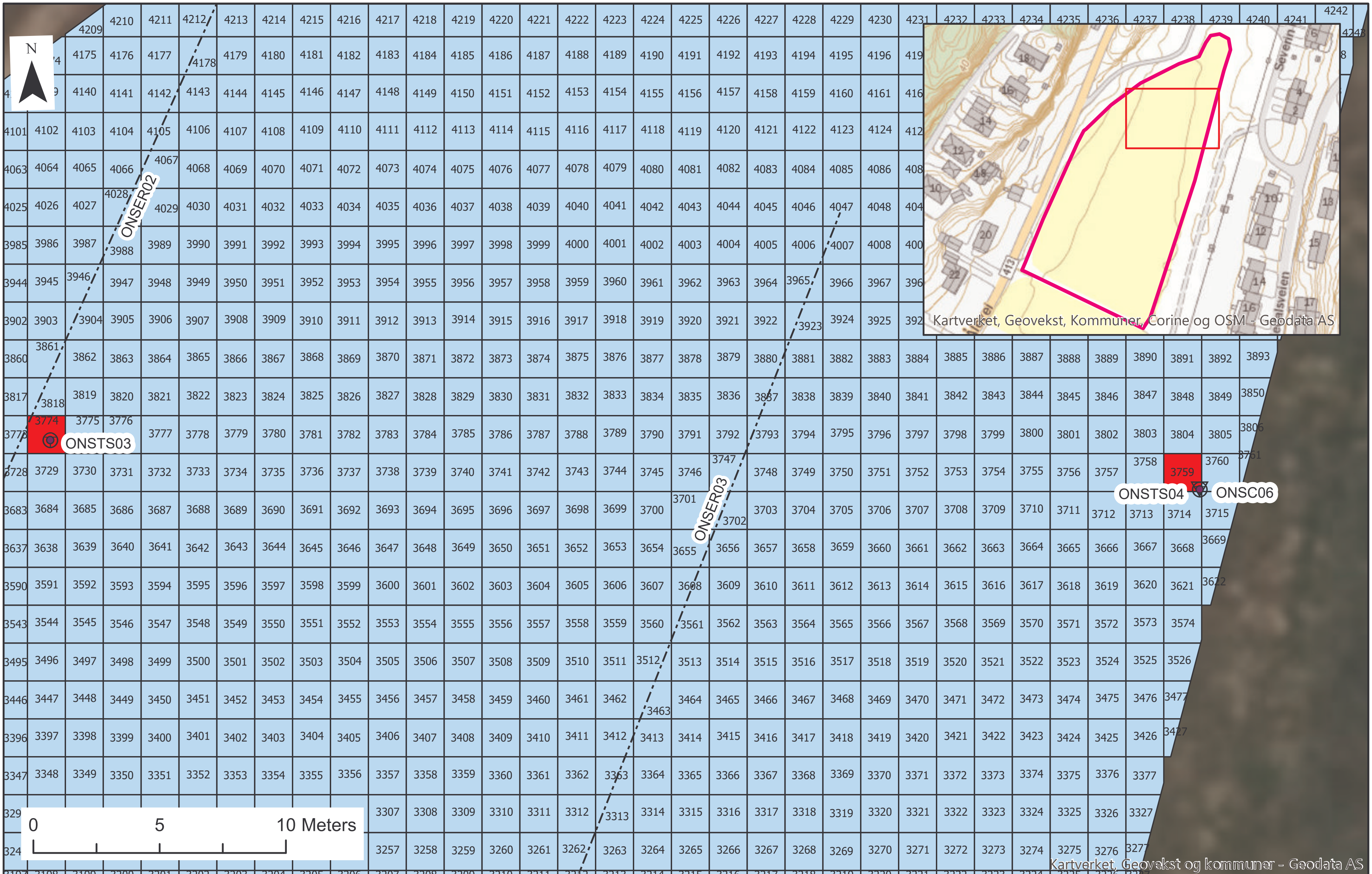
Spatial Reference:
ETRS 1989 UTM Zone 32N

Area:
Centre

Document No.	
20160154-10-R	
Figure No.	
4.1.4	
Date	Drawn by
2017-07-10	**HCS/RCa**

NGTS

P:\2016\01\20160154\Kart\Onsoy\Figures\2017-07-10\GridMapDetail_TP(4).pdf



ERT_Lines
EM_Lines
MASW_Lines
GPR_Lines

Site grid status cells
- Unauthorised
- Used
- Planned
- Available

Groundinvestigations
- BG
- BH54
- BH54C
- BH72
- BH75
- BHGPS
- BHGPTr
- BHSB
- BHSBm
- CPT
- CPTU
- CPTU-DIS
- RCPTU
- RCPTU-DIS
- SCPTU
- SCPTU-DIS
- DBERT
- DBGPR
- DBseism
- FVT
- EPCT
- HFST
- INC
- PAC
- Piezo
- RCD
- RPS
- RWS
- SBP
- SDMT
- SLU
- SP
- SS
- THS
- TS
- VSP
- XBERT
- XBGPR
- XBseism
- NA
- StandP
- MASW
- PS

Norwegian GeoTest Sites - Onsøy

Detailed grid with tests Onsøy - topography view
Grid 1.5 x 1.5
Site area: 10200sqm
Available cells: 3057

Spatial Reference:
ETRS 1989 UTM Zone 32N

Area:
North

Document No.
20160154-10-R

Figure No.
4.1.5

Date	Drawn by
2018-01-25	**AGu**

NGTS

P:\2016\01\20160154\KartOnsoy\Figures\2017-07-10\GridMapDetail_TP(4).pdf

SiteAdmin
- Site grid
- ERT_Lines
- EM_Lines
- MASW_Lines
- GPR_Lines

Site grid status cells
- Unauthorised

- Used
- Planned
- Available

Groundinvestigations
- BG
- BH54
- BH54C
- BH72
- BH75
- BHGPS
- BHGPTr
- BHSB
- BHSBm
- CPT
- CPTU
- CPTU-DIS
- RCPTU
- RCPTU-DIS
- SCPTU
- SCPTU-DIS
- DBERT
- DBGPR
- DBseism
- FVT
- EPCT
- HFST
- INC
- PAC
- Piezo
- RCD
- RPS
- RWS
- SBP
- SDMT
- SLU
- SP
- SS
- THS
- TS
- VSP
- XBERT
- XBGPR
- XBseism
- NA
- StandP
- MASW
- PS

Norwegian GeoTest Sites - Onsøy

Detailed grid with tests Onsøy - topography view
Grid 1.5 x 1.5
Site area: 10200sqm
Available cells: 3057

Spatial Reference:
ETRS 1989 UTM Zone 32N

Area:
Backup site

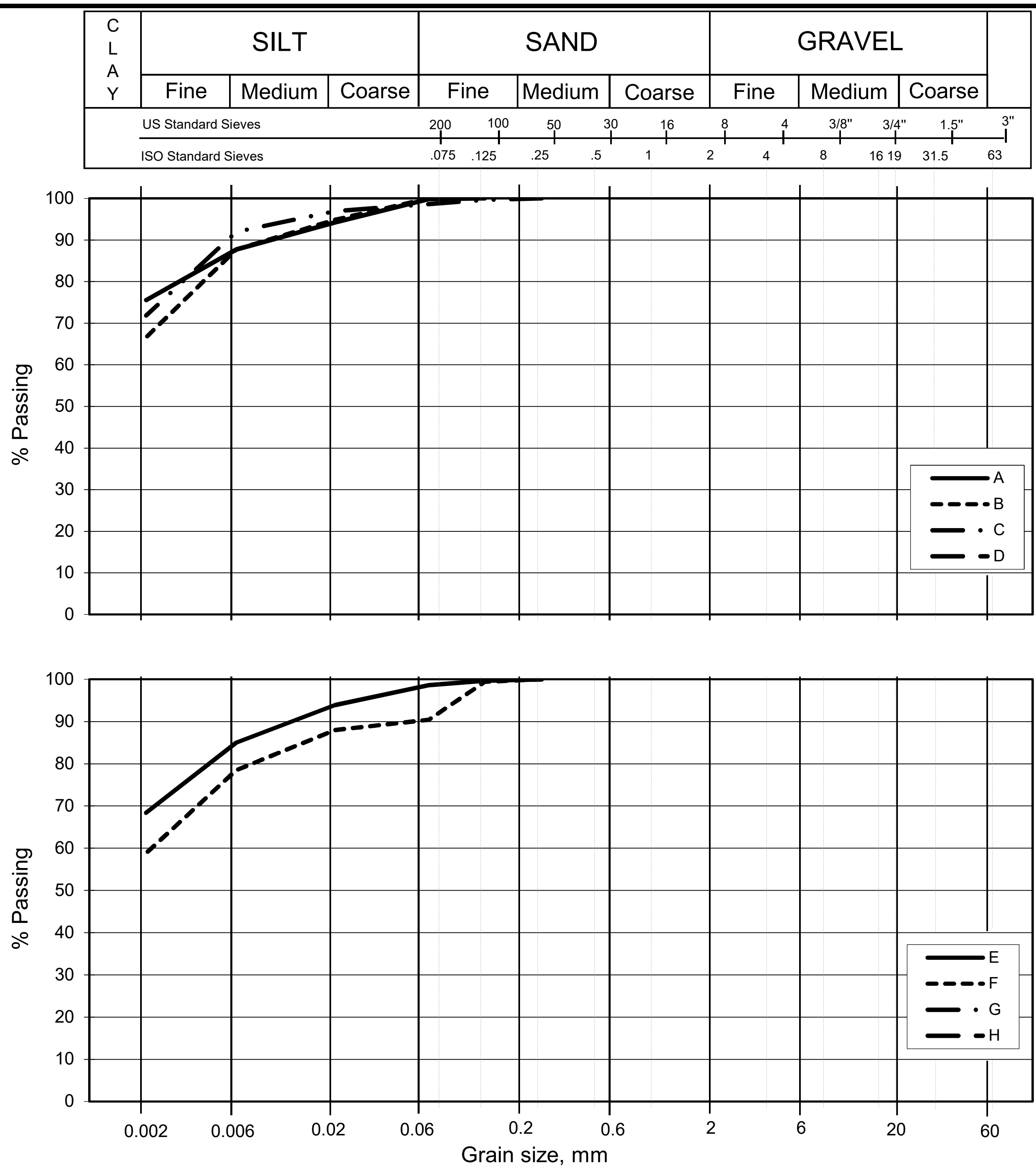
Document No.
20160154-10-R

Figure No.
4.1.6

Date	Drawn by
2017-07-10	**HCS/RCa**

NGTS

P:\2016\01\20160154\Kart\Onsoy\Figures\2017-07-10\GridMapDetail_TP(2).pdf



Curve	Boring No.	Sample No.	Depth m	D_{10} mm	D_{60} mm	Clay cont. %	Soil Description	Method dry/wet-sieving
A	ONSB02	3	3.08			75.5	CLAY	fall.drop
B	ONSB02	4	4.08			66.6	CLAY	fall.drop
C	ONSB02	5	5.10			71.8	CLAY	fall.drop
D								
E	ONSB02	6	6.05			68.4	CLAY	fall.drop
F	ONSB02	9	9.08		0.002	58.8	CLAY	fall.drop
G								
H								

Rev. 0 / Dato 2015-02-27 / Sign. SK

#VALUE!

Norwegian GeoTest Sites - Onsøy

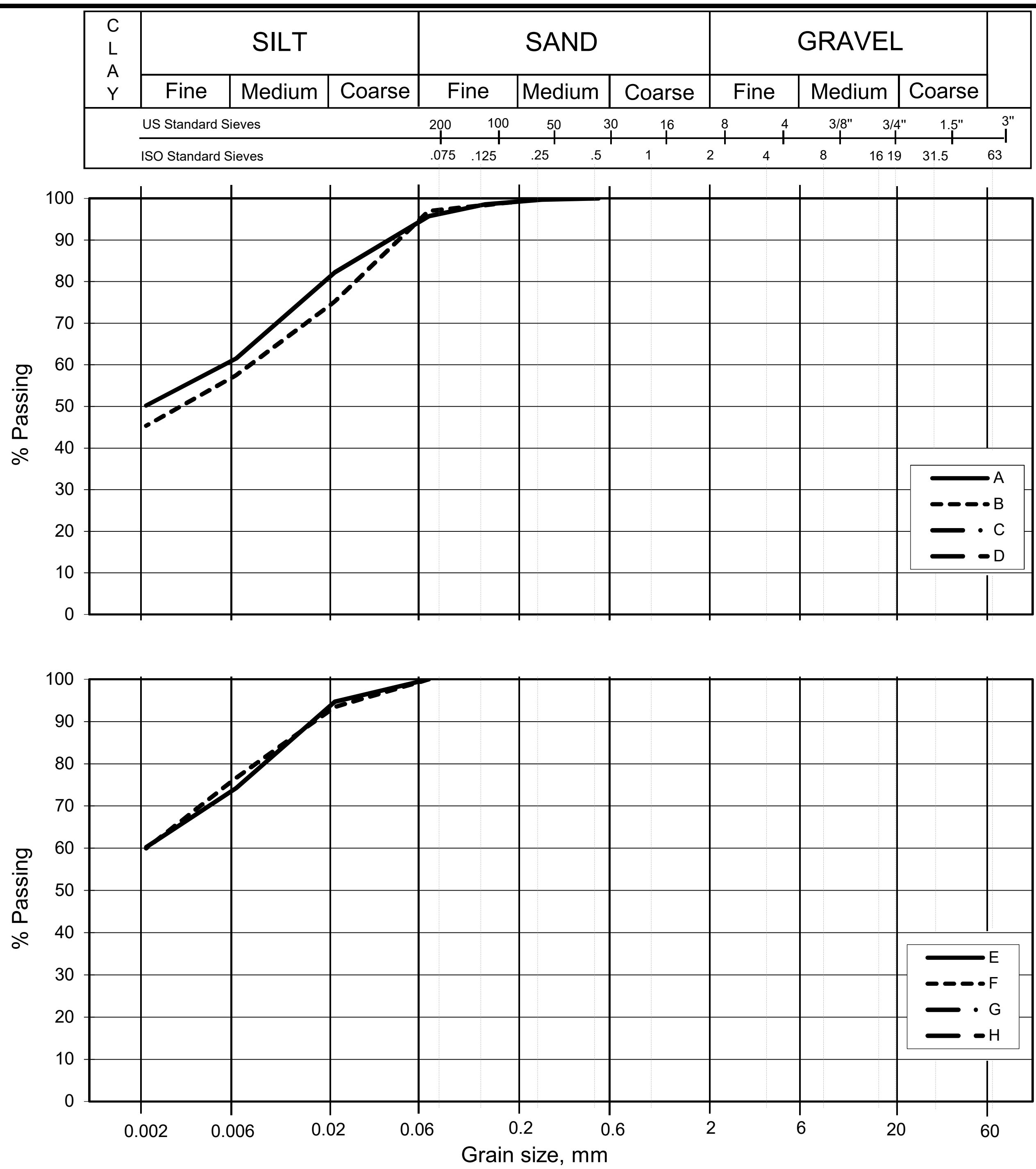
Grain size distribution curves

Carried out as part of NGI project no. 20140839-02-R,

NDP - Conductor Field Testing

Document No.	20160154-10-R
Figure No.	5.1.1
Date	2016/03/11
Drawn by	JRO/FP

NGI



Curve	Boring No.	Sample No.	Depth m	D_{10} mm	D_{60} mm	Clay cont. %	Soil Description	Method dry/wet-sieving
A	ONSB02	8	8.20		0.005	50.2	CLAY	fall.drop
B	ONSB02	8	8.61		0.007	45.4	CLAY	fall.drop
C								
D								
E	ONSB02	13	13.20			60.2	CLAY	fall.drop
F	ONSB02	13	13.60		0.002	60.0	CLAY	fall.drop
G								
H								

Rev. 1 / Dato 2016-05-09 / Sign. SK

#VALUE!

Norwegian GeoTest Sites - Onsøy

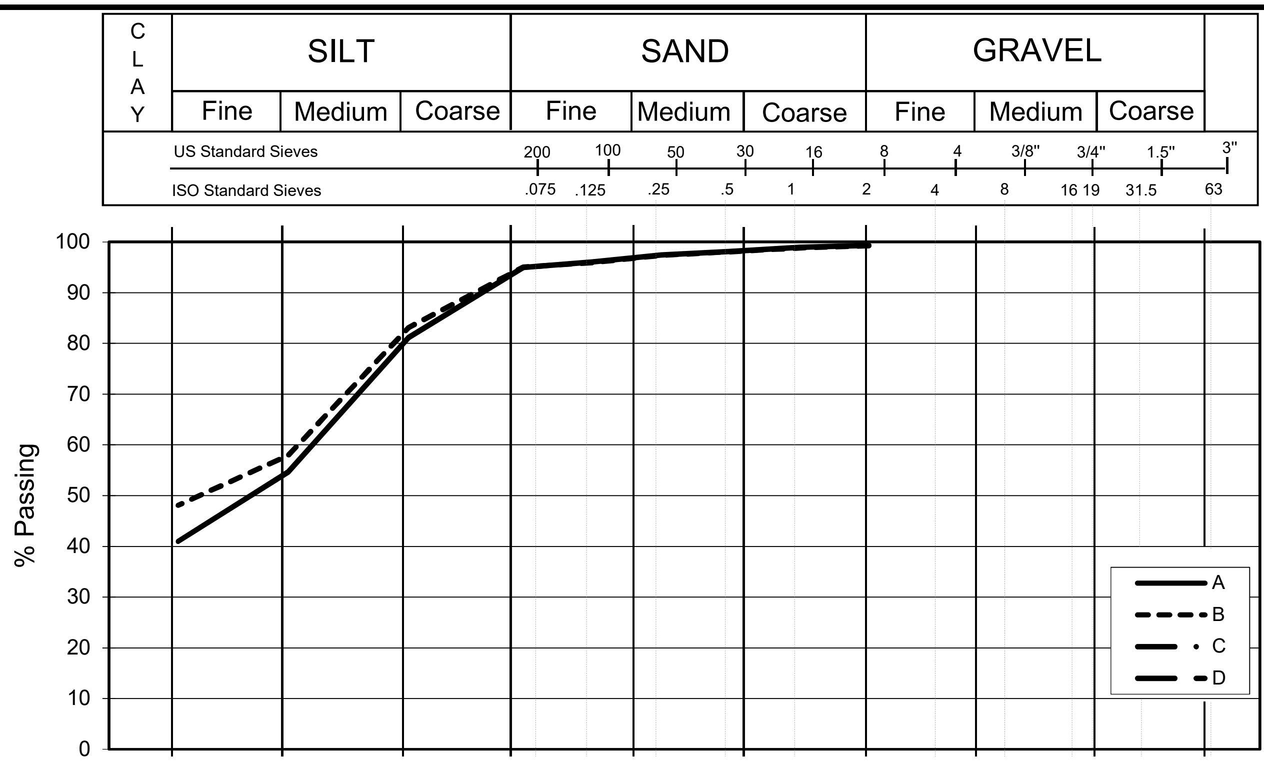
Grain size distribution curves

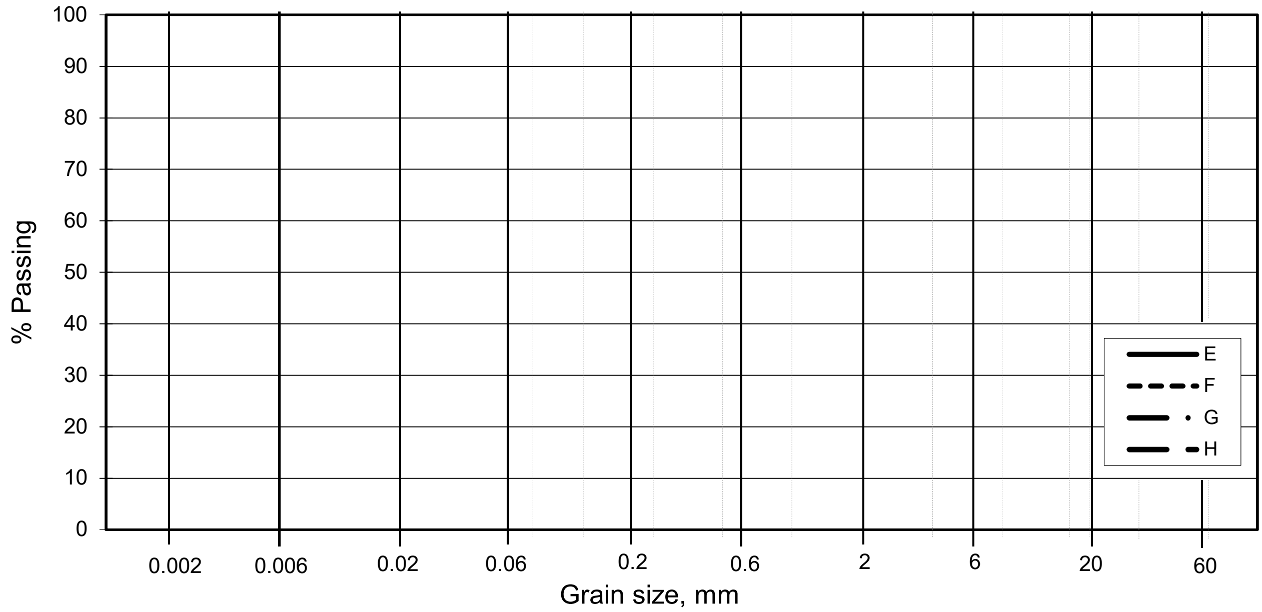
Document No. 20160154-10-R

Figure No. 5.1.2

Date 2016/12/21

Drawn by / Checked FP/MAS





Curve	Boring No.	Sample No.	Depth m	D_{10} mm	D_{60} mm	Clay cont. %	Soil Description	Method dry/wet-sieving
A	ONSB02	18	18.48		0.008	41.0	CLAY	fall.drop
B	ONSB02	19	19.20		0.007	48.1	CLAY	fall.drop
C								
D								
E								
F								
G								
H								

Rev. 1 / Dato 2016-05-09 / Sign. SK

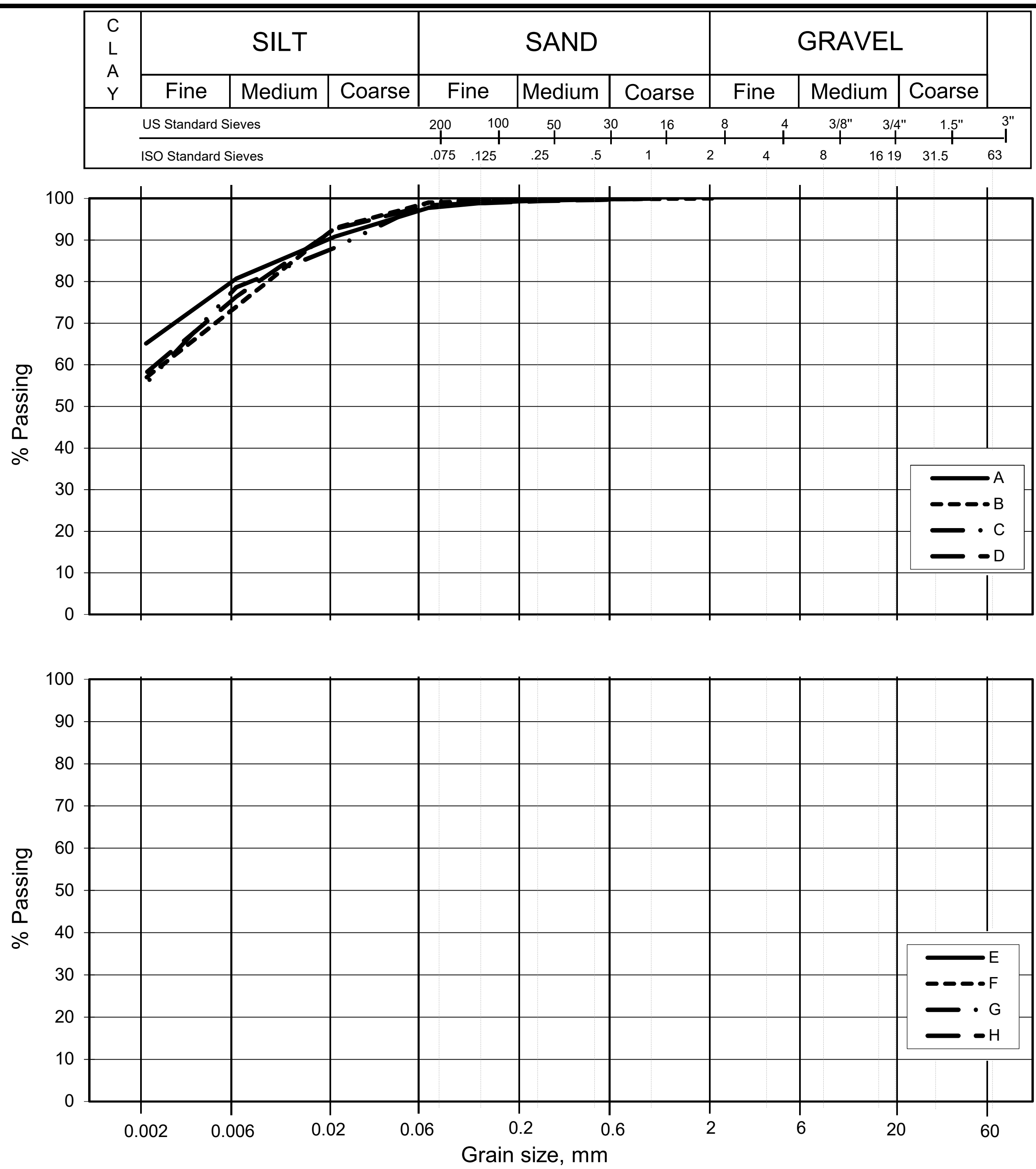
#VALUE!

Norwegian GeoTest Sites - Onsøy

Grain size distribution curves

Document No.	20160154-10-R
Figure No.	5.1.3
Date	2016/12/21
Drawn by / Checked	FP/MAS

NGI



Curve	Boring No.	Sample No.	Depth m	D_{10} mm	D_{60} mm	Clay cont. %	Soil Description	Method dry/wet-sieving
A	ONSB01	1-A	6.85			65.1	CLAY	fall.drop
B	ONSB01	4-A-3	14.14		0.002	56.9	CLAY	fall.drop
C	ONSB01	5	14.43		0.002	55.6	CLAY	fall.drop
D	ONSB01	6	14.81		0.002	58.1	CLAY	fall.drop
E								
F								
G								
H								

Rev. 1 / Dato 2016-05-09 / Sign. SK

#VALUE!

Norwegian GeoTest Sites - Onsøy

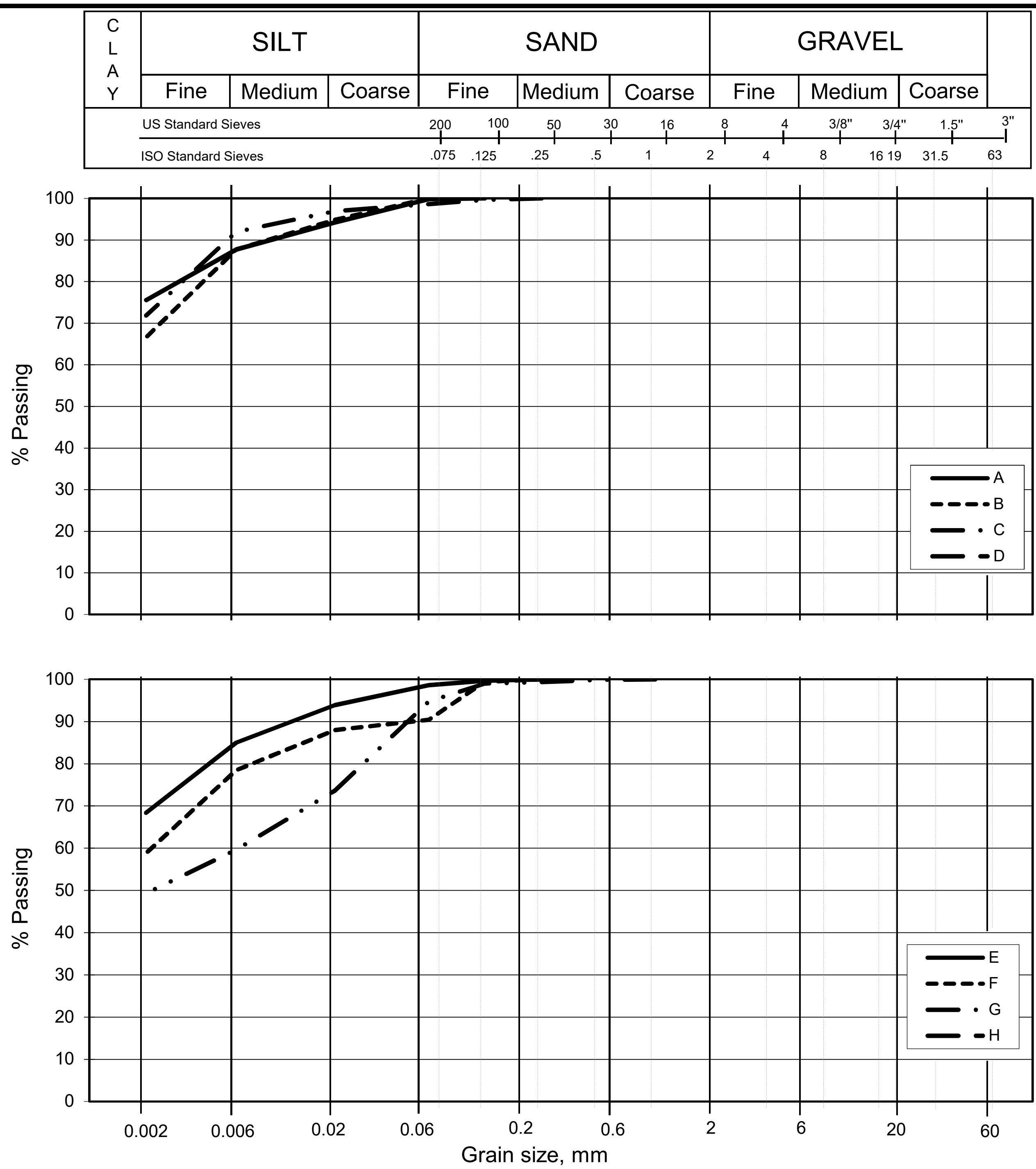
Grain size distribution curves

Document No.
20160154-10-R

Figure No.
5.1.4

Date
2016/12/13

Drawn by / Checked
StS



Curve	Boring No.	Sample No.	Depth m	D_{10} mm	D_{60} mm	Clay cont. %	Soil Description	Method dry/wet-sieving
A	ONSB02	3	3.08			75.5	CLAY	fall.drop
B	ONSB02	4	4.08			66.6	CLAY	fall.drop
C	ONSB02	5	5.10			71.8	CLAY	fall.drop
D								
E	ONSB02	6	6.05			68.4	CLAY	fall.drop
F	ONSB02	9	9.08		0.002	58.8	CLAY	fall.drop
G	ONSB02	11	11.13		0.006	49.3	CLAY	fall.drop
H								

Rev. 0 / Dato 2015-02-27 / Sign. SK

#VALUE!

Norwegian GeoTest Sites - Onsøy

Grain size distribution curves

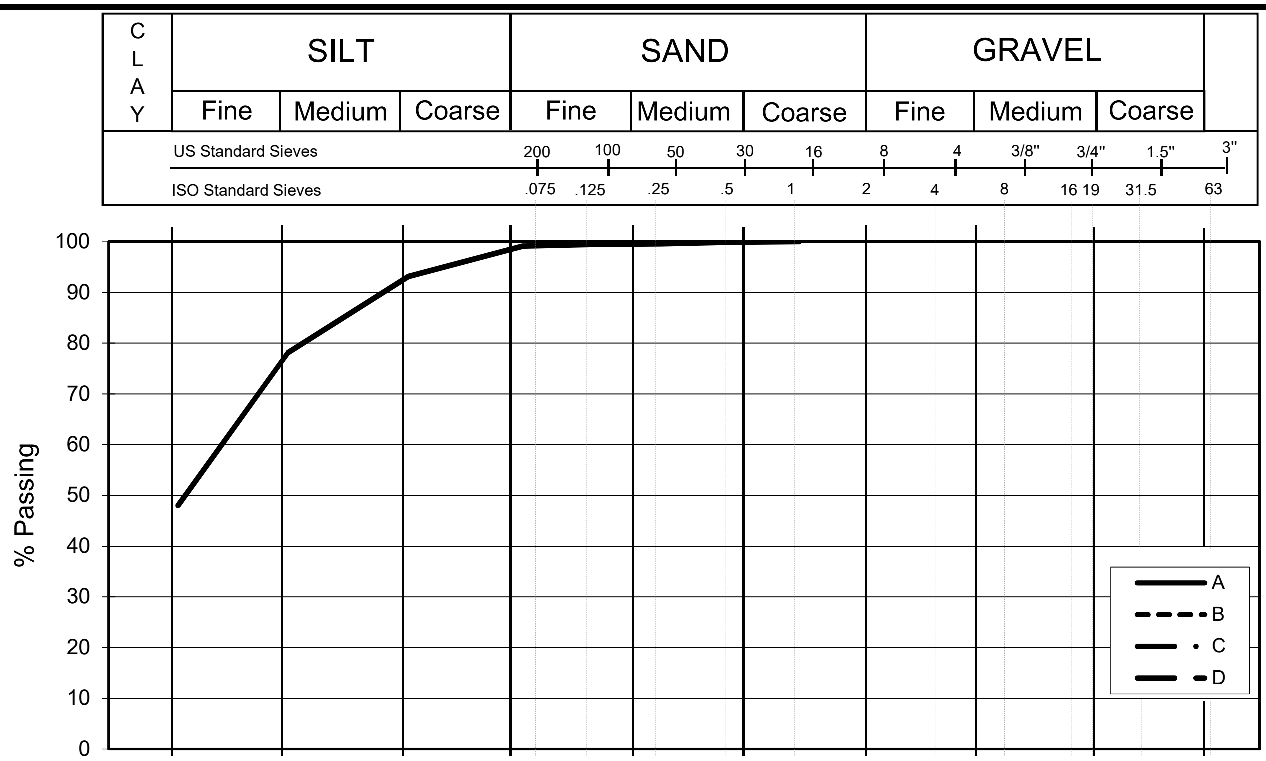
Document No. 20160154-10-R

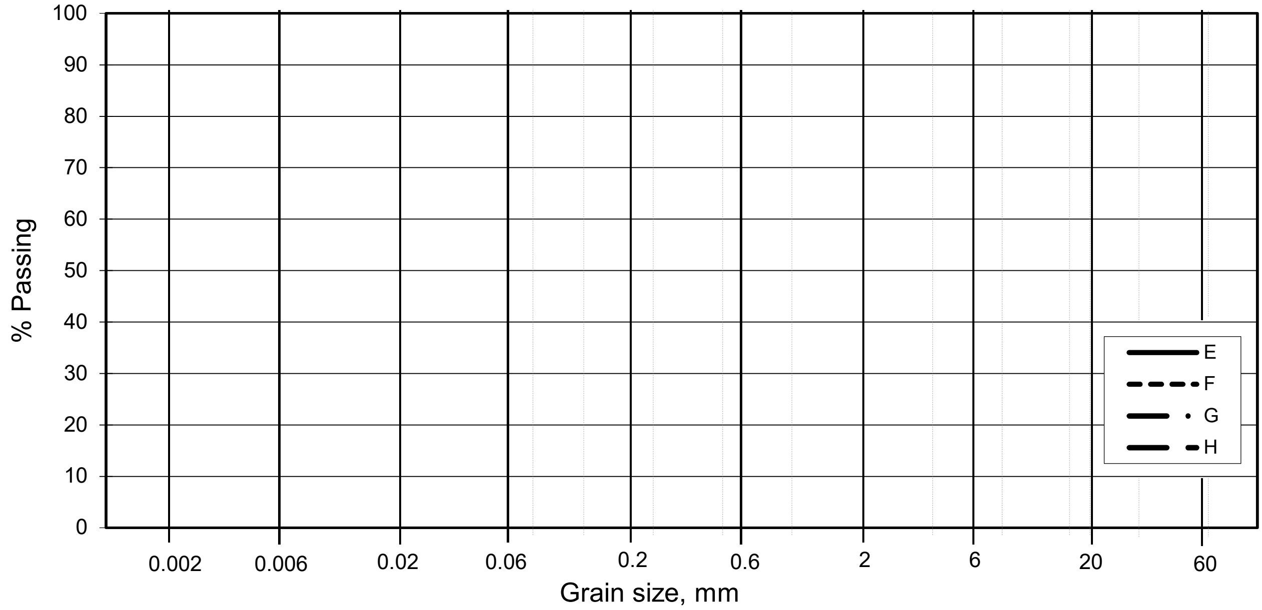
Figure No. 5.1.5

Date 2016/12/13

Drawn by StS

NGI





Curve	Boring No.	Sample No.	Depth m	D_{10} mm	D_{60} mm	Clay cont. %	Soil Description	Method dry/wet-sieving
A	ONSB17	Shoe	4.60		0.003	48.0	CLAY	fall.drop
B								
C								
D								
E								
F								
G								
H								

Rev. 2 / Dato 2017-02-15 / Sign. SK

#VALUE!

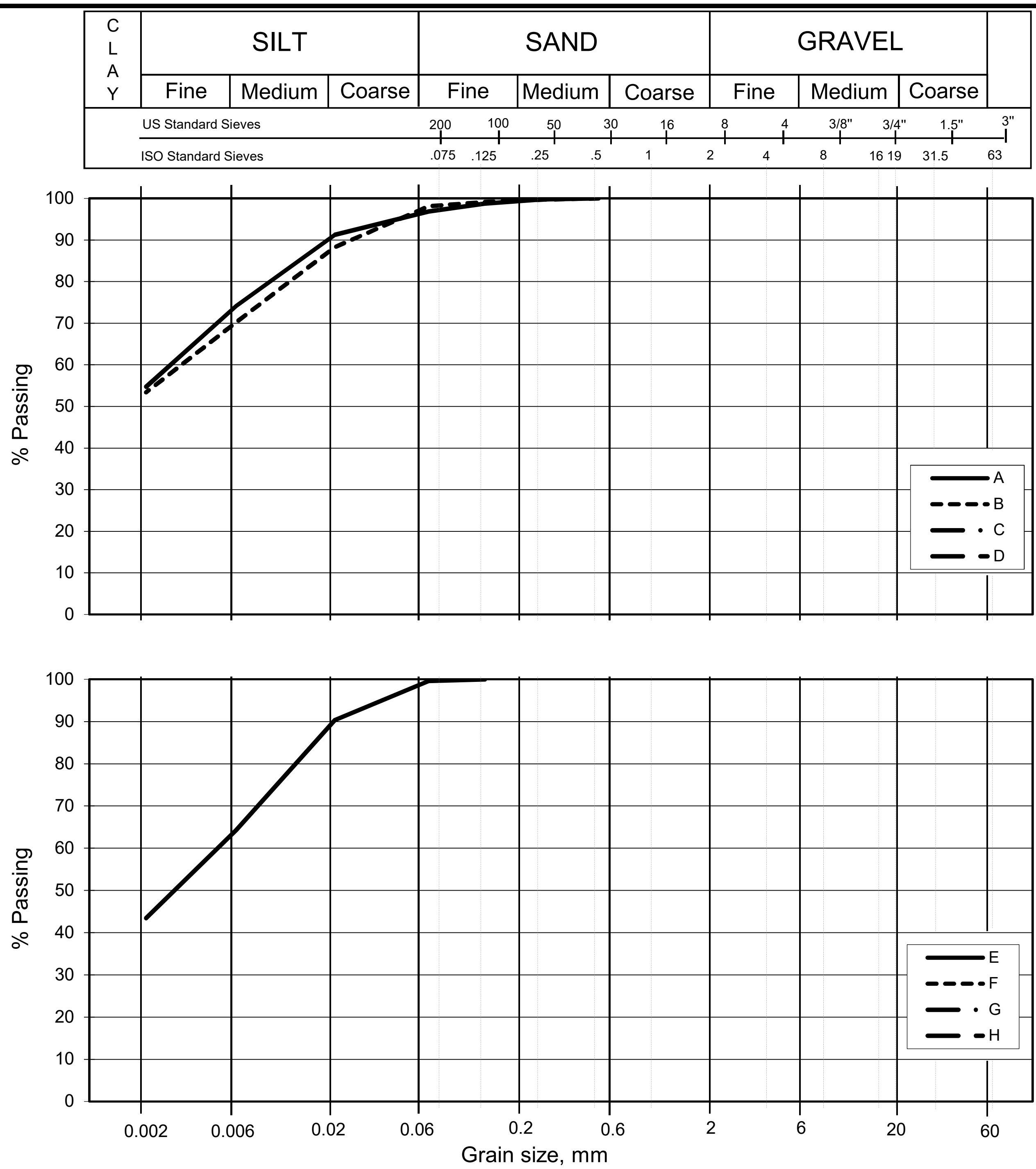
Norwegian GeoTest Sites - Onsøy

Grain size distribution curves

Carried out as part of NGI project no. 20170642,

IHC SWORD field testing Onsøy

Document No.	
20160154-10-R	
Figure No.	
5.1.6	
Date	Drawn by / Checked
2017/08/04	JRO/THV



Curve	Boring No.	Sample No.	Depth m	D_{10} mm	D_{60} mm	Clay cont. %	Soil Description	Method dry/wet-sieving
A	ONSB41	11	10.74		0.003	54.7	CLAY	fall.drop
B	ONSB41	13	12.71		0.003	53.4	CLAY	fall.drop
C								
D								
E	ONSB41	20	19.08		0.005	43.4	CLAY	fall.drop
F								
G								
H								

Rev. 2 / Dato 2017-02-15 / Sign. SK   #VALUE!

Norwegian GeoTest Sites - Onsøy

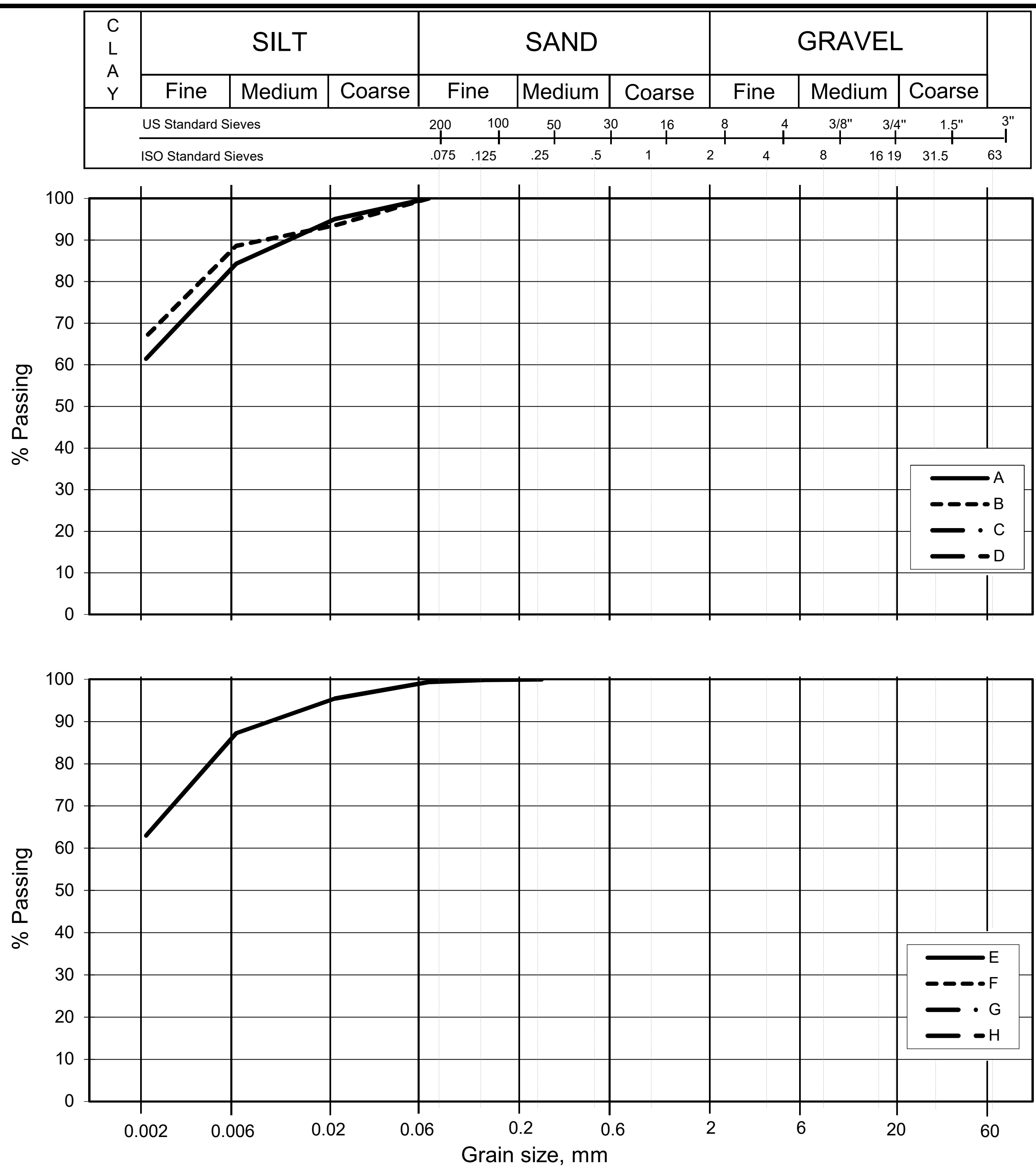
Grain size distribution curves

Document No. 20160154-10-R

Figure No. 5.1.7

Date 2018/01/23

Drawn by / Checked FP/JRO



Curve	Boring No.	Sample No.	Depth m	D_{10} mm	D_{60} mm	Clay cont. %	Soil Description	Method dry/wet-sieving
A	ONSB41	4	3.78			61.5	CLAY	fall.drop
B	ONSB41	6	5.47			66.8	CLAY	fall.drop
C								
D								
E	ONSB41	10	8.87			63.0	CLAY	fall.drop
F								
G								
H								

Rev. 2 / Dato 2017-02-15 / Sign. SK

#VALUE!

Norwegian GeoTest Sites - Onsøy

Grain size distribution curves

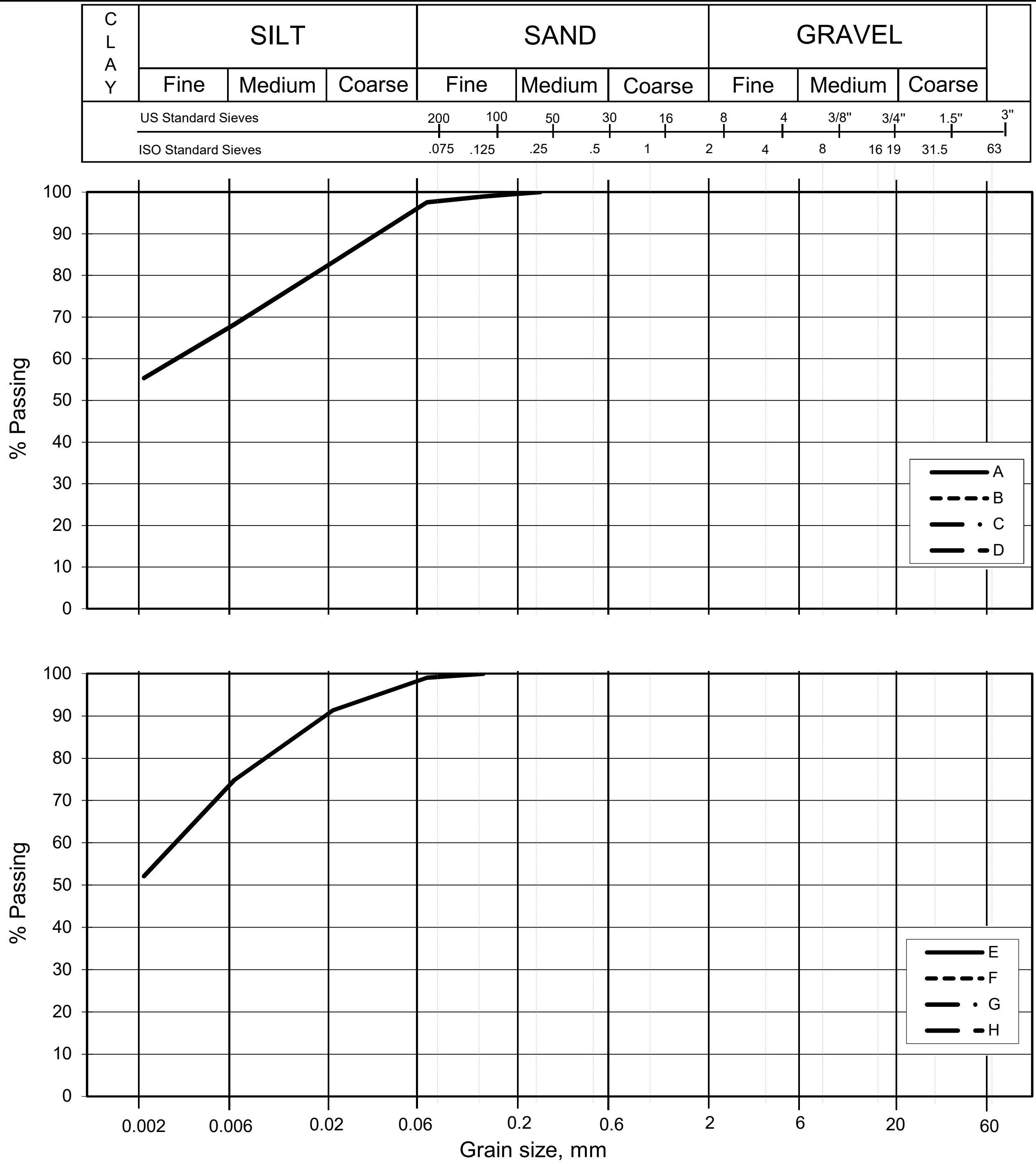
Document No. 20160154-10-R

Figure No. 5.1.8

Date 2018/04/20

Drawn by / Checked FP/JRO

NGI



Curve	Boring No.	Sample No.	Depth m	D_{10} mm	D_{60} mm	Clay cont. %	Soil Description	Method dry/wet-sieving
A	ONSB41	17	16.54		0.003	55.4	CLAY	fall.drop
B								
C								
D								
E	ONSB41	20	19.36		0.003	52.1	CLAY	fall.drop
F								
G								
H								

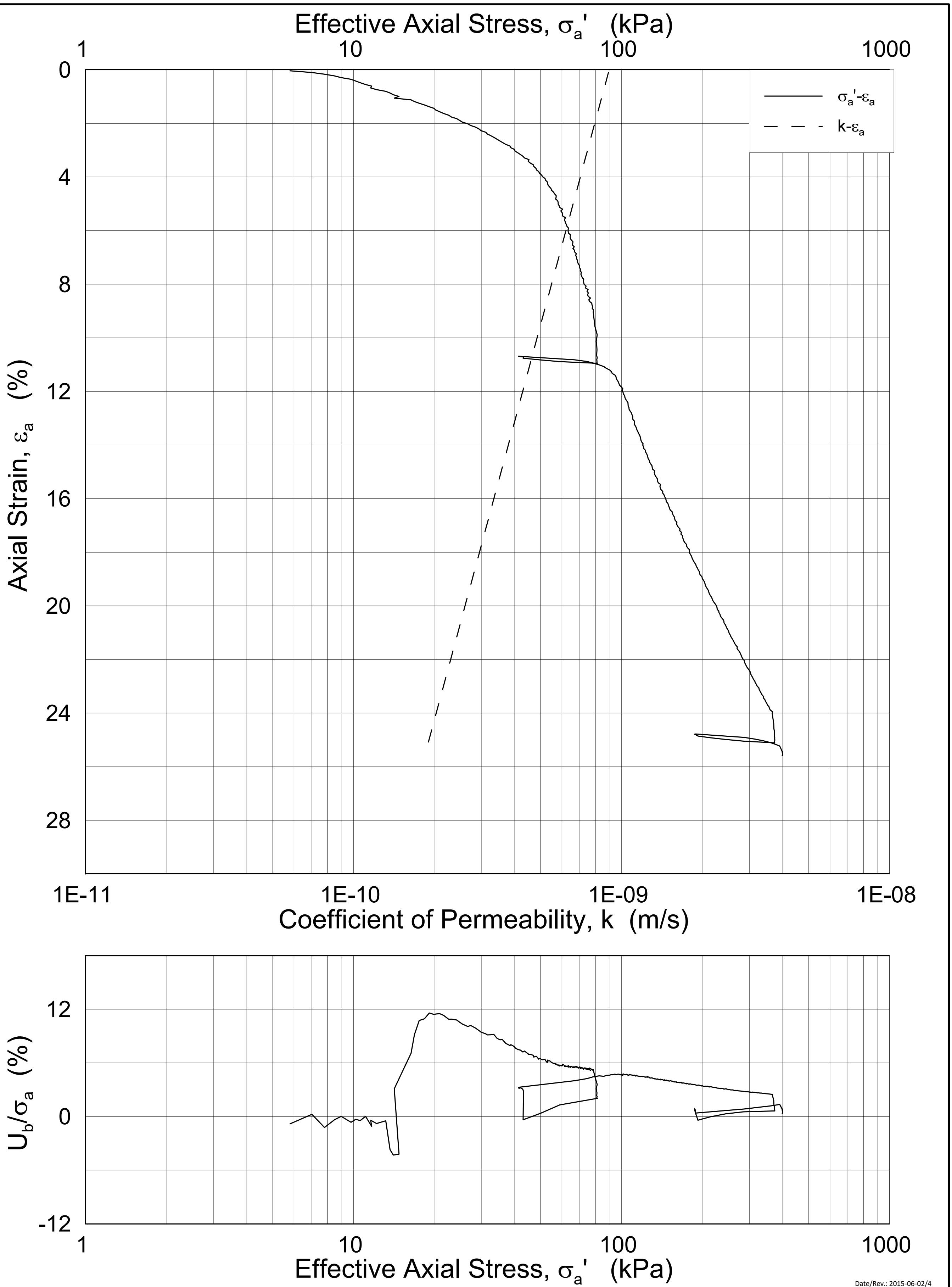
Rev. 2 / Dato 2017-02-15 / Sign. SK #VALUE!

Norwegian GeoTest Sites - Onsøy

Grain size distribution curves

Document No.	20160154-10-R
Figure No.	5.1.9
Date	2018/05/04
Drawn by / Checked	JRO/

NGI



Date/Rev.: 2015-06-02/4

P:\2016\01\20160154\Leveranseedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.1, 2-3-D-1 log (crs3223).grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

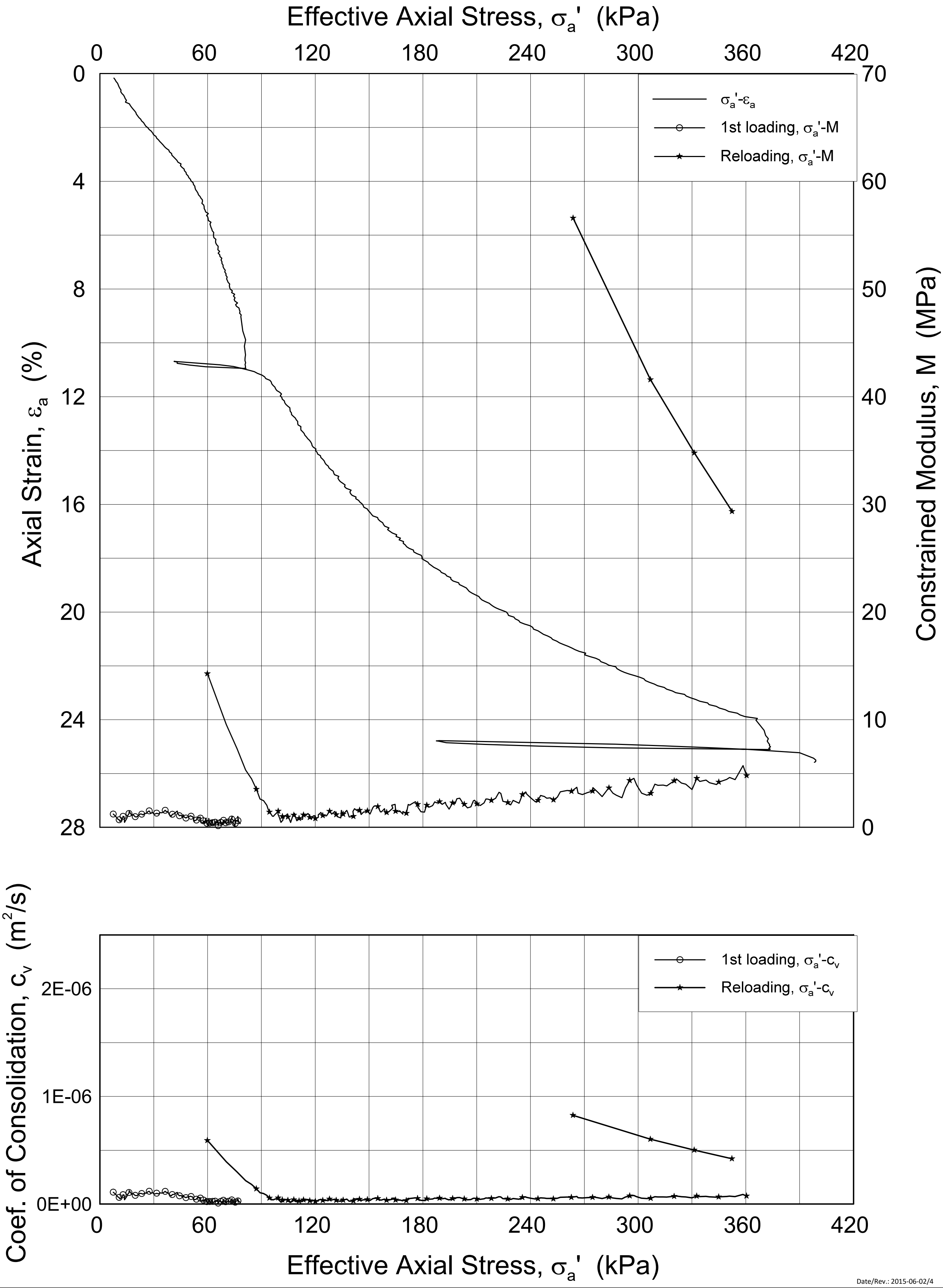
Oedometer test (CRSC)

Figure No. 5.2.1

Date 2018-12-10

Drawn by / Checked FP/ GS

				Depth	=	3.23	m
Boring: ONSB02	Tube:	3		p_0'	=	29.8	kPa
	Part:	D		w_i	=	71.7	%
	Test:	1		γ_i	=	15.48	kN/m³



Date/Rev.: 2015-06-02/4

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	3.23	m
Boring: ONSB02	Tube:	3		p_0'	=	29.8	kPa
	Part:	D		w_i	=	71.7	%
	Test:	1		γ_i	=	15.48	kN/m³

Document No.
20160154-10-R

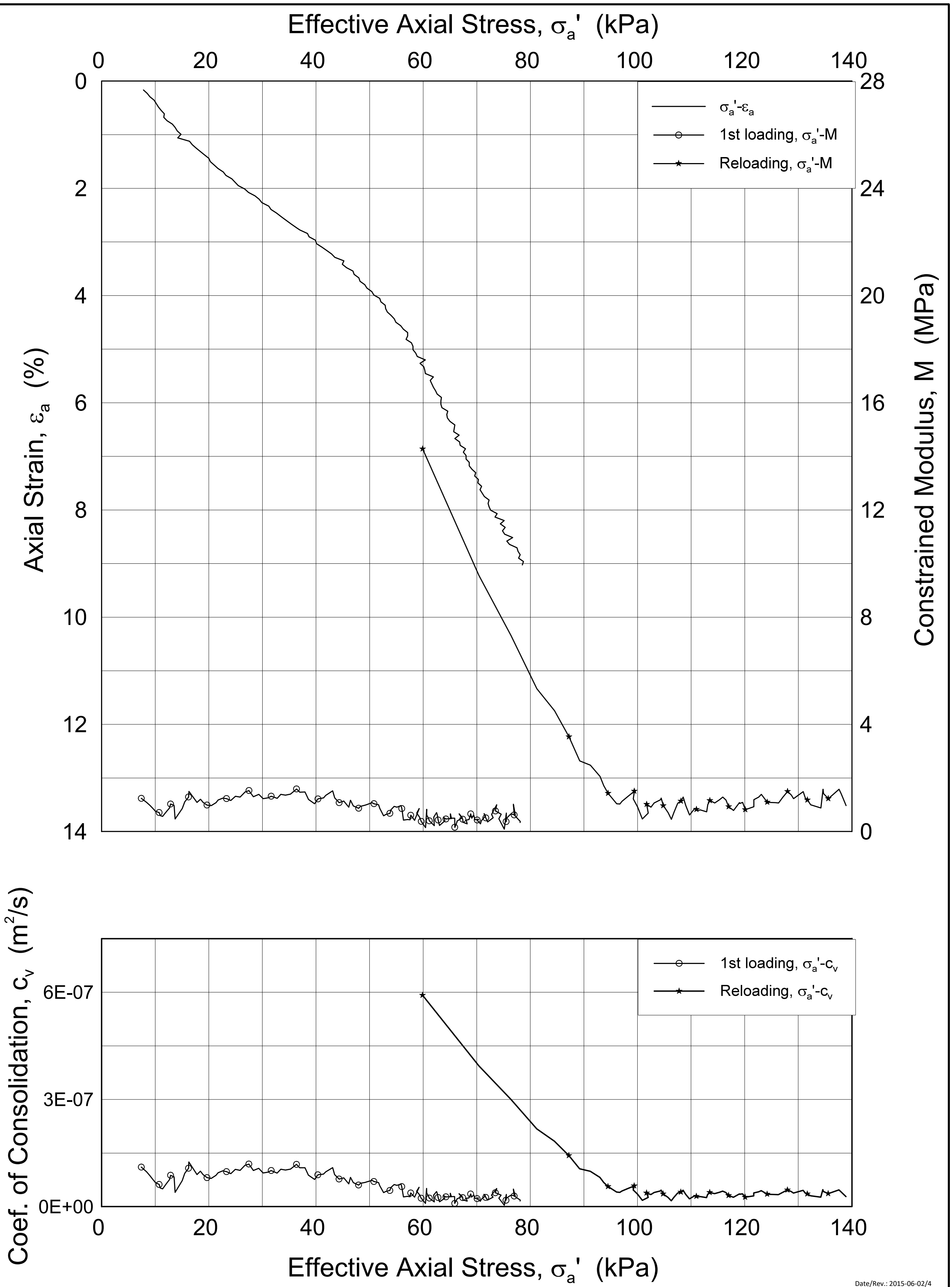
Figure No.
5.2.2

Date
2018-12-10

Drawn by / Checked
FP/ GS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.2, 2-3-D-1 lin (crs3223).grf



Date/Rev.: 2015-06-02/4

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.3, 2-3-D-1 lin-2 (crs3223).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

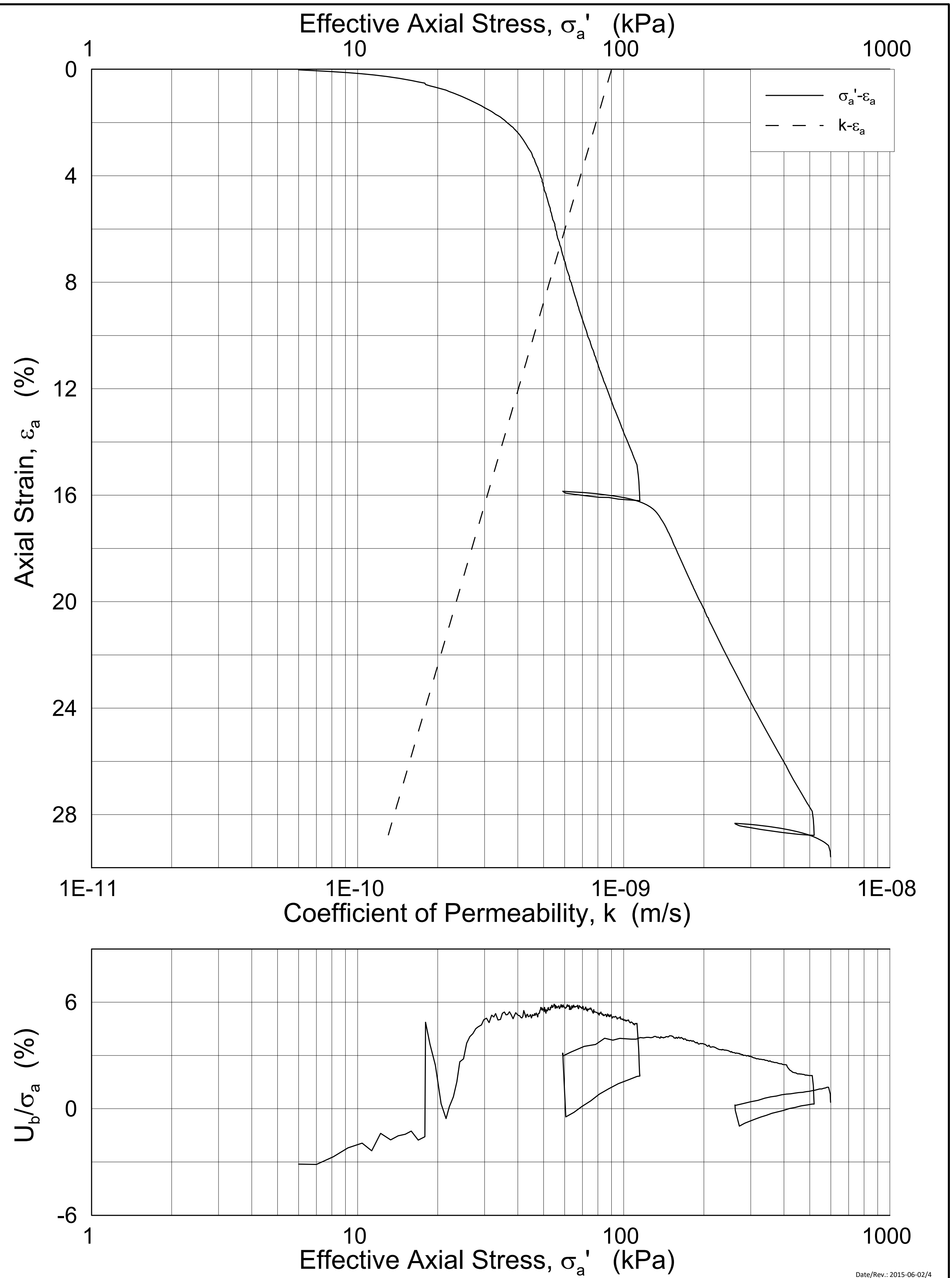
				Depth	=	3.23	m
Boring:	ONSB02	Tube:	3	p_0'	=	29.8	kPa
		Part:	D	w_i	=	71.7	%
		Test:	1	γ_i	=	15.48	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.3

Date 2018-12-10

Drawn by / Checked FP/ GS



Date/Rev.: 2015-06-02/4

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.4, 2-5-D-1 log (crs3222).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB02 | Tube: 5 | Part: D | Test: 1

Depth = 5.25 m
p_0' = 41.3 kPa
w_i = 71.1 %
γ_i = 16.01 kN/m³

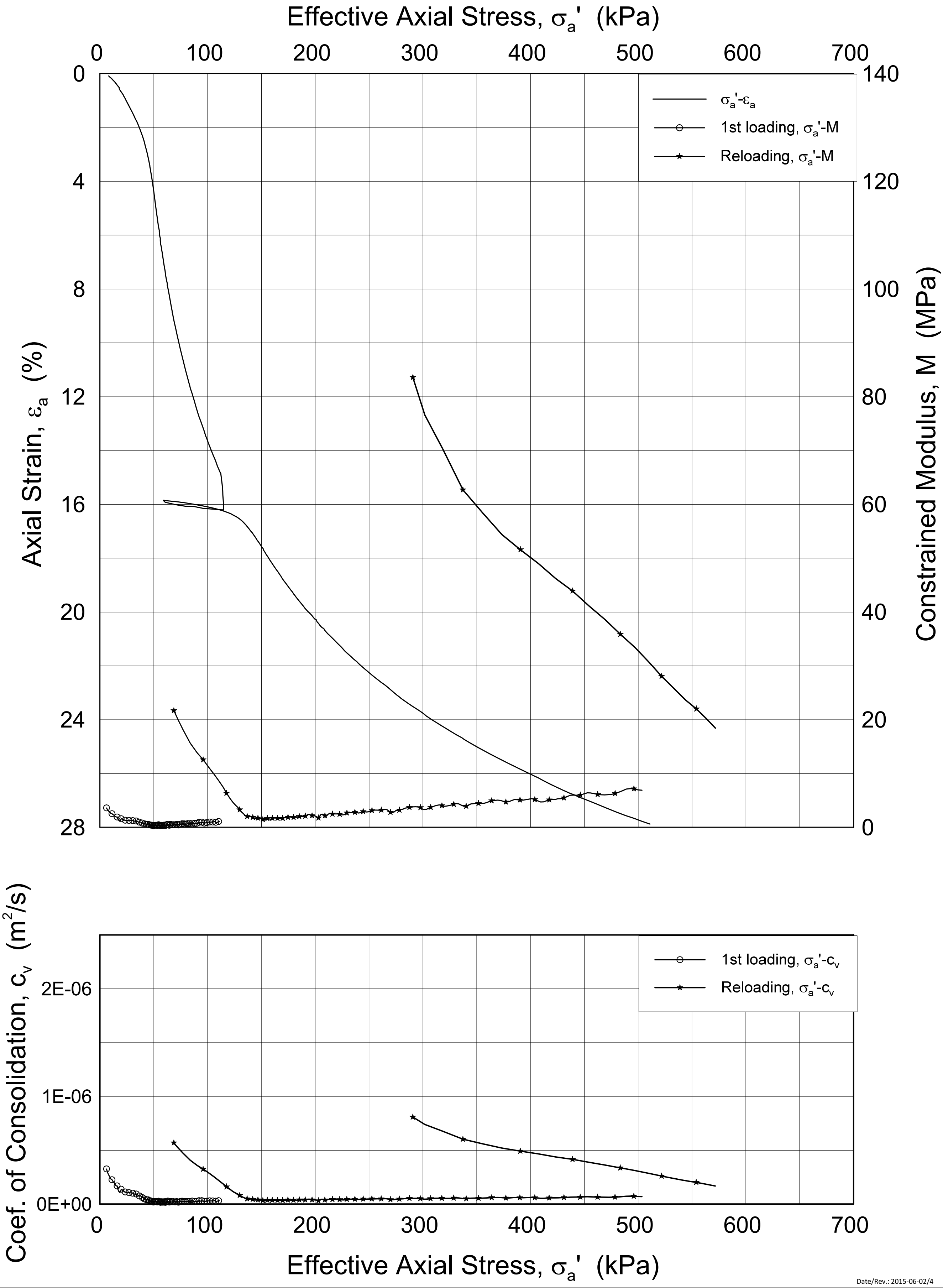
Document No. 20160154-10-R

Figure No. 5.2.4

Date 2018-12-10

Drawn by / Checked FP/ GS

NGI



Date/Rev.: 2015-06-02/4

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

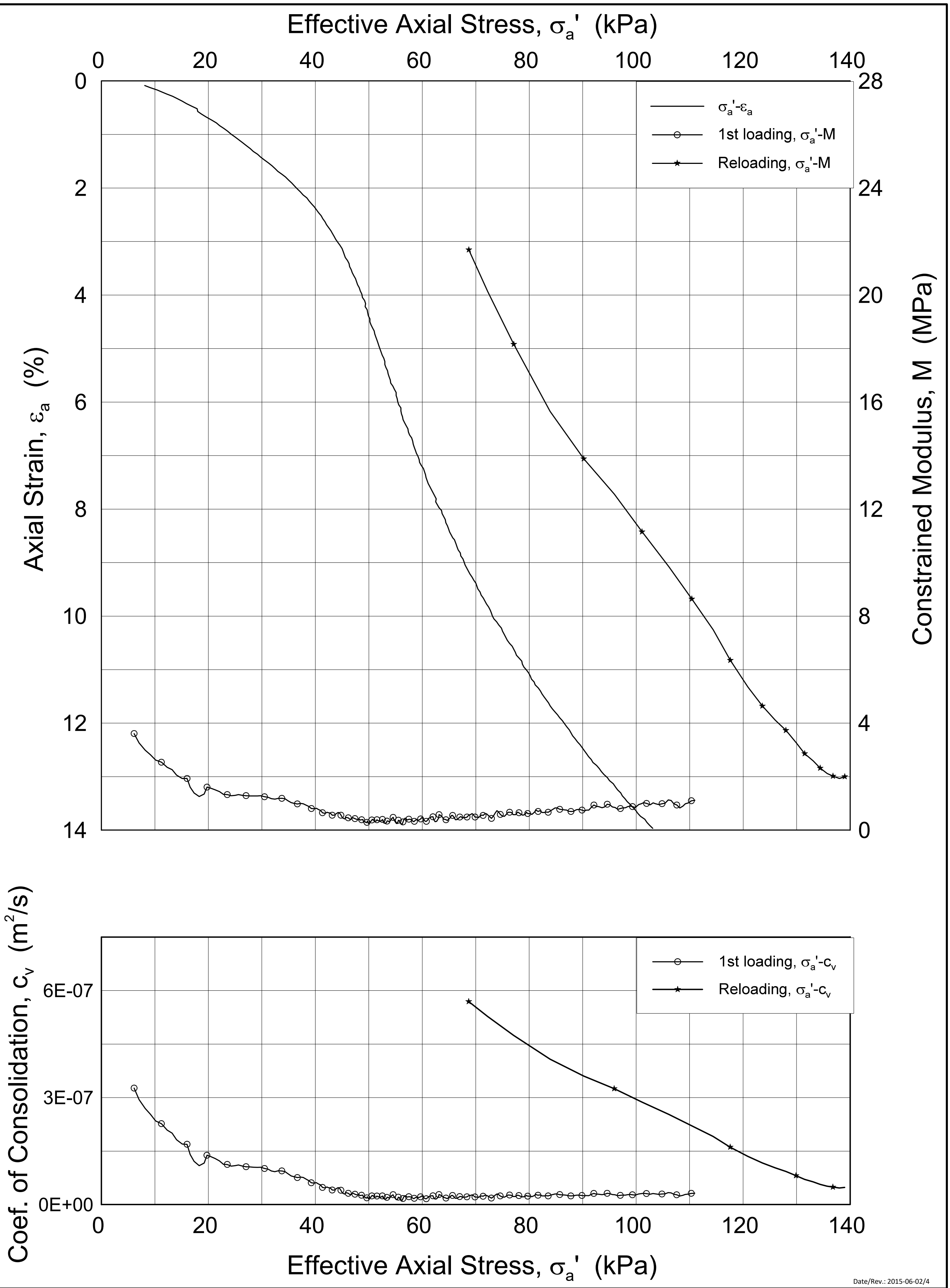
				Depth	=	5.25	m
Boring: ONSB02	Tube:	5		p_0'	=	41.3	kPa
	Part:	D		w_i	=	71.1	%
	Test:	1		γ_i	=	16.01	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.5

Date 2018-12-10

Drawn by / Checked FP/ GS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.6, 2-5-D-1 lin-2 (crs3222).grf

Date/Rev.: 2015-06-02/4

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

			Depth	=	5.25	m
Boring: ONSB02	Tube:	5	p_0'	=	41.3	kPa
	Part:	D	w_i	=	71.1	%
	Test:	1	γ_i	=	16.01	kN/m³

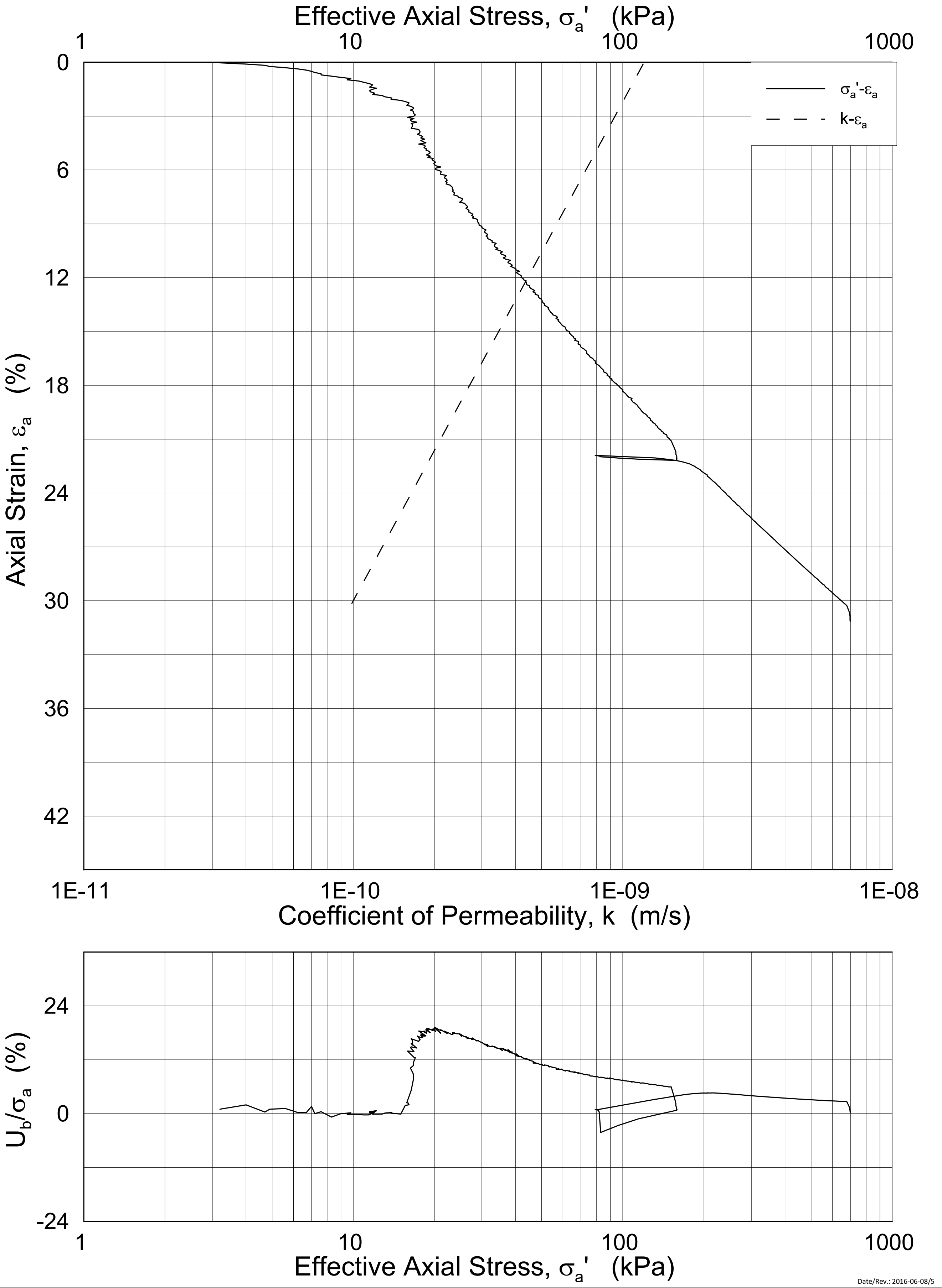
Document No. 20160154-10-R

Figure No. 5.2.6

Date 2018-12-10

Drawn by / Checked FP/ GS

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.7
	Date 2018-12-10 / Drawn by / Checked FP/ MAS

Boring: ONSB04 Tube: 1 Part: B Test: 1

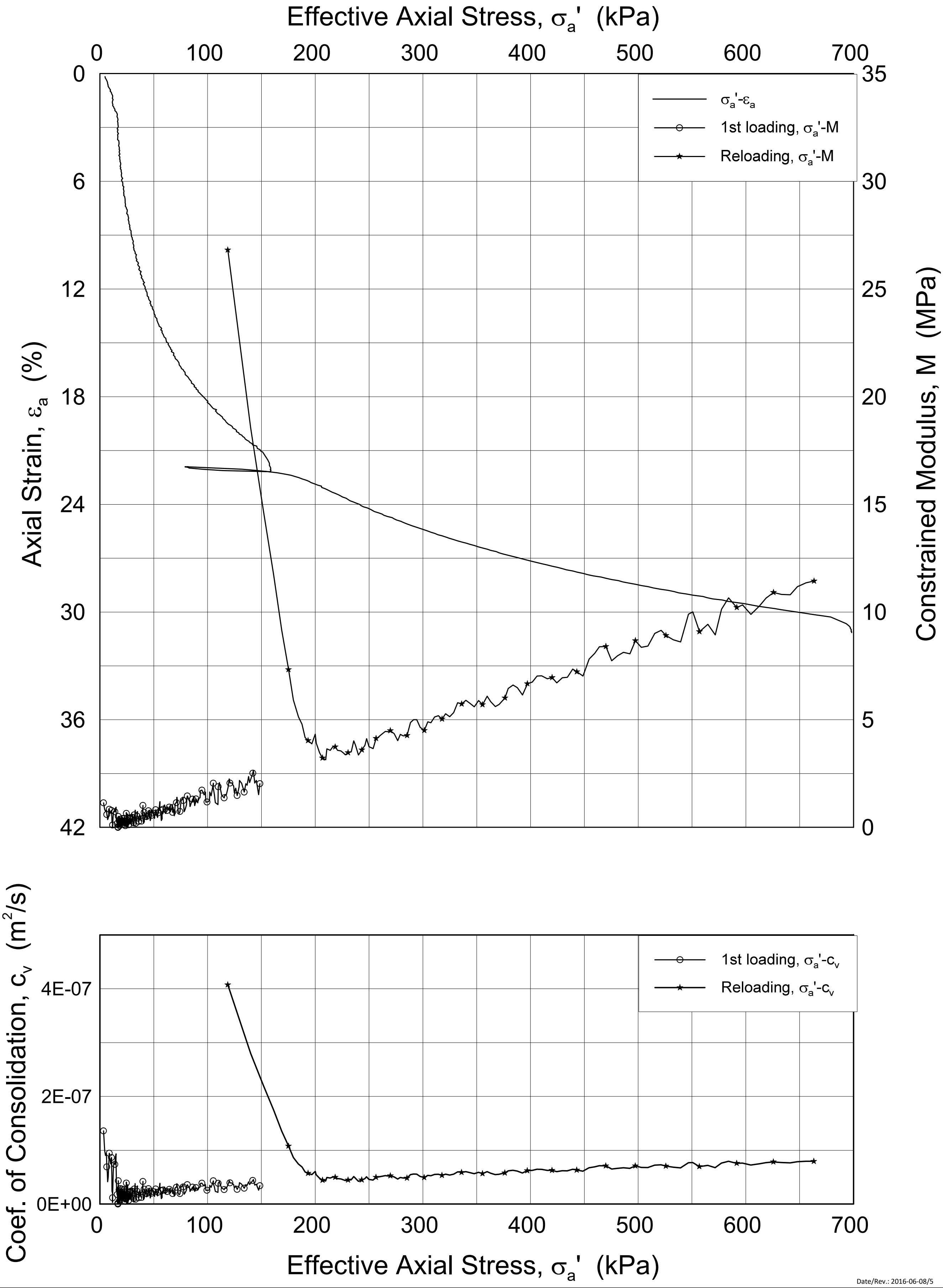
Depth = 8.42 m

p_0' = 52.5 kPa

w_i = 63.8 %

γ_i = 16.55 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.7, Piston1-1-B-1 log (crs3346).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.8, Piston1-1-B-1 lin (crs3346).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	8.42	m
Boring:	ONSB04	Tube:	1	p_0'	=	52.5	kPa
		Part:	B	w_i	=	63.8	%
		Test:	1	γ_i	=	16.55	kN/m³

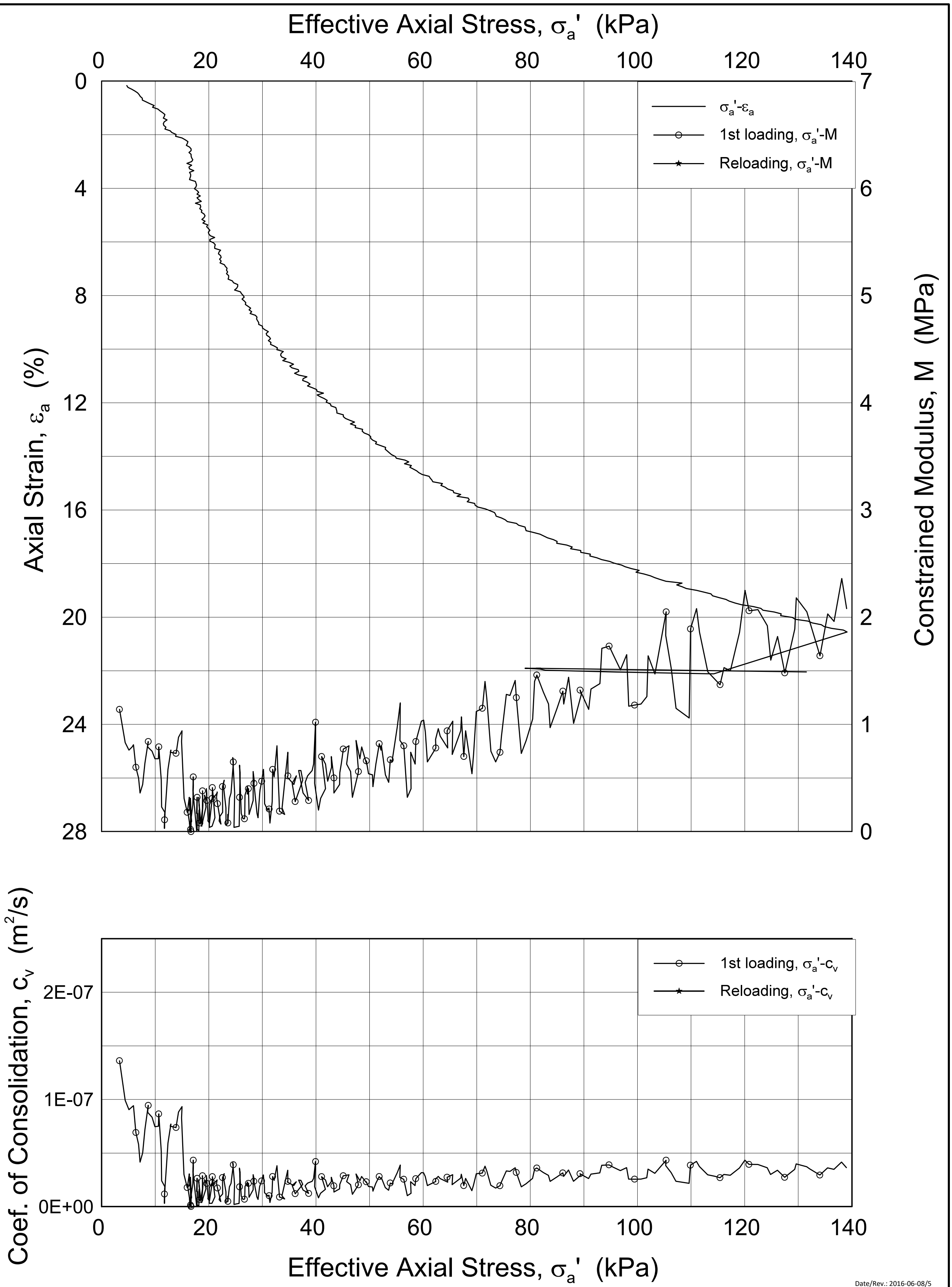
Document No. 20160154-10-R

Figure No. 5.2.8

Date 2018-12-10

Drawn by / Checked FP / MAS

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.9, Piston1-1-B-1 lin-2 (crs3346).grf

Date/Rev.: 2016-06-08/5

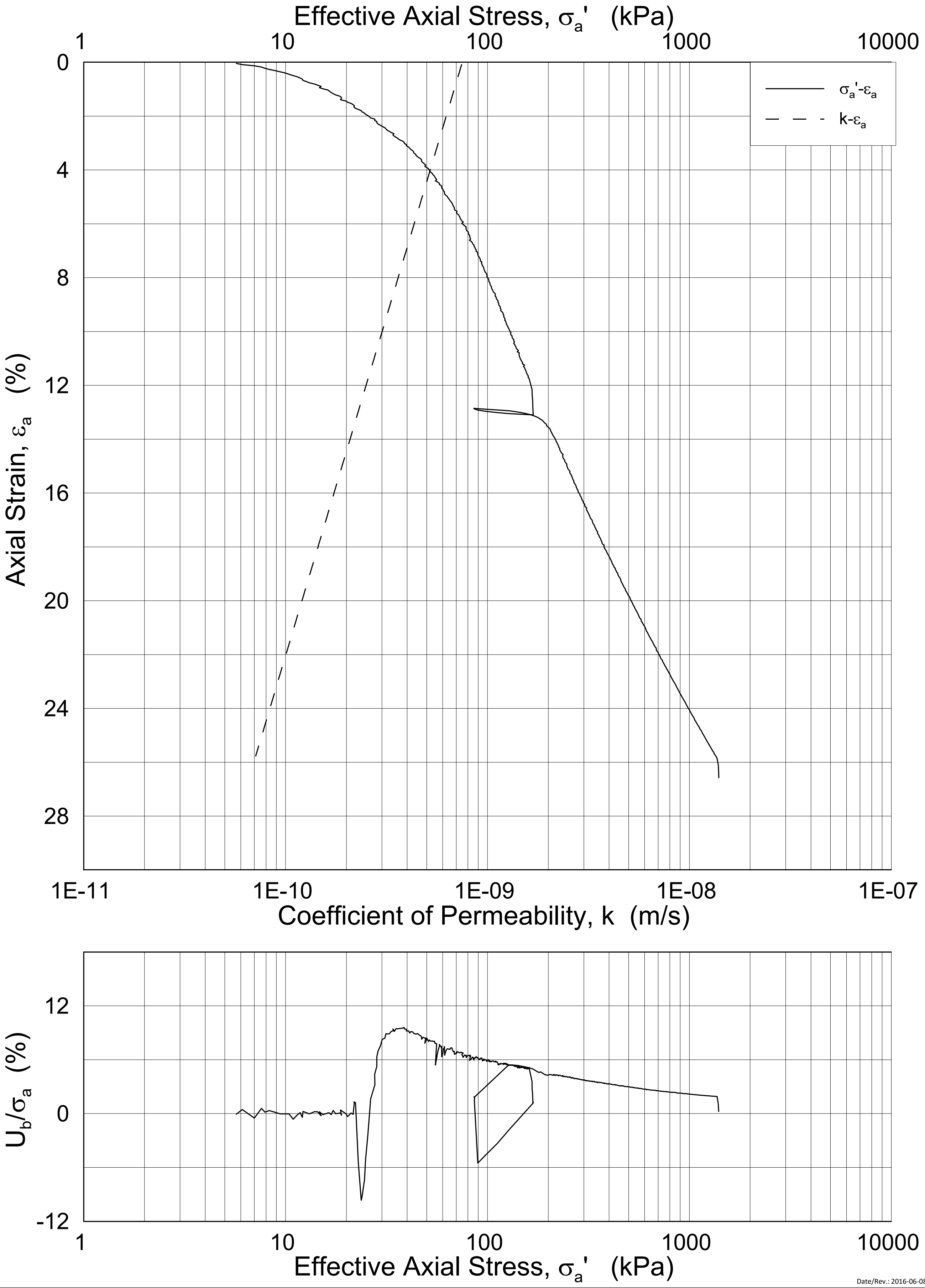
Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.9	
	Date 2018-12-10	Drawn by / Checked FP / MAS

Boring: ONSB04

Tube: 1
Part: B
Test: 1

Depth = 8.42 m
p_0' = 52.5 kPa
w_i = 63.8 %
γ_i = 16.55 kN/m³

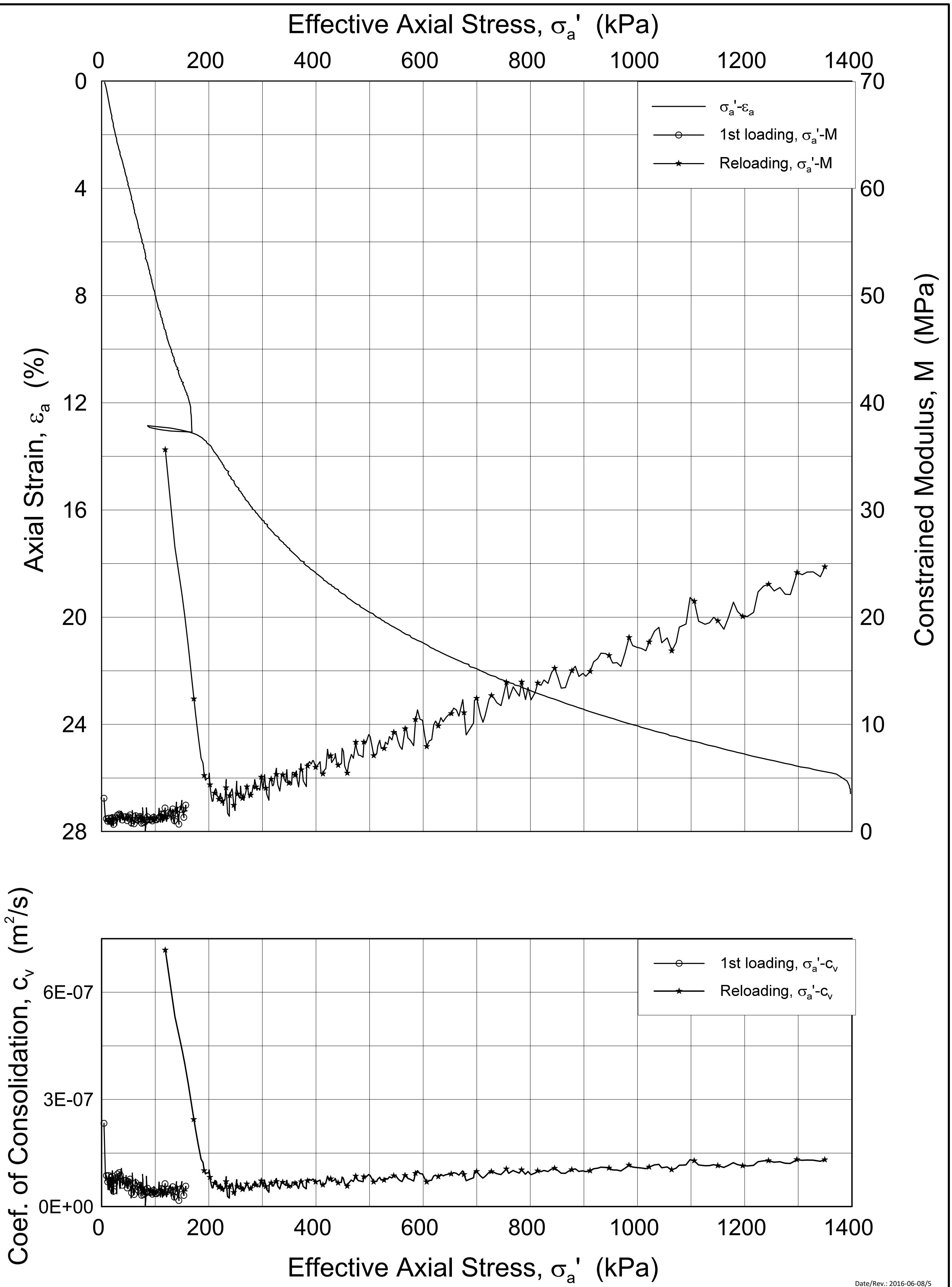
NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.10, Piston1-2-B-1 log (crs3343).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Oedometer test (CRSC)			Figure No. 5.2.10
		Depth = 9.12 m	Date 2018-12-10 / Drawn by / Checked FP / GS
Boring: ONSB04	Tube: 2	p_0' = 57.6 kPa	NGI
	Part: B	w_i = 44.5 %	
	Test: 1	γ_i = 17.90 kN/m³	



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	9.12	m
Boring: ONSB04	Tube:	2		p_0'	=	57.6	kPa
	Part:	B		w_i	=	44.5	%
	Test:	1		γ_i	=	17.90	kN/m³

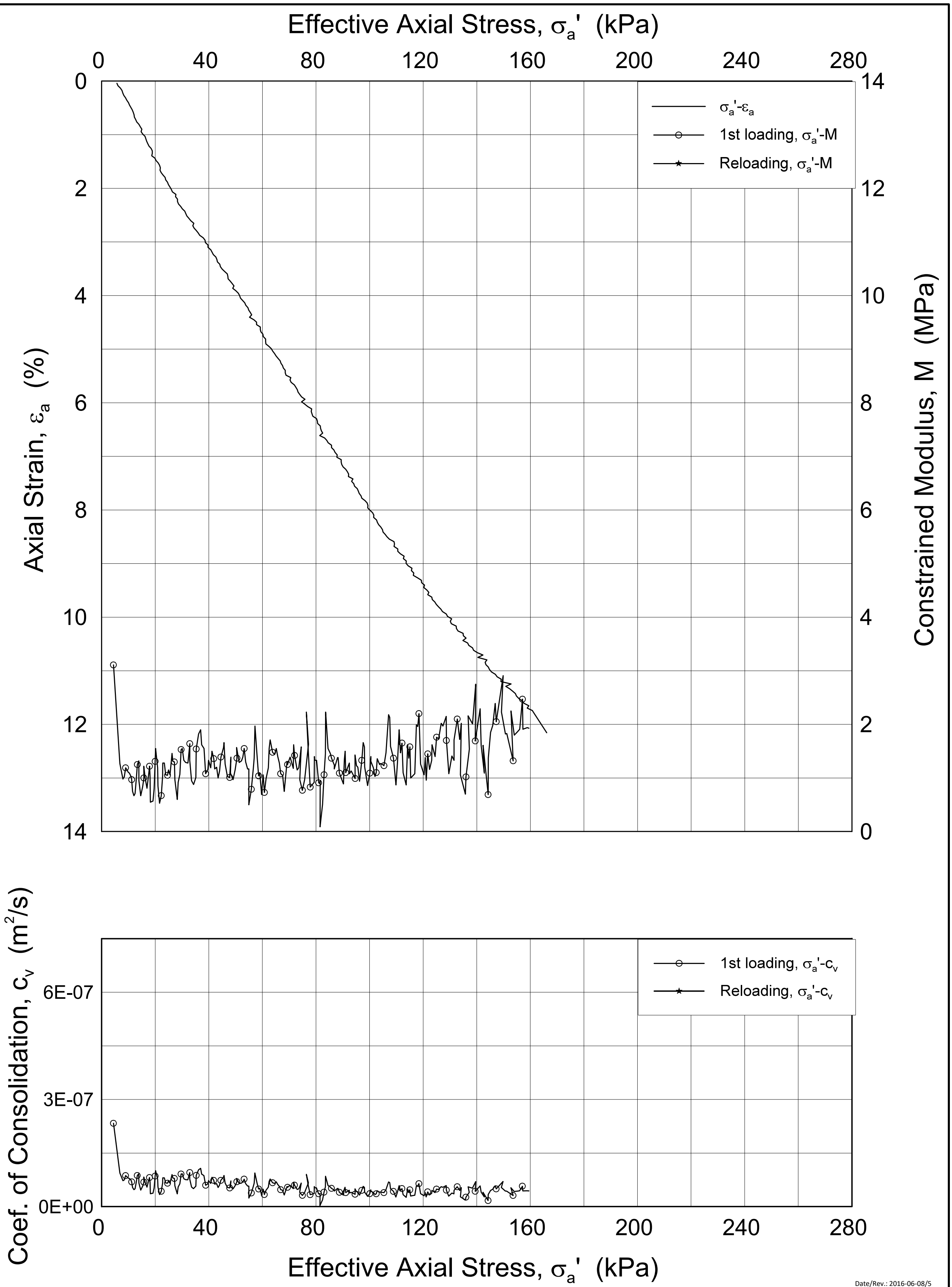
Document No. 20160154-10-R

Figure No. 5.2.11

Date 2018-12-10

Drawn by / Checked FP / GS

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.11, Piston1-2-B-1 lin (crs3343).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.12, Piston1-2-B-1 lin-2 (crs3343).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Document No. 20160154-10-R

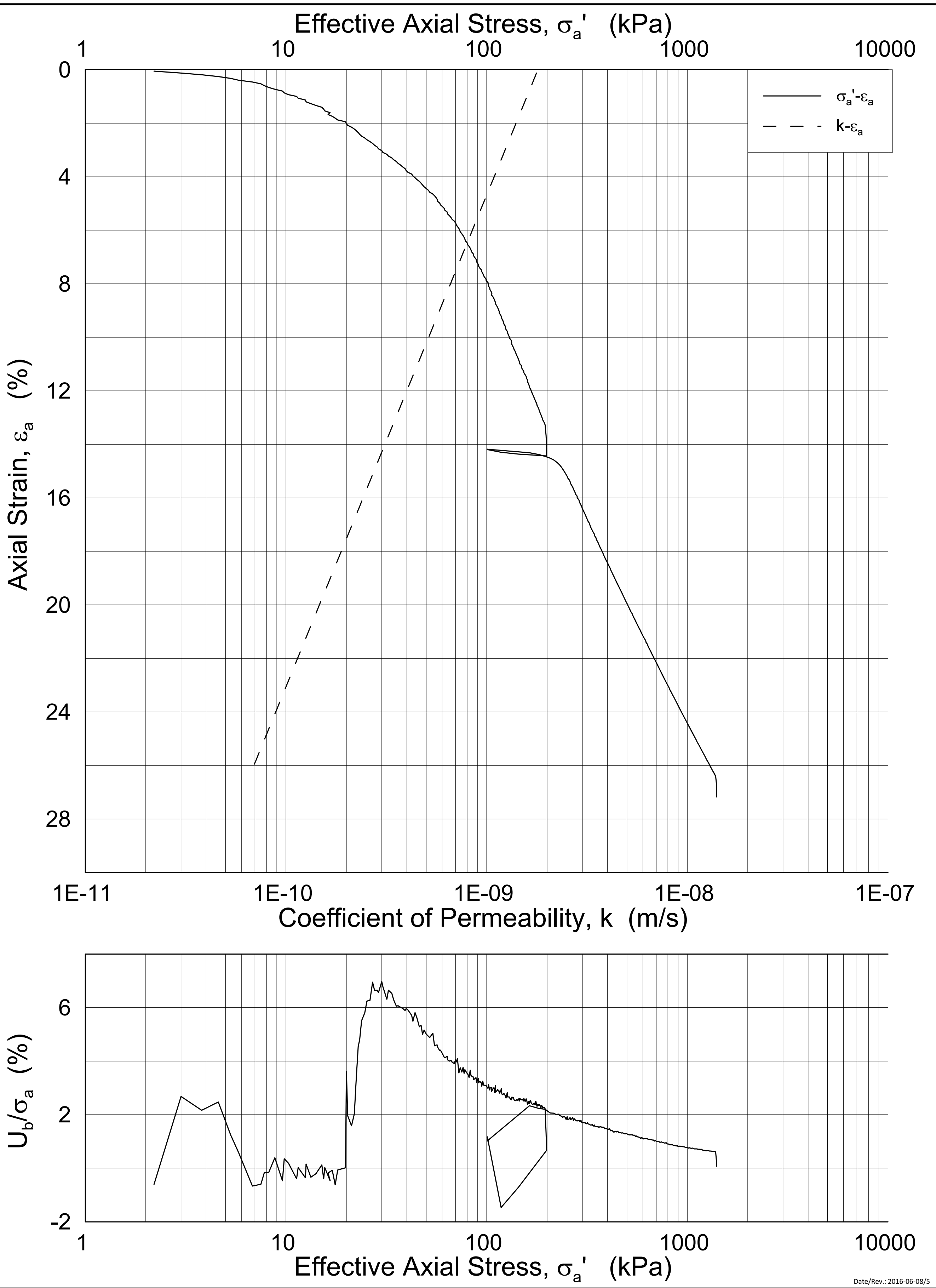
Figure No. 5.2.12

Date 2018-12-10

Drawn by / Checked FP / GS

				Depth	=	9.12	m
Boring:	ONSB04	Tube:	2	p_0'	=	57.6	kPa
		Part:	B	w_i	=	44.5	%
		Test:	1	γ_i	=	17.90	kN/m³

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.13, Piston1-3-B-1 log (crs3347).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

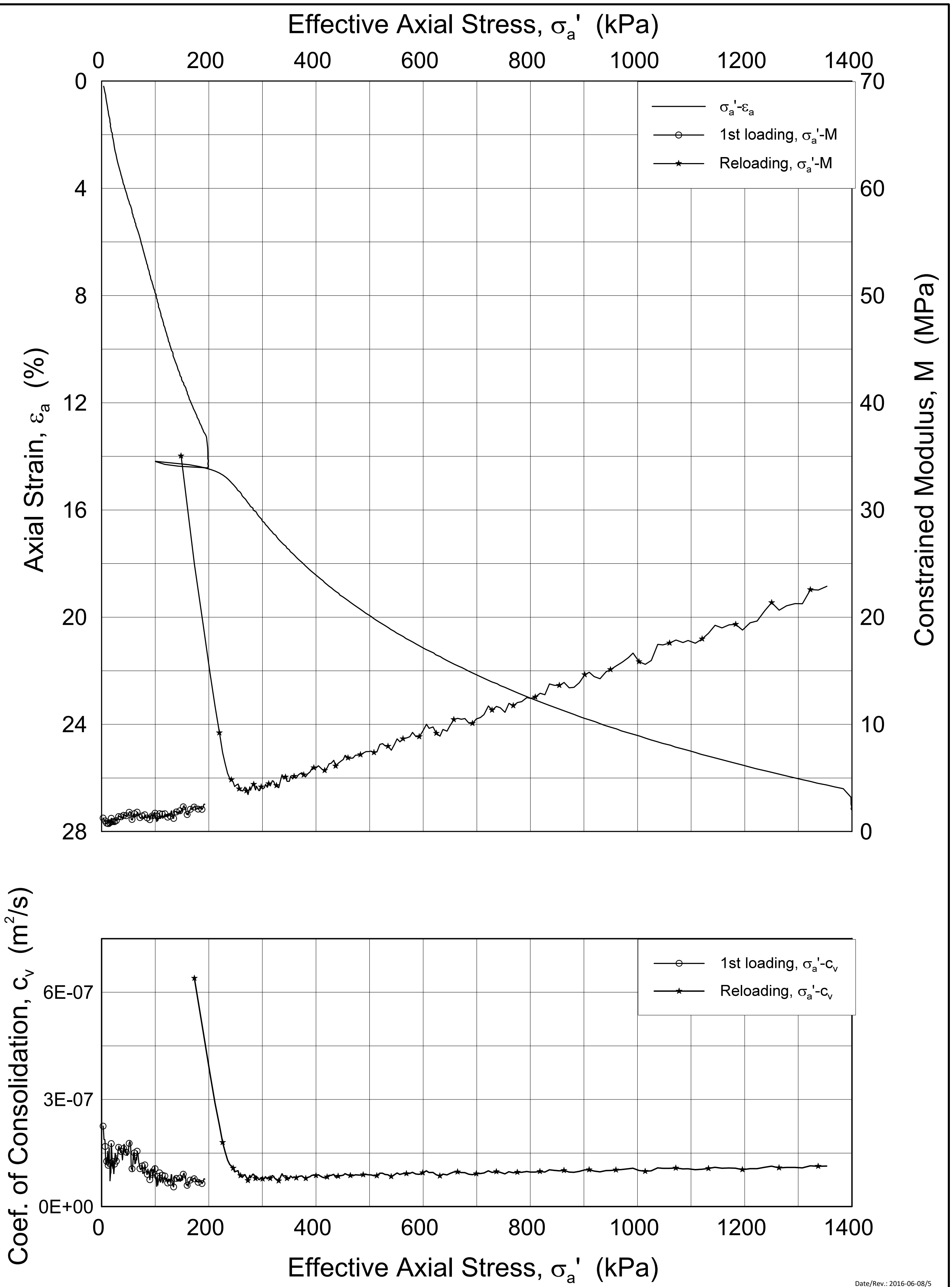
				Depth	=	10.02	m
Boring:	ONSB04	Tube:	3	p_0'	=	64.1	kPa
		Part:	B	w_i	=	42.7	%
		Test:	1	γ_i	=	17.93	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.13

Date	Drawn by / Checked
2018-12-10	JRo / MAS

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.14, Piston1-3-B-1 lin (crs3347).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.14
	Date 2018-12-10 — Drawn by / Checked JRo / MAS

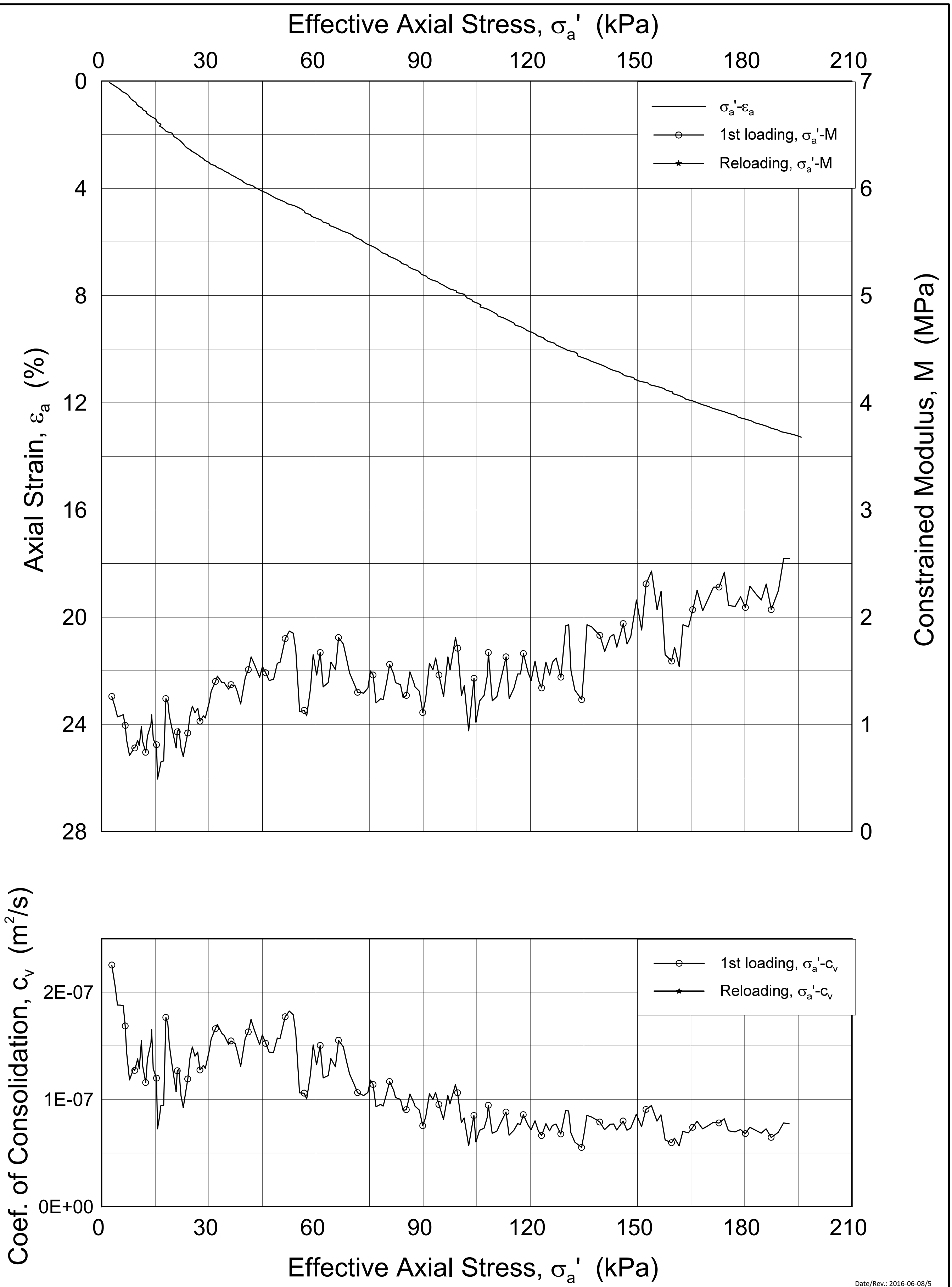
Depth = 10.02 m

Boring: ONSB04 Tube: 3 p_0' = 64.1 kPa

Part: B w_i = 42.7 %

Test: 1 γ_i = 17.93 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.15, Piston1-3-B-1 lin-2 (crs3347).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Document No. 20160154-10-R

Figure No. 5.2.15

Date 2018-12-10

Drawn by / Checked JRo / MAS

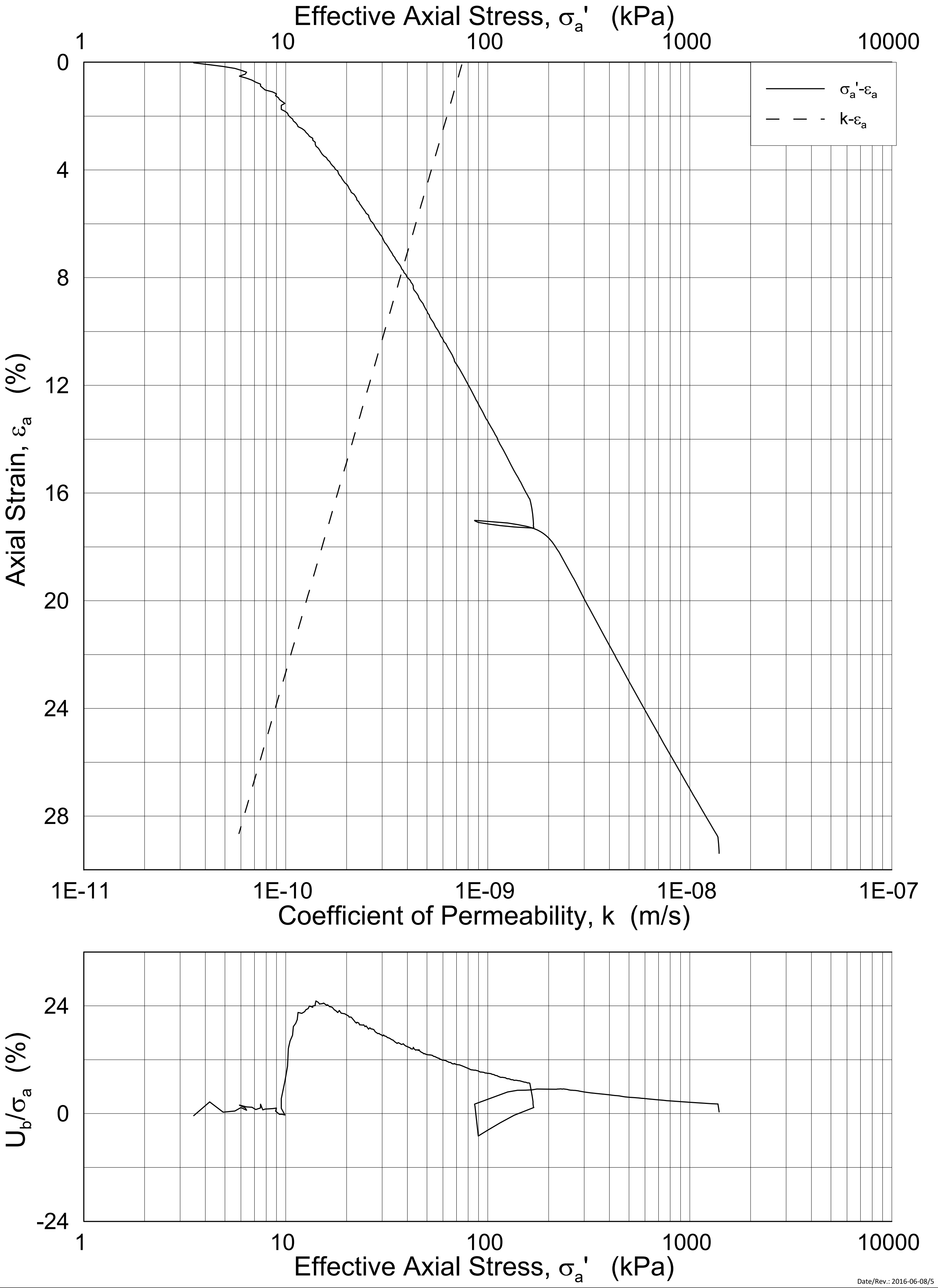
Depth = 10.02 m

Boring: ONSB04 Tube: 3 p_0' = 64.1 kPa

Part: B w_i = 42.7 %

Test: 1 γ_i = 17.93 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Document No. 20160154-10-R

Figure No. 5.2.16

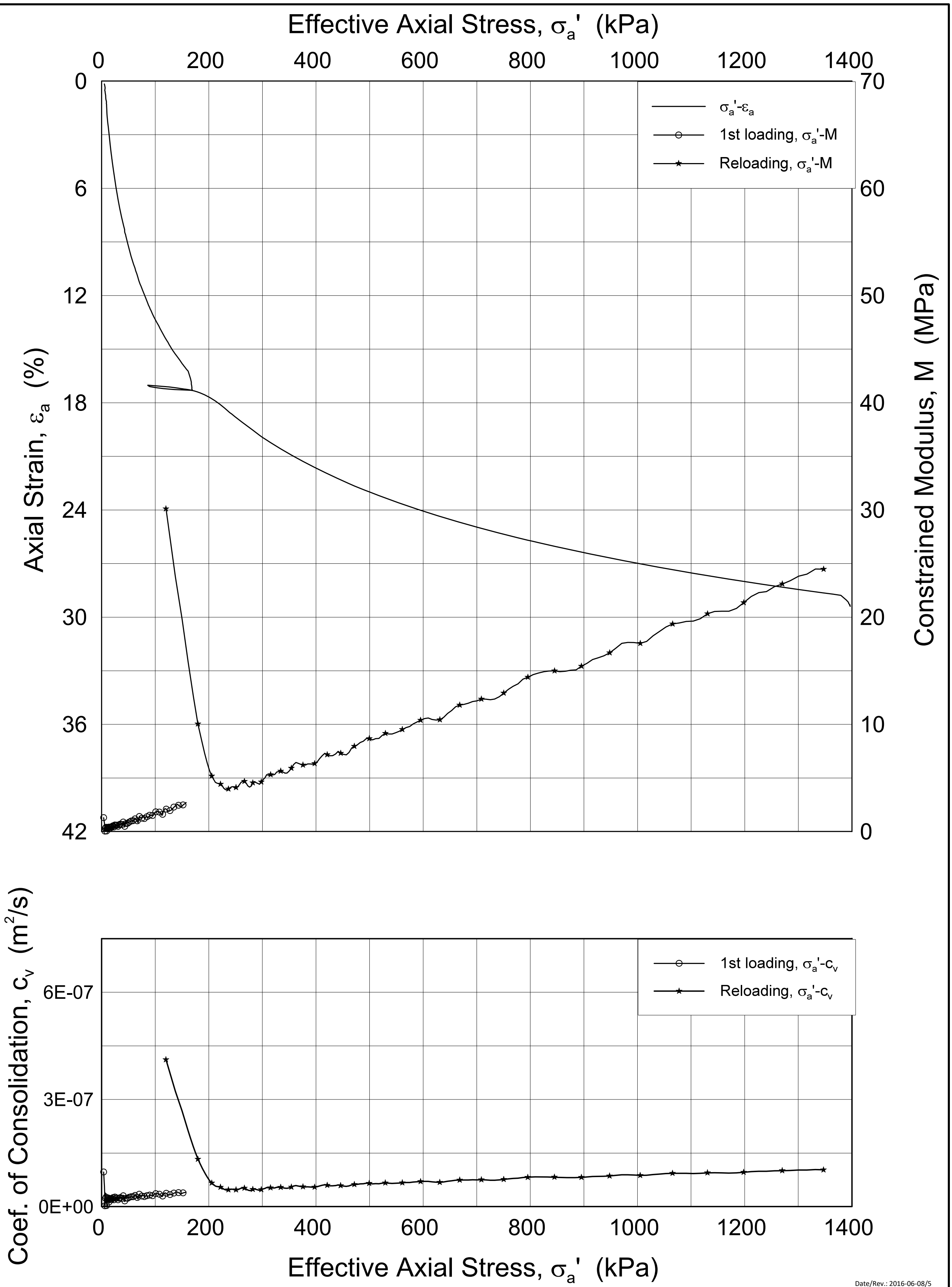
Date	Drawn by / Checked
2018-12-10	FP / GS

Boring: ONSB04

Tube: 2
Part: B
Test: 1

Depth = 8.97 m
p_0' = 56.5 kPa
w_i = 53.1 %
γ_i = 17.09 kN/m³

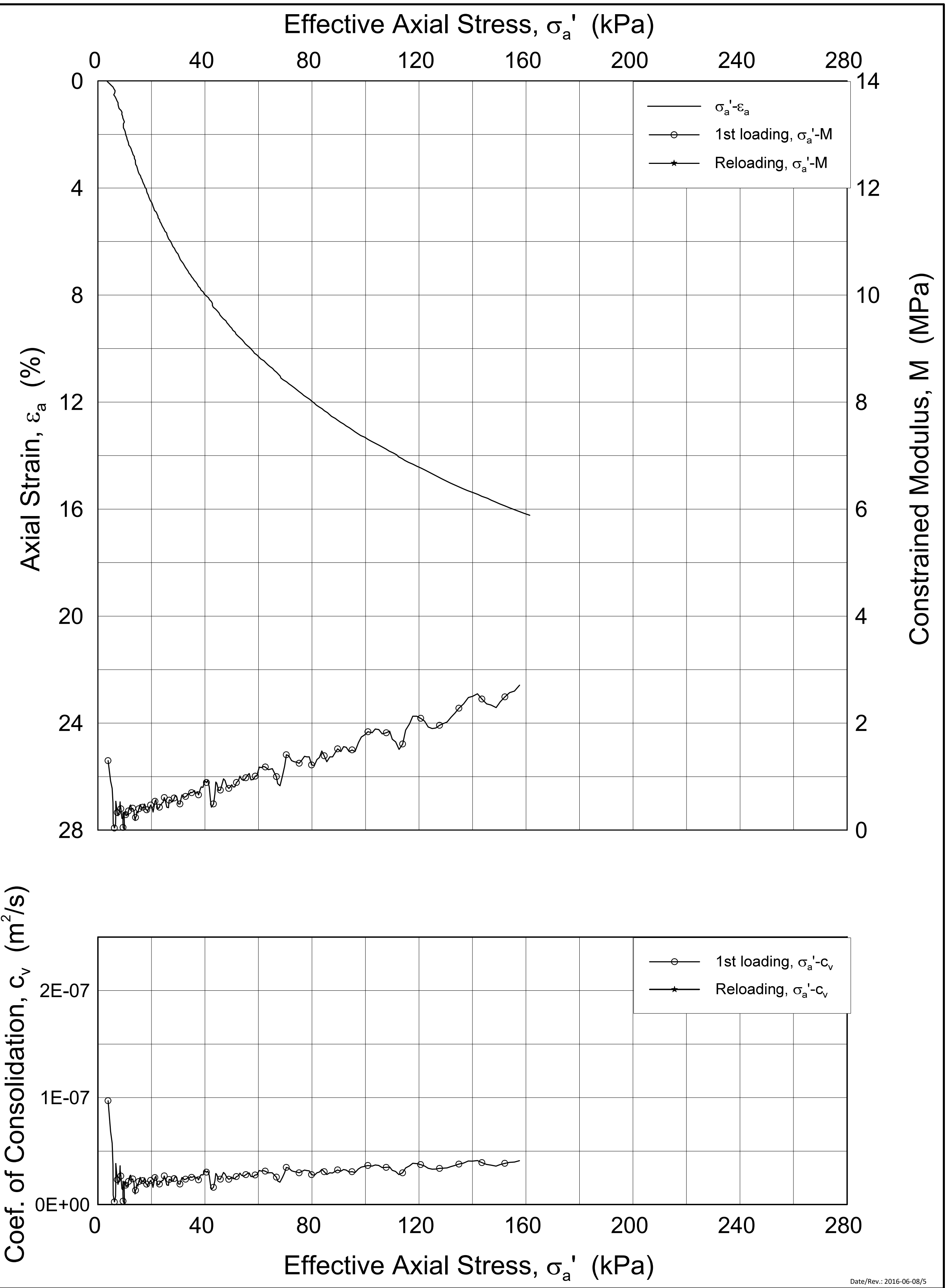
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.16, Push1-2-B-1 log (crs3345).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.17, Push1-2-B-1 lin (crs3345).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.17
Depth = 8.97 m	Date 2018-12-10 / Drawn by / Checked FP / GS
Boring: ONSB04 · Tube: 2 · p_0' = 56.5 kPa	NGI
Part: B · w_i = 53.1 %	
Test: 1 · γ_i = 17.09 kN/m³	



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.18, Push1-2-B-1 lin-2 (crs3345).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

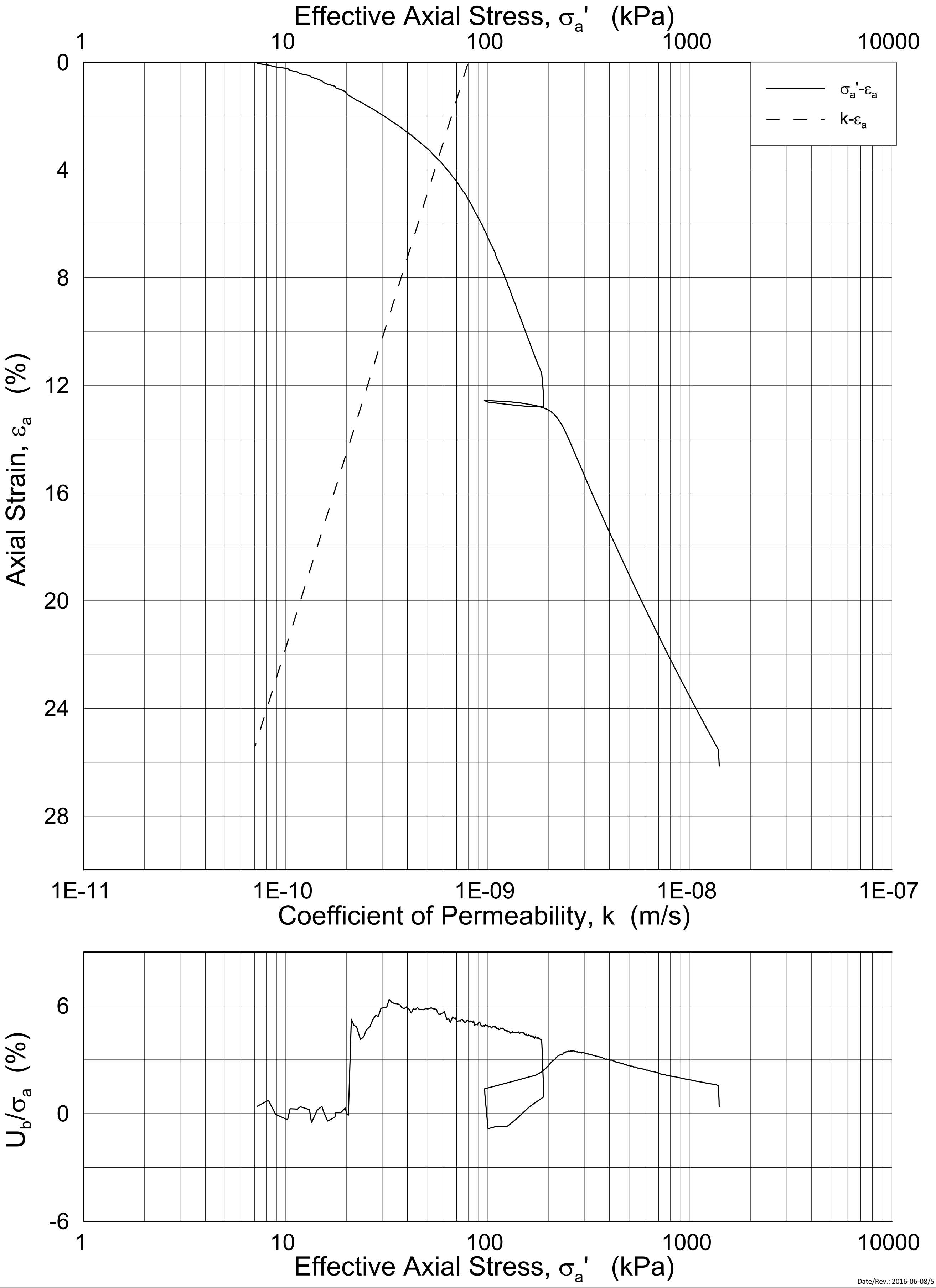
Boring: ONSB05	Tube:	2	Depth	=	8.97	m
	Part:	B	p_0'	=	56.5	kPa
	Test:	1	w_i	=	53.1	%
			γ_i	=	17.09	kN/m³

Document No.
20160154-10-R

Figure No.
5.2.18

Date
2018-12-10

Drawn by / Checked
FP / GS



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

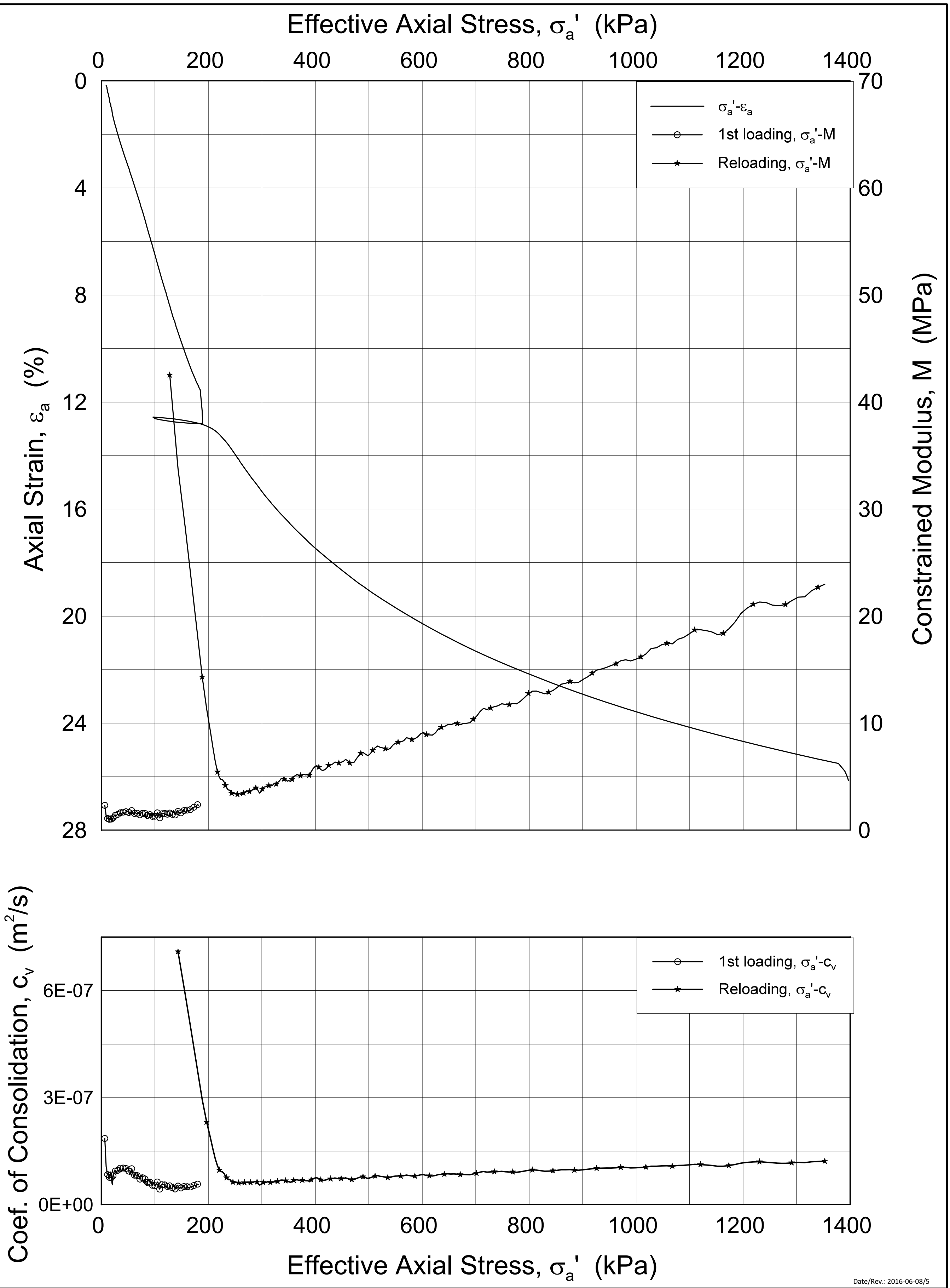
Boring: ONSB05			Depth	=	9.97	m
	Tube:	3	p_0'	=	63.8	kPa
	Part:	B	w_i	=	44.3	%
	Test:	1	γ_i	=	17.60	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.19

Date	Drawn by / Checked
2018-12-10	FP / GS

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.20, Push1-3-B-1 lin (crs3344).grf

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.20
	Date 2018-12-10 / Drawn by / Checked FP / GS

Boring: ONSB05   Tube: 3   Part: B   Test: 1

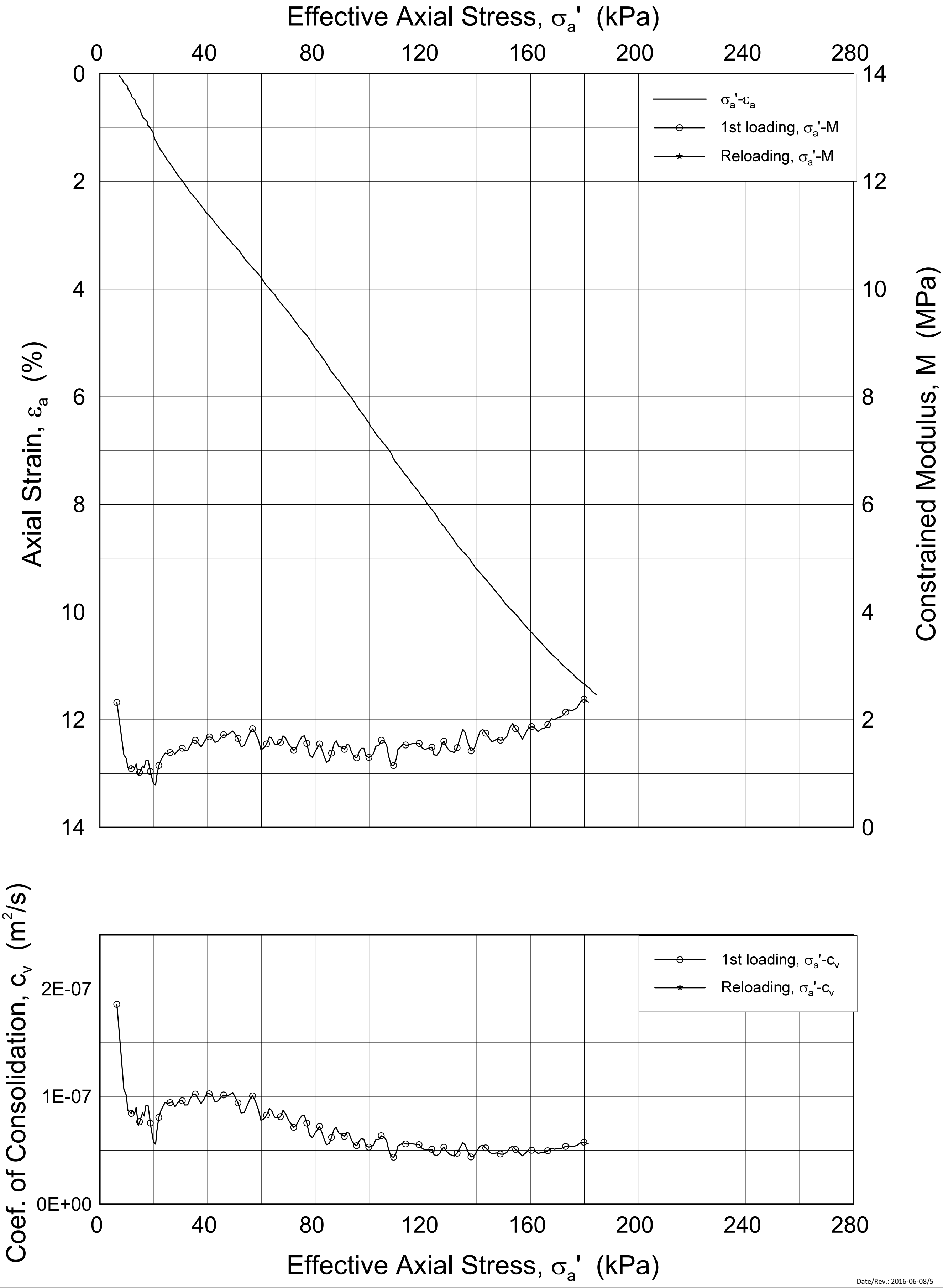
Depth = 9.97 m

p_0' = 63.8 kPa

w_i = 44.3 %

γ_i = 17.60 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

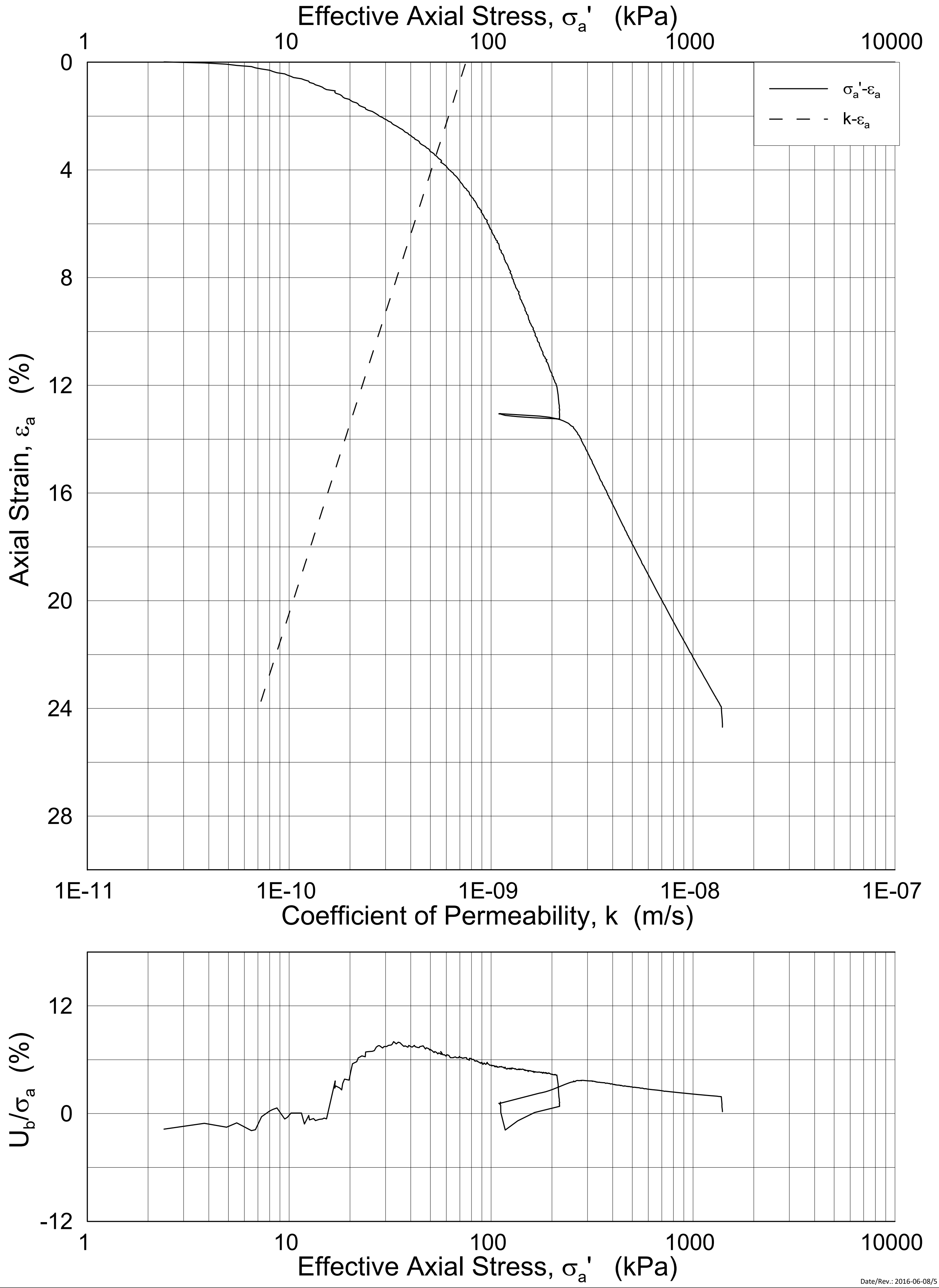
Document No. 20160154-10-R

Figure No. 5.2.21

Date	Drawn by / Checked
2018-12-10	FP / GS

				Depth	=	9.97	m
Boring: ONSB05	Tube:	3		p_0'	=	63.8	kPa
	Part:	B		w_i	=	44.3	%
	Test:	1		γ_i	=	17.60	kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.21, Push1-3-B-1 lin-2 (crs3344).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.22, Push1-4-B-1 log (crs3350).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.22
	Date 2018-12-10 / Drawn by / Checked FP / GS

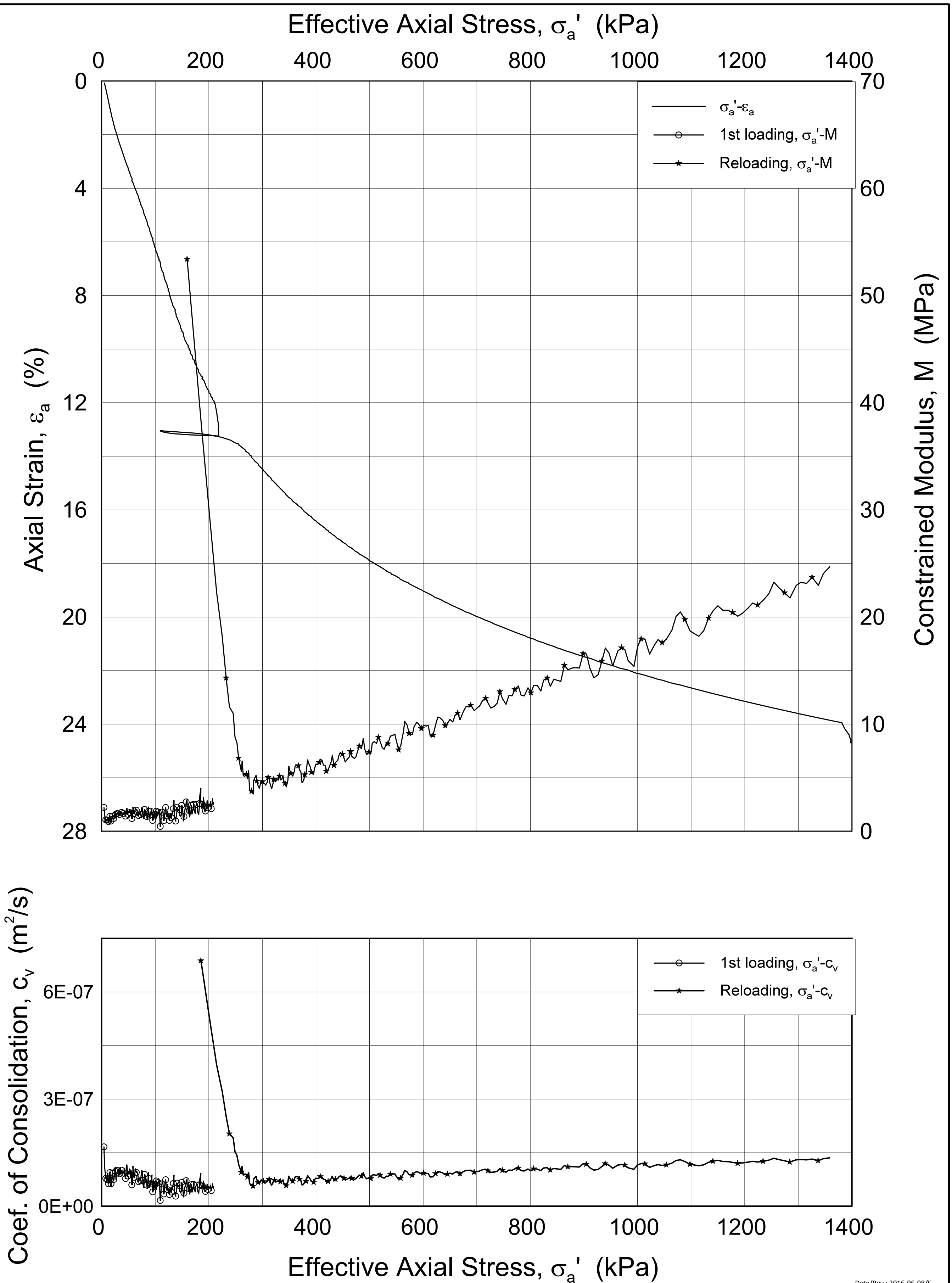
Boring: ONSB05 Tube: 4 Part: B Test: 1

Depth = 10.97 m

p_0' = 71.1 kPa

w_i = 39.8 %

γ_i = 18.27 kN/m³



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.23, Push1-4-B-1 lin (crs3350).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	10.97	m	
Boring:	ONSB05	Tube:	4	p_0'	=	71.1	kPa	
		Part:	B	w_i	=	39.8	%	
		Test:	1	γ_i	=	18.27	kN/m^3	

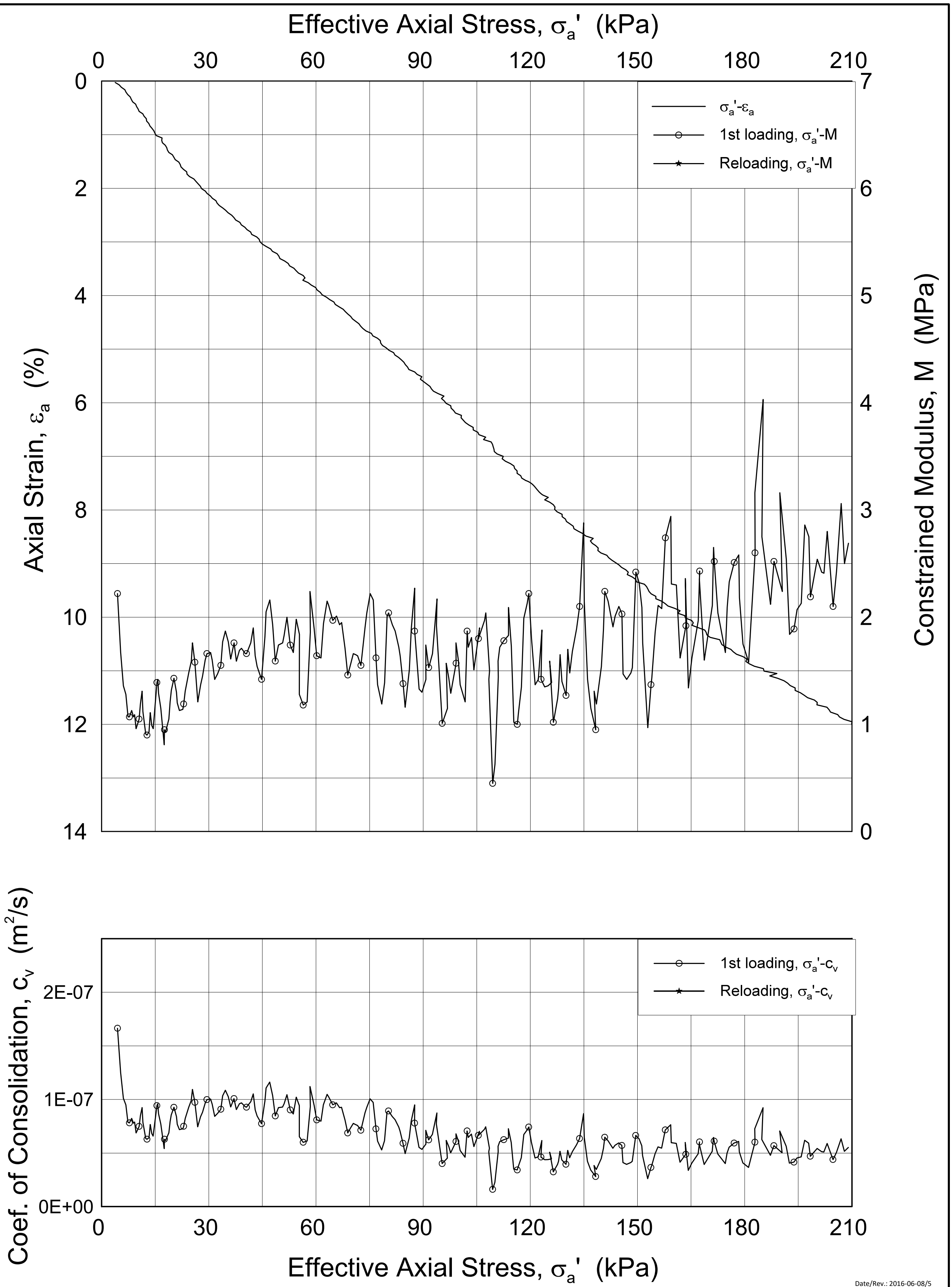
Document No. 20160154-10-R

Figure No. 5.2.23

Date: 2018-12-10

Drawn by / Checked: FP / GS

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.24
	Date 2018-12-10 / Drawn by / Checked FP / GS

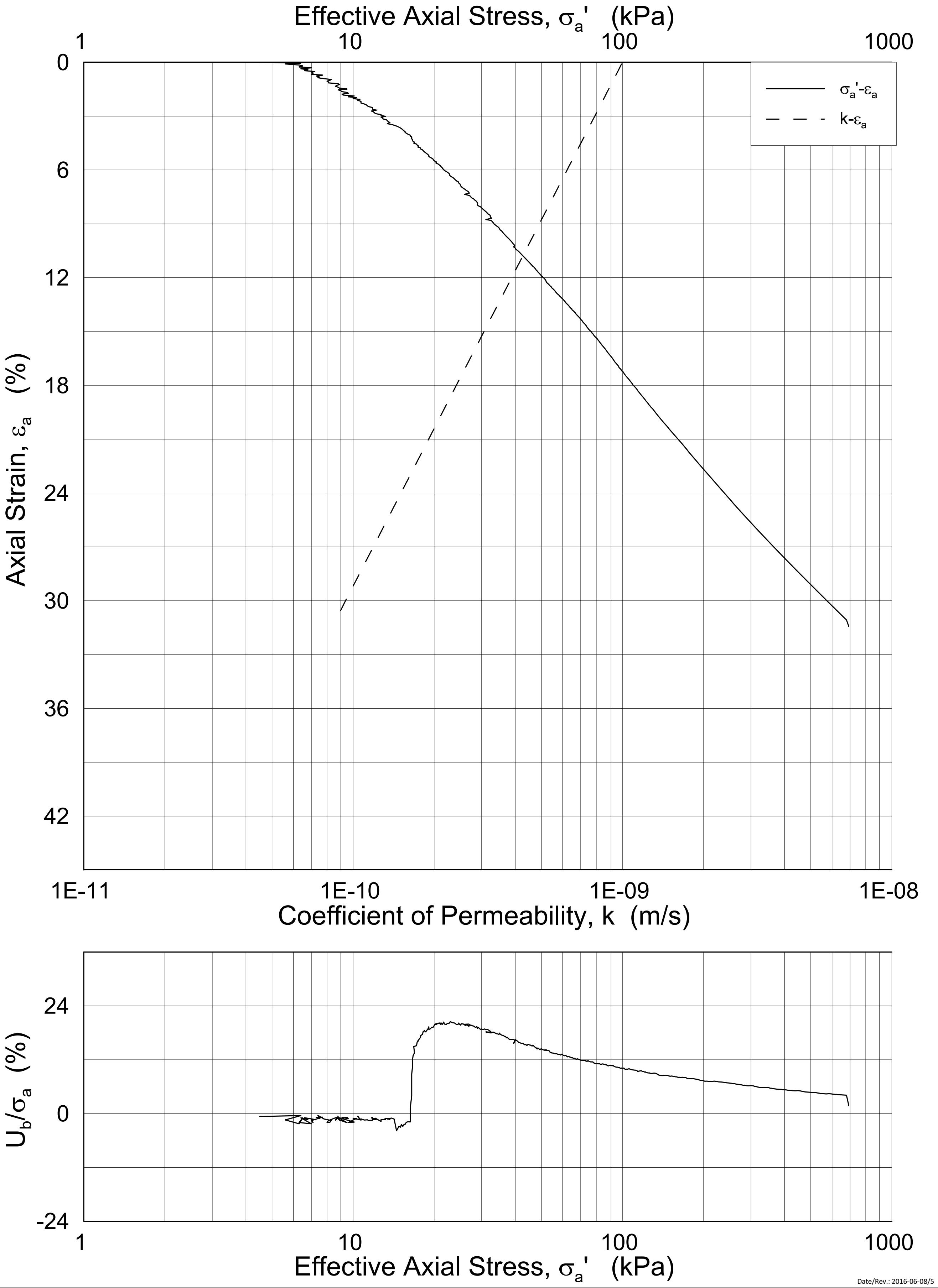
Depth = 10.97 m

Boring: ONSB05 Tube: 4 p_0' = 71.1 kPa

Part: B w_i = 39.8 %

Test: 1 γ_i = 18.27 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.24, Push1-4-B-1 lin-2 (crs3350).grf



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.25
	Date 2018-12-10 / Drawn by / Checked FI /GS

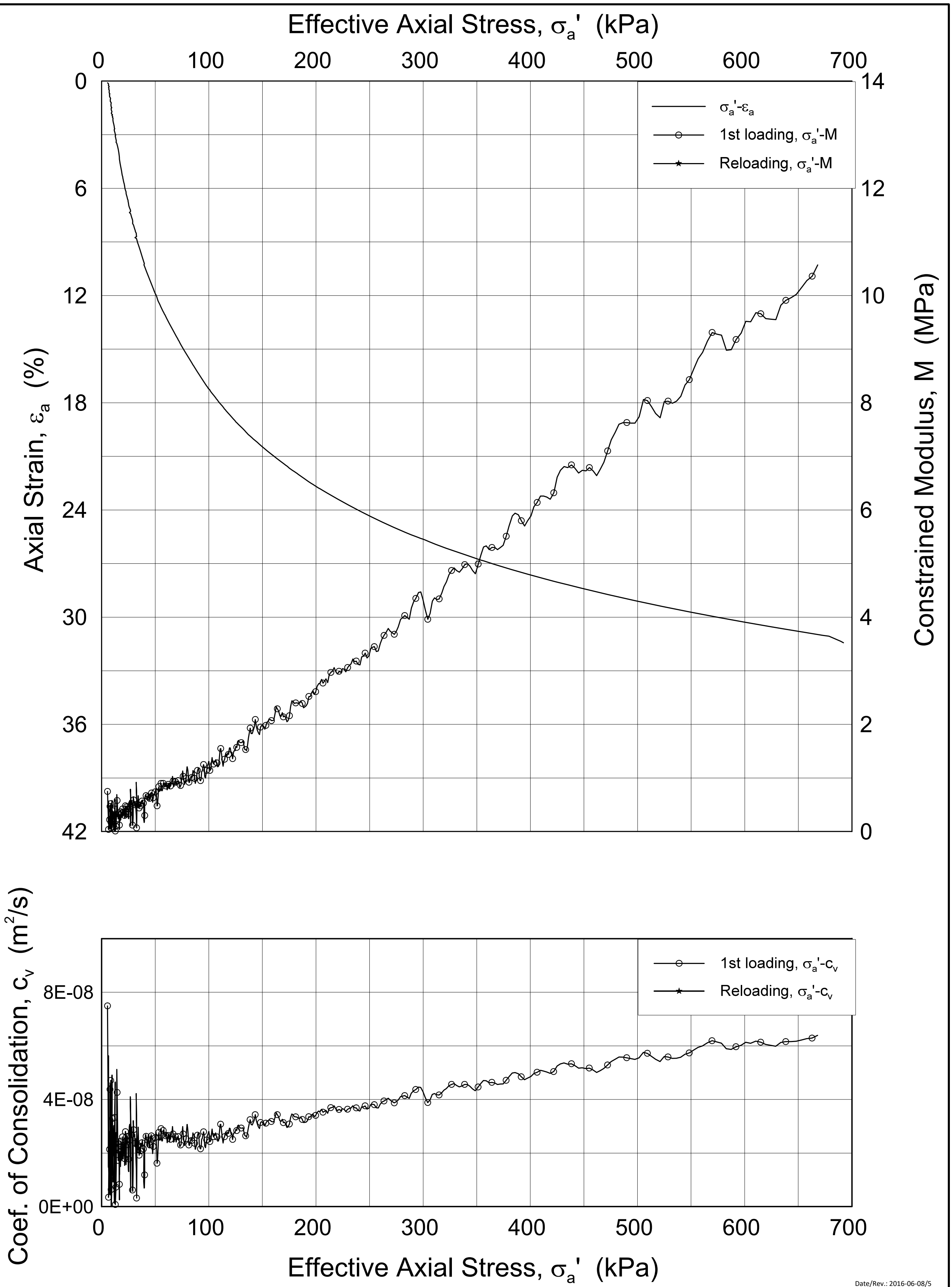
Depth = 5.67 m

Boring: ONSB06 Tube: 1-1 p_0' = 32.4 kPa

Part: B w_i = 69.3 %

Test: 1 γ_i = 16.29 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	5.67	m
Boring:	ONSB06	Tube:	1-1	p_0'	=	32.4	kPa
		Part:	B	w_i	=	69.3	%
		Test:	1	γ_i	=	16.29	kN/m³

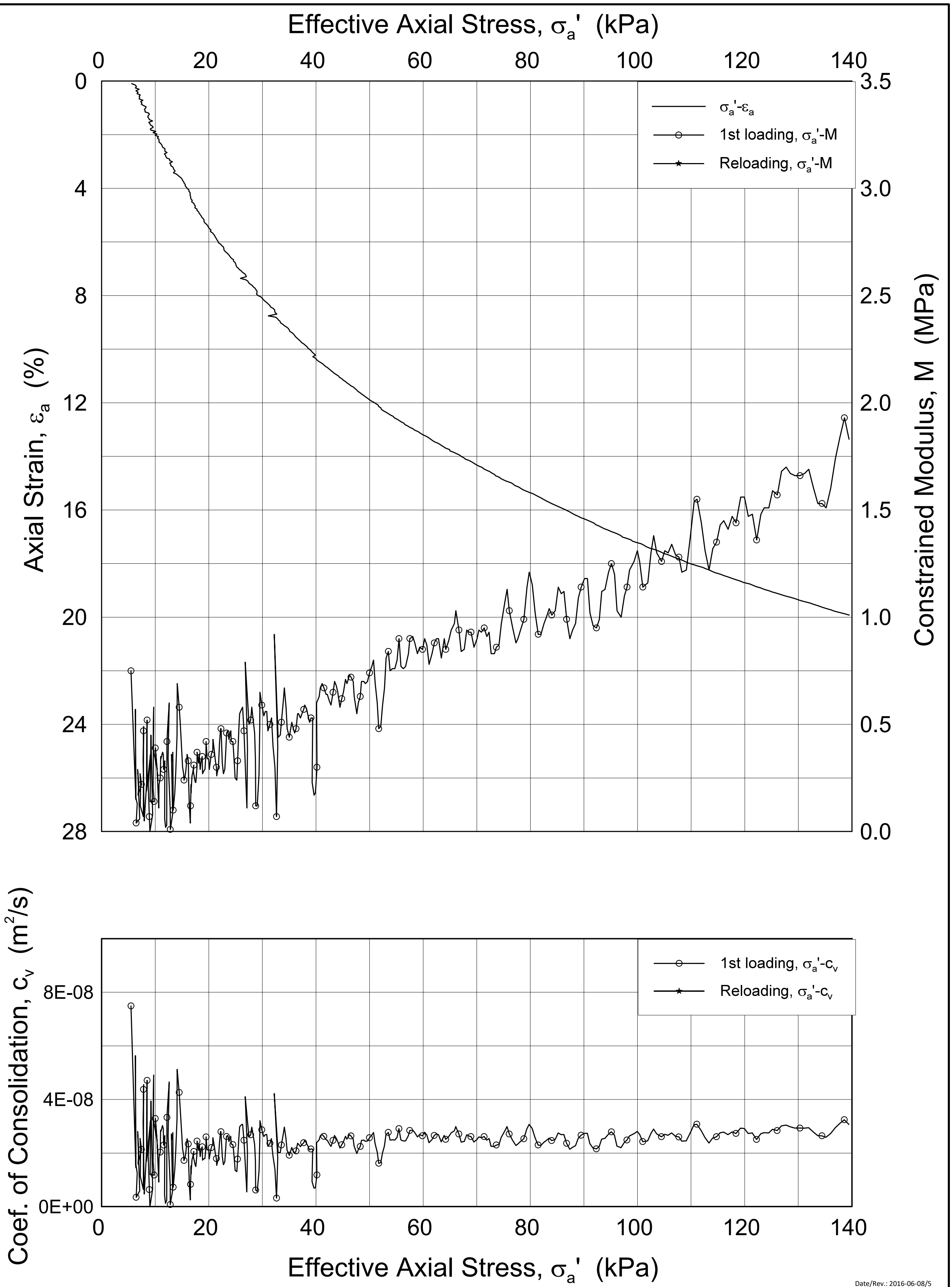
Document No. 20160154-10-R

Figure No. 5.2.26

Date 2018-12-10

Drawn by / Checked FI /GS

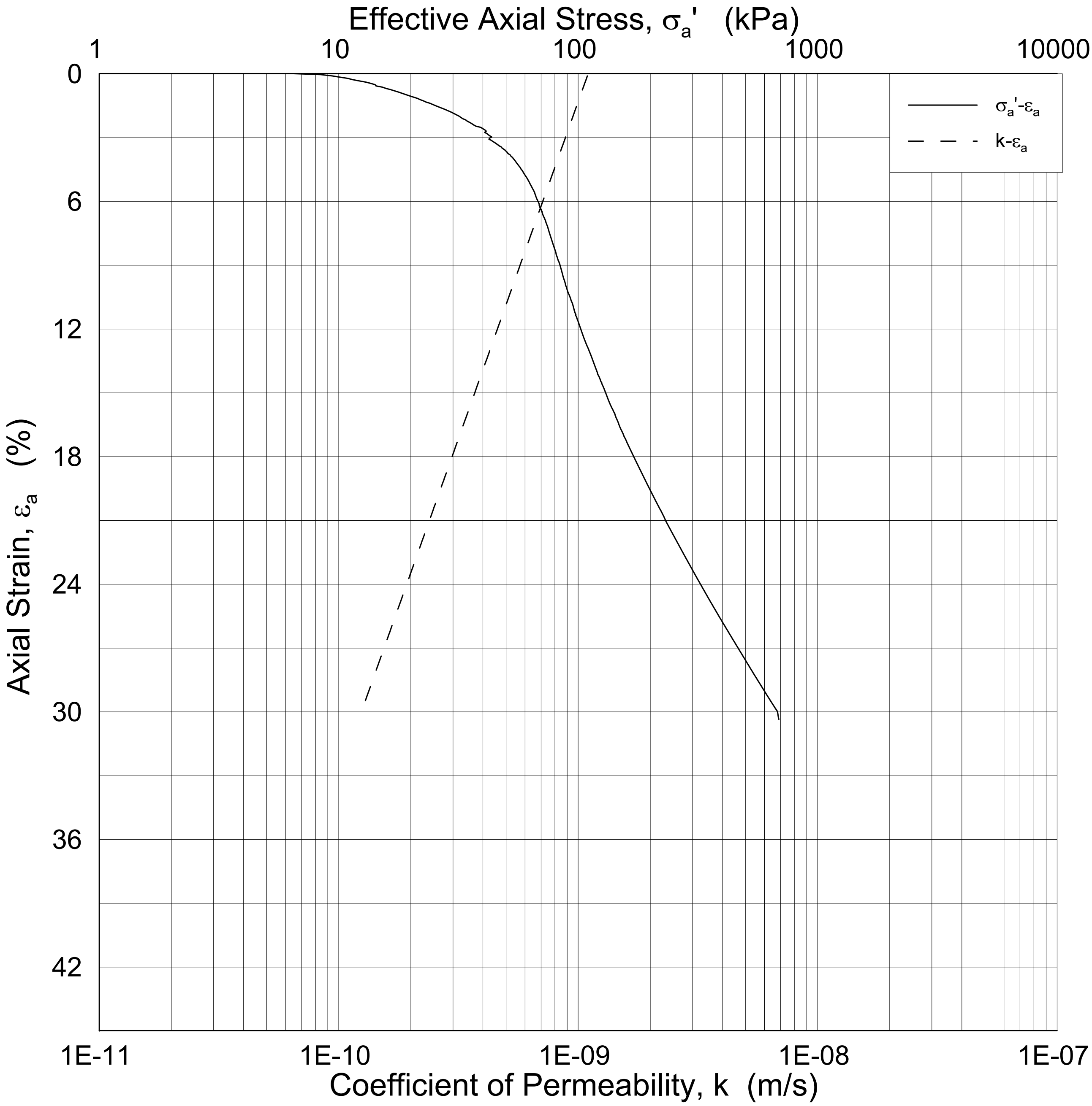
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.26, BH1-1-1-B-1 Lin (CRS3535).grf

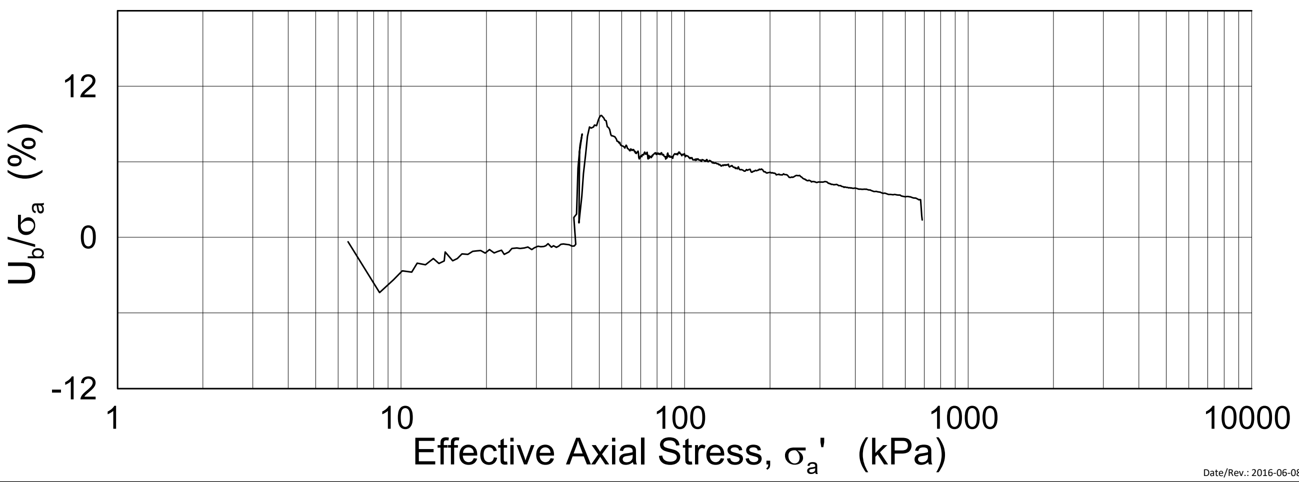


P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.27, BH1-1-1-B-1 Lin2 (CRS3535).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.27	
Boring: ONSB06 Tube: 1-1 Part: B Test: 1	Date 2018-12-10	Drawn by / Checked FI /GS
Depth = 5.67 m; p_0' = 32.4 kPa; w_i = 69.3 %; γ_i = 16.29 kN/m³	NGI	





Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

			Depth	=	6.3	m
Boring: ONSB06	Tube:	1-2	p_0'	=	36.0	kPa
	Part:	B	w_i	=	69.5	%
	Test:	1	γ_i	=	16.03	kN/m³

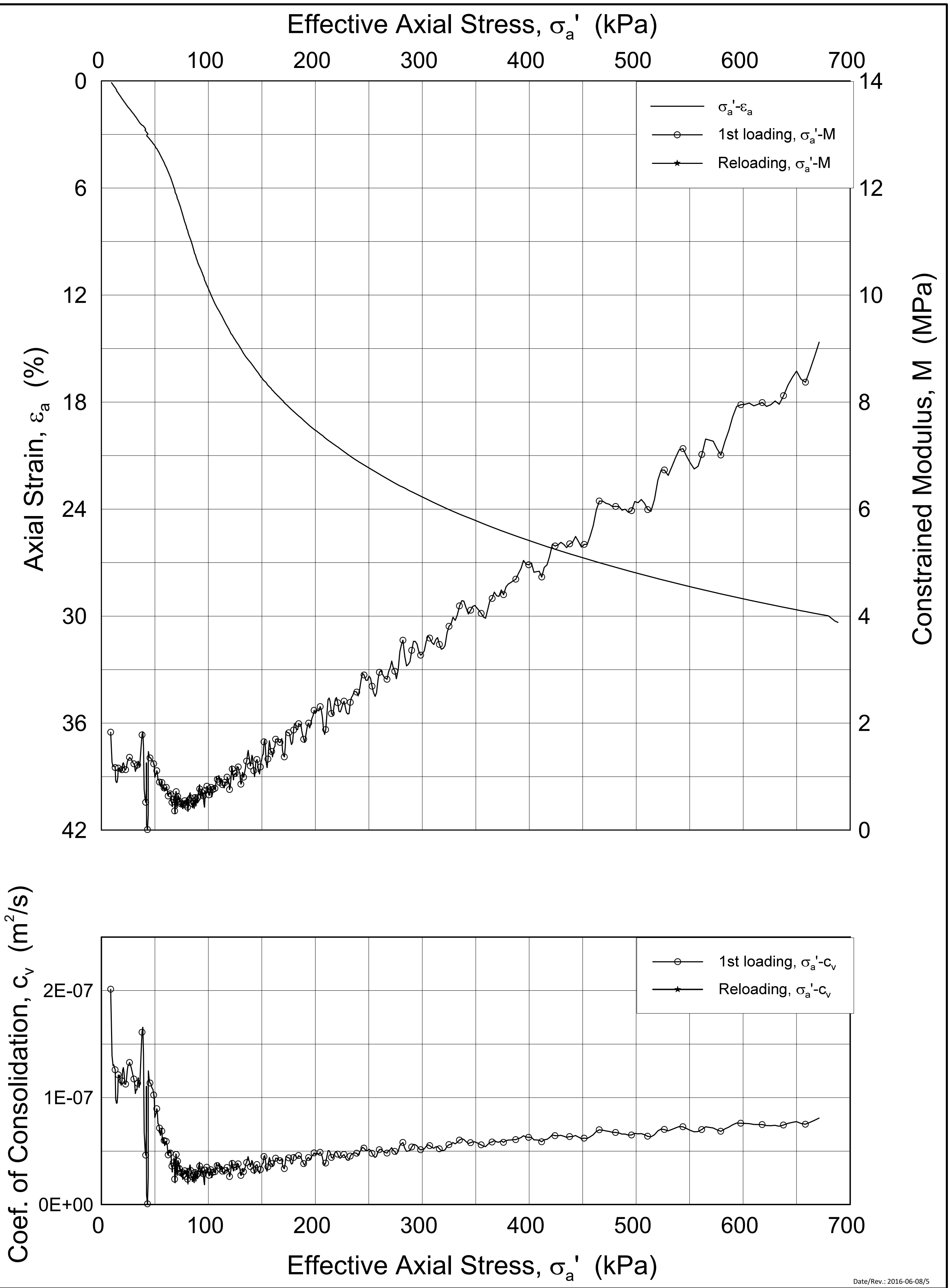
Document No. 20160154-10-R

Figure No. 5.2.28

Date	Drawn by / Checked
2018-12-10	FI /GS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.28, BH1-1-2-B-1 Log (CRS3443).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.29, BH1-1-2-B-1 lin (CRS3443).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

			Depth	=	6.3	m
Boring: ONSB06	Tube:	1-2	p_0'	=	36.0	kPa
	Part:	B	w_i	=	69.5	%
	Test:	1	γ_i	=	16.03	kN/m³

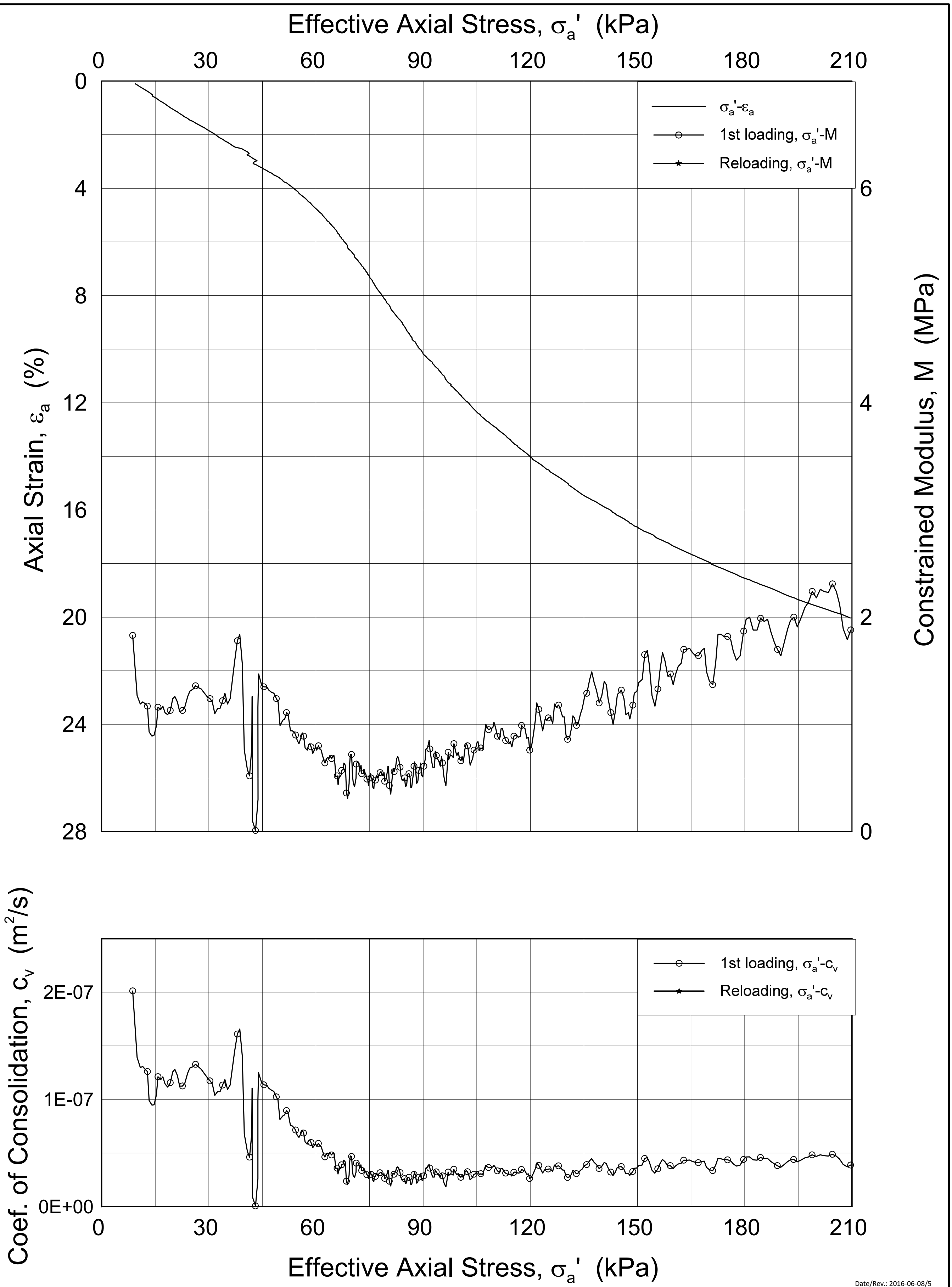
Document No.
20160154-10-R

Figure No.
5.2.29

Date
2018-12-10

Drawn by / Checked
FI / GS

NGI



Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

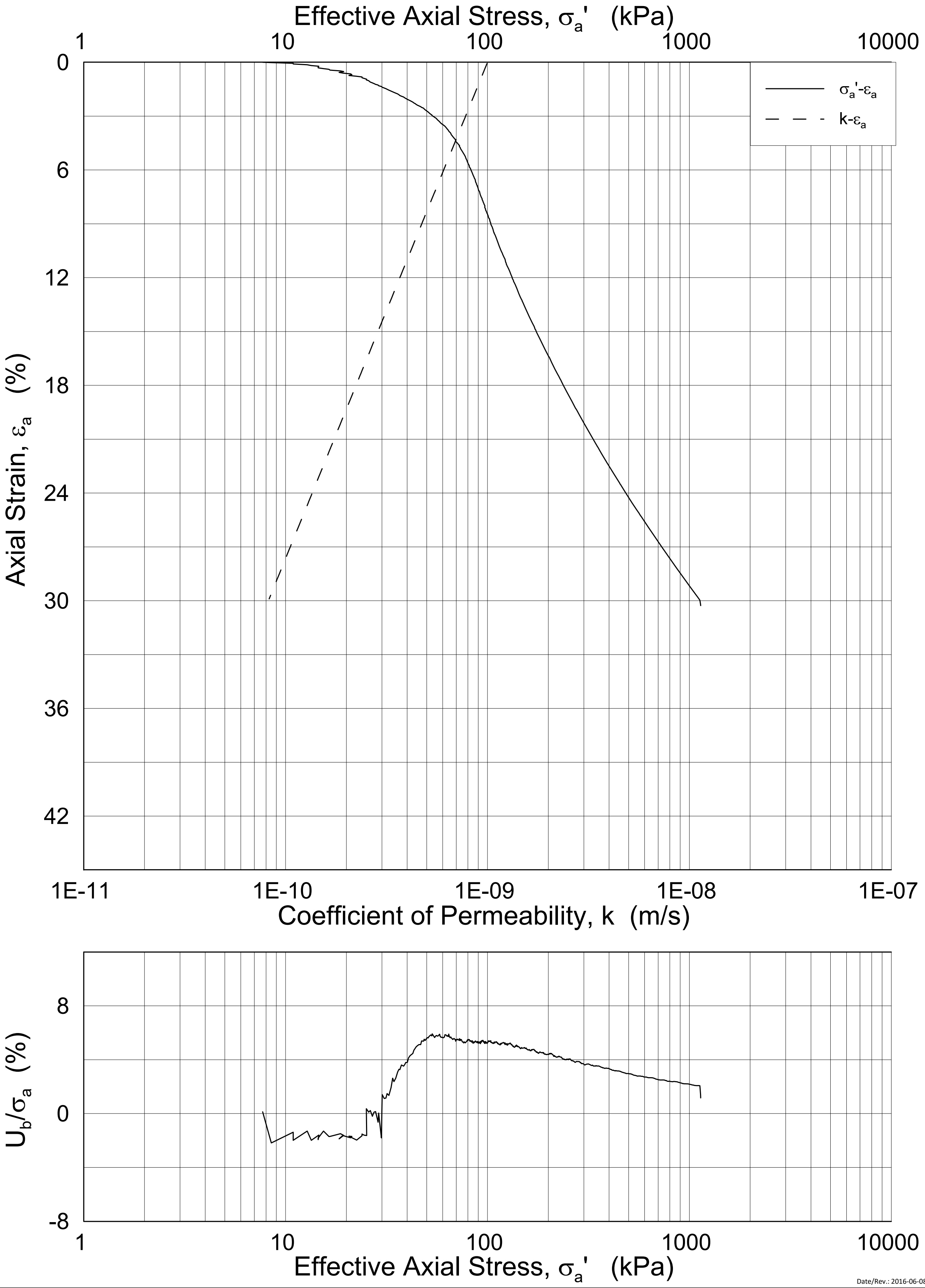
				Depth	=	6.3	m
Boring:	ONSB06	Tube:	1-2	p_0'	=	36.0	kPa
		Part:	B	w_i	=	69.5	%
		Test:	1	γ_i	=	16.03	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.30

Date 2018-12-10

Drawn by / Checked FI / GS



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.31, BH1-1-3-B-1 Log (CRS3538).grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.31

Oedometer test (CRSC)

Date 2018-12-10

Drawn by / Checked FI /GS

Boring: ONSB06

Tube: 1-3

Part: B

Test: 1

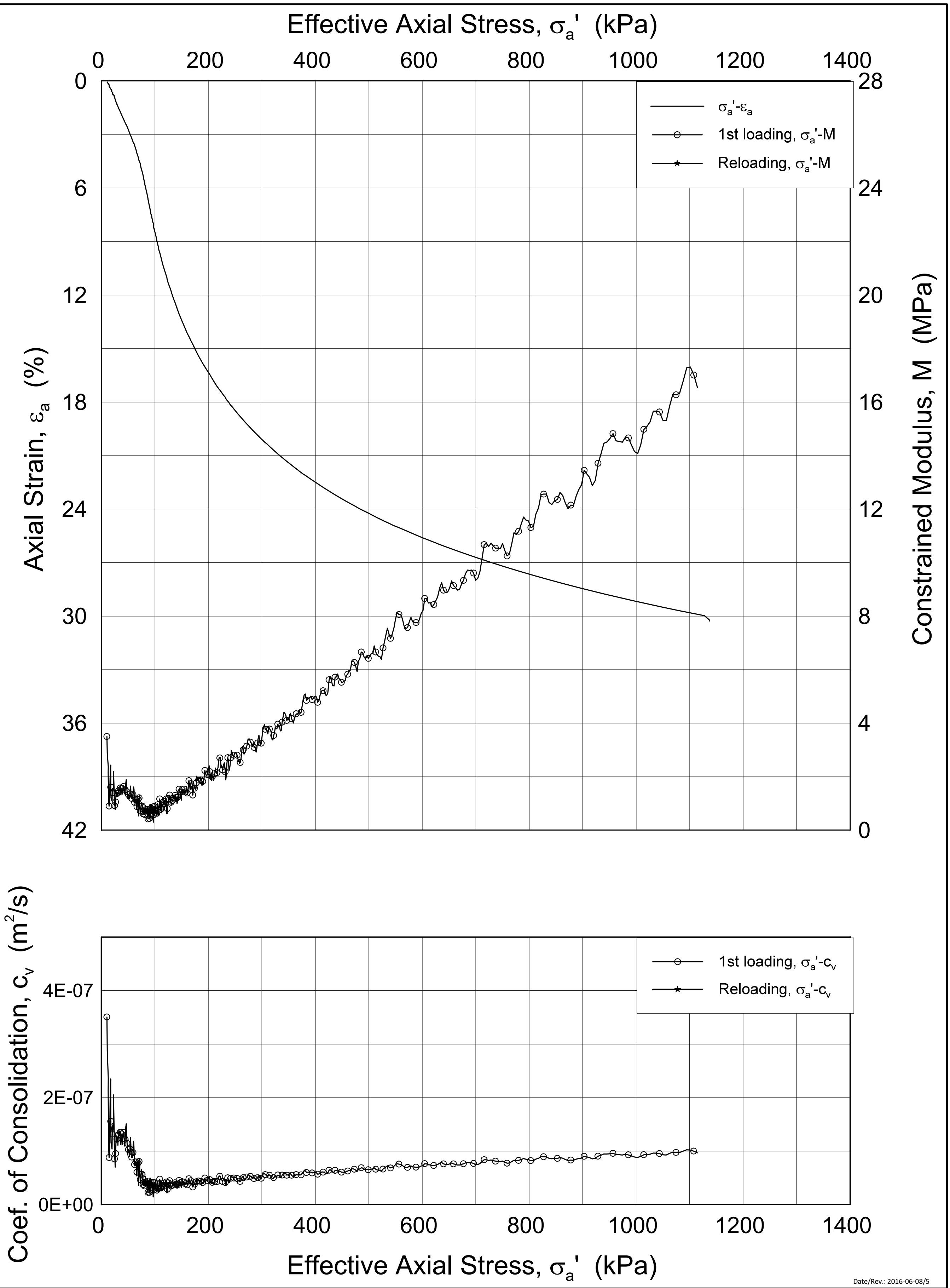
Depth = 7.2 m

p_0' = 43.6 kPa

w_i = 61.2 %

γ_i = 16.48 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.32, BH1-1-3-B-1 Lin (CRS3538).grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.32

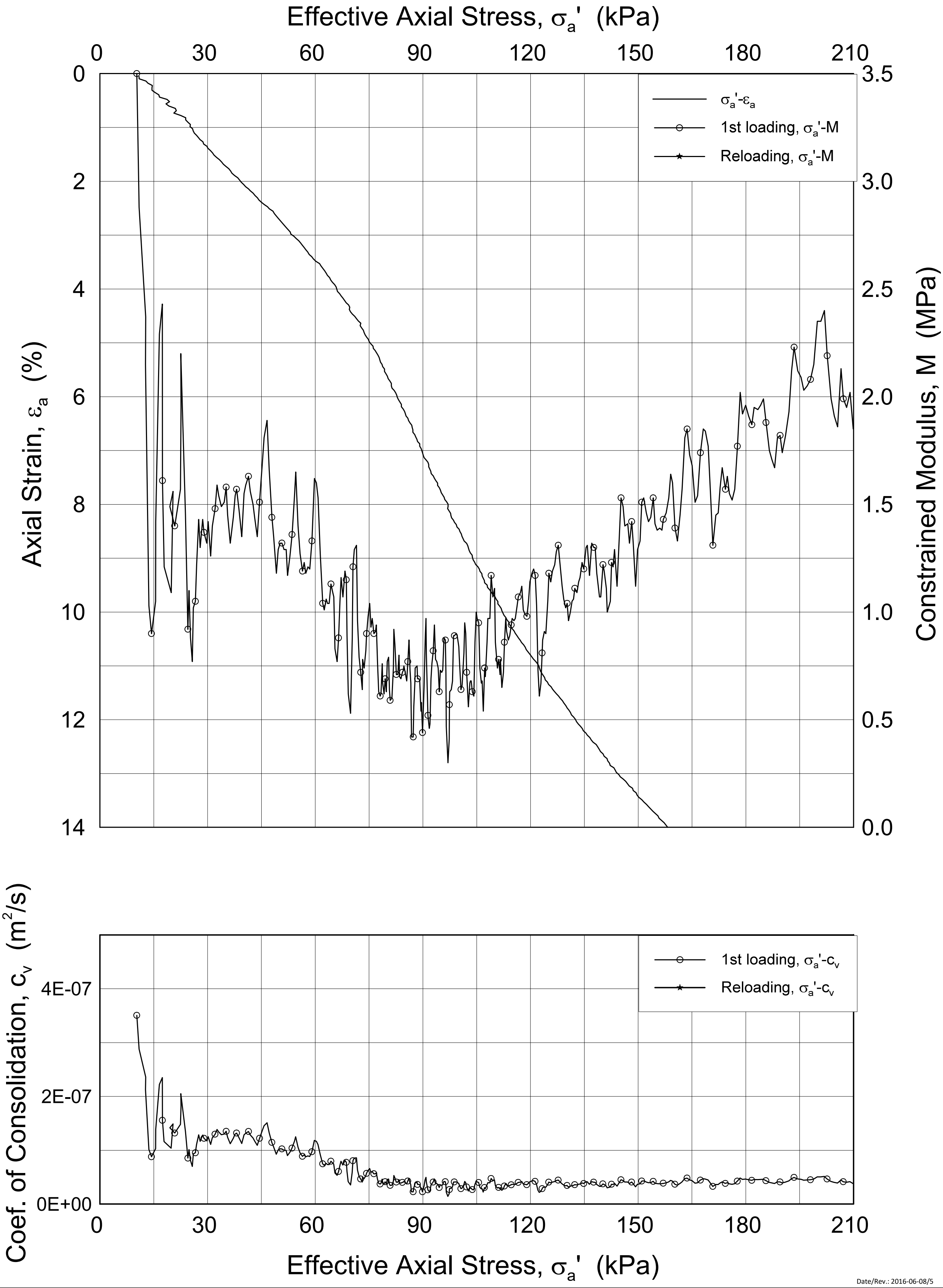
Date 2018-12-10

Drawn by / Checked FI /GS

Oedometer test (CRSC)

Boring:	ONSB06	Tube:	1-3	Depth	=	7.2	m
		Part:	B	p_0'	=	43.6	kPa
		Test:	1	w_i	=	61.2	%
				γ_i	=	16.48	kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.33

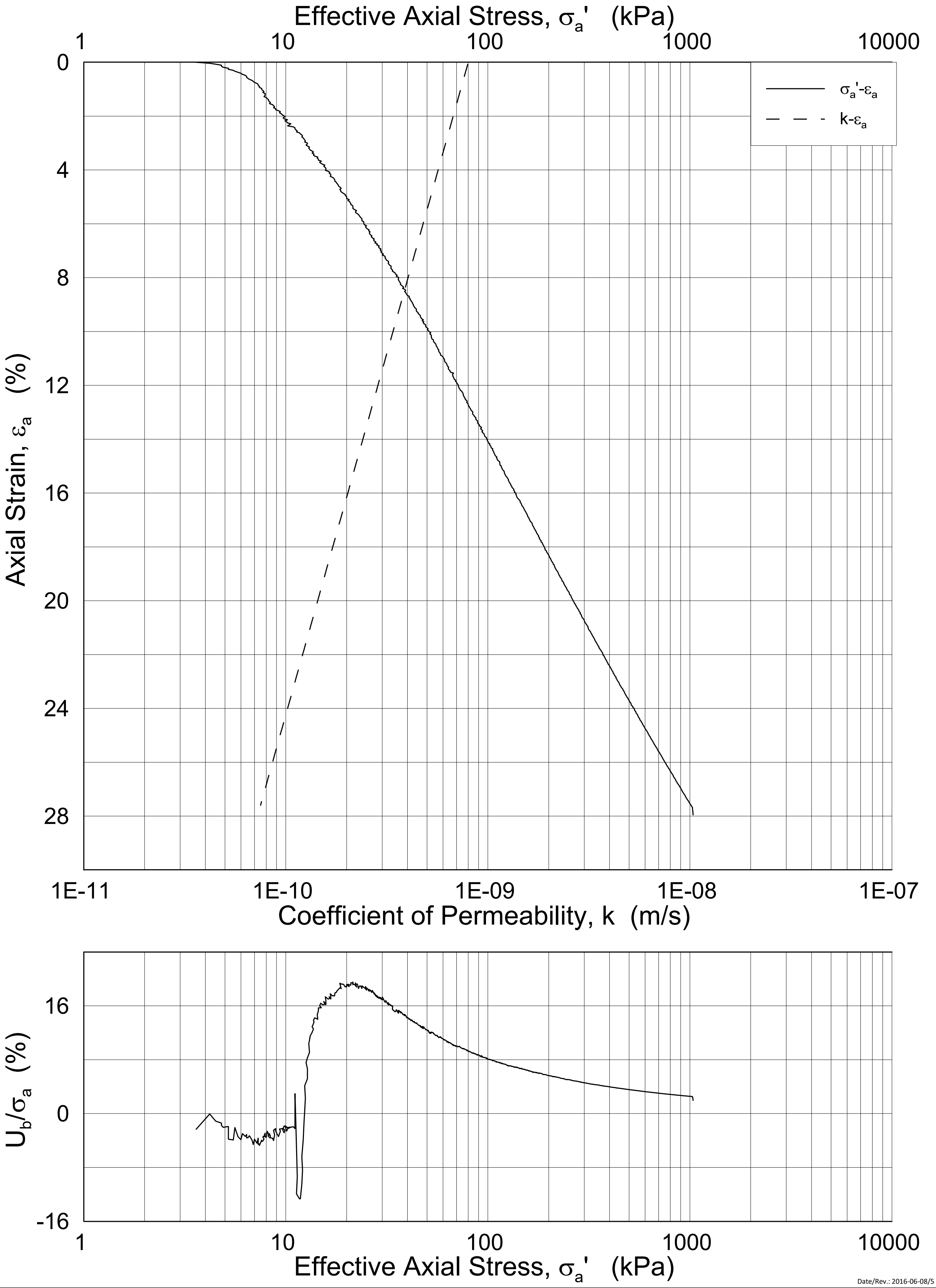
Oedometer test (CRSC)

Date 2018-12-10

Drawn by / Checked FI /GS

Boring: ONSB06	Tube:	1-3	Depth	=	7.2	m
	Part:	B	p_0'	=	43.6	kPa
	Test:	1	w_i	=	61.2	%
			γ_i	=	16.48	kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.33, BH1-1-3-B-1 Lin2 (CRS3538).grf



Date/Rev.: 2016-06-08/5

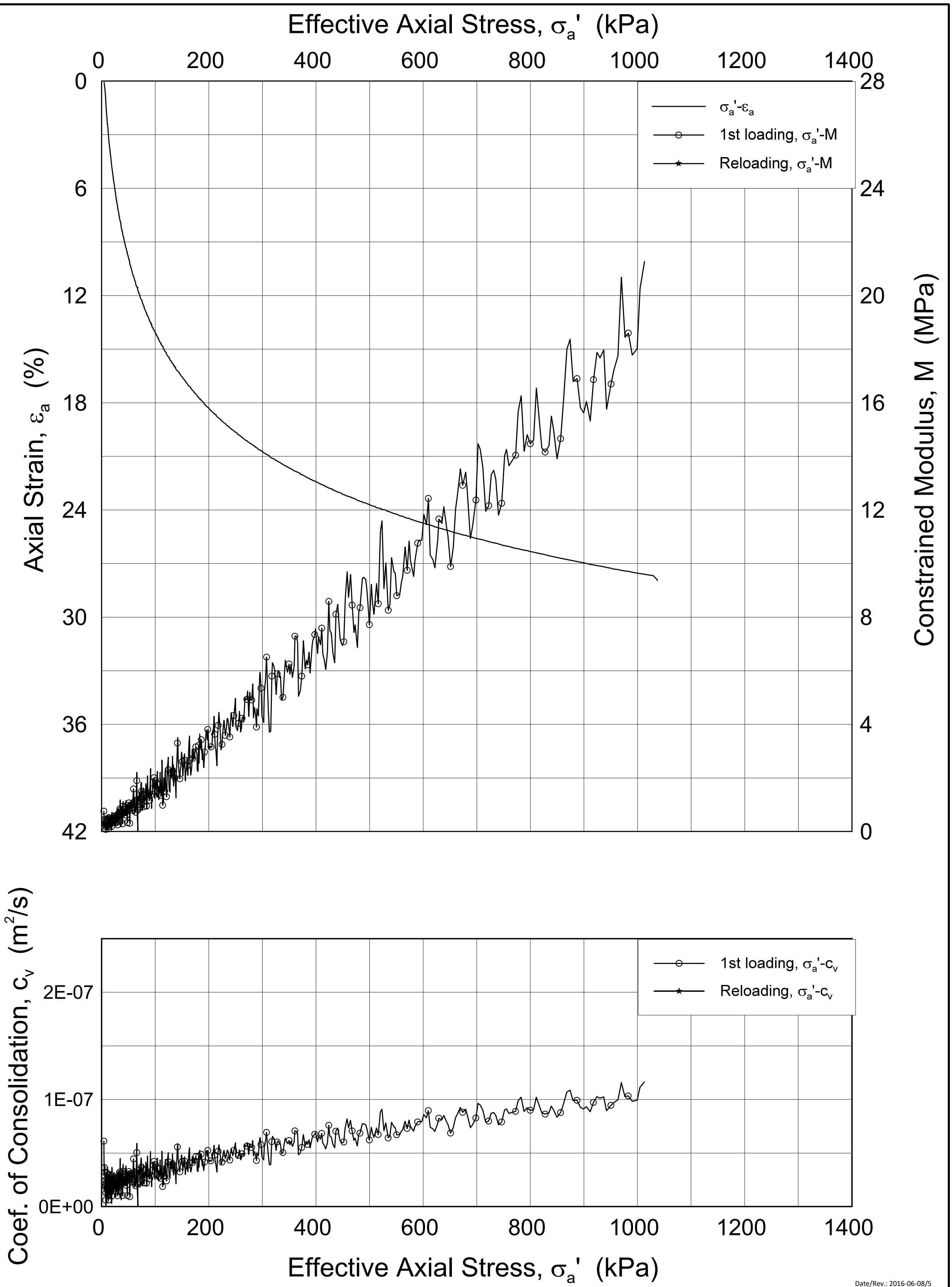
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.34, BH1-2-1-B-1 Log (CRS3446).grf

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.34	
	Date 2018-12-10	Drawn by / Checked FI / GS

Boring: ONSB06   Tube: 2-1   Part: B   Test: 1

Depth = 8.67 m
p_0' = 54.3 kPa
w_i = 45.6 %
γ_i = 17.40 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.35

Date 2018-12-10

Drawn by / Checked FI /GS

Oedometer test (CRSC)

Boring: ONSB06 | Tube: 2-1 | Part: B | Test: 1

Depth = 8.67 m

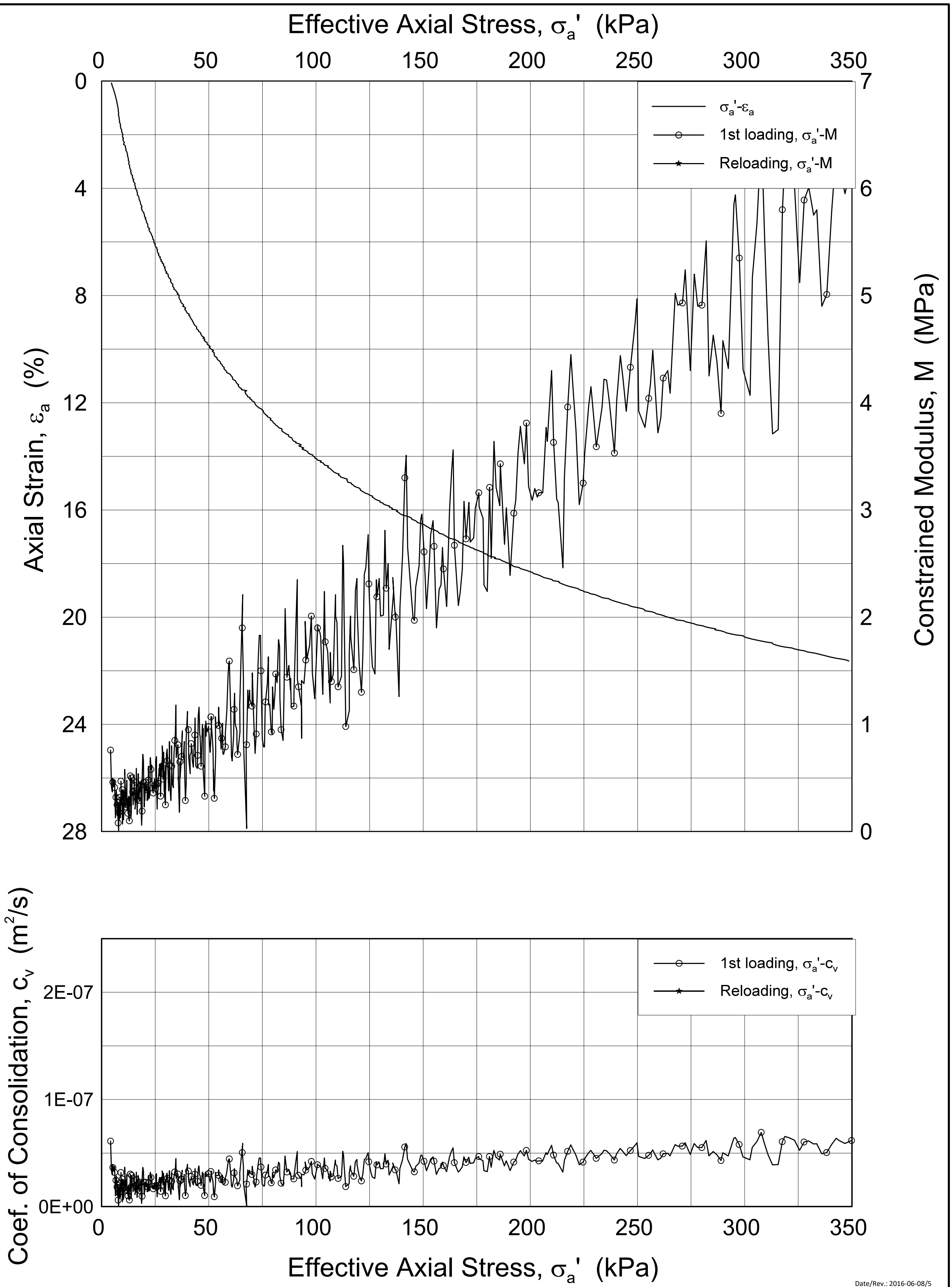
p_0' = 54.3 kPa

w_i = 45.6 %

γ_i = 17.40 kN/m³

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.35, BH1-2-1-B-1 Lin (CRS3446).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.36, BH1-2-1-B-1 Lin2 (CRS3446).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB06 | Tube: 2-1 | Part: B | Test: 1

Depth = 8.67 m

p_0' = 54.3 kPa

w_i = 45.6 %

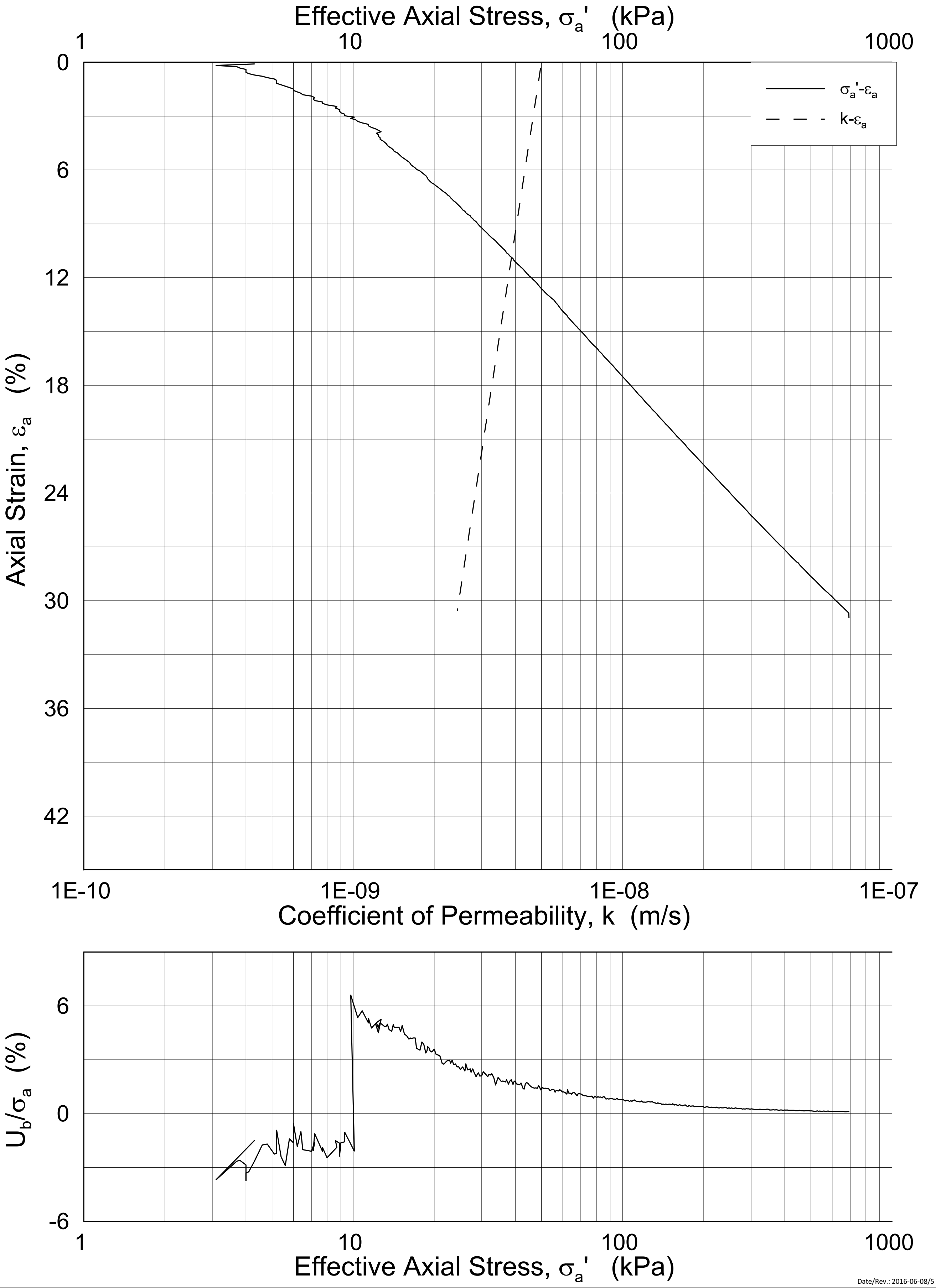
γ_i = 17.40 kN/m³

Document No. 20160154-10-R

Figure No. 5.2.36

Date 2018-12-10

Drawn by / Checked FI /GS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.37, Bh2-1-1-B-1 Log (CRS3530).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.37

Date 2018-12-10

Drawn by / Checked FI /GS

Oedometer test (CRSC)

Boring: ONSB07 Tube: 1-1 Part: B Test: 1

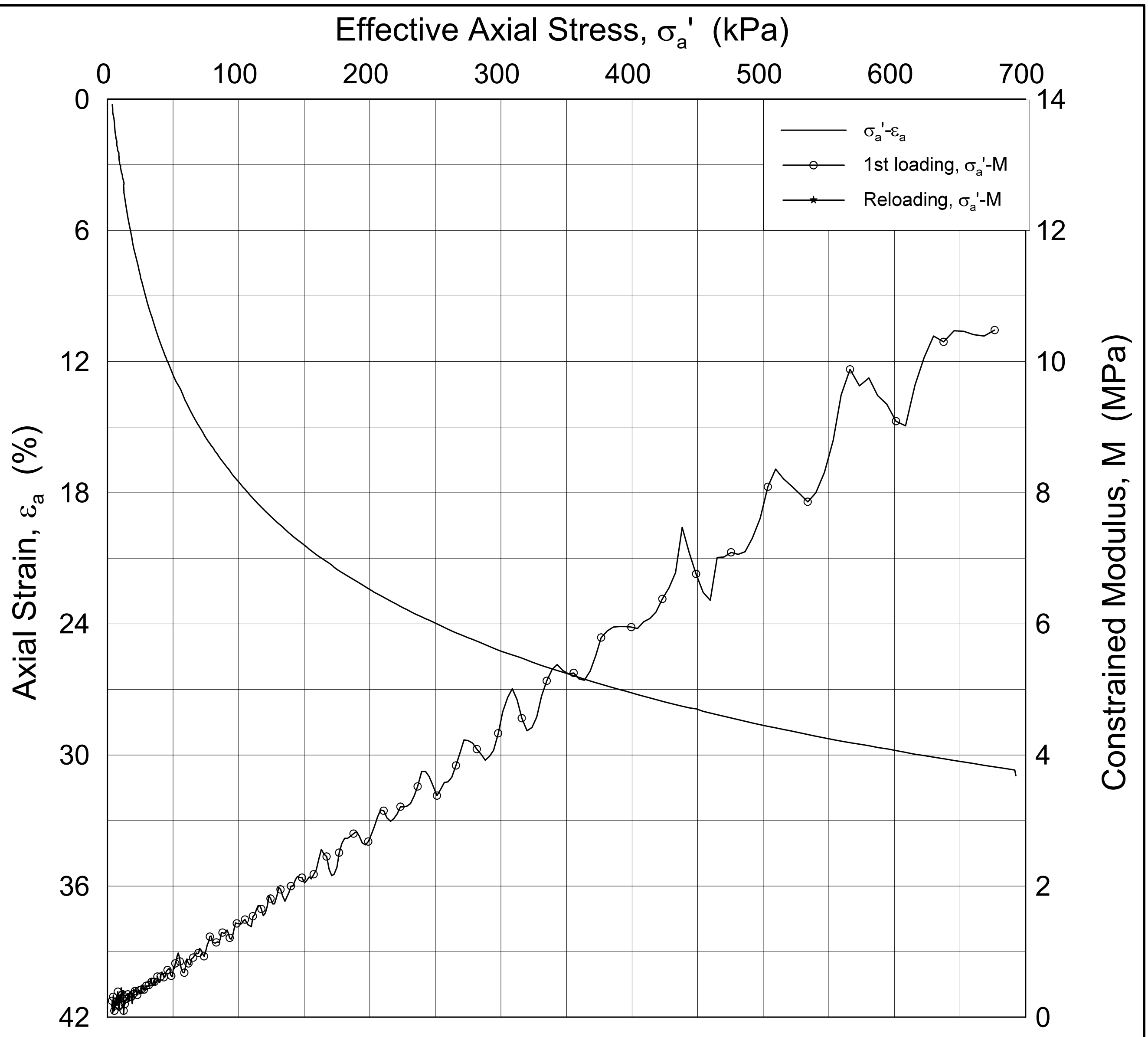
Depth = 5.65 m

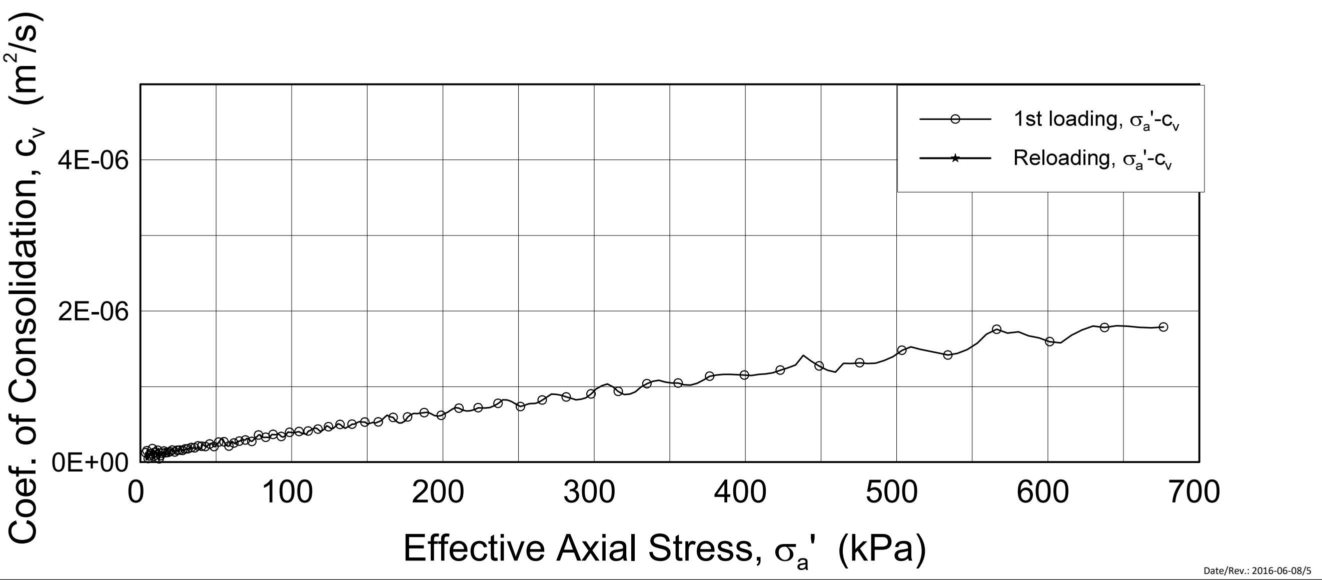
p_0' = 32.2 kPa

w_i = 69.0 %

γ_i = 15.99 kN/m³

NGI





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.38, Bh2-1-1-B-1 Lin (CRS3530).grf

Norwegian GeoTest Sites - Onsøy

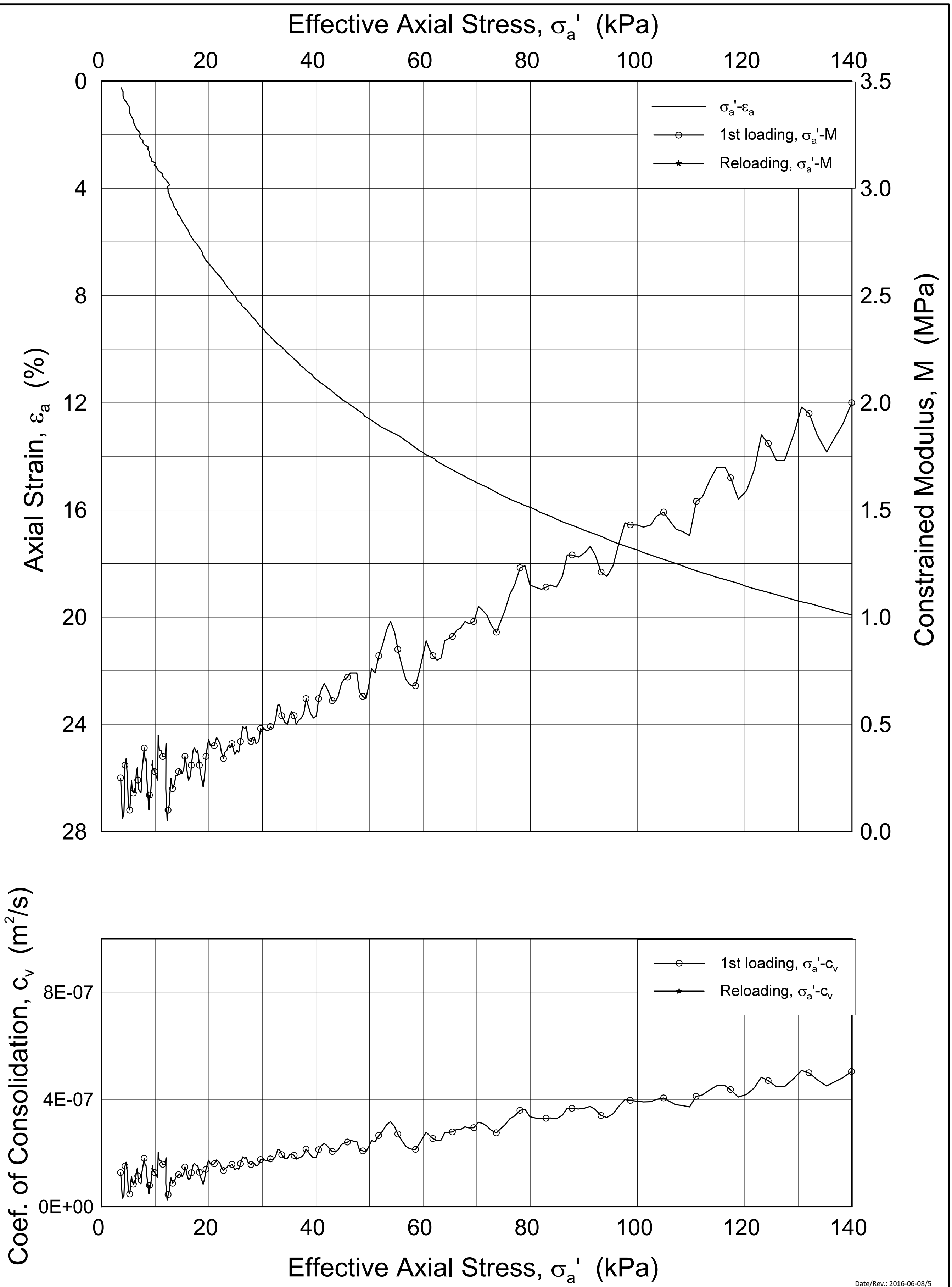
Oedometer test (CRSC)

				Depth	=	5.65	m
Boring:	ONSB07	Tube:	1-1	p_0'	=	32.2	kPa
		Part:	B	w_i	=	69.0	%
		Test:	1	γ_i	=	15.99	kN/m³

Document No.
20160154-10-R

Figure No.
5.2.38

Date	Drawn by / Checked
2018-12-10	FI /GS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.39, Bh2-1-1-B-1 Lin2 (CRS3530).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

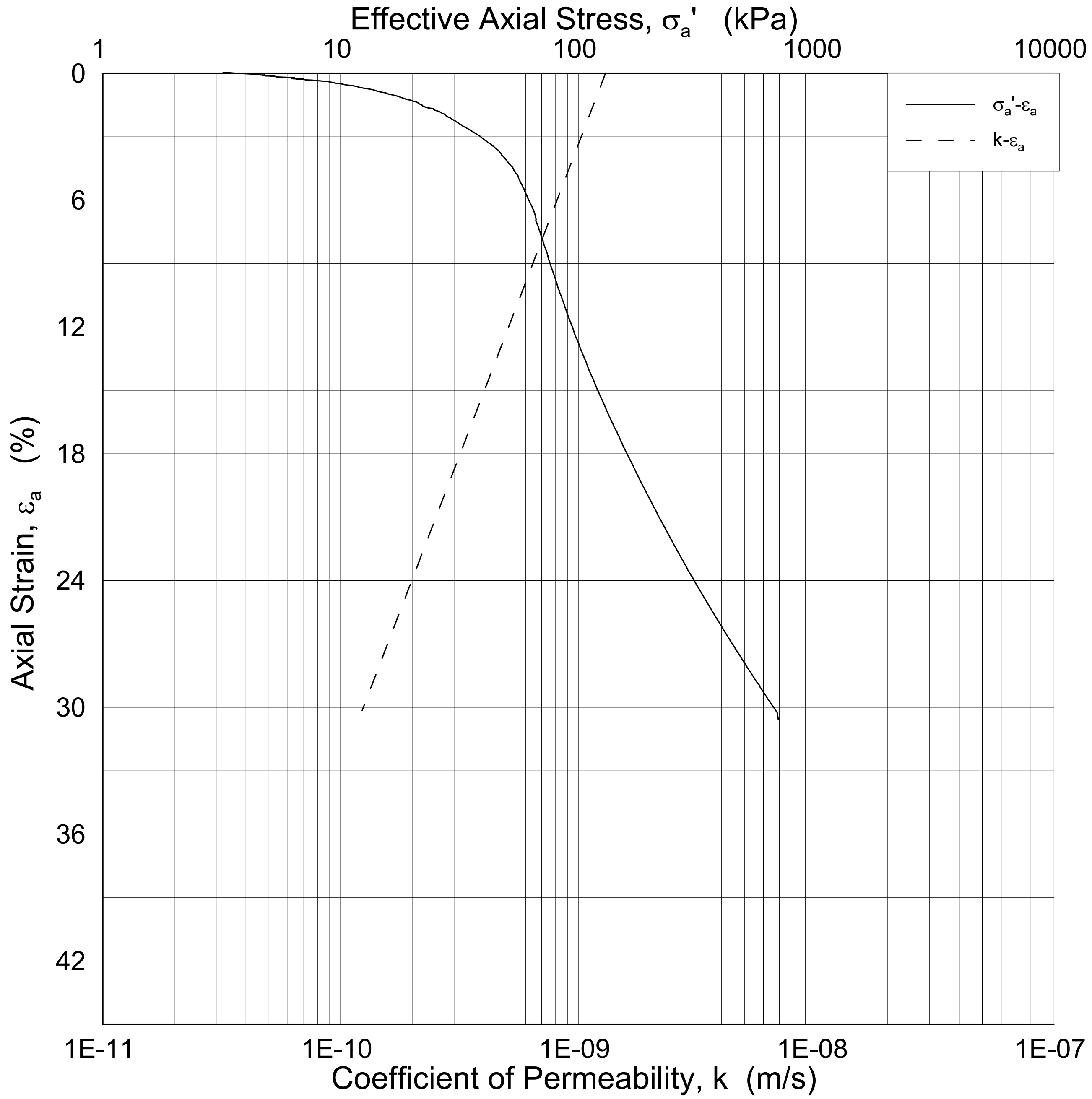
				Depth	=	5.65	m
Boring:	ONSB07	Tube:	1-1	p_0'	=	32.2	kPa
		Part:	B	w_i	=	69.0	%
		Test:	1	γ_i	=	15.99	kN/m³

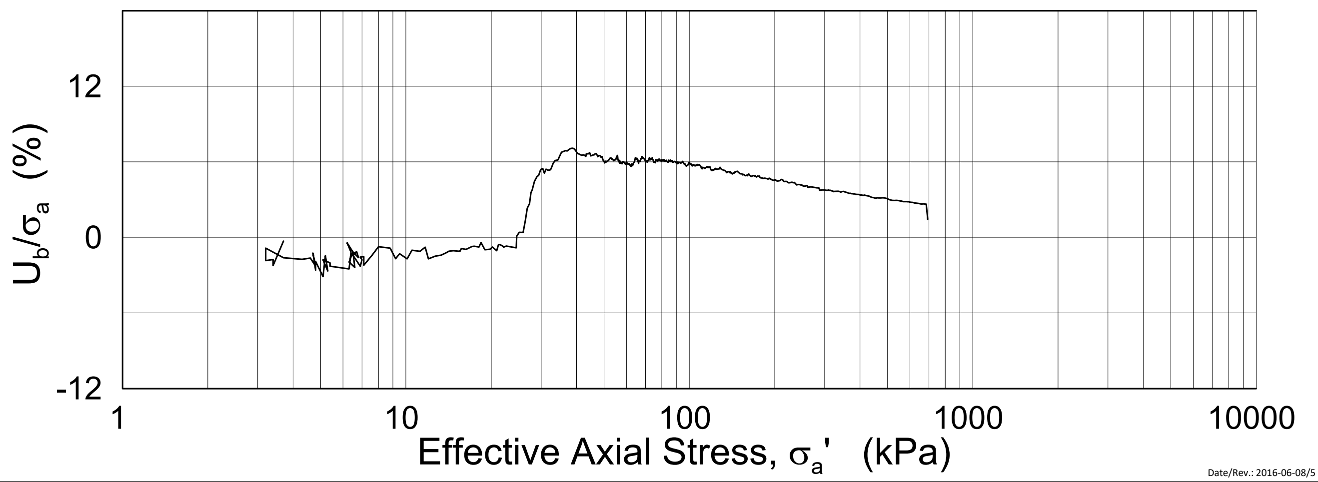
Document No. 20160154-10-R

Figure No. 5.2.39

Date 2018-12-10

Drawn by / Checked FI /GS





Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.40
	Date 2018-12-10 / Drawn by / Checked FI / GS

Boring: ONSB07 | Tube: 1-2 | Part: B | Test: 1

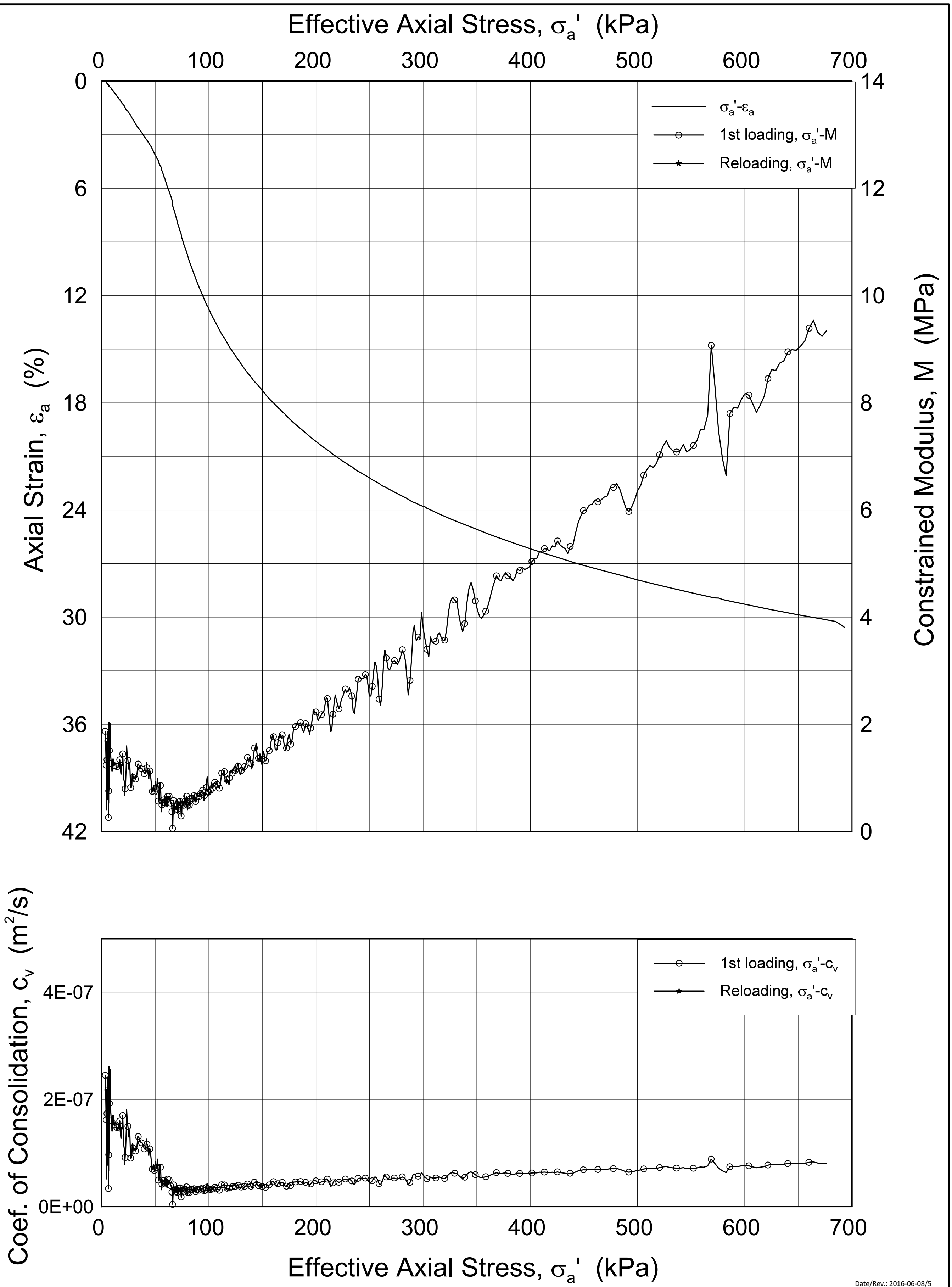
Depth = 6.27 m

p_0' = 36.8 kPa

w_i = 67.5 %

γ_i = 15.99 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.40, BH2-1-2-B-1 Log(CRS3445).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.41, BH2-1-2-B-1 Lin (CRS3445).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.41

Date 2018-12-10

Drawn by / Checked FI /GS

Oedometer test (CRSC)

Boring: ONSB07 Tube: 1-2 Part: B Test: 1

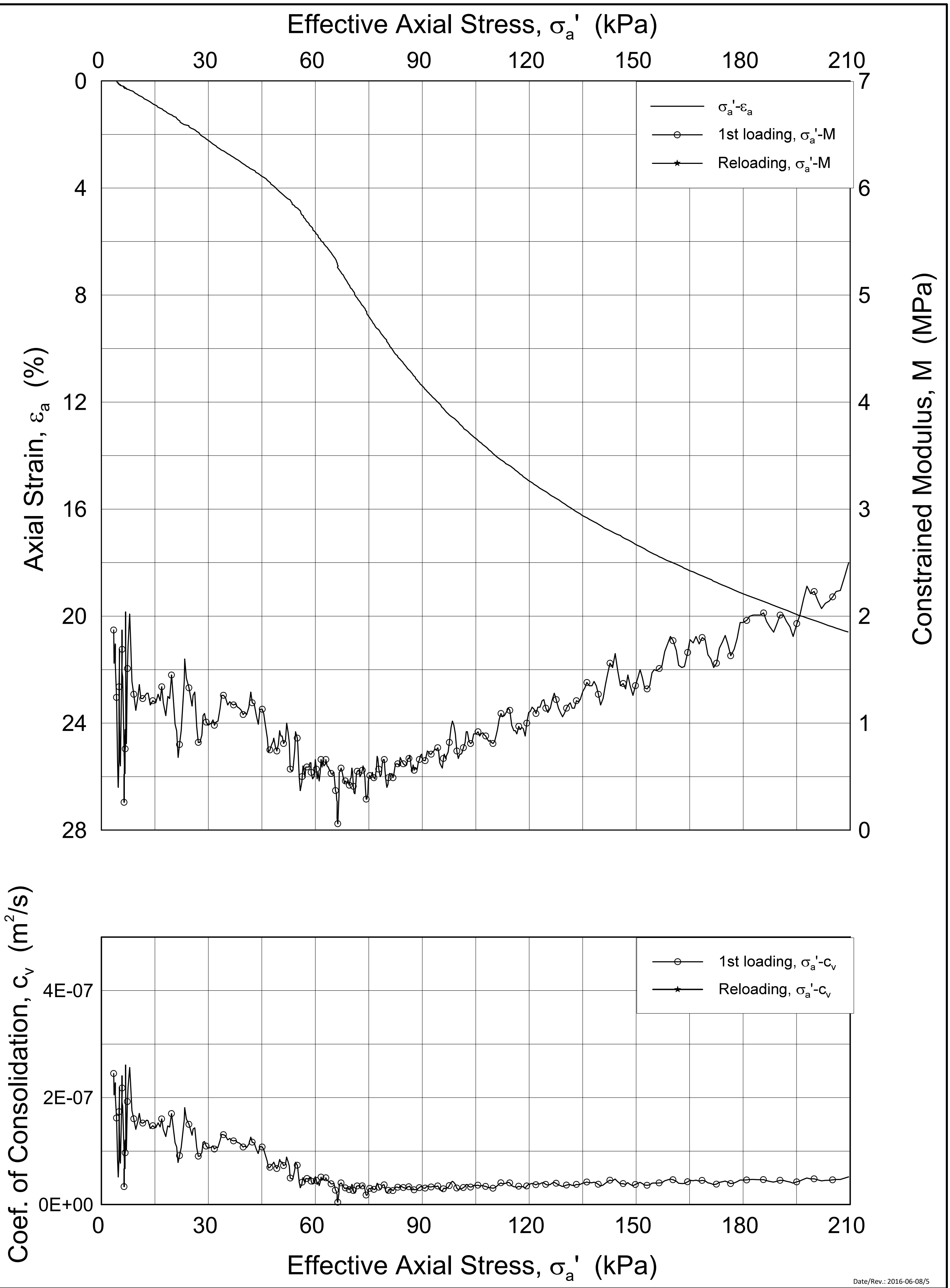
Depth = 6.27 m

p_0' = 36.8 kPa

w_i = 67.5 %

γ_i = 15.99 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	6.27	m
Boring: ONSB07	Tube:	1-2		p_0'	=	36.8	kPa
	Part:	B		w_i	=	67.5	%
	Test:	1		γ_i	=	15.99	kN/m³

Document No.
20160154-10-R

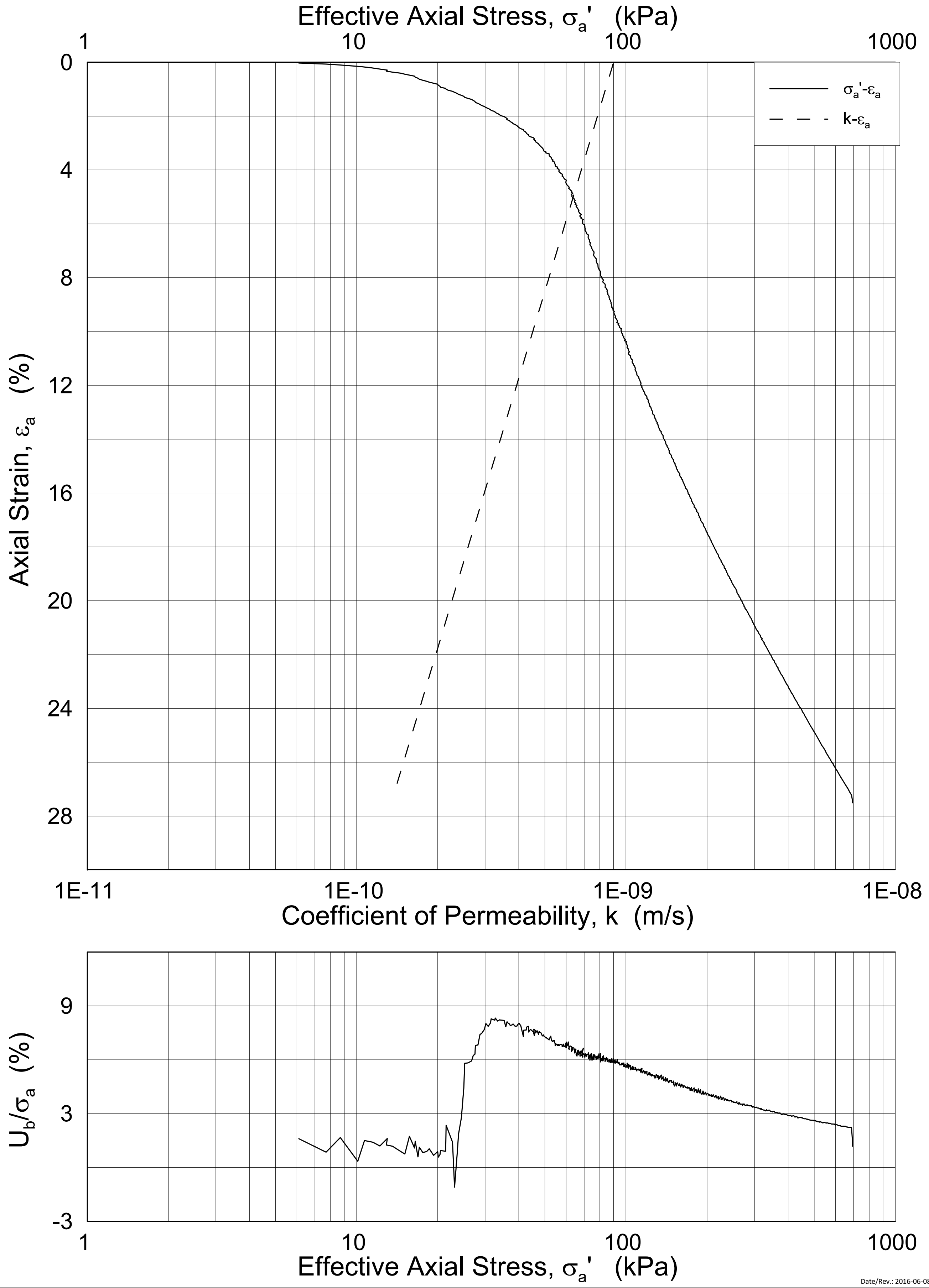
Figure No.
5.2.42

Date
2018-12-10

Drawn by / Checked
FI /GS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.42, BH2-1-2-B-1 Lin2 (CRS3445).grf



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB07

Tube: 1-3

Part: B

Test: 1

Depth = 7.27 m

p_0' = 44.1 kPa

w_i = 59.4 %

γ_i = 16.21 kN/m³

Document No.
20160154-10-R

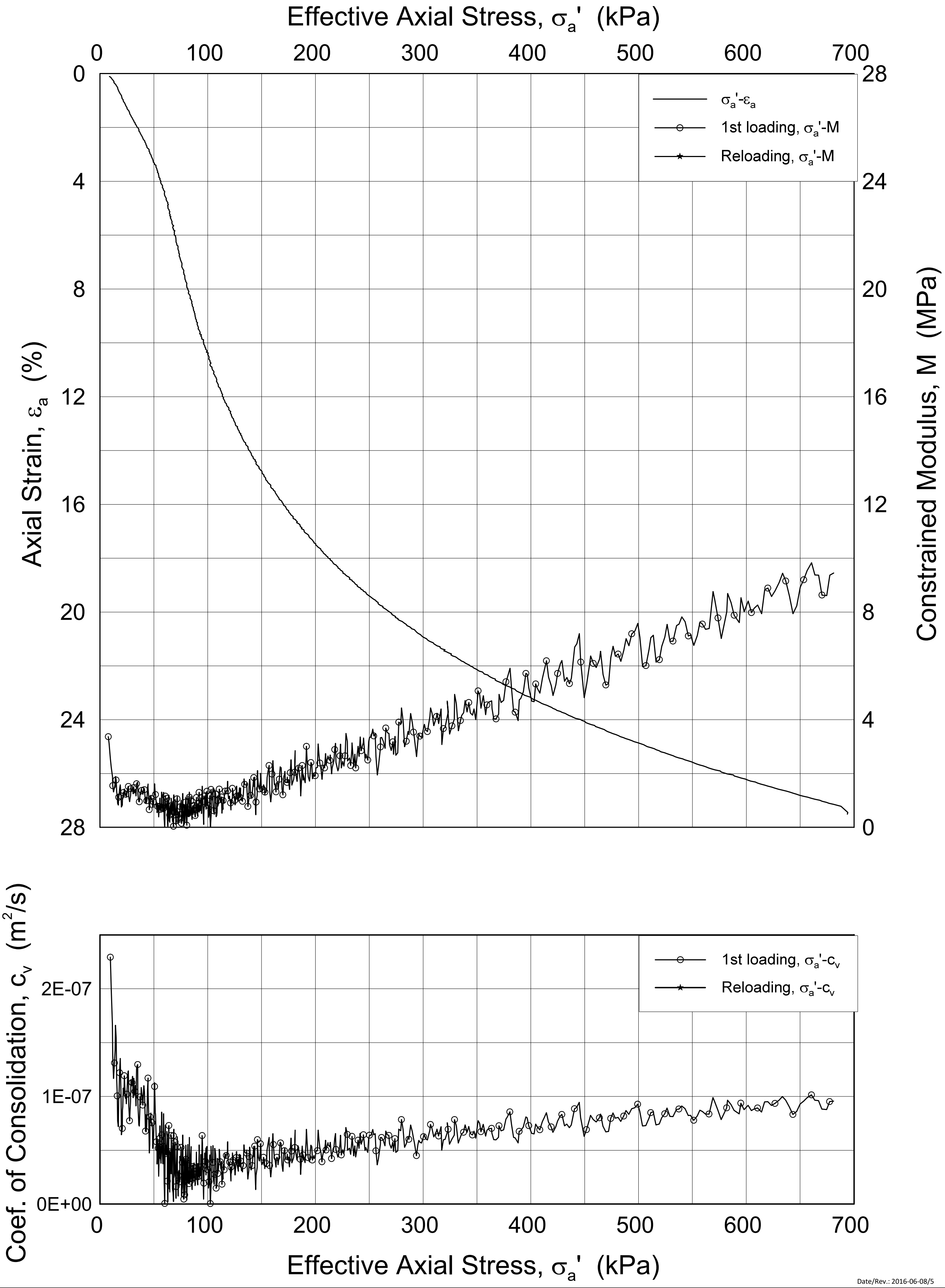
Figure No.
5.2.43

Date
2018-12-10

Drawn by / Checked
FP / MAS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.43, BH2-1-3-B-1 log (CRS3568).grf



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.44, BH2-1-3-B-1 lin (CRS3568).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

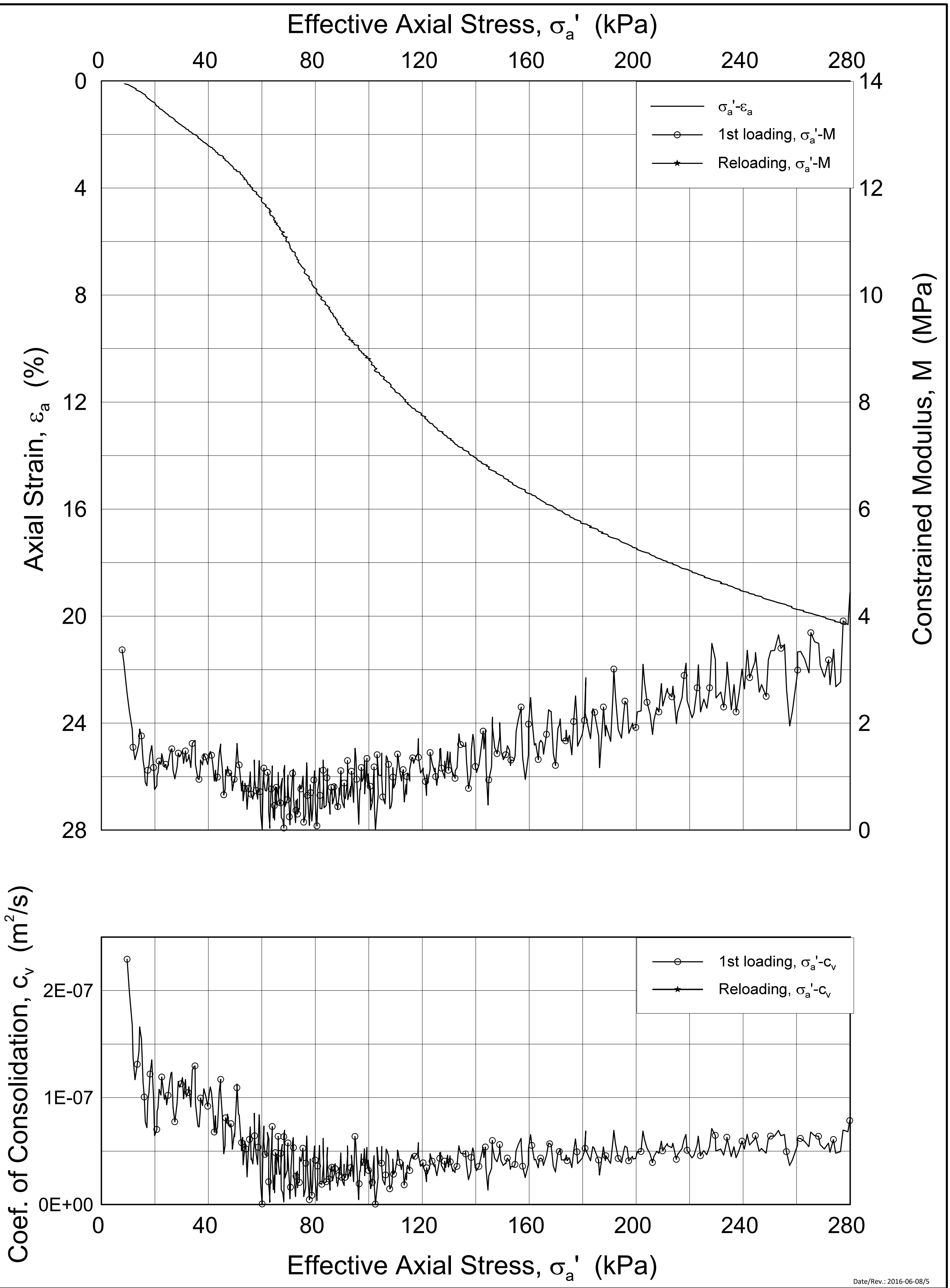
				Depth	=	7.27	m
Boring:	ONSB07	Tube:	1-3	p_0'	=	44.1	kPa
		Part:	B	w_i	=	59.4	%
		Test:	1	γ_i	=	16.21	kN/m³

Document No.
20160154-10-R

Figure No.
5.2.44

Date	Drawn by / Checked
2018-12-10	FP / MAS

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.45	
	Date 2018-12-10	Drawn by / Checked FP / MAS

Boring: ONSB07 — Tube: 1-3 — Part: B — Test: 1

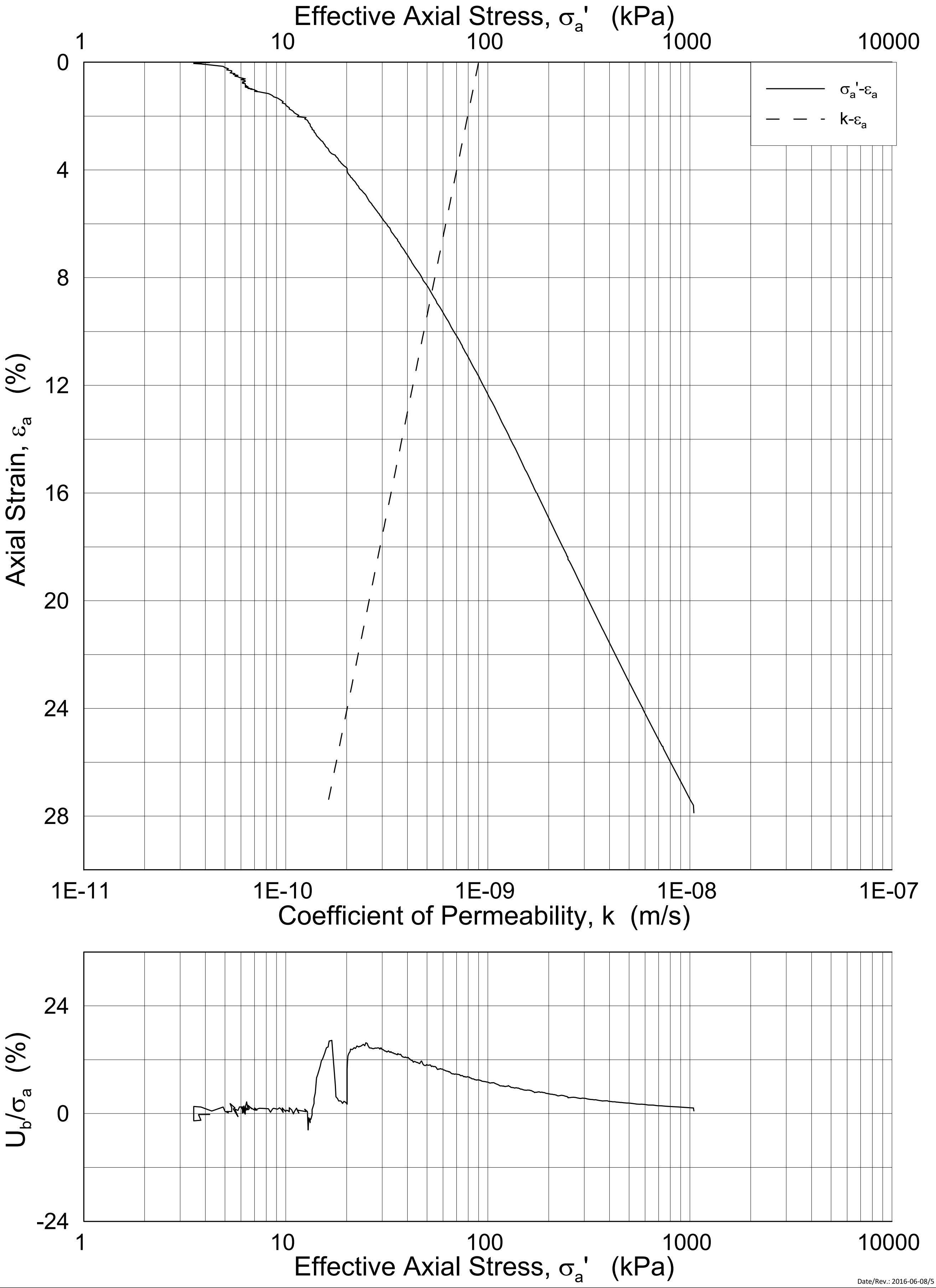
Depth = 7.27 m

p_0' = 44.1 kPa

w_i = 59.4 %

γ_i = 16.21 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.45, BH2-1-3-B-1 lin-2 (CRS3568).grf



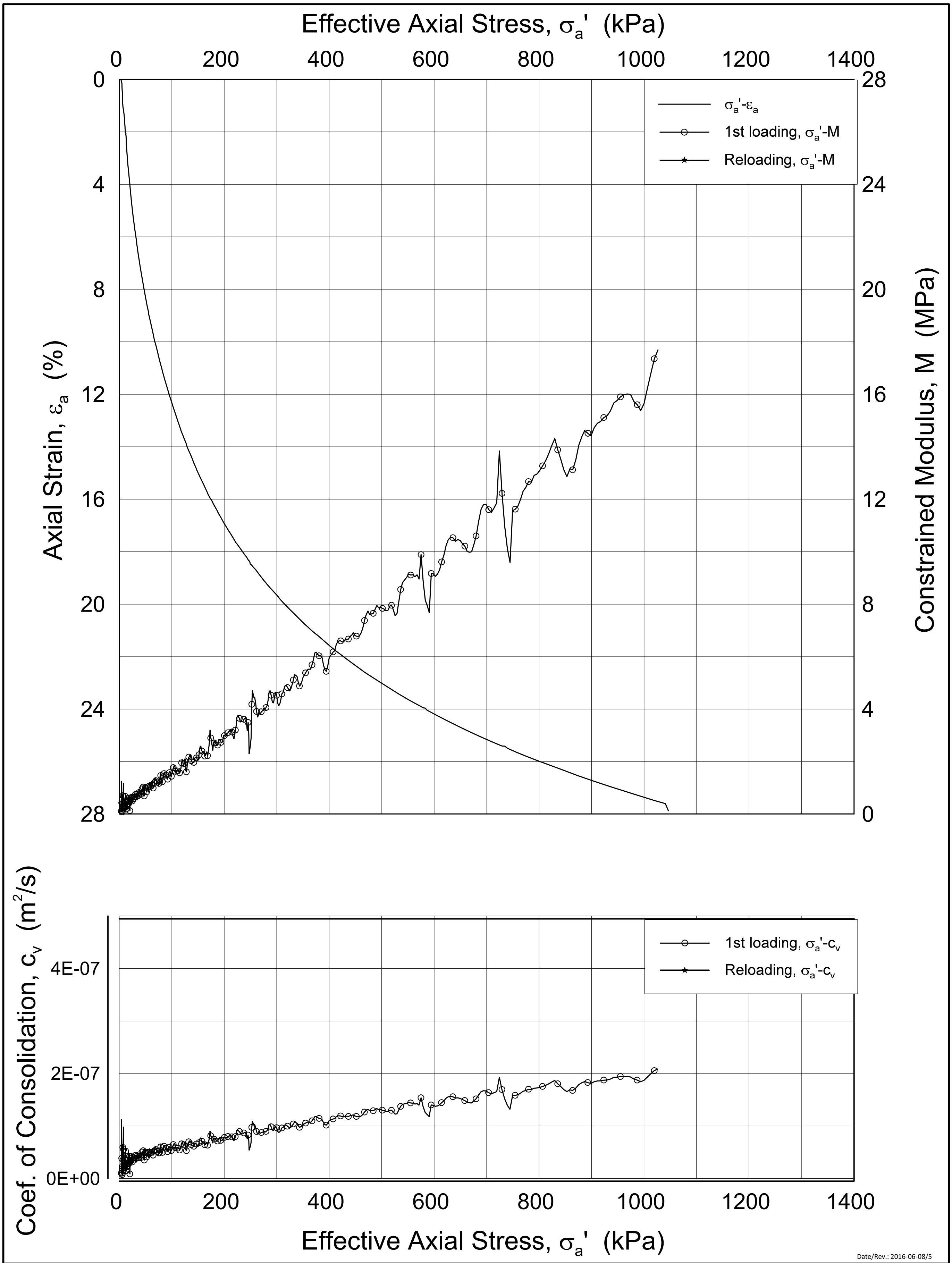
Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.46

					Date	Drawn by / Checked
			Depth	= 8.67 m	2018-12-10	FI /GS
Boring: ONSB07	Tube:	2-1	p_0'	= 54.3 kPa		
	Part:	B	w_i	= 51.4 %		
	Test:	1	γ_i	= 17.19 kN/m³		

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.46, BH2-2-1-B-1 Log (CRS3454).grf



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring:	ONSB07	Tube:	2-1	Depth	=	8.67	m
		Part:	B	p_0'	=	54.3	kPa
		Test:	1	w_i	=	51.4	%
				γ_i	=	17.19	kN/m³

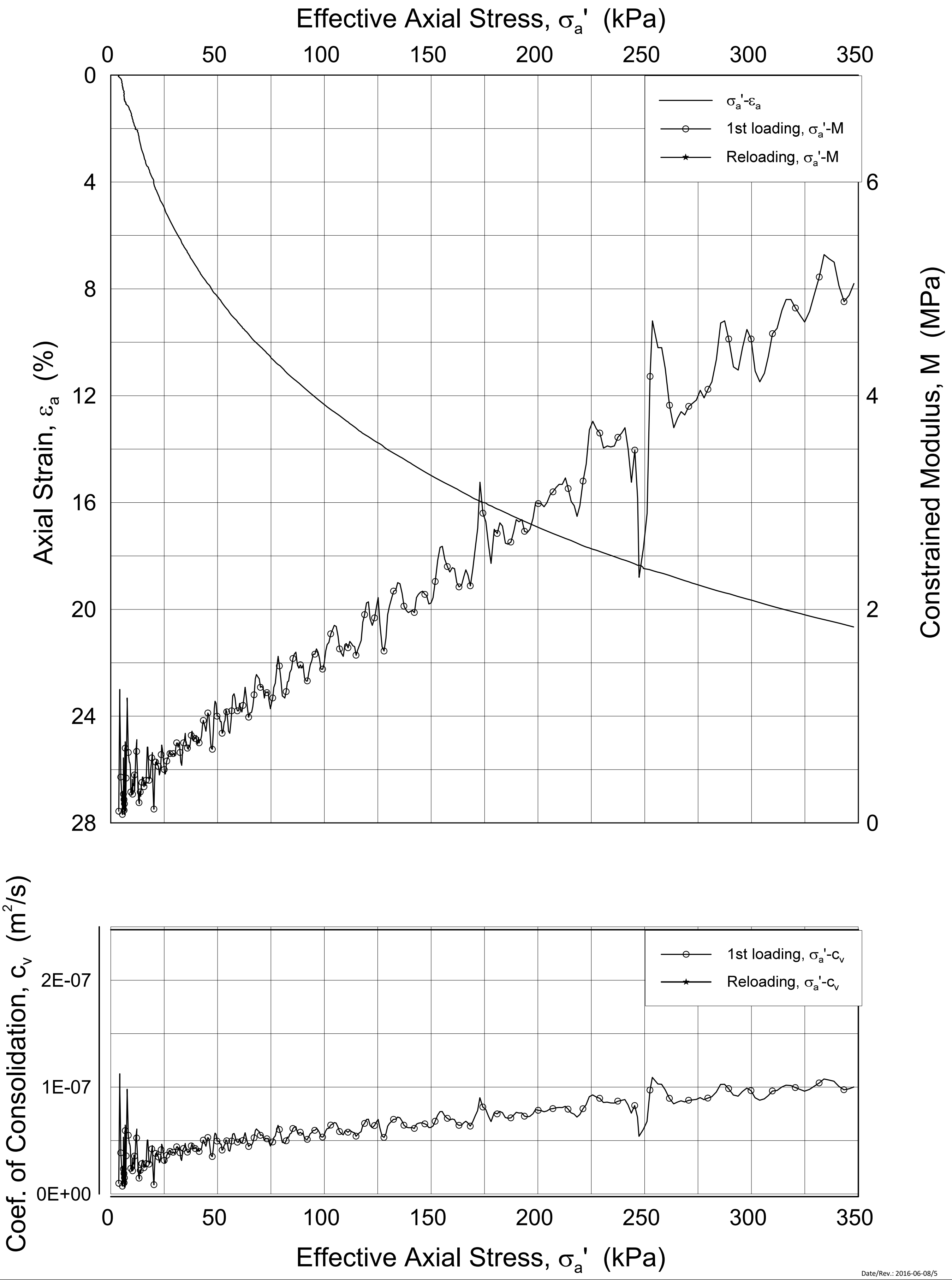
Document No. 20160154-10-R

Figure No. 5.2.47

Date 2018-12-10

Drawn by / Checked FI / GS

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.48

Date 2018-12-10

Drawn by / Checked FI / GS

Oedometer test (CRSC)

Boring: ONSB07 Tube: 2-1 Part: B Test: 1

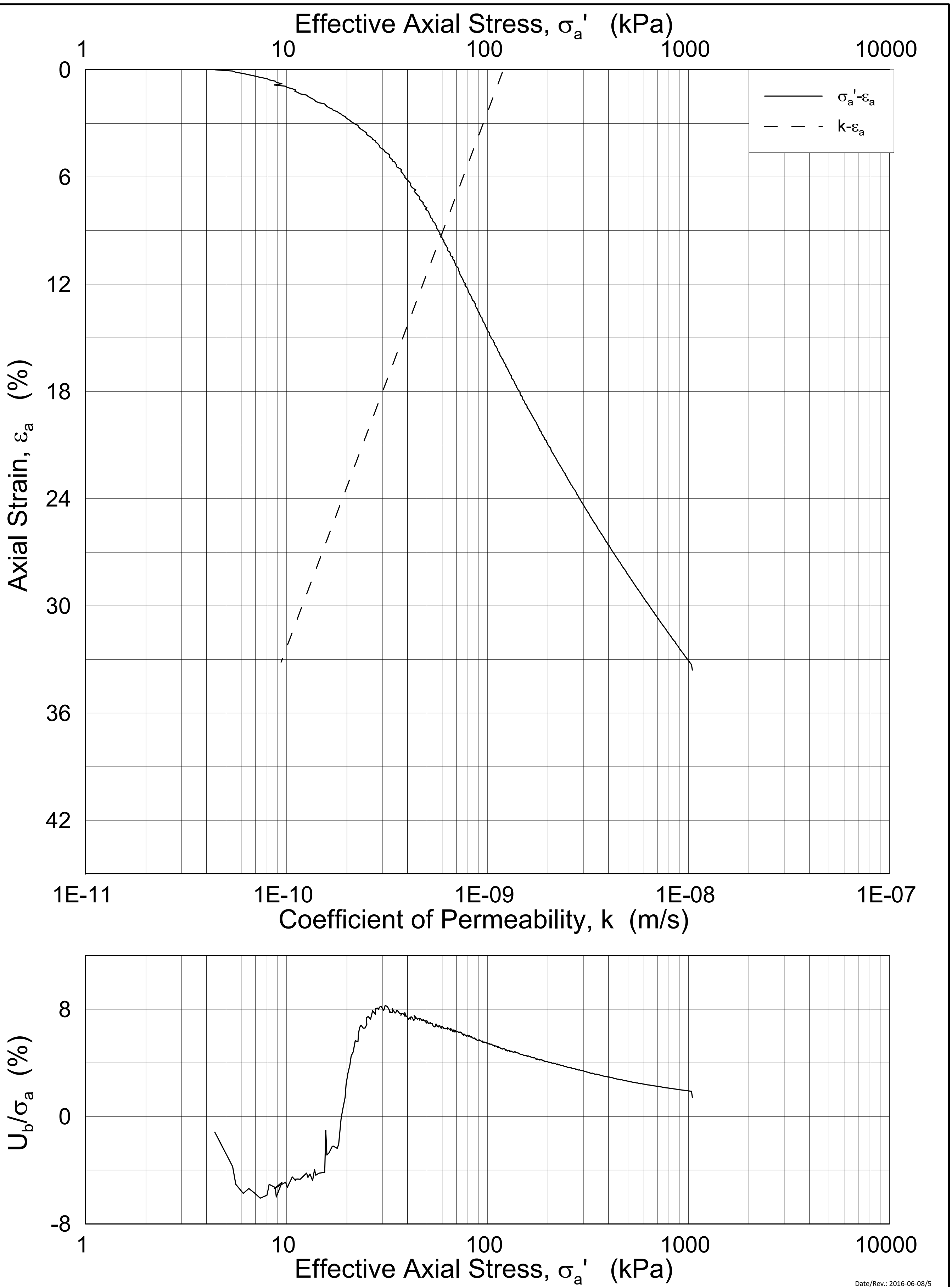
Depth = 8.67 m

p_0' = 54.3 kPa

w_i = 51.4 %

γ_i = 17.19 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.48, BH2-2-1-B-1 Lin2 (CRS3454).grf



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.49
	Date 2018-12-10 / Drawn by / Checked FI /GS

Boring: ONSB08 Tube: 1-2 Part: B Test: 1

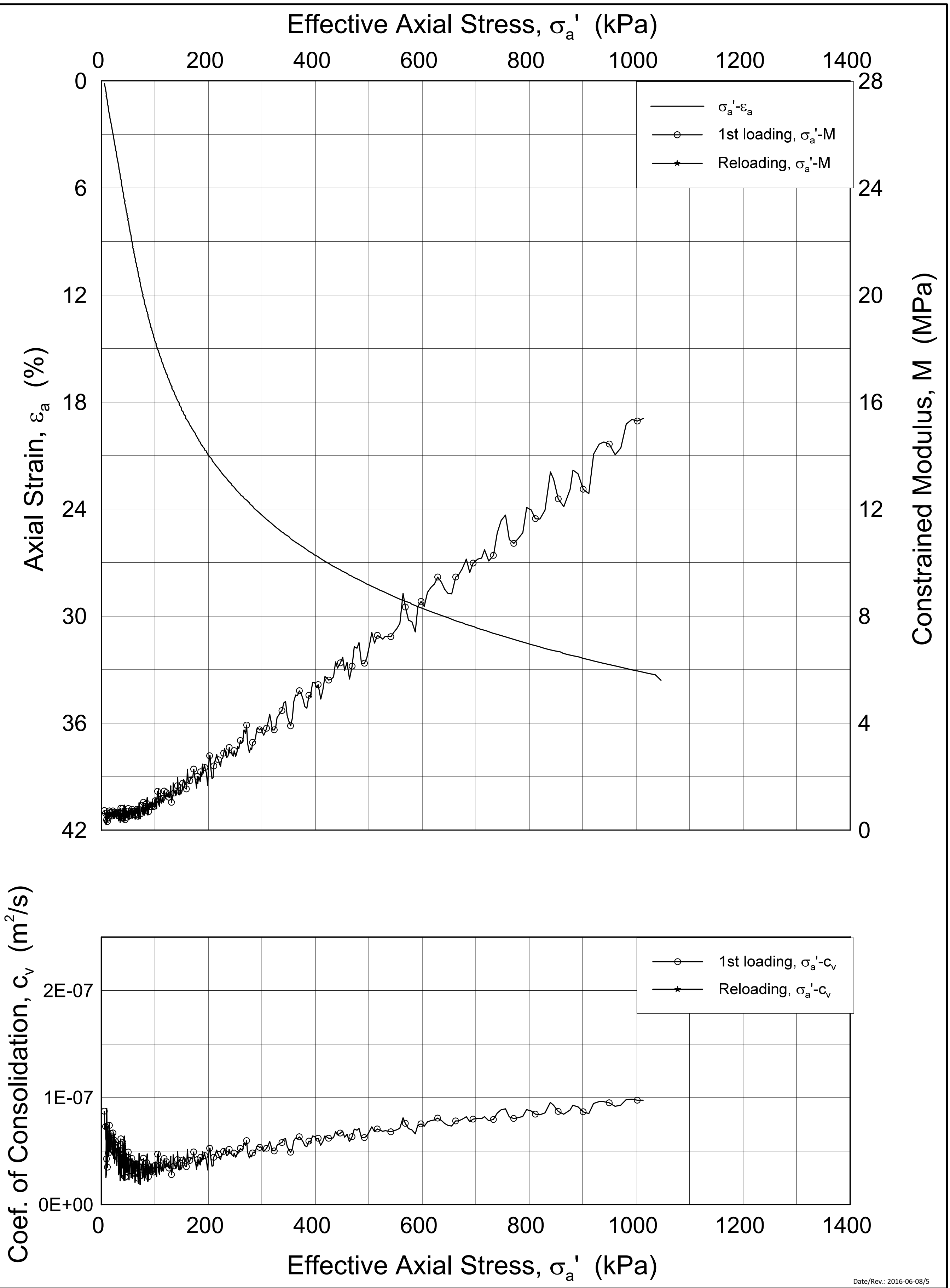
Depth = 6.6 m

p_0' = 39.2 kPa

w_i = 69.3 %

γ_i = 15.71 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.49, BH3-1-2-B-1 Log(CRS3455).grf



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.50, BH3-1-2-B-1 Lin (CRS3455).grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.50

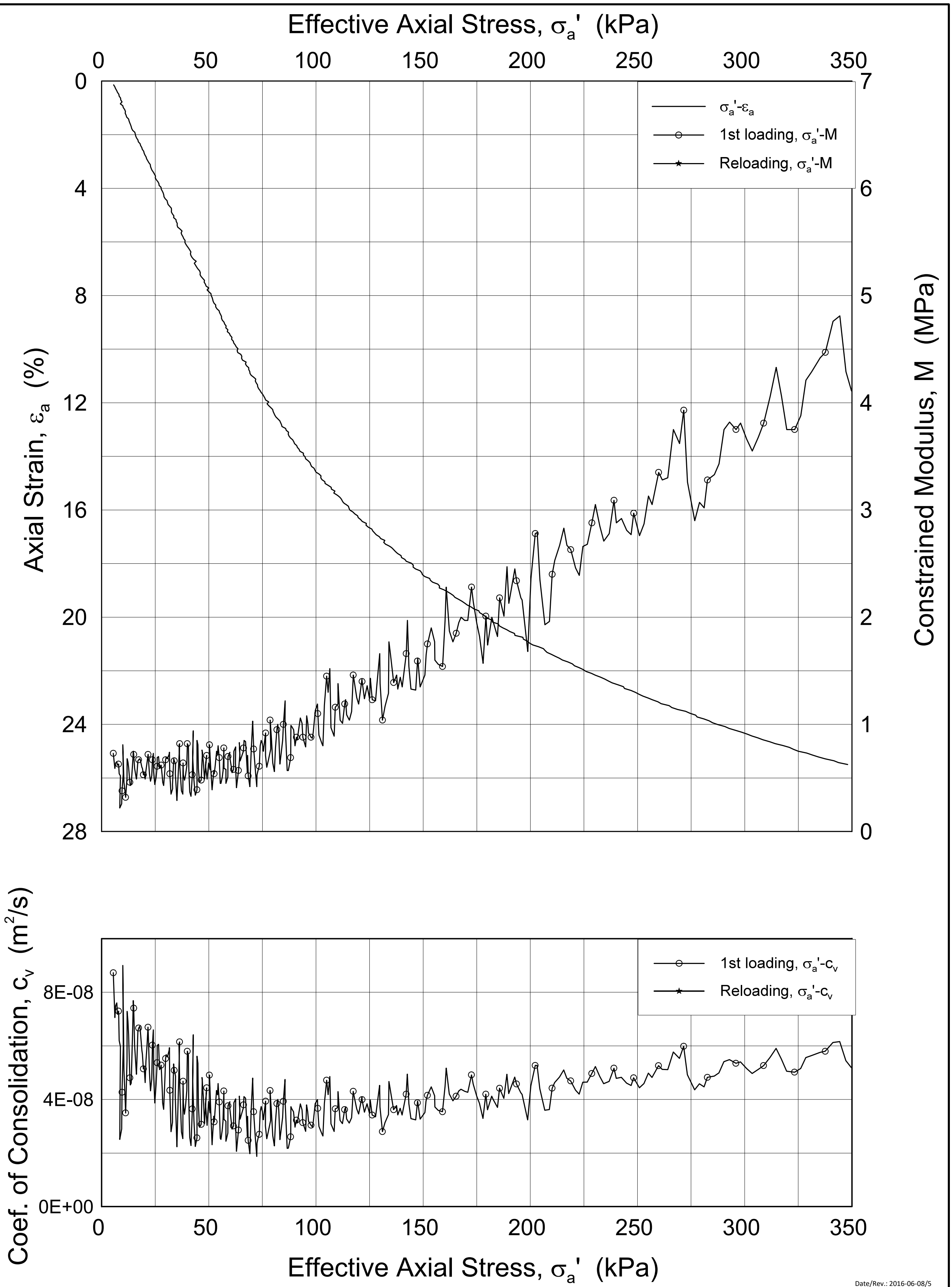
Oedometer test (CRSC)

Date 2018-12-10

Drawn by / Checked FI /GS

				Depth	=	6.6	m
Boring:	ONSB08	Tube:	1-2	p_0'	=	39.2	kPa
		Part:	B	w_i	=	69.3	%
		Test:	1	γ_i	=	15.71	kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.51

Oedometer test (CRSC)

Date 2018-12-10

Drawn by / Checked FI /GS

Boring: ONSB08

Tube: 1-2

Part: B

Test: 1

Depth = 6.6 m

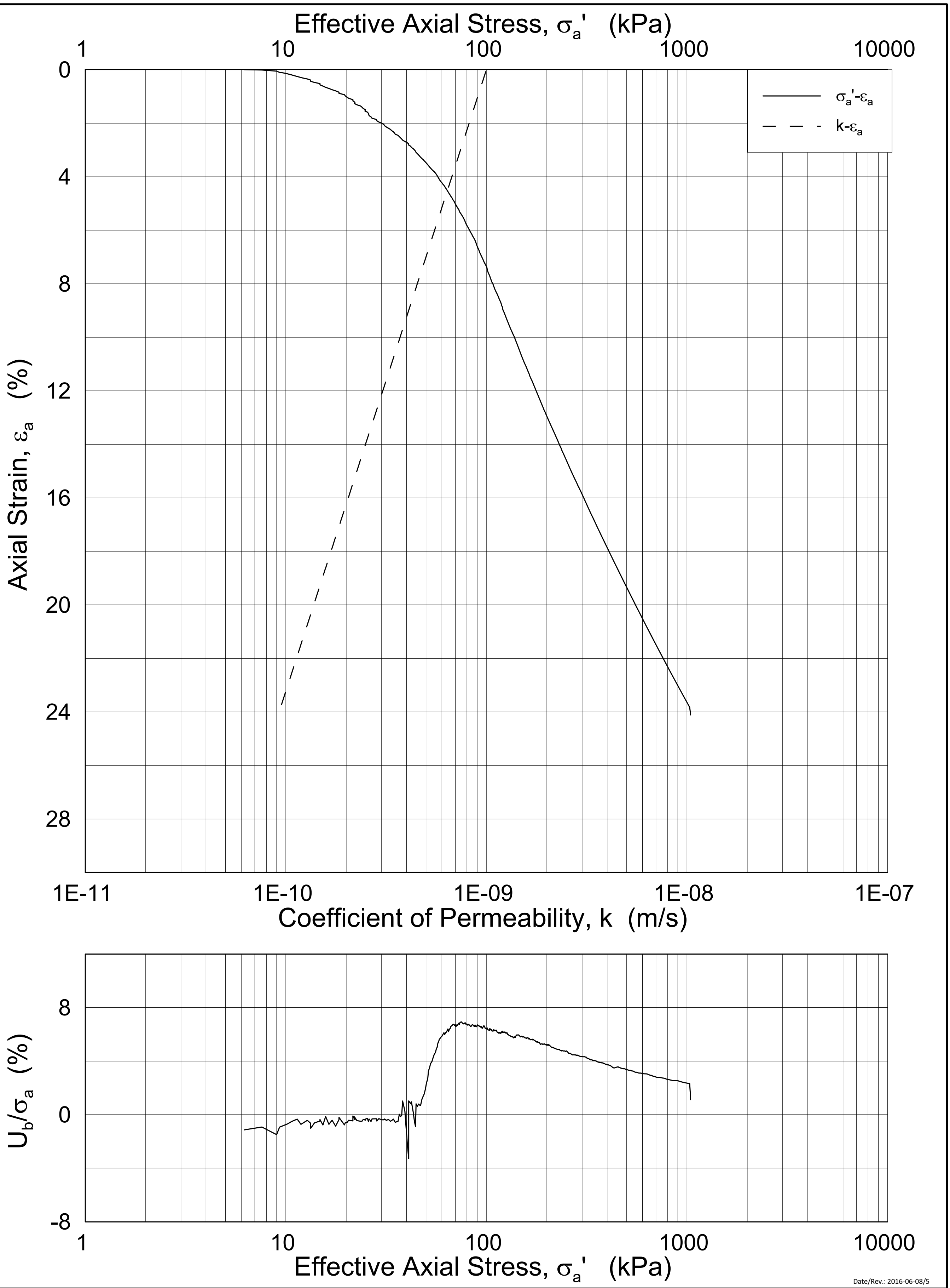
p_0' = 39.2 kPa

w_i = 69.3 %

γ_i = 15.71 kN/m³

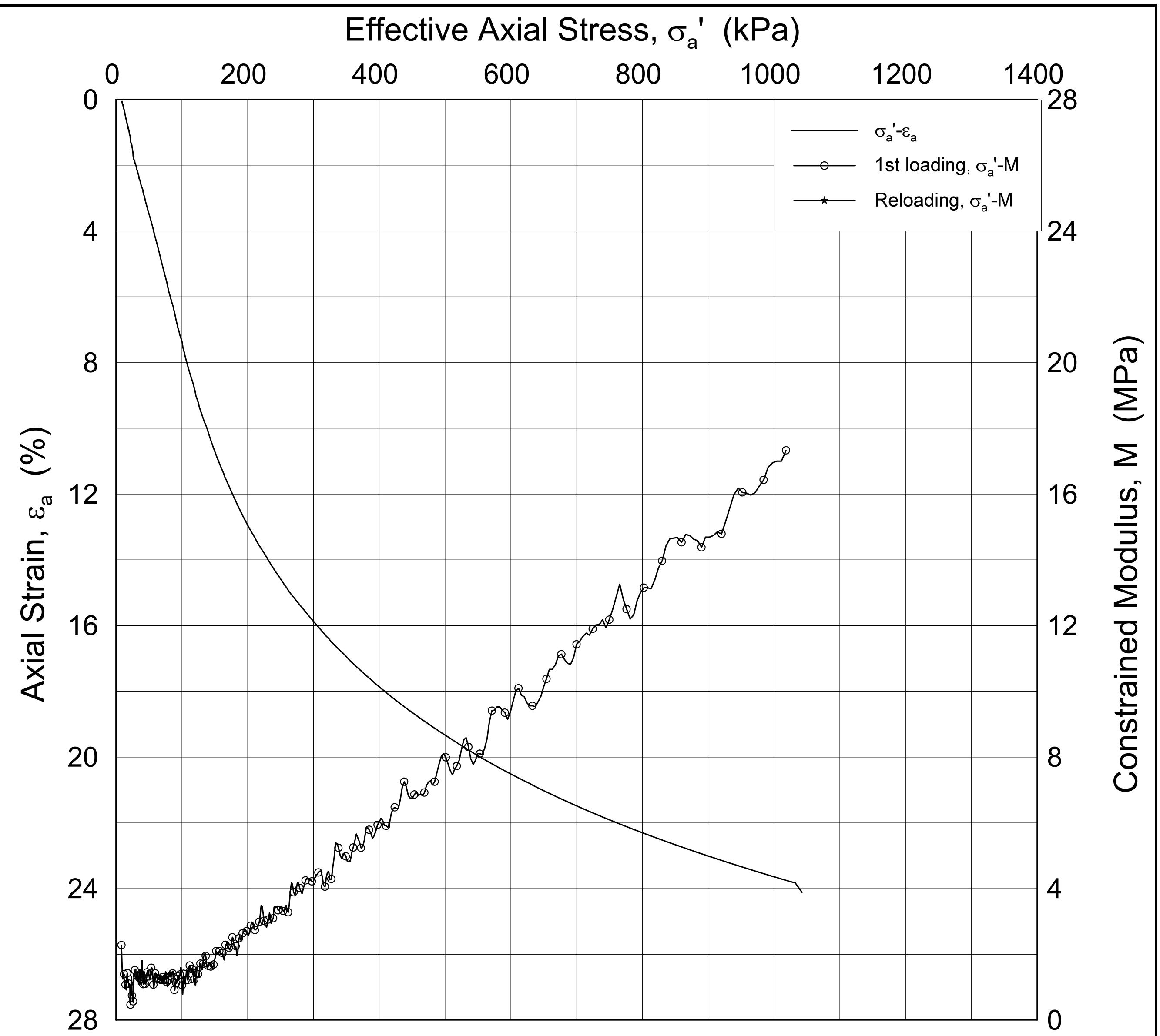
NGI

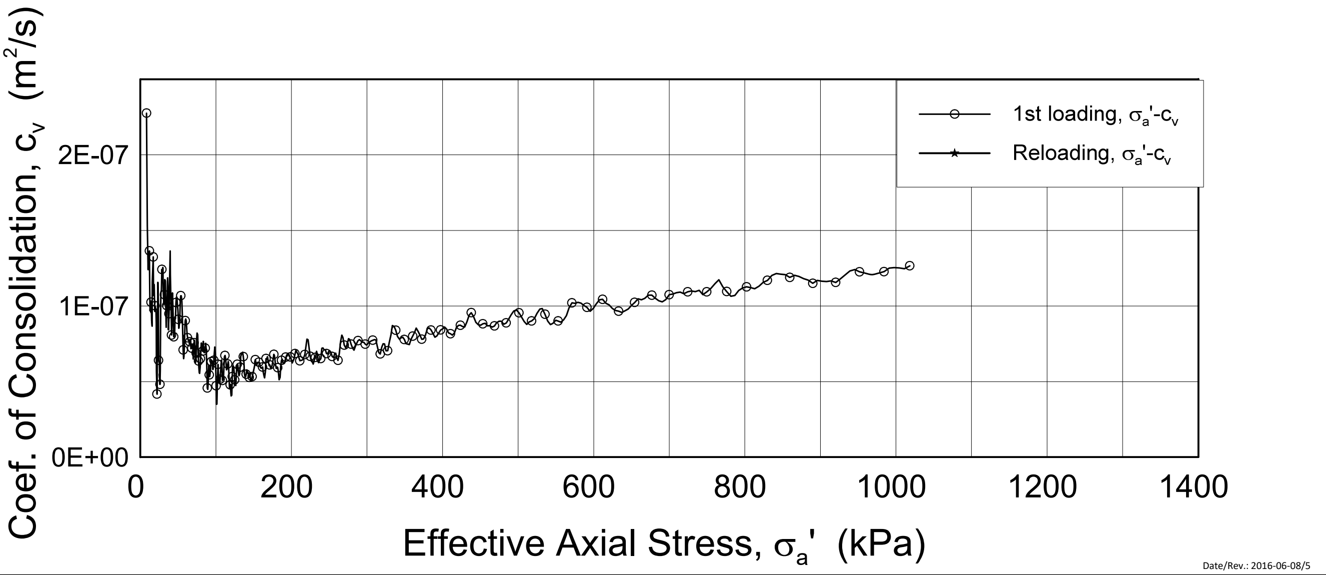
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.51, BH3-1-2-B-1 Lin2 (CRS3455).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.52, BH3-2-2-B-1 Log (CRS3453).grf

Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R
Oedometer test (CRSC)		Figure No. 5.2.52
Boring: ONSB08	Depth = 9.59 m	Date 2018-12-10 / Drawn by / Checked FI /GS
Tube: 2-2	p_0' = 61.0 kPa	NGI
Part: B	w_i = 41.7 %	
Test: 1	γ_i = 17.65 kN/m³	



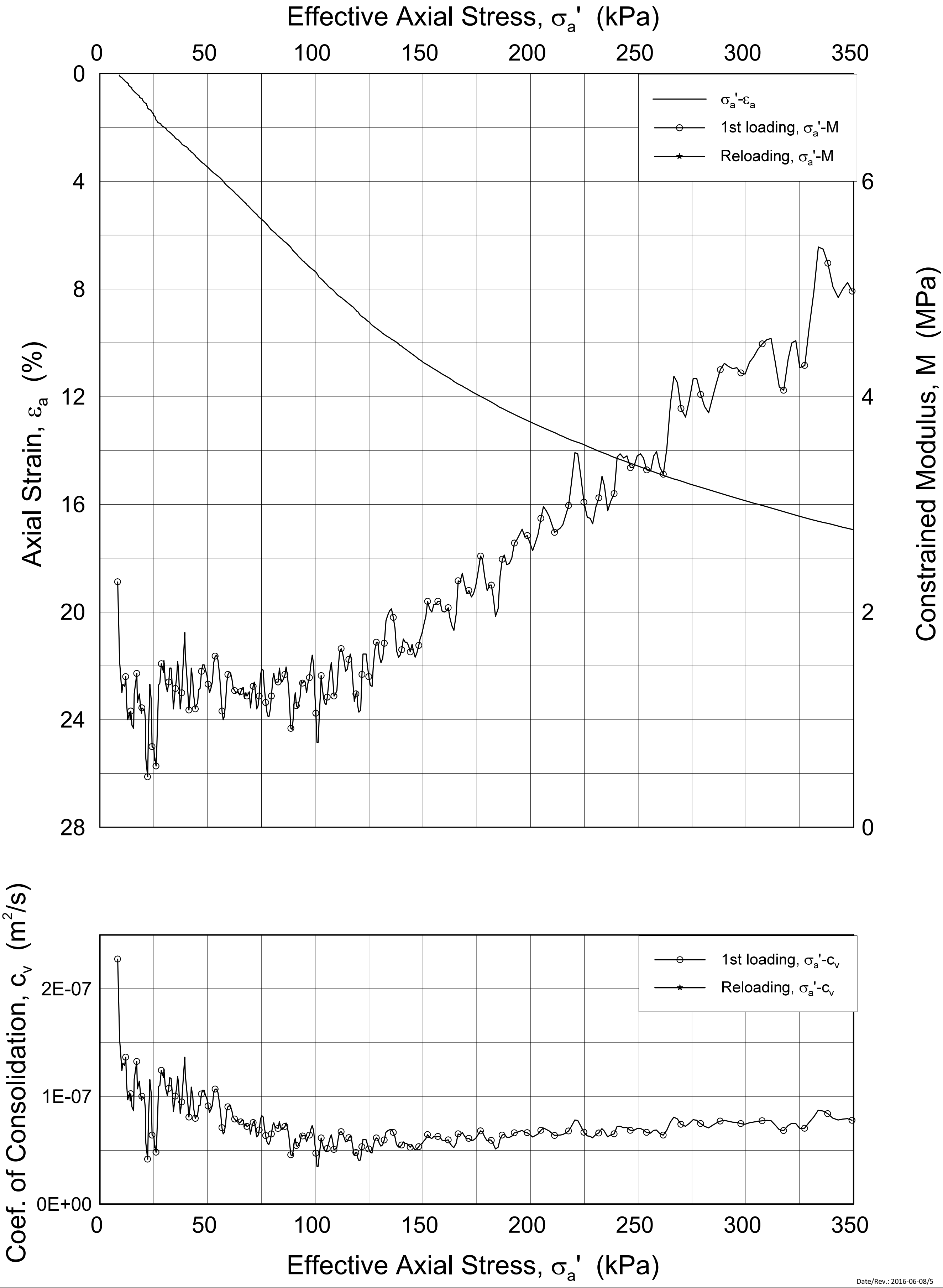


P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.53, BH3-2-2-B-1 Lin (CRS3453).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R
Oedometer test (CRSC)		Figure No. 5.2.53
Boring: ONSB08 Tube: 2-2 Part: B Test: 1	Depth = 9.59 m; p_0' = 61.0 kPa; w_i = 41.7 %; γ_i = 17.65 kN/m³	Date 2018-12-10 / Drawn by / Checked FI /GS

NGI



Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB08	Tube:	2-2	Depth	=	9.59	m
	Part:	B	p_0'	=	61.0	kPa
			w_i	=	41.7	%
	Test:	1	γ_i	=	17.65	kN/m³

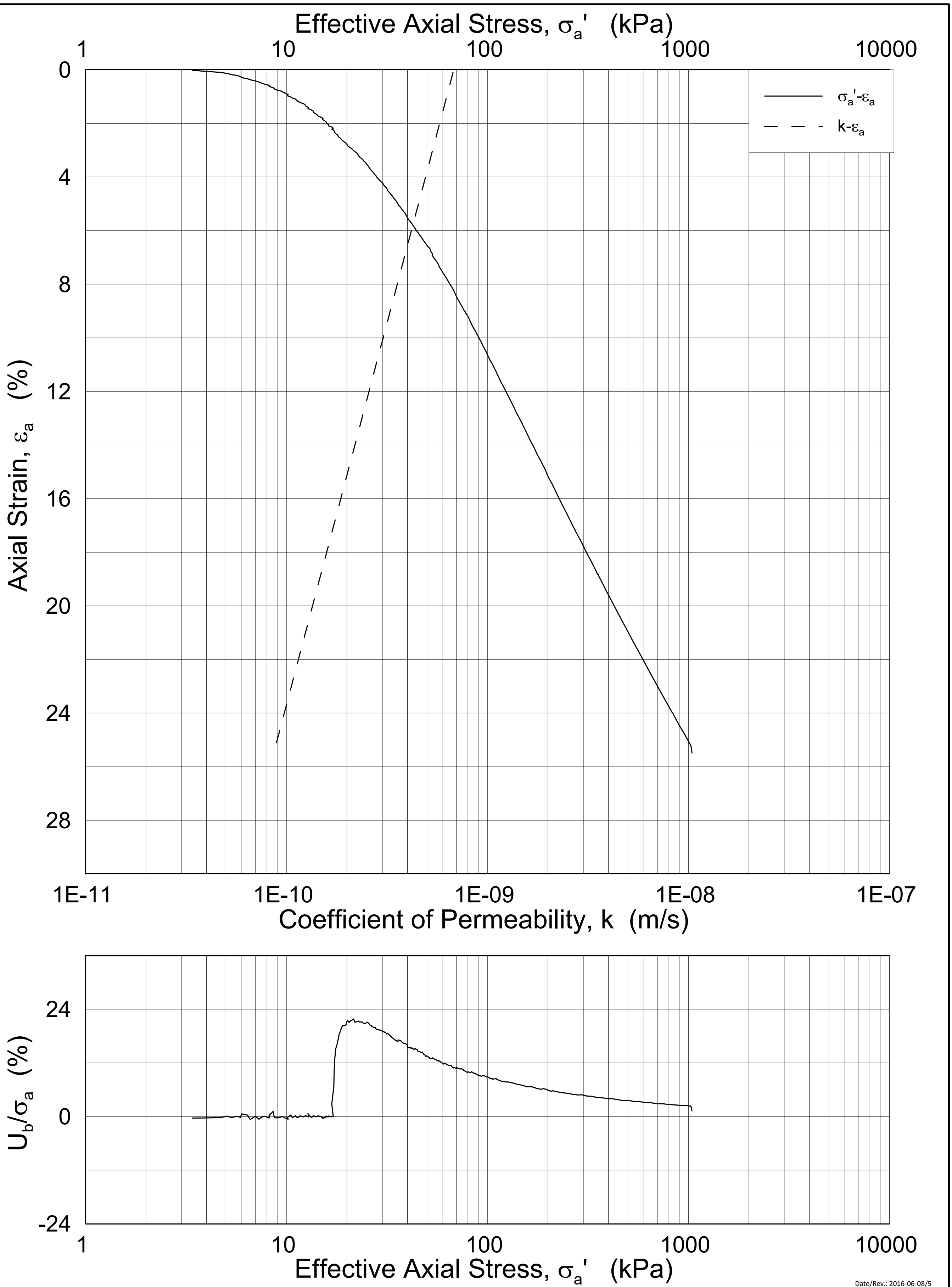
Document No. 20160154-10-R

Figure No. 5.2.54

Date 2018-12-10

Drawn by / Checked FI /GS

NGI



Date/Rev.: 2016-06-08/5

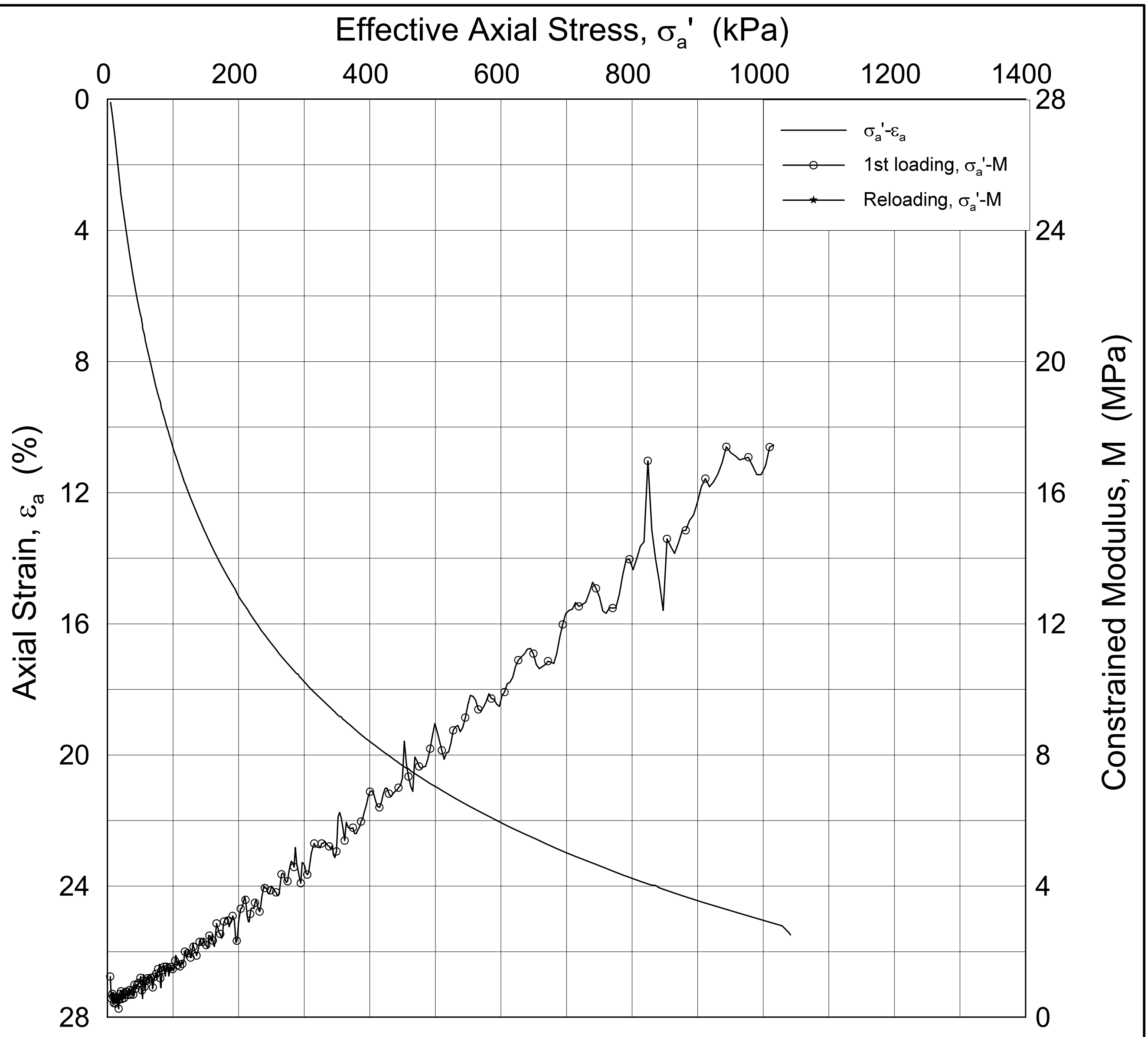
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.55, BH4-2-1-B-1 Log (CRS3523).grf

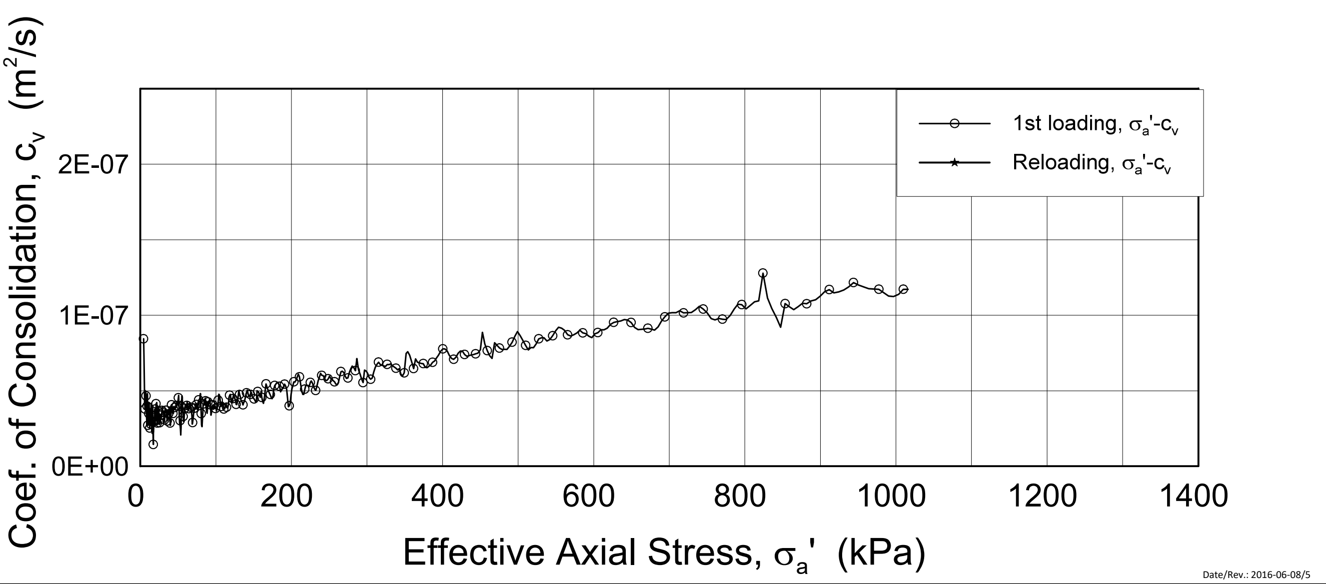
Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.55
	Date 2018-12-10 / Drawn by / Checked FI /GS

Boring: ONSB09 | Tube: 2-1 | Part: B | Test: 1

Depth = 8.67 m
p_0' = 54.3 kPa
w_i = 45.7 %
γ_i = 17.48 kN/m³

NGI





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.56, BH4-2-1-B-1 Lin (CRS3523).grf

Date/Rev.: 2016-06-08/5

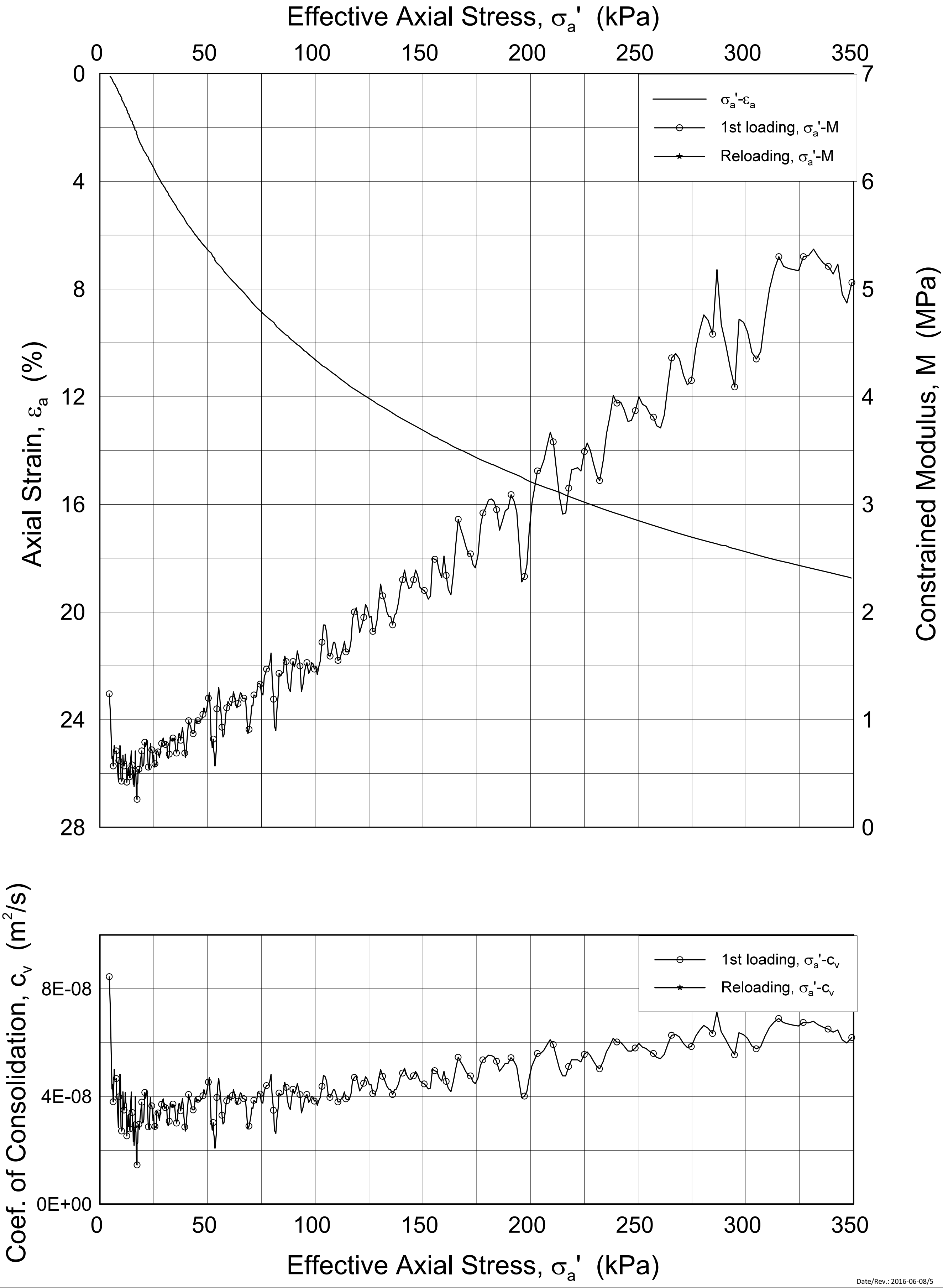
Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.56	
	Date 2018-12-10	Drawn by / Checked FI /GS

Depth = 8.67 m

Boring: ONSB09 Tube: 2-1 p_0' = 54.3 kPa

Part: B w_i = 45.7 %

Test: 1 γ_i = 17.48 kN/m³



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

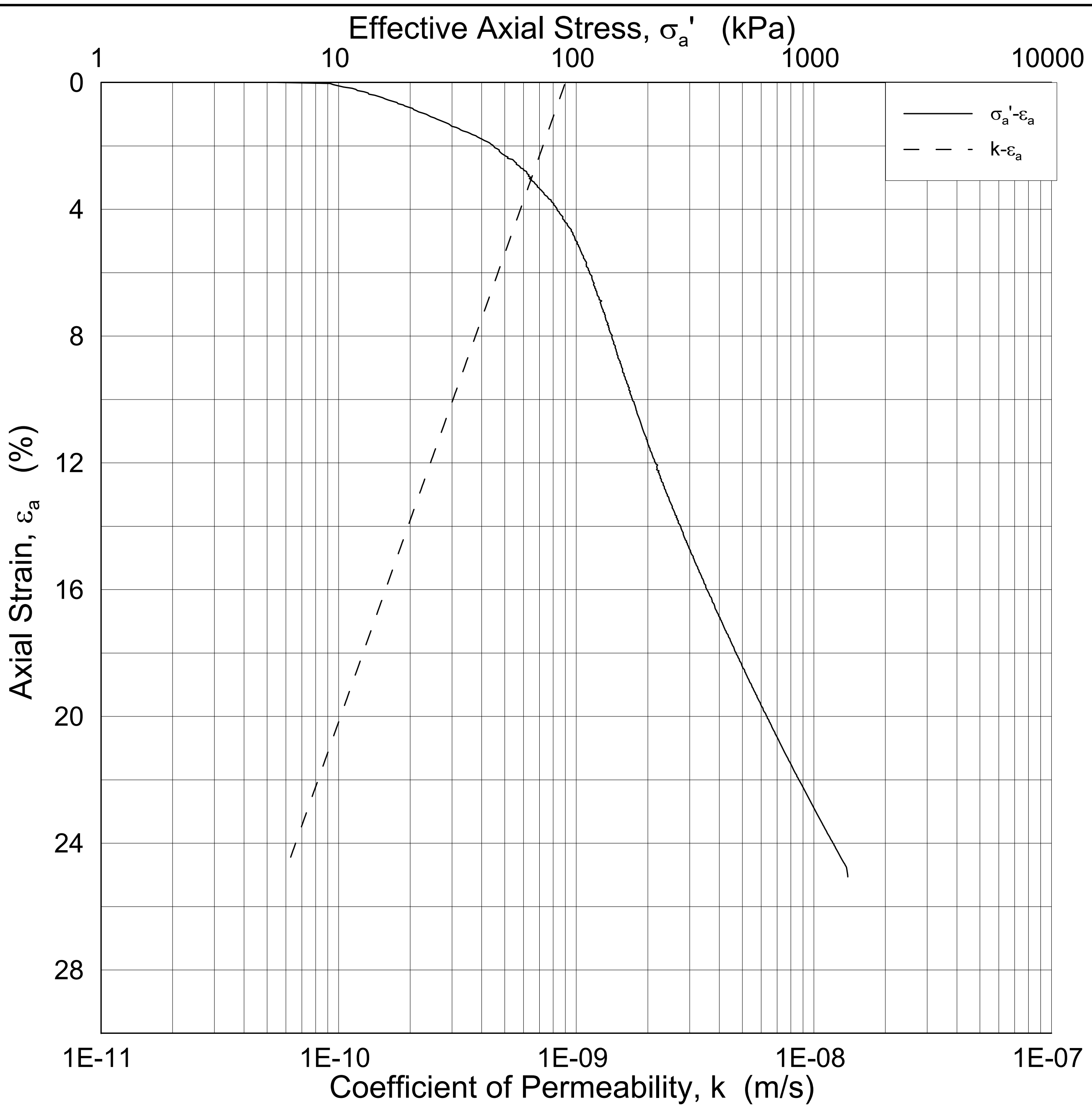
Boring: ONSB09	Tube: 2-1	Depth = 8.67 m
	Part: B	p_0' = 54.3 kPa
	Test: 1	w_i = 45.7 %
		γ_i = 17.48 kN/m³

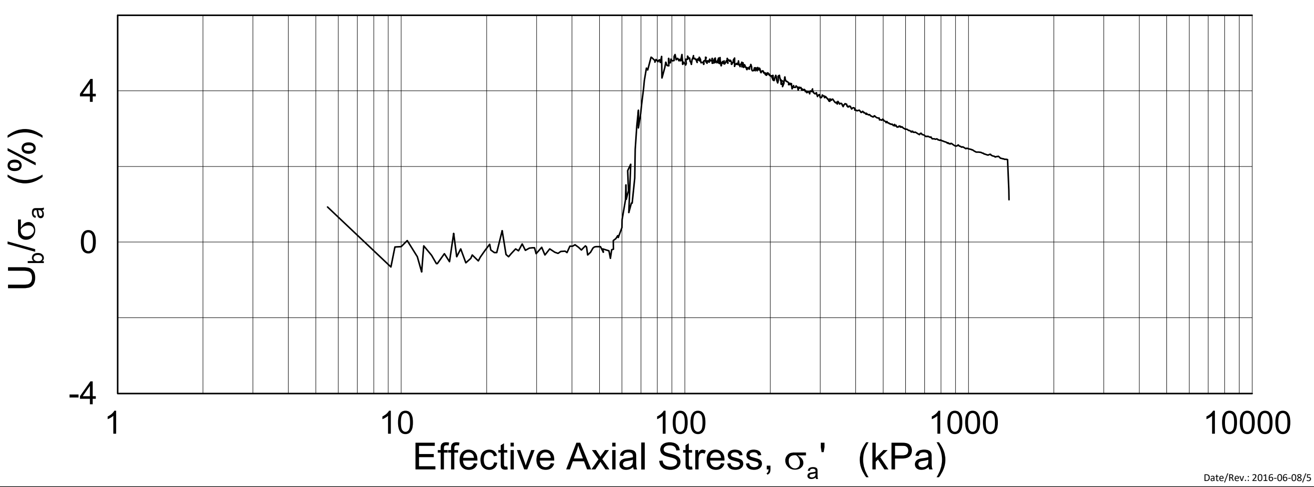
Document No. 20160154-10-R

Figure No. 5.2.57

Date	Drawn by / Checked
2018-12-10	FI /GS

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.57, BH4-2-1-B-1 Lin2 (CRS3523).grf





Date/Rev.: 2016-06-08/5

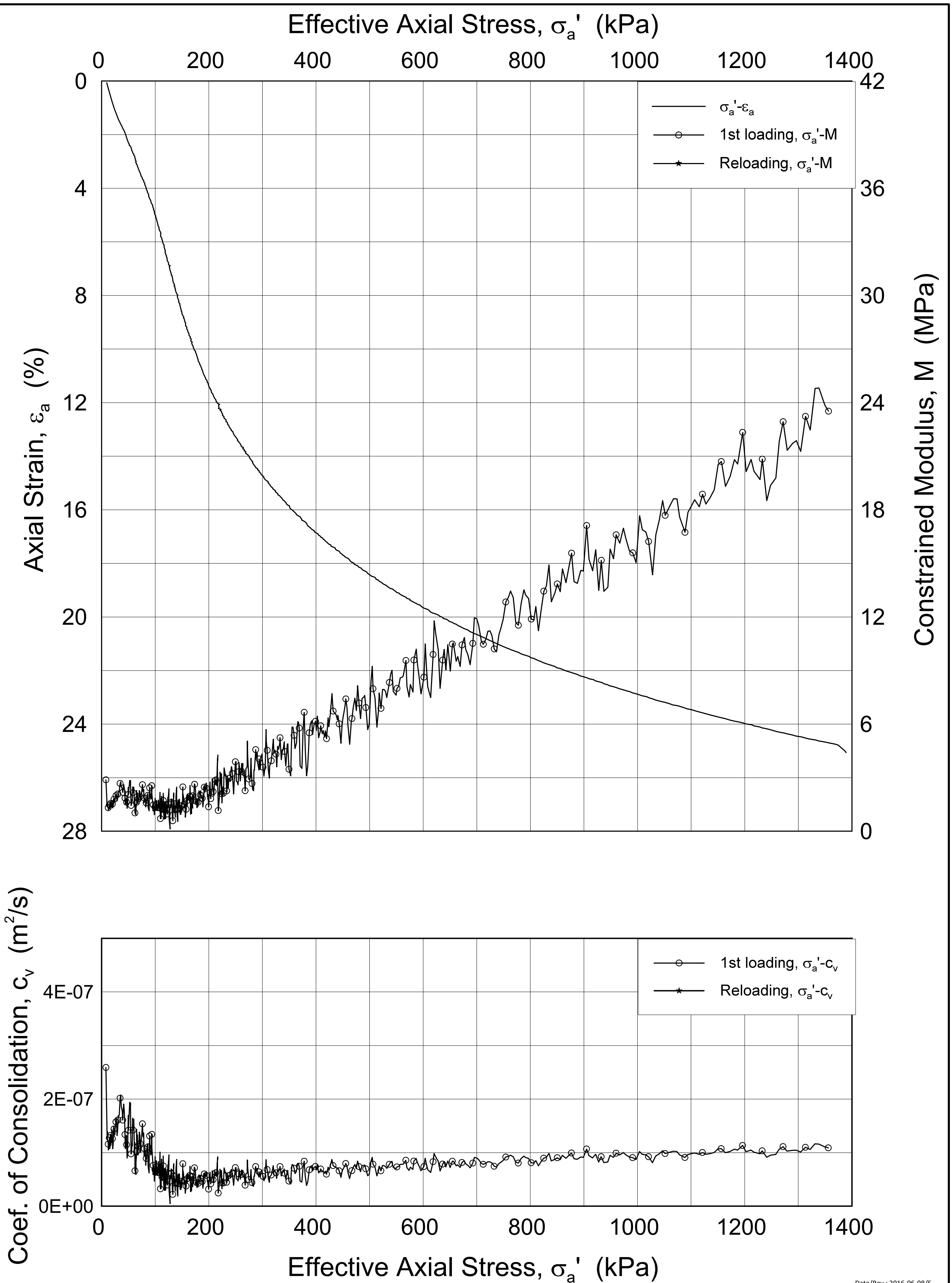
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.58, BH4-2-2-B-1 log (CRS3442).grf

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.58
	Date 2018-12-10 — Drawn by / Checked FI /GS

Boring: ONSB09

Tube: 2-2
Part: B
Test: 1

Depth = 9.63 m
p_0' = 61.3 kPa
w_i = 42.3 %
γ_i = 17.92 kN/m³



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.59, BH4-2-2-B-1 lin(CRS3442).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Document No. 20160154-10-R

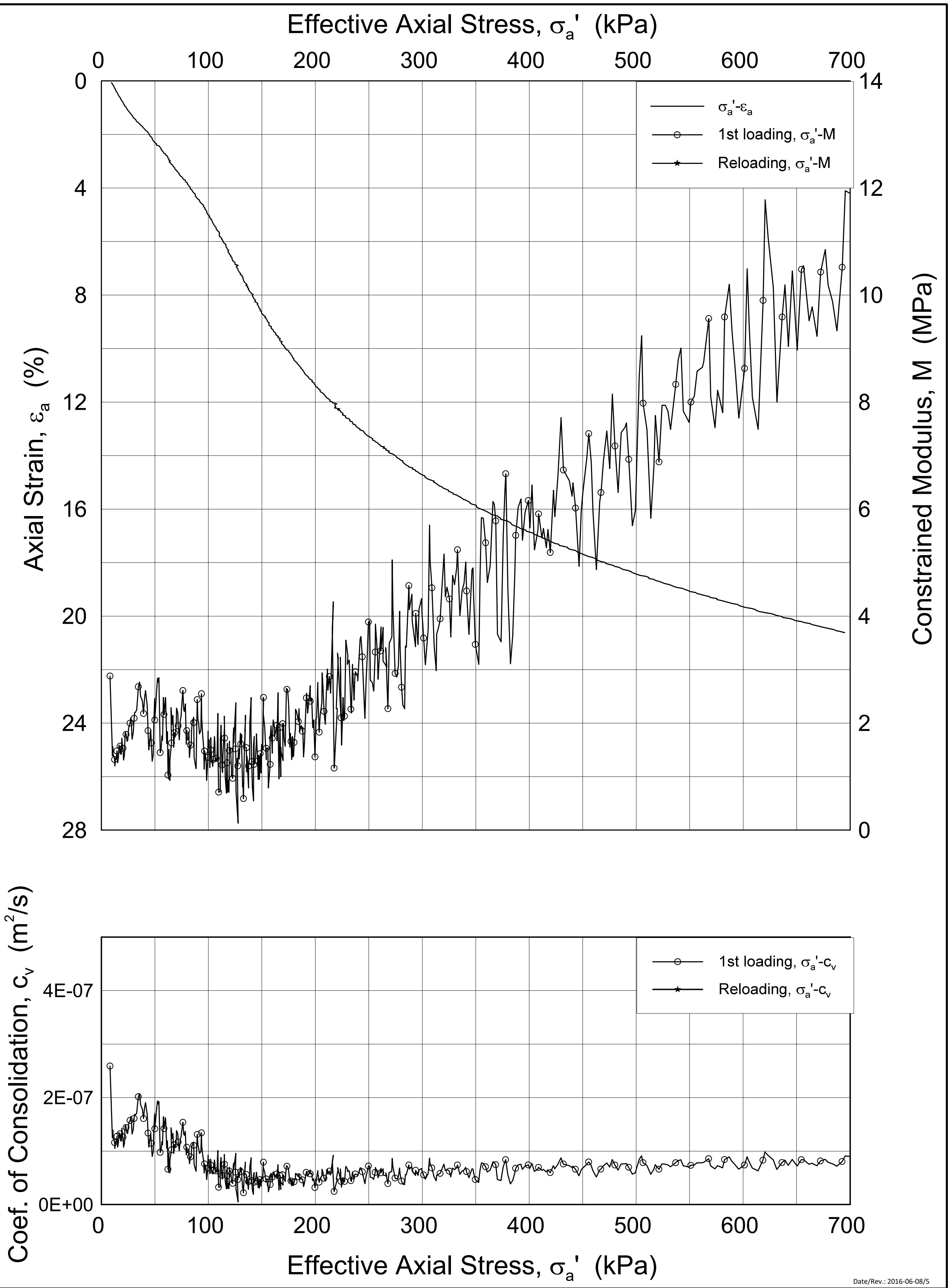
Figure No. 5.2.59

Date 2018-12-10

Drawn by / Checked FI /GS

				Depth	=	9.63	m
Boring: ONSB09	Tube:	2-2		p_0'	=	61.3	kPa
	Part:	B		w_i	=	42.3	%
	Test:	1		γ_i	=	17.92	kN/m³

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.60, BH4-2-2-B-1 lin2 (CRS3442).grf

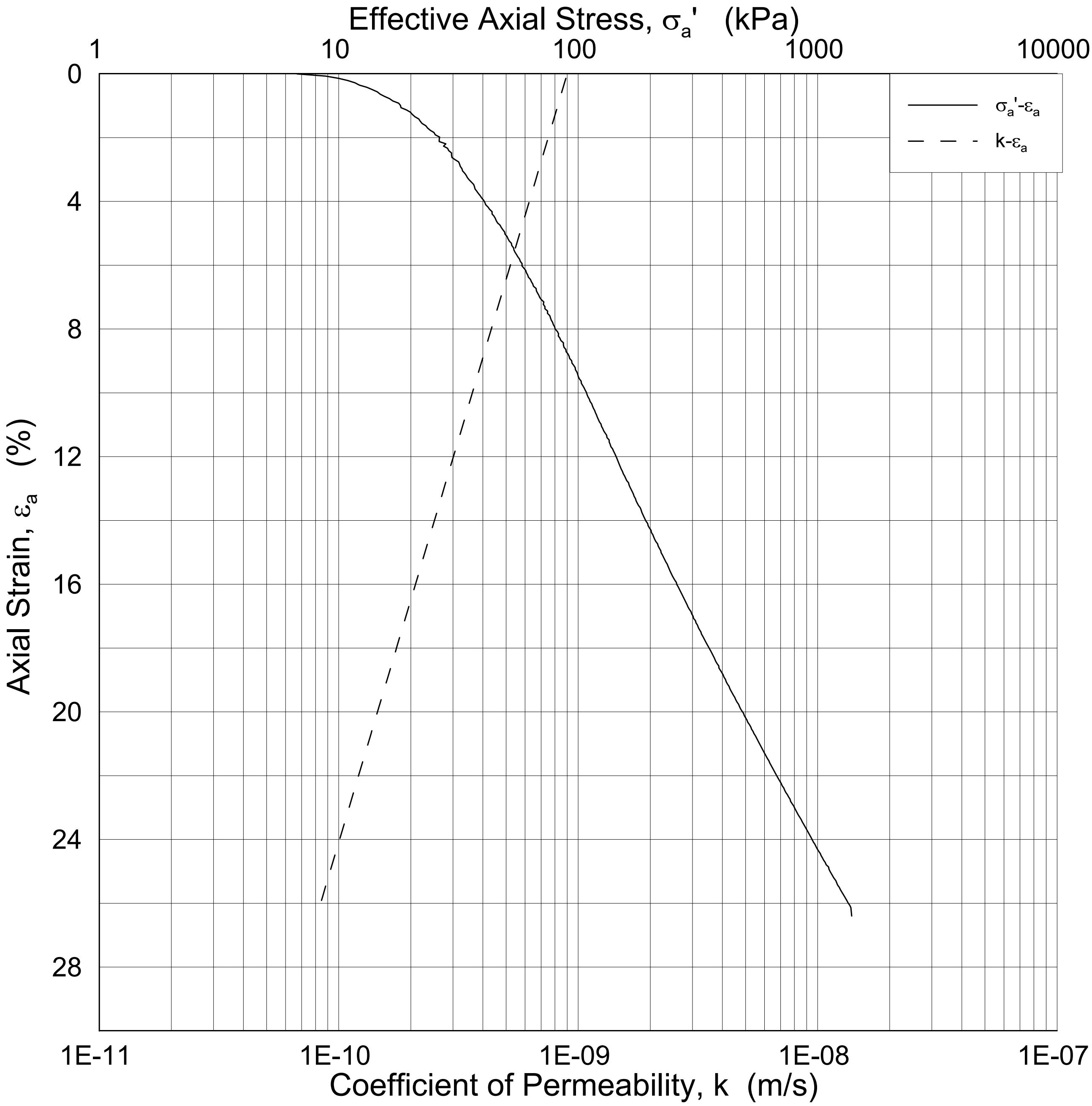
Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.60
	Date 2018-12-10 / Drawn by / Checked FI /GS

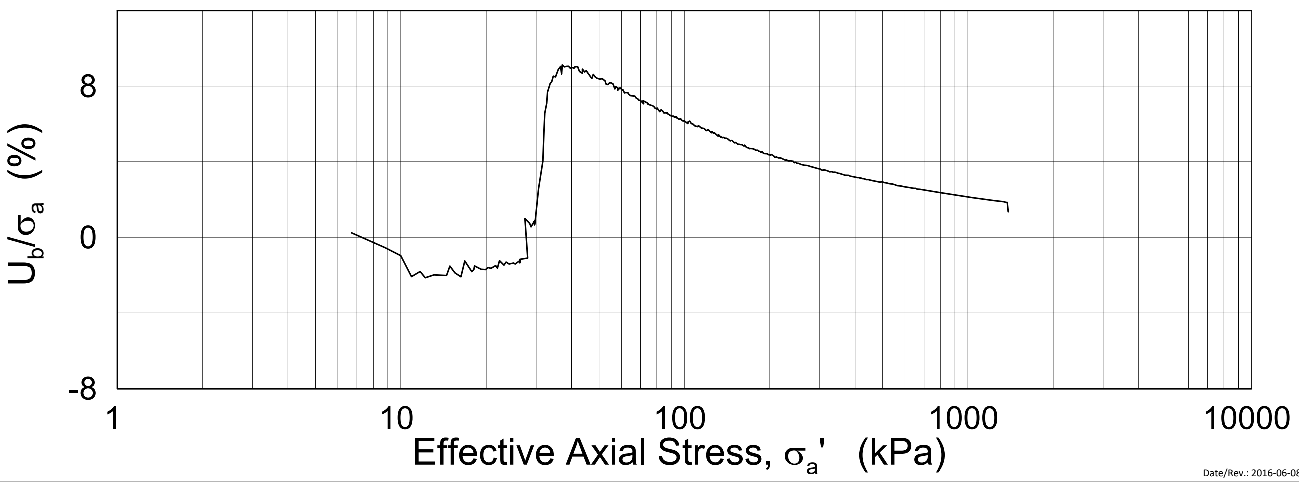
Depth = 9.63 m

Boring: ONSB09 Tube: 2-2 p_0' = 61.3 kPa

Part: B w_i = 42.3 %

Test: 1 γ_i = 17.92 kN/m³





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.61, BH4-2-3-B-1 Log (CRS3528).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

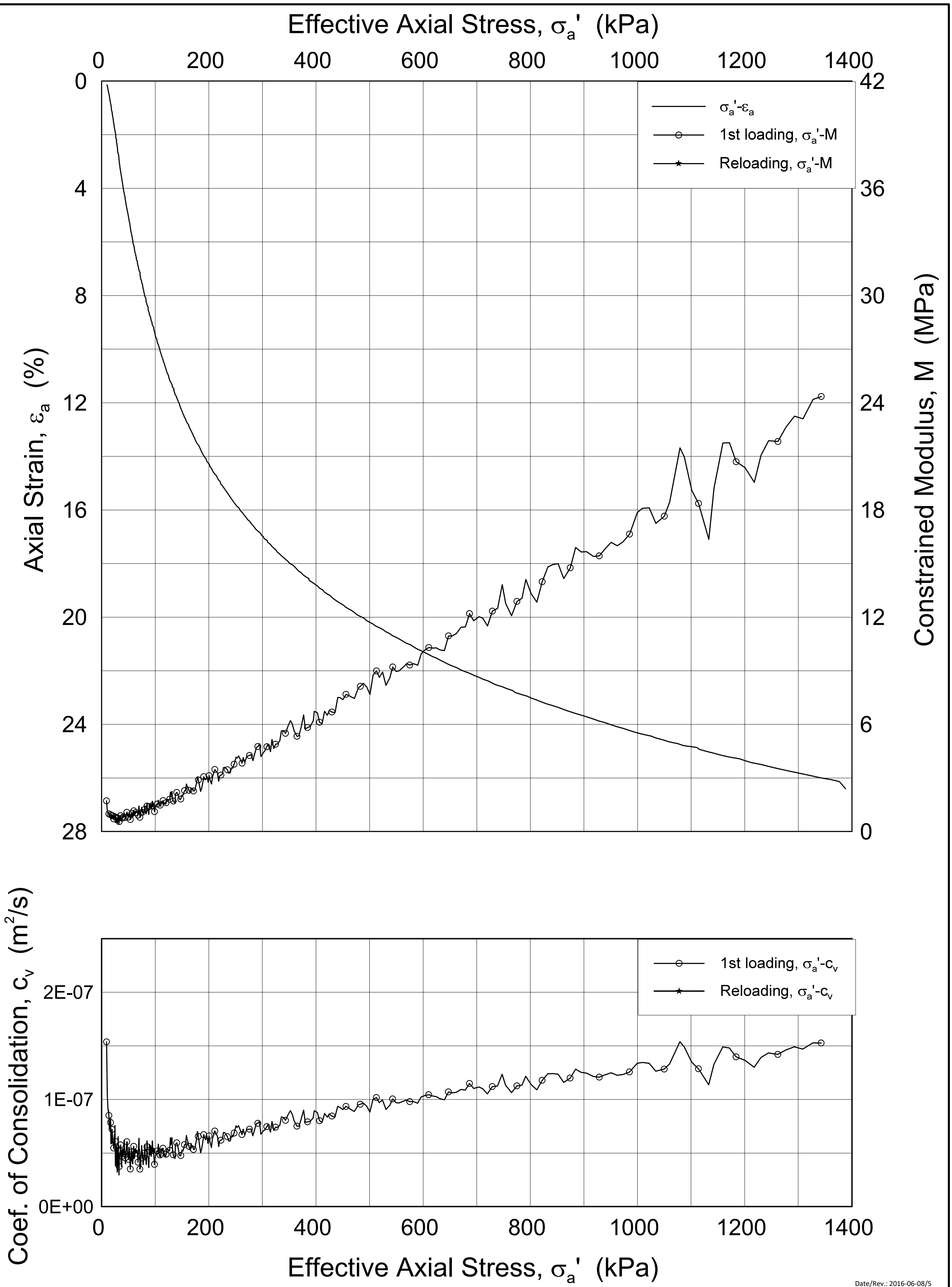
				Depth	=	10.57	m
Boring:	ONSB09	Tube:	2-3	p_0'	=	68.2	kPa
		Part:	B	w_i	=	42.9	%
		Test:	1	γ_i	=	17.92	kN/m^3

Document No.
20160154-10-R

Figure No.
5.2.61

Date	Drawn by / Checked
2018-12-10	FI /GS

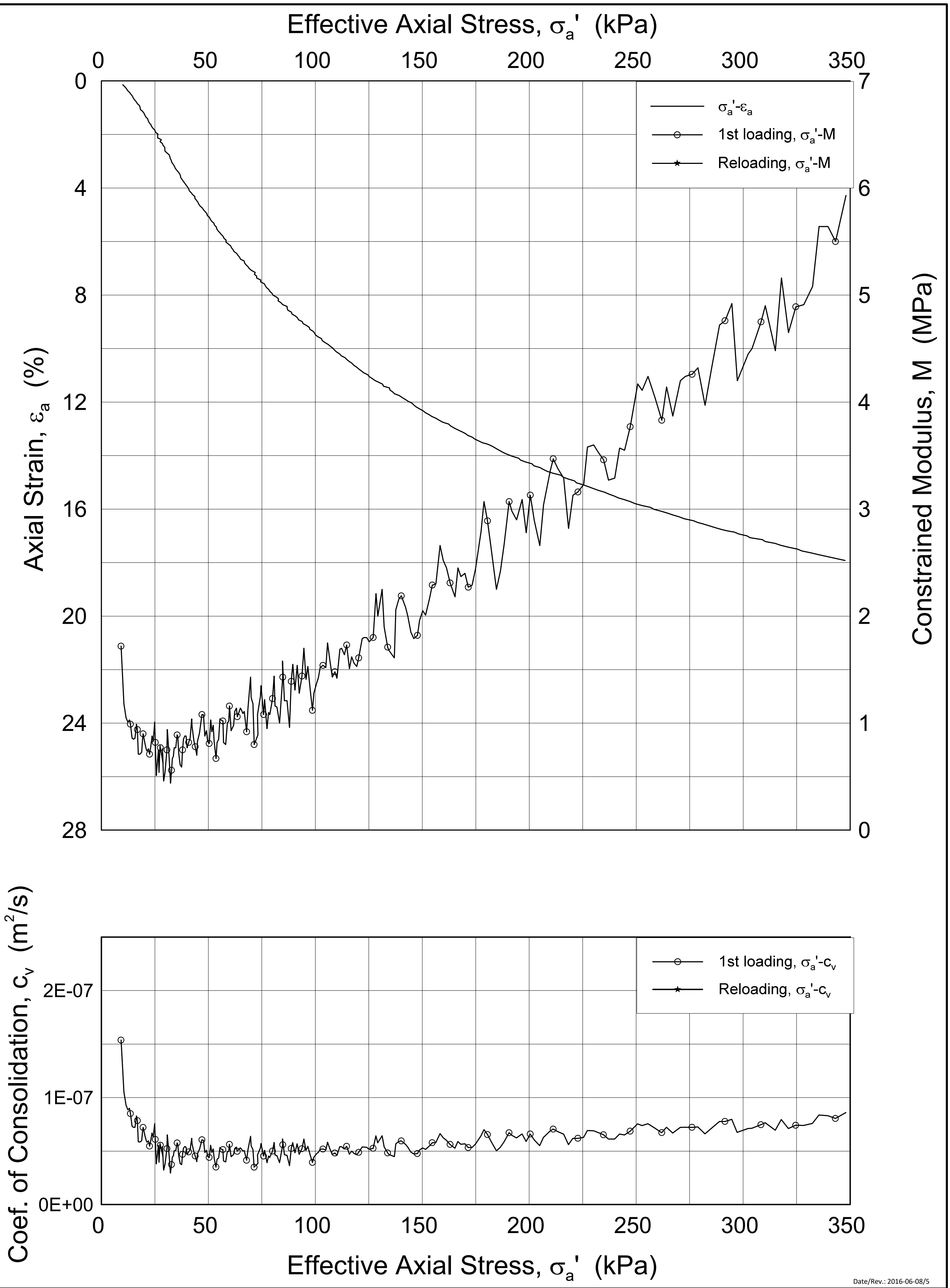
NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.62, BH4-2-3-B-1 Lin (CRS3528).grf

Norwegian GeoTest Sites - Onsøy				Document No. 20160154-10-R
Oedometer test (CRSC)				Figure No. 5.2.62
			Depth = 10.57 m	Date 2018-12-10 / Drawn by / Checked FI /GS
Boring: ONSB09	Tube:	2-3	p_0' = 68.2 kPa	NGI
	Part:	B	w_i = 42.9 %	
	Test:	1	γ_i = 17.92 kN/m³	



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Document No.	20160154-10-R			
Figure No.	5.2.63			
Date	2018-12-10	Drawn by / Checked	FI /GS	

Boring: ONSB09

Tube: 2-3

Part: B

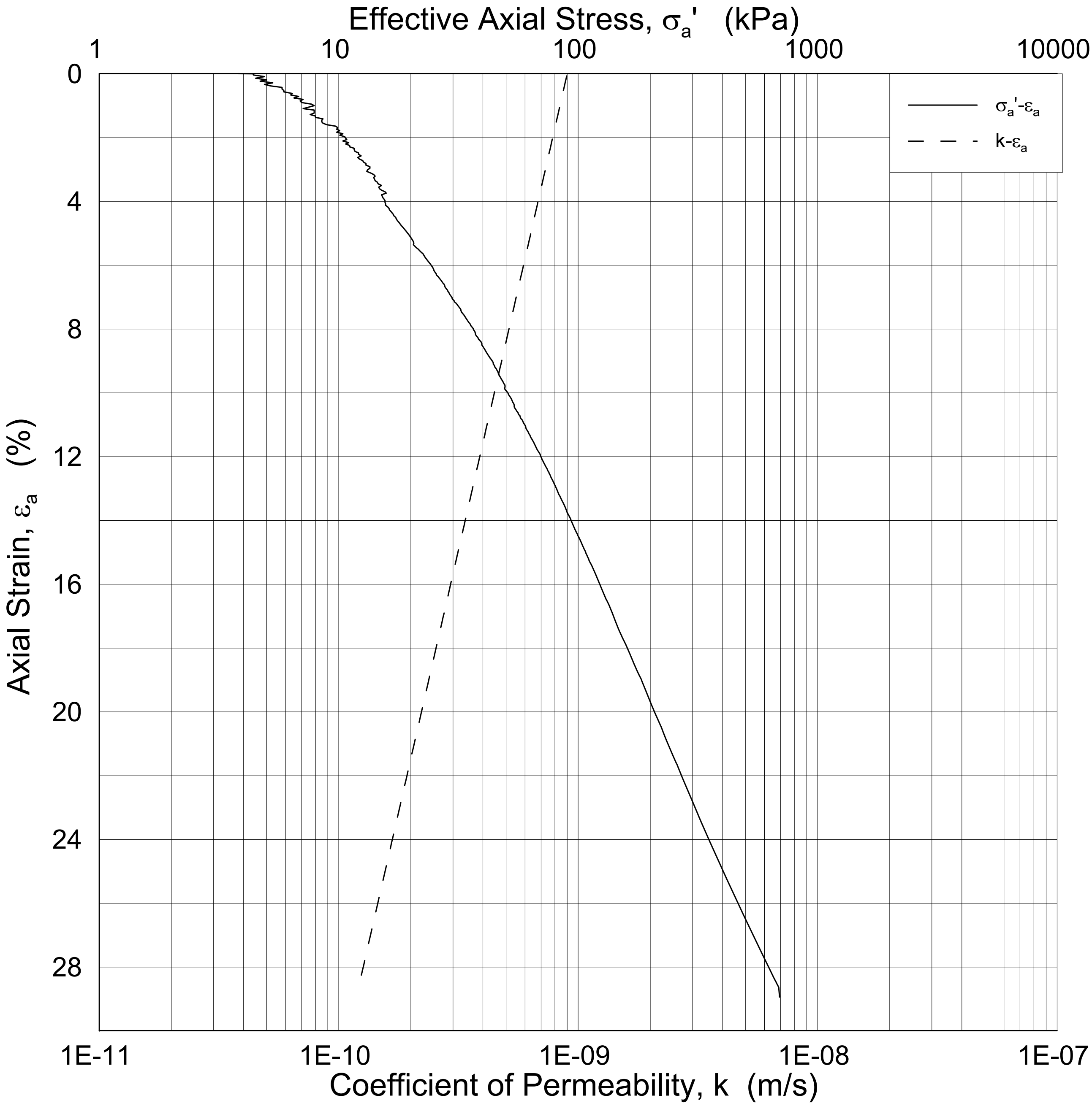
Test: 1

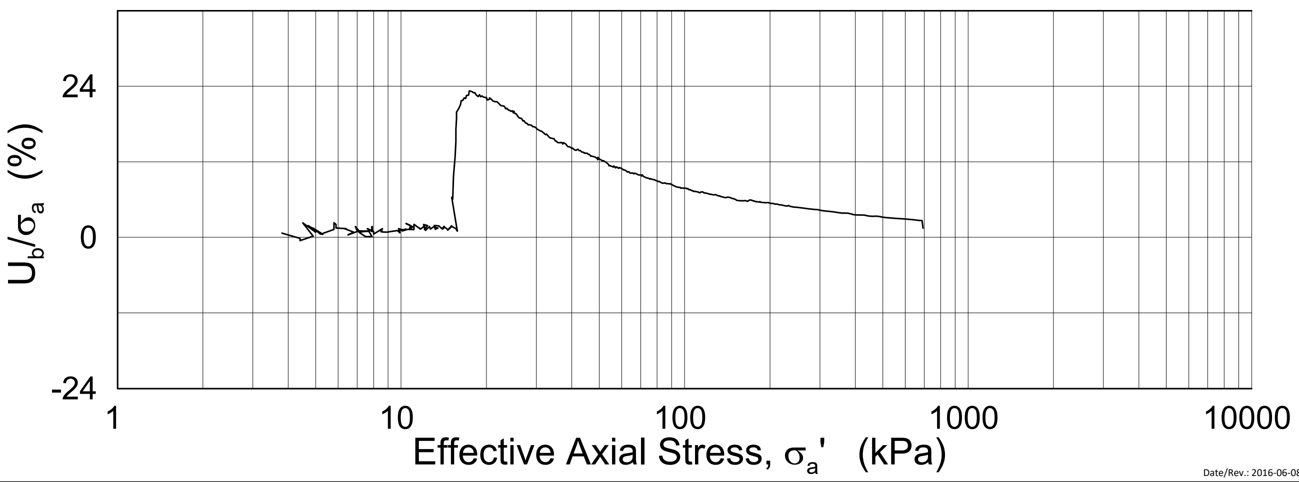
Depth = 10.57 m

p_0' = 68.2 kPa

w_i = 42.9 %

γ_i = 17.92 kN/m³





Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

		Depth	= 5.67 m
Boring: ONSB10	Tube: 1-1	p_0'	= 32.9 kPa
	Part: B	w_i	= 67.5 %
	Test: 1	γ_i	= 16.10 kN/m³

Document No. 20160154-10-R

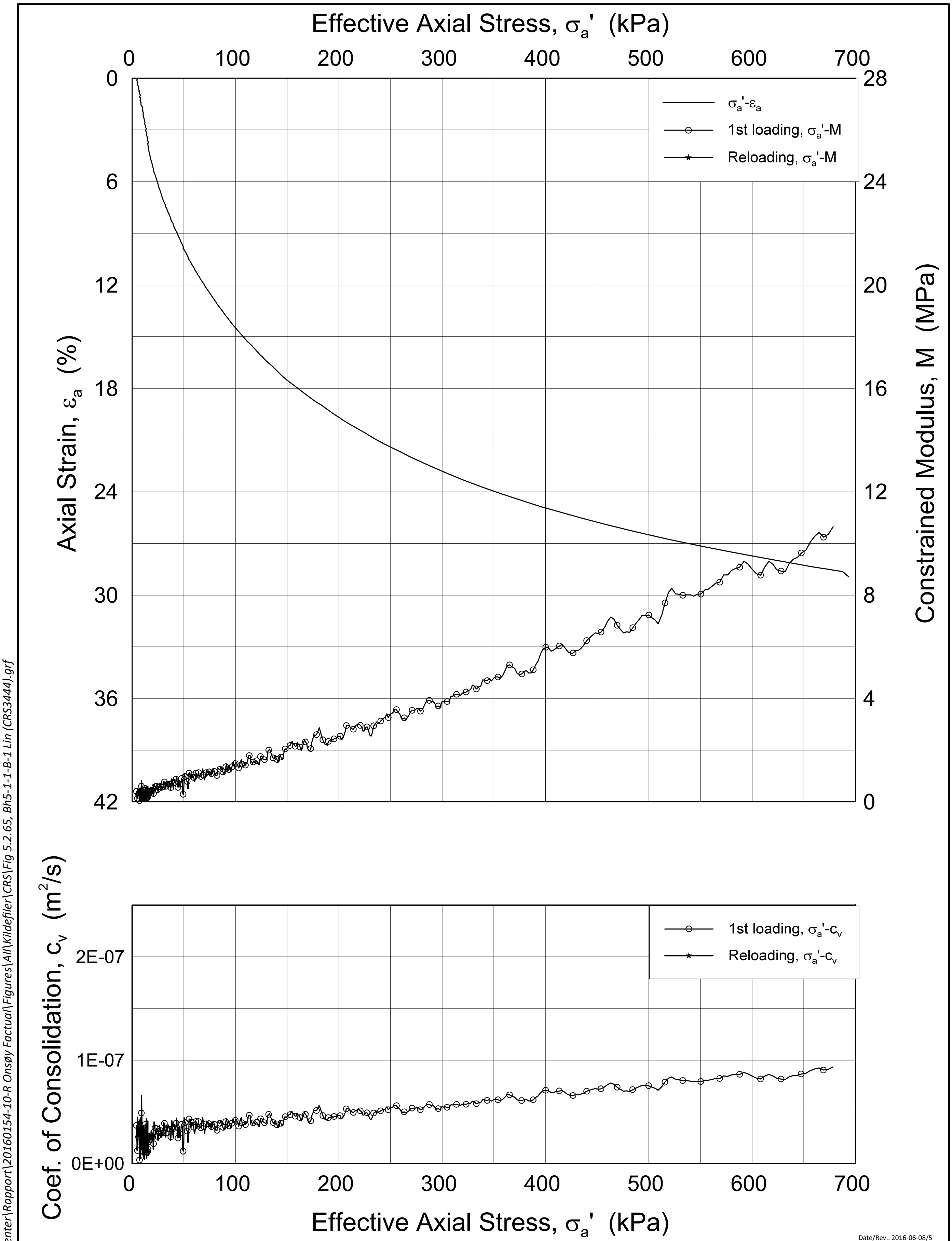
Figure No. 5.2.64

Date 2018-12-10

Drawn by / Checked FI /GS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.64, Bh5-1-1-B-1 Log (CRS3444).grf



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	5.67	m
Boring:	ONSB10	Tube:	1-1	p_0'	=	32.9	kPa
		Part:	B	w_i	=	67.5	%
		Test:	1	γ_i	=	16.10	kN/m³

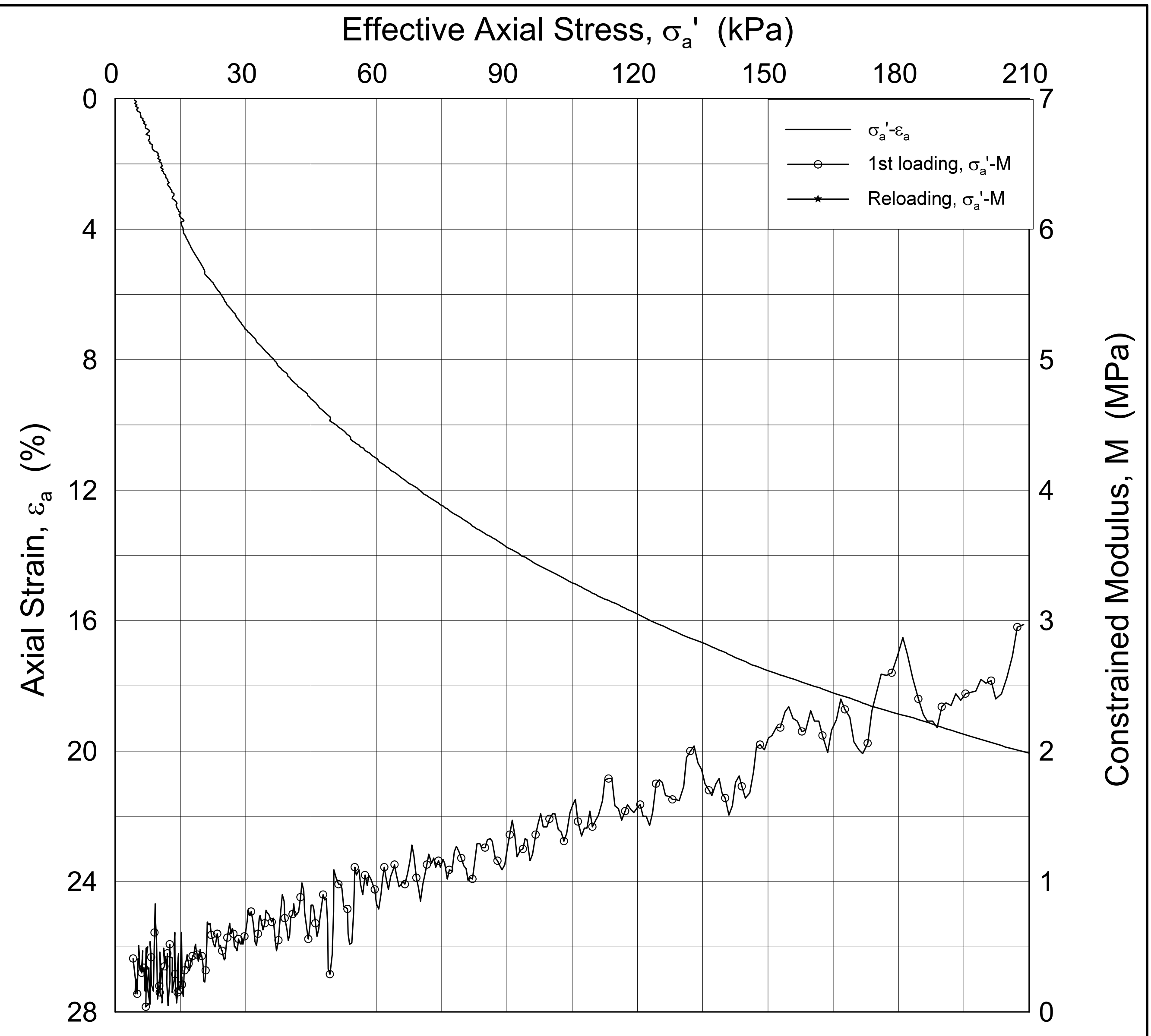
Document No. 20160154-10-R

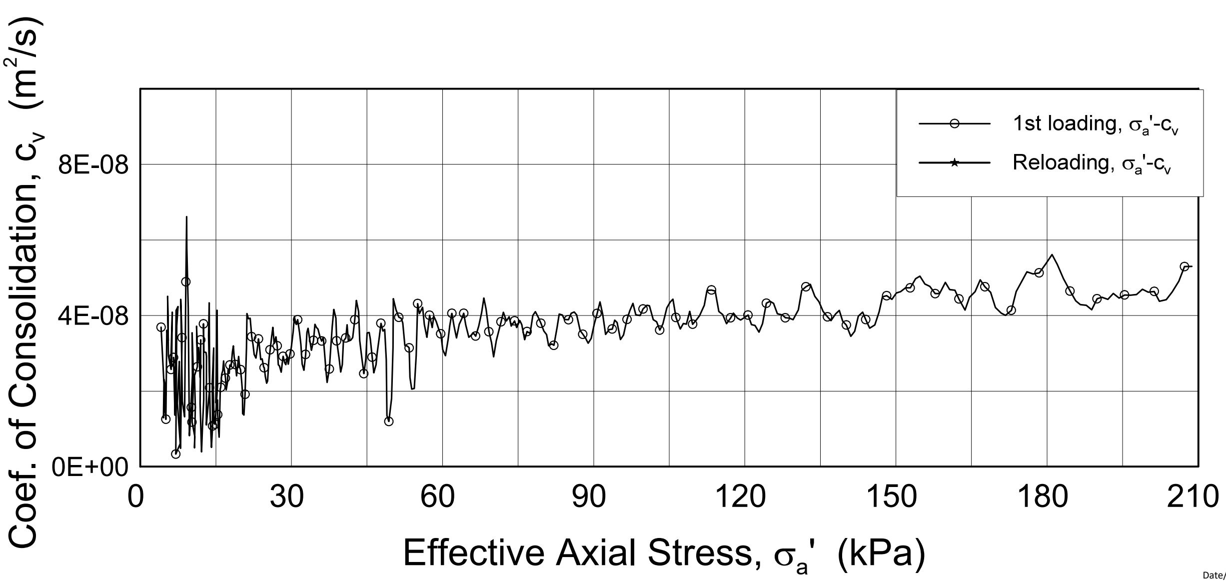
Figure No. 5.2.65

Date 2018-12-10

Drawn by / Checked FI /GS

NGI





P:\2016\01\20160154\Leveranse dokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.66, Bh5-1-1-B-1 Lin2 (CRS3444).grf

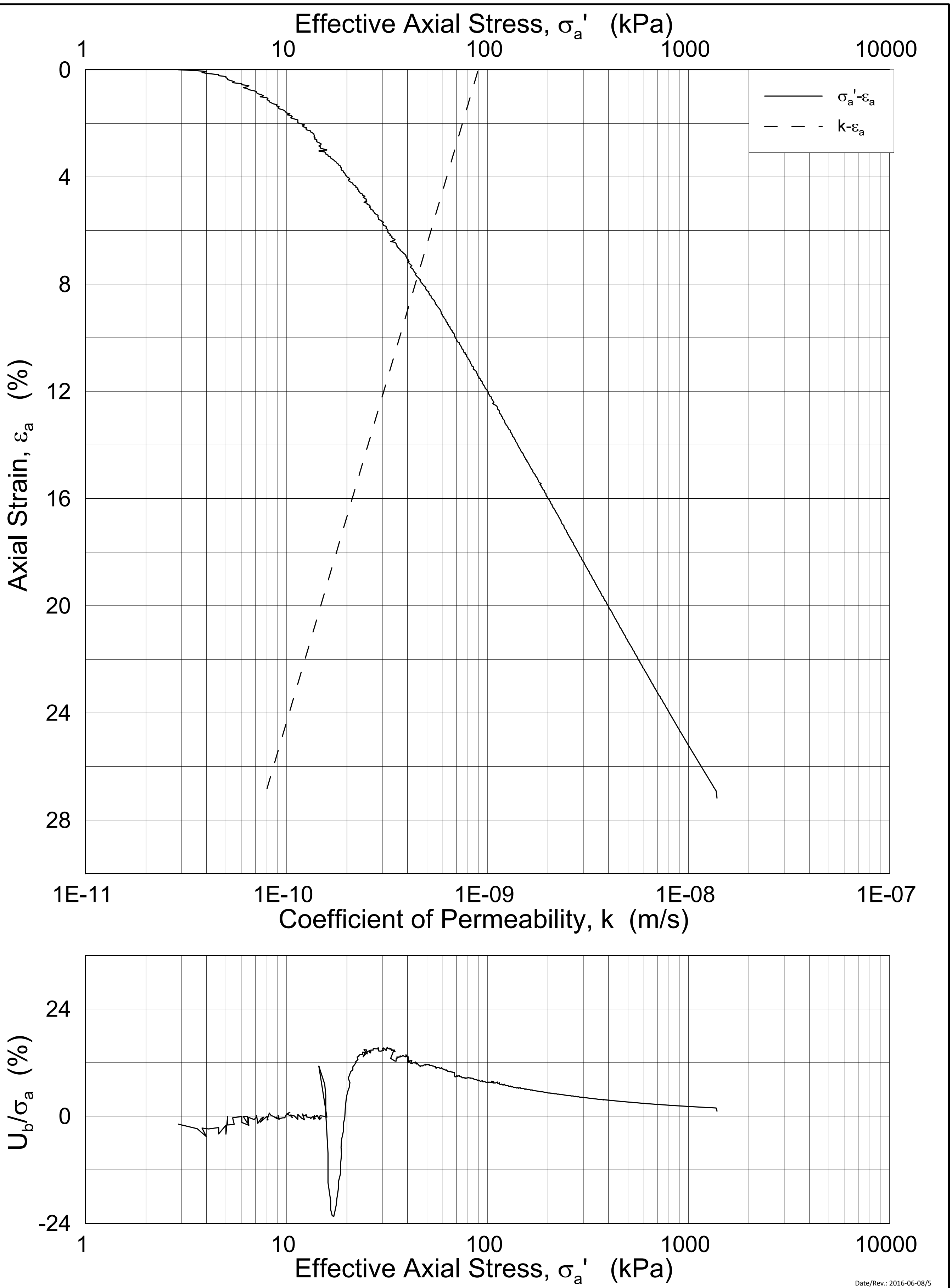
Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.66
	Date 2018-12-10 / Drawn by / Checked FI /GS

Boring: ONSB10 Tube: 1-1 Part: B Test: 1

Depth = 5.67 m
p_0' = 32.9 kPa
w_i = 67.5 %
γ_i = 16.10 kN/m³

NGI



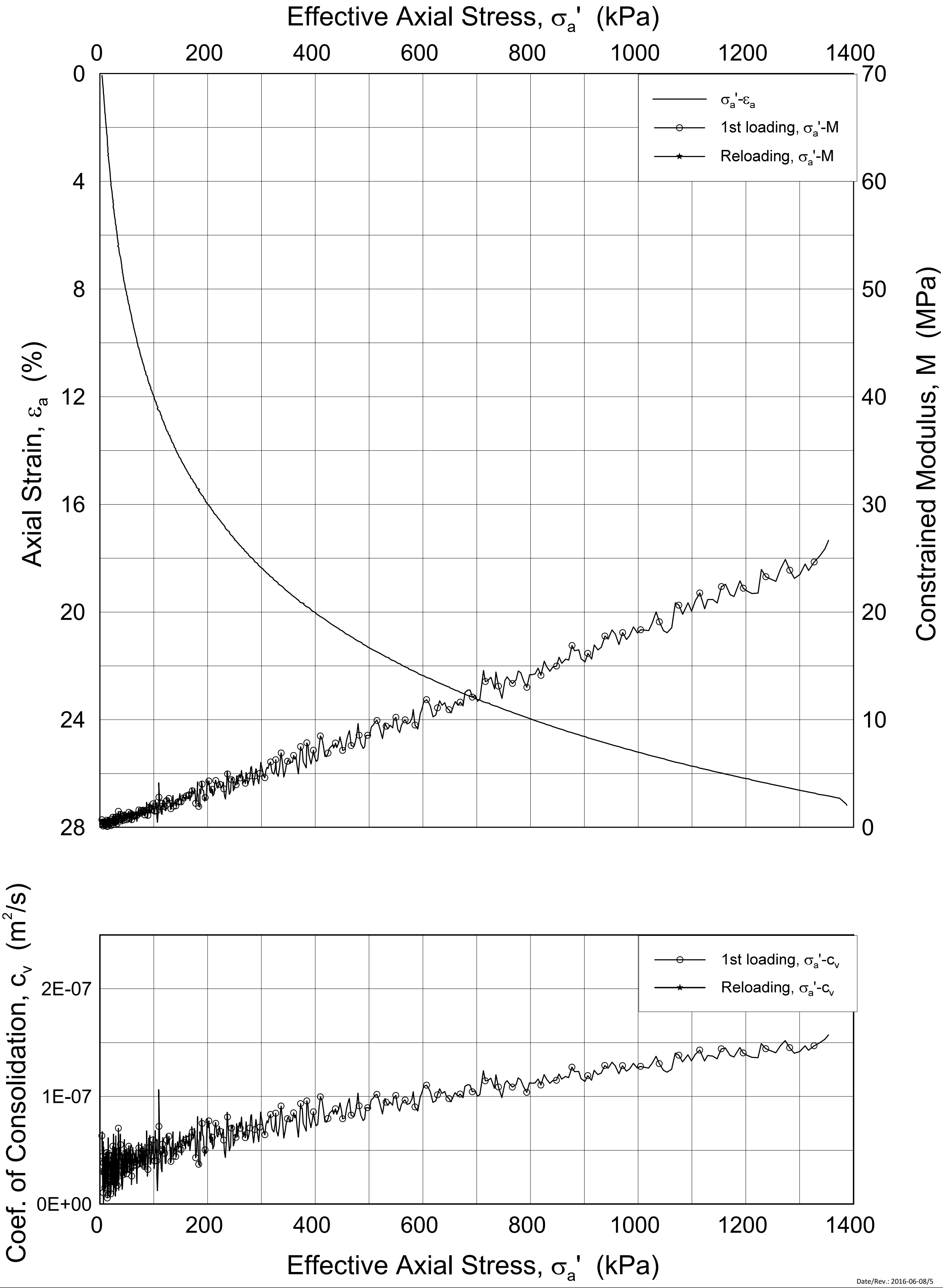
Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.67	
	Date 2018-12-10	Drawn by / Checked FI /GS

				Depth	=	8.67	m
Boring:	ONSB10	Tube:	2-1	p_0'	=	54.3	kPa
		Part:	B	w_i	=	43.2	%
		Test:	1	γ_i	=	17.86	kN/m³

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.67, BH5-2-1-B-1 Log (CRS3441).grf



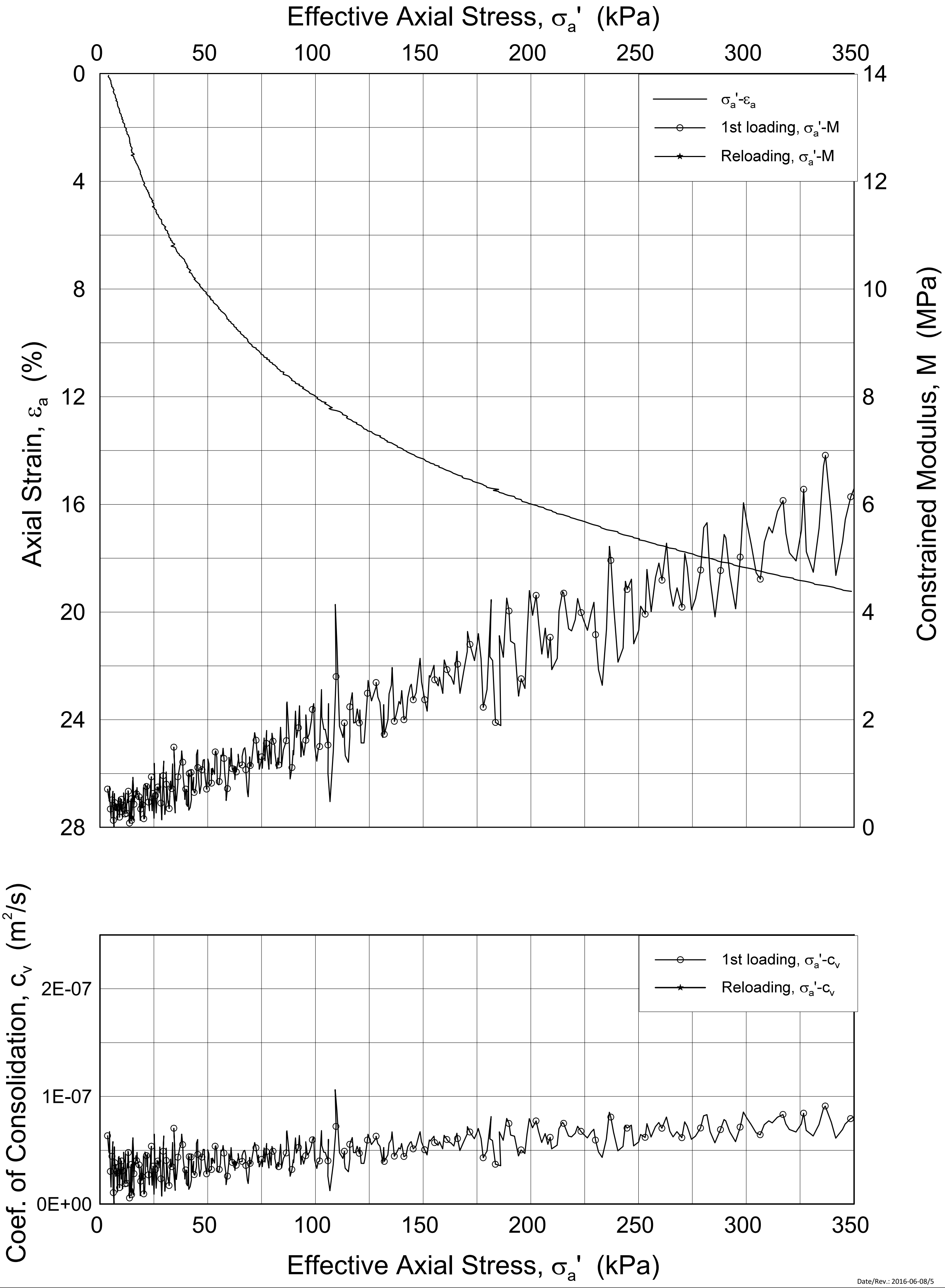
Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth =	8.67	m
Boring: ONSB10	Tube:	2-1		p_0' =	54.3	kPa
	Part:	B		w_i =	43.2	%
	Test:	1		γ_i =	17.86	kN/m³

Document No.	20160154-10-R
Figure No.	5.2.68
Date	2018-12-10
Drawn by / Checked	FI / GS

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.69, BH5-2-1-B-1 Lin2 (CRS3441).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

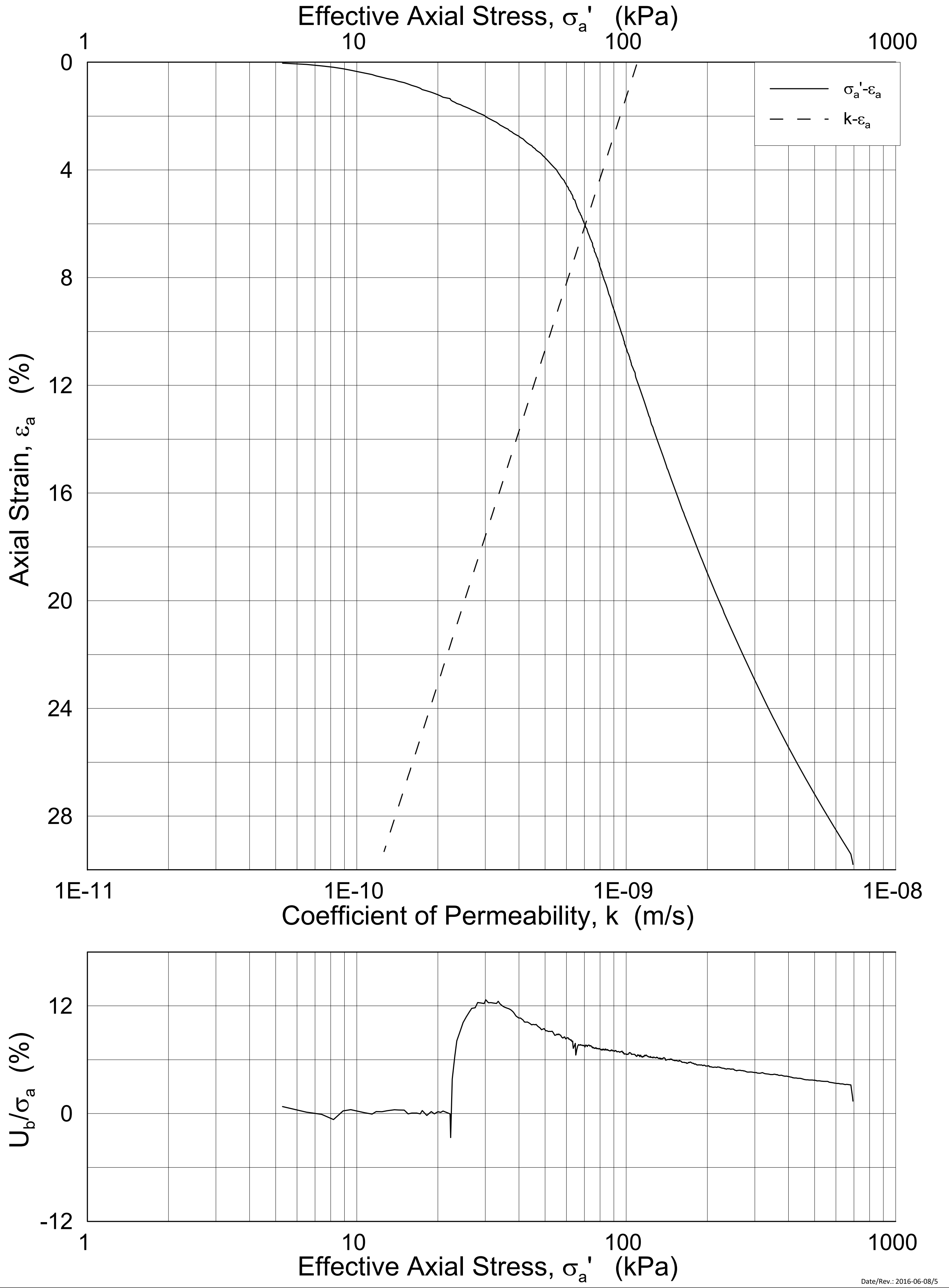
Document No. 20160154-10-R

Figure No. 5.2.69

Date 2018-12-10

Drawn by / Checked FI / GS

				Depth	=	8.67	m
Boring: ONSB10	Tube:	2-1		p_0'	=	54.3	kPa
	Part:	B		w_i	=	43.2	%
	Test:	1		γ_i	=	17.86	kN/m³



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

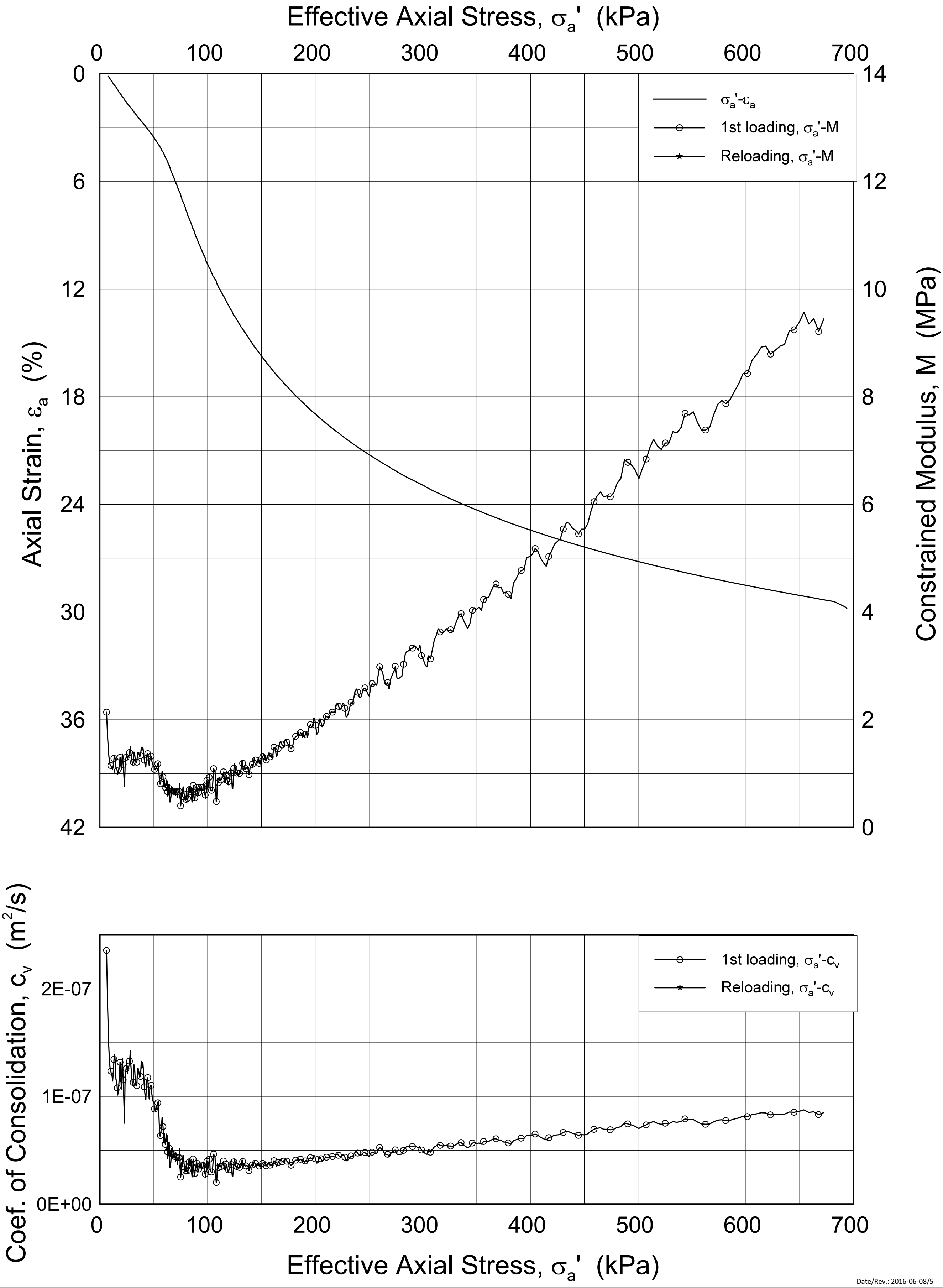
Document No.
20160154-10-R

Figure No.
5.2.70

Date	Drawn by / Checked
2018-12-10	FP/ MAS

				Depth	=	6.19	m
Boring:	ONSB11	Tube:	1-2	p_0'	=	36.2	kPa
		Part:	A	w_i	=	65.3	%
		Test:	1	γ_i	=	16.22	kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.70, BH7-1-2-A-1 log (CRS3580).grf



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.71, BH7-1-2-A-1 lin (CRS3580).grf

Norwegian GeoTest Sites - Onsøy

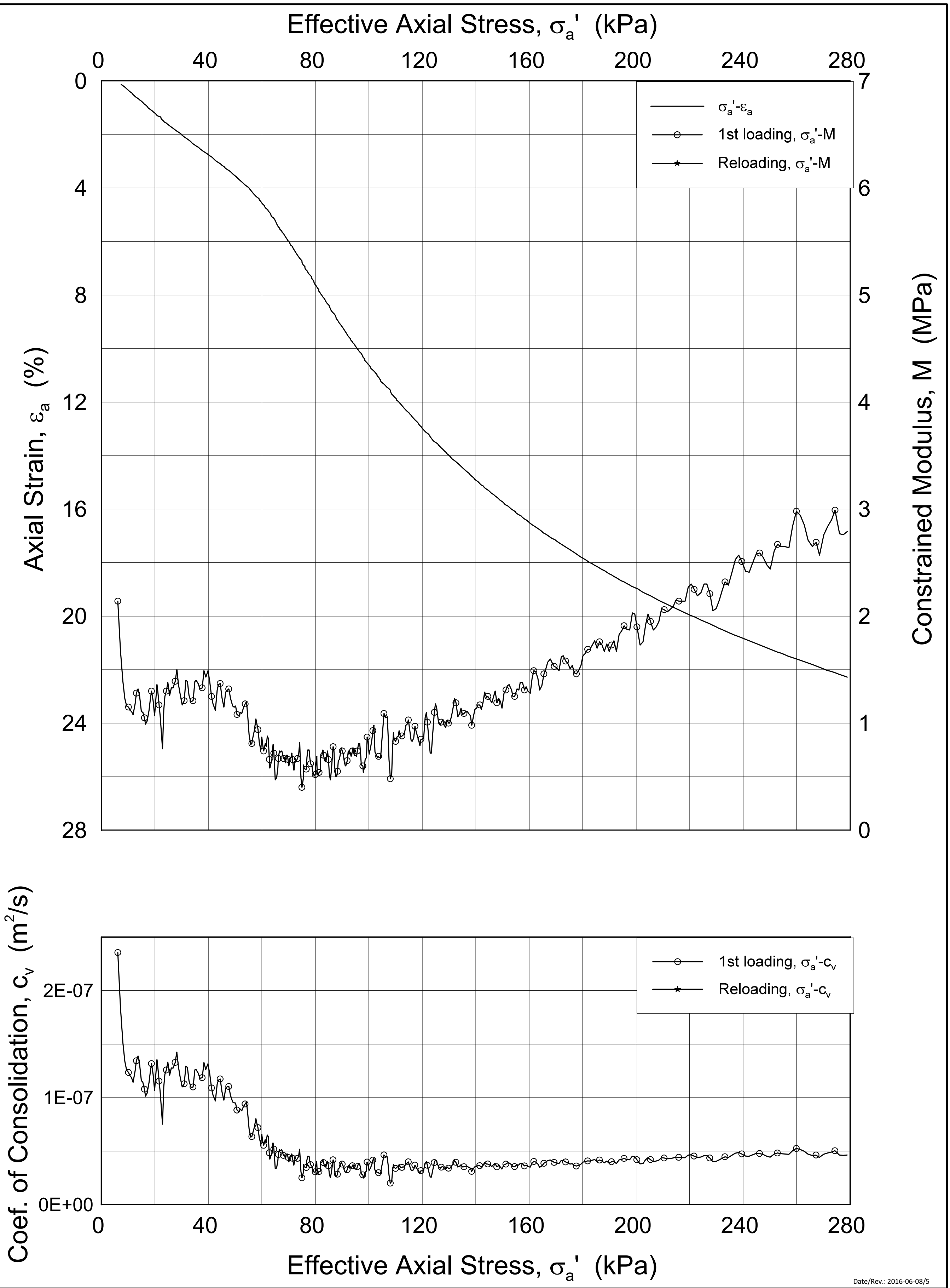
Oedometer test (CRSC)

				Depth	=	6.19	m
Boring:	ONSB11	Tube:	1-2	p_0'	=	36.2	kPa
		Part:	A	w_i	=	65.3	%
		Test:	1	γ_i	=	16.22	kN/m³

Document No.
20160154-10-R

Figure No.
5.2.71

Date	Drawn by / Checked
2018-12-10	FP / MAS



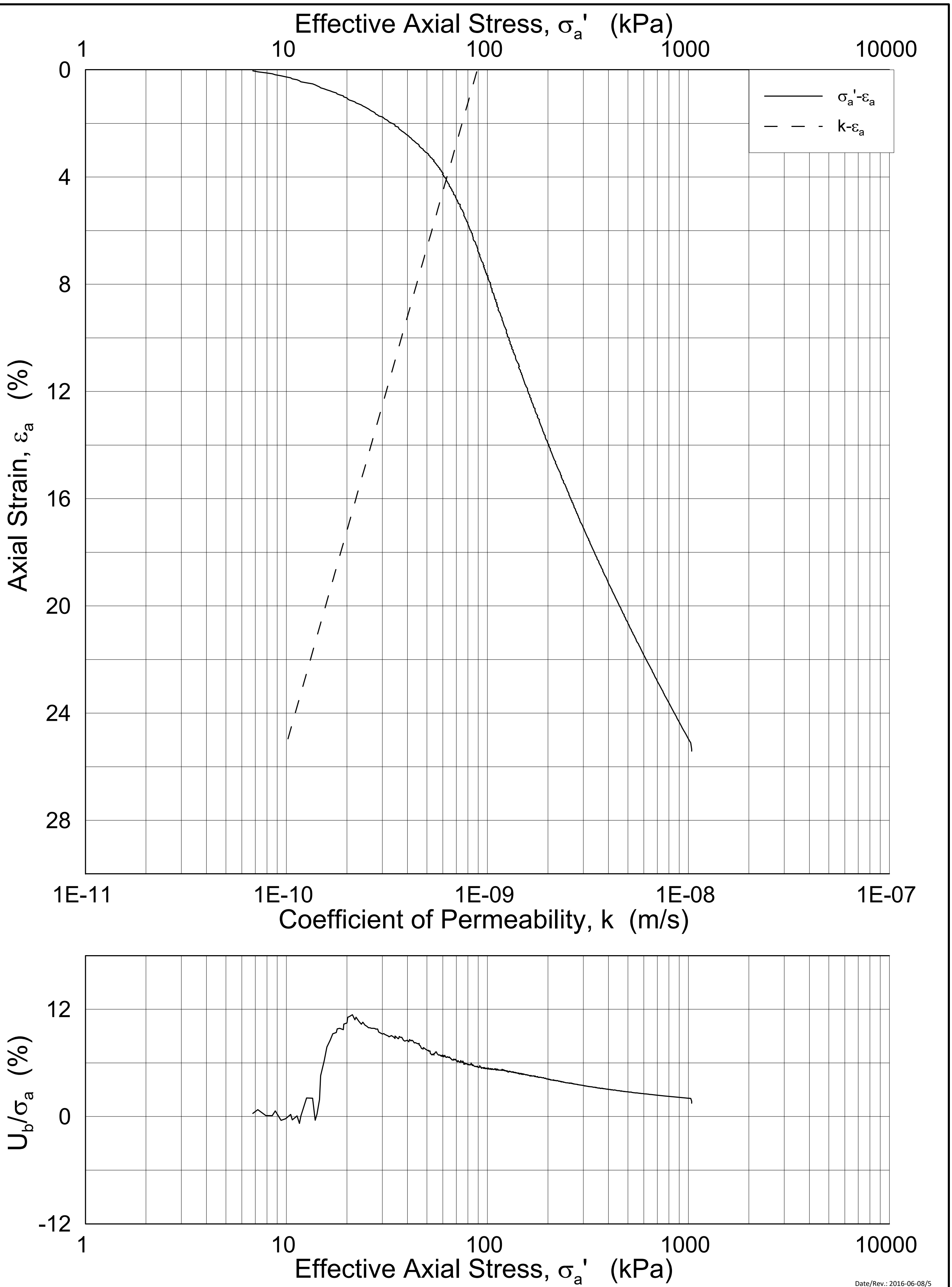
Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	6.19 m
Boring:	ONSB11	Tube:	1-2	p_0'	=	36.2 kPa
		Part:	A	w_i	=	65.3 %
		Test:	1	γ_i	=	16.22 kN/m³

Document No.	20160154-10-R
Figure No.	5.2.72
Date	2018-12-10
Drawn by / Checked	FP / MAS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.73, BH7-2-2-A-1 log (CRS3570).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Document No. 20160154-10-R

Figure No. 5.2.73

Date 2018-12-10

Drawn by / Checked FP / MAS

Boring: ONSB11 | Tube: 2-2 | Part: A | Test: 1

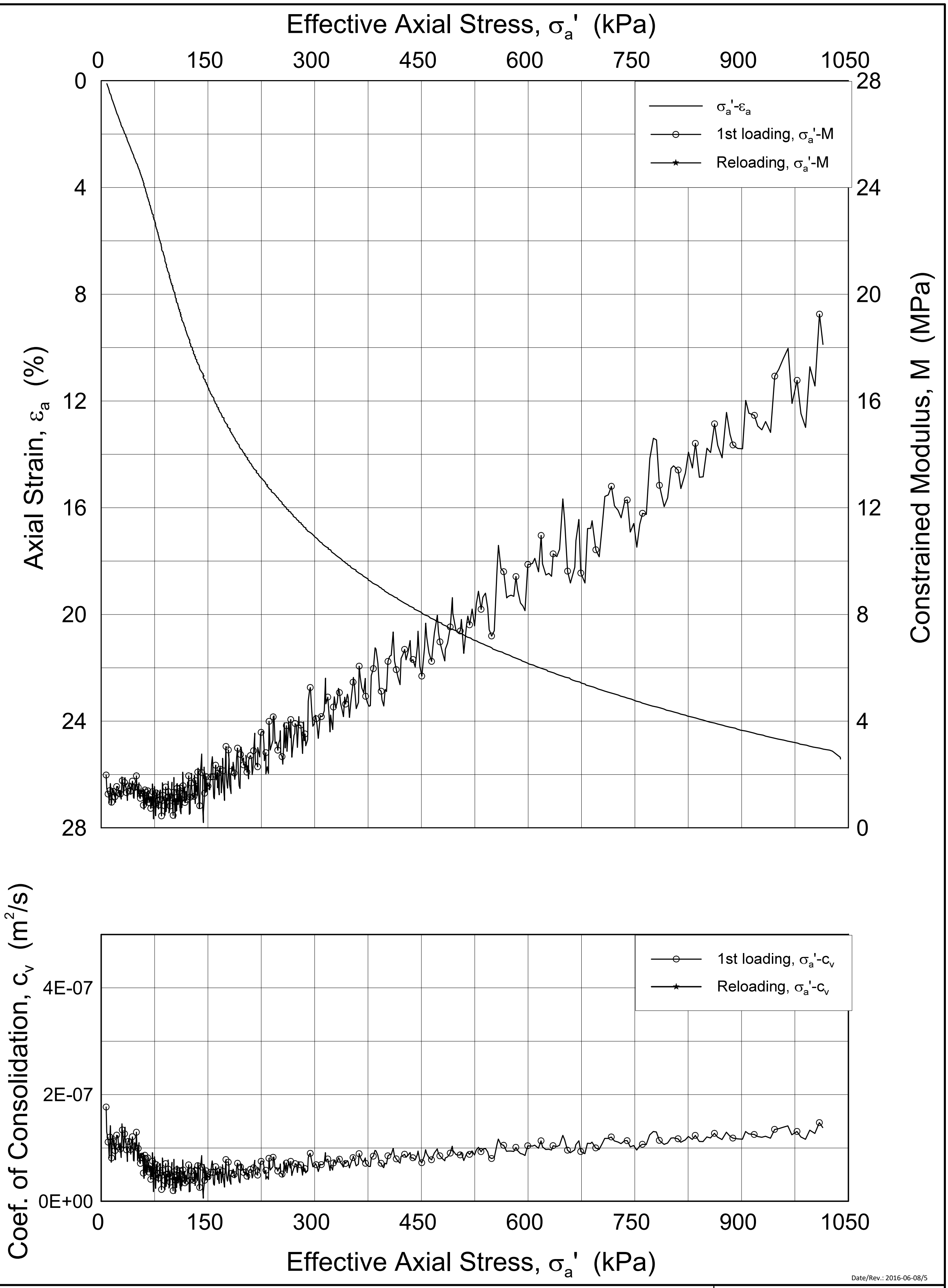
Depth = 8.93 m

p_0' = 56.2 kPa

w_i = 44.9 %

γ_i = 17.34 kN/m³

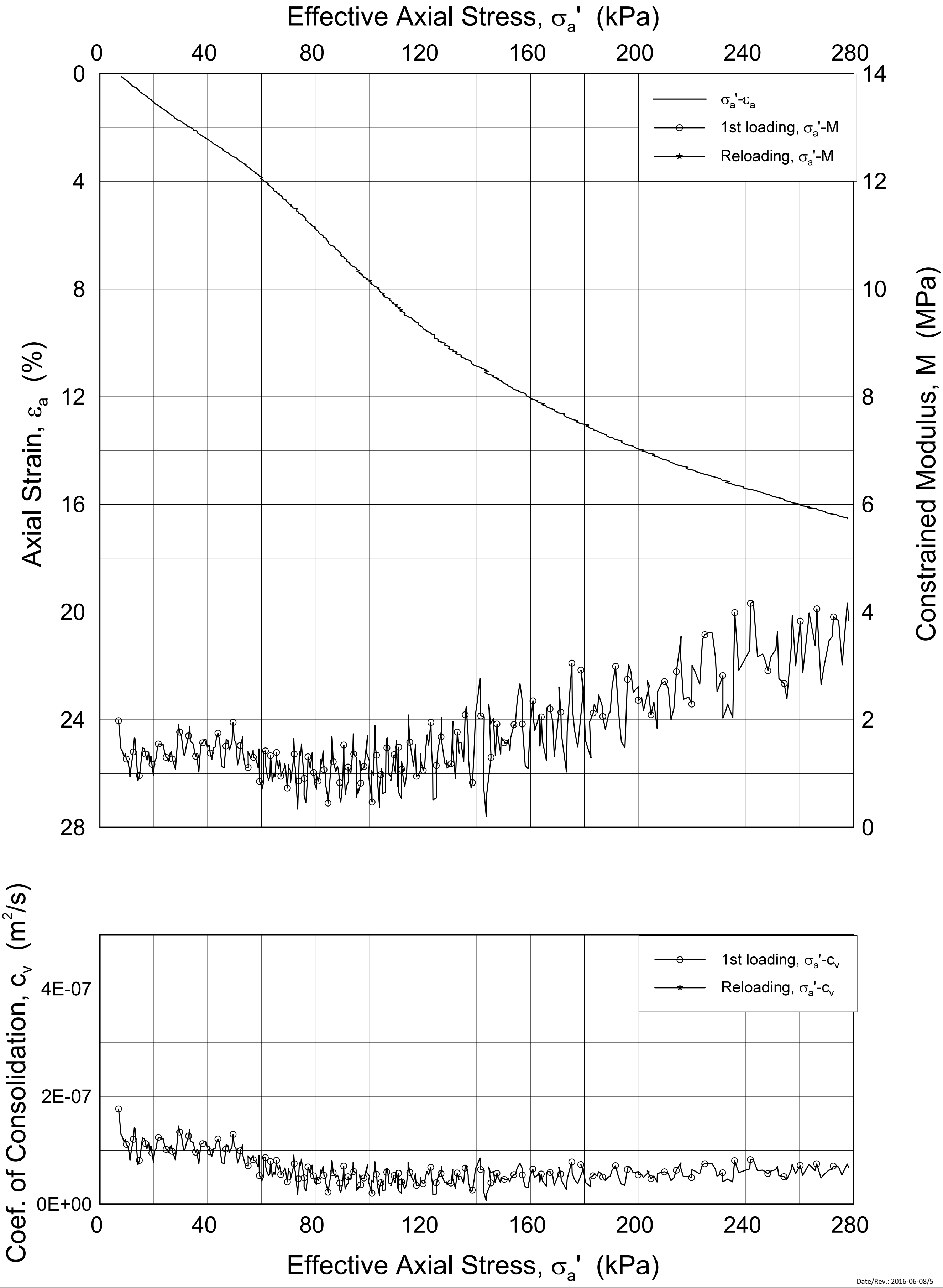
NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.74, BH7-2-2-A-1 lin (CRS3570).grf

Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Oedometer test (CRSC)							Figure No. 5.2.74
			Depth	=	8.93	m	Date 2018-12-10 / Drawn by / Checked FP / MAS
Boring: ONSB11	Tube:	2-2	p_0'	=	56.2	kPa	
	Part:	A	w_i	=	44.9	%	
	Test:	1	γ_i	=	17.34	kN/m³	



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.75, BH7-2-2-A-1 lin-2 (CRS3570).grf

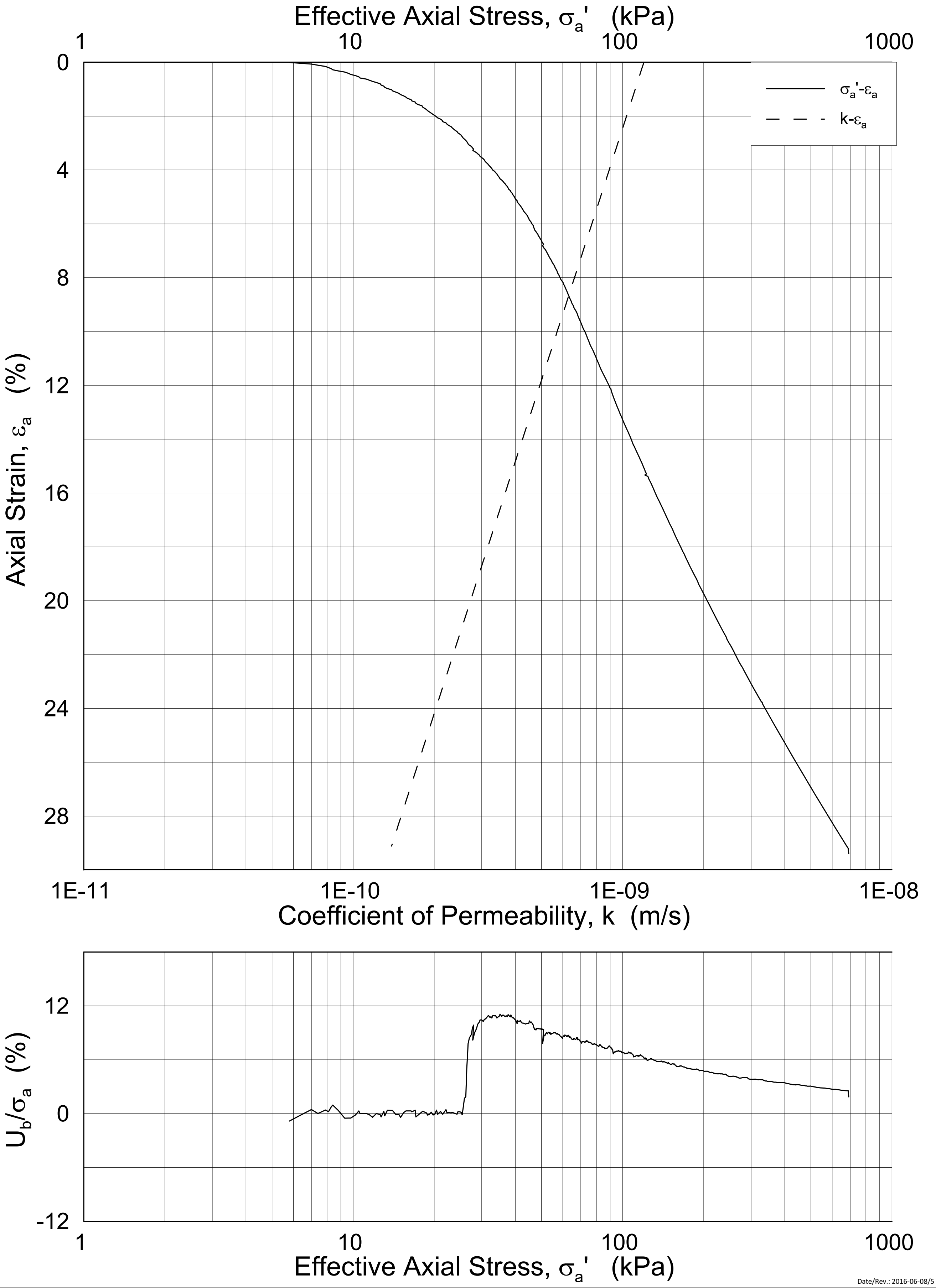
Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.75
	Date 2018-12-10 / Drawn by / Checked FP / MAS

Boring: ONSB11 | Tube: 2-2 | Part: A | Test: 1

Depth = 8.93 m
p_0' = 56.2 kPa
w_i = 44.9 %
γ_i = 17.34 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Document No. 20160154-10-R

Figure No. 5.2.76

Date 2018-12-10

Drawn by / Checked FP / MAS

Boring: ONSB12

Tube: 1-2

Part: A

Test: 1

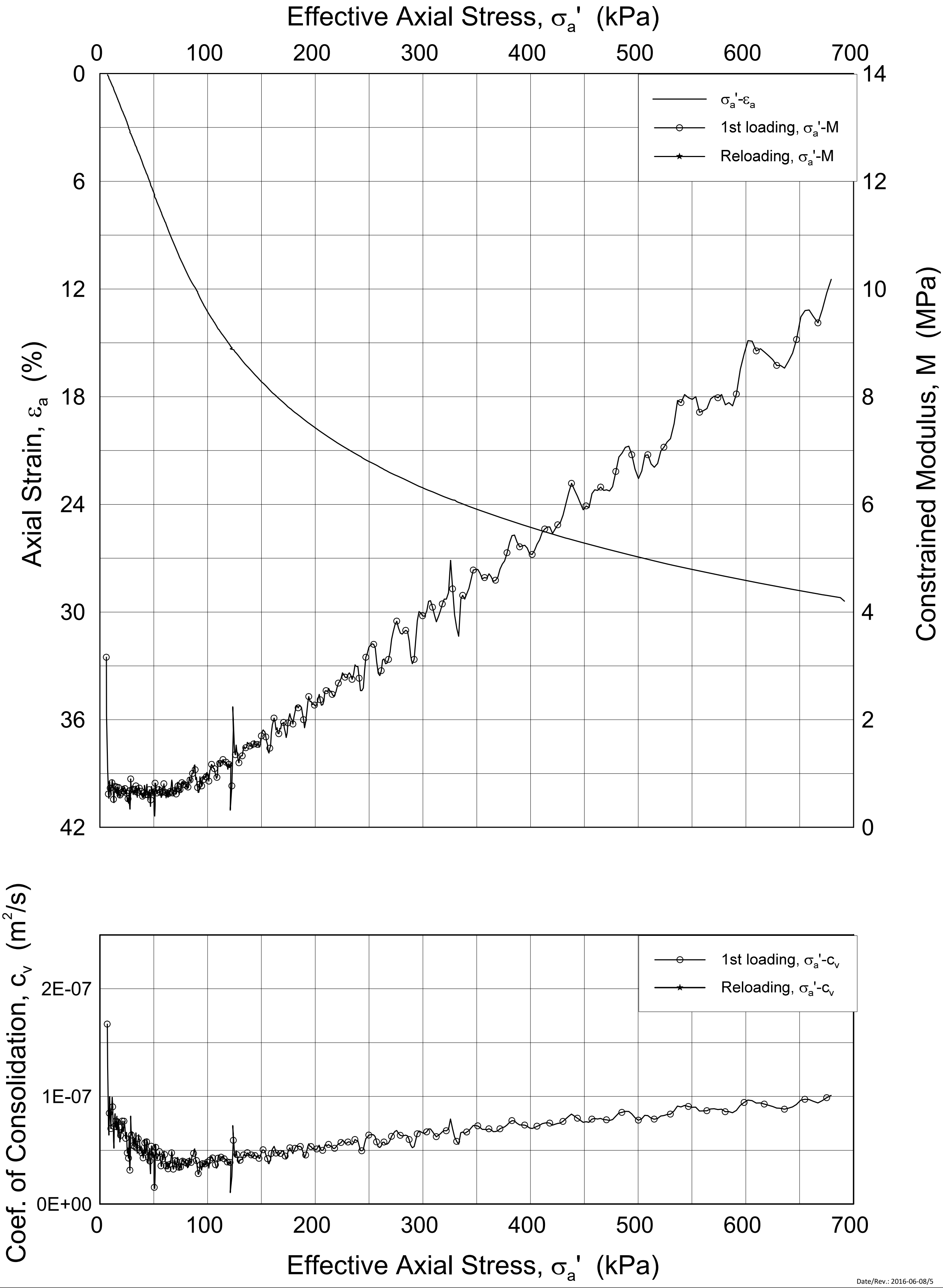
Depth = 6.17 m

p_0' = 36.0 kPa

w_i = 65.7 %

γ_i = 16.20 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.76, BH8-1-2-A-1 log (CRS3579).grf



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.77, BH8-1-2-A-1 lin (CRS3579).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Document No. 20160154-10-R

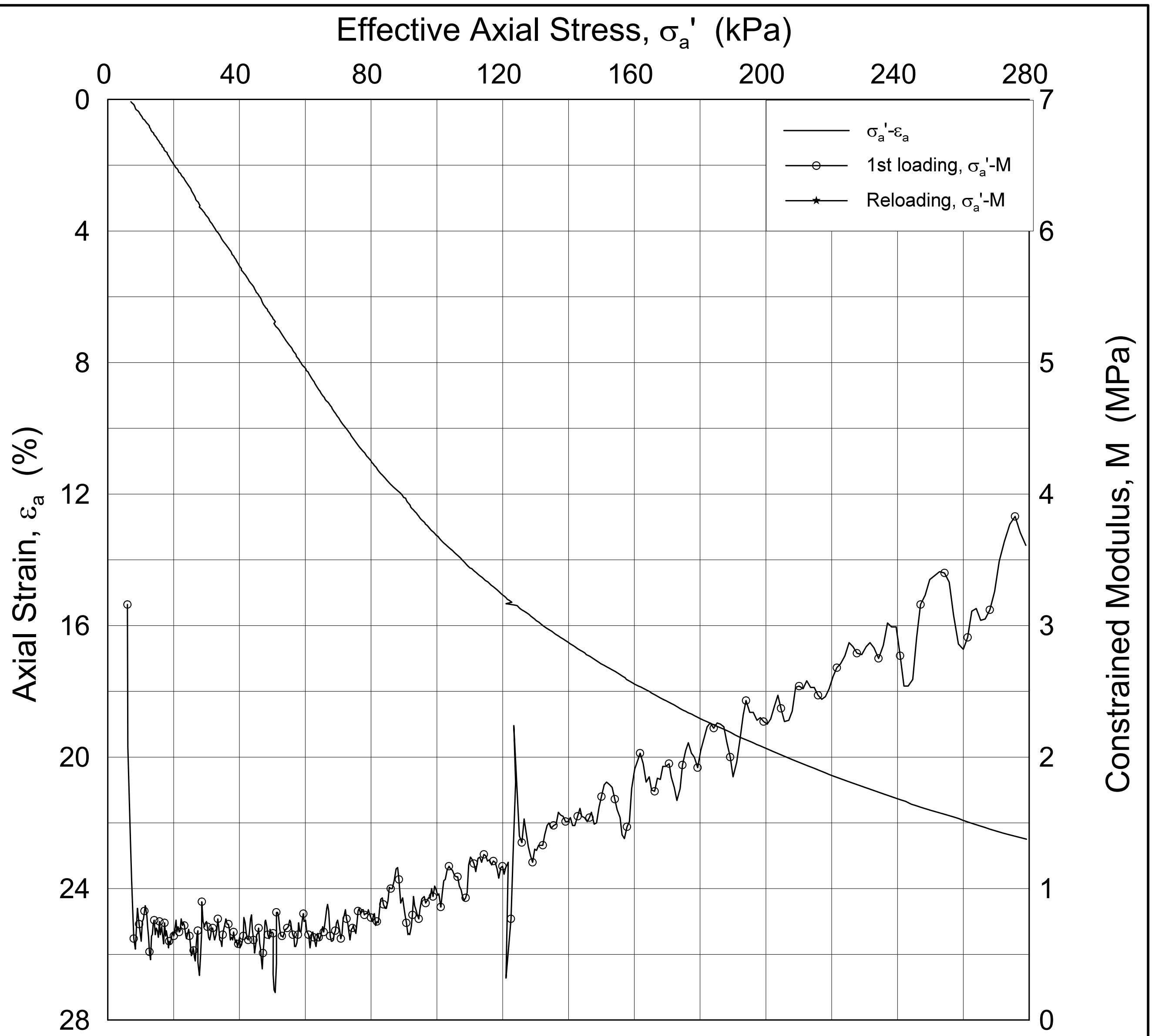
Figure No. 5.2.77

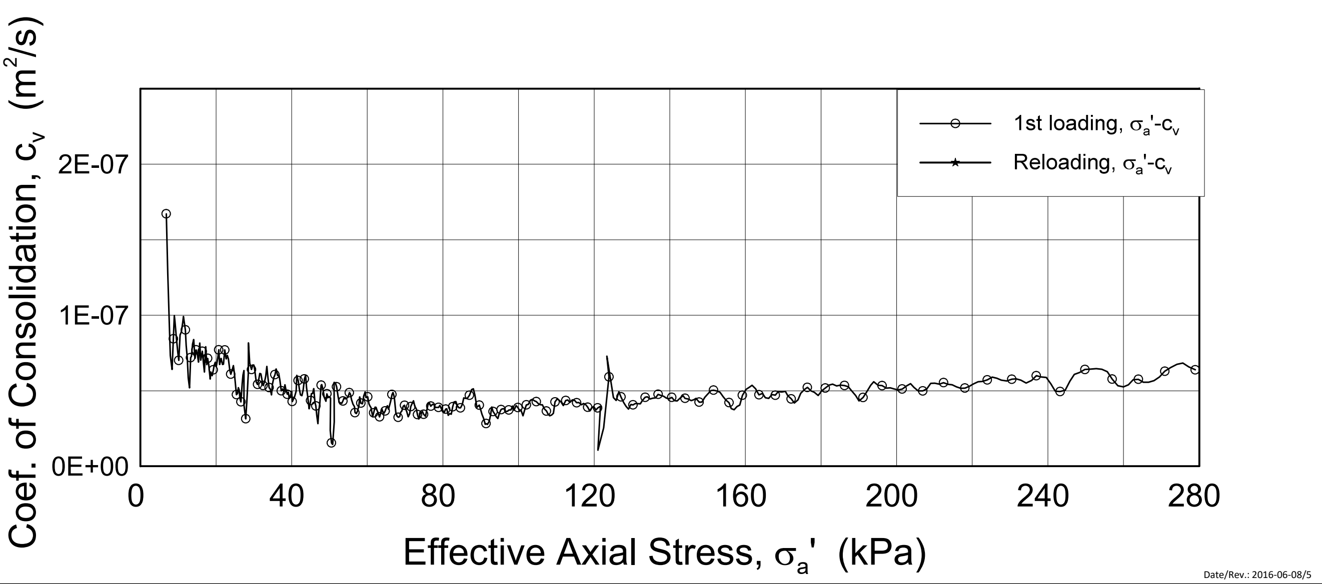
Date 2018-12-10

Drawn by / Checked FP / MAS

		Depth	= 6.17 m
Boring: ONSB12	Tube: 1-2	p_0'	= 36.0 kPa
	Part: A	w_i	= 65.7 %
	Test: 1	γ_i	= 16.20 kN/m³

NGI





Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	6.17	m
Boring:	ONSB12	Tube:	1-2	p_0'	=	36.0	kPa
		Part:	A	w_i	=	65.7	%
		Test:	1	γ_i	=	16.20	kN/m³

Document No. 20160154-10-R

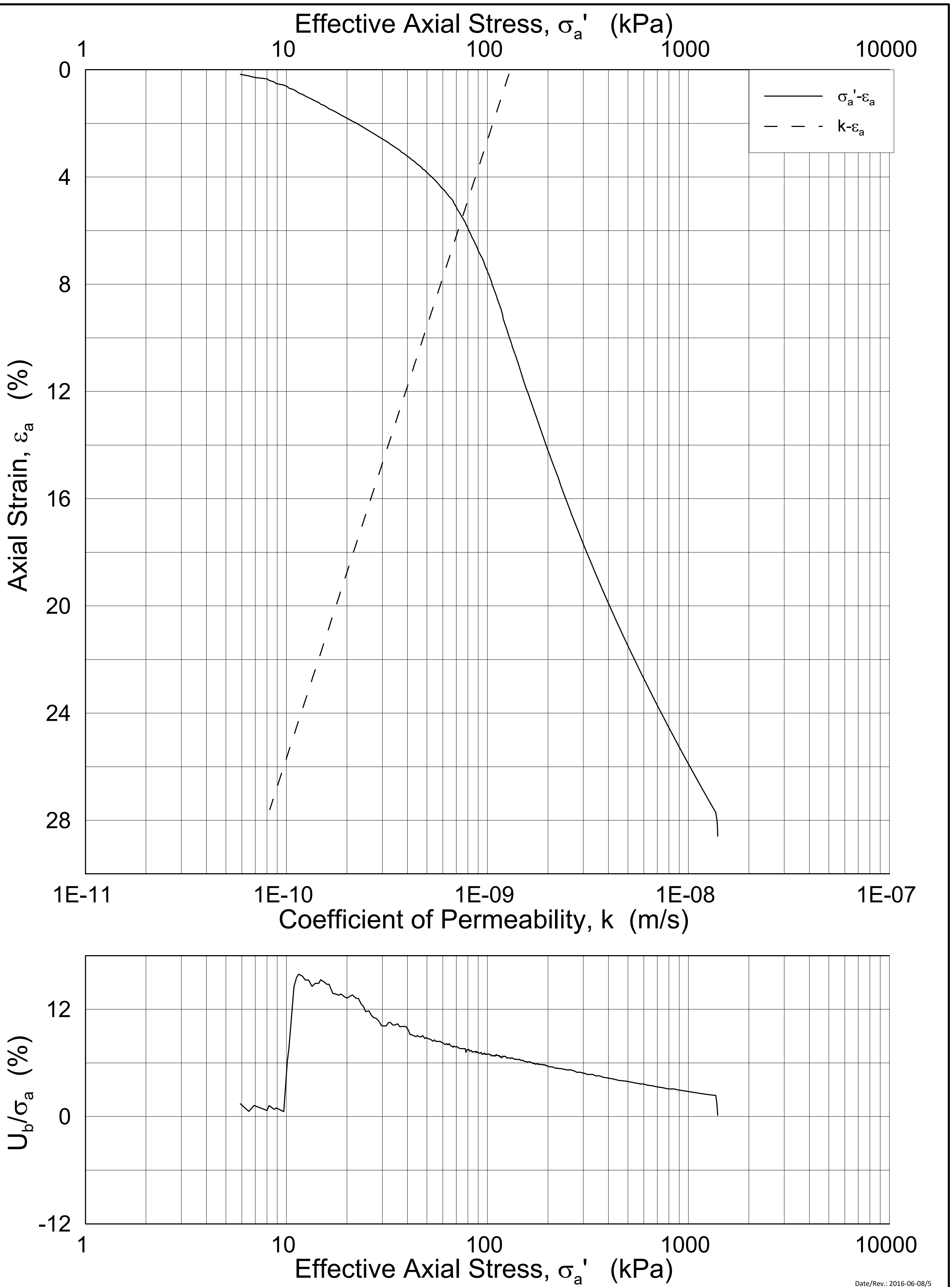
Figure No. 5.2.78

Date 2018-12-10

Drawn by / Checked FP / MAS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.78, BH8-1-2-A-1 lin-2 (CRS3579).grf



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.79
	Date 2018-12-10 / Drawn by / Checked FP / MAS

Boring: ONSB12 | Tube: 2-2 | Part: A | Test: 1

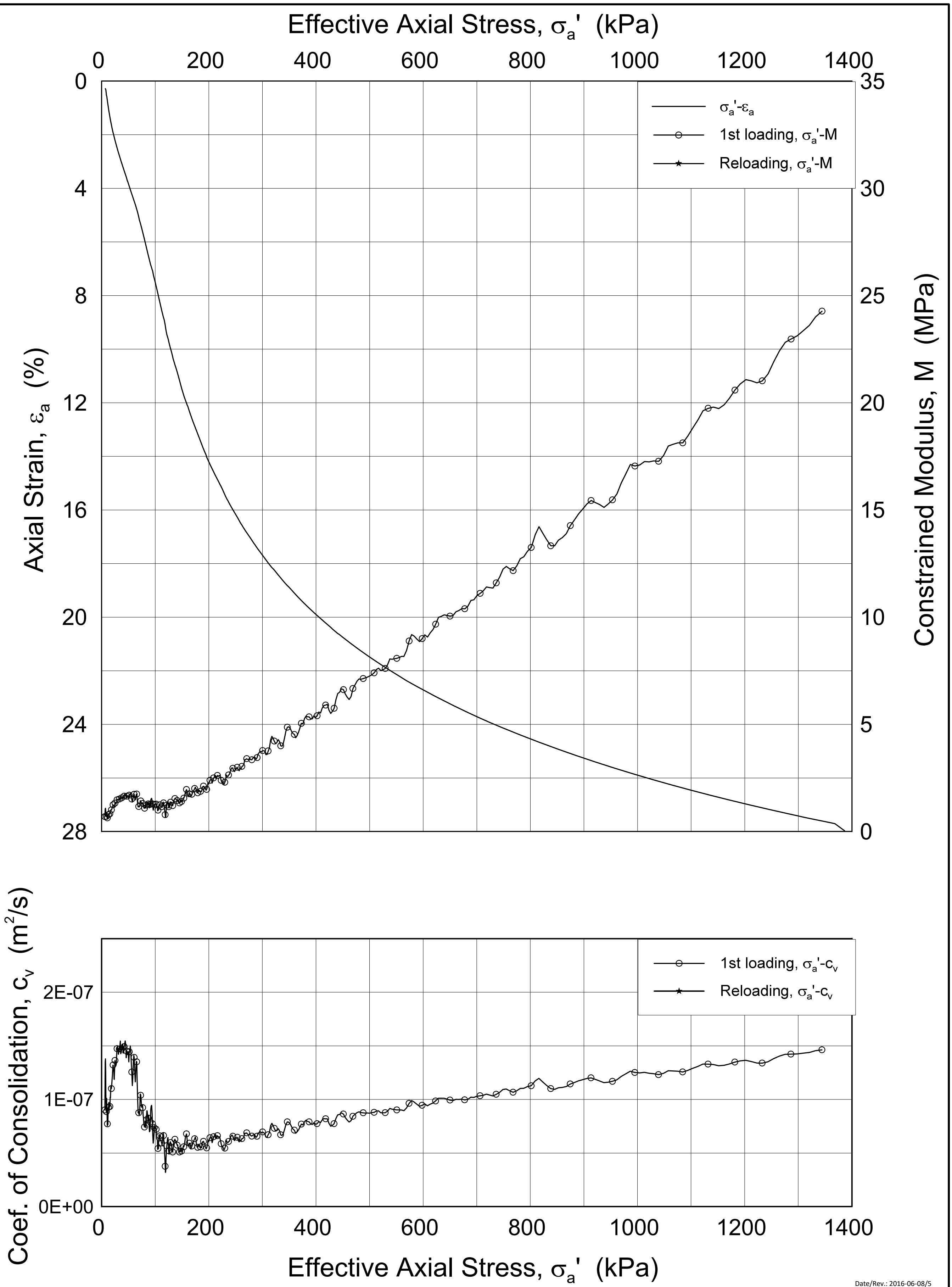
Depth = 9.25 m

p_0' = 58.5 kPa

w_i = 44.4 %

γ_i = 17.55 kN/m³

NGI

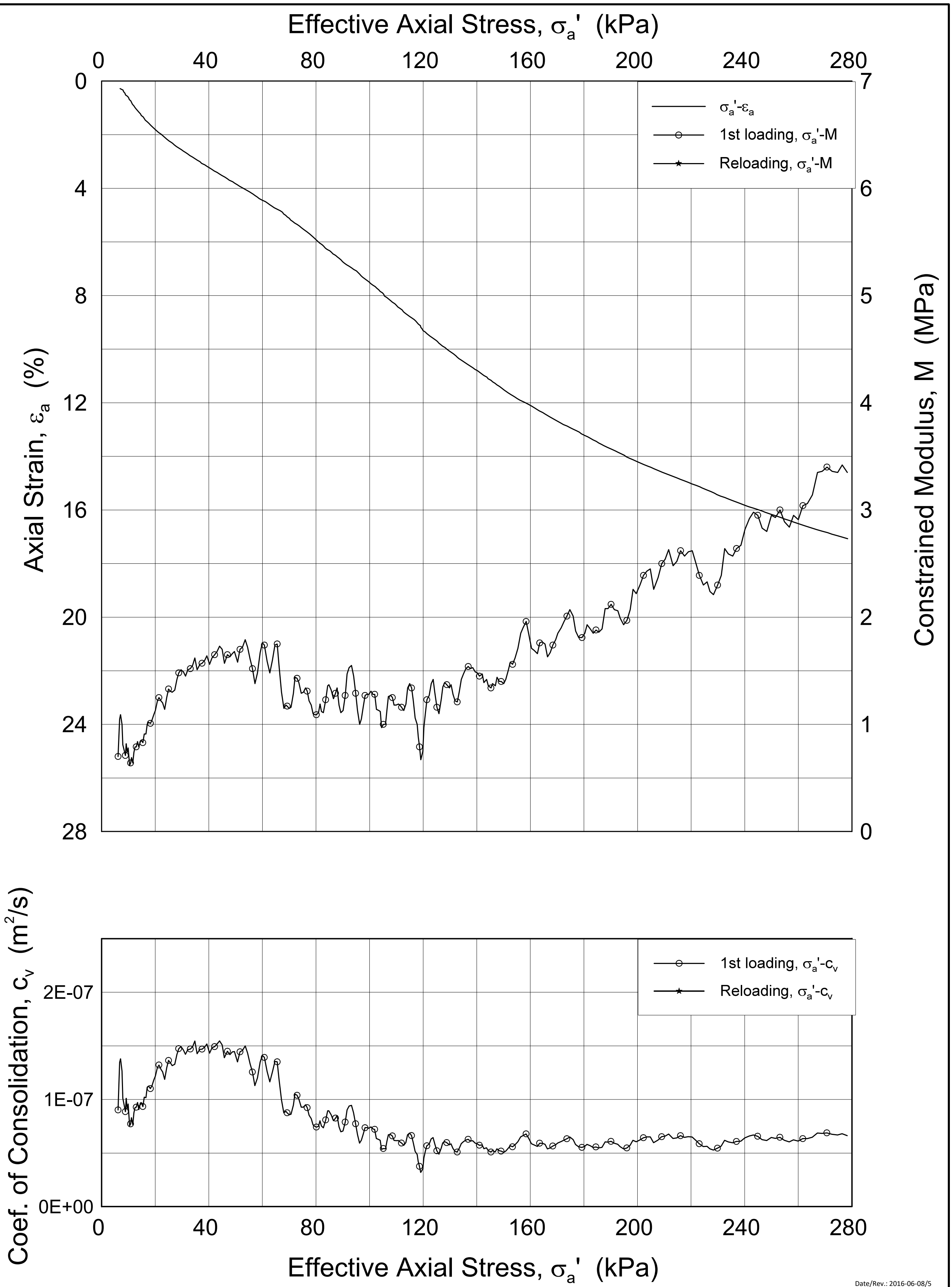


P:\2016\01\20160154\Leveranseddokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.80, BH8-2-2-A-1 lin (CRS3572).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.80

				Date	Drawn by / Checked
		Depth	= 9.25 m	2018-12-10	FP / MAS
Boring: ONSB13	Tube: 2-2	p_0'	= 58.5 kPa		
	Part: A	w_i	= 44.4 %		
	Test: 1	γ_i	= 17.55 kN/m³		



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.81, BH8-2-2-A-1 lin-2 (CRS3572).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.81
	Date 2018-12-10 / Drawn by / Checked FP / MAS

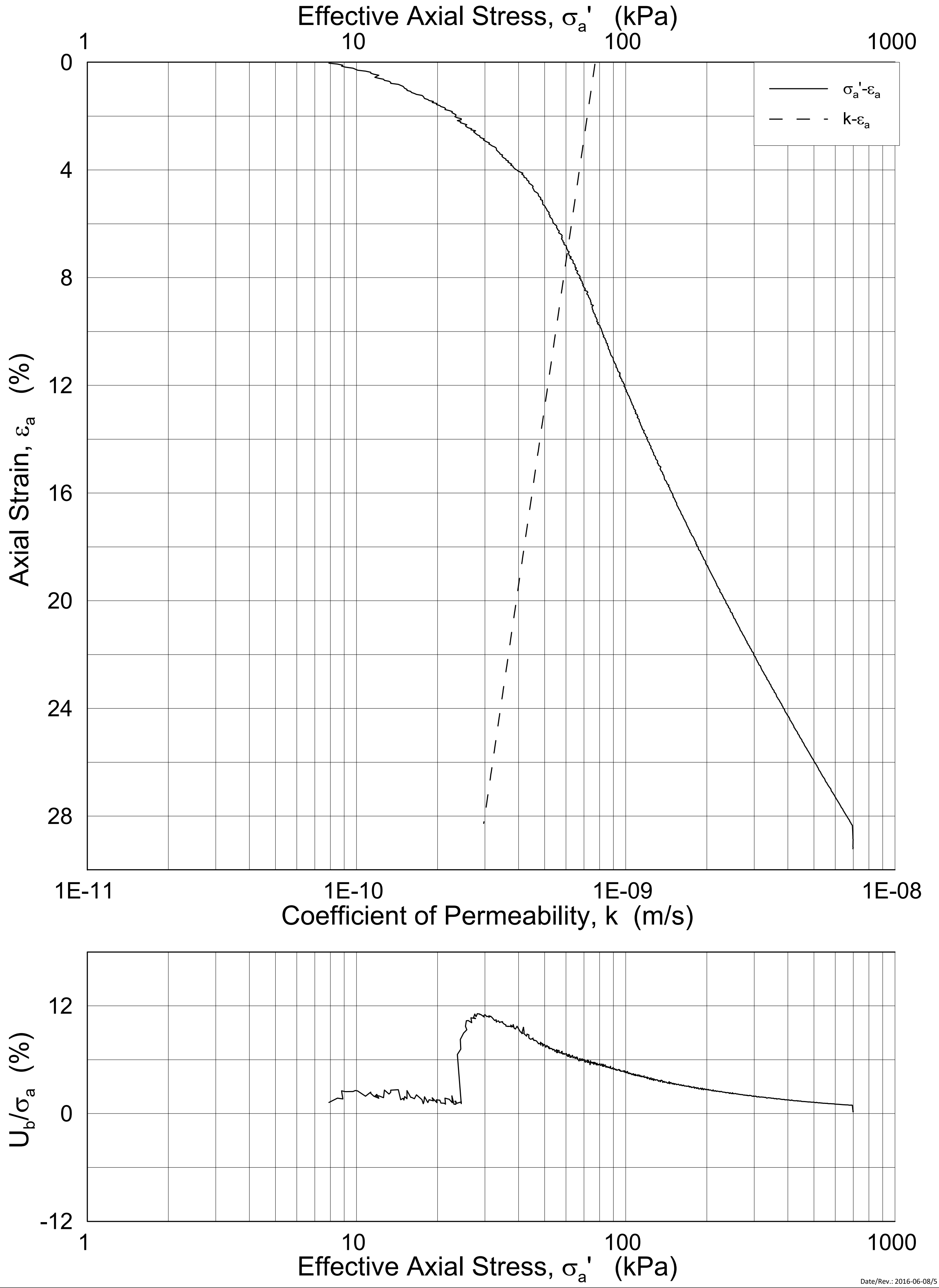
Depth = 9.25 m

Boring: ONSB12 Tube: 2-2 p_0' = 58.5 kPa

Part: A w_i = 44.4 %

Test: 1 γ_i = 17.55 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.82, BH9-1-2-A-1 log (CRS3585).grf

Date/Rev.: 2016-06-08/5

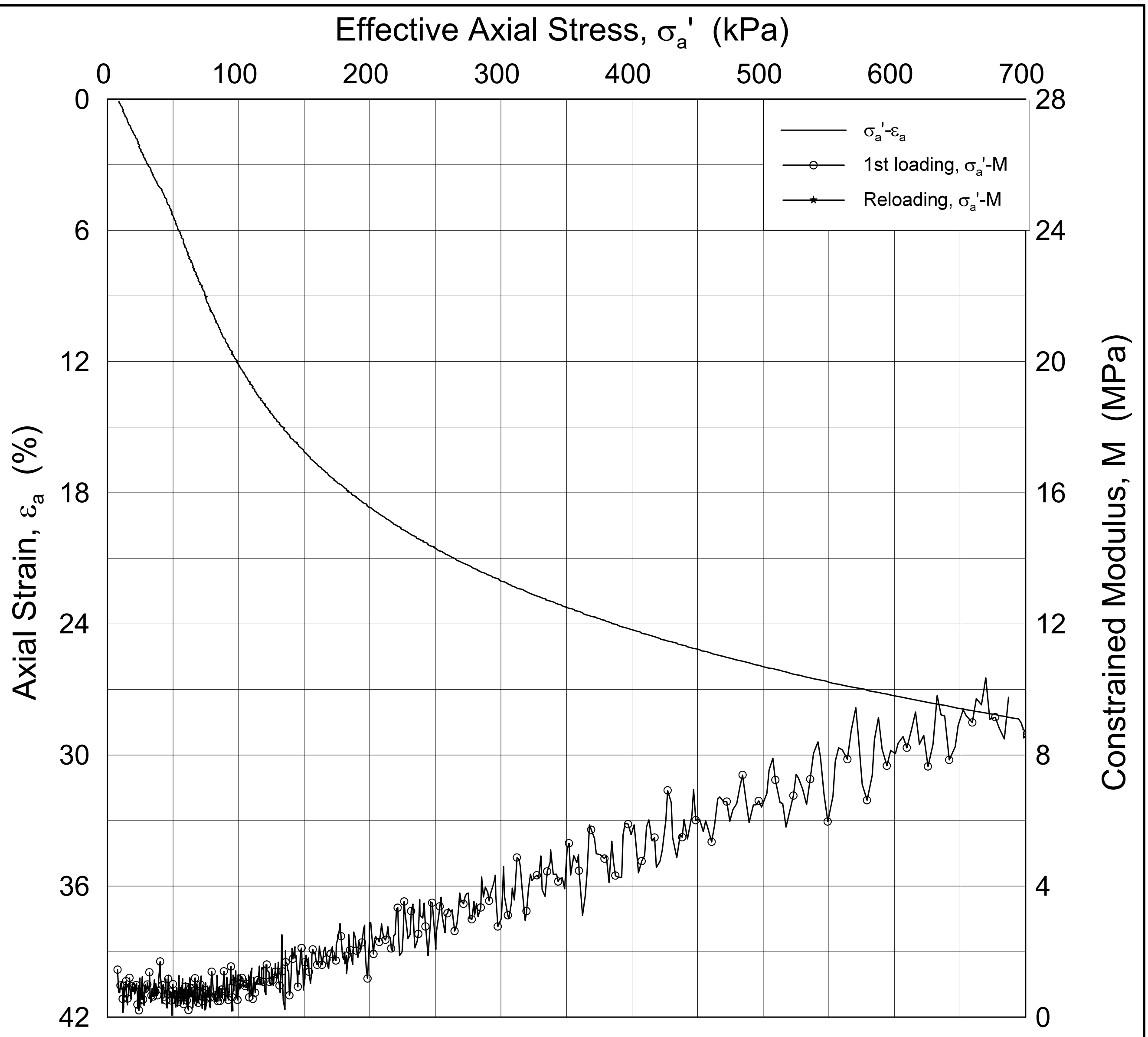
Norwegian GeoTest Sites - Onsøy

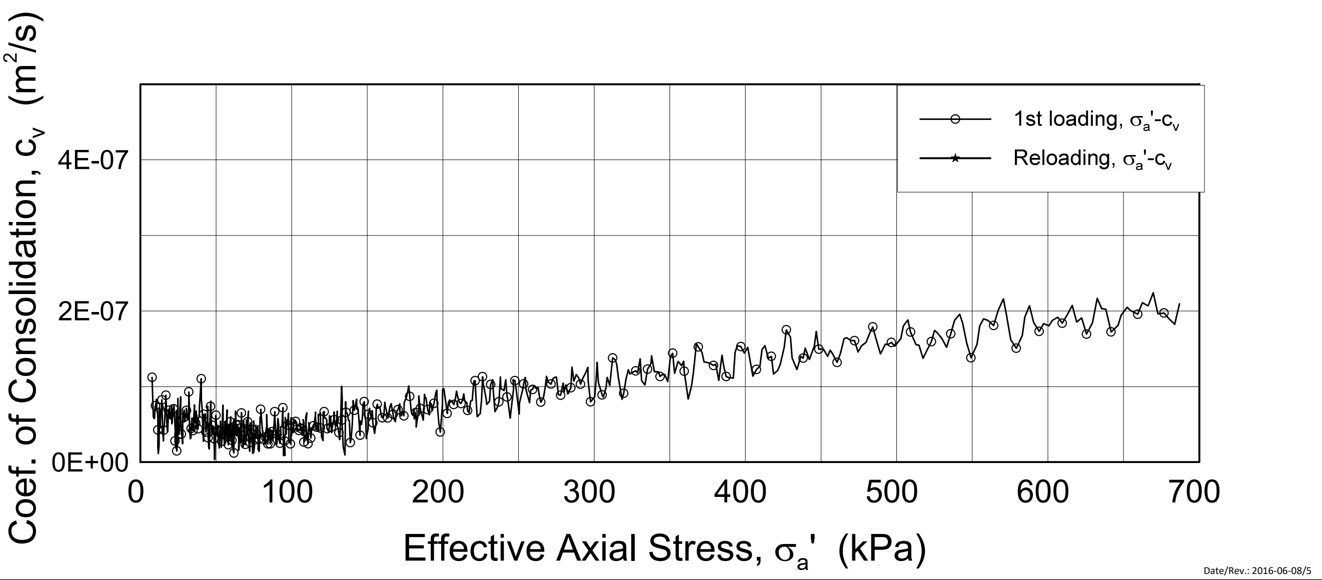
Oedometer test (CRSC)

				Depth	=	5.98 m
Boring: ONSB13	Tube:	1-2		p_0'	=	34.7 kPa
	Part:	A		w_i	=	64.8 %
	Test:	1		γ_i	=	16.28 kN/m³

Document No.	20160154-10-R
Figure No.	5.2.82
Date	2018-12-10
Drawn by / Checked	FP / MAS

NGI





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.83, BH9-1-2-A-1 lin (CRS3585).grf

Date/Rev.: 2016-06-08/5

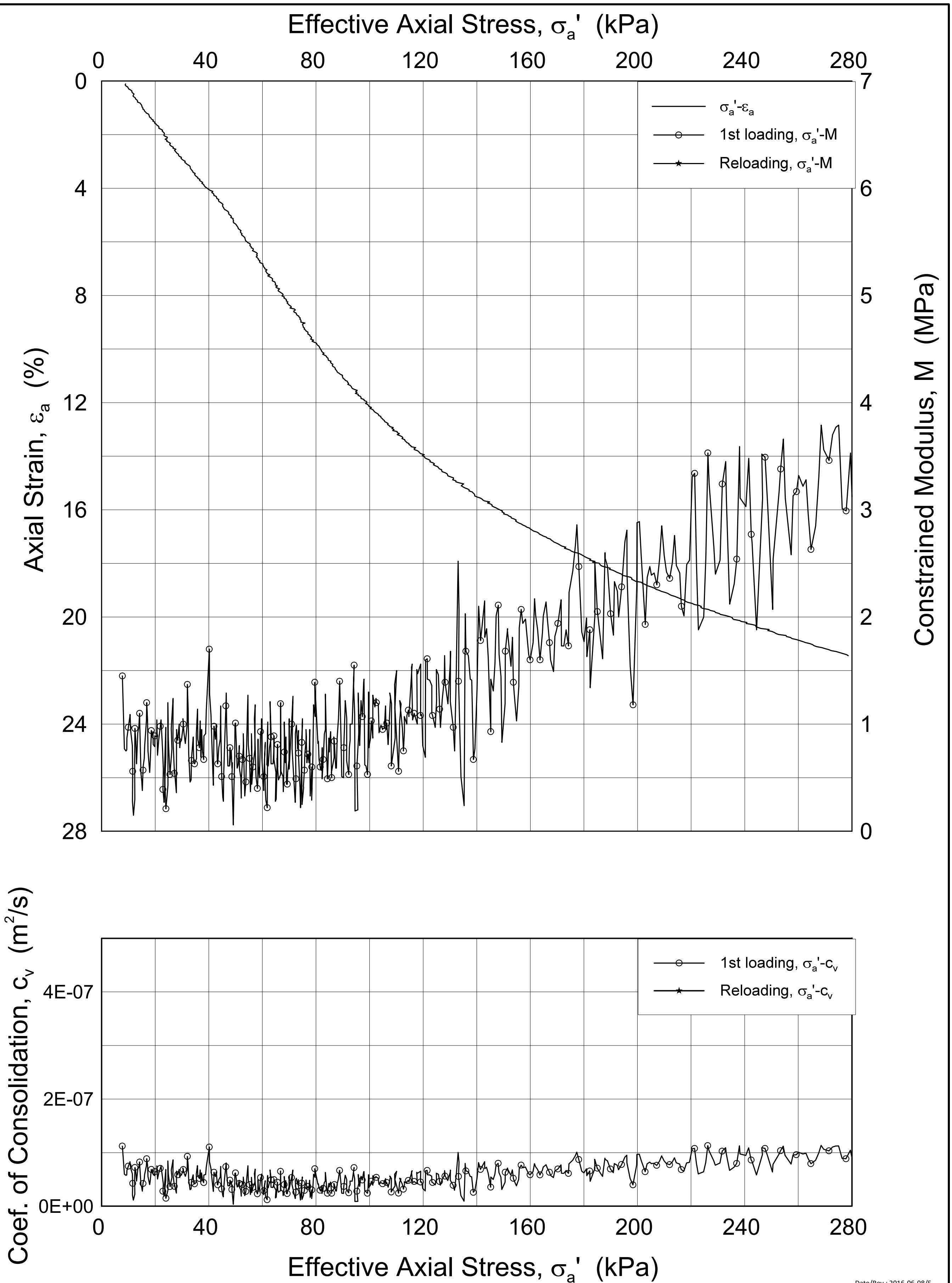
Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.83
	Date 2018-12-10 / Drawn by / Checked FP / MAS

Depth = 5.98 m

Boring: ONSB13 Tube: 1-2 p_0' = 34.7 kPa

Part: A w_i = 64.8 %

Test: 1 γ_i = 16.28 kN/m³



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Document No. 20160154-10-R

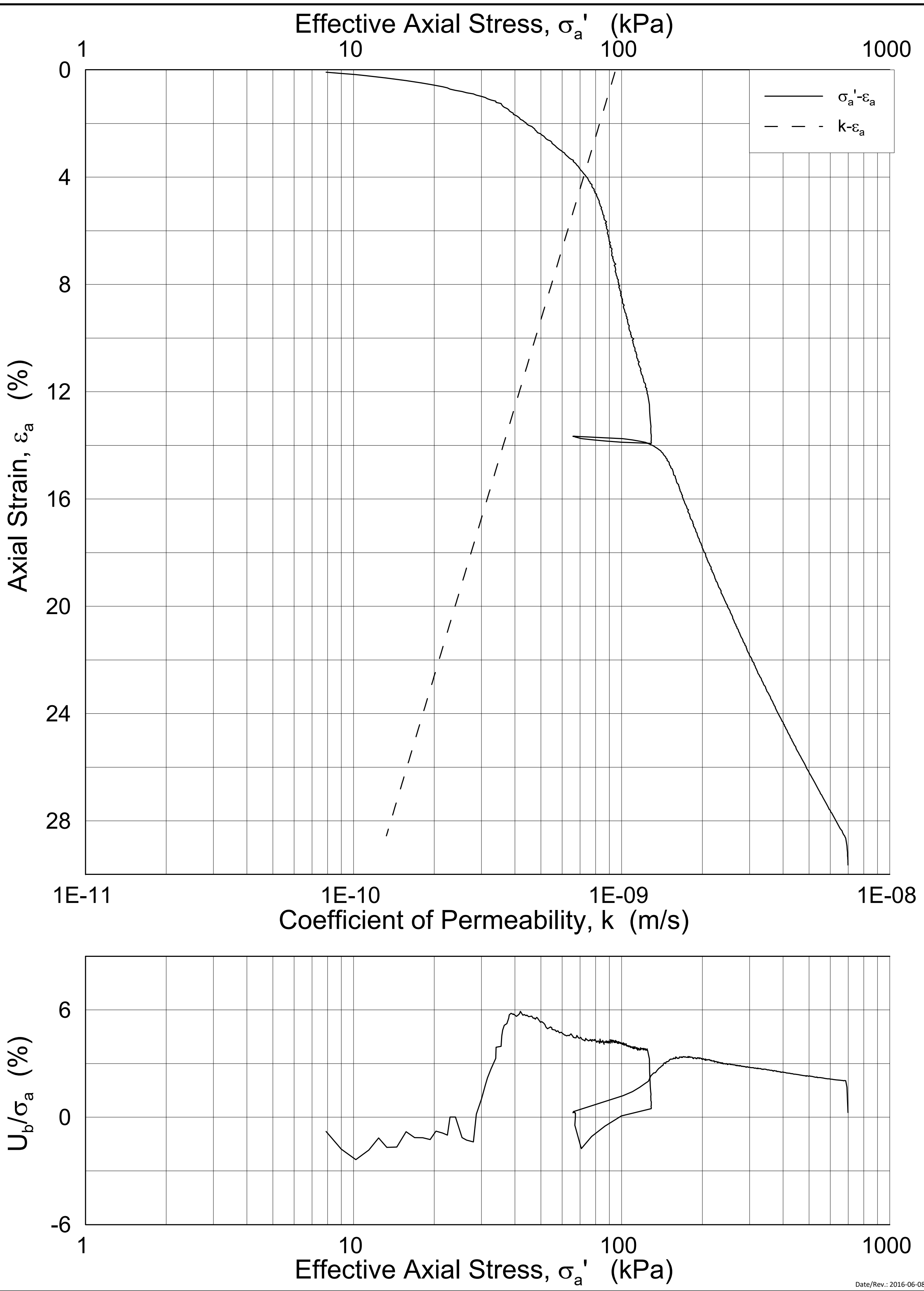
Figure No. 5.2.84

Date 2018-12-10

Drawn by / Checked FP / MAS

			Depth	=	5.98	m
Boring: ONSB13	Tube:	1-2	p_0'	=	34.7	kPa
	Part:	A	w_i	=	64.8	%
	Test:	1	γ_i	=	16.28	kN/m³

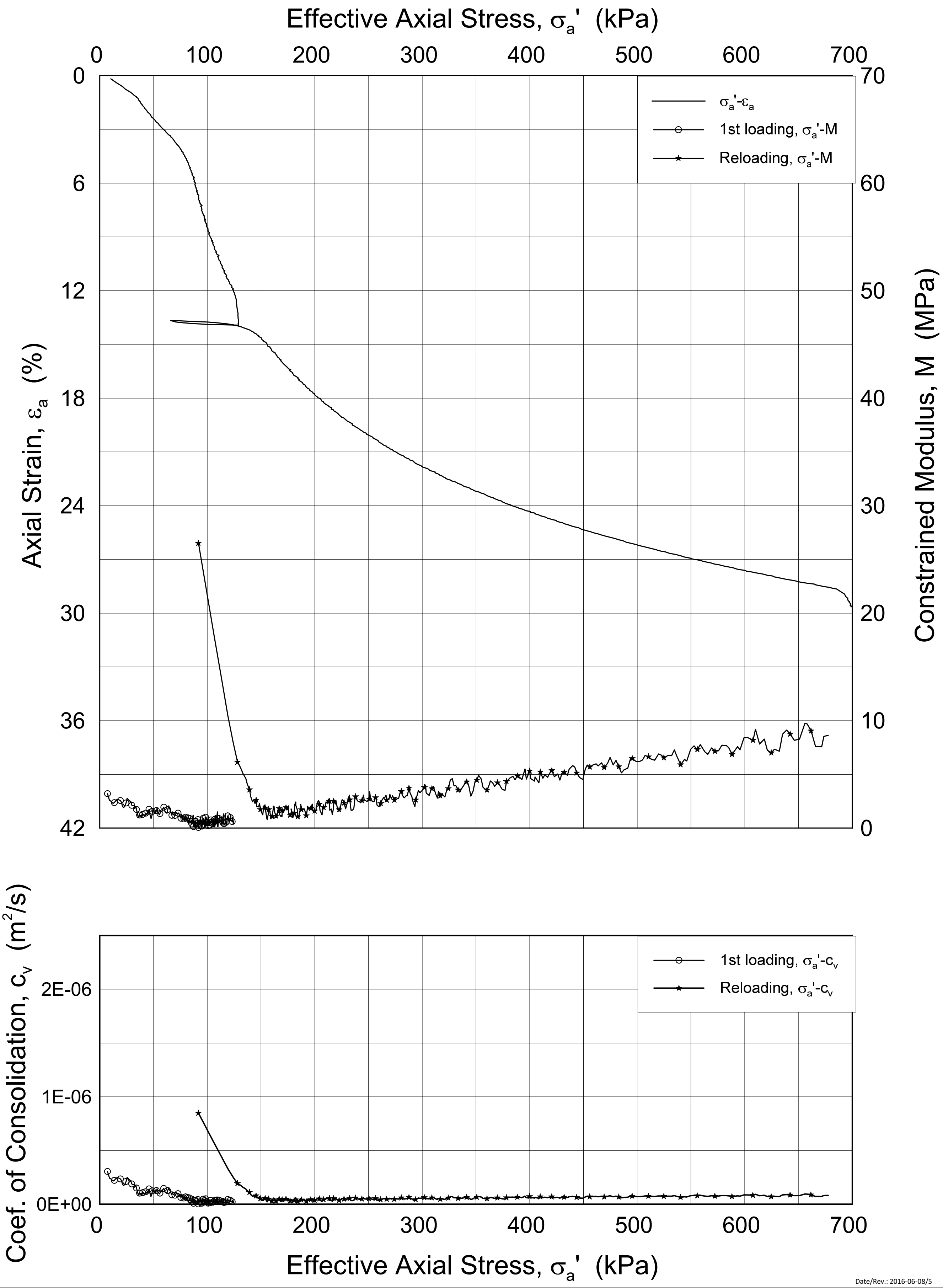
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.84, BH9-1-2-A-1 lin-2 (CRS3585).grf



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.85, BL-1-1-A-1 log (crs3377).grf

Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Oedometer test (CRSC)							Figure No. 5.2.85
			Depth	=	6.87	m	Date 2018-12-10 / Drawn by / Checked FP / GS
Boring: ONSB01	Tube:	1	p_0'	=	41.2	kPa	NGI
	Part:	A	w_i	=	63.8	%	
	Test:	1	γ_i	=	16.46	kN/m³	



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.86, BL-1-1-A-1 lin (crs3377).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB01

Tube:	1	Depth	=	6.87	m
Part:	A	p_0'	=	41.2	kPa
Test:	1	w_i	=	63.8	%
		γ_i	=	16.46	kN/m³

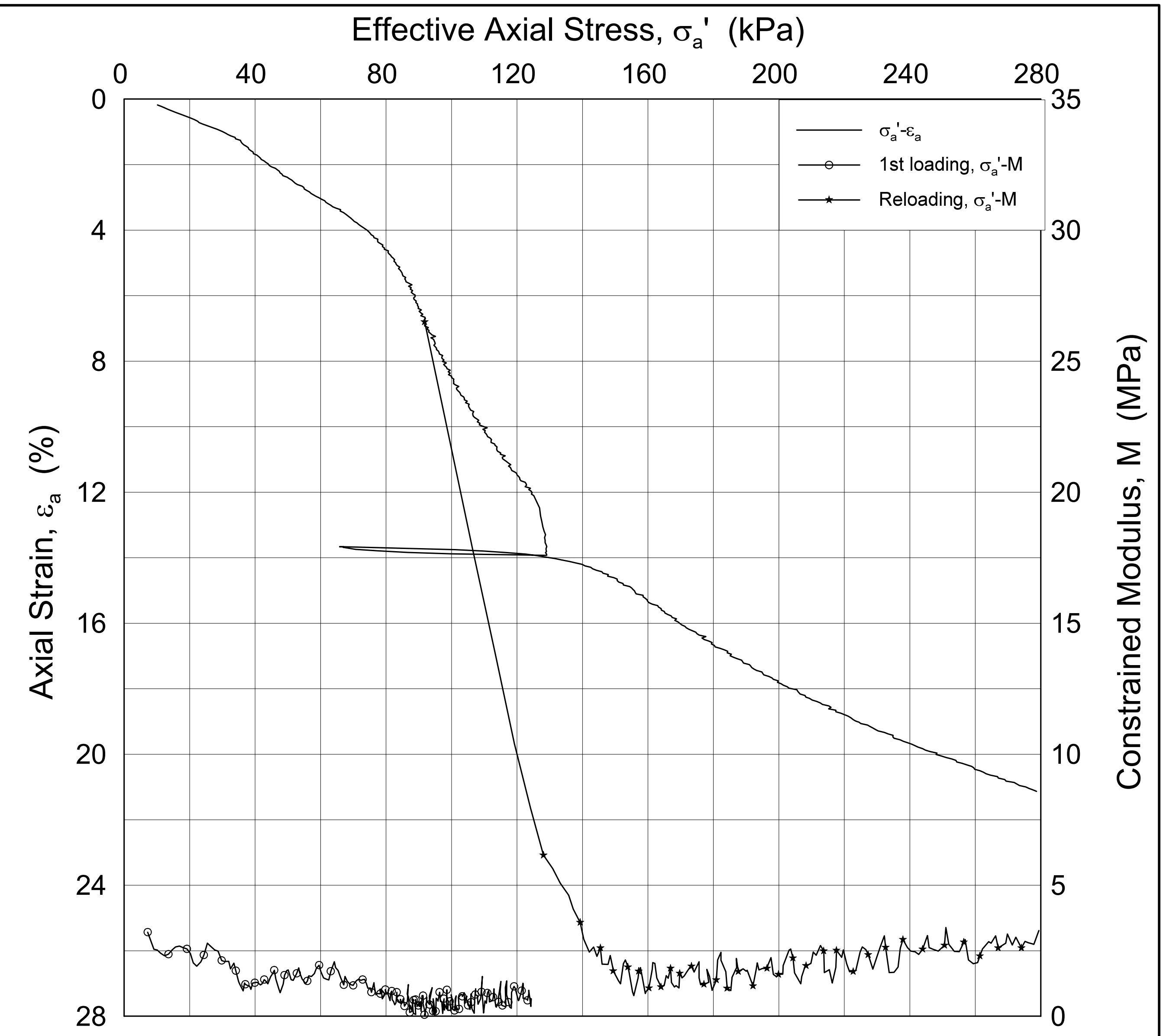
Document No. 20160154-10-R

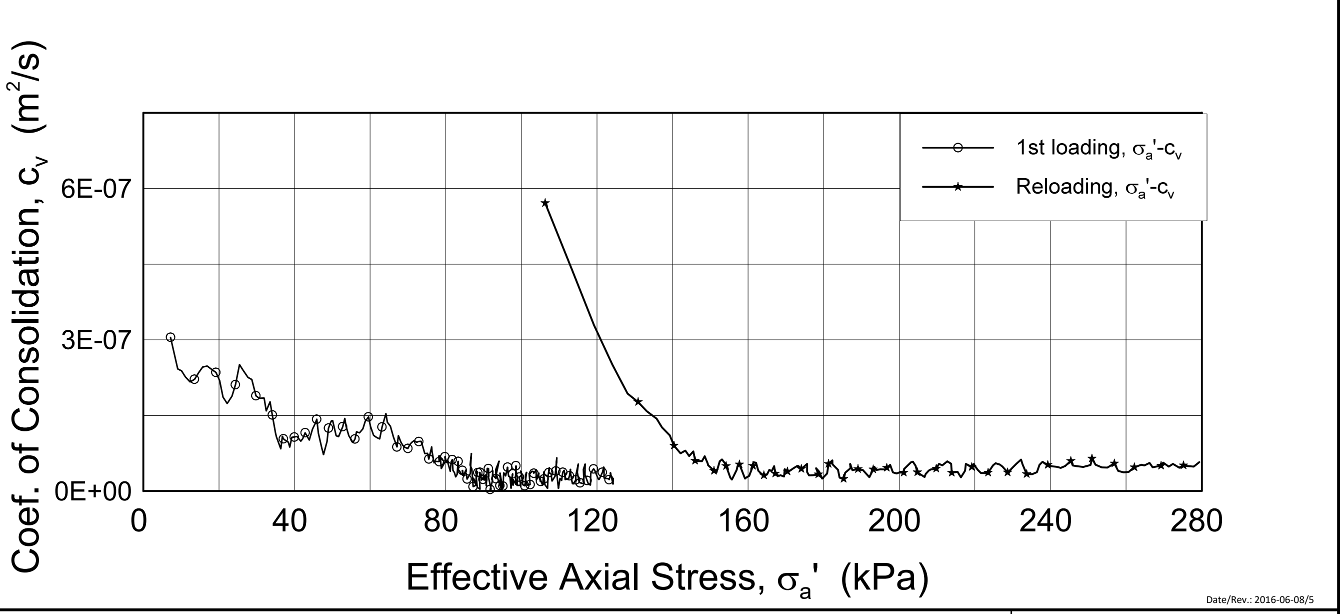
Figure No. 5.2.86

Date 2018-12-10

Drawn by / Checked FP / GS

NGI





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.87, BL-1-1-A-1 lin-2 (crs3377).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB01			Depth	=	6.87	m
	Tube:	1	p_0'	=	41.2	kPa
	Part:	A	w_i	=	63.8	%
	Test:	1	γ_i	=	16.46	kN/m³

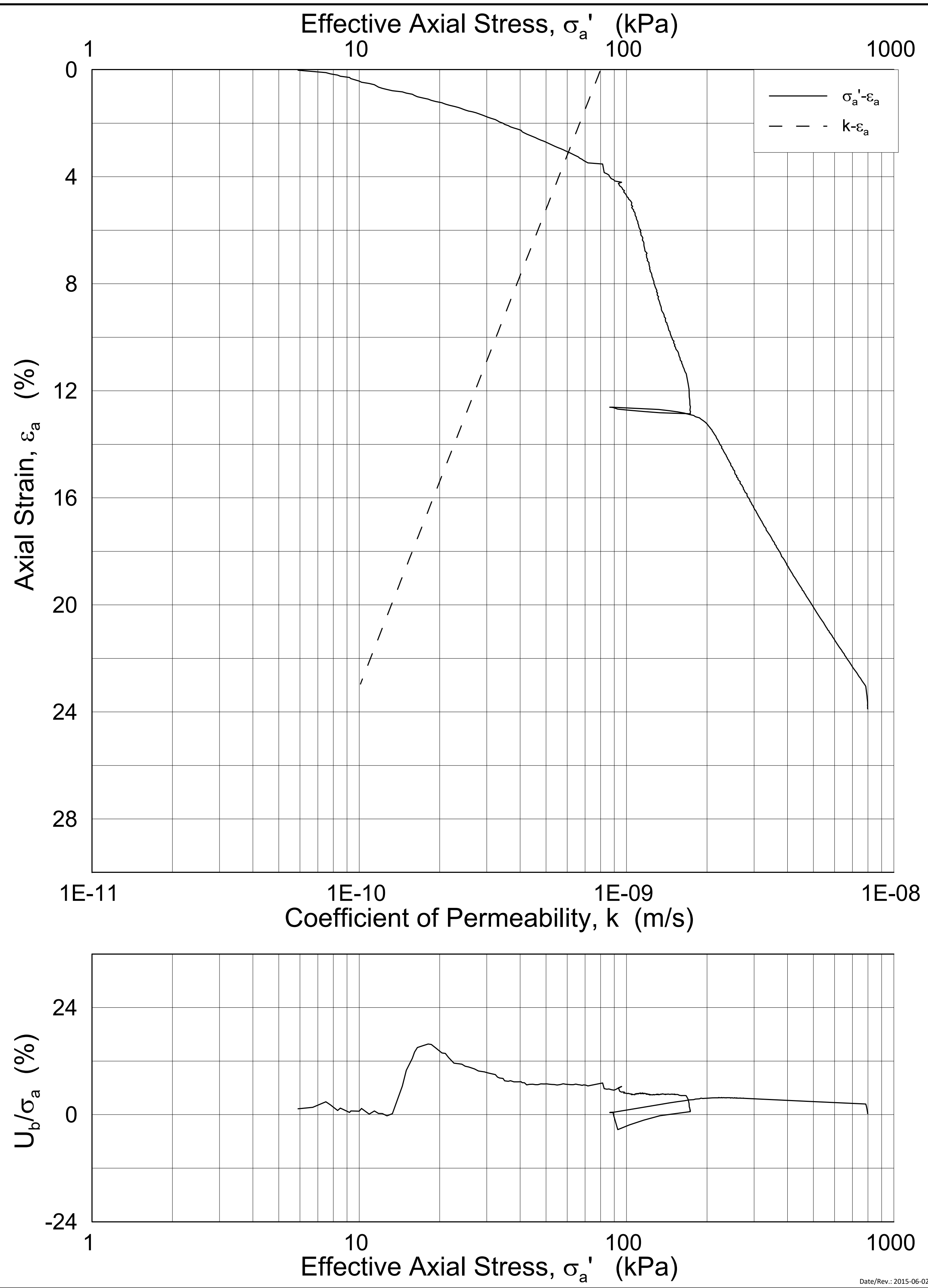
Document No.
20160154-10-R

Figure No.
5.2.87

Date
2018-12-10

Drawn by / Checked
FP / GS

NGI



Date/Rev.: 2015-06-02/4

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.88, BL-1-2-A-1 log (crs3297).grf

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.88
	Date 2018-12-10 / Drawn by / Checked FP/ MAS

Boring: ONSB01 Tube: 2 Part: A Test: 1

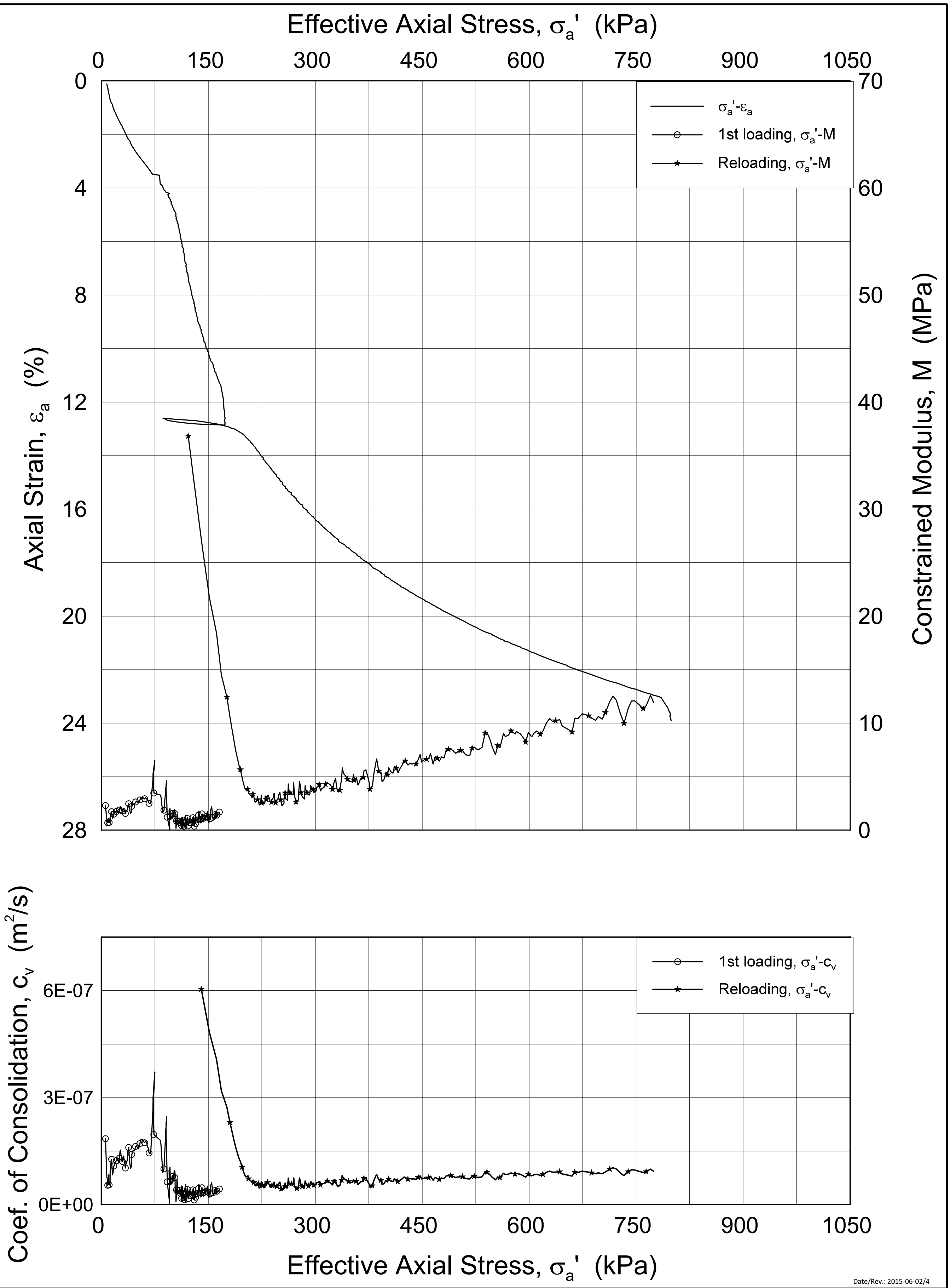
Depth = 10.22 m

p_0' = 65.6 kPa

w_i = 42.7 %

γ_i = 17.95 kN/m³

NGI



Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.89	
	Date 2018-12-10	Drawn by / Checked FP/ MAS

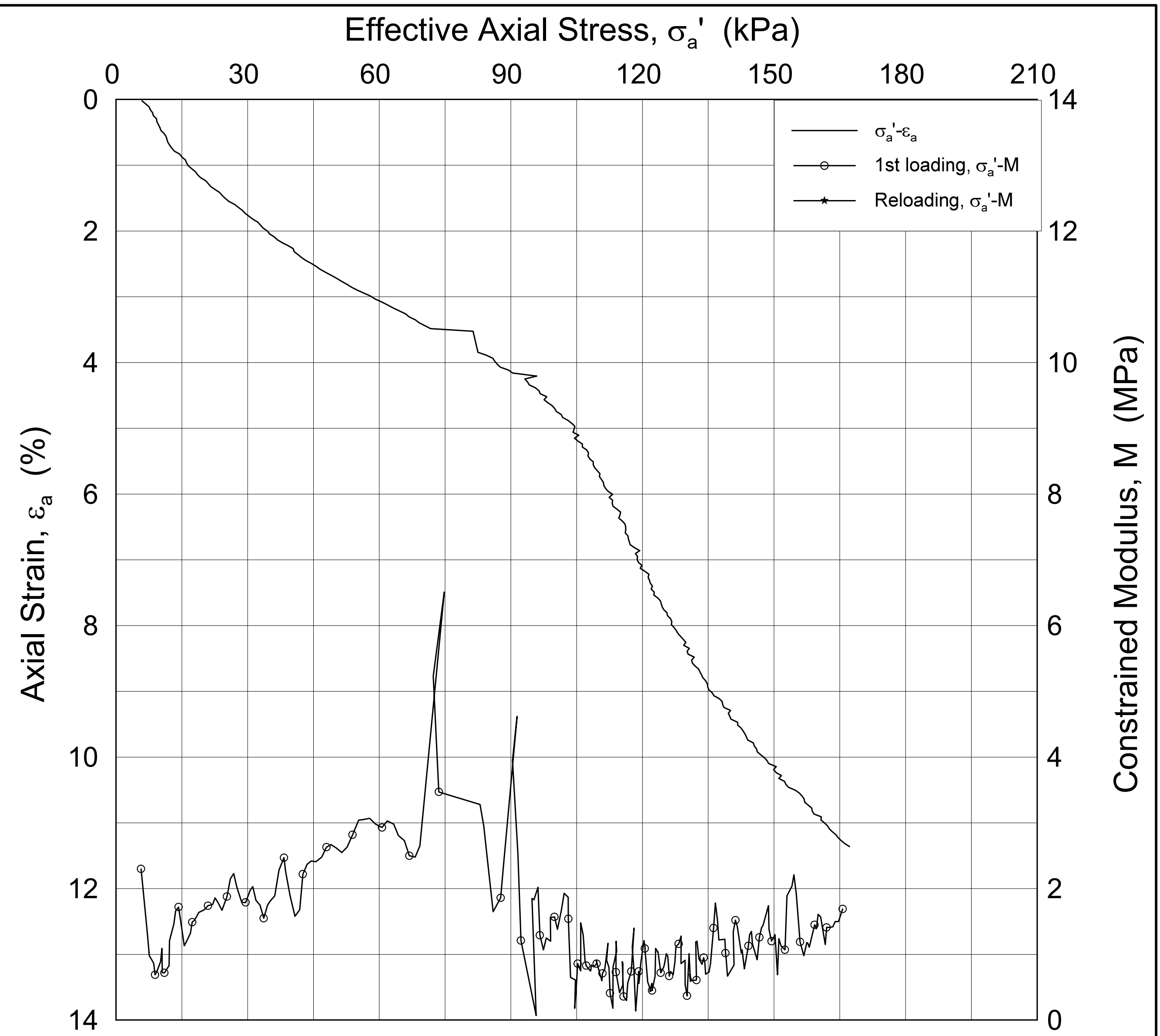
Depth = 10.22 m

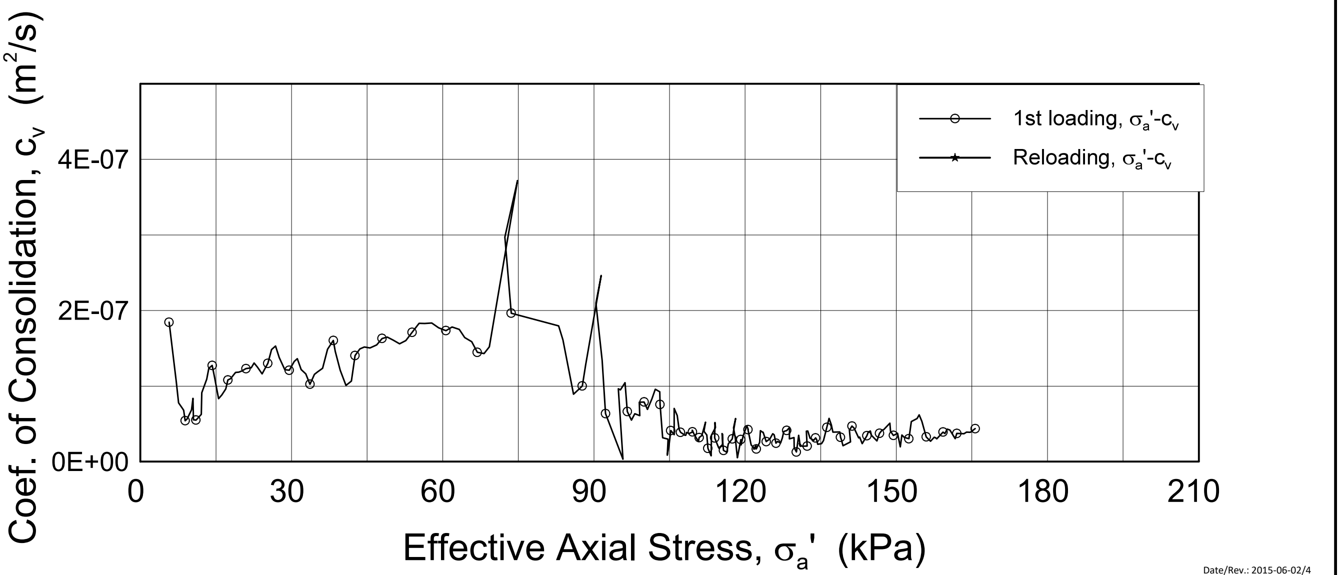
Boring: ONSB01 Tube: 2 p_0' = 65.6 kPa

Part: A w_i = 42.7 %

Test: 1 γ_i = 17.95 kN/m³

NGI





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.90, BL-1-2-A-1 lin-2 (crs3297).grf

Date/Rev.: 2015-06-02/4

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB01	Tube:	2	Depth	=	10.22	m
			p_0'	=	65.6	kPa
	Part:	A	w_i	=	42.7	%
	Test:	1	γ_i	=	17.95	kN/m³

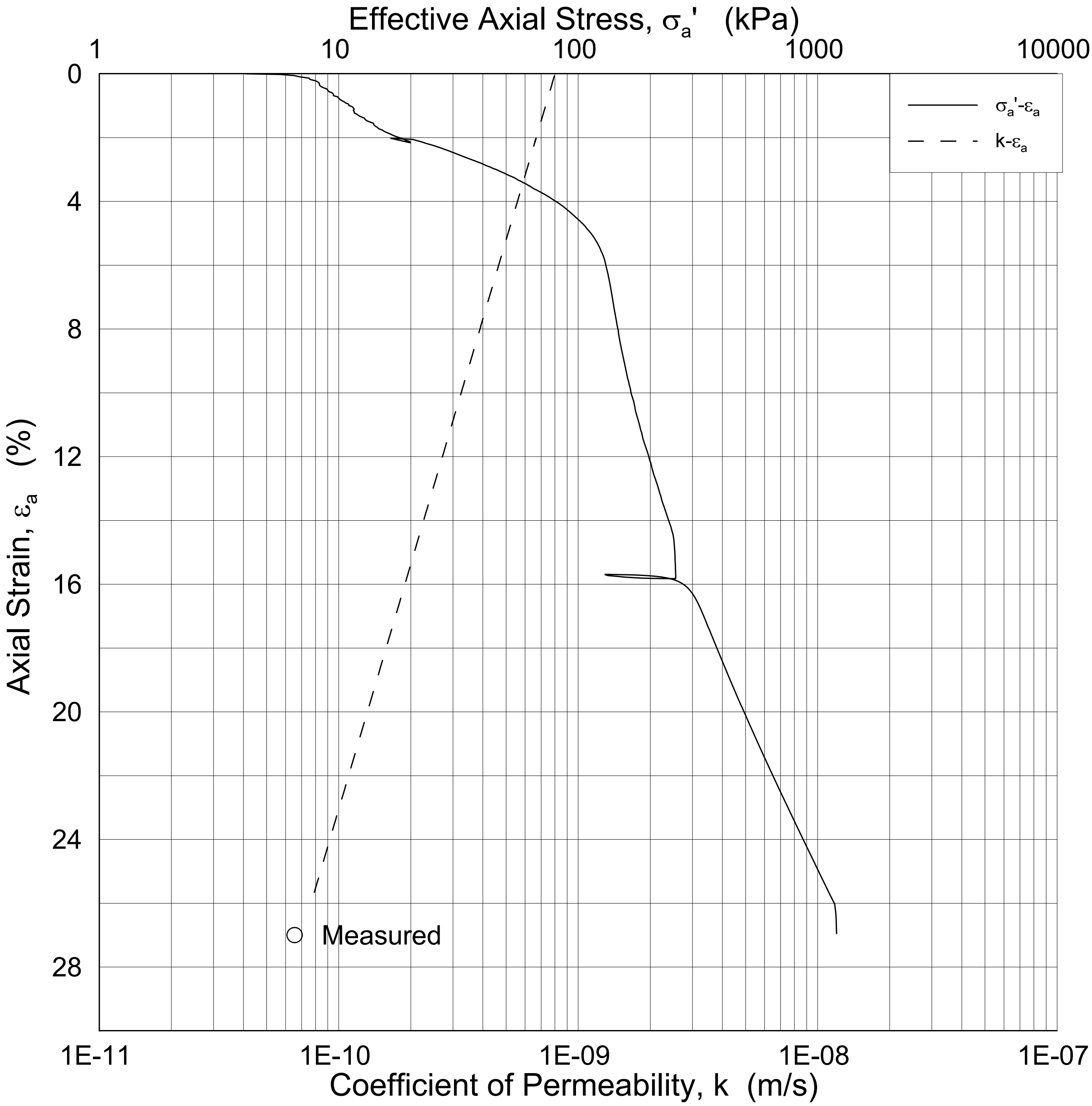
Document No. 20160154-10-R

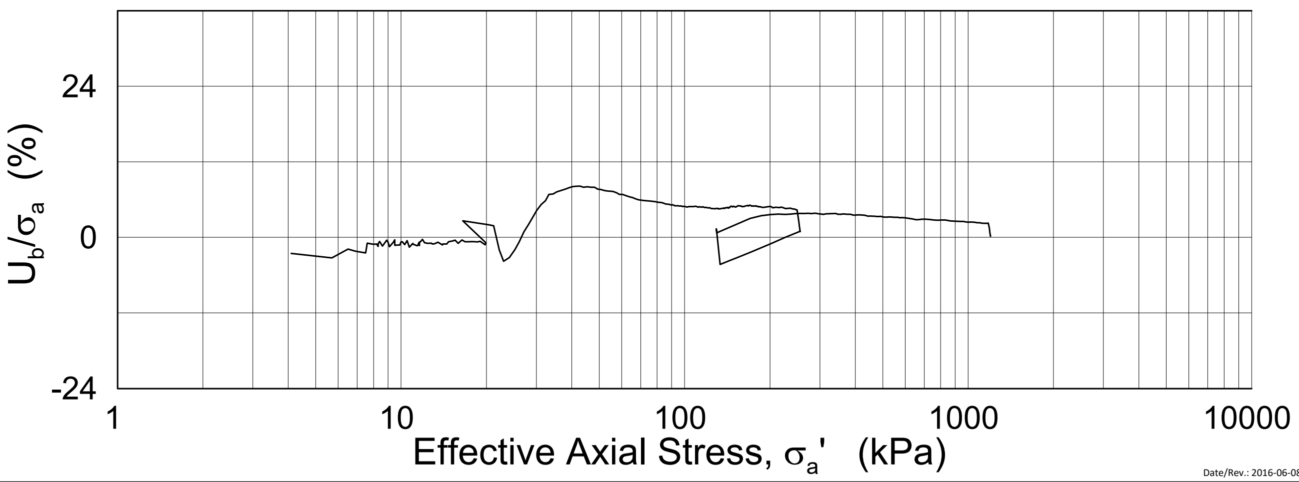
Figure No. 5.2.90

Date 2018-12-10

Drawn by / Checked FP/ MAS

NGI





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.91, BL-1-3-A-1 Log(CRS3402).grf

Norwegian GeoTest Sites - Onsøy

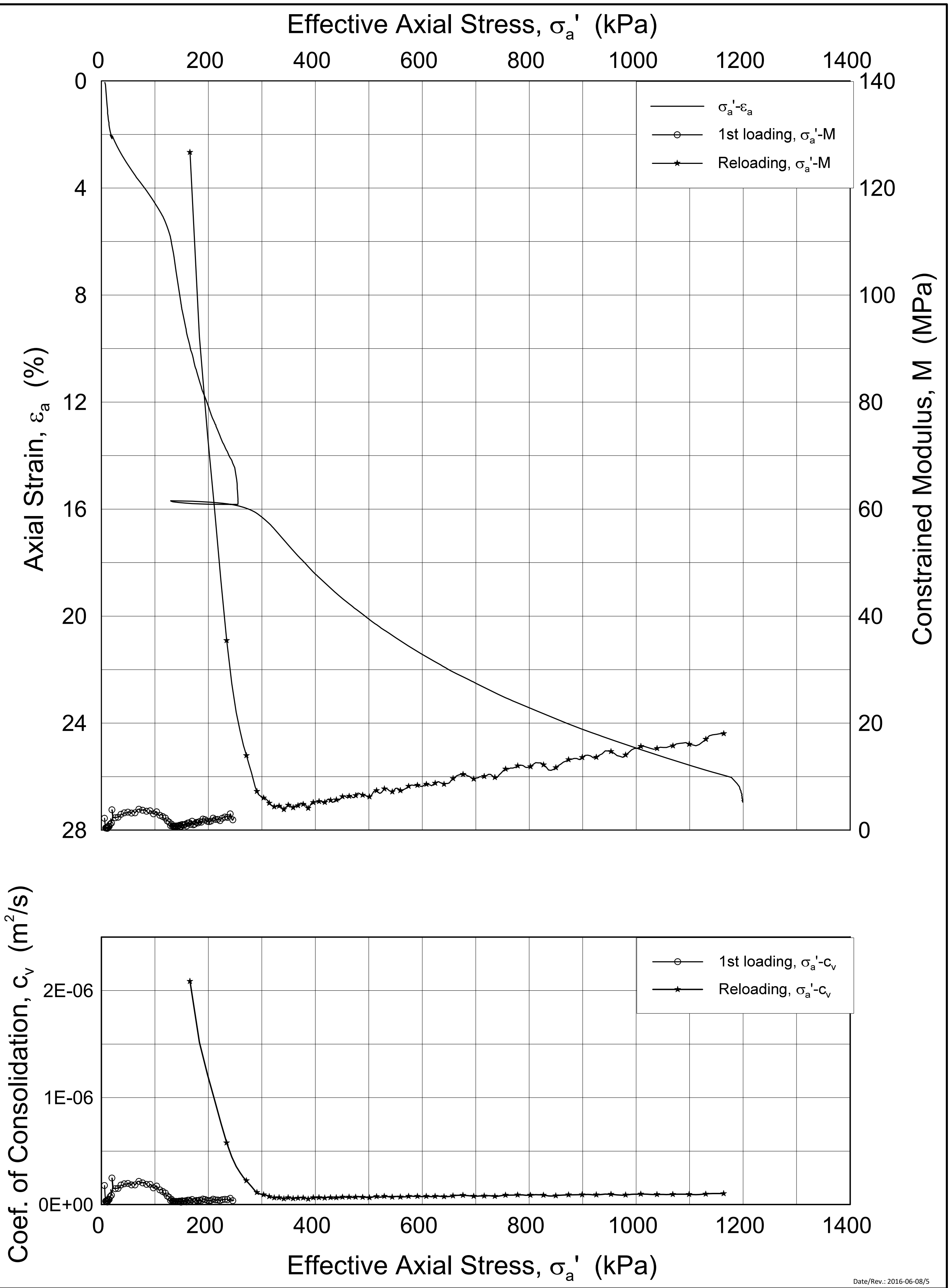
Oedometer test (CRSC)

				Depth	=	12.22	m
Boring:	ONSB01	Tube:	3	p_0'	=	80.2	kPa
		Part:	A	w_i	=	46.1	%
		Test:	1	γ_i	=	17.46	kN/m³

Document No.
20160154-10-R

Figure No.
5.2.91

Date	Drawn by / Checked
2018-12-10	FI / GS



Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

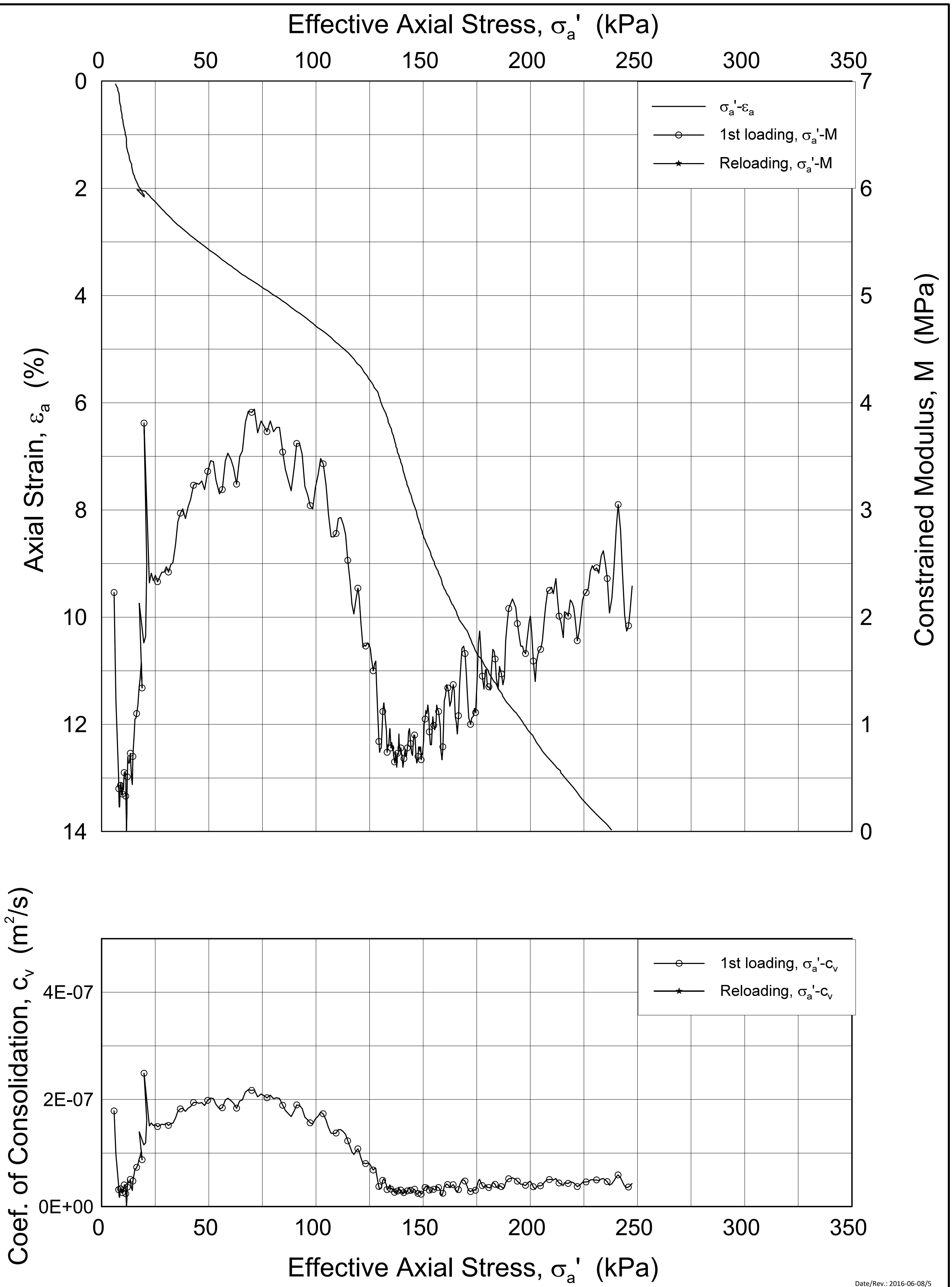
				Depth	=	12.22	m	
Boring:	ONSB01	Tube:	3	p_0'	=	80.2	kPa	
		Part:	A	w_i	=	46.1	%	
		Test:	1	γ_i	=	17.46	kN/m³	

Document No.
20160154-10-R

Figure No.
5.2.92

Date	Drawn by / Checked
2018-12-10	FI / GS

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.93, BL-1-3-A-1 Lin2 (CRS3402).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB01

Tube: 3

Part: A

Test: 1

Depth = 12.22 m

p_0' = 80.2 kPa

w_i = 46.1 %

γ_i = 17.46 kN/m³

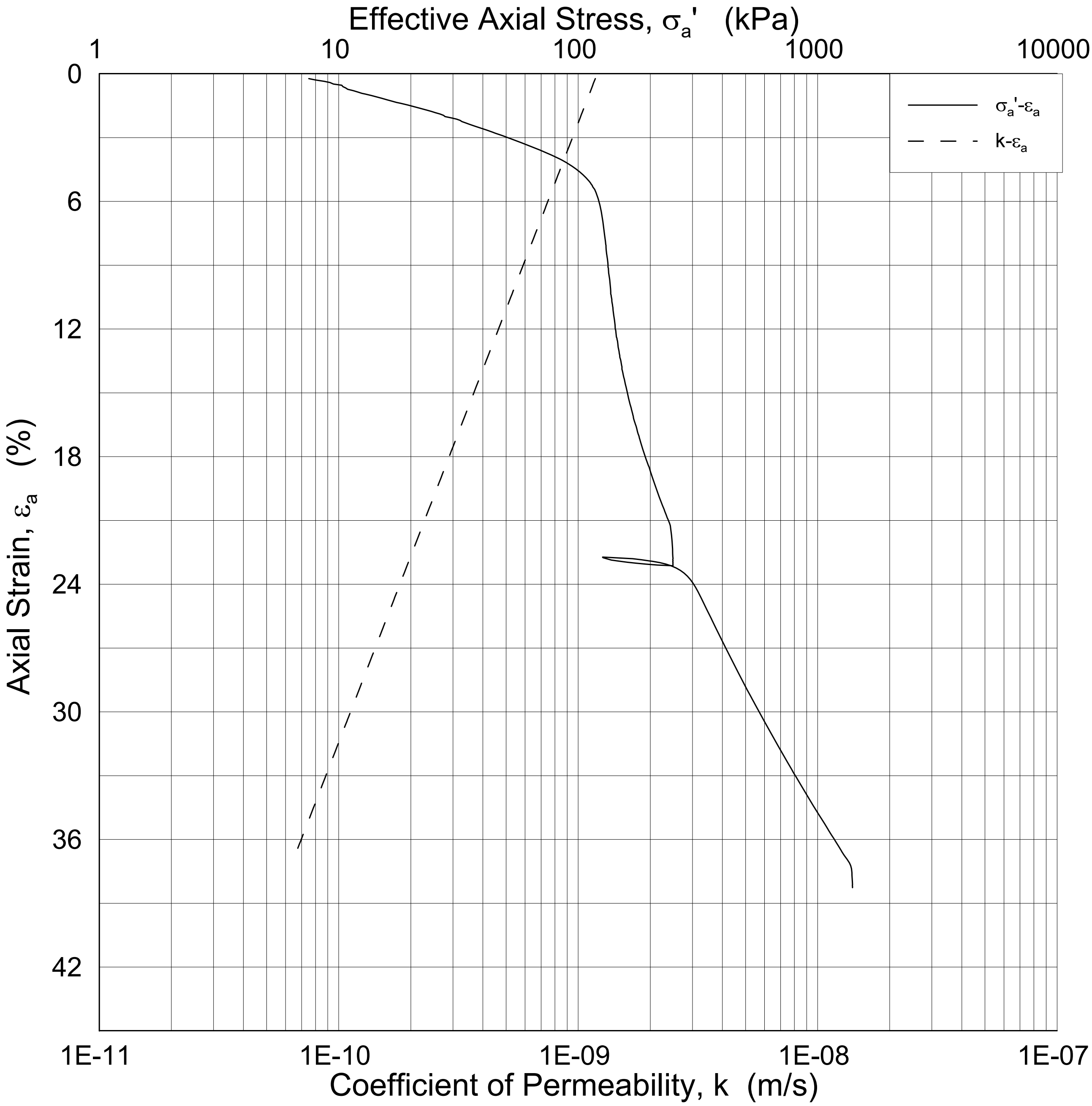
Document No. 20160154-10-R

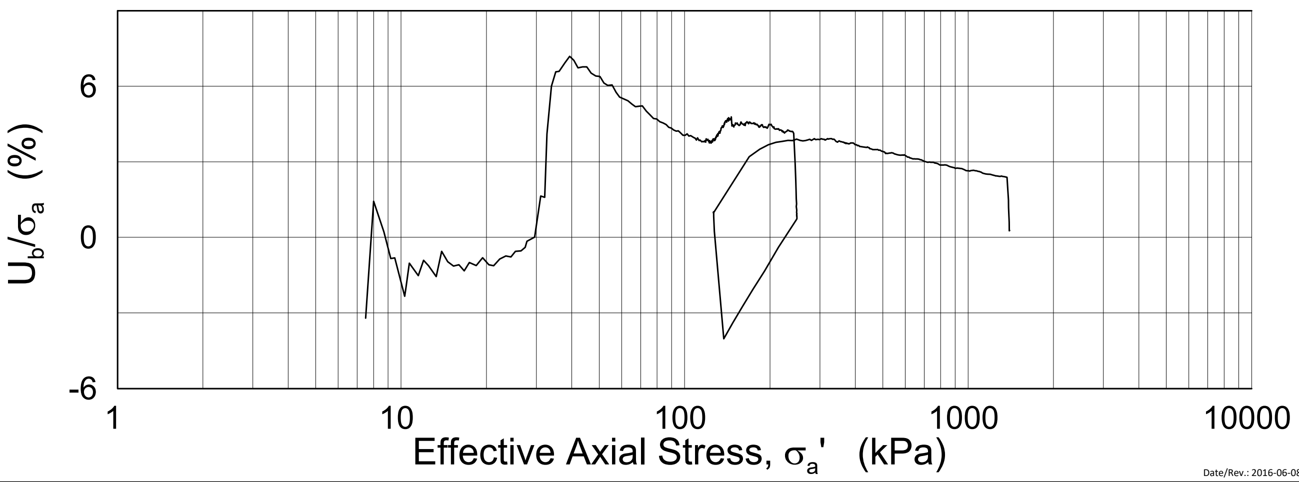
Figure No. 5.2.93

Date 2018-12-10

Drawn by / Checked FI / GS

NGI





Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB01	Tube:	4	Depth	=	14.14 m
	Part:	A	p_0'	=	94.0 kPa
	Test:	1	w_i	=	73.0 %
			γ_i	=	15.78 kN/m³

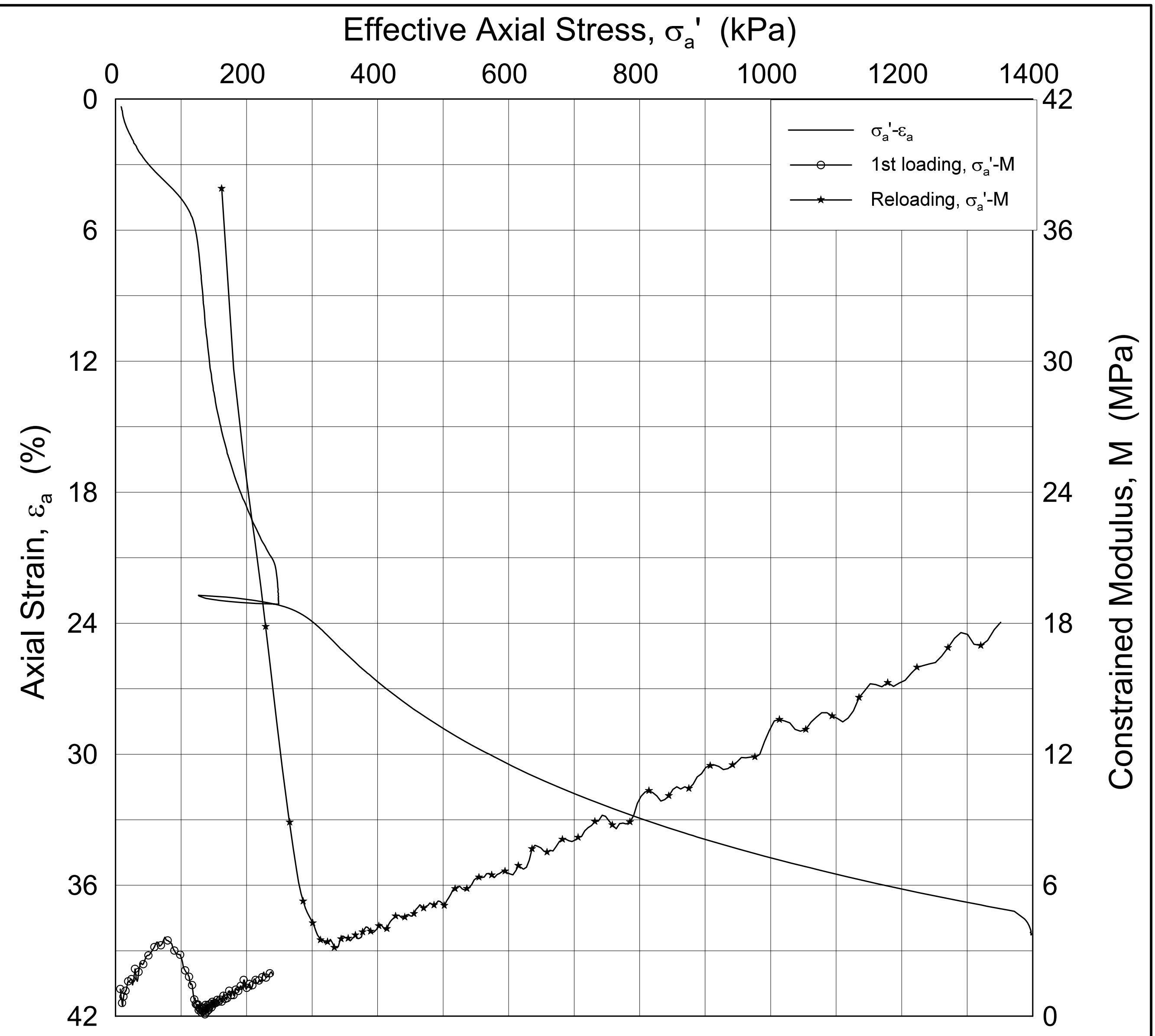
Document No. 20160154-10-R

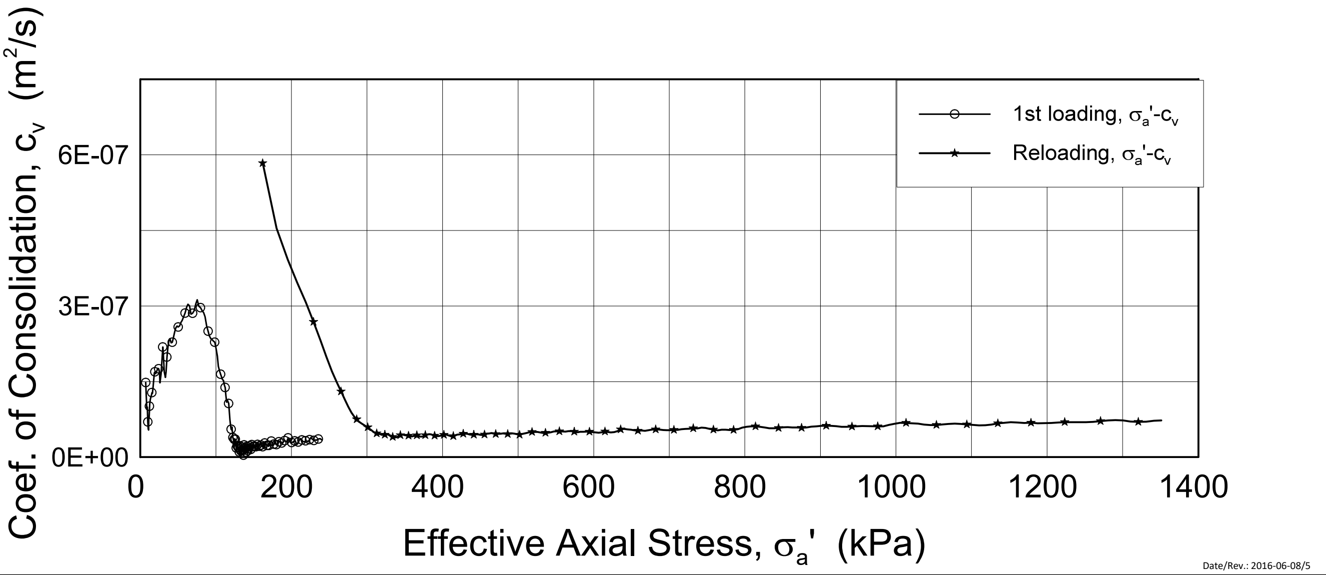
Figure No. 5.2.94

Date 2018-12-10

Drawn by / Checked FP / GS

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.94, BL-1-4-A-1 log (crs3333).grf





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.95, BL-1-4-A-1 lin (crs3333).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

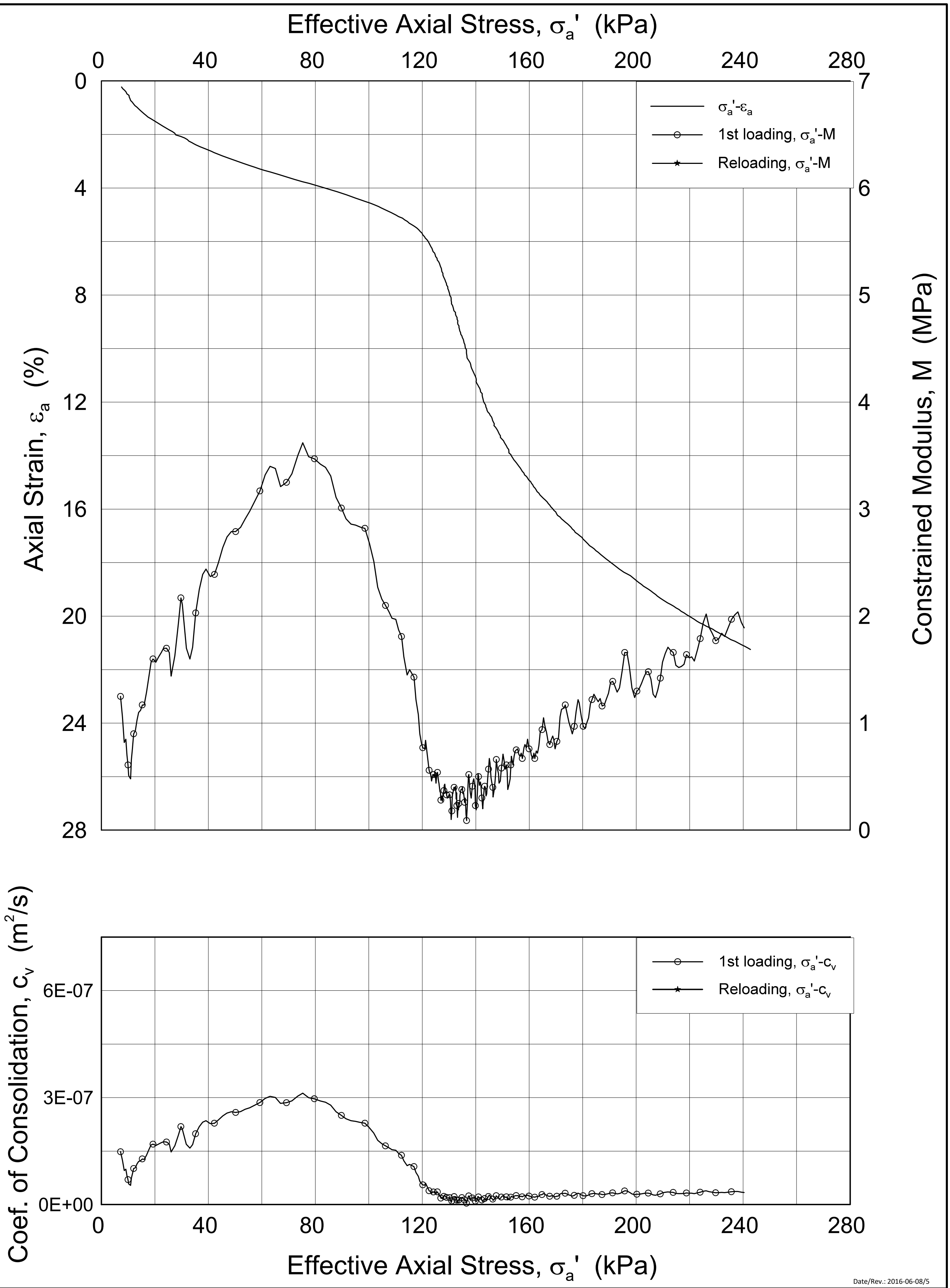
Boring: ONSB01	Tube:	4	Depth	=	14.14	m
	Part:	A	p_0'	=	94.0	kPa
	Test:	1	w_i	=	73.0	%
			γ_i	=	15.78	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.95

Date 2018-12-10

Drawn by / Checked FP / GS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.96, BL-1-4-A-1 lin-2 (crs3333).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	14.14	m	
Boring:	ONSB01	Tube:	4	p_0'	=	94.0	kPa	
		Part:	A	w_i	=	73.0	%	
		Test:	1	γ_i	=	15.78	kN/m^3	

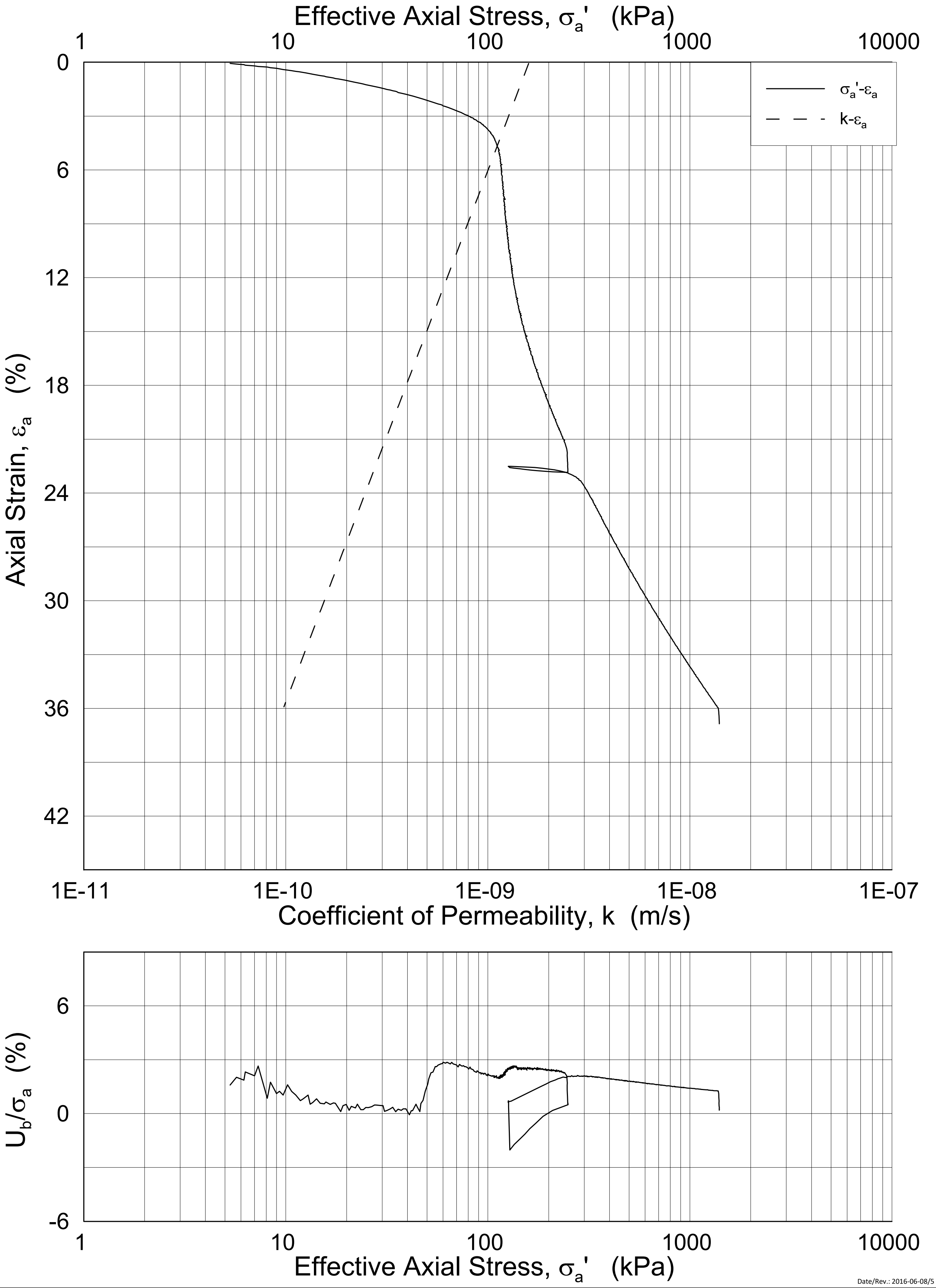
Document No.
20160154-10-R

Figure No.
5.2.96

Date
2018-12-10

Drawn by / Checked
FP / GS

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.97, BL-1-5-A-1 log (crs3383).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

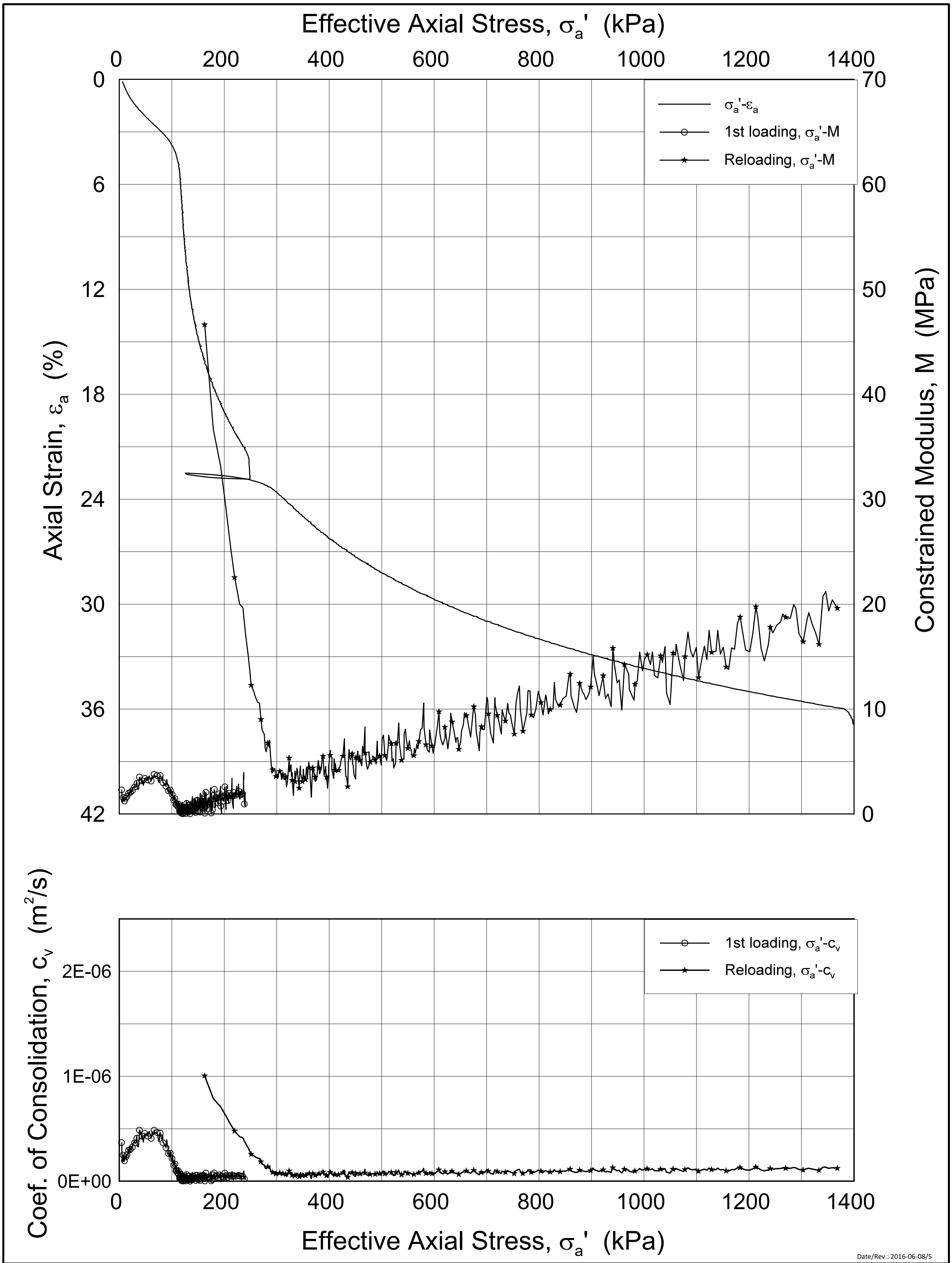
				Depth	=	14.43	m
Boring:	ONSB01	Tube:	5	p_0'	=	95.8	kPa
		Part:	A	w_i	=	68.9	%
		Test:	1	γ_i	=	16.10	kN/m³

Document No.
20160154-10-R

Figure No.
5.2.97

Date	Drawn by / Checked
2018-12-10	FP / GS

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring:	ONSB01	Tube:	5	Depth	=	14.43	m
		Part:	A	p_0'	=	95.8	kPa
		Test:	1	w_i	=	68.9	%
				γ_i	=	16.10	kN/m³

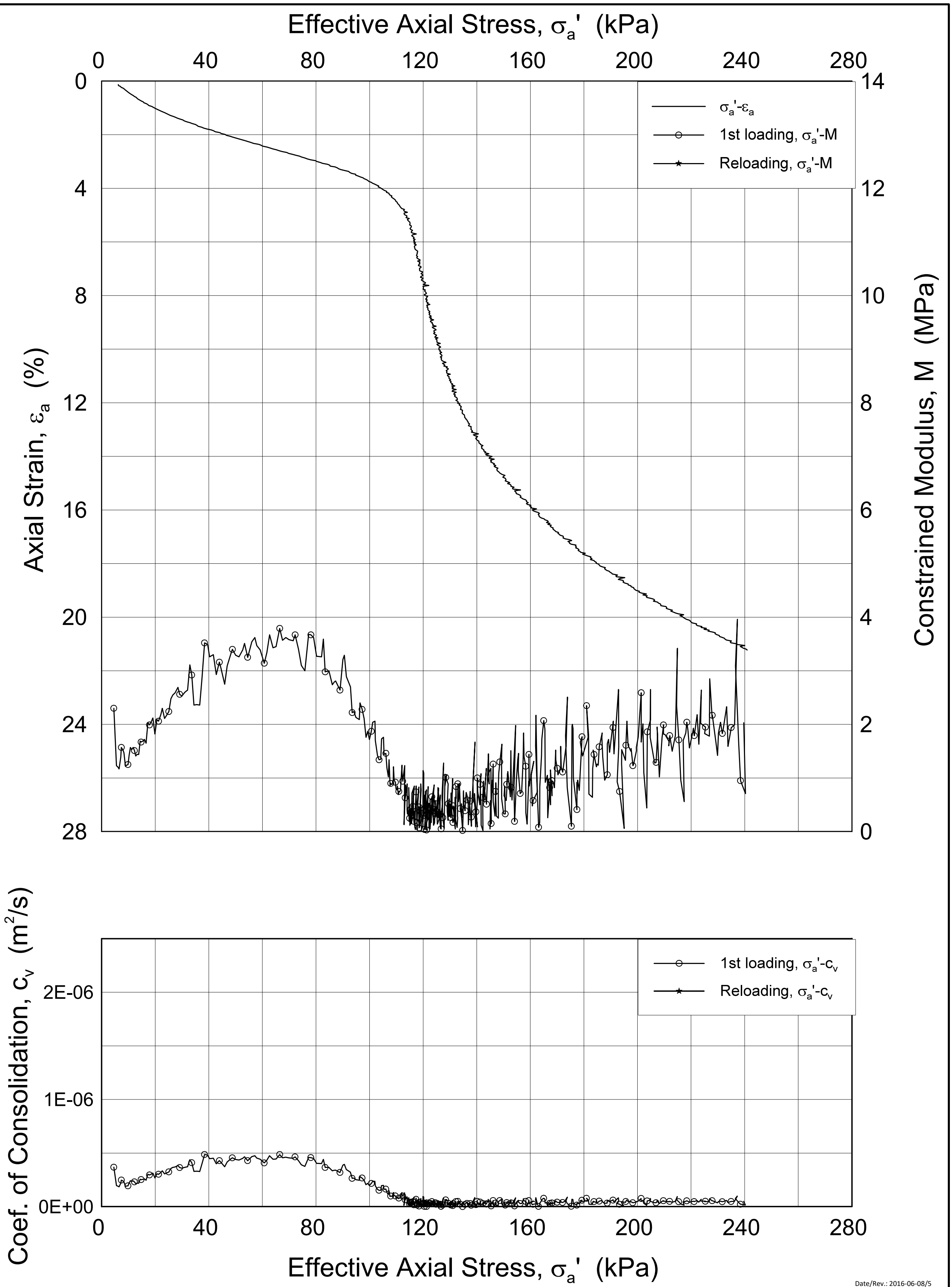
Document No. 20160154-10-R

Figure No. 5.2.98

Date 2018-12-10

Drawn by / Checked FP / GS

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.98, BL-1-5-A-1 lin (crs3383).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.99, BL-1-5-A-1 lin-2 (crs3383).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.99
	Date 2018-12-10 — Drawn by / Checked FP / GS

Boring: ONSB01 — Tube: 5 — Part: A — Test: 1

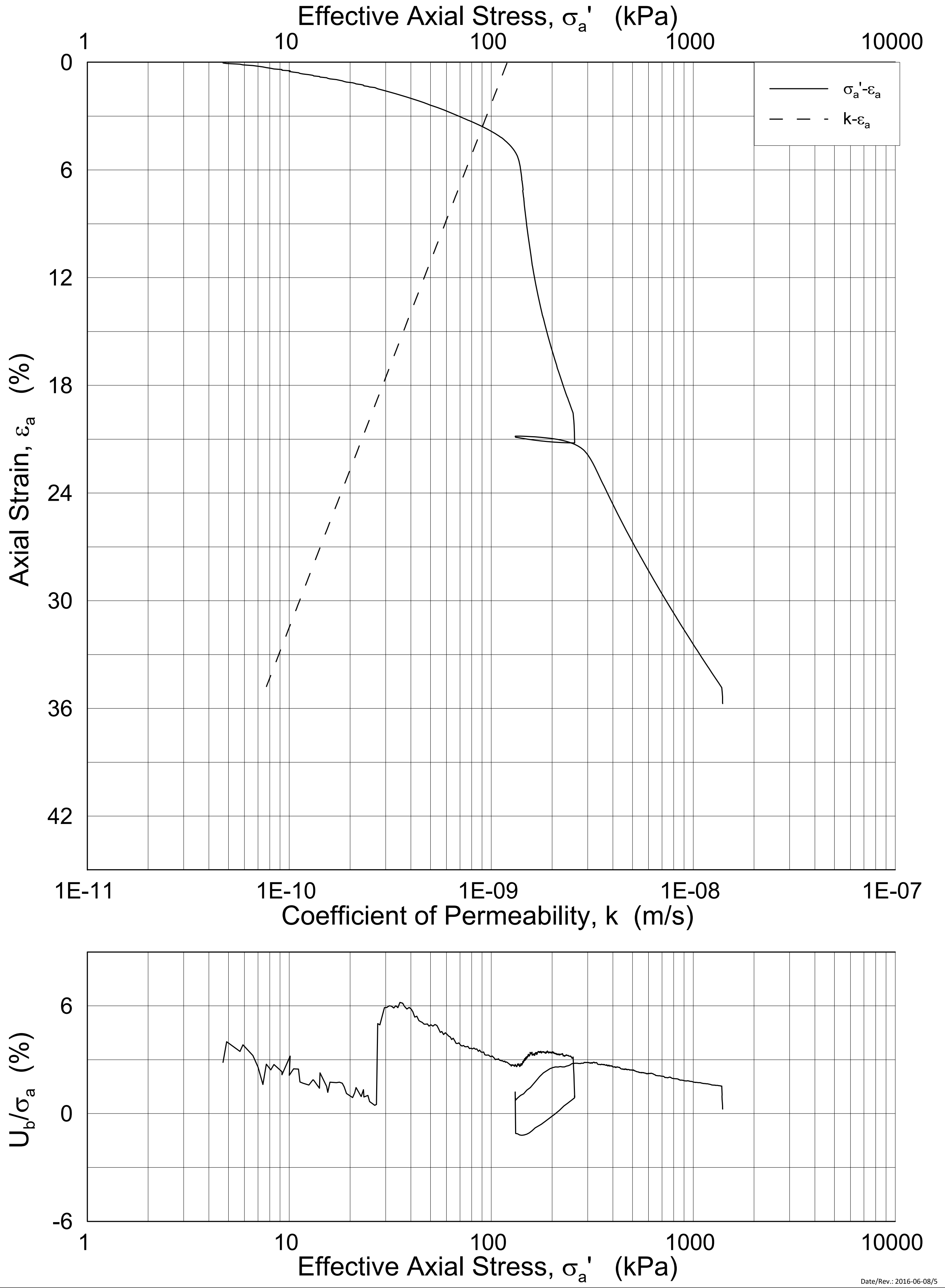
Depth = 14.43 m

p_0' = 95.8 kPa

w_i = 68.9 %

γ_i = 16.10 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring:	ONSB01	Tube:	6	Depth	=	14.82	m
		Part:	A	p_0'	=	98.1	kPa
		Test:	1	w_i	=	63.9	%
				γ_i	=	16.46	kN/m³

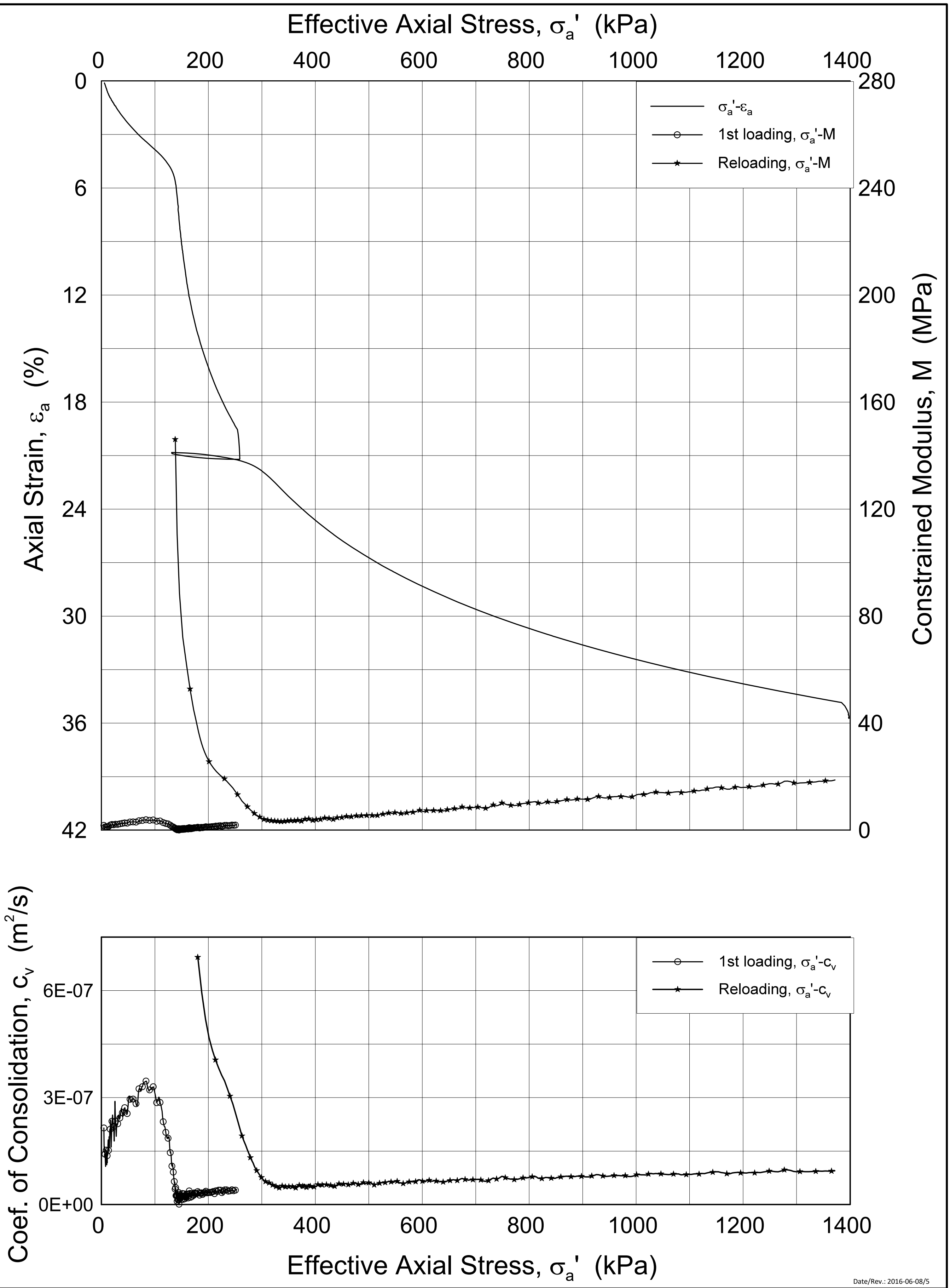
Document No.
20160154-10-R

Figure No.
5.2.100

Date	Drawn by / Checked
2018-12-10	FP / GS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.100, BL-1-6-A-1 log (crs3381).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.101, BL-1-6-A-1 lin (crs3381).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

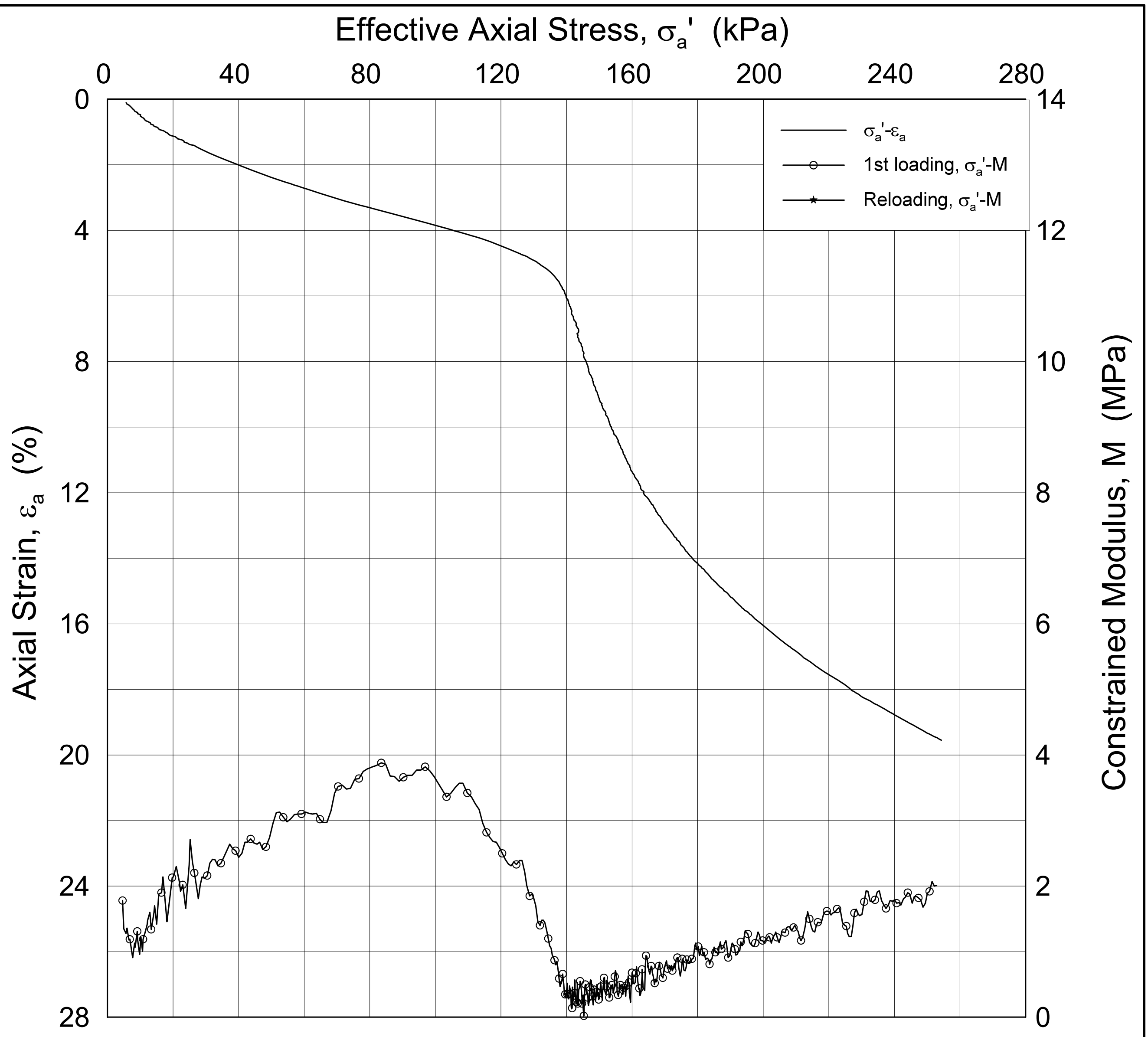
				Depth	=	14.82	m
Boring:	ONSB01	Tube:	6	p_0'	=	98.1	kPa
		Part:	A	w_i	=	63.9	%
		Test:	1	γ_i	=	16.46	kN/m³

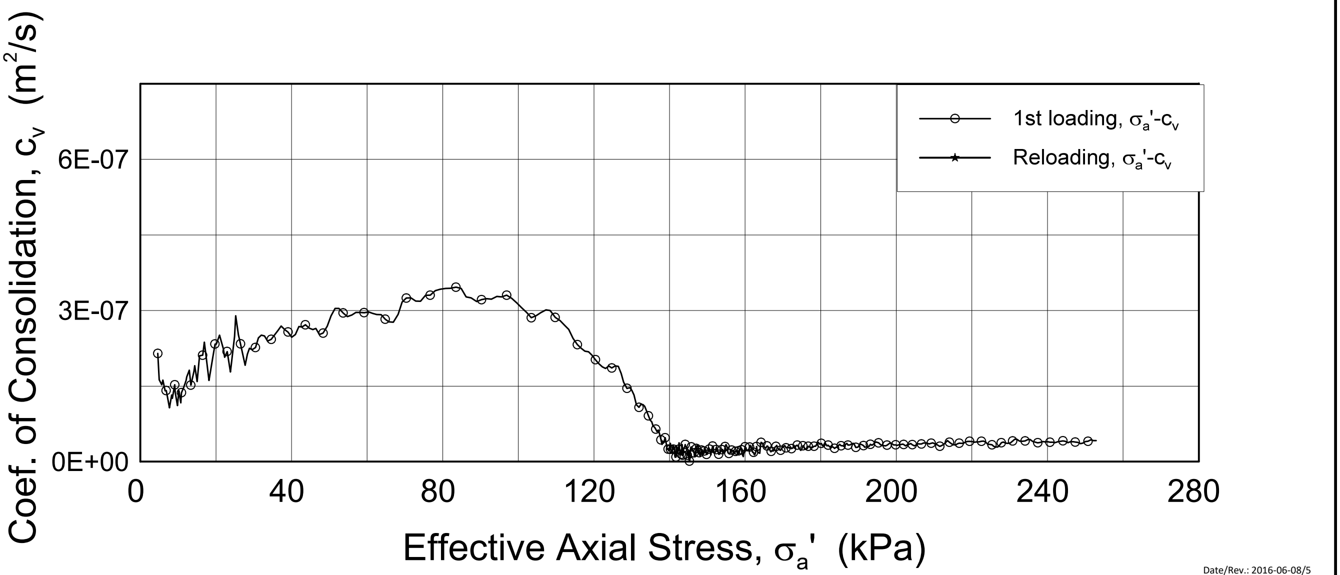
Document No. 20160154-10-R

Figure No. 5.2.101

Date 2018-12-10

Drawn by / Checked FP / GS





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.102, BL-1-6-A-1 lin-2 (crs3381).grf

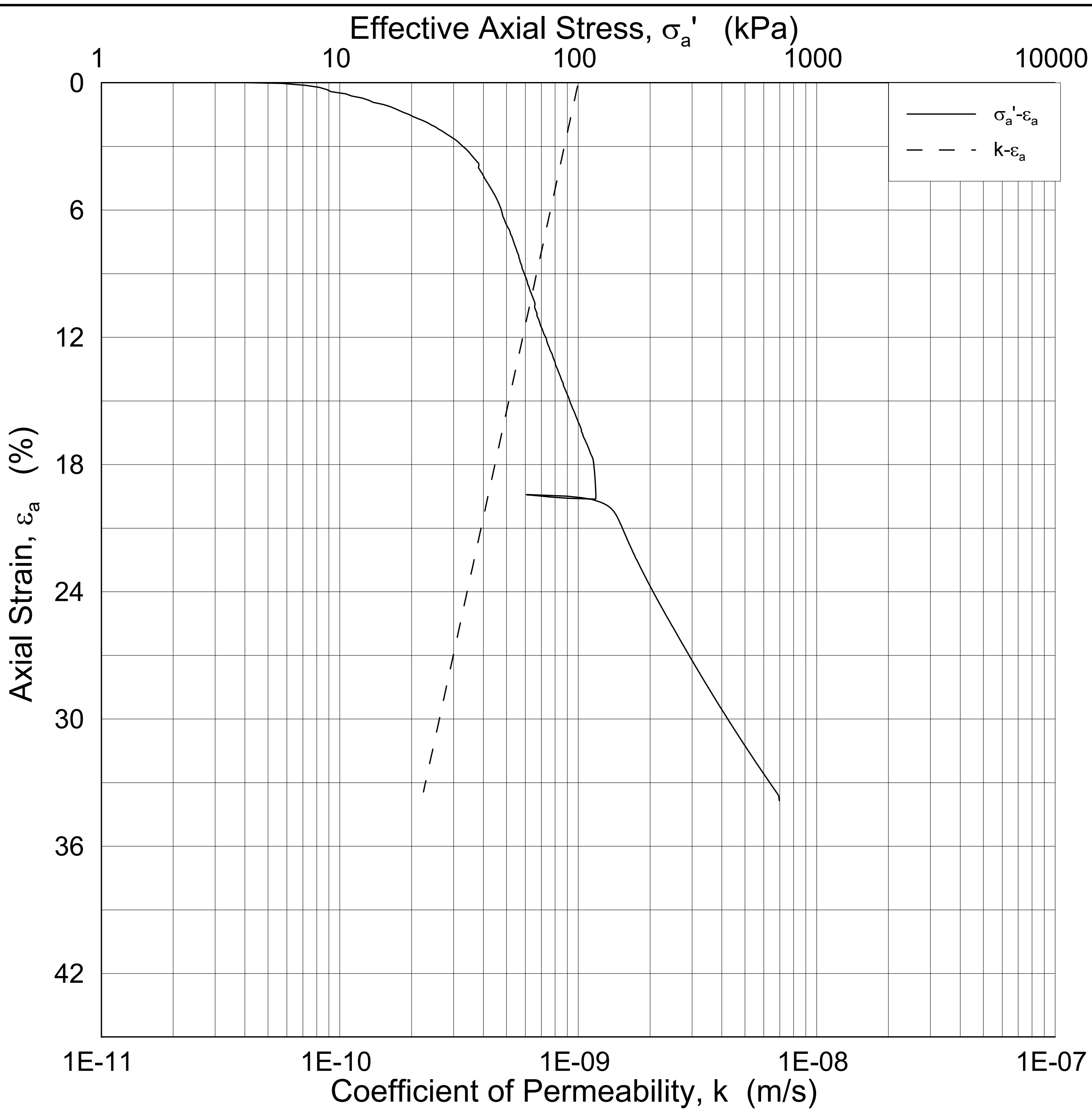
Norwegian GeoTest Sites - Onsøy

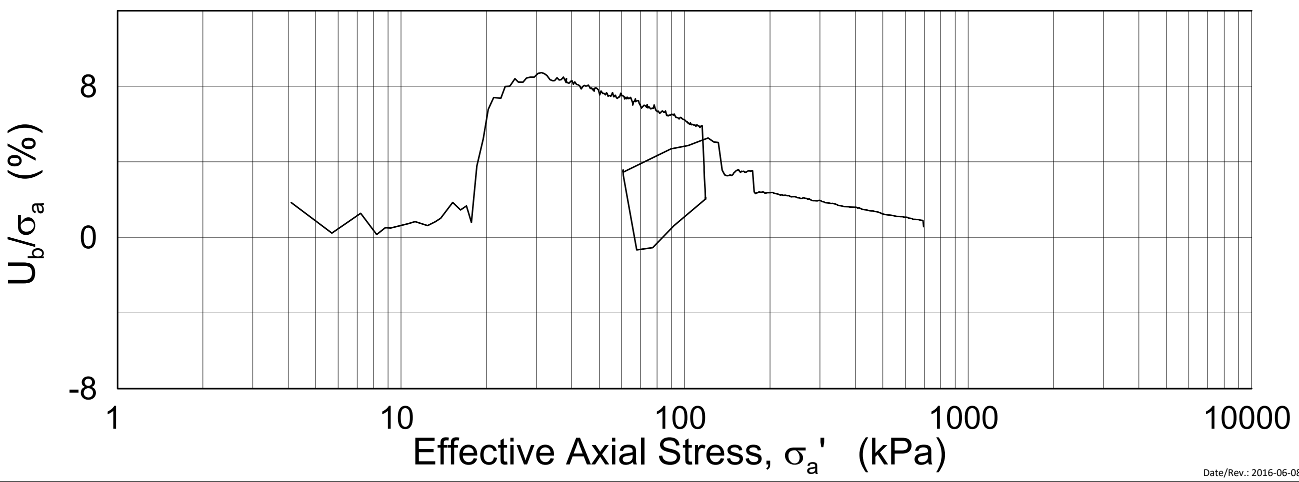
Oedometer test (CRSC)

Boring: ONSB01 Tube: 6 Part: A Test: 1

Depth = 14.82 m
p_0' = 98.1 kPa
w_i = 63.9 %
γ_i = 16.46 kN/m³

Document No.	20160154-10-R
Figure No.	5.2.102
Date	2018-12-10
Drawn by / Checked	FP / GS





Date/Rev.: 2016-06-08/5

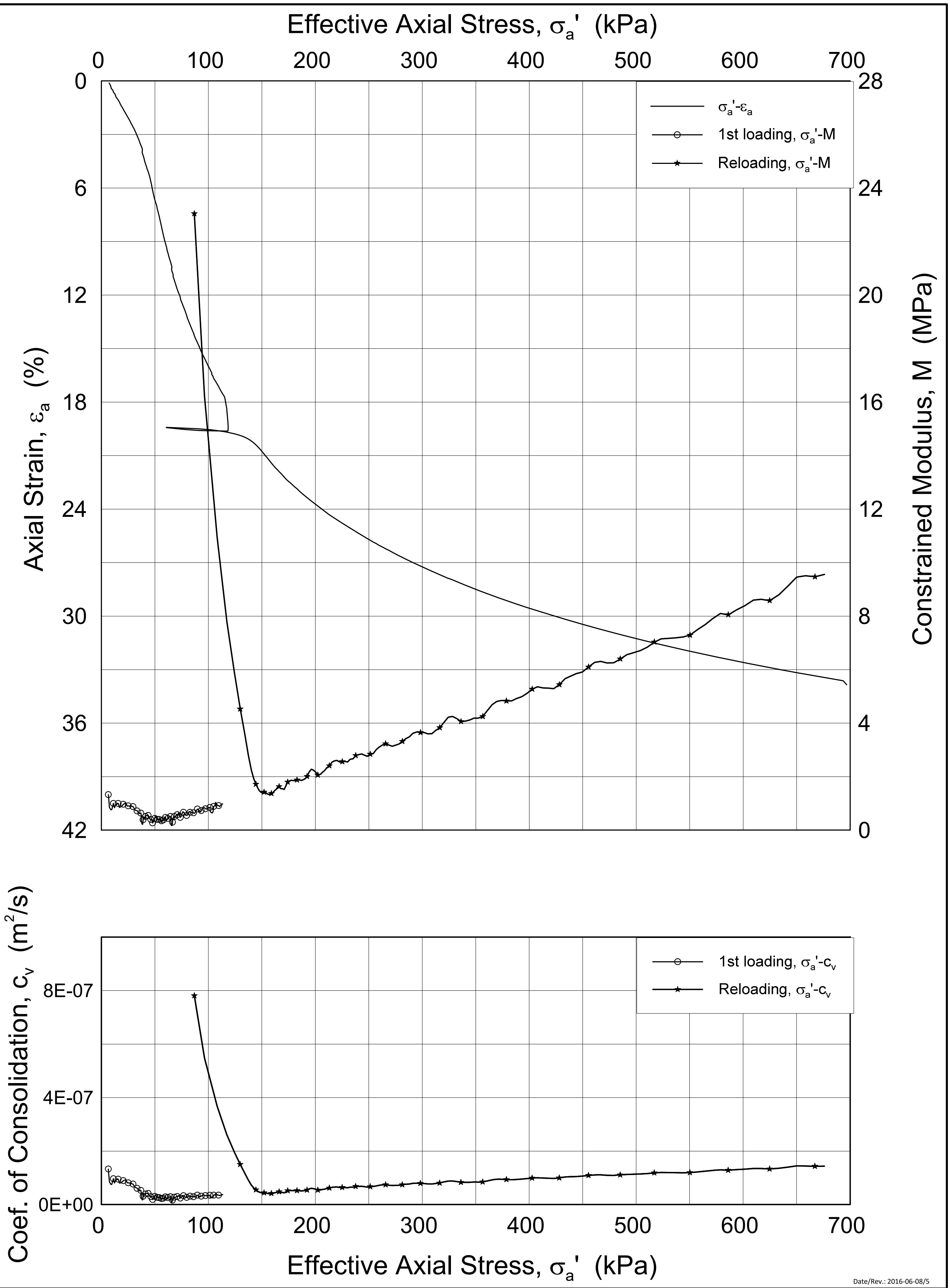
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.103, ONSB41-6-A-1 Log (CRS4134).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	5.21	m
Boring:	ONSB41	Tube:	6	p_0'	=	28.4	kPa
		Part:	A	w_i	=	78.1	%
		Test:	1	γ_i	=	15.62	kN/m³

Document No. 20160154-10-R	
Figure No. 5.2.103	
Date 2018-12-10	Drawn by / Checked FI/GS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.104, ONSB41-6-A-1 Lin (CRS4134).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.104	
	Date 2018-12-10	Drawn by / Checked FI/GS

Boring: ONSB41 — Tube: 6 — Part: A — Test: 1

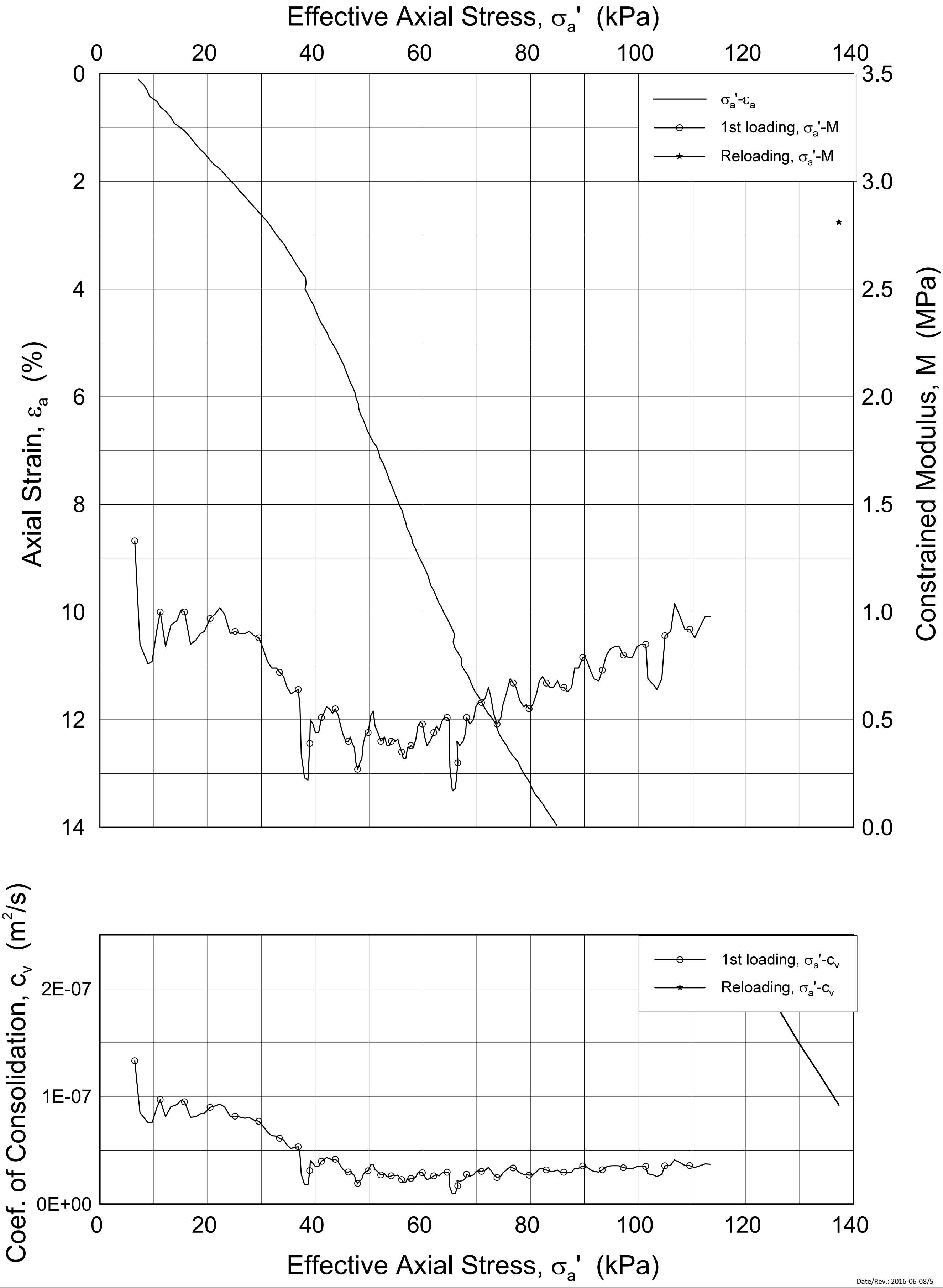
Depth = 5.21 m

p_0' = 28.4 kPa

w_i = 78.1 %

γ_i = 15.62 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.105

Date 2018-12-10

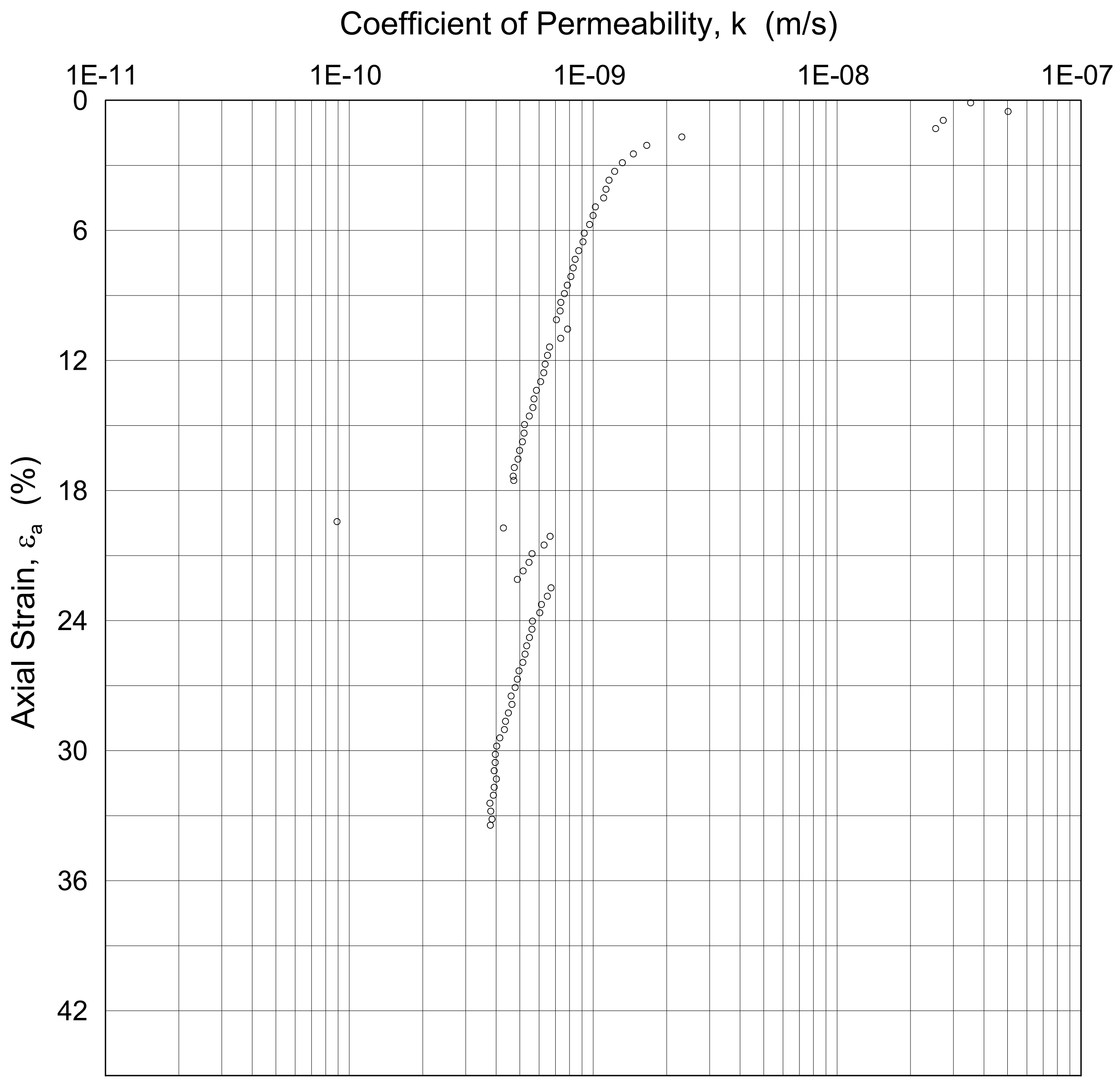
Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB41	Tube:	6		Depth	=	5.21	m
	Part:	A		p_0'	=	28.4	kPa
	Test:	1		w_i	=	78.1	%
				γ_i	=	15.62	kN/m³

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.105, ONSB41-6-A-1 Lin2 (CRS4134).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.106, kcrs4134.grf

Date/Rev.: 2016-06-08/5

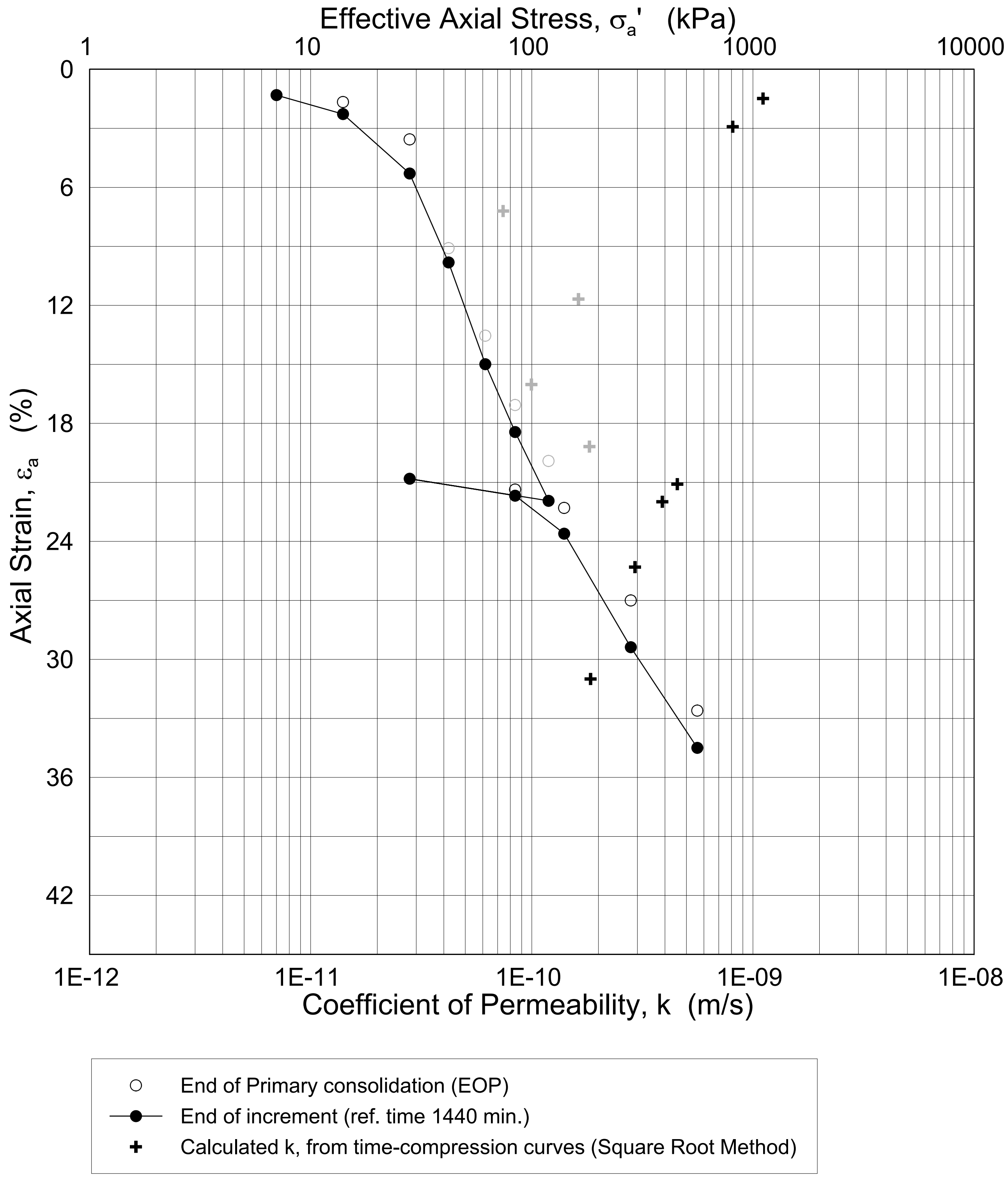
Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB41 Tube: 6
Part: A
Test: 1

Depth = 5.21 m
p_0' = 28.4 kPa
w_i = 78.1 %
γ_i = 15.62 kN/m³

Document No. 20160154-10-R
Figure No. 5.2.106
Date 2018-12-10
Drawn by / Checked FI/GS



Note: k-values and EOP values in grey refer to data of difficult interpretation

Norwegian GeoTest Sites - Onsøy

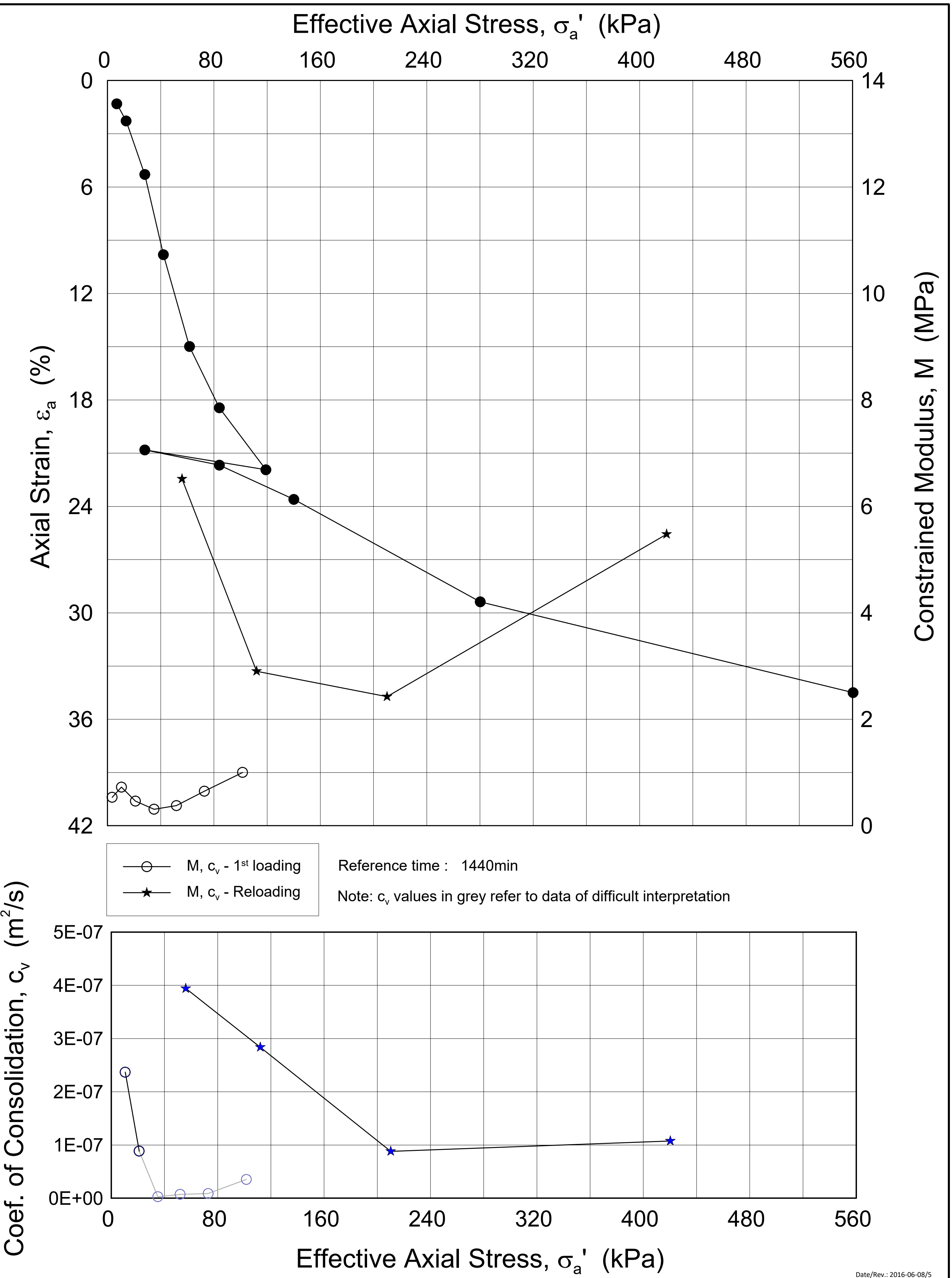
Oedometer test (CRSC)

				Depth	=	5.27	m	
Boring:	ONSB41	Tube:	6	p_0'	=	28.8	kPa	
		Part:	B	w_i	=	80.2	%	
		Test:	1	γ_i	=	15.54	kN/m³	

Document No. 20160154-10-R

Figure No. 5.2.107

Date	Drawn by / Checked
2018-12-10	JRo / PCa



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.108, ONSB41-6-B-1-LIN.grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.108

Date 2018-12-10

Drawn by / Checked JRo/ PCa

Oedometer test (CRSC)

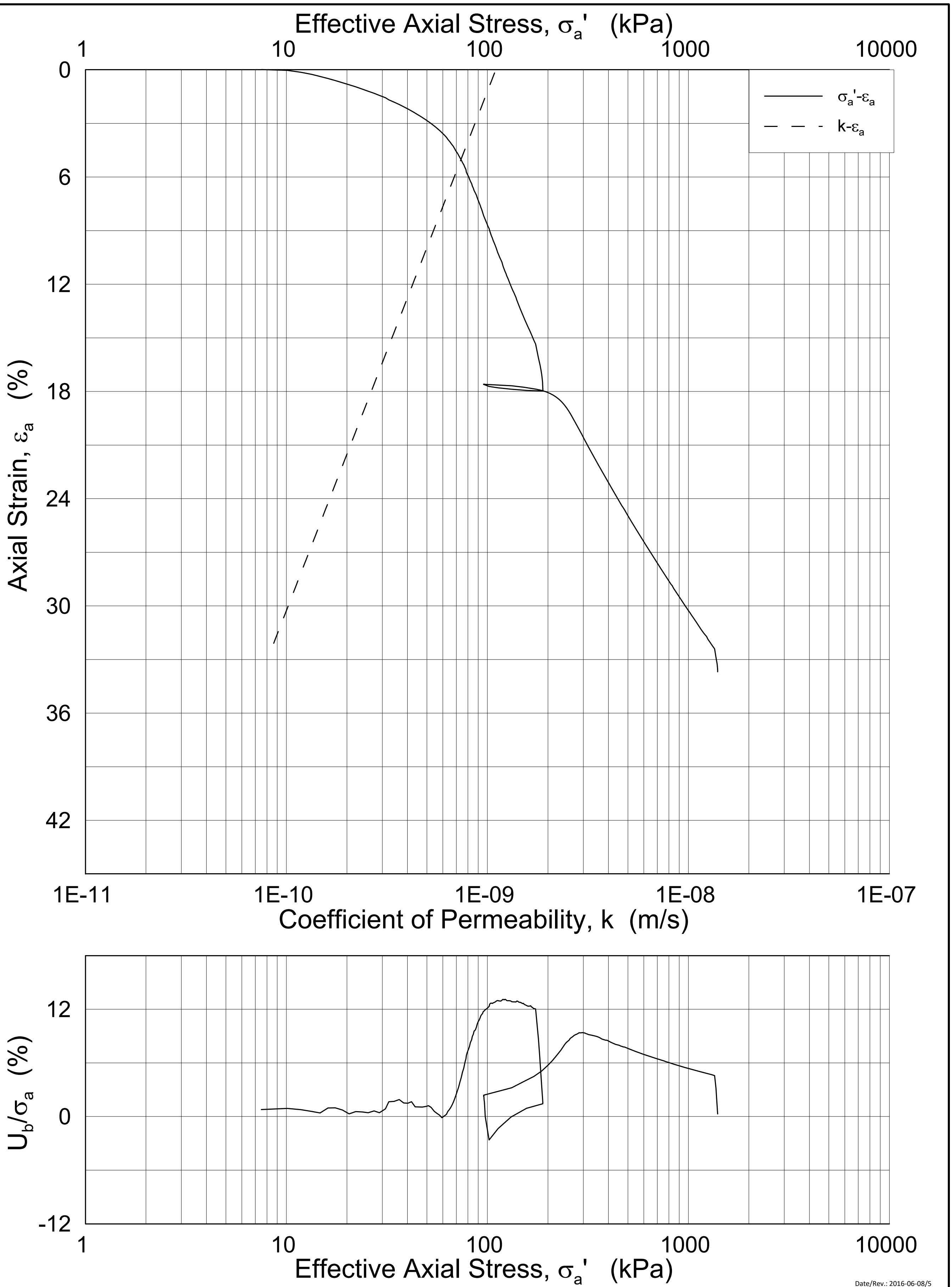
Boring: ONSB41 Tube: 6 Part: B Test: 1

Depth = 5.27 m

p_0' = 28.8 kPa

w_i = 80.2 %

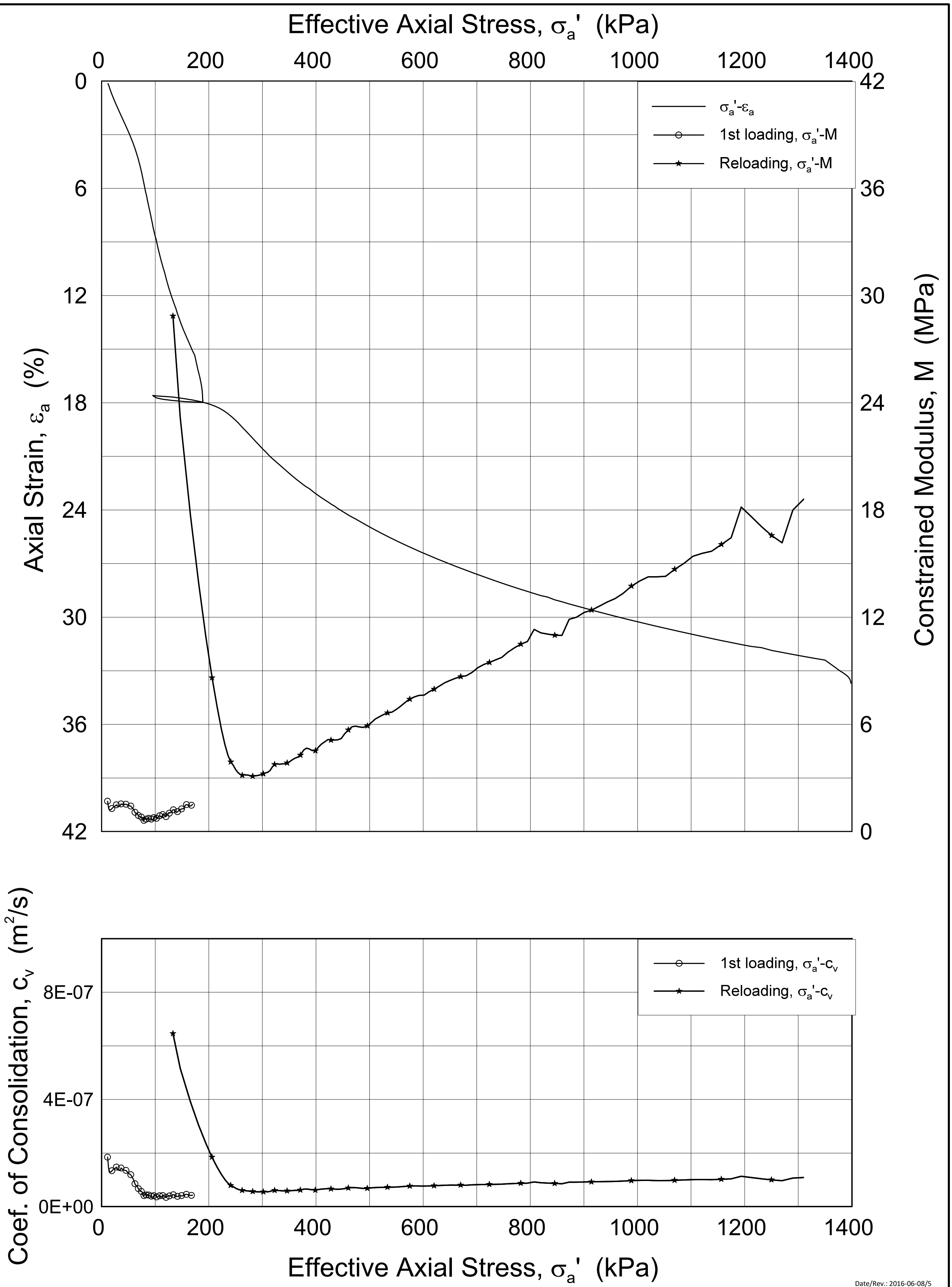
γ_i = 15.54 kN/m^3



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.109	
Boring: ONSB41 Tube: 10 Part: A Test: 1	Date 2018-12-10	Drawn by / Checked FI/GS
Depth = 8.62 m; p_0' = 54.0 kPa; w_i = 67.1 %; γ_i = 16.03 kN/m³	NGI	

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.109, ONSB41-10-A-1 Log (CRS4133).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.110, ONSB41-10-A-1 Lin (CRS4133).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.110

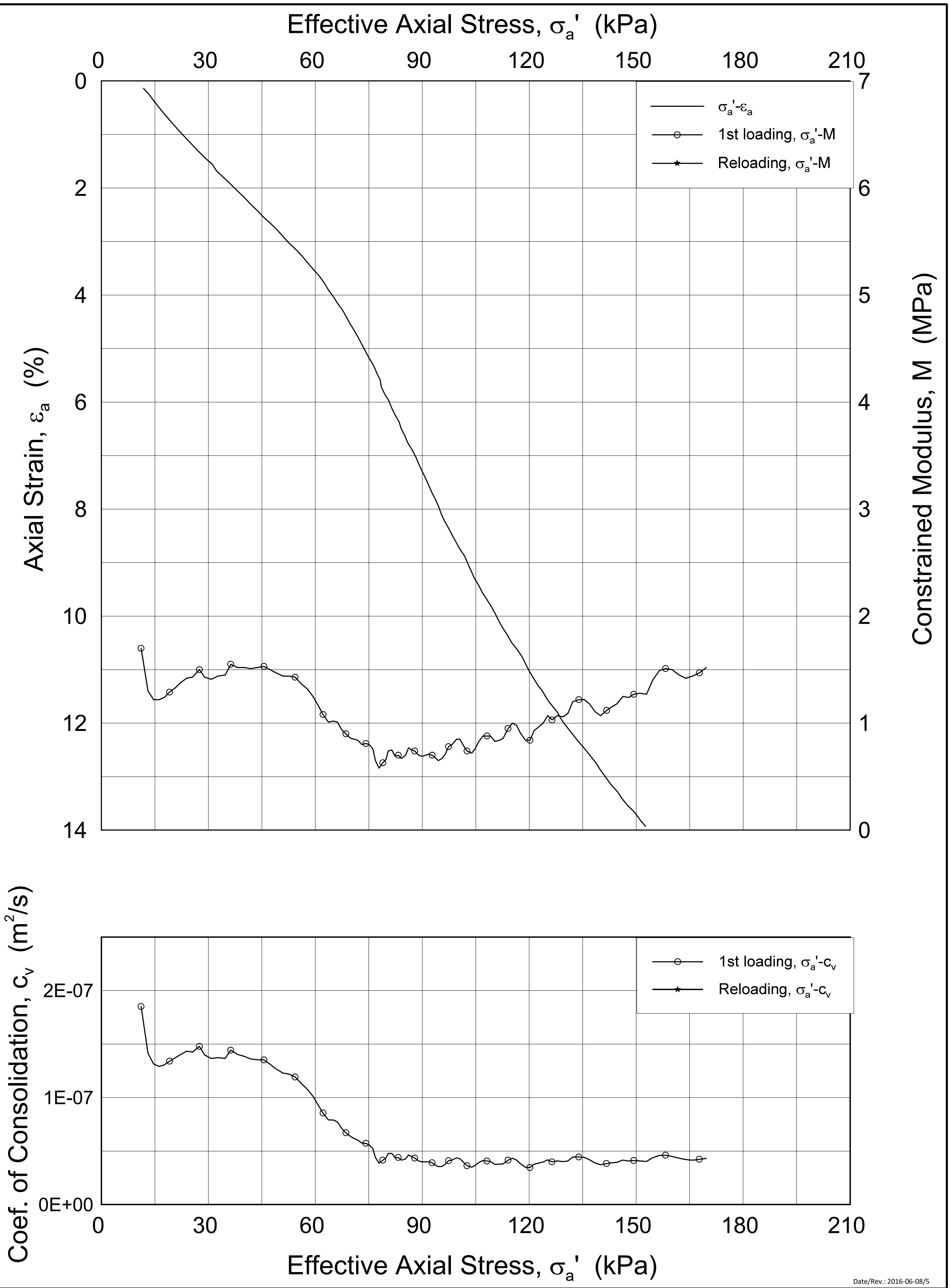
Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB41	Tube:	10	Depth	=	8.62	m
			p_0'	=	54.0	kPa
	Part:	A	w_i	=	67.1	%
	Test:	1	γ_i	=	16.03	kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	8.62	m
Boring:	ONSB41	Tube:	10	p_0'	=	54.0	kPa
		Part:	A	w_i	=	67.1	%
		Test:	1	γ_i	=	16.03	kN/m³

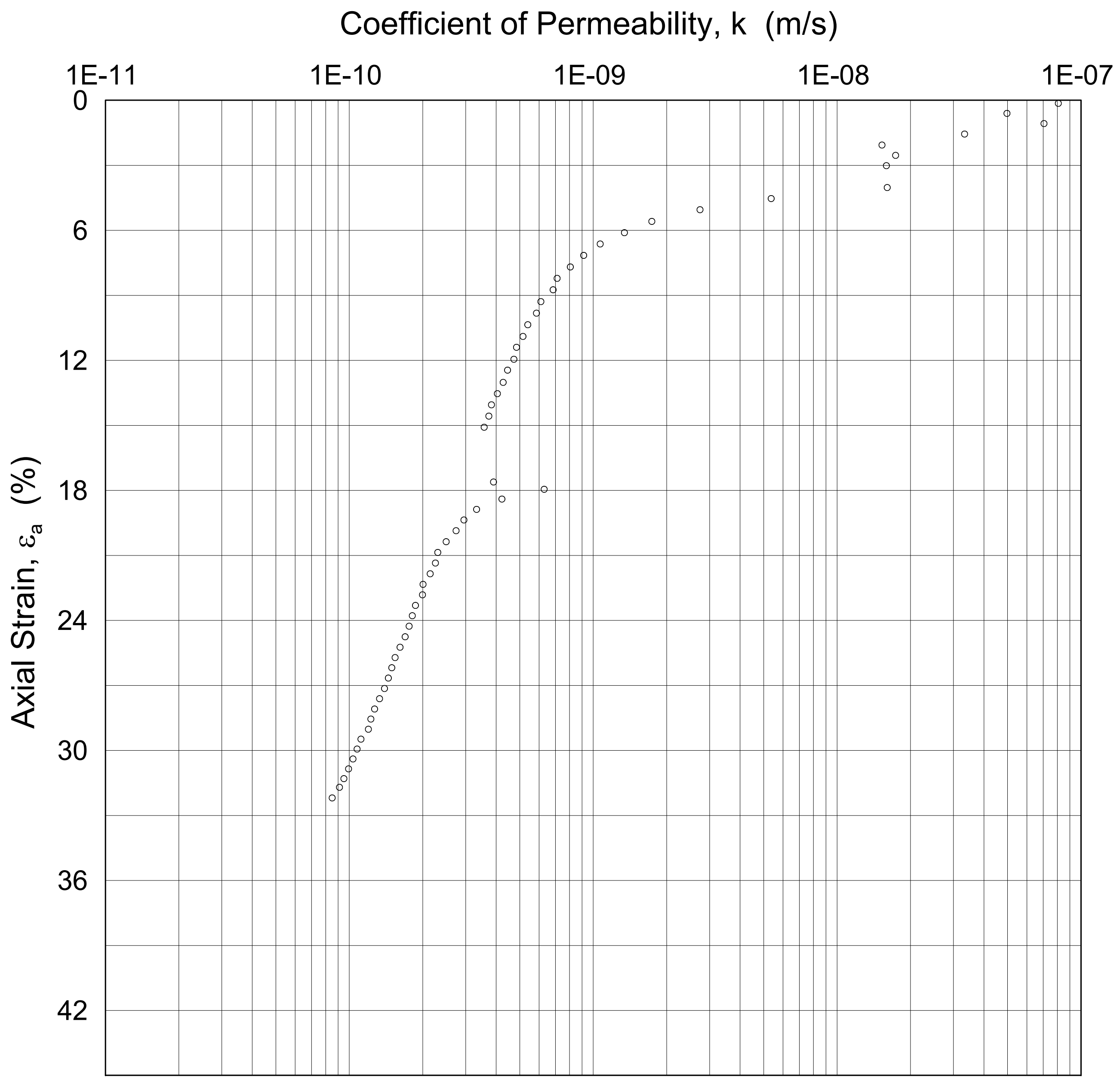
Document No.
20160154-10-R

Figure No.
5.2.111

Date
2018-12-10

Drawn by / Checked
FI/GS

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.111, ONSB41-10-A-1 Lin2 (CRS4133).grf



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB41 Tube: 10

Part: A

Test: 1

Depth = 8.62 m

p_0' = 54.0 kPa

w_i = 67.1 %

γ_i = 16.03 kN/m³

Document No. 20160154-10-R

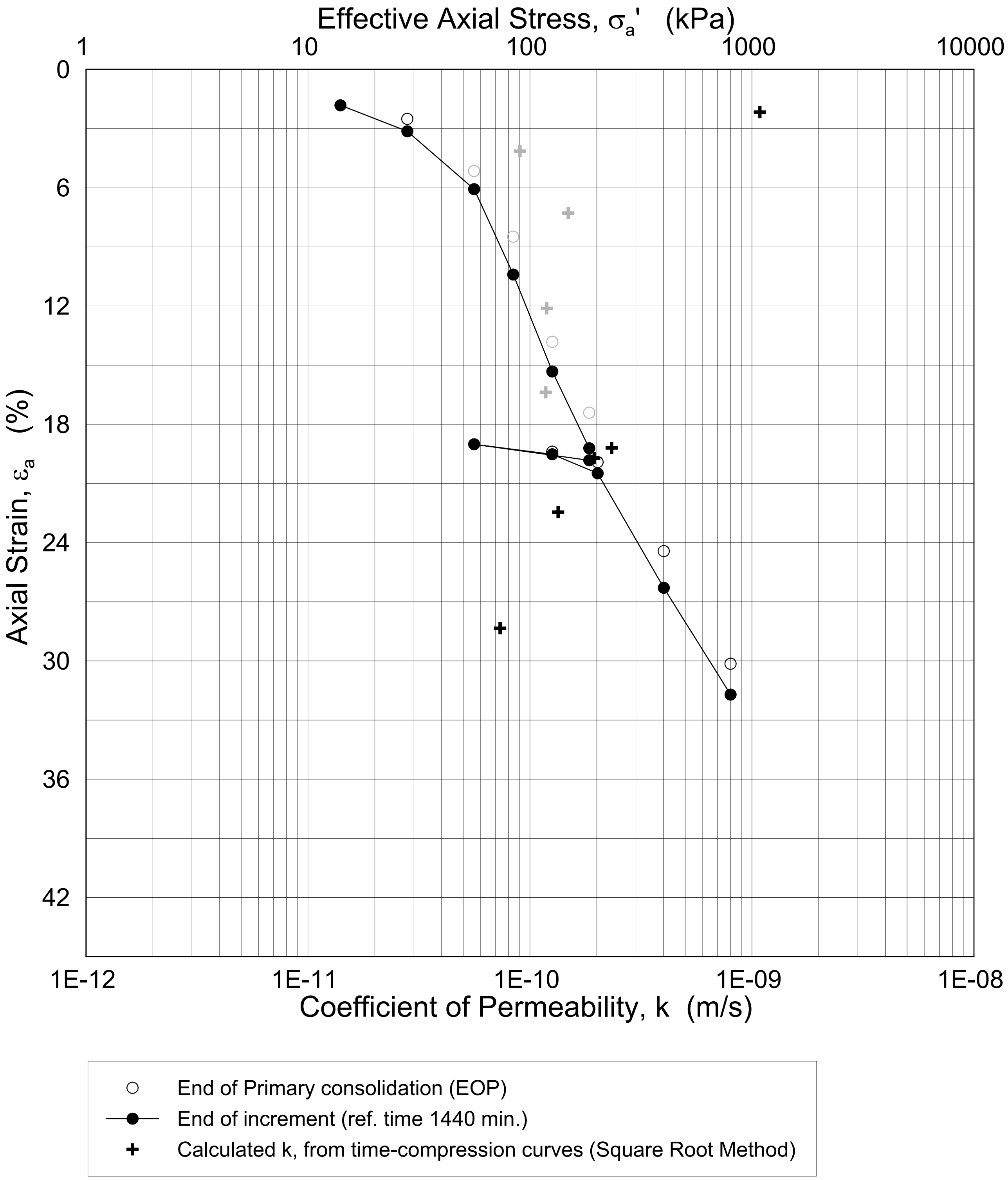
Figure No. 5.2.112

Date 2018-12-10

Drawn by / Checked FI/GS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.112, kcrs4133.grf



Note: k-values and EOP values in grey refer to data of difficult interpretation

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	8.67	m	
Boring:	ONSB41	Tube:	10	p_0'	=	54.3	kPa	
		Part:	B	w_i	=	66.2	%	
		Test:	1	γ_i	=	16.31	kN/m³	

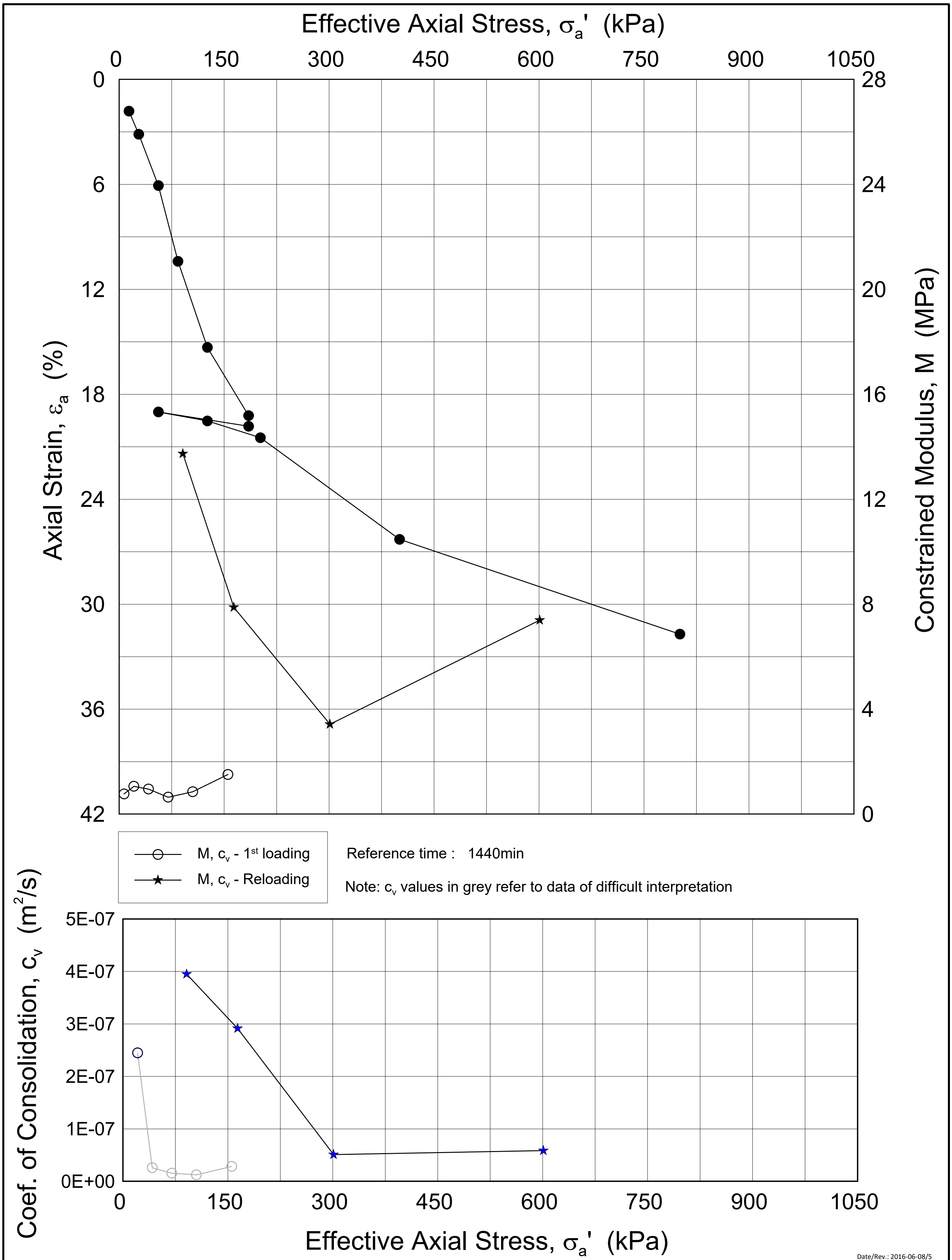
Document No. 20160154-10-R

Figure No. 5.2.113

Date 2018-12-10

Drawn by / Checked JRo / PCa

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.113, ONSB41-10-B-1_data-LOG.grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.114, ONSB41-10-B-1_data-LIN.grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.114

Date 2018-12-10

Drawn by / Checked JRo/ PCa

Oedometer test (CRSC)

Boring: ONSB41 Tube: 10 Part: B Test: 1

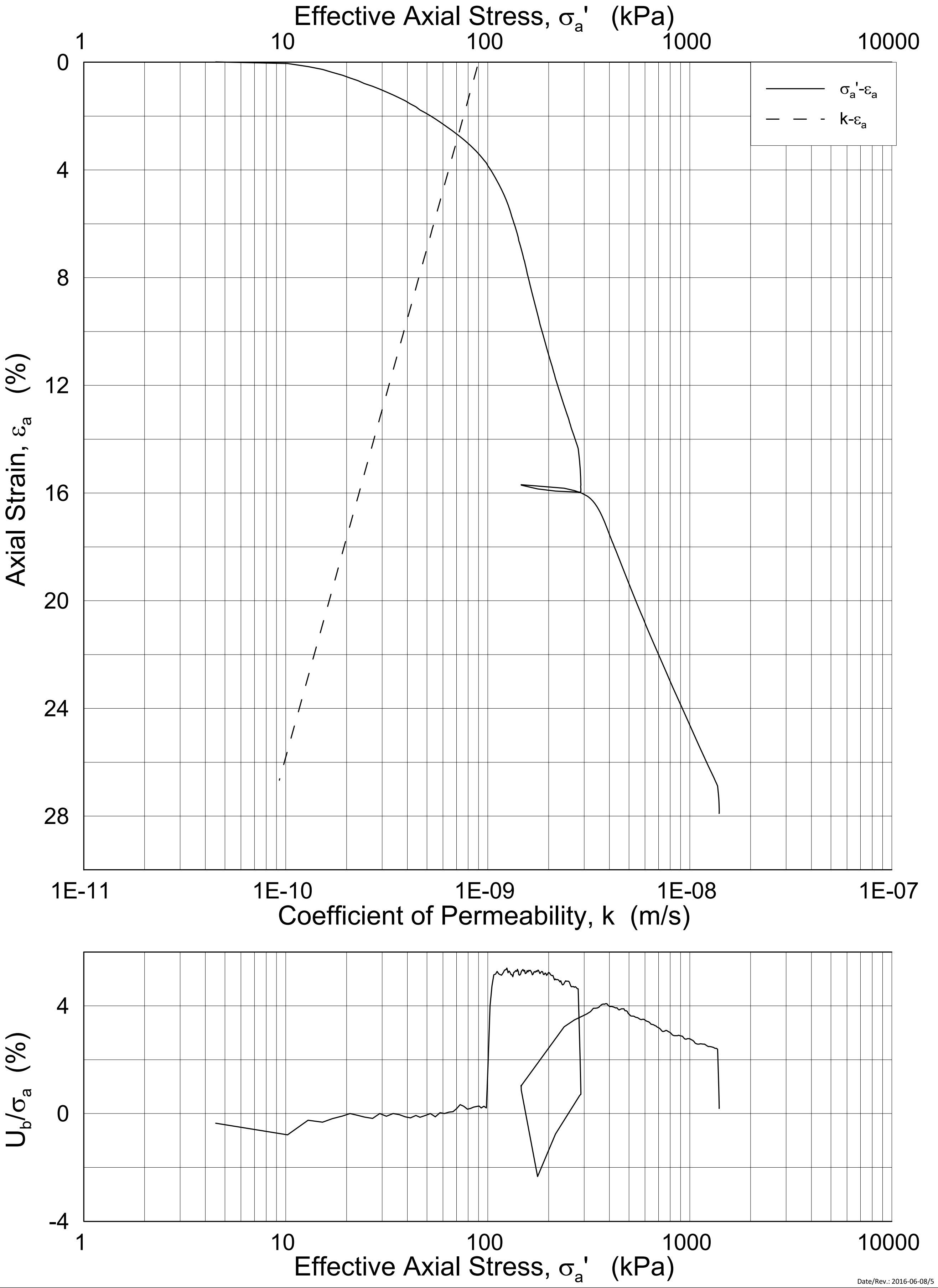
Depth = 8.67 m

p_0' = 54.3 kPa

w_i = 66.2 %

γ_i = 16.31 kN/m³

NGI



P:\2016\01\20160154\Leveranseddokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.115, ONSB41-17-A-1 Log (CRS4132).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.115
	Date 2018-12-10 — Drawn by / Checked FI/GS

Boring: ONSB41 Tube: 17 Part: A Test: 1

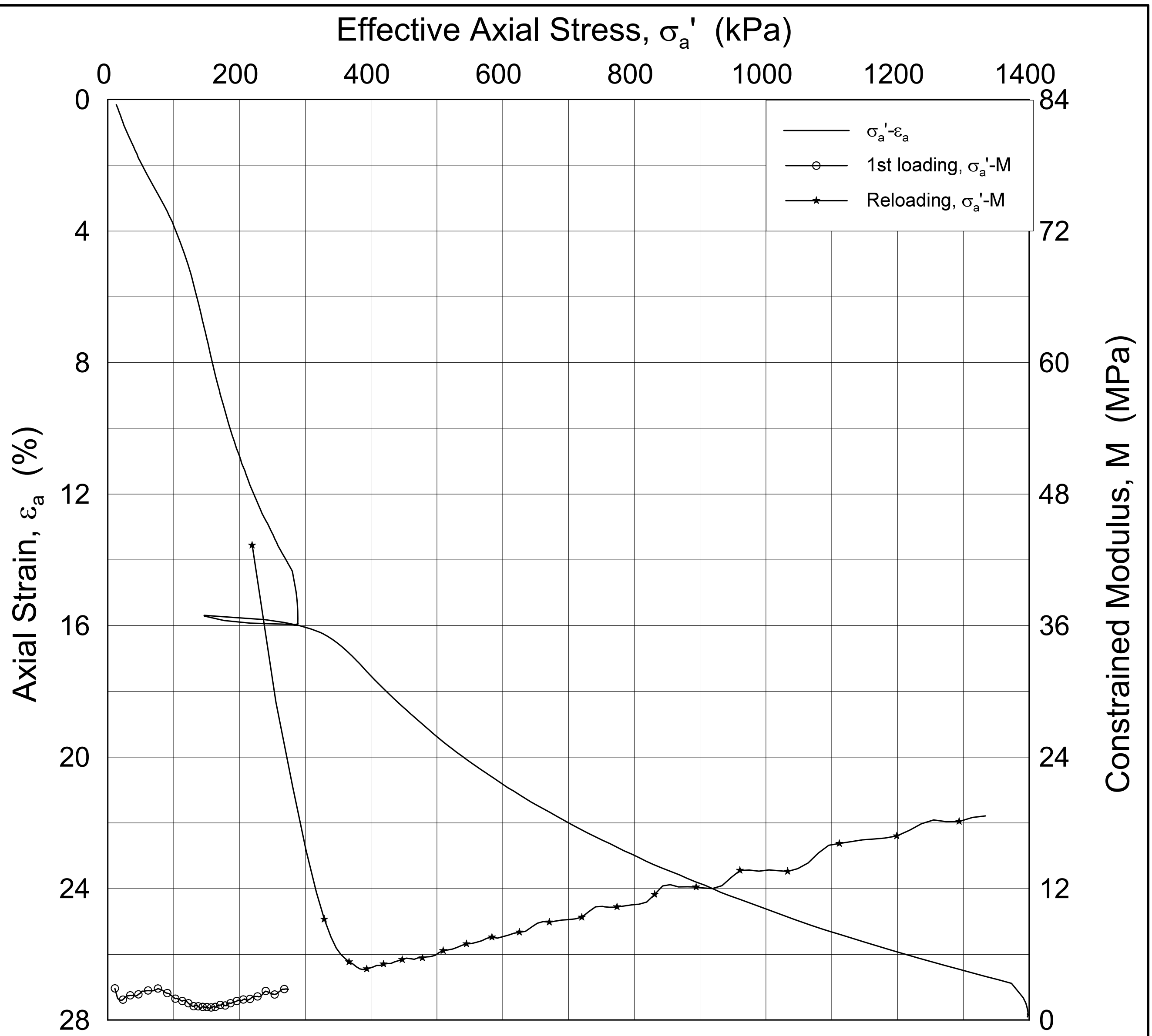
Depth = 16.12 m

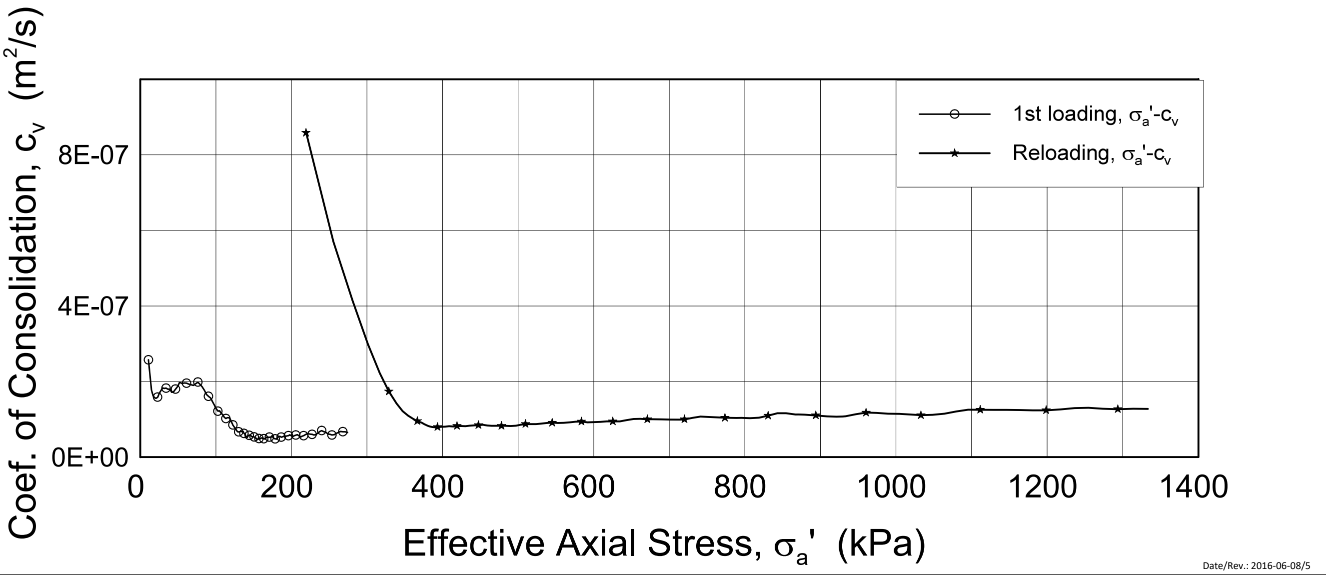
p_0' = 108.7 kPa

w_i = 48.5 %

γ_i = 17.48 kN/m³

NGI





P:\2016\01\20160154\Leveranseddokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.116, ONSB41-17-A-1 Lin (CRS4132).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.116
Depth = 16.12 m	Date 2018-12-10 / Drawn by / Checked FI/GS

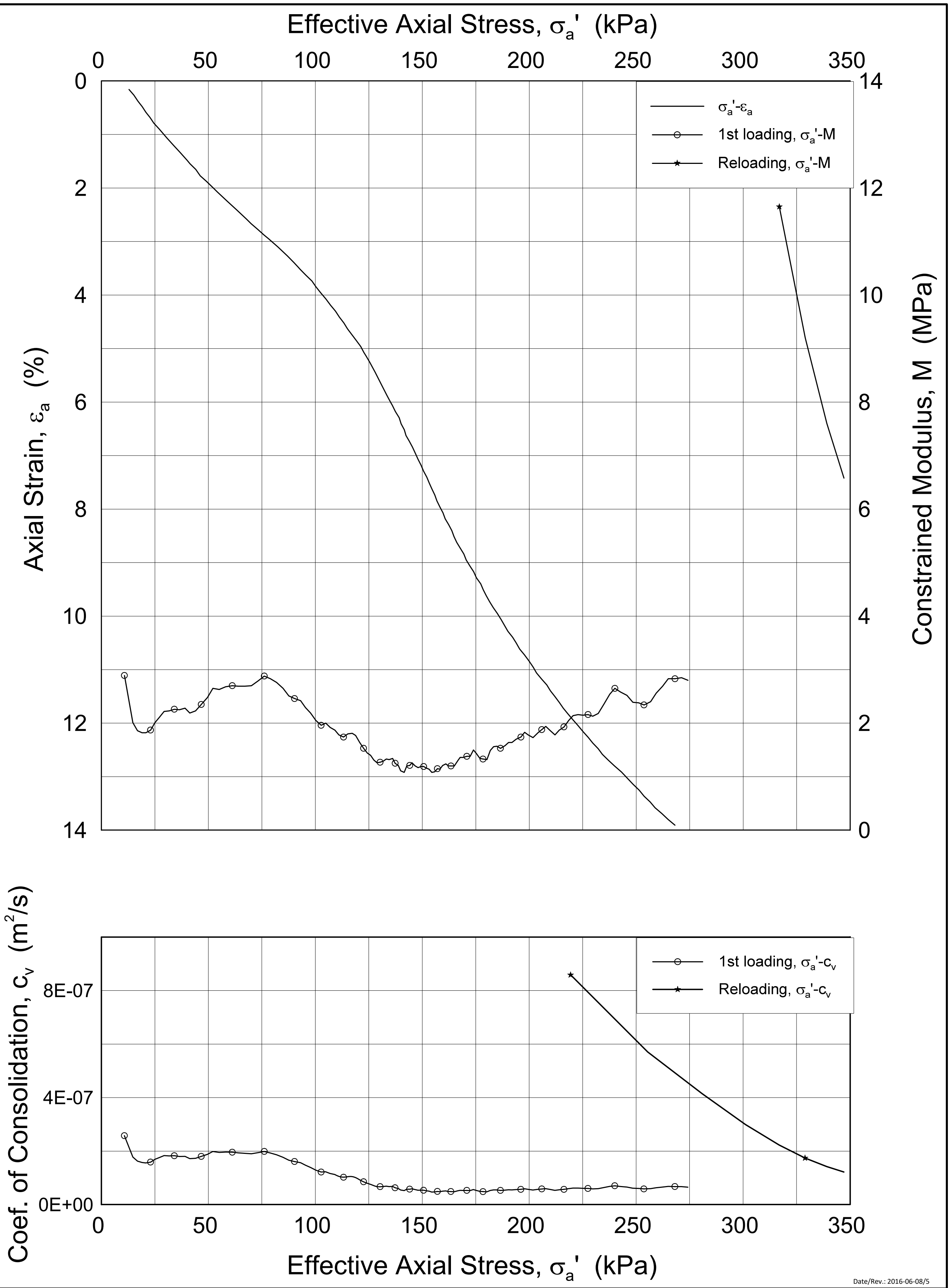
Boring: ONSB41 Tube: 17 Part: A Test: 1

p_0' = 108.7 kPa

w_i = 48.5 %

γ_i = 17.48 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.117, ONSB41-17-A-1 Lin2 (CRS4132).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.117

Oedometer test (CRSC)

Date	Drawn by / Checked
2018-12-10	FI/GS

Boring: ONSB41 — Tube: 17 — Part: A — Test: 1

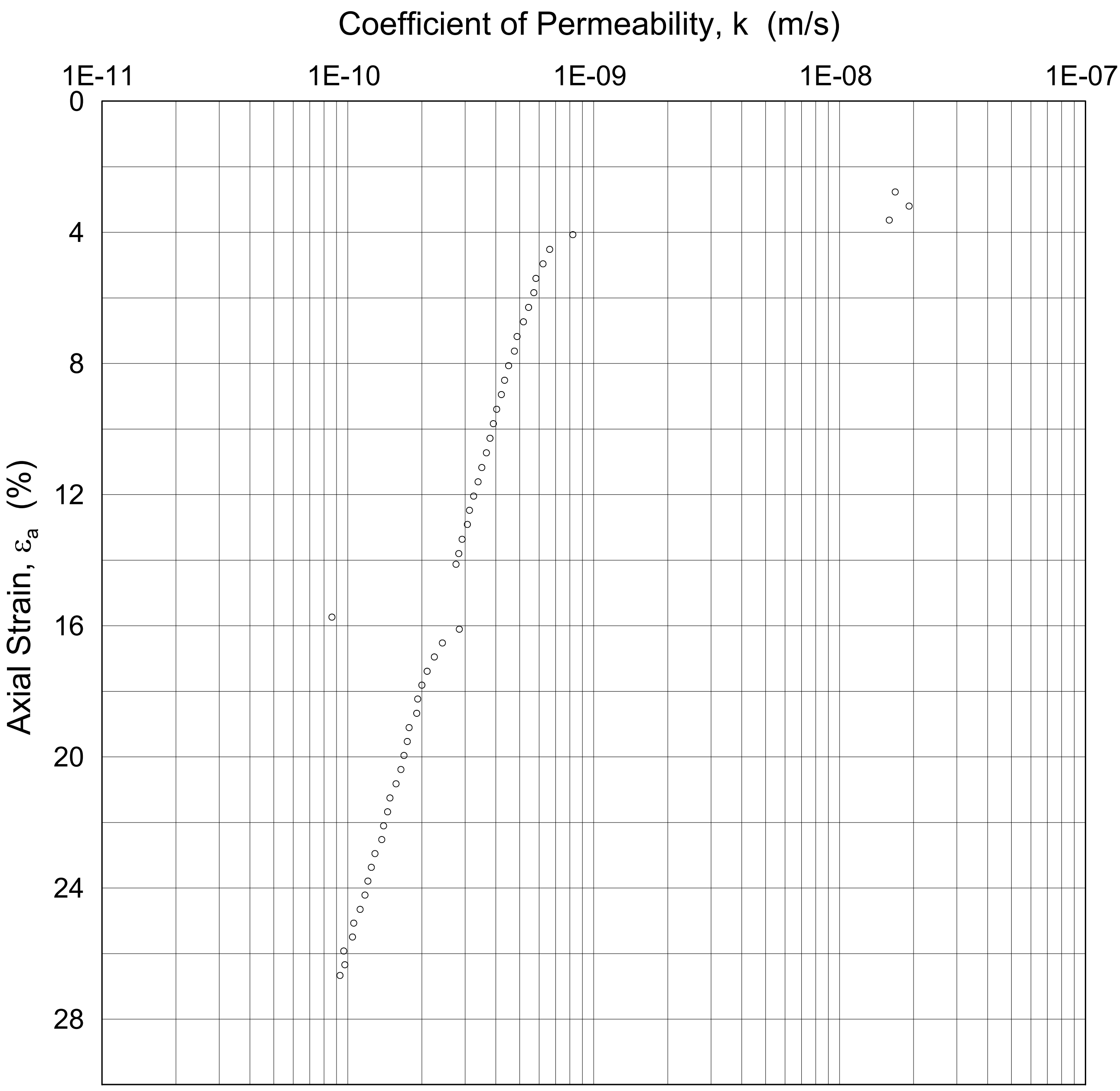
Depth = 16.12 m

p_0' = 108.7 kPa

w_i = 48.5 %

γ_i = 17.48 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

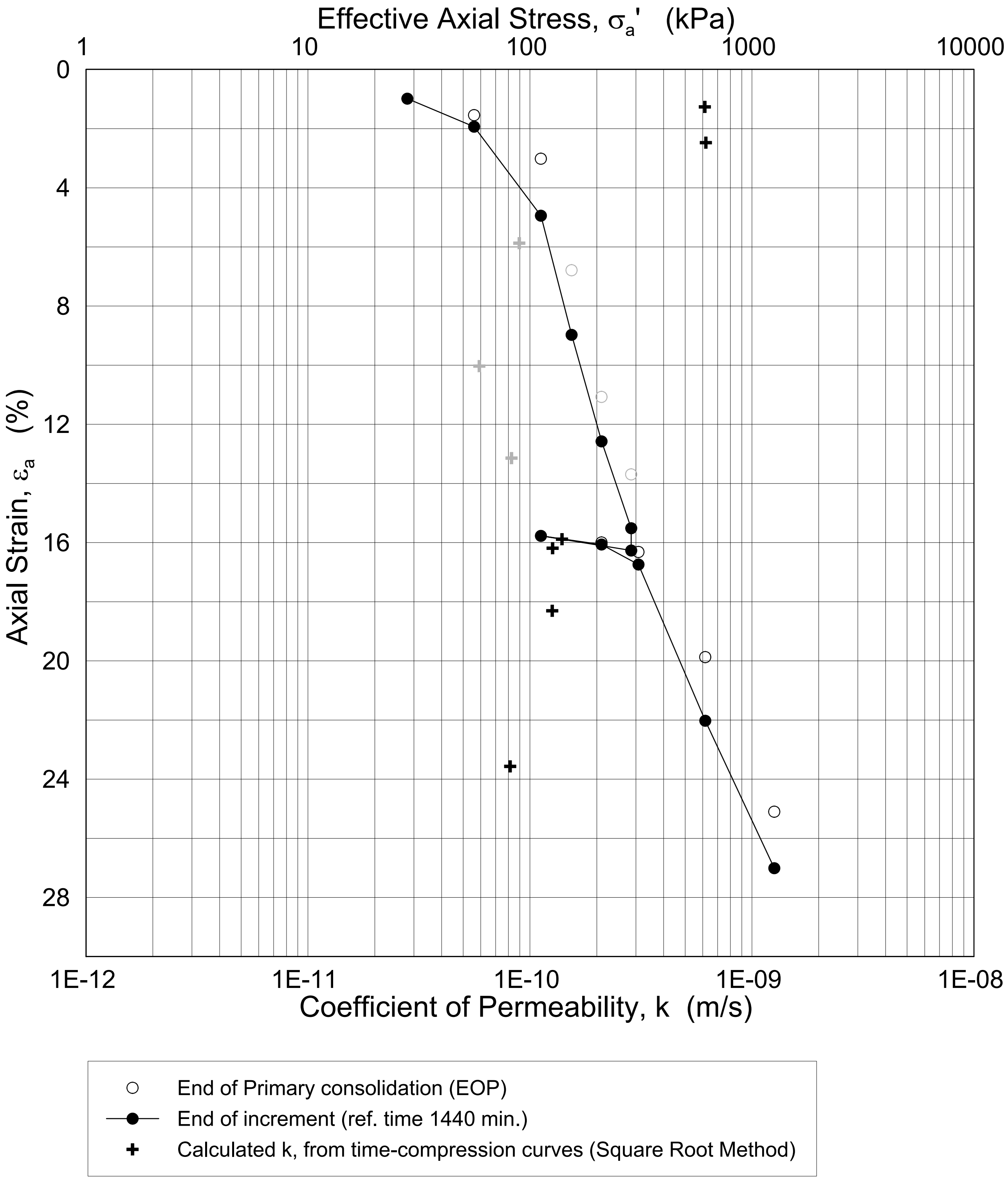
Oedometer test (CRSC)

Boring: ONSB41	Tube:	17	Depth	=	16.12	m
	Part:	A	p_0'	=	108.7	kPa
	Test:	1	w_i	=	48.5	%
			γ_i	=	17.48	kN/m³

Document No. 20160154-10-R
Figure No. 5.2.118
Date 2018-12-10
Drawn by / Checked FI/GS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.118, kcrs4132.grf



Note: k-values and EOP values in grey refer to data of difficult interpretation

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.119
	Date 2018-12-10 — Drawn by / Checked JRo / PCa

Boring: ONSB41 Tube: 17 Part: B Test: 1

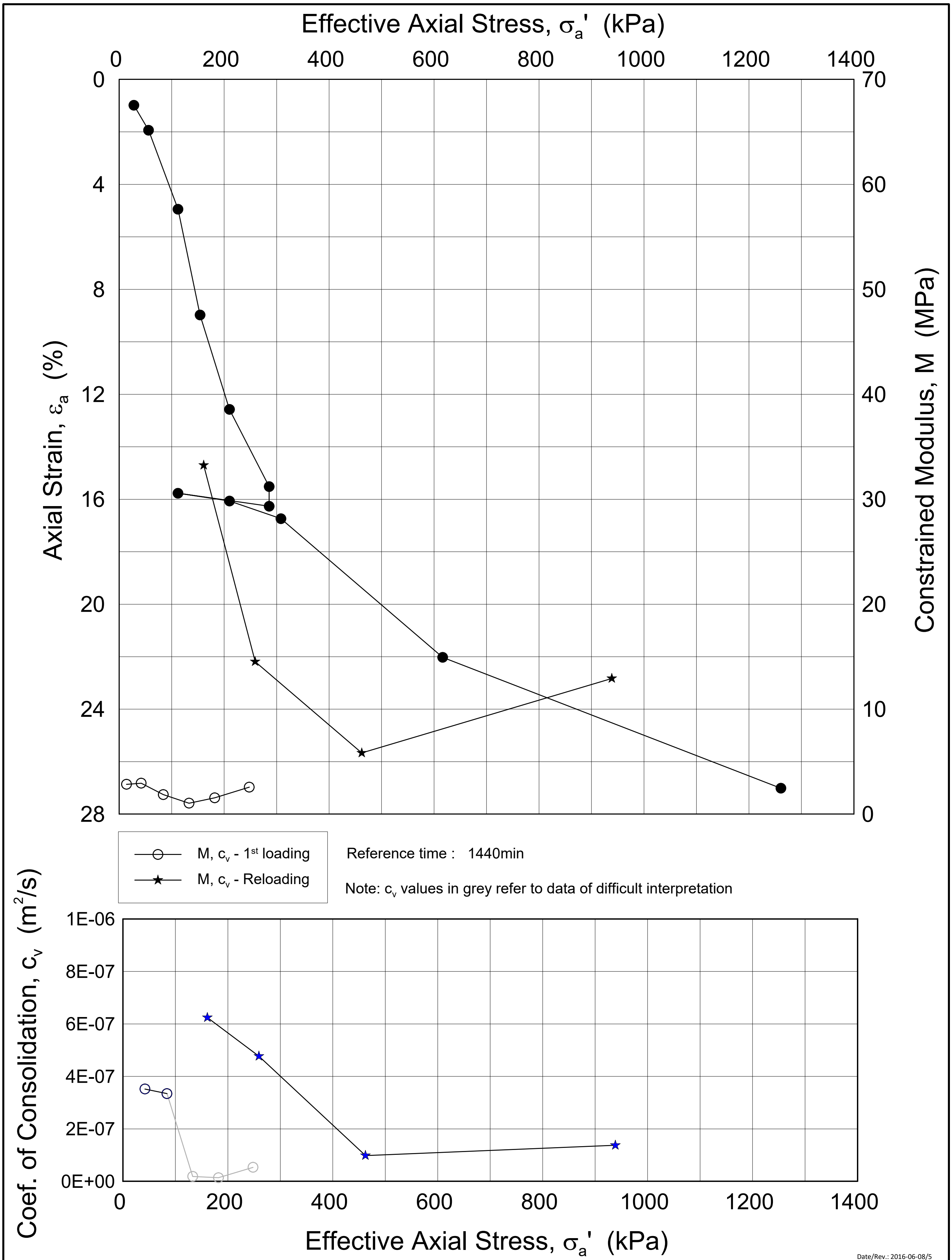
Depth = 16.17 m

p_0' = 109.1 kPa

w_i = 47.5 %

γ_i = 17.48 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.119, ONSB41-17-B-1_data-LOG.grf



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.120

Date 2018-12-10

Drawn by / Checked JRo/ PCa

Oedometer test (CRSC)

Boring: ONSB41 Tube: 17 Part: B Test: 1

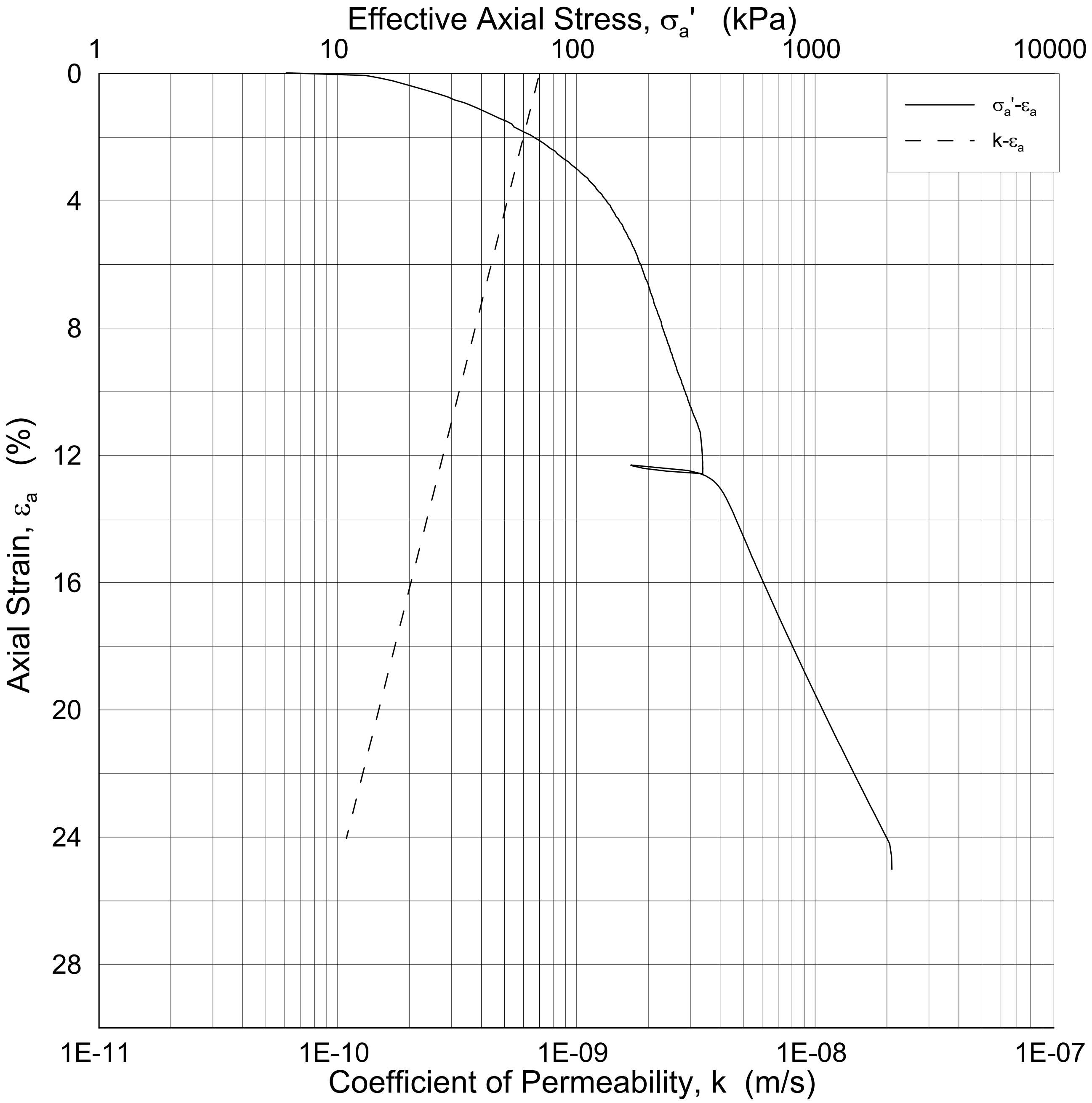
Depth = 16.17 m

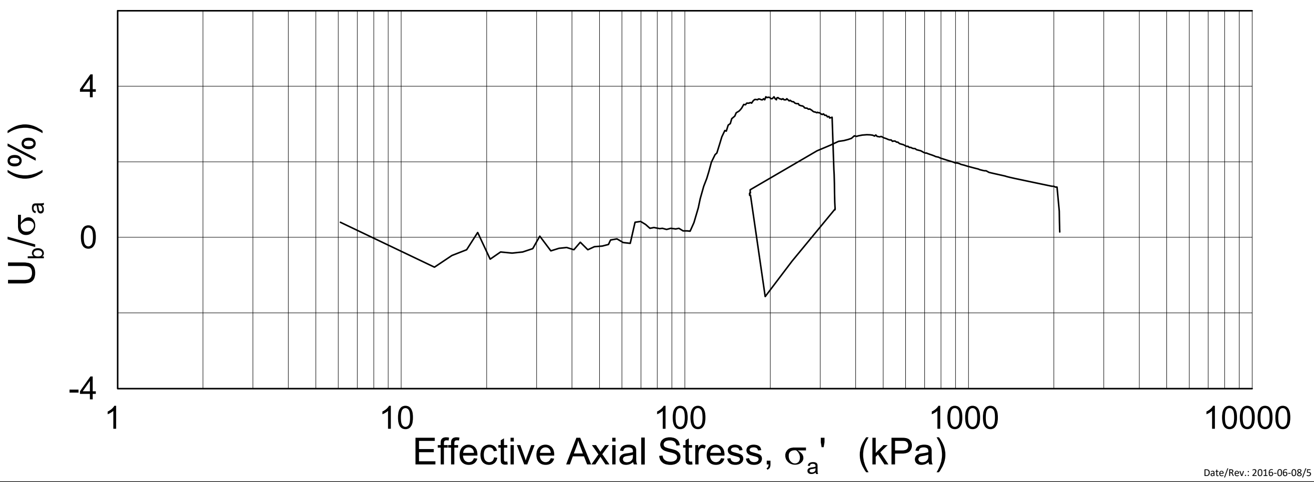
p_0' = 109.1 kPa

w_i = 47.5 %

γ_i = 17.48 kN/m³

NGI





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.121, ONSB41-20-A-1 Log (CRS4114).grf

Norwegian GeoTest Sites - Onsøy

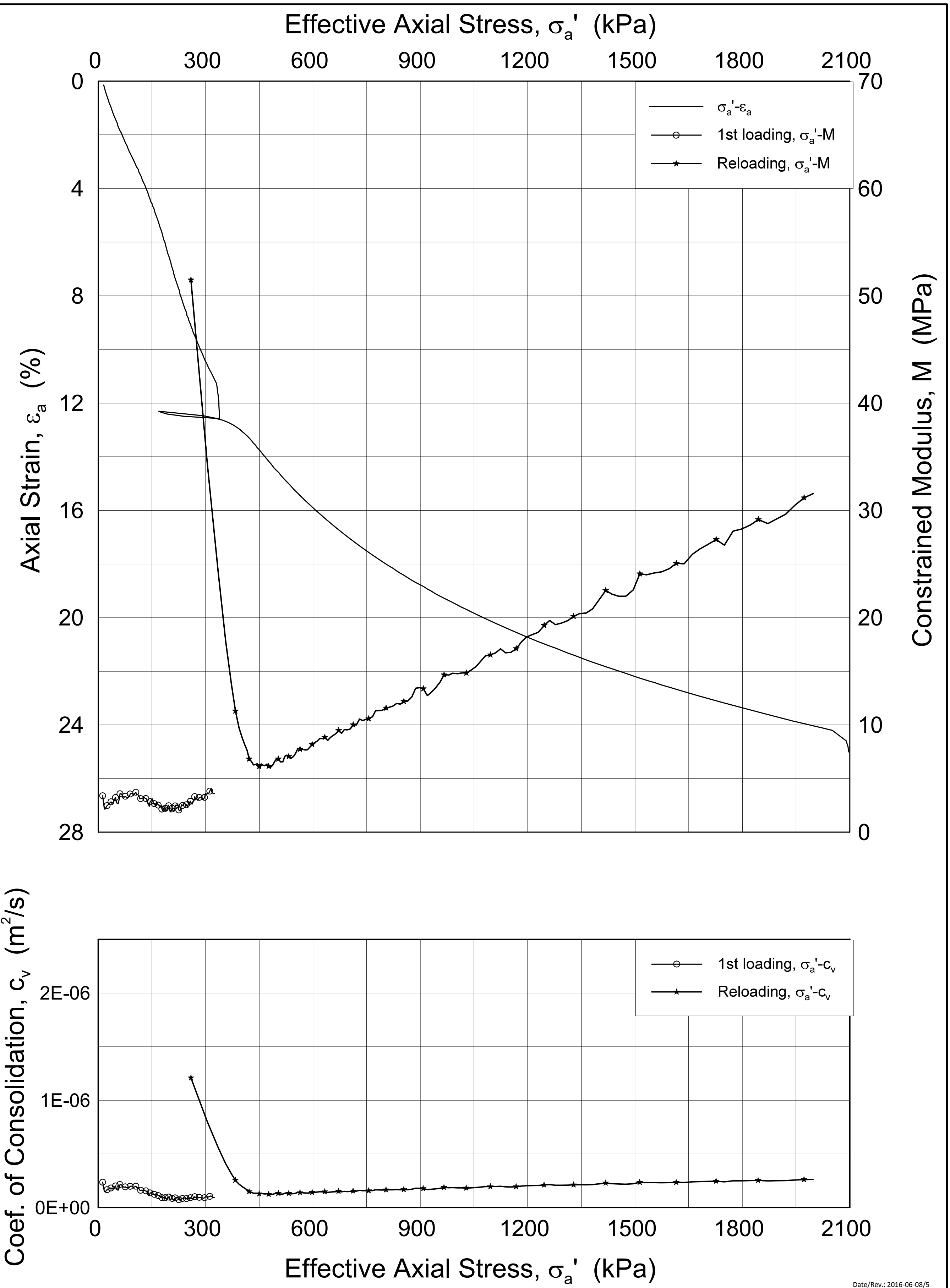
Oedometer test (CRSC)

Boring:	ONSB41			Depth	=	19.12	m
		Tube:	20	p_0'	=	130.6	kPa
		Part:	A	w_i	=	43.5	%
		Test:	1	γ_i	=	17.75	kN/m³

Document No.
20160154-10-R

Figure No.
5.2.121

Date	Drawn by / Checked
2018-12-10	FI/GS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.122, ONSB41-20-A-1 Lin(CRS4114).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.122	
	Date 2018-12-10	Drawn by / Checked FI/GS

Boring: ONSB41 Tube: 20 Part: A Test: 1

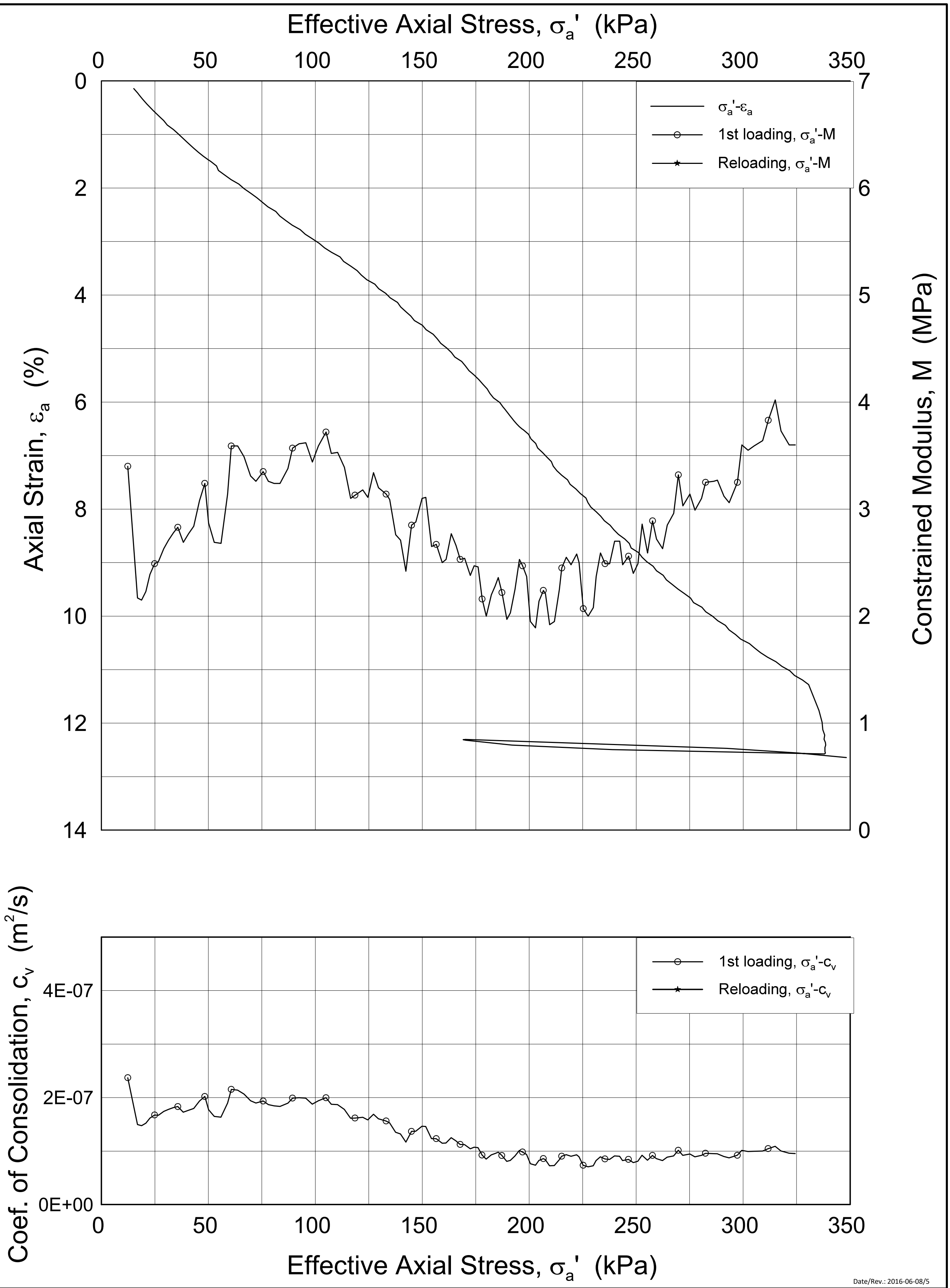
Depth = 19.12 m

p_0' = 130.6 kPa

w_i = 43.5 %

γ_i = 17.75 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.123, ONSB41-20-A-1 Lin2 (CRS4114).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.123

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB41

Tube: 20

Part: A

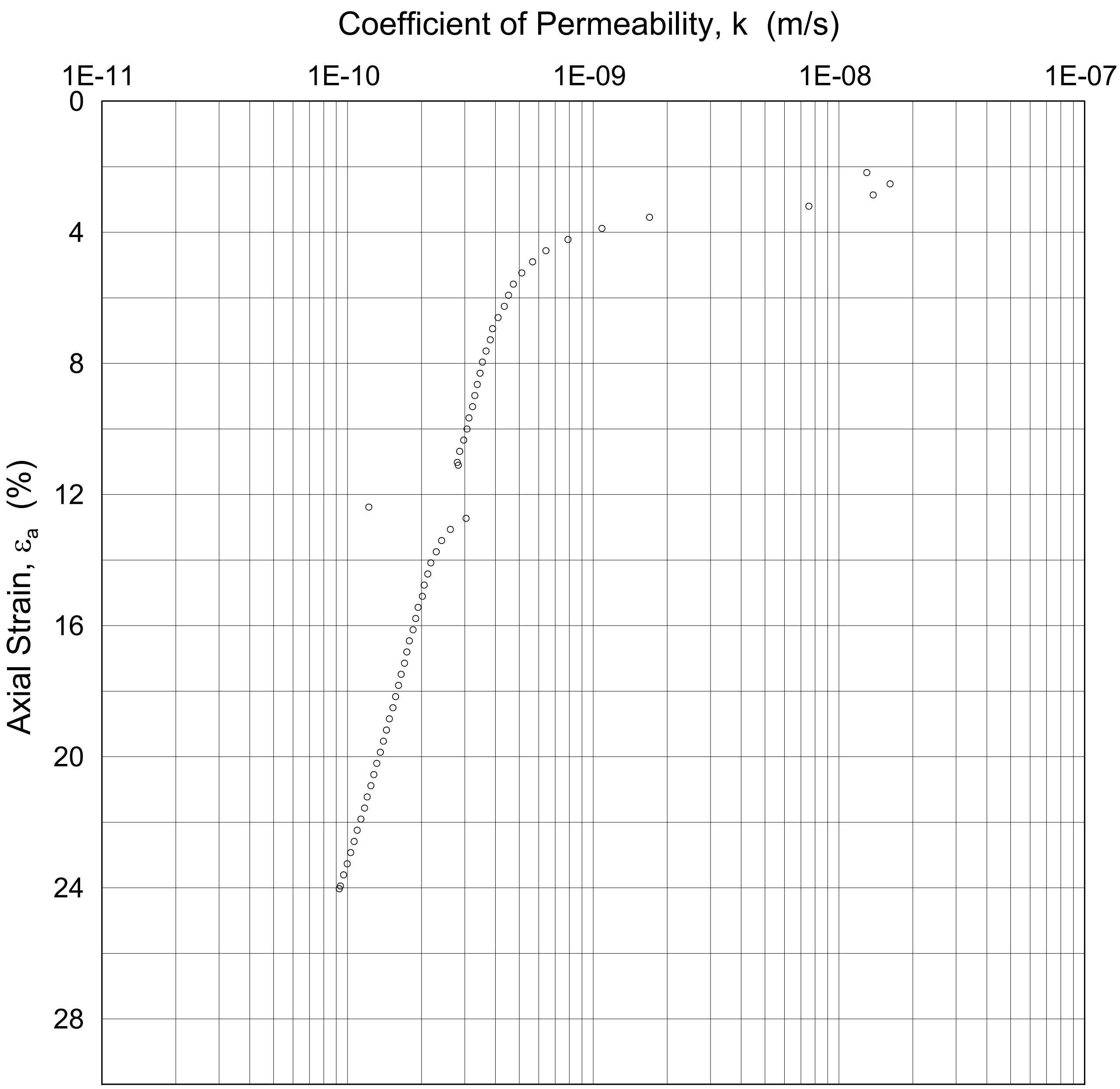
Test: 1

Depth = 19.12 m

p_0' = 130.6 kPa

w_i = 43.5 %

γ_i = 17.75 kN/m³



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.124, kcrs4114.grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

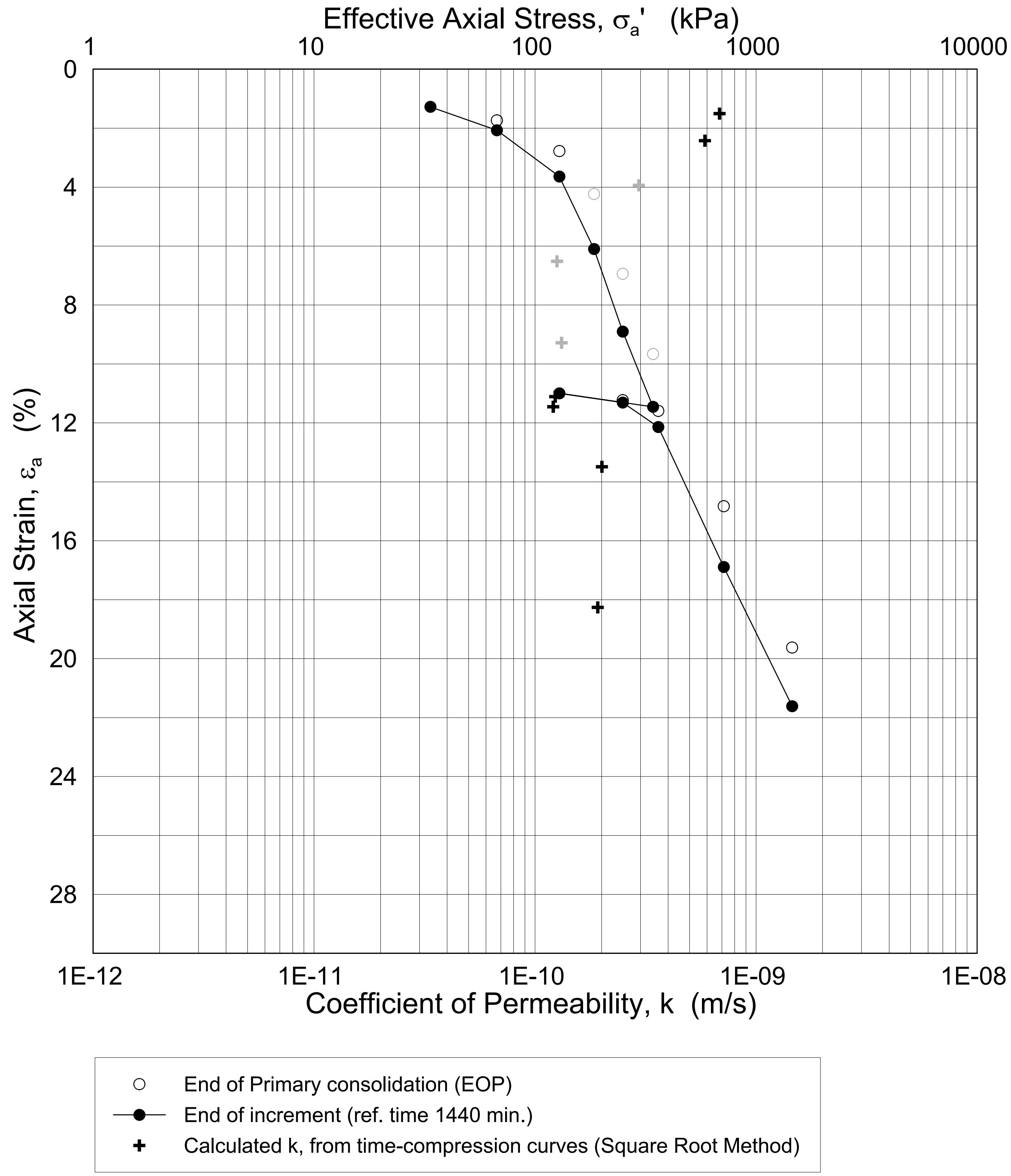
Boring:	ONSB41	Tube:	20	Depth	=	19.12	m
		Part:	A	p_0'	=	130.6	kPa
		Test:	1	w_i	=	43.5	%
				γ_i	=	17.75	kN/m³

Document No.
20160154-10-R

Figure No.
5.2.124

Date	Drawn by / Checked
2018-12-10	FI/GS

NGI



Note: k-values and EOP values in grey refer to data of difficult interpretation

Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.125, ONSB41-20-B-1-LOG.grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

				Depth	=	19.17	m	
Boring:	ONSB41	Tube:	20	p_0'	=	131.0	kPa	
		Part:	B	w_i	=	42.0	%	
		Test:	1	γ_i	=	18.06	kN/m³	

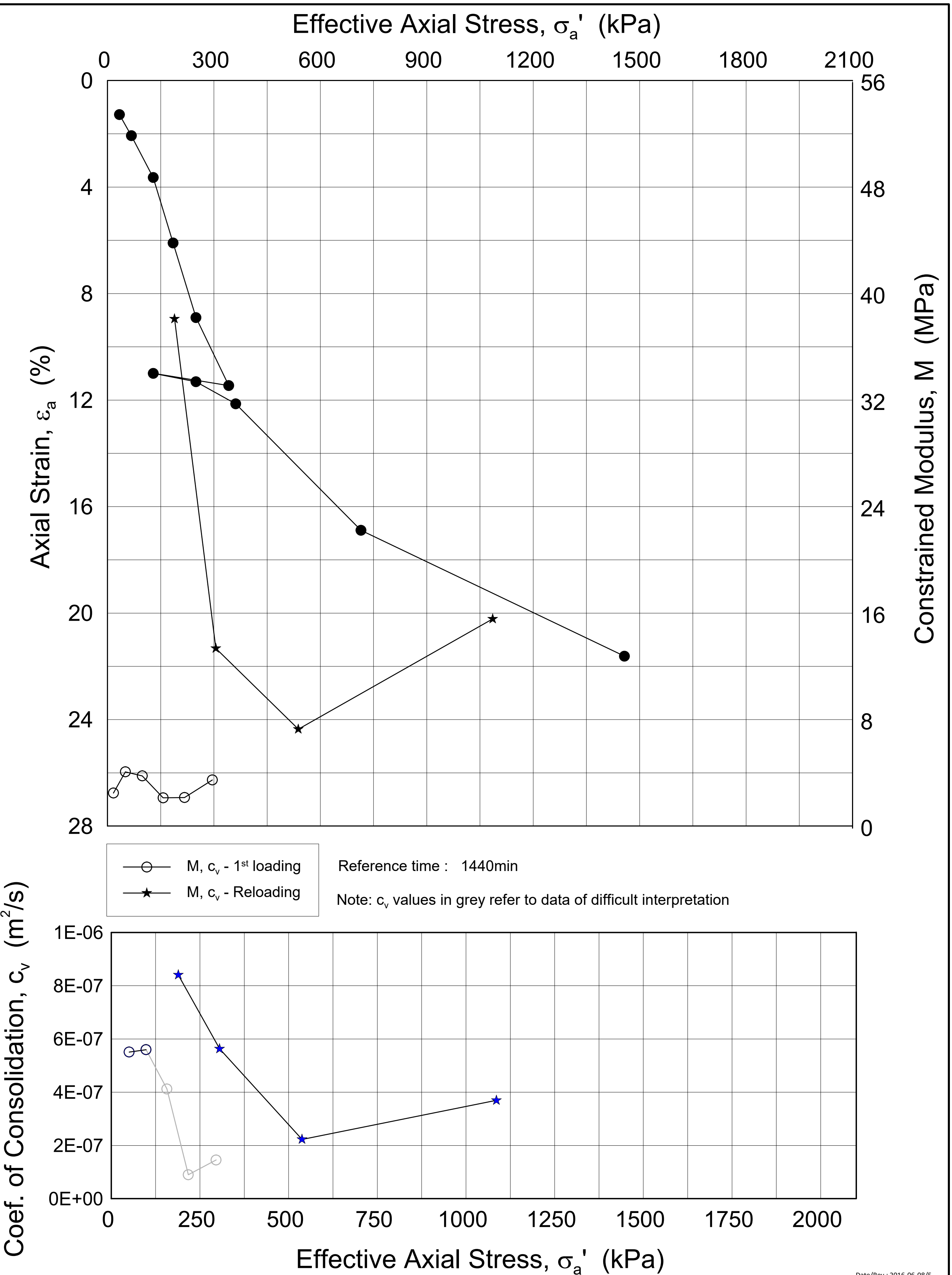
Document No. 20160154-10-R

Figure No. 5.2.125

Date 2018-12-10

Drawn by / Checked JRo / PCa

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring:	ONSB41	Tube:	20	Depth	=	19.17	m
		Part:	B	p_0'	=	131.0	kPa
		Test:	1	w_i	=	42.0	%
				γ_i	=	18.06	kN/m³

Document No. 20160154-10-R

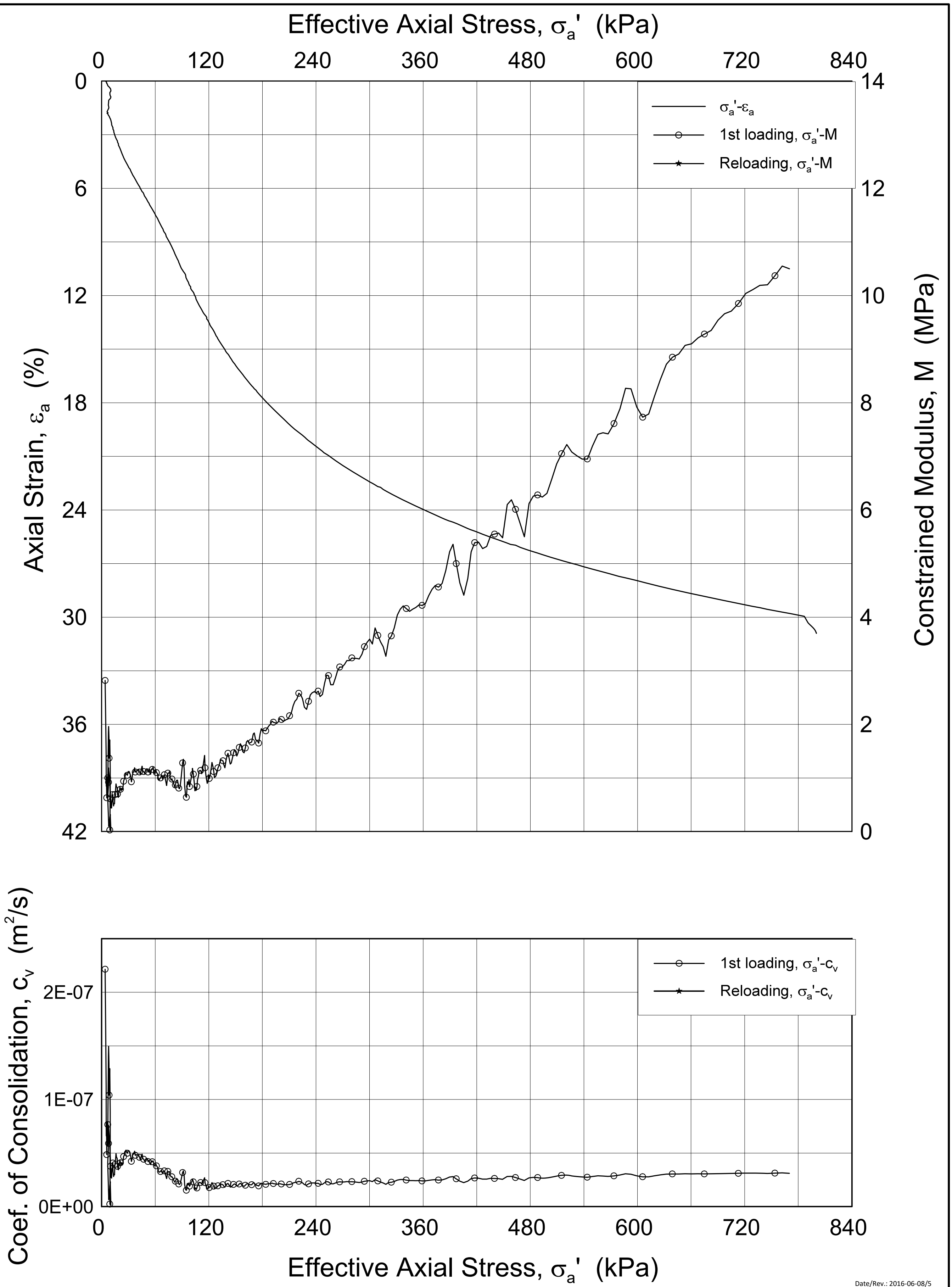
Figure No. 5.2.126

Date 2018-12-10

Drawn by / Checked JRo/ PCa

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.126, ONSB41-20-B-1-LIN.grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.127, ONSB14-10-1-2 Lin (CRS4048).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.127
	Date 2018-12-10 · Drawn by / Checked FI/GS

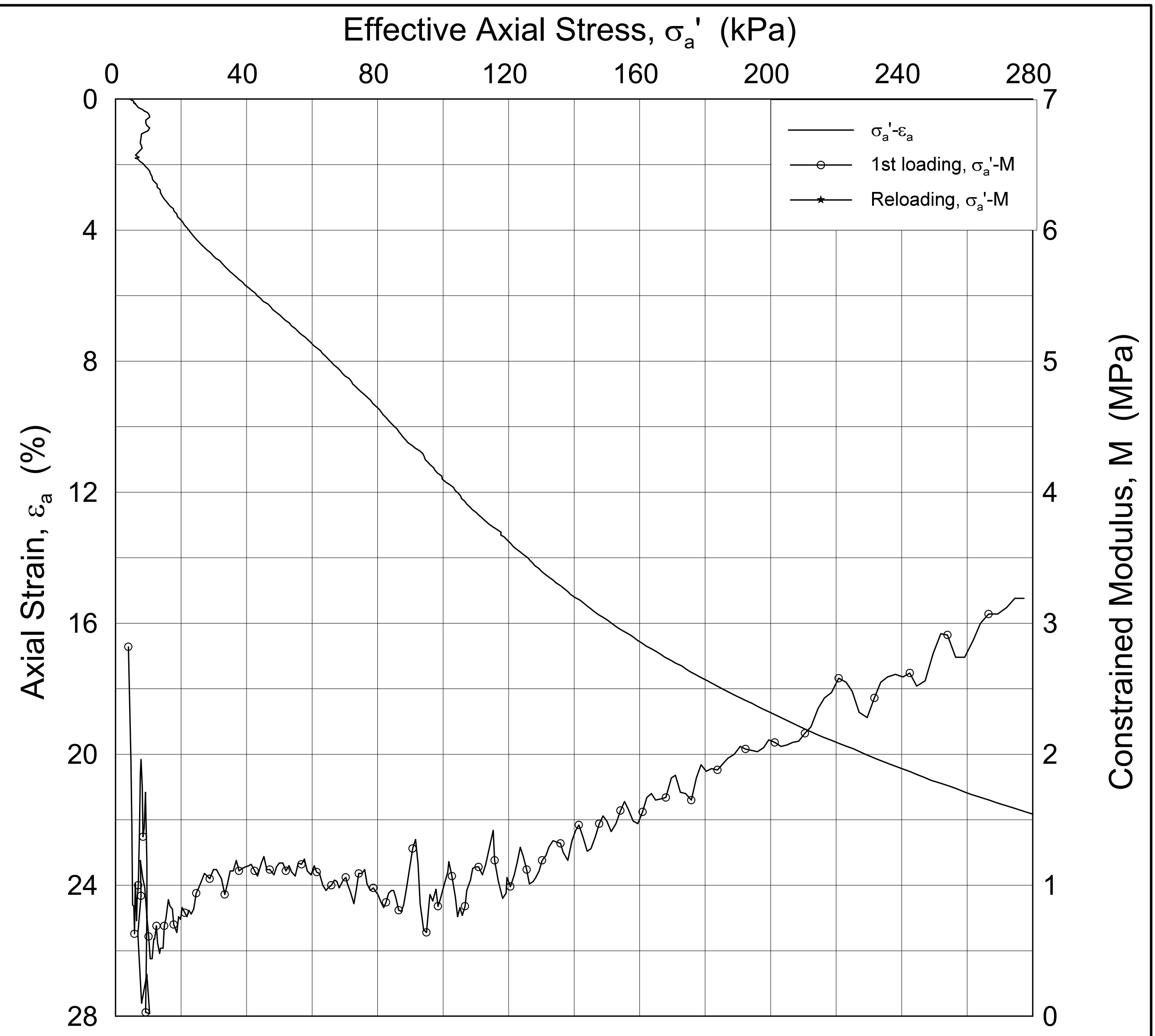
Boring: ONSB14 · Tube: 10 · Part: 1 · Test: 2

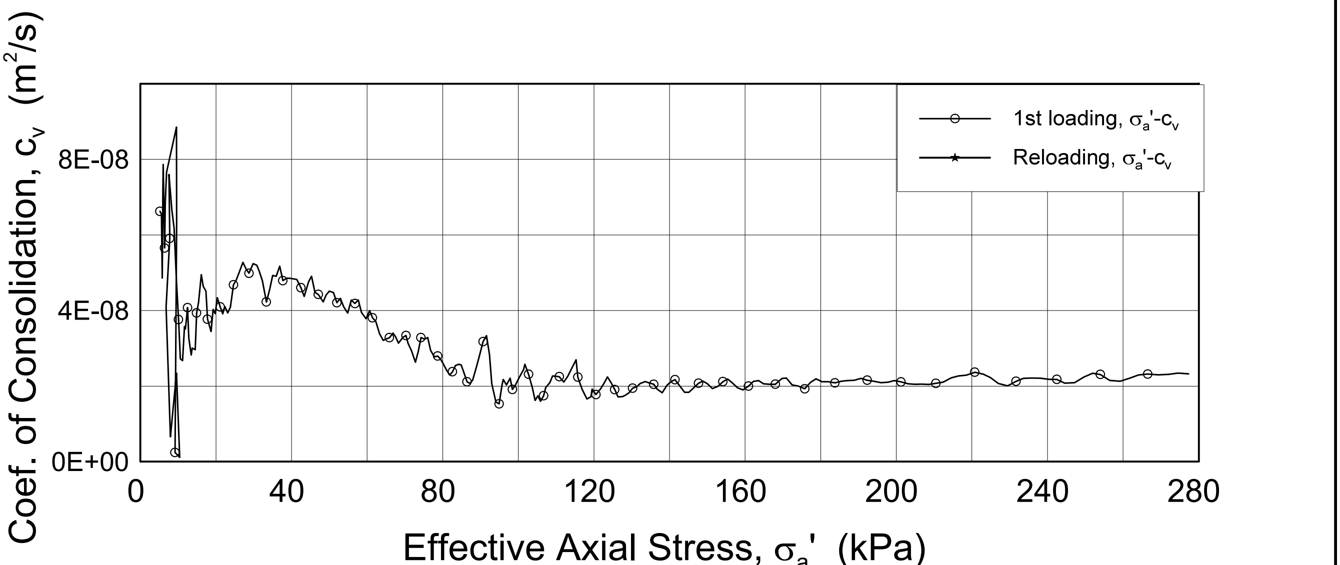
Depth = 8.6 m

p_0' = 55.3 kPa

w_i = 66.5 %

γ_i = 16.15 kN/m³





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.128, ONSB14-10-1-2 Lin2 (CRS4048).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB14 Tube: 10 Part: 1 Test: 2

Depth = 8.6 m

p_0' = 55.3 kPa

w_i = 66.5 %

γ_i = 16.15 kN/m³

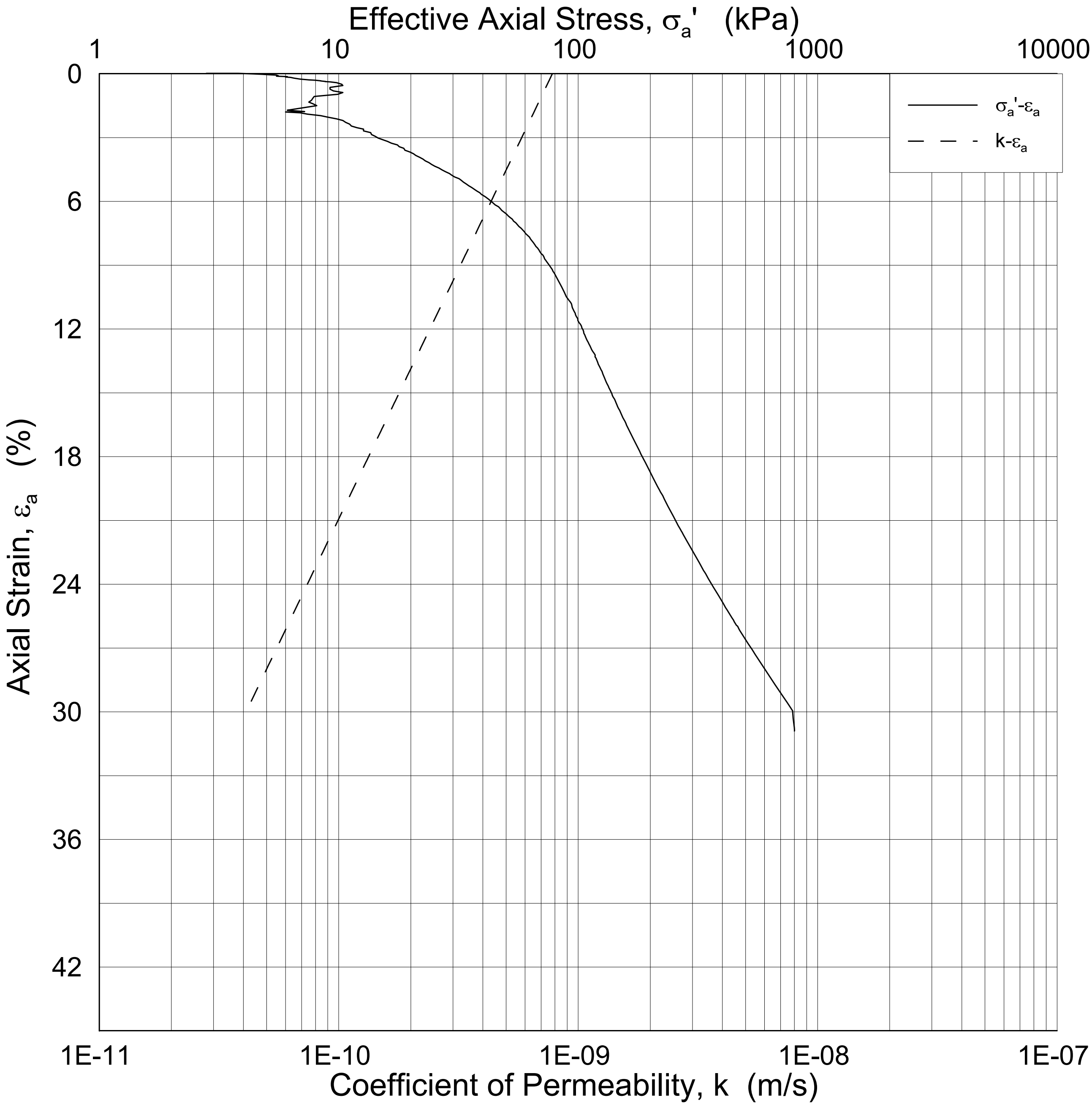
Document No. 20160154-10-R

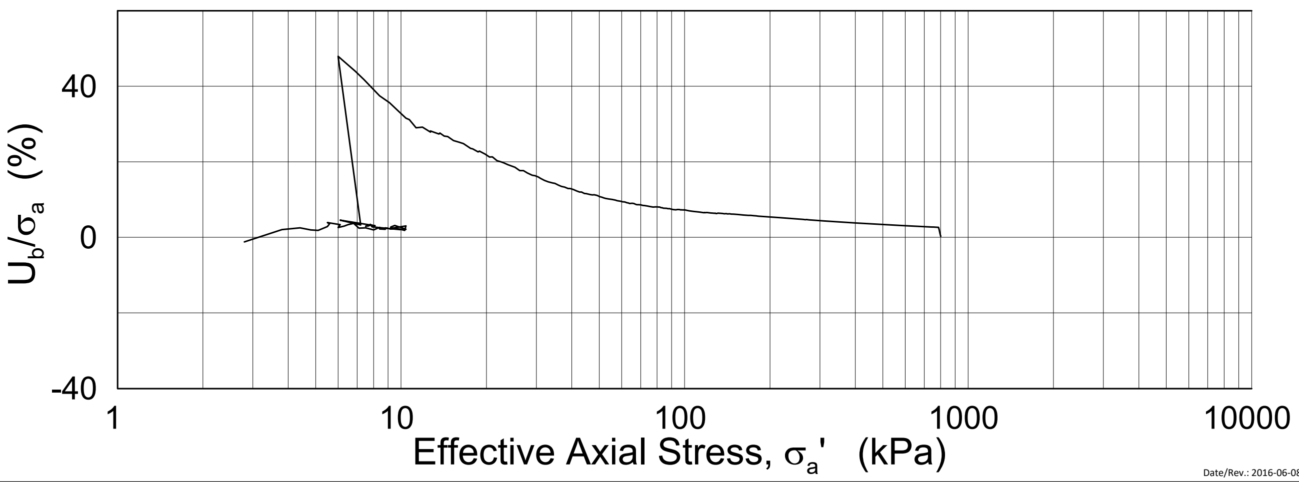
Figure No. 5.2.128

Date 2018-12-10

Drawn by / Checked FI/GS

NGI





Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

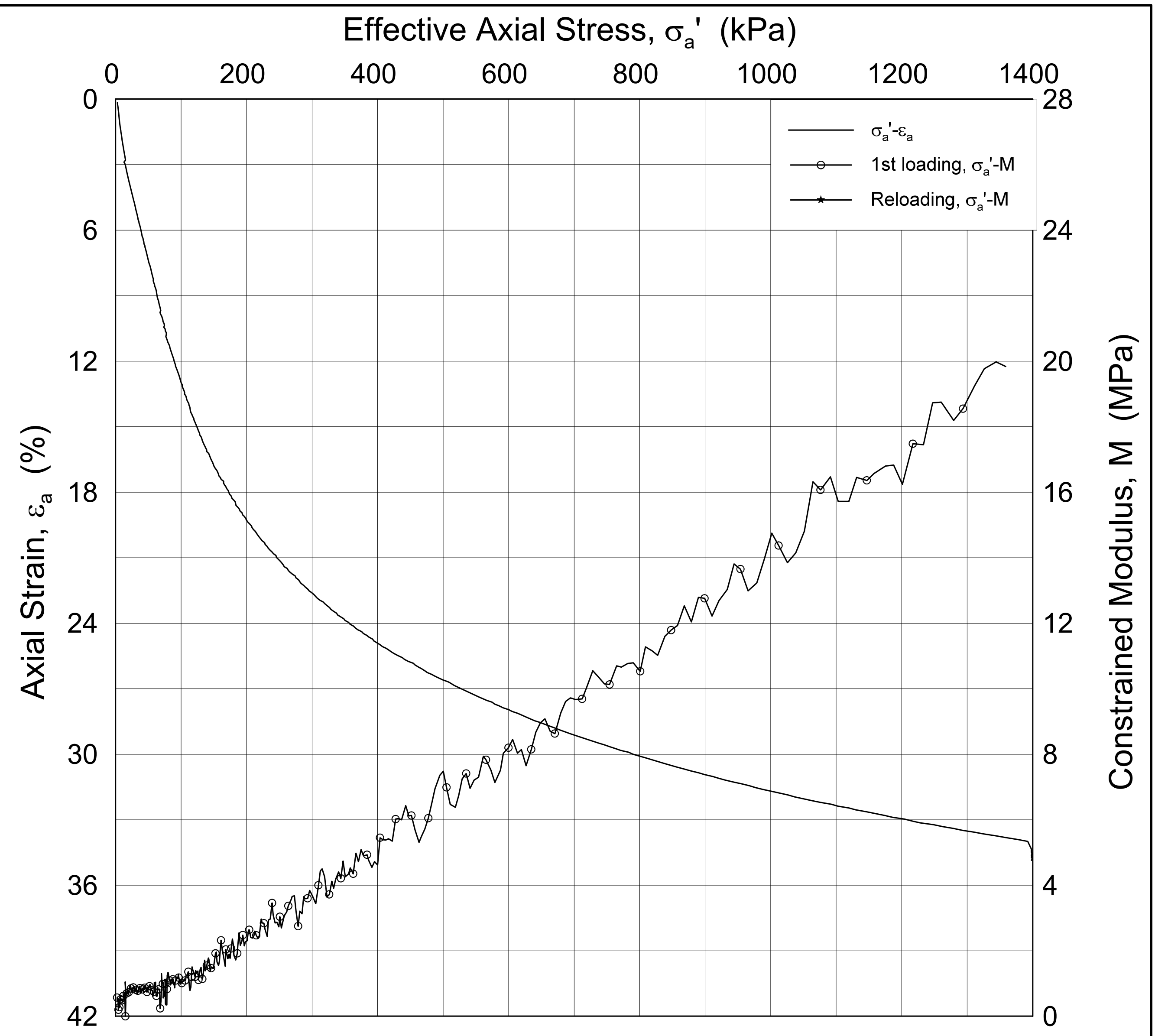
			Depth	=	8.6	m
Boring: ONSB14	Tube:	10	p_0'	=	55.3	kPa
	Part:	1	w_i	=	66.5	%
	Test:	2	γ_i	=	16.15	kN/m³

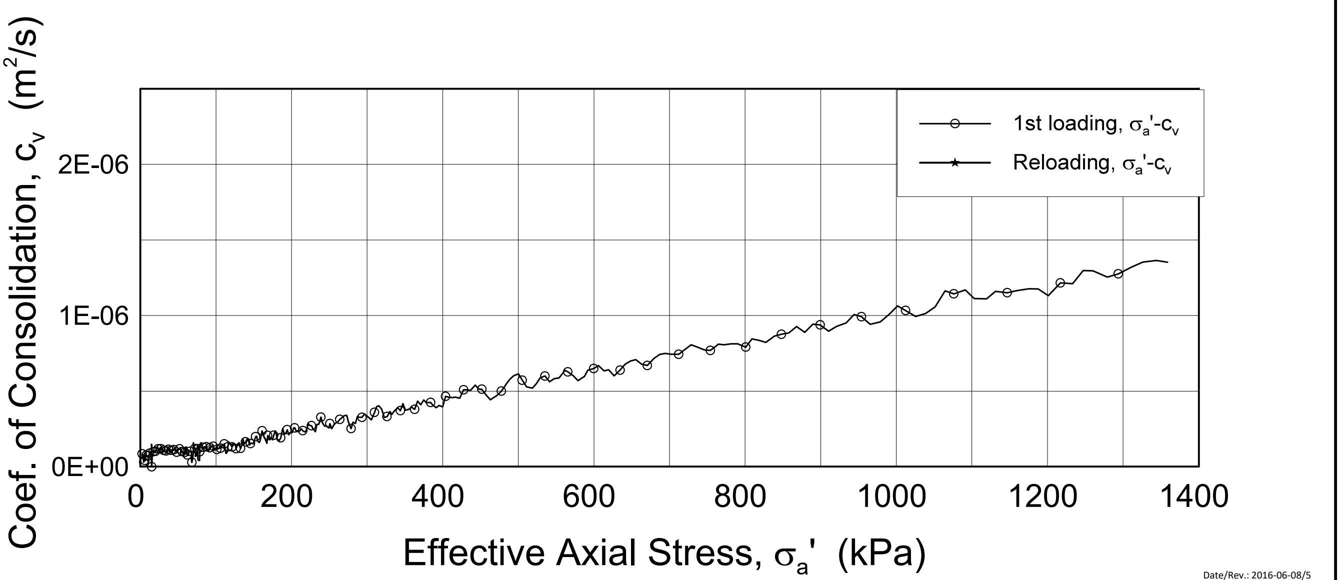
Document No. 20160154-10-R

Figure No. 5.2.129

Date 2018-12-10

Drawn by / Checked FI/GS





Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.130

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

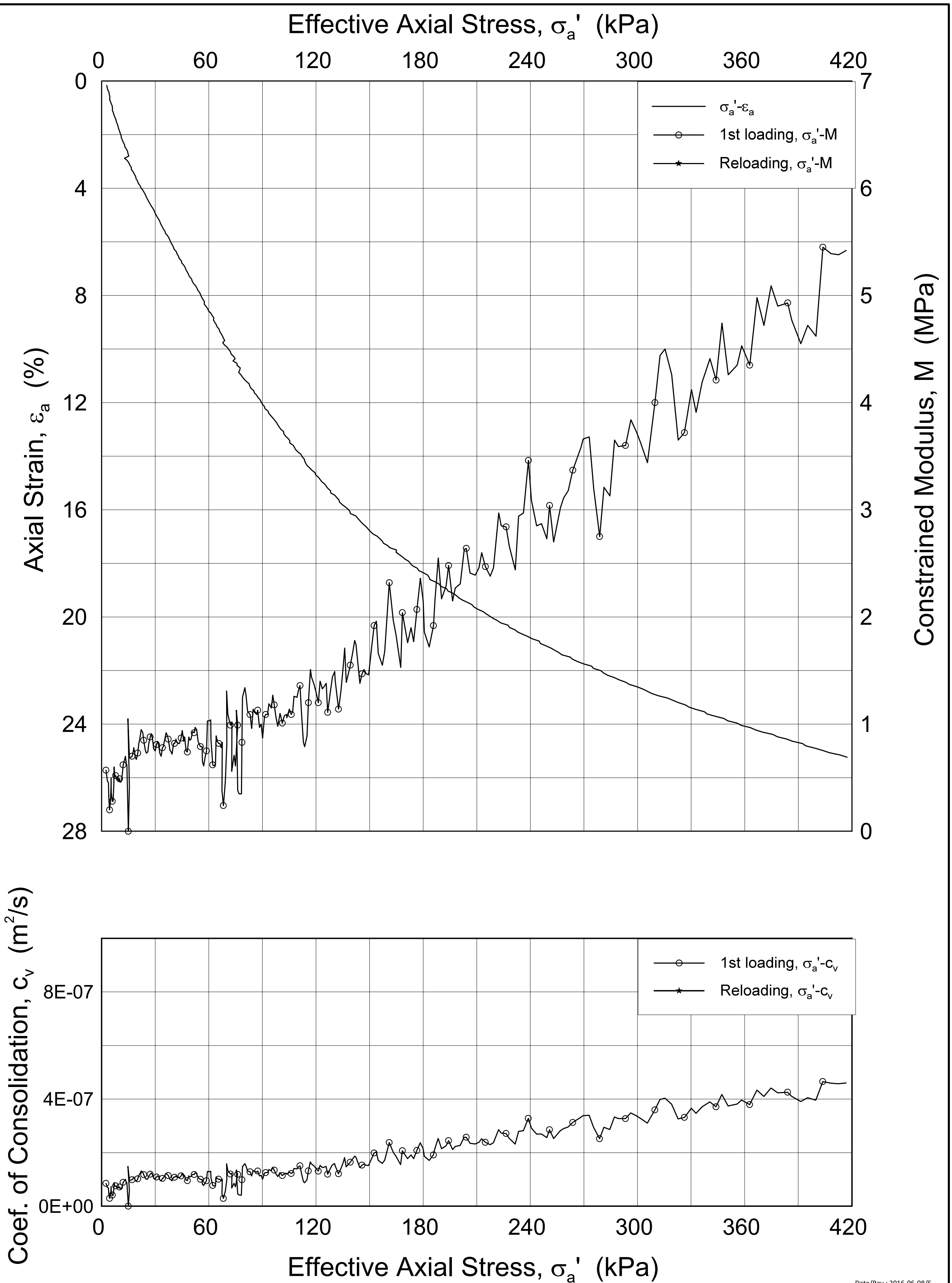
Boring: ONSB14 Tube: 11 Part: 1 Test: 2

Depth = 9.5 m

p_0' = 61.0 kPa

w_i = 64.6 %

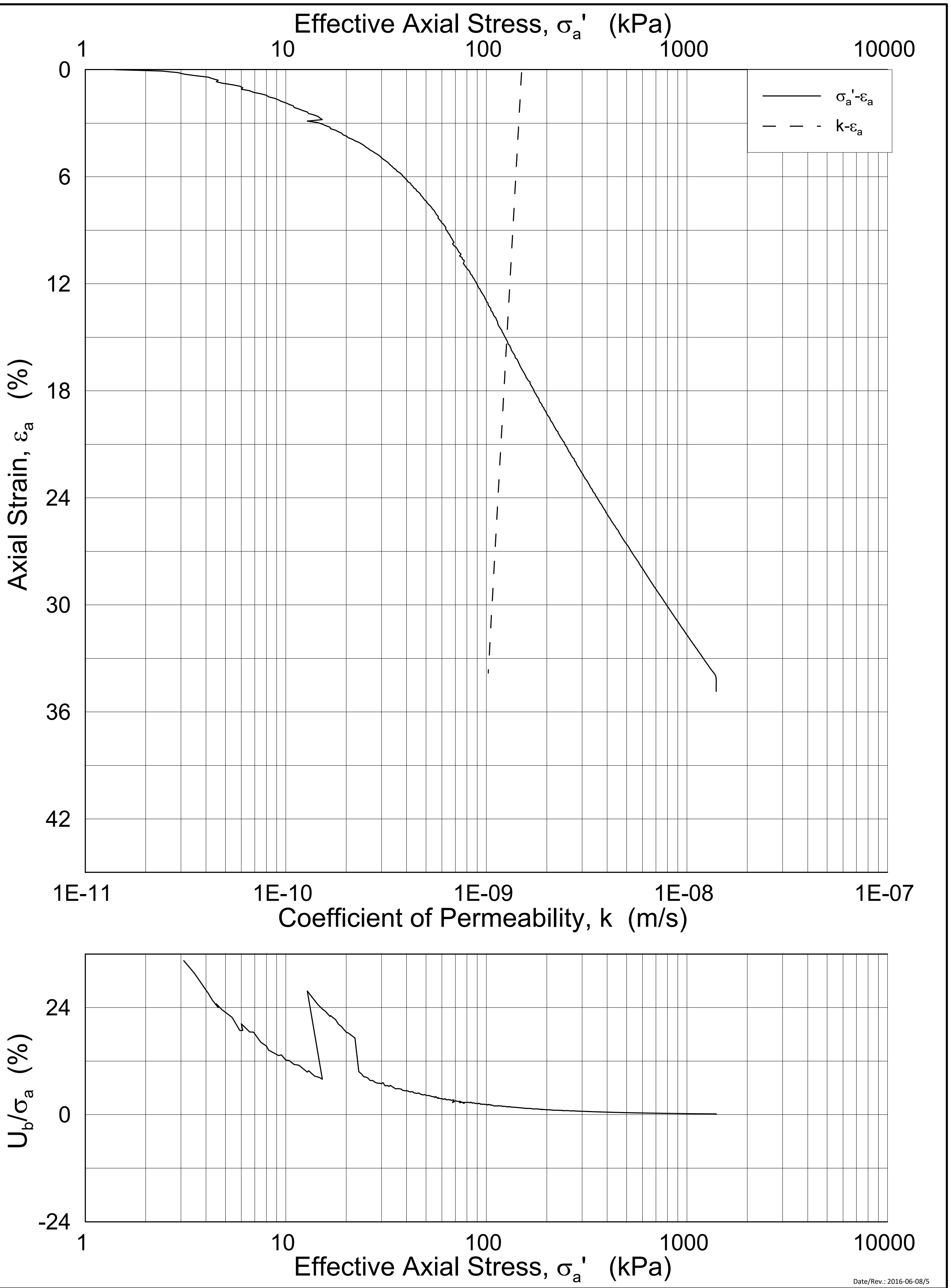
γ_i = 16.17 kN/m³



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.131, ONSB14-11-1-2 Lin2 (CRS4055).grf

Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R
Oedometer test (CRSC)		Figure No. 5.2.131
Boring: ONSB14	Depth = 9.5 m	Date 2018-12-10 / Drawn by / Checked FI/GS
Tube: 11	p_0' = 61.0 kPa	NGI
Part: 1	w_i = 64.6 %	
Test: 2	γ_i = 16.17 kN/m³	



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.132, ONSB14-11-1-2 Log(CRS4055).grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.132

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB14

Tube: 11

Part: 1

Test: 2

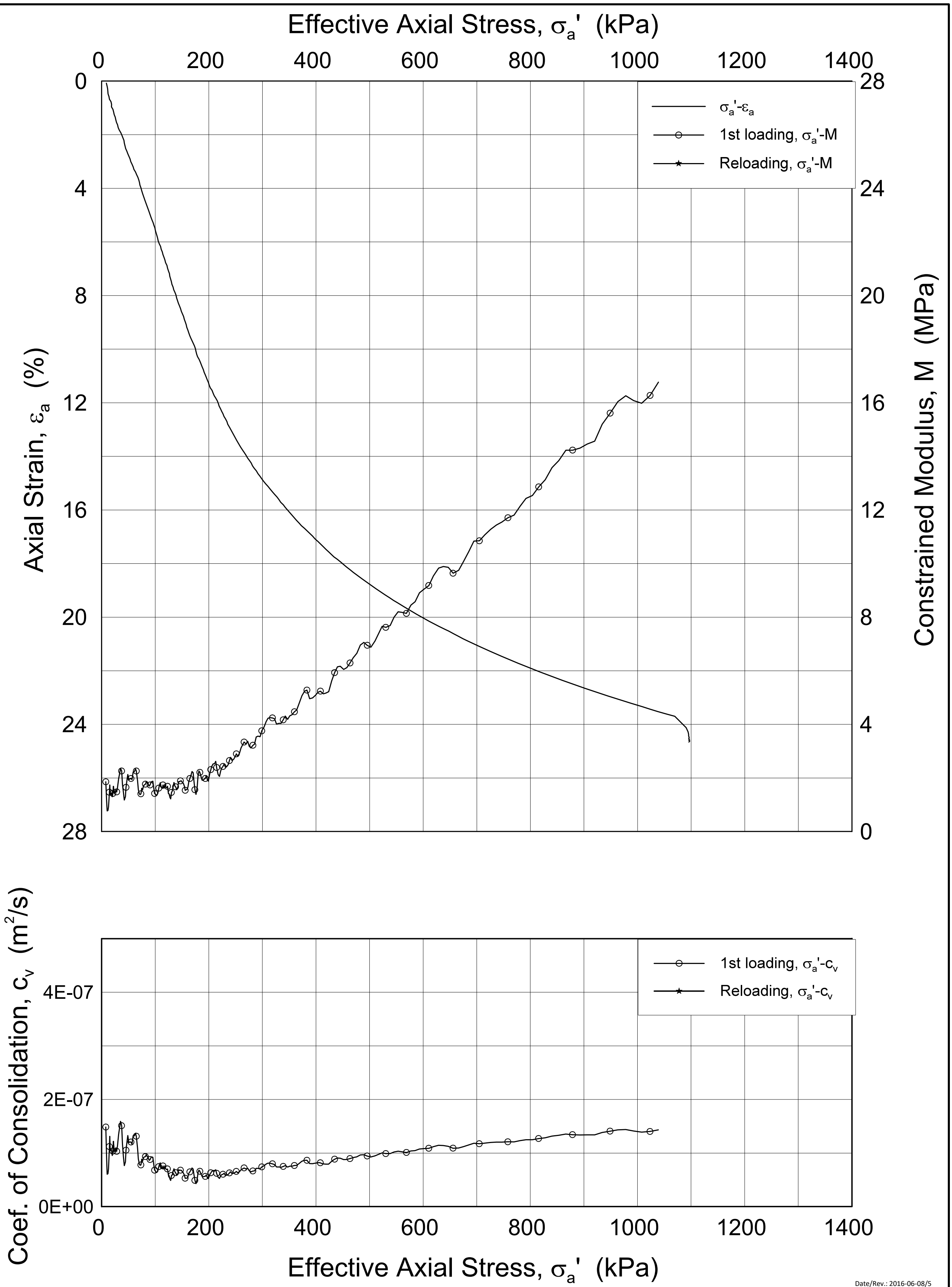
Depth = 9.5 m

p_0' = 61.0 kPa

w_i = 64.6 %

γ_i = 16.17 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.133, ONSB14-14-1-2 Lin (CRS4047).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

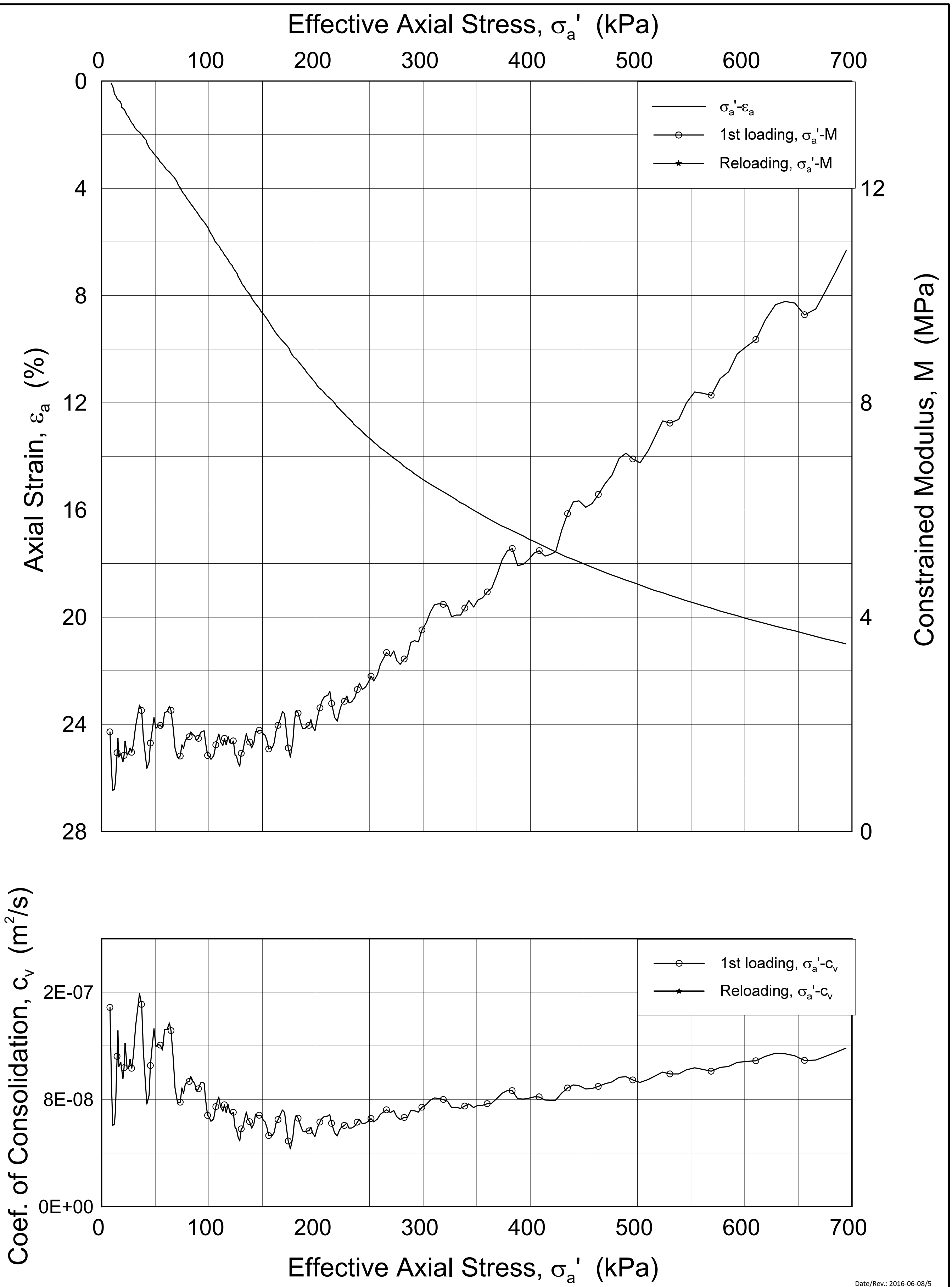
				Depth	=	12.34	m
Boring:	ONSB14	Tube:	14	p_0'	=	79.3	kPa
		Part:	1	w_i	=	43.0	%
		Test:	2	γ_i	=	17.64	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.133

Date	Drawn by / Checked
2018-12-10	FI/GS

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.134	
	Date 2018-12-10	Drawn by / Checked FI/GS

Boring: ONSB14 Tube: 14 Part: 1 Test: 2

Depth = 12.34 m

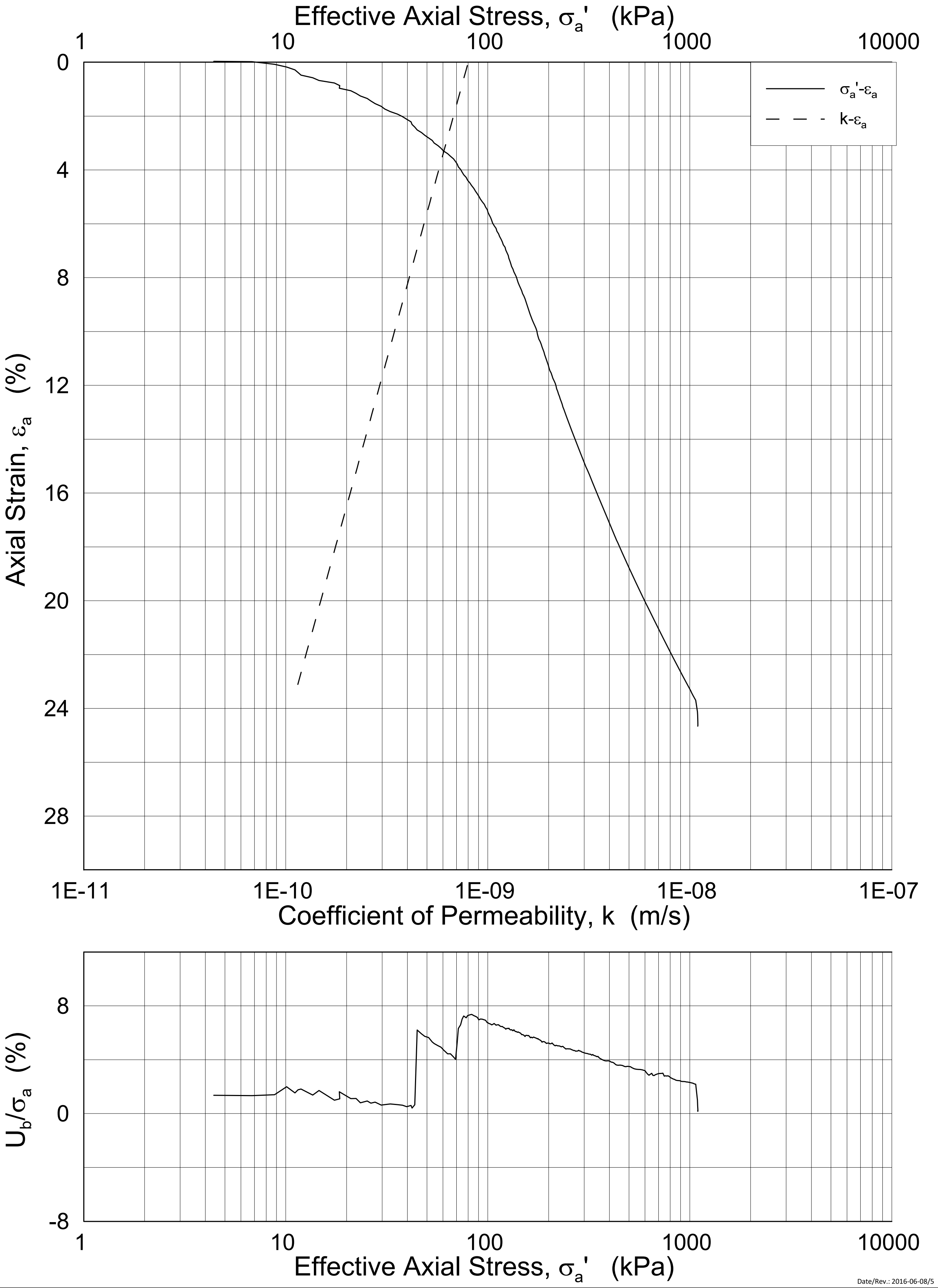
p_0' = 79.3 kPa

w_i = 43.0 %

γ_i = 17.64 kN/m³

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.134, ONSB14-14-1-2 Lin2 (CRS4047).grf



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.135, ONSB14-14-1-2 Log(CRS4047).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB14

Tube: 14
Part: 1
Test: 2

Depth = 12.34 m
p_0' = 79.3 kPa
w_i = 43.0 %
γ_i = 17.64 kN/m³

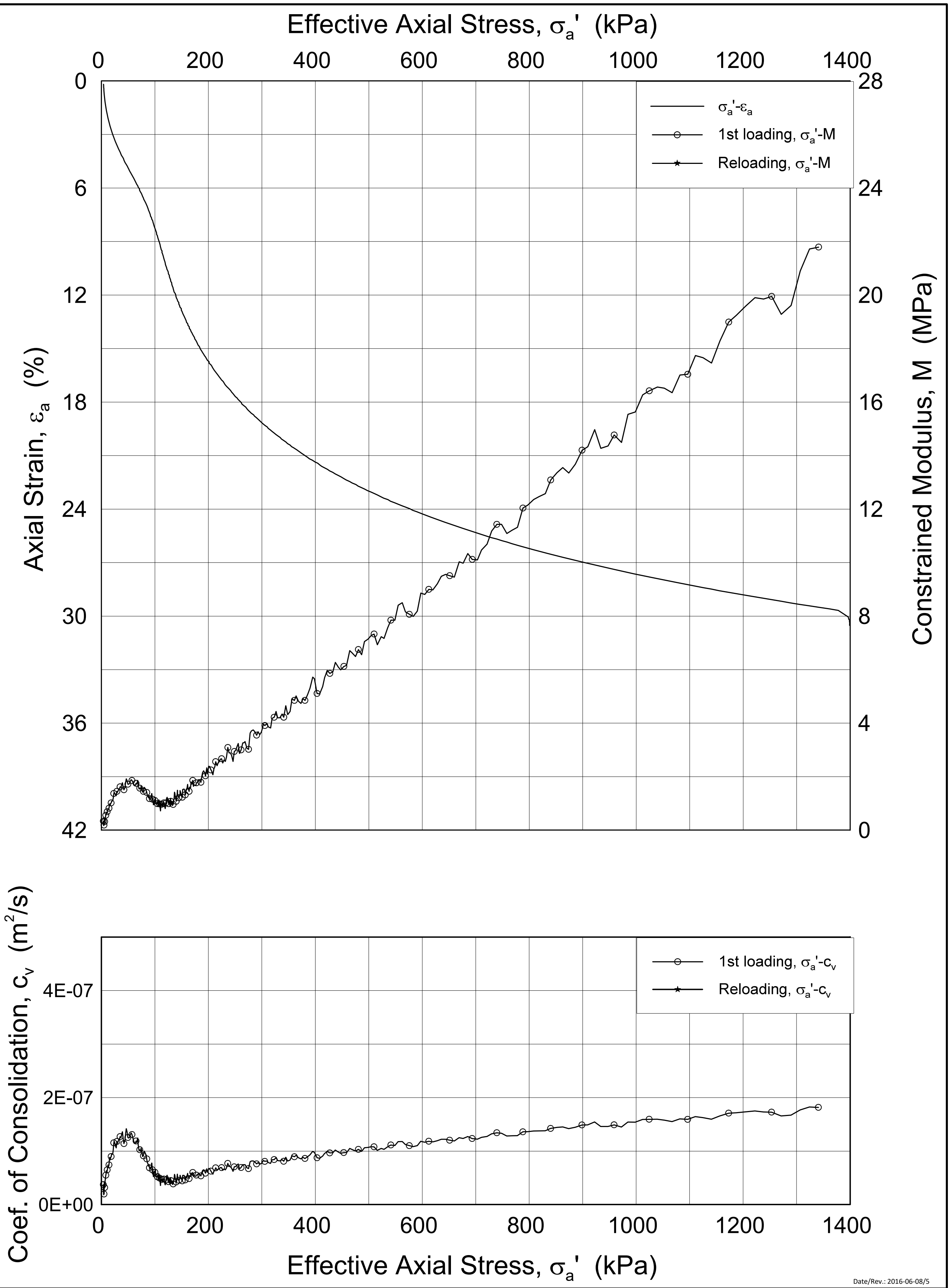
Document No.
20160154-10-R

Figure No.
5.2.135

Date
2018-12-10

Drawn by / Checked
FI/GS

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.136, ONSB21b-3-1-2 Lin (CRS4002).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.136

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

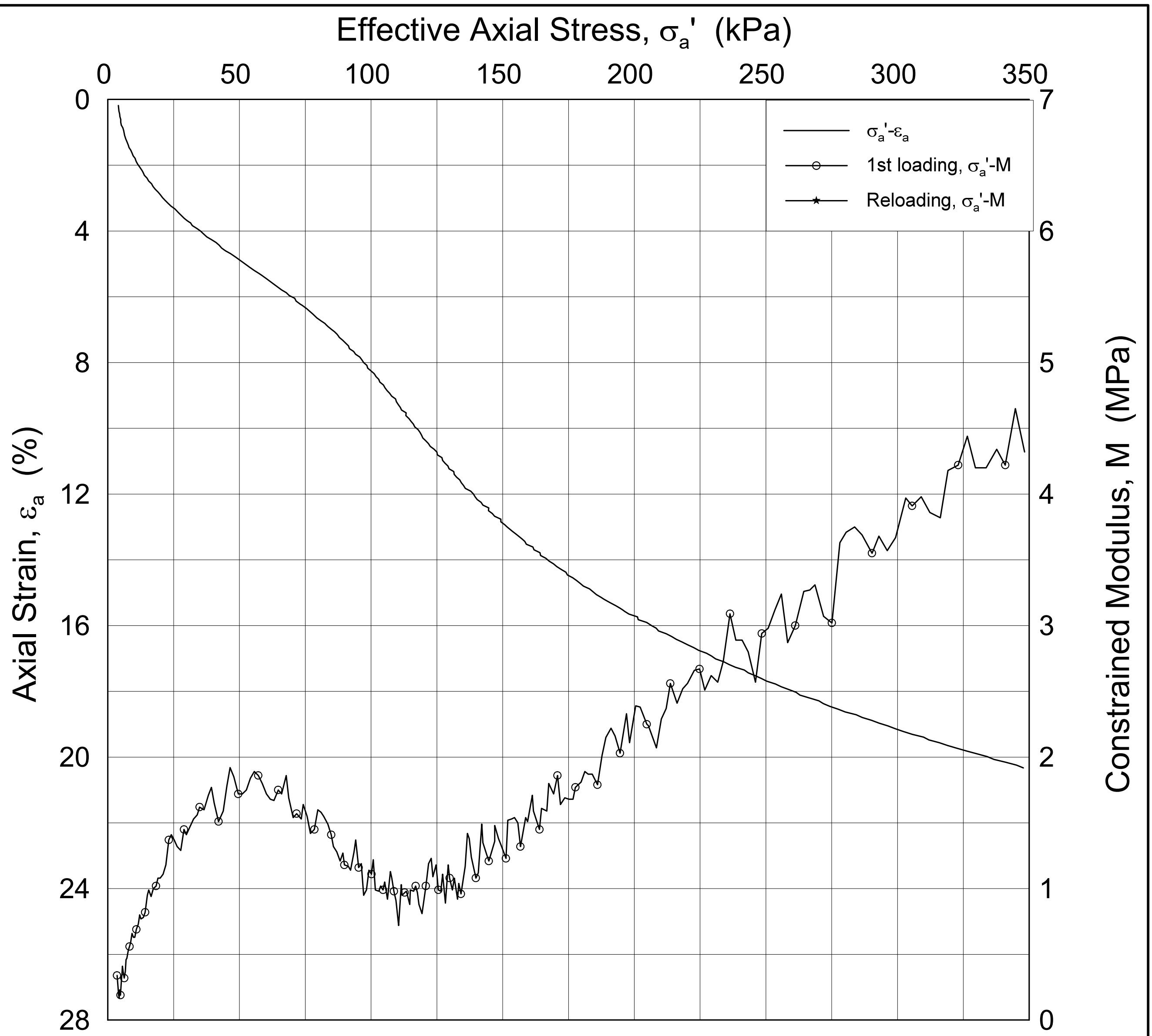
Boring: ONSB21 Tube: 3 Part: 1 Test: 2

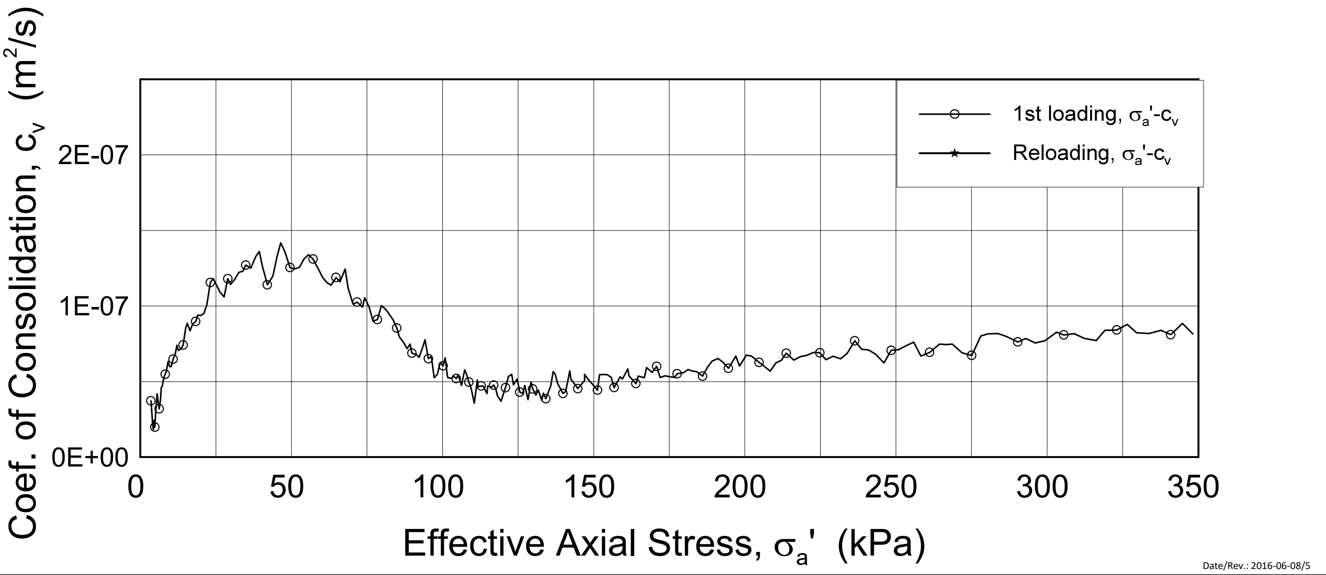
Depth = 11.83 m

p_0' = 76.0 kPa

w_i = 47.7 %

γ_i = 17.47 kN/m³





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.137, ONSB21b-3-1-2 Lin2 (CRS4002).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.137
	Date 2018-12-10 / Drawn by / Checked FI/GS

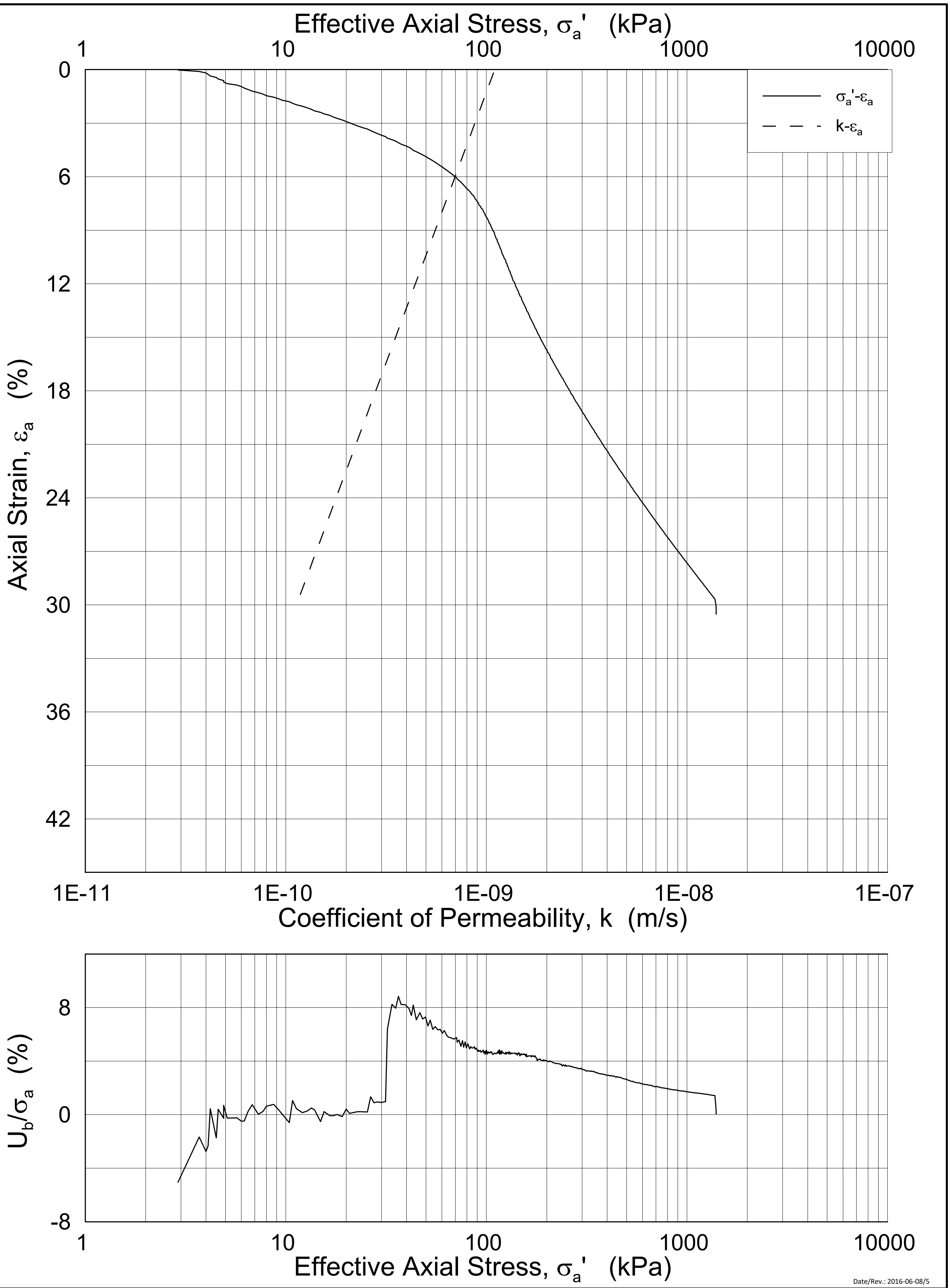
Boring: ONSB21 — Tube: 3 — Part: 1 — Test: 2

Depth = 11.83 m

p_0' = 76.0 kPa

w_i = 47.7 %

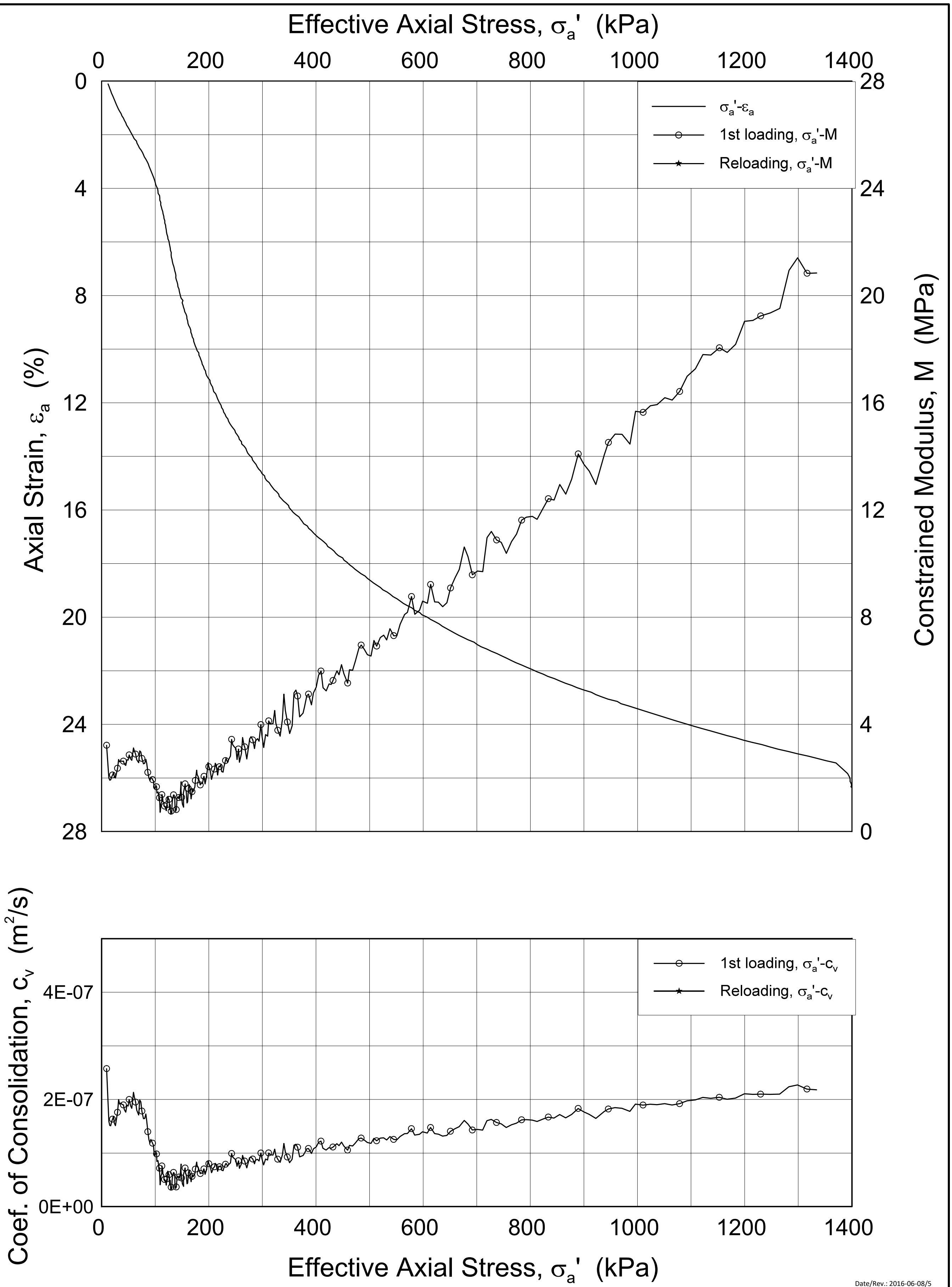
γ_i = 17.47 kN/m³



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.138, ONSB21b-3-1-2 Log(CRS4002).grf

Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R
Oedometer test (CRSC)		Figure No. 5.2.138
Boring: ONSB21	Depth = 11.83 m	Date 2018-12-10 / Drawn by / Checked FI/GS
Tube: 3	p_0' = 76.0 kPa	NGI
Part: 1	w_i = 47.7 %	
Test: 2	γ_i = 17.47 kN/m³	



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB21	Tube:	3	Depth	=	12.83 m
	Part:	2	p_0'	=	82.4 kPa
			w_i	=	46.2 %
	Test:	2	γ_i	=	17.53 kN/m³

Document No. 20160154-10-R

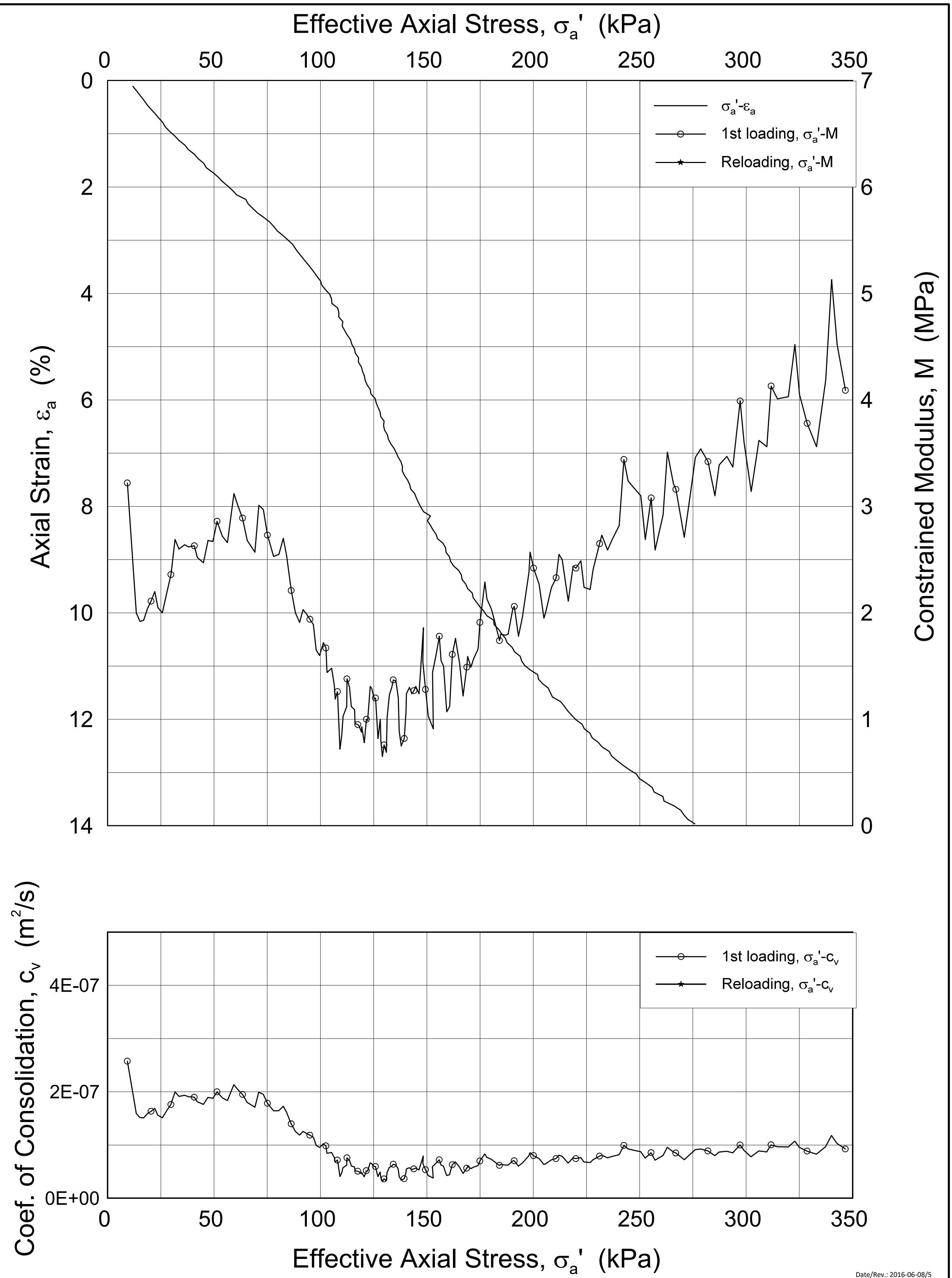
Figure No. 5.2.139

Date 2018-12-10

Drawn by / Checked FI/GS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.139, ONSB21b-3-2-2 Lin (CRS4004).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.140, ONSB21b-3-2-2 Lin2 (CRS4004).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB21	Tube:	3	Depth	=	12.83	m
			p_0'	=	82.4	kPa
	Part:	2	w_i	=	46.2	%
	Test:	2	γ_i	=	17.53	kN/m³

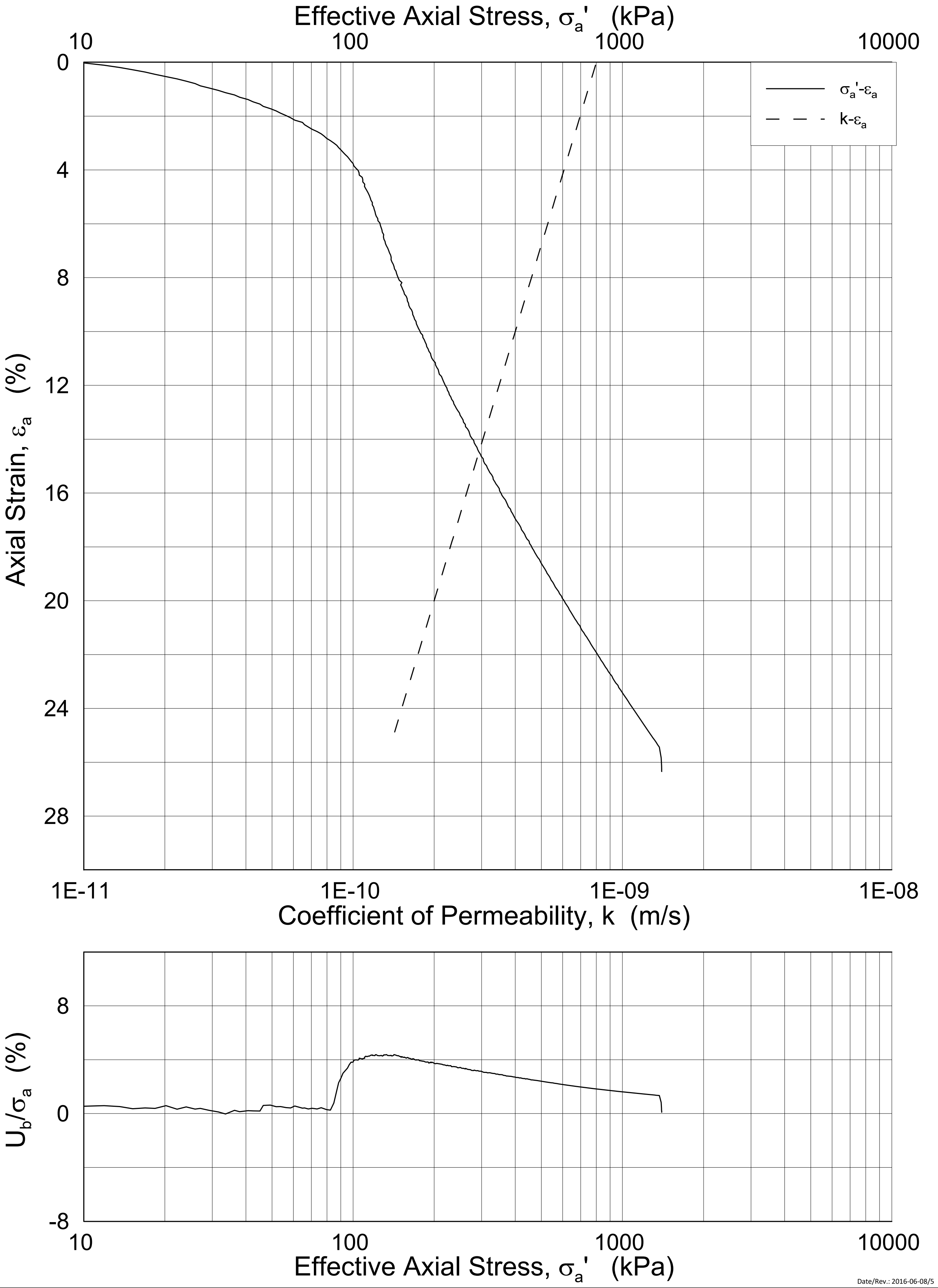
Document No. 20160154-10-R

Figure No. 5.2.140

Date 2018-12-10

Drawn by / Checked FI/GS

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.141, ONSB21b-3-2-2 Log(CRS4004).grf

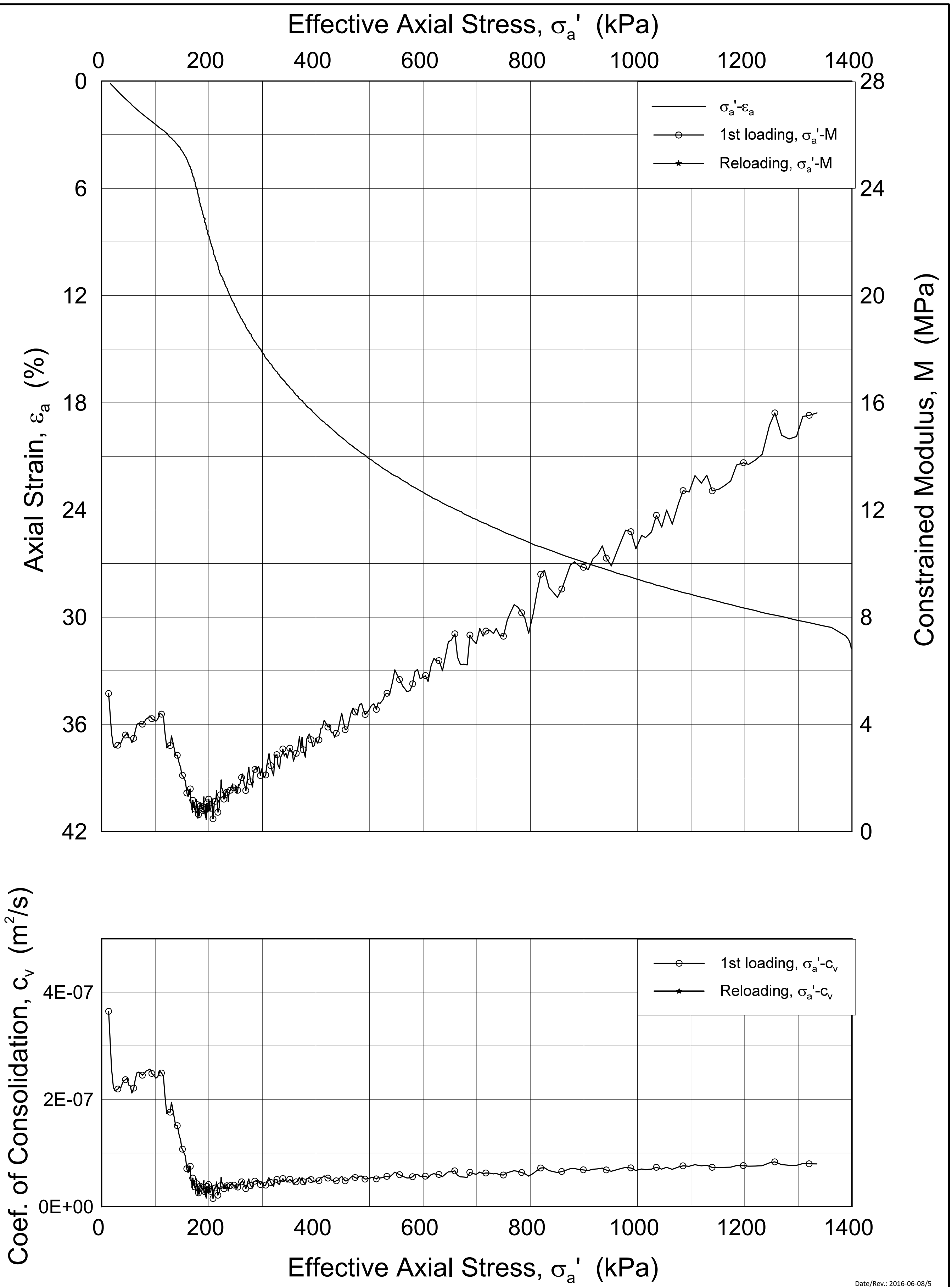
Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.141
	Date 2018-12-10; Drawn by / Checked FI/GS

Boring: ONSB21 Tube: 3 Part: 2 Test: 2

Depth = 12.83 m
p_0' = 82.4 kPa
w_i = 46.2 %
γ_i = 17.53 kN/m³

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.142, ONSB21b-3-3-2 Lin (CRS4003).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB21 | Tube: 3 | Part: 3 | Test: 2

Depth = 13.83 m

p_0' = 88.9 kPa

w_i = 63.6 %

γ_i = 16.25 kN/m³

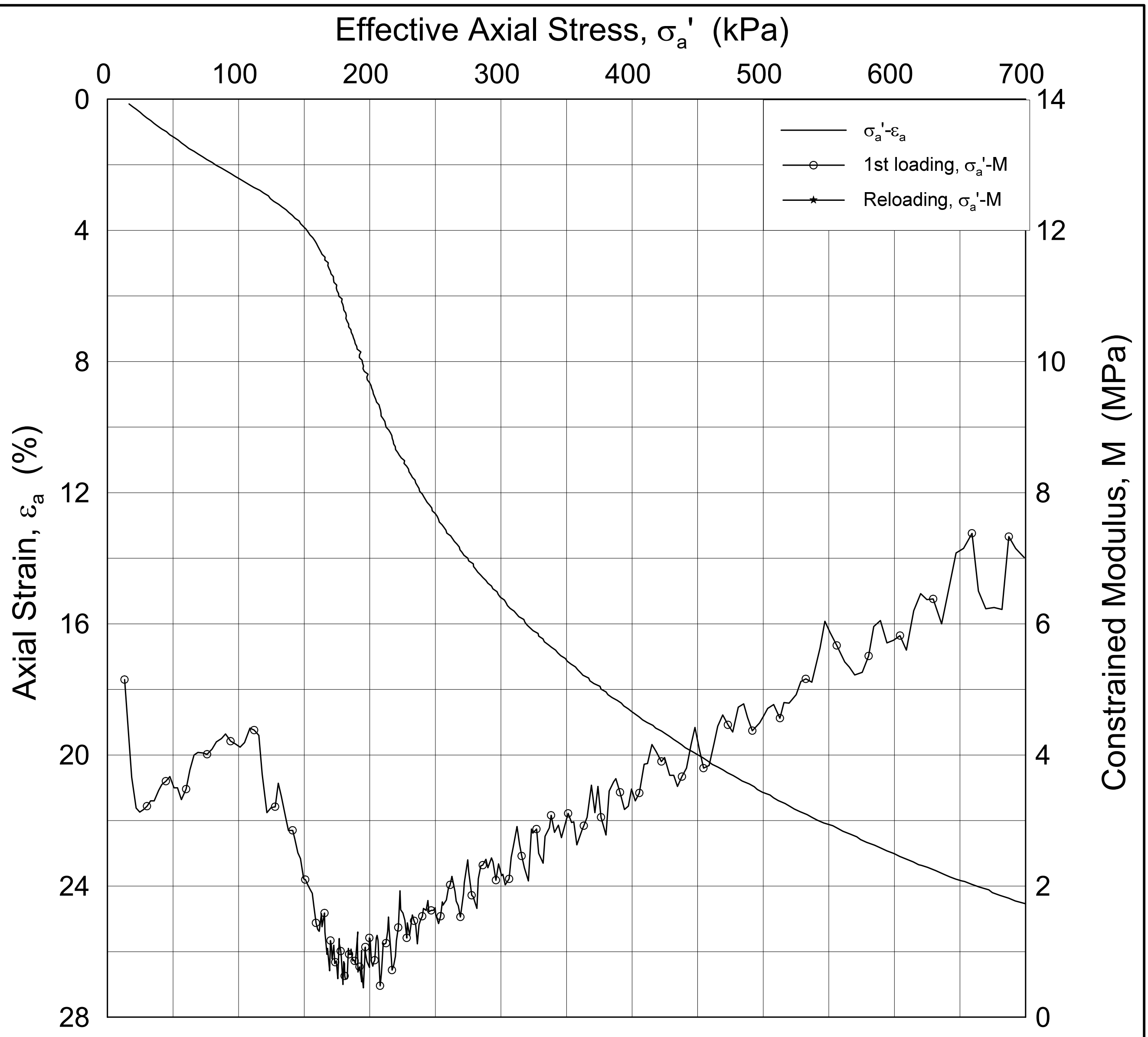
Document No. 20160154-10-R

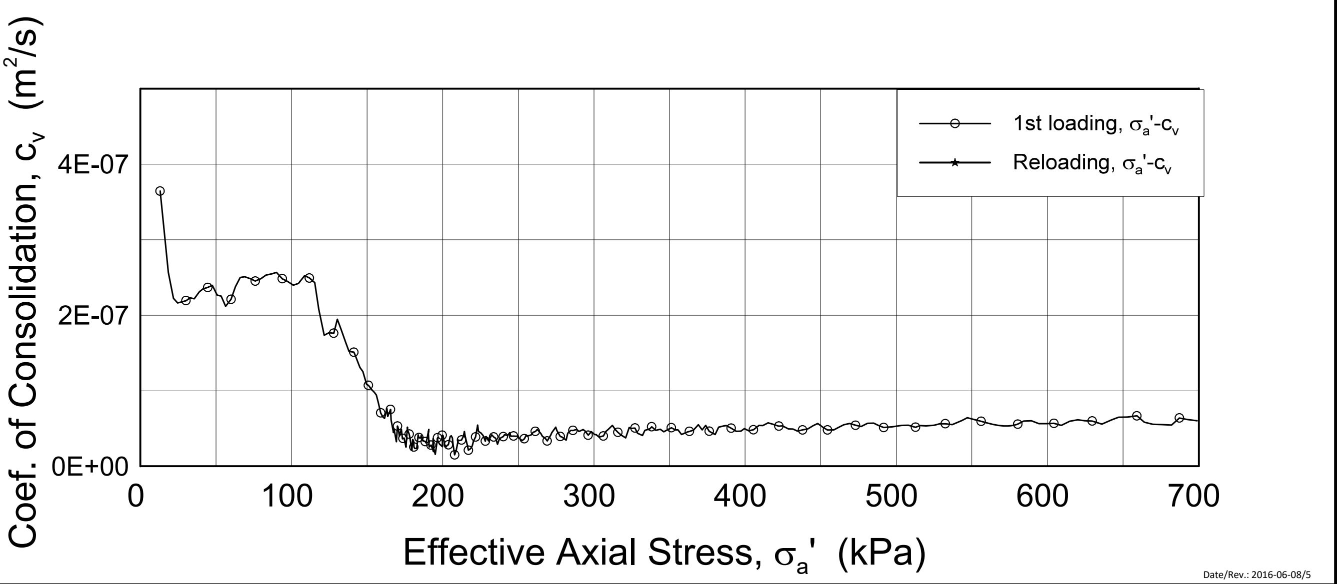
Figure No. 5.2.142

Date 2018-12-10

Drawn by / Checked FI/GS

NGI

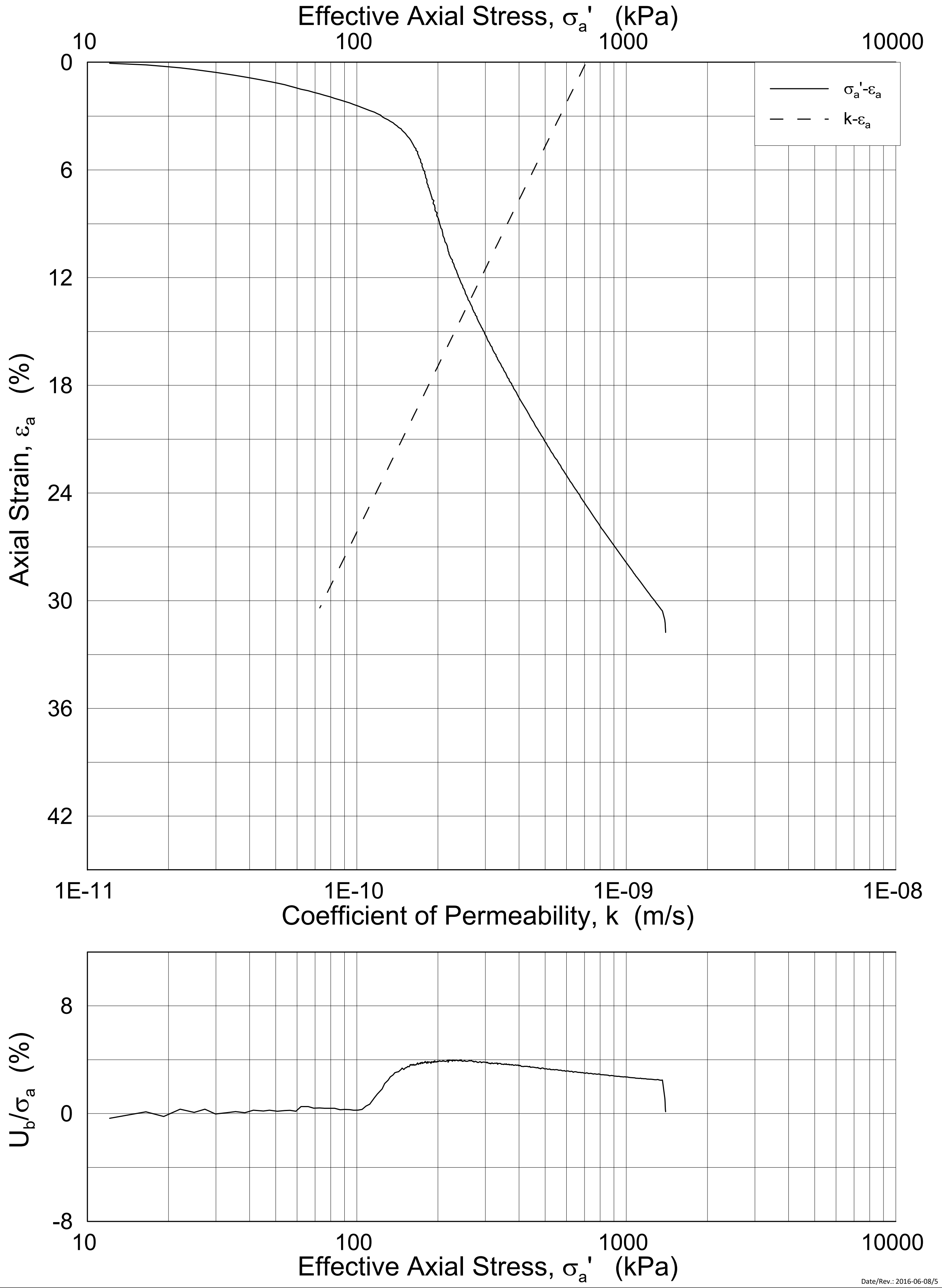




Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.143, ONSB21b-3-3-2 Lin2 (CRS4003).grf

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.143
Boring: ONSB21 Tube: 3 Part: 3 Test: 2	Date 2018-12-10 ; Drawn by / Checked FI/GS
Depth = 13.83 m ; p_0' = 88.9 kPa ; w_i = 63.6 % ; γ_i = 16.25 kN/m³	



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.144, ONSB21b-3-3-2 Log(CRS4003).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.144
	Date 2018-12-10 / Drawn by / Checked FI/GS

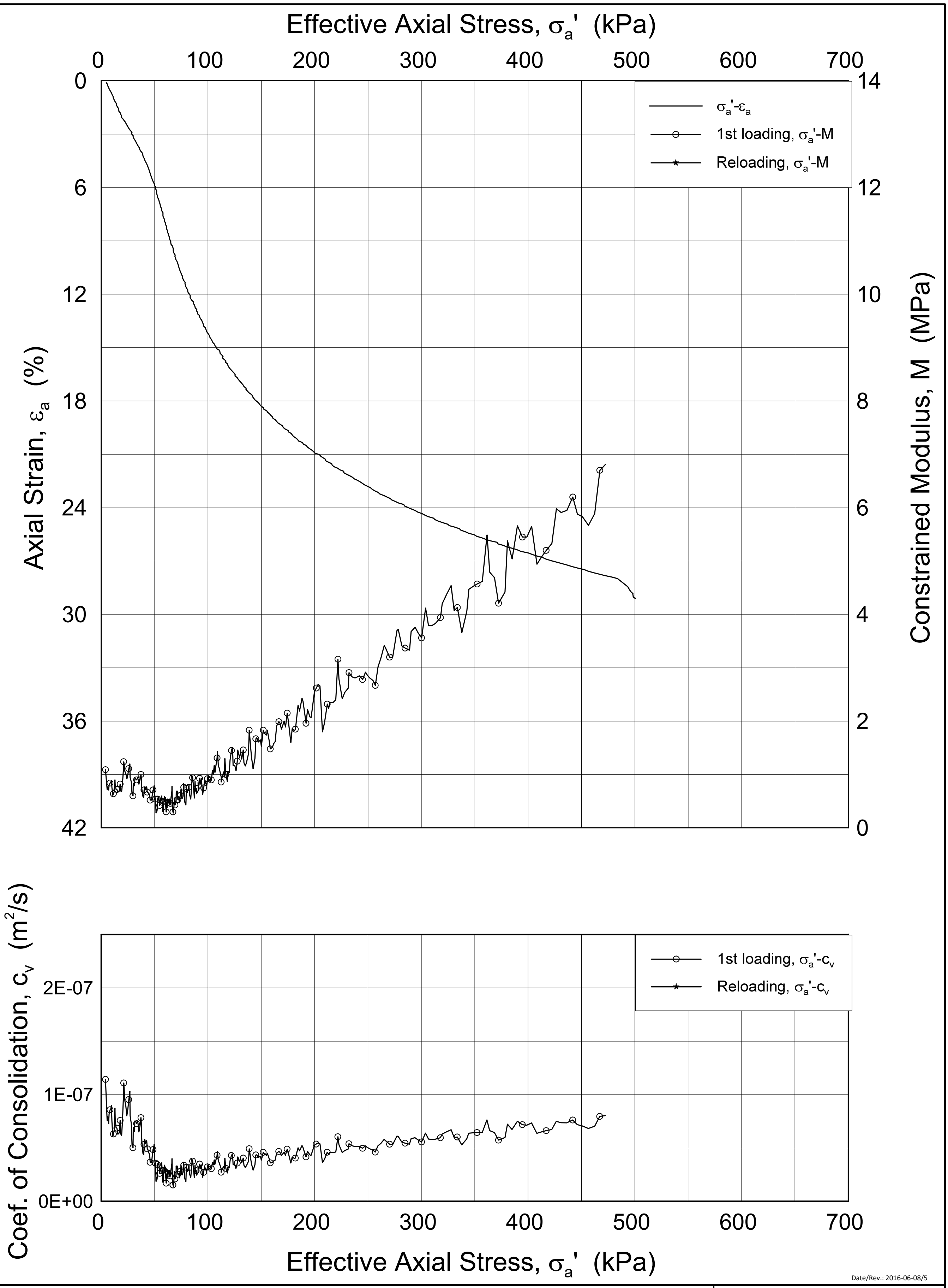
Boring: ONSB21 Tube: 3 Part: 3 Test: 2

Depth = 13.83 m

p_0' = 88.9 kPa

w_i = 63.6 %

γ_i = 16.25 kN/m³



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.145, ONSB22b-1-1-2 Lin (CRS4026).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB22 | Tube: 1 | Part: 1 | Test: 2

Depth = 5.7 m

p_0' = 36.6 kPa

w_i = 71.0 %

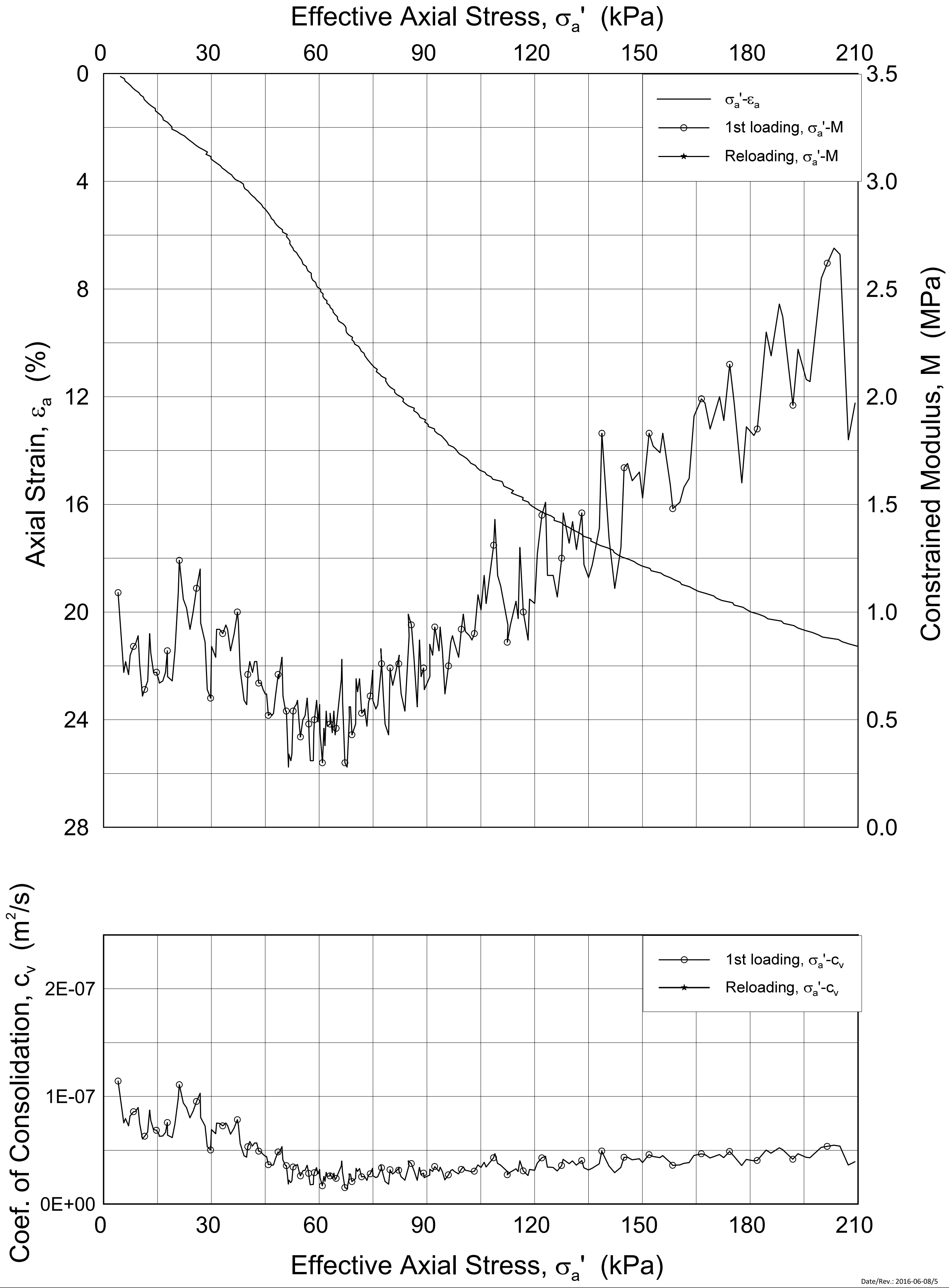
γ_i = 15.92 kN/m³

Document No. 20160154-10-R

Figure No. 5.2.145

Date 2018-12-10

Drawn by / Checked FI/GS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.146, ONSB22b-1-1-2 Lin2 (CRS4026).grf

Norwegian GeoTest Sites - Onsøy

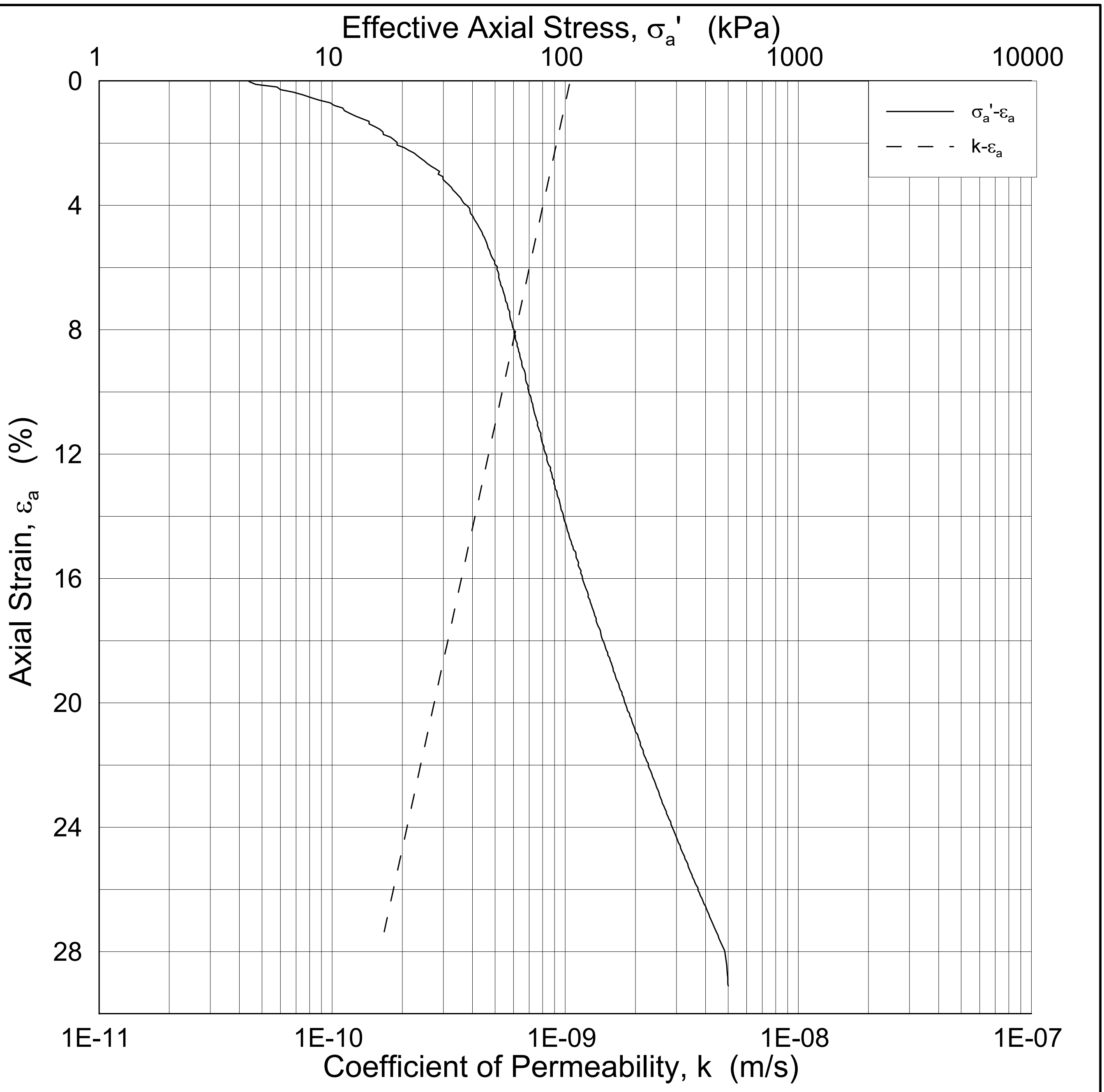
Oedometer test (CRSC)

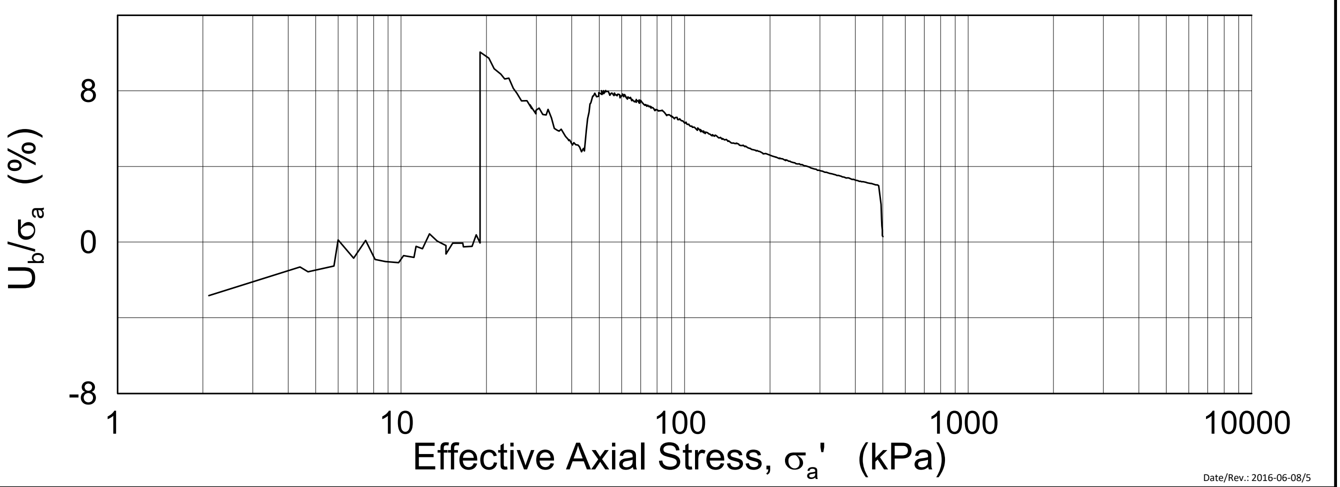
Boring: ONSB22 Tube: 1 Part: 1 Test: 2

Depth = 5.7 m
p_0' = 36.6 kPa
w_i = 71.0 %
γ_i = 15.92 kN/m³

Document No. 20160154-10-R
Figure No. 5.2.146
Date 2018-12-10
Drawn by / Checked FI/GS

NGI





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.147, ONSB22b-1-1-2 Log (CRS4026).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB22 Tube: 1 Part: 1 Test: 2

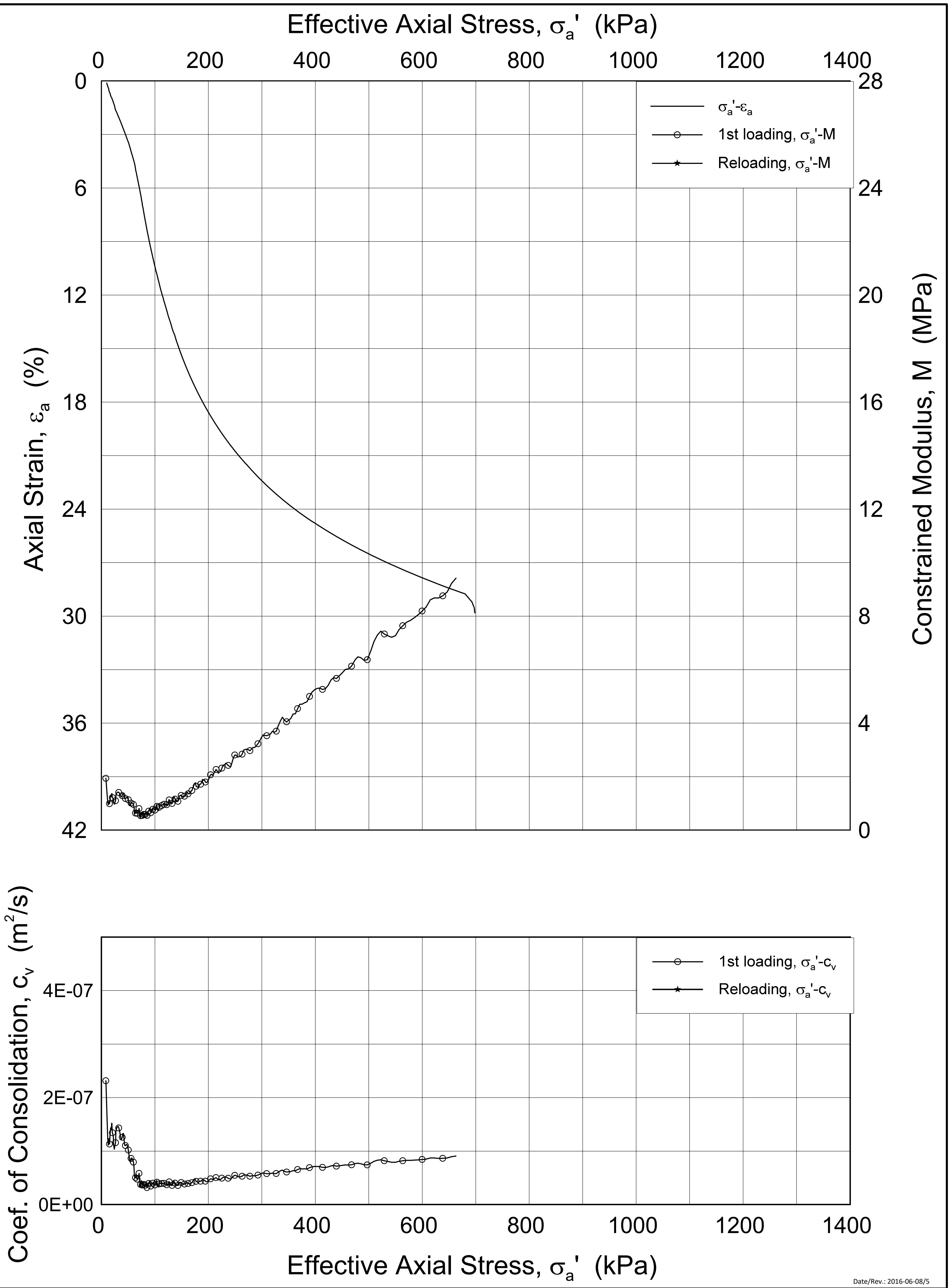
Depth = 5.7 m
p_0' = 36.6 kPa
w_i = 71.0 %
γ_i = 15.92 kN/m³

Document No. 20160154-10-R

Figure No. 5.2.147

Date 2018-12-10

Drawn by / Checked FI/GS



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.148, ONSB22b-1-2-2 Lin (CRS4027).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

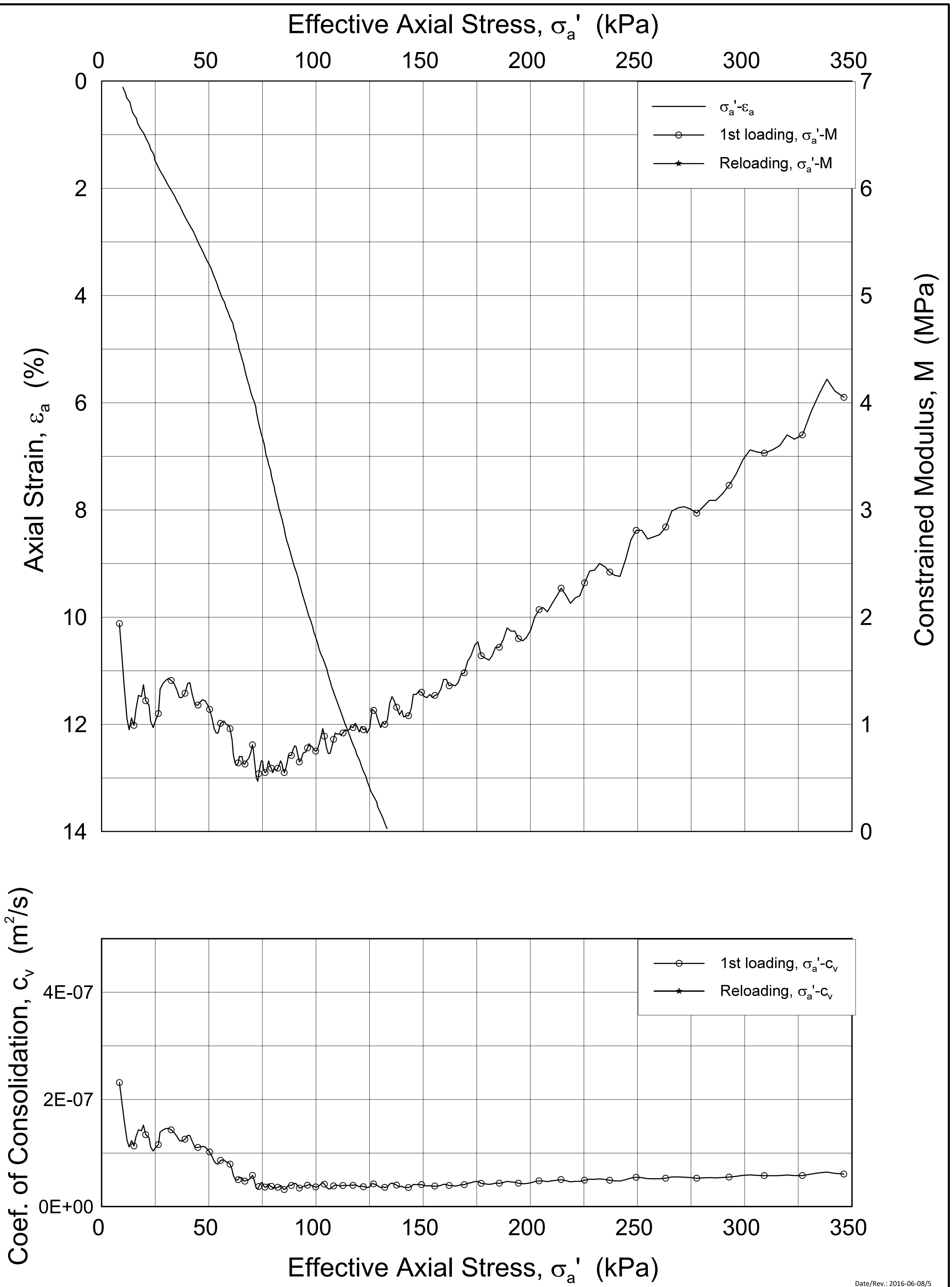
				Depth	=	6.9	m	
Boring:	ONSB22	Tube:	1	p_0'	=	44.4	kPa	
		Part:	2	w_i	=	68.6	%	
		Test:	2	γ_i	=	16.08	kN/m³	

Document No. 20160154-10-R

Figure No. 5.2.148

Date: 2018-12-10

Drawn by / Checked: FI/GS

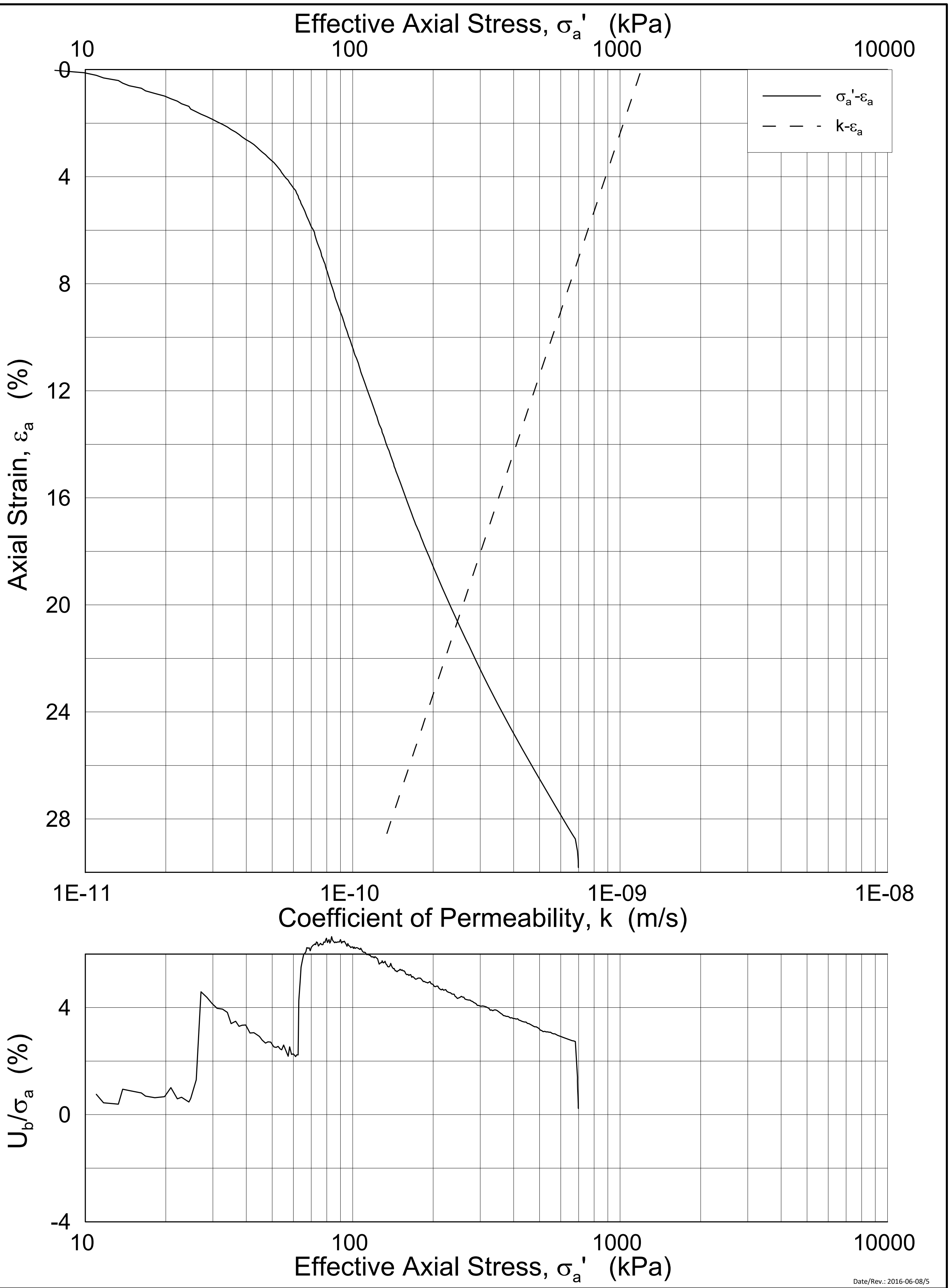


Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.149
	Date 2018-12-10 / Drawn by / Checked FI/GS

Boring: ONSB22 Tube: 1 Part: 2 Test: 2

Depth = 6.9 m
p_0' = 44.4 kPa
w_i = 68.6 %
γ_i = 16.08 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.150, ONSB22b-1-2-2 Log (CRS4027).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.150

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB22 Tube: 1 Part: 2 Test: 2

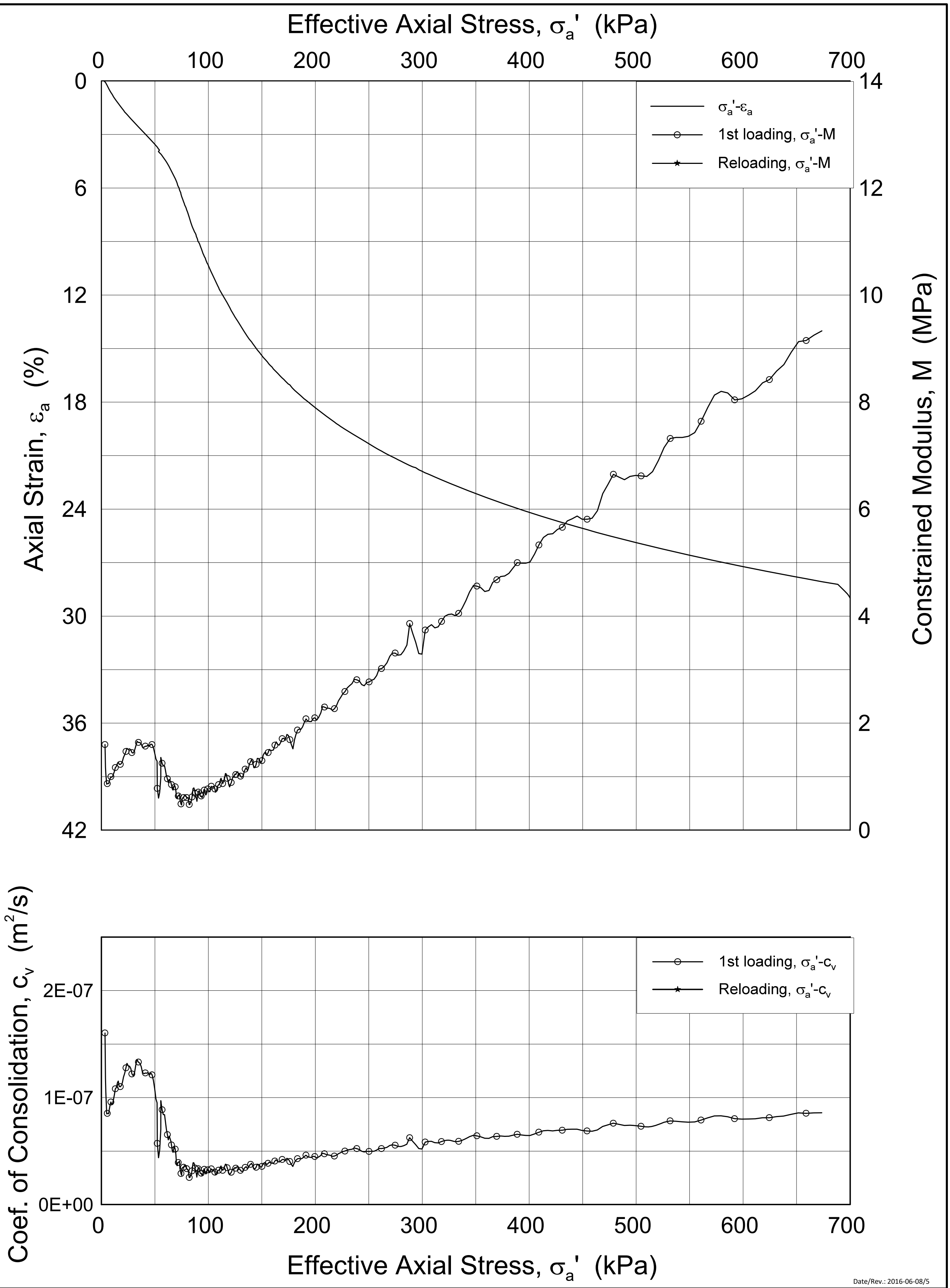
Depth = 6.9 m

p_0' = 44.4 kPa

w_i = 68.6 %

γ_i = 16.08 kN/m³

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.151, ONSB22b-1-3-2 Lin (CRS4031).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

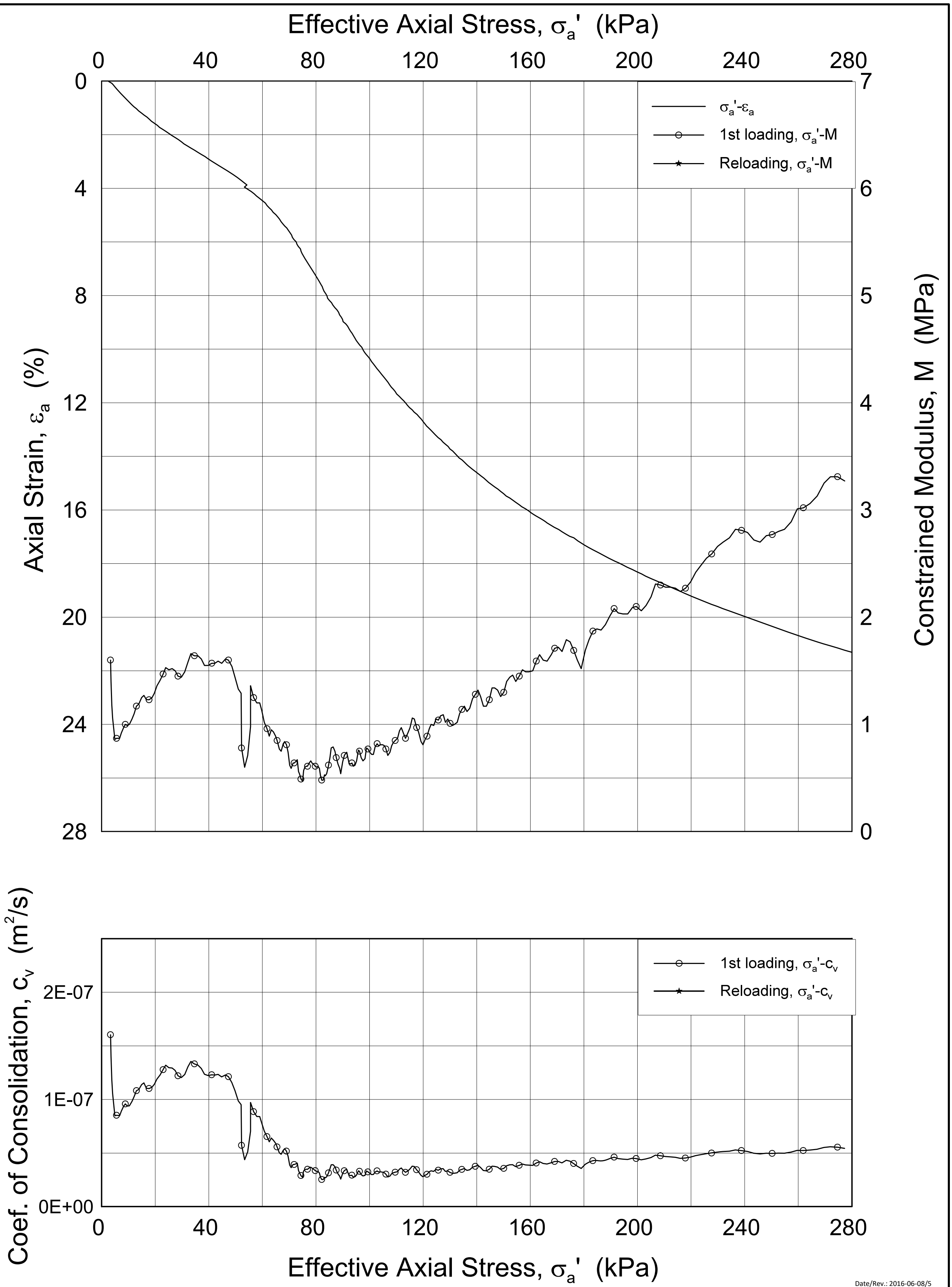
				Depth	=	7.65	m
Boring:	ONSB22	Tube:	1	p_0'	=	49.2	kPa
		Part:	3	w_i	=	60.0	%
		Test:	2	γ_i	=	15.45	kN/m³

Document No.
20160154-10-R

Figure No.
5.2.151

Date
2018-12-10

Drawn by / Checked
FI/GS



Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.152

Oedometer test (CRSC)

Date 2018-12-10

Drawn by / Checked FI/GS

Boring: ONSB22

Tube: 1

Part: 3

Test: 2

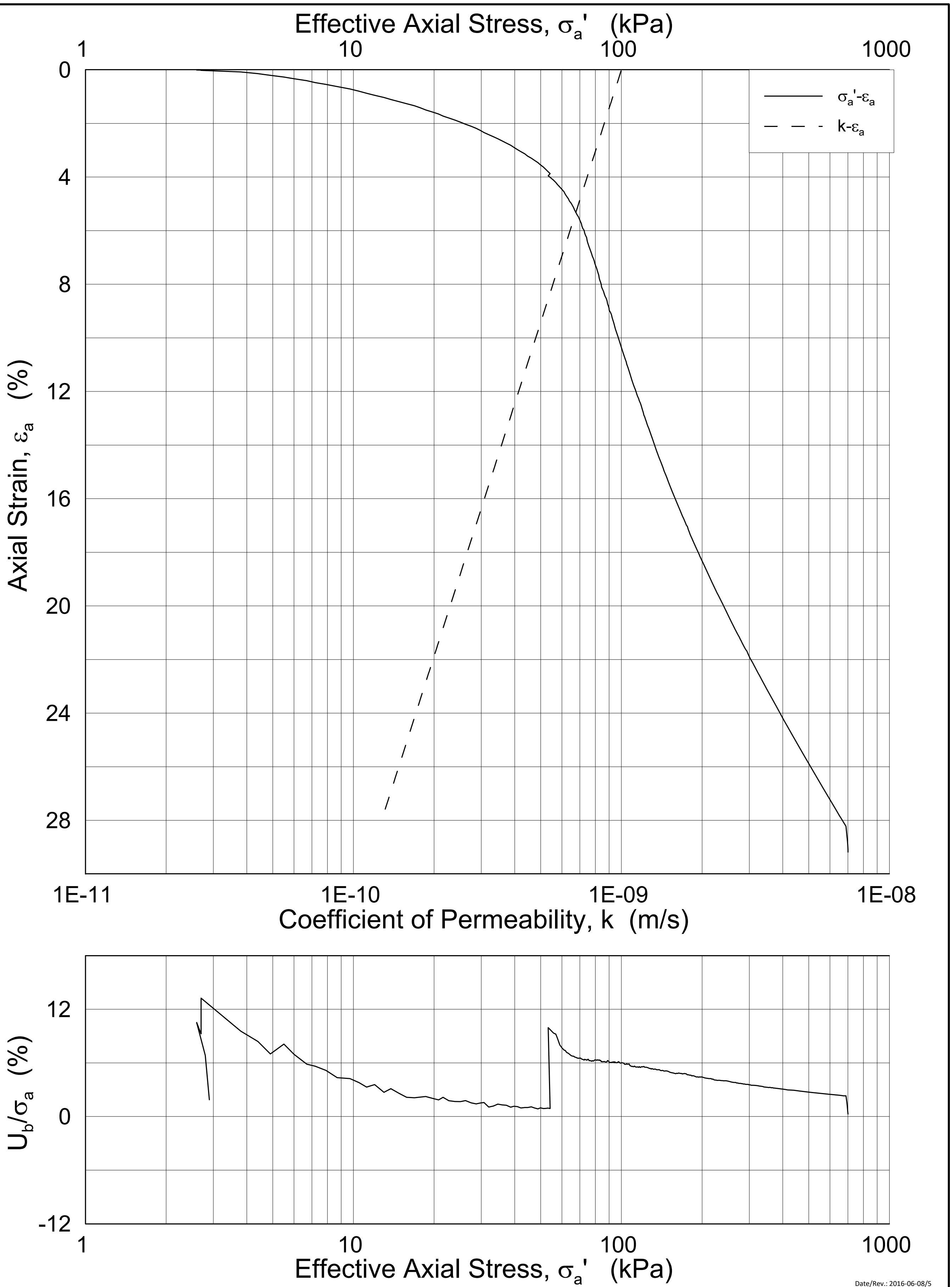
Depth = 7.65 m

p_0' = 49.2 kPa

w_i = 60.0 %

γ_i = 15.45 kN/m³

NGI

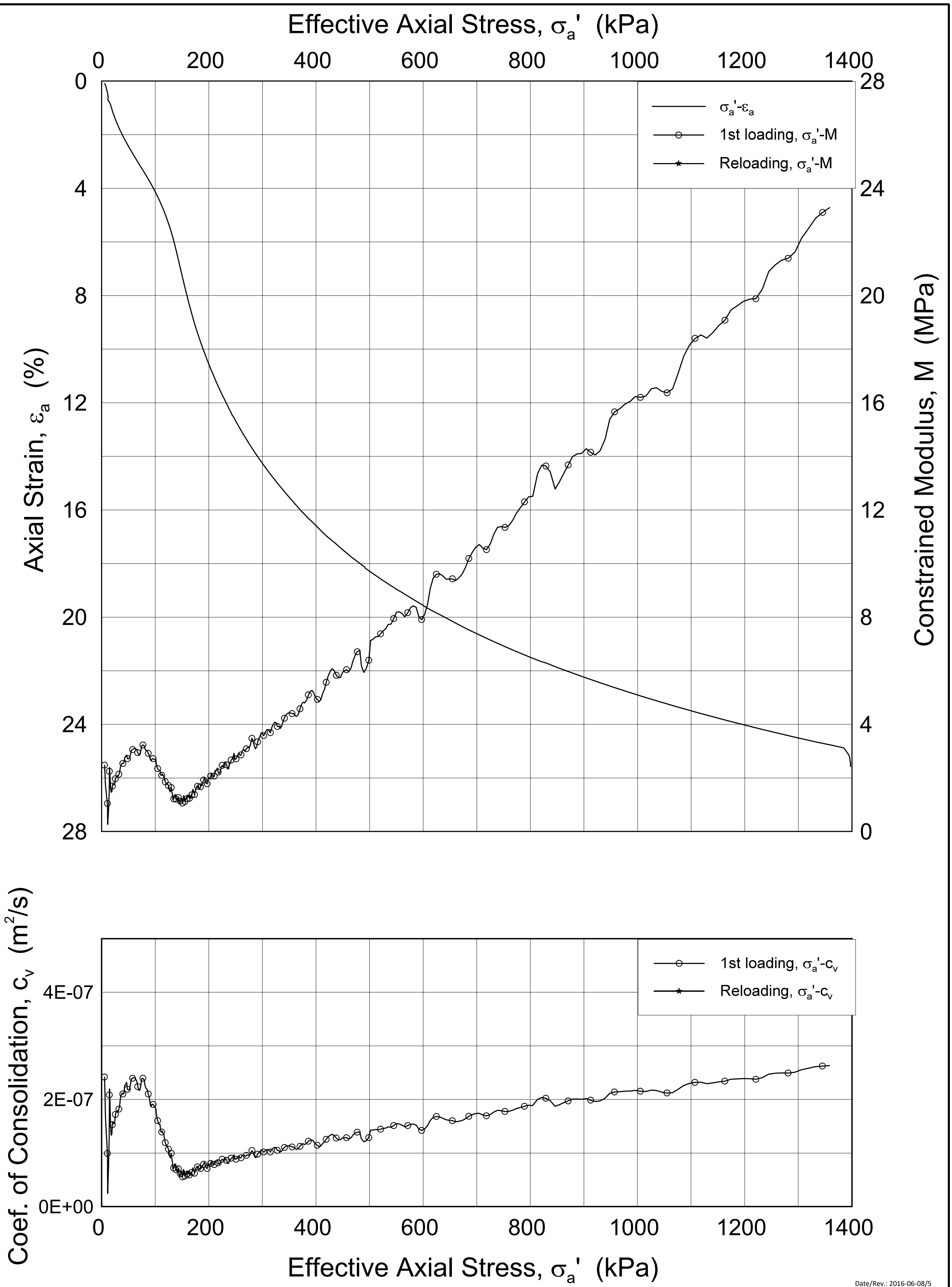


P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.153, ONSB22b-1-3-2 Log (CRS4031).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.153
Boring: ONSB22 Tube: 1 Part: 3 Test: 2	Date 2018-12-10
Depth = 7.65 m; p_0' = 49.2 kPa; w_i = 60.0 %; γ_i = 15.45 kN/m³	Drawn by / Checked FI/GS

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.154, ONSB22b-3-1-2 Lin(CRS4007).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.154

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB22 | Tube: 3 | Part: 1 | Test: 2

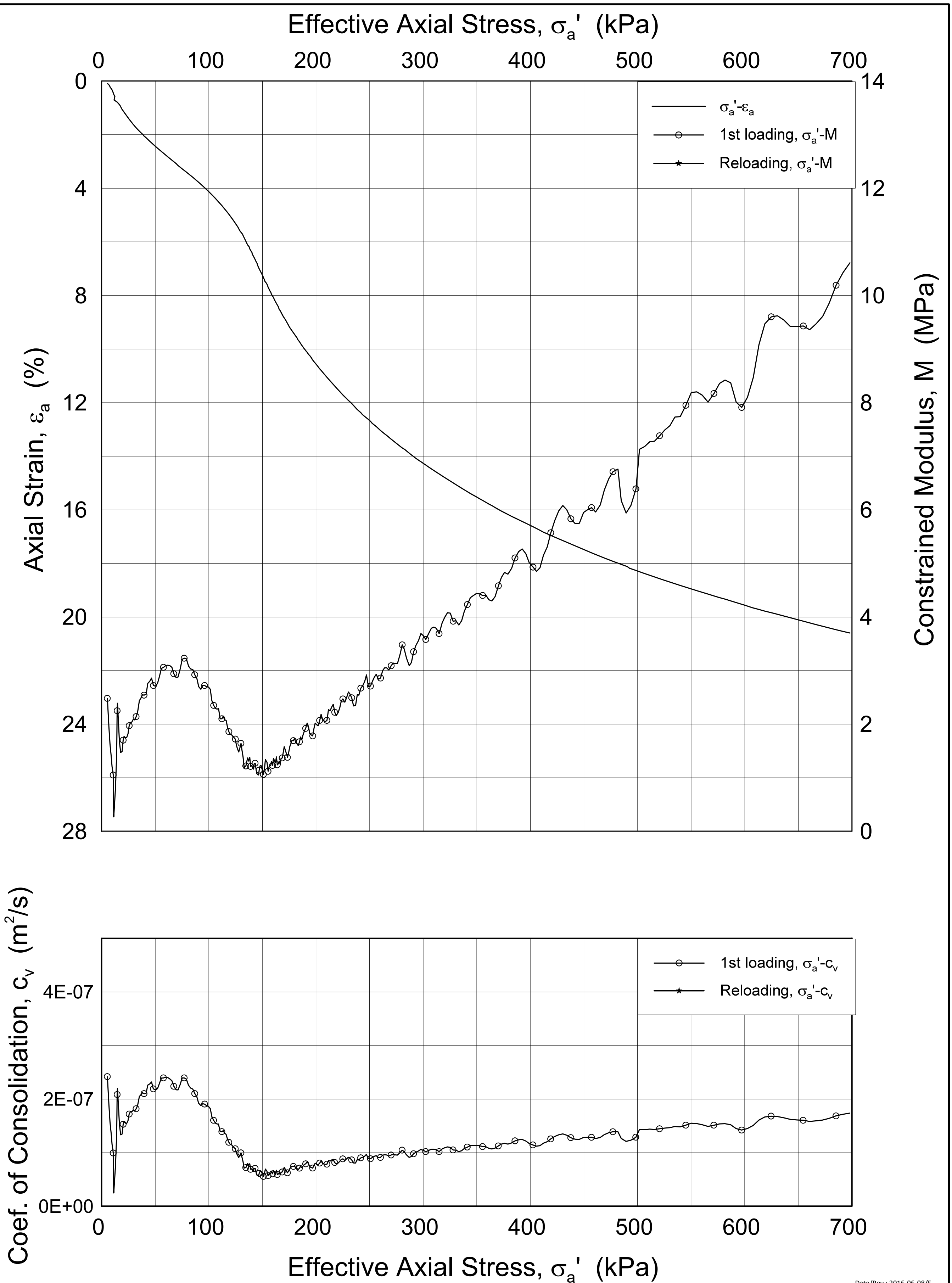
Depth = 13.7 m

p_0' = 88.0 kPa

w_i = 45.1 %

γ_i = 17.74 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.155, ONSB22b-3-1-2 Lin2(CRS4007).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB22 | Tube: 3 | Part: 1 | Test: 2

Depth = 13.7 m

p_0' = 88.0 kPa

w_i = 45.1 %

γ_i = 17.74 kN/m³

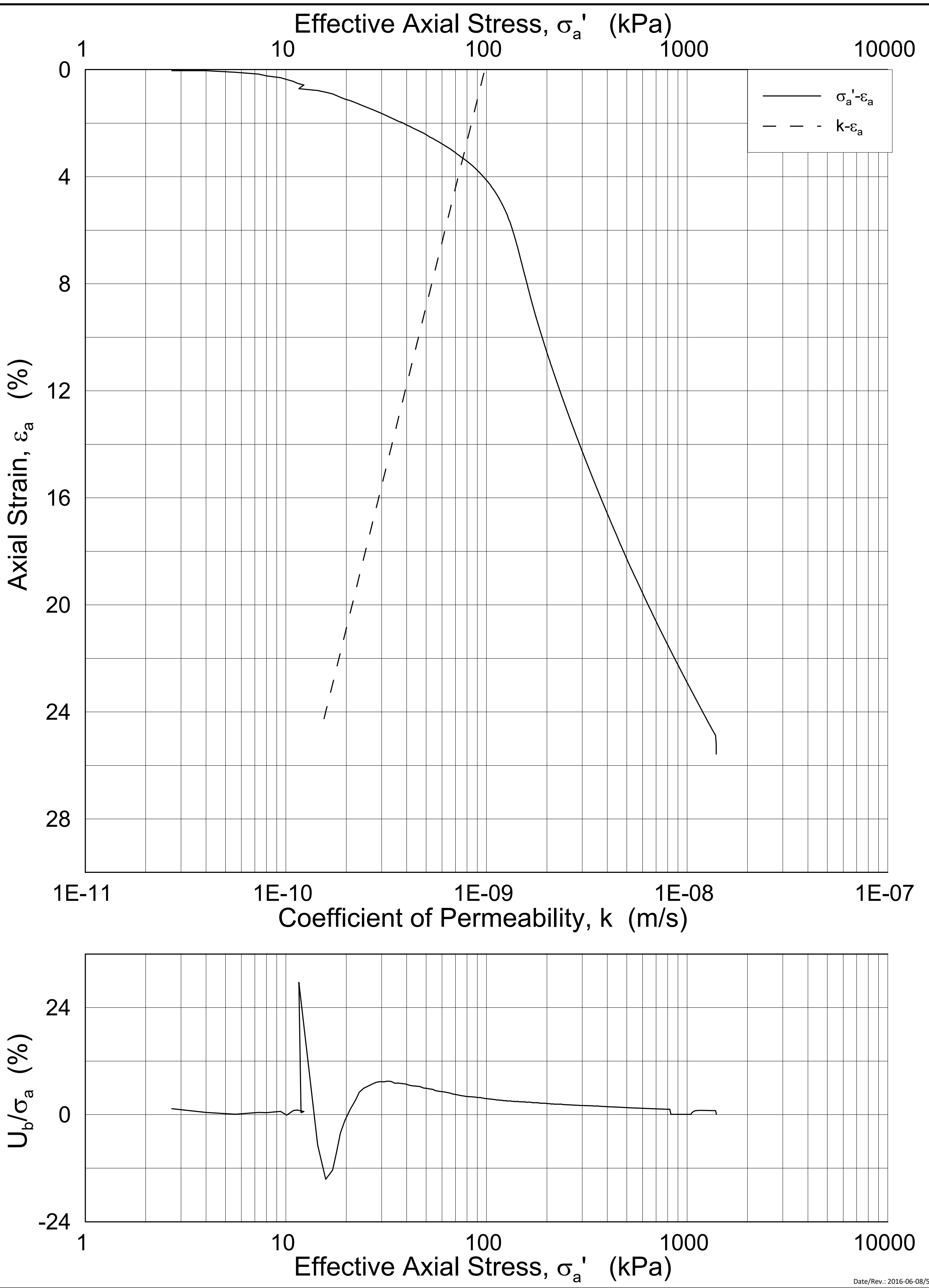
Document No. 20160154-10-R

Figure No. 5.2.155

Date 2018-12-10

Drawn by / Checked FI/GS

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.156, ONSB22b-3-1-2 Log(CRS4007).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB22

Tube:	3	Depth	=	13.7	m
Part:	1	p_0'	=	88.0	kPa
Test:	2	w_i	=	45.1	%
		γ_i	=	17.74	kN/m³

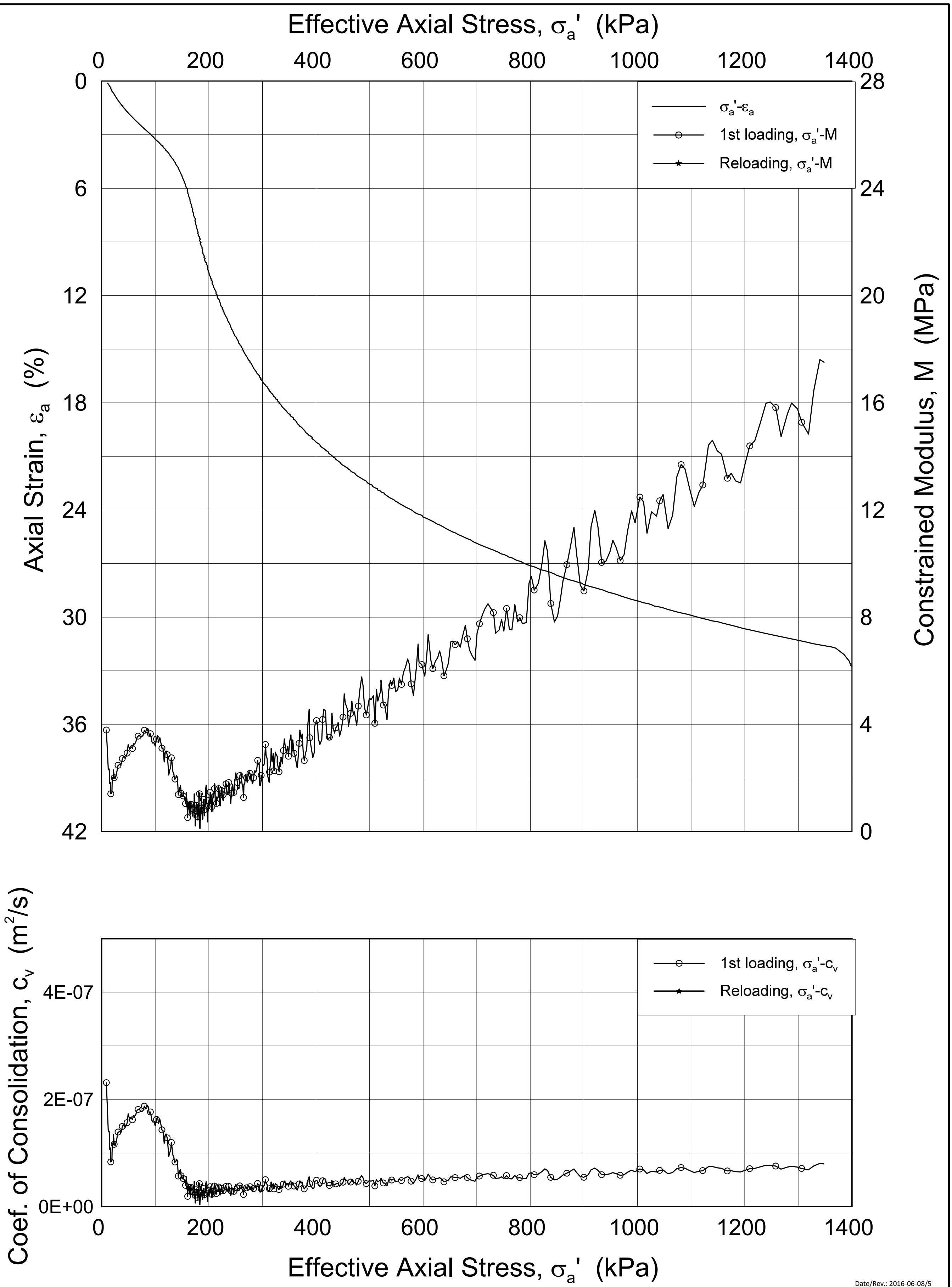
Document No. 20160154-10-R

Figure No. 5.2.156

Date 2018-12-10

Drawn by / Checked FI/GS

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.157, ONSB22b-3-2-2 Lin (CRS4008).grf

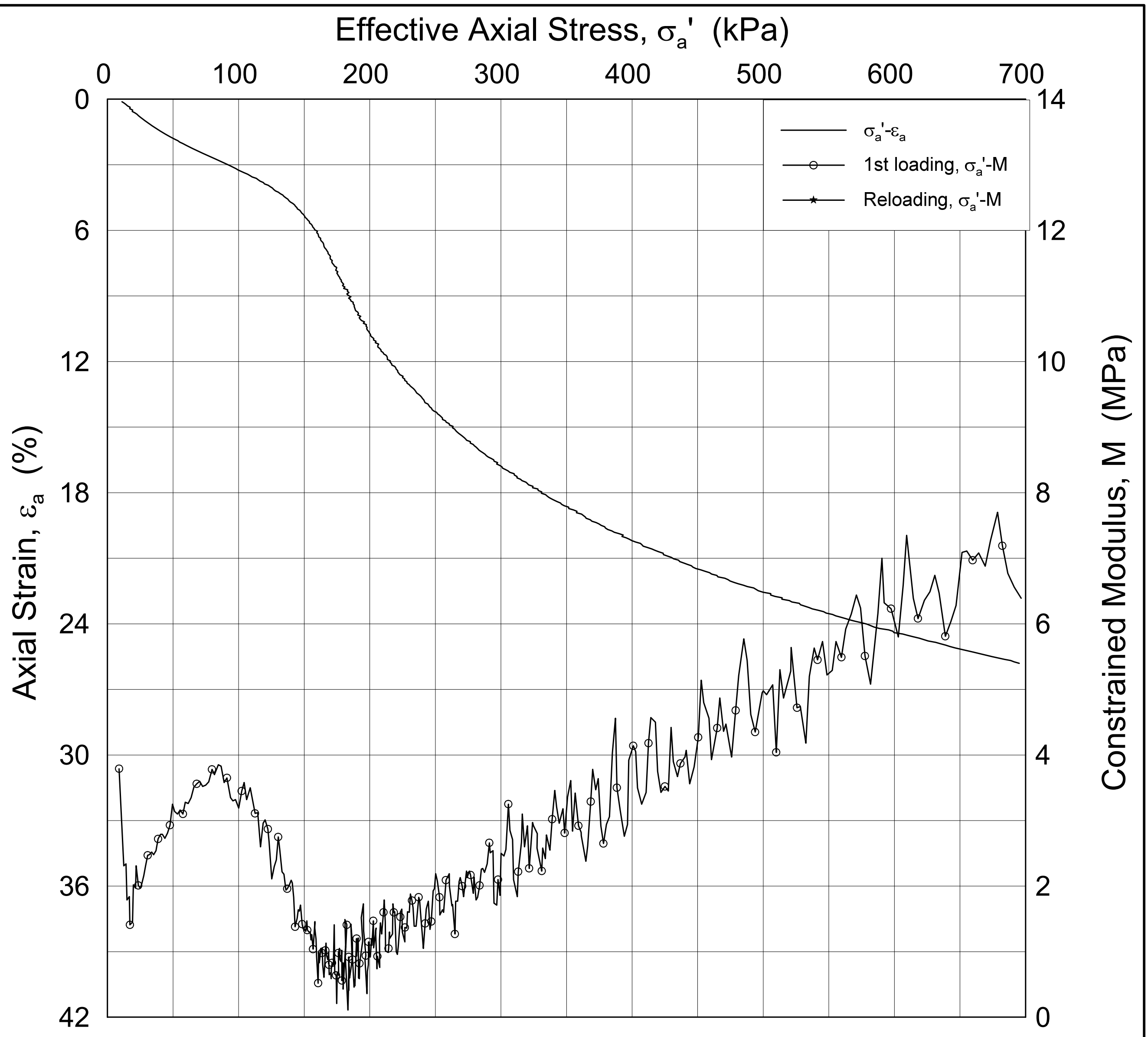
Date/Rev.: 2016-06-08/5

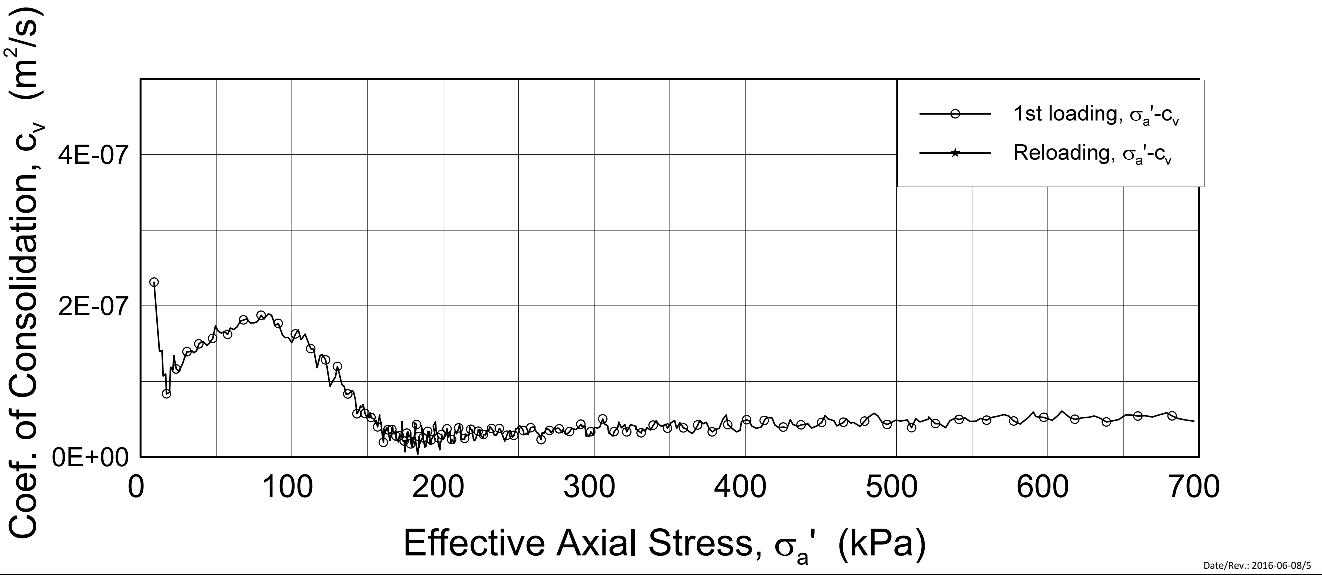
Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.157
	Date 2018-12-10 / Drawn by / Checked FI/GS

Boring: ONSB22 Tube: 3 Part: 2 Test: 2

Depth = 14.45 m
p_0' = 92.8 kPa
w_i = 65.2 %
γ_i = 16.15 kN/m³

NGI





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.158, ONSB22b-3-2-2 Lin2 (CRS4008).grf

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.158
	Date 2018-12-10 / Drawn by / Checked FI/GS

Boring: ONSB22 Tube: 3 Part: 2 Test: 2

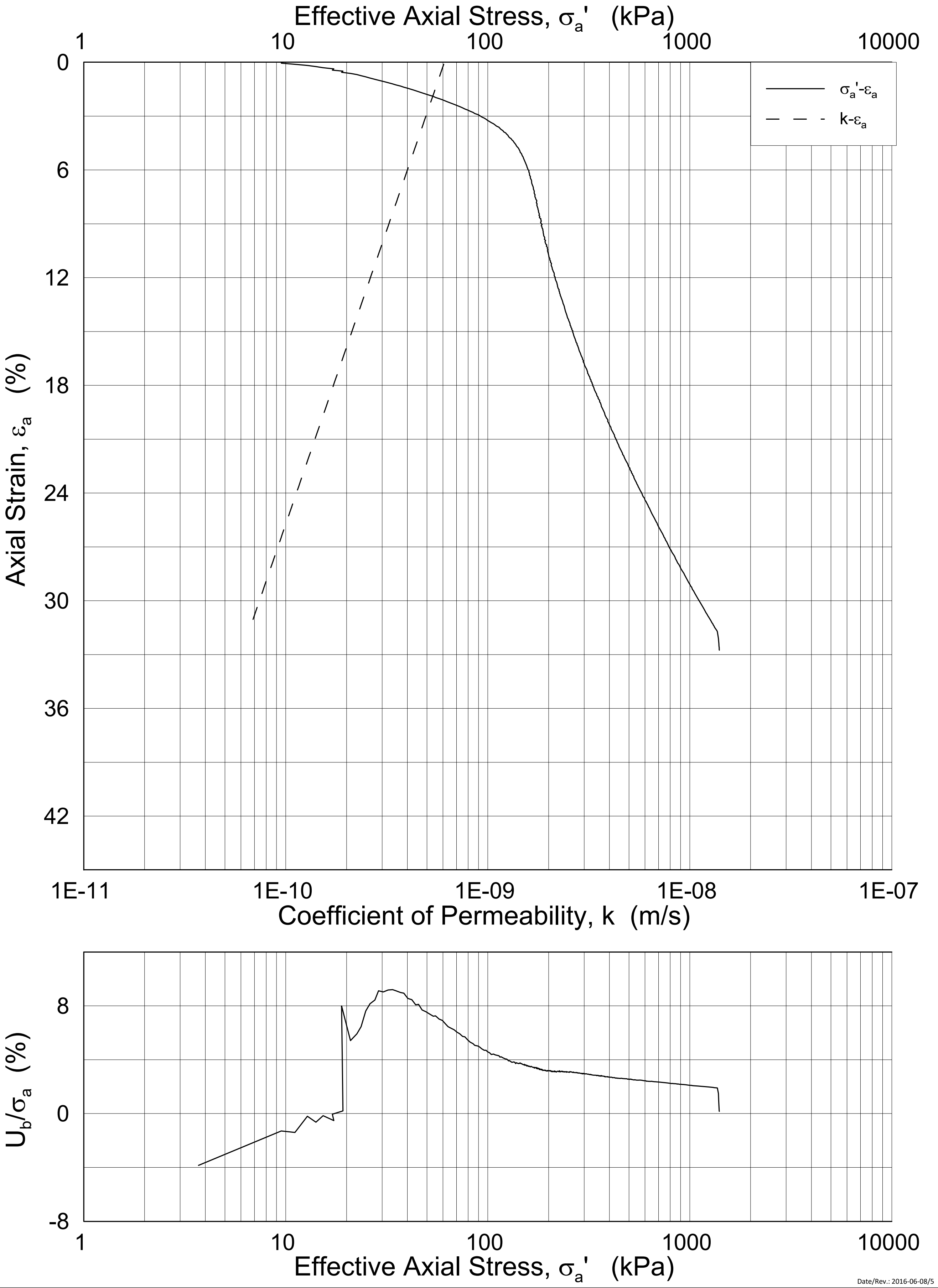
Depth = 14.45 m

p_0' = 92.8 kPa

w_i = 65.2 %

γ_i = 16.15 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.159, ONSB22b-3-2-2 Log(CRS4008).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.159

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB22 | Tube: 3 | Part: 2 | Test: 2

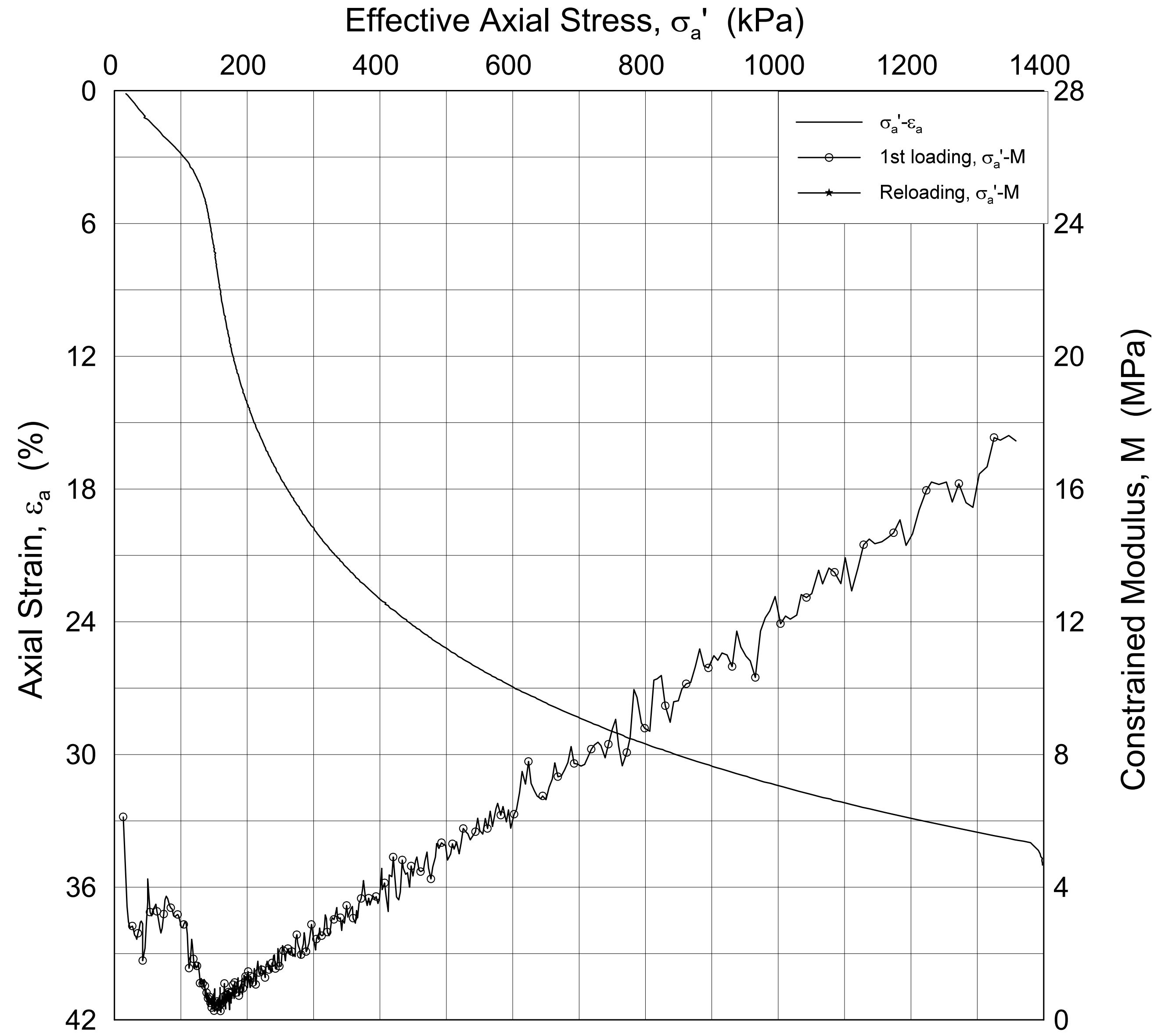
Depth = 14.45 m

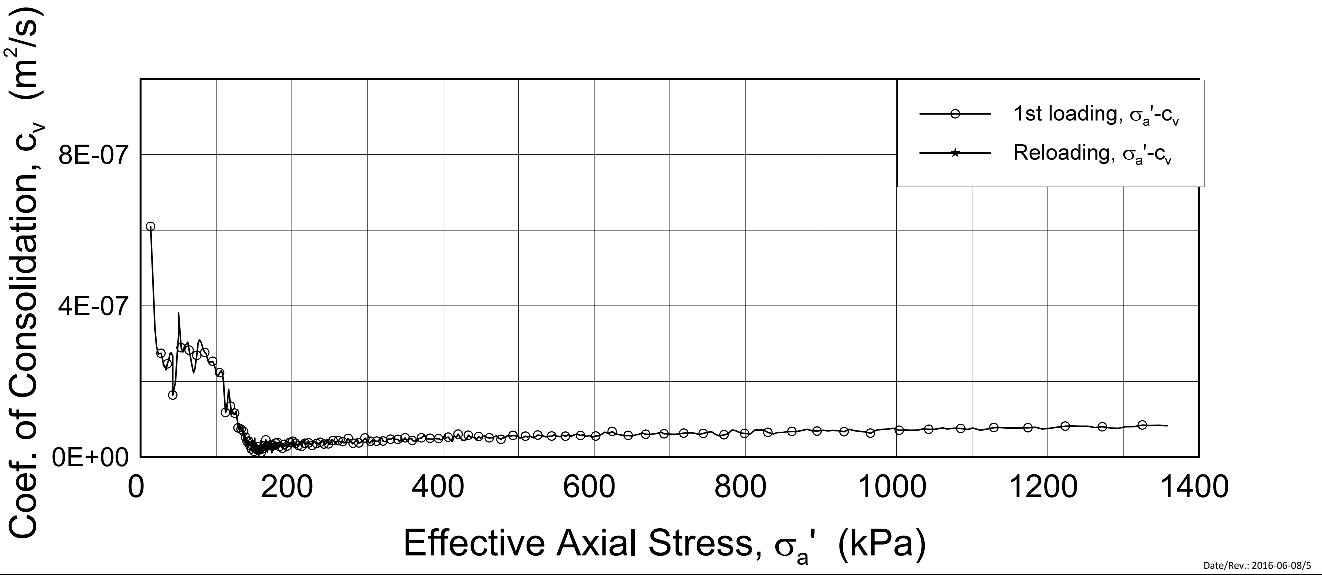
p_0' = 92.8 kPa

w_i = 65.2 %

γ_i = 16.15 kN/m³

NGI





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.160, ONSB22b-3-3-2 Lin (CRS4005).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.160
	Date 2018-12-10; Drawn by / Checked FI/GS

Boring: ONSB22 — Tube: 3 — Part: 3 — Test: 2

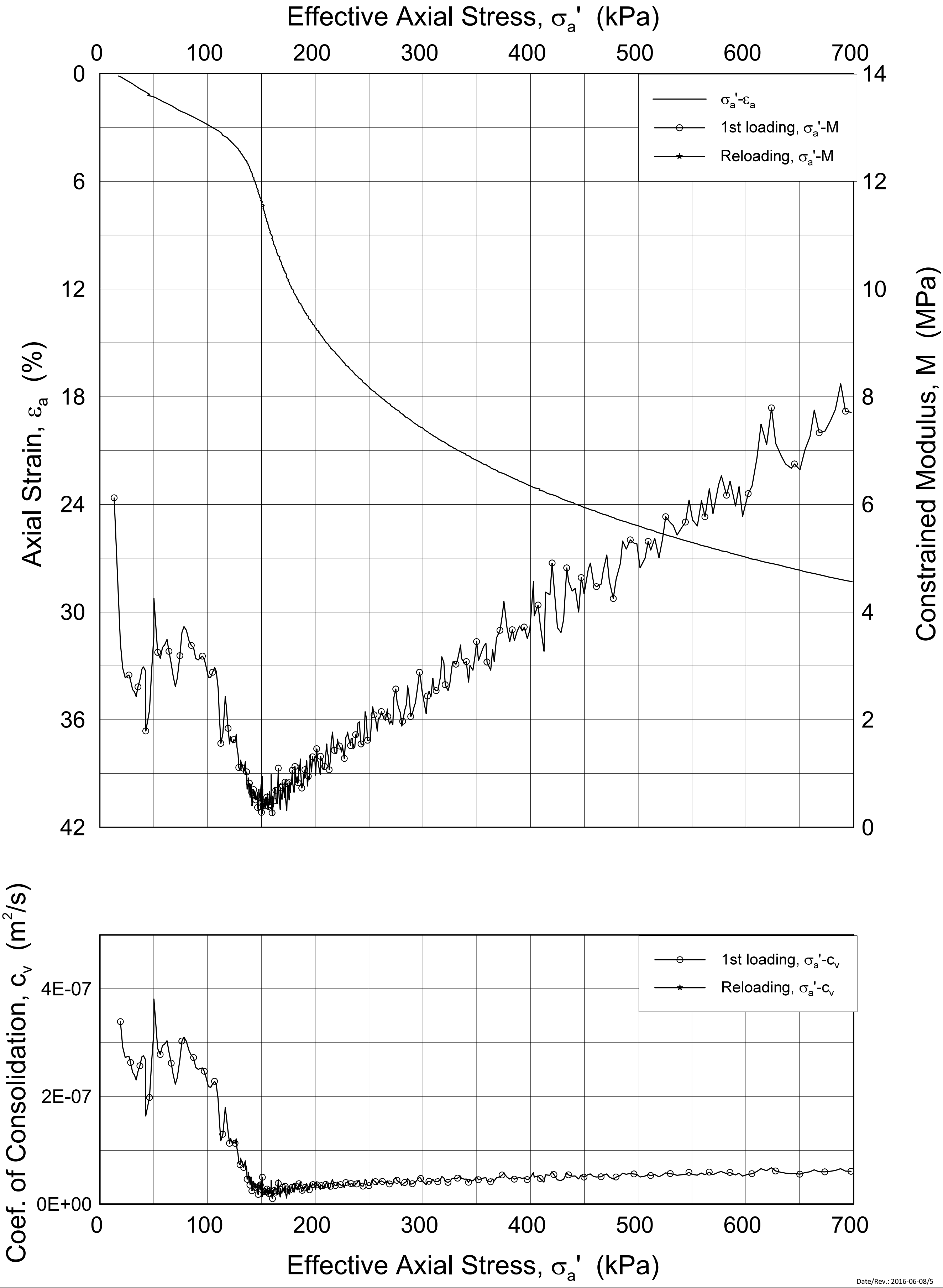
Depth = 15.35 m

p_0' = 98.6 kPa

w_i = 71.2 %

γ_i = 15.66 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB22	Tube:	3	Depth	=	15.35	m
	Part:	3	p_0'	=	98.6	kPa
	Test:	2	w_i	=	71.2	%
			γ_i	=	15.66	kN/m³

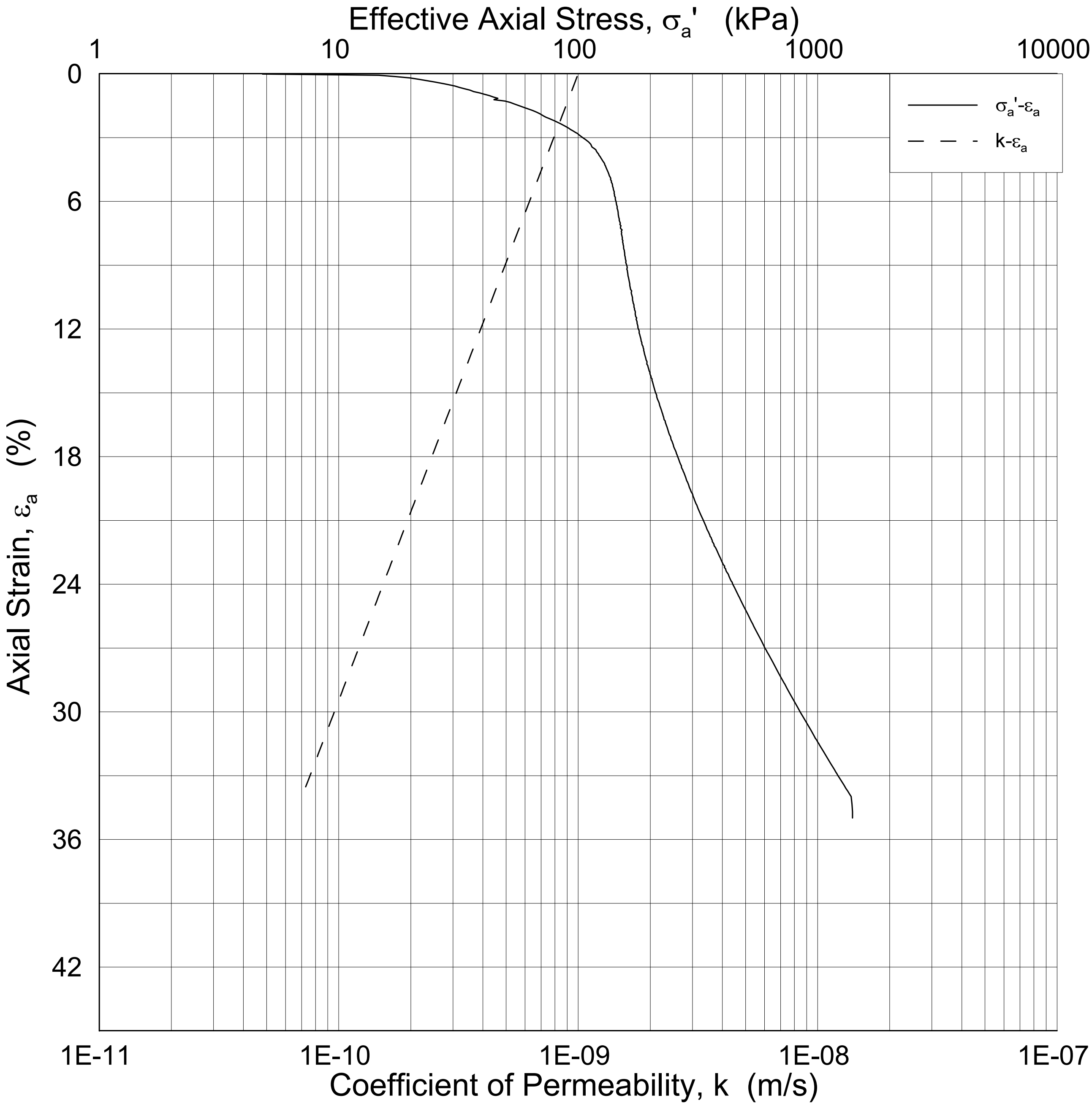
Document No. 20160154-10-R

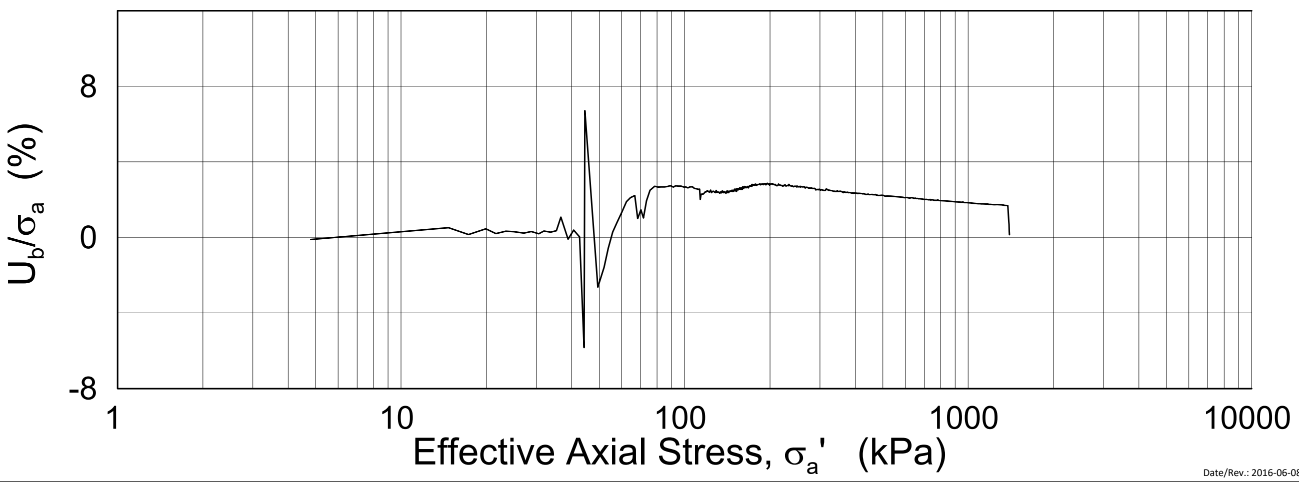
Figure No. 5.2.161

Date 2018-12-10

Drawn by / Checked FI/GS

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.161, ONSB22b-3-3-2 Lin2 (CRS4005).grf





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.162, ONSB22b-3-3-2 Log(CRS4005).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB22 Tube: 3 Part: 3 Test: 2

Depth = 15.35 m
p_0' = 98.6 kPa
w_i = 71.2 %
γ_i = 15.66 kN/m³

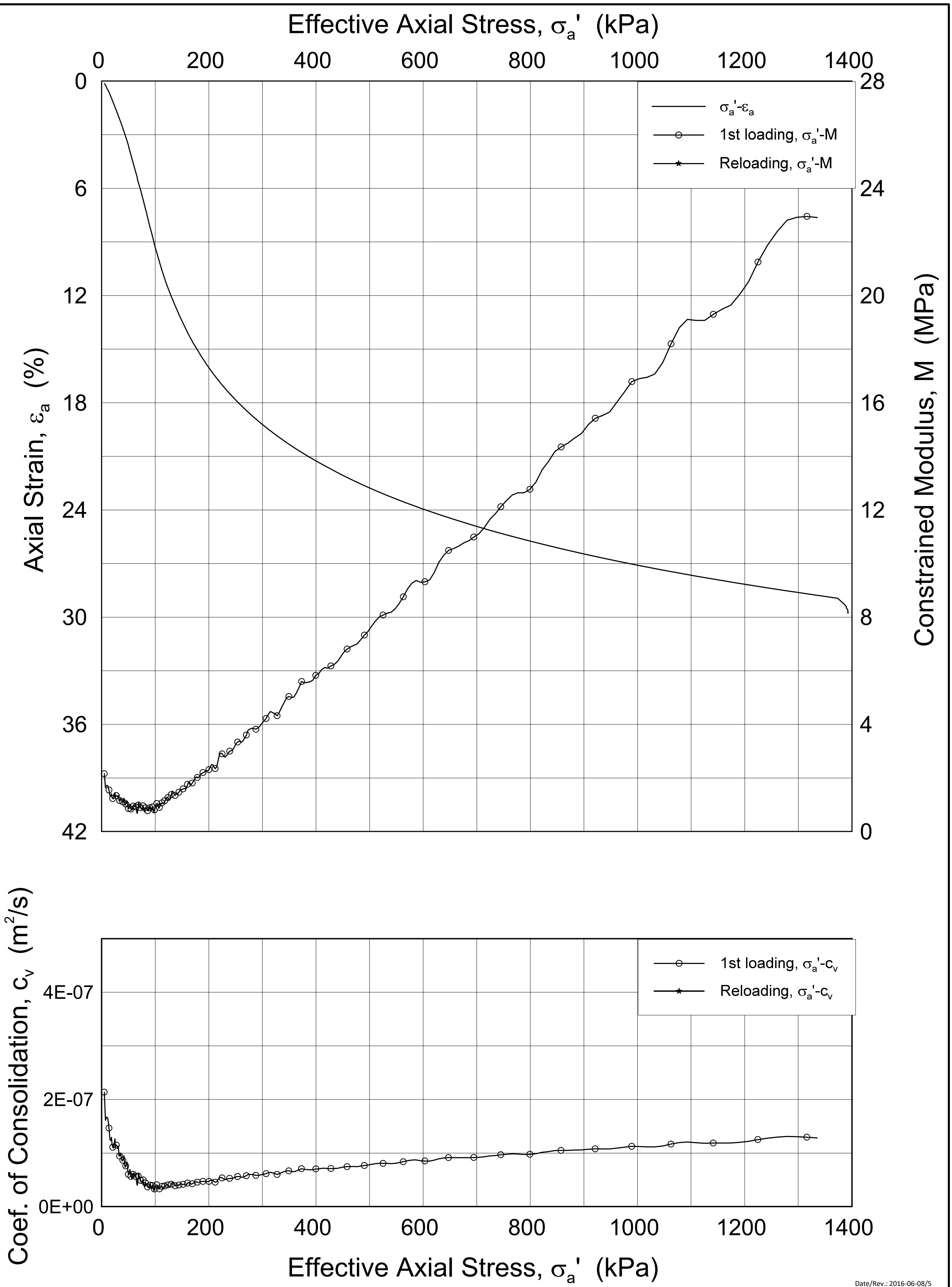
Document No. 20160154-10-R

Figure No. 5.2.162

Date 2018-12-10

Drawn by / Checked FI/GS

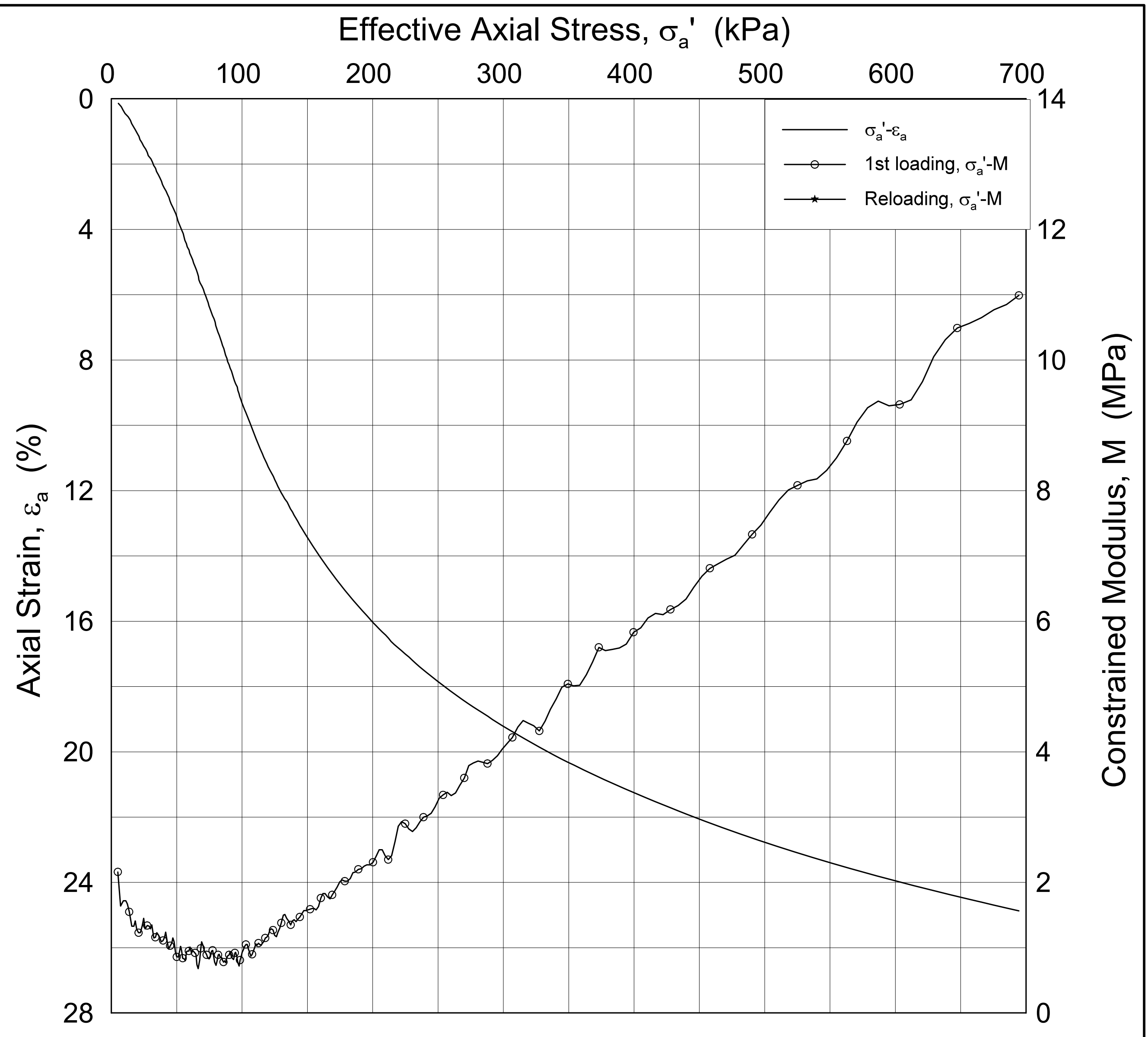
NGI

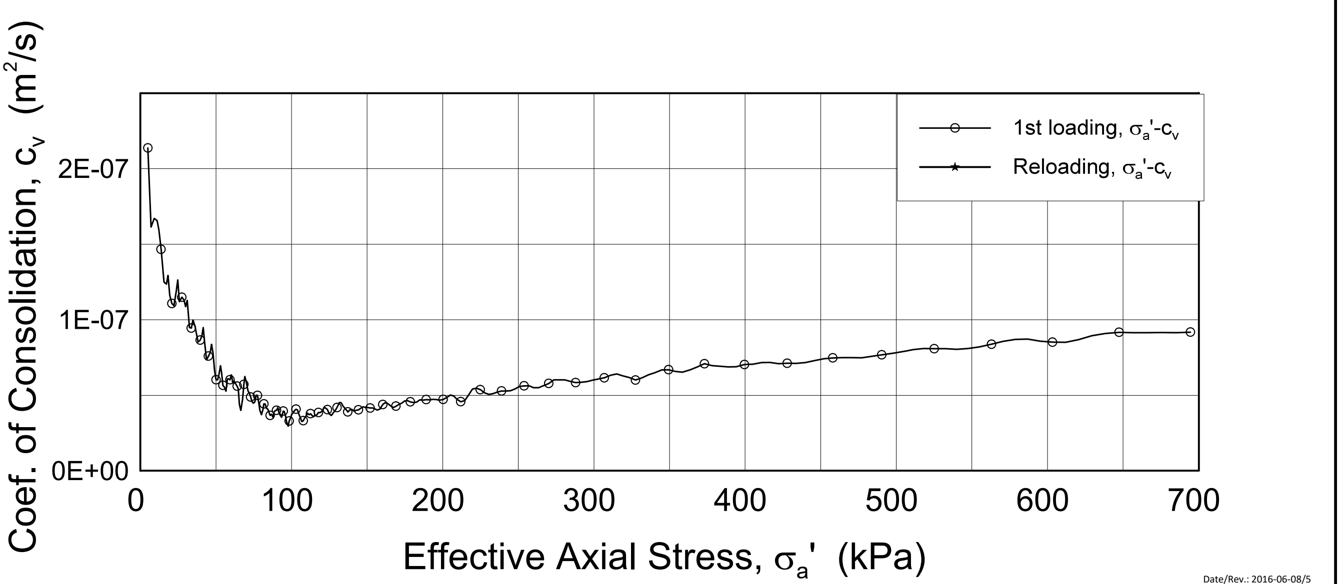


P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.163, ONSB25b-2-1-2 Lin (CRS4033).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R
Oedometer test (CRSC)		Figure No. 5.2.163
	Depth = 8.91 m	Date 2018-12-10 — Drawn by / Checked FI/GS
Boring: ONSB25 — Tube: 2	p_0' = 57.3 kPa	NGI
Part: 1	w_i = 60.0 %	
Test: 2	γ_i = 16.67 kN/m³	





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.164, ONSB25b-2-1-2 Lin2 (CRS4033).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.164
	Date 2018-12-10 / Drawn by / Checked FI/GS

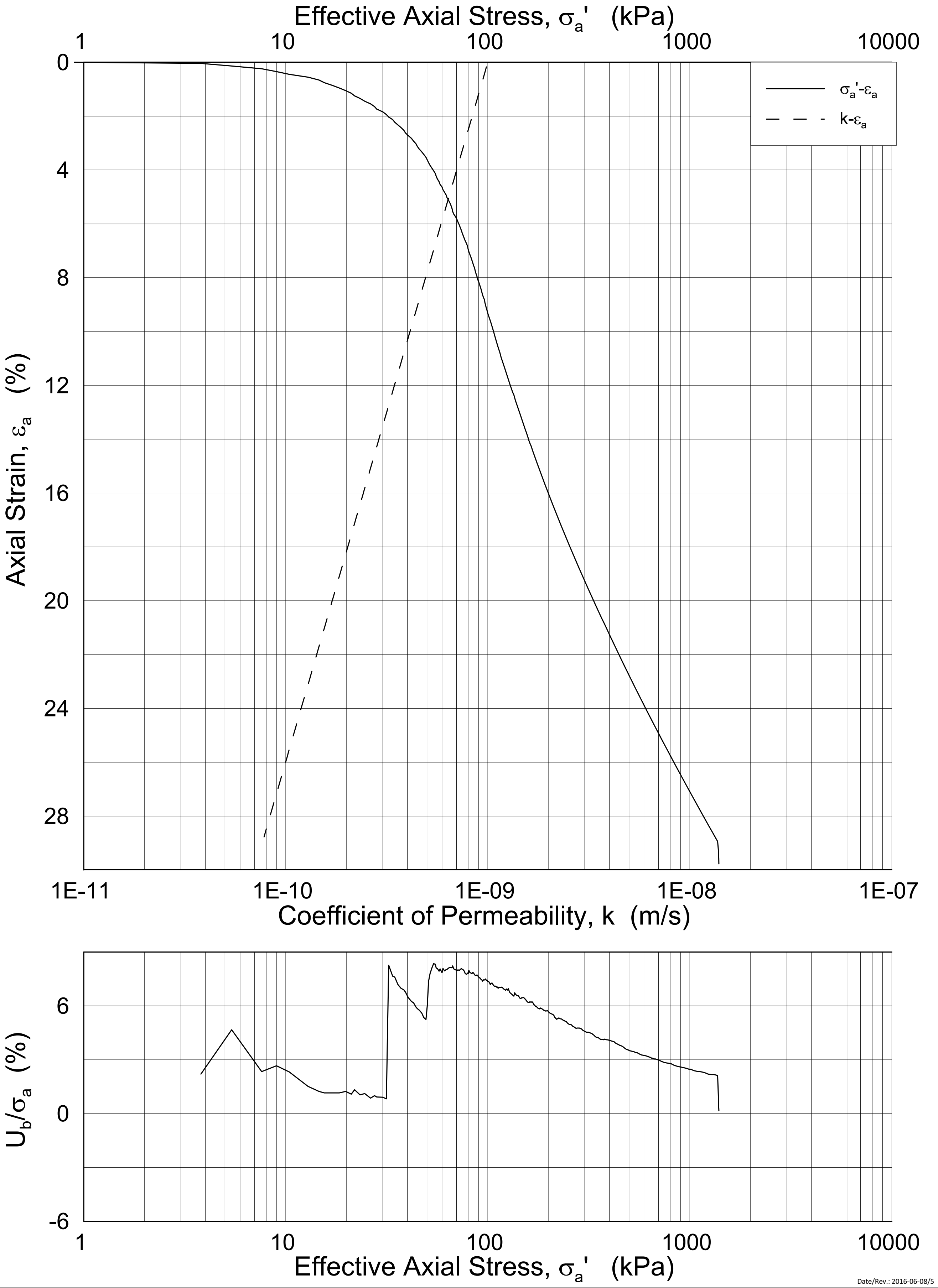
Boring: ONSB25 | Tube: 2 | Part: 1 | Test: 2

Depth = 8.91 m

p_0' = 57.3 kPa

w_i = 60.0 %

γ_i = 16.67 kN/m³



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.165, ONSB25b-2-1-2 Log (CRS4033).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

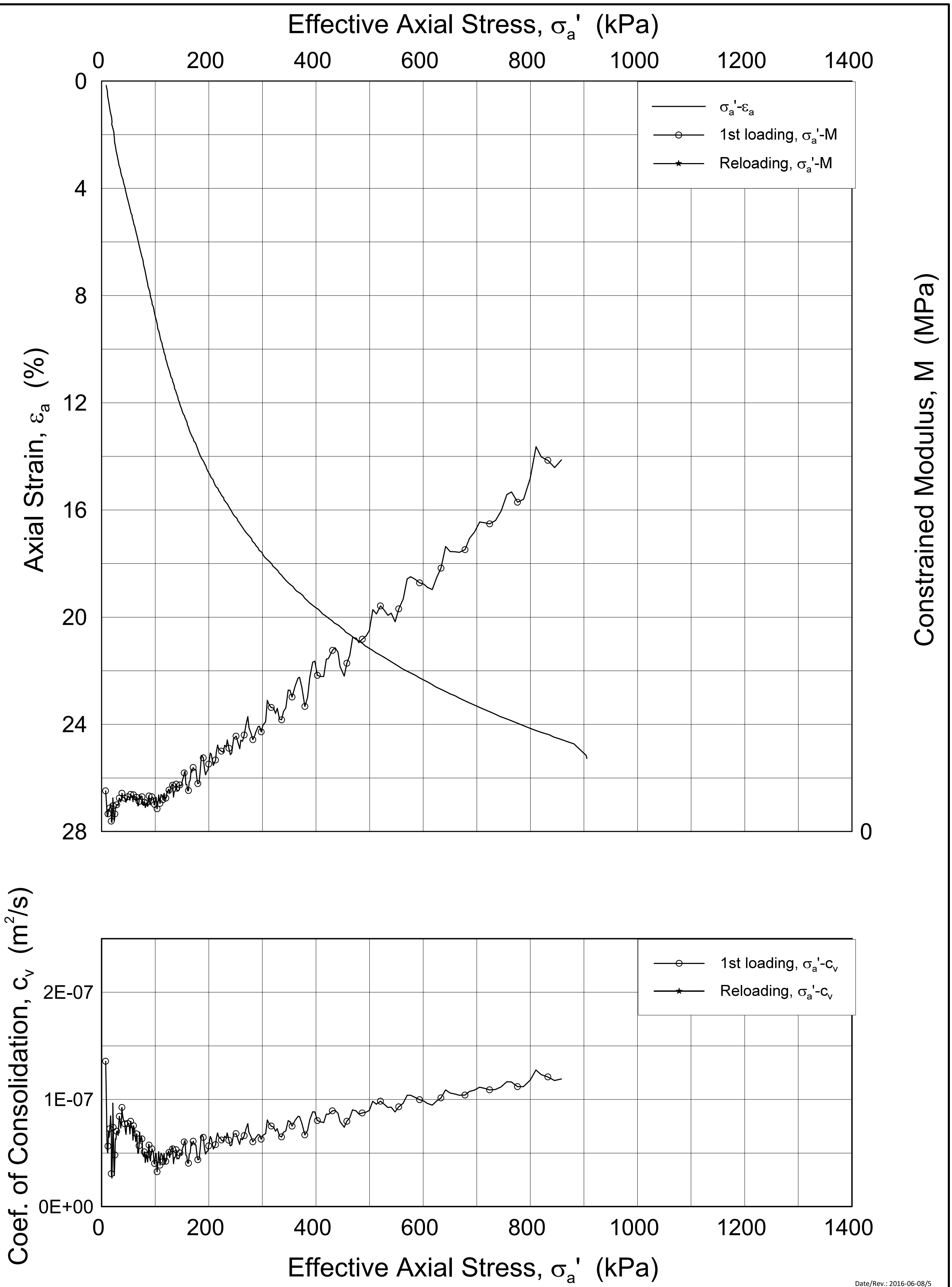
Boring:	ONSB25	Tube:	2	Depth	=	8.91	m
		Part:	1	p_0'	=	57.3	kPa
		Test:	2	w_i	=	60.0	%
				γ_i	=	16.67	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.165

Date 2018-12-10

Drawn by / Checked FI/GS



Date/Rev.: 2016-06-08/5

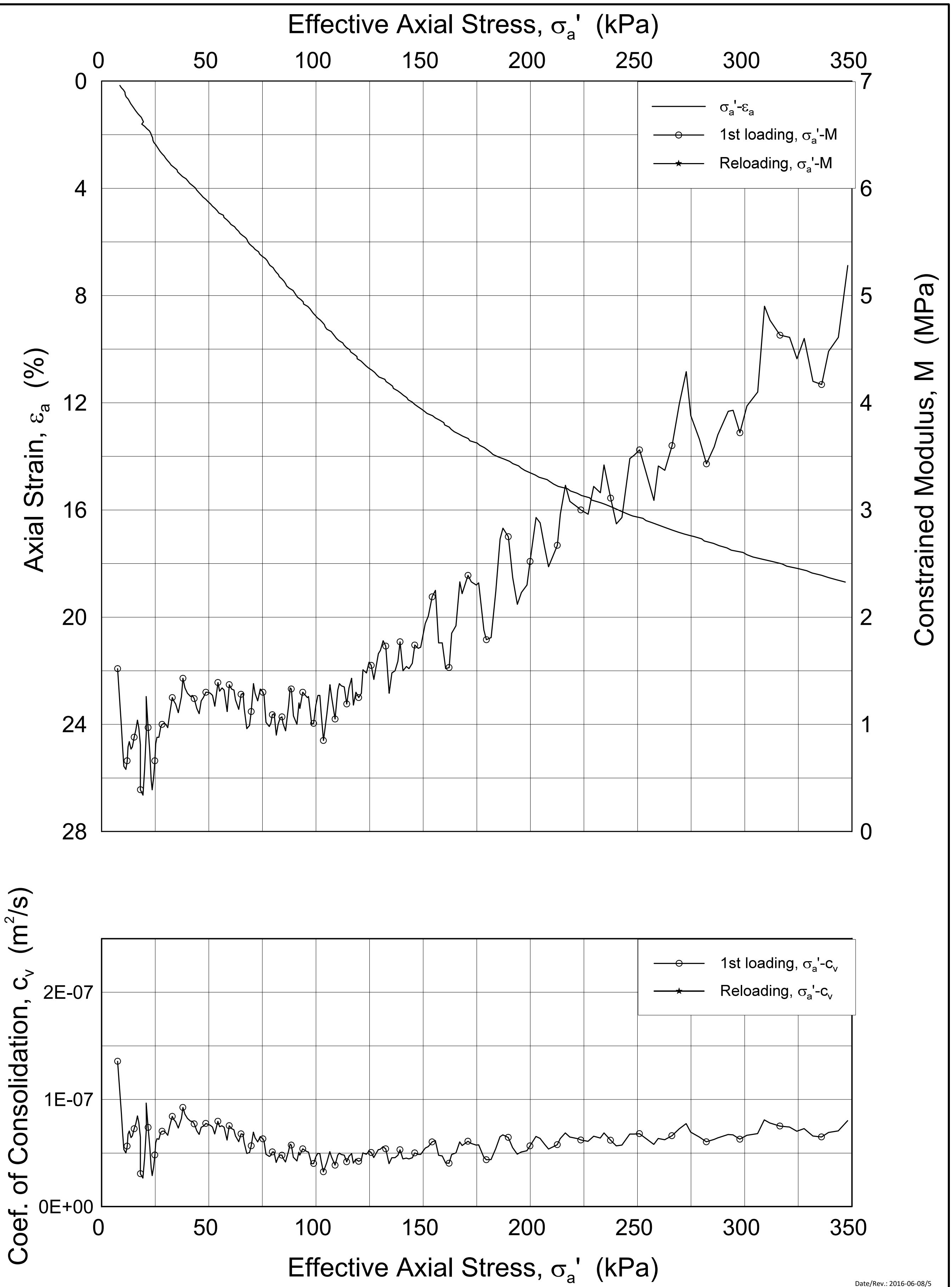
Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB25	Tube:	2	Depth	=	10.16	m
			p_0'	=	65.3	kPa
	Part:	2	w_i	=	46.3	%
	Test:	2	γ_i	=	17.69	kN/m³

Document No. 20160154-10-R	
Figure No. 5.2.166	
Date 2018-12-10	Drawn by / Checked FI/GS

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.167, ONSB25b-2-2-2 Lin2 (CRS4040).grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.167

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

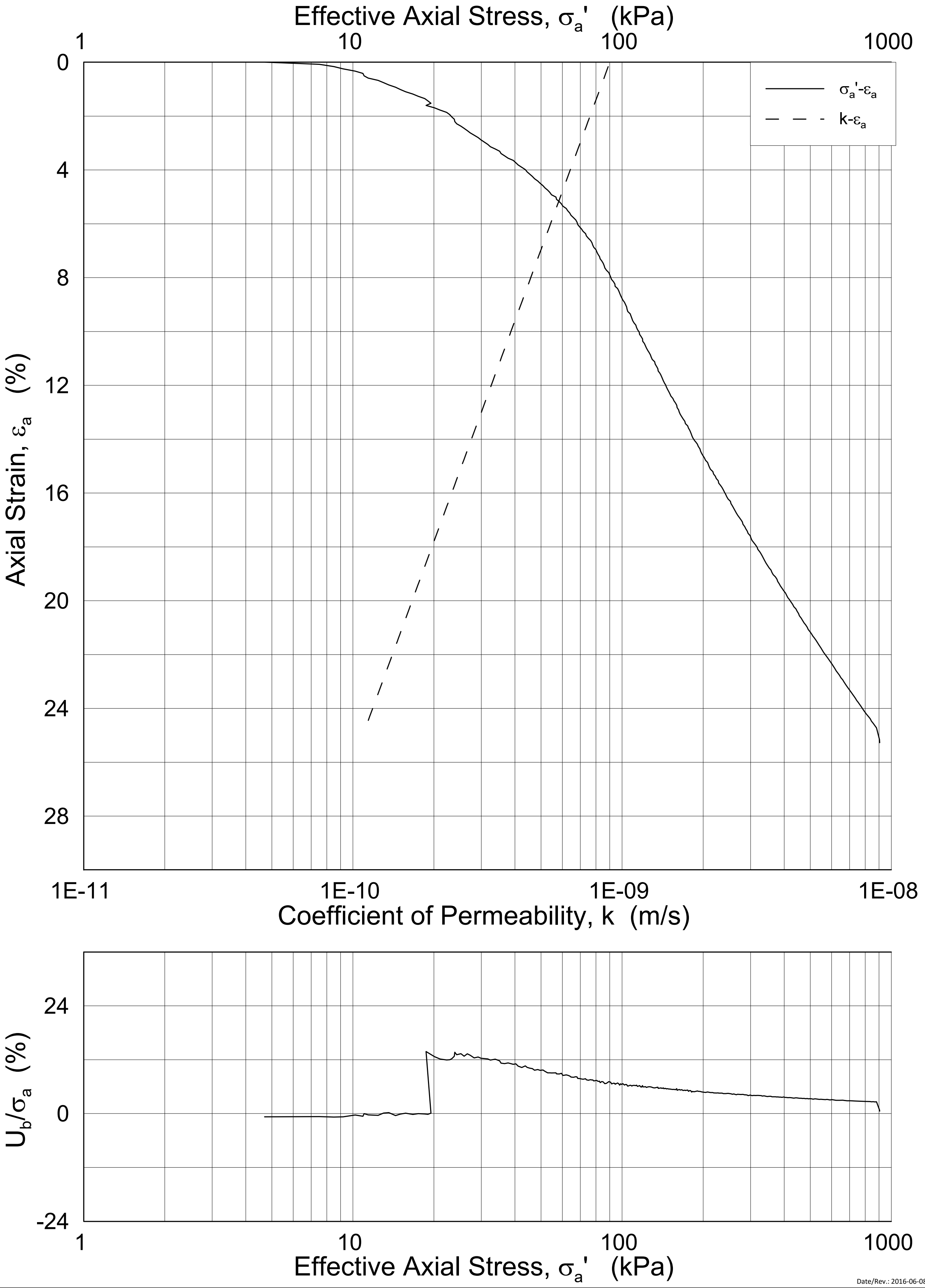
Boring: ONSB25 Tube: 2 Part: 2 Test: 2

Depth = 10.16 m

p_0' = 65.3 kPa

w_i = 46.3 %

γ_i = 17.69 kN/m³



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.168, ONSB25b-2-2-2 Log (CRS4040).grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.168

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB25 Tube: 2 Part: 2 Test: 2

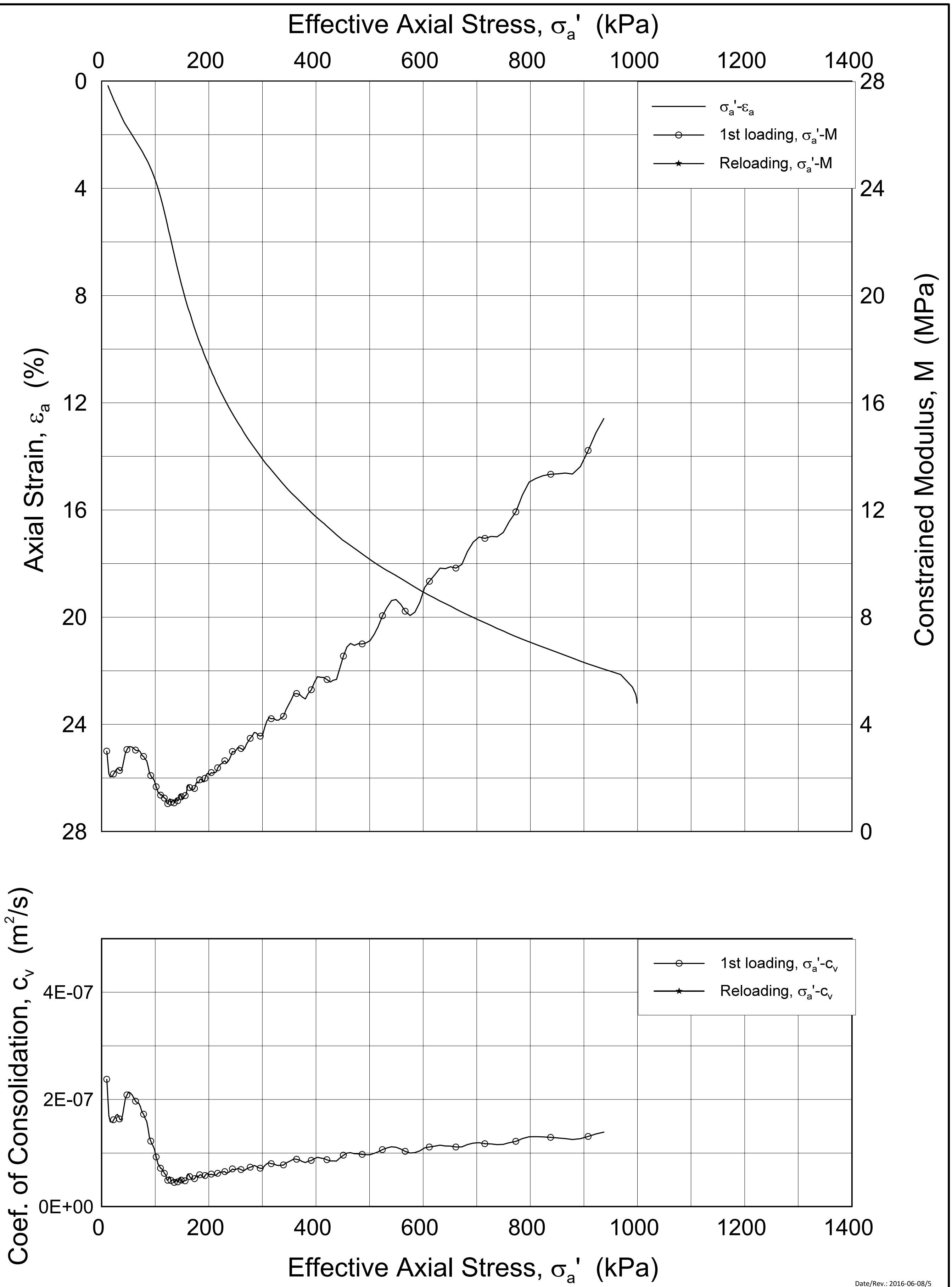
Depth = 10.16 m

p_0' = 65.3 kPa

w_i = 46.3 %

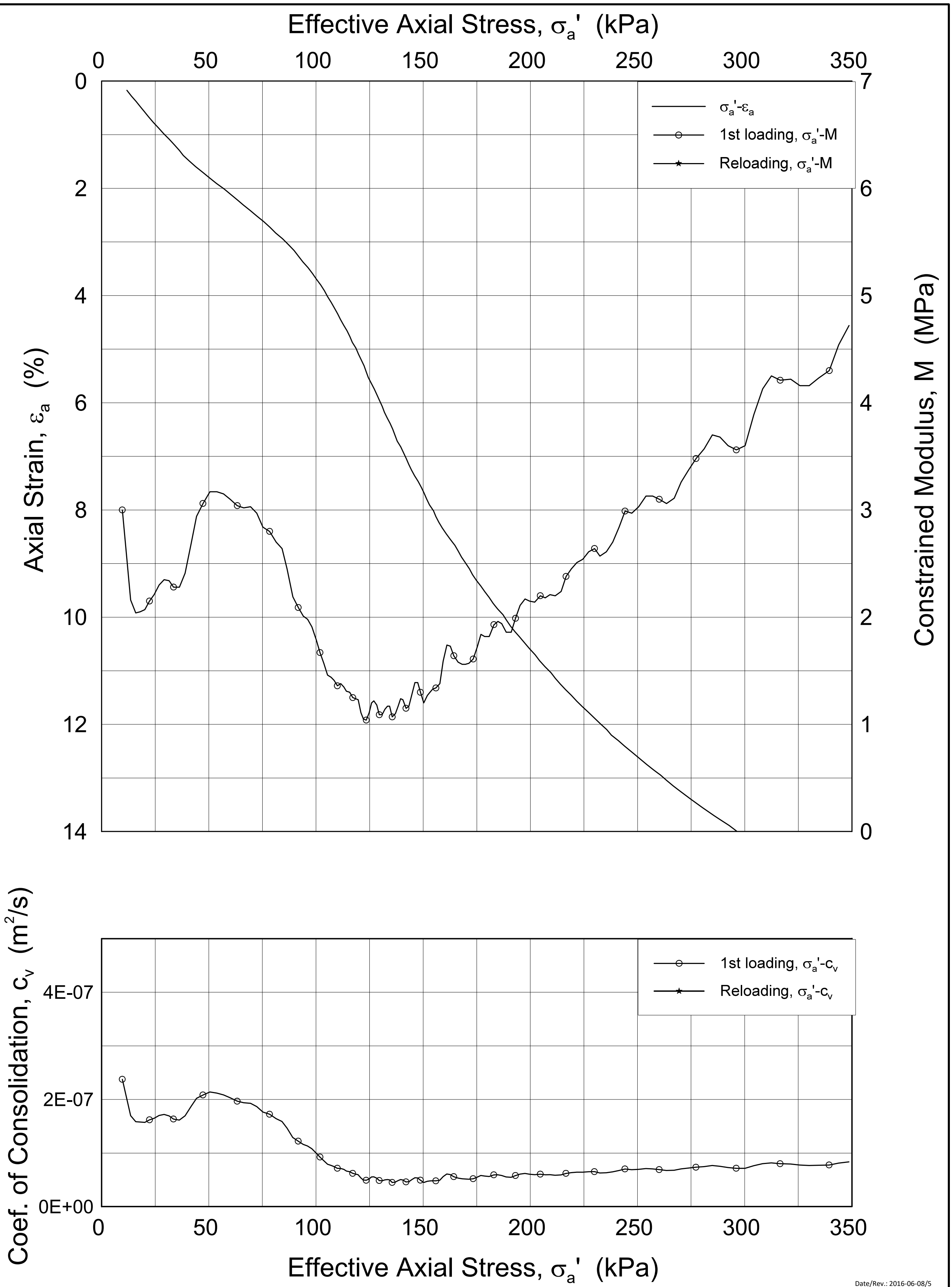
γ_i = 17.69 kN/m³

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.169
Depth = 10.66 m	Date 2018-12-10 / Drawn by / Checked FI/GS
Boring: ONSB25 Tube: 2 p_0' = 68.5 kPa	
Part: 3 w_i = 42.3 %	
Test: 2 γ_i = 18.03 kN/m³	NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.170, ONSB25b-2-3-2 Lin2 (CRS4041).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

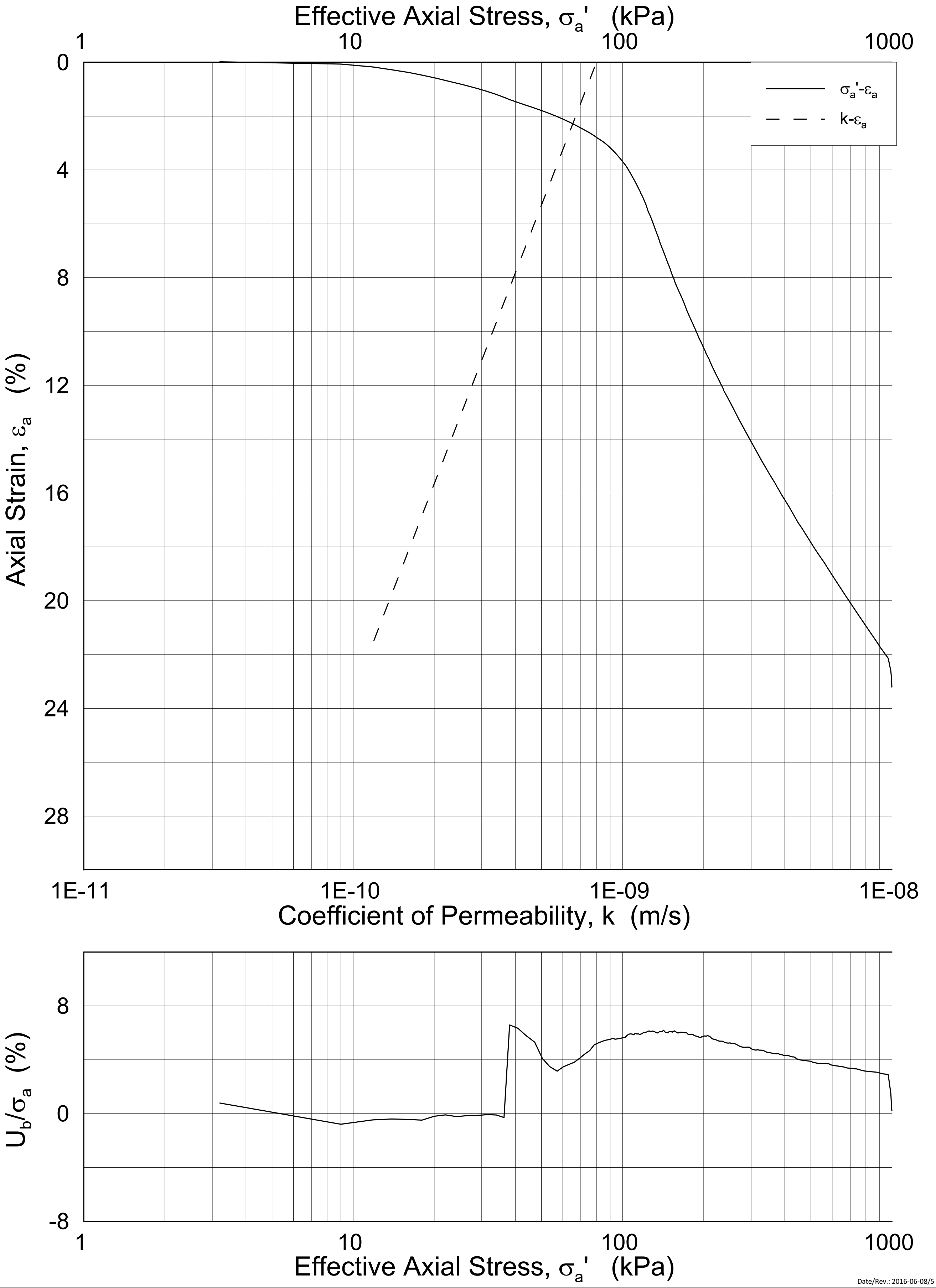
Boring:	ONSB25	Tube:	2	Depth	=	10.66	m
		Part:	3	p_0'	=	68.5	kPa
		Test:	2	w_i	=	42.3	%
				γ_i	=	18.03	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.170

Date 2018-12-10

Drawn by / Checked FI/GS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.171, ONSB25b-2-3-2 Log (CRS4041).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB25 | Tube: 2 | Part: 3 | Test: 2

Depth = 10.66 m

p_0' = 68.5 kPa

w_i = 42.3 %

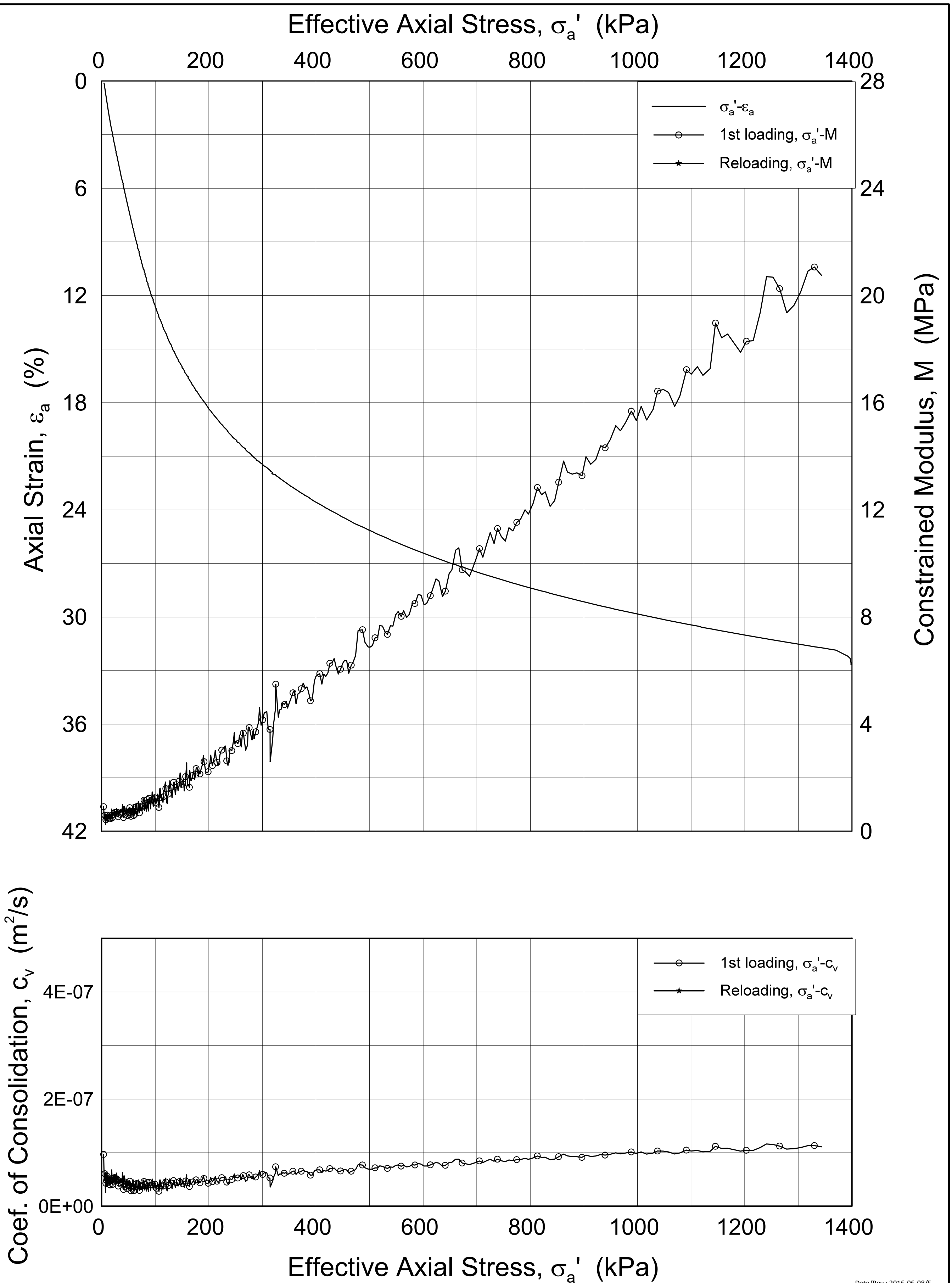
γ_i = 18.03 kN/m³

Document No. 20160154-10-R

Figure No. 5.2.171

Date 2018-12-10

Drawn by / Checked FI/GS



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

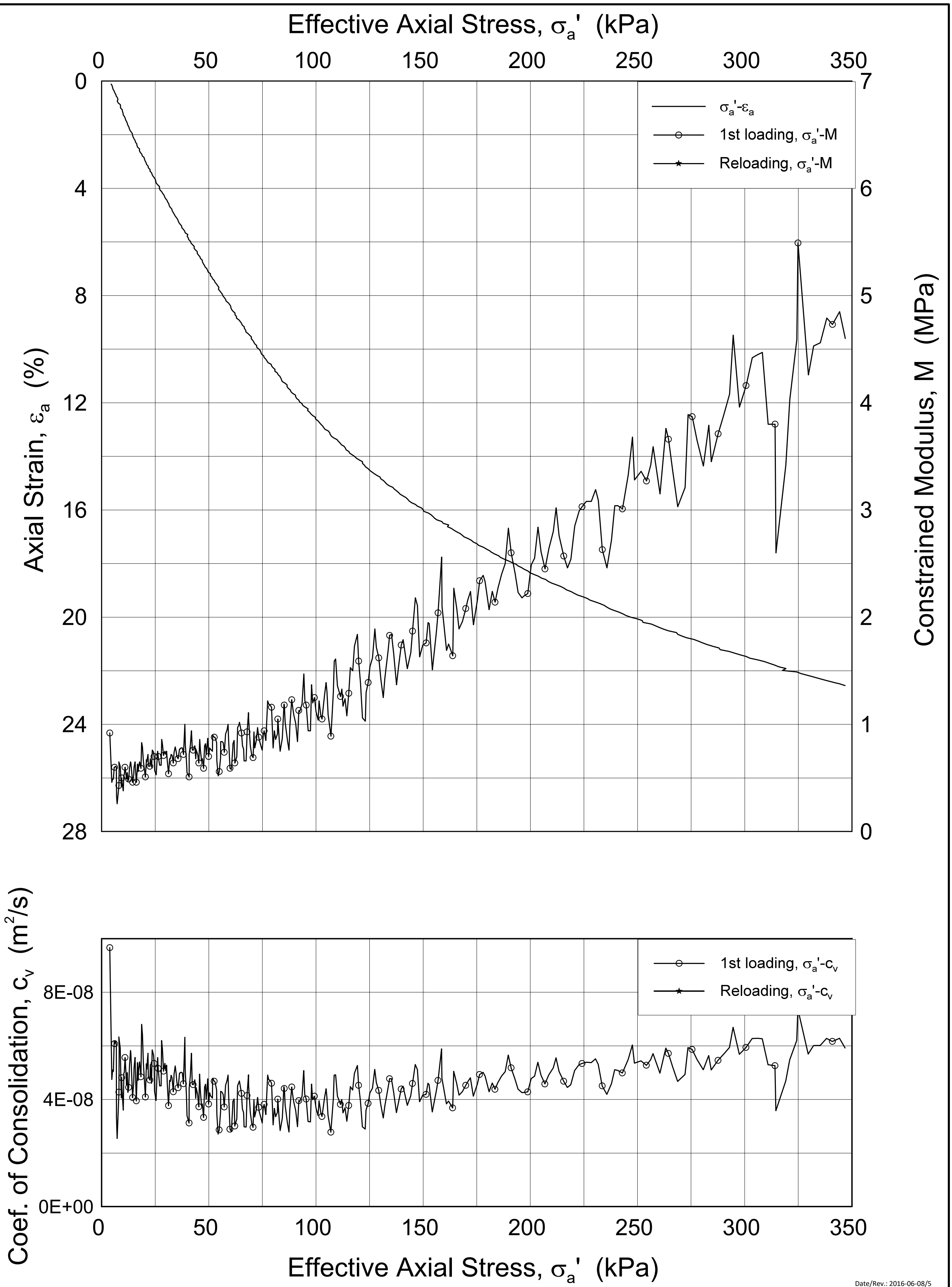
				Depth	=	8.7	m	
Boring:	ONSB27	Tube:	2	p_0'	=	55.9	kPa	
		Part:	1	w_i	=	58.8	%	
		Test:	2	γ_i	=	16.83	kN/m³	

Document No.
20160154-10-R

Figure No.
5.2.172

Date	Drawn by / Checked
2018-12-10	FI/GS

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.172, ONSB27b-2-1-2 Lin (CRS4006).grf



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.173
	Date 2018-12-10 / Drawn by / Checked FI/GS

Boring: ONSB27 Tube: 2 Part: 1 Test: 2

Depth = 8.7 m

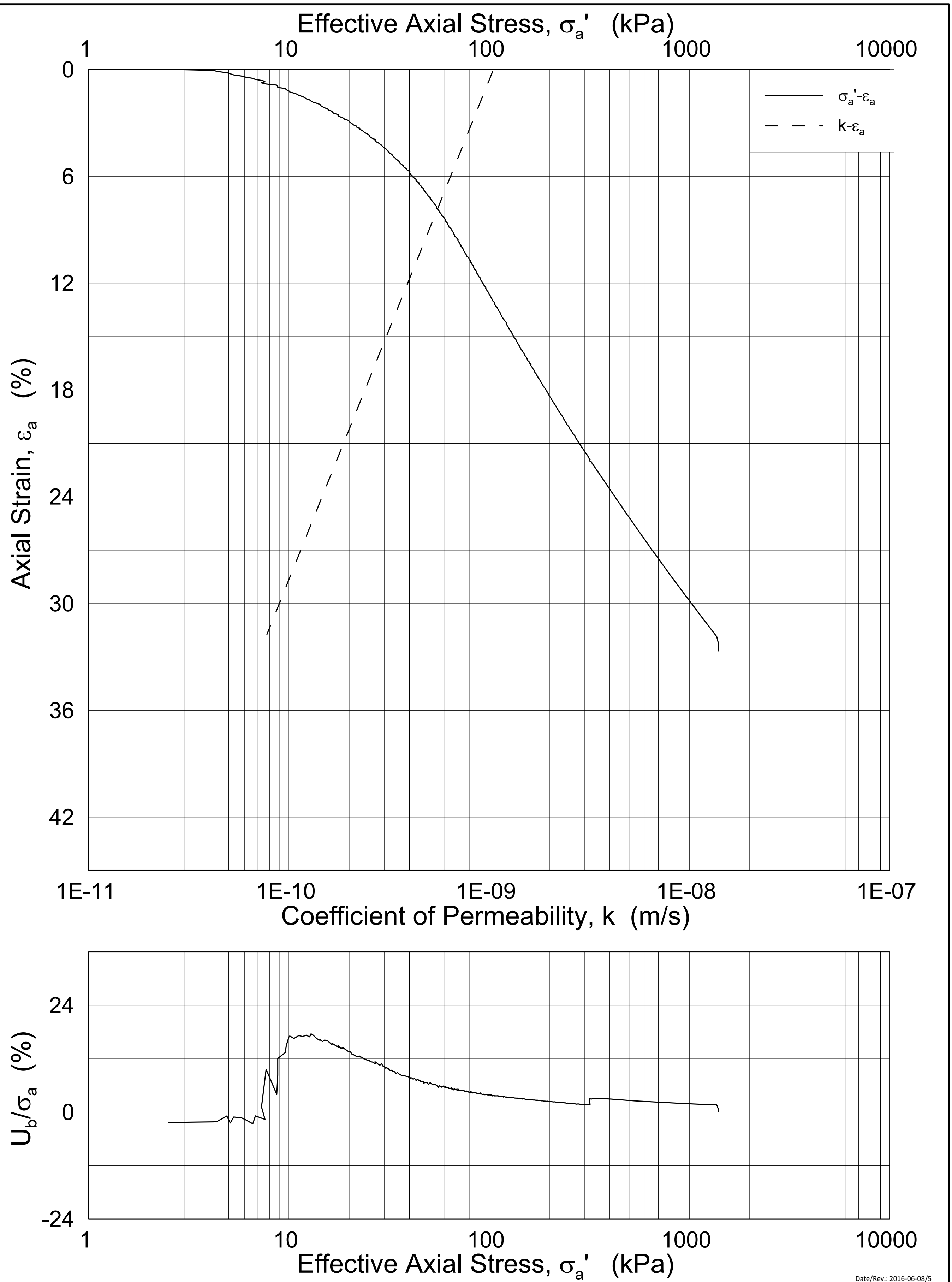
p_0' = 55.9 kPa

w_i = 58.8 %

γ_i = 16.83 kN/m³

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.173, ONSB27b-2-1-2 Lin2 (CRS4006).grf



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.174, ONSB27b-2-1-2 Log (CRS4006).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

			Depth	=	8.7	m
Boring: ONSB27	Tube:	2	p_0'	=	55.9	kPa
	Part:	1	w_i	=	58.8	%
	Test:	2	γ_i	=	16.83	kN/m³

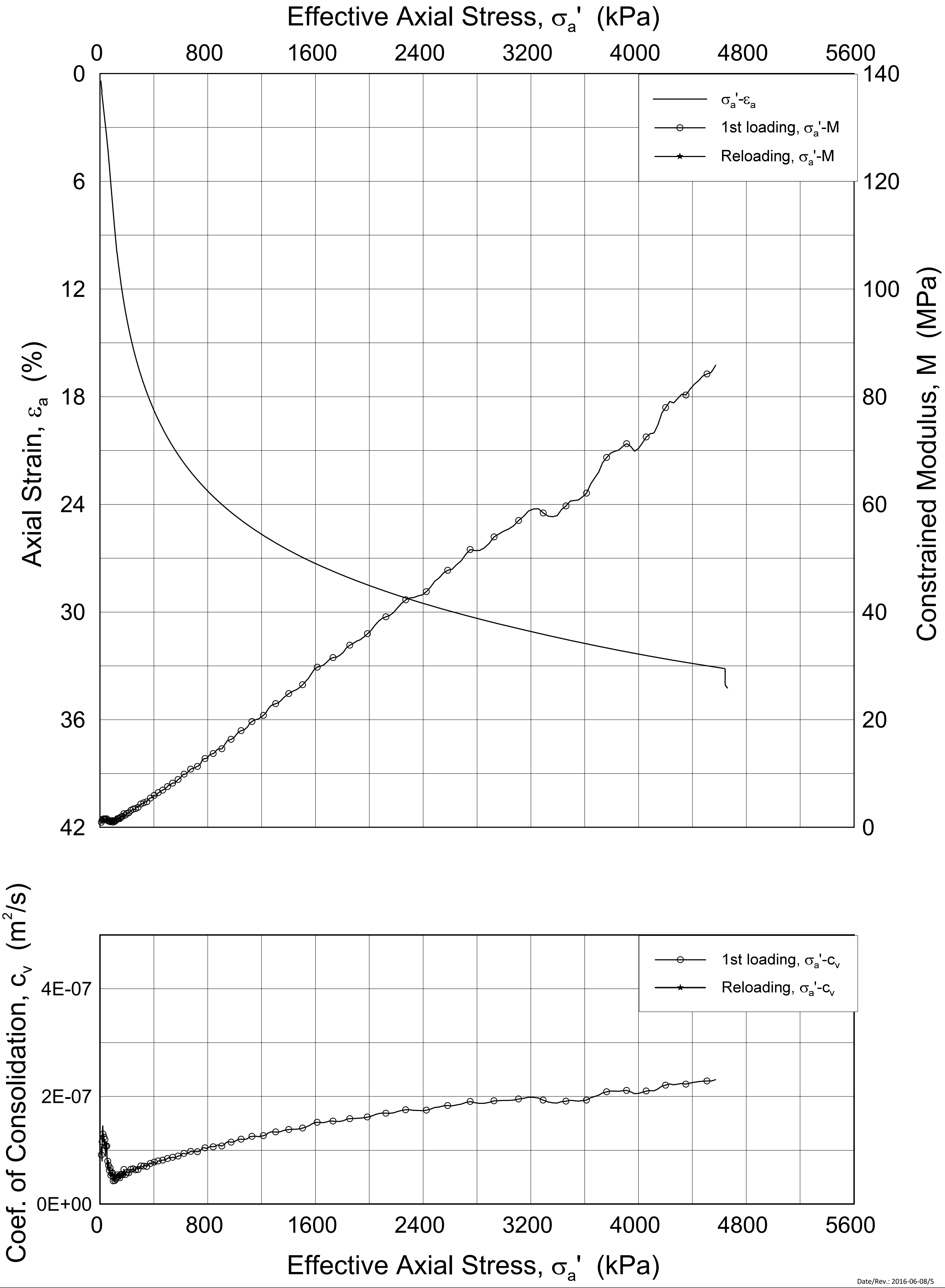
Document No. 20160154-10-R

Figure No. 5.2.174

Date 2018-12-10

Drawn by / Checked FI/GS

NGI



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.175

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB27 Tube: 2 Part: 2 Test: 2

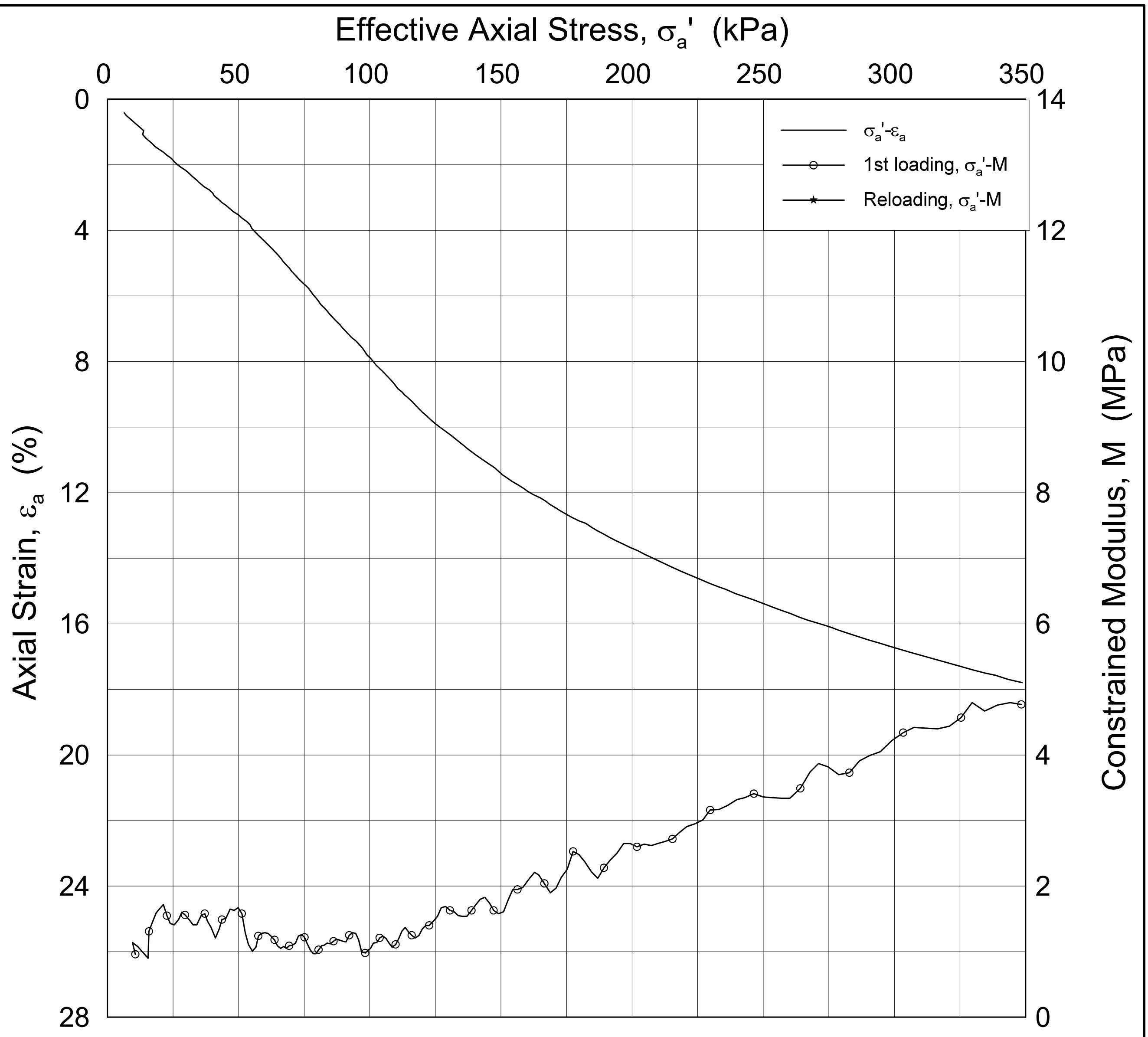
Depth = 10.1 m

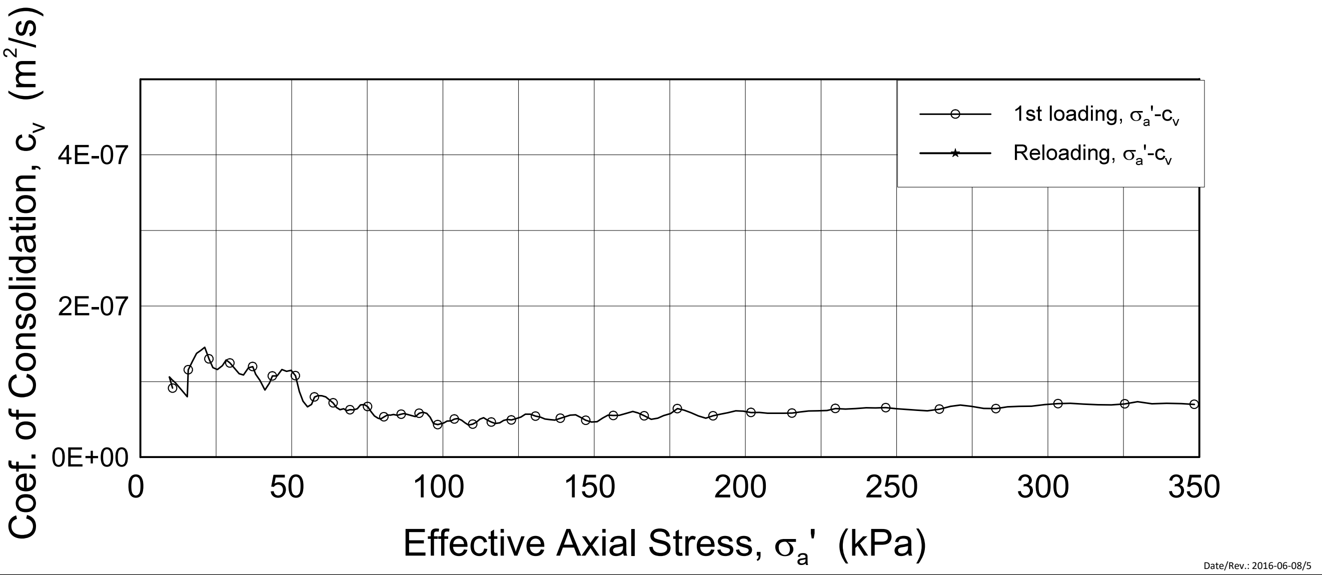
p_0' = 64.9 kPa

w_i = 45.3 %

γ_i = 17.67 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.175, ONSB27b-2-2-2 Lin (CRS4012).grf





Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.176, ONSB27b-2-2-2 Lin2 (CRS4012).grf

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

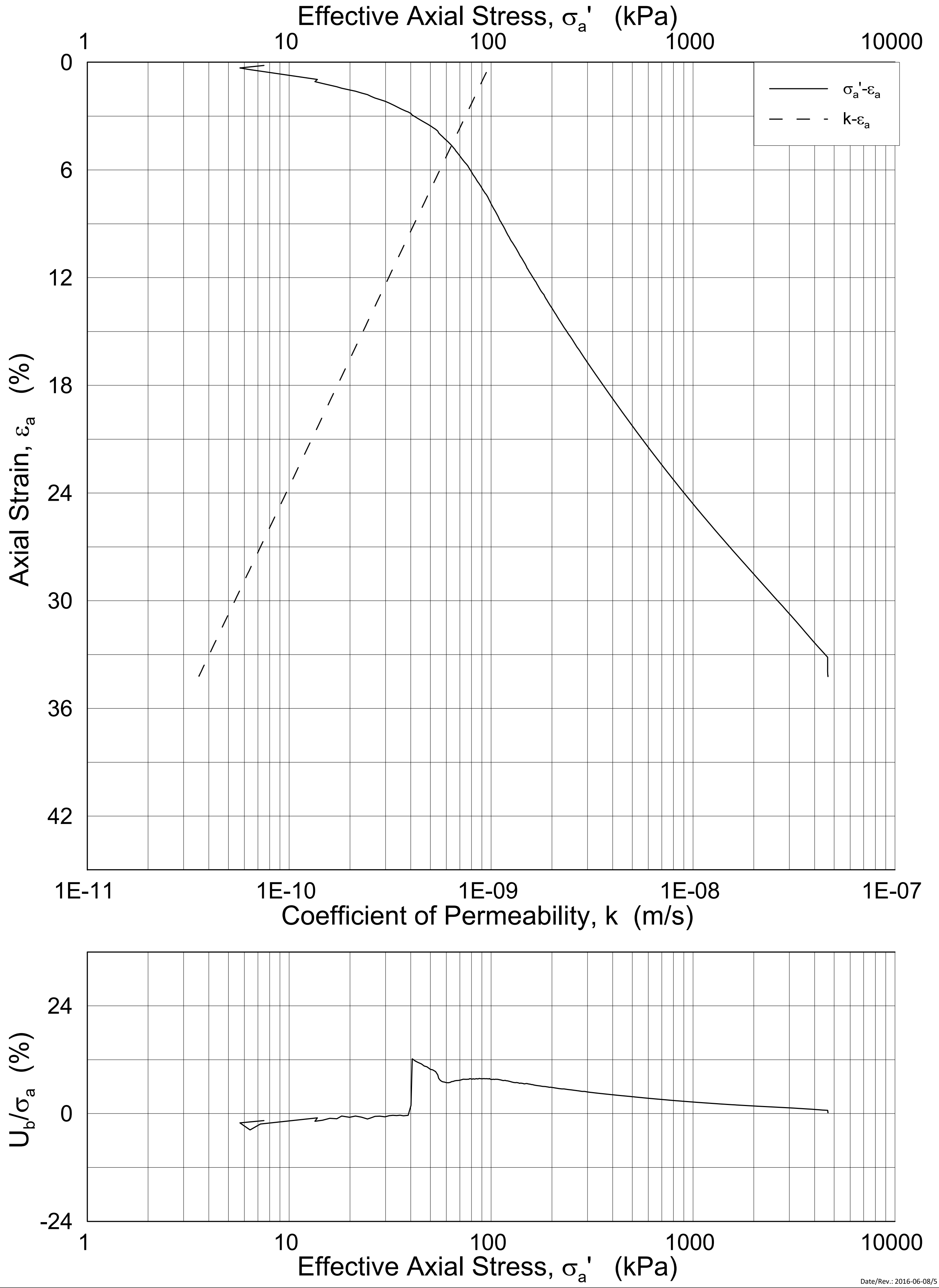
			Depth	=	10.1	m
Boring: ONSB27	Tube:	2	p_0'	=	64.9	kPa
	Part:	2	w_i	=	45.3	%
	Test:	2	γ_i	=	17.67	kN/m³

Document No. 20160154-10-R

Figure No. 5.2.176

Date 2018-12-10

Drawn by / Checked FI/GS



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.177

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB27 | Tube: 2 | Part: 2 | Test: 2

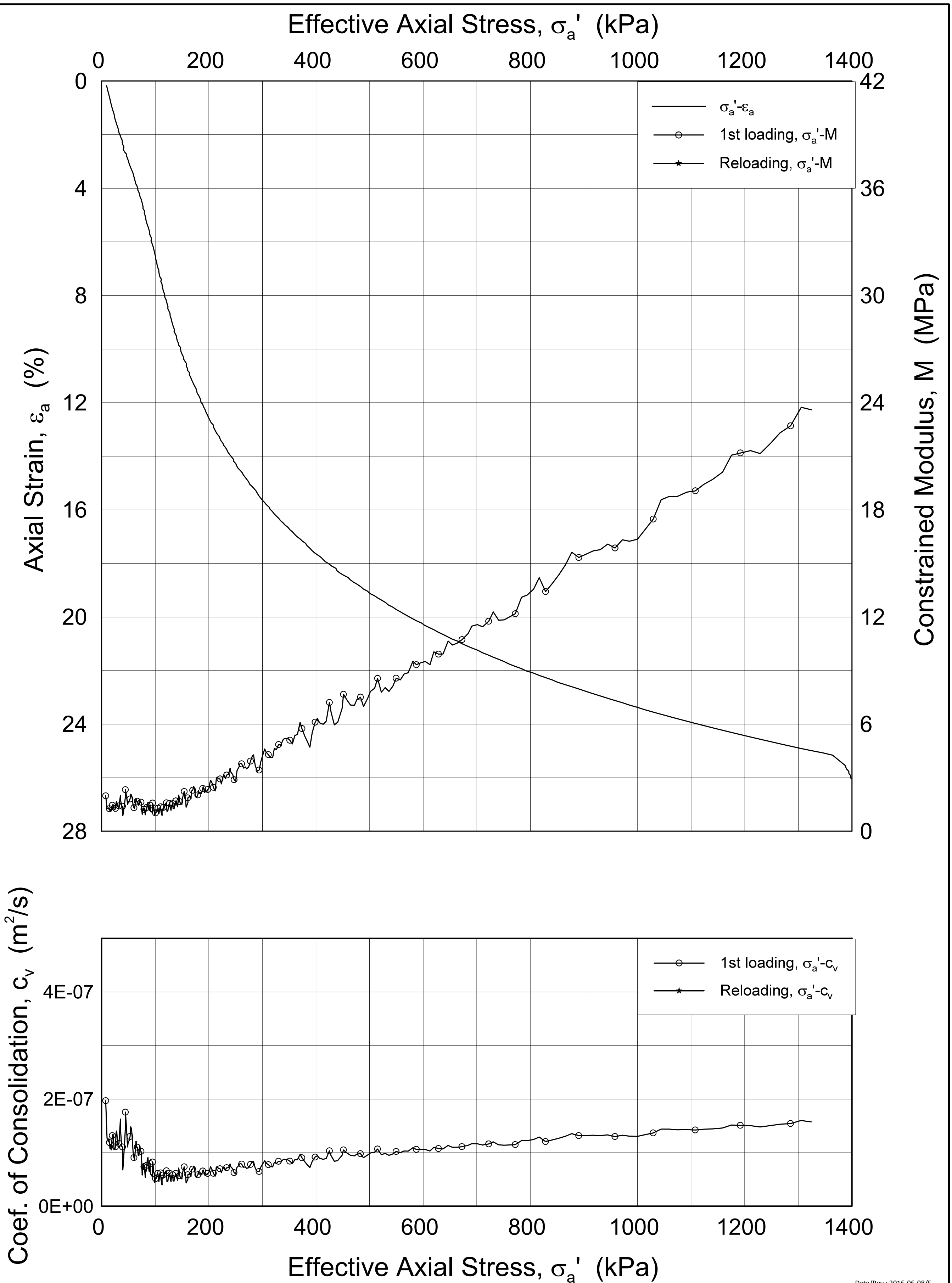
Depth = 10.1 m

p_0' = 64.9 kPa

w_i = 45.3 %

γ_i = 17.67 kN/m³

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.178, ONSB27b-2-3-2 Lin (CRS4015).grf

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R	
Oedometer test (CRSC)	Figure No. 5.2.178	
	Date 2018-12-10	Drawn by / Checked FI/GS

Boring: ONSB27 — Tube: 2 — Part: 3 — Test: 2

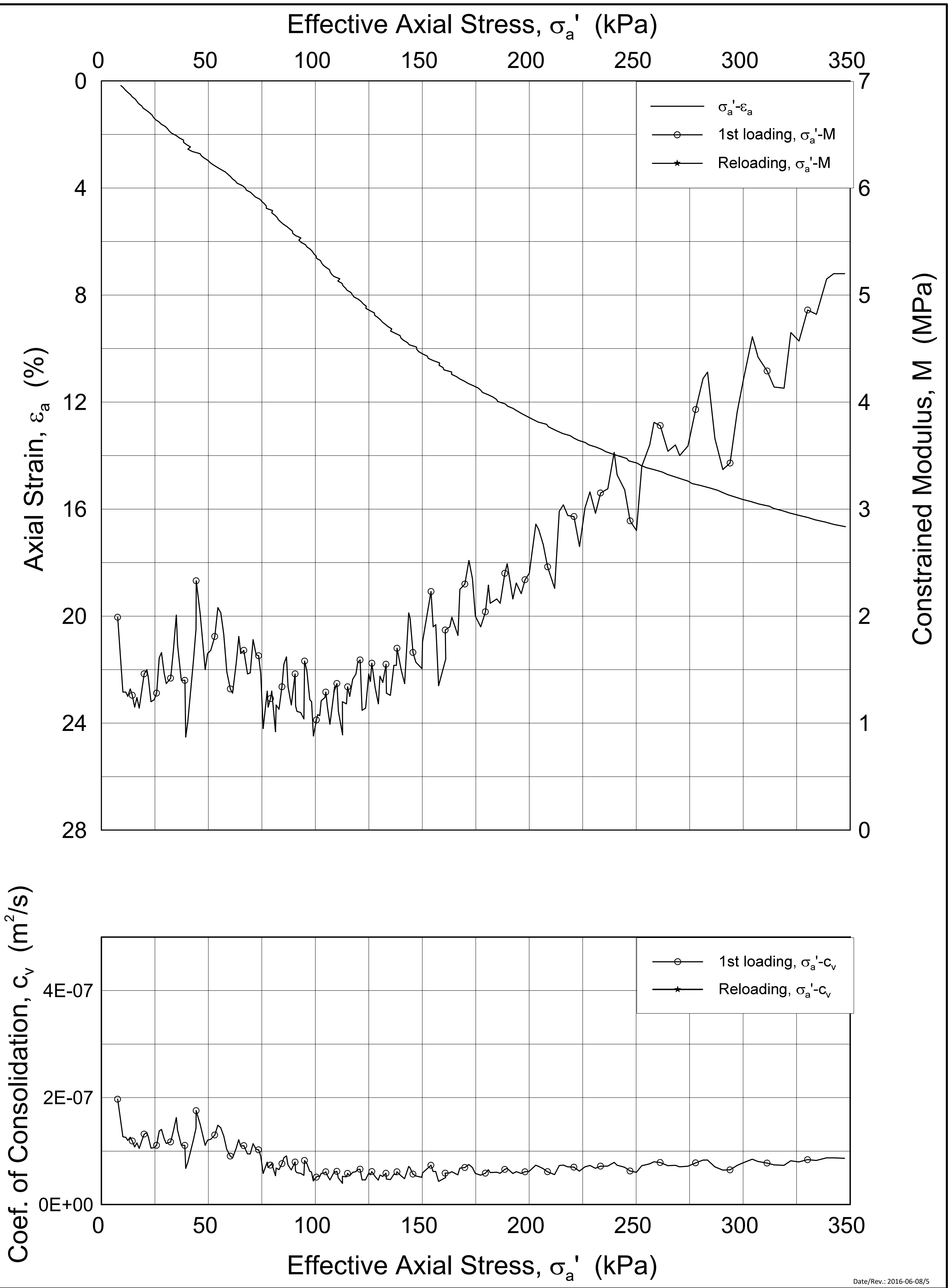
Depth = 10.76 m

p_0' = 69.1 kPa

w_i = 43.2 %

γ_i = 17.78 kN/m³

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.179, ONSB27b-2-3-2 Lin2 (CRS4015).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB27	Tube:	2	Depth	=	10.76	m
			p_0'	=	69.1	kPa
	Part:	3	w_i	=	43.2	%
	Test:	2	γ_i	=	17.78	kN/m³

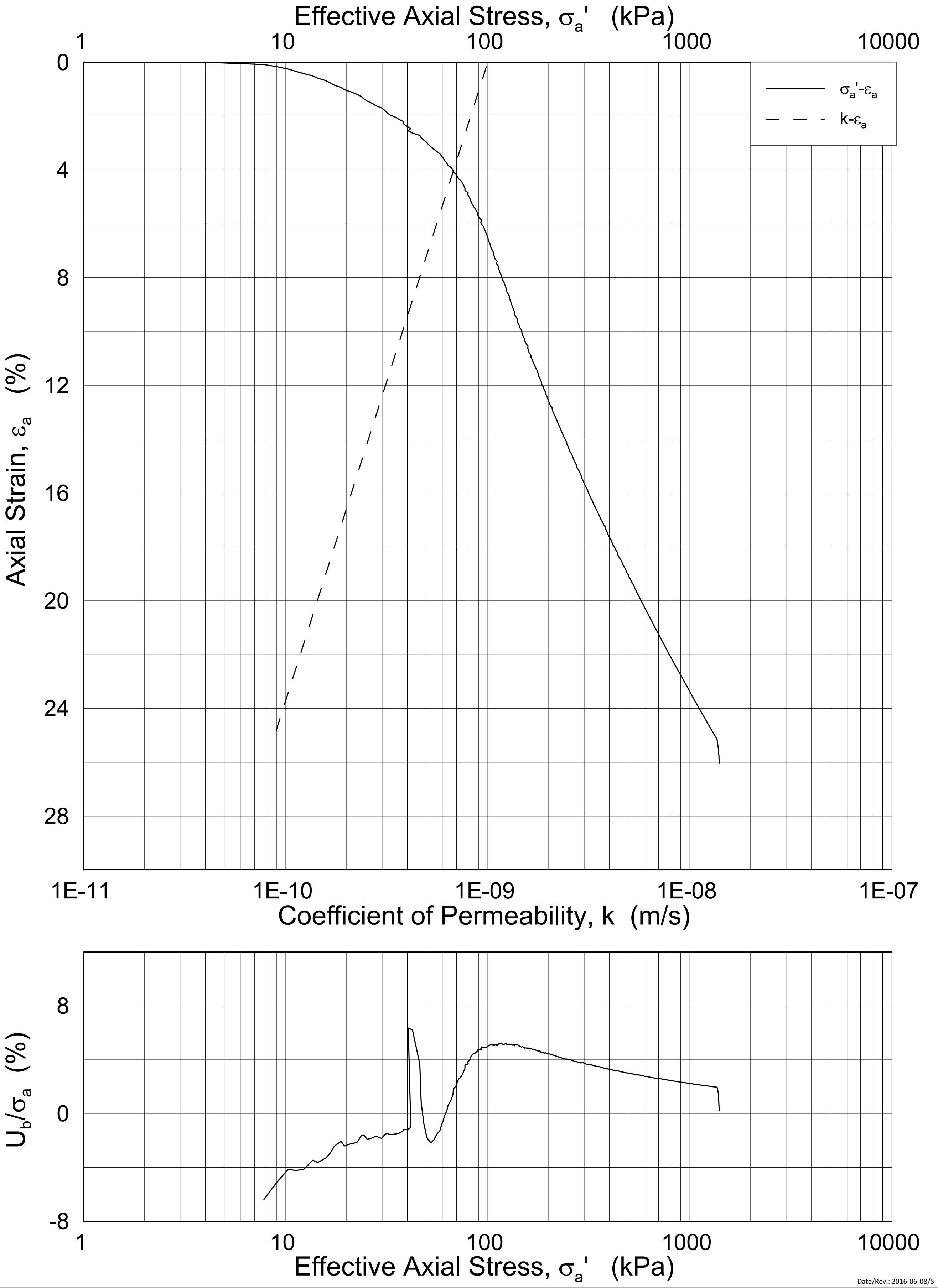
Document No. 20160154-10-R

Figure No. 5.2.179

Date 2018-12-10

Drawn by / Checked FI/GS

NGI



Date/Rev.: 2016-06-08/5

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.180, ONSB27b-2-3-2 Log (CRS4015).grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.180

Oedometer test (CRSC)

Date 2018-12-10

Drawn by / Checked FI/GS

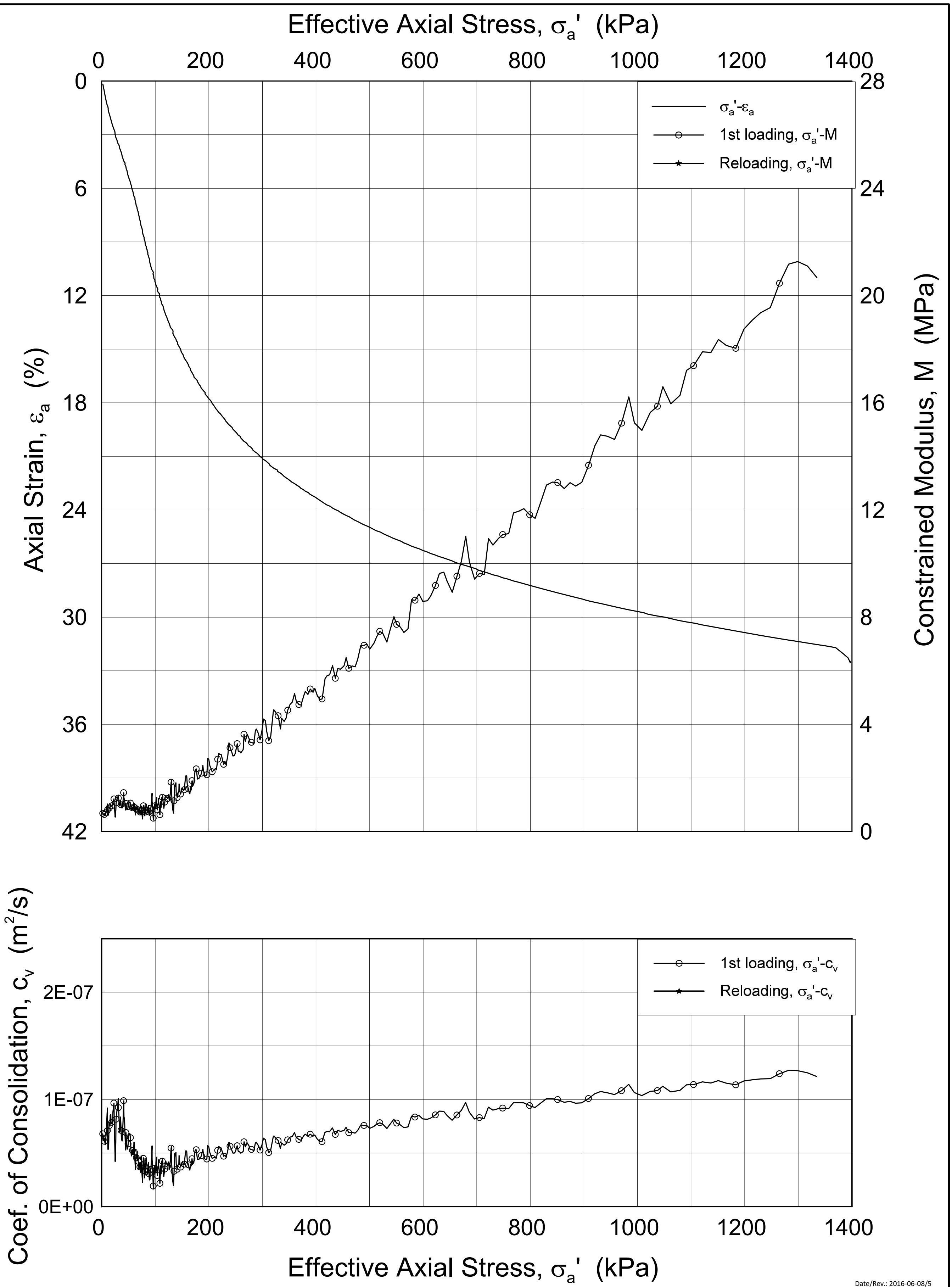
Boring: ONSB27 Tube: 2 Part: 3 Test: 2

Depth = 10.76 m

p_0' = 69.1 kPa

w_i = 43.2 %

γ_i = 17.78 kN/m³



Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.181

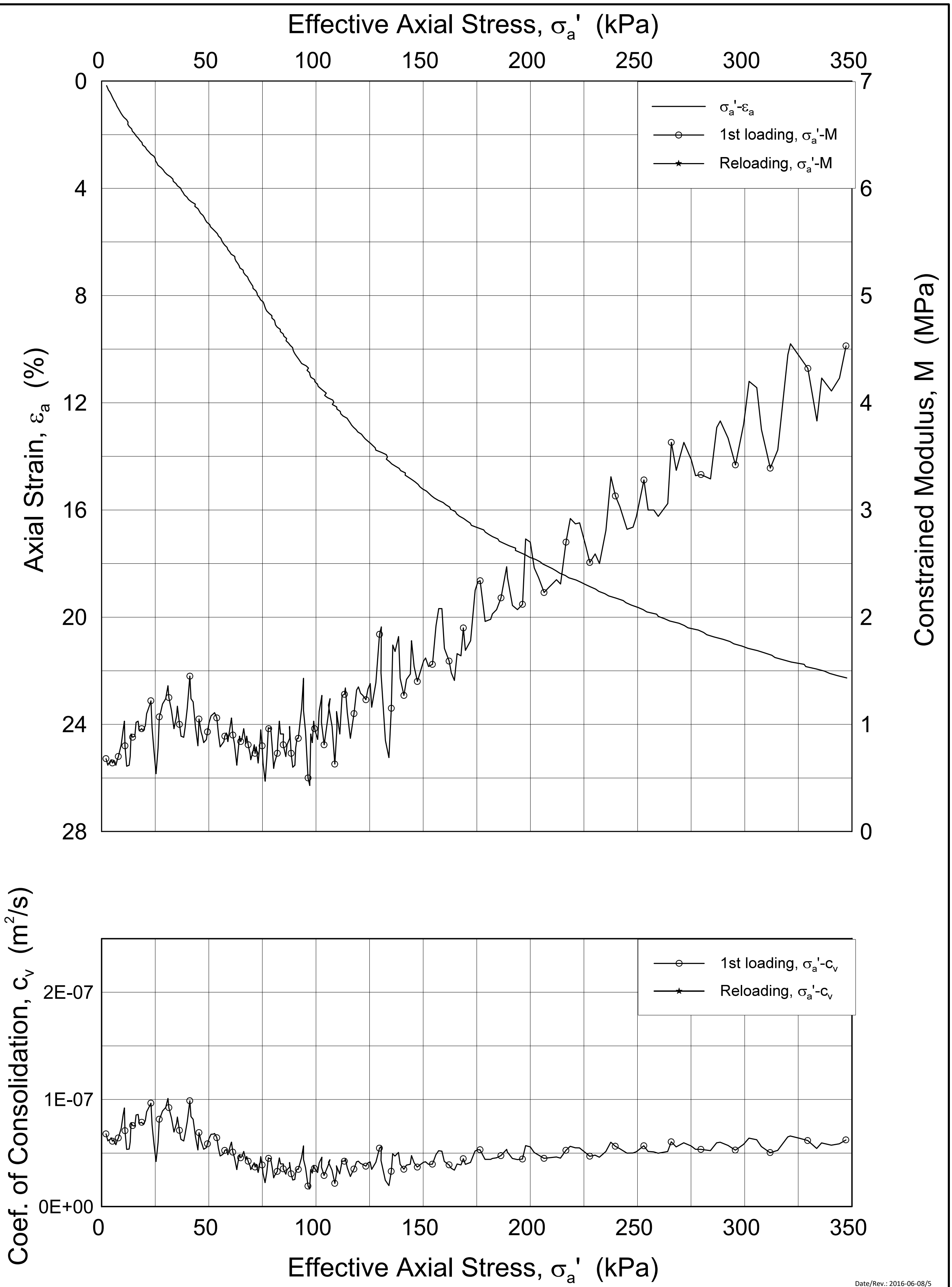
Oedometer test (CRSC)

Date 2018-12-10

Drawn by / Checked FI/GS

				Depth	=	8.7	m
Boring: ONSB28	Tube:	2		p_0'	=	55.9	kPa
	Part:	1		w_i	=	59.9	%
	Test:	2		γ_i	=	16.56	kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.181, ONSB28b-2-1-2 Lin (CRS4016).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.182, ONSB28b-2-1-2 Lin2 (CRS4016).grf

Date/Rev.: 2016-06-08/5

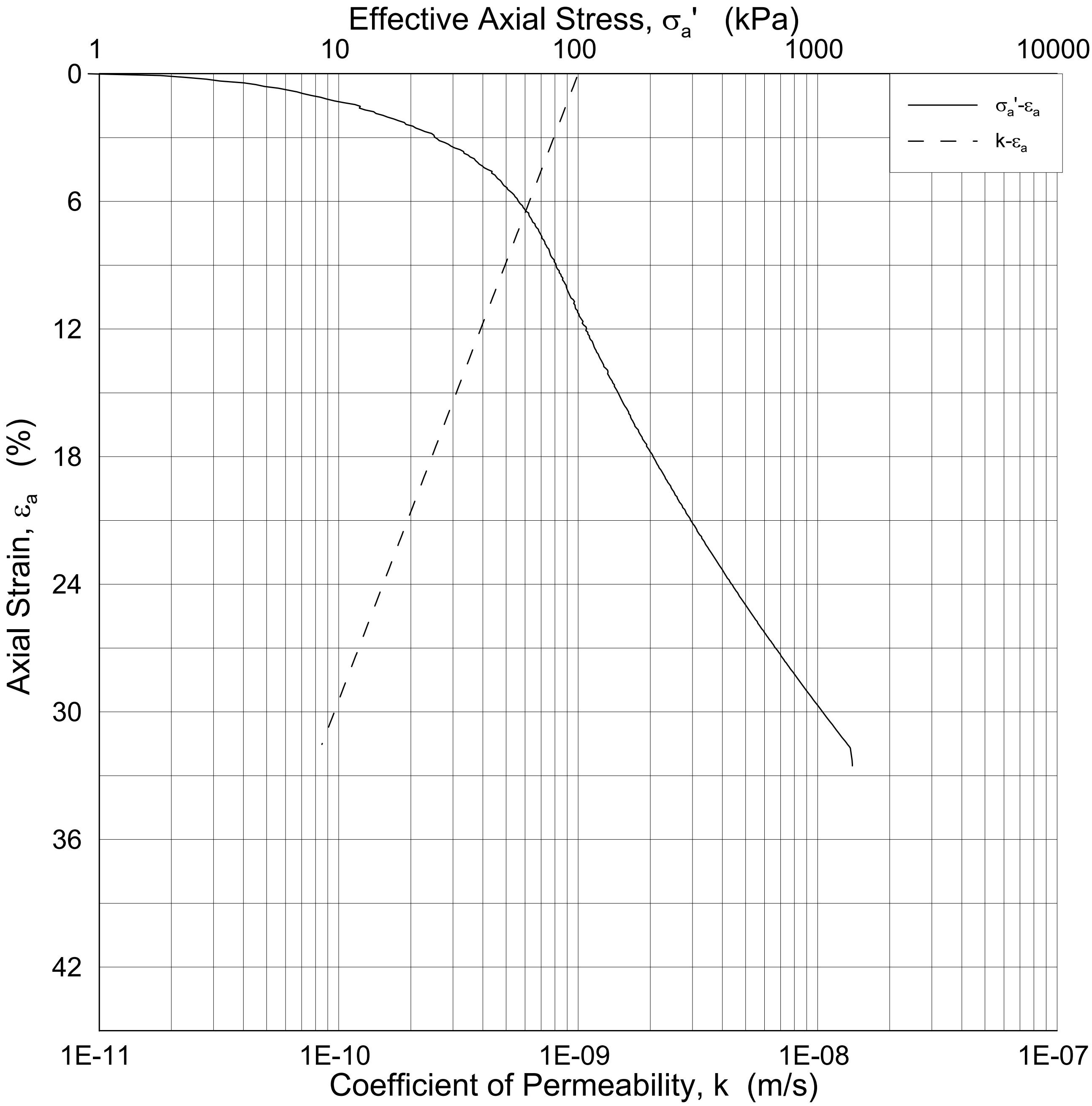
Norwegian GeoTest Sites - Onsøy

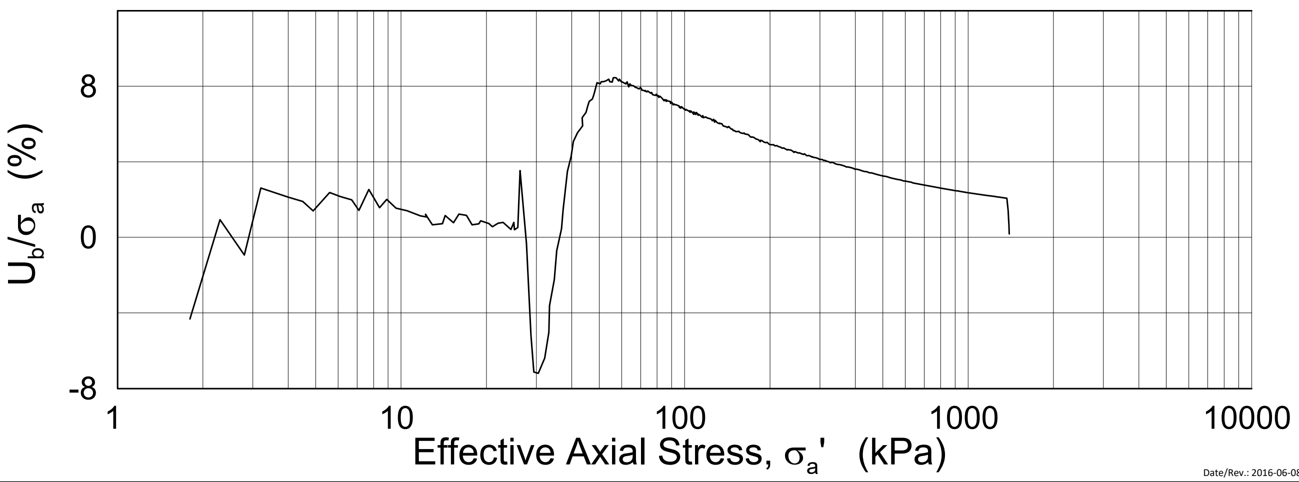
Oedometer test (CRSC)

			Depth	=	8.7	m
Boring: ONSB28	Tube:	2	p_0'	=	55.9	kPa
	Part:	1	w_i	=	59.9	%
	Test:	2	γ_i	=	16.56	kN/m³

Document No.	20160154-10-R
Figure No.	5.2.182
Date	2018-12-10
Drawn by / Checked	FI/GS

NGI





Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB28 Tube: 2 Part: 1 Test: 2

Depth = 8.7 m

p_0' = 55.9 kPa

w_i = 59.9 %

γ_i = 16.56 kN/m³

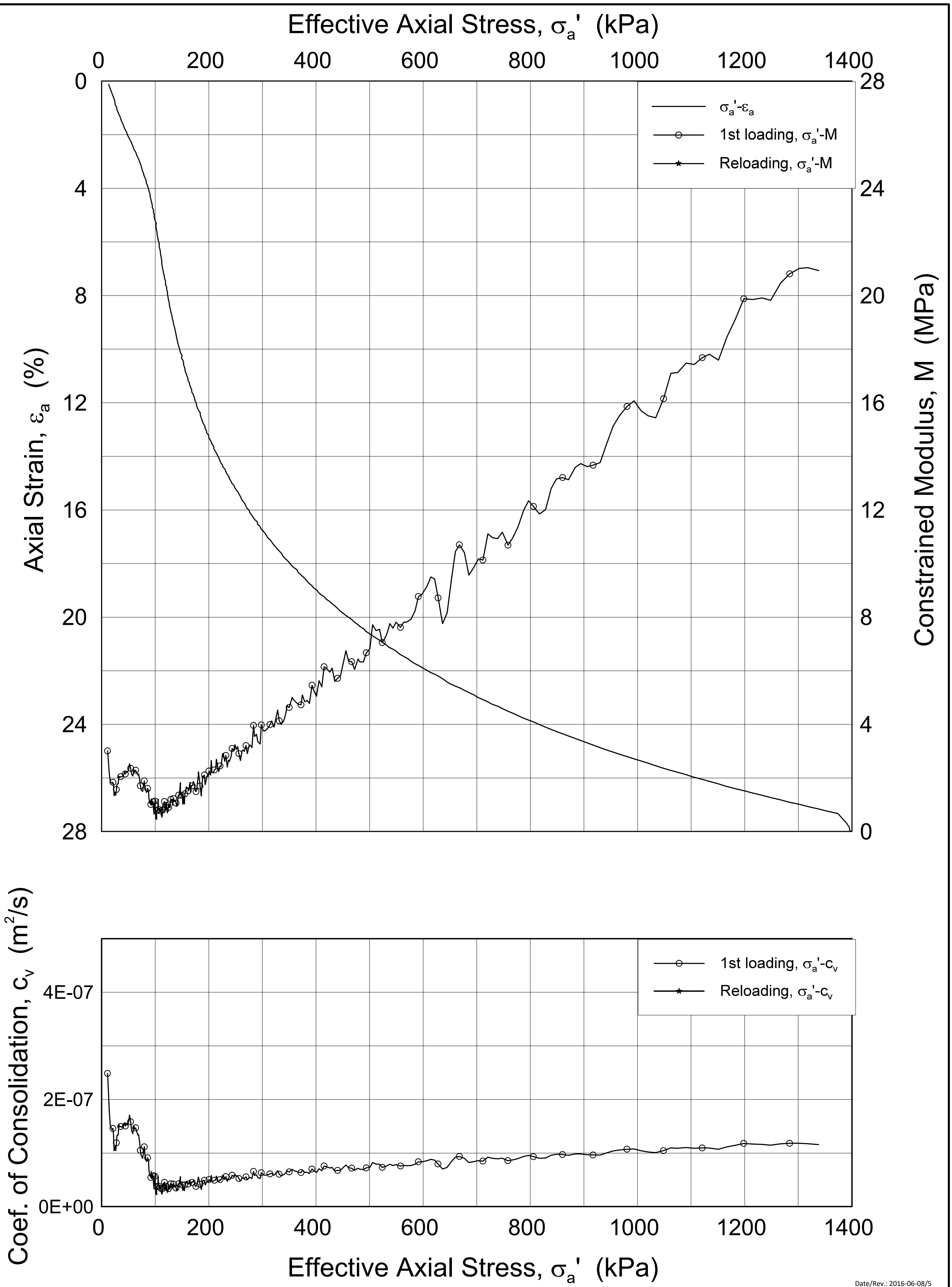
Document No. 20160154-10-R

Figure No. 5.2.183

Date 2018-12-10

Drawn by / Checked FI/GS

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.183, ONSB28b-2-1-2 Log (CRS4016).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.184, ONSB28b-2-2-2 Lin (CRS4017).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Oedometer test (CRSC)

Boring: ONSB28 Tube: 2 Part: 2 Test: 2

Depth = 9.65 m

p_0' = 62.0 kPa

w_i = 50.6 %

γ_i = 17.13 kN/m³

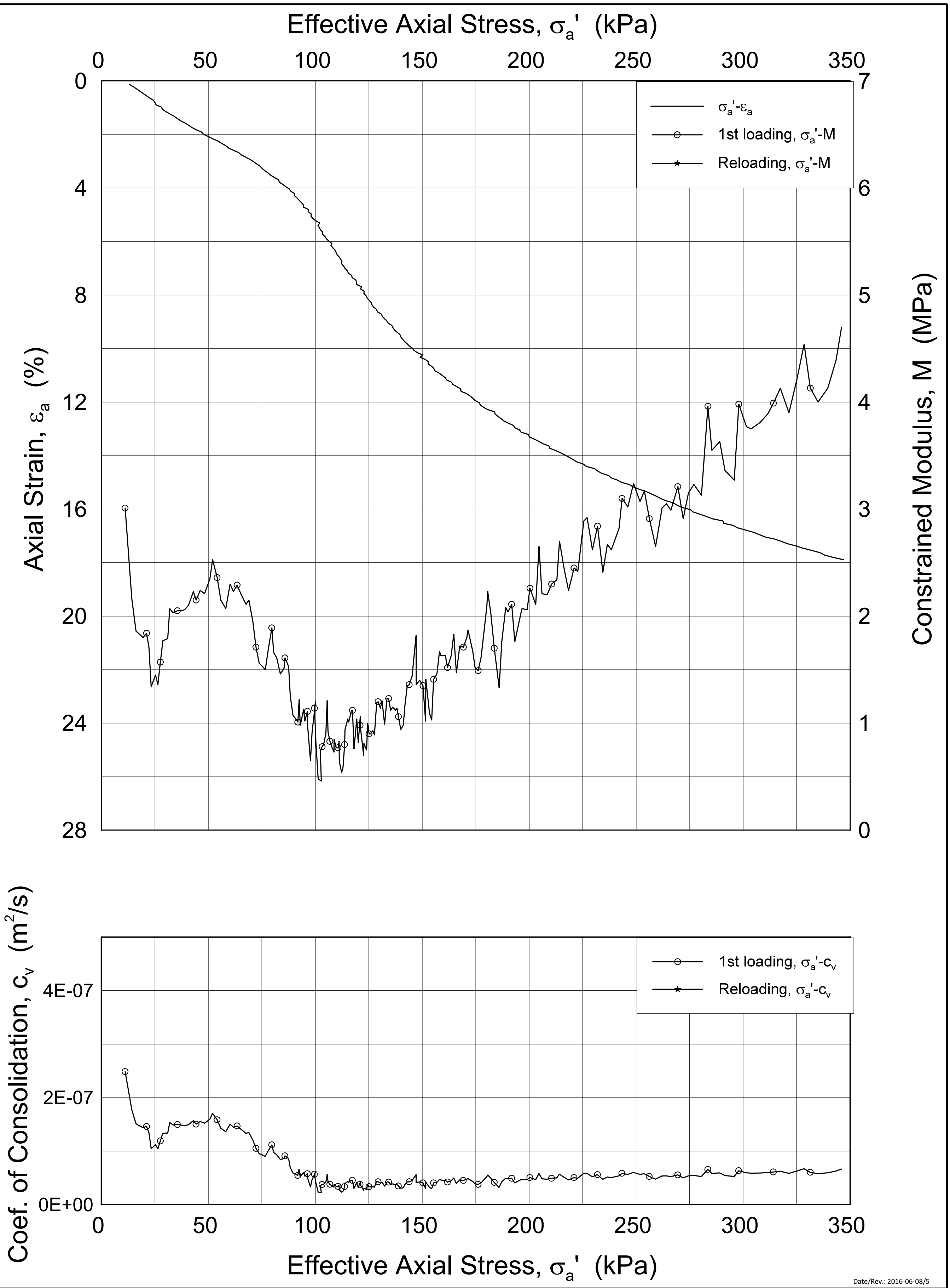
Document No. 20160154-10-R

Figure No. 5.2.184

Date 2018-12-10

Drawn by / Checked FI/GS

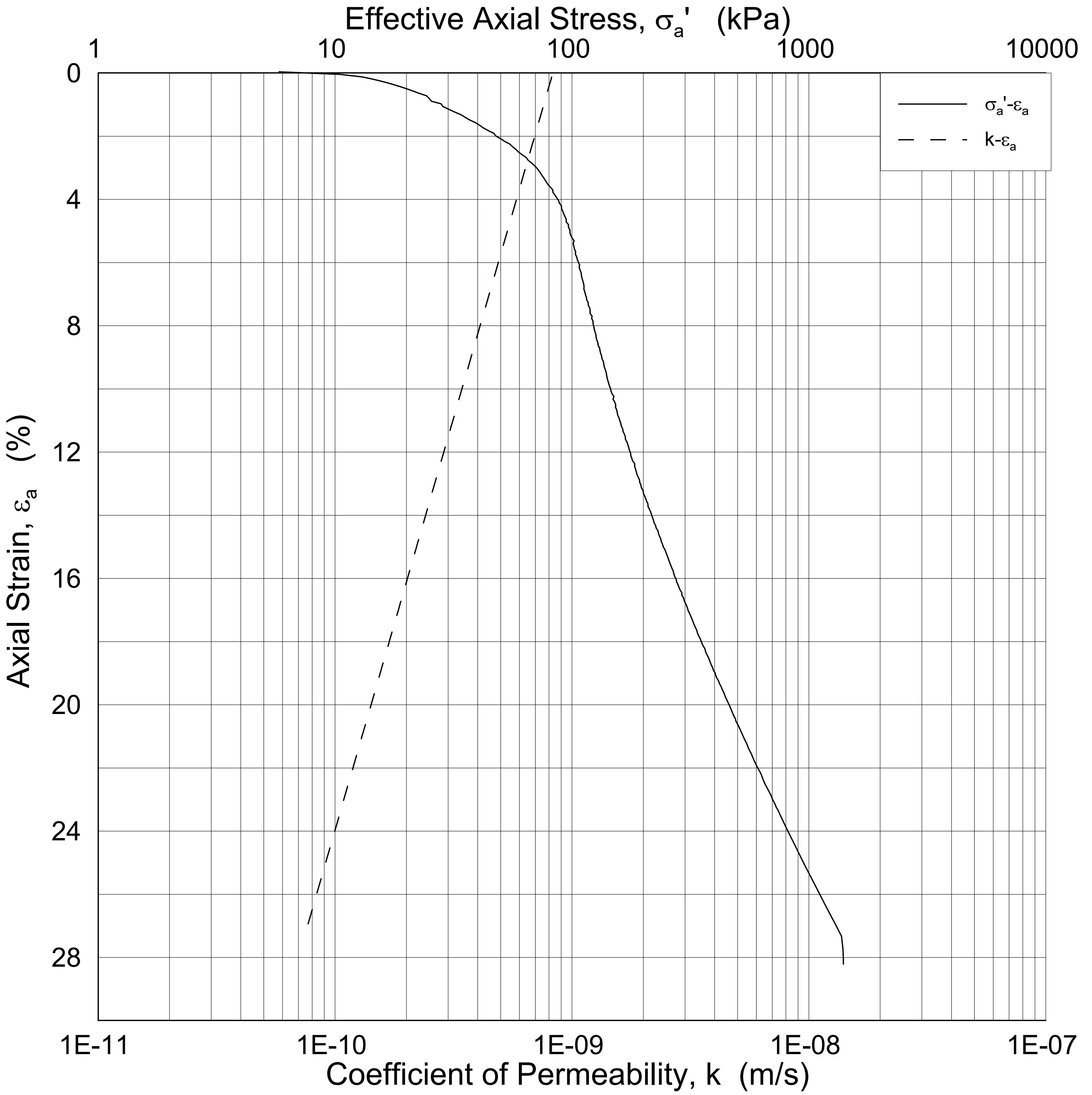
NGI

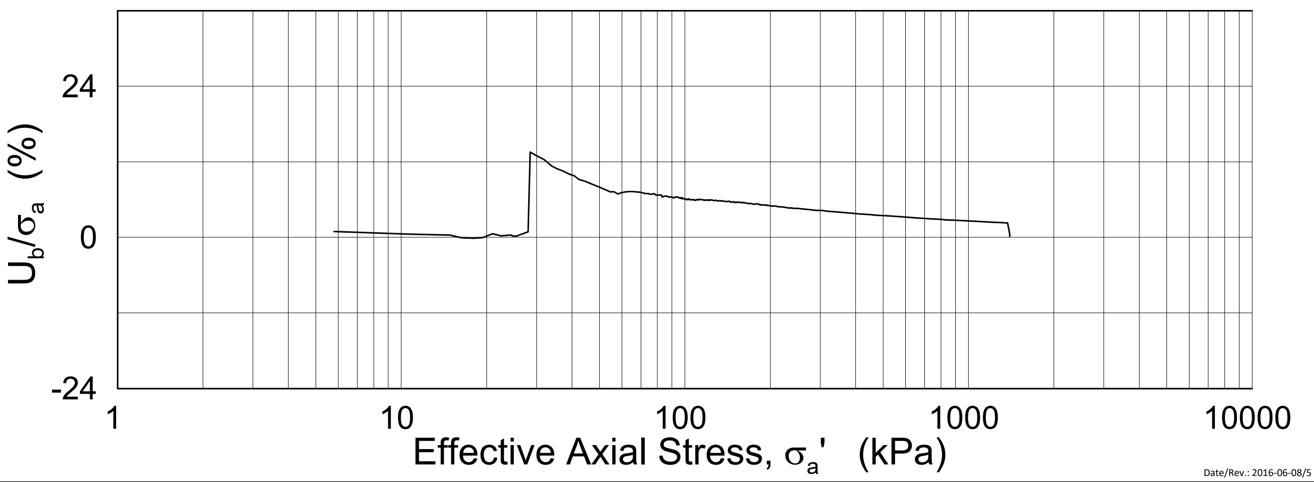


P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.185, ONSB28b-2-2-2 Lin2 (CRS4017).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.185
Boring: ONSB28 — Tube: 2 — Part: 2 — Test: 2	Date: 2018-12-10 — Drawn by / Checked: FI/GS
Depth = 9.65 m; p_0' = 62.0 kPa; w_i = 50.6 %; γ_i = 17.13 kN/m³	NGI





Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.186

Date: 2018-12-10 | Drawn by / Checked: FI/GS

Boring: ONSB28   Tube: 2   Part: 2   Test: 2

Depth = 9.65 m

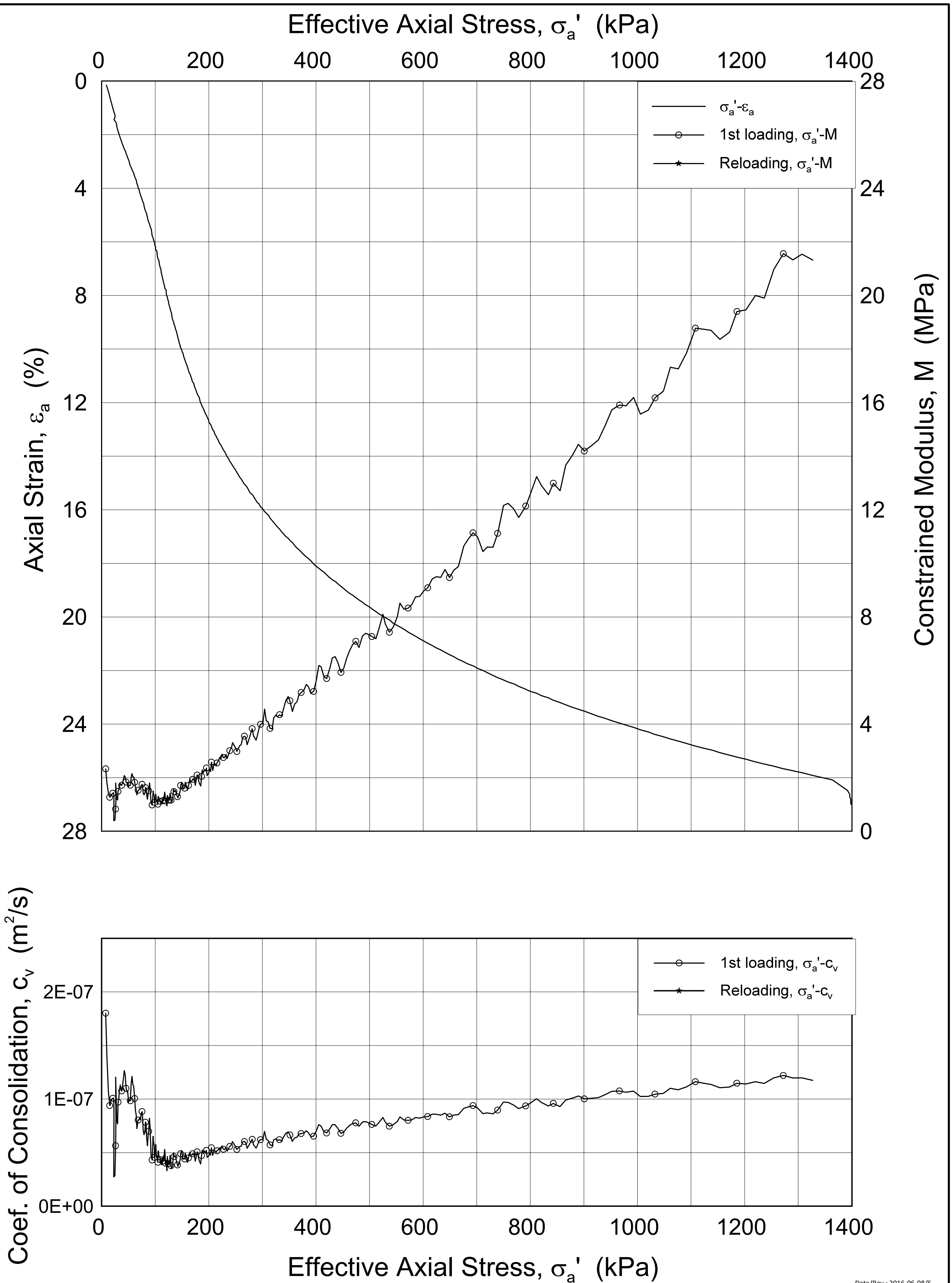
p_0' = 62.0 kPa

w_i = 50.6 %

γ_i = 17.13 kN/m³

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.186, ONSB28b-2-2-2 Log (CRS4017).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.187, ONSB28b-2-3-2 Lin (CRS4018).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.187
	Date 2018-12-10 / Drawn by / Checked FI/GS

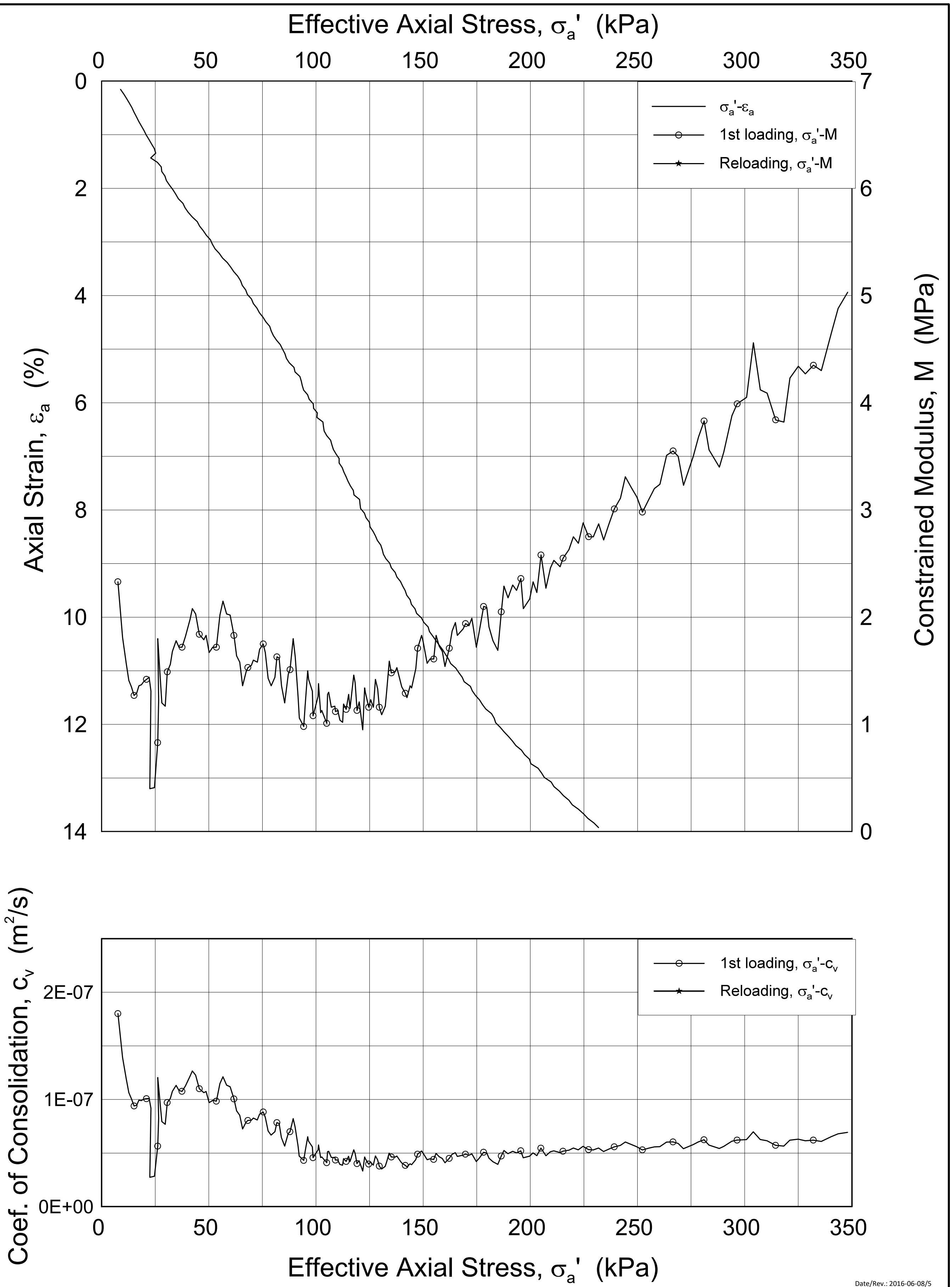
Boring: ONSB28   Tube: 2   Part: 3   Test: 2

Depth = 10.65 m

p_0' = 68.4 kPa

w_i = 43.3 %

γ_i = 17.95 kN/m³



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.188, ONSB28b-2-3-2 Lin2 (CRS4018).grf

Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Oedometer test (CRSC)	Figure No. 5.2.188
	Date 2018-12-10 — Drawn by / Checked FI/GS

Boring: ONSB28 — Tube: 2 — Part: 3 — Test: 2

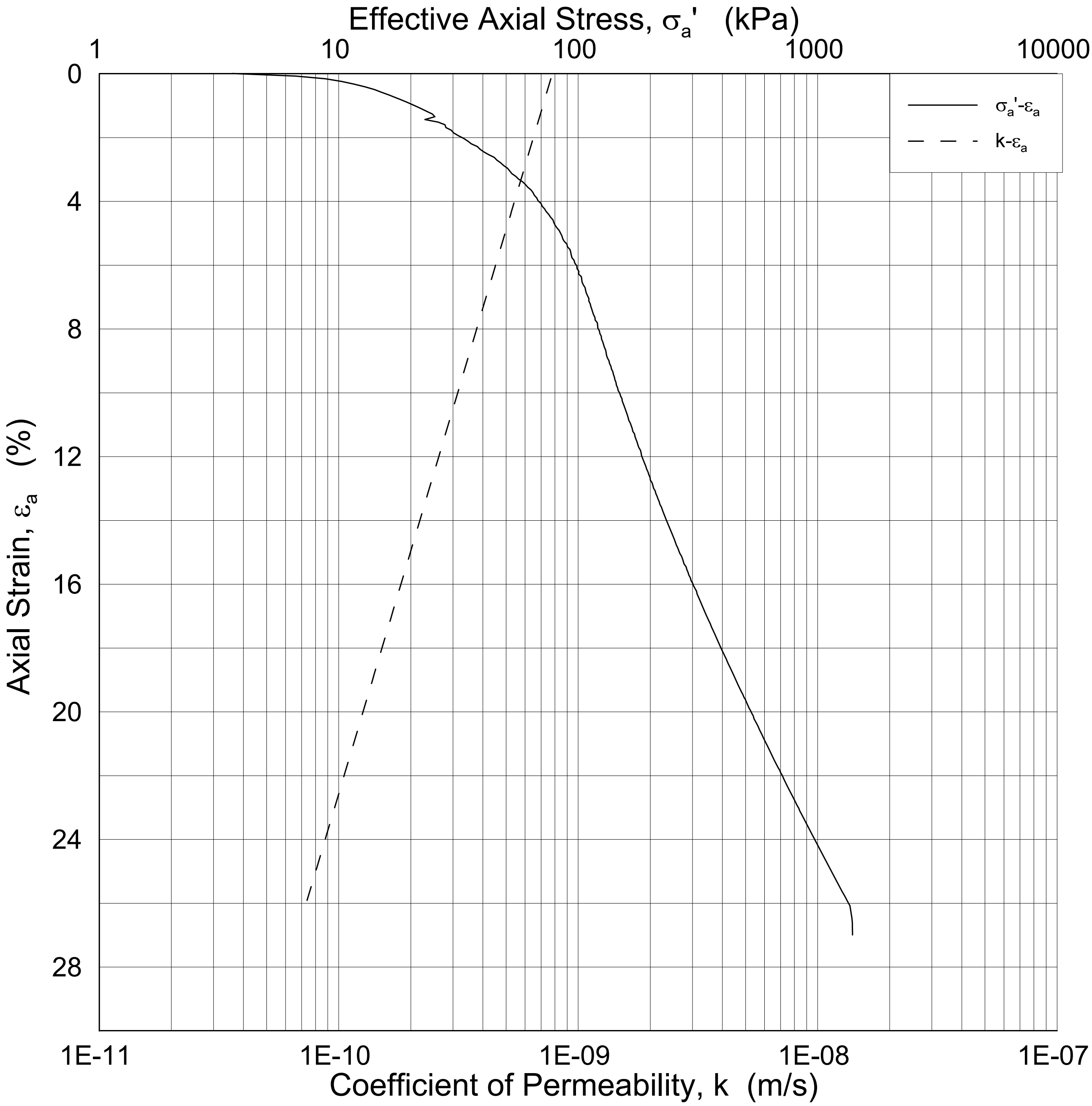
Depth = 10.65 m

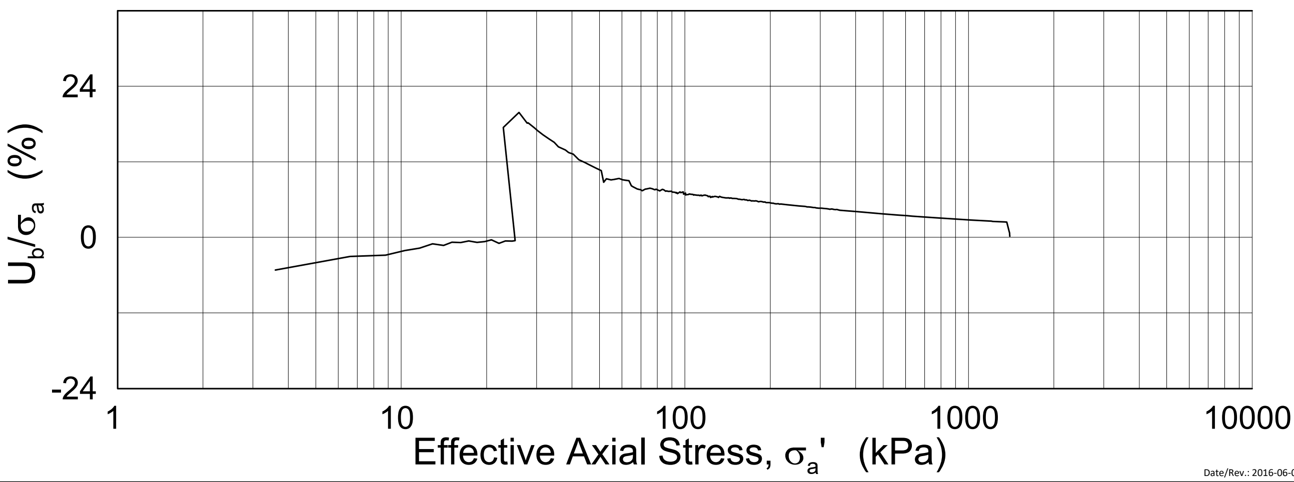
p_0' = 68.4 kPa

w_i = 43.3 %

γ_i = 17.95 kN/m³

NGI





Date/Rev.: 2016-06-08/5

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.2.189

Date 2018-12-10

Drawn by / Checked FI/GS

Oedometer test (CRSC)

Boring: ONSB28 Tube: 2 Part: 3 Test: 2

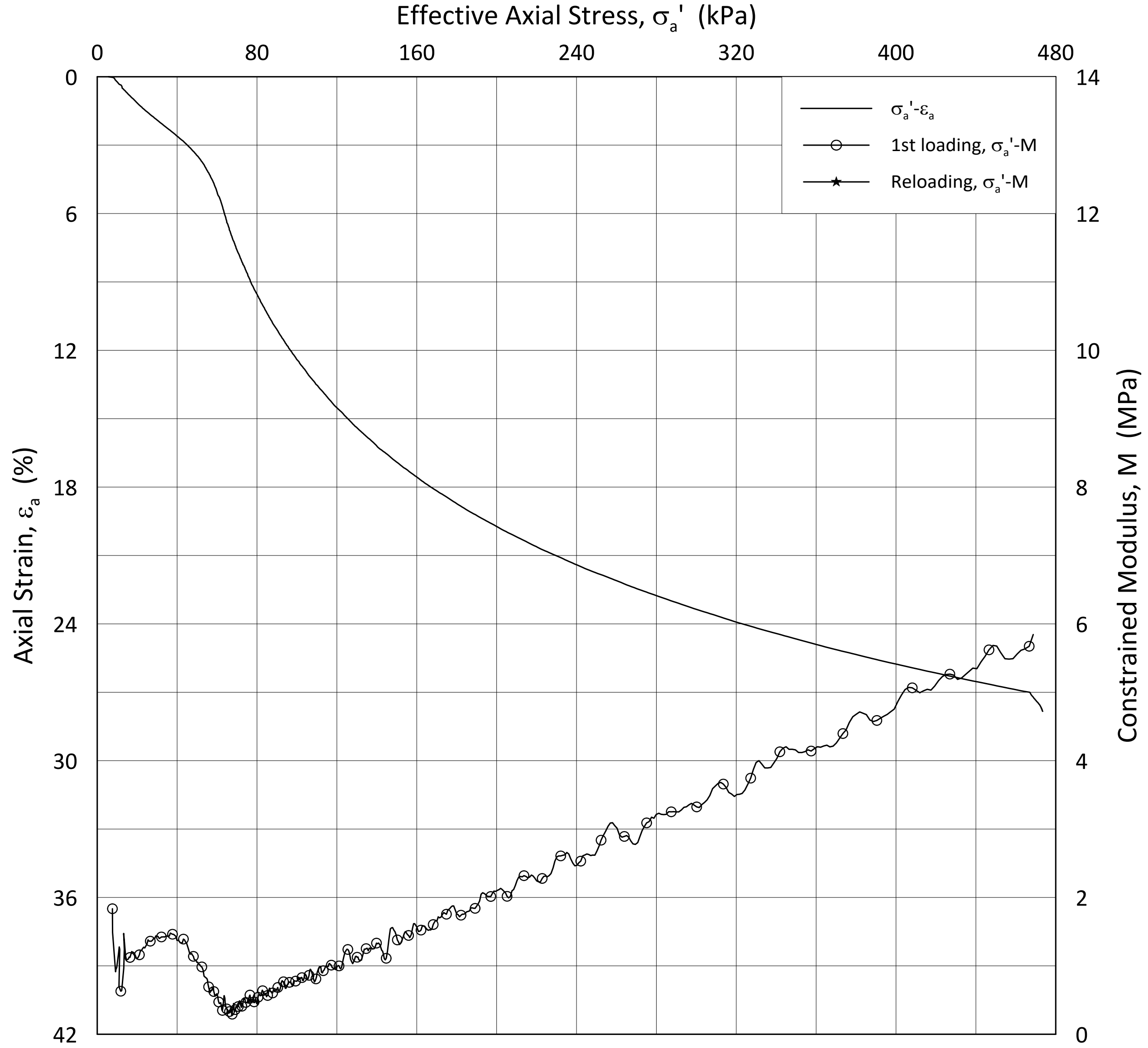
Depth = 10.65 m

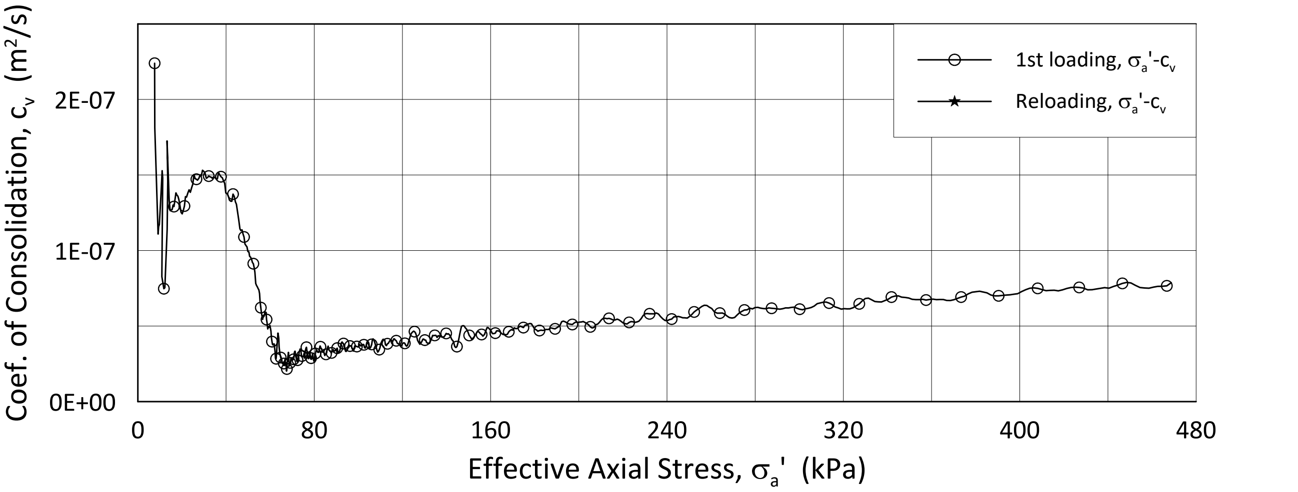
p_0' = 68.4 kPa

w_i = 43.3 %

γ_i = 17.95 kN/m³

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\CRS\Fig 5.2.189, ONSB28b-2-3-2 Log (CRS4018).grf



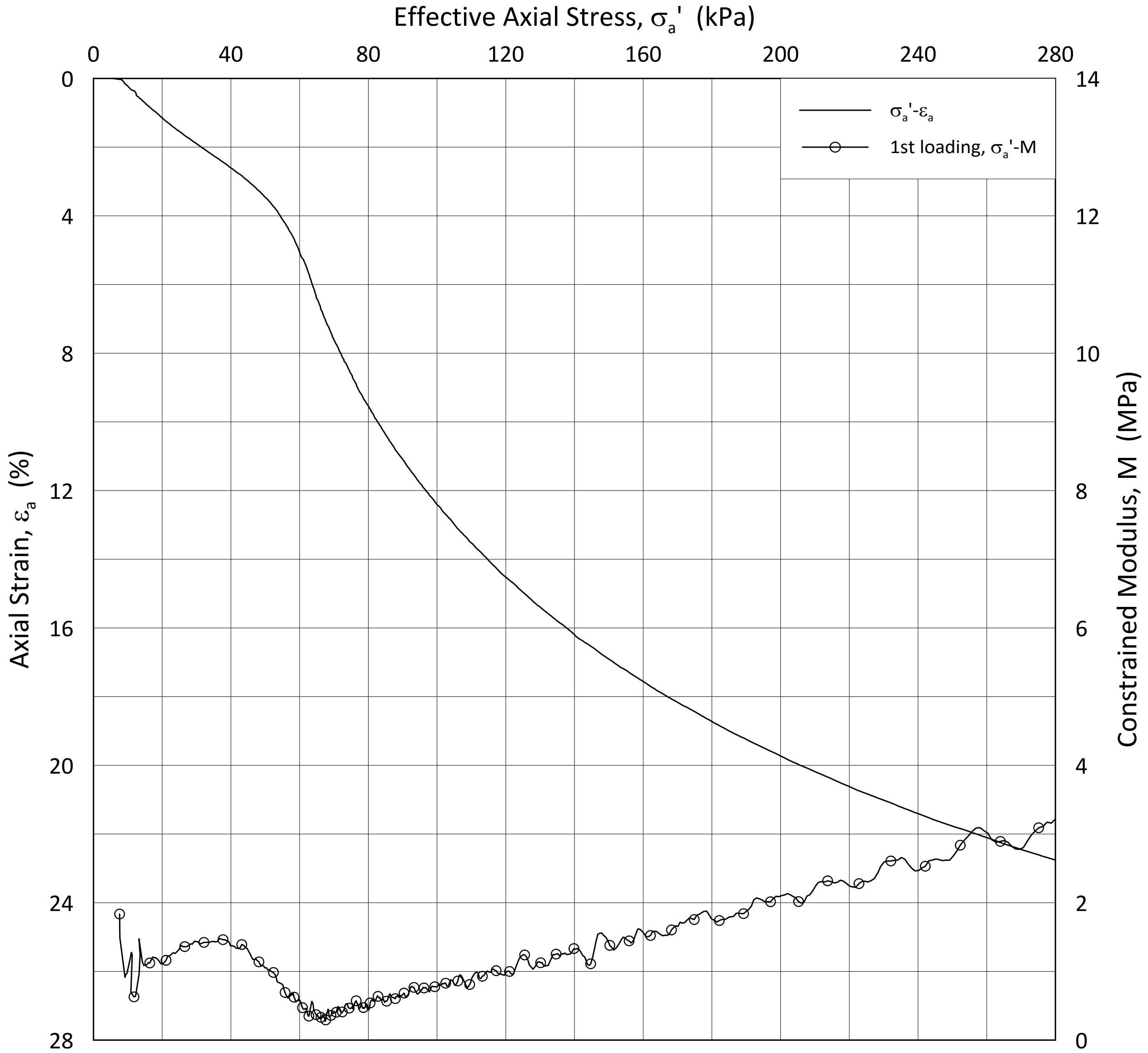


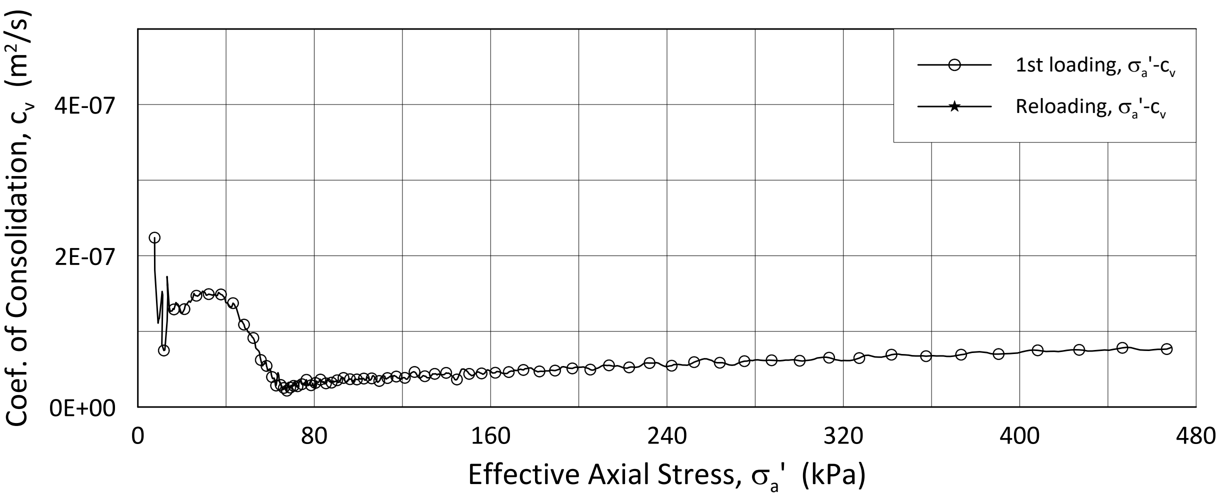
Date/Rev.: 2019-03-07/02

NS 8018:1993

H:\LABDATA\2016\20160154\ONS-Onsoy\Oedom\20160154_ONSB43_2-C-1_LIN.grf

NGTS Onsøy		Document No. 20160154	
Oedometer test: **CRS**	Boring: **ONSB43**	Figure No. 5.2.190	
Tube: **2**	Depth = **3.05** m	Date 2019-10-18	Drawn by FP
Part: **C**	p_0' = **27.8** kPa	[redacted]	
Test: **1**	w_i = **69.5** %		
Lab.: **NGI Oslo**	γ_i = **16.03** kN/m³		



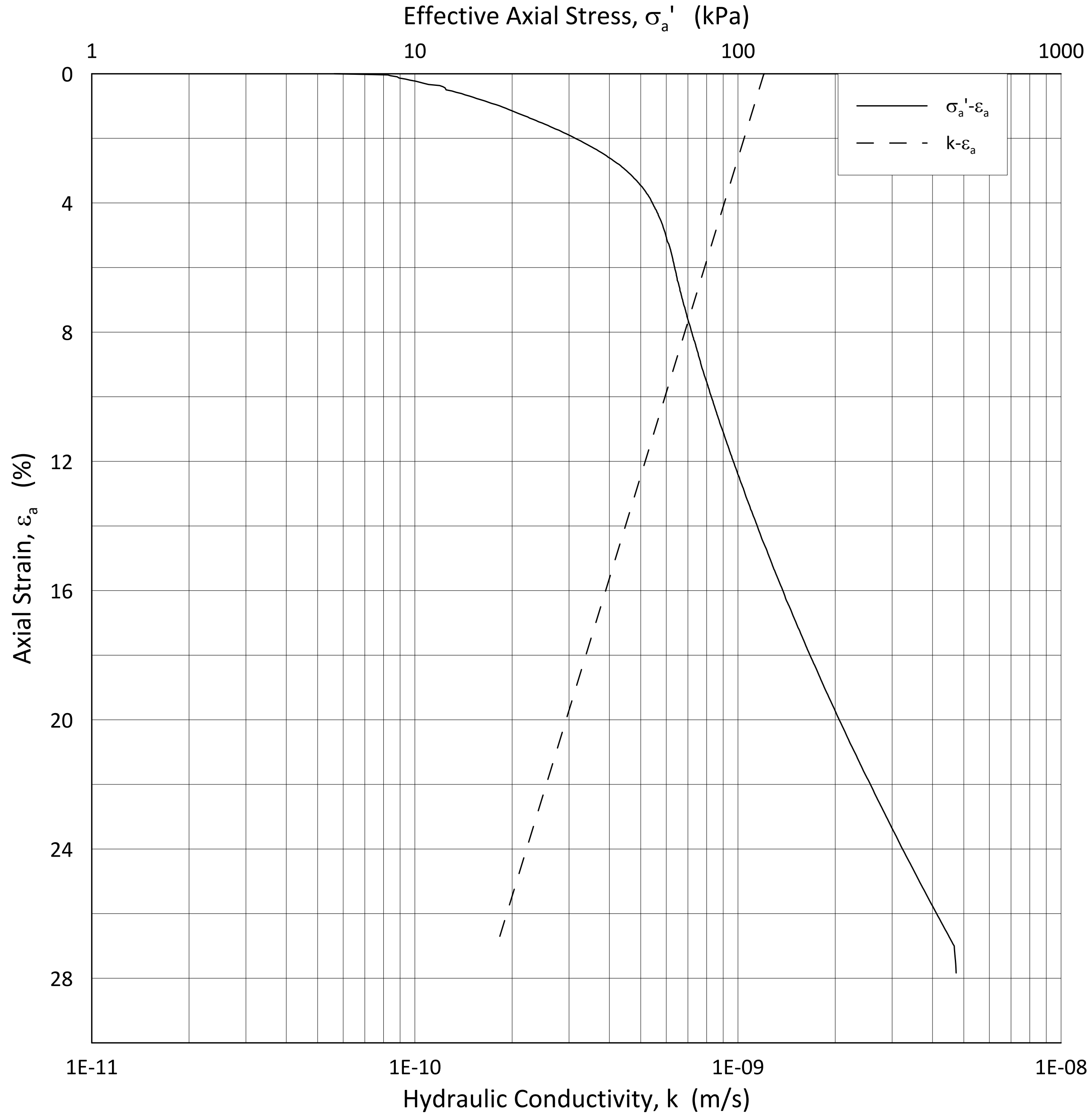


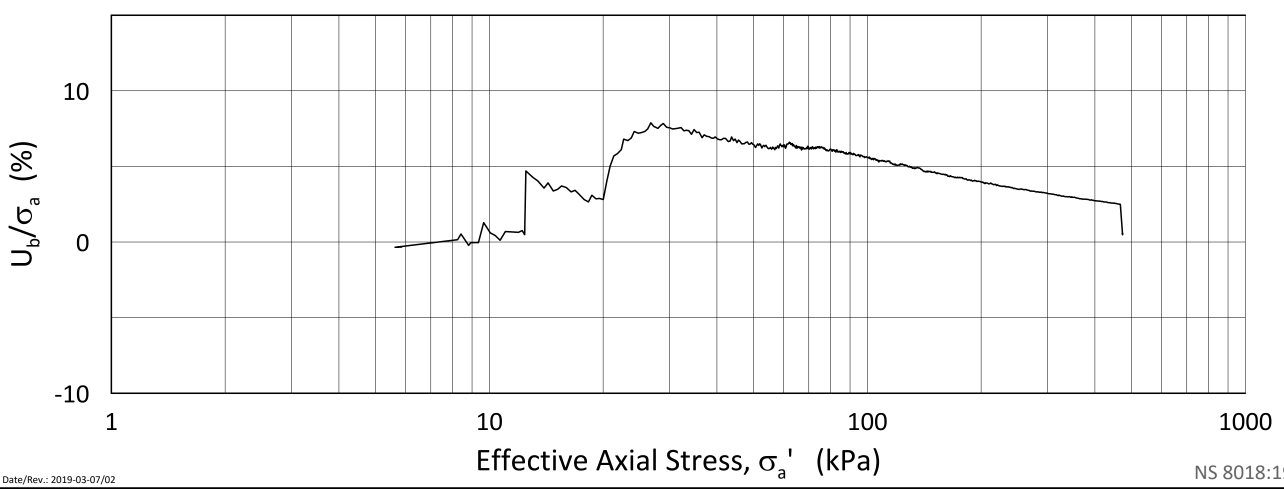
Date/Rev.: 2019-03-07/02

NS 8018:1993

H:\LABDATA\2016\20160154\ONS-Onsoy\Oedom\20160154_ONSB43_2-C-1_LIN2.grf

NGTS Onsøy		Document No. 20160154	
Oedometer test: **CRS**	Boring: **ONSB43**	Figure No. 5.2.191	
Tube: **2**	Depth = **3.05** m	Date 2019-10-18	Drawn by FP
Part: **C**	p_0' = **27.8** kPa		
Test: **1**	w_i = **69.5** %		
Lab.: **NGI Oslo**	γ_i = **16.03** kN/m³		



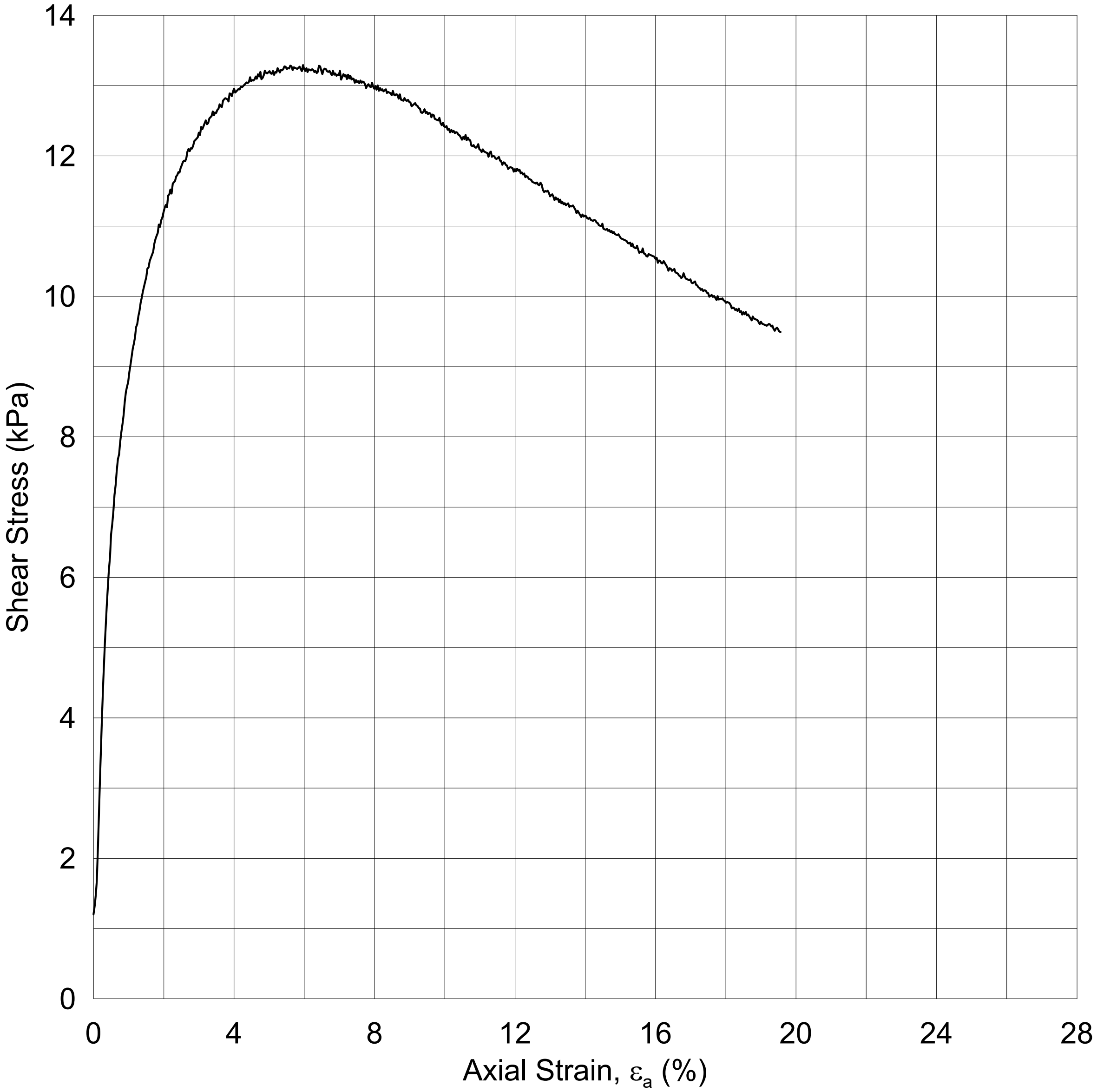


Date/Rev.: 2019-03-07/02

NS 8018:1993

H:\LABDATA\2016\20160154\ONS-Onsoy\Oedom\20160154_ONSB43_2-C-1_LOG.grf

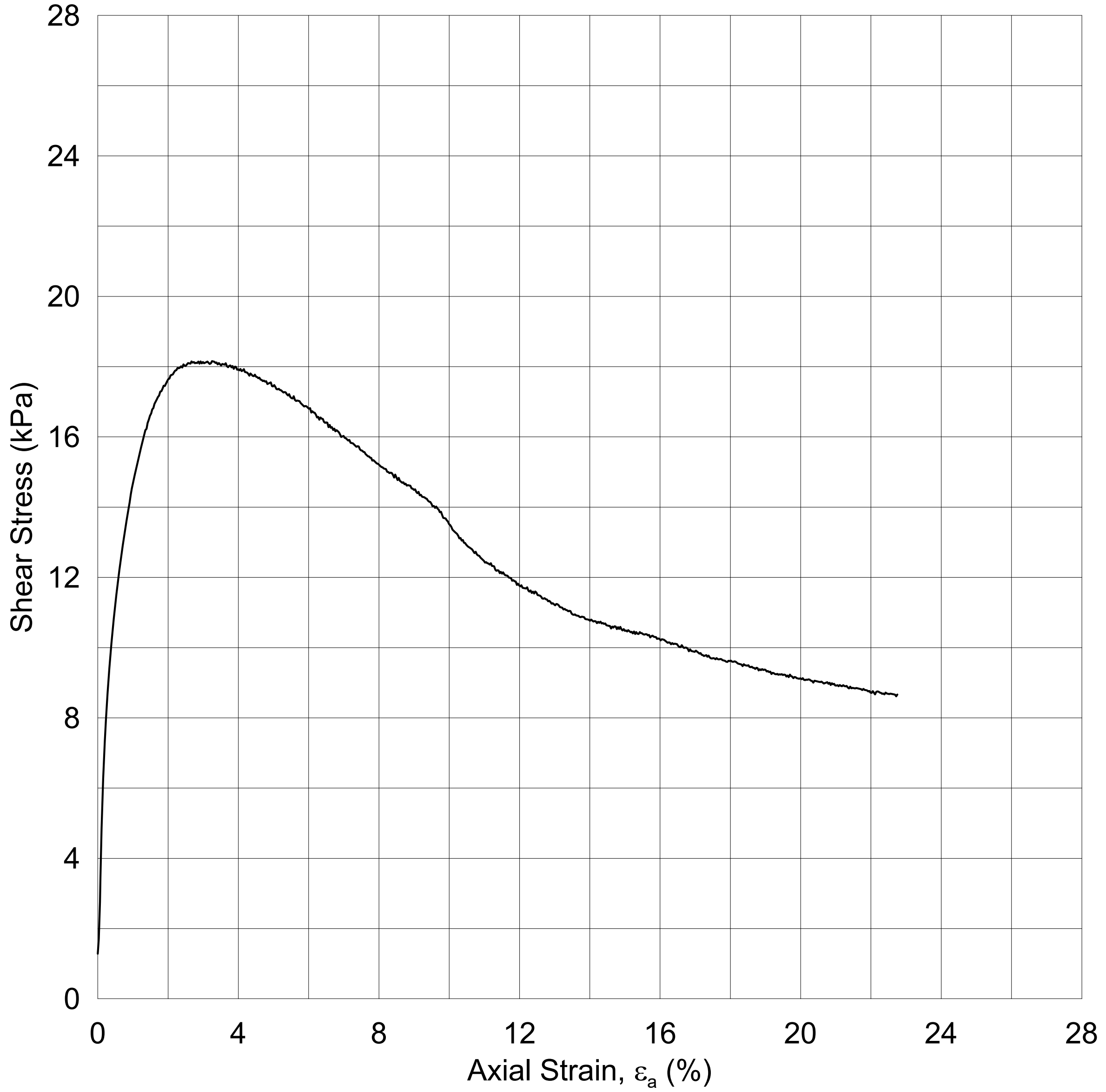
NGTS Onsøy		Document No. 20160154	
Oedometer test: **CRS**	Boring: **ONSB43**	Figure No. 5.2.192	
Tube: **2** Part: **C** Test: **1** Lab.: **NGI Oslo**	Depth = **3.05** m p_0' = **27.8** kPa w_i = **69.5** % γ_i = **16.03** kN/m³	Date 2019-10-18	Drawn by FP
		[redacted]	



\\xfil2\ngilab\LABDATA\2016\20160154\ONS-Onsoy\UU-ONSB41-2018\02_data processed\ONSB41-4-D-1.grf

Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R	
UU-test		Figure No. 5.3.1	
Boring: ONSB41	Depth = 3.66 m	Date 2018/06/26	Drawn by/checked YSu / MAS
Tube: 4	p_o' = 16.7 kPa		
Part: D	w_i = 69.5 %	NGI	
Test: 1	γ_i = 15.7 kN/m³		



Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

UU-test

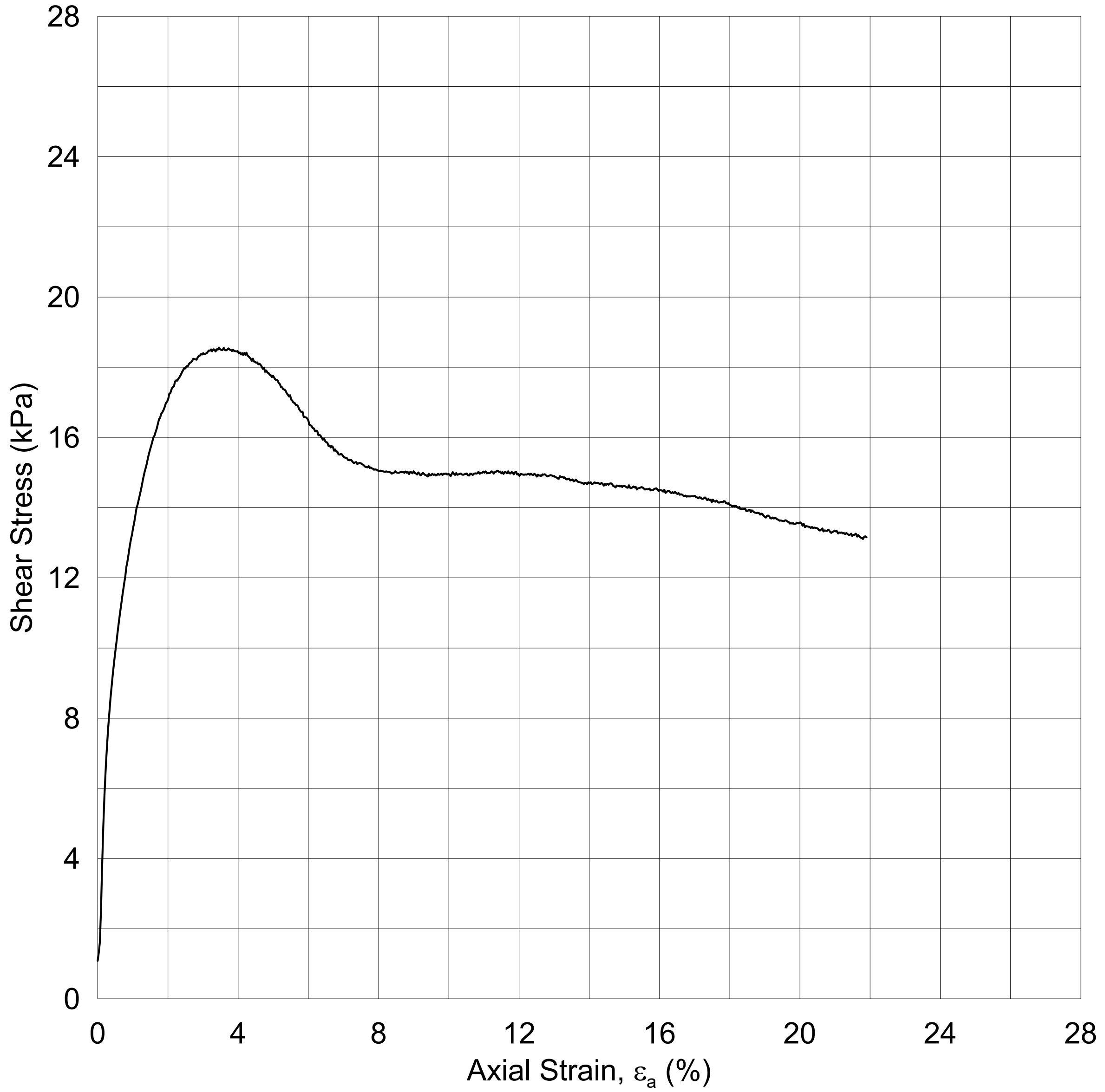
Figure No. 5.3.2

Boring: ONSB41	Depth	=	7.14	m
Tube: 8	p_o'	=	42.3	kPa
Part: D	w_i	=	69.4	%
Test: 1	γ_i	=	15.8	kN/m³

Date 2018/06/26

Drawn by/checked YSu / MAS

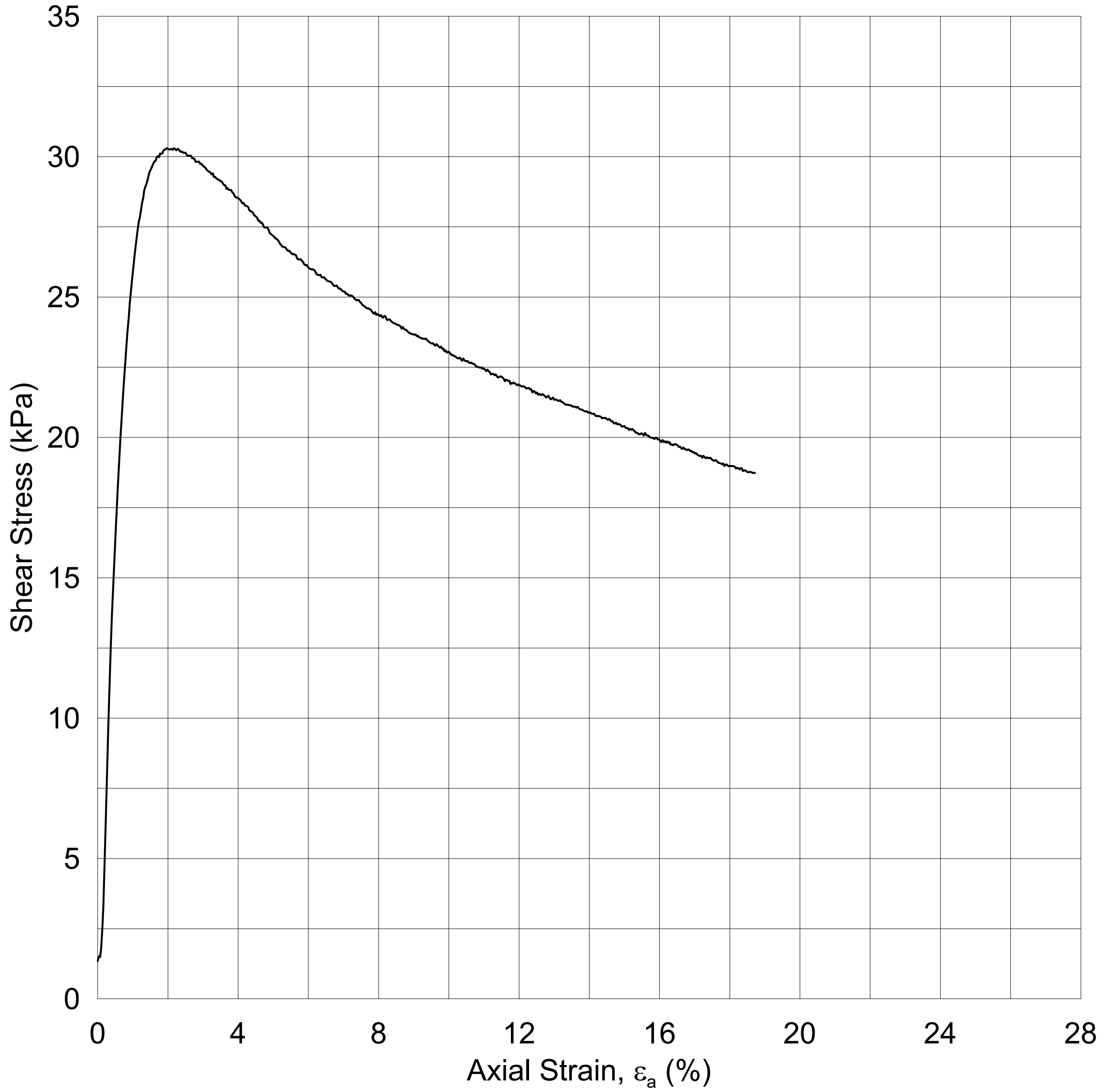
NGI



\\xfil2\ngilab\LABDATA\2016\20160154\ONS-Onsoy\UU-ONSB41-2018\02_data processed\ONSB41-12-D-1.grf

Dato/rev.: 2014-12-23/01

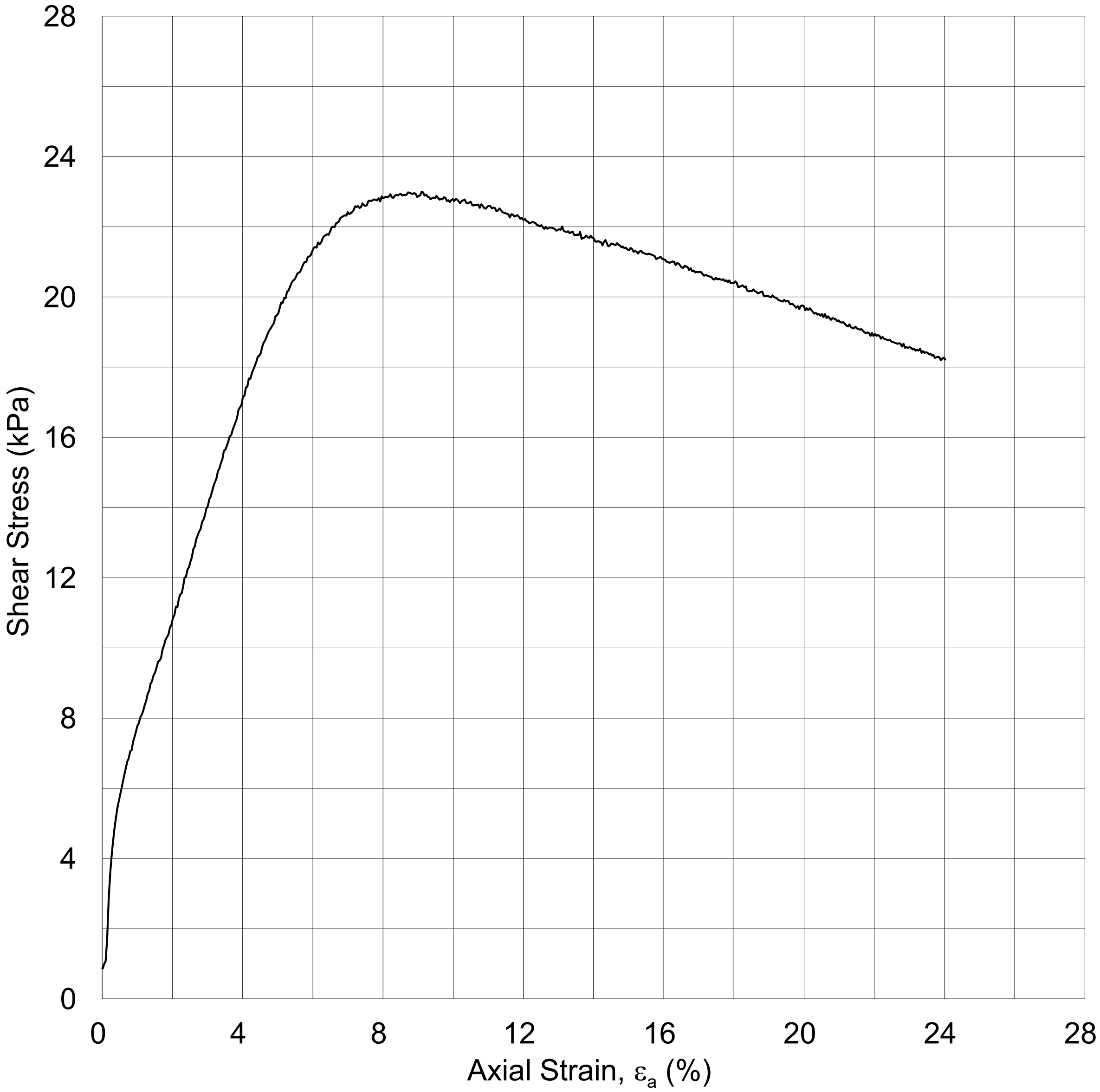
Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R
UU-test		Figure No. 5.3.3
Boring: ONSB41 Tube: 12 Part: D Test: 1	Depth = 11.66 m p_o' = 75.1 kPa w_i = 44.3 % γ_i = 17.5 kN/m³	Date 2018/06/26 — Drawn by/checked YSu / MAS NGI



\\xfil2\ngilab\LABDATA\2016\20160154\ONS-Onsoy\UU-ONSB41-2018\02_data processed\ONSB41-15-D-1.grf

Dato/rev.: 2014-12-23/01

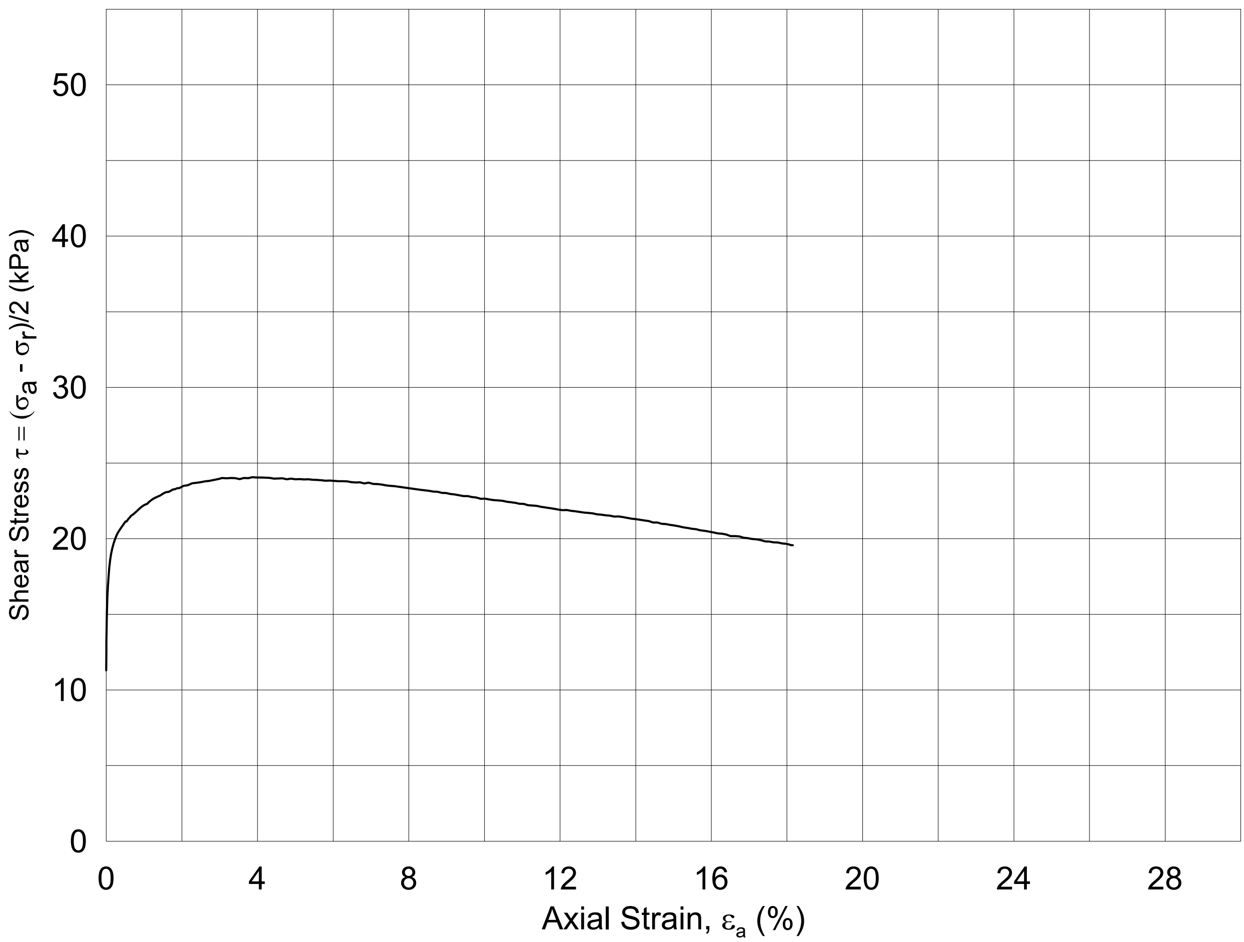
Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R
UU-test		Figure No. 5.3.4
Boring: ONSB41	Depth = 14.37 m	Date 2018/06/26 — Drawn by/checked YSu / MAS
Tube: 15	p_o' = 97.0 kPa	NGI
Part: D	w_i = 41.5 %	
Test: 1	γ_i = 17.5 kN/m³	

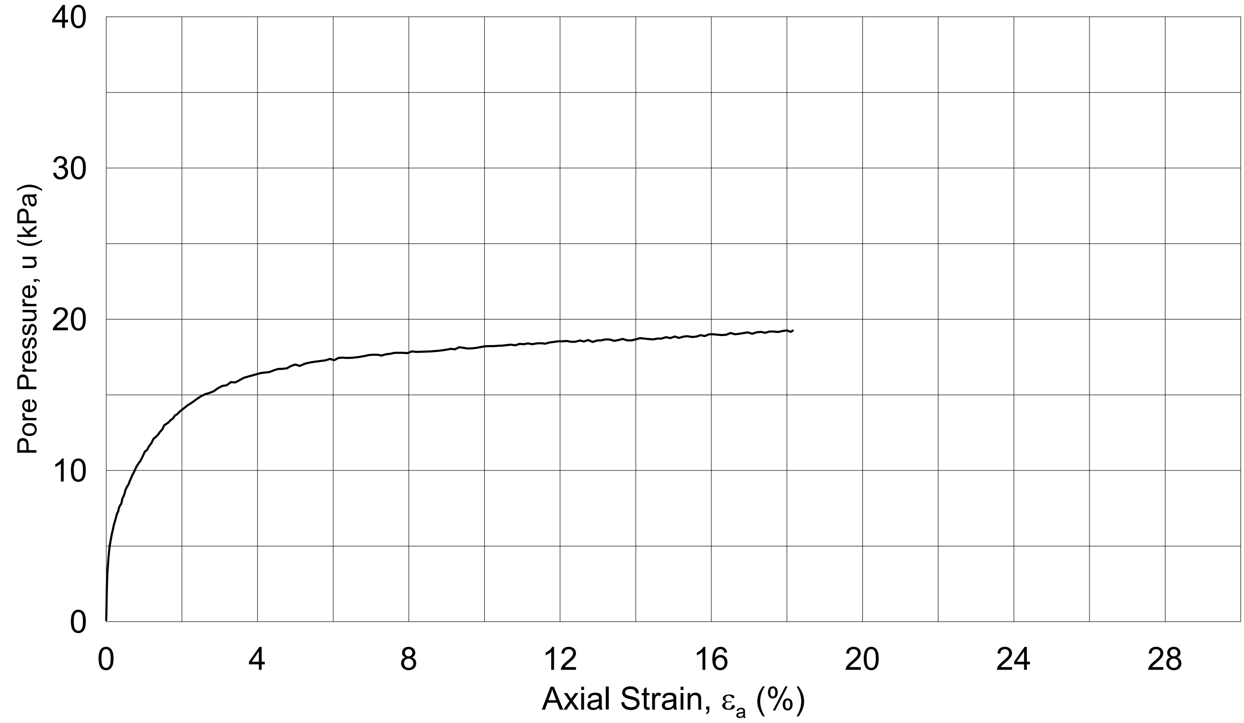


H:\LABDATA\2016\20160154\ONS-Onsoy\UU-ONSB41-2018\02_data processed\ONSB41-20-1-UU.grf

Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R	
UU-test		Figure No. 5.3.5	
Boring: ONSB41	Depth = 19.37 m	Date 2018/09/11	Drawn by/checked YSu / GS
Tube: 20	p_o' = kPa		
Part: 1	w_i = 41.611 %		
Test: UU	γ_i = 17.42 kN/m³		



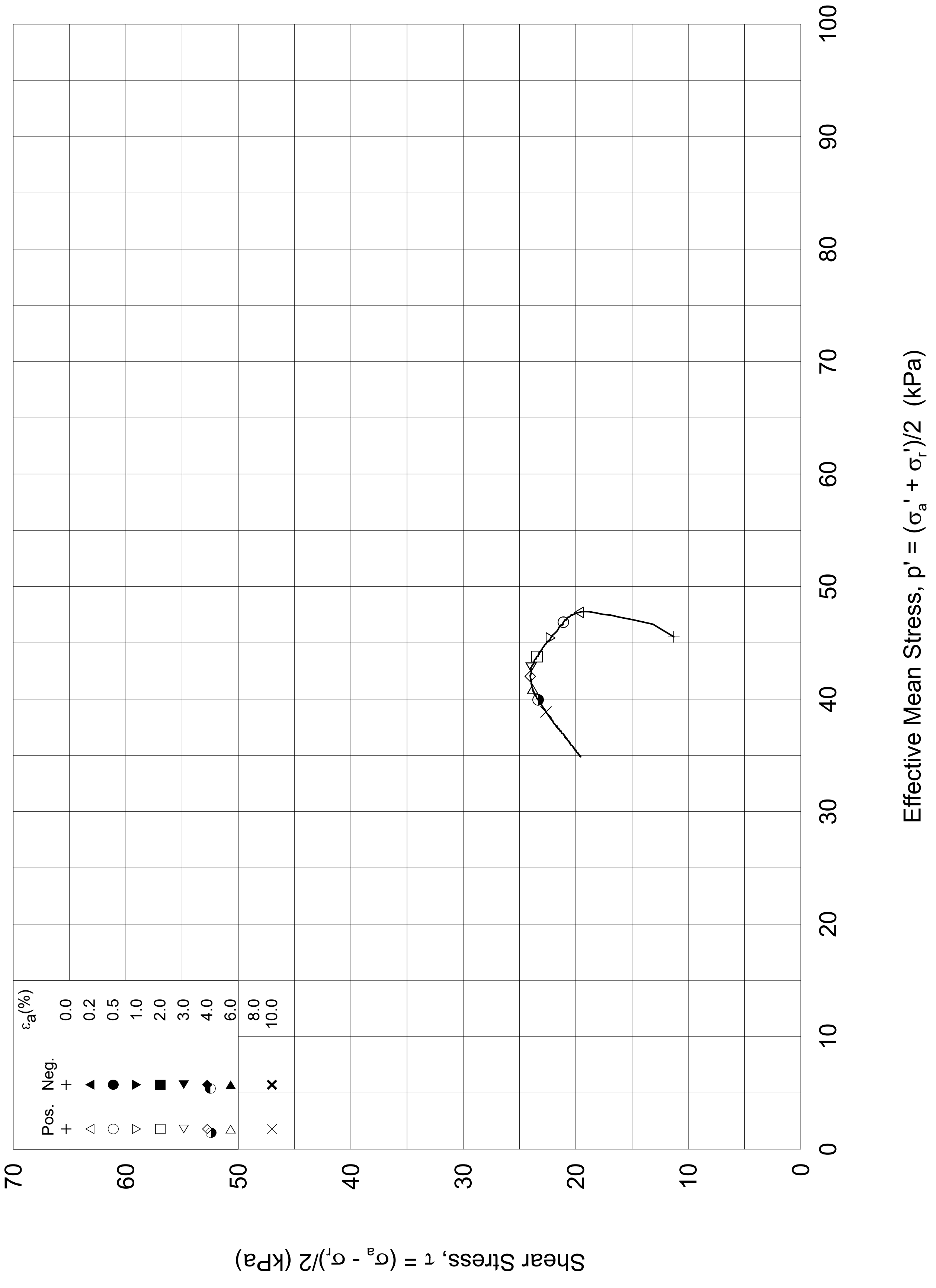


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**				Document No. 20160154-10-R
				Figure No. 5.3.6
Boring: **ONSB04**	Depth = **9.08** m	Consolidation stresses		Date 2018-12-10 / Drawn by/checked ThV / GS
Tube: **2**	po' = **58.3** kPa	(kPa) max. min. final		
Part: **C**	w_i = **43.1** %	σ_{ac}' = - - **57.1**		
Test: **1**	w_c = **40.0** %	σ_{rc}' = - - **34.3**		

PISTON1-2-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**

Boring:	**ONSB04**	Depth =	**9.08**	m	Consolidation stresses			
Tube:	**2**	po' =	**58.3**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**43.1**	%	σ_{ac}' =	-	-	**57.1**
Test:	**1**	w_c =	**40.0**	%	σ_{rc}' =	-	-	**34.3**

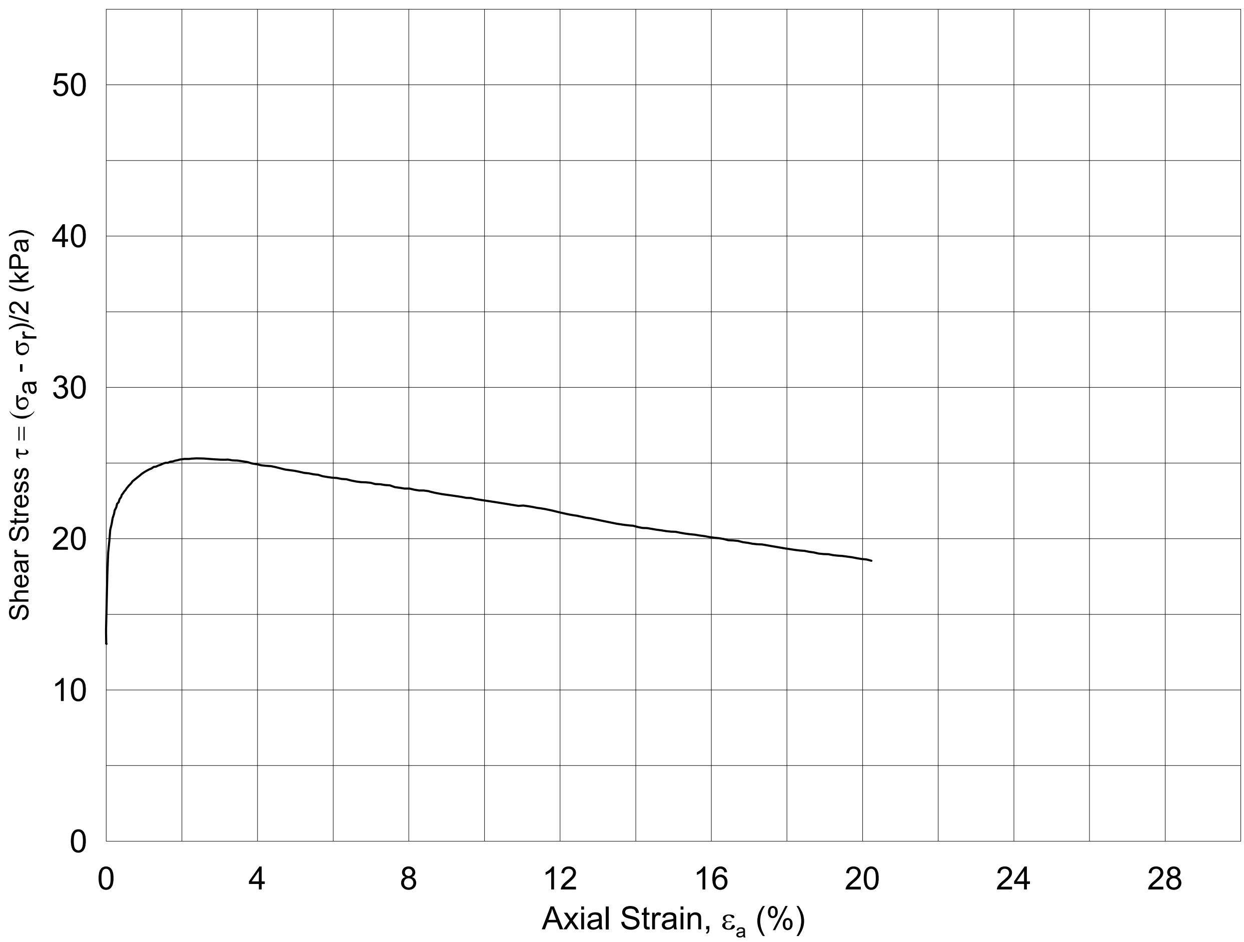
Document No. 20160154-10-R

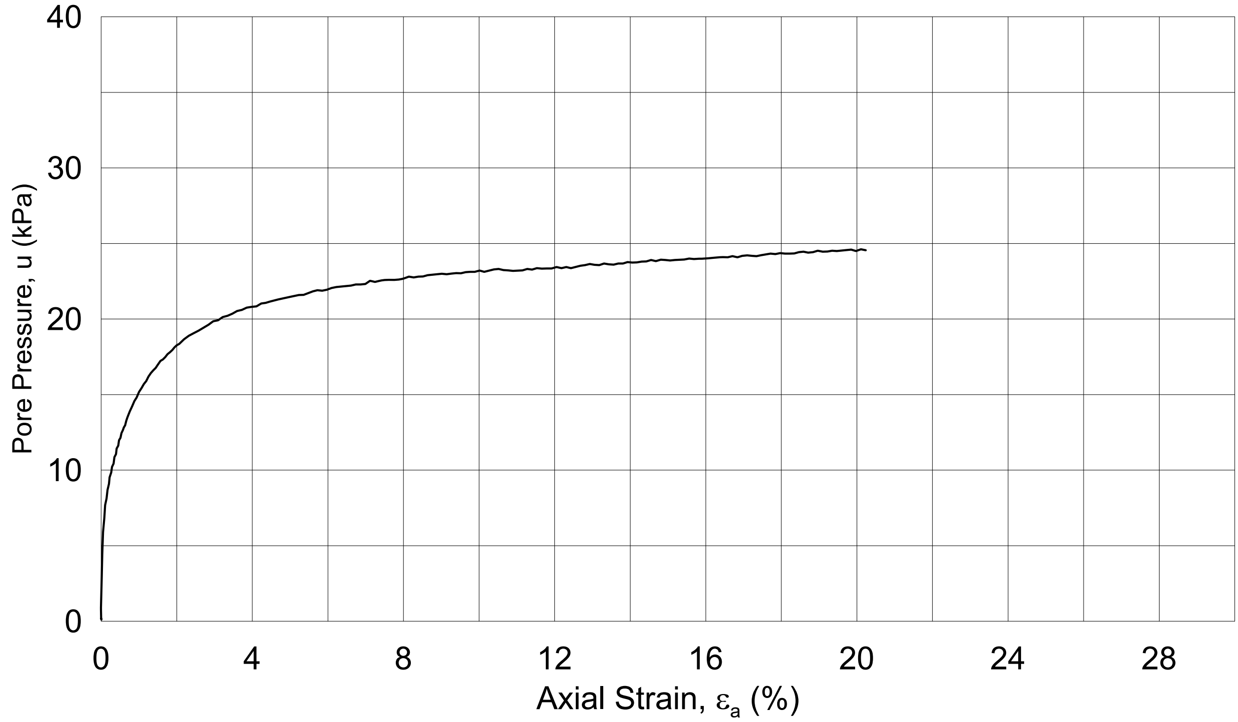
Figure No. 5.3.7

Date 2018-12-10

Drawn by/checked ThV / GS

PISTON1-2-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.8

Triaxial test: **CAUC**

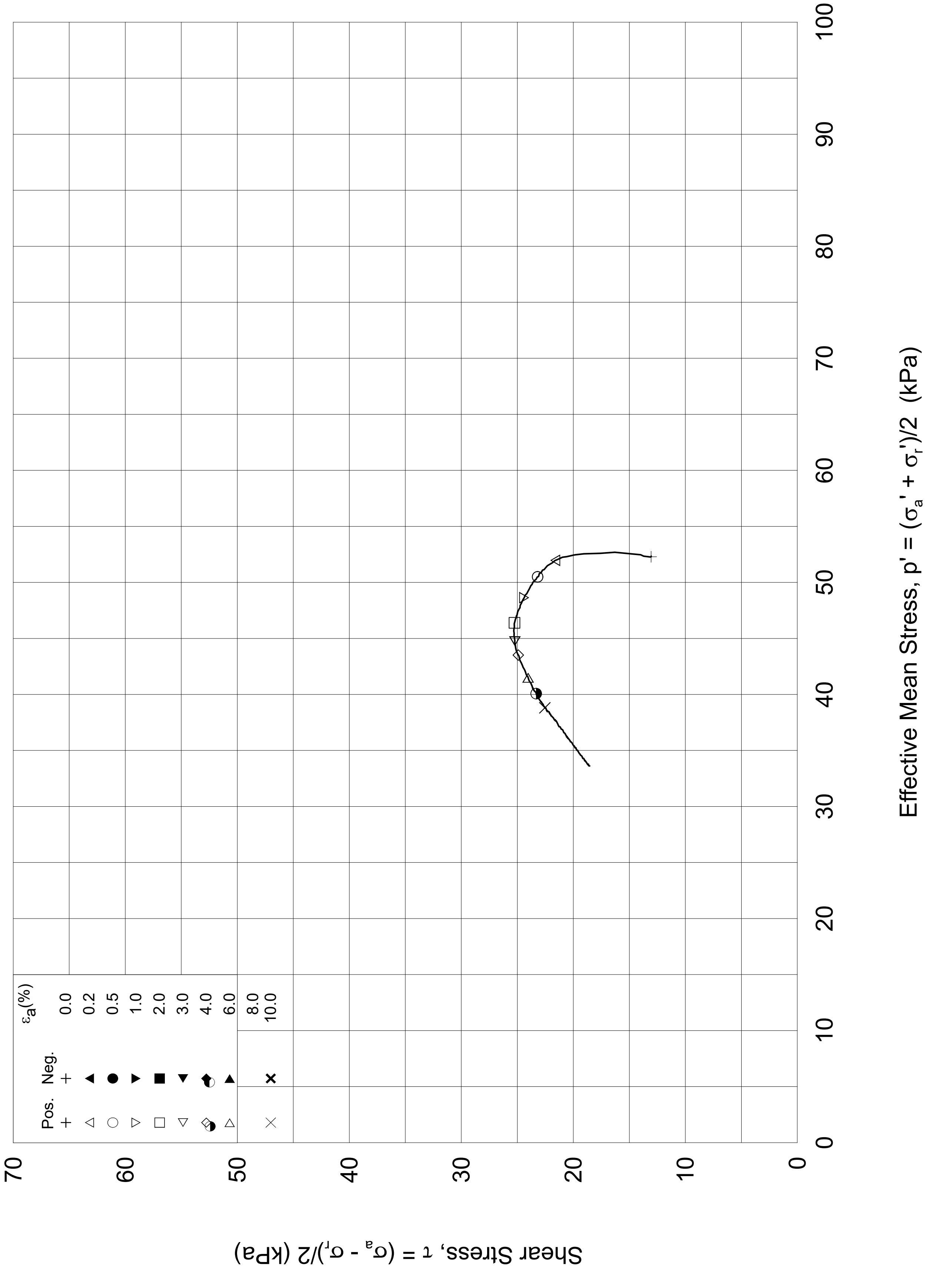
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB04**	Depth =	**10.13**	m	Consolidation stresses			
Tube:	**3**	po' =	**65.6**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**42.1**	%	σ_{ac}' =	-	-	**65.5**
Test:	**1**	w_c =	**39.2**	%	σ_{rc}' =	-	-	**39.4**

NGI

PISTON1-3-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.9

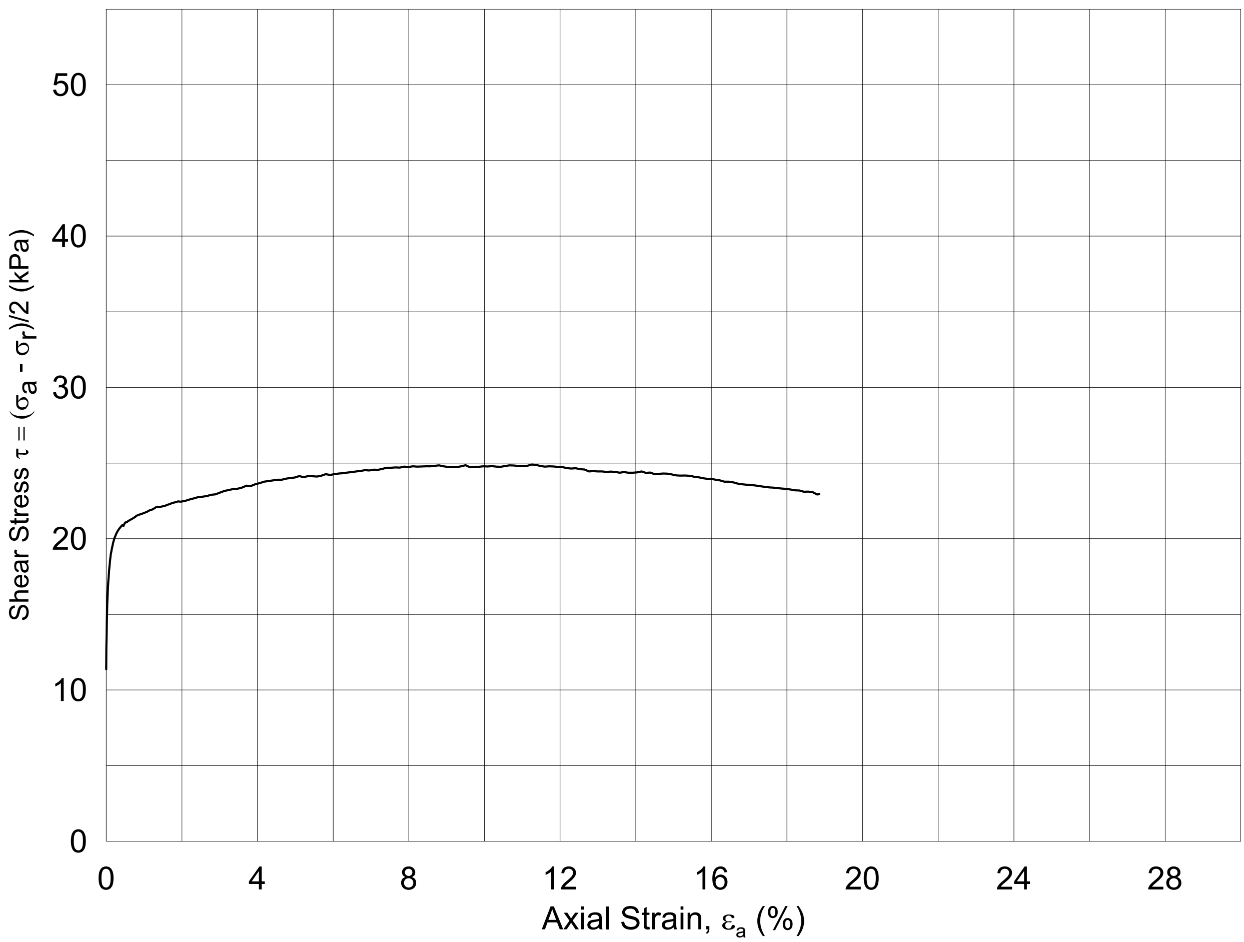
Triaxial test: **CAUC**

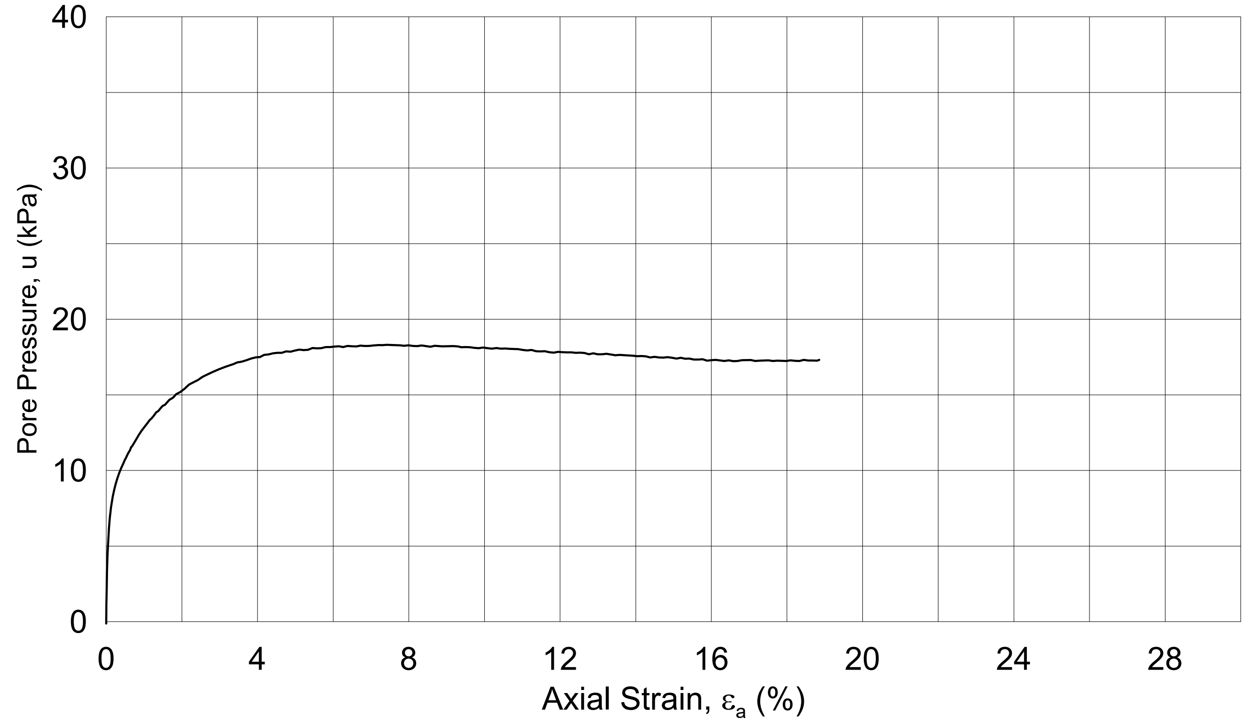
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB04**	Depth =	**10.13**	m	Consolidation stresses				
Tube:	**3**	po' =	**65.6**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**42.1**	%	σ_{ac}' =	-	-	**65.5**	
Test:	**1**	w_c =	**39.2**	%	σ_{rc}' =	-	-	**39.4**	

PISTON1-3-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

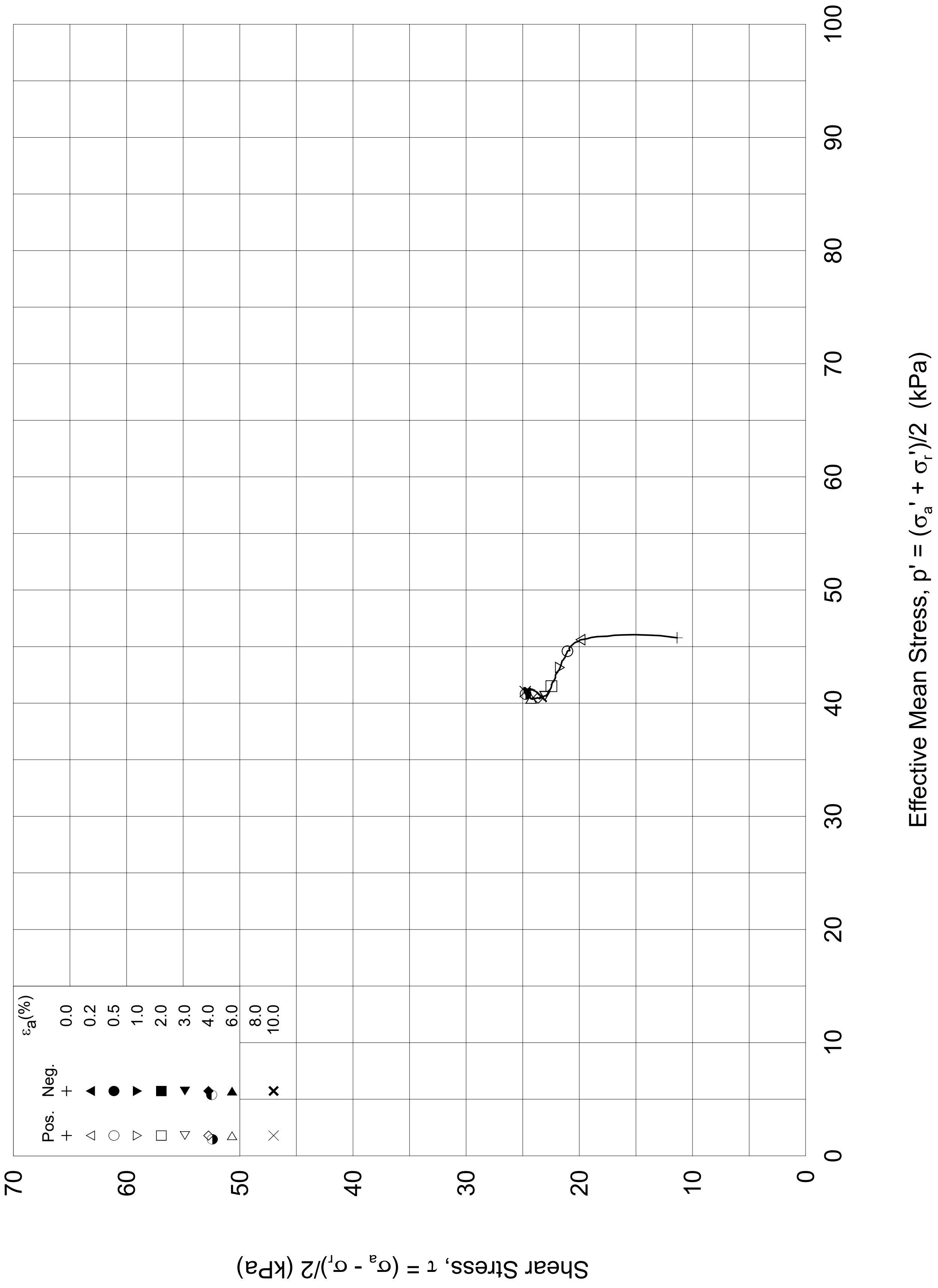
Document No. 20160154-10-R

Triaxial test: **CAUC**

Figure No. 5.3.10

Boring:	**ONSB05**	Depth =	**9.07**	m	Consolidation stresses				Date 2018-12-10
Tube:	**2**	po' =	**57.2**	kPa	(kPa)	max.	min.	final	Drawn by/checked ThV / GS
Part:	**C**	w_i =	**46.5**	%	σ_{ac}' =	-	-	**57.1**	
Test:	**1**	w_c =	**40.9**	%	σ_{rc}' =	-	-	**34.3**	

PUSH1-2-C-1.Plot1.grf

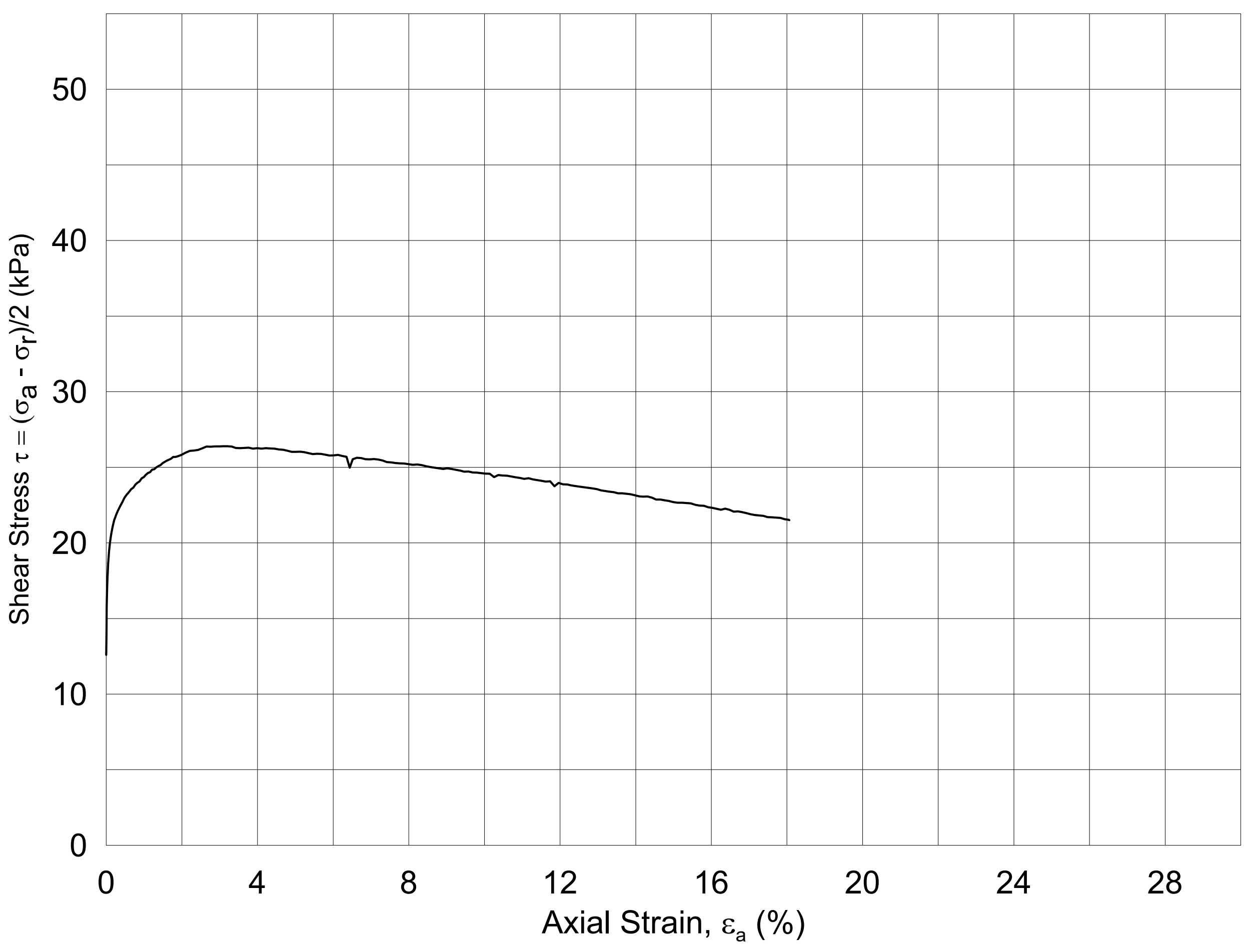


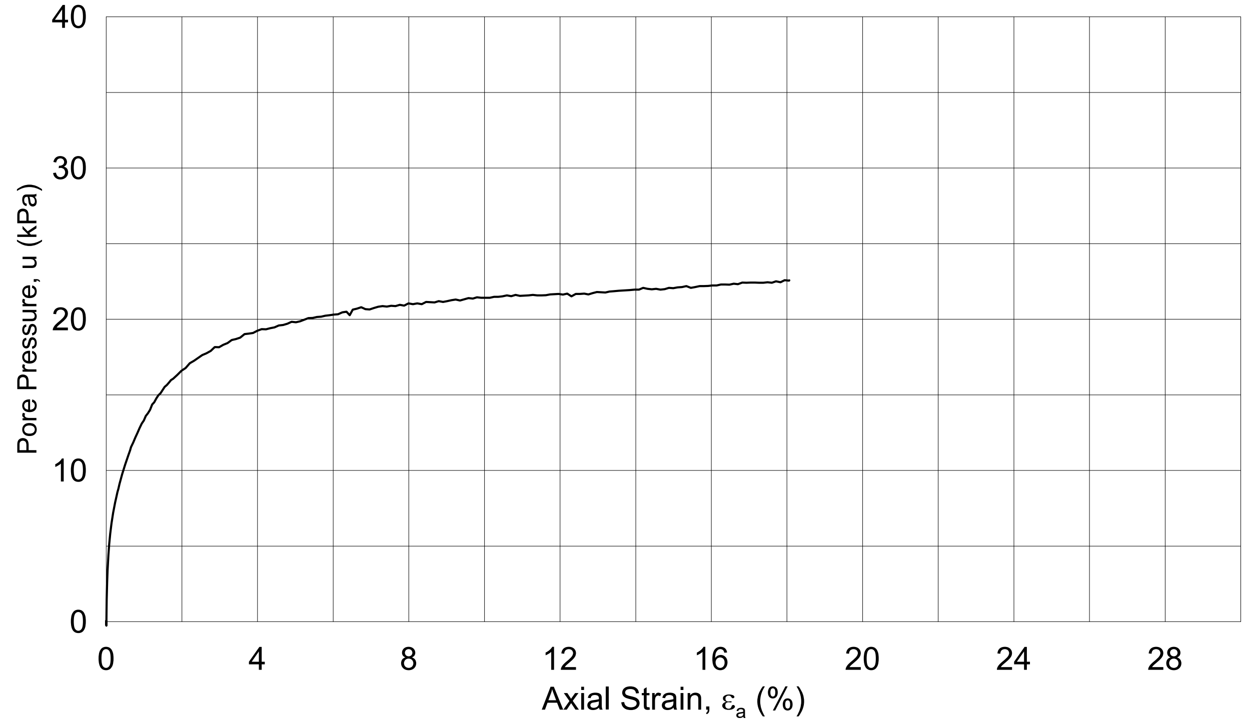
Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**								Document No. 20160154-10-R
								Figure No. 5.3.11
Boring: **ONSB05**	Depth =	**9.07**	m	Consolidation stresses				Date 2018-12-10 / Drawn by/checked ThV / GS
Tube: **2**	po' =	**57.2**	kPa	(kPa)	max.	min.	final	
Part: **C**	w_i =	**46.5**	%	σ_{ac}' =	-	-	**57.1**	
Test: **1**	w_c =	**40.9**	%	σ_{rc}' =	-	-	**34.3**	

PUSH1-2-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.12

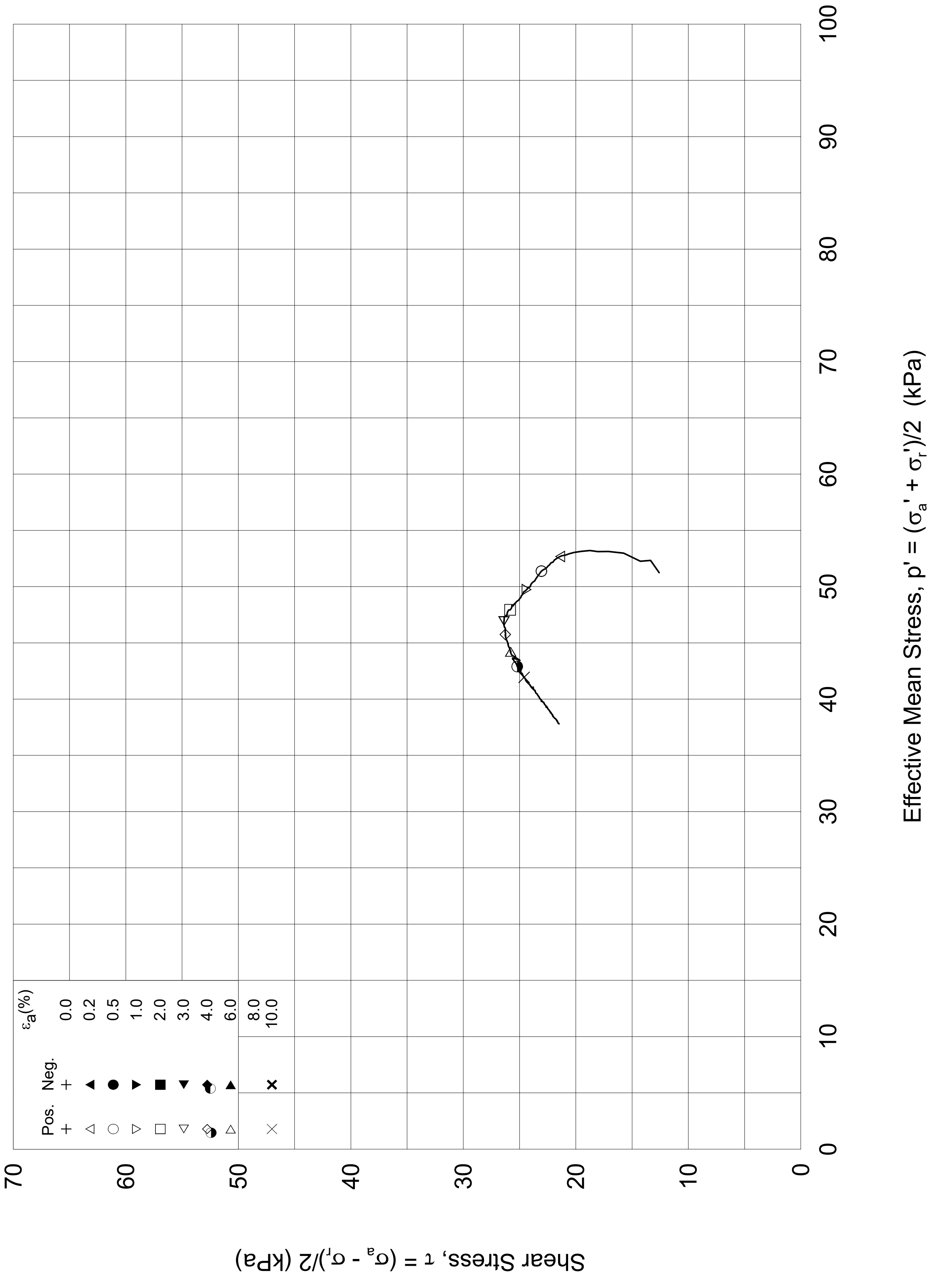
Triaxial test: **CAUC**

Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB05**	Depth =	**10.07**	m	Consolidation stresses				
Tube:	**3**	po' =	**64.5**	kPa	(kPa)		max.	min.	final
Part:	**C**	w_i =	**41.9**	%	σ_{ac}' =		-	-	**64.4**
Test:	**1**	w_c =	**39.3**	%	σ_{rc}' =		-	-	**38.7**

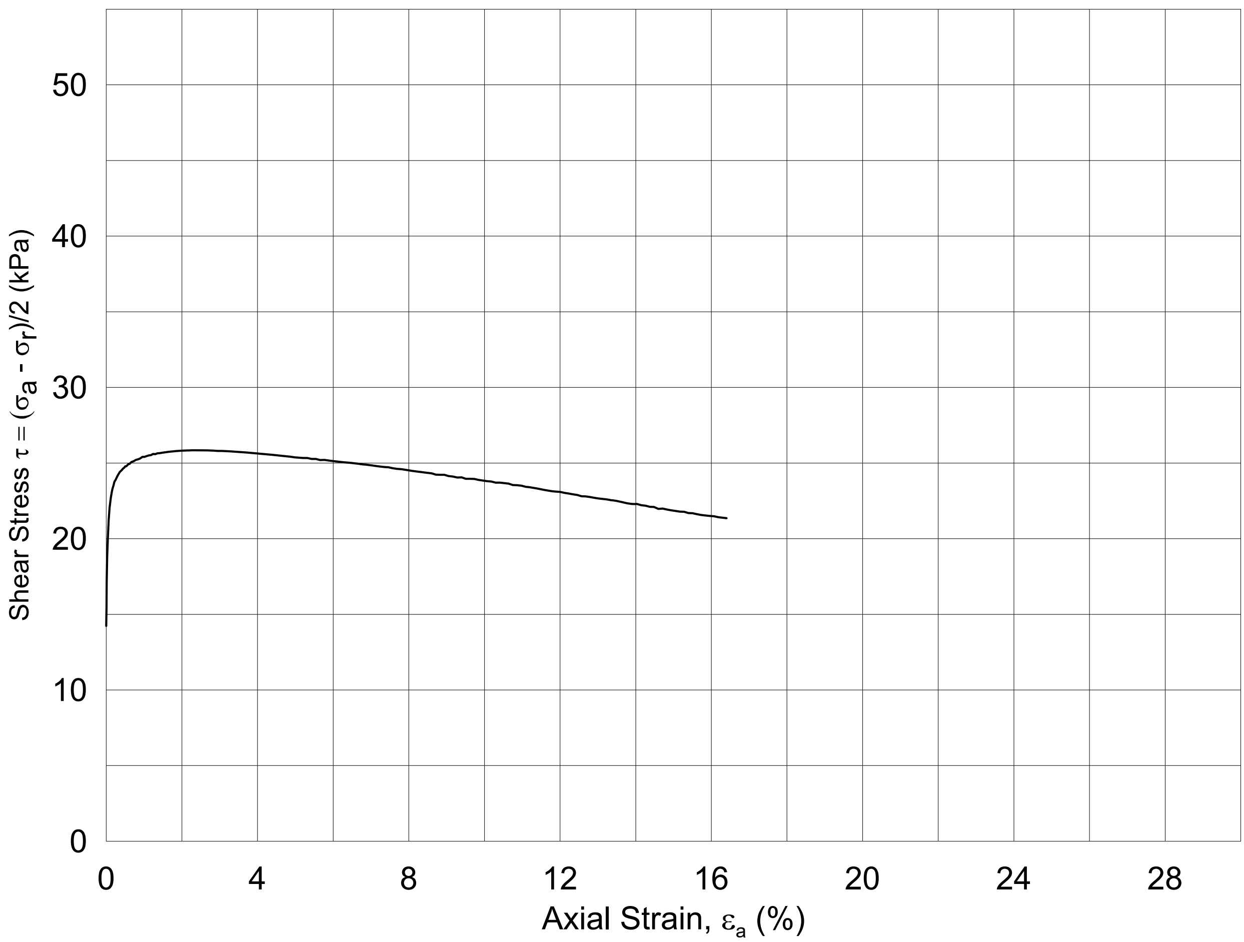
PUSH1-3-C-1.Plot1.grf

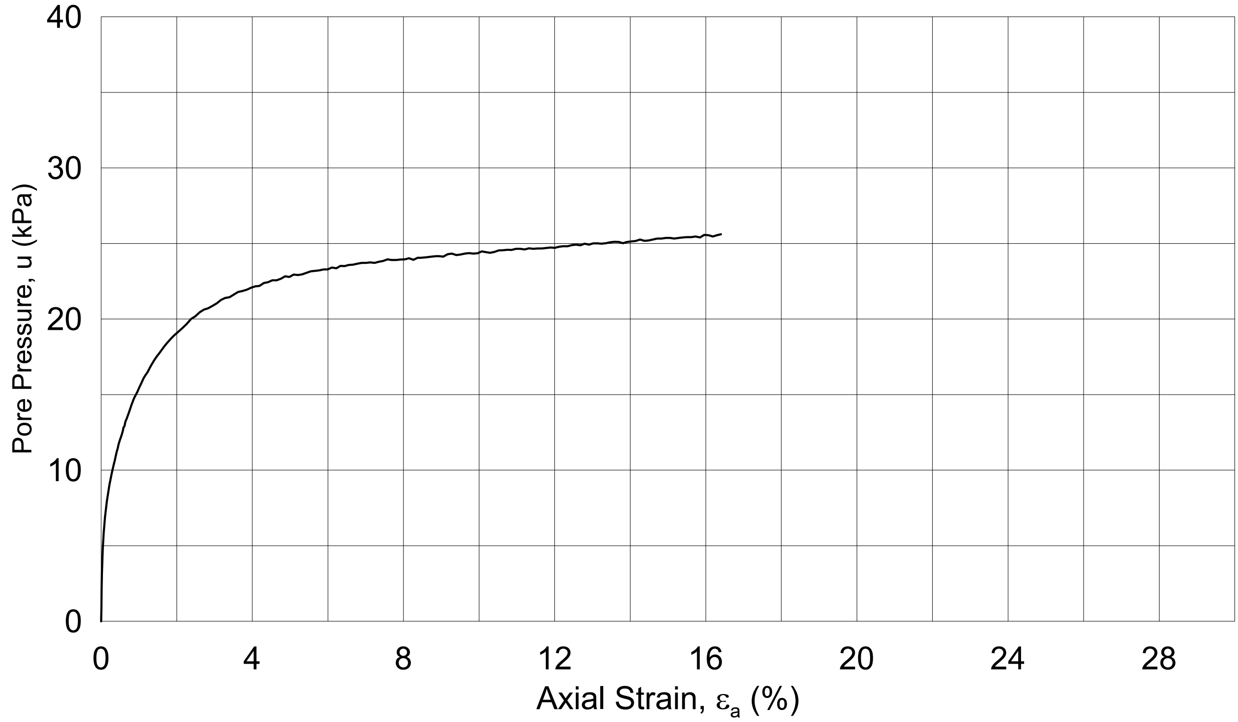


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: **CAUC**							Figure No. 5.3.13
Boring: **ONSB05**	Depth = **10.07** m	Consolidation stresses					Date 2018-12-10 / Drawn by/checked ThV / GS
Tube: **3**	po' = **64.5** kPa	(kPa)	max.	min.	final		
Part: **C**	w_i = **41.9** %	σ_{ac}' =	-	-	**64.4**		
Test: **1**	w_c = **39.3** %	σ_{rc}' =	-	-	**38.7**		

PUSH1-3-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.14

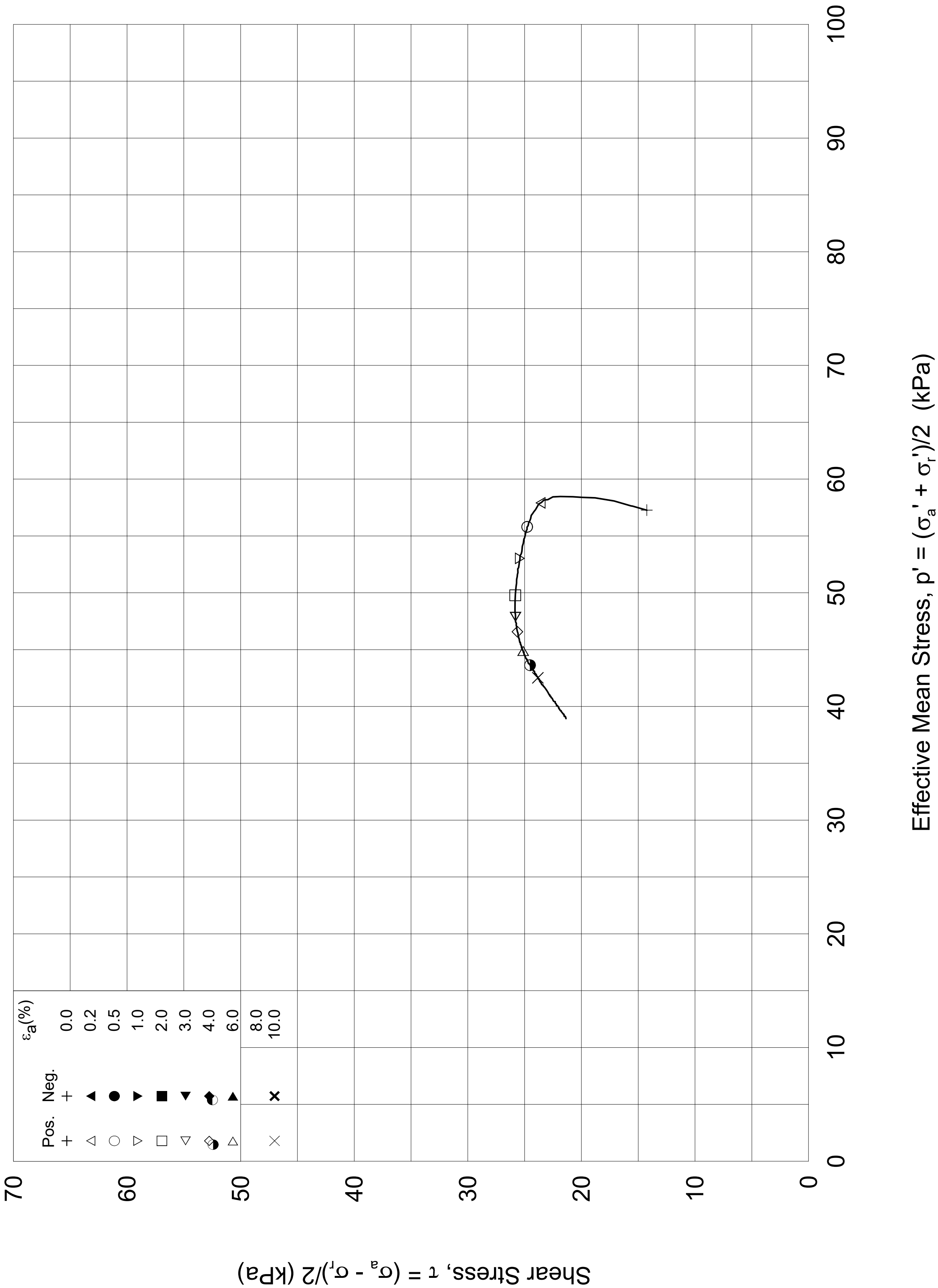
Triaxial test: **CAUC**

Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB05**	Depth =	**11.07**	m	Consolidation stresses			
Tube:	**4**	po' =	**71.8**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**39.2**	%	σ_{ac}' =	-	-	**71.6**
Test:	**1**	w_c =	**36.3**	%	σ_{rc}' =	-	-	**43.0**

PUSH1-4-C-1.Plot1.grf

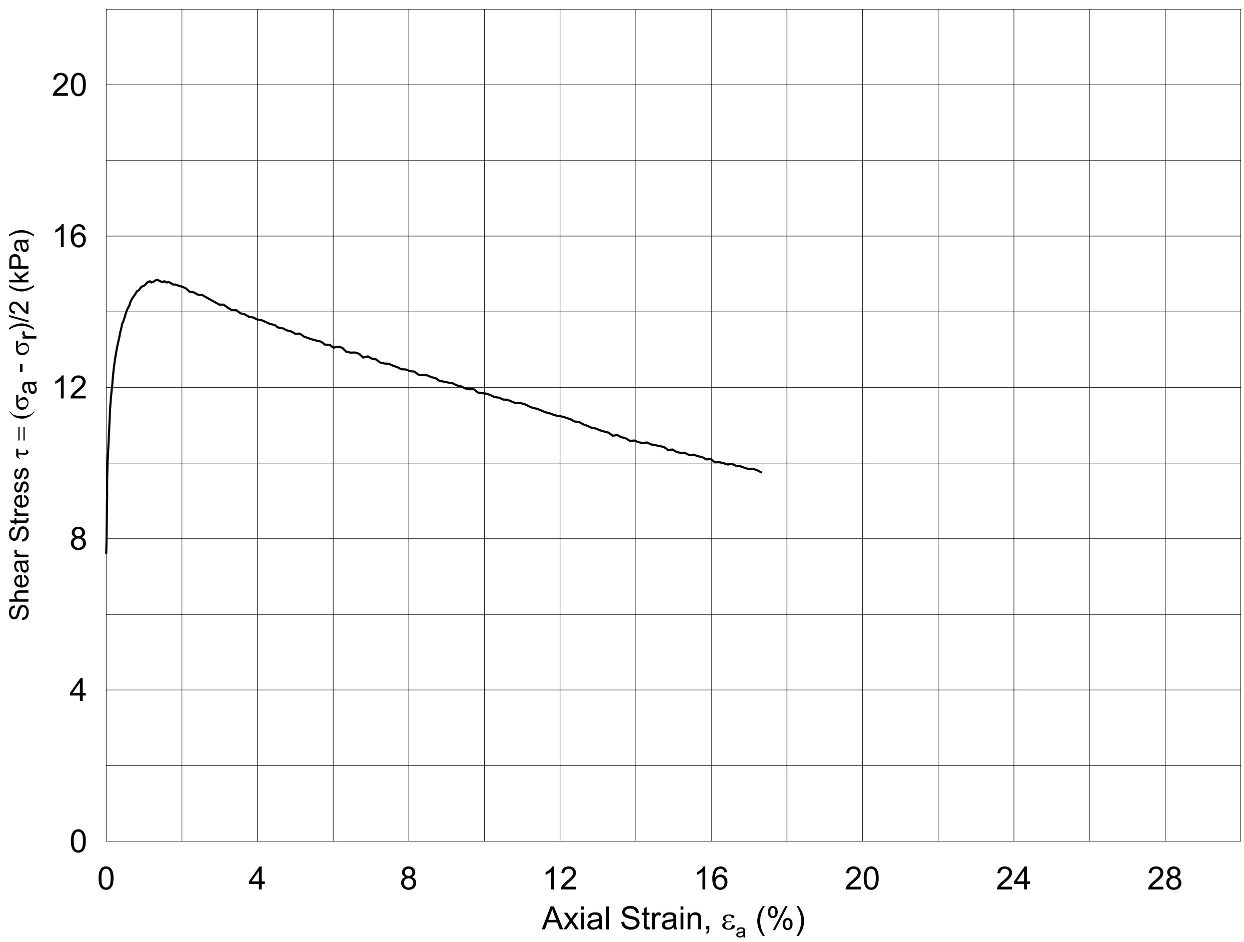


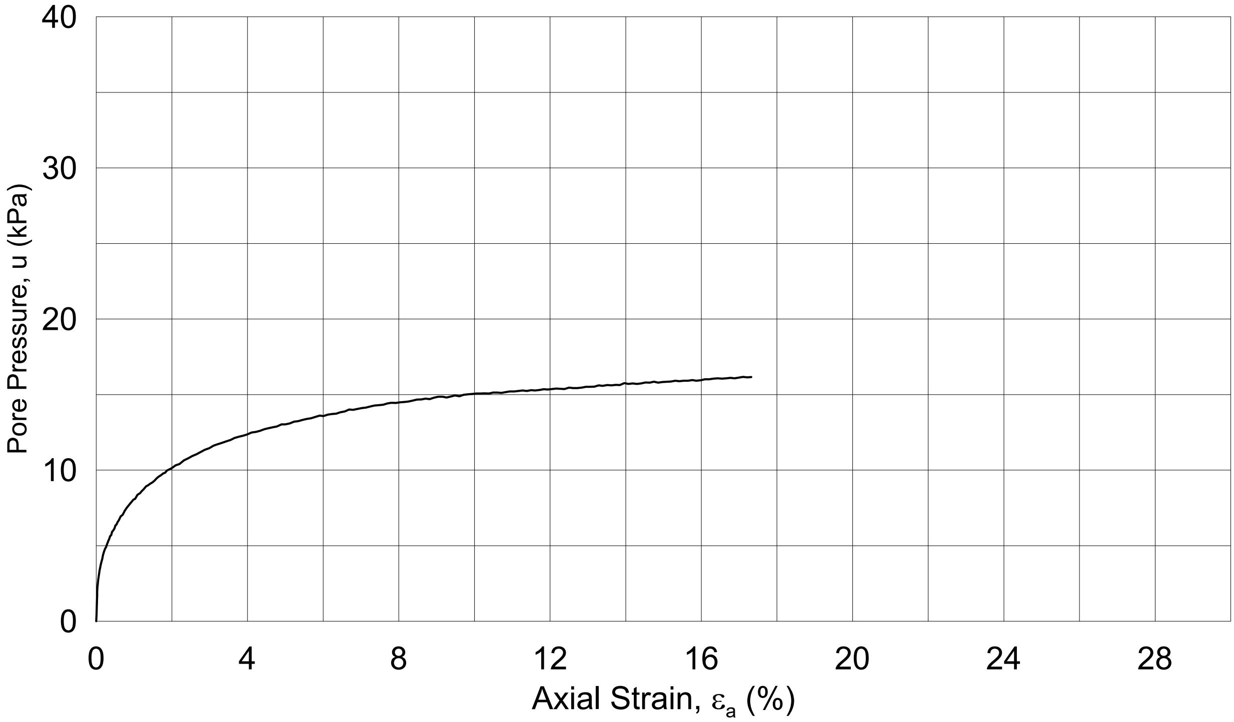
Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**								Document No. 20160154-10-R	
								Figure No. 5.3.15	
Boring:	**ONSB05**	Depth =	**11.07**	m	Consolidation stresses			Date 2018-12-10	Drawn by/checked ThV / GS
Tube:	**4**	po' =	**71.8**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**39.2**	%	σ_{ac}' =	-	-	**71.6**	
Test:	**1**	w_c =	**36.3**	%	σ_{rc}' =	-	-	**43.0**	

PUSH1-4-C-1.Plot2.grf

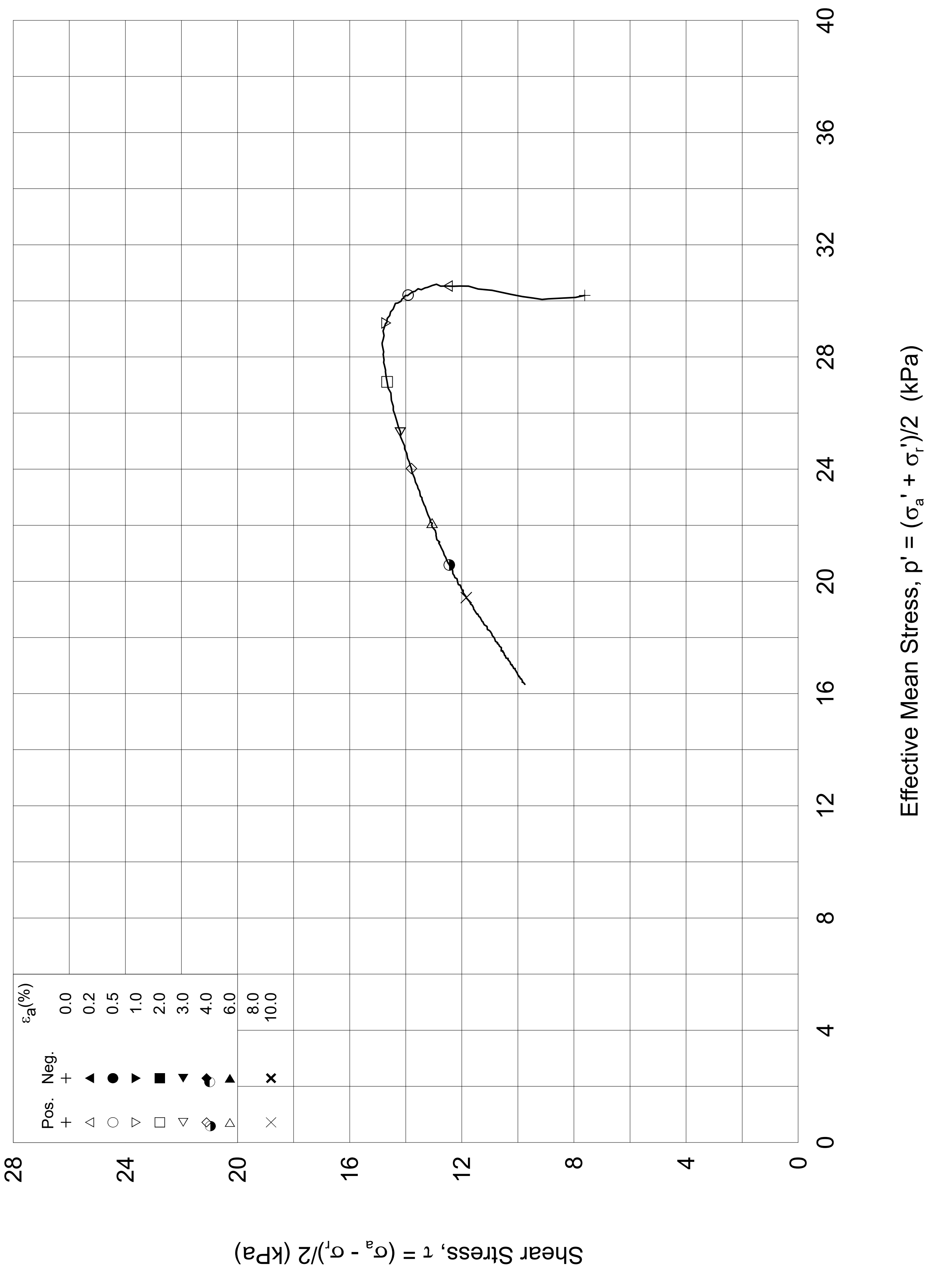




Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R
Triaxial test: **CAUC**										Figure No. 5.3.16
Boring:	**ONSB06**	Depth =	**6.40**	m	Consolidation stresses					Date 2018-12-10 / Drawn by/checked ThV / GS
Tube:	**1-2**	po' =	**37.7**	kPa	(kPa)	max.	min.	final		
Part:	**C**	w_i =	**66.4**	%	σ_{ac}' =	-	-	**37.6**		NGI
Test:	**1**	w_c =	**63.7**	%	σ_{rc}' =	-	-	**22.6**		

BH1-1-2-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.17

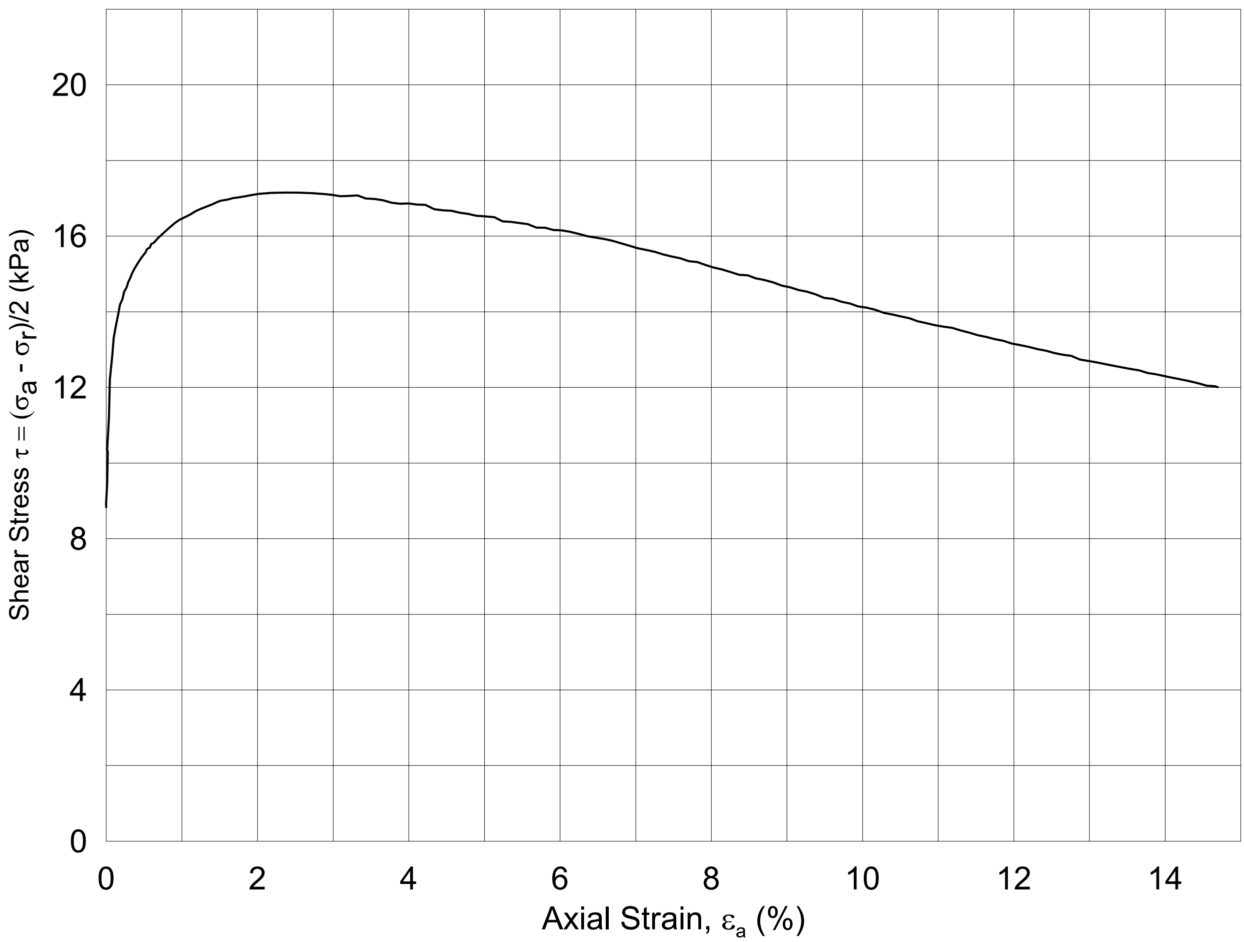
Triaxial test: **CAUC**

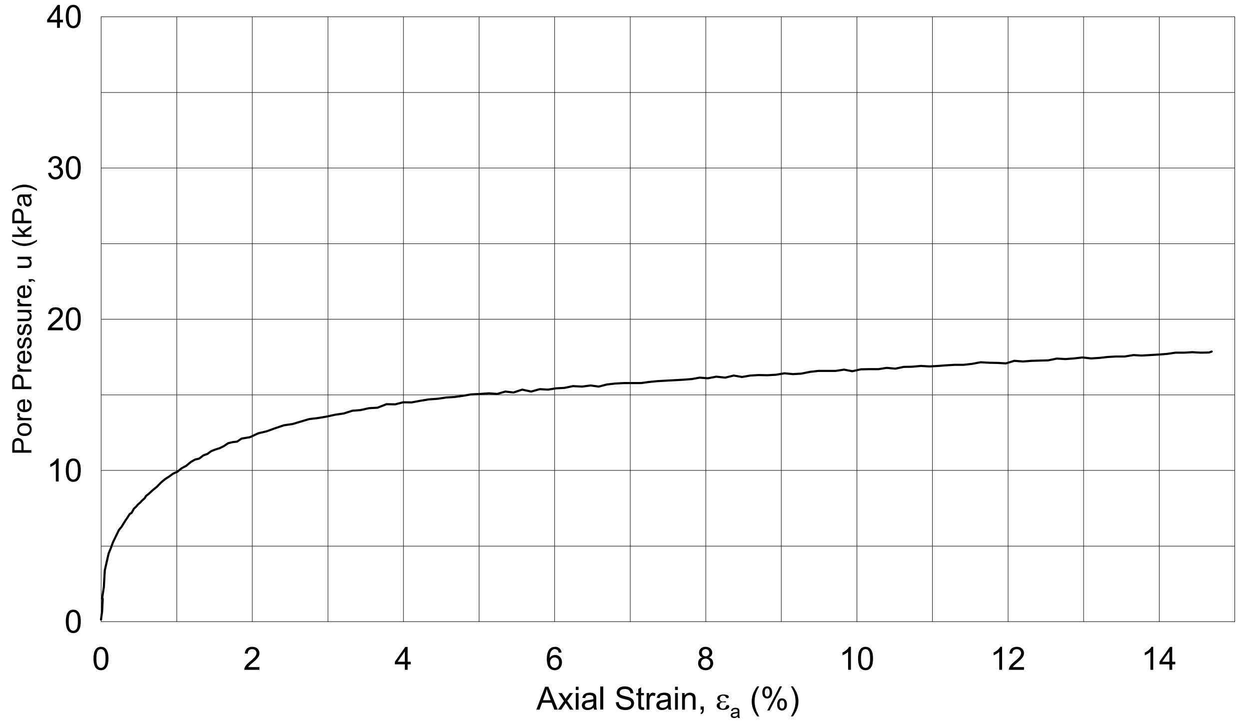
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB06**	Depth =	**6.40**	m		Consolidation stresses			
Tube:	**1-2**	po' =	**37.7**	kPa		(kPa)	max.	min.	final
Part:	**C**	w_i =	**66.4**	%		σ_{ac}' =	-	-	**37.6**
Test:	**1**	w_c =	**63.7**	%		σ_{rc}' =	-	-	**22.6**

BH1-1-2-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Triaxial test: **CAUC**

Figure No. 5.3.18

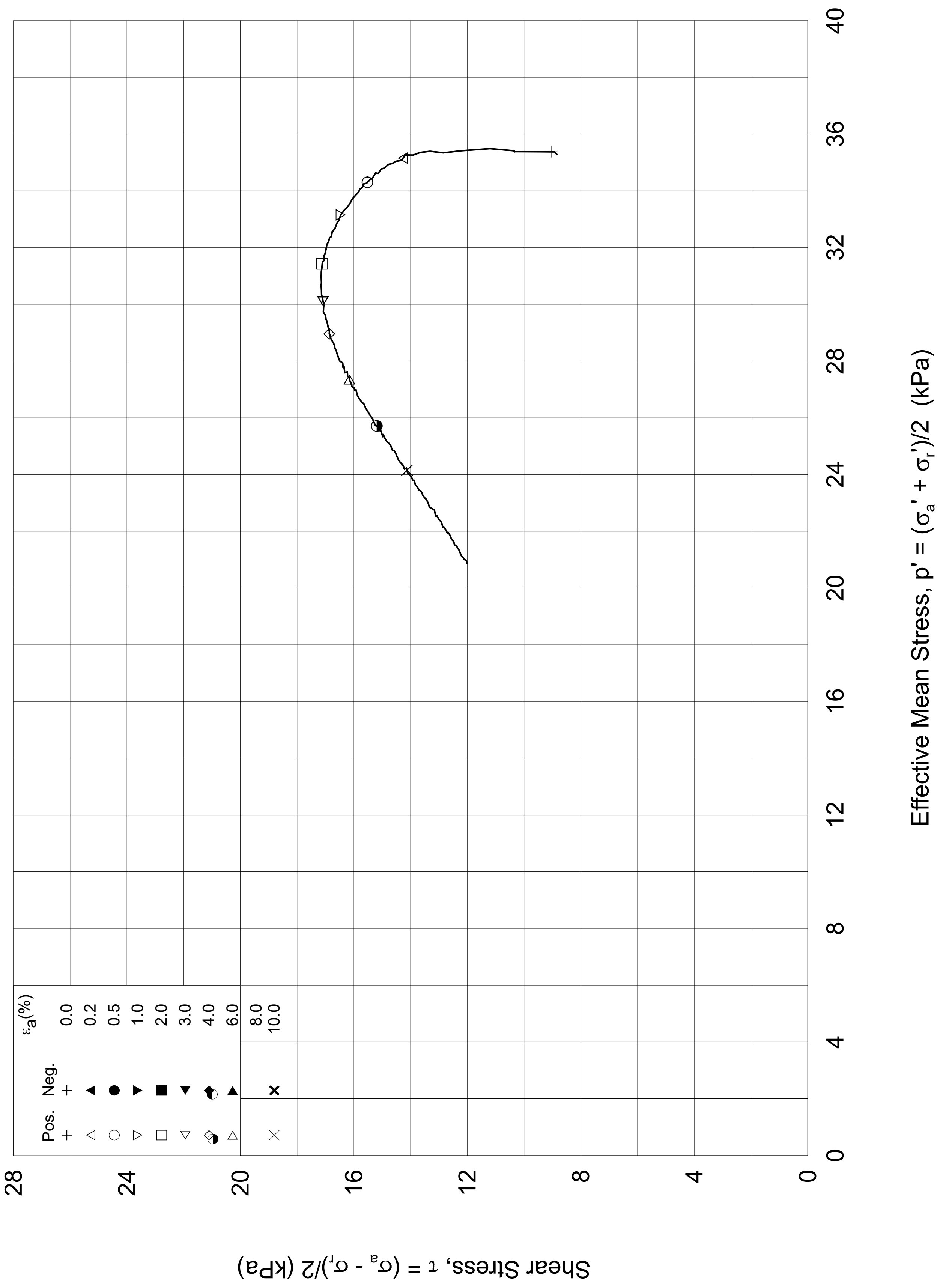
Boring:	**ONSB06**	Depth =	**7.30**	m	Consolidation stresses				
Tube:	**1-3**	po' =	**44.3**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**59.8**	%	σ_{ac}' =	-	-	**44.2**	
Test:	**1**	w_c =	**57.9**	%	σ_{rc}' =	-	-	**26.6**	

Date: 2018-12-10

Drawn by/checked: ThV / GS

NGI

BH1-1-3-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**

Boring:	**ONSB06**	Depth =	**7.30**	m	Consolidation stresses			
Tube:	**1-3**	po' =	**44.3**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**59.8**	%	σ_{ac}' =	-	-	**44.2**
Test:	**1**	w_c =	**57.9**	%	σ_{rc}' =	-	-	**26.6**

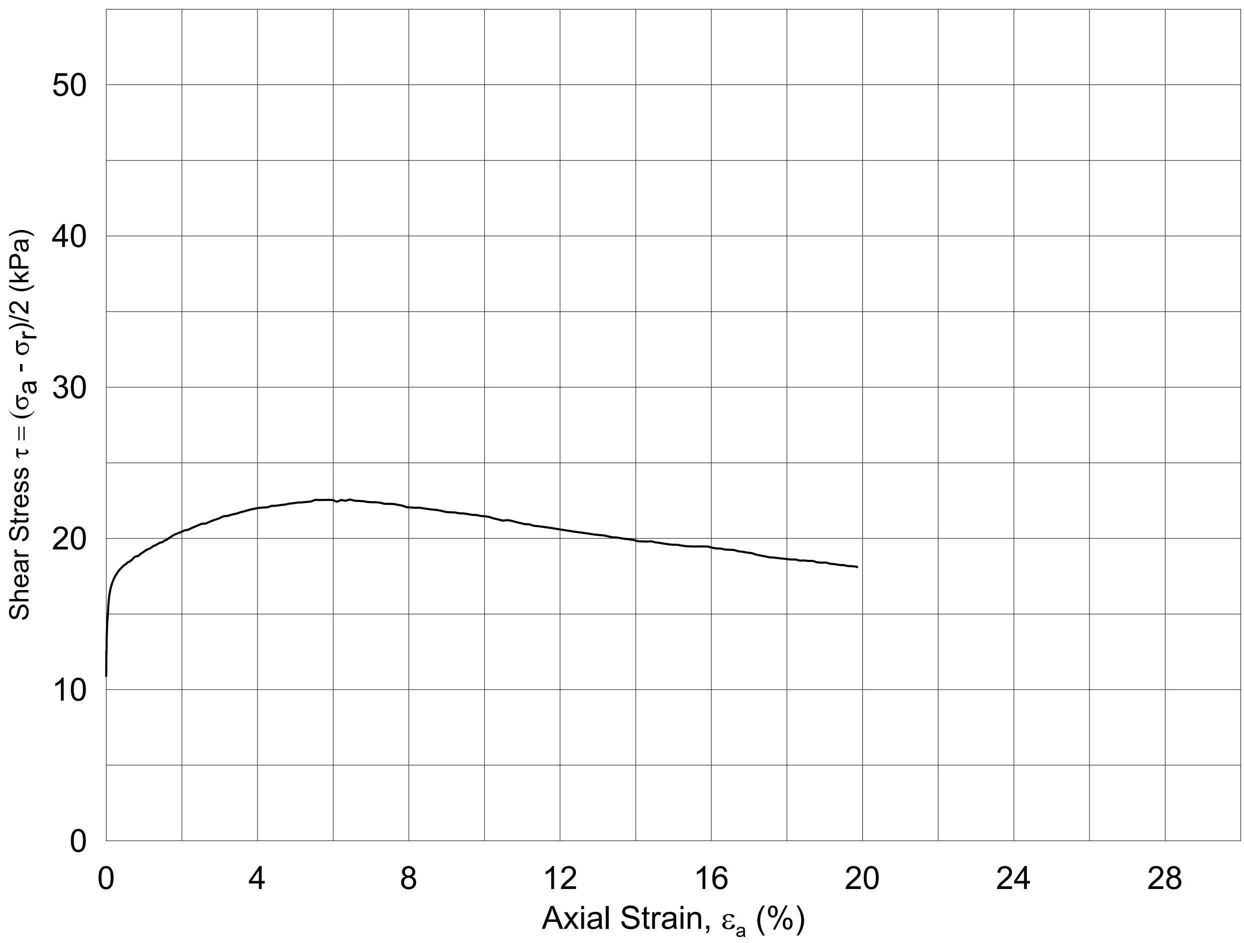
Document No. 20160154-10-R

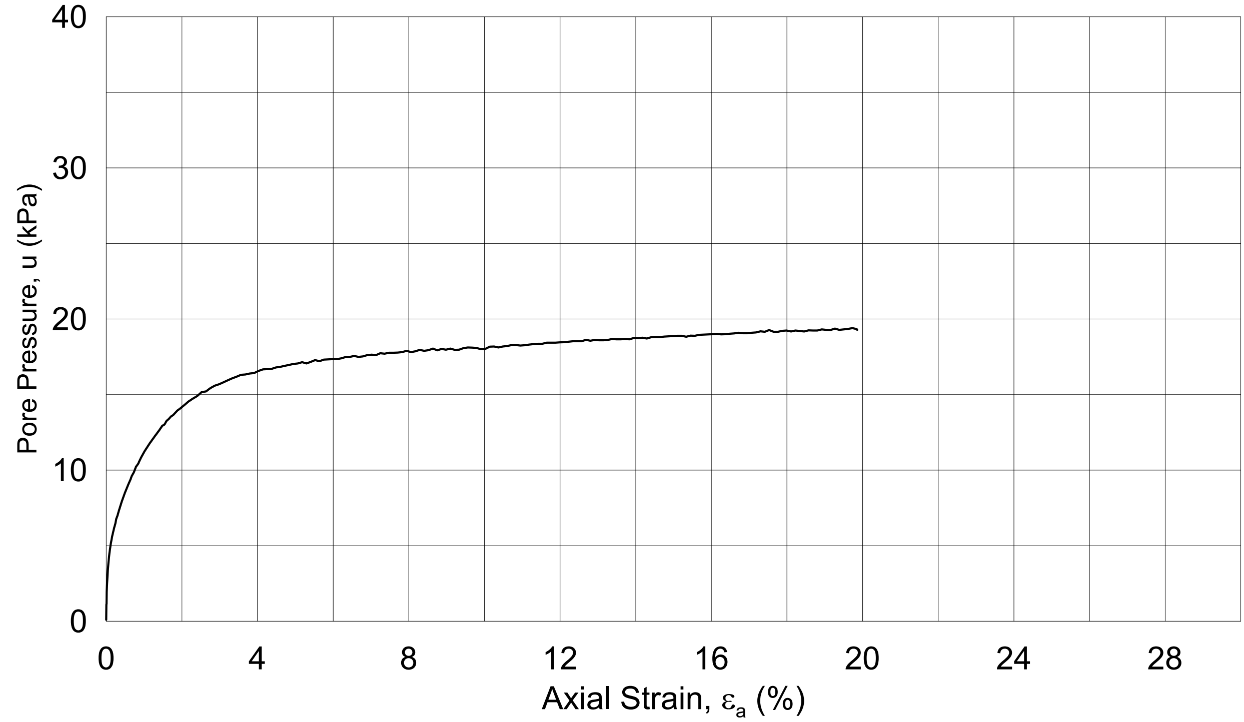
Figure No. 5.3.19

Date 2018-12-10

Drawn by/checked ThV / GS

BH1-1-3-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.20

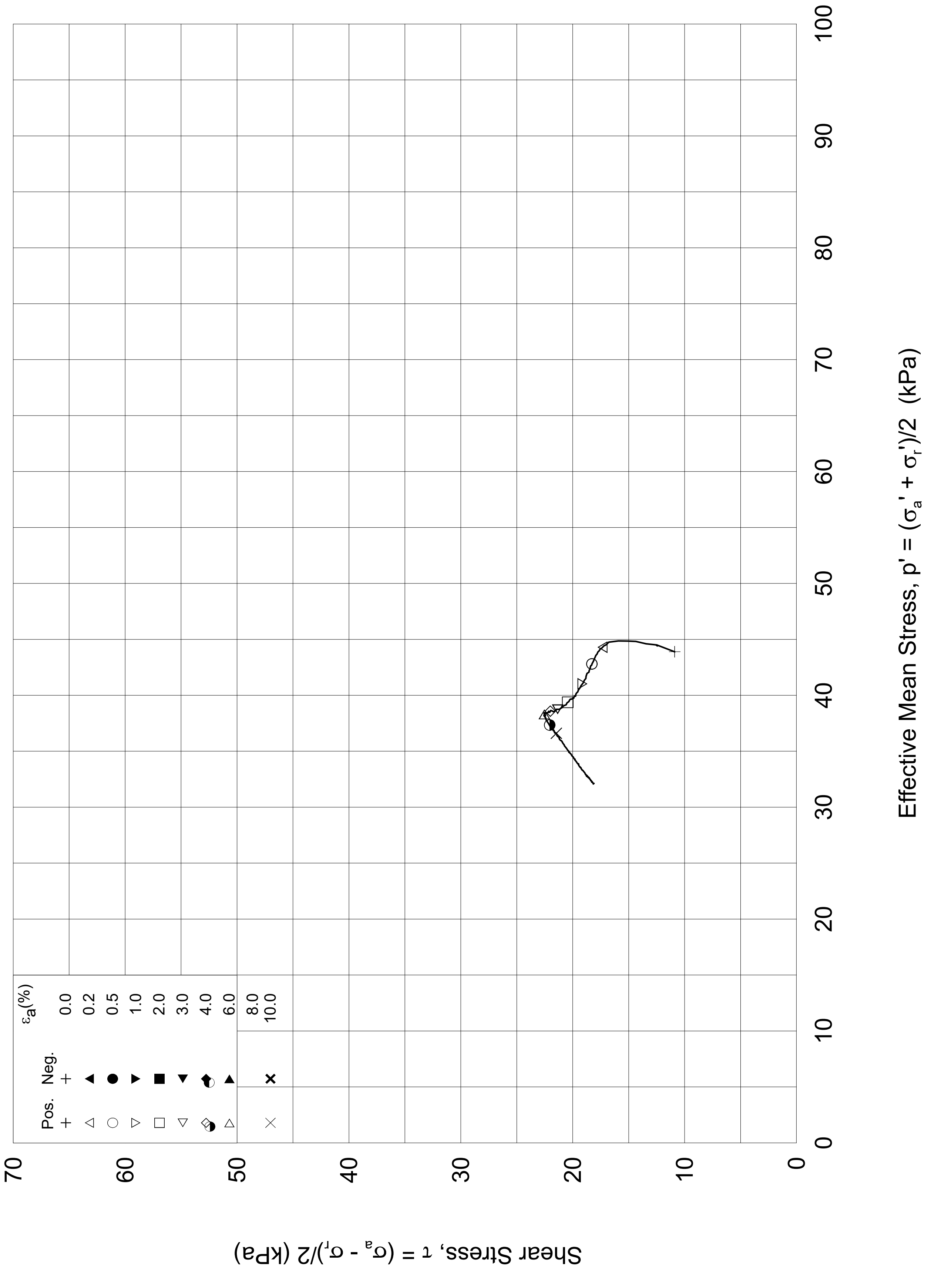
Date 2018-12-10

Drawn by/checked ThV / GS

Triaxial test: **CAUC**

Boring:	**ONSB06**	Depth =	**8.78**	m	Consolidation stresses			
Tube:	**2-1**	po' =	**55.1**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**45.2**	%	σ_{ac}' =	-	-	**55.1**
Test:	**1**	w_c =	**40.6**	%	σ_{rc}' =	-	-	**33.1**

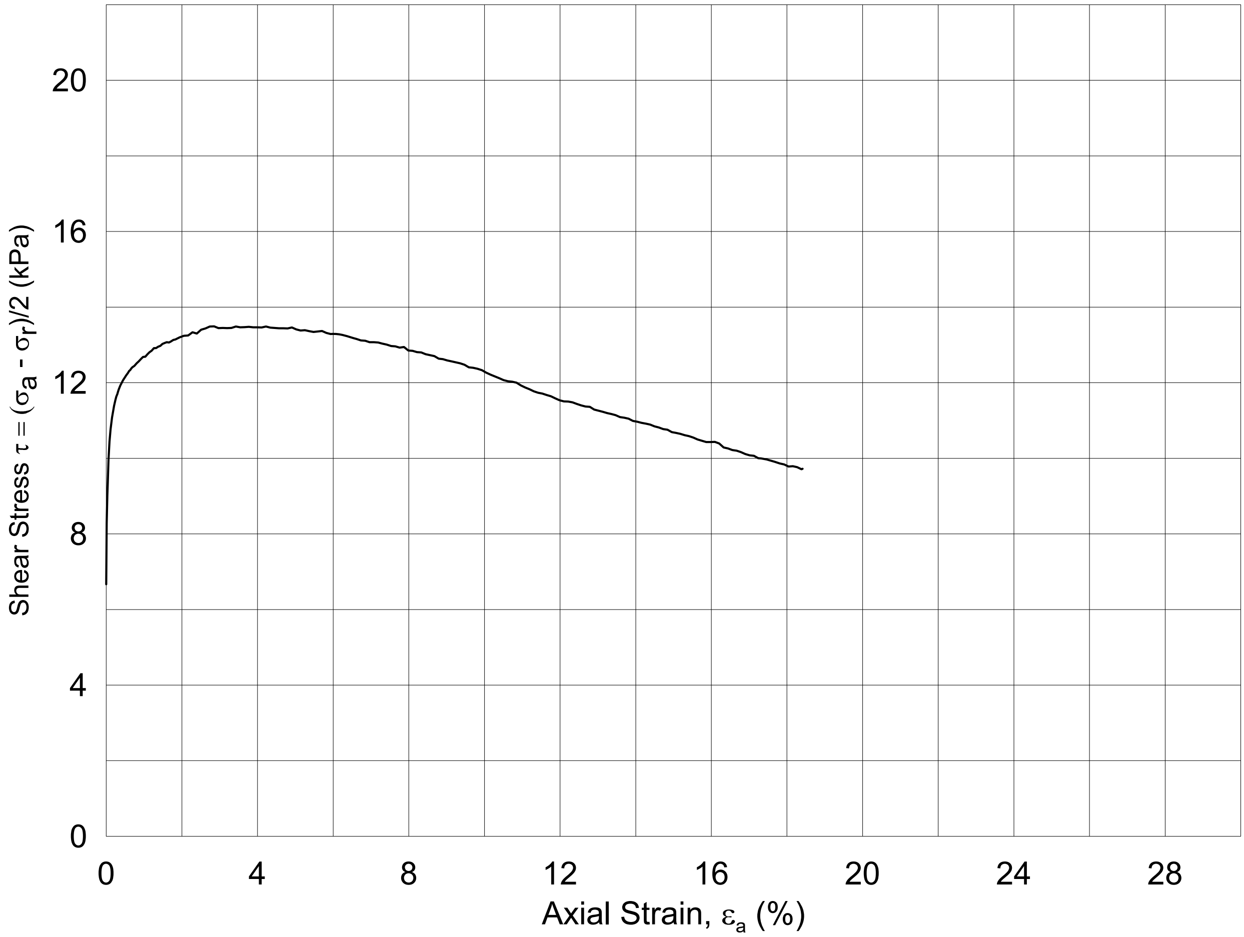
BH1-2-1-C-1.Plot1.grf

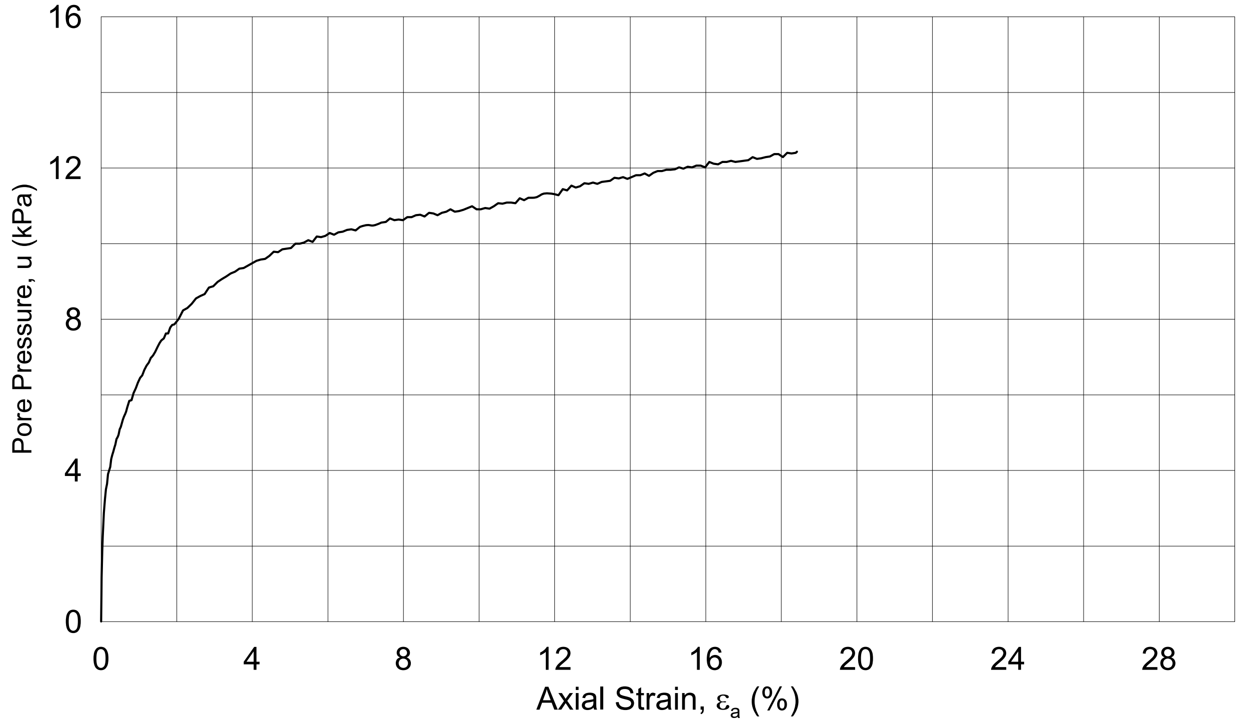


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: **CAUC**								Figure No. 5.3.21
Boring: **ONSB06**	Depth =	**8.78**	m	Consolidation stresses				Date 2018-12-10 / Drawn by/checked ThV / GS
Tube: **2-1**	po' =	**55.1**	kPa	(kPa)	max.	min.	final	
Part: **C**	w_i =	**45.2**	%	σ_{ac}' =	-	-	**55.1**	
Test: **1**	w_c =	**40.6**	%	σ_{rc}' =	-	-	**33.1**	

BH1-2-1-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.22

Triaxial test: **CAUC**

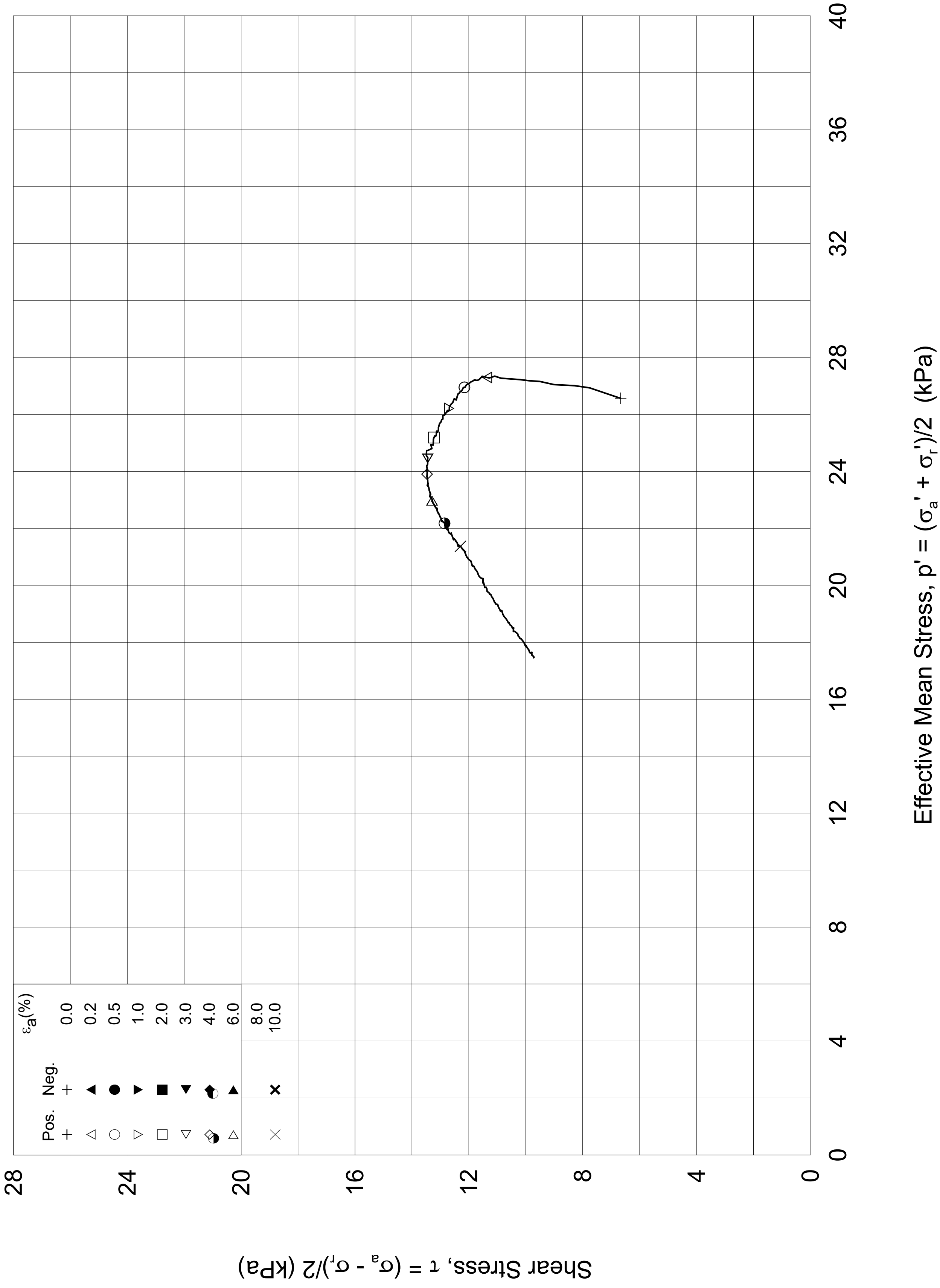
Boring: **ONSB07**	Depth =	**5.78**	m	Consolidation stresses				
Tube: **1-1**	po' =	**33.2**	kPa	(kPa)	max.	min.	final	
Part: **C**	w_i =	**68.5**	%	σ_{ac}' =	-	-	**33.3**	
Test: **1**	w_c =	**63.6**	%	σ_{rc}' =	-	-	**19.9**	

Date 2018-12-10

Drawn by/checked ThV / GS

NGI

BH2-1-1-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

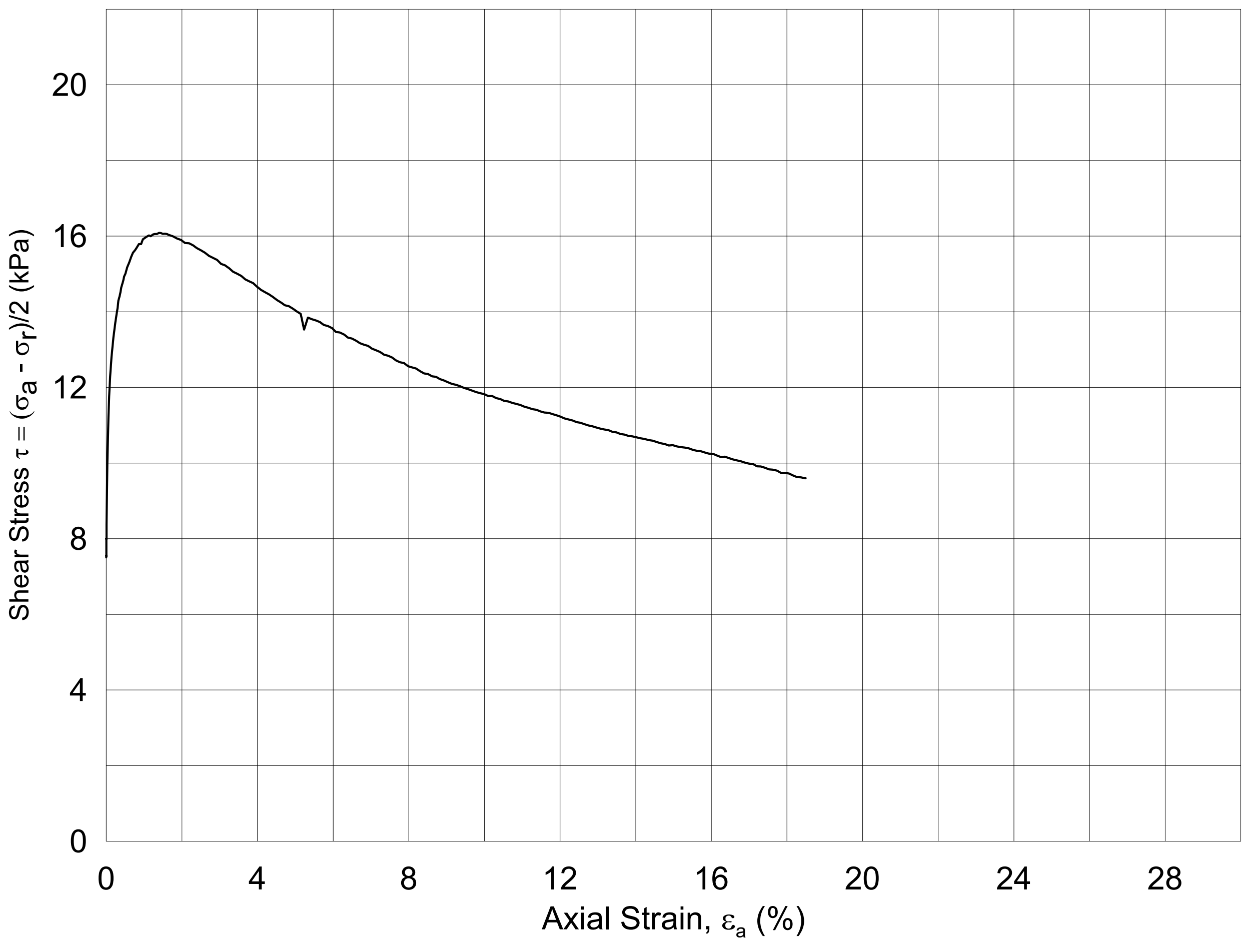
Norwegian GeoTest Sites - Onsøy

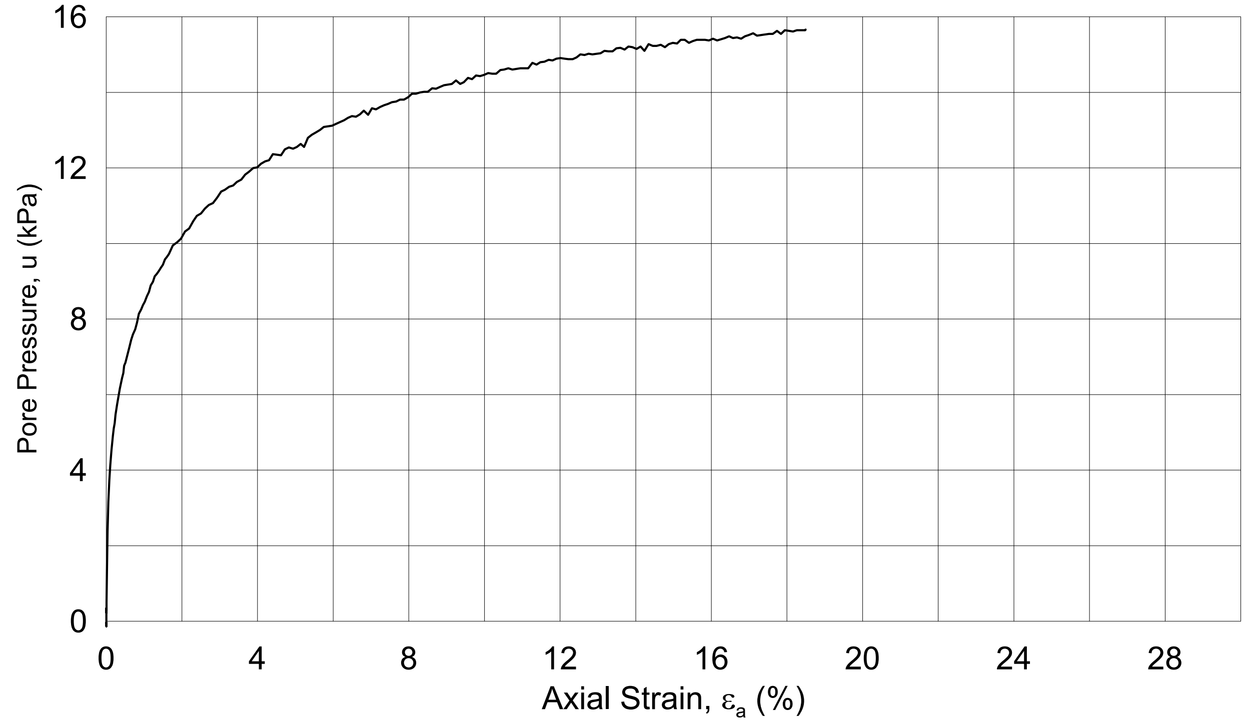
Document No.	20160154-10-R							
Figure No.	5.3.23							
Date	2018-12-10	Drawn by/checked	ThV / GS					

Triaxial test: **CAUC**

Boring:	**ONSB07**	Depth =	**5.78**	m	Consolidation stresses			
Tube:	**1-1**	po' =	**33.2**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**68.5**	%	σ_{ac}' =	-	-	**33.3**
Test:	**1**	w_c =	**63.6**	%	σ_{rc}' =	-	-	**19.9**

BH2-1-1-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.24

Triaxial test: **CAUC**

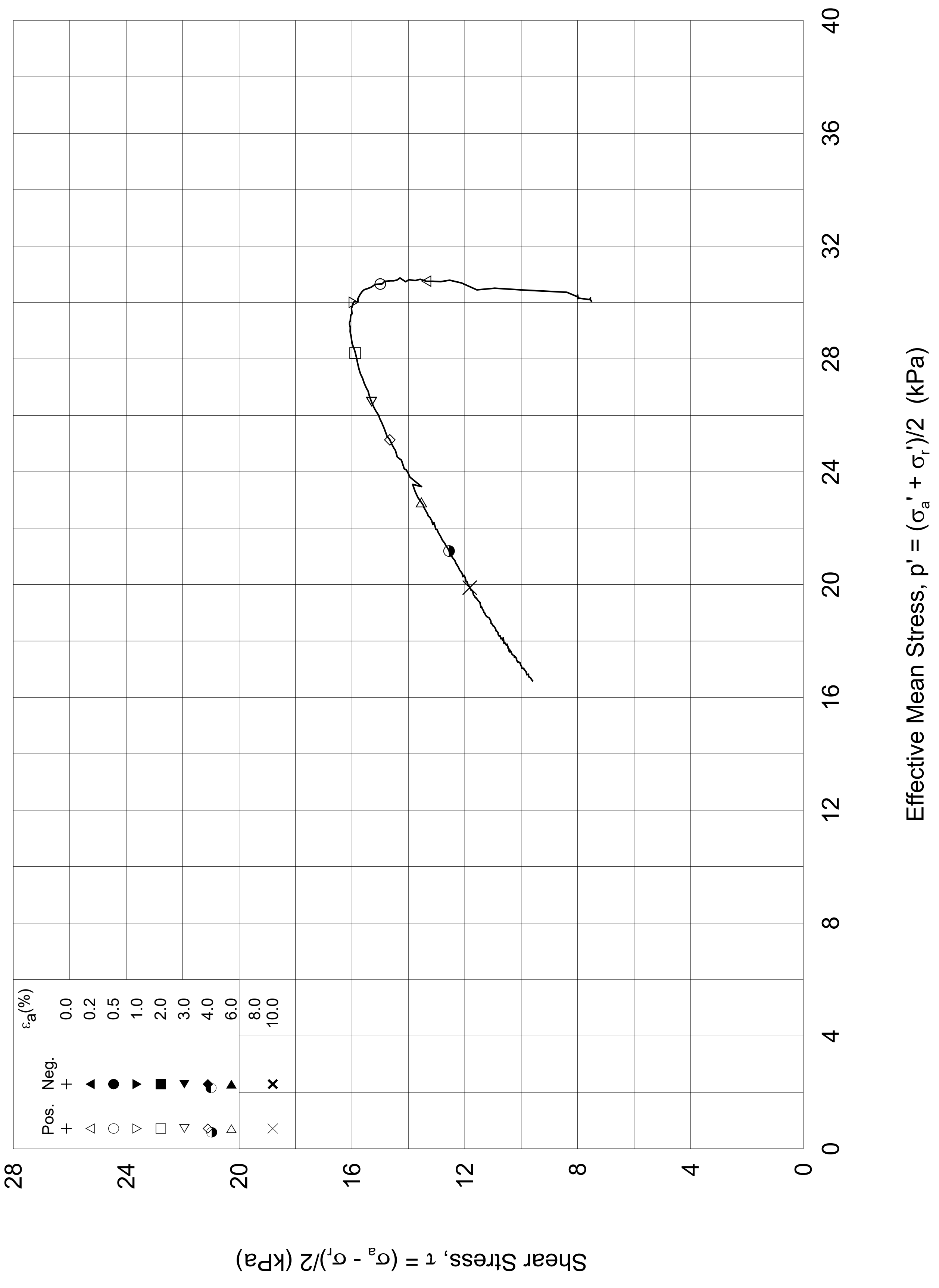
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB07**	Depth =	**6.37**	m	Consolidation stresses			
Tube:	**1-2**	po' =	**37.5**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**67.0**	%	σ_{ac}' =	-	-	**37.4**
Test:	**1**	w_c =	**65.0**	%	σ_{rc}' =	-	-	**22.5**

NGI

BH2-1-2-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.25

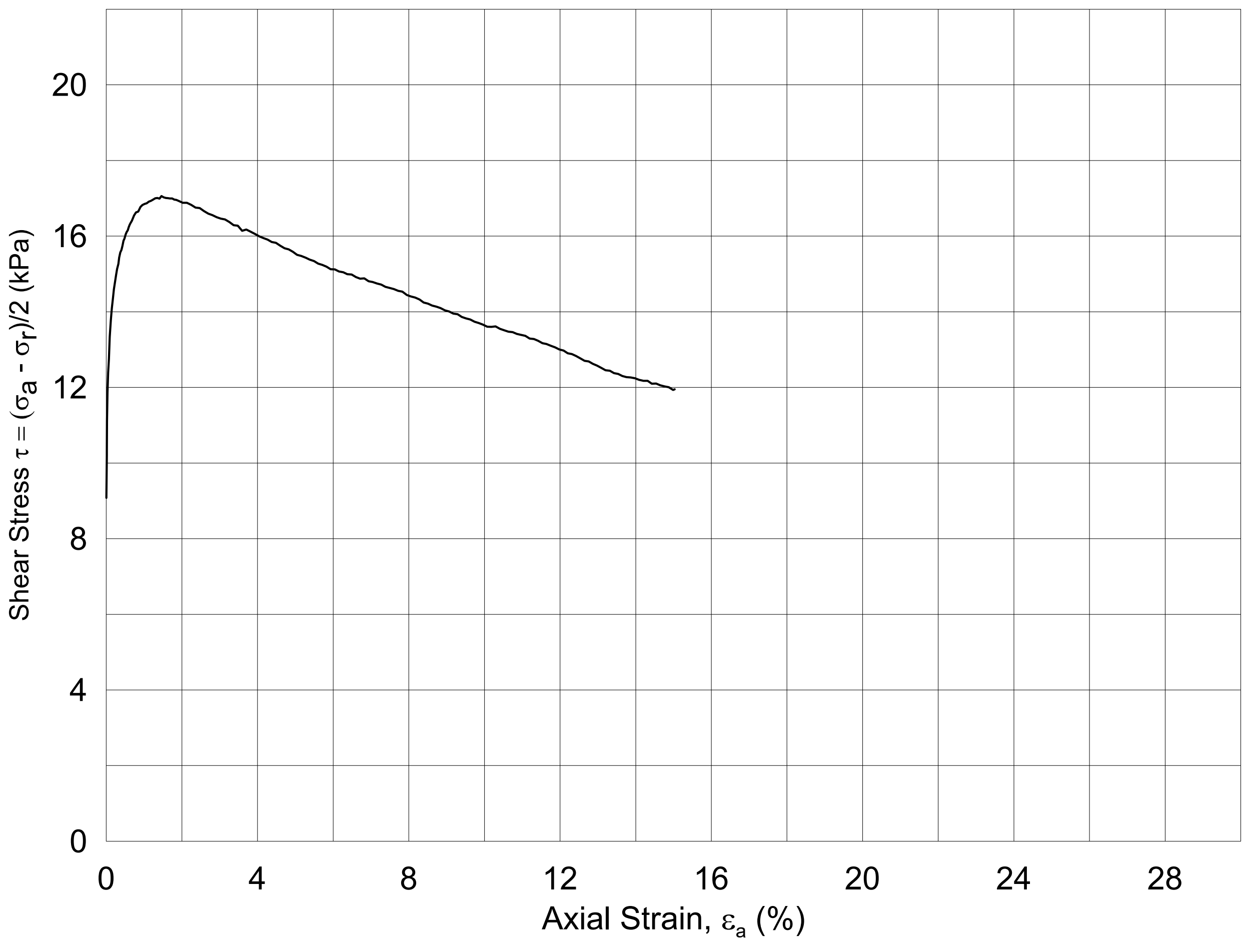
Triaxial test: **CAUC**

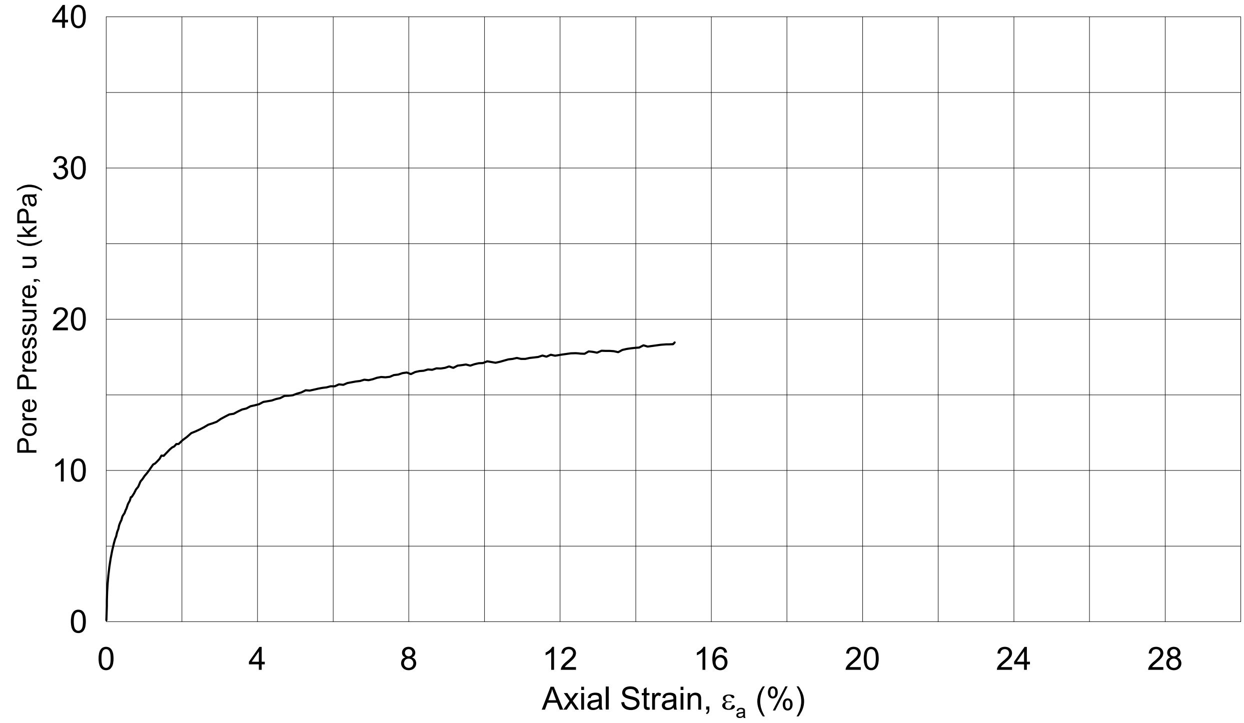
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB07**	Depth =	**6.37**	m	Consolidation stresses			
Tube:	**1-2**	po' =	**37.5**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**67.0**	%	σ_{ac}' =	-	-	**37.4**
Test:	**1**	w_c =	**65.0**	%	σ_{rc}' =	-	-	**22.5**

BH2-1-2-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.26

Triaxial test: **CAUC**

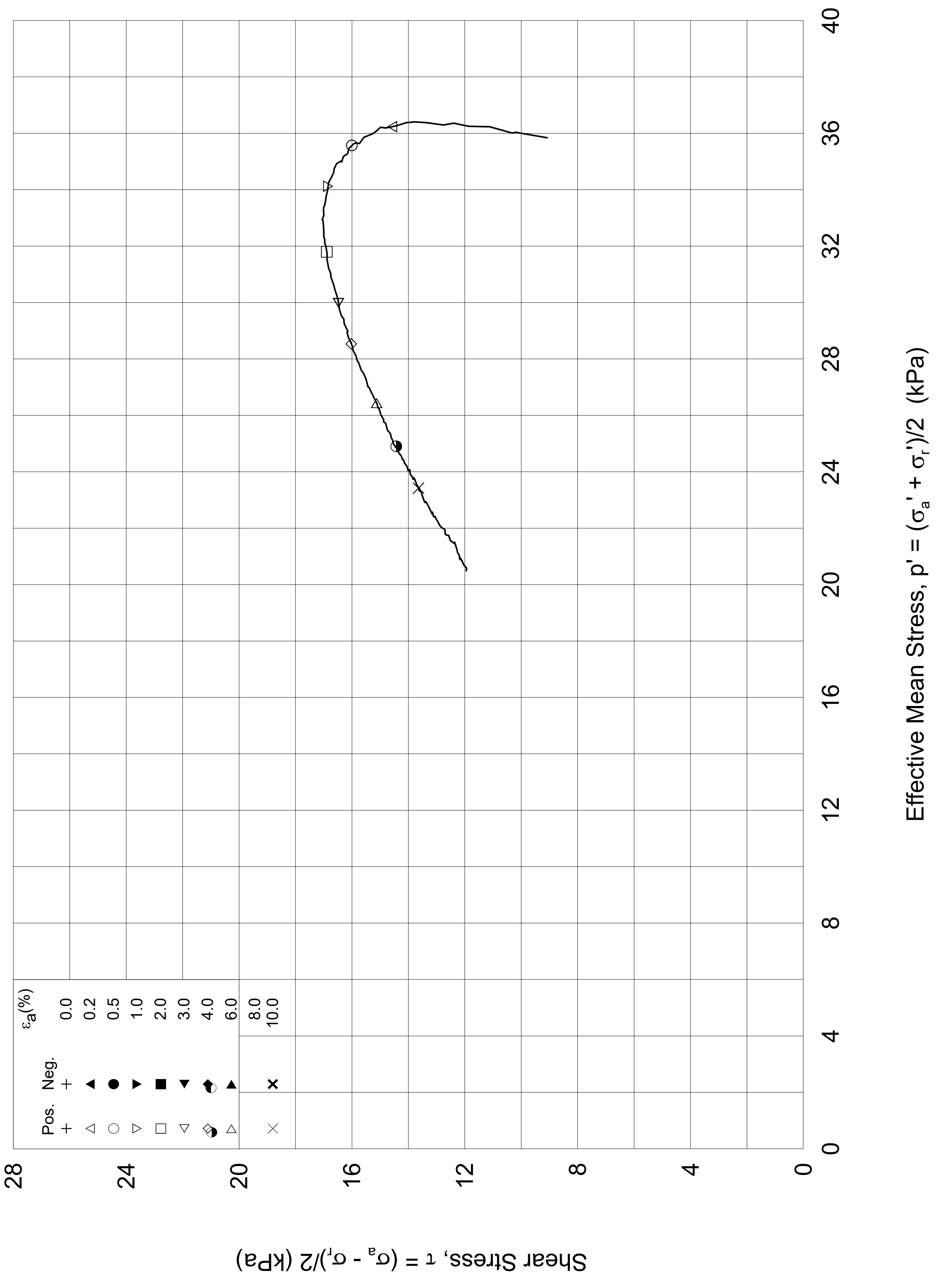
Boring:	**ONSB07**	Depth =	**7.37**	m	Consolidation stresses				
Tube:	**1-3**	po' =	**44.8**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**59.8**	%	σ_{ac}' =	-	-	**44.7**	
Test:	**1**	w_c =	**58.1**	%	σ_{rc}' =	-	-	**26.9**	

Date 2018-12-10

Drawn by/checked ThV / GS

NGI

BH2-1-3-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.27

Triaxial test: **CAUC**

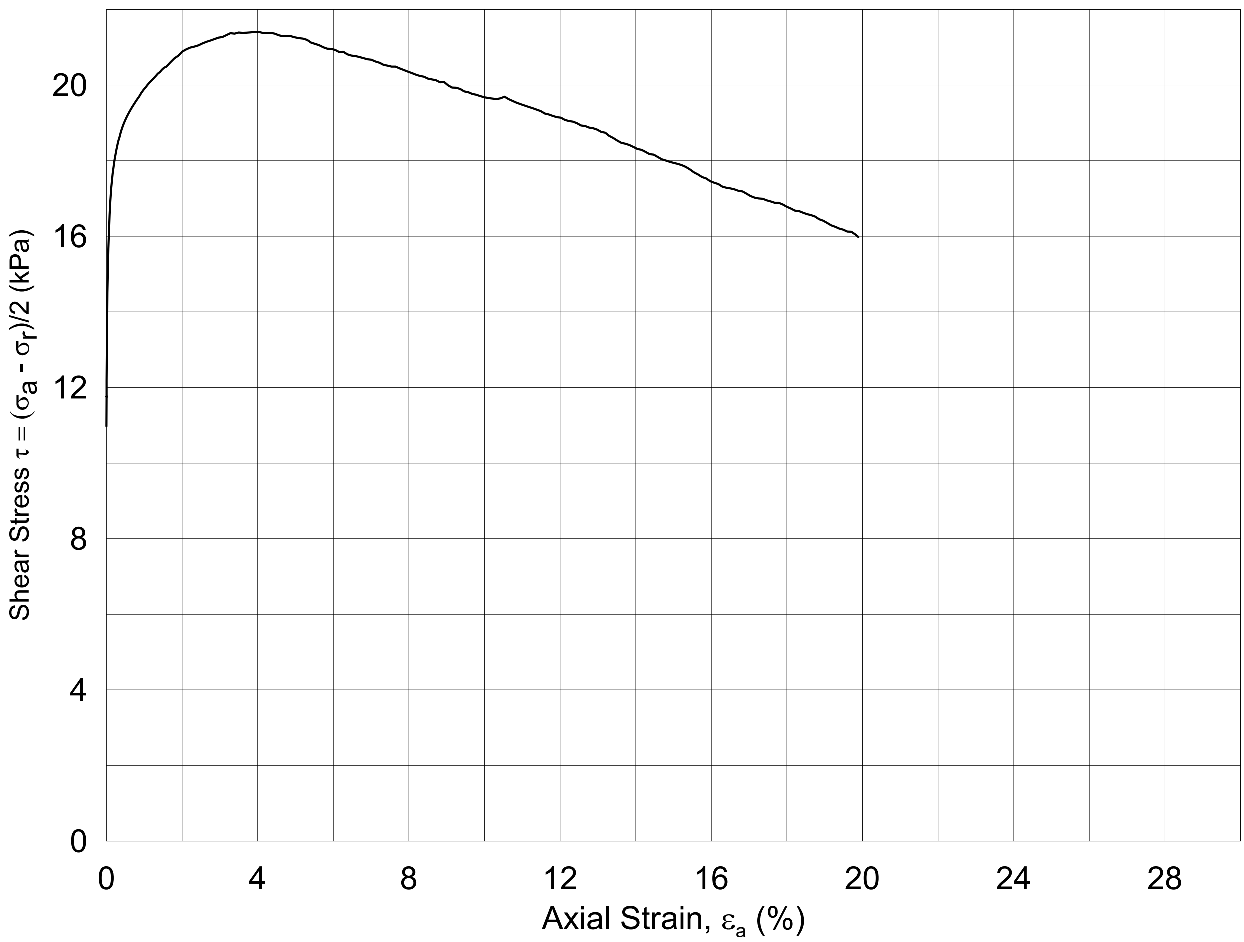
Boring:	**ONSB07**	Depth =	**7.37**	m	Consolidation stresses				
Tube:	**1-3**	po' =	**44.8**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**59.8**	%	σ_{ac}' =	-	-	**44.7**	
Test:	**1**	w_c =	**58.1**	%	σ_{rc}' =	-	-	**26.9**	

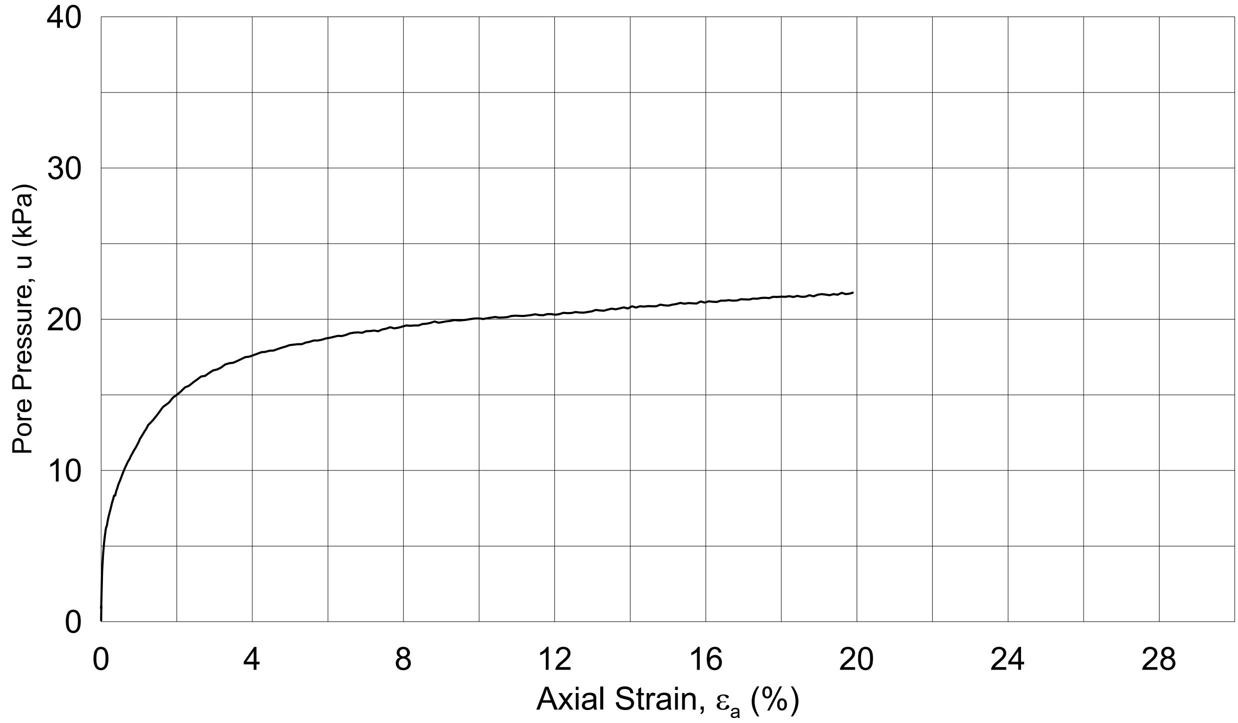
Date: 2018-12-10

Drawn by/checked: ThV / GS

NGI

BH2-1-3-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.28

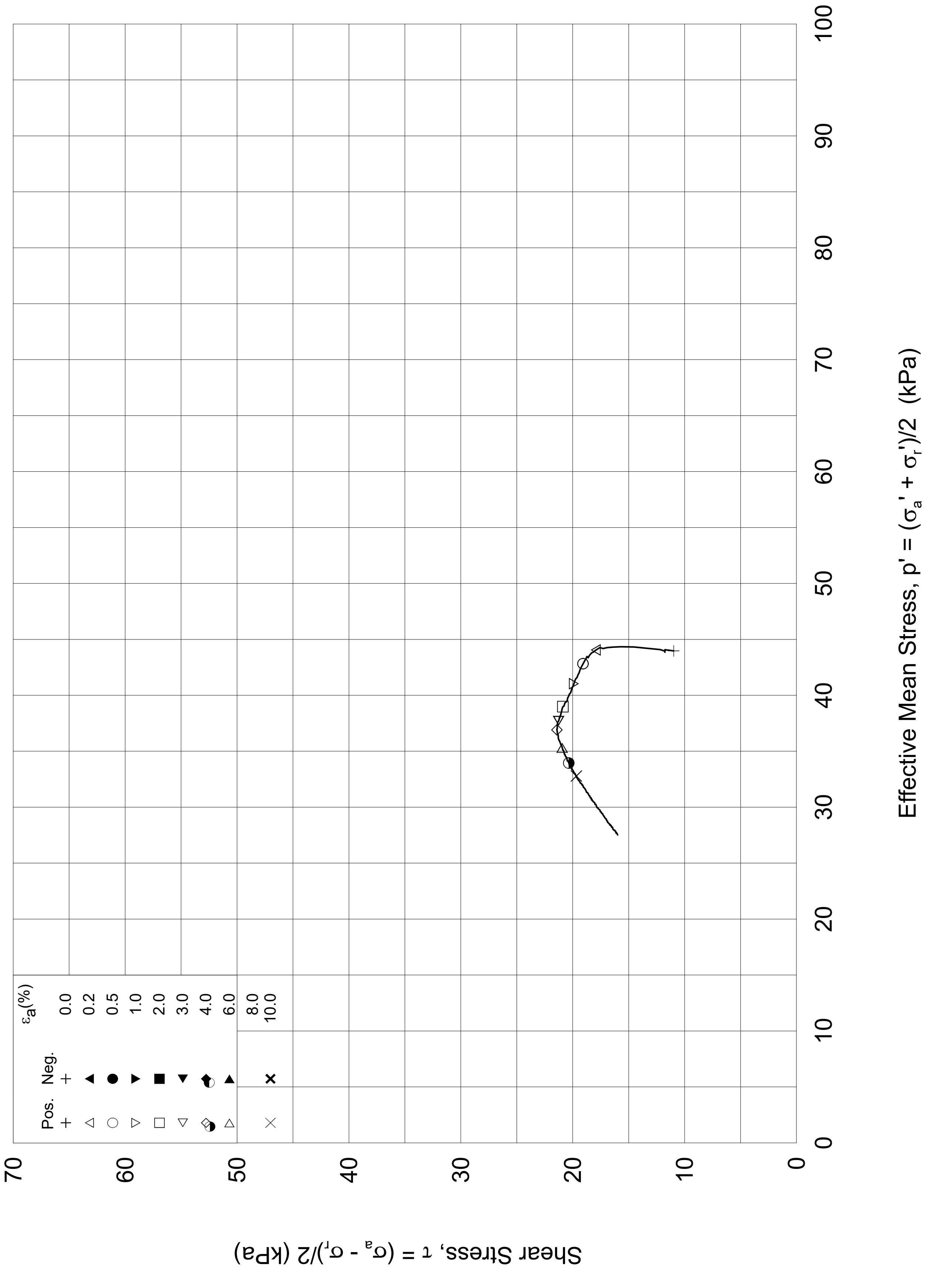
Triaxial test: **CAUC**

Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB07**	Depth =		**8.78**	m	Consolidation stresses			
Tube:	**2-1**	po'	=	**55.1**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i	=	**51.0**	%	σ_{ac}' =	-	-	**55.0**
Test:	**1**	w_c	=	**46.4**	%	σ_{rc}' =	-	-	**33.1**

BH2-2-1-C-1.Plot1.grf

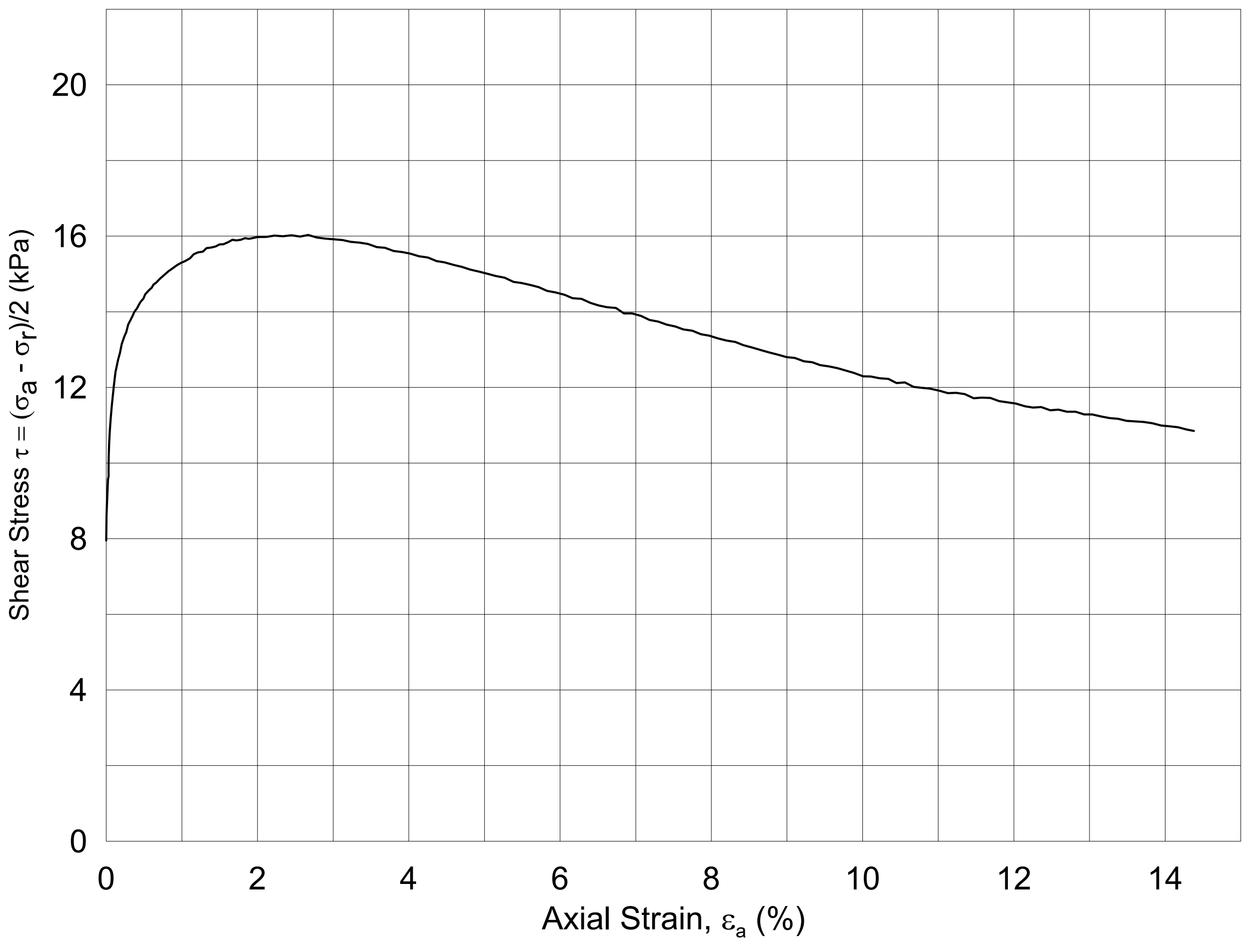


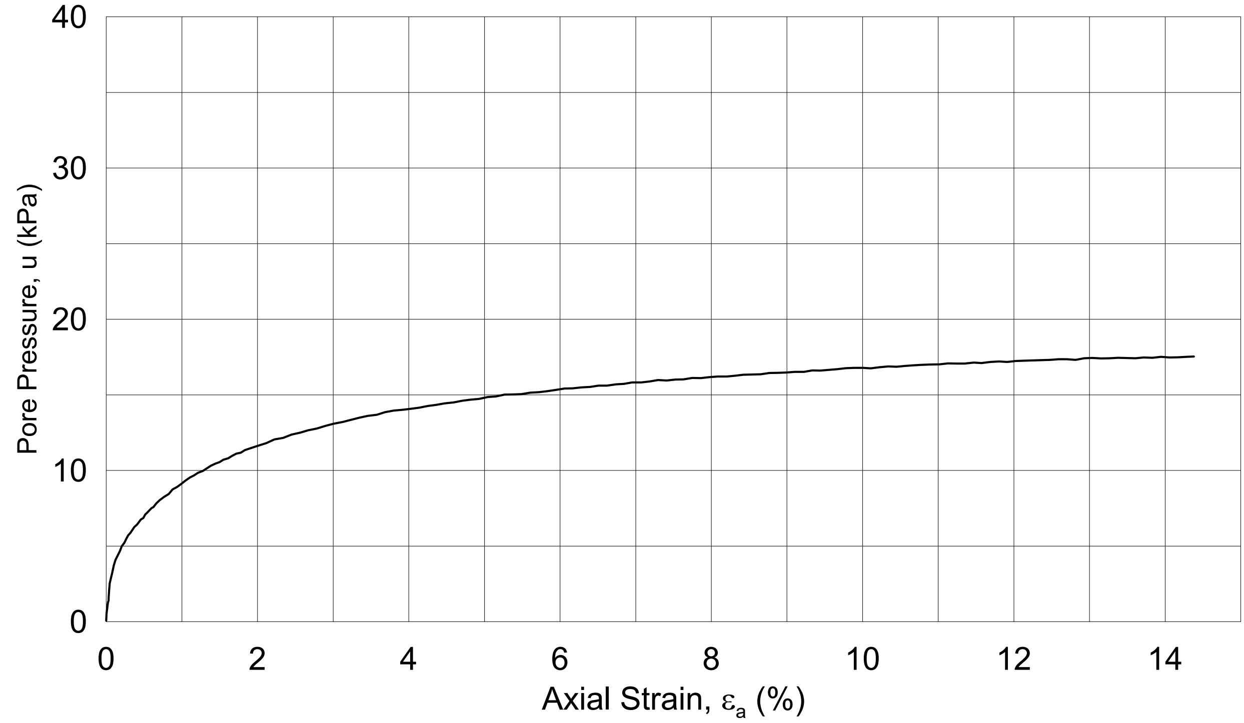
Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**										Document No. 20160154-10-R
										Figure No. 5.3.29
Boring:	**ONSB07**	Depth =	**8.78**	m	Consolidation stresses					Date 2018-12-10
Tube:	**2-1**	po' =	**55.1**	kPa	(kPa)	max.	min.	final		Drawn by/checked ThV / GS
Part:	**C**	w_i =	**51.0**	%	σ_{ac}' =	-	-	**55.0**		NGI
Test:	**1**	w_c =	**46.4**	%	σ_{rc}' =	-	-	**33.1**		

BH2-2-1-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.30

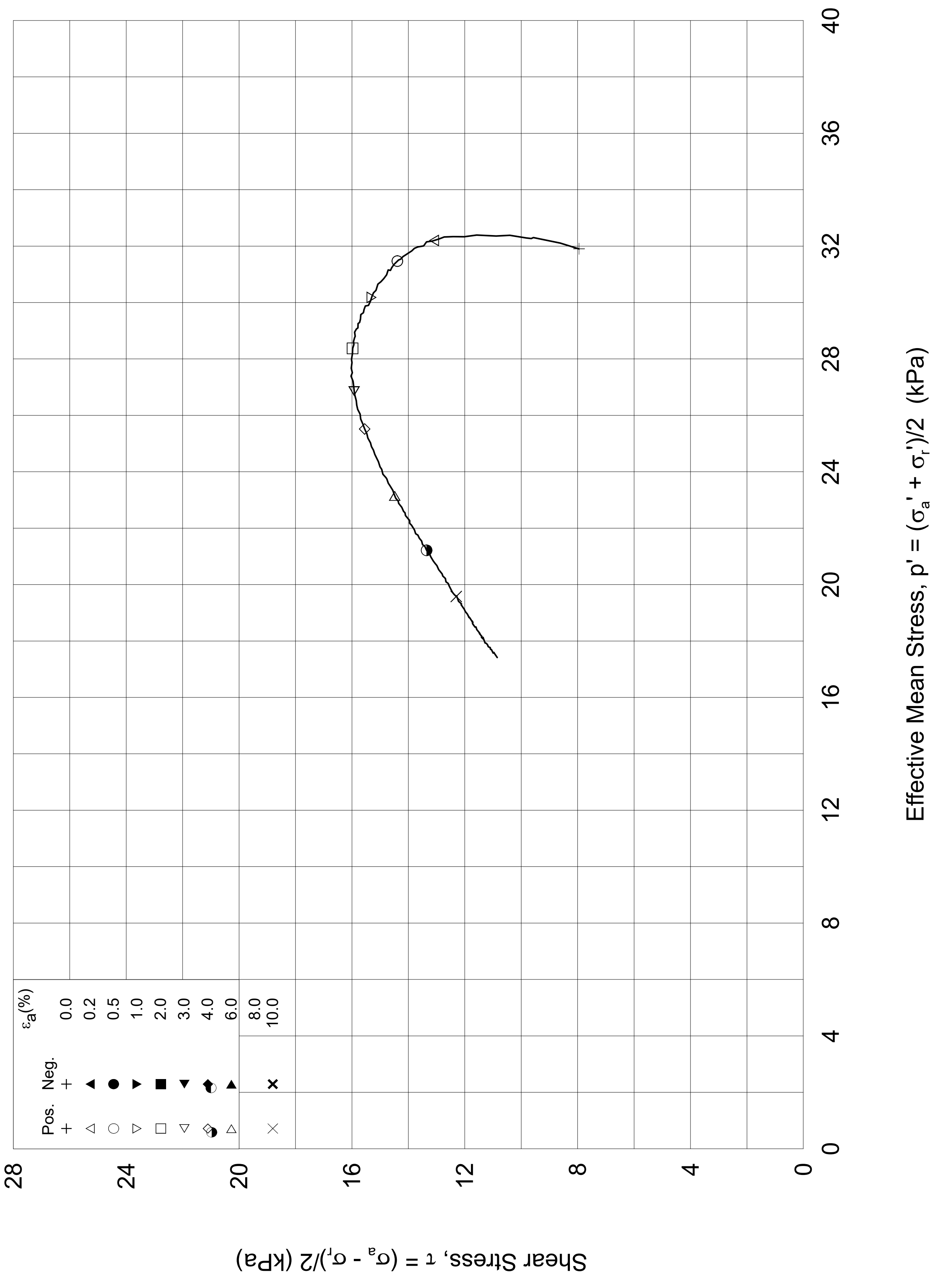
Triaxial test: **CAUC**

Boring:	**ONSB08**	Depth =	**6.73**	m	Consolidation stresses				
Tube:	**1-2**	po' =	**40.1**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**68.2**	%	σ_{ac}' =	-	-	**40.0**	
Test:	**1**	w_c =	**62.5**	%	σ_{rc}' =	-	-	**24.0**	

Date: 2018-12-10

Drawn by/checked: ThV / GS

BH3-1-2-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**				
Boring: **ONSB08**	Depth = **6.73** m	Consolidation stresses		
Tube: **1-2**	po' = **40.1** kPa	(kPa) max.	min.	final
Part: **C**	w_i = **68.2** %	σ_{ac}' = -	-	**40.0**
Test: **1**	w_c = **62.5** %	σ_{rc}' = -	-	**24.0**

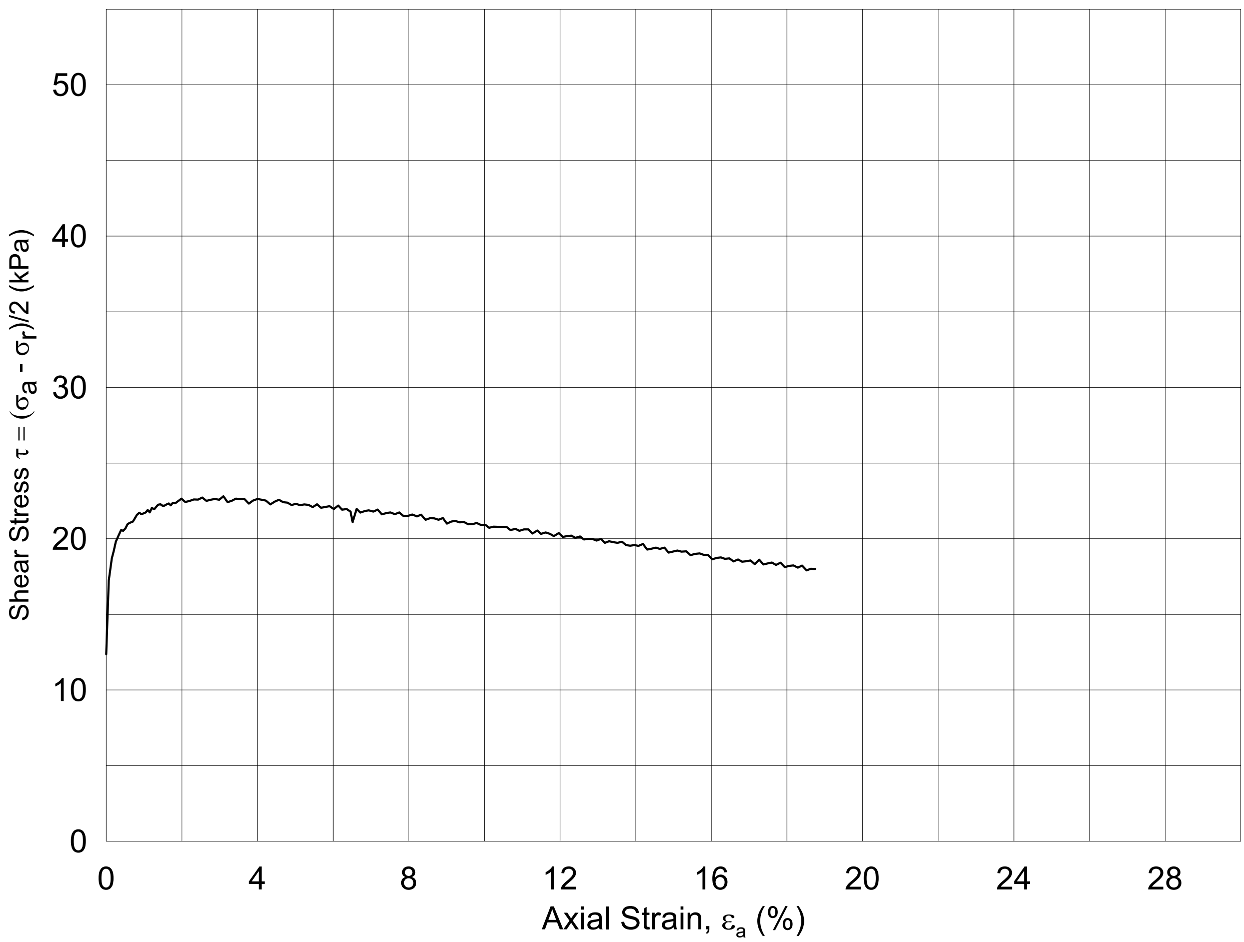
Document No. 20160154-10-R

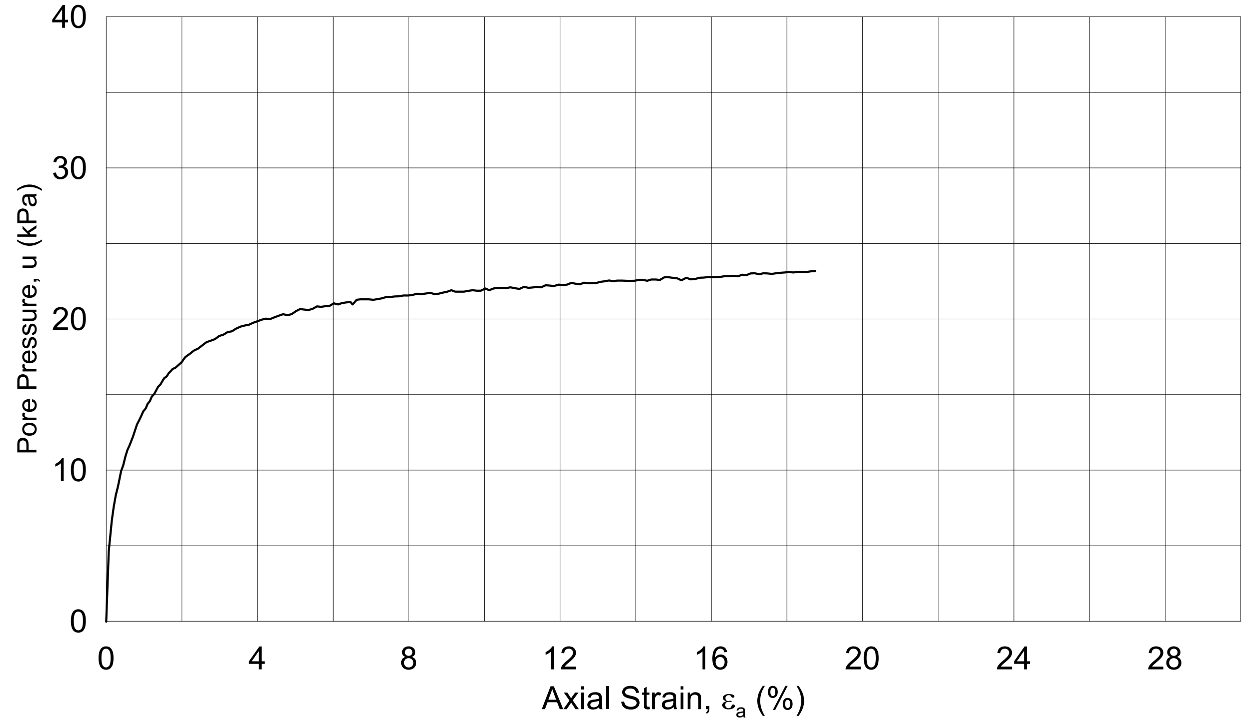
Figure No. 5.3.31

Date 2018-12-10

Drawn by/checked ThV / GS

BH3-1-2-C-1.Plot2.grf

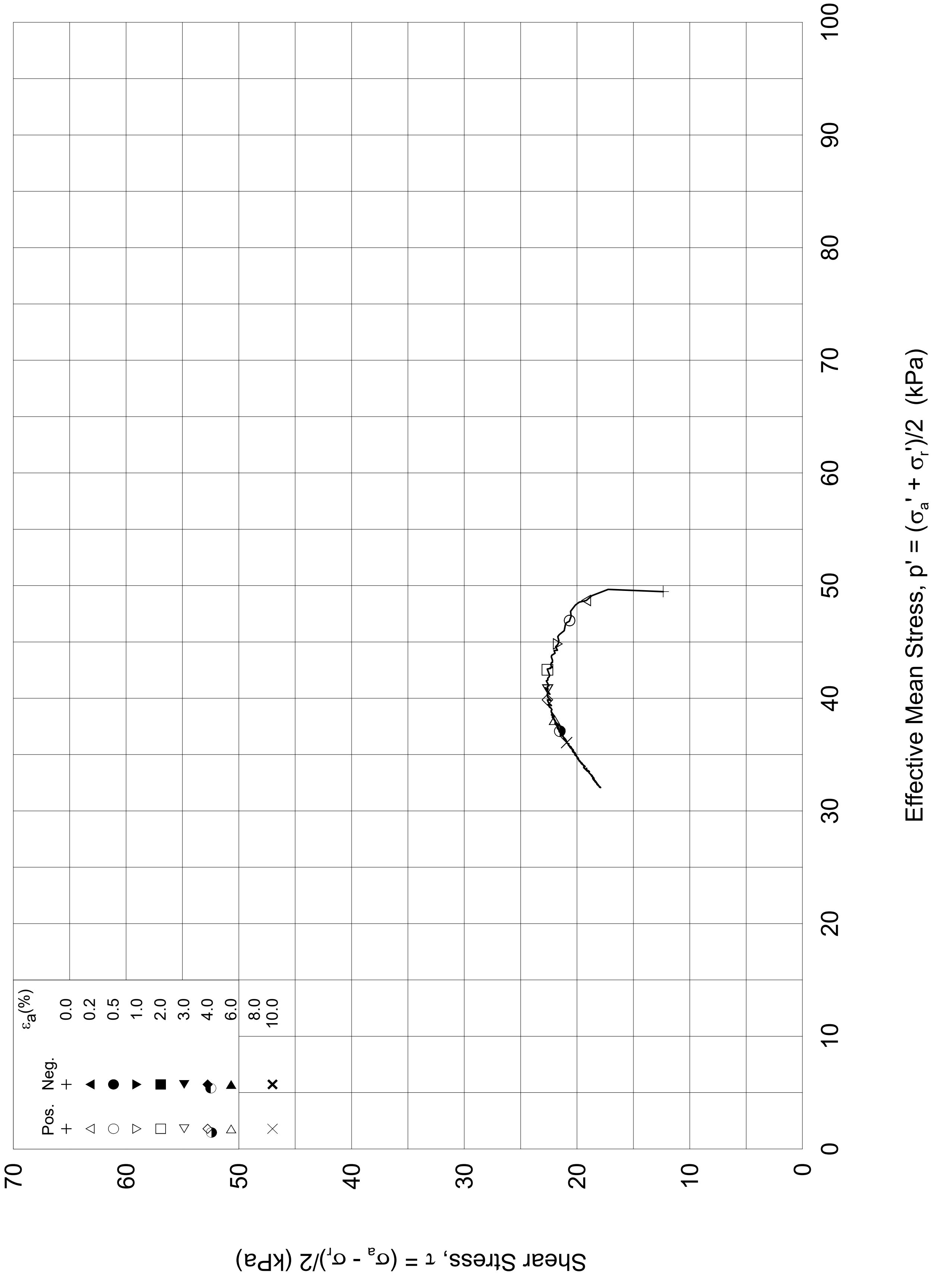




Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy				Document No. 20160154-10-R
Triaxial test: **CAUC**				Figure No. 5.3.32
Boring: **ONSB08**	Depth = **9.70** m	Consolidation stresses		Date 2018-12-10 / Drawn by/checked ThV / GS
Tube: **2-2**	po' = **61.8** kPa	(kPa) max. min. final		
Part: **C**	w_i = **41.7** %	σ_{ac}' = - - **61.7**		NGI
Test: **1**	w_c = **38.7** %	σ_{rc}' = - - **37.0**		

BH3-2-2-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

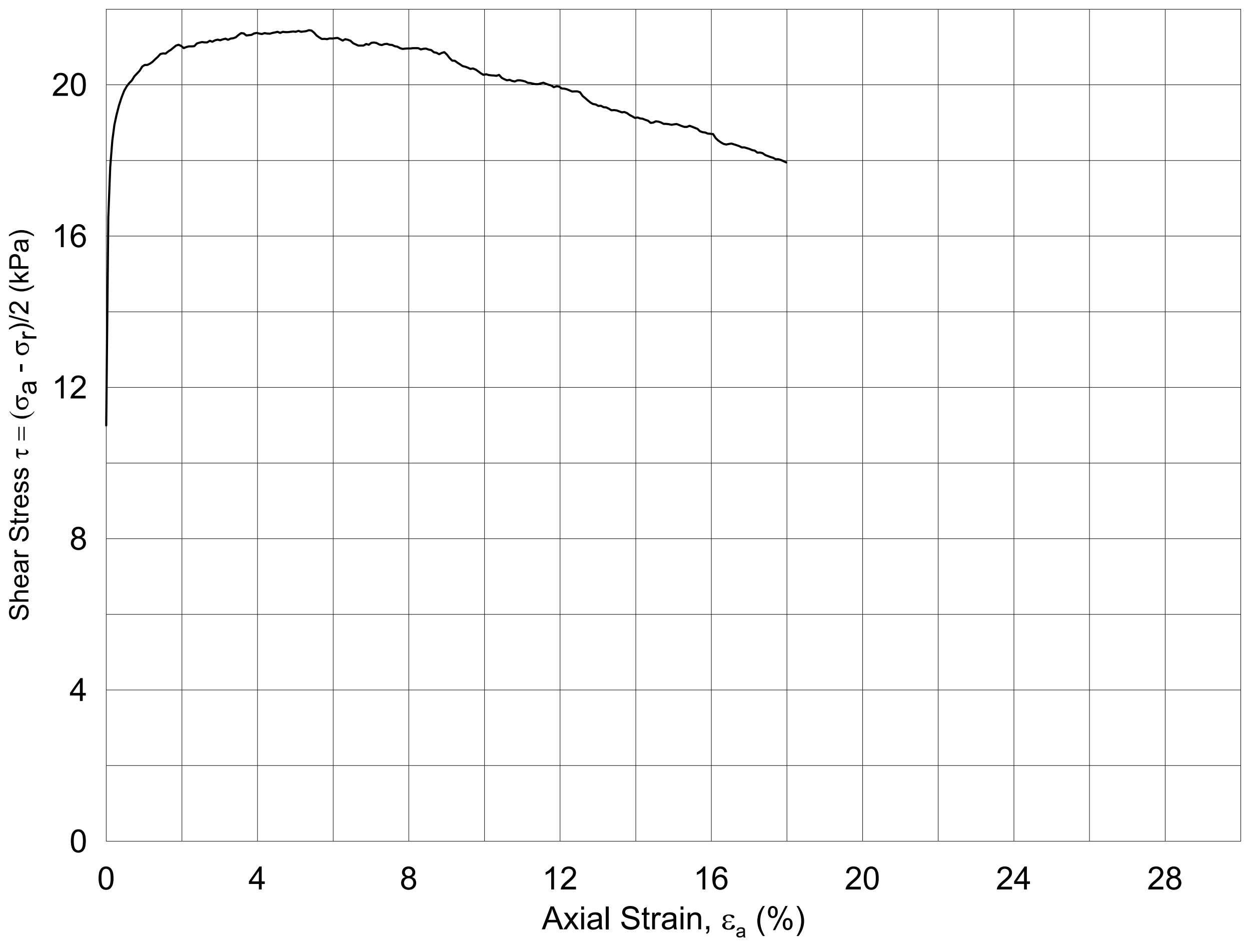
Document No.	20160154-10-R			
Figure No.	5.3.33			
Date	2018-12-10	Drawn by/checked	ThV / GS	

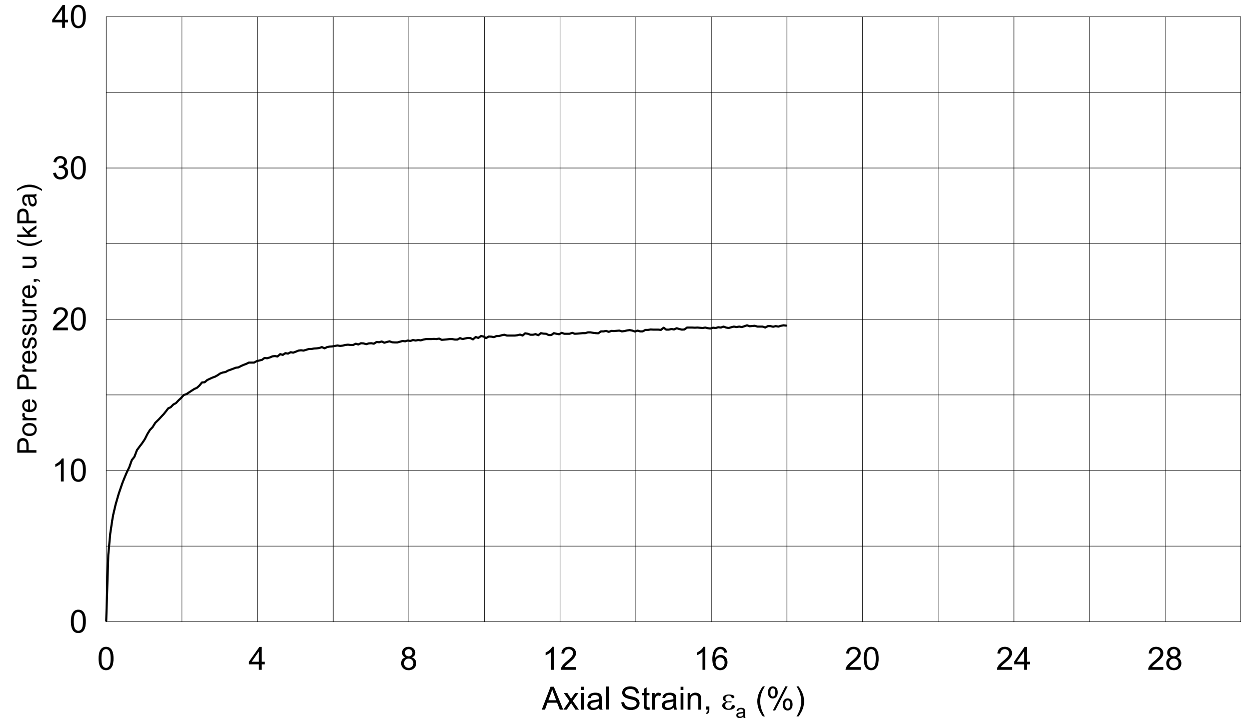
Triaxial test: **CAUC**

Boring:	**ONSB08**	Depth =	**9.70**	m	Consolidation stresses				
Tube:	**2-2**	po' =	**61.8**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**41.7**	%	σ_{ac}' =	-	-	**61.7**	
Test:	**1**	w_c =	**38.7**	%	σ_{rc}' =	-	-	**37.0**	

NGI

BH3-2-2-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.34

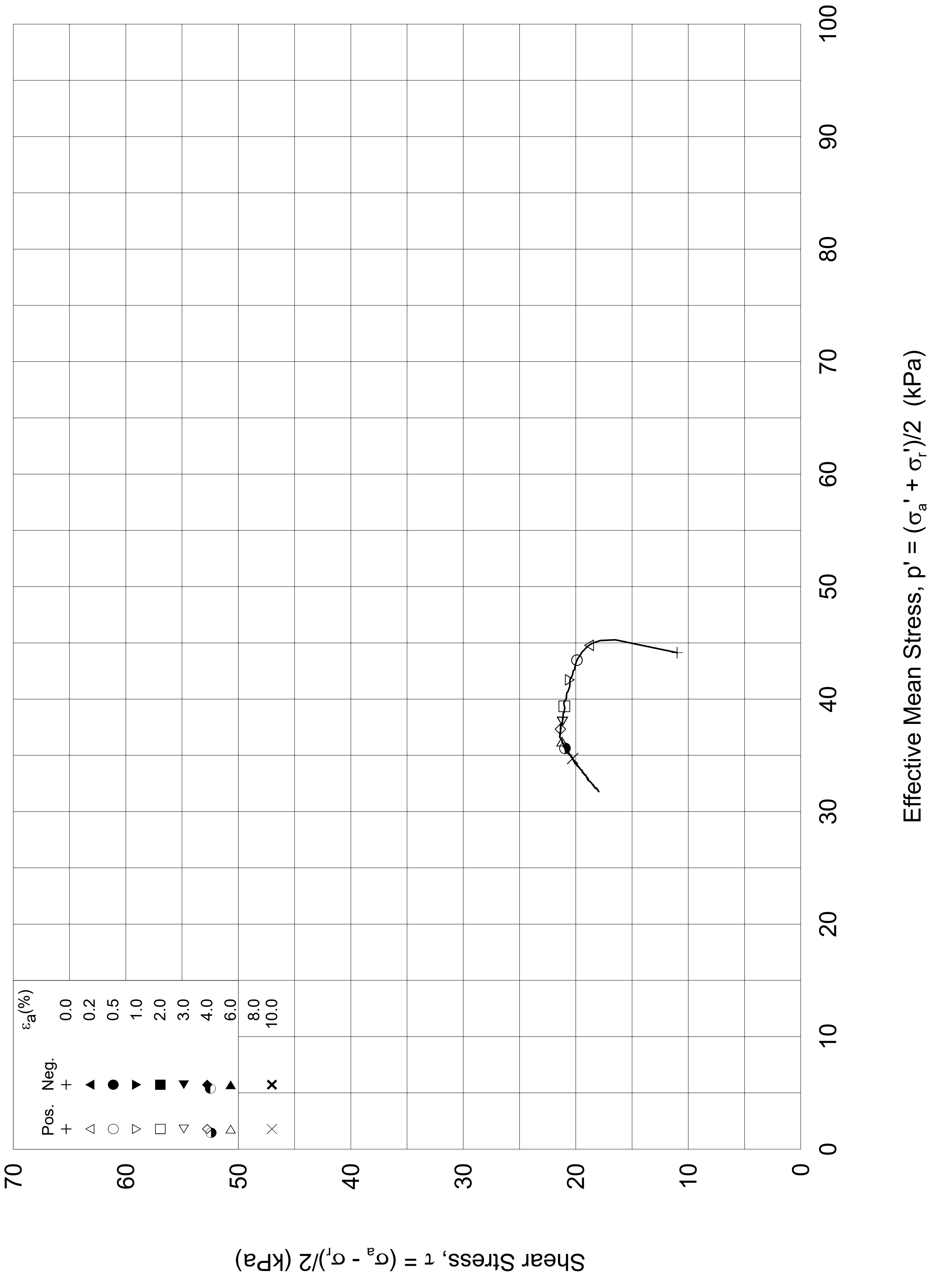
Triaxial test: **CAUC**

Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB09**	Depth =	**8.78**	m	Consolidation stresses			
Tube:	**2-1**	po' =	**55.1**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**45.7**	%	σ_{ac}' =	-	-	**55.1**
Test:	**1**	w_c =	**40.8**	%	σ_{rc}' =	-	-	**33.2**

BH4-2-1-C-1.Plot1.grf



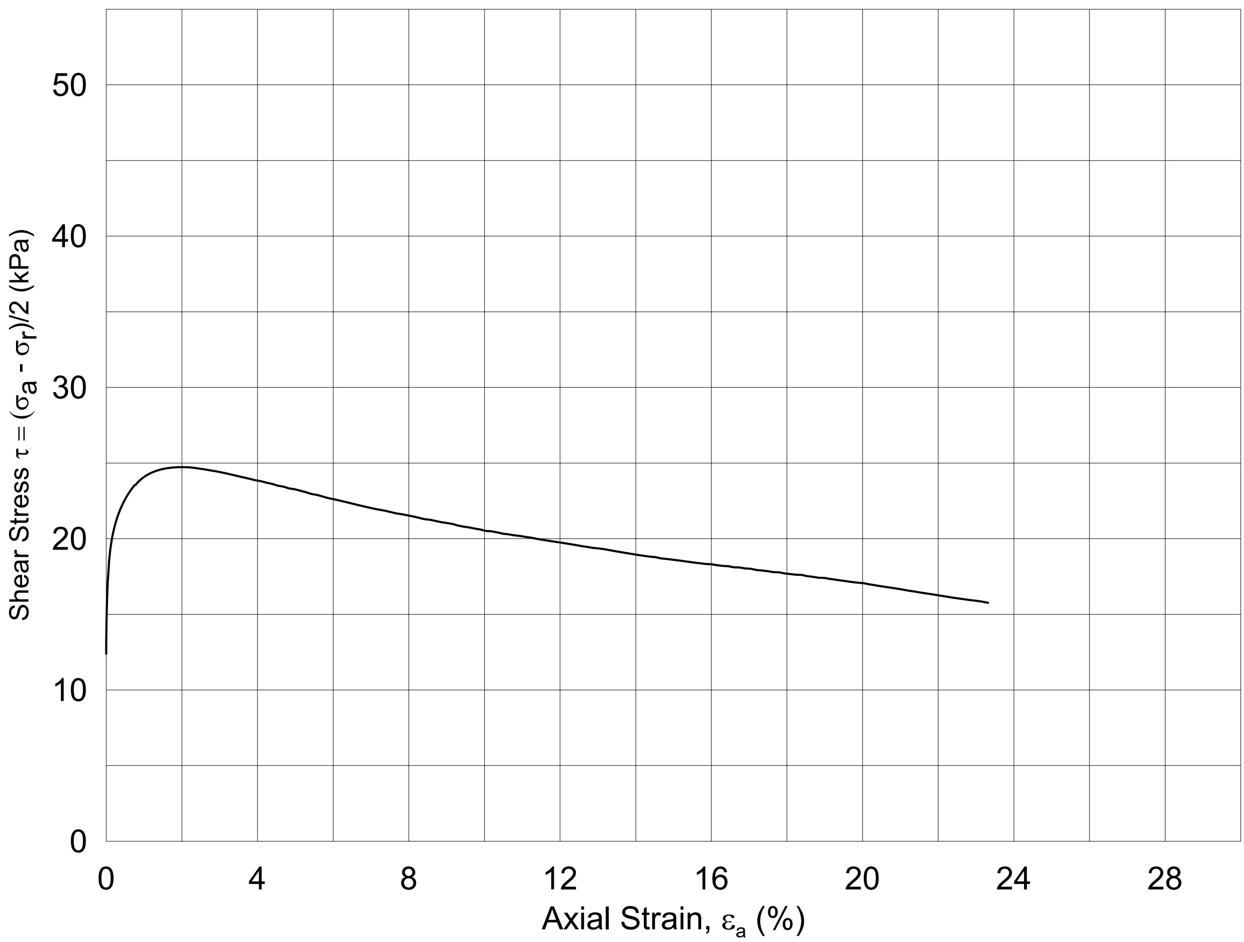
Dato/rev.: 2014-12-23/01

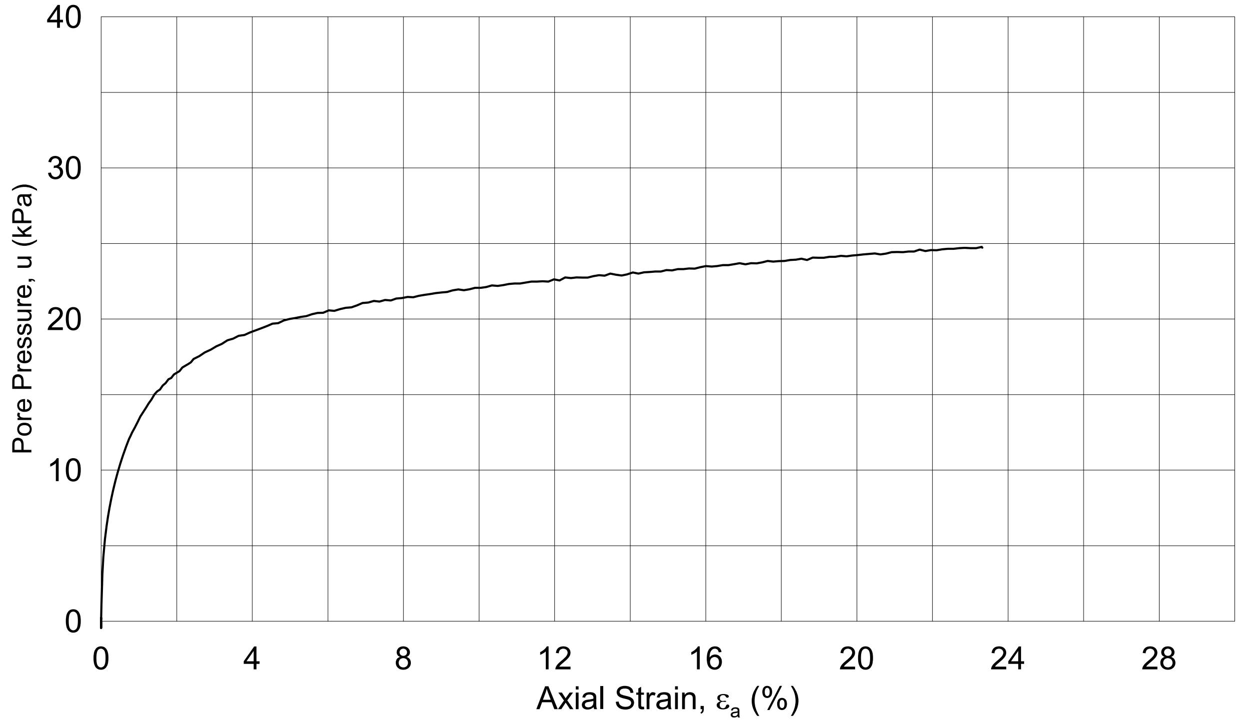
Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**								Document No. 20160154-10-R
								Figure No. 5.3.35
Boring:	**ONSB09**	Depth =	**8.78**	m	Consolidation stresses			Date 2018-12-10 / Drawn by/checked ThV / GS
Tube:	**2-1**	po' =	**55.1**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**45.7**	%	σ_{ac}' =	-	-	**55.1**
Test:	**1**	w_c =	**40.8**	%	σ_{rc}' =	-	-	**33.2**

NGI

BH4-2-1-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

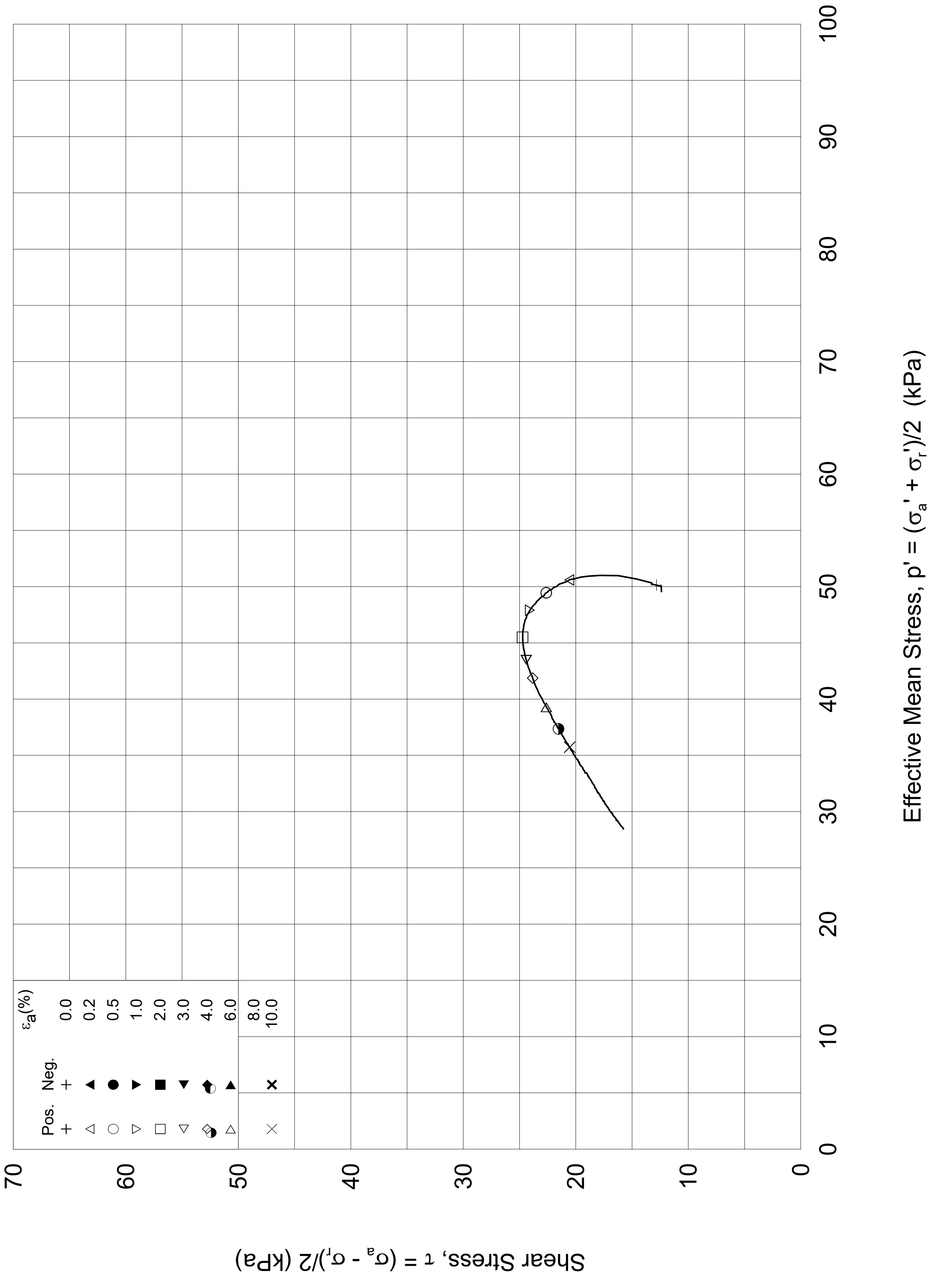
Document No. 20160154-10-R

Figure No. 5.3.36

Triaxial test: **CAUC**

Boring:	**ONSB09**	Depth =	**9.73**	m	Consolidation stresses				Date 2018-12-10	Drawn by/checked ThV / GS
Tube:	**2-2**	po' =	**62.0**	kPa	(kPa)	max.	min.	final		
Part:	**C**	w_i =	**41.7**	%	σ_{ac}' =	-	-	**61.9**		
Test:	**1**	w_c =	**39.6**	%	σ_{rc}' =	-	-	**37.2**		

BH4-2-2-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

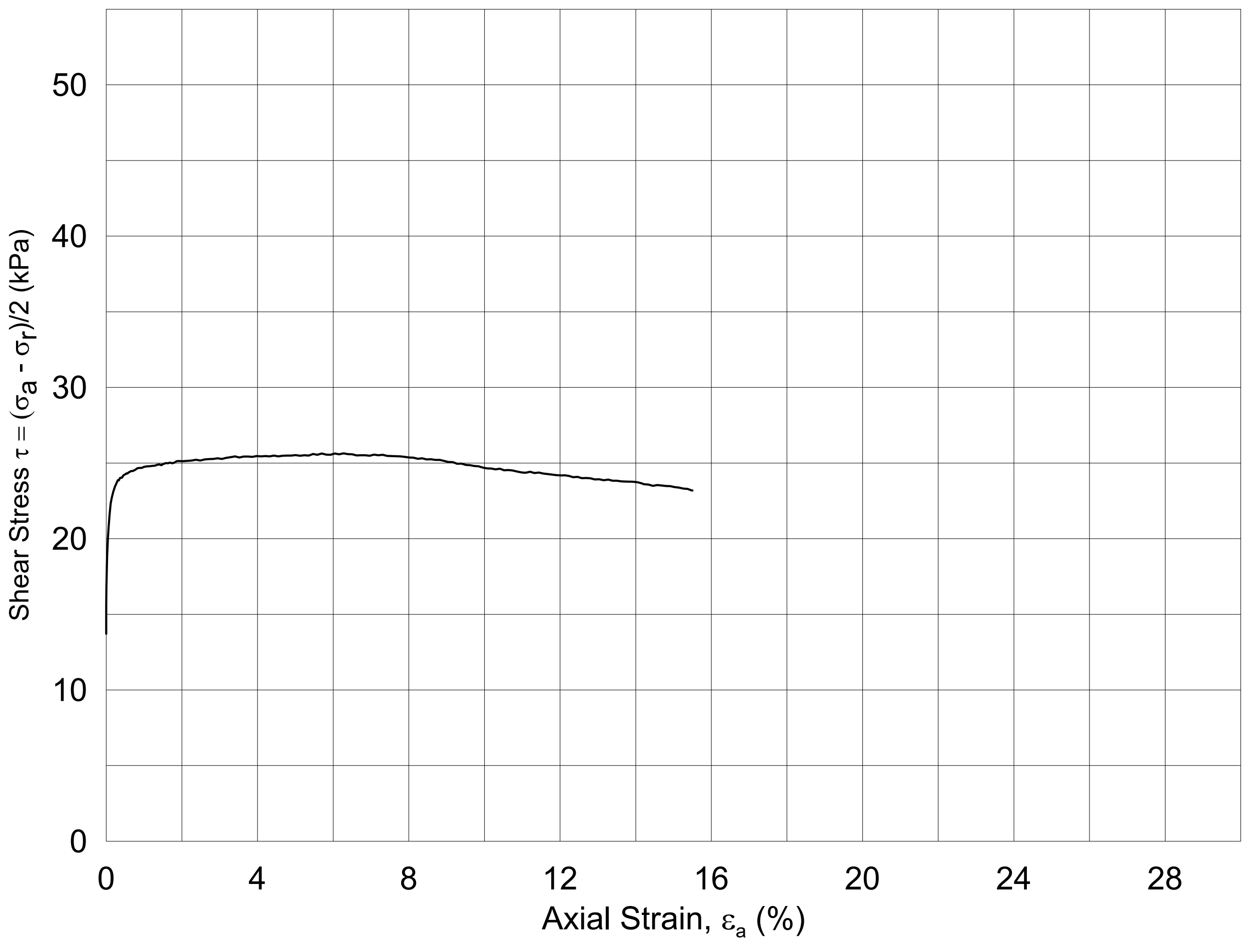
Norwegian GeoTest Sites - Onsøy

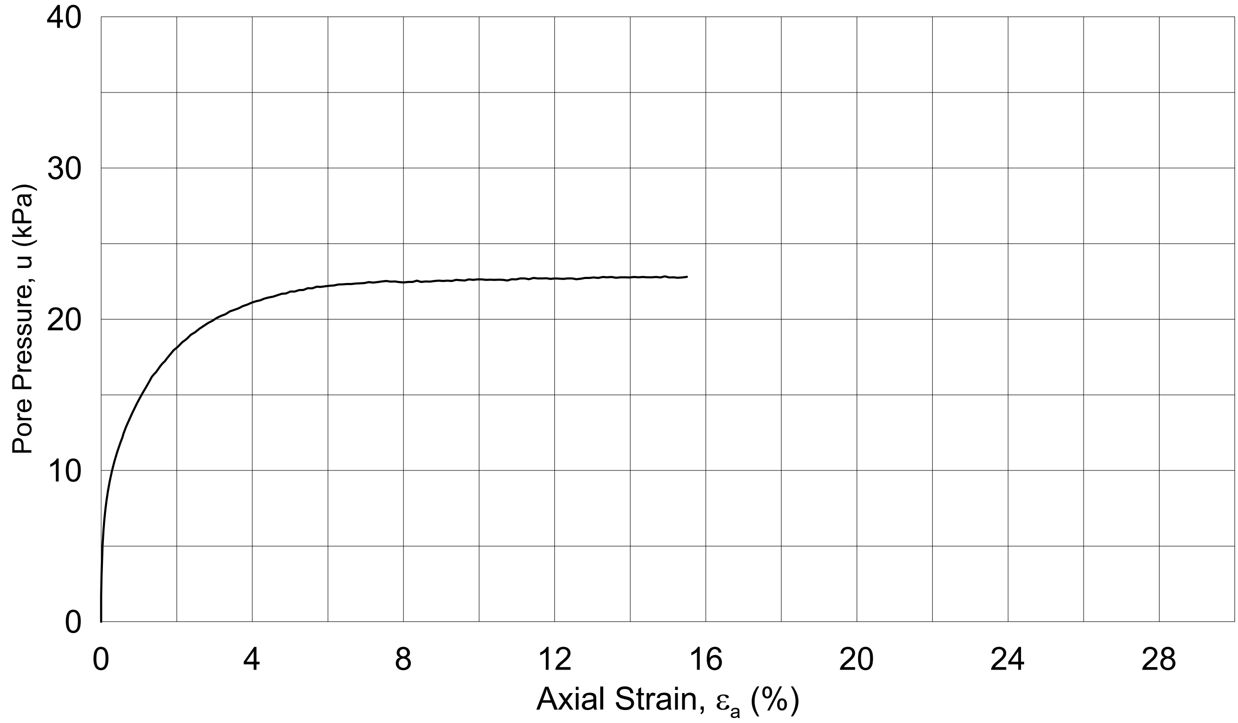
Document No.	20160154-10-R			
Figure No.	5.3.37			
Date	2018-12-10	Drawn by/checked	ThV / GS	

Triaxial test: **CAUC**

Boring:	**ONSB09**	Depth =	**9.73**	m	Consolidation stresses			
Tube:	**2-2**	po' =	**62.0**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**41.7**	%	σ_{ac}' =	-	-	**61.9**
Test:	**1**	w_c =	**39.6**	%	σ_{rc}' =	-	-	**37.2**

BH4-2-2-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

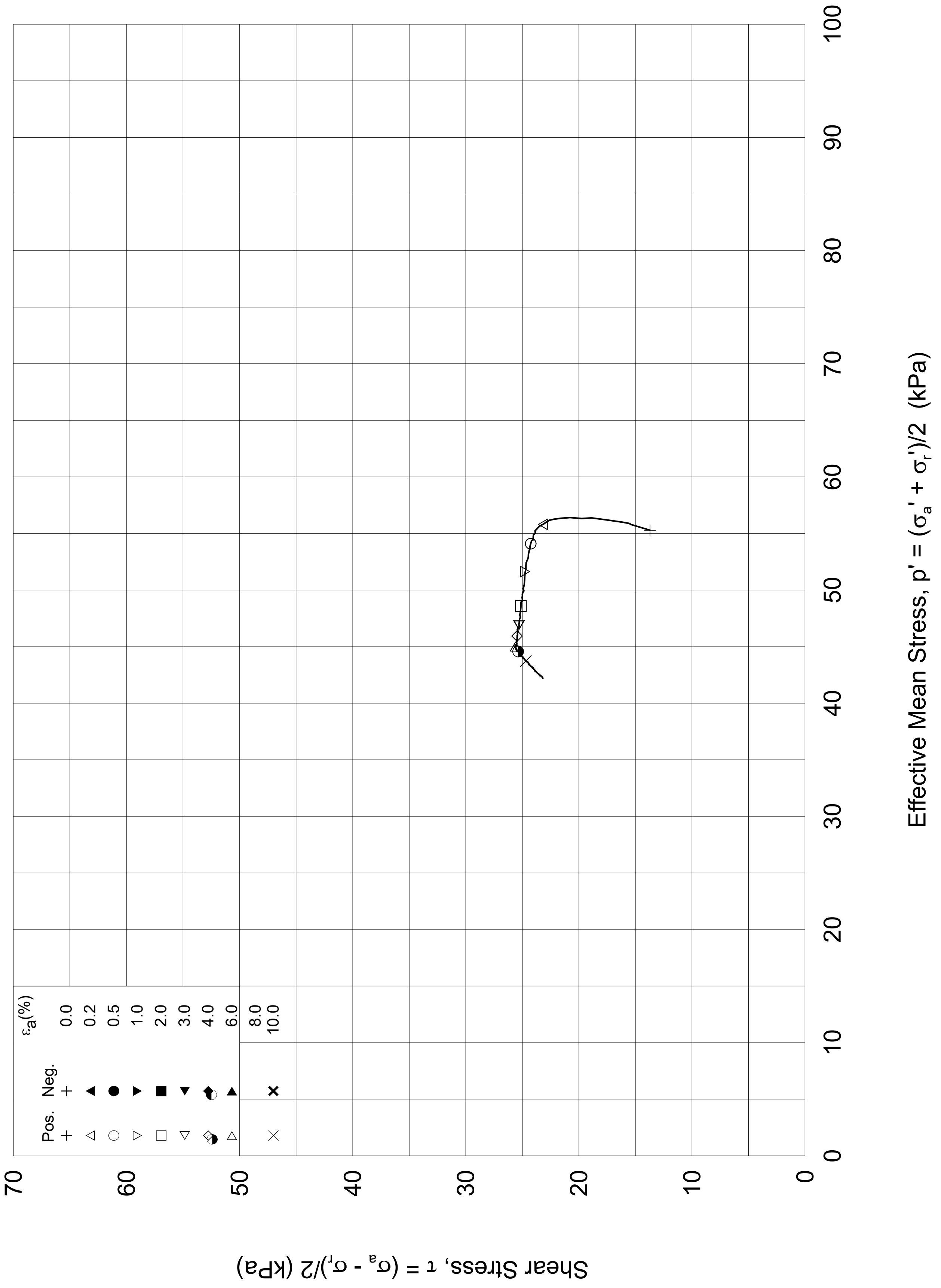
Document No. 20160154-10-R

Triaxial test: **CAUC**

Figure No. 5.3.38

Boring:	**ONSB09**	Depth =	**10.68**	m	Consolidation stresses				Date 2018-12-10	Drawn by/checked ThV / GS
Tube:	**2-3**	po' =	**69.3**	kPa	(kPa)	max.	min.	final		
Part:	**C**	w_i =	**42.4**	%	σ_{ac}' =	-	-	**69.2**		
Test:	**1**	w_c =	**37.2**	%	σ_{rc}' =	-	-	**41.6**		

BH4-2-3-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.39

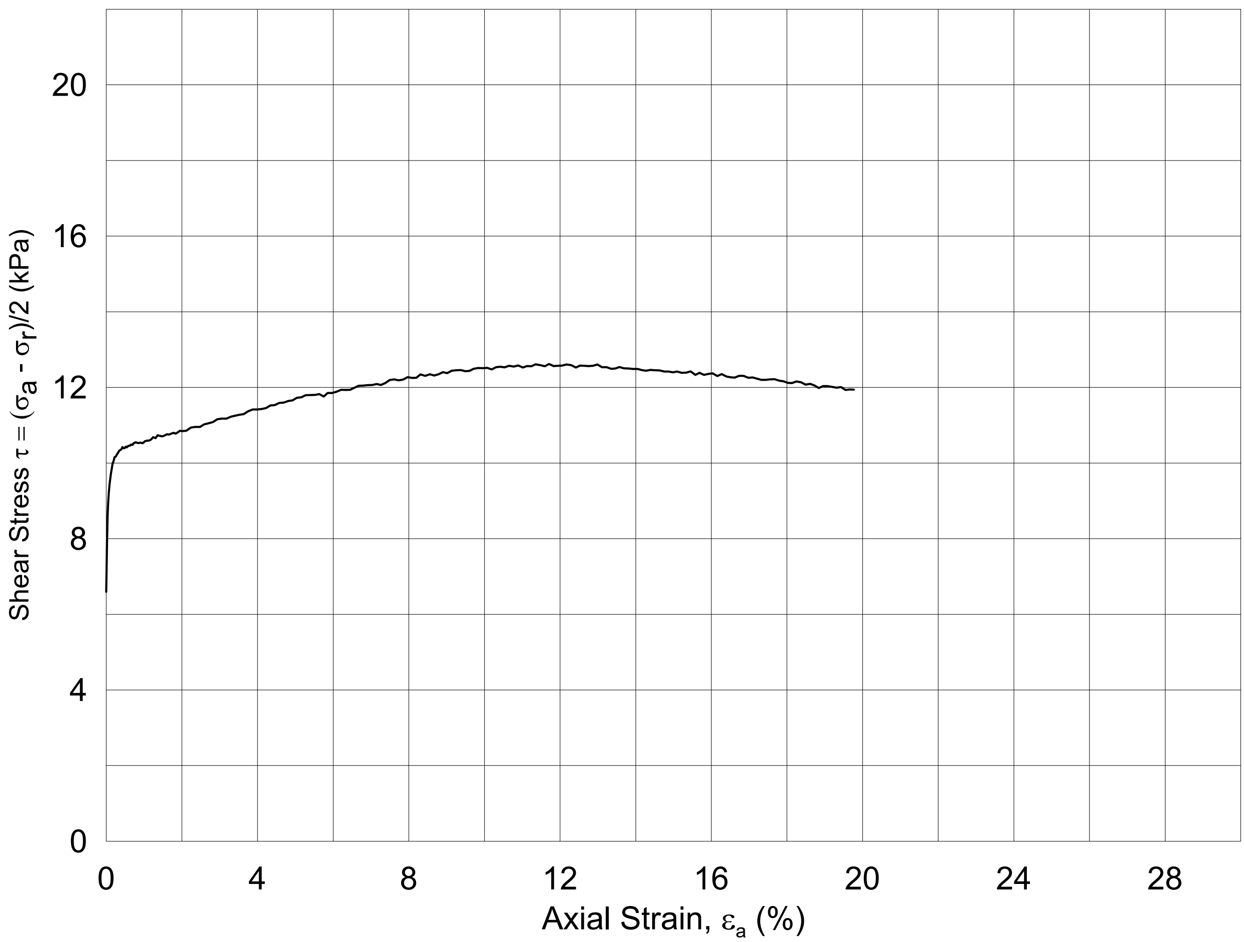
Triaxial test: **CAUC**

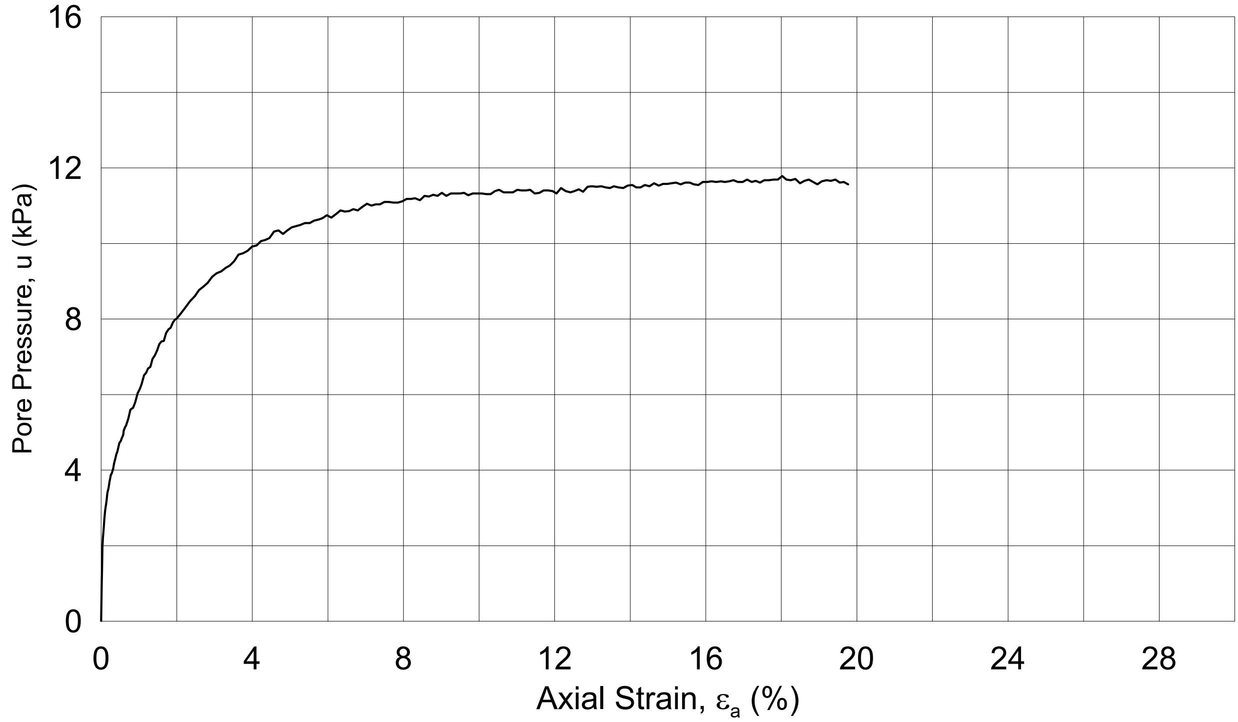
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB09**	Depth =	**10.68**	m	Consolidation stresses				
Tube:	**2-3**	po' =	**69.3**	kPa	(kPa)		max.	min.	final
Part:	**C**	w_i =	**42.4**	%	σ_{ac}' =		-	-	**69.2**
Test:	**1**	w_c =	**37.2**	%	σ_{rc}' =		-	-	**41.6**

BH4-2-3-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

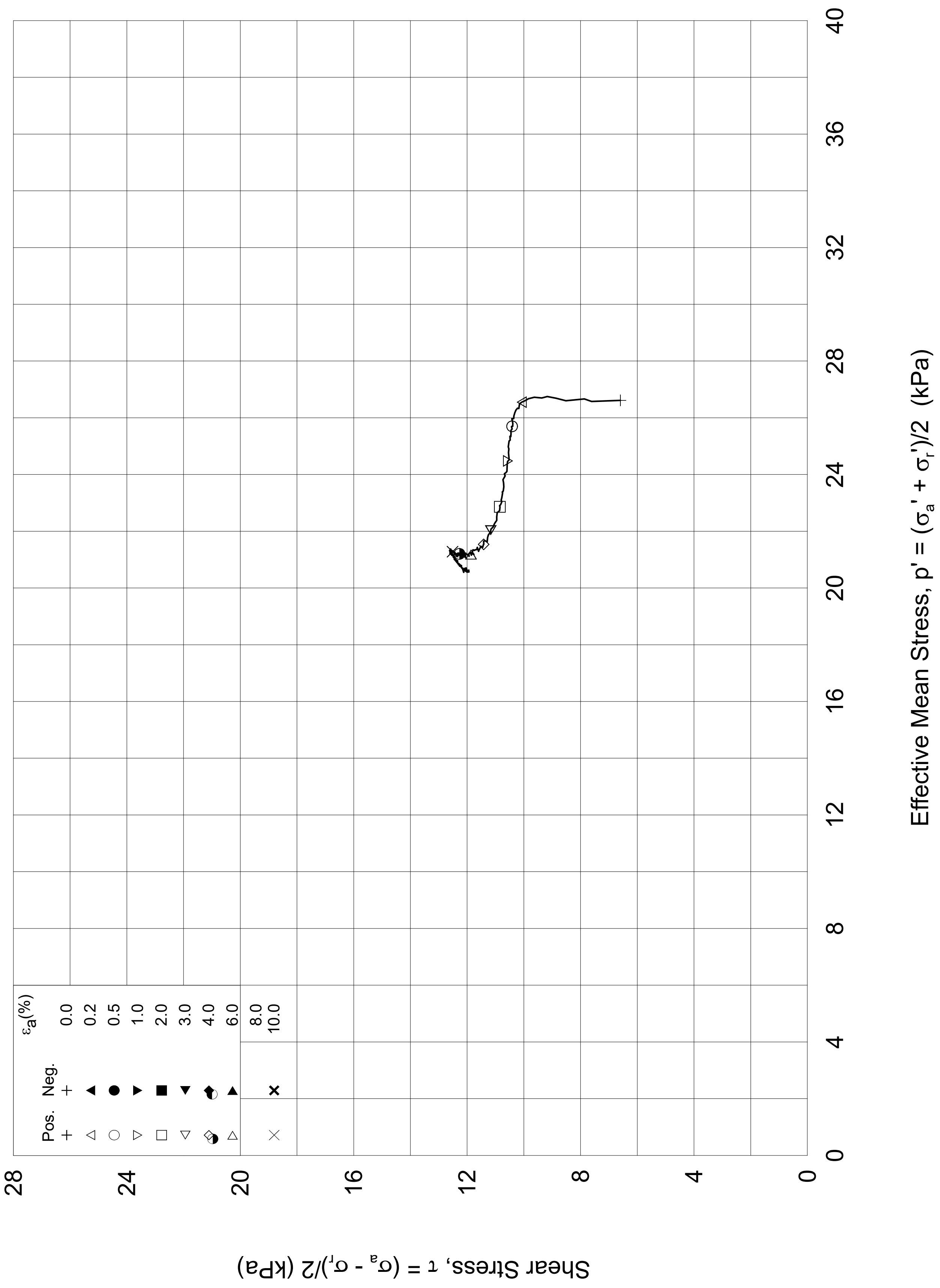
Document No. 20160154-10-R

Triaxial test: **CAUC**

Figure No. 5.3.40

Boring:	**ONSB10**	Depth =	**5.78**	m	Consolidation stresses				Date 2018-12-10
Tube:	**1-1**	po' =	**33.5**	kPa	(kPa)	max.	min.	final	Drawn by/checked ThV / GS
Part:	**C**	w_i =	**68.1**	%	σ_{ac}' =	-	-	**33.4**	
Test:	**1**	w_c =	**61.1**	%	σ_{rc}' =	-	-	**20.0**	

BH5-1-1-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.41

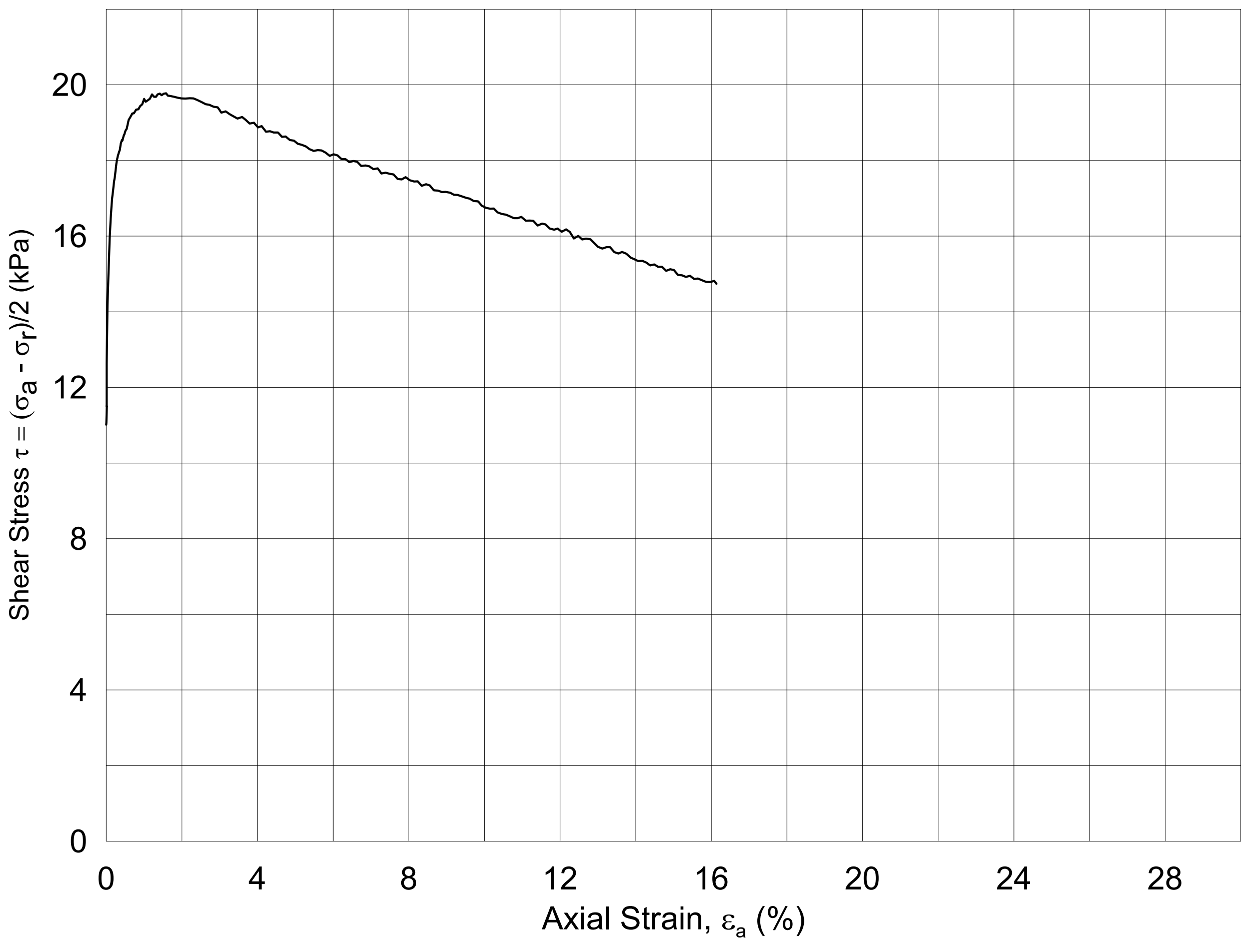
Date 2018-12-10

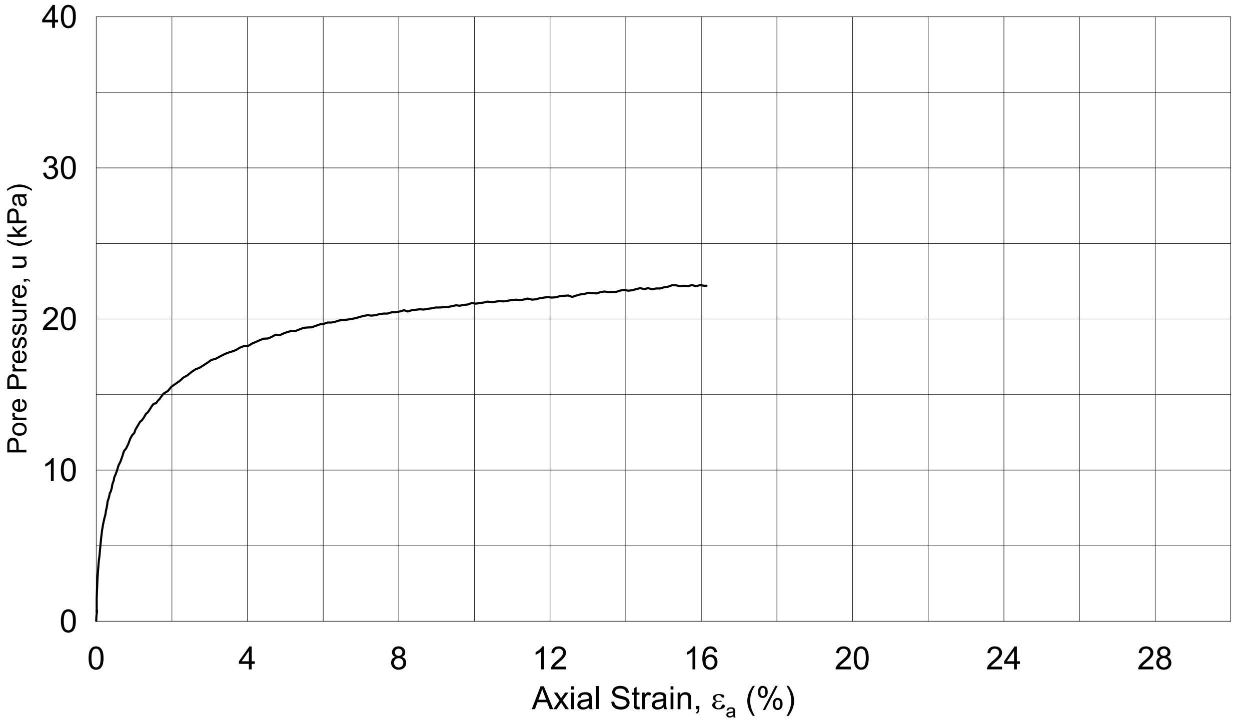
Drawn by/checked ThV / GS

Triaxial test: **CAUC**

Boring:	**ONSB10**	Depth =		**5.78**	m	Consolidation stresses					
Tube:	**1-1**	po'	=	**33.5**	kPa	(kPa)		max.	min.	final	
Part:	**C**	w_i	=	**68.1**	%	σ_{ac}' =		-	-	**33.4**	
Test:	**1**	w_c	=	**61.1**	%	σ_{rc}' =		-	-	**20.0**	

BH5-1-1-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No.: 20160154-10-R

Figure No.: 5.3.42

Triaxial test: **CAUC**

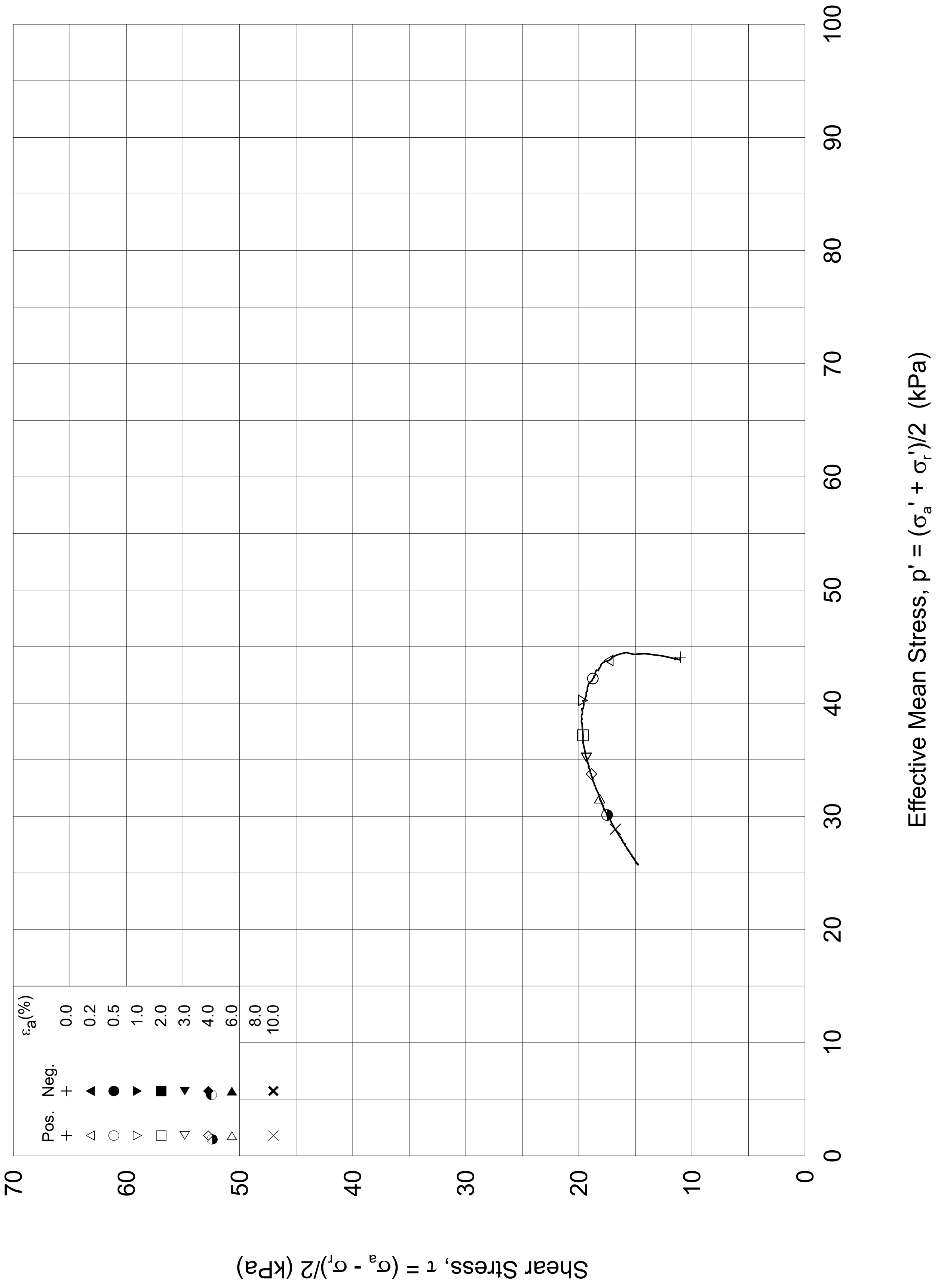
Date: 2018-12-10

Drawn by/checked: ThV / GS

Boring:	**ONSB10**	Depth =	**8.78**	m	Consolidation stresses			
Tube:	**2-1**	po' =	**55.1**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**43.5**	%	σ_{ac}' =	-	-	**55.0**
Test:	**1**	w_c =	**40.4**	%	σ_{rc}' =	-	-	**33.0**

NGI

BH5-2-1-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**								
Boring:	**ONSB10**	Depth =	**8.78**	m	Consolidation stresses			
Tube:	**2-1**	po' =	**55.1**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**43.5**	%	σ_{ac}' =	-	-	**55.0**
Test:	**1**	w_c =	**40.4**	%	σ_{rc}' =	-	-	**33.0**

Document No. 20160154-10-R

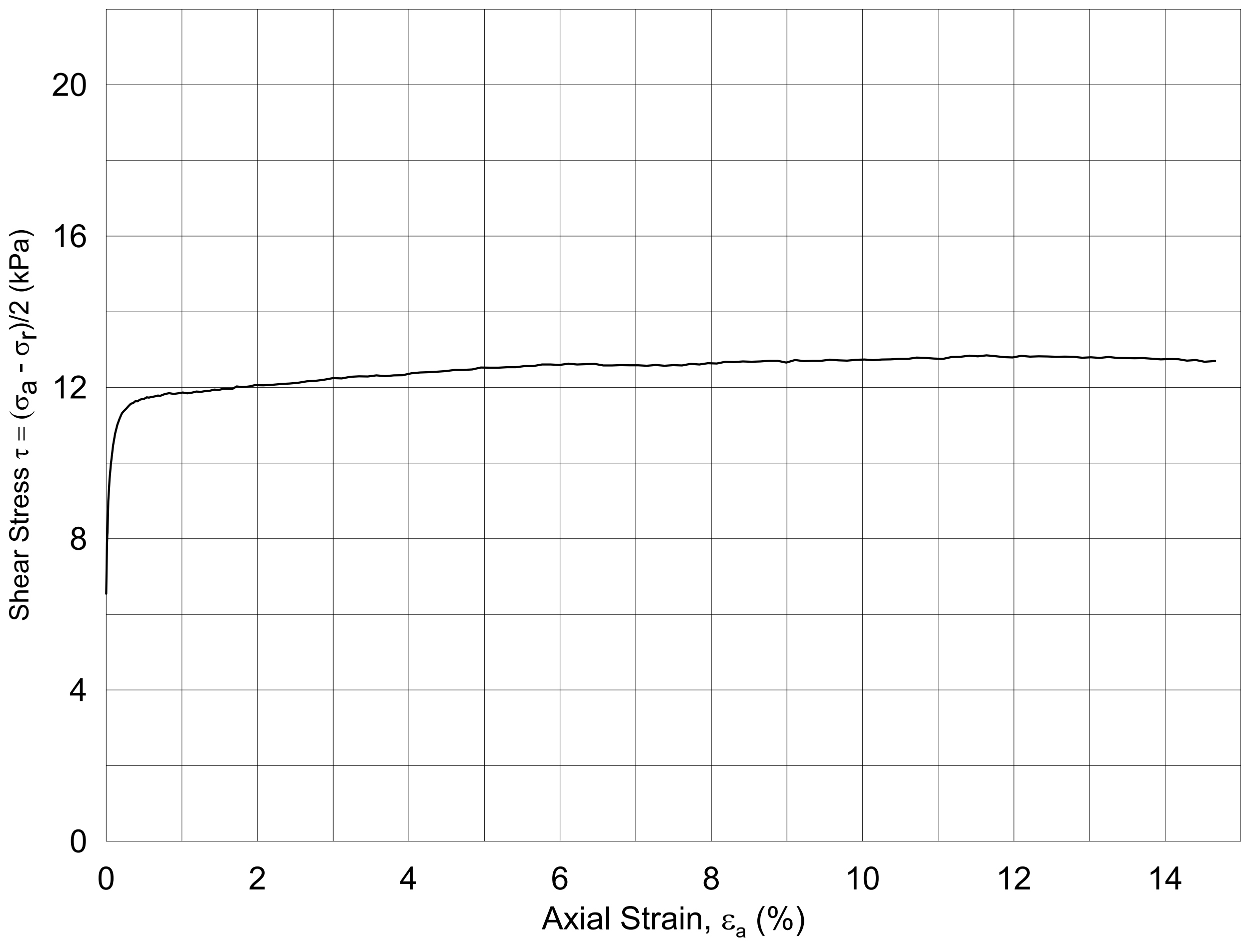
Figure No. 5.3.43

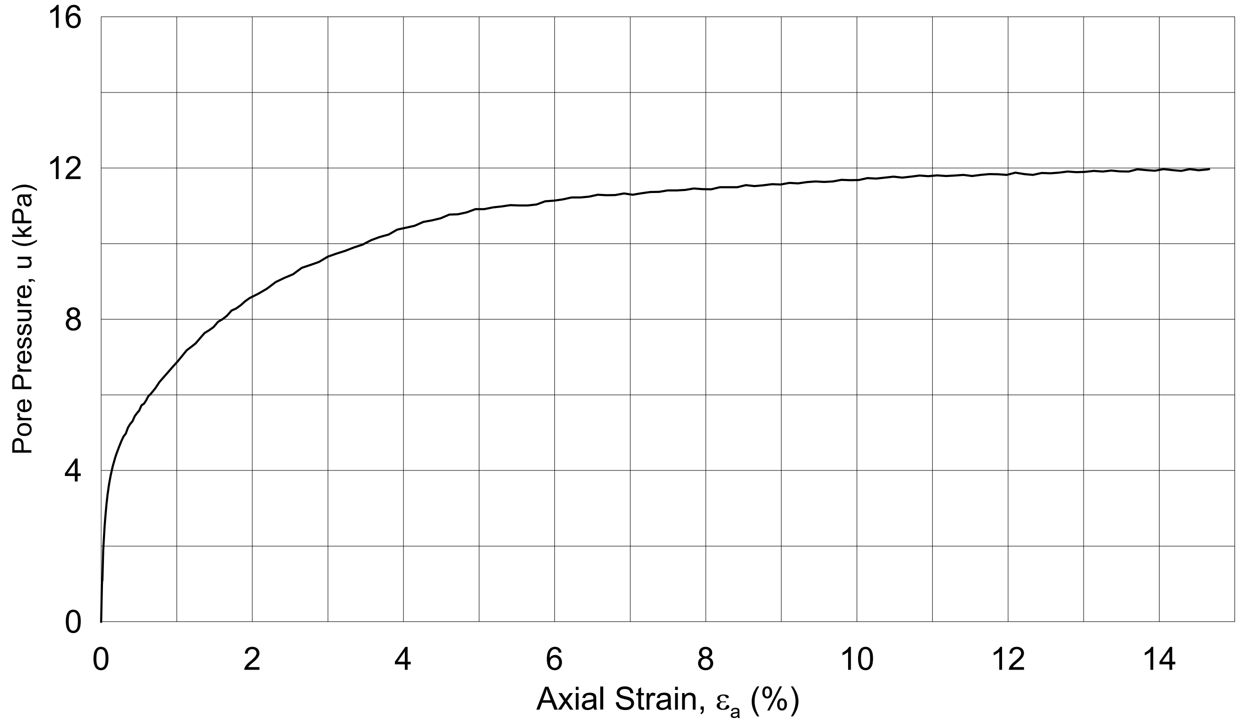
Date 2018-12-10

Drawn by/checked ThV / ThV

NGI

BH5-2-1-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

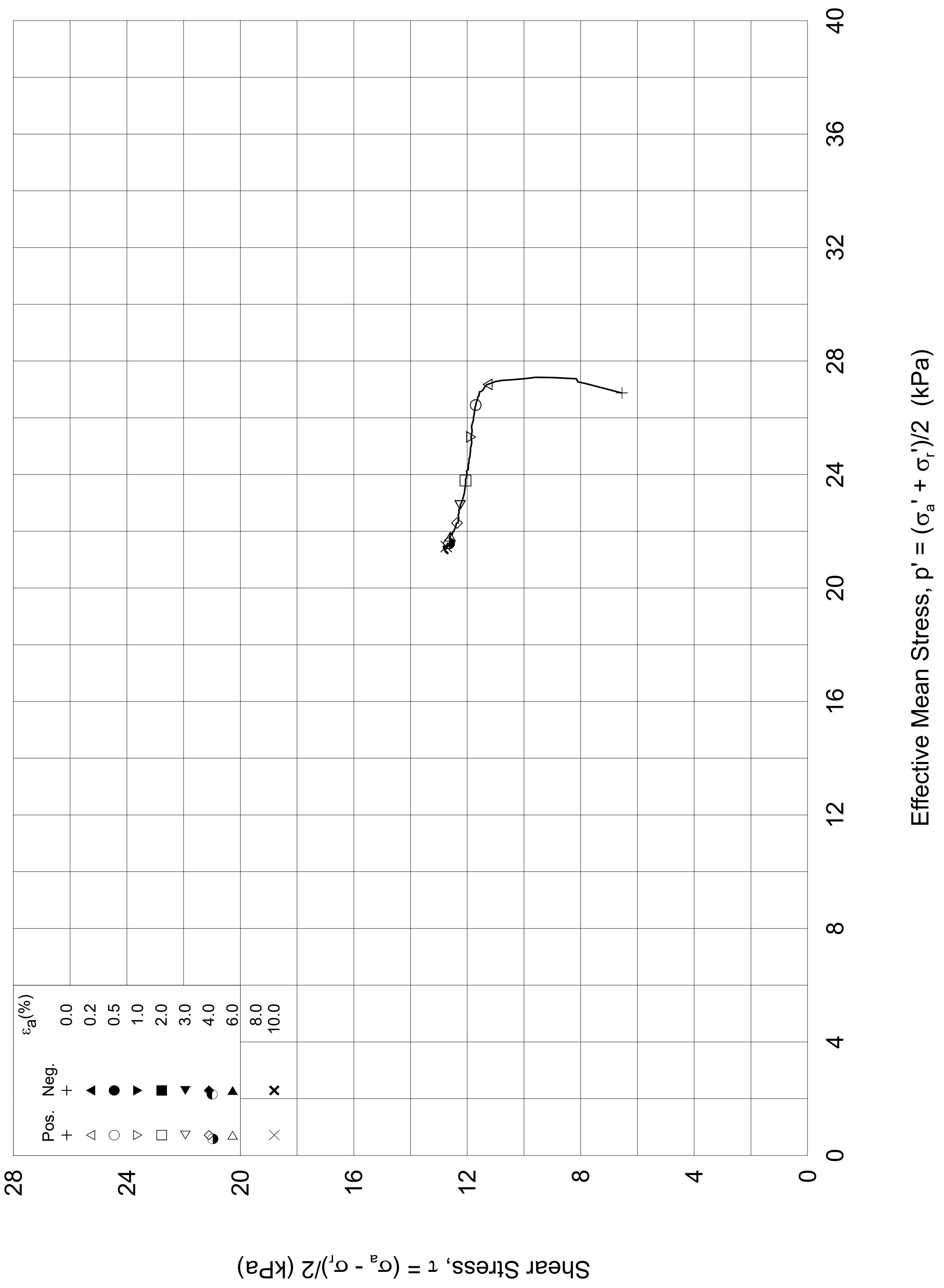
Document No. 20160154-10-R

Figure No. 5.3.44

Triaxial test: **CAUC**

Boring:	**ONSB11**	Depth =	**5.87**	m	Consolidation stresses				Date	2018-12-10	Drawn by/checked ThV / MAS
Tube:	**1-1**	po' =	**33.9**	kPa	(kPa)	max.	min.	final			
Part:	**A**	w_i =	**66.3**	%	σ_{ac}' =	-	-	**33.8**			
Test:	**1**	w_c =	**57.4**	%	σ_{rc}' =	-	-	**20.3**			

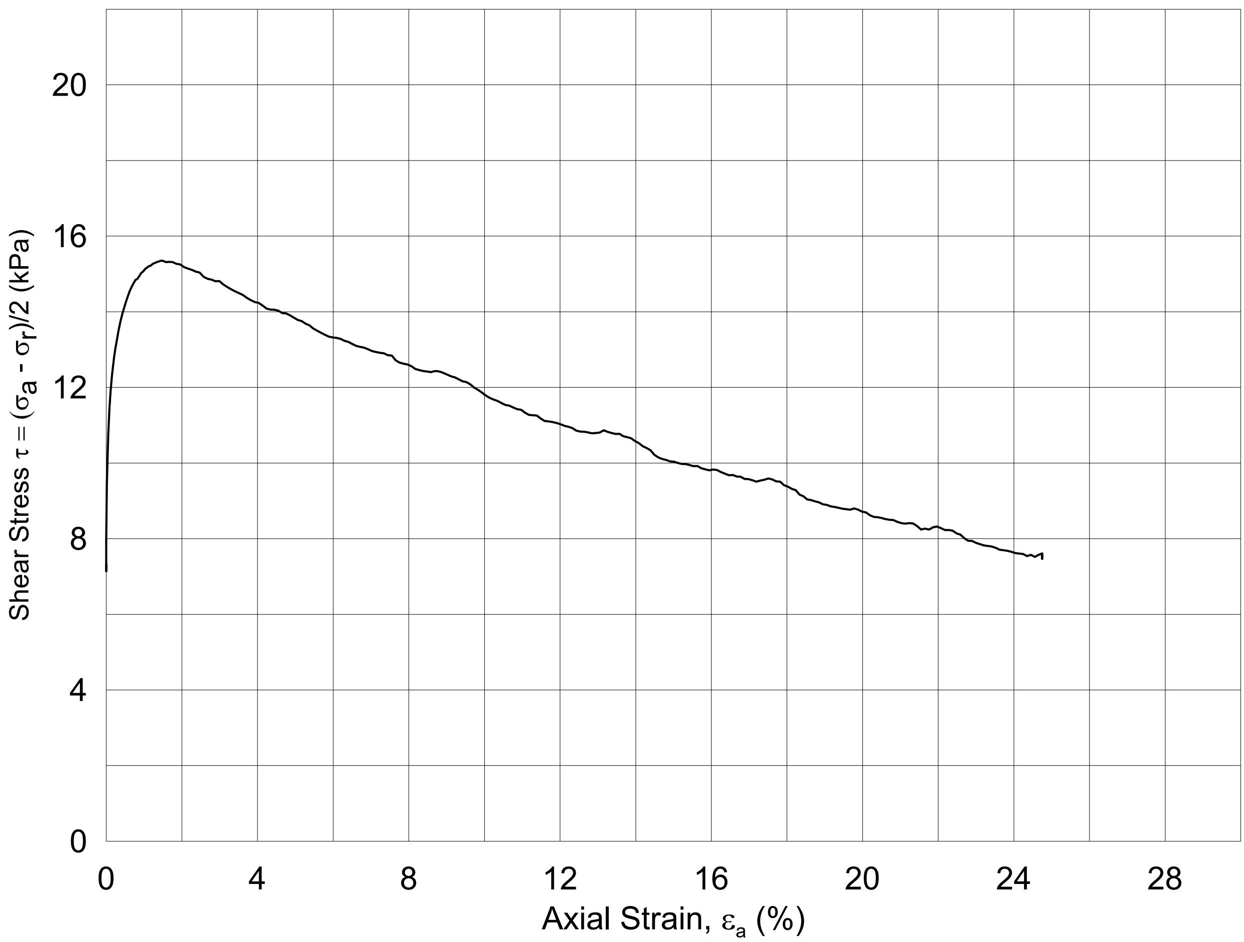
BH7-1-1-A-1.Plot1.grf

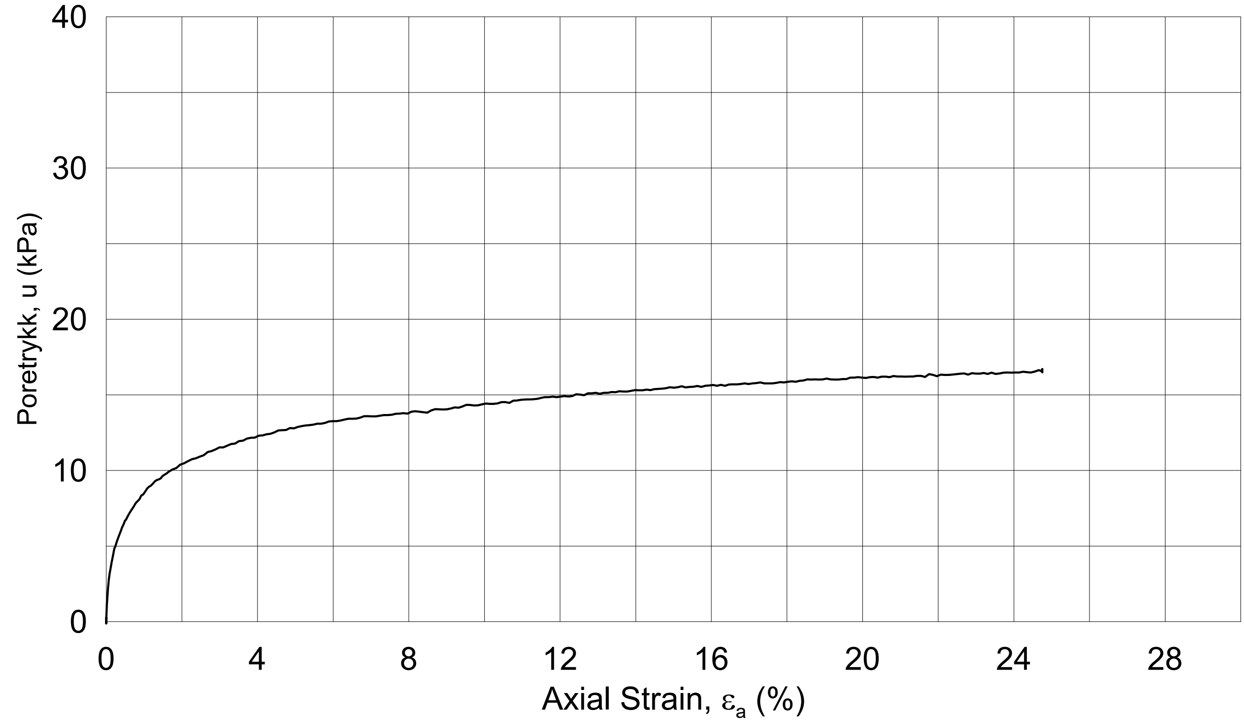


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: **CAUC**								Figure No. 5.3.45
Boring: **ONSB11**	Depth =	**5.87**	m	Consolidation stresses				Date 2018-12-10 / Drawn by/checked ThV / MAS
Tube: **1-1**	po' =	**33.9**	kPa	(kPa)	max.	min.	final	
Part: **A**	w_i =	**66.3**	%	σ_{ac}' =	-	-	**33.8**	
Test: **1**	w_c =	**57.4**	%	σ_{rc}' =	-	-	**20.3**	

BH7-1-1-A-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

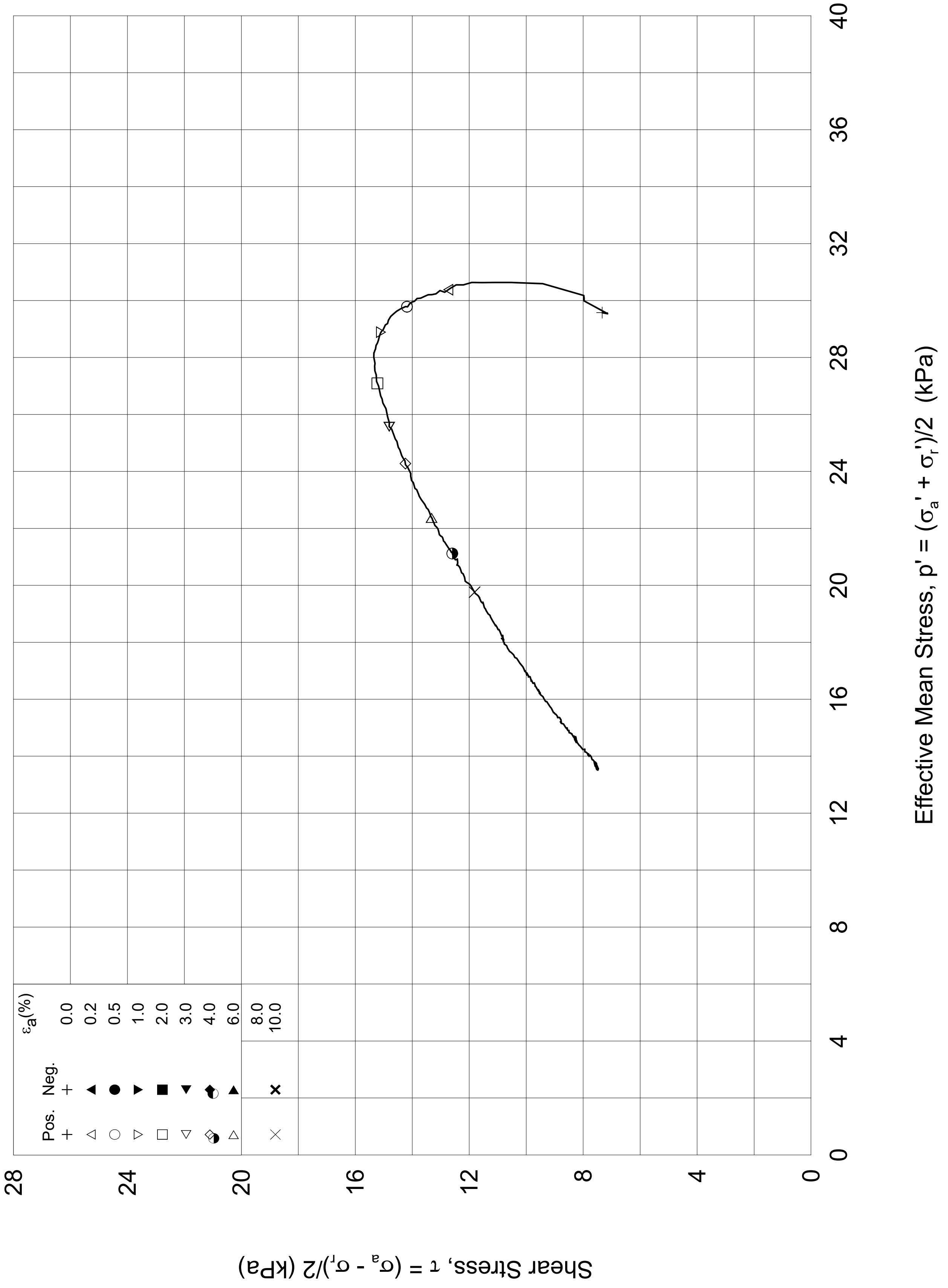
Figure No. 5.3.46

Triaxial test: **CAUC**

Date 2018-12-10 | Drawn by/checked ThV / GS

Boring:	**ONSB11**	Depth =	**6.30**	m	Consolidation stresses			
Tube:	**1-2**	po' =	**37.0**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**64.7**	%	σ_{ac}' =	-	-	**36.9**
Test:	**1**	w_c =	**63.4**	%	σ_{rc}' =	-	-	**22.3**

BH7-1-2-B-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.47

Triaxial test: **CAUC**

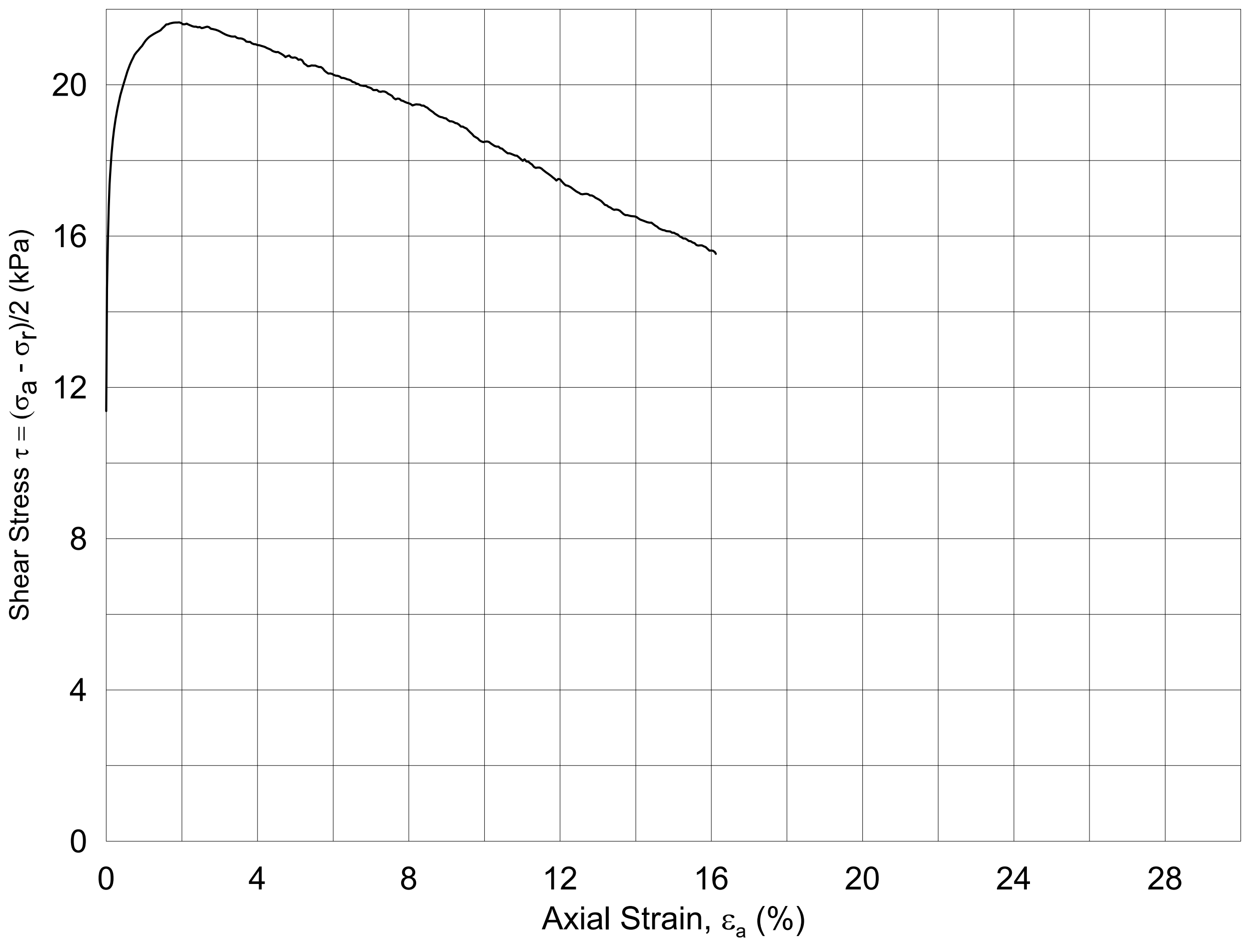
Date 2018-12-10

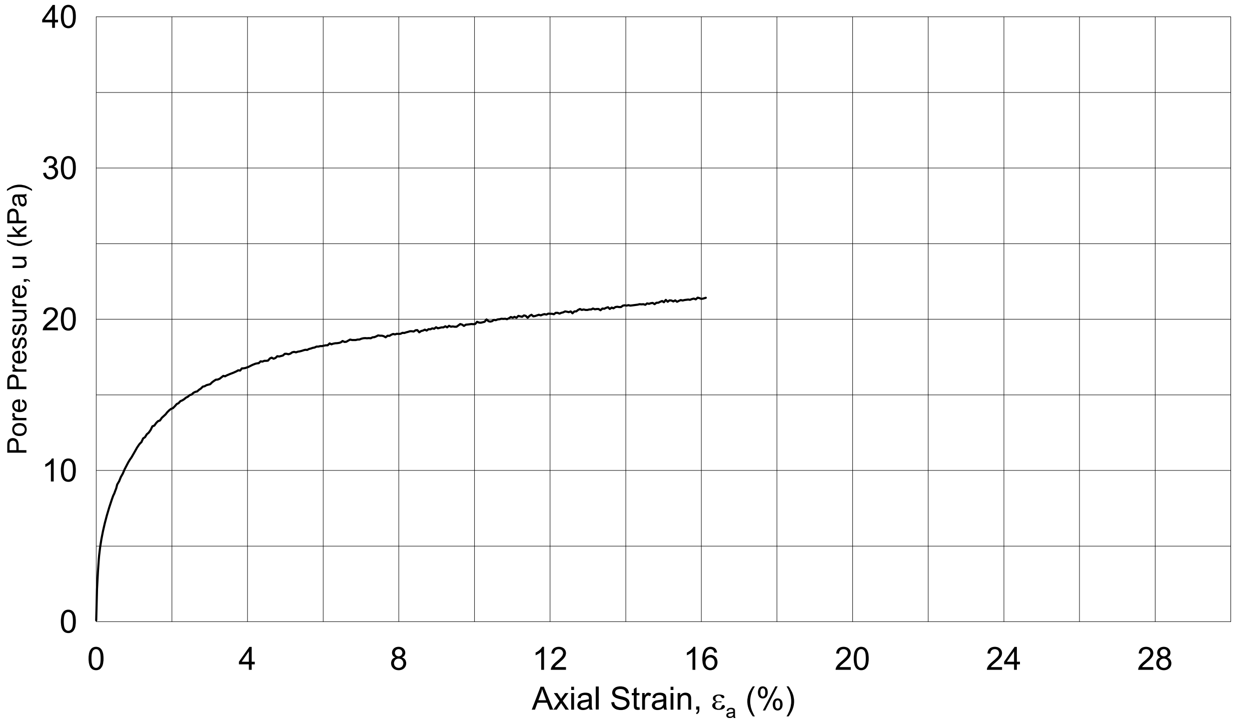
Drawn by/checked ThV / GS

Boring:	**ONSB11**	Depth	=	**6.30**	m	Consolidation stresses			
Tube:	**1-2**	po'	=	**37.0**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i	=	**64.7**	%	σ_{ac}' =	-	-	**36.9**
Test:	**1**	w_c	=	**63.4**	%	σ_{rc}' =	-	-	**22.3**

NGI

BH7-1-2-B-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.48

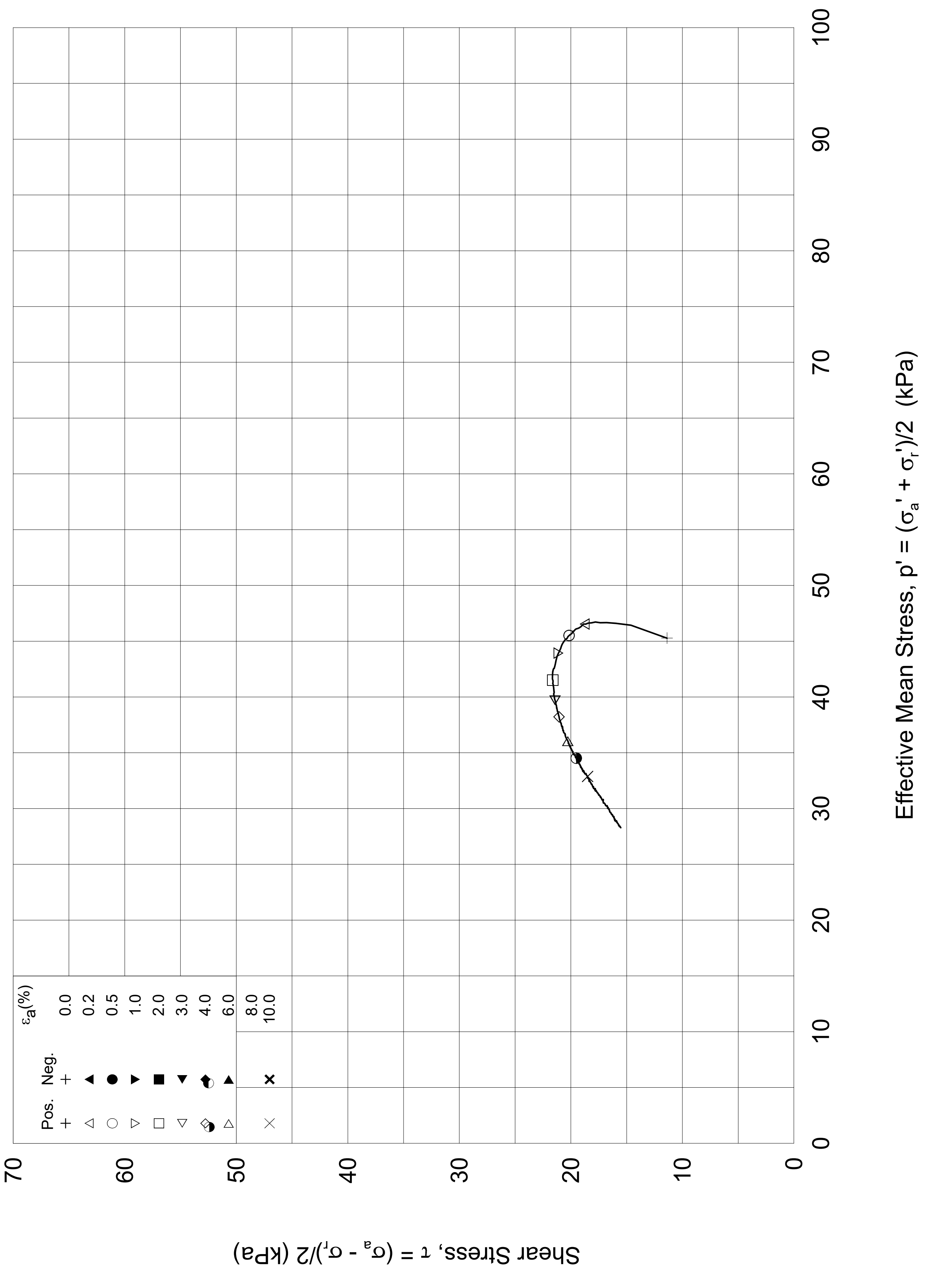
Triaxial test: **CAUC**

Boring:	**ONSB11**	Depth =	**9.06**	m	Consolidation stresses				
Tube:	**2-2**	po' =	**57.0**	kPa	(kPa)	max.	min.	final	
Part:	**B**	w_i =	**43.6**	%	σ_{ac}' =	-	-	**56.7**	
Test:	**1**	w_c =	**40.8**	%	σ_{rc}' =	-	-	**33.9**	

Date 2018-12-10

Drawn by/checked ThV / GS

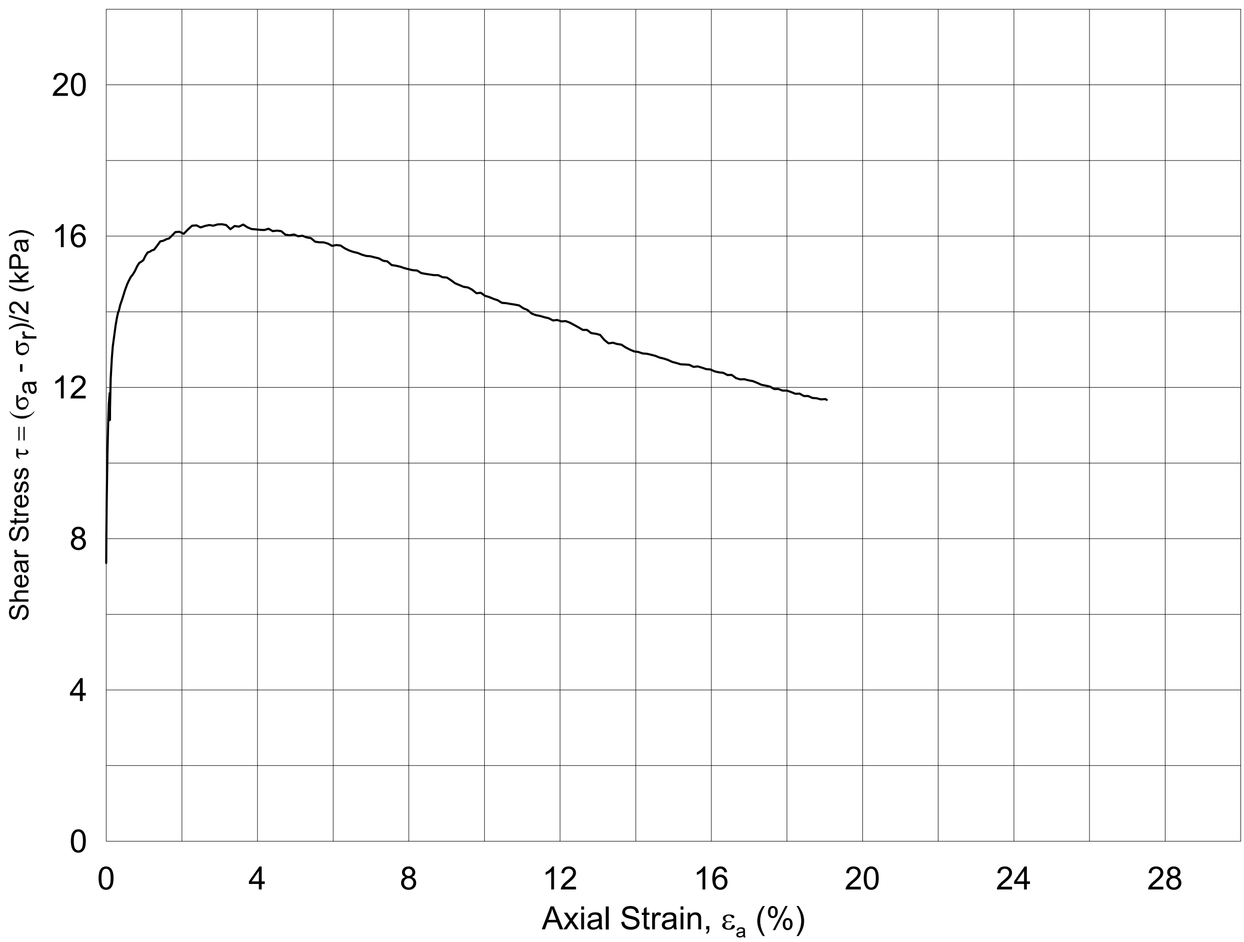
BH7-2-2-B-1.Plot1.grf

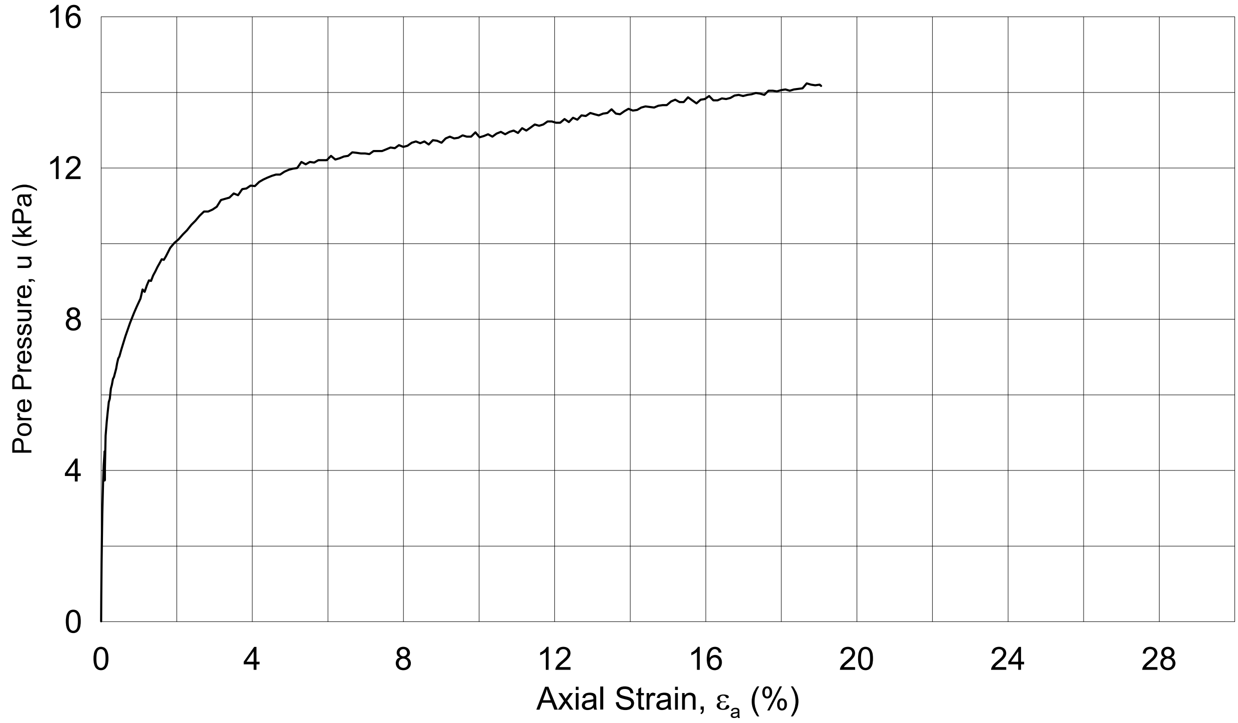


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: **CAUC**								Figure No. 5.3.49
Boring: **ONSB11**	Depth = **9.06** m		Consolidation stresses					Date 2018-12-10 / Drawn by/checked ThV / GS
Tube: **2-2**	po' = **57.0** kPa		(kPa)	max.	min.	final		
Part: **B**	w_i = **43.6** %		σ_{ac}' =	-	-	**56.7**		
Test: **1**	w_c = **40.8** %		σ_{rc}' =	-	-	**33.9**		NGI

BH7-2-2-B-1.Plot2.grf



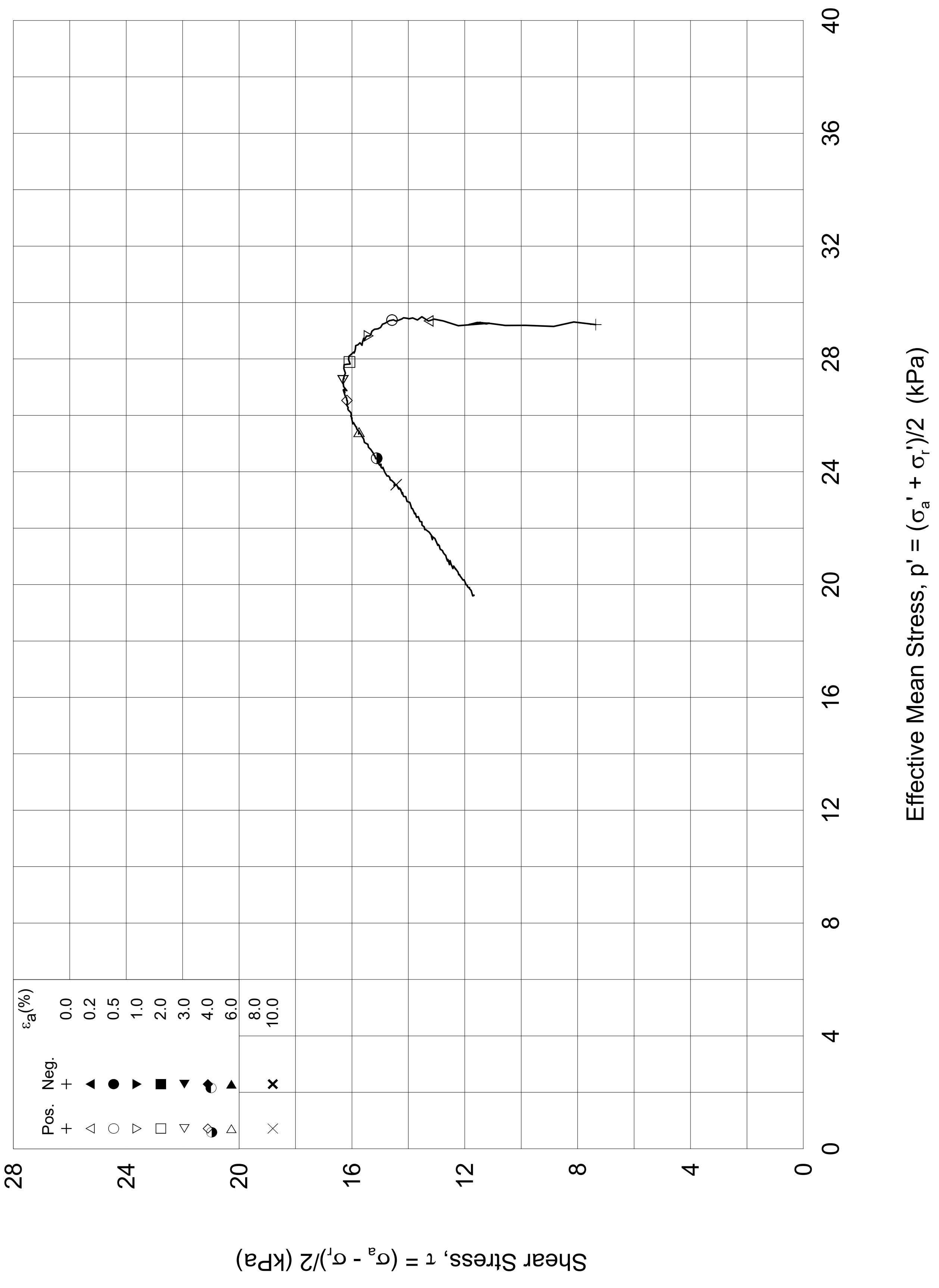


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: **CAUC**									Figure No. 5.3.50
Boring: **ONSB12**	Depth =	**6.28**	m	Consolidation stresses					Date 2018-12-10 / Drawn by/checked ThV / GS
Tube: **1-2**	po' =	**36.7**	kPa	(kPa)	max.	min.	final		
Part: **B**	w_i =	**64.7**	%	σ_{ac}' =	-	-	**36.5**		
Test: **1**	w_c =	**61.8**	%	σ_{rc}' =	-	-	**21.8**		

NGI

BH8-1-2-B-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**								
Boring:	**ONSB12**	Depth =	**6.28**	m	Consolidation stresses			
Tube:	**1-2**	po' =	**36.7**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**64.7**	%	σ_{ac}' =	-	-	**36.5**
Test:	**1**	w_c =	**61.8**	%	σ_{rc}' =	-	-	**21.8**

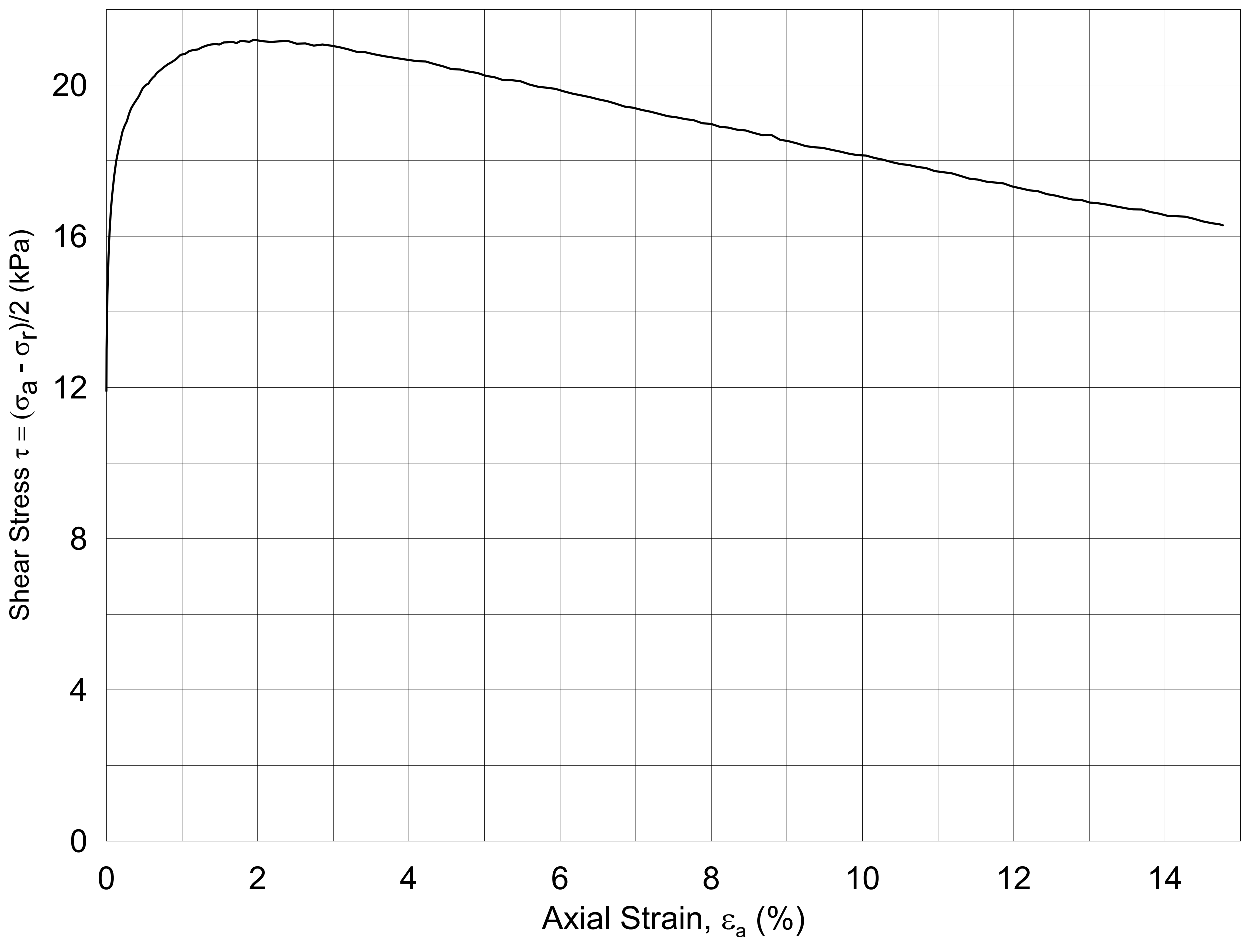
Document No. 20160154-10-R

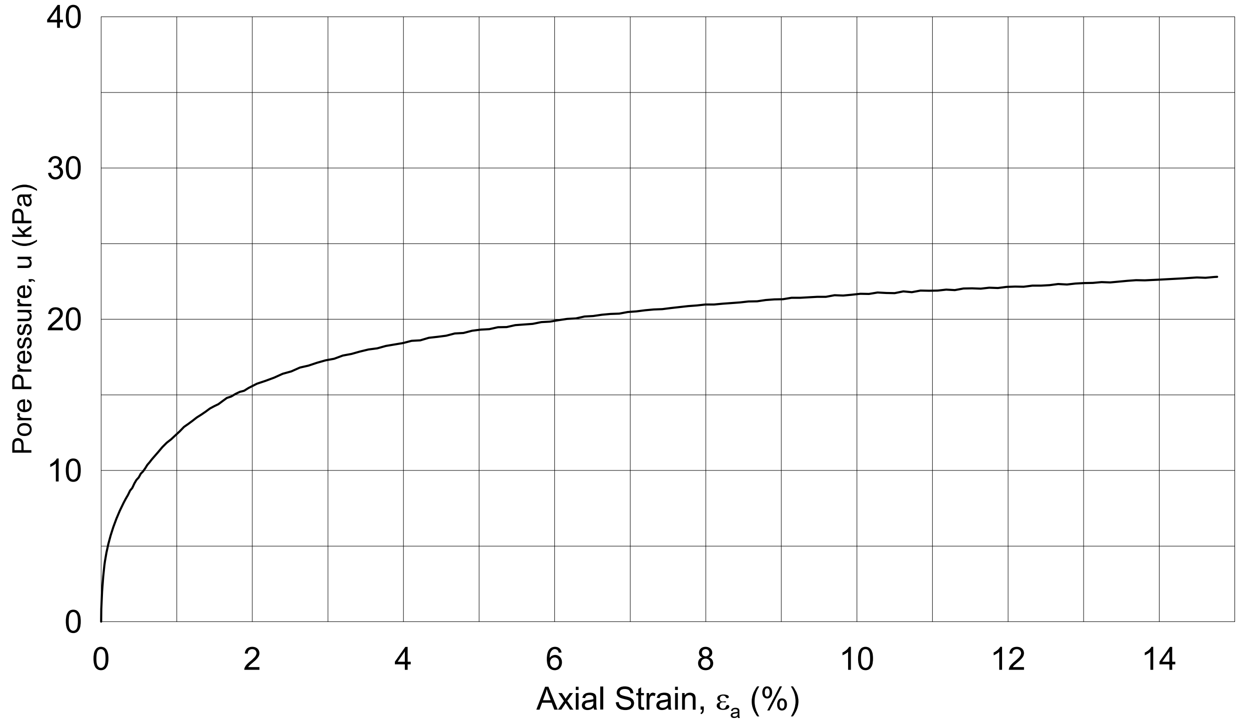
Figure No. 5.3.51

Date 2018-12-10

Drawn by/checked ThV / GS

BH8-1-2-B-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.52

Triaxial test: **CAUC**

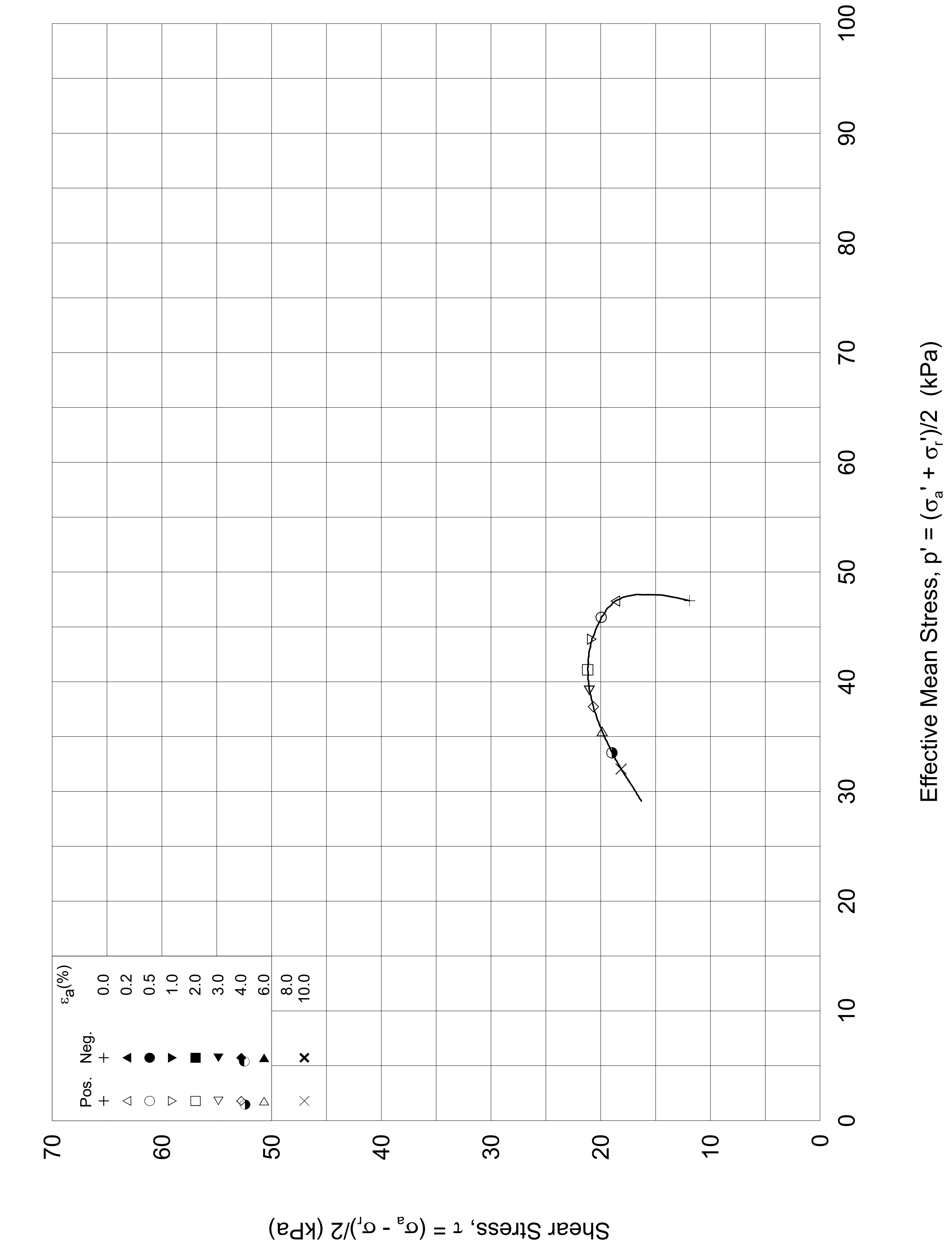
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB12**	Depth =	**9.37**	m	Consolidation stresses			
Tube:	**2-2**	po' =	**59.2**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**43.5**	%	σ_{ac}' =	-	-	**59.2**
Test:	**1**	w_c =	**40.9**	%	σ_{rc}' =	-	-	**35.5**

NGI

BH8-2-2-B-1.Plot1.grf

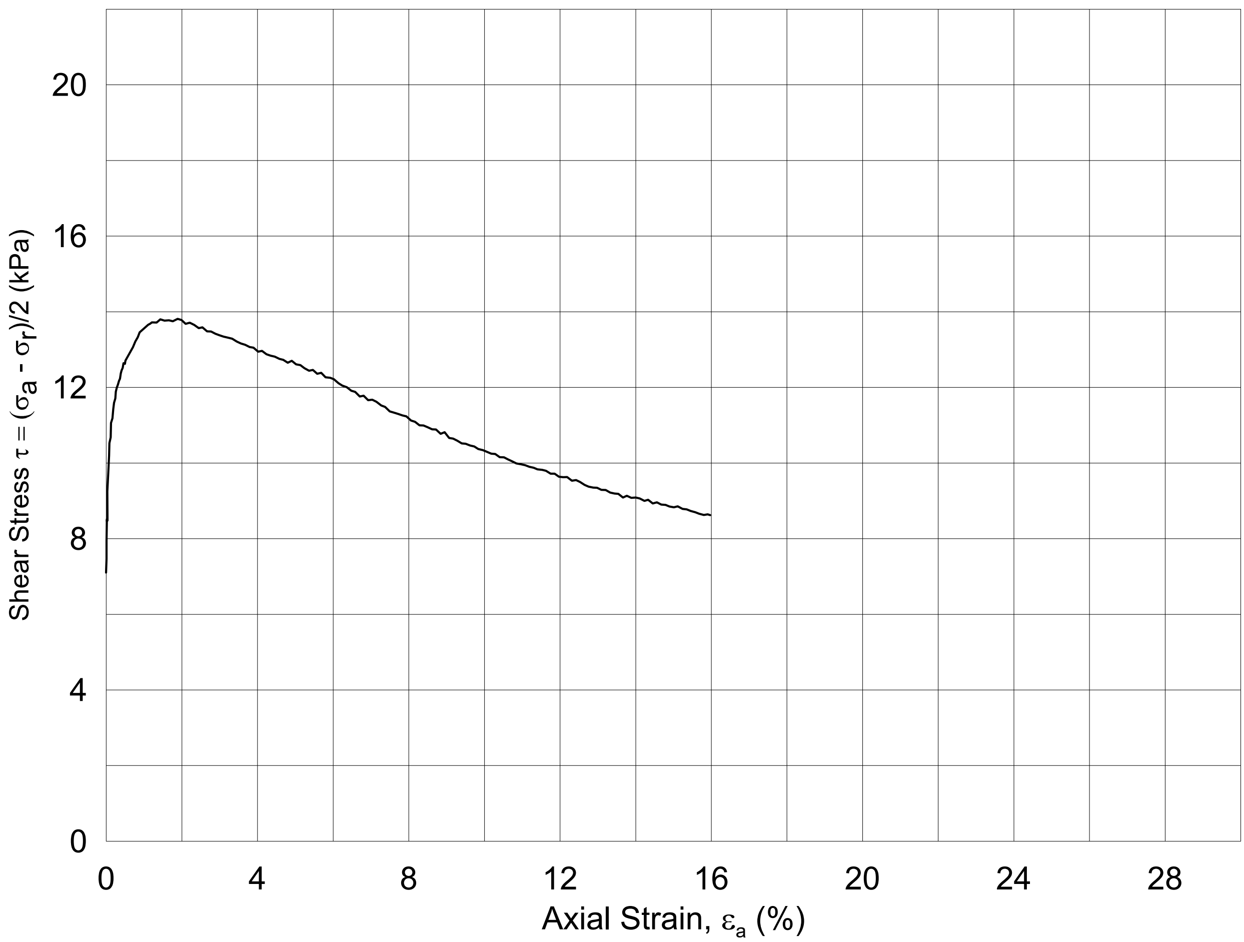


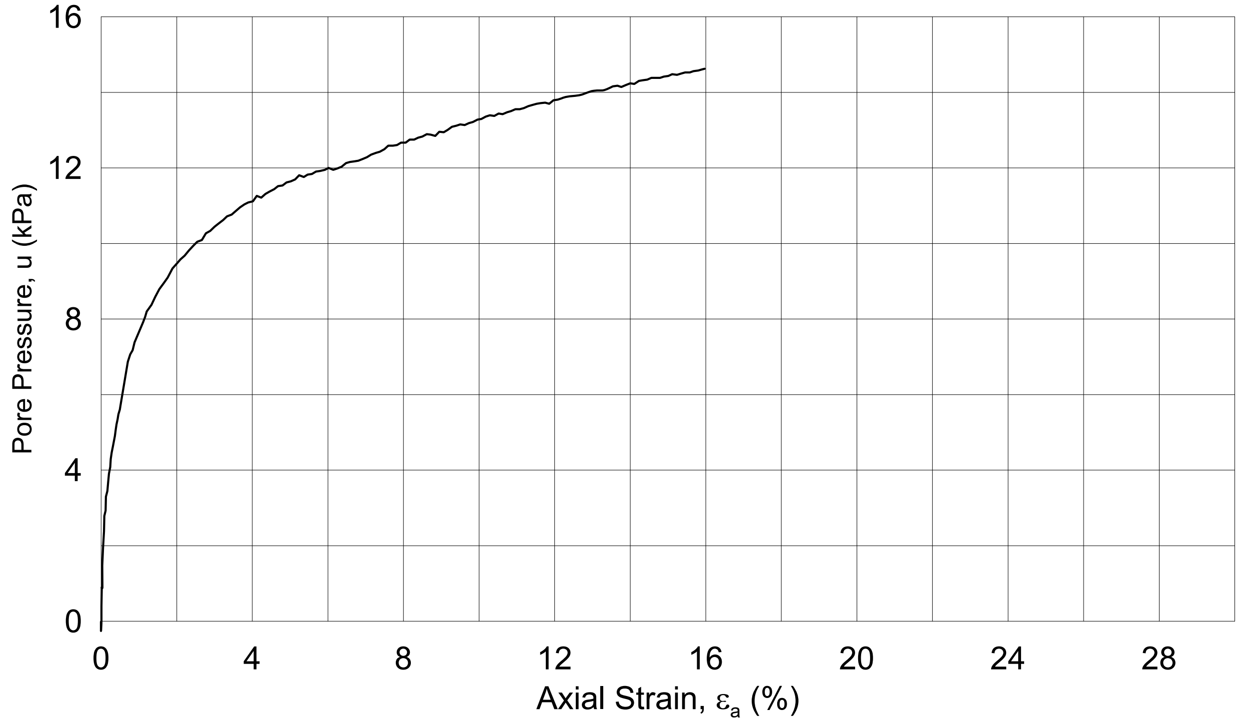
Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**							Document No.	20160154-10-R
							Figure No.	5.3.53
Boring: **ONSB12**	Depth =	**9.37**	m	Consolidation stresses			Date: 2018-12-10	Drawn by/checked: ThV / GS
Tube: **2-2**	po' =	**59.2**	kPa	(kPa)	max.	min.	final	
Part: **B**	w_i =	**43.5**	%	σ_{ac}' =	-	-	**59.2**	
Test: **1**	w_c =	**40.9**	%	σ_{rc}' =	-	-	**35.5**	

BH8-2-2-B-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

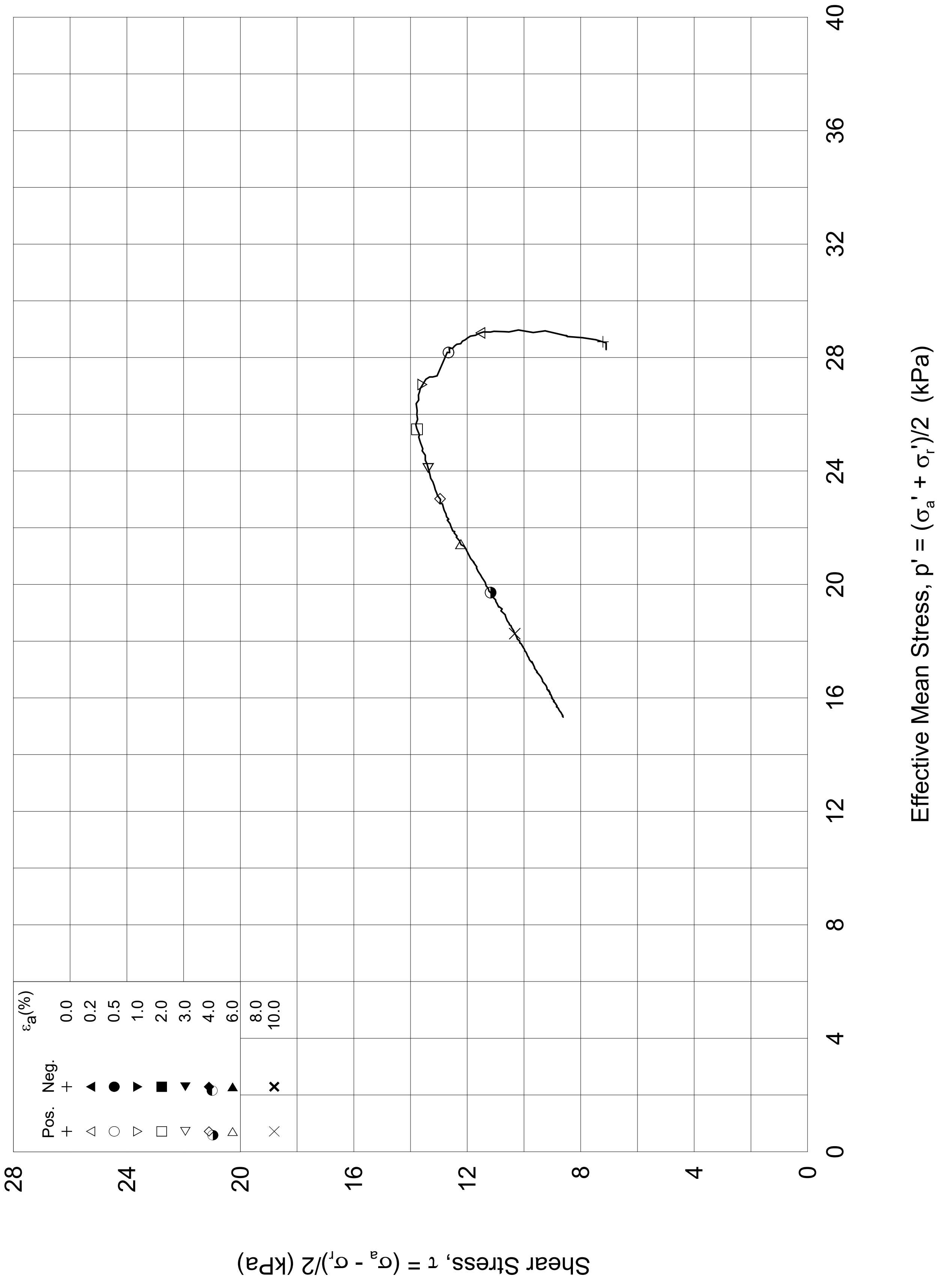
Triaxial test: **CAUC**

Figure No. 5.3.54

Boring:	**ONSB13**	Depth =	**6.10**	m	Consolidation stresses				Date 2018-12-10 / Drawn by/checked ThV / GS
Tube:	**1-2**	po' =	**35.4**	kPa	(kPa)	max.	min.	final	
Part:	**B**	w_i =	**64.2**	%	σ_{ac}' =	-	-	**35.3**	
Test:	**1**	w_c =	**62.5**	%	σ_{rc}' =	-	-	**21.1**	

NGI

BH9-1-2-B-1.Plot1.grf



Dato/rev.: 2014-12-23/01

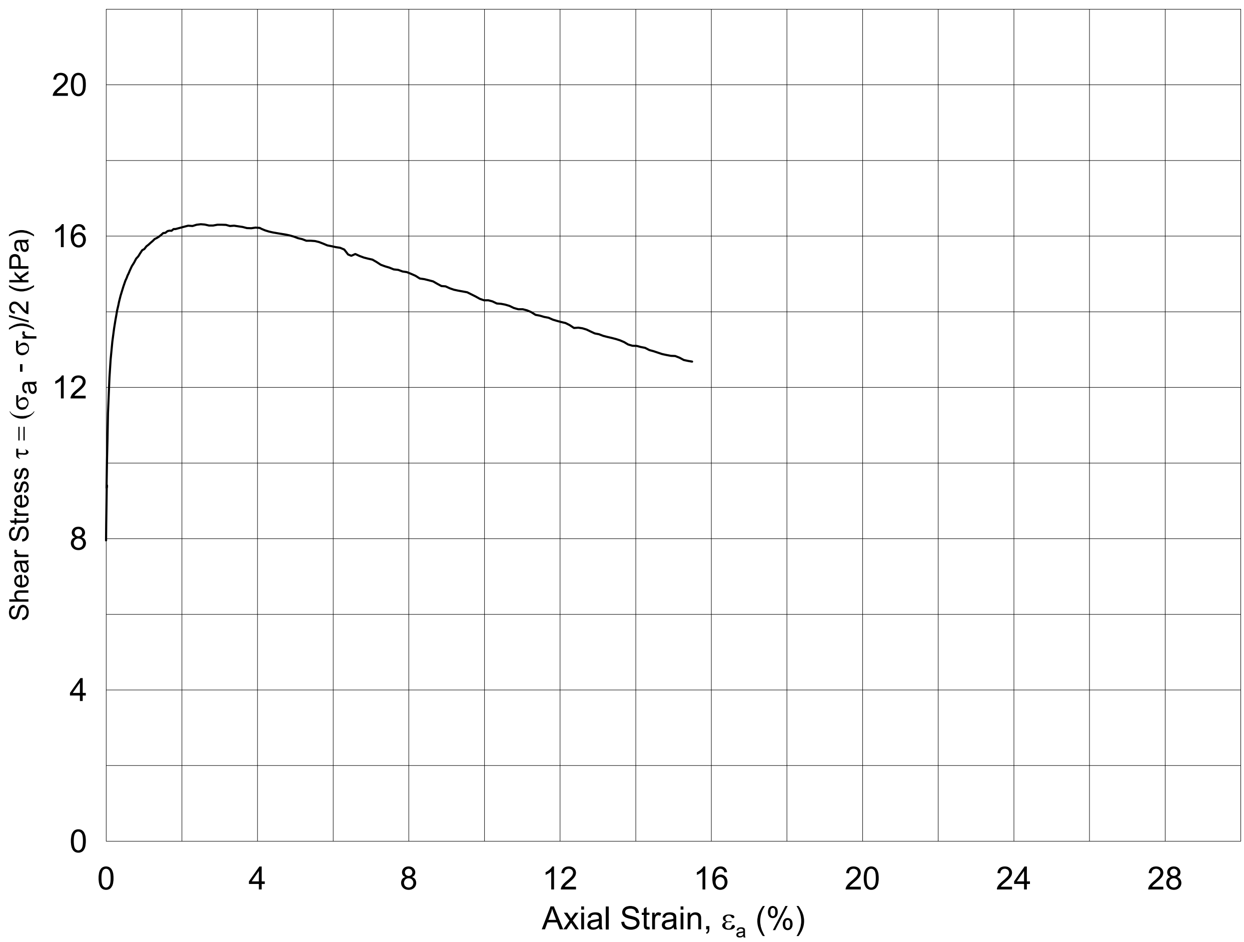
Norwegian GeoTest Sites - Onsøy

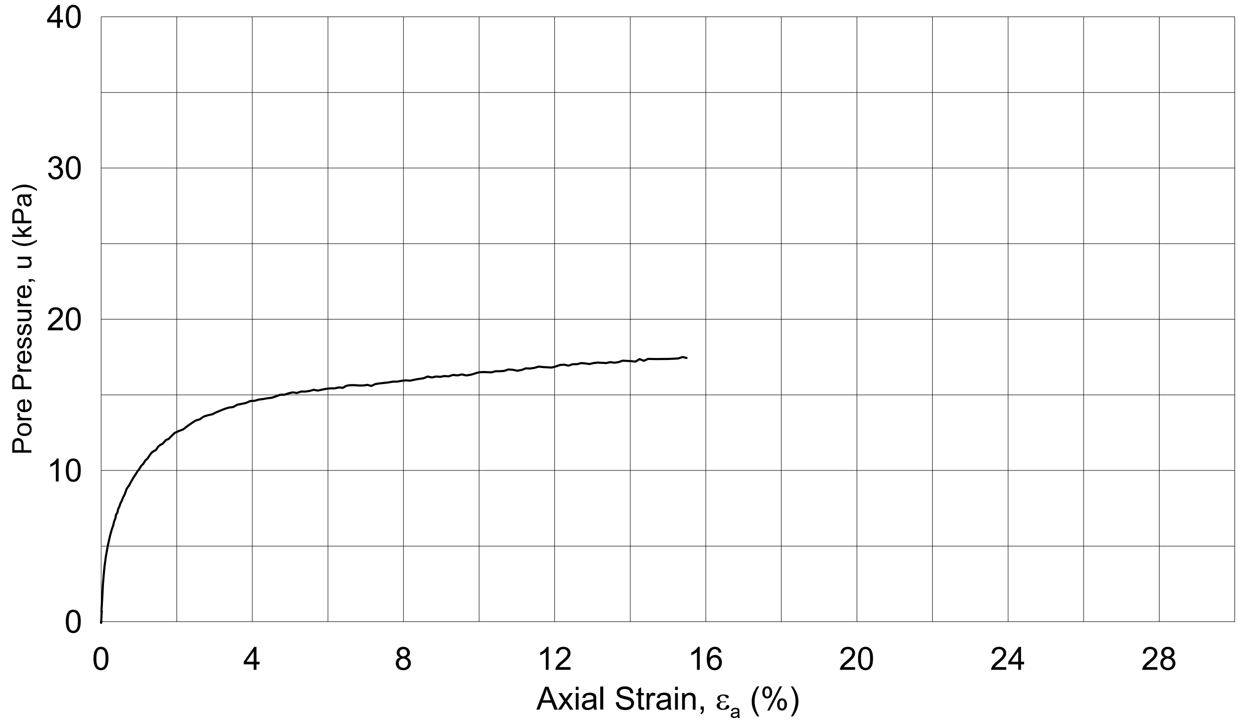
Triaxial test: **CAUC**									
Boring:	**ONSB13**	Depth =	**6.10**	m	Consolidation stresses				
Tube:	**1-2**	po' =	**35.4**	kPa	(kPa)	max.	min.	final	
Part:	**B**	w_i =	**64.2**	%	σ_{ac}' =	-	-	**35.3**	
Test:	**1**	w_c =	**62.5**	%	σ_{rc}' =	-	-	**21.1**	

Document No.	20160154-10-R
Figure No.	5.3.55
Date	2018-12-10
Drawn by/checked	ThV / GS

NGI

BH9-1-2-B-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Triaxial test: **CAUC**

Figure No. 5.3.56

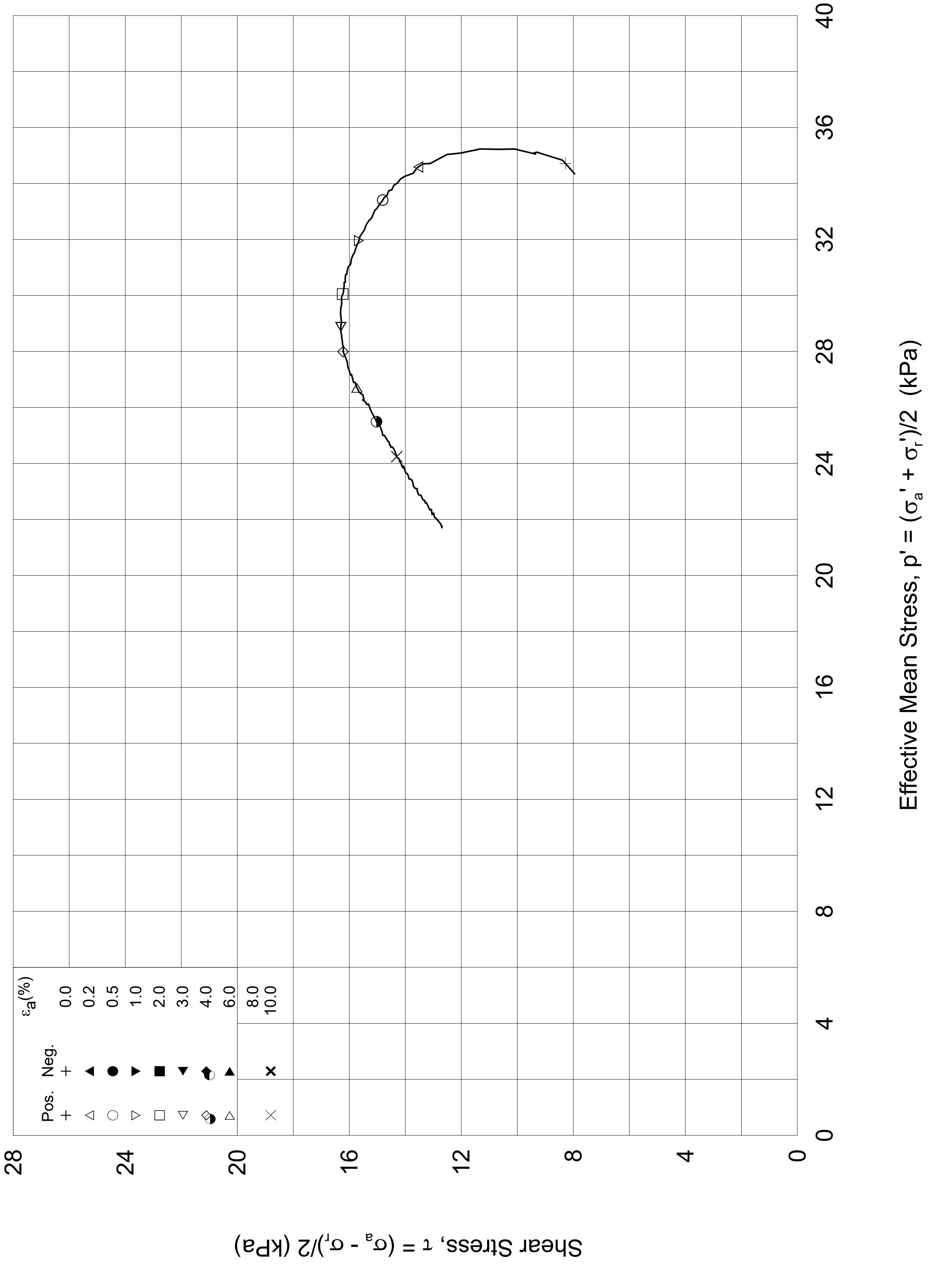
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB13**	Depth =	**7.04**		m	Consolidation stresses			
Tube:	**1-3**	po'	=	**42.4**	kPa	(kPa)	max.	min.	final
Part:	**A**	w_i	=	**54.9**	%	σ_{ac}' =	-	-	**42.3**
Test:	**1**	w_c	=	**51.6**	%	σ_{rc}' =	-	-	**26.4**

NGI

BH9-1-3-A-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**						
Boring: **ONSB13**	Depth = **7.04** m	Consolidation stresses				
Tube: **1-3**	po' = **42.4** kPa	(kPa)	max.	min.	final	
Part: **A**	w_i = **54.9** %	σ_{ac}' =	-	-	**42.3**	
Test: **1**	w_c = **51.6** %	σ_{rc}' =	-	-	**26.4**	

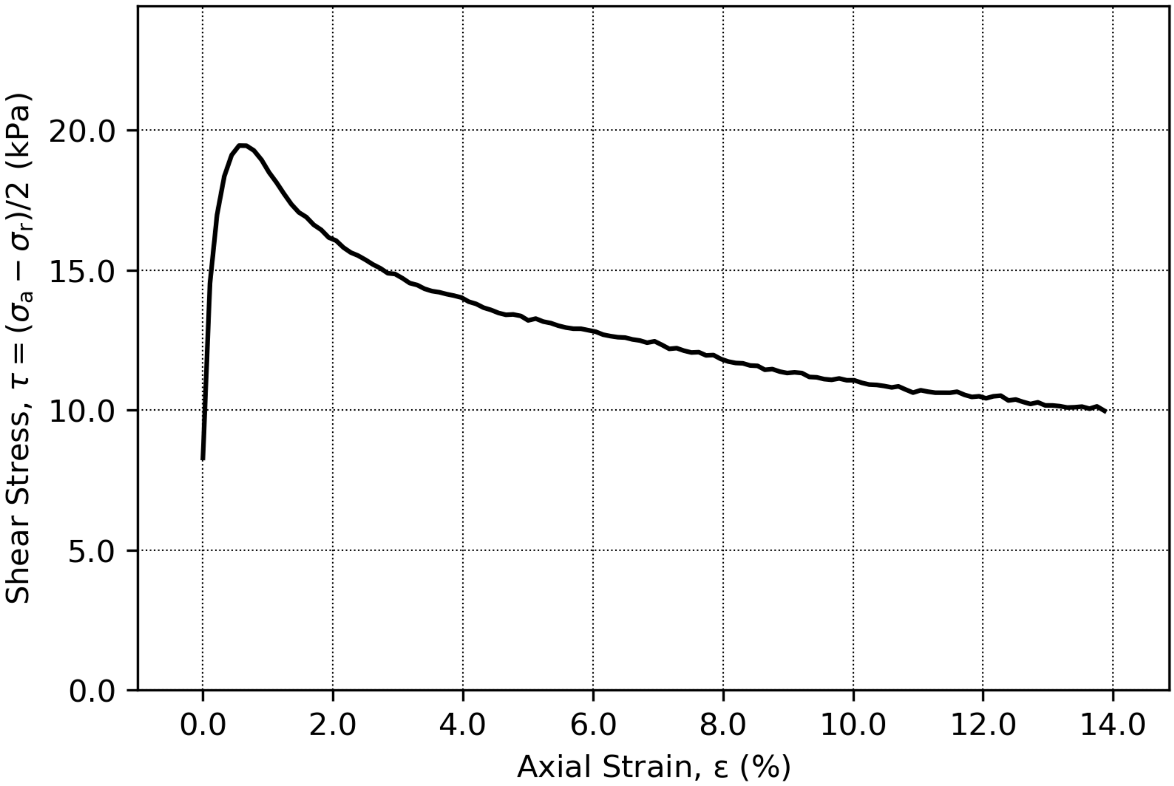
Document No. 20160154-10-R

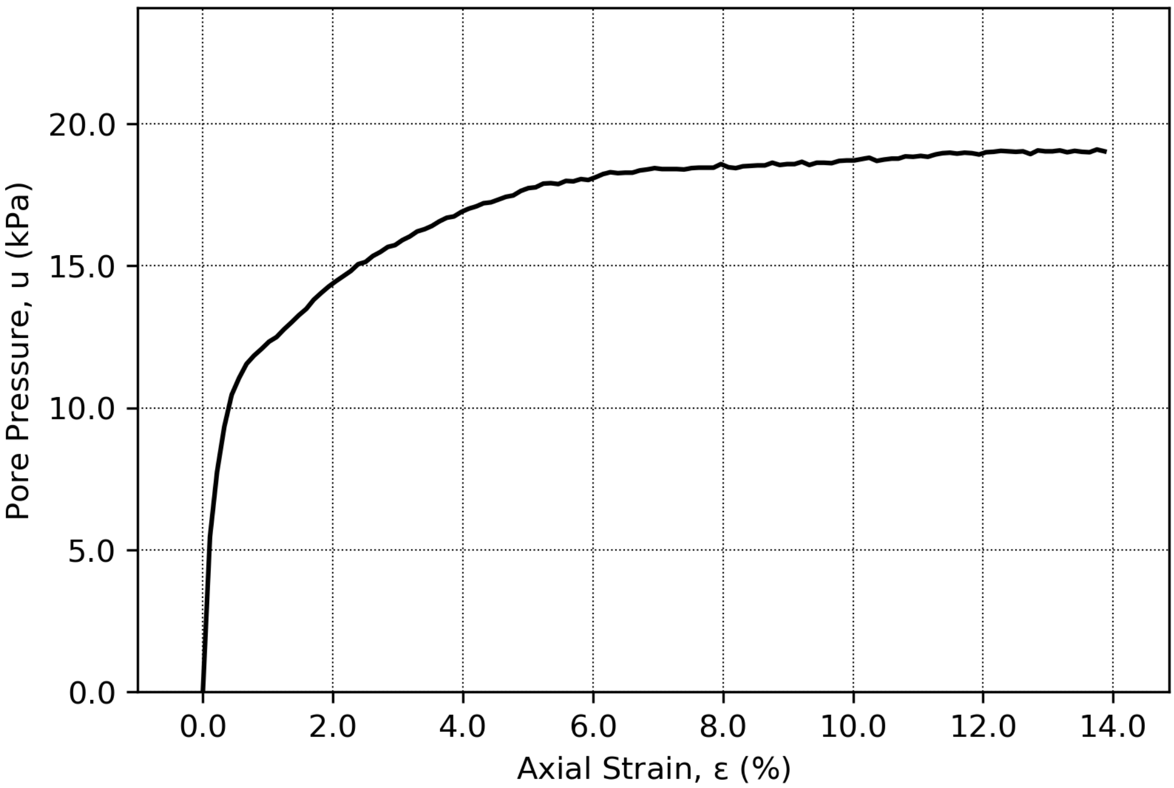
Figure No. 5.3.57

Date 2018-12-10

Drawn by/checked ThV / GS

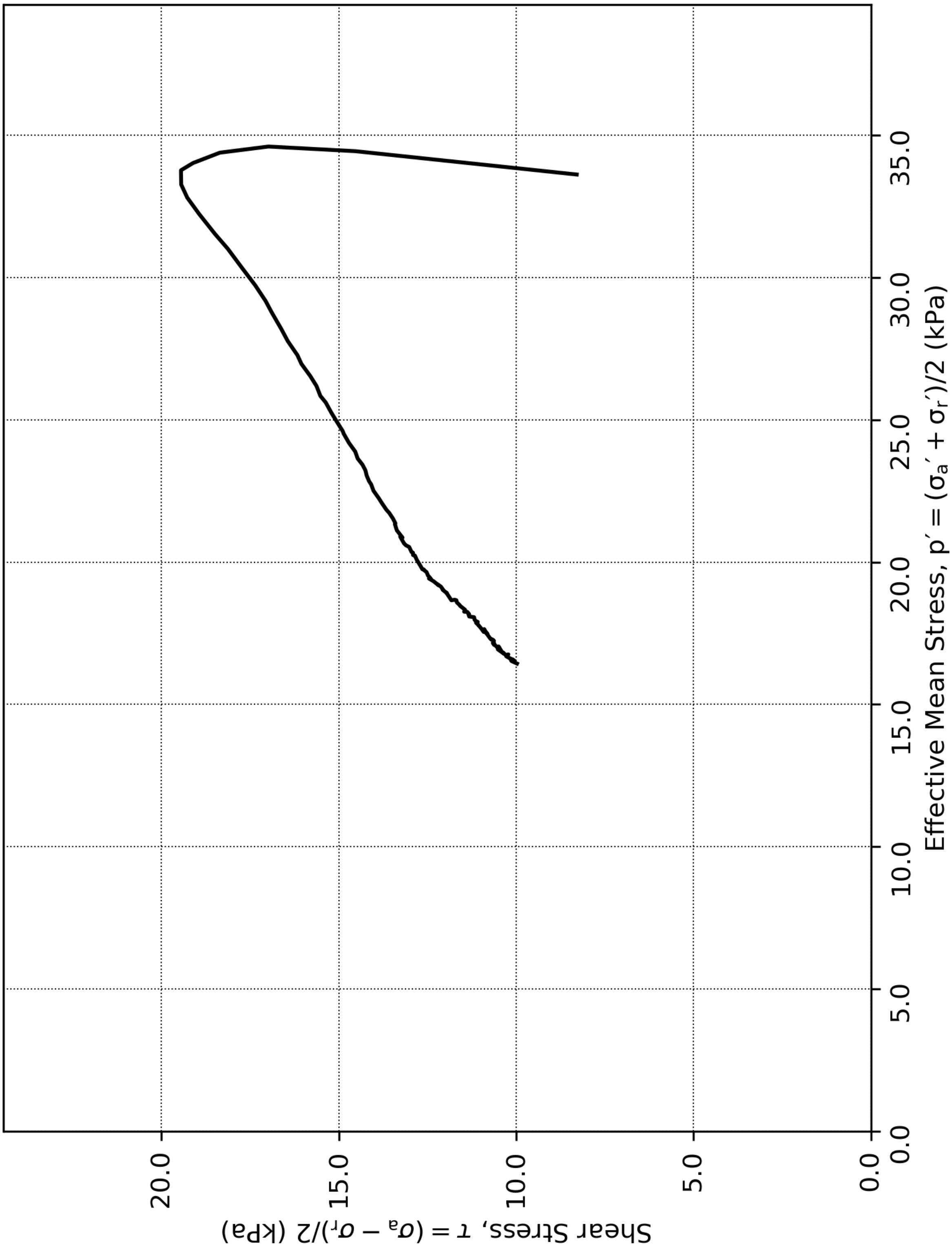
BH9-1-3-A-1.Plot2.grf





Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.58
Boring:	ONSB01	Depth = 6.96	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	1	p_0' = 42.1	kPa	(kPa)	max.	min.	final	
Part:	B	w_i = 64.6	%	σ_{ac}'	-	-	42.2	
Test:	1	w_c = 64.0	%	σ_{rc}'	-	-	25.3	

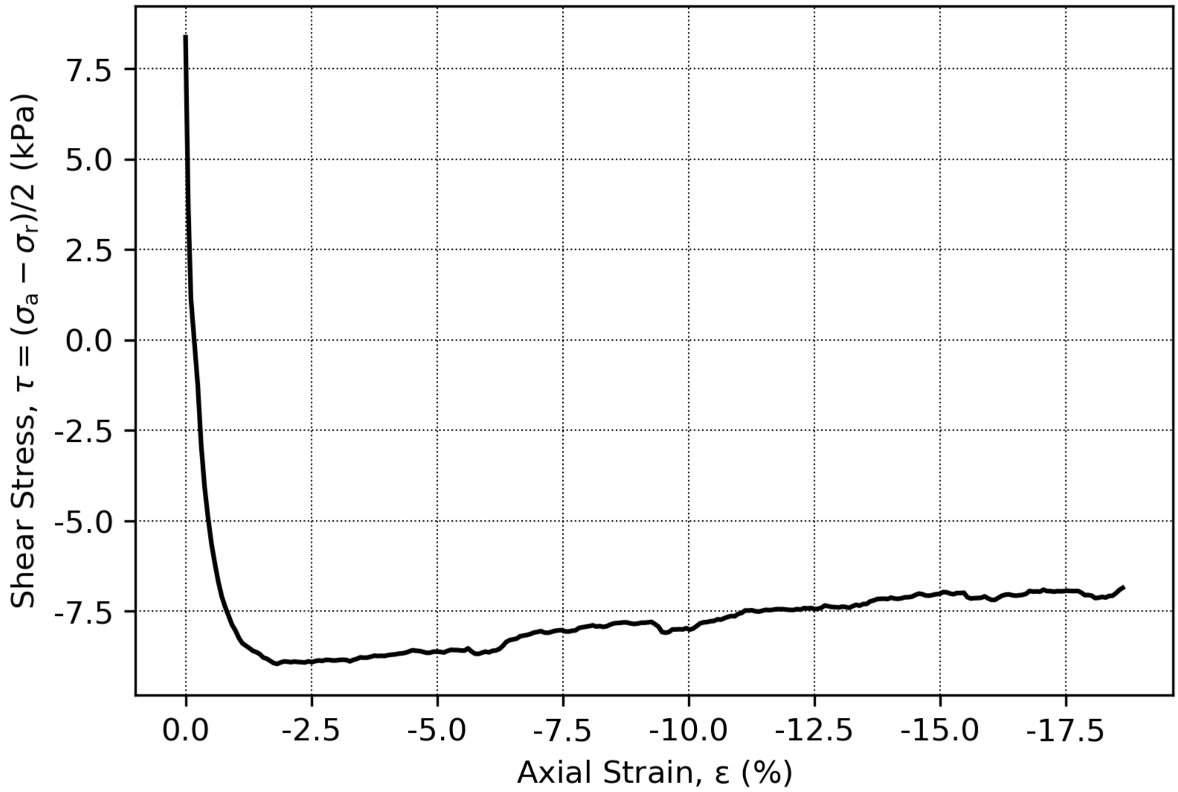
P:\2016\01\20160154\Lab\Onsøy\Triax

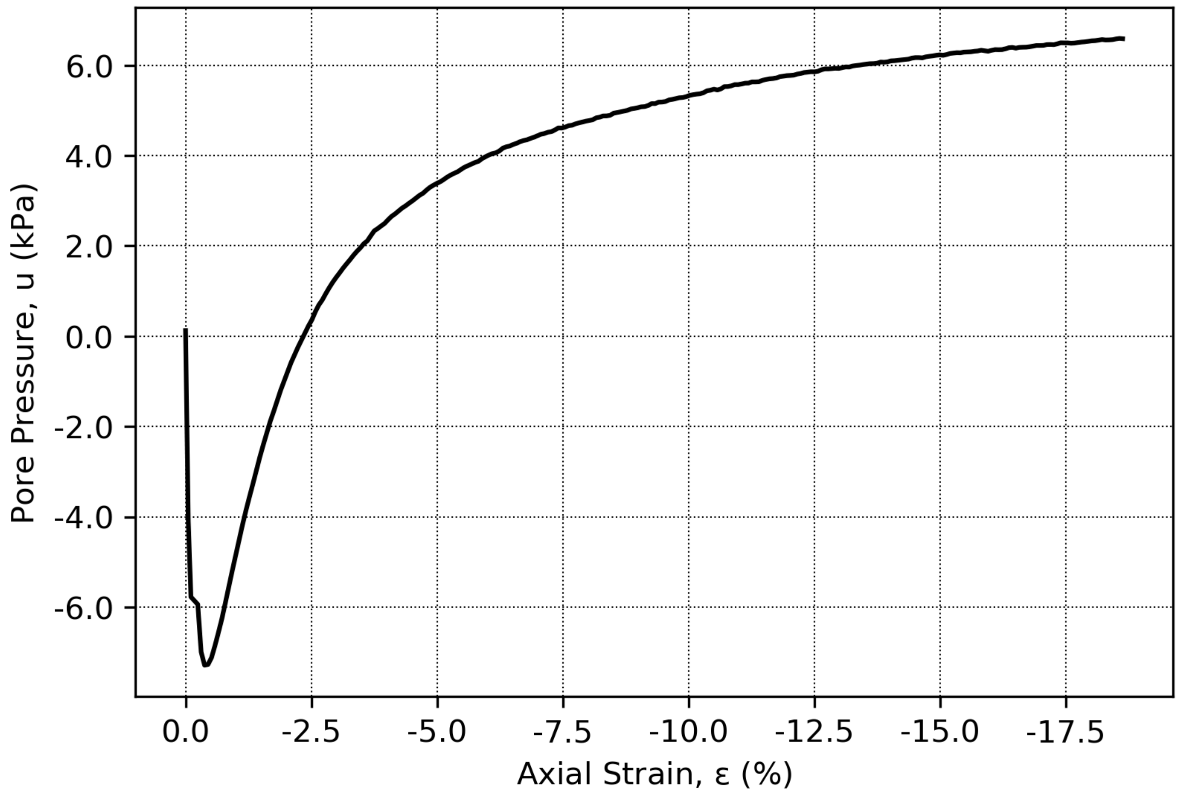


Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.59
Boring:	ONSB01	Depth	= 6.96	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	1	p_0'	= 42.1	kPa	(kPa)	max.	min.	final
Part:	B	w_i	= 64.6	%	σ_{ac}'	-	-	42.2
Test:	1	w_c	= 64.0	%	σ_{rc}'	-	-	25.3

NGI

P:\2016\01\20160154\Lab\Onsøy\Triax

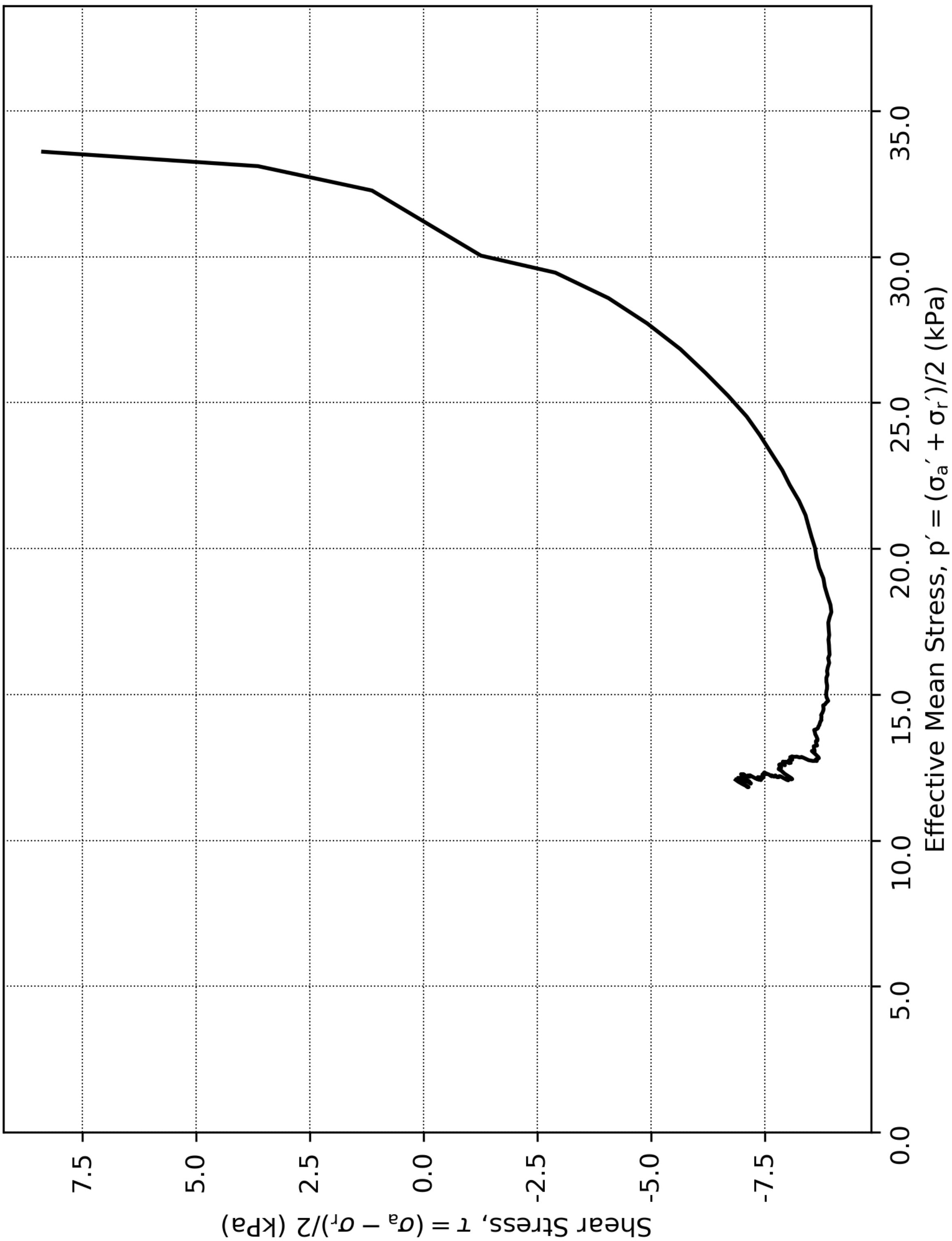




P:\2016\01\20160154\Lab\Onsøy\Triax

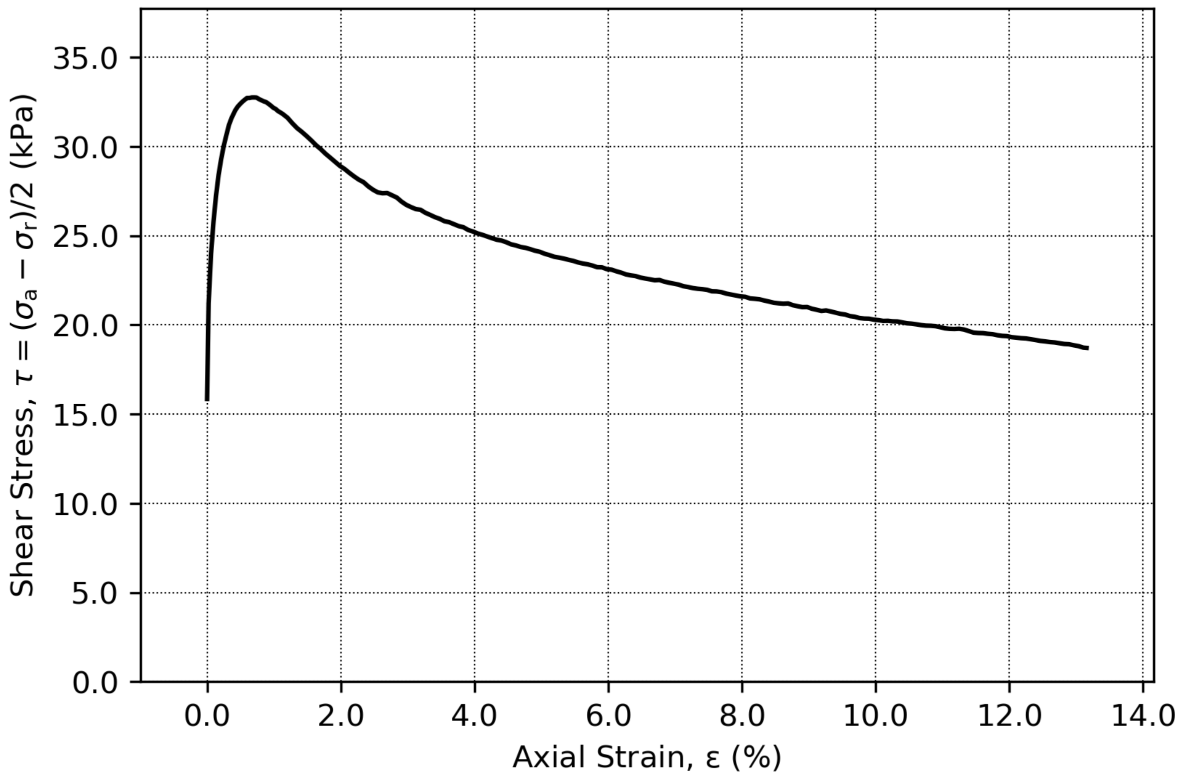
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUE								Figure No. 5.3.60
Boring:	ONSB01	Depth = 6.96	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	1	p_0' = 42.1	kPa	(kPa)	max.	min.	final	
Part:	B	w_i = 65.5	%	σ_{ac}'	-	-	42.1	
Test:	2	w_c = 64.8	%	σ_{rc}'	-	-	25.3	

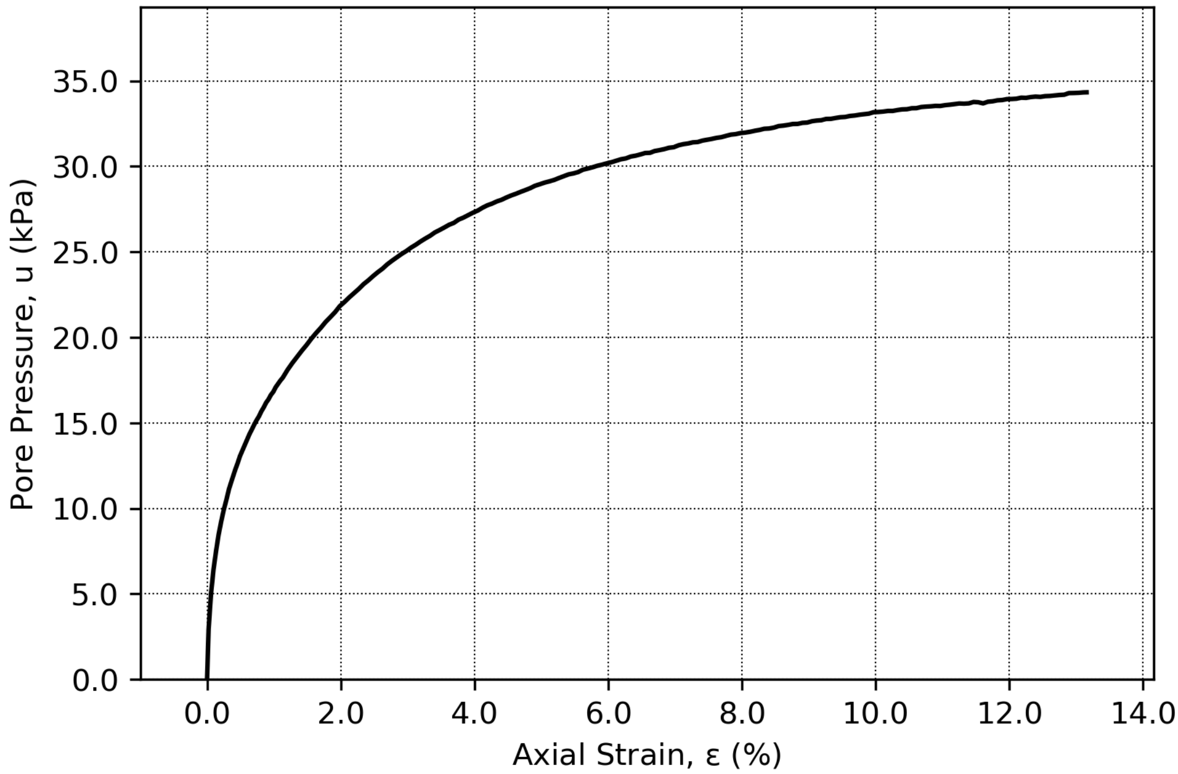
NGI



Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUE							Figure No. 5.3.61	
Boring:	ONSB01	Depth = 6.96	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	1	p_0' = 42.1	kPa	(kPa)	max.	min.	final	
Part:	B	w_i = 65.5	%	σ_{ac}'	-	-	42.1	
Test:	2	w_c = 64.8	%	σ_{rc}'	-	-	25.3	

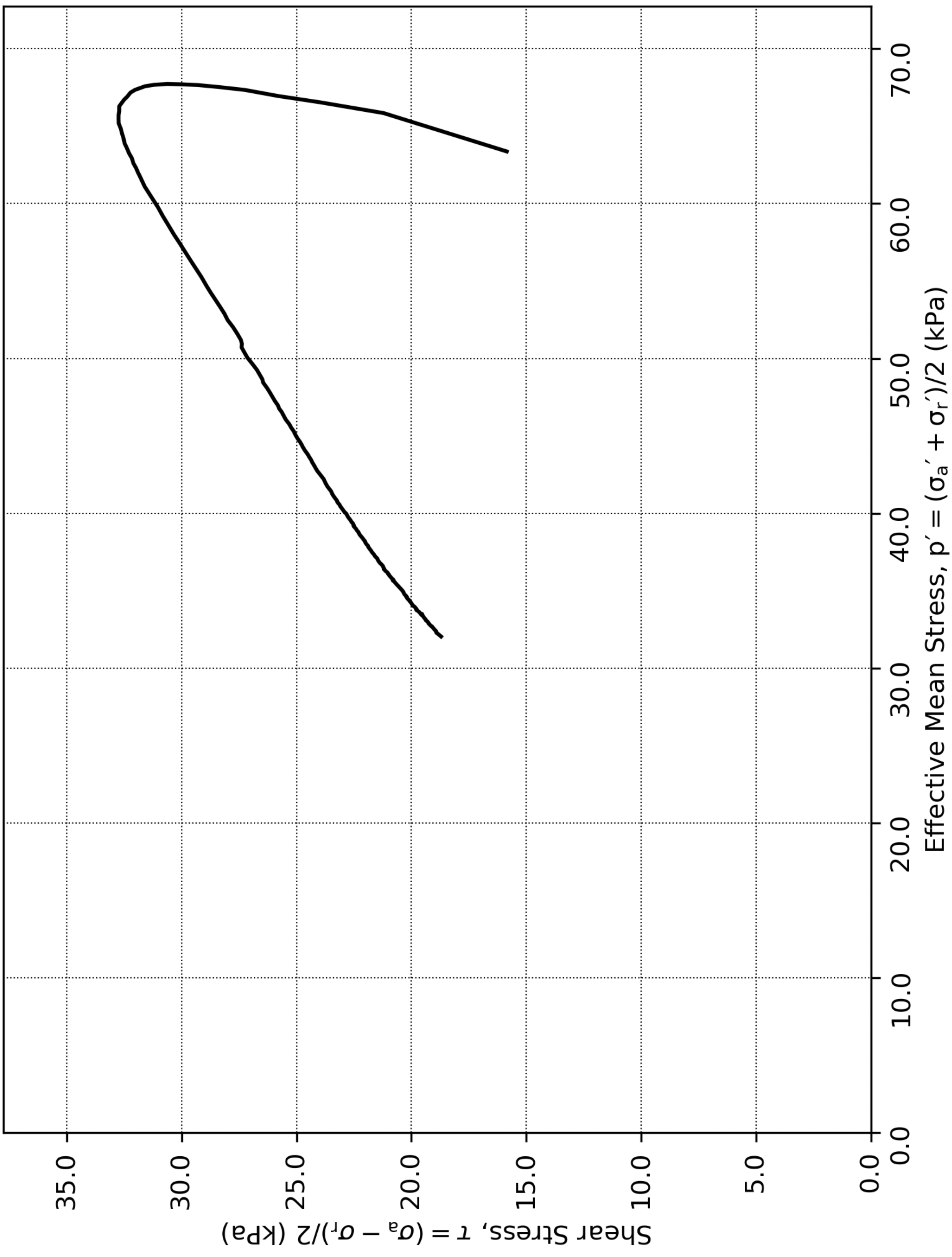
P:\2016\01\20160154\Lab\Onsøy\Triax





Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R	
Triaxial test: CAUE										Figure No. 5.3.62	
Boring:	ONSB01	Depth	= 12.1	m	Consolidation stresses					Date 2018-12-10	Drawn by AGu
Tube:	3	p_0'	= 79.3	kPa	(kPa)	max.	min.	final			
Part:	B	w_i	= 46.1	%	σ_{ac}'	-	-	79.3			
Test:	1	w_c	= 45.5	%	σ_{rc}'	-	-	47.6			

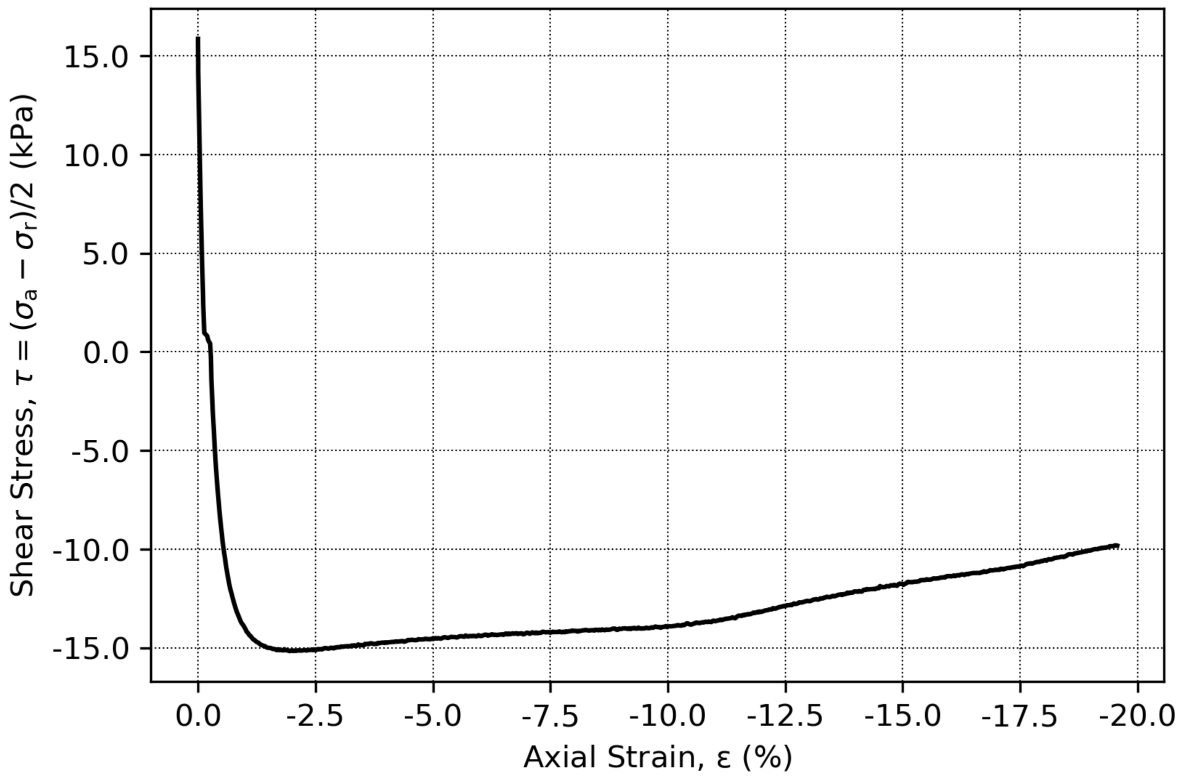
P:\2016\01\20160154\Lab\Onsøy\Triax

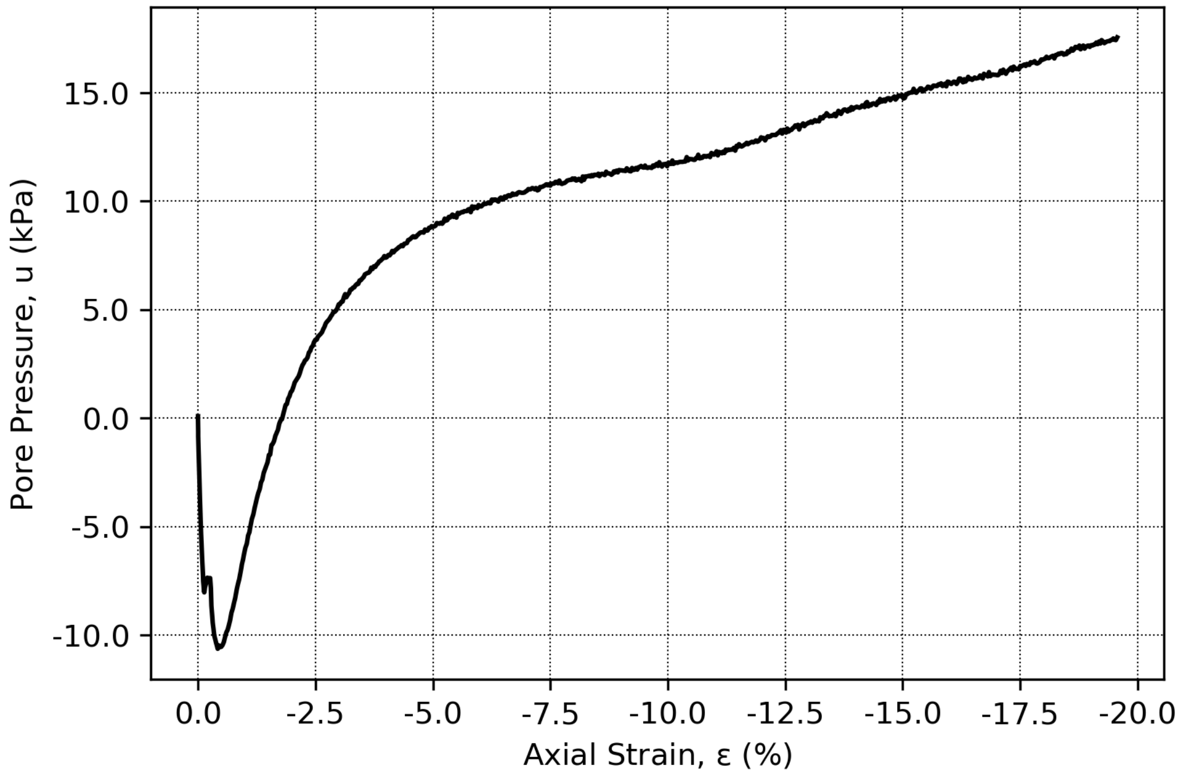


Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUE							Figure No. 5.3.63	
Boring: ONSB01	Depth = 12.1	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube: 3	p_0' = 79.3	kPa	(kPa)	max.	min.	final		
Part: B	w_i = 46.1	%	σ_{ac}'	-	-	79.3		
Test: 1	w_c = 45.5	%	σ_{rc}'	-	-	47.6		

NGI

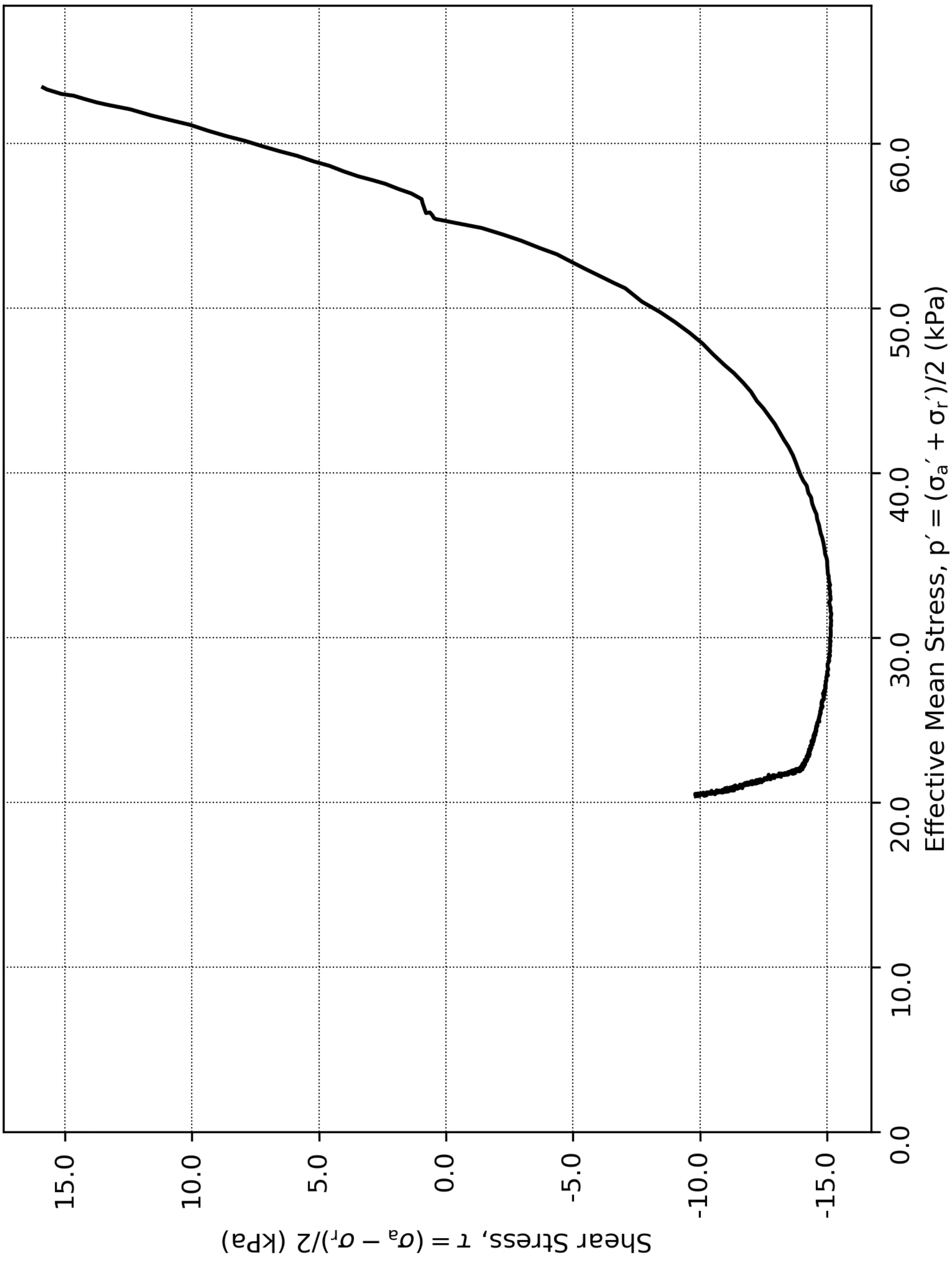
P:\2016\01\20160154\Lab\Onsøy\Triax





Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUE								Figure No. 5.3.64	
Boring:	ONSB01	Depth	= 12.1	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	3	p_0'	= 79.3	kPa	(kPa)	max.	min.	final	
Part:	B	w_i	= 45.3	%	σ_{ac}'	-	-	79.2	
Test:	2	w_c	= 44.8	%	σ_{rc}'	-	-	47.6	

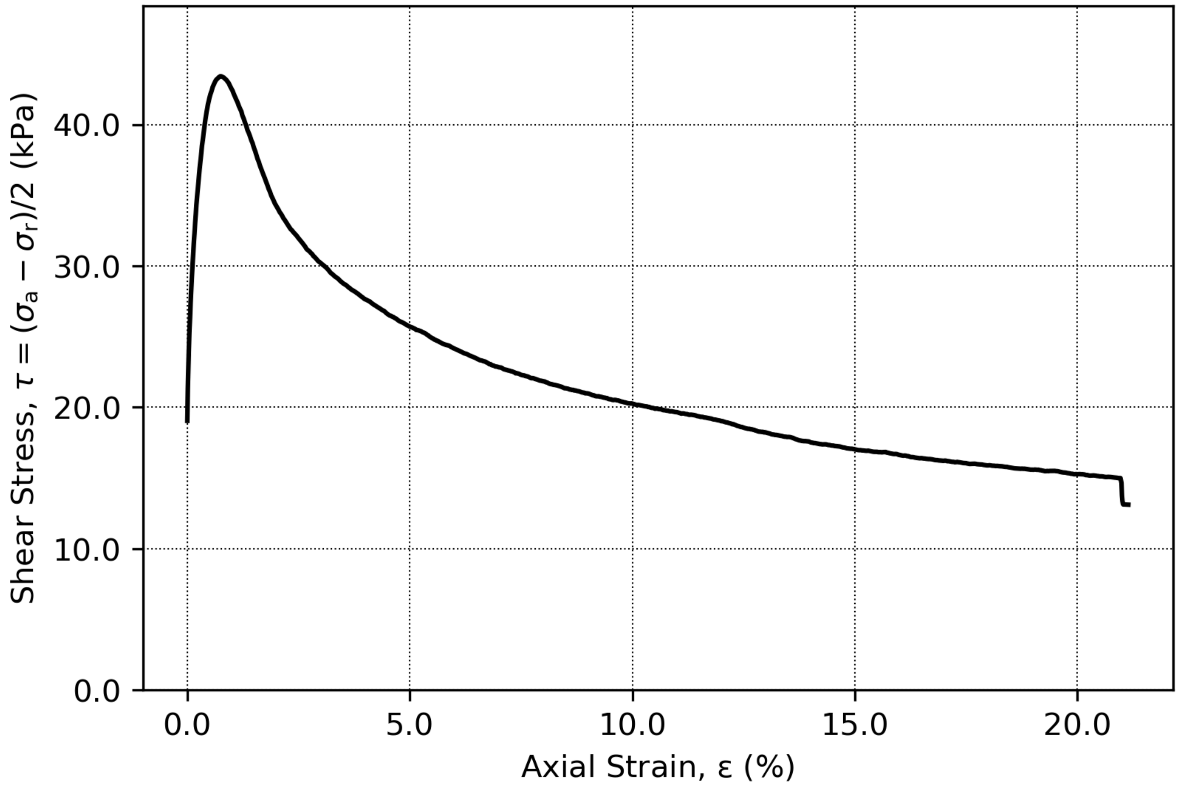
P:\2016\01\20160154\Lab\Onsøy\Triax

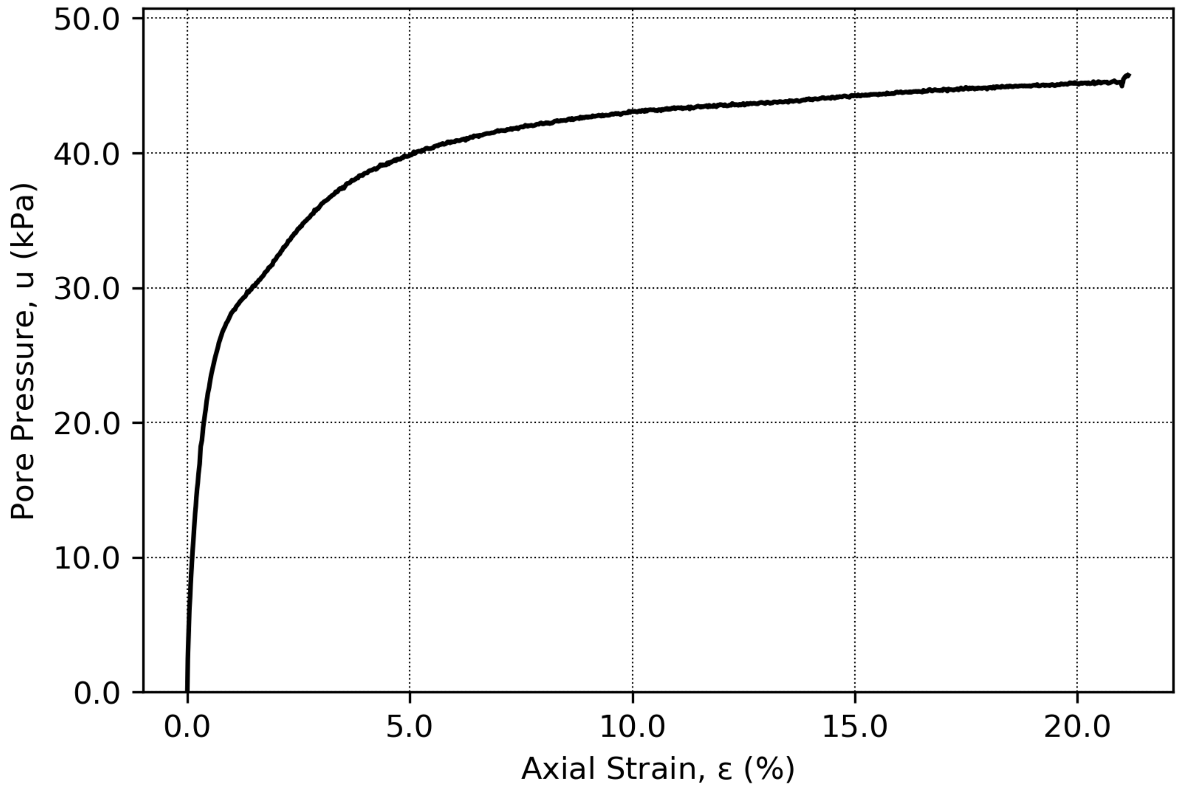


Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUE							Figure No. 5.3.65
Boring:	ONSB01	Depth = 12.1	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	3	p_0' = 79.3	kPa	(kPa)	max.	min.	final
Part:	B	w_i = 45.3	%	σ_{ac}'	-	-	79.2
Test:	2	w_c = 44.8	%	σ_{rc}'	-	-	47.6

NGI

P:\2016\01\20160154\Lab\Onsøy\Triax

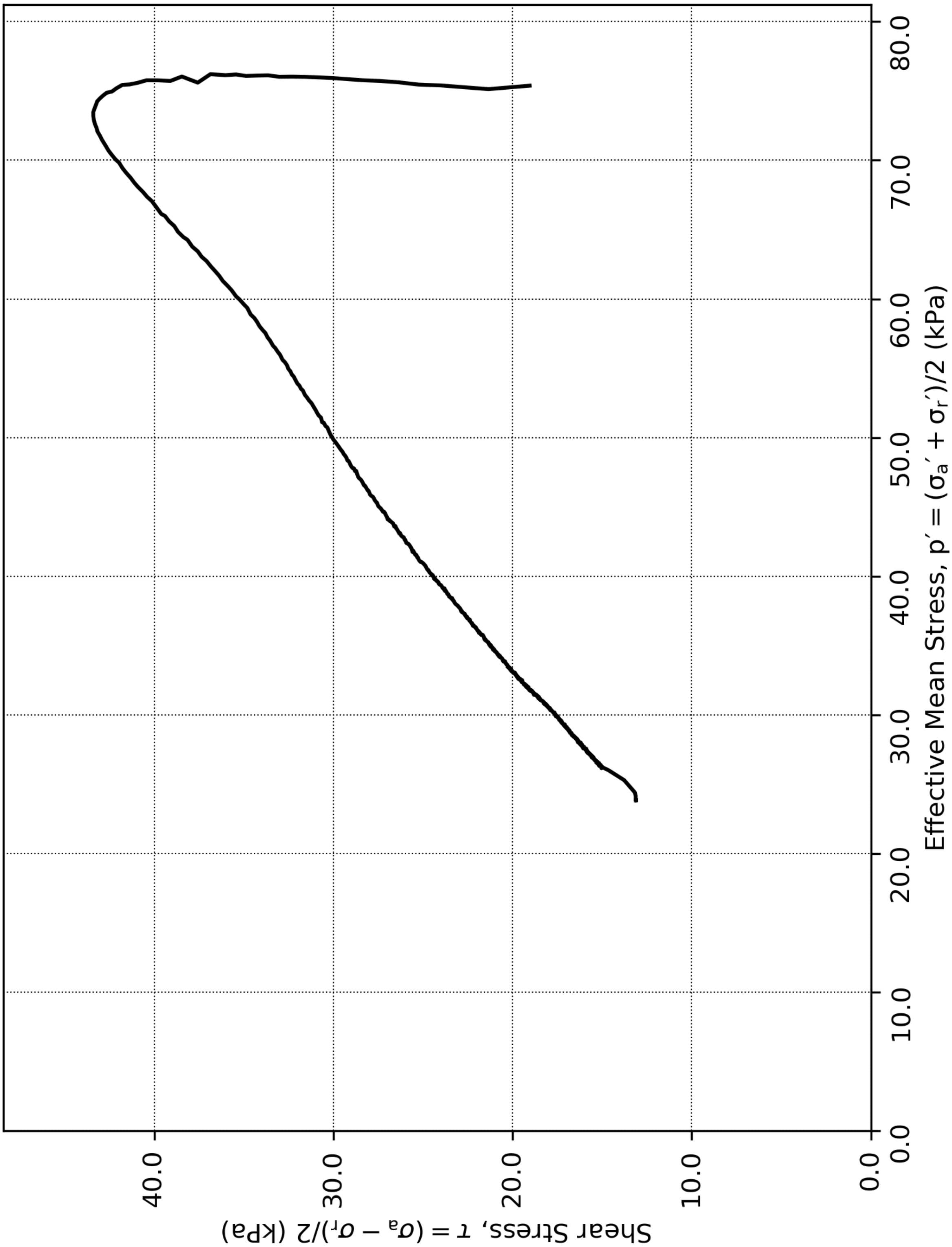




P:\2016\01\20160154\Lab\Onsøy\Triax

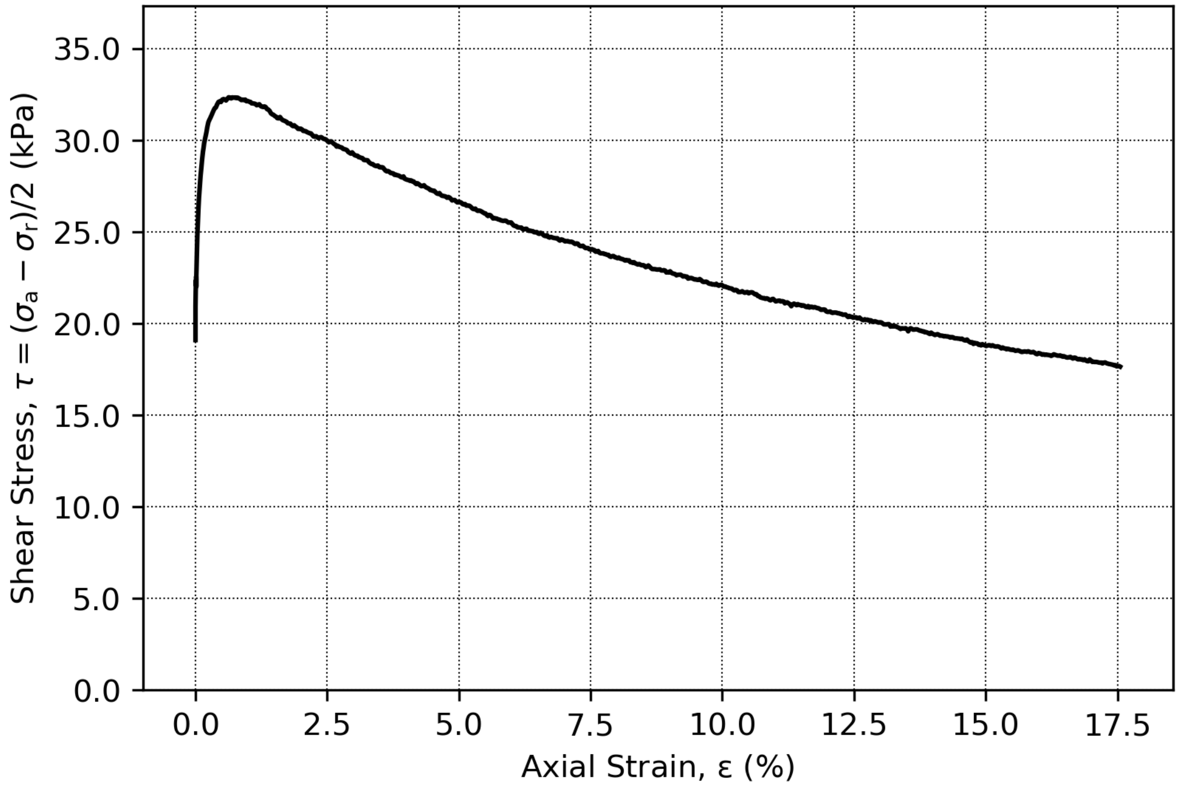
Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R
Triaxial test: CAUc										Figure No. 5.3.66
Boring:	ONSB01	Depth	= 14.1	m	Consolidation stresses					Date 2018-12-10 / Drawn by AGu
Tube:	4	p_0'	= 93.8	kPa	(kPa)	max.	min.	final		
Part:	B	w_i	= 70.4	%	σ_{ac}'	-	-	93.9		
Test:	1	w_c	= 68.6	%	σ_{rc}'	-	-	56.2		

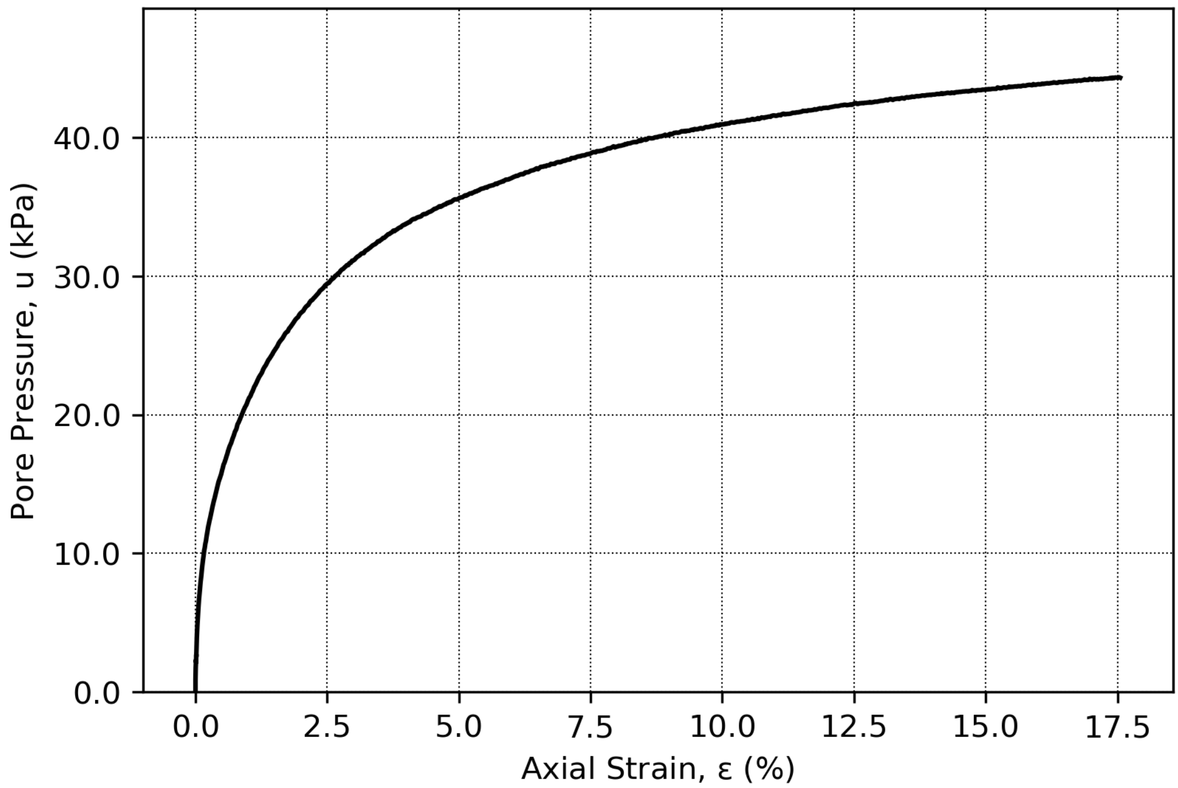
NGI



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUc								Figure No. 5.3.67	
Boring:	ONSB01	Depth	= 14.1	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	4	p_0'	= 93.8	kPa	(kPa)	max.	min.	final	
Part:	B	w_i	= 70.4	%	σ_{ac}'	-	-	93.9	
Test:	1	w_c	= 68.6	%	σ_{rc}'	-	-	56.2	

P:\2016\01\20160154\Lab\Onsøy\Triax

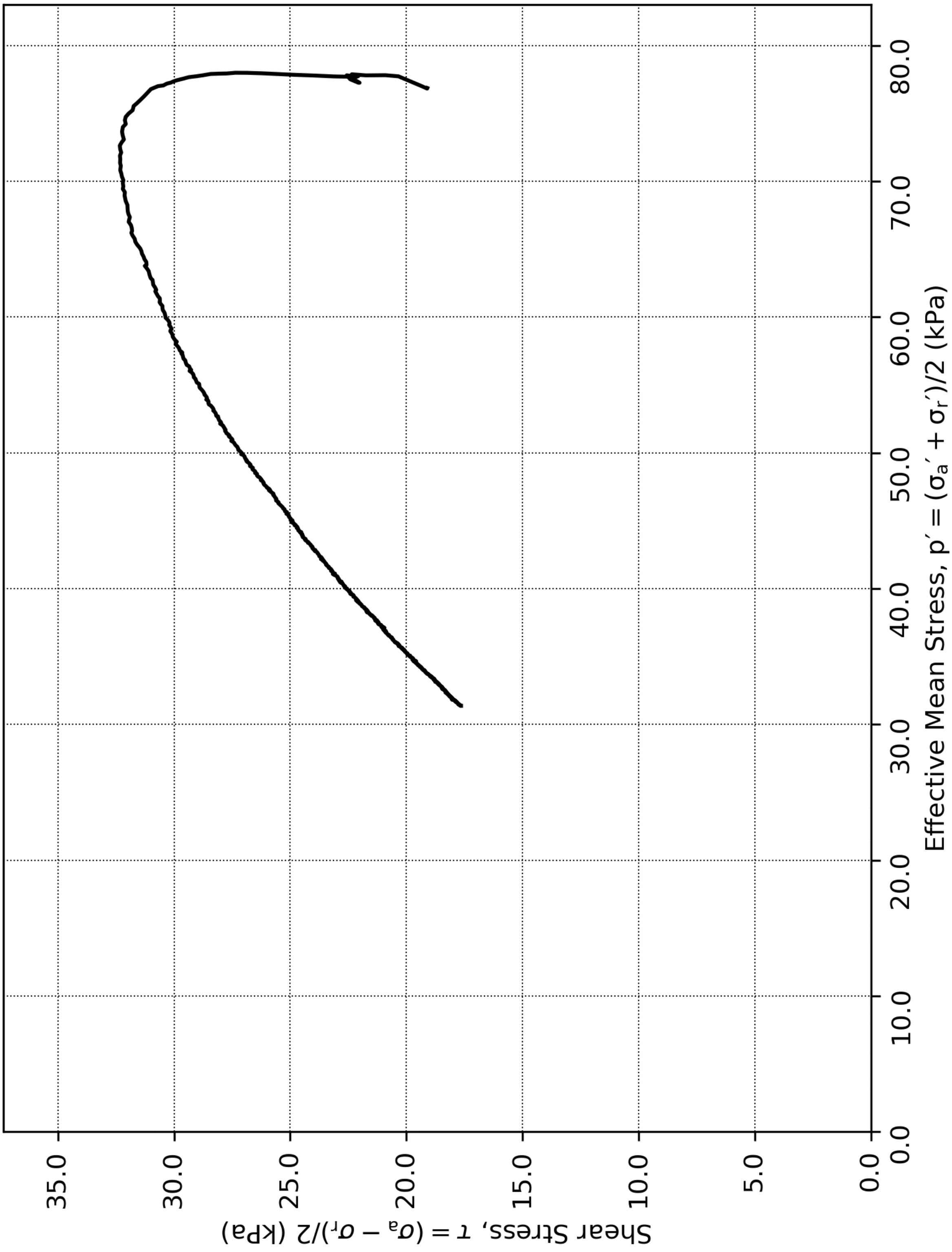




Norwegian GeoTest Sites - Onsøy						Document No. 20160154-10-R
Triaxial test: CAUC						Figure No. 5.3.68
Boring: ONSB01	Depth = 14.52	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube: 5	p_0' = 96.6	kPa	(kPa)	max.	min.	final
Part: B	w_i = 70.2	%	σ_{ac}'	-	-	96.0
Test: 1	w_c = 60.2	%	σ_{rc}'	-	-	57.8

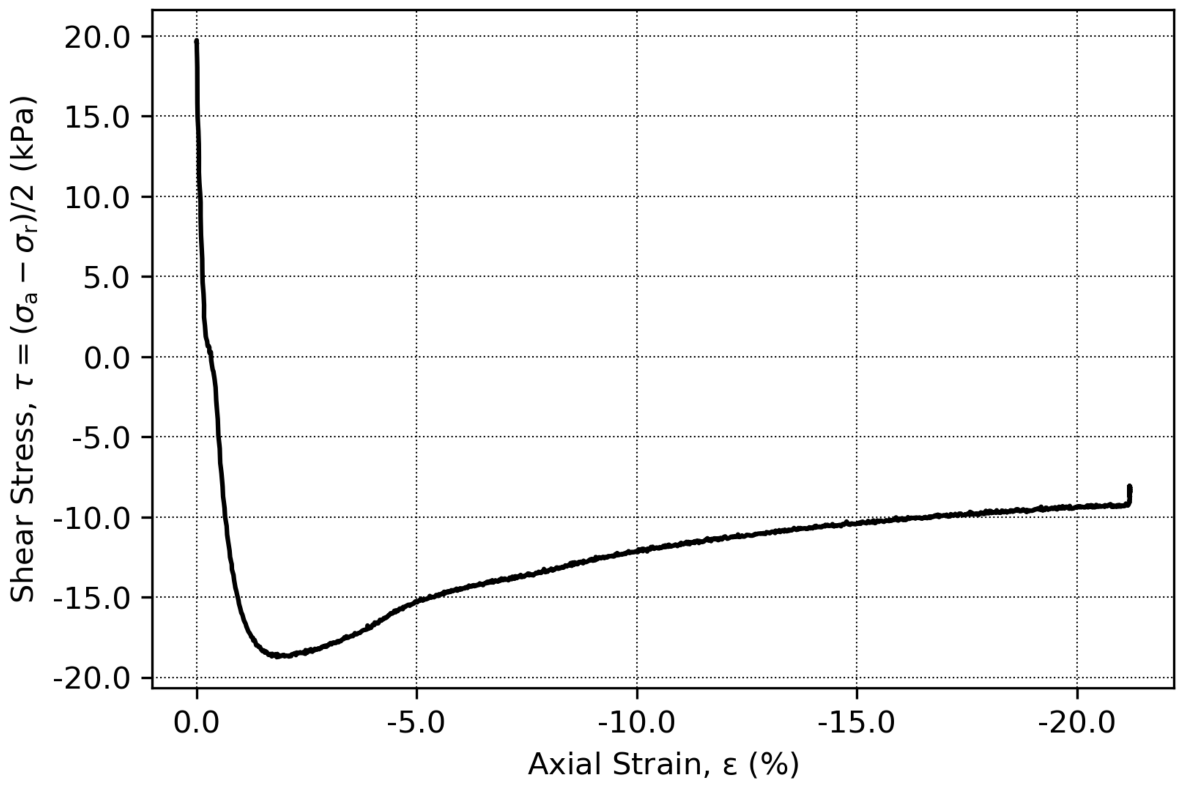
NGI

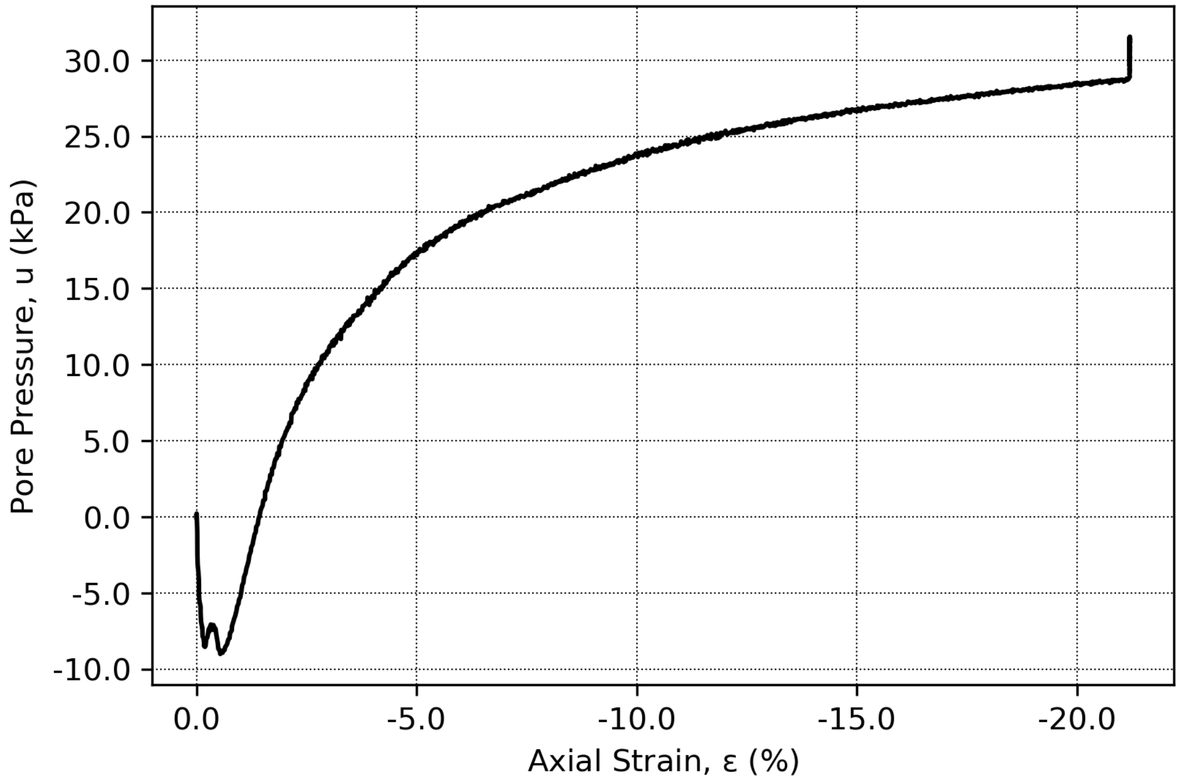
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.69	
Boring:	ONSB01	Depth = 14.52	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	5	p_0' = 96.6	kPa	(kPa)	max.	min.	final	
Part:	B	w_i = 70.2	%	σ_{ac}'	-	-	96.0	
Test:	1	w_c = 60.2	%	σ_{rc}'	-	-	57.8	

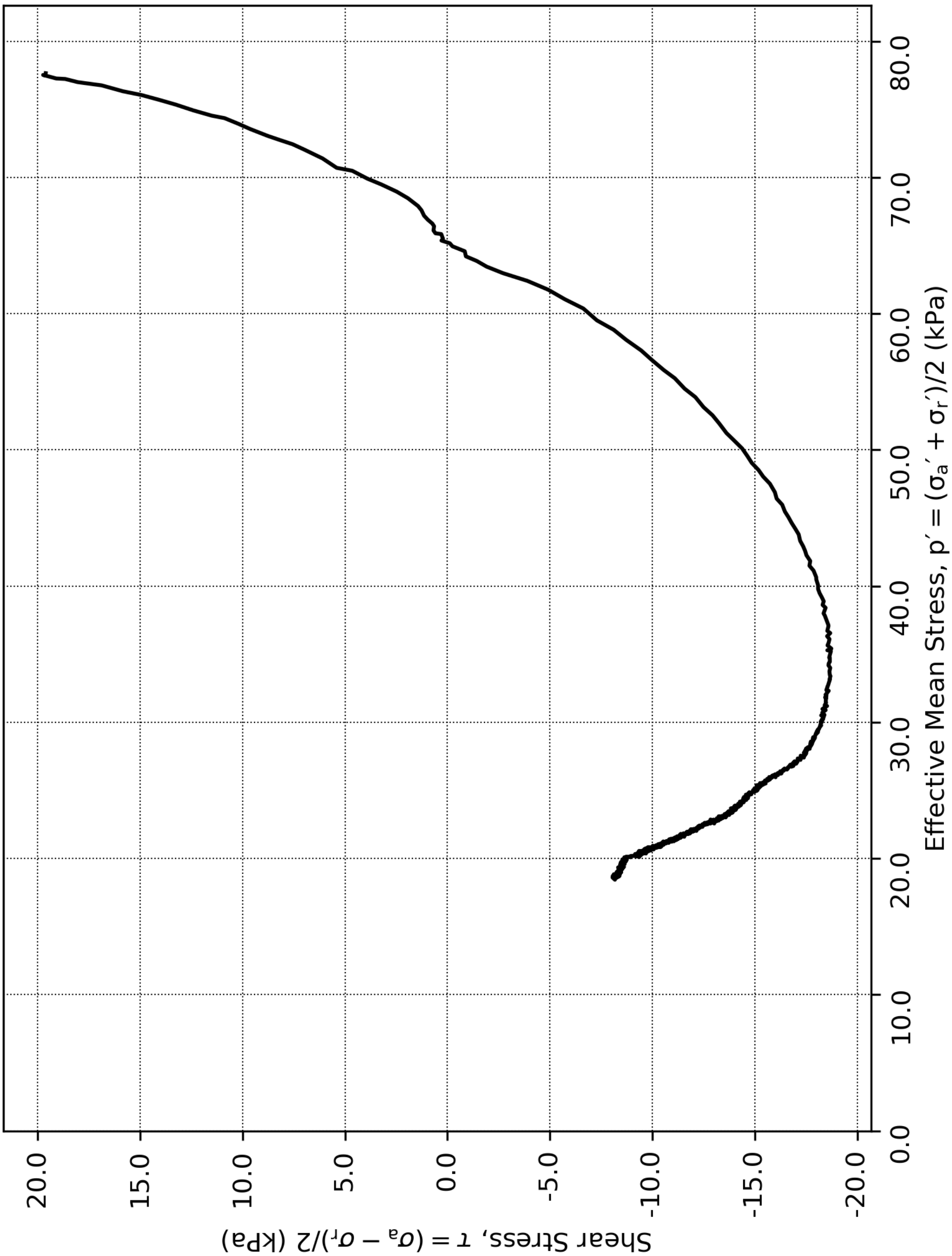
P:\2016\01\20160154\Lab\Onsøy\Triax





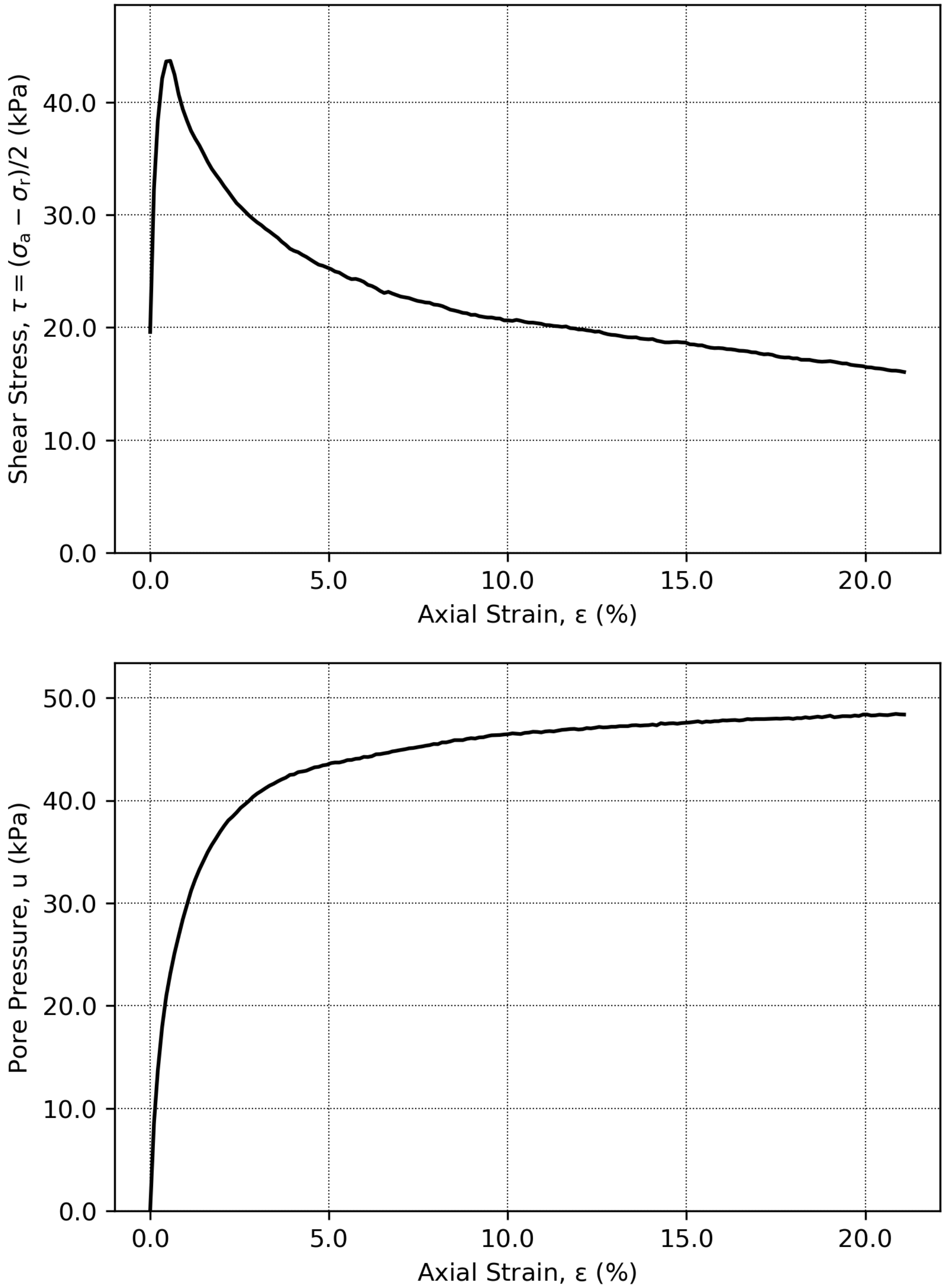
P:\2016\01\20160154\Lab\Onsøy\Triax

Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUE									Figure No. 5.3.70	
Boring:	ONSB01	Depth	= 14.52	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	5	p_0'	= 96.6	kPa	(kPa)	max.	min.	final		
Part:	B	w_i	= 67.5	%	σ_{ac}'	-	-	96.5		
Test:	2	w_c	= 65.4	%	σ_{rc}'	-	-	58.0		



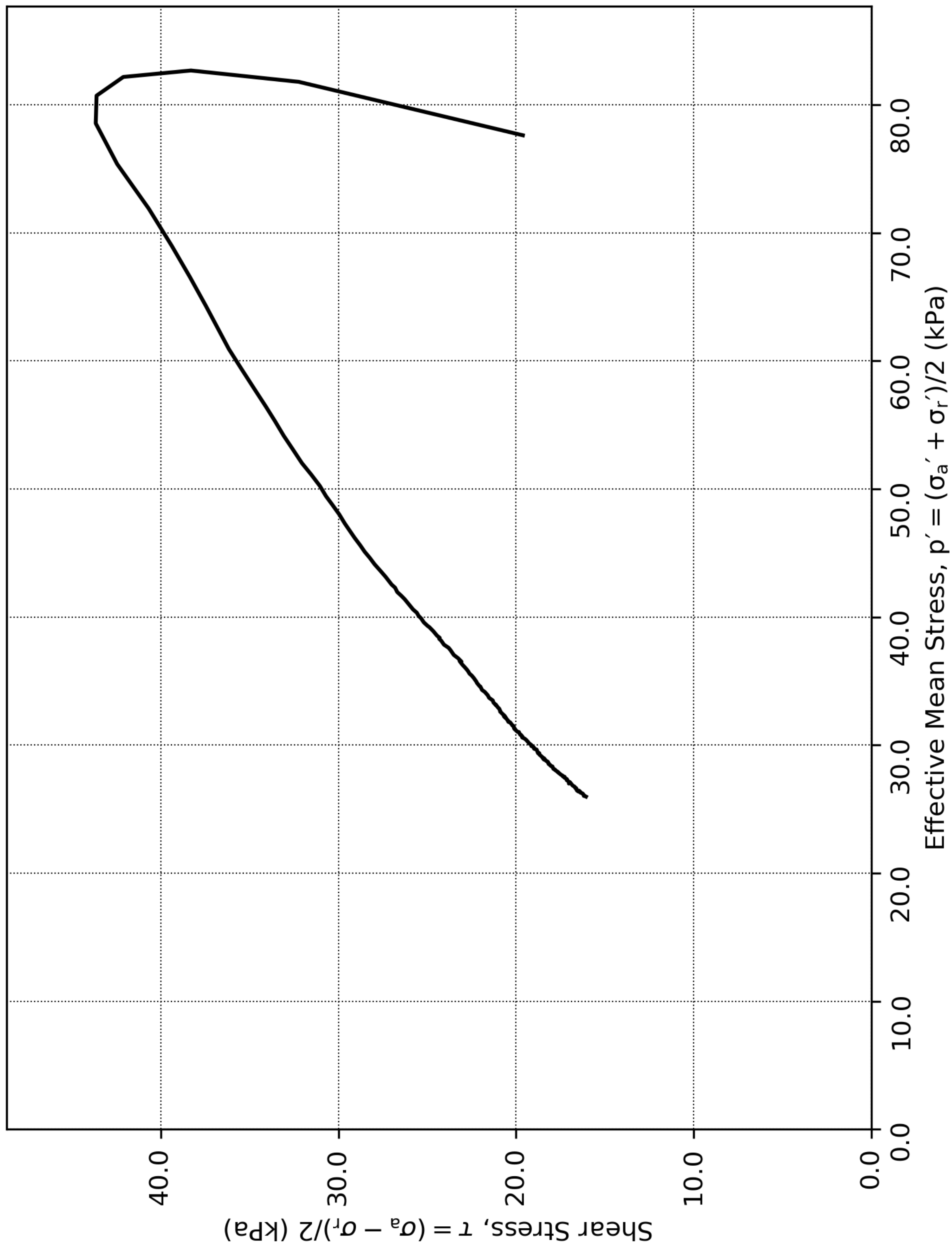
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUE								Figure No. 5.3.71
Boring:	ONSB01	Depth	= 14.52	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	5	p_0'	= 96.6	kPa	(kPa)	max.	min.	final
Part:	B	w_i	= 67.5	%	σ_{ac}'	-	-	96.5
Test:	2	w_c	= 65.4	%	σ_{rc}'	-	-	58.0

P:\2016\01\20160154\Lab\Onsøy\Triax



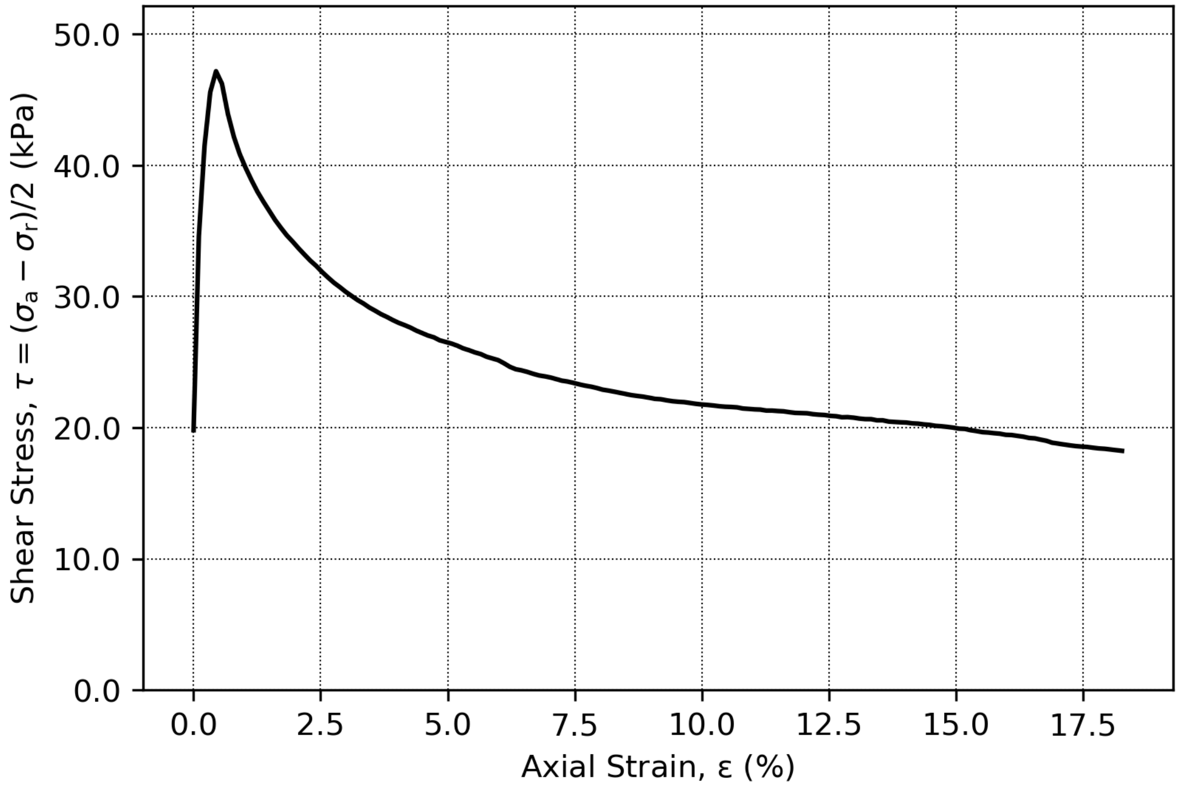
P:\2016\01\20160154\Lab\Onsøy\Triax

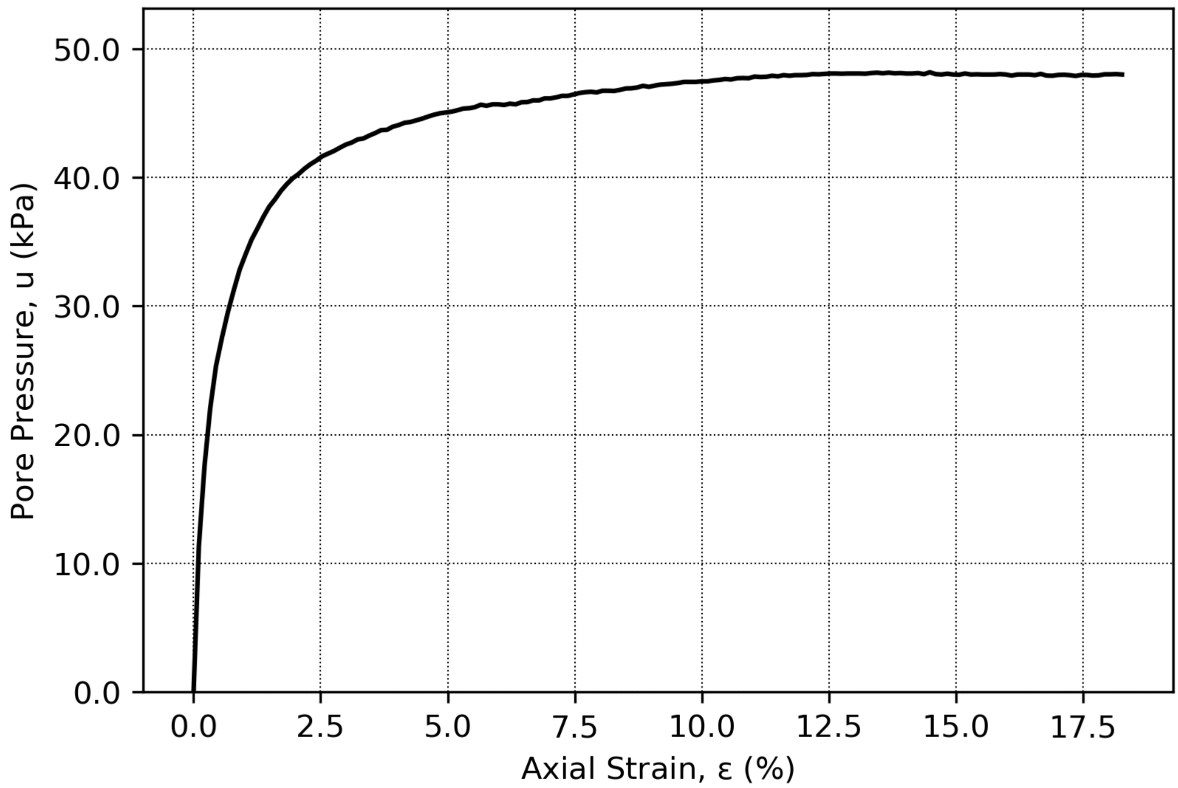
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.72
Boring:	ONSB01	Depth	= 14.52	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	5	p_0'	= 96.6	kPa	(kPa)	max.	min.	final	
Part:	B	w_i	= 68.1	%	σ_{ac}'	-	-	97.1	
Test:	3	w_c	= 66.3	%	σ_{rc}'	-	-	58.0	



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.73
Boring:	ONSB01	Depth	= 14.52	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	5	p_0'	= 96.6	kPa	(kPa)	max.	min.	final
Part:	B	w_i	= 68.1	%	σ_{ac}'	-	-	97.1
Test:	3	w_c	= 66.3	%	σ_{rc}'	-	-	58.0

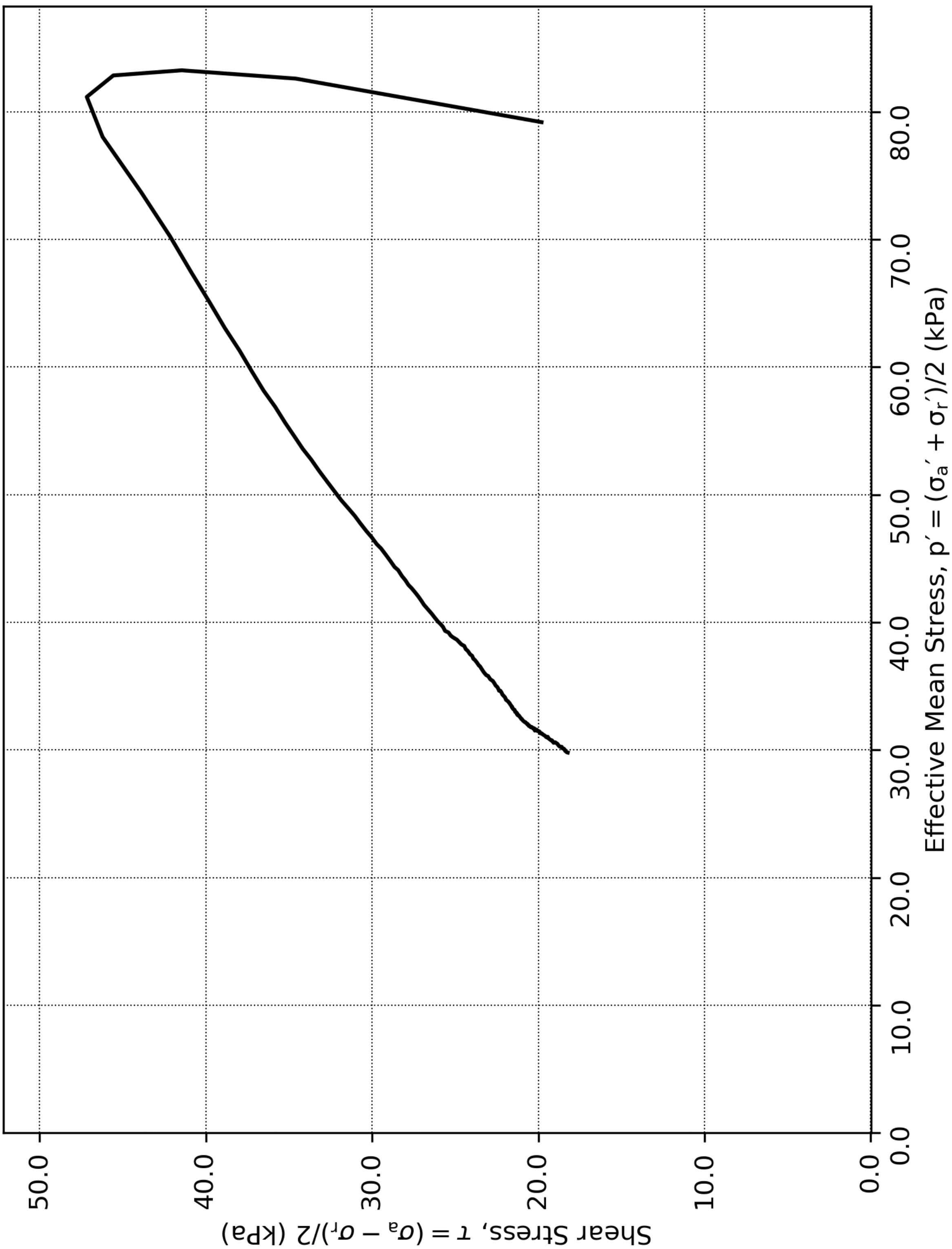
P:\2016\01\20160154\Lab\Onsøy\Triax



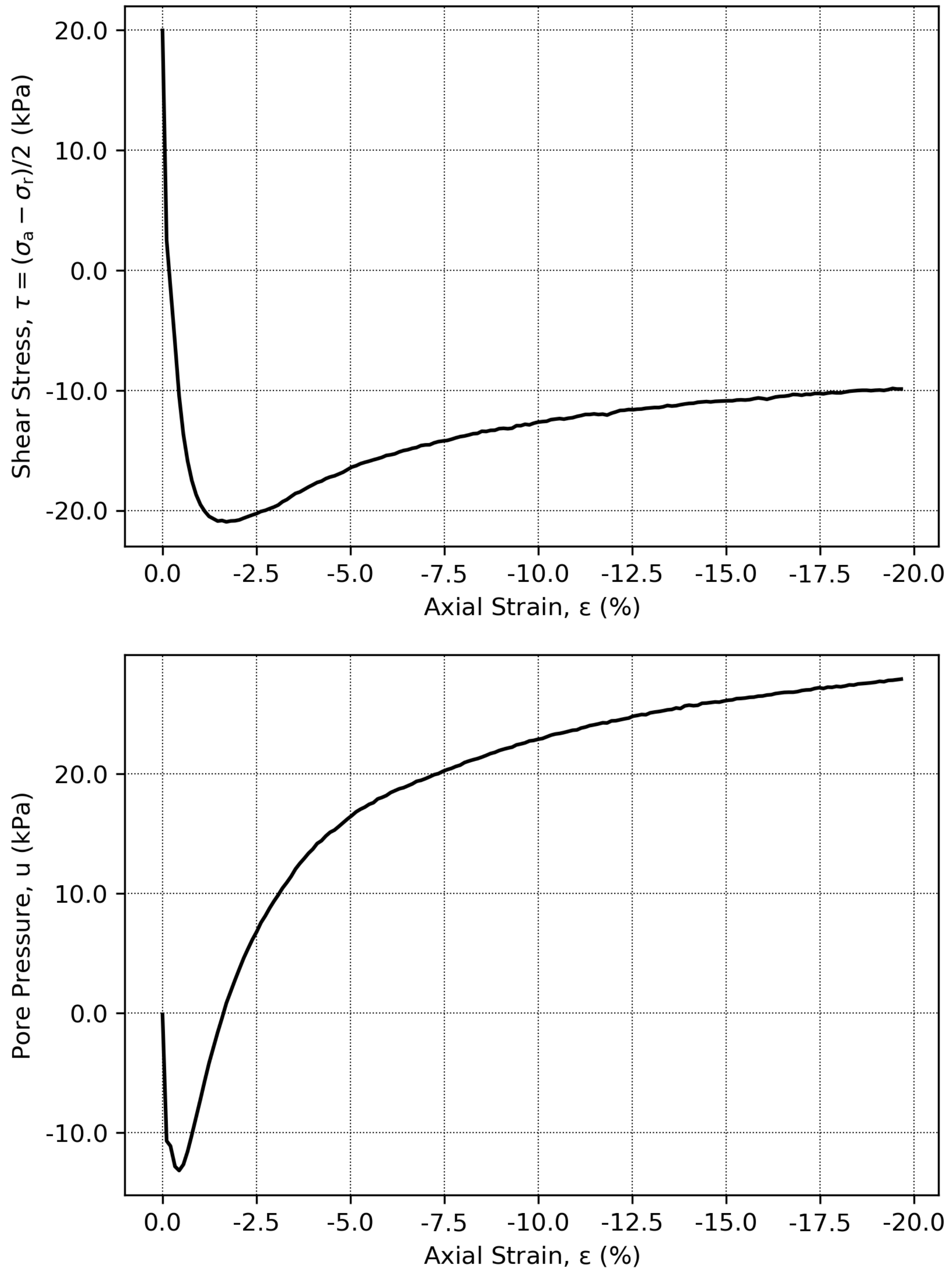


Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.74	
Boring:	ONSB01	Depth	= 14.89	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	6	p_0'	= 98.9	kPa	(kPa)	max.	min.	final		
Part:	B	w_i	= 62.7	%	σ_{ac}'	-	-	98.9		
Test:	1	w_c	= 61.5	%	σ_{rc}'	-	-	59.3		

P:\2016\01\20160154\Lab\Onsøy\Triax

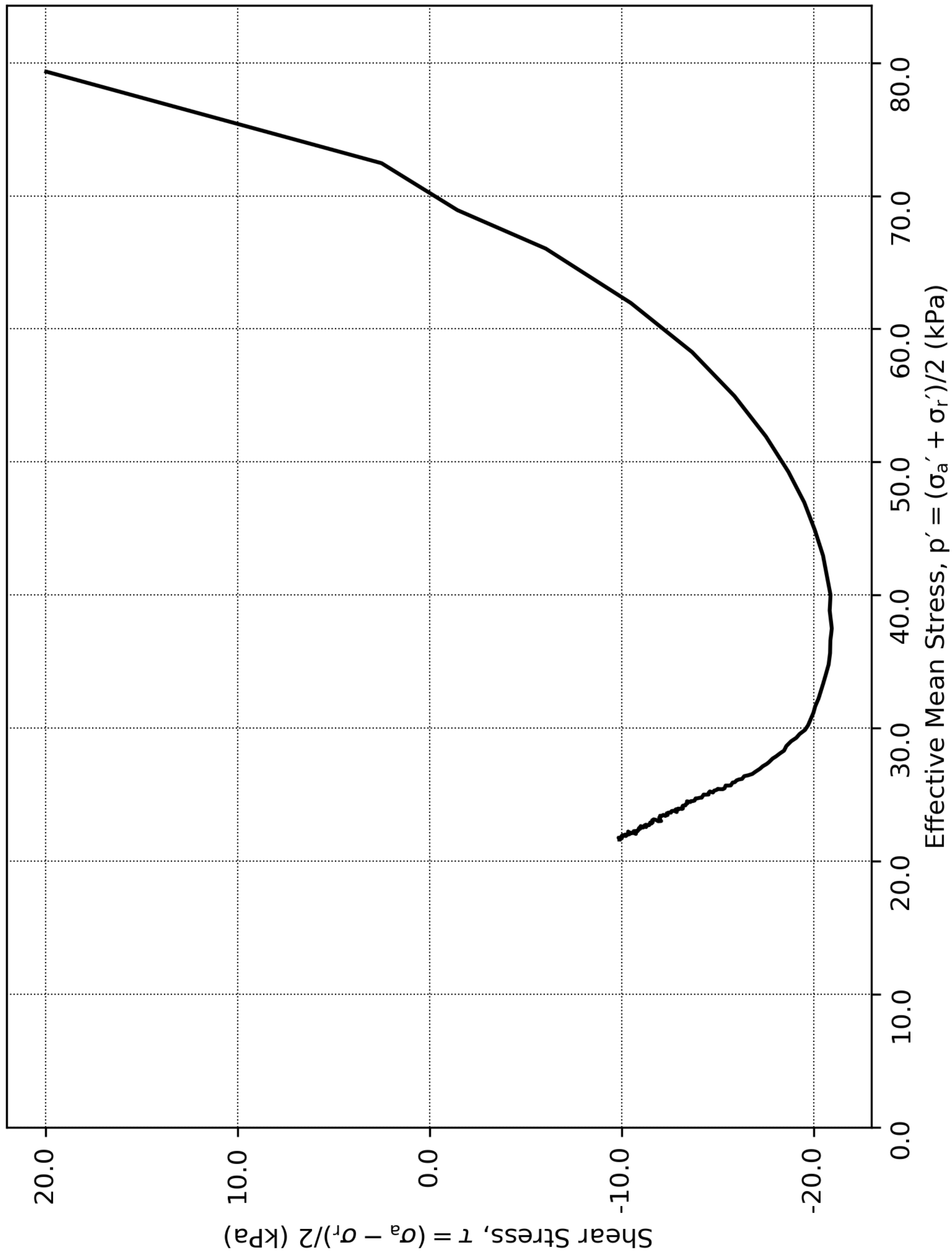


Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.75	
Boring:	ONSB01	Depth	= 14.89	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	6	p_0'	= 98.9	kPa	(kPa)	max.	min.	final		
Part:	B	w_i	= 62.7	%	σ_{ac}'	-	-	98.9		
Test:	1	w_c	= 61.5	%	σ_{rc}'	-	-	59.3		



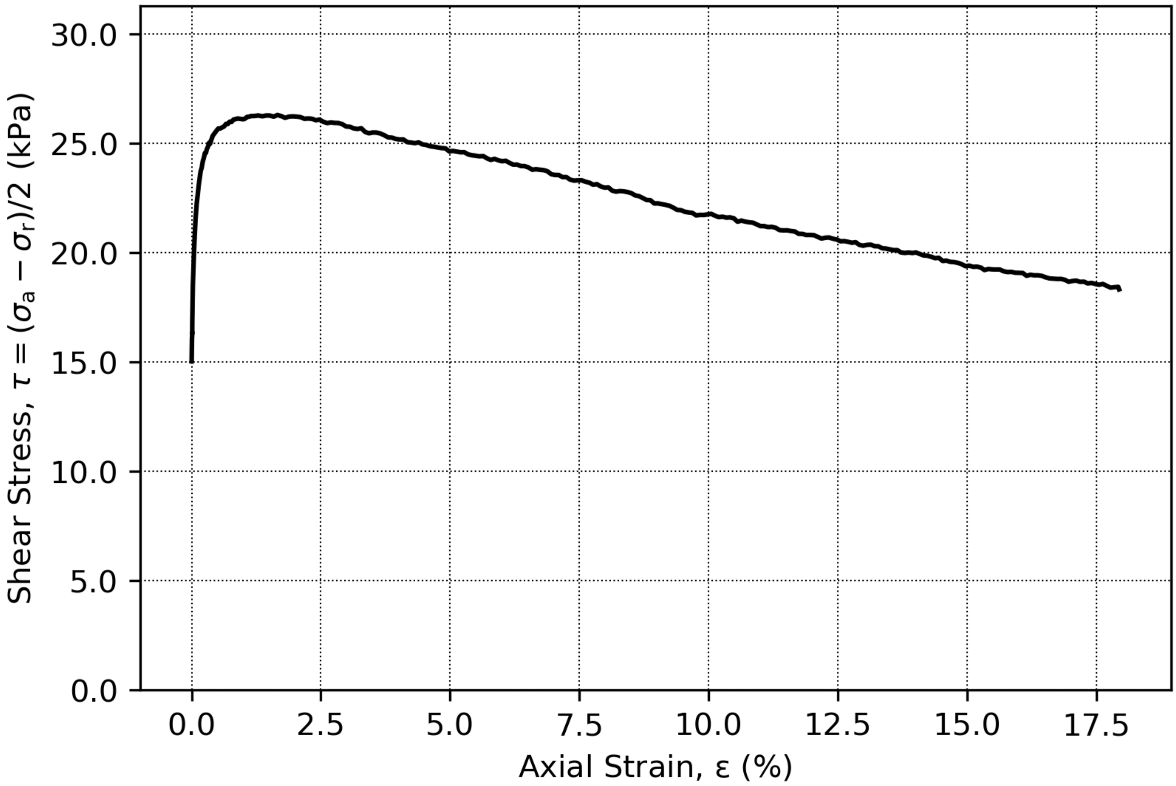
P:\2016\01\20160154\Lab\Onsøy\Triax

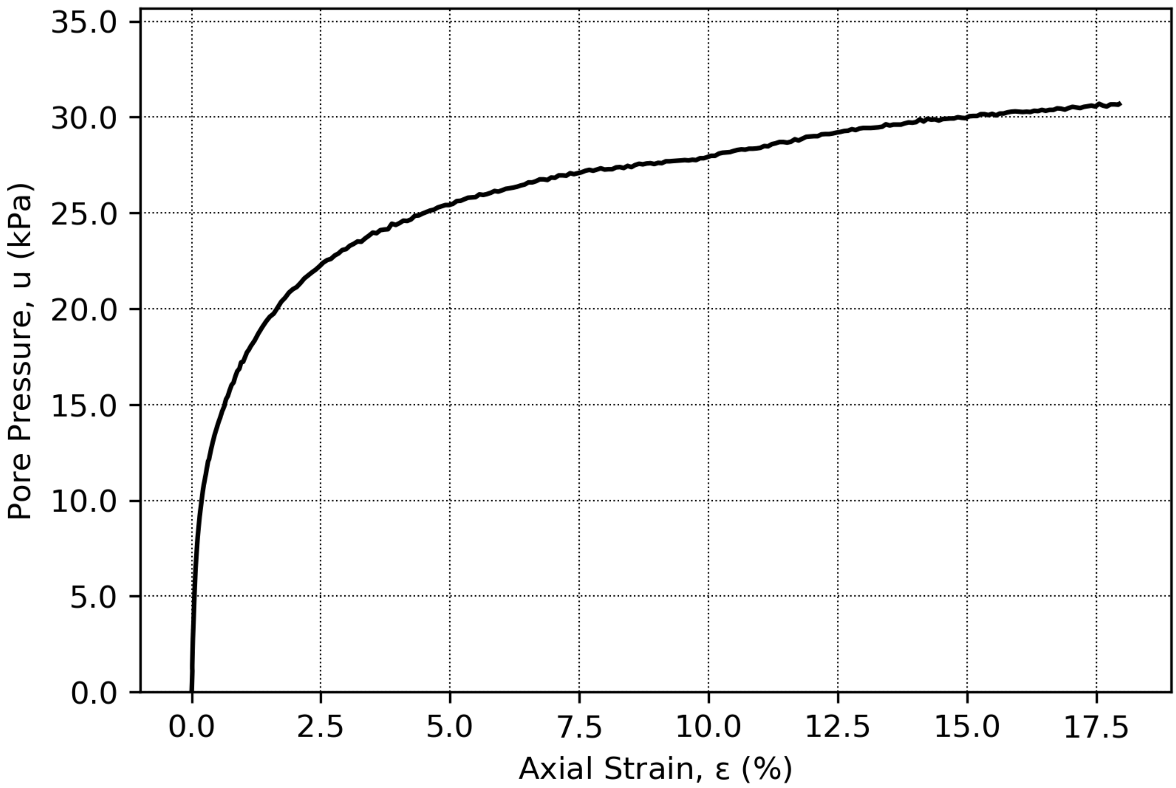
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUE								Figure No. 5.3.76	
Boring:	ONSB01	Depth	= 14.89	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	6	p_0'	= 98.9	kPa	(kPa)	max.	min.	final	
Part:	B	w_i	= 63.2	%	σ_{ac}'	-	-	98.9	
Test:	2	w_c	= 62.0	%	σ_{rc}'	-	-	59.2	



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUE								Figure No. 5.3.77
Boring:	ONSB01	Depth	= 14.89	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	6	p_0'	= 98.9	kPa	(kPa)	max.	min.	final
Part:	B	w_i	= 63.2	%	σ_{ac}'	-	-	98.9
Test:	2	w_c	= 62.0	%	σ_{rc}'	-	-	59.2

P:\2016\01\20160154\Lab\Onsøy\Triax

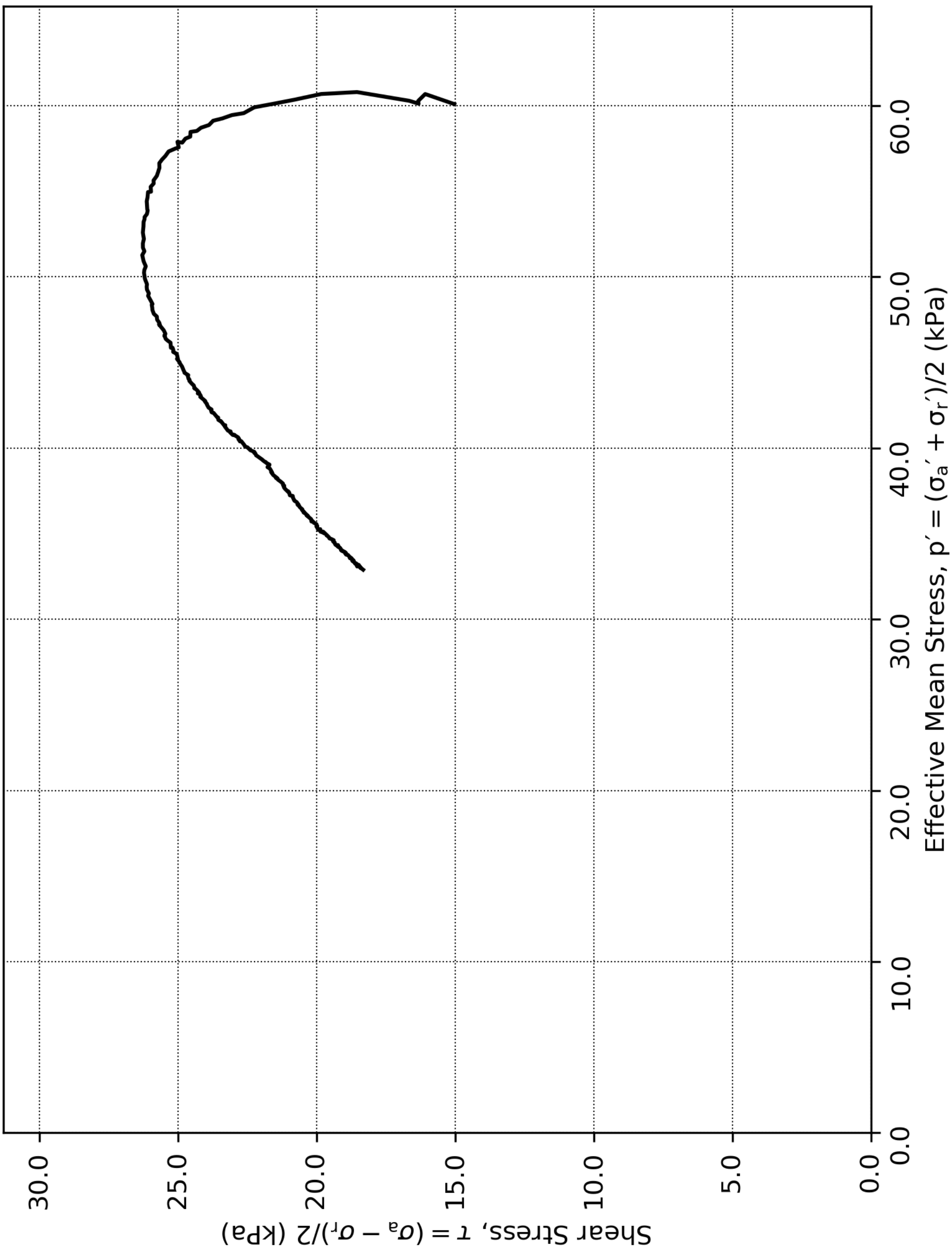




P:\2016\01\20160154\Lab\Onsøy\Triax

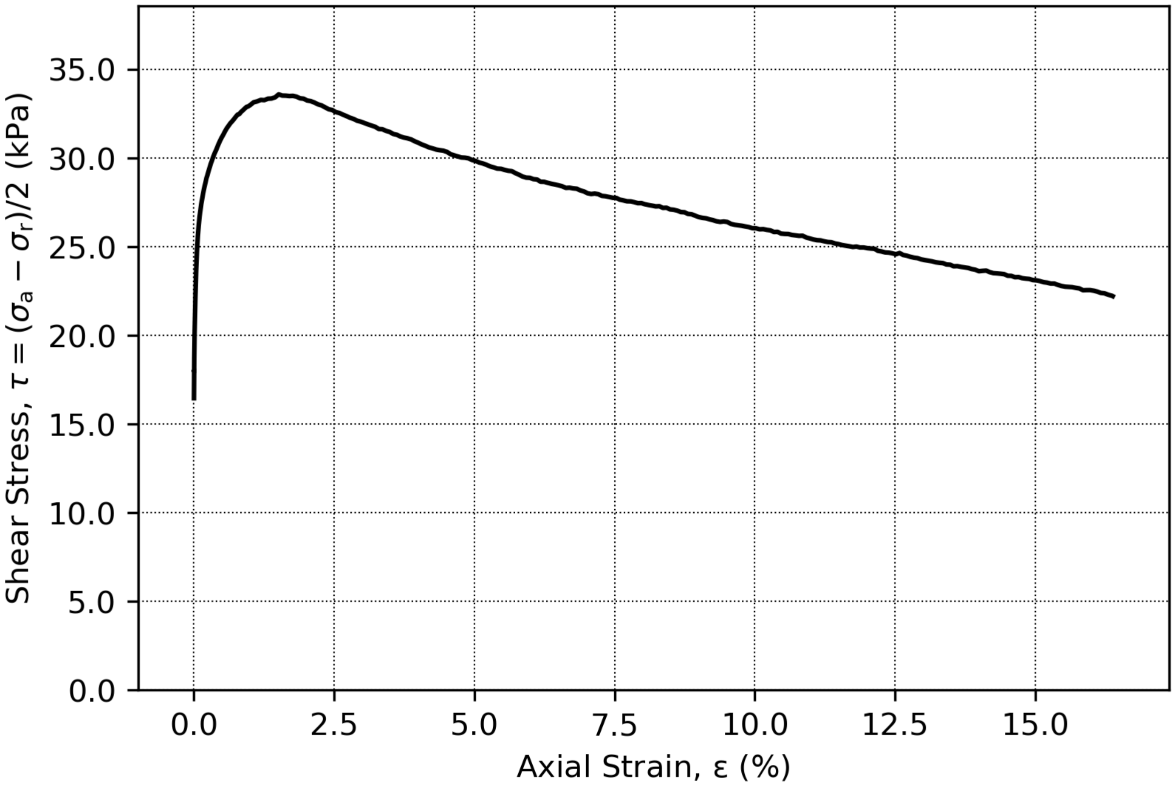
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.78
Boring:	ONSB21	Depth	= 11.7	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	3	p_0'	= 75.1	kPa	(kPa)	max.	min.	final
Part:	1	w_i	= 47.5	%	σ_{ac}'	-	-	75.1
Test:	1	w_c	= 43.1	%	σ_{rc}'	-	-	45.0

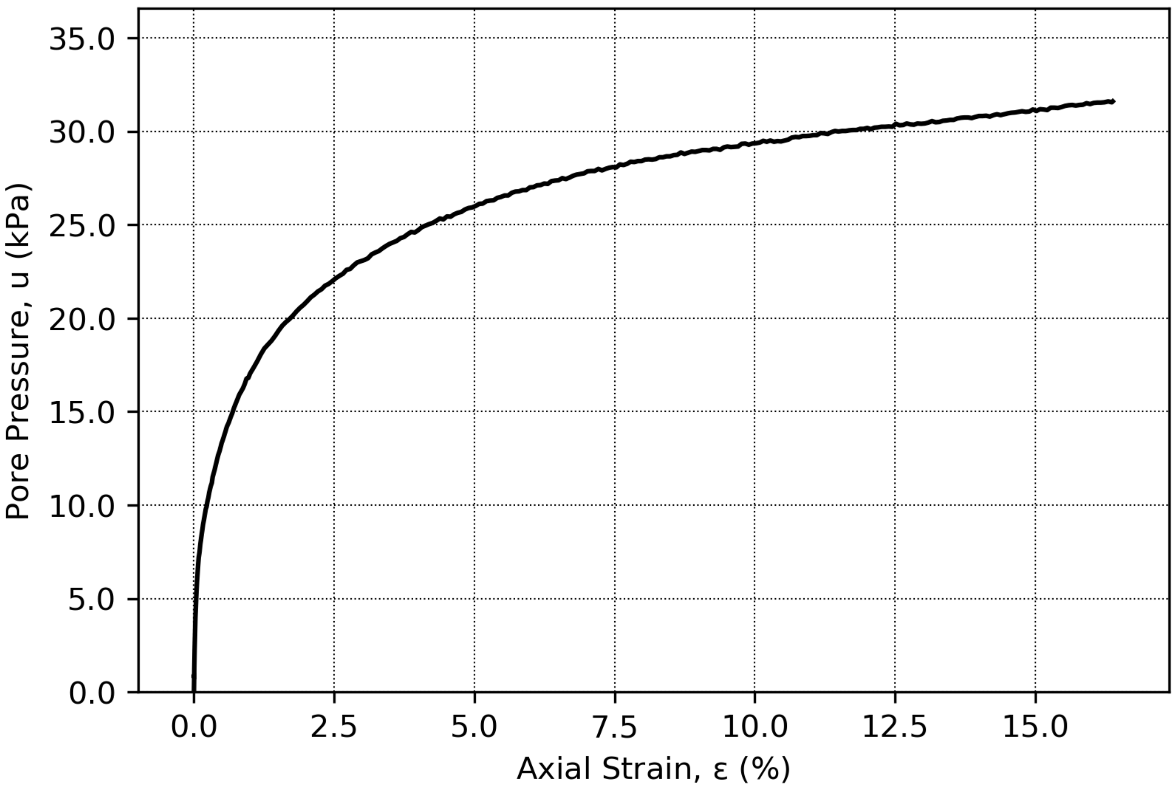
NGI



P:\2016\01\20160154\Lab\Onsøy\Triax

Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.79	
Boring:	ONSB21	Depth	= 11.7	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	3	p_0'	= 75.1	kPa	(kPa)	max.	min.	final		
Part:	1	w_i	= 47.5	%	σ_{ac}'	-	-	75.1		
Test:	1	w_c	= 43.1	%	σ_{rc}'	-	-	45.0		

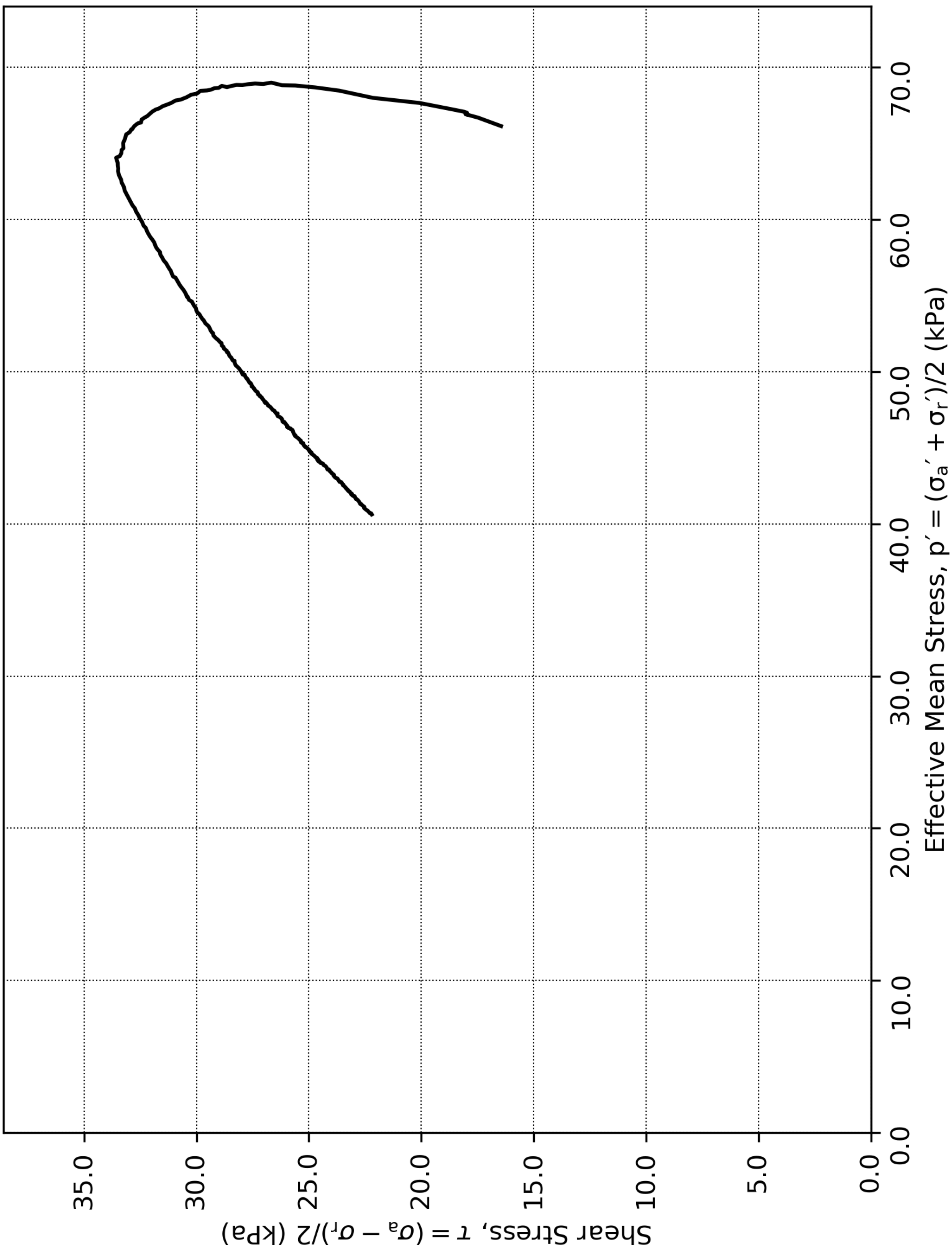




P:\2016\01\20160154\Lab\Onsøy\Triax

Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.80
Boring:	ONSB21	Depth	= 12.9	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	3	p_0'	= 82.9	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 44.8	%	σ_{ac}'	-	-	82.8
Test:	1	w_c	= 43.2	%	σ_{rc}'	-	-	49.8

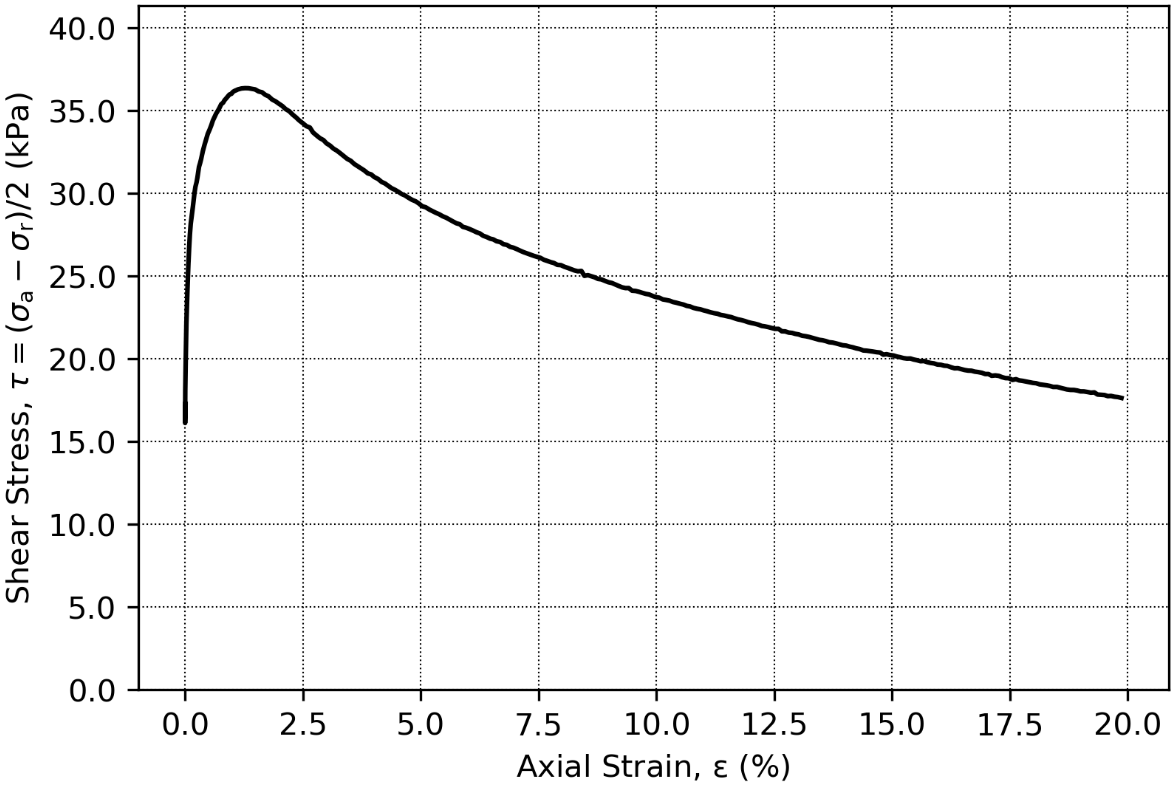
NGI

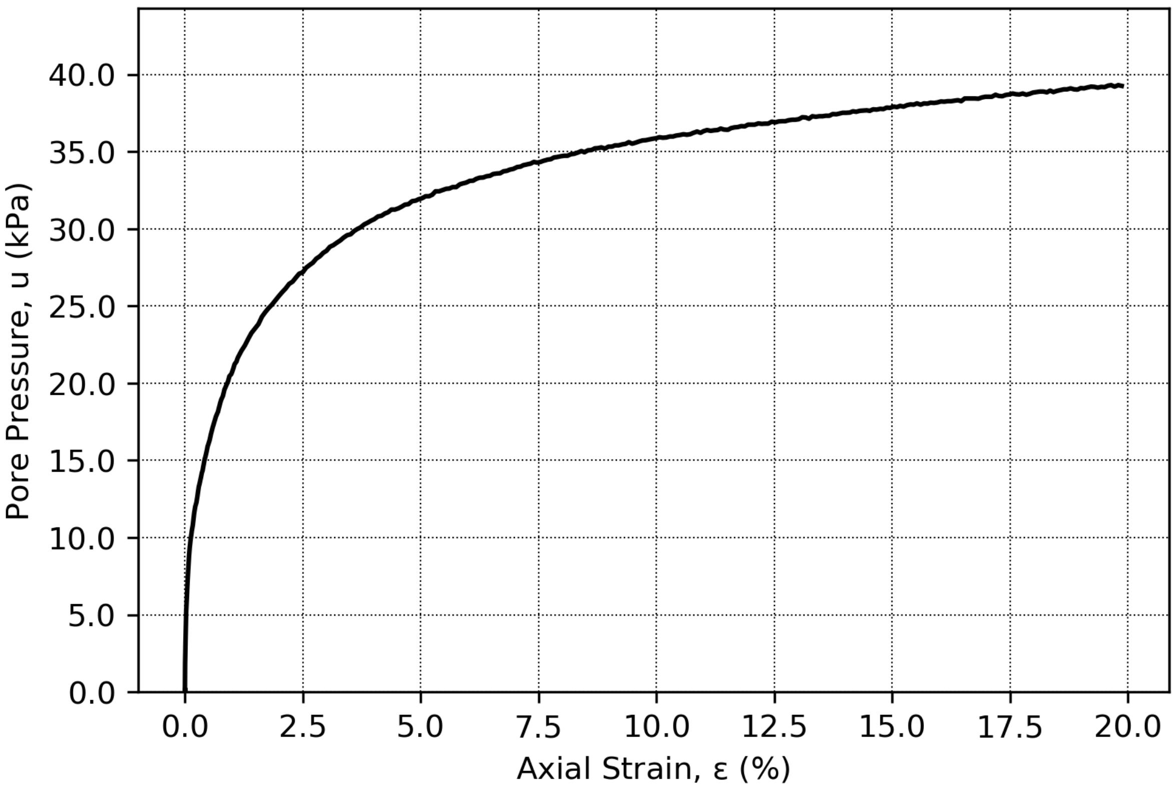


P:\2016\01\20160154\Lab\Onsøy\Triax

Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.81	
Boring: ONSB21	Depth	= 12.9	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube: 3	p_0'	= 82.9	kPa	(kPa)	max.	min.	final	
Part: 2	w_i	= 44.8	%	σ_{ac}'	-	-	82.8	
Test: 1	w_c	= 43.2	%	σ_{rc}'	-	-	49.8	

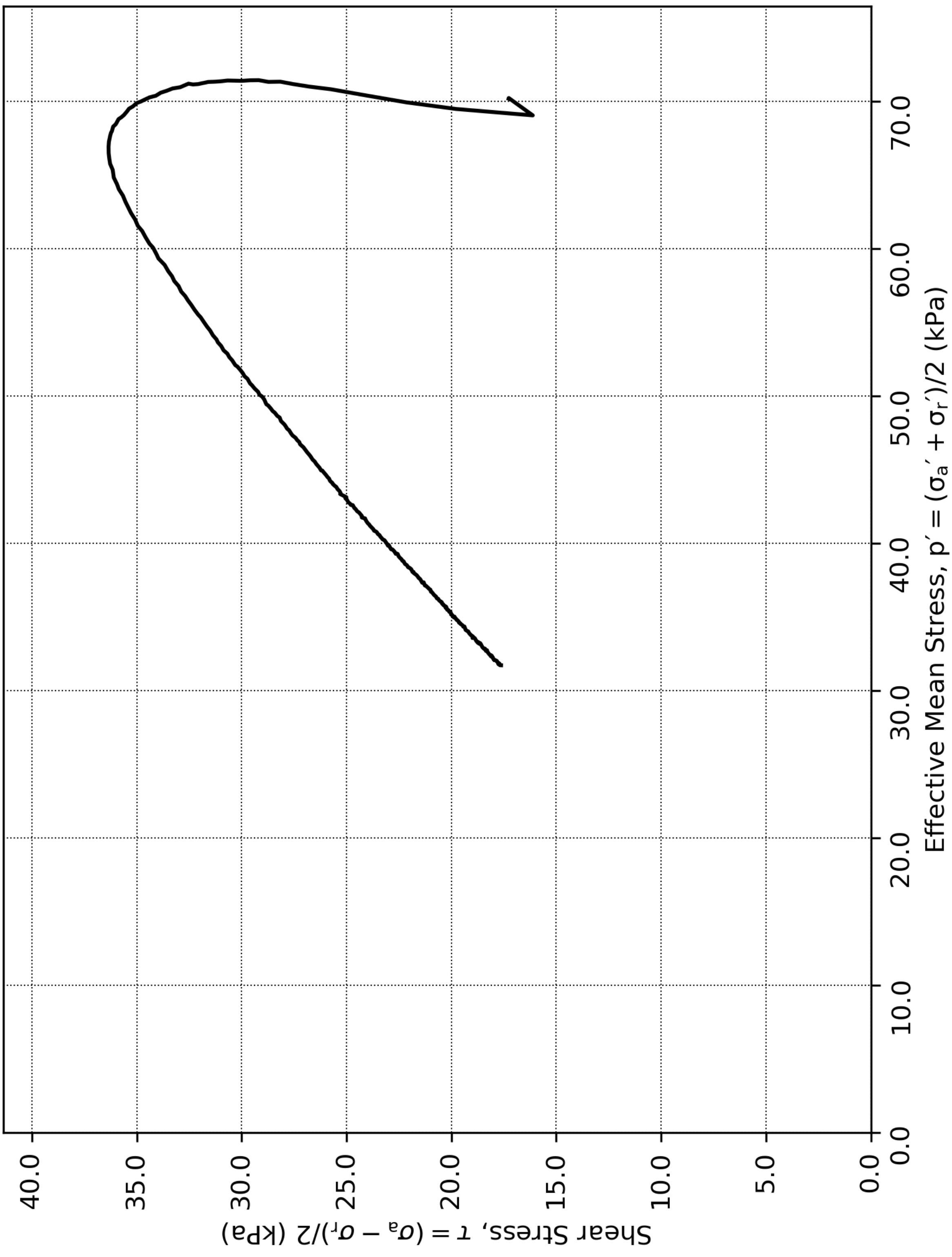
NGI





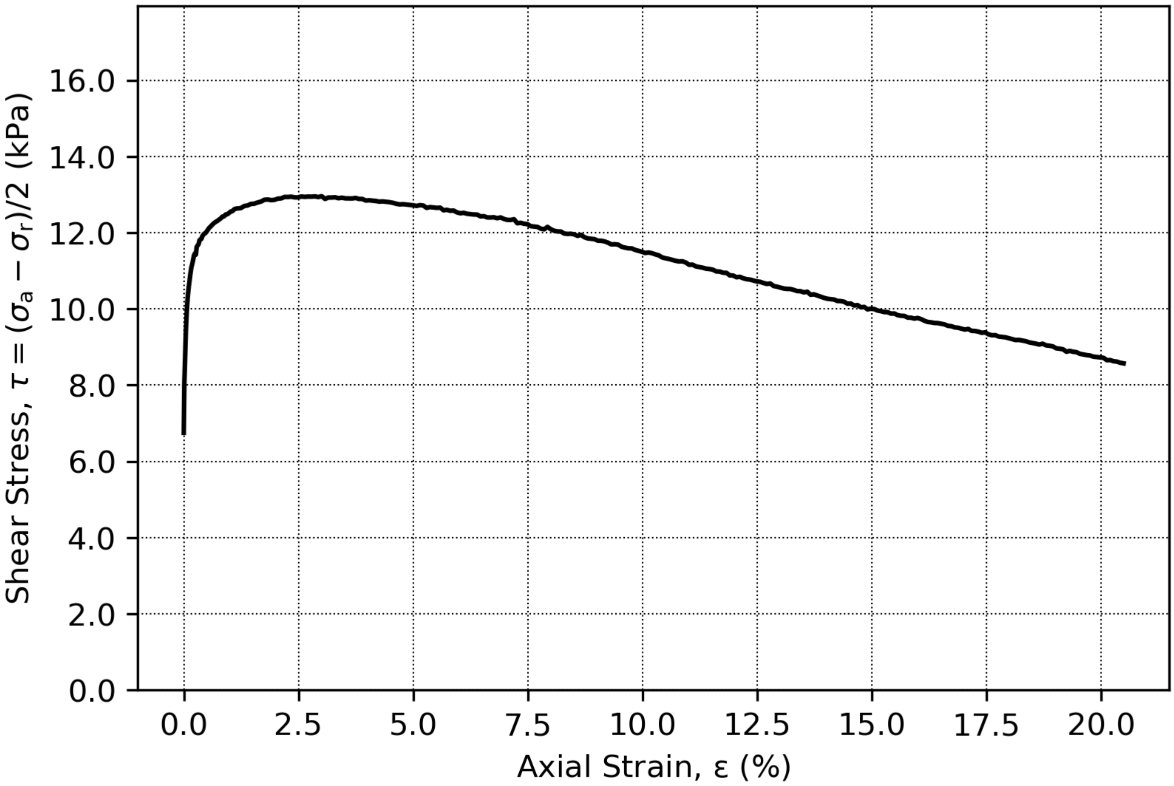
Norwegian GeoTest Sites - Onsøy						Document No. 20160154-10-R
Triaxial test: CAUC						Figure No. 5.3.82
Boring: ONSB21	Depth = 13.75 m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: 3	p_0' = 88.3 kPa	(kPa)	max.	min.	final	
Part: 3	w_i = 61.9 %	σ_{ac}'	-	-	88.3	
Test: 1	w_c = 59.7 %	σ_{rc}'	-	-	53.0	

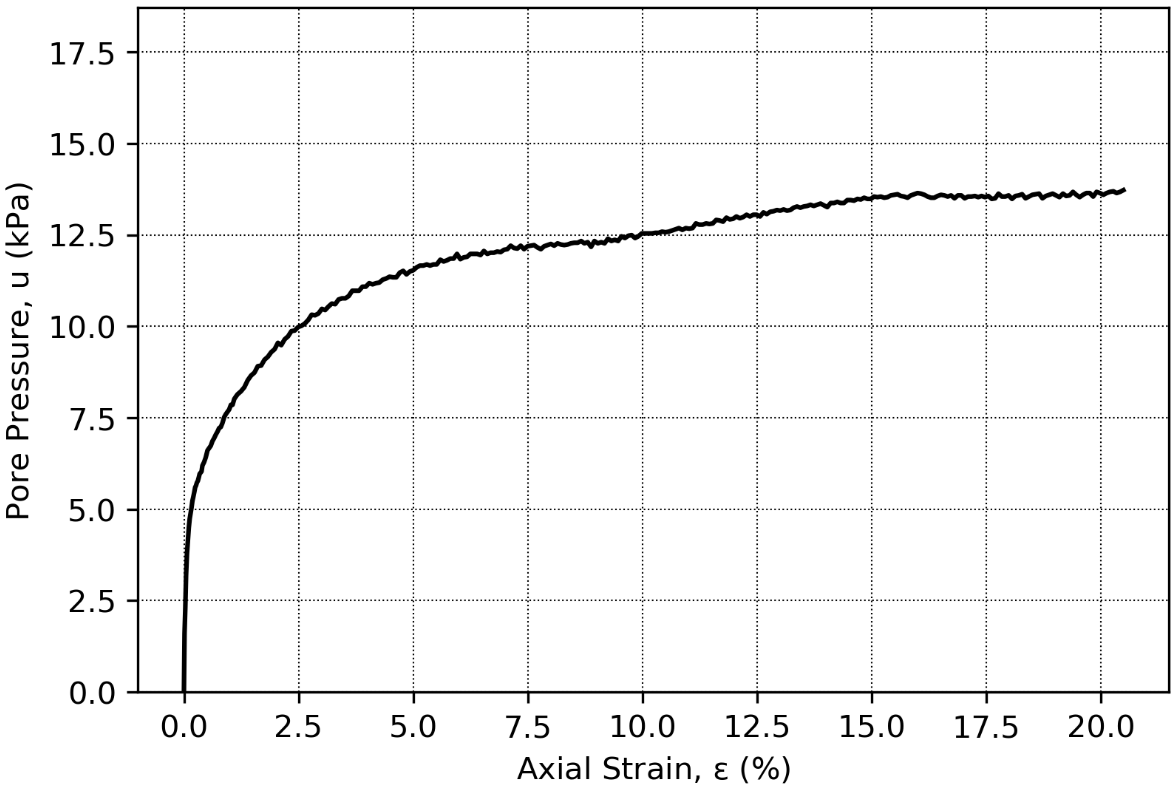
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.83	
Boring:	ONSB21	Depth	= 13.75	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	3	p_0'	= 88.3	kPa	(kPa)	max.	min.	final		
Part:	3	w_i	= 61.9	%	σ_{ac}'	-	-	88.3		
Test:	1	w_c	= 59.7	%	σ_{rc}'	-	-	53.0		

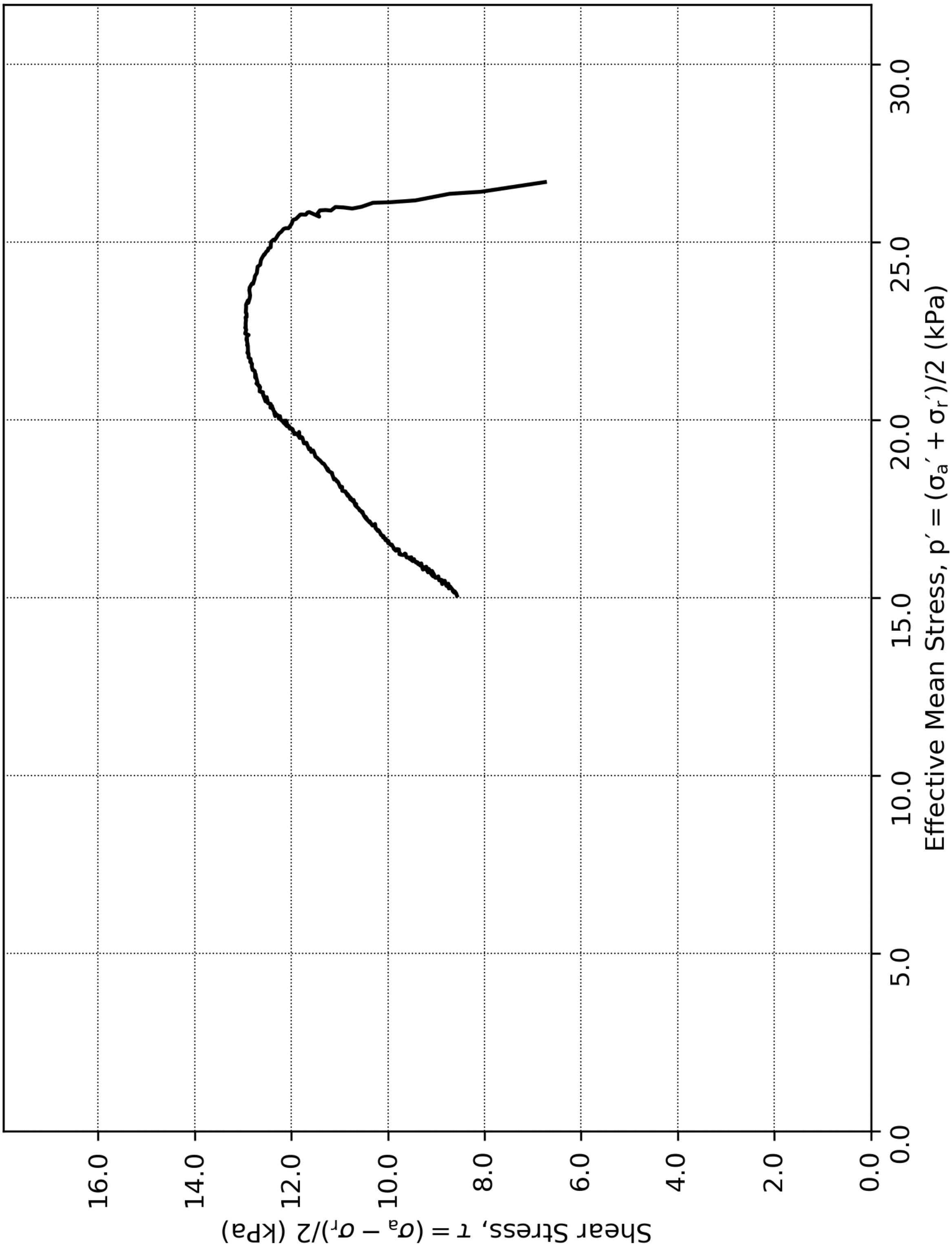
P:\2016\01\20160154\Lab\Onsøy\Triax



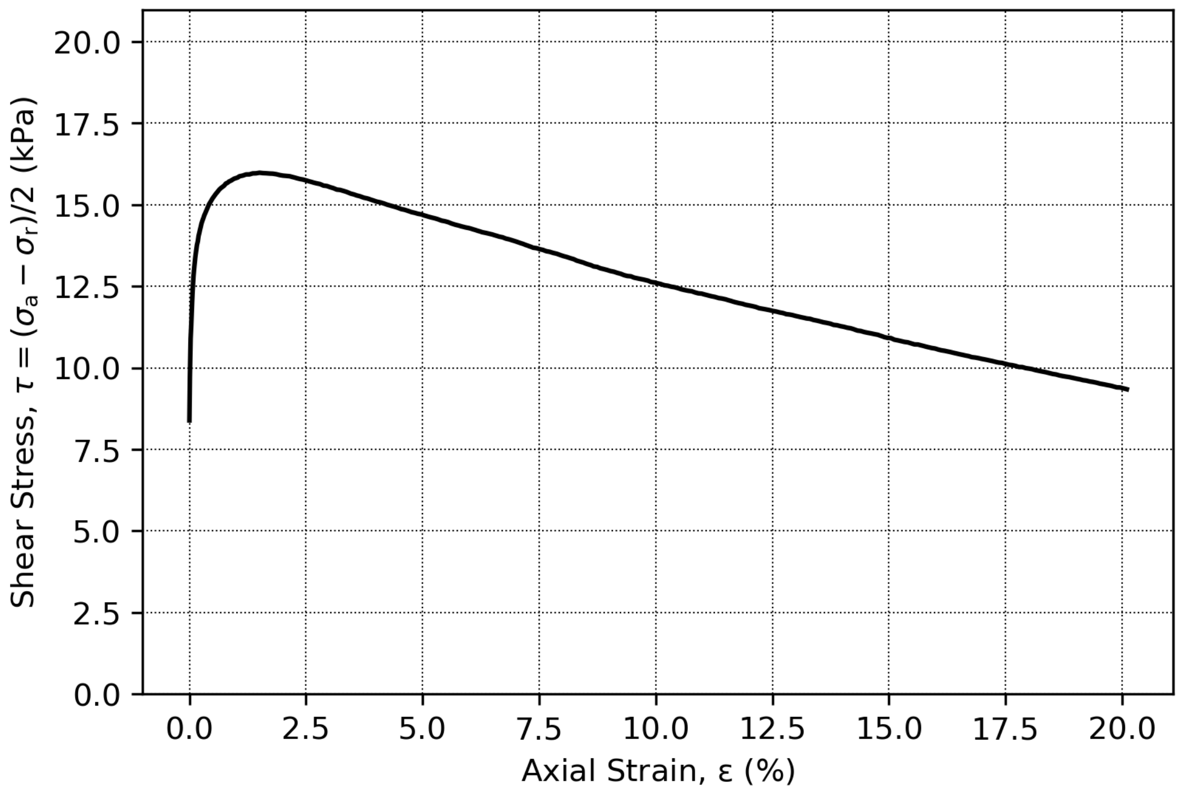


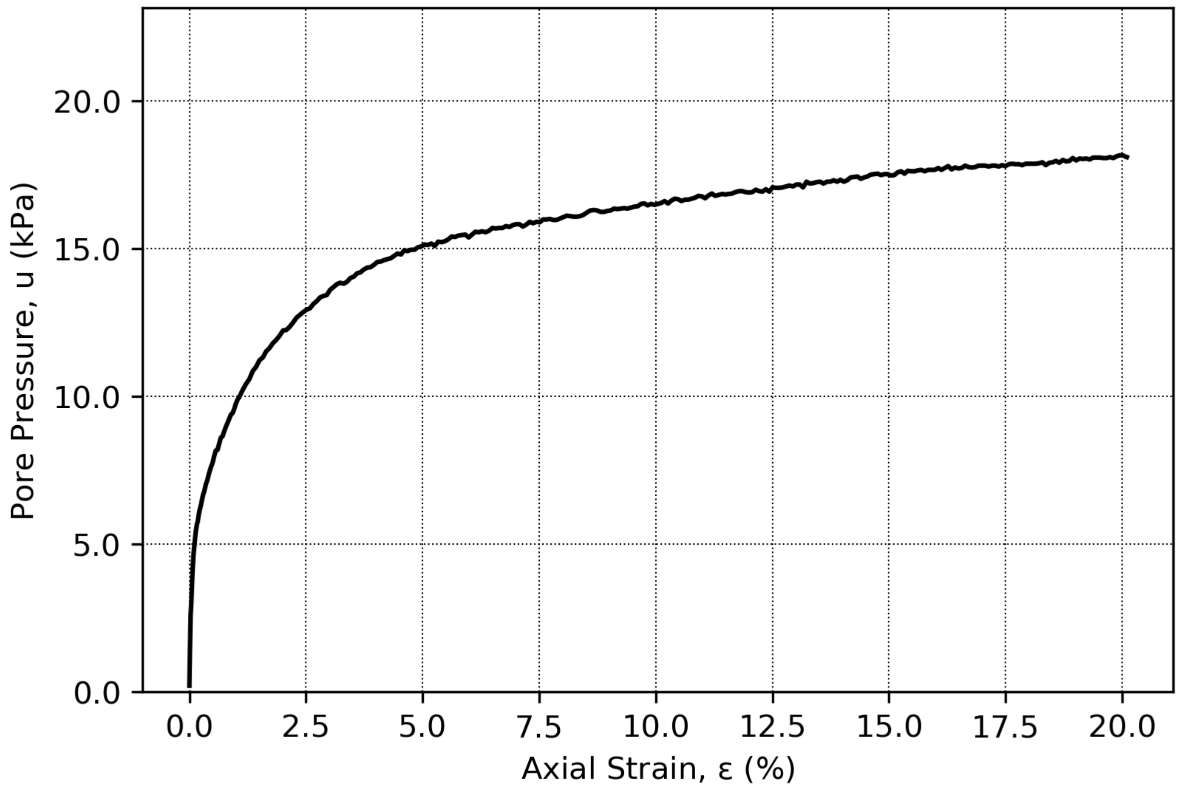
P:\2016\01\20160154\Lab\Onsøy\Triax

Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.84	
Boring:	ONSB22	Depth = 5.78	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S1	p_0' = 33.2	kPa	(kPa)	max.	min.	final	
Part:	1	w_i = 69.3	%	σ_{ac}'	-	-	33.2	
Test:	1	w_c = 65.2	%	σ_{rc}'	-	-	19.9	

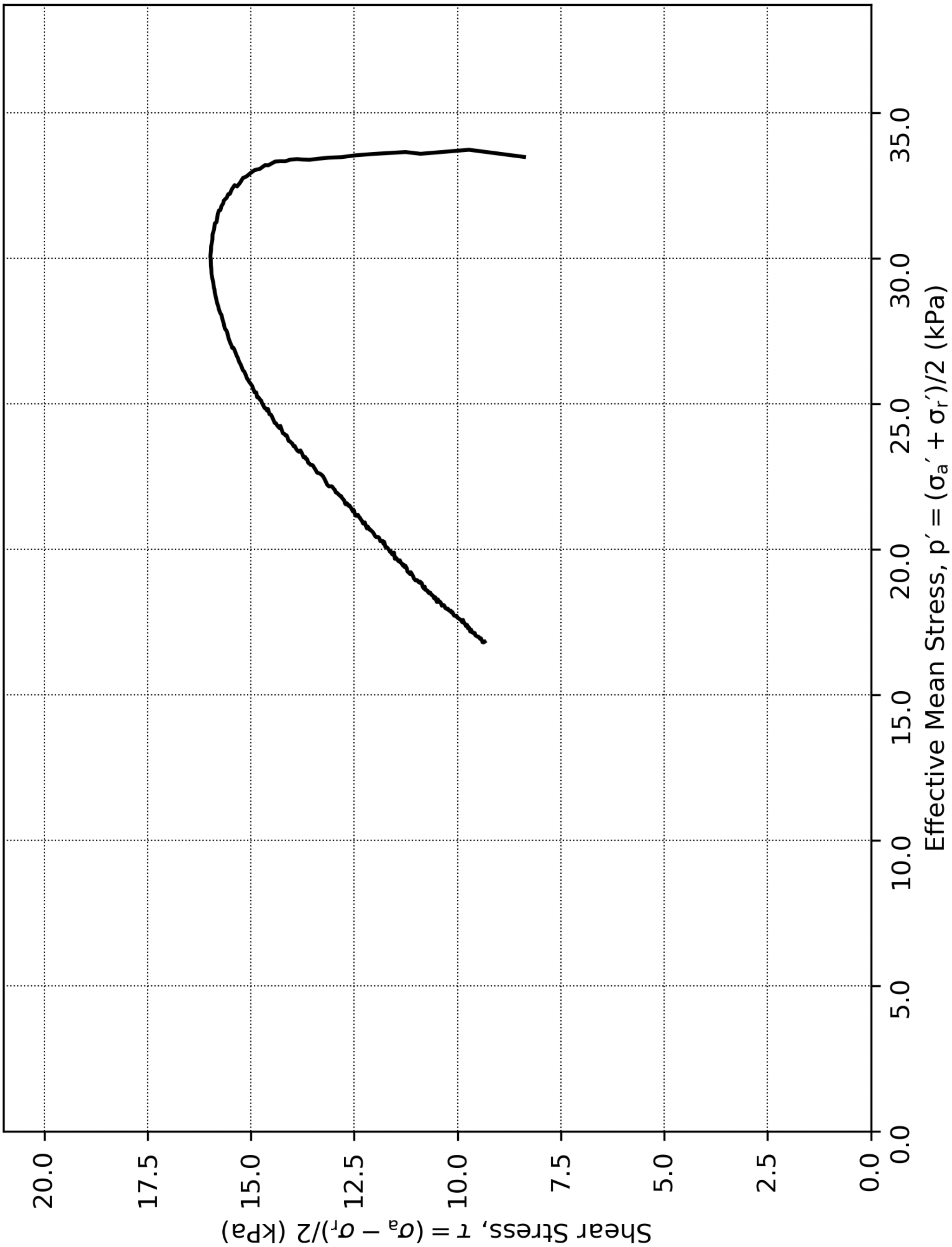


Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.85	
Boring: ONSB22	Depth = 5.78	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube: S1	p_0' = 33.2	kPa	(kPa)	max.	min.	final	NGI	
Part: 1	w_i = 69.3	%	σ_{ac}'	-	-	33.2		
Test: 1	w_c = 65.2	%	σ_{rc}'	-	-	19.9		



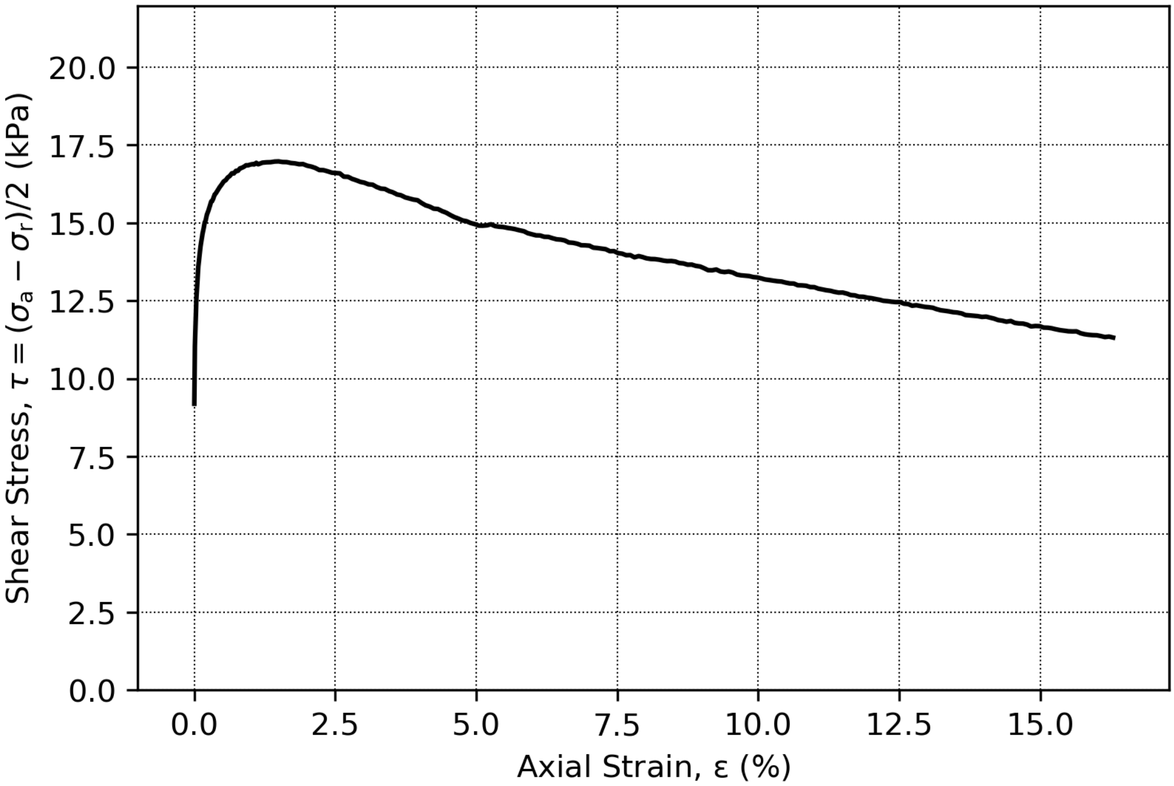


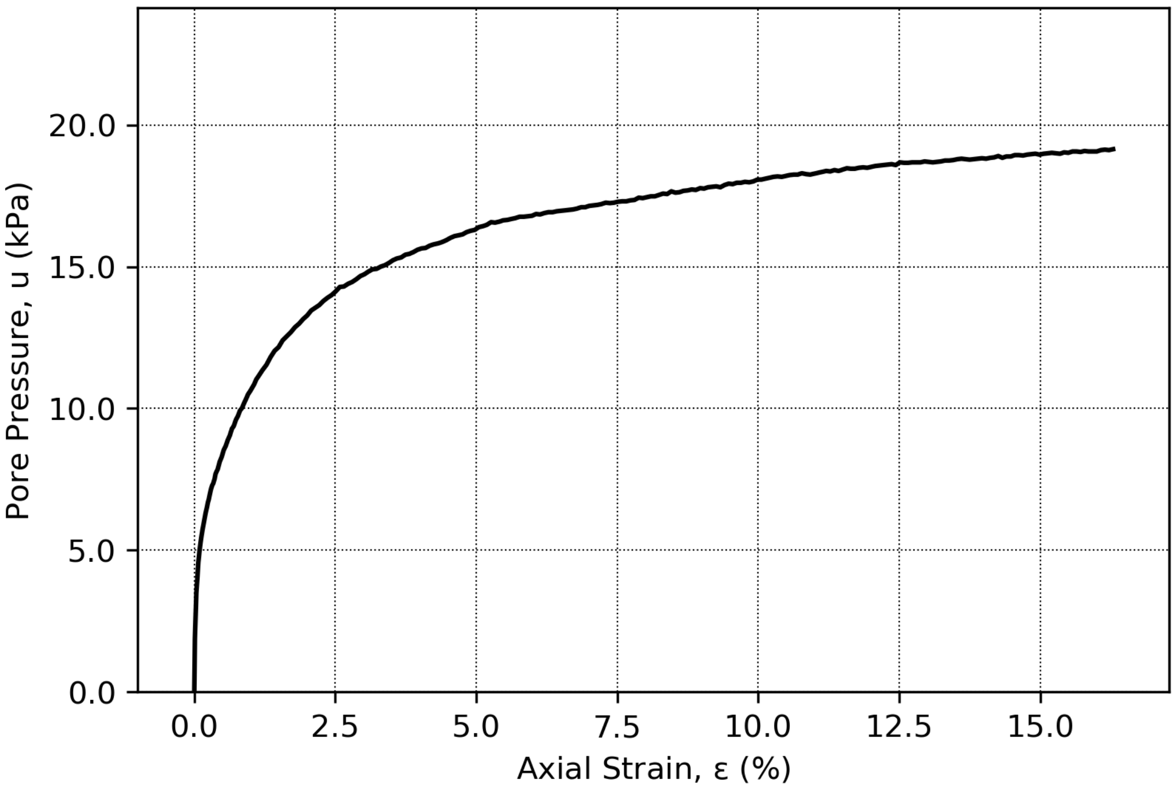
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.86	
Boring:	ONSB22	Depth	= 6.98	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S1	p_0'	= 42.2	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 66.9	%	σ_{ac}'	-	-	42.1	
Test:	1	w_c	= 64.0	%	σ_{rc}'	-	-	25.3	



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.87	
Boring:	ONSB22	Depth	= 6.98	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S1	p_0'	= 42.2	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 66.9	%	σ_{ac}'	-	-	42.1	
Test:	1	w_c	= 64.0	%	σ_{rc}'	-	-	25.3	

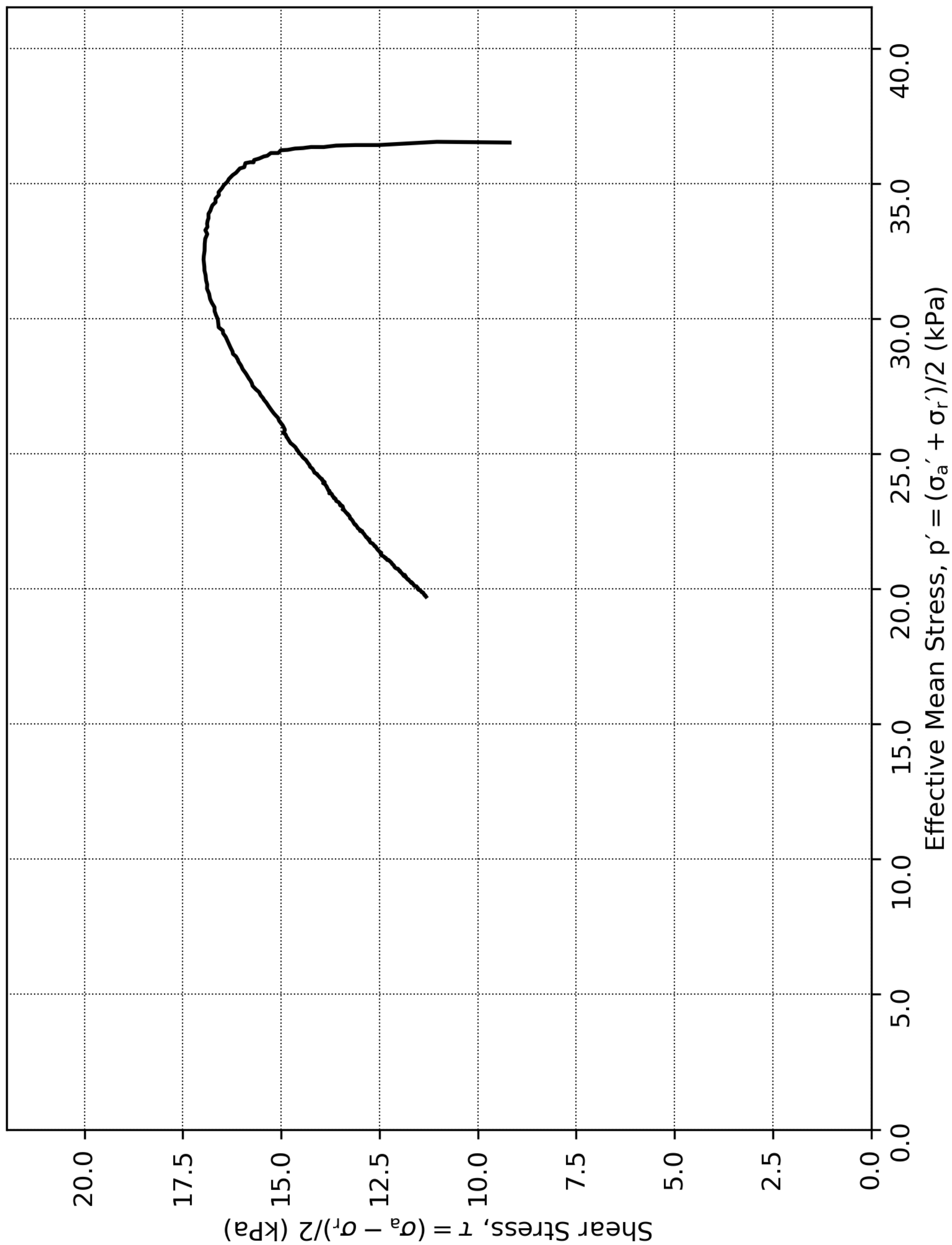
P:\2016\01\20160154\Lab\Onsøy\Triax





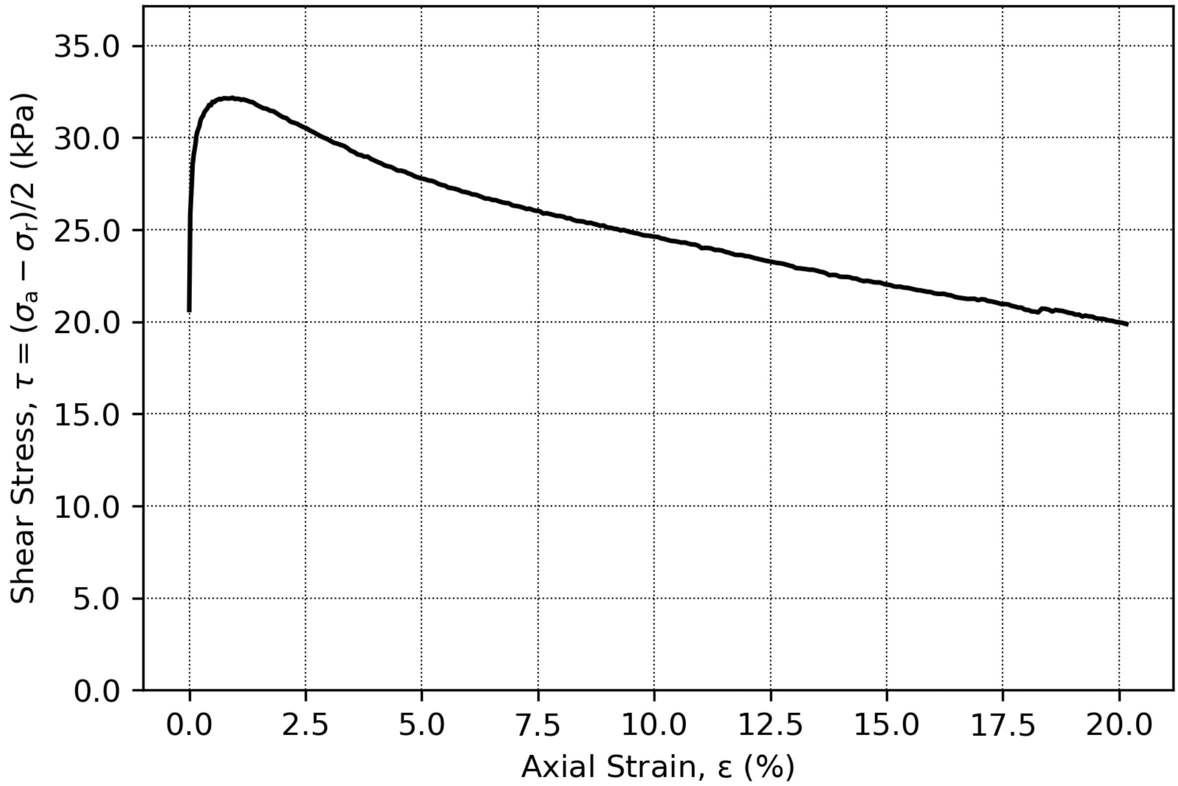
P:\2016\01\20160154\Lab\Onsøy\Triax

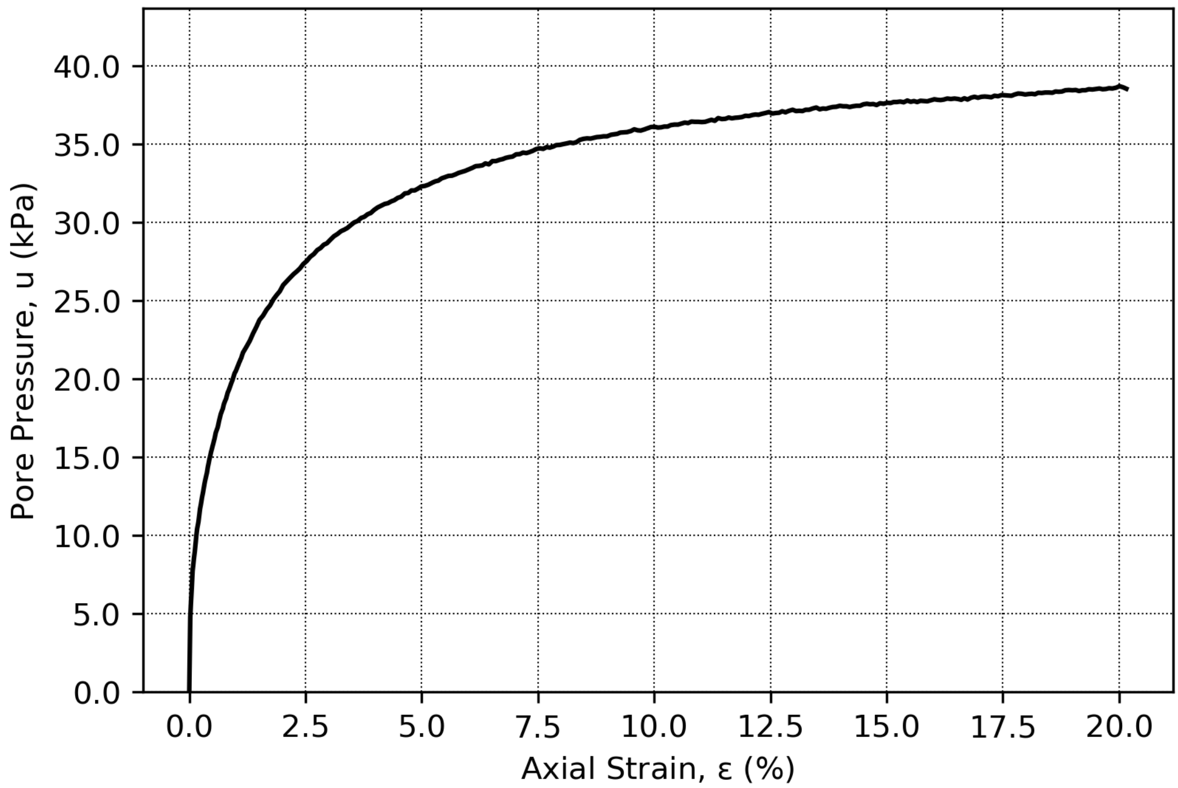
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.88
Boring:	ONSB22	Depth = 7.53	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0' = 45.7	kPa	(kPa)	max.	min.	final	
Part:	3	w_i = 64.6	%	σ_{ac}'	-	-	45.6	NGI
Test:	1	w_c = 61.7	%	σ_{rc}'	-	-	27.4	



Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.89	
Boring: ONSB22	Depth = 7.53	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube: S1	p_0' = 45.7	kPa	(kPa)	max.	min.	final		
Part: 3	w_i = 64.6	%	σ_{ac}'	-	-	45.6		
Test: 1	w_c = 61.7	%	σ_{rc}'	-	-	27.4		

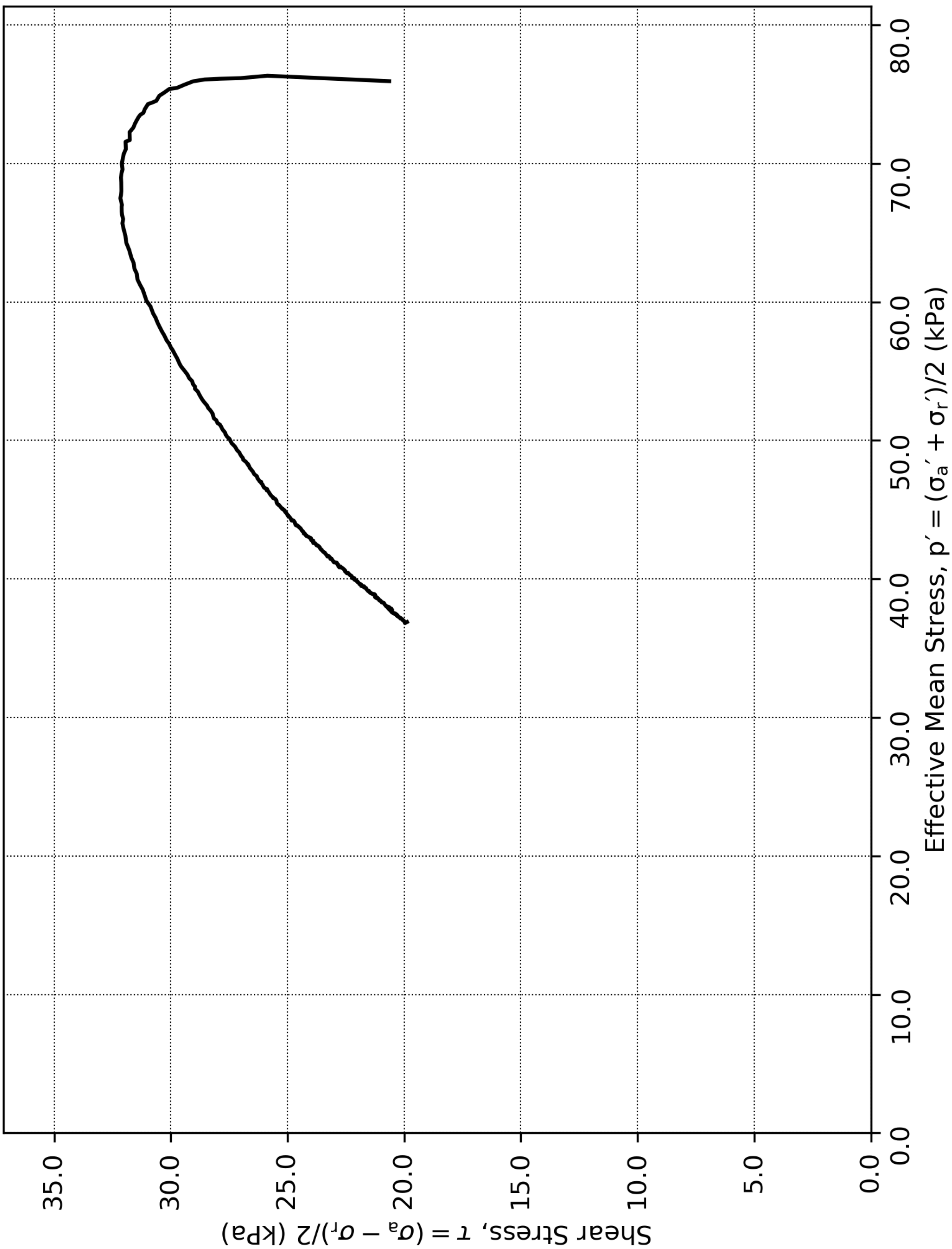
P:\2016\01\20160154\Lab\Onsøy\Triax





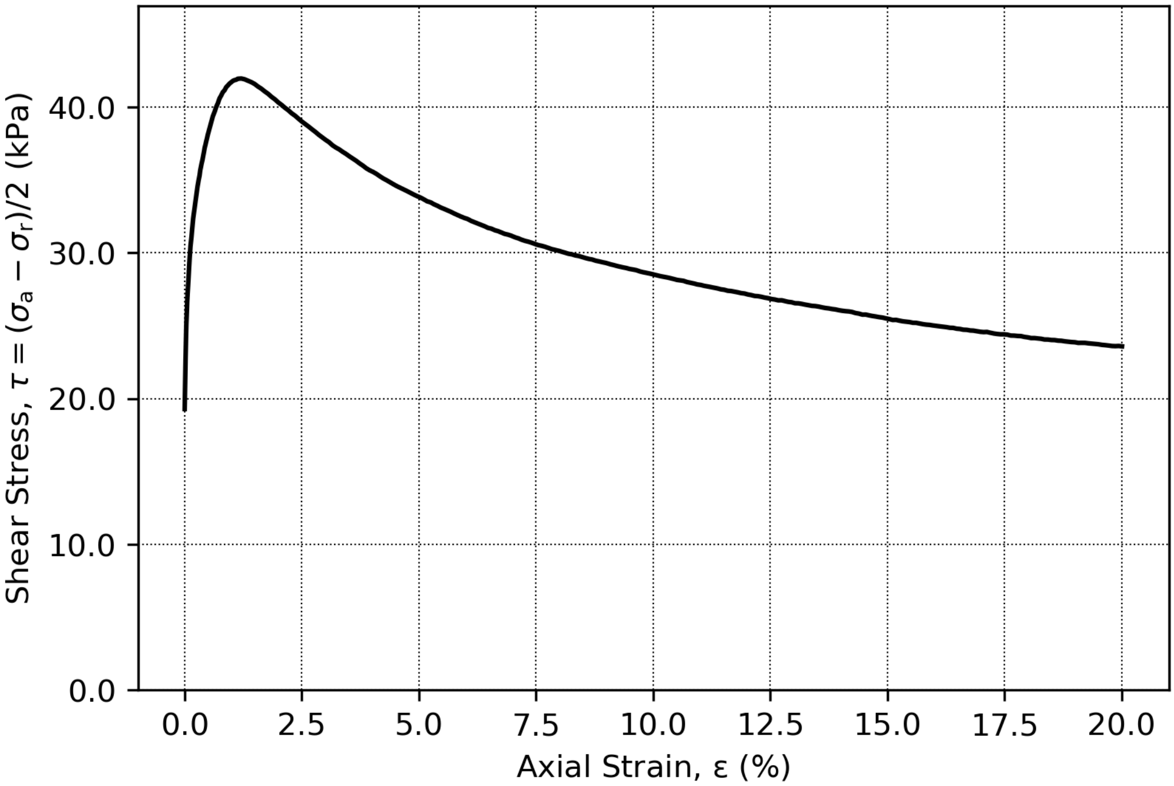
P:\2016\01\20160154\Lab\Onsøy\Triax

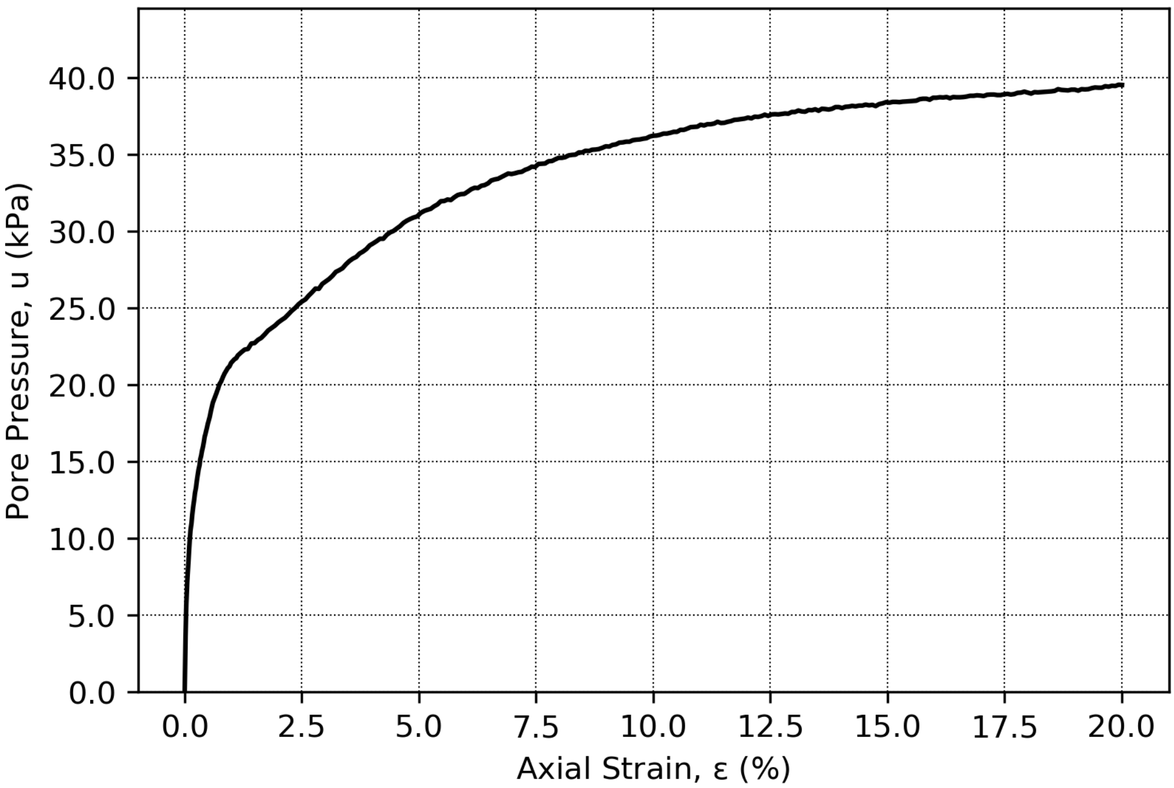
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.90
Boring:	ONSB22	Depth	= 13.78	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0'	= 92.0	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 44.3	%	σ_{ac}'	-	-	96.4	
Test:	1	w_c	= 41.6	%	σ_{rc}'	-	-	55.3	



Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.91
Boring:	ONSB22	Depth = 13.78	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0' = 92.0	kPa	(kPa)	max.	min.	final
Part:	1	w_i = 44.3	%	σ_{ac}'	-	-	96.4
Test:	1	w_c = 41.6	%	σ_{rc}'	-	-	55.3

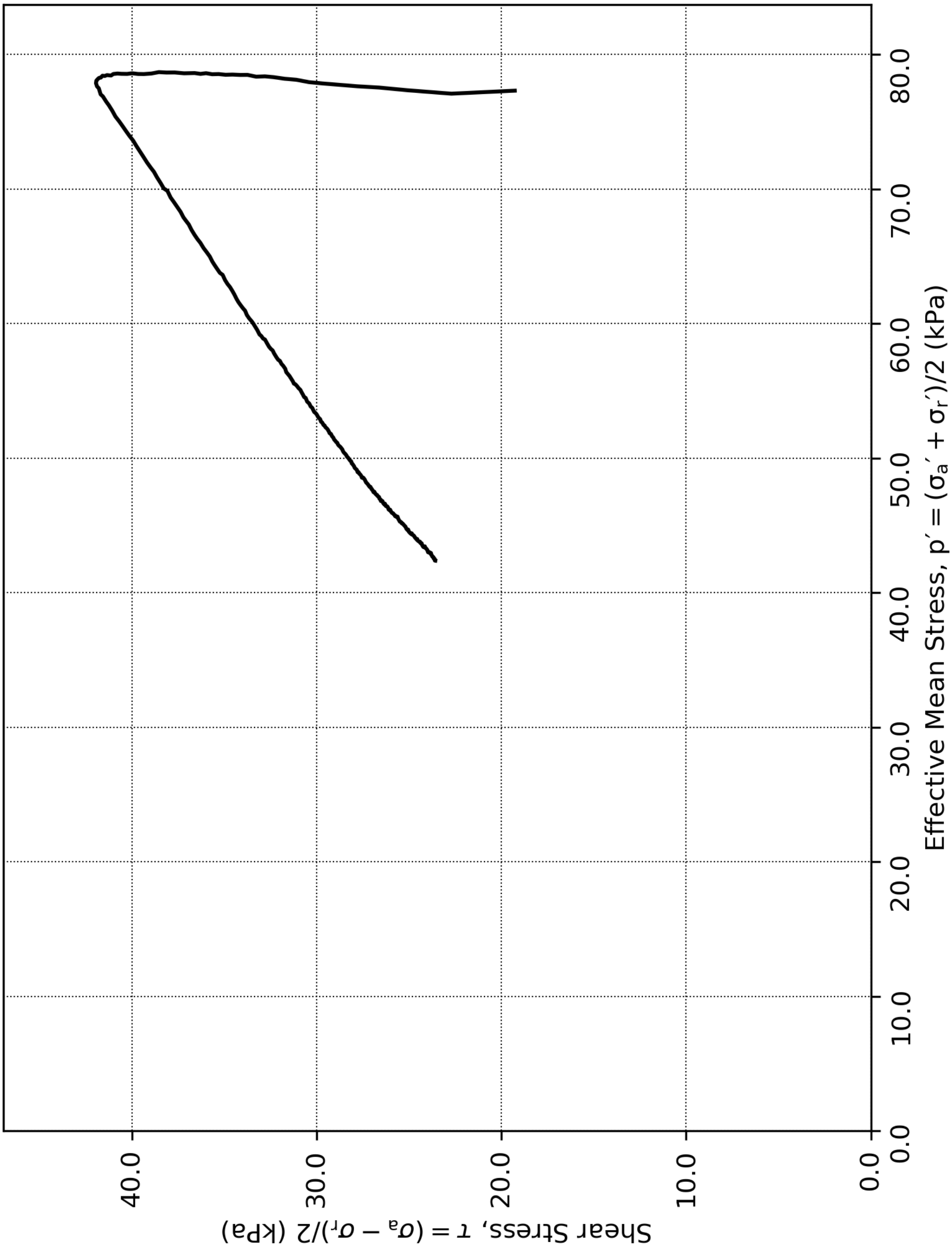
P:\2016\01\20160154\Lab\Onsøy\Triax





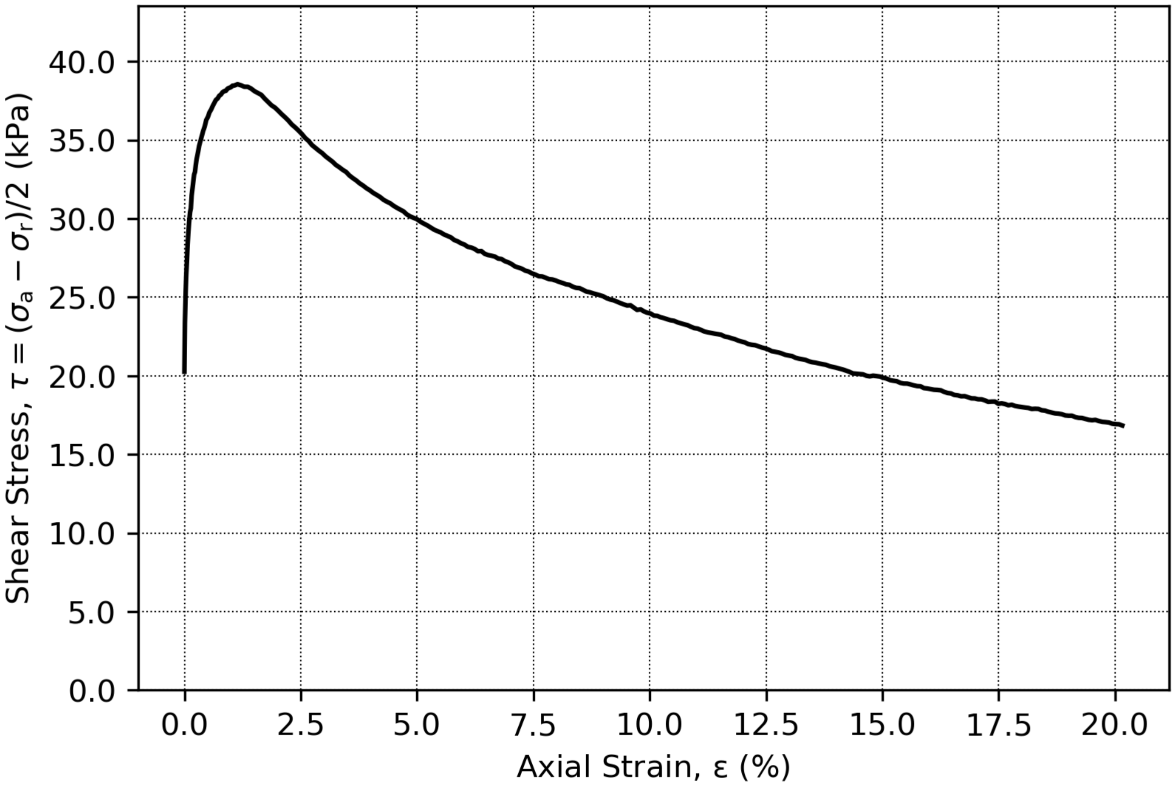
P:\2016\01\20160154\Lab\Onsøy\Triax

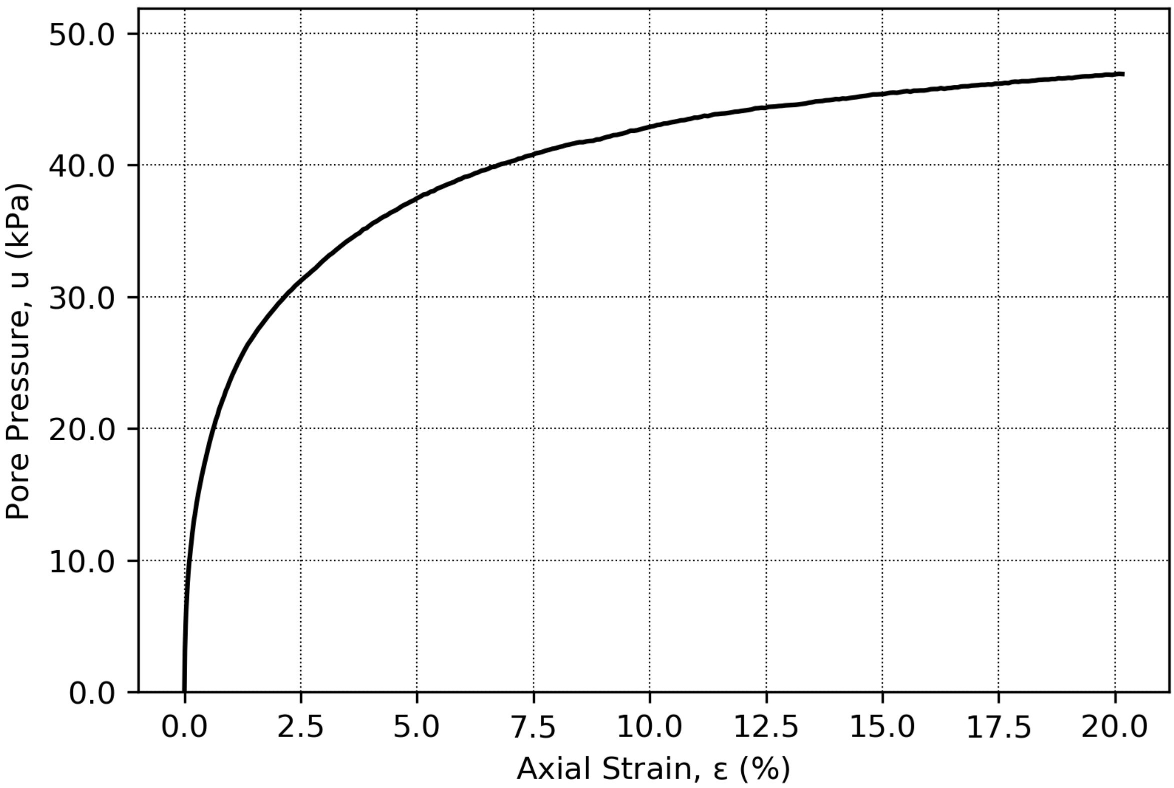
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.92	
Boring:	ONSB22	Depth	= 14.58	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S3	p_0'	= 96.6	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 61.0	%	σ_{ac}'	-	-	96.6	
Test:	1	w_c	= 59.2	%	σ_{rc}'	-	-	58.0	



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.93	
Boring:	ONSB22	Depth	= 14.58	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S3	p_0'	= 96.6	kPa	(kPa)	max.	min.	final		
Part:	2	w_i	= 61.0	%	σ_{ac}'	-	-	96.6		
Test:	1	w_c	= 59.2	%	σ_{rc}'	-	-	58.0		

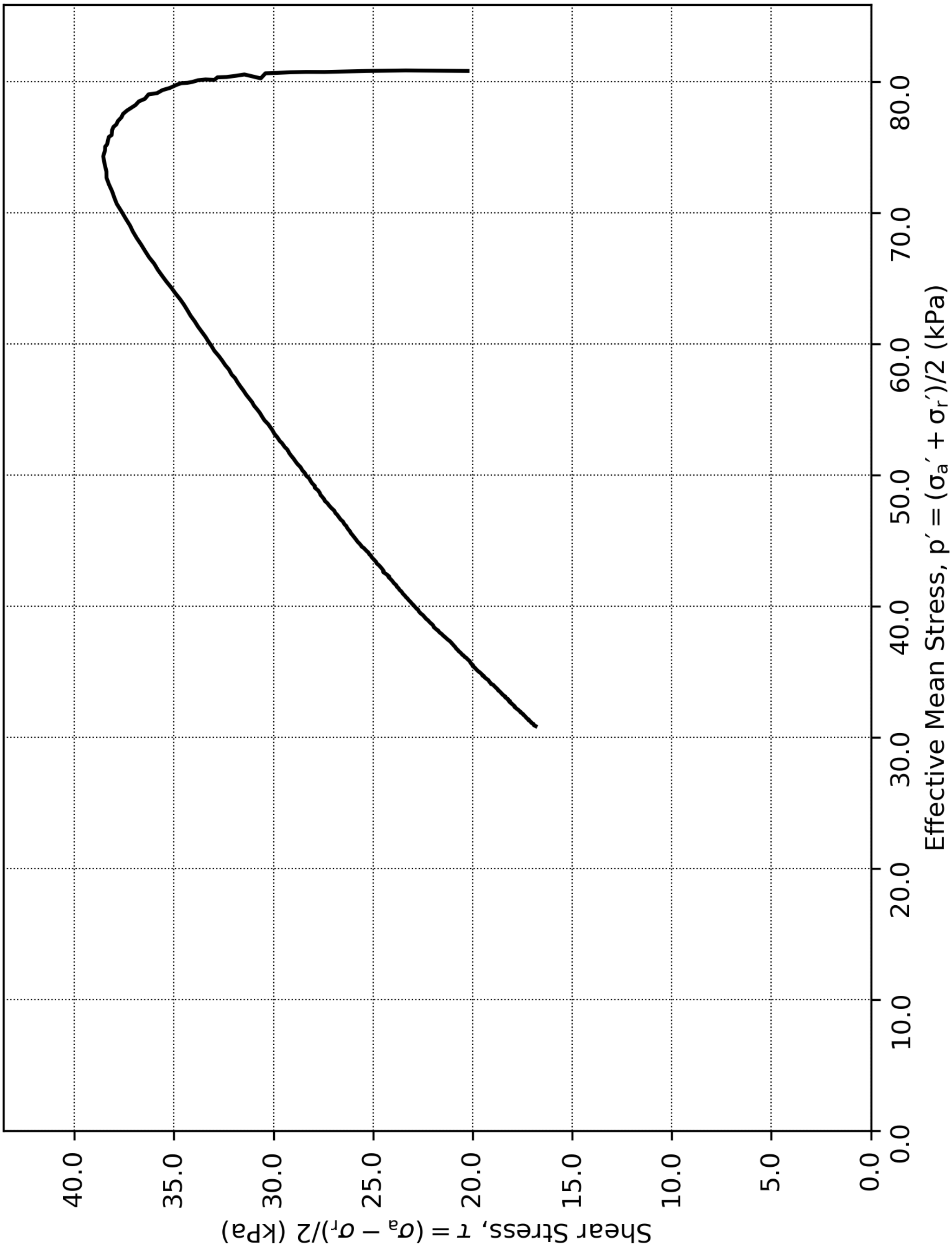
P:\2016\01\20160154\Lab\Onsøy\Triax





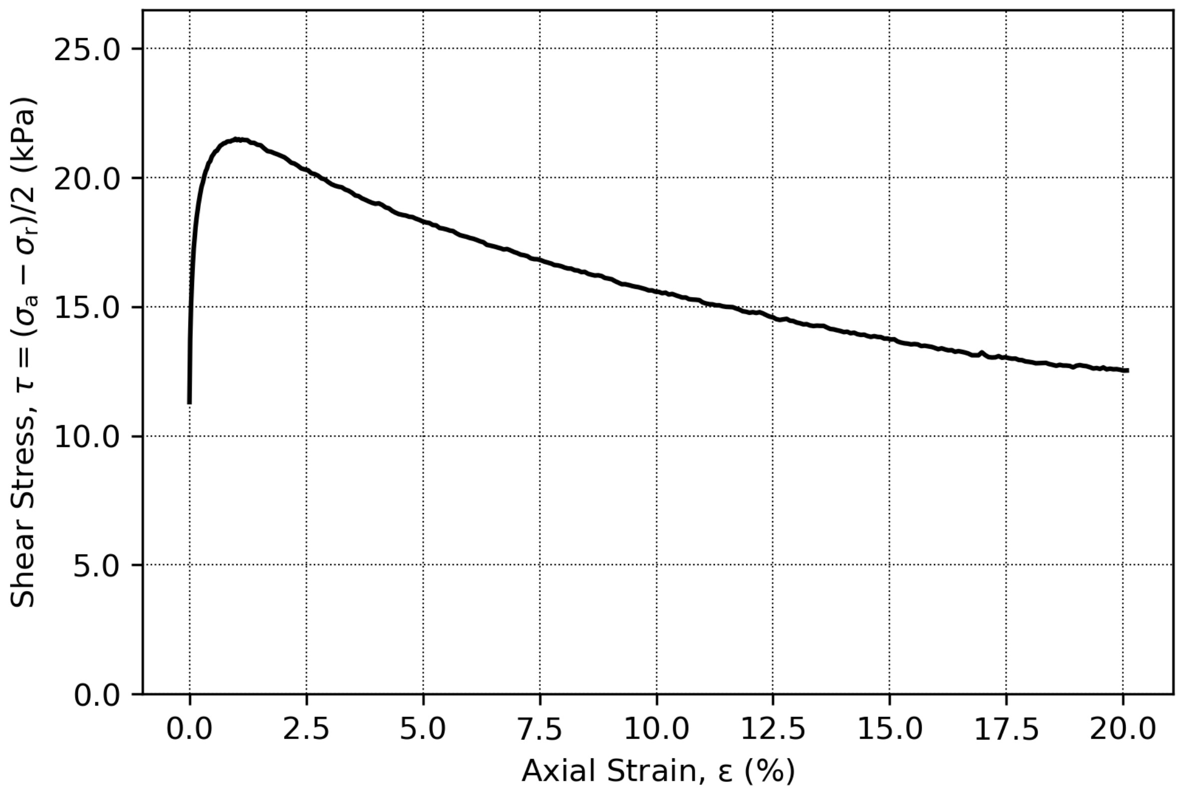
P:\2016\01\20160154\Lab\Onsøy\Triax

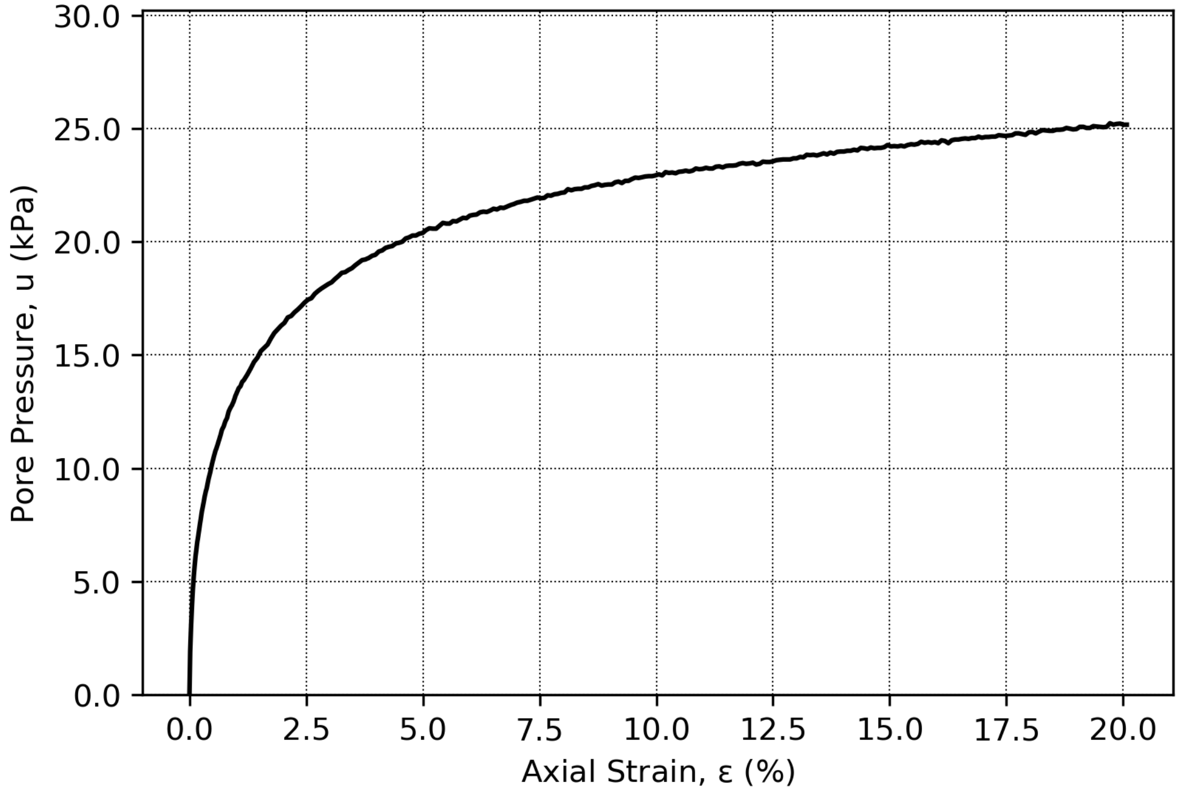
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.94	
Boring:	ONSB22	Depth	= 15.28	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S3	p_0'	= 100.8	kPa	(kPa)	max.	min.	final	NGI	
Part:	3	w_i	= 69.8	%	σ_{ac}'	-	-	100.8		
Test:	1	w_c	= 67.0	%	σ_{rc}'	-	-	60.6		



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.95	
Boring:	ONSB22	Depth	= 15.28	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S3	p_0'	= 100.8	kPa	(kPa)	max.	min.	final	
Part:	3	w_i	= 69.8	%	σ_{ac}'	-	-	100.8	
Test:	1	w_c	= 67.0	%	σ_{rc}'	-	-	60.6	

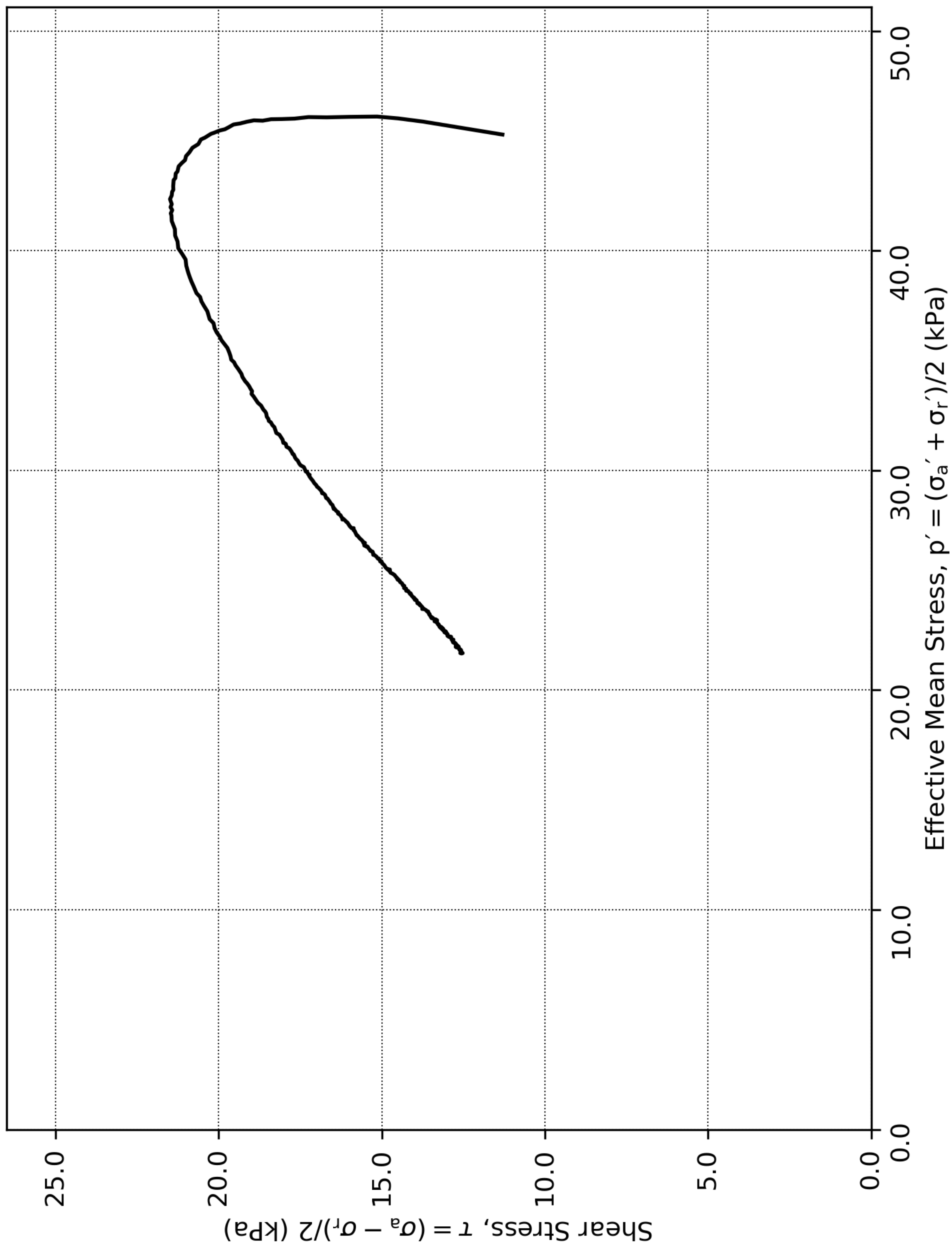
P:\2016\01\20160154\Lab\Onsøy\Triax





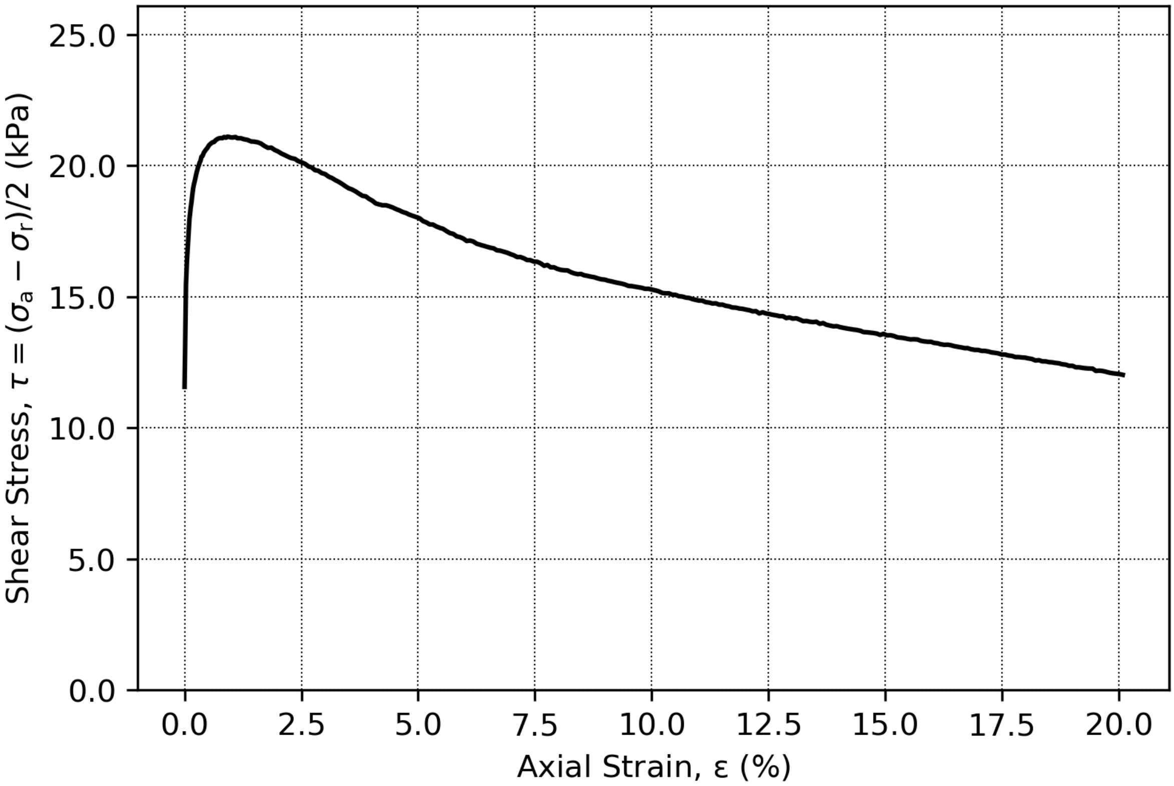
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.96	
Boring:	ONSB25	Depth	= 8.98	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 56.6	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 56.0	%	σ_{ac}'	-	-	56.6	
Test:	2	w_c	= 52.7	%	σ_{rc}'	-	-	34.0	

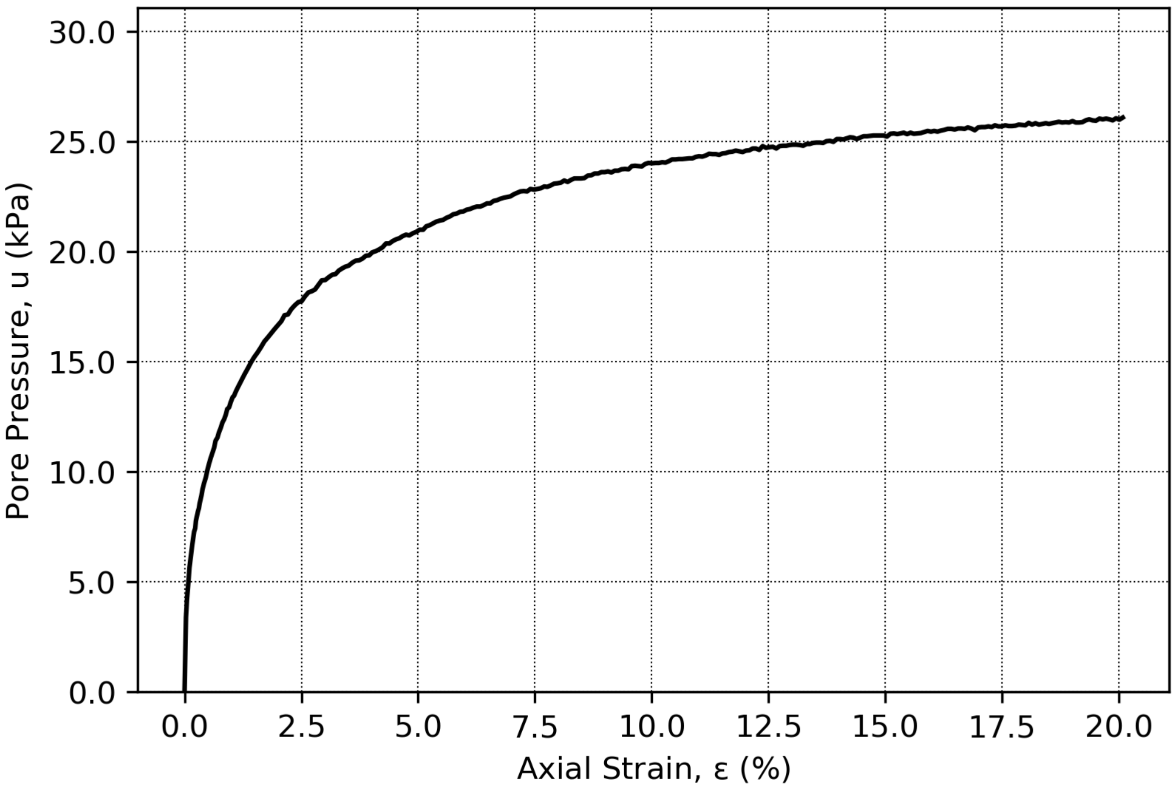
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.97	
Boring:	ONSB25	Depth	= 8.98	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 56.6	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 56.0	%	σ_{ac}'	-	-	56.6	
Test:	2	w_c	= 52.7	%	σ_{rc}'	-	-	34.0	

P:\2016\01\20160154\Lab\Onsøy\Triax

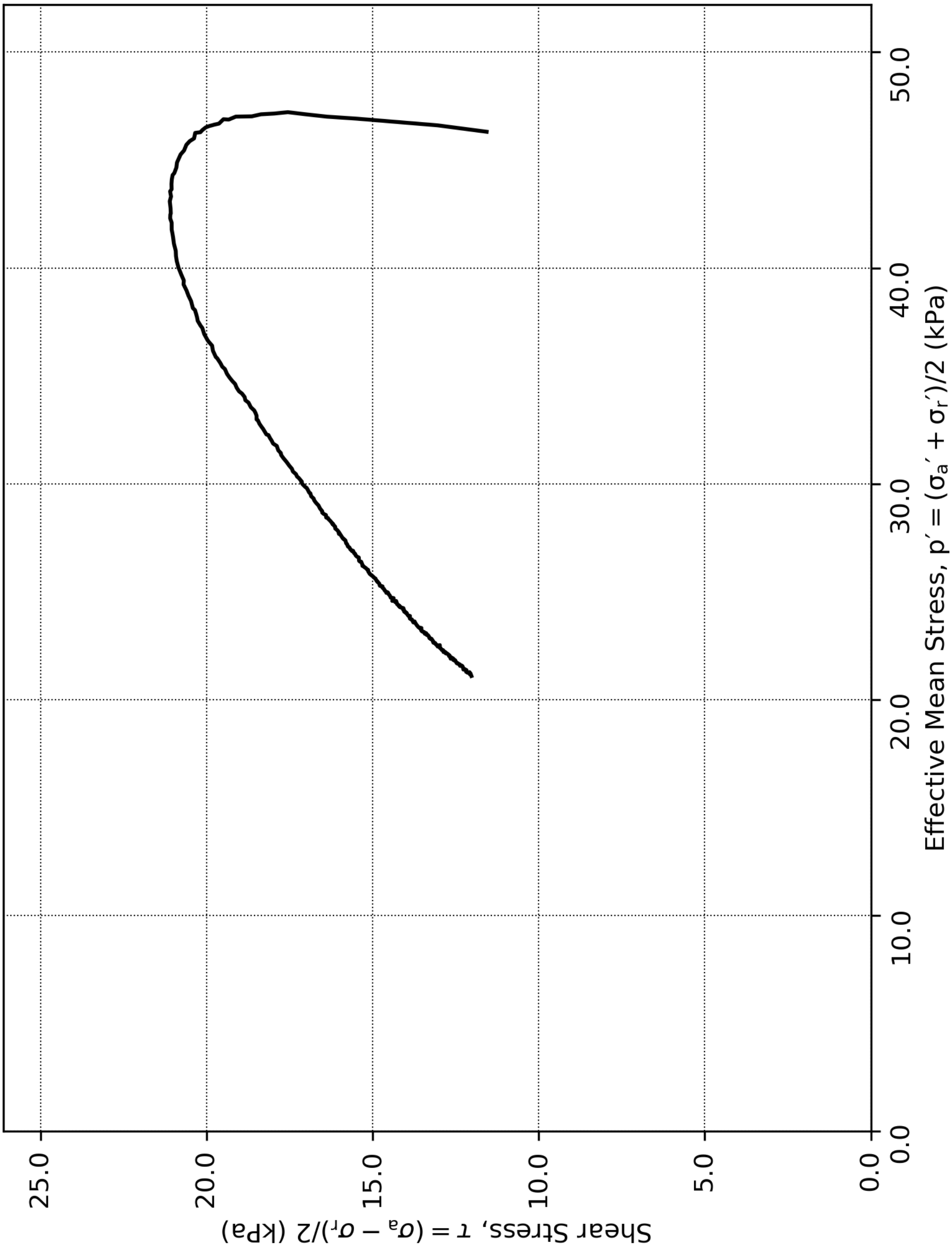




P:\2016\01\20160154\Lab\Onsøy\Triax

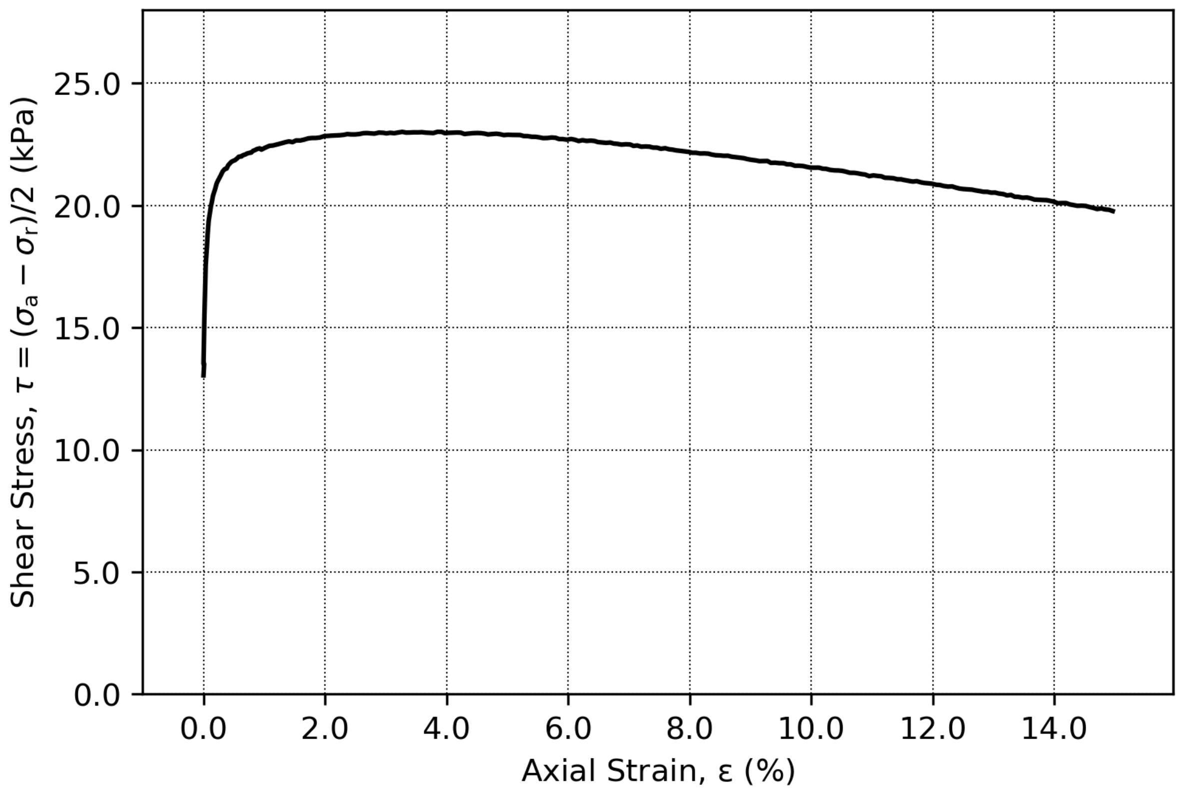
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.98
Boring:	ONSB25	Depth	= 9.18	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 57.9	kPa	(kPa)	max.	min.	final
Part:	1	w_i	= 53.4	%	σ_{ac}'	-	-	57.8
Test:	3	w_c	= 50.4	%	σ_{rc}'	-	-	34.8

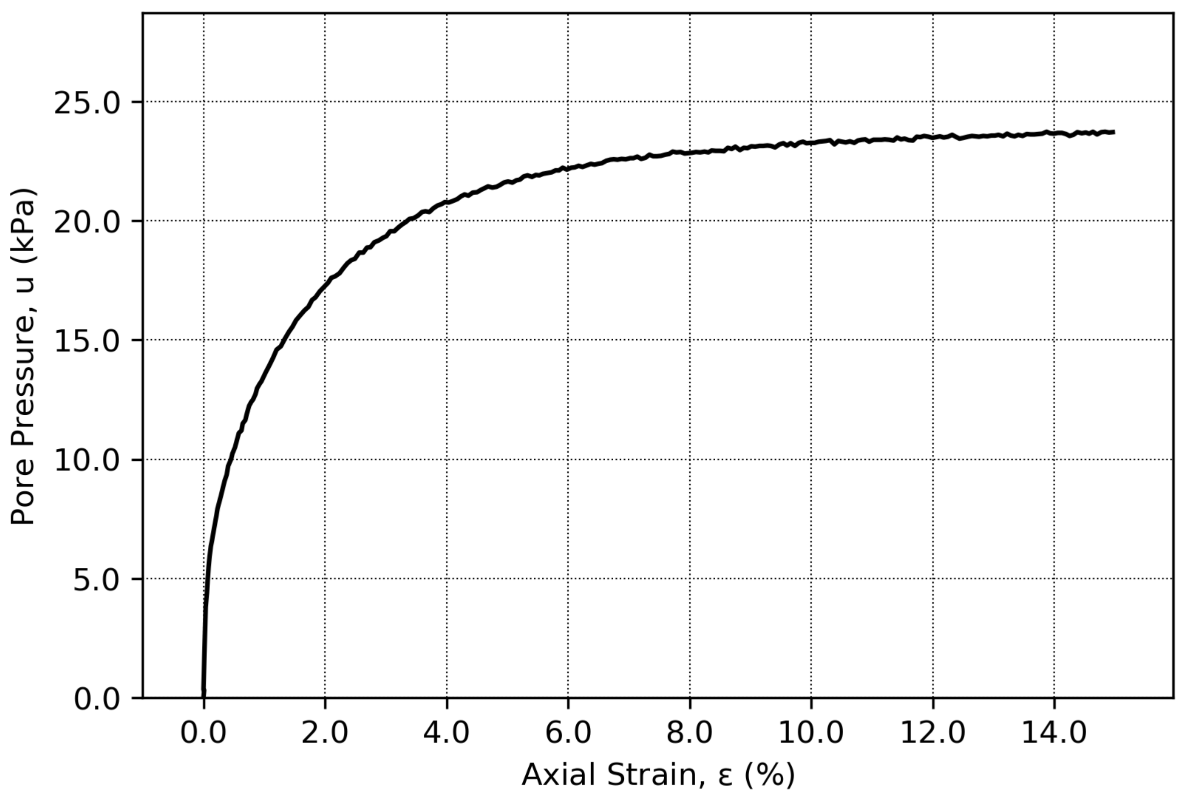
NGI



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.99	
Boring:	ONSB25	Depth = 9.18	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0' = 57.9	kPa	(kPa)	max.	min.	final		
Part:	1	w_i = 53.4	%	σ_{ac}'	-	-	57.8		
Test:	3	w_c = 50.4	%	σ_{rc}'	-	-	34.8		

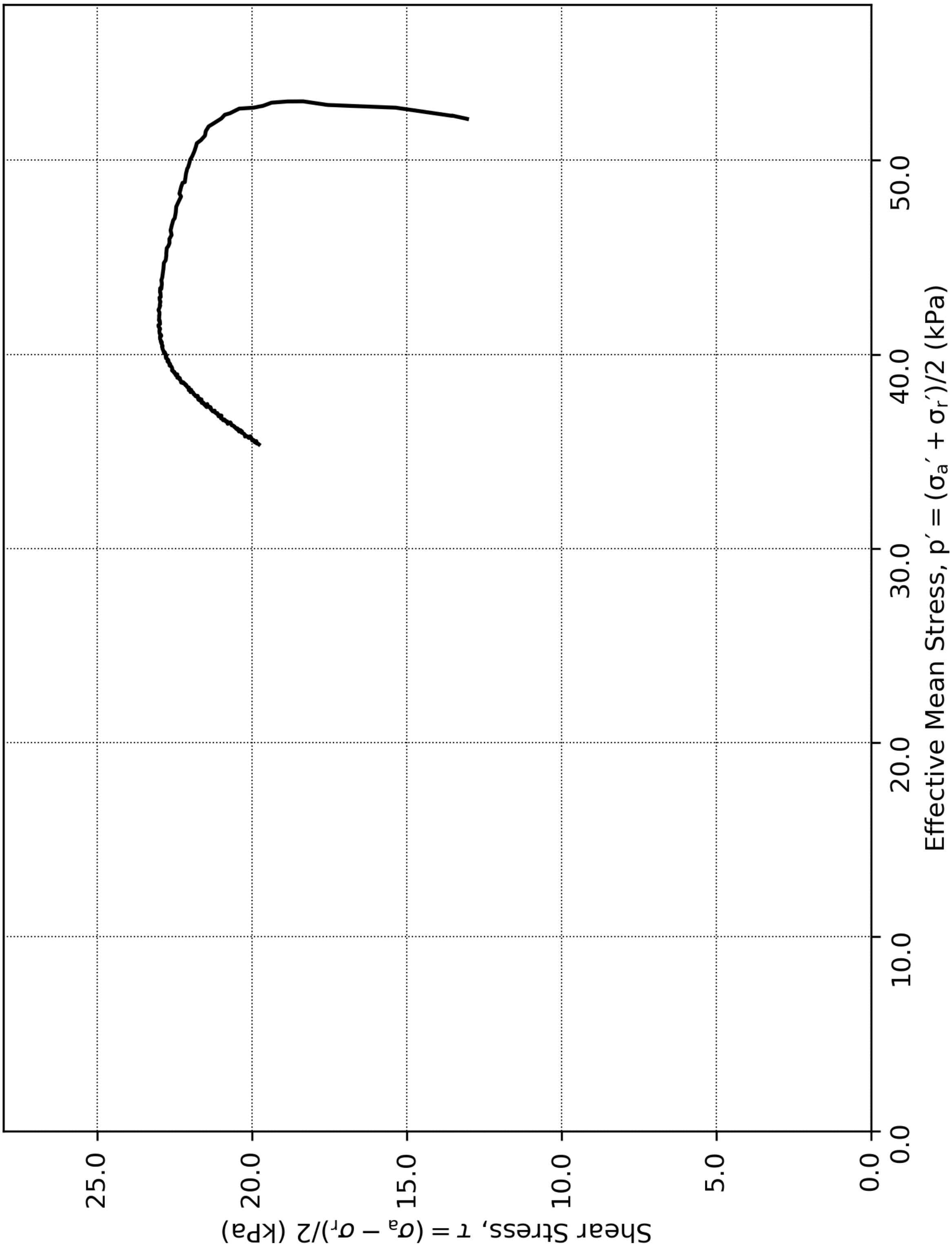
P:\2016\01\20160154\Lab\Onsøy\Triax





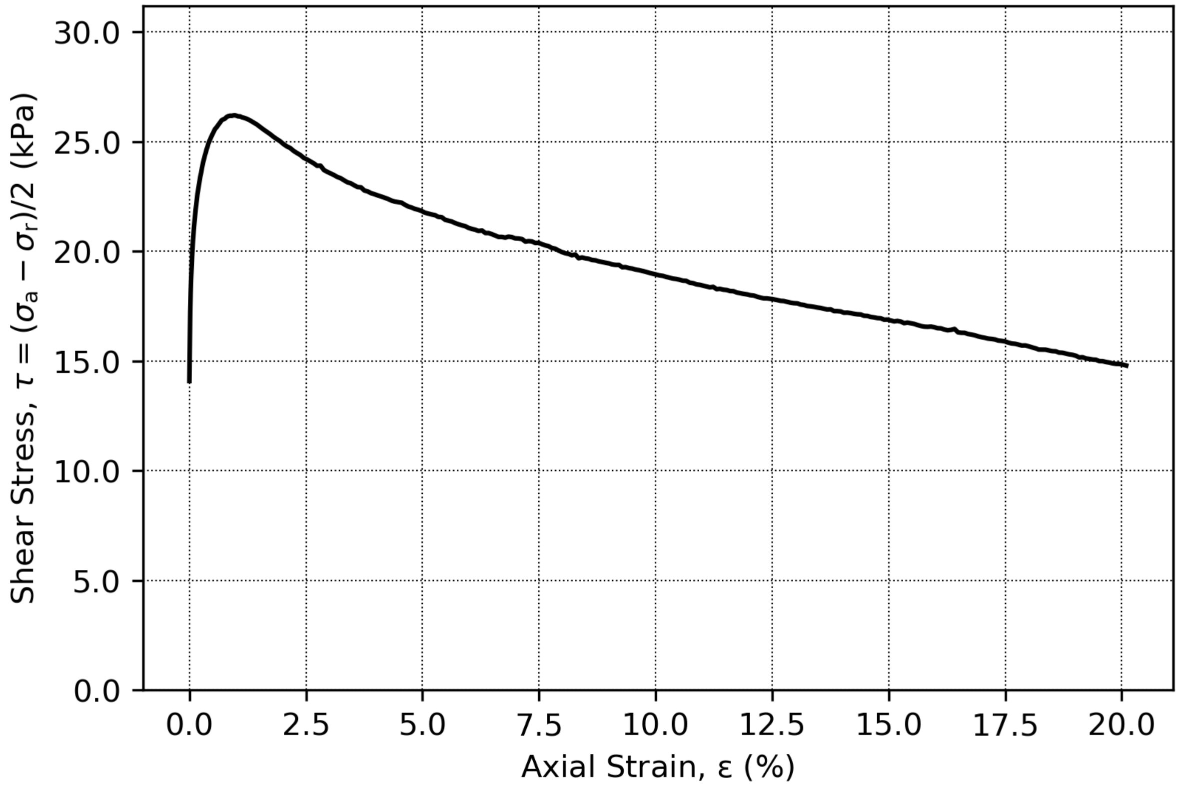
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.100
Boring:	ONSB25	Depth	= 10.14	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 65.1	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 47.0	%	σ_{ac}'	-	-	65.1	
Test:	1	w_c	= 41.7	%	σ_{rc}'	-	-	39.1	

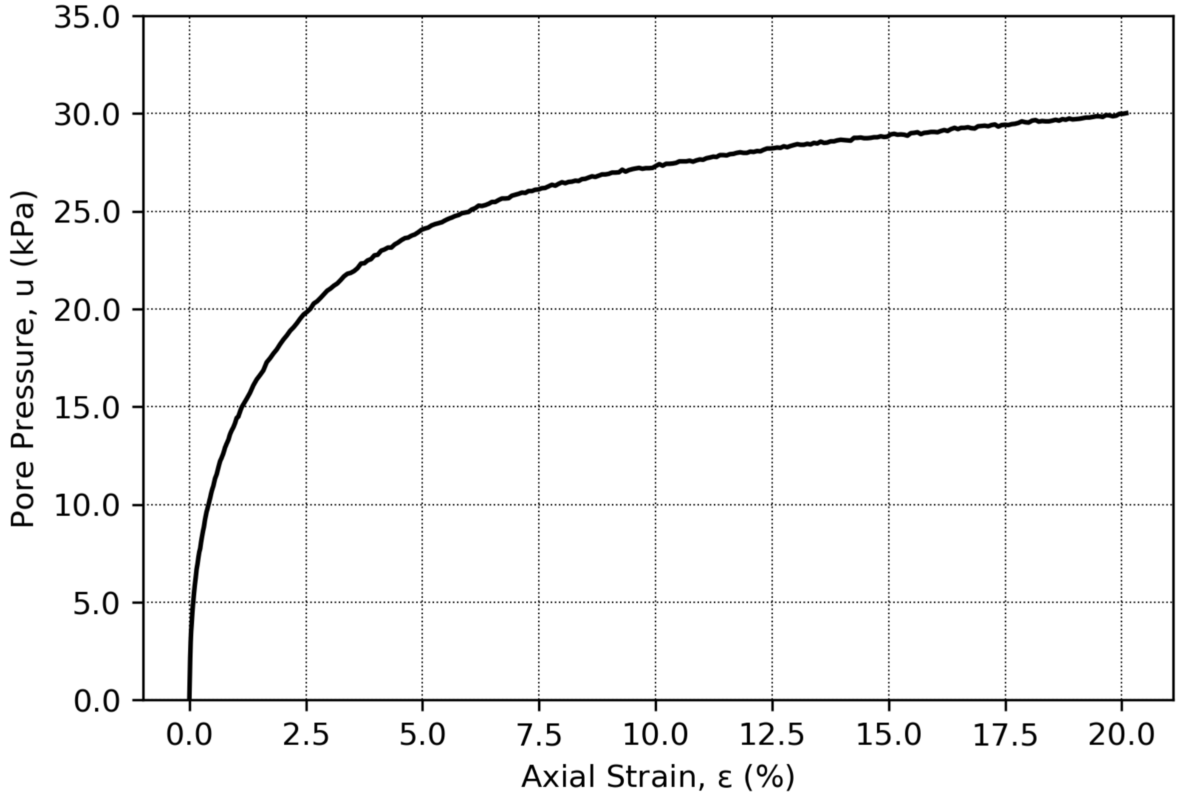
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.101
Boring:	ONSB25	Depth = 10.14	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0' = 65.1	kPa	(kPa)	max.	min.	final	
Part:	2	w_i = 47.0	%	σ_{ac}'	-	-	65.1	
Test:	1	w_c = 41.7	%	σ_{rc}'	-	-	39.1	

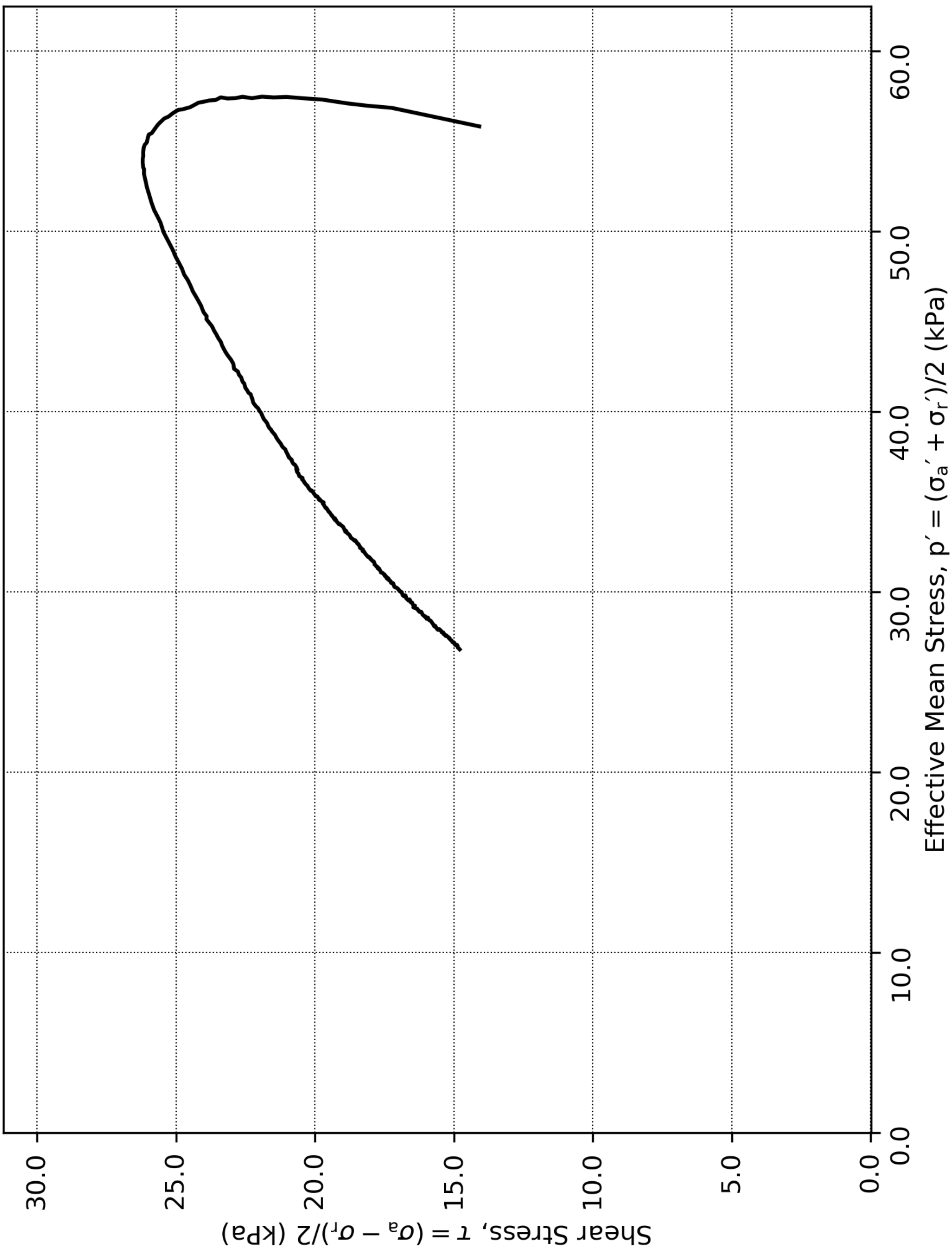
P:\2016\01\20160154\Lab\Onsøy\Triax





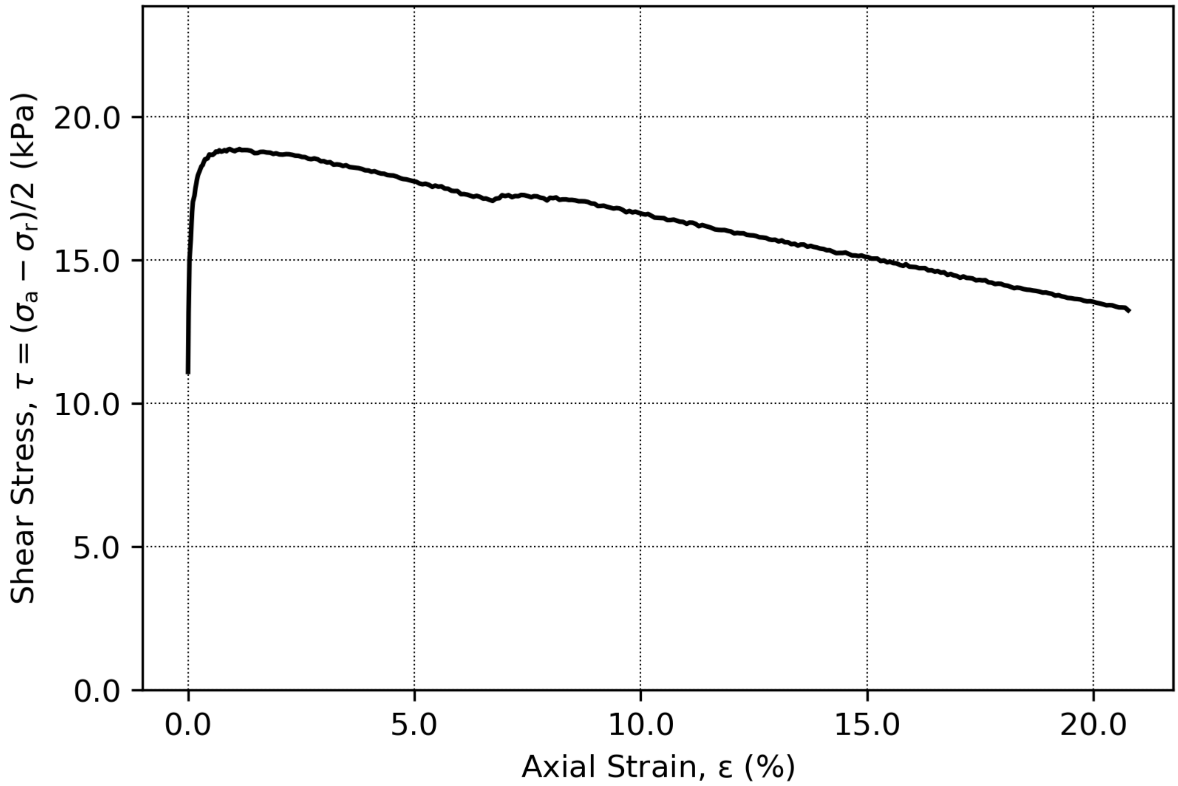
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.102	
Boring: ONSB25	Depth	= 10.79	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube: S2	p_0'	= 69.7	kPa	(kPa)	max.	min.	final	
Part: 3	w_i	= 42.3	%	σ_{ac}'	-	-	69.7	
Test: 1	w_c	= 40.3	%	σ_{rc}'	-	-	41.8	

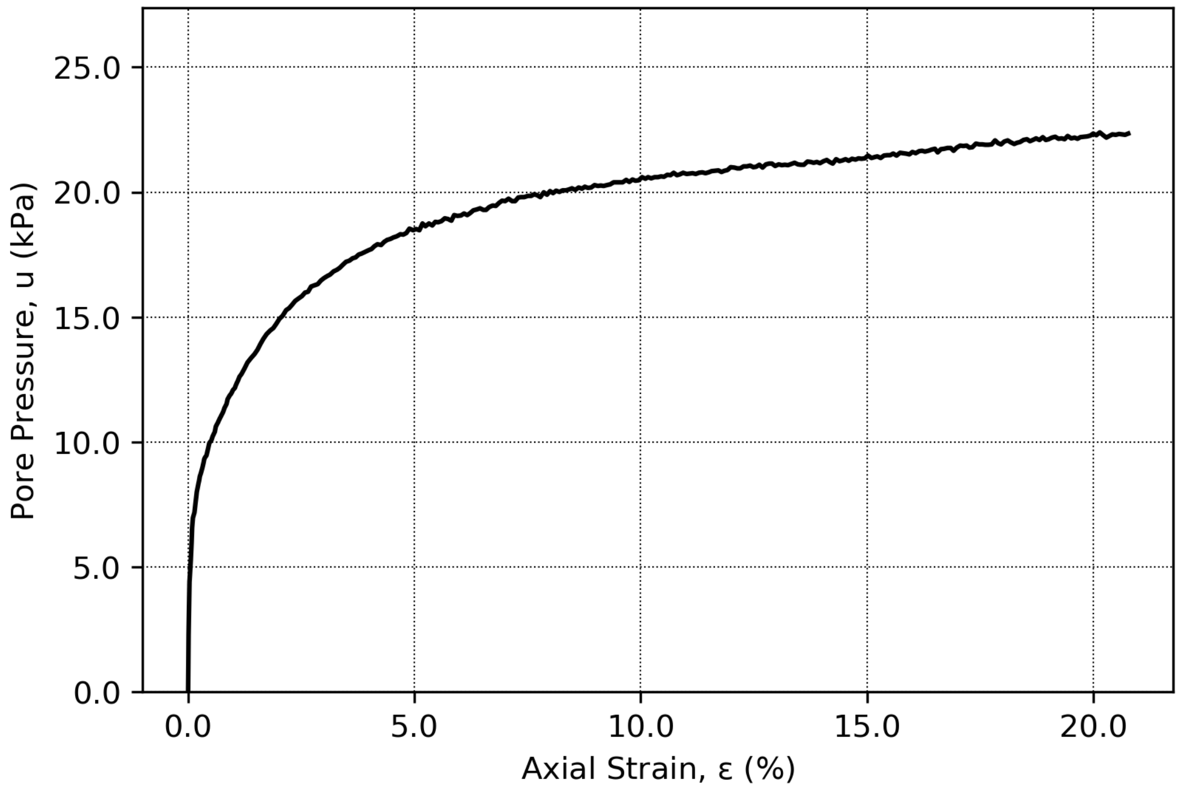
P:\2016\01\20160154\Lab\Onsøy\Triax



P:\2016\01\20160154\Lab\Onsøy\Triax

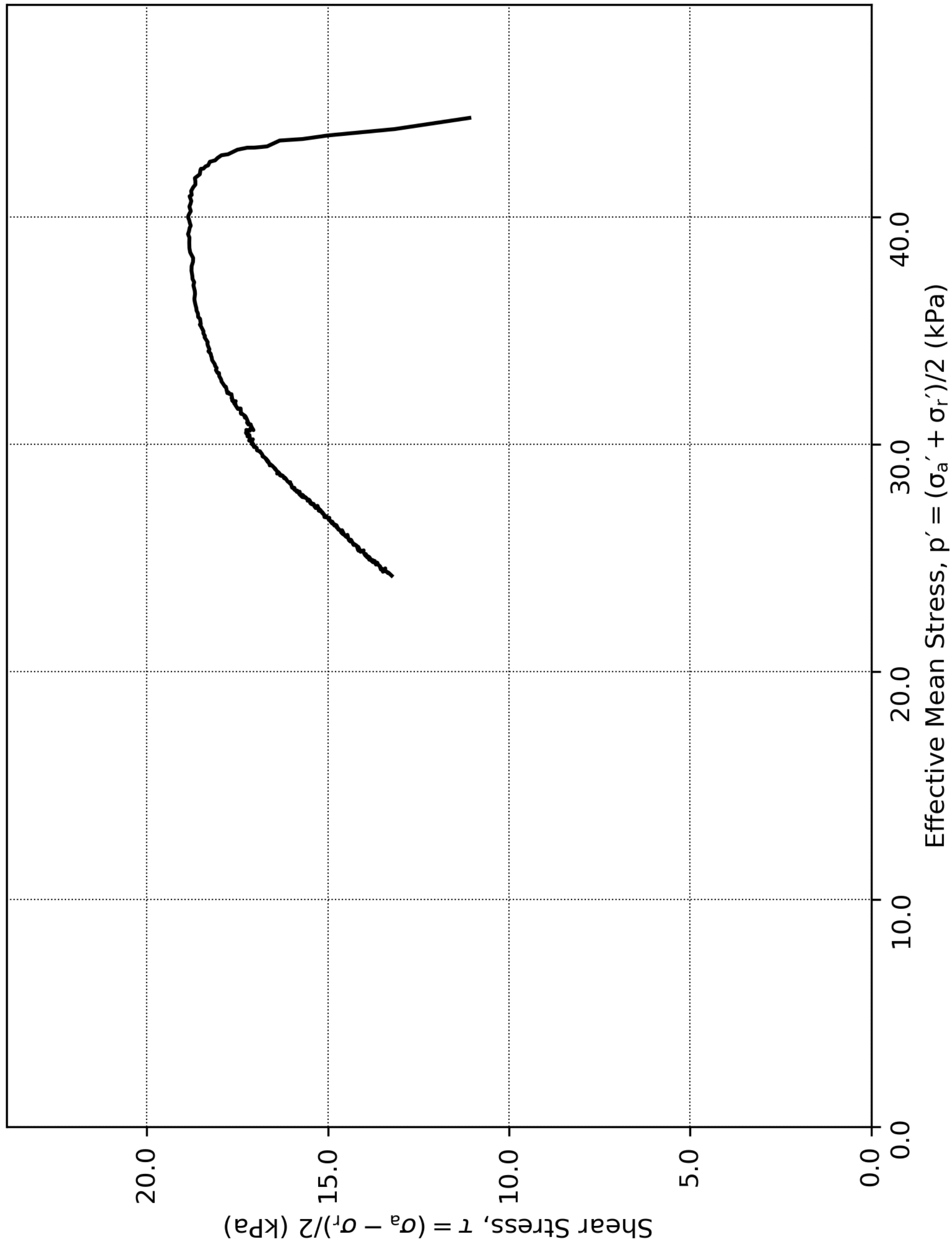
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.103
Boring: ONSB25	Depth = 10.79	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S2	p_0' = 69.7	kPa	(kPa)	max.	min.	final	
Part: 3	w_i = 42.3	%	σ_{ac}'	-	-	69.7	
Test: 1	w_c = 40.3	%	σ_{rc}'	-	-	41.8	NGI





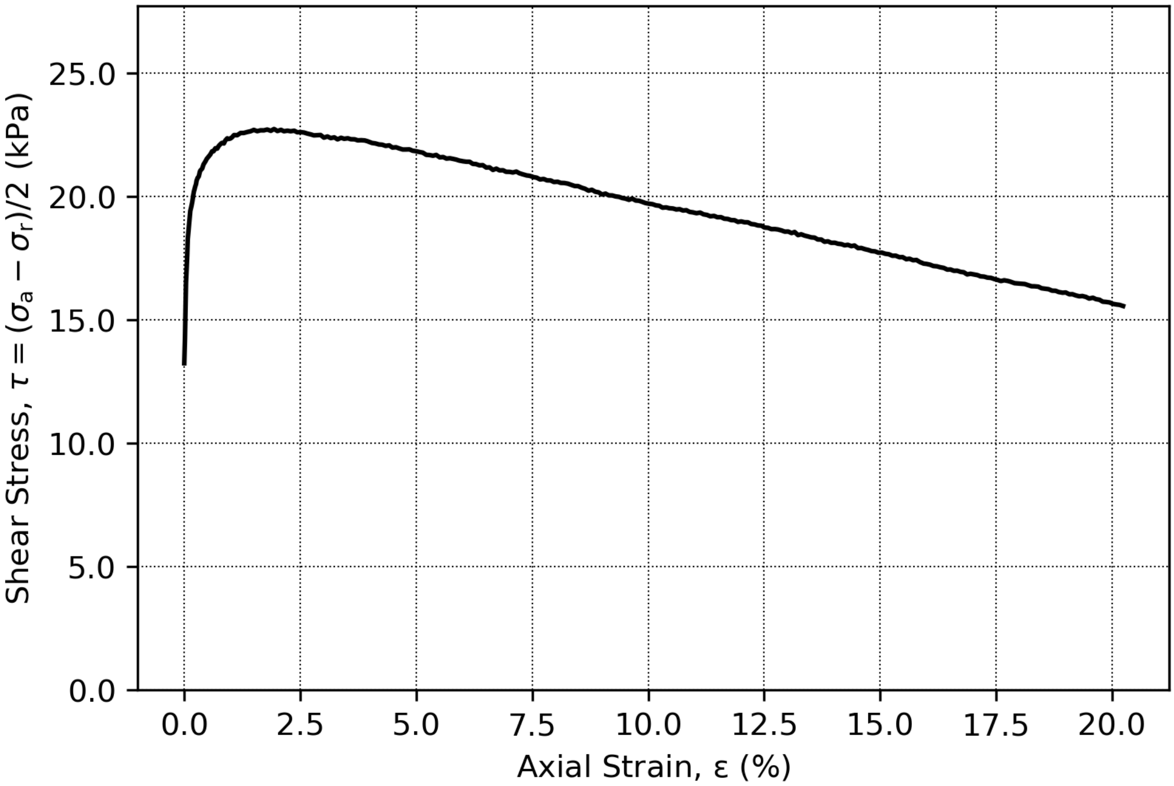
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.104	
Boring:	ONSB27	Depth	= 8.78	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 55.1	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 57.2	%	σ_{ac}'	-	-	55.1	
Test:	1	w_c	= 52.0	%	σ_{rc}'	-	-	33.0	

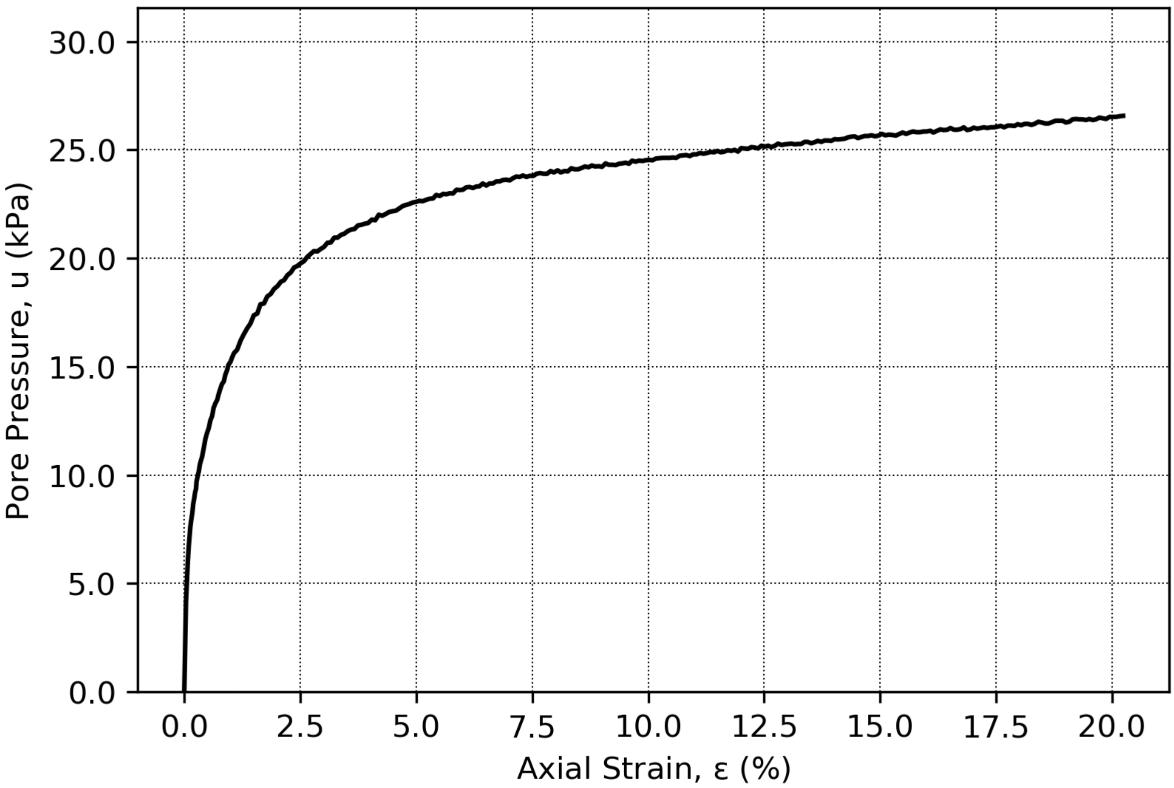
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.105	
Boring:	ONSB27	Depth	= 8.78	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 55.1	kPa	(kPa)	max.	min.	final	NGI
Part:	1	w_i	= 57.2	%	σ_{ac}'	-	-	55.1	
Test:	1	w_c	= 52.0	%	σ_{rc}'	-	-	33.0	

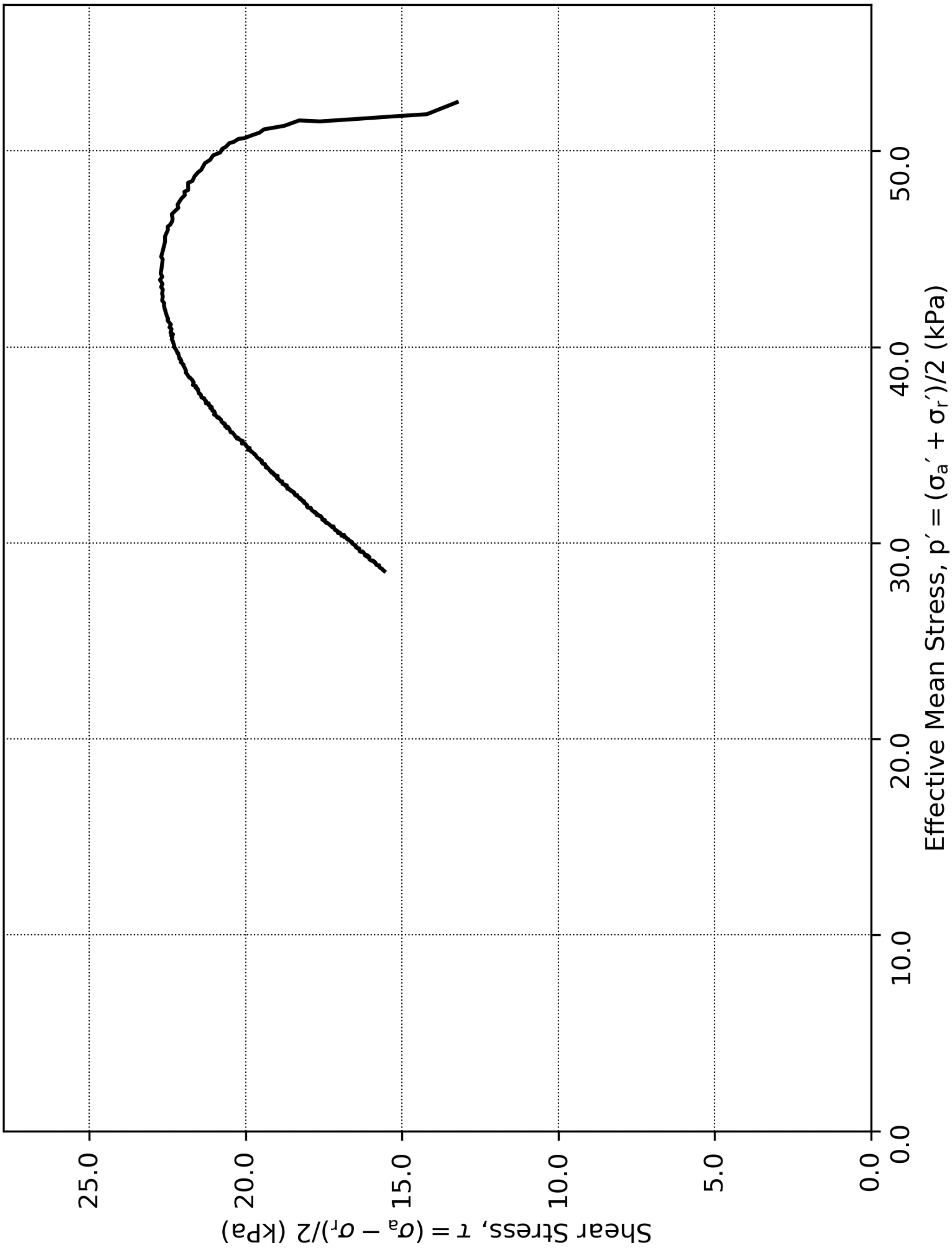
P:\2016\01\20160154\Lab\Onsøy\Triax





P:\2016\01\20160154\Lab\Onsøy\Triax

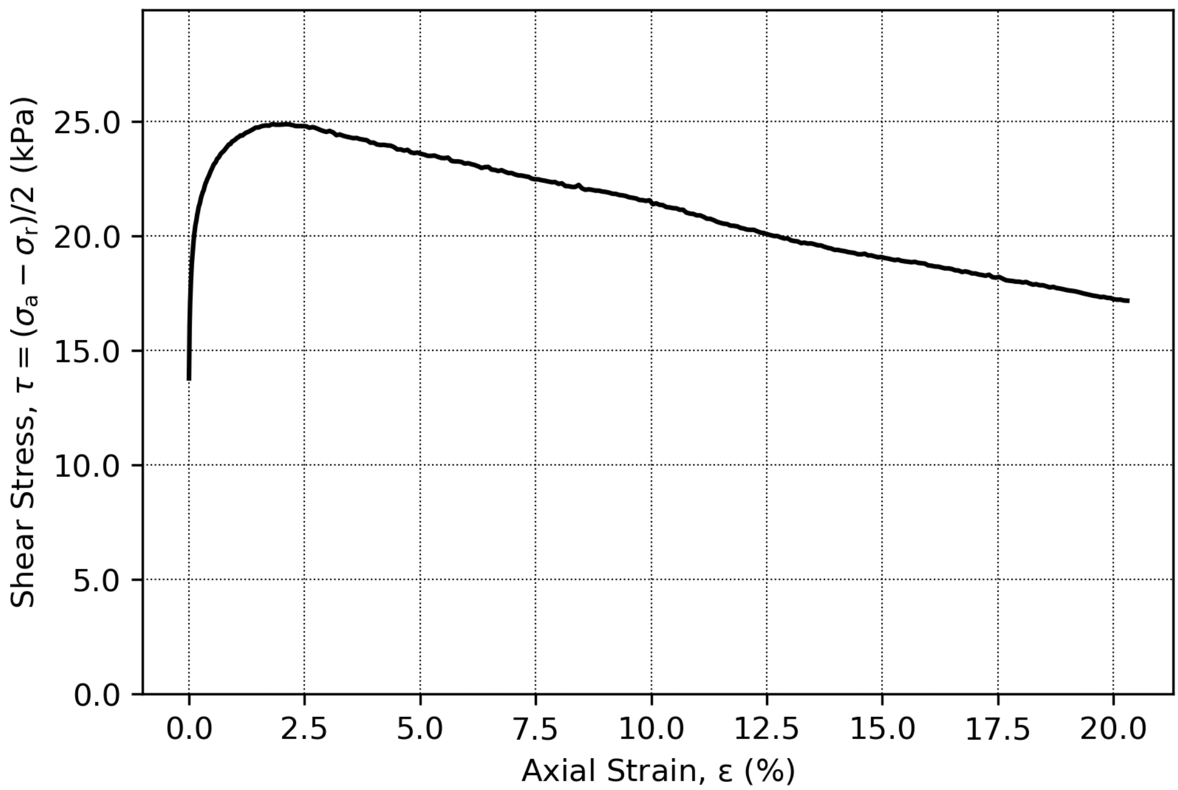
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.106
Boring:	ONSB27	Depth	= 10.18	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 65.4	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 45.1	%	σ_{ac}'	-	-	65.3	
Test:	1	w_c	= 41.7	%	σ_{rc}'	-	-	39.3	

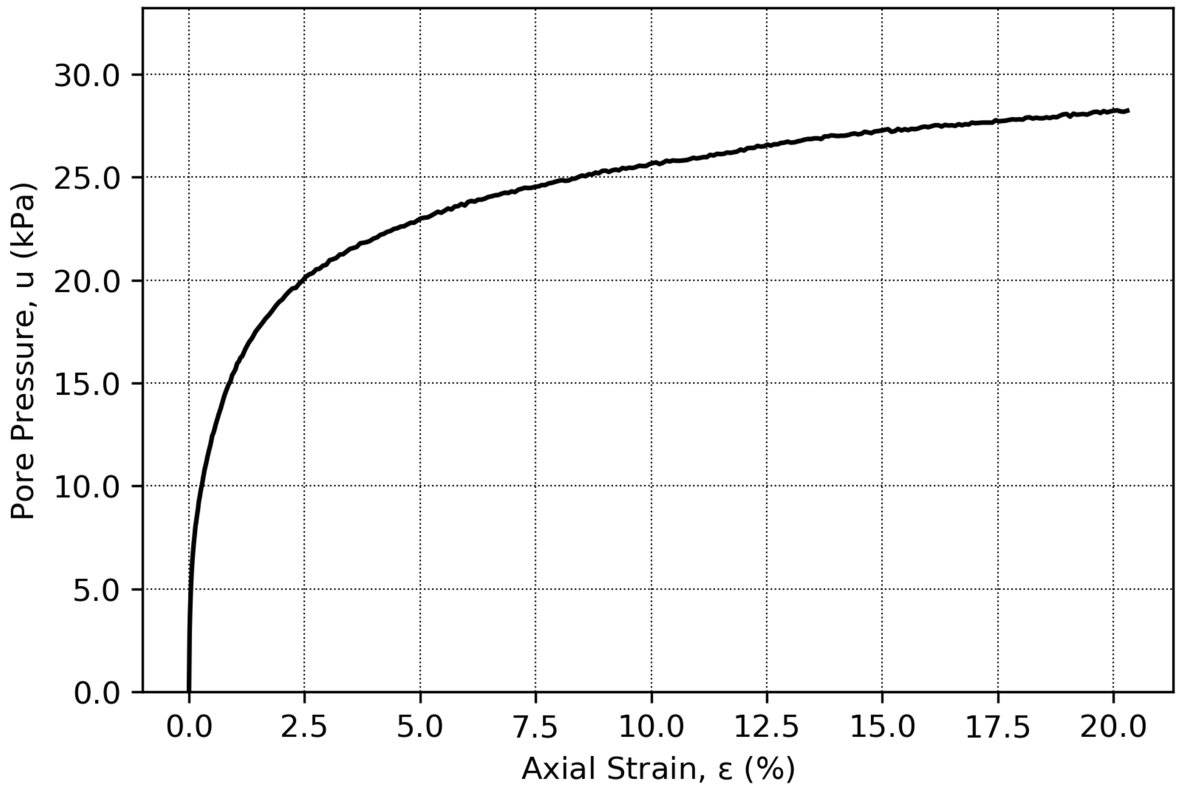


Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.107
Boring:	ONSB27	Depth	= 10.18	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 65.4	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 45.1	%	σ_{ac}'	-	-	65.3
Test:	1	w_c	= 41.7	%	σ_{rc}'	-	-	39.3

NGI

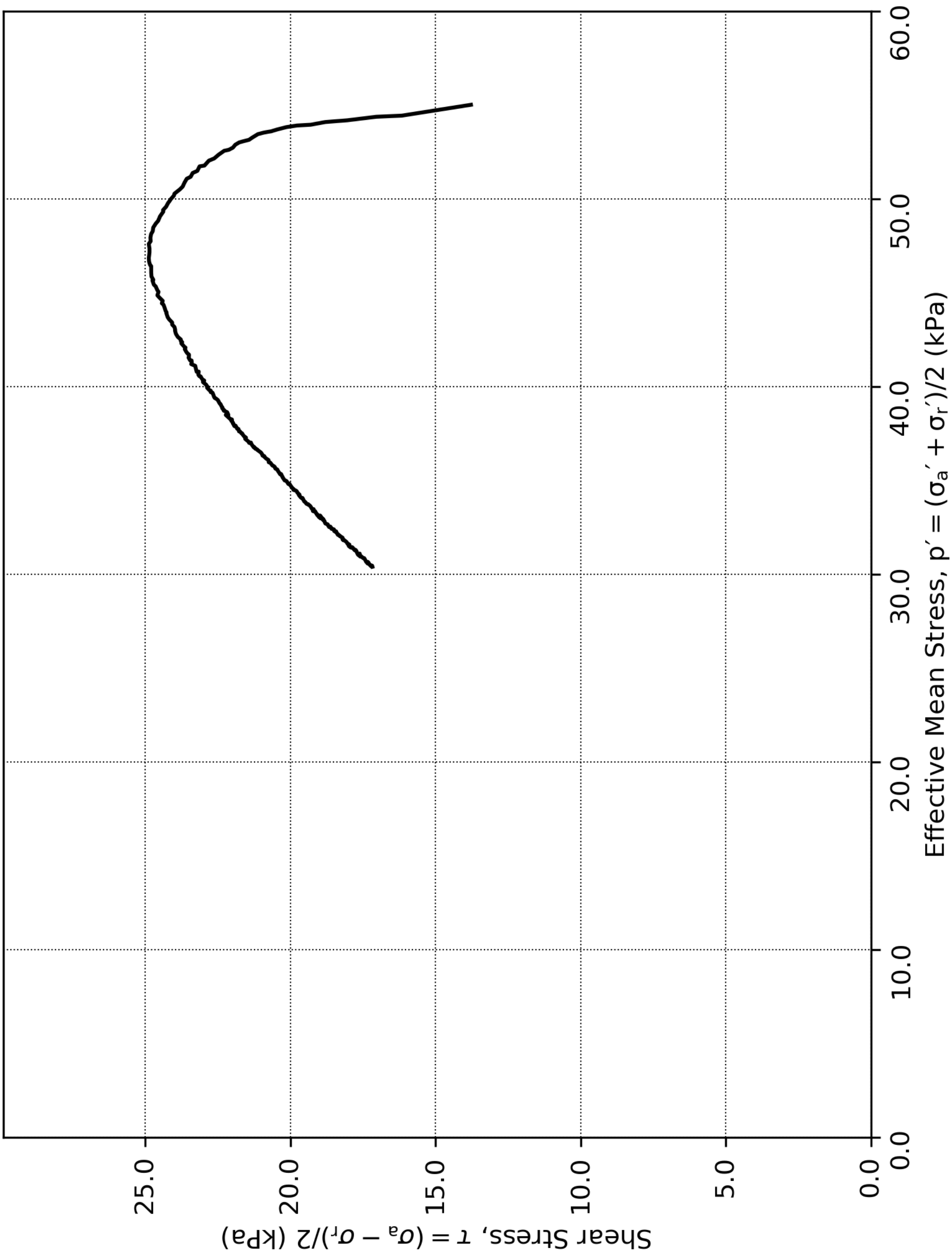
P:\2016\01\20160154\Lab\Onsøy\Triax





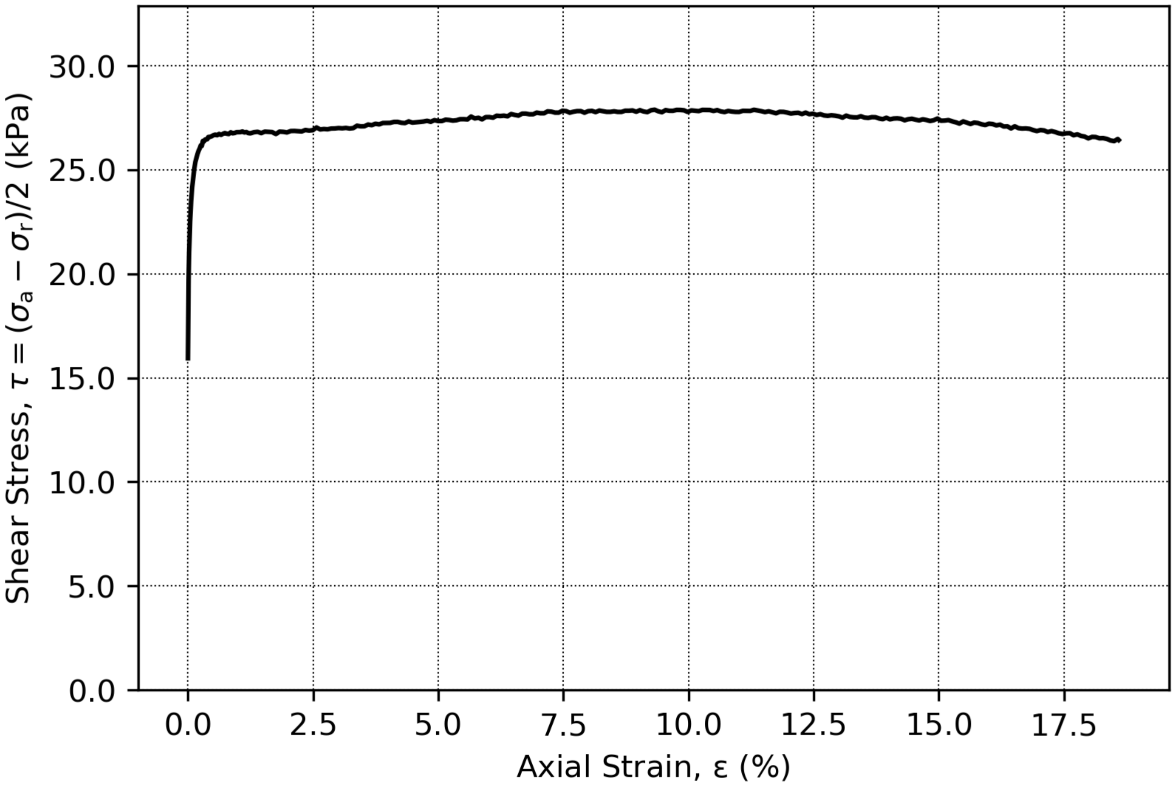
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.108
Boring:	ONSB27	Depth	= 10.65	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 68.6	kPa	(kPa)	max.	min.	final
Part:	3	w_i	= 42.3	%	σ_{ac}'	-	-	68.7
Test:	1	w_c	= 39.6	%	σ_{rc}'	-	-	41.2

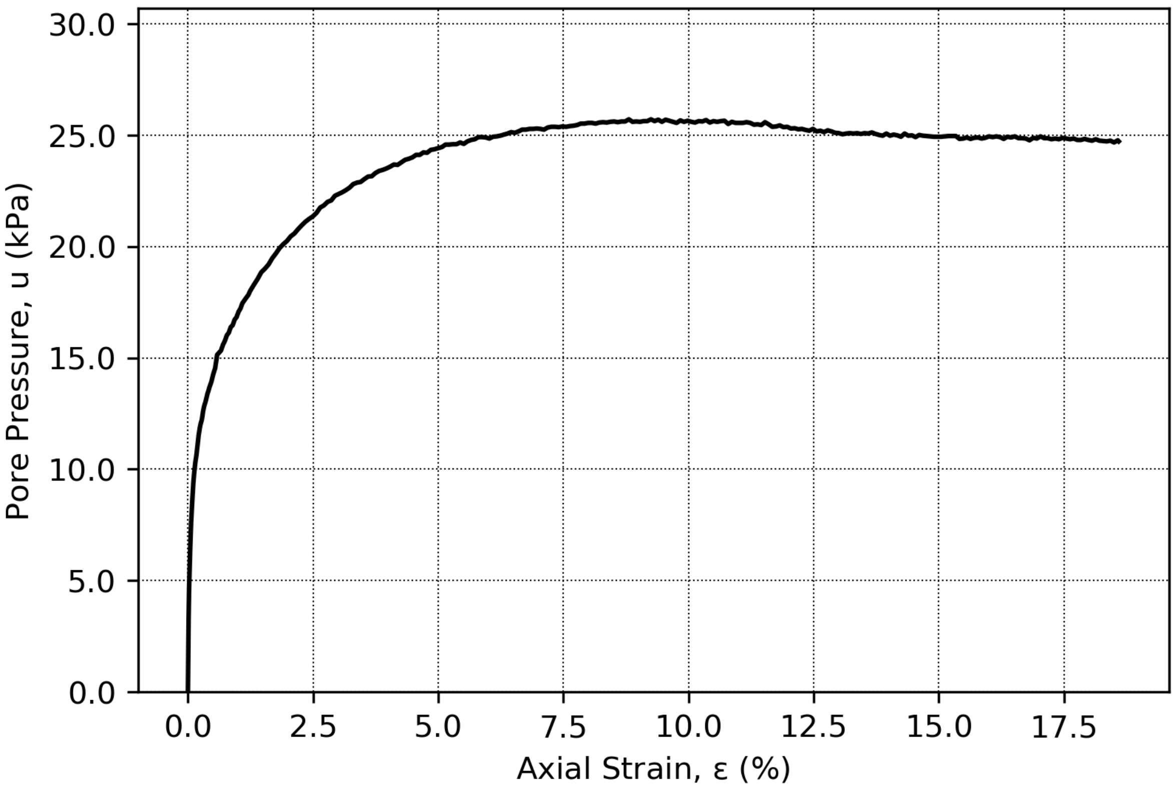
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.109	
Boring:	ONSB27	Depth	= 10.65	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 68.6	kPa	(kPa)	max.	min.	final	
Part:	3	w_i	= 42.3	%	σ_{ac}'	-	-	68.7	
Test:	1	w_c	= 39.6	%	σ_{rc}'	-	-	41.2	

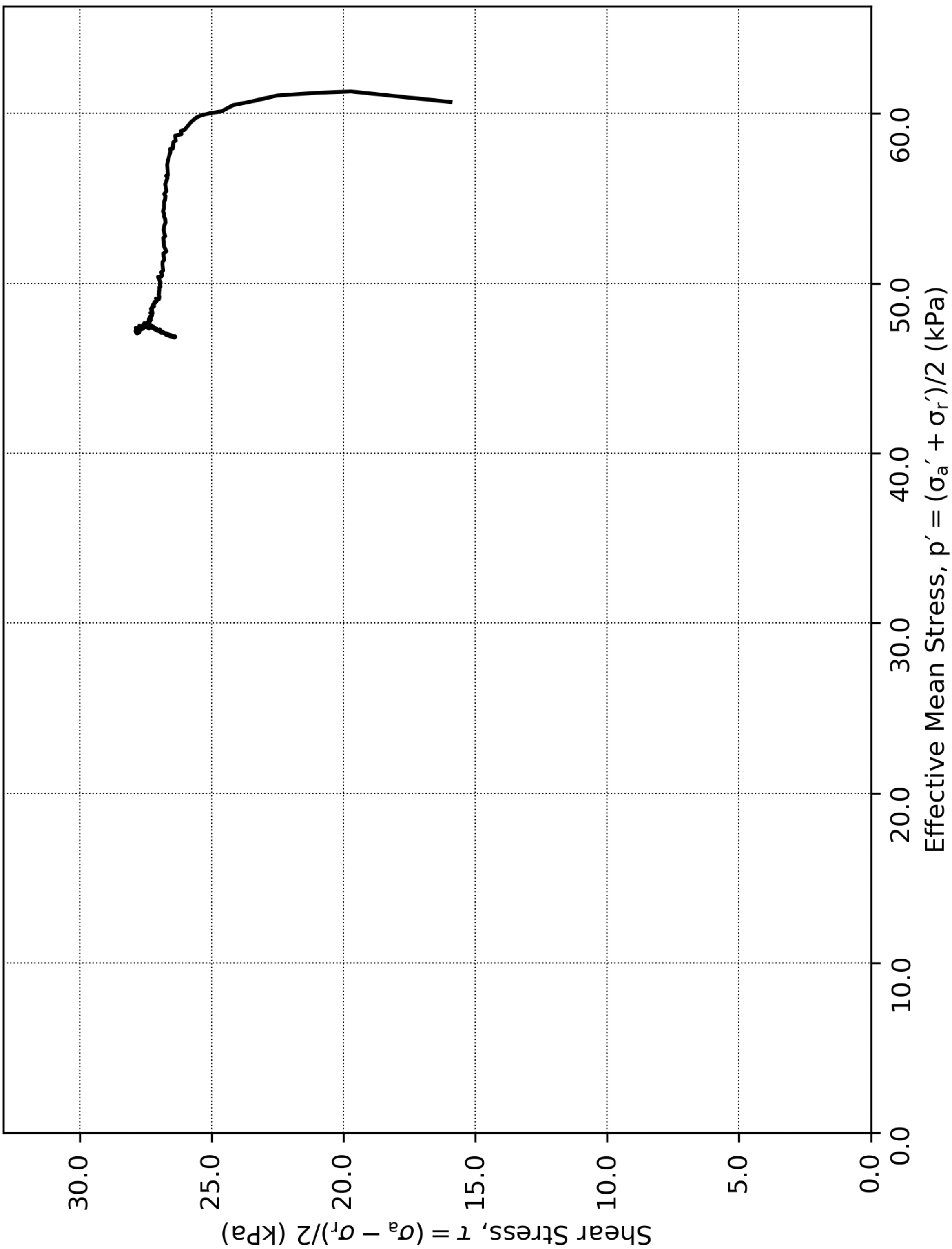
P:\2016\01\20160154\Lab\Onsøy\Triax





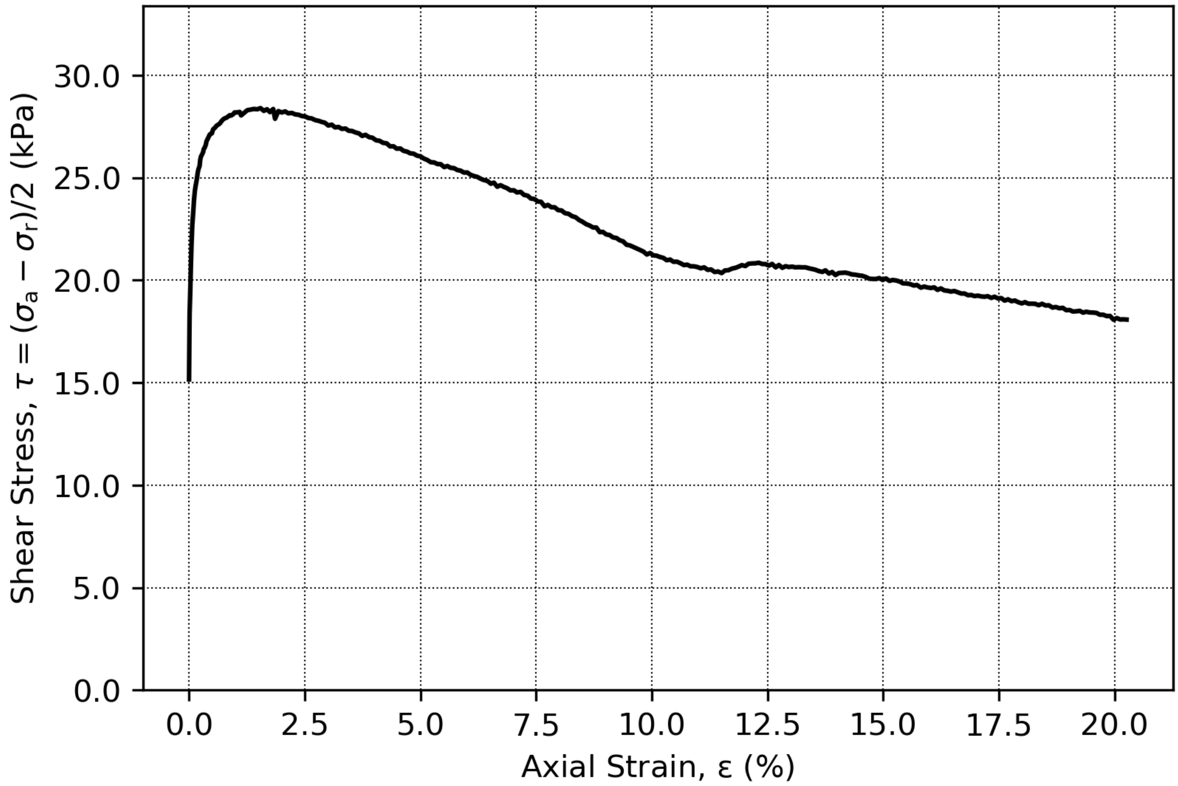
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.110
Boring: ONSB27	Depth	= 11.55	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S3	p_0'	= 75.5	kPa	(kPa)	max.	min.	final	
Part: 1	w_i	= 40.7	%	σ_{ac}'	-	-	77.0	
Test: 1	w_c	= 32.4	%	σ_{rc}'	-	-	44.8	

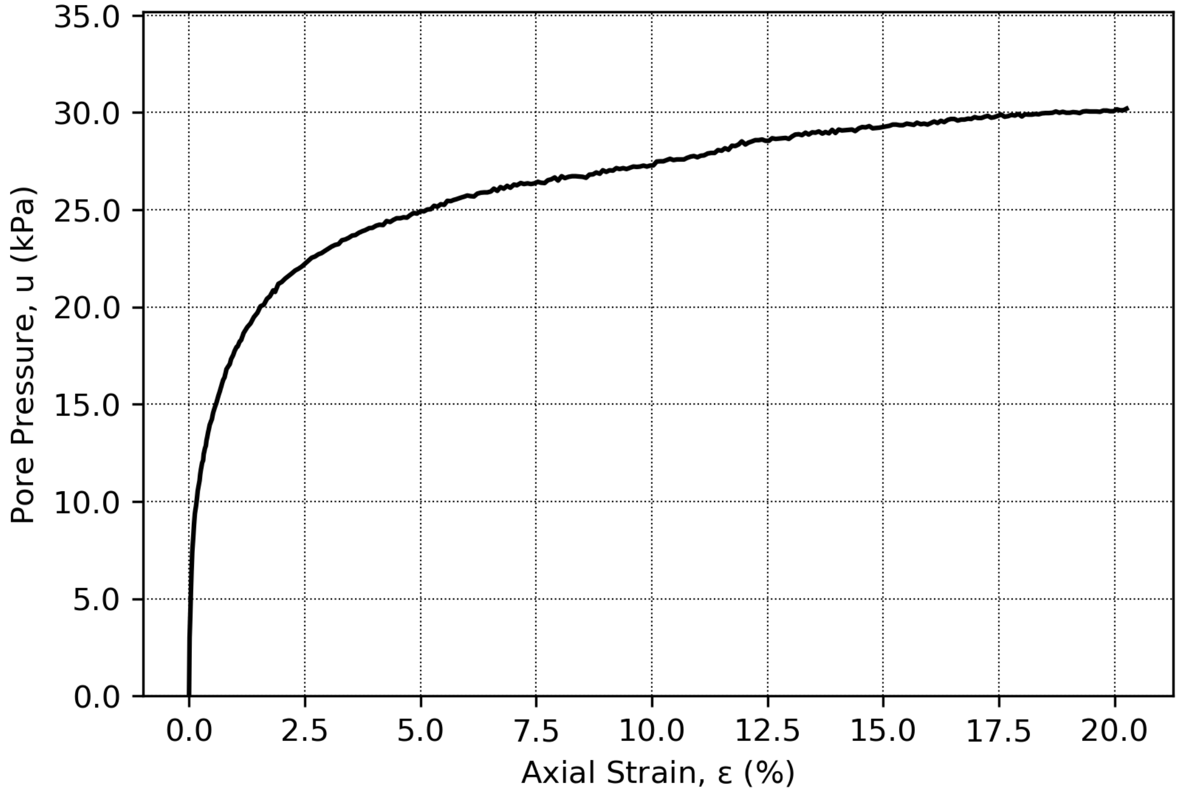
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.111	
Boring:	ONSB27	Depth = 11.55	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S3	p_0' = 75.5	kPa	(kPa)	max.	min.	final		
Part:	1	w_i = 40.7	%	σ_{ac}'	-	-	77.0		
Test:	1	w_c = 32.4	%	σ_{rc}'	-	-	44.8		

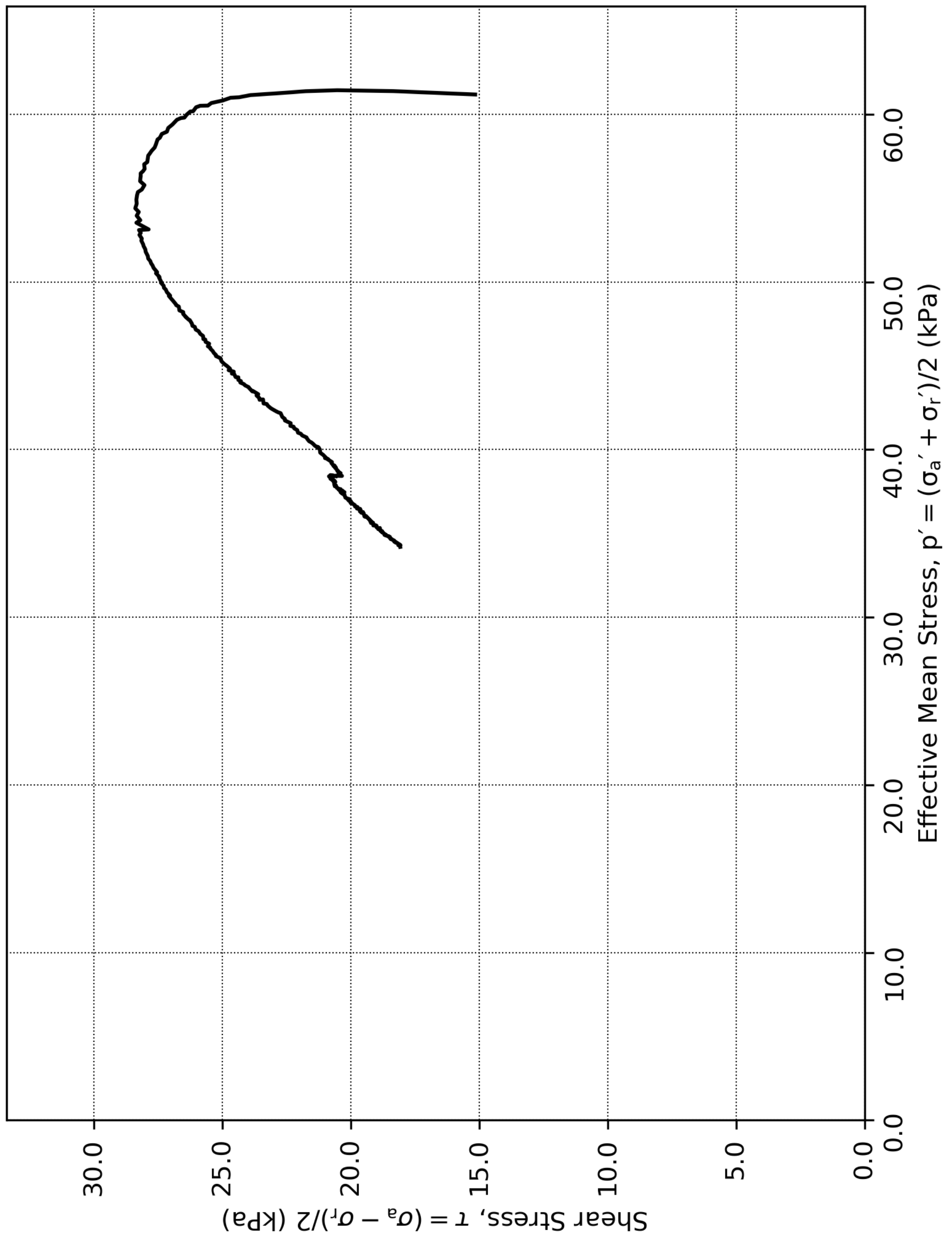
P:\2016\01\20160154\Lab\Onsøy\Triax





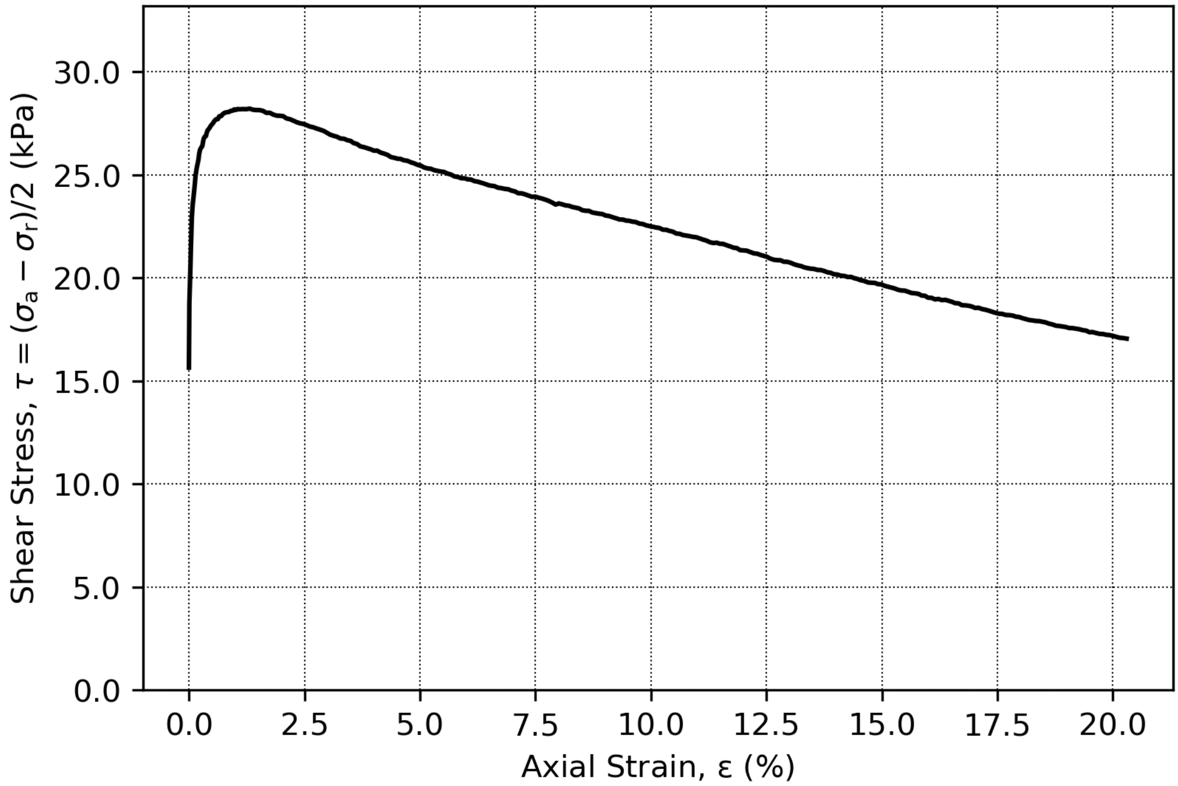
P:\2016\01\20160154\Lab\Onsøy\Triax

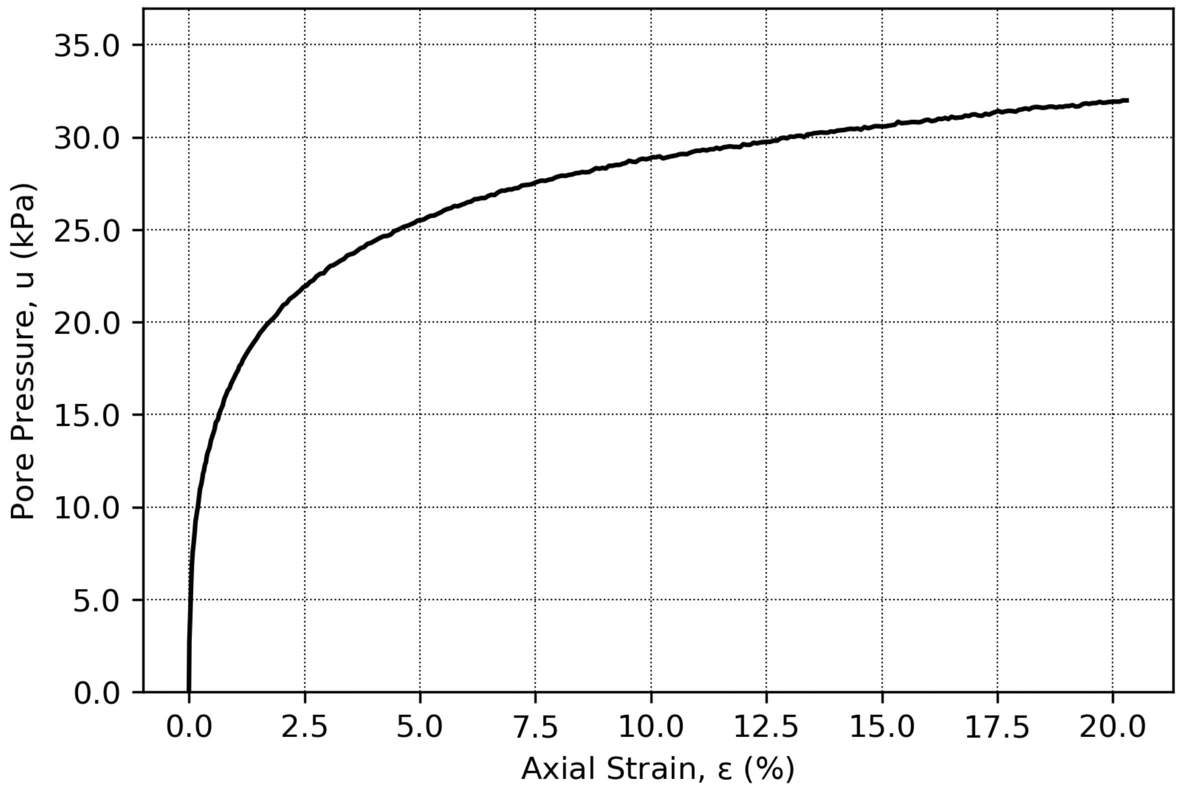
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.112	
Boring:	ONSB27	Depth	= 11.71	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S3	p_0'	= 76.7	kPa	(kPa)	max.	min.	final		
Part:	1	w_i	= 41.5	%	σ_{ac}'	-	-	76.7		
Test:	2	w_c	= 37.7	%	σ_{rc}'	-	-	46.0		



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.113
Boring:	ONSB27	Depth	= 11.71	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0'	= 76.7	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 41.5	%	σ_{ac}'	-	-	76.7	
Test:	2	w_c	= 37.7	%	σ_{rc}'	-	-	46.0	

P:\2016\01\20160154\Lab\Onsøy\Triax

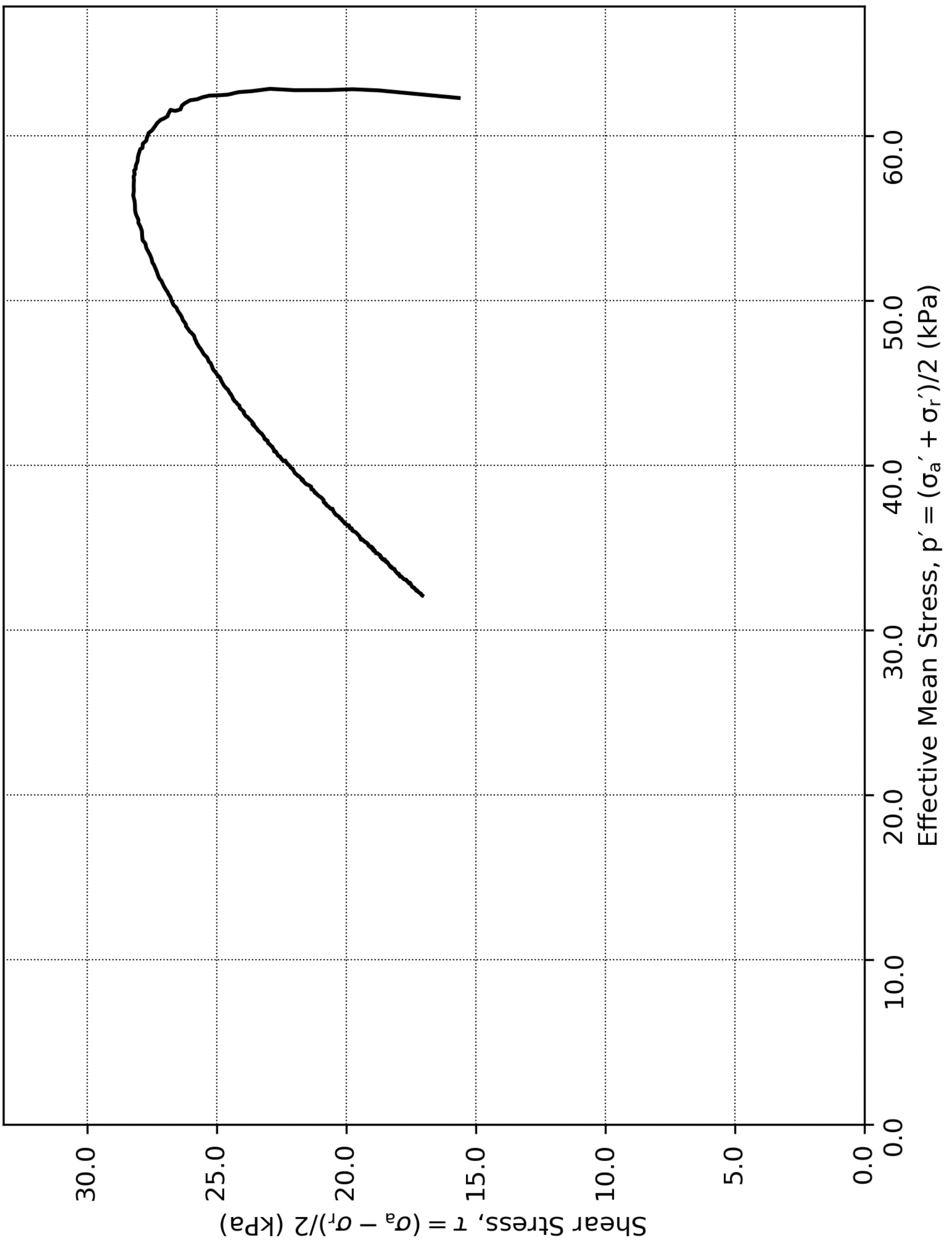




P:\2016\01\20160154\Lab\Onsøy\Triax

Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.114
Boring:	ONSB27	Depth	= 11.87	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0'	= 77.8	kPa	(kPa)	max.	min.	final
Part:	1	w_i	= 40.6	%	σ_{ac}'	-	-	77.8
Test:	3	w_c	= 37.5	%	σ_{rc}'	-	-	46.7

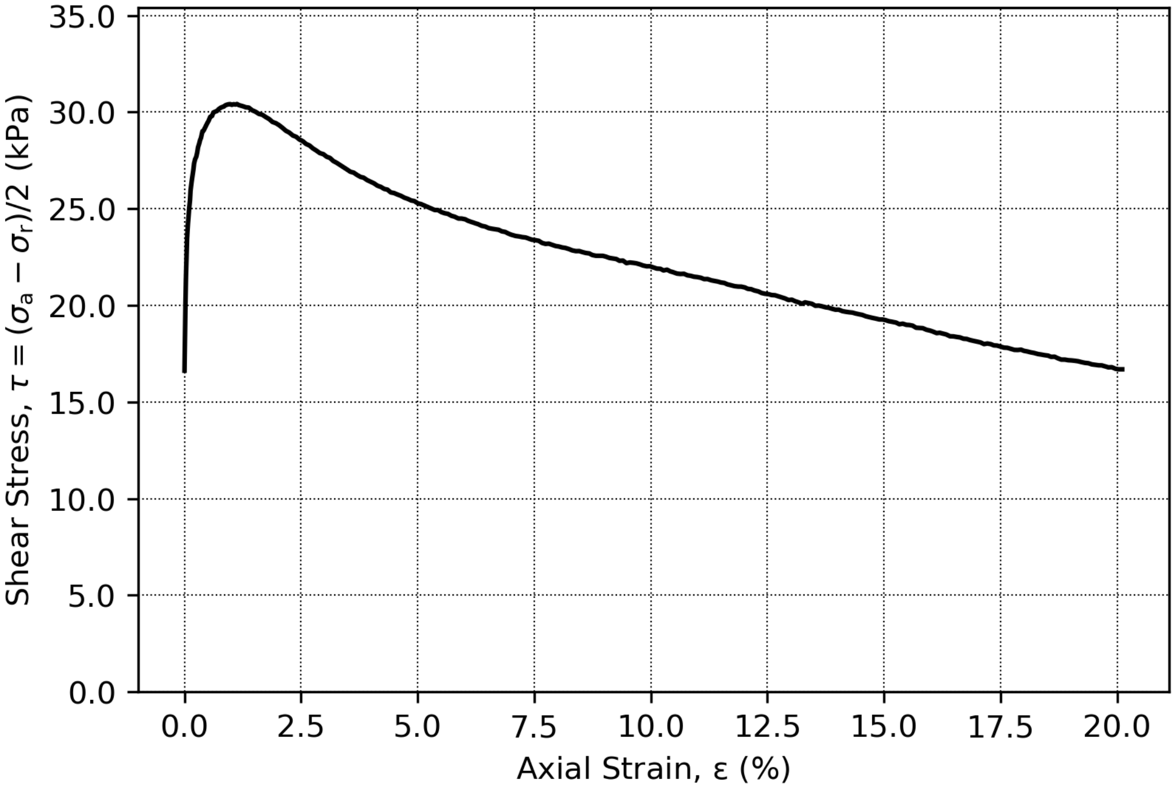
NGI

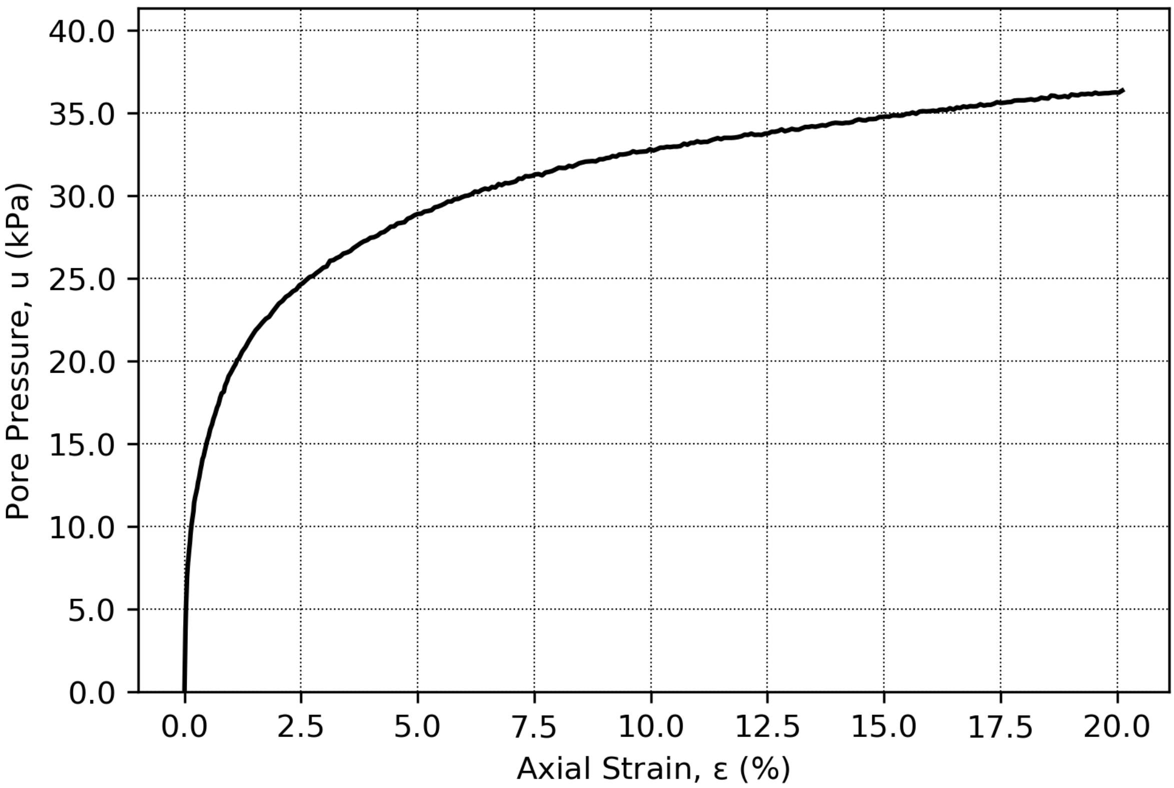


Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.115
Boring:	ONSB27	Depth	= 11.87	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0'	= 77.8	kPa	(kPa)	max.	min.	final
Part:	1	w_i	= 40.6	%	σ_{ac}'	-	-	77.8
Test:	3	w_c	= 37.5	%	σ_{rc}'	-	-	46.7

NGI

P:\2016\01\20160154\Lab\Onsøy\Triax

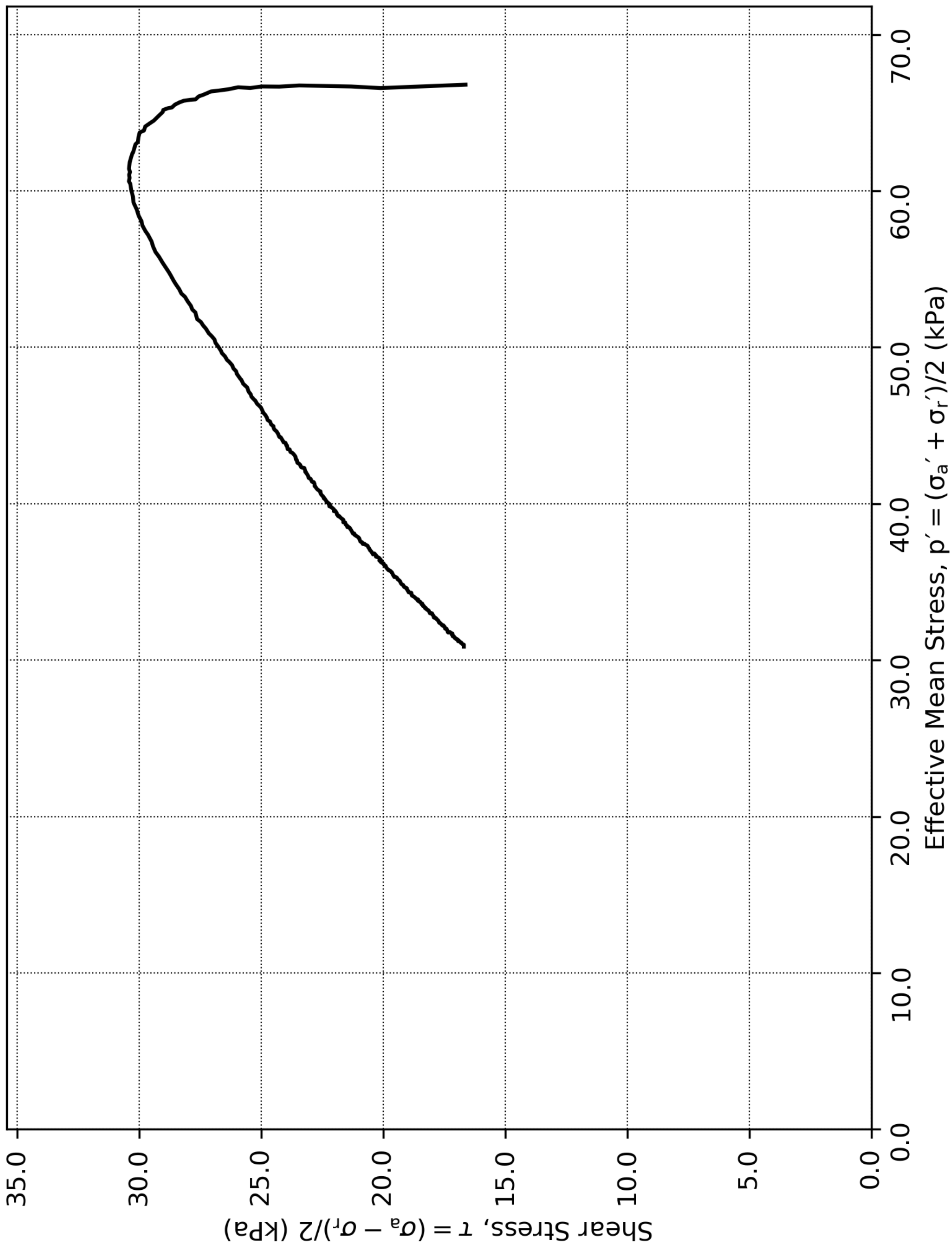




P:\2016\01\20160154\Lab\Onsøy\Triax

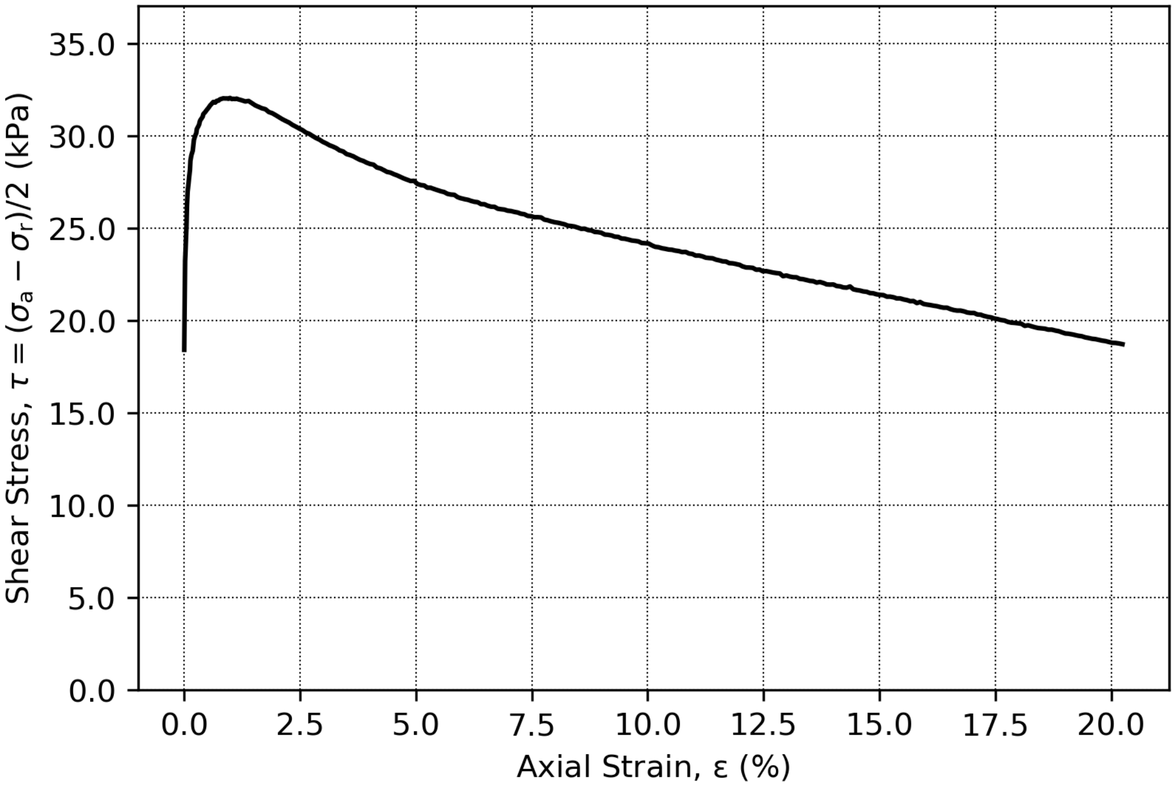
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.116
Boring:	ONSB27	Depth	= 12.73	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0'	= 83.7	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 45.6	%	σ_{ac}'	-	-	83.7
Test:	1	w_c	= 43.7	%	σ_{rc}'	-	-	50.2

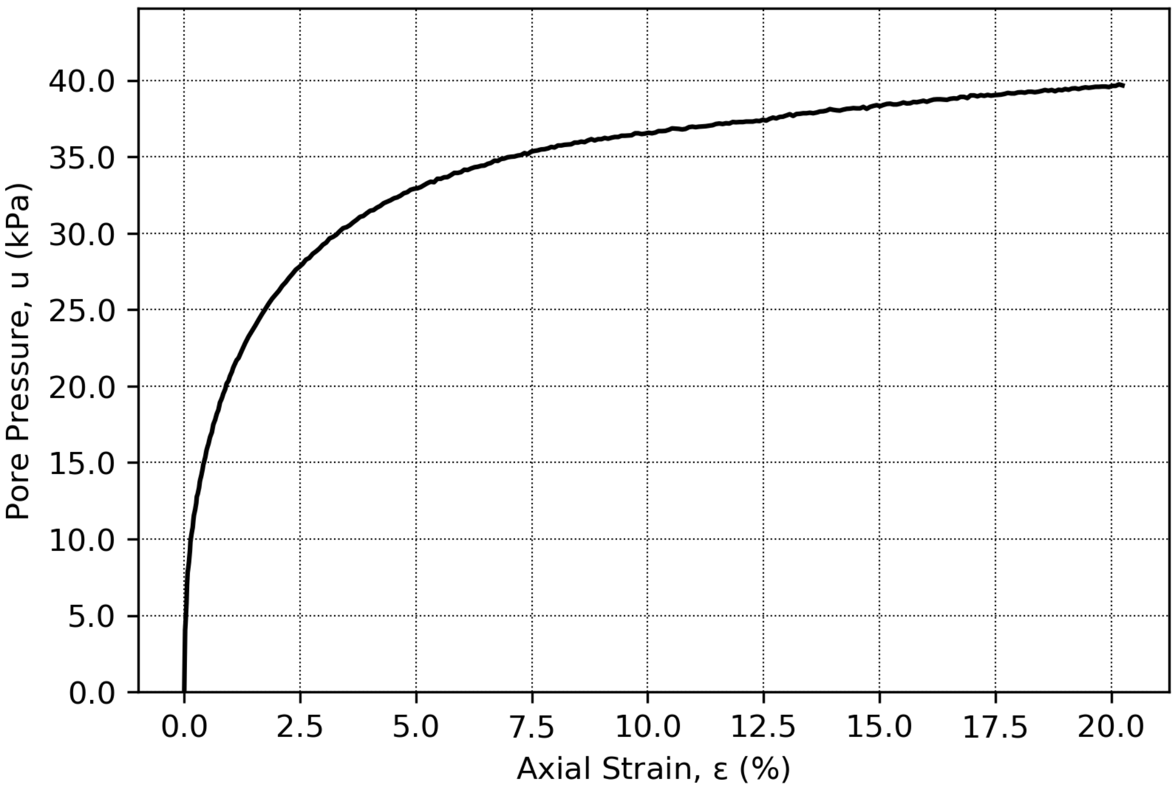
NGI



P:\2016\01\20160154\Lab\Onsøy\Triax

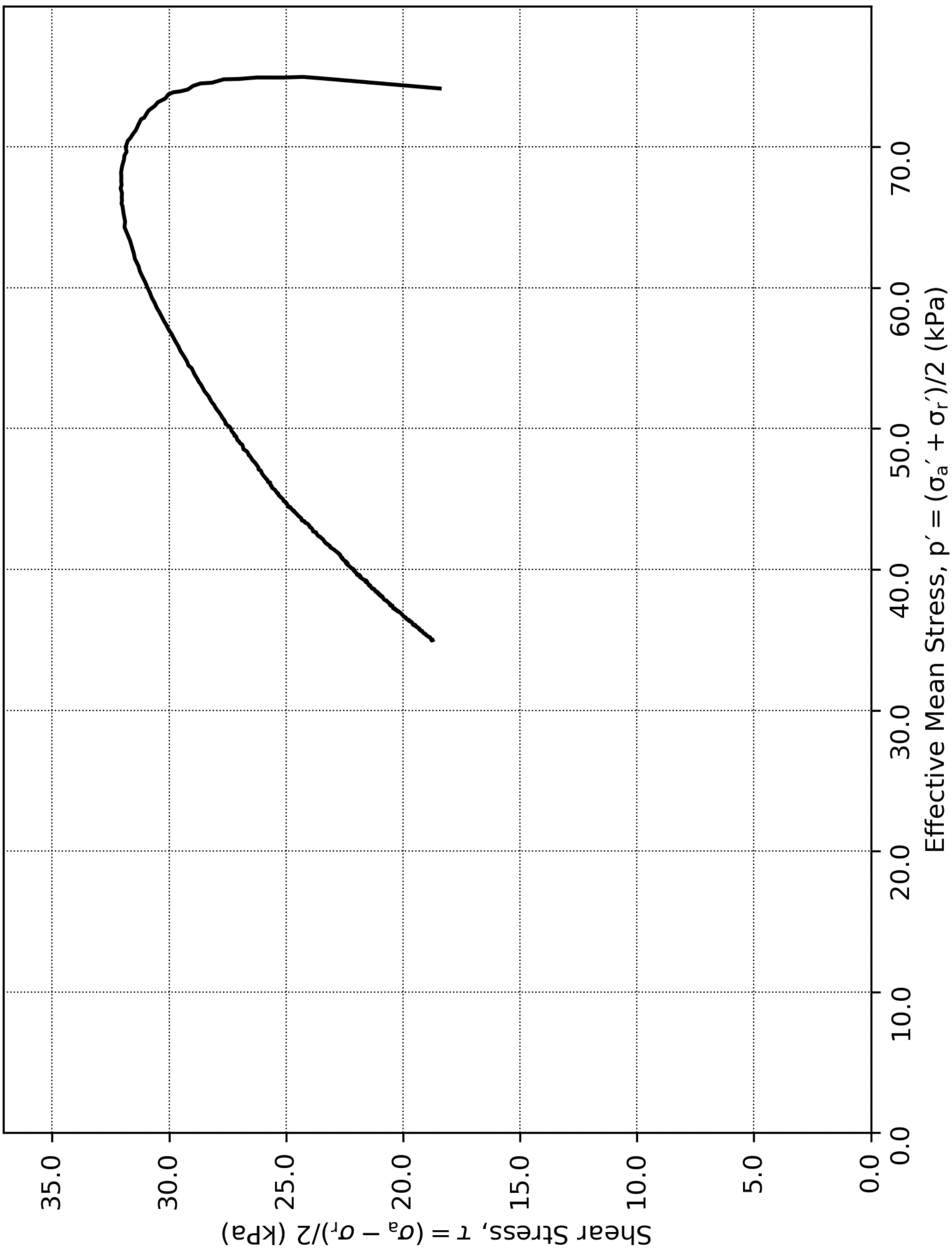
Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R	
Triaxial test: CAUC										Figure No. 5.3.117	
Boring:	ONSB27	Depth	= 12.73	m	Consolidation stresses					Date 2018-12-10	Drawn by AGu
Tube:	S3	p_0'	= 83.7	kPa	(kPa)	max.	min.	final		NGI	
Part:	2	w_i	= 45.6	%	σ_{ac}'	-	-	83.7			
Test:	1	w_c	= 43.7	%	σ_{rc}'	-	-	50.2			





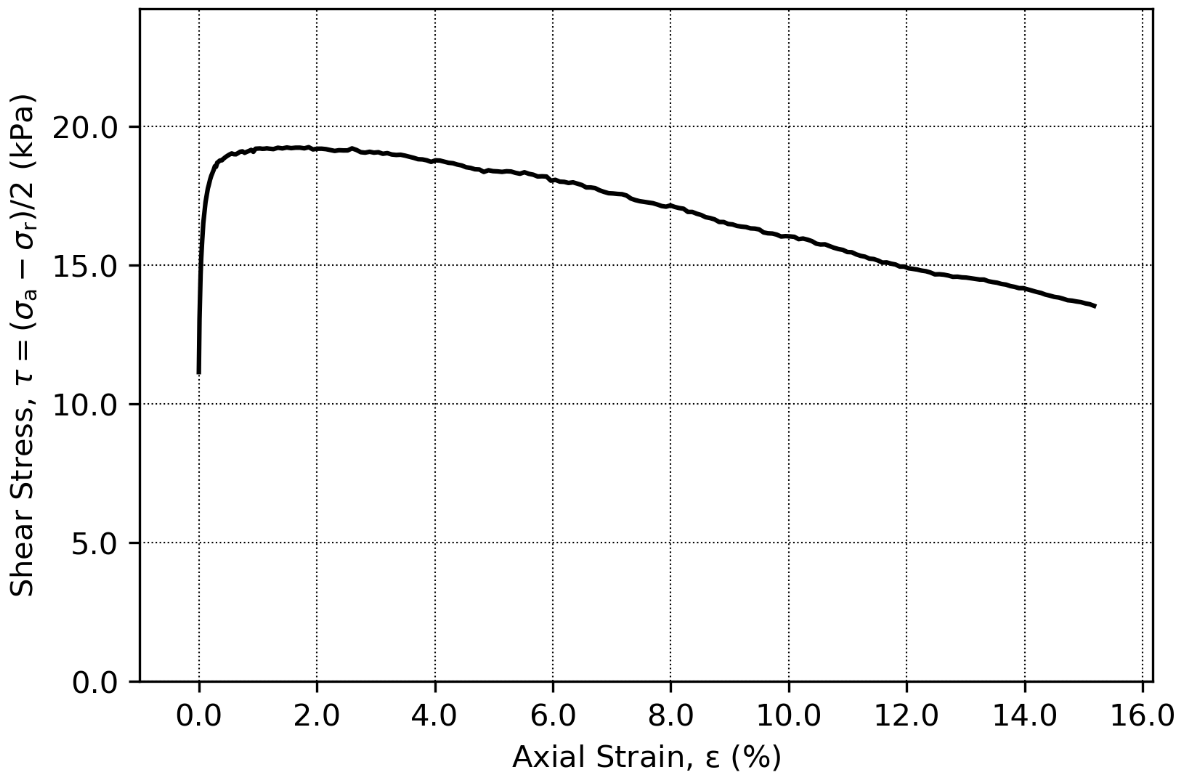
P:\2016\01\20160154\Lab\Onsøy\Triax

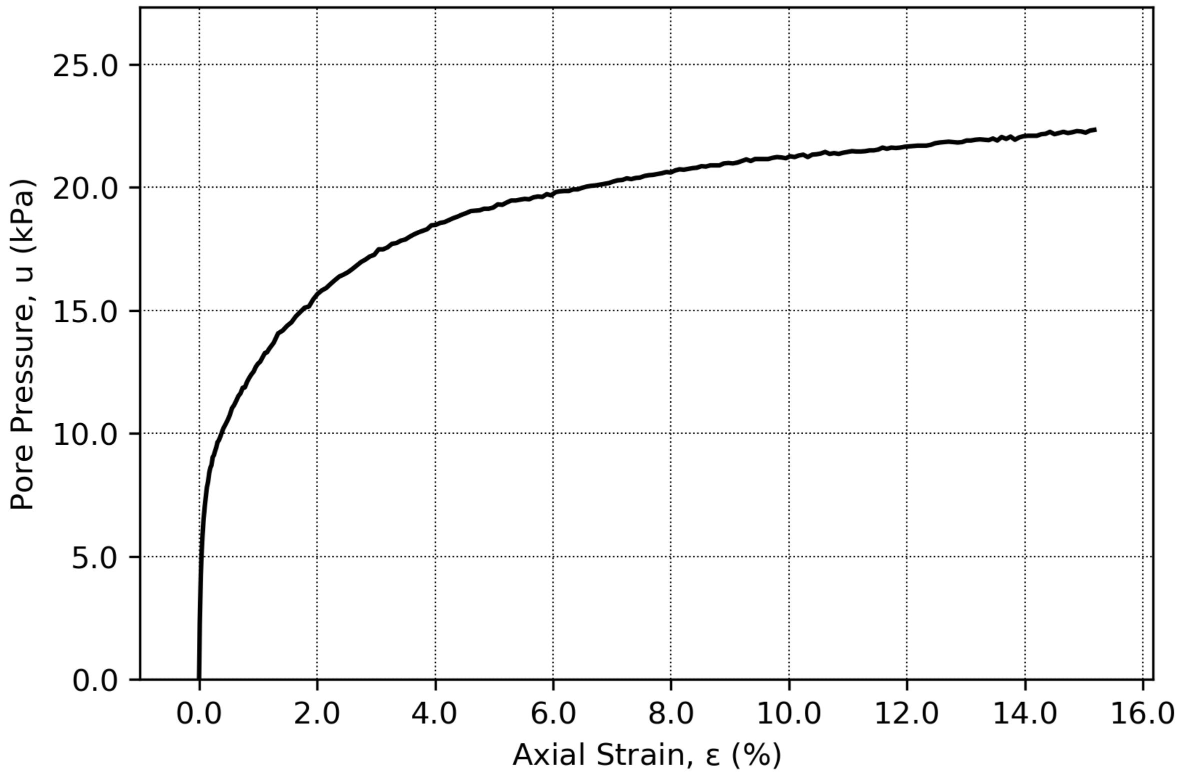
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.118
Boring:	ONSB27	Depth	= 13.57	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0'	= 92.7	kPa	(kPa)	max.	min.	final	
Part:	3	w_i	= 43.8	%	σ_{ac}'	-	-	92.6	
Test:	1	w_c	= 41.4	%	σ_{rc}'	-	-	55.6	



P:\2016\01\20160154\Lab\Onsøy\Triax

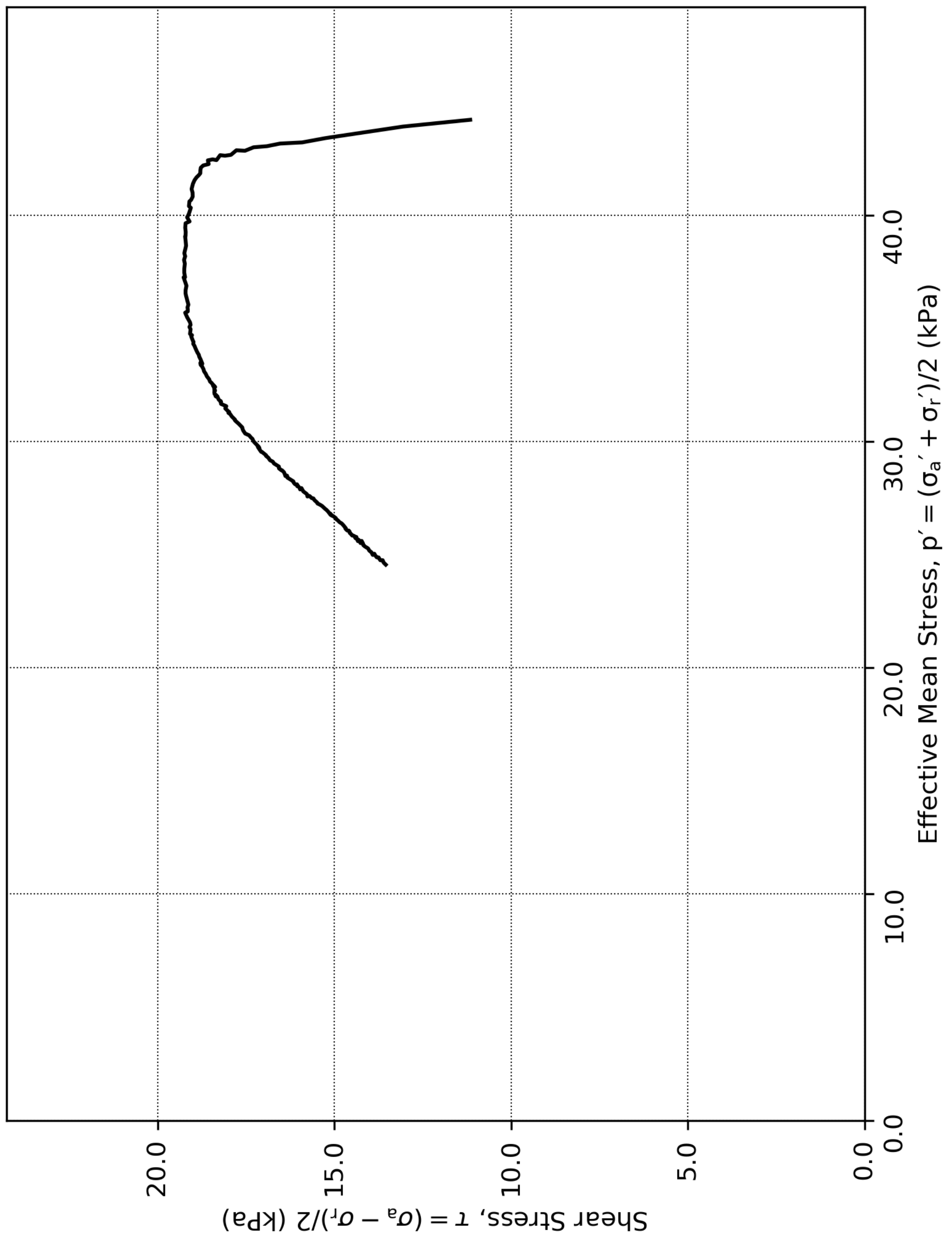
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.119
Boring:	ONSB27	Depth = 13.57	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0' = 92.7	kPa	(kPa)	max.	min.	final	
Part:	3	w_i = 43.8	%	σ_{ac}'	-	-	92.6	NGI
Test:	1	w_c = 41.4	%	σ_{rc}'	-	-	55.6	





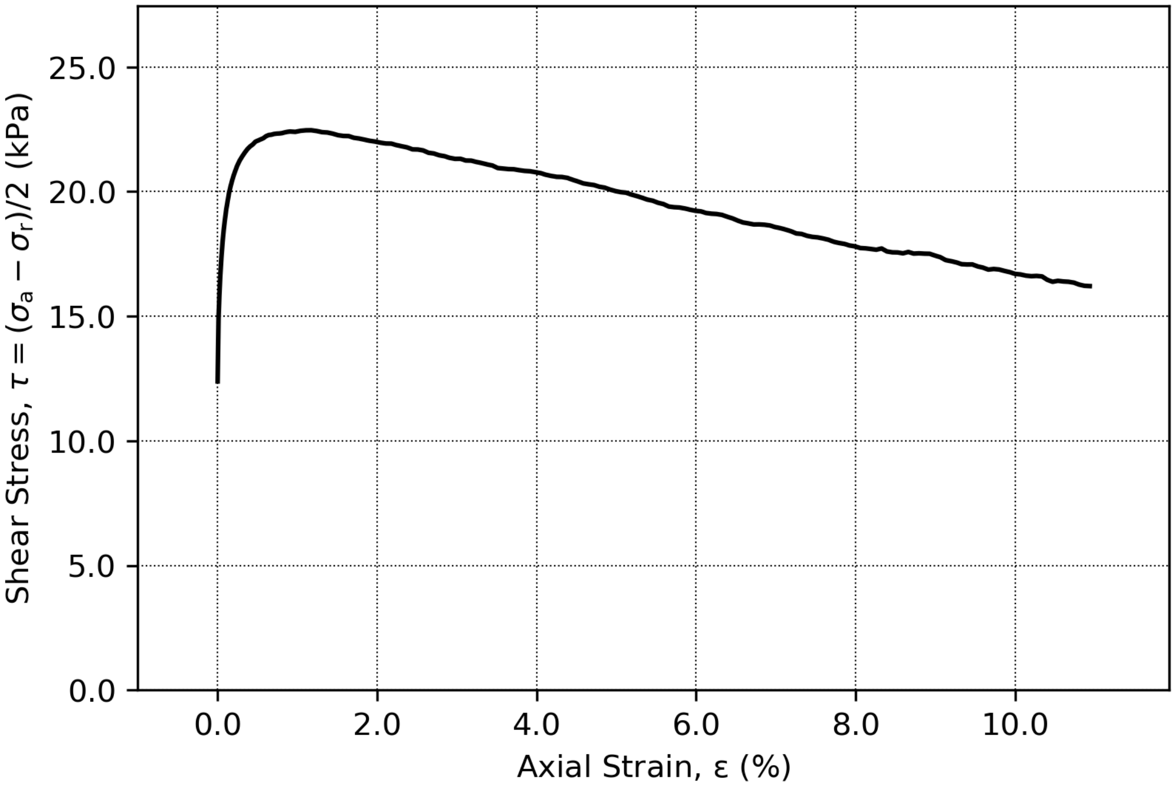
P:\2016\01\20160154\Lab\Onsøy\Triax

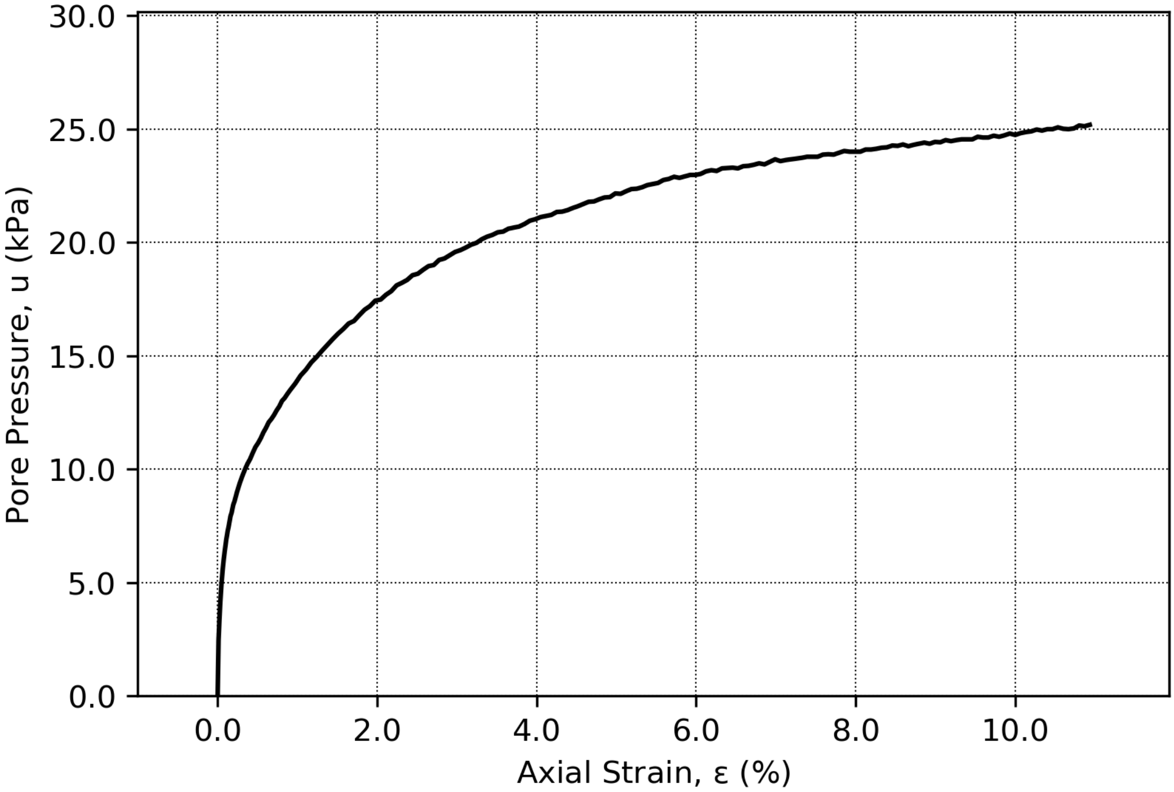
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.120
Boring:	ONSB28	Depth	= 8.54	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 55.1	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 60.0	%	σ_{ac}'	-	-	55.1	
Test:	1	w_c	= 53.2	%	σ_{rc}'	-	-	33.1	



Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.121	
Boring:	ONSB28	Depth	= 8.54	m	Consolidation stresses		Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 55.1	kPa	(kPa) max.	min. final		
Part:	1	w_i	= 60.0	%	σ_{ac}' -	- 55.1		
Test:	1	w_c	= 53.2	%	σ_{rc}' -	- 33.1		

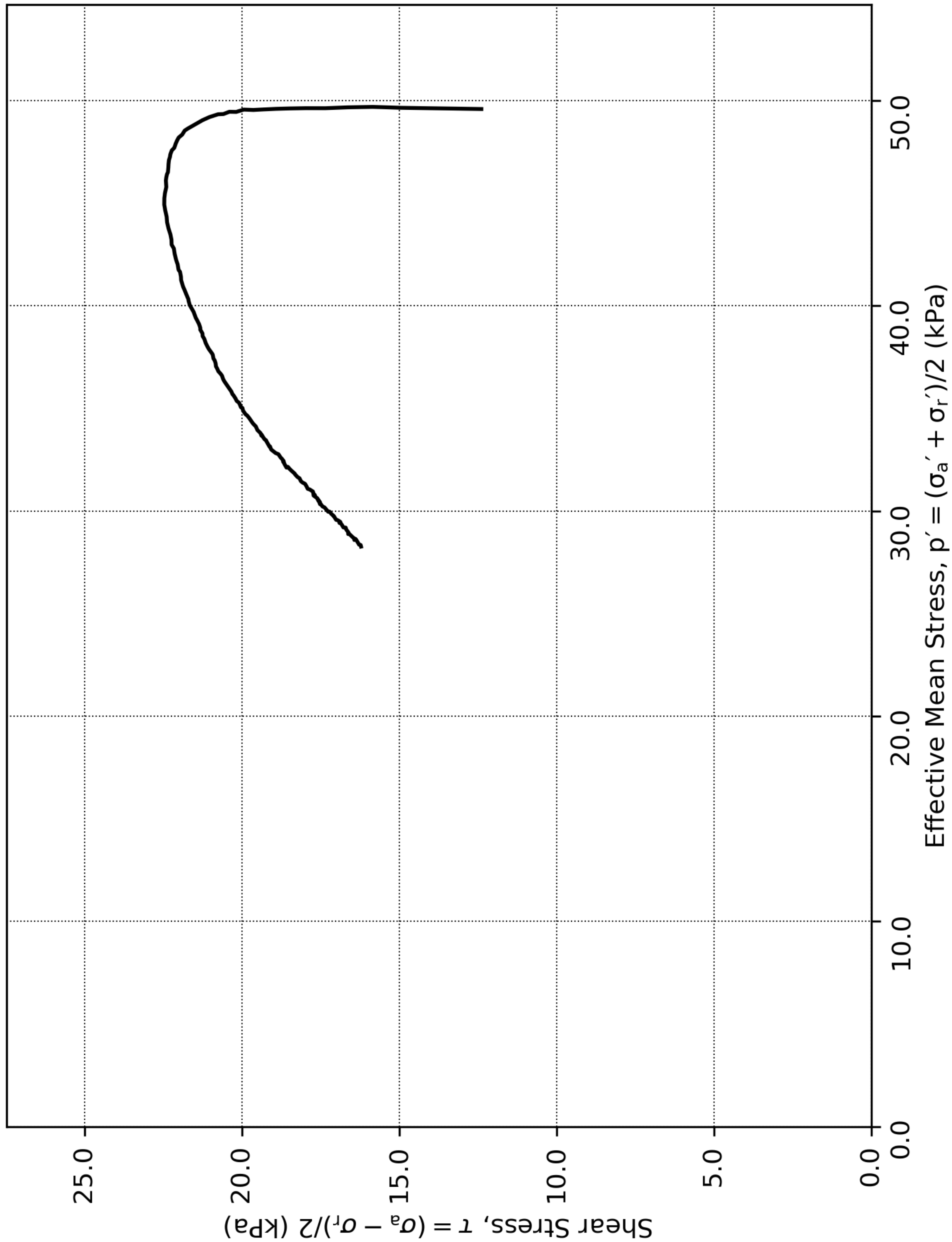
P:\2016\01\20160154\Lab\Onsøy\Triax





Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.122
Boring:	ONSB28	Depth = 9.73	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0' = 62.0	kPa	(kPa)	max.	min.	final	
Part:	2	w_i = 50.4	%	σ_{ac}'	-	-	61.9	NGI
Test:	1	w_c = 47.4	%	σ_{rc}'	-	-	37.2	

P:\2016\01\20160154\Lab\Onsøy\Triax

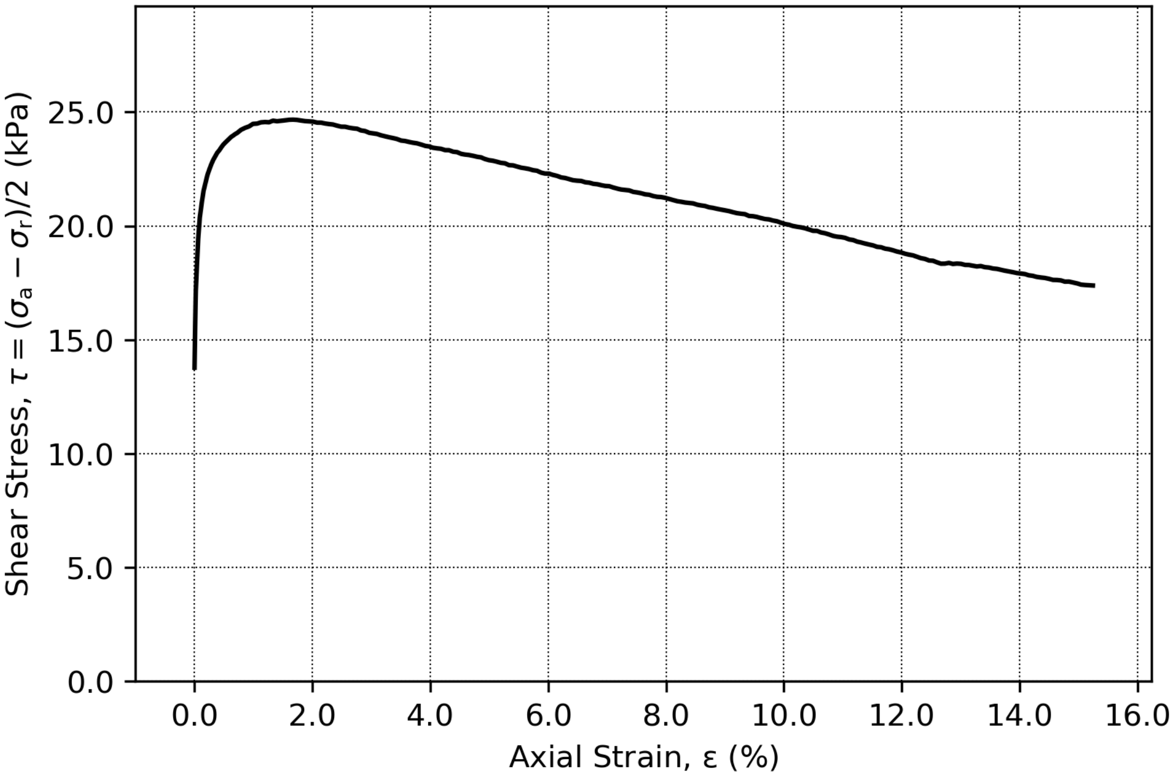


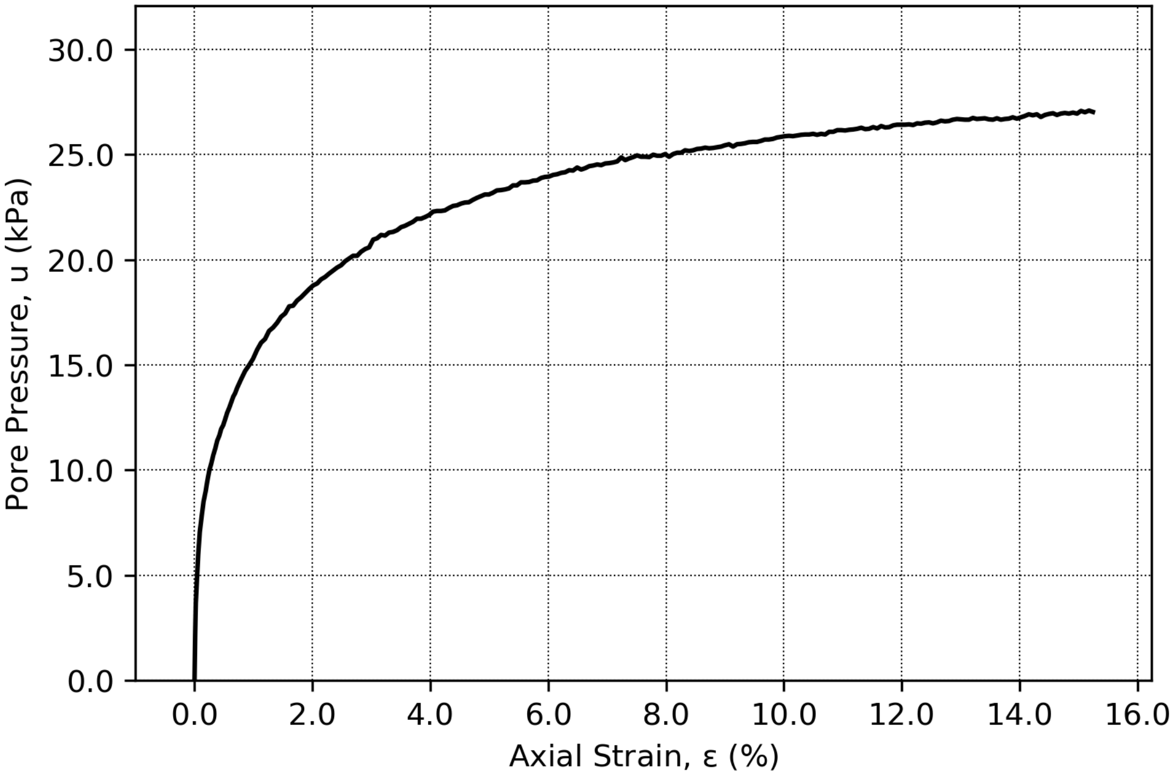
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.123
Boring:	ONSB28	Depth	= 9.73	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 62.0	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 50.4	%	σ_{ac}'	-	-	61.9
Test:	1	w_c	= 47.4	%	σ_{rc}'	-	-	37.2

NGI

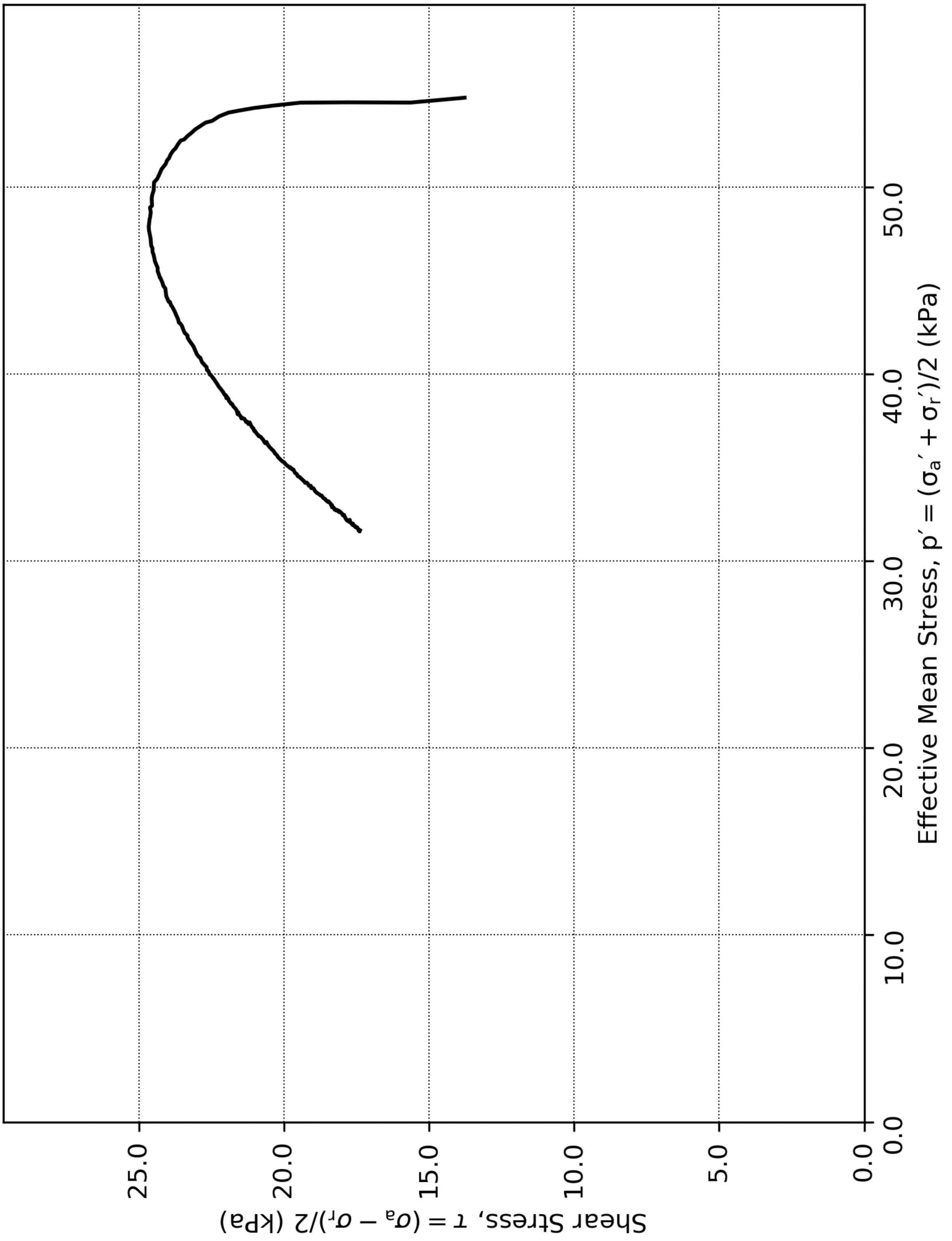
P:\2016\01\20160154\Lab\Onsøy\Triax

P:\2016\01\20160154\Lab\Onsøy\Triax



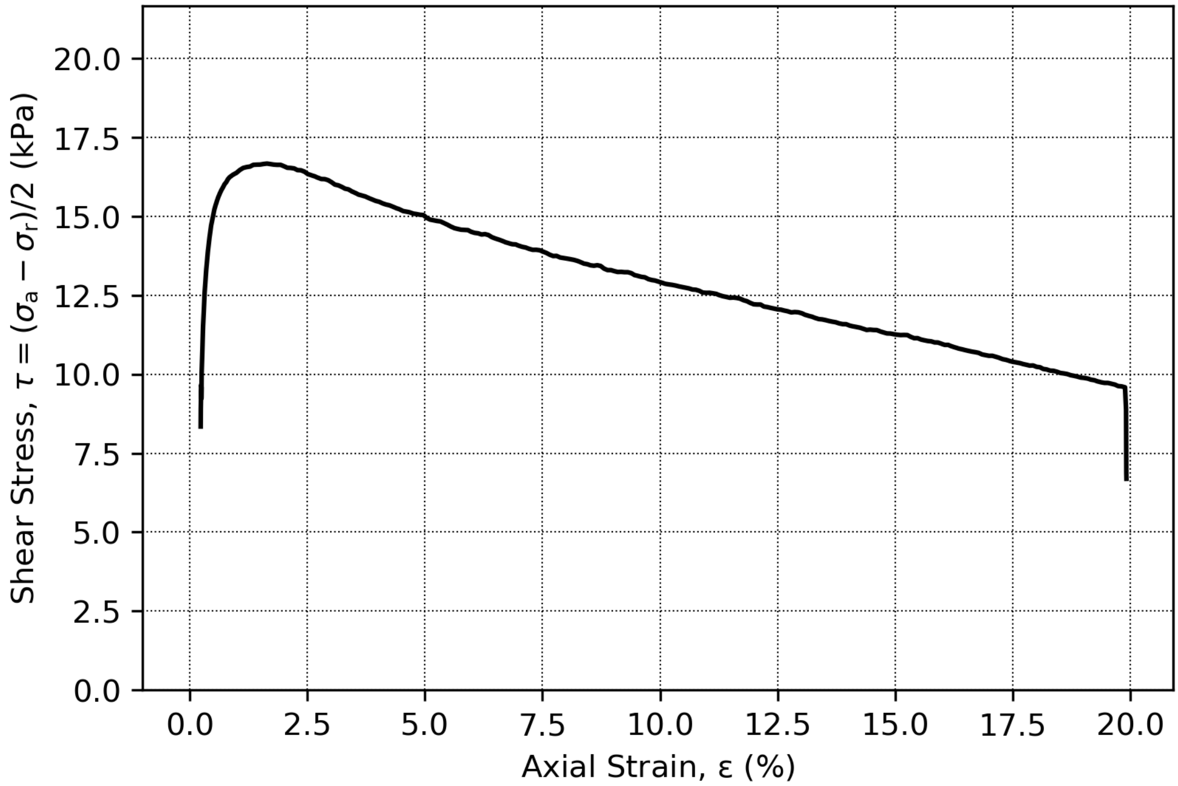


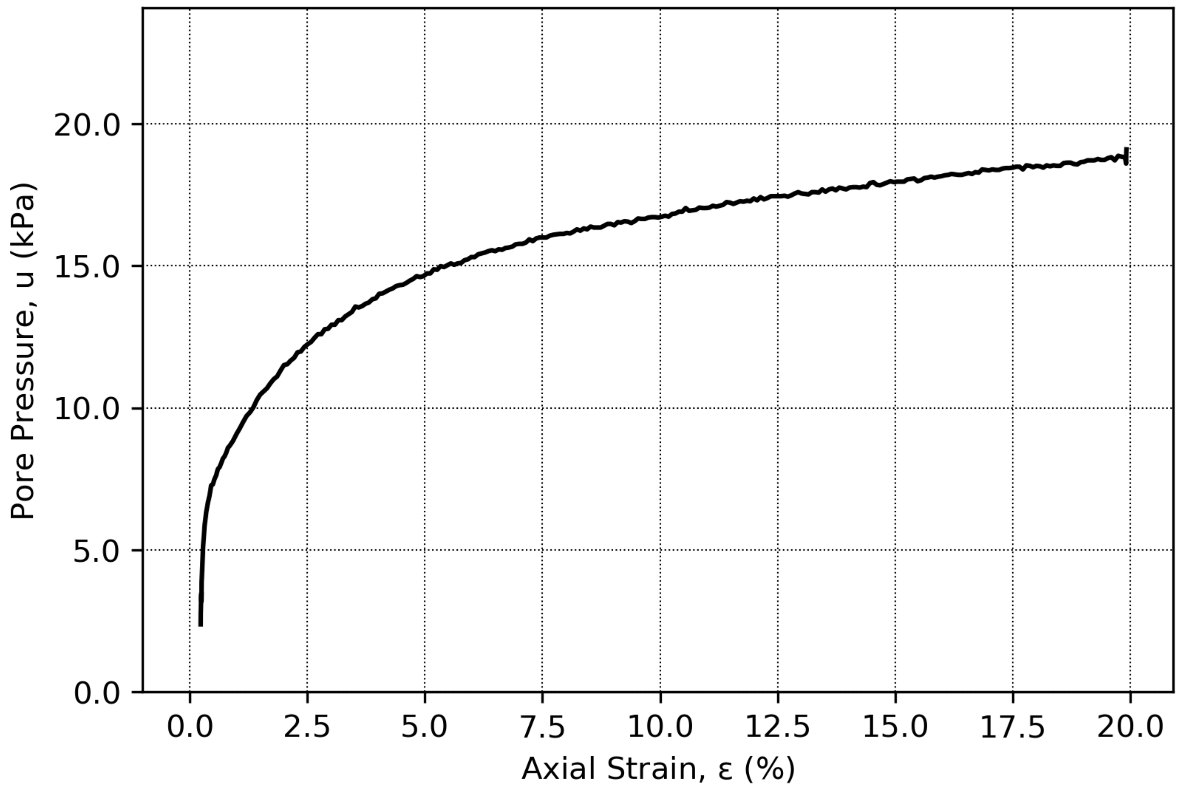
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.124
Boring:	ONSB28	Depth = 10.67	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0' = 68.6	kPa	(kPa)	max.	min.	final	
Part:	3	w_i = 43.0	%	σ_{ac}'	-	-	68.6	
Test:	1	w_c = 40.2	%	σ_{rc}'	-	-	41.1	



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.125
Boring:	ONSB28	Depth	= 10.67	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 68.6	kPa	(kPa)	max.	min.	final	
Part:	3	w_i	= 43.0	%	σ_{ac}'	-	-	68.6	
Test:	1	w_c	= 40.2	%	σ_{rc}'	-	-	41.1	

P:\2016\01\20160154\Lab\Onsøy\Triax

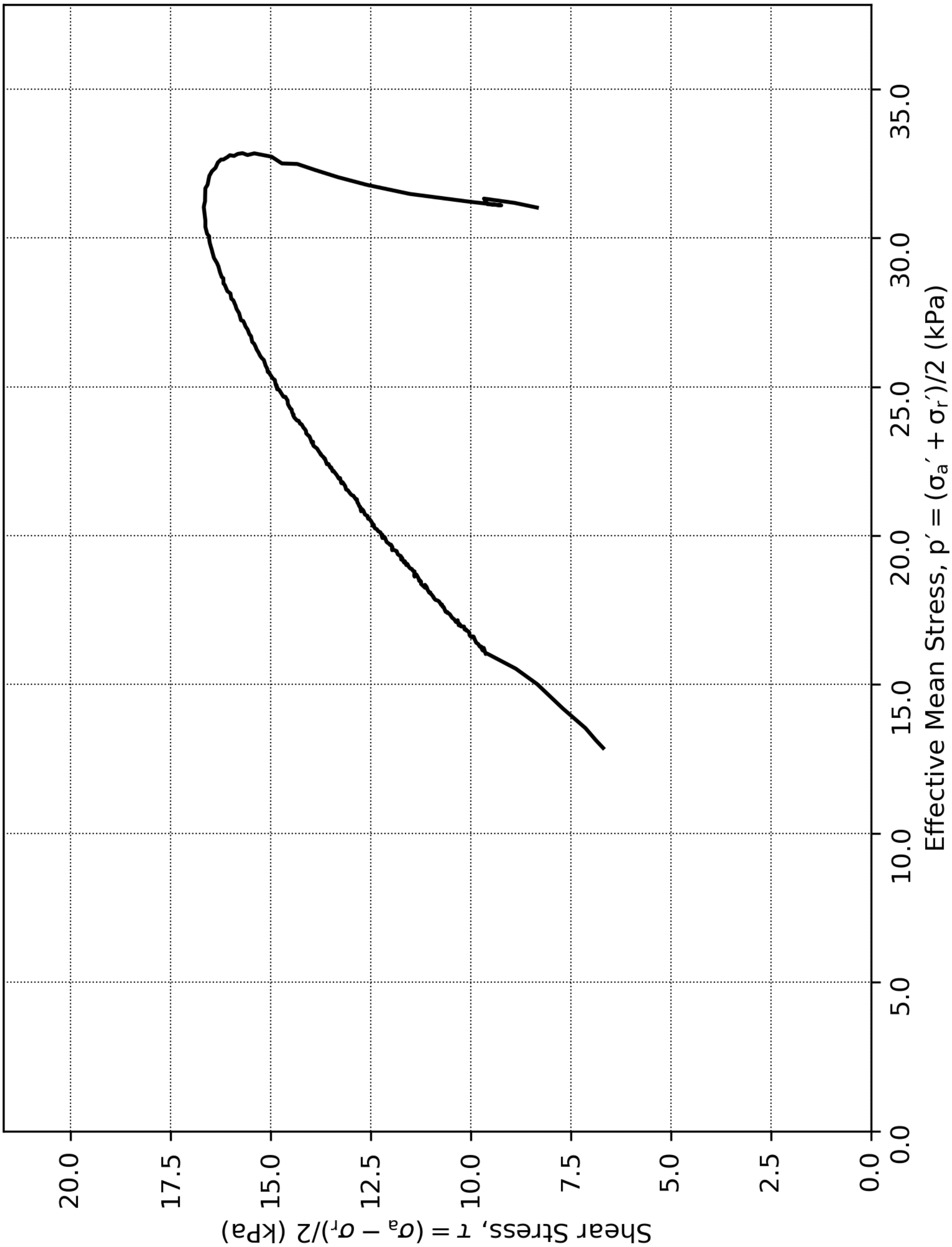




Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.126
Boring:	ONSB29	Depth	= 6.9	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 41.7	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 70.5	%	σ_{ac}'	-	-	41.7
Test:	1	w_c	= 67.5	%	σ_{rc}'	-	-	25.0

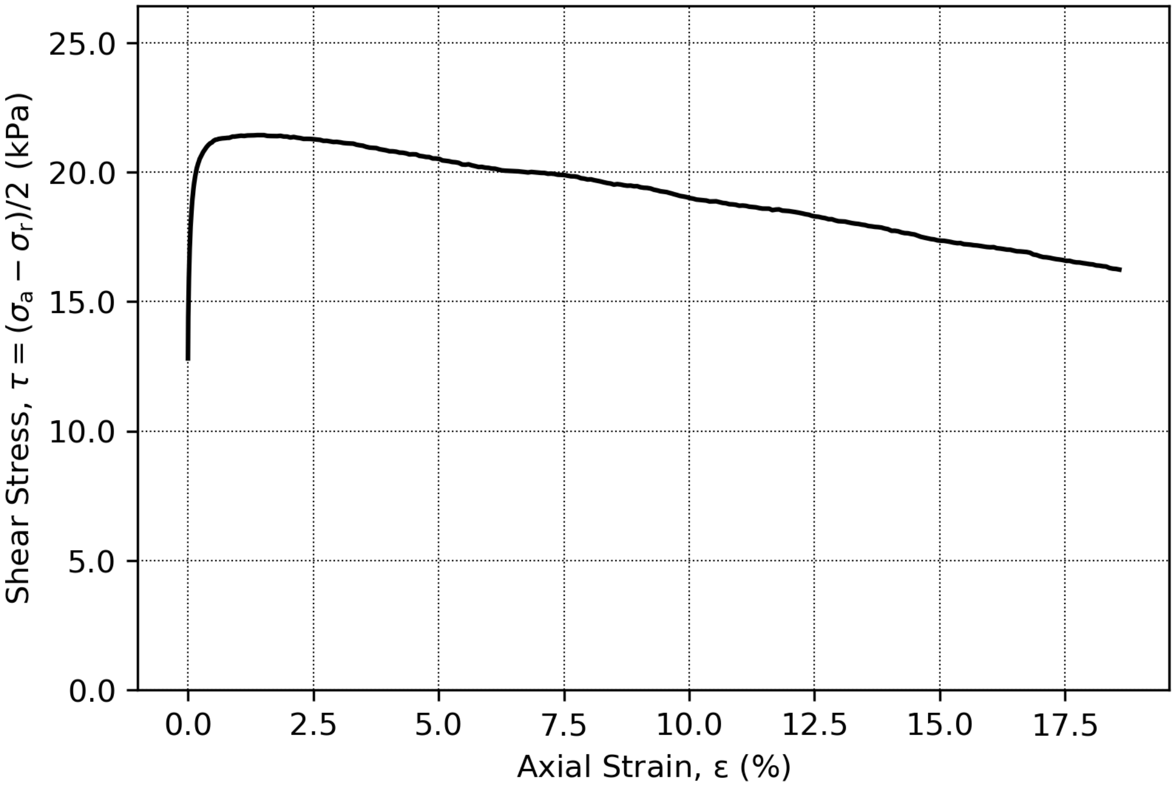
NGI

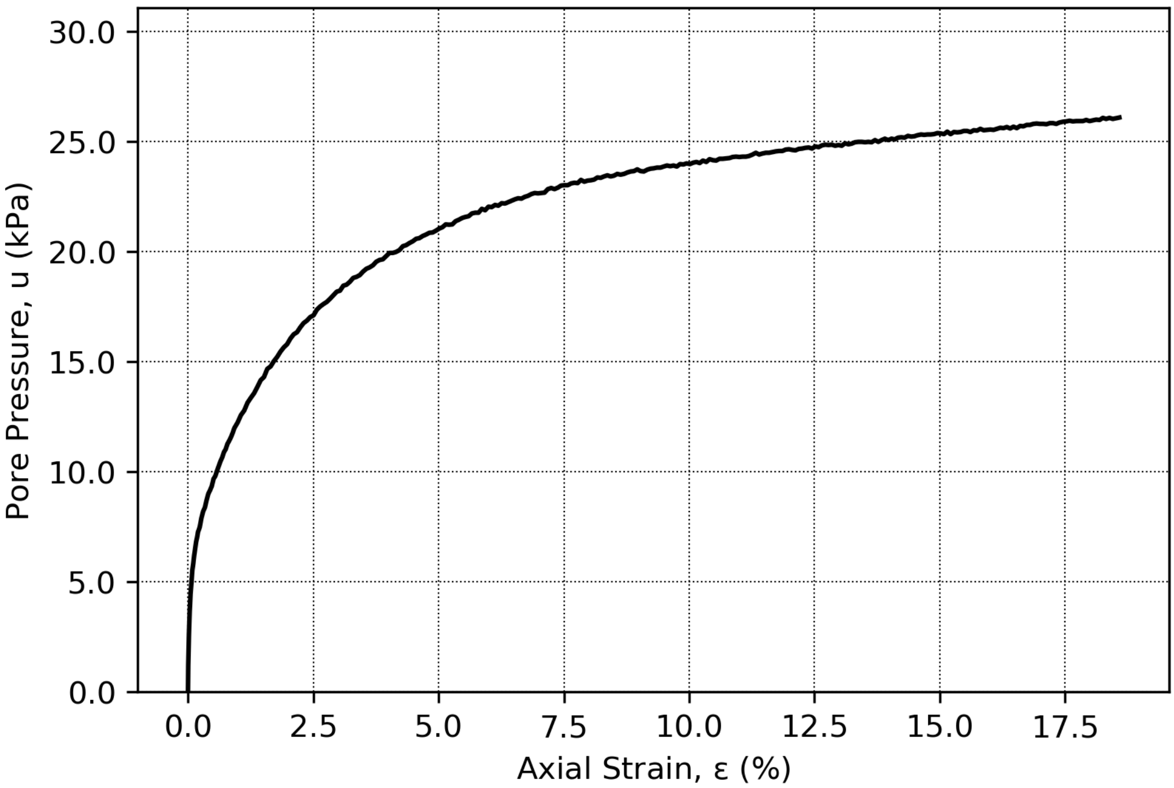
P:\2016\01\20160154\Lab\Onsøy\Triax



P:\2016\01\20160154\Lab\Onsøy\Triax

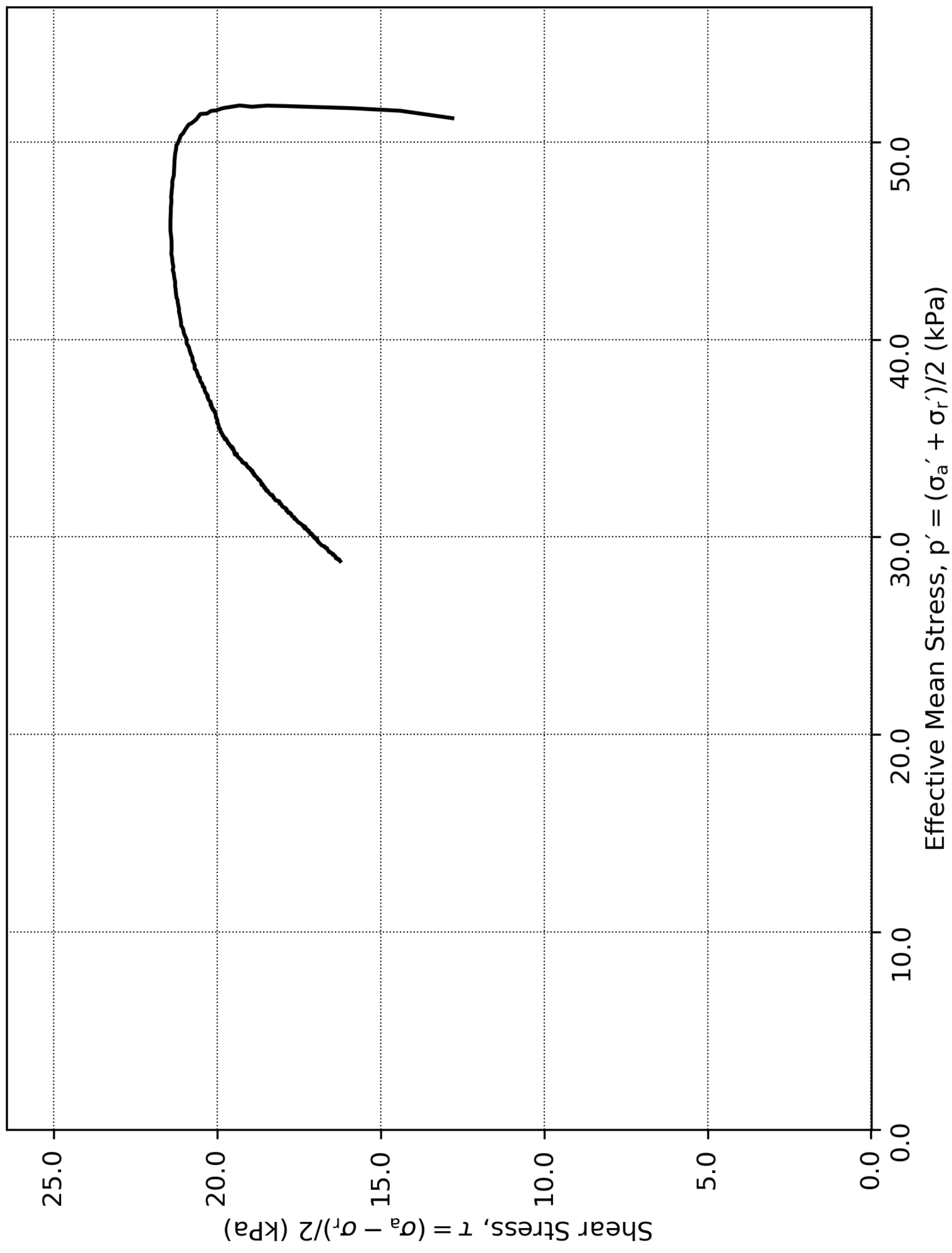
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.127
Boring: ONSB29	Depth = 6.9	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S1	p_0' = 41.7	kPa	(kPa)	max.	min.	final	
Part: 2	w_i = 70.5	%	σ_{ac}'	-	-	41.7	
Test: 1	w_c = 67.5	%	σ_{rc}'	-	-	25.0	NGI





P:\2016\01\20160154\Lab\Onsøy\Triax

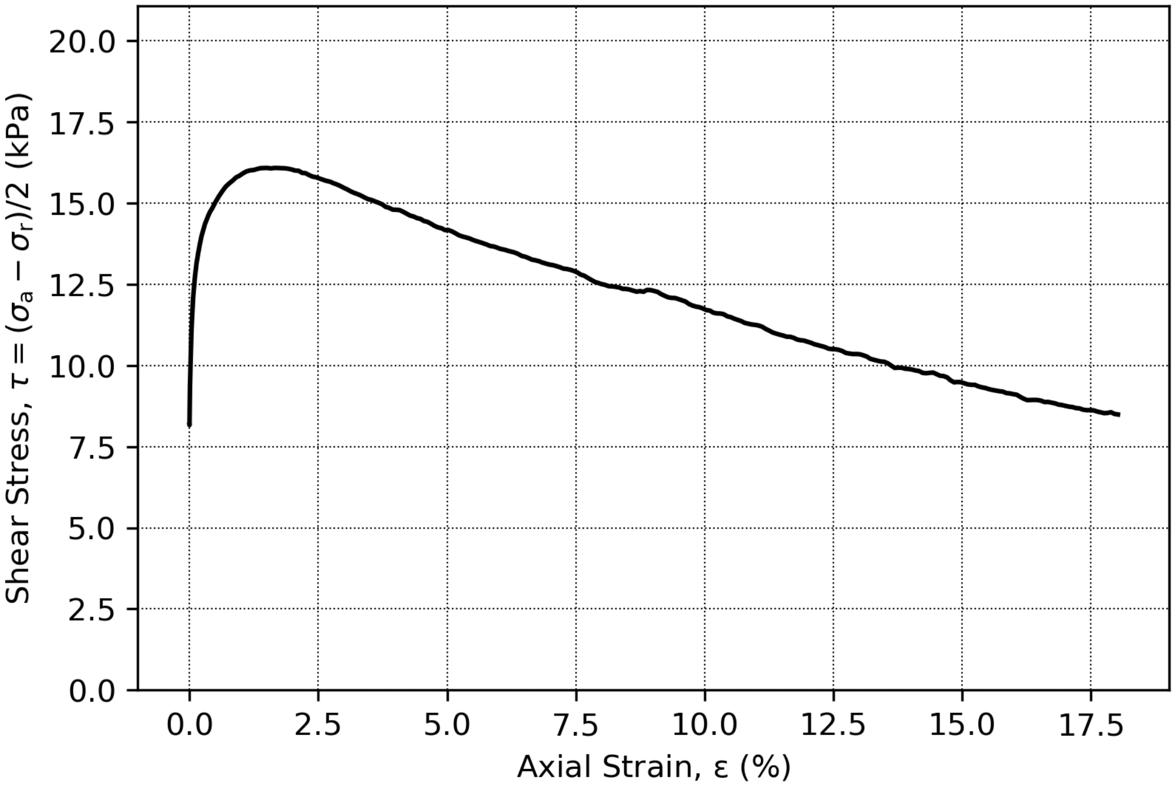
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.128
Boring:	ONSB29	Depth	= 9.96	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 64.0	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 67.7	%	σ_{ac}'	-	-	64.0
Test:	1	w_c	= 58.9	%	σ_{rc}'	-	-	38.4

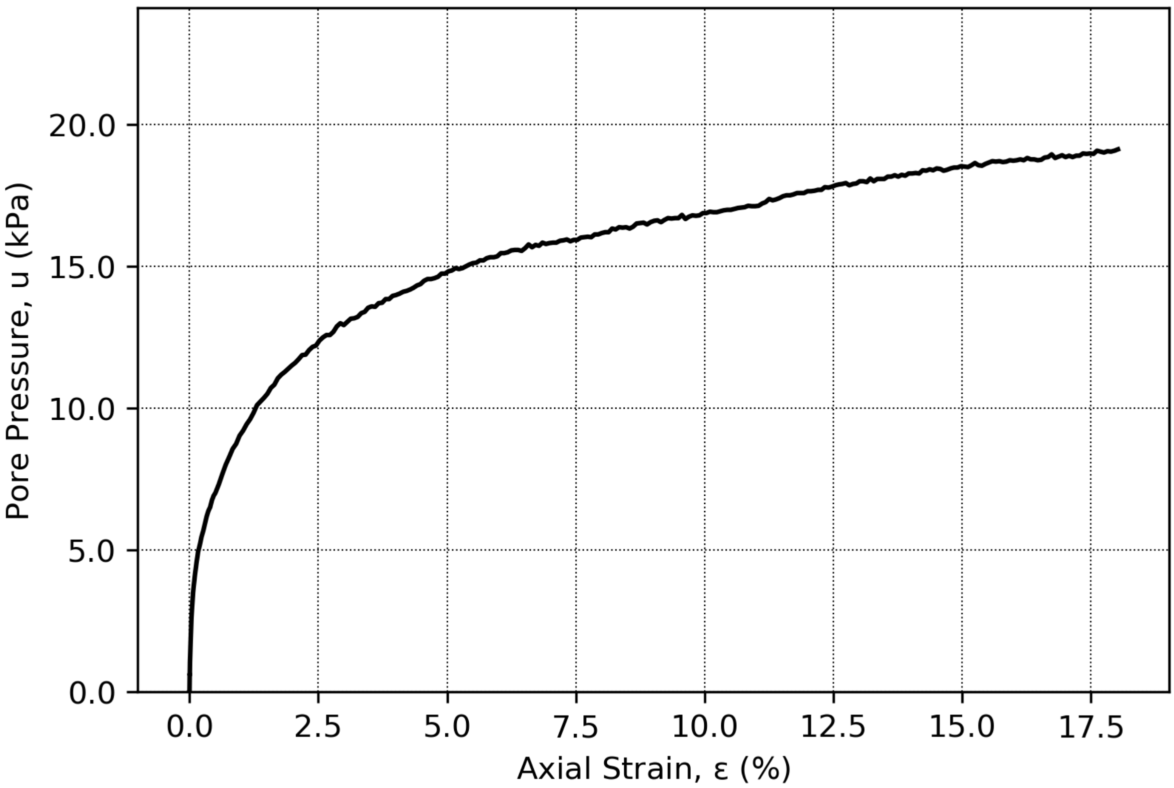


Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.129
Boring:	ONSB29	Depth	= 9.96	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 64.0	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 67.7	%	σ_{ac}'	-	-	64.0
Test:	1	w_c	= 58.9	%	σ_{rc}'	-	-	38.4

NGI

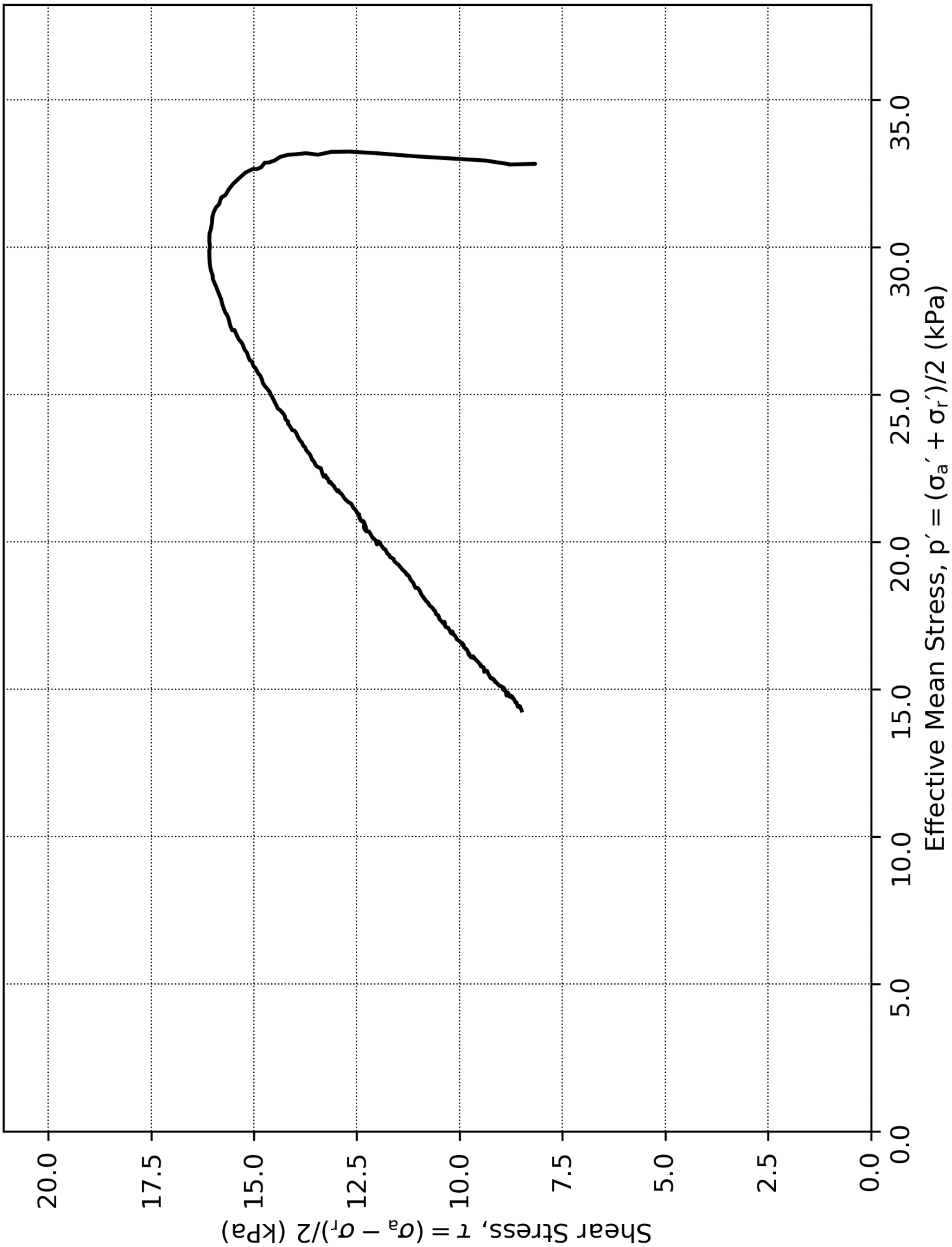
P:\2016\01\20160154\Lab\Onsøy\Triax





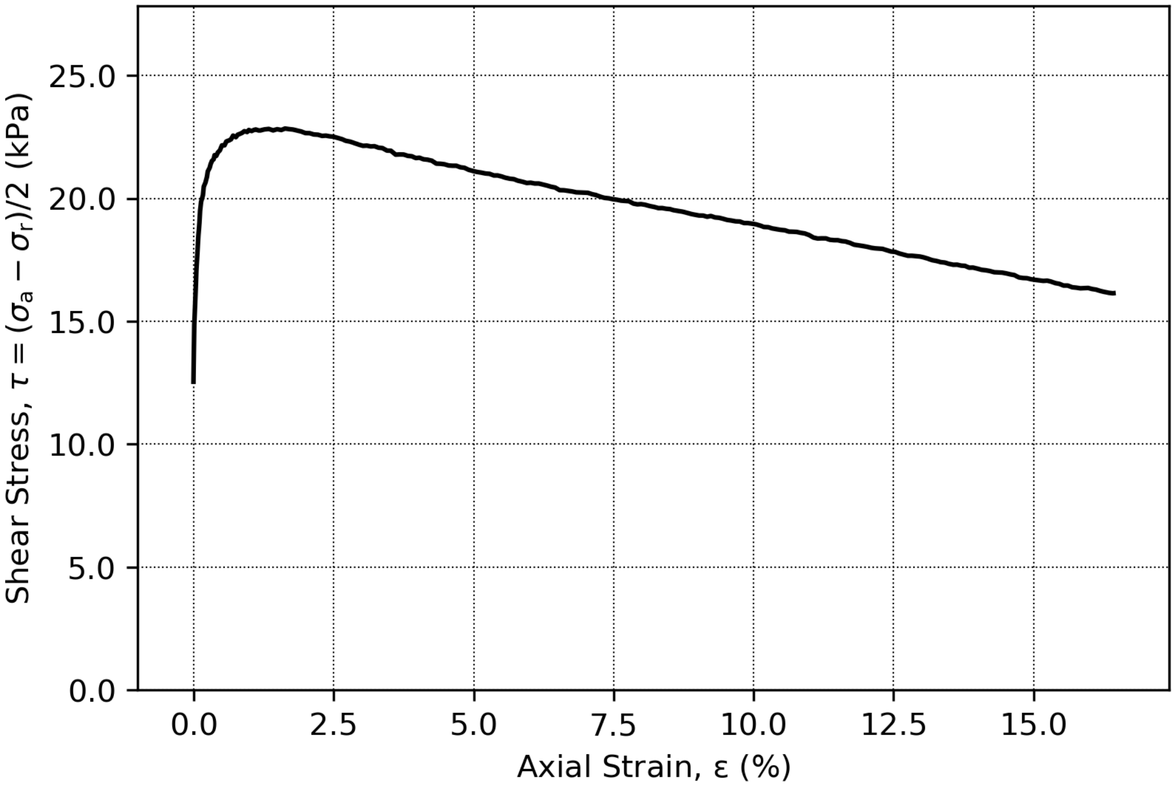
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.130
Boring:	ONSB31	Depth	= 6.77	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 41.0	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 57.0	%	σ_{ac}'	-	-	41.0
Test:	1	w_c	= 54.0	%	σ_{rc}'	-	-	24.6

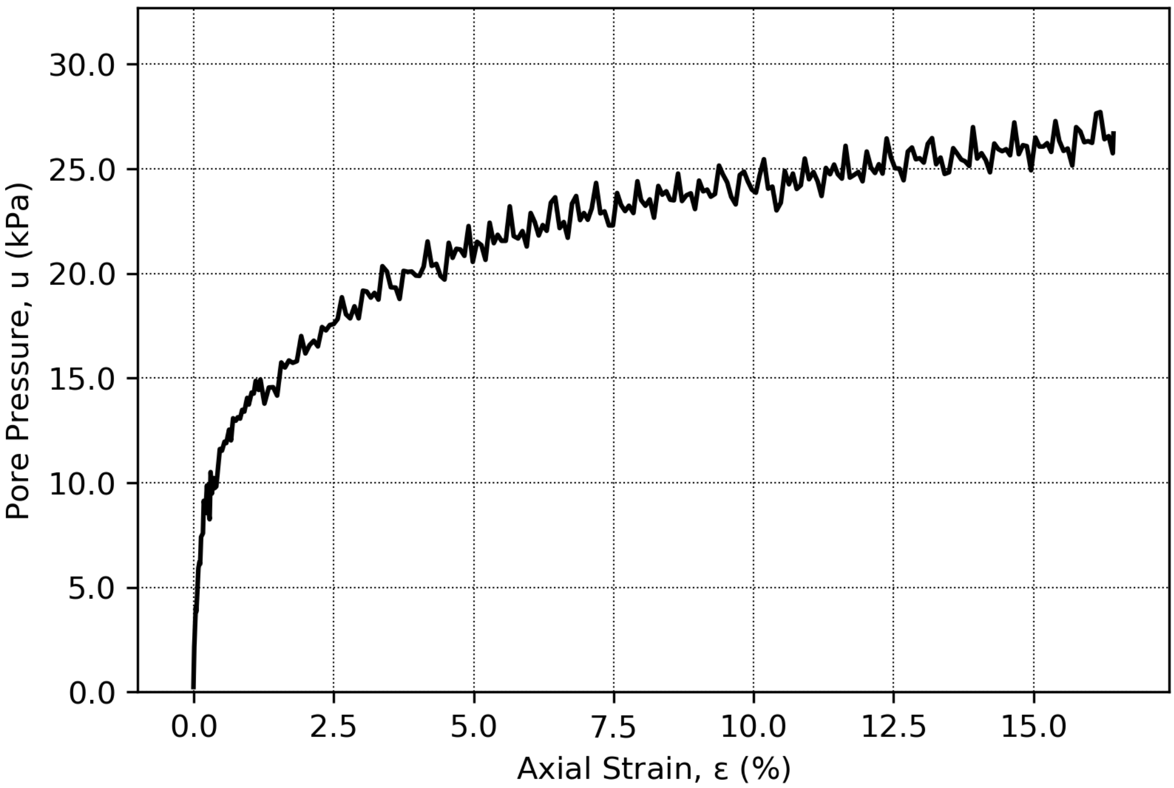
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.131	
Boring:	ONSB31	Depth	= 6.77	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S1	p_0'	= 41.0	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 57.0	%	σ_{ac}'	-	-	41.0	
Test:	1	w_c	= 54.0	%	σ_{rc}'	-	-	24.6	

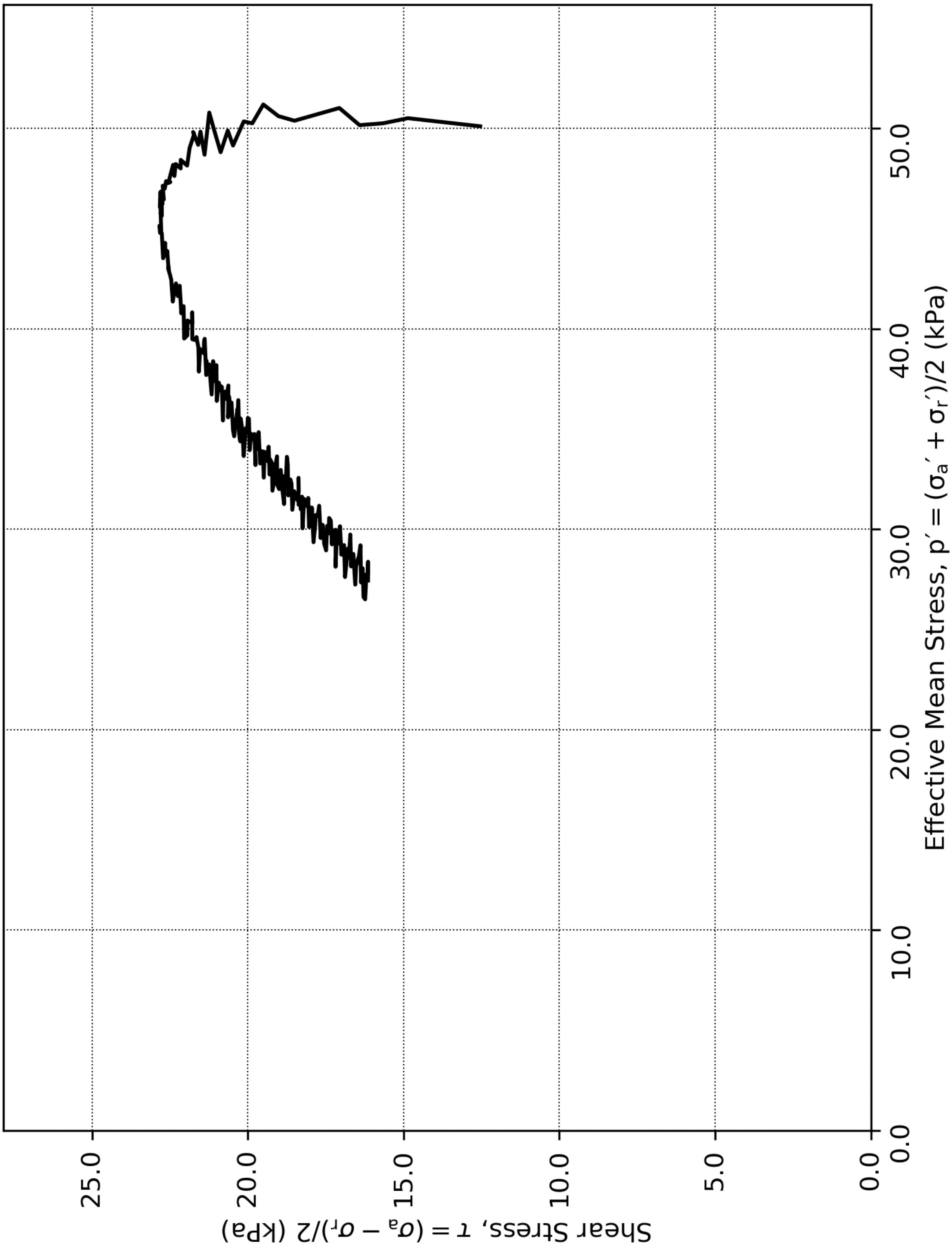
P:\2016\01\20160154\Lab\Onsøy\Triax





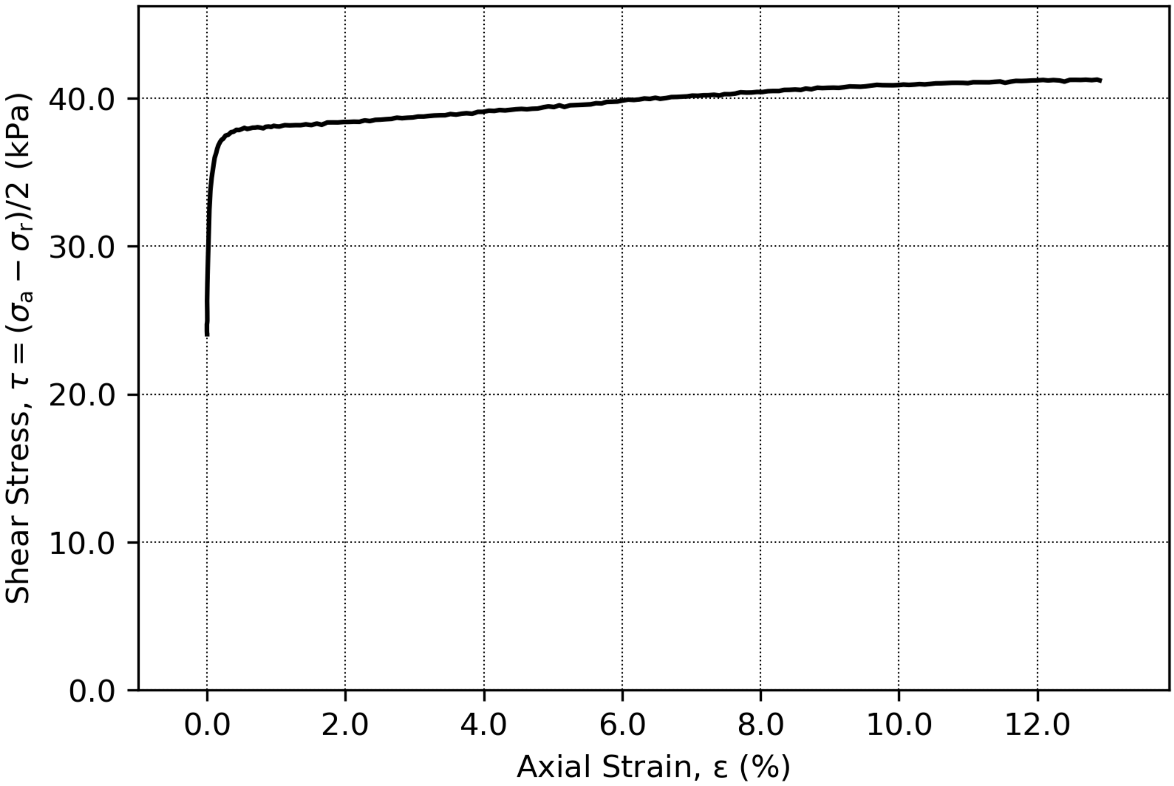
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.132
Boring: ONSB31	Depth = 9.82	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S2	p_0' = 63.1	kPa	(kPa)	max.	min.	final	
Part: 2	w_i = 64.1	%	σ_{ac}'	-	-	62.9	
Test: 1	w_c = 59.7	%	σ_{rc}'	-	-	37.8	

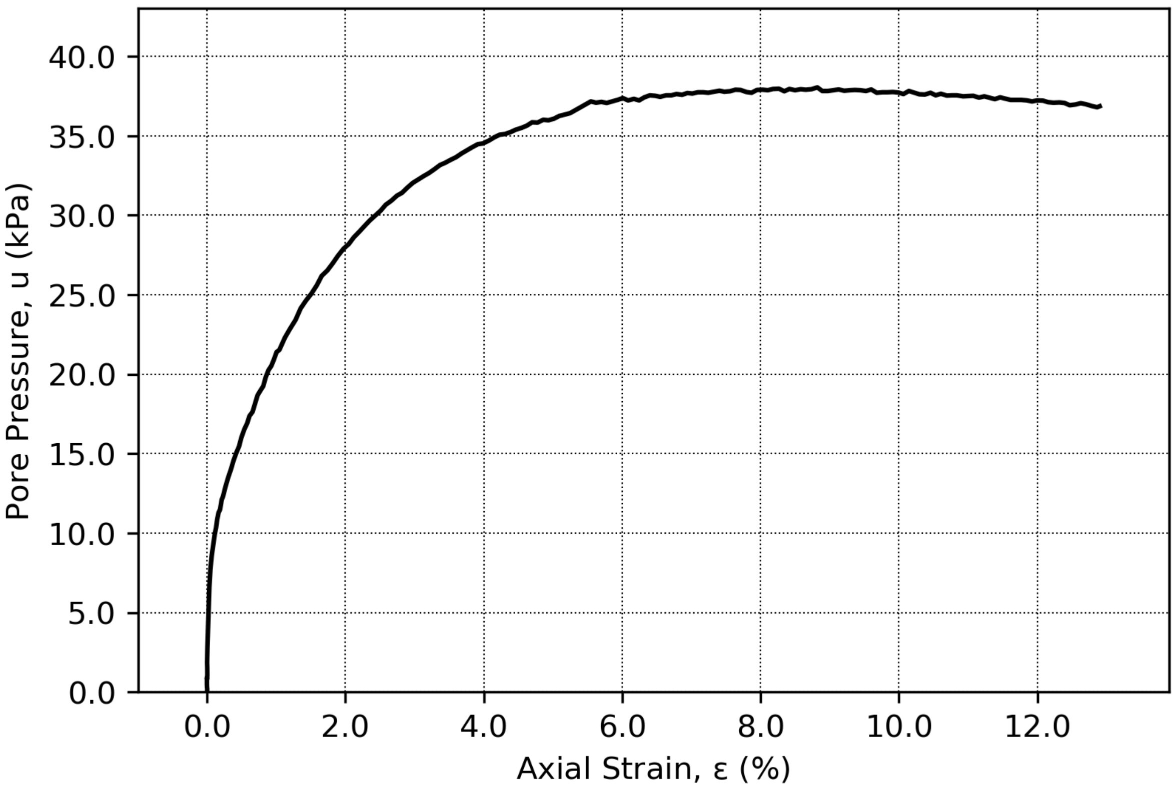
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R	
Triaxial test: CAUC										Figure No. 5.3.133	
Boring:	ONSB31	Depth	= 9.82	m	Consolidation stresses					Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 63.1	kPa	(kPa)	max.	min.	final			
Part:	2	w_i	= 64.1	%	σ_{ac}'	-	-	62.9		NGI	
Test:	1	w_c	= 59.7	%	σ_{rc}'	-	-	37.8			

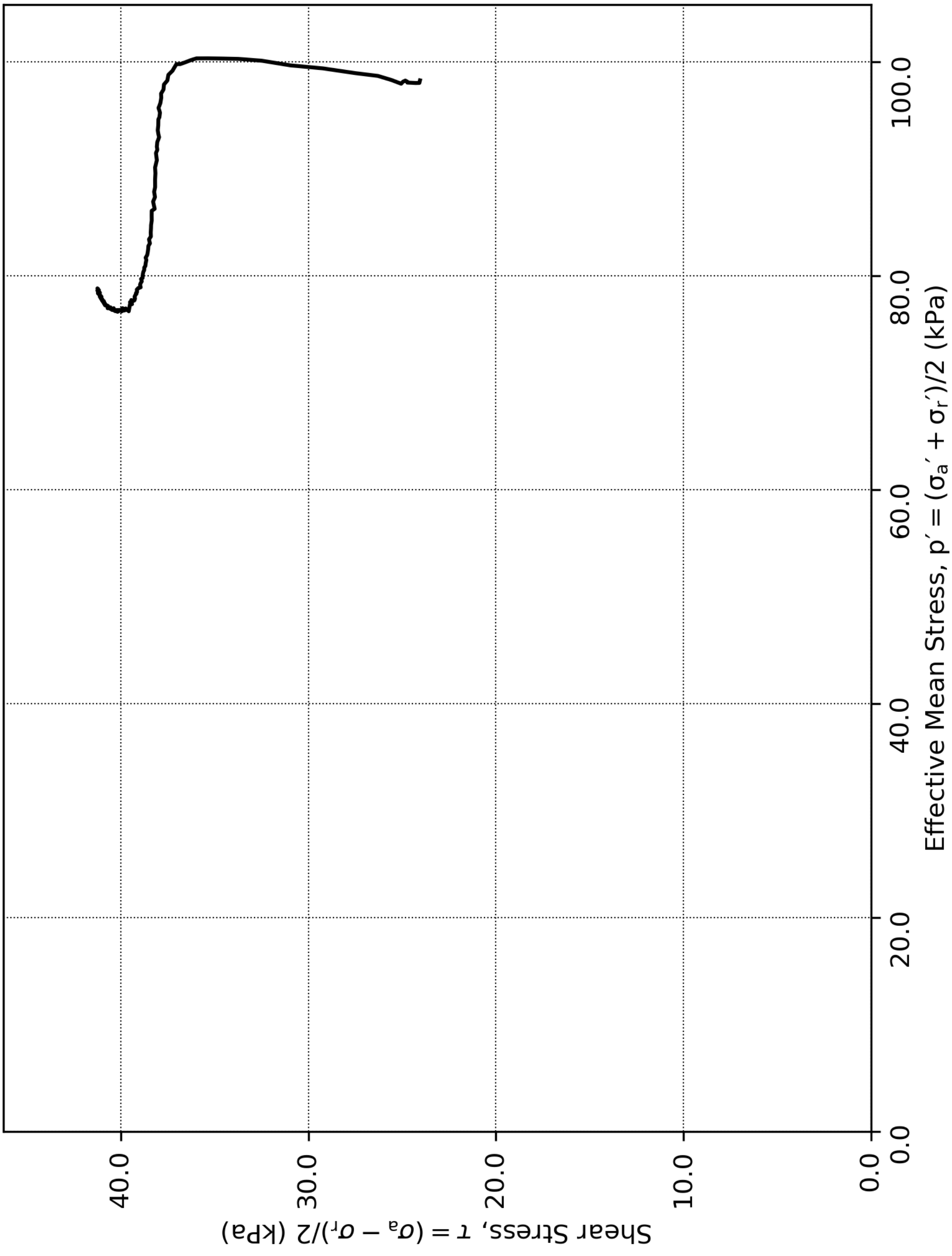
P:\2016\01\20160154\Lab\Onsøy\Triax





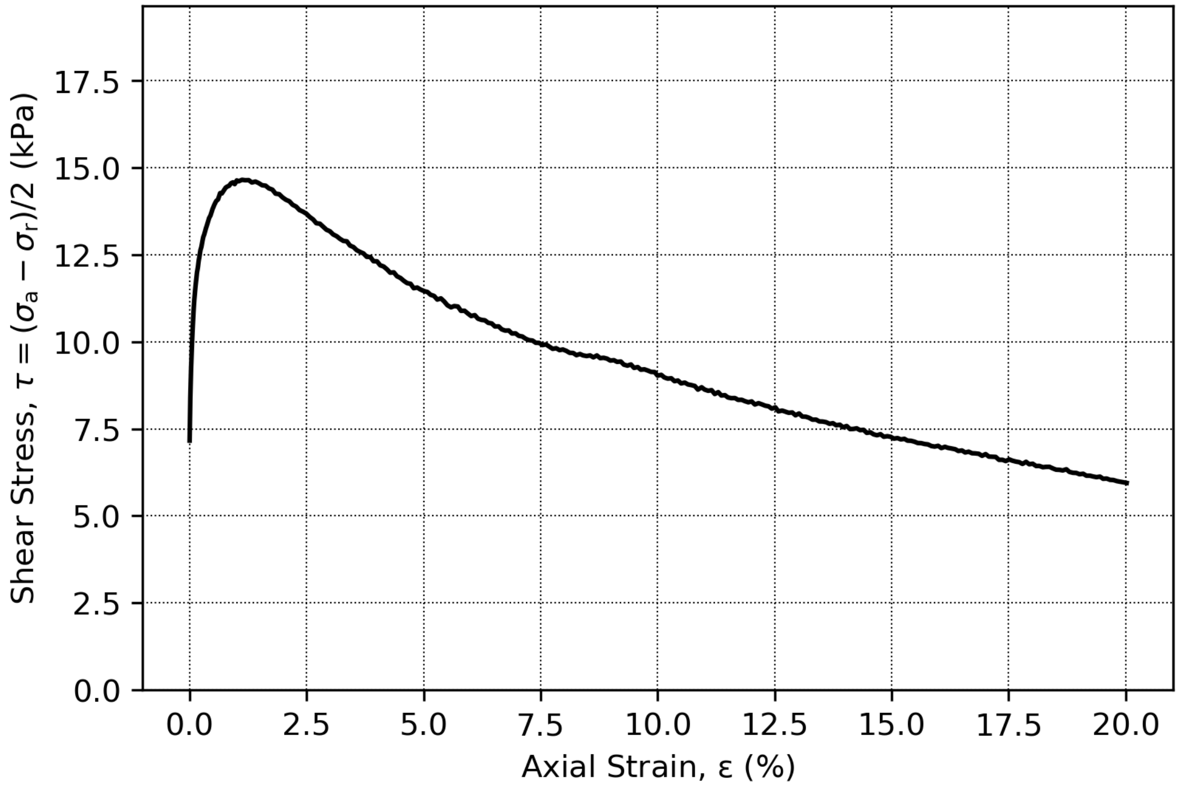
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.134
Boring:	ONSB31	Depth	= 18.47	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S5	p_0'	= 123.6	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 49.1	%	σ_{ac}'	-	-	122.3	
Test:	1	w_c	= 41.3	%	σ_{rc}'	-	-	74.2	

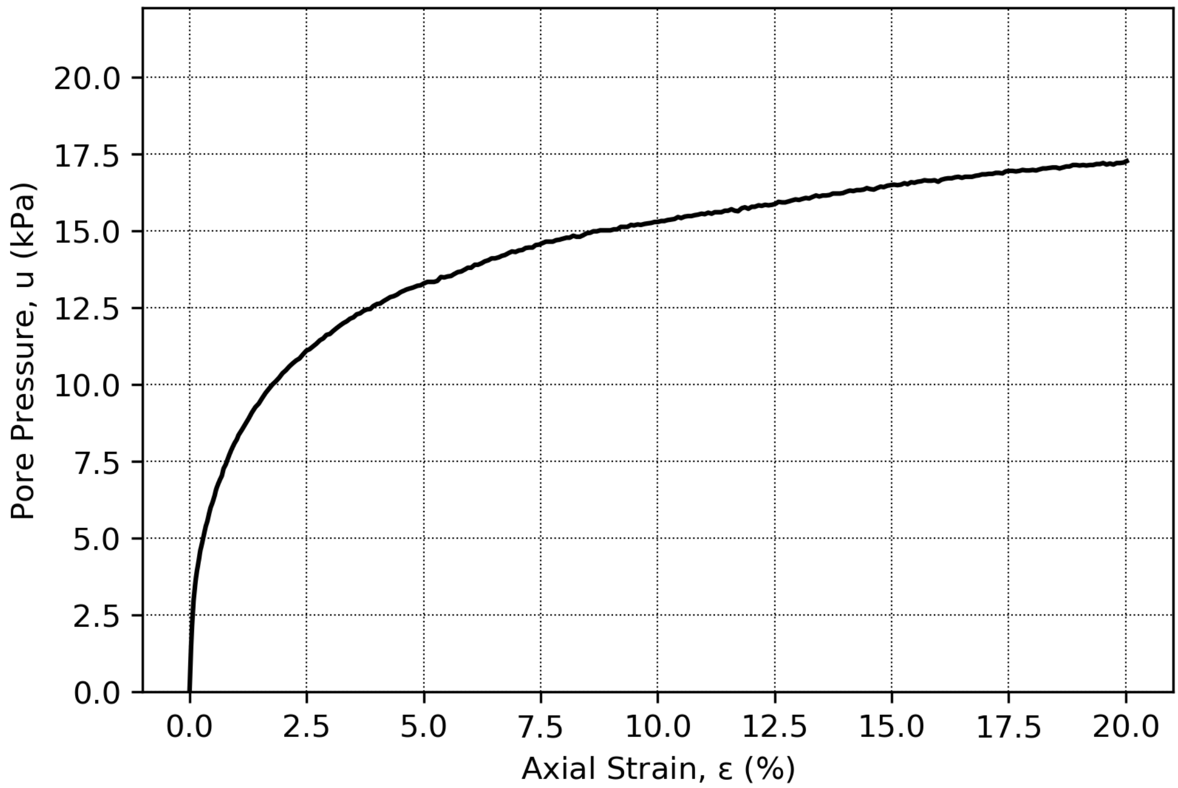
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.135
Boring:	ONSB31	Depth = 18.47	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S5	p_0' = 123.6	kPa	(kPa)	max.	min.	final	
Part:	2	w_i = 49.1	%	σ_{ac}'	-	-	122.3	
Test:	1	w_c = 41.3	%	σ_{rc}'	-	-	74.2	

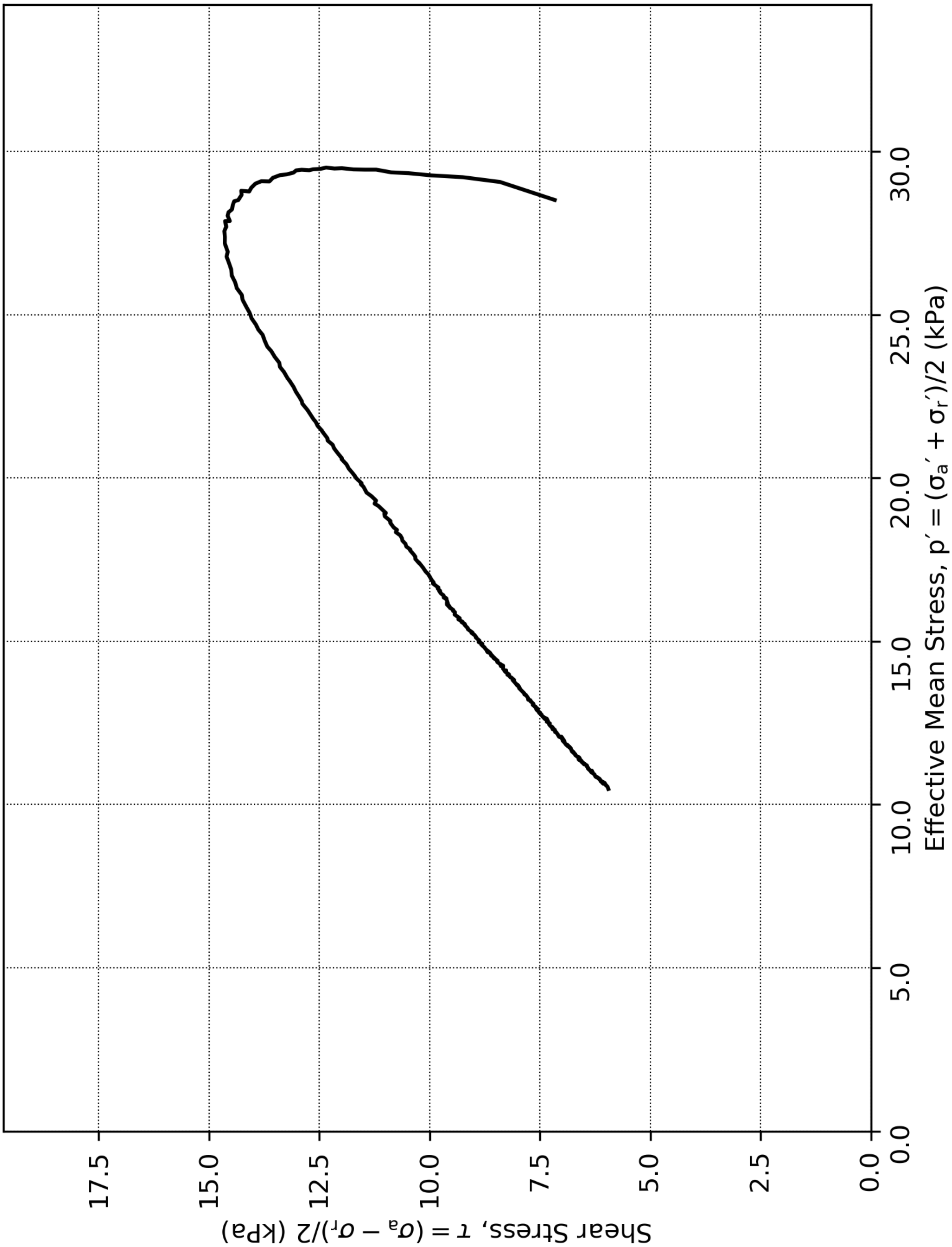
P:\2016\01\20160154\Lab\Onsøy\Triax





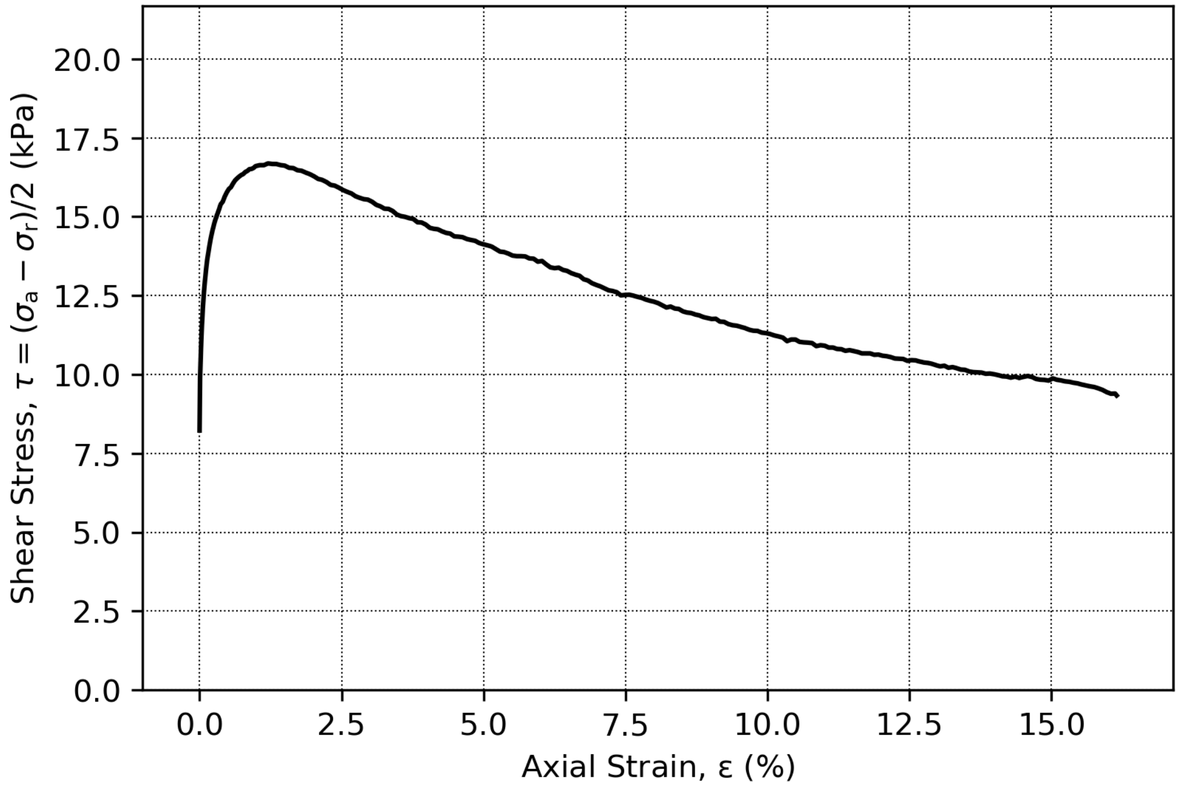
P:\2016\01\20160154\Lab\Onsøy\Triax

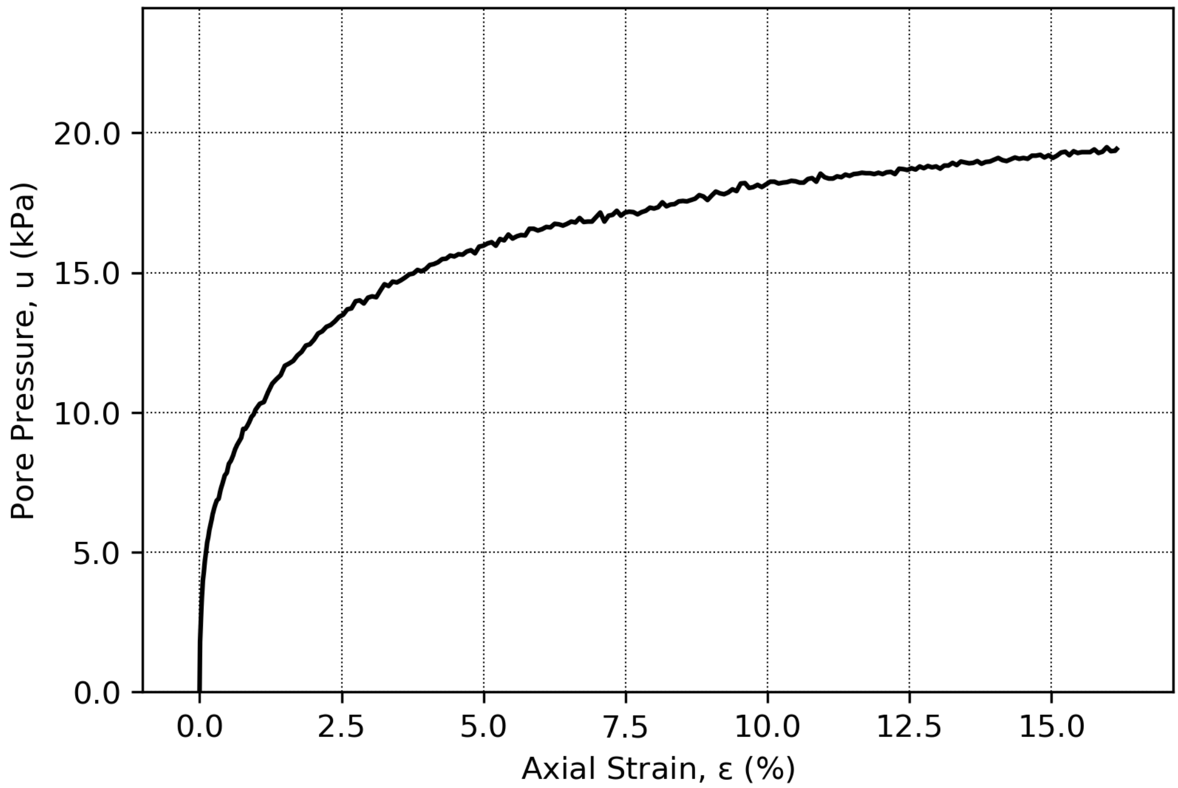
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.136
Boring:	ONSB32	Depth	= 5.92	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 35.8	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 81.2	%	σ_{ac}'	-	-	35.6	NGI
Test:	1	w_c	= 78.6	%	σ_{rc}'	-	-	21.4	



P:\2016\01\20160154\Lab\Onsøy\Triax

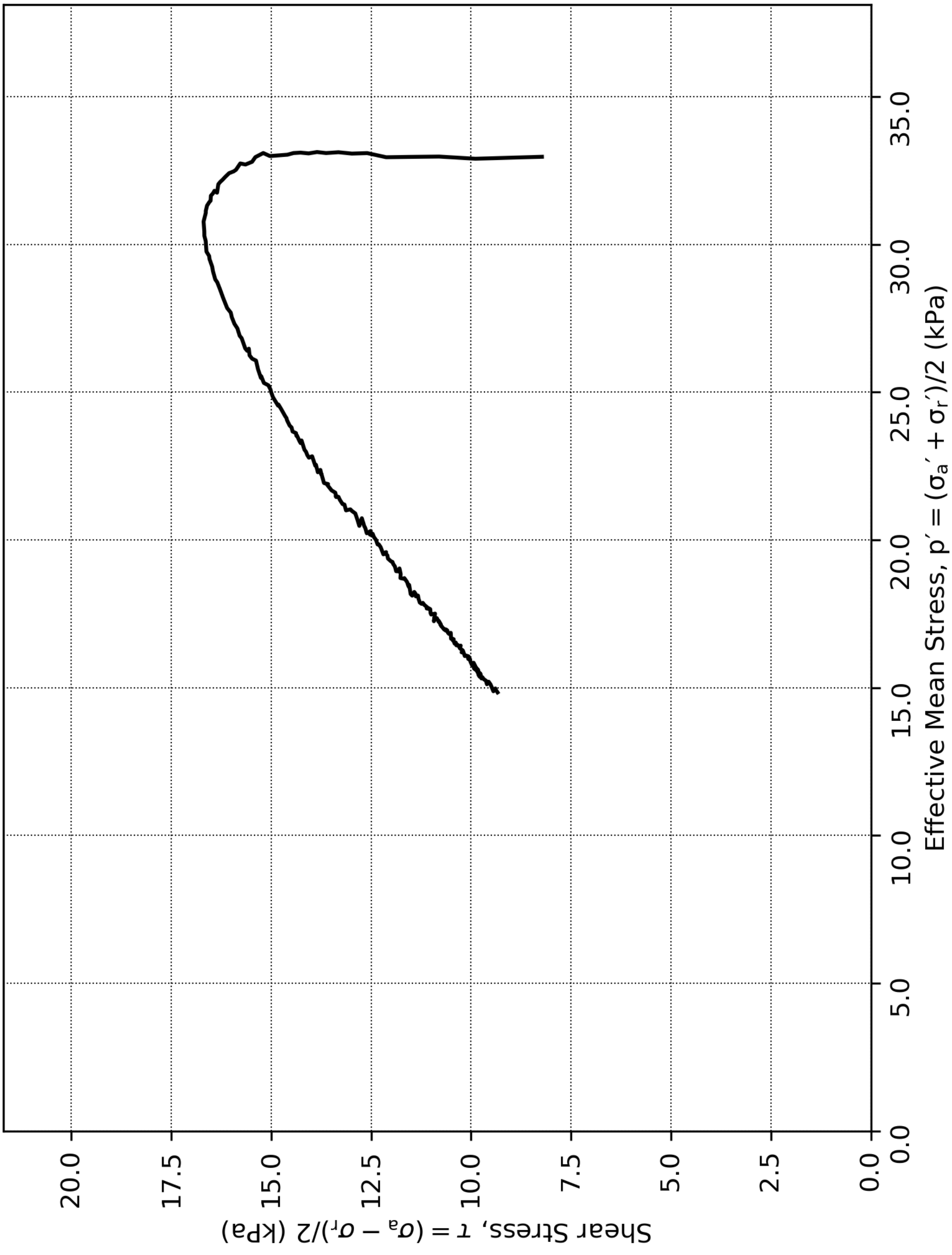
Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R
Triaxial test: CAUC										Figure No. 5.3.137
Boring:	ONSB32	Depth	= 5.92	m	Consolidation stresses					Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 35.8	kPa	(kPa)	max.	min.	final		NGI
Part:	1	w_i	= 81.2	%	σ_{ac}'	-	-	35.6		
Test:	1	w_c	= 78.6	%	σ_{rc}'	-	-	21.4		





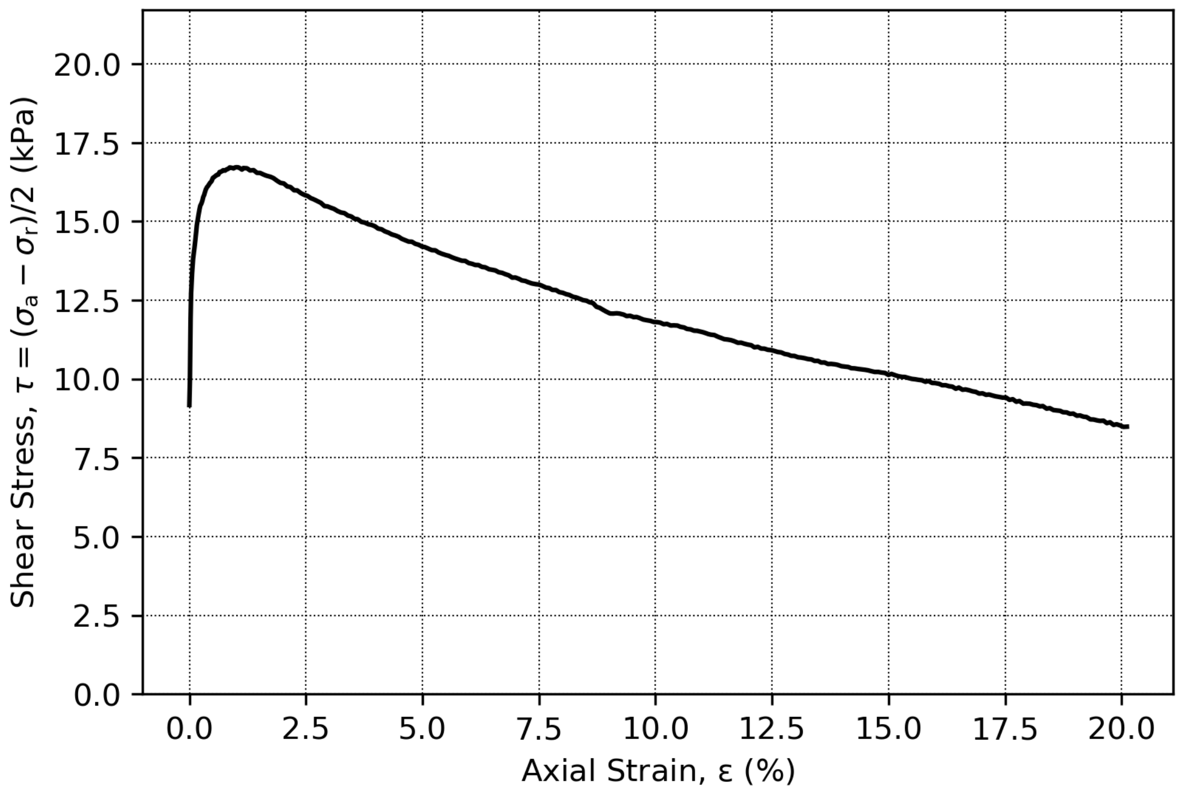
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.138
Boring:	ONSB32	Depth	= 6.82	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 41.3	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 77.2	%	σ_{ac}'	-	-	41.2	
Test:	1	w_c	= 74.5	%	σ_{rc}'	-	-	24.8	

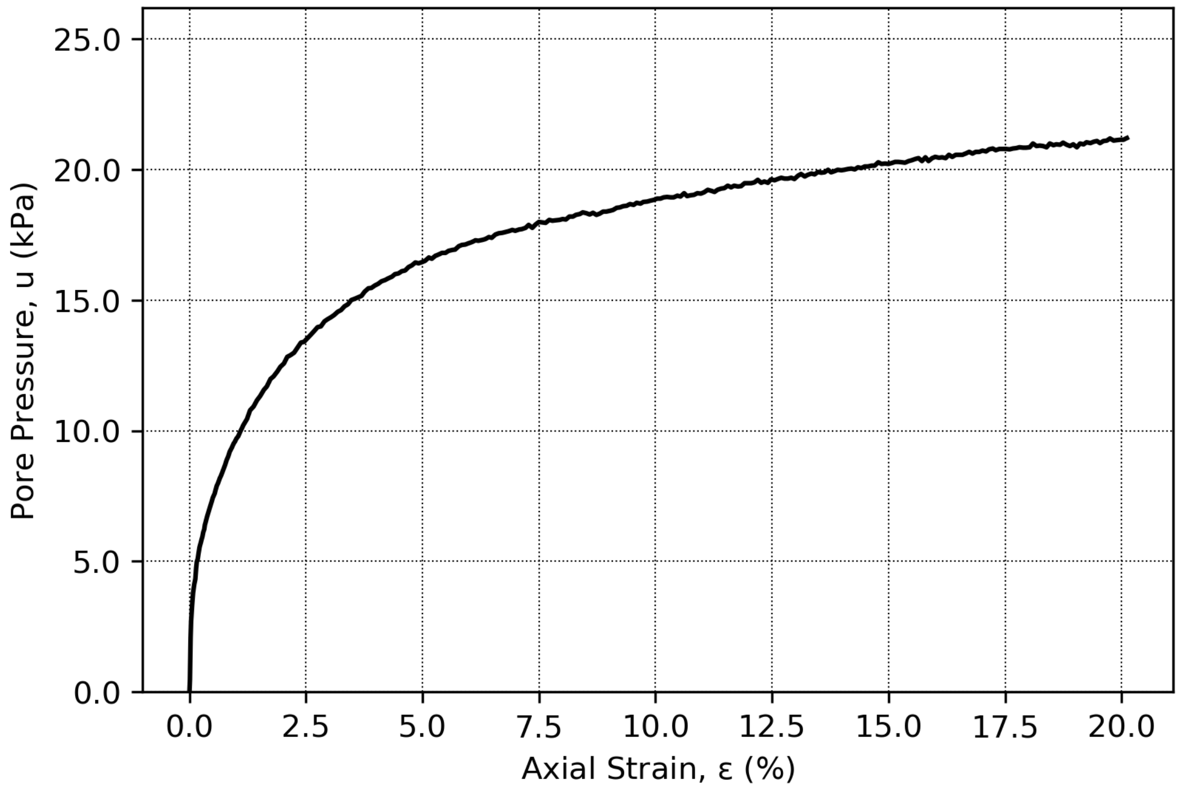
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.139
Boring: ONSB32	Depth = 6.82	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S1	p_0' = 41.3	kPa	(kPa)	max.	min.	final	
Part: 2	w_i = 77.2	%	σ_{ac}'	-	-	41.2	
Test: 1	w_c = 74.5	%	σ_{rc}'	-	-	24.8	

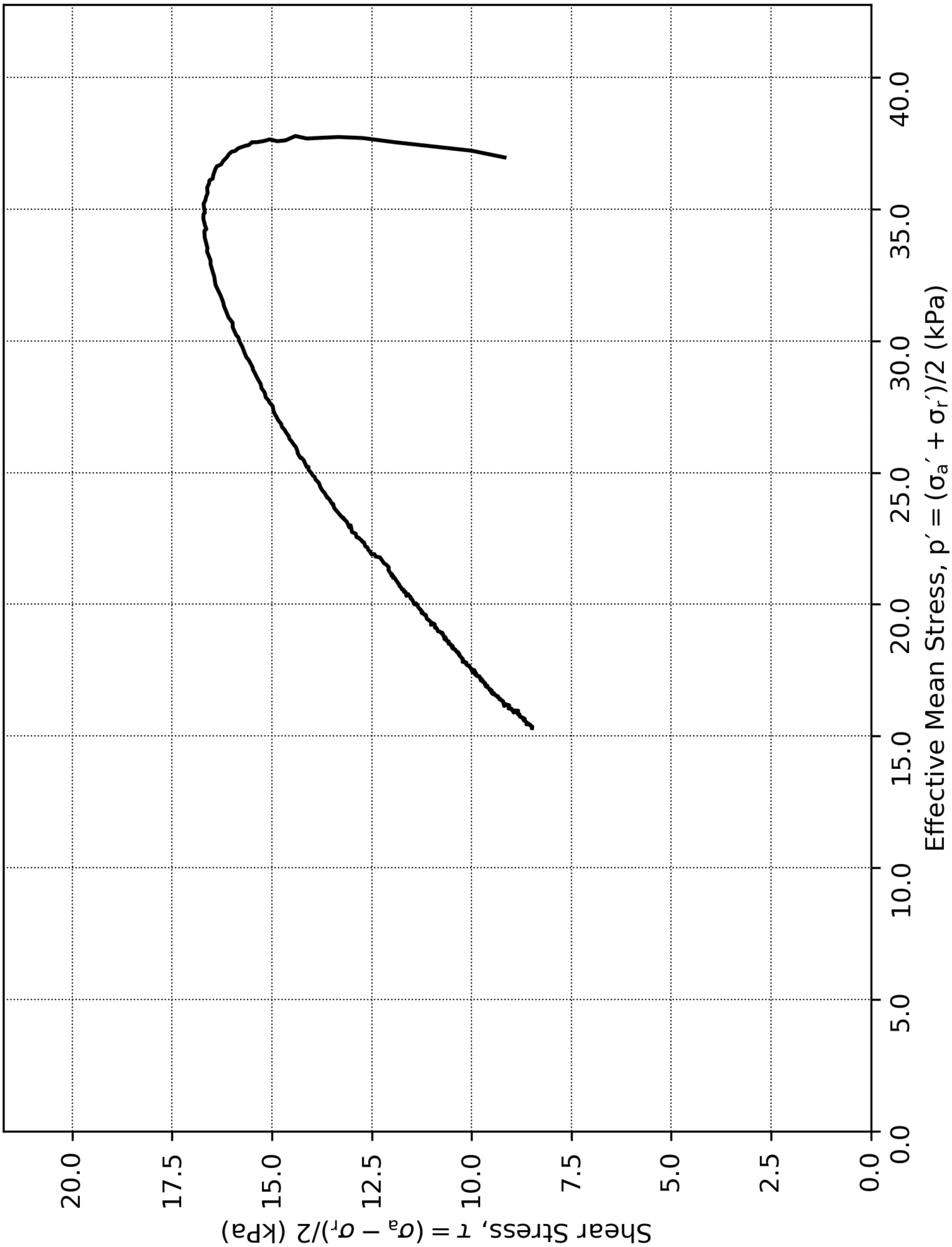
P:\2016\01\20160154\Lab\Onsøy\Triax





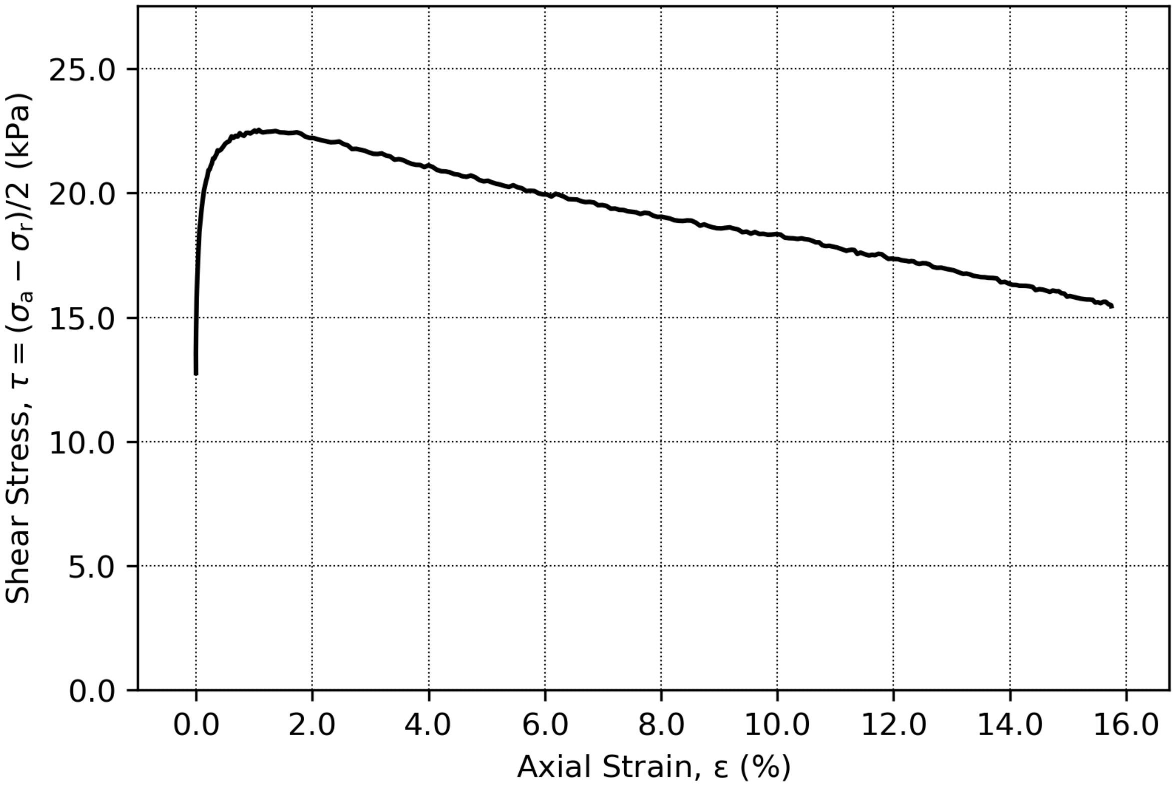
P:\2016\01\20160154\Lab\Onsøy\Triax

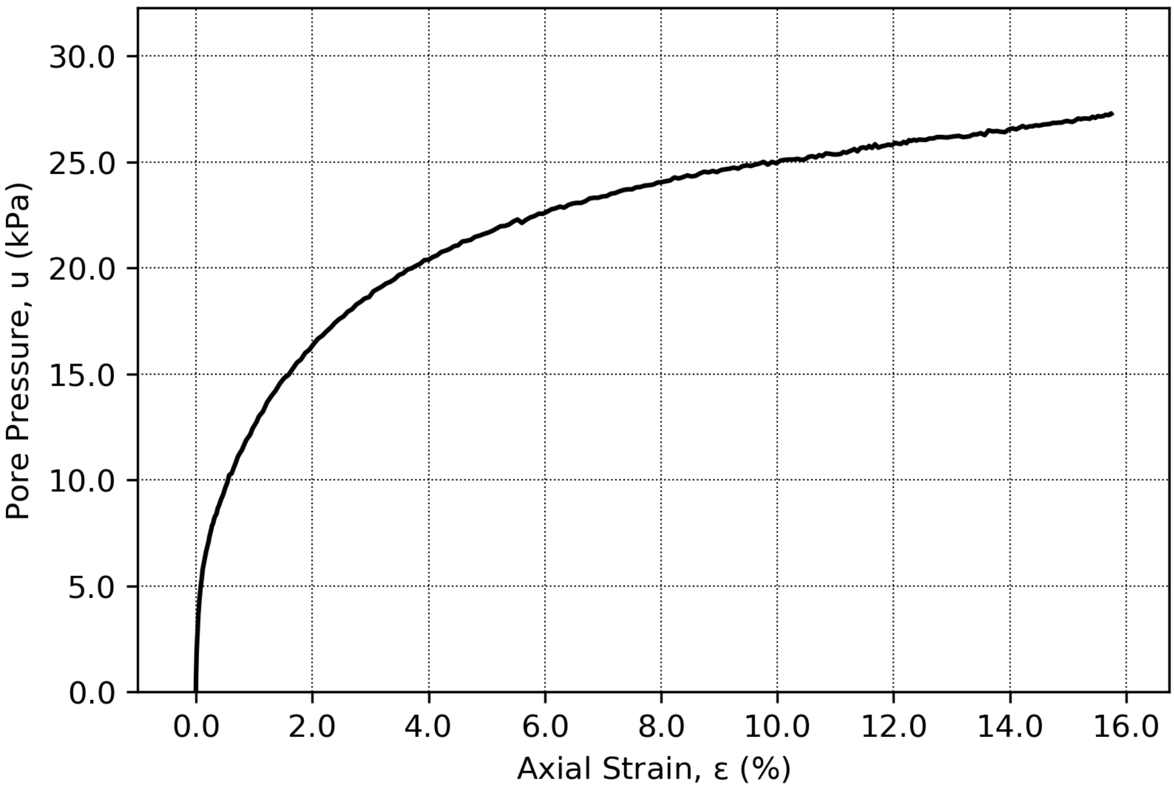
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.140	
Boring:	ONSB32	Depth = 7.62	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S1	p_0' = 46.3	kPa	(kPa)	max.	min.	final	NGI
Part:	3	w_i = 70.9	%	σ_{ac}'	-	-	46.1	
Test:	1	w_c = 68.2	%	σ_{rc}'	-	-	27.7	



Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.141
Boring: ONSB32	Depth = 7.62	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S1	p_0' = 46.3	kPa	(kPa)	max.	min.	final	
Part: 3	w_i = 70.9	%	σ_{ac}'	-	-	46.1	
Test: 1	w_c = 68.2	%	σ_{rc}'	-	-	27.7	

P:\2016\01\20160154\Lab\Onsøy\Triax

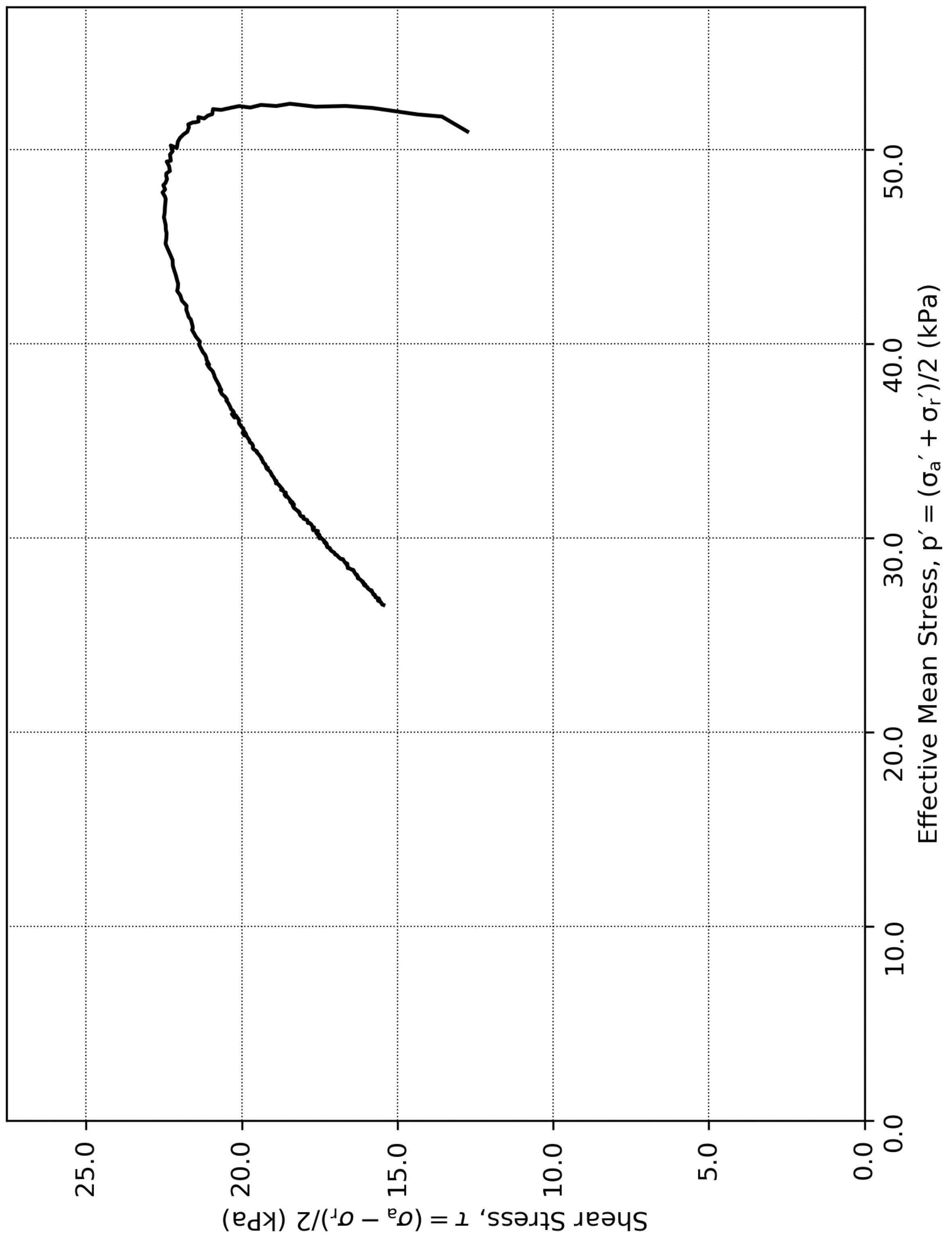




P:\2016\01\20160154\Lab\Onsøy\Triax

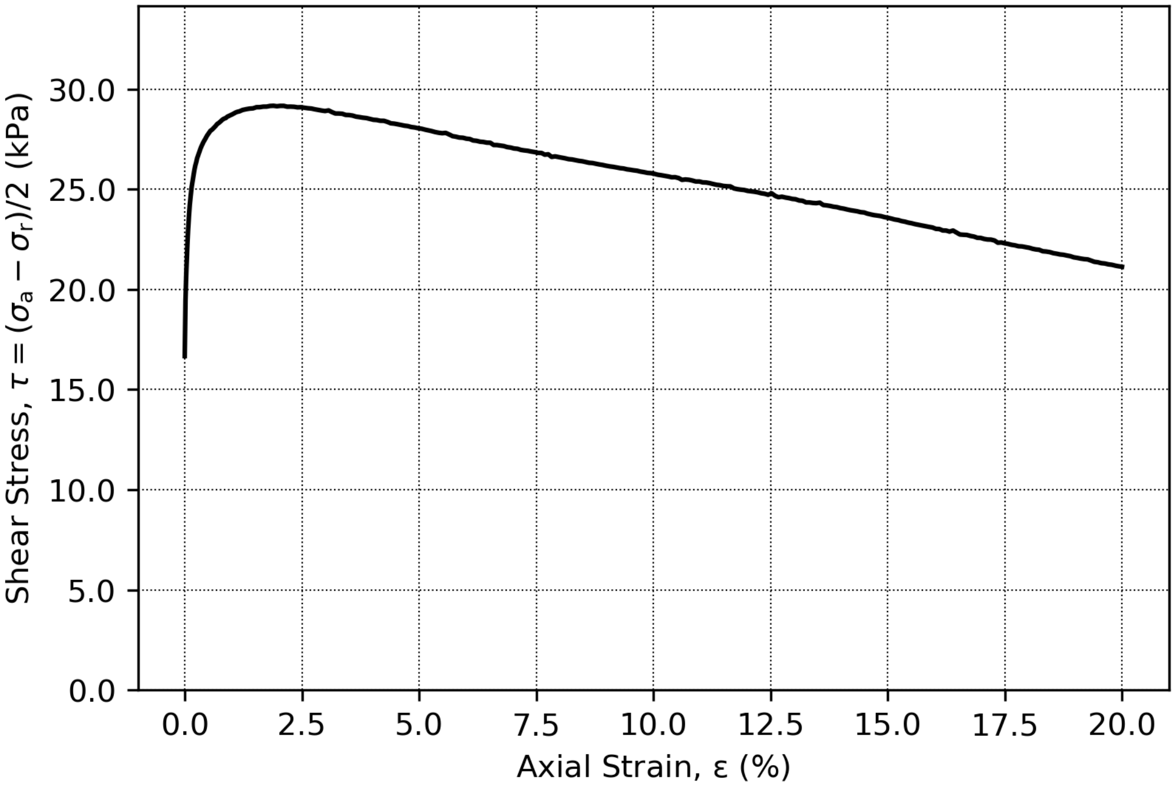
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.142
Boring:	ONSB32	Depth	= 9.92	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 63.7	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 65.1	%	σ_{ac}'	-	-	63.7
Test:	1	w_c	= 60.8	%	σ_{rc}'	-	-	38.2

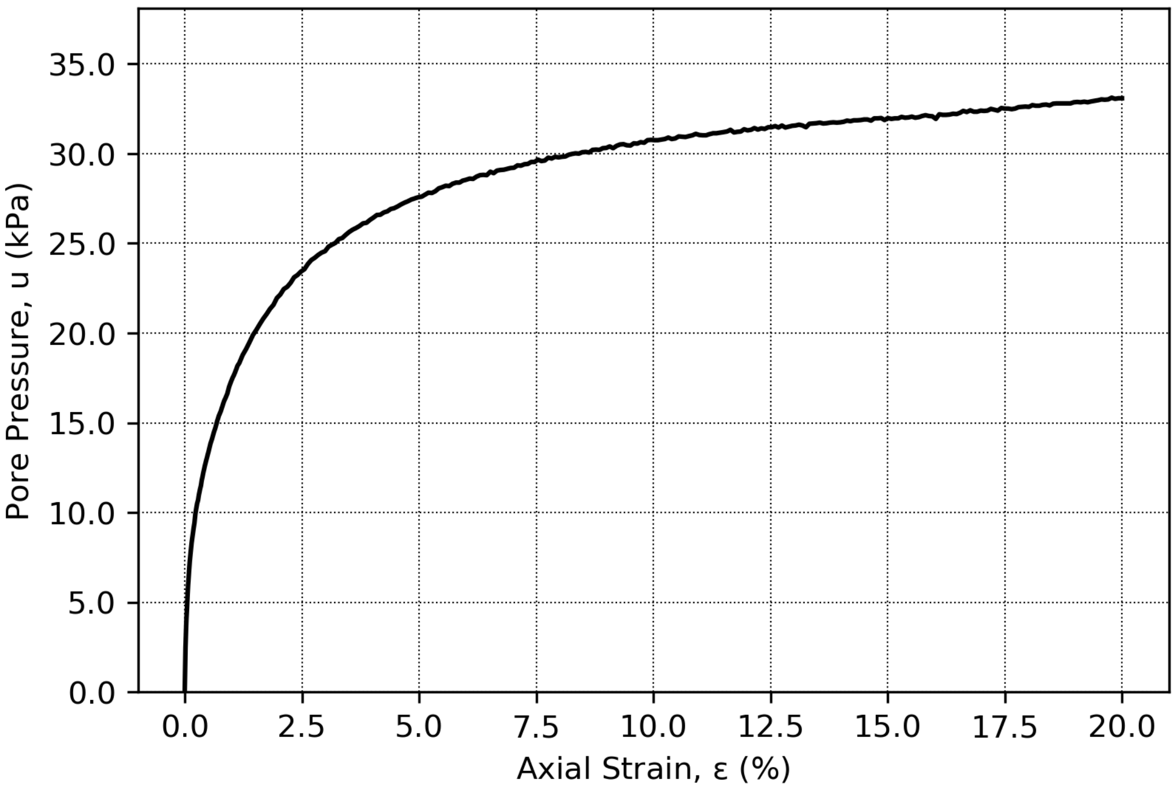
NGI



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.143	
Boring:	ONSB32	Depth = 9.92	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0' = 63.7	kPa	(kPa)	max.	min.	final		
Part:	2	w_i = 65.1	%	σ_{ac}'	-	-	63.7		
Test:	1	w_c = 60.8	%	σ_{rc}'	-	-	38.2		

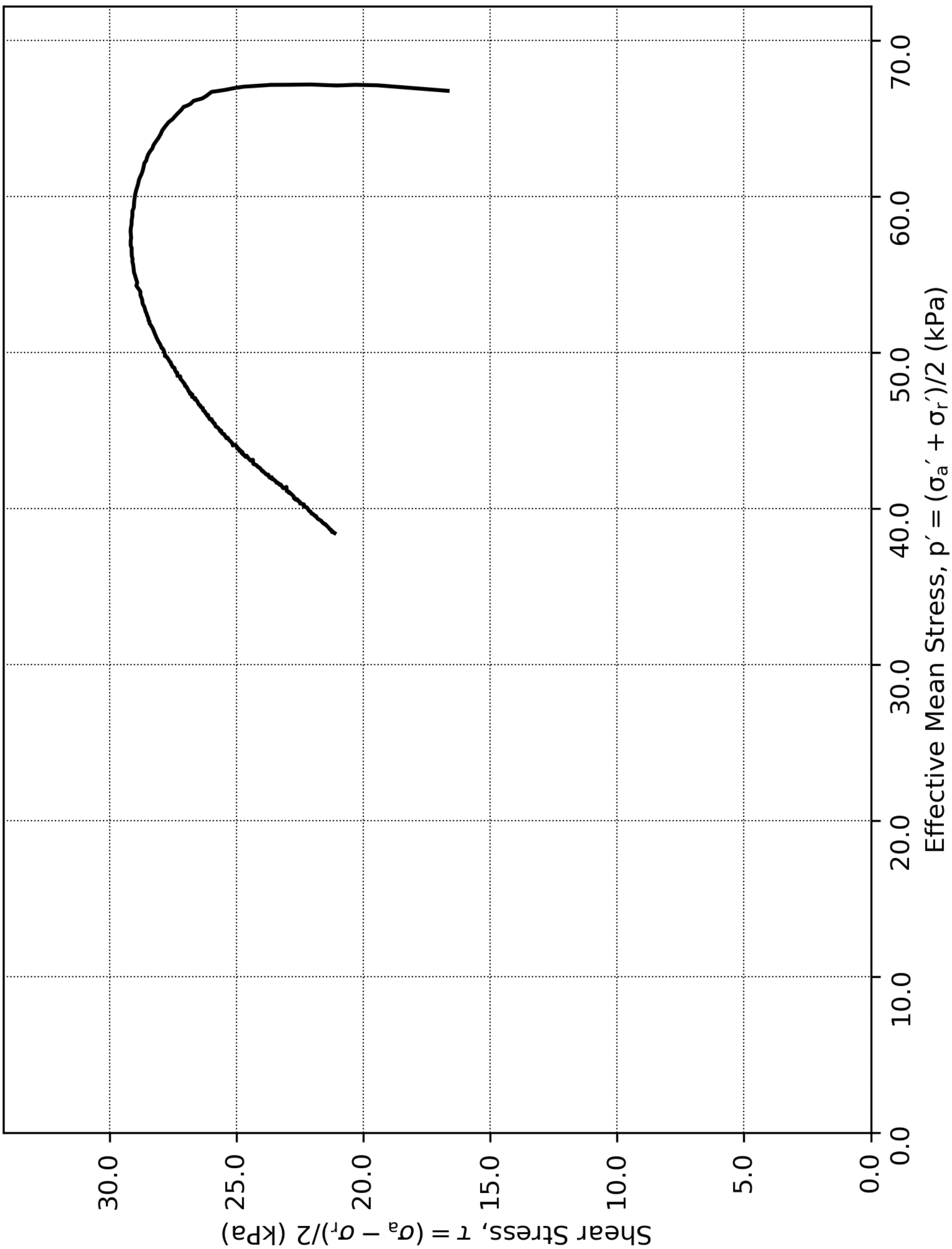
P:\2016\01\20160154\Lab\Onsøy\Triax





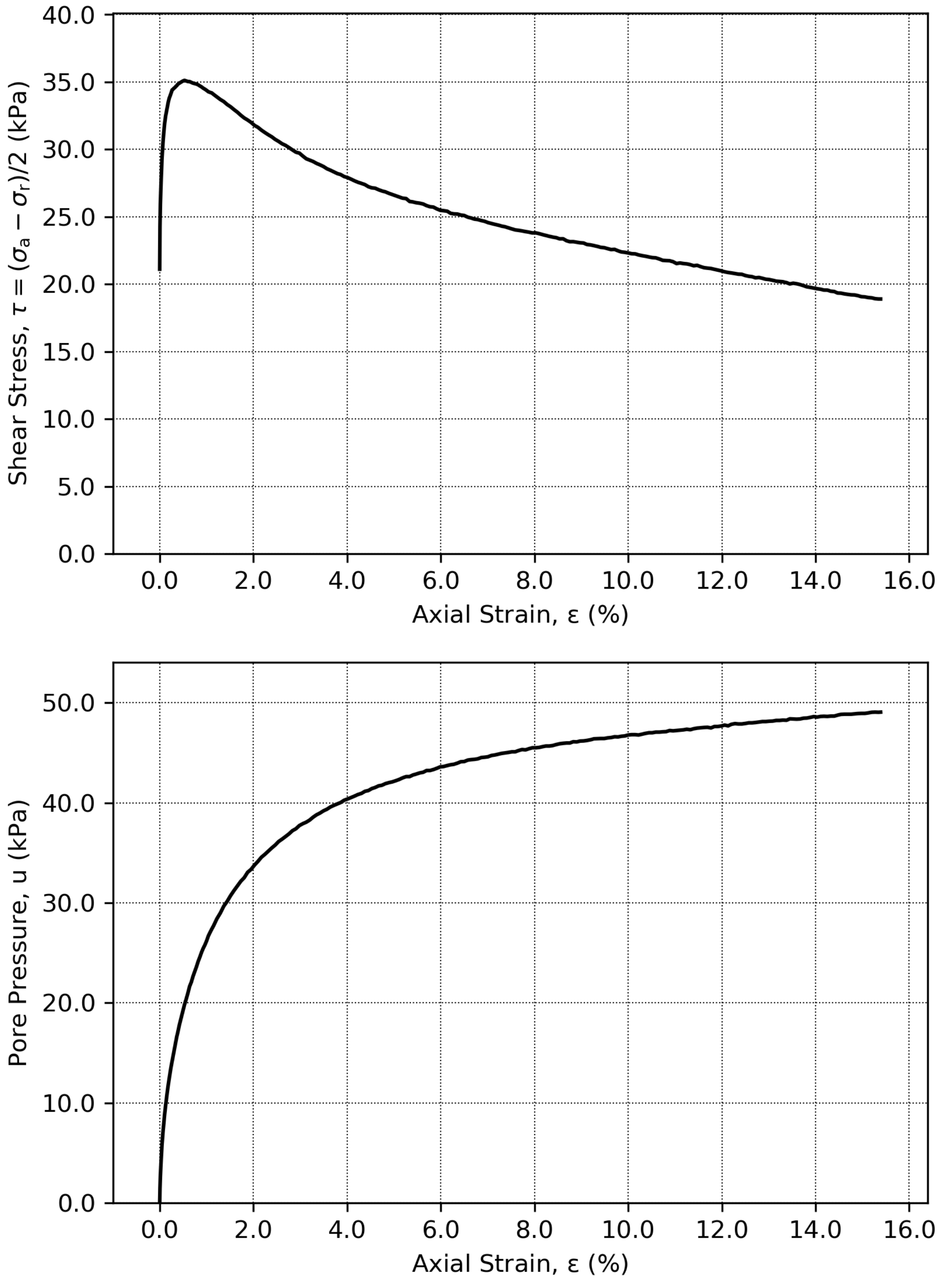
P:\2016\01\20160154\Lab\Onsøy\Triax

Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.144
Boring:	ONSB32	Depth = 12.57	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0' = 83.6	kPa	(kPa)	max.	min.	final	
Part:	2	w_i = 43.9	%	σ_{ac}'	-	-	83.6	
Test:	1	w_c = 40.1	%	σ_{rc}'	-	-	50.1	



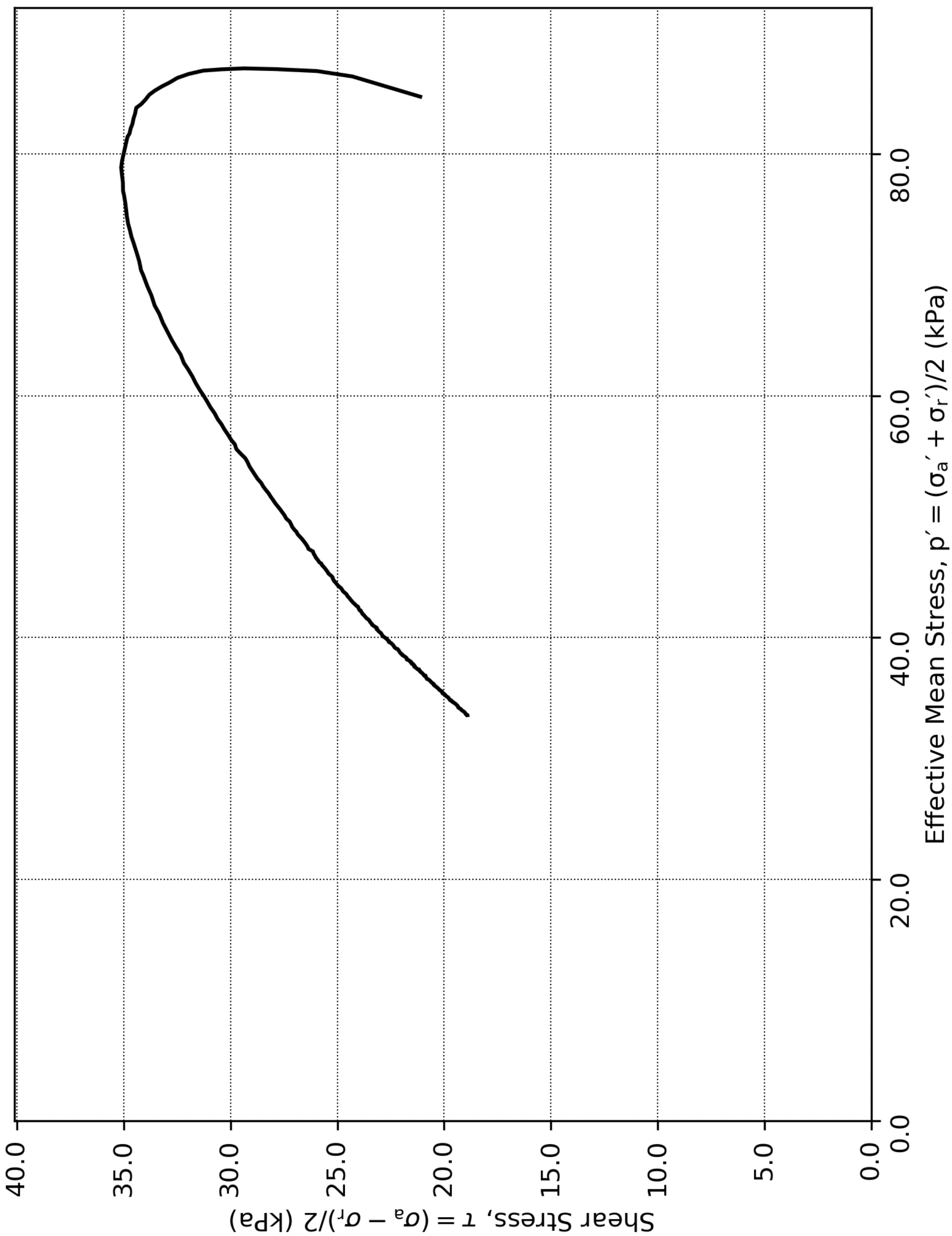
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.145
Boring:	ONSB32	Depth = 12.57	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0' = 83.6	kPa	(kPa)	max.	min.	final
Part:	2	w_i = 43.9	%	σ_{ac}'	-	-	83.6
Test:	1	w_c = 40.1	%	σ_{rc}'	-	-	50.1

P:\2016\01\20160154\Lab\Onsøy\Triax



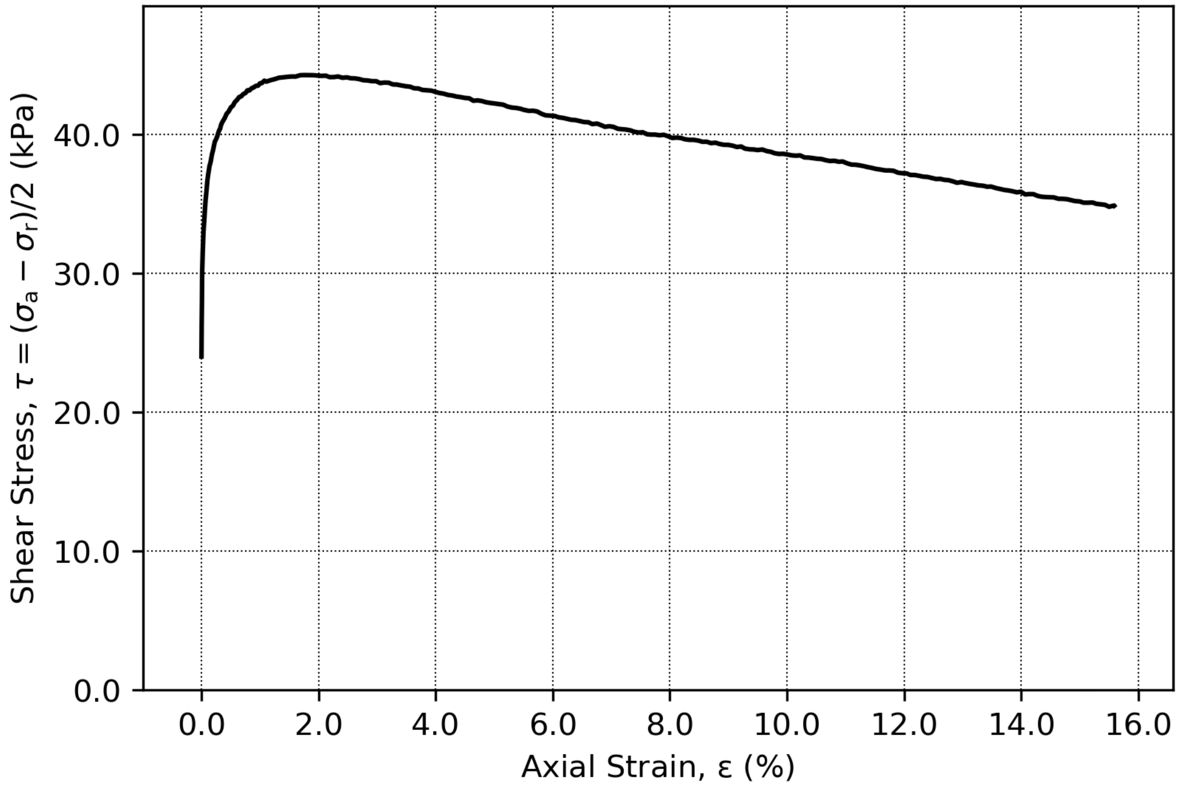
P:\2016\01\20160154\Lab\Onsøy\Triax

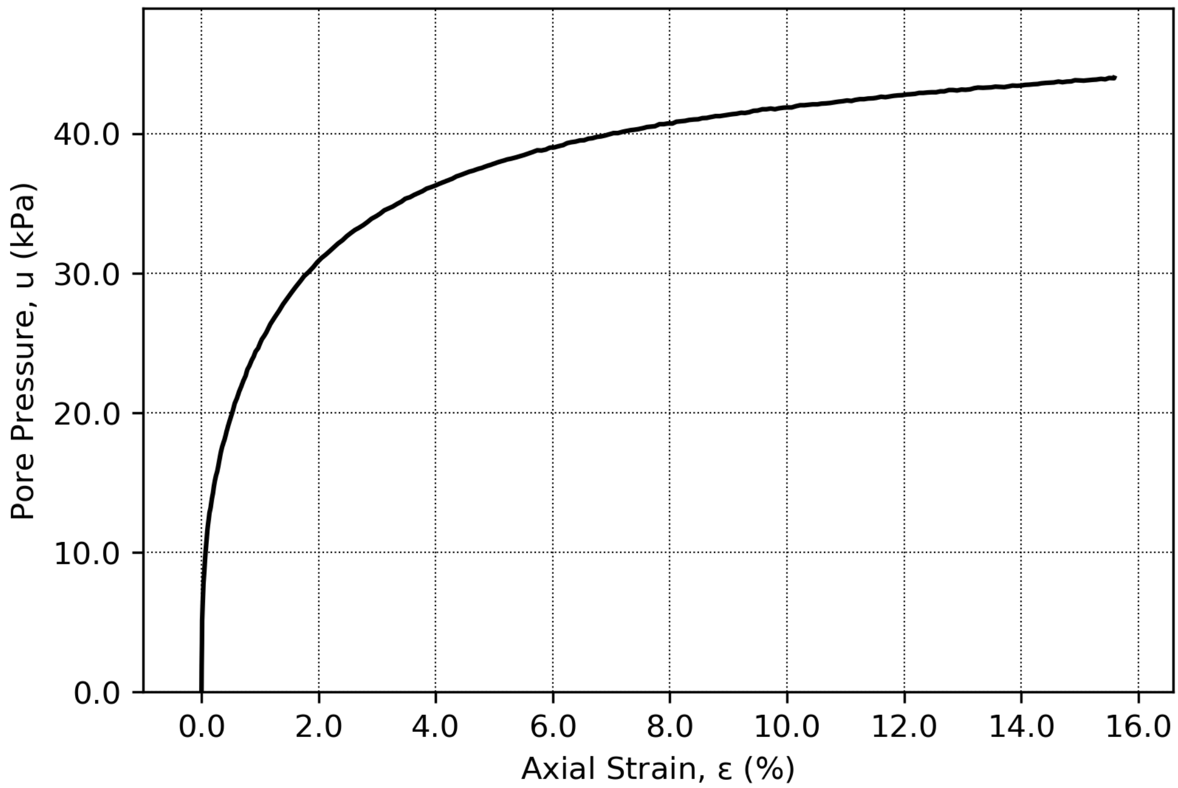
Norwegian GeoTest Sites - Onsøy						Document No. 20160154-10-R
Triaxial test: CAUC						Figure No. 5.3.146
Boring: ONSB32	Depth = 15.97 m	Consolidation stresses				Date 2018-12-10; Drawn by AGu
Tube: S4	p_0' = 106.1 kPa	(kPa)	max.	min.	final	NGI
Part: 2	w_i = 47.7 %	σ_{ac}'	-	-	106.1	
Test: 1	w_c = 44.3 %	σ_{rc}'	-	-	63.6	



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.147	
Boring:	ONSB32	Depth	= 15.97	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S4	p_0'	= 106.1	kPa	(kPa)	max.	min.	final		
Part:	2	w_i	= 47.7	%	σ_{ac}'	-	-	106.1		
Test:	1	w_c	= 44.3	%	σ_{rc}'	-	-	63.6		

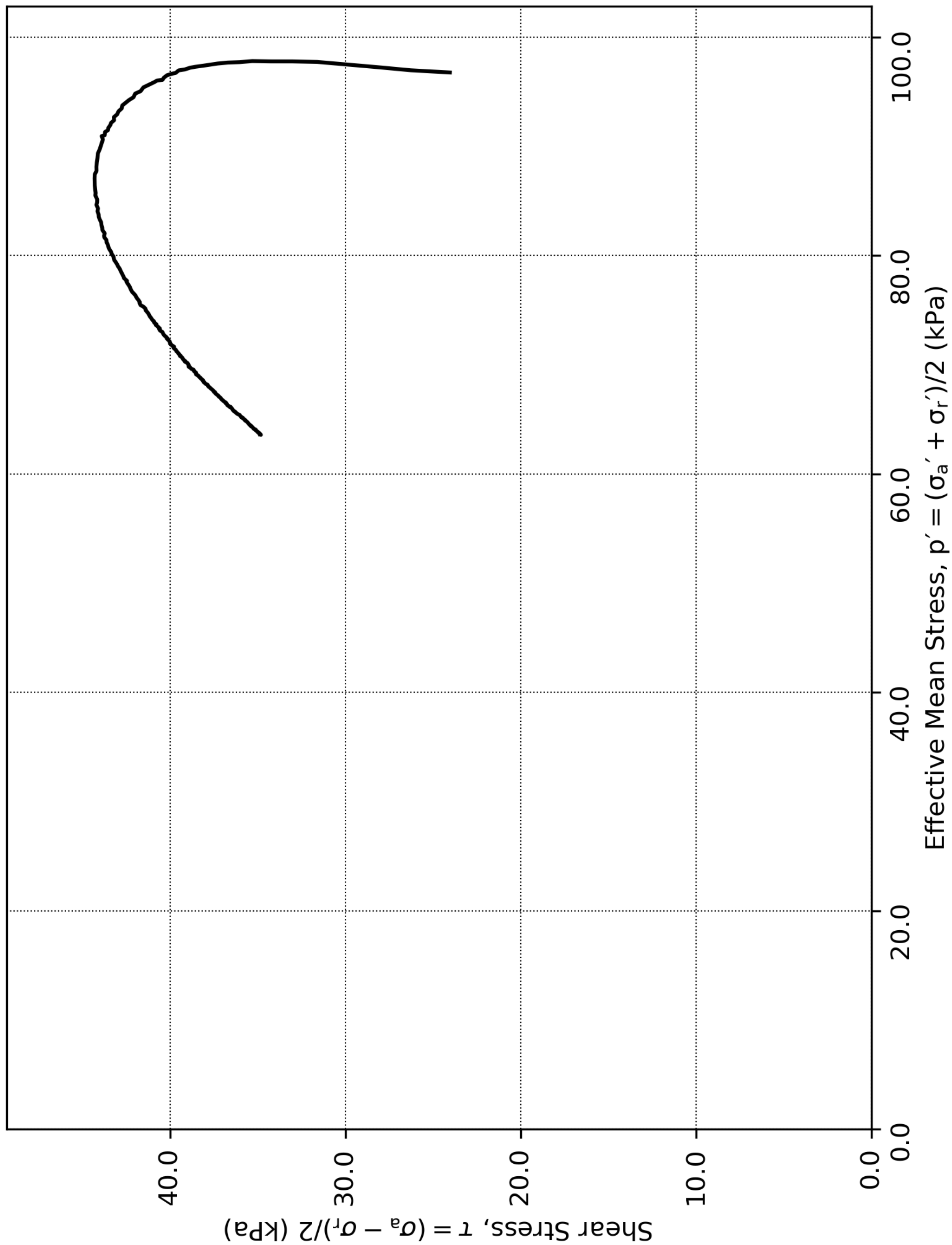
P:\2016\01\20160154\Lab\Onsøy\Triax



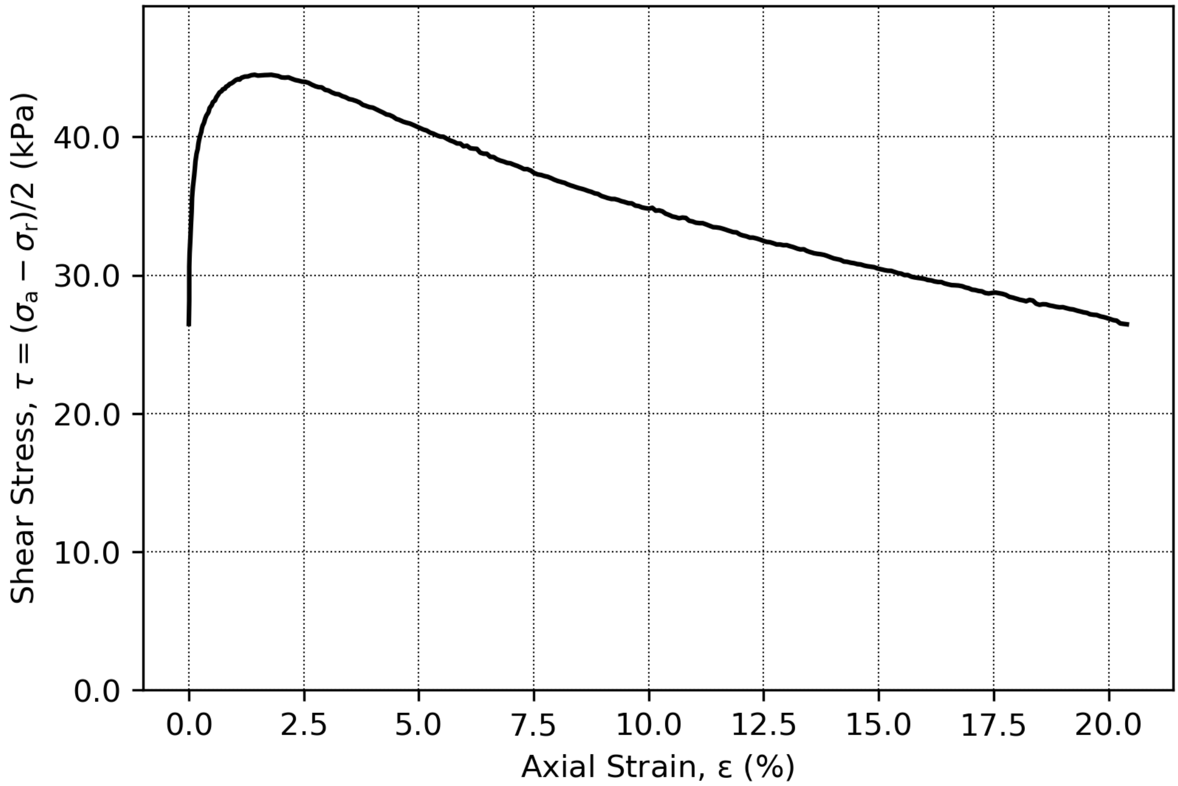


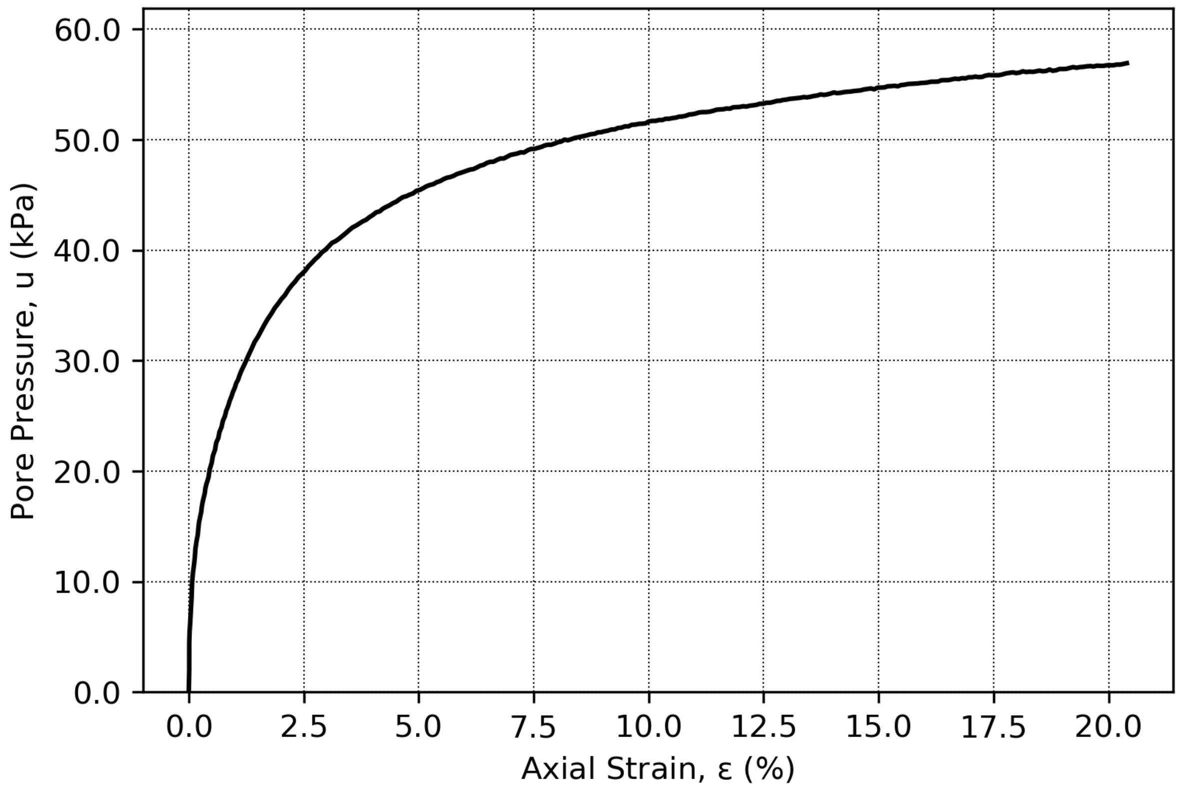
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.148
Boring:	ONSB32	Depth	= 19.02	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S5	p_0'	= 121.0	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 44.4	%	σ_{ac}'	-	-	120.9	NGI
Test:	1	w_c	= 41.5	%	σ_{rc}'	-	-	72.5	

P:\2016\01\20160154\Lab\Onsøy\Triax



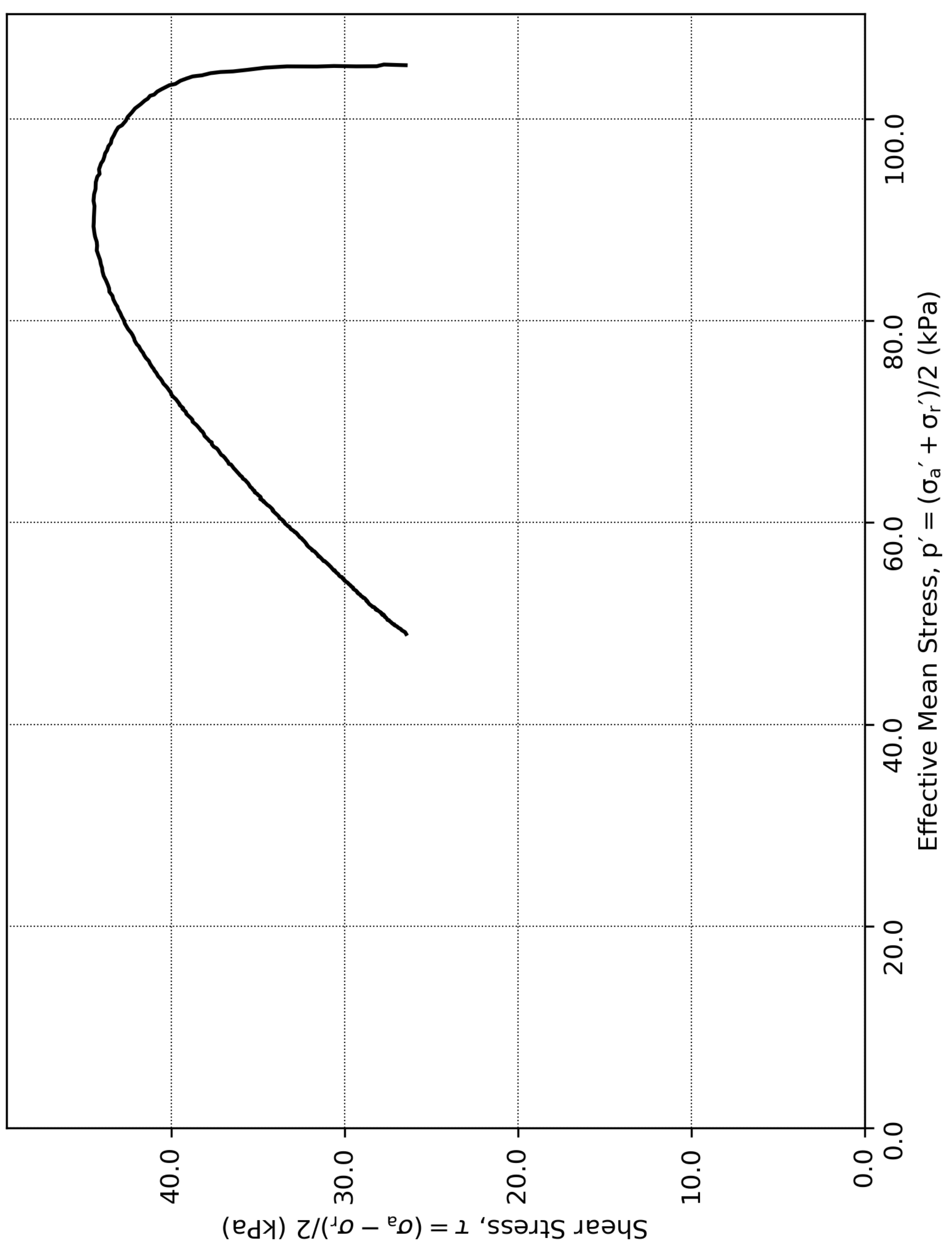
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.149
Boring:	ONSB32	Depth	= 19.02	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S5	p_0'	= 121.0	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 44.4	%	σ_{ac}'	-	-	120.9	
Test:	1	w_c	= 41.5	%	σ_{rc}'	-	-	72.5	





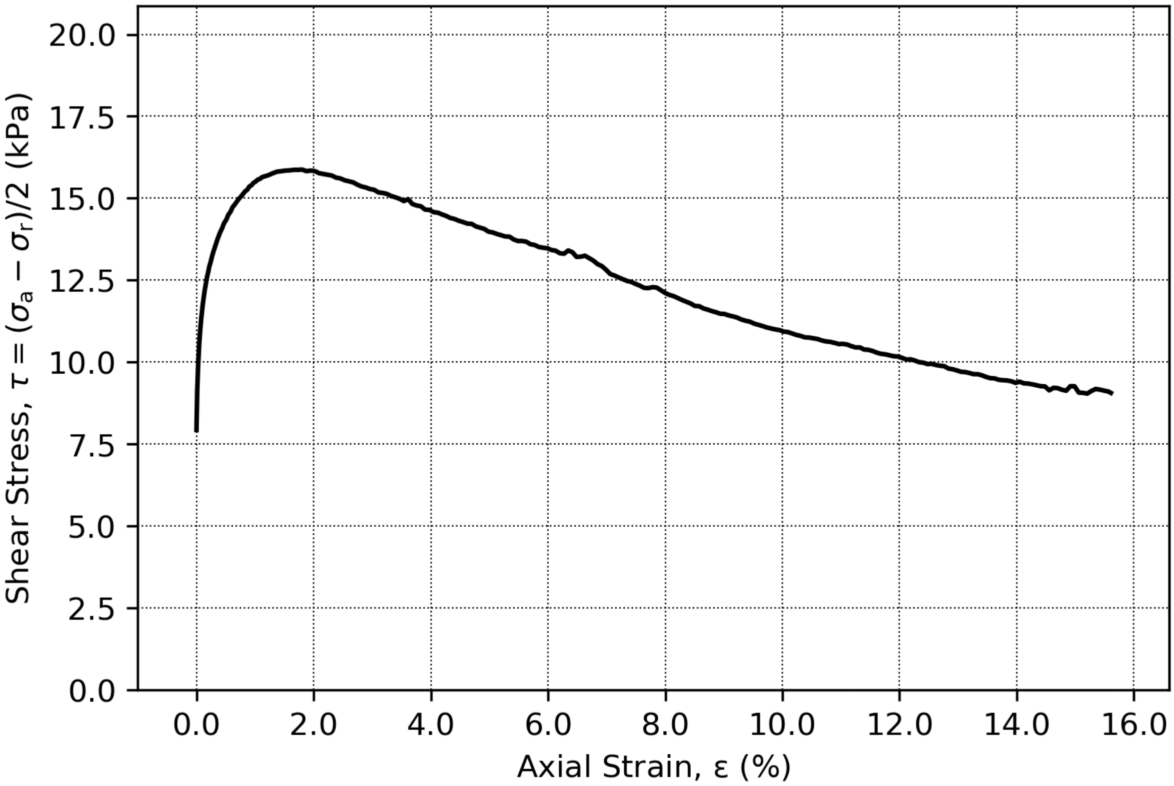
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.150
Boring:	ONSB32	Depth	= 20.21	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S5	p_0'	= 131.9	kPa	(kPa)	max.	min.	final
Part:	4	w_i	= 61.8	%	σ_{ac}'	-	-	131.5
Test:	1	w_c	= 56.4	%	σ_{rc}'	-	-	79.1

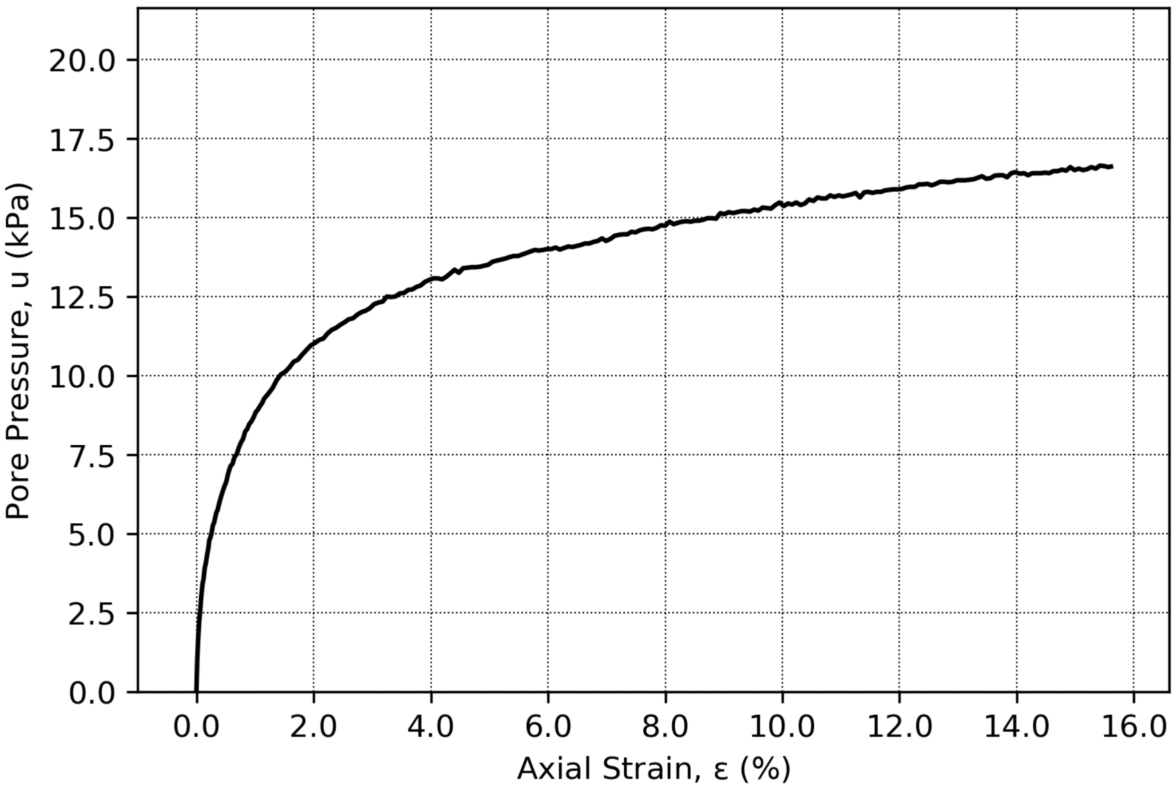
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.151
Boring:	ONSB32	Depth = 20.21	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S5	p_0' = 131.9	kPa	(kPa)	max.	min.	final	
Part:	4	w_i = 61.8	%	σ_{ac}'	-	-	131.5	
Test:	1	w_c = 56.4	%	σ_{rc}'	-	-	79.1	

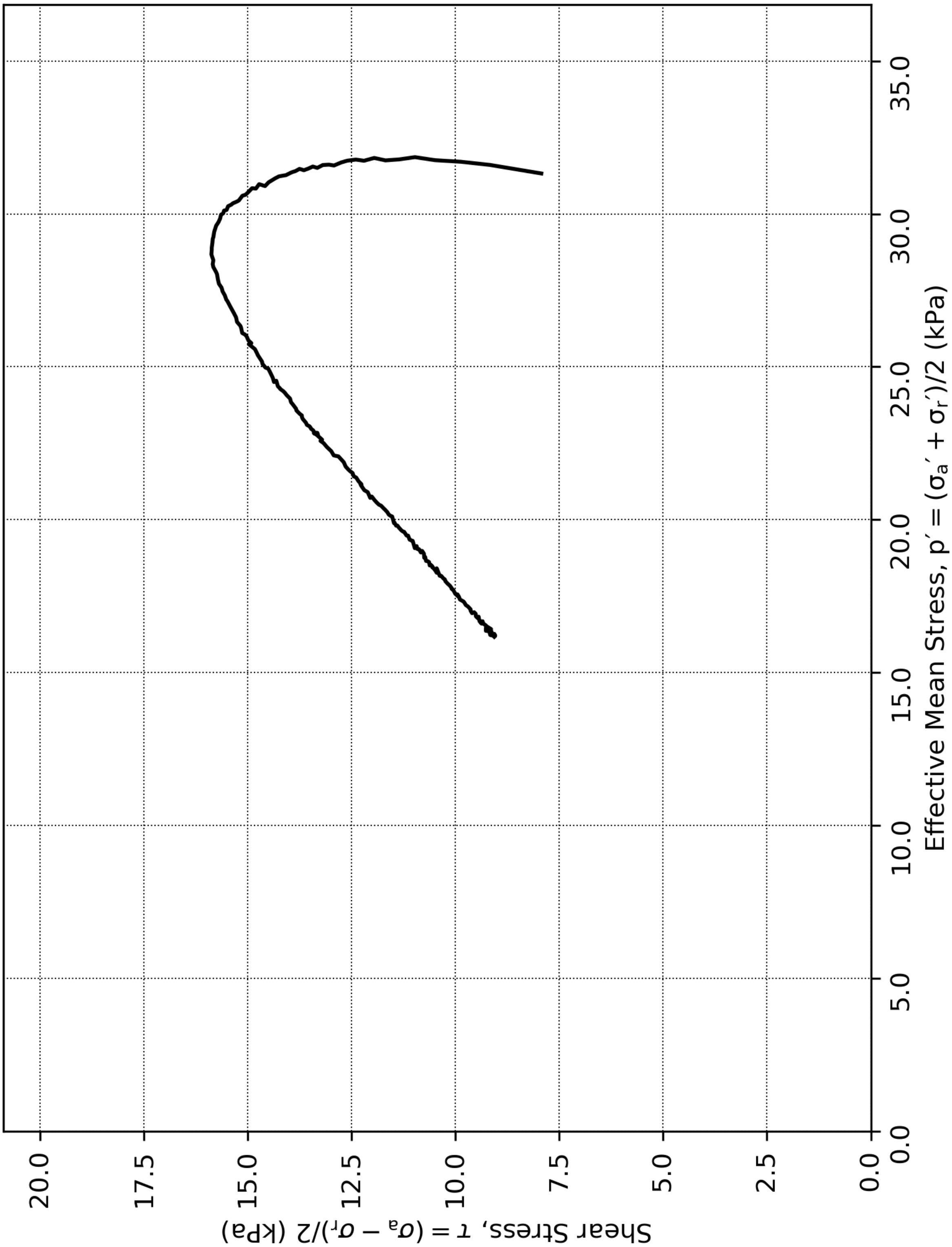
P:\2016\01\20160154\Lab\Onsøy\Triax





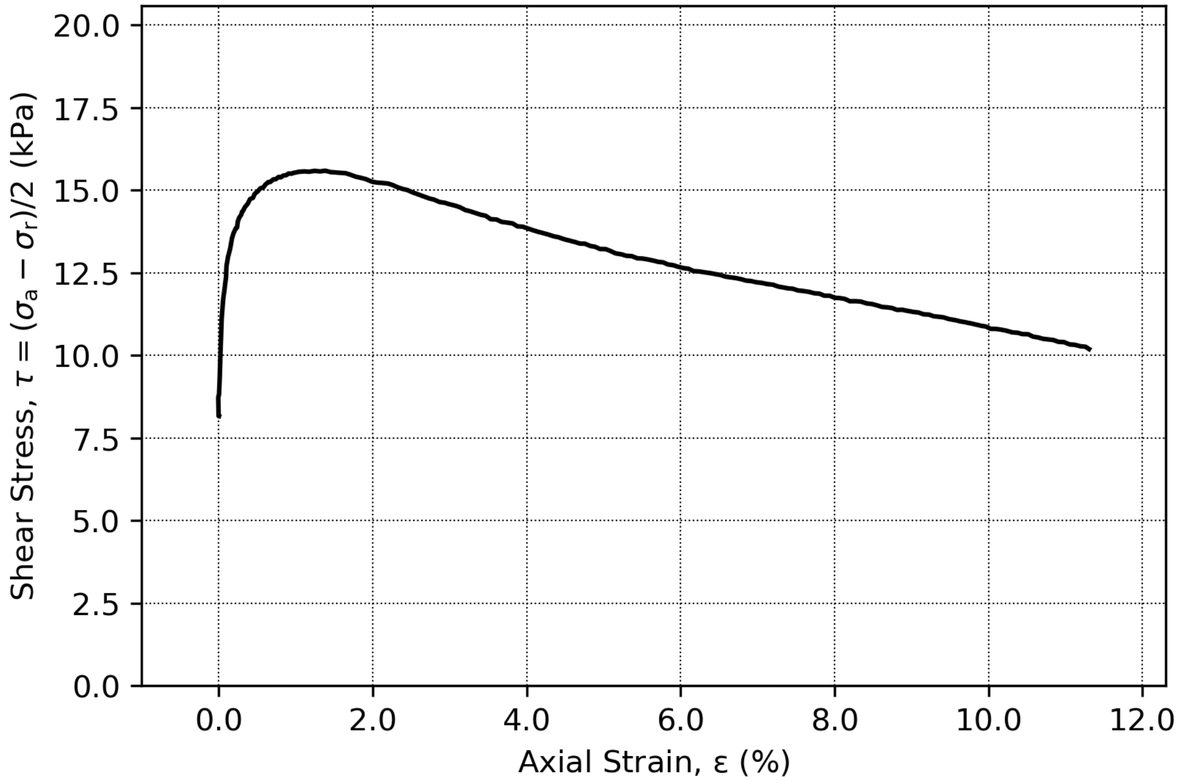
P:\2016\01\20160154\Lab\Onsøy\Triax

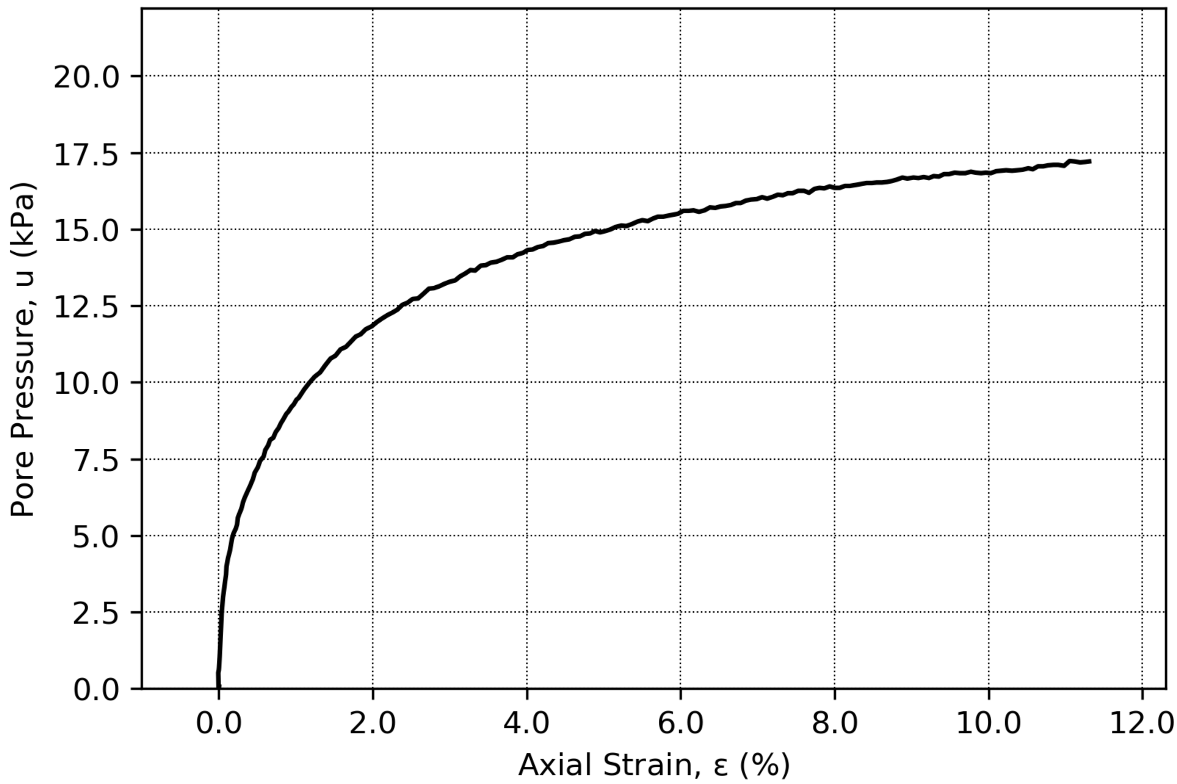
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.152
Boring:	ONSB33	Depth	= 6.4	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 39.1	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 74.5	%	σ_{ac}'	-	-	39.0	
Test:	2	w_c	= 72.6	%	σ_{rc}'	-	-	23.4	



P:\2016\01\20160154\Lab\Onsøy\Triax

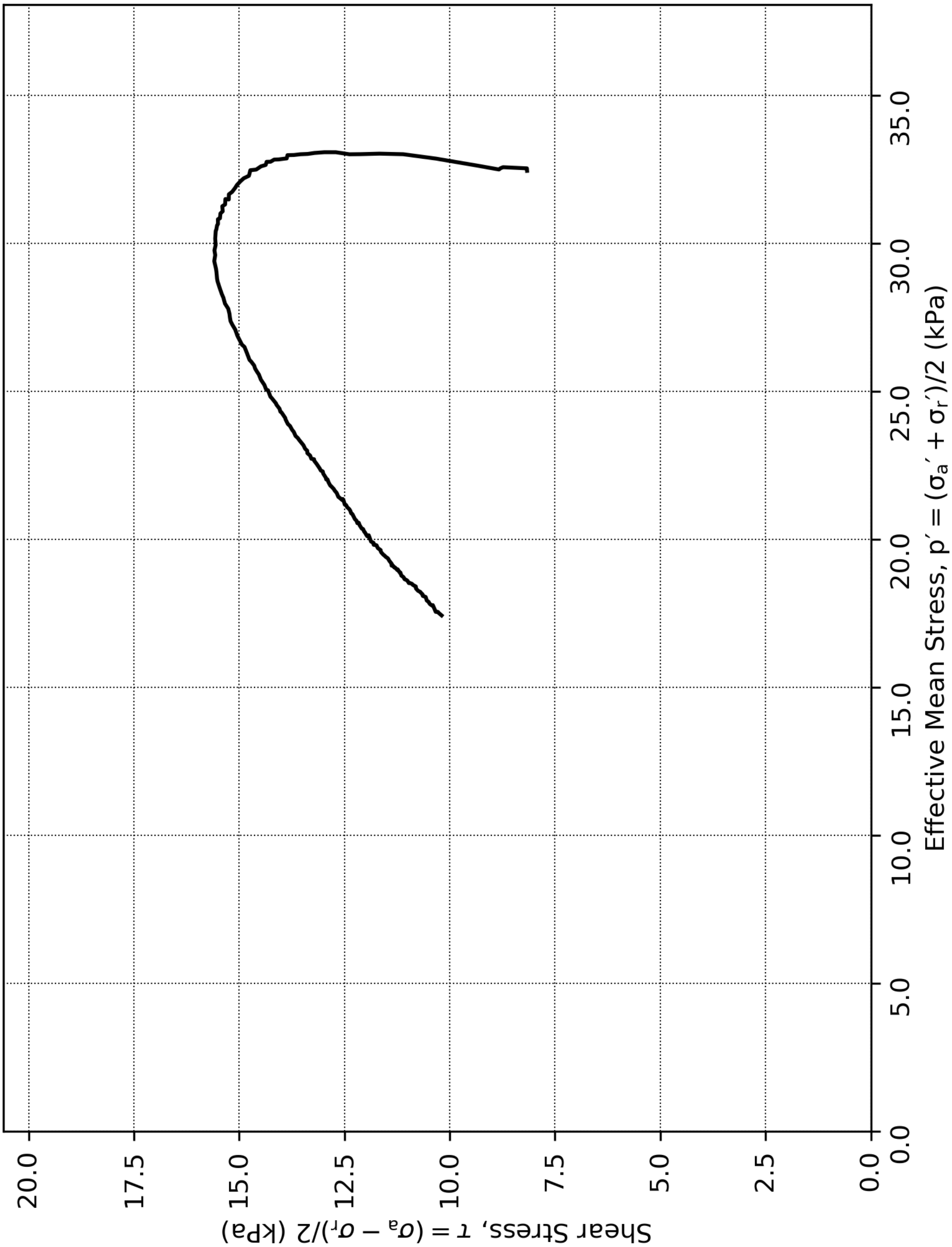
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.153	
Boring: ONSB33	Depth = 6.4	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube: S1	p_0' = 39.1	kPa	(kPa)	max.	min.	final	NGI	
Part: 1	w_i = 74.5	%	σ_{ac}'	-	-	39.0		
Test: 2	w_c = 72.6	%	σ_{rc}'	-	-	23.4		





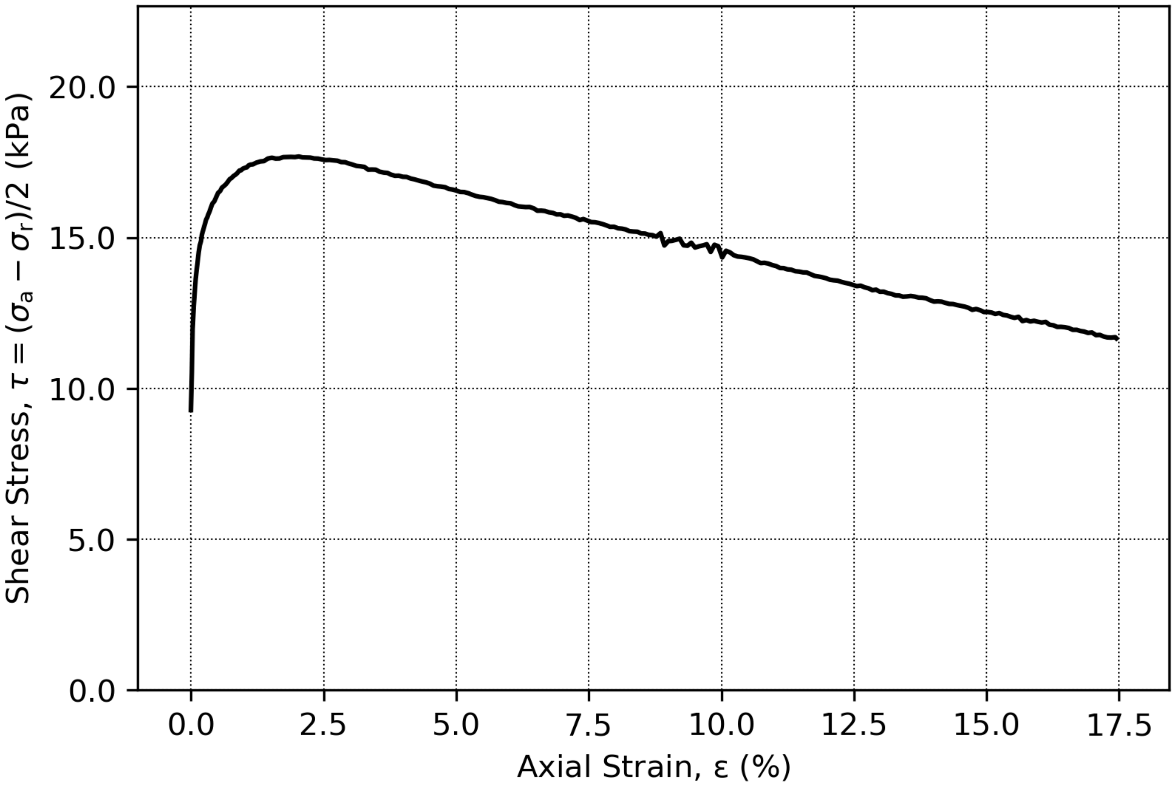
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.154
Boring: ONSB33	Depth = 6.71	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S1	p_0' = 40.59	kPa	(kPa)	max.	min.	final	
Part: 2	w_i = 75.7	%	σ_{ac}'	-	-	40.6	
Test: 1	w_c = 73.5	%	σ_{rc}'	-	-	24.3	

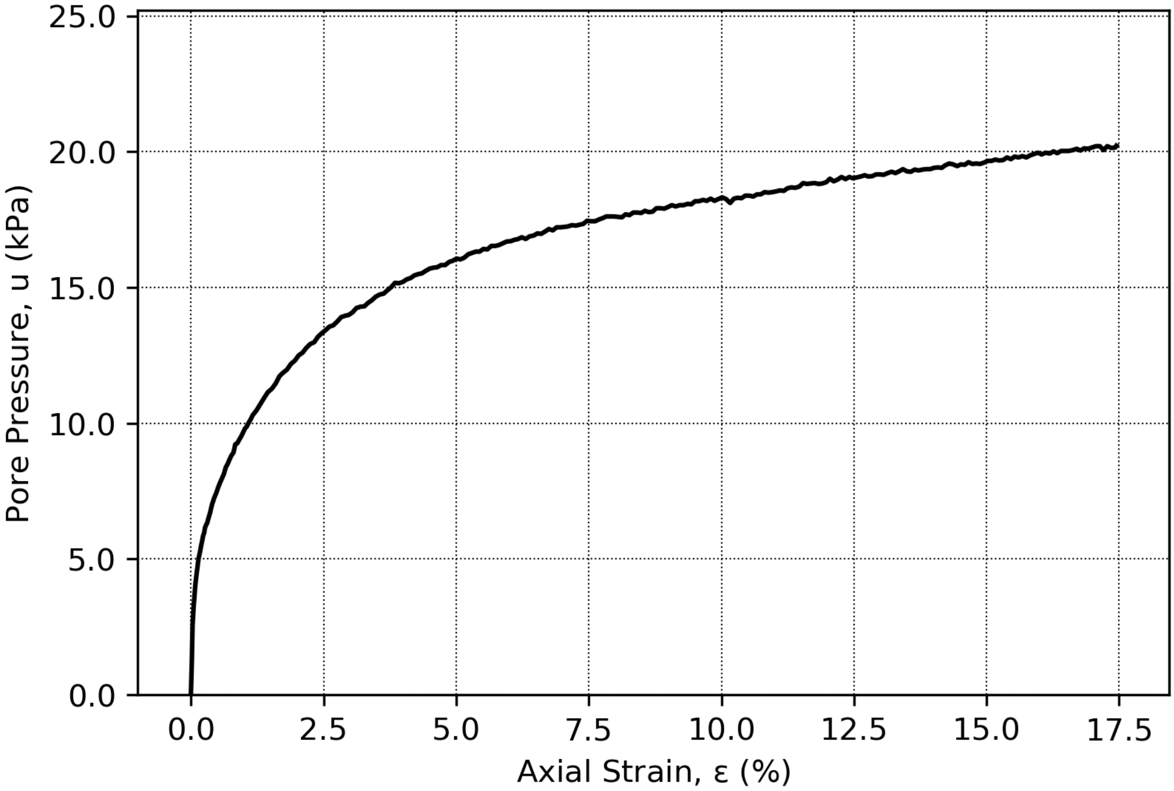
P:\2016\01\20160154\Lab\Onsøy\Triax



P:\2016\01\20160154\Lab\Onsøy\Triax

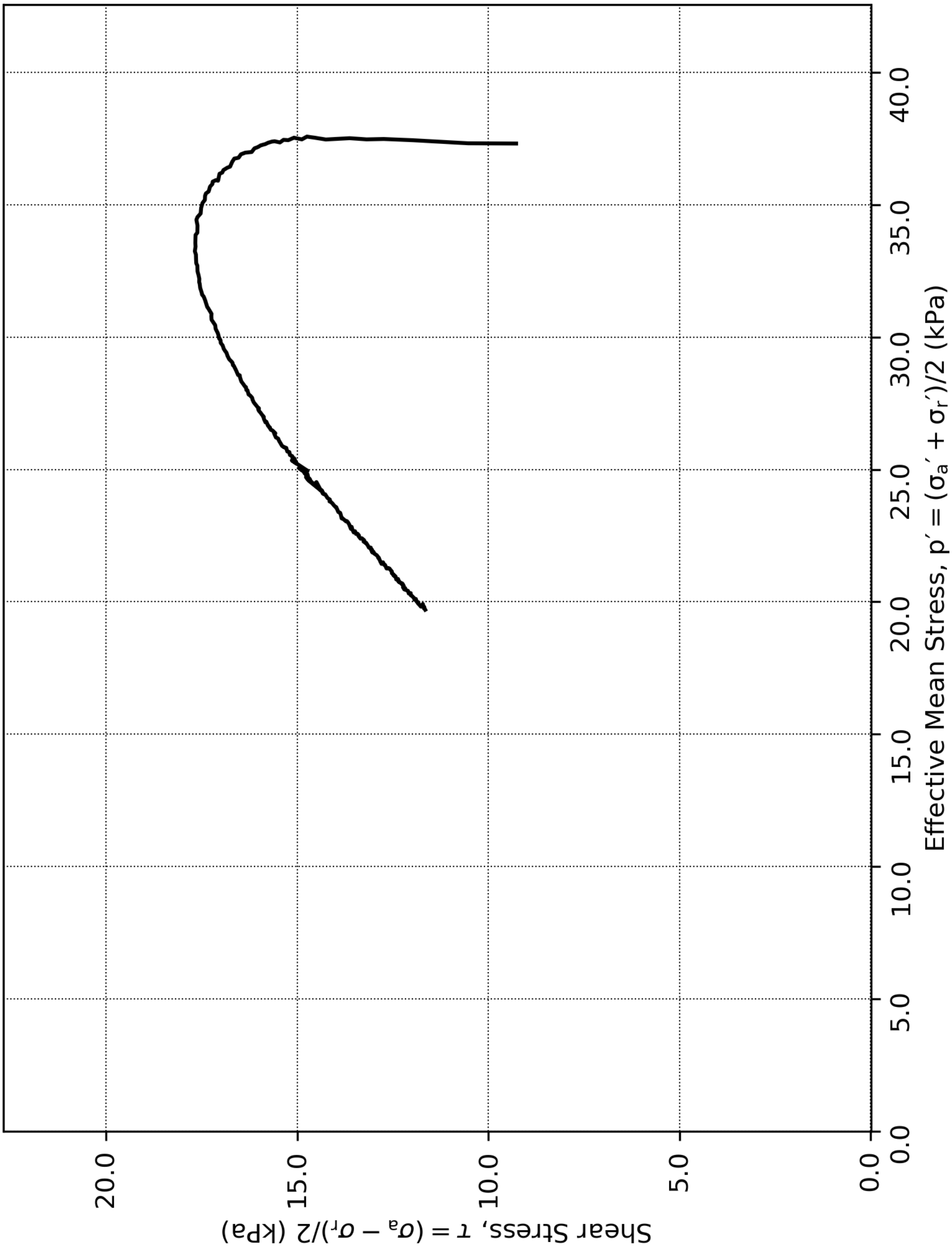
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.155	
Boring: ONSB33	Depth = 6.71	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube: S1	p_0' = 40.59	kPa	(kPa)	max.	min.	final		
Part: 2	w_i = 75.7	%	σ_{ac}'	-	-	40.6		
Test: 1	w_c = 73.5	%	σ_{rc}'	-	-	24.3		





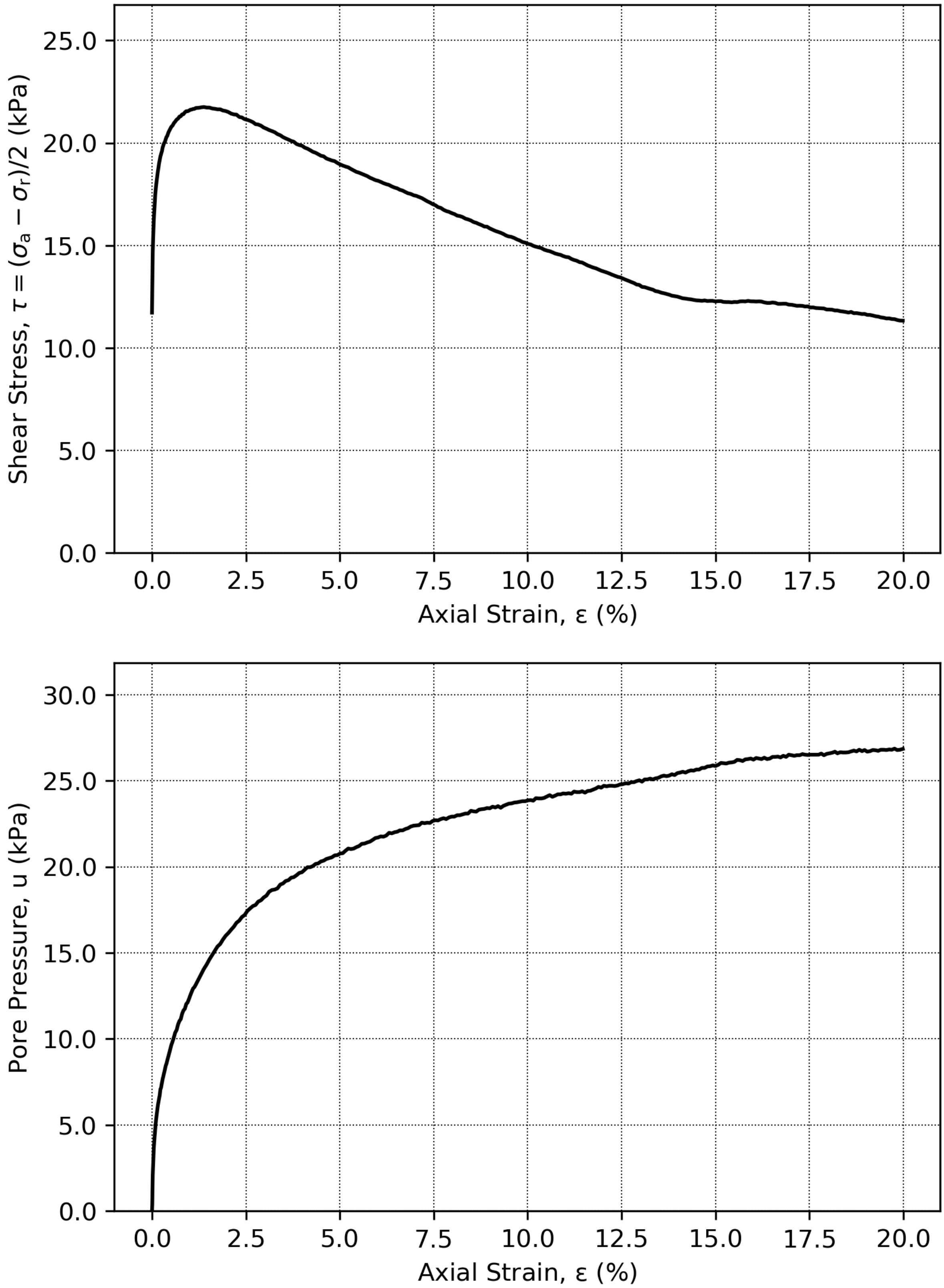
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.156
Boring: ONSB33	Depth = 7.75	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S1	p_0' = 46.6	kPa	(kPa)	max.	min.	final	
Part: 3	w_i = 71.3	%	σ_{ac}'	-	-	46.5	NGI
Test: 1	w_c = 68.0	%	σ_{rc}'	-	-	28.0	

P:\2016\01\20160154\Lab\Onsøy\Triax



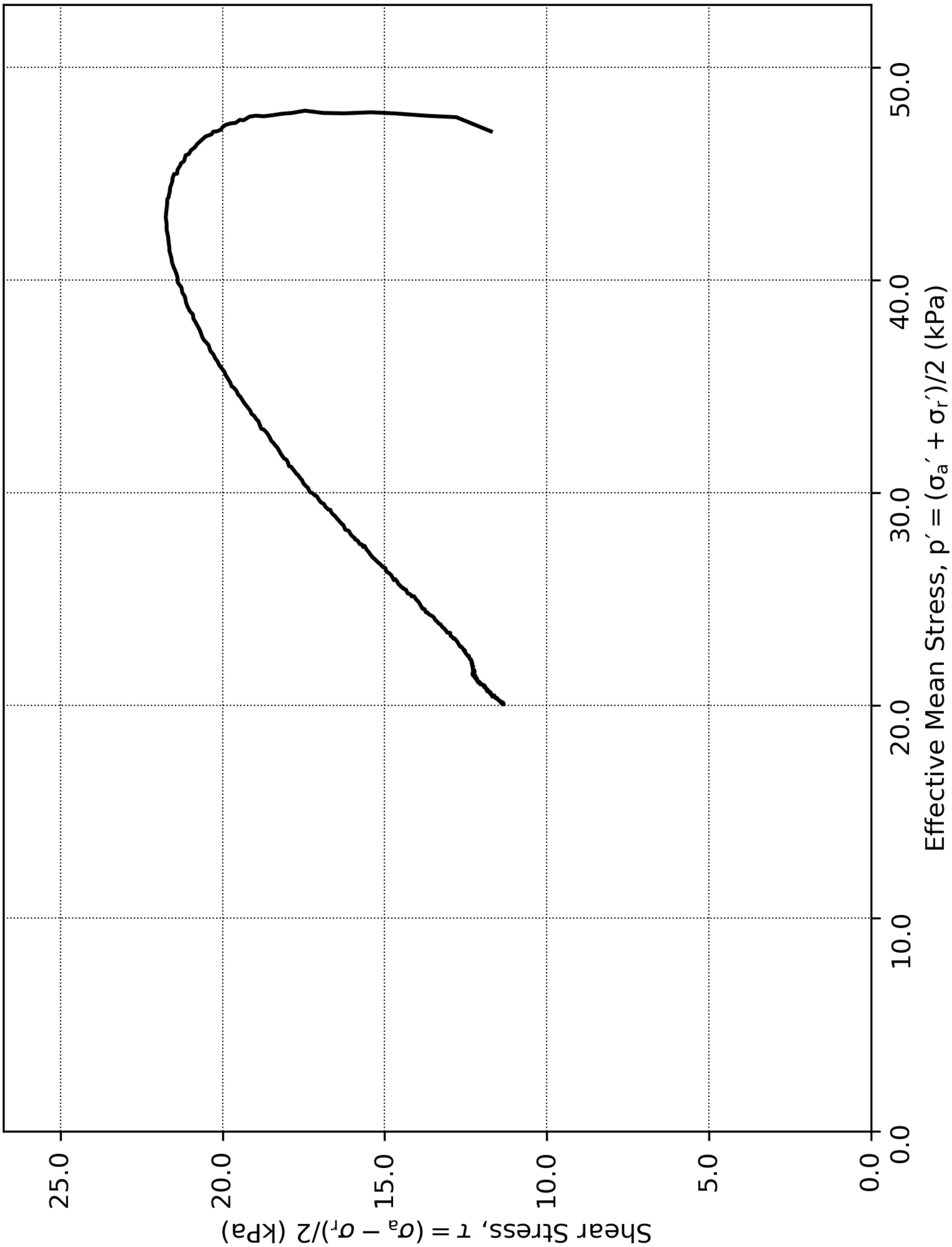
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.157
Boring:	ONSB33	Depth	= 7.75	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 46.6	kPa	(kPa)	max.	min.	final
Part:	3	w_i	= 71.3	%	σ_{ac}'	-	-	46.5
Test:	1	w_c	= 68.0	%	σ_{rc}'	-	-	28.0

P:\2016\01\20160154\Lab\Onsøy\Triax



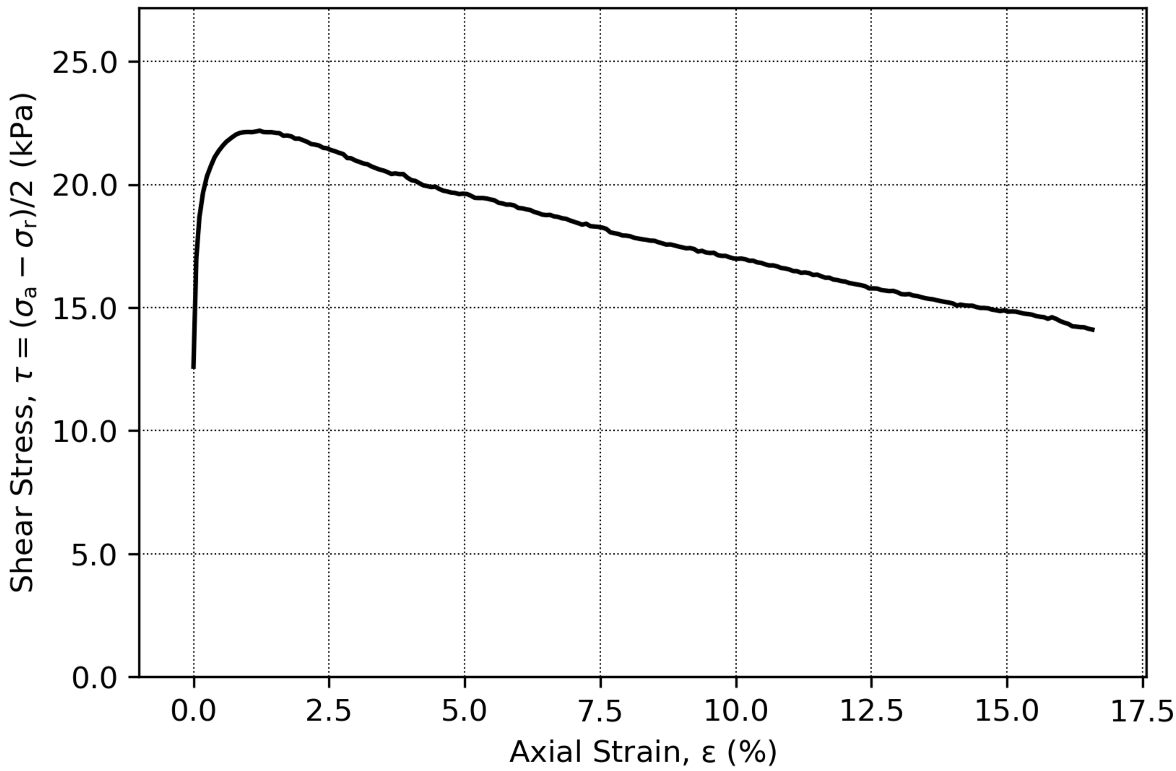
P:\2016\01\20160154\Lab\Onsøy\Triax

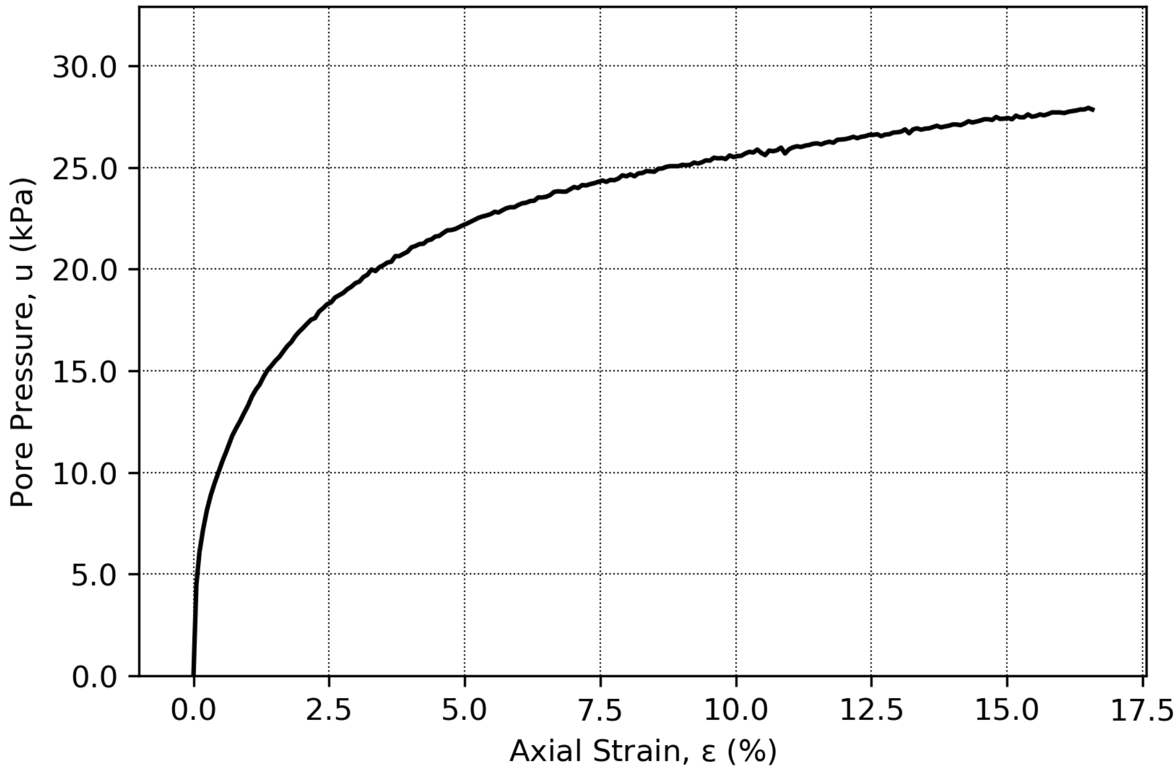
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.158
Boring:	ONSB33	Depth	= 9.16	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 58.9	kPa	(kPa)	max.	min.	final
Part:	1	w_i	= 67.7	%	σ_{ac}'	-	-	58.7
Test:	1	w_c	= 64.3	%	σ_{rc}'	-	-	35.2



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.159	
Boring:	ONSB33	Depth	= 9.16	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 58.9	kPa	(kPa)	max.	min.	final		
Part:	1	w_i	= 67.7	%	σ_{ac}'	-	-	58.7		
Test:	1	w_c	= 64.3	%	σ_{rc}'	-	-	35.2		

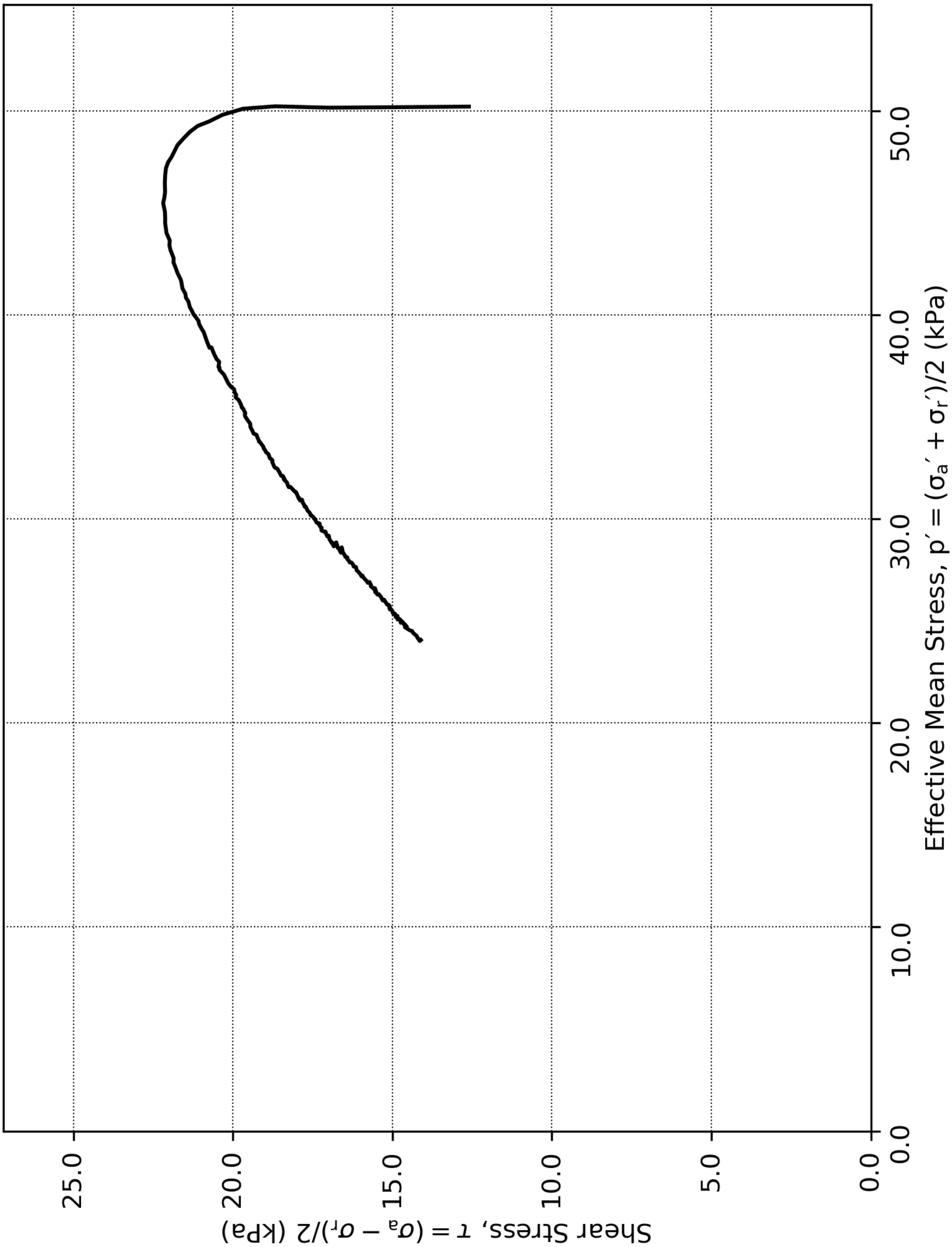
P:\2016\01\20160154\Lab\Onsøy\Triax





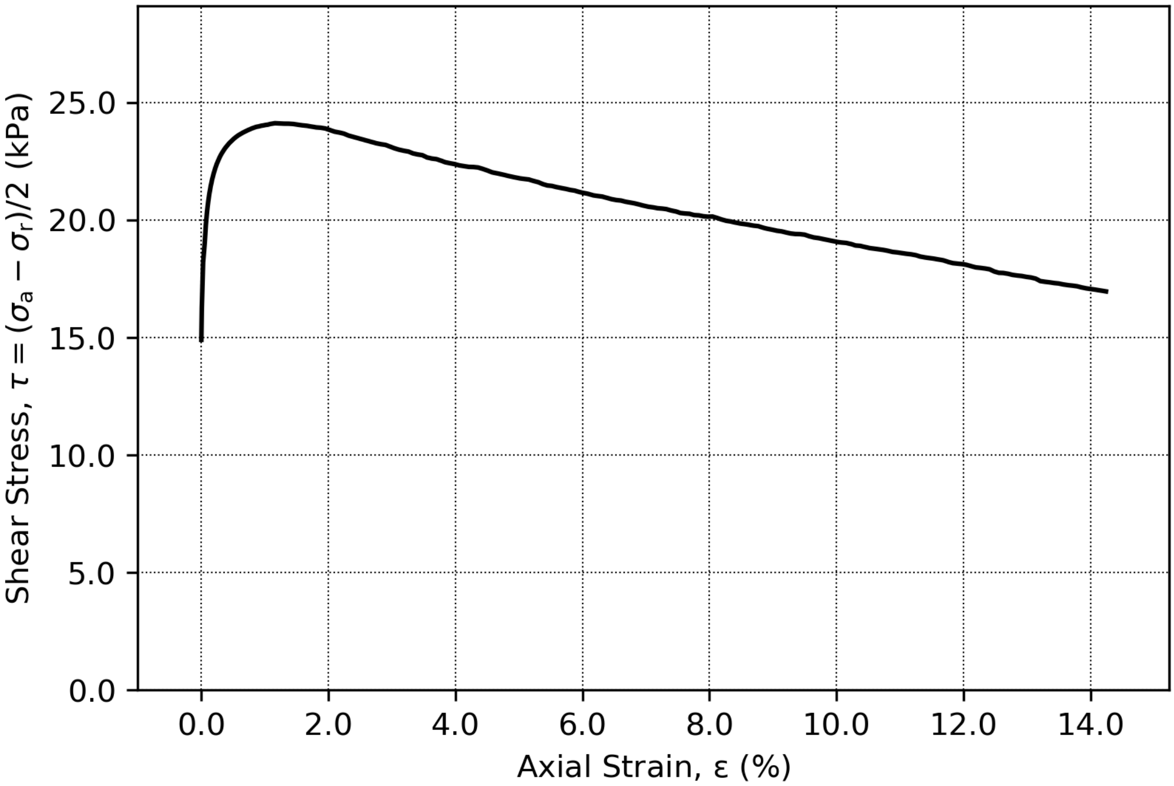
P:\2016\01\20160154\Lab\Onsøy\Triax

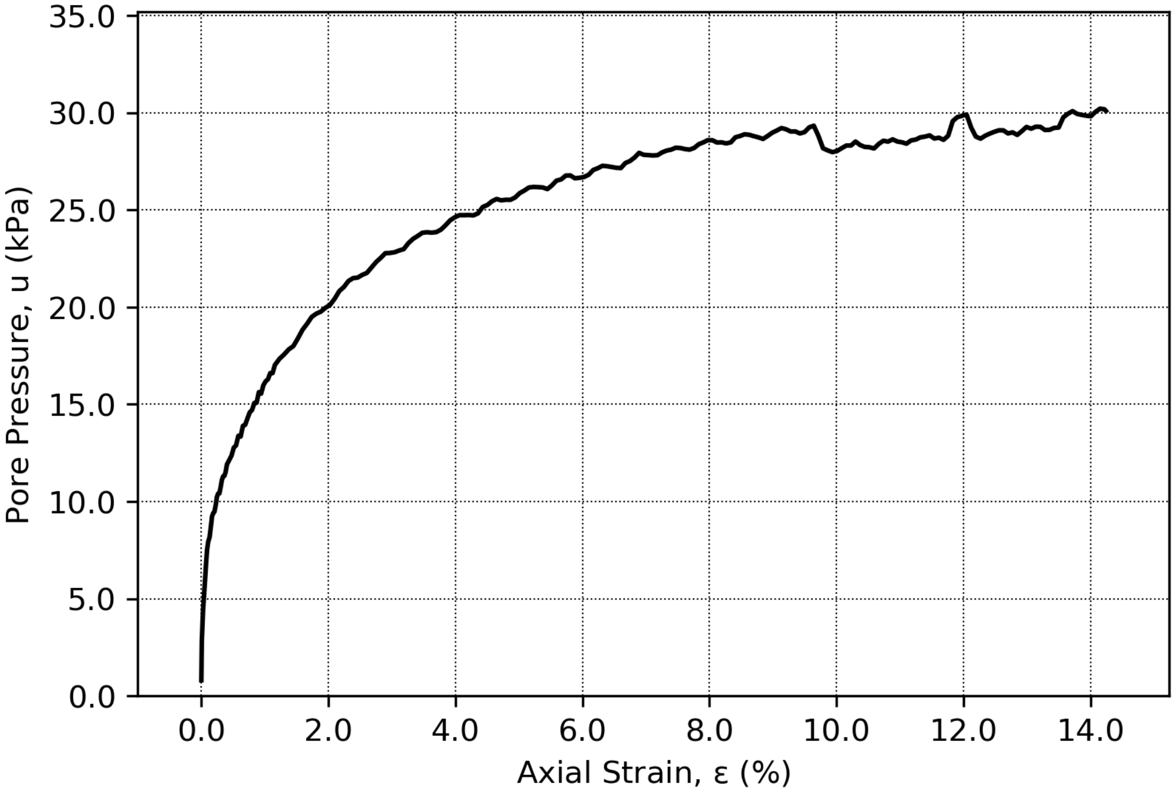
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.160	
Boring:	ONSB33	Depth	= 9.76	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 62.72	kPa	(kPa)	max.	min.	final	NGI	
Part:	2	w_i	= 66.8	%	σ_{ac}'	-	-	62.7		
Test:	1	w_c	= 63.7	%	σ_{rc}'	-	-	37.6		



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.161	
Boring:	ONSB33	Depth	= 9.76	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 62.72	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 66.8	%	σ_{ac}'	-	-	62.7	
Test:	1	w_c	= 63.7	%	σ_{rc}'	-	-	37.6	

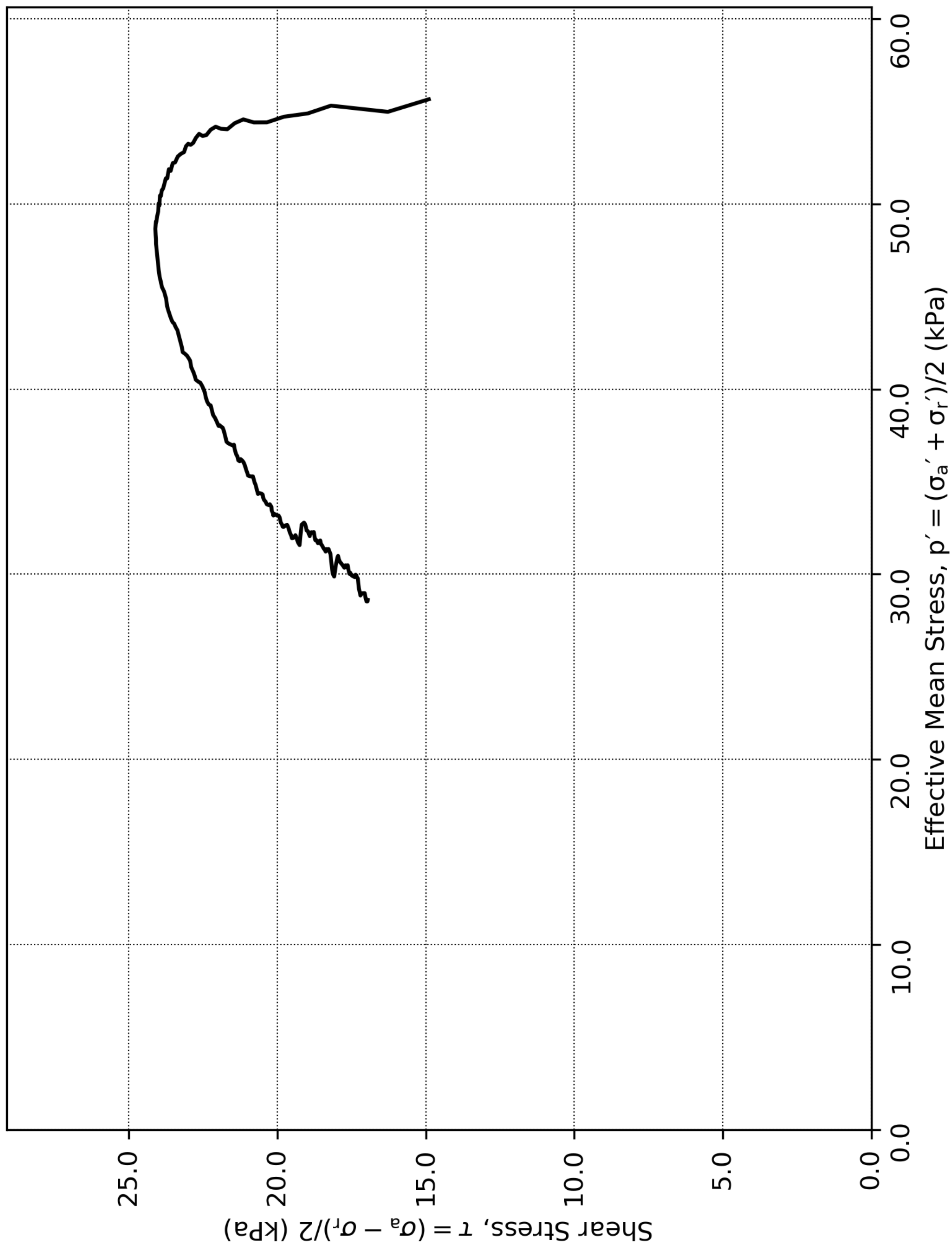
P:\2016\01\20160154\Lab\Onsøy\Triax





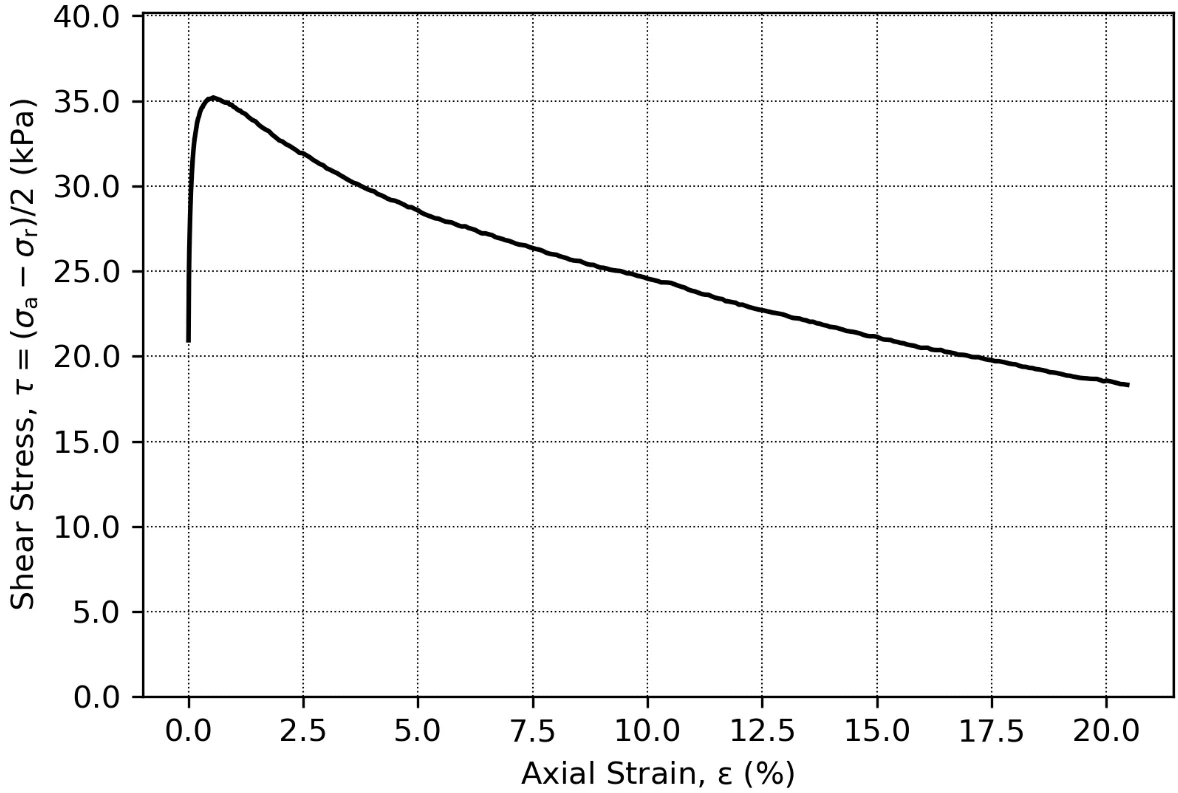
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.162	
Boring:	ONSB33	Depth	= 10.8	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 69.4	kPa	(kPa)	max.	min.	final	
Part:	3	w_i	= 62.6	%	σ_{ac}'	-	-	69.2	
Test:	1	w_c	= 58.9	%	σ_{rc}'	-	-	41.5	

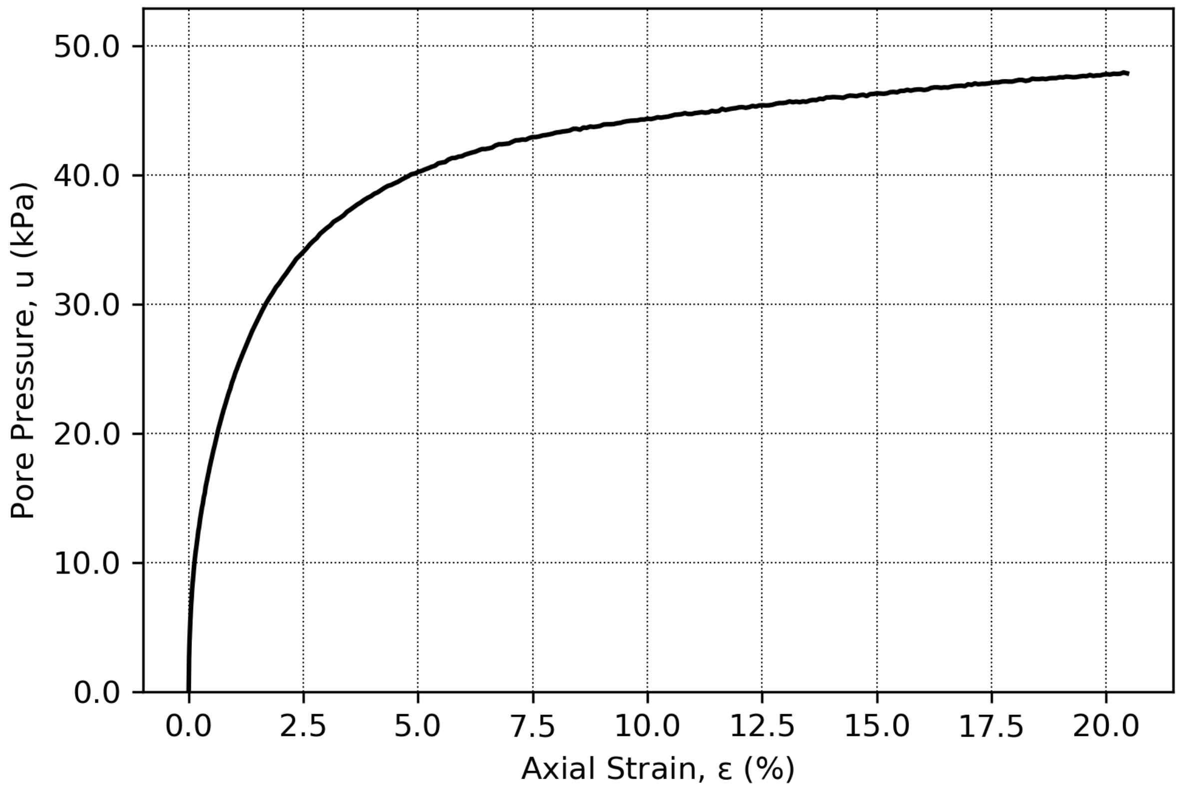
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.163	
Boring:	ONSB33	Depth	= 10.8	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0'	= 69.4	kPa	(kPa)	max.	min.	final		
Part:	3	w_i	= 62.6	%	σ_{ac}'	-	-	69.2		
Test:	1	w_c	= 58.9	%	σ_{rc}'	-	-	41.5		

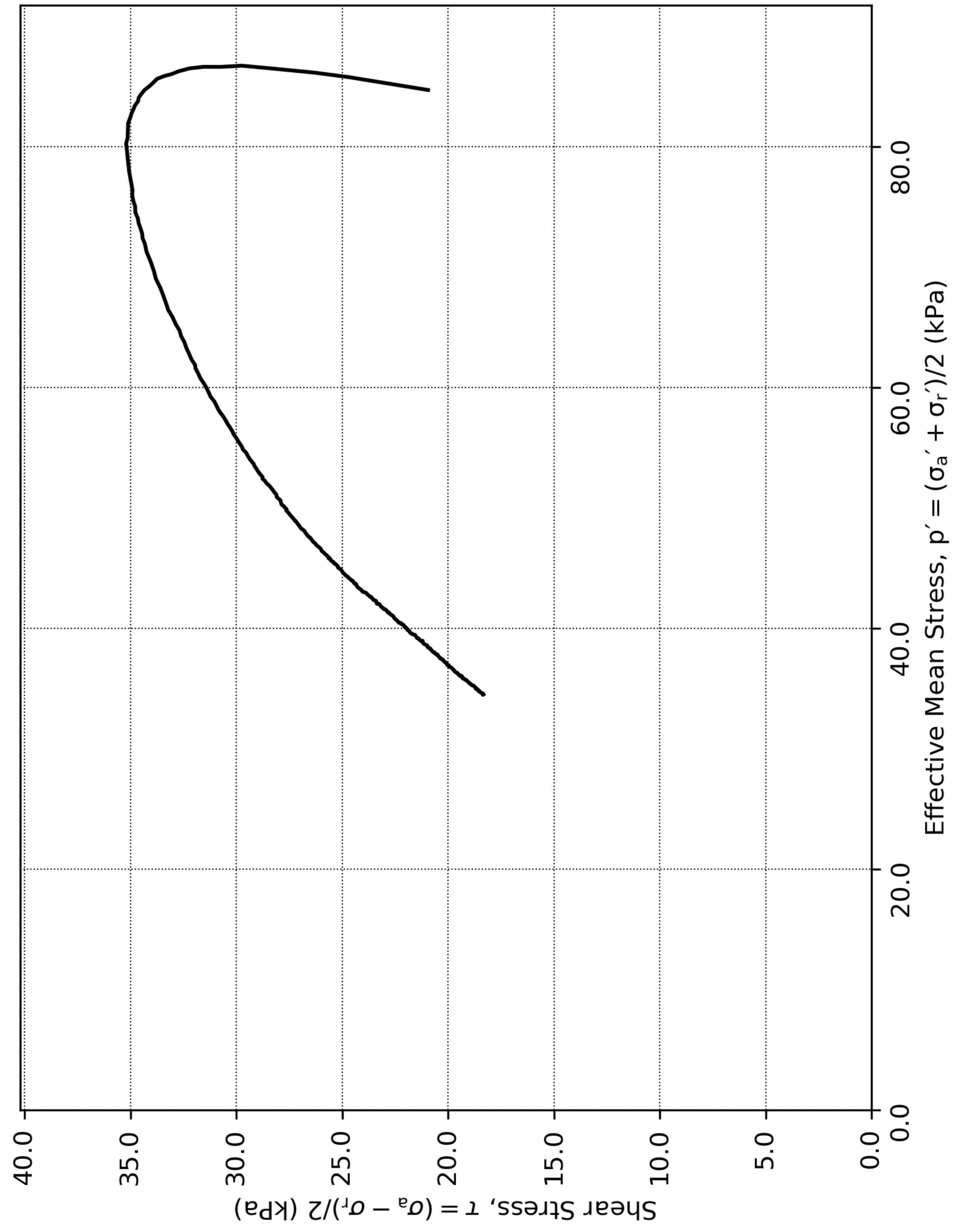
P:\2016\01\20160154\Lab\Onsøy\Triax





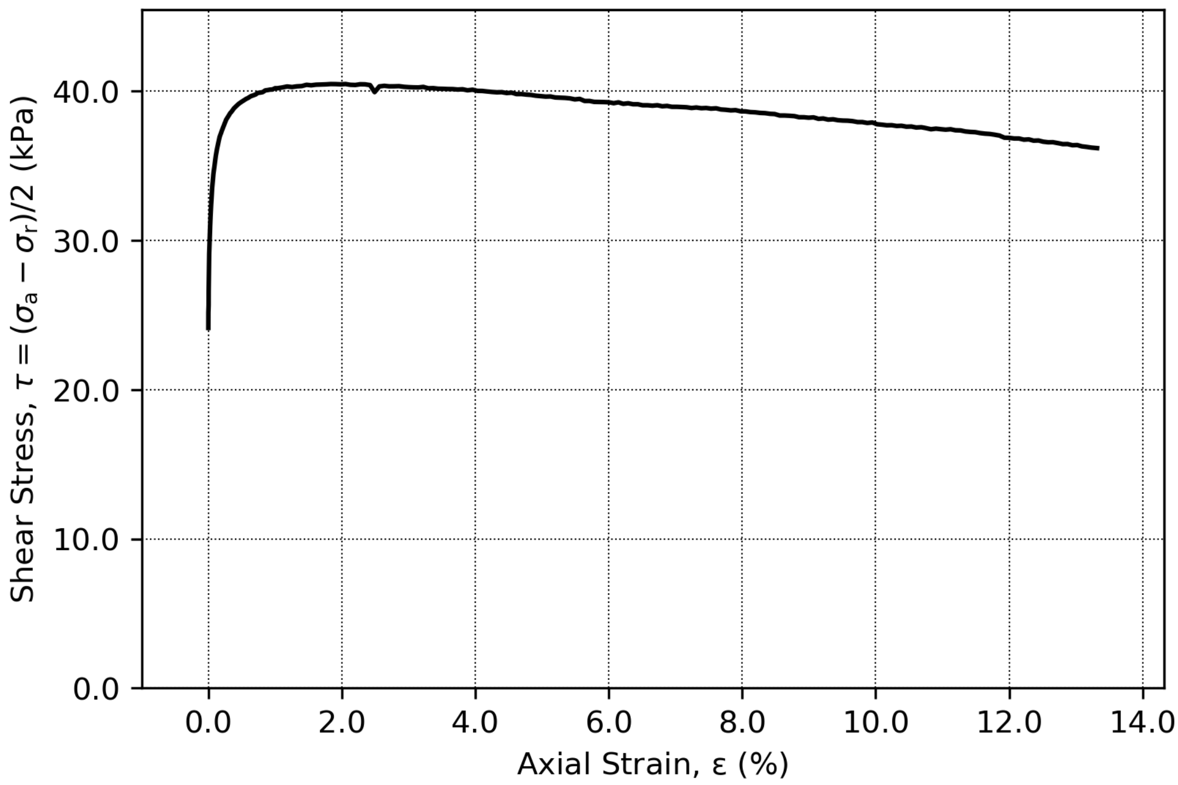
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.164
Boring:	ONSB33	Depth	= 15.95	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S4	p_0'	= 105.9	kPa	(kPa)	max.	min.	final	NGI
Part:	2	w_i	= 46.0	%	σ_{ac}'	-	-	105.8	
Test:	1	w_c	= 42.1	%	σ_{rc}'	-	-	63.7	

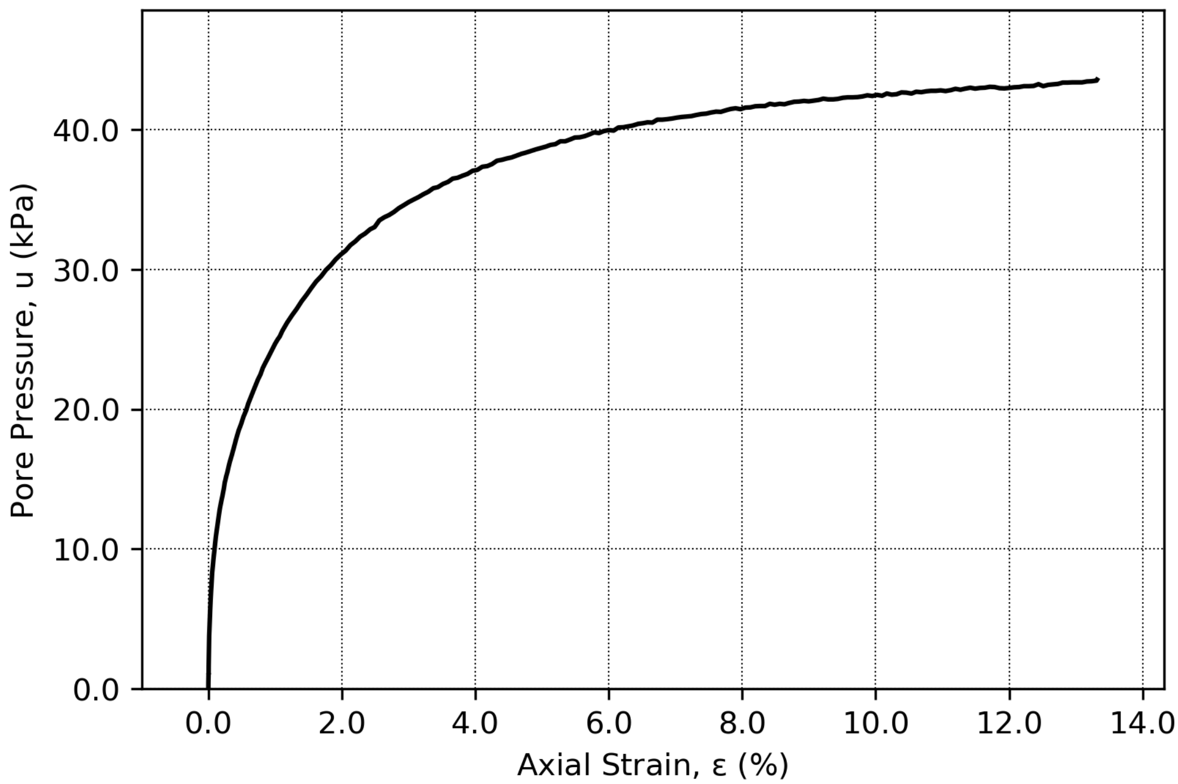
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy						Document No. 20160154-10-R	
Triaxial test: CAUC						Figure No. 5.3.165	
Boring:	ONSB33	Depth = 15.95	m	Consolidation stresses		Date 2018-12-10	Drawn by AGu
Tube:	S4	p_0' = 105.9	kPa	(kPa)	max. / min. / final		
Part:	2	w_i = 46.0	%	σ_{ac}'	- / - / 105.8		
Test:	1	w_c = 42.1	%	σ_{rc}'	- / - / 63.7		

P:\2016\01\20160154\Lab\Onsøy\Triax





Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Triaxial test: CAUC

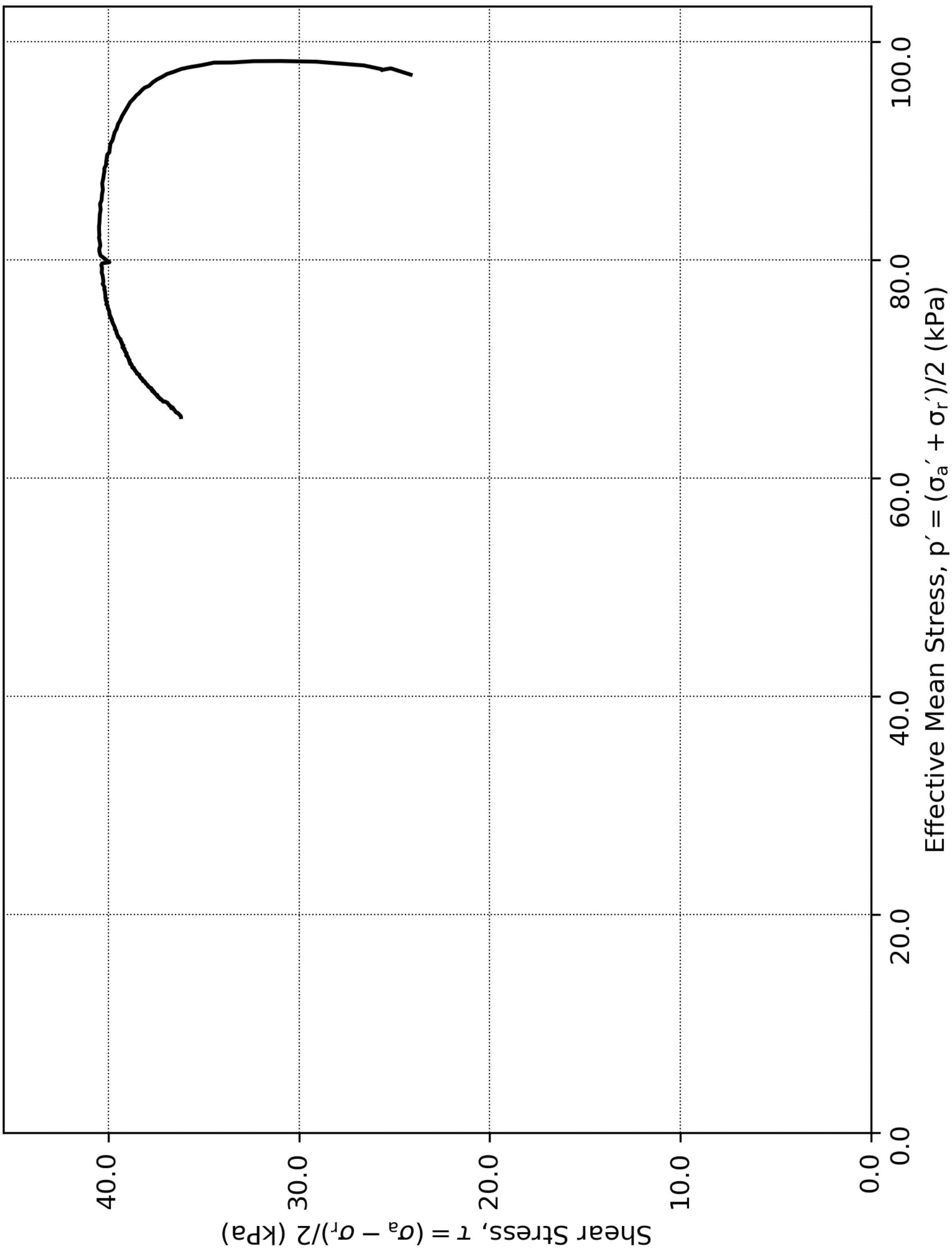
Figure No. 5.3.166

Date 2018-12-10

Drawn by AGu

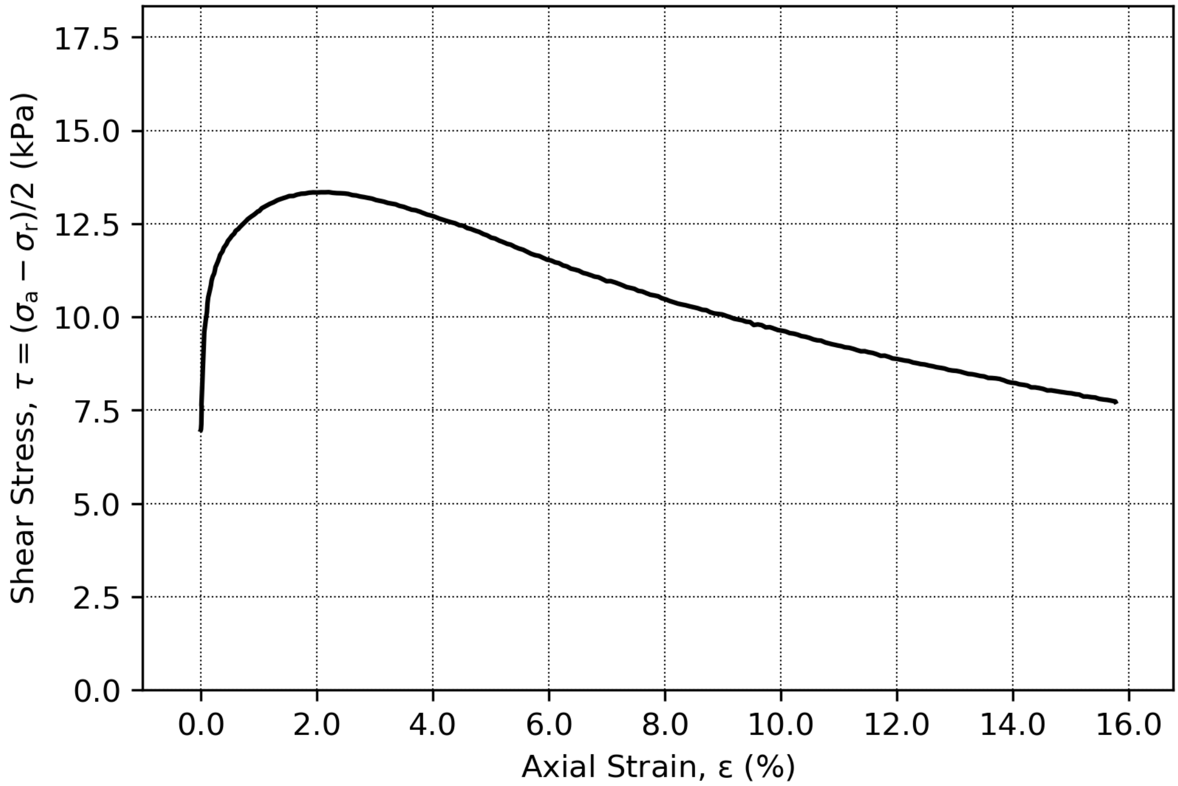
Boring:	ONSB33	Depth	= 18.8	m	Consolidation stresses			
Tube:	S5	p_0'	= 121.3	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 44.3	%	σ_{ac}'	-	-	121.3
Test:	1	w_c	= 39.7	%	σ_{rc}'	-	-	72.8

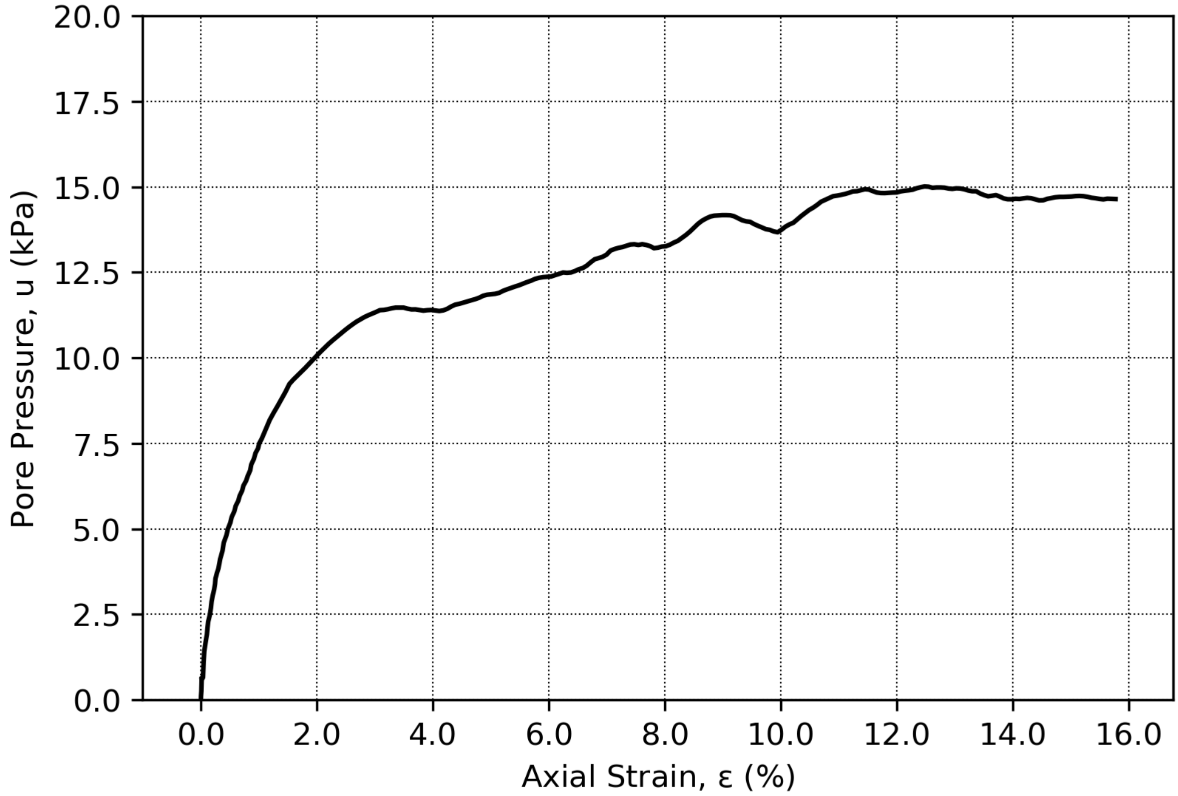
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.167	
Boring:	ONSB33	Depth	= 18.8	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S5	p_0'	= 121.3	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 44.3	%	σ_{ac}'	-	-	121.3	
Test:	1	w_c	= 39.7	%	σ_{rc}'	-	-	72.8	

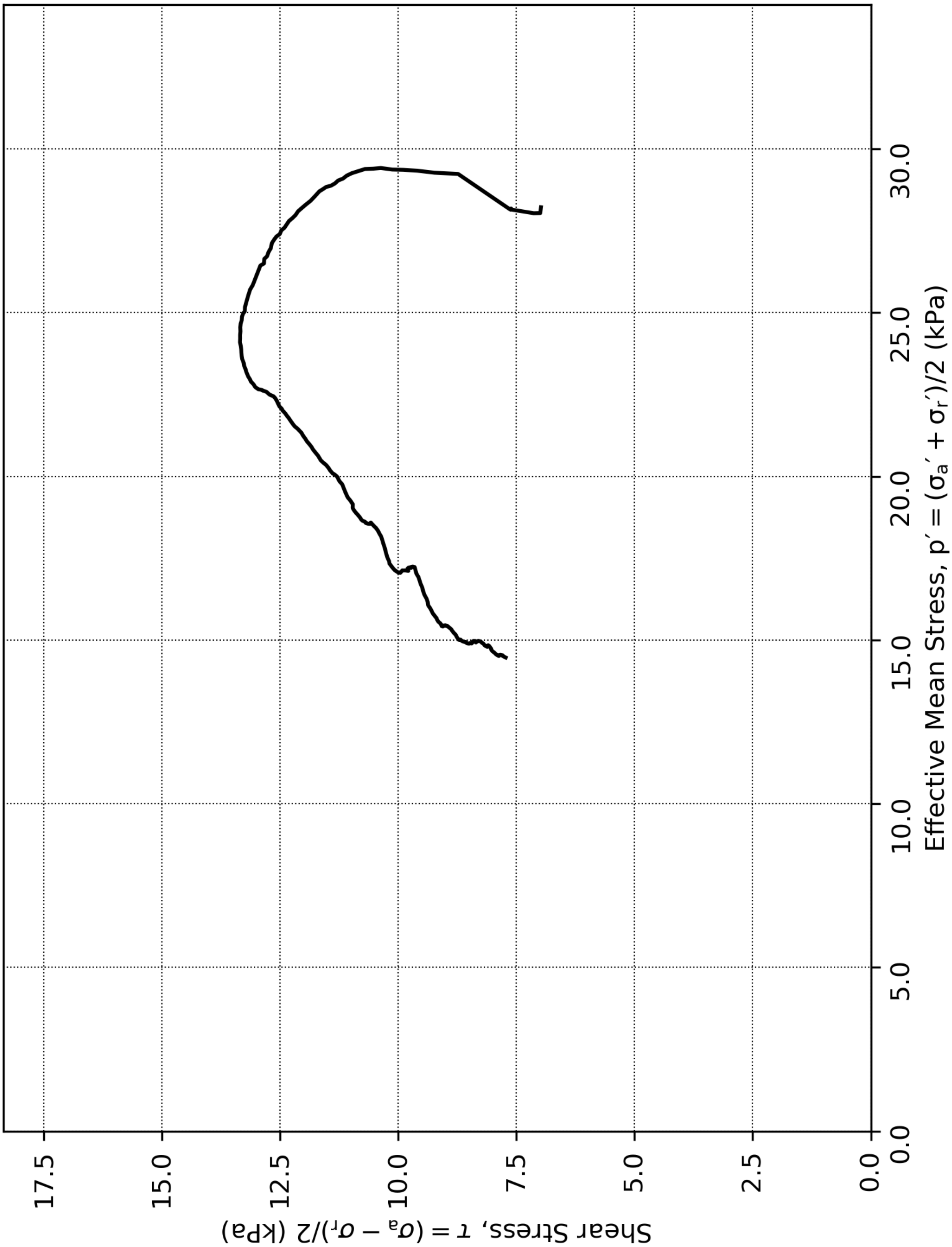
P:\2016\01\20160154\Lab\Onsøy\Triax





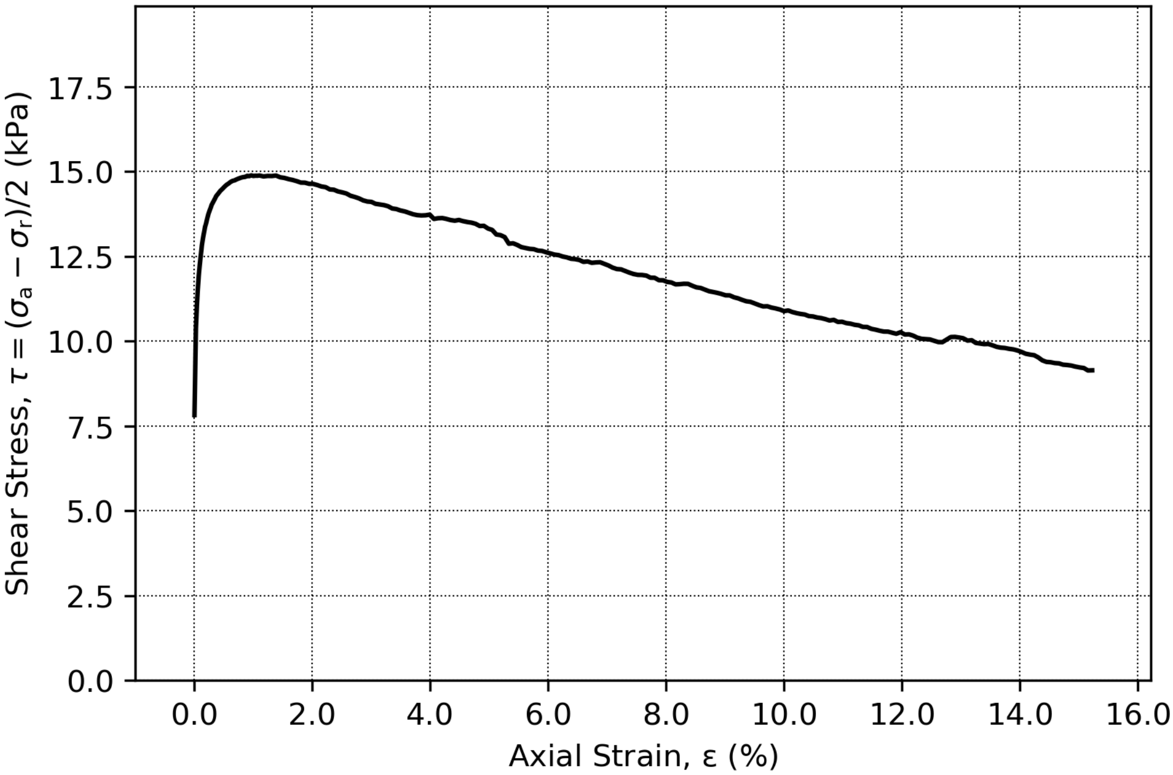
P:\2016\01\20160154\Lab\Onsøy\Triax

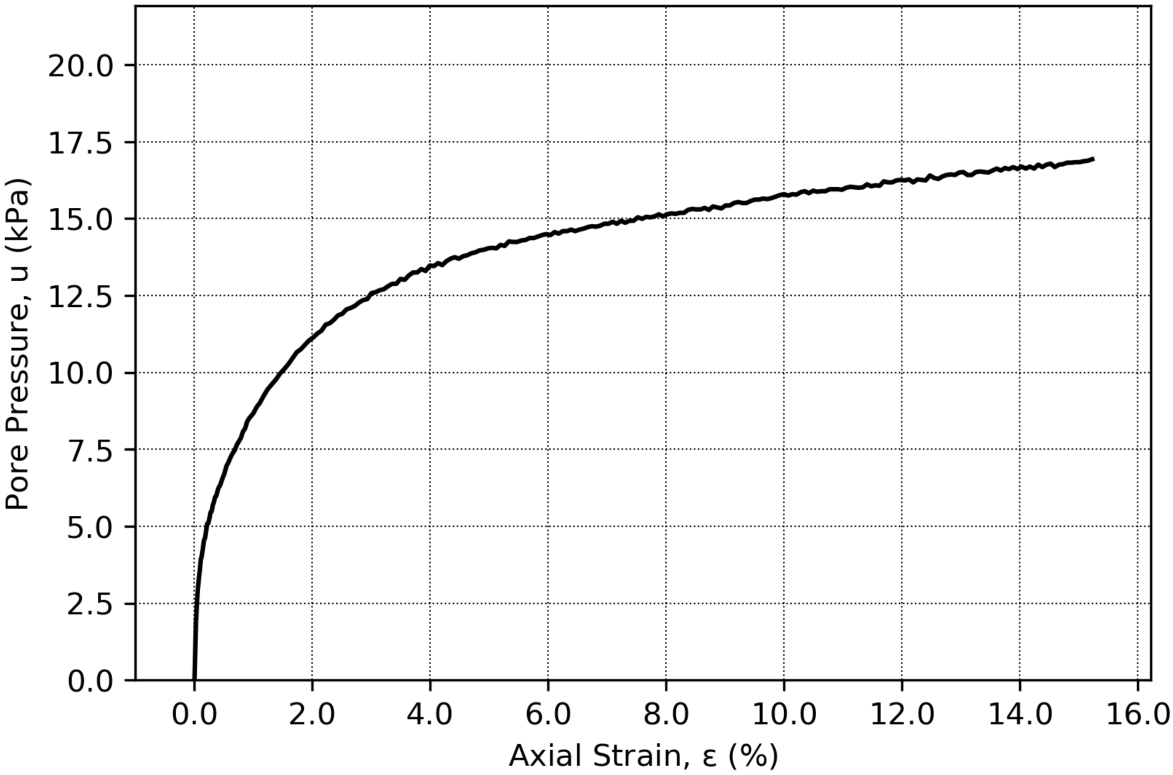
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.168
Boring:	ONSB34	Depth	= 5.85	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 35.4	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 80.1	%	σ_{ac}'	-	-	35.1	NGI
Test:	1	w_c	= 76.3	%	σ_{rc}'	-	-	21.2	



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.169	
Boring:	ONSB34	Depth	= 5.85	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S1	p_0'	= 35.4	kPa	(kPa)	max.	min.	final		
Part:	1	w_i	= 80.1	%	σ_{ac}'	-	-	35.1		
Test:	1	w_c	= 76.3	%	σ_{rc}'	-	-	21.2		

P:\2016\01\20160154\Lab\Onsøy\Triax

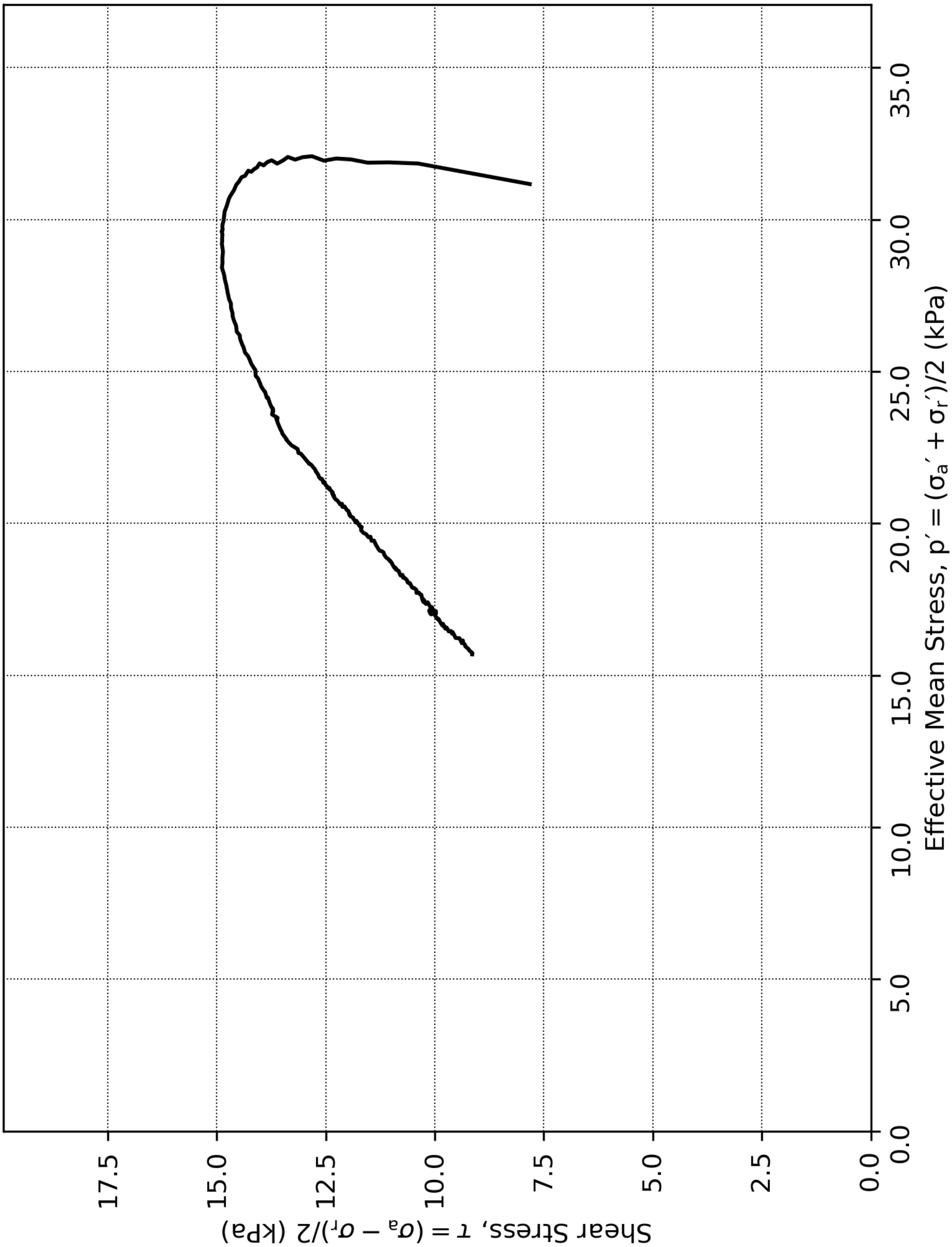




Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.170
Boring:	ONSB34	Depth	= 6.38	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 38.9	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 76.2	%	σ_{ac}'	-	-	38.8	
Test:	1	w_c	= 72.1	%	σ_{rc}'	-	-	23.3	

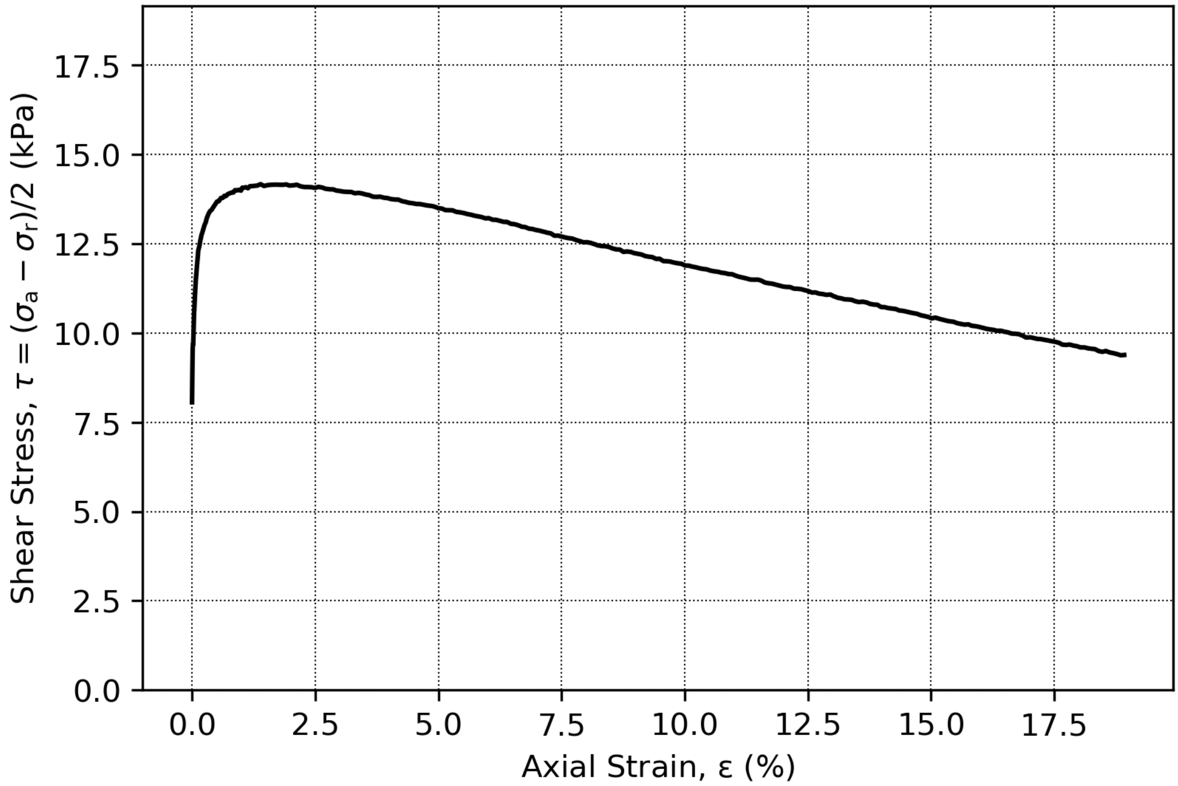
NGI

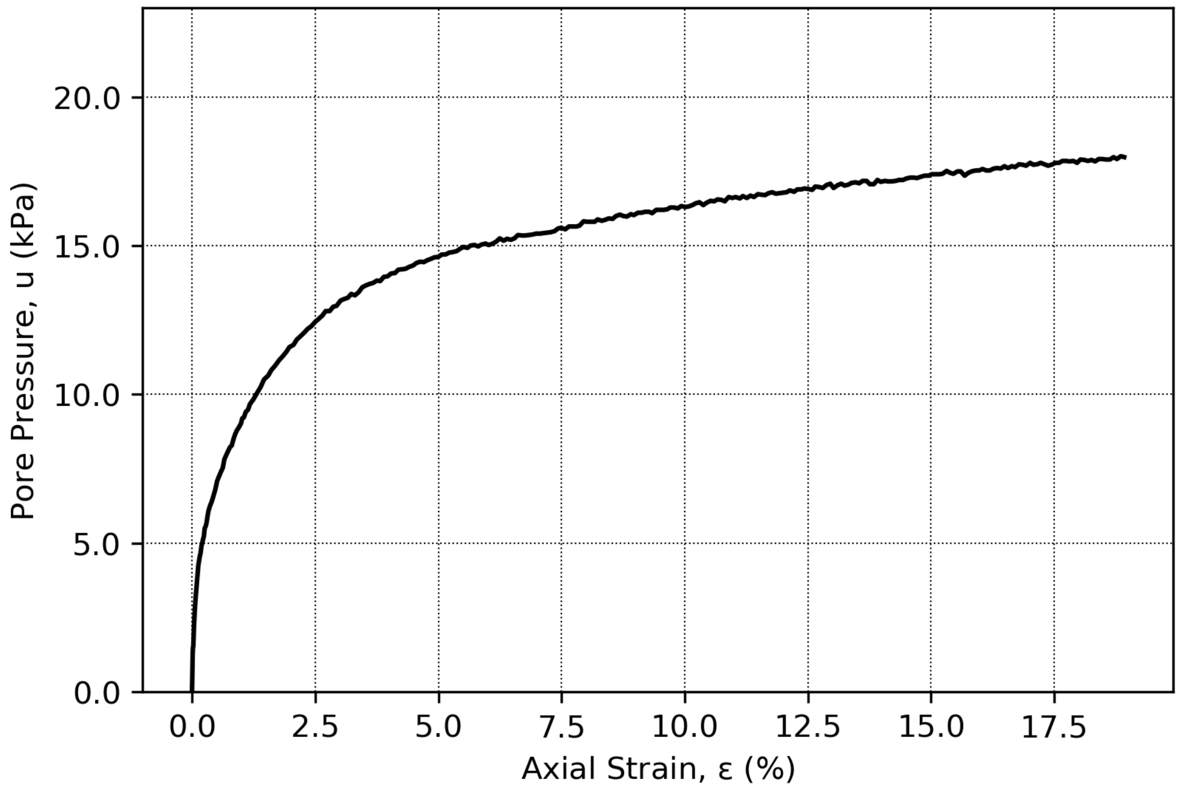
P:\2016\01\20160154\Lab\Onsøy\Triax



Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.171
Boring: ONSB34	Depth = 6.38	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S1	p_0' = 38.9	kPa	(kPa)	max.	min.	final	
Part: 2	w_i = 76.2	%	σ_{ac}'	-	-	38.8	
Test: 1	w_c = 72.1	%	σ_{rc}'	-	-	23.3	

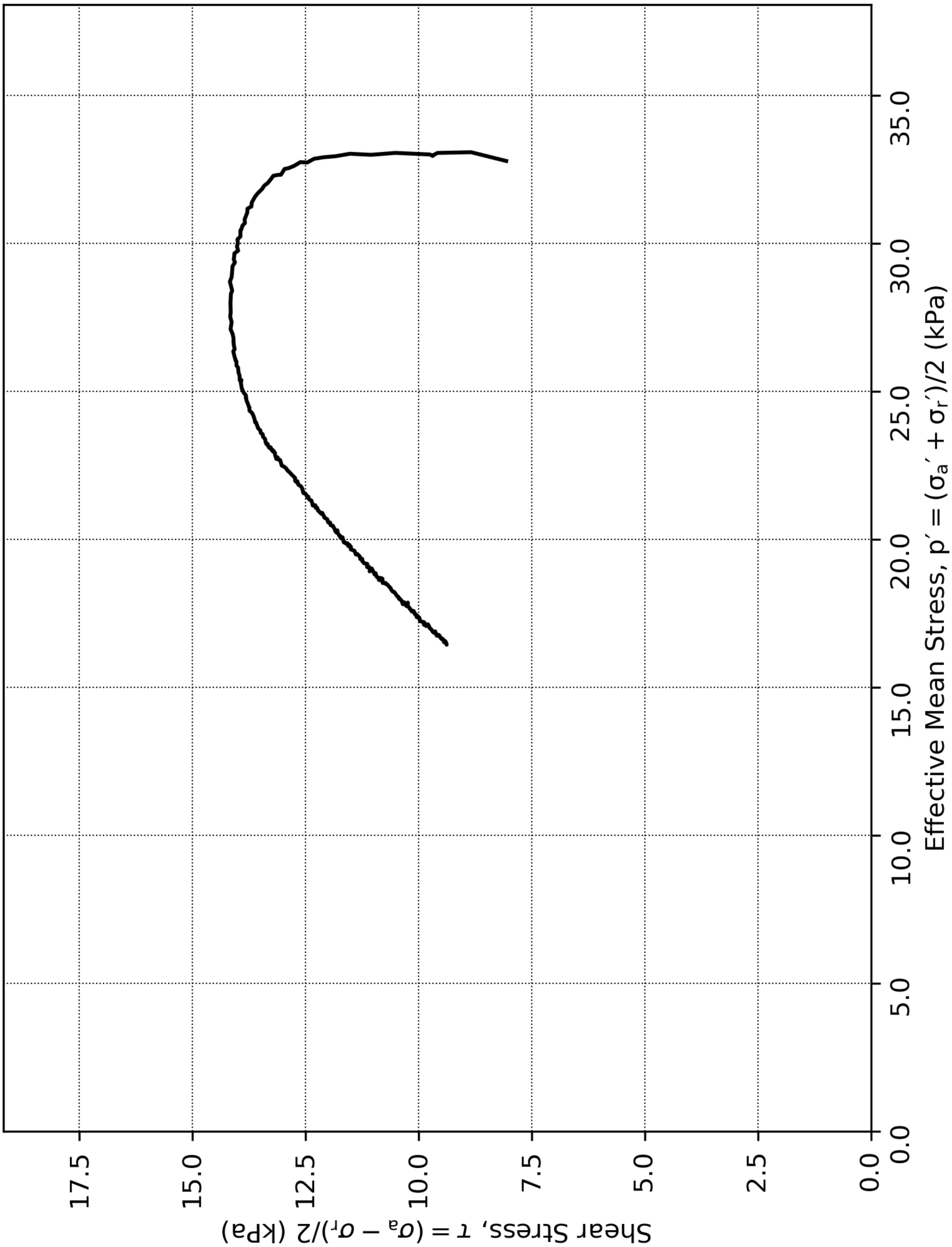
P:\2016\01\20160154\Lab\Onsøy\Triax





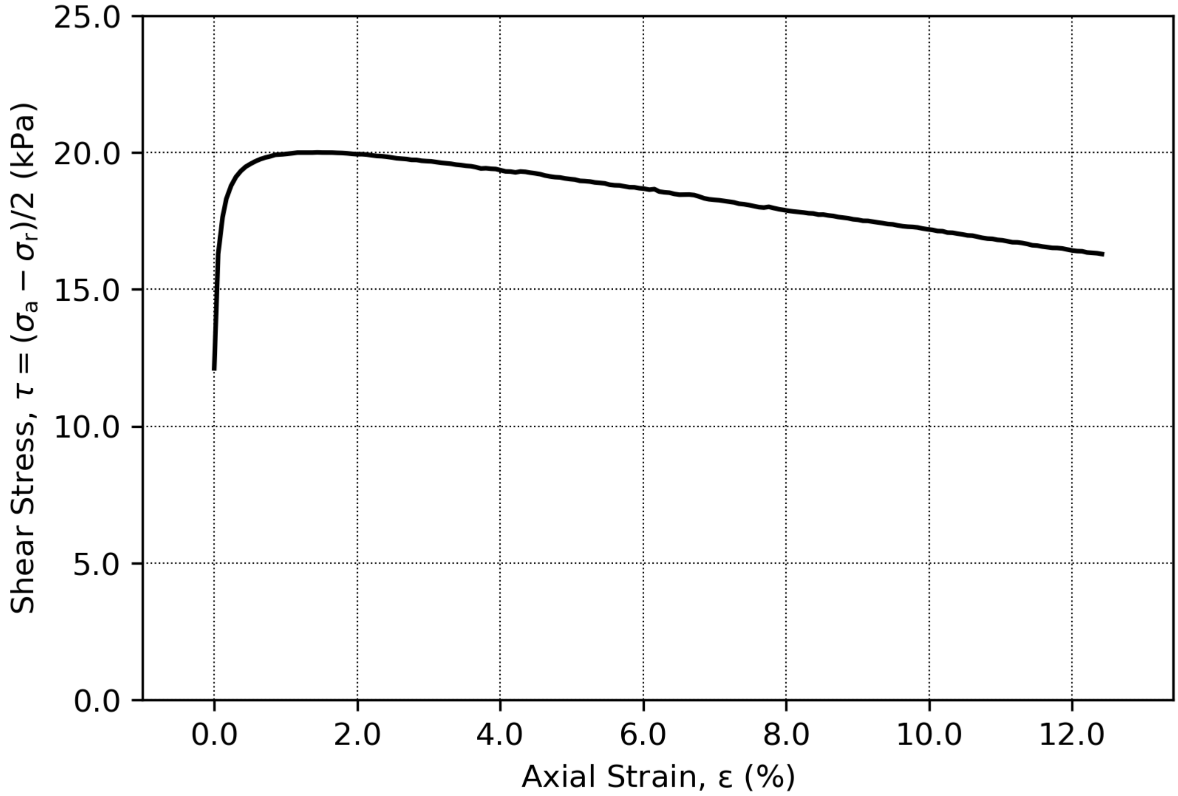
P:\2016\01\20160154\Lab\Onsøy\Triax

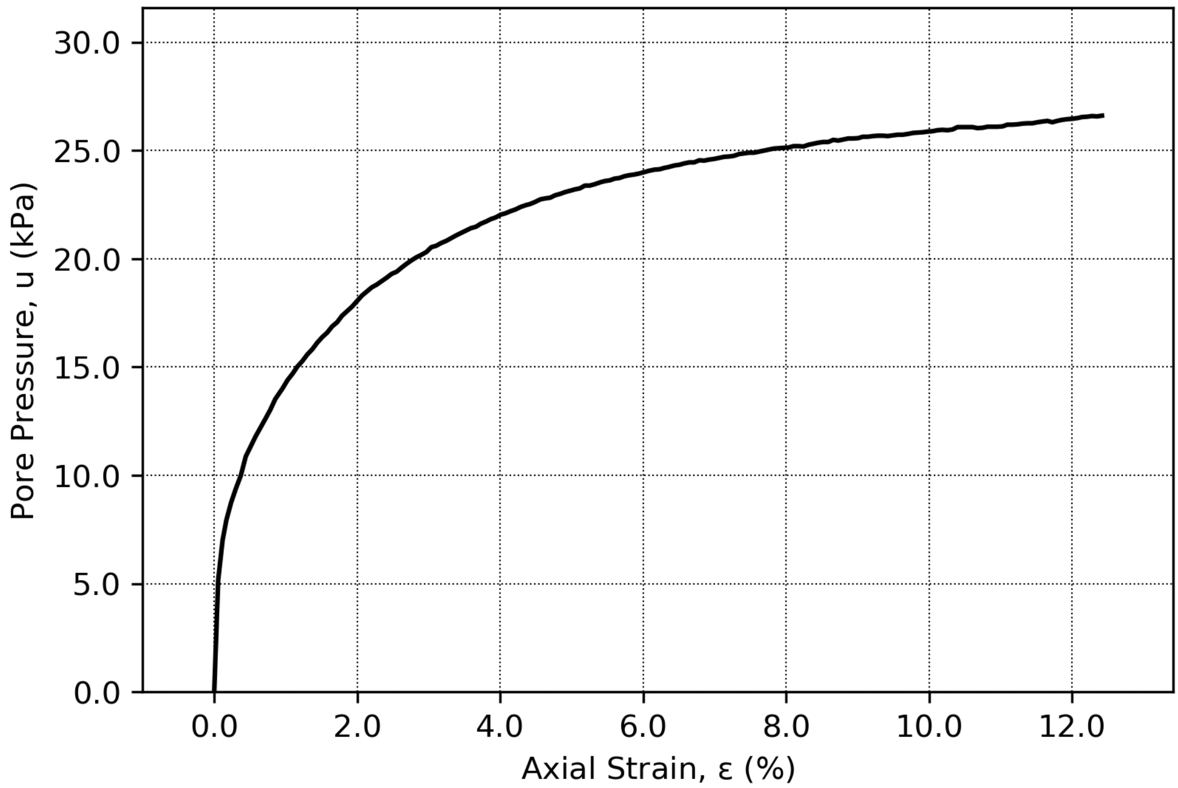
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.172
Boring:	ONSB34	Depth = 6.84	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0' = 41.3	kPa	(kPa)	max.	min.	final	
Part:	2	w_i = 75.6	%	σ_{ac}'	-	-	41.2	NGI
Test:	2	w_c = 68.5	%	σ_{rc}'	-	-	24.8	



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.173
Boring:	ONSB34	Depth	= 6.84	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S1	p_0'	= 41.3	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 75.6	%	σ_{ac}'	-	-	41.2
Test:	2	w_c	= 68.5	%	σ_{rc}'	-	-	24.8

P:\2016\01\20160154\Lab\Onsøy\Triax

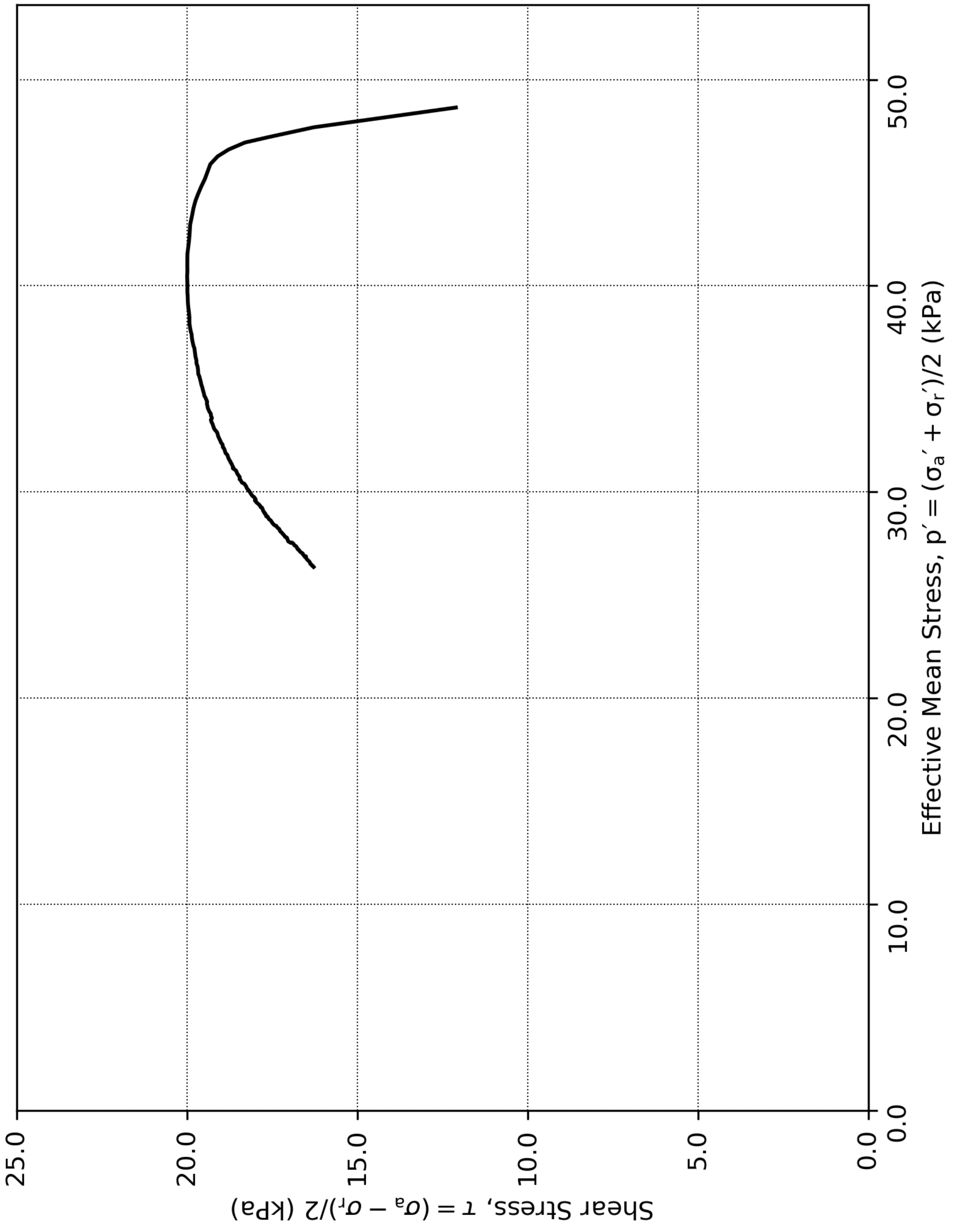




P:\2016\01\20160154\Lab\Onsøy\Triax

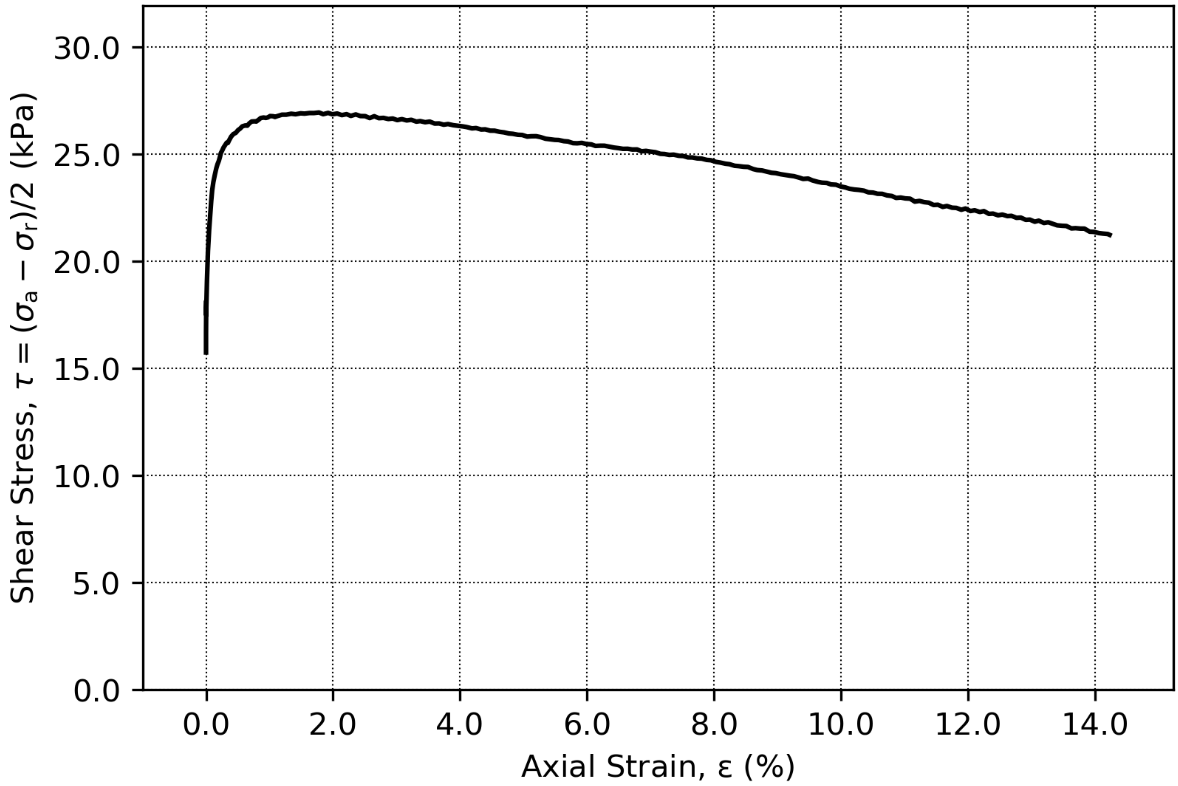
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.174
Boring:	ONSB34	Depth	= 9.45	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S2	p_0'	= 60.9	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 70.5	%	σ_{ac}'	-	-	60.8
Test:	1	w_c	= 62.9	%	σ_{rc}'	-	-	36.6

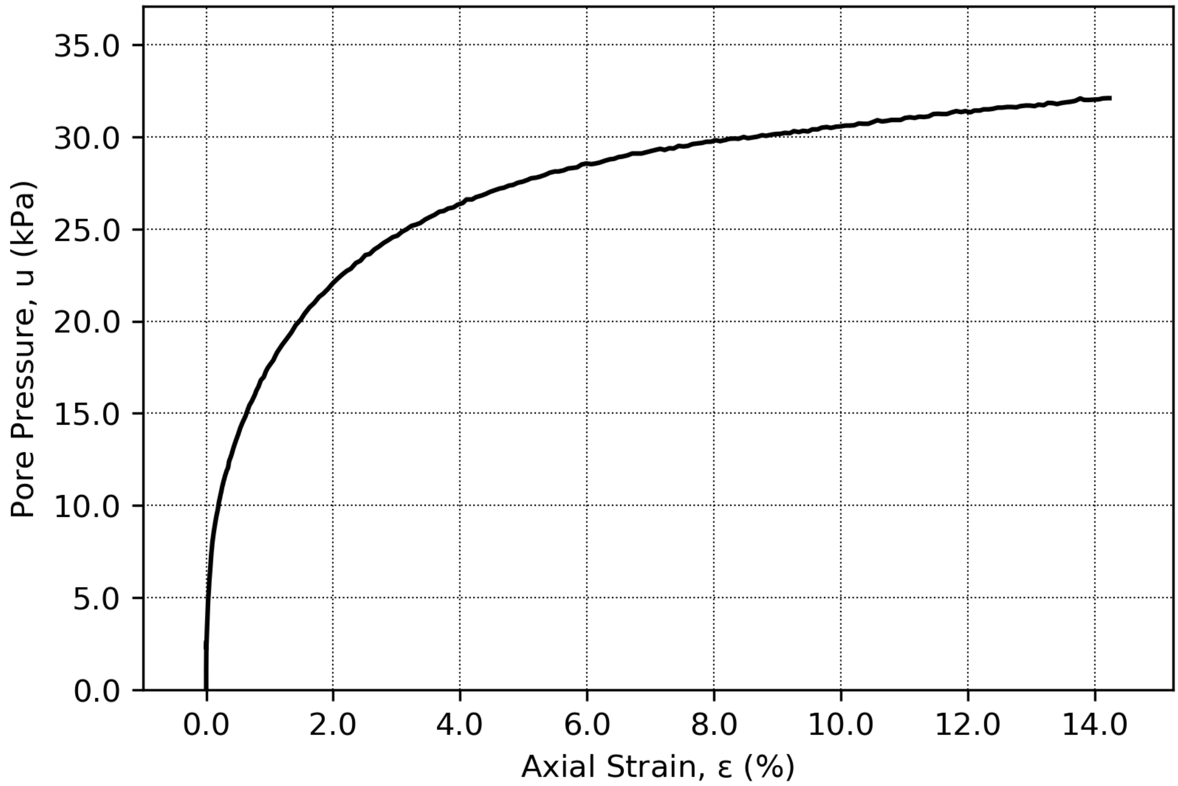
NGI



Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.175	
Boring:	ONSB34	Depth = 9.45	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S2	p_0' = 60.9	kPa	(kPa)	max.	min.	final	
Part:	2	w_i = 70.5	%	σ_{ac}'	-	-	60.8	
Test:	1	w_c = 62.9	%	σ_{rc}'	-	-	36.6	

P:\2016\01\20160154\Lab\Onsøy\Triax

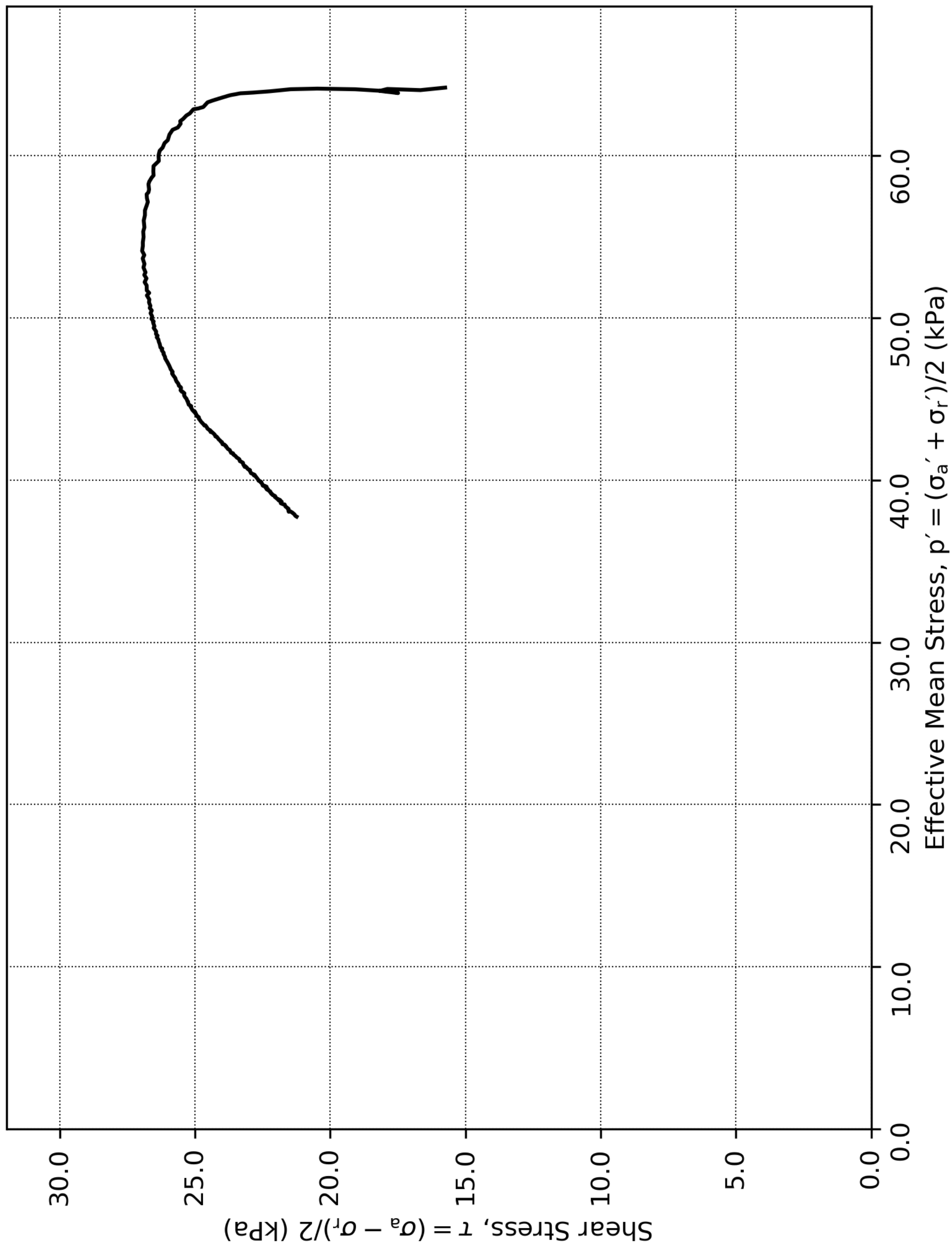




P:\2016\01\20160154\Lab\Onsøy\Triax

Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R
Triaxial test: CAUC										Figure No. 5.3.176
Boring:	ONSB34	Depth	= 12.5	m	Consolidation stresses					Date 2018-12-10 / Drawn by AGu
Tube:	S3	p_0'	= 80.7	kPa	(kPa)	max.	min.	final		
Part:	2	w_i	= 49.8	%	σ_{ac}'	-	-	80.6		
Test:	1	w_c	= 46.3	%	σ_{rc}'	-	-	48.4		

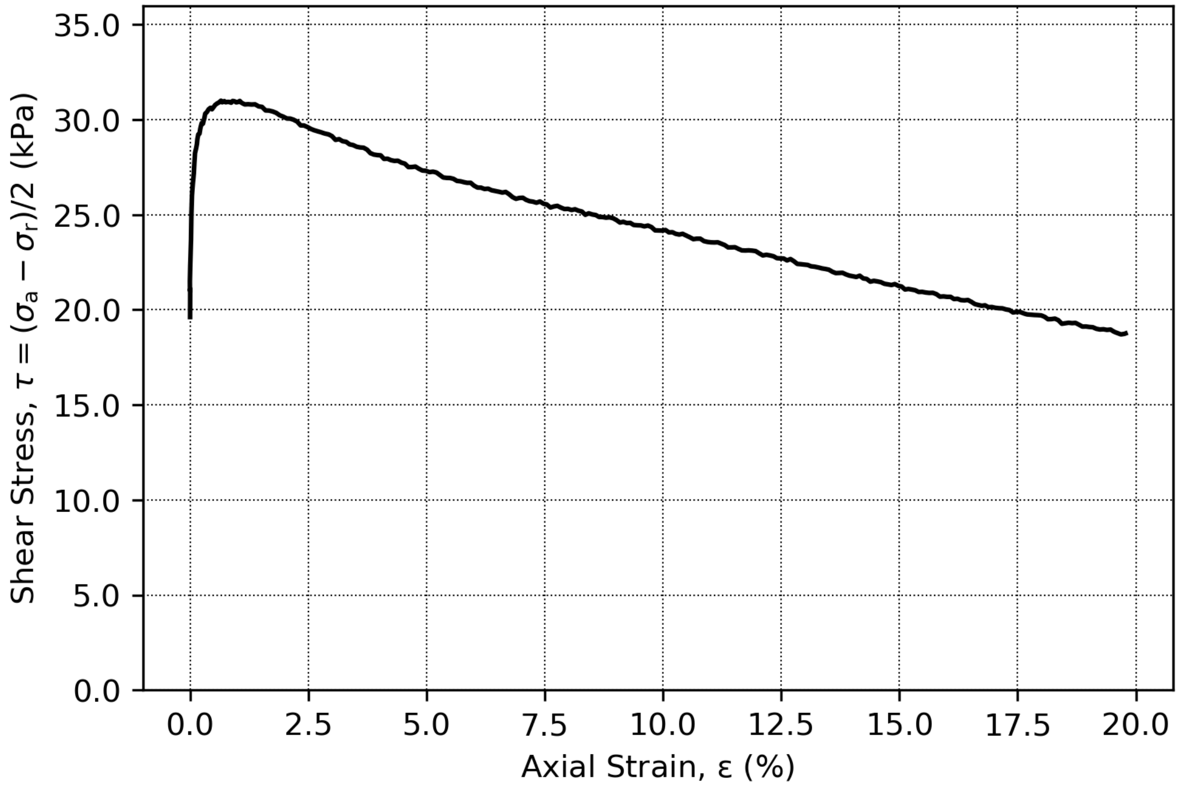
NGI

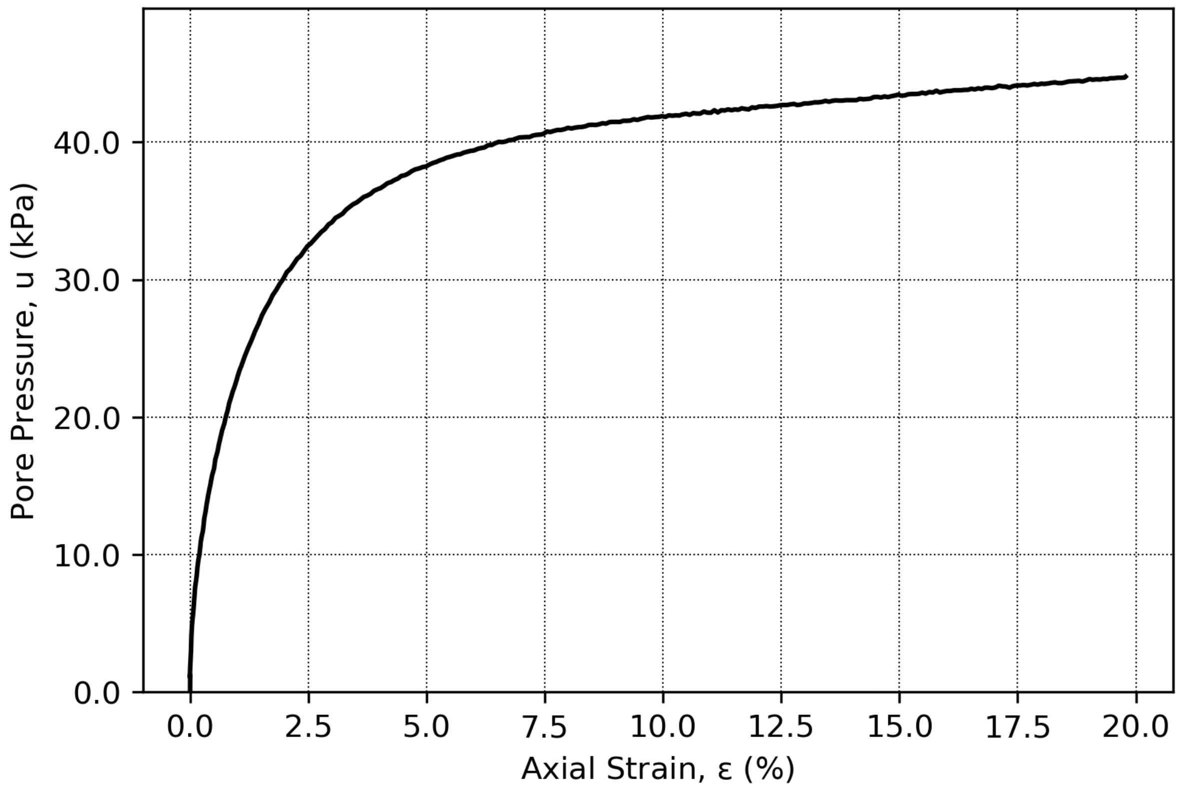


Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.177	
Boring:	ONSB34	Depth	= 12.5	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S3	p_0'	= 80.7	kPa	(kPa)	max.	min.	final		
Part:	2	w_i	= 49.8	%	σ_{ac}'	-	-	80.6		
Test:	1	w_c	= 46.3	%	σ_{rc}'	-	-	48.4		

NGI

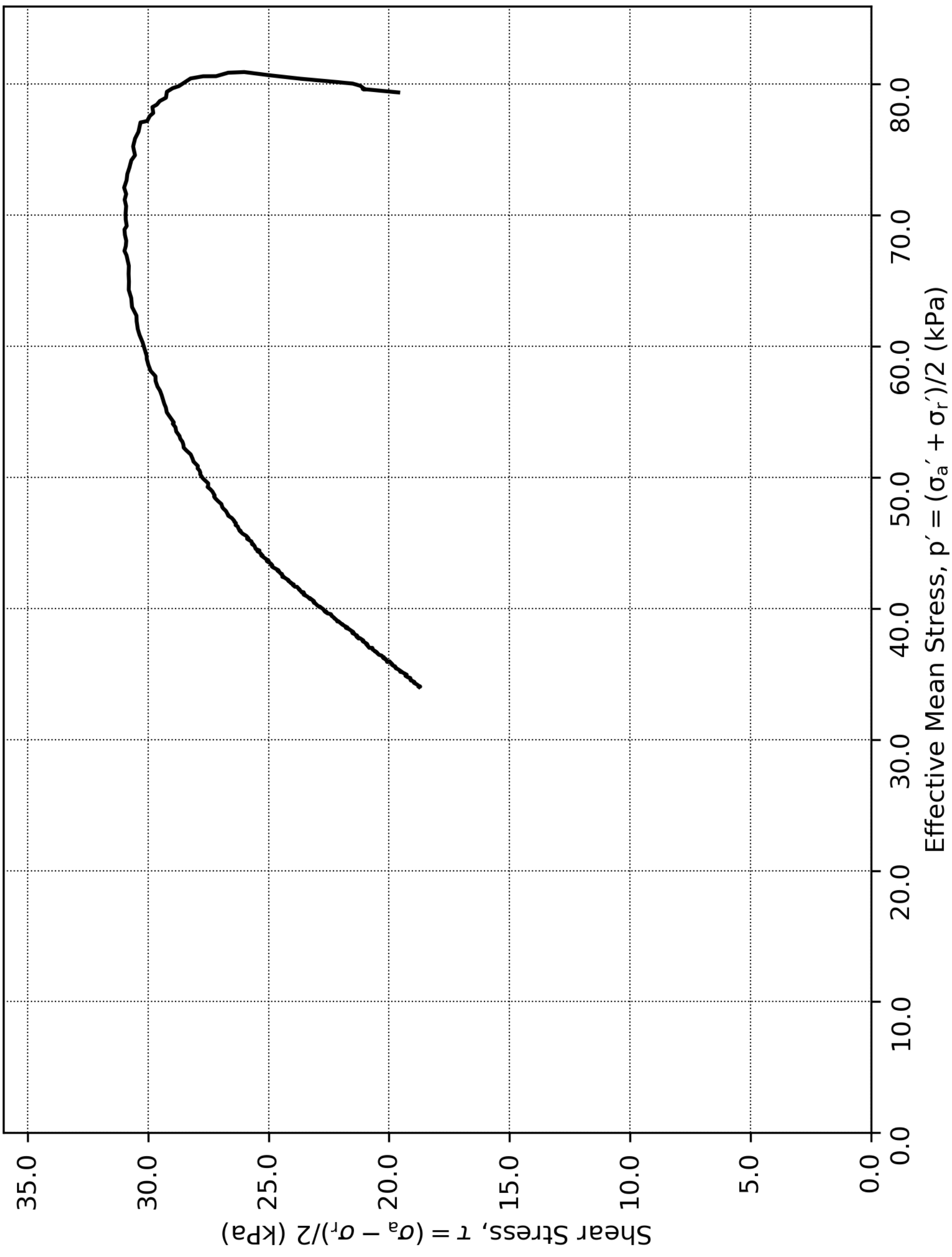
P:\2016\01\20160154\Lab\Onsøy\Triax





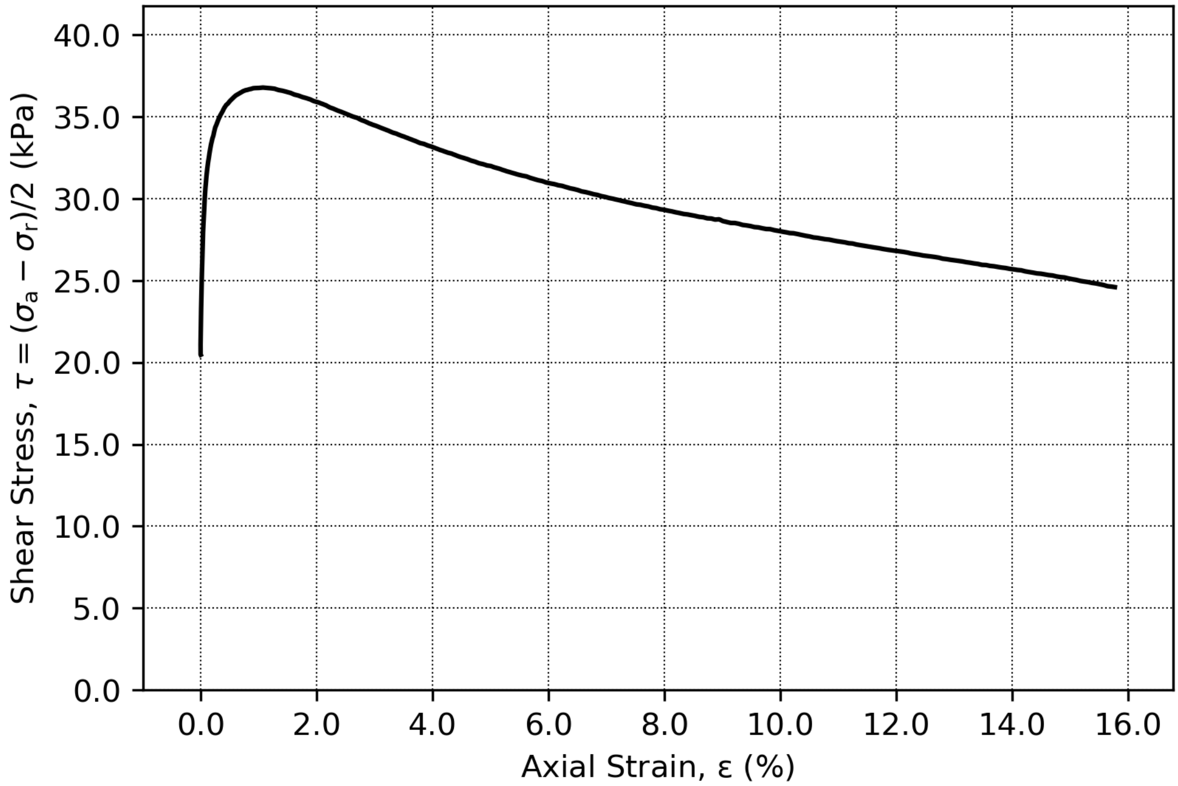
P:\2016\01\20160154\Lab\Onsøy\Triax

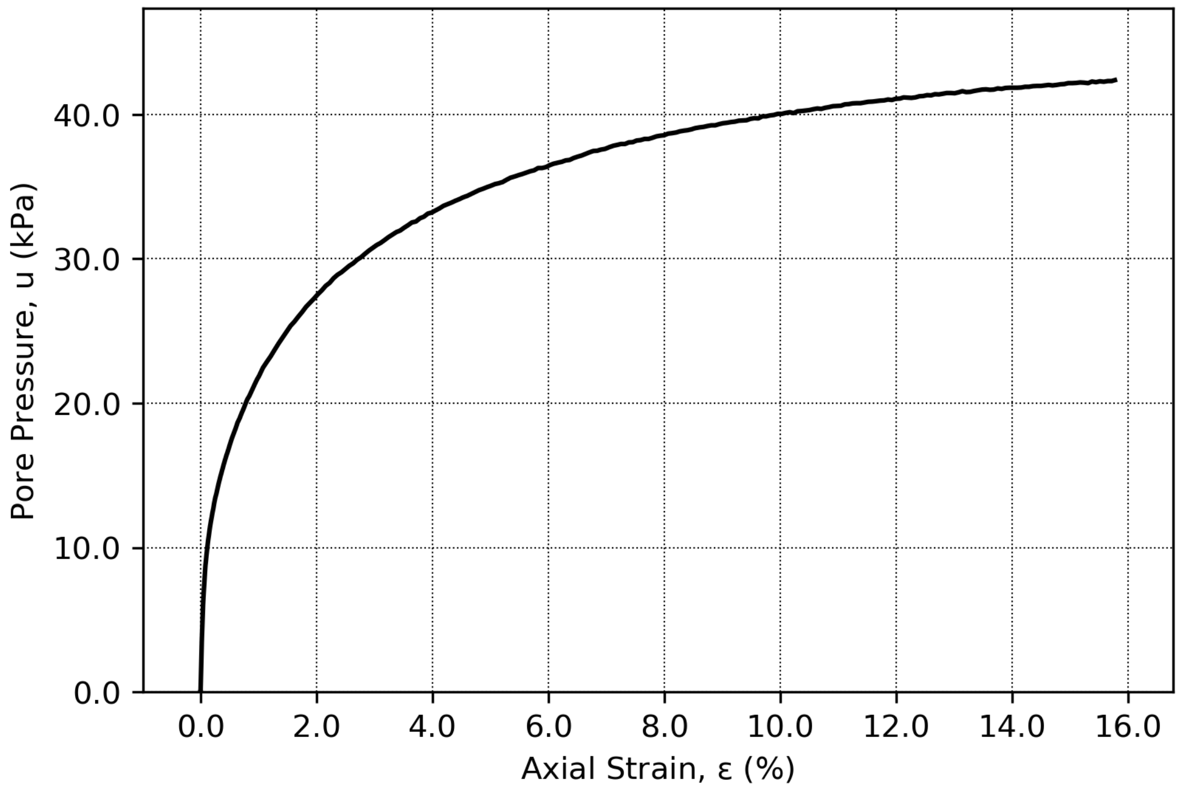
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.178	
Boring:	ONSB34	Depth	= 15.0	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S4	p_0'	= 99.6	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	= 46.6	%	σ_{ac}'	-	-	99.3	
Test:	1	w_c	= 42.4	%	σ_{rc}'	-	-	59.7	



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.179	
Boring:	ONSB34	Depth	= 15.0	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S4	p_0'	= 99.6	kPa	(kPa)	max.	min.	final	NGI	
Part:	1	w_i	= 46.6	%	σ_{ac}'	-	-	99.3		
Test:	1	w_c	= 42.4	%	σ_{rc}'	-	-	59.7		

P:\2016\01\20160154\Lab\Onsøy\Triax

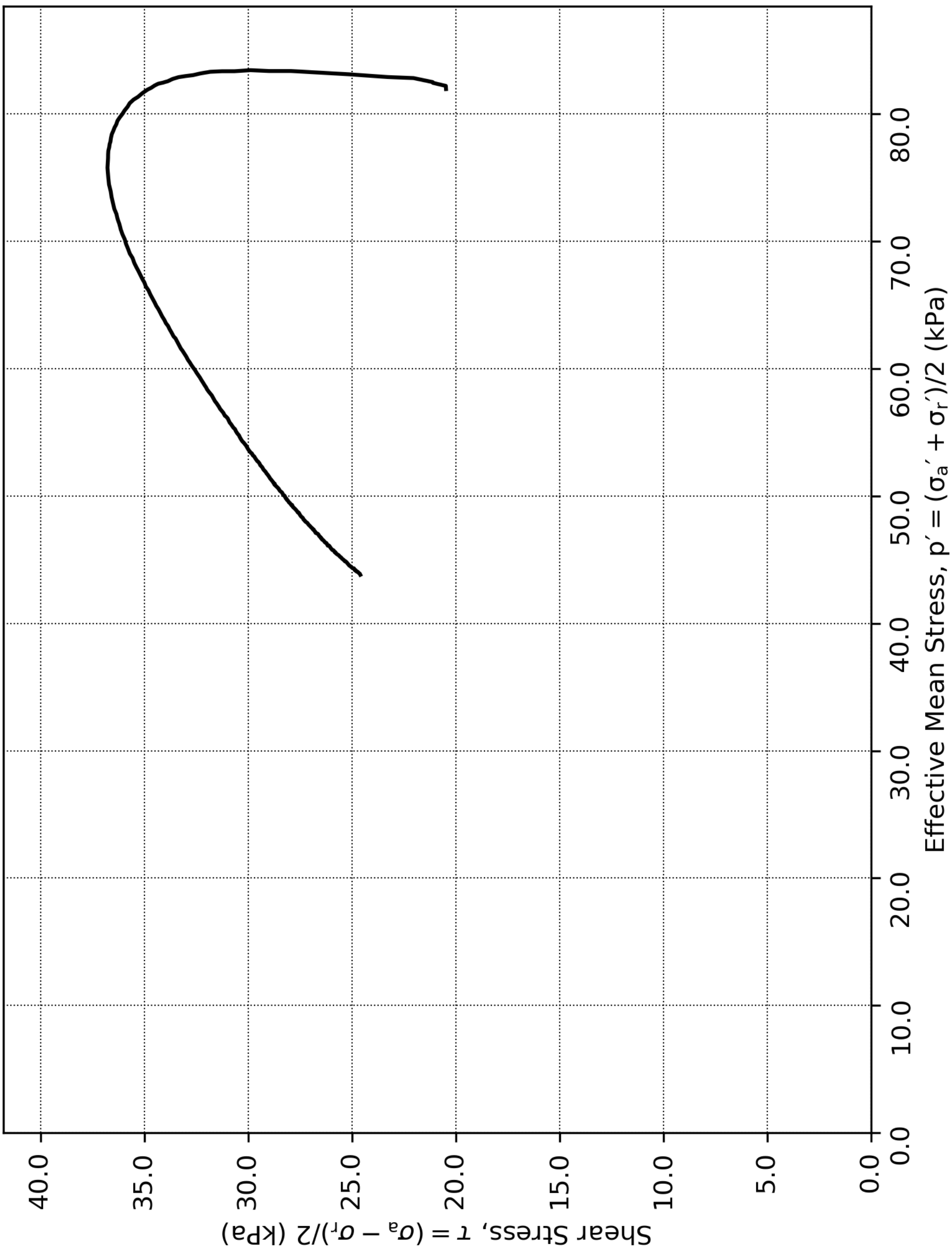




P:\2016\01\20160154\Lab\Onsøy\Triax

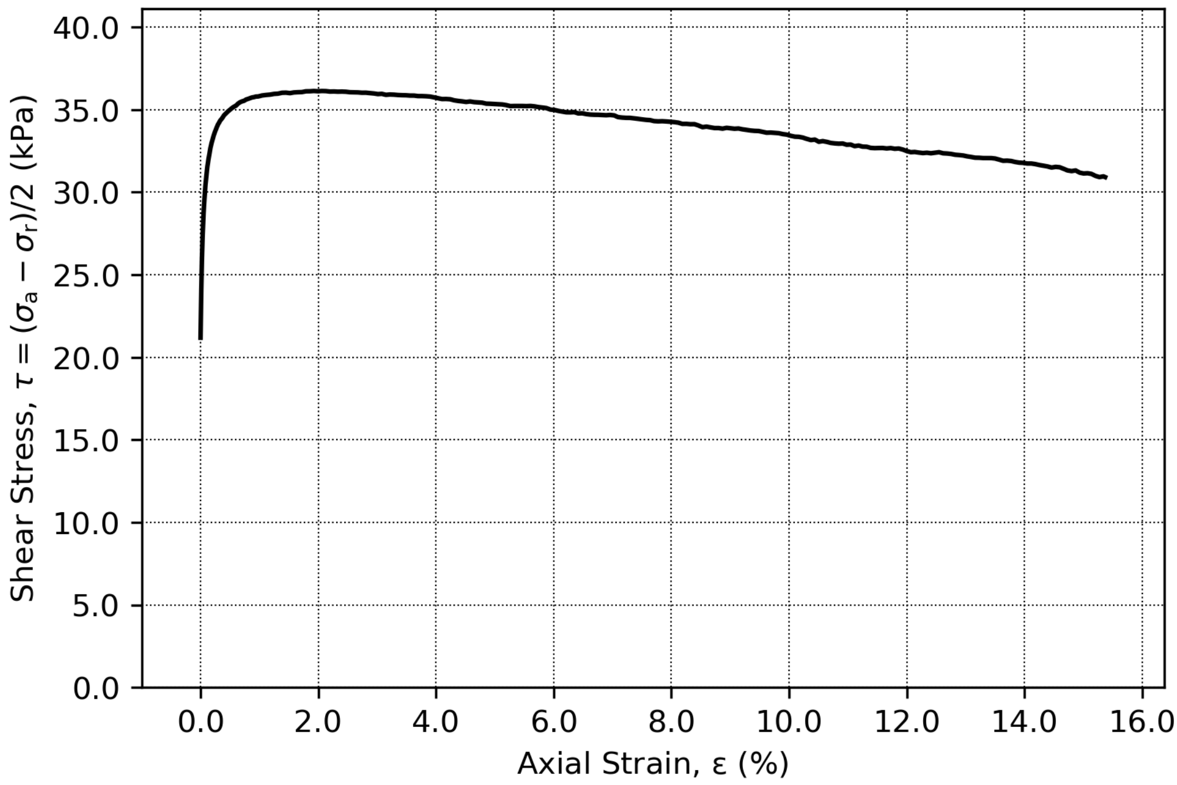
Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.180
Boring:	ONSB34	Depth = 15.54	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S4	p_0' = 102.5	kPa	(kPa)	max.	min.	final
Part:	2	w_i = 48.0	%	σ_{ac}'	-	-	102.3
Test:	1	w_c = 45.2	%	σ_{rc}'	-	-	61.4

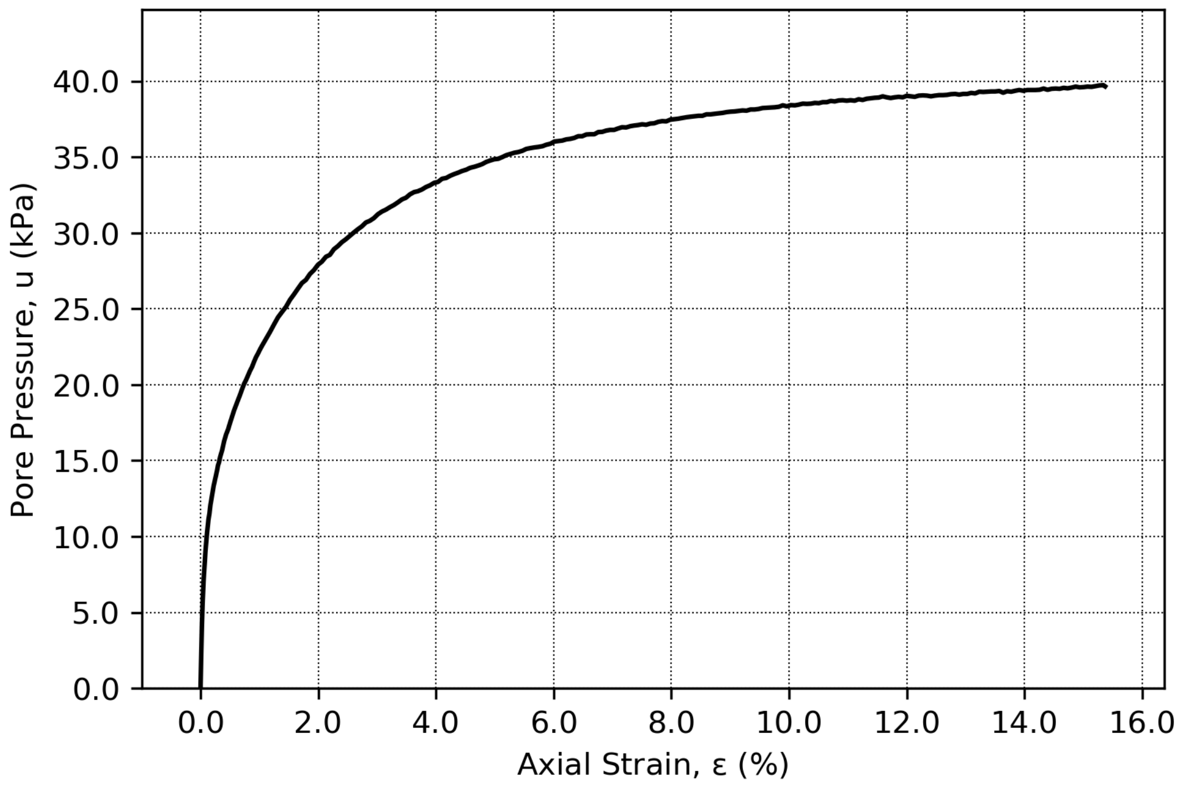
NGI



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.181
Boring:	ONSB34	Depth	= 15.54	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S4	p_0'	= 102.5	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 48.0	%	σ_{ac}'	-	-	102.3
Test:	1	w_c	= 45.2	%	σ_{rc}'	-	-	61.4

P:\2016\01\20160154\Lab\Onsøy\Triax

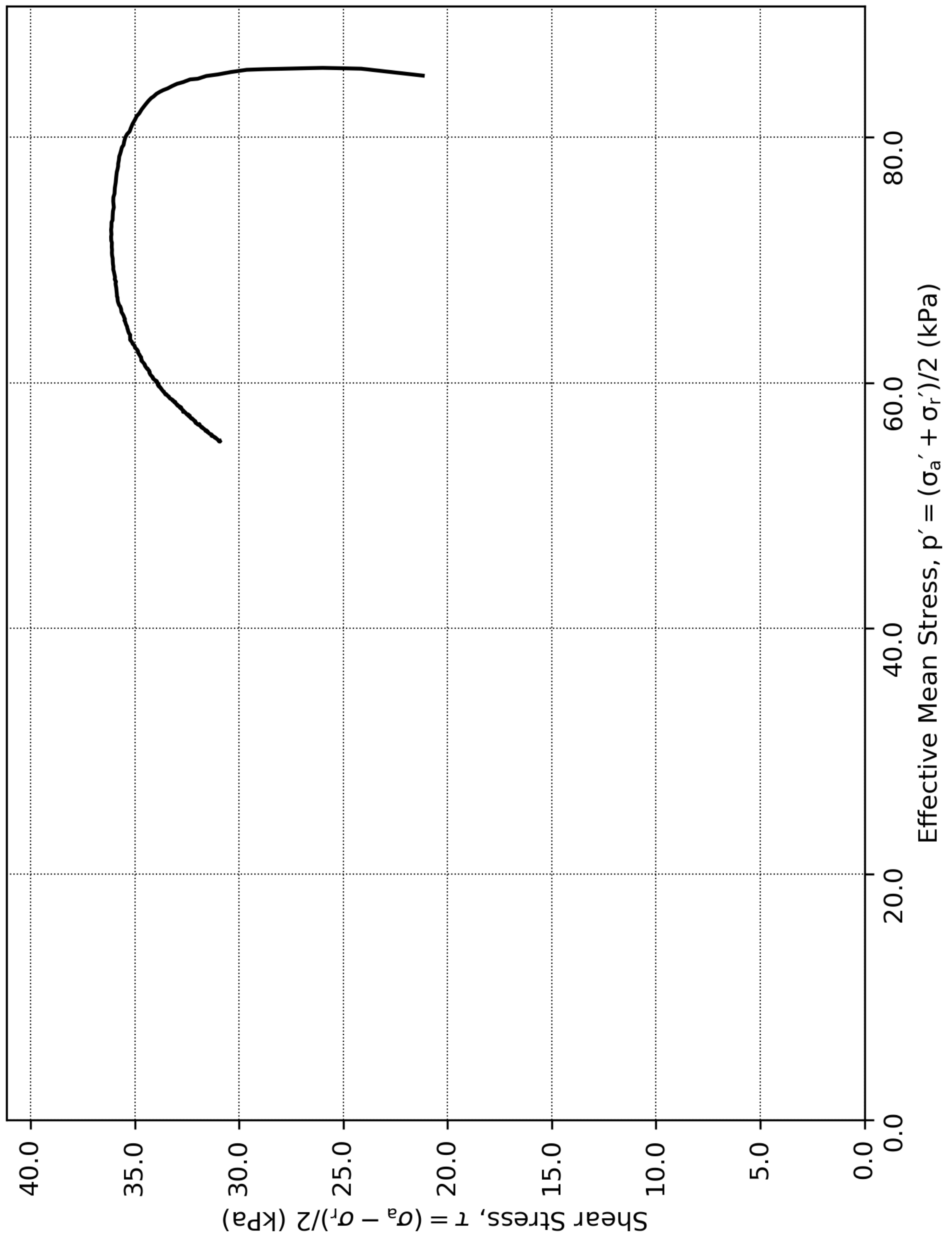




Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R	
Triaxial test: CAUC										Figure No. 5.3.182	
Boring:	ONSB34	Depth	= 16.25	m	Consolidation stresses					Date 2018-12-10	Drawn by AGu
Tube:	S4	p_0'	= 106.3	kPa	(kPa)	max.	min.	final			
Part:	2	w_i	= 45.3	%	σ_{ac}'	-	-	106.3			
Test:	2	w_c	= 40.0	%	σ_{rc}'	-	-	63.8			

NGI

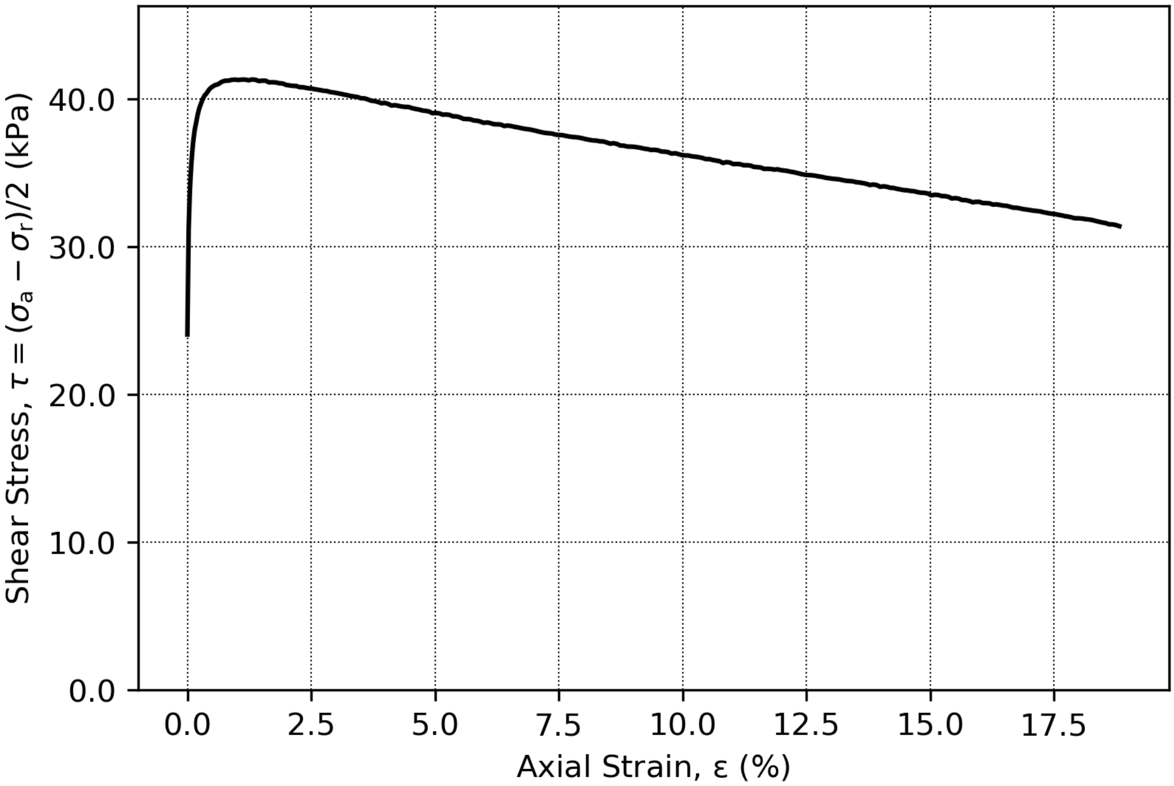
P:\2016\01\20160154\Lab\Onsøy\Triax

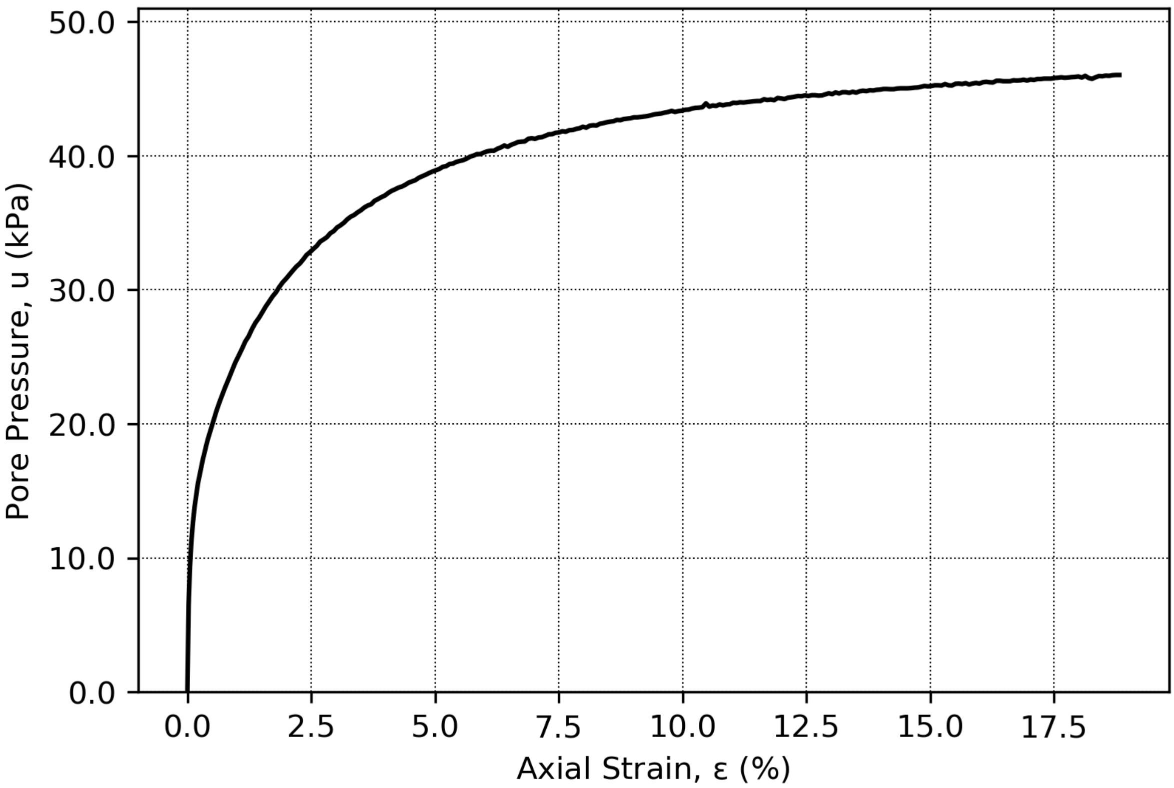


Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Triaxial test: CAUC							Figure No. 5.3.183	
Boring:	ONSB34	Depth = 16.25	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S4	p_0' = 106.3	kPa	(kPa)	max.	min.	final	
Part:	2	w_i = 45.3	%	σ_{ac}'	-	-	106.3	
Test:	2	w_c = 40.0	%	σ_{rc}'	-	-	63.8	

NGI

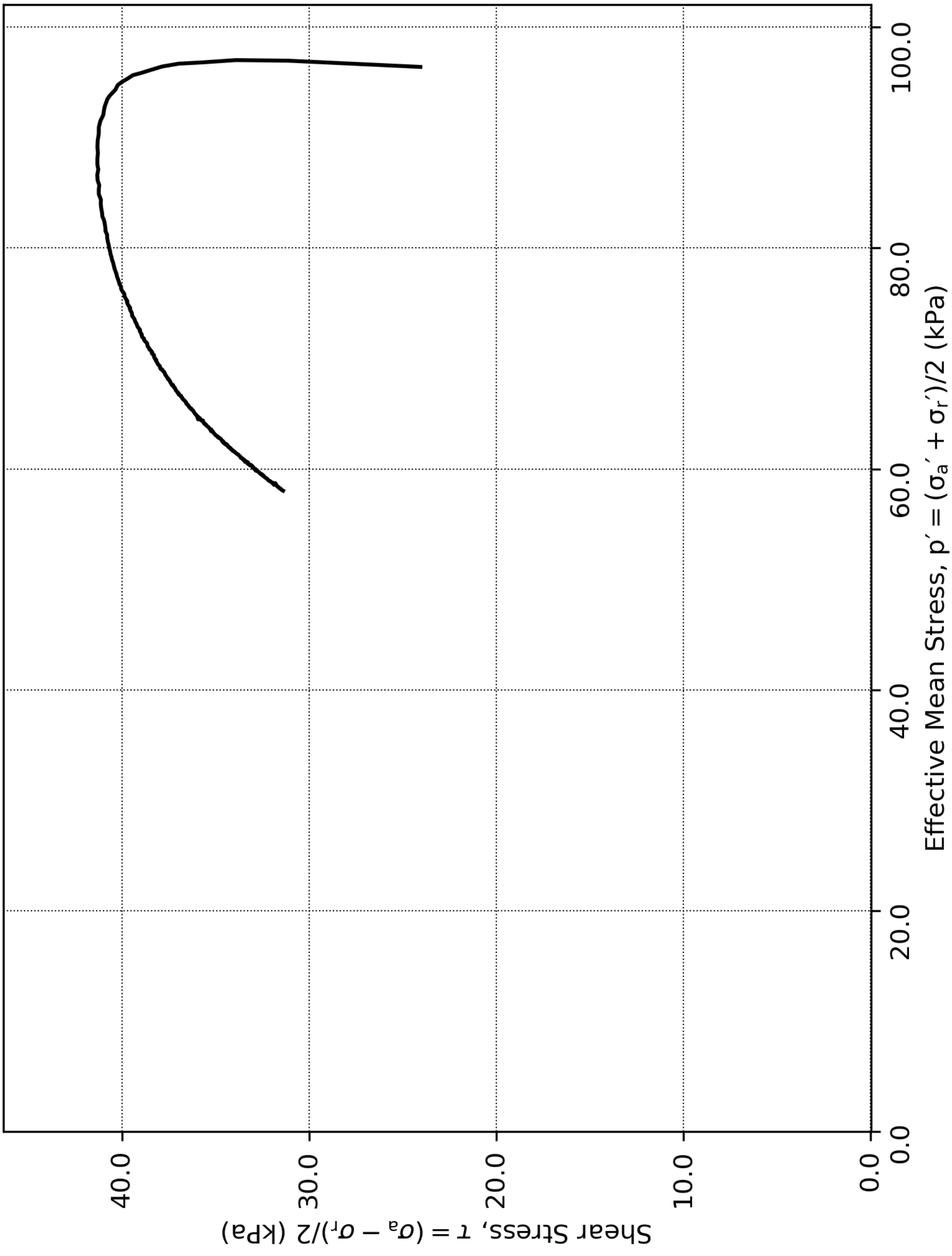
P:\2016\01\20160154\Lab\Onsøy\Triax





Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.184
Boring: ONSB34	Depth = 18.95	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube: S5	p_0' = 120.6	kPa	(kPa)	max.	min.	final	
Part: 2	w_i = 46.6	%	σ_{ac}'	-	-	120.5	
Test: 1	w_c = 41.5	%	σ_{rc}'	-	-	72.3	

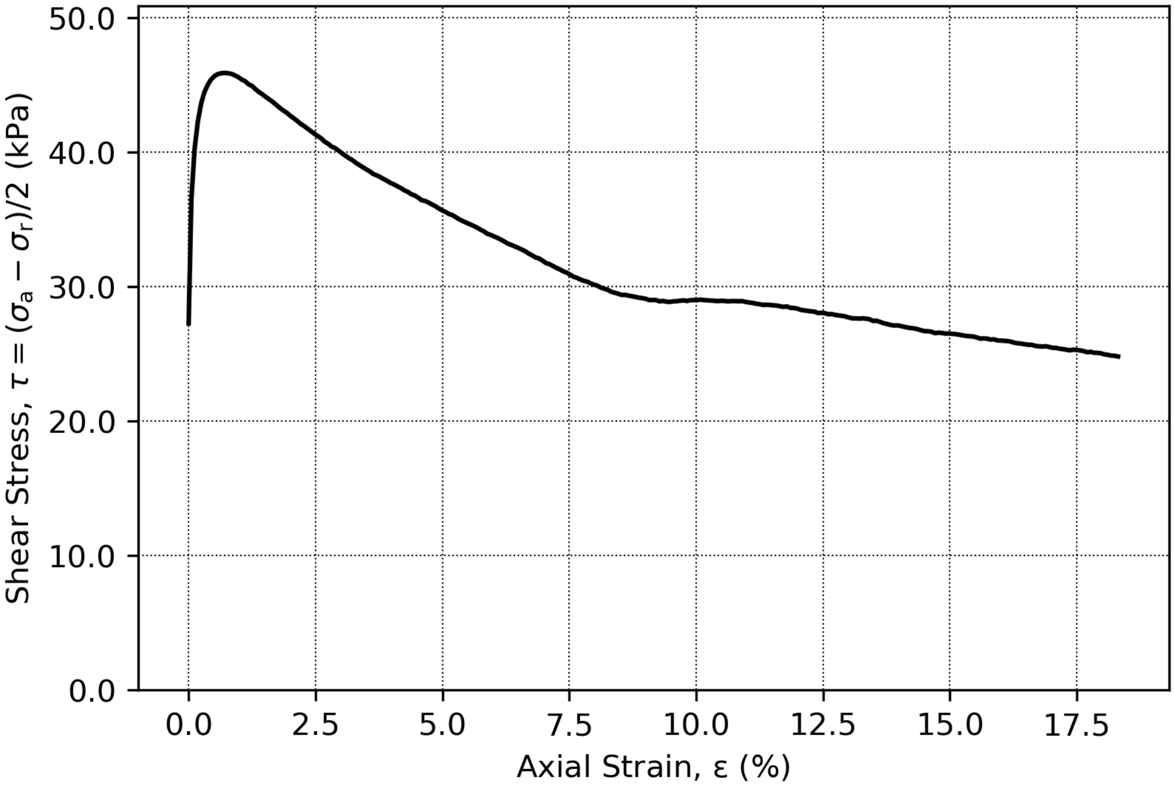
P:\2016\01\20160154\Lab\Onsøy\Triax

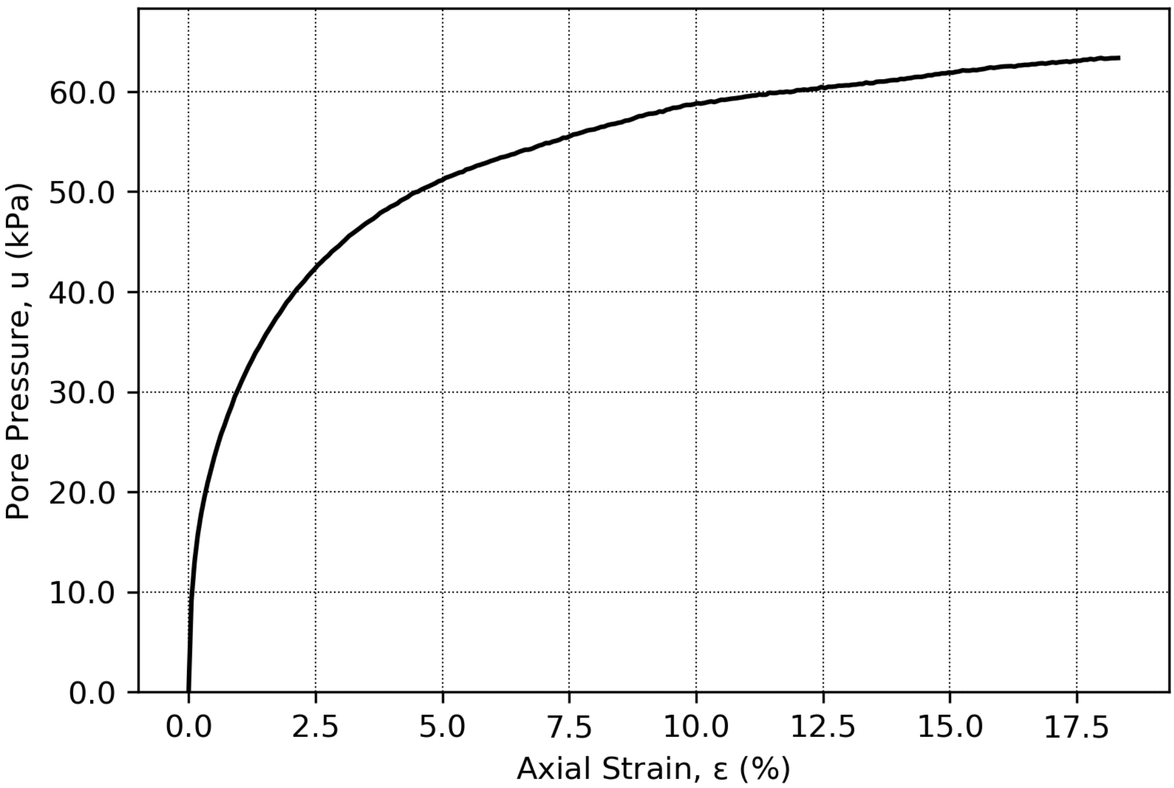


Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Triaxial test: CAUC							Figure No. 5.3.185
Boring:	ONSB34	Depth = 18.95	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S5	p_0' = 120.6	kPa	(kPa)	max.	min.	final
Part:	2	w_i = 46.6	%	σ_{ac}'	-	-	120.5
Test:	1	w_c = 41.5	%	σ_{rc}'	-	-	72.3

NGI

P:\2016\01\20160154\Lab\Onsøy\Triax

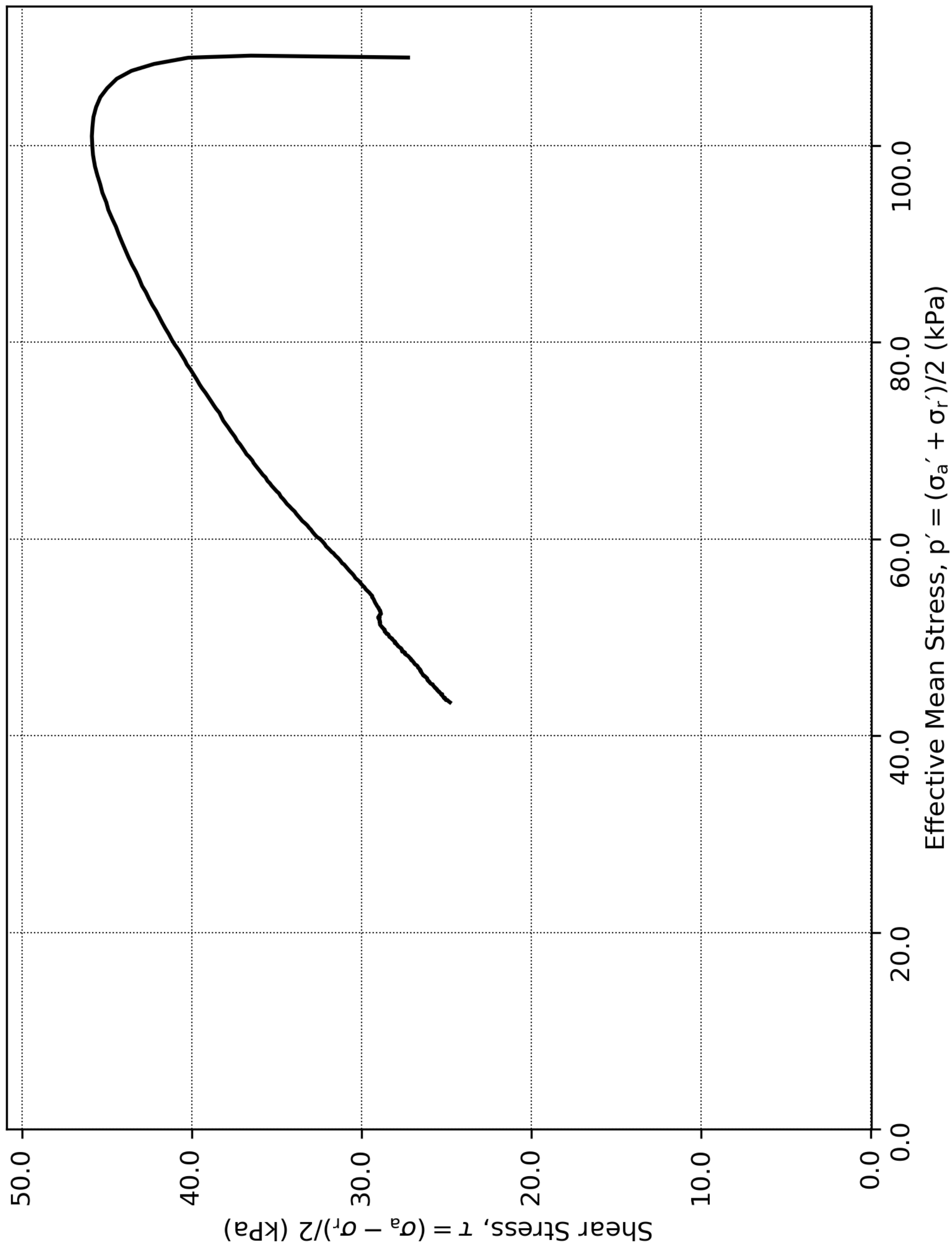




P:\2016\01\20160154\Lab\Onsøy\Triax

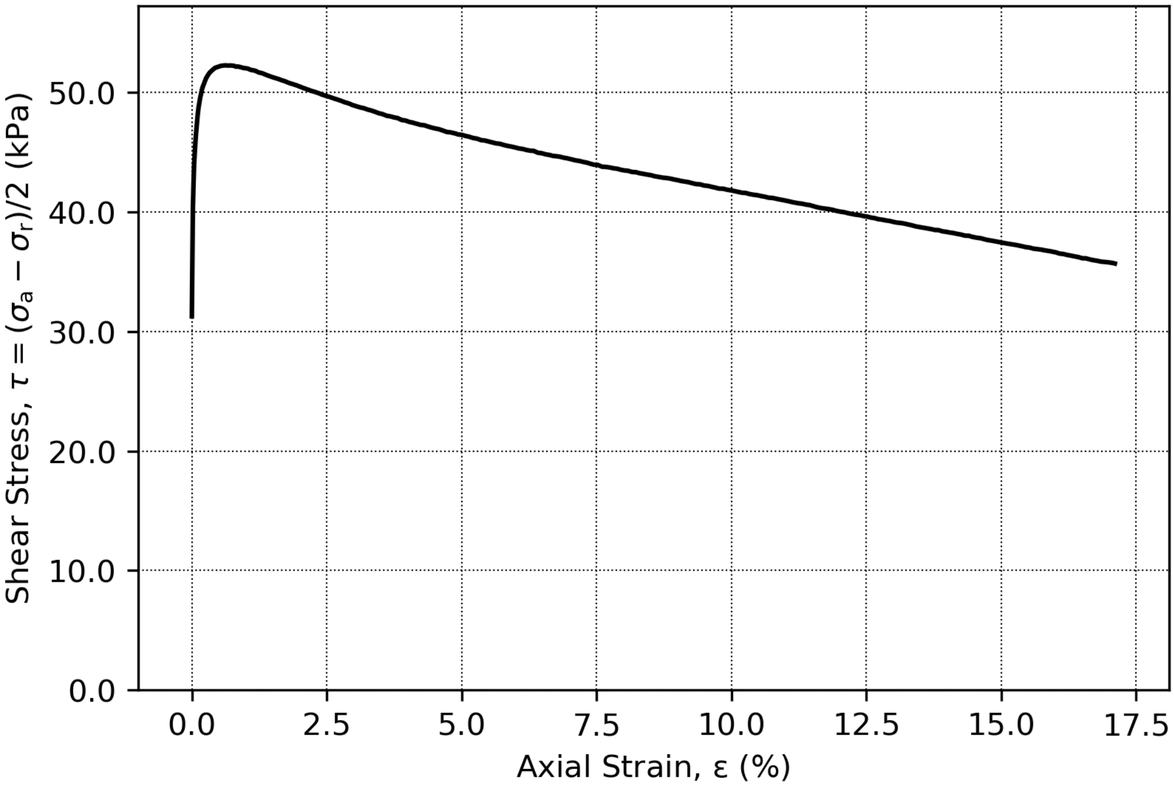
Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
Triaxial test: CAUC								Figure No. 5.3.186
Boring:	ONSB34	Depth	= 21.69	m	Consolidation stresses			Date 2018-12-10 / Drawn by AGu
Tube:	S6	p_0'	= 136.3	kPa	(kPa)	max.	min.	final
Part:	2	w_i	= 64.4	%	σ_{ac}'	-	-	136.2
Test:	1	w_c	= 59.1	%	σ_{rc}'	-	-	81.7

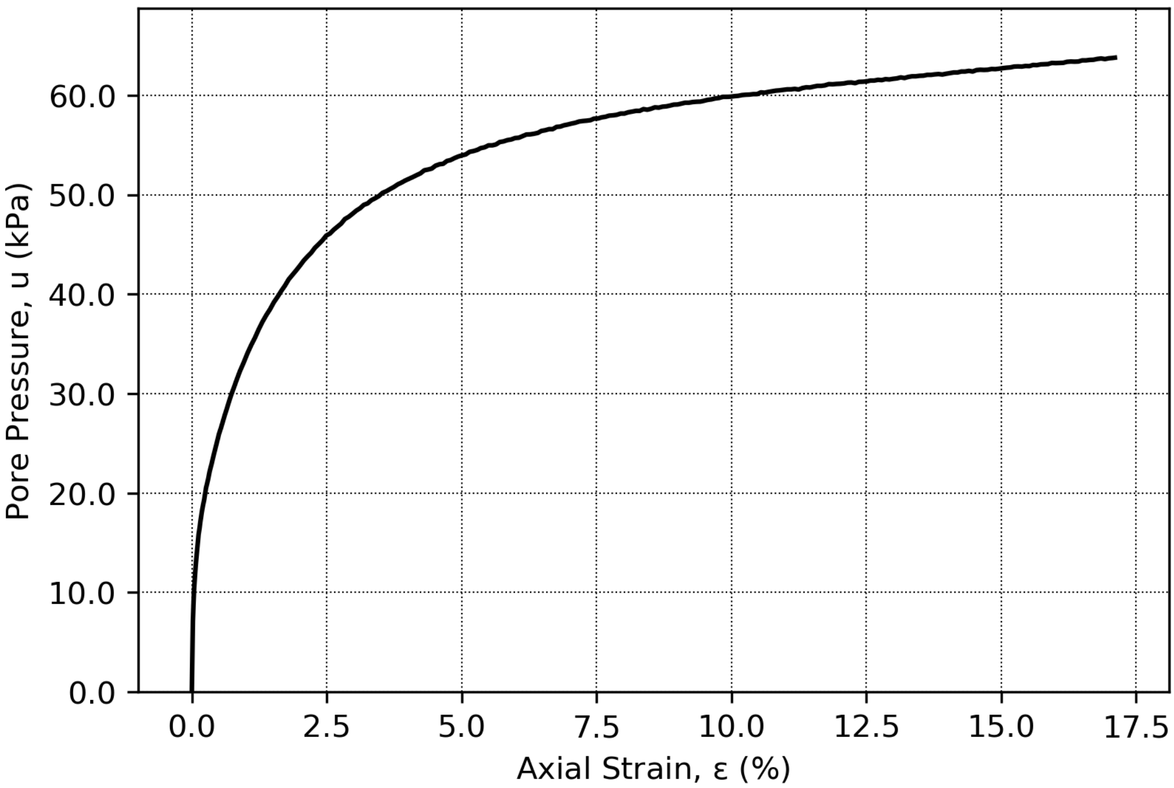
NGI



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.187	
Boring:	ONSB34	Depth	= 21.69	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S6	p_0'	= 136.3	kPa	(kPa)	max.	min.	final		
Part:	2	w_i	= 64.4	%	σ_{ac}'	-	-	136.2		
Test:	1	w_c	= 59.1	%	σ_{rc}'	-	-	81.7		

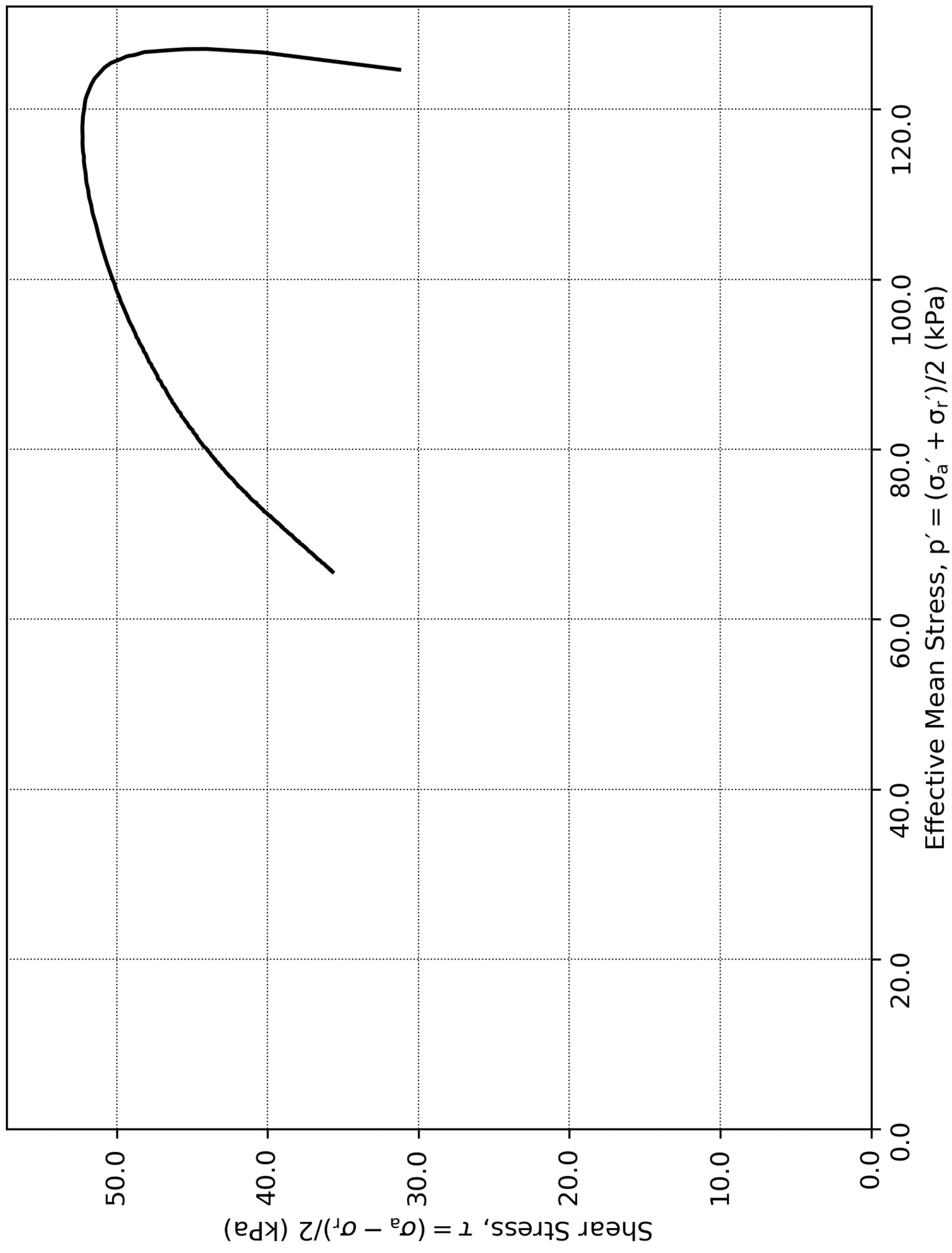
P:\2016\01\20160154\Lab\Onsøy\Triax





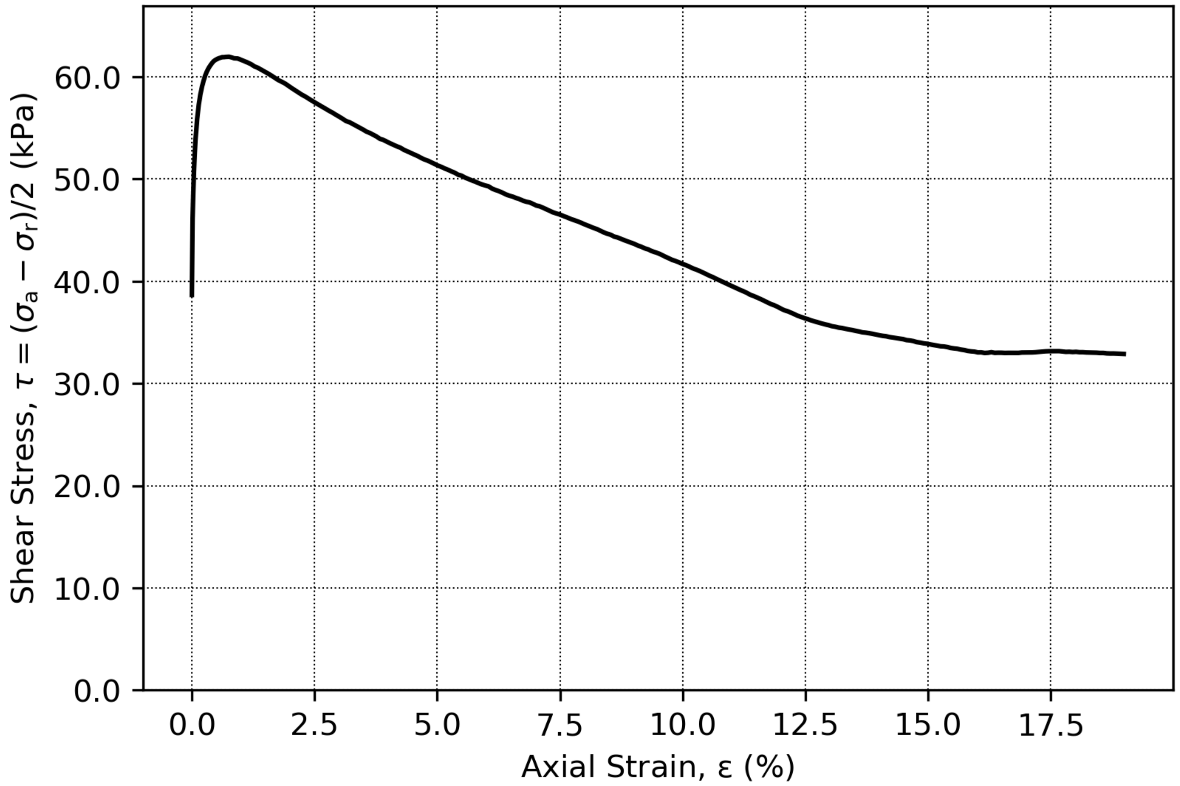
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R	
Triaxial test: CAUC									Figure No. 5.3.188	
Boring:	ONSB34	Depth	= 25.05	m	Consolidation stresses				Date 2018-12-10	Drawn by AGu
Tube:	S7	p_0'	= 155.8	kPa	(kPa)	max.	min.	final		
Part:	2	w_i	= 38.3	%	σ_{ac}'	-	-	155.9	NGI	
Test:	1	w_c	= 34.1	%	σ_{rc}'	-	-	93.5		

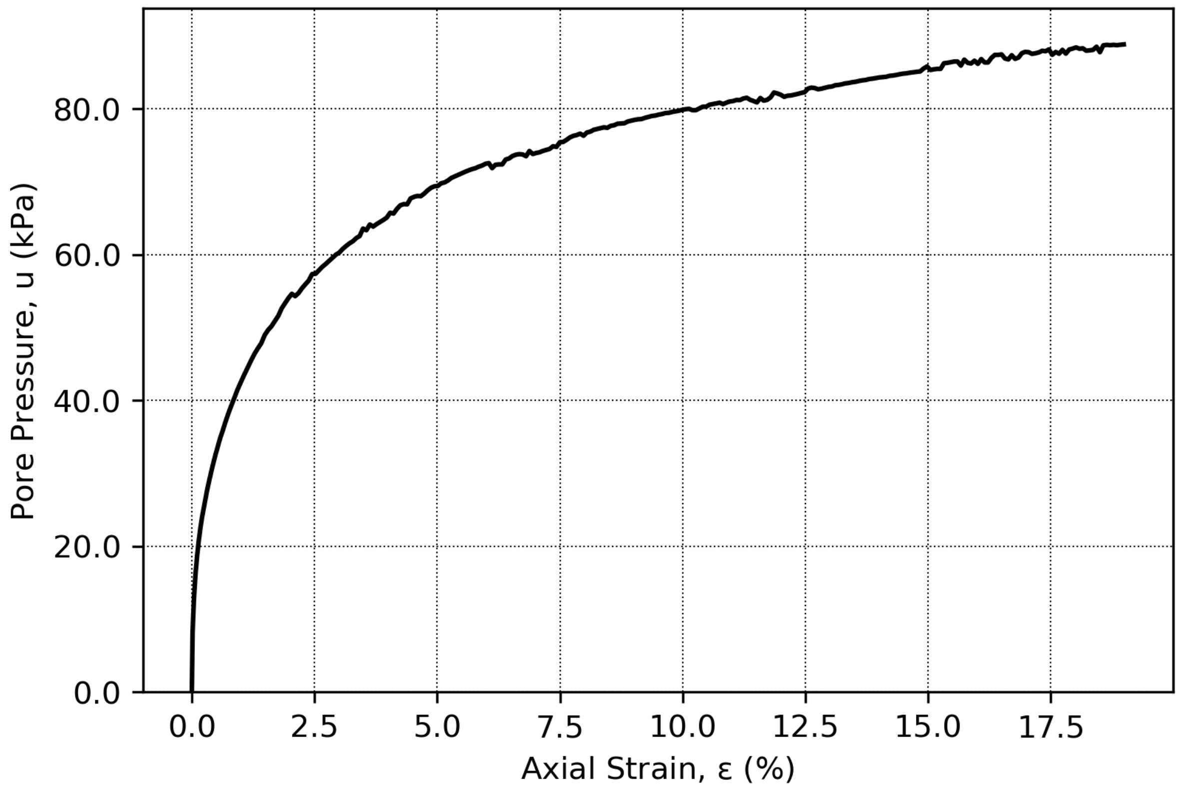
P:\2016\01\20160154\Lab\Onsøy\Triax



P:\2016\01\20160154\Lab\Onsøy\Triax

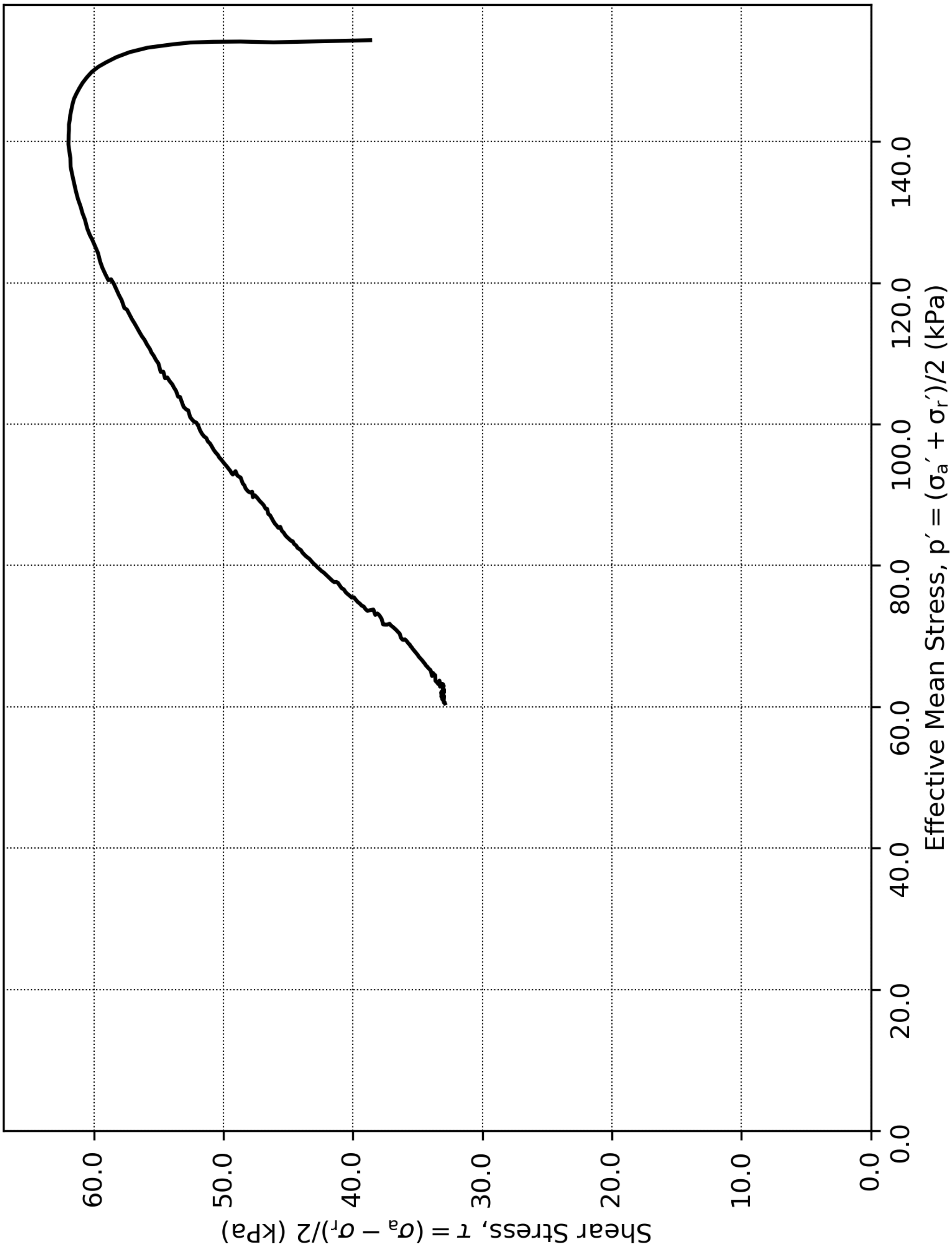
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.189
Boring:	ONSB34	Depth	= 25.05	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S7	p_0'	= 155.8	kPa	(kPa)	max.	min.	final	
Part:	2	w_i	= 38.3	%	σ_{ac}'	-	-	155.9	
Test:	1	w_c	= 34.1	%	σ_{rc}'	-	-	93.5	





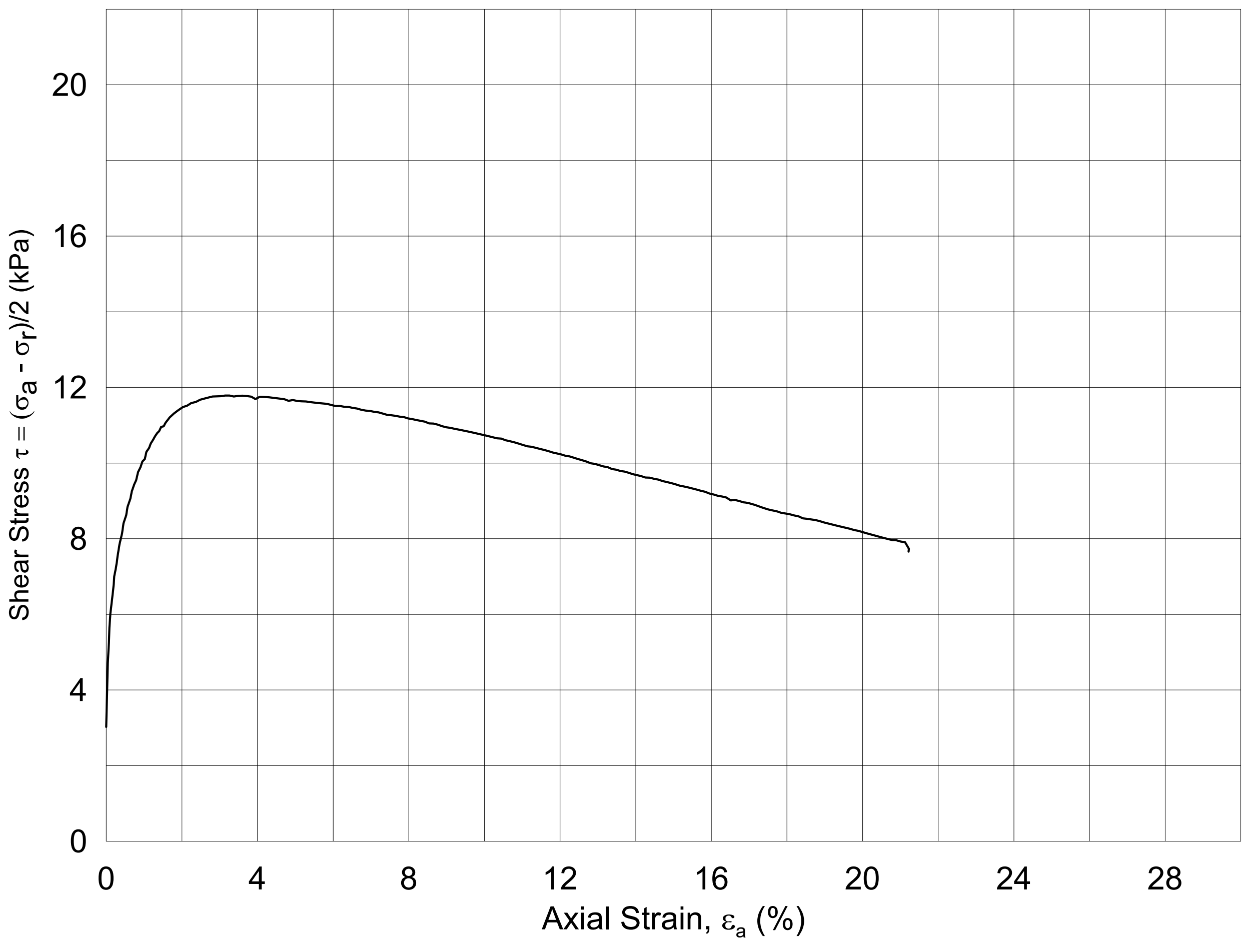
P:\2016\01\20160154\Lab\Onsøy\Triax

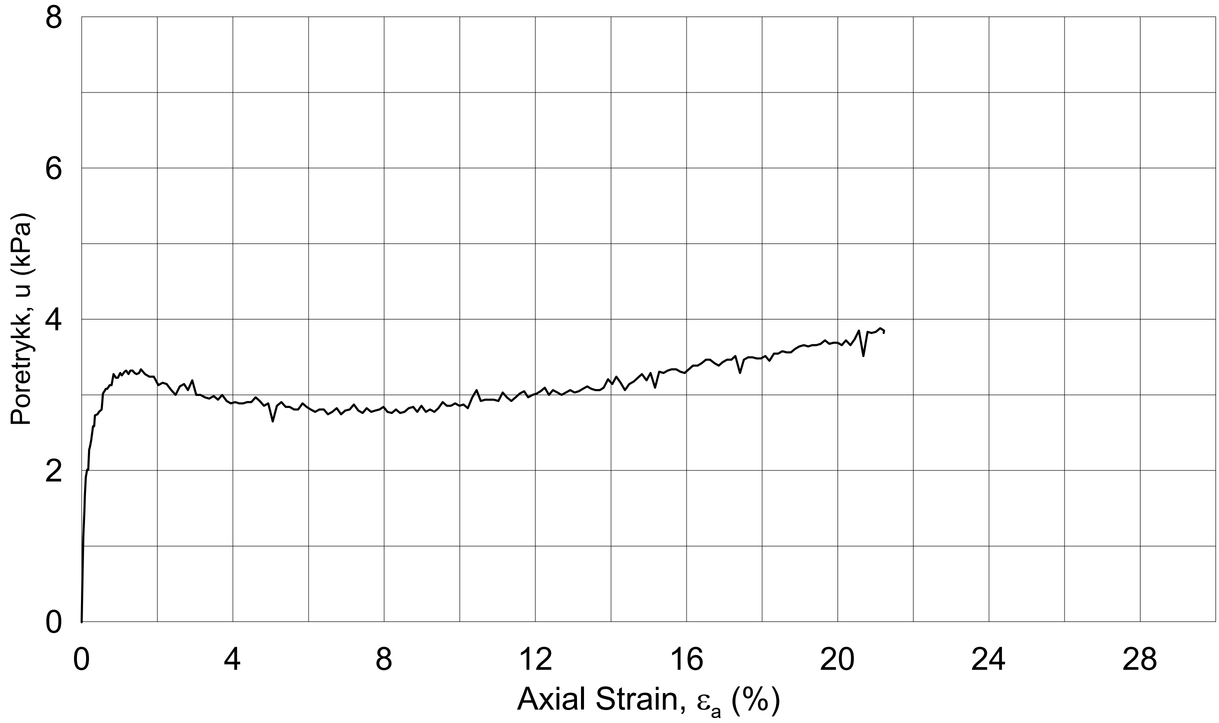
Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: CAUC									Figure No. 5.3.190
Boring:	ONSB34	Depth	= 26.56	m	Consolidation stresses				Date 2018-12-10 / Drawn by AGu
Tube:	S7	p_0'	= 193.4	kPa	(kPa)	max.	min.	final	
Part:	4	w_i	= 42.7	%	σ_{ac}'	-	-	193.3	
Test:	1	w_c	= 38.0	%	σ_{rc}'	-	-	116.1	



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R	
Triaxial test: CAUC								Figure No. 5.3.191	
Boring:	ONSB34	Depth	= 26.56	m	Consolidation stresses			Date 2018-12-10	Drawn by AGu
Tube:	S7	p_0'	= 193.4	kPa	(kPa)	max.	min.	final	
Part:	4	w_i	= 42.7	%	σ_{ac}'	-	-	193.3	
Test:	1	w_c	= 38.0	%	σ_{rc}'	-	-	116.1	

P:\2016\01\20160154\Lab\Onsøy\Triax





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.192

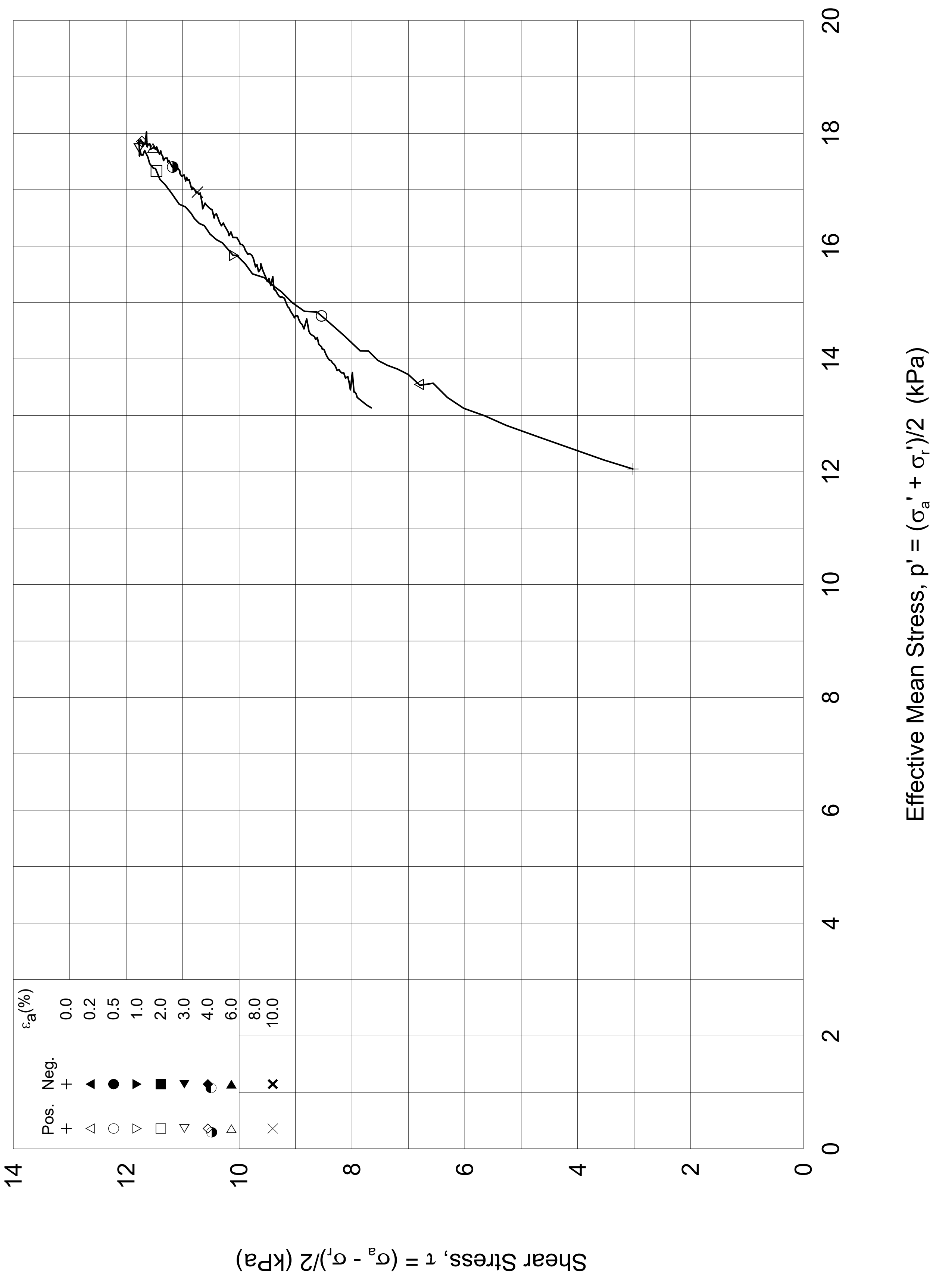
Date 2018-12-10

Drawn by/checked ThV / GS

Triaxial test: **CAUC**

Boring:	**ONSB41**	Depth =	**3.34**	m		Consolidation stresses			
Tube:	**4**	po' =	**15.0**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**66.1**	%	σ_{ac}' =	-	-	**15.0**
Test:	**1**	w_c =	**65.6**	%	σ_{rc}' =	-	-	**9.0**

ONSB41-4-B-1.Plot1.grf

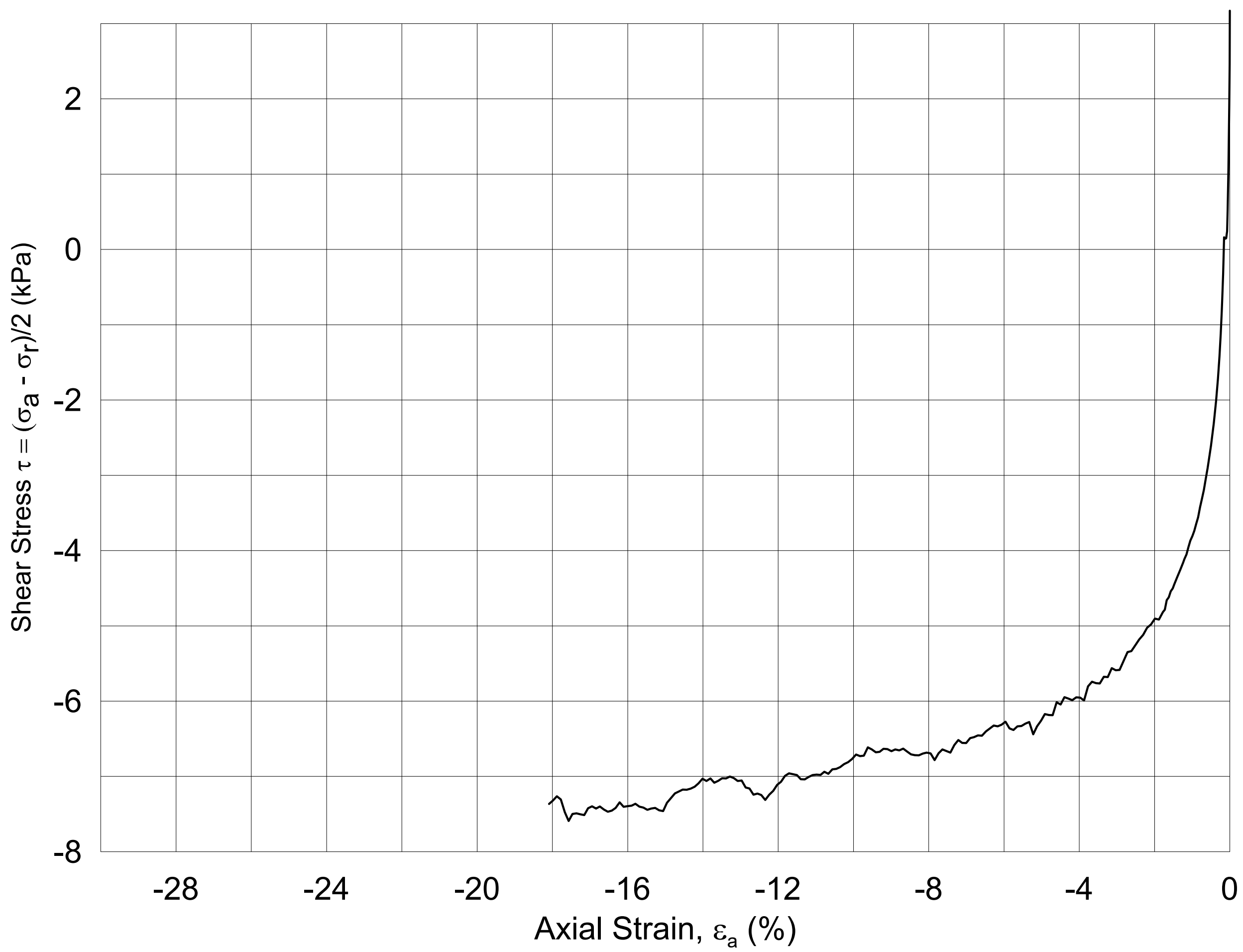


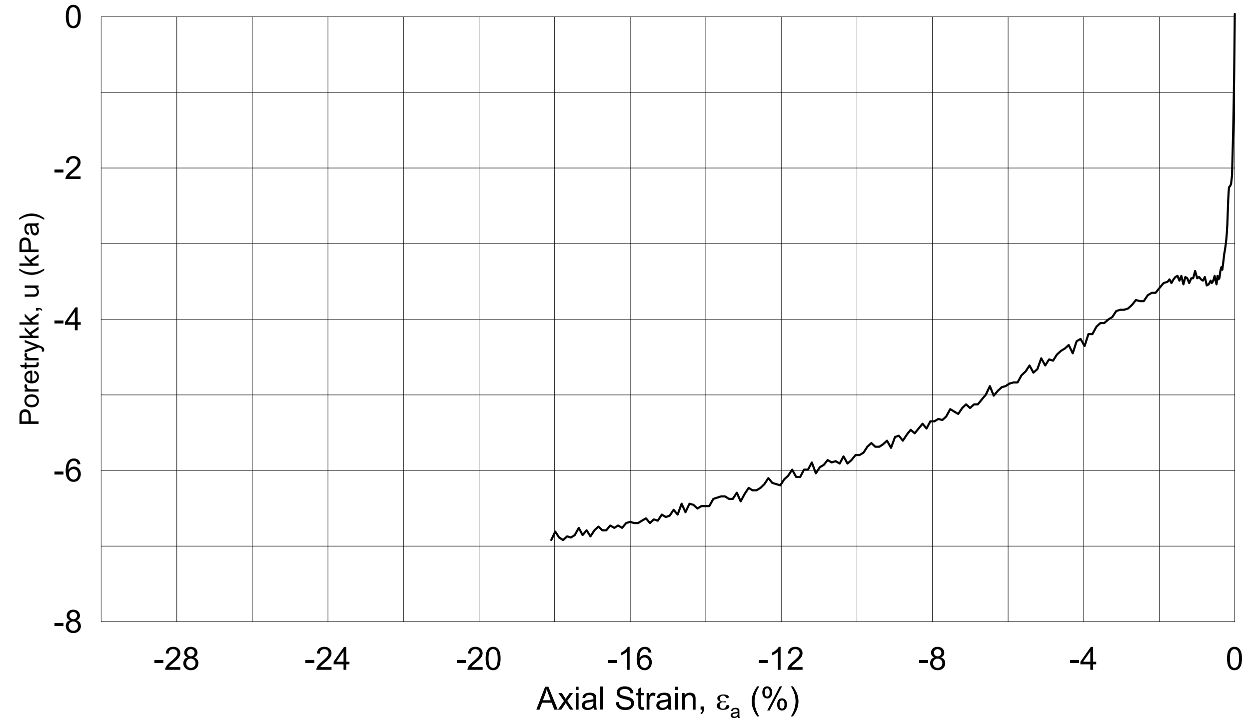
Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**										Document No. 20160154-10-R
										Figure No. 5.3.193
Boring:	**ONSB41**	Depth =	**3.34**	m	Consolidation stresses					Date 2018-12-10 / Drawn by/checked ThV / GS
Tube:	**4**	po' =	**15.0**	kPa	(kPa)		max.	min.	final	
Part:	**B**	w_i =	**66.1**	%	σ_{ac}' =		-	-	**15.0**	
Test:	**1**	w_c =	**65.6**	%	σ_{rc}' =		-	-	**9.0**	

ONSB41-4-B-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.194

Triaxial test: **CAUC**

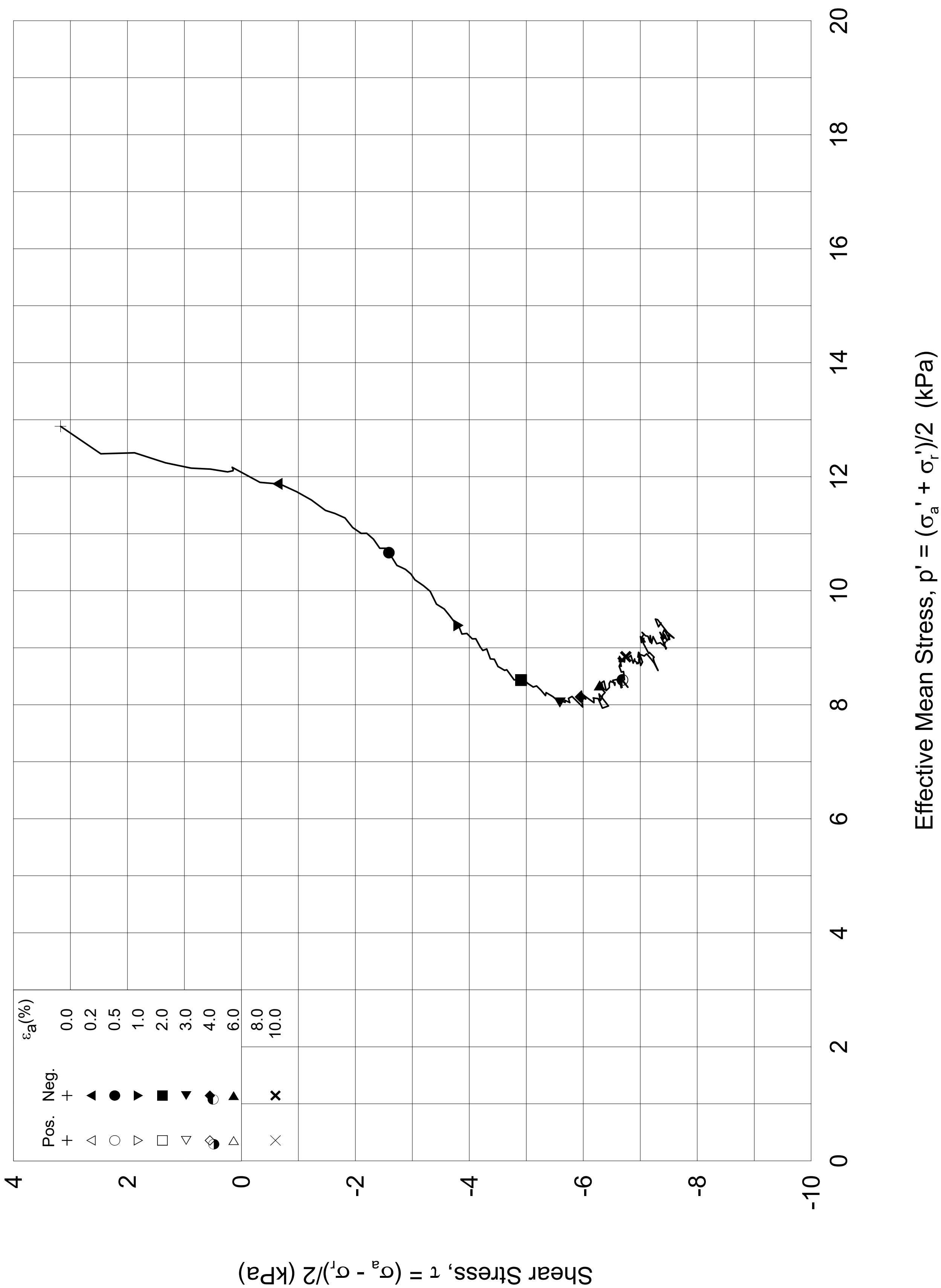
Boring:	**ONSB41**	Depth =	**3.48**	m	Consolidation stresses			
Tube:	**4**	po' =	**16.1**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**68.6**	%	σ_{ac}' =	-	-	**16.2**
Test:	**1**	w_c =	**68.0**	%	σ_{rc}' =	-	-	**9.7**

Date 2018-12-10

Drawn by/checked ThV / GS

NGI

ONSB41-4-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.195

Triaxial test: **CAUC**

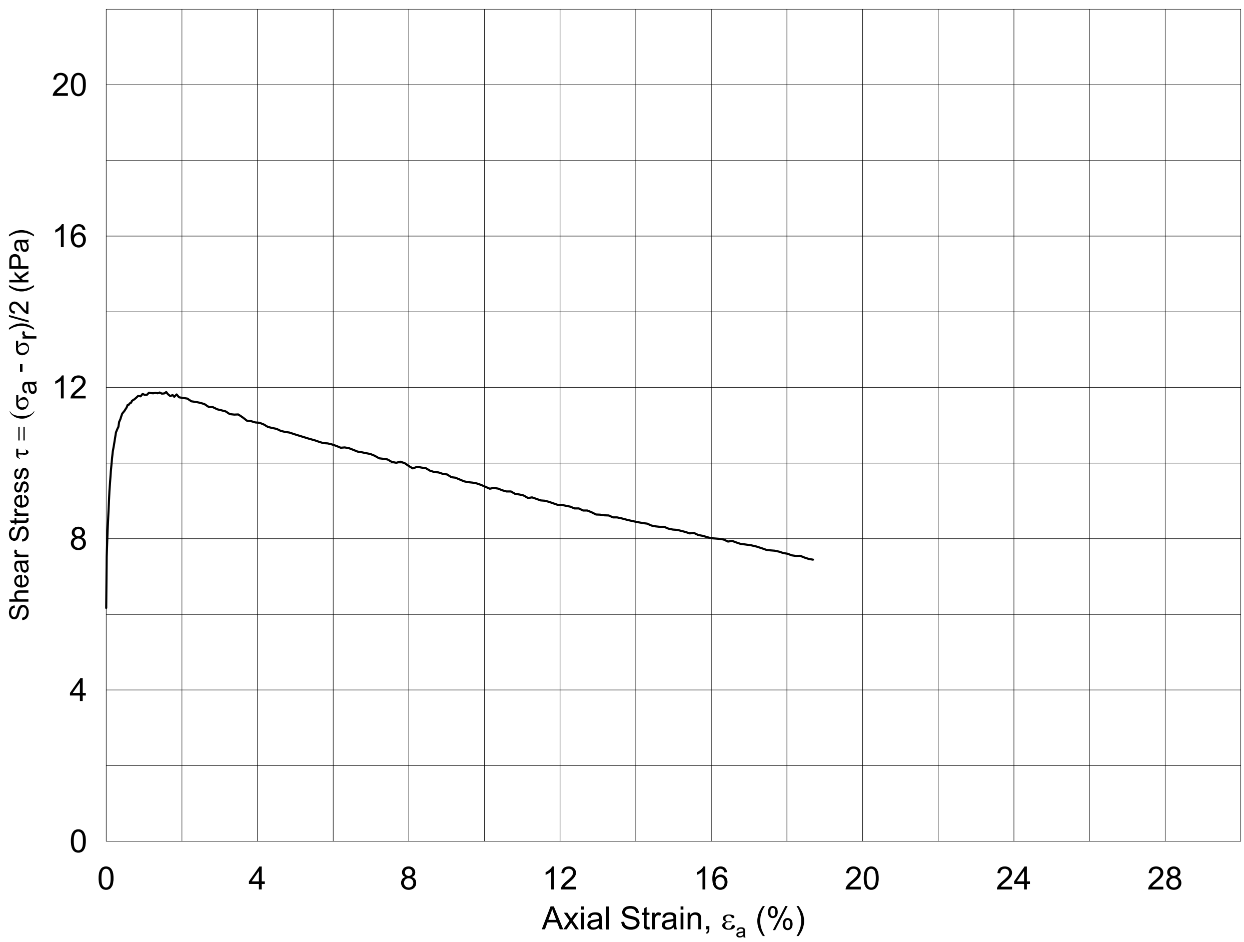
Date 2018-12-10

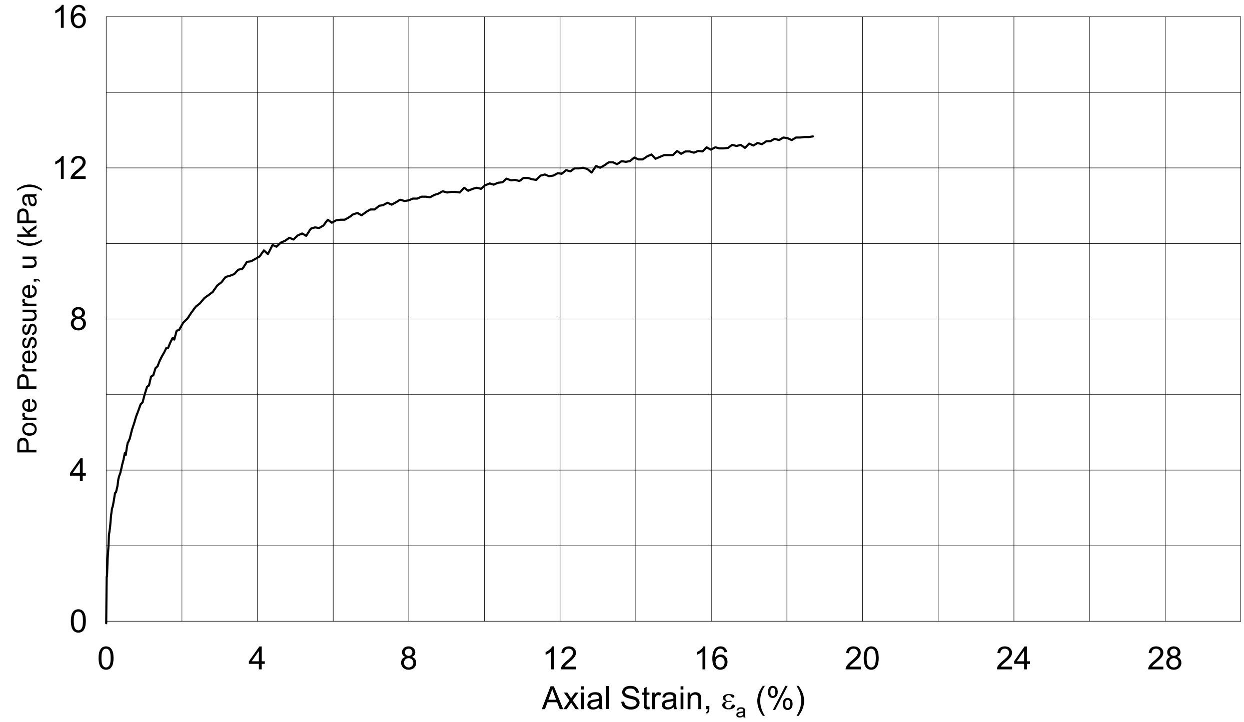
Drawn by/checked ThV / GS

Boring:	**ONSB41**	Depth =	**3.48**	m	Consolidation stresses			
Tube:	**4**	po' =	**16.1**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**68.6**	%	σ_{ac}' =	-	-	**16.2**
Test:	**1**	w_c =	**68.0**	%	σ_{rc}' =	-	-	**9.7**

NGI

ONSB41-4-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**								
Boring:	**ONSB41**	Depth =	**5.47**	m	Consolidation stresses			
Tube:	**6**	po' =	**30.7**	kPa	(kPa)	max.	min.	final
Part:	**D**	w_i =	**76.4**	%	σ_{ac}' =	-	-	**30.7**
Test:	**1**	w_c =	**72.0**	%	σ_{rc}' =	-	-	**18.3**

Document No. 20160154-10-R

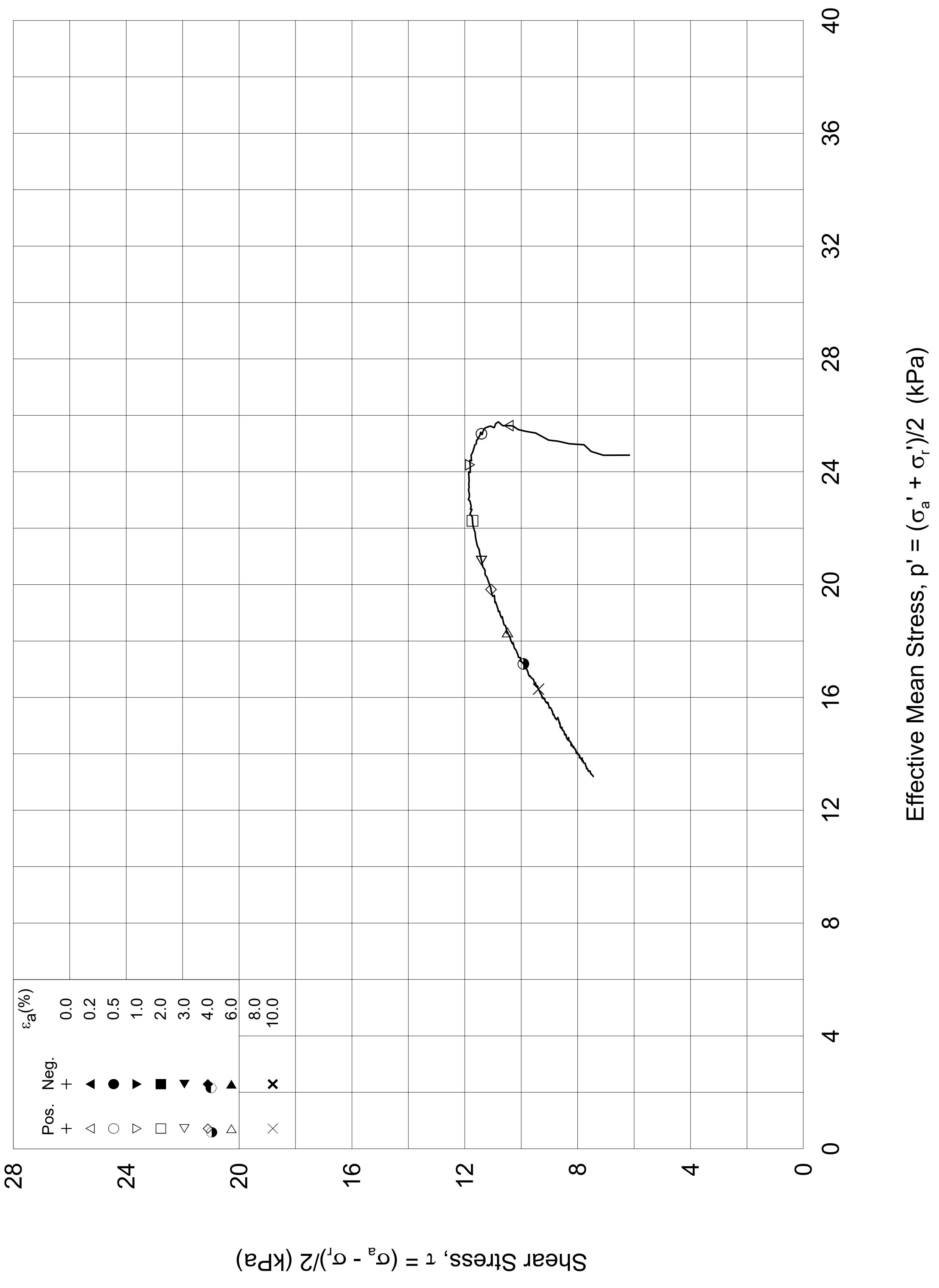
Figure No. 5.3.196

Date 2018-12-10

Drawn by/checked ThV / GS

NGI

ONSB41-6-D-1.Plot1.grf

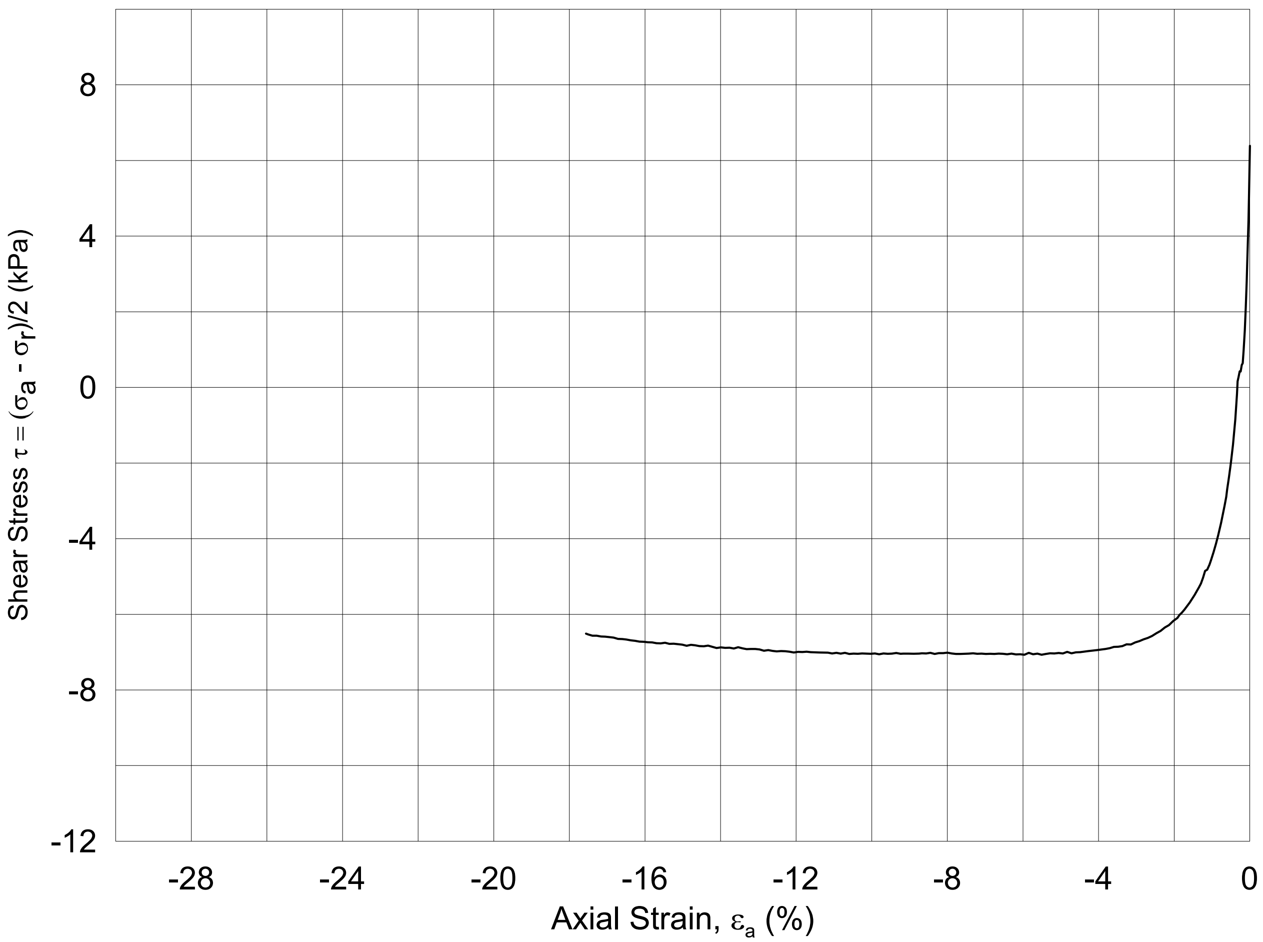


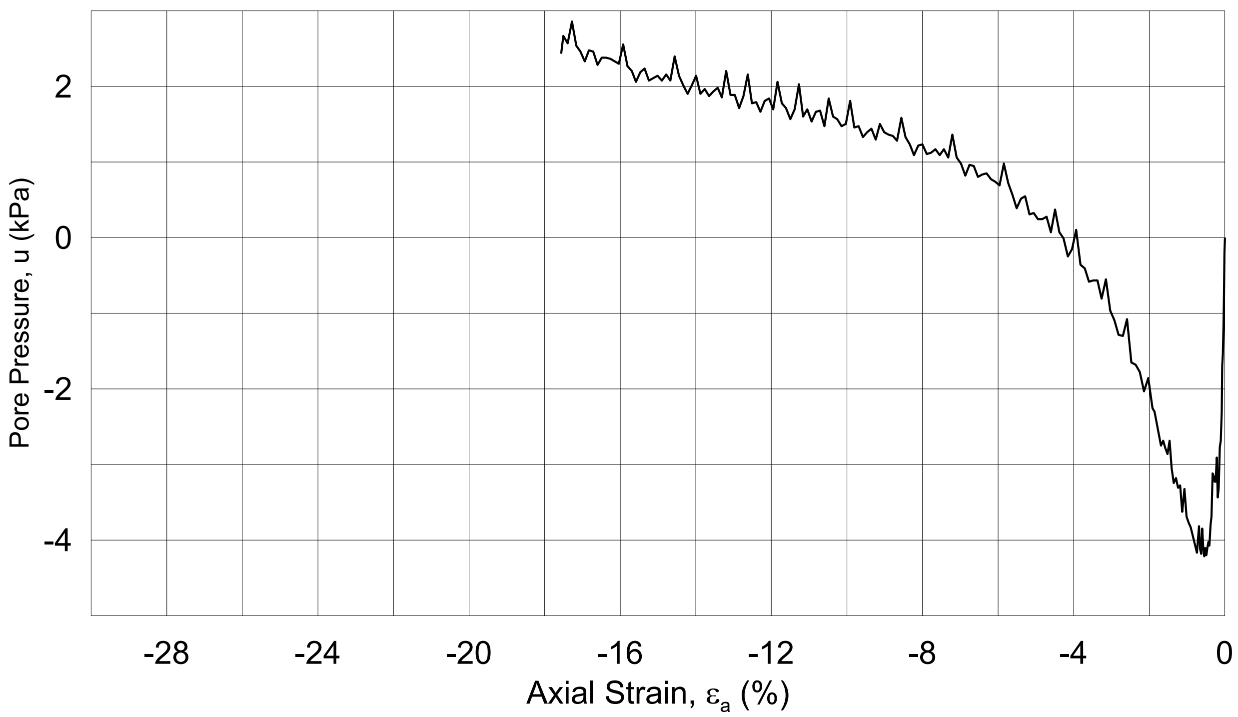
Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**			Document No. 20160154-10-R	
			Figure No. 5.3.197	
Boring: **ONSB41**	Depth = **5.47** m	Consolidation stresses	Date 2018-12-10	Drawn by/checked ThV / GS
Tube: **6**	po' = **30.7** kPa	(kPa) max. min. final		
Part: **D**	w_i = **76.4** %	σ_{ac}' = - - **30.7**		
Test: **1**	w_c = **72.0** %	σ_{rc}' = - - **18.3**		

ONSB41-6-D-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUE**									
Boring:	**ONSB41**	Depth =	**5.63**	m	Consolidation stresses				
Tube:	**6**	po' =	**31.9**	kPa	(kPa)	max.	min.	final	
Part:	**E**	w_i =	**79.7**	%	σ_{ac}' =	-	-	**31.7**	
Test:	**1**	w_c =	**75.0**	%	σ_{rc}' =	-	-	**19.1**	

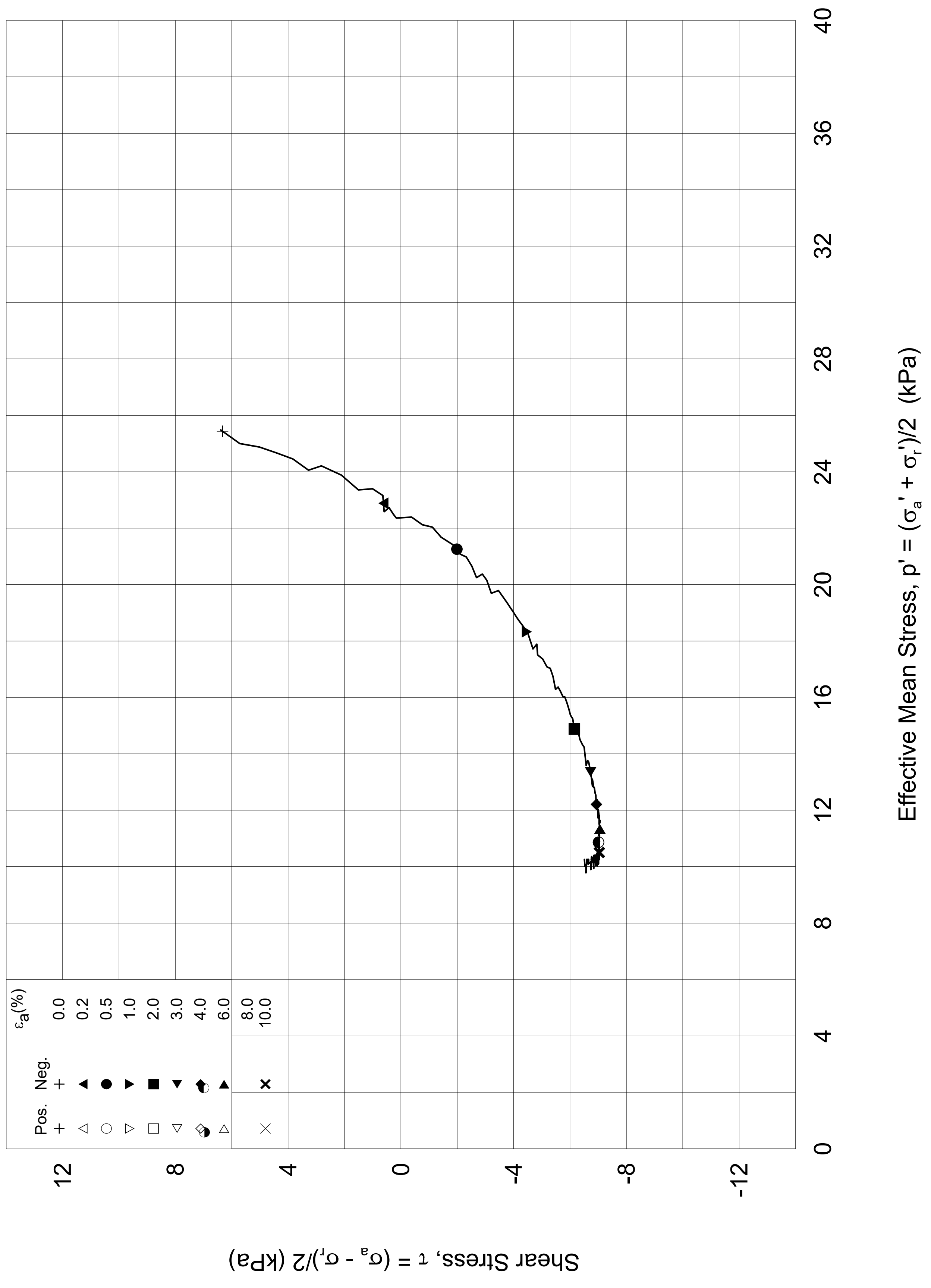
Document No. 20160154-10-R

Figure No. 5.3.198

Date 2018-12-10

Drawn by/checked ThV / GS

ONSB41-6-E-1.Plot1.grf

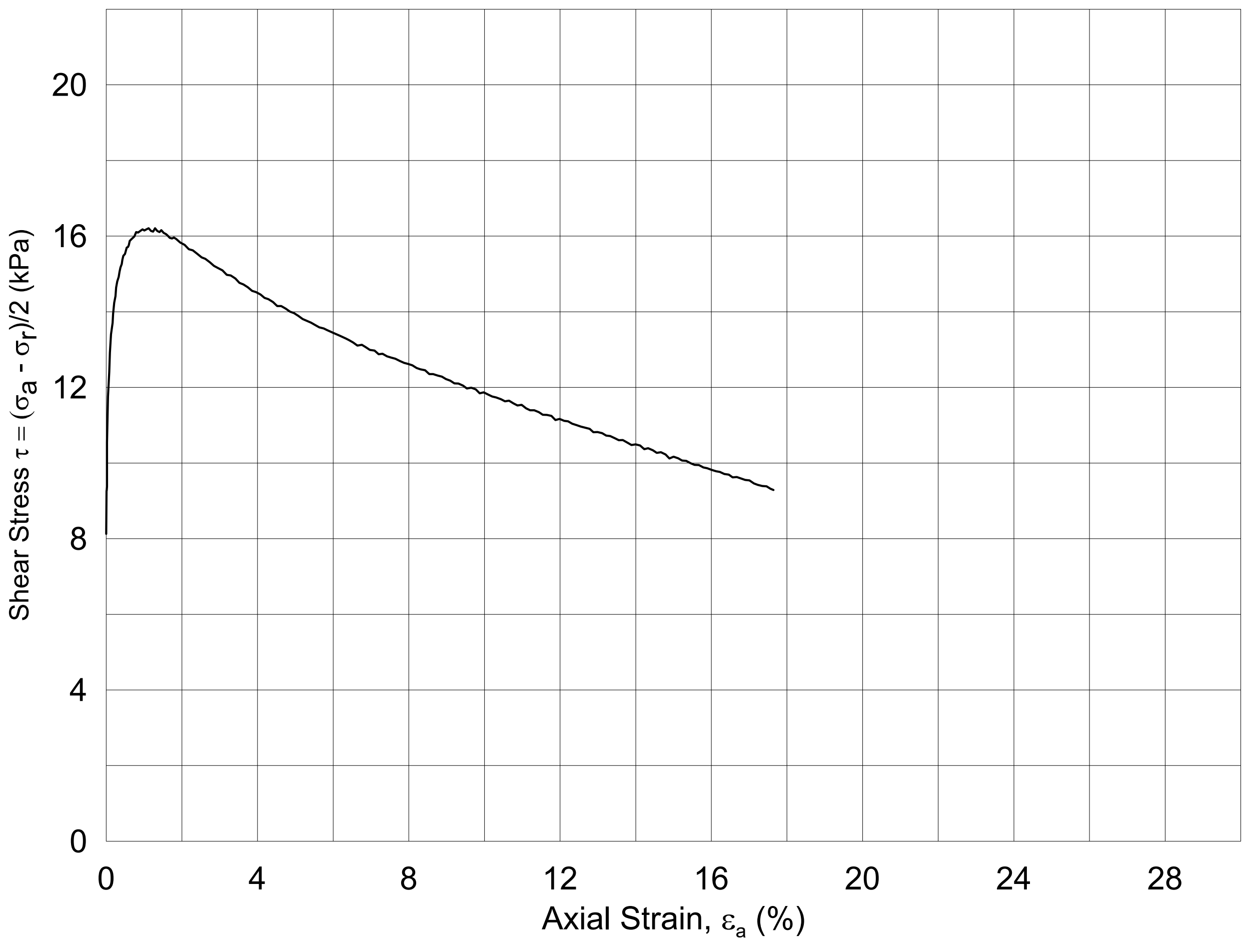


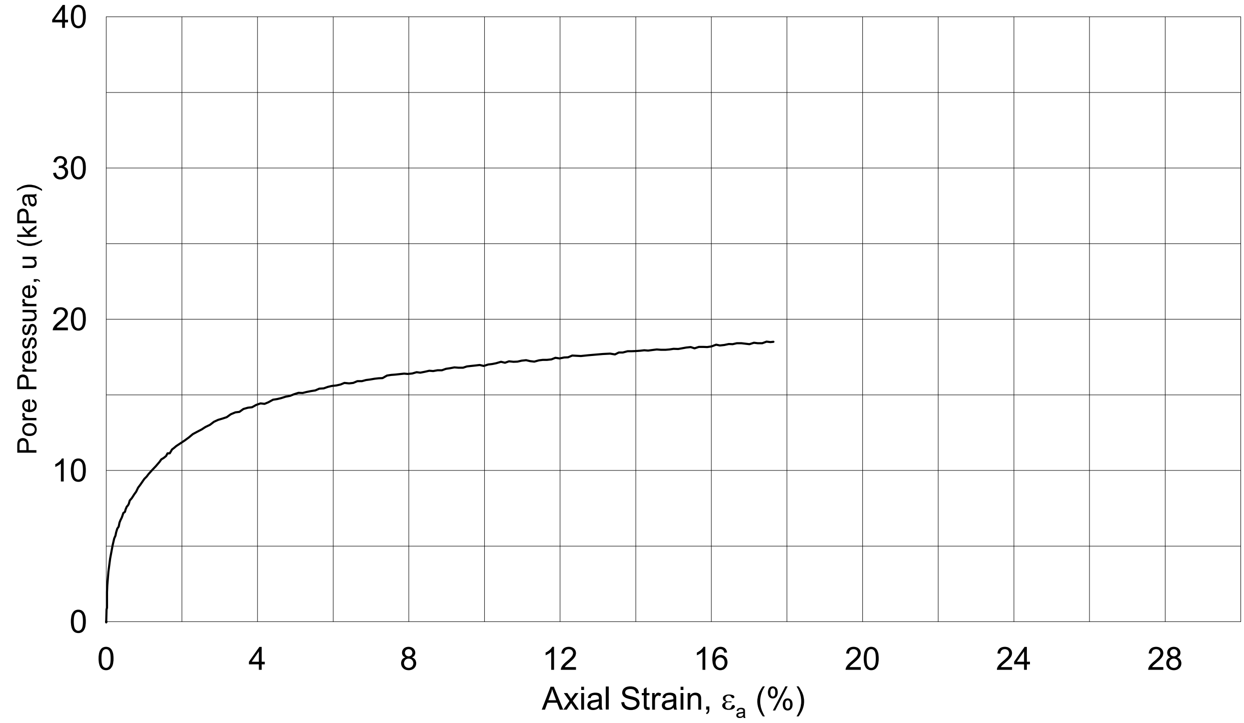
Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUE**										Document No. 20160154-10-R
										Figure No. 5.3.199
Boring:	**ONSB41**	Depth =	**5.63**	m	Consolidation stresses					Date 2018-12-10 / Drawn by/checked ThV / GS
Tube:	**6**	po' =	**31.9**	kPa	(kPa)		max.	min.	final	
Part:	**E**	w_i =	**79.7**	%	σ_{ac}' =		-	-	**31.7**	
Test:	**1**	w_c =	**75.0**	%	σ_{rc}' =		-	-	**19.1**	

ONSB41-6-E-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.200

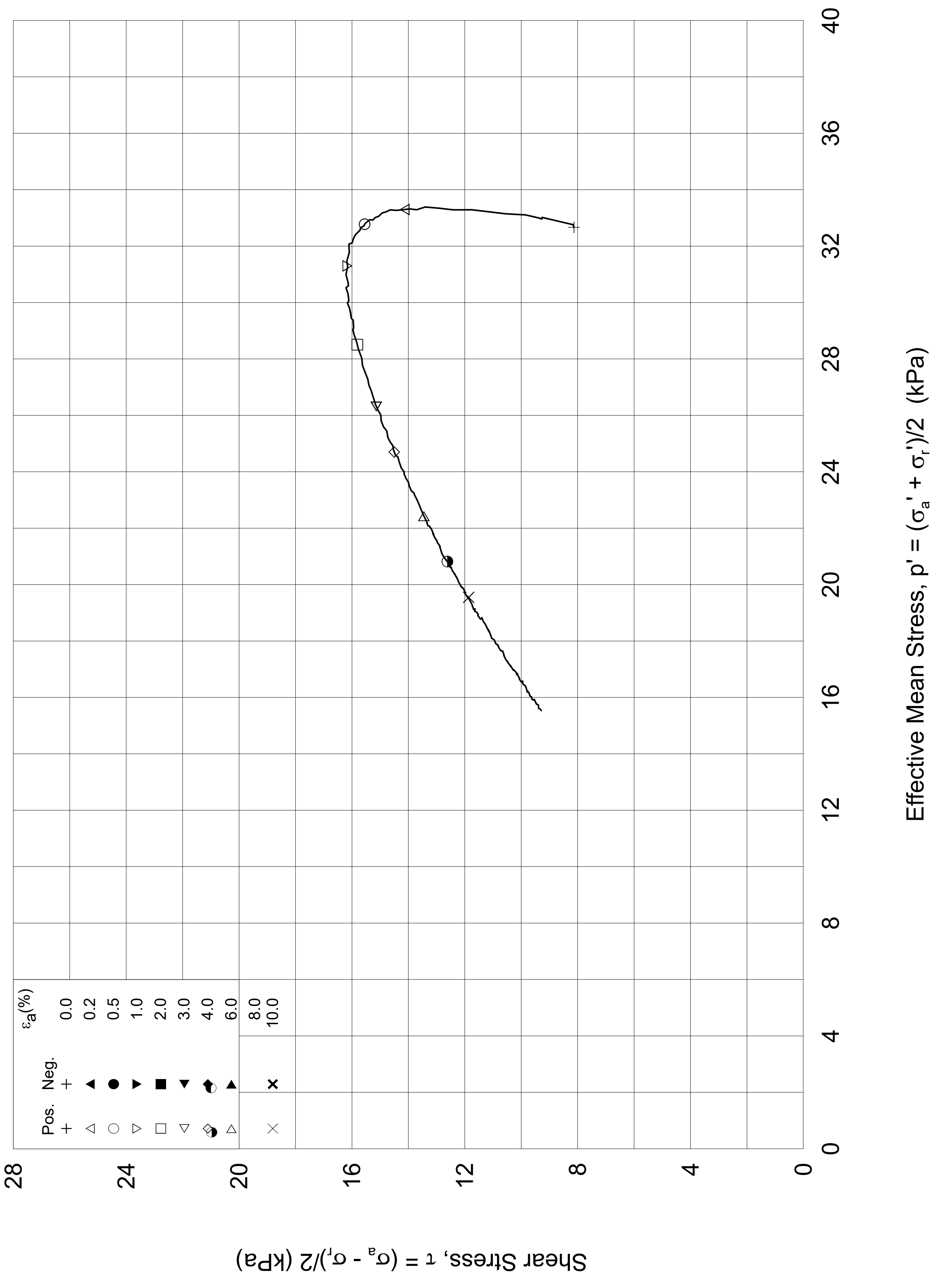
Triaxial test: **CAUC**

Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB41**	Depth =	**6.84**	m		Consolidation stresses			
Tube:	**8**	po' =	**40.8**	kPa	(kPa)	max.	min.	final	
Part:	**B**	w_i =	**70.4**	%	σ_{ac}' =	-	-	**40.8**	
Test:	**1**	w_c =	**68.2**	%	σ_{rc}' =	-	-	**24.5**	

ONSB41-8-B-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.201

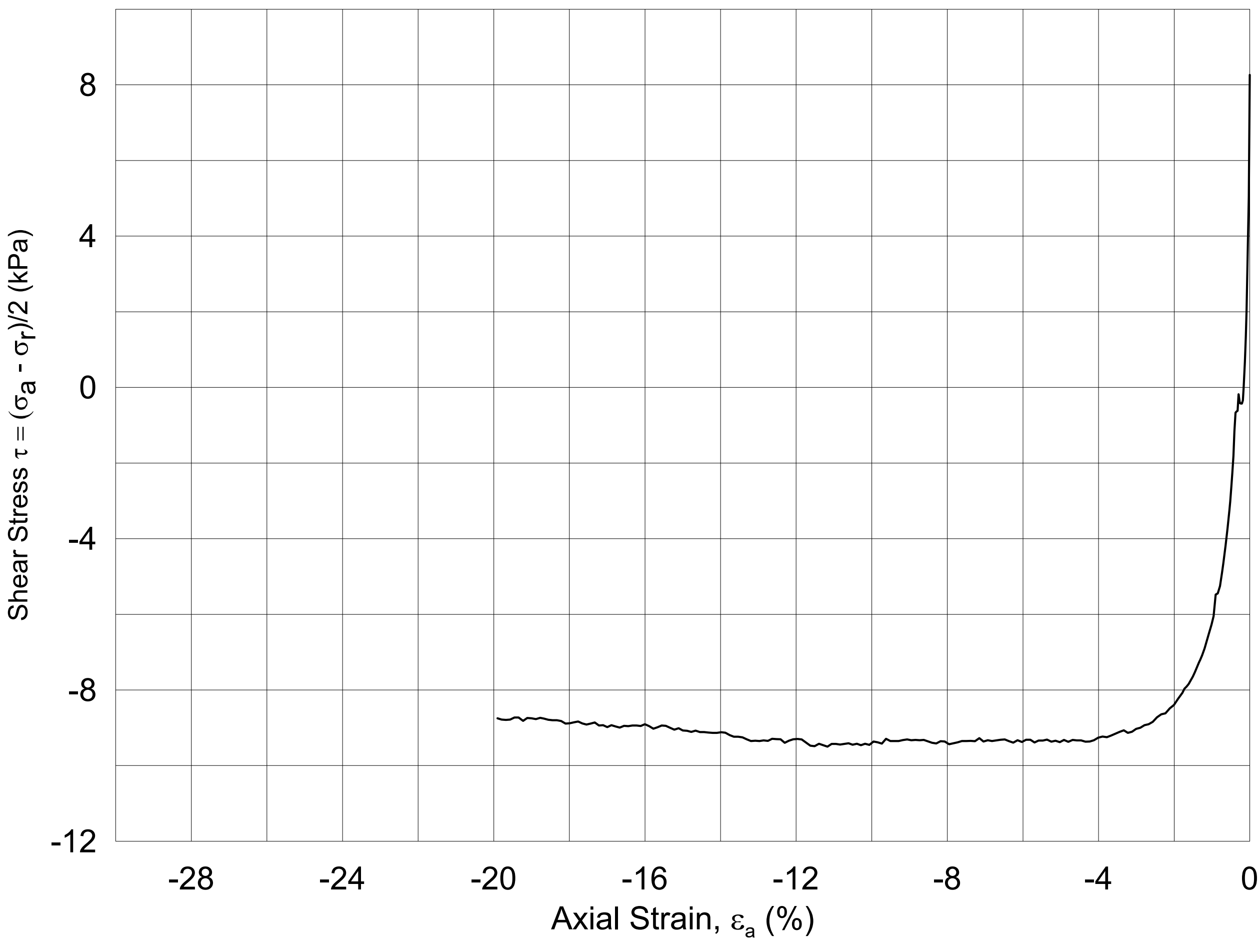
Triaxial test: **CAUC**

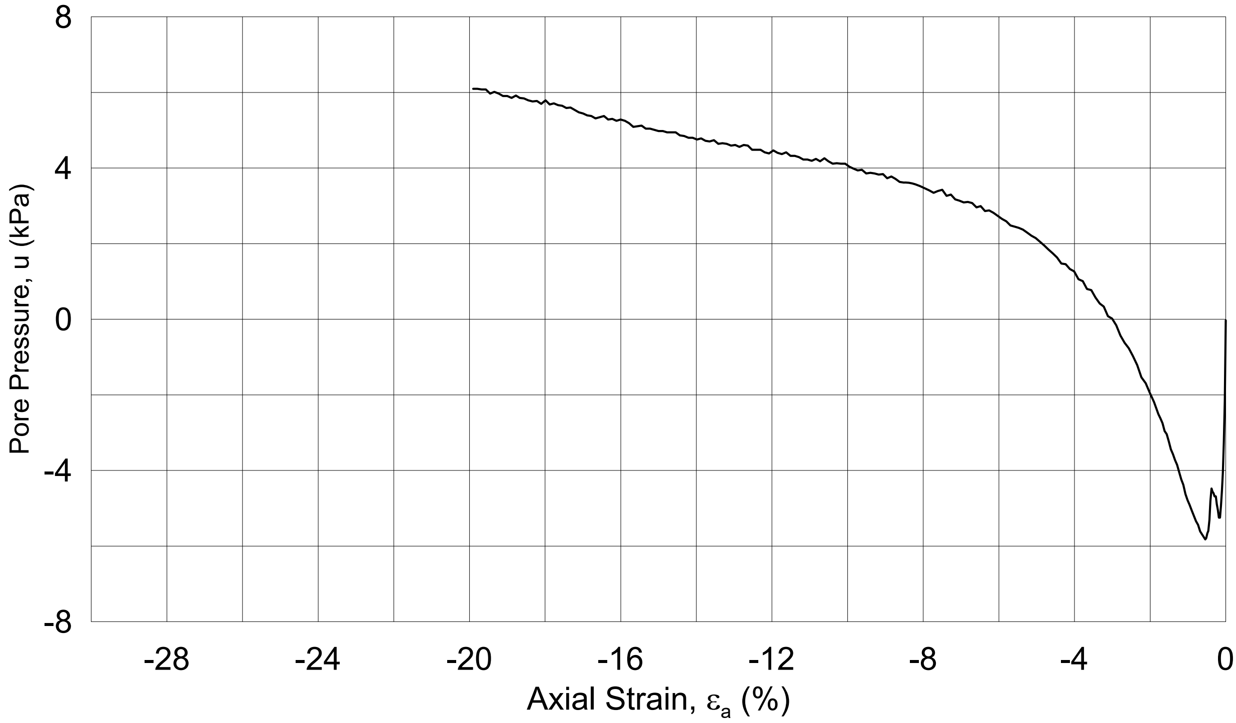
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB41**	Depth =	**6.84**	m	Consolidation stresses			
Tube:	**8**	po' =	**40.8**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**70.4**	%	σ_{ac}' =	-	-	**40.8**
Test:	**1**	w_c =	**68.2**	%	σ_{rc}' =	-	-	**24.5**

ONSB41-8-B-1.Plot2.grf

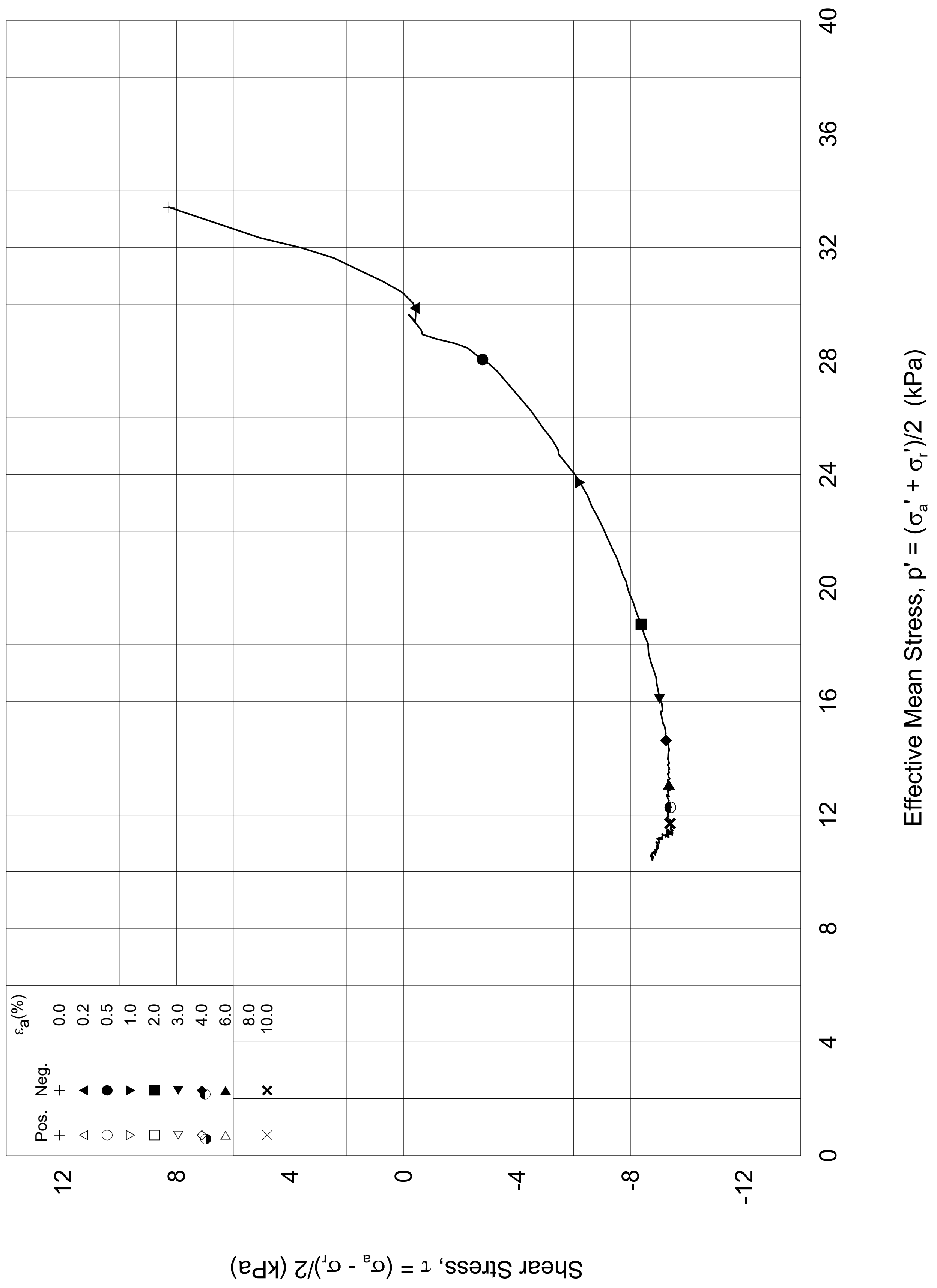




Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: **CAUE**									Figure No. 5.3.202
Boring:	**ONSB41**	Depth =	**6.97**	m	Consolidation stresses				Date 2018-12-10; Drawn by/checked ThV / GS
Tube:	**8**	po' =	**41.9**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**72.2**	%	σ_{ac}' =	-	-	**41.8**	
Test:	**1**	w_c =	**68.5**	%	σ_{rc}' =	-	-	**25.1**	

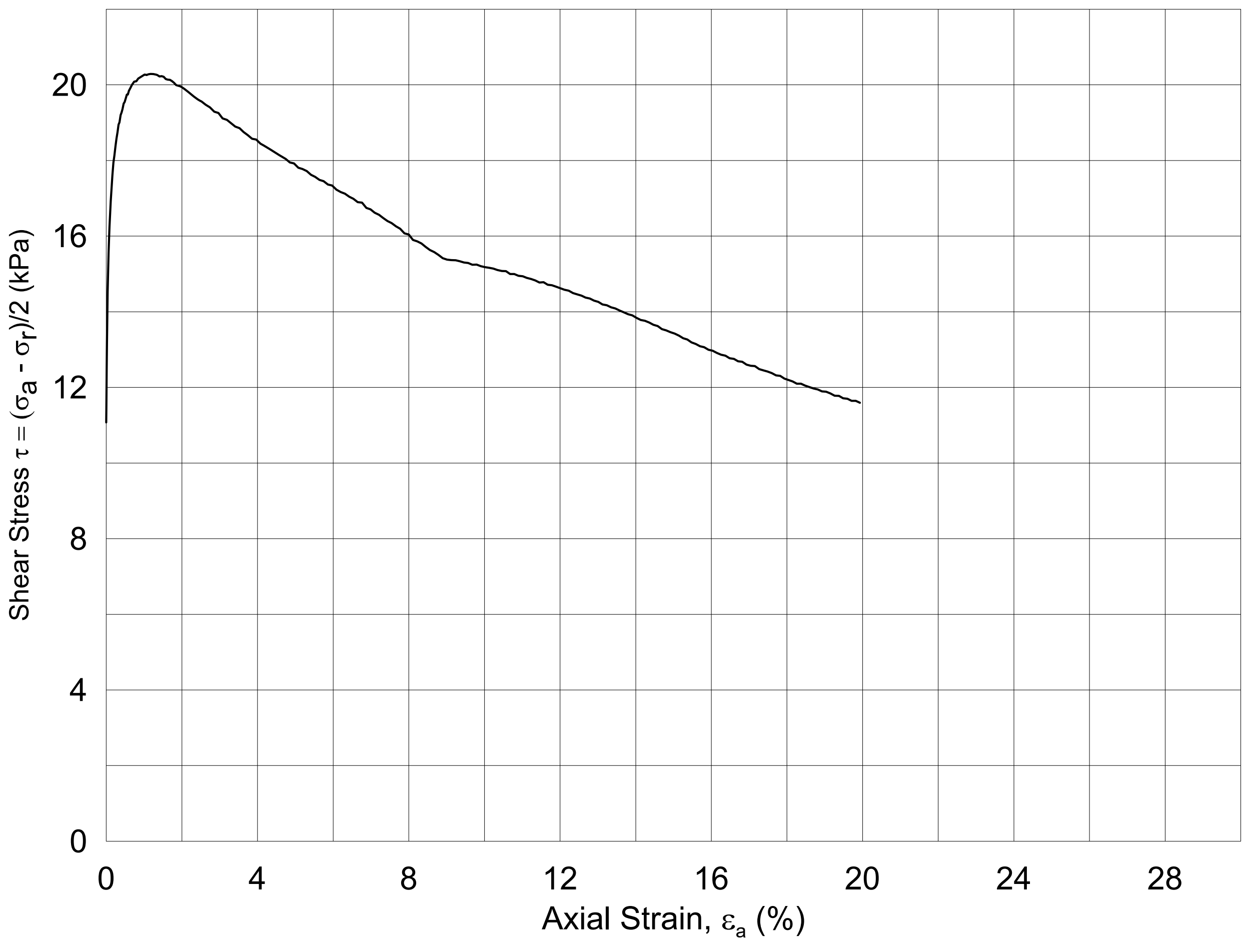
ONSB41-8-C-1.Plot1.grf

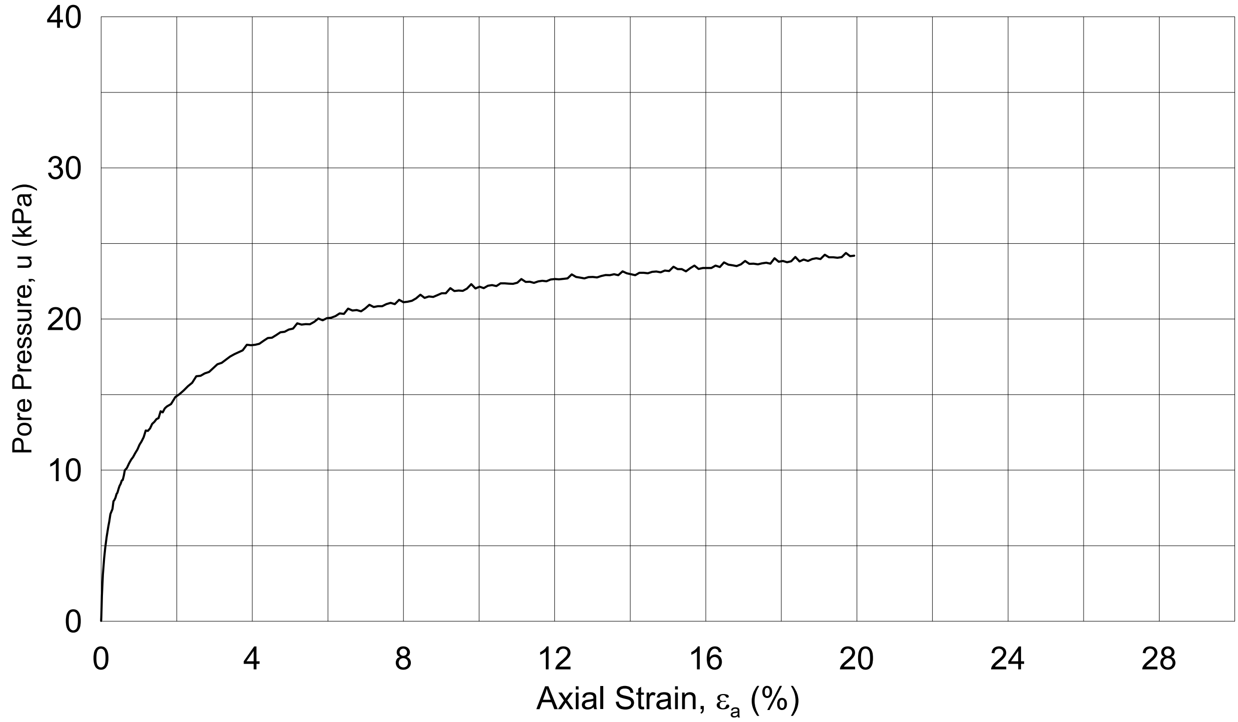


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: **CAUE**									Figure No. 5.3.203
Boring:	**ONSB41**	Depth =	**6.97**	m	Consolidation stresses				Date 2018-12-10 / Drawn by/checked ThV / GS
Tube:	**8**	po' =	**41.9**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**72.2**	%	σ_{ac}' =	-	-	**41.8**	
Test:	**1**	w_c =	**68.5**	%	σ_{rc}' =	-	-	**25.1**	

ONSB41-8-C-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.204

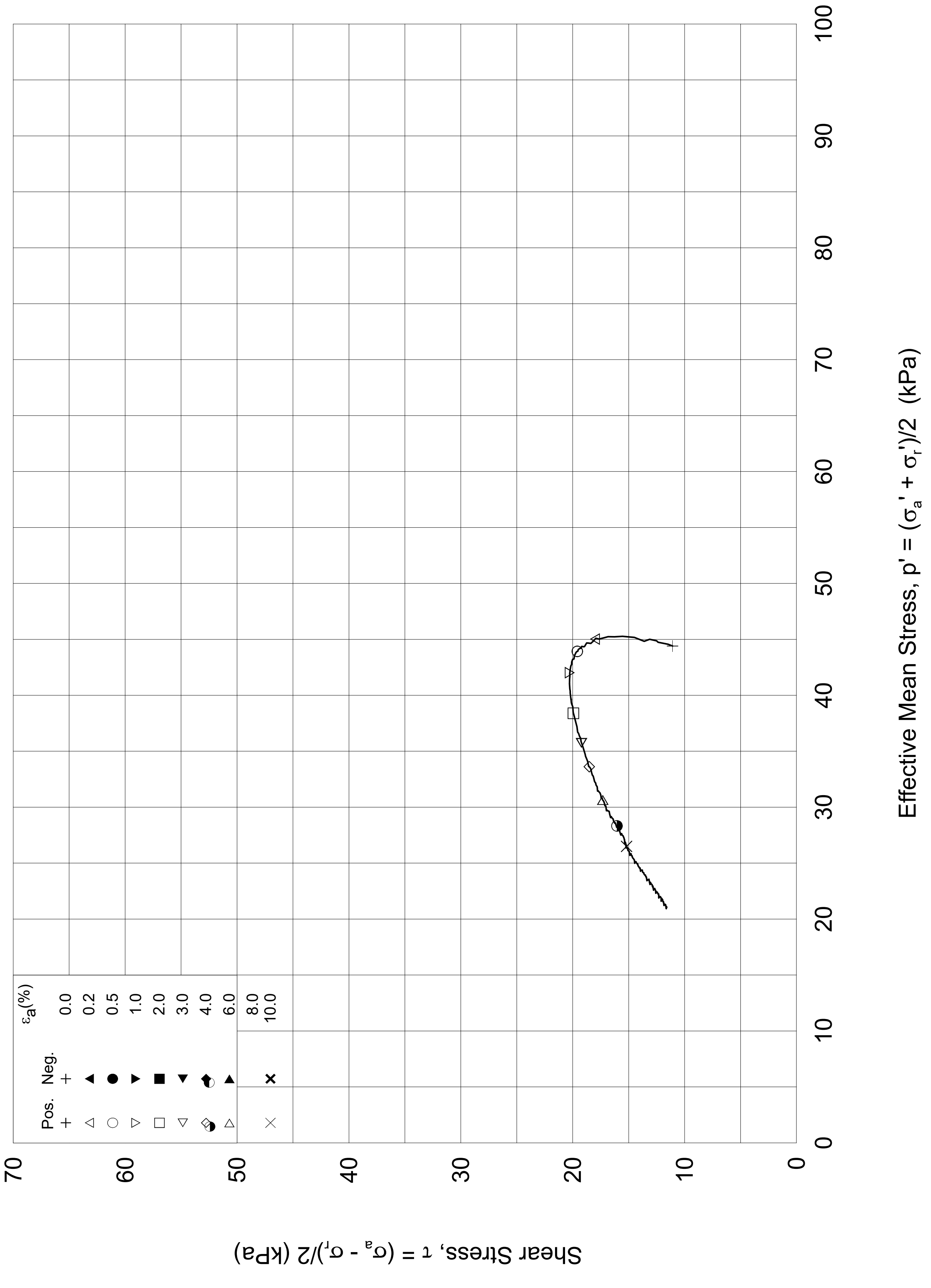
Triaxial test: **CAUC**

Boring:	**ONSB41**	Depth =	**8.87**	m	Consolidation stresses				
Tube:	**10**	po' =	**55.4**	kPa	(kPa)	max.	min.	final	
Part:	**D**	w_i =	**65.0**	%	σ_{ac}' =	-	-	**55.4**	
Test:	**1**	w_c =	**63.1**	%	σ_{rc}' =	-	-	**33.3**	

Date: 2018-12-10

Drawn by/checked: ThV / GS

ONSB41-10-D-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Triaxial test: **CAUC**

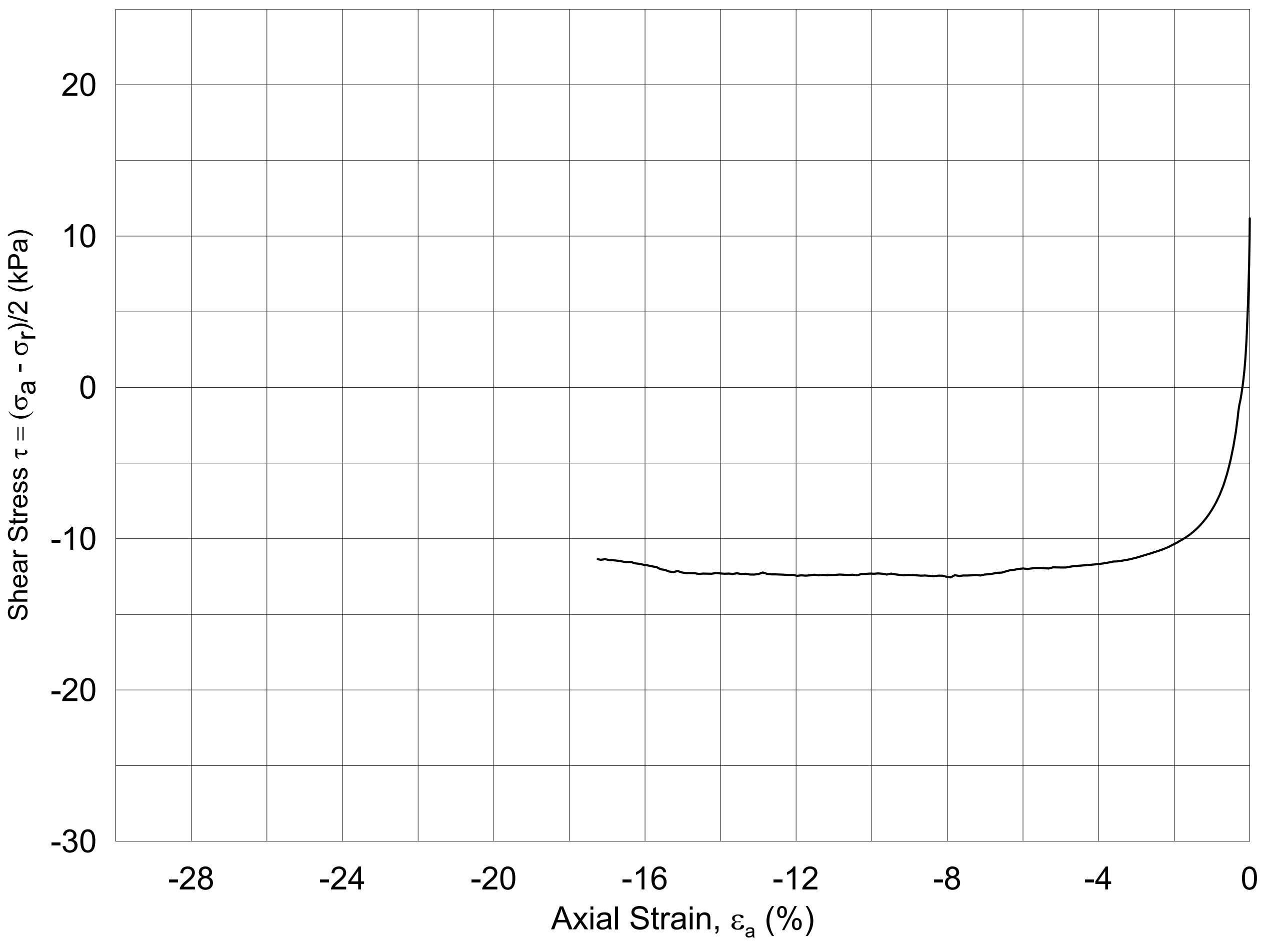
Figure No. 5.3.205

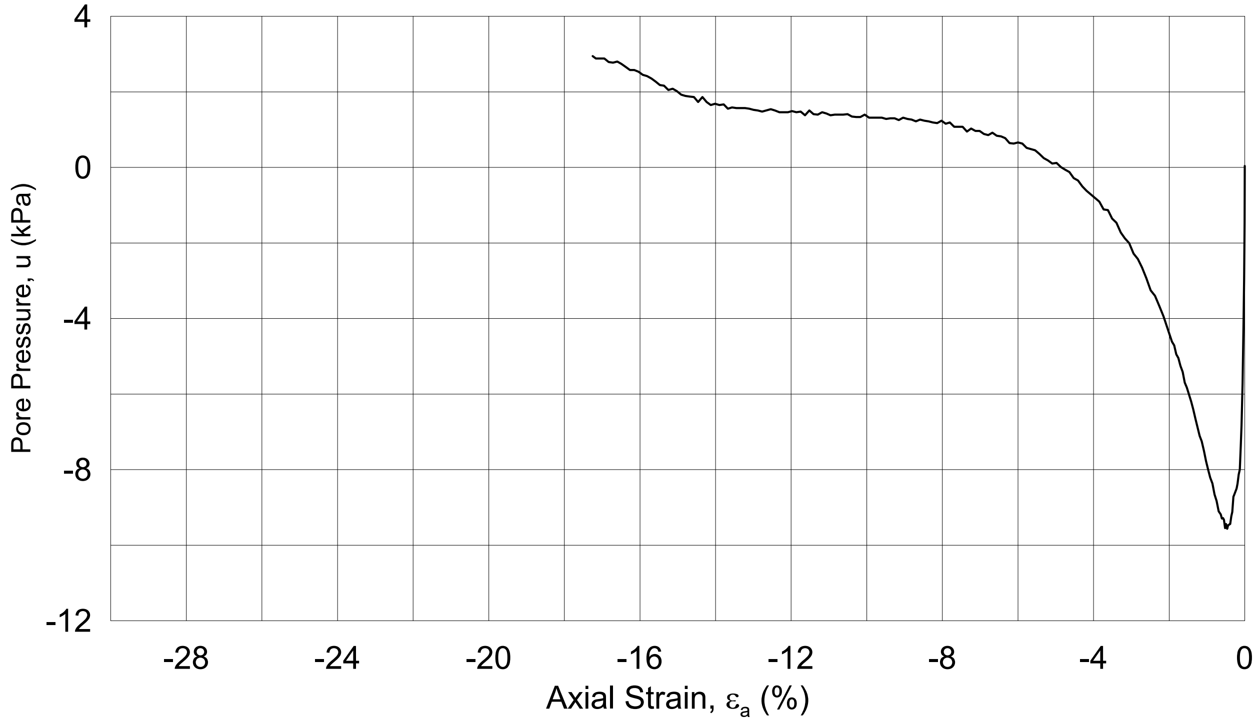
Boring:	**ONSB41**	Depth =	**8.87**	m	Consolidation stresses				
Tube:	**10**	po' =	**55.4**	kPa	(kPa)	max.	min.	final	
Part:	**D**	w_i =	**65.0**	%	σ_{ac}' =	-	-	**55.4**	
Test:	**1**	w_c =	**63.1**	%	σ_{rc}' =	-	-	**33.3**	

Date 2018-12-10

Drawn by/checked ThV / GS

ONSB41-10-D-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.206

Triaxial test: **CAUE**

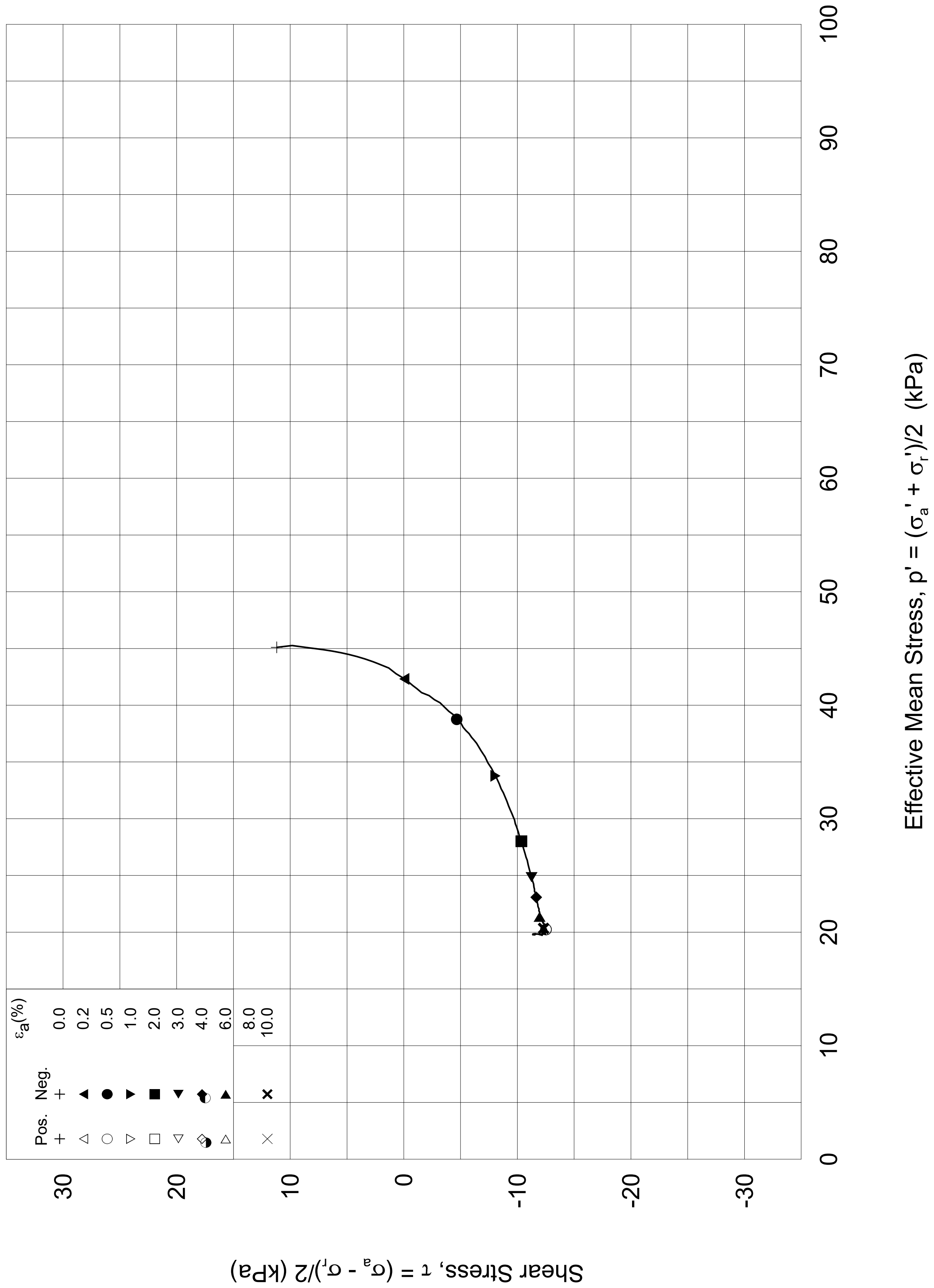
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB41**	Depth =	**9.02**	m	Consolidation stresses			
Tube:	**10**	po'	=	**56.5**	kPa	(kPa)	max.	min.	final
Part:	**E**	w_i	=	**62.4**	%	σ_{ac}' =	-	-	**56.4**
Test:	**1**	w_c	=	**58.1**	%	σ_{rc}' =	-	-	**33.9**

NGI

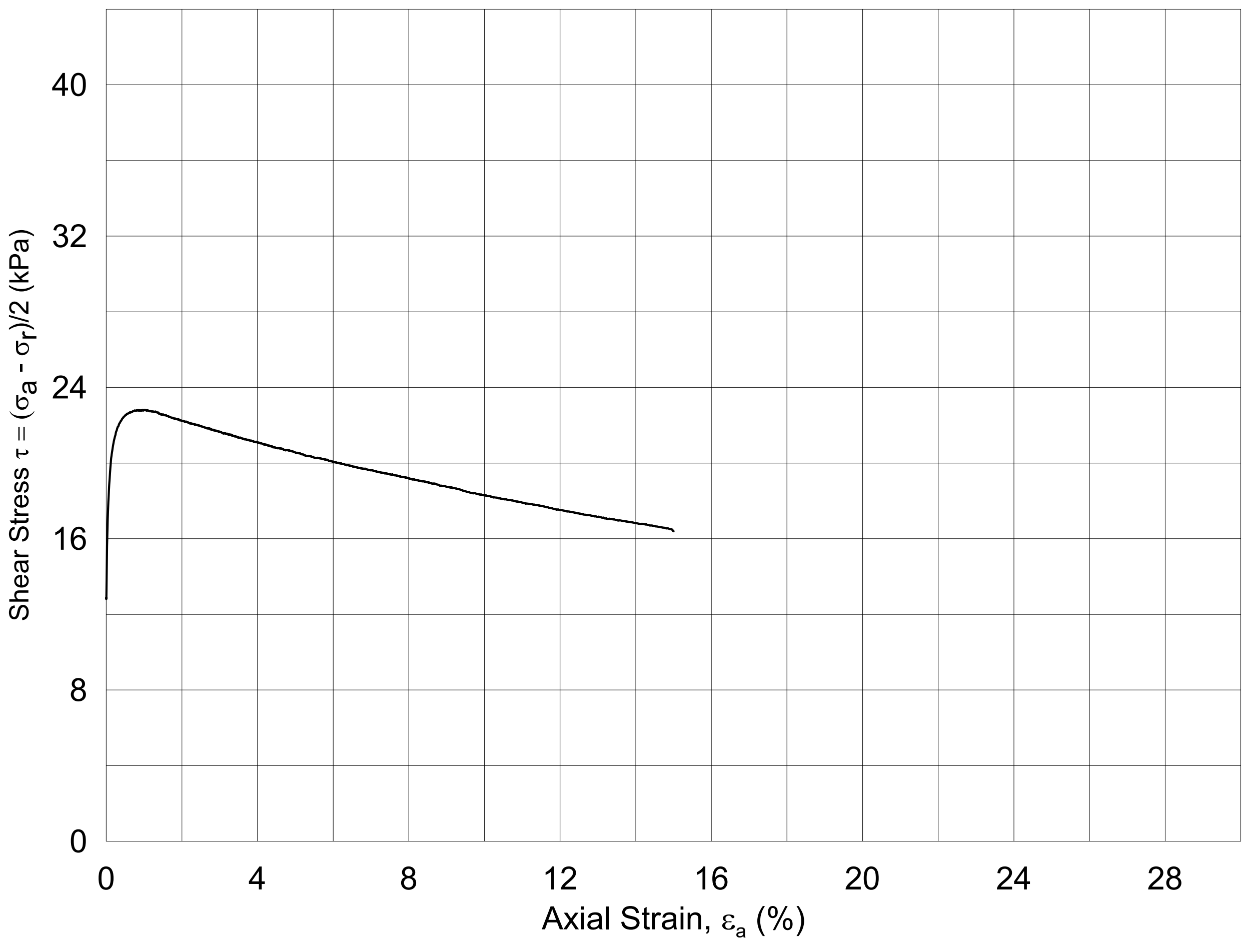
ONSB41-10-E-1.Plot1.grf

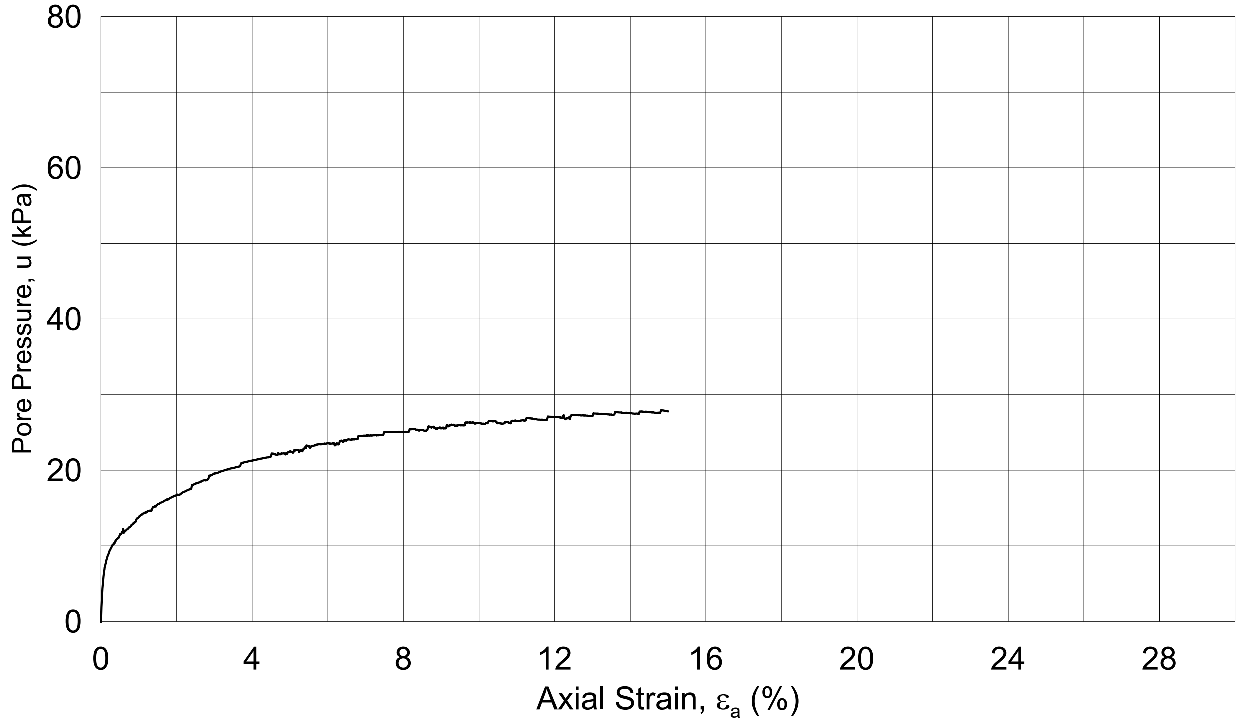


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
Triaxial test: **CAUE**									Figure No. 5.3.207
Boring:	**ONSB41**	Depth =	**9.02**	m	Consolidation stresses				Date 2018-12-10 / Drawn by/checked ThV / GS
Tube:	**10**	po' =	**56.5**	kPa	(kPa)	max.	min.	final	
Part:	**E**	w_i =	**62.4**	%	σ_{ac}' =	-	-	**56.4**	
Test:	**1**	w_c =	**58.1**	%	σ_{rc}' =	-	-	**33.9**	NGI

ONSB41-10-E-1.Plot2.grf





Dato/rev.: 2014-12-23/01

BH_WFS2_H03_BATCH_F4_CIUC_01.Plot1.grf

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**

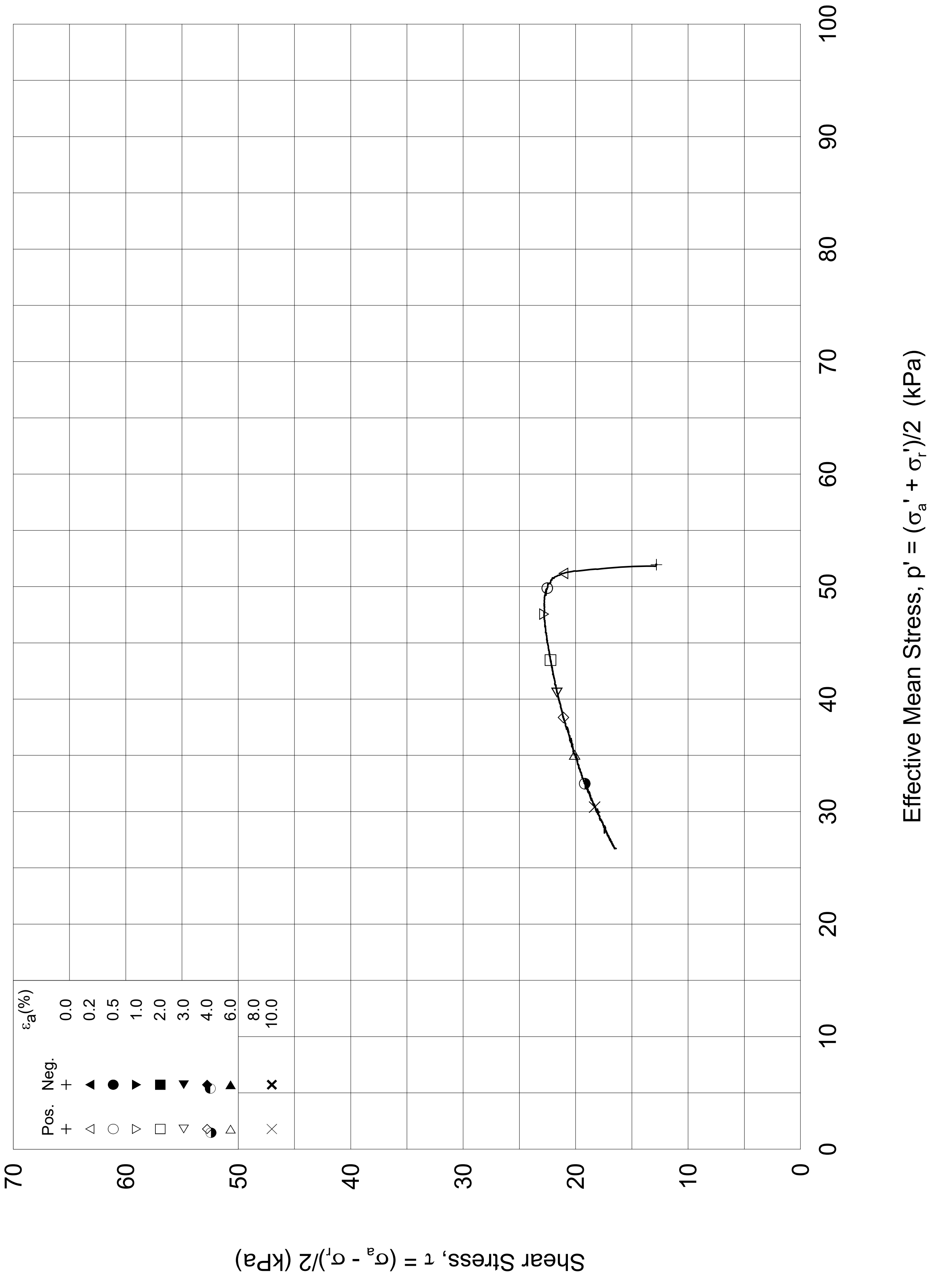
Boring:	**ONSB41**	Depth =		**10.18**	m	Consolidation stresses				
Tube:	**11**	po'	=	**65.3**	kPa	(kPa)		max.	min.	final
Part:	**A**	w_i	=	**59.6**	%	σ_{ac}' =		-	-	**65.2**
Test:	**1**	w_c	=	**56.1**	%	σ_{rc}' =		-	-	**39.1**

Document No. 20160154-10-R

Figure No. 5.3.208

Date 2018-12-10

Drawn by/checked PCa / MAS



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**									
Boring:	**ONSB41**	Depth =	**10.18**	m	Consolidation stresses				
Tube:	**11**	po' =	**65.3**	kPa	(kPa)	max.	min.	final	
Part:	**A**	w_i =	**59.6**	%	σ_{ac}' =	-	-	**65.2**	
Test:	**1**	w_c =	**56.1**	%	σ_{rc}' =	-	-	**39.1**	

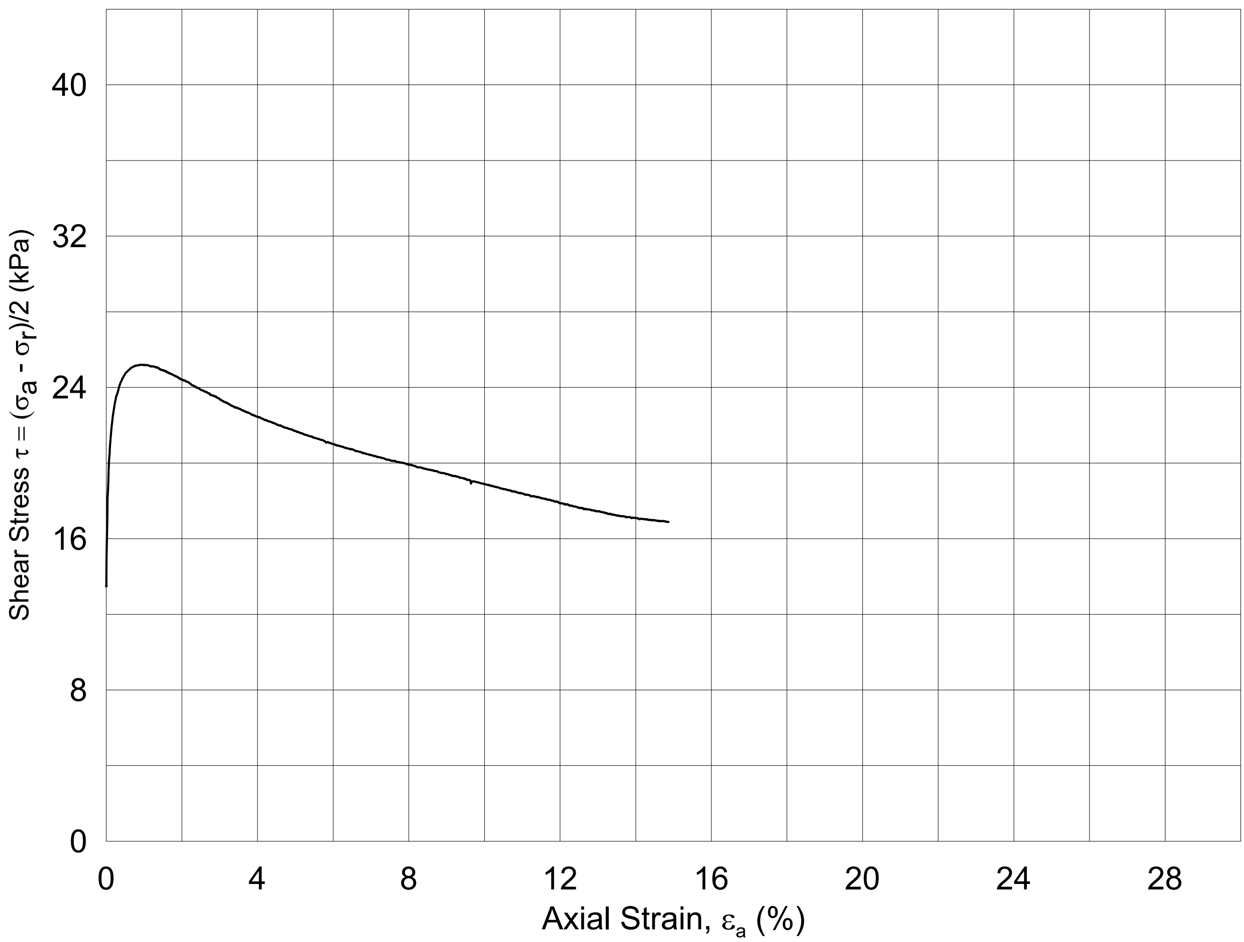
Document No. 20160154-10-R

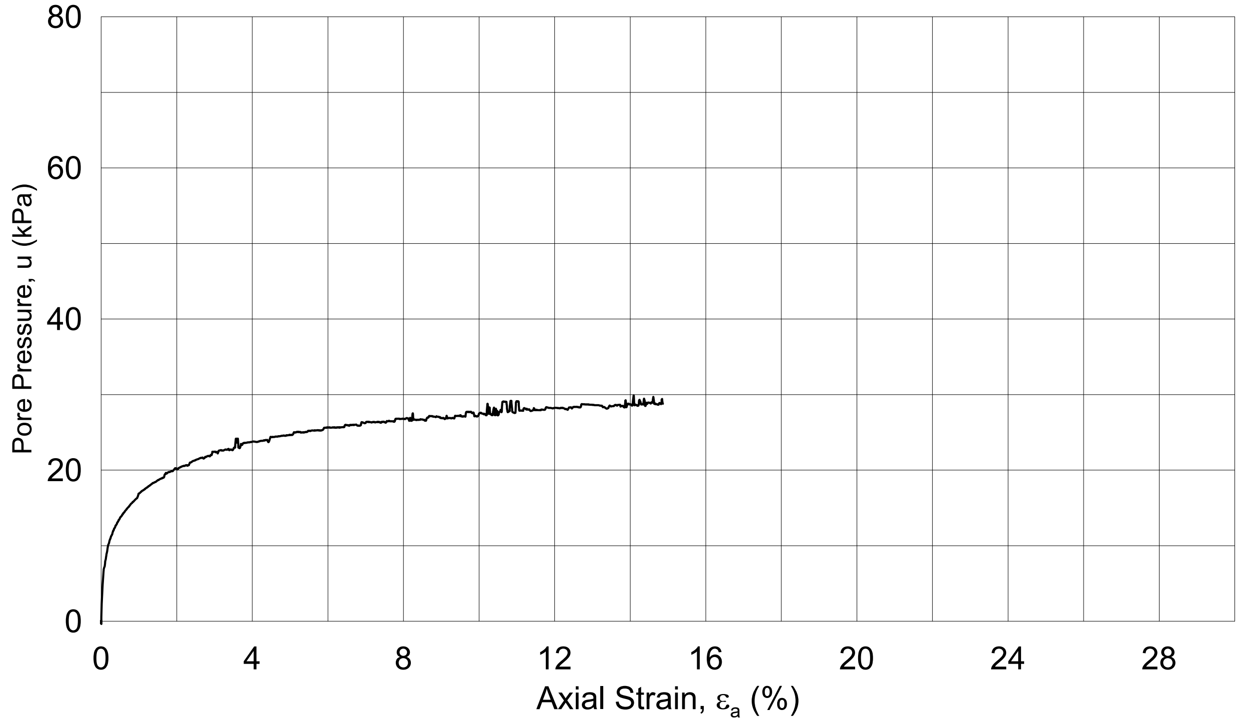
Figure No. 5.3.209

Date 2018-12-10

Drawn by/checked PCa / MAS

BH_WFS2_H03_BATCH_E4_CIUC_01.Plot2.grf





Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.210

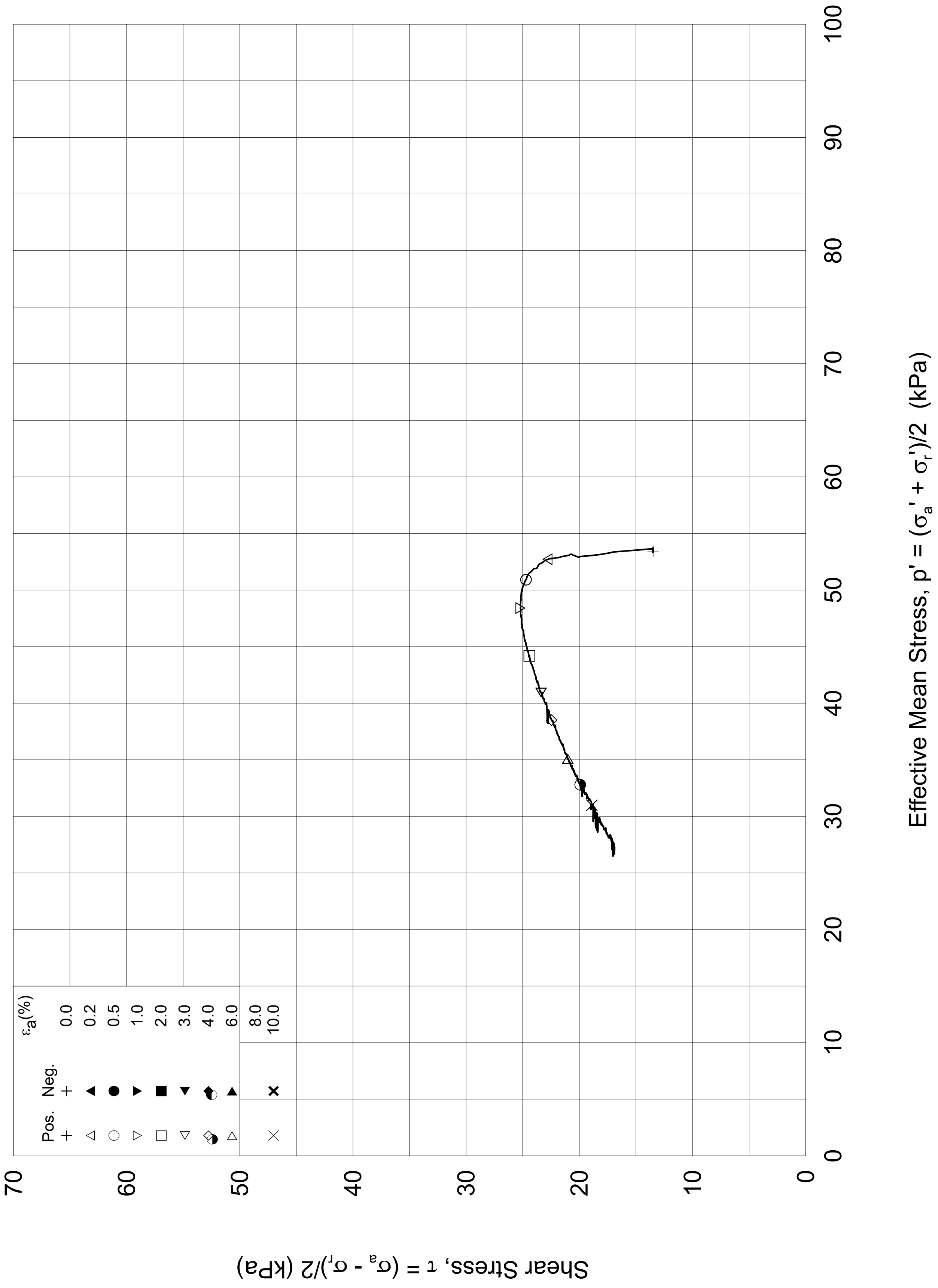
Triaxial test: **CAUC**

Date 2018-12-10

Drawn by/checked PCa / MAS

Boring:	**ONSB41**	Depth =	**10.32**	m	Consolidation stresses				
Tube:	**11**	po' =	**66.4**	kPa	(kPa)	max.	min.	final	
Part:	**B**	w_i =	**55.0**	%	σ_{ac}' =	-	-	**67.3**	
Test:	**1**	w_c =	**52.74-**	%	σ_{rc}' =	-	-	**40.4**	

NGI



Dato/rev.: 2014-12-23/01

BH_WFS2_H03_BATCH_E4_CIUC_01.Plot2.grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.211

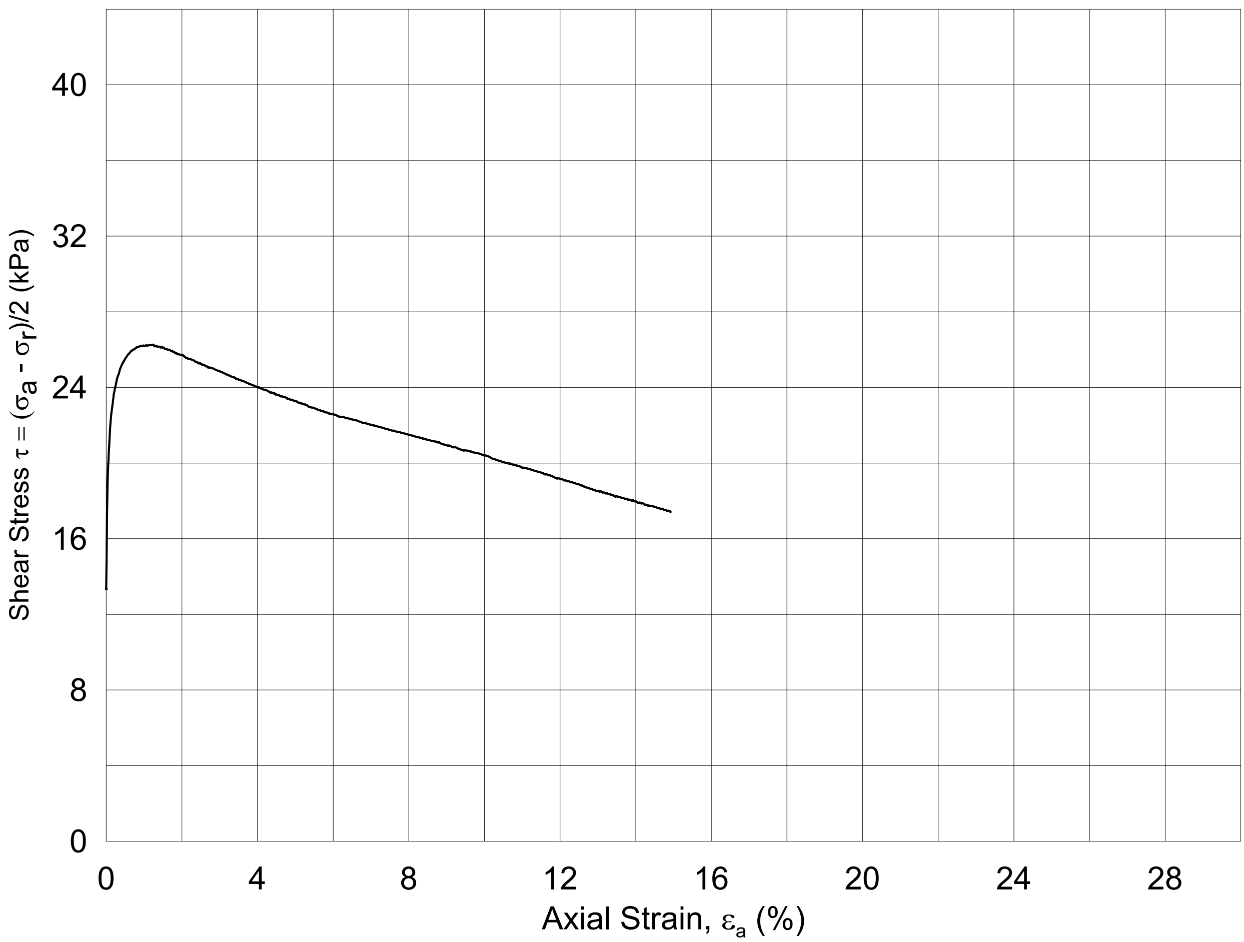
Triaxial test: **CAUC**

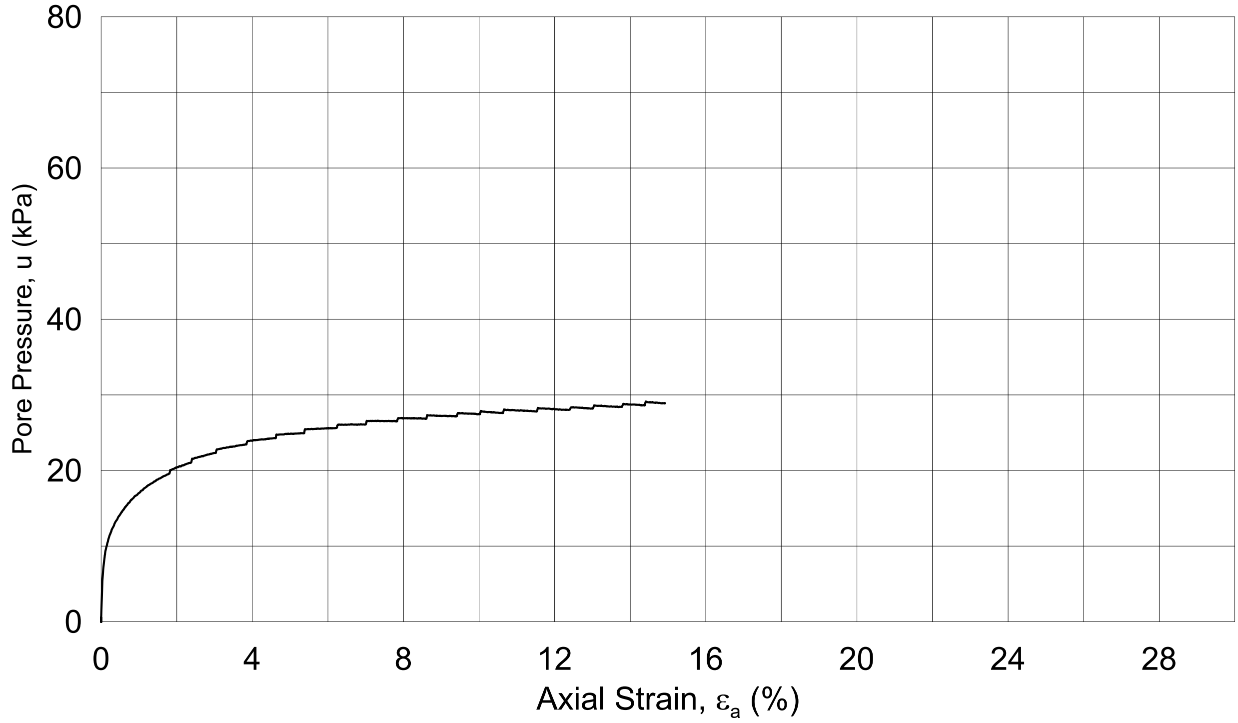
Date 2018-12-10

Drawn by/checked PCa / GS

Boring:	**ONSB41**	Depth =	**10.32**	m	Consolidation stresses			
Tube:	**11**	po' =	**66.4**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**55.0**	%	σ_{ac}' =	-	-	**67.3**
Test:	**1**	w_c =	**52.7**	%	σ_{rc}' =	-	-	**40.4**

NGI





Dato/rev.: 2014-12-23/01

BH_WFS2_H03_BATCH_E4_CIUC_01.Plot1.grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

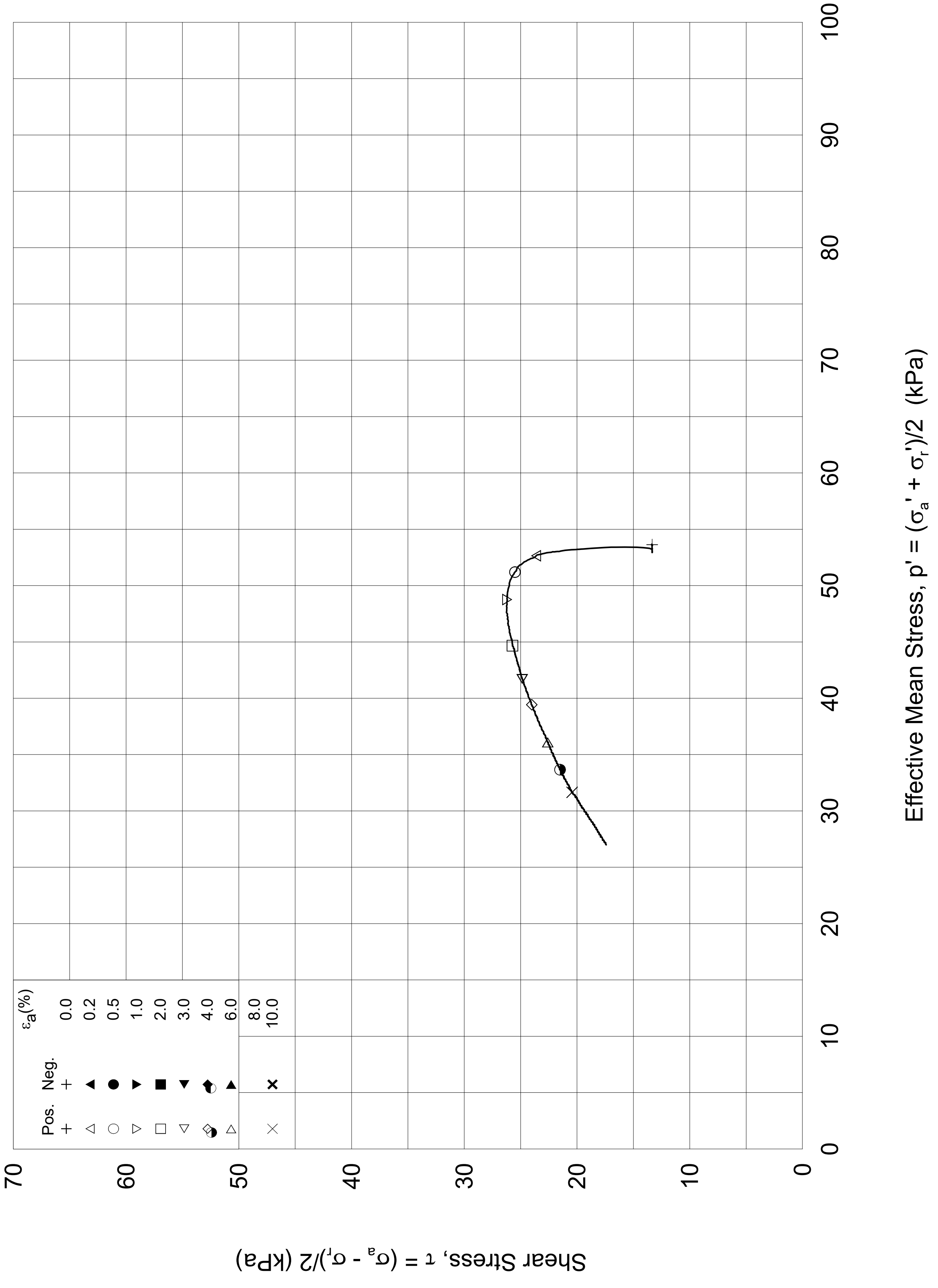
Figure No. 5.3.212

Triaxial test: **CAUC**

Date 2018-12-10

Drawn by/checked PCa / MAS

Boring:	**ONSB41**	Depth =	**16.60**	m	Consolidation stresses			
Tube:	**11**	po' =	**67.5**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**53.79**	%	σ_{ac}' =	-	-	**67.0**
Test:	**1**	w_c =	**52.20**	%	σ_{rc}' =	-	-	**40.3**



Dato/rev.: 2014-12-23/01

BH_WFS2_H03_BATCH_E4_CIUC_01.Plot2.grf

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**

Boring:	**ONSB41**	Depth =	**10.60**	m
Tube:	**11**	po' =	**67.5**	kPa
Part:	**C**	w_i =	**53.79**	%
Test:	**1**	w_c =	**52.20**	%

Consolidation stresses

(kPa)	max.	min.	final
σ_{ac}' =	-	-	**67.0**
σ_{rc}' =	-	-	**40.3**

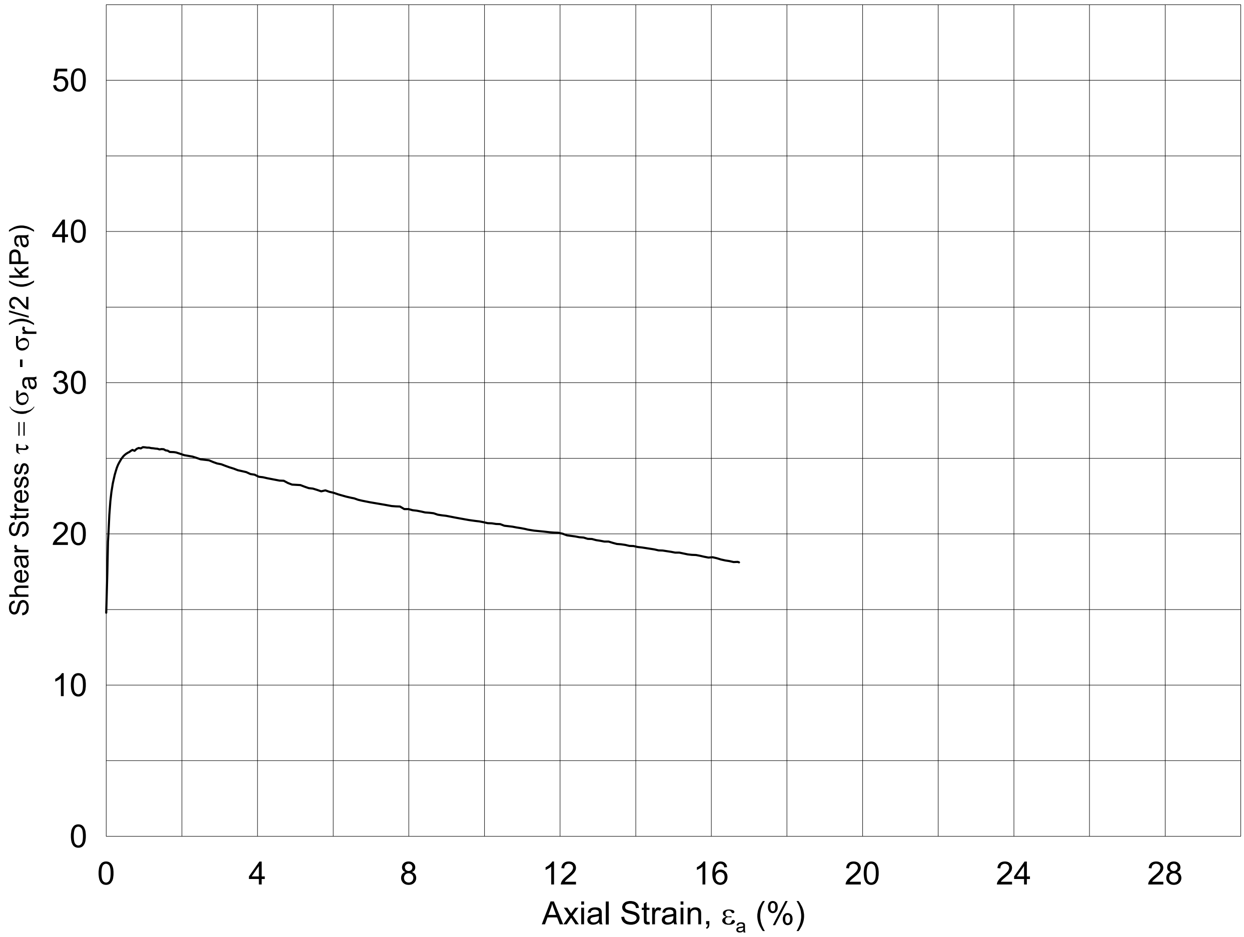
Document No. 20160154-10-R

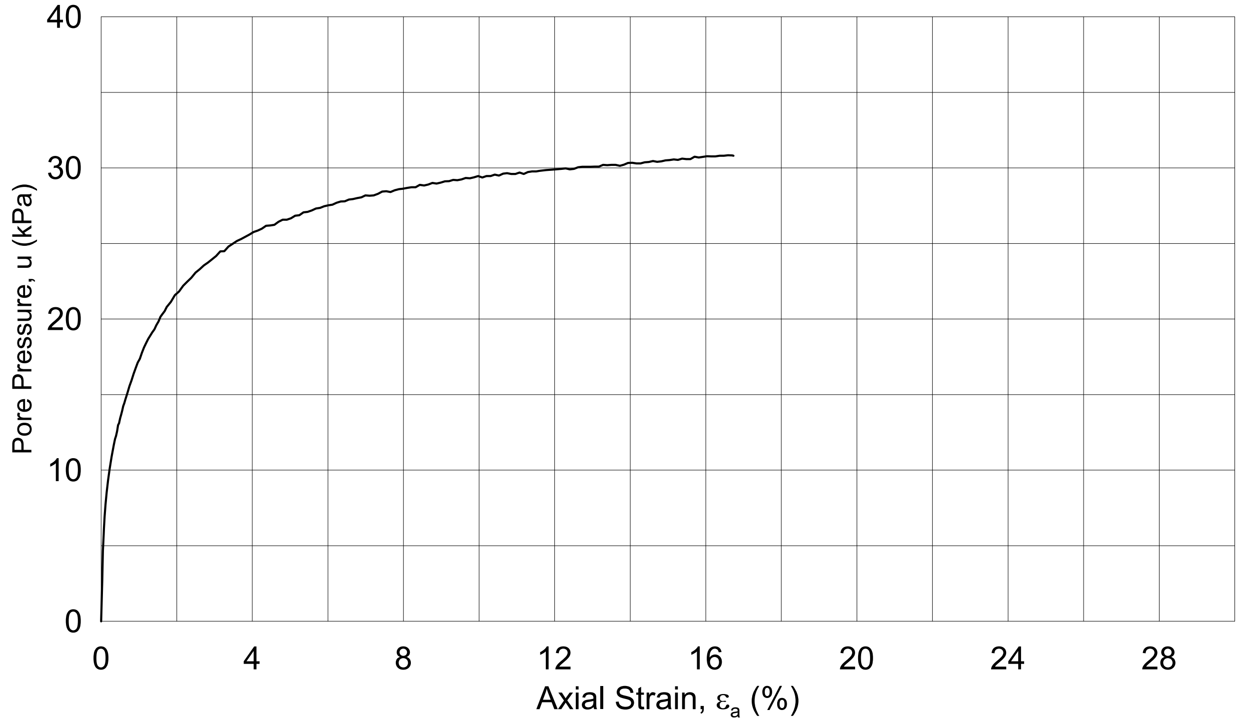
Figure No. 5.3.213

Date 2018-12-10

Drawn by/checked PCa / MAS

NGI





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.214

Triaxial test: **CAUC**

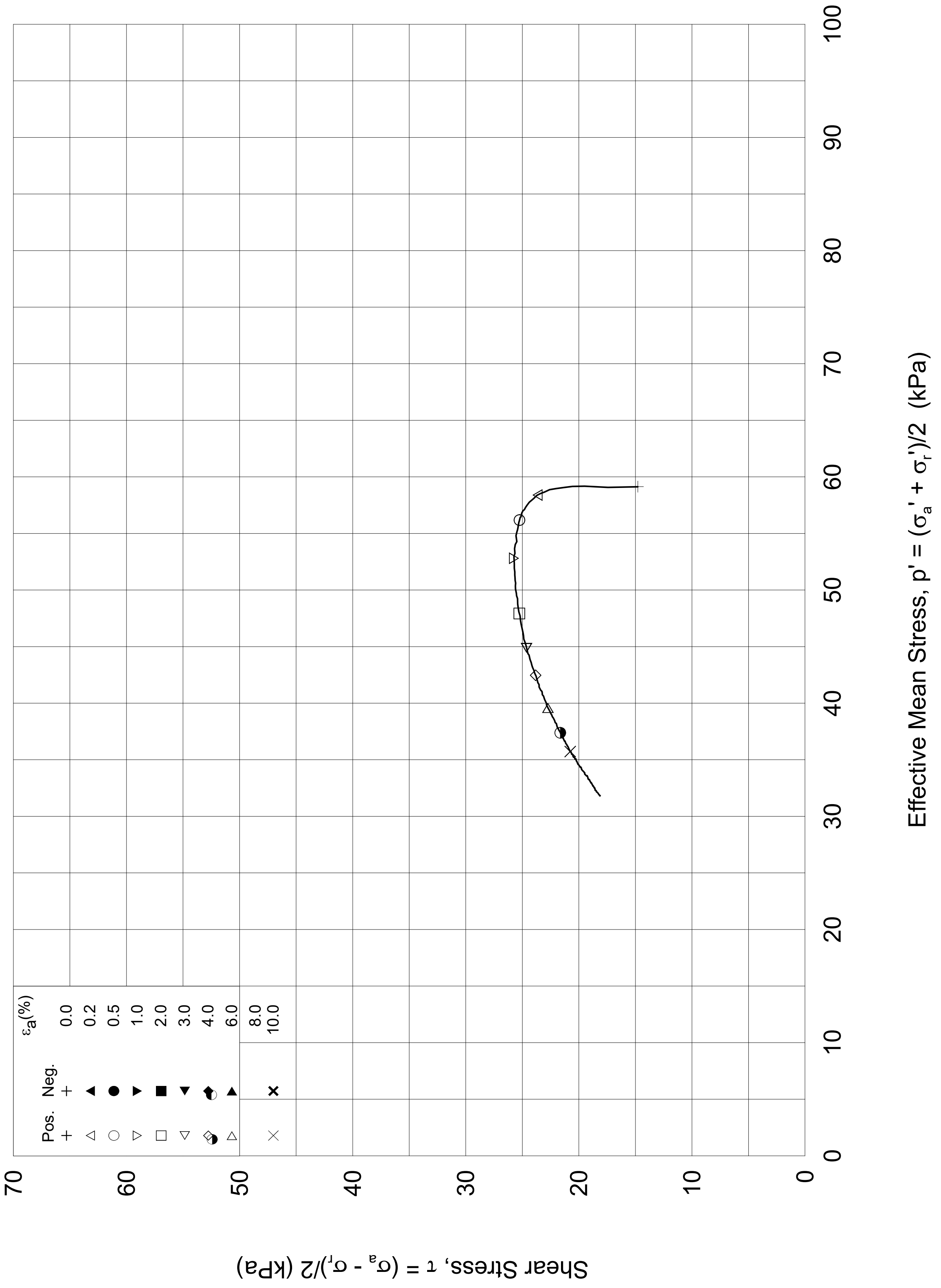
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB41**	Depth =	**11.37** m	Consolidation stresses			
Tube:	**12**	po' =	**73.9** kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**47.7** %	σ_{ac}' =	-	-	**73.9**
Test:	**1**	w_c =	**44.7** %	σ_{rc}' =	-	-	**44.3**

NGI

ONSB41-12-B-1.Plot1.grf



Dato/rev.: 2014-12-23/01

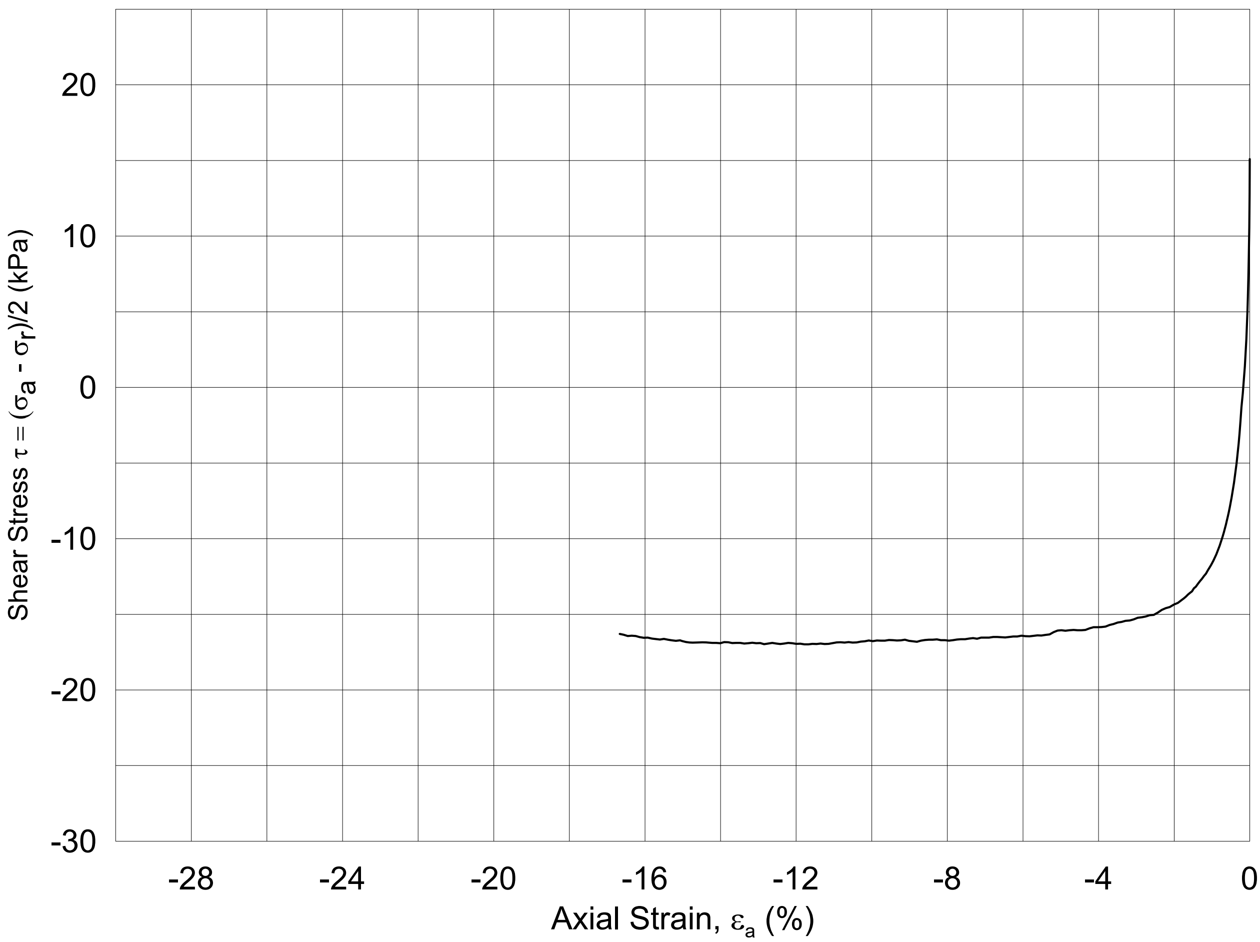
Norwegian GeoTest Sites - Onsøy

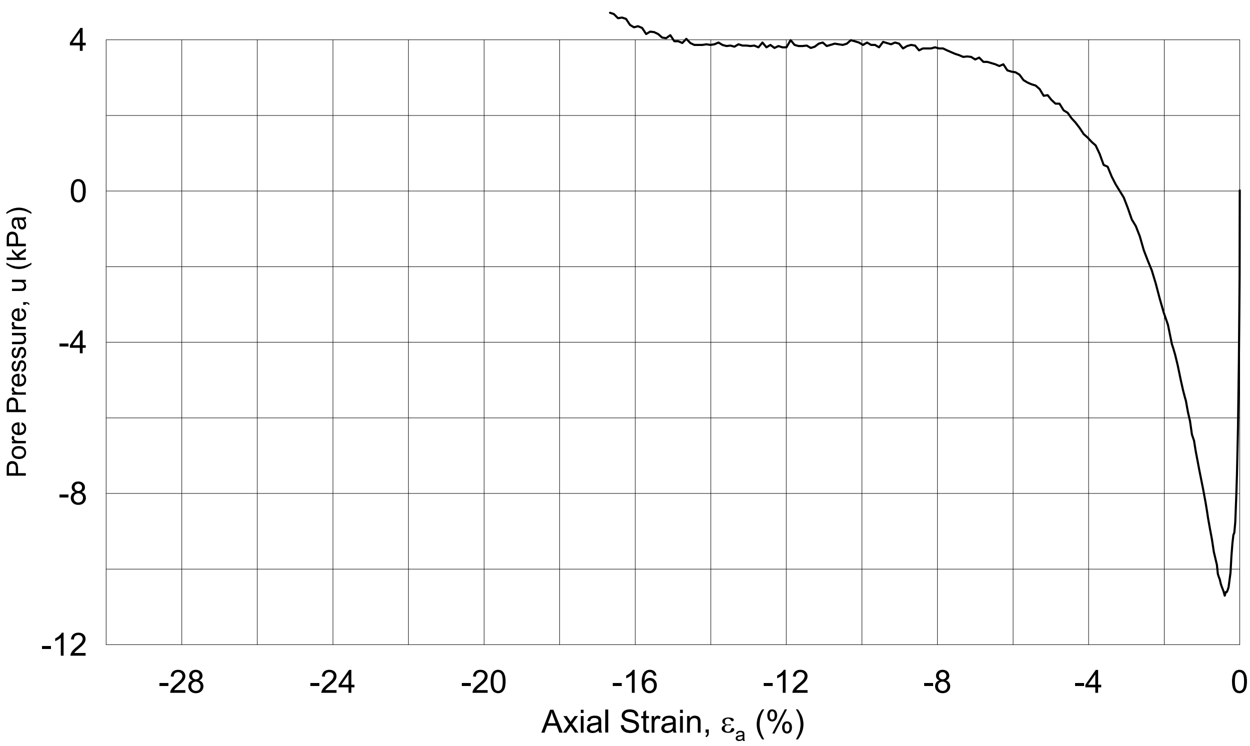
Document No.	20160154-10-R					
Figure No.	5.3.215					
Date	2018-12-10	Drawn by/checked	ThV / GS			

Triaxial test: **CAUC**

Boring:	**ONSB41**	Depth =	**11.37**	m	Consolidation stresses			
Tube:	**12**	po' =	**73.9**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**47.7**	%	σ_{ac}' =	-	-	**73.9**
Test:	**1**	w_c =	**44.7**	%	σ_{rc}' =	-	-	**44.3**

ONSB41-12-B-1.Plot2.grf



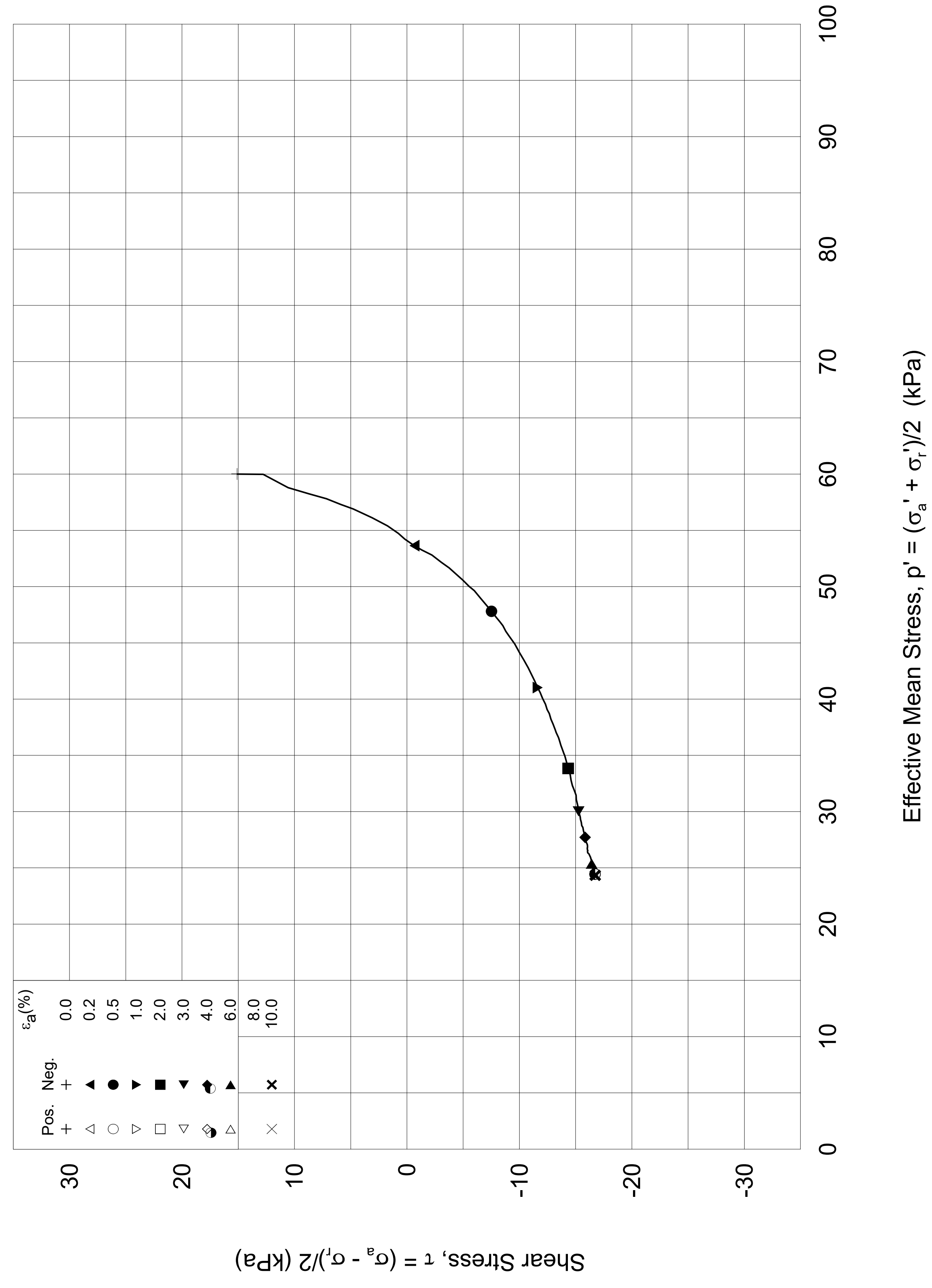


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R	
Triaxial test: **CAUE**		Figure No. 5.3.216	
Boring: **ONSB41**	Depth = **11.50** m	Date 2018-12-10	Drawn by/checked ThV / GS
Tube: **12**	po' = **74.9** kPa		
Part: **C**	w_i = **45.7** %		
Test: **1**	w_c = **42.0** %		

Consolidation stresses (kPa)	max.	min.	final
σ_{ac}' =	-	-	**74.9**
σ_{rc}' =	-	-	**44.9**

ONSB41-12-C-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.217

Triaxial test: **CAUE**

Date: 2018-12-10

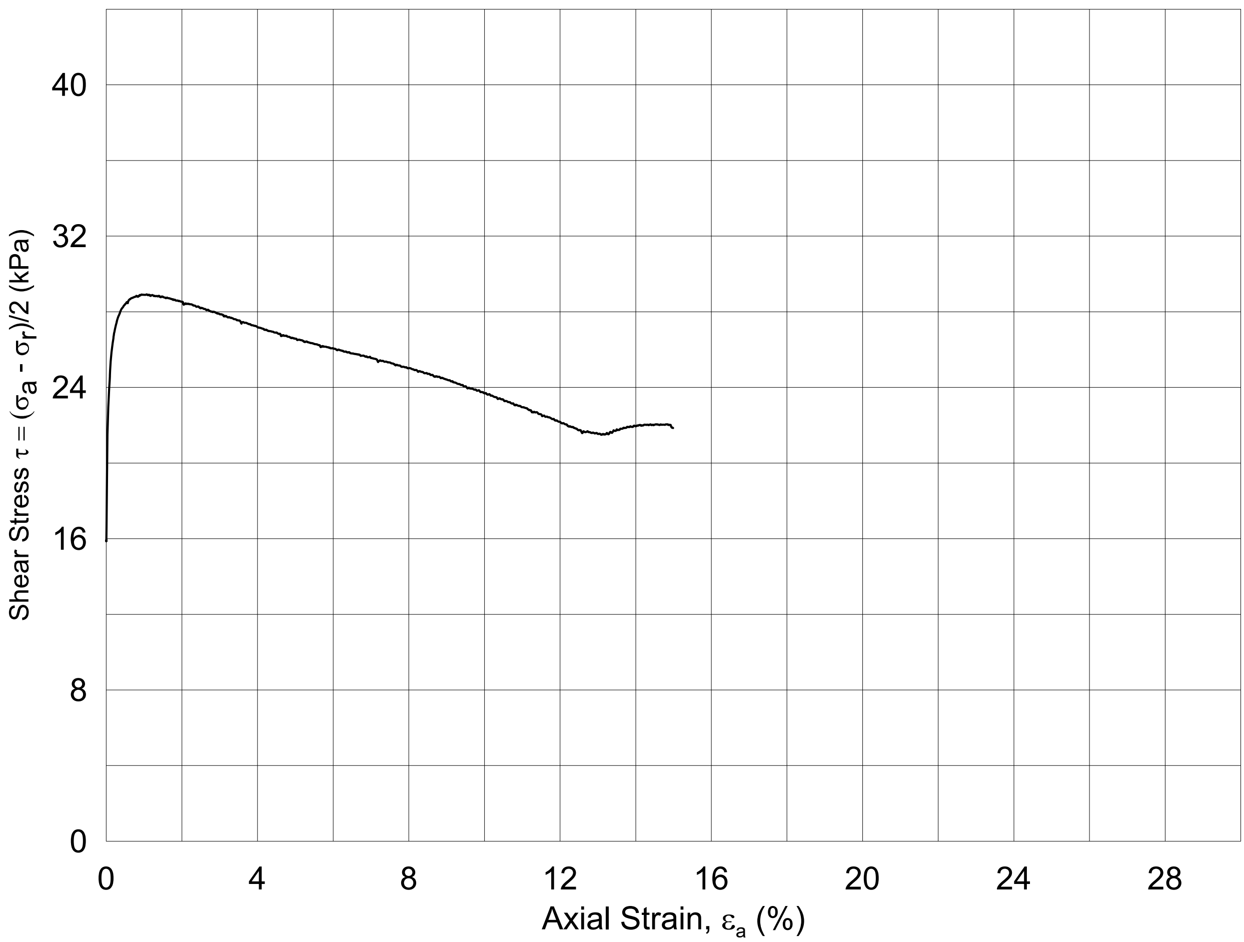
Drawn by/checked: ThV / GS

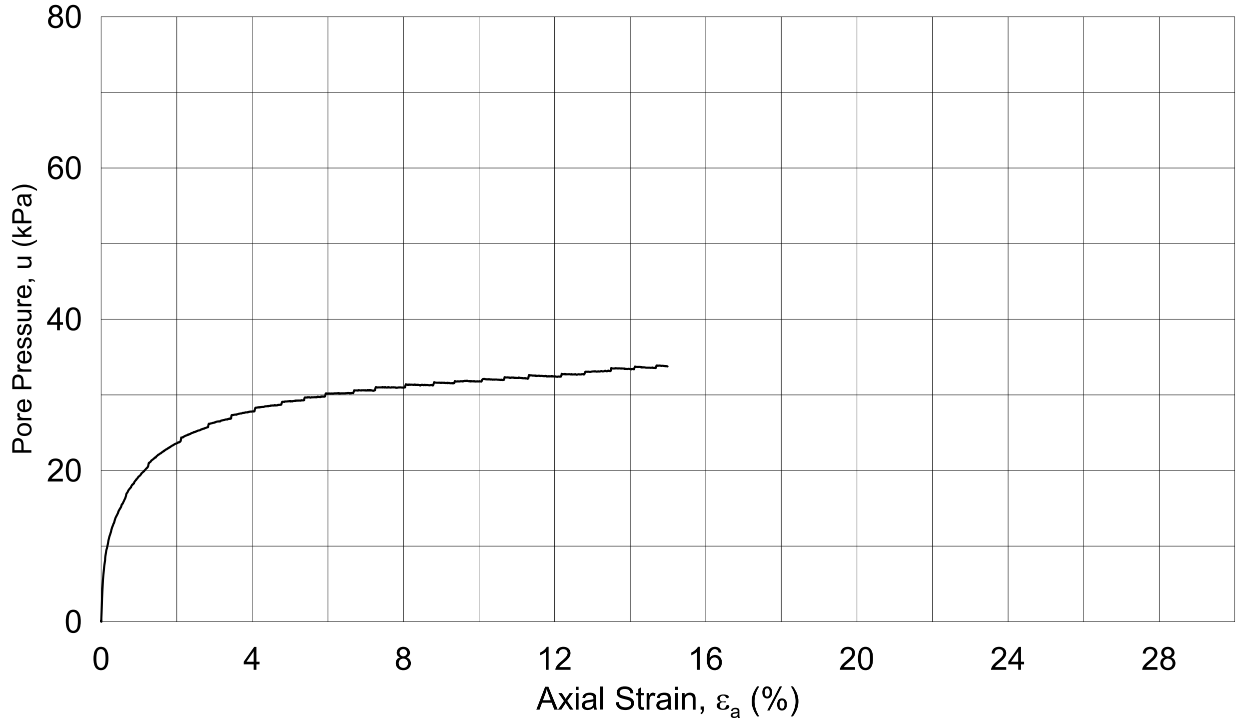
Boring:	**ONSB41**	Depth =	**11.50**	m	
Tube:	**12**	po' =	**74.9**	kPa	
Part:	**C**	w_i =	**45.7**	%	
Test:	**1**	w_c =	**42.0**	%	

Consolidation stresses

(kPa)	max.	min.	final
σ_{ac}' =	-	-	**74.9**
σ_{rc}' =	-	-	**44.9**

ONSB41-12-C-1.Plot2.grf

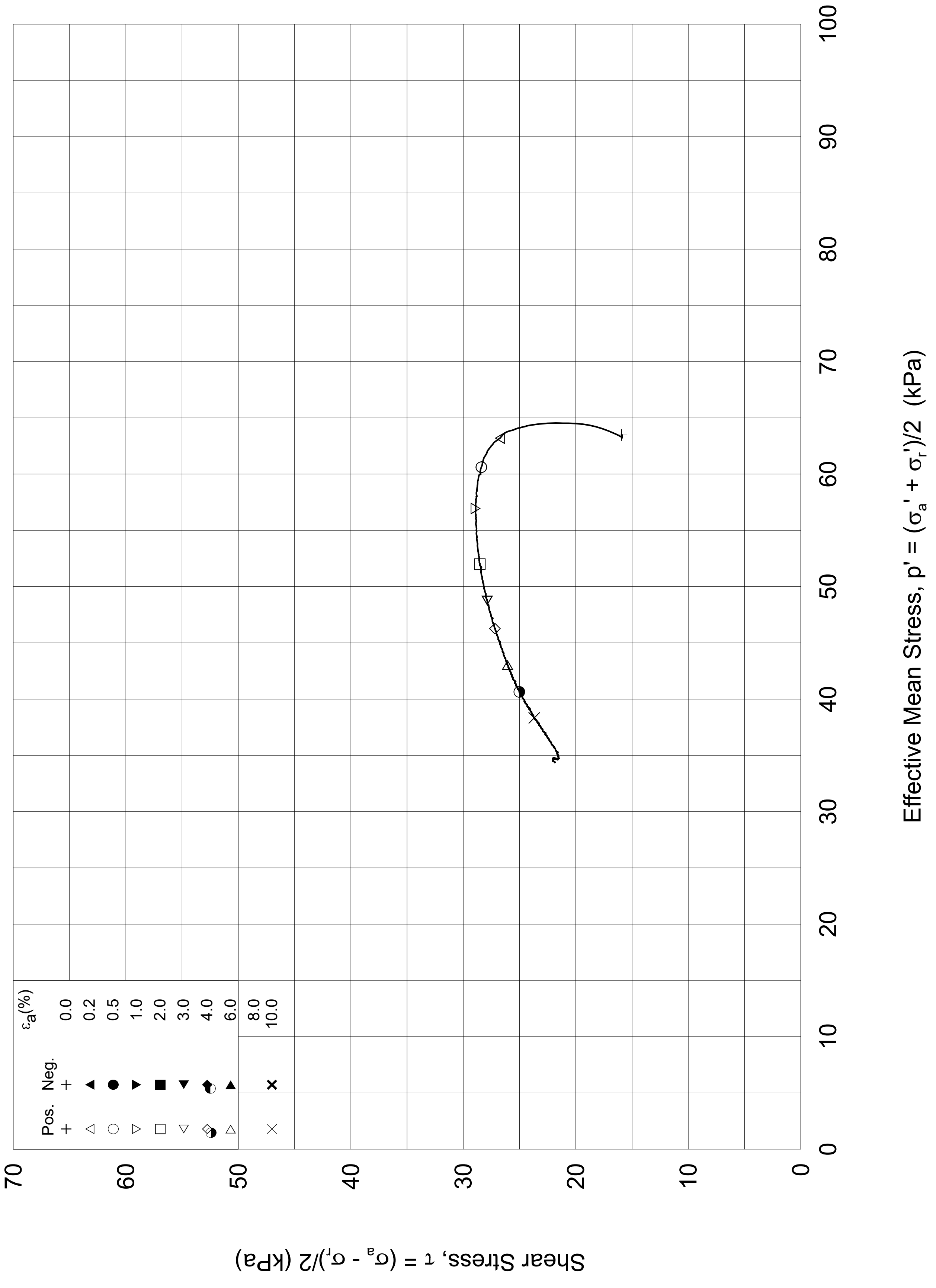




Dato/rev.: 2014-12-23/01

BH_WFS2_H03_BATCH_E4_CIUC_01.Plot1.grf

Norwegian GeoTest Sites - Onsøy											Document No. 20160154-10-R	
Triaxial test: **CAUC**											Figure No. 5.3.218	
Boring:	**ONSB41**	Depth =	**12.18**	m	Consolidation stresses						Date 2018-12-10	Drawn by/checked PCa / MAS
Tube:	**13**	po' =	**79.7**	kPa	(kPa)	max.	min.	final			NGI	
Part:	**A**	w_i =	**43.66**	%	σ_{ac}' =	-	-	**79.5**				
Test:	**1**	w_c =	**40.36**	%	σ_{rc}' =	-	-	**47.7**				



Dato/rev.: 2014-12-23/01

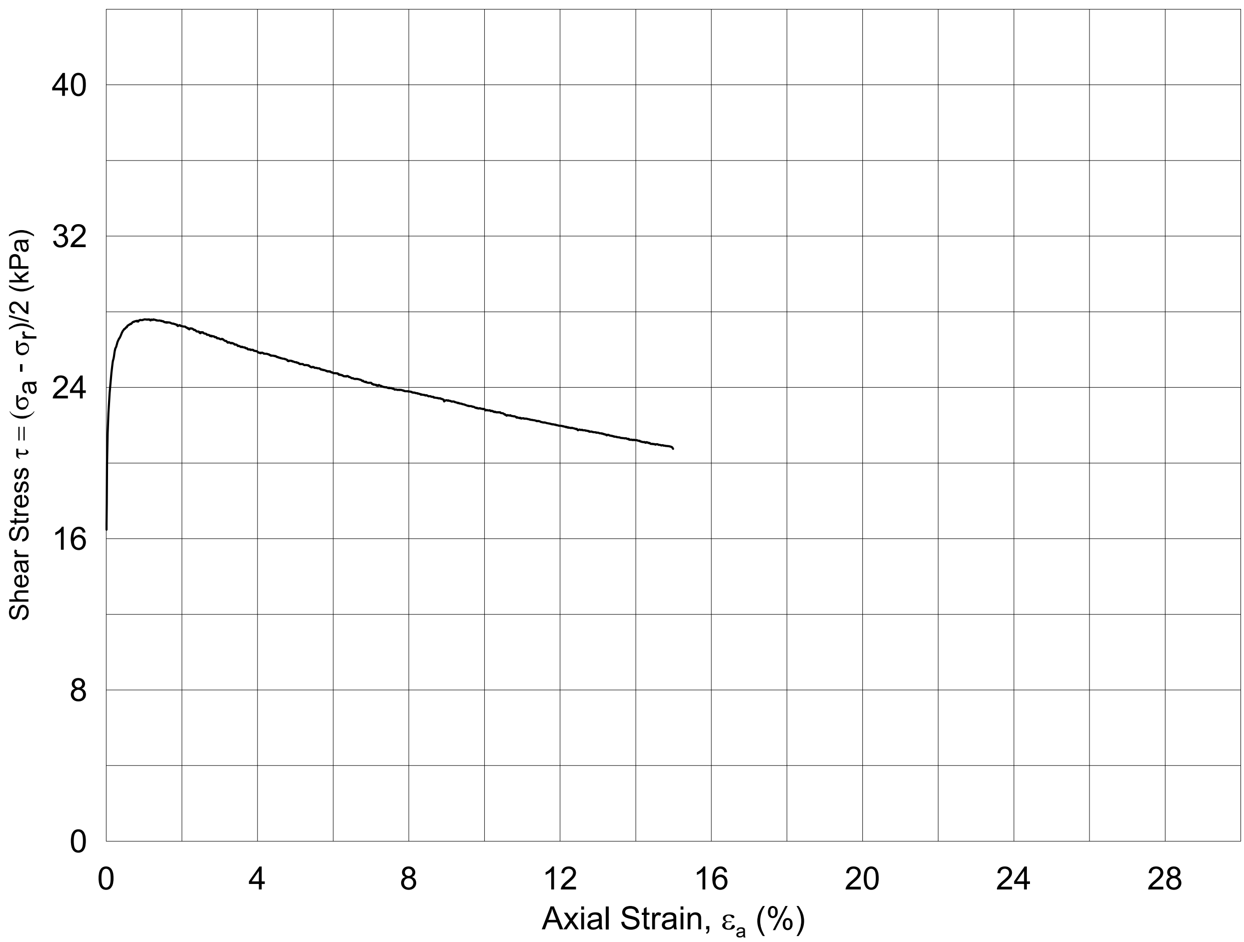
BH_WFS2_H03_BATCH_E4_CIUC_01.Plot2.grf

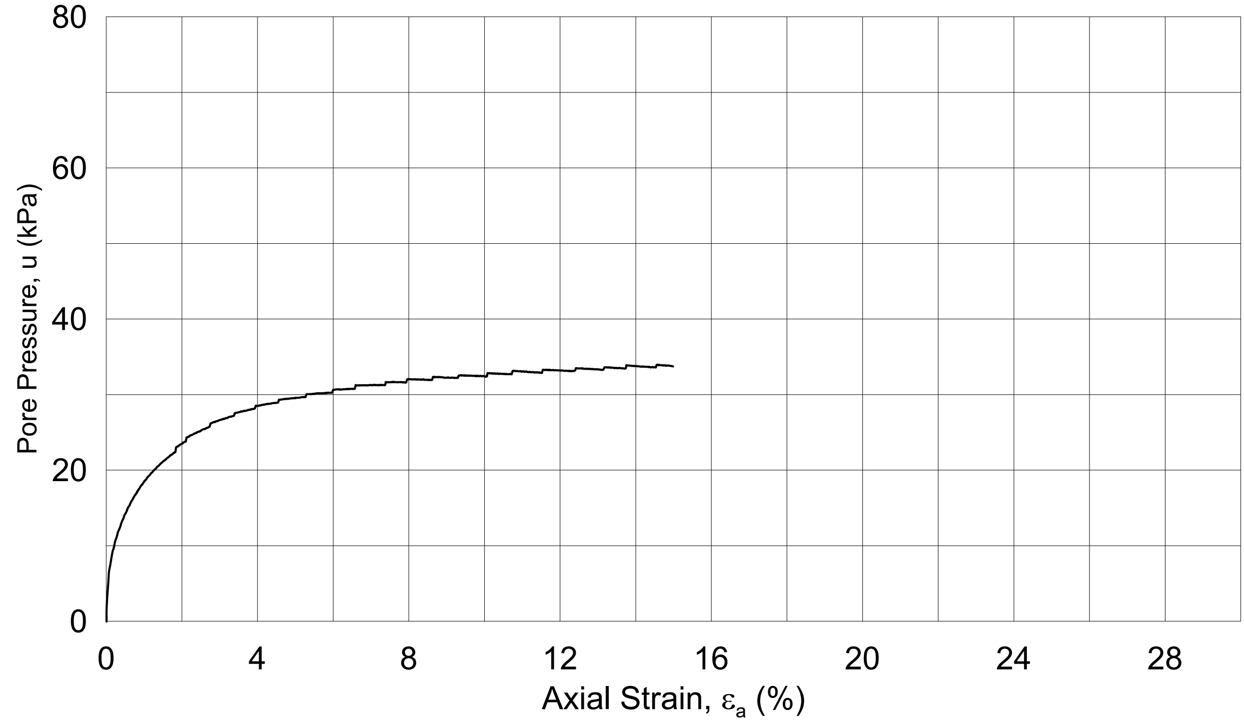
Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**								
Boring:	**ONSB41**	Depth =	**12.18**	m	Consolidation stresses			
Tube:	**13**	po' =	**79.7**	kPa	(kPa)	max.	min.	final
Part:	**A**	w_i =	**43.66**	%	σ_{ac}' =	-	-	**79.5**
Test:	**1**	w_c =	**40.36**	%	σ_{rc}' =	-	-	**47.7**

Document No.	20160154-10-R
Figure No.	5.3.219
Date	2018-12-10
Drawn by/checked	PCa / MAS

NGI





Dato/rev.: 2014-12-23/01

BH_WFS2_H03_BATCH_E4_CIUC_01.Plot1.grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

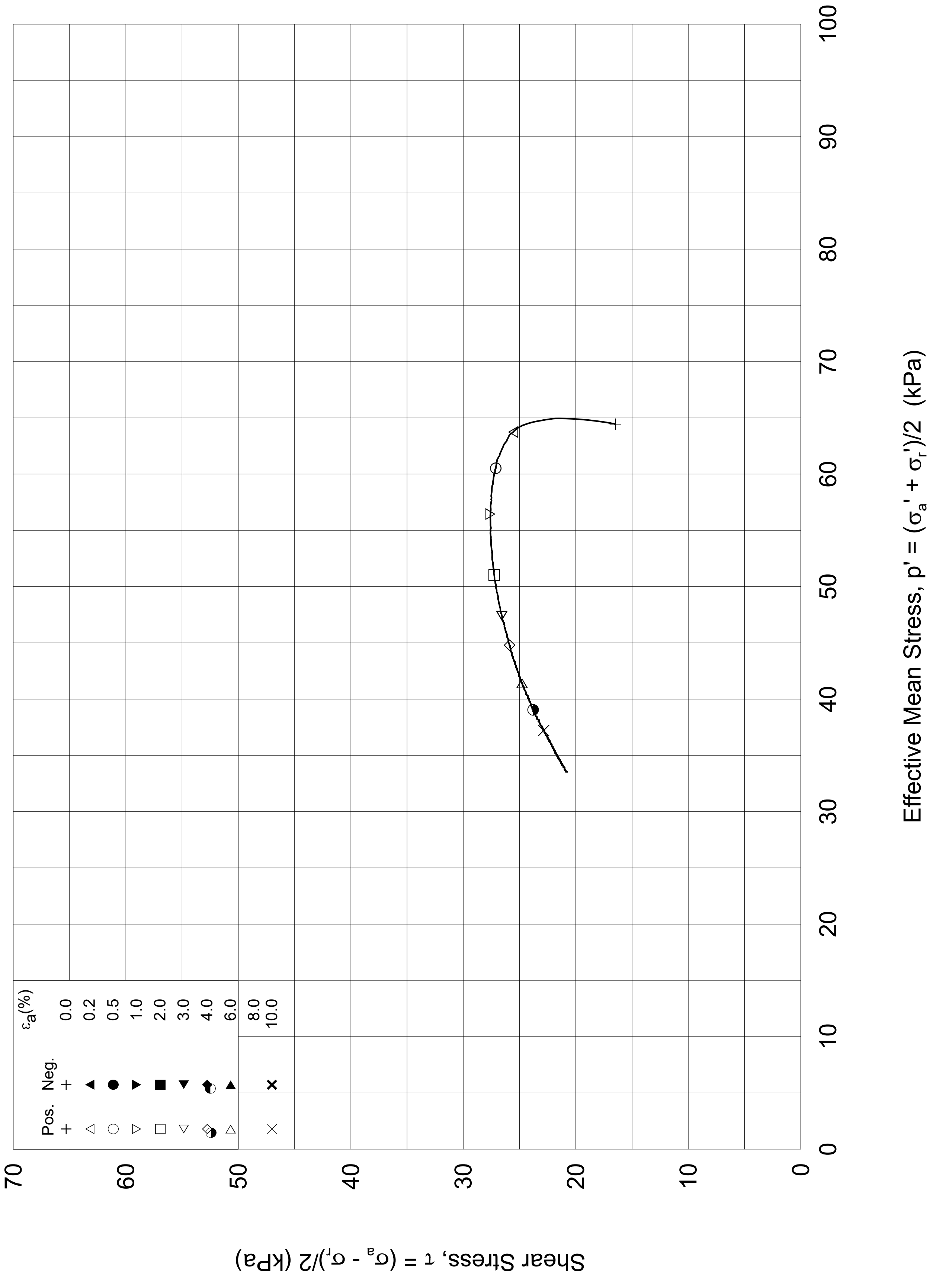
Figure No. 5.3.220

Triaxial test: **CAUC**

Date 2018-12-10

Drawn by/checked PCa / MAS

Boring:	**ONSB41**	Depth =	**12.33**	m	Consolidation stresses			
Tube:	**13**	po' =	**81.0**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**43.81**	%	σ_{ac}' =	-	-	**80.9**
Test:	**1**	w_c =	**41.34**	%	σ_{rc}' =	-	-	**48.3**

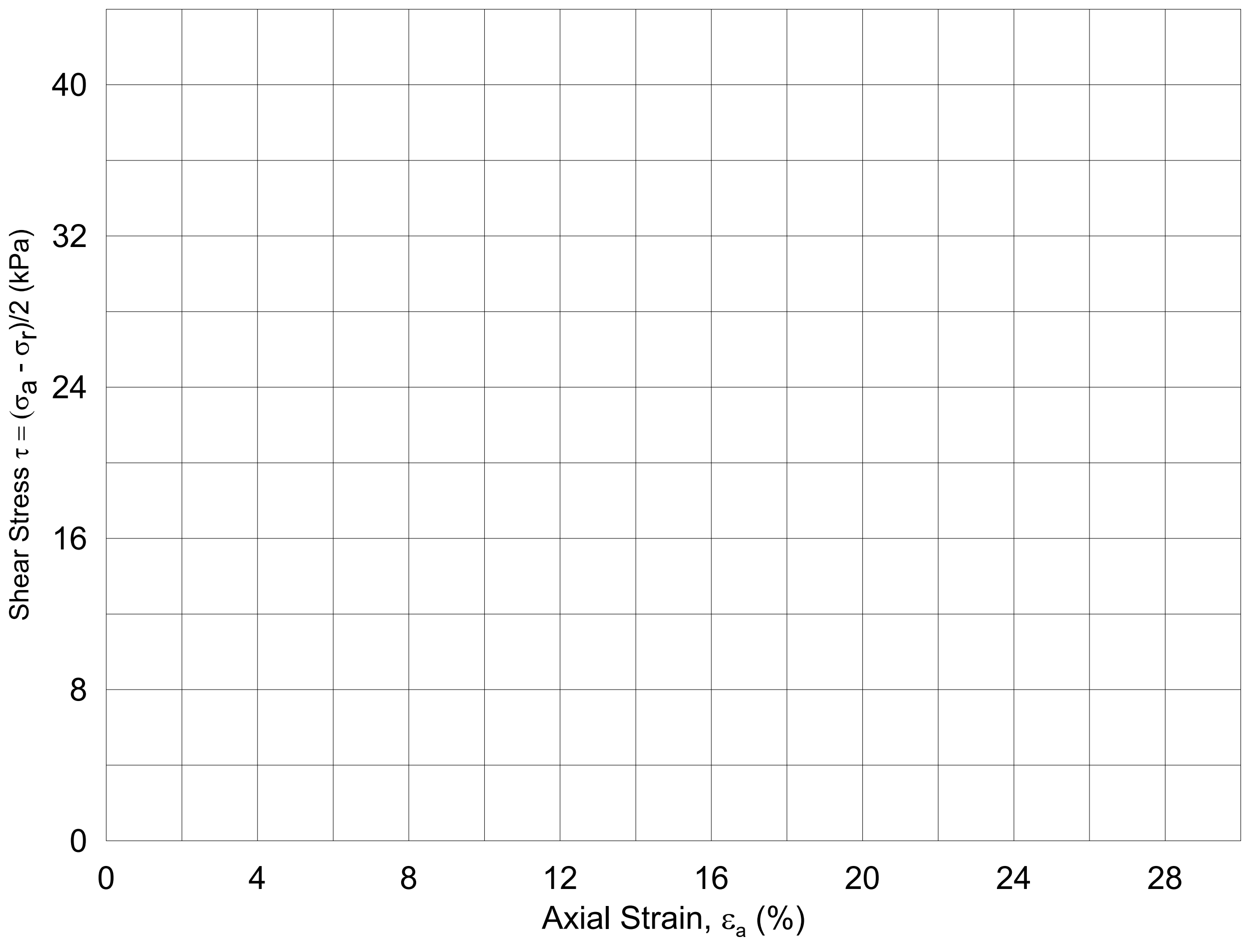


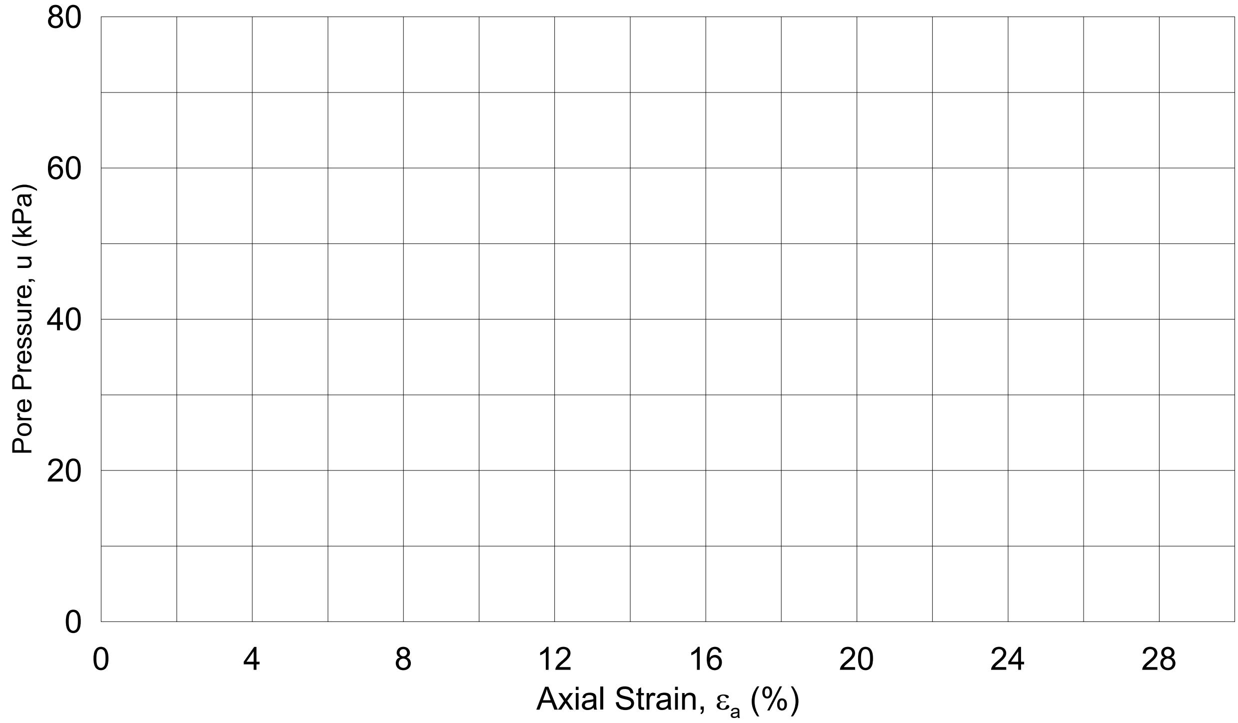
Dato/rev.: 2014-12-23/01

BH_WFS2_H03_BATCH_E4_CIUC_01.Plot2.grf

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**									Document No. 20160154-10-R	
									Figure No. 5.3.221	
Boring:	**ONSB41**	Depth =	**12.33**	m	Consolidation stresses				Date 2018-12-10	Drawn by/checked PCa / MAS
Tube:	**13**	po' =	**81.0**	kPa	(kPa)	max.	min.	final		
Part:	**B**	w_i =	**43.81**	%	σ_{ac}' =	-	-	**80.9**		
Test:	**1**	w_c =	**41.34**	%	σ_{rc}' =	-	-	**48.3**		



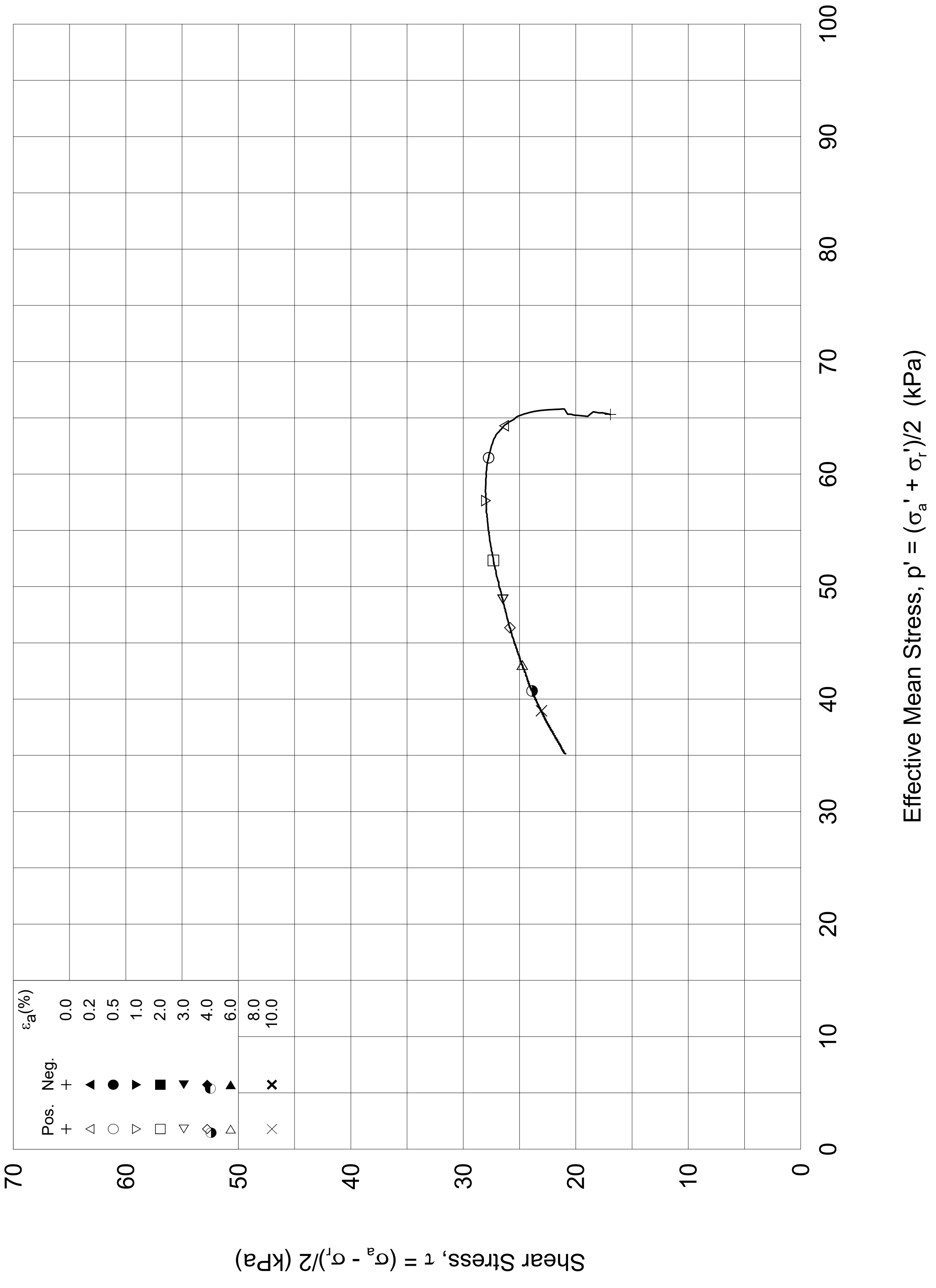


Dato/rev.: 2014-12-23/01

BH_WFS2_H03_BATCH_E4_CIUC_01.Plot1.grf

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**											Document No. 20160154-10-R
											Figure No. 5.3.222
Boring:	**ONSB41**	Depth =		**12.47**	m	Consolidation stresses					Date 2018-12-10 / Drawn by/checked PCa / MAS
Tube:	**13**	po'	=	**82.1**	kPa	(kPa)		max.	min.	final	
Part:	**C**	w_i	=	**41.18**	%	σ_{ac}' =		-	-	**81.9**	
Test:	**1**	w_c	=	**39.62**	%	σ_{rc}' =		-	-	**49.3**	



Dato/rev.: 2014-12-23/01

BH_WFS2_H03_BATCH_E4_CIUC_01.Plot2.grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

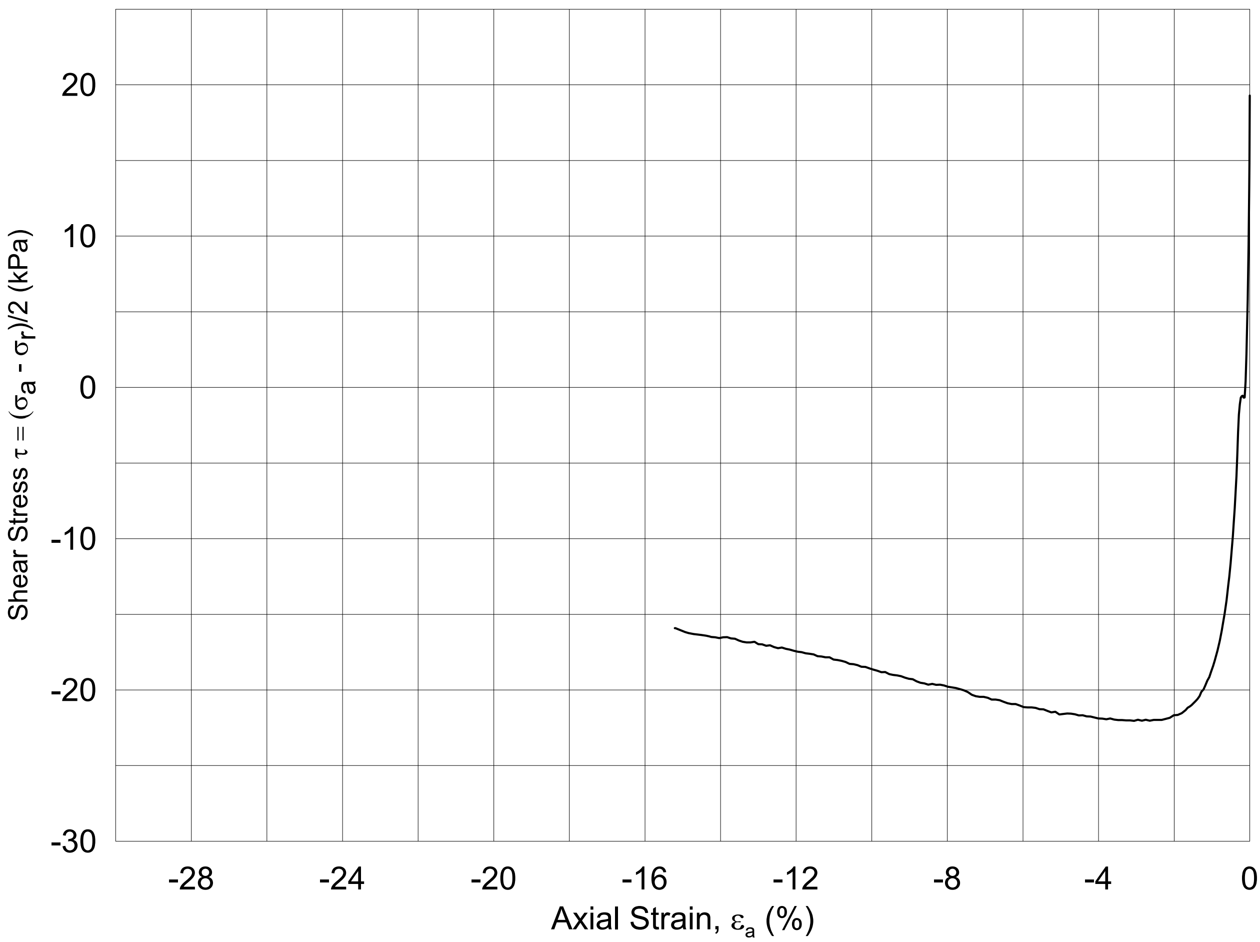
Triaxial test: **CAUC**

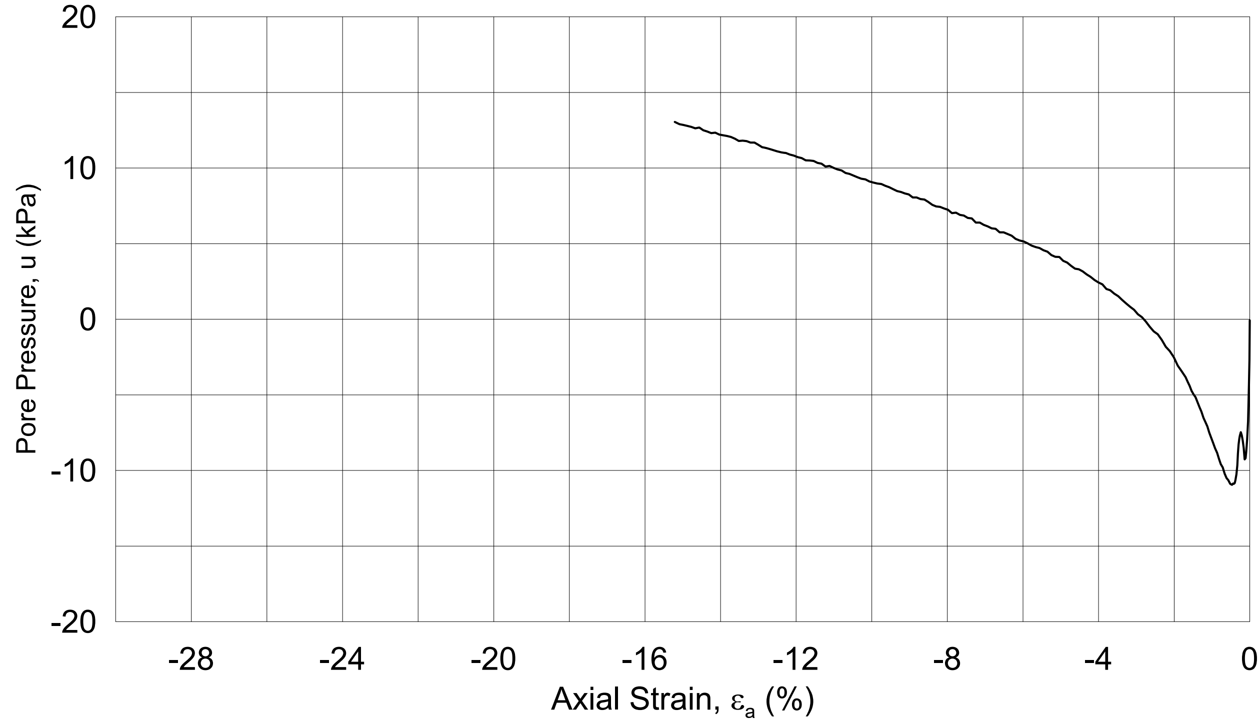
Figure No. 5.3.223

Boring:	**ONSB41**	Depth =	**12.47**	m	Consolidation stresses				
Tube:	**13**	po' =	**82.1**	kPa	(kPa)	max.	min.	final	
Part:	**C**	w_i =	**41.18**	%	σ_{ac}' =	-	-	**81.9**	
Test:	**1**	w_c =	**39.62**	%	σ_{rc}' =	-	-	**49.3**	

Date: 2018-12-10

Drawn by/checked: PCa / MAS





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.224

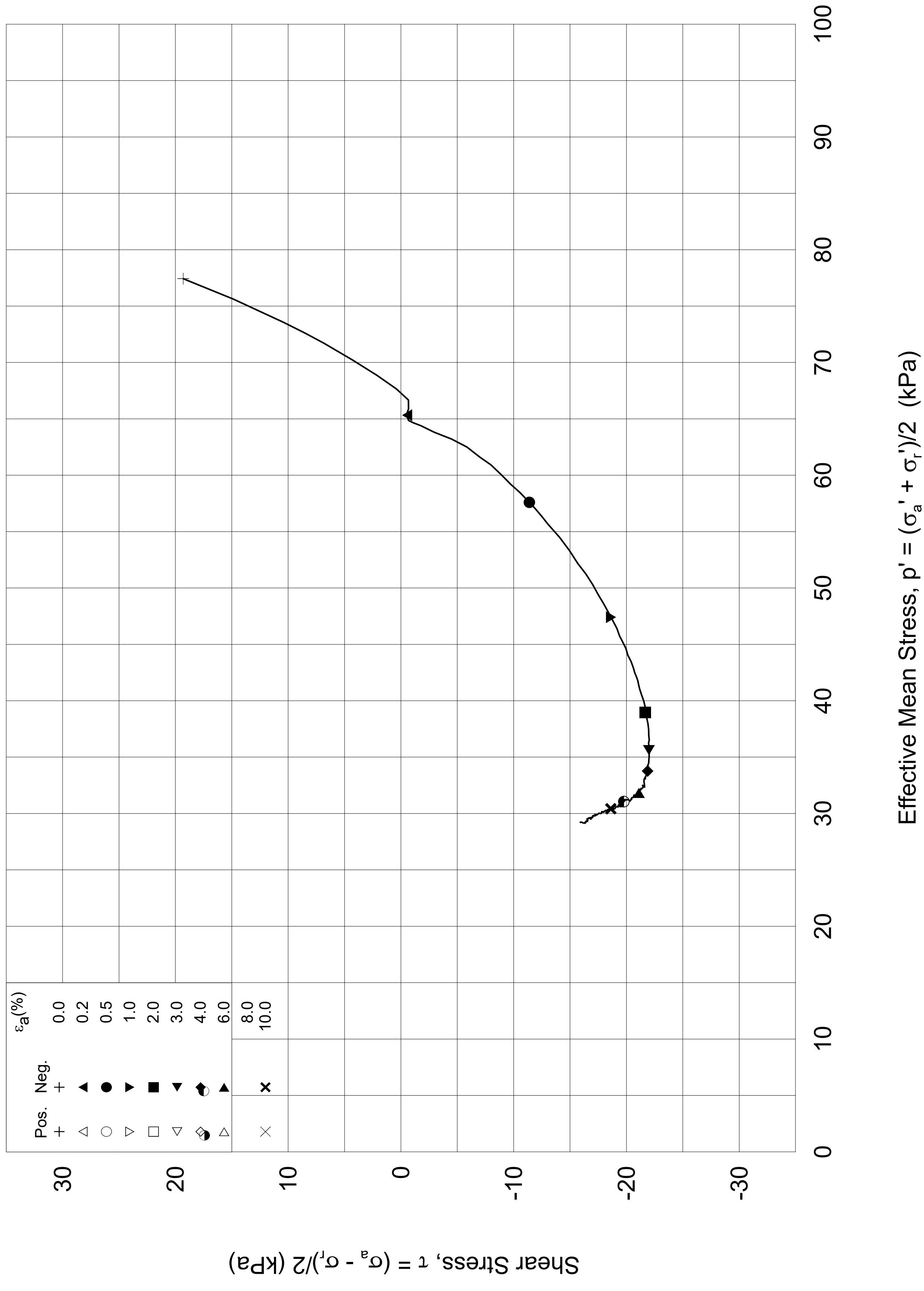
Triaxial test: **CAUE**

Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB41**	Depth =	**14.50**	m	Consolidation stresses			
Tube:	**15**	po' =	**96.8**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**33.2**	%	σ_{ac}' =	-	-	**96.8**
Test:	**1**	w_c =	**30.7**	%	σ_{rc}' =	-	-	**58.1**

ONSB41-15-B-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Triaxial test: **CAUE**

Figure No. 5.3.225

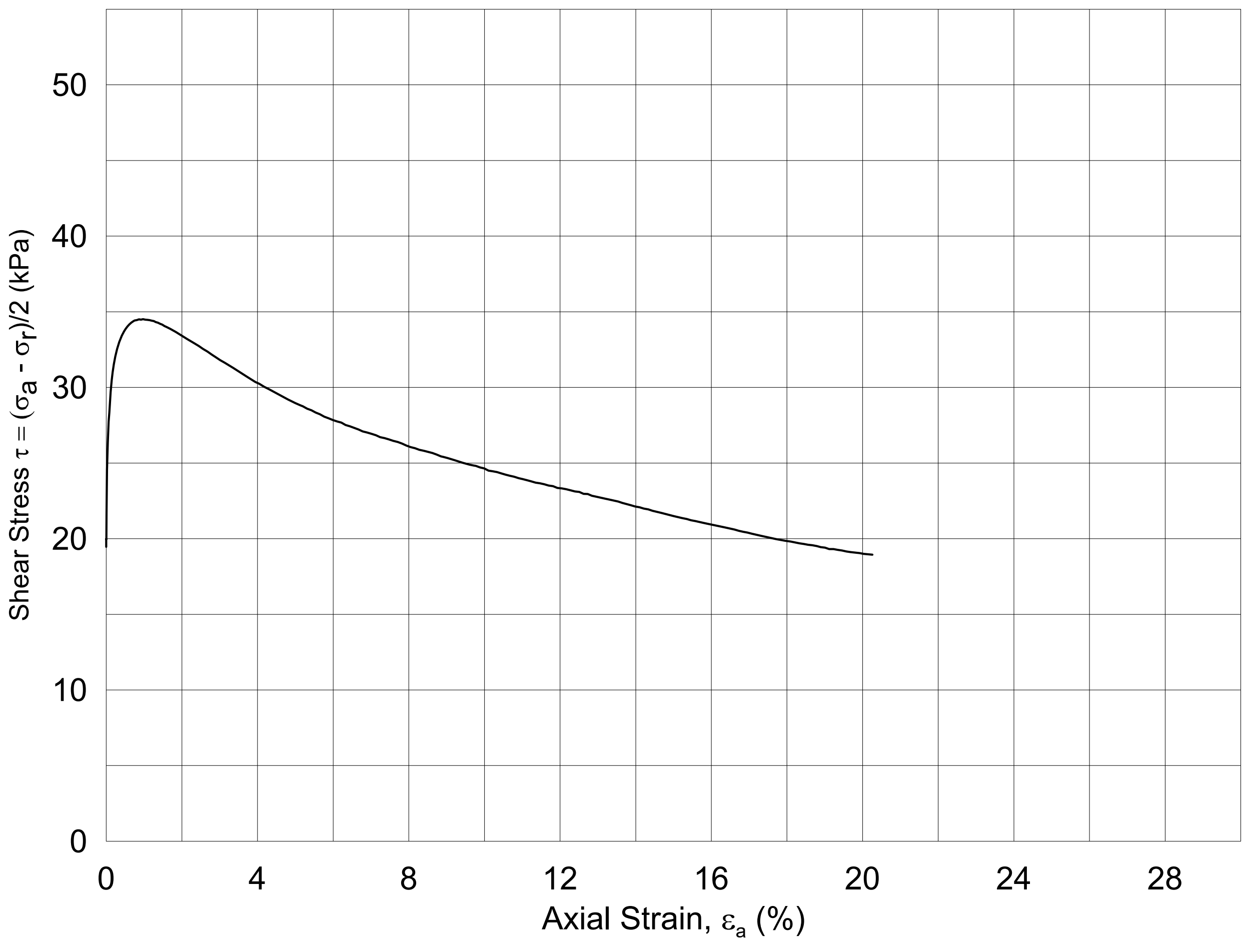
Boring:	**ONSB41**	Depth =	**14.50**	m	Consolidation stresses			
Tube:	**15**	po' =	**96.8**	kPa	(kPa)	max.	min.	final
Part:	**B**	w_i =	**33.2**	%	σ_{ac}' =	-	-	**96.8**
Test:	**1**	w_c =	**30.7**	%	σ_{rc}' =	-	-	**58.1**

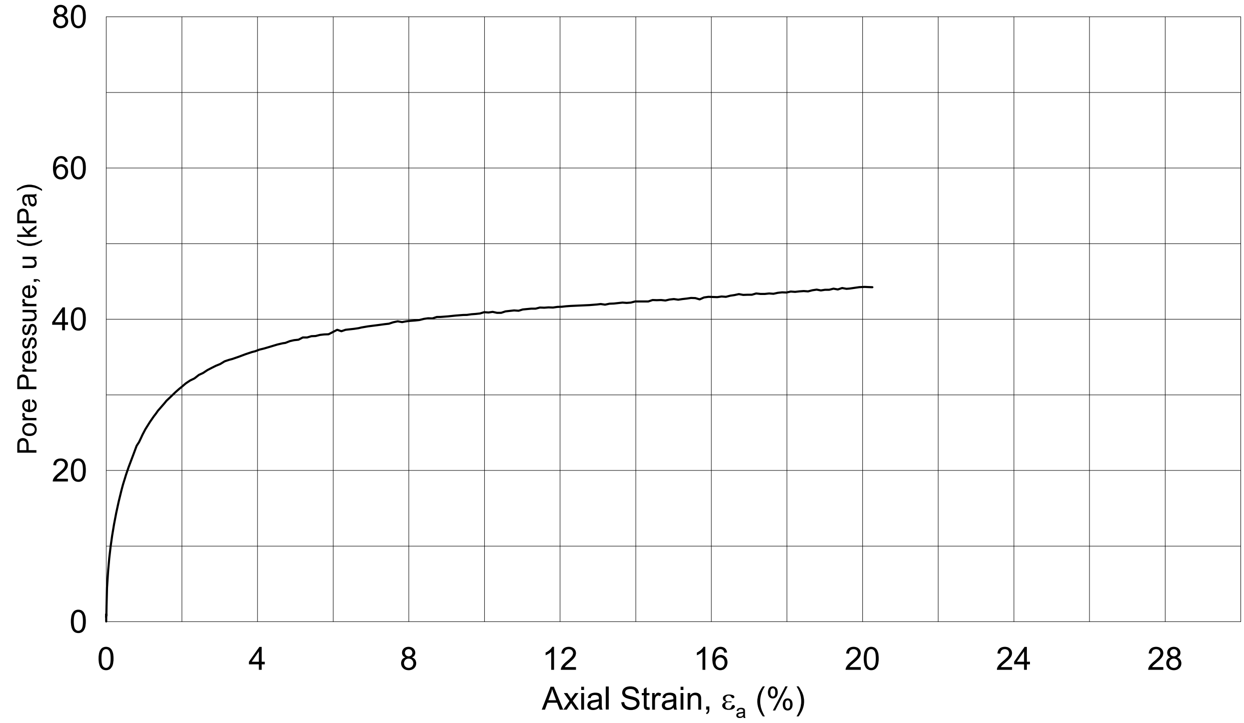
Date: 2018-12-10

Drawn by/checked: ThV / GS

NGI

ONSB41-15-B-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

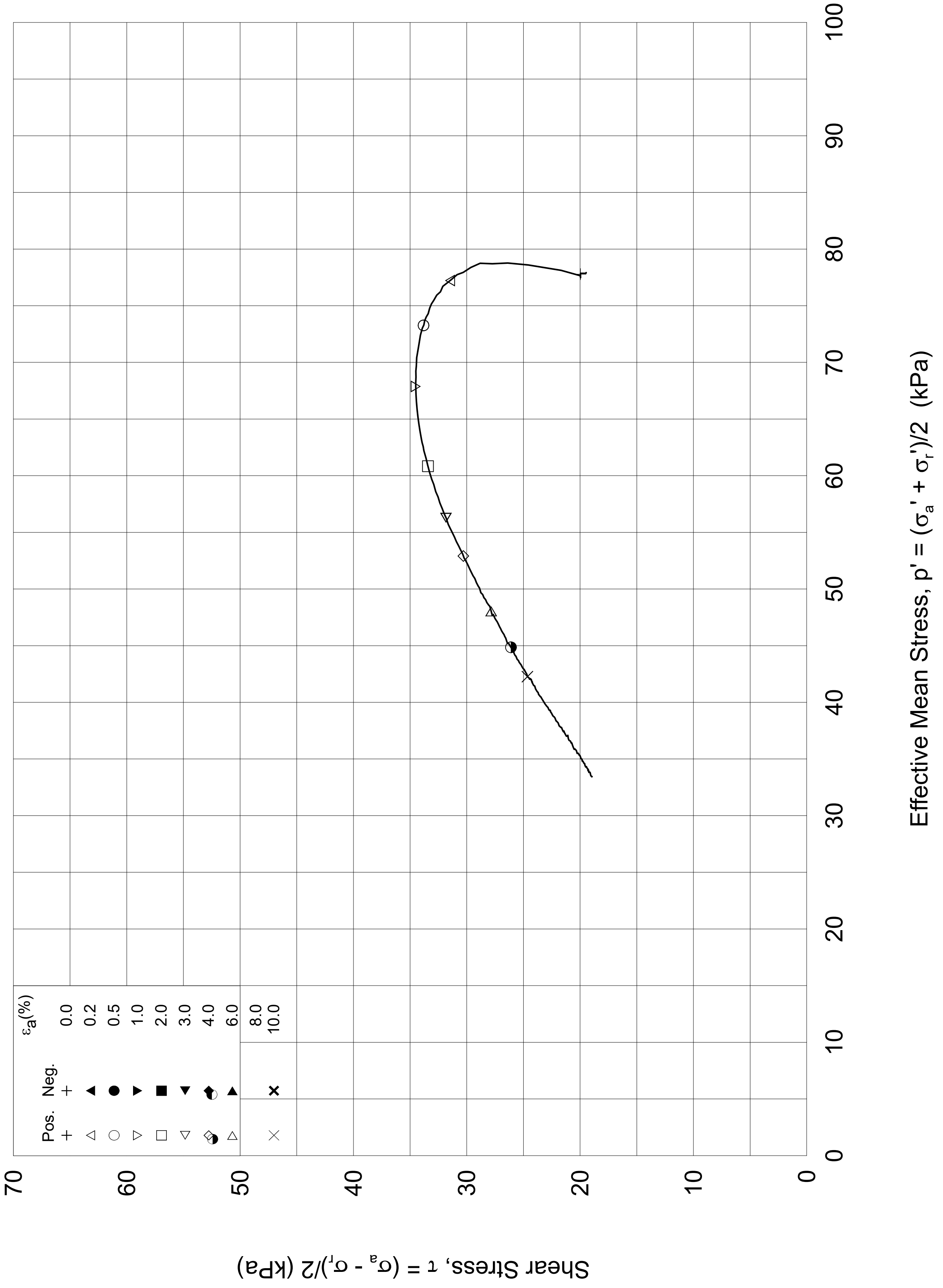
Document No. 20160154-10-R

Triaxial test: **CAUC**

Figure No. 5.3.226

Boring:	**ONSB41**	Depth =	**14.63**	m	Consolidation stresses				Date 2018-12-10	Drawn by/checked ThV / GS
Tube:	**15**	po' =	**97.5**	kPa	(kPa)	max.	min.	final		
Part:	**C**	w_i =	**48.0**	%	σ_{ac}' =	-	-	**97.3**		
Test:	**1**	w_c =	**44.8**	%	σ_{rc}' =	-	-	**58.5**		

ONSB41-15-C-1.Plot1.grf

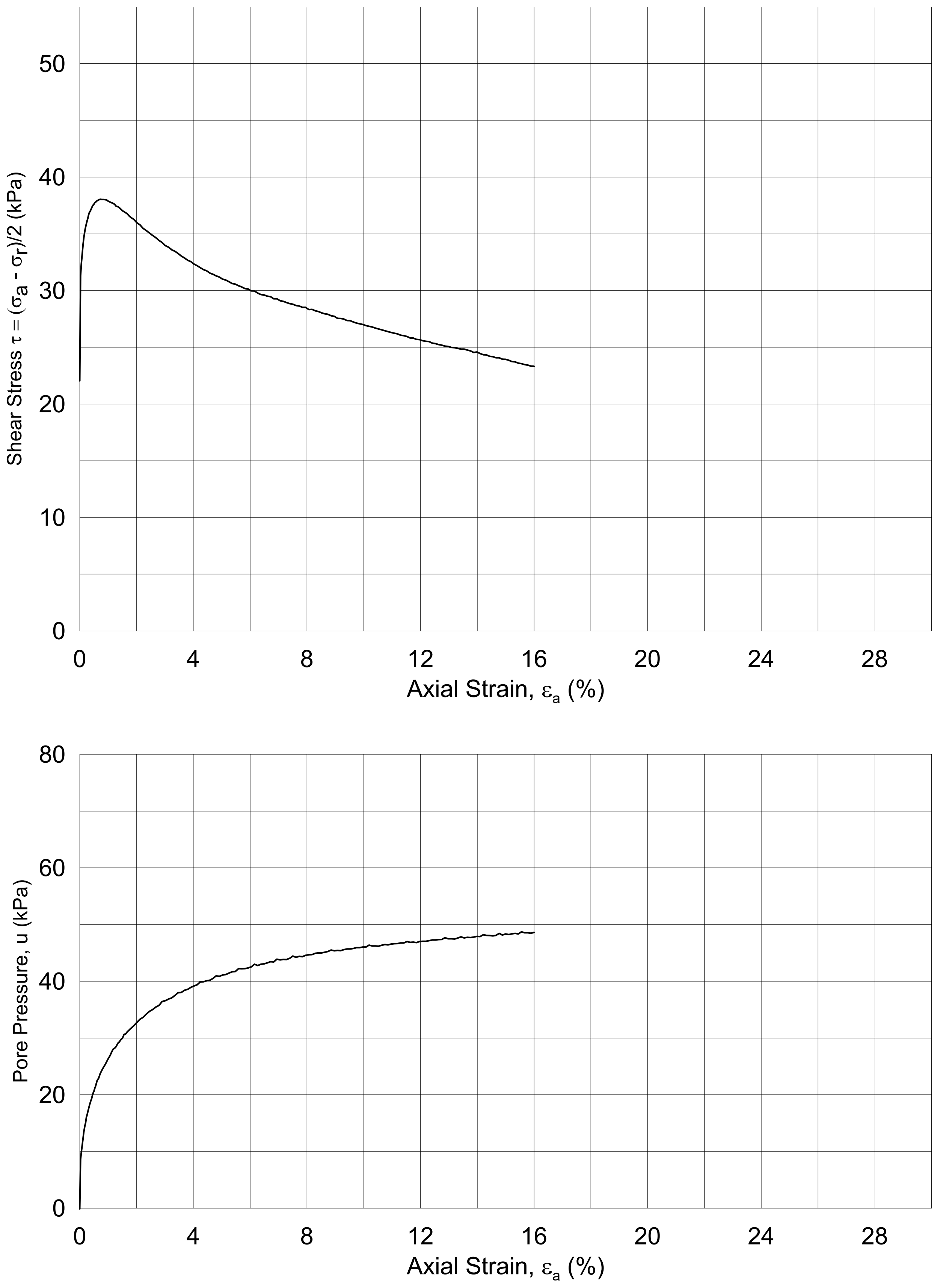


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**								Document No. 20160154-10-R
								Figure No. 5.3.227
Boring:	**ONSB41**	Depth =	**14.63**	m	Consolidation stresses			Date 2018-12-10 / Drawn by/checked ThV / GS
Tube:	**15**	po' =	**97.5**	kPa	(kPa)	max.	min.	final
Part:	**C**	w_i =	**48.0**	%	σ_{ac}' =	-	-	**97.3**
Test:	**1**	w_c =	**44.8**	%	σ_{rc}' =	-	-	**58.5**

ONSB41-15-C-1.Plot2.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUC**								
Boring:	**ONSB41**	Depth =	**16.40**	m	Consolidation stresses			
Tube:	**17**	po' =	**110.2**	kPa	(kPa)	max.	min.	final
Part:	**D**	w_i =	**46.9**	%	σ_{ac}' =	-	-	**110.3**
Test:	**1**	w_c =	**44.6**	%	σ_{rc}' =	-	-	**66.1**

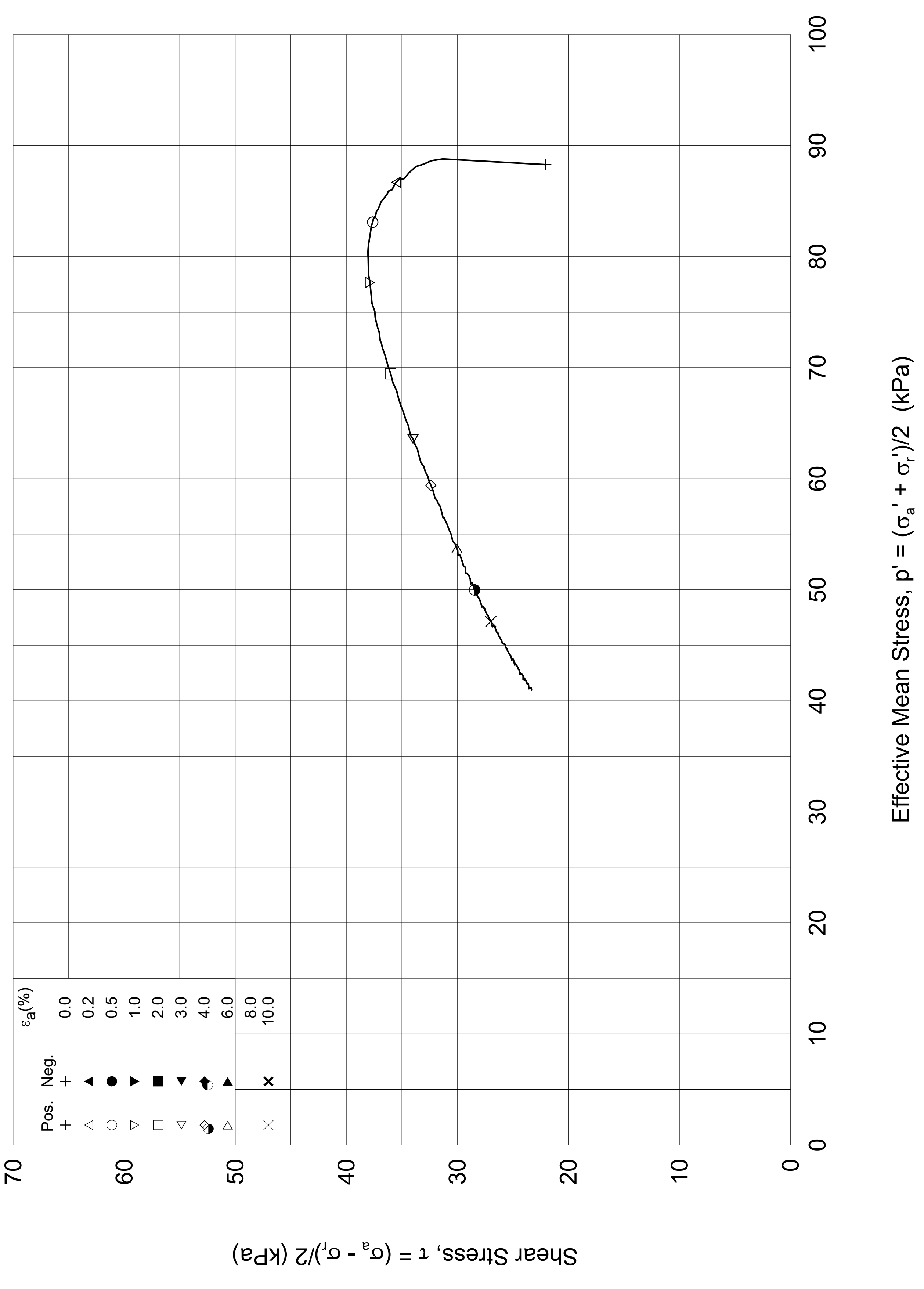
Document No. 20160154-10-R

Figure No. 5.3.228

Date 2018-12-10

Drawn by/checked ThV / GS

ONSB41-17-D-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.229

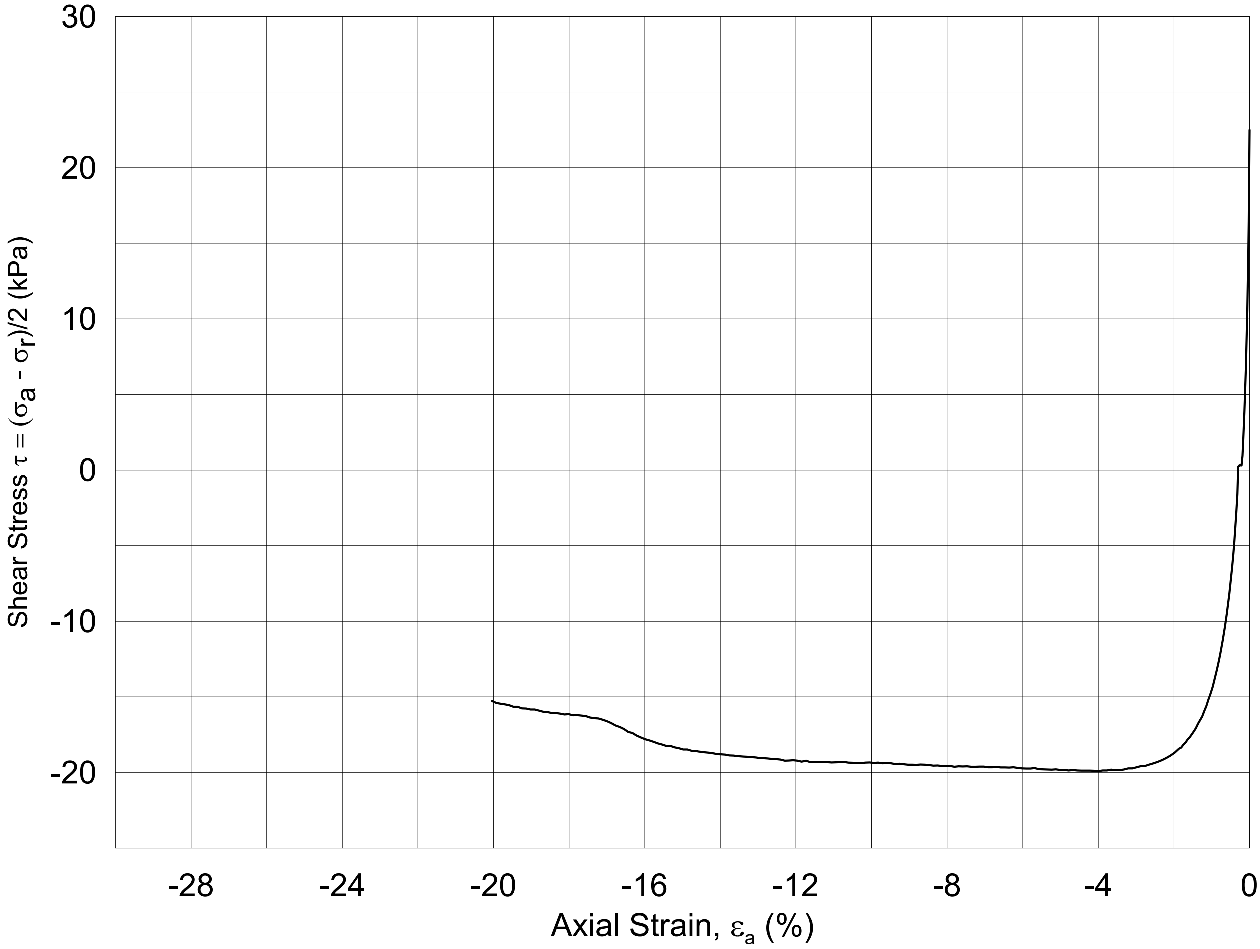
Triaxial test: **CAUC**

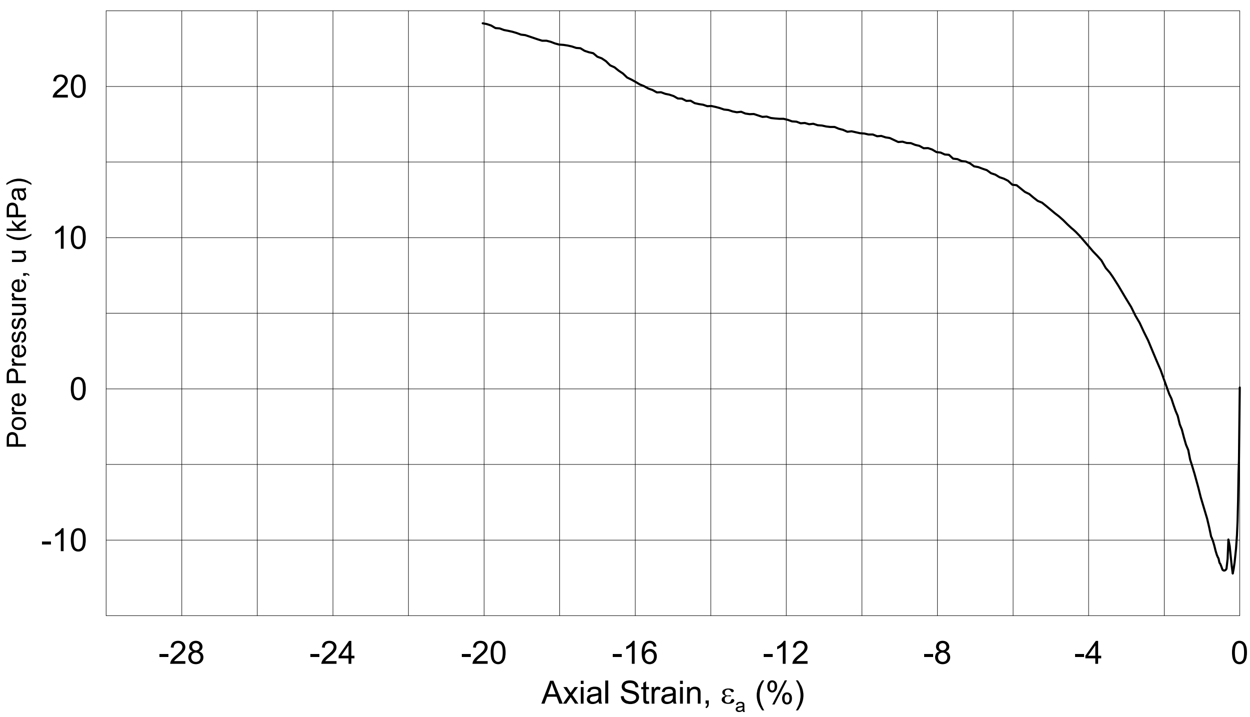
Date 2018-12-10

Drawn by/checked ThV / GS

Boring:	**ONSB41**	Depth =	**16.40**	m	Consolidation stresses			
Tube:	**17**	po' =	**110.2**	kPa	(kPa)	max.	min.	final
Part:	**D**	w_i =	**46.9**	%	σ_{ac}' =	-	-	**110.3**
Test:	**1**	w_c =	**44.6**	%	σ_{rc}' =	-	-	**66.1**

ONSB41-17-D-1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

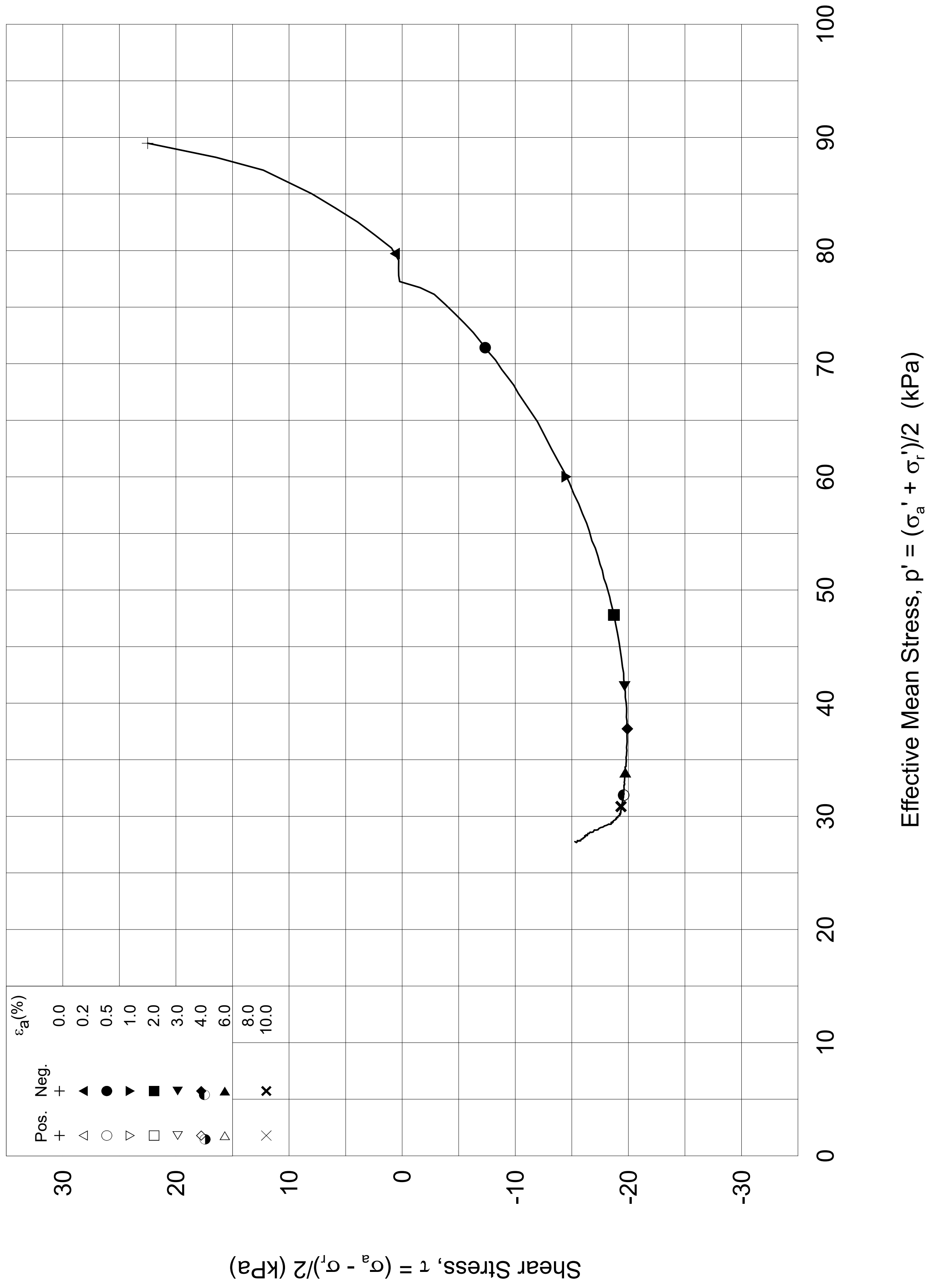
Document No.	20160154-10-R
Figure No.	5.3.230
Date	2018-12-10
Drawn by/checked	ThV / GS

Triaxial test: **CAUE**

Boring:	**ONSB41**	Depth =	**16.54**	m	Consolidation stresses			
Tube:	**17**	po' =	**111.8**	kPa	(kPa)	max.	min.	final
Part:	**E**	w_i =	**47.8**	%	σ_{ac}' =	-	-	**111.7**
Test:	**1**	w_c =	**45.5**	%	σ_{rc}' =	-	-	**67.0**

NGI

ONSB41-17-E-1.Plot1.grf



Dato/rev.: 2014-12-23/01

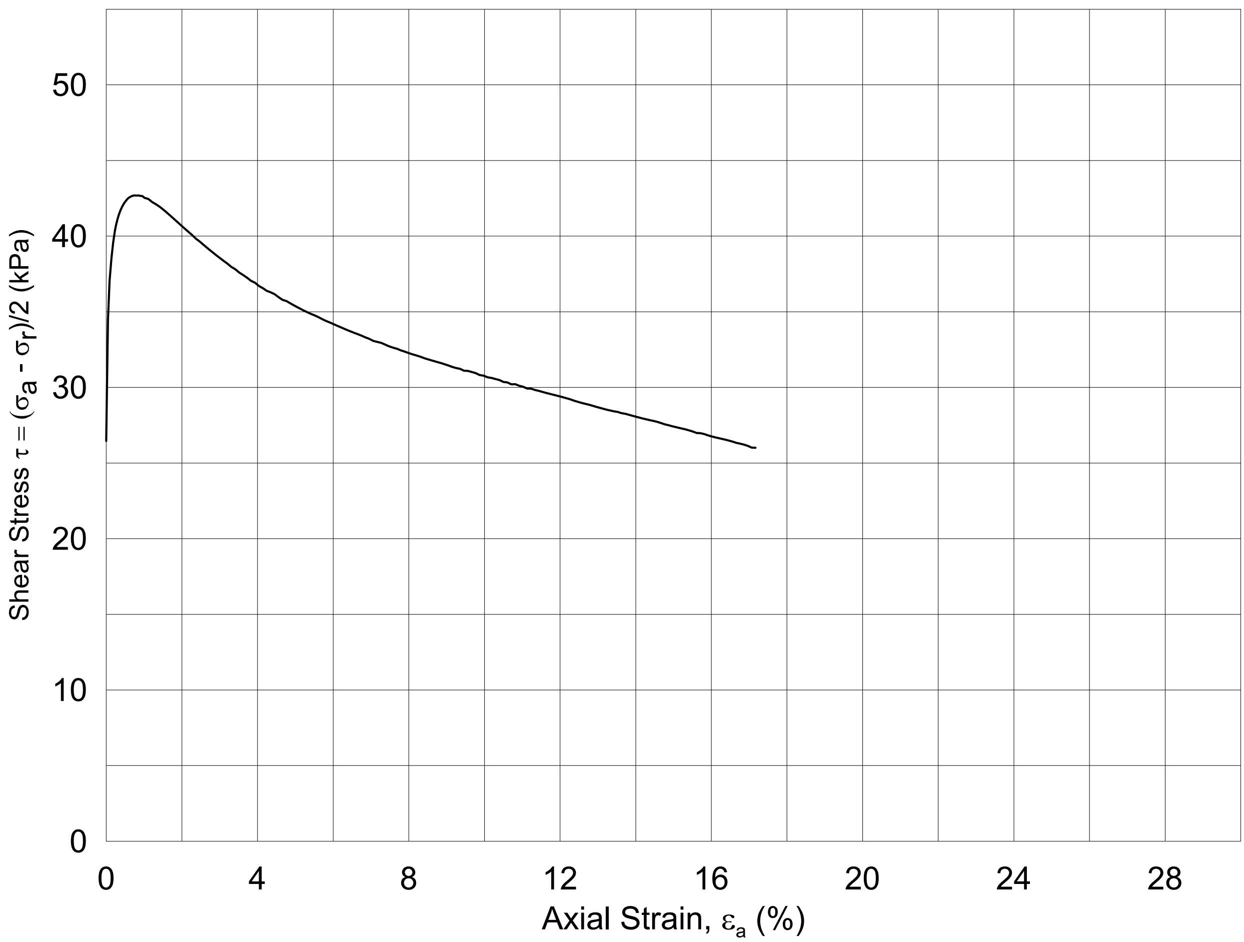
Norwegian GeoTest Sites - Onsøy

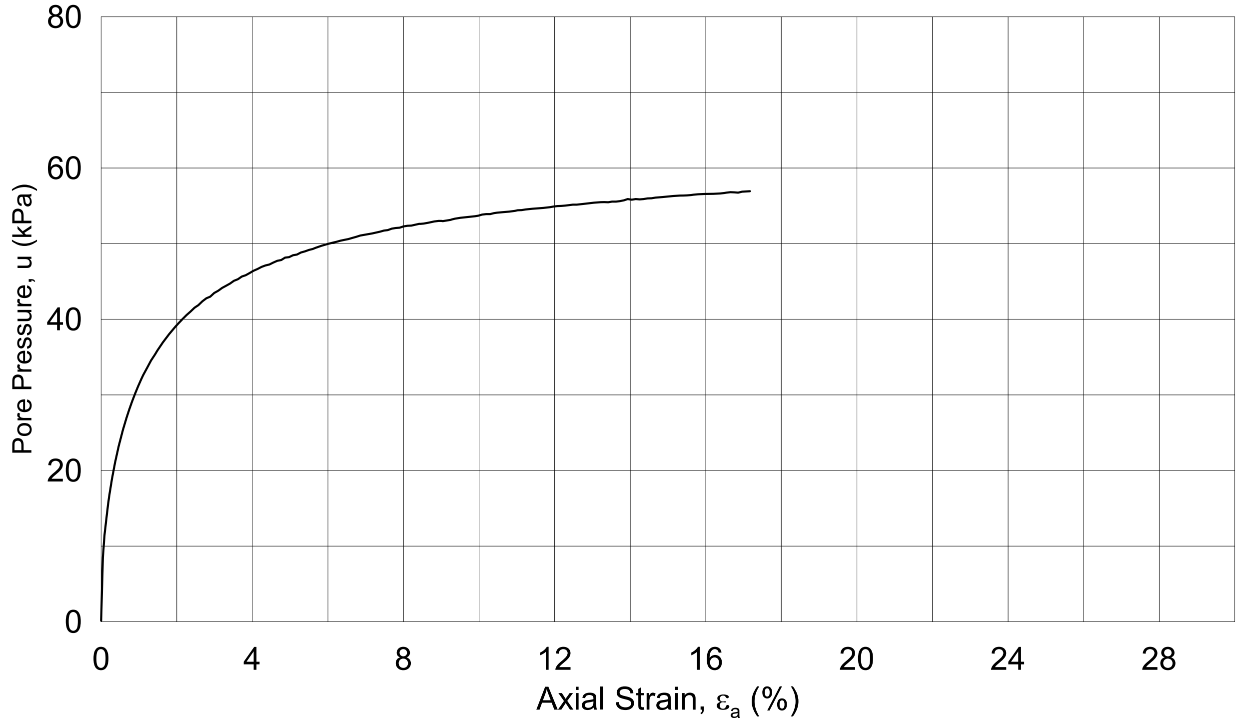
Document No.	20160154-10-R	
Figure No.	5.3.231	
Date	2018-12-10	Drawn by/checked: ThV / GS

Triaxial test: **CAUE**

Boring:	**ONSB41**	Depth =	**16.54**	m	Consolidation stresses			
Tube:	**17**	po' =	**111.8**	kPa	(kPa)	max.	min.	final
Part:	**E**	w_i =	**47.8**	%	σ_{ac}' =	-	-	**111.7**
Test:	**1**	w_c =	**45.5**	%	σ_{rc}' =	-	-	**67.0**

ONSB41-17-E-1.Plot2.grf



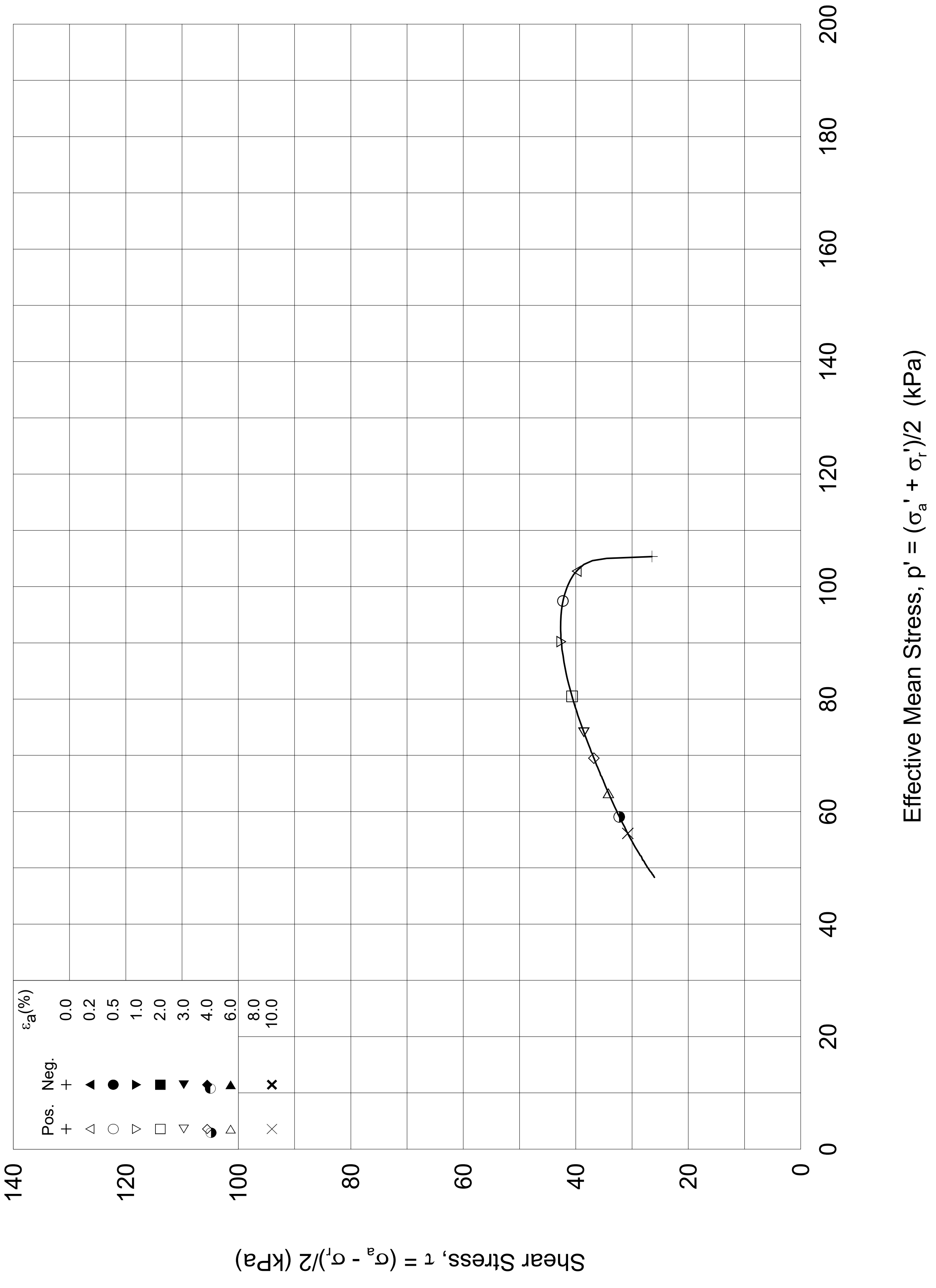


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Triaxial test: **CAUC**			Figure No. 5.3.232
Boring: **ONSB41**	Depth = **19.36** m	Consolidation stresses	Date 2018-12-10 / Drawn by/checked ThV / GS
Tube: **20**	po' = **132.1** kPa	(kPa) max. min. final	
Part: **D**	w_i = **40.6** %	σ_{ac}' = - - **131.9**	
Test: **1**	w_c = **38.6** %	σ_{rc}' = - - **79.0**	

NGI

ONSB41-20-D-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

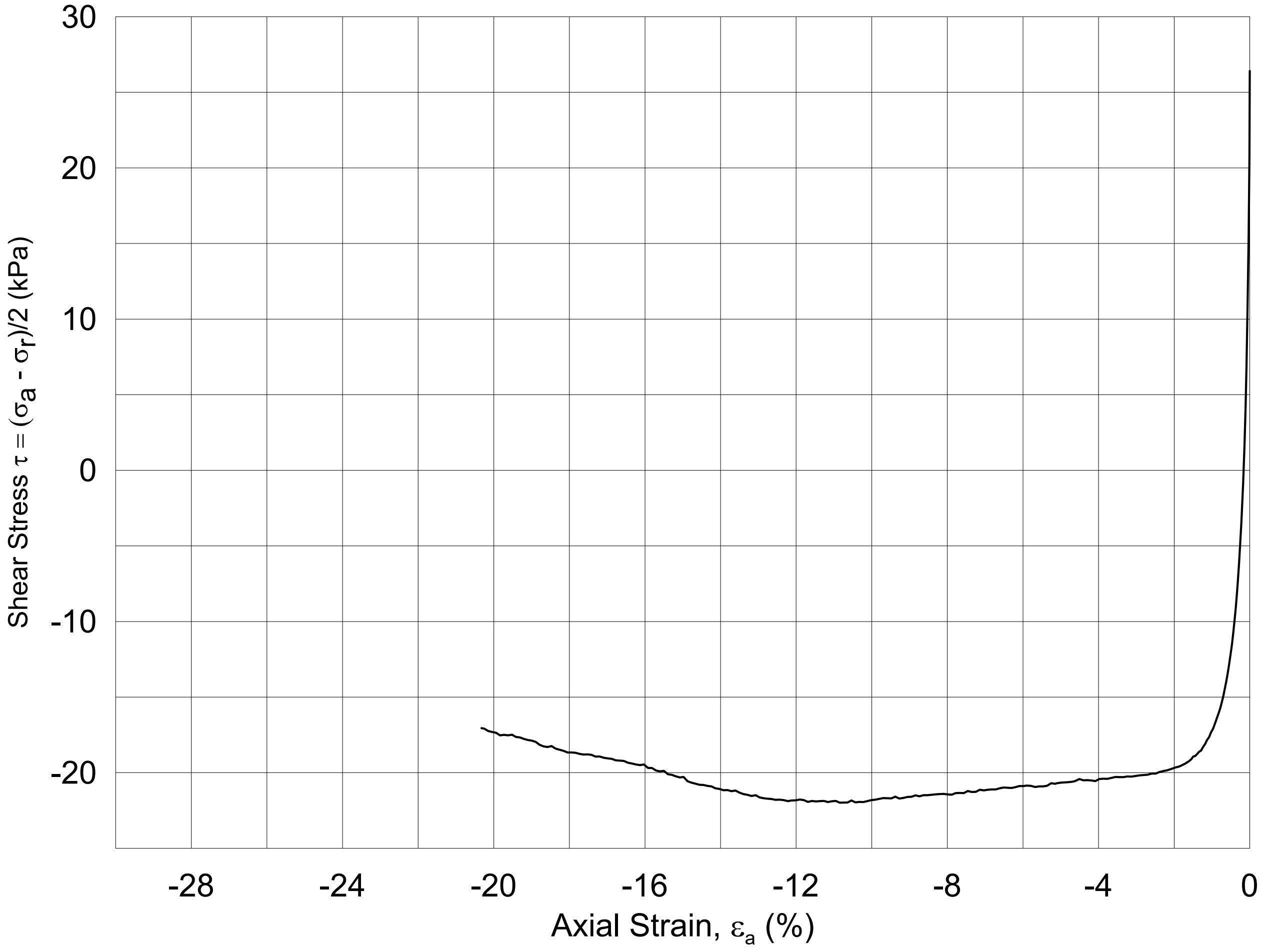
Document No.	20160154-10-R				
Figure No.	5.3.233				
Date	2018-12-10	Drawn by/checked	ThV / GS		

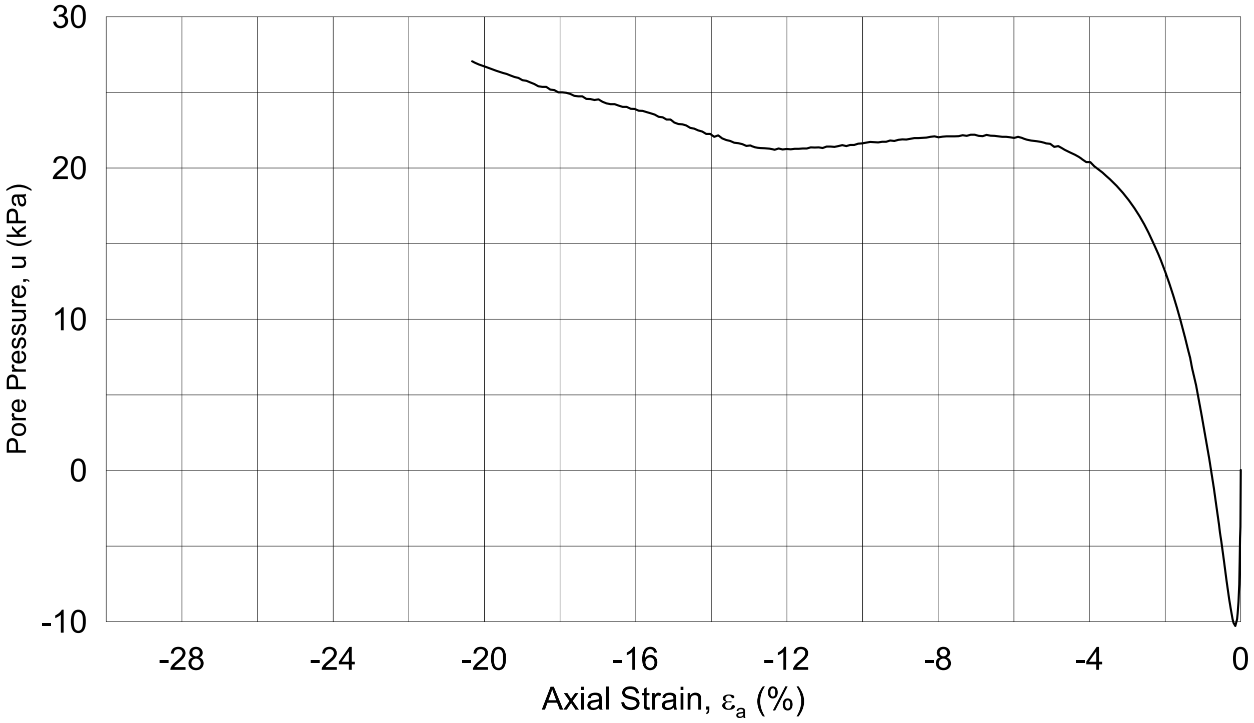
Triaxial test: **CAUC**

Boring:	**ONSB41**	Depth =		**19.36**	m	Consolidation stresses					
Tube:	**20**	po'	=	**132.1**	kPa	(kPa)		max.	min.	final	
Part:	**D**	w_i	=	**40.6**	%	σ_{ac}' =		-	-	**131.9**	
Test:	**1**	w_c	=	**38.6**	%	σ_{rc}' =		-	-	**79.0**	

ONSB41-20-D-1.Plot2.grf

NGI



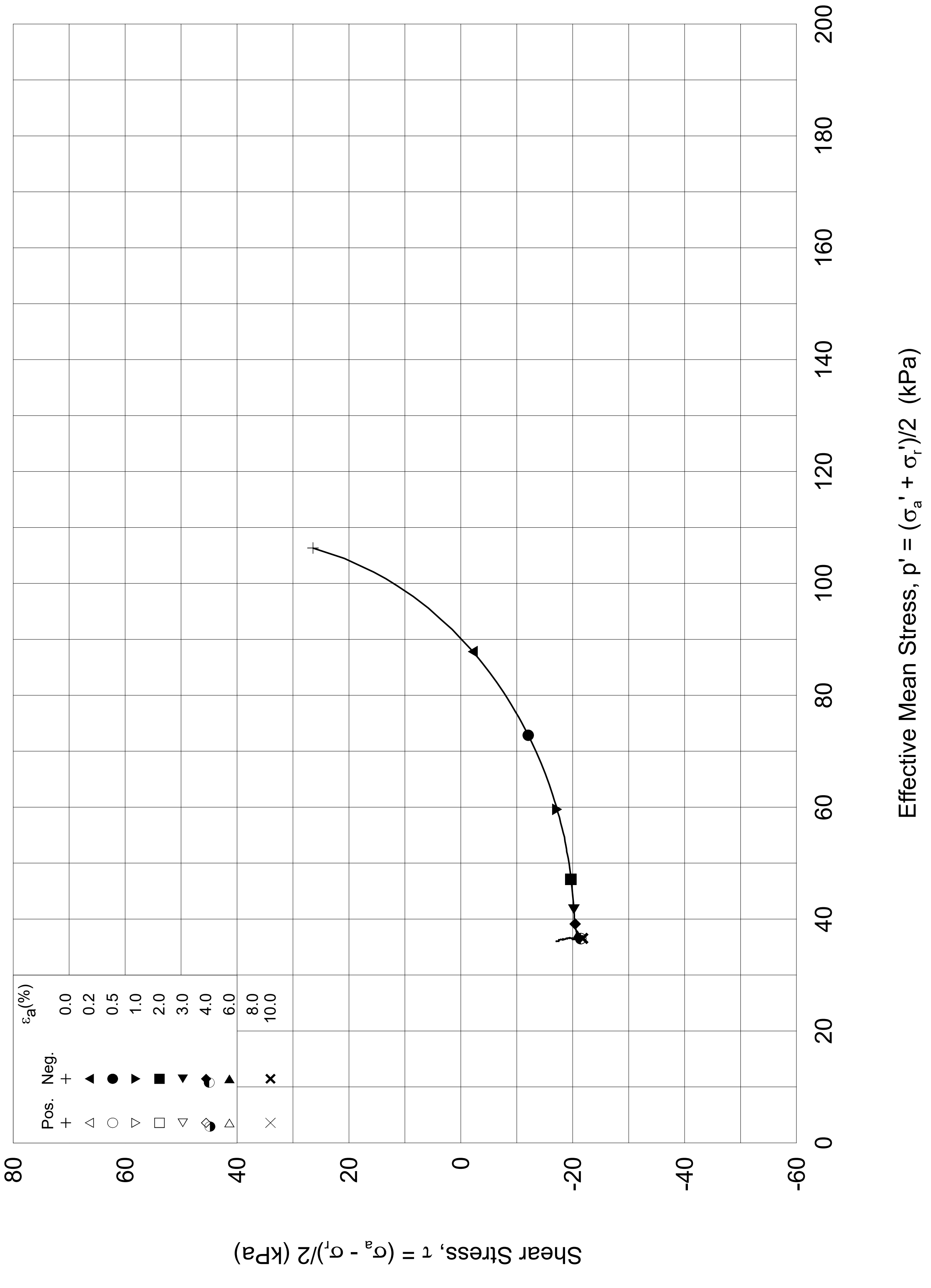


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUE**							Document No. 20160154-10-R Figure No. 5.3.234
Boring: **ONSB41**	Depth = **19.52** m	Consolidation stresses					Date 2018-12-10 / Drawn by/checked ThV / GS
Tube: **20**	po' = **133.2** kPa	(kPa)	max.	min.	final		
Part: **E**	w_i = **39.6** %	σ_{ac}' =	-	-	**132.8**		
Test: **1**	w_c = **38.2** %	σ_{rc}' =	-	-	**79.9**		

ONSB41-20-E-1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.235

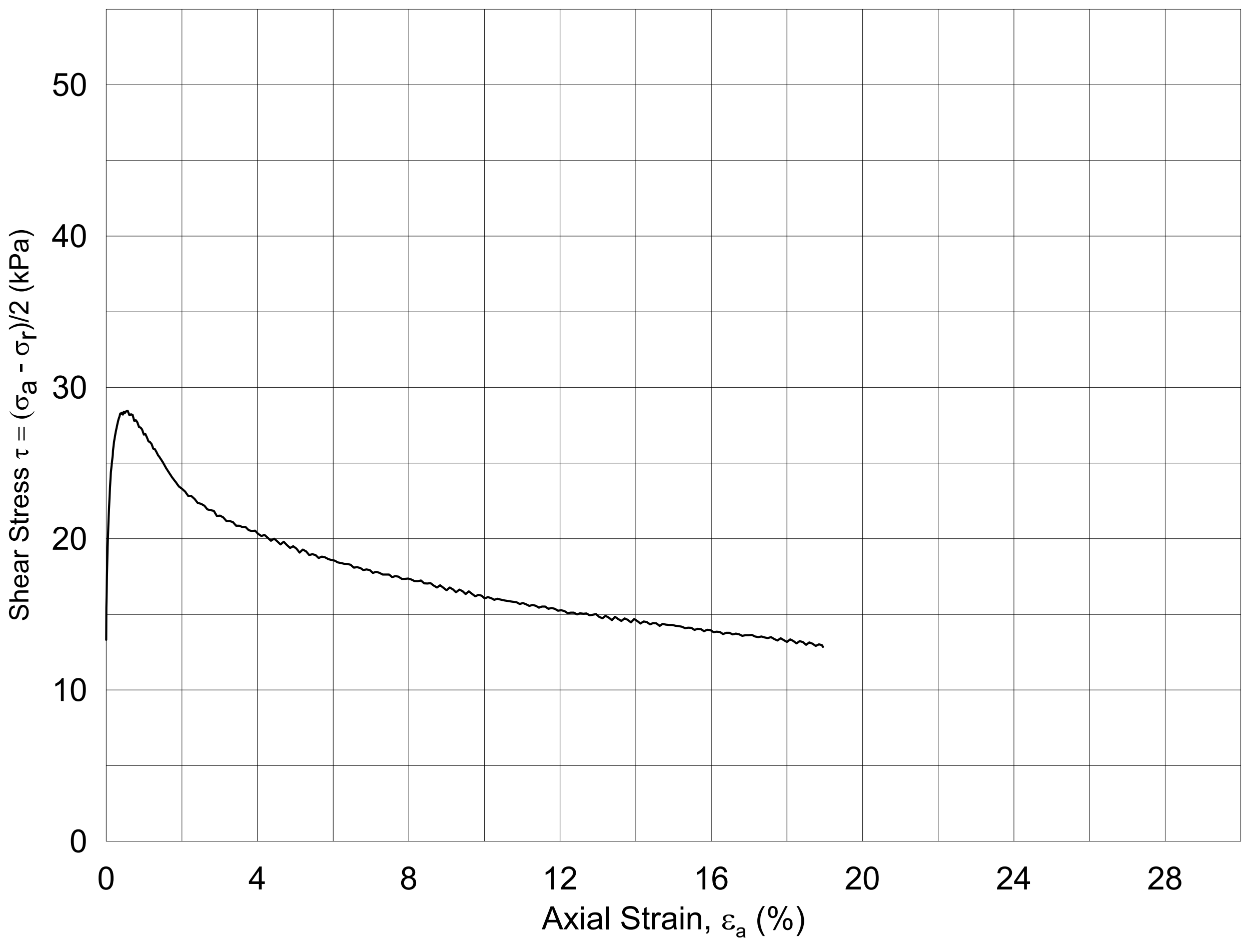
Triaxial test: **CAUE**

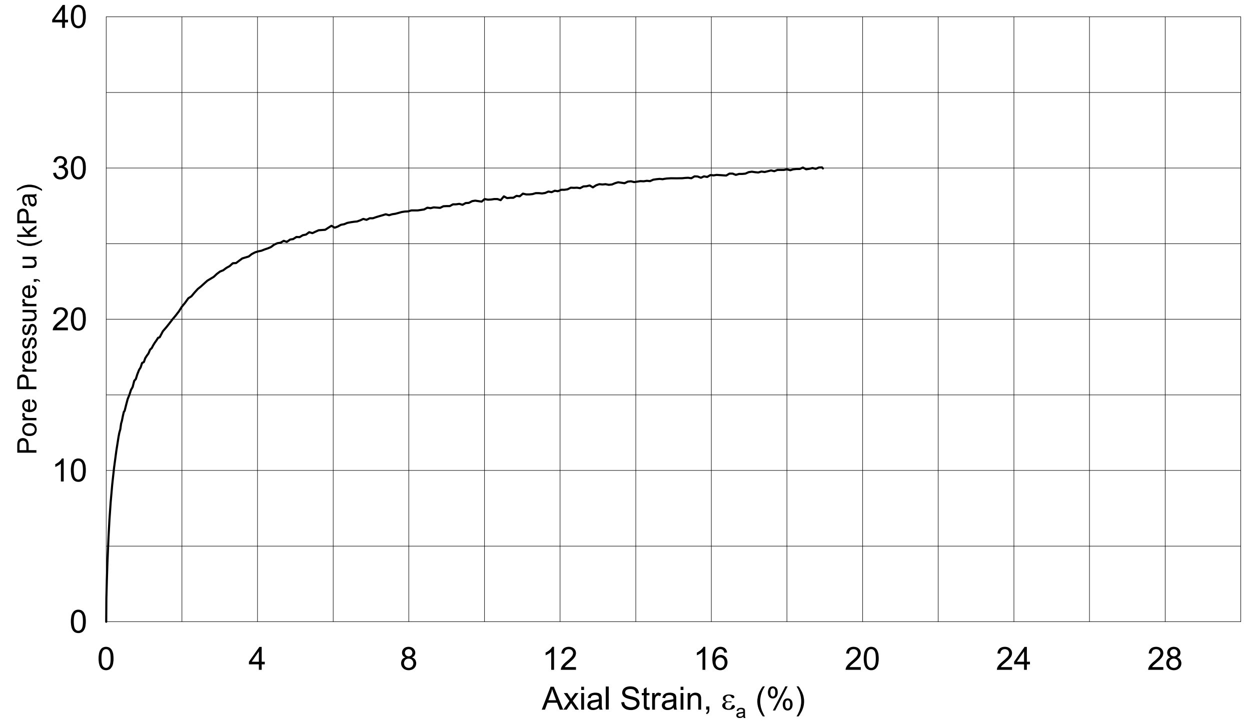
Boring:	**ONSB41**	Depth =	**19.52**	m	Consolidation stresses				
Tube:	**20**	po' =	**133.2**	kPa	(kPa)	max.	min.	final	
Part:	**E**	w_i =	**39.6**	%	σ_{ac}' =	-	-	**132.8**	
Test:	**1**	w_c =	**38.2**	%	σ_{rc}' =	-	-	**79.9**	

Date: 2018-12-10

Drawn by/checked: ThV / GS

ONSB41-20-E-1.Plot2.grf





Dato/rev.: 2014-12-23/01

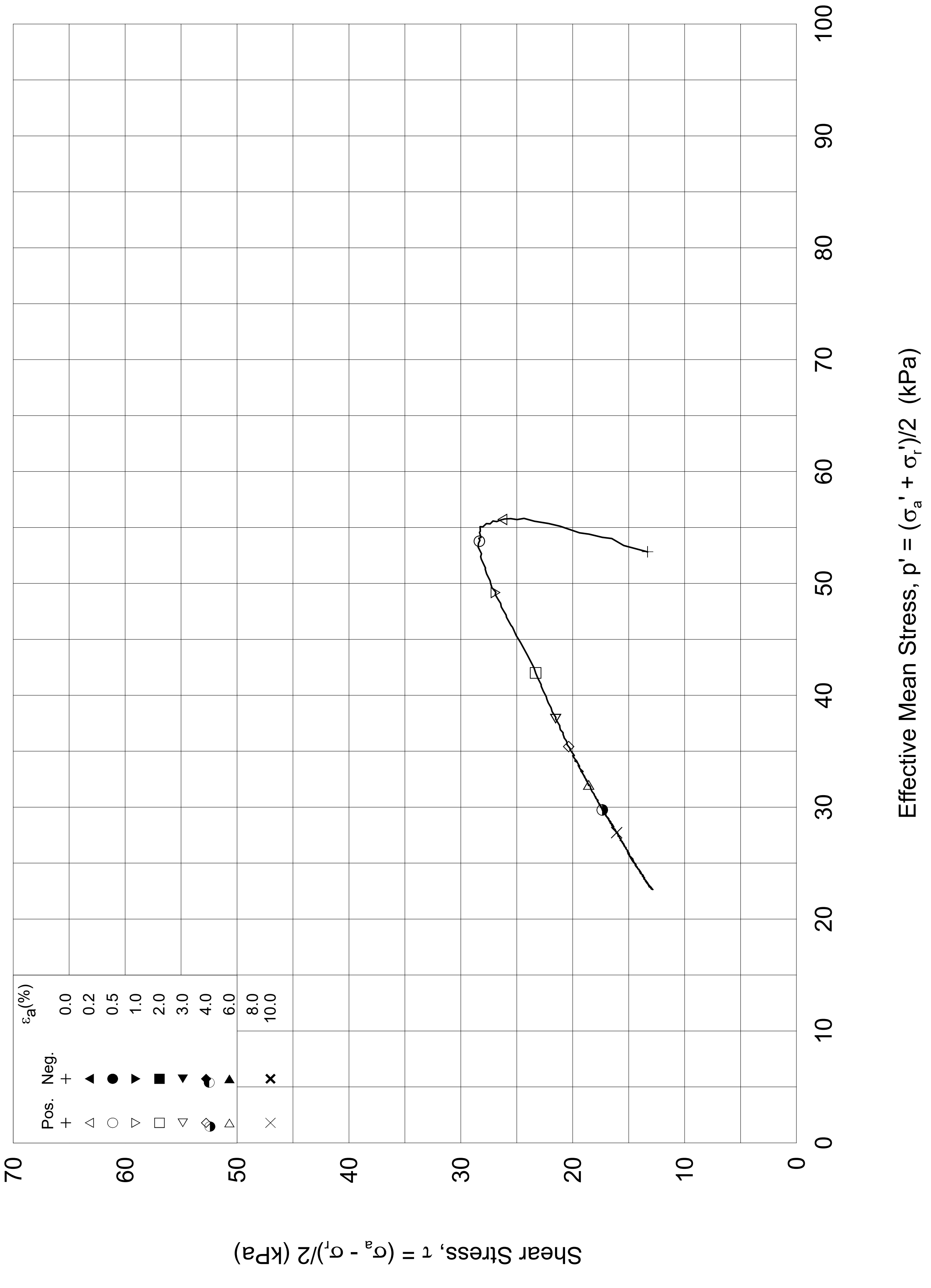
Norwegian GeoTest Sites - Onsøy

Document No.	20160154-10-R				
Figure No.	5.3.236				
Date	2018-12-10	Drawn by/checked	PCa / GS		

Triaxial test: **CAUc**

							Consolidation stresses			
Boring:	**Onsoy**	Depth =	**10.24**	m			(kPa)	max.	min.	final
Tube:	**Block2016**	po'	=	**65.8**	kPa					
Part:	**1**	w_i	=	**43.6**	%		σ_{ac}' =	-	-	**65.7**
Test:	**T1**	w_c	=	**43.0**	%		σ_{rc}' =	-	-	**39.5**

Onsoy-Block2016-1-T1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.237

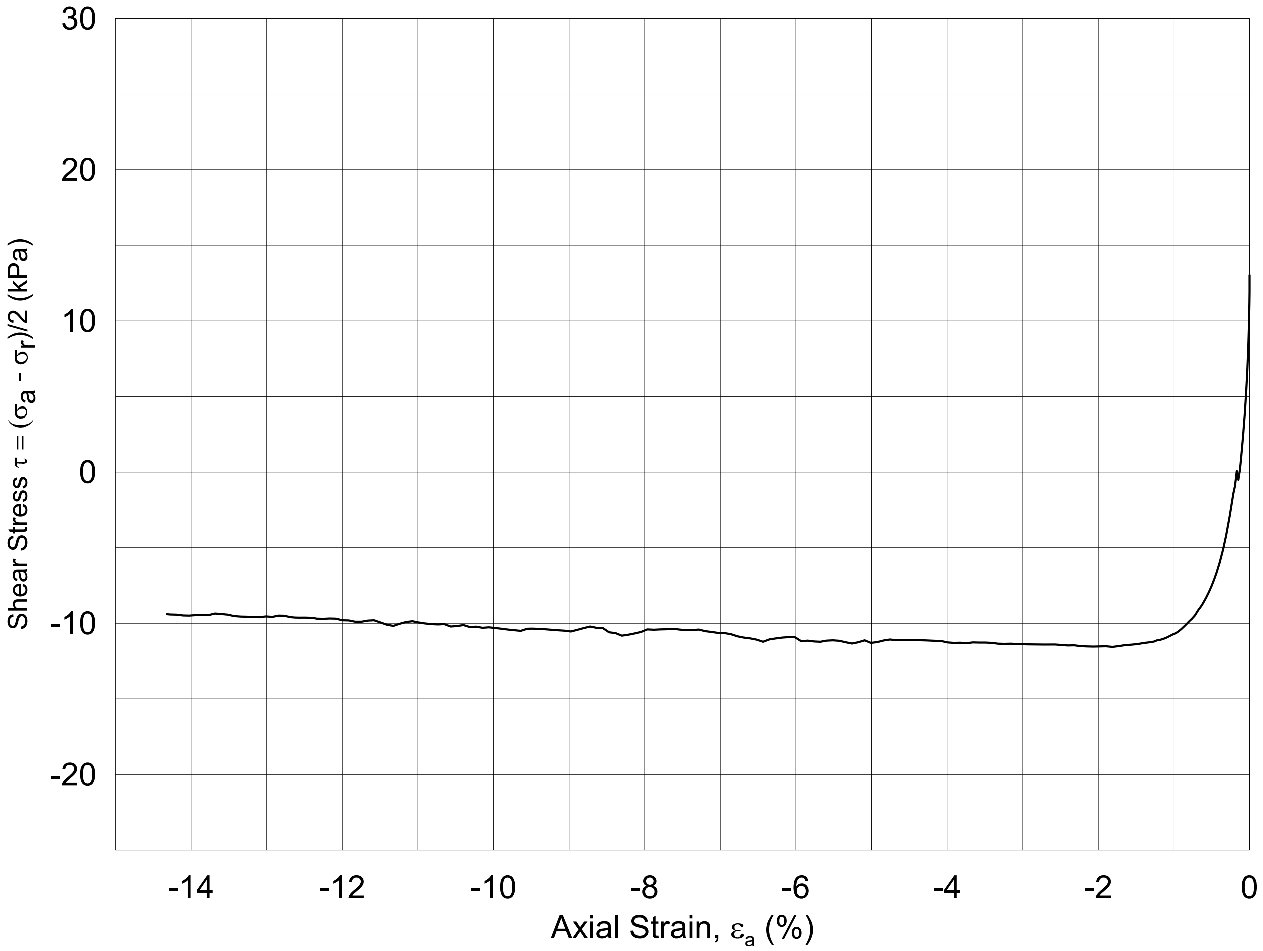
Triaxial test: **CAUc**

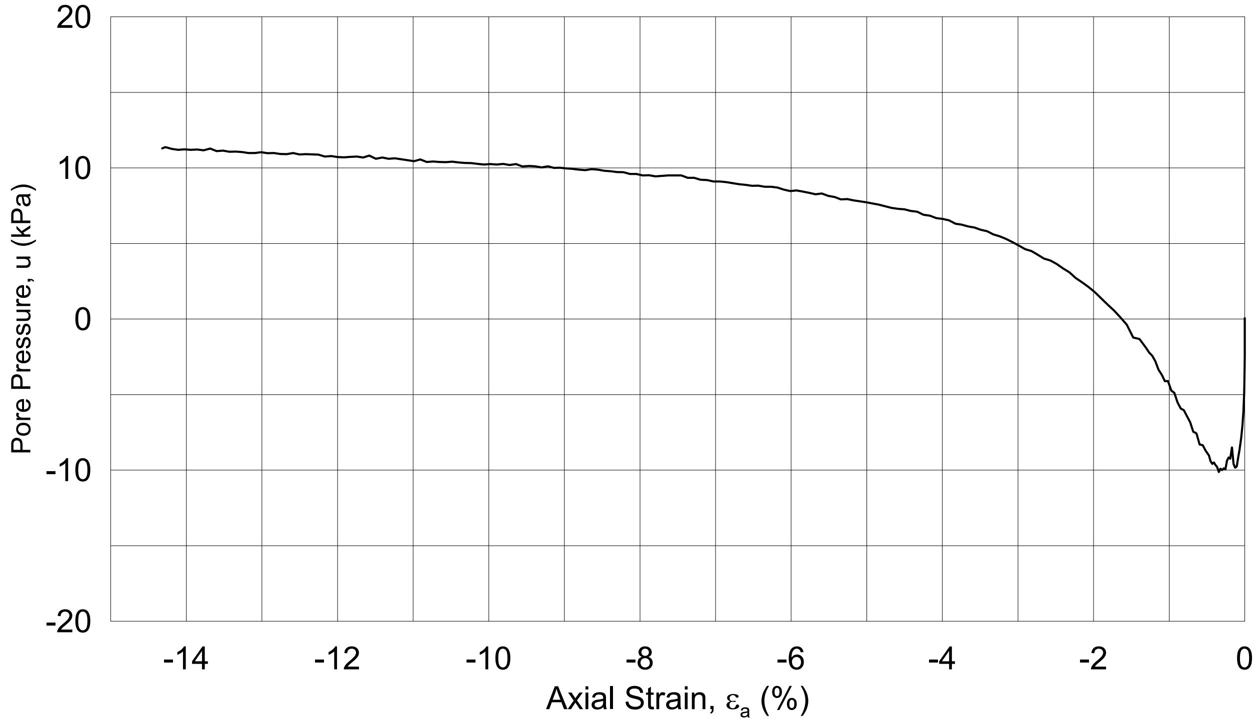
Boring:	**Onsoy**	Depth =	**10.24**	m	Consolidation stresses				
Tube:	**Block2016**	po' =	**65.8**	kPa	(kPa)	max.	min.	final	
Part:	**1**	w_i =	**43.6**	%	σ_{ac}' =	-	-	**65.7**	
Test:	**T1**	w_c =	**43.0**	%	σ_{rc}' =	-	-	**39.5**	

Date: 2018-12-10

Drawn by/checked: PCa / GS

Onsoy-Block2016-1-T1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Triaxial test: **CAUe**

Figure No. 5.3.238

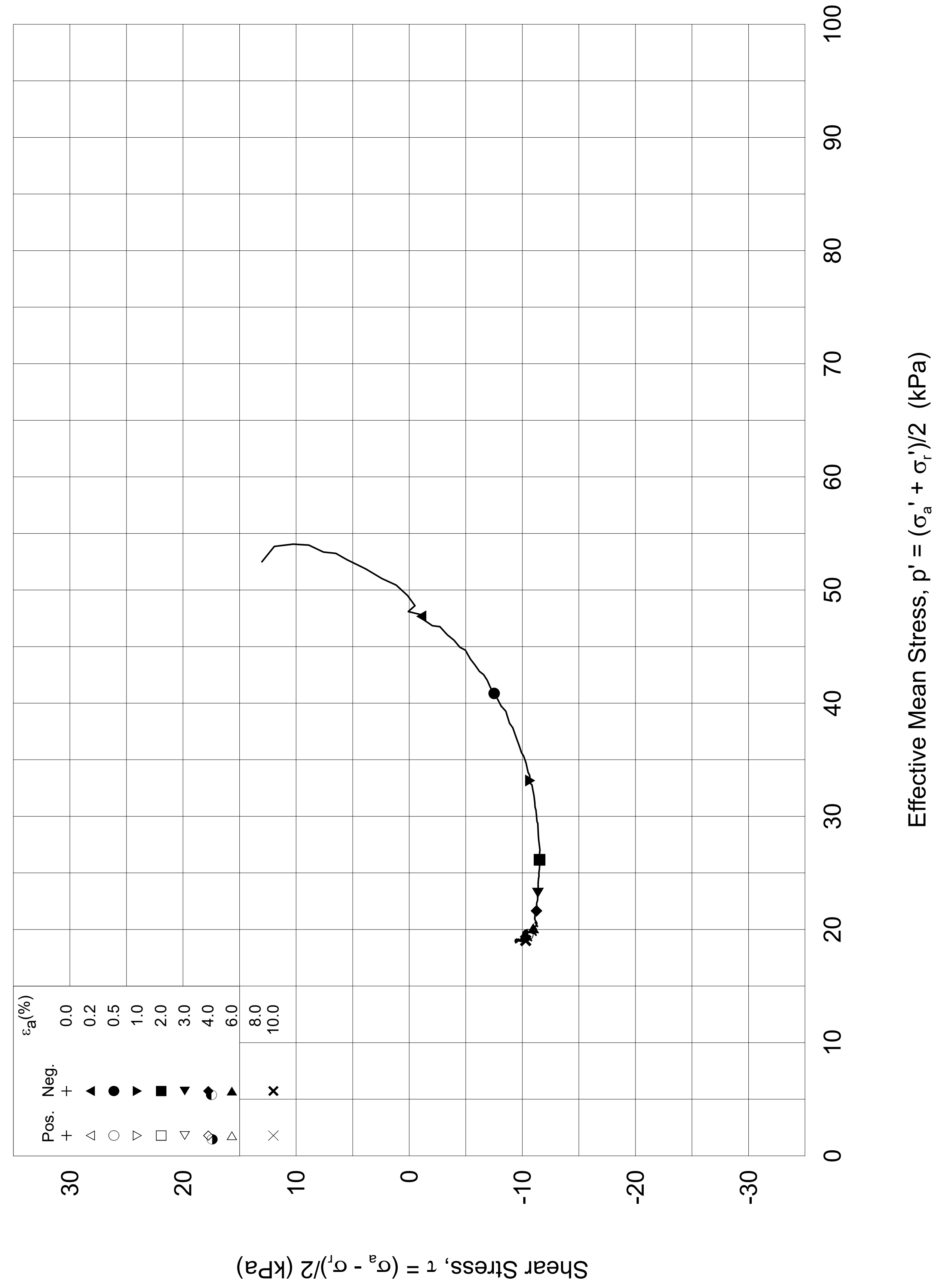
Boring:	**Onsoy**	Depth =	**10.24**	m	Consolidation stresses				
Tube:	**Block2016**	po' =	**65.8**	kPa	(kPa)	max.	min.	final	
Part:	**1**	w_i =	**41.6**	%	σ_{ac}' =	-	-	**65.8**	
Test:	**T2**	w_c =	**40.8**	%	σ_{rc}' =	-	-	**39.5**	

Date 2018-12-10

Drawn by/checked ThV / GS

NGI

Onsoy-Block2016-1-T2.Plot1.grf



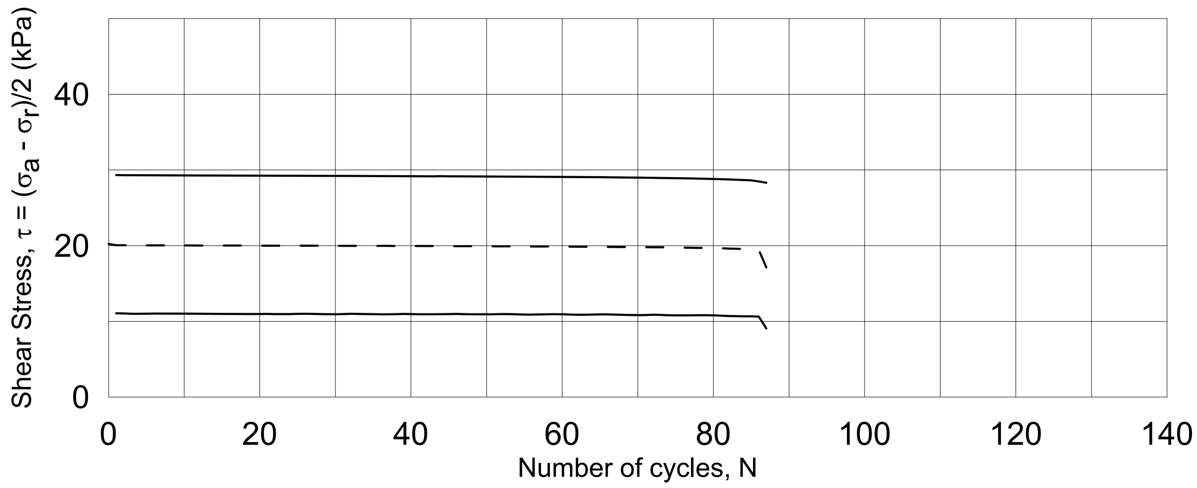
Dato/rev.: 2014-12-23/01

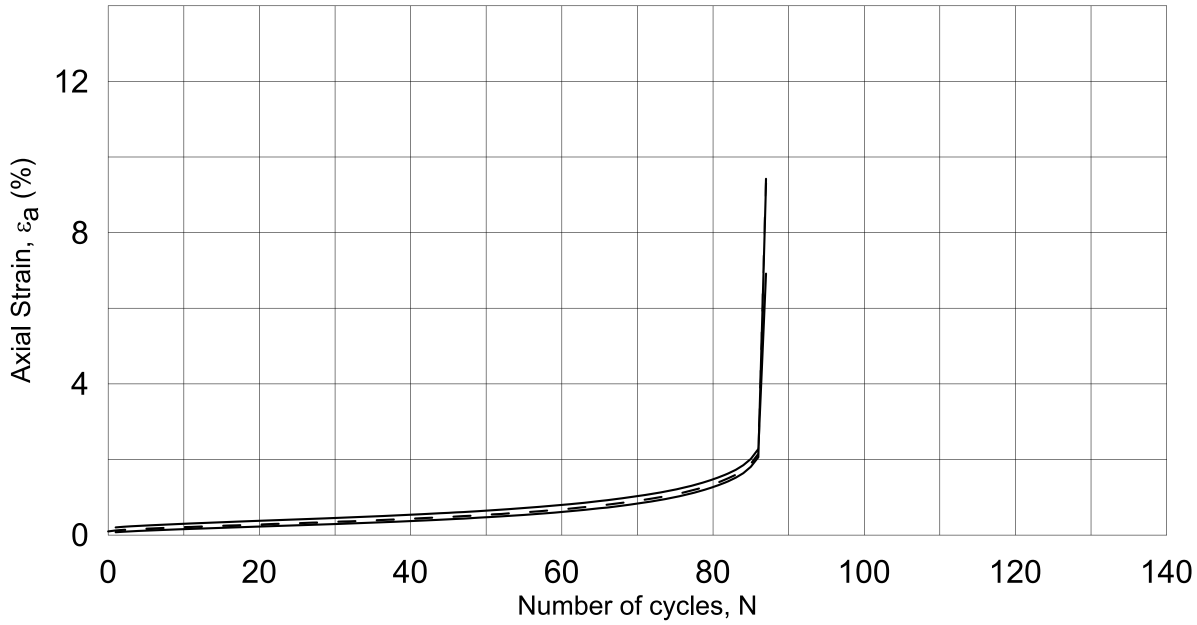
Norwegian GeoTest Sites - Onsøy

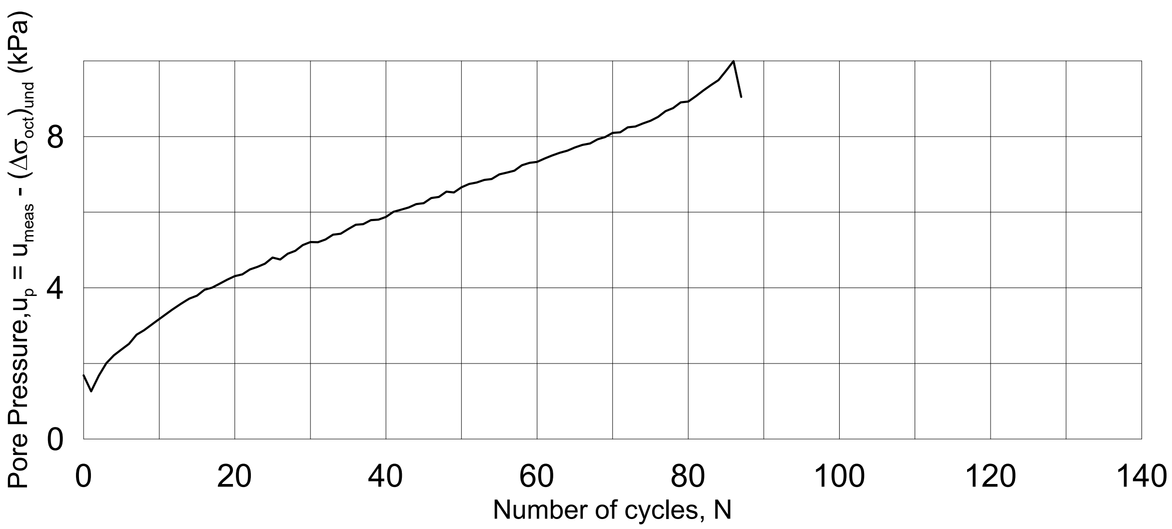
Triaxial test: **CAUe**								
Boring:	**Onsoy**	Depth =	**10.24**	m	Consolidation stresses			
Tube:	**Block2016**	po' =	**65.8**	kPa	(kPa)	max.	min.	final
Part:	**1**	w_i =	**41.6**	%	σ_{ac}' =	-	-	**65.8**
Test:	**T2**	w_c =	**40.8**	%	σ_{rc}' =	-	-	**39.5**

Document No.	20160154-10-R
Figure No.	5.3.239
Date	2018-12-10
Drawn by/checked	ThV / GS

Onsoy-Block2016-1-T2.Plot2.grf



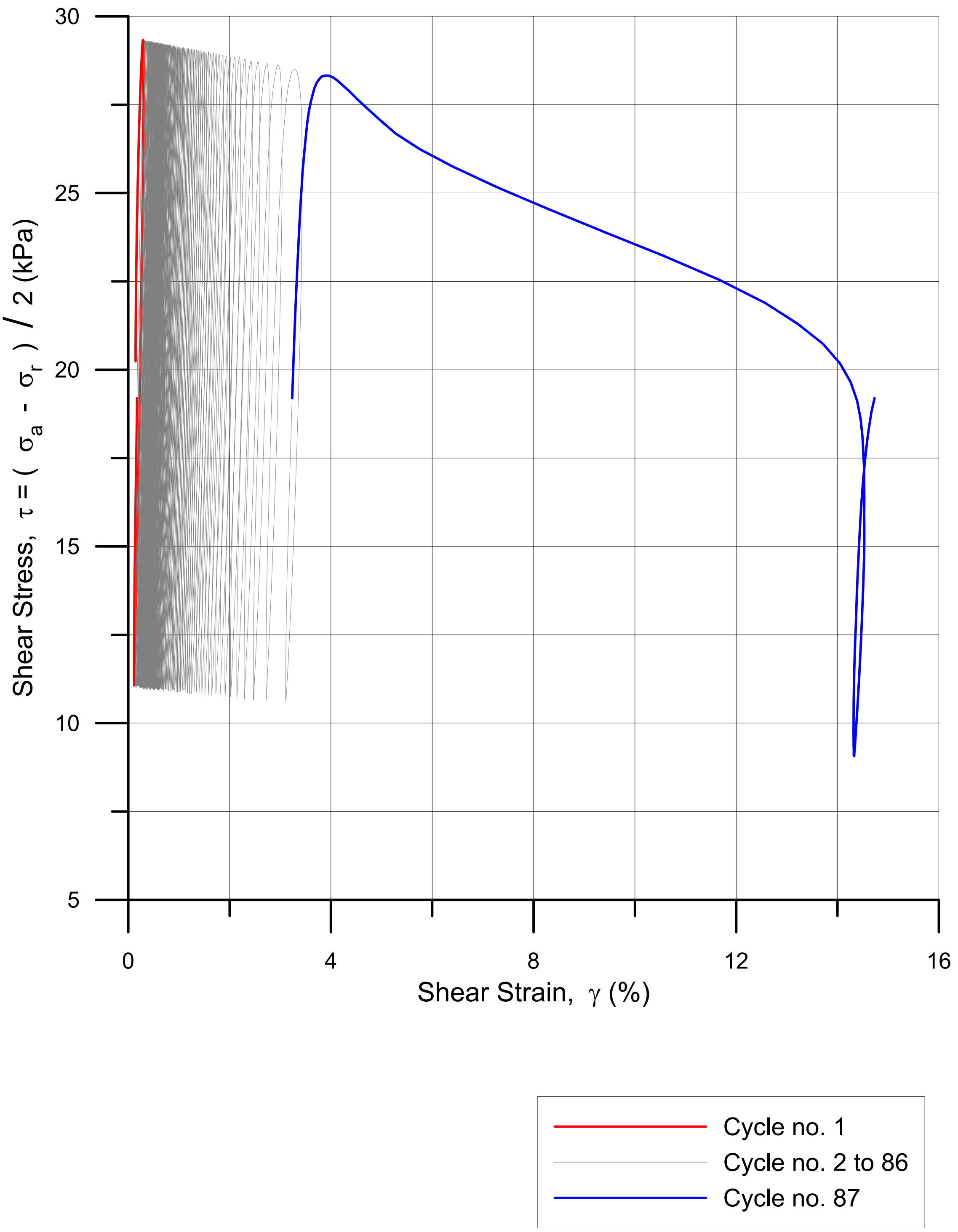




Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R
Triaxial test: **CAUcy**										Figure No. 5.3.240
Boring:	**ONSB01**	Depth =	**10.24**	m	Consolidation stresses					Date 2018-12-10; Drawn by/checked MAS / GS
Tube:	**2**	po' =	**65.8**	kPa	(kPa)		max.	min.	final	
Part:	**A**	w_i =	**44.2**	%	σ_{ac}' =		-	-	**65.7**	
Test:	**Tcy1**	w_c =	**43.8**	%	σ_{rc}' =		-	-	**39.5**	

Onsoy-Block2016-1-Tcy1.Plot1.grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB01\Cyclic\Fig 5_3_241, ONSB01-2-B-Tcy1.s_Tau_vs_GammaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-07-04

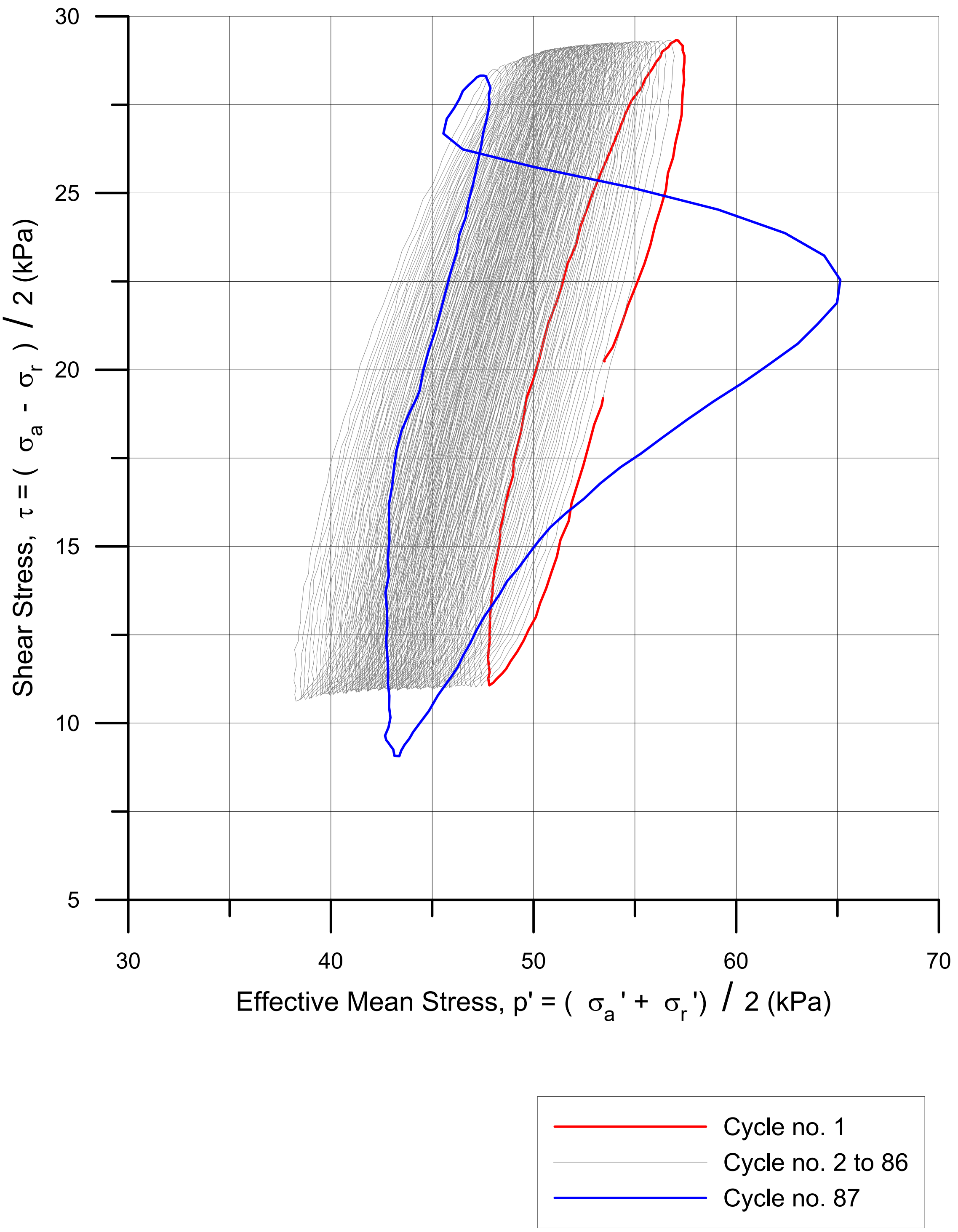
Figure No. 5.3.241

Drawn by

CAUcy

Boring:	Onsøy	Depth	=	10.24	m	Consolidation stresses			
Tube:	Block2016	p_o'	=	65.8	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	44.2	%	σ_{ac}' =			65.7
Test:	Tcy1	w_c	=	43.8	%	τ_c =			13.1

NGI



Norwegian GeoTest Sites - Onsøy

CAUcy									
Boring:	Onsøy	Depth	=	10.24	m	Consolidation stresses			
Tube:	Block2016	p_o'	=	65.8	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	44.2	%	σ_{ac}' =			65.7
Test:	Tcy1	w_c	=	43.8	%	τ_c =			13.1

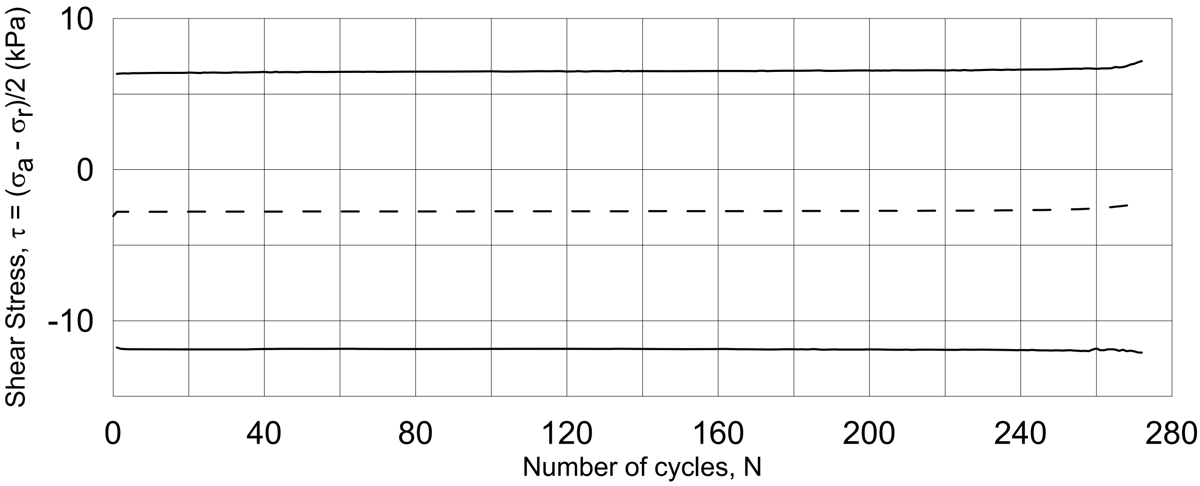
Document No. 20160154-10-R

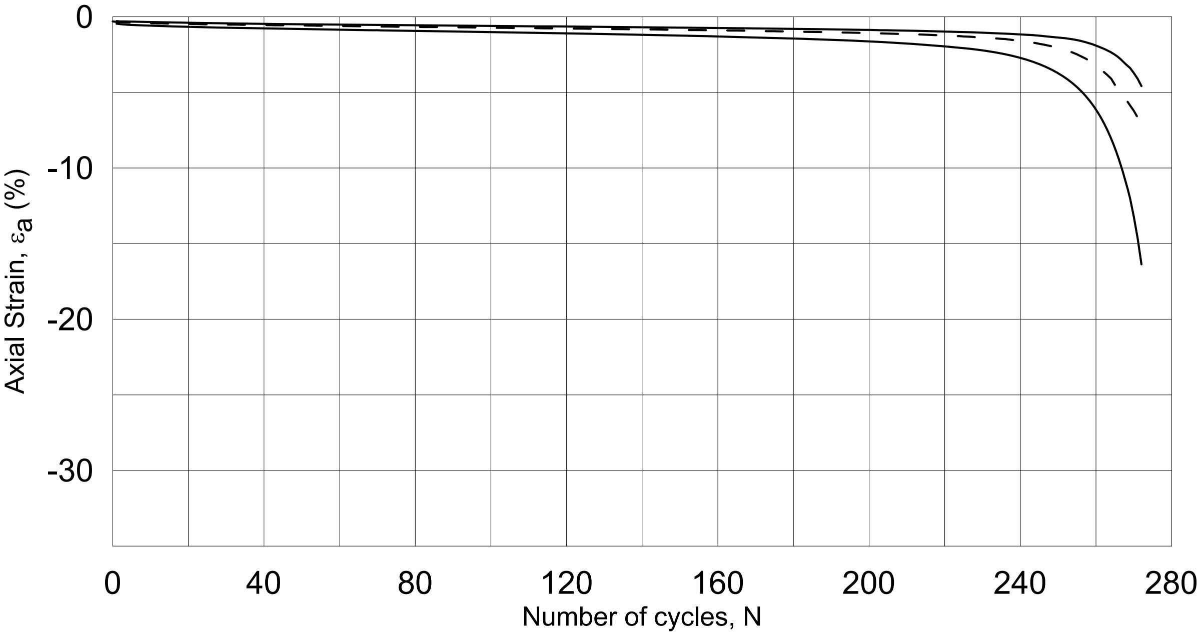
Date 2016-07-04

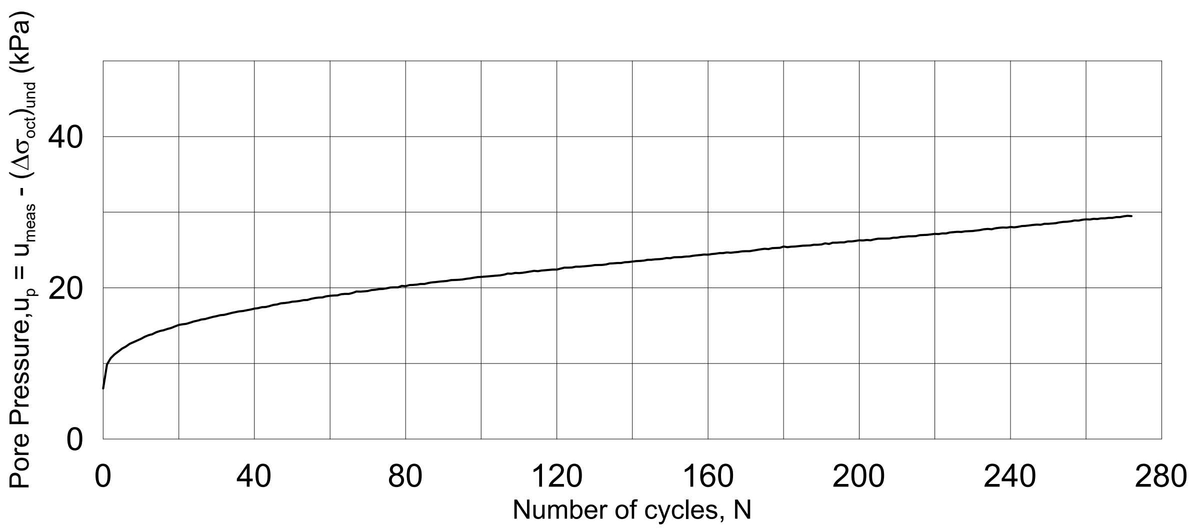
Figure No. 5.3.242

Drawn by

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB01\Cyclic\Fig 5_3_242, ONSB01-2-B-Tcy1.s_Tau_vs_SigmaGraphNo1.Grf





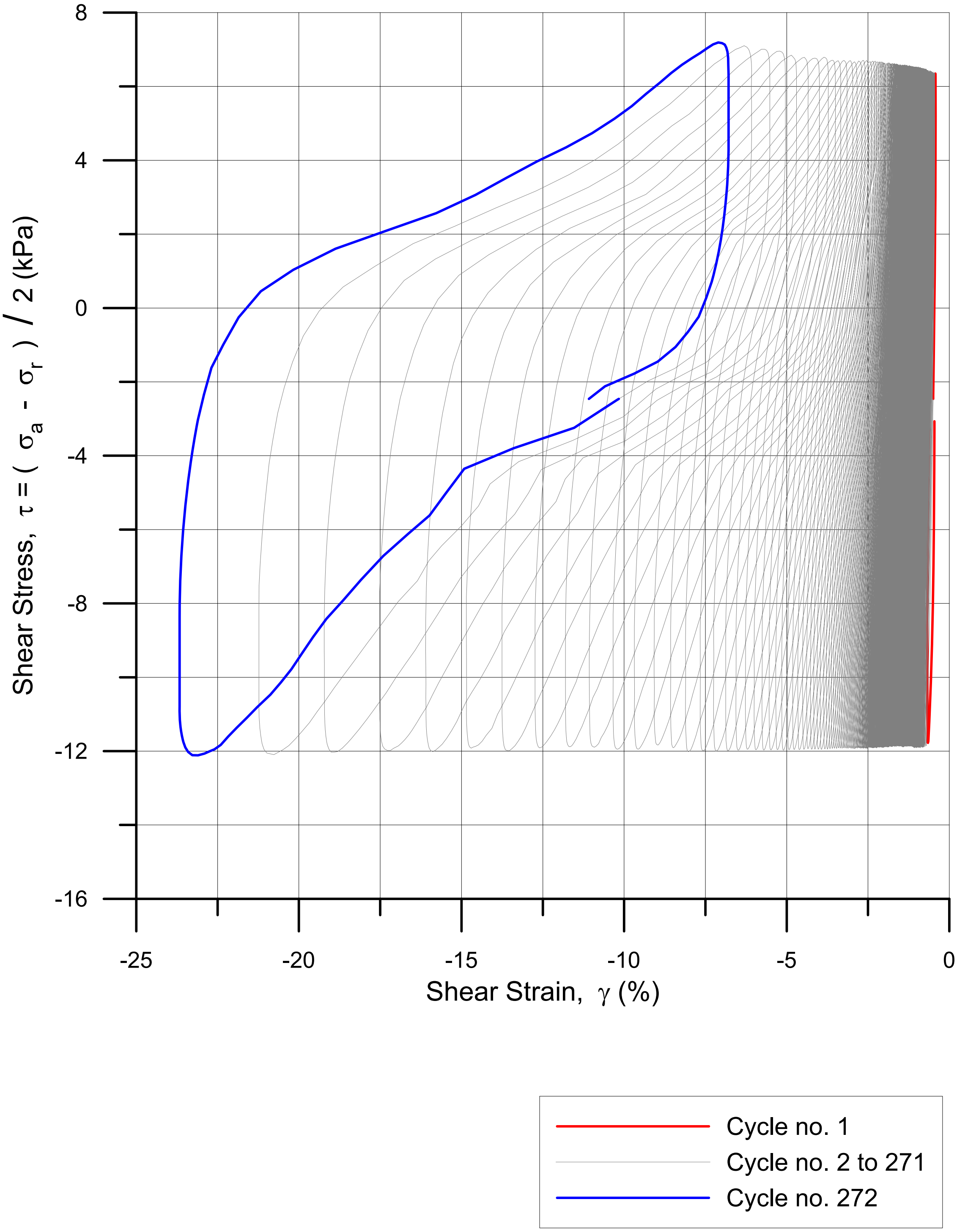


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUcy**											Document No. 20160154-10-R Figure No. 5.3.243
Boring:	**ONSB01**	Depth =	**10.24**	m	Consolidation stresses					Date 2018-12-10	Drawn by/checked MAS / GS
Tube:	**2**	po' =	**65.8**	kPa	(kPa)		max.	min.	final		
Part:	**A**	w_i =	**41.9**	%	σ_{ac}' =		-	-	**65.8**		
Test:	**Tcy2**	w_c =	**41.3**	%	σ_{rc}' =		-	-	**39.5**		

Onsoy-Block2016-1-Tcy2.Plot1.grf



Norwegian GeoTest Sites - Onsøy

CAUcy									
Boring:	Onsøy	Depth	=	10.24	m	Consolidation stresses			
Tube:	Block2016	p_o'	=	65.8	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	41.9	%	σ_{ac}' =			65.8
Test:	Tcy2	w_c	=	41.3	%	τ_c =			13.15

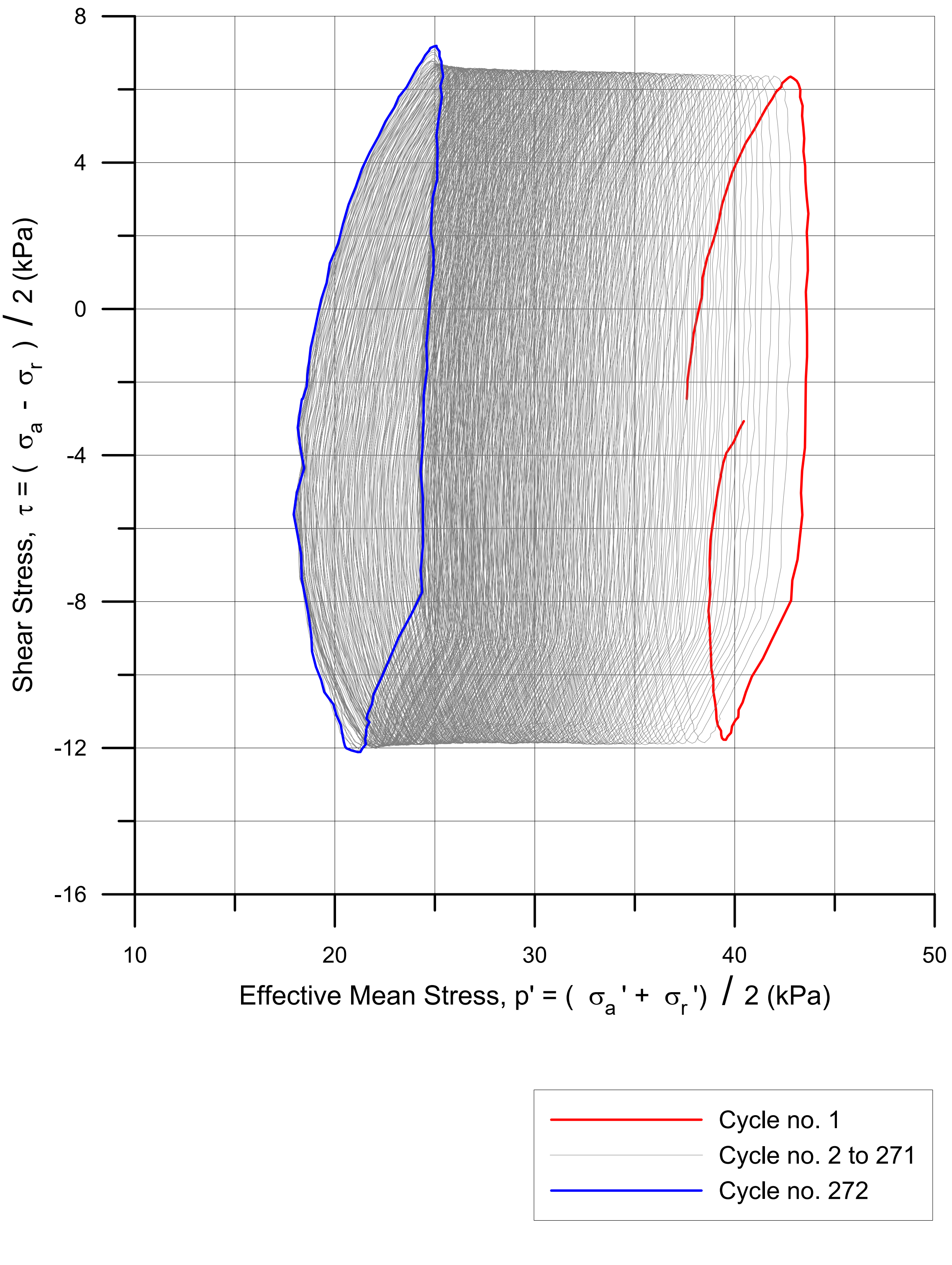
Document No.
20160154-10-R

Date
2016-07-04

Figure No.
5.3.244

Drawn by

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB01\Cyclic\Fig 5_3_245, ONSB01-2-B-Tcy2.s_Tau_vs_SigmaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-07-04

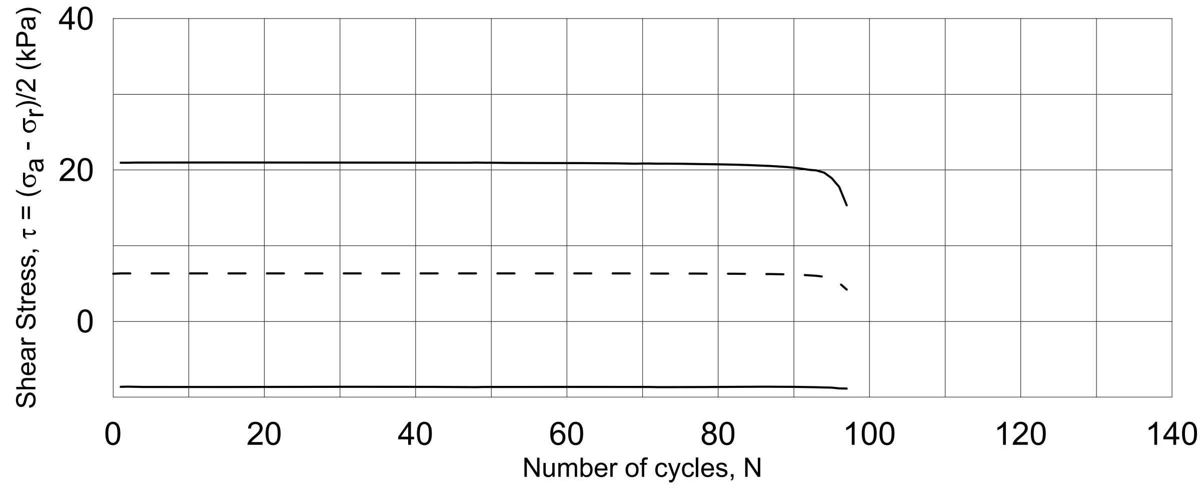
Figure No. 5.3.245

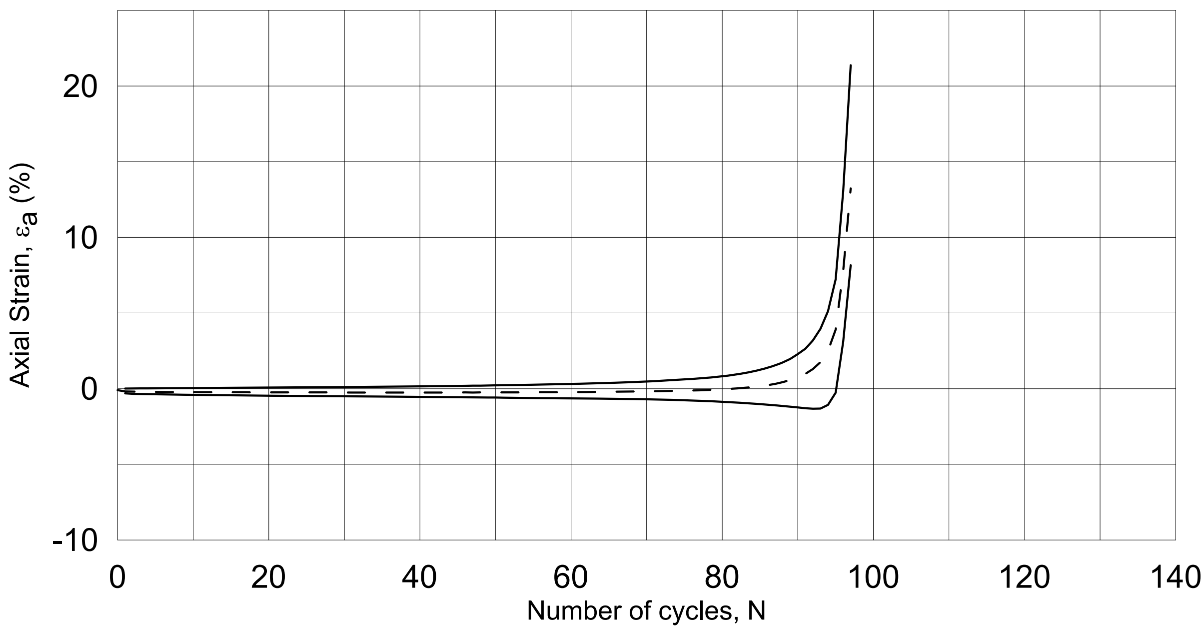
Drawn by

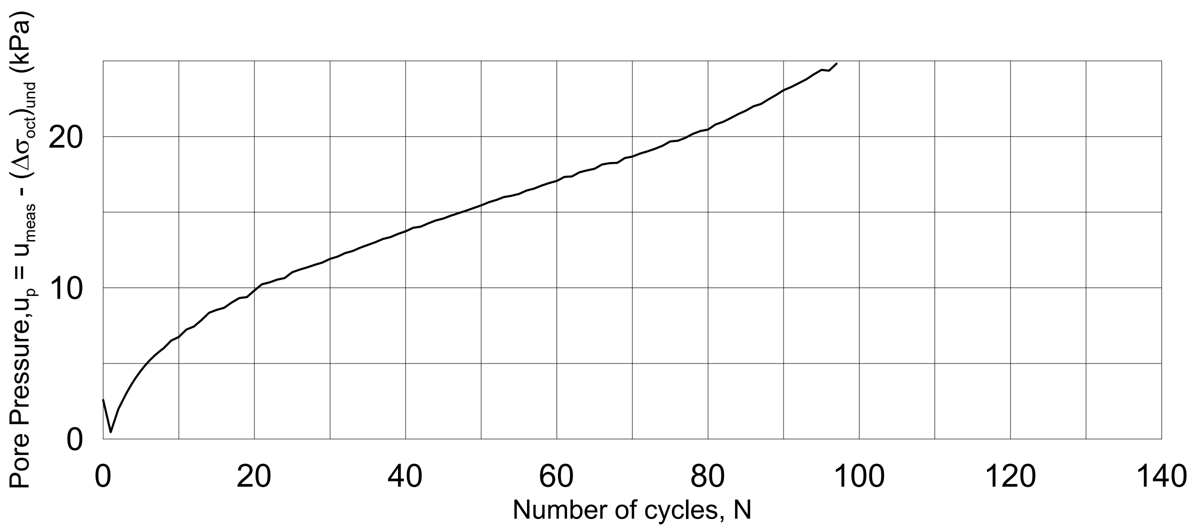
CAUcy

Boring:	Onsøy	Depth	=	10.24	m	Consolidation stresses				
Tube:	Block2016	p_o'	=	65.8	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	=	41.9	%	σ_{ac}' =			65.8	
Test:	Tcy2	w_c	=	41.3	%	τ_c =			13.15	

NGI







Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Triaxial test: **CAUcy**

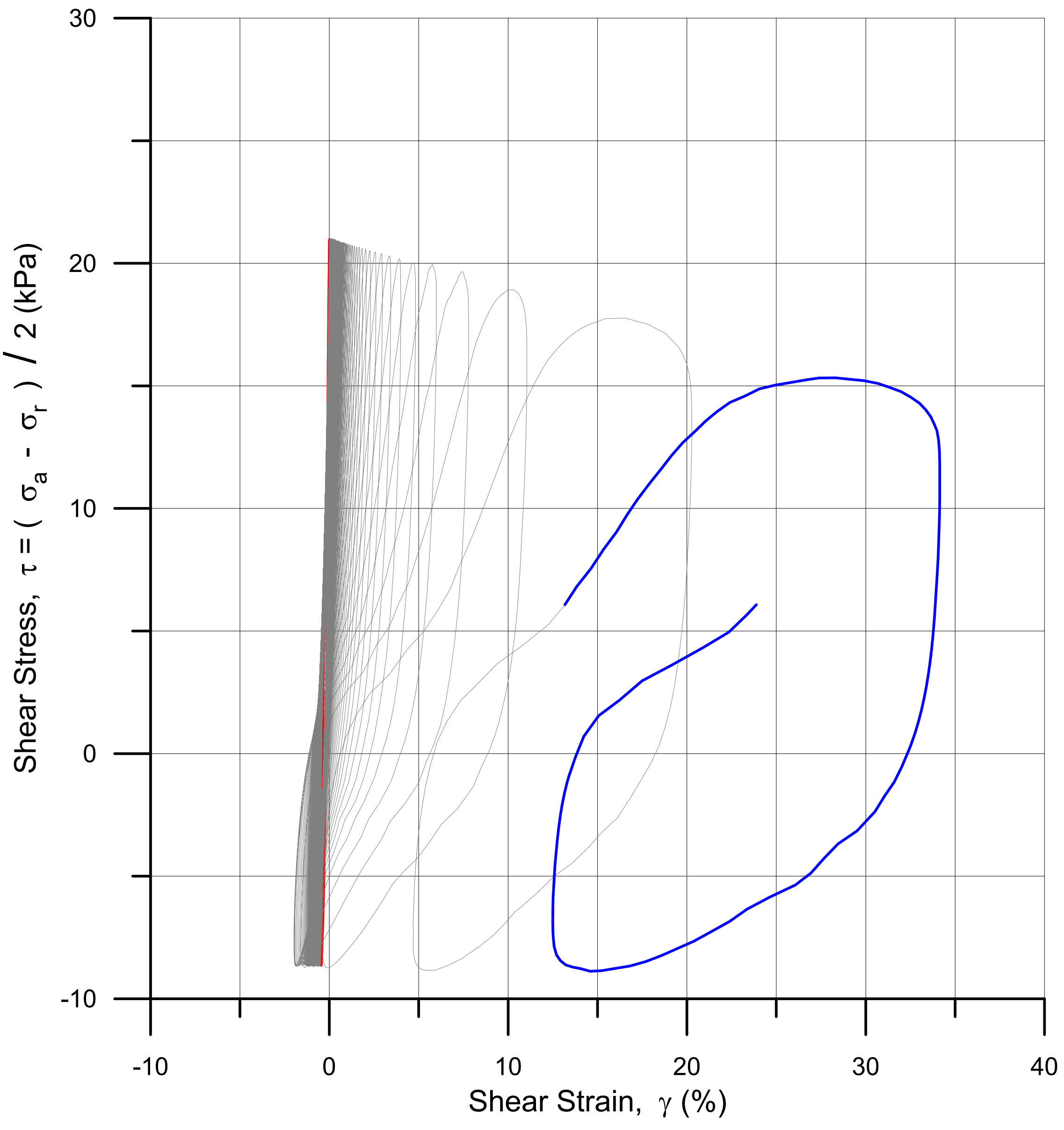
Figure No. 5.3.246

Boring:	**ONSB01**	Depth =	**10.24**	m	Consolidation stresses			
Tube:	**2**	po' =	**65.8**	kPa	(kPa)	max.	min.	final
Part:	**A**	w_i =	**43.5**	%	σ_{ac}' =	-	-	**65.7**
Test:	**Tcy3**	w_c =	**43.1**	%	σ_{rc}' =	-	-	**39.5**

Date: 2018-12-10

Drawn by/checked: MAS / GS

Onsoy-Block2016-1-Tcy3.Plot1.grf



Norwegian GeoTest Sites - Onsøy

CAUcy

Boring:	Onsøy	Depth	=	10.24	m	Consolidation stresses		
Tube:	Block2016	p_o'	=	65.8	kPa	(kPa) max.	min.	final
Part:	1	w_i	=	43.5	%	σ_{ac}' =		65.7
Test:	Tcy3	w_c	=	43.1	%	τ_c =		13.1

Document No. 20160154-10-R

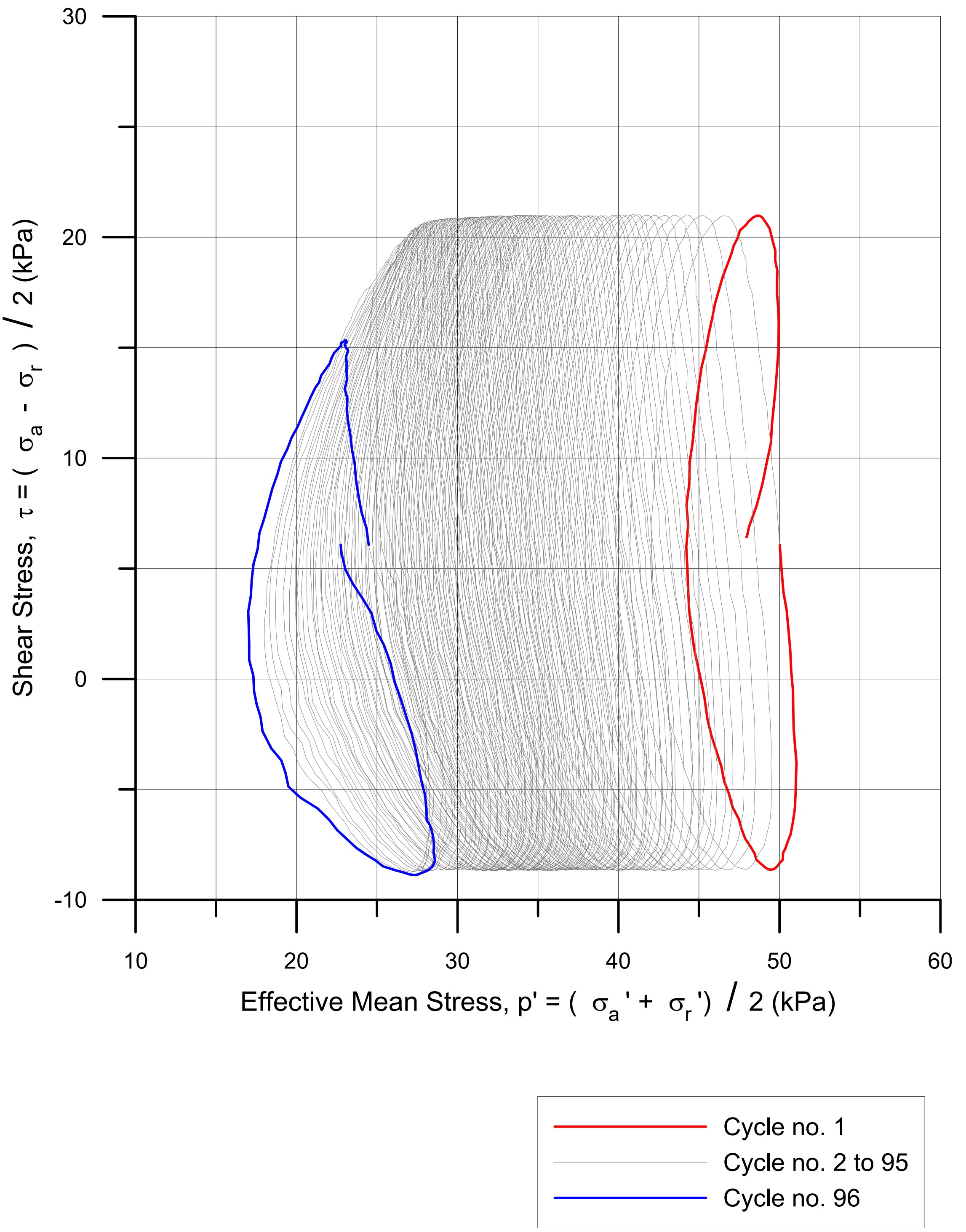
Date 2016-07-06

Figure No. 5.3.247

Drawn by

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB01\Cyclic\Fig 5_3_248, ONSB01-2-B-Tcy3.s_Tau_vs_SigmaGraphNo1.Grf



Norwegian GeoTest Sites - Onsøy

CAUcy									
Boring:	Onsøy	Depth	=	10.24	m	Consolidation stresses			
Tube:	Block2016	p_o'	=	65.8	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	43.5	%	σ_{ac}' =			65.7
Test:	Tcy3	w_c	=	43.1	%	τ_c =			13.1

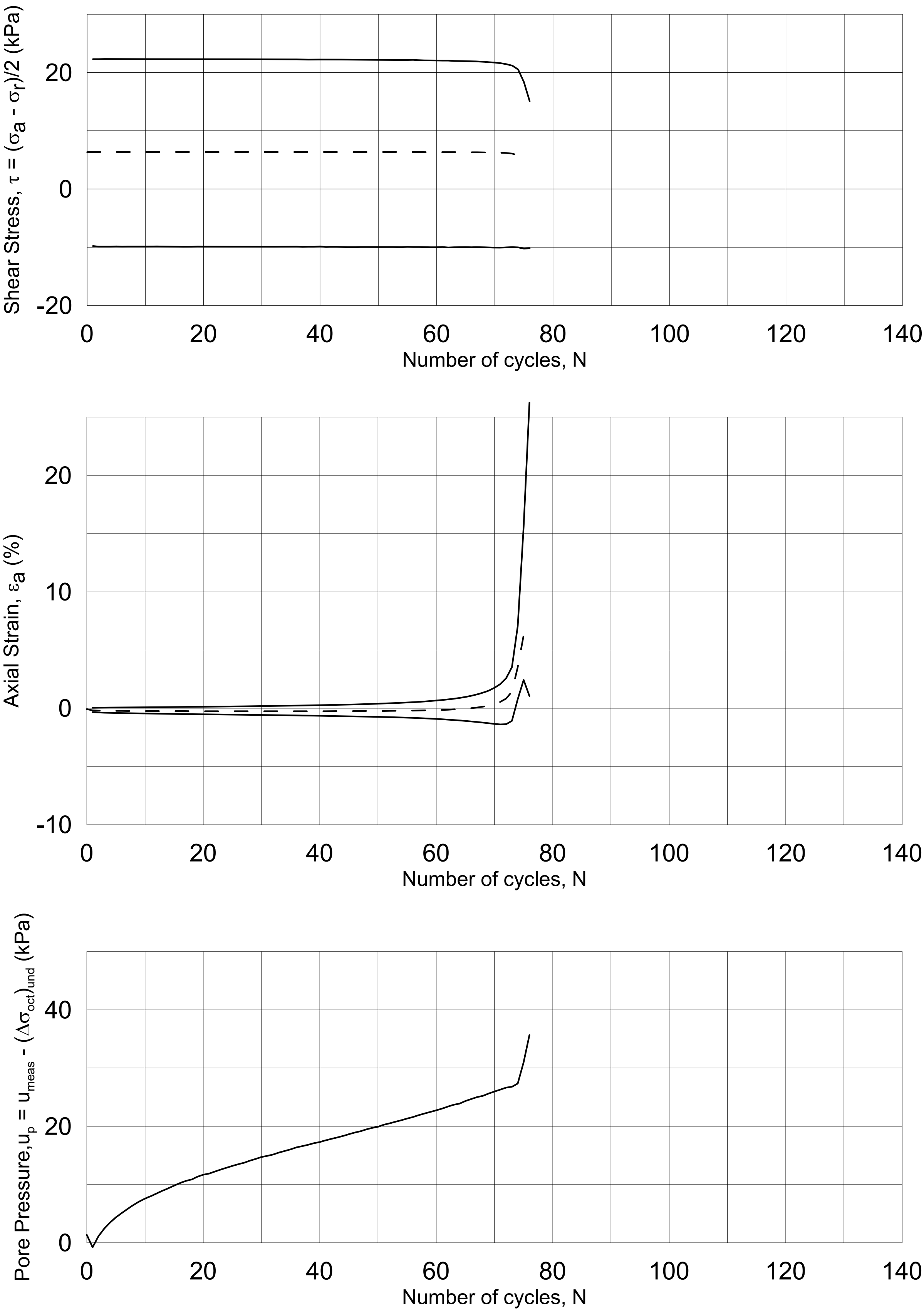
Document No.
20160154-10-R

Date
2016-07-06

Figure No.
5.3.248

Drawn by

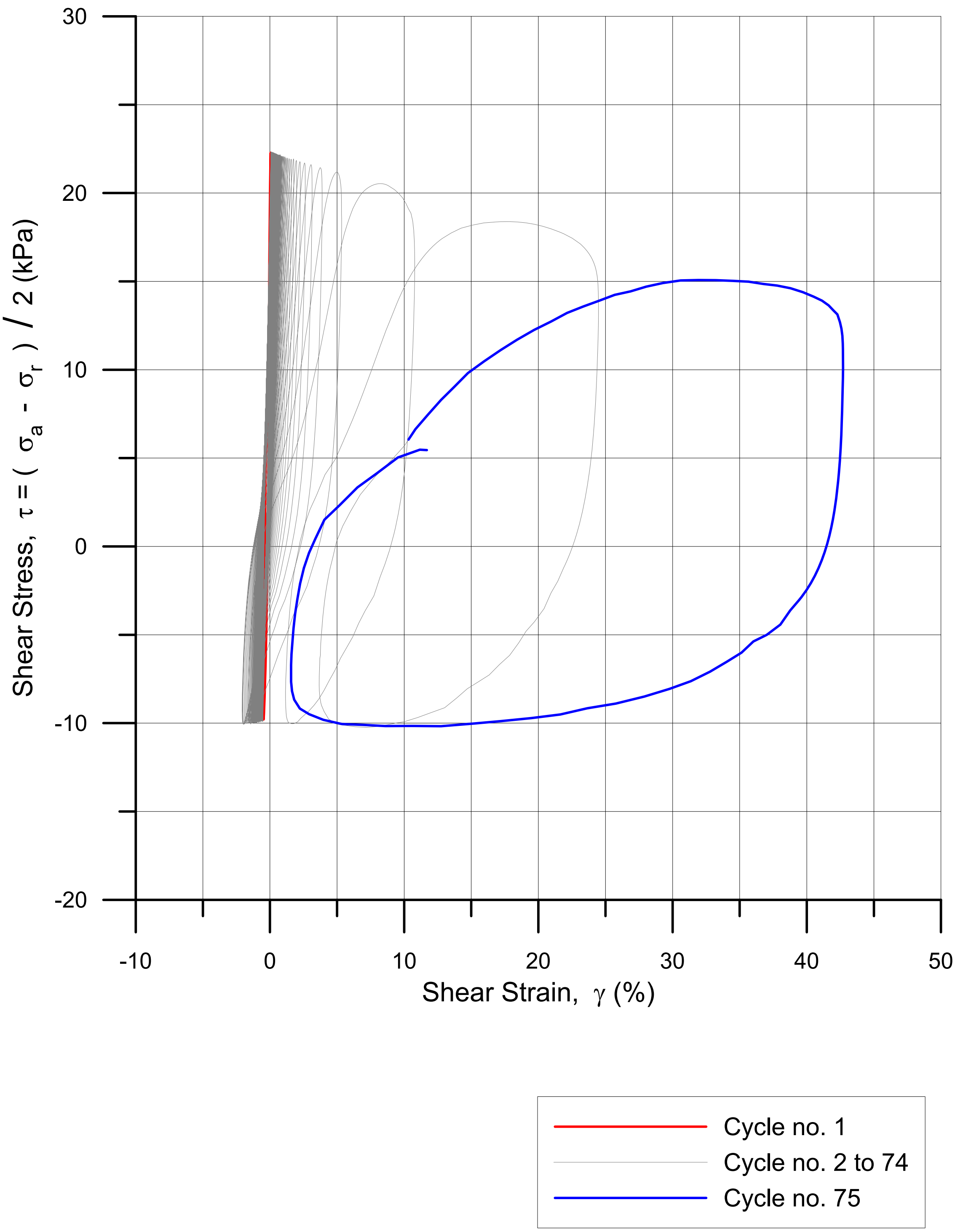
NGI



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R
Triaxial test: **CAUcy**										Figure No. 5.3.249
Boring:	**ONSB01**	Depth =	**10.24**	m	Consolidation stresses					Date 2018-12-10 / Drawn by/checked MAS / GS
Tube:	**2**	po' =	**65.8**	kPa	(kPa)		max.	min.	final	
Part:	**A**	w_i =	**42.2**	%	σ_{ac}' =		-	-	**65.7**	NGI
Test:	**Tcy4**	w_c =	**41.7**	%	σ_{rc}' =		-	-	**39.5**	

Onsoy-Block2016-1-Tcy4.Plot1.grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB01\Cyclic\Fig 5_3_250, ONSB01-2-B-Tcy4.s_Tau_vs_GammaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-07-06

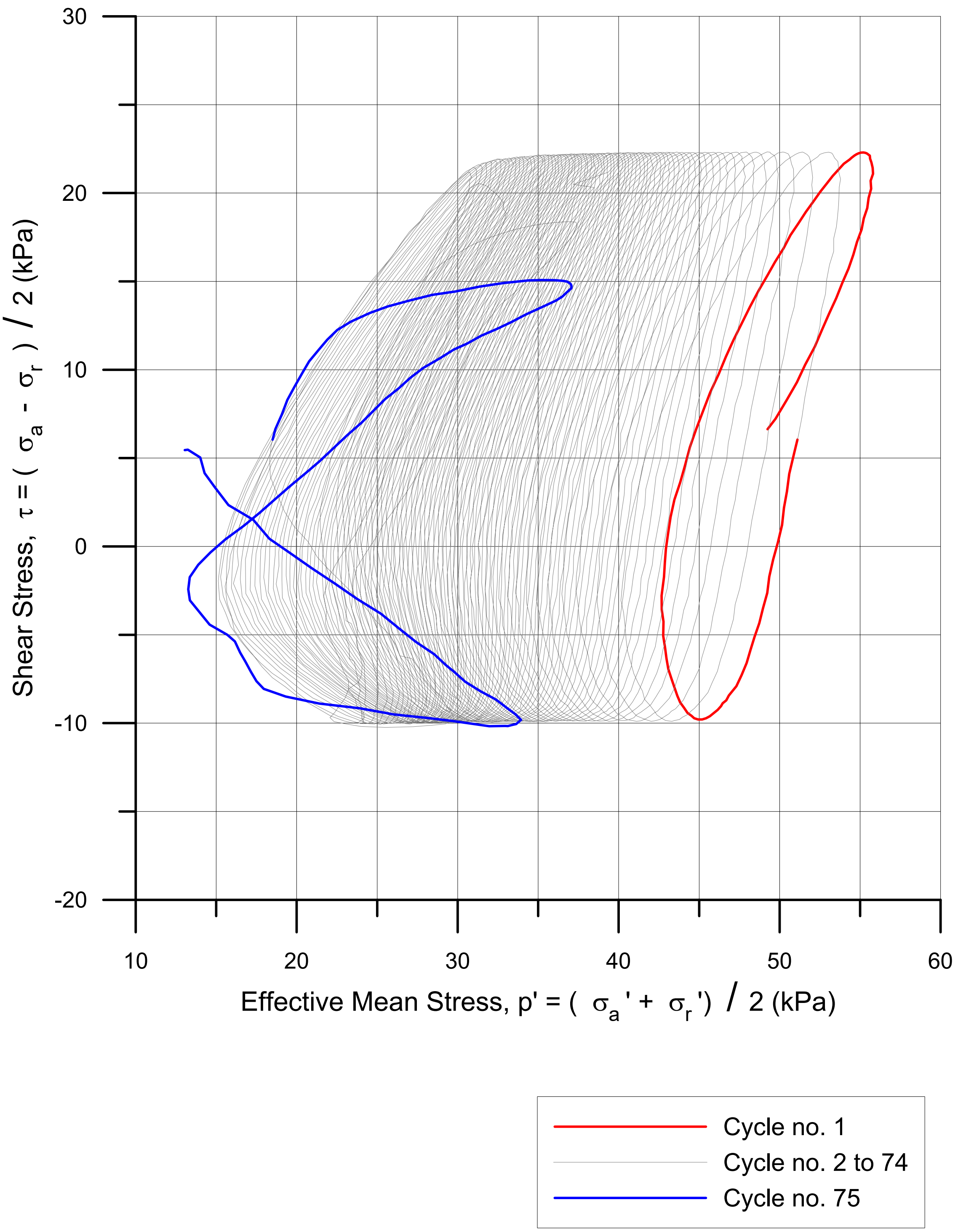
Figure No. 5.3.250

Drawn by

NGI

CAUcy

Boring:	Onsøy	Depth	=	10.24	m		Consolidation stresses		
Tube:	Block2016	p_o'	=	65.8	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	42.2	%	σ_{ac}' =			65.7
Test:	Tcy4	w_c	=	41.7	%	τ_c =			13.1



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB01\Cyclic\Fig 5_3_251, ONSB01-2-B-Tcy4.s_Tau_vs_SigmaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

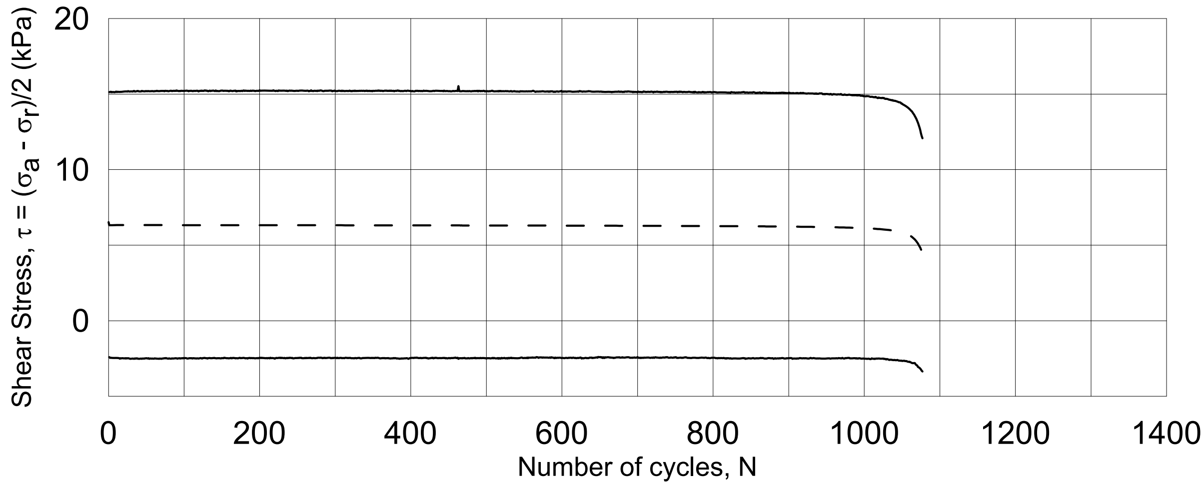
Date 2016-07-06

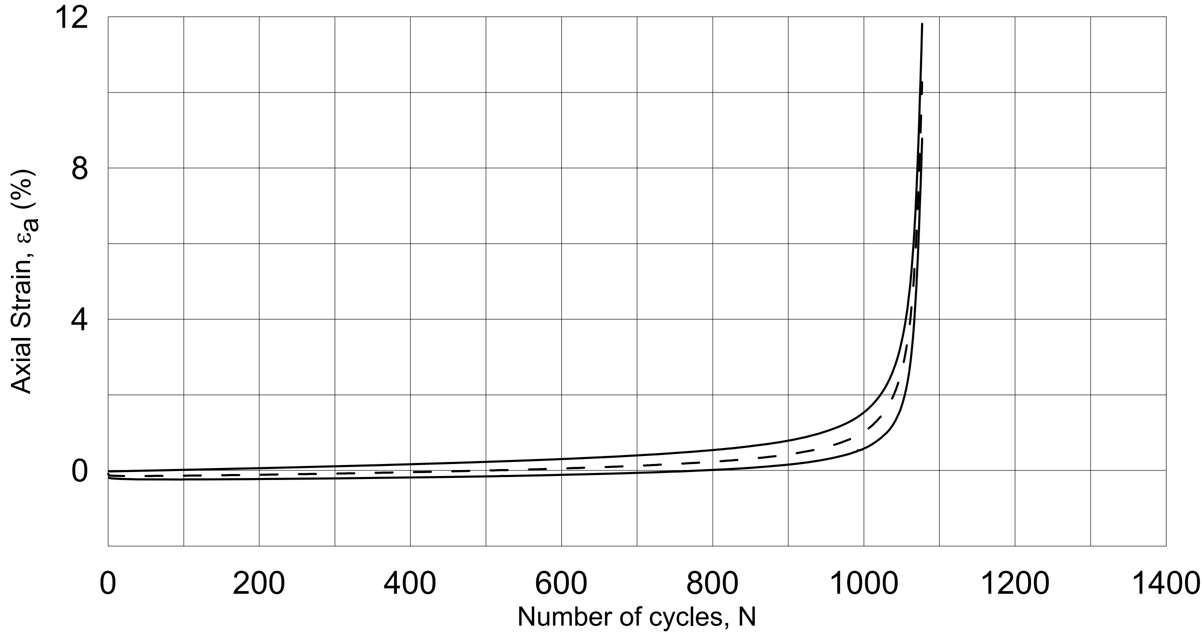
Figure No. 5.3.251

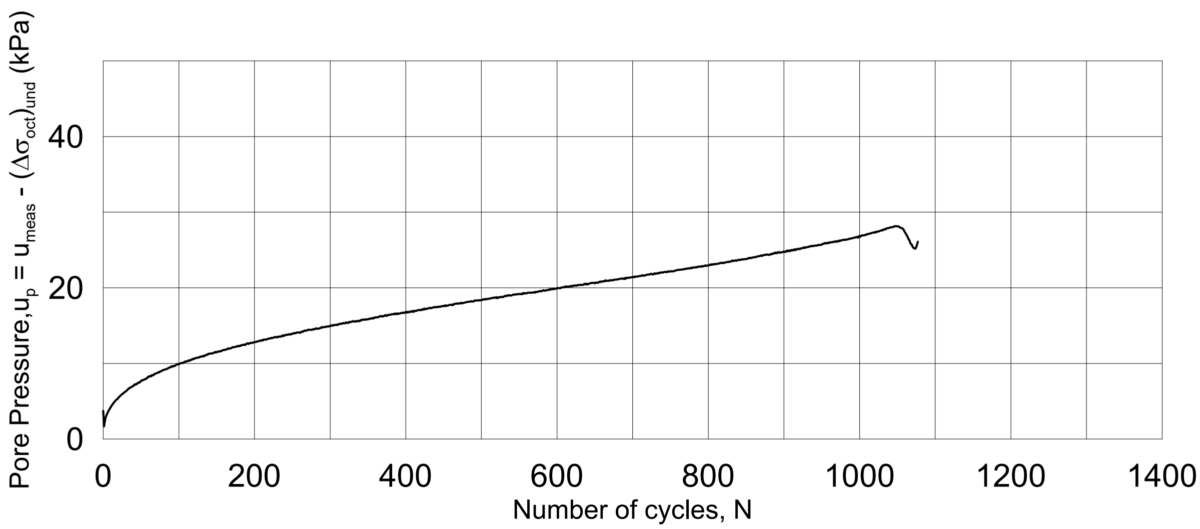
Drawn by

CAUcy

Boring:	Onsøy	Depth	=	10.24	m	Consolidation stresses			
Tube:	Block2016	p_o'	=	65.8	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	42.2	%	σ_{ac}' =			65.7
Test:	Tcy4	w_c	=	41.7	%	τ_c =			13.1







Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

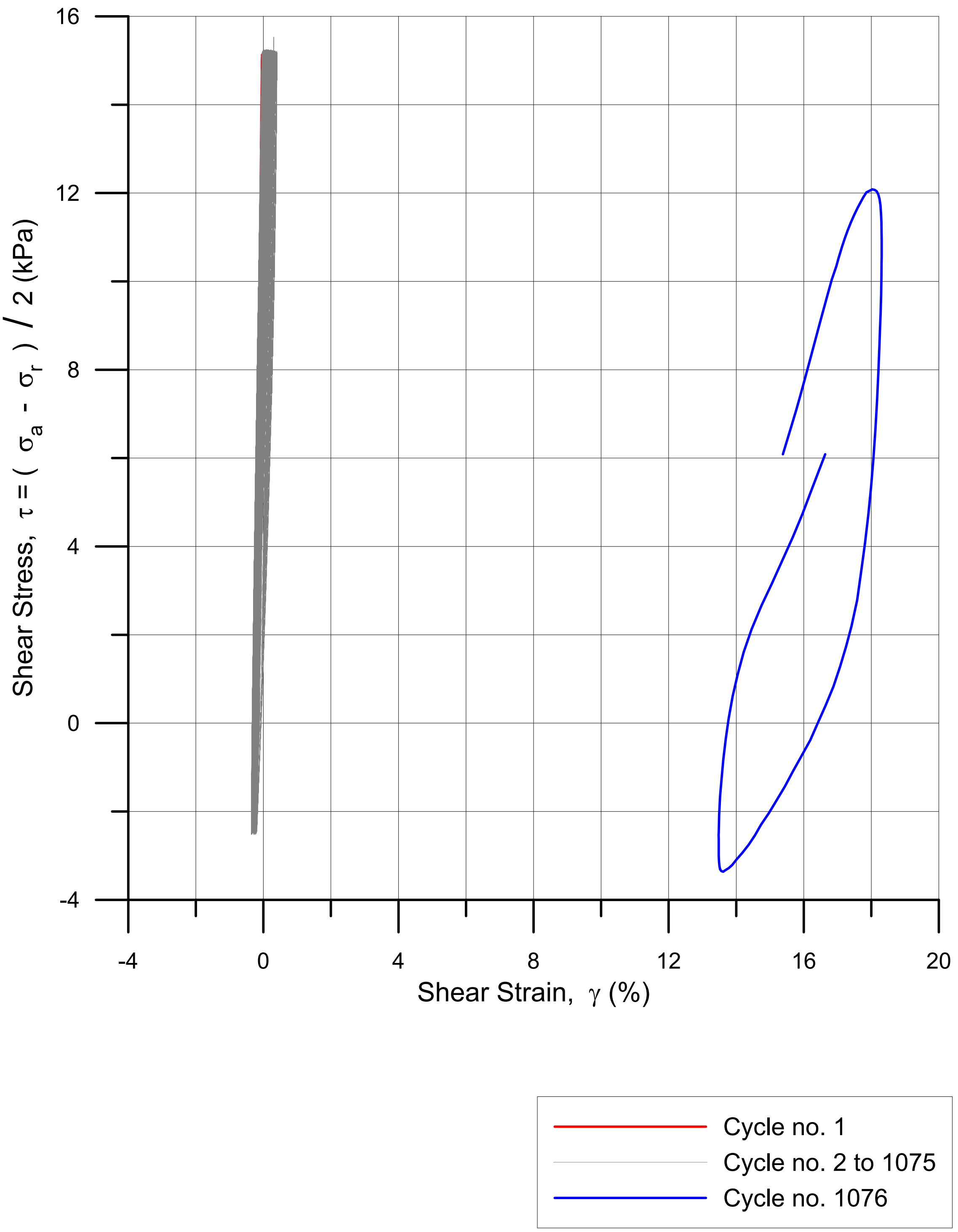
Document No. 20160154-10-R

Figure No. 5.3.252

Triaxial test: **CAUcy**

Boring:	**ONSB01**	Depth =	**10.24**	m	Consolidation stresses				Date 2018-12-10	Drawn by/checked MAS / GS
Tube:	**2**	po' =	**65.8**	kPa	(kPa)	max.	min.	final		
Part:	**A**	w_i =	**45.5**	%	σ_{ac}' =	-	-	**65.7**		
Test:	**Tcy5**	w_c =	**43.8**	%	σ_{rc}' =	-	-	**39.6**		

Onsoy-Block2016-1-Tcy5.Plot1.grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB01\Cyclic\Fig 5_3_253, ONSB01-2-B-Tcy5.s_Tau_vs_GammaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-08-18

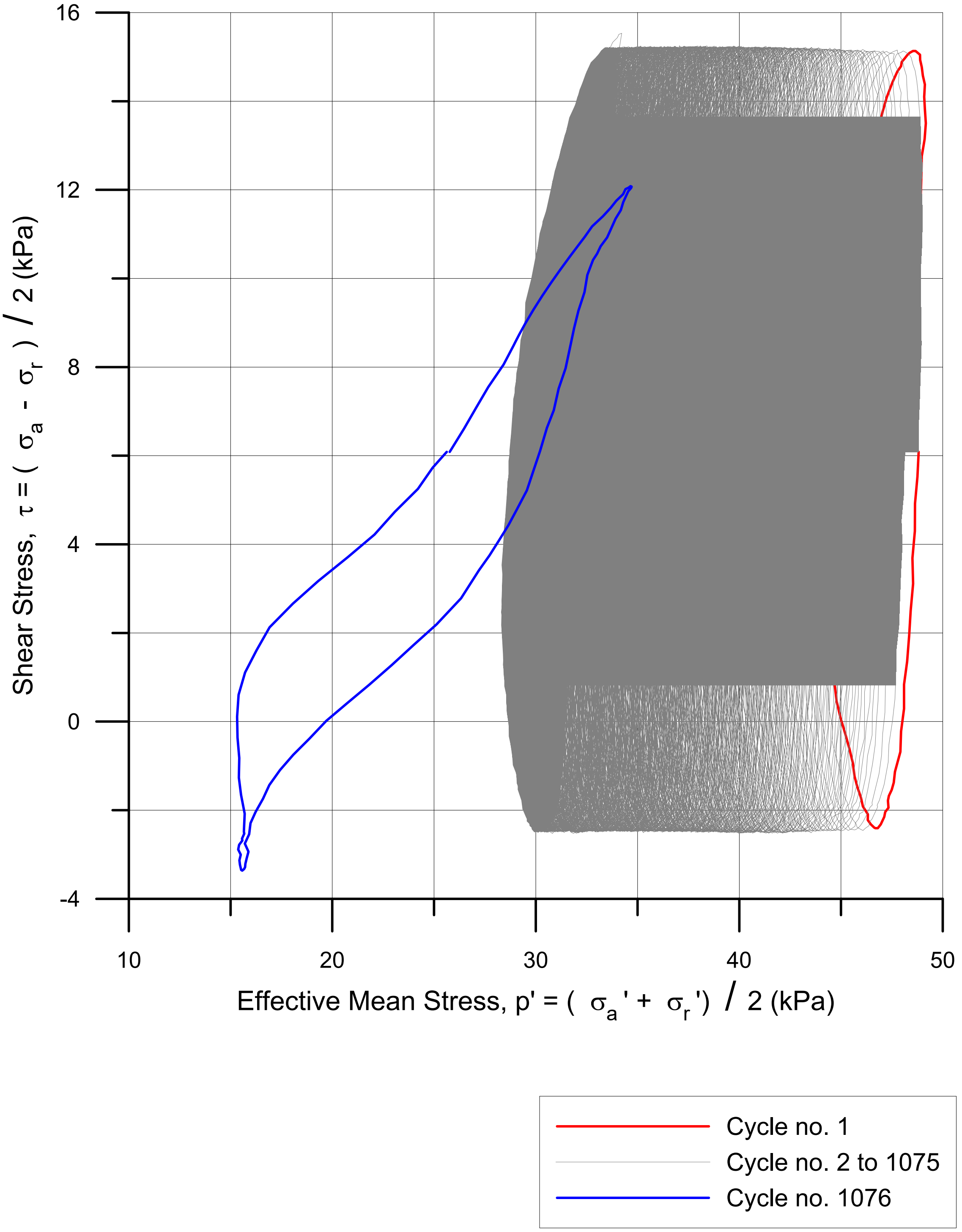
Figure No. 5.3.253

Drawn by

CAUcy

Boring:	Onsøy	Depth =	10.24	m	Consolidation stresses				
Tube:	Block2016	p_0' =	65.8	kPa	(kPa)	max.	min.	final
Part:	1	w_i =	45.5	%	σ_{ac}' =			65.7
Test:	Tcy5	w_c =	43.8	%	τ_c =			13.05

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB01\Cyclic\Fig 5_3_254, ONSB01-2-B-Tcy5.s_Tau_vs_SigmaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-08-18

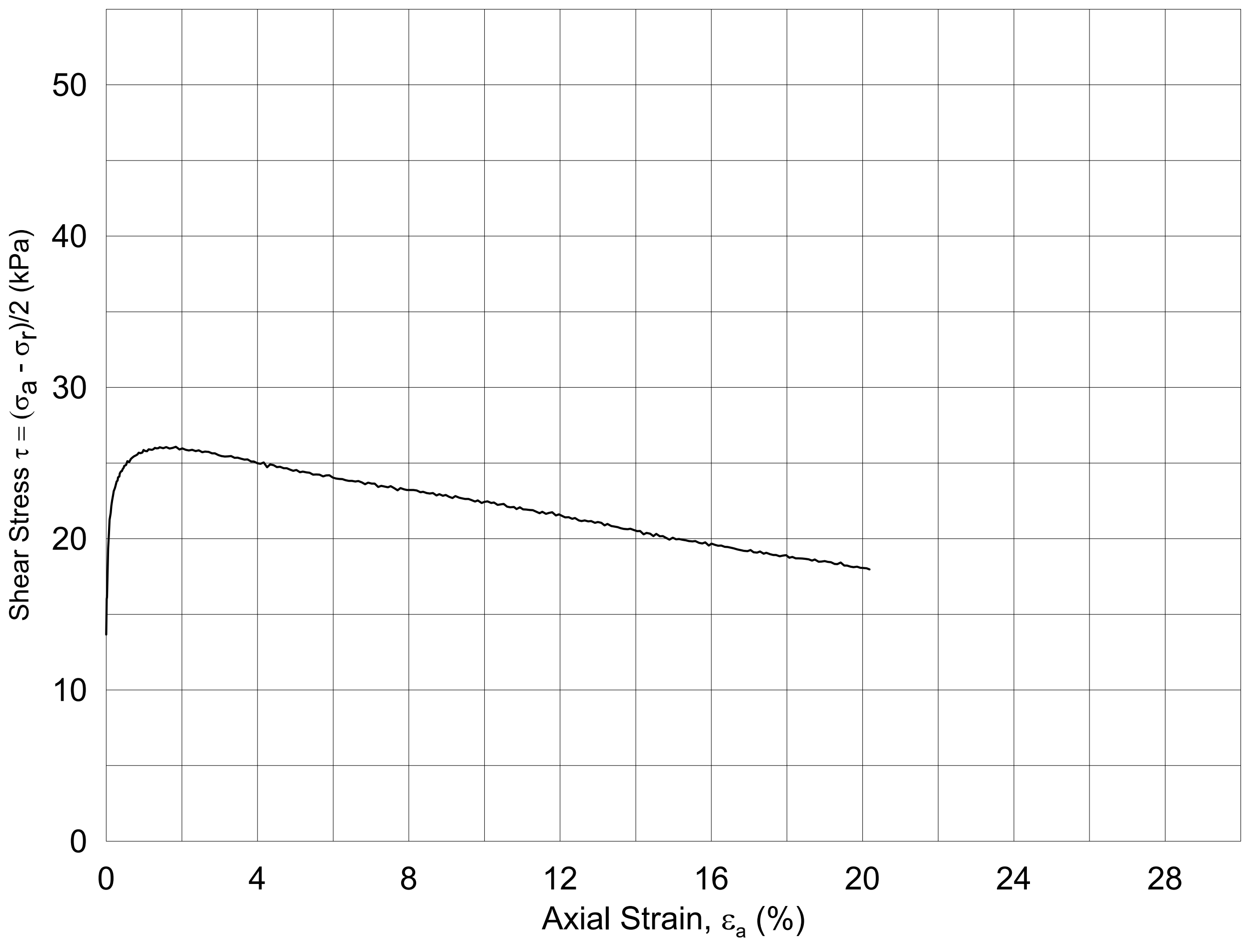
Figure No. 5.3.254

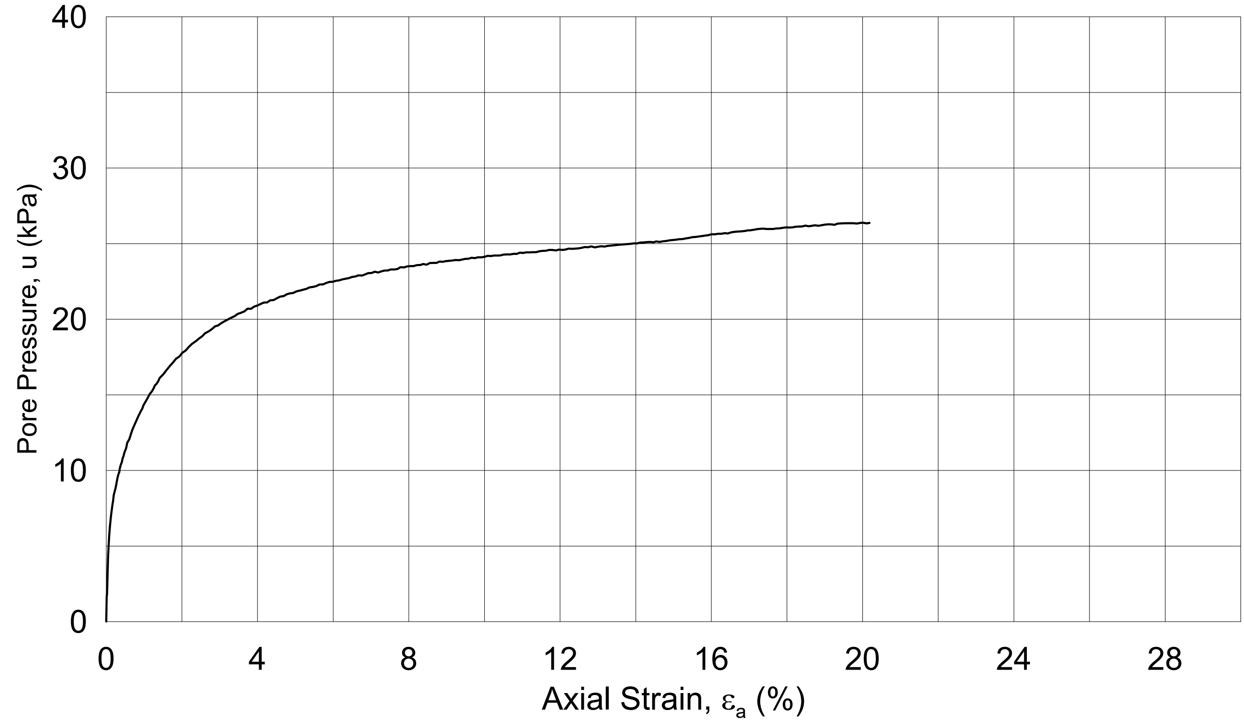
Drawn by

CAUcy

Boring:	Onsøy	Depth	=	10.24	m	Consolidation stresses				
Tube:	Block2016	p_o'	=	65.8	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	=	45.5	%	σ_{ac}' =			65.7	
Test:	Tcy5	w_c	=	43.8	%	τ_c =			13.05	

NGI





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.255

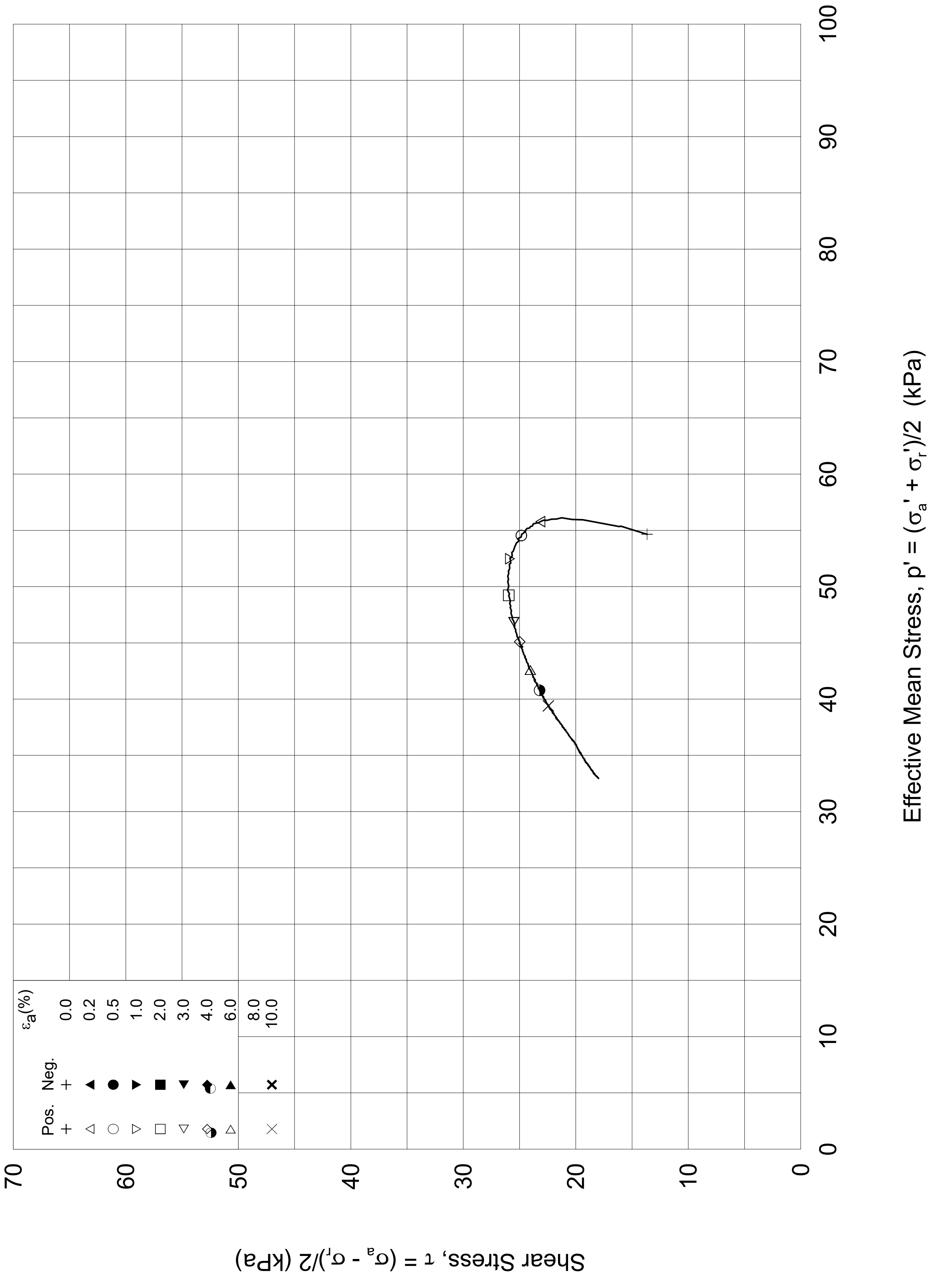
Triaxial test: **CAUc**

Date: 2018-12-10

Drawn by/checked: PCa / GS

Boring:	**Onsoy**	Depth =		**10.60**	m	Consolidation stresses				
Tube:	**54Tube2016**	po'	=	**68.4**	kPa	(kPa)		max.	min.	final
Part:	**1**	w_i	=	**41.1**	%	σ_{ac}' =		-	-	**68.2**
Test:	**T1**	w_c	=	**38.9**	%	σ_{rc}' =		-	-	**41.0**

Onsoy-54Tube2016-1-T1.Plot1.grf



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Triaxial test: **CAUc**							
Boring:	**Onsoy**	Depth =	**10.60** m	Consolidation stresses			
Tube:	**54Tube2016**	po' =	**68.4** kPa	(kPa)	max.	min.	final
Part:	**1**	w_i =	**41.1** %	σ_{ac}' =	-	-	**68.2**
Test:	**T1**	w_c =	**38.9** %	σ_{rc}' =	-	-	**41.0**

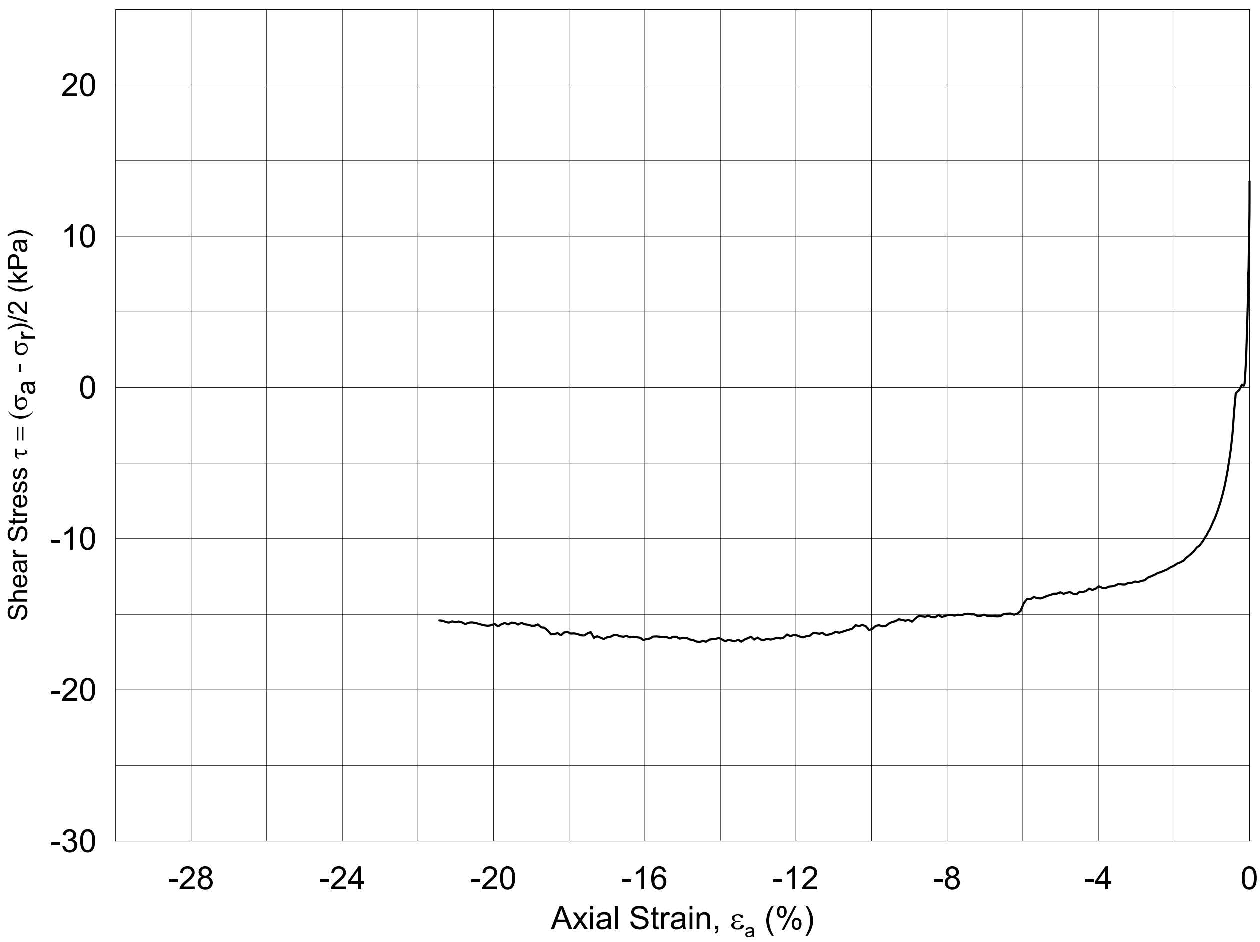
Document No. 20160154-10-R

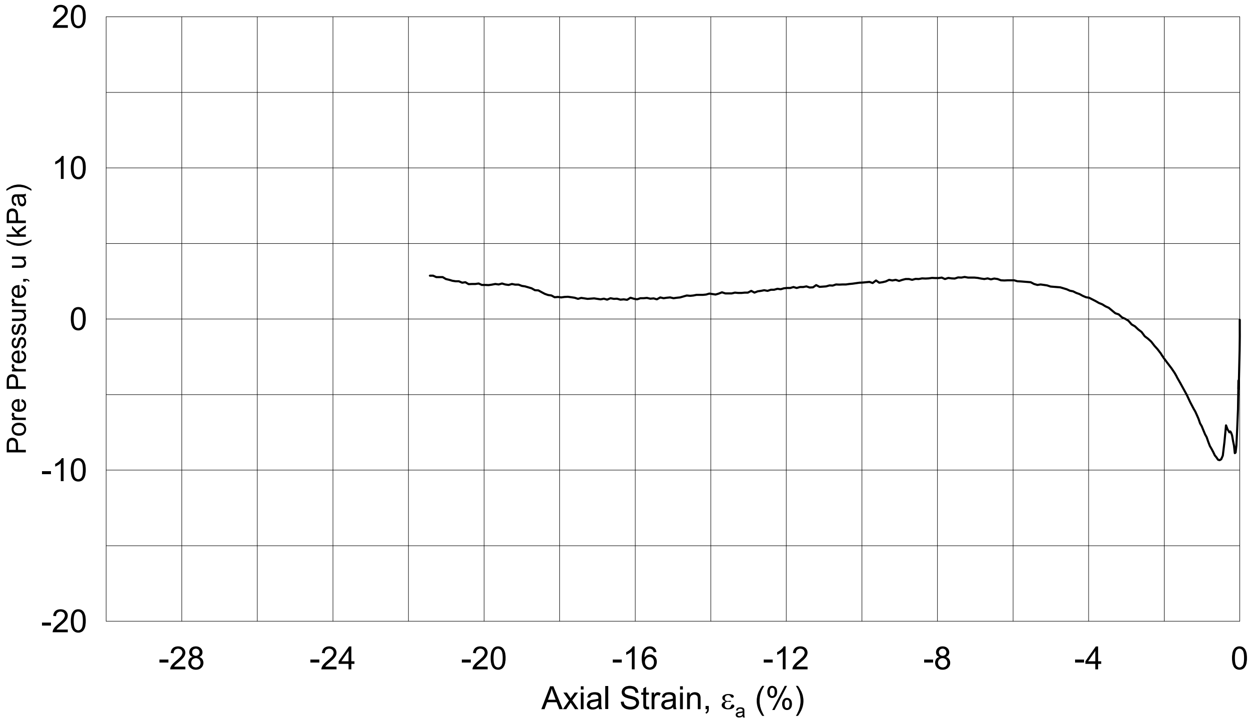
Figure No. 5.3.256

Date 2018-12-10

Drawn by/checked PCa / GS

Onsoy-54Tube2016-1-T1.Plot2.grf





Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Triaxial test: **CAUe**

Figure No. 5.3.257

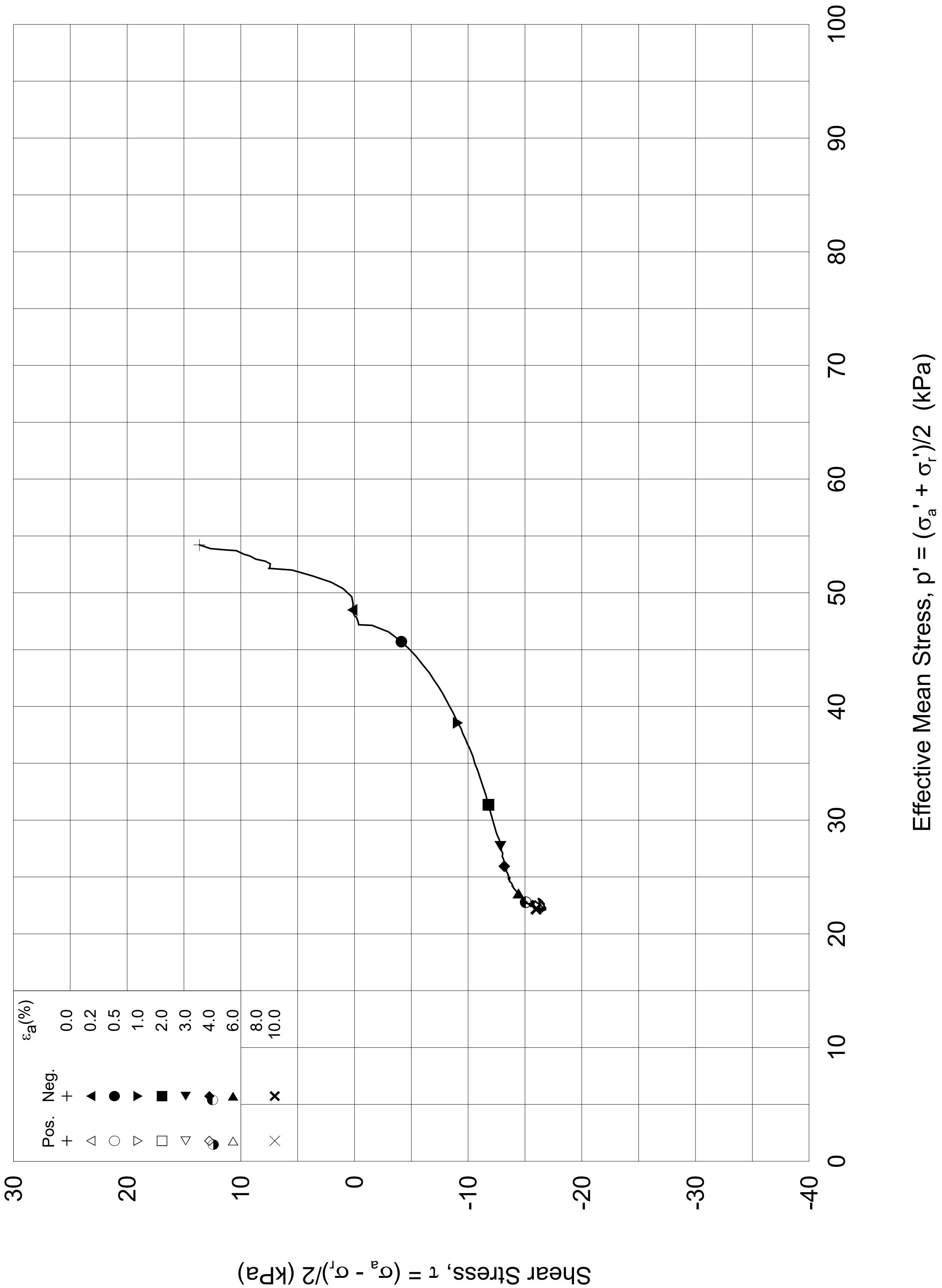
Boring:	**Onsoy**	Depth =	**10.48**	m	Consolidation stresses				
Tube:	**54Tube2016**	po' =	**67.5**	kPa	(kPa)	max.	min.	final	
Part:	**1**	w_i =	**42.3**	%	σ_{ac}' =	-	-	**67.5**	
Test:	**T2**	w_c =	**40.5**	%	σ_{rc}' =	-	-	**40.5**	

Date 2018-12-10

Drawn by/checked ThV / GS

NGI

Onsoy-54Tube2016-1-T2.Plot1.grf



Dato/rev.: 2014-12-23/01

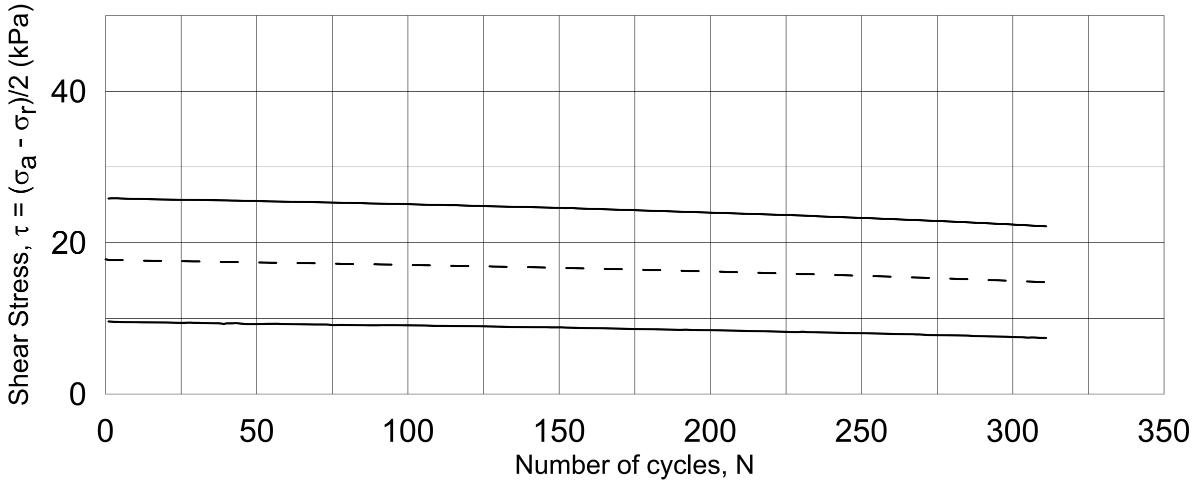
Norwegian GeoTest Sites - Onsøy

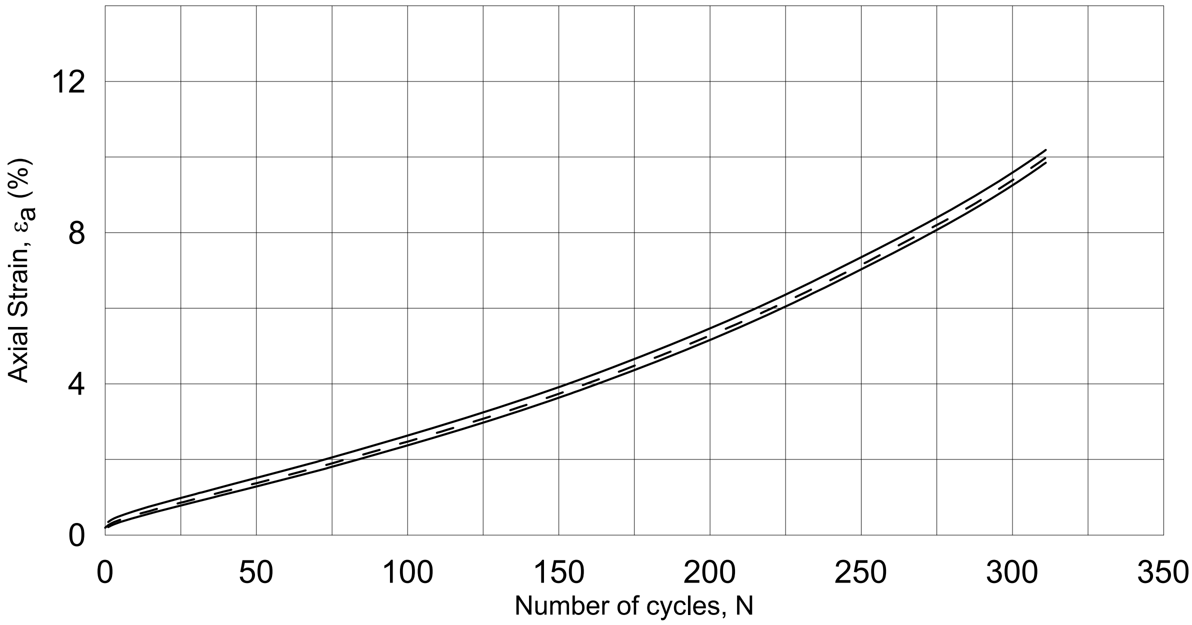
Document No.	20160154-10-R	
Figure No.	5.3.258	
Date	2018-12-10	Drawn by/checked: ThV / GS

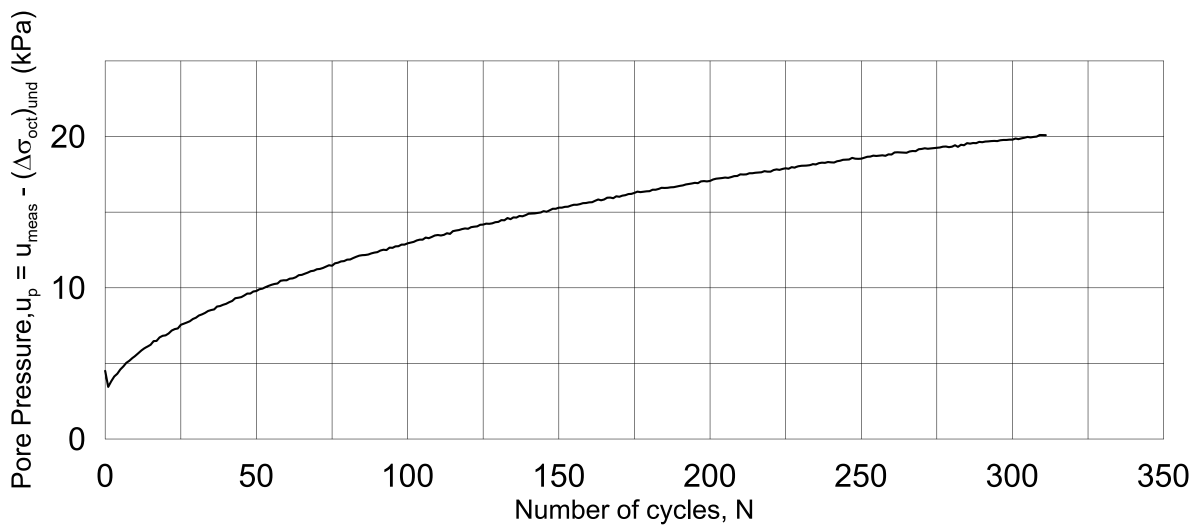
Triaxial test: **CAUe**

Boring:	**Onsoy**	Depth =	**10.48**	m	Consolidation stresses				
Tube:	**54Tube2016**	po' =	**67.5**	kPa	(kPa)	max.	min.	final
Part:	**1**	w_i =	**42.3**	%	σ_{ac}' =	-	-	**67.5**
Test:	**T2**	w_c =	**40.5**	%	σ_{rc}' =	-	-	**40.5**

Onsoy-54Tube2016-1-T2.Plot2.grf







Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.259

Triaxial test: **CAUcy**

Date 2018-12-10

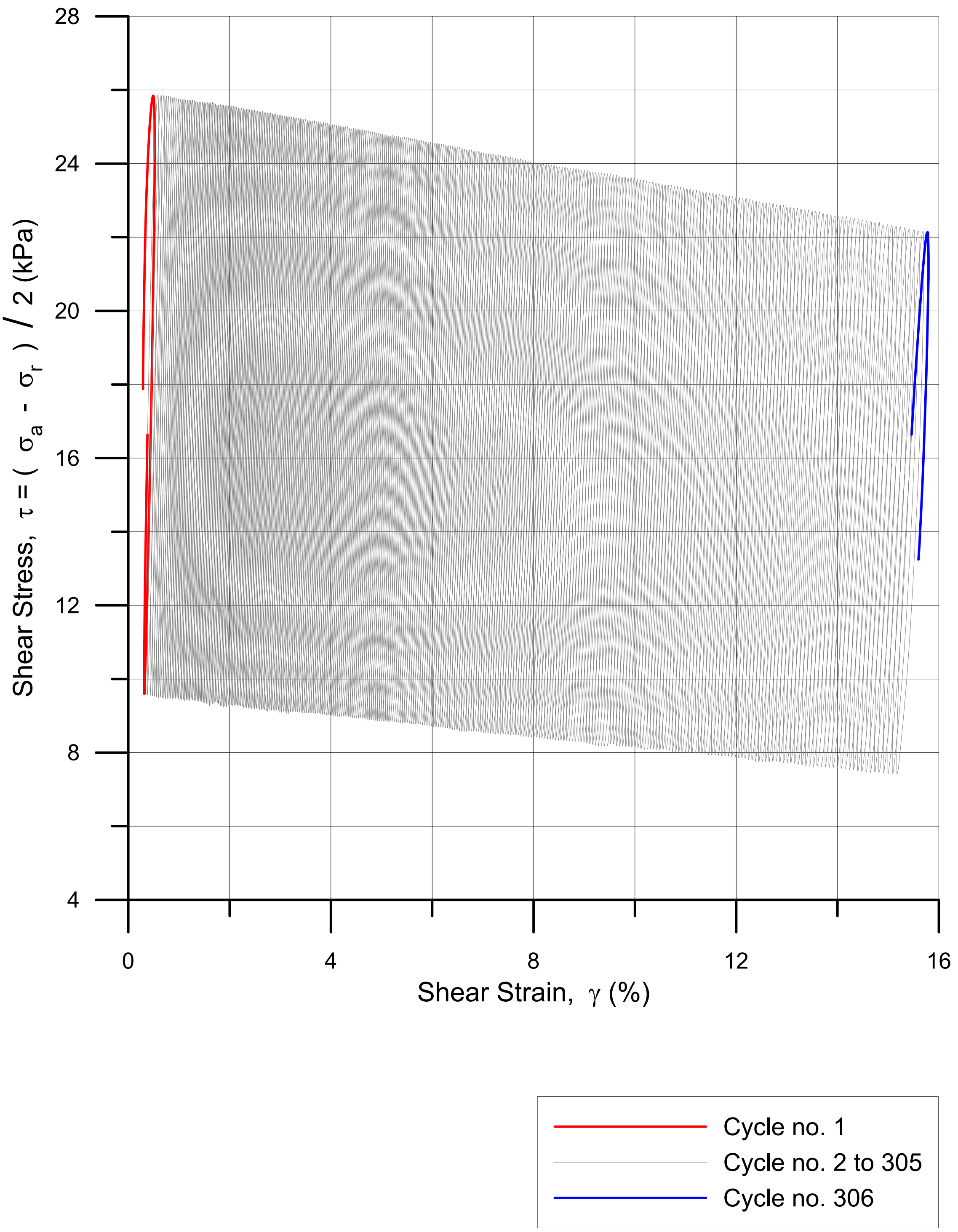
Drawn by/checked MAS / GS

Boring:	**ONSB03**	Depth =	**10.34**	m	Consolidation stresses					
Tube:	**54tube2016**	po' =	**66.5**	kPa	(kPa)	max.	min.	final		
Part:	**1**	w_i =	**41.4**	%	σ_{ac}' =	-	-	**66.3**		
Test:	**Tcy1**	w_c =	**39.1**	%	σ_{rc}' =	-	-	**39.9**		

NGI

Onsoy-54tube2016-1-Tcy1.Plot1.grf

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB03\Cyclic\Fig 5_3_260, ONSB03-Tube2016-1-Tcy1.s_Tau_vs_GammaGraphNo1.Grf



Norwegian GeoTest Sites - Onsøy

CAUcy										
Boring:	Onsøy	Depth	=	10.34	m	Consolidation stresses				
Tube:	54tube2016	p_o'	=	66.5	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	=	41.4	%	σ_{ac}' =			66.3	
Test:	Tcy1	w_c	=	39.1	%	τ_c =			13.2	

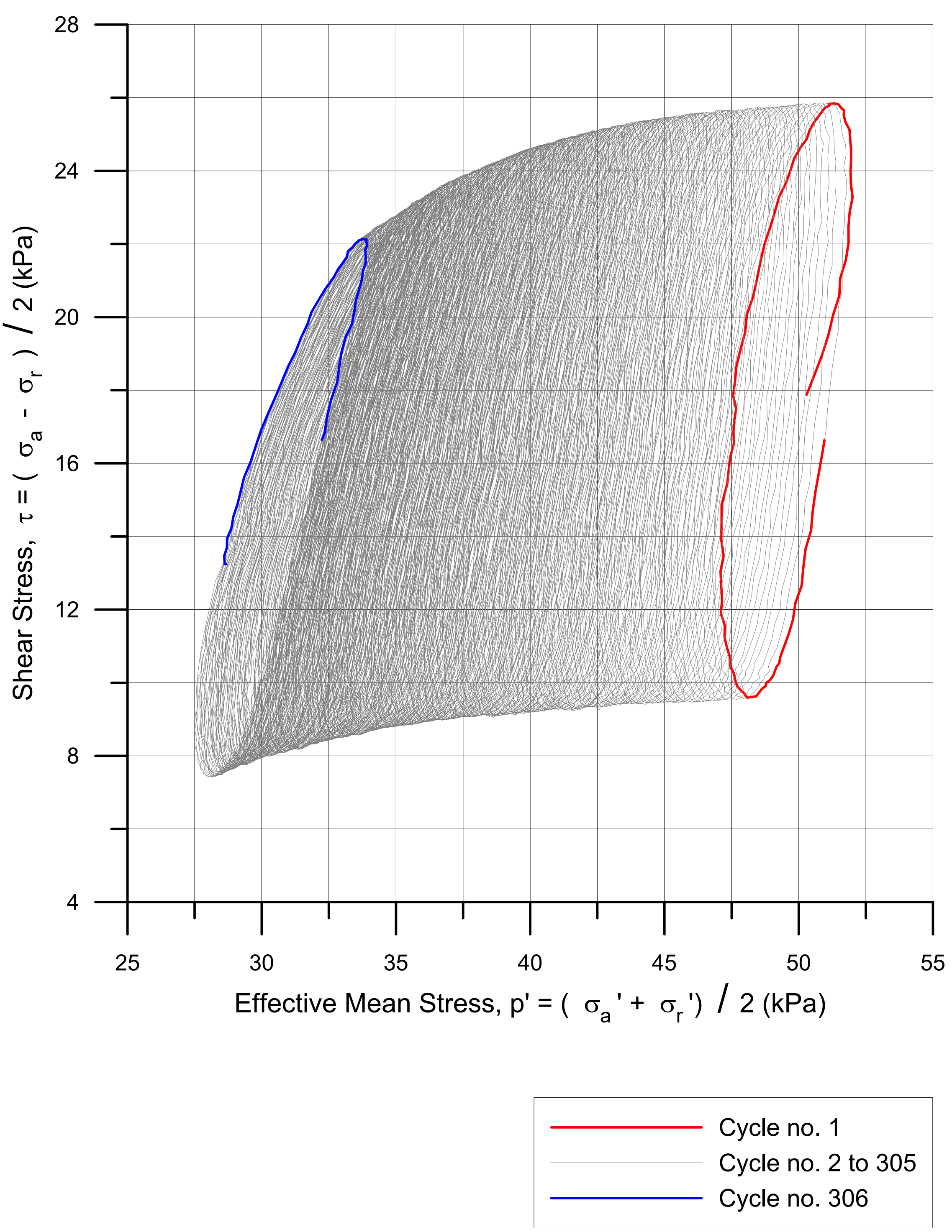
Document No.
20160154-10-R

Date
2016-08-18

Figure No.
5.3.260

Drawn by

NGI



Norwegian GeoTest Sites - Onsøy

CAUcy										
Boring:	Onsøy	Depth	=	10.34	m	Consolidation stresses				
Tube:	54tube2016	p_o'	=	66.5	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	=	41.4	%	σ_{ac}' =			66.3	
Test:	Tcy1	w_c	=	39.1	%	τ_c =			13.2	

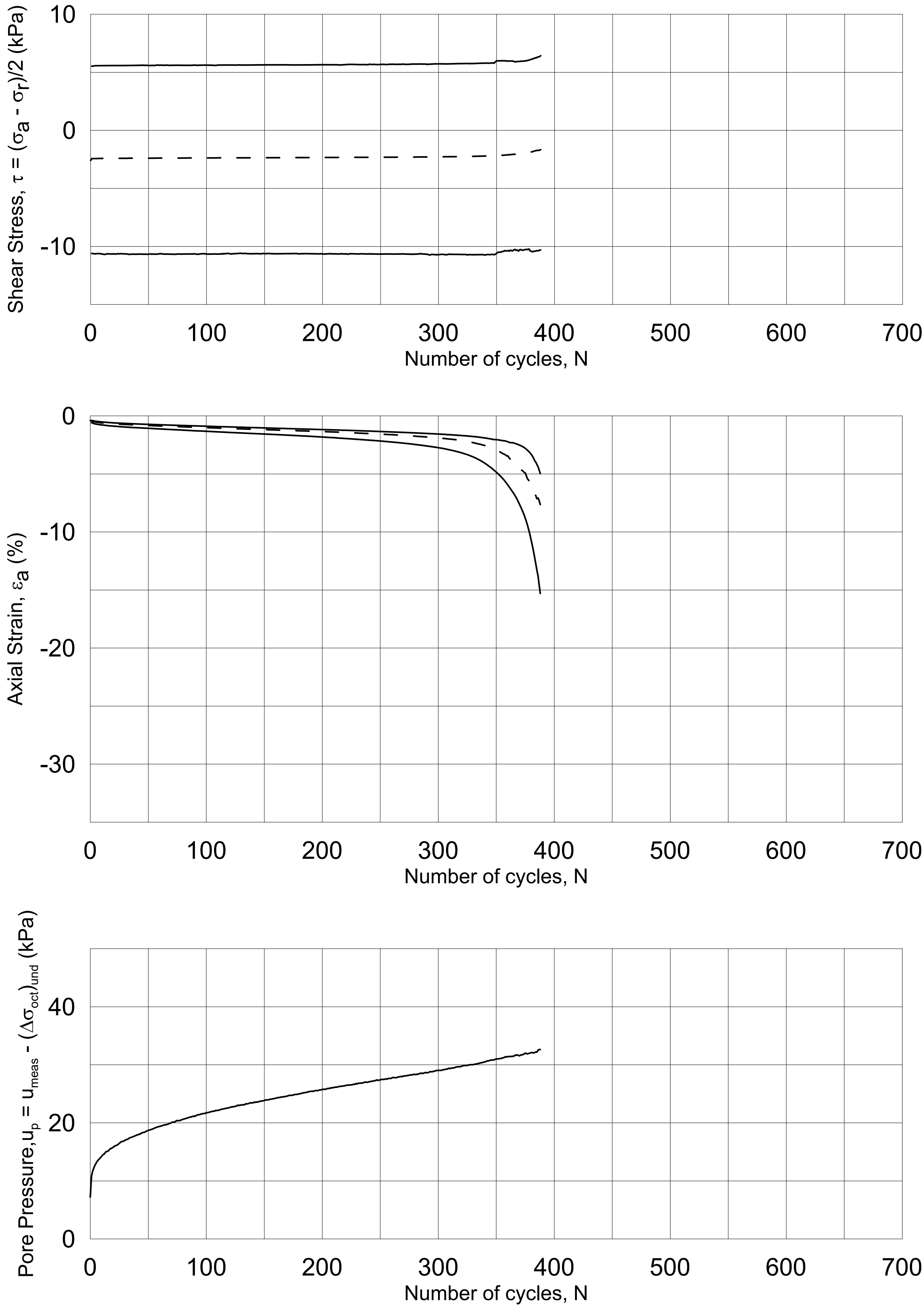
Document No.
20160154-10-R

Date
2016-08-18

Figure No.
5.3.261

Drawn by

NGI



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.262

Triaxial test: **CAUcy**

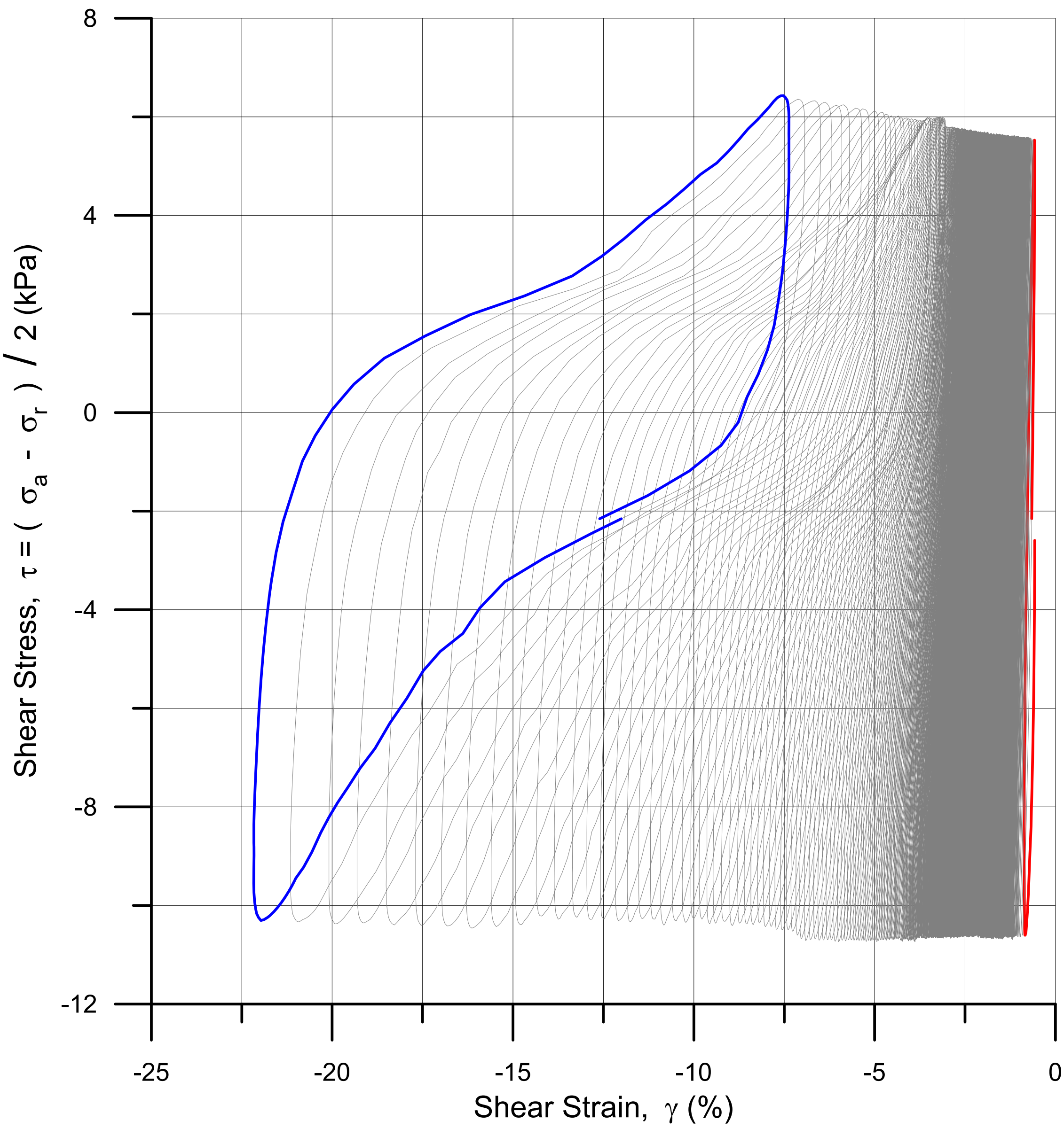
Date 2018-12-10

Drawn by/checked XXX / XXX

Boring:	**ONSB03**	Depth =	**10.23**	m	Consolidation stresses			
Tube:	**54tube2016**	po' =	**65.7**	kPa	(kPa)	max.	min.	final
Part:	**1**	w_i =	**42.3**	%	σ_{ac}' =	-	-	**65.7**
Test:	**Tcy2**	w_c =	**40.2**	%	σ_{rc}' =	-	-	**39.4**

NGI

Onsoy-54tube2016-1-Tcy2.Plot1.grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB03\Cyclic\Fig 5_3_263, ONSB03-Tube2016-1-Tcy2.s_Tau_vs_GammaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-07-04

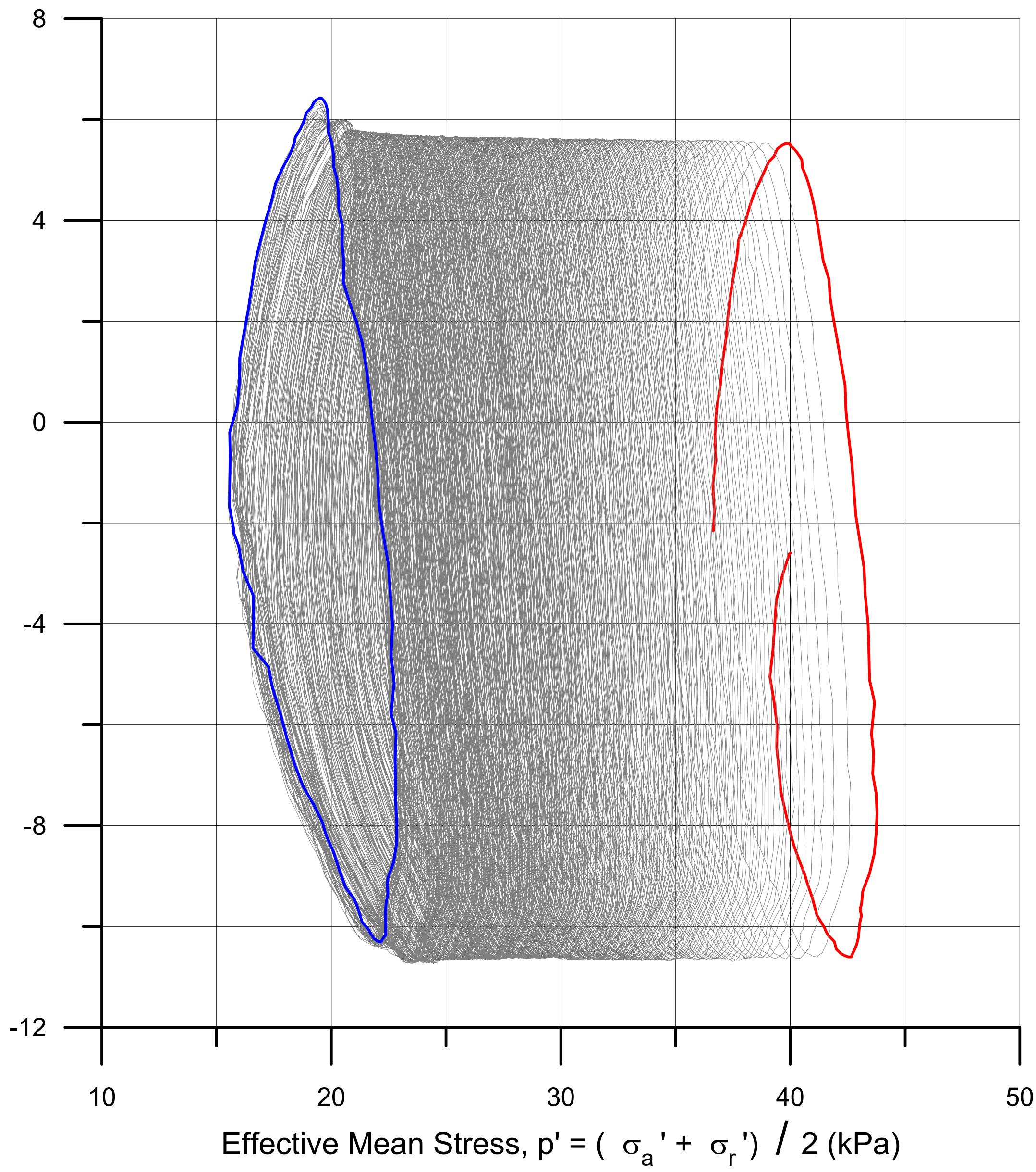
Figure No. 5.3.263

Drawn by

CAUcy

Boring:	Onsøy	Depth	=	10.23	m	Consolidation stresses			
Tube:	54tube2016	p_o'	=	65.7	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	42.3	%	σ_{ac}' =			65.7
Test:	Tcy2	w_c	=	40.2	%	τ_c =			13.15

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB03\Cyclic\Fig 5_3_264, ONSB03-Tube2016-1-Tcy2.s_Tau_vs_SigmaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

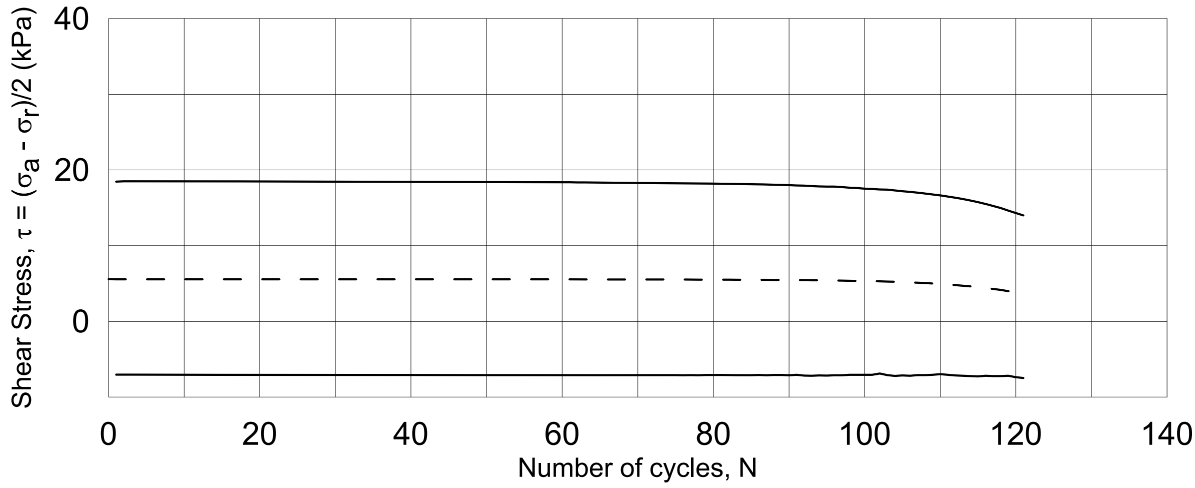
Date 2016-07-04

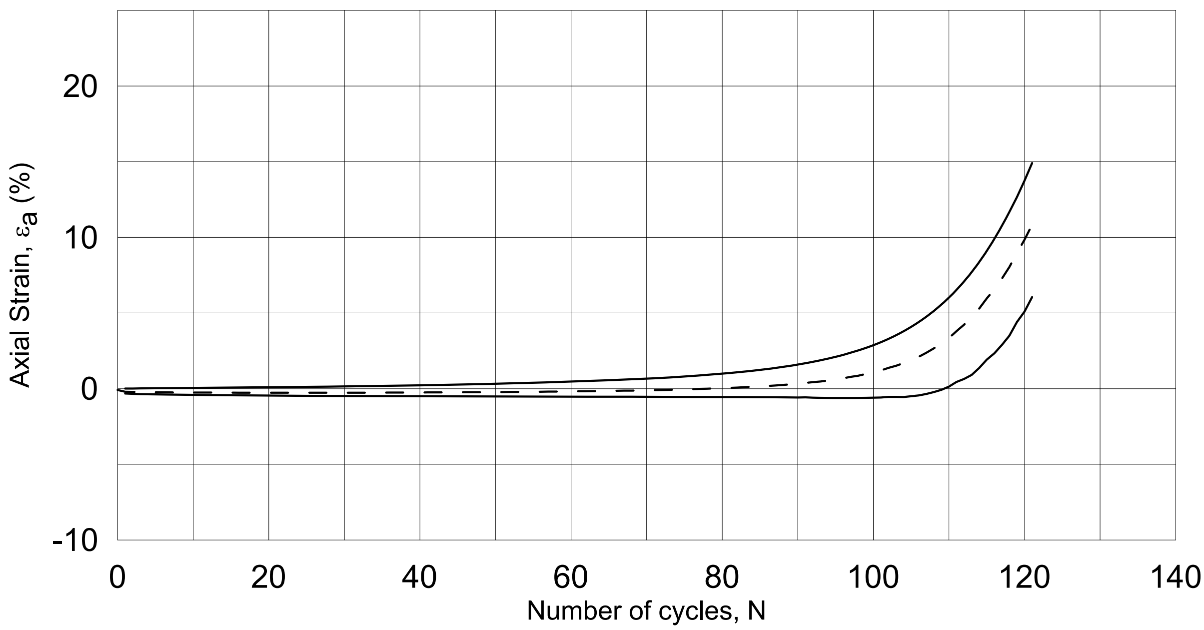
Figure No. 5.3.264

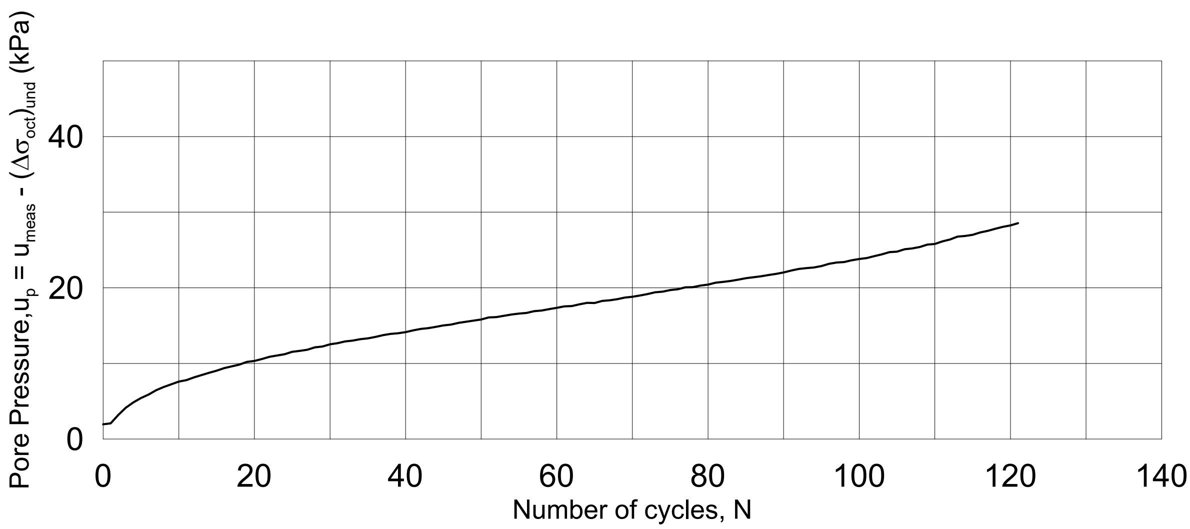
Drawn by

CAUcy

Boring:	Onsøy	Depth	=	10.23	m	Consolidation stresses			
Tube:	54tube2016	p_o'	=	65.7	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	42.3	%	σ_{ac}' =			65.7
Test:	Tcy2	w_c	=	40.2	%	τ_c =			13.15







Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.265

Triaxial test: **CAUcy**

Boring:	**ONSB03**	Depth =	**10.11**	m	Consolidation stresses				
Tube:	**54tube2016**	po' =	**64.8**	kPa	(kPa)	max.	min.	final	
Part:	**1**	w_i =	**45.6**	%	σ_{ac}' =	-	-	**64.8**	
Test:	**Tcy3**	w_c =	**40.9**	%	σ_{rc}' =	-	-	**38.9**	

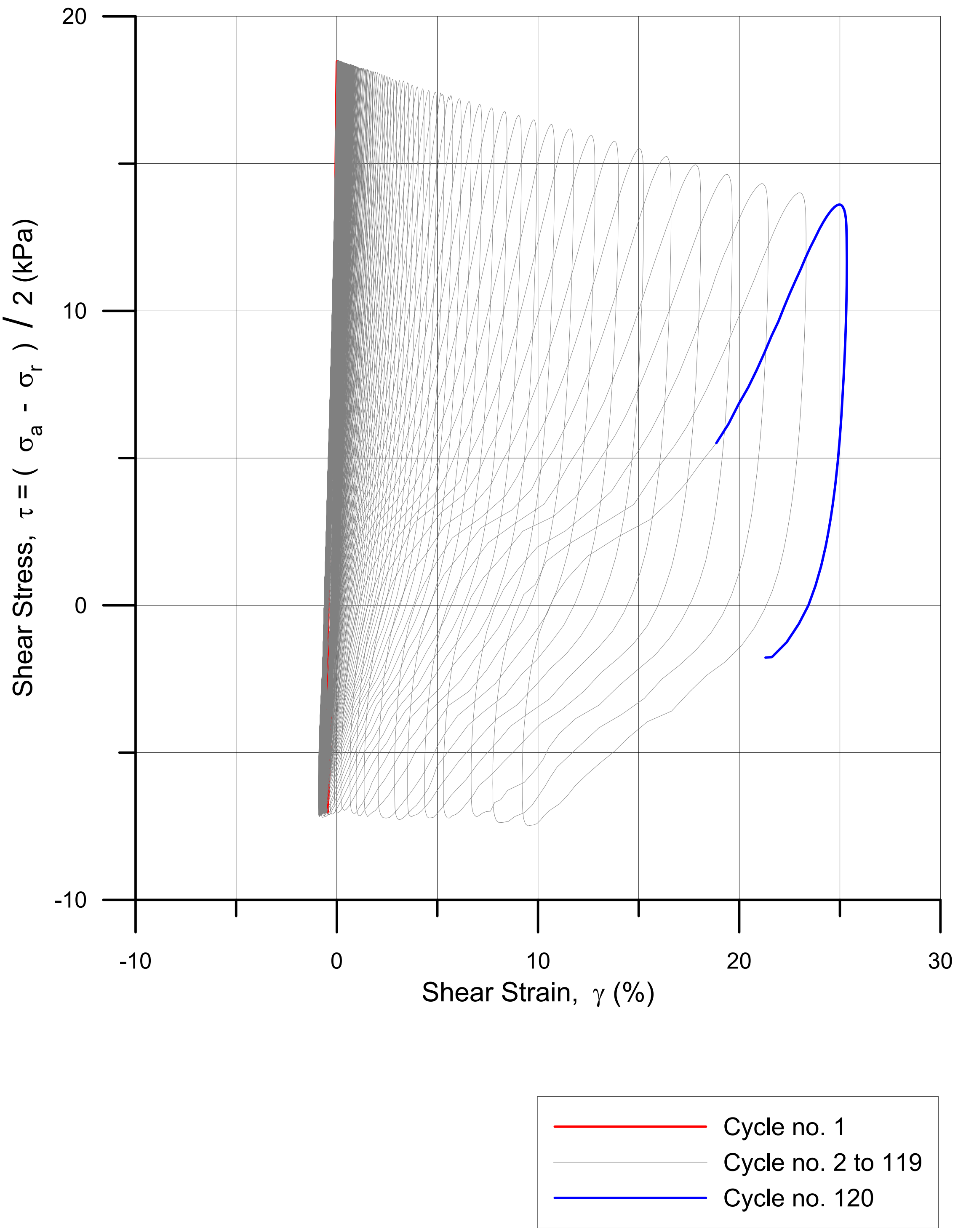
Date: 2018-12-10

Drawn by/checked: MAS / GS

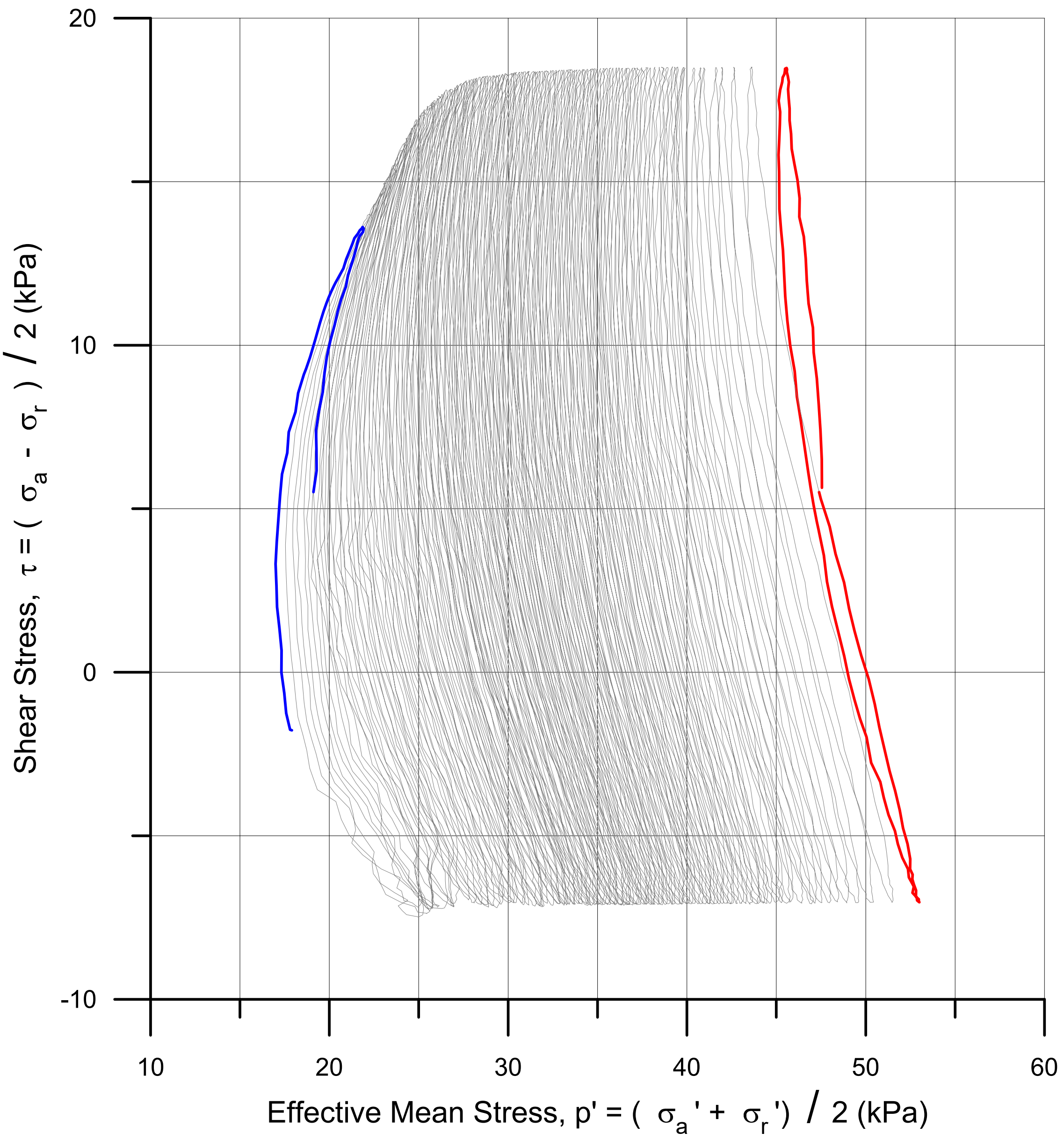
NGI

Onsoy-54tube2016-1-Tcy3.Plot1.grf

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB03\Cyclic\Fig 5_3_266, ONSB03-Tube2016-1-Tcy3.s_Tau_vs_GammaGraphNo1.Grf



Norwegian GeoTest Sites - Onsøy											Document No. 20160154-10-R
CAUcy											Date 2016-07-04
Boring:	Onsøy	Depth	=	10.11	m	Consolidation stresses					
Tube:	54tube2016	p_o'	=	64.8	kPa	(kPa)	max.	min.	final		Figure No. 5.3.266
Part:	1	w_i	=	45.6	%	σ_{ac}' =			64.8		Drawn by
Test:	Tcy3	w_c	=	40.9	%	τ_c =			13.0		NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB03\Cyclic\Fig 5_3_267, ONSB03-Tube2016-1-Tcy3.s_Tau_vs_SigmaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-07-04

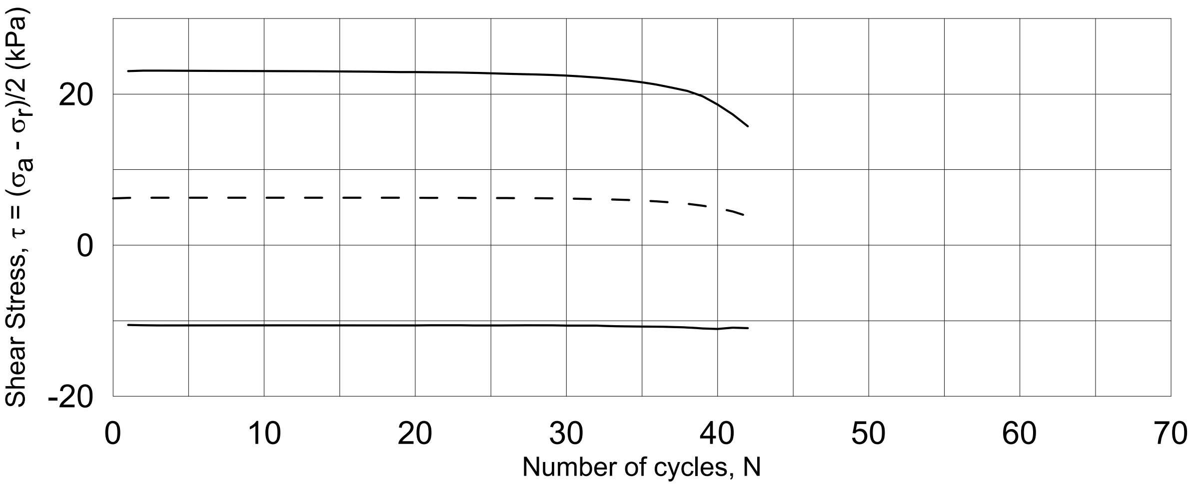
Figure No. 5.3.267

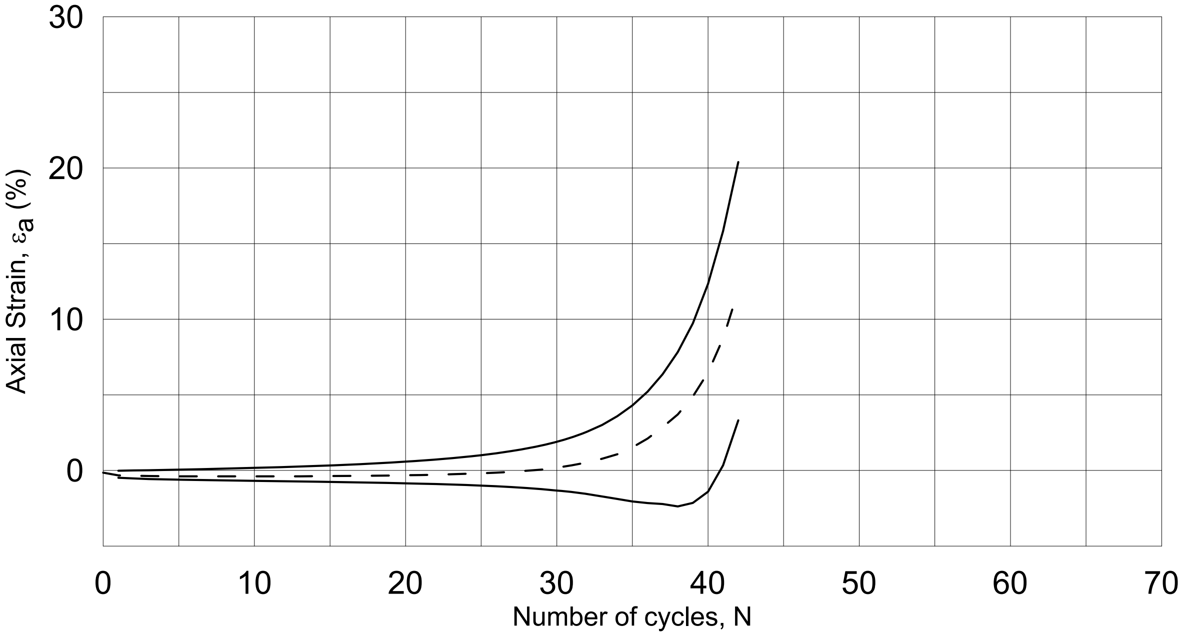
Drawn by

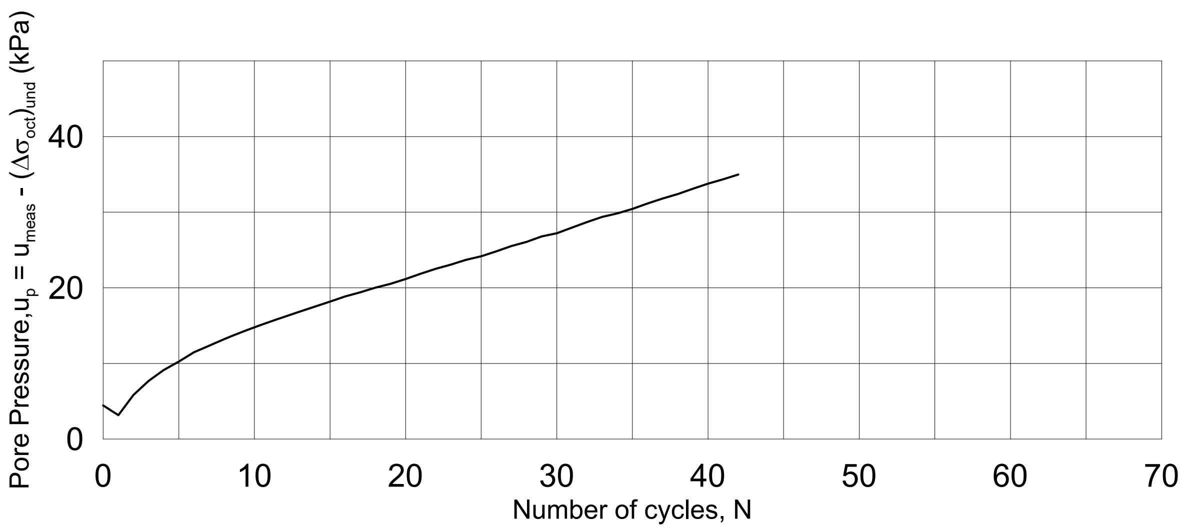
CAUcy

Boring:	Onsøy	Depth	=	10.11	m		Consolidation stresses			
Tube:	54tube2016	p_o'	=	64.8	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	=	45.6	%	σ_{ac}' =			64.8	
Test:	Tcy3	w_c	=	40.9	%	τ_c =			13.0	

NGI





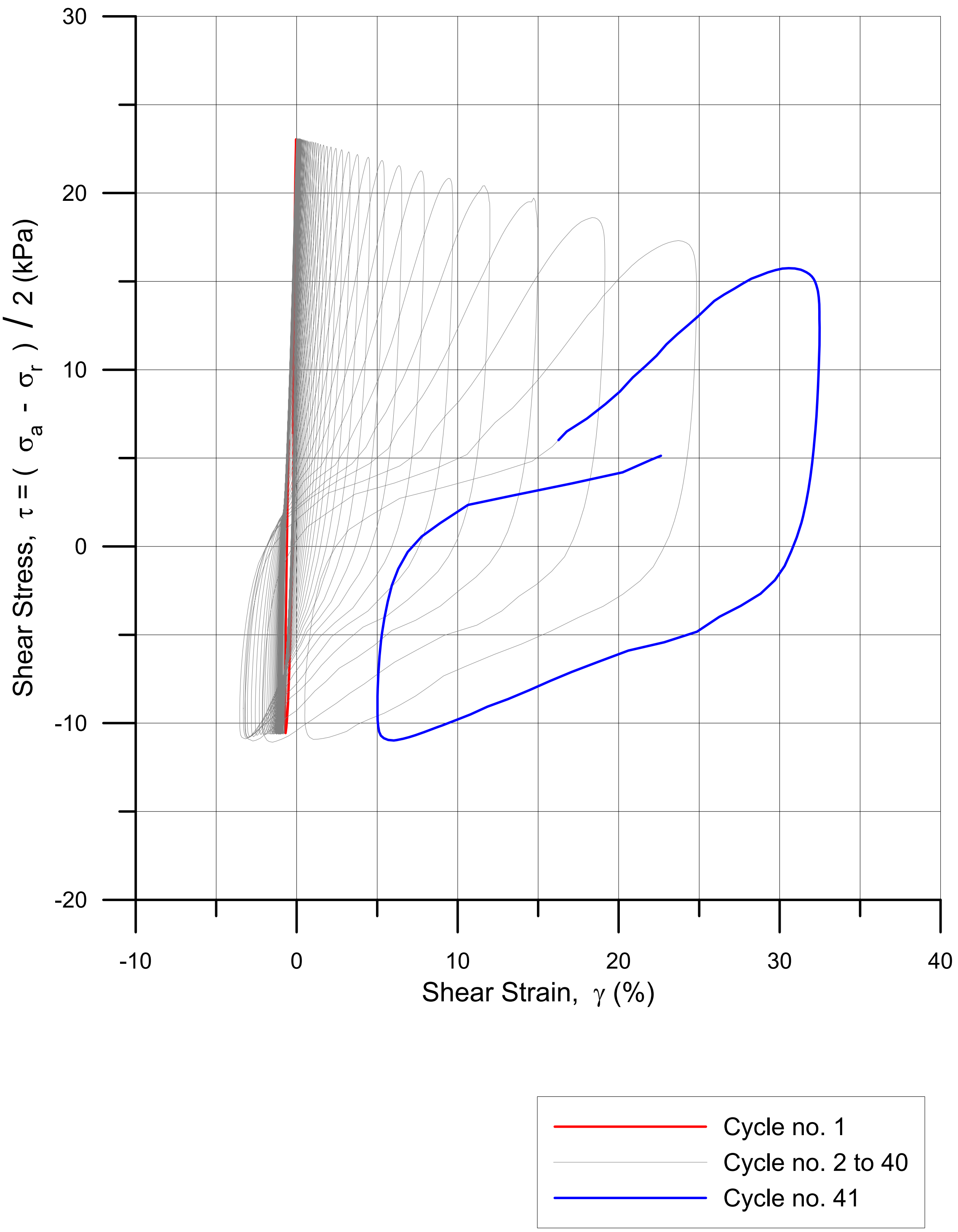


Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R
Triaxial test: **CAUcy**										Figure No. 5.3.268
Boring:	**ONSB03**	Depth =	**12.13**	m	Consolidation stresses					Date 2018-12-10 / Drawn by/checked MAS / GS
Tube:	**54tube2016**	po' =	**79.4**	kPa	(kPa)	max.	min.	final		
Part:	**1**	w_i =	**43.0**	%	σ_{ac}' =	-	-	**79.4**		NGI
Test:	**Tcy4**	w_c =	**41.1**	%	σ_{rc}' =	-	-	**47.6**		

Onsoy-54tube2016-1-Tcy4.Plot1.grf

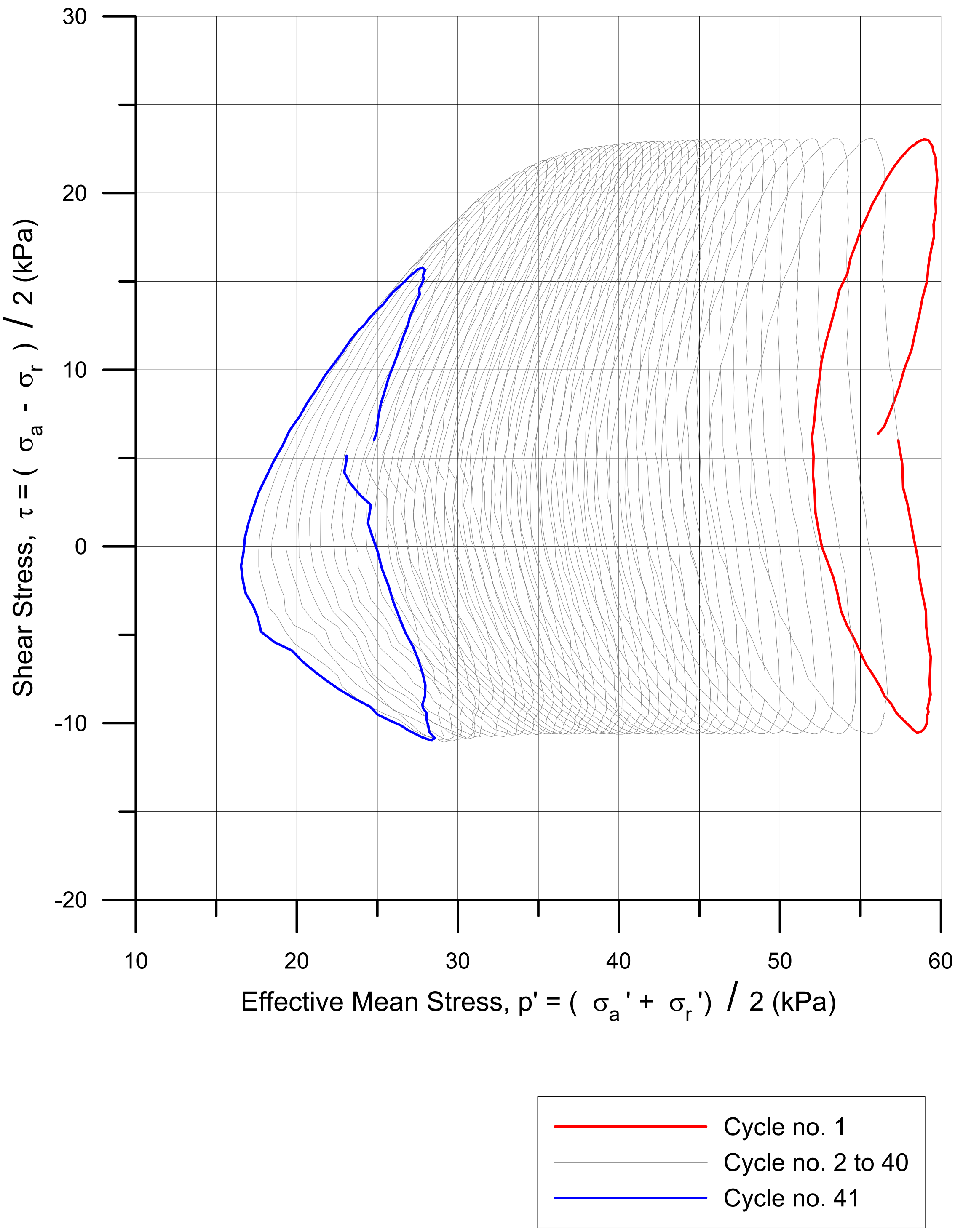
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB03\Cyclic\Fig 5_3_269, ONSB03-Tube2016-1-Tcy4.s_Tau_vs_GammaGraphNo1.Grf



Norwegian GeoTest Sites - Onsøy								Document No. 20160154-10-R
CAUcy								Date 2016-07-08
Boring:	Onsøy	Depth =	12.13	m	Consolidation stresses			Figure No. 5.3.269
Tube:	54tube2016	p_o' =	79.4	kPa	(kPa)	max.	min.	final
Part:	1	w_i =	43.0	%	σ_{ac}' =			79.4
Test:	Tcy4	w_c =	41.1	%	τ_c =			15.9

Drawn by

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB03\Cyclic\Fig 5_3_270, ONSB03-Tube2016-1-Tcy4.s_Tau_vs_SigmaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

CAUcy												
Boring:	Onsøy	Depth	=	12.13	m	Consolidation stresses						
Tube:	54tube2016	p_o'	=	79.4	kPa	(kPa)	max.	min.	final			
Part:	1	w_i	=	43.0	%	σ_{ac}' =			79.4			
Test:	Tcy4	w_c	=	41.1	%	τ_c =			15.9			

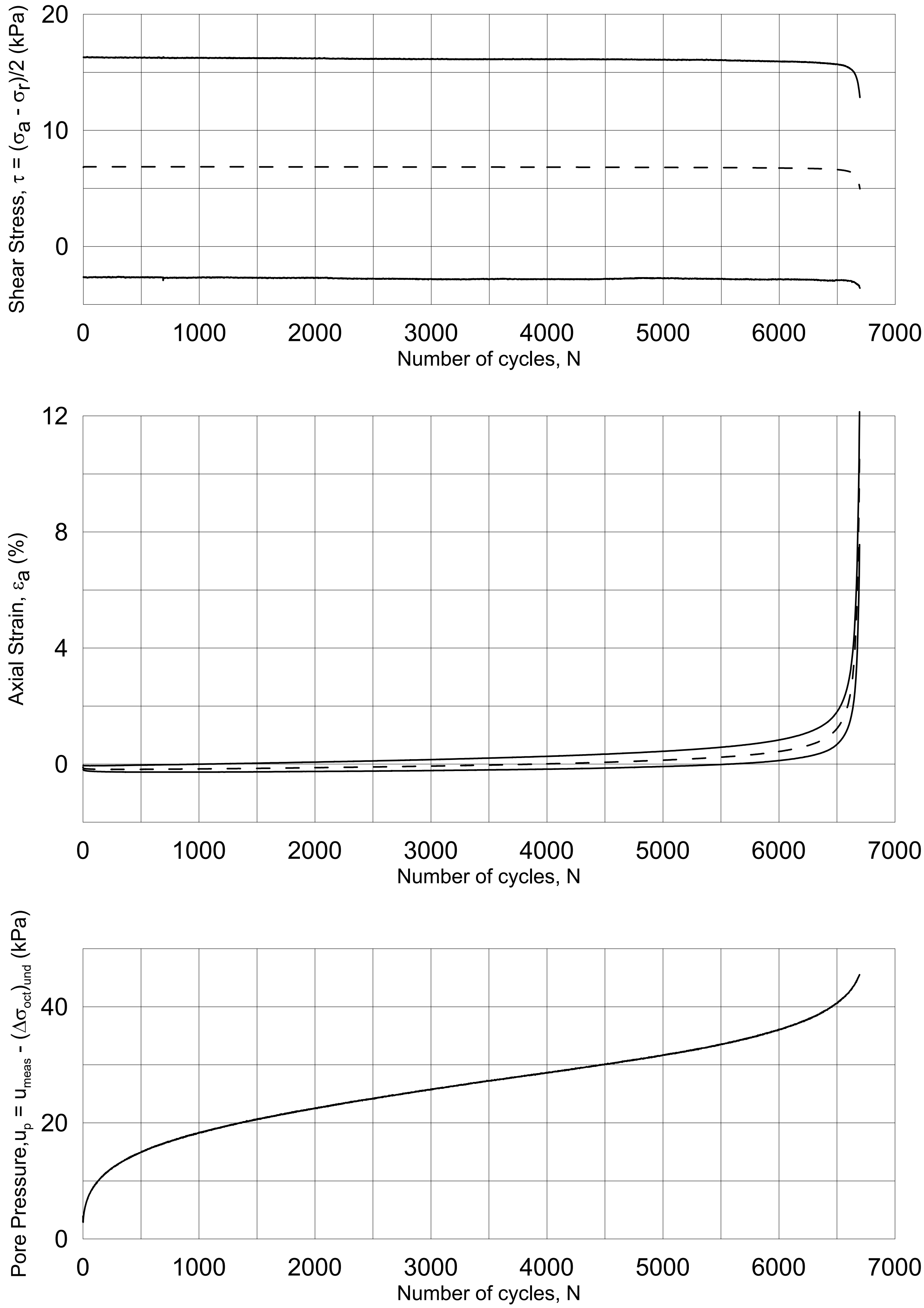
Document No. 20160154-10-R

Date 2016-07-08

Figure No. 5.3.270

Drawn by

NGI



Dato/rev.: 2014-12-23/01

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Figure No. 5.3.271

Triaxial test: **CAUcy**

Date 2018-12-10

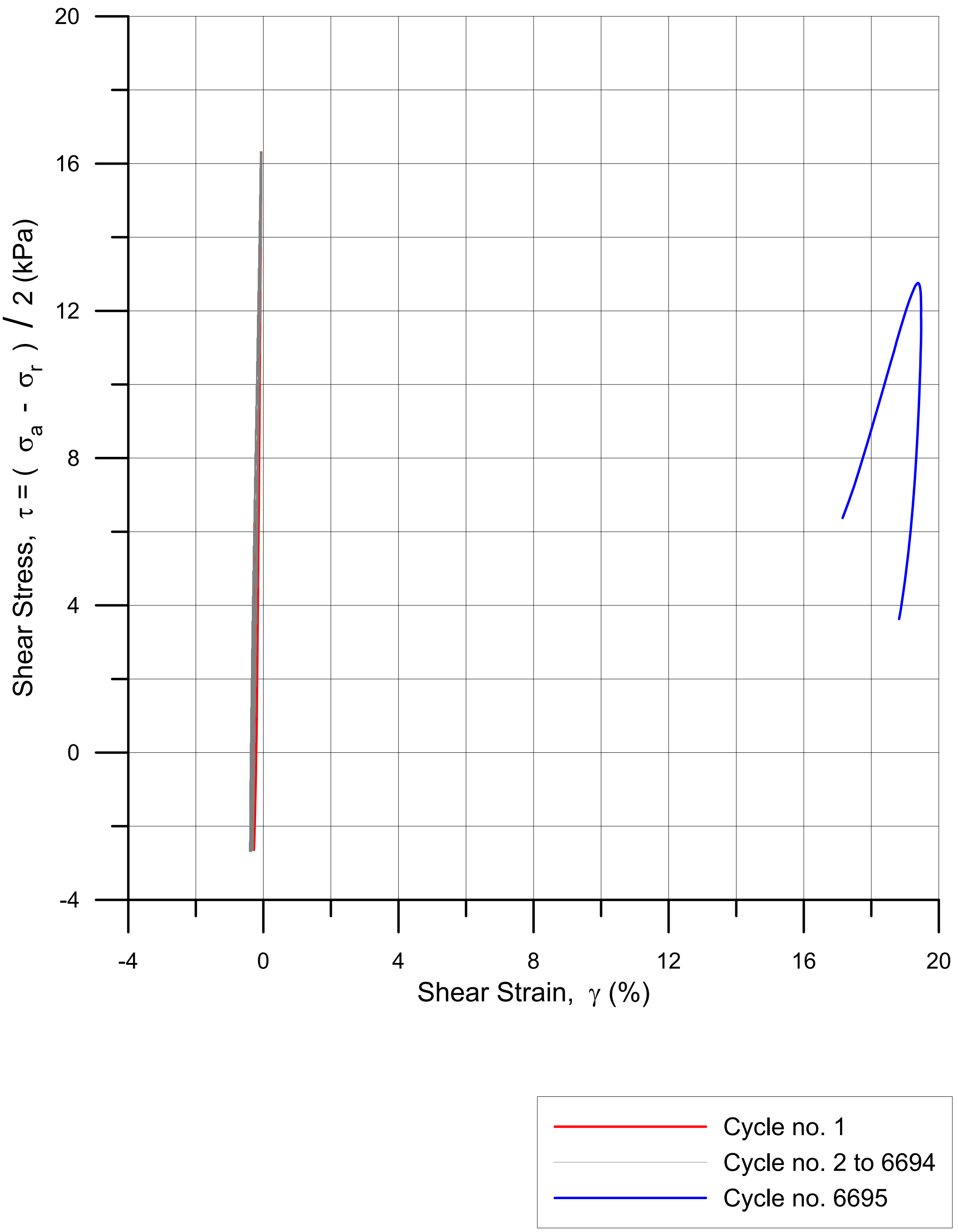
Drawn by/checked MAS / GS

Boring:	**ONSB03**	Depth =	**12.25**	m	Consolidation stresses					
Tube:	**54tube2016**	po'	=	**80.3**	kPa	(kPa)	max.	min.	final	
Part:	**1**	w_i	=	**44.4**	%	σ_{ac}' =	-	-	**80.2**	
Test:	**Tcy5**	w_c	=	**42.3**	%	σ_{rc}' =	-	-	**48.2**	

NGI

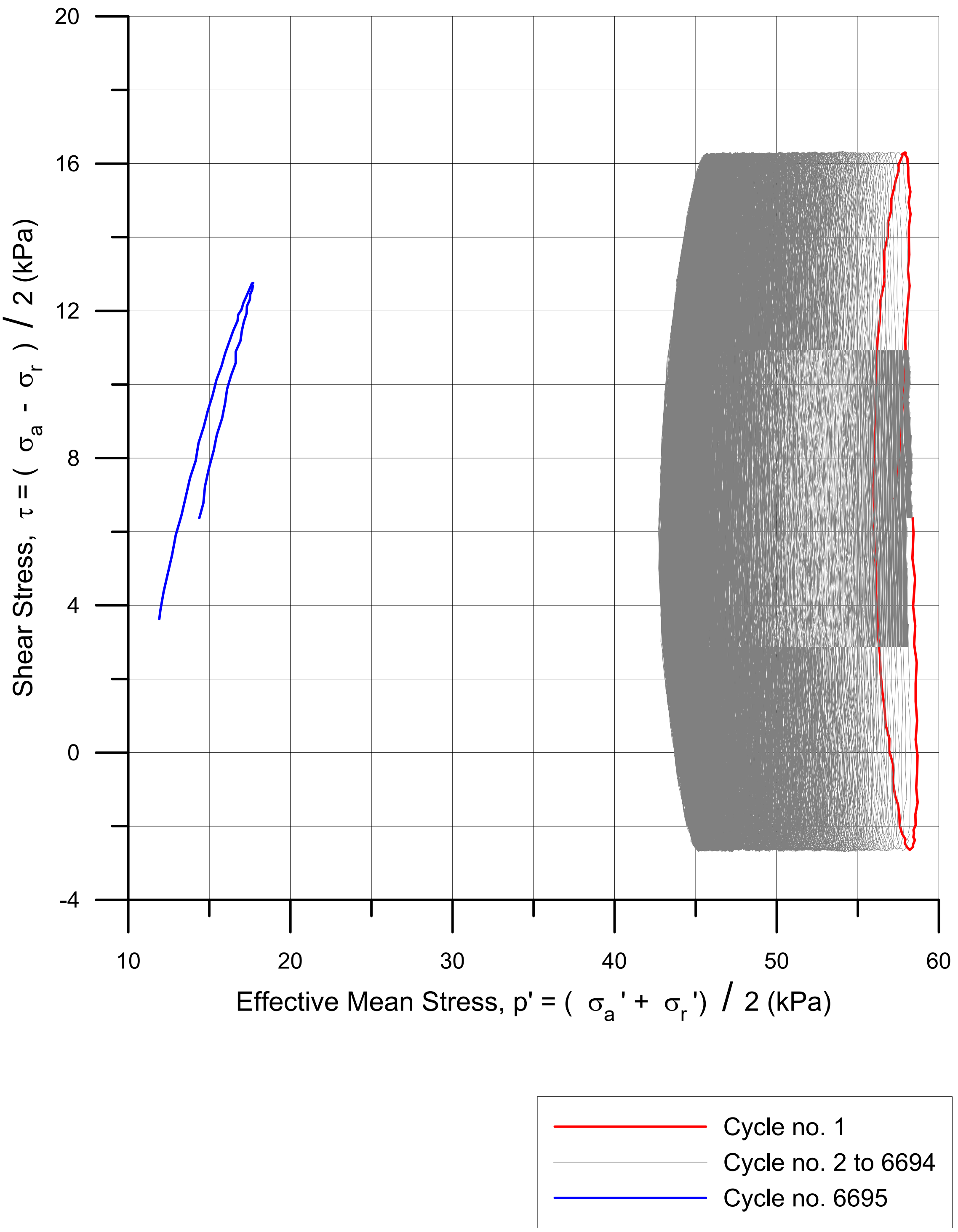
Onsoy-54tube2016-1-Tcy5.Plot1.grf

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB03\Cyclic\Fig 5_3_272, ONSB03-Tube2016-1-Tcy5.s_Tau_vs_GammaGraphNo1.Grf



Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
CAUcy									Date 2016-07-08
Boring:	Onsøy	Depth =	12.25	m	Consolidation stresses				Figure No. 5.3.272
Tube:	54tube2016	p_o' =	80.3	kPa	(kPa)	max.	min.	final	Drawn by
Part:	1	w_i =	44.4	%	σ_{ac}' =			80.2	
Test:	Tcy5	w_c =	42.3	%	τ_c =			16.0	NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\TRX\20160386\ONSB03\Cyclic\Fig 5_3_273, ONSB03-Tube2016-1-Tcy5.s_Tau_vs_SigmaGraphNo1.Grf



Norwegian GeoTest Sites - Onsøy

CAUcy										
Boring:	Onsøy	Depth	=	12.25	m	Consolidation stresses				
Tube:	54tube2016	p_o'	=	80.3	kPa	(kPa)	max.	min.	final	
Part:	1	w_i	=	44.4	%	σ_{ac}' =			80.2	
Test:	Tcy5	w_c	=	42.3	%	τ_c =			16.0	

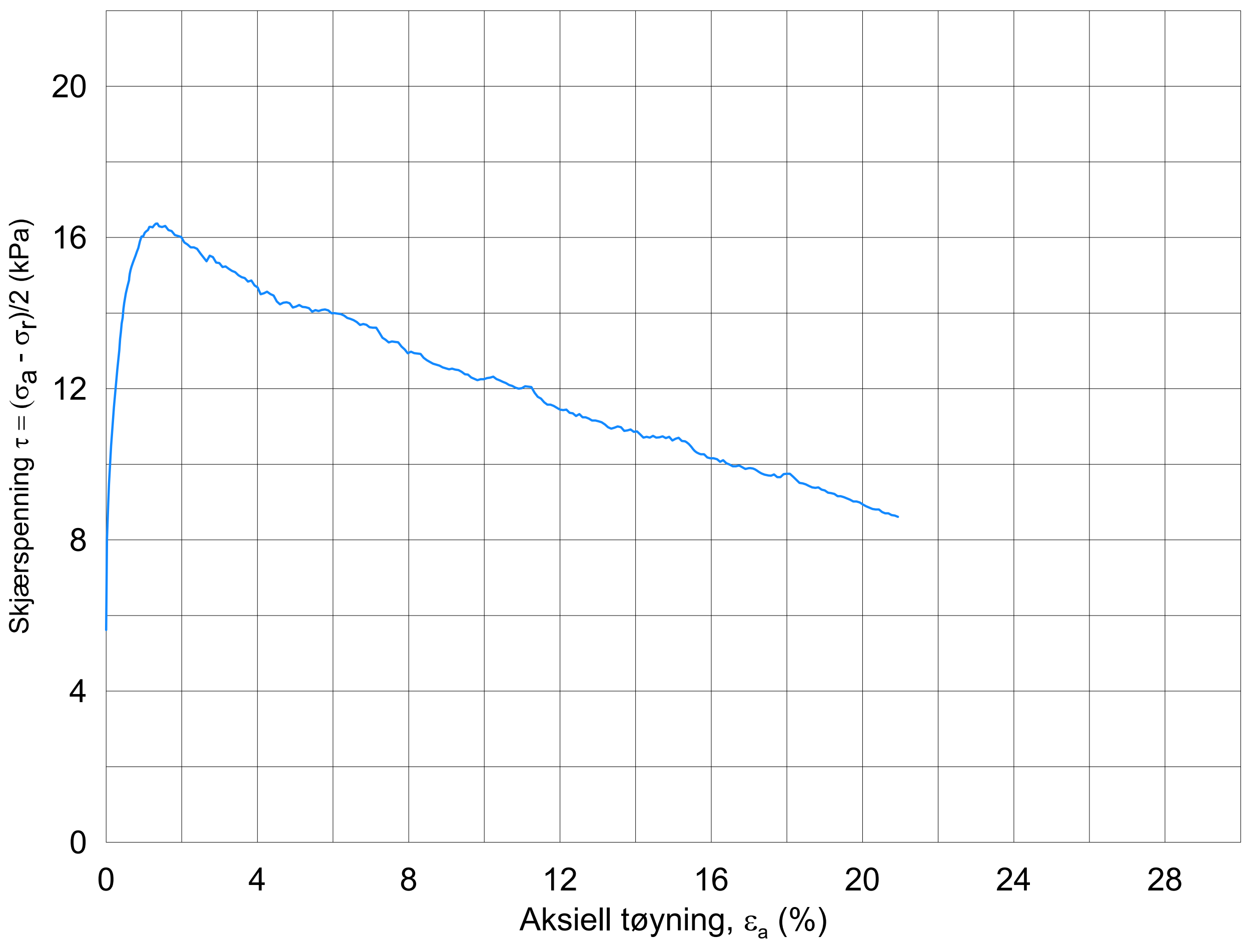
Document No.
20160154-10-R

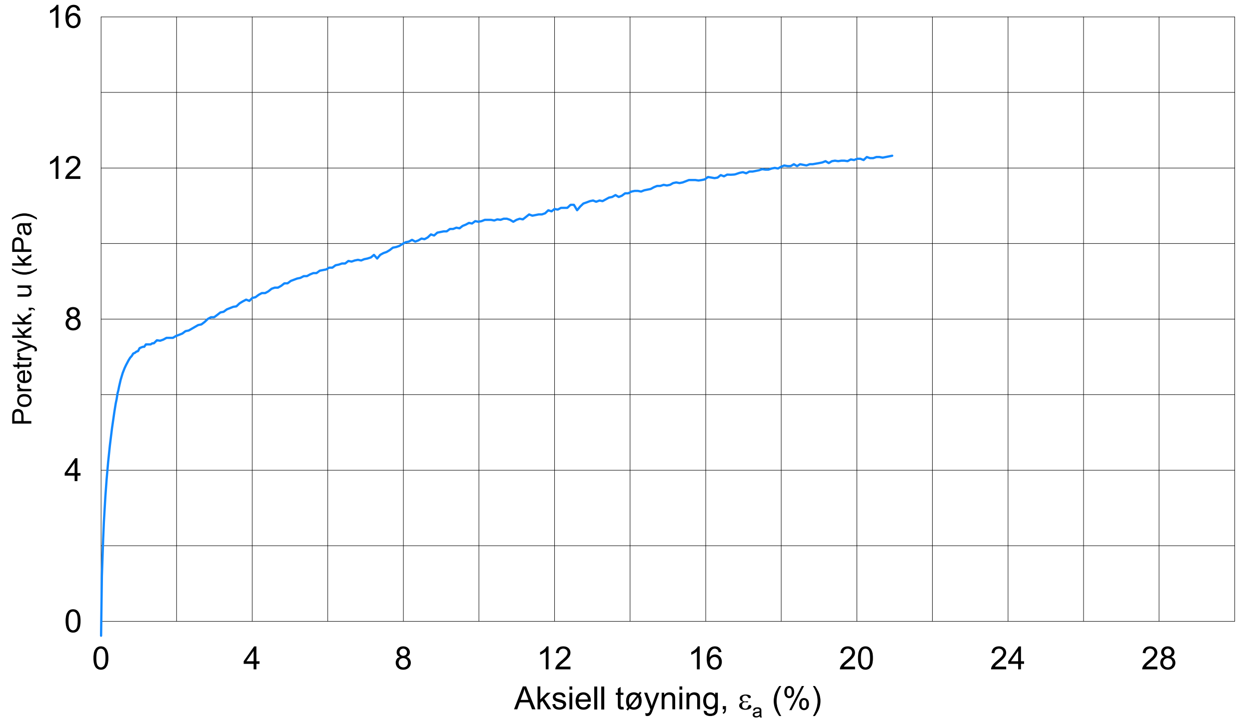
Date
2016-07-08

Figure No.
5.3.273

Drawn by

NGI





Dato/Rev.: 2014-12-23/02

NGTS Onsøy

Dokument nr. 20160154-01-R

Treaksial forsøk: **CAUC**

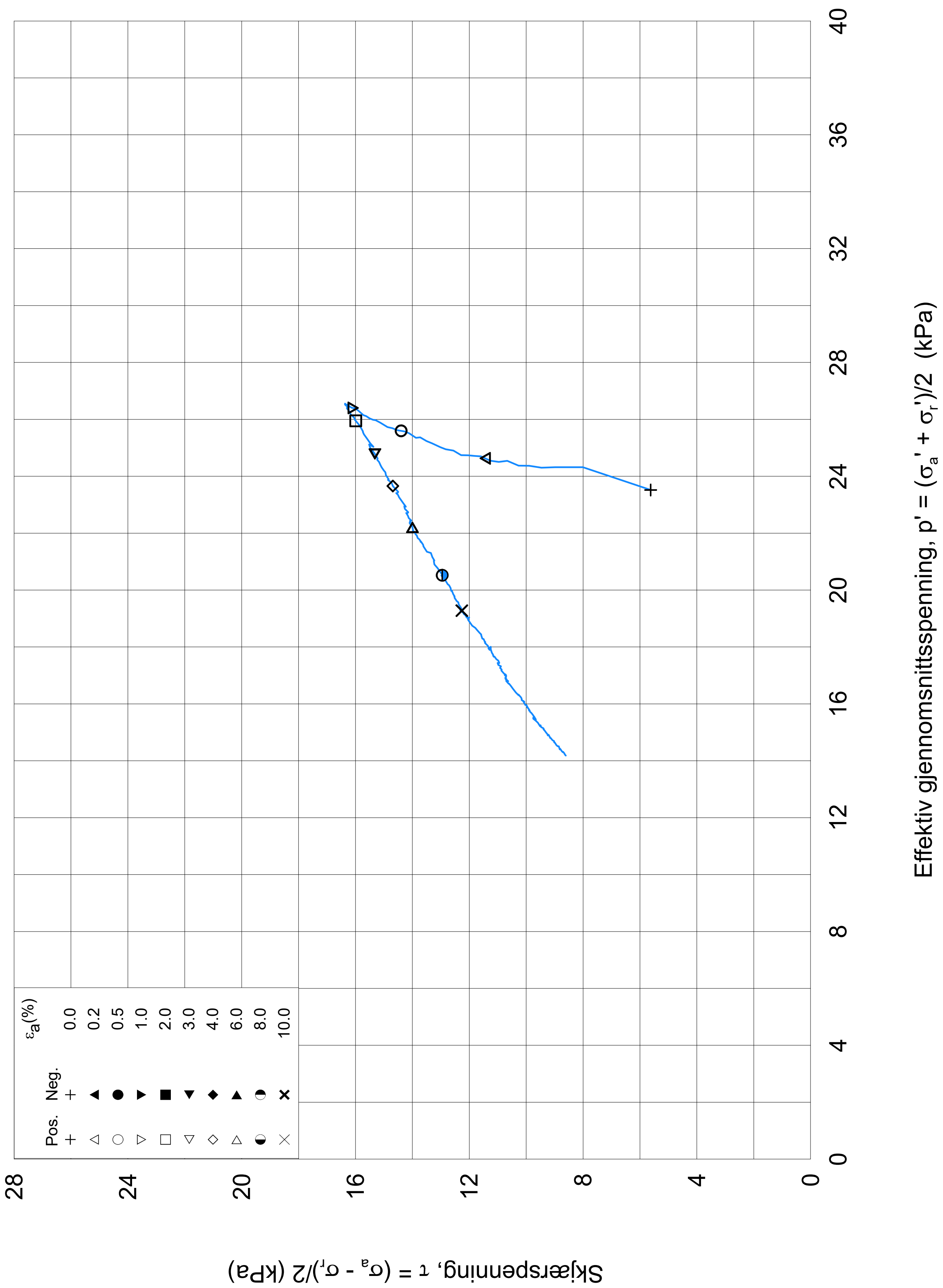
Figur nr. 5.3.274

Dato 2019-10-01

Tegnet av / kontr. AGU / GS

Boring:	**ONSB43**	Dybde =	**2.95**	m	Konsolidering-spenninger			
Sylinder:	**2**	po' =	**26.7**	kPa	(kPa)	maks.	min.	endelig
Del:	**B**	w_i =	**70.8**	%	σ_{ac}' =	-	-	**26.7**
Test:	**1**	w_c =	**70.6**	%	σ_{rc}' =	-	-	**17.4**

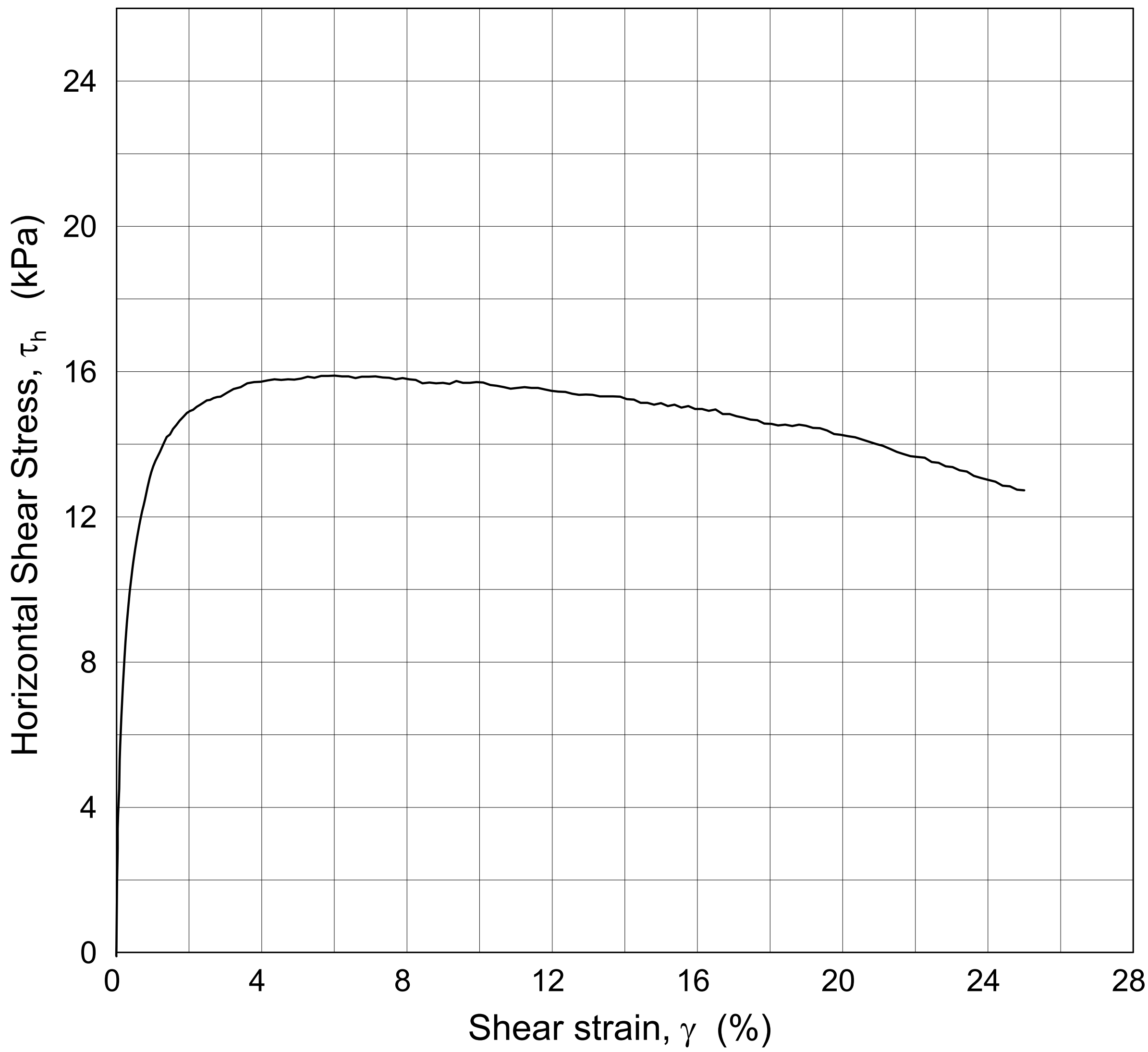
ONSB43-2-B-1.Plot1.grf

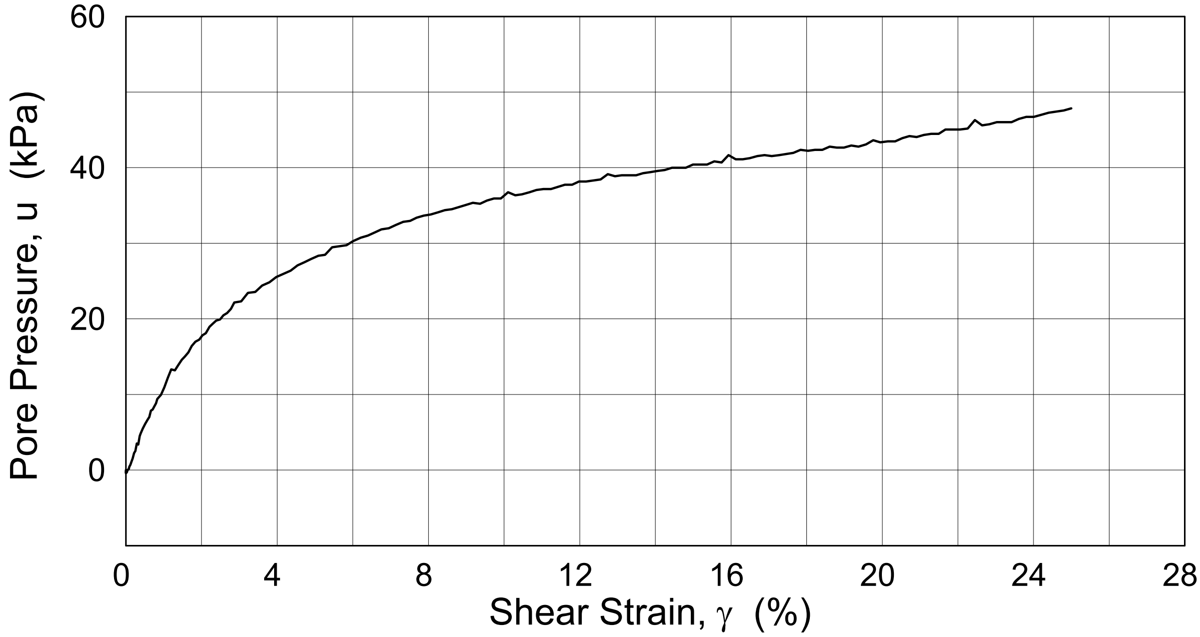


Dato/Rev.: 2014-12-23/02

NGTS Onsøy									Dokument nr. 20160154-01-R
Treaksial forsøk: **CAUC**									Figur nr. 5.3.275
Boring: **ONSB43**	Dybde =	**2.95**	m	Konsolidering-spenninger					Dato 2019-10-01 / Tegnet av / kontr. AGU / GS
Sylinder: **2**	po' =	**26.7**	kPa	(kPa)	maks.	min.	endelig		
Del: **B**	w_i =	**70.8**	%	σ_{ac}' =	-	-	**26.7**		
Test: **1**	w_c =	**70.6**	%	σ_{rc}' =	-	-	**17.4**		

ONSB43-2-B-1.Plot2.grf





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.1, 2-3-c-1-1(ccv1794).grf

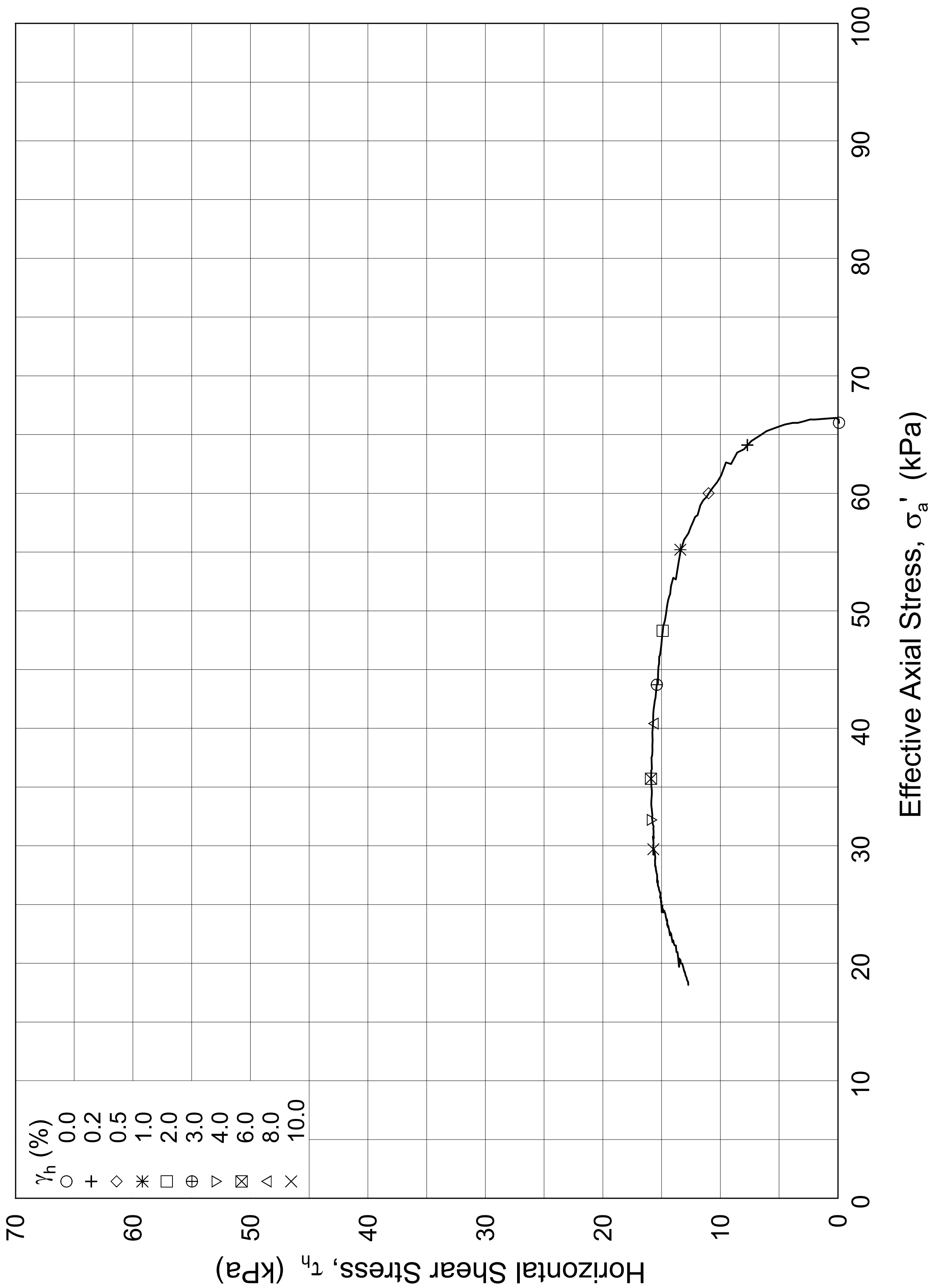
Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Document No.	20160154-10-R			
Figure No.	5.4.1			
Date	2018-11-29	Drawn by/checked	JLa / MAS	
Boring: **ONSB02**	Depth = **3.13** m	Consolidation stresses		
Tube: **3**	p_o' = **29.5** kPa	(kPa) max.	min.	final
Part: **C**	w_i = **70.6** %	σ_{ac}' = 66.0	-	**66.0**
Test: **1**	γ_i = **15.28** kN/m³	τ_c' = -	-	**-**

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.2, 2-3-c-1-2(ccv1794).grf

Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring: **ONSB02**	Depth =	**3.13**	m	Consolidation stresses			
Tube: **3**	p_o' =	**29.5**	kPa	(kPa)	max.	min.	final
Part: **C**	w_i =	**70.6**	%	σ_{ac}' =	66.0	-	**66.0**
Test: **1**	γ_i =	**15.28**	kN/m³	τ_c' =	-	-	**-**

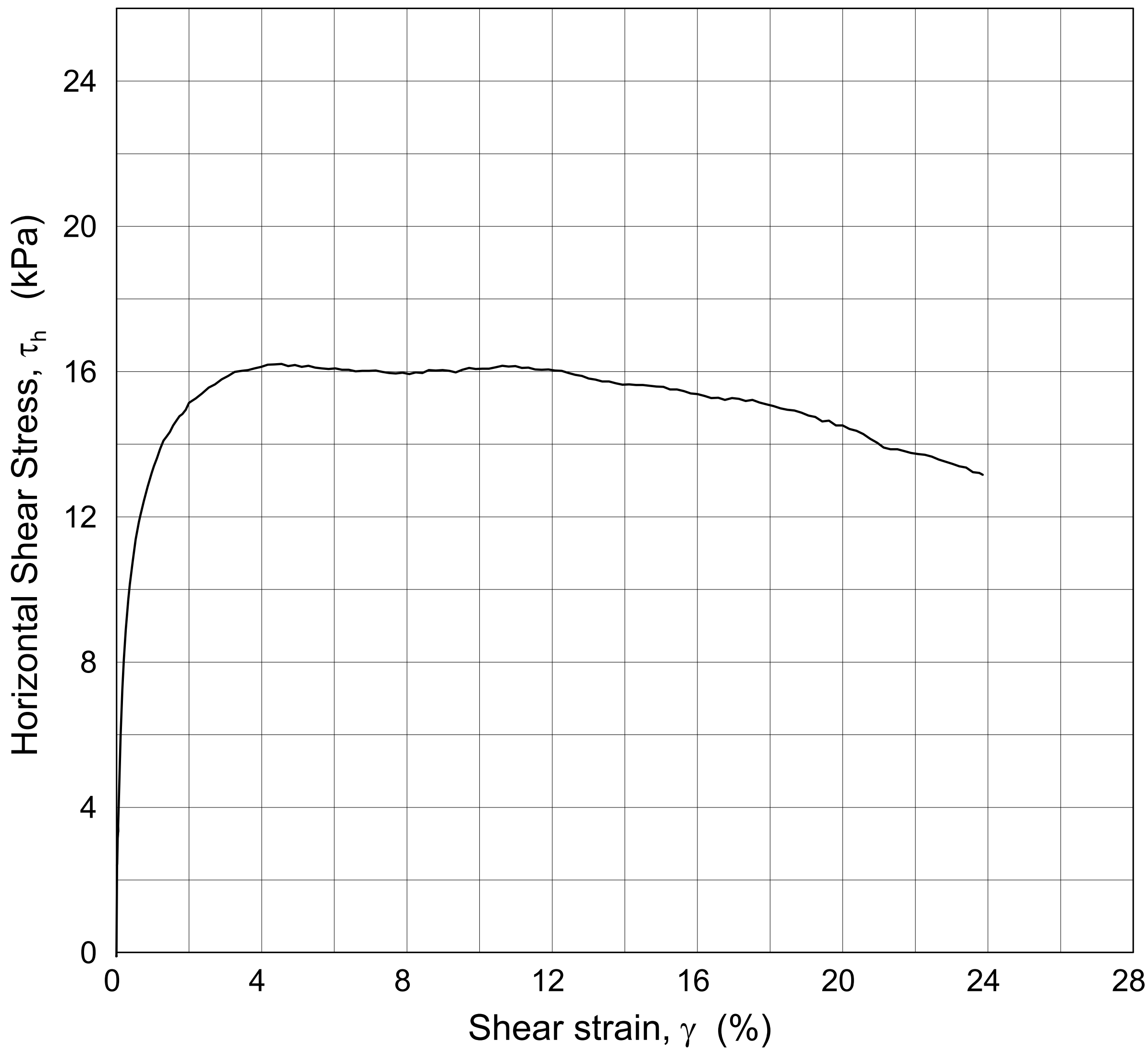
Document No.
20160154-10-R

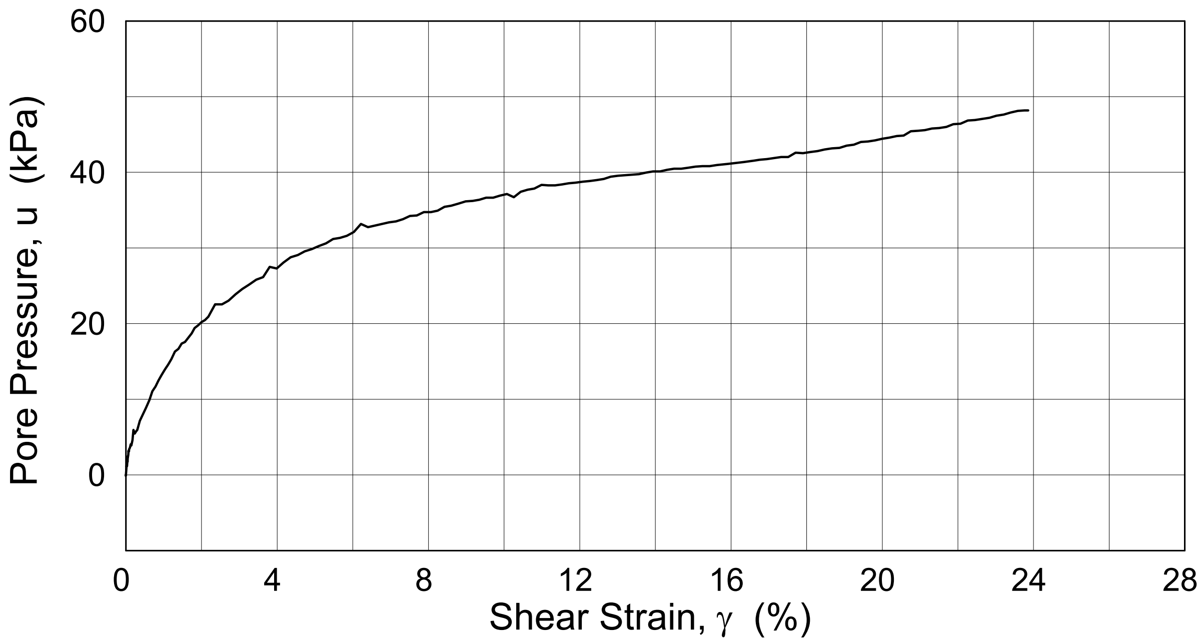
Figure No.
5.4.2

Date
2018-11-29

Drawn by/checked
JLa / MAS

NGI





Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

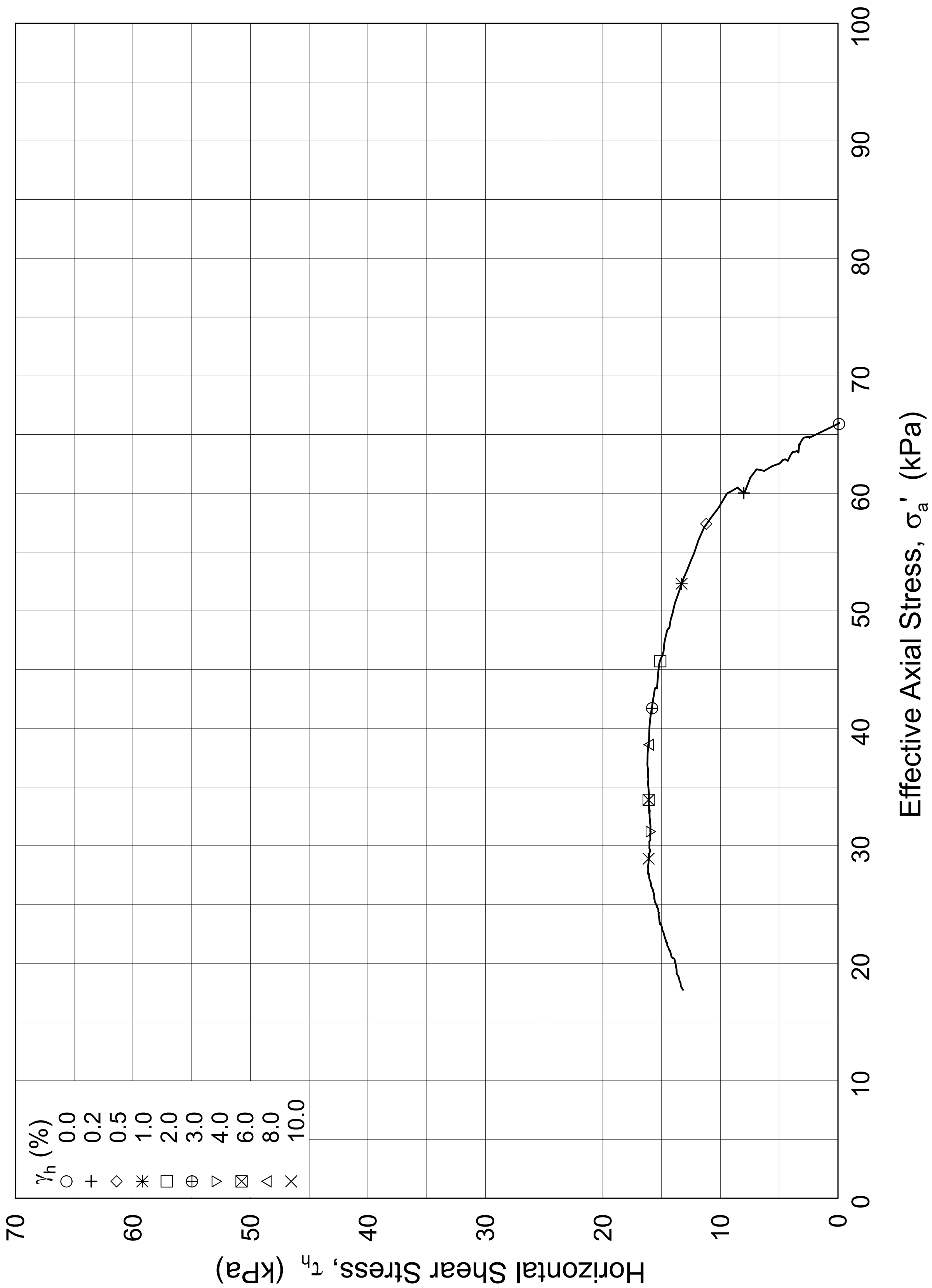
Direct Simple Shear Test

Figure No. 5.4.3

Boring:	**ONSB02**	Depth	=	**4.33**	m	Consolidation stresses				Date: 2018-11-29
Tube:	**4**	p_o'	=	**35.3**	kPa	(kPa)	max.	min.	final	Drawn by/checked: JLa / MAS
Part:	**C**	w_i	=	**69.3**	%	σ_{ac}' =	65.9	-	**65.9**	
Test:	**1**	γ_i	=	**15.03**	kN/m³	τ_c' =	-	-	**-**	

NGI

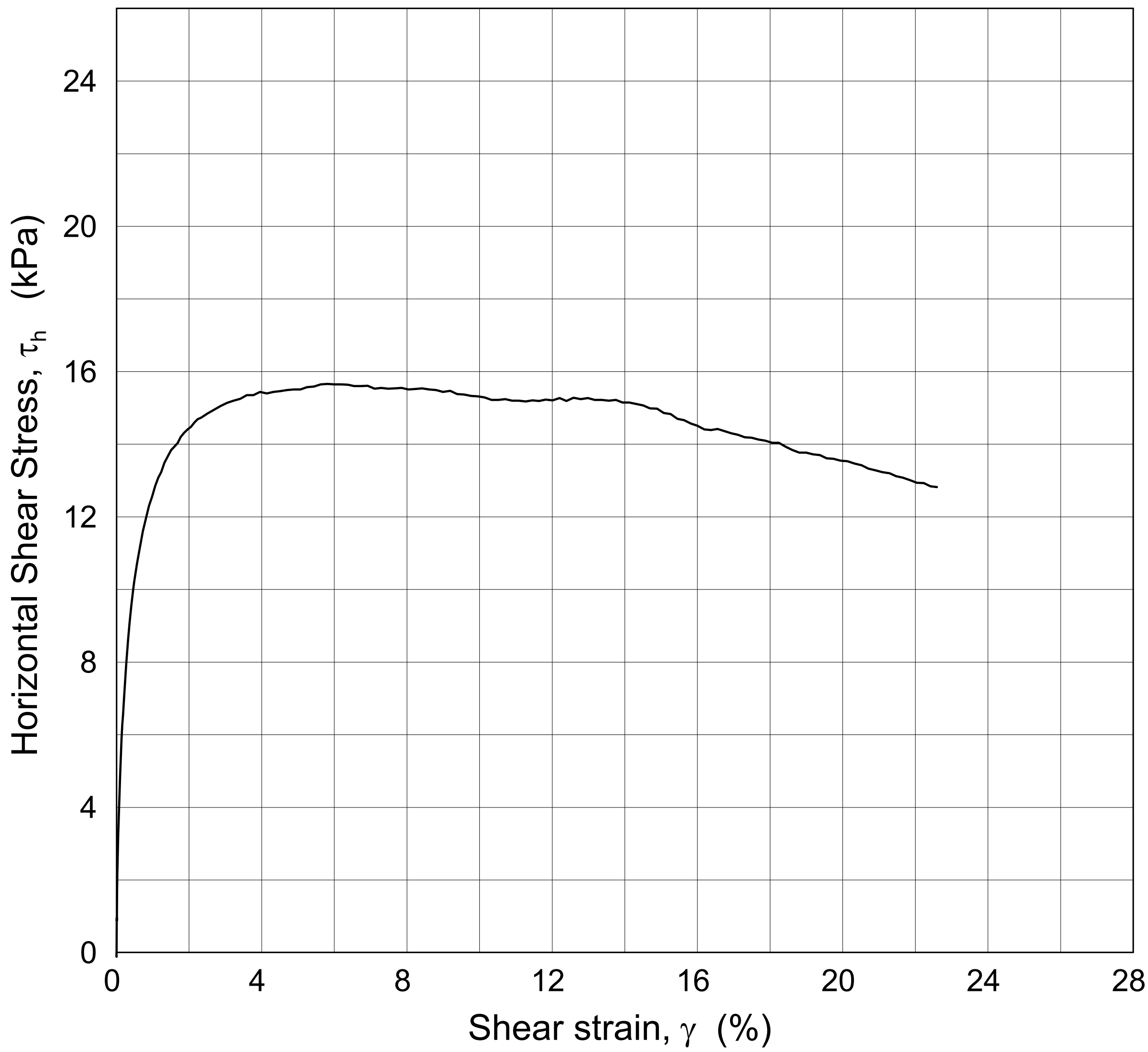
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.3, 2-4-c-1-1(ccv1796).grf

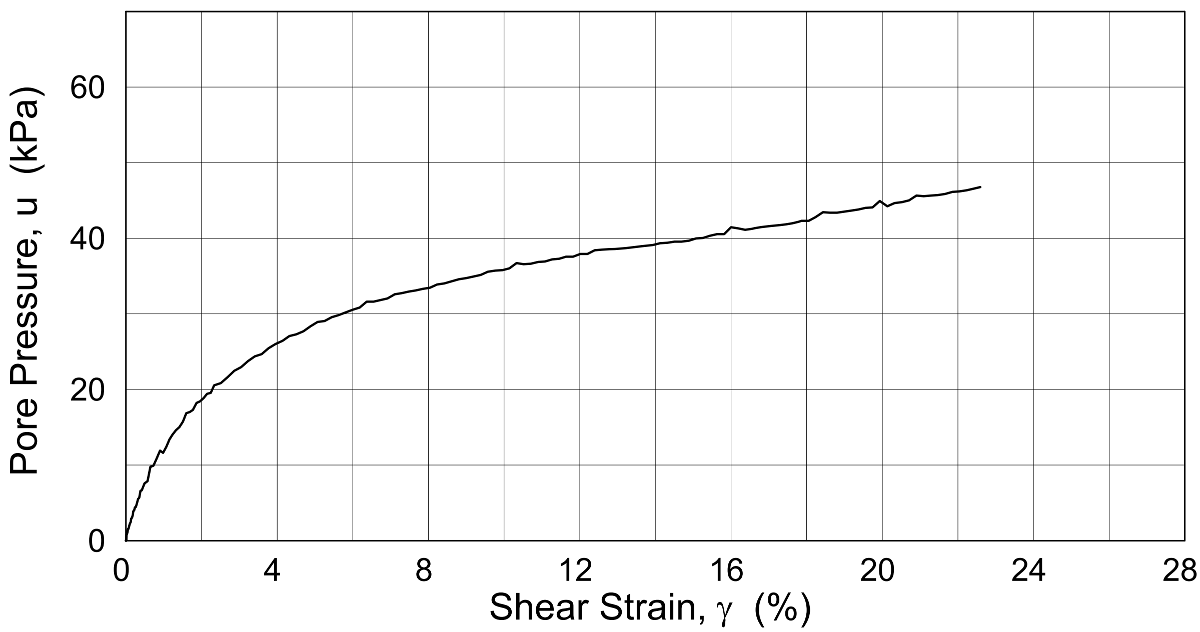


Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy						Document No. 20160154-10-R
Direct Simple Shear Test						Figure No. 5.4.4
Boring: **ONSB02**	Depth = **4.33** m	Consolidation stresses				Date 2018-11-29 / Drawn by/checked JLa / MAS
Tube: **4**	p_o' = **35.3** kPa	(kPa)	max.	min.	final	
Part: **C**	w_i = **69.3** %	σ_{ac}' =	65.9	-	**65.9**	
Test: **1**	γ_i = **15.03** kN/m³	τ_c' =	-	-	**-**	

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.4, 2-4-c-1-2(ccv1796).grf





Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring:	**ONSB02**	Depth	=	**5.2**	m	Consolidation stresses					
Tube:	**5**	p_o'	=	**41.0**	kPa	(kPa)	max.	min.	final		
Part:	**C**	w_i	=	**68.1**	%	σ_{ac}' =	66.0	-	**66.0**		
Test:	**1**	γ_i	=	**15.32**	kN/m³	τ_c' =	-	-	**-**		

Document No.
20160154-10-R

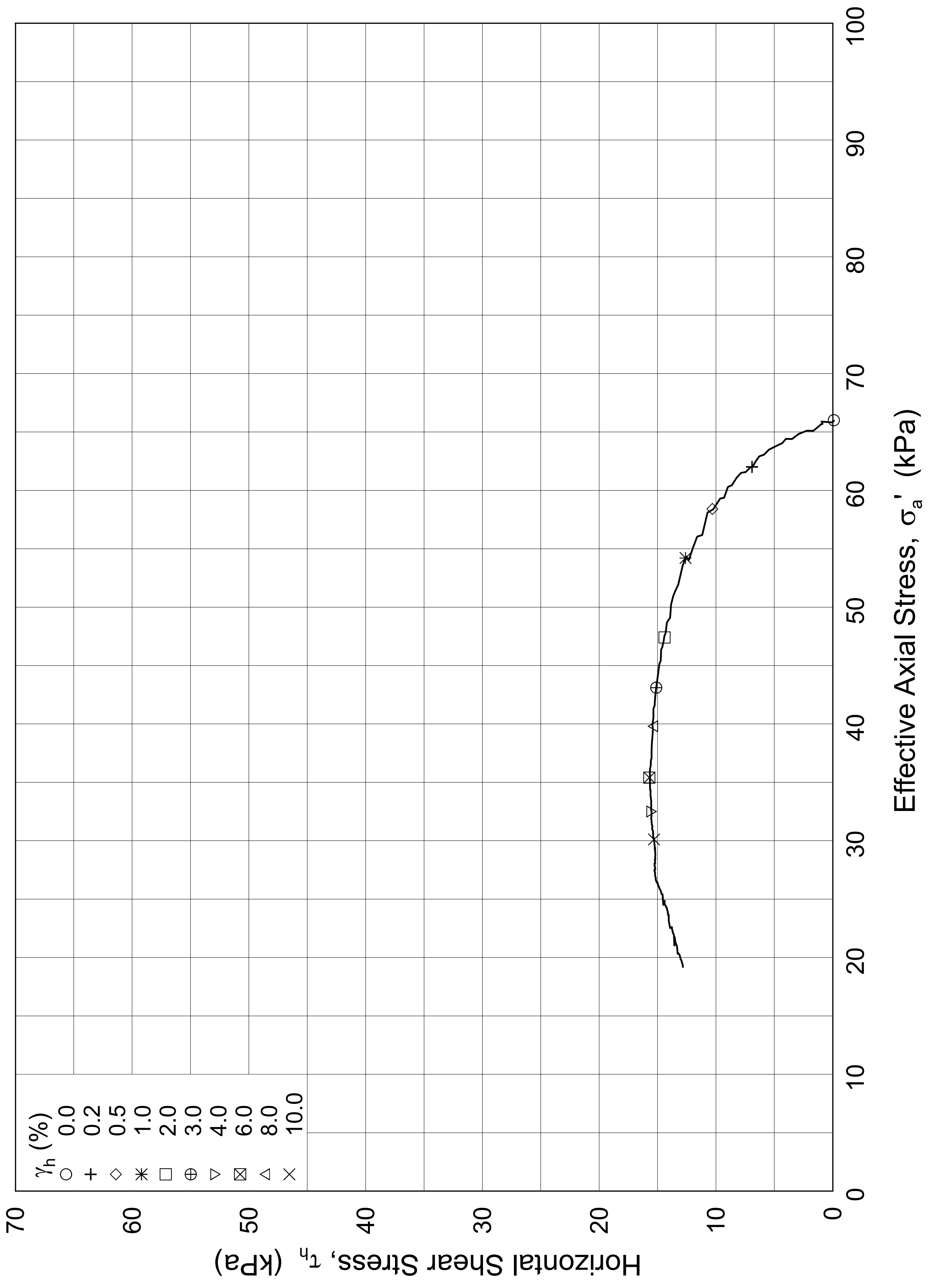
Figure No.
5.4.5

Date
2018-11-29

Drawn by/checked
JLa / MAS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.5, 2-5-c-1-1(ccv1793).grf

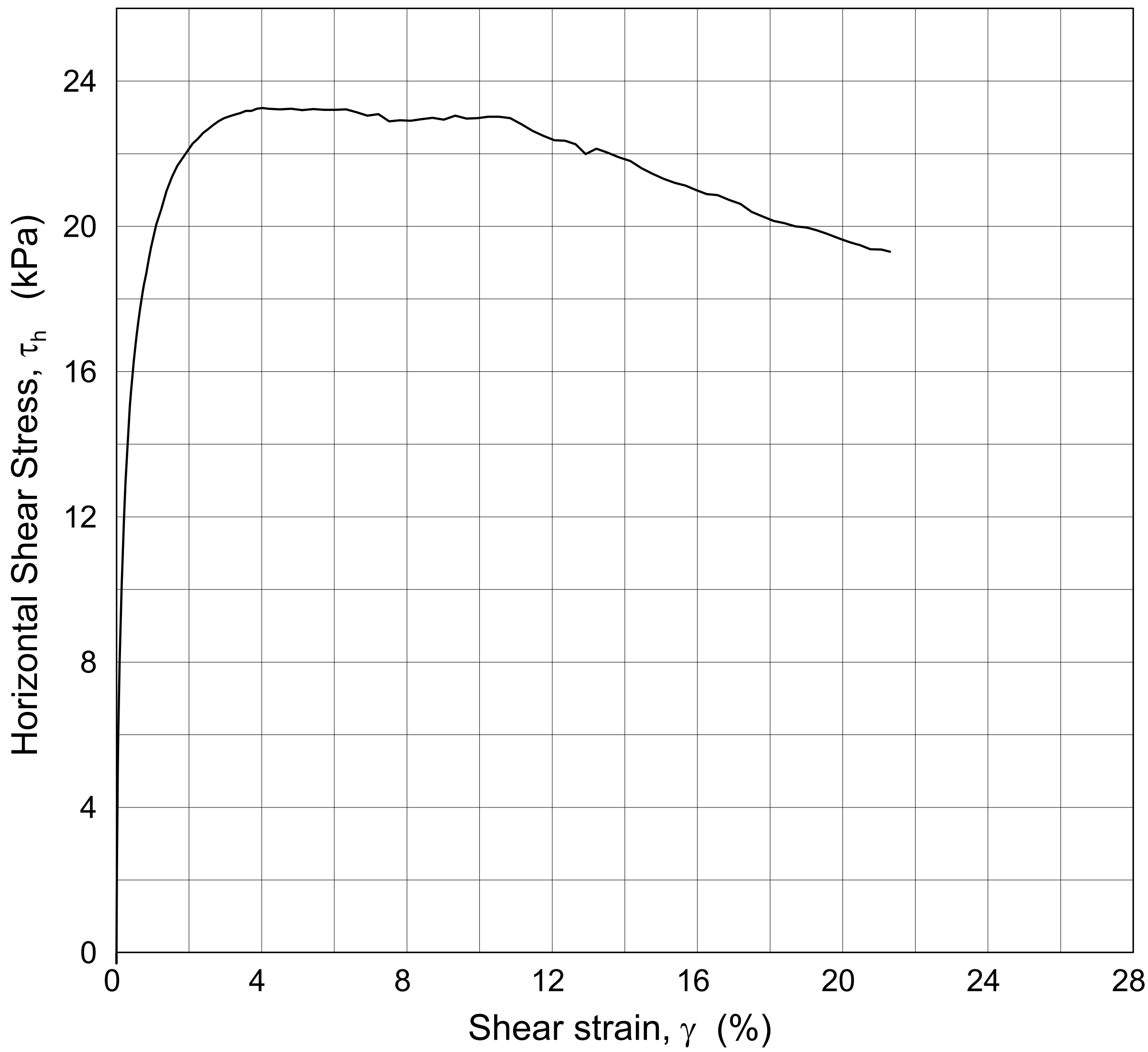


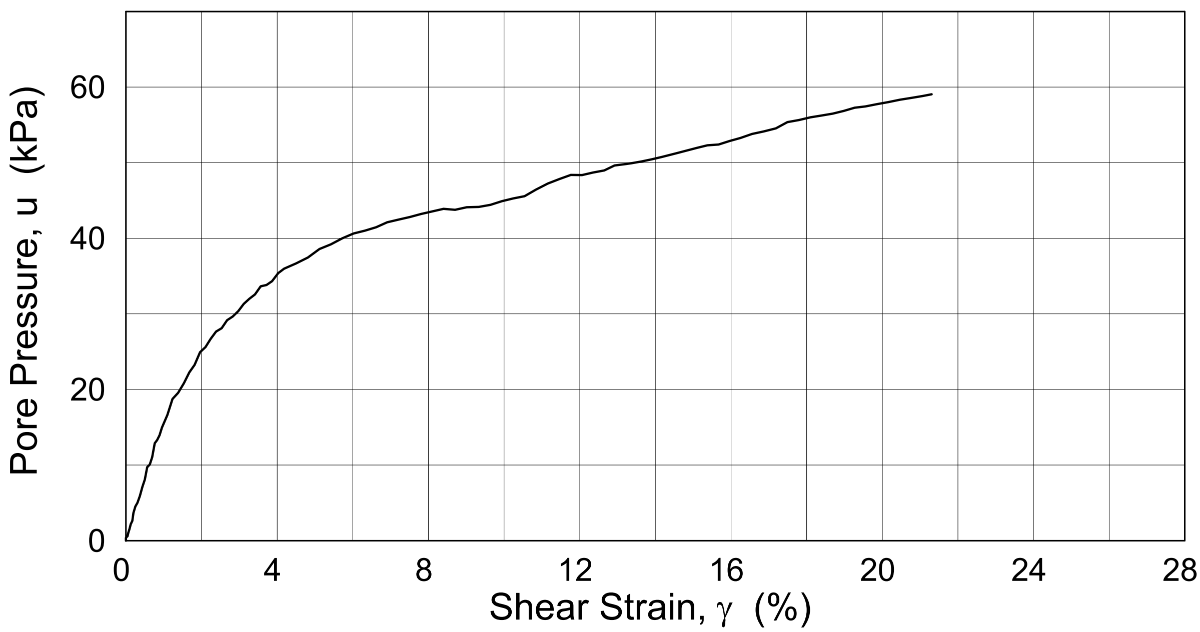
Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy				Document No. 20160154-10-R
Direct Simple Shear Test				Figure No. 5.4.6
Boring: **ONSB02**	Depth = **5.2** m	Consolidation stresses		Date 2018-11-29 / Drawn by/checked JLa / MAS
Tube: **5**	p_0' = **41.0** kPa	(kPa) max. min. final		
Part: **C**	w_i = **68.1** %	σ_{ac}' = 66.0 - **66.0**		
Test: **1**	γ_i = **15.32** kN/m³	τ_c' = - - **-**		

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.6, 2-5-c-1-2(ccv1793).grf

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.7, 2-9-c-1-1(ccv1797).grf





Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

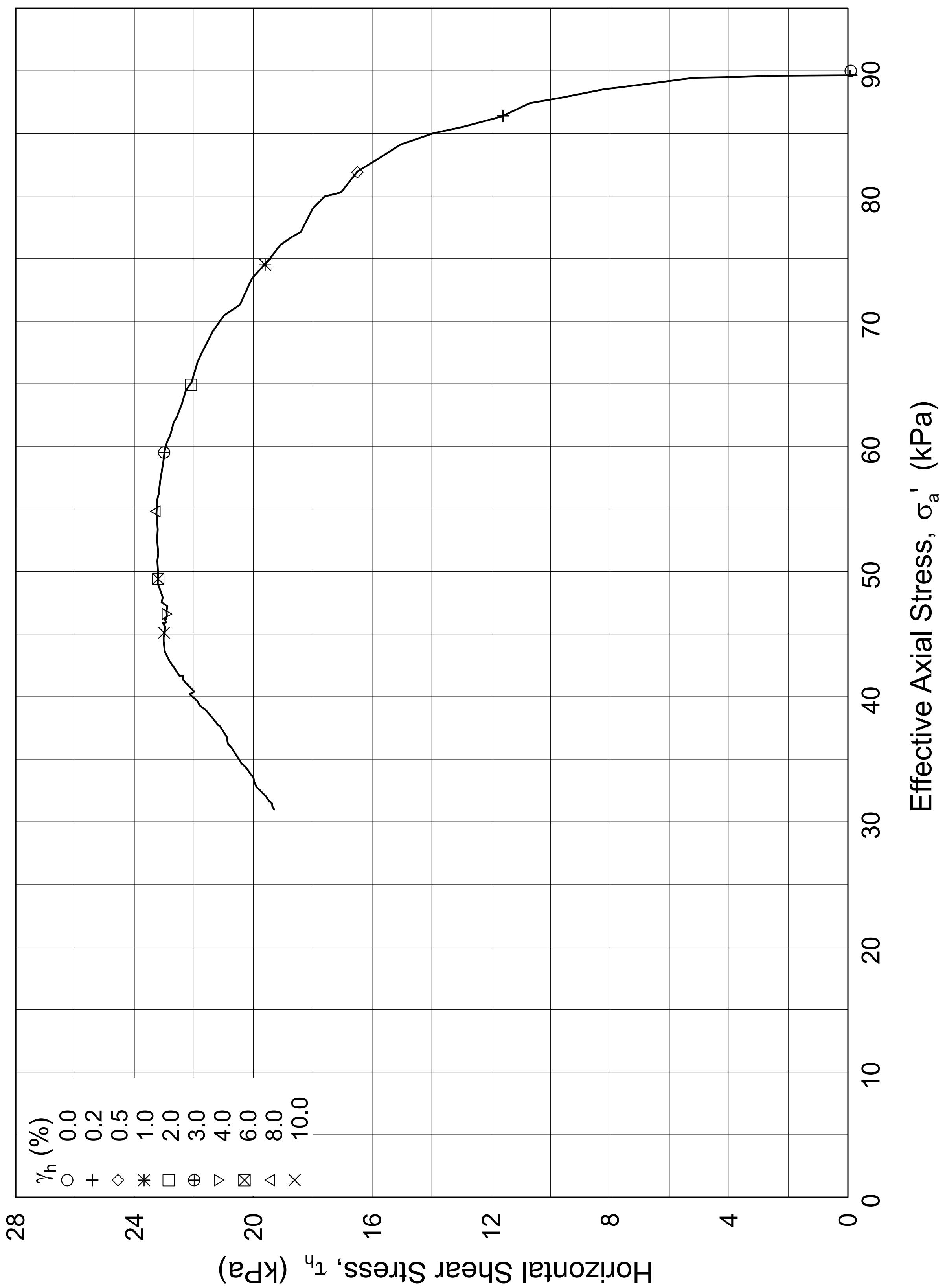
Direct Simple Shear Test

Boring: **ONSB02**	Depth	=	**9.18**	m	Consolidation stresses				
Tube: **9**	p_o'	=	**90.0**	kPa	(kPa)	max.	min.	final	
Part: **C**	w_i	=	**44.4**	%	σ_{ac}' =	90.0	-	**90.0**	
Test: **1**	γ_i	=	**17.02**	kN/m³	τ_c' =	-	-	**-**	

Document No.
20160154-10-R

Figure No.
5.4.7

Date	Drawn by/checked
2018-11-29	TAb / MAS



Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

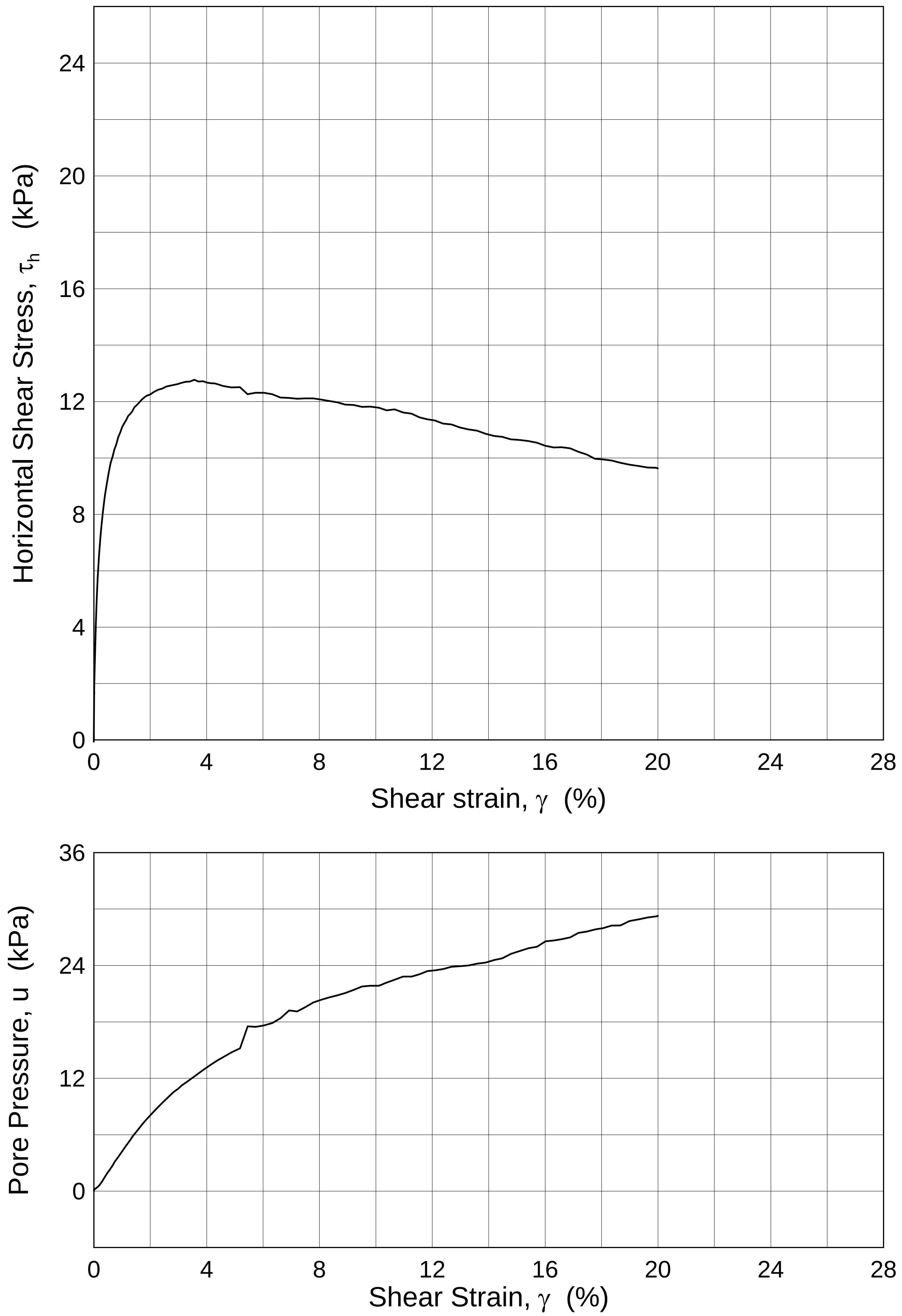
Direct Simple Shear Test

Boring: **ONSB02**	Depth =	**9.18**	m	Consolidation stresses			
Tube: **9**	p_o' =	**90.0**	kPa	(kPa)	max.	min.	final
Part: **C**	w_i =	**44.4**	%	σ_{ac}' =	90.0	-	**90.0**
Test: **1**	γ_i =	**17.02**	kN/m³	τ_c' =	-	-	**-**

Document No.	20160154-10-R
Figure No.	5.4.8
Date	2018-11-29
Drawn by/checked	TAb / MAS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.8, 2-9-c-1-2(ccv1797).grf



H:\LABDATA\2016\20160154\Dss\DSS\res\bl-1-1-a-2-1(ccv1862).grf

Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring:	**ONSB01**	Depth	=	**6.87**	m	Consolidation stresses				
Tube:	**1**	p_0'	=	**41.2**	kPa	(kPa)	max.	min.	final	
Part:	**A**	w_i	=	**65.8**	%	σ_{ac}' =	47.8	-	**41.1**	
Test:	**2**	γ_i	=	**15.92**	kN/m³	τ_c' =	-	-	**-**	

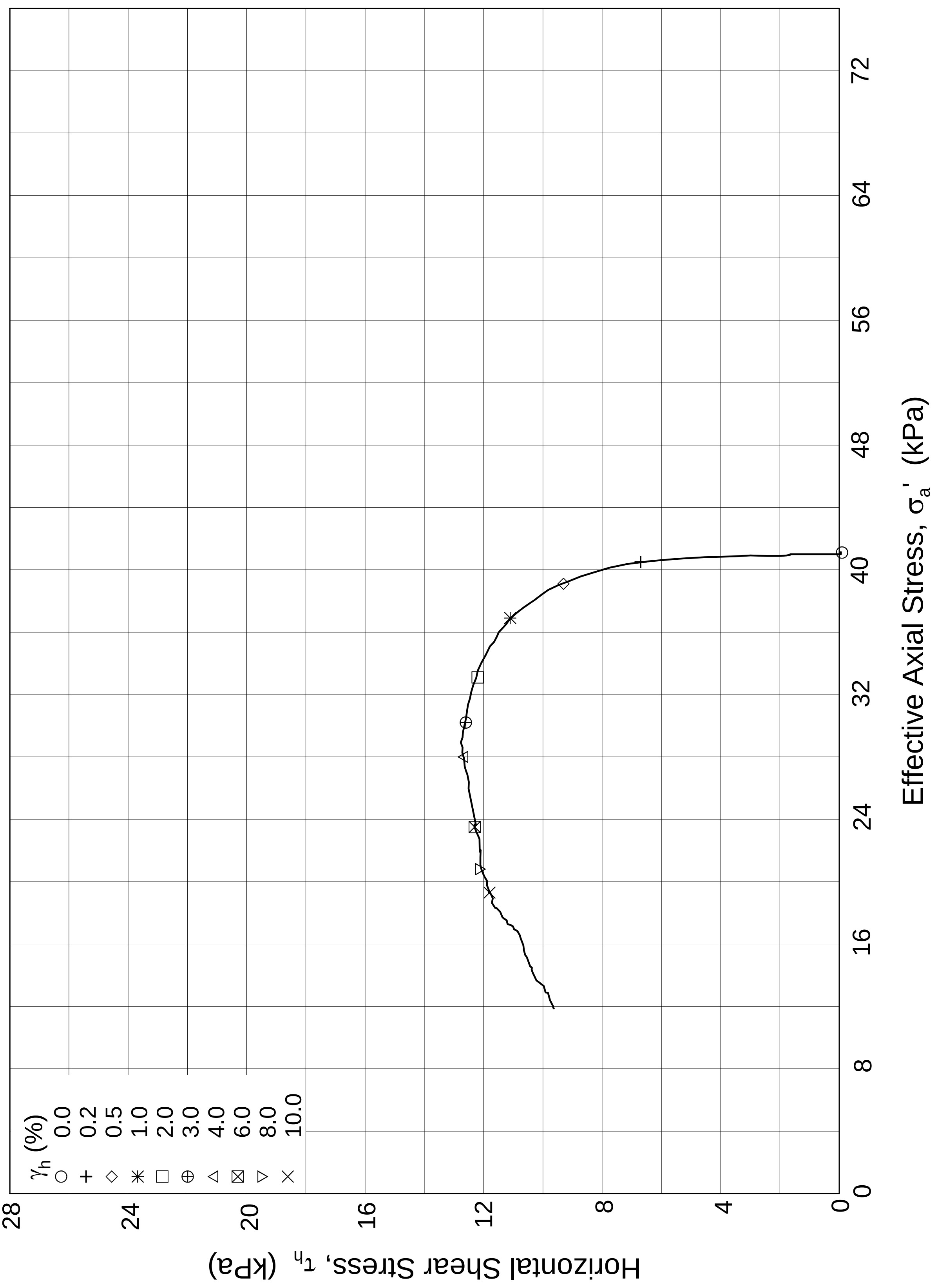
Document No. 20160154-10-R

Figure No. 5.4.9

Date 2016-08-16

Drawn by/checked TAb / MAS

NGI



H:\LABDATA\2016\20160154\Dss\res\bl-1-1-a-2-2(ccv1862).grf

Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Document No. 20160154-10-R

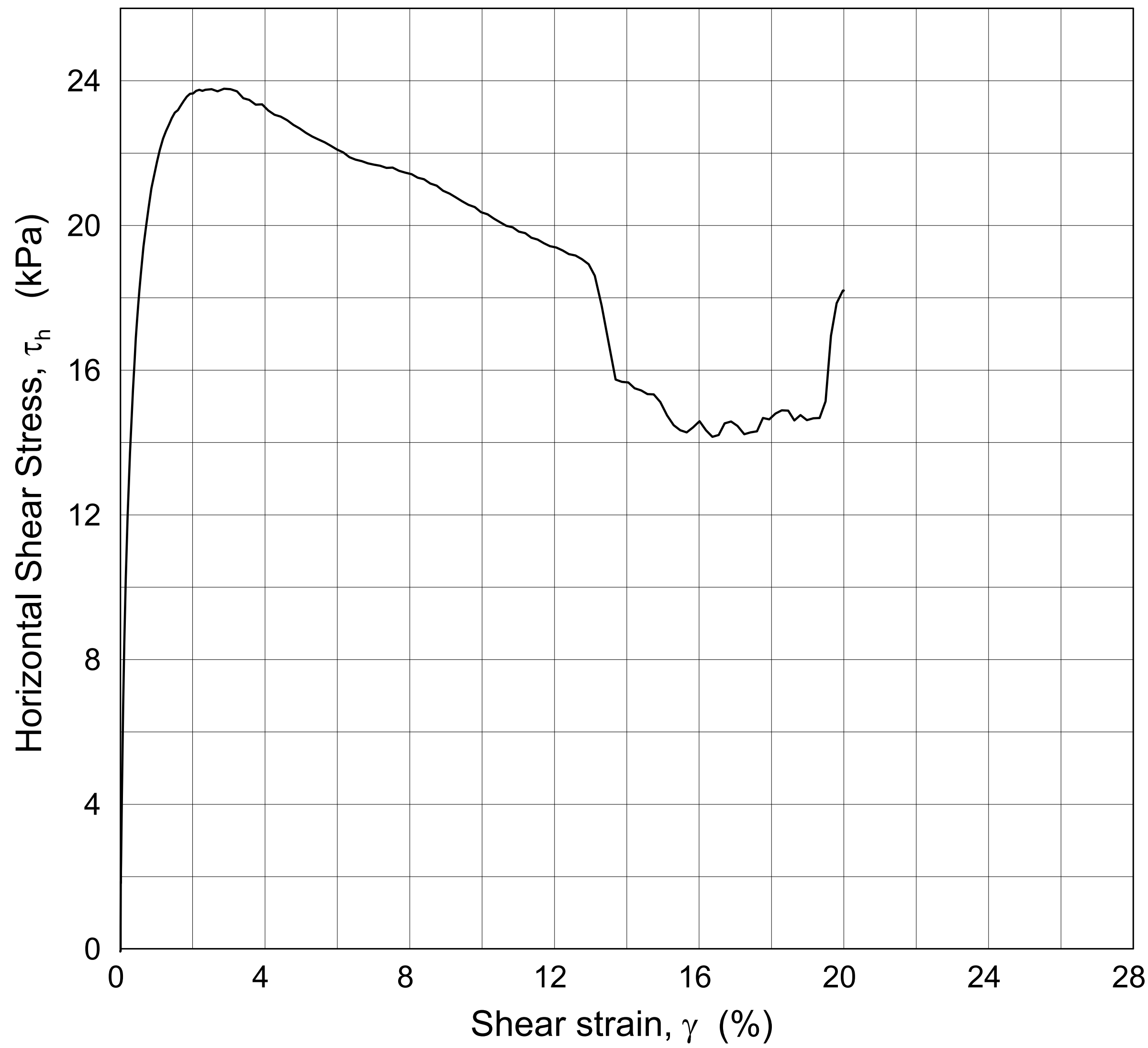
Figure No. 5.4.10

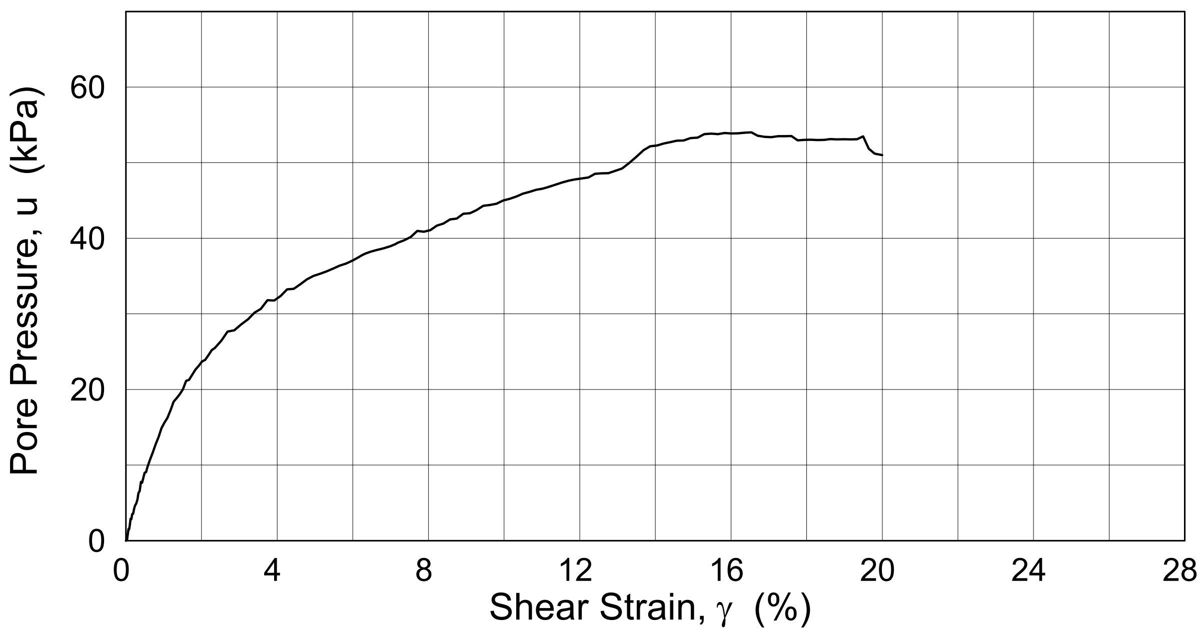
Date 2016-08-17

Drawn by/checked TAb / MAS

Boring:	**ONSB01**	Depth =	**6.87**	m	Consolidation stresses				
Tube:	**1**	p_o' =	**41.2**	kPa	(kPa)	max.	min.	final	
Part:	**A**	w_i =	**65.8**	%	σ_{ac}' =	47.8	-	**41.1**	
Test:	**2**	γ_i =	**15.92**	kN/m³	τ_c' =	-	-	**-**	

NGI

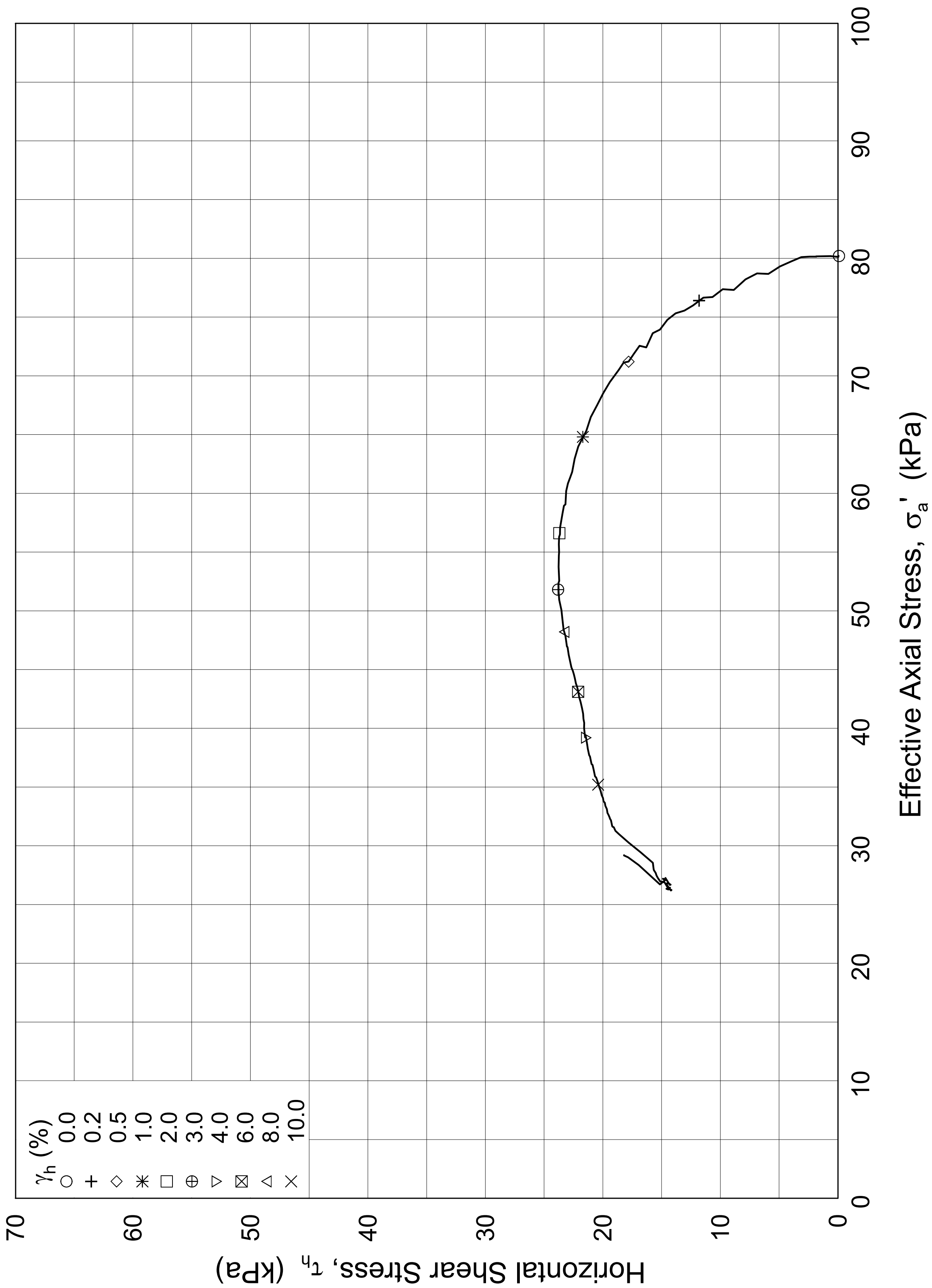




Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R	
Direct Simple Shear Test							Figure No. 5.4.11	
Boring: **ONSB01**	Depth = **12.22** m	Consolidation stresses					Date 2018-11-29	Drawn by/checked JLa / MAS
Tube: **3**	p_o' = **80.2** kPa	(kPa)	max.	min.	final			
Part: **B**	w_i = **46.0** %	σ_{ac}' =	80.2	-	**80.2**		NGI	
Test: **1**	γ_i = **17.32** kN/m³	τ_c' =	-	-	**-**			

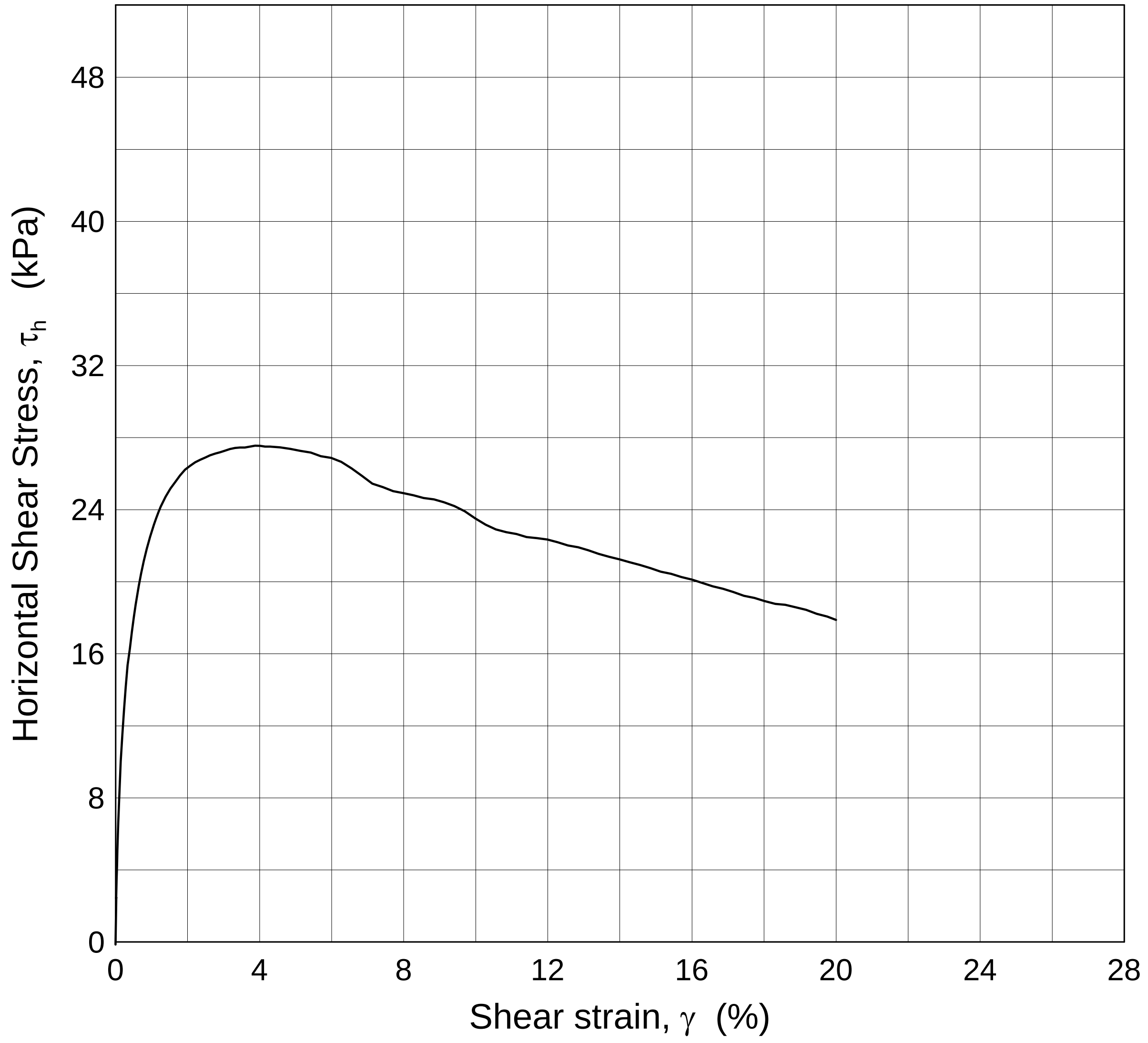
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.11, onsøy-block2016-2-dsss1-1(ccv1834).grf

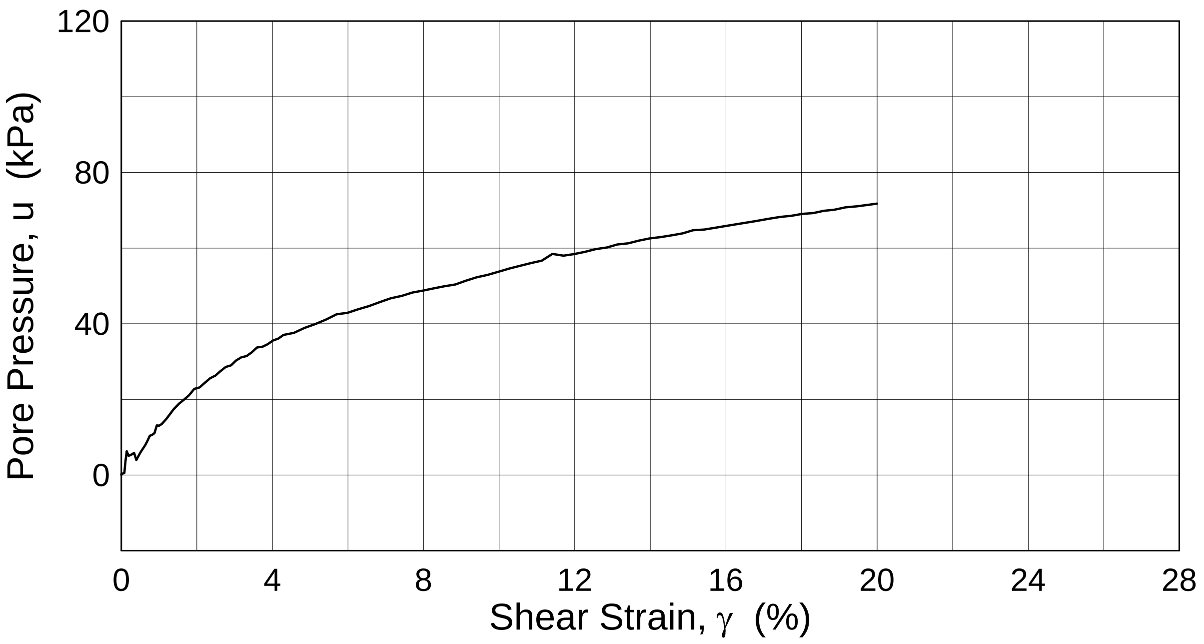


Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.12
Boring: **ONSB01**	Depth = **12.22** m	Consolidation stresses	Date 2018-11-29
Tube: **3**	p_o' = **80.2** kPa	(kPa) max. min. final	Drawn by/checked JLa / MAS
Part: **B**	w_i = **46.0** %	σ_{ac}' = 80.2 - **80.2**	NGI
Test: **1**	γ_i = **17.32** kN/m³	τ_c' = - - **-**	

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.12, onsøy-block2016-2-dsss1-2(ccv1834).grf





Date/Rev.: 2015-01-12/4

H:\LABDATA\2016\20160154\Dss\res\bl-1-4-a-2-1(ccv1867).grf

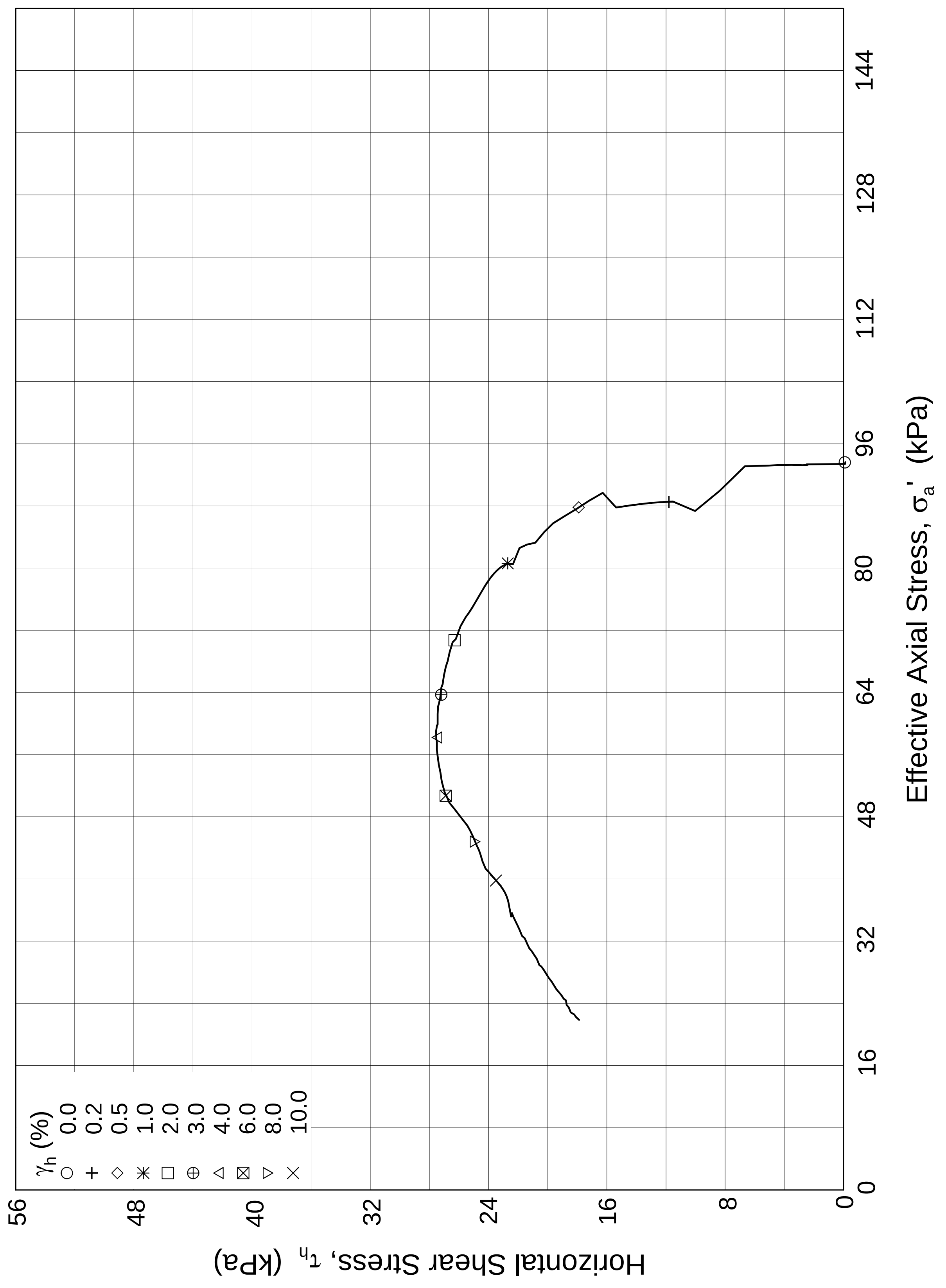
Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring:	**ONSB01**	Depth	=	**14.14**	m	Consolidation stresses				
Tube:	**4**	p_o'	=	**93.8**	kPa	(kPa)	max.	min.	final	
Part:	**A**	w_i	=	**71.4**	%	σ_{ac}' =	99.5	-	**93.6**	
Test:	**2**	γ_i	=	**15.78**	kN/m³	τ_c' =	-	-	**-**	

Document No.	20160154-10-R
Figure No.	5.4.13
Date	2016-08-23
Drawn by/checked	TAb / MAS

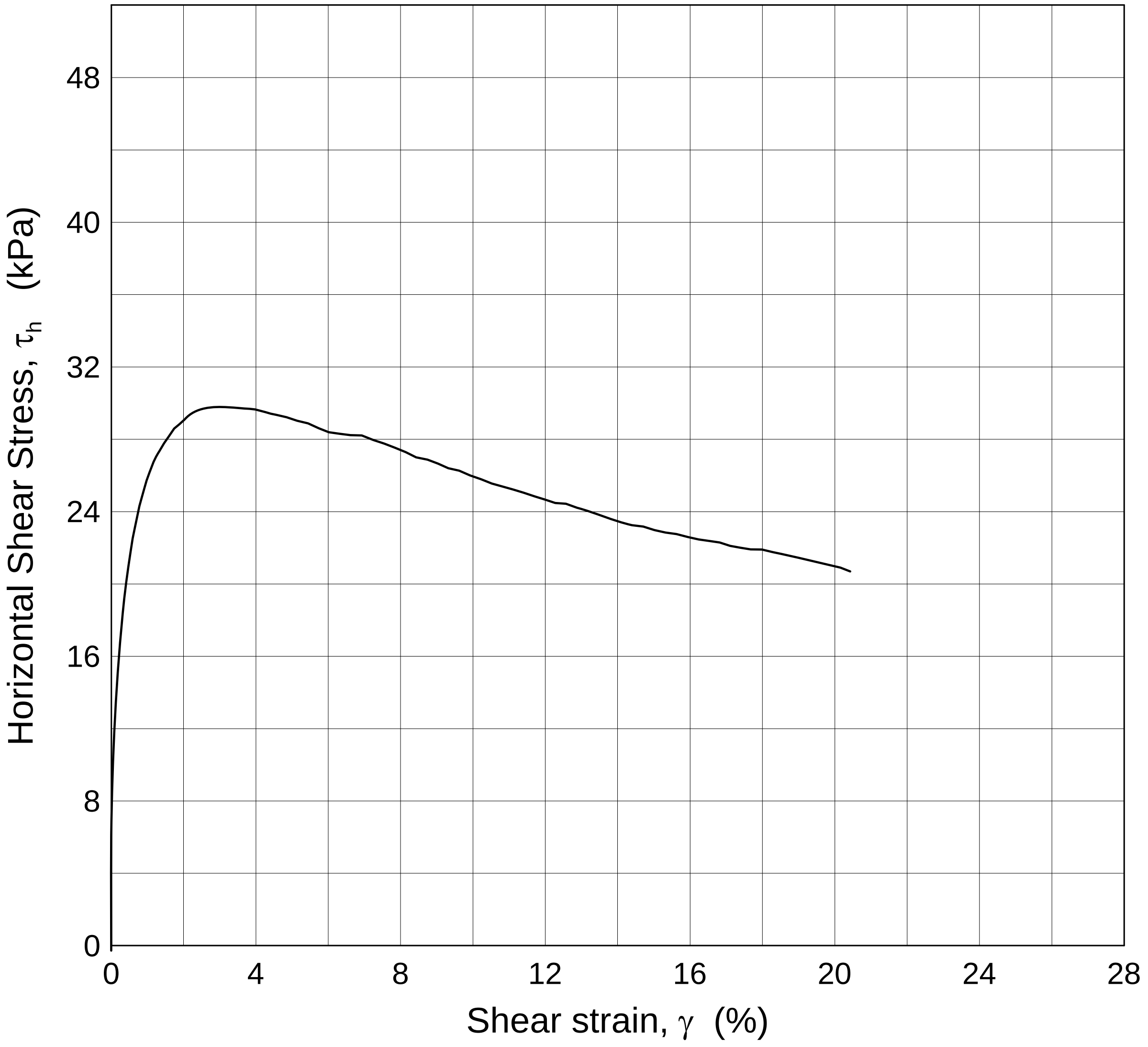
NGI

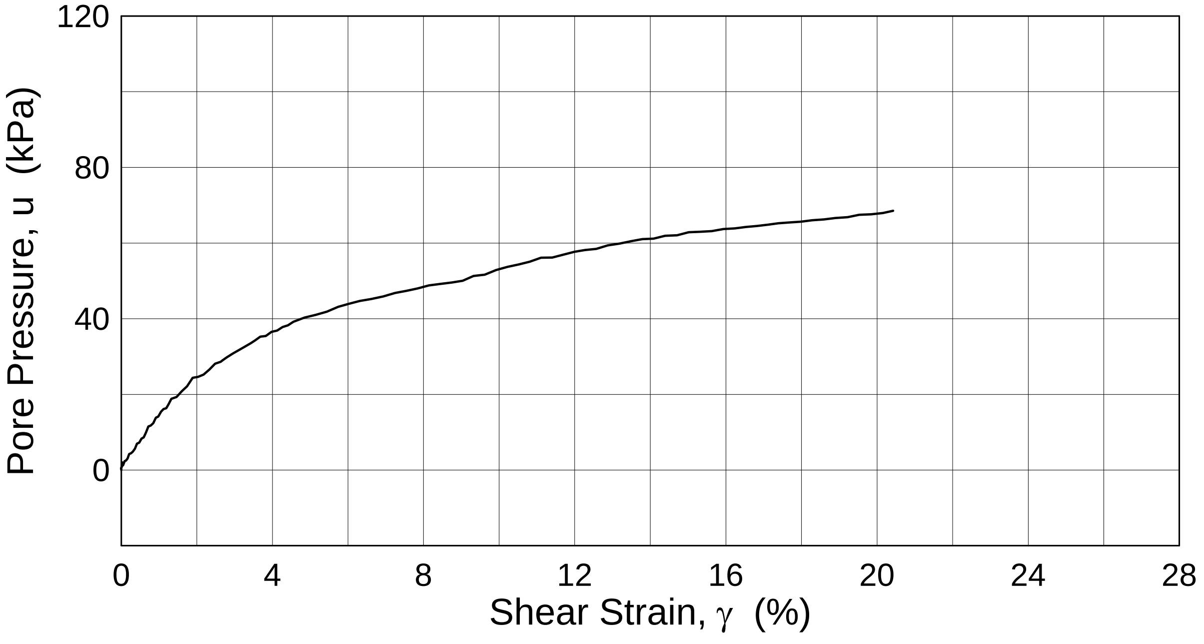


H:\LABDATA\2016\20160154\Dss\res\bl-1-4-a-2-2(ccv1867).grf

Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
Direct Simple Shear Test							Figure No. 5.4.14
Boring: **ONSB01**	Depth = **14.14** m	Consolidation stresses					Date 2016-08-23 / Drawn by/checked TAb / MAS
Tube: **4**	p_0' = **93.8** kPa	(kPa)	max.	min.	final		
Part: **A**	w_i = **71.4** %	σ_{ac}' =	99.5	-	**93.6**		
Test: **2**	γ_i = **15.78** kN/m³	τ_c' =	-	-	**-**		

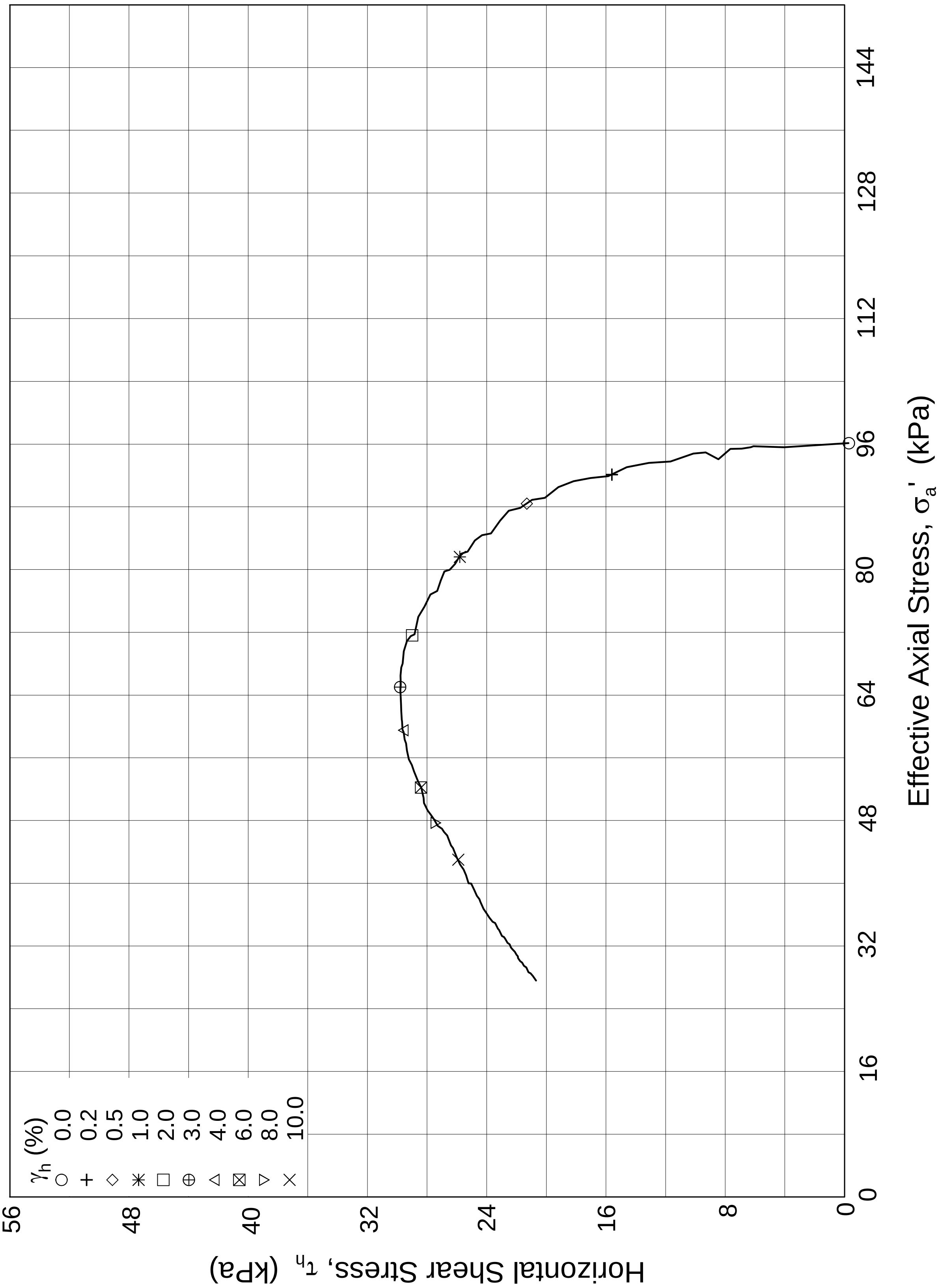




H:\LABDATA\2016\20160154\Dss\res\bl-1-5-a-2-1(ccv1866).grf

Date/Rev.: 2015-01-12/4

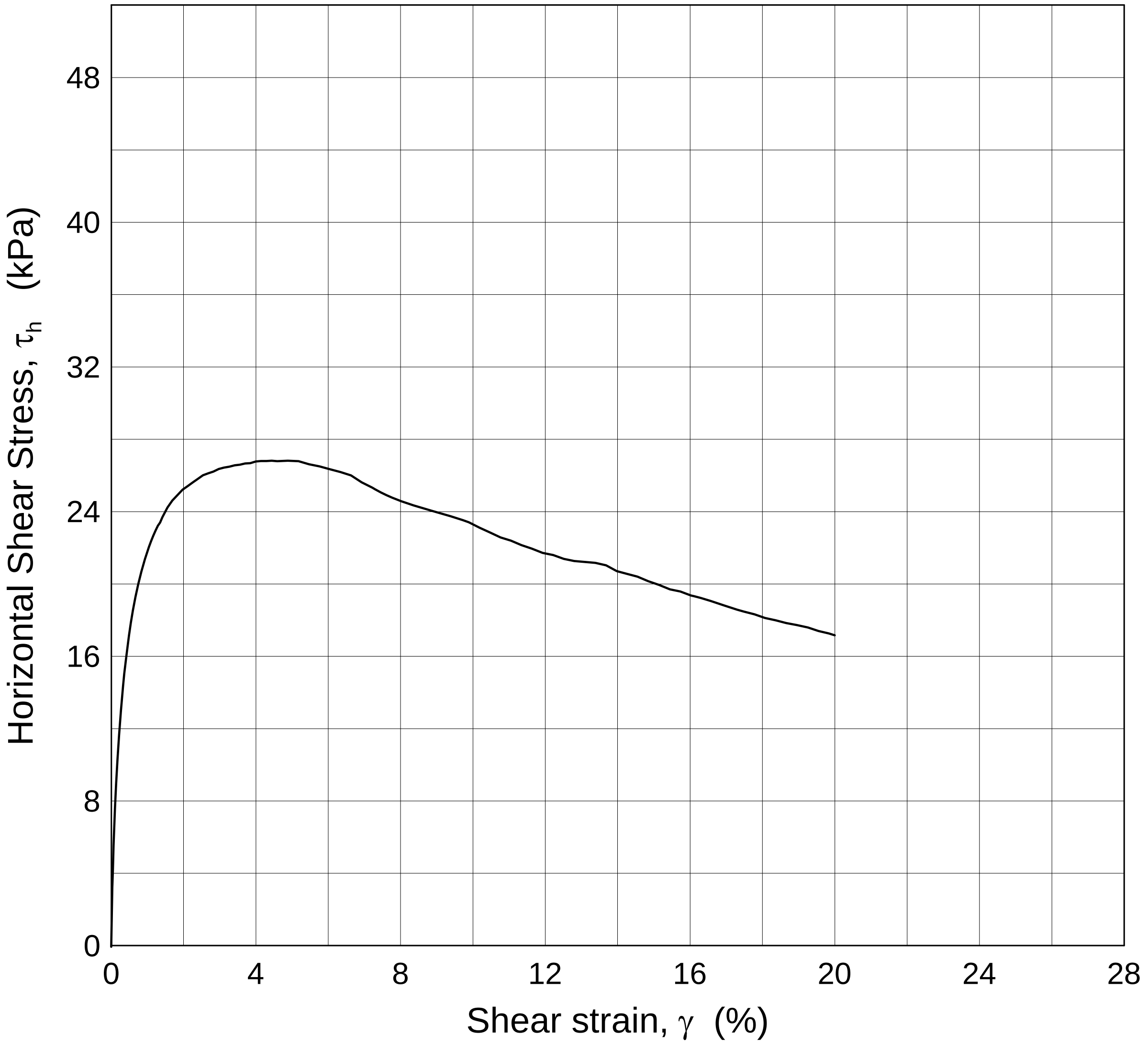
Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.15
Boring: **ONSB01**	Depth = **14.43** m	Consolidation stresses	Date 2016-08-23 / Drawn by/checked TAb / MAS
Tube: **5**	p_o' = **95.8** kPa	(kPa) max. min. final	NGI
Part: **A**	w_i = **68.1** %	σ_{ac}' = 100.6 - **96.1**	
Test: **2**	γ_i = **15.47** kN/m³	τ_c' = - - **-**	

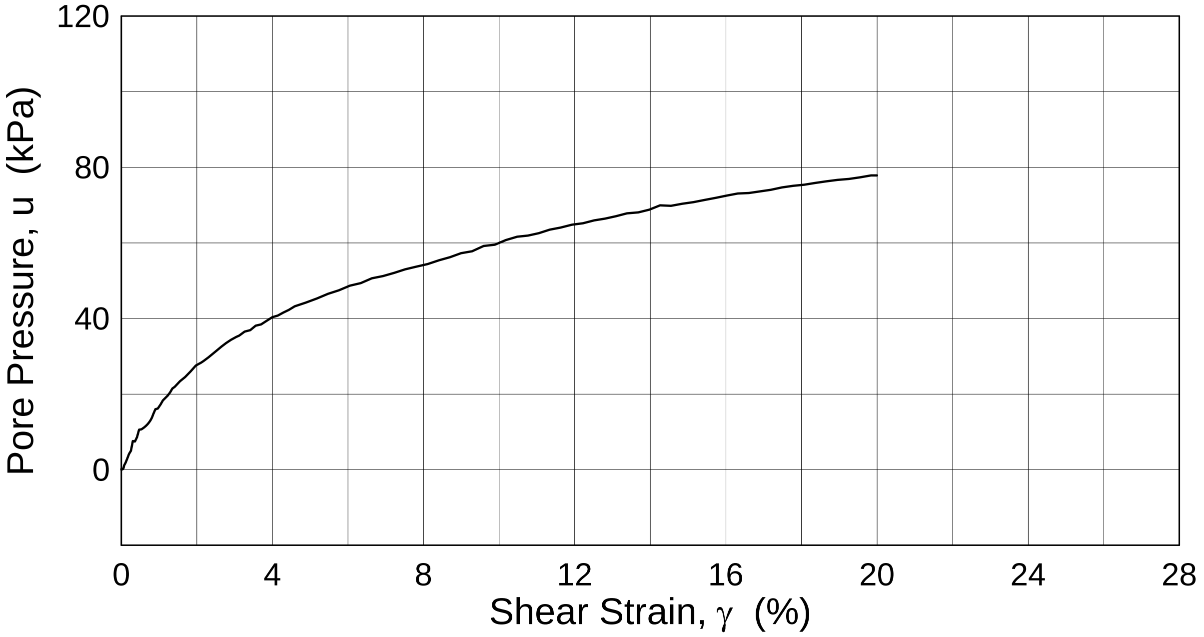


Date/Rev.: 2015-01-12/4

H:\LABDATA\2016\20160154\Dss\res\bl-1-5-a-2-2(ccv1866).grf

Norwegian GeoTest Sites - Onsøy										Document No. 20160154-10-R
Direct Simple Shear Test										Figure No. 5.4.16
Boring: **ONSB01**	Depth	=	**14.43**	m	Consolidation stresses					Date 2016-08-23 / Drawn by/checked TAb / MAS
Tube: **5**	p_o'	=	**95.8**	kPa	(kPa)	max.	min.	final		
Part: **A**	w_i	=	**68.1**	%	σ_{ac}' =	100.6	-	**96.1**		NGI
Test: **2**	γ_i	=	**27.7**	kN/m³	τ_c' =	-	-	**-**		





Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring: **ONSB01**	Depth	=	**14.82**	m	Consolidation stresses				
Tube: **6**	p_0'	=	**98.1**	kPa	(kPa)	max.	min.	final	
Part: **A**	w_i	=	**67.6**	%	σ_{ac}' =	103.0	-	**98.1**	
Test: **2**	γ_i	=	**15.44**	kN/m³	τ_c' =	-	-	**-**	

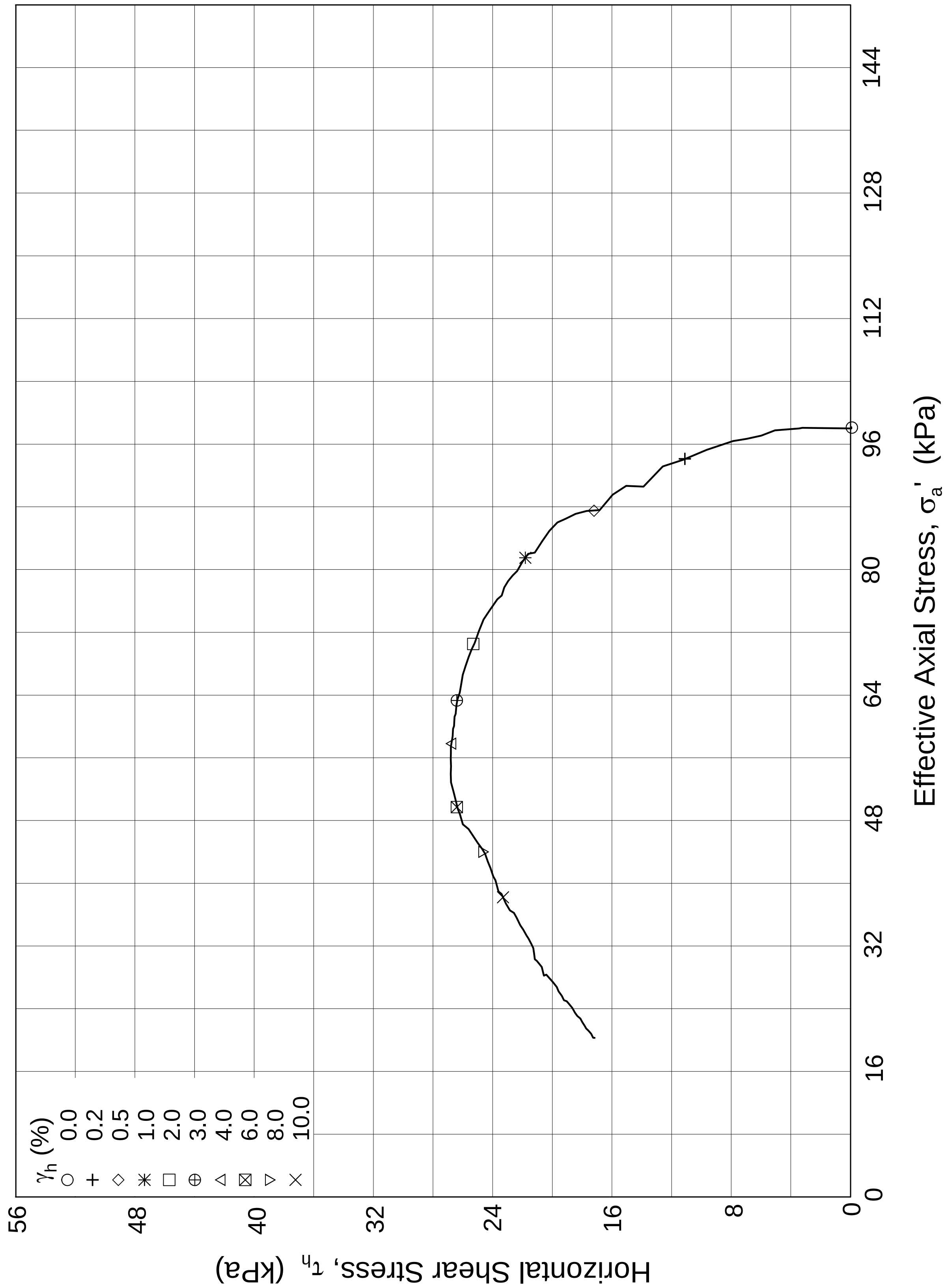
Document No. 20160154-10-R

Figure No. 5.4.17

Date 2016-08-17

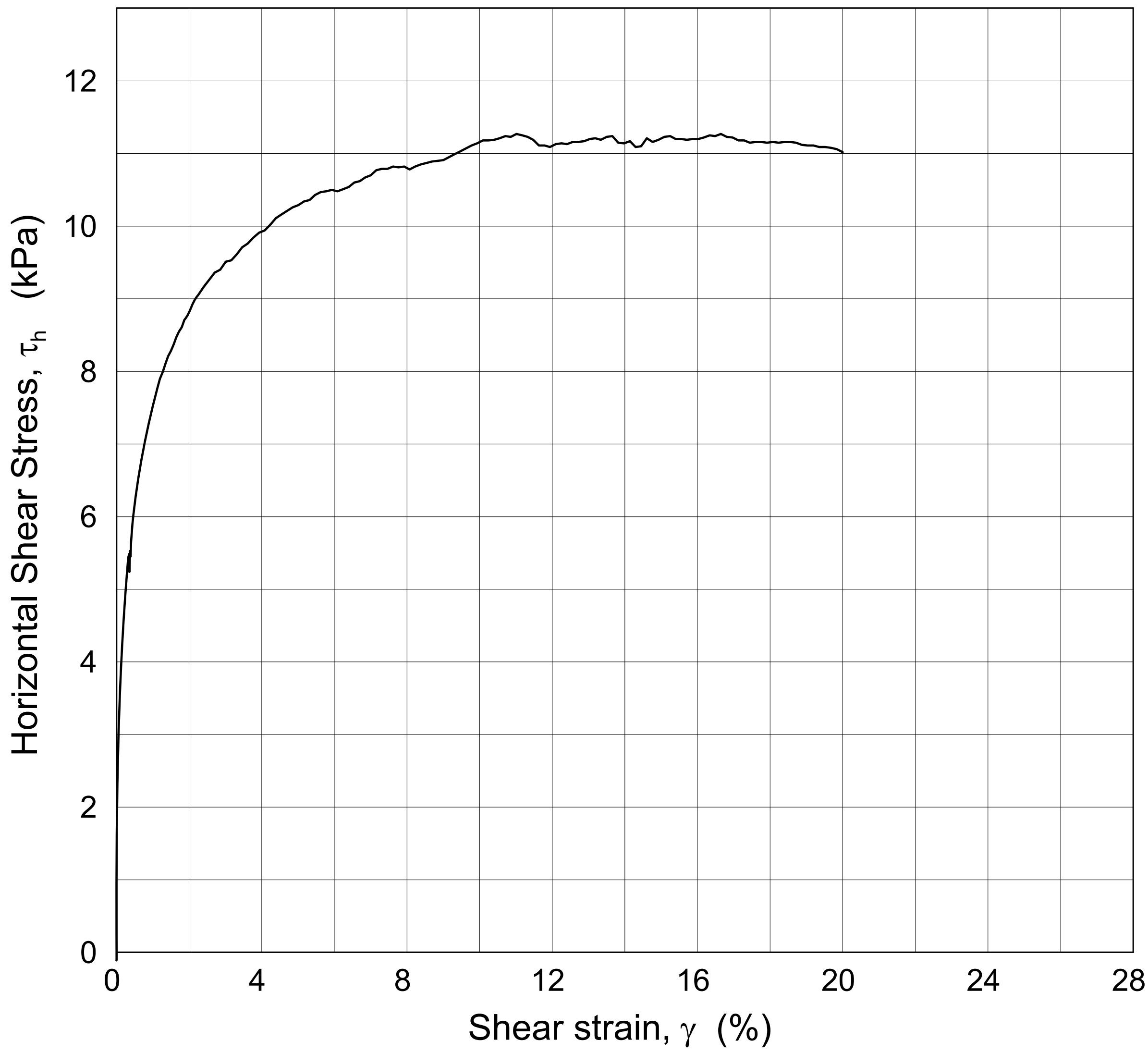
Drawn by/checked TAb / MAS

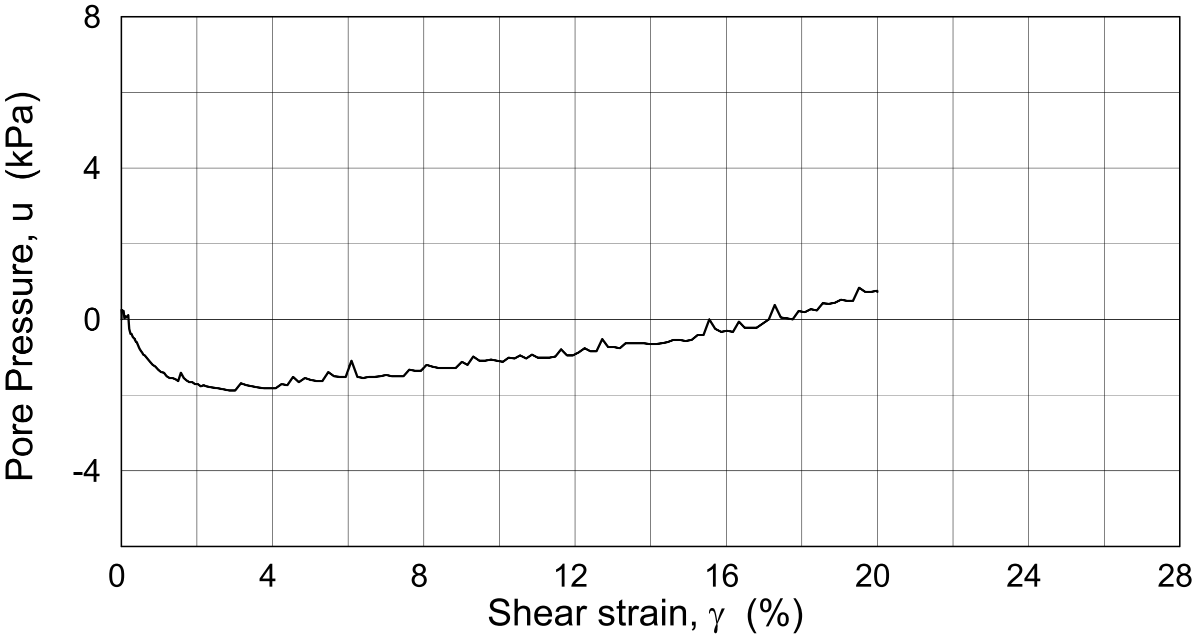
H:\LABDATA\2016\20160154\Dss\res\bl-1-6-a-2-1(ccv1863).grf



Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy					Document No. 20160154-10-R
Direct Simple Shear Test					Figure No. 5.4.18
Boring: **ONSB01**	Depth = **14.82** m	Consolidation stresses			Date 2016-08-17 / Drawn by/checked TAb / MAS
Tube: **6**	p_o' = **98.1** kPa	(kPa)	max.	min. / final	
Part: **A**	w_i = **67.6** %	σ_{ac}' =	103.0	- / **98.1**	NGI
Test: **2**	γ_i = **15.44** kN/m³	τ_c' =	-	- / **-**	





Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring: ONSB41	Depth = 3.12 m	Consolidation stresses	
Tube: 4	p_0' = 13.8 kPa	(kPa) max. min. final	
Part: A	w_i = 65.3 %	σ_{ac}' = 28.7 - **13.8**	
Test: 1	γ_i = 15.80 kN/m³	τ_c' = - - **-**	

Document No. 20160154-10-R

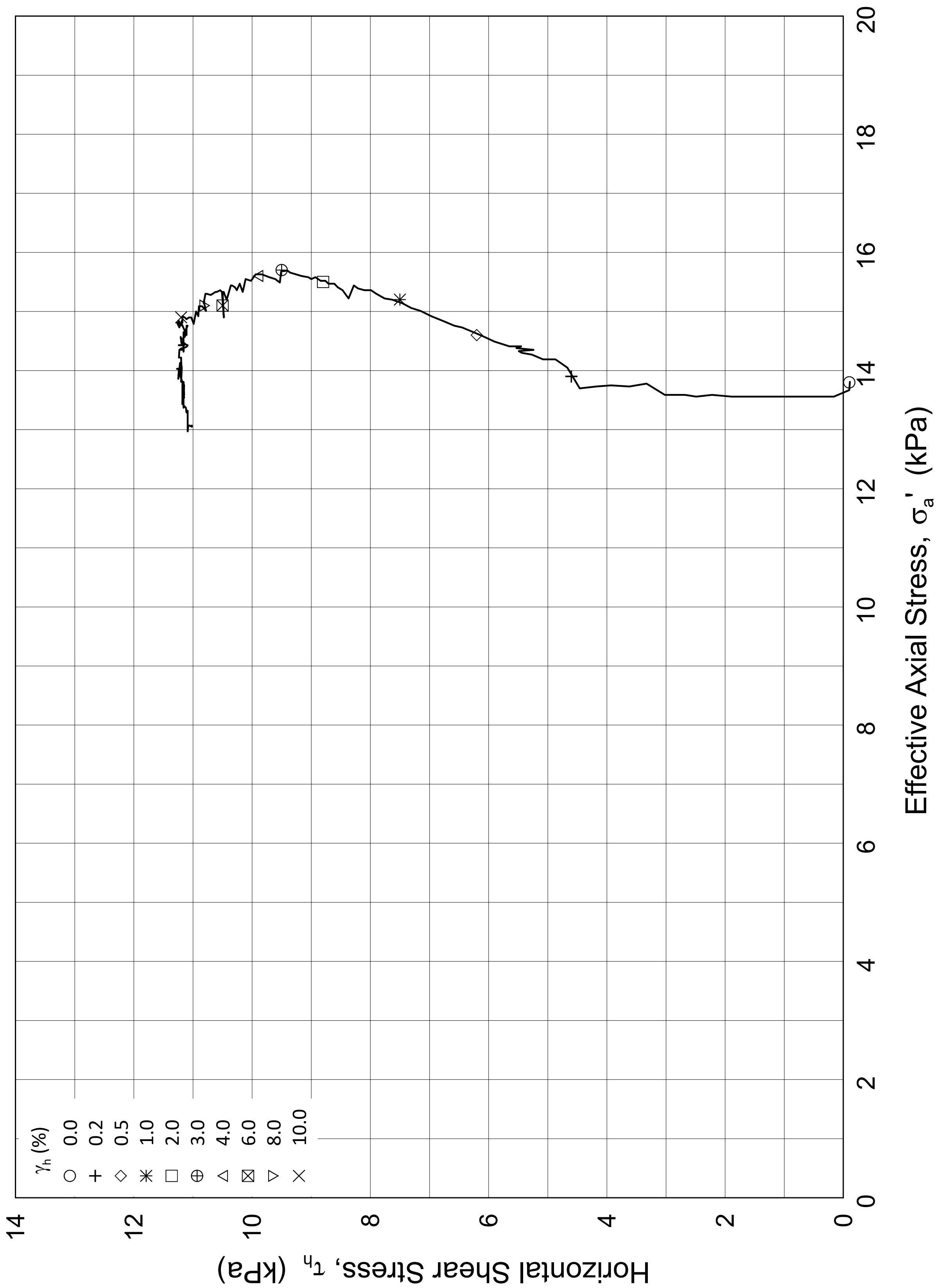
Figure No. 5.4.19

Date 2018-11-29

Drawn by / Checked JLA / MAS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.19, onsb41-4-a-1-1(ccv2065).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.20, onsb41-4-a-1-2(ccv2065).grf

Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring:	ONSB41	Depth =	3.12	m	Consolidation stresses					
Tube:	4	p_0' =	13.8	kPa	(kPa)	max.	min.	final		
Part:	A	w_i =	65.3	%	σ_{ac}' =	28.7	-	**13.8**		
Test:	1	γ_i =	15.80	kN/m³	τ_c' =	-	-	-		

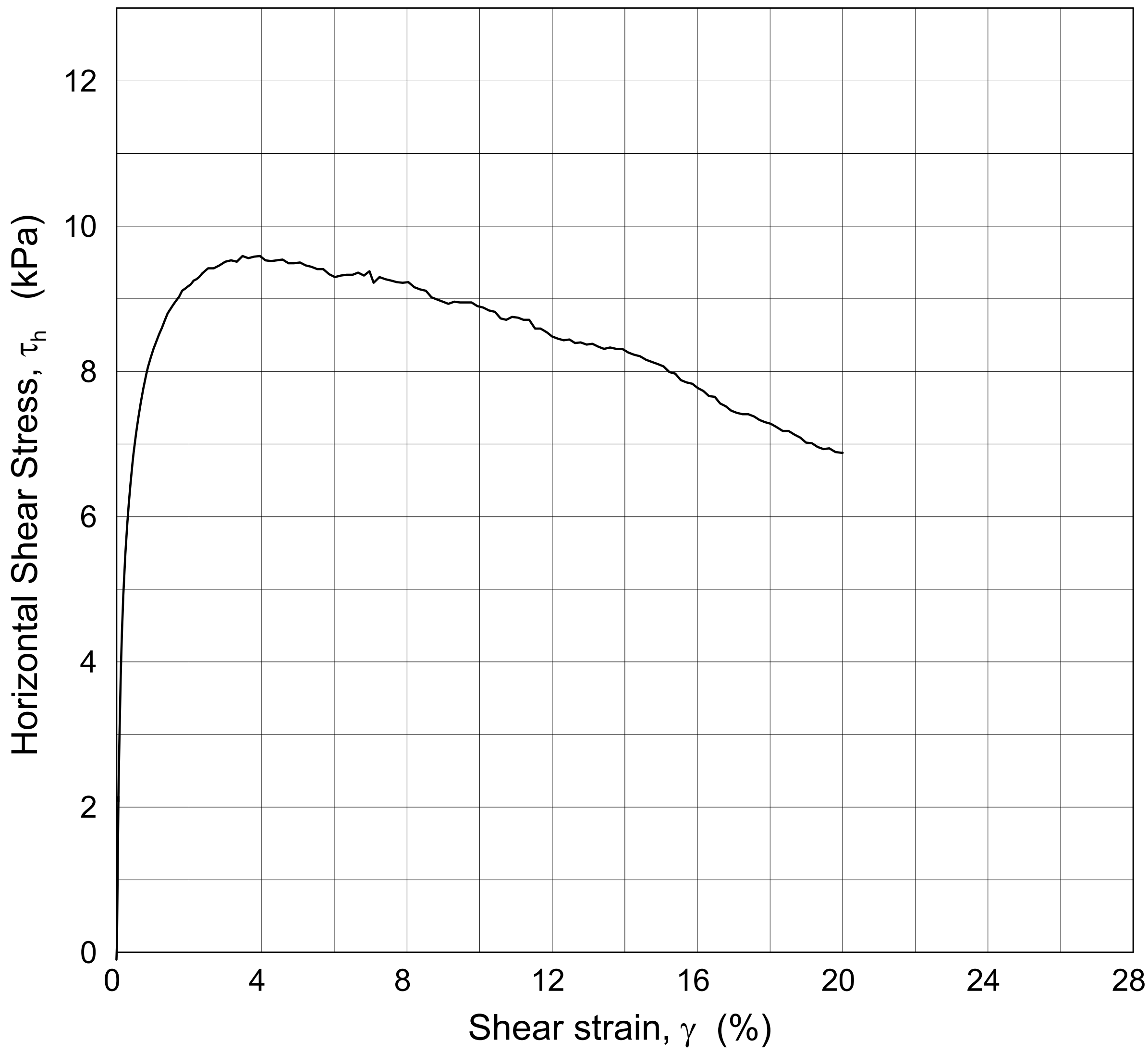
Document No. 20160154-10-R

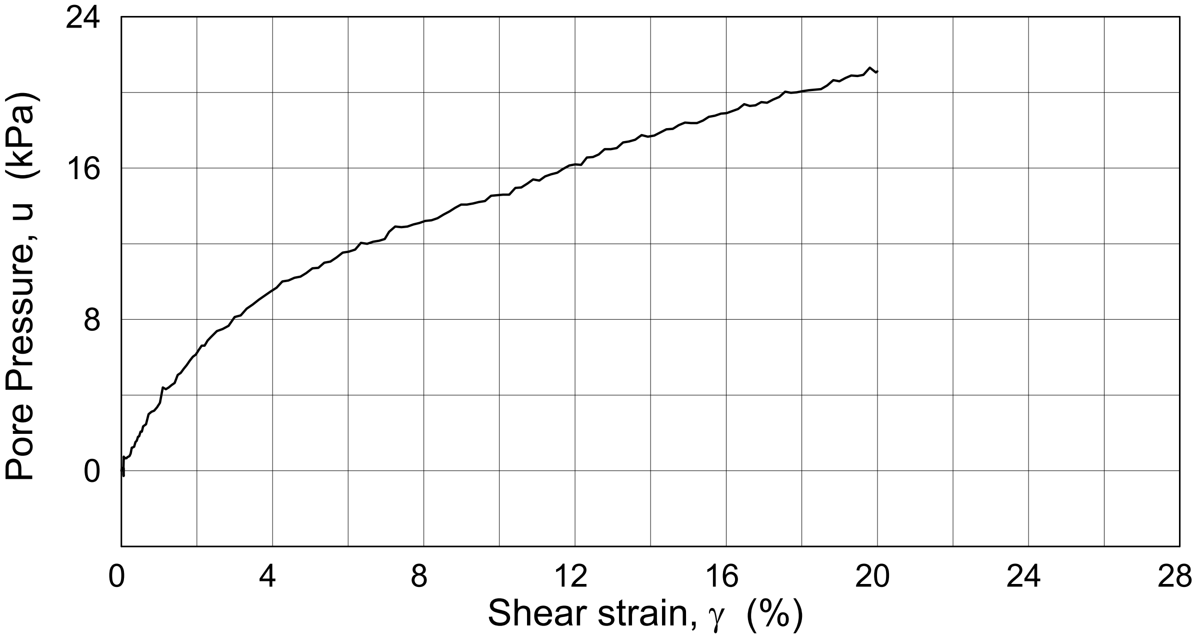
Figure No. 5.4.20

Date 2018-11-29

Drawn by / Checked JLA / MAS

NGI





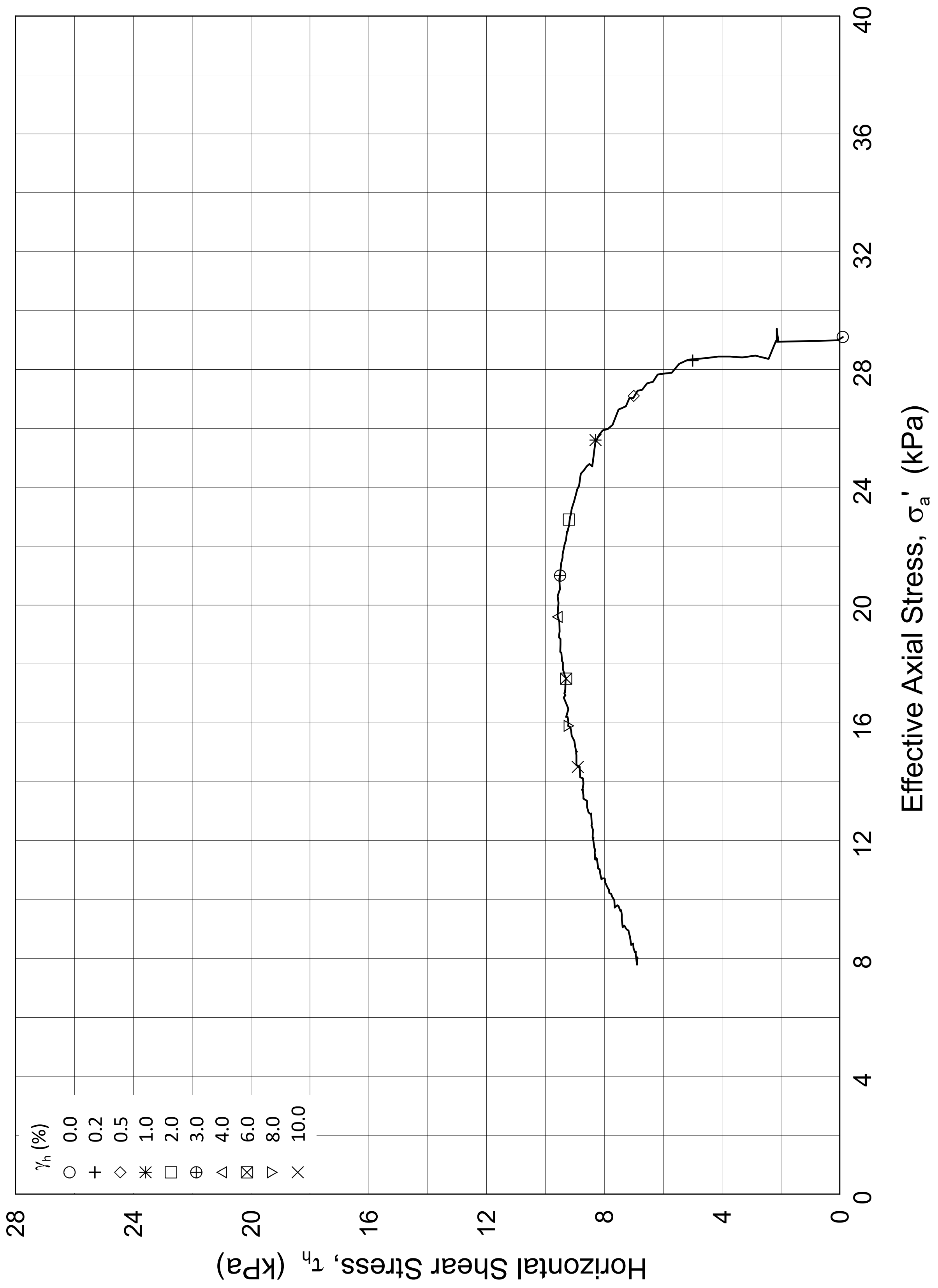
Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

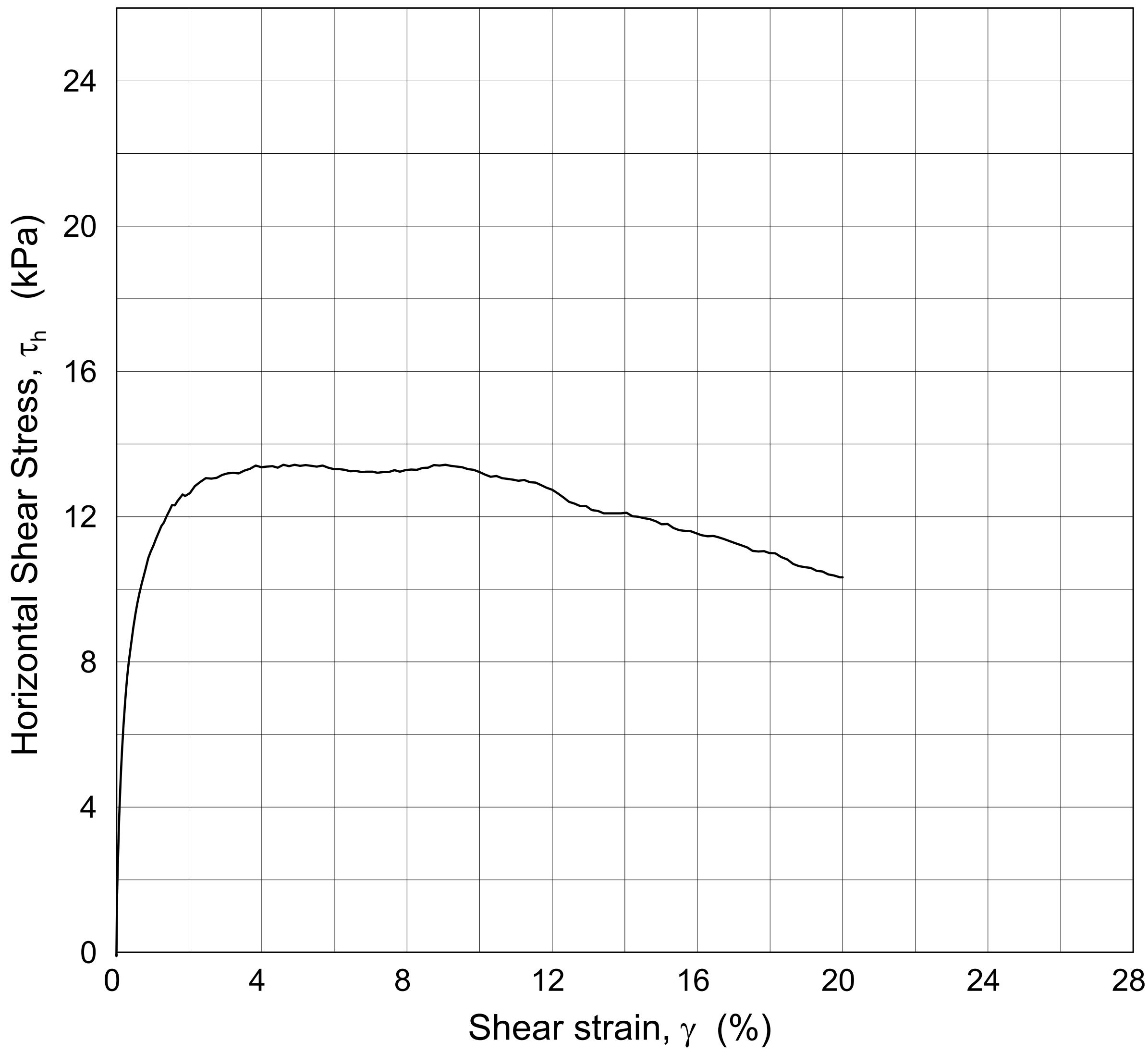
Direct Simple Shear Test

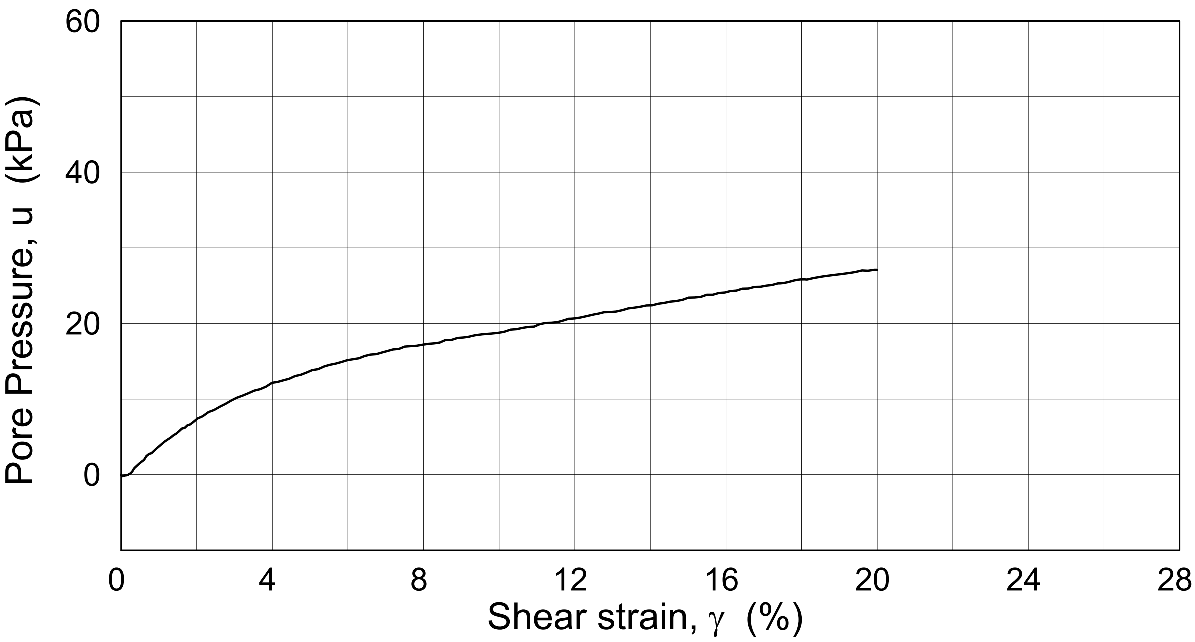
Boring: ONSB41	Depth = 5.22 m	Consolidation stresses	Document No. 20160154-10-R
Tube: 6	p_0' = 29.1 kPa	(kPa) max. min. final	Figure No. 5.4.21
Part: C	w_i = 78.4 %	σ_{ac}' = 37.2 - **29.1**	Date 2018-11-29
Test: 1	γ_i = 15.30 kN/m³	τ_c' = - - **-**	Drawn by / Checked JLA / MAS

NGI



Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.22
Boring: ONSB41	Depth = 5.22 m	Consolidation stresses	Date 2018-11-29
Tube: 6	p_0' = 29.1 kPa	(kPa) max. min. final	Drawn by / Checked JLA / MAS
Part: C	w_i = 78.4 %	σ_{ac}' = 37.2 - **29.1**	NGI
Test: 1	γ_i = 15.30 kN/m³	τ_c' = - - **-**	





Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring: ONSB41	Depth = 6.62 m	Consolidation stresses	
Tube: 8	p_0' = 39.4 kPa	(kPa) max. min. final	
Part: A	w_i = 70.1 %	σ_{ac}' = 47.3 - **39.4**	
Test: 1	γ_i = 15.49 kN/m³	τ_c' = - - **-**	

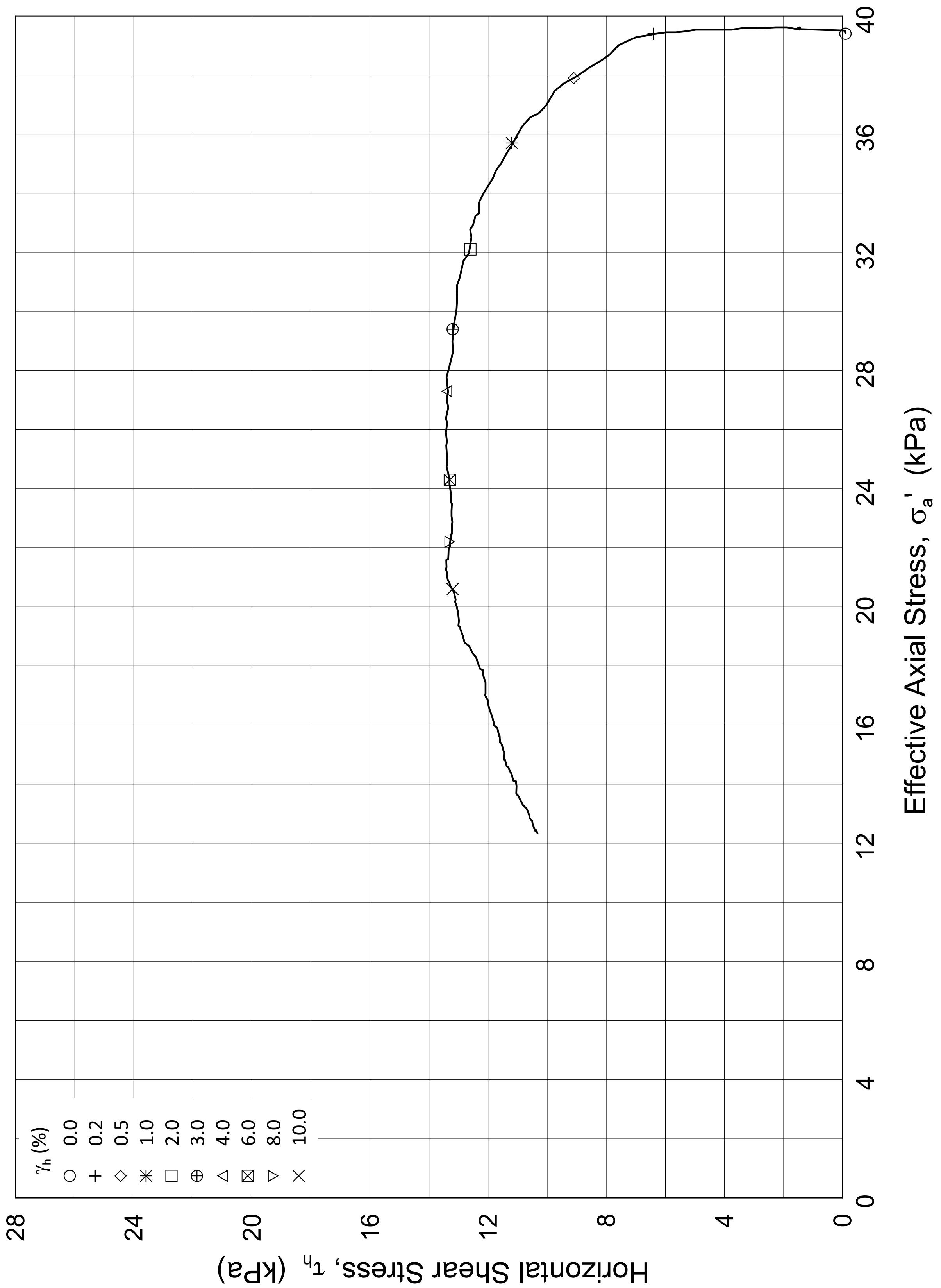
Document No. 20160154-10-R

Figure No. 5.4.23

Date 2018-11-29

Drawn by / Checked JLA / MAS

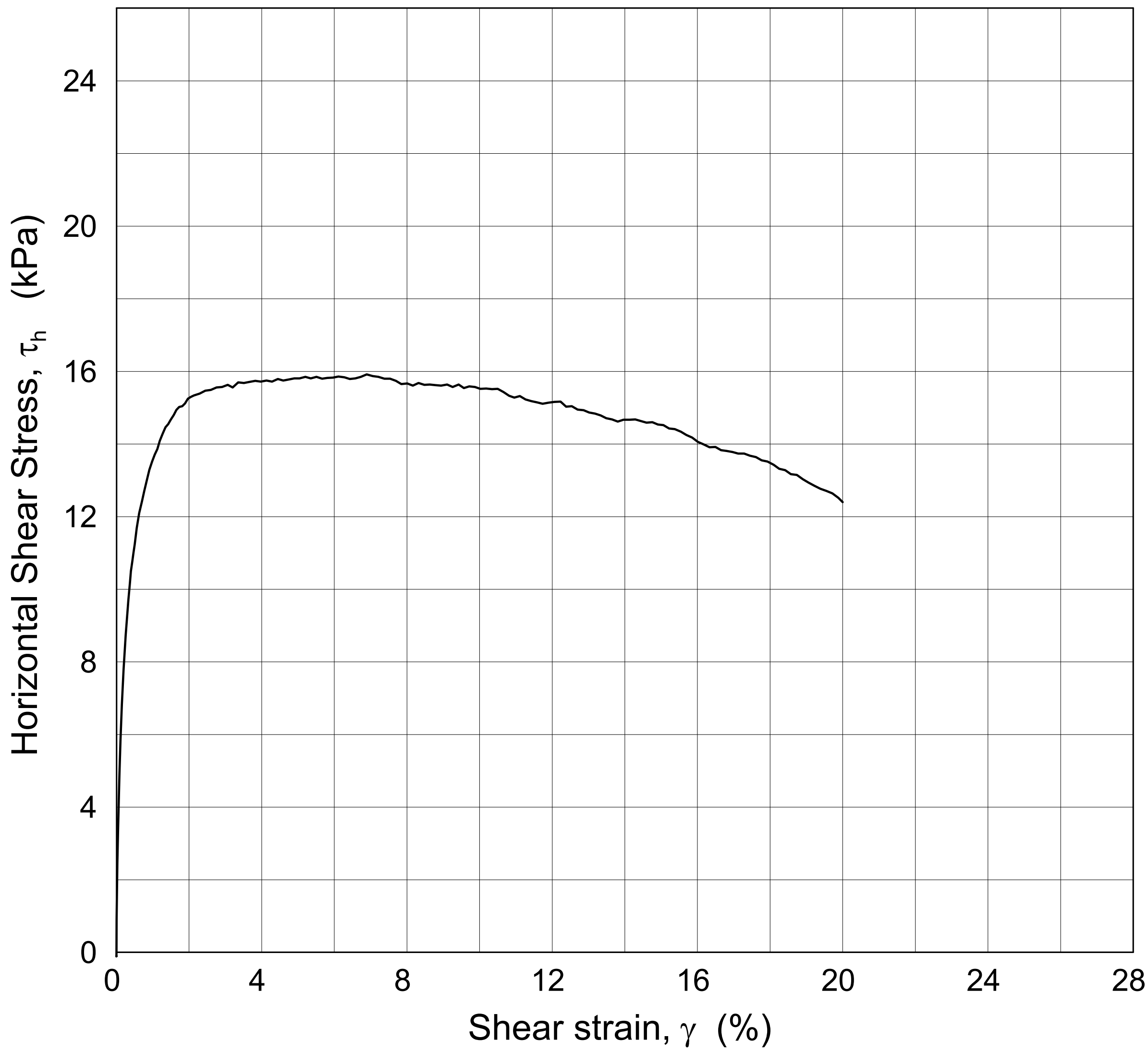
NGI

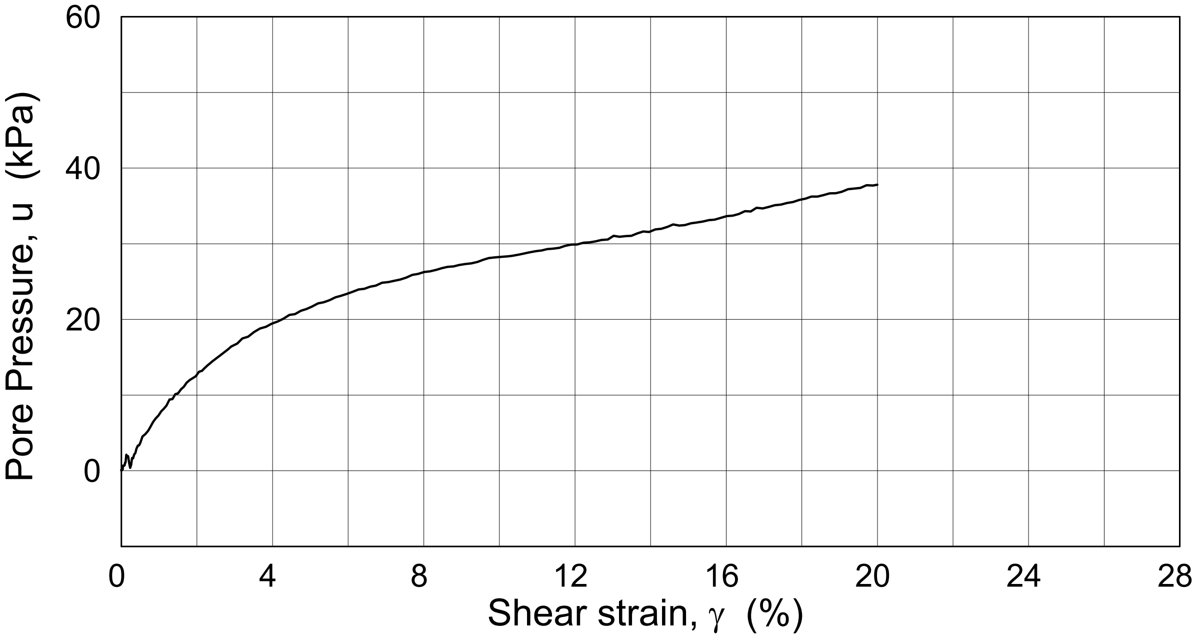


Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.24
Boring: ONSB41	Depth = 6.62 m	Consolidation stresses	Date 2018-11-29
Tube: 8	p_0' = 39.4 kPa	(kPa) max. min. final	Drawn by / Checked JLA / MAS
Part: A	w_i = 70.1 %	σ_{ac}' = 47.3 - **39.4**	NGI
Test: 1	γ_i = 15.49 kN/m³	τ_c' = - - **-**	

P:\2016\01\20160154\Leveranseedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.24, onsb41-8-a-1-2(ccv2067).grf





P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.25, onsb41-10-c-1-(ccv2062).grf

Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Direct Simple Shear Test

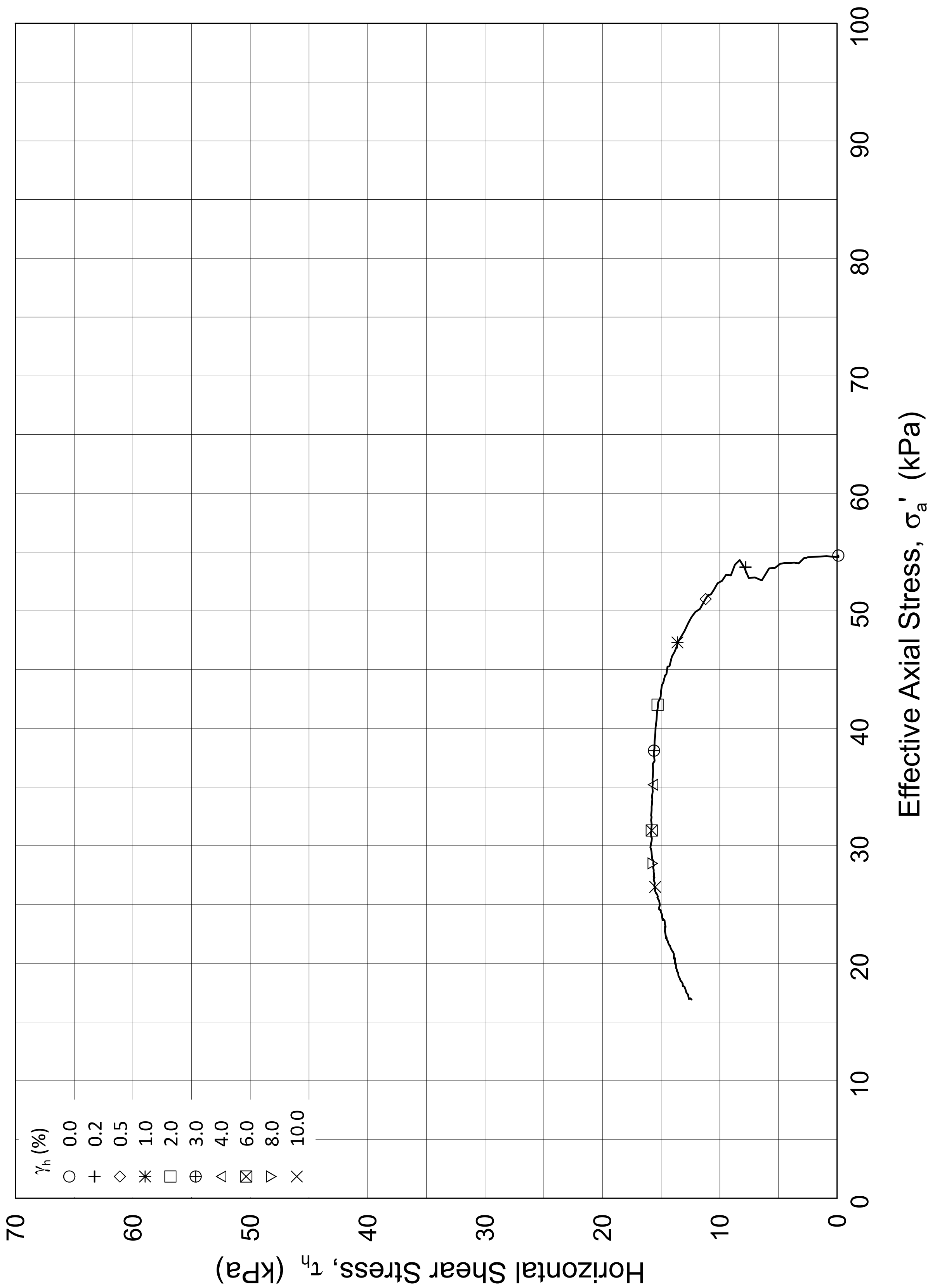
Figure No. 5.4.25

Date 2018-11-29

Drawn by / Checked JLA / MAS

Boring:	ONSB41	Depth =	8.72	m	Consolidation stresses			
Tube:	10	p_0' =	54.7	kPa	(kPa)	max.	min.	final
Part:	C	w_i =	65.6	%	σ_{ac}' =	60.0	-	**54.7**
Test:	1	γ_i =	15.59	kN/m³	τ_c' =	-	-	**-**

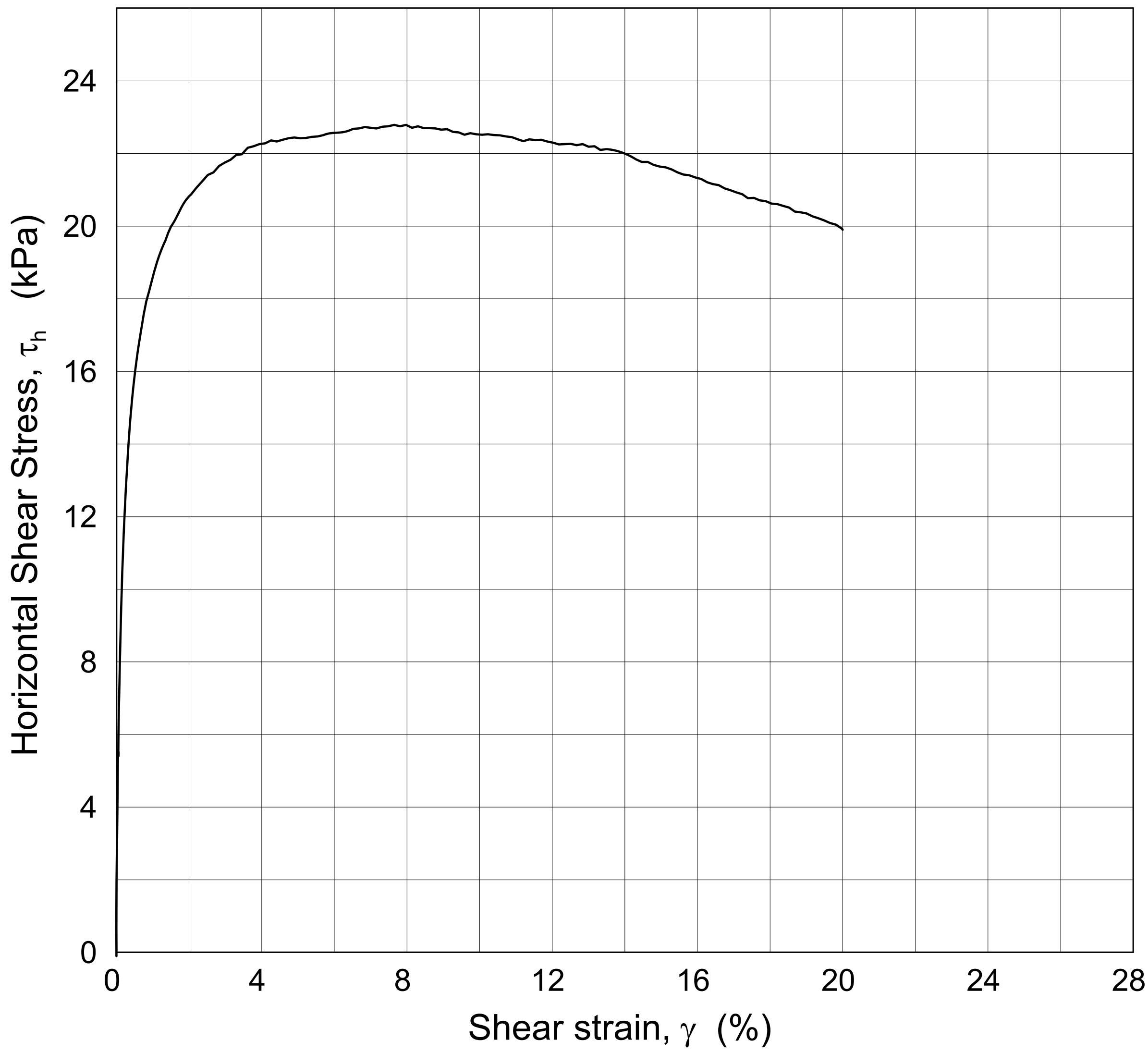
NGI

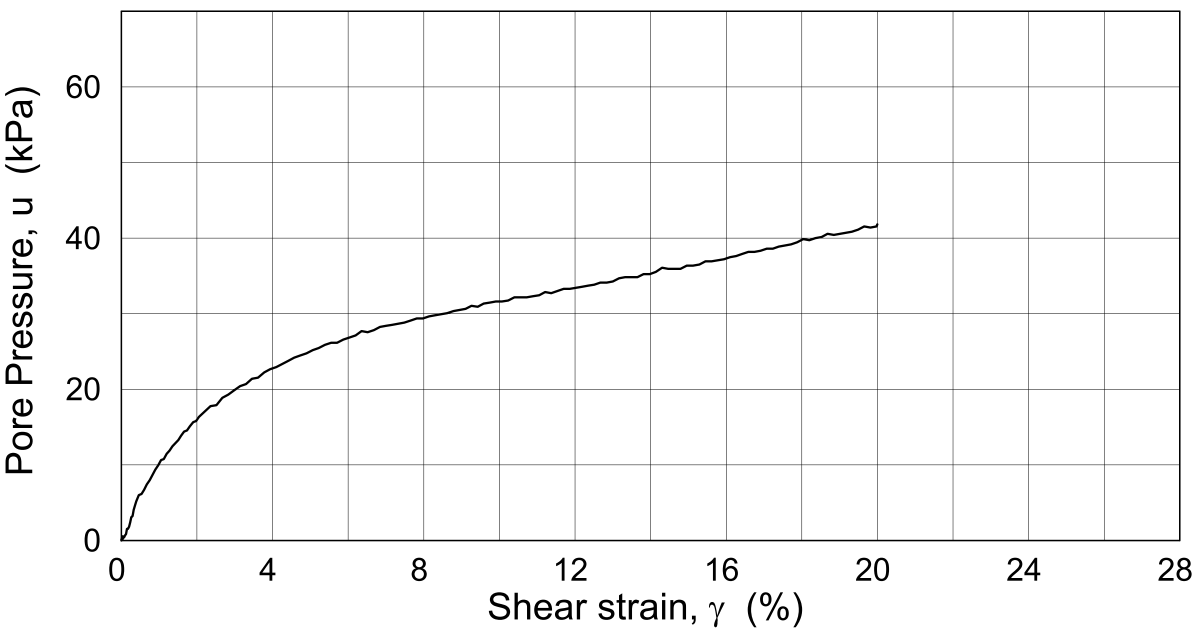


Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.26
Boring: ONSB41	Depth = 8.72 m	Consolidation stresses	Date 2018-11-29
Tube: 10	p_0' = 54.7 kPa	(kPa) max. min. final	Drawn by / Checked JLA / MAS
Part: C	w_i = 65.6 %	σ_{ac}' = 60.0 - **54.7**	
Test: 1	γ_i = 15.59 kN/m³	τ_c' = - - **-**	

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.26, onsb41-10-c-1-2(ccv2062).grf





Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Direct Simple Shear Test

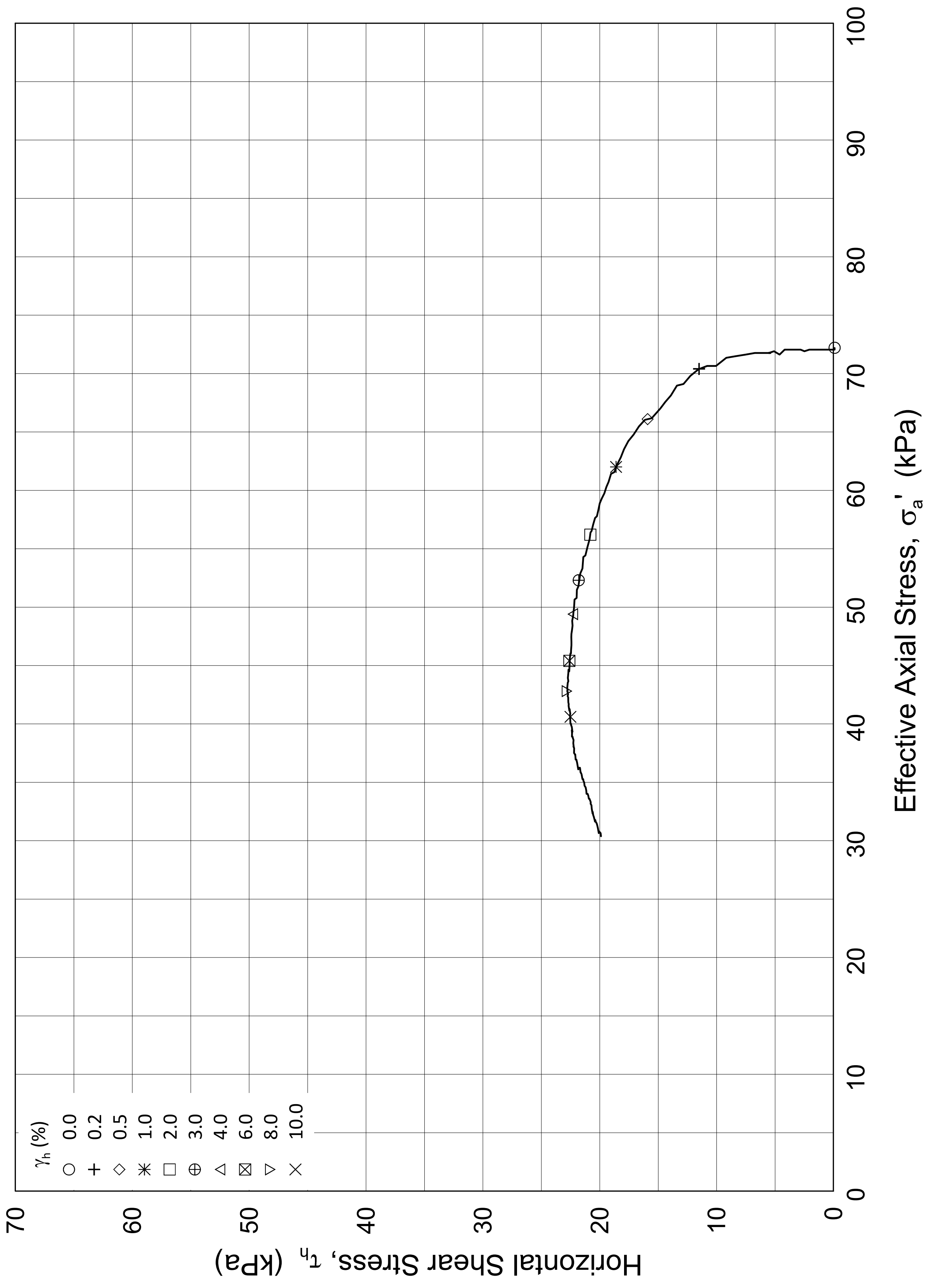
Figure No. 5.4.27

Date 2018-11-29

Drawn by / Checked JLA / MAS

Boring: ONSB41	Depth = 11.12 m	Consolidation stresses				
Tube: 12	p_0' = 72.2 kPa	(kPa)	max.	min.	final	
Part: A	w_i = 51.2 %	σ_{ac}' =	77.0	-	**72.2**	
Test: 1	γ_i = 16.78 kN/m³	τ_c' =	-	-	**-**	

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.27, onsb41-12-a-1-1(ccv2063).grf

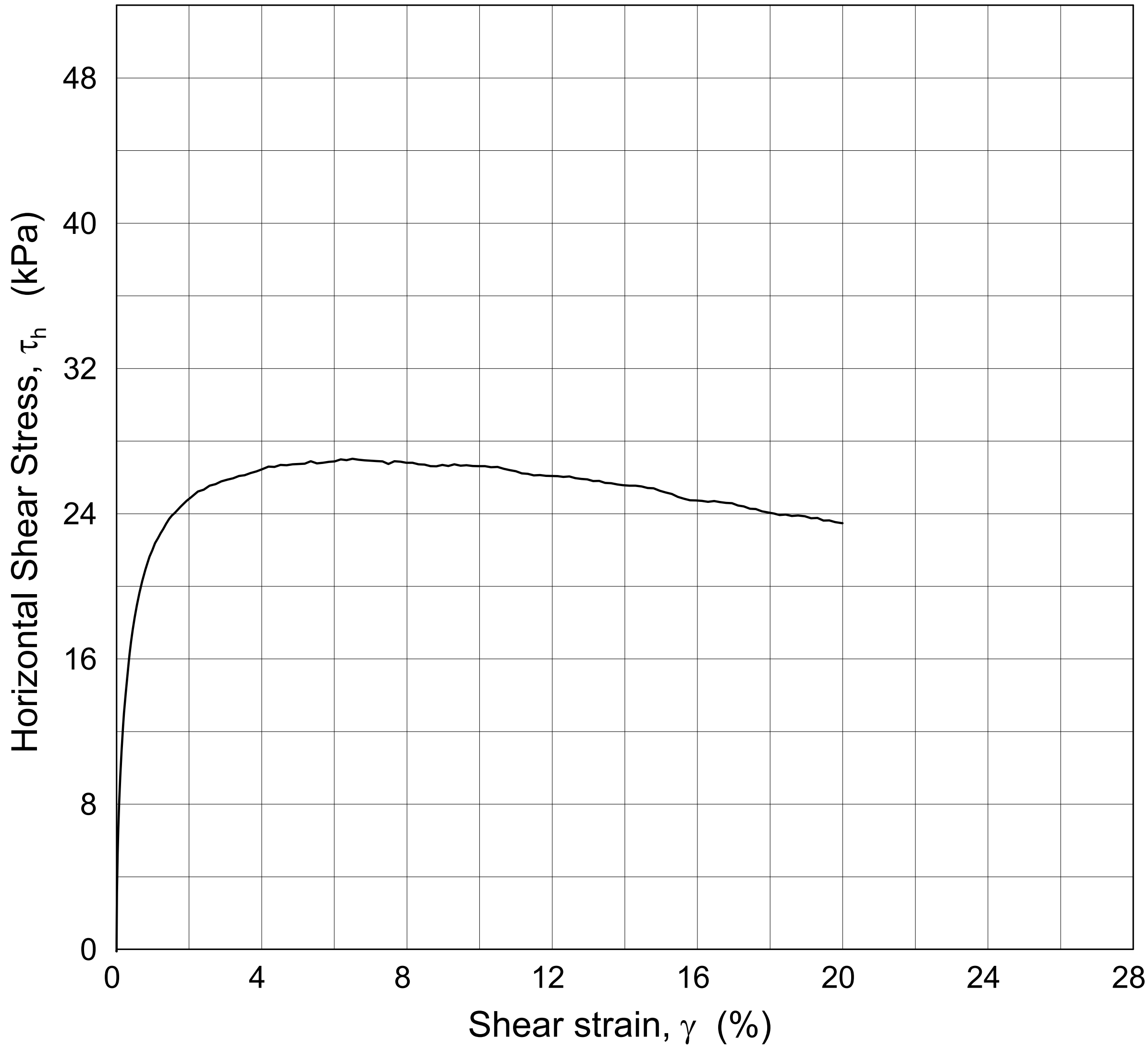


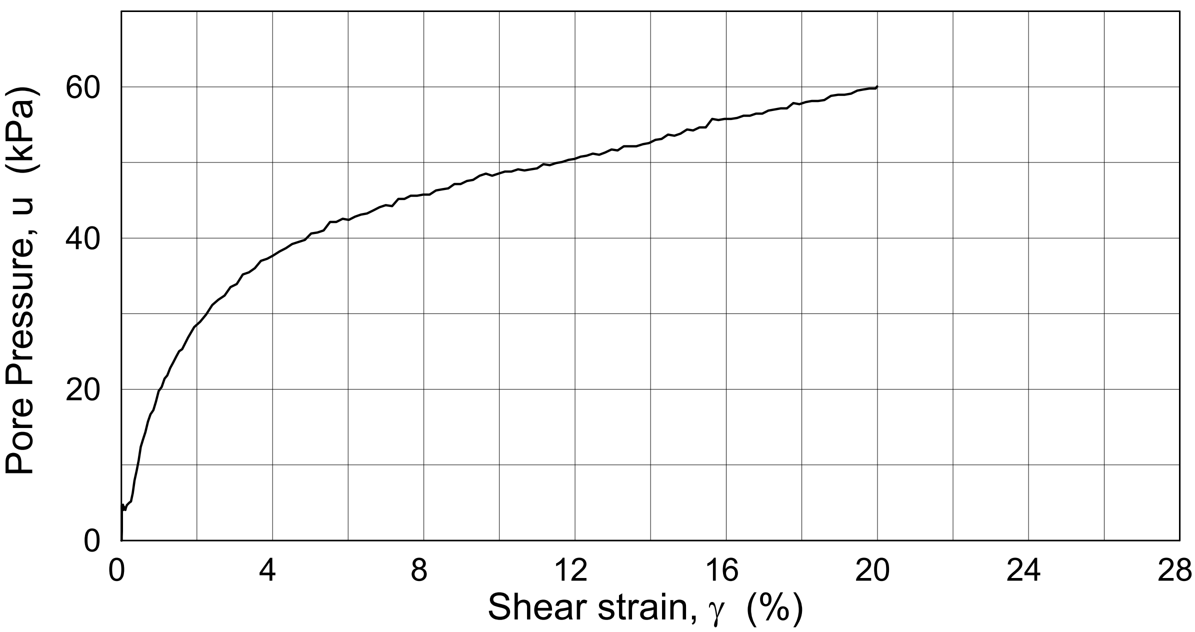
Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Direct Simple Shear Test	Figure No. 5.4.28

Boring: ONSB41	Depth = 11.12 m	Consolidation stresses	Date 2018-11-29
Tube: 12	p_0' = 72.2 kPa	(kPa) max. min. final	Drawn by / Checked JLA / MAS
Part: A	w_i = 51.2 %	σ_{ac}' = 77.0 - **72.2**	
Test: 1	γ_i = 16.78 kN/m³	τ_c' = - - **-**	

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.28, onsb41-12-a-1-2(ccv2063).grf





Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring: ONSB41	Depth = 14.12 m	Consolidation stresses	
Tube: 15	p_0' = 94.1 kPa	(kPa) max. min. final	
Part: A	w_i = 48.8 %	σ_{ac}' = 94.1 - **94.1**	
Test: 1	γ_i = 17.01 kN/m³	τ_c' = - - **-**	

Document No.
20160154-10-R

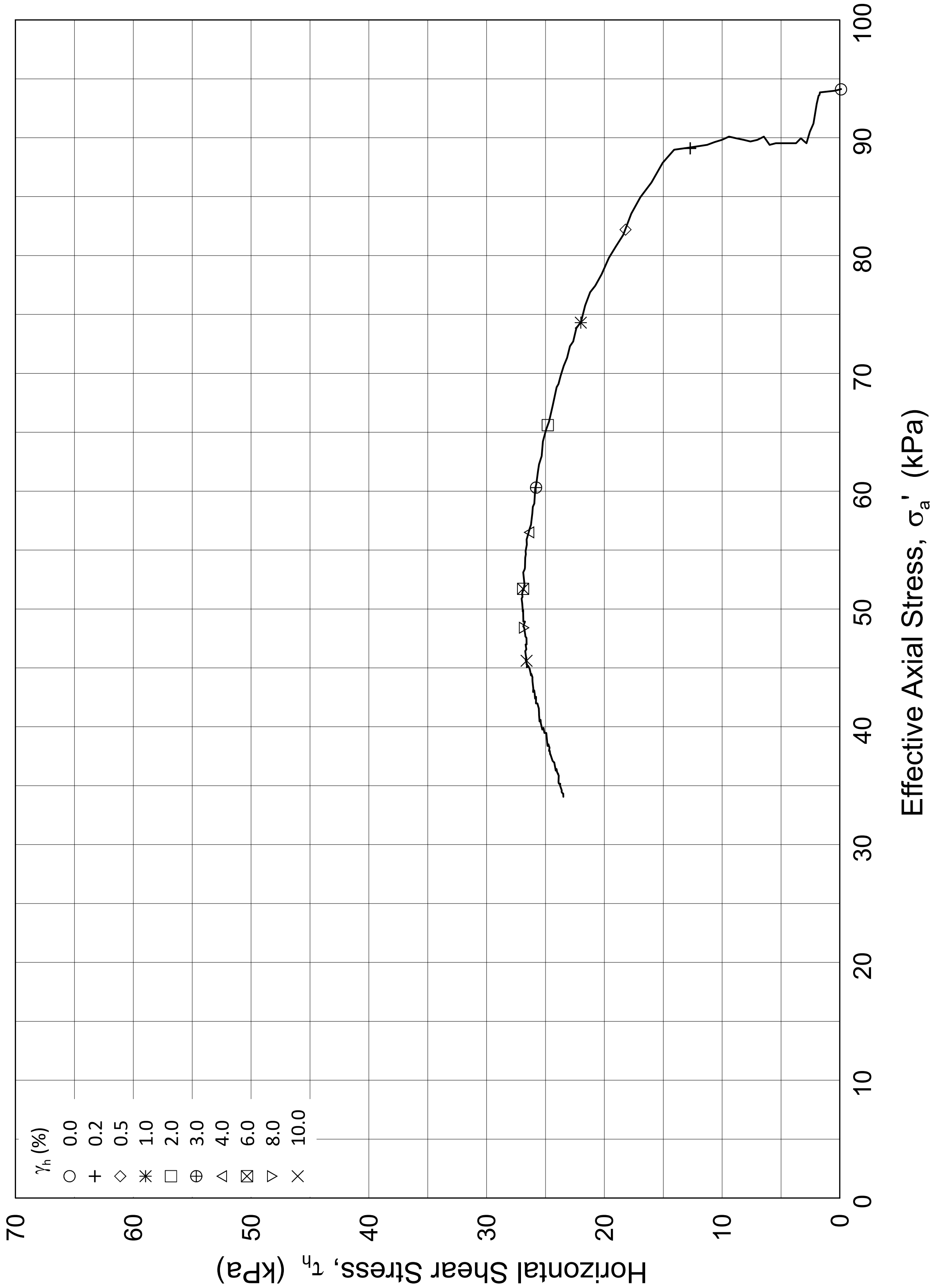
Figure No.
5.4.29

Date
2018-11-29

Drawn by / Checked
JLA / MAS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.29, onsb41-15-a-1-1(ccv2064).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.30, onsb41-15-a-1-2(ccv2064).grf

Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring: ONSB41	Depth = 14.12 m	Consolidation stresses	
Tube: 15	p_0' = 94.1 kPa	(kPa) max. min. final	
Part: A	w_i = 48.8 %	σ_{ac}' = 94.1 - **94.1**	
Test: 1	γ_i = 17.01 kN/m³	τ_c' = - - **-**	

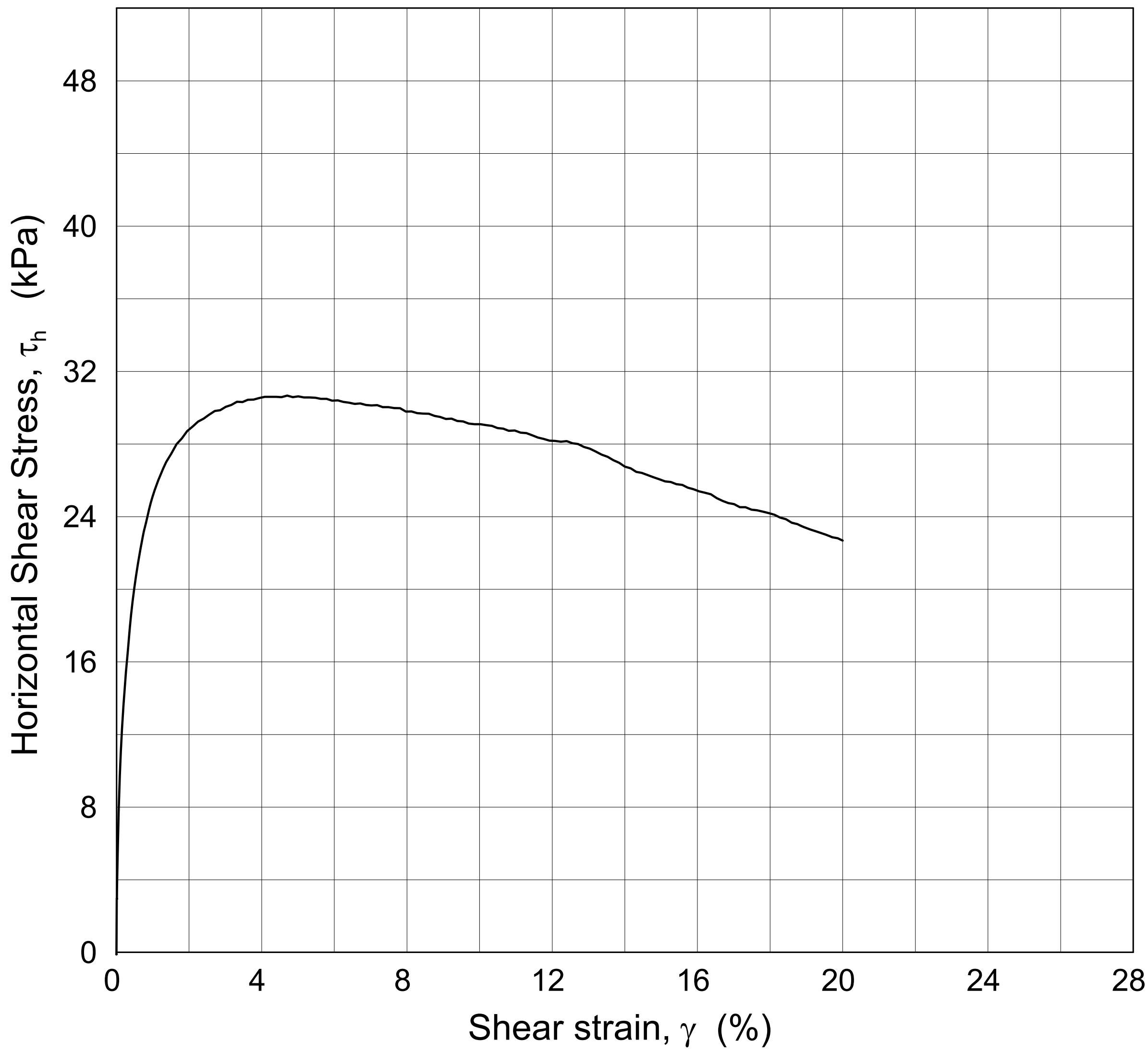
Document No. 20160154-10-R

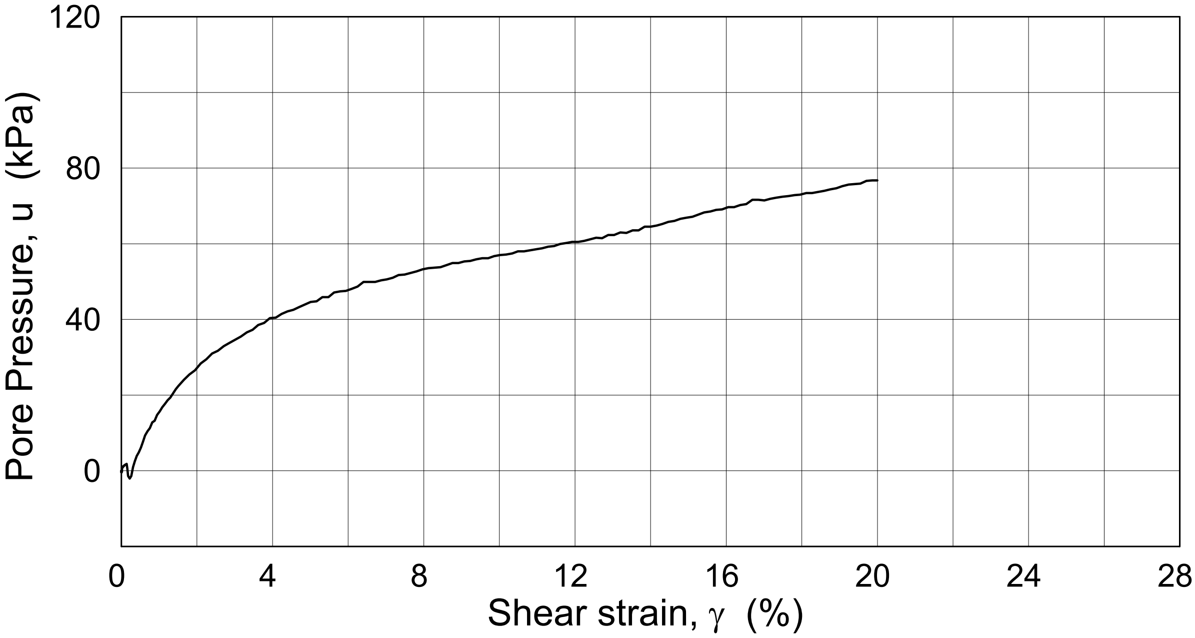
Figure No. 5.4.30

Date 2018-11-29

Drawn by / Checked JLA / MAS

NGI

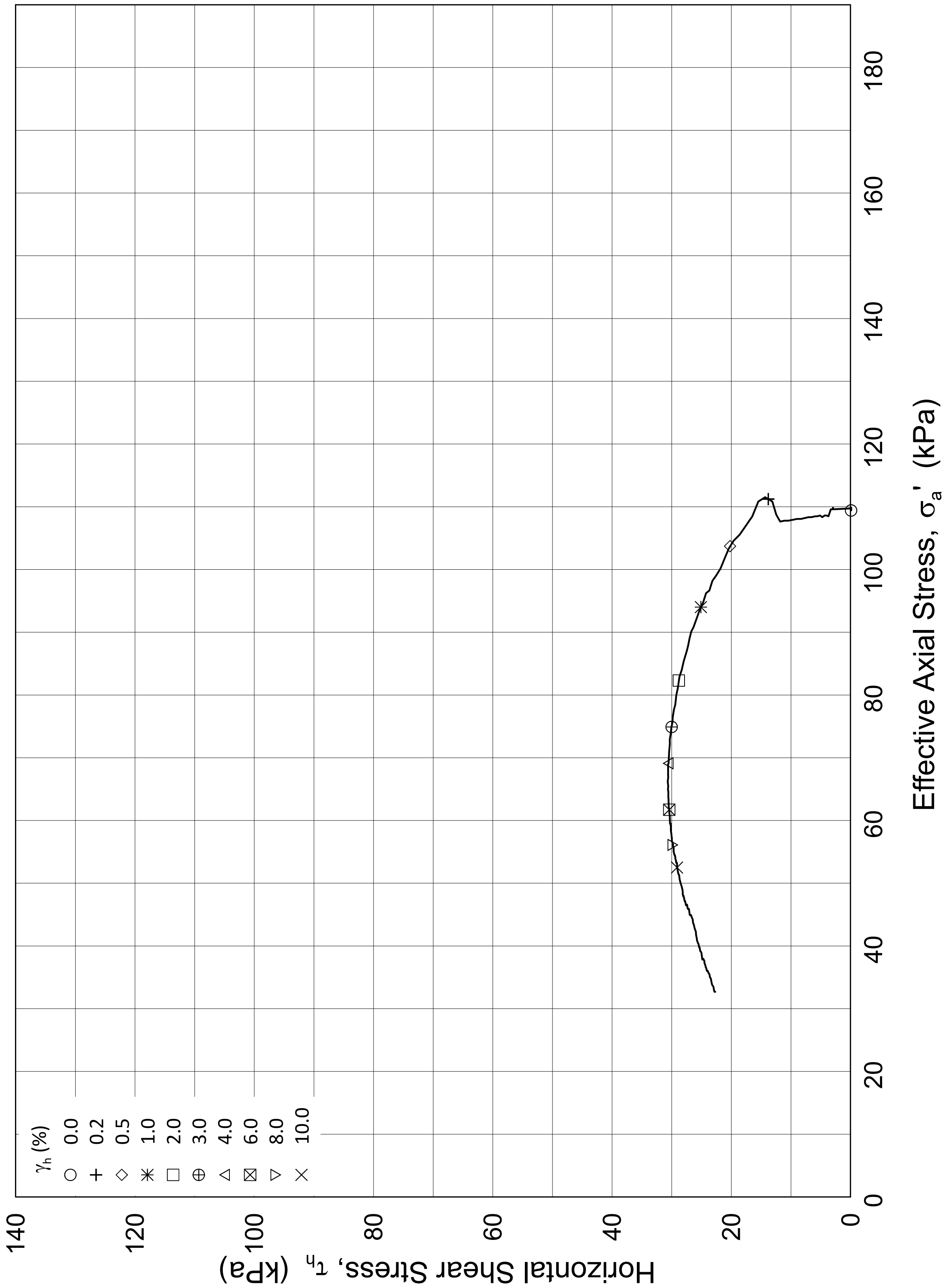




Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.31
Boring: ONSB41	Depth = 16.22 m	Consolidation stresses	Date 2018-11-29; Drawn by / Checked JLA / MAS
Tube: 17	p_0' = 109.4 kPa	(kPa) max. min. final	
Part: C	w_i = 46.6 %	σ_{ac}' = 109.4 - **109.4**	NGI
Test: 1	γ_i = 17.13 kN/m³	τ_c' = - - **-**	

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.31, onsb41-17-c-1-1(ccv2061).grf



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.32, onsb41-17-c-1-2(ccv2061).grf

Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

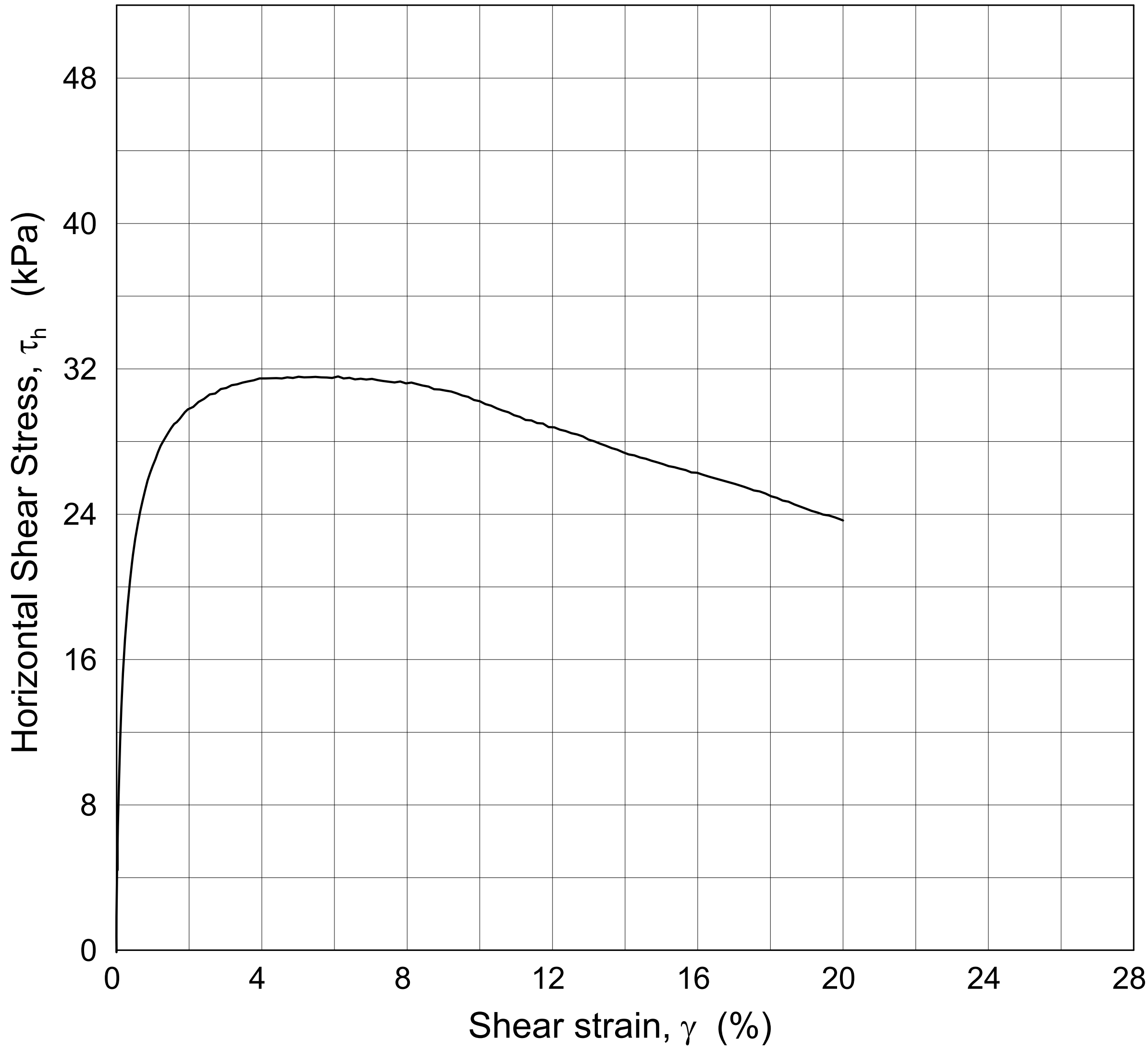
Boring: ONSB41	Depth = 16.22 m	Consolidation stresses	
Tube: 17	p_0' = 109.4 kPa	(kPa) max. min. final	
Part: C	w_i = 46.6 %	σ_{ac}' = 109.4 - **109.4**	
Test: 1	γ_i = 17.13 kN/m³	τ_c' = - - **-**	

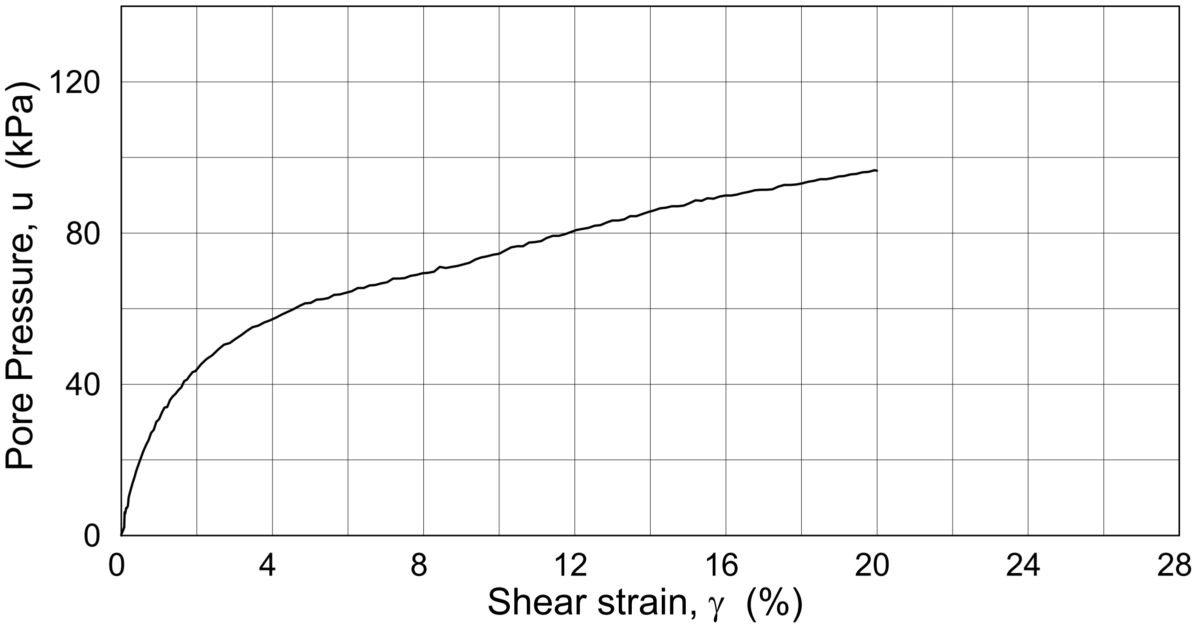
Document No.
20160154-10-R

Figure No.
5.4.32

Date	Drawn by / Checked
2018-11-29	JLA / MAS

NGI

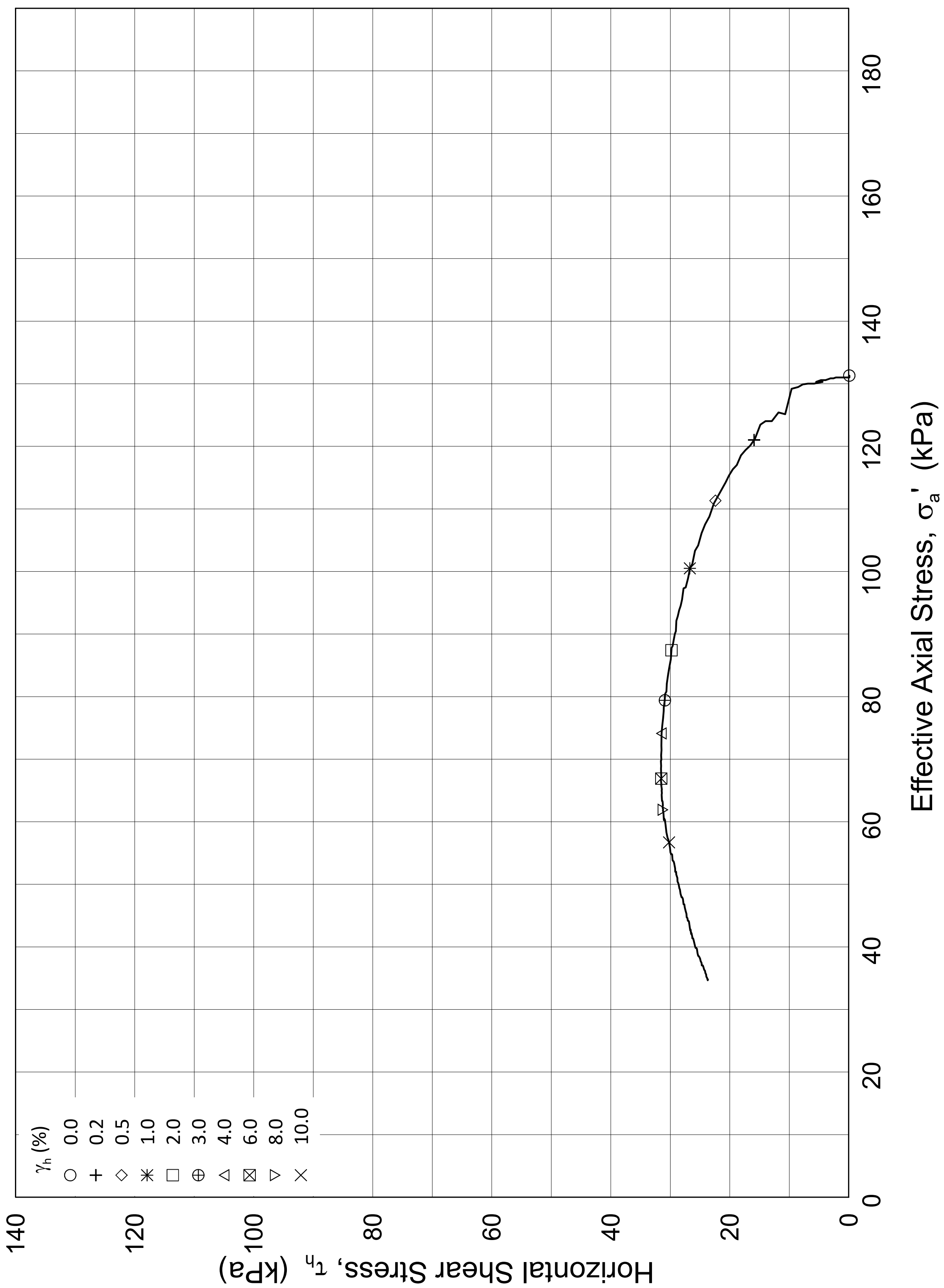




P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.33, onsb41-20-c-1-1(ccv2060).grf

Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.33
Boring: ONSB41	Depth = 19.22 m	Consolidation stresses	Date 2018-11-29
Tube: 20	p_0' = 131.3 kPa	(kPa) max. min. final	Drawn by / Checked JLA / MAS
Part: C	w_i = 43.0 %	σ_{ac}' = 131.3 - **131.3**	
Test: 1	γ_i = 17.91 kN/m³	τ_c' = - - **-**	



Date/Rev.: 2016-10-28/6

Norwegian GeoTest Sites - Onsøy

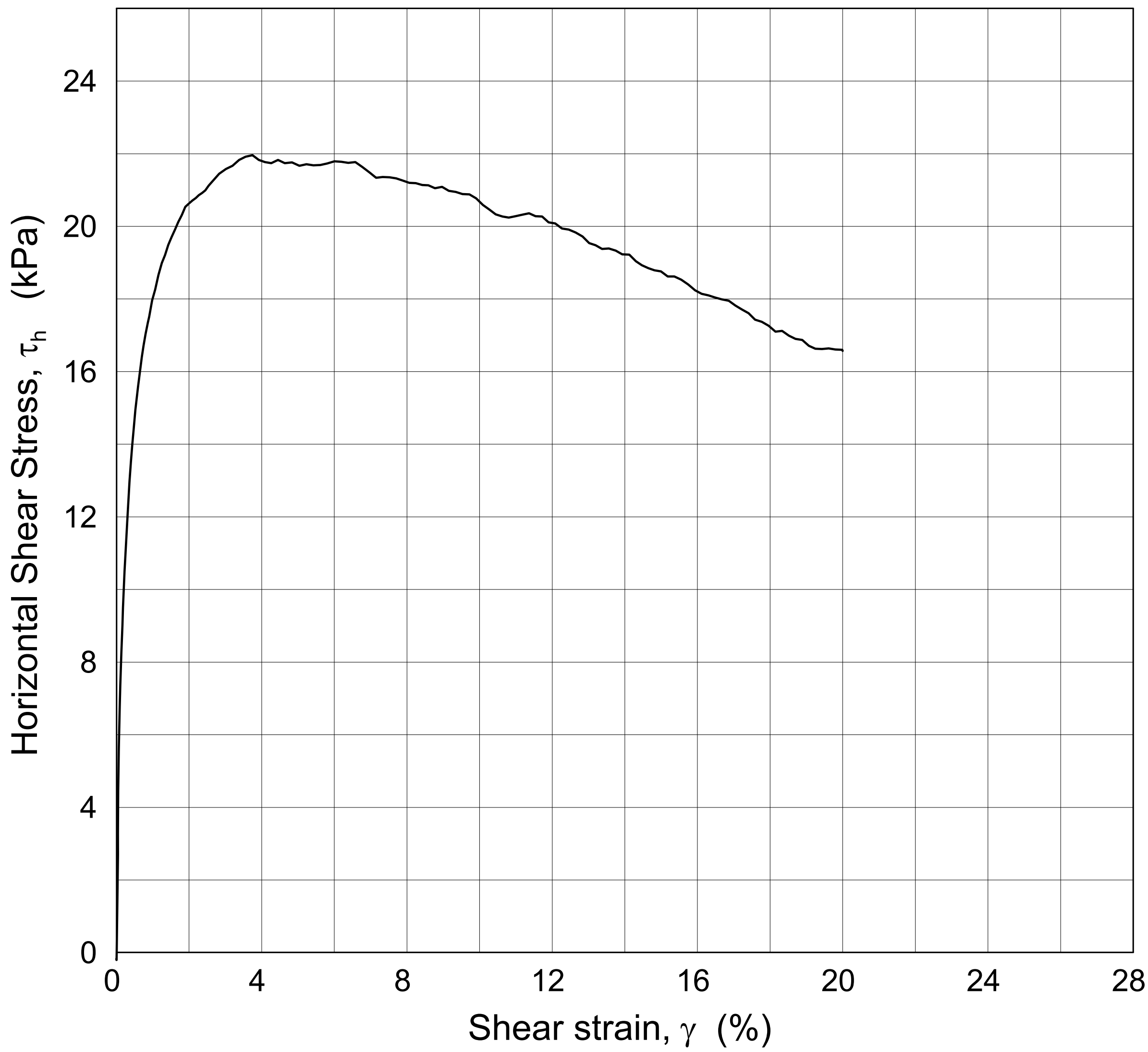
Direct Simple Shear Test

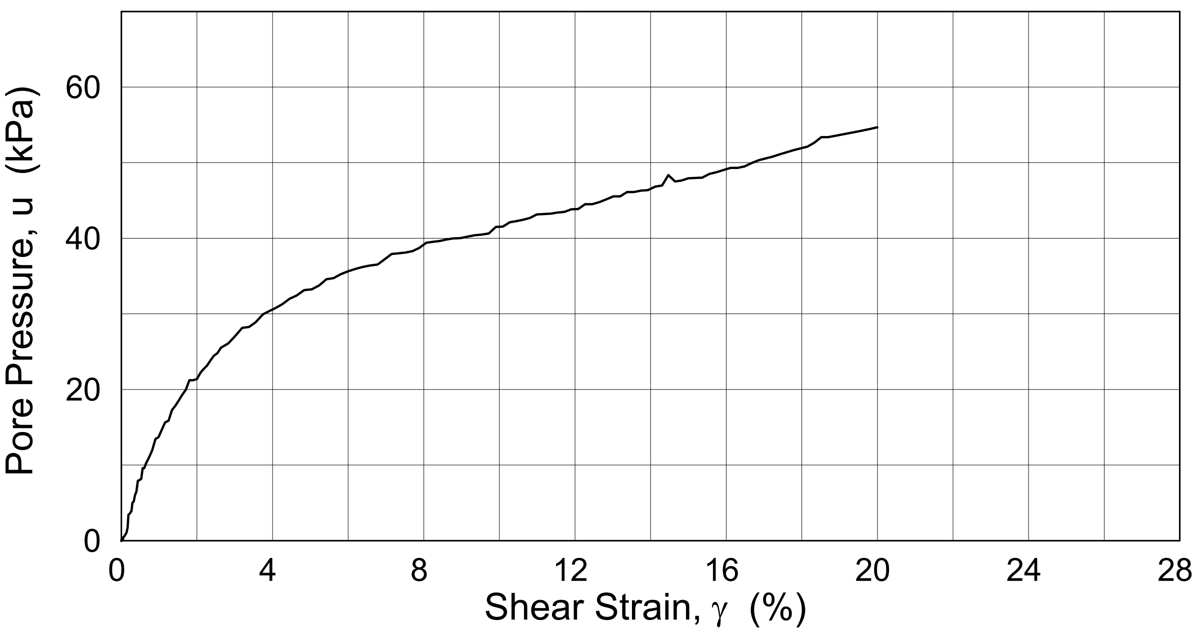
Boring: ONSB41	Depth = 19.22 m	Consolidation stresses
Tube: 20	p_0' = 131.3 kPa	(kPa) max. min. final
Part: C	w_i = 43.0 %	σ_{ac}' = 131.3 - **131.3**
Test: 1	γ_i = 17.91 kN/m³	τ_c' = - - **-**

Document No.	20160154-10-R
Figure No.	5.4.34
Date	2018-11-29
Drawn by / Checked	JLA / MAS

NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Document No\Fig 5.4.34, onsb41-20-c-1-2(ccv2060).grf





Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring:	**ONSB03**	Depth =	**12.44**	m	Consolidation stresses			
Tube:	**54tube2016**	p_o' =	**81.8**	kPa	(kPa)	max.	min.	final
Part:	**1**	w_i =	**45.3**	%	σ_{ac}' =	81.8	-	**81.8**
Test:	**DSSs1**	γ_i =	**17.52**	kN/m³	τ_c' =	-	-	**-**

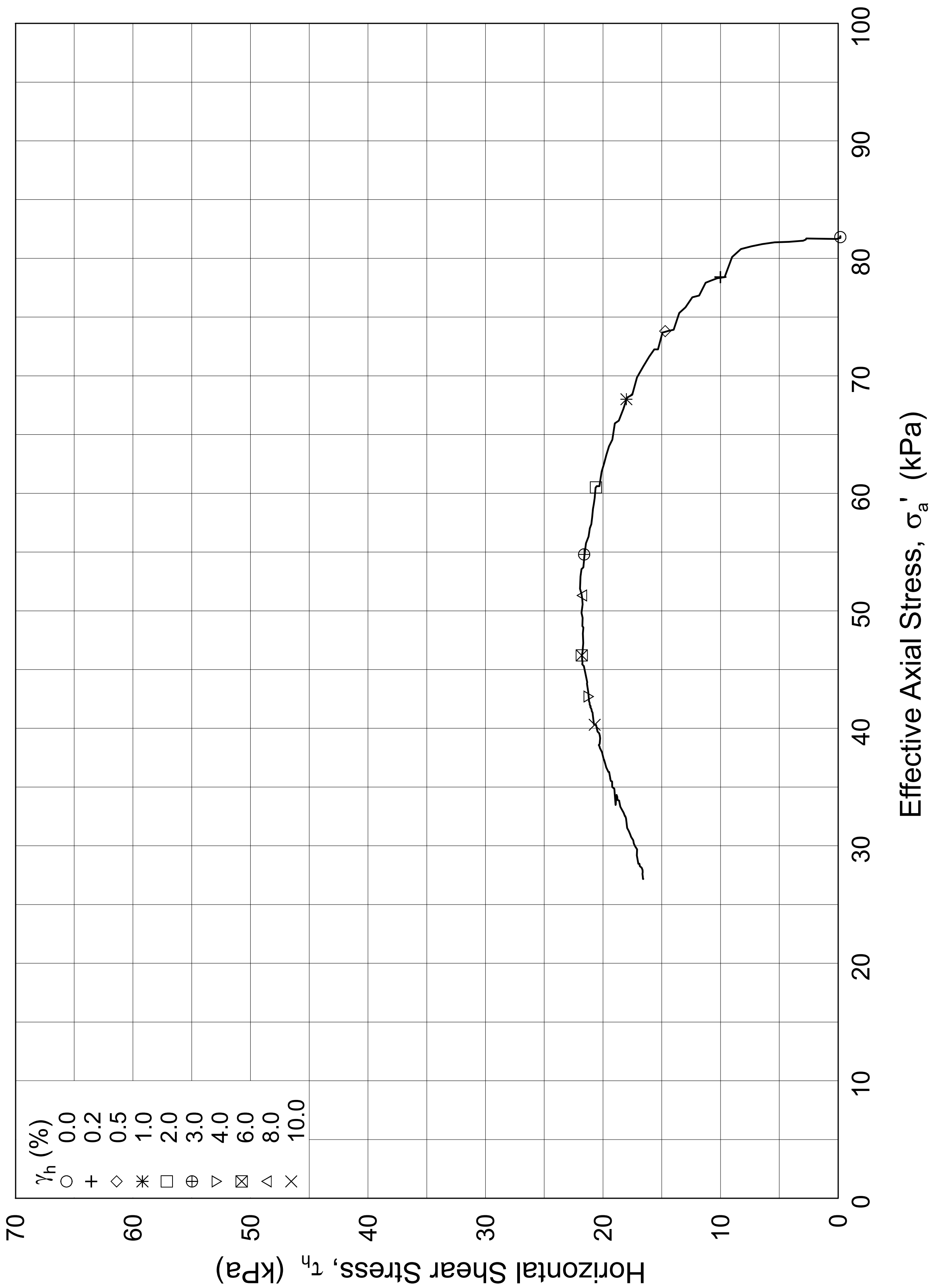
Document No.
20160154-10-R

Figure No.
5.4.35

Date: 2018-11-29

Drawn by/checked: JLa / MAS

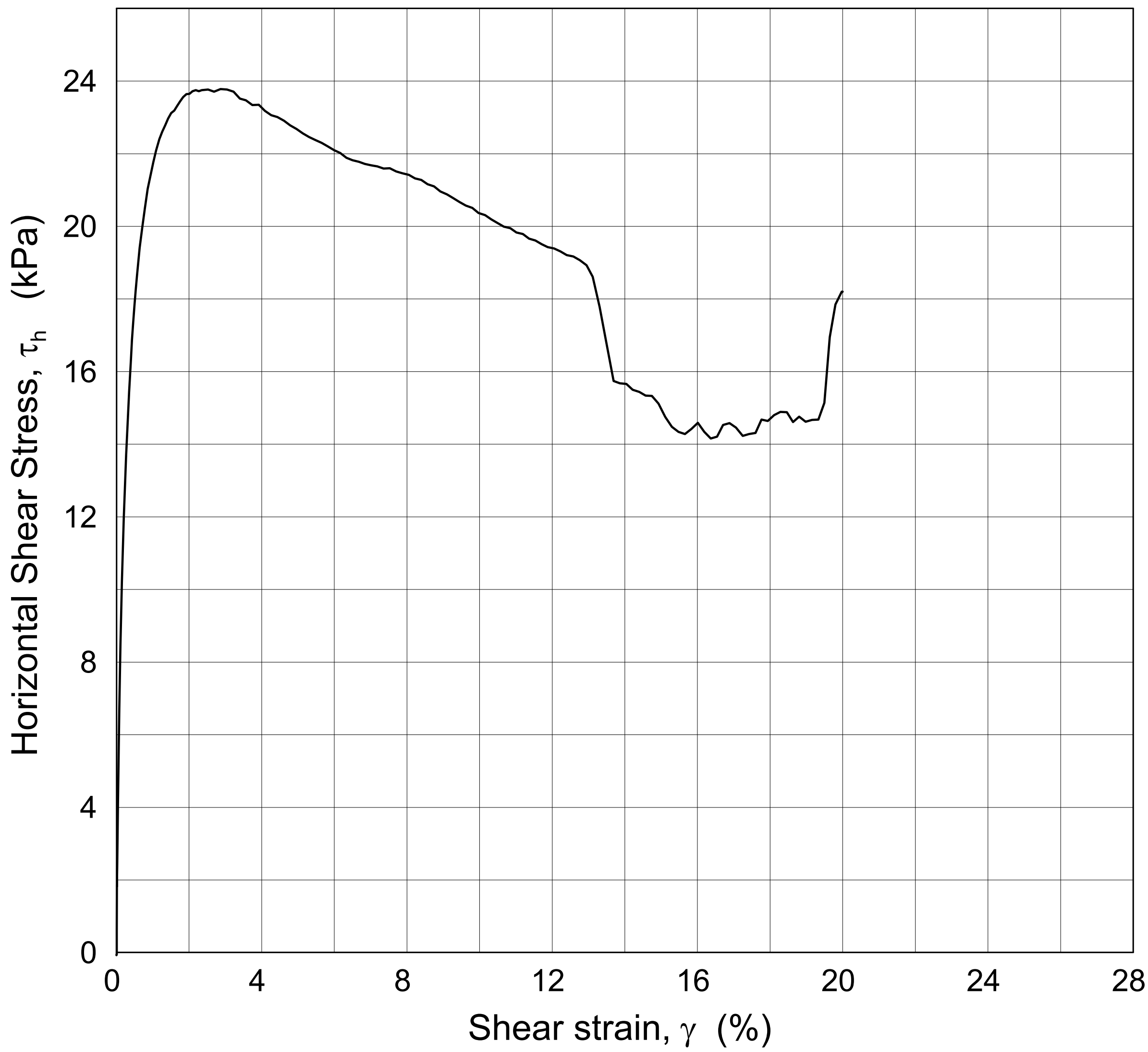
P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.35, onsøy-54tube2016-1-dsss1-1(ccv1831).grf

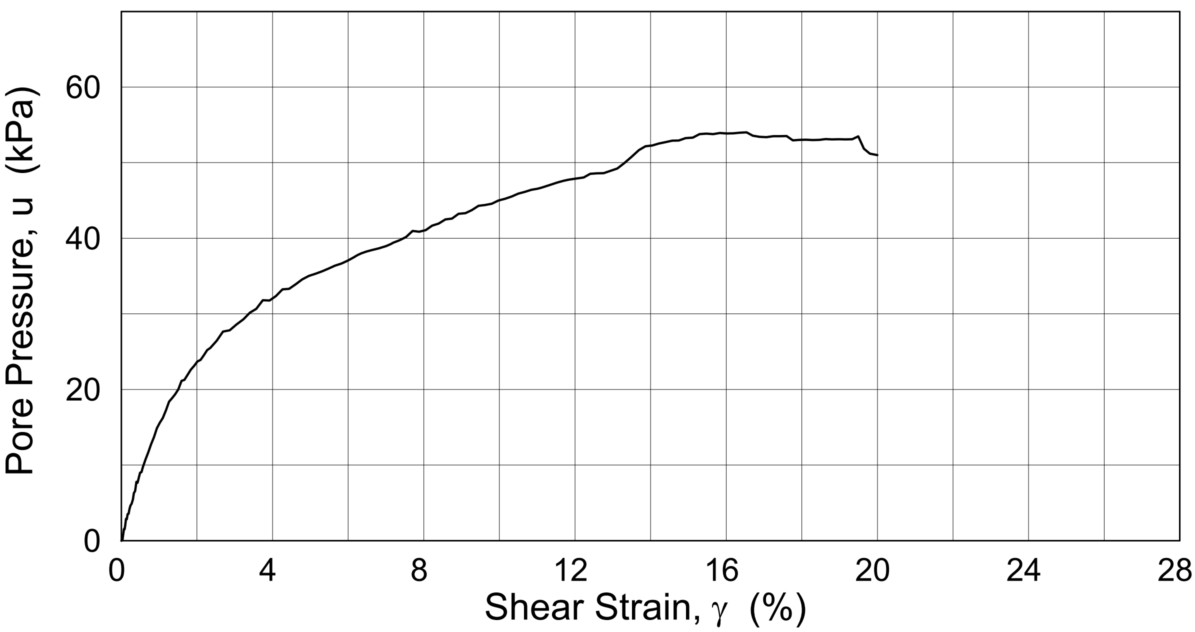


Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy				Document No. 20160154-10-R
Direct Simple Shear Test				Figure No. 5.4.36
Boring: **ONSB03**	Depth = **12.44** m	Consolidation stresses		Date 2018-11-29
Tube: **54tube2016**	p_o' = **81.8** kPa	(kPa)	max. / min. / final	Drawn by/checked JLa / MAS
Part: **1**	w_i = **45.3** %	σ_{ac}' =	81.8 / - / **81.8**	
Test: **DSSs1**	γ_i = **17.52** kN/m³	τ_c' =	- / - / **-**	

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.36, onsøy-54tube2016-1-dsss1-2(ccv1831).grf

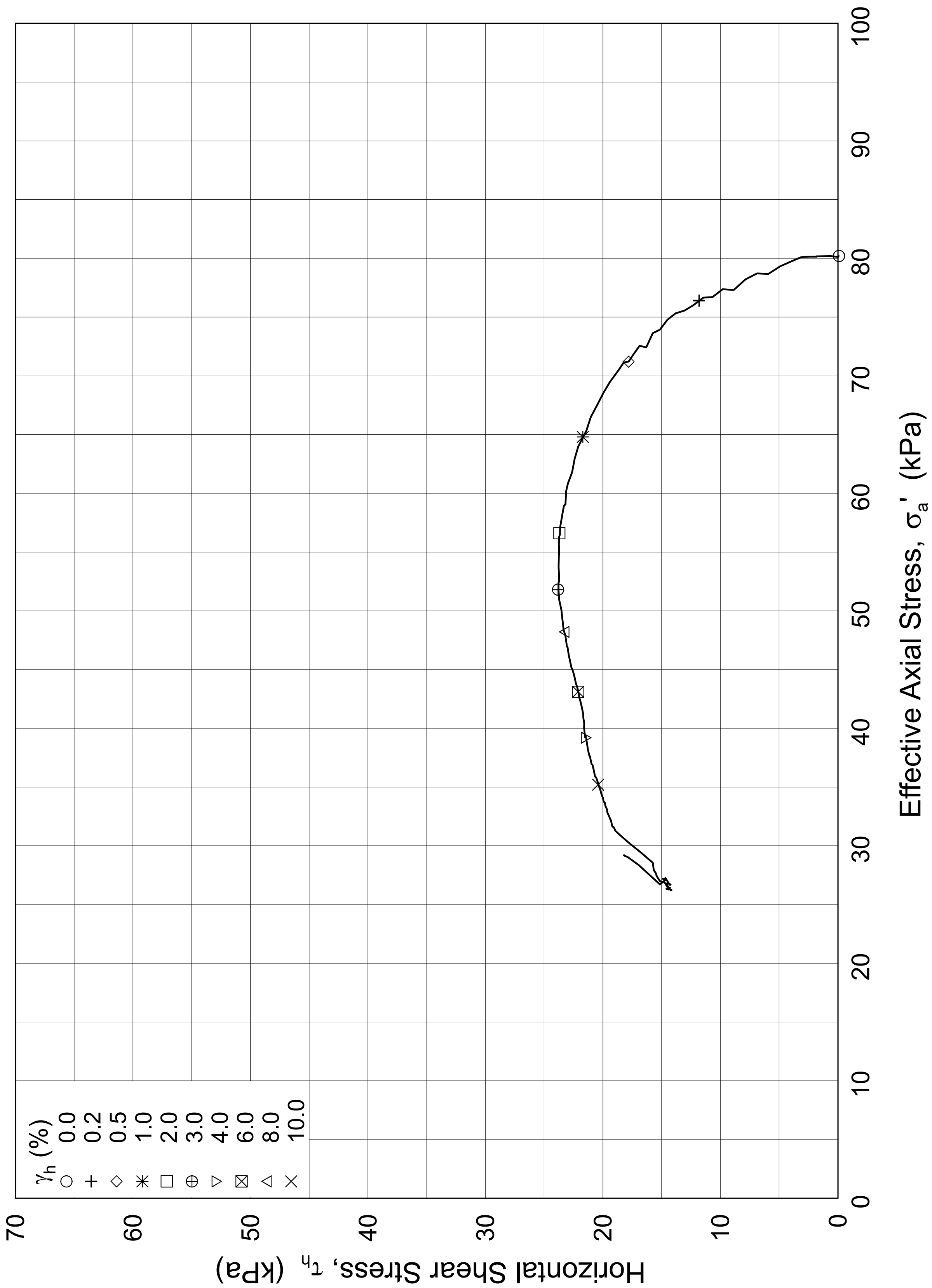




Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.37
Boring: **ONSB03**	Depth = **12.22** m	Consolidation stresses	Date 2018-11-29 / Drawn by/checked JLa / MAS
Tube: **Block2016**	p_o' = **80.2** kPa	(kPa) max. min. final	
Part: **2**	w_i = **46.0** %	σ_{ac}' = 80.2 - **80.2**	
Test: **DSSs1**	γ_i = **17.32** kN/m^3	τ_c' = - - **-**	

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.37, onsøy-block2016-2-dsss1-1(ccv1834).grf



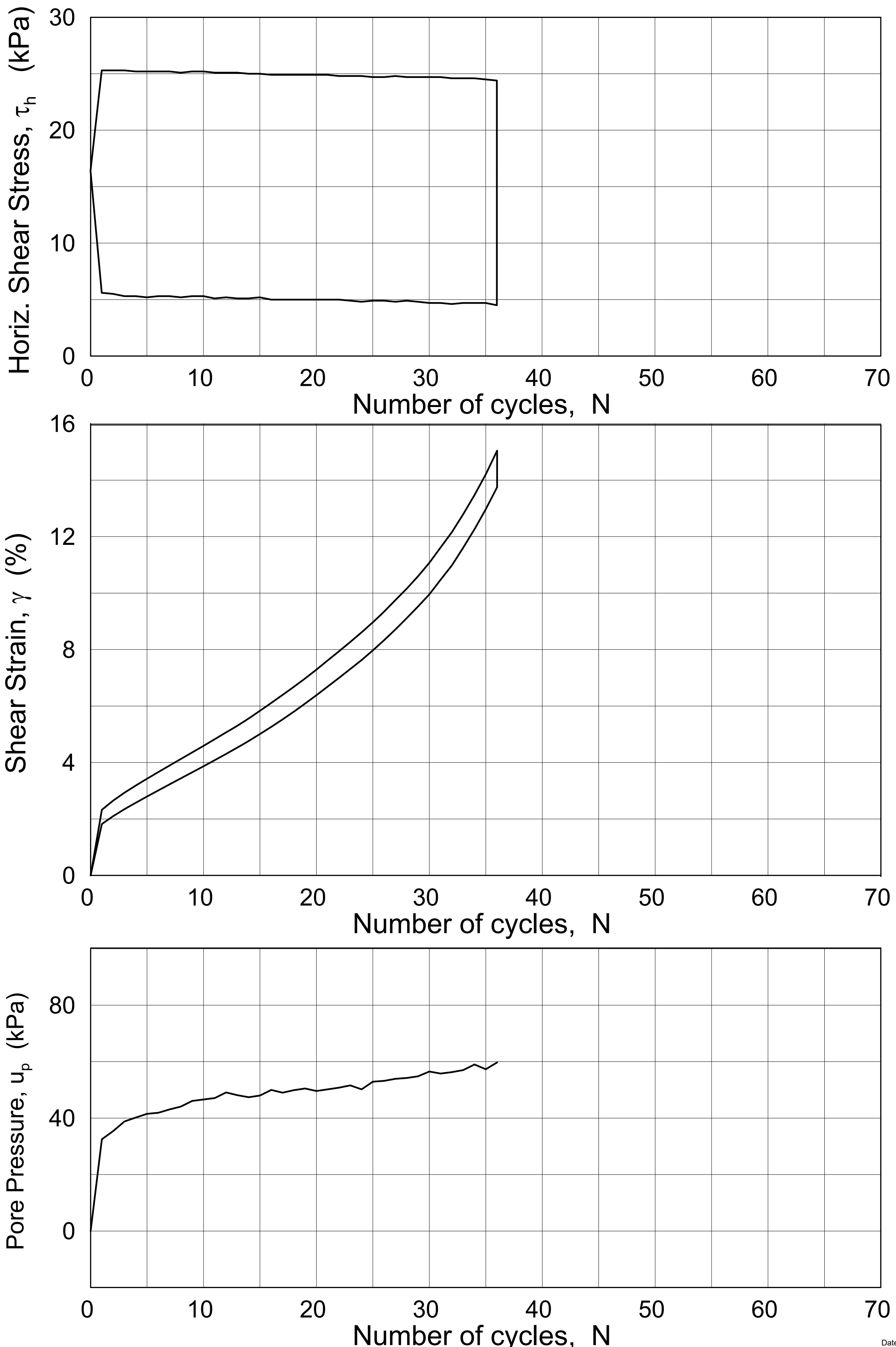
Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy		Document No. 20160154-10-R
Direct Simple Shear Test		Figure No. 5.4.38
		Date 2018-11-29 / Drawn by/checked JLa / MAS

Boring: **ONSB03**	Depth =	**12.22**	m	Consolidation stresses			
Tube: **Block2016**	p_o' =	**80.2**	kPa	(kPa)	max.	min.	final
Part: **2**	w_i =	**46.0**	%	σ_{ac}' =	80.2	-	**80.2**
Test: **DSSs1**	γ_i =	**17.32**	kN/m³	τ_c' =	-	-	**-**

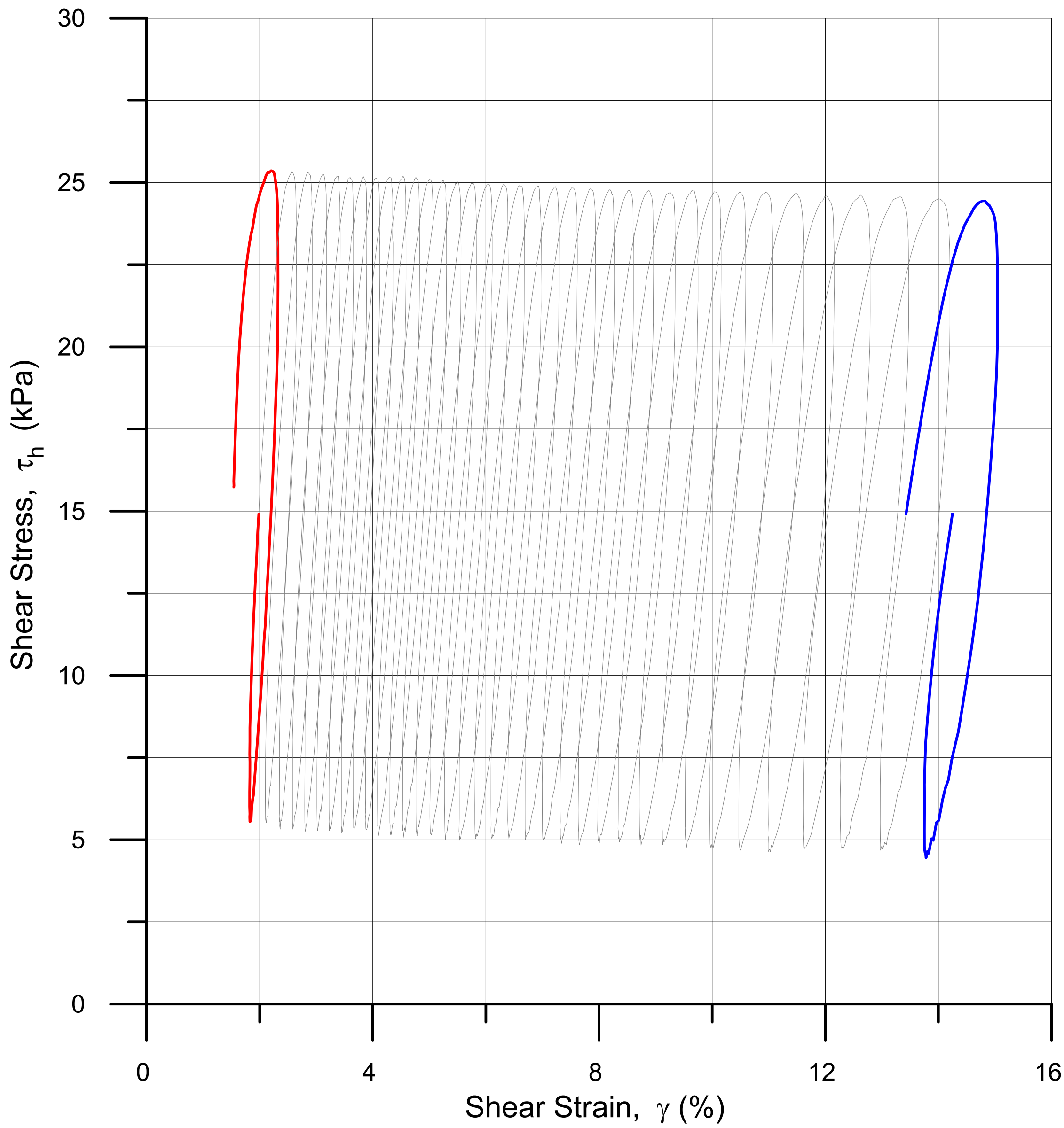
NGI

P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.38, onsøy-block2016-2-dsss1-2(ccv1834).grf



Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.39
Boring: **ONSB03**	Depth = **12.34** m	Consolidation stresses	Date 2018-11-29 / Drawn by/checked JLa / MAS
Tube: **54tube2016**	p_o' = **81.2** kPa	(kPa) max. min. final	
Part: **1**	w_i = **45.4** %	σ_{ac}' = 81.2 - **81.2**	
Test: **DSScy1**	γ_i = **17.29** kN/m³	τ_c' = - - **-**	



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.40, ncy1578_Tau_vs_GammaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-06-23

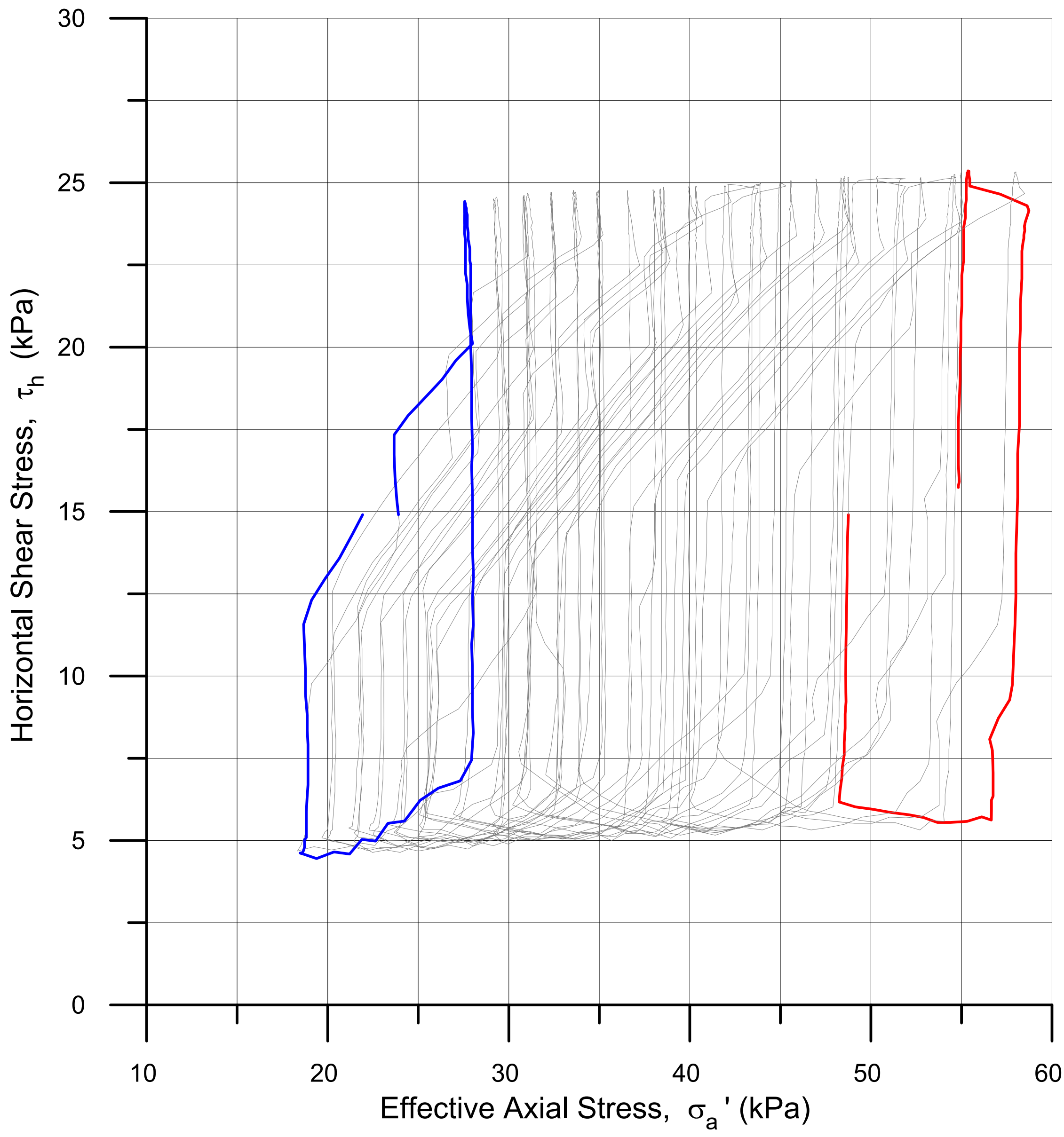
Figure No. 5.4.40

Drawn by

DSScy

Boring:	ONSB03	Depth	=	12.34	m	Consolidation stresses			
Tube:	54tube2016	p_o'	=	81.2	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	45.4	%	σ_{ac}' =			81.2
Test:	DSScy1	w_c	=	44.1	%	τ_c =			

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.41, ncy1578_Tau_vs_SigmaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

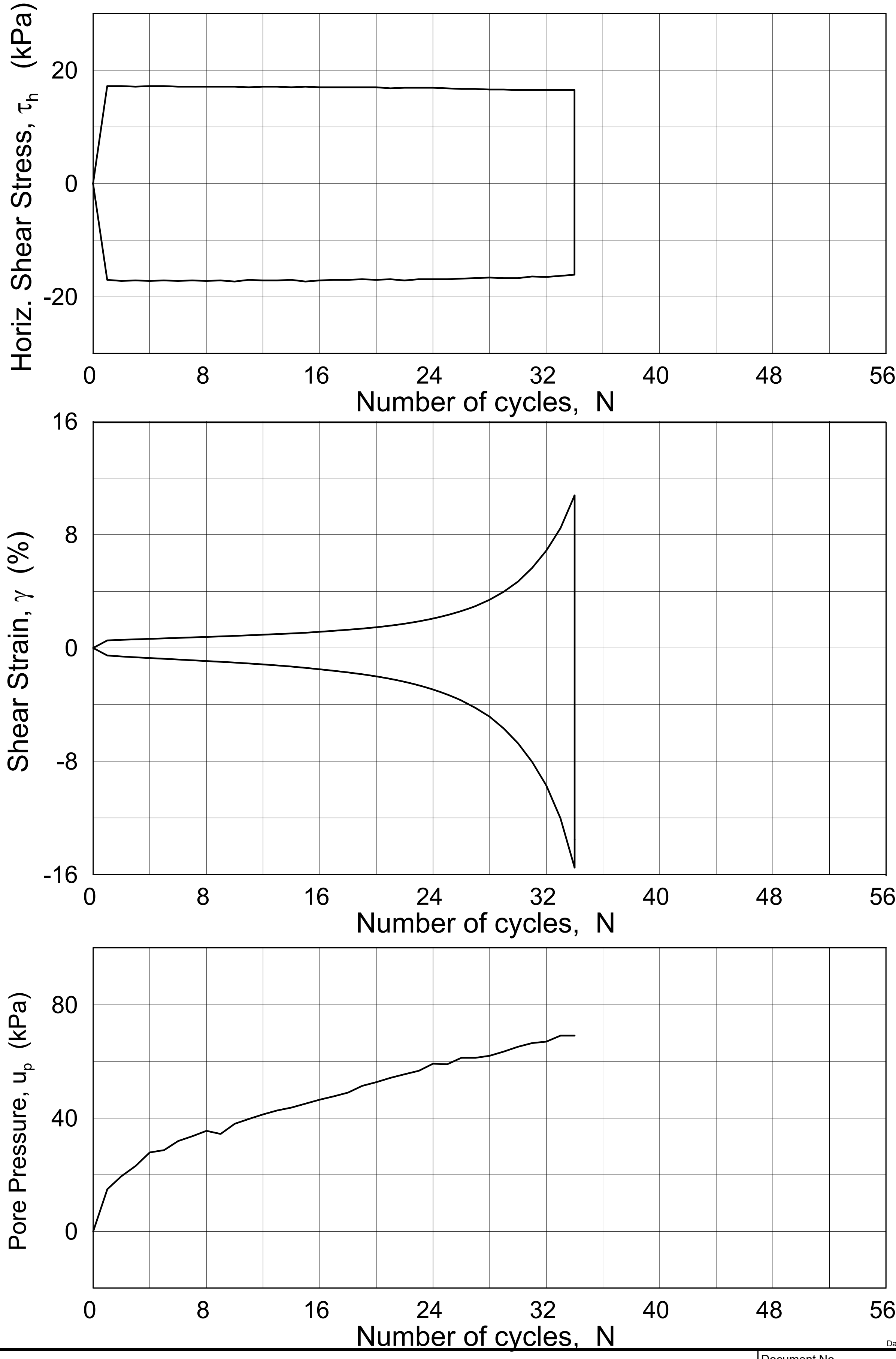
Date 2016-06-23

Figure No. 5.4.41

Drawn by

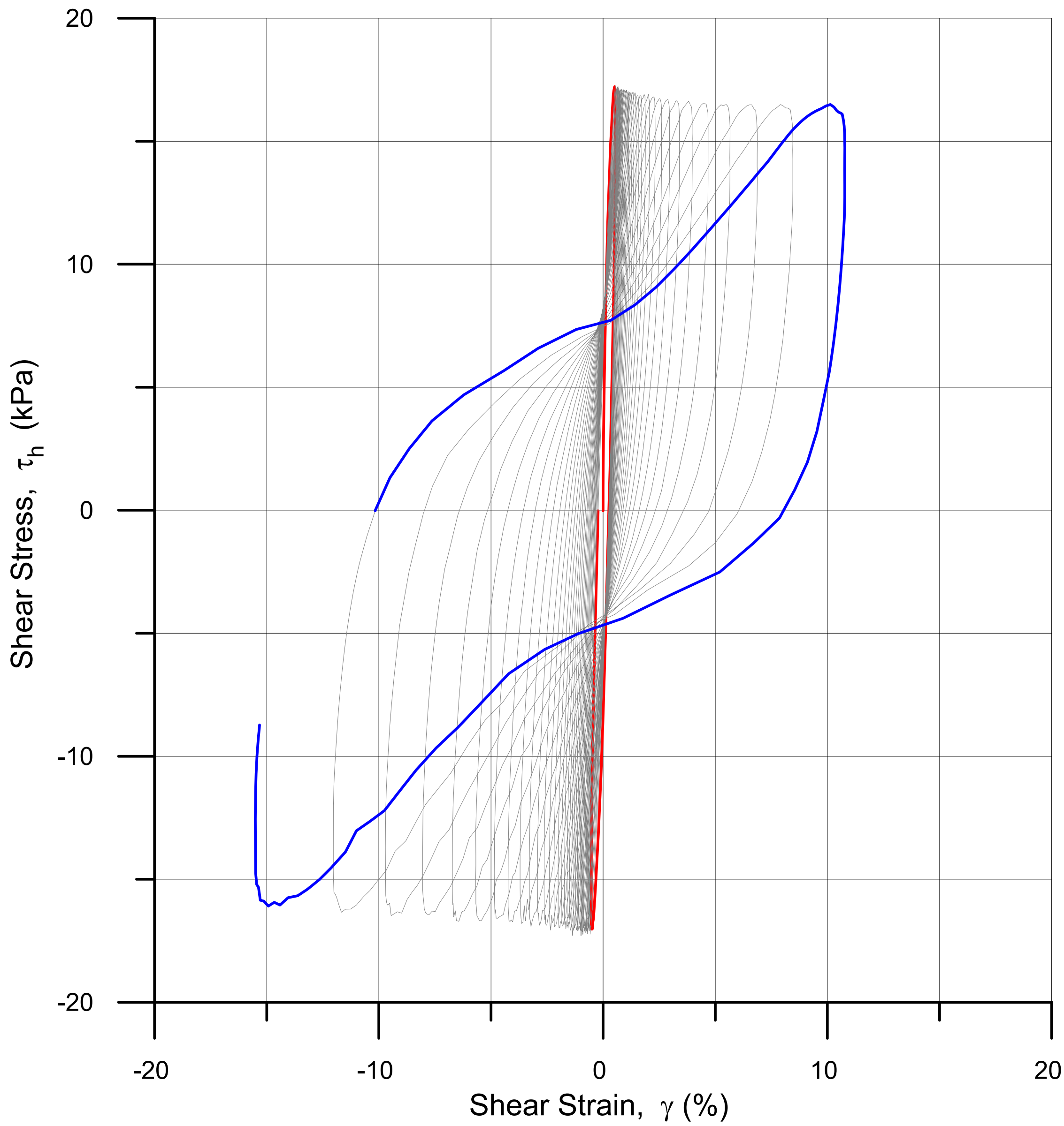
DSScy

Boring:	ONSB03	Depth	=	12.34	m	Consolidation stresses			
Tube:	54tube2016	p_o'	=	81.2	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	45.4	%	σ_{ac}' =			81.2
Test:	DSScy1	w_c	=	44.1	%	τ_c =			



Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Direct Simple Shear Test			Figure No. 5.4.42
Boring: **ONSB03**	Depth = **12.38** m	Consolidation stresses	Date 2018-11-29 / Drawn by/checked JLa / MAS
Tube: **54tube2016**	p_o' = **81.4** kPa	(kPa) max. min. final	
Part: **1**	w_i = **45.2** %	σ_{ac}' = 81.4 - **81.4**	
Test: **DSScy2**	γ_i = **17.31** kN/m³	τ_c' = - - **-**	



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.43, ncy1579_Tau_vs_GammaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-06-23

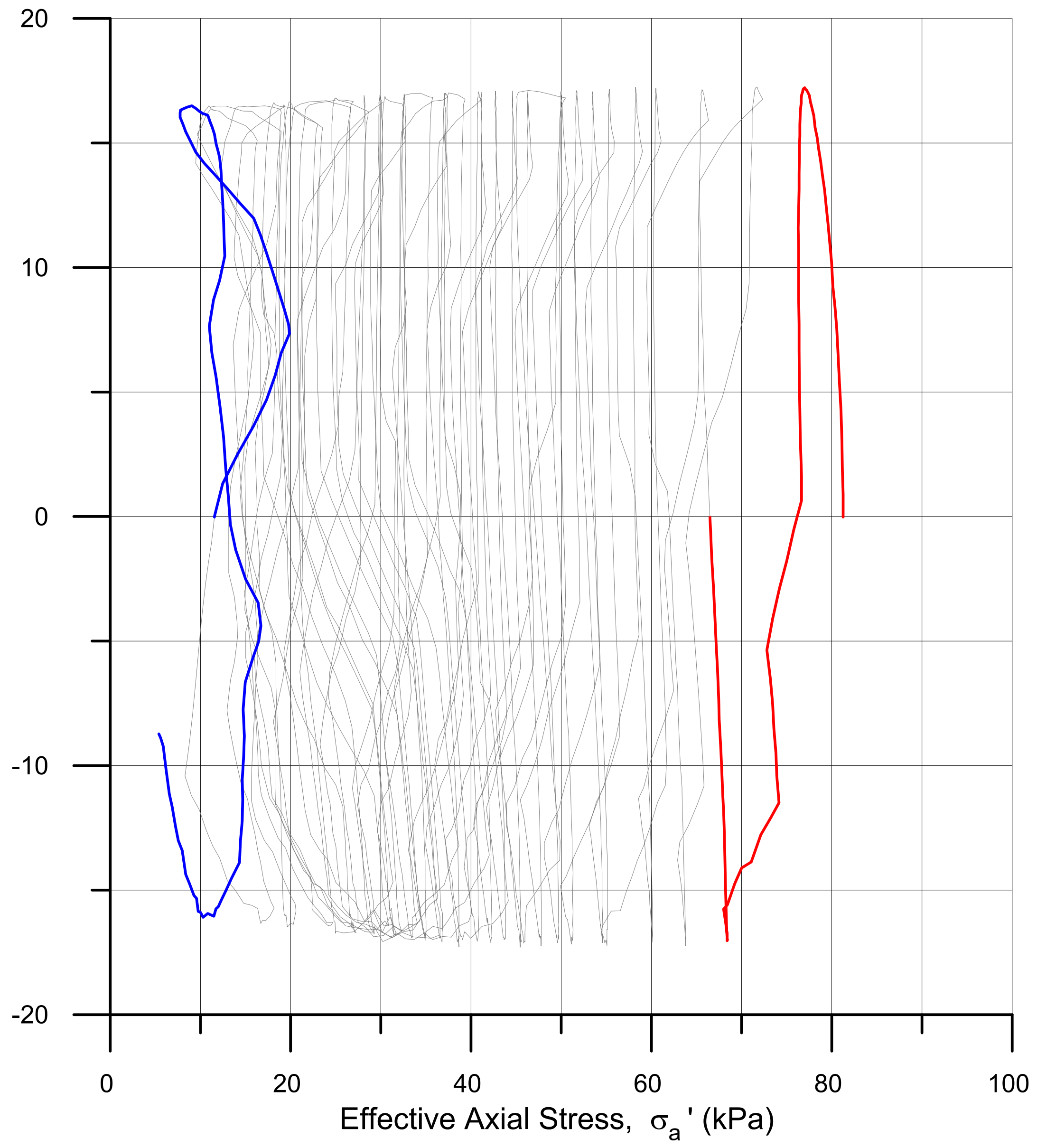
Figure No. 5.4.43

Drawn by

DSScy

Boring:	ONSB03	Depth	=	12.38	m		Consolidation stresses			
Tube:	54tube2016	p_0'	=	81.4	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	45.2	%	σ_{ac}' =			81.4
Test:	DSScy2	w_c	=	44.3	%	τ_c =			

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.44, ncy1579_Tau_vs_SigmaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

DSScy									
Boring:	ONSB03	Depth	=	12.38	m	Consolidation stresses			
Tube:	54tube2016	p_o'	=	81.4	kPa	(kPa)	max.	min.	final
Part:	1	w_i	=	45.2	%	σ_{ac}' =			81.4
Test:	DSScy2	w_c	=	44.3	%	τ_c =			

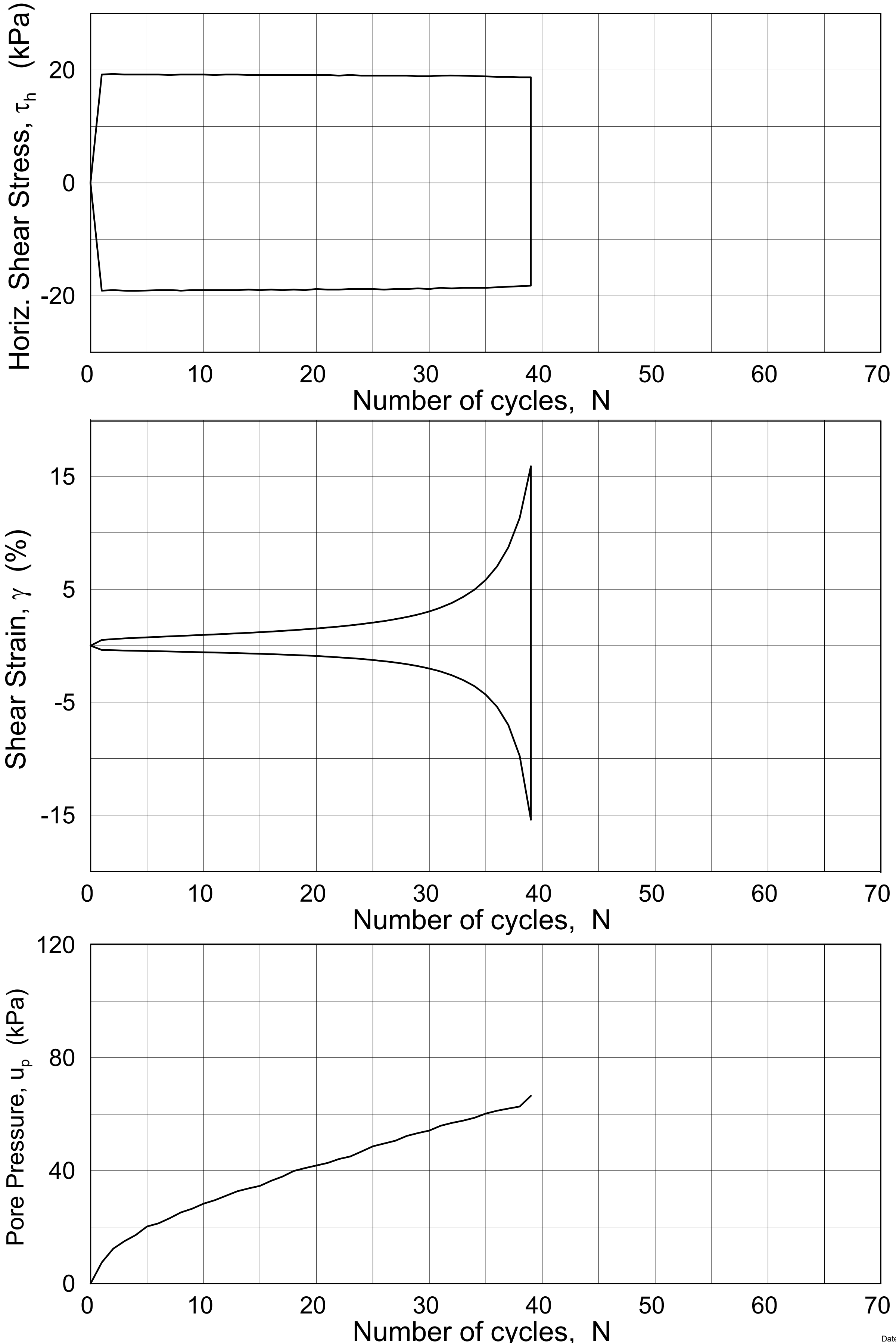
Document No. 20160154-10-R

Date 2016-06-23

Figure No. 5.4.44

Drawn by

NGI



Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

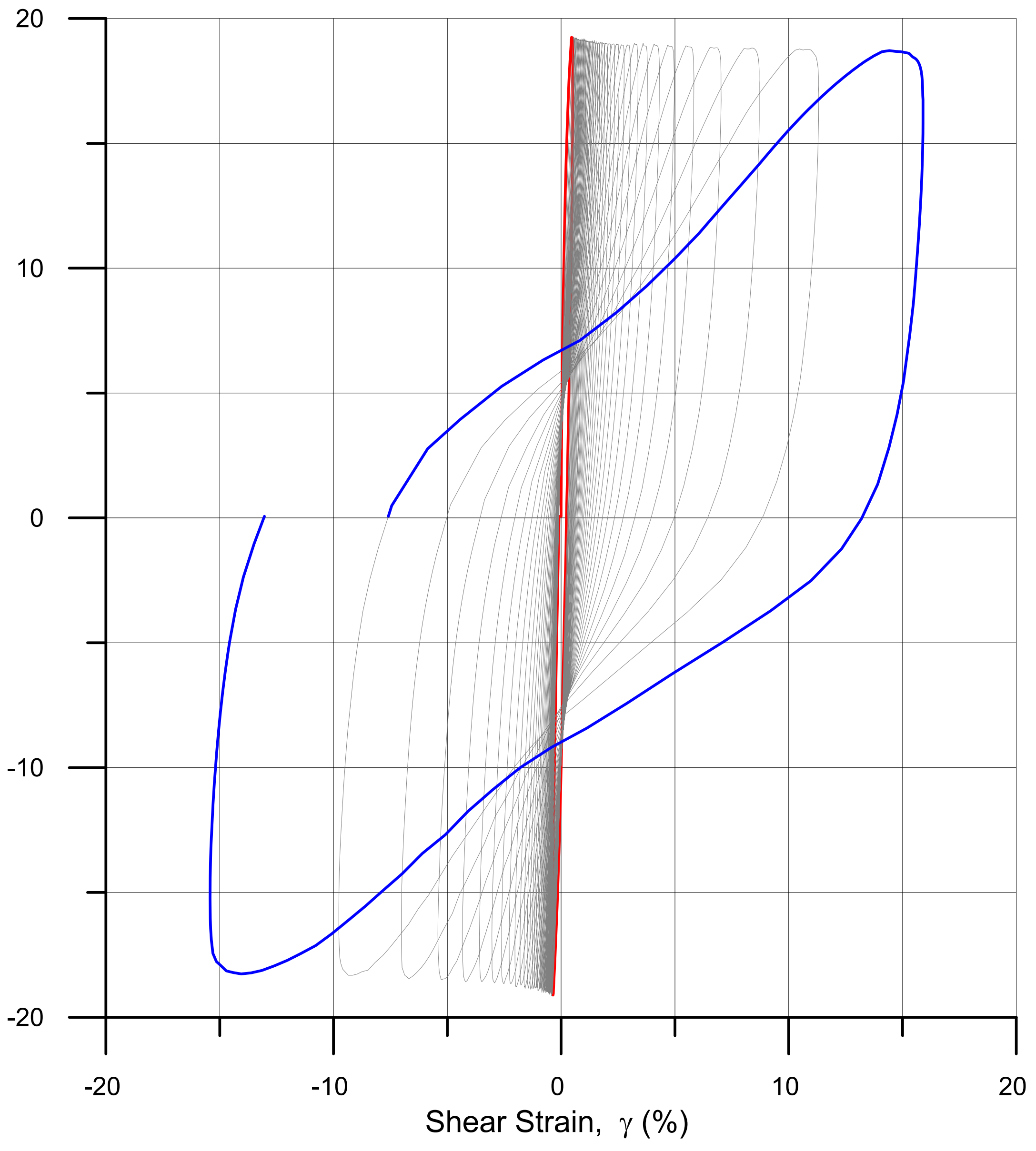
Direct Simple Shear Test

Figure No. 5.4.45

Boring: **ONSB01**	Depth =	**12.32**	m	Consolidation stresses				
Tube: **Block2016**	p_o' =	**80.9**	kPa	(kPa)	max.	min.	final	
Part: **2**	w_i =	**45.3**	%	σ_{ac}' =	80.9	-	**80.9**	
Test: **DSScy2**	γ_i =	**17.20**	kN/m³	τ_c' =	-	-	**-**	

Date: 2018-11-29

Drawn by/checked: JLa / MAS



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.46, ncy1581_Tau_vs_GammaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-06-23

Figure No. 5.4.46

Drawn by

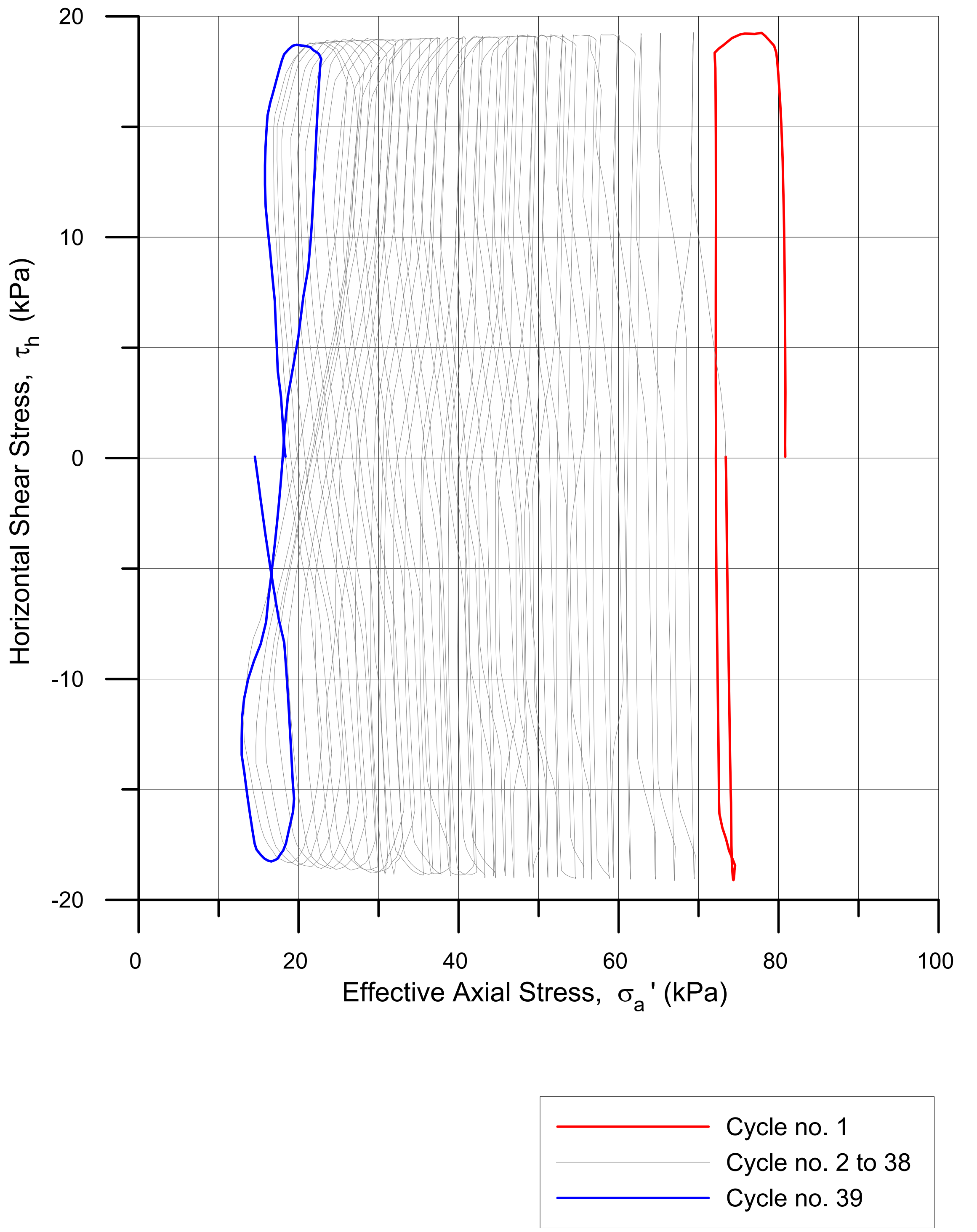
DSScy

Boring:	ONSB01	Depth =	12.32	m		
Tube:	Block2016	p_o' =	80.9	kPa		
Part:	2	w_i =	45.3	%		
Test:	DSScy2	w_c =	44.6	%		

Consolidation stresses

(kPa)	max.	min.	final
σ_{ac}' =			80.9
τ_c =			

NGI



Norwegian GeoTest Sites - Onsøy

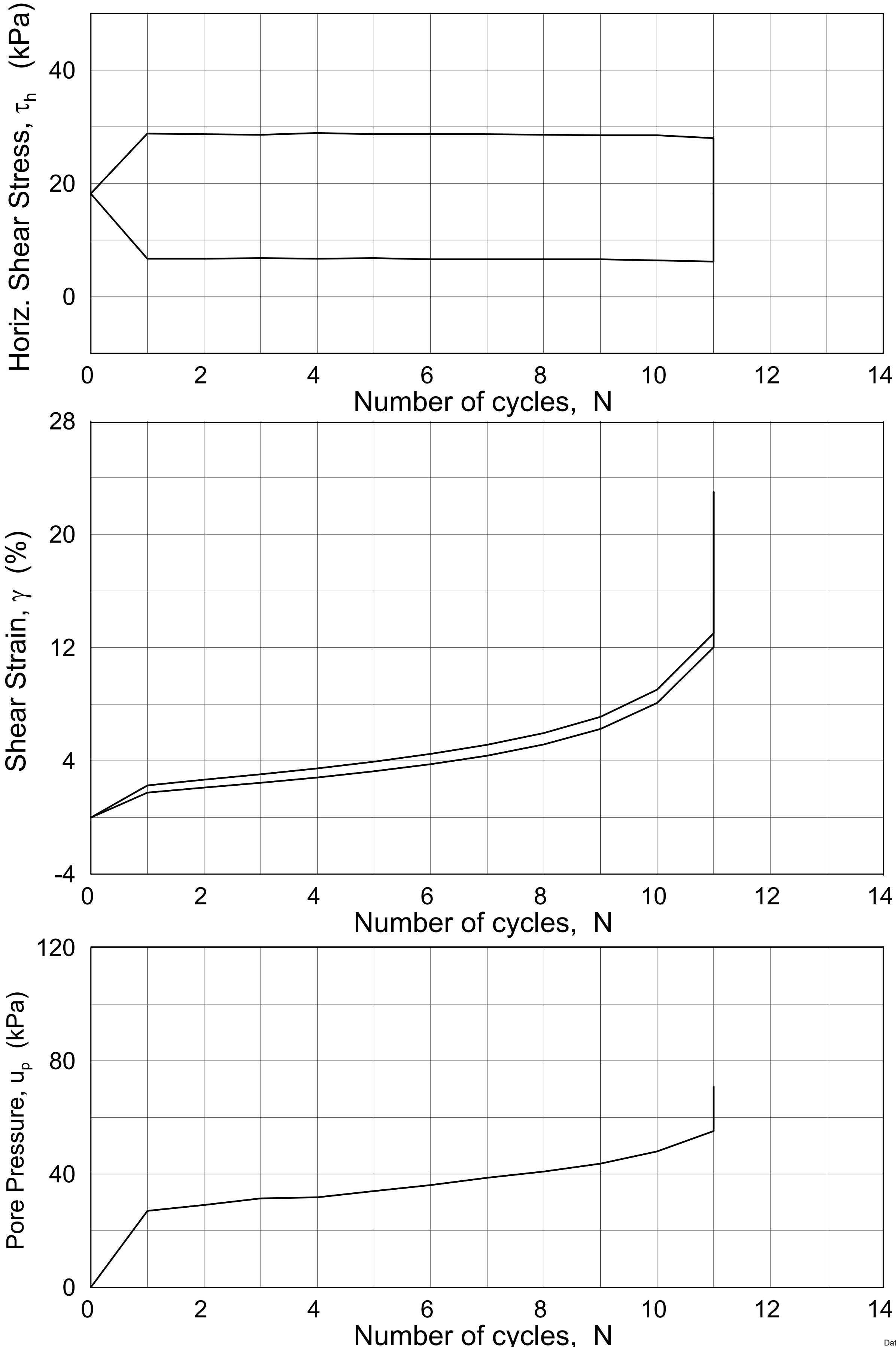
DSScy									
Boring:	ONSB01	Depth	=	12.32	m	Consolidation stresses			
Tube:	Block2016	p_o'	=	80.9	kPa	(kPa)	max.	min.	final
Part:	2	w_i	=	45.3	%	σ_{ac}' =			80.9
Test:	DSScy2	w_c	=	44.6	%	τ_c =			

Document No. 20160154-10-R

Date 2016-06-23

Figure No. 5.4.47

Drawn by



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Figure No\Fig 5.4.48, onsøy-block2016-2-dsscy1a(ncy1582).grf

Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Direct Simple Shear Test

Boring: **ONSB01**	Depth = **12.27** m	Consolidation stresses	
Tube: **Block2016**	p_o' = **80.6** kPa	(kPa) max. min. final	
Part: **2**	w_i = **46.3** %	σ_{ac}' = 80.6 - **80.6**	
Test: **DSScy1a**	γ_i = **17.30** kN/m³	τ_c' = - - **-**	

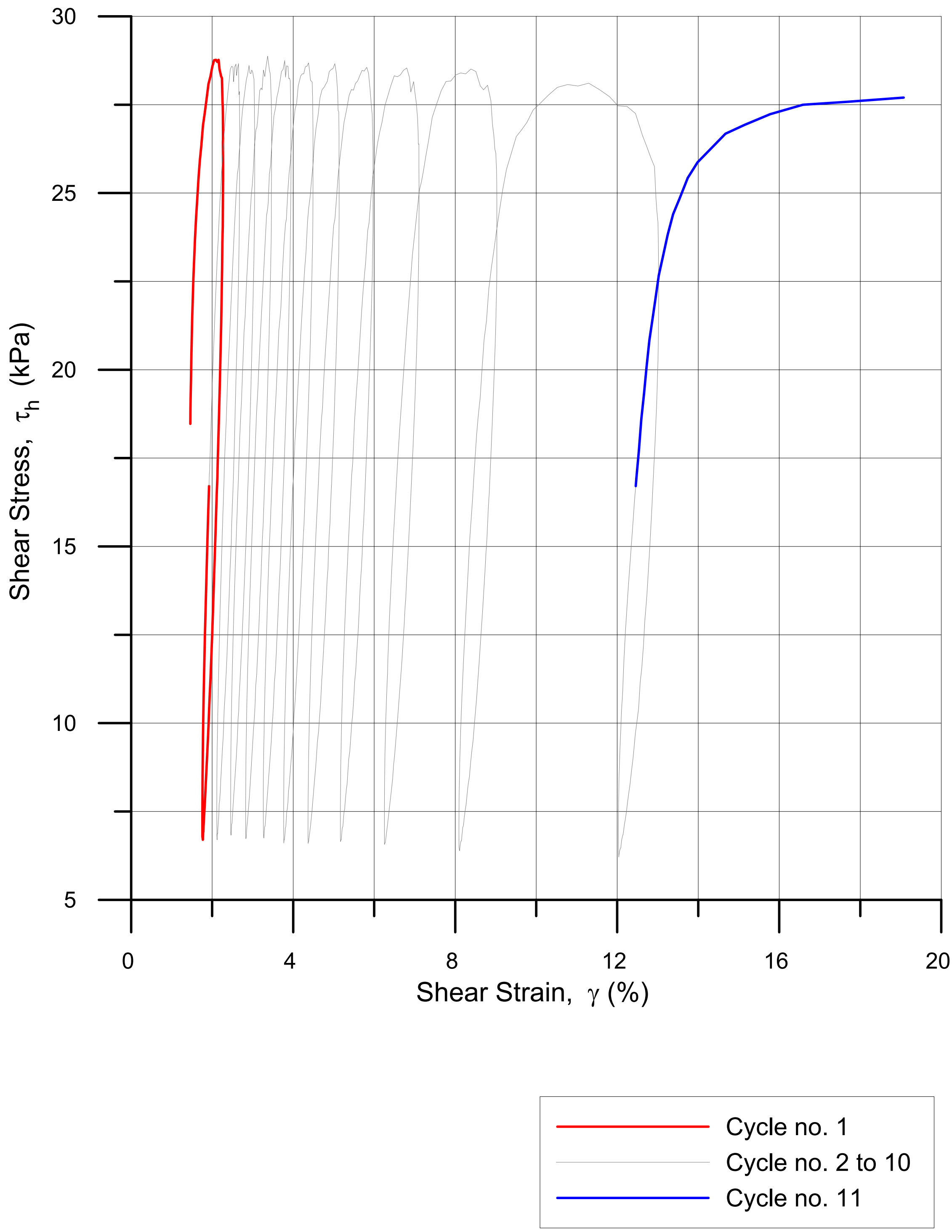
Document No. 20160154-10-R

Figure No. 5.4.48

Date 2018-11-29

Drawn by/checked JLa / MAS

NGI



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.49, ncy1582_Tau_vs_GammaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

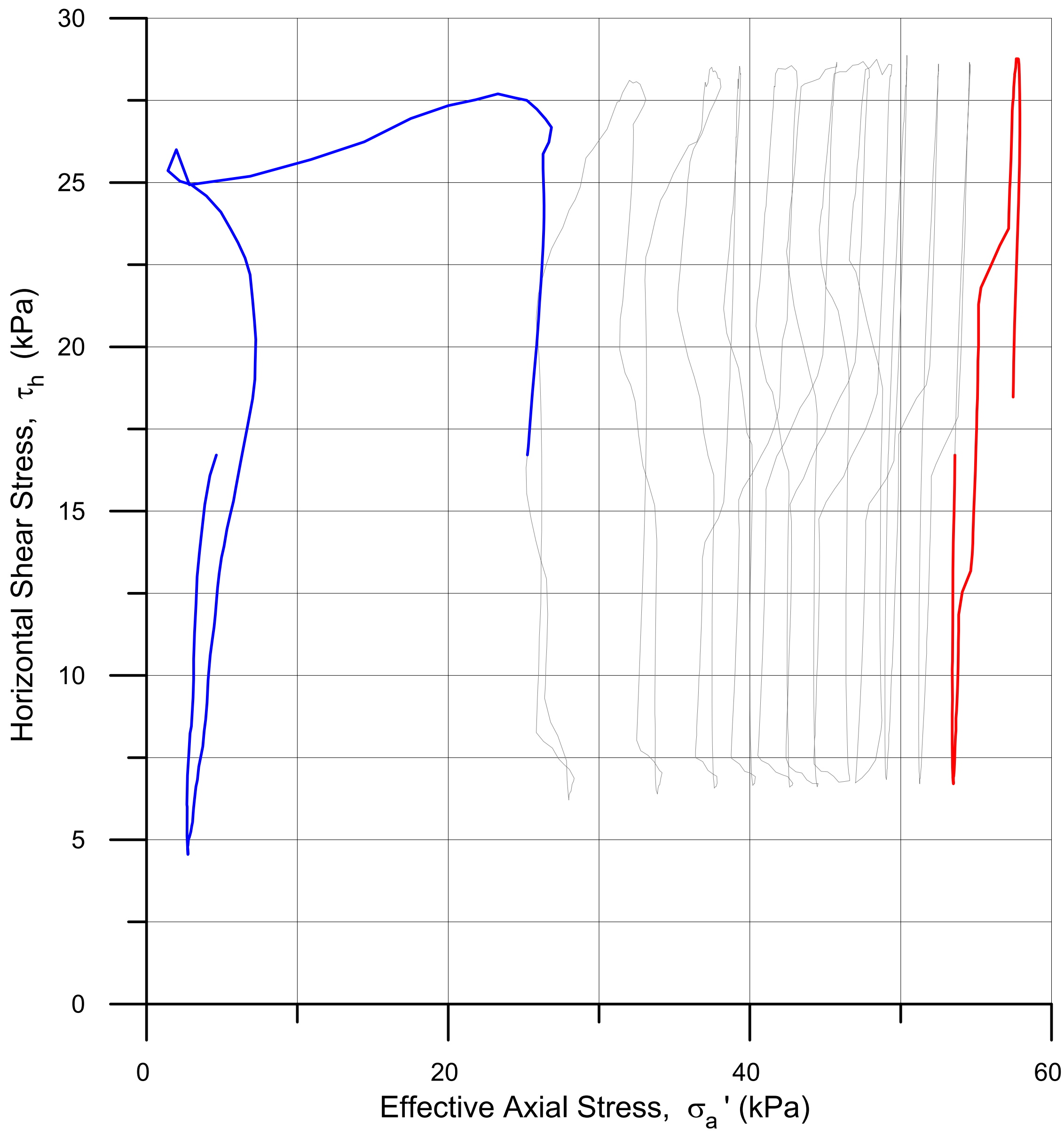
Date 2016-06-23

Figure No. 5.4.49

Drawn by

DSScy

Boring:	ONSB01	Depth =	12.27	m	Consolidation stresses			
Tube:	Block2016	p_o' =	80.6	kPa	(kPa)	max.	min.	final
Part:	2	w_i =	46.3	%	σ_{ac}' =			80.6
Test:	DSScy1a	w_c =	45.6	%	τ_c =			



P:\2016\01\20160154\Leveransedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\All\Kildefiler\DSS\Fig 5.4.50, ncy1582_Tau_vs_SigmaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy

DSScy										Document No. 20160154-10-R
						Consolidation stresses				Date 2016-06-23
Boring:	ONSB01	Depth	=	12.27	m	(kPa)	max.	min.	final	Figure No. 5.4.50
Tube:	Block2016	p_o'	=	80.6	kPa	σ_{ac}' =			80.6	Drawn by
Part:	2	w_i	=	46.3	%	τ_c =				
Test:	DSScy1a	w_c	=	45.6	%					

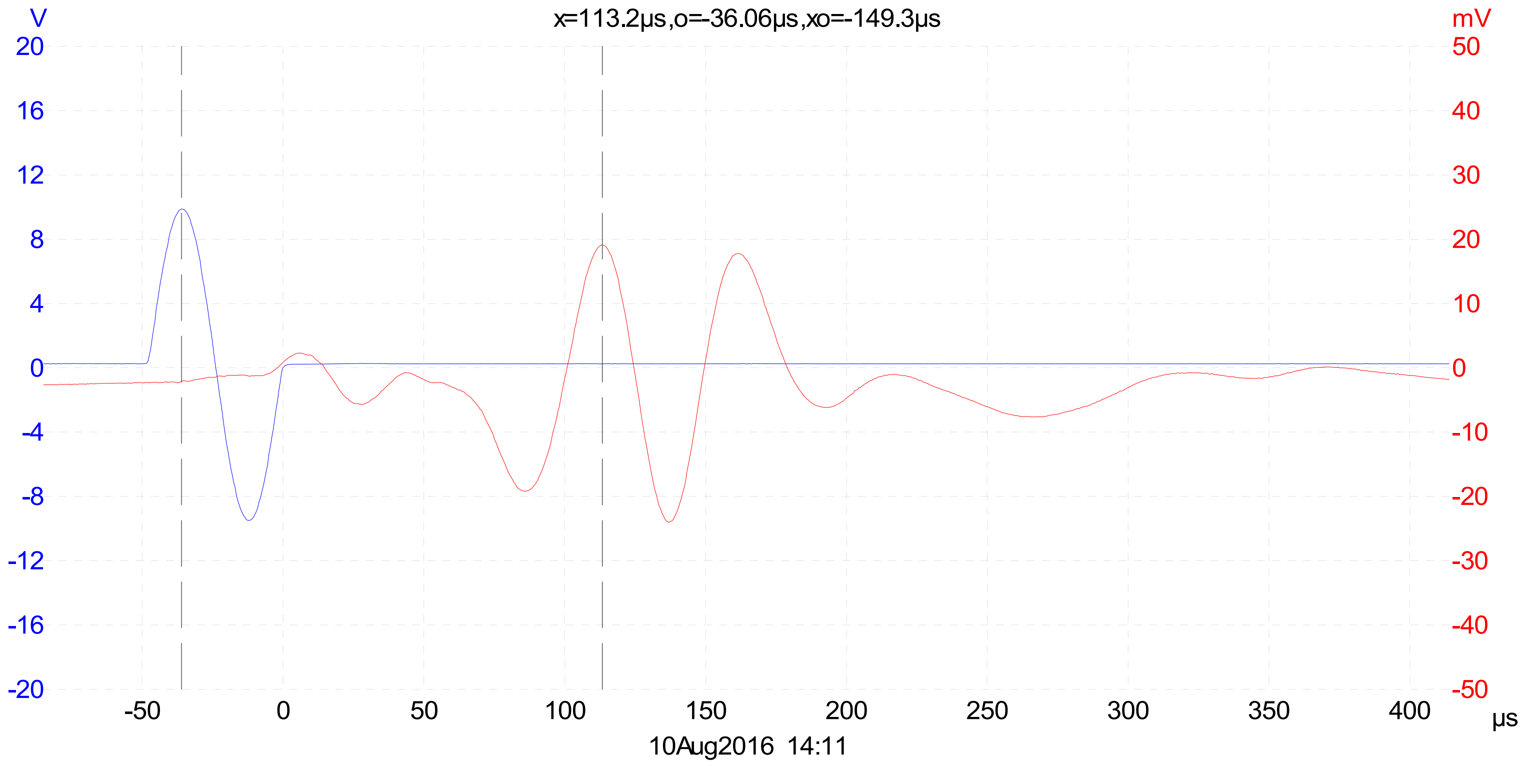
NGI

Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB01
Tube	1
Part	A
Test	2

Figure 5.5.1

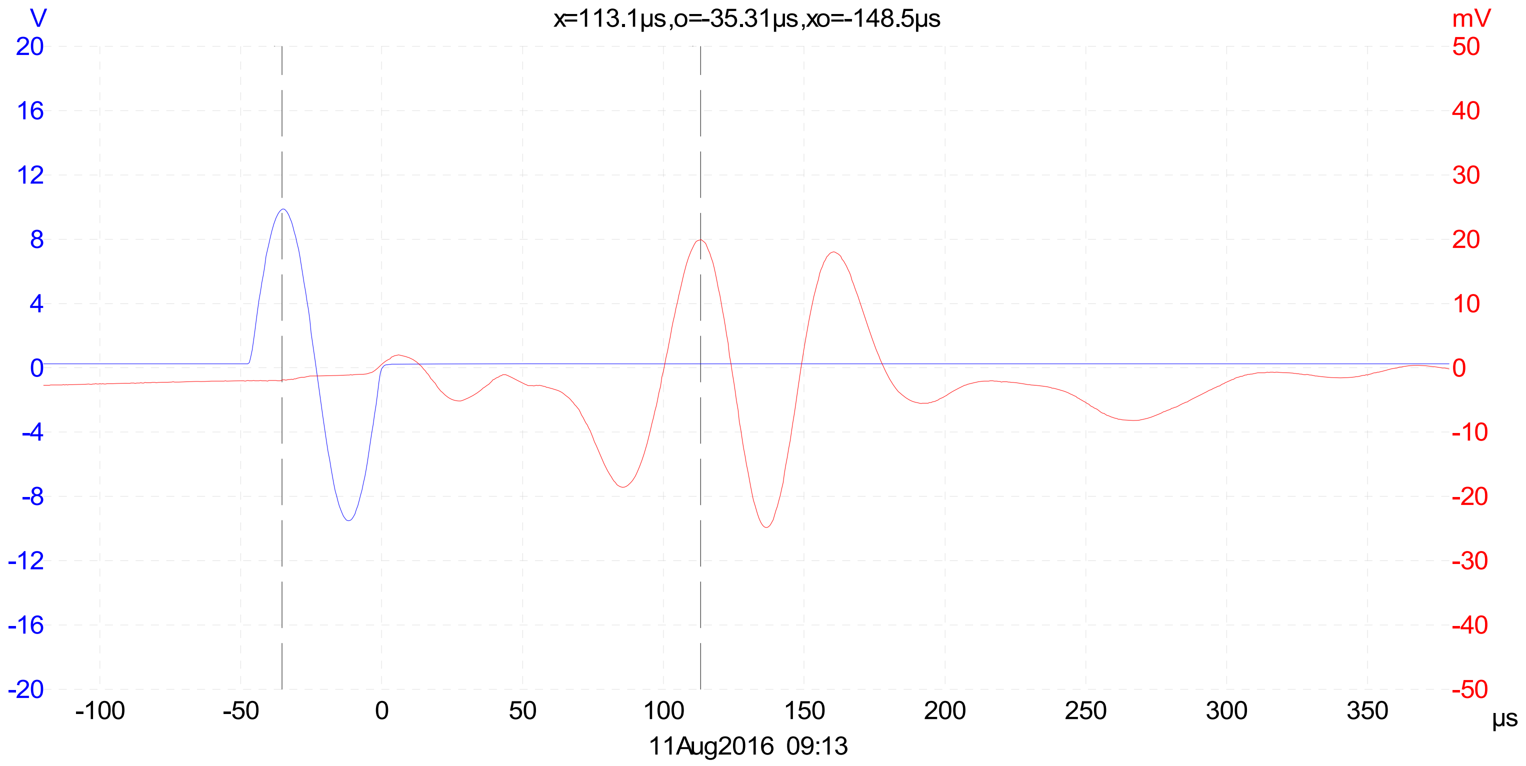


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB01
Tube	1
Part	A
Test	2

Figure 5.5.2

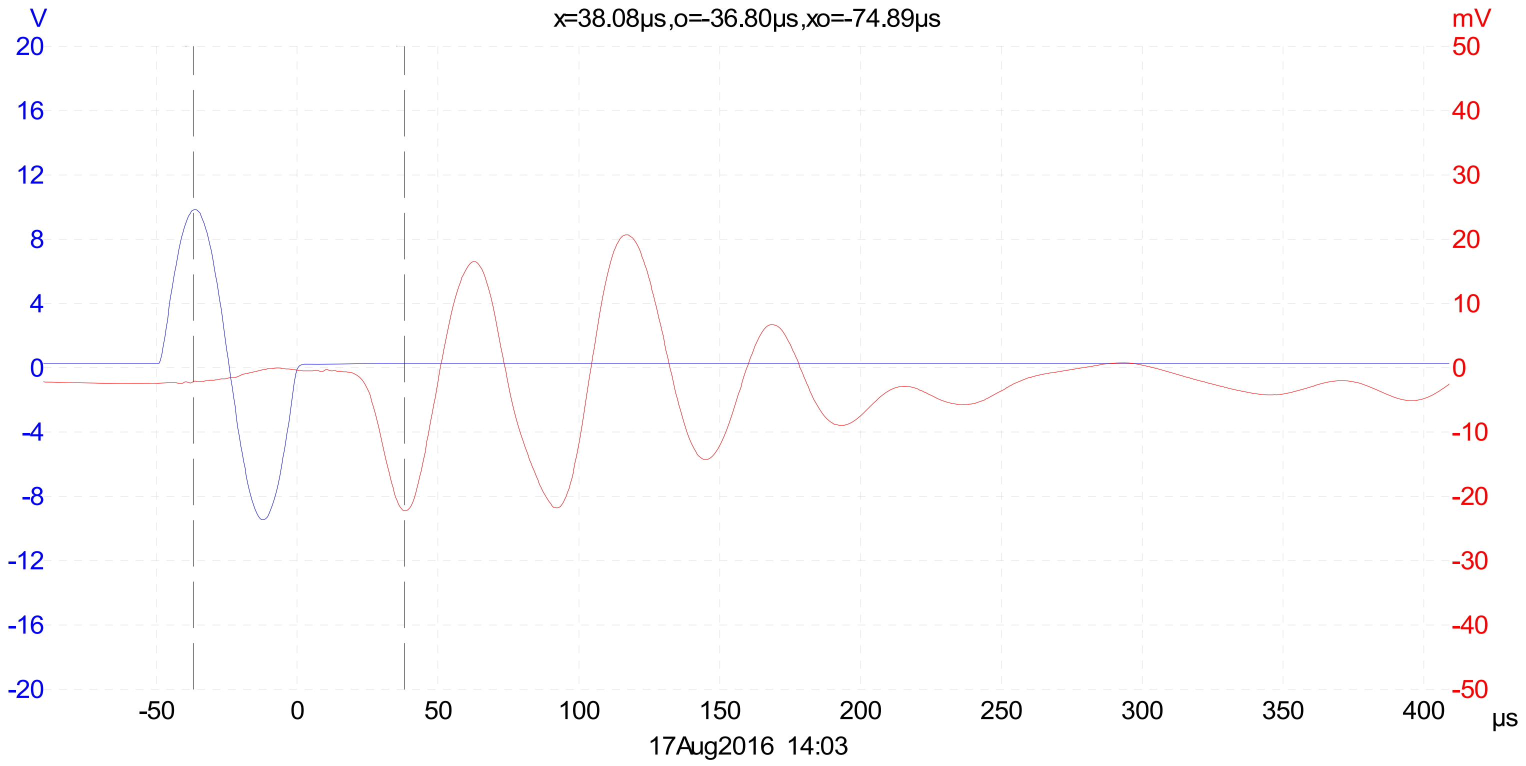


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB01
Tube	4
Part	A
Test	2

Figure 5.5.3

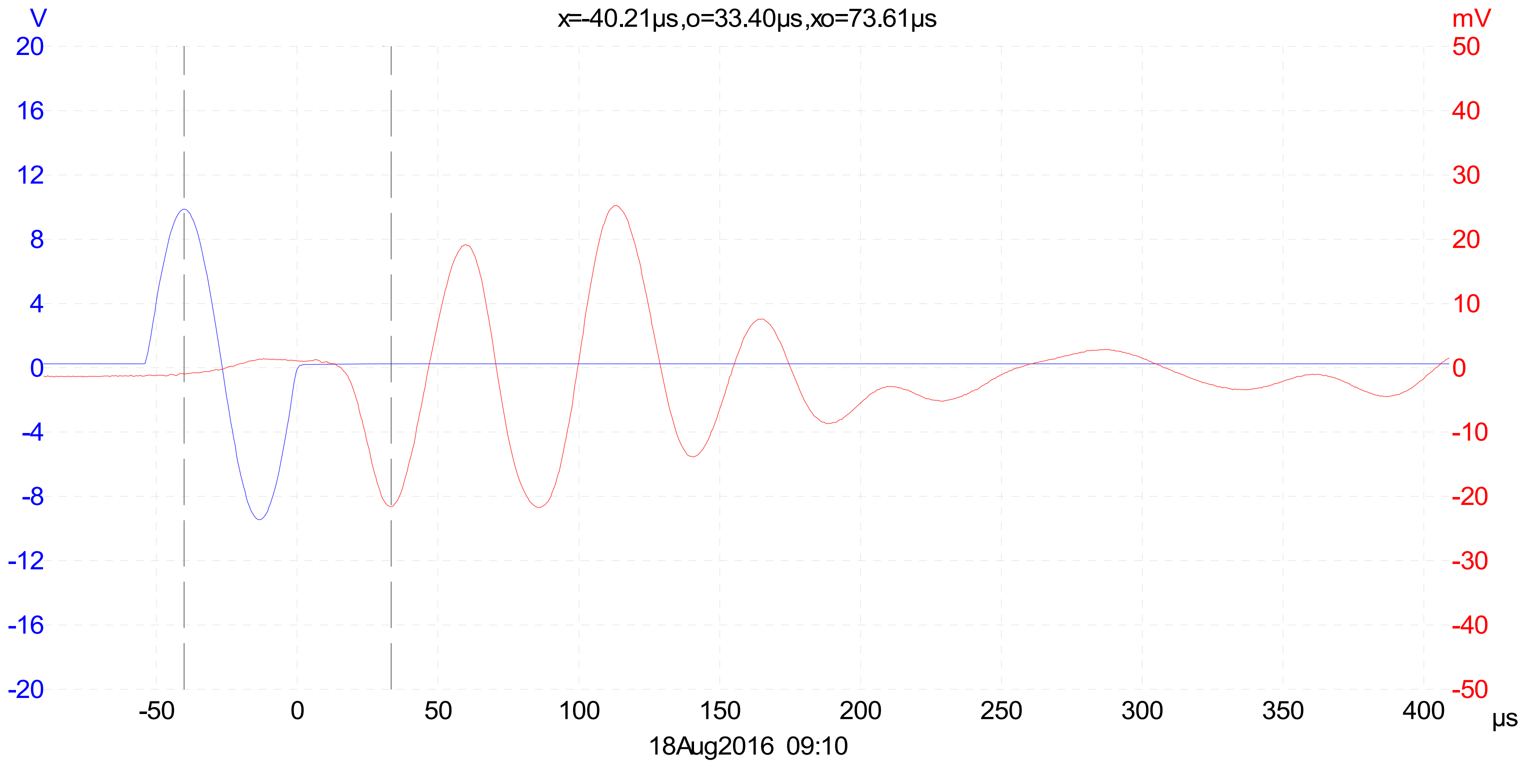


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB01
Tube	4
Part	A
Test	2

Figure 5.5.4

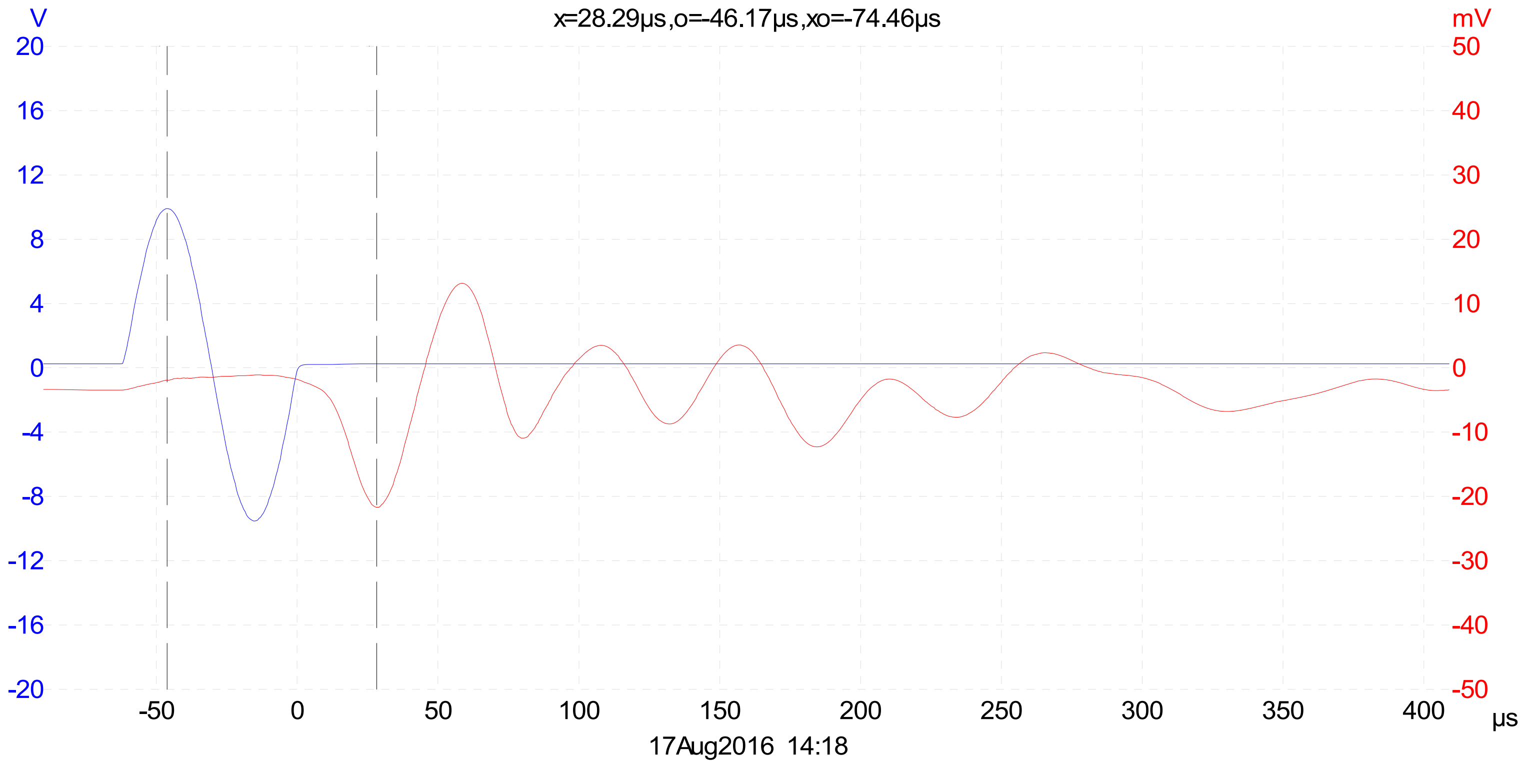


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB01
Tube	5
Part	A
Test	2

Figure 5.5.5

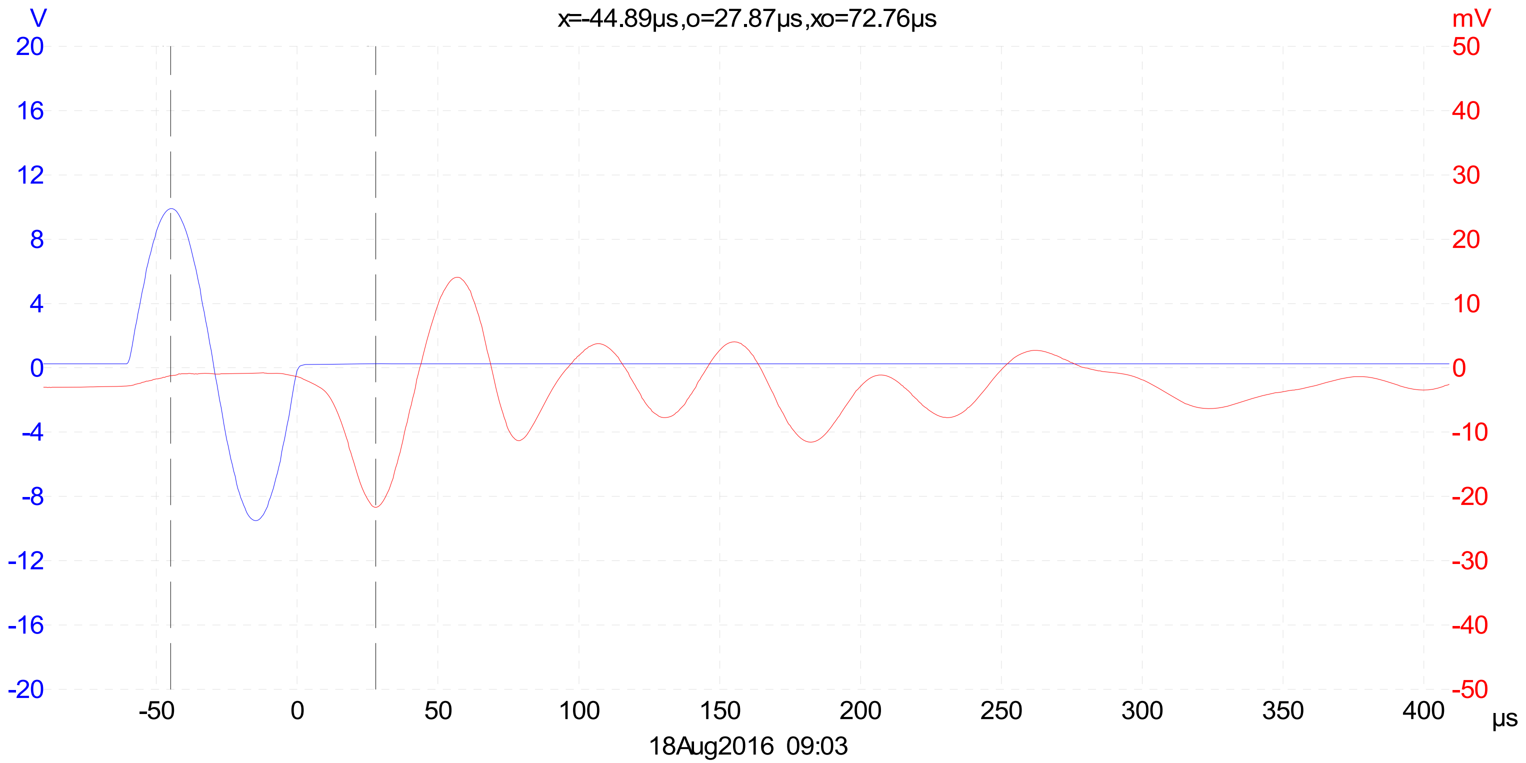


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB01
Tube	5
Part	A
Test	2

Figure 5.5.6

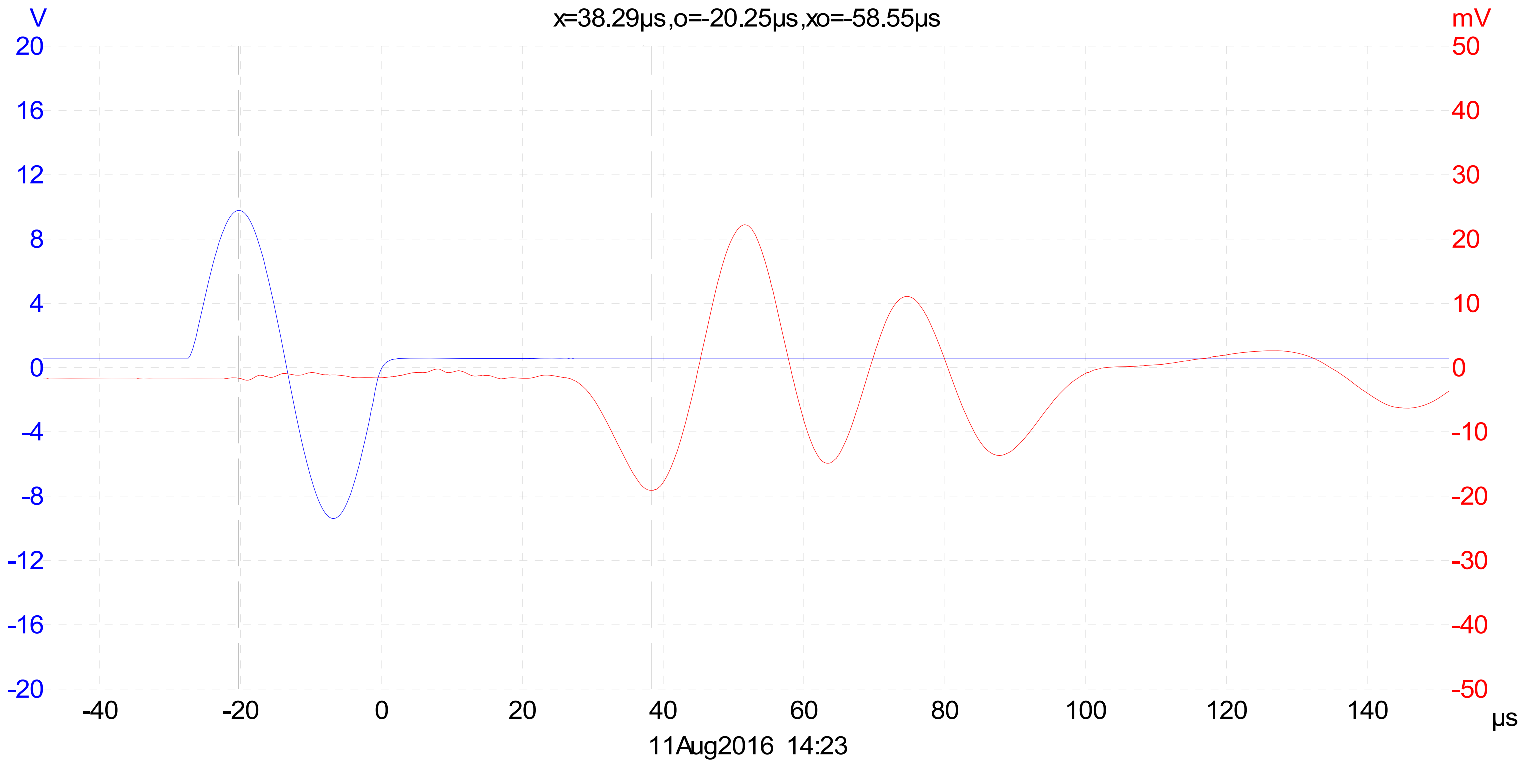


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB01
Tube	6
Part	A
Test	2

Figure 5.5.7

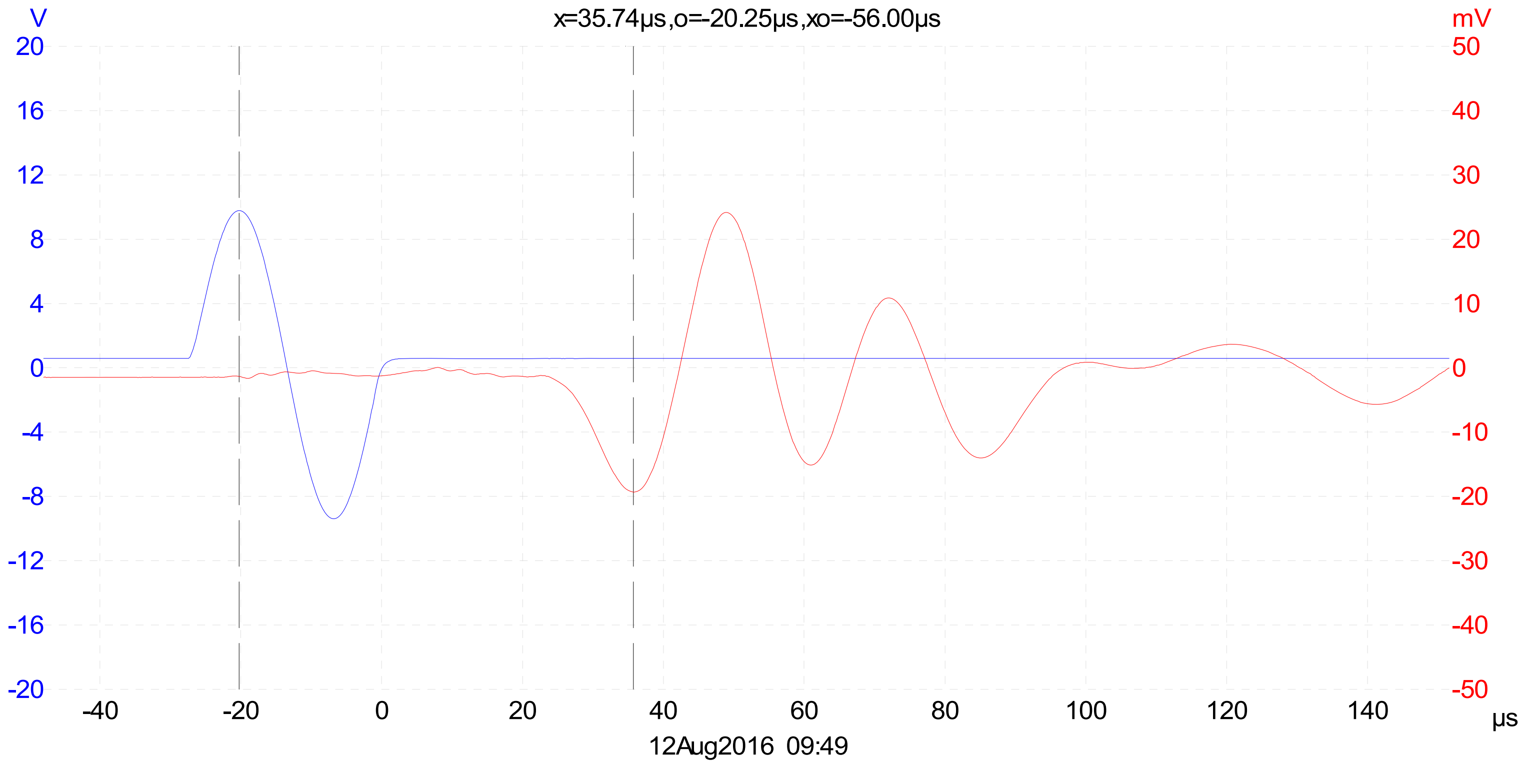


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB01
Tube	6
Part	A
Test	2

Figure 5.5.8

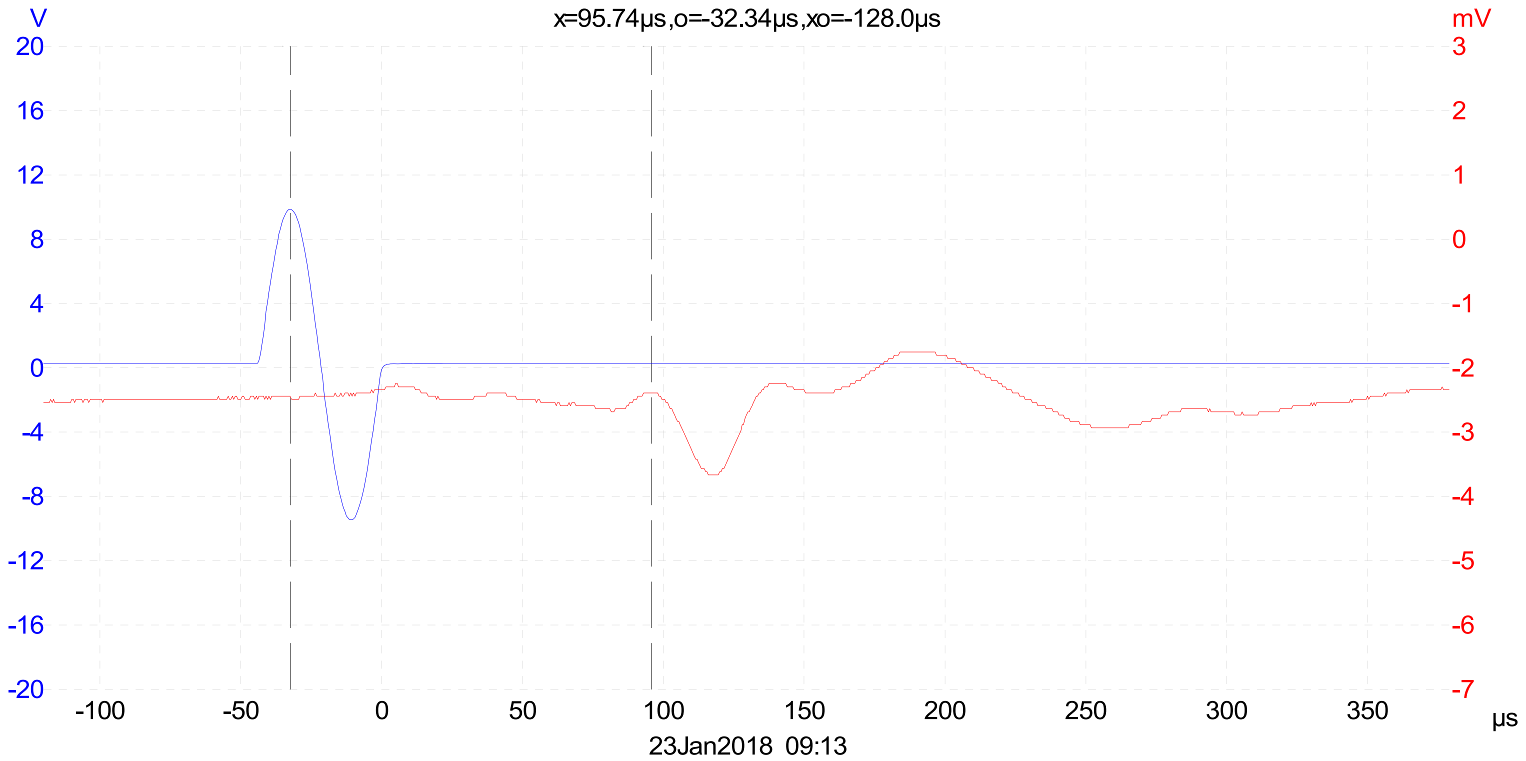


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	4
Part	A
Test	1

Figure 5.5.9

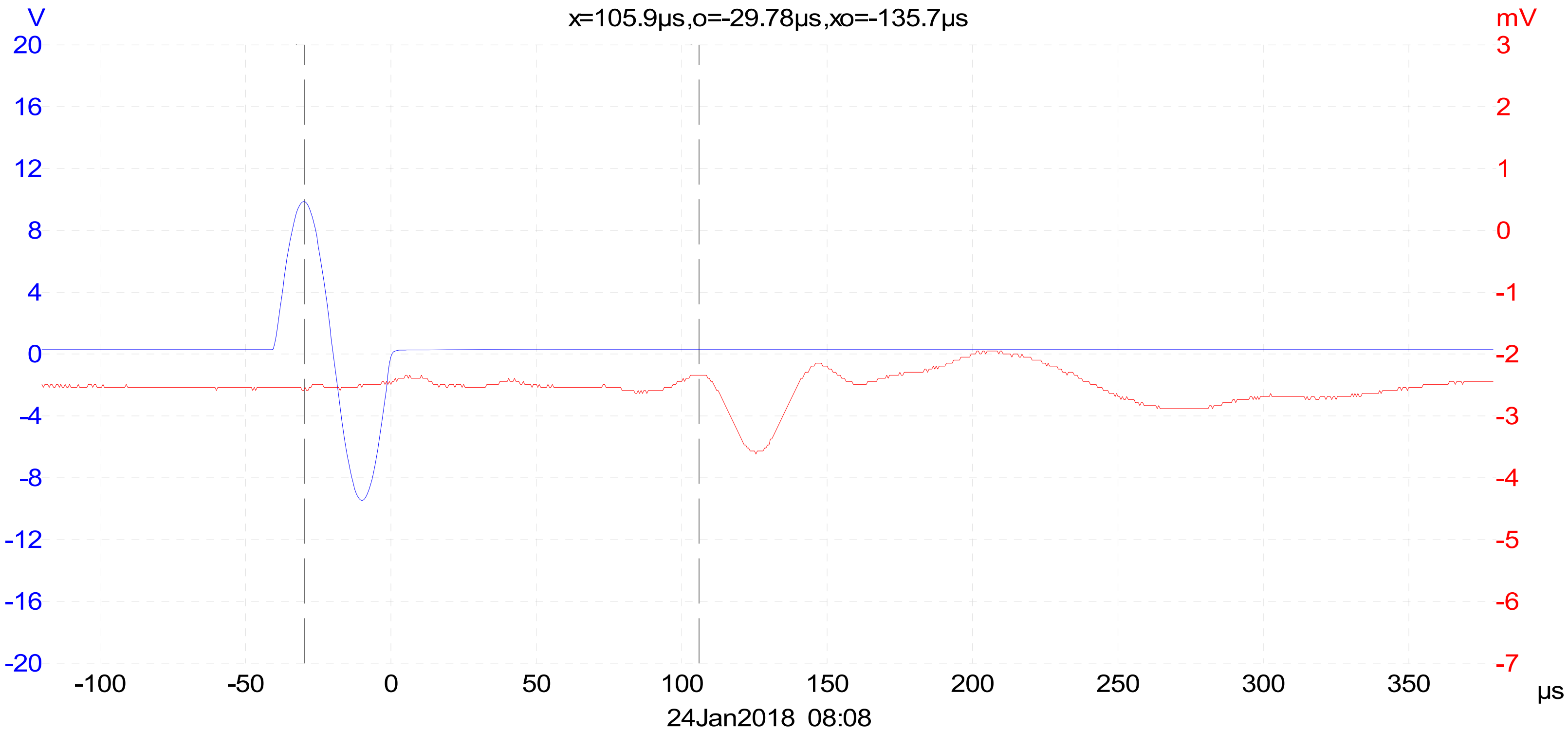


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	4
Part	A
Test	1

Figure 5.5.10

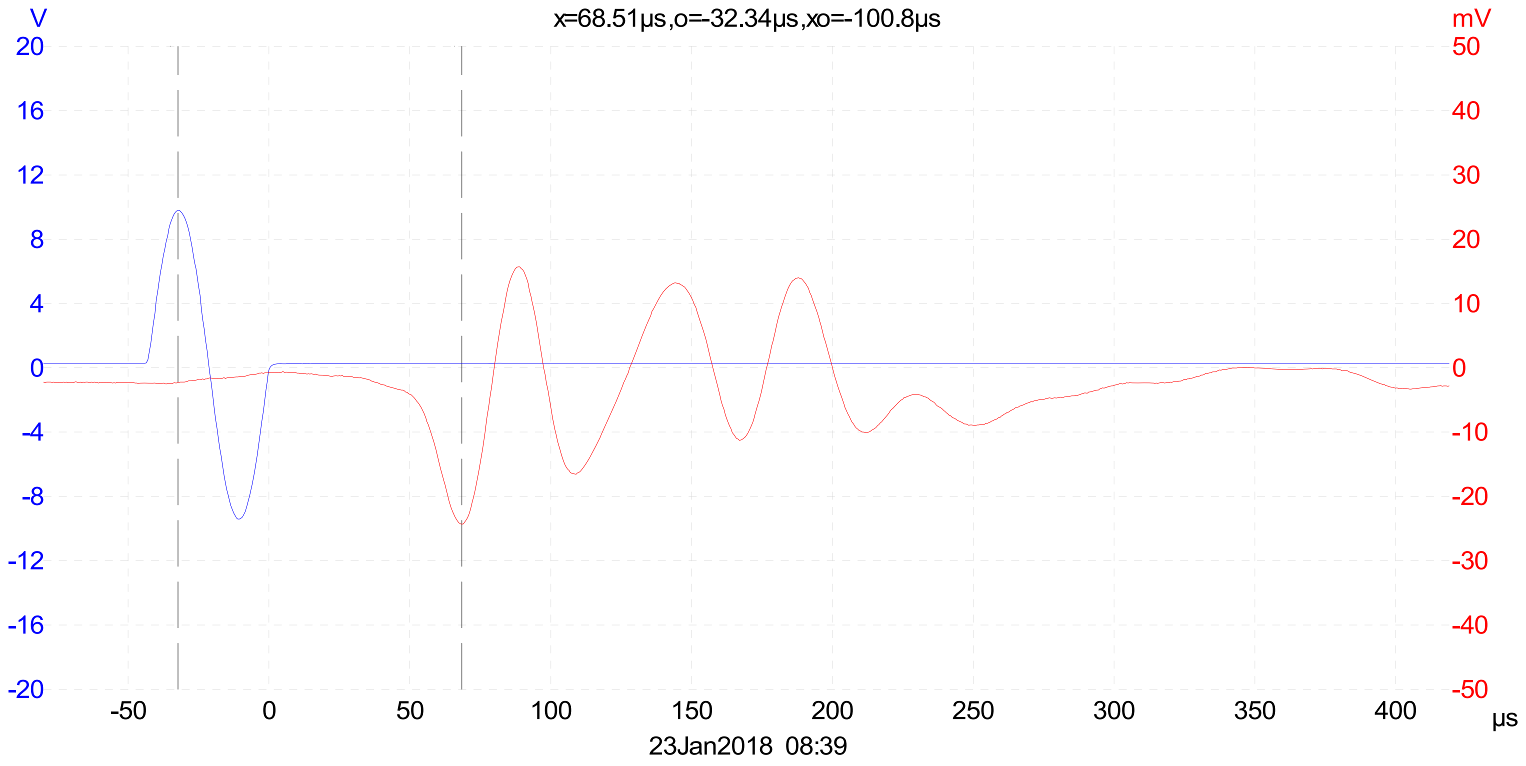


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	6
Part	C
Test	1

Figure 5.5.11

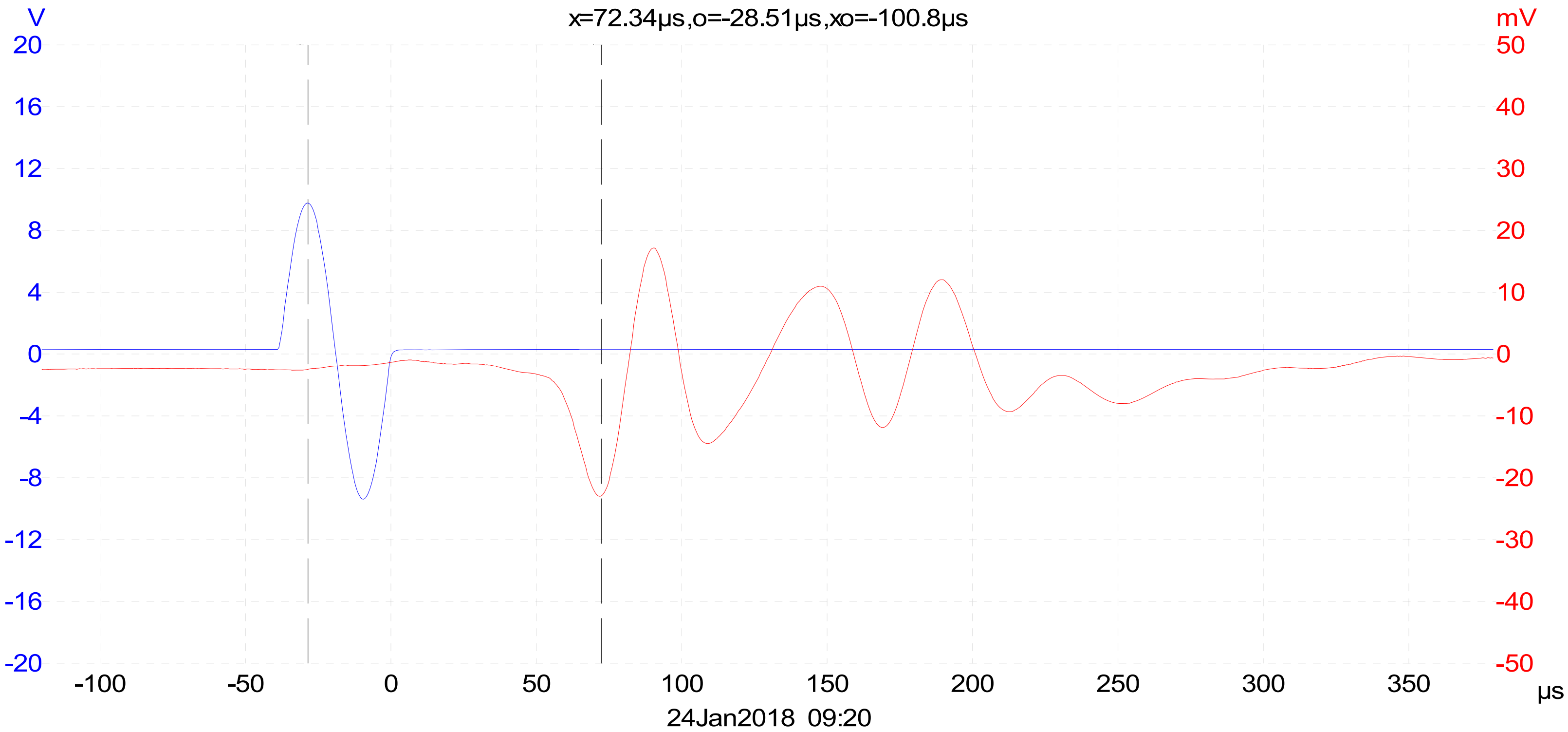


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	6
Part	C
Test	1

Figure 5.5.12

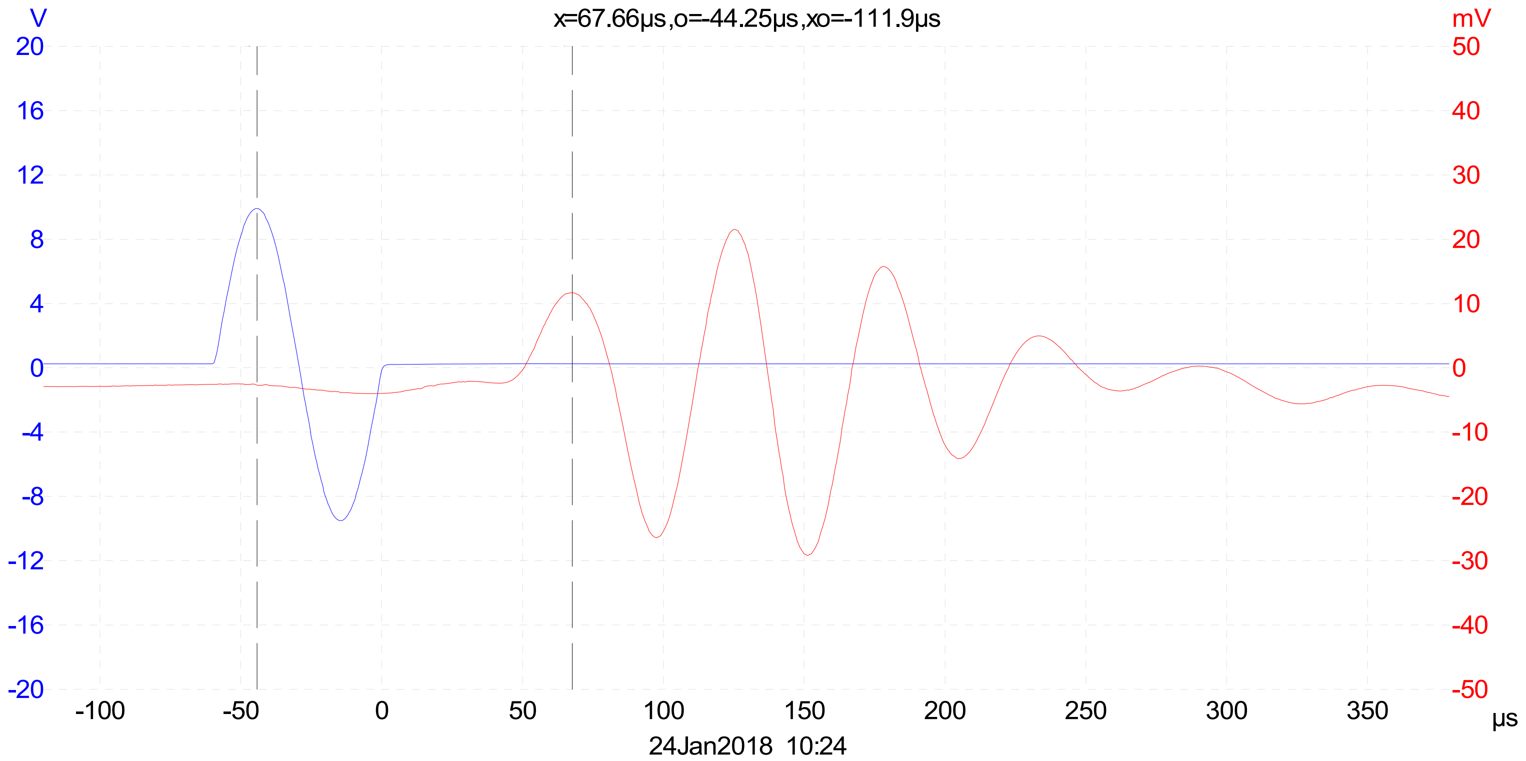


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	8
Part	A
Test	1

Figure 5.5.13

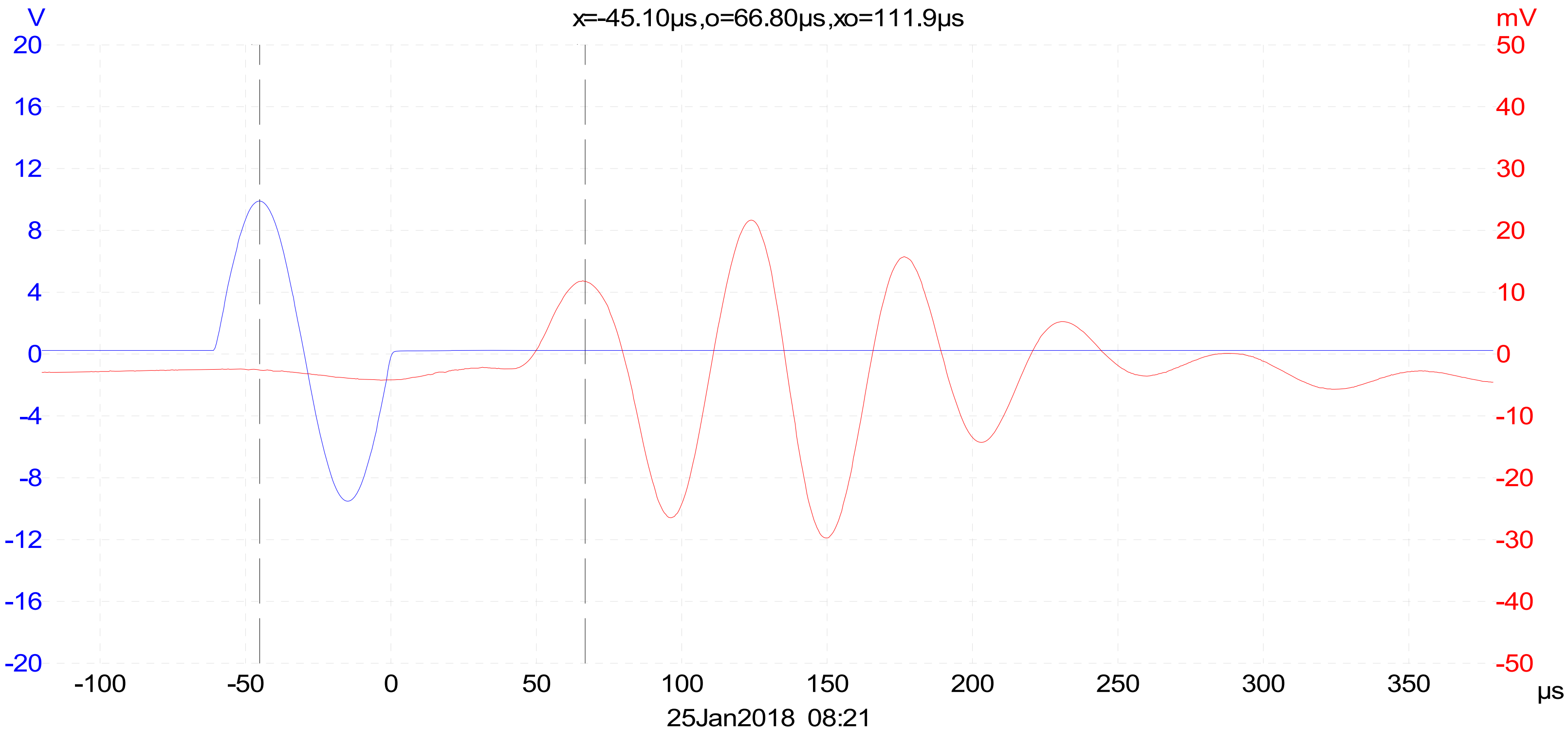


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	8
Part	A
Test	1

Figure 5.5.14

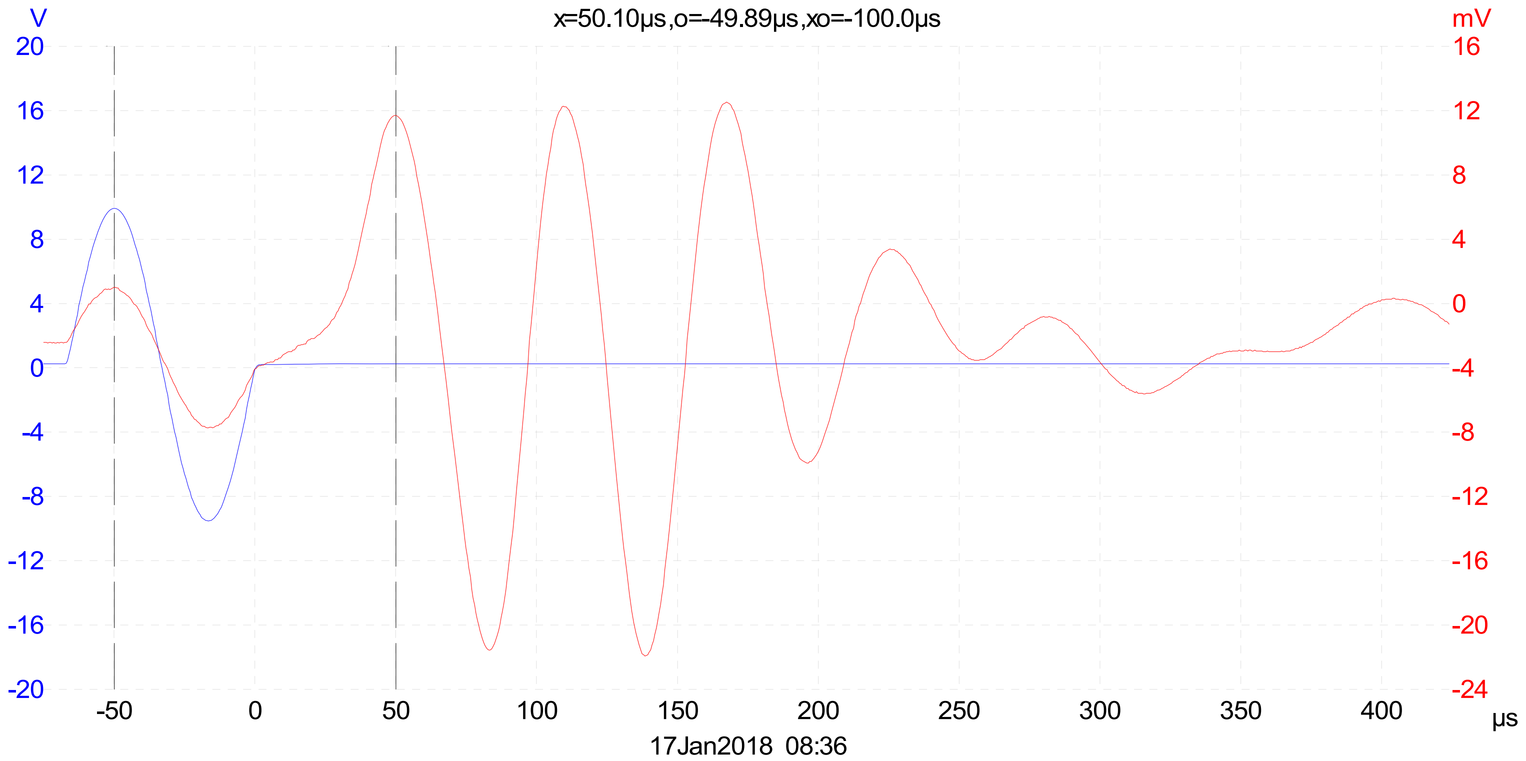


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	10
Part	C
Test	1

Figure 5.5.15

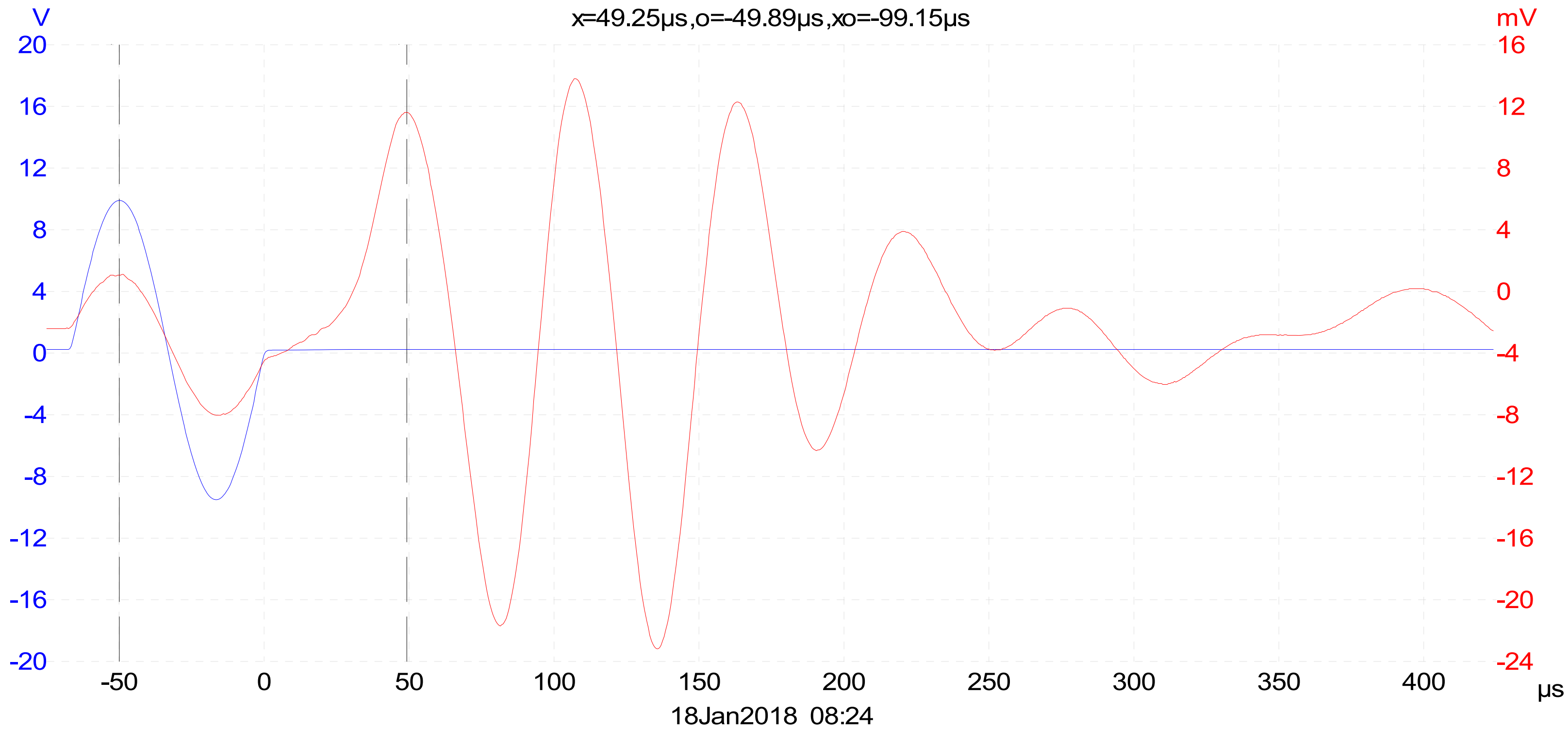


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	10
Part	C
Test	1

Figure 5.5.16

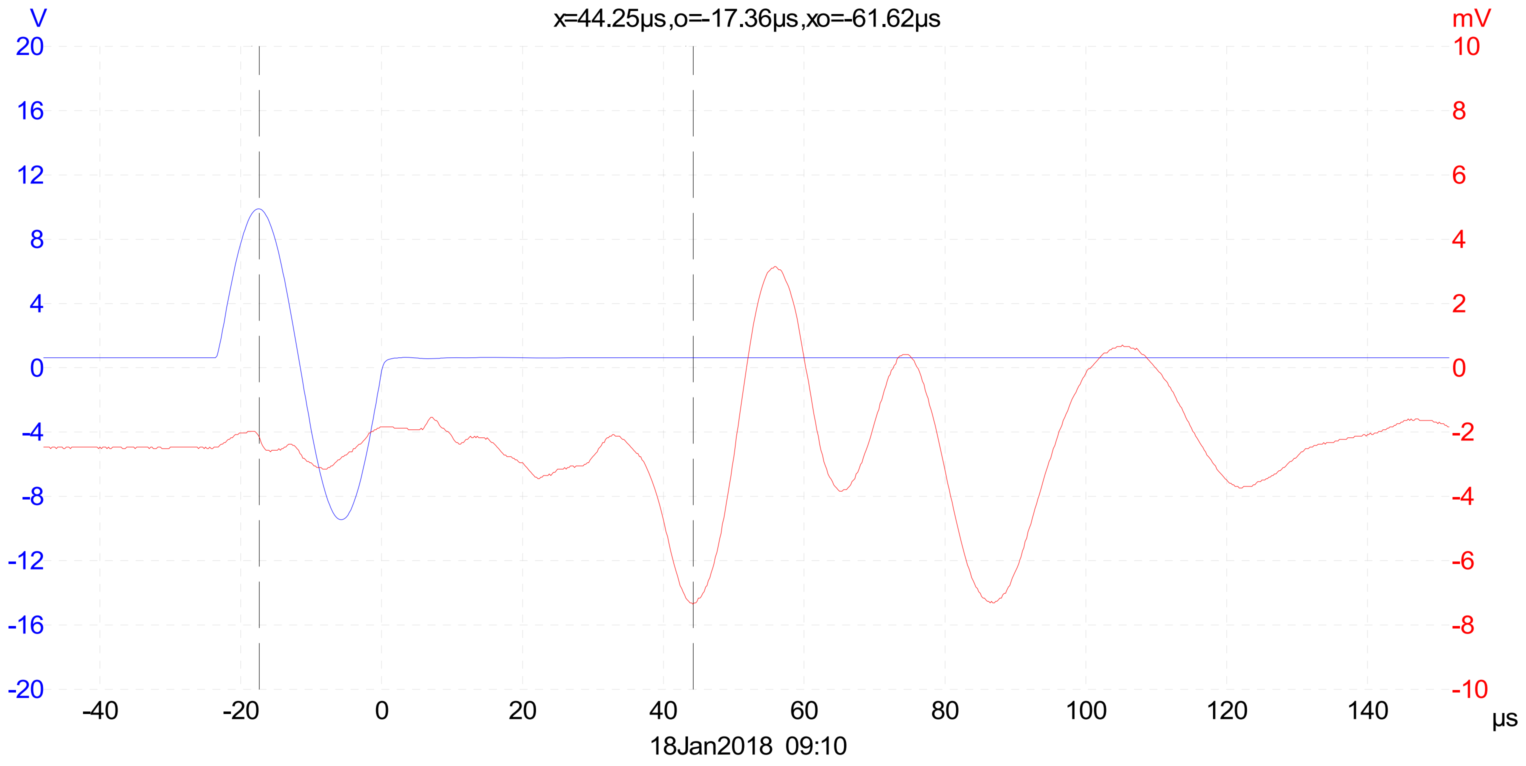


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	12
Part	A
Test	1

Figure 5.5.17

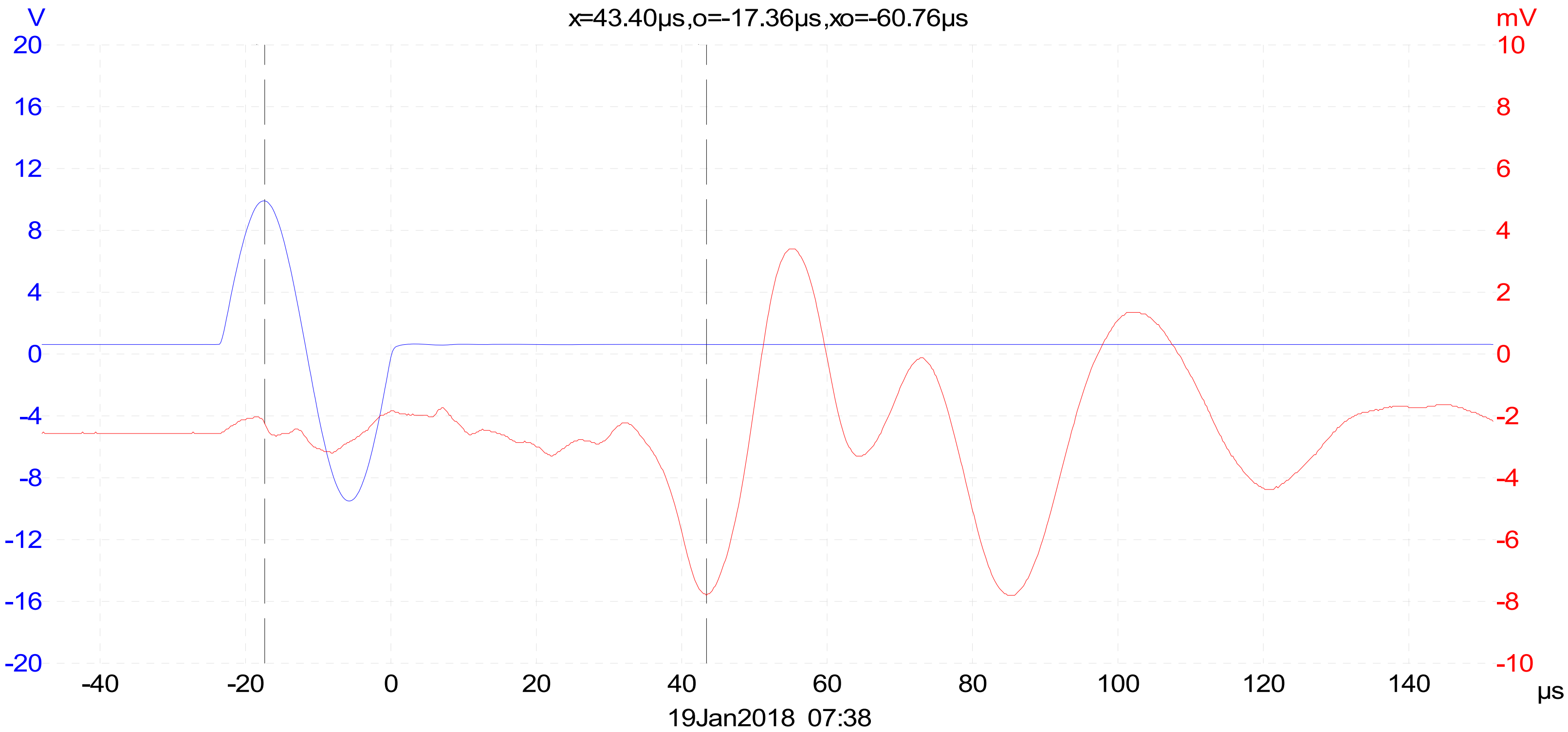


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	12
Part	A
Test	1

Figure 5.5.18

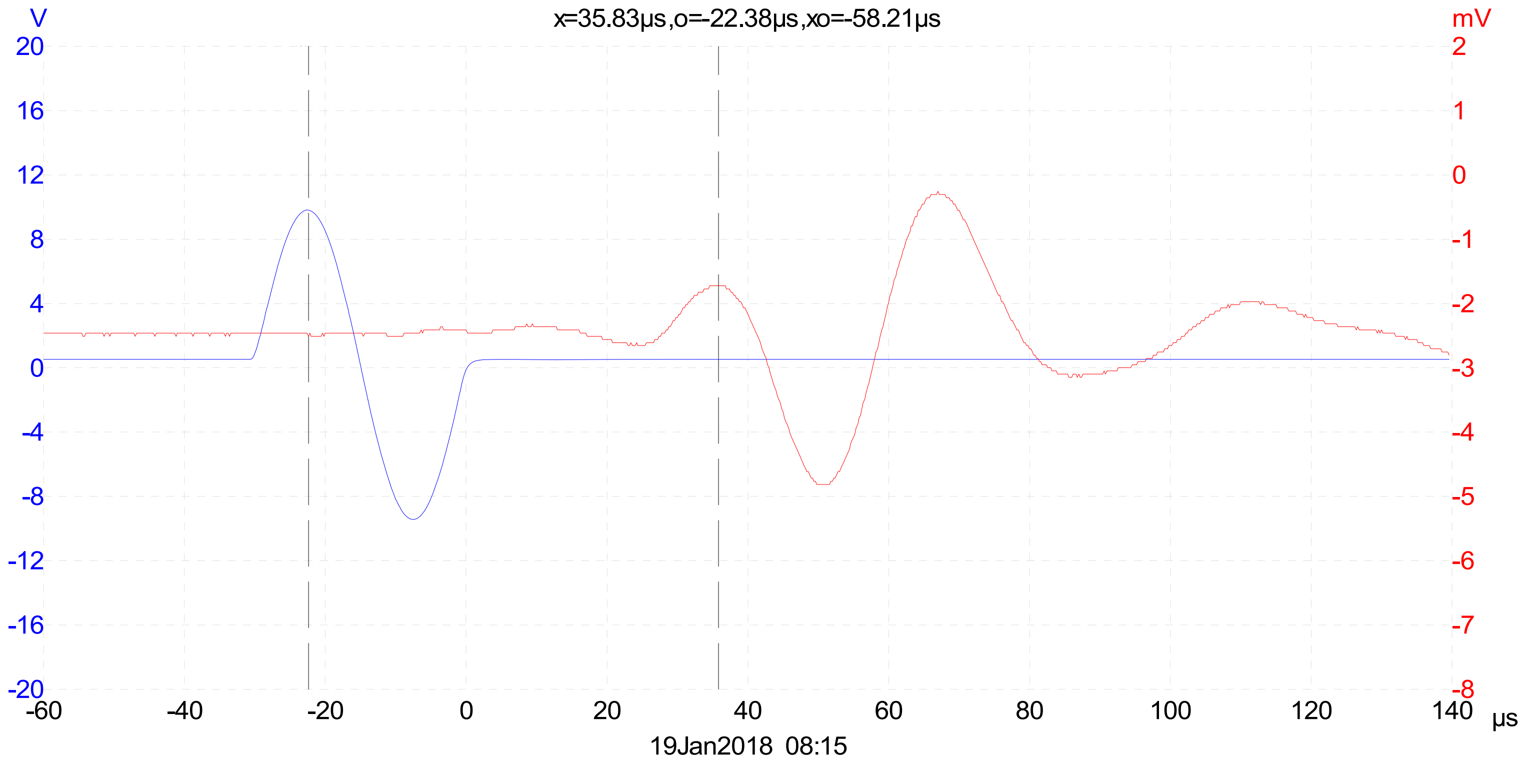


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	15
Part	A
Test	1

Figure 5.5.19

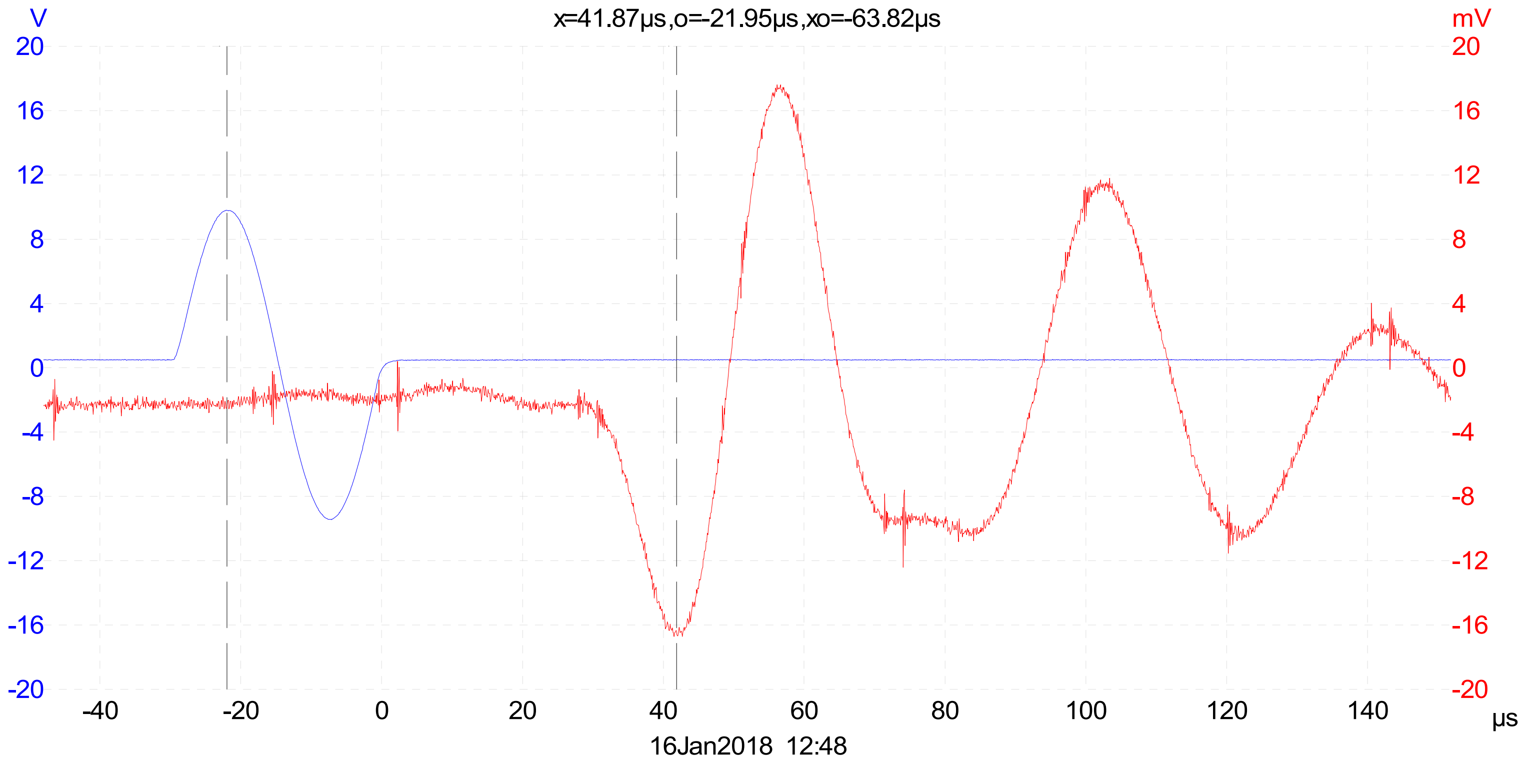


Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	ONSB41
Tube	17
Part	C
Test	1

Figure 5.5.20

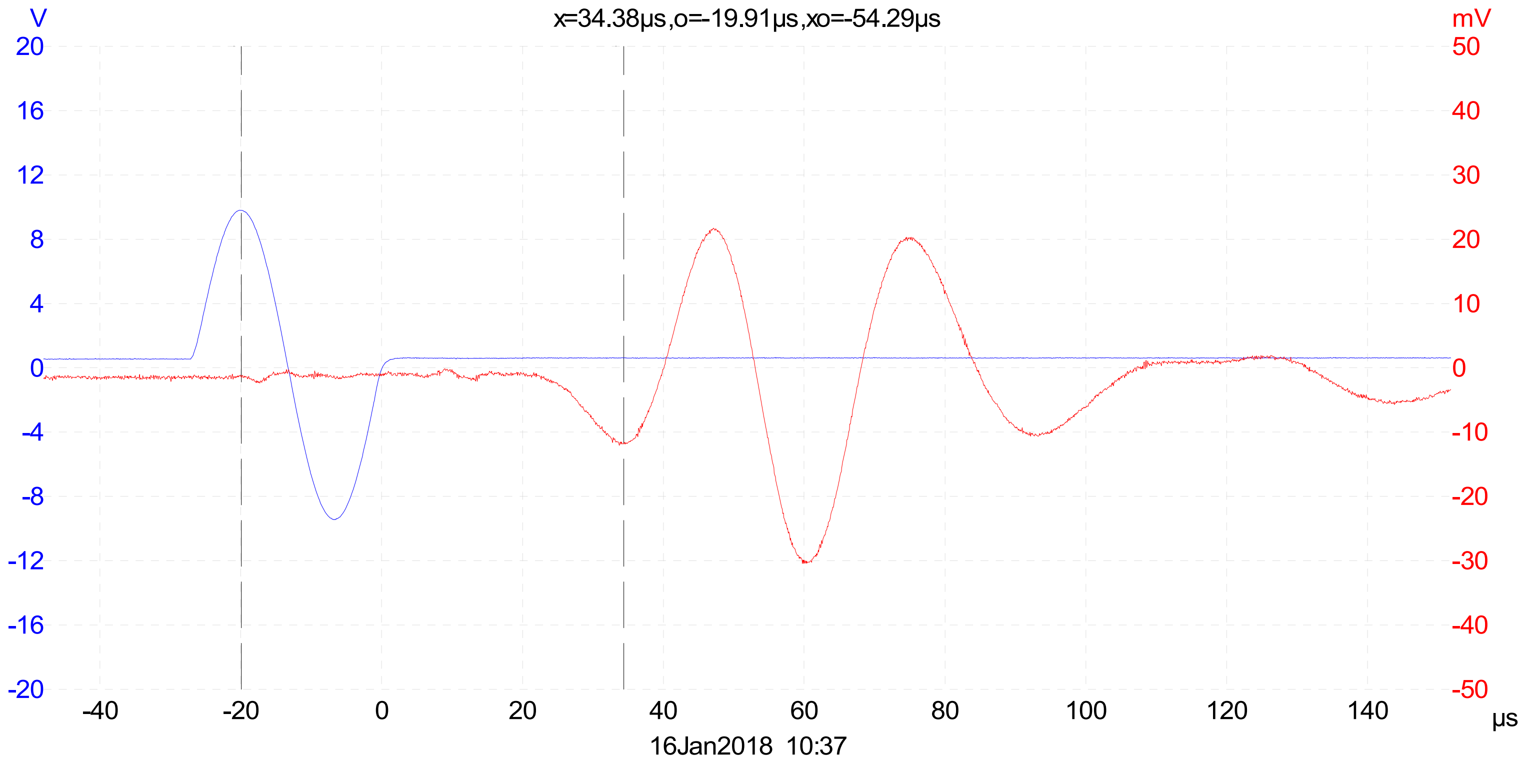


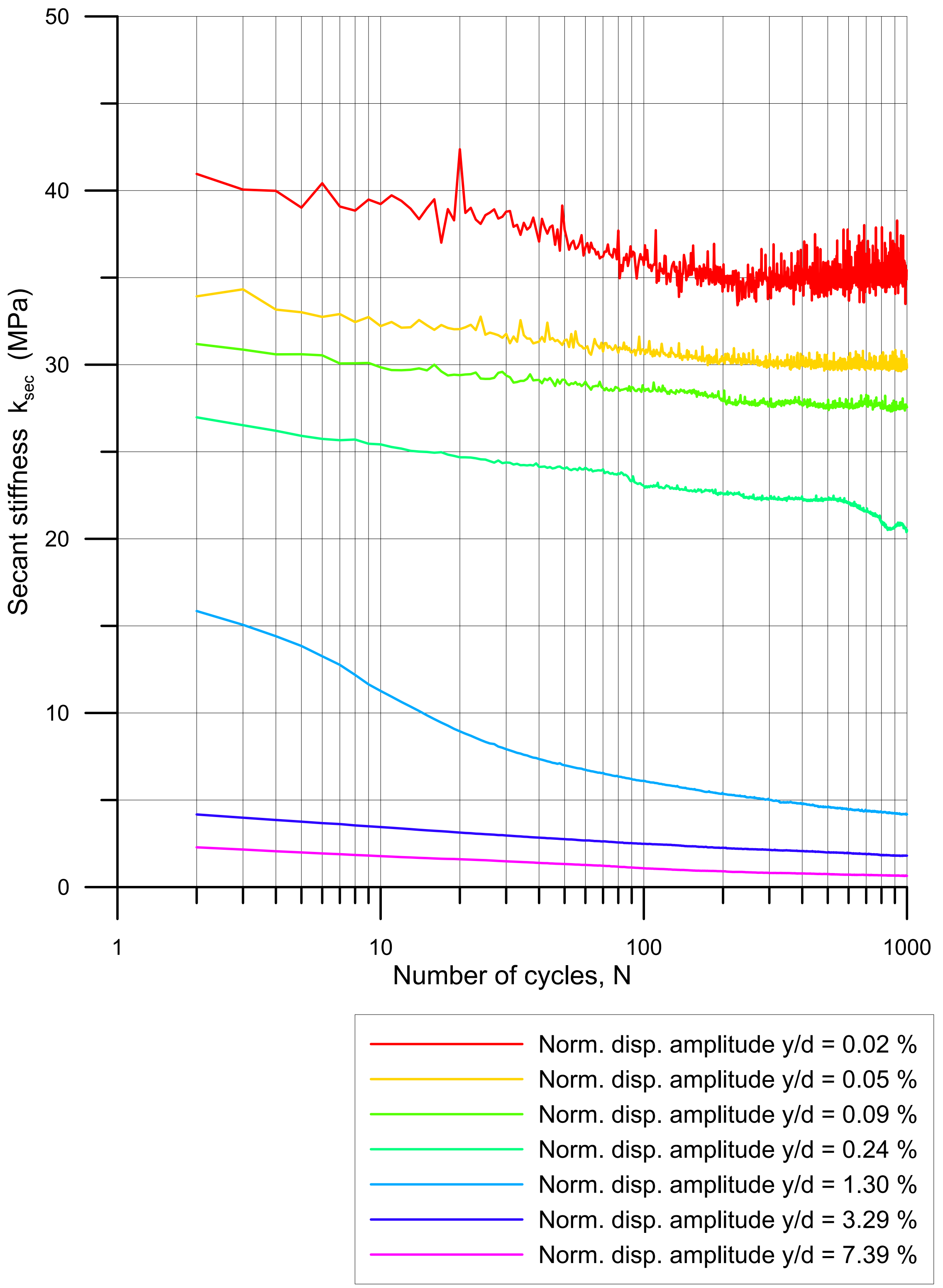
Result from Gmax

Project Name	Norwegian GeoTest Sites - Onsøy

Project No	20160154
Boring	onsb41
Tube	20
Part	c
Test	1

Figure 5.5.21

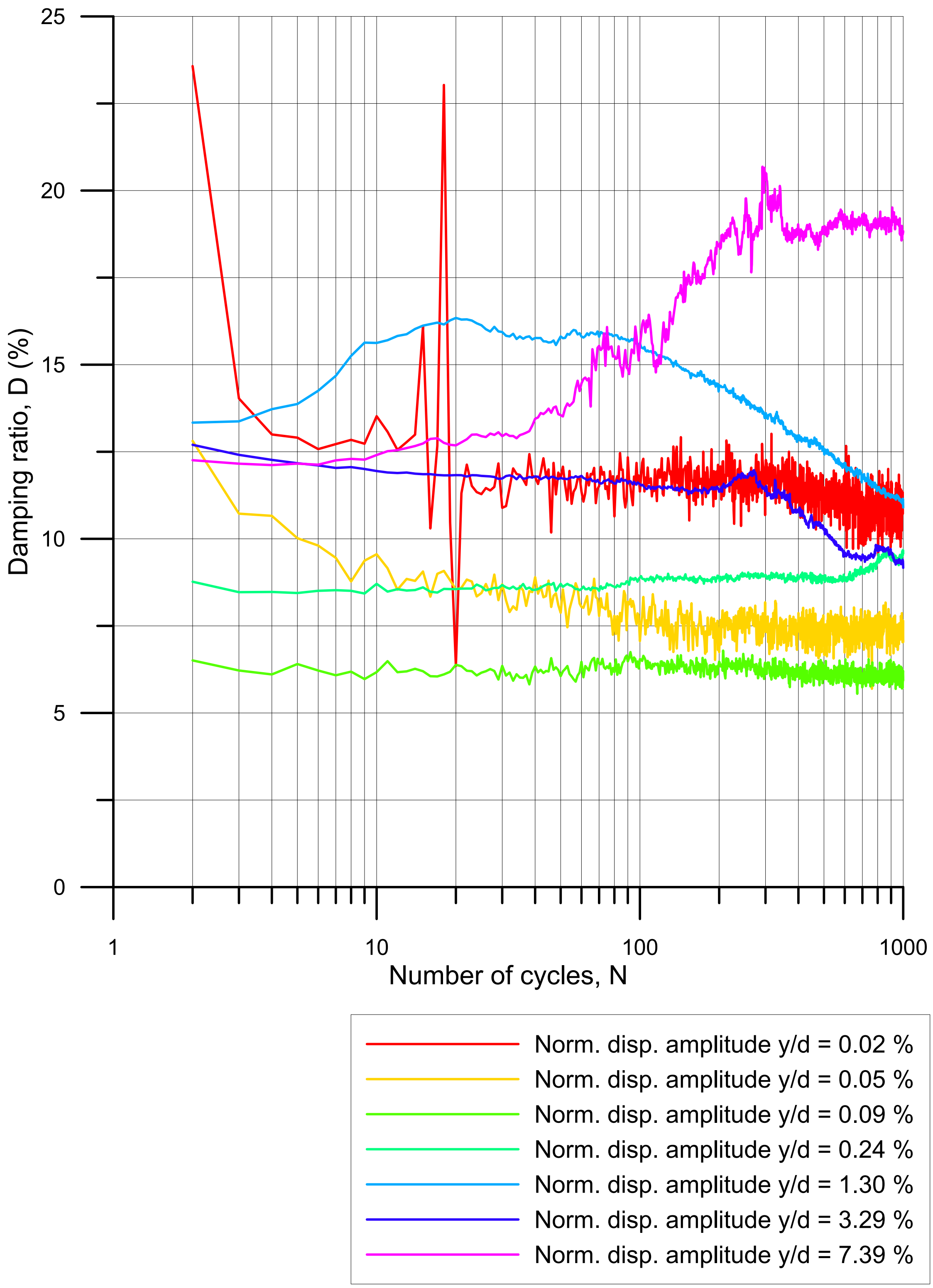




P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_48_cyclic_001\Rev. 2\DLP\2015_Onsøy_48_pro_G_vs_N.Grf

Norwegian GeoTest Sites - Onsøy

2015_Onsøy_48_Cyclic_001	Sym. disp. controlled test with given cyclic amplitudes			Document No. 20160154-10-R	Date 2016-10-03
Boring: ONSB02	Depth = 6.40 m	Consolidation stresses		Figure No. 5.7.1	
Tube: 6	p_o' = 47.6 kPa	(kPa) max. min. final			
Part: C	w_i = 64.9 %	σ_{ac}' = 47.6 47.6 47.6		Drawn by HSt	NGI
Test: 1	w_c = %	τ_c =			



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_48_cyclic_001\Rev. 2\DLP\2015_Onsøy_48_pro_D_vs_N.Grf

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

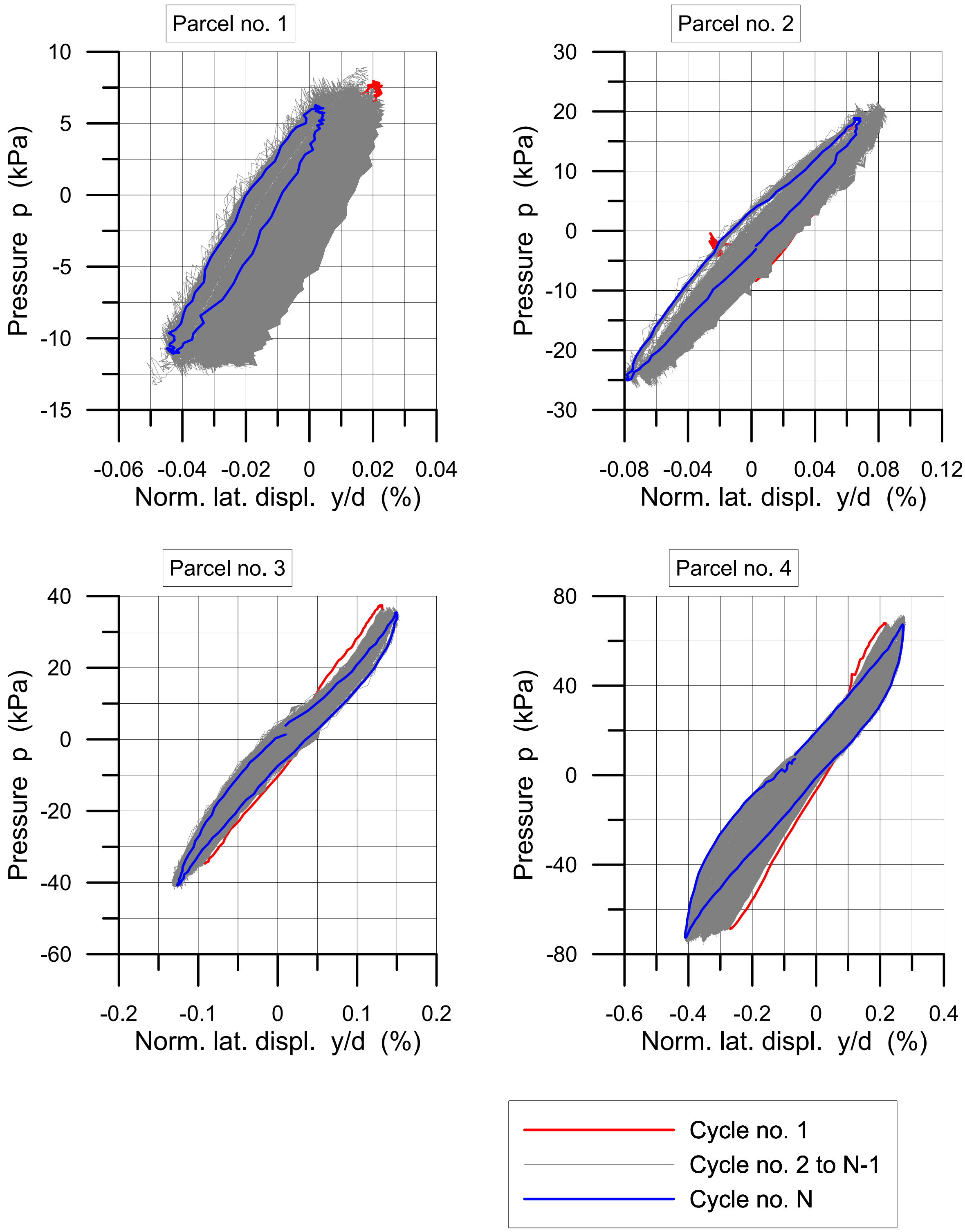
2015_Onsøy_48_Cyclic_001		Sym. disp. controlled test with given cyclic amplitudes					
Boring:	ONSB02	Depth =	6.40 m	Consolidation stresses			
Tube:	6	p_o' =	47.6 kPa	(kPa)	max.	min.	final
Part:	C	w_i =	64.9 %	σ_{ac}' =	47.6	47.6	47.6
Test:	1	w_c =	%	τ_c =			

Date: 2016-10-03

Figure No. 5.7.2

Drawn by: HSt

NGI



Norwegian GeoTest Sites - Onsøy

2015_Onsøy_48_Cyclic_001		Sym. disp. controlled test with given cyclic amplitudes						
Boring:	ONSB02	Depth	=	6.40	m	Consolidation stresses		
Tube:	6	p_o'	=	47.6	kPa	(kPa) max.	min.	final
Part:	C	w_i	=	64.9	%	σ_{ac}' = 47.6	47.6	47.6
Test:	1	w_c	=		%	τ_c =		

Document No.: 20160154-10-R

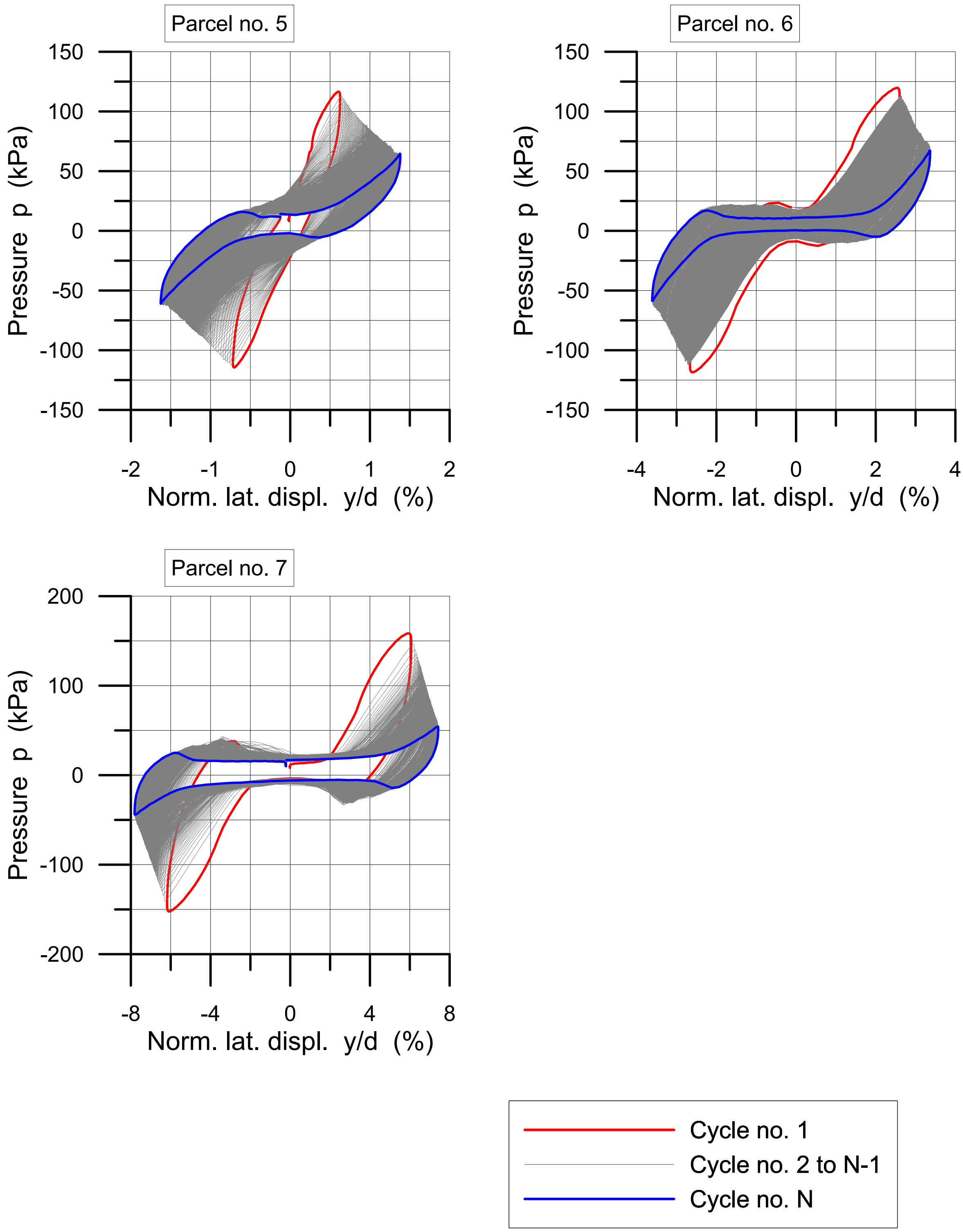
Date: 2016-10-03

Figure No.: 5.7.3

Drawn by: HSt

NGI

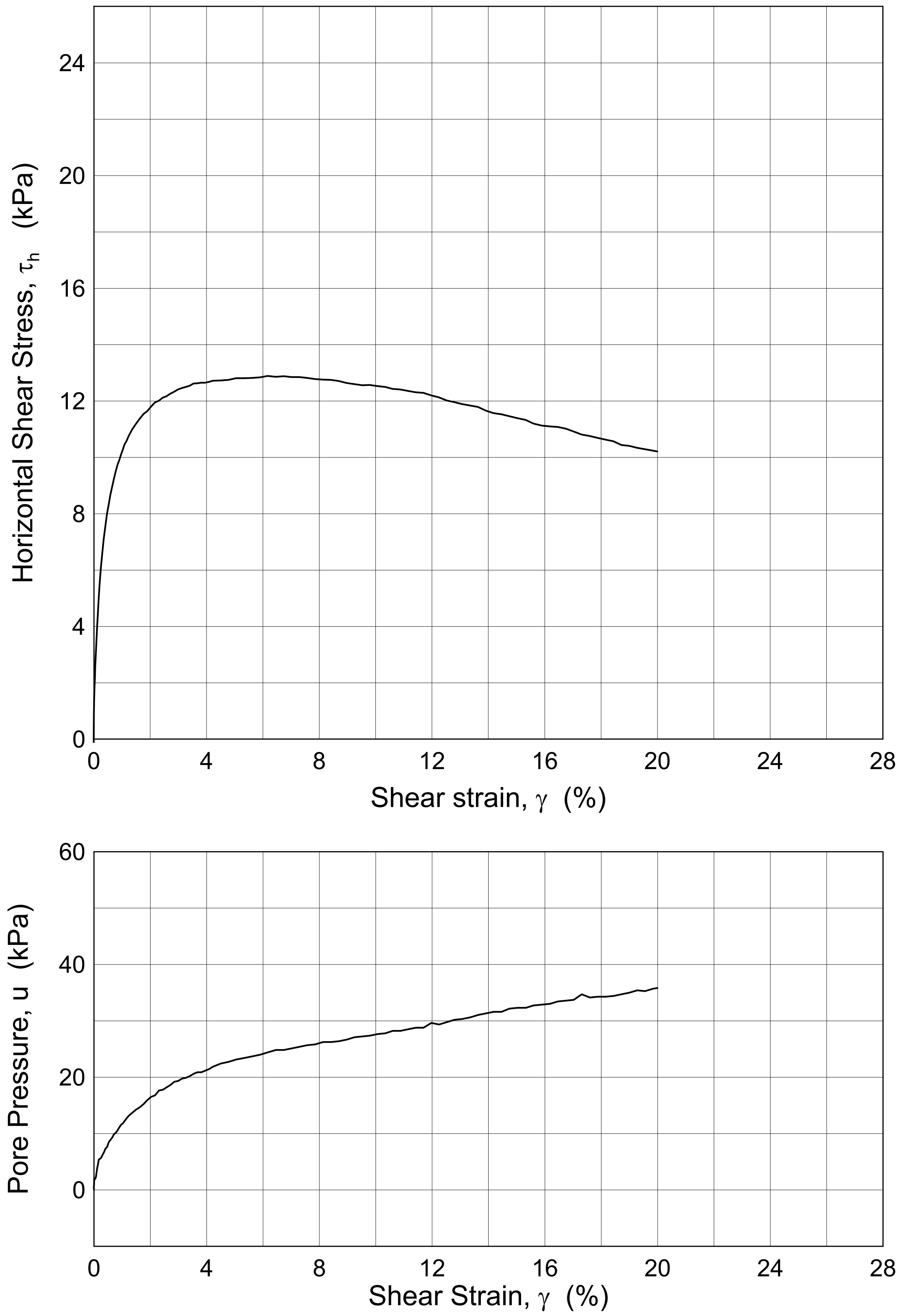
P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_48_cyclic_001\Rev. 2\DLP\2015_Onsøy_48_pro_Tau_vs_GammaGraphNo1.Grf



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_48_cyclic_001\Rev. 2\DLP\2015_Onsøy_48_pro_Tau_vs_GammaGraphNo2.Grf

Norwegian GeoTest Sites -Onsøy

Document No. 20160154-10-R									
2015_Onsøy_48_Cyclic_001		Sym. disp. controlled test with given cyclic amplitudes							Date 2016-10-03
Boring:	ONSB02	Depth =	6.40	m	Consolidation stresses				Figure No. 5.7.4
Tube:	6	p_o' =	47.6	kPa	(kPa)	max.	min.	final	
Part:	C	w_i =	64.9	%	σ_{ac}' =	47.6	47.6	47.6	Drawn by HSt
Test:	1	w_c =		%	τ_c =				NGI



Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Standard Static Direct Simple Shear Test

Figure No. 5.7.5

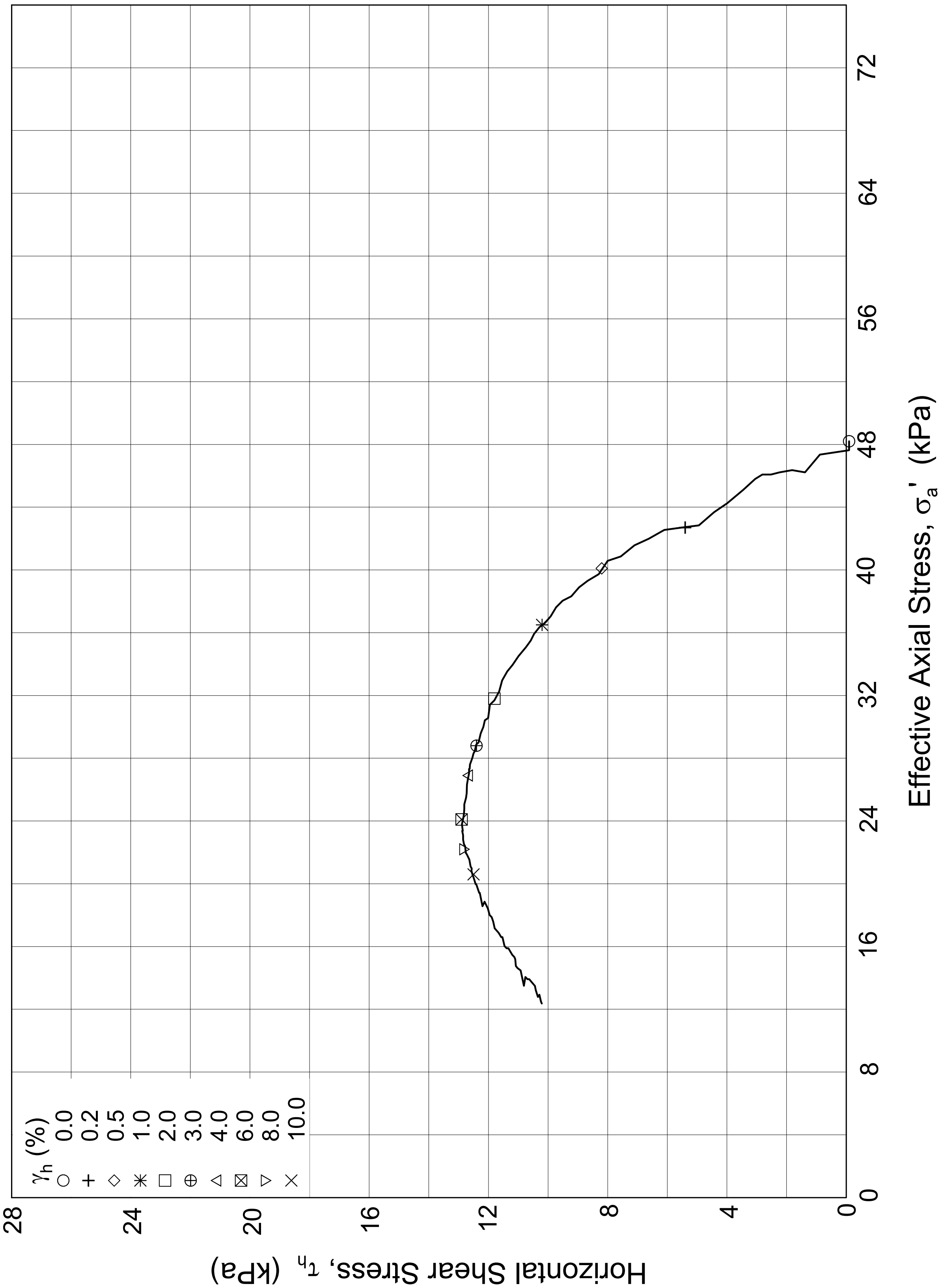
Date 2016-10-19

Drawn by/checked TAb / MAS

Boring: **ONSB02**	Depth =	**5.42**	m	Consolidation stresses				
Tube: **6**	p_o' =	**48.2**	kPa	(kPa)	max.	min.	final	
Part: **D**	w_i =	**61.70**	%	σ_{ac}' =	48.2	-	**48.2**	
Test: **1**	γ_i =	**27.5**	kN/m³	τ_c' =	-	-	**-**	

NGI

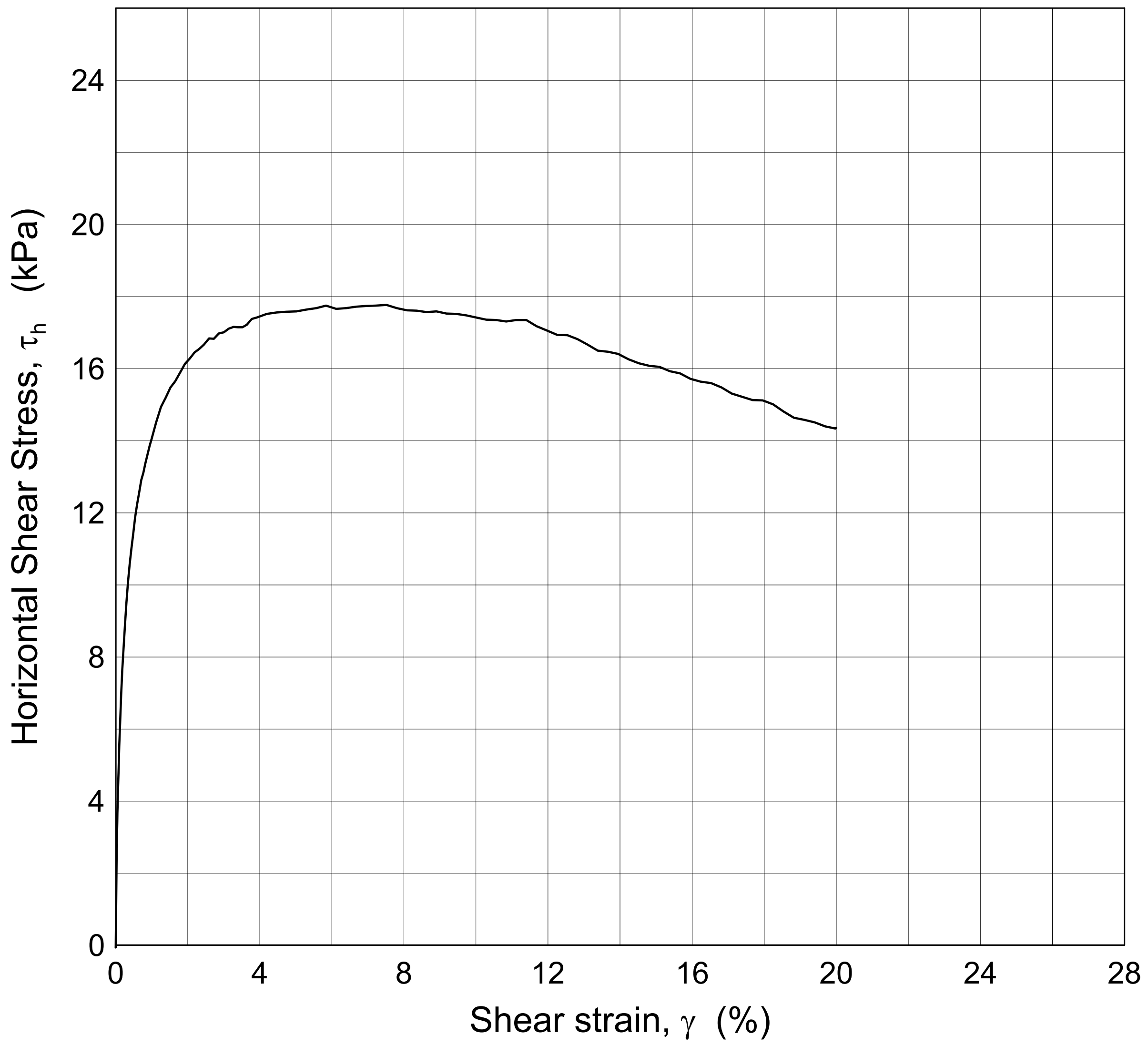
P:\2014\08\20140839\Lab\DSS\Fig 2_06 bh2-6-d-1-1(ccv1832).grf

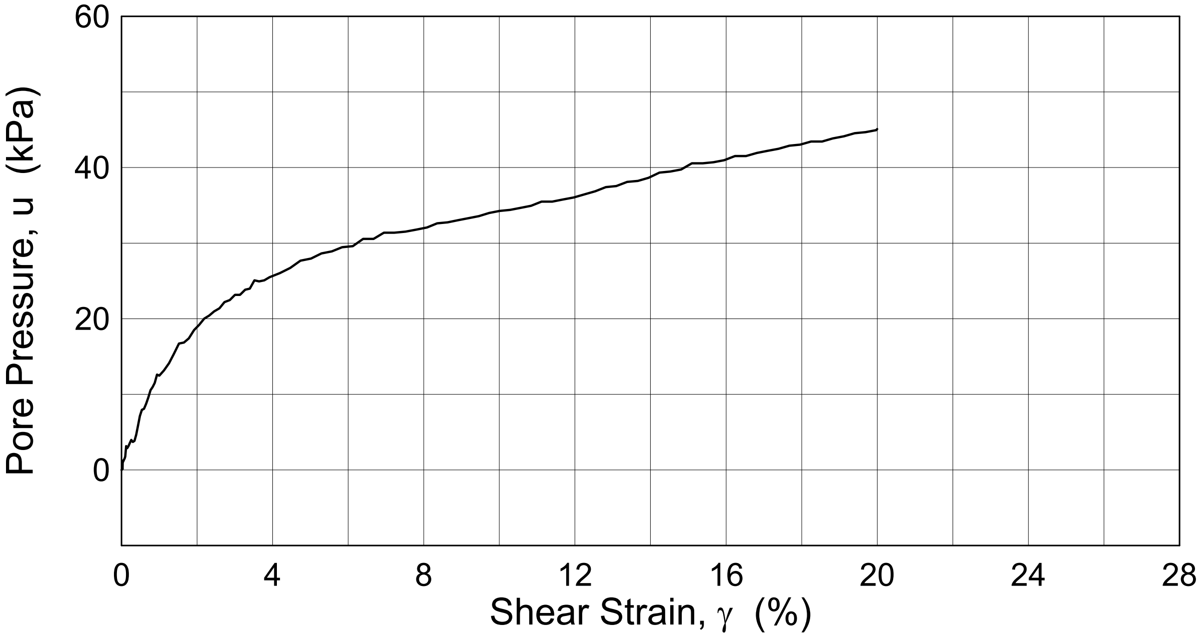


Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy											Document No. 20160154-10-R	
Standard Static Direct Simple Shear Test											Figure No. 5.7.6	
Boring:	ONSB02	Depth	=	5.42	m	Consolidation stresses					Date 2016-10-19	Drawn by/checked TAb / MAS
Tube:	6	p_o'	=	48.2	kPa	(kPa)	max.	min.	final			
Part:	D	w_i	=	64.7	%	σ_{ac}' =	48.2	-	48.2		NGI	
Test:	1	γ_i	=	16.01	kN/m³	τ_c' =	-	-	-			

P:\2014\08\20140839\Lab\DSS\Fig 2_07 bh2-6-d-1-2(ccv1832).grf





P:\2014\08\20140839\Lab\DSS\Fig 2_09 bh2-9-c-1-1(ccv1836).grf

Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

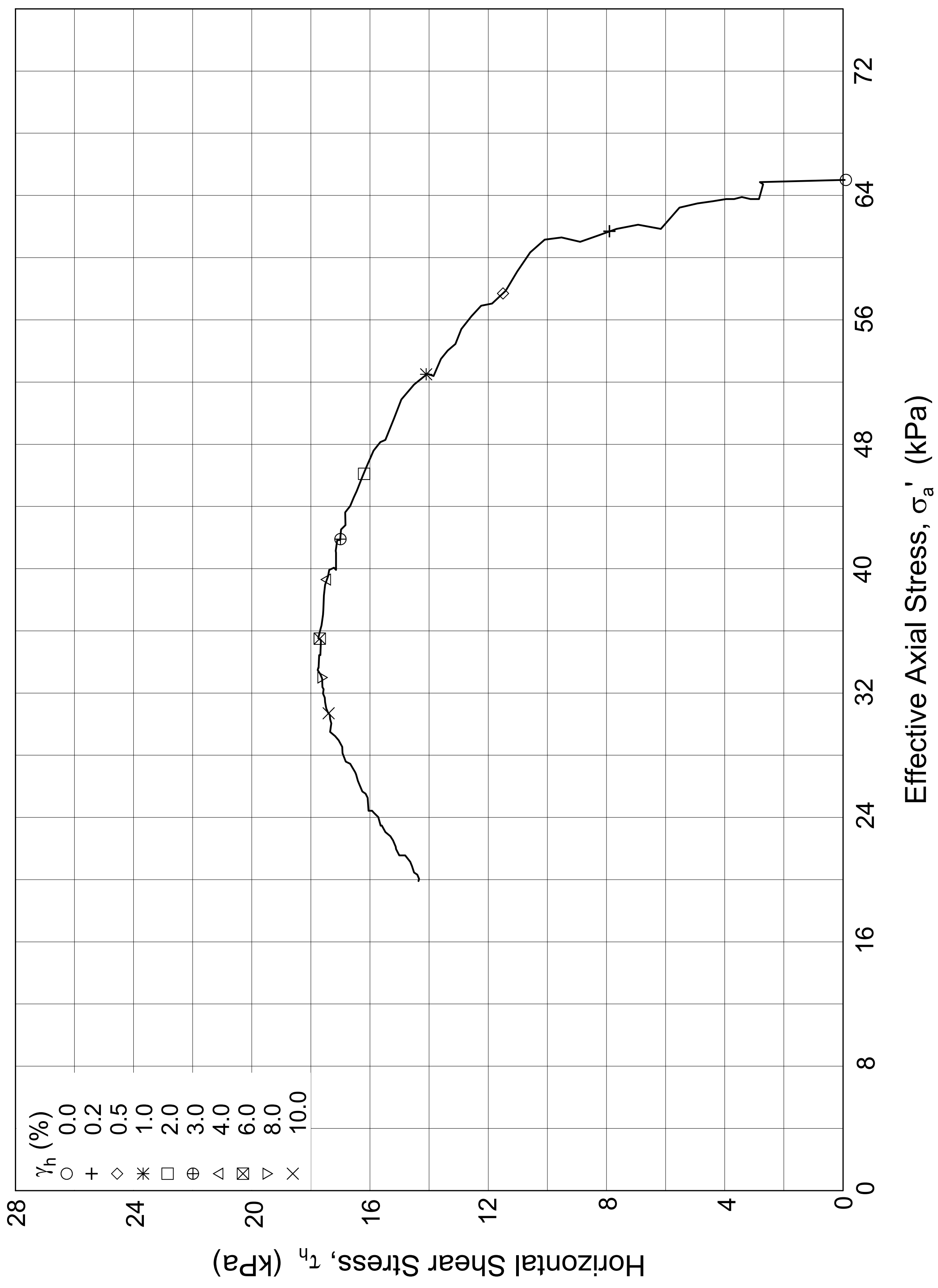
Document No. 20160154-10-R

Standard Static Direct Simple Shear Test

Figure No. 5.7.7

Boring: **ONSB02**	Depth =	**9.27**	m	Consolidation stresses				Date 2016-10-19
Tube: **9**	p_o' =	**65.0**	kPa	(kPa)	max.	min.	final	Drawn by/checked TAb / MAS
Part: **C**	w_i =	**42.98**	%	σ_{ac}' =	65.0	-	**65.0**	
Test: **1**	γ_i =	**17.59**	kN/m³	τ_c' =	-	-	**-**	

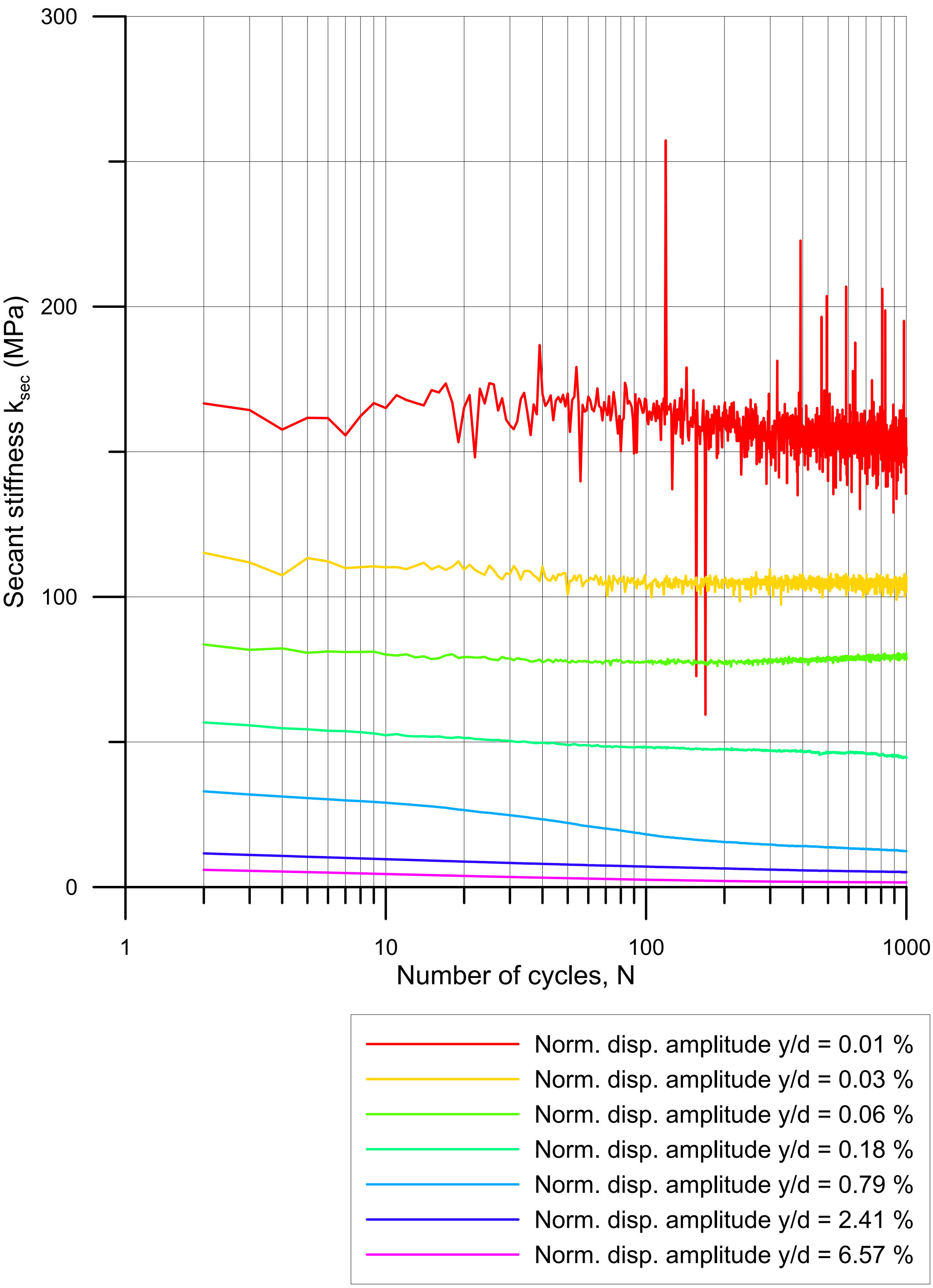
NGI



P:\2014\08\20140839\Lab\DSS\Fig 2_10 bh2-9-c-1-2(ccv1836).grf

Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy					Document No. 20160154-10-R
Standard Static Direct Simple Shear Test					Figure No. 5.7.8
Boring: **ONSB02**	Depth = **9.27** m	Consolidation stresses			Date 2016-10-19 / Drawn by/checked TAb / MAS
Tube: **9**	p_o' = **65.0** kPa	(kPa) max.	min.	final	NGI
Part: **C**	w_i = **42.98** %	σ_{ac}' = 65.0	-	**65.0**	
Test: **1**	γ_i = **17.59** kN/m³	τ_c' = -	-	**-**	



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_65_cyclic_002\Rev. 2\DLP\2015_Onsøy_65_pro_G_vs_N.Grf

Norwegian GeoTest Sites -Onsøy

Document No. 20160154-10-R

2015_Onsøy_65_Cyclic_002 — Sym. disp. controlled test with given cyclic amplitudes

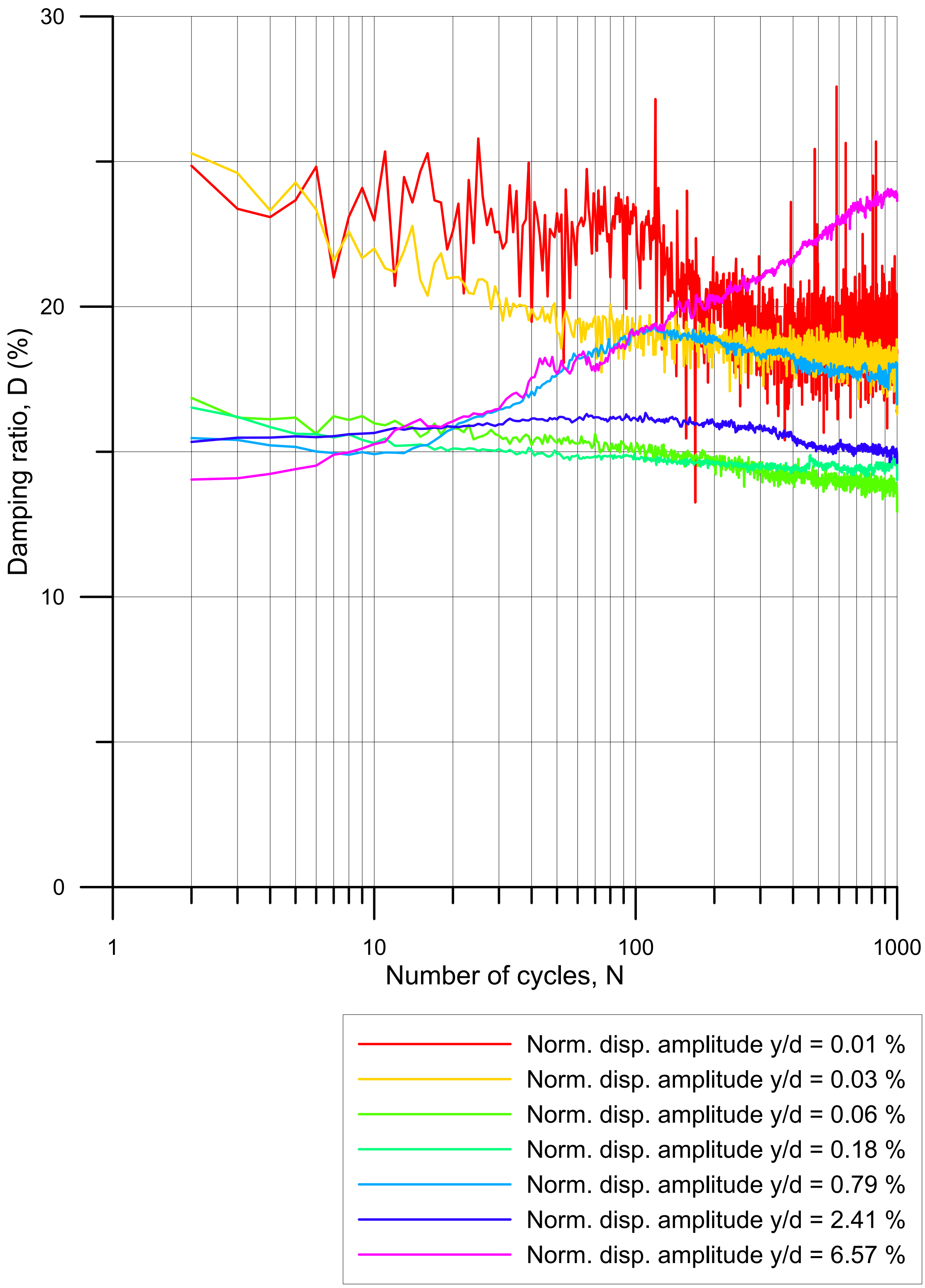
Date: 2016-10-03

Boring:	ONSB02	Depth =	9.375	m	Consolidation stresses			
Tube:	9	p_o' =	65.2	kPa	(kPa)	max.	min.	final
Part:	D	w_i =		%	σ_{ac}' =	65.2	65.2	65.2
Test:	1	w_c =		%	τ_c =			

Figure No. 5.7.9

Drawn by HSt

NGI

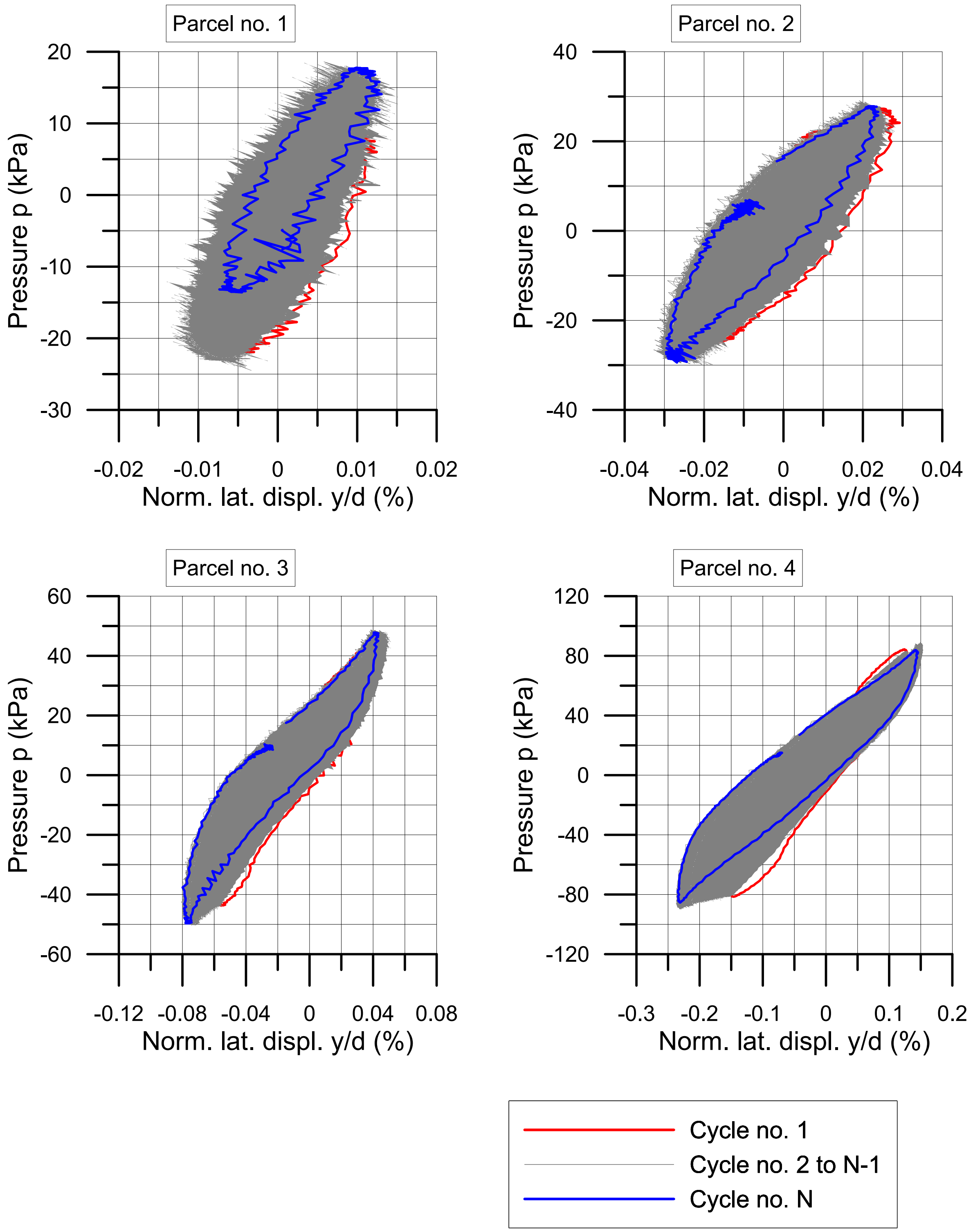


P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_65_cyclic_002\Rev. 2\DLP\2015_Onsøy_65_pro_D_vs_N.Grf

Norwegian GeoTest Sites - Onsøy

2015_Onsøy_65_Cyclic_002		Sym. disp. controlled test with given cyclic amplitudes						
Boring:	ONSB02	Depth =	9.375	m	Consolidation stresses			
Tube:	9	p_o' =	65.2	kPa	(kPa)	max.	min.	final
Part:	D	w_i =		%	σ_{ac}' =	65.2	65.2	65.2
Test:	1	w_c =		%	τ_c =			

Document No. 20160154-10-R
Date 2016-10-02
Figure No. 5.7.10
Drawn by HSt
NGI

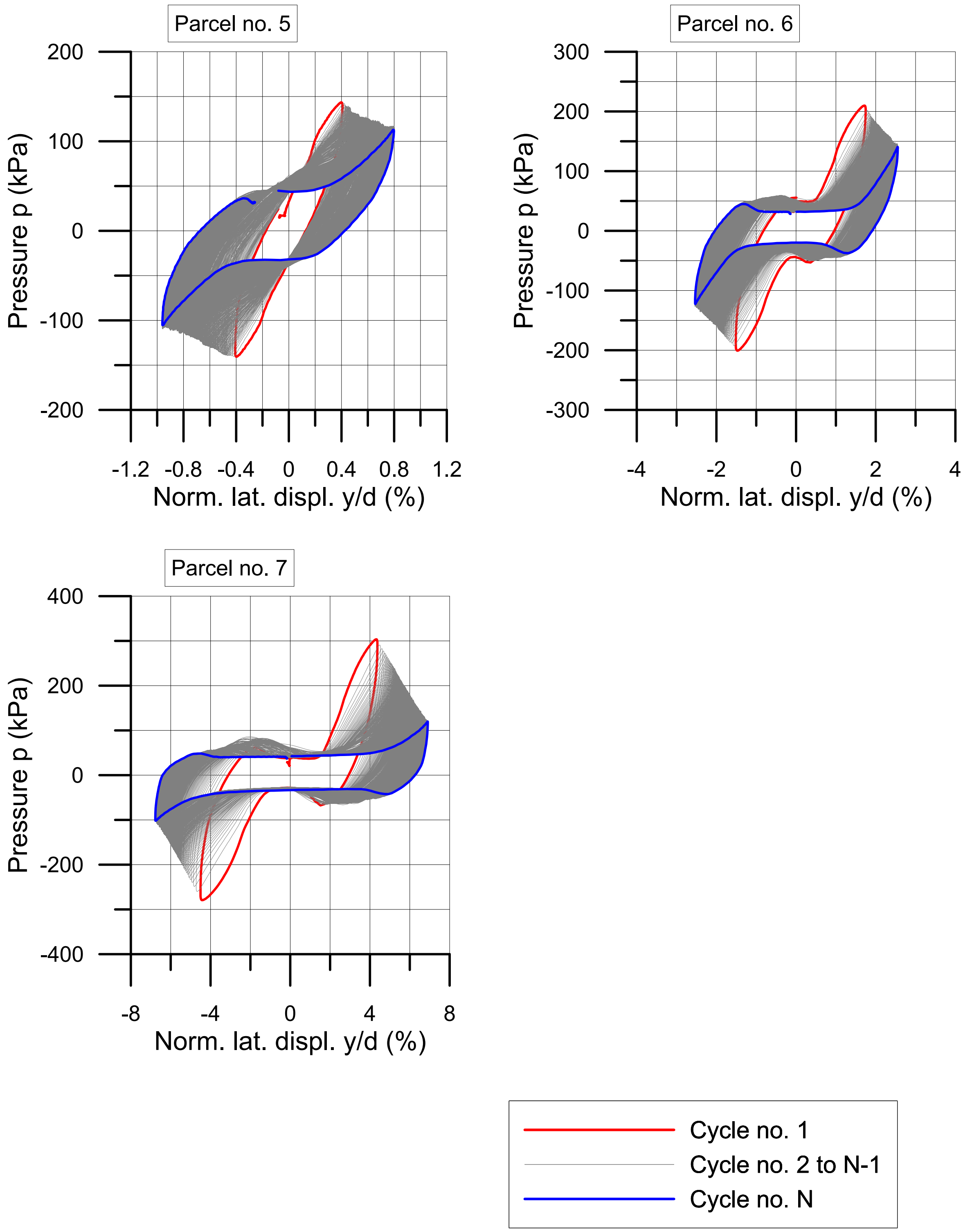


P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_65_cyclic_002\Rev. 2\DLP\2015_Onsøy_65_pro_Tau_vs_GammaGraphNo1.Grf

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
2015_Onsøy_65_Cyclic_002	Sym. disp. controlled test with given cyclic amplitudes		Date 2016-10-03

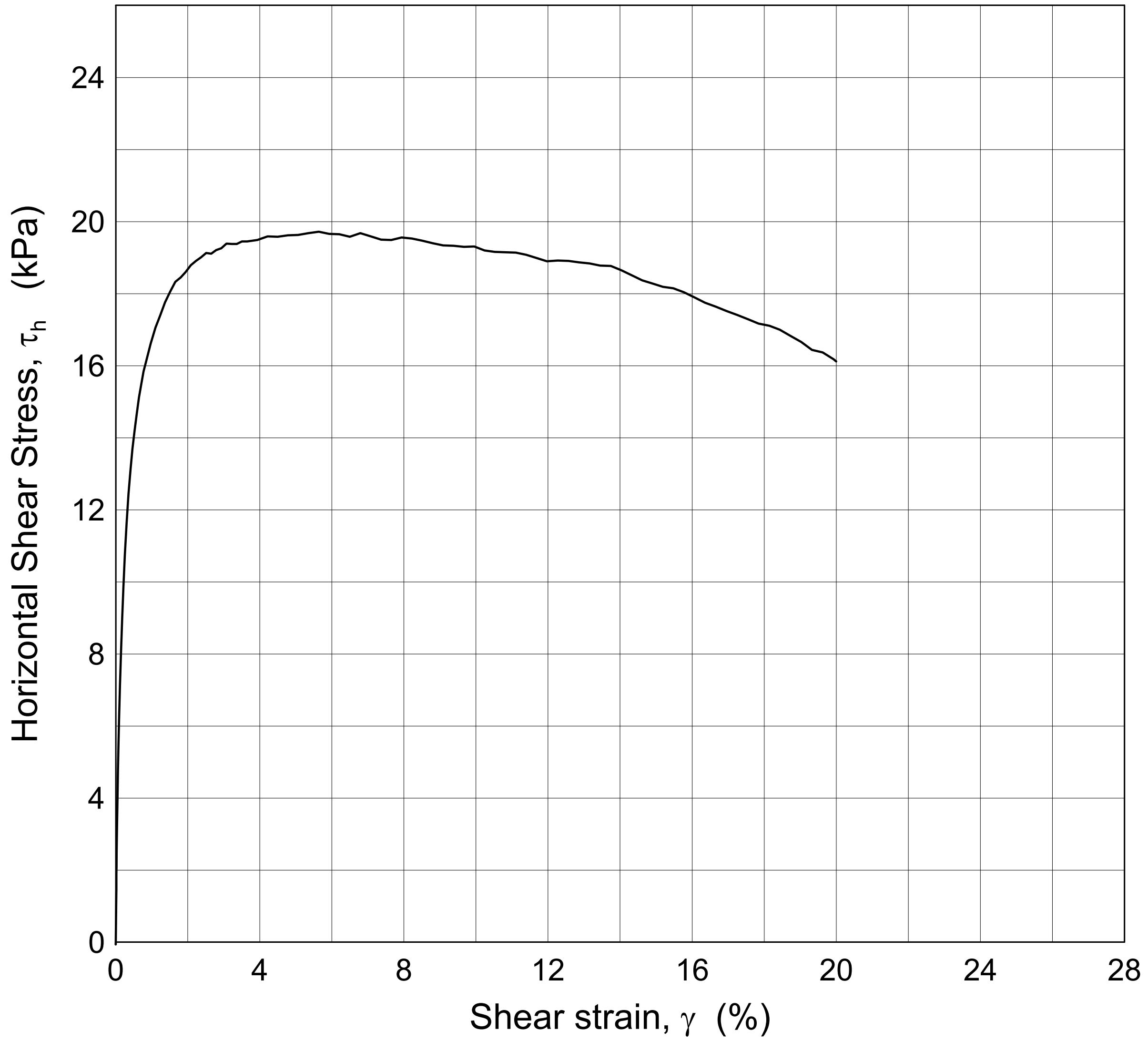
Boring:	ONSB02	Depth	=	9.375	m	Consolidation stresses				Figure No. 5.7.11
Tube:	9	p_o'	=	65.2	kPa	(kPa)	max.	min.	final	
Part:	D	w_i	=		%	σ_{ac}' =	65.2	65.2	65.2	Drawn by
Test:	1	w_c	=		%	τ_c =				HSt

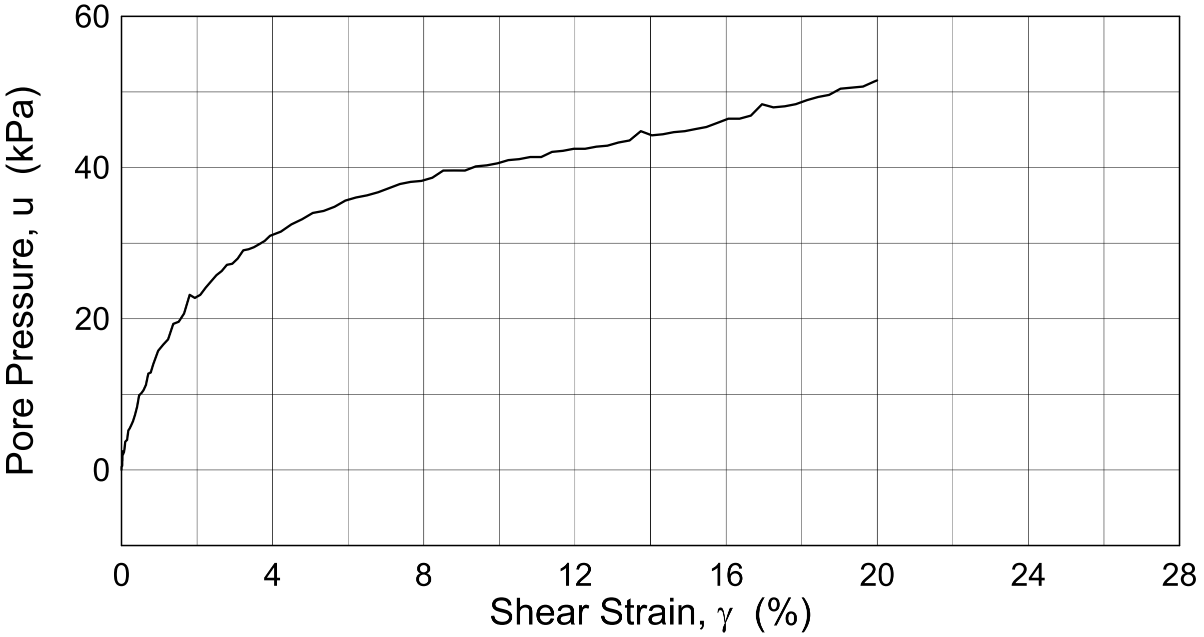
NGI



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_65_cyclic_002\Rev. 2\DLP\2015_Onsøy_65_pro_Tau_vs_GammaGraphNo2.Grf

Norwegian GeoTest Sites - Onsøy									Document No. 20160154-10-R
2015_Onsøy_65_Cyclic_002		Sym. disp. controlled test with given cyclic amplitudes							Date 2016-10-03
Boring:	ONSB02	Depth	=	9.375 m	Consolidation stresses				Figure No. 5.7.12
Tube:	9	p_o'	=	65.2 kPa	(kPa)	max.	min.	final	
Part:	D	w_i	=	%	σ_{ac}' =	65.2	65.2	65.2	Drawn by HSt
Test:	1	w_c	=	%	τ_c =				NGI





Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

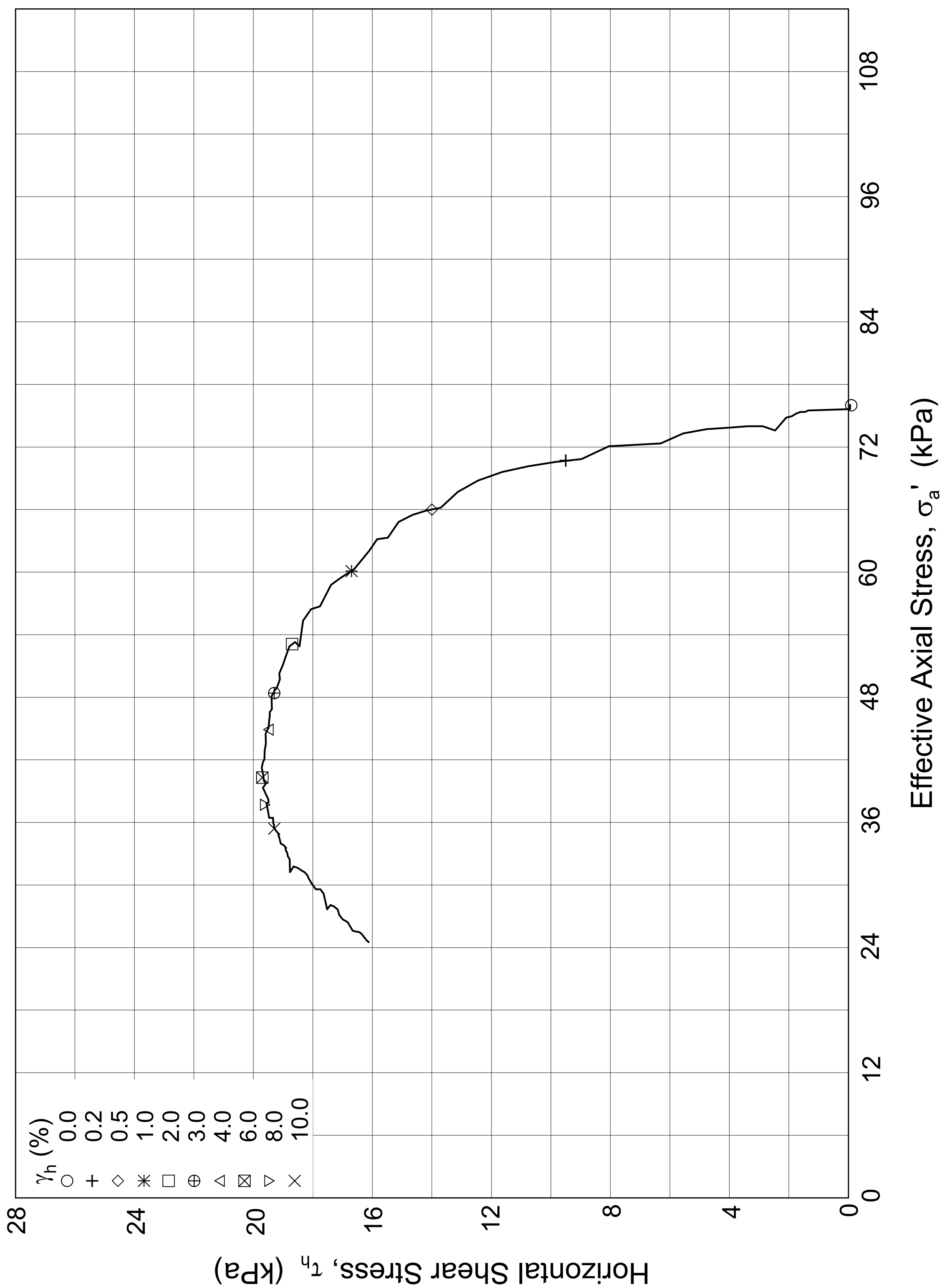
Stndard Static Direct Simple Shear Test

Figure No. 5.7.13

Boring: **ONSB02**	Depth =	**11.12**	m	Consolidation stresses				Date: 2016-10-19
Tube: **11**	p_o' =	**76.0**	kPa	(kPa)	max.	min.	final	Drawn by/checked: TAb / MAS
Part: **B**	w_i =	**46.9**	%	σ_{ac}' =	76.0	-	**76.0**	
Test: **1**	γ_i =	**16.88**	kN/m³	τ_c' =	-	-	**-**	

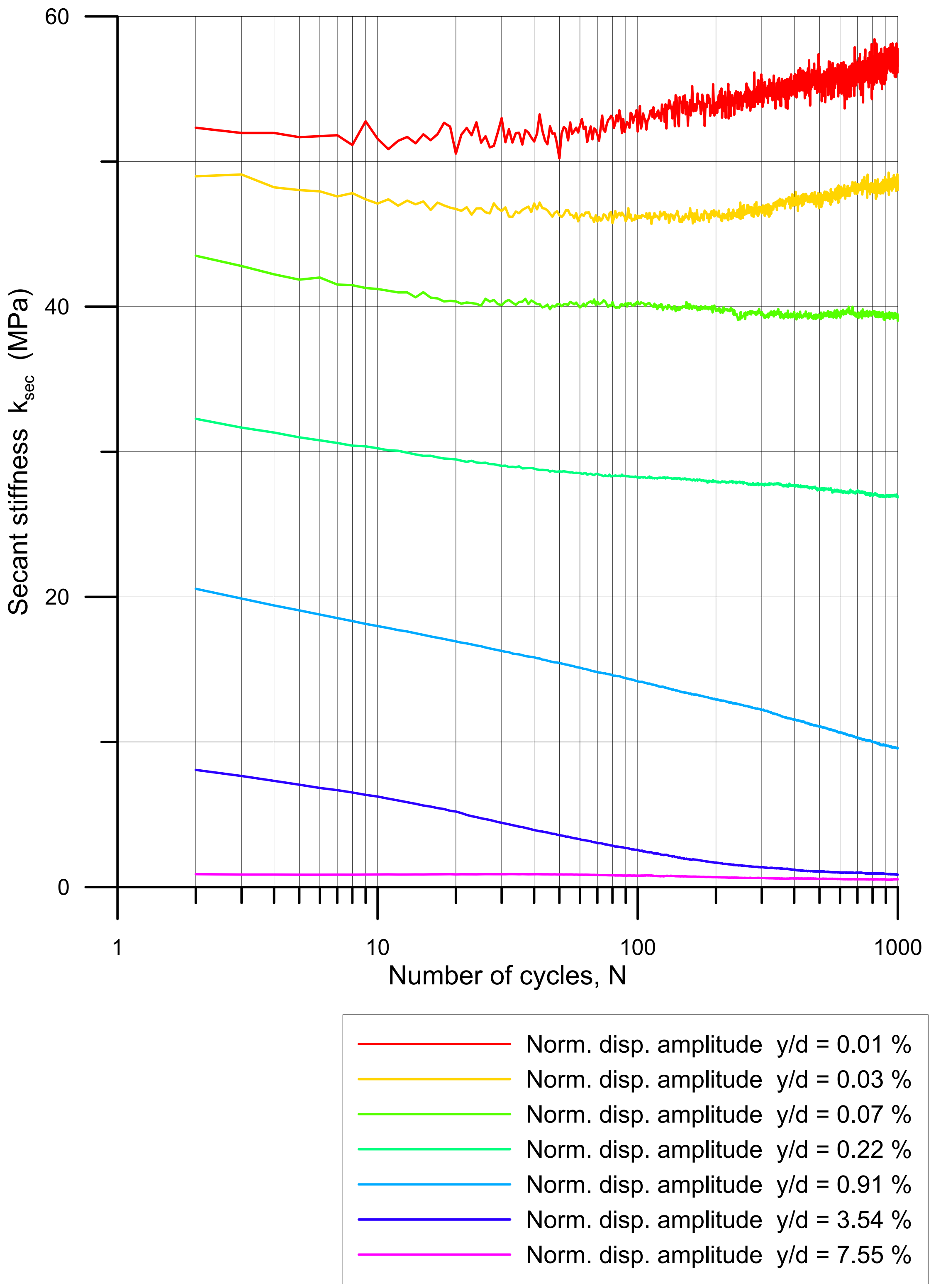
NGI

P:\2014\08\20140839\Lab\DSS\Fig 2_15 bh2-11-b-1-1(ccv1837).grf



Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy				Document No. 20160154-10-R
Stndard Static Direct Simple Shear Test				Figure No. 5.7.14
Boring: **ONSB02**	Depth = **11.12** m	Consolidation stresses		Date 2016-10-19 / Drawn by/checked TAb / MAS
Tube: **11**	p_o' = **76.0** kPa	(kPa) max. min. final		
Part: **B**	w_i = **46.9** %	σ_{ac}' = 76.0 - **76.0**		
Test: **1**	γ_i = **16.88** kN/m³	τ_c' = - - **-**		



Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

2015_Onsøy_76_Cyclic_003

Sym. disp. controlled test with given cyclic amplitudes

Date 2016-10-10

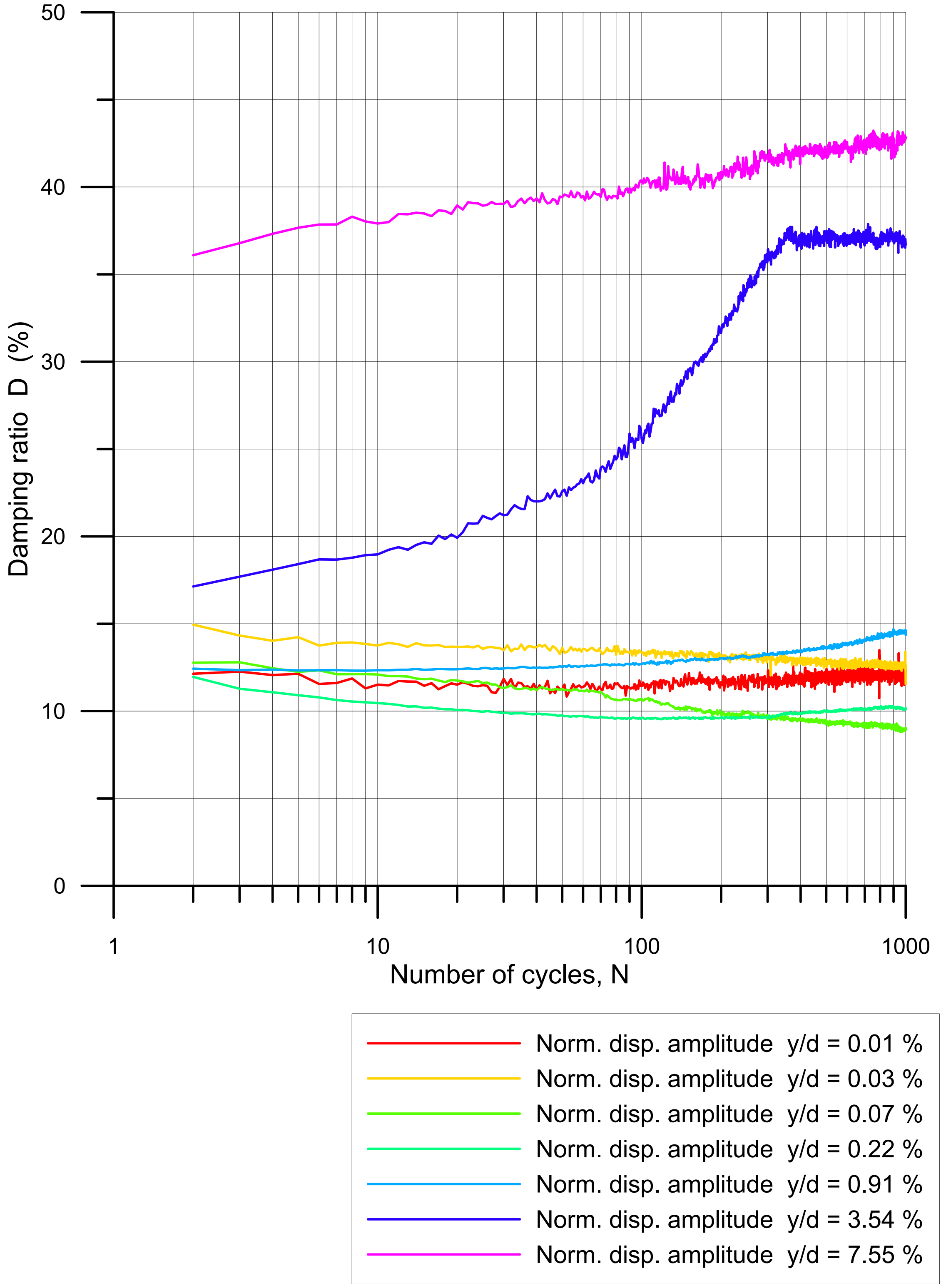
Boring:	ONSB02	Depth =	11.375	m	Consolidation stresses			
Tube:	11	p_o' =	76.7	kPa	(kPa)	max.	min.	final
Part:	C	w_i =	42.7	%	σ_{ac}' =	76.7	76.7	76.7
Test:	1	w_c =		%	τ_c =			

Figure No. 5.7.15

Drawn by HSt

NGI

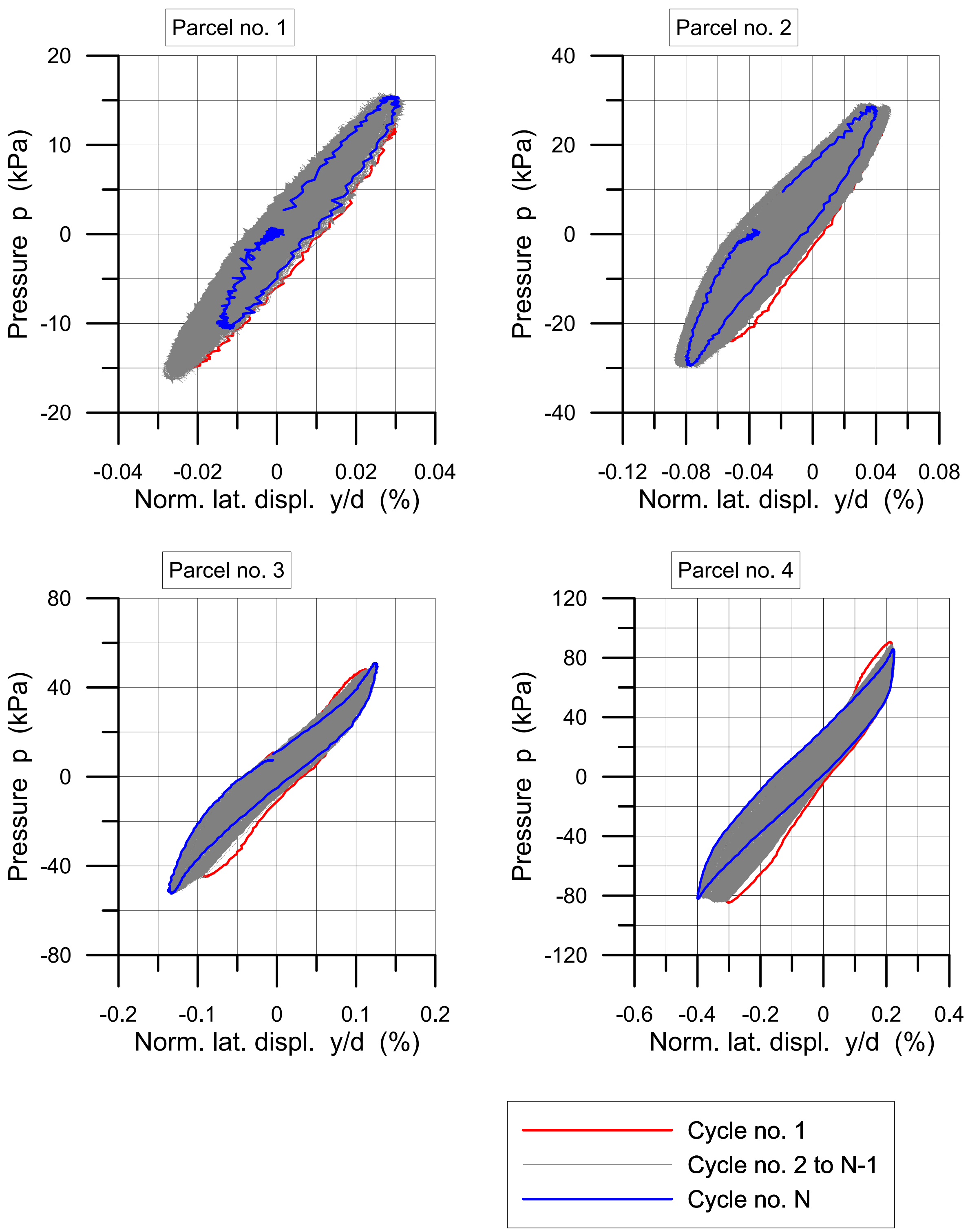
P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_76_cyclic_003\Rev. 2\DLP\2015_Onsøy_76_pro_G_vs_N.Grf



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_76_cyclic_003\Rev. 2\DLP\2015_Onsøy_76_pro_D_vs_N.Grf

Norwegian GeoTest Sites - Onsøy

2015_Onsøy_76_Cyclic_003		Sym. disp. controlled test with given cyclic amplitudes									Document No. 20160154-10-R	
Boring:	ONSB02	Depth	=	11.375	m	Consolidation stresses					Date 2016-10-10	
Tube:	11	p_o'	=	76.7	kPa	(kPa)	max.	min.	final		Figure No. 5.7.16	NGI
Part:	C	w_i	=	42.7	%	σ_{ac}' =	76.7	76.7	76.7		Drawn by HSt	
Test:	1	w_c	=		%	τ_c =						



Norwegian GeoTest Sites - Onsøy

Document No. 20160154-10-R

Date 2016-10-10

Figure No. 5.7.17

Drawn by HSt

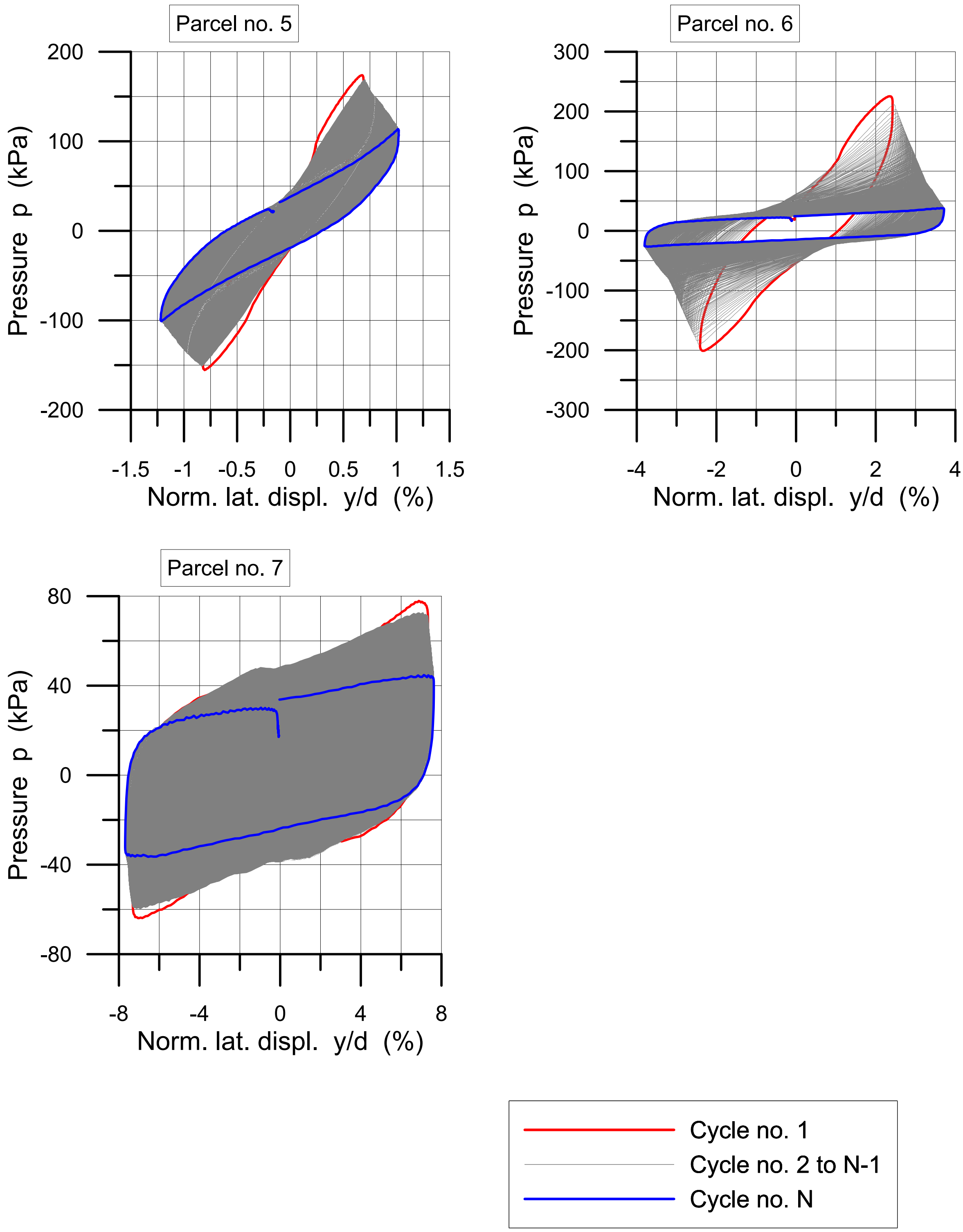
2015_Onsøy_76_Cyclic_003

Sym. disp. controlled test with given cyclic amplitudes

Boring:	ONSB02	Depth =	11.375 m		Consolidation stresses			
Tube:	11	p_o' =	76.7 kPa		(kPa)	max.	min.	final
Part:	C	w_i =	42.7 %		σ_{ac}' =	76.7	76.7	76.7
Test:	1	w_c =	%		τ_c =			

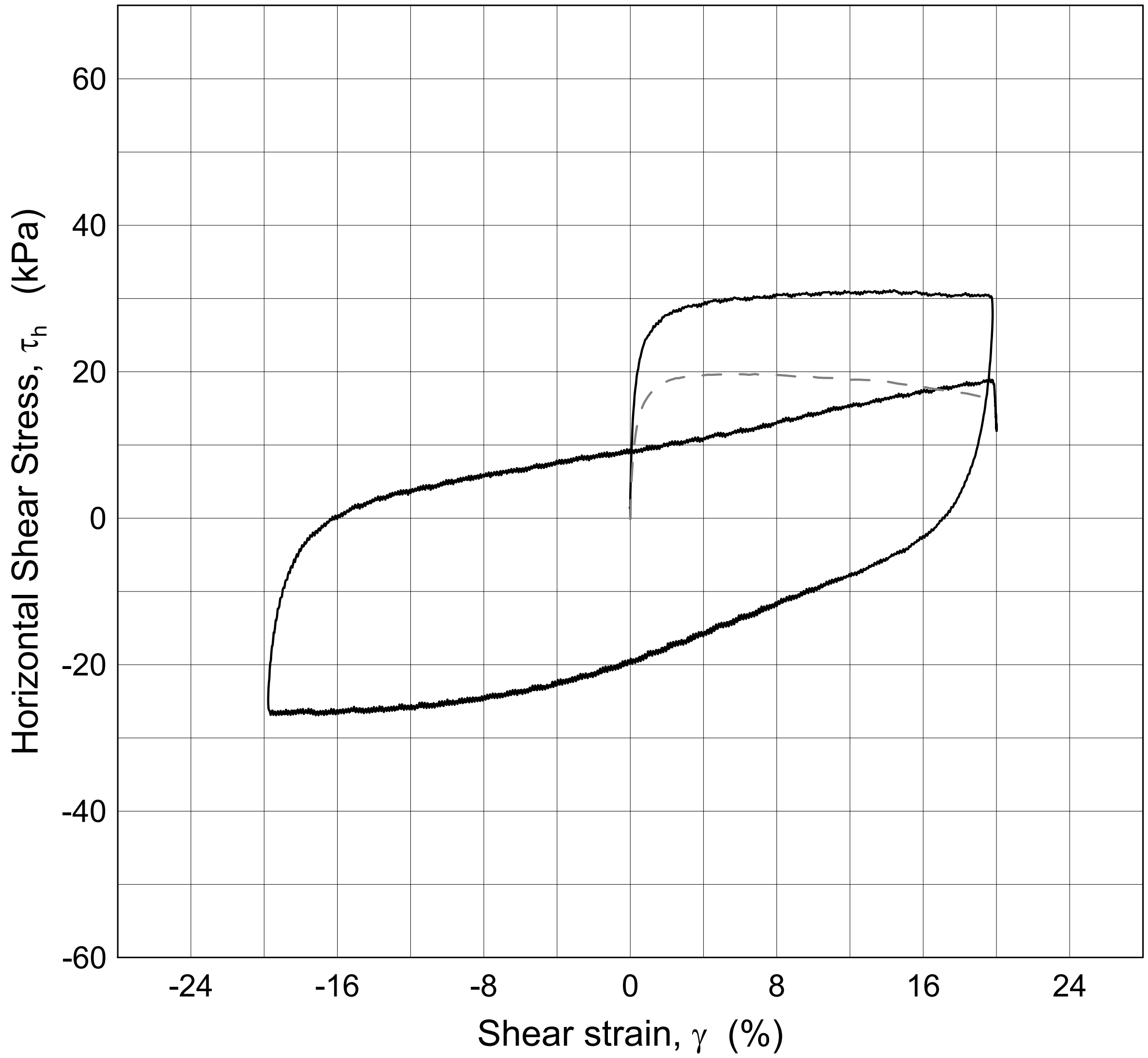
NGI

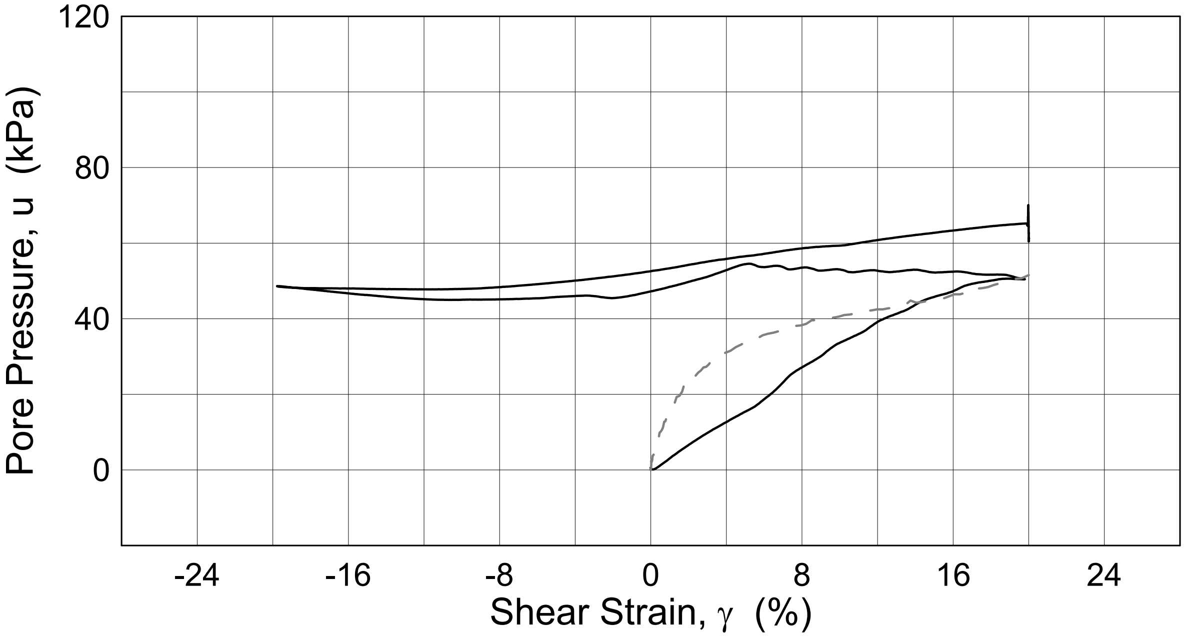
P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_76_cyclic_003\Rev. 2\DLP\2015_Onsøy_76_pro_Tau_vs_GammaGraphNo1.Grf



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\2015_Onsøy_76_cyclic_003\Rev. 2\DLP\2015_Onsøy_76_pro_Tau_vs_GammaGraphNo2.Grf

Norwegian GeoTest Sites - Onsøy							Document No. 20160154-10-R
2015_Onsøy_76_Cyclic_003		Sym. disp. controlled test with given cyclic amplitudes					Date 2016-10-10
Boring:	ONSB02	Depth = 11.375 m	Consolidation stresses				Figure No. 5.7.18
Tube:	11	p_o' = 76.7 kPa	(kPa)	max.	min.	final	
Part:	C	w_i = 42.7 %	σ_{ac}' =	76.7	76.7	76.7	Drawn by HSt
Test:	1	w_c = %	τ_c =				NGI

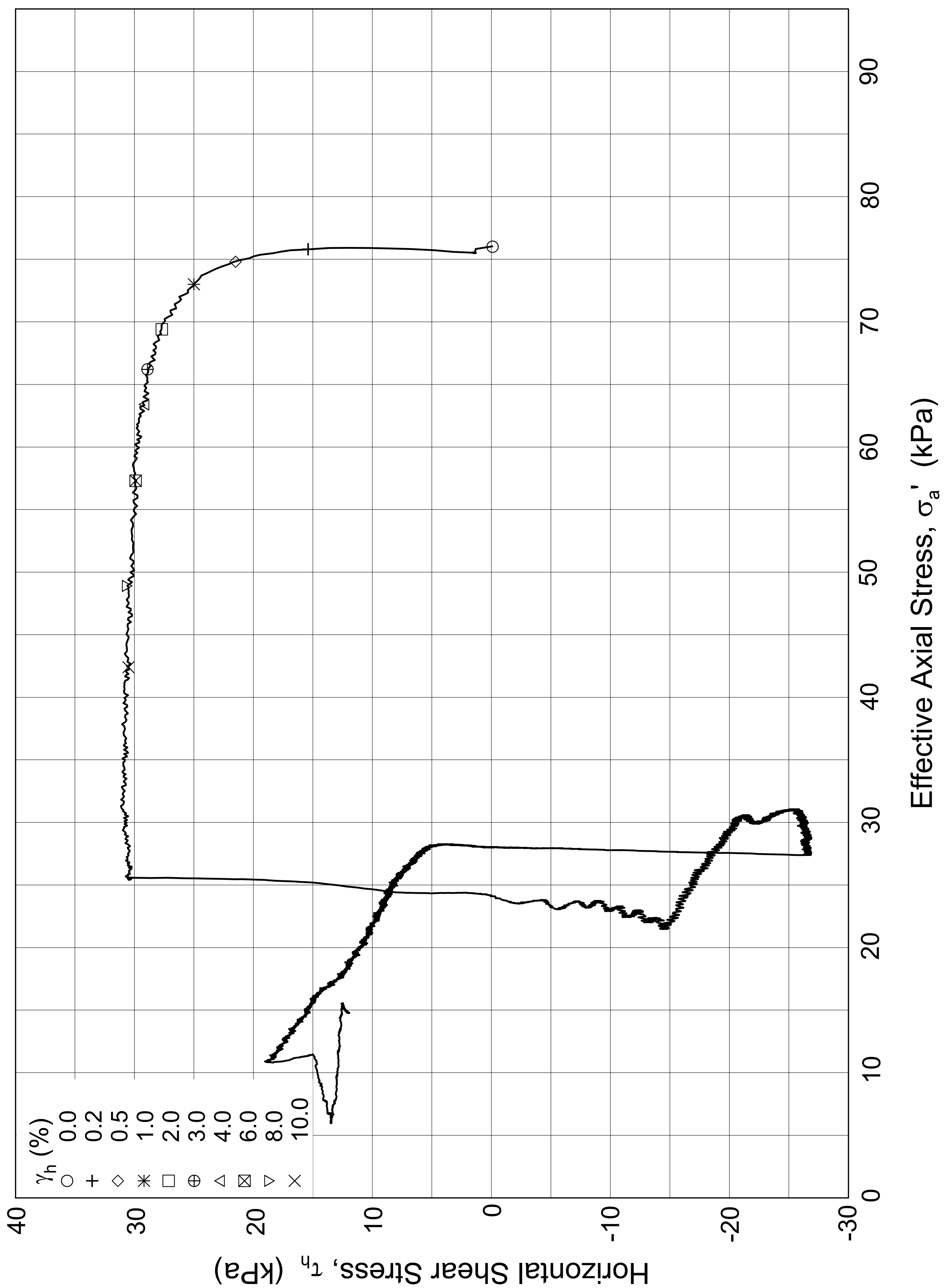




Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy			Document No. 20160154-10-R
Rapid Static Direct Simple Shear Test (incl. Standard Static DSS test in the back)			Figure No. 5.7.19
Boring: **ONSB02**	Depth = **11.53** m	Consolidation stresses	Date 2016-10-19 / Drawn by/checked TAb / MAS
Tube: **11**	p_0' = **76.0** kPa	(kPa) max. min. final	
Part: **B**	w_i = **43.8** %	σ_{ac}' = 76.0 - **76.0**	NGI
Test: **2**	γ_i = **17.41** kN/m^3	τ_c' = - - **-**	

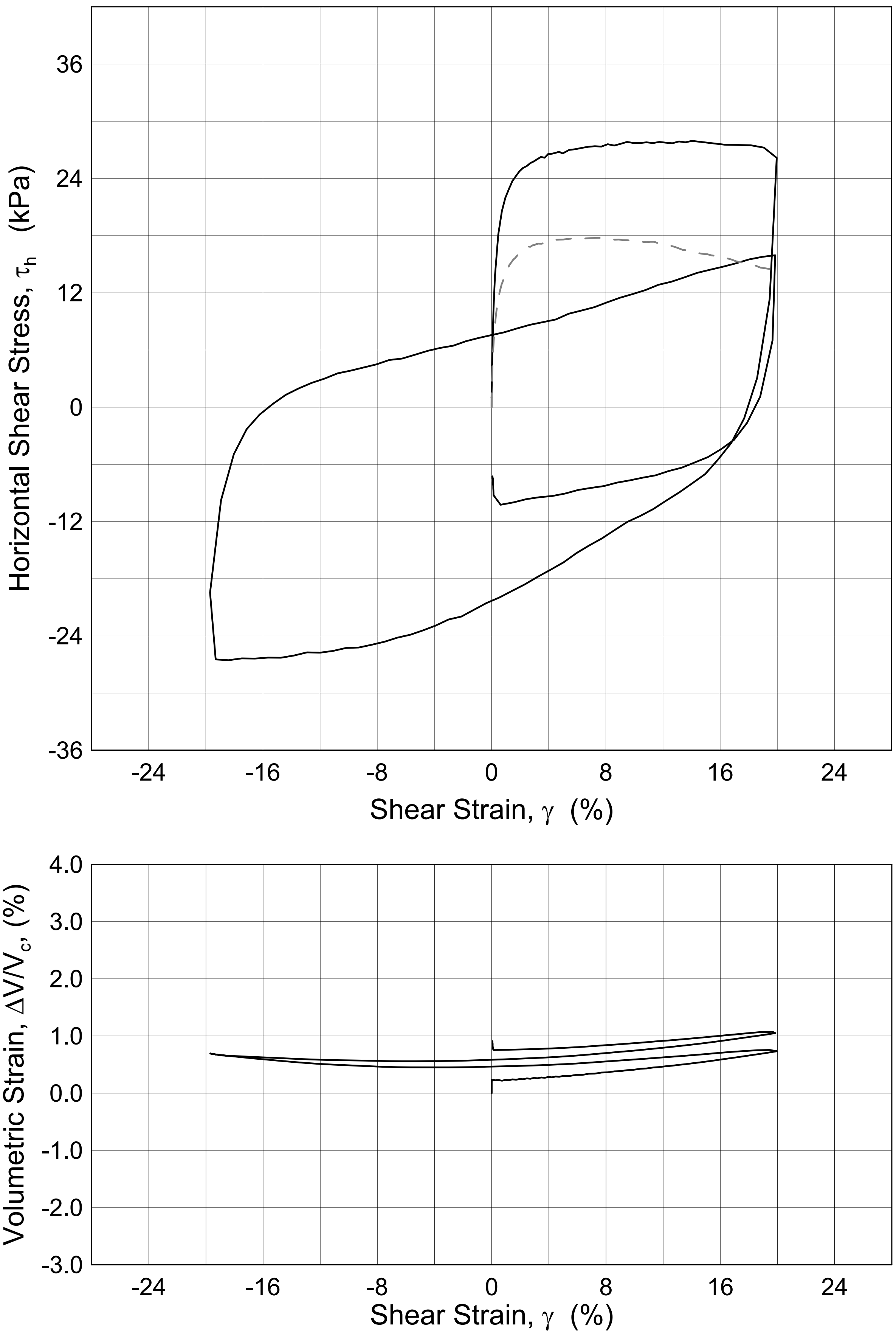
P:\2014\08\20140839\Lab\DSS\Fig 2_22 bh2-11-b-2-1(ccv1851).grf



P:\2014\08\20140839\Lab\DSS\Fig 2_23 bh2-11-b-2-2(ccv1851).grf

Date/Rev.: 2015-01-12/4

Norwegian GeoTest Sites - Onsøy				Document No. 20160154-10-R	
Rapid Static Direct Simple Shear Test				Figure No. 5.7.20	
Boring: **ONSB02**	Depth = **11.53** m	Consolidation stresses		Date 2016-10-19	Drawn by/checked TAB/ MAS
Tube: **11**	p_o' = **76.0** kPa	(kPa) max. min. final			
Part: **B**	w_i = **43.8** %	σ_{ac}' = 76.0 - **76.0**			
Test: **2**	γ_i = **17.41** kN/m³	τ_c' = - - **-**			



Norwegian GeoTest Sites - Onsøy

Rapid Static Direct Simple Shear Test (incl. Standard Static DSS test in the back)

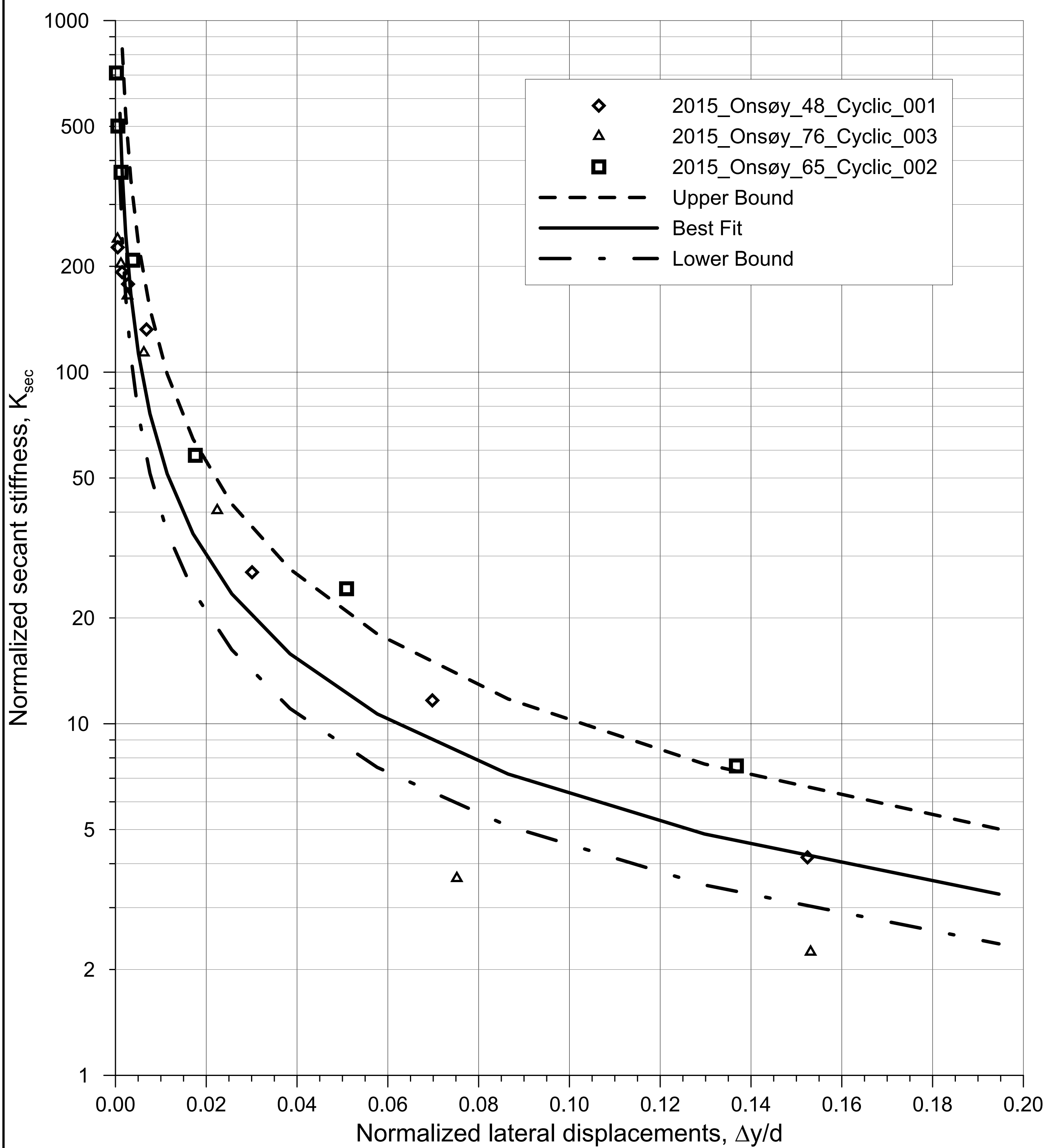
Document No.	20160154-10-R
Figure No.	5.7.21
Date	2016-10-19
Drawn by / contr.	TAb / MAS

Boring:	ONSB02	Depth	=	10.13	m
Tube:	10	po'	=	65.0	kPa
Part:	A	w_i	=	42.9	%
Test:	1	γ_i	=	17.49	kN/m³

Consolidation stresses

(kPa)	maks.	min.	final
σ_{ac}' =	65.0	-	**65.0**
τ_c' =	-	-	**-**

NGI



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\Fig 3_02 Norm Secant Stiffness K_sec.grf

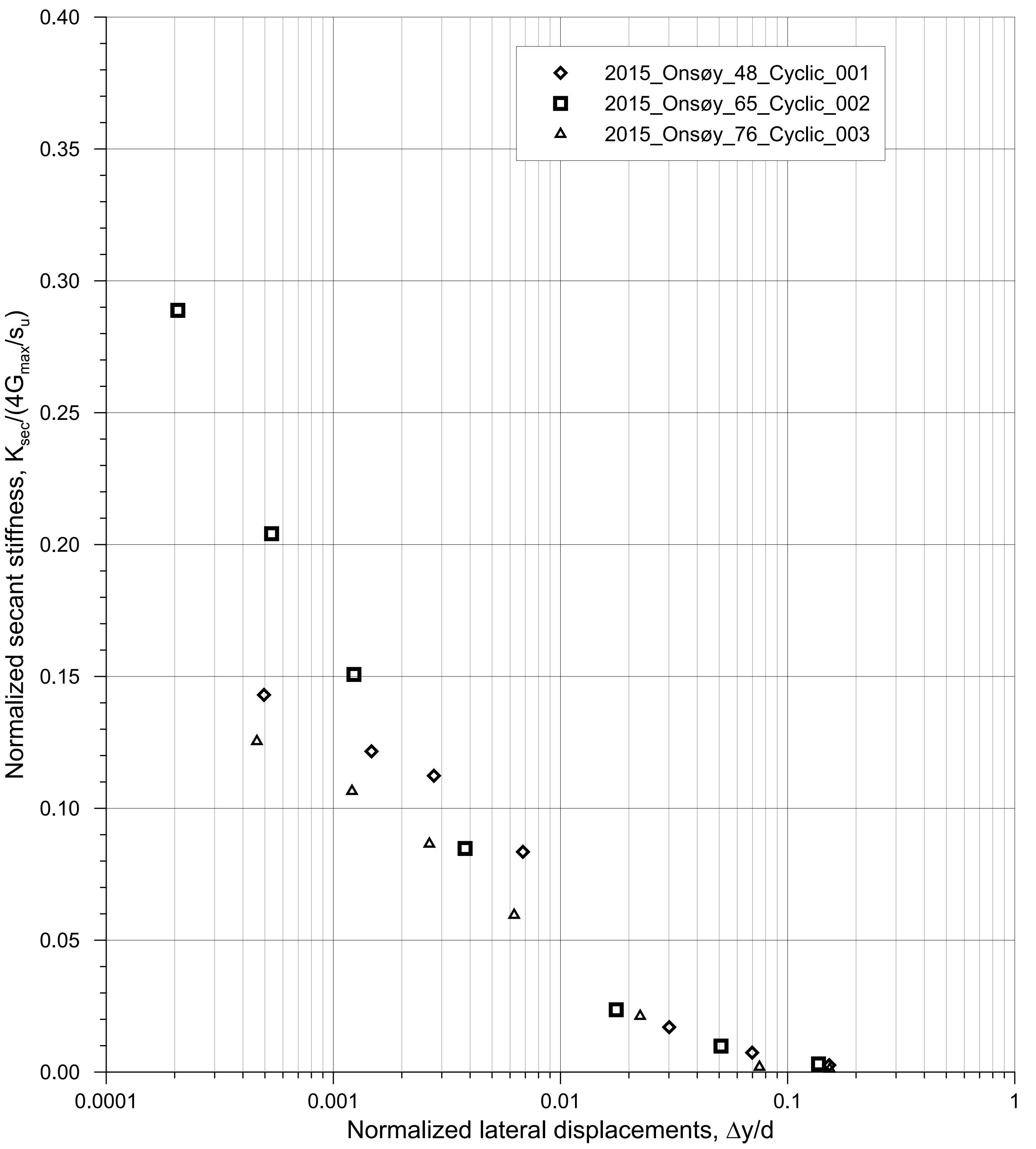
Date/Rev.: 2015-01-21/01

Norwegian GeoTest Sites - Onsøy

Normalized steady-state secant stiffness values versus normalized displacements (two-way) including Lower Bound (LB), Best Fit (BF) and Upper Bound (UB) curves after Zakeri et al. (2015; 2016 b,c)

Document No. 20160154-10-R	
Figure No. 5.7.22	
Date 2016-10-20	Drawn by HSt

NGI



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\Fig 3_03 Norm Norm Secant Stiffness K_sec.grf

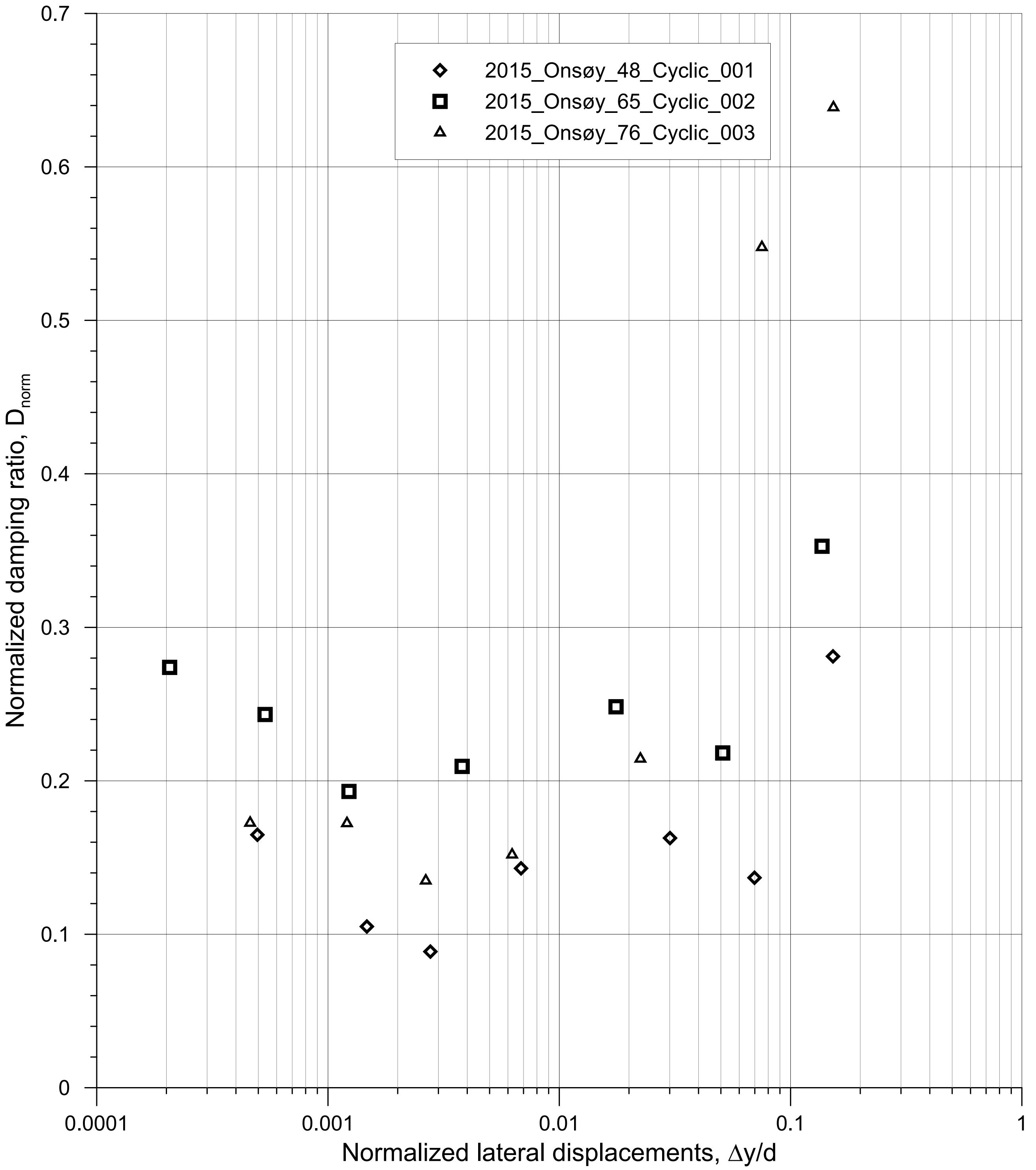
Date/Rev.: 2015-01-21/01

Norwegian GeoTest Sites - Onsøy

Normalized steady-state secant stiffness values normalized by the normalized G-modulus plotted versus normalized displacements (two-way).

Document No.	20160154-10-R
Figure No.	5.7.23
Date	2016-10-19
Drawn by	HSt

NGI



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\Fig 3_04 Norm Damping Ratio.grf

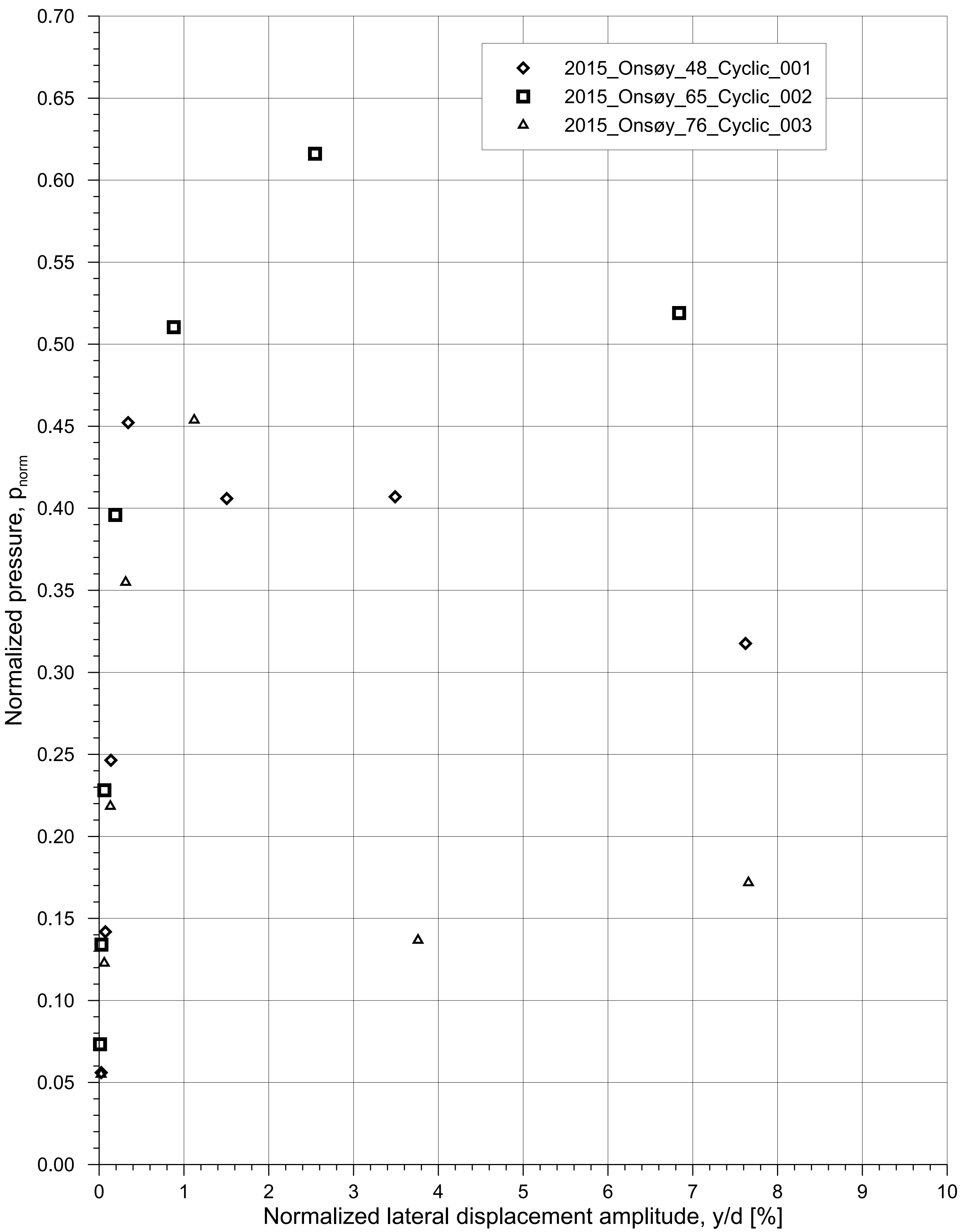
Date/Rev.: 2015-01-21/01

Norwegian GeoTest Sites - Onsøy

Steady state damping ratios normalized normalized by the maximum theoretical damping ratio of 67% versus normalized lateral displacements (two-way).

Document No.	20160154-10-R
Figure No.	5.7.24
Date	2016-10-19
Drawn by	HSt

NGI



P:\2014\08\20140839\Beregninger\Phase 2\p-y testing\Fig 3_05 Norm Pressure.grf

Date/Rev.: 2015-01-21/01

Norwegian GeoTest Sites - Onsøy

Normalized cyclic p-y curve derived from normalized secant stiffness values versus normalized lateral displacement amplitude (one-way).

Document No. 20160154-10-R	
Figure No. 5.7.25	
Date 2016-10-19	Drawn by HSt

NGI

Appendix A

ERT MEASUREMENTS

Contents

A1 Introduction

NGI has been using a test site on a farm field at Onsøy, Fredrikstad for several decades. The clay at Onsøy is thick, uniform and plastic. Unfortunately that site will be constructed and a new site becomes necessary. This document provides the performed Electrical Resistivity Tomography (ERT) field measurements at two different sites at Onsøy, the old test site and a new site. The aim of the ERT survey was to map the bedrock topography.

A2 Geological context

The sediment map of the area is shown in Figure A1. The areas of interest are covered with thick marine deposit and the bedrock is granite. Marine clay has usually a low resistivity ($\rho < 100\ \Omega m$) while granite is very resistive ($\rho > 1000\ \Omega m$). The contrast between the two materials makes it a good target for an ERT survey.

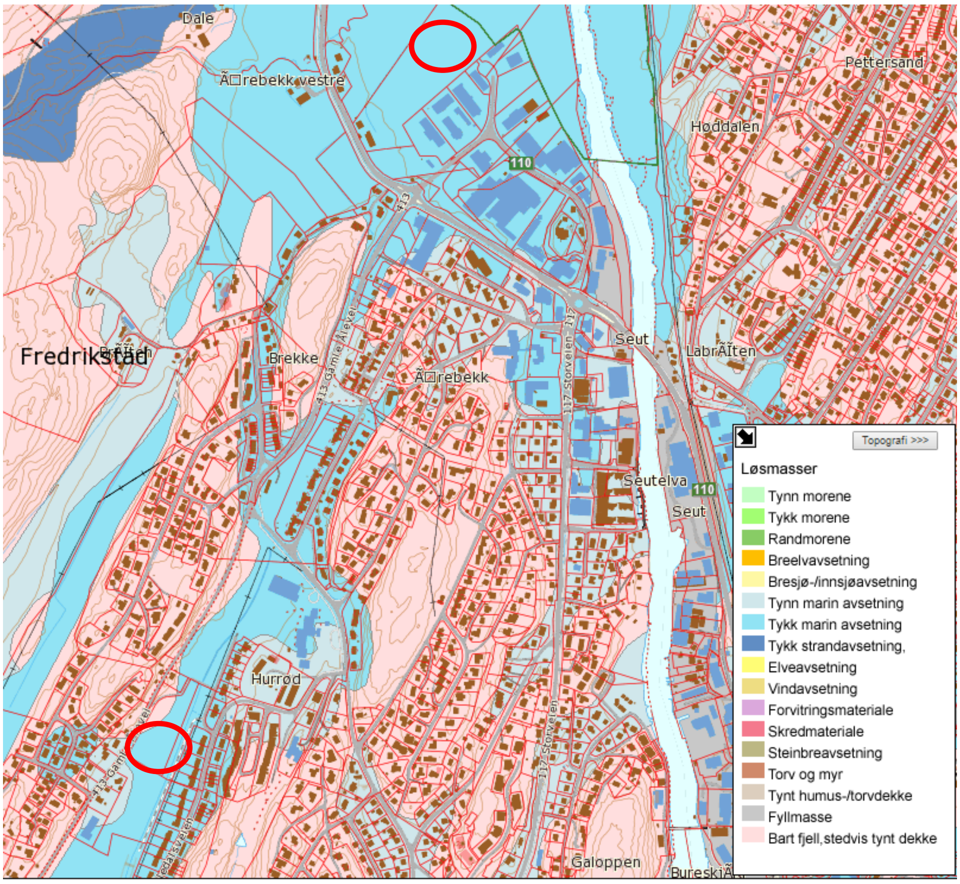


Figure A1 NGU sediments map (http://geo.ngu.no/kart/losmasse/). The two areas of interest are marked with circles.

A3 NGI old test site

NGI has been using an area NE of Fredrikstad for approximately 40 years, but the nearby industrial site is now expending. There has not been any ERT nor RCPT conducted at that site. We have therefore acquired a small ERT profile near the recent block sampling from 2015 (number 6 on Figure A2), before the site gets inaccessible.

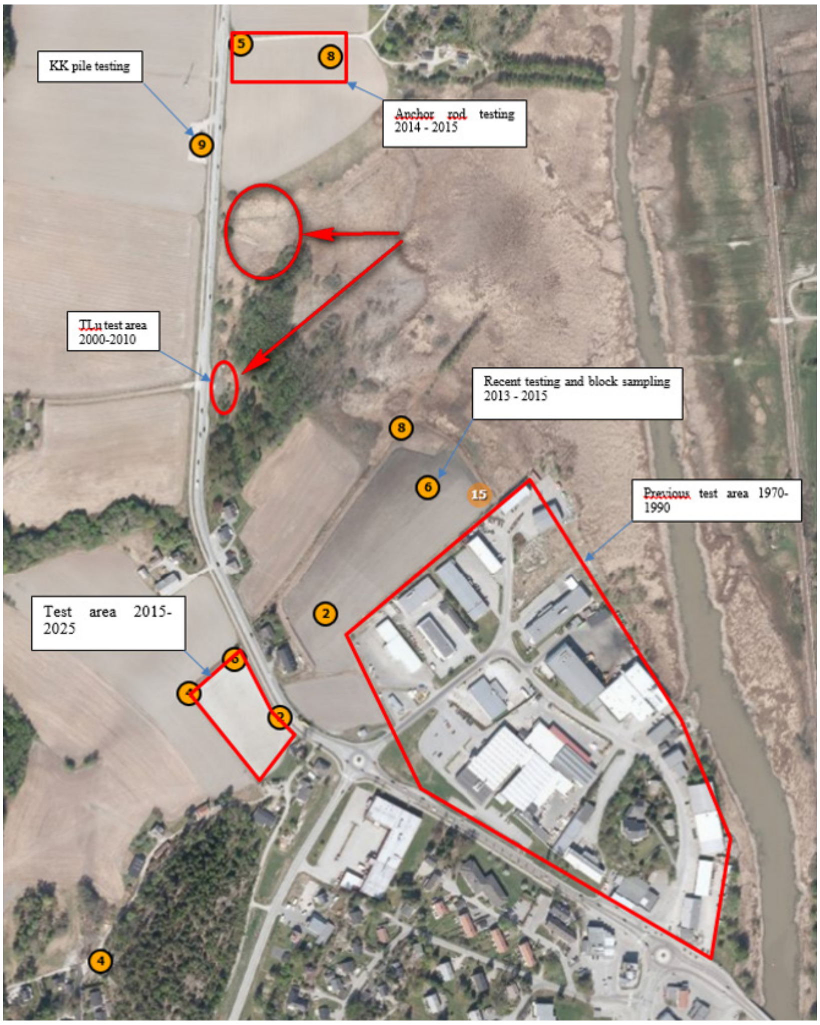


Figure A2 The old test site where NGI has been conducting research for the last 4 decades. It is located at the northern mark on the map in Figure A1.

A4 ERT survey

A4.1 Acquisition

NGI acquired three ERT profiles on January 26 2016. The air temperature was 3°C and the ground was covered with ~5 cm snow. The surface of the ground was frozen, but we could hammer down the electrodes easily and obtained good contact with the ground. The survey was performed with a 12-channel Terrameter LS recording unit (ABEM, 2011). The multiple gradient array was chosen for the acquisition protocol, it has been designed for use in multichannel systems (Dahlin and Zhou, 2006) and is optimal for this instrument. Figure A3 shows a map of the profiles as they were carried out in the field.

NGI acquired a fourth ERT profile on April 26 2017. The air temperature was 20°C. The surface of the ground was very dry. The survey was performed with the newly aquired 12-channel Terrameter LS2 recording unit (ABEM, 2017). The multiple gradient array was kept as in 2016.

NGI acquired a fifth ERT profile on June 14 2016 during the ISGTS workshop. It rained a lot during the survey. The multiple gradient array was kept as in 2016 and 2017.

Figure A3 Aerial picture of Onsøy with the approximate positions of the five ERT profiles.

A4.2 Processing

The raw data were inverted with software RES2DINV (RES2DINV, 2015) to obtain the model resistivity distribution. The following options were chosen for the inversion:

- half unit cell spacing;
- manual removal of noisy data points
- robust inversion;
- the inversion was automatically stopped at iteration 7 but the best model is kept for reporting;
- the same color scale was used for the 4 profiles.

A4.3 Onsøy old test site

The profile was chosen to be as close as possible to block sample 1 (6567875.181E; 608790.816N in UTM32N) to allow direct comparison in laboratory measurements.

Figure A4 ERT acquisition along profile L1 at Onsøy old test site.

The electrode spacing is 1 m, the total length of the profile is 80 m. The electrodes were planted in a harvested field at the border of a swamp that is a natural reserve (Figure A5). Generally, the contact resistances were good, < 1 kΩ. In order to obtain position of the ERT profile, electrode positions were measured with a Differential GPS every 20 m. The profile ends positions are given in Table A-1.

Table A-1 DGPS coordinates of the profiles ends. Projection: UTM zone 32N. Elevation from DGPS given above sea-level.

PROFIL - LENGTH (m)	EASTING (m)	NORTHING (m)	ELEVATION ABOVE SEALEVEL (m)
L1- 0	6567891.164	608727.188	0.726
L1- 80	6567882.853	608764.837	0.753

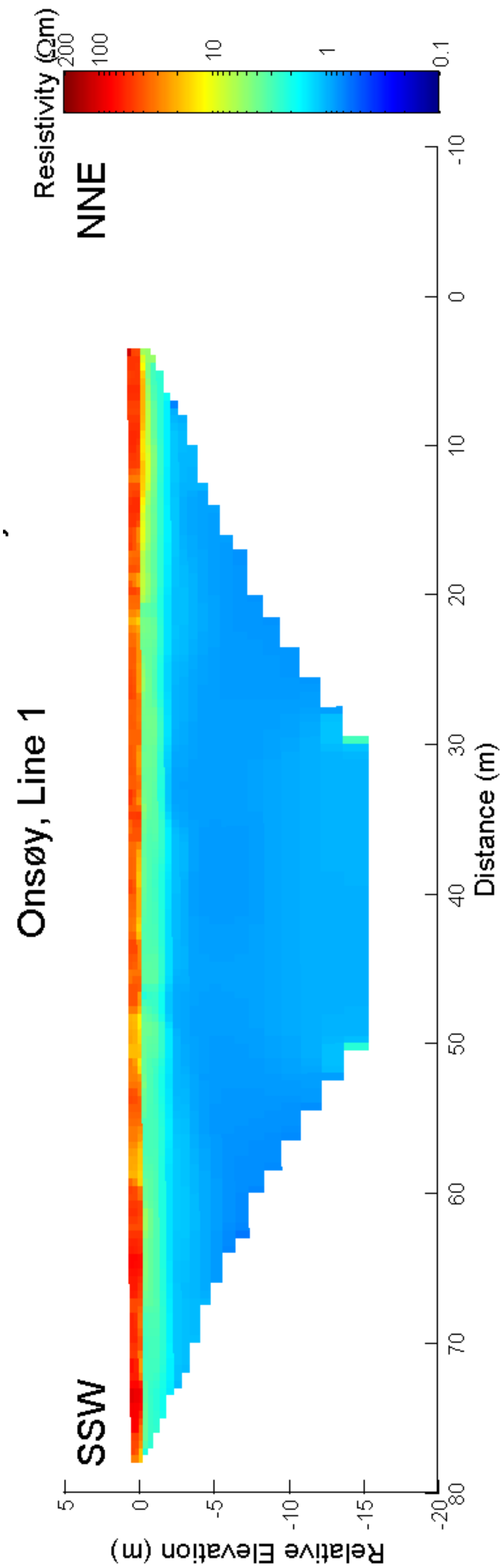


Figure A5 Resistivity profile L1. All the resistivity profiles have the same colour scale. There is no vertical exaggeration.

The resistivity profile is presented in Figure A5. Only the best resistivity model is shown here. The data fit is very good for profile L1 (RMS=2.5% at iteration 4). The depth of investigation along profile L1 is only 15 m in the center part of the profile. We observe a very thick marine clay layer. The top is marked by a ~1 m thick dry crust layer. The clay thickness is greater than the penetration depth of the profile. The clay is very homogeneous and extremely conductive (ρ < 1 Ωm) due to its high salt content.

A4.4 Onsøy new test site

Two parallel profiles approximately 30 m apart, were acquired on January 26 2016. The electrode spacing is 2 m, the total length of the profiles is 160 m. The profiles were extended towards the south on the property of Fredrikstad municipality in order to reach the maximum penetration depth in the area of interest. The electrodes were planted in ploughed field (Figure A6). Generally, the contact resistances were not as good as for L1, but reasonable (< 10 kΩ). In order to obtain position of the ERT profiles, electrode positions were measured with a Differential GPS every 40 m.

One perpendicular profile was acquired on April 26 2017. The electrode spacing is 1 m, the total length of the profiles is 80 m. The profile is just south of the recently planted field (Figure A7) and it runs along the borehole positions. The contact resistances were good (< 2 kΩ). In order to obtain position of the ERT profile, electrode positions were measured with a Differential GPS every 20 m.

One new profile L5 was acquired on June 14 2019. The electrode spacing is 1 m, the total length of the profiles is 76 m. The profile is north of profile L4.

The profiles ends positions are given in Table A-2.

Table A-2 DGPS coordinates of the profiles ends. Projection: UTM zone 32N. Elevation from DGPS given above sea-level. Note that there was no DGPS data for line 5 and the end points were guessed on an aerial picture

PROFIL - LENGTH (m)	EASTING (m)	NORTHING (m)	ELEVATION ABOVE SEALEVEL (m)
L2- 0	6566555.336	608297.658	5.95
L2- 160	6566409.565	608232.238	6.41
L3- 0	6566546.985	608322.311	5.75
L3- 160	6566397.691	608265.205	5.90
L4- 0	608252.829	6566445.511	6.07
L4- 80	608307.281	6566420.295	5.04
L5- 0	608314	6566455	6
L5- 76	608242	6566483	6

Figure A6 ERT acquisition along profile L3 at Onsøy new test site in January 2016.

Figure A7 ERT acquisition along profile L4 at Onsøy new test site in April 2017.

Only the best resistivity models are shown here. The data fit is good for profile L2 (RMS=4.9% at iteration 4), profile L3 (RMS=5.6% at iteration 5), profile L4 (MS=2% at iteration 5), and profile L5 (MS=0.83% at iteration 4). The depth of investigation along profiles L2 and L3 is 30 m at the center of the profiles. The depth of investigation is only 16 m along profiles L4 and L5 as they are shorter due to limited width of the field.

The resistivity profiles are presented in Figure A8, Figure A9, and Figure A10. On all profiles, the top is marked by a ~1 m thick resistive ($\rho > 100$ Ωm) dry crust layer.

The northern part of L2 is marked by the resistive granitic bedrock. At its northern end, the clay layer is only a few meters thick. At its southern end, the clay layer probably exceeds 13 meters. Because of the smoothing effect of the inversion method, it is difficult to pin-point the bedrock depth without further information.

L3 is difficult to interpret because it is most likely affected by 3D effects. The resistive bodies at the two corners are an effect of the resistive bedrock but not in the alignment with the profile. Indeed, the two profiles are in a valley bordered by steep flanks. Again, the clay layer probably exceeds 13 meters but it needs to be confirmed by a perpendicular ERT profile or boreholes.

The western part of L4 and L5 is marked by the resistive granitic bedrock. The bedrock interface follows the profile border on the western side, it exceeds the DOI in the center of the profile and we observe that it shallows again near the eastern model corner. We observe that the resistivity increases with depth below 10 m depth. This indicates that the bedrock depth is probably very close to the model DOI (16 m). Therefore, the clay layer exceeds 16 meters in the center of the profile but probably not by very much.

There is a very good agreement between the perpendicular profiles at the two crossing points. A 3D visualization of the three profiles would reveal this nicely.

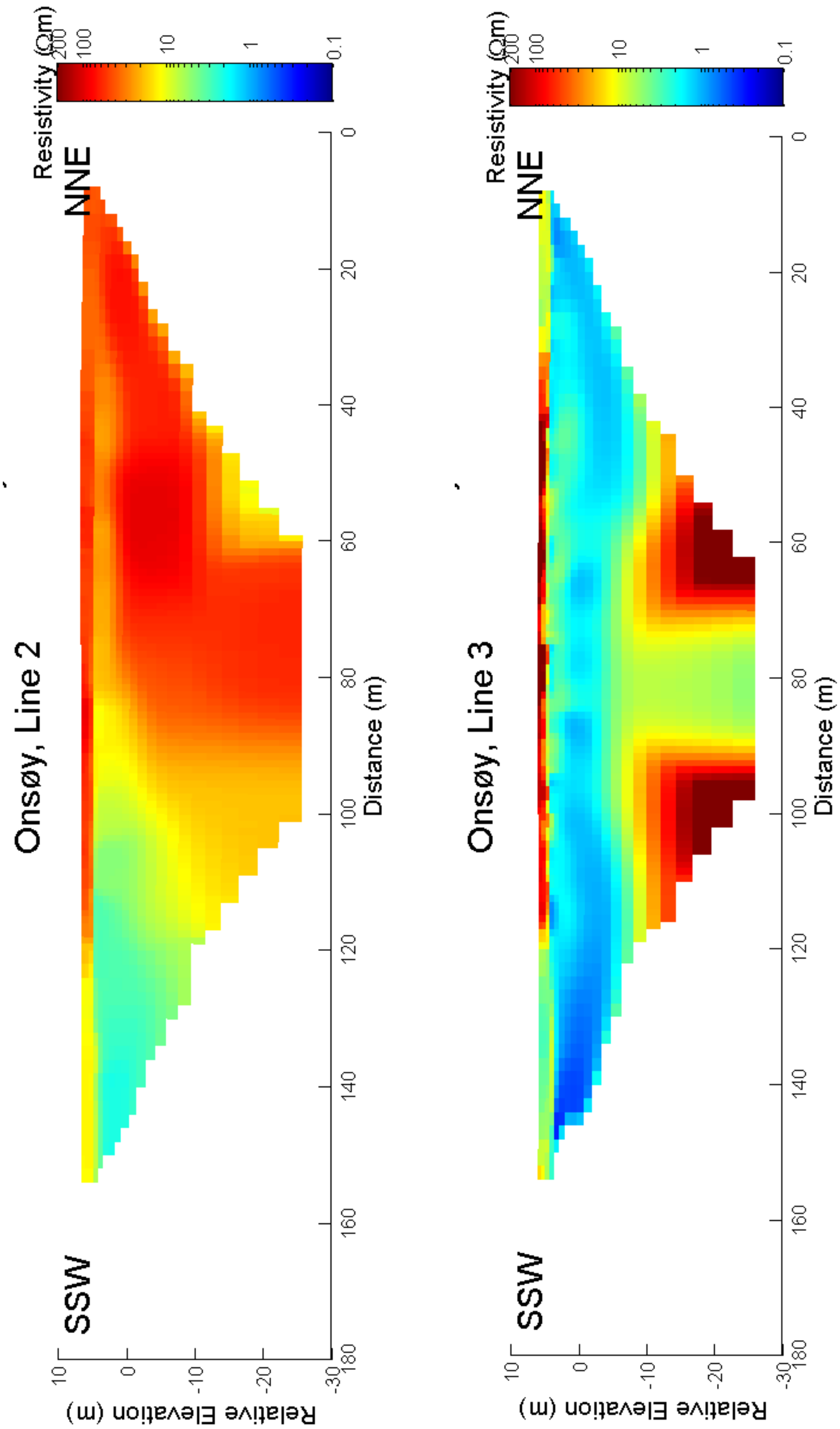


Figure A8 Resistivity profiles L2 (left panel, also western profile) and L3 (right panel, also eastern profile).

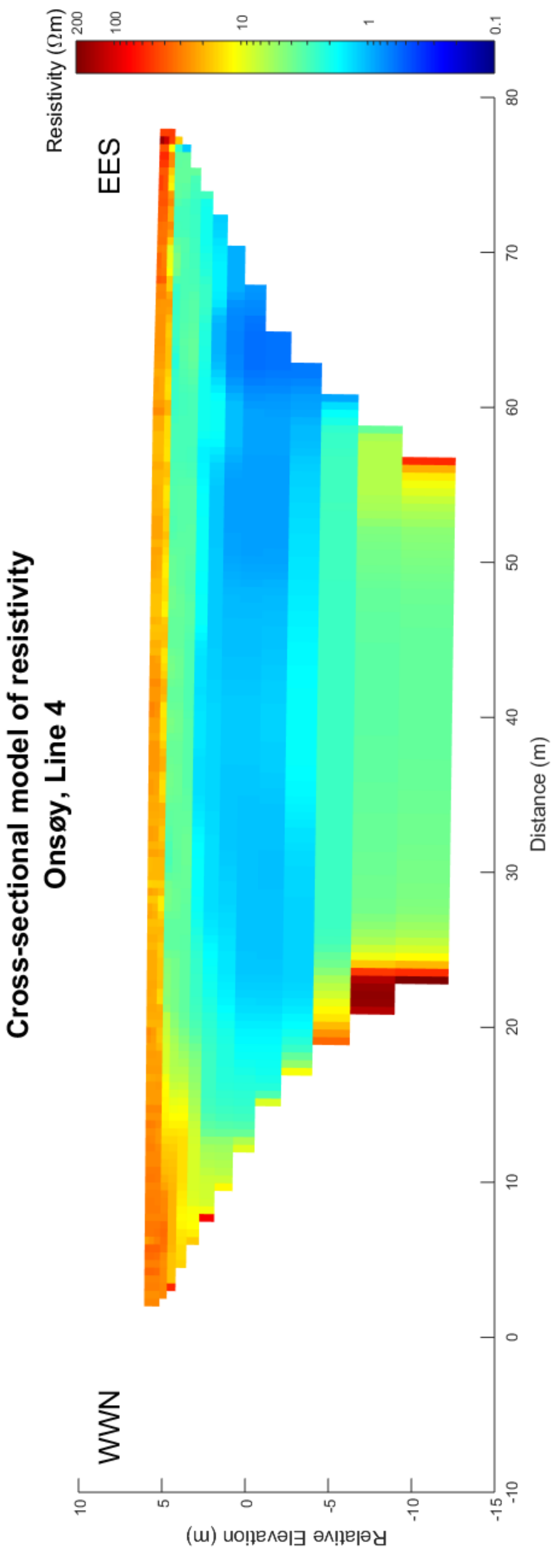


Figure A9 Resistivity profile L4.

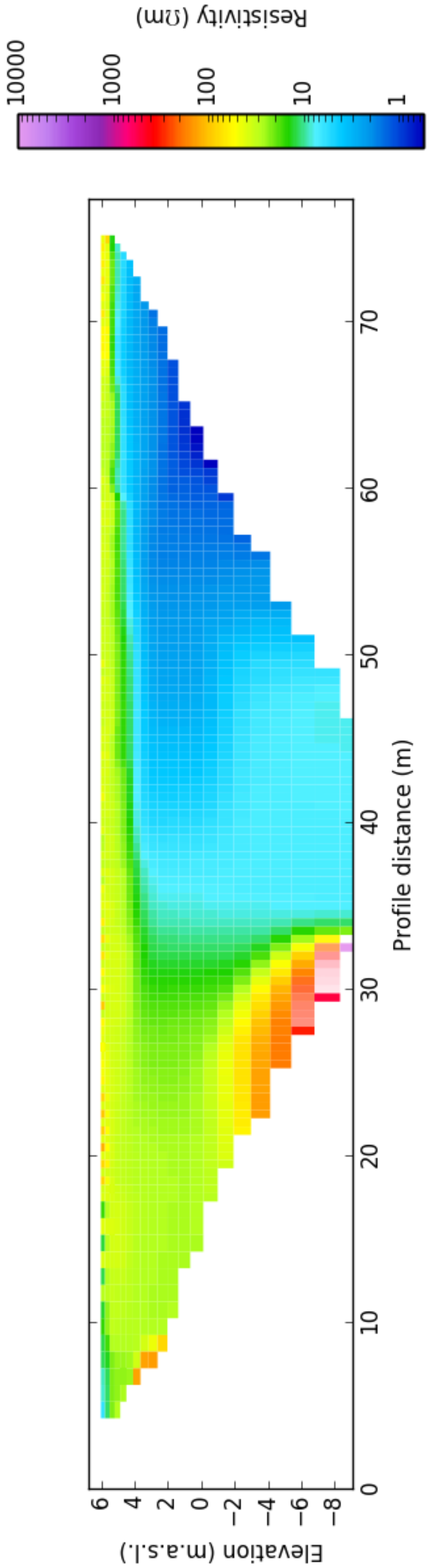


Figure A10 Resistivity profile L5 from WWN to EES.

A5 Conclusion

From the ERT results we can clearly identify three layers: dry crust, marine clay and resistive bedrock. The bedrock topography is however difficult to retrieve in the new test site. The penetration depth would be sufficient but the geometry of the valley makes it difficult for 2D profiling. Thanks to the newly acquired perpendicular profile, we can say that the clay layer exceeds 16 meters in the area of interest. However, the width of the fields limits its length to 80 m, leading to a penetration depth of only 16 m in the center of the profile. Further synthetic tests could verify whether other acquisition geometry (pole-dipole for example) could improve the penetration depth. There is also an aerial power line that runs along the southern border of the farmer property, which might cause limitation for future research tests.

A6 References

ABEM, 2011, Terrameter LS, Instruction Manual, ABEM20110412, http://abem.se/files/upload/User Guide Terrameter LS 1.7.pdf.

ABEM, 2017, Terrameter LS2, User Manual, ABEM Product Number 33 3200 95, http://www.guidelinegeo.com/wp-content/uploads/2016/11/ABEM-Terrameter-LS-2-User-Manual.pdf

Dahlin, T. and Zhou, B., 2006. Multiple gradient array measurements for multi-channel 2D resistivity imaging. Near Surface Geophysics, 4 (2), 213-123.

RES2DINV, 2015, Geotomo Software. http://www.geoelectrical.com/, Window 7 Version 6.

Appendix B

MASW AND PASSIVE SEISMICS MEASUREMENTS

Contents

B1 MASW testing

A Multi-channel Analysis of Surface Waves (MASW) survey was conducted by NGI the 9th of March 2018. The ground was covered with snow, but there was only a thin frozen crust layer in the subsurface. The weather was optimal for seismic surveying with no rain and little wind. The acquisition parameters are summarized in Table B1-1. One profile was acquired in the centre of the new test site (ONSM01).

Table B1-1 MASW survey acquisition parameters

Recording system	Daqlink, 2*12 channels
Geophone type	Single geophone 4.5-Hz (vertical)
Receiver interval	1 m
Recording time	2 s
Sampling interval	1 ms
Recording filter	None
Polarity	SEG convention
File format	SEG2
Data storage type	Un-stacked
Source	Sledge hammer (5 kg) and rubber plate
Shot count/location	4 to 5 shots per location
Source positions	4 m both ends of the array

The data was processed using the WinMASW software (Dal Moro et al., 2015). Once the acquisition geometry is properly defined and the data are vertically stacked for repeated shots-receiver combinations, the data quality is assessed in time domain (Figure B1.1). The effective mode, a combination of the 1st and higher modes, is then picked in phase-velocity domain. These picks are used for the velocity inversion with WinMASW. The inversion of the dispersion curves provides a 1D Vs profile averaging the subsurface properties below the geophone array. Data and results are presented in Figures B1.2 and B1.3. The data fit is not very good, but the shape of the effective mode (increasing velocity with increasing frequency) indicates that there is a velocity inversion (i.e. the velocity does not continuously increase with depth).

The two solutions for the south and north shot gather are quite different and further processing is needed. In Figure B1.2, we observe however a fast layer near the top which is also detected by the Pagani test.

B2 Passive seismic testing

Microtremor array exploration is a method for inferring the subsurface structure by identifying the phase velocity of surface waves through array observations of microtremors (also referred to as ambient noise, microseisms, etc.). NEID has developed a new method in the recent years for extracting surface wave characteristics from miniature arrays (Cho and Senna, 2016).

The passive seismic survey was conducted by NGI and NEID the 7th of March 2018. The ground was covered with snow, but there was only a thin frozen crust layer in the subsurface. The weather was optimal with no rain and little wind. The acquisition parameters are summarized in Table B2-1. The new (ONSPS01) and the old test (ONSPS02) sites were acquired.

Table B2-1 Passive seismic survey acquisition parameters

Recording system	Datamark JU410 (HAKUSAN CORPORATION)
Geophone type	Accelerometers, 3 channels, JA-40GA-4G
Recording time	15 min
Sampling rate	200 Hz
Recording filter	None
Polarity	Z,E,N
File format	WIN format developed by ERI Univ. of Tokyo & ascii

The data was processed with the open source software Geopsy (e.g. Wathelet et al., 2008). The H/V spectral ratio of microtremor measurements is generally able to estimate the predominant frequency of a site (Nakamura, 1989). First, horizontal to vertical ratio are derived from each of the two sites.

The spectral ratio at the new site (ONSPS01) presents a peak at 0.6 Hz (Figure B4). The spectral ratio at the old site (ONSPS02) presents a clear peak at 1.8 Hz (Figure B5). Assuming an average Vs velocity of 160 m/s, it provides a sediment thickness of 25 m at the new site and 22 m at the old site (Depth=Vs/4F_0). It is suspected that the H/V spectral ratio for the new site do not show any clear frequency peak due to the valley shape of the substructure that does not follow the 1D assumption.

The phase-velocity dispersion curve could also be calculated from the noise measurements. As for the MASW method, those dispersion curves could be inverted to obtain the shallow velocity structure, but this is still work in progress.

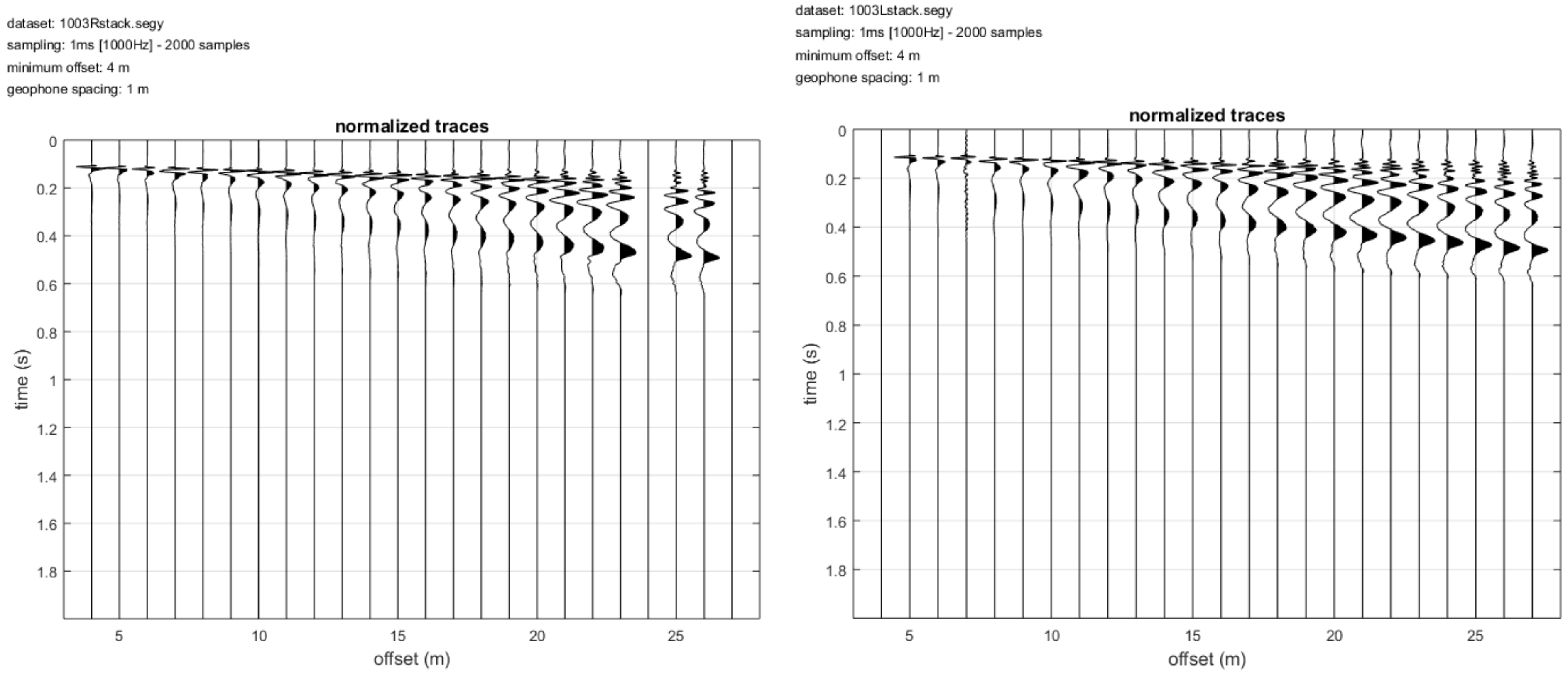
B3 References

Cho, I. and Senna, S. (2016). Constructing a system to explore shallow velocity structures using a miniature microtremor array. Synthesiology, Vol. 9, No. 2, pp 87-98.

Dal Moro G, Keller L., and Poggi V.A (2015). Comprehensive seismic characterization via multi component analysis of active and passive data. First Break, Vol. 33, pp. 45-53.

Nakamura, Y. (1989). A Method for Dynamic Characteristics Estimation of Subsurface using Microtremor on the Ground Surface, Quarterly Report of RTRI, Vol. 30, No.1, pp25-33.

Wathelet, M., Jongmans, D. Ohrnberger, M. and Bonnefoy-Claudet, S. (2008). Array performances for ambient vibrations on a shallow structure and consequences over V_s inversion. Journal of Seismology. Vol. 12, pp. 1-19.

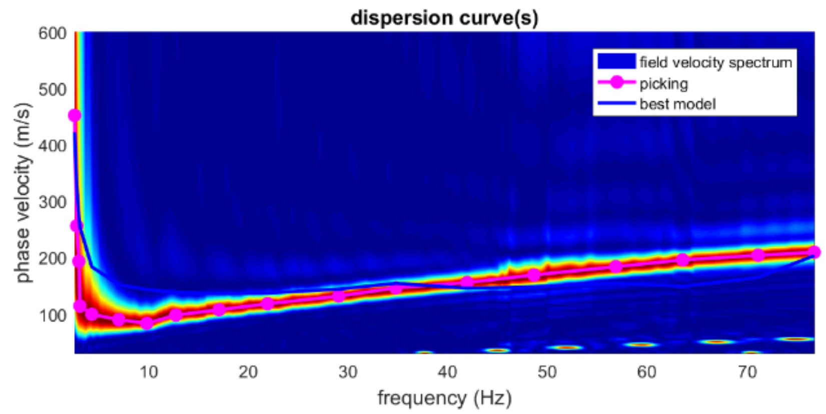


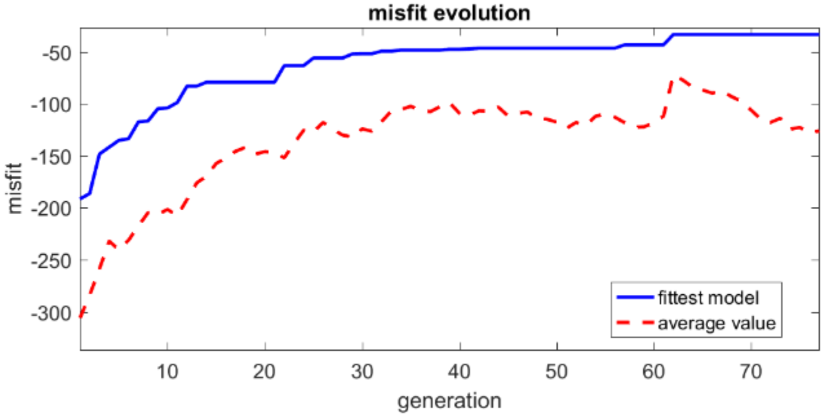
Norwegian GeoTest Sites - Onsøy

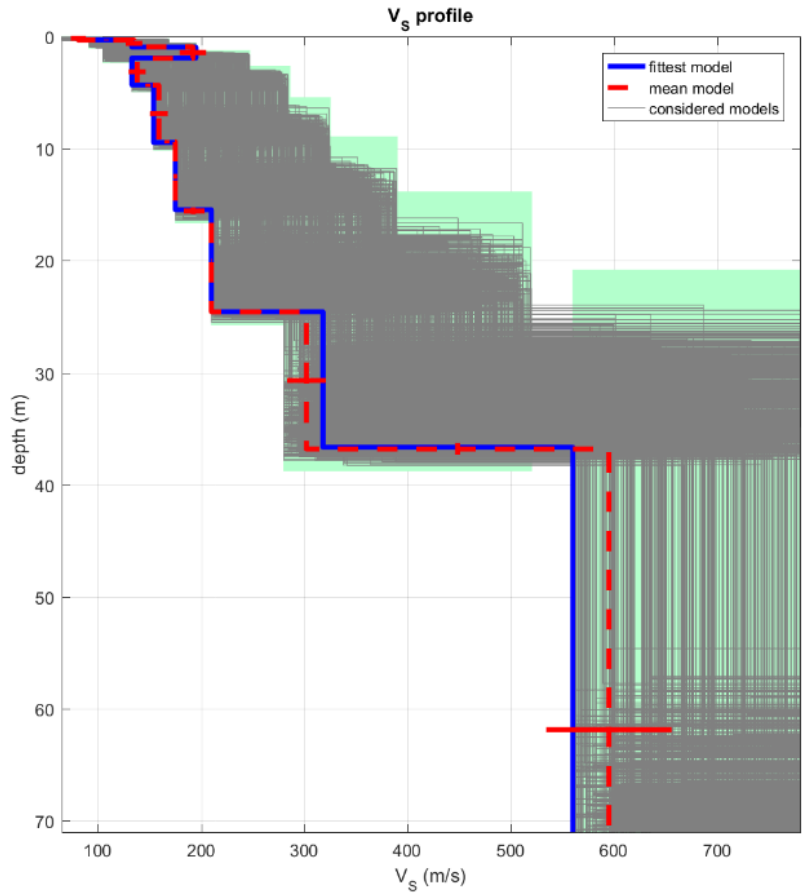
MASW profile ONSM01 at the new site.
Left : south side shot gather (1003R).
Right : north side shot gather (1003L).

Document no.	
20160154-10-R	
Figure no.	
B1.1	
Date	Drawn by
2018-05-09	SaB

NGTS







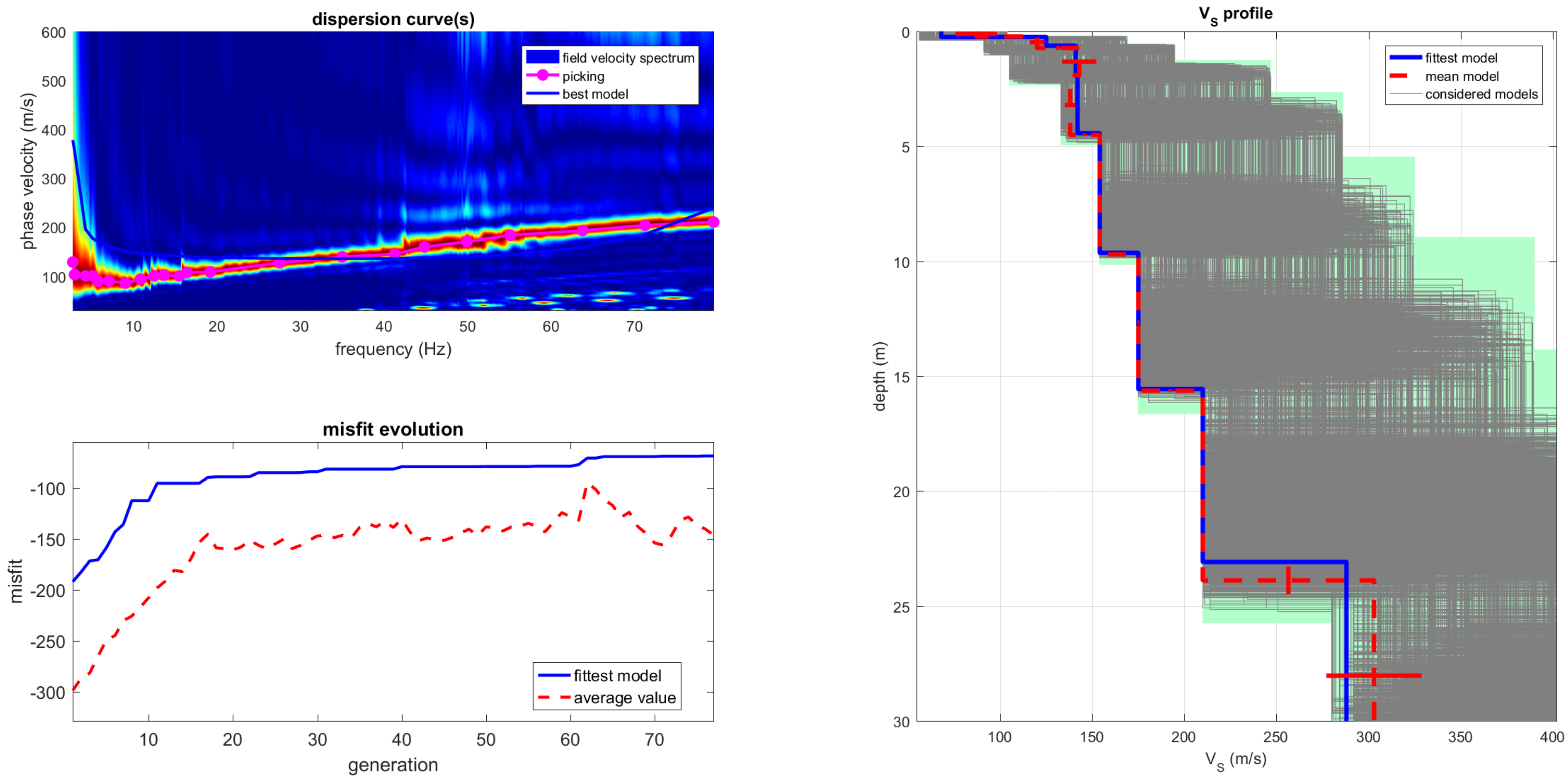
dataset: 1003Rstack-CLEAN.sgy

dispersion curve: 1003Reffective.cdp

Vs30 (best model): 188 m/s

Vs30 (mean model): 189 m/s

Norwegian GeoTest Sites – Onsøy	Document no. 20160154-10-R	
Dispersion curve of ONSM01 (south side shot gather 1003R) and inversion results. Top Left: the pink dots are picks for the effective mode. The blue curve is the data fit after inversion. Right: Best fitting velocity structure. We observe a fast layer near the top which is also detected by the Pagani test.	Figure no. B1.2	
	Date 2018-05-09	Drawn by SaB
	NGTS	



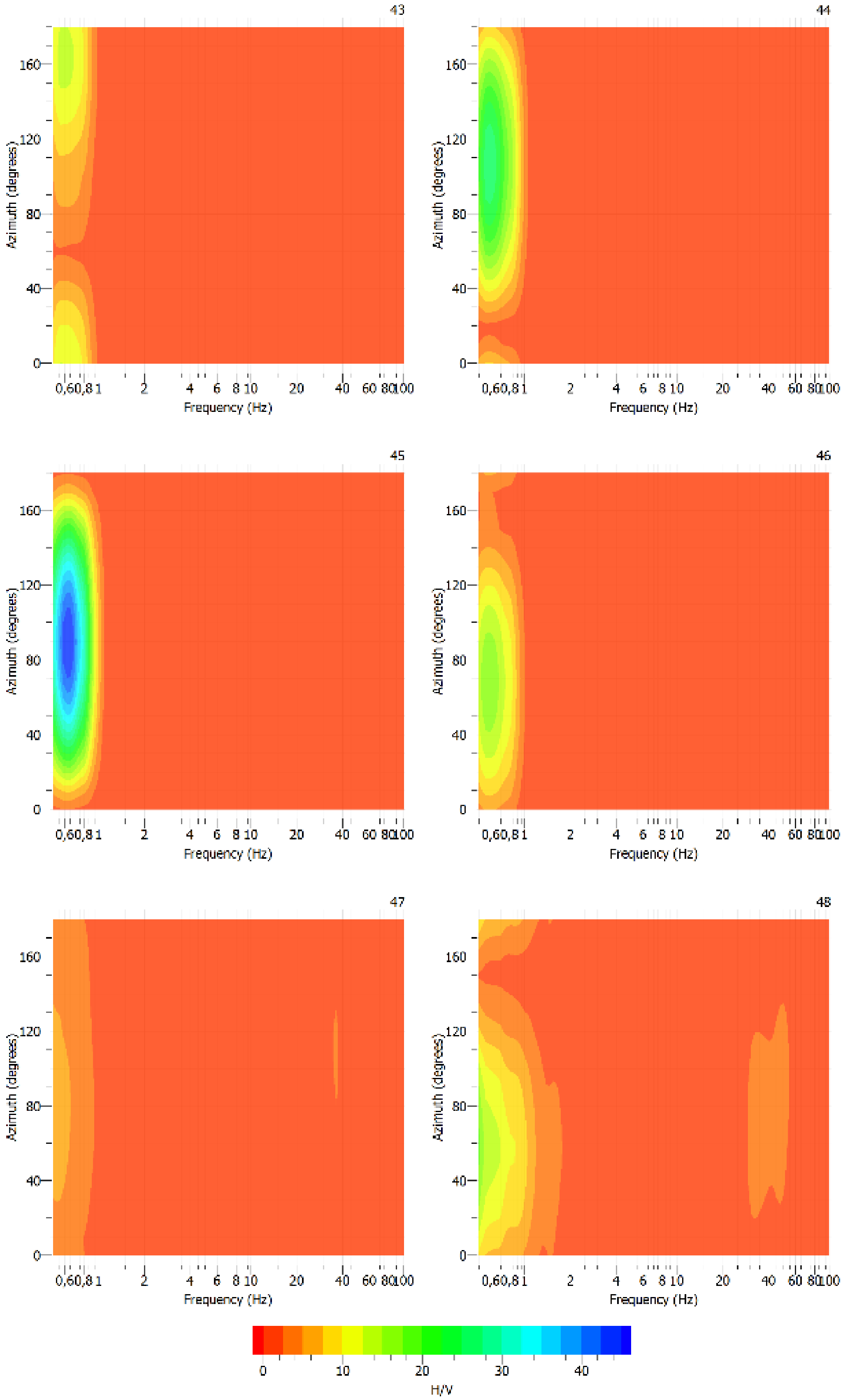
dataset: 1003Lstack-CLEAN.sgy

dispersion curve: 1003Leffective.cdp

Vs30 (best model): 186 m/s

Vs30 (mean model): 186 m/s

Norwegian GeoTest Sites – Onsøy	Document no. 20160154-10-R	
Dispersion curve of ONSM01 (north side shot gather 1003L) and inversion results. Top Left: the pink dots are picks for the effective mode. The blue curve is the data fit after inversion. Right: Best fitting velocity structure.	Figure no. B1.3	
	Date 2018-05-15	Drawn by SaB
	NGTS	



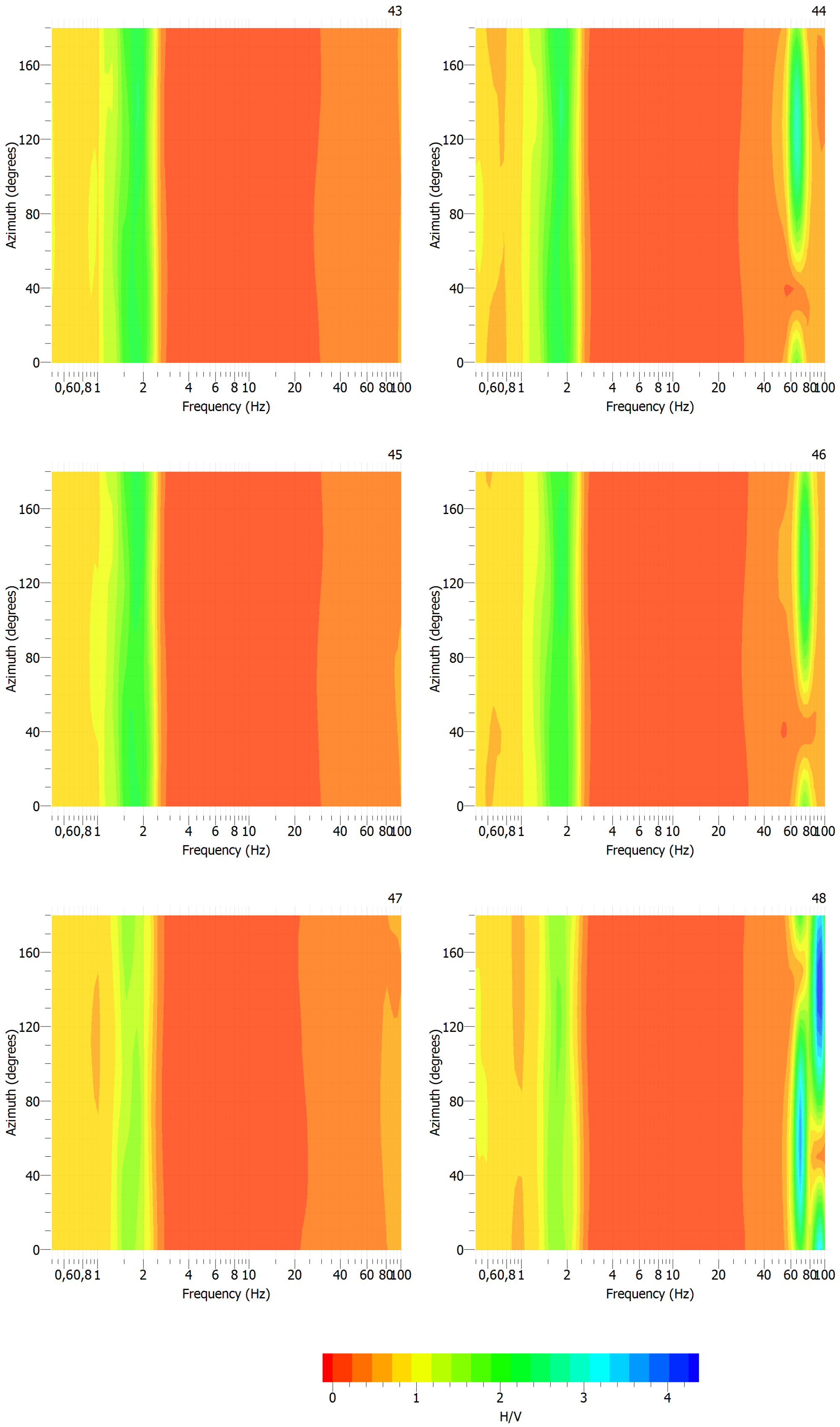
Norwegian GeoTest Sites – Onsøy

Passive seismic array.
H/V spectral ratio of the 6 stations recorded at the new site ONSPS01.
The spectral ratio presents a peak at 0.6 Hz.

Document no.	
20160154-10-R	
Figure no.	
B1.4	
Date	Drawn by
2018-05-09	SaB

NGTS

document1



Norwegian GeoTest Sites – Onsøy	Document no. 20160154-10-R
Passive seismic array. H/V spectral ratio of the 6 stations recorded at the old site ONSPS02. The spectral ratio presents a clear peak at 1.8 Hz. Old Onsøy site.	Figure no. B1.5 Date: 2018-05-09 / Drawn by: SaB NGTS

document1

Appendix C

FIELD VANE TEST

Contents

Table

Figure

C1 Introduction

In order to both map the ground conditions and test new field equipment, field vane testing was performed at the new Onsøy test site. The field vane test is an easy and straightforward way of obtaining estimates of the undrained shear strength of clays. The test was performed using a Geotech ElectricVane EVT2000 standard model manufactured by Geotech.

The field vane test was originally developed in Sweden and has become a widely used method for the determination of the undrained shear strength of clays. The test is conducted by pushing a vane into undisturbed clay and consequently measuring the torsion moment required to rotate the vane with a given speed.

C2 Methodology

The field vane experiments were conducted by technical operators from NGI in cooperation with the Swedish geotechnical field equipment company Geotech AB on November 15th, 2017. The Geotech ElectricVane EVT2000 equipment consists of a tapered end vane with height 110 mm and width 65 mm mounted to rod with the motor enclosed (Geotech 2014). This unit is mounted to Ø22 mm extensions rods, and a set of cables transfers data to a logging unit at the ground surface. While testing the torsion moment or torque is measured in real-time and viewed on an attached laptop. In addition, the tilt and speed of the vane is continuously registered.

The vane test was performed in accordance with guidelines given in NGF Melding 4 /2/. The registered raw data was processed in NovaLog-Vane, enclosed with the equipment as well as with Microsoft Excel.

C3 Measurements and observations

Measurements of both undisturbed and remoulded shear strength were taken at depth intervals of 50 cm between 2.5 m and 20 m depth below ground surface. To avoid damage to the vane, predrilling to a depth of 2 m was conducted before the vane measurements started. All testing was conducted in borehole ONSV01.

Most of the sounding was conducted without any incidents. At about 13 m depth however, the field vane equipment stopped in contact with a distinctly harder material. It is unknown whether this was a thin pocket or layer of dense gravel or an actual rock. After retraction and inspection at the ground surface, total sounding equipment was used to predrill past this and the sounding was continued.

C4 Results

Measuring of speed, torque, shear, angle and tilt is taken continuously as the testing is conducted. An example of these readings are shown in Table C4-1 below. Please note that this is only a brief view of a small amount of the total amount of readings taken during the test. Derived values of undisturbed and remoulded undrained shear strength with depth is shown in Figure C4.1.

Table C4-1 Brief view of readings taken while testing

Depth	Speed	Torque	Shear	Angle	Tilt	SecondsElapsed	Time
4,5	0	-0,238	-0,238	0	0,94	26,27	2,0171E+16
4,5	0,01	-0,238	-0,238	0,01	0,92	26,645	2,0171E+16
4,5	0,01	0,071	0,071	0,01	0,92	27,05	2,0171E+16
4,5	0,01	0,071	0,071	0,02	0,99	27,44	2,0171E+16
4,5	0,01	0,397	0,397	0,02	0,99	27,83	2,0171E+16
4,5	0,02	0,397	0,397	0,03	0,97	28,22	2,0171E+16
4,5	0,02	0,717	0,717	0,03	0,97	28,61	2,0171E+16
4,5	0,02	0,717	0,717	0,05	1	29	2,0171E+16
4,5	0,02	1,022	1,022	0,05	1	29,39	2,0171E+16
4,5	0,03	1,022	1,022	0,07	0,94	29,78	2,0171E+16
4,5	0,03	1,337	1,337	0,07	0,94	30,17	2,0171E+16
4,5	0,03	1,337	1,337	0,09	1	30,56	2,0171E+16
4,5	0,03	1,641	1,641	0,09	1	30,95	2,0171E+16
4,5	0,04	1,641	1,641	0,12	0,95	31,34	2,0171E+16
4,5	0,04	1,942	1,942	0,12	0,95	31,73	2,0171E+16
4,5	0,04	1,942	1,942	0,16	0,95	32,12	2,0171E+16
4,5	0,04	2,239	2,239	0,16	0,95	32,51	2,0171E+16
4,5	0,05	2,239	2,239	0,19	0,95	32,9	2,0171E+16
4,5	0,05	2,533	2,533	0,19	0,95	33,29	2,0171E+16
4,5	0,05	2,533	2,533	0,23	1,03	33,68	2,0171E+16
4,5	0,05	2,822	2,822	0,23	1,03	34,07	2,0171E+16
4,5	0,05	2,822	2,822	0,27	0,96	34,46	2,0171E+16
4,5	0,05	3,108	3,108	0,27	0,96	34,85	2,0171E+16
4,5	0,06	3,108	3,108	0,31	1,01	35,24	2,0171E+16
4,5	0,06	3,396	3,396	0,31	1,01	35,646	2,0171E+16
4,5	0,06	3,396	3,396	0,36	0,98	36,02	2,0171E+16
4,5	0,06	3,676	3,676	0,36	0,98	36,426	2,0171E+16

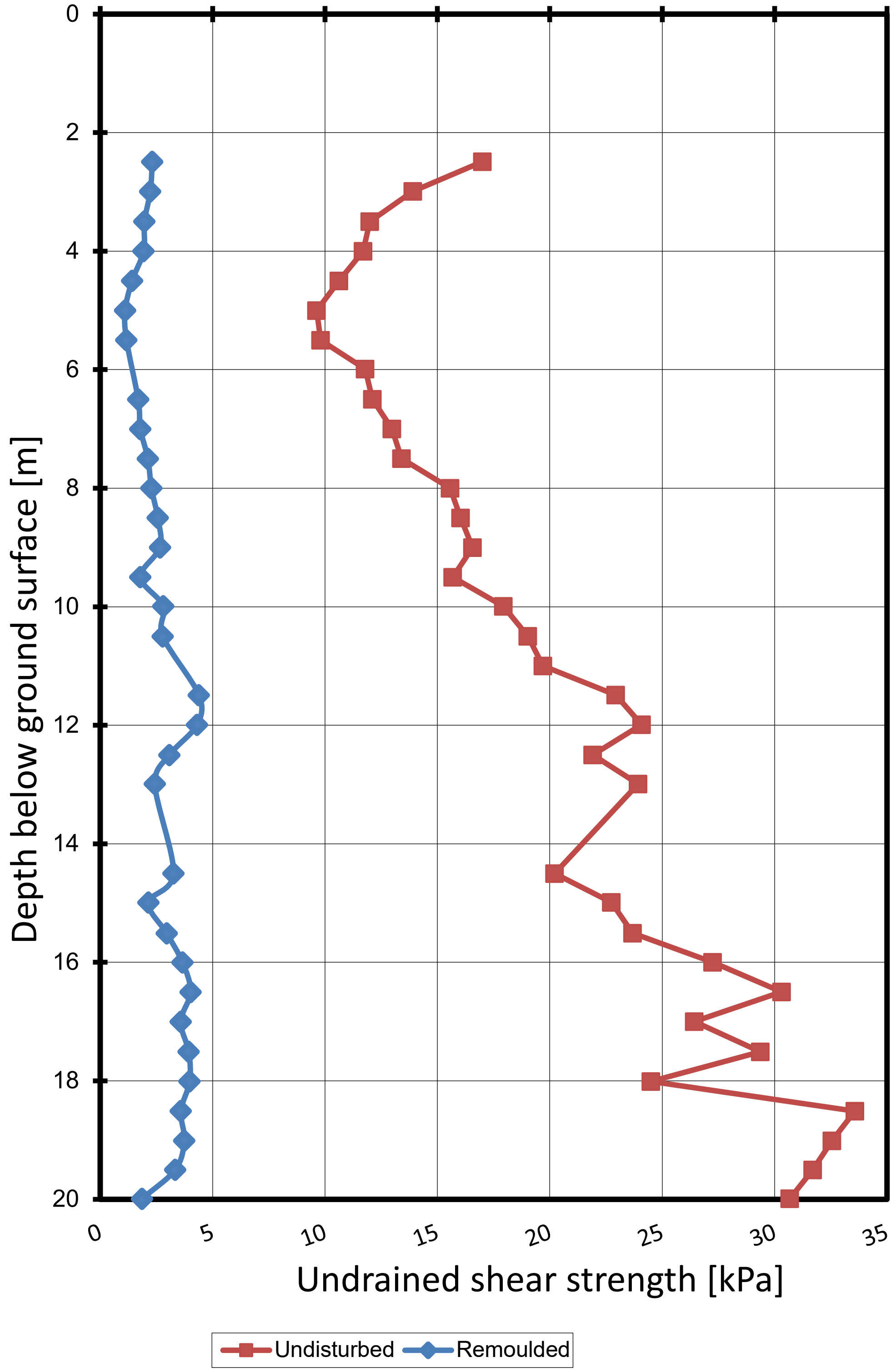


Figure C4.1 Derived values of undisturbed and remoulded shear strength with depth

C5 References

Kåsin et. al (2016) NGTS In situ standards report. Report 20160154-03-R.

Geotech (2014) User manual Electrical Field Vane Instrument Geotech EVT 2000

NGF (1987) Melding nr 4: Veiledning for utførelse av vingeboring

Appendix D

ROTARY PRESSURE SOUNDING RESULTS

Contents

D1 Individual test results

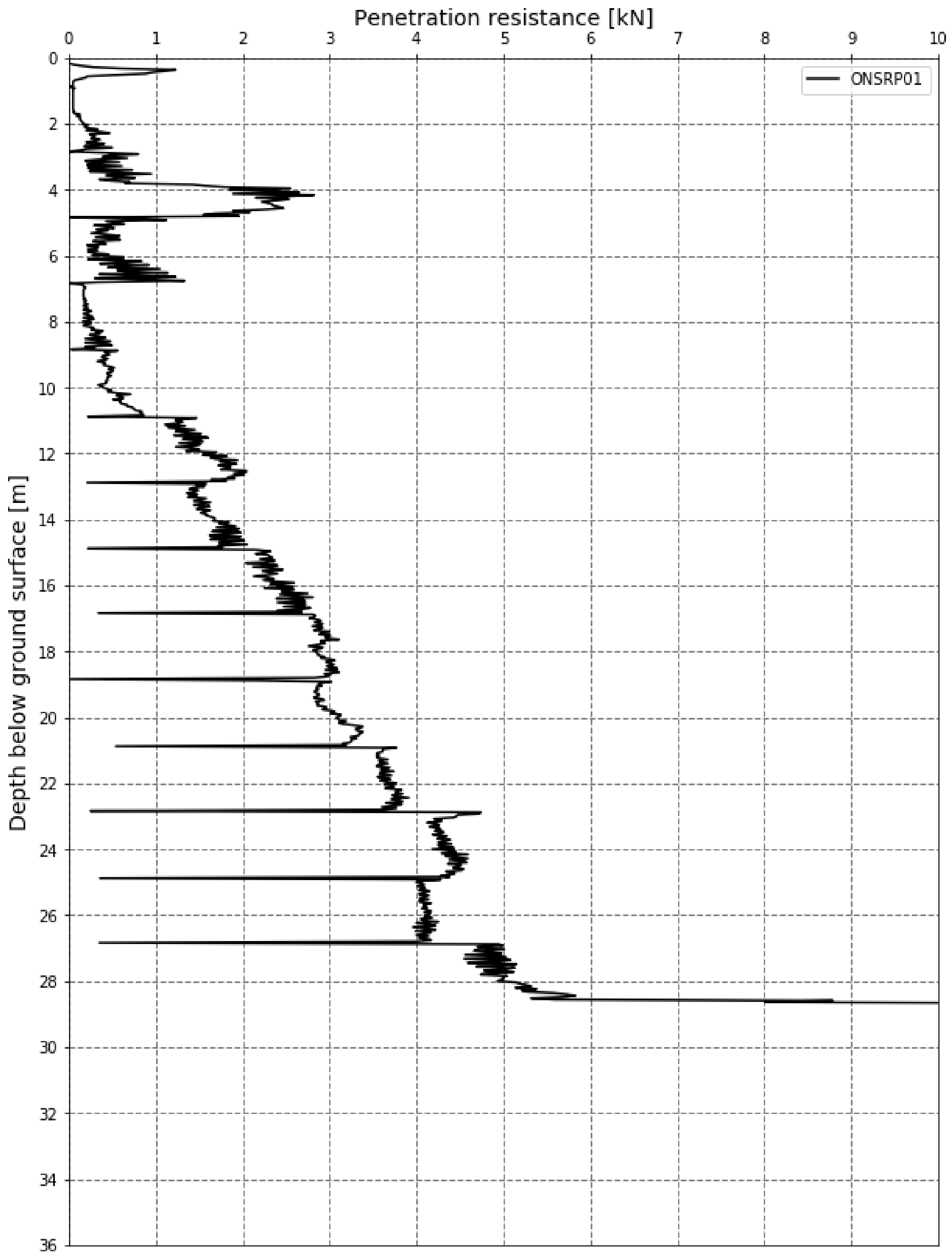


Figure D1.1 Result from rotary pressure sounding – ONSRP01

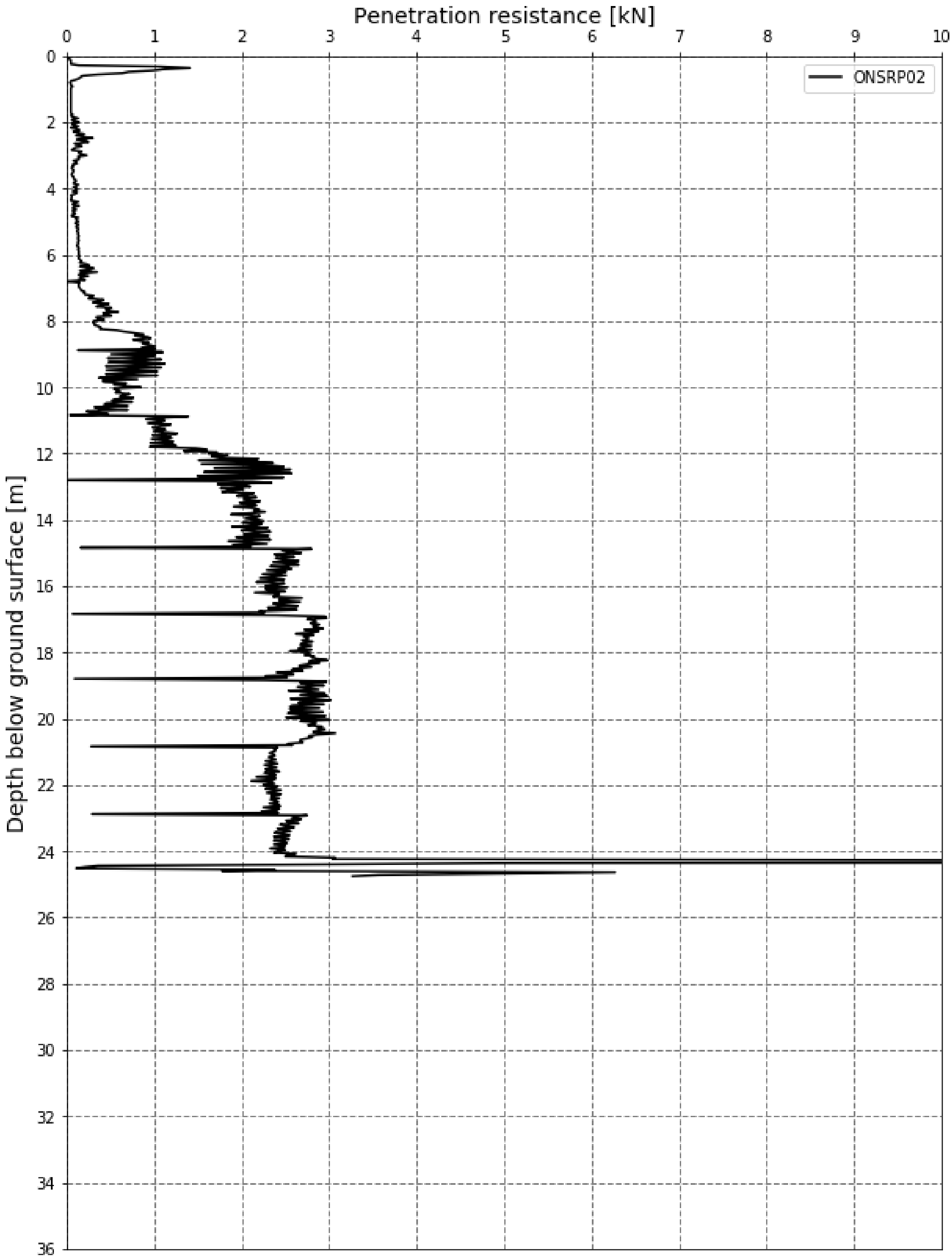


Figure D1.2 Result from rotary pressure sounding – ONSRP02

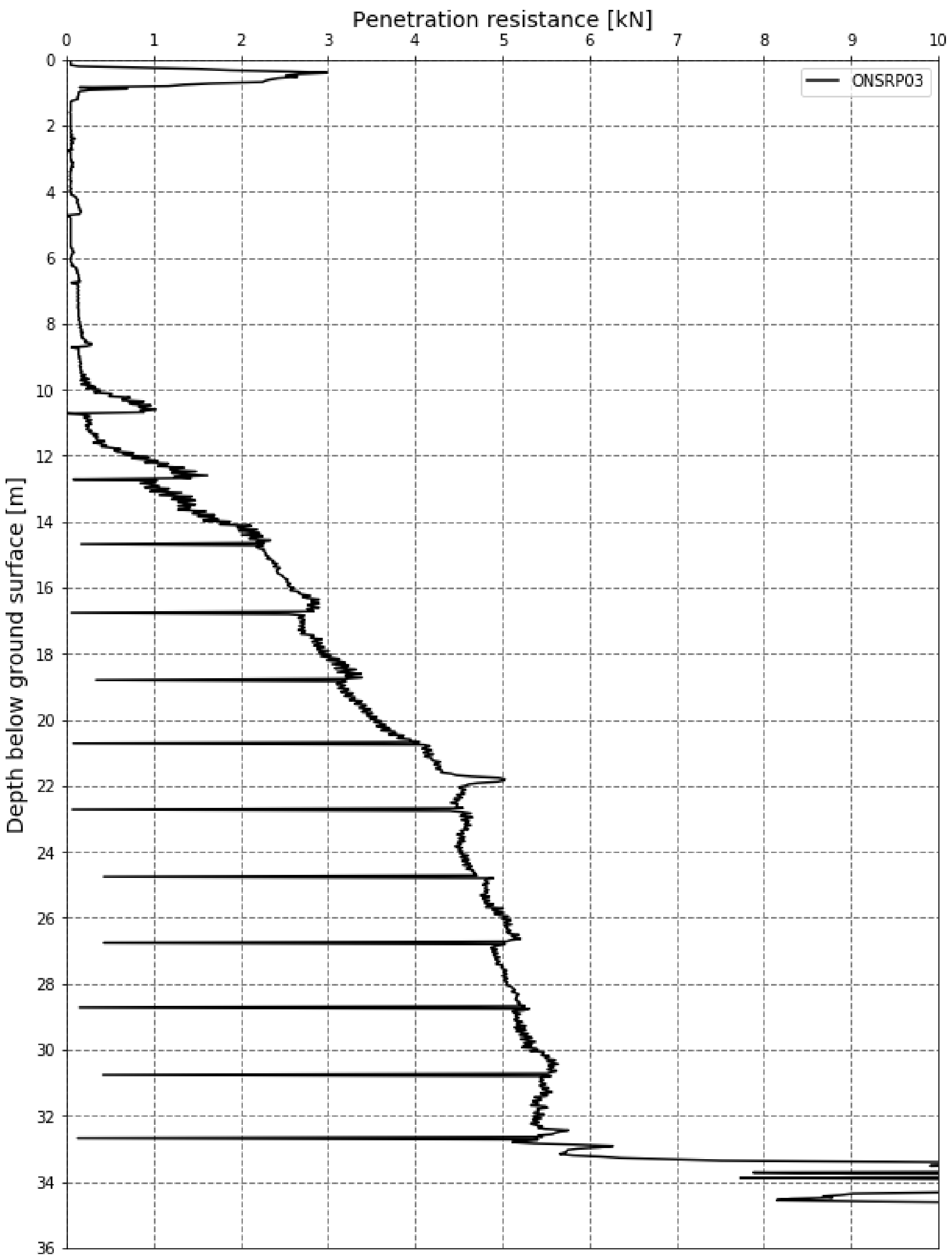


Figure D1.3 Result from rotary pressure sounding – ONSRP03

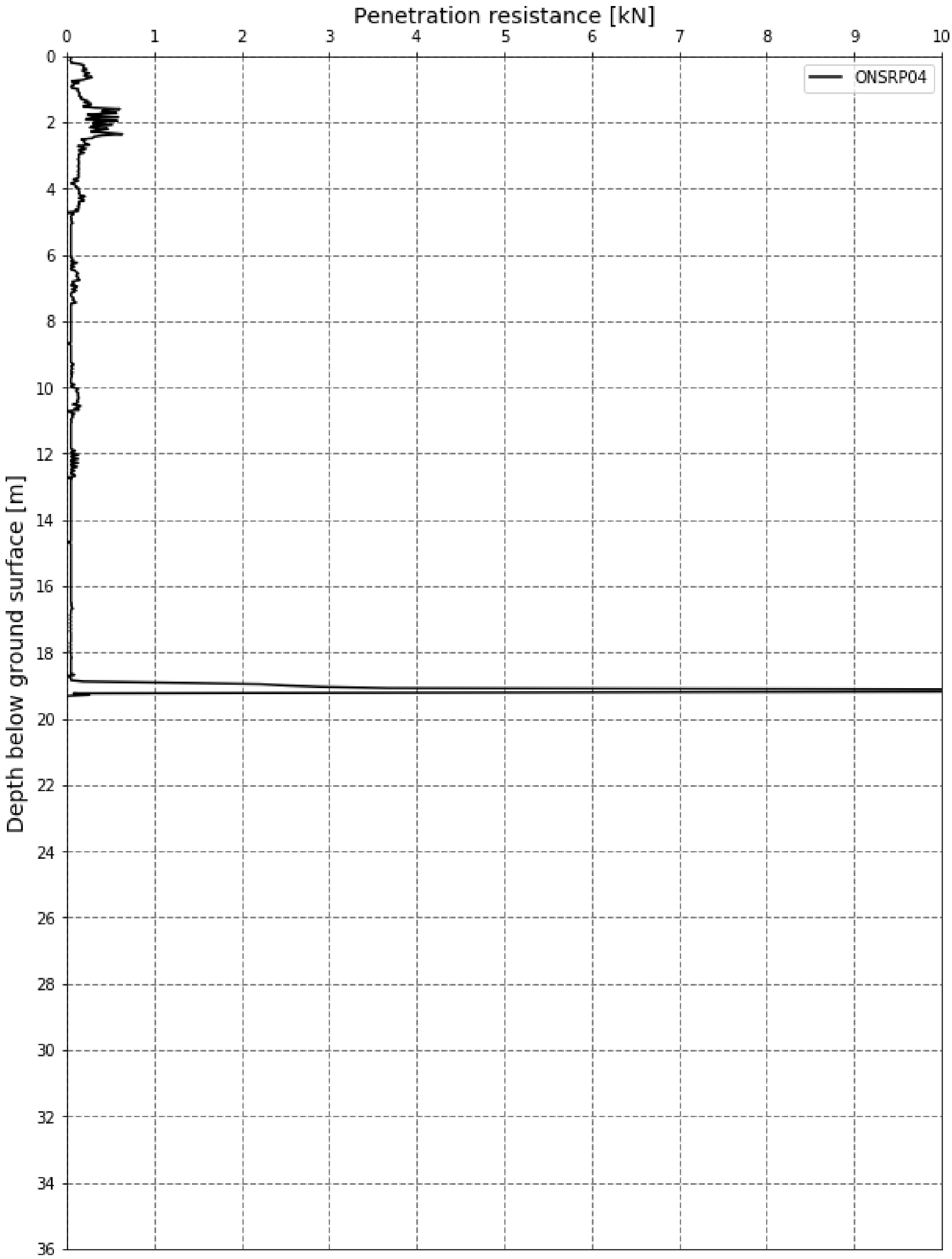


Figure D1.4 Result from rotary pressure sounding – ONSRP04

Appendix E

INDIVIDUAL TOTAL SOUNDING TEST RESULTS

Contents

E1 Individual total sounding test results

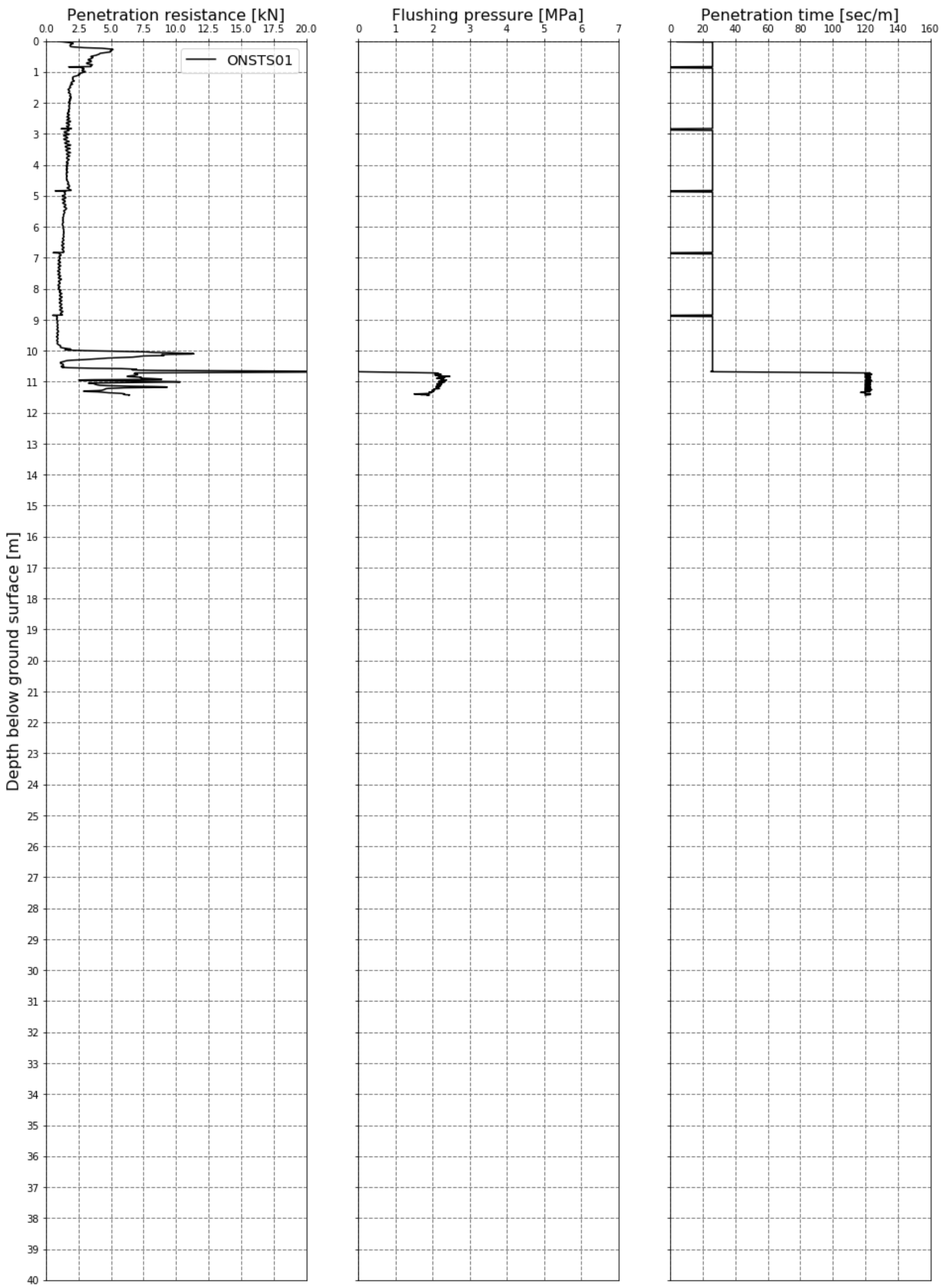


Figure E1.1 Total sounding result – ONSTS01

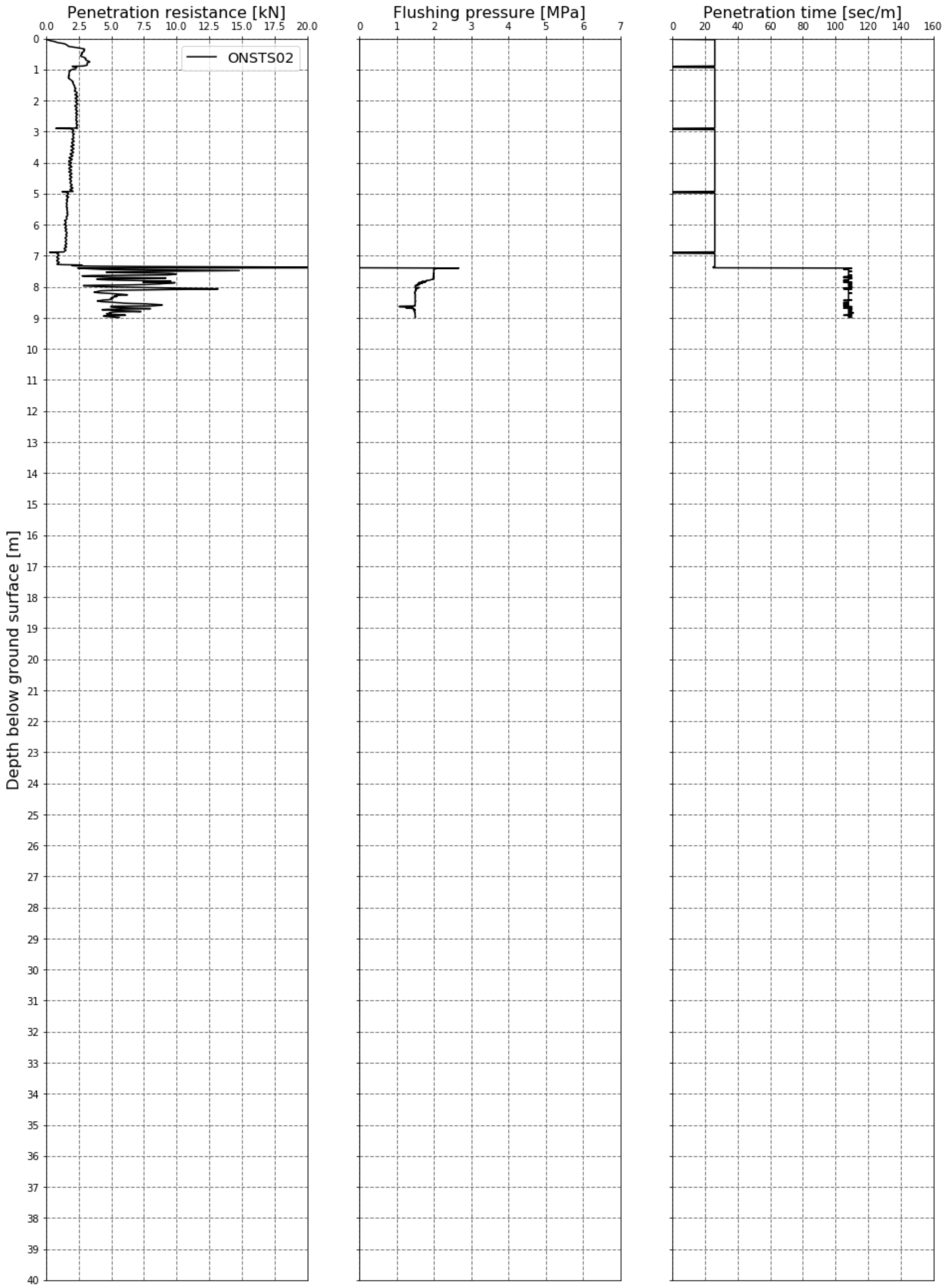


Figure E1.2 Total sounding result – ONSTS02

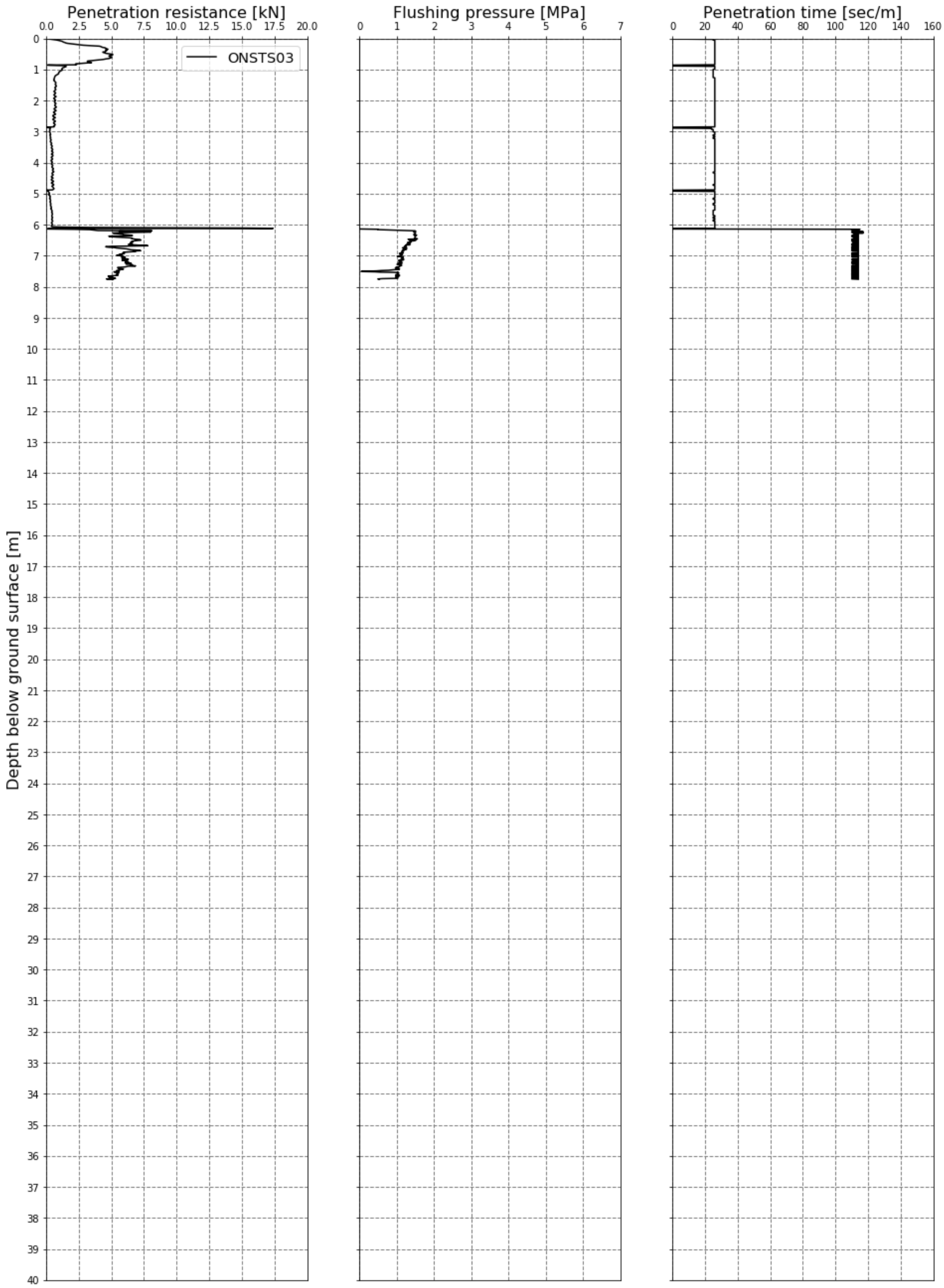


Figure E1.3 Total sounding result – ONSTS03

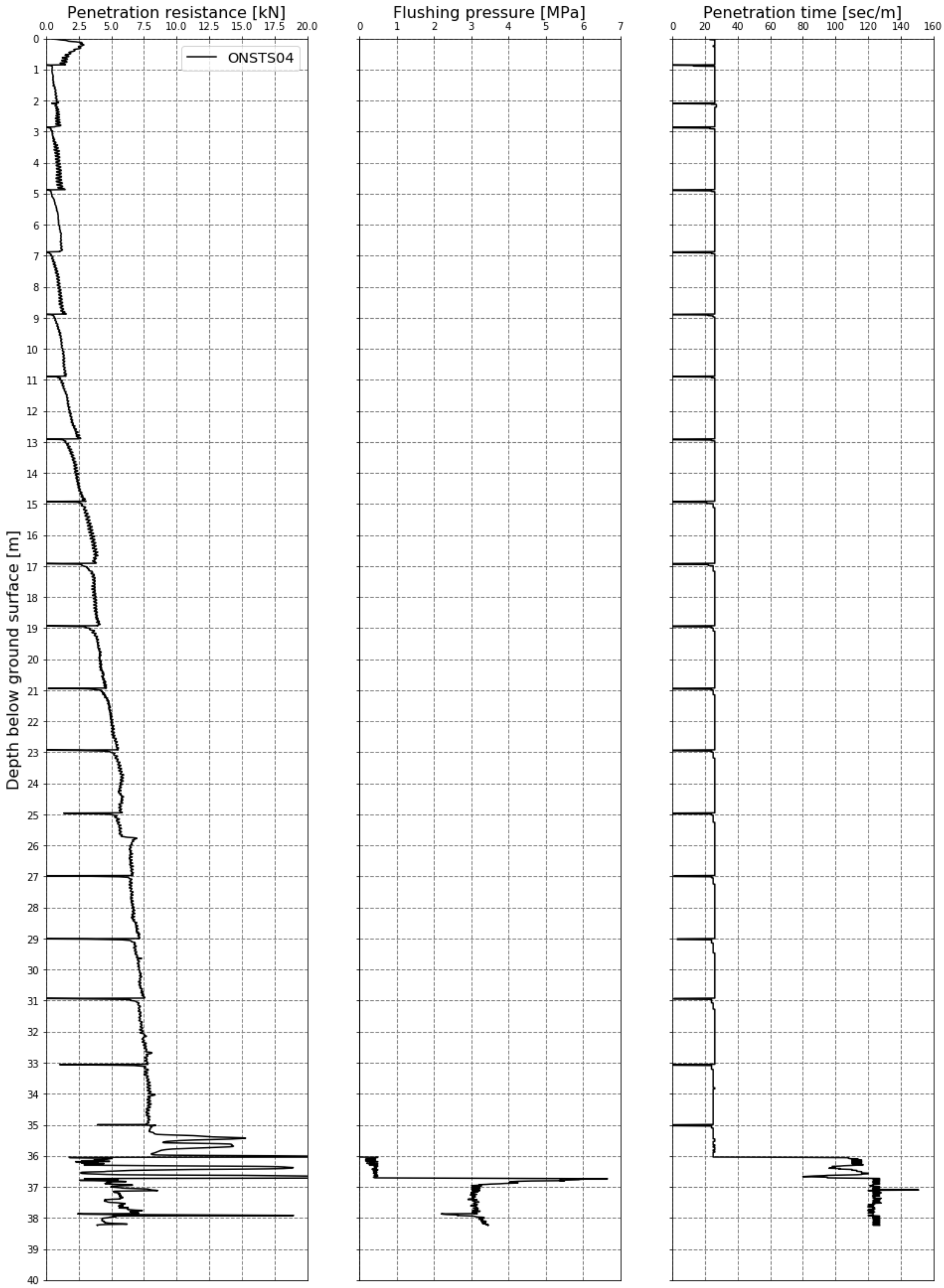


Figure E1.4 Total sounding result – ONSTS04

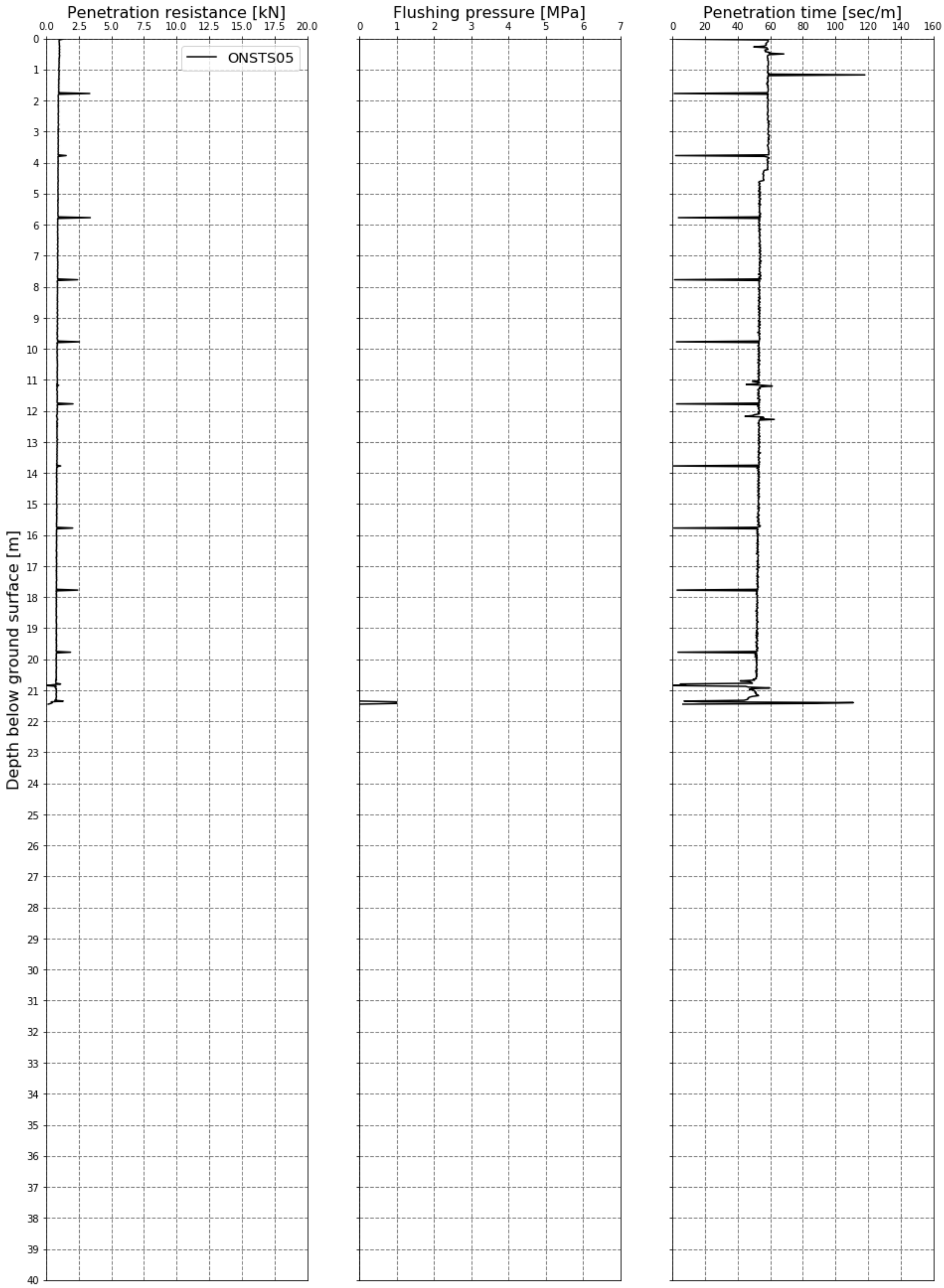


Figure E1.5 Total sounding result – ONSTS05

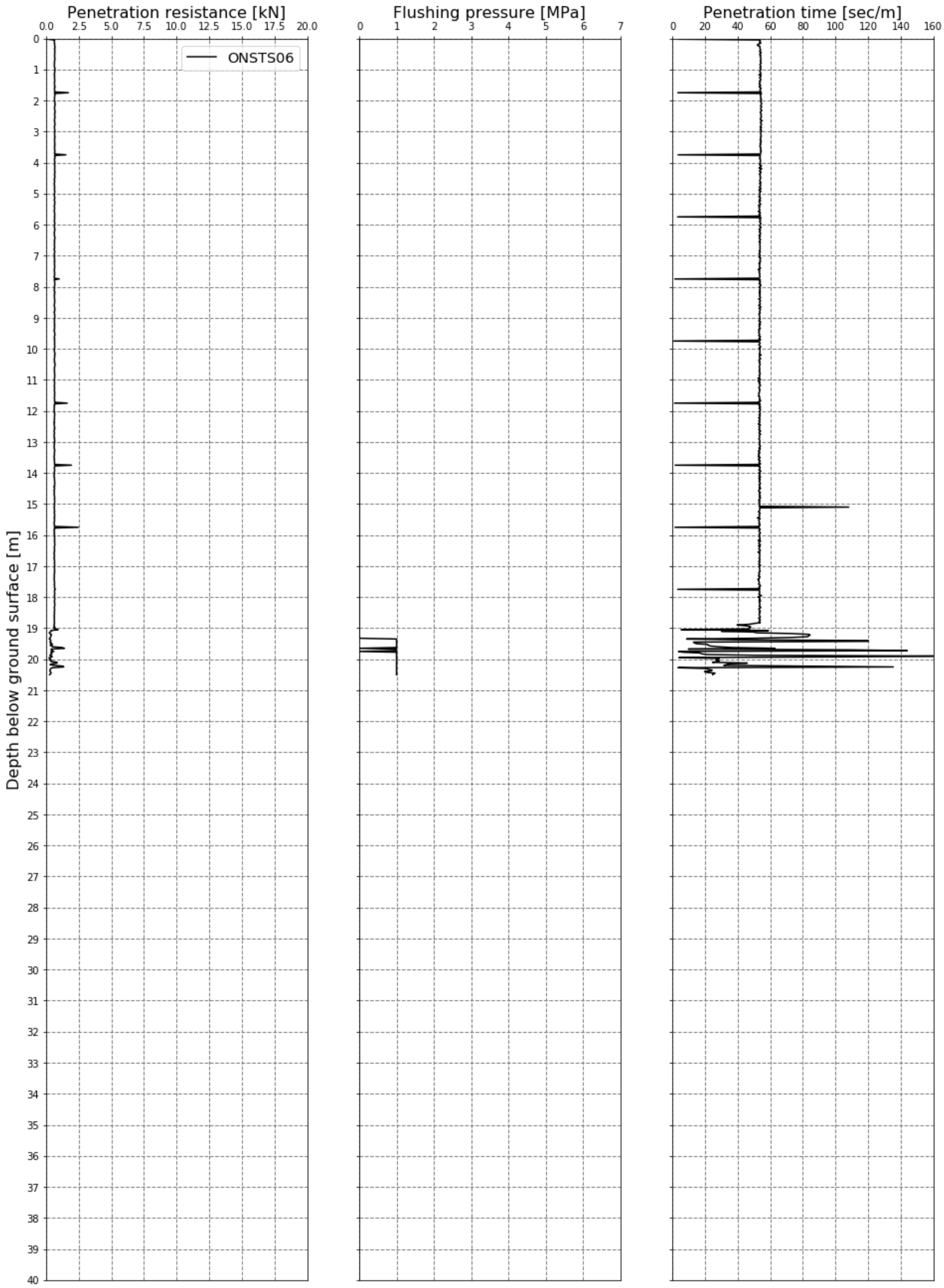


Figure E1.6 Total sounding result – ONSTS06

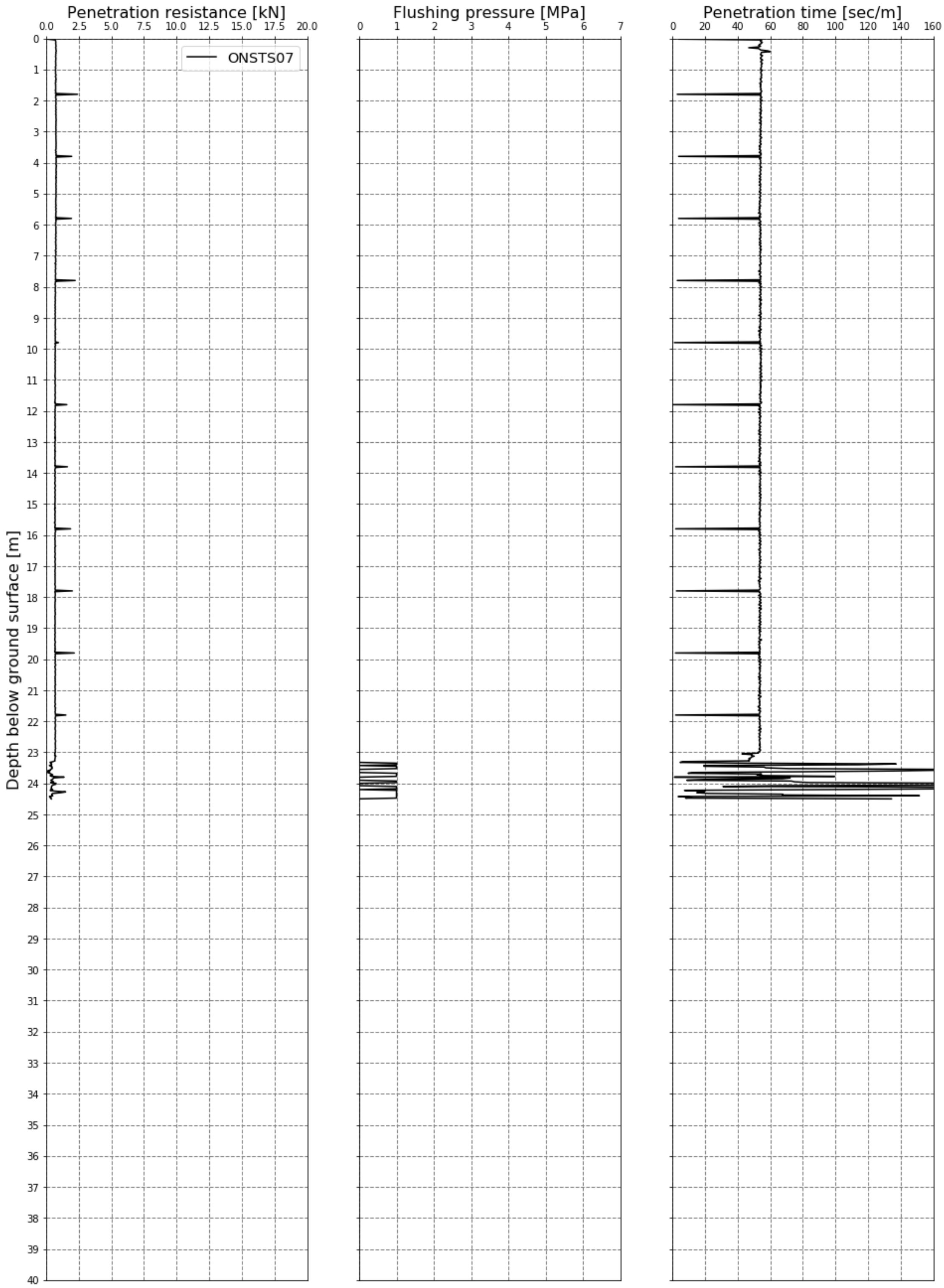


Figure E1.7 Total sounding result – ONSTS07

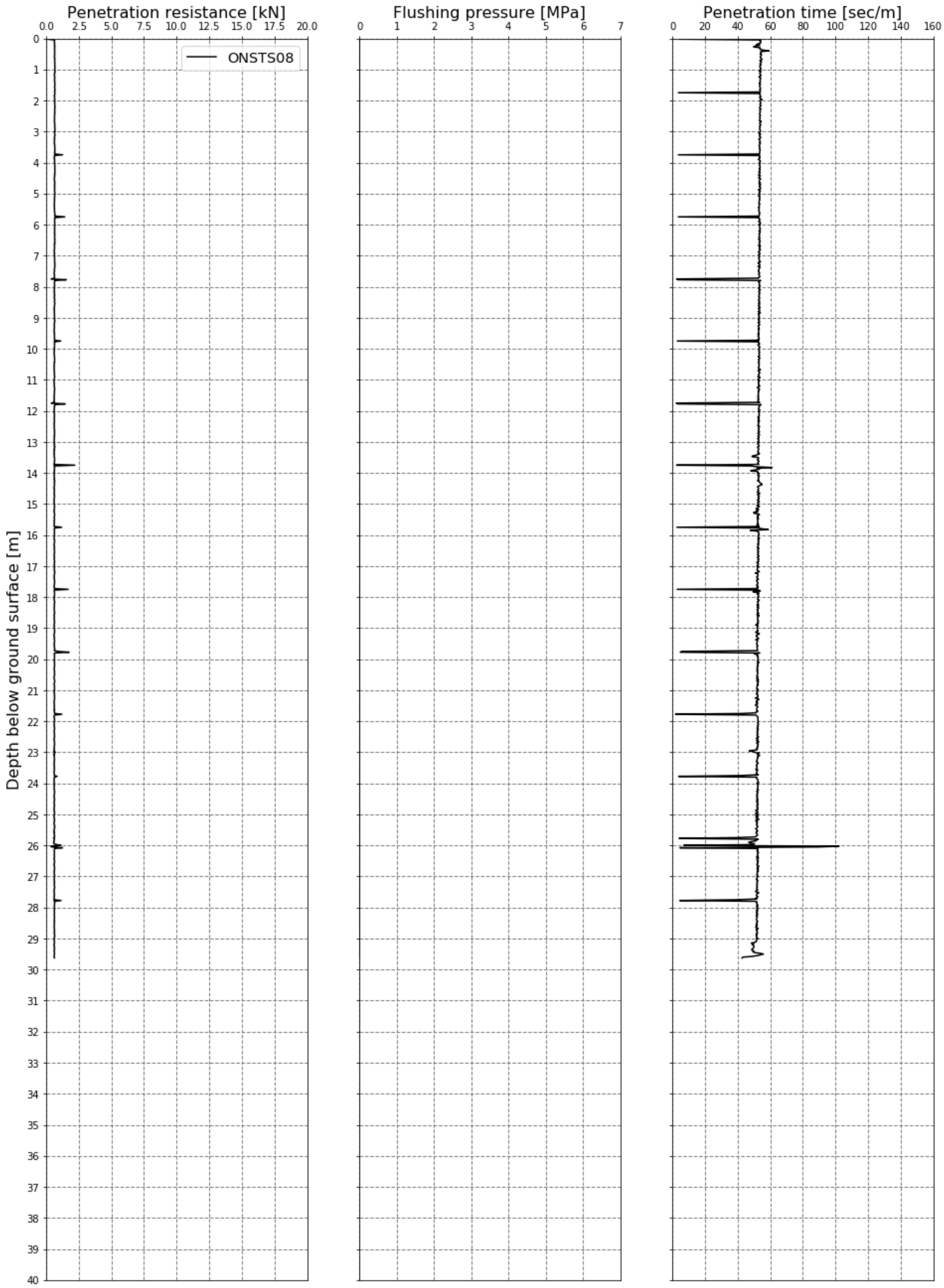


Figure E1.8 Total sounding result – ONSTS08

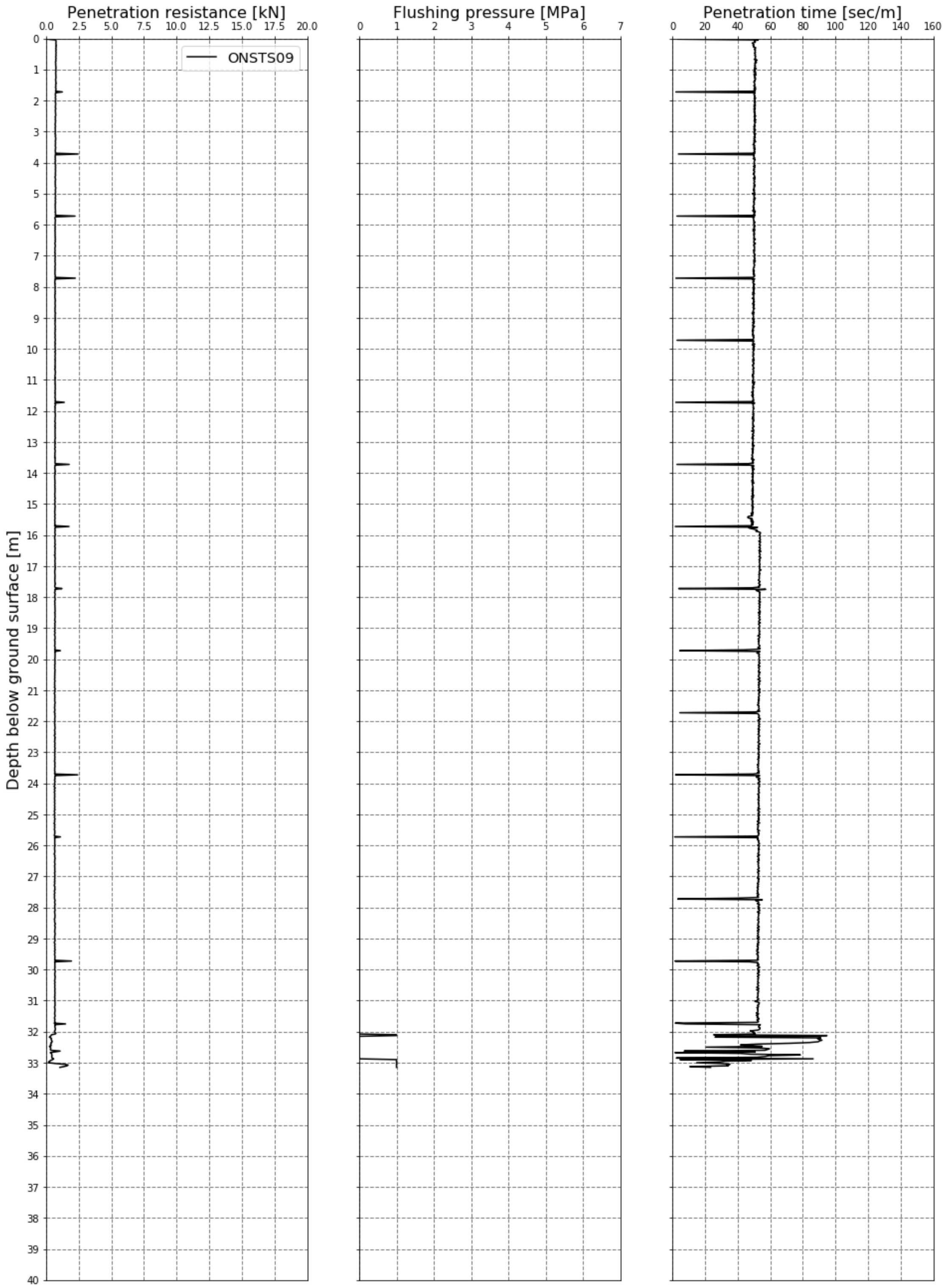


Figure E1.9 Total sounding result – ONSTS09

Appendix F

INDIVIDUAL CONE PENETRATION TEST RESULTS

Contents

F1 Individual cone penetration test results

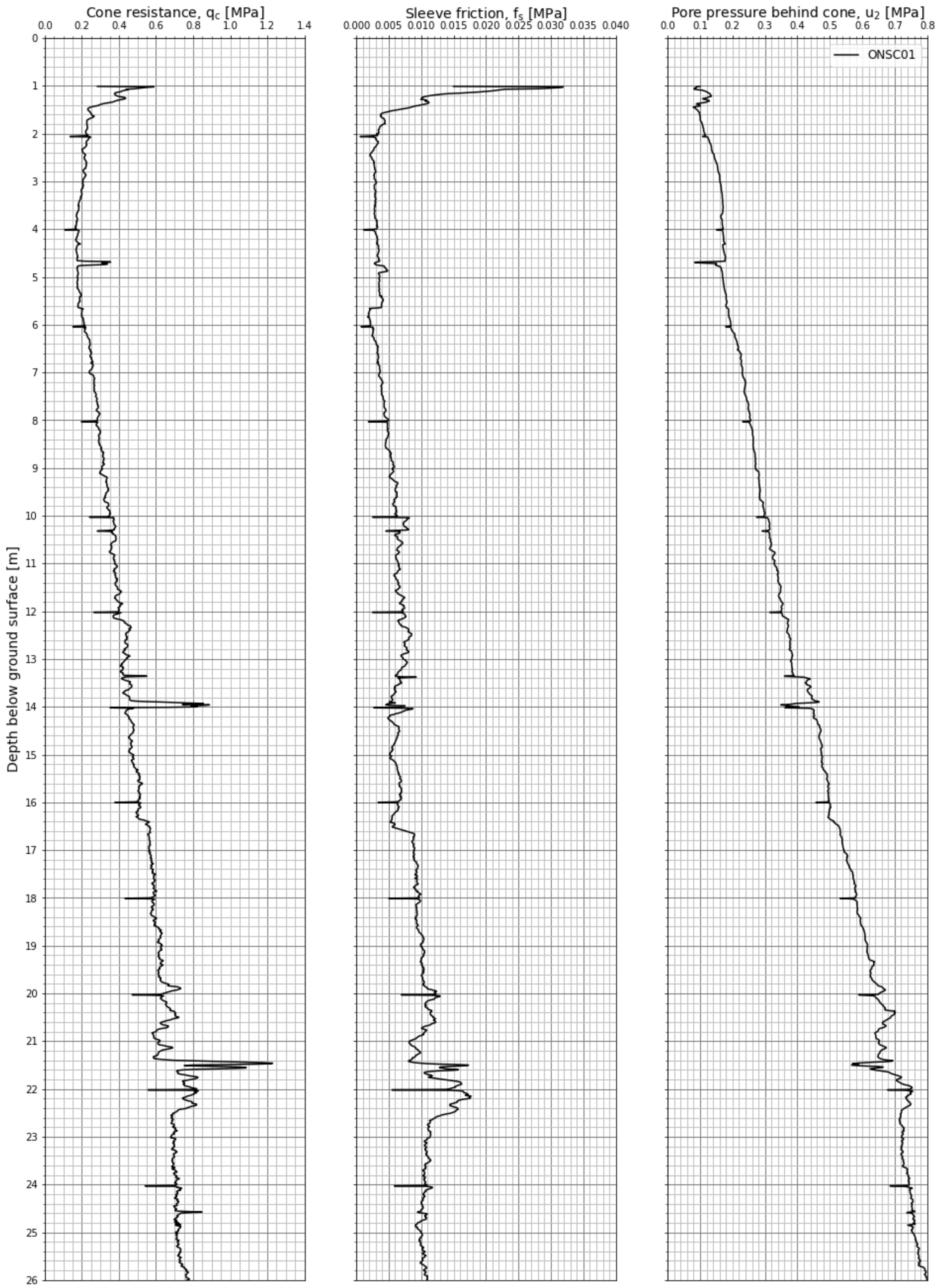


Figure F1.1 Measured q_c, f_s and u_2 for test ONSC01

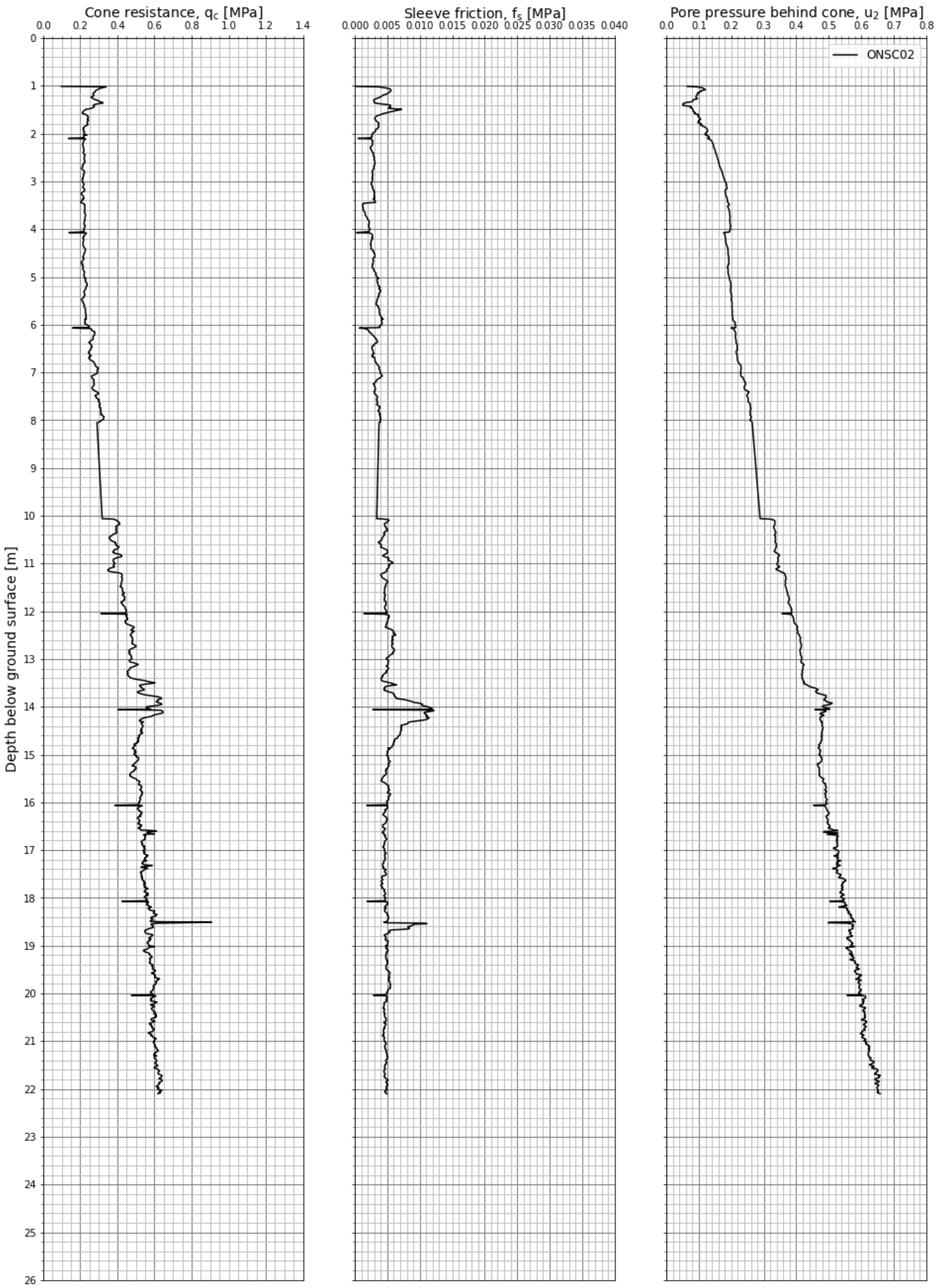


Figure F1.2 Measured q_c, f_s and u_2 for test ONSC02

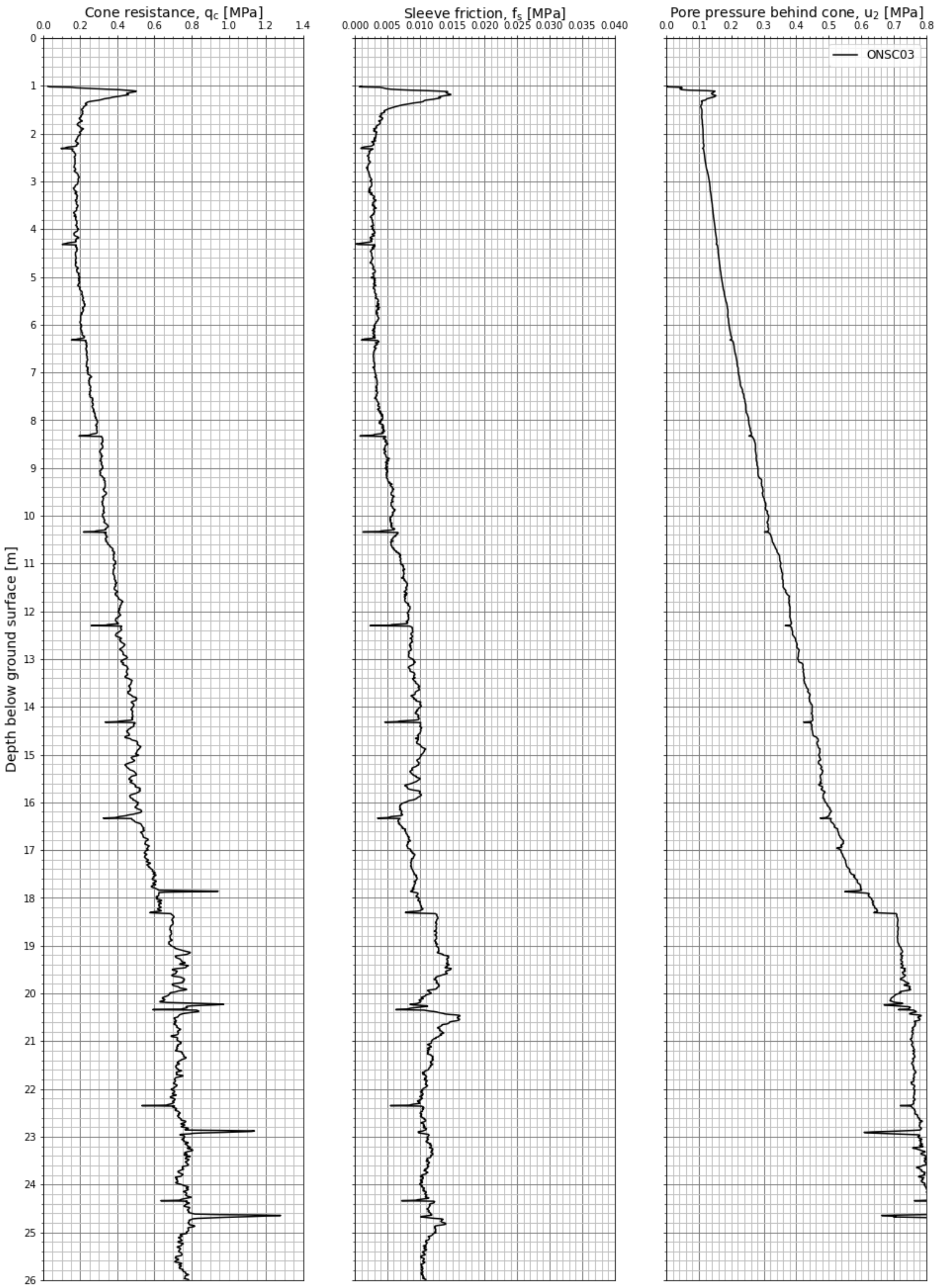


Figure F1.3 Measured q_c, f_s and u_2 for test ONSC03

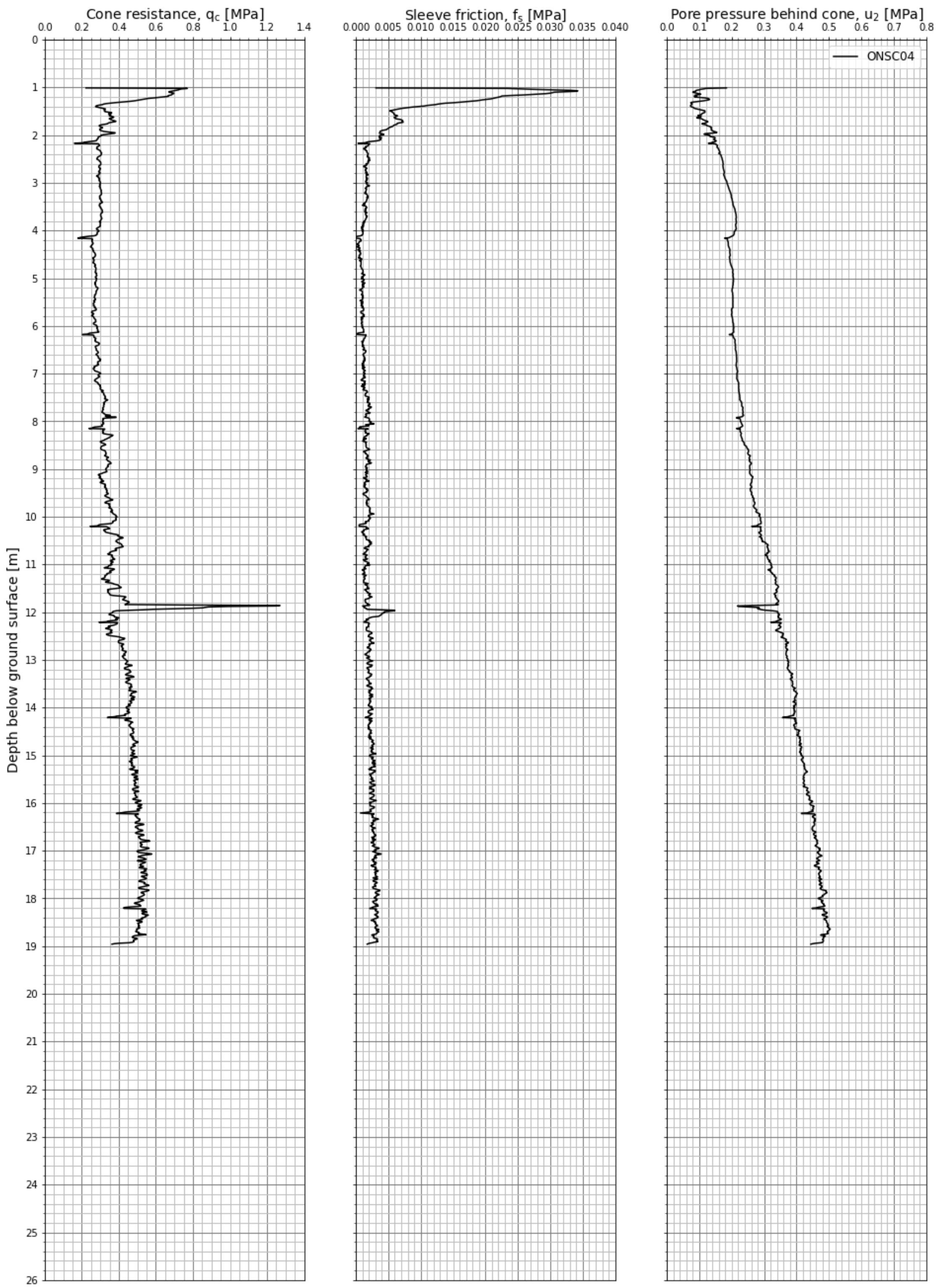


Figure F1.4 Measured q_c, f_s and u_2 for test ONSC04

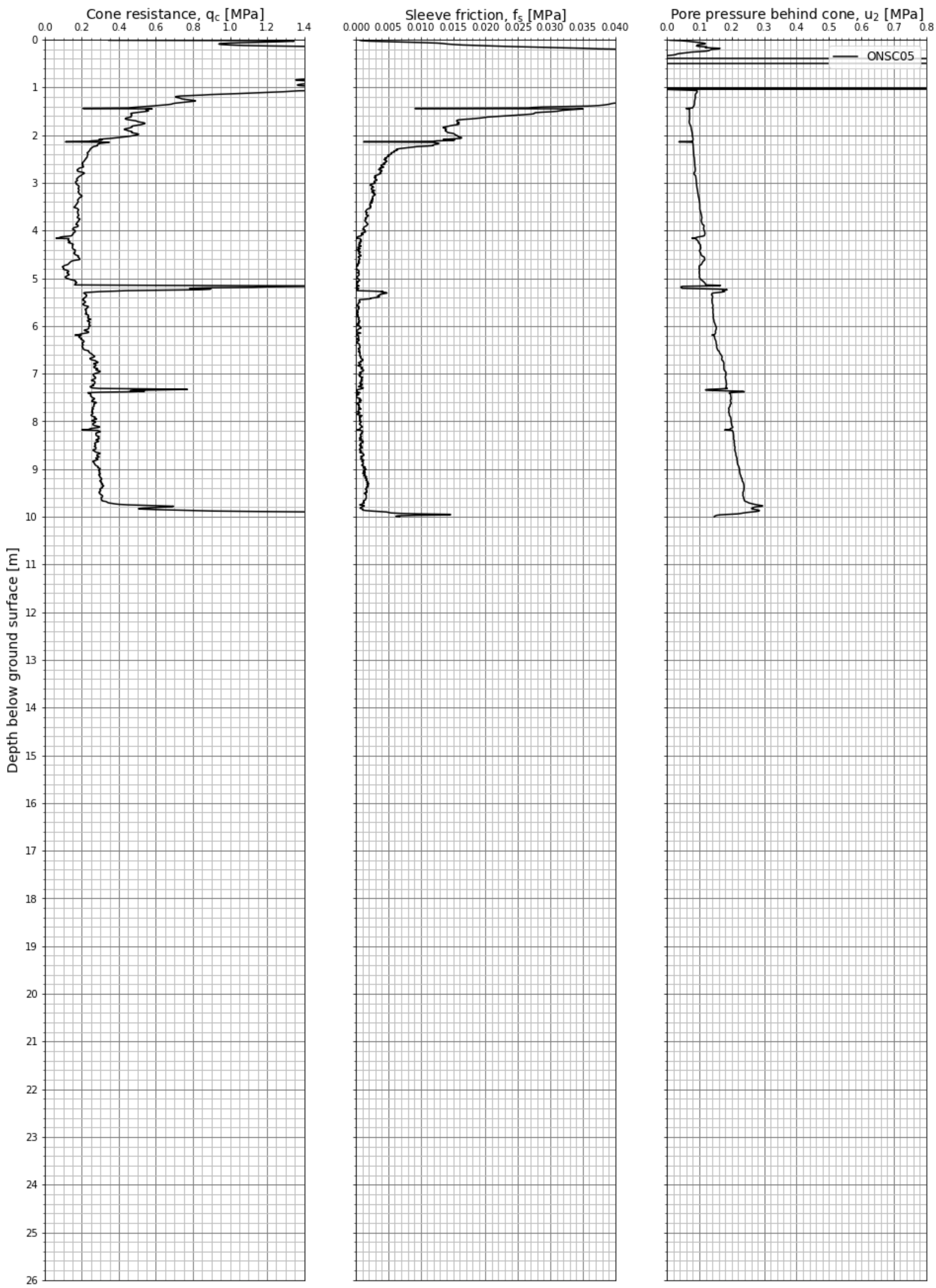


Figure F1.5 Measured q_c, f_s and u_2 for test ONSC05

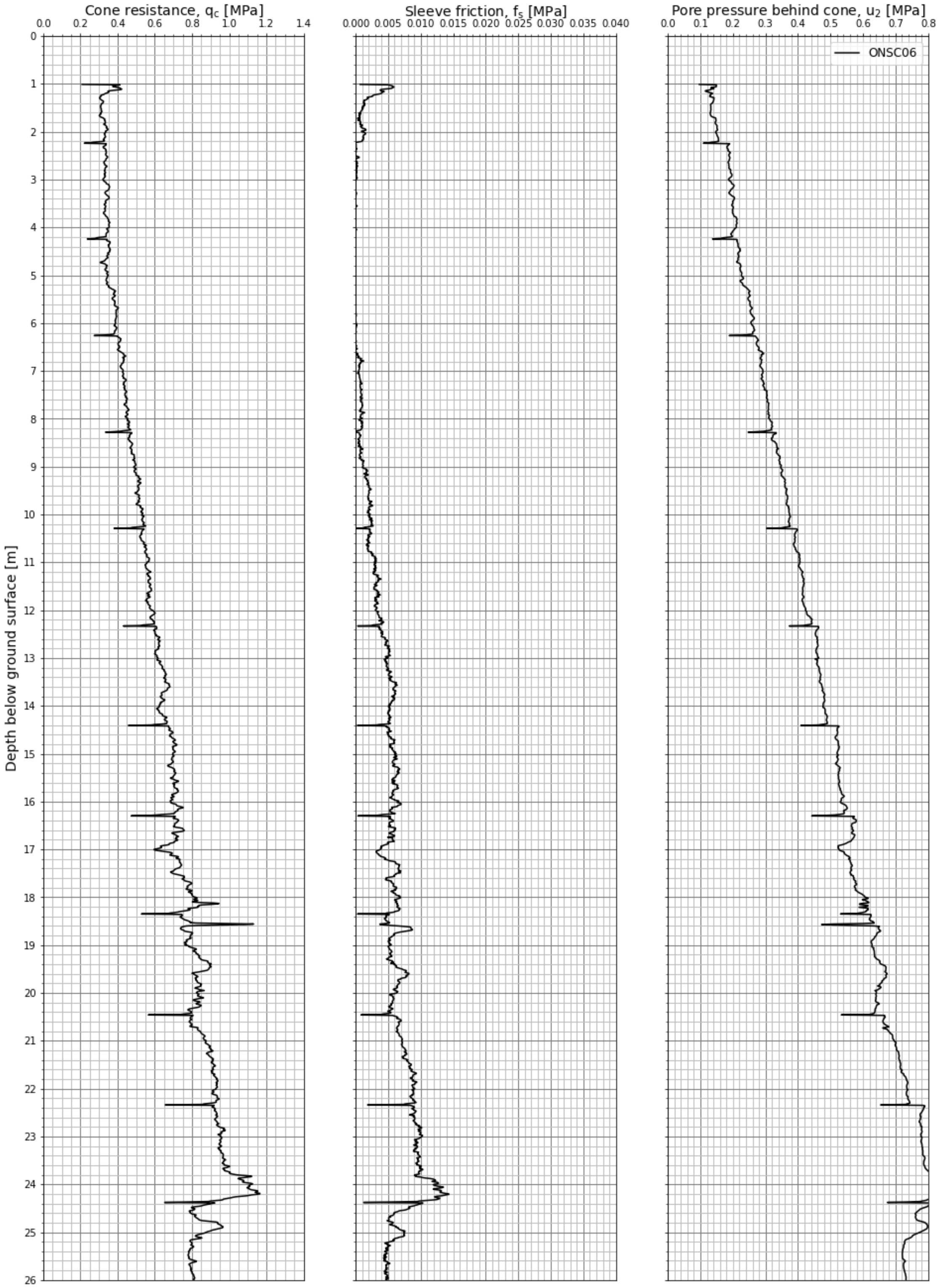


Figure F1.6 Measured q_c, f_s and u_2 for test ONSC06

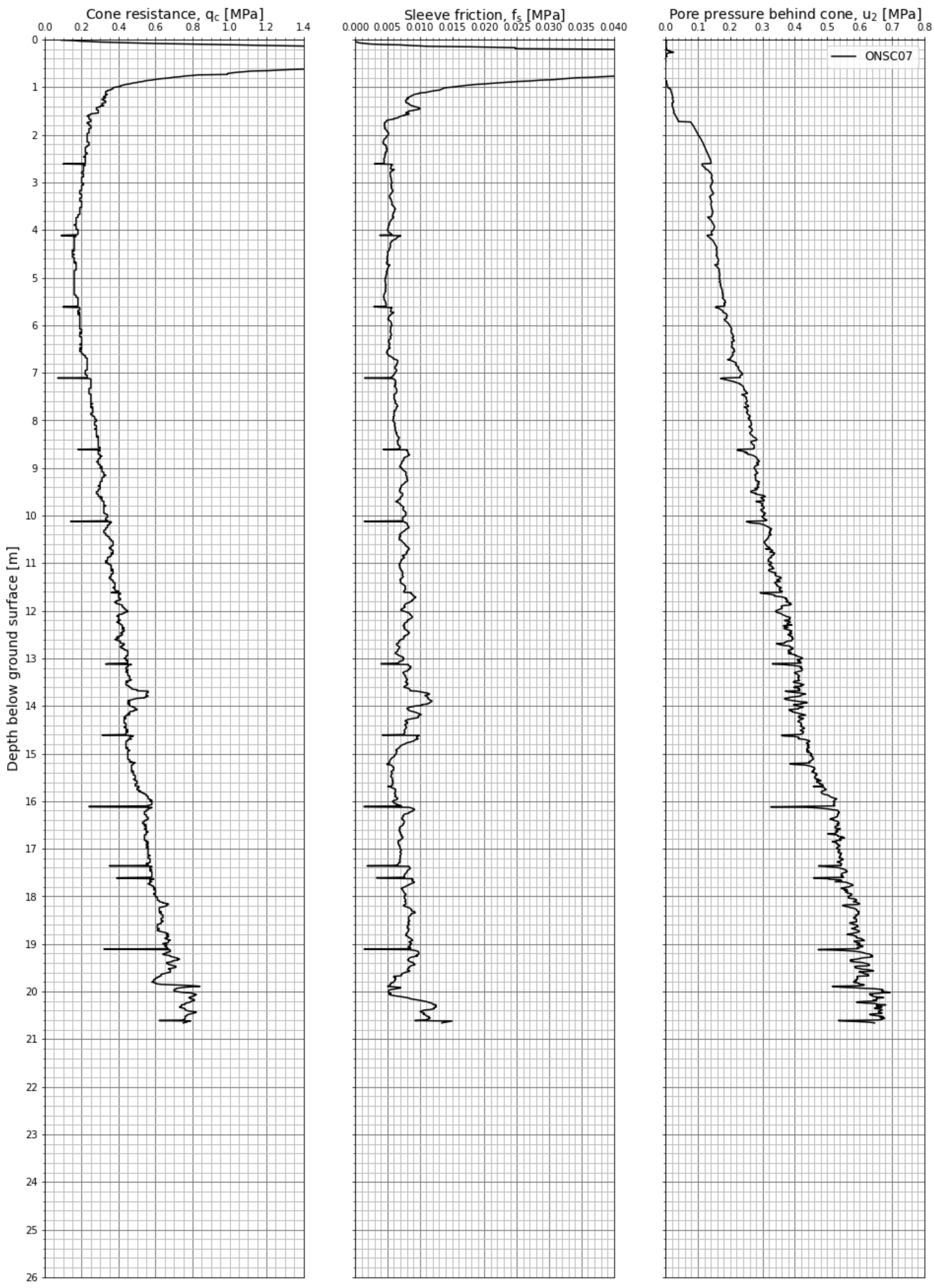


Figure F1.7 Measured q_c, f_s and u_2 for test ONSC07

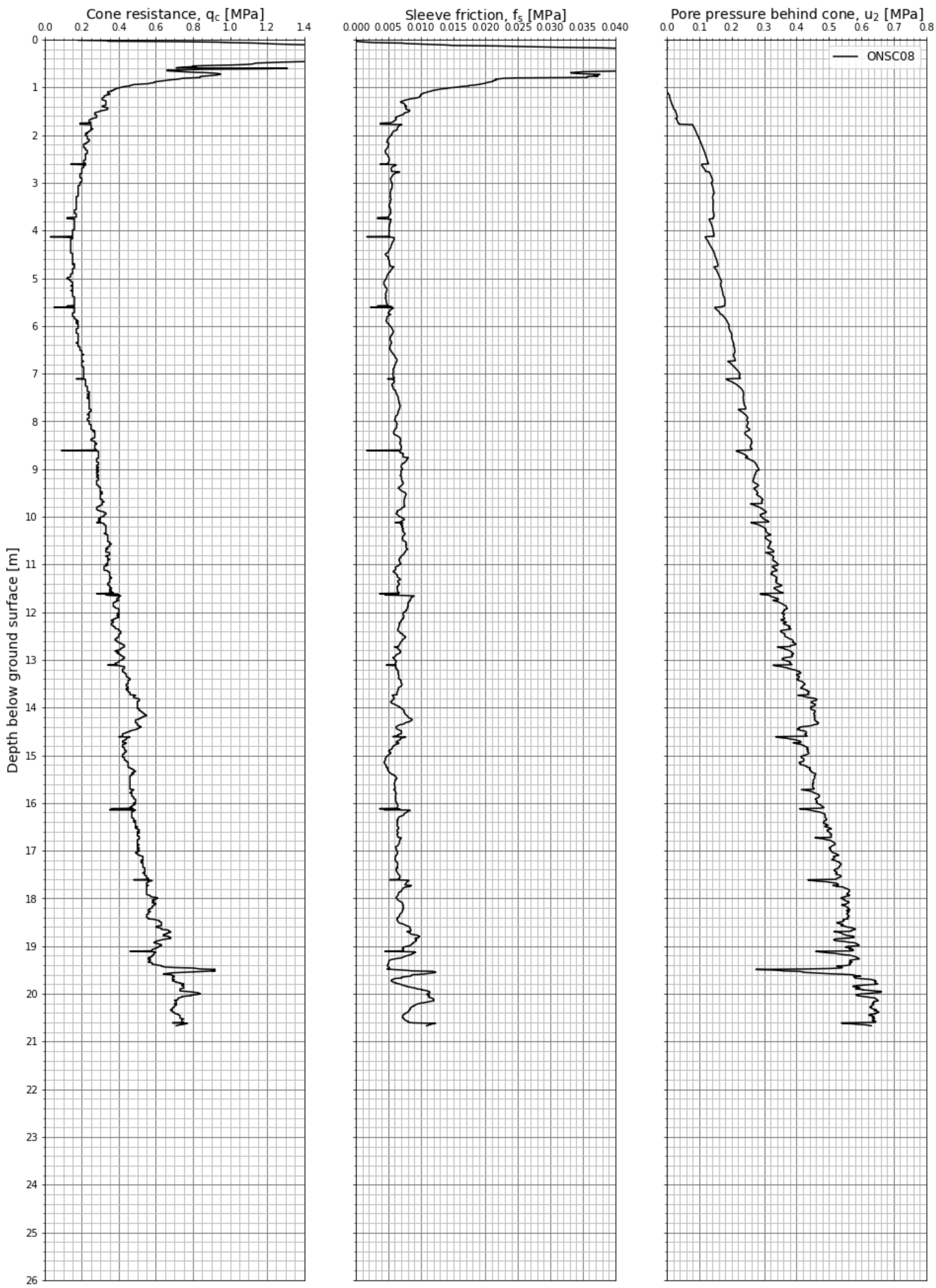


Figure F1.8 Measured q_c, f_s and u_2 for test ONSC08

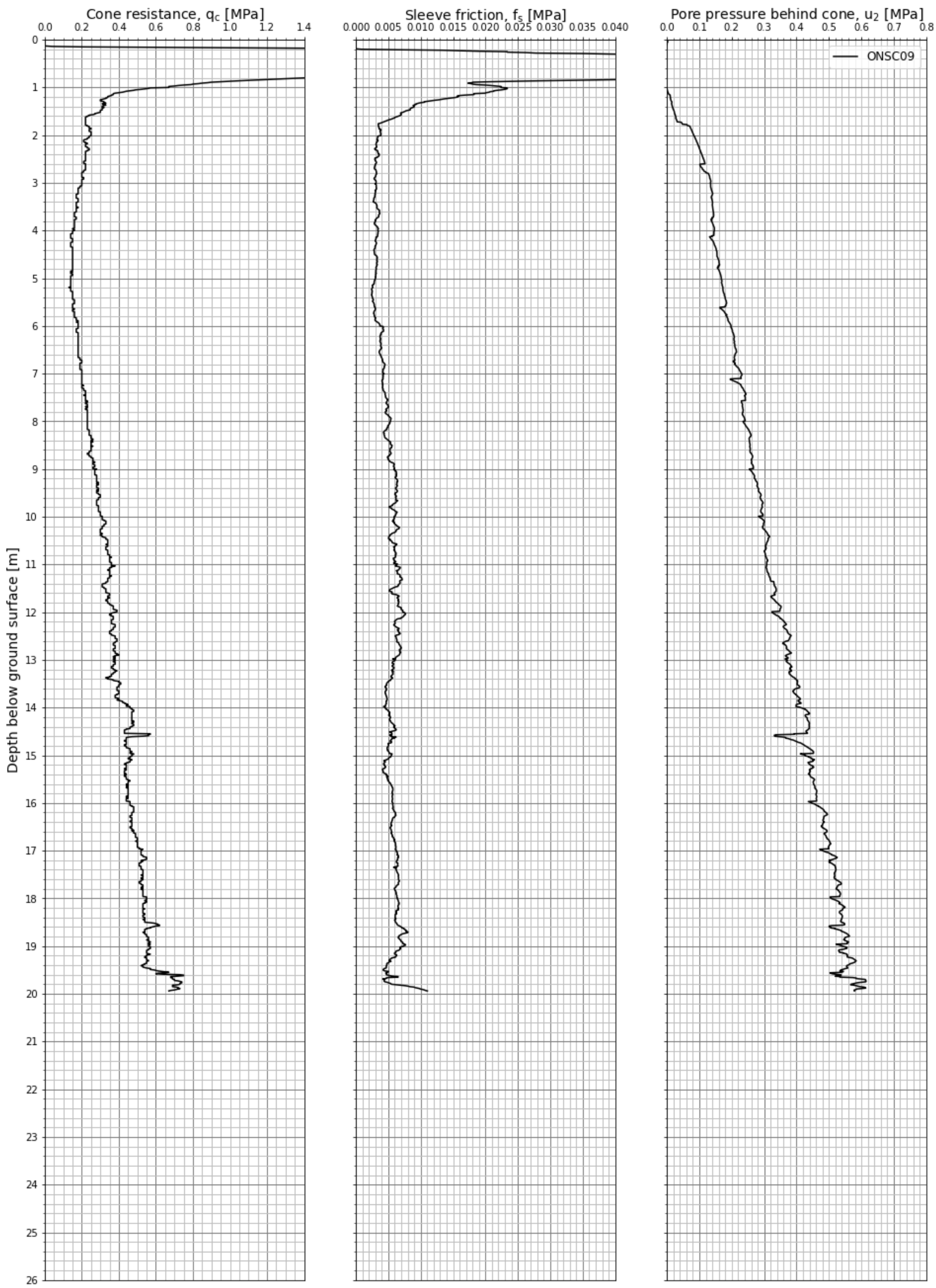


Figure F1.9 Measured q_c, f_s and u_2 for test ONSC09

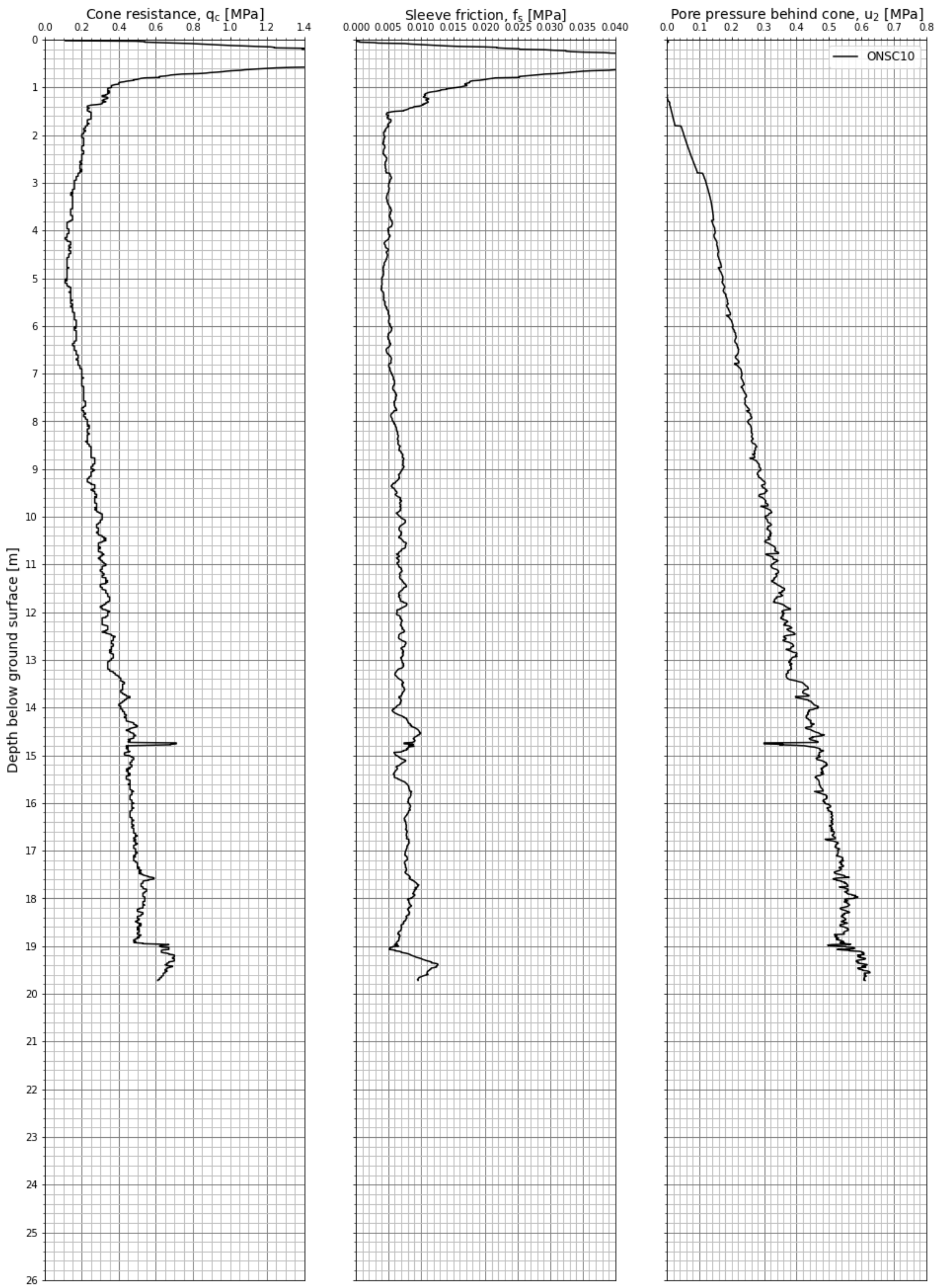


Figure F1.10 Measured q_c, f_s and u_2 for test ONSC10

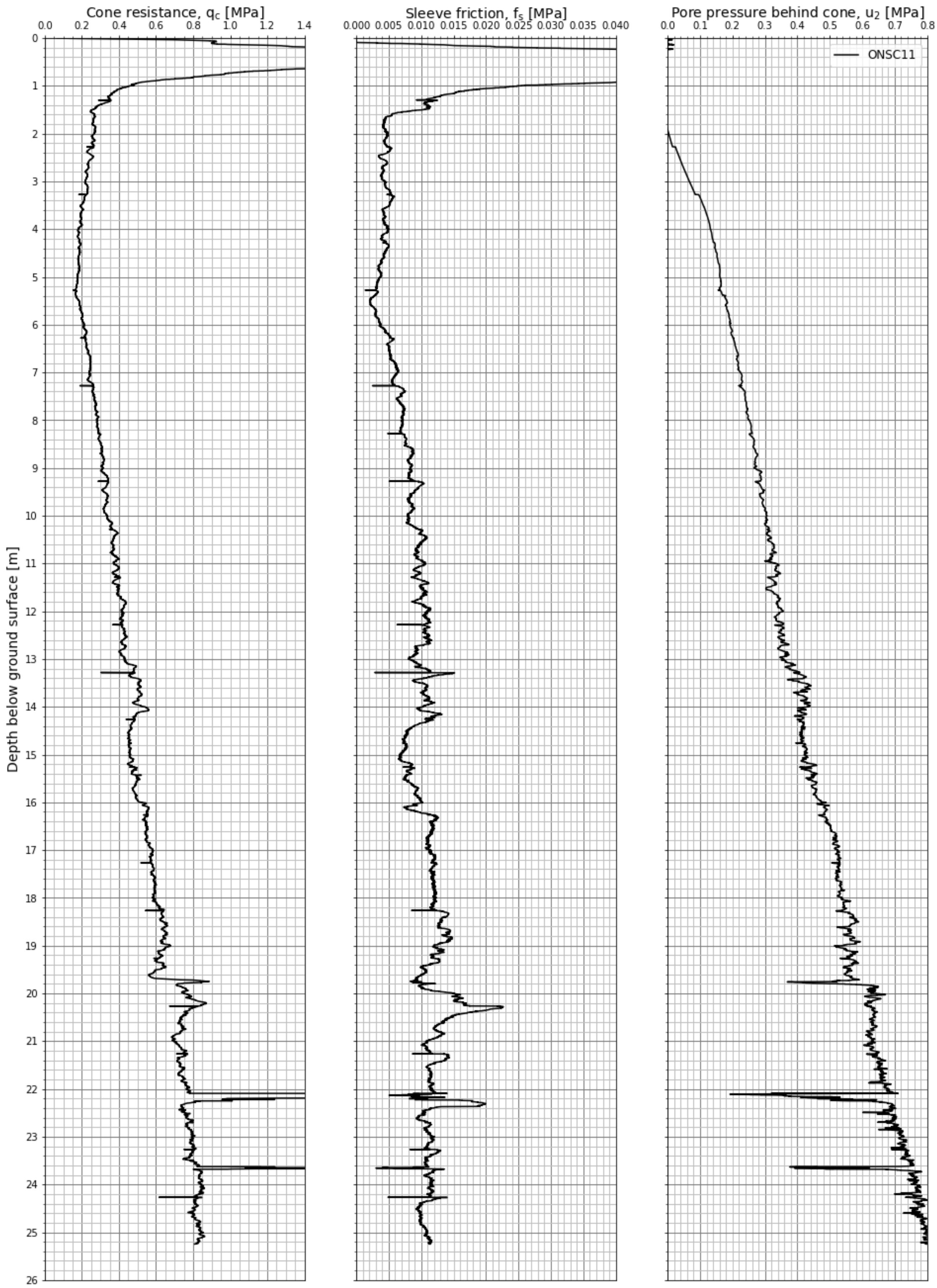


Figure F1.11 Measured q_c, f_s and u_2 for test ONSC11

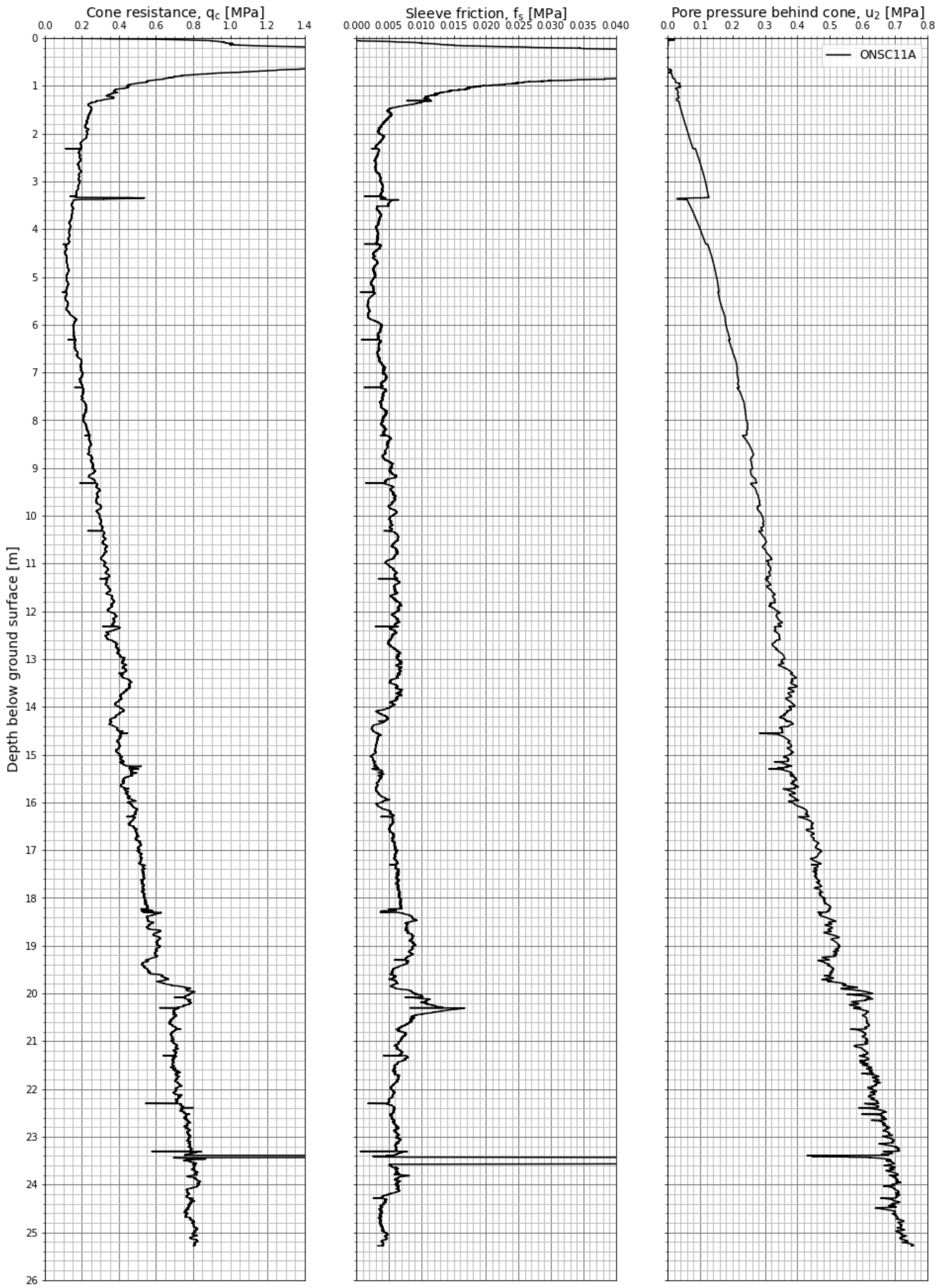


Figure F1.12 Measured q_c, f_s and u_2 for test ONSC11A

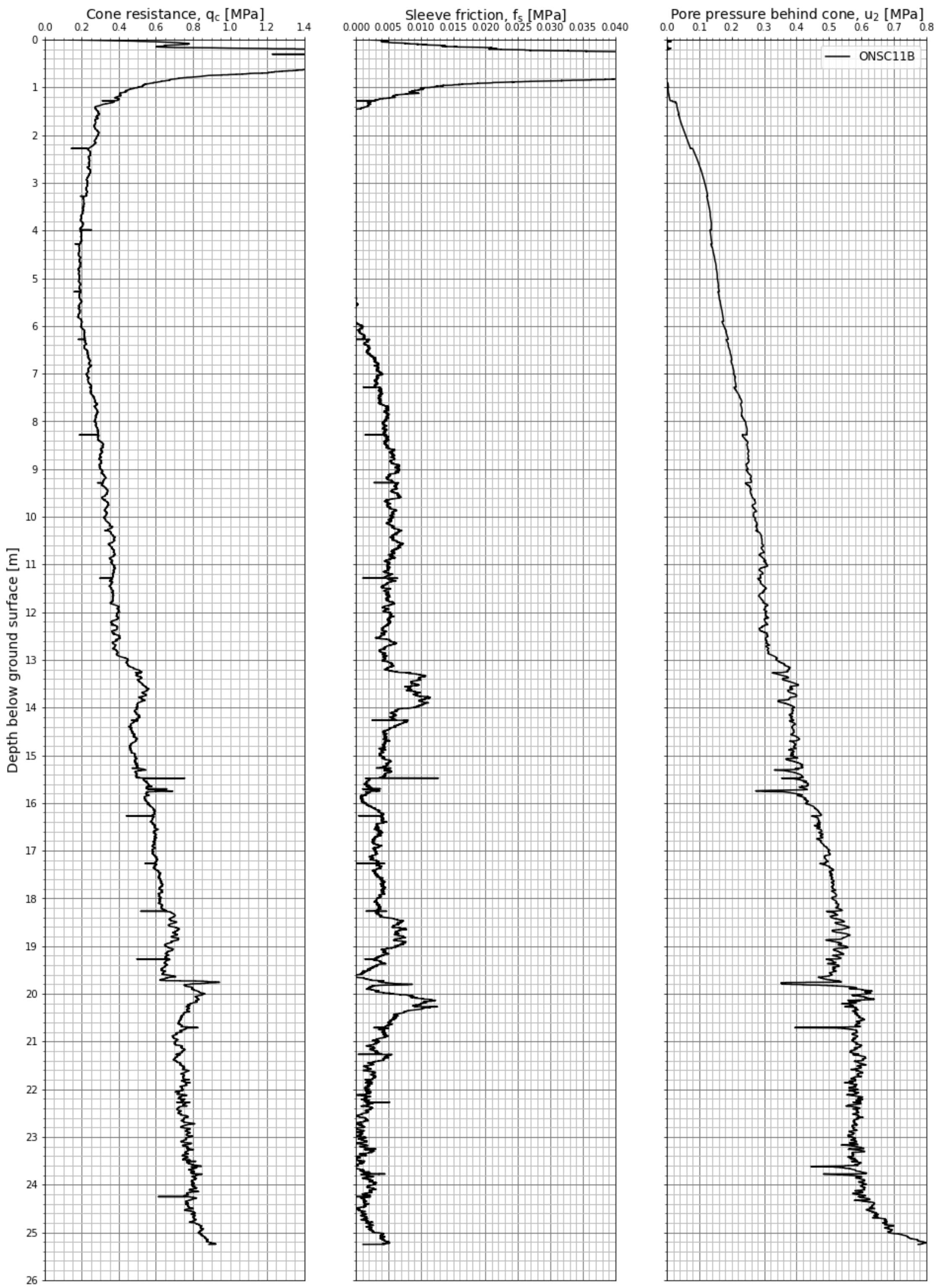


Figure F1.13 Measured q_c, f_s and u_2 for test ONSC11B

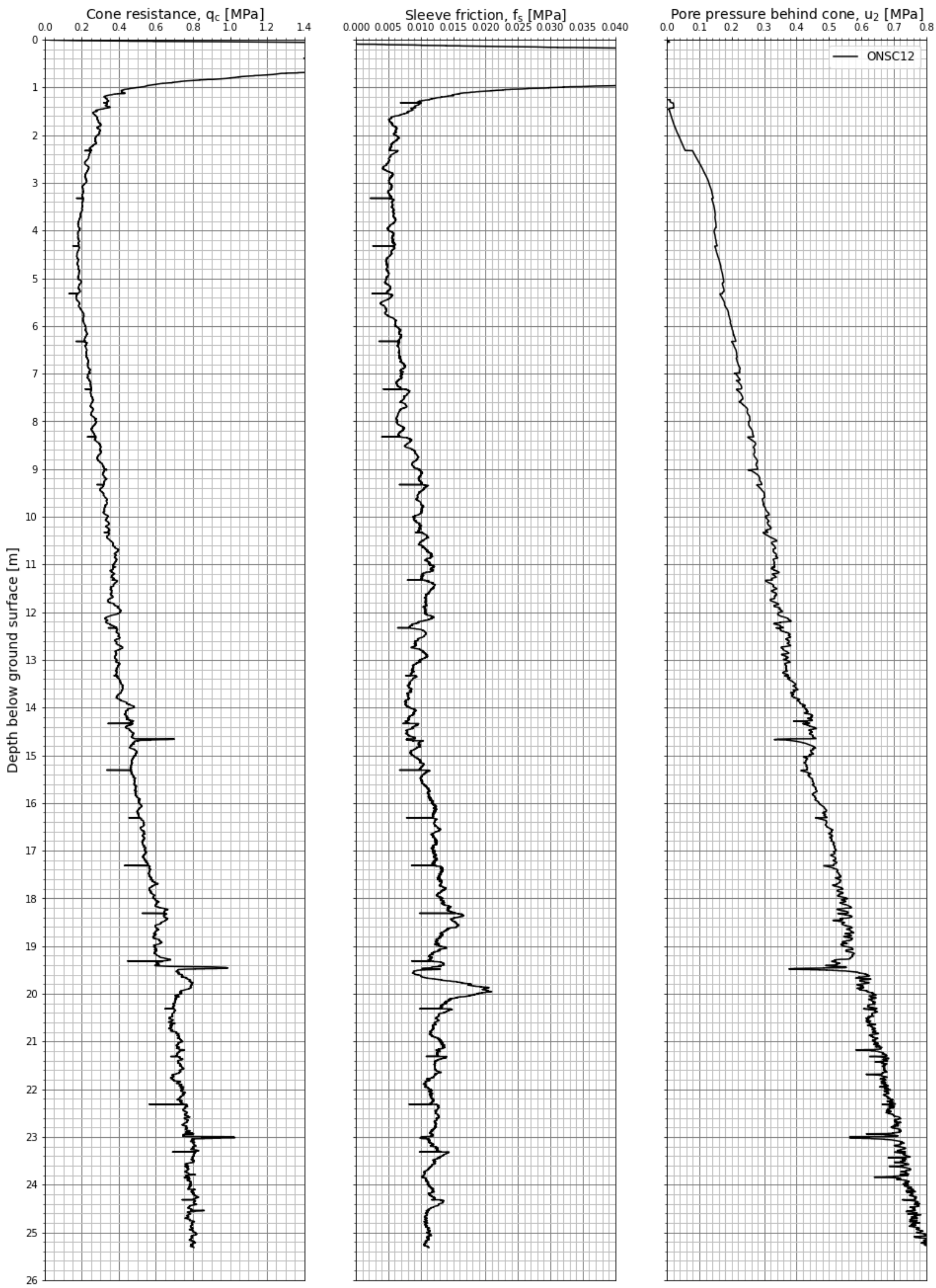


Figure F1.14 Measured q_c, f_s and u_2 for test ONSC12

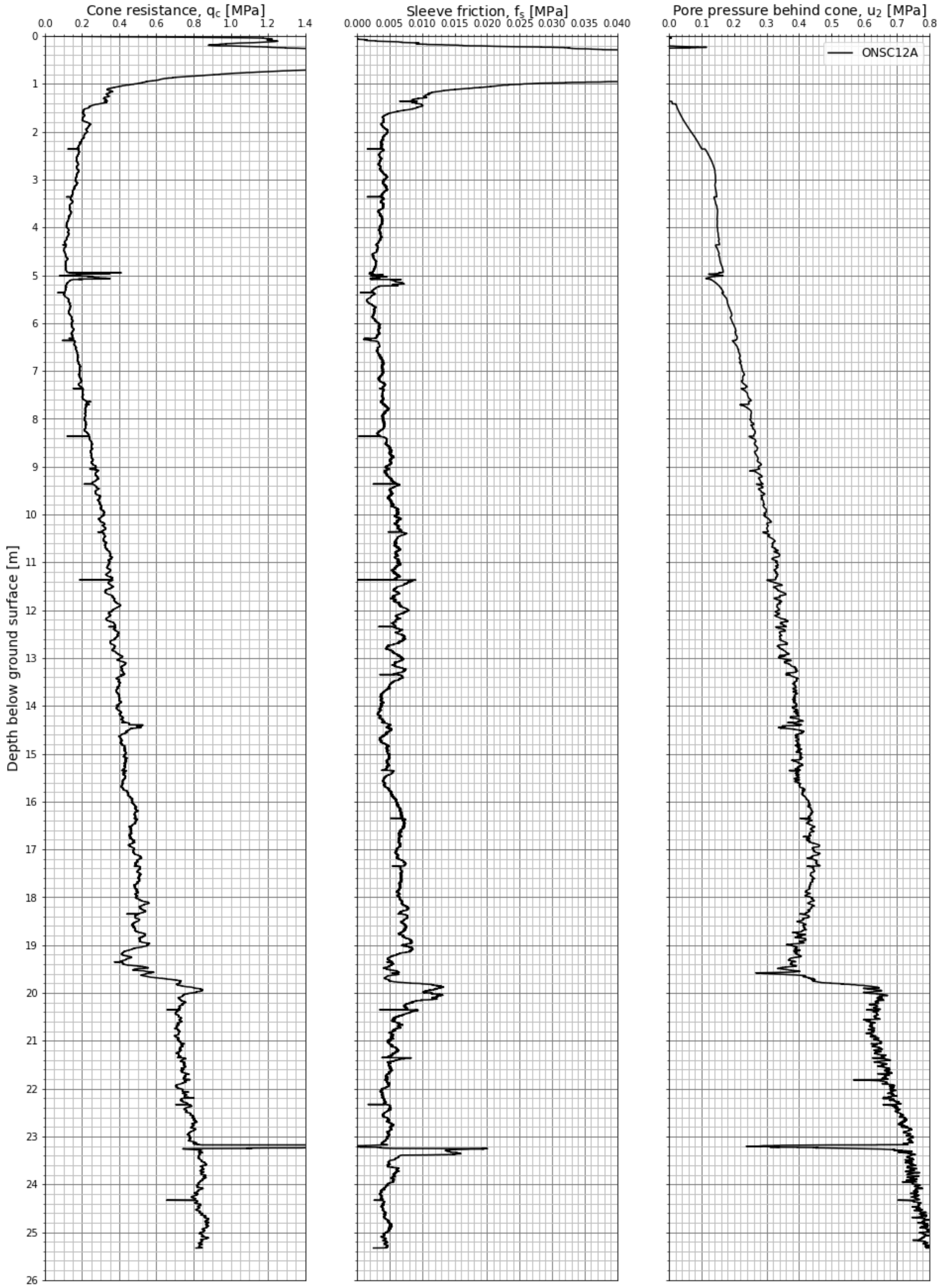


Figure F1.15 Measured q_c, f_s and u_2 for test ONSC12A

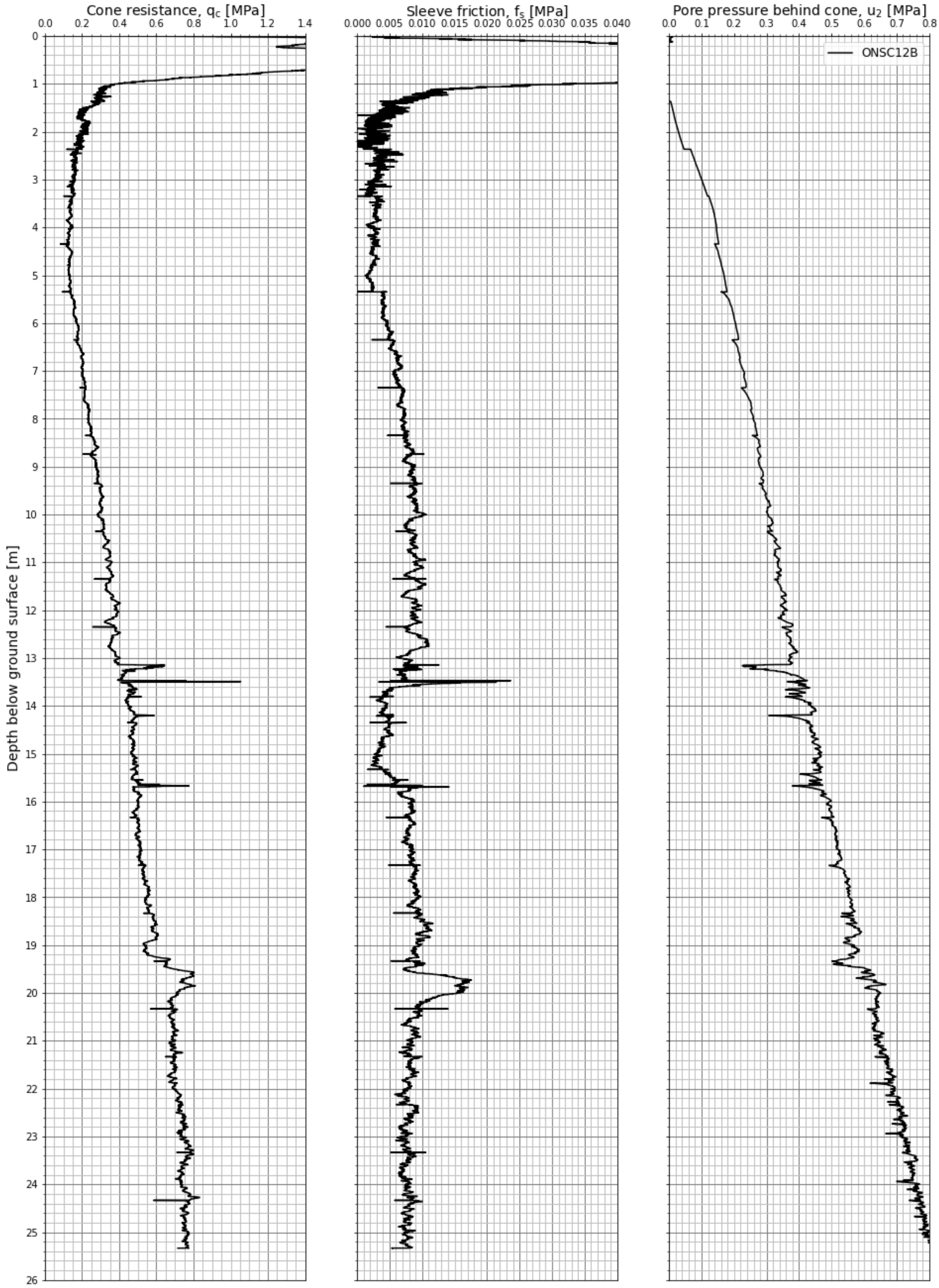


Figure F1.16 Measured q_c, f_s and u_2 for test ONSC12B

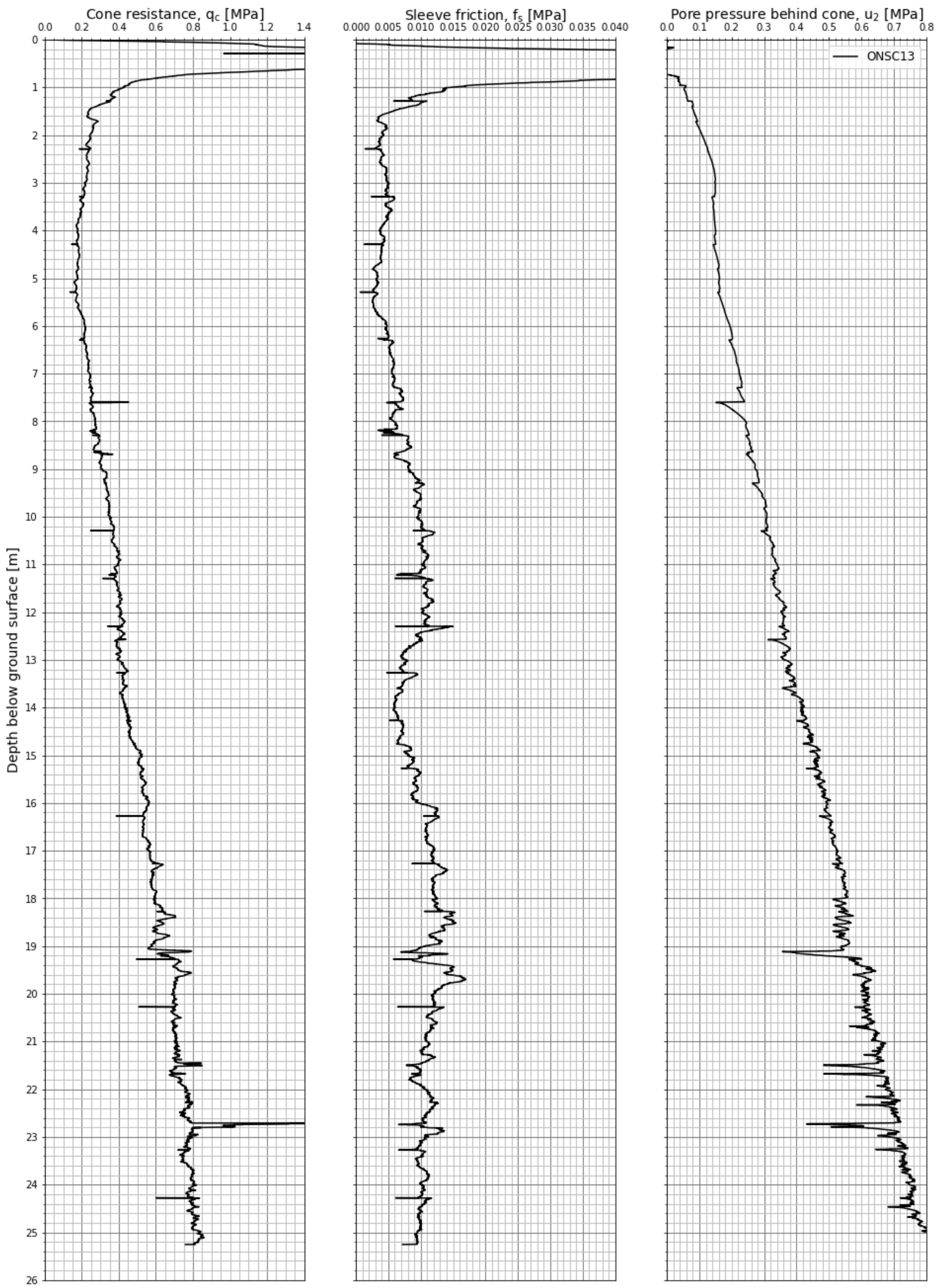


Figure F1.17 Measured q_c, f_s and u_2 for test ONSC13

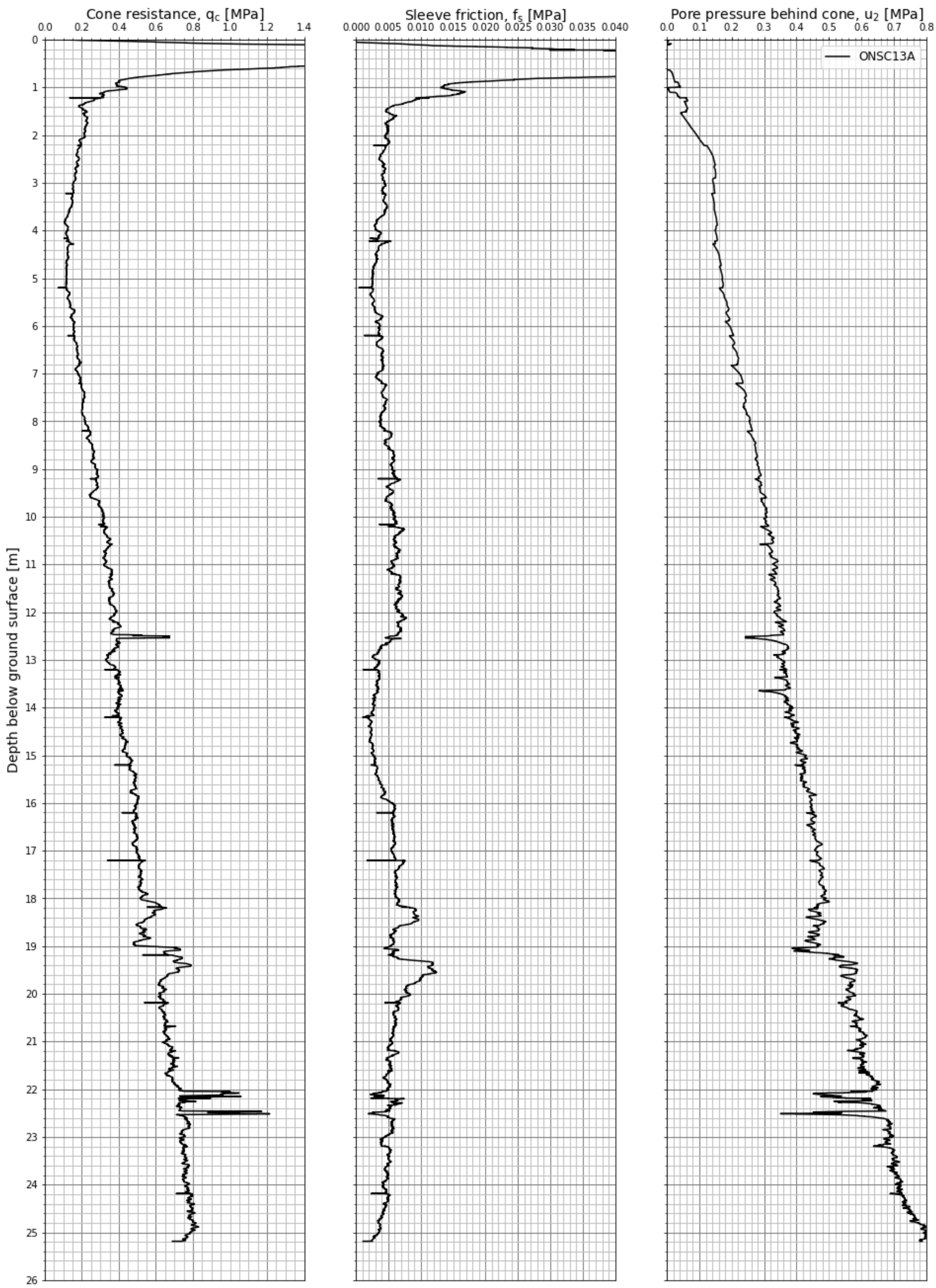


Figure F1.18 Measured q_c, f_s and u_2 for test ONSC13A

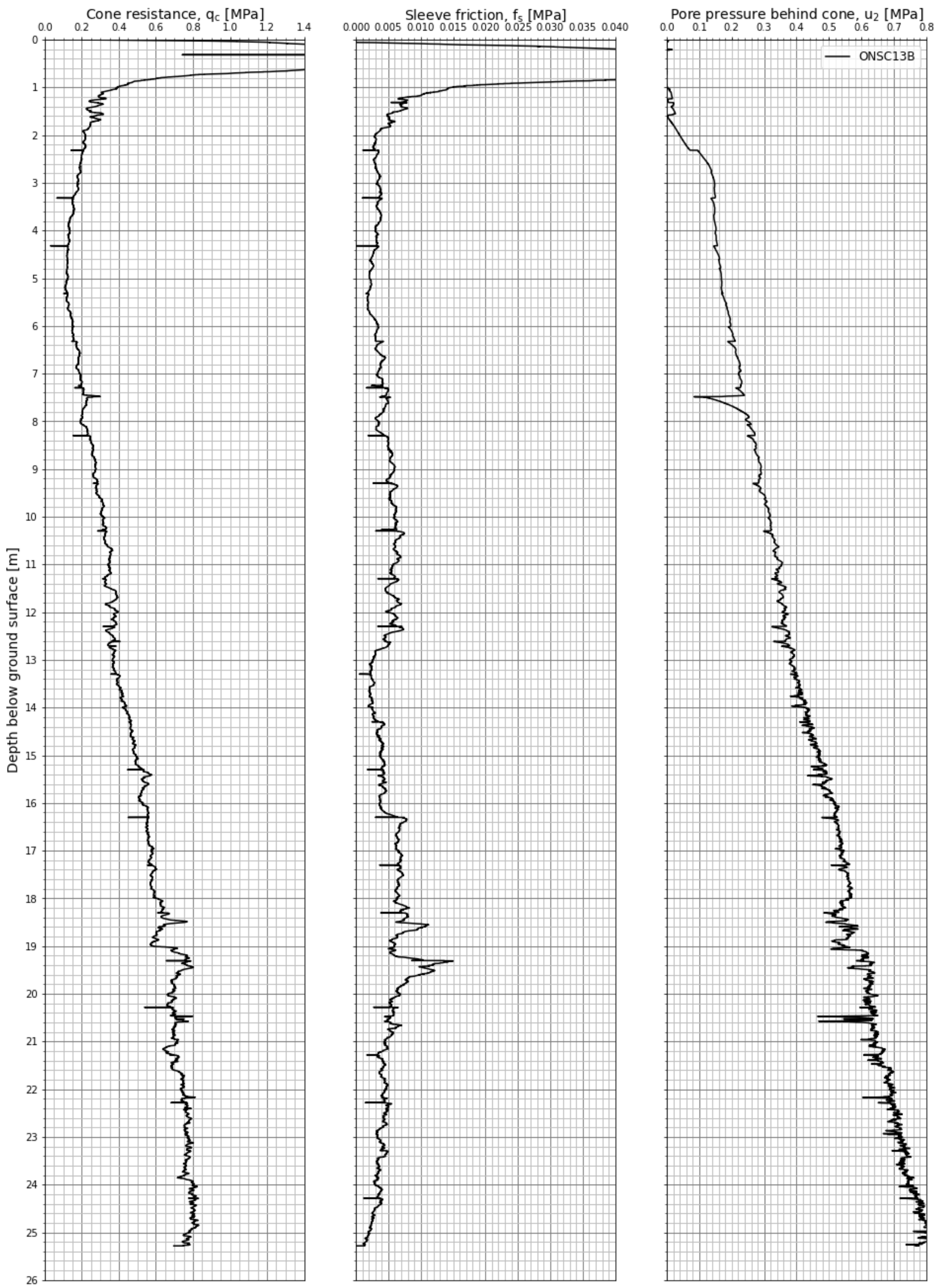


Figure F1.19 Measured q_c, f_s and u_2 for test ONSC13B

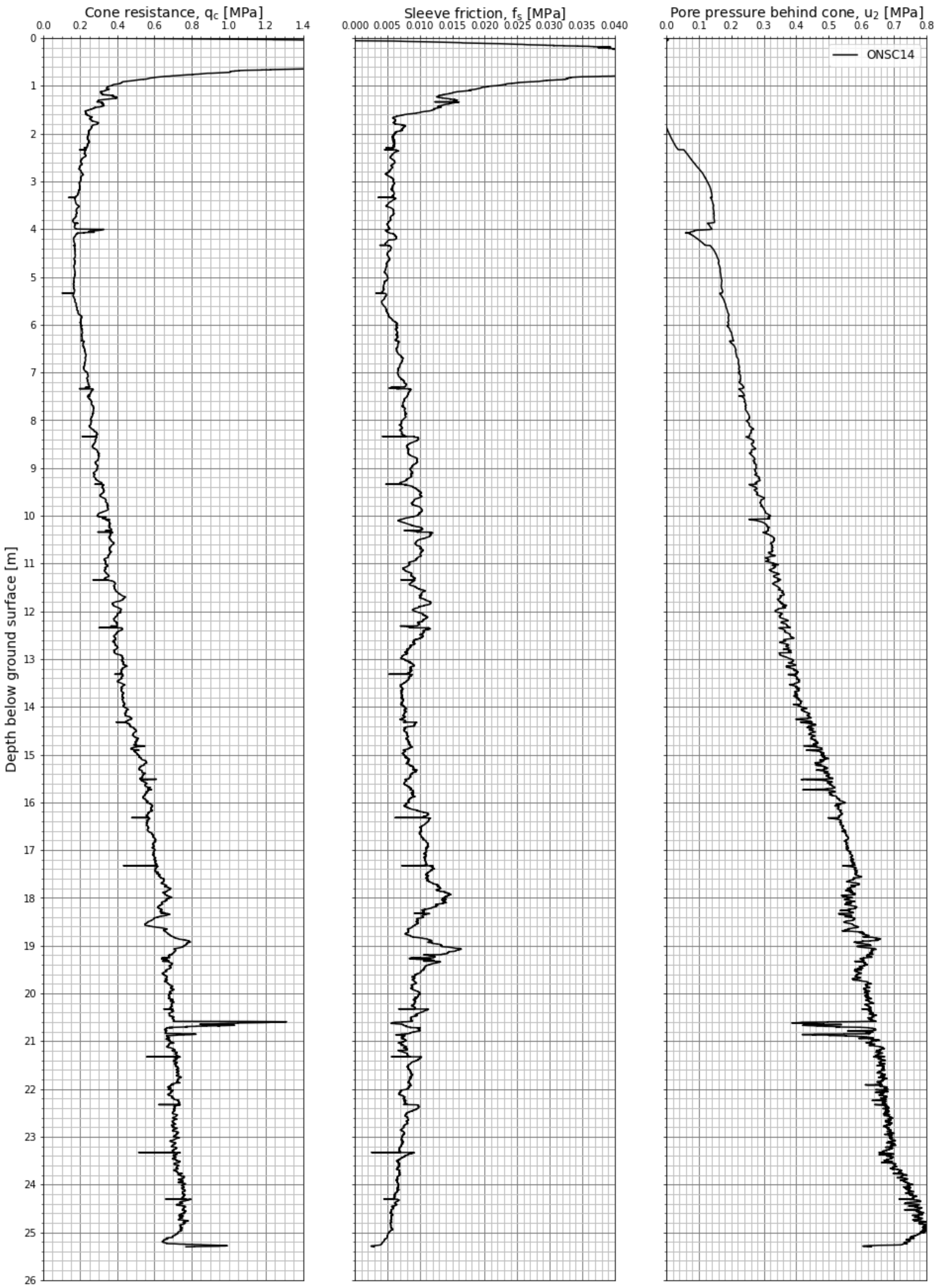


Figure F1.20 Measured q_c, f_s and u_2 for test ONSC14

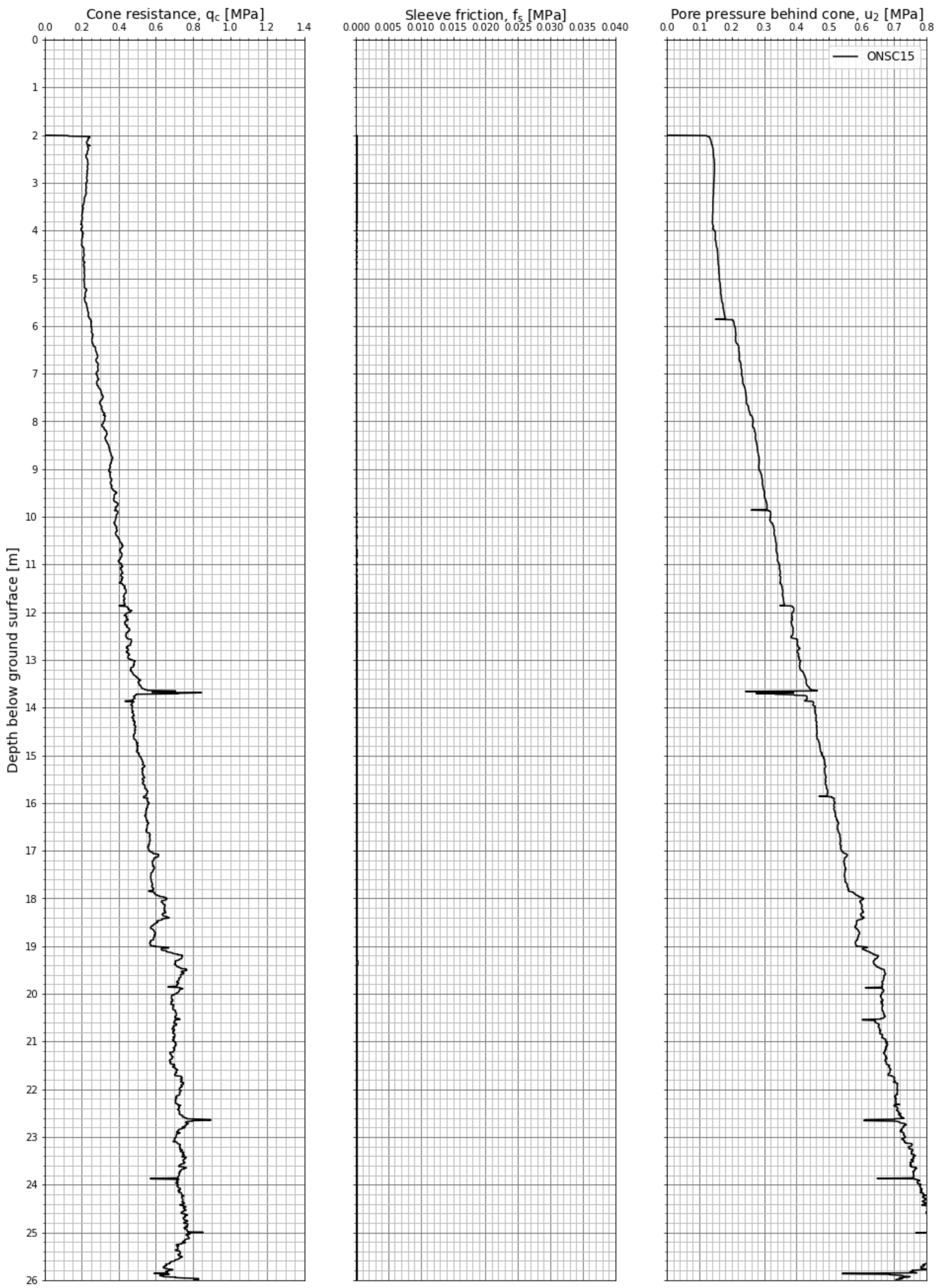


Figure F1.21 Measured q_c, f_s and u_2 for test ONSC15

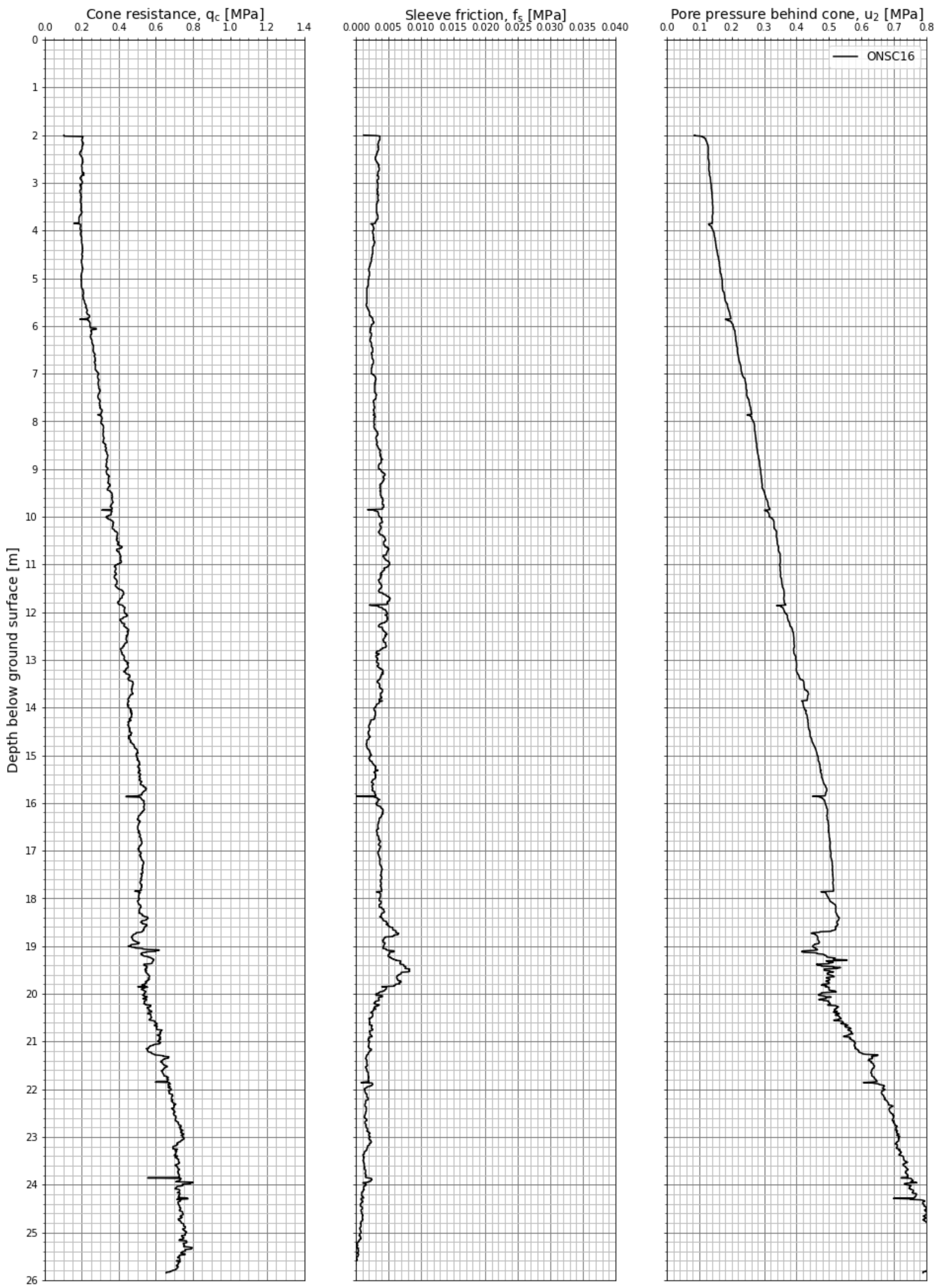


Figure F1.22 Measured q_c, f_s and u_2 for test ONSC16

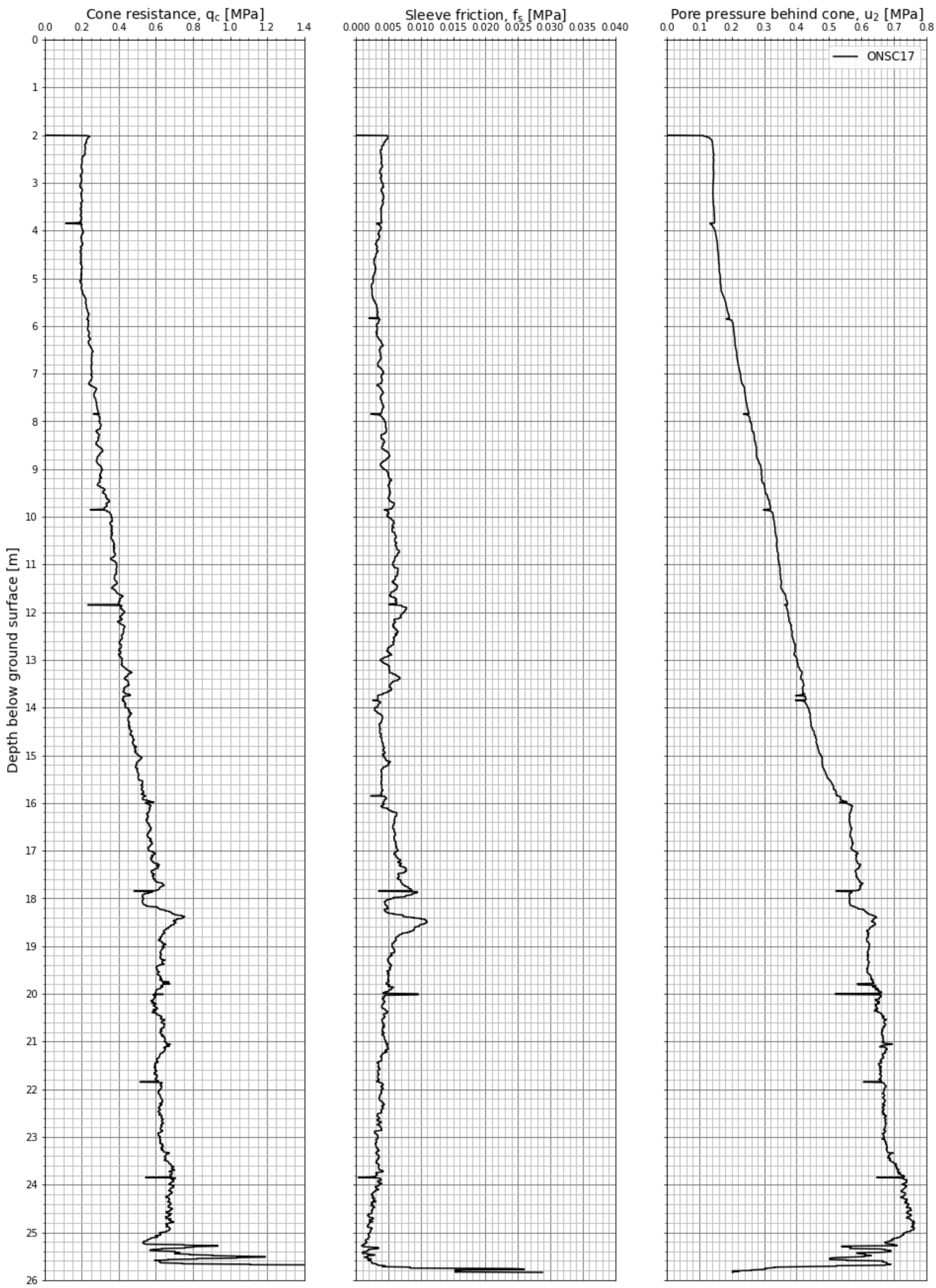


Figure F1.23 Measured q_c, f_s and u_2 for test ONSC17

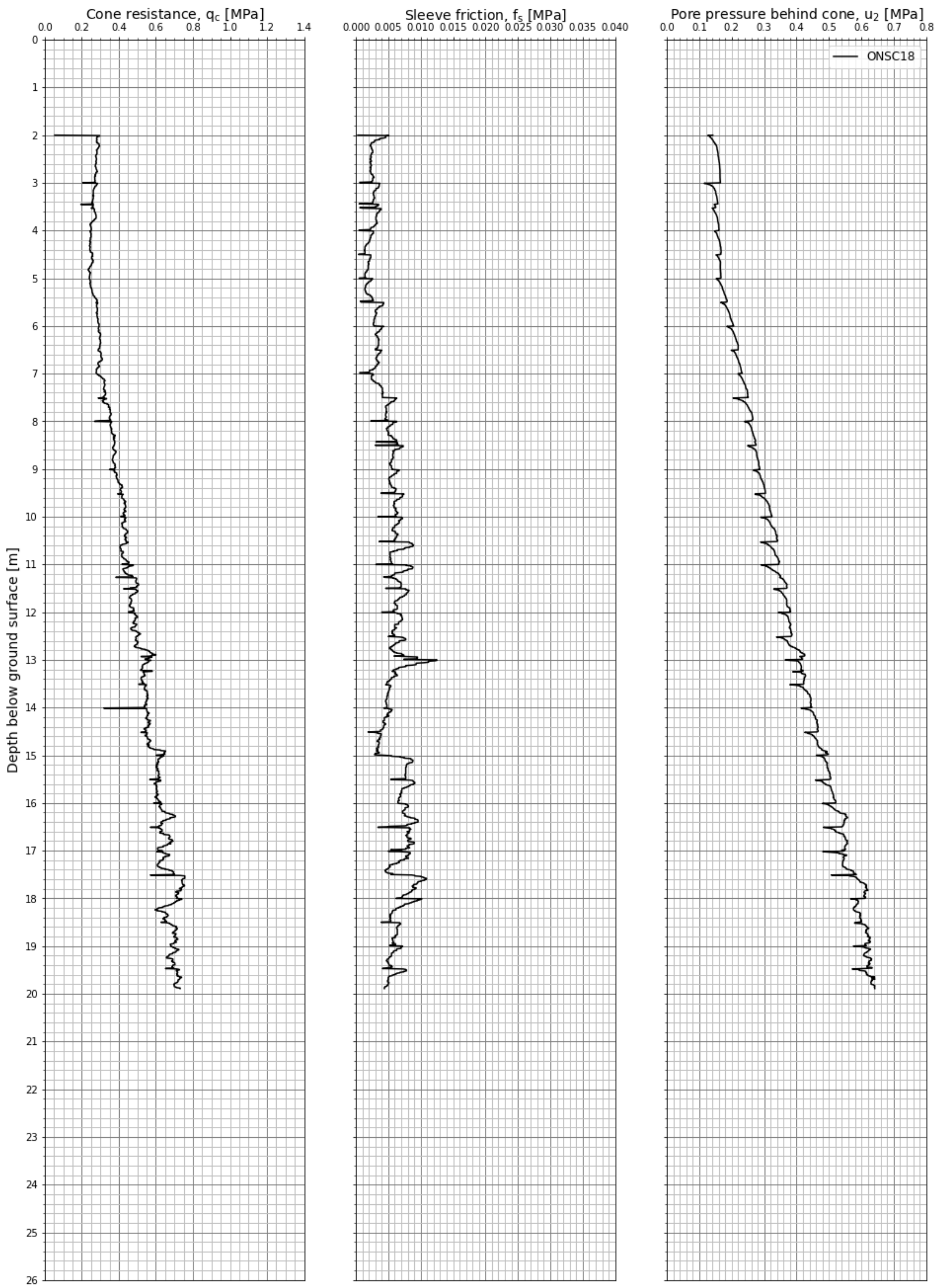


Figure F1.24 Measured q_c, f_s and u_2 for test ONSC18

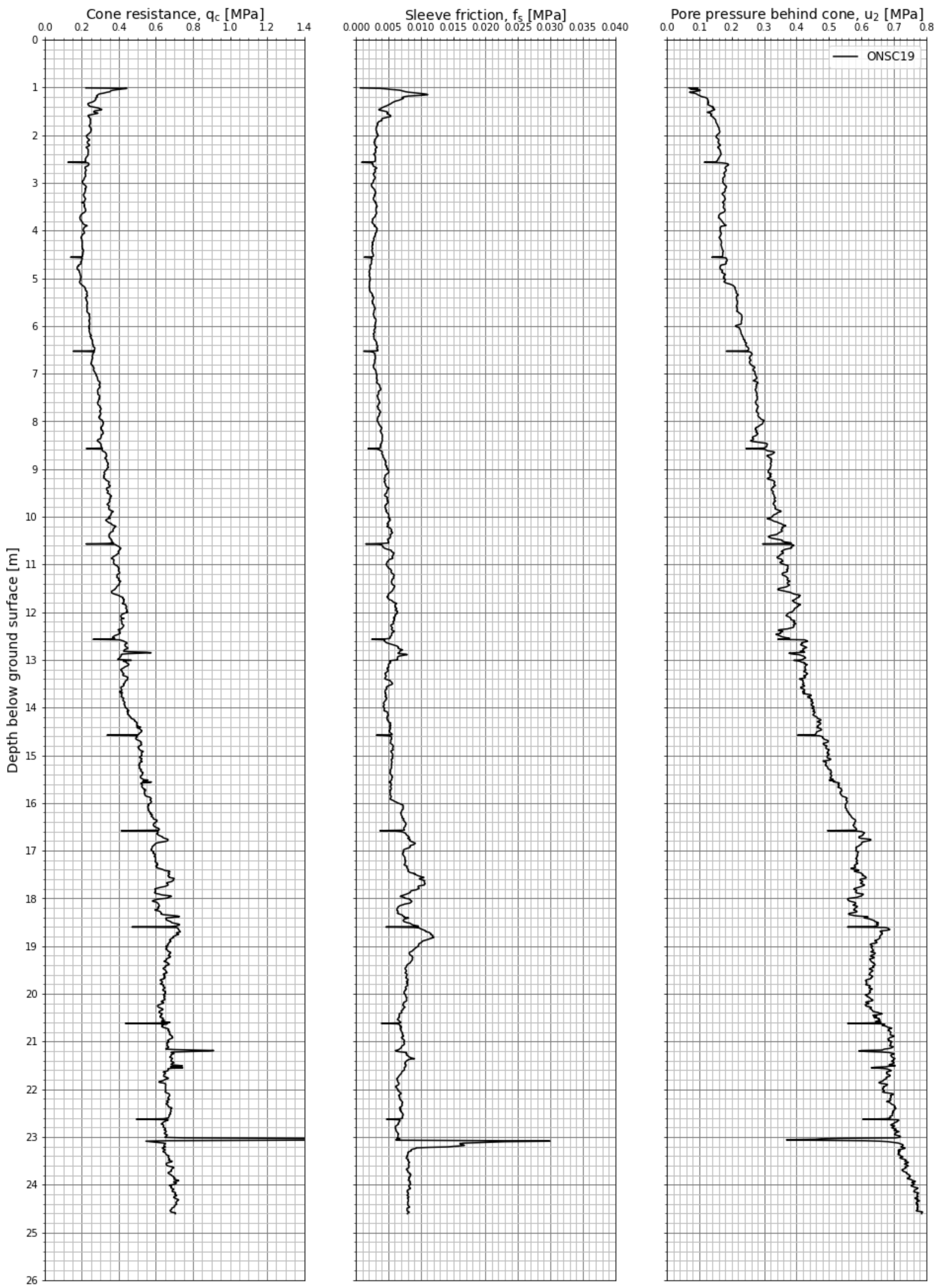


Figure F1.25 Measured q_c, f_s and u_2 for test ONSC19

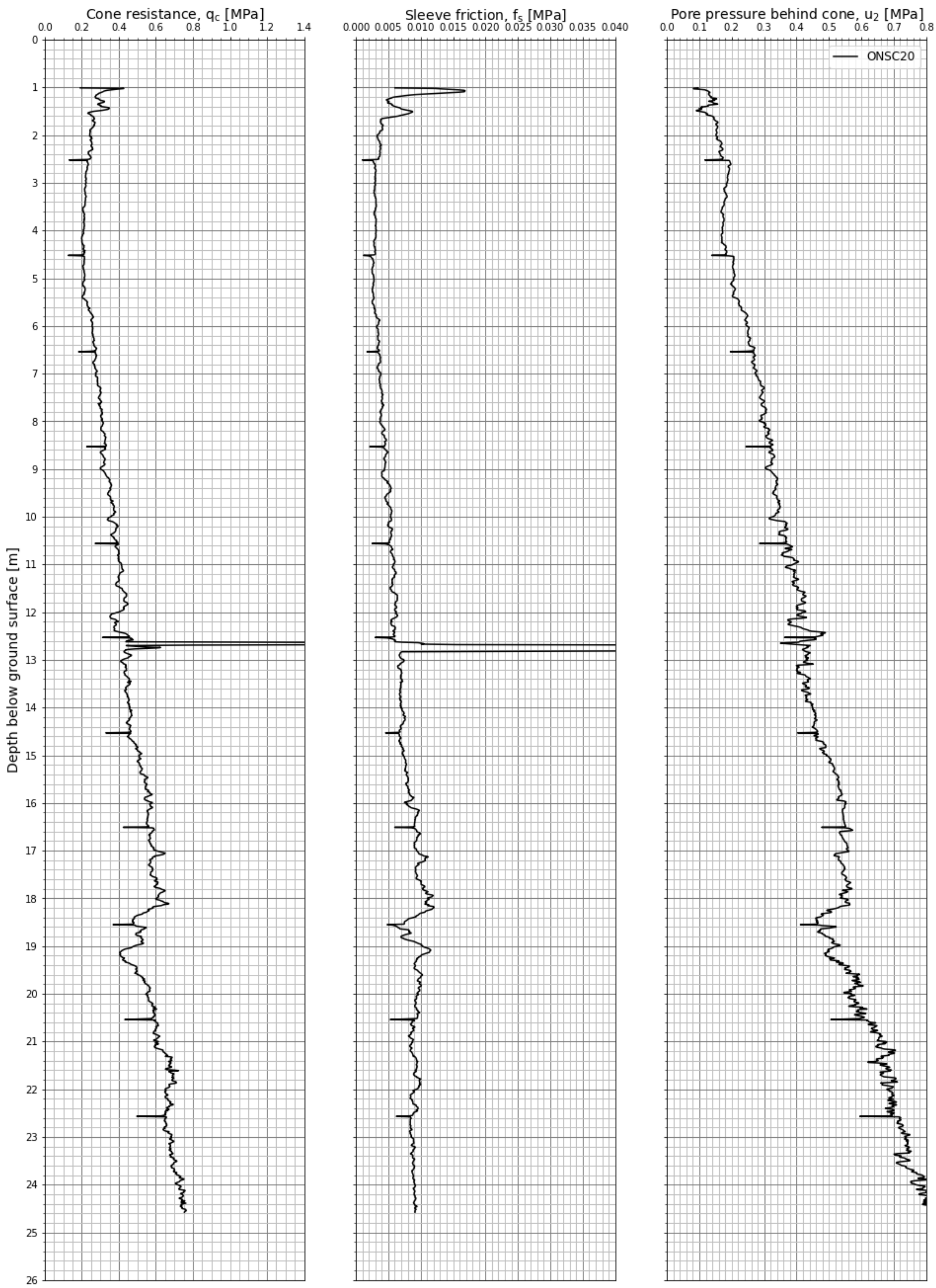


Figure F1.26 Measured q_c, f_s and u_2 for test ONSC20

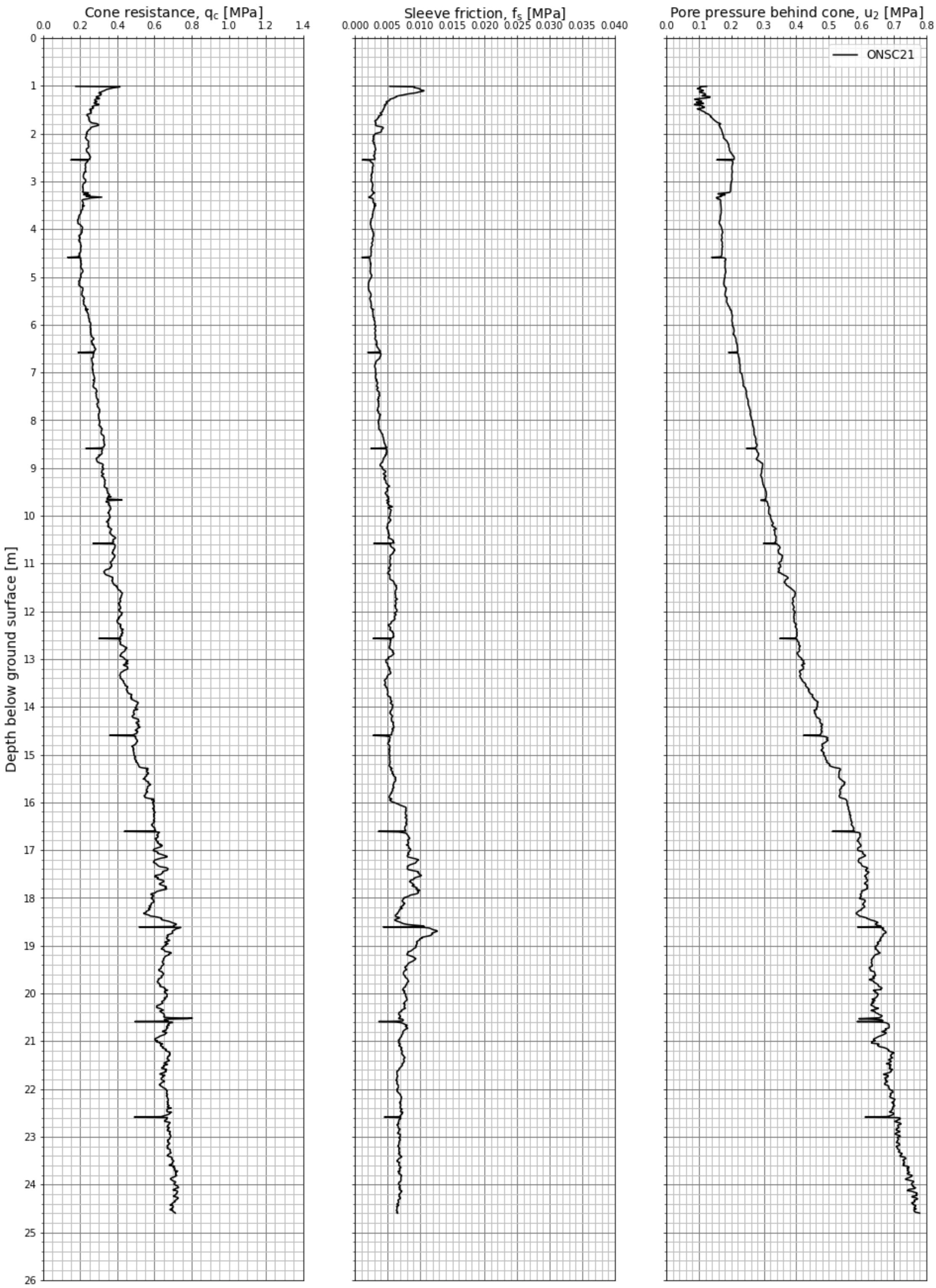


Figure FF1.27 Measured q_c, f_s and u_2 for test ONSC21

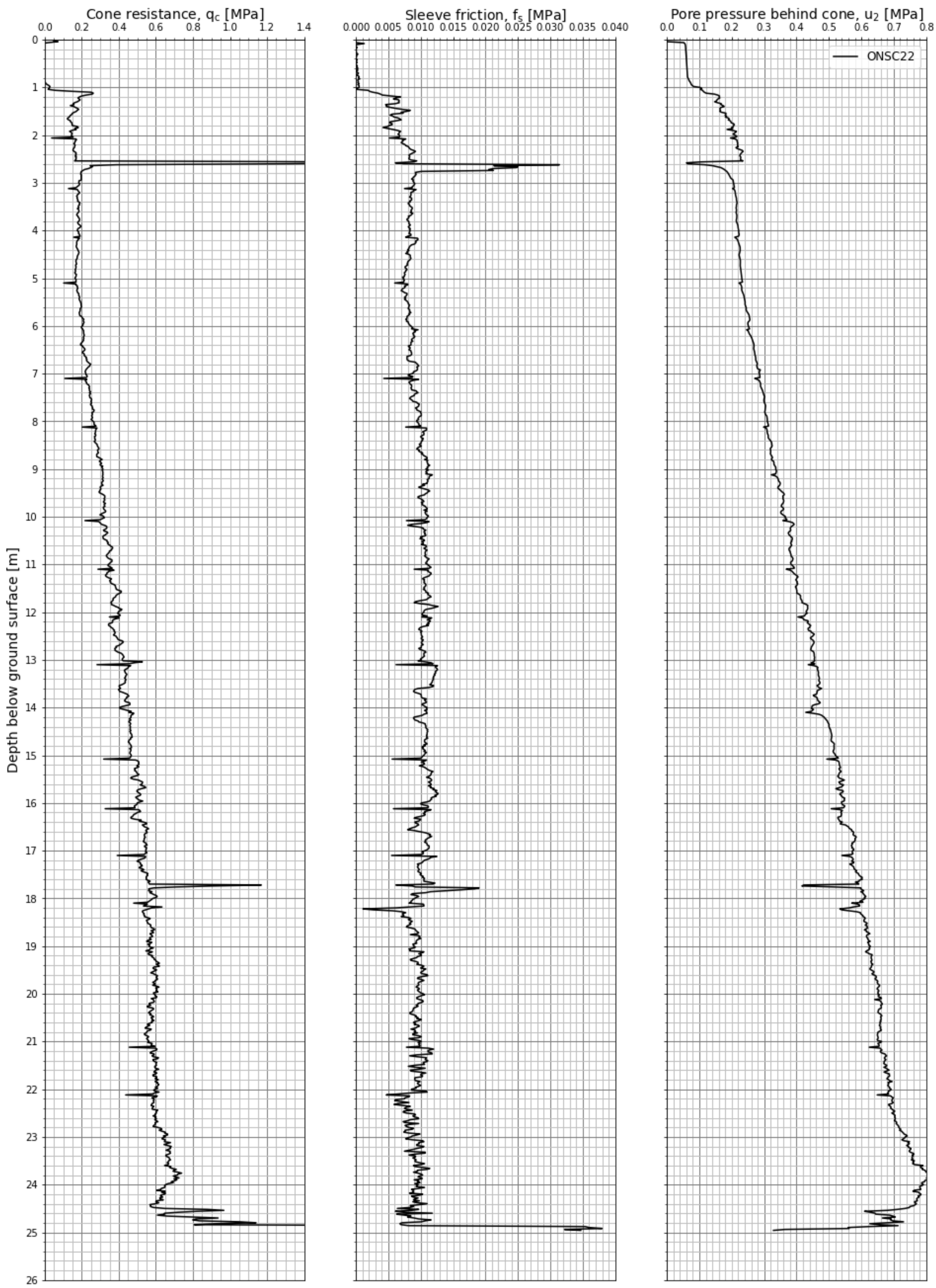


Figure F1.28 Measured q_c, f_s and u_2 for test ONSC22

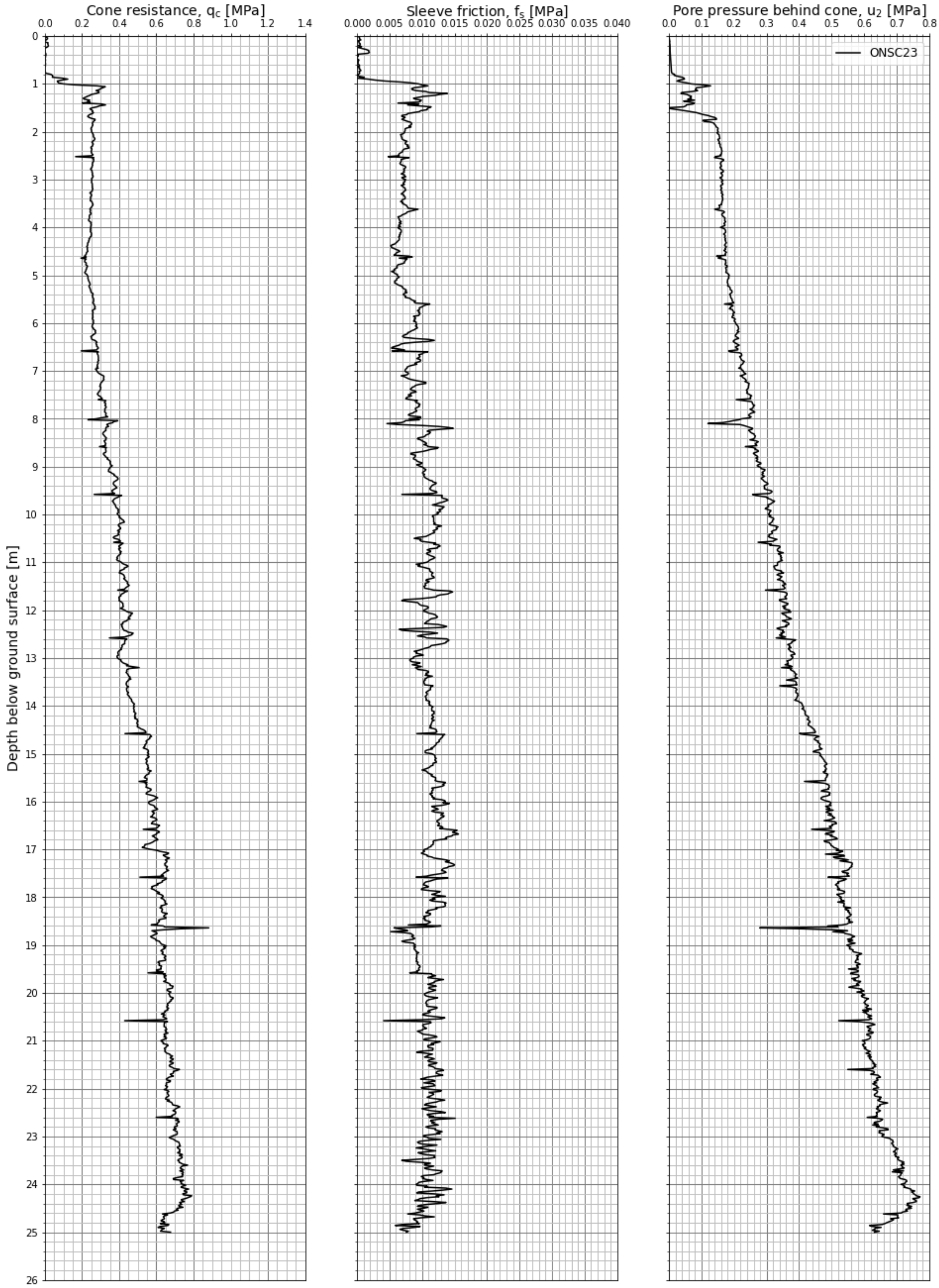


Figure F1.29 Measured q_c, f_s and u_2 for test ONSC23

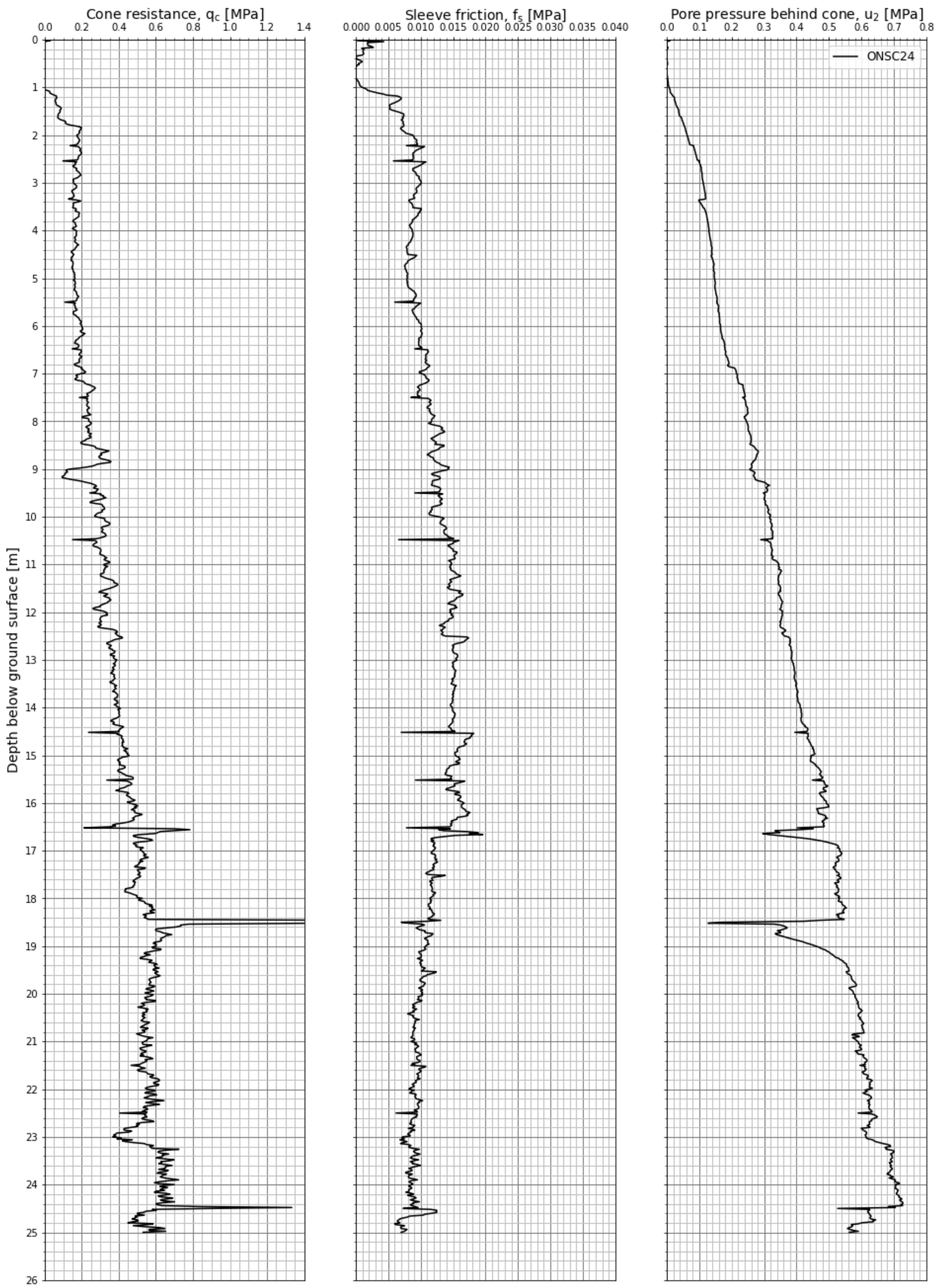


Figure F1.30 Measured q_c, f_s and u_2 for test ONSC24

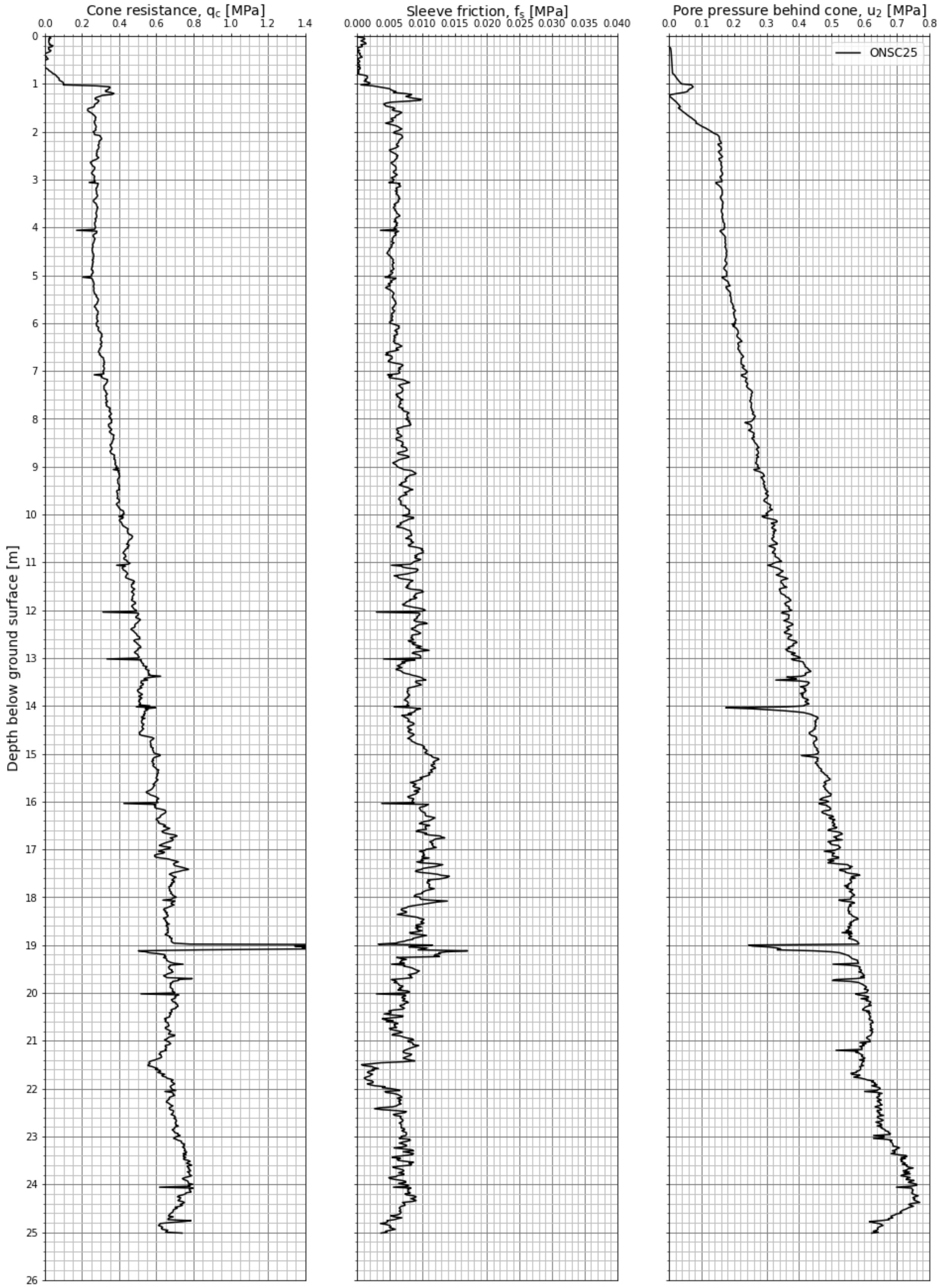


Figure F1.31 Measured q_c, f_s and u_2 for test ONSC25

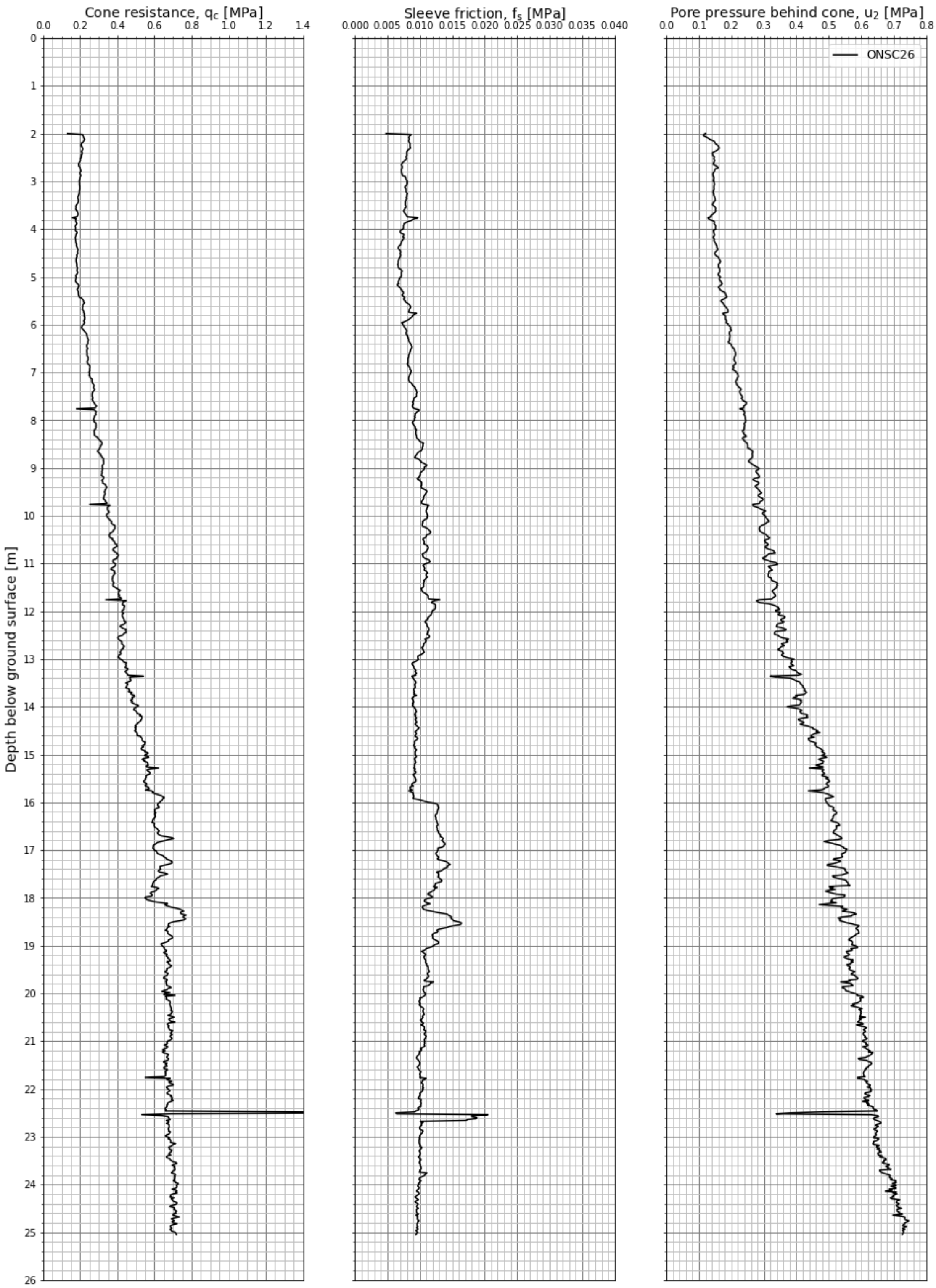


Figure F1.32 Measured q_c, f_s and u_2 for test ONSC26

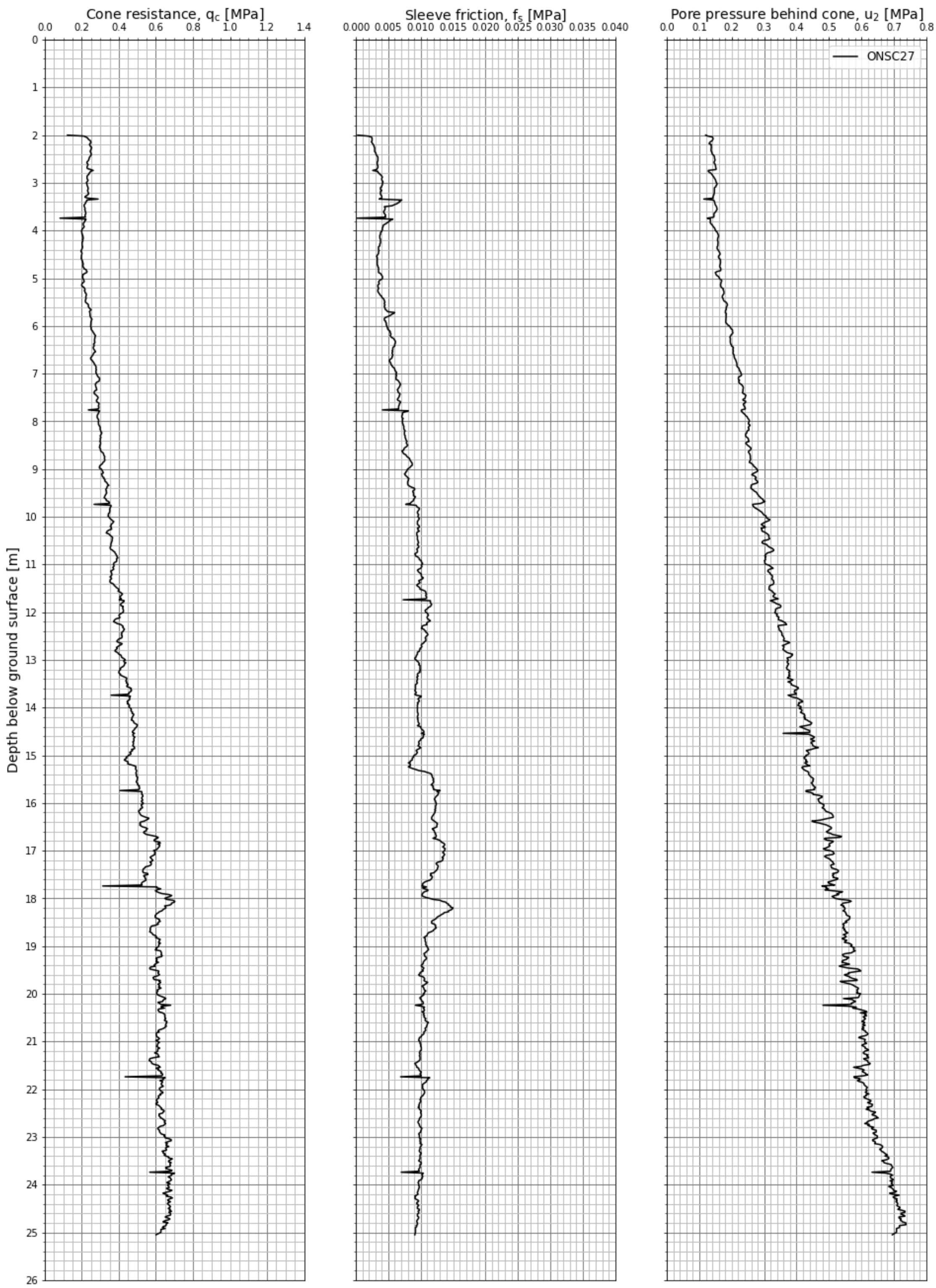


Figure F1.33 Measured q_c, f_s and u_2 for test ONSC27

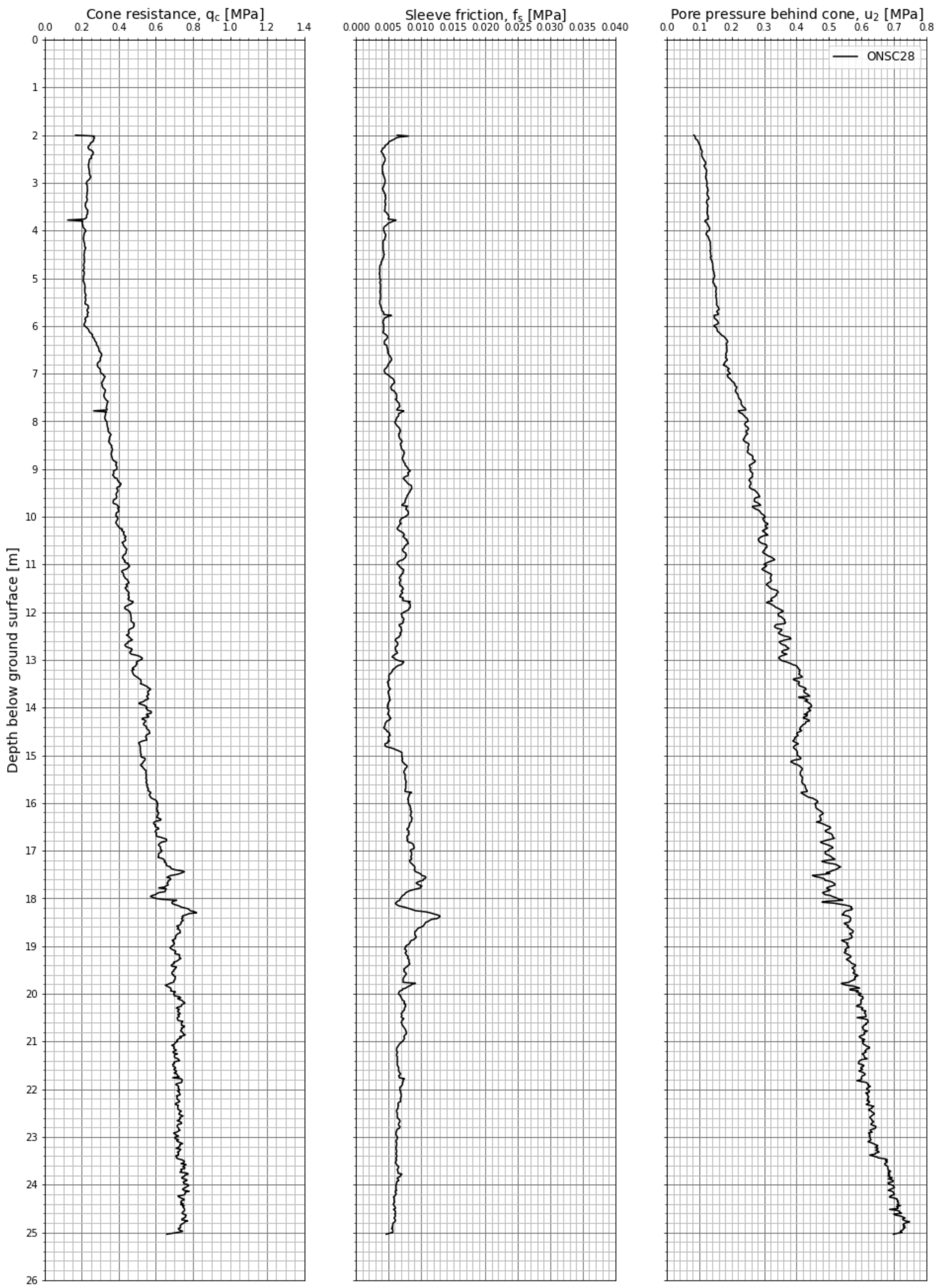


Figure F1.34 Measured q_c, f_s and u_2 for test ONSC28

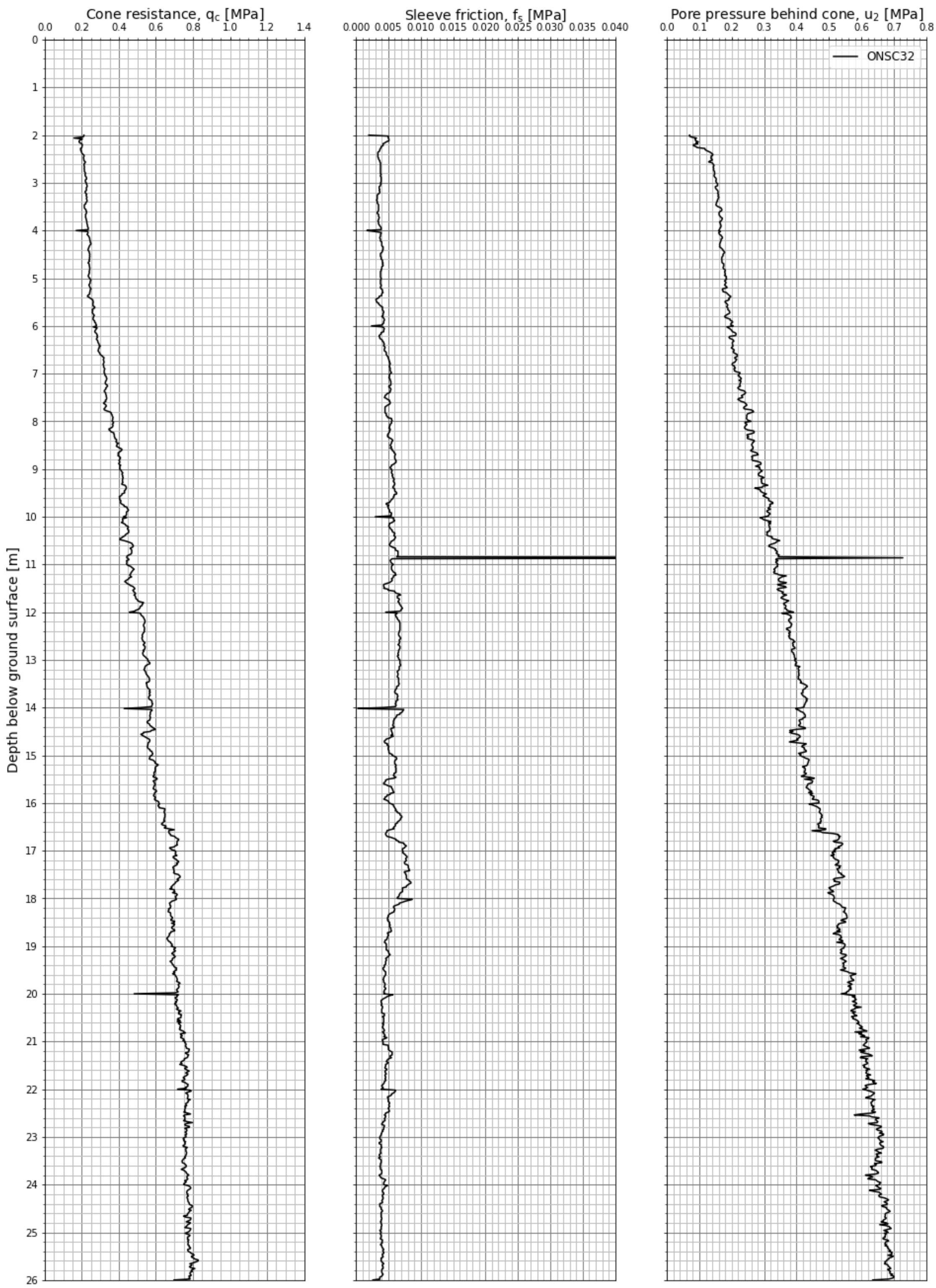


Figure F1.35 Measured q_c, f_s and u_2 for test ONSC29

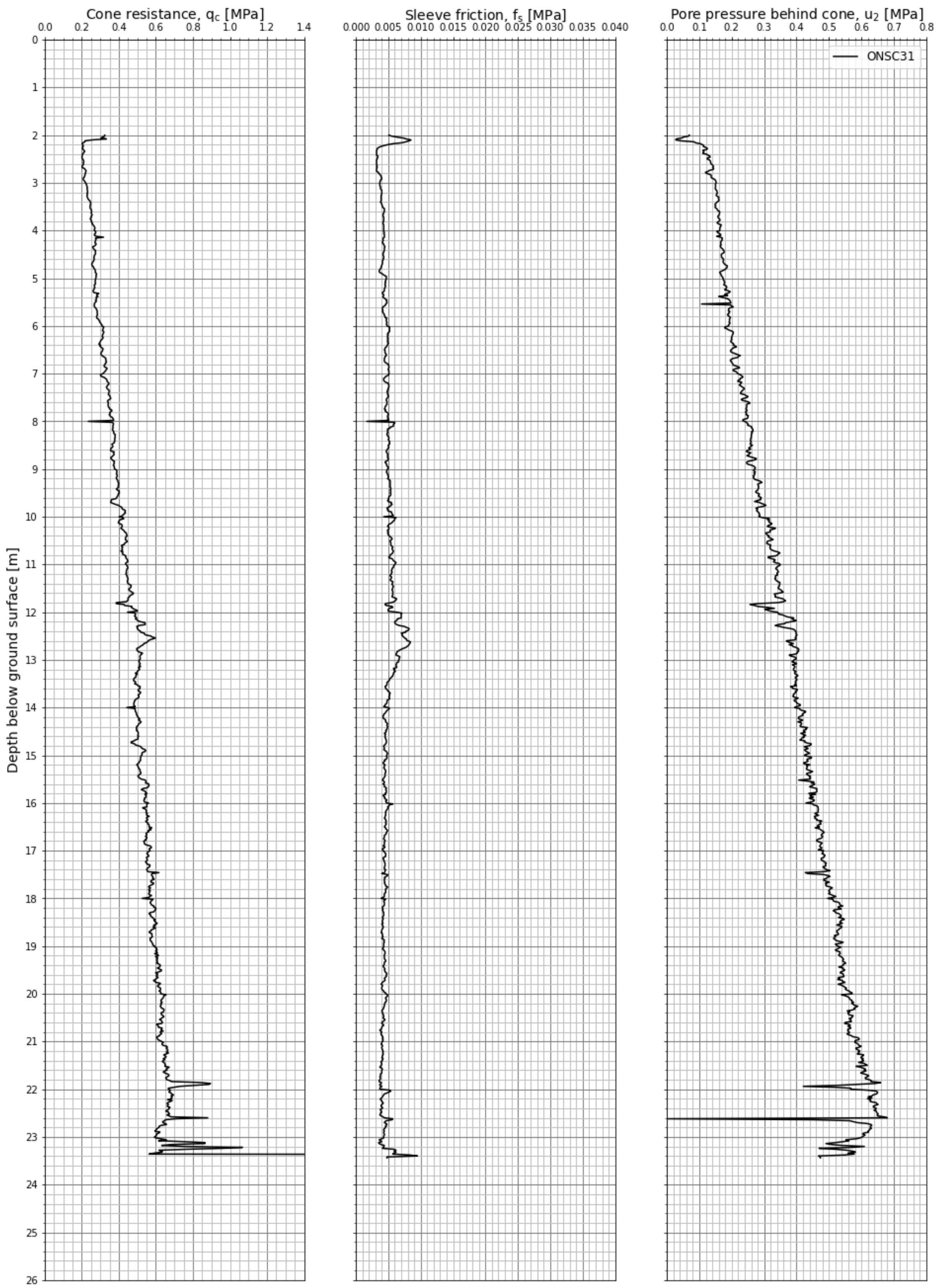


Figure F1.36 Measured q_c, f_s and u_2 for test ONSC30

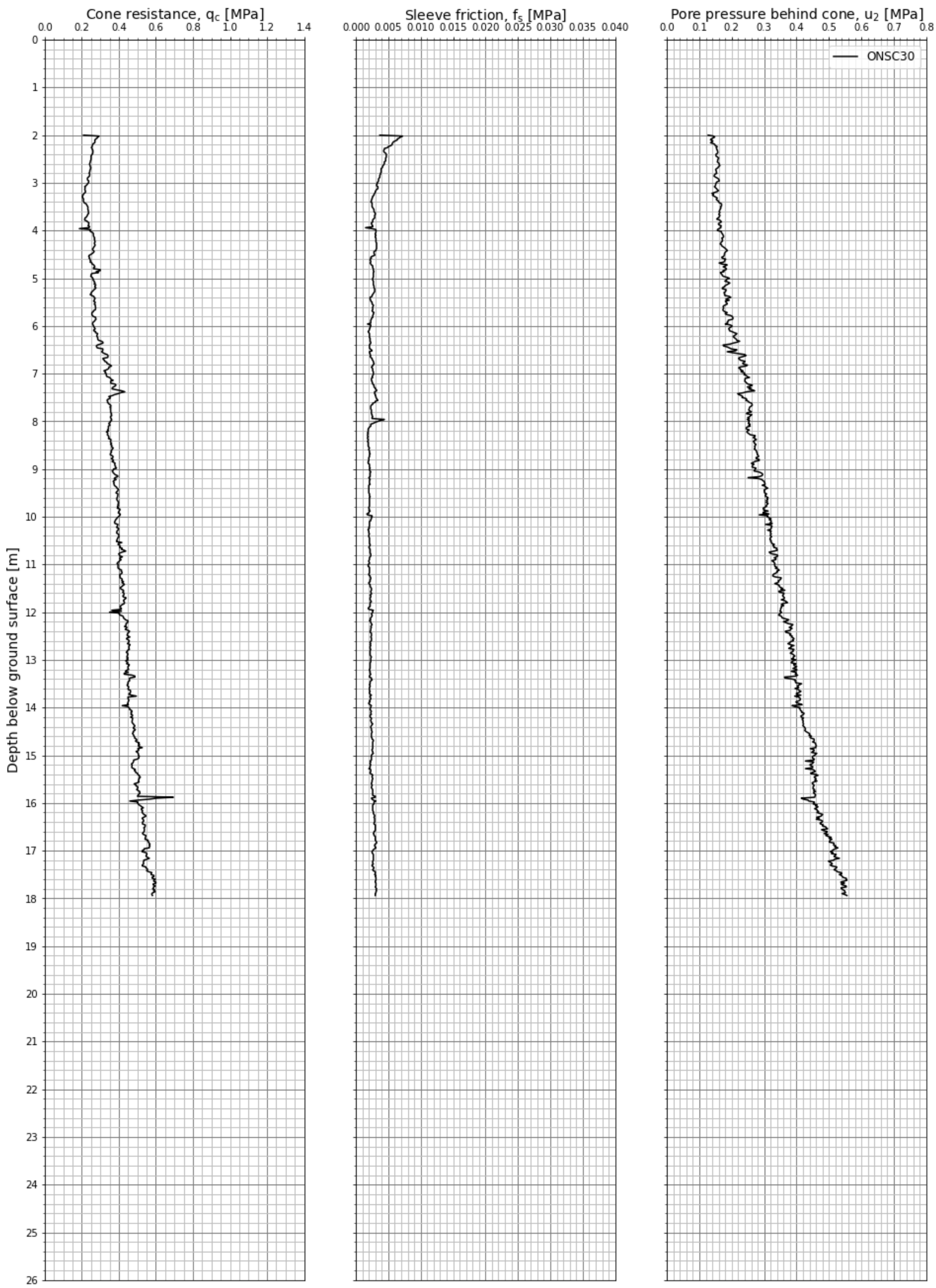


Figure F1.37 Measured q_c, f_s and u_2 for test ONSC31

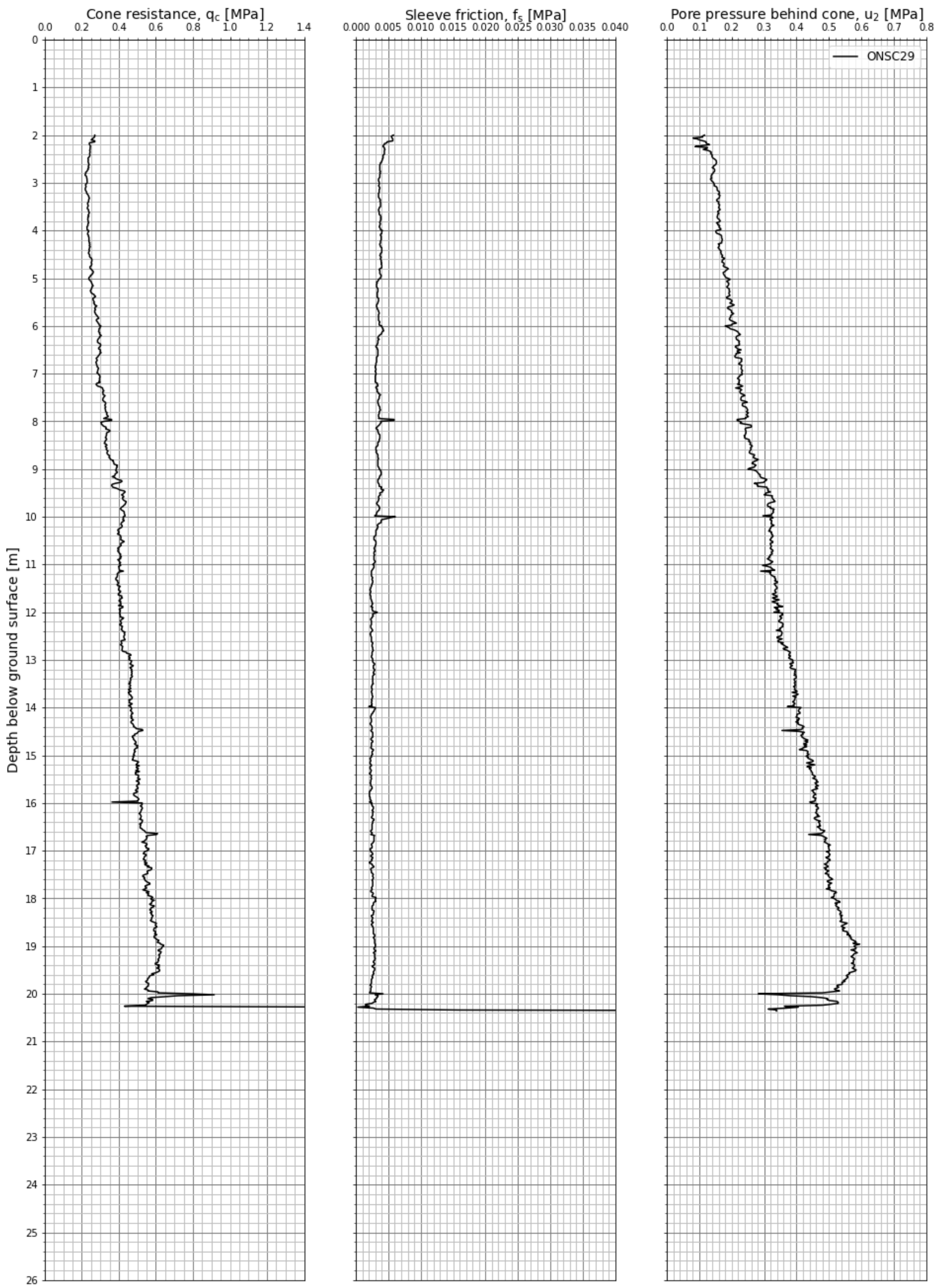


Figure F1.38 Measured q_c, f_s and u_2 for test ONSC32

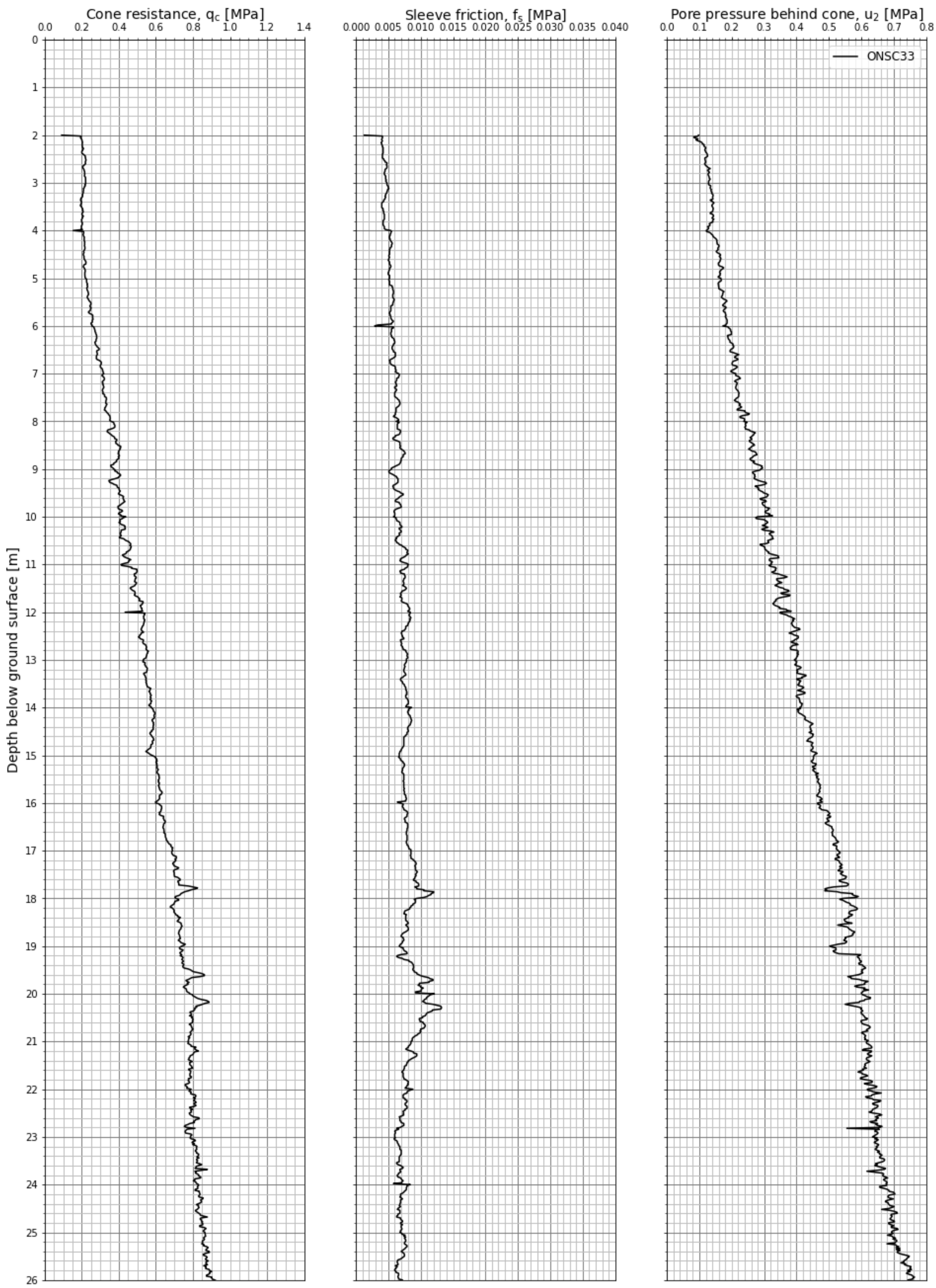


Figure F1.39 Measured q_c, f_s and u_2 for test ONSC33

F2 Resistivity measurements

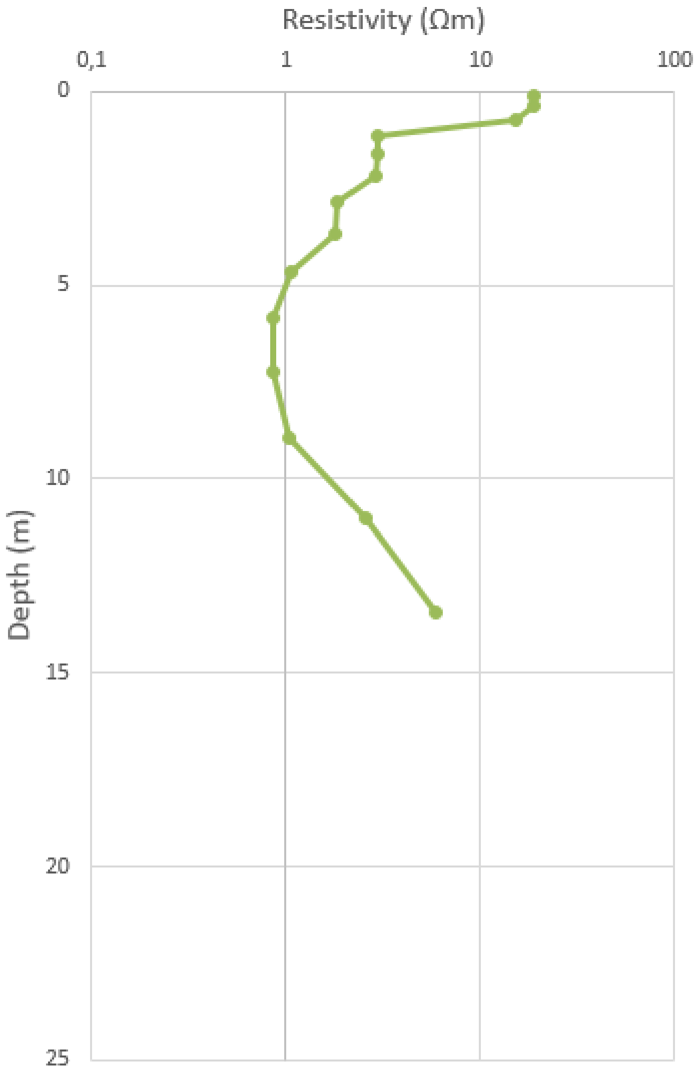


Figure F2.1 1D resistivity profile along L4 at x= 58 m from the start of the profile, near the eastern edge of the trapezoidal model.

F3 Seismic CPTU results

Figure F3.1 illustrates the shear wave velocity with depth obtained from seismic CPTU measurements.

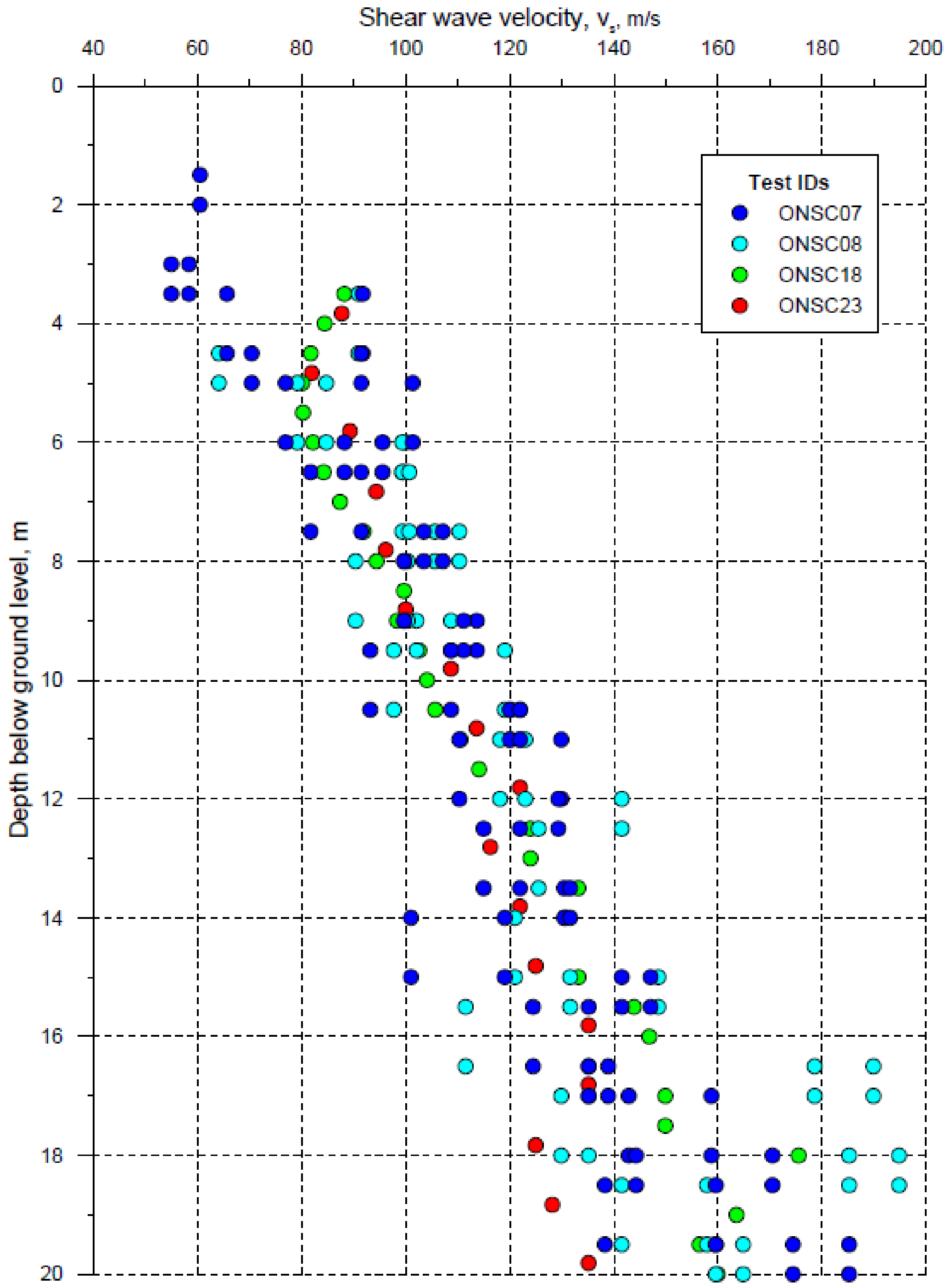


Figure F3.1 Shear wave velocity with depth from seismic CPTU tests.

F4 Calibration certificates

CALIBRATION CERTIFICATE FOR CPT PROBE 4648

Probe No	4648
Date of Calibration	2017-10-23
Calibrated by	Christoffer Hurtig……………………………….
Run No	544
Test Class:	ISO 1

Point Resistance — Tip Area 10cm²

Maximum Load	100	MPa
Range	100	MPa
Scaling Factor	**849**	
Resolution	0,8986	kPa
Area factor (a)	0,861	

ERRORS

Max. Temperature effect when not loaded 26,943 kPa

Temperature range 5 –40 deg. Celsius.

Local Friction — Sleeve Area 150cm²

Maximum Load	0,5	MPa
Range	0,5	MPa
Scaling Factor	**4035**	
Resolution	0,0095	kPa
Area factor (b)	0	

ERRORS

Max. Temperature effect when not loaded 0,359 kPa

Temperature range 5 –40 deg. Celsius.

Pore Pressure

Maximum Load	2,5	MPa
Range	2	MPa
Scaling Factor	**3474**	
Resolution	0,022	kPa

ERRORS

Max. Temperature effect when not loaded 2,107 kPa

Temperature range 5 –40 deg. Celsius.

Tilt Angle. Scaling Factor: 0,93

Range	0 - 40	Deg.

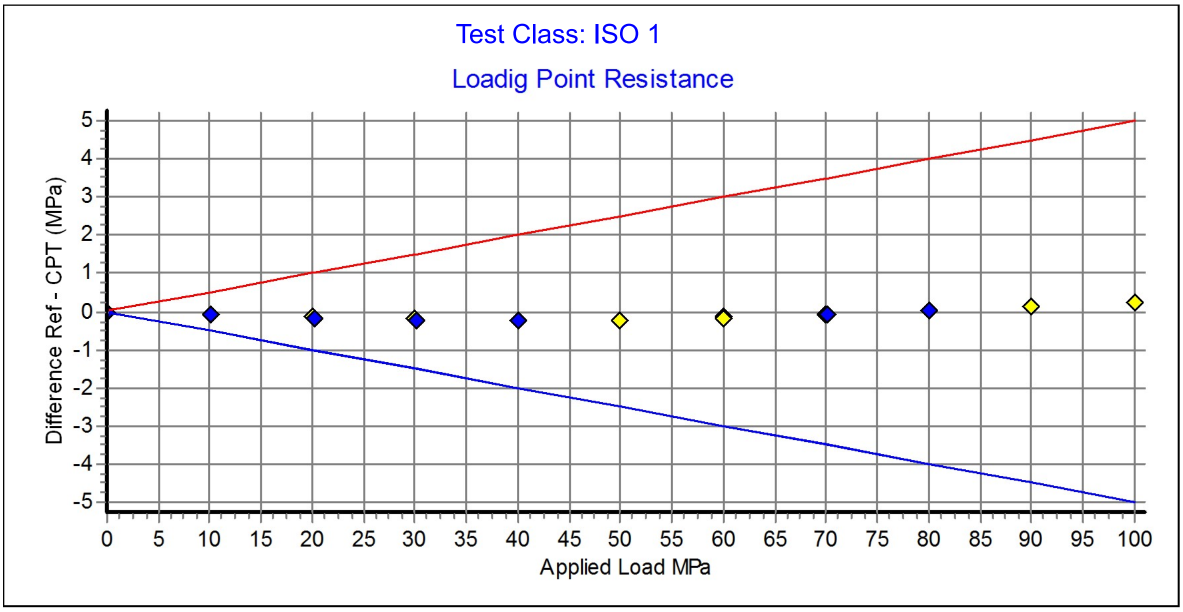
Backup memory

Temperature sensor

Calibration Certificate. **Loading Point Resistance** Göteborg:2017-10-23

Probe No: **4648**
Date of Calibration: **2017-10-23**
Calibration Run No: **544**
Calibrated by: **Christoffer Hurtig**
Scaling Factor: 849
Reference Cell: 75672

Applied Load MPa	PointRes. MPa	Difference MPa	Accuracy %/MV	Friction MPa	PorePress MPa
0,000	0,000	0,000	0,000	0,000	0,000
10,019	10,098	-0,079	-0,788	0,000	-0,001
19,995	20,148	-0,153	-0,765	0,000	-0,002
30,008	30,207	-0,199	-0,663	0,000	-0,003
40,009	40,232	-0,223	-0,557	0,000	-0,004
50,013	50,229	-0,216	-0,431	0,000	-0,005
60,045	60,218	-0,173	-0,288	0,000	-0,006
70,003	70,097	-0,094	-0,134	0,000	-0,006
80,010	80,006	0,004	0,005	0,000	-0,007
90,026	89,907	0,119	0,132	0,000	-0,008
100,036	99,778	0,258	0,257	0,000	-0,009
89,956	89,825	0,131	0,145	0,000	-0,006
80,013	79,995	0,018	0,022	0,000	-0,005
70,027	70,104	-0,077	-0,110	0,000	-0,003
60,014	60,169	-0,155	-0,258	0,000	-0,002
49,949	50,165	-0,216	-0,432	0,000	-0,002
40,052	40,292	-0,240	-0,599	0,000	-0,001
30,060	30,289	-0,229	-0,761	0,000	0,000
20,108	20,285	-0,177	-0,880	0,000	0,000
10,046	10,137	-0,091	-0,905	0,000	0,000
0,000	0,000	0,000	0,000	0,000	0,000



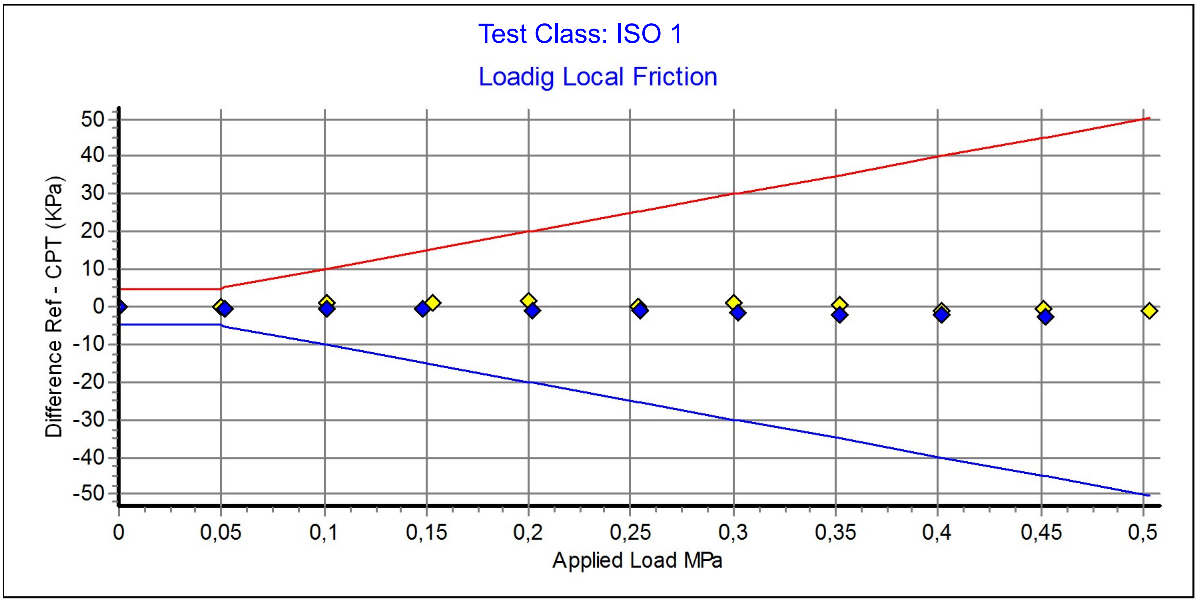
GEOTECH Specialists in Geotechnical Field Equipment

Ingenjörsfirman Geotech AB +46 (0)31-28 99 20 www.geotech.se
Datavägen 53 +46 (0)31-68 16 39 VAT No.
SE-436 32 ASKIM, Sweden SE556098559901

Calibration Certificate. **Loading Local Friction** Göteborg:2017-10-23

Probe No: **4648**
Date of Calibration: **2017-10-23**
Calibration Run No: **544**
Calibrated by: **Christoffer Hurtig**
Scaling Factor: 4035
Reference Cell: 76360

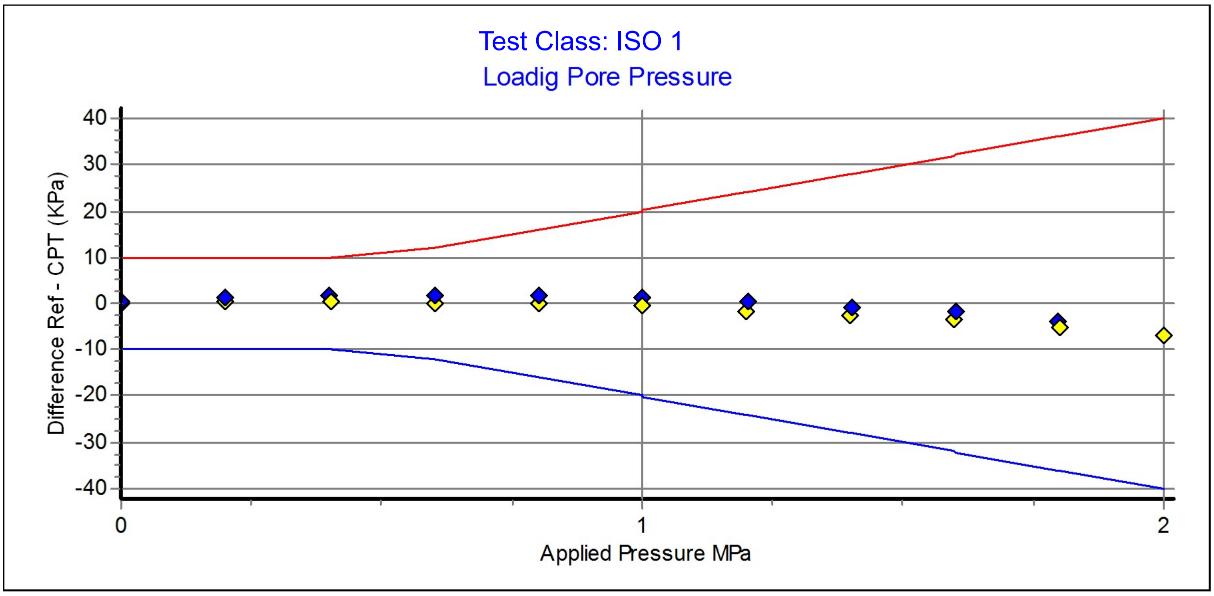
Ref MPa	Friction MPa	Difference KPa	Accuracy %/MV	PointRes. MPa	PorePress MPa
0,000	0,000	0,000	0,000	0,000	0,000
0,050	0,050	0,009	0,000	0,012	0,000
0,101	0,100	0,974	0,000	0,013	0,000
0,153	0,152	1,319	0,000	0,015	0,000
0,200	0,199	1,619	0,000	0,016	0,000
0,253	0,253	0,169	0,067	0,017	0,000
0,300	0,299	1,025	0,342	0,019	0,000
0,352	0,351	0,578	0,164	0,019	0,000
0,402	0,403	-1,016	-0,252	0,019	0,000
0,451	0,451	-0,433	-0,095	0,019	0,000
0,503	0,504	-0,923	-0,183	0,020	0,000
0,452	0,455	-2,608	-0,572	0,018	0,000
0,402	0,404	-2,309	-0,571	0,018	0,000
0,352	0,354	-2,087	-0,589	0,016	0,000
0,302	0,304	-1,659	-0,544	0,017	0,000
0,254	0,255	-0,843	-0,330	0,015	0,000
0,202	0,203	-0,928	-0,455	0,014	0,000
0,148	0,149	-0,698	0,000	0,014	0,000
0,101	0,101	-0,370	0,000	0,014	0,000
0,052	0,053	-0,461	0,000	0,011	0,000
0,000	0,000	-0,164	0,000	0,009	0,000



Calibration Certificate. **Loading Pore Pressure** Göteborg:2017-10-23

Probe No: **4648**
Date of Calibration: **2017-10-23**
Calibration Run No: **544**
Calibrated by: **Christoffer Hurtig**
Scaling Factor: 3474
Reference Cell: 44410026

Appl. Press MPa	**PorePress MPa**	**Difference KPa**	**Accuracy %/MV**	**PointRes. MPa**	**Friction MPa**	**Area Factor A = PR/PP**	**Area Factor B = LF/PP**
0,000	0,000	0,100	0,000	0,000	0,000		
0,199	0,199	0,277	0,000	0,163	0,000	0,819	0,000
0,403	0,402	0,301	0,074	0,337	0,000	0,838	0,000
0,600	0,600	0,100	0,016	0,510	0,000	0,850	0,000
0,802	0,802	-0,215	-0,026	0,685	0,000	0,854	0,000
1,002	1,002	-0,323	-0,032	0,860	0,000	0,858	0,000
1,199	1,200	-1,600	-0,133	1,034	0,000	0,861	0,000
1,401	1,404	-2,427	-0,172	1,211	0,000	0,862	0,000
1,600	1,604	-3,646	-0,227	1,385	0,000	0,863	0,000
1,800	1,805	-5,345	-0,296	1,562	0,000	0,865	0,000
2,001	2,008	-7,002	-0,348	1,740	0,000	0,866	0,000
1,798	1,802	-4,017	-0,222	1,562	0,000	0,866	0,000
1,603	1,605	-1,870	-0,116	1,393	0,000	0,867	0,000
1,402	1,403	-0,993	-0,070	1,216	0,000	0,866	0,000
1,202	1,202	0,400	0,033	1,044	0,000	0,868	0,000
0,999	0,998	1,195	0,119	0,867	0,000	0,868	0,000
0,802	0,800	1,916	0,239	0,695	0,000	0,868	0,000
0,601	0,599	1,801	0,300	0,519	0,000	0,866	0,000
0,397	0,396	1,686	0,425	0,341	0,000	0,861	0,000
0,200	0,199	1,156	0,000	0,170	0,000	0,854	0,000
0,000	0,000	0,354	0,000	0,000	0,000		

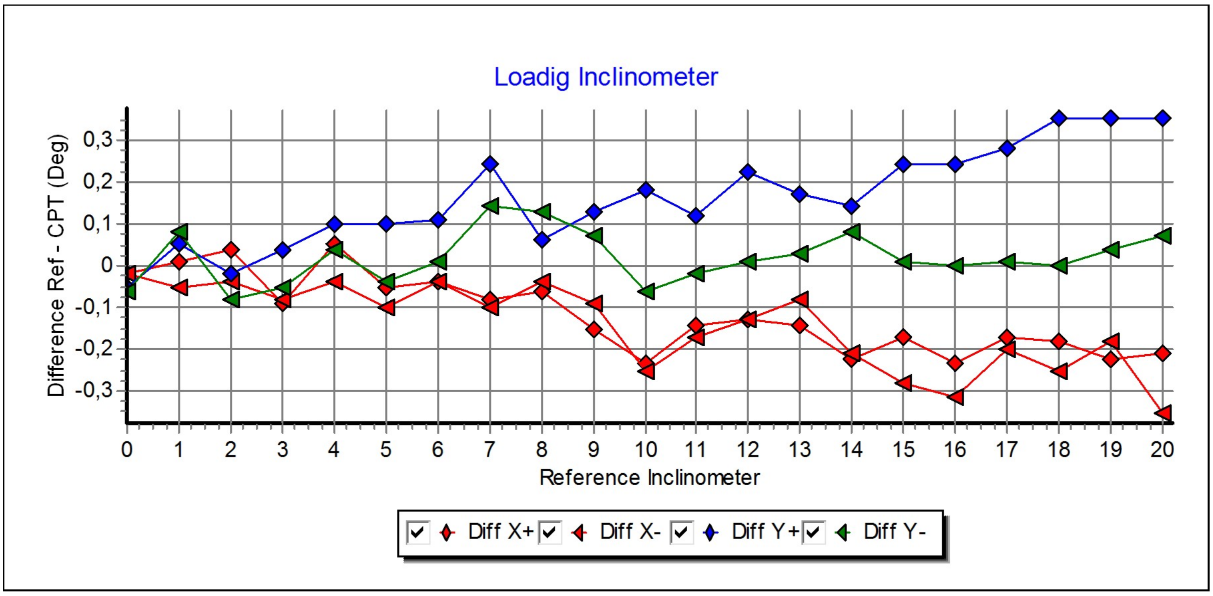


Ingenjörsfirman Geotech AB +46 (0)31-28 99 20 www.geotech.se
Datavägen 53 +46 (0)31-68 16 39 VAT No.

Calibration Certificate. **Loading Inclinometer** Göteborg:2017-10-23

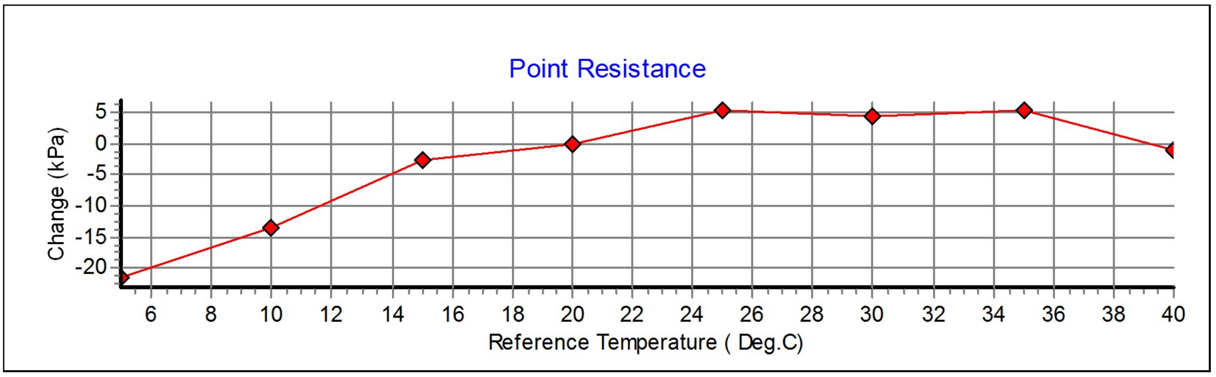
Probe No: **4648**
Date of Calibration: **2017-10-23**
Calibration Run No: **544**
Calibrated by: **Christoffer Hurtig**
Scaling Factor: 0,93

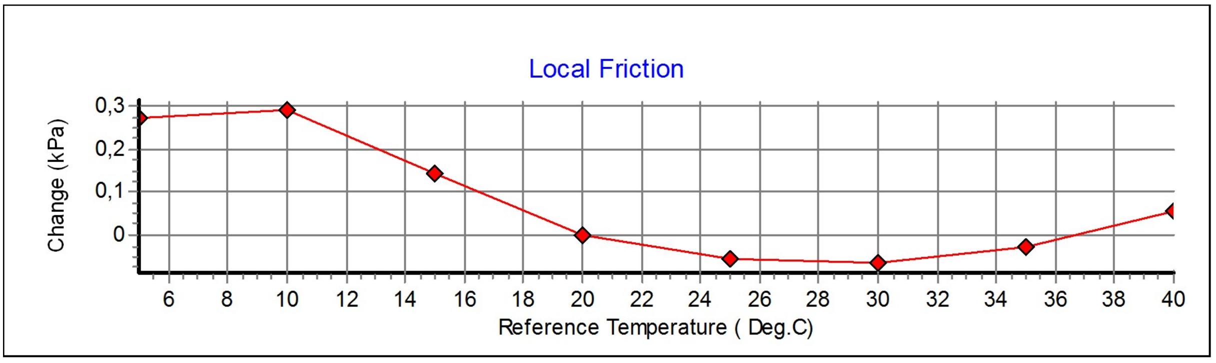
Appl. Incin. Deg	X+ Deg	X- Deg	Y+ Deg	Y- Deg	Diff X+ Deg	Diff X- Deg	Diff Y+ Deg	Diff Y- Deg
0,00	0,02	0,02	0,05	0,06	-0,02	-0,02	-0,05	-0,06
1,00	0,99	1,05	0,95	0,92	0,01	-0,05	0,05	0,08
2,00	1,96	2,04	2,02	2,08	0,04	-0,04	-0,02	-0,08
3,00	3,09	3,08	2,96	3,05	-0,09	-0,08	0,04	-0,05
4,00	3,95	4,04	3,90	3,96	0,05	-0,04	0,10	0,04
5,00	5,05	5,10	4,90	5,04	-0,05	-0,10	0,10	-0,04
6,00	6,04	6,04	5,89	5,99	-0,04	-0,04	0,11	0,01
7,00	7,08	7,10	6,76	6,86	-0,08	-0,10	0,24	0,14
8,00	8,06	8,04	7,94	7,87	-0,06	-0,04	0,06	0,13
9,00	9,15	9,09	8,87	8,93	-0,15	-0,09	0,13	0,07
10,00	10,23	10,25	9,82	10,06	-0,23	-0,25	0,18	-0,06
11,00	11,14	11,17	10,88	11,02	-0,14	-0,17	0,12	-0,02
12,00	12,13	12,13	11,78	11,99	-0,13	-0,13	0,22	0,01
13,00	13,14	13,08	12,83	12,97	-0,14	-0,08	0,17	0,03
14,00	14,22	14,21	13,86	13,92	-0,22	-0,21	0,14	0,08
15,00	15,17	15,28	14,76	14,99	-0,17	-0,28	0,24	0,01
16,00	16,23	16,31	15,76	16,00	-0,23	-0,31	0,24	0,00
17,00	17,17	17,20	16,72	16,99	-0,17	-0,20	0,28	0,01
18,00	18,18	18,25	17,65	18,00	-0,18	-0,25	0,35	0,00
19,00	19,22	19,18	18,65	18,96	-0,22	-0,18	0,35	0,04
20,00	20,21	20,35	19,65	19,93	-0,21	-0,35	0,35	0,07

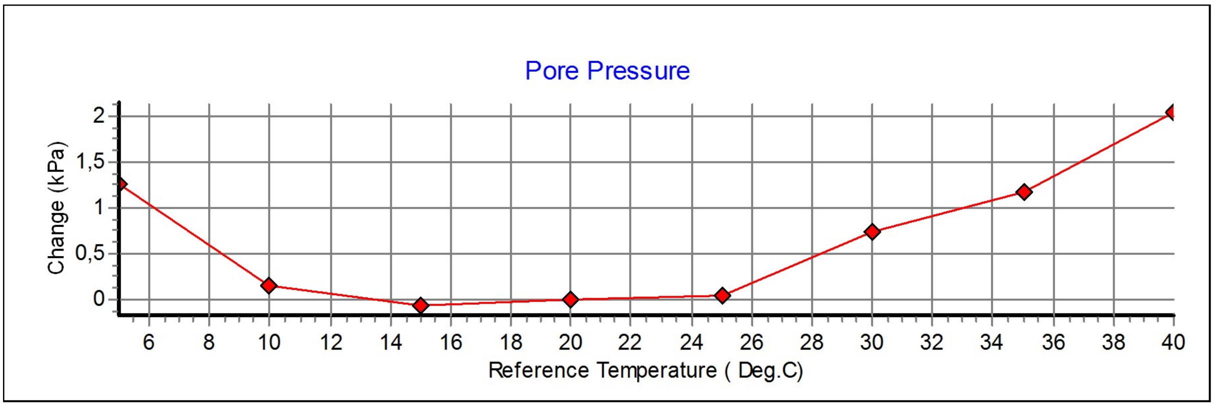


Calibration of temperature effect when not loaded. Göteborg:2017-10-23

Probe No: **4648**
Date of Calibration: **2017-10-23**
Calibration Run No: **544**
Calibrated by: **Christoffer Hurtig**







Calibration procedure. Göteborg: 2017-10-23

We are following the procedure that is described in the European Standard **EN ISO22476-1:**

Point resistance.

The point resistance is calibrated from 0 to maximum range in 10 steps up and down.
Then we adjust the calibration factor to fit the best linearity.

Local friction.

A special adapter unit substitutes the cone and transfers the axial forces to the lower end of the friction sleeve. The friction is calibrated from 0 to maximum range in 10 steps up and down then the sleeve is turned 90 degrees and the calibration repeated.
Then we adjust the calibration factor to fit the best linearity.

Pore pressure & Area ratio a and b.

The completed probe is installed in a special chamber and the pore pressure sensor are calibrated from 0 to maximum range in 10 step up and down.
Then we adjust the calibration factor to fit the best linearity.
At half range the pressure of the point and friction is registered and used for calculation of the area factor.

Tilt inclination.

The tilt sensor is calibrated +/- 20deg. from vertical line in steps of 1 deg.
This will be done in 2 orthogonal directions.

Temperature.

The temperature sensor are calibrated in steps of 5**°C** from 5 to 40 **°C**.

Temperature compensation.

The Point, Friction and the Pore pressure sensors in the probe is temperature compensated and tested in the range 5 to 40 **°C.**

Calibration reference equipment.

Reference	Load cell	HBM C2/100kN FB088 no.N75672
Reference	Load cell	HBM C2/20kN FB088 no.N76360
Reference	Pressure sensor	HBM P3MB 1MPa no.160410072
Reference	Pressure sensor	HBM P3MB 2MPa no.44410026
Reference	Pressure sensor	HBM P3MB 50MPa no.140510158

The reference sensors are connected to the Geotech black box together with the CPT probe. The measuring data from the reference sensors are simultaneously send to the computer and stored in the Geotech calibration software. The completed systems are recalibrated at RISE Research Institutes of Sweden once a year.

Environment.
Air pressure: 1018,3 hPa.
Temperature: 20,0 °C.

Cptlog Cone data base information

Göteborg: 2017-10-23

Cone name		Serial number		Date of purchase
4648		4648		User.

Ranges		Geometric parameters		Scaling factors
Point resistance: 100	(Mpa)	Area factor a: 0,861		Point resistance: 849
Local friction: 0,5	(Mpa)	Area factor b: 0		Local friction: 4035
Pore pressure: 2	(Mpa)	Tip area: 10	(cm^2)	Pore pressure: 3474
Tilt sensor: 40	(Deg)	Sleeve area: 150	(cm^2)	Tilt sensor: 0,93
temperature:	©			temperature: 1
Elect. Conductivity:	(mS/m)			Elect. Conductivity A:
				Elect. Conductivity B:

Type

NOVA cone

Memory option

With memory

CALIBRATION CERTIFICATE FOR CPT PROBE 4936

Probe No	4936
Date of Calibration	2017-11-15
Calibrated by	Joakim Tingström………………………………
Run No	465
Test Class:	ISO 0

Point Resistance **Tip Area 10cm²**

Maximum Load	25	MPa
Range	25	MPa
Scaling Factor	**3310**	
Resolution	0,2305	kPa
Area factor (a)	0,828	

<u>ERRORS</u>

Max. Temperature effect when not loaded 20,732 kPa

Temperature range 5 –40 deg. Celsius.

Local Friction **Sleeve Area 150cm²**

Maximum Load	0,5	MPa
Range	0,5	MPa
Scaling Factor	**3799**	
Resolution	0,01	kPa
Area factor (b)	0,001	

<u>ERRORS</u>

Max. Temperature effect when not loaded 0,371 kPa

Temperature range 5 –40 deg. Celsius.

Pore Pressure

Maximum Load	2	MPa
Range	2	MPa
Scaling Factor	**3493**	
Resolution	0,0218	kPa

<u>ERRORS</u>

Max. Temperature effect when not loaded 0,742 kPa

Temperature range 5 –40 deg. Celsius.

Tilt Angle. **Scaling Factor: 0,92**

Range	0 - 40	Deg.

Backup memory

GEOTECH Specialists in Geotechnical Field Equipment

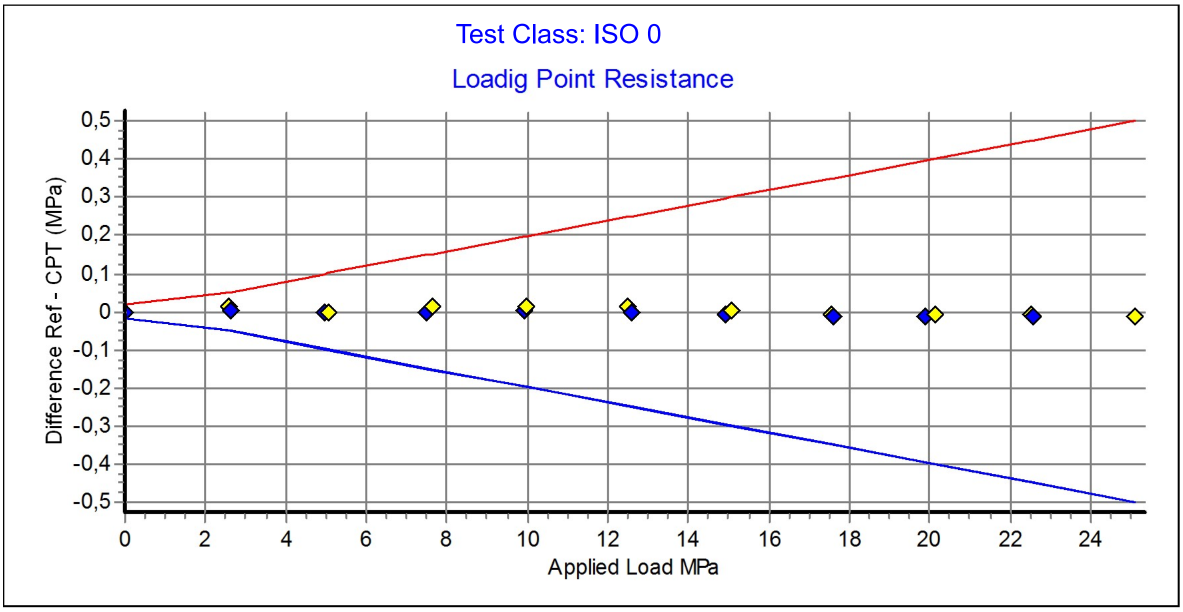
Ingenjörsfirman Geotech AB +46 (0)31-28 99 20 www.geotech.se

Datavägen 53 +46 (0)31-68 16 39 VAT No.

Calibration Certificate. **Loading Point Resistance** Göteborg:2017-11-15

Probe No: **4936**
Date of Calibration: **2017-11-15**
Calibration Run No: **465**
Calibrated by: **Joakim Tingström**
Scaling Factor: 3310
Reference Cell: 58604

Applied Load MPa	PointRes. MPa	Difference MPa	Accuracy %/MV	Friction MPa	PorePress MPa
0,000	0,000	0,000	0,000	0,000	0,000
2,581	2,570	0,011	0,426	0,000	0,000
5,056	5,056	0,000	0,000	0,000	0,000
7,614	7,603	0,011	0,144	0,001	0,000
9,991	9,976	0,015	0,150	0,001	0,000
12,521	12,505	0,016	0,127	0,001	0,000
15,070	15,068	0,002	0,013	0,001	0,000
17,554	17,559	-0,005	-0,028	0,002	0,000
20,130	20,139	-0,009	-0,044	0,002	-0,001
22,510	22,518	-0,008	-0,035	0,002	-0,001
25,092	25,105	-0,013	-0,051	0,002	-0,001
22,574	22,585	-0,011	-0,048	0,002	-0,001
19,892	19,904	-0,012	-0,060	0,001	0,000
17,581	17,592	-0,011	-0,062	0,001	0,000
14,911	14,916	-0,005	-0,033	0,001	0,000
12,582	12,583	-0,001	-0,007	0,000	0,000
9,921	9,917	0,004	0,040	0,000	0,000
7,467	7,468	-0,001	-0,013	0,000	0,000
4,947	4,947	0,000	0,000	0,000	0,000
2,609	2,605	0,004	0,153	0,000	0,000
0,000	0,000	0,000	0,000	0,000	0,000

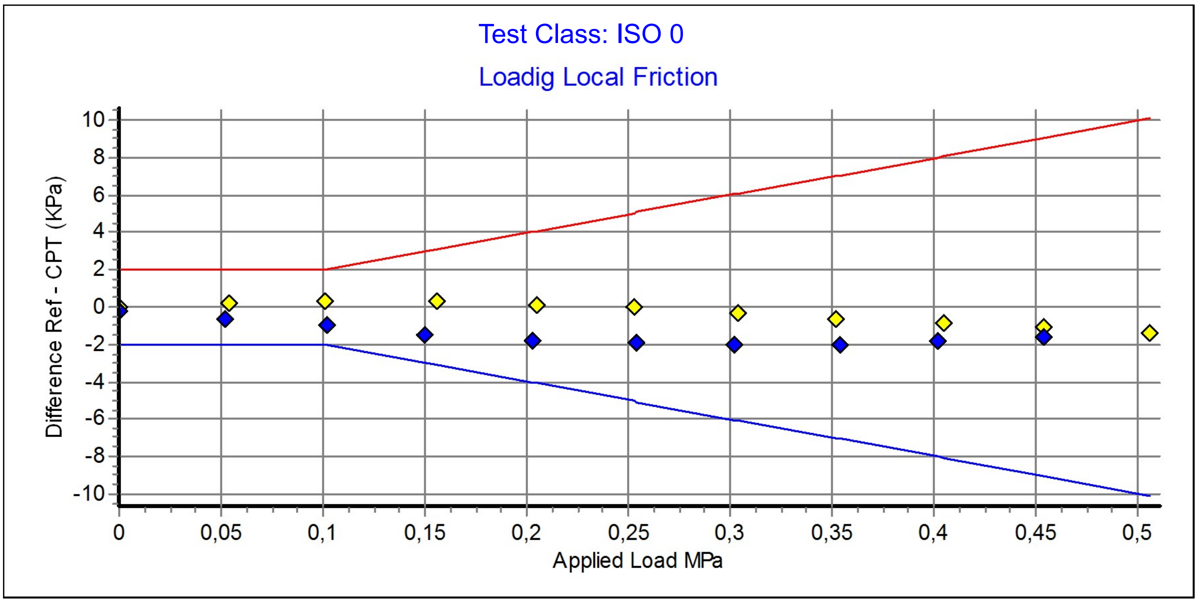


Ingenjörsfirman Geotech AB +46 (0)31-28 99 20 www.geotech.se
Datavägen 53 +46 (0)31-68 16 39 VAT No.
SE-436 32 ASKIM, Sweden SE556098559901

Calibration Certificate. **Loading Local Friction** Göteborg:2017-11-15

Probe No: **4936**
Date of Calibration: **2017-11-15**
Calibration Run No: **465**
Calibrated by: **Joakim Tingström**
Scaling Factor: 3799
Reference Cell: 50598

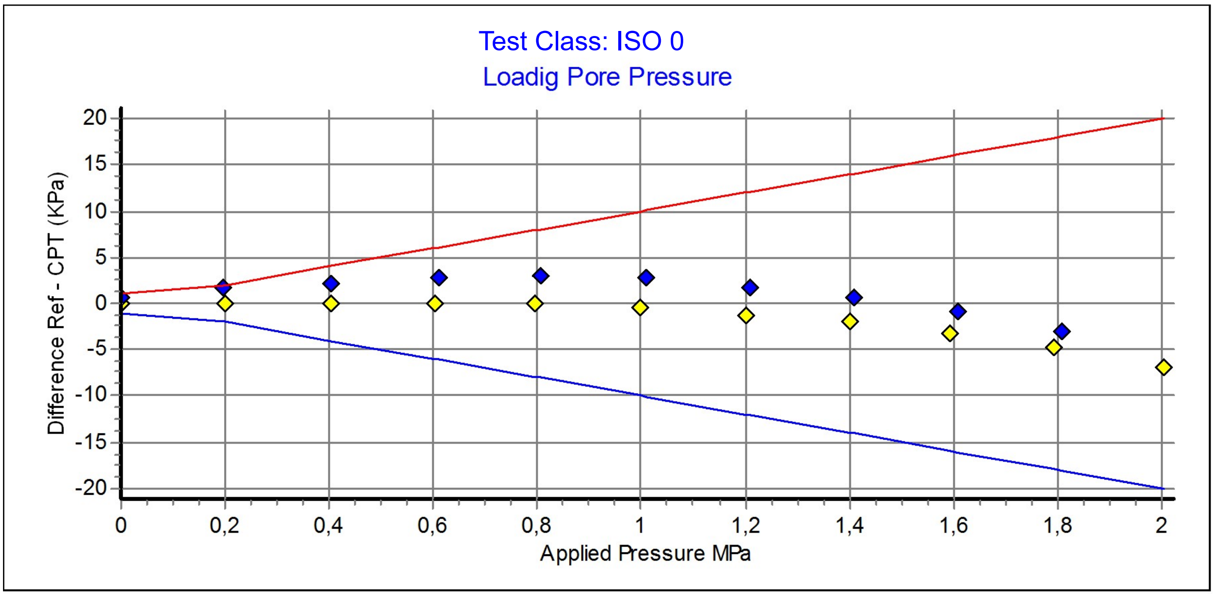
Ref MPa	Friction MPa	Difference KPa	Accuracy %/MV	PointRes. MPa	PorePress MPa
0,000	0,000	0,000	0,000	0,000	0,000
0,054	0,053	0,207	0,000	0,001	0,000
0,101	0,101	0,337	0,000	0,002	0,000
0,156	0,155	0,322	0,000	0,003	0,000
0,205	0,205	0,063	0,031	0,004	0,000
0,253	0,253	0,051	0,020	0,004	0,000
0,304	0,304	-0,341	-0,112	0,005	0,000
0,352	0,353	-0,666	-0,188	0,005	0,000
0,405	0,406	-0,823	-0,202	0,006	0,000
0,454	0,455	-1,054	-0,231	0,006	0,000
0,506	0,508	-1,361	-0,268	0,007	0,000
0,454	0,455	-1,617	-0,355	0,006	0,000
0,402	0,403	-1,850	-0,458	0,006	0,000
0,354	0,356	-1,998	-0,560	0,005	0,000
0,302	0,304	-1,975	-0,648	0,004	0,000
0,254	0,256	-1,942	-0,756	0,003	0,000
0,203	0,205	-1,810	-0,882	0,003	0,000
0,150	0,152	-1,490	0,000	0,003	0,000
0,102	0,103	-0,989	0,000	0,003	0,000
0,052	0,053	-0,687	0,000	0,003	0,000
0,000	0,000	-0,160	0,000	0,000	0,000



Calibration Certificate. **Loading Pore Pressure** Göteborg:2017-11-15

Probe No: **4936**
Date of Calibration: **2017-11-15**
Calibration Run No: **465**
Calibrated by: **Joakim Tingström**
Scaling Factor: 3493
Reference Cell: 44410026

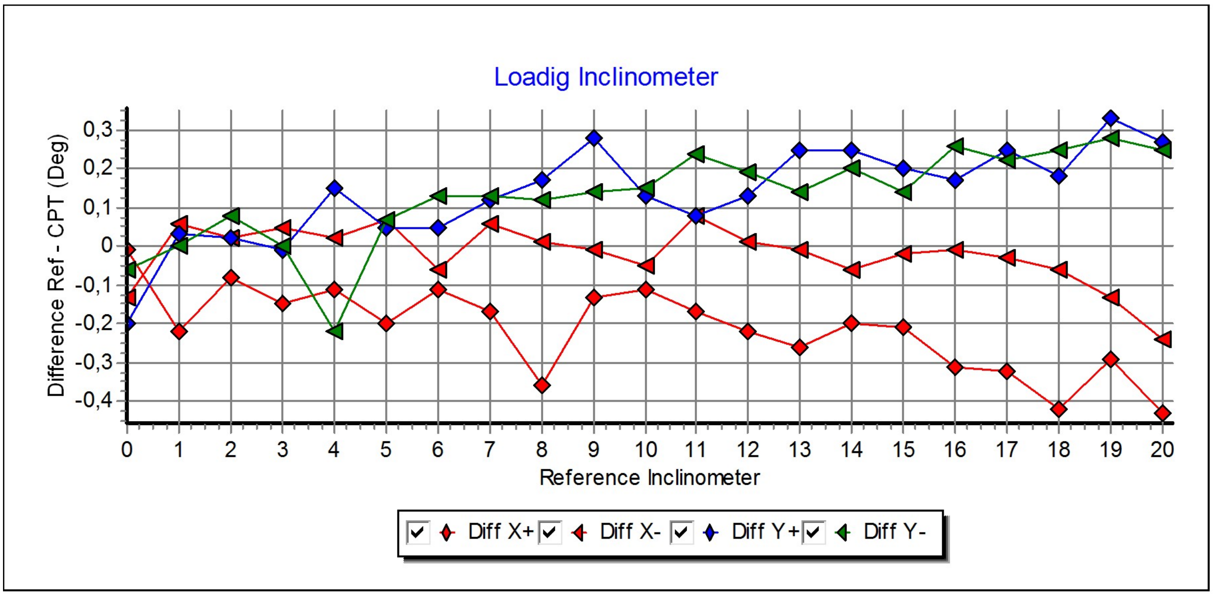
Appl. Press MPa	PorePress MPa	Difference KPa	Accuracy %/MV	PointRes. MPa	Friction MPa	Area Factor A = PR/PP	Area Factor B = LF/PP
0,000	0,000	0,100	0,000	0,000	0,000	0,000	
0,200	0,200	0,100	0,008	0,160	0,000	0,800	0,000
0,403	0,403	0,100	0,003	0,315	0,001	0,781	0,002
0,602	0,602	0,100	0,003	0,480	0,002	0,797	0,003
0,796	0,796	0,100	-0,003	0,648	0,002	0,814	0,002
1,000	1,001	-0,471	-0,047	0,823	0,002	0,822	0,002
1,203	1,204	-1,204	-0,100	0,997	0,002	0,828	0,001
1,402	1,403	-1,892	-0,134	1,168	0,002	0,832	0,001
1,593	1,596	-3,311	-0,207	1,333	0,002	0,835	0,001
1,793	1,798	-4,831	-0,268	1,506	0,002	0,837	0,001
2,004	2,011	-6,850	-0,340	1,688	0,002	0,839	0,001
1,810	1,813	-3,012	-0,166	1,522	0,002	0,839	0,001
1,608	1,609	-0,857	-0,053	1,350	0,001	0,839	0,000
1,409	1,408	0,560	0,039	1,182	0,001	0,839	0,000
1,209	1,207	1,812	0,150	1,015	0,001	0,840	0,000
1,008	1,006	2,830	0,281	0,845	0,001	0,840	0,001
0,807	0,804	2,919	0,362	0,676	0,000	0,840	0,000
0,612	0,609	2,890	0,474	0,513	0,000	0,842	0,000
0,405	0,403	2,258	0,560	0,341	0,000	0,846	0,000
0,196	0,194	1,830	0,000	0,165	0,000	0,850	0,000
0,001	0,000	0,618	0,000	0,002	0,000	0,000	



Calibration Certificate. **Loading Inclinometer** Göteborg:2017-11-15

Probe No: **4936**
Date of Calibration: **2017-11-15**
Calibration Run No: **465**
Calibrated by: **Joakim Tingström**
Scaling Factor: 0,92

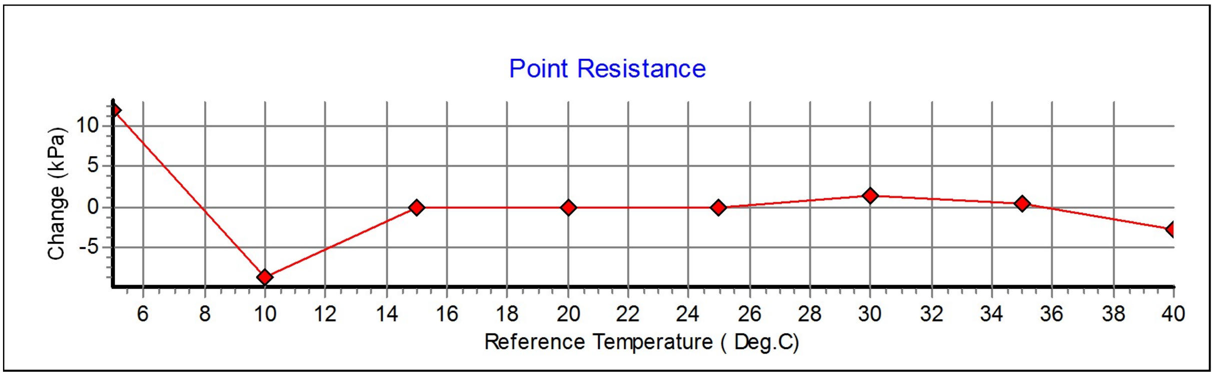
Appl. Incin. Deg	**X+ Deg**	**X- Deg**	**Y+ Deg**	**Y- Deg**	**Diff X+ Deg**	**Diff X- Deg**	**Diff Y+ Deg**	**Diff Y- Deg**
0,00	0,01	0,13	0,20	0,06	-0,01	-0,13	-0,20	-0,06
1,00	1,22	0,94	0,97	1,00	-0,22	0,06	0,03	0,00
2,00	2,08	1,98	1,98	1,92	-0,08	0,02	0,02	0,08
3,00	3,15	2,95	3,01	3,00	-0,15	0,05	-0,01	0,00
4,00	4,11	3,98	3,85	4,22	-0,11	0,02	0,15	-0,22
5,00	5,20	4,93	4,95	4,93	-0,20	0,07	0,05	0,07
6,00	6,11	6,06	5,95	5,87	-0,11	-0,06	0,05	0,13
7,00	7,17	6,94	6,88	6,87	-0,17	0,06	0,12	0,13
8,00	8,36	7,99	7,83	7,88	-0,36	0,01	0,17	0,12
9,00	9,13	9,01	8,72	8,86	-0,13	-0,01	0,28	0,14
10,00	10,11	10,05	9,87	9,85	-0,11	-0,05	0,13	0,15
11,00	11,17	10,92	10,92	10,76	-0,17	0,08	0,08	0,24
12,00	12,22	11,99	11,87	11,81	-0,22	0,01	0,13	0,19
13,00	13,26	13,01	12,75	12,86	-0,26	-0,01	0,25	0,14
14,00	14,20	14,06	13,75	13,80	-0,20	-0,06	0,25	0,20
15,00	15,21	15,02	14,80	14,86	-0,21	-0,02	0,20	0,14
16,00	16,31	16,01	15,83	15,74	-0,31	-0,01	0,17	0,26
17,00	17,32	17,03	16,75	16,78	-0,32	-0,03	0,25	0,22
18,00	18,42	18,06	17,82	17,75	-0,42	-0,06	0,18	0,25
19,00	19,29	19,13	18,67	18,72	-0,29	-0,13	0,33	0,28
20,00	20,43	20,24	19,73	19,75	-0,43	-0,24	0,27	0,25

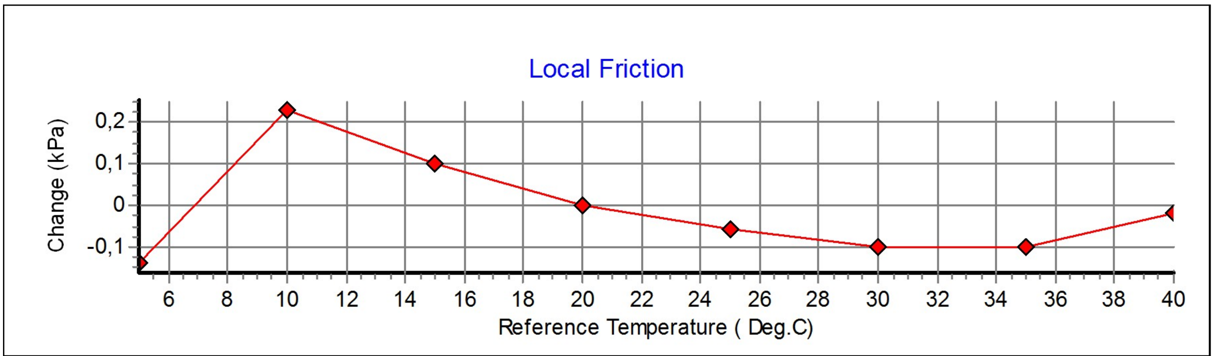


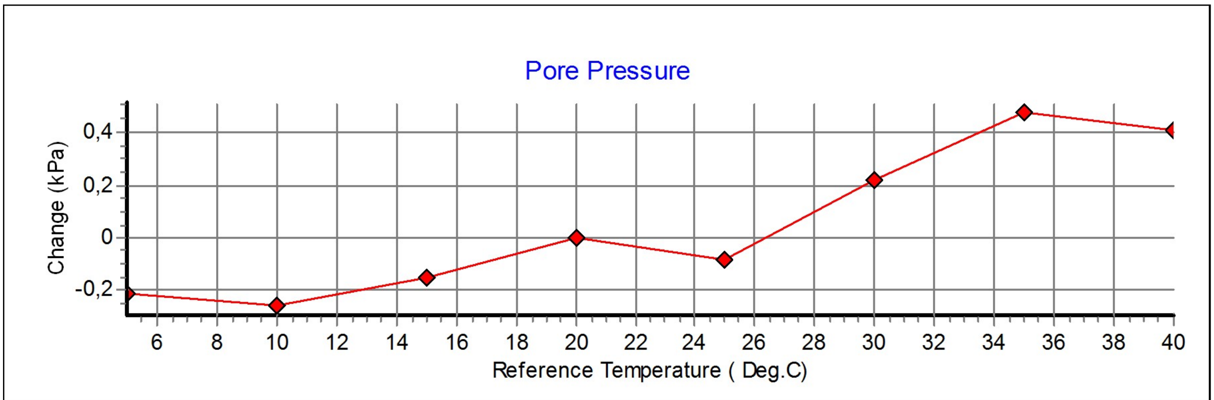
Calibration of temperature effect when not loaded.

Göteborg:2017-11-15

Probe No: **4936**
Date of Calibration: **2017-11-15**
Calibration Run No: **465**
Calibrated by: **Joakim Tingström**







Calibration procedure.

Göteborg: 2017-11-15

We are following the procedure that is described in the European Standard **EN ISO22476-1:**

Point resistance.

The point resistance is calibrated from 0 to maximum range in 10 steps up and down.
Then we adjust the calibration factor to fit the best linearity.

Local friction.

A special adapter unit substitutes the cone and transfers the axial forces to the lower end of the friction sleeve. The friction is calibrated from 0 to maximum range in 10 steps up and down then the sleeve is turned 90 degrees and the calibration repeated.
Then we adjust the calibration factor to fit the best linearity.

Pore pressure & Area ratio a and b.

The completed probe is installed in a special chamber and the pore pressure sensor are calibrated from 0 to maximum range in 10 step up and down.
Then we adjust the calibration factor to fit the best linearity.
At half range the pressure of the point and friction is registered and used for calculation of the area factor.

Tilt inclination.

The tilt sensor is calibrated +/- 20deg. from vertical line in steps of 1 deg.
This will be done in 2 orthogonal directions.

Temperature.

The temperature sensor is calibrated in steps of 5**°C** from 5 to 40 **°C**.

Temperature compensation.

The Point, Friction and the Pore pressure sensors in the probe is temperature compensated and tested in the range 5 to 40 **°C.**

Calibration reference equipment.

Reference	Load cell	HBM C2/100kN FB088 no.N58604
Reference	Load cell	HBM C2/20kN FB088 no.N50598
Reference	Pressure sensor	HBM P3MB 1MPa no.160410072
Reference	Pressure sensor	HBM P3MB 2MPa no.44410026
Reference	Pressure sensor	HBM P3MB 50MPa no.140510158

The reference sensors are connected to the Geotech black box together with the CPT probe. The measuring data from the reference sensors are simultaneously send to the computer and stored in the Geotech calibration software. The completed systems are recalibrated at RISE Research Institutes of Sweden once a year.

Environment.

Air pressure: 1018,2 hPa.

Temperature: 23,0 °C.

Cptlog Cone data base information

Göteborg: 2017-11-15

Cone name	Serial number	Date of purchase
4936	4936	User.

Ranges		Geometric parameters		Scaling factors
Point resistance		Area factor a		Point resistance
25	(Mpa)	0,828		3310
Local friction		Area factor b		Local friction
0,5	(Mpa)	0,001		3799
Pore pressure		Tip area		Pore pressure
2	(Mpa)	10	(cm^2)	3493
Tilt sensor		Sleeve area		Tilt sensor
40	(Deg)	150	(cm^2)	0,92
temperature				temperature
	©			1
Elect. Conductivity				Elect. Conductivity A
	(mS/m)			
				Elect. Conductivity B

Type

Nova cone

Memory option

With memory

Kalibreringscertifikat

Environmental Mechanics AB intygar att CPT sonden av typ Memocone, med det serienummer som anges nedan, har blivit kalibrerad i vårt laboratorie samt passerat vår kvalitetskontroll.

Serienummer:	20759	Visad last/crosstalk:	
Kalibreringsdatum:	07-mar-2016	Q när F lastas:	0.0 %FSO
Max tillåten belastning:	50 kN	F när Q lastas:	<0.3 %FSO
Area faktor:	a=0.69b=0.006	U när Q lastas (Q<=7MPa) :	<0.2 %FSO

☑ ISO 22476-1 användningsklass 1 godkännande

☑ ASTM D 5778 godkännande

☐ ISO 22476-1 användningsklass 0 godkännande

Envi

Envi
Environmental Mechanics AB
Kungegårdsgatan 7
S-441 57 Alingsås
SWEDEN

Kalibreringscertifikat

Environmental Mechanics AB intygar att CPT sonden av typ Memocone, med det serienummer som anges nedan, har blivit kalibrerad i vårt laboratorie samt passerat vår kvalitetskontroll.

Serienummer:	30451
Kalibreringsdatum:	17-jun-2015
Max tillåten belastning:	50 kN
Area faktor:	a=0.68b=0.006

Visad last/crosstalk:

Q när F lastas:	0.0 %FSO
F när Q lastas:	<0.3 %FSO
U när Q lastas (Q<=7MPa) :	<0.2 %FSO

☑ ISO 22476-1 användningsklass 1 godkännande

☑ ASTM D 5778 godkännande

☐ ISO 22476-1 användningsklass 0 godkännande

Envi

Envi
Environmental Mechanics AB
Kungegårdsgatan 7
S-441 57
SWEDEN

Kalibreringscertifikat

Environmental Mechanics AB intygar att CPT sonden av typ Memocone, med det serienummer som anges nedan, har blivit kalibrerad i vårt laboratorie samt passerat vår kvalitetskontroll.

Serienummer:	51706
Kalibreringsdatum:	13-jun-2017
Max tillåten belastning:	50 kN
Area faktor:	a=0.69b=0.005

Visad last/crosstalk:

Q när F lastas:	0.0 %FSO
F när Q lastas:	<0.3 %FSO
U när Q lastas (Q<=7MPa) :	<0.1 %FSO

☑ ISO 22476-1 användningsklass 1 godkännande

☑ ASTM D 5778 godkännande

☑ ISO 22476-1 användningsklass 0 godkännande

För klass 0 får maximal belastning på Q inte överstiga 10MPa (10kN)!

Envi

Calibration Certificate

a.p. van den berg
The CPT factory

1.1 General

Cone number:	150912
Cone type:	I-CFXYP20-10
Description:	Tip 75 MPa Sleeve 1.00 MPa Inclinometer 20° Pore 2MPa
Part number:	0100277B
Certificate number:	150912-2
Client:	Norwegian Public Roads Administration

1.2 Calibration equipment

	calibrated
Autolog 3000	
SN2090011	August 2016 (Peekel: EA 44251)
SN2090011	August 2016 (Peekel: EA 44251)
SN2090011	August 2016 (Peekel: EA 44251)
Reference Loadcell 100kN H54435	August 2016 (HBM: 56471 2016-08)
Reference Loadcell 20kN D16200	August 2016 (HBM: 56490 2016-08)
Reference Sensor 40 Bar 4318470	August 2015 (Trescal: 1607-12075)
Reference ACS-080-2-SC00-HE 08/11 470480	February 2015 (Trescal: 1502-10558)
Reference ACS-080-2-SC00-HE 08/11 470480	February 2015 (Trescal: 1502-10558)

1.3 Standard

EN ISO 22476-1 2012 Class 2

1.4 Result

The sensor complies to the above standard

Calibrated by:	J.W. van der Meer
Date:	03/10/2017
Signature:	

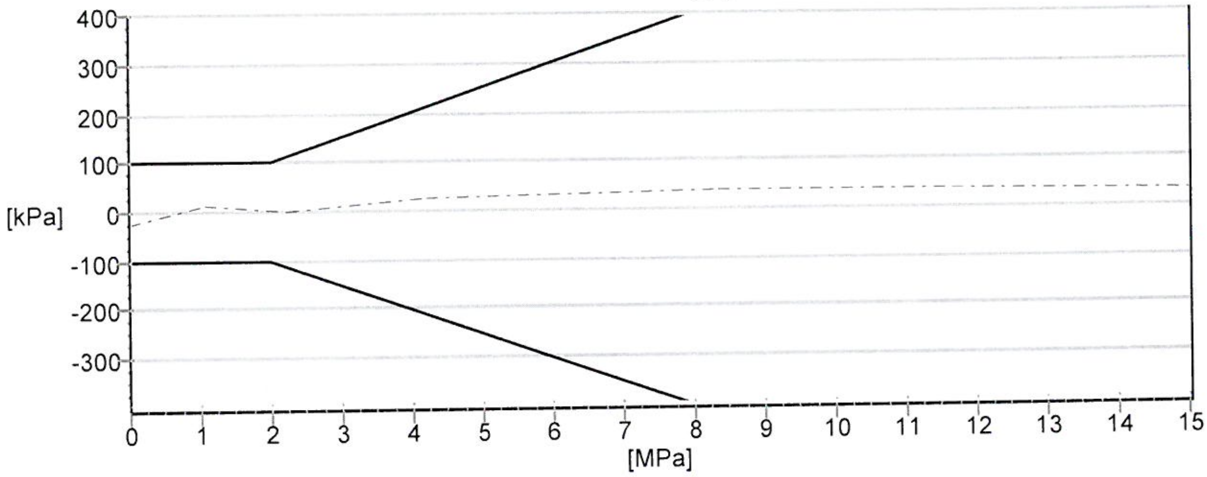
QA Manager:	L. Jaarsma
Date:	03/10/2017
Signature:	

A.P. van den Berg Ingenieursburo
IJzerweg 4, 8445 PK Heerenveen
P.O. Box 68, 8440 AB Heerenveen
The Netherlands
Tel: +31 (0)513 631355
Fax: +31 (0)513 631212

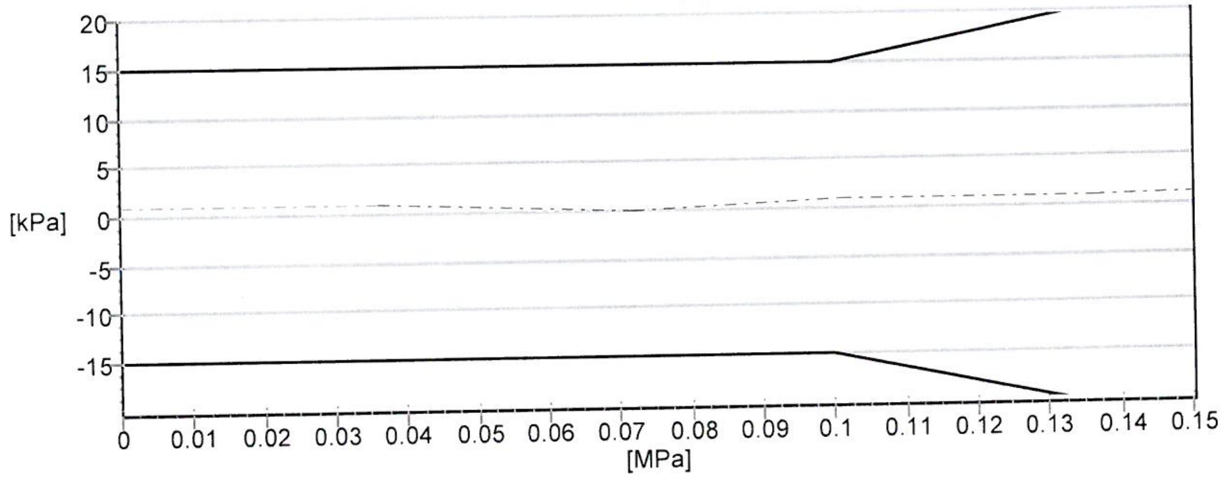
info@apvandenberg.com
www.apvandenberg.com

Chamber of commerce 01...
VAT: NL-00.66.92.907.B-01
IBAN: NL67.RABO.0.33.07.64.969
BIC: RABONL2U

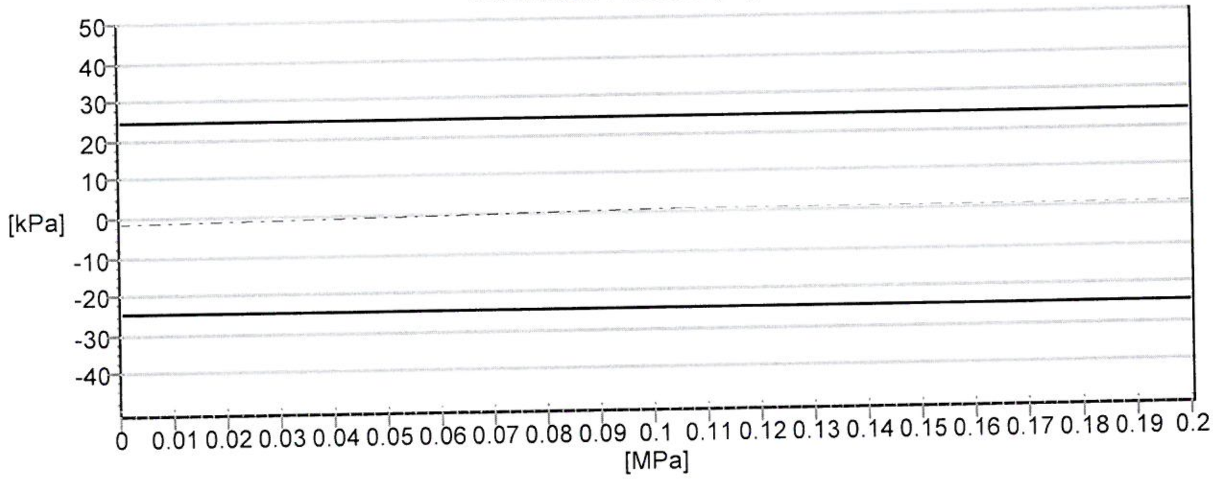
Cone Resistance (qc)



Local Friction (fs)



Pore Water Pressure (u2)



- - Deviation ——— EN ISO 22476-1 2012 Class 2

150912-2

A.P. van den Berg Ingenieursburo
IJzerweg 4, 8445 PK Heerenveen
P.O. Box 68, 8440 AB Heerenveen
The Netherlands
Tel: +31 (0)513 631355
Fax: +31 (0)513 631212

info@apvandenberg.com
www.apvandenberg.com

Chamber of commerce no. ...
VAT: NL-00.66.32.907.B-01
IBAN: NL67.RABO.0.33.07.64.969
BIC: RABONL2U

Zero Value				**Max. Deviation from Zero Value**		
Cone	-0,026	[MPa]		Cone	3.75	[MPa]
Sleeve	-0,0021	[MPa]		Sleeve	0.05	[MPa]
Pore(u2)	-6,5	[kPa]		Pore(u2)	100.0	[kPa]

Ref [MPa]	Cone [MPa]	Cone-Ref [kPa]
0.002	-0.021	-23
1.085	1.095	10
2.235	2.233	-2
4.194	4.222	28
8.355	8.391	36
11.640	11.677	37
20.938	20.961	23
29.866	29.875	9
40.431	40.416	-15
50.510	50.520	10
60.843	60.827	-16
75.566	75.584	18

Ref [MPa]	Sleeve [MPa]	Sleeve-Ref [kPa]
0.000	0.000	0
0.036	0.037	1
0.072	0.072	0
0.101	0.102	1
0.137	0.138	1
0.198	0.200	2
0.271	0.272	1
0.403	0.405	2
0.536	0.538	2
0.676	0.678	2
0.806	0.808	2
1.003	1.003	0

Ref [MPa]	Pore(u2) [MPa]	Pore(u2)-Ref [kPa]
-0.001	-0.003	-2
0.106	0.107	1
0.206	0.207	1
0.306	0.306	0
0.407	0.408	1
0.504	0.505	1
0.803	0.804	1
0.985	0.986	1
1.210	1.212	2
1.406	1.407	1
1.504	1.505	1
2.006	2.006	0

A.P. van den Berg Ingenieursburo
IJzerweg 4, 8445 PK Heerenveen
P.O. Box 68, 8440 AB Heerenveen
The Netherlands
Tel: +31 (0)513 631355
Fax: +31 (0)513 631212

info@apvandenberg.com
www.apvandenberg.com

Chamber of Commerce: 01049637
VAT: NL-00.66.32.907.B-01
IBAN: NL.67.RABO.0.33.07.64.969
BIC: RABONL2U

A:	**Cone Resistance**	
	Accuracy	100.0 kPa or 5.0%
	Nom.Cone Resistance	75 MPa
	Max.Cone Resistance	150 MPa
	Effective Area	10 cm²
B:	**Local Friction**	
	Accuracy	15.0 kPa or 15.0%
	Nom.Local Friction	1.00 MPa
	Max.Local Friction	1.50 MPa
	Effective Area	150 cm²
C:	**Pore Water Pressure**	
	Accuracy	25.0 kPa or 3.0%
	Nom.Pore Water Pressure	2 MPa
	Max.Pore Water Pressure	3 MPa
D:	**Inclination X**	
	Accuracy	1.0°
	Nom.Inclination X	20°
	Max.Inclination X	25°
E:	**Inclination Y**	
	Accuracy	1.0°
	Nom.Inclination Y	20°
	Max.Inclination Y	25°

A.P. van den Berg Ingenieursburo
IJzerweg 4, 8445 PK Heerenveen
P.O. Box 68, 8440 AB Heerenveen
The Netherlands
Tel: +31 (0)513 631355
Fax: +31 (0)513 631212

info@apvandenberg.com
www.apvandenberg.com

Chamber of commerce 01049657
VAT: NL-00.66.32.907.B-01
IBAN: NL67.RABO.0.33.07.64.969
BIC: RABONL2U

TEST CERTIFICATE
Icone (all versions)

Supplier:	A.P. v.d. Berg Machinefabriek, Heerenveen The Netherlands
Production-order:	76519
Client:	Norwegian Public Roads Administration
Cone-type:	I-CFXYP20-10
Cone-number:	150912

To test / To check item	Required value	Checked value
Check Quad-ring groove behind friction sleeve with check ring; **Sample testing: 1 of every 5 Icones is tested.**	Sleeve fixed	—
Isolation-resistance.	>0.5 GΩ	0,5 GΩ
Straightness: Icone 5, 10 and 15 cm^2 S < 2.2. mm. At Icone base: S < 0,2 mm	S<= 2,2 mm	0,55 mm
"Classic calibration" NOT present! Check of calibration-file: "Classic calibration" removed.	O.K.	—
Check alarm-settings Icone. Alarm values are set. (Kill Shutdown).	O.K.	OK
Software version - check at opening screen.	version:	2.0
Calibration date of Icone; check cone data [F1]..[F1].	Yes	OK
Initial zero-Value Tip after calibration – within 1.0 % of nominal load.	O.K.	[initials]
Initial zero-Value Local Friction after calibration – within 1.0% of nominal load.	O.K.	[initials]
Initial zero-Value Pore Pressure after calibration – within 1.0% of nominal load.	O.K.	[initials]
Initial zero-Value Inclination X. Initial zero-Value Inclination Y.	-1°< X <+1° -1° < Y <+1°	-0.1 ° 0.1 °
Measurements Tip resistance OK?	Tested range	0-75 MPA
Influence Tip load on **Local Friction and Pore Pressure:** Max. tip load: 5 cm^2: 100 MPa; 10 cm^2: 100 MPa; 15 cm^2: 75 MPa.	LF < 10 kPa PP <½% nom	9 KPA 0,3 KPA
Measurements local friction OK?	Tested range:	0-1 MPA
Local friction at max. load.	Tested value:	1,5 MPA
Measurements Pore Pressure OK?	Tested range:	0-2000 KPA
Measure Pore Pressure to 150%.	Tested value:	3000 KPA
Measurements Inclination OK?	Tested range:	24°-0°-24°
Cone recognition on disconnecting and connecting Icone again?	Yes	OK

Remarks:

Calibrated by: J.W. van der Meer	Date: 03/10/2017	Sign.: [signature]
Final check: C.J. Ouwejan	Date: 03/10/2017	Sign.: [signature]

R:\E&D\Beproevingsprotocollen\Beproevingsprotocol Icone English version 3.doc.docx
Work instructions: Beproevingsprotocol Icone English version 3.doc.docx

1.1 General

Cone number:	150928
Cone type:	I-C5F0p15XYP20-10
Description:	Tip 7.5 MPa Sleeve 0.15 MPa Inclinometer 20° Pore 2MPa
Part number:	0100269A
Certificate number:	150928-2
Client:	Norwegian Public Roads Administration

1.2 Calibration equipment

	calibrated
Autolog 3000	
SN2090011	August 2016 (Peekel: EA 44251)
SN2090011	August 2016 (Peekel: EA 44251)
SN2090011	August 2016 (Peekel: EA 44251)
Reference Loadcell 20kN D16200	August 2016 (HBM: 56490 2016-08)
Reference Loadcell 20kN D16200	August 2016 (HBM: 56490 2016-08)
Reference Sensor 40 Bar 4318470	August 2015 (Trescal: 1607-12075)
Reference ACS-080-2-SC00-HE 08/11 470480	February 2015 (Trescal: 1502-10558)
Reference ACS-080-2-SC00-HE 08/11 470480	February 2015 (Trescal: 1502-10558)

1.3 Standard
EN ISO 22476-1 2012 Class 2

1.4 Result
The sensor complies to the above standard

Calibrated by: J.W. van der Meer
Date: 29/09/2017
Signature:

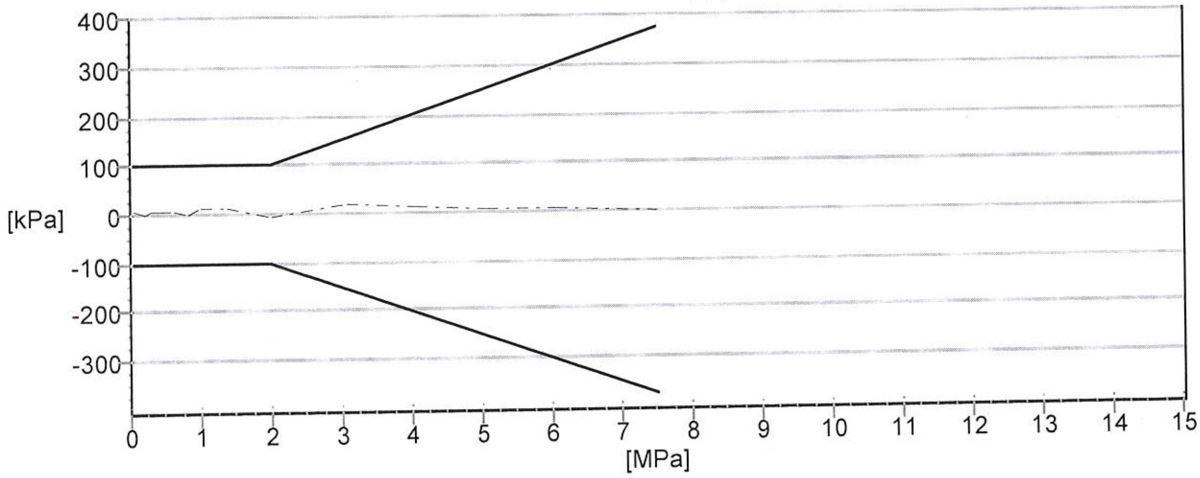
QA Manager: L. Jaarsma
Date: 29/09/2017
Signature:

A.P. van den Berg Ingenieursburo
IJzerweg 4, 8445 PK Heerenveen
P.O. Box 68, 8440 AB Heerenveen
The Netherlands
Tel: +31 (0)513 631355
Fax: +31 (0)513 631212

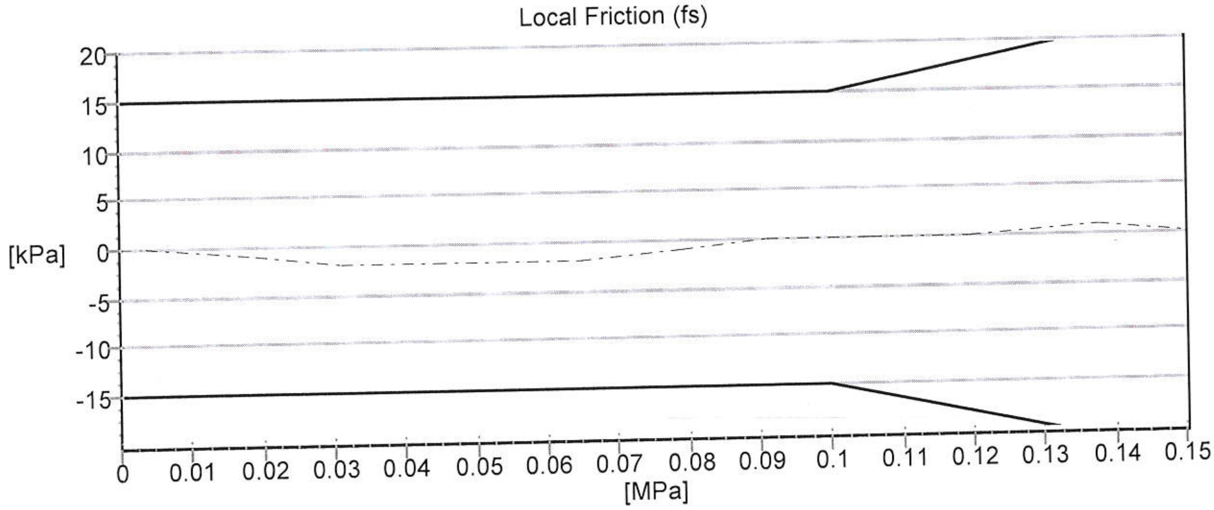
info@apvandenberg.com
www.apvandenberg.com

Chamber of commerce 01062967
VAT: NL-00.66.32.907.B-01
IBAN: NL.67.RABO.0.33.07.64.969
BIC: RABONL2U

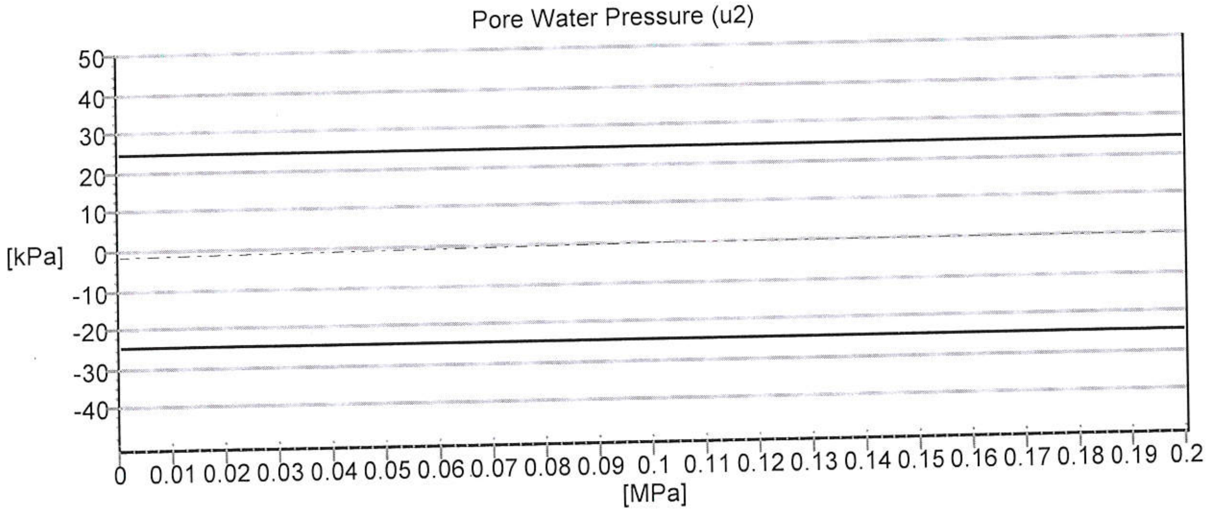
Cone Resistance (qc)



Local Friction (fs)



Pore Water Pressure (u2)



- - - Deviation —— EN ISO 22476-1 2012 Class 2

150928-2

A.P. van den Berg Ingenieursburo
IJzerweg 4, 8445 PK Heerenveen
P.O. Box 68, 8440 AB Heerenveen
The Netherlands
Tel: +31 (0)513 631355
Fax: +31 (0)513 631212

info@apvandenberg.com
www.apvandenberg.com

Zero Value			**Max. Deviation from Zero Value**		
Cone	0.004	[MPa]	Cone	0.375	[MPa]
Sleeve	0.0002	[MPa]	Sleeve	0.0075	[MPa]
Pore(u2)	-4.7	[kPa]	Pore(u2)	100.0	[kPa]

Ref [MPa]	Cone [MPa]	Cone-Ref [kPa]
0.003	0.010	7
0.068	0.076	8
0.196	0.194	-2
0.311	0.321	10
0.428	0.435	7
0.610	0.619	9
0.816	0.812	-4
1.005	1.017	12
1.381	1.393	12
1.989	1.979	-10
3.076	3.098	22
4.074	4.088	14
5.073	5.079	6
6.058	6.065	7
7.517	7.518	1

Ref [MPa]	Sleeve [MPa]	Sleeve-Ref [kPa]
0.000	0.001	1
0.004	0.004	0
0.019	0.018	-1
0.031	0.029	-2
0.044	0.042	-2
0.065	0.063	-2
0.079	0.078	-1
0.091	0.091	0
0.106	0.105	-1
0.120	0.120	0
0.138	0.138	0
0.152	0.152	0

Ref [MPa]	Pore(u2) [MPa]	Pore(u2)-Ref [kPa]
-0.002	-0.003	-1
0.102	0.103	1
0.204	0.204	0
0.306	0.307	1
0.401	0.402	1
0.608	0.610	2
0.795	0.797	2
1.014	1.017	3
1.205	1.207	2
1.406	1.409	3
1.609	1.611	2
2.010	2.011	1

A.P. van den Berg Ingenieursburo
IJzerweg 4, 8445 PK Heerenveen
P.O. Box 68, 8440 AB Heerenveen
The Netherlands
Tel: +31 (0)513 631355
Fax: +31 (0)513 631212

info@apvandenberg.com
www.apvandenberg.com

Chamber of commerce: 01049637
VAT: NL-00.66.32.907.B-01
IBAN: NL.67.RABO.0.33.07.64.969
BIC: RABONL2U

A:	**Cone Resistance**	
	Accuracy	100.0 kPa or 5.0%
	Nom.Cone Resistance	7.5 MPa
	Max.Cone Resistance	15 MPa
	Effective Area	10 cm²

B:	**Local Friction**	
	Accuracy	15.0 kPa or 15.0%
	Nom.Local Friction	0.15 MPa
	Max.Local Friction	0.30 MPa
	Effective Area	150 cm²

C:	**Pore Water Pressure**	
	Accuracy	25.0 kPa or 3.0%
	Nom.Pore Water Pressure	2 MPa
	Max.Pore Water Pressure	3 MPa

D:	**Inclination X**	
	Accuracy	1.0°
	Nom.Inclination X	20°
	Max.Inclination X	25°

E:	**Inclination Y**	
	Accuracy	1.0°
	Nom.Inclination Y	20°
	Max.Inclination Y	25°

A.P. van den Berg Ingenieursburo
IJzerweg 4, 8445 PK Heerenveen
P.O. Box 68, 8440 AB Heerenveen
The Netherlands
Tel: +31 (0)513 631355
Fax: +31 (0)513 631212

info@apvandenberg.com
www.apvandenberg.com

Chamber of comm[illegible]
VAT: NL-00.66.32.907.B-01
IBAN: NL.67.RABO.0.33.07.64.969
BIC: RABONL2U

calibration certificate

DC10CFIIP.C14251 / 001

World's first manufacturer of CPT equipment

Cone number	DC10CFIIP.C14251	Client	Geomil internal production
Kind of cone	Compression		Westbaan 240
Calibration date	15-Sep-2017		2841 MC Moordrecht
Print date	16-Oct-2017		Netherlands

Channel 1	Cone resistance (q_c)	Channel 2	Local sleeve friction (f_s)	Channel 3	Pore pressure (u)
	$q_c = Q_c / A_c$		$f_s = F_s / A_s$		
Range	0 ... 50 kN	Range	0 ... 7.5 kN	Range	0 ... 20 bar
A_c	1000 mm²	A_s	15000 mm²		
Zero load reading	8853370 digits	Zero load reading	7785932 digits	Zero load reading	8027061 digits
a-factor	0.776	b-factor	0		
		Offset	80.1 mm		

Q_c Load (kN)	Eqv. q_c (MPa)	Output (Digits)	F_s Load (kN)	Eqv. f_s (MPa)	Output (Digits)	Pressure (bar)	Eqv. u (MPa)	Output (Digits)
0	0	0	0.00	0.00	0	0	0.0	0
5	5	595167	0.75	0.05	600568	2	0.2	616554
10	10	1191402	1.50	0.10	1219848	4	0.4	1240129
15	15	1787468	2.25	0.15	1841715	6	0.6	1865821
20	20	2383357	3.00	0.20	2465420	8	0.8	2491270
25	25	2979066	3.75	0.25	3090215	10	1.0	3118604
30	30	3574586	4.50	0.30	3715353	12	1.2	3745781
35	35	4169912	5.25	0.35	4340085	14	1.4	4372309
40	40	4765039	6.00	0.40	4963662	16	1.6	5001311
45	45	5359959	6.75	0.45	5585337	18	1.8	5625466
50	50	5954667	7.50	0.50	6204362	20	2.0	6248061
45	45	5360416	6.75	0.45	5596740			
40	40	4766534	6.00	0.40	4980769			
35	35	4172373	5.25	0.35	4361440			
30	30	3577890	4.50	0.30	3739550			
25	25	2983042	3.75	0.25	3115899			
20	20	2387786	3.00	0.20	2491286			
15	15	1792079	2.25	0.15	1866509			
10	10	1195878	1.50	0.10	1242366			
5	5	599140	0.75	0.05	619657			
0	0	843	0.00	0.00	6592			

Zero load error	0.01 %	Zero load error	0.11 %	Zero load error	0.01 %
Max. linearity	0.10 %	Max. linearity	0.34 %	Max. linearity	0.15 %
Max. hysteresis	0.08 %	Max. hysteresis	0.42 %		

LLOYD'S REGISTER • LRQA
ISO 9001

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

calibration certificate

DC10CFIIP.C14251 / 001

Geomil equipment
World's first manufacturer of CPT equipment

Channel 4	Inclination X	Channel 5	Inclination Y	Channel 6	None
Range	-20 ... 20 °	Range	-20 ... 20 °		

Angle (°)	Output (Digits)	Angle (°)	Output (Digits)
-20	-4596	-20	-5526
-15	-3298	-15	-4228
-10	-2000	-10	-2930
-5	-702	-5	-1632
0	276	0	-744
5	1895	5	965
10	3193	10	2263
15	4491	15	3561
20	5789	20	4860

Calibration instrument(s)	Certificate number(s)	Date(s)
GSNCAL/822084350	2070856.06600.1	04-Sep-2017

Remark
We declare that the electrical cone with serial number DC10CFIIP.C14251 has been calibrated and that the specifications are according to the ISO 22476-1:2012 (Geotechnical investigation and testing – Field testing - Part 1: Electrical cone and piezocone penetration test).
The calibrations are traceable to national and international standards.

Date	15-Sep-2017	Date	15-Sep-2017
Calibrated by	Joost Neugebauer	Approved by	Jody Jansen
Signature		Signature	

LLOYD'S REGISTER · LRQA ISO 9001

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

calibration certificate

DC10CFIIP.C17010 / 001

Geomil equipment
World's first manufacturer of CPT equipment

Cone number	DC10CFIIP.C17010	Client	Geomil internal production
Kind of cone	Compression		Westbaan 240
Calibration date	15-Sep-2017		2841 MC Moordrecht
Print date	16-Oct-2017		Netherlands

Channel 1	Cone resistance (q_c) $q_c = Q_c / A_c$	Channel 2	Local sleeve friction (f_s) $f_s = F_s / A_s$	Channel 3	Pore pressure (u)
Range	0 ... 100 kN	Range	0 ... 15 kN	Range	0 ... 20 bar
A_c	1000 mm²	A_s	15000 mm²		
Zero load reading	7604956 digits	Zero load reading	8348955 digits	Zero load reading	8319072 digits
a-factor	0.771	b-factor	-0.007		
		Offset	80.1 mm		

Q_c Load (kN)	Eqv. q_c (MPa)	Output (Digits)	F_s Load (kN)	Eqv. f_s (MPa)	Output (Digits)	Pressure (bar)	Eqv. u (MPa)	Output (Digits)
0	0	0	0.0	0.0	0	0	0.0	0
10	10	695915	1.5	0.1	672623	2	0.2	578446
20	20	1393008	3.0	0.2	1345691	4	0.4	1163720
30	30	2089696	4.5	0.3	2018410	6	0.6	1750998
40	40	2785944	6.0	0.4	2690765	8	0.8	2336123
50	50	3481718	7.5	0.5	3362740	10	1.0	2921532
60	60	4176985	9.0	0.6	4034322	12	1.2	3507381
70	70	4871710	10.5	0.7	4705495	14	1.4	4092760
80	80	5565860	12.0	0.8	5376245	16	1.6	4678767
90	90	6259399	13.5	0.9	6046556	18	1.8	5261454
100	100	6952295	15.0	1.0	6716415	20	2.0	5843924
90	90	6254308	13.5	0.9	6045550			
80	80	5561602	12.0	0.8	5374875			
70	70	4868259	10.5	0.7	4704054			
60	60	4174313	9.0	0.6	4033027			
50	50	3479796	7.5	0.5	3361732			
40	40	2784741	6.0	0.4	2690110			
30	30	2089182	4.5	0.3	2018099			
20	20	1393150	3.0	0.2	1345638			
10	10	696680	1.5	0.1	672667			
0	0	-337	0.0	0.0	1645			

Zero load error	0.01 %	Zero load error	0.02 %	Zero load error	0.04 %
Max. linearity	0.08 %	Max. linearity	0.07 %	Max. linearity	0.10 %
Max. hysteresis	0.07 %	Max. hysteresis	0.02 %		

LLOYD'S REGISTER LRQA ISO 9001

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

calibration certificate

DC10CFIIP.C17010 / 001

Geomil equipment

World's first manufacturer of CPT equipment

Channel 4	Inclination X	Channel 5	Inclination Y	Channel 6	None
Range	-20 ... 20 °	Range	-20 ... 20 °		

Angle (°)	Output (Digits)	Angle (°)	Output (Digits)
-20	-4263	-20	-4175
-15	-2965	-15	-2877
-10	-1667	-10	-1579
-5	-368	-5	-281
0	651	0	749
5	2228	5	2316
10	3526	10	3614
15	4825	15	4912
20	6123	20	6211

Calibration instrument(s)	Certificate number(s)	Date(s)
GSNCAL/822084350	2070856.06600.1	04-Sep-2017

Remark

We declare that the electrical cone with serial number DC10CFIIP.C17010 has been calibrated and that the specifications are according to the ISO 22476-1:2012 (Geotechnical investigation and testing – Field testing - Part 1: Electrical cone and piezocone penetration test). The calibrations are traceable to national and international standards.

Date	15-Sep-2017	Date	15-Sep-2017
Calibrated by	Joost Neugebauer	Approved by	Kevin Janssens
Signature		Signature	

LLOYD'S REGISTER · LRQA
ISO 9001

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

DC10 / DS10 Series

Specifications electrical (piezo)cone

Characteristics

Cone type
- Compression / Subtraction (*)

Parameters (CFII or CFIIP)
- Cone resistance
- Sleeve friction
- Pore pressure (optional)
- Inclination (XY)

Dimensions

Cross sectional area of cone (A_c)	:	1 000	mm²
Surface area of friction sleeve (A_s)	:	15 000	mm²
Total length	:	279	mm

Range & accuracy

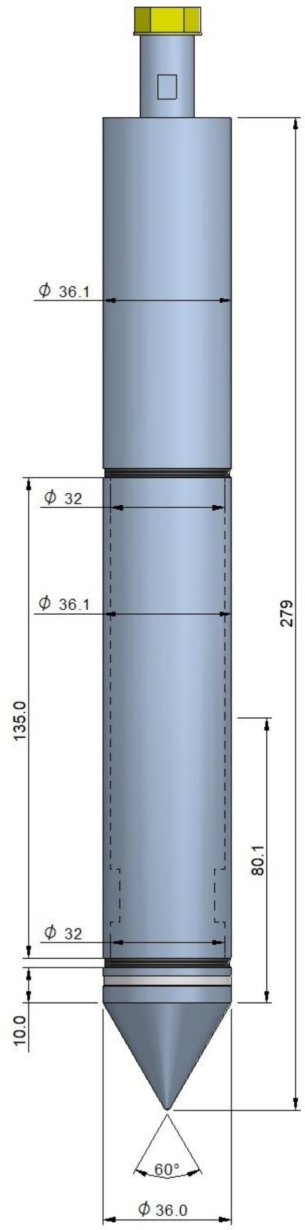
Cone resistance load cell			
Range	:	50 / 100*	MPa
Overload capacity	:	150	%
Net area ratio (a)	:	0.8	
Sleeve friction load cell			
Range	:	0.5 / 1.0*	MPa
Overload capacity	:	130	%
Cross sectional area bottom (A_{sb})	:	219	mm²
Cross sectional area top (A_{st})	:	219	mm²
Net area ratio (b)	:	0	
Offset of sleeve centre	:	80.1	mm
Pore pressure transducer			
Range	:	2.0	MPa
Burst pressure	:	150	%
Inclinometers			
Type	:	Dual accelerometer	
Range	:	- 20 ... + 20	°

Temperature range

Operating temperature	:	- 10 ... + 40	°C
Storage temperature	:	- 40 ... + 60	°C

Notes

Down-hole signal conditioning and temperature compensation
Other load ranges available on request
Filter located in tip (u_1) or shoulder (u_2)
Wear resistant outer parts



a = A_n / A_c
A_n = cross sectional area of load cell
A_c = cross sectional area of cone

b = (A_{sb} − A_{st}) / A_s
A_{sb} = cross sectional area of friction sleeve bottom
A_{st} = cross sectional area of friction sleeve top
A_s = surface area of friction sleeve

calibration certificate

DC15CFIIP.C17190 / 001

World's first manufacturer of CPT equipment

Cone number	DC15CFIIP.C17190	Client	Geomil internal production
Kind of cone	Compression		Westbaan 240
Calibration date	15-Sep-2017		2841 MC Moordrecht
Print date	16-Oct-2017		Netherlands

Channel 1	Cone resistance (q_c)	Channel 2	Local sleeve friction (f_s)	Channel 3	Pore pressure (u)
	$q_c = Q_c / A_c$		$f_s = F_s / A_s$		
Range	0 ... 150 kN	Range	0 ... 22.5 kN	Range	0 ... 20 bar
A_c	1500 mm²	A_s	22500 mm²		
Zero load reading	7856941 digits	Zero load reading	8439505 digits	Zero load reading	8446662 digits
a-factor	0.783	b-factor	-0.001		
		Offset	97.6 mm		

Q_c Load (kN)	Eqv. q_c (MPa)	Output (Digits)	F_s Load (kN)	Eqv. f_s (MPa)	Output (Digits)	Pressure (bar)	Eqv. u (MPa)	Output (Digits)
0	0	0	0.00	0.0	0	0	0.0	0
15	10	758923	2.25	0.1	684216	2	0.2	622138
30	20	1522560	4.50	0.2	1371789	4	0.4	1249510
45	30	2284766	6.75	0.3	2058214	6	0.6	1879556
60	40	3045579	9.00	0.4	2743463	8	0.8	2508221
75	50	3805039	11.25	0.5	3427502	10	1.0	3136594
90	60	4563185	13.50	0.6	4110302	12	1.2	3764657
105	70	5320057	18.00	0.8	5472057	14	1.4	4391379
120	80	6075695	20.25	0.9	6150951	16	1.6	5019904
135	90	6830137	22.50	1.0	6828480	18	1.8	5643446
150	100	7583424	20.25	0.9	6154962	20	2.0	6272129
135	90	6826468	18.00	0.8	5477802			
120	80	6072456	13.50	0.6	4119074			
105	70	5317698	11.25	0.5	3437238			
90	60	4561975	9.00	0.4	2753573			
75	50	3805073	6.75	0.3	2067946			
60	40	3046773	4.50	0.2	1380223			
45	30	2286860	2.25	0.1	690269			
30	20	1525117	0.00	0.0	558			
15	10	761327						
0	0	-4481						

Zero load error	0.06 %	Zero load error	0.01 %	Zero load error	0.02 %
Max. linearity	0.18 %	Max. linearity	0.34 %	Max. linearity	0.08 %
Max. hysteresis	0.05 %	Max. hysteresis	0.15 %		

LLOYD'S REGISTER • LRQA
ISO 9001

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

calibration certificate

DC15CFIIP.C17190 / 001

Geomil equipment

World's first manufacturer of CPT equipment

Channel 4	Inclination X	Channel 5	Inclination Y	Channel 6	None
Range	-20 ... 20 °	Range	-20 ... 20 °		

Angle (°)	Output (Digits)	Angle (°)	Output (Digits)
-20	-4667	-20	-4702
-15	-3368	-15	-3404
-10	-2070	-10	-2105
-5	-772	-5	-807
0	195	0	157
5	1825	5	1789
10	3123	10	3088
15	4421	15	4386
20	5719	20	5684

Calibration instrument(s)	Certificate number(s)	Date(s)
GSNCAL/822084350	2070856.06600.1	04-Sep-2017

Remark

We declare that the electrical cone with serial number DC15CFIIP.C17190 has been calibrated and that the specifications are according to the ISO 22476-1:2012 (Geotechnical investigation and testing – Field testing - Part 1: Electrical cone and piezocone penetration test).
The calibrations are traceable to national and international standards.

Date	15-Sep-2017	Date	15-Sep-2017
Calibrated by	Joost Neugebauer	Approved by	Jody Jansen
Signature		Signature	

ISO 9001

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

certificate_cal_001_v1

DC15 / DS15 Series

Specifications electrical (piezo)cone

Characteristics

Cone type
- Compression / Subtraction (*)

Parameters (CFII or CFIIP)
- Cone resistance
- Sleeve friction
- Pore pressure (optional)
- Inclination (XY)

Dimensions

Cross sectional area of cone (A_c)	:	1 500	mm²
Surface area of friction sleeve (A_s)	:	22 500	mm²
Total length	:	319	mm

Range & accuracy

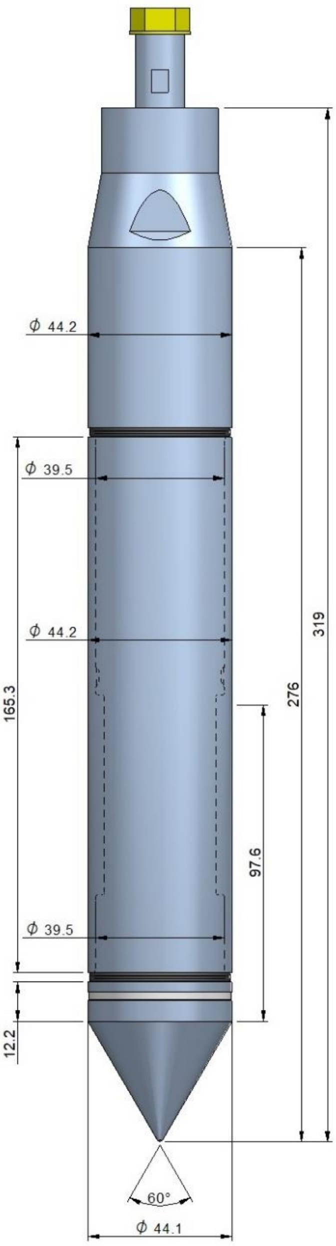
Cone resistance load cell			
Range	:	100	MPa
Overload capacity	:	150	%
Net area ratio (a)	:	0.8	
Sleeve friction load cell			
Design range	:	1.0	MPa
Overload capacity	:	130	%
Cross sectional area bottom (A_{sb})	:	309	mm²
Cross sectional area top (A_{st})	:	309	mm²
Net area ratio (b)	:	0	
Offset of sleeve centre	:	97.6	mm
Pore pressure transducer			
Range	:	2.0	MPa
Burst pressure	:	150	%
Inclinometers			
Type	:	Dual accelerometer	
Range	:	- 20 … + 20	°

Temperature range

Operating temperature	:	- 10 … + 40	°C
Storage temperature	:	- 40 … + 60	°C

Notes

Down-hole signal conditioning and temperature compensation
Other load ranges available on request
Filter located in tip (u_1) or shoulder (u_2)
Wear resistant outer parts
Cylindrical end piece available on request



a = A_n / A_c
A_n = cross sectional area of load cell
A_c = cross sectional area of cone

b = (A_{sb} – A_{st}) / A_s
A_{sb} = cross sectional area of friction sleeve bottom
A_{st} = cross sectional area of friction sleeve top
A_s = surface area of friction sleeve

Westbaan 240 - 2841 MC Moordrecht - The Netherlands
P.O. Box 450 - 2800 AL Gouda - The Netherlands
T. +31 (0) 172 427 800 - F. +31 (0) 172 427 801
info@geomil.com - www.geomil.com

Bank Rabobank - Account no. 1350.49.229
IBAN NL78 RABO 0135 0492 29 - BIC RABONL2U
VAT no. NL812396212B01
Chamber of Commerce no. 2435053

calibration certificate

DS10CFIIP.S17176 / 001

Geomil equipment

World's first manufacturer of CPT equipment

Cone number	DS10CFIIP.S17176	Client	Geomil internal production
Kind of cone	Subtraction		Westbaan 240
Calibration date	15-Sep-2017		2841 MC Moordrecht
Print date	16-Oct-2017		Netherlands

Channel 1	Cone resistance (q_c)	Channel 2	Local sleeve friction (f_s)	Channel 3	Pore pressure (u)
	$q_c = Q_c / A_c$		$f_s = F_s / A_s$		
Range	0 ... 100 kN	Range	0 ... 100 kN	Range	0 ... 20 bar
A_c	1000 mm²	A_s	15000 mm²		
Zero load reading	7623146 digits	Zero load reading	7554737 digits	Zero load reading	8212984 digits
a-factor	0.76	b-factor	0.002		
		Offset	80.1 mm		

Q_c Load (kN)	Eqv. q_c (MPa)	Output (Digits)	F_s Load (kN)	Eqv. f_s (MPa)	Output (Digits)	Pressure (bar)	Eqv. u (MPa)	Output (Digits)
0	0	0	0	0.000	0	0	0.0	0
10	10	692677	10	0.667	710792	2	0.2	715133
20	20	1387394	20	1.333	1423525	4	0.4	1438947
30	30	2081296	30	2.000	2135310	6	0.6	2170393
40	40	2774358	40	2.667	2846138	8	0.8	2888594
50	50	3466554	50	3.333	3555998	10	1.0	3635534
60	60	4157859	60	4.000	4264878	12	1.2	4339022
70	70	4848245	70	4.667	4972769	14	1.4	5062640
80	80	5537689	80	5.333	5679659	16	1.6	5785605
90	90	6226163	90	6.000	6385538	18	1.8	6508129
100	100	6913643	100	6.667	7090395	20	2.0	7227065
90	90	6224832	90	6.000	6382755			
80	80	5536128	80	5.333	5676938			
70	70	4846764	70	4.667	4970502			
60	60	4156689	60	4.000	4263322			
50	50	3465852	50	3.333	3555272			
40	40	2774201	40	2.667	2846227			
30	30	2081686	30	2.000	2136061			
20	20	1388255	20	1.333	1424648			
10	10	693857	10	0.667	711864			
0	0	-925	0	0.000	-1304			

Zero load error	0.01 %	Zero load error	0.02 %	Zero load error	0.01 %
Max. linearity	0.14 %	Max. linearity	0.15 %	Max. linearity	0.30 %
Max. hysteresis	0.02 %	Max. hysteresis	0.04 %		

LLOYD'S REGISTER • LRQA

ISO 9001

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

calibration certificate

DS10CFIIP.S17176 / 001

Geomil equipment

World's first manufacturer of CPT equipment

Channel 4	Inclination X	Channel 5	Inclination Y	Channel 6	None
Range	-20 ... 20 °	Range	-20 ... 20 °		
Angle (°)	Output (Digits)	Angle (°)	Output (Digits)		
-20	-4982	-20	-5000		
-15	-3684	-15	-3702		
-10	-2386	-10	-2404		
-5	-1088	-5	-1105		
0	-136	0	-157		
5	1509	5	1491		
10	2807	10	2789		
15	4105	15	4088		
20	5404	20	5386		

Calibration instrument(s)	Certificate number(s)	Date(s)
GSNCAL/822084350	2070856.06600.1	04-Sep-2017

Remark

We declare that the electrical cone with serial number DS10CFIIP.S17176 has been calibrated and that the specifications are according to the ISO 22476-1:2012 (Geotechnical investigation and testing – Field testing - Part 1: Electrical cone and piezocone penetration test). The calibrations are traceable to national and international standards.

Date	15-Sep-2017	Date	15-Sep-2017
Calibrated by	Joost Neugebauer	Approved by	Jody Jansen
Signature		Signature	

LLOYD'S REGISTER • LRQA
ISO 9001

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

World's first manufacturer of CPT equipment

calibration certificate

DS15CFIIP.S16299 / 001

Cone number	DS15CFIIP.S16299	Client	Geomil internal production
Kind of cone	Subtraction		Westbaan 240
Calibration date	15-Sep-2017		2841 MC Moordrecht
Print date	16-Oct-2017		Netherlands

Channel 1	Cone resistance (q_c)	Channel 2	Local sleeve friction (f_s)	Channel 3	Pore pressure (u)
	$q_c = Q_c / A_c$		$f_s = F_s / A_s$		
Range	0 ... 150 kN	Range	0 ... 150 kN	Range	0 ... 20 bar
A_c	1500 mm²	A_s	22500 mm²		
Zero load reading	8366299 digits	Zero load reading	8048019 digits	Zero load reading	8468774 digits
a-factor	0.7996	b-factor	-0.0004		
		Offset	97.6 mm		

Q_c Load (kN)	Eqv. q_c (MPa)	Output (Digits)	F_s Load (kN)	Eqv. f_s (MPa)	Output (Digits)	Pressure (bar)	Eqv. u (MPa)	Output (Digits)
0	0	0	0	0.000	0	0	0.0	0
15	10	764094	15	0.667	767668	2	0.2	621899
30	20	1528727	30	1.333	1535338	4	0.4	1250626
45	30	2292661	45	2.000	2302184	6	0.6	1880278
60	40	3055891	60	2.667	3068217	8	0.8	2509658
75	50	3818414	75	3.333	3833453	10	1.0	3138596
90	60	4580224	90	4.000	4597905	12	1.2	3769480
105	70	5341317	105	4.667	5361587	14	1.4	4397140
120	80	6101688	120	5.333	6124515	16	1.6	5025810
135	90	6861331	135	6.000	6886700	18	1.8	5651888
150	100	7620244	150	6.667	7648159	20	2.0	6280928
135	90	6862218	135	6.000	6886718			
120	80	6103156	120	5.333	6124191			
105	70	5343339	105	4.667	5361266			
90	60	4582718	90	4.000	4597815			
75	50	3821247	75	3.333	3833709			
60	40	3058877	60	2.667	3068822			
45	30	2295562	45	2.000	2303026			
30	20	1531252	30	1.333	1536194			
15	10	765901	15	0.667	768197			
0	0	729	0	0.000	739			

Zero load error	0.01 %	Zero load error	0.01 %	Zero load error	0.00 %
Max. linearity	0.15 %	Max. linearity	0.13 %	Max. linearity	0.10 %
Max. hysteresis	0.04 %	Max. hysteresis	0.01 %		

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

calibration certificate

DS15CFIIP.S16299 / 001

Channel 4	Inclination X	Channel 5	Inclination Y	Channel 6	None
Range	-20 ... 20 °	Range	-20 ... 20 °		
Angle (°)	Output (Digits)	Angle (°)	Output (Digits)		
-20	-4912	-20	-5439		
-15	-3614	-15	-4140		
-10	-2316	-10	-2842		
-5	-1018	-5	-1544		
0	-72	0	-646		
5	1579	5	1053		
10	2877	10	2351		
15	4175	15	3649		
20	5474	20	4947		

Calibration instrument(s)	Certificate number(s)	Date(s)
GSNCAL/822084350	2070856.06600.1	04-Sep-2017

Remark
We declare that the electrical cone with serial number DS15CFIIP.S16299 has been calibrated and that the specifications are according to the ISO 22476-1:2012 (Geotechnical investigation and testing – Field testing - Part 1: Electrical cone and piezocone penetration test).
The calibrations are traceable to national and international standards.

Date	15-Sep-2017	Date	15-Sep-2017
Calibrated by	Joost Neugebauer	Approved by	Jody Jansen
Signature		Signature	

LLOYD'S REGISTER · LRQA
ISO 9001

Westbaan 240 | 2841 MC Moordrecht | The Netherlands | P.O. Box 450 | 2800 AL Gouda | The Netherlands
t: +31(0) 172 427 800 | f: +31(0) 172 427 801 | info@geomil.com | www.geomil.com

PAGANI® GEOTECHNICAL EQUIPMENT

Loc. Campogrande , n° 26
29010 CALENDASCO (PC)
ITALY

www.pagani-geotechnical.com
info@pagani-geotechnical.com
Tel: +39 0523 771535 - Fax: +39 0523 773449

CONE CALIBRATION CERTIFICATE

N° Z044/17

Calibrated system *(Sistema tarato)* **:**

Serial number	**Mkj485**
Sensor	**TIP RESISTANCE**
Max. Capacity [MPa]:	**50**
Scaling Factor:	**192280**
Tip net area ratio (a_n):	**0,78**
Sleeve net ratio (b_n):	**0,00**

Addressee *(destinatario)* **:**

Pagani Geotecnical Equipment s.r.l.
loc. Campogrande n° 26
29010 Calendasco (Piacenza) ITALY

Applied load measurement system:
(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	33870

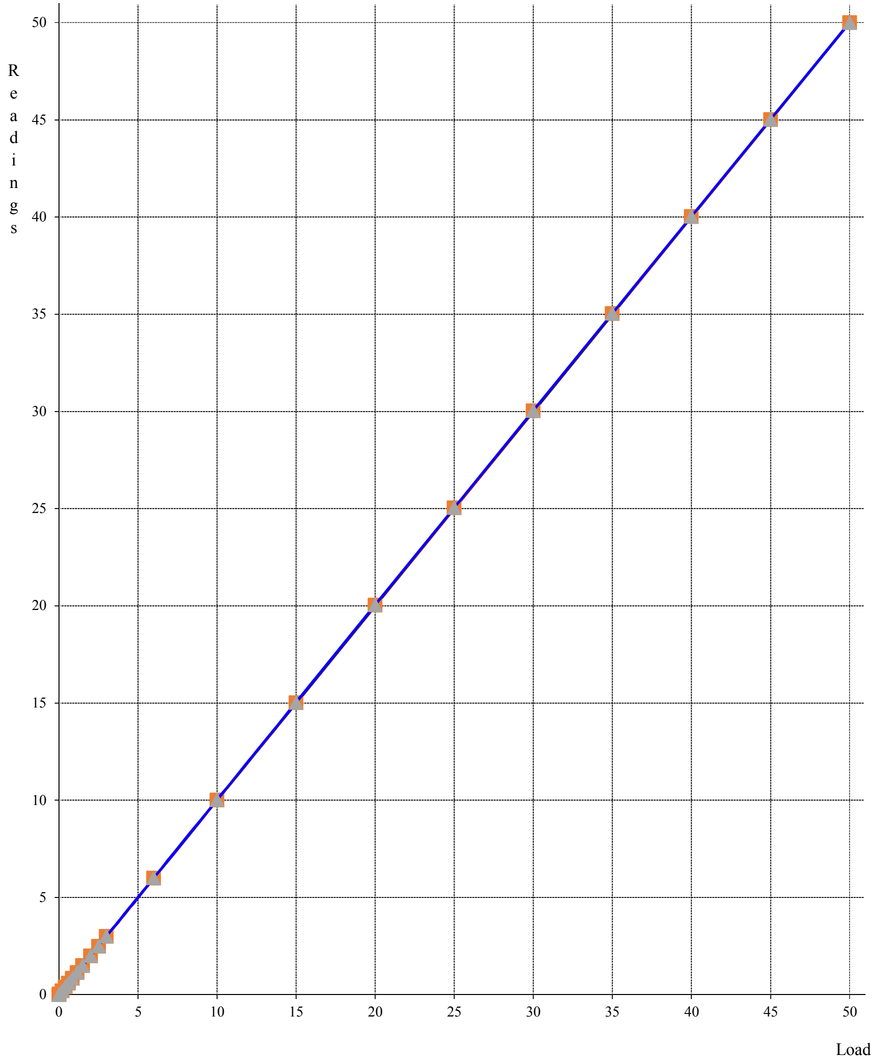
Power press:

Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	27/02/2017
Certificate N.	LAT 052 1702374FSE
Temperature of calibration	22°C
Humidity	35%

Factory calibration in accordance with ASTM 05778-12



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,00
2	0,03	0,03	0,03	0,03
3	0,20	0,19	0,20	0,20
4	0,40	0,40	0,40	0,40
5	0,60	0,59	0,60	0,60
6	0,85	0,84	0,85	0,85
7	1,15	1,13	1,15	1,15
8	1,50	1,49	1,50	1,50
9	2,00	1,99	2,00	2,00
10	2,50	2,49	2,50	2,50
11	3,00	2,99	3,00	3,00
12	6,00	5,99	6,00	6,01
13	10,00	10,01	10,00	10,02
14	15,00	15,02	15,00	15,04
15	20,00	20,03	20,00	20,05
16	25,00	25,03	25,00	25,05
17	30,00	30,03	30,00	30,05
18	35,00	35,03	35,00	35,05
19	40,00	40,03	40,00	40,04
20	45,00	45,01	45,00	45,02
21	50,00	50,00	50,00	50,01

Unit: Mpa

Zero-load error:	=	0,000	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,068	% FSO
Hysteresis:	=	0,042	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,098	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by ______________

Date of issue 08/04/2017

PAGANI® GEOTECHNICAL EQUIPMENT

Loc. Campogrande , n° 26
29010 CALENDASCO (PC)
ITALY

www.pagani-geotechnical.com
info@pagani-geotechnical.com
Tel: +39 0523 771535 - Fax: +39 0523 773449

CONE CALIBRATION CERTIFICATE
N° Z044/17

Calibrated system *(Sistema tarato)* **:**

Serial number	**Mkj485**
Sensor	**SLEEVE FRICTION**
Max. Capacity [kPa]:	**1600**
Scaling Factor:	**30703**

Addressee *(destinatario)* **:**
Pagani Geotecnical Equipment s.r.l.
loc. Campogrande n° 26
29010 Calendasco (Piacenza) ITALY

Applied load measurement system:
(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	33870

Power press:

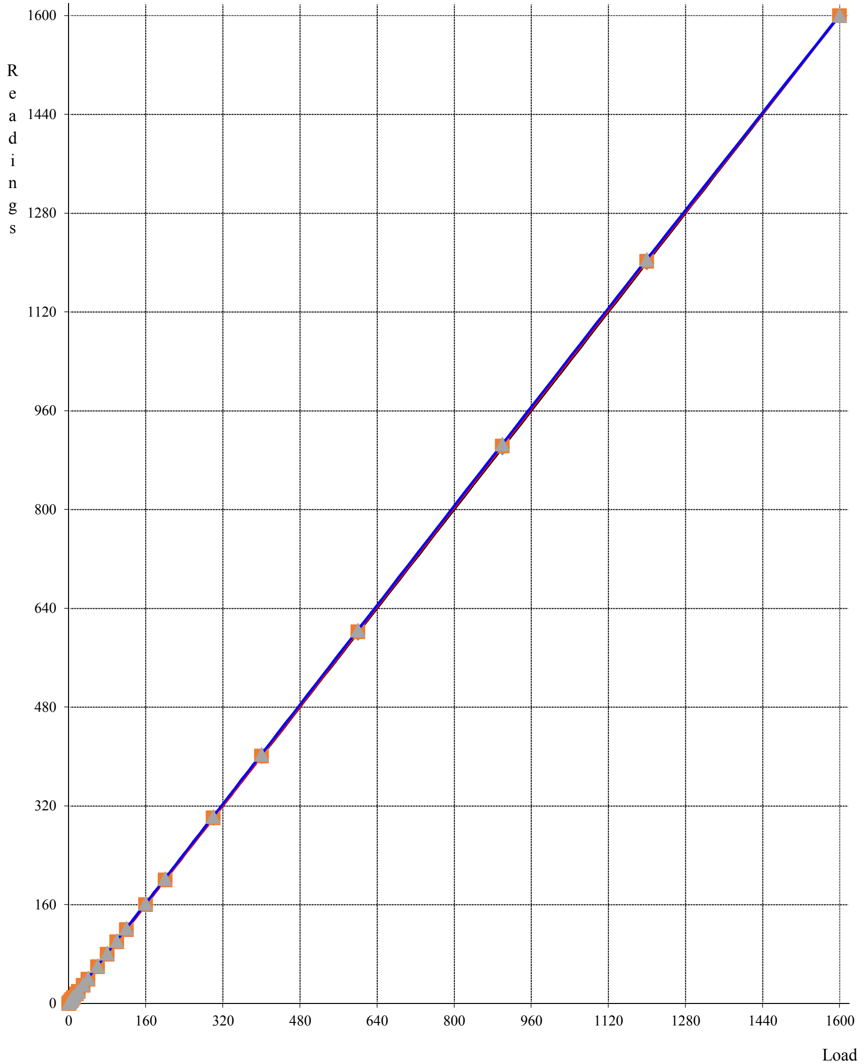
Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	27/02/2017
Certificate N.	LAT 052 1702374FSE

Temperature of calibration	22°C
Humidity	35%

Factory calibration in accordance with ASTM 05778-12



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,07	0,00	0,67
2	2,00	1,80	2,00	2,53
3	5,00	4,80	5,00	5,67
4	7,00	6,73	7,00	7,67
5	10,00	9,60	10,00	10,60
6	16,00	15,53	16,00	16,67
7	20,00	19,47	20,00	20,73
8	30,00	29,47	30,00	30,80
9	40,00	39,53	40,00	40,93
10	60,00	59,60	60,00	61,07
11	80,00	79,73	80,00	81,33
12	100,00	99,80	100,00	101,60
13	120,00	119,93	120,00	121,73
14	160,00	160,13	160,00	162,07
15	200,00	200,27	200,00	202,33
16	300,00	300,53	300,00	302,80
17	400,00	400,87	400,00	403,40
18	600,00	601,80	600,00	604,53
19	900,00	902,67	900,00	905,67
20	1200,00	1202,20	1200,00	1205,27
21	1600,00	1600,00	1600,00	1600,53

Unit: kPa

Zero-load error:	=	0,038	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,167	% FSO
Hysteresis:	=	0,192	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,021	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by [signature]

Date of issue 08/04/2017

PAGANI® GEOTECHNICAL EQUIPMENT

Loc. Campogrande , n° 26
29010 CALENDASCO (PC)
ITALY

www.pagani-geotechnical.com
info@pagani-geotechnical.com
Tel: +39 0523 771535 - Fax: +39 0523 773449

CONE CALIBRATION CERTIFICATE
N° Z044/17

Calibrated system *(Sistema tarato)* **:**

Serial number	**Mkj485**
Sensor	**PORE PRESSURE**
Max. Capacity [kPa]:	**2500**
Scaling Factor:	**11063**
Sensor	**TILT ANGLE**
Max. Inclination [°]:	**20**
Scaling Factor:	**152155**

Addressee *(destinatario)* **:**

Pagani Geotecnical Equipment s.r.l.
loc. Campogrande n° 26
29010 Calendasco (Piacenza) ITALY

Applied load measurement system:
(Sistema di rilevamento del carico applicato)

Pressure Generator:

Manufacturer	AEP transducers
Model	GPM500

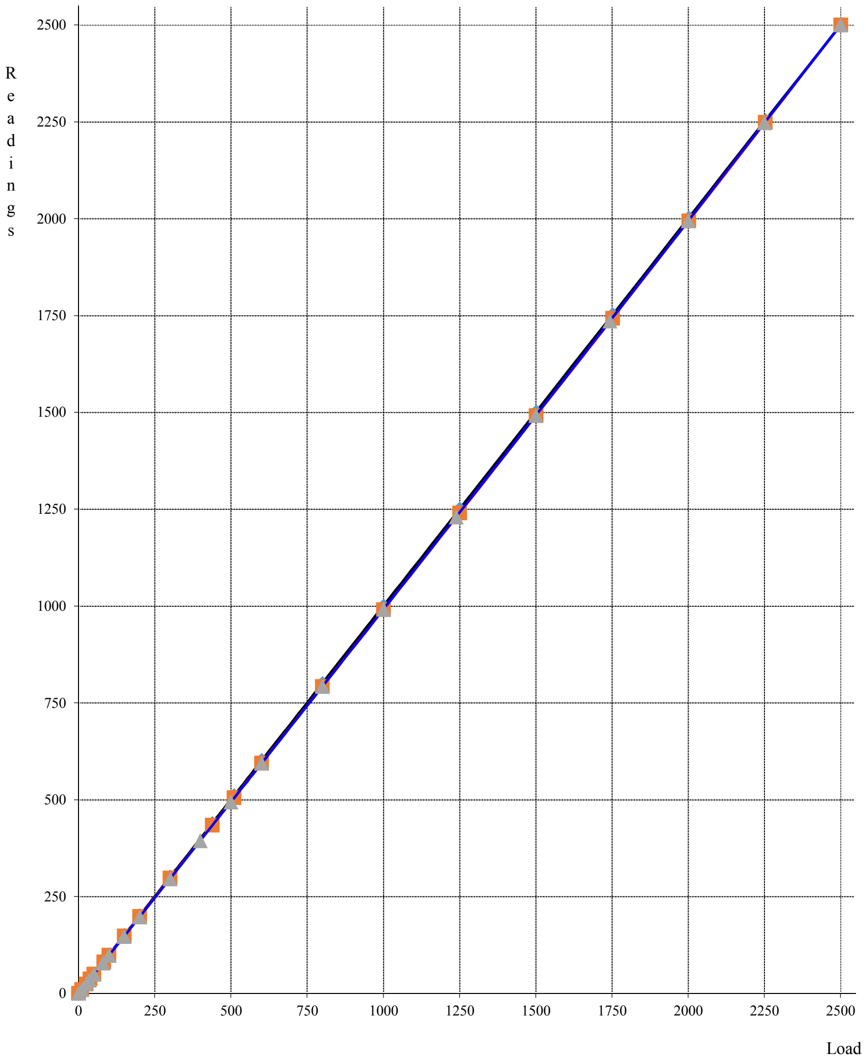
Digital Indicator:

Manufacturer	AEP transducers
Model	LAB DMM
Serial Number	301796

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	25/01/2017
Certificate N.	LAT 093-9717P
Temperature of calibration	22°C
Humidity	35%

Factory calibration in accordance with ASTM 05778-12



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,00
2	10,40	10,10	10,00	9,50
3	25,20	24,70	25,00	24,20
4	38,20	37,50	34,80	34,00
5	50,80	50,00	50,00	49,10
6	83,00	81,50	79,60	78,10
7	100,00	98,60	100,20	98,30
8	150,00	148,20	149,00	146,40
9	200,80	198,40	200,00	196,90
10	300,60	297,70	300,00	295,80
11	438,80	434,40	399,00	393,80
12	510,40	505,50	500,00	493,80
13	601,00	595,00	600,80	594,10
14	800,00	792,40	800,00	792,10
15	1000,00	991,10	1000,40	991,90
16	1250,40	1240,40	1238,80	1230,00
17	1501,00	1492,00	1500,20	1491,90
18	1752,00	1743,40	1743,20	1735,90
19	2001,60	1994,60	1999,60	1993,90
20	2253,20	2249,10	2250,00	2247,00
21	2500,20	2500,10	2500,00	2500,10

Unit: kPa

Zero-load error:	=	0,000	% FSO
Nonlinearity:	=	0,400	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by ____________

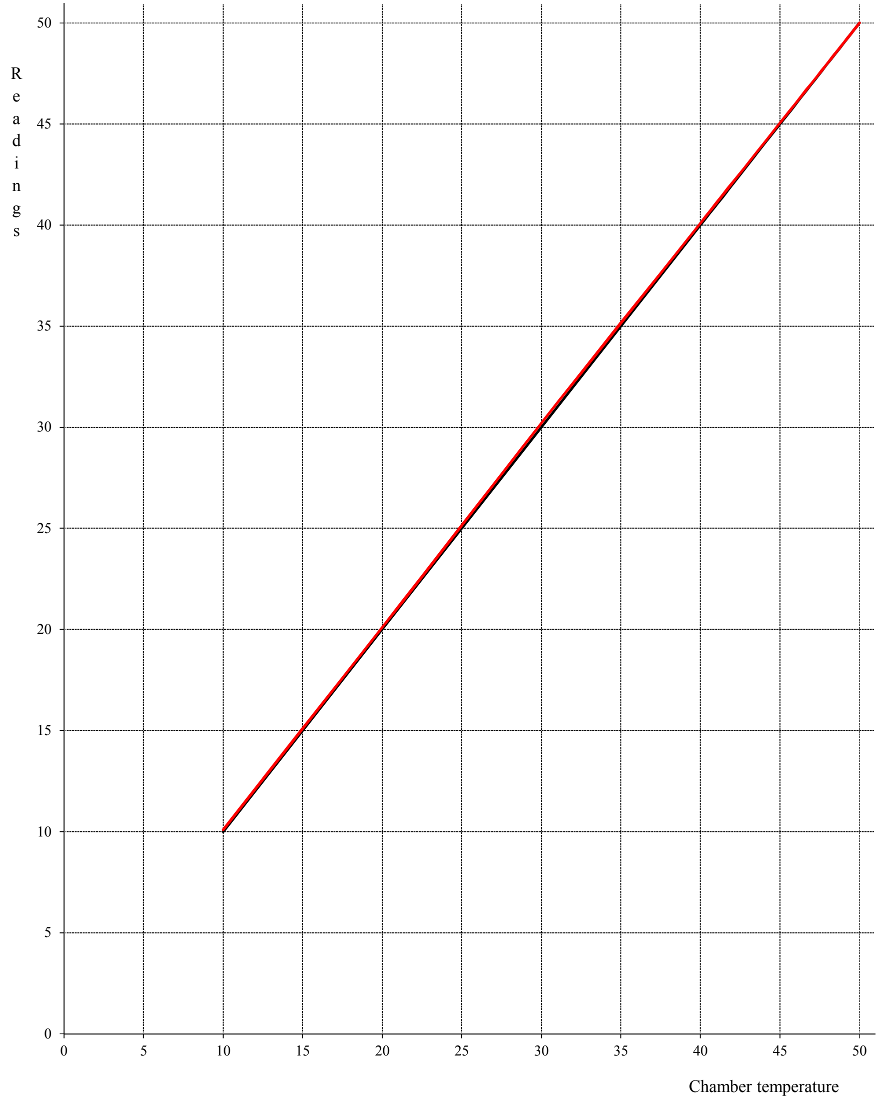
Date of issue 08/04/2017

PAGANI® GEOTECHNICAL EQUIPMENT
Loc. Santimento, 44
29010 CALENDASCO (PC)
ITALY
www.pagani-geotechnical.com
info@pagani-geotechnical.com
Tel: +39 0523 771535 - Fax: +39 0523 773449

CONE CALIBRATION CERTIFICATE
N° Z044/17

Calibrated system *(Sistema tarato)* **:**

Serial number	**Mkj485**
Sensor	**TEMPERATURE**
Max. Temperature [°C]:	**50**
Scaling Factor:	**444854**



	Ch temp	Readings
1	10,00	10,10
2	20,00	20,10
3	30,00	30,20
4	40,00	40,10
5	50,00	50,00

Unit: °C

Addressee *(destinatario)* **:**
ROCKBIT UK ltd
Unit 4 Neptune Court Orion Business Park
North Shields , Tyne & Wear NE29 7UW UK

Psychrometric system:
(Sistema psicrometrico)

Manufacturer	ATT Angelantoni
Model	DY340
Serial Number	TT00210

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	03/04/2013
Certificate N.	021/13

Temperature of calibration
Humidity

Cone calibrated by Claudio C.

Date of issue 08/04/2017

PAGANI® GEOTECHNICAL EQUIPMENT

Loc. Campogrande , n° 26
29010 CALENDASCO (PC)
ITALY

www.pagani-geotechnical.com
info@pagani-geotechnical.com
Tel: +39 0523 771535 - Fax: +39 0523 773449

CONE CALIBRATION CERTIFICATE

N° Z045/17

Calibrated system *(Sistema tarato)* **:**

Serial number	**Mkj528**
Sensor	**TIP RESISTANCE**
Max. Capacity [MPa]:	**50**
Scaling Factor:	**184460**
Tip net area ratio (a_n):	**0,79**
Sleeve net ratio (b_n):	**0,00**

Addressee *(destinatario)* **:**

Pagani Geotecnical Equipment s.r.l.
loc. Campogrande n° 26
29010 Calendasco (Piacenza) ITALY

Applied load measurement system:
(Sistema di rilevamento del carico applicato)

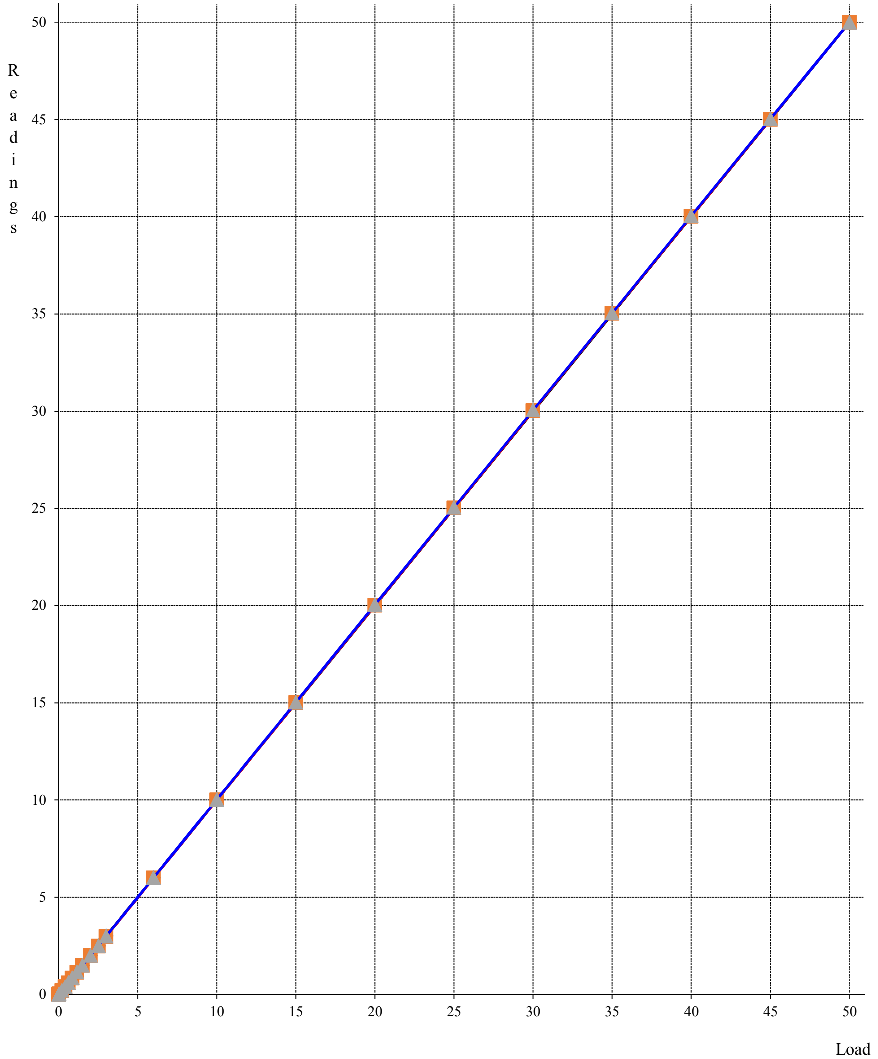
Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	33870
Power press:	
Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	27/02/2017
Certificate N.	LAT 052 1702374FSE
Temperature of calibration	22°C
Humidity	35%

Factory calibration in accordance with ASTM 05778-12



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,00
2	0,03	0,03	0,03	0,03
3	0,20	0,19	0,20	0,20
4	0,40	0,39	0,40	0,40
5	0,60	0,59	0,60	0,60
6	0,85	0,84	0,85	0,85
7	1,15	1,13	1,15	1,15
8	1,50	1,49	1,50	1,50
9	2,00	1,98	2,00	2,00
10	2,50	2,48	2,50	2,50
11	3,00	2,98	3,00	3,00
12	6,00	5,99	6,00	6,01
13	10,00	10,00	10,00	10,02
14	15,00	15,01	15,00	15,03
15	20,00	20,02	20,00	20,05
16	25,00	25,02	25,00	25,05
17	30,00	30,03	30,00	30,06
18	35,00	35,03	35,00	35,05
19	40,00	40,02	40,00	40,05
20	45,00	45,01	45,00	45,03
21	50,00	50,00	50,00	50,01

Unit: Mpa

Zero-load error:	=	0,000	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,056	% FSO
Hysteresis:	=	0,056	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,240	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by ______________ Date of issue 08/04/2017

PAGANI®
GEOTECHNICAL EQUIPMENT

Loc. Campogrande , n° 26
29010 CALENDASCO (PC)
ITALY

www.pagani-geotechnical.com
info@pagani-geotechnical.com
Tel: +39 0523 771535 - Fax: +39 0523 773449

CONE CALIBRATION CERTIFICATE
N° Z045/17

Calibrated system *(Sistema tarato)* **:**

Serial number	**Mkj528**
Sensor	**SLEEVE FRICTION**
Max. Capacity [kPa]:	**1600**
Scaling Factor:	**32064**

Addressee *(destinatario)* **:**

Pagani Geotecnical Equipment s.r.l.
loc. Campogrande n° 26
29010 Calendasco (Piacenza) ITALY

Applied load measurement system:
(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	33870

Power press:

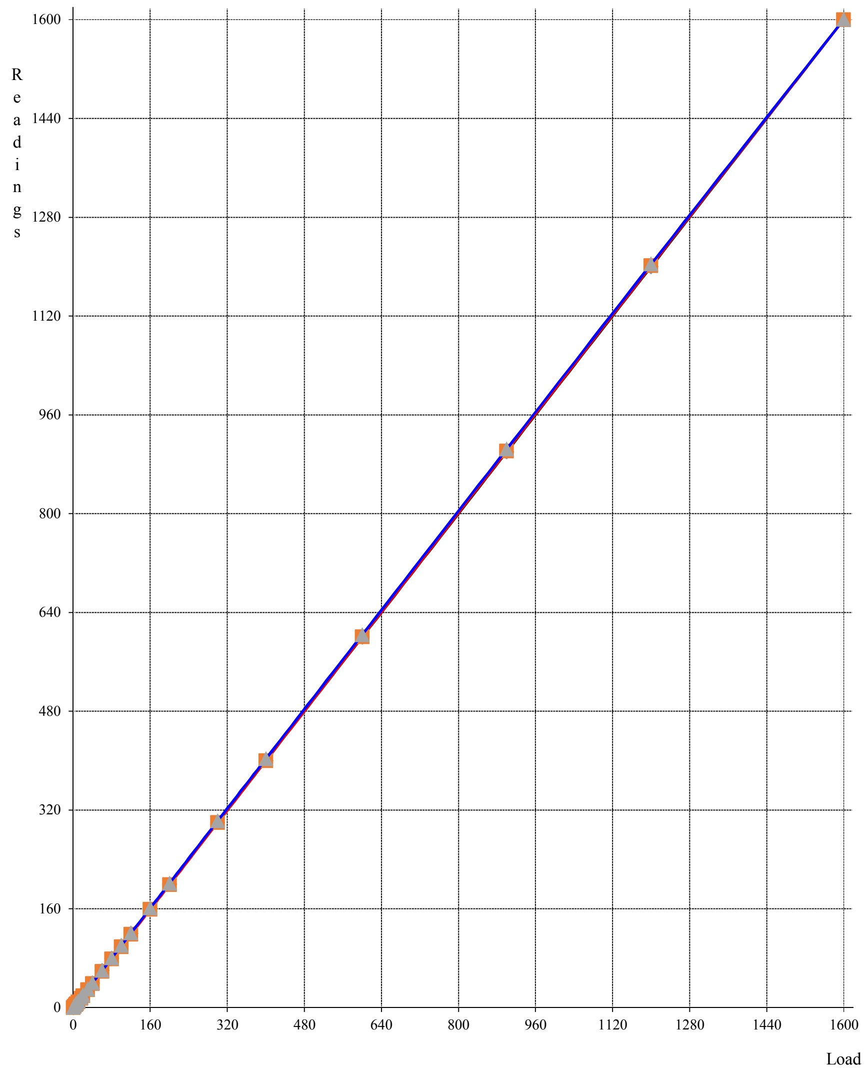
Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	27/02/2017
Certificate N.	LAT 052 1702374FSE

Temperature of calibration	22°C
Humidity	35%

Factory calibration in accordance with ASTM 05778-12



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,07	0,00	0,47
2	2,00	1,73	2,00	2,27
3	5,00	4,40	5,00	5,07
4	7,00	6,27	7,00	7,07
5	10,00	9,20	10,00	10,07
6	16,00	14,93	16,00	15,93
7	20,00	18,87	20,00	19,93
8	30,00	28,80	30,00	30,00
9	40,00	38,67	40,00	40,00
10	60,00	58,60	60,00	60,20
11	80,00	78,60	80,00	80,33
12	100,00	98,67	100,00	100,47
13	120,00	118,73	120,00	120,60
14	160,00	158,87	160,00	160,93
15	200,00	199,00	200,00	201,33
16	300,00	299,53	300,00	302,20
17	400,00	399,80	400,00	402,80
18	600,00	600,47	600,00	603,67
19	900,00	901,20	900,00	904,33
20	1200,00	1201,27	1200,00	1203,93
21	1600,00	1600,00	1600,00	1600,33

Unit: kPa

Zero-load error:	=	0,025	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,088	% FSO
Hysteresis:	=	0,200	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,020	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by ______

Date of issue 08/04/2017

PAGANI®
GEOTECHNICAL EQUIPMENT

Loc. Campogrande , n° 26
29010 CALENDASCO (PC)
ITALY

www.pagani-geotechnical.com
info@pagani-geotechnical.com
Tel: +39 0523 771535 - Fax: +39 0523 773449

CONE CALIBRATION CERTIFICATE
N° Z045/17

Calibrated system *(Sistema tarato)* **:**

Serial number	**Mkj528**
Sensor	**PORE PRESSURE**
Max. Capacity [kPa]:	**2500**
Scaling Factor:	**11012**
Sensor	**TILT ANGLE**
Max. Inclination [°]:	**20**
Scaling Factor:	**151154**

Addressee *(destinatario)* **:**
Pagani Geotecnical Equipment s.r.l.
loc. Campogrande n° 26
29010 Calendasco (Piacenza) ITALY

Applied load measurement system:
(Sistema di rilevamento del carico applicato)

Pressure Generator:

Manufacturer	AEP transducers
Model	GPM500

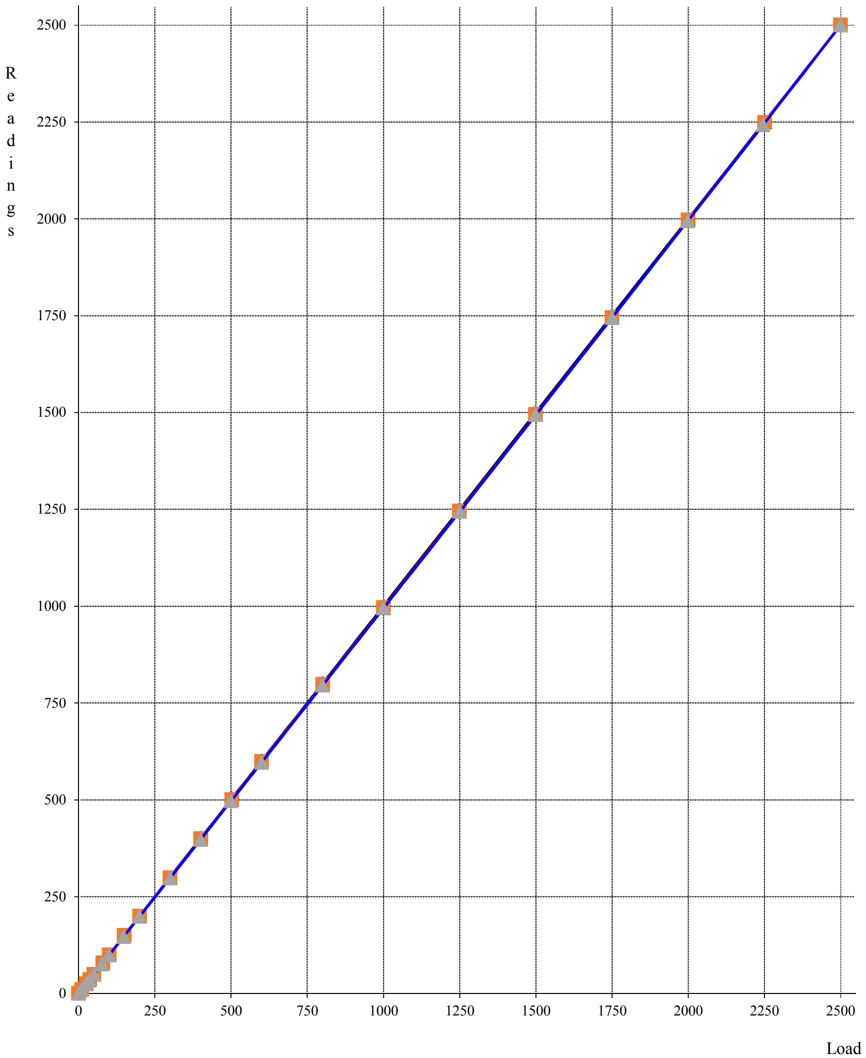
Digital Indicator:

Manufacturer	AEP transducers
Model	LAB DMM
Serial Number	301796

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	25/01/2017
Certificate N.	LAT 093-9717P
Temperature of calibration	22°C
Humidity	35%

Factory calibration in accordance with ASTM 05778-12



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,00
2	10,00	10,00	10,00	9,90
3	25,00	24,90	25,00	24,60
4	36,40	36,00	35,00	34,30
5	50,00	49,30	50,00	49,30
6	80,00	79,00	76,20	75,80
7	101,00	100,00	100,00	99,60
8	150,00	149,70	147,60	146,90
9	200,00	199,50	199,80	198,60
10	300,00	299,10	300,00	298,20
11	401,00	399,70	400,00	397,60
12	502,80	500,80	500,00	496,90
13	600,80	598,60	600,00	596,30
14	801,00	797,80	800,00	795,30
15	1000,00	996,20	1000,60	995,20
16	1249,80	1245,50	1250,60	1244,70
17	1499,60	1494,90	1500,00	1494,50
18	1749,60	1744,70	1750,00	1744,80
19	1999,40	1996,80	1998,20	1994,30
20	2250,80	2249,00	2246,00	2242,70
21	2500,00	2500,10	2499,40	2500,10

Unit: kPa

Zero-load error:	=	0,000	% FSO
Nonlinearity:	=	0,196	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by ______________

Date of issue 08/04/2017

Göteborg:2018-08-14

CALIBRATION CERTIFICATE FOR CPT PROBE 4842

Probe No	4842
Date of Calibration	2018-08-14
Calibrated by	Christoffer Hurtig………………………………
Run No	806
Test Class:	ISO 1

Point Resistance — Tip Area 10cm²

Maximum Load	50	MPa
Range	50	MPa
Scaling Factor	**1596**	
Resolution	0,478	kPa
Area factor (a)	0,832	

ERRORS

Max. Temperature effect when not loaded 20,065 kPa

Temperature range 5 –40 deg. Celsius.

Local Friction — Sleeve Area 150cm²

Maximum Load	0,5	MPa
Range	0,5	MPa
Scaling Factor	**3448**	
Resolution	0,0111	kPa
Area factor (b)	0	

ERRORS

Max. Temperature effect when not loaded 0,718 kPa

Temperature range 5 –40 deg. Celsius.

Pore Pressure

Maximum Load	2	MPa
Range	2	MPa
Scaling Factor	**3469**	
Resolution	0,022	kPa

ERRORS

Max. Temperature effect when not loaded 1,89 kPa

Temperature range 5 –40 deg. Celsius.

Tilt Angle. — Scaling Factor: 0,92

Range	0 - 40	Deg.

Backup memory

Temperature sensor

Calibration Certificate. **Loading Point Resistance** Göteborg:2018-08-14

Probe No: **4842**
Date of Calibration: **2018-08-14**
Calibration Run No: **806**
Calibrated by: **Christoffer Hurtig**
Scaling Factor: 1596
Reference Cell: 75672

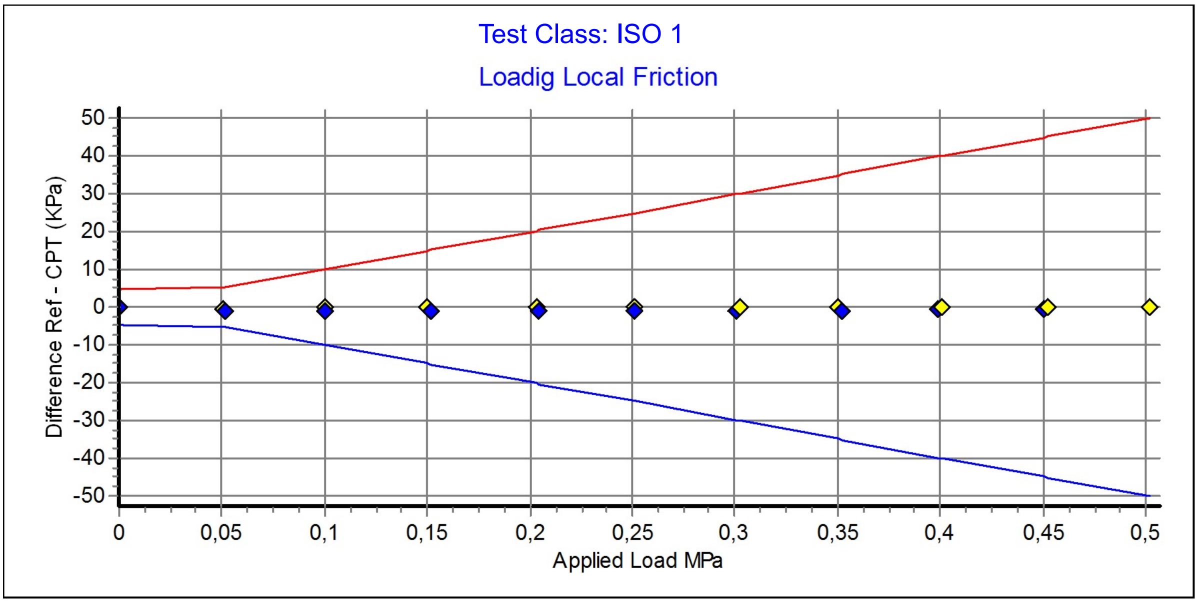
Applied Load MPa	**PointRes. MPa**	**Difference MPa**	**Accuracy %/MV**	**Friction MPa**	**PorePress MPa**
0,000	0,000	0,000	0,000	0,000	0,000
5,026	5,035	-0,009	-0,179	0,000	0,000
10,019	10,036	-0,017	-0,169	0,000	-0,001
15,036	15,062	-0,026	-0,172	0,000	-0,001
20,035	20,067	-0,032	-0,159	0,001	-0,002
25,034	25,070	-0,036	-0,143	0,001	-0,002
30,033	30,063	-0,030	-0,099	0,002	-0,003
35,029	35,054	-0,025	-0,071	0,002	-0,003
40,031	40,037	-0,006	-0,015	0,002	-0,003
45,036	45,028	0,008	0,017	0,003	-0,004
50,029	49,994	0,035	0,070	0,003	-0,004
45,039	45,042	-0,003	-0,006	0,002	-0,003
39,979	40,004	-0,025	-0,062	0,002	-0,002
35,044	35,086	-0,042	-0,119	0,001	-0,002
30,027	30,090	-0,063	-0,209	0,001	-0,001
25,055	25,122	-0,067	-0,267	0,001	0,000
20,026	20,090	-0,064	-0,319	0,000	0,000
15,024	15,076	-0,052	-0,346	0,000	0,000
10,016	10,054	-0,038	-0,379	0,000	0,000
5,035	5,057	-0,022	-0,436	0,000	0,000
0,000	-0,003	0,003	0,000	0,000	0,000

GEOTECH
Specialists in Geotechnical Field Equipment
Ingenjörsfirman Geotech AB +46 (0)31-28 99 20 www.geotech.se
Datavägen 53 +46 (0)31-68 16 39 VAT No.
SE-436 32 ASKIM, Sweden SE556098559901

Calibration Certificate. **Loading Local Friction** Göteborg:2018-08-14

Probe No: **4842**
Date of Calibration: **2018-08-14**
Calibration Run No: **806**
Calibrated by: **Christoffer Hurtig**
Scaling Factor: 3448
Reference Cell: 76360

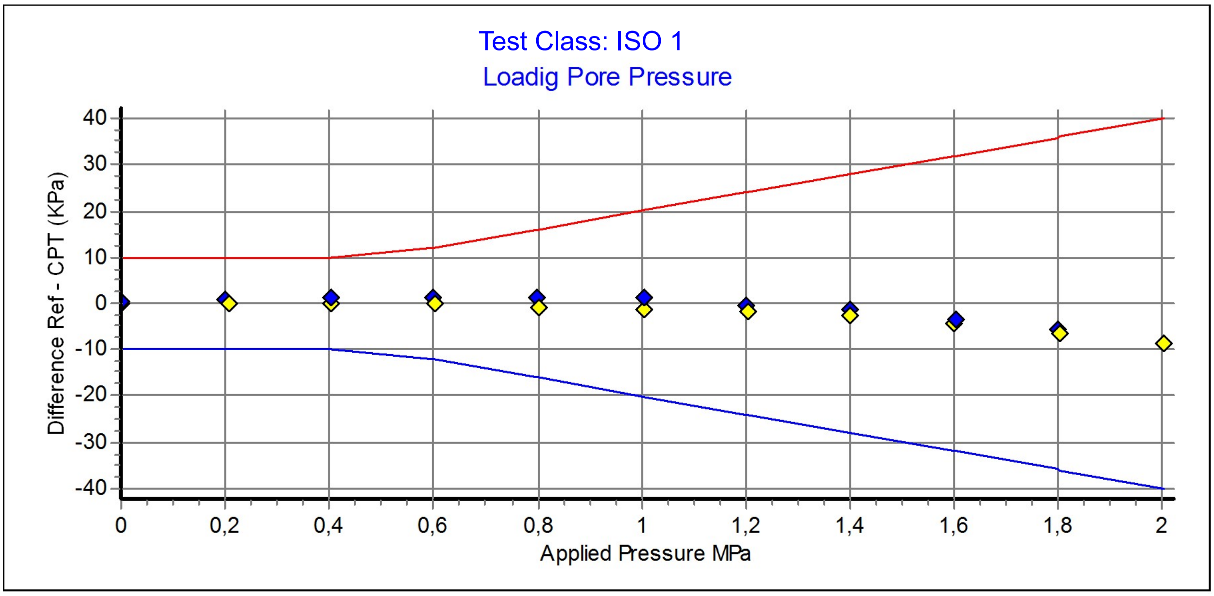
Ref MPa	**Friction MPa**	**Difference KPa**	**Accuracy %/MV**	**PointRes. MPa**	**PorePress MPa**
0,000	0,000	0,000	0,000	0,000	0,000
0,051	0,051	-0,298	0,000	0,003	0,000
0,100	0,100	0,000	0,000	0,003	0,000
0,150	0,149	0,094	0,000	0,003	0,000
0,203	0,203	0,118	0,058	0,004	0,000
0,251	0,250	0,171	0,068	0,005	0,000
0,303	0,302	0,077	0,025	0,004	0,000
0,350	0,350	0,001	0,000	0,006	0,000
0,401	0,401	0,065	0,016	0,007	0,000
0,452	0,452	-0,079	-0,017	0,006	0,000
0,502	0,502	-0,103	-0,020	0,007	0,000
0,450	0,450	-0,417	-0,092	0,005	0,000
0,399	0,400	-0,682	-0,170	0,005	0,000
0,352	0,353	-0,944	-0,267	0,002	0,000
0,301	0,302	-1,083	-0,357	0,003	0,000
0,251	0,252	-1,133	-0,448	0,002	0,000
0,204	0,205	-1,163	-0,566	0,001	0,000
0,152	0,153	-1,132	0,000	0,001	0,000
0,100	0,101	-1,011	0,000	0,001	0,000
0,052	0,052	-0,938	0,000	0,000	0,000
0,000	0,000	-0,011	0,000	0,001	0,000



Calibration Certificate. **Loading Pore Pressure** Göteborg:2018-08-14

Probe No:	**4842**
Date of Calibration:	**2018-08-14**
Calibration Run No:	**806**
Calibrated by:	**Christoffer Hurtig**
Scaling Factor:	**3469**
Reference Cell:	44410026

Appl. Press MPa	**PorePress MPa**	**Difference KPa**	**Accuracy %/MV**	**PointRes. MPa**	**Friction MPa**	**Area Factor A = PR/PP**	**Area Factor B = LF/PP**
0,000	0,000	0,100	0,000	0,000	0,000		
0,207	0,207	0,100	0,037	0,162	0,000	0,782	0,000
0,401	0,400	0,100	0,018	0,315	0,000	0,787	0,000
0,604	0,604	0,100	-0,011	0,490	0,000	0,811	0,000
0,800	0,801	-0,973	-0,121	0,660	0,000	0,824	0,000
1,003	1,004	-1,211	-0,120	0,832	0,000	0,828	0,000
1,204	1,206	-1,589	-0,131	1,004	0,000	0,832	0,000
1,401	1,403	-2,478	-0,176	1,173	0,000	0,836	0,000
1,601	1,606	-4,335	-0,269	1,345	0,000	0,837	0,000
1,801	1,808	-6,333	-0,350	1,518	0,000	0,839	0,000
2,002	2,011	-8,528	-0,424	1,691	0,000	0,840	0,000
1,797	1,803	-5,799	-0,321	1,516	0,000	0,840	0,000
1,602	1,605	-3,431	-0,213	1,348	0,000	0,839	0,000
1,398	1,399	-1,463	-0,104	1,179	0,000	0,842	0,000
1,201	1,202	-0,386	-0,032	1,010	0,000	0,840	0,000
1,004	1,003	1,134	0,113	0,844	0,000	0,841	0,000
0,799	0,798	1,171	0,146	0,669	0,000	0,838	0,000
0,599	0,597	1,304	0,218	0,498	0,000	0,834	0,000
0,401	0,399	1,150	0,287	0,328	0,000	0,822	0,000
0,201	0,200	0,948	0,472	0,159	0,000	0,795	0,000
0,000	0,000	0,534	0,000	0,002	0,000		

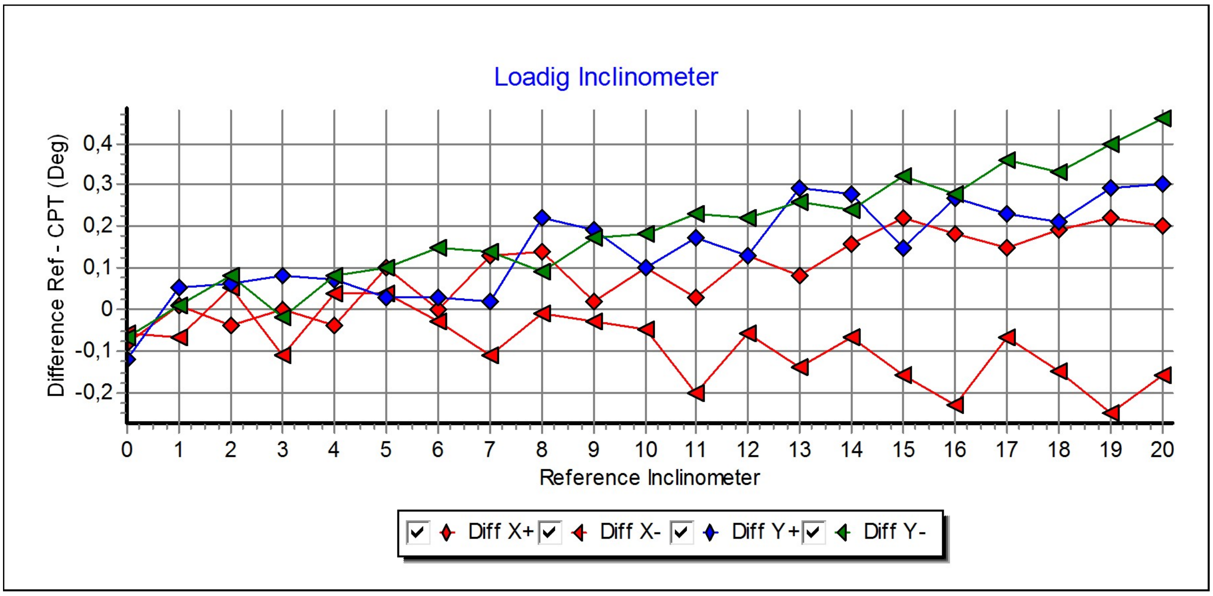


GEOTECH Specialists in Geotechnical Field Equipment
Ingenjörsfirman Geotech AB +46 (0)31-28 99 20 www.geotech.se
Datavägen 53 +46 (0)31-68 16 39 VAT No.

Calibration Certificate. **Loading Inclinometer** Göteborg:2018-08-14

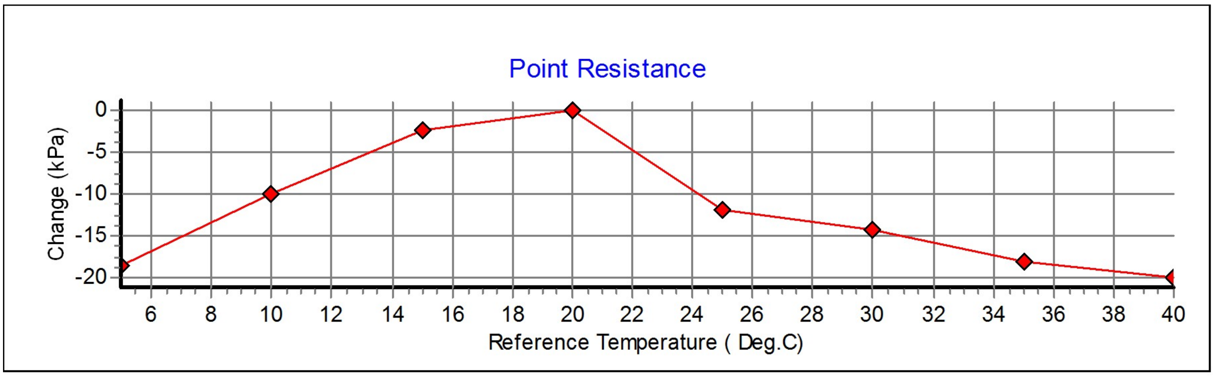
Probe No: **4842**
Date of Calibration: **2018-08-14**
Calibration Run No: **806**
Calibrated by: **Christoffer Hurtig**
Scaling Factor: 0,92

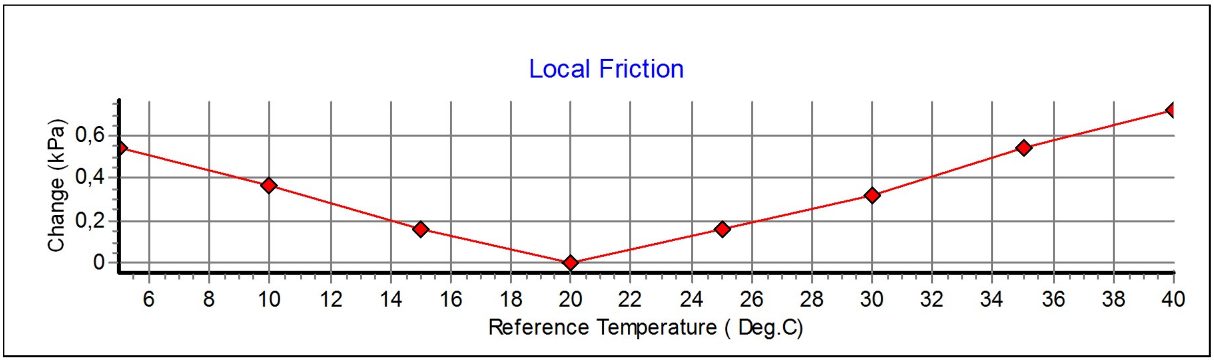
Appl. Incin. Deg	X+ Deg	X- Deg	Y+ Deg	Y- Deg	Diff X+ Deg	Diff X- Deg	Diff Y+ Deg	Diff Y- Deg
0,00	0,08	0,06	0,12	0,07	-0,08	-0,06	-0,12	-0,07
1,00	0,99	1,07	0,95	0,99	0,01	-0,07	0,05	0,01
2,00	2,04	1,95	1,94	1,92	-0,04	0,05	0,06	0,08
3,00	3,00	3,11	2,92	3,02	0,00	-0,11	0,08	-0,02
4,00	4,04	3,96	3,93	3,92	-0,04	0,04	0,07	0,08
5,00	4,90	4,96	4,97	4,90	0,10	0,04	0,03	0,10
6,00	6,00	6,03	5,97	5,85	0,00	-0,03	0,03	0,15
7,00	6,87	7,11	6,98	6,86	0,13	-0,11	0,02	0,14
8,00	7,86	8,01	7,78	7,91	0,14	-0,01	0,22	0,09
9,00	8,98	9,03	8,81	8,83	0,02	-0,03	0,19	0,17
10,00	9,90	10,05	9,90	9,82	0,10	-0,05	0,10	0,18
11,00	10,97	11,20	10,83	10,77	0,03	-0,20	0,17	0,23
12,00	11,87	12,06	11,87	11,78	0,13	-0,06	0,13	0,22
13,00	12,92	13,14	12,71	12,74	0,08	-0,14	0,29	0,26
14,00	13,84	14,07	13,72	13,76	0,16	-0,07	0,28	0,24
15,00	14,78	15,16	14,85	14,68	0,22	-0,16	0,15	0,32
16,00	15,82	16,23	15,73	15,72	0,18	-0,23	0,27	0,28
17,00	16,85	17,07	16,77	16,64	0,15	-0,07	0,23	0,36
18,00	17,81	18,15	17,79	17,67	0,19	-0,15	0,21	0,33
19,00	18,78	19,25	18,71	18,60	0,22	-0,25	0,29	0,40
20,00	19,80	20,16	19,70	19,54	0,20	-0,16	0,30	0,46

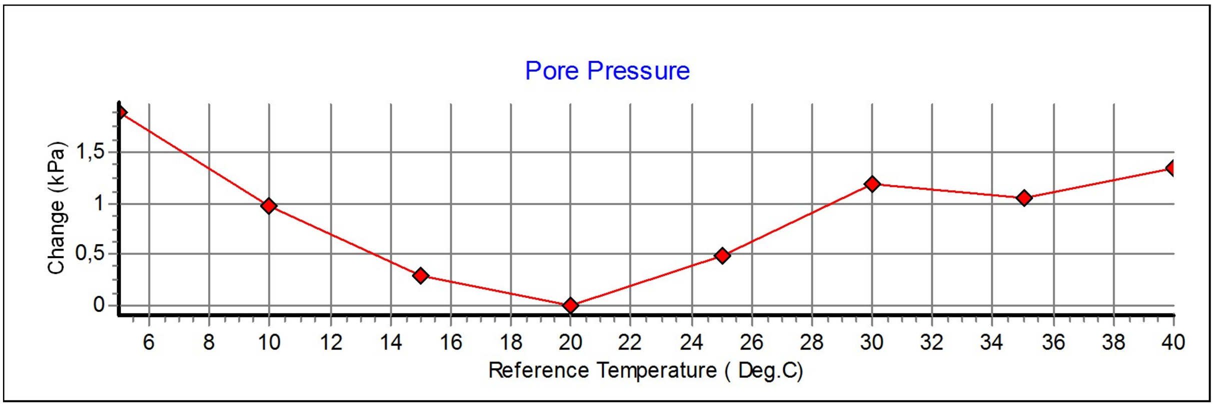


Calibration of temperature effect when not loaded. Göteborg:2018-08-14

Probe No: **4842**
Date of Calibration: **2018-08-14**
Calibration Run No: **806**
Calibrated by: **Christoffer Hurtig**







Calibration procedure. Göteborg: 2018-08-14

We are following the procedure that is described in the European Standard **EN ISO22476-1:**

Point resistance.

The point resistance is calibrated from 0 to maximum range in 10 steps up and down.
Then we adjust the calibration factor to fit the best linearity.

Local friction.

A special adapter unit substitutes the cone and transfers the axial forces to the lower end of the friction sleeve. The friction is calibrated from 0 to maximum range in 10 steps up and down then the sleeve is turned 90 degrees and the calibration repeated.
Then we adjust the calibration factor to fit the best linearity.

Pore pressure & Area ratio a and b.

The completed probe is installed in a special chamber and the pore pressure sensor are calibrated from 0 to maximum range in 10 step up and down.
Then we adjust the calibration factor to fit the best linearity.
At half range the pressure of the point and friction is registered and used for calculation of the area factor.

Tilt inclination.

The tilt sensor is calibrated +/- 20deg. from vertical line in steps of 1 deg.
This will be done in 2 orthogonal directions.

Temperature.

The temperature sensor are calibrated in steps of 5**°C** from 5 to 40 **°C**.

Temperature compensation.

The Point, Friction and the Pore pressure sensors in the probe is temperature compensated and tested in the range 5 to 40 **°C.**

Calibration reference equipment.

Reference	Load cell	HBM C2/100kN FB088 no.N75672
Reference	Load cell	HBM C2/20kN FB088 no.N76360
Reference	Pressure sensor	HBM P3MB 1MPa no.160410072
Reference	Pressure sensor	HBM P3MB 2MPa no.44410026
Reference	Pressure sensor	HBM P3MB 50MPa no.140510158

The reference sensors are connected to the Geotech black box together with the CPT probe. The measuring data from the reference sensors are simultaneously send to the computer and stored in the Geotech calibration software. The completed systems are recalibrated at RISE Research Institutes of Sweden once a year.

Environment.
Air pressure: 1008,0 hPa.
Temperature: 29,0 °C.

Cptlog Cone data base information

Göteborg: 2018-08-14

Cone name		Serial number		Date of purchase
4842		4842		User.

Ranges

Ranges		Geometric parameters		Scaling factors
Point resistance: 50	(Mpa)	Area factor a: 0,832		Point resistance: 1596
Local friction: 0,5	(Mpa)	Area factor b: 0		Local friction: 3448
Pore pressure: 2	(Mpa)	Tip area: 10	(cm^2)	Pore pressure: 3469
Tilt sensor: 40	(Deg)	Sleeve area: 150	(cm^2)	Tilt sensor: 0,92
temperature:	©			temperature: 1
Elect. Conductivity:	(mS/m)			Elect. Conductivity A:
				Elect. Conductivity B:

Type

NOVA cone

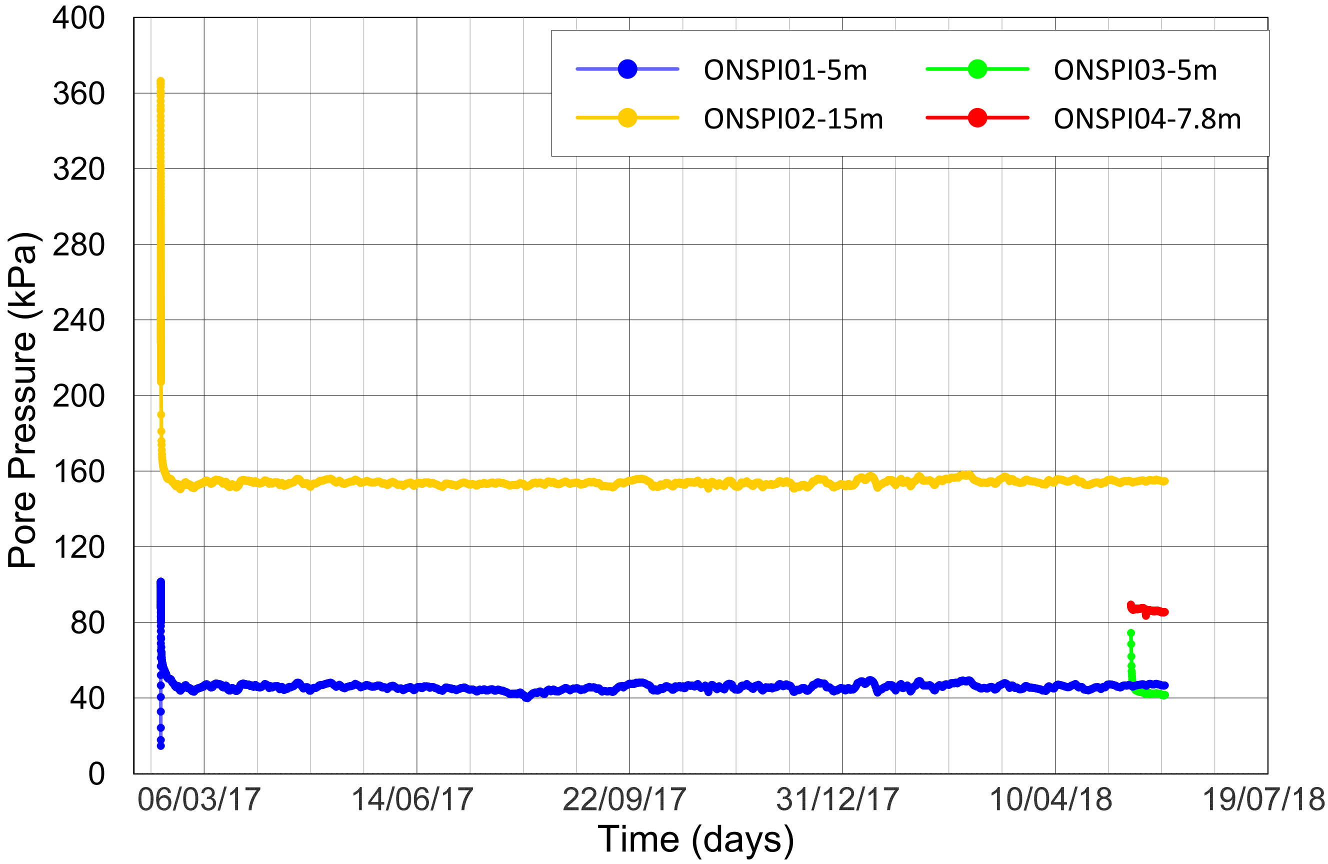
Memory option

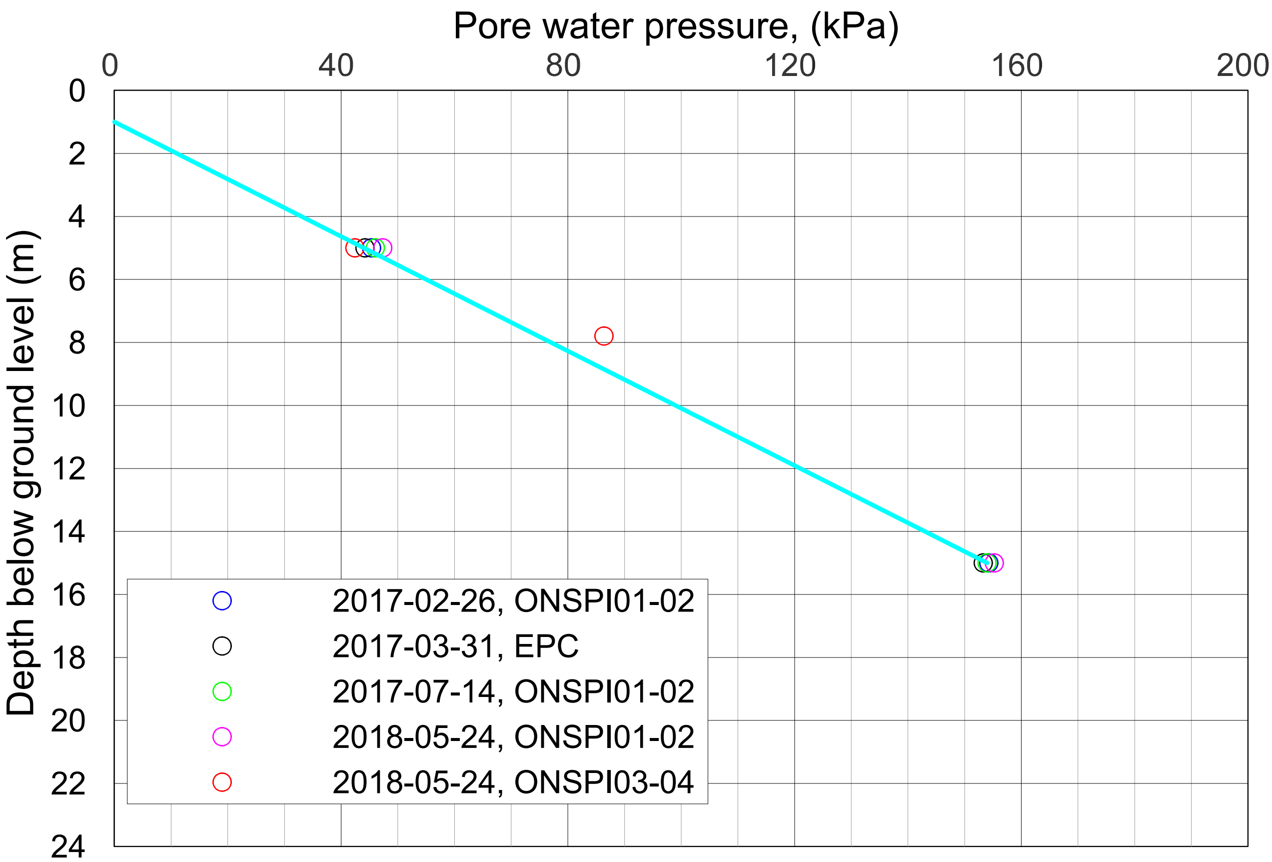
With memory

Appendix G

PIEZOMETER MEASUREMENTS

Contents





Date/Rev.: 2015-01-21/01

P:\2016\01\20160154\Leveranseedokumenter\Rapport\20160154-10-R Onsøy Factual\Figures\Figure_4.8.1_In situ pore pressure.grf

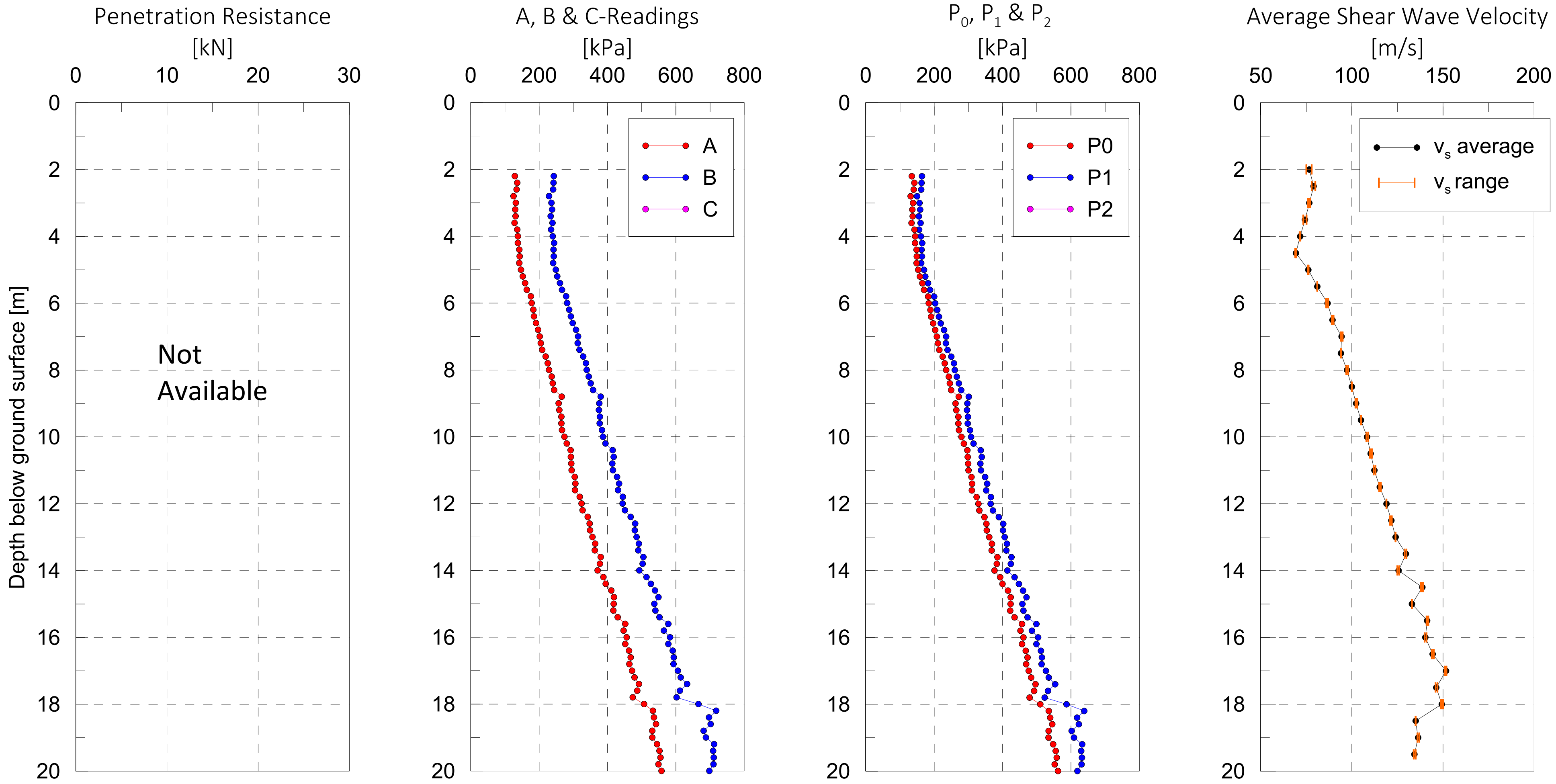
Norwegian GeoTest Sites - Onsøy	Document No. 20160154-10-R
Piezometer readings Depth interval 5 to 15 m	Figure No. G1.1
	Date 13.06.2018
	Drawn by StS/AGu

NGTS

Appendix H

SEISMIC DILATOMETER TEST RESULTS

Contents



P:\2016\01\20160154\Fieldwork\Onsøy\SDMT\ONSD01.grf

Date/Rev.: 2015-01-21/01

Calibration Constants

ΔA_{Before} = 7 kPa	ΔA_{After} = 7 kPa
ΔB_{Before} = 79 kPa	ΔB_{After} = 79 kPa

Norwegian GeoTest Sites - Onsøy

Test Type: Seismic Dilatometer Test

Test ID: ONSD01

Location: Onsøy

Document No. 20160154-10-R

Figure No. H1.1

Date 2018-06-15

Drawn by AGu

NGTS

Appendix I

HYDRAULIC FRACTURE STRESS TEST

Contents

I1 Introduction and method

The NGTS project is presently testing a simple method for *in situ* measurement of the lateral earth pressure in normally consolidated undrained soils. The method is based on the principles of hydraulic fracturing outlined by Bjerrum and Andersen (1972). A vertical crack is initiated in the soil around a piezometer filter. The water pressure at which the crack closes is estimated based on water flow measurements. This pressure is believed to be identical to the total stress across the crack, from which K_0 can be determined. See NGTS (2018) for further details on testing method and procedure.

I2 Tests and results

Individual test results from hydraulic fracturing and subsequent falling head tests are illustrated in Figures I2.1 to I2.12. The testing to date has been carried out at two locations, in three rounds. The testing procedure was modified before each test round according to Section I3. Table I3-1 presents the summary of tests carried out. A remark is included for each test stating the major uncertainties.

I3 Discussion and recommendation for further testing

Three rounds of hydraulic fracture testing at two locations have been carried out to revision date. First round was carried out the 22th of December 2016 and the second and third were carried out the 27th of June and the 19th of October 2018. The testing procedure was modified before each round of testing. For the falling head tests during the first round of testing, no water was allowed to flow from within the system into the surrounding soil. The reason was that the system was hydraulically closed after switching off the water pump. The decrease in pressure head seen in Figure I2.2 and Figure I2.8 head stems from the dissipation of excess pore pressure around the filter. Hence, it is uncertain whether the data from the first round of testing can be used to estimate the horizontal effective stress. Zero readings in free air was not carried out.

The test was improved before the second round of testing. A bladder system was included to allow water to flow freely from within the tube into the surrounding soil during falling head test. The water was measured by weight of the full bladder system. Results suggest that the bladder system was not fully saturated and that the weight of the water was too small for the gauge. Zero readings in free air was not carried out.

The flow was monitored by filming a measuring cylinder during the third round of testing. Before this round, the bladder system was modified to achieve full saturation.

Test ONSH02-02 cannot be used to estimate the horizontal effective stress because no crack was initiated. All tests from location ONSH01 show unrealistic results and it is suggested to leave these tests out from further comparison with other test methods. It is believed that there is a system leakage.

It is believed that there exist a linear relationship between pressure head and water flow when laminar flow occurs and no crack is present (Houlsby, 1976). Results from ONSH01-03 and ONSH02-03 suggest that there exists a linear relationship between pressure head and time after crack closing which can be used to assess the in situ horizontal stress and thereby the K0. Based on the results presented in herein, a list of recommendations before further testing is included.

1. For the Onsøy site, the flow rate during crack opening should be about 13 ml/min
2. Flow rate must be monitored during falling head test
3. Zero readings in free air should be taken before and after each test
4. The test could be improve by measuring the water pressure at filter location

Table I3-1 Summary of hydraulic fracture tests

Test Location	Test No.	Test Date	Filter Depth[1)]	σ_h' [kPa]	Zero reading	σ_v' [kPa]	K_0 [-]	Note
ONSH01	01	2016-12-22	6 m bgl.[1)]	-	-	40.5	-	No water flow after pump switch off
ONSH01	02	2018-06-27	6 m bgl.[1)]	34	-	40.5	0.84	Bladder system not fully saturated?
ONSH01	03	2018-10-17	8 m bgl.[1)]	34	0 kPa	50.0	0.68	
ONSH02	01	2016-12-22	6 m bgl.	24.5	-	40.5	0.60	No water flow after pump switch off
ONSH02	02	2018-06-27	6 m bgl.	-	-	40.5	-	No crack initiated.
ONSH02	03	2018-10-17	8 m bgl.	25	9 kPa	50.0	0.50	

1) This number needs to be checked

I4 References

NGTS (2018). Standardization of in situ tests and field work. NGI report no. 20160154-03-R.

Houlsby, A. C. (1976). Routine interpretation of the Lugeon water-test. Quarterly Journal of Engineering Geology and Hydrogeology, 9(4), 303-313.

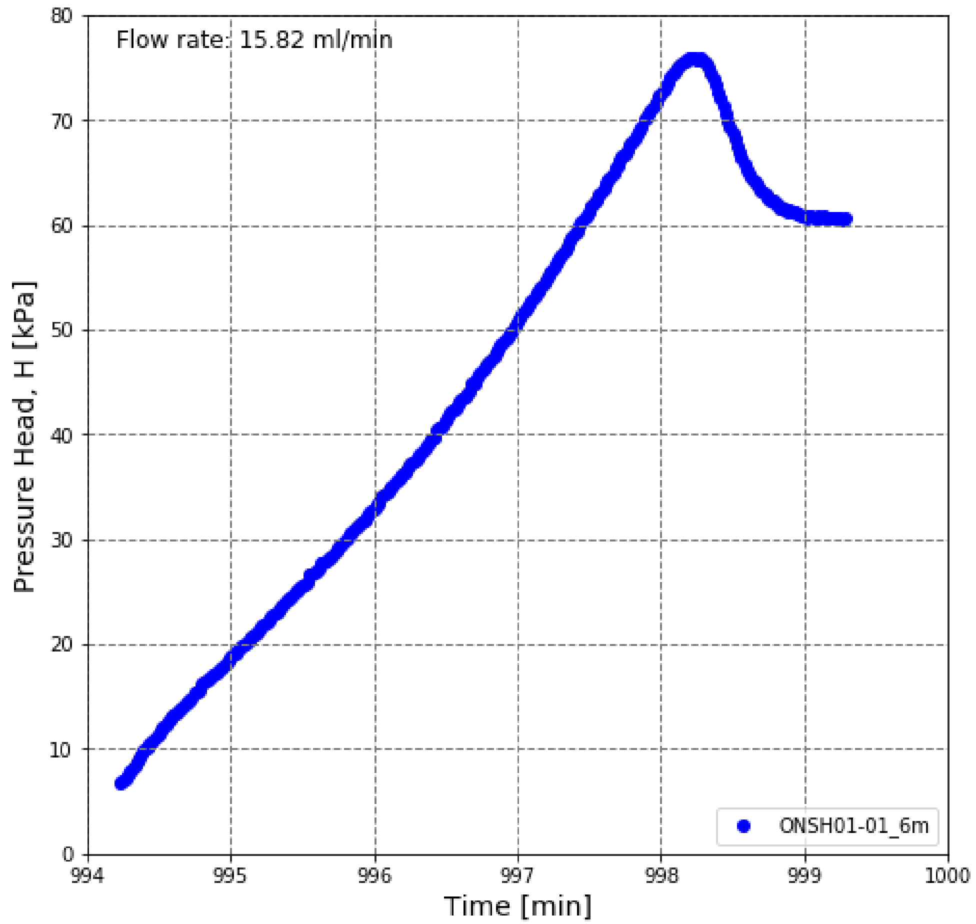


Figure I2.1 Hydraulic fracturing. ONSH01, test no. 01 at 6 m depth bgl.

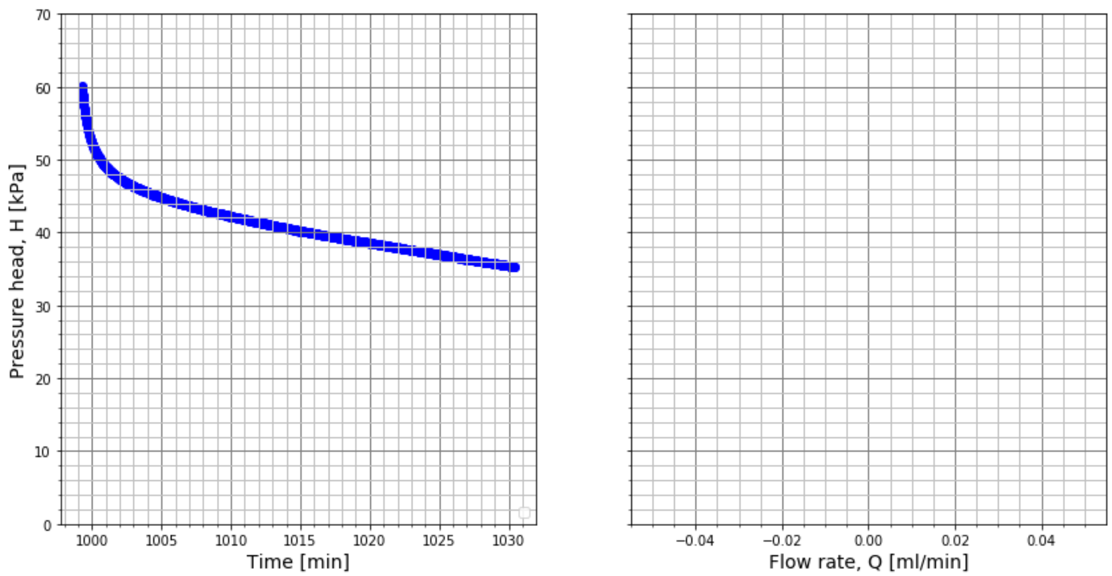


Figure I2.2 Falling head test after hydraulic fracturing. ONSH01, test no. 01 at 6 m depth bgl.

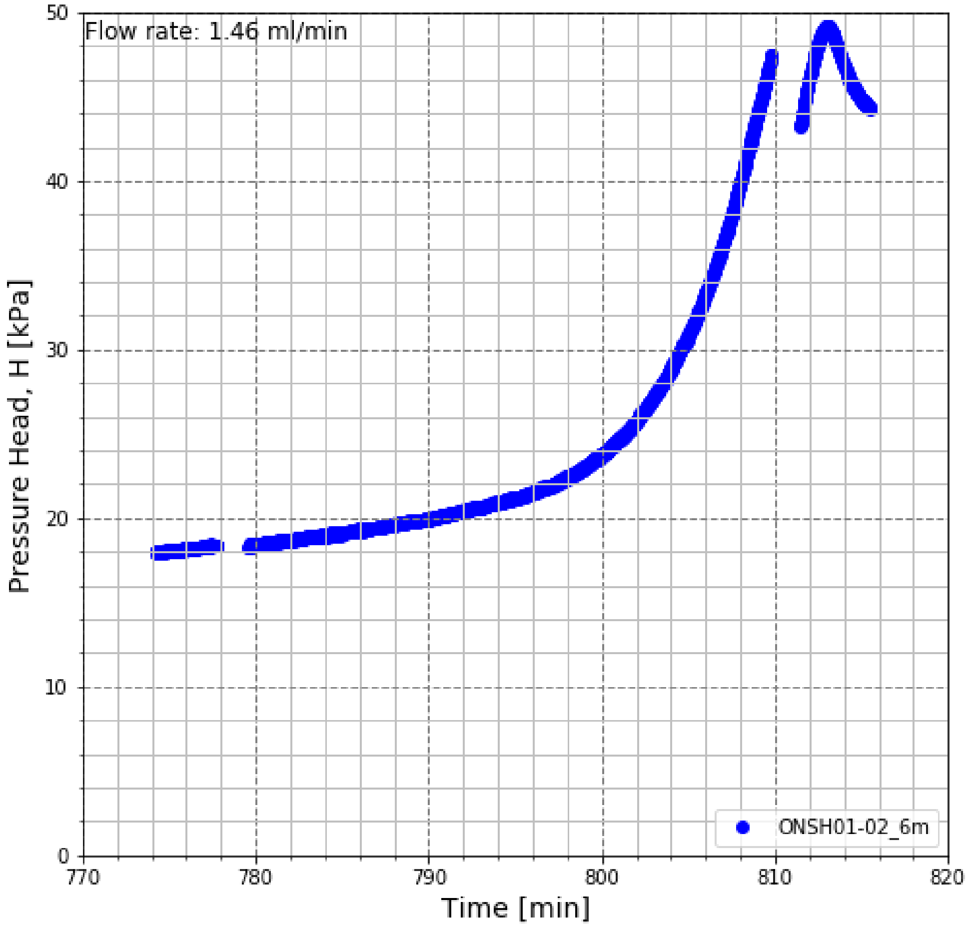


Figure I2.3 Hydraulic fracturing. ONSH01, test no. 02 at 6 m depth bgl.

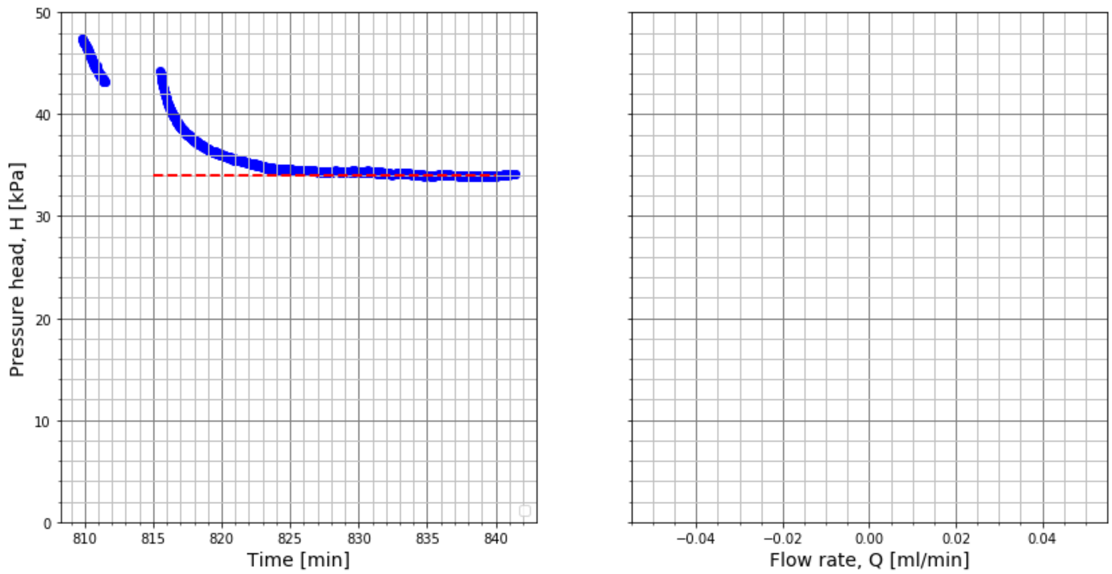


Figure I2.4 Falling head test after hydraulic fracturing. ONSH01, test no. 02 at 6 m depth bgl.

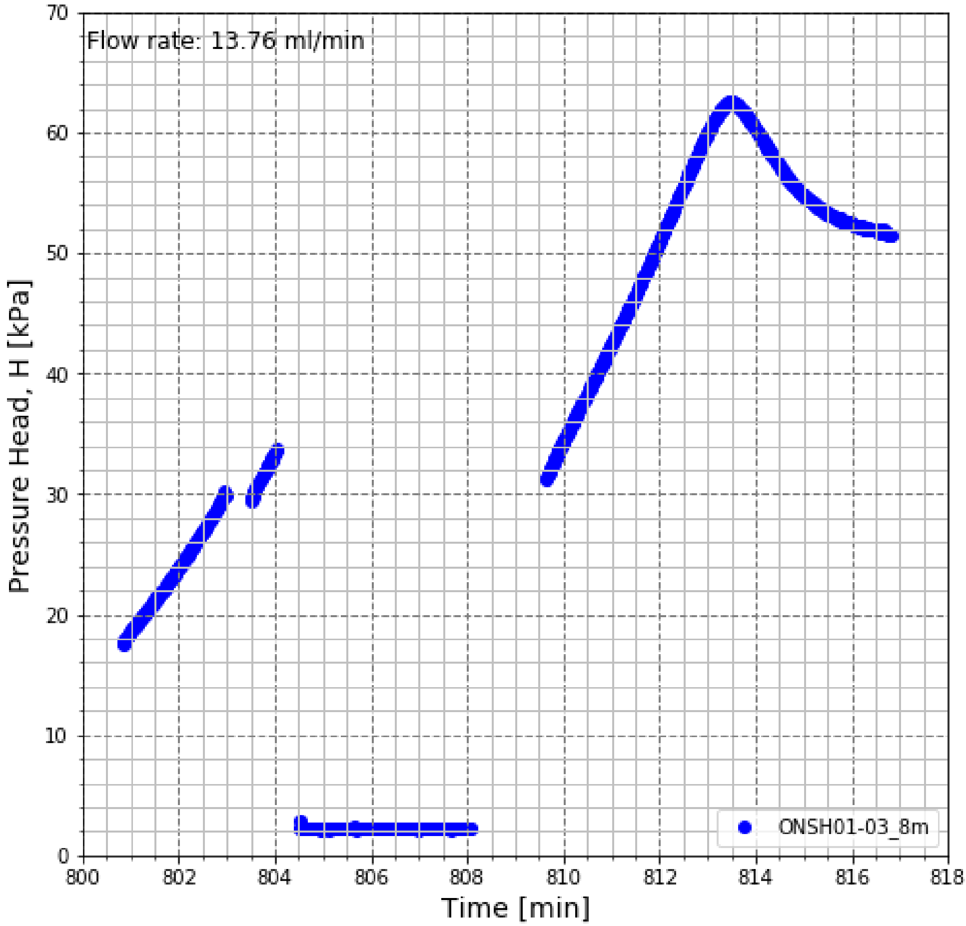


Figure I2.5 Hydraulic fracturing. ONSH01, test no. 03 at 8 m depth bgl.

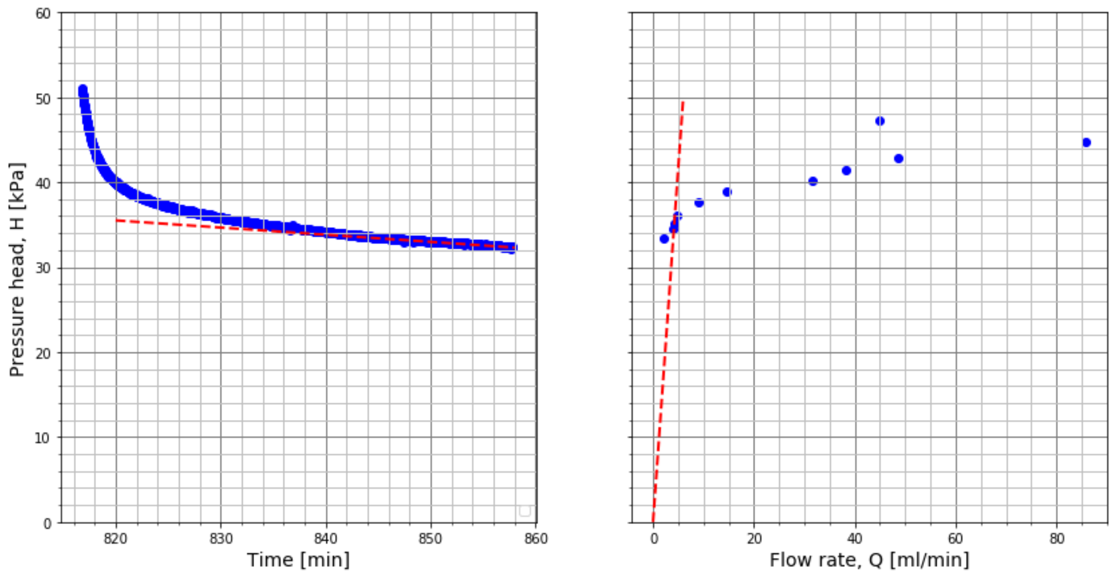


Figure I2.6 Falling head test after hydraulic fracturing. ONSH01, test no. 03 at 8 m depth bgl.

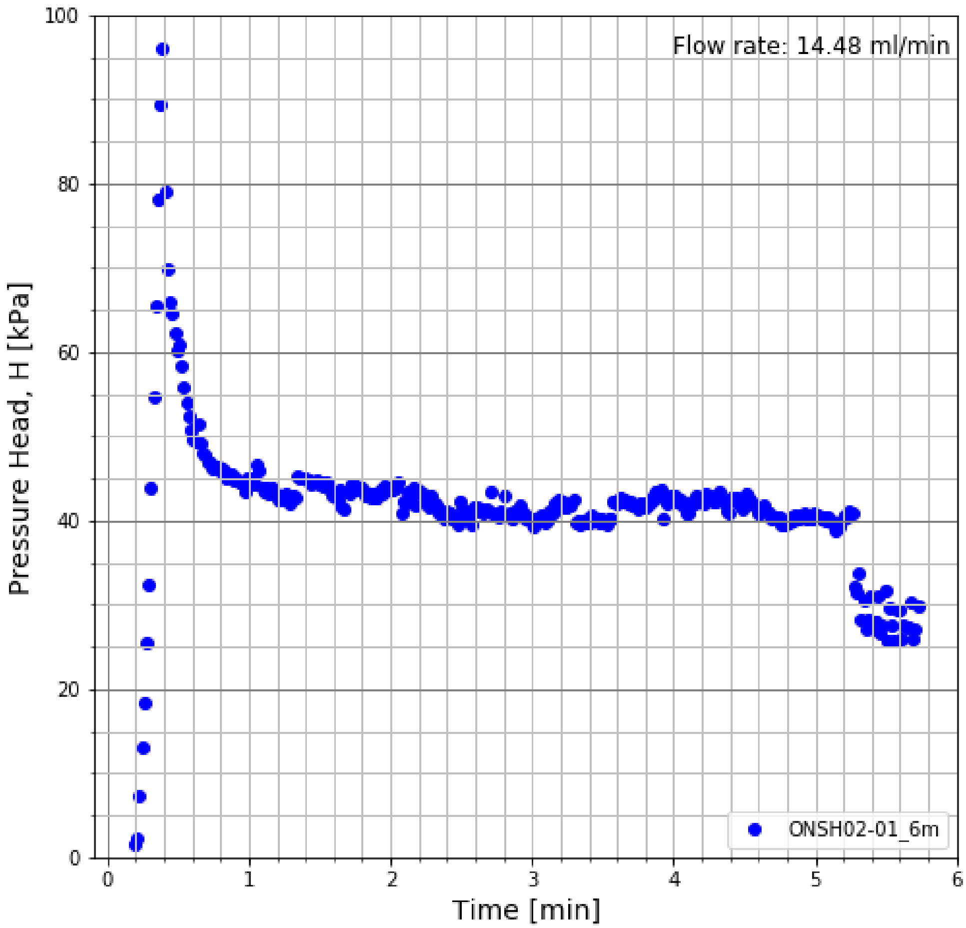


Figure I2.7 Hydraulic fracturing. ONSH02, test no. 01 at 6 m depth bgl.

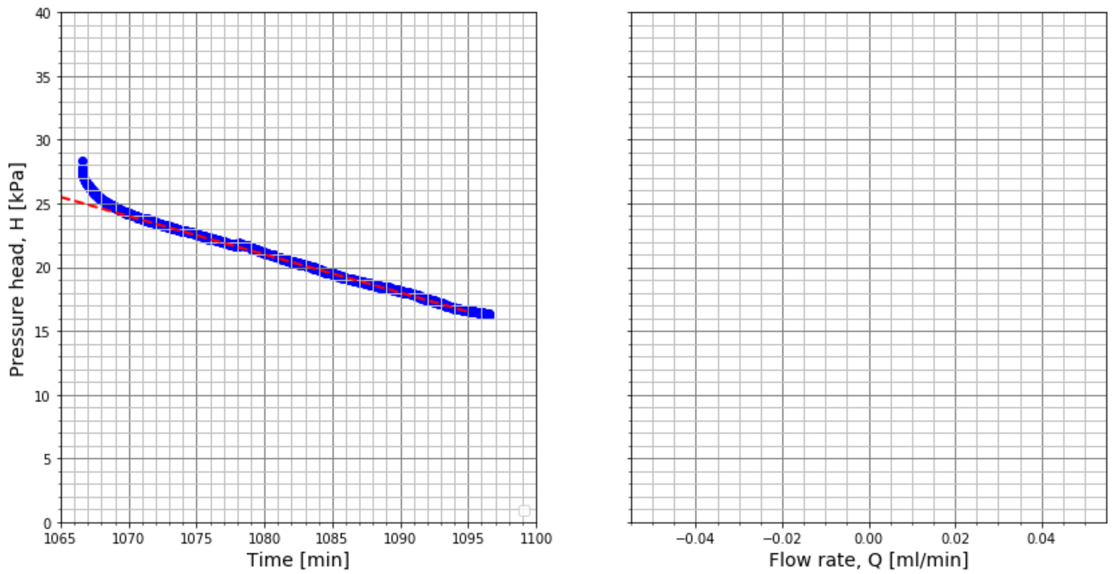


Figure I2.8 Falling head test after hydraulic fracturing. ONSH02, test no. 01 at 6 m depth bgl.

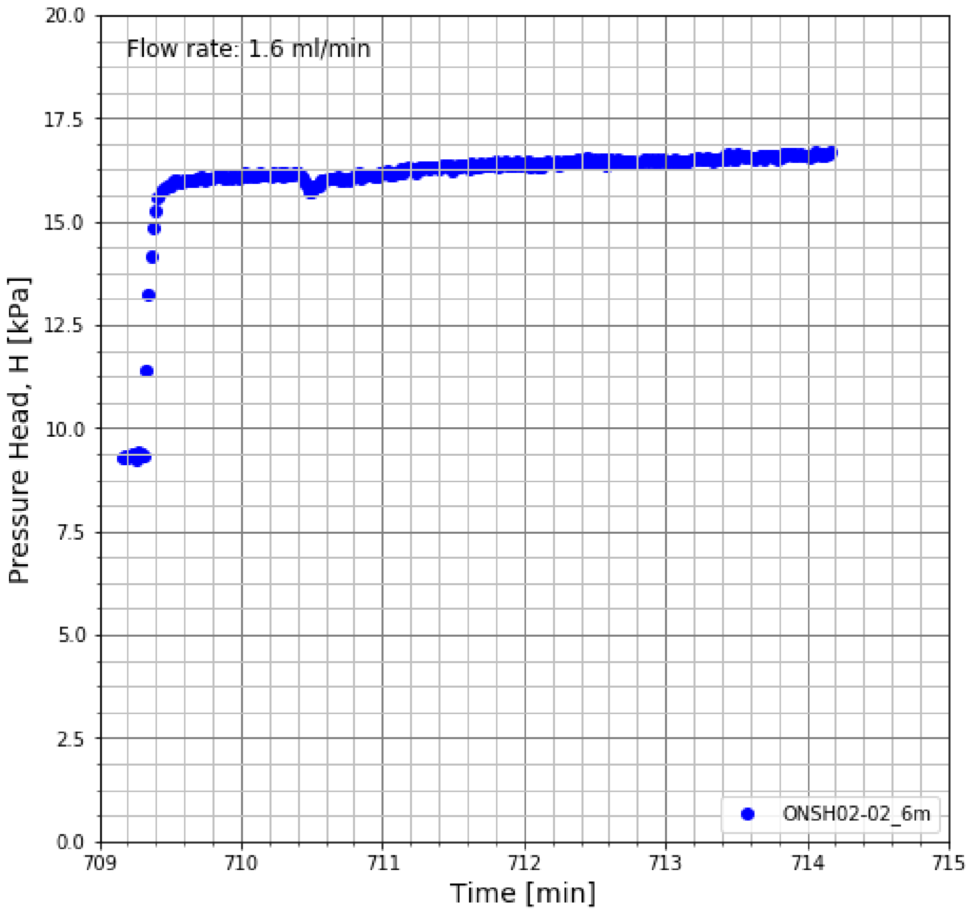


Figure I2.9 Hydraulic fracturing. ONSH02, test no. 02 at 6 m depth bgl.

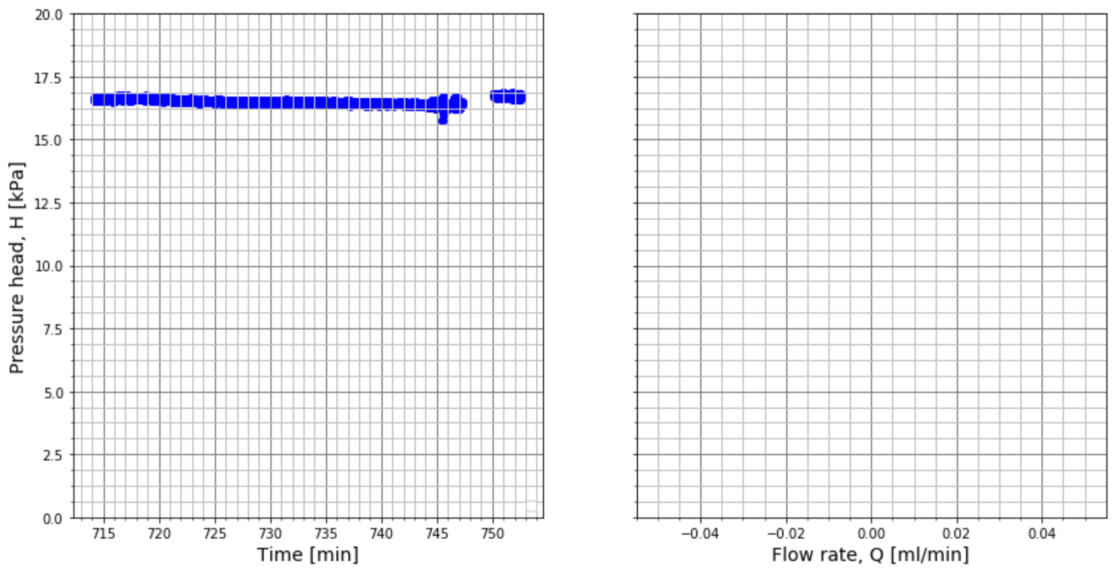


Figure I2.10 Falling head test after hydraulic fracturing. ONSH02, test no. 02 at 6 m depth bgl.

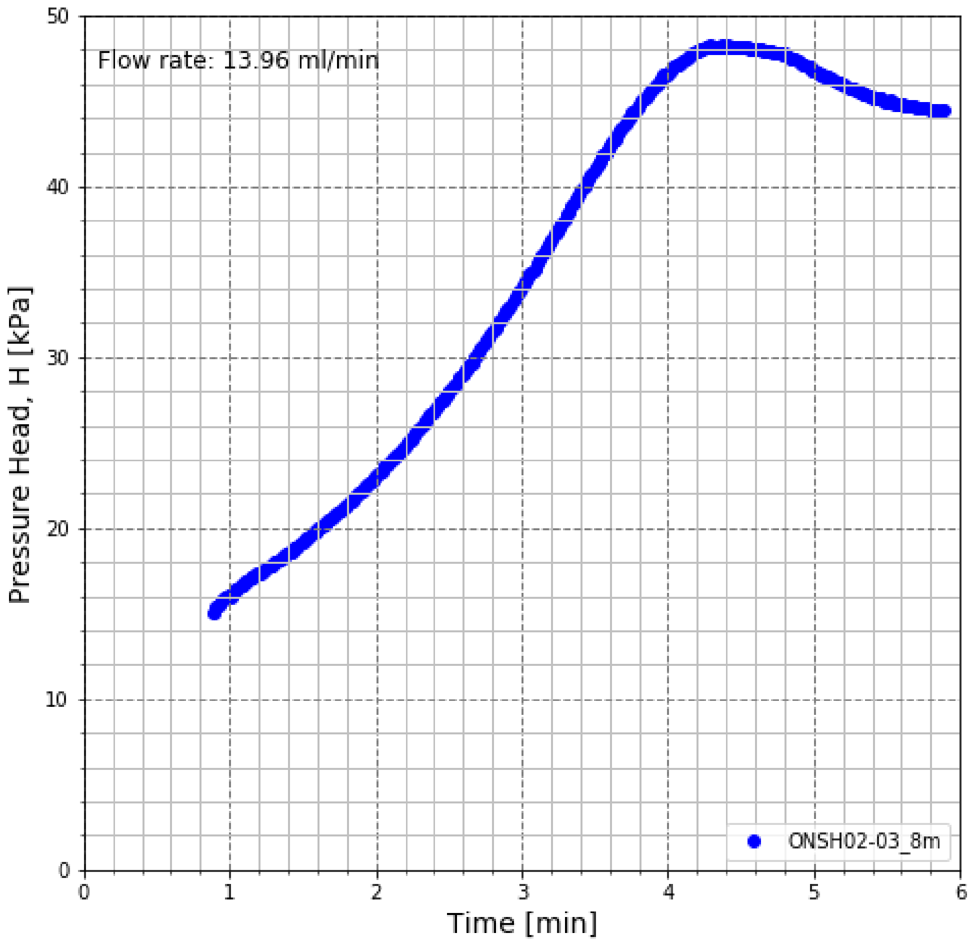


Figure I2.11 Hydraulic fracturing. ONSH02, test no. 02 at 6 m depth bgl.

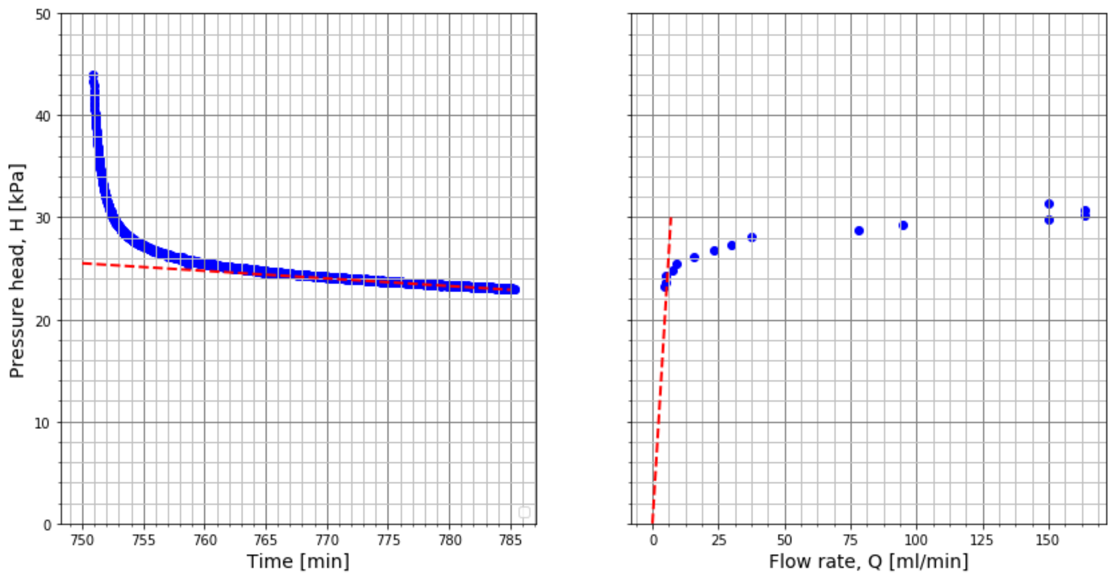


Figure I2.12 Falling head test after hydraulic fracturing. ONSH02, test no. 01 at 6 m depth bgl.

Appendix J

CALIBRATION DATA SHEETS AND USER MANUAL

Contents

Calibration Data Sheet
Advanced Solutions GLÖTZL

EPE/P AI 7/14 K5

Name of measuring point: **PWD**

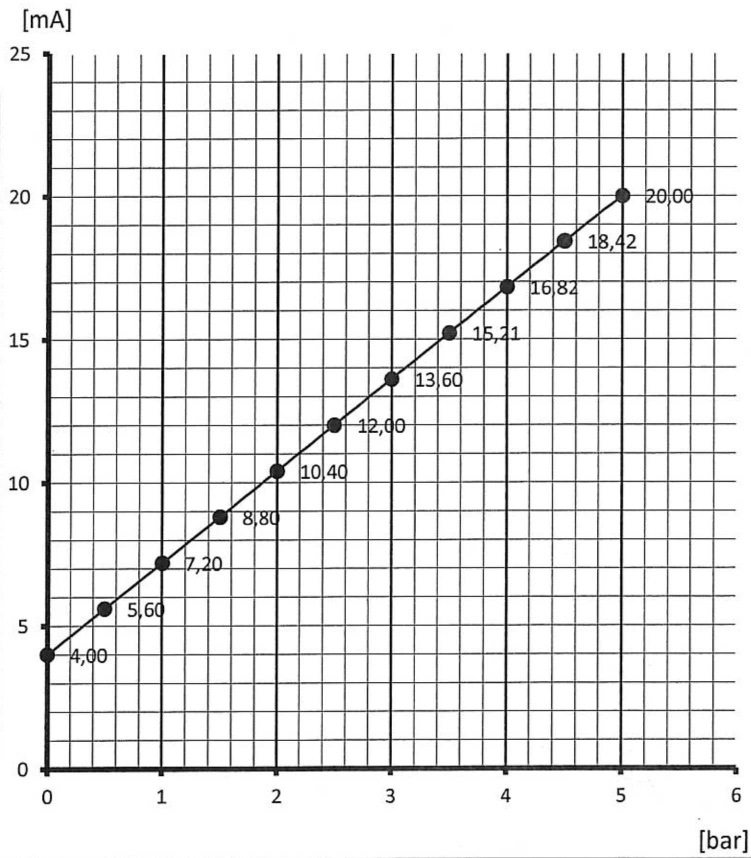
Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Porenwasserdruck**			Stab
Serial No.: 16 24691	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-5 bar	Transducer: PA-8-10 / 25	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 3,2 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,50	5,60	
1,00	7,20	
1,50	8,80	
2,00	10,40	
2,50	12,00	
3,00	13,60	
3,50	15,21	
4,00	16,82	
4,50	18,42	
5,00	20,00	

Calibration factor: 3,2 mA/bar

Calibration factor:



Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

2010 GS Version 03.05.12

Calibration Data Sheet

Advanced Solutions GLÖTZL

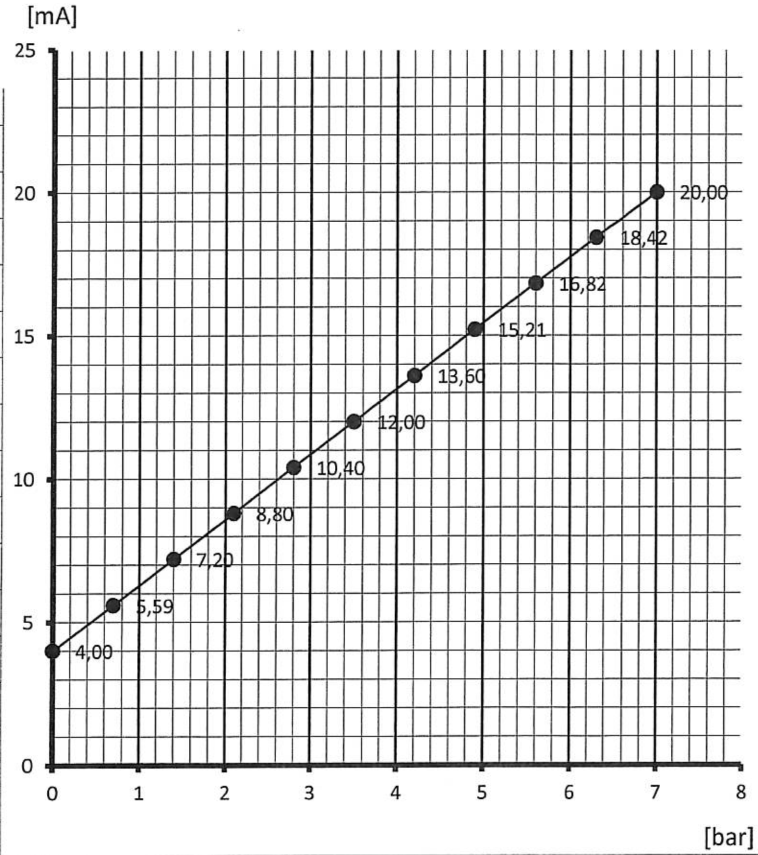
EPE/P AI 7/14 K5

Name of measuring point: **EE**

Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Erddruck**			Responsible: Stab
Serial No.: 16 24692	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-7 bar	Transducer: PA-8-10 / 97	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested: [signature]
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 2,28571 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,70	5,59	
1,40	7,20	
2,10	8,80	
2,80	10,40	
3,50	12,00	
4,20	13,60	
4,90	15,21	
5,60	16,82	
6,30	18,42	
7,00	20,00	



Calibration factor: 2,28571 mA/bar

Calibration factor:

Parameters of measuring equipment: mA

Offset:	Factor:	Zero:	A-time:	pV-value: 8,6

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

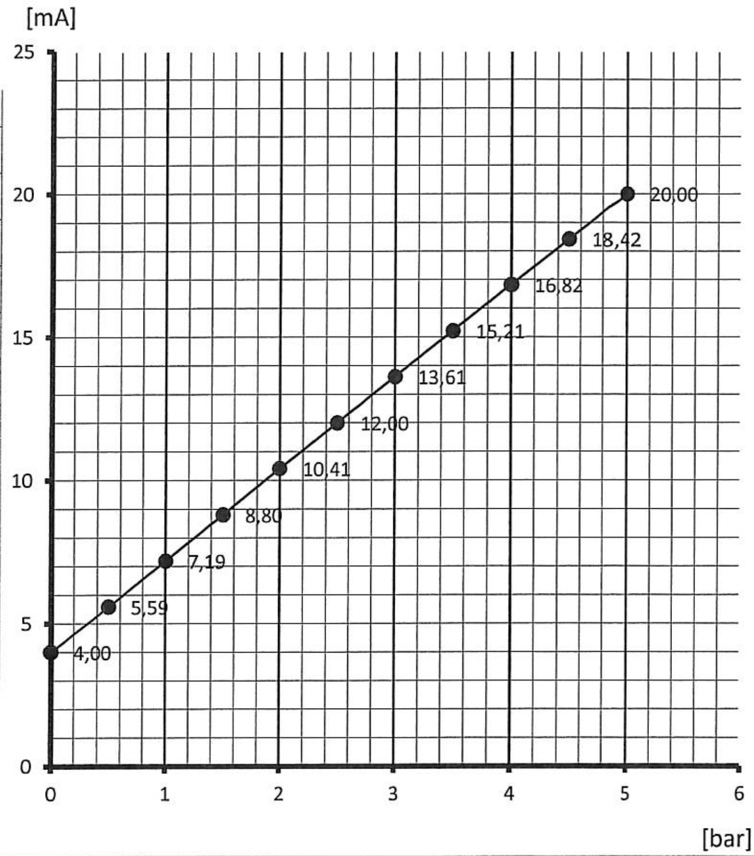
EPE/P AI 7/14 K5

Name of measuring point: **PWD**

Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Porenwasserdruck**			Responsible: Stab
Serial No.: 16 24693	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-5 bar	Transducer: PA-8-10 / 30	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested: [signature]
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 3,2 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,50	5,59	
1,00	7,19	
1,50	8,80	
2,00	10,41	
2,50	12,00	
3,00	13,61	
3,50	15,21	
4,00	16,82	
4,50	18,42	
5,00	20,00	



Calibration factor: 3,2 mA/bar

Calibration factor:

Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

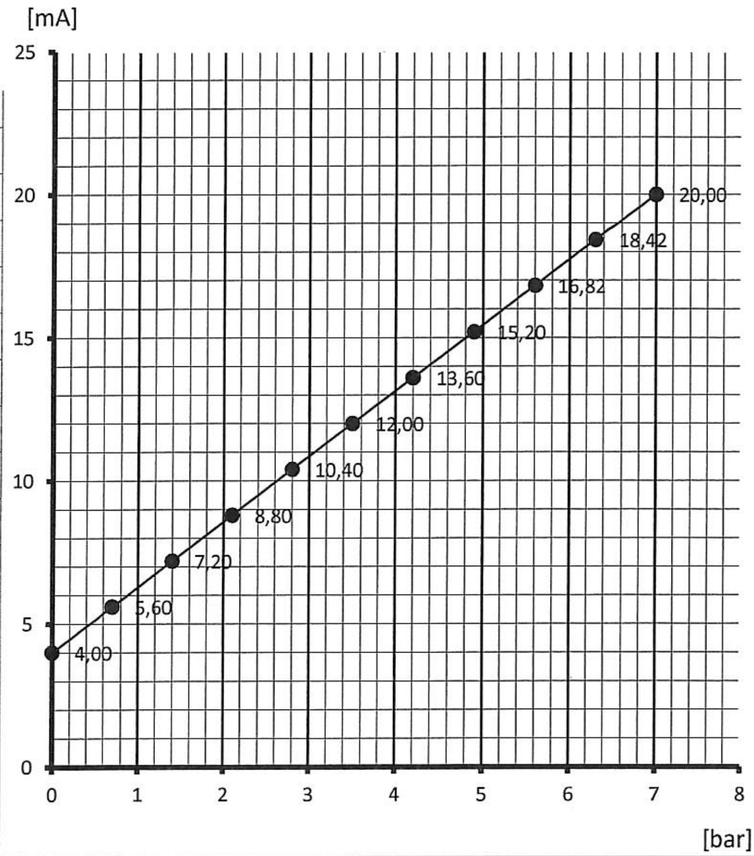
EPE/P AI 7/14 K5

Name of measuring point: **EE**

Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Erddruck**			Responsible: Stab
Serial No.: 16 24694	Client / Project: Norwegian Geotechnical Institute			Date: 28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-7 bar	Transducer: PA-8-10 / 98	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested: [signature]
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 2,28571 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,70	5,60	
1,40	7,20	
2,10	8,80	
2,80	10,40	
3,50	12,00	
4,20	13,60	
4,90	15,20	
5,60	16,82	
6,30	18,42	
7,00	20,00	



Calibration factor: 2,28571 mA/bar

Calibration factor:

Parameters of measuring equipment: mA

Offset:	Factor:	Zero:	A-time:	pV-value: 8,79

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet Advanced Solutions GLÖTZL

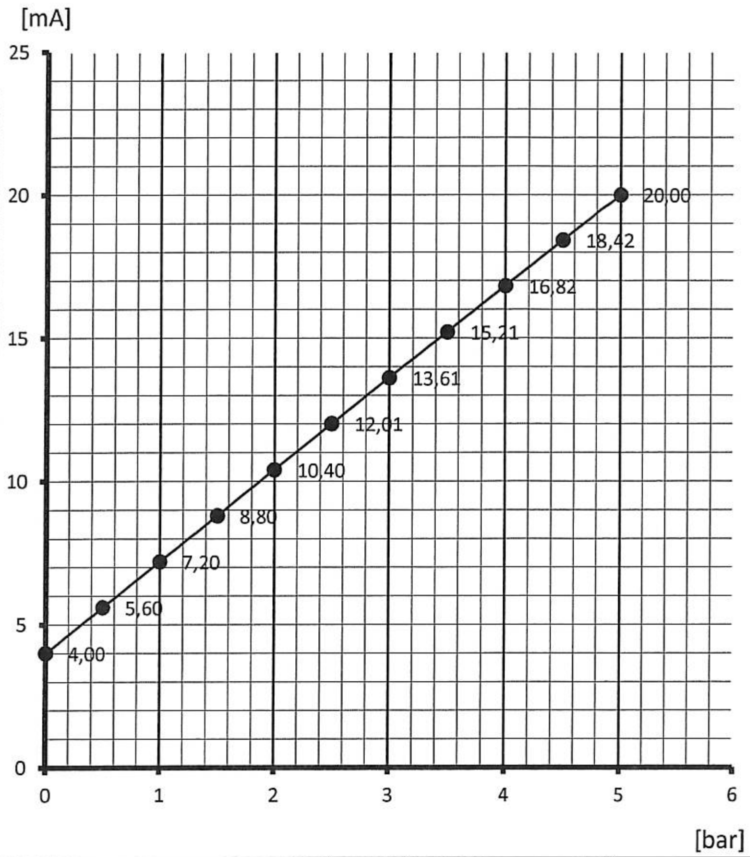
EPE/P AI 7/14 K5

Name of measuring point: **PWD**

Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Porenwasserdruck**			Responsible: Stab
Serial No.: 16 24695	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-5 bar	Transducer: PA-8-10 / 2	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 3,2 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,50	5,60	
1,00	7,20	
1,50	8,80	
2,00	10,40	
2,50	12,01	
3,00	13,61	
3,50	15,21	
4,00	16,82	
4,50	18,42	
5,00	20,00	



Calibration factor: 3,2 mA/bar

Calibration factor:

Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin configuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

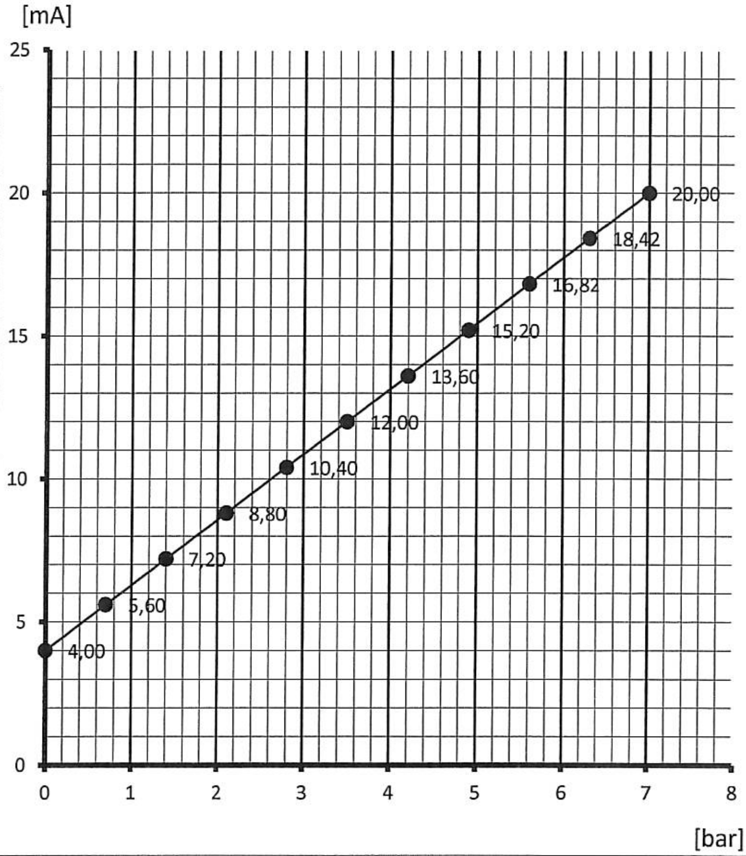
EPE/P AI 7/14 K5

Name of measuring point: **EE**

Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Erddruck**			Stab
Serial No.:	Client / Project:			Date:
16 24696	Norwegian Geotechnical Institute			28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-7 bar	Transducer: PA-8-10 / 104	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: -25 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 2,28571 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,70	5,60	
1,40	7,20	
2,10	8,80	
2,80	10,40	
3,50	12,00	
4,20	13,60	
4,90	15,20	
5,60	16,82	
6,30	18,42	
7,00	20,00	



Calibration factor: 2,28571 mA/bar

Calibration factor:

Parameters of measuring equipment: mA

Offset:	Factor:	Zero:	A-time:	pV-value: 8,67

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet Advanced Solutions GLÖTZL

EPE/P AI 7/14 K5

Name of measuring point: **PWD**

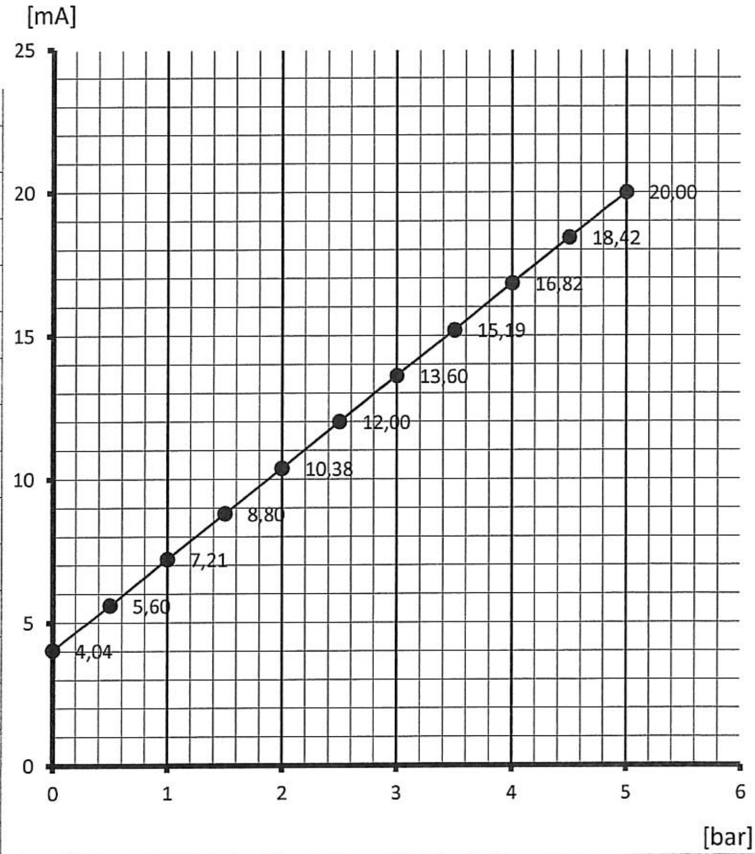
Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Porenwasserdruck**			Responsible: Stab
Serial No.: 16 24697	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-5 bar	Transducer: PA-8-10 / 26	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 3,2 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,04	
0,50	5,60	
1,00	7,21	
1,50	8,80	
2,00	10,38	
2,50	12,00	
3,00	13,60	
3,50	15,19	
4,00	16,82	
4,50	18,42	
5,00	20,00	

Calibration factor: 3,2 mA/bar

Calibration factor:



Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

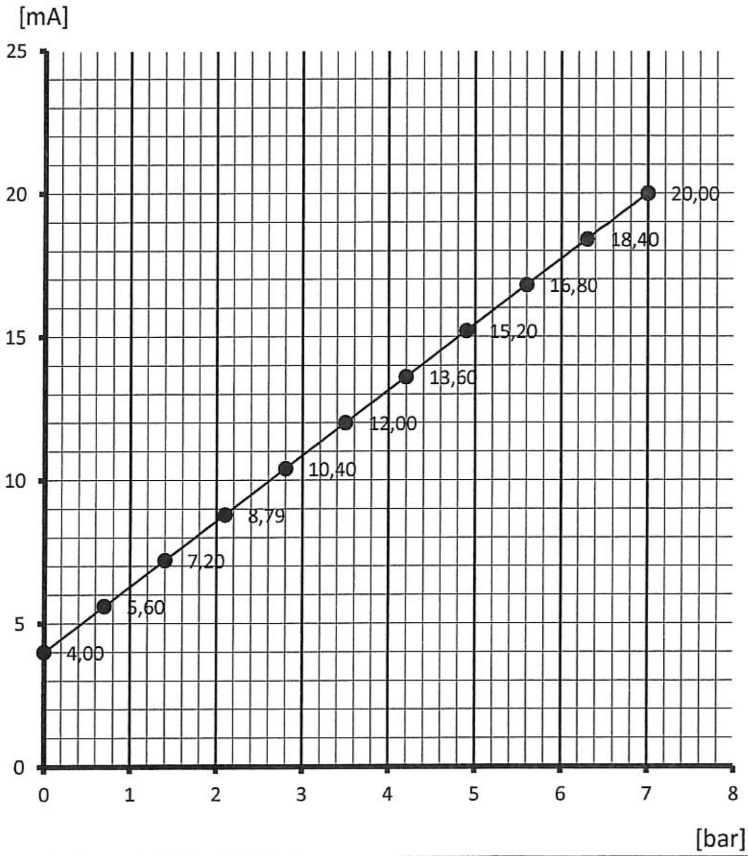
EPE/P AI 7/14 K5

Name of measuring point: **EE**

Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Erddruck**			Responsible: Stab
Serial No.: 16 24698	Client / Project: Norwegian Geotechnical Institute			Date: 28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-7 bar	Transducer: PA-8-10 / 100	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: -25 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 2,28571 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,70	5,60	
1,40	7,20	
2,10	8,79	
2,80	10,40	
3,50	12,00	
4,20	13,60	
4,90	15,20	
5,60	16,80	
6,30	18,40	
7,00	20,00	



Calibration factor: 2,28571 mA/bar

Calibration factor:

Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:	mA 8,72

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Connection line Number	Main cable Grouping	Terminator	Measuring device Connection	Measuring device Channel
		Supply +	red					
		Supply -	blue					
		Screen	transp.					

Calibration Data Sheet Advanced Solutions GLÖTZL

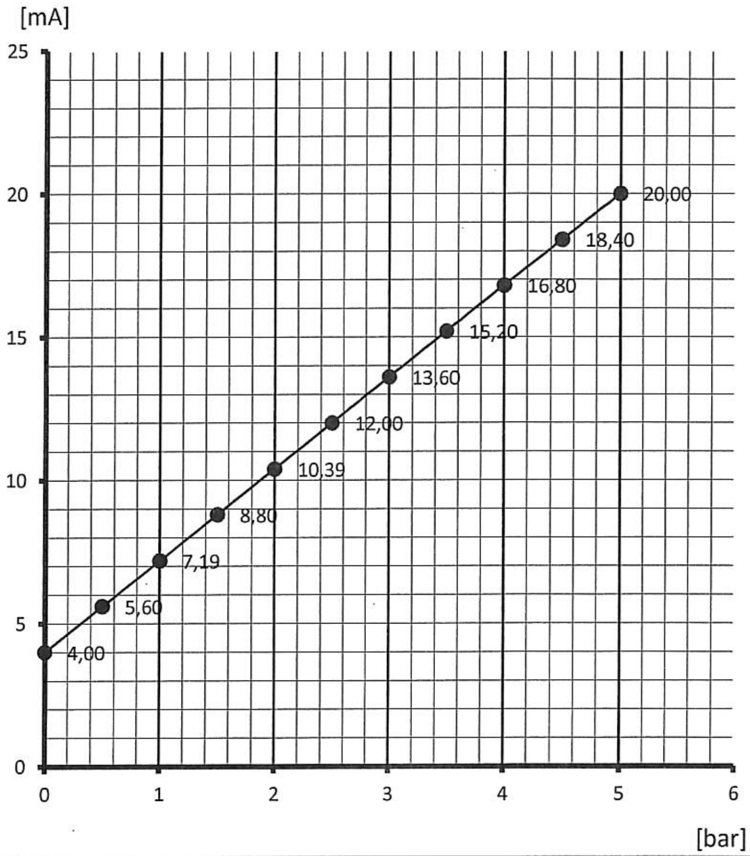
EPE/P AI 7/14 K5

Name of measuring point: **PWD**

Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Porenwasserdruck**			Responsible: Stab
Serial No.: 16 24699	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-5 bar	Transducer: PA-8-10 / 19	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested: [signature]
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 3,2 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,50	5,60	
1,00	7,19	
1,50	8,80	
2,00	10,39	
2,50	12,00	
3,00	13,60	
3,50	15,20	
4,00	16,80	
4,50	18,40	
5,00	20,00	



Calibration factor: 3,2 mA/bar

Calibration factor:

Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin configuration	Connection line Color	Connection line Number	Main cable Grouping	Terminator	Measuring device Connection	Measuring device Channel
		Supply +	red					
		Supply -	blue					
		Screen	transp.					

Calibration Data Sheet

Advanced Solutions GLÖTZL

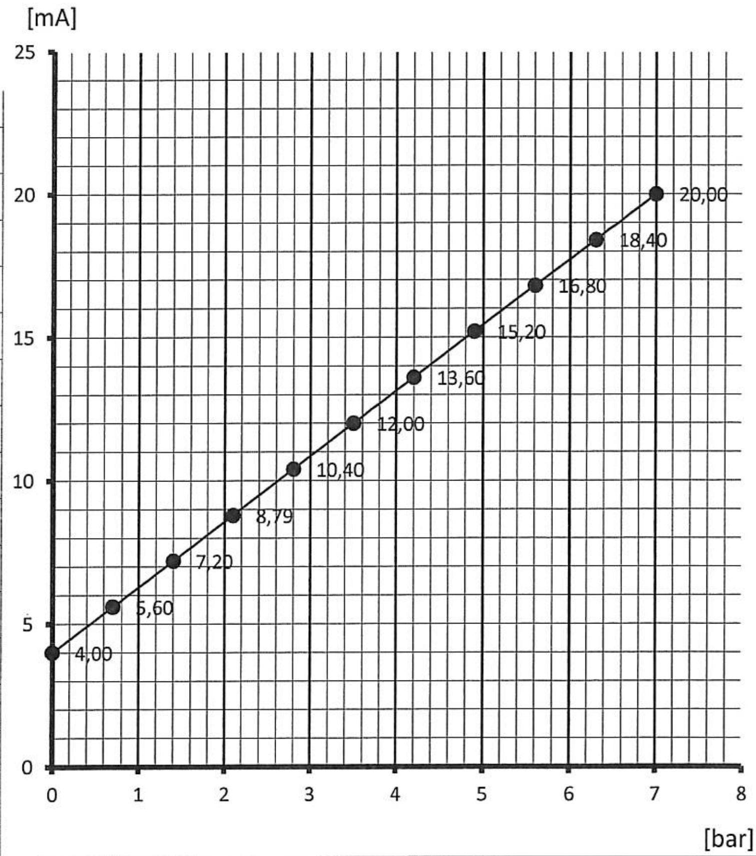
EPE/P AI 7/14 K5

Name of measuring point: **EE**

Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Erddruck**			Responsible: Stab
Serial No.: 16 24700	Client / Project: Norwegian Geotechnical Institute			Date: 28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-7 bar	Transducer: PA-8-10 / 106	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: -25 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 2,28571 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,70	5,60	
1,40	7,20	
2,10	8,79	
2,80	10,40	
3,50	12,00	
4,20	13,60	
4,90	15,20	
5,60	16,80	
6,30	18,40	
7,00	20,00	



Calibration factor: 2,28571 mA/bar

Calibration factor:

Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:	mA 8,64

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

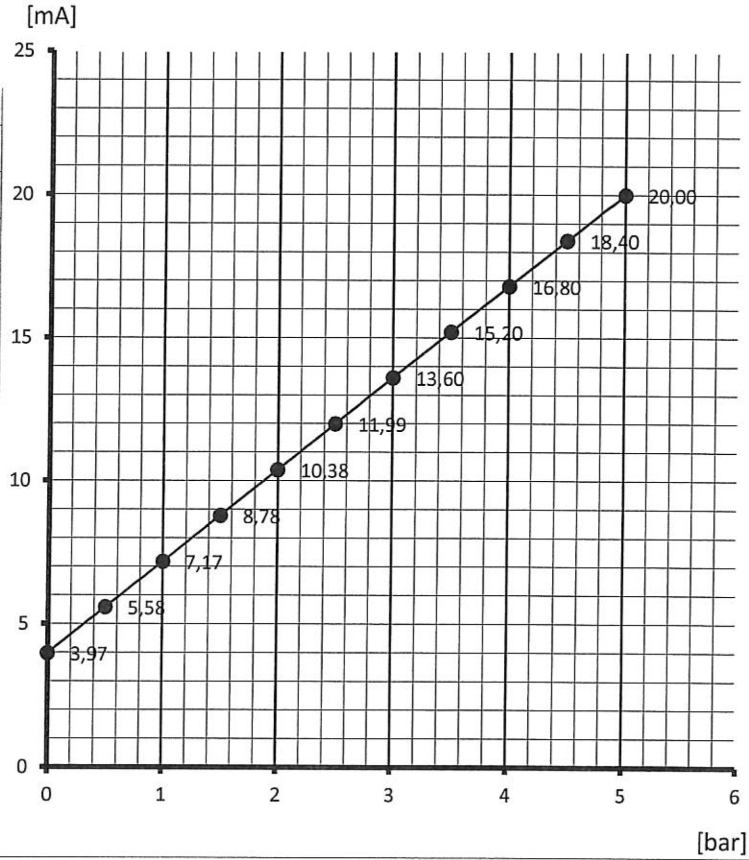
EPE/P AI 7/14 K5

Name of measuring point: **PWD**

Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Porenwasserdruck**			Stab
Serial No.:	Client / Project:			Date:
16 24701	Norwegian Geotechnical Institute			27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-5 bar	Transducer: PA-8-10 / 11	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 3,2 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	**Measured value in** [mA]	
0,00	3,97	
0,50	5,58	
1,00	7,17	
1,50	8,78	
2,00	10,38	
2,50	11,99	
3,00	13,60	
3,50	15,20	
4,00	16,80	
4,50	18,40	
5,00	20,00	



Calibration factor: 3,2 mA/bar

Calibration factor:

Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

EPE/P AI 7/14 K5 Name of measuring point: **EE**

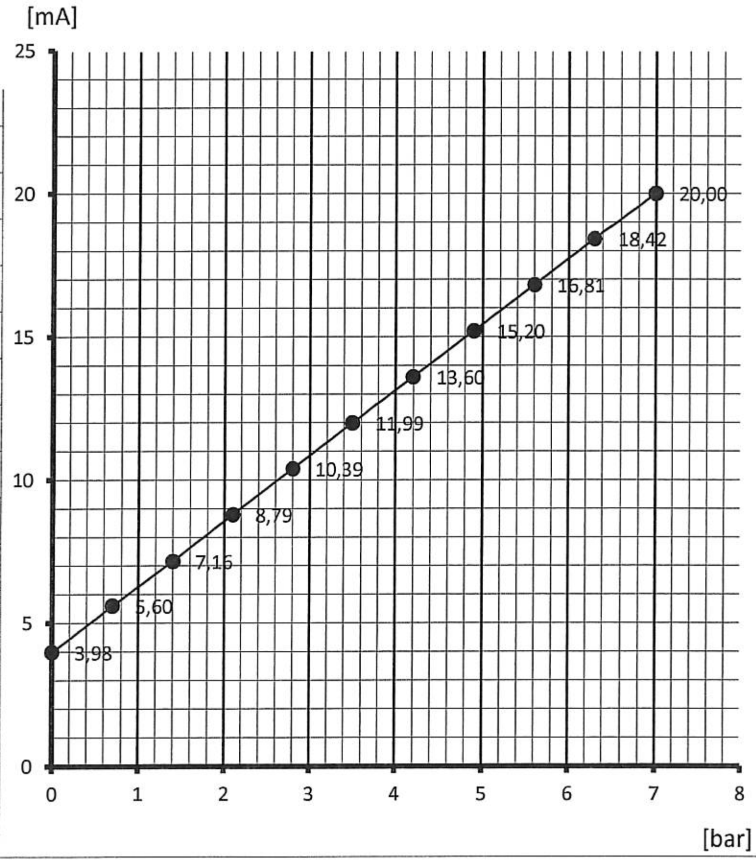
Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Erddruck**			Stab
Serial No.:	Client / Project:			Date:
16 24702	Norwegian Geotechnical Institute			28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-7 bar	Transducer: PA-8-10 / 27	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: -25 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 2,28571 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	**Measured value in** [mA]	
0,00	3,98	
0,70	5,60	
1,40	7,16	
2,10	8,79	
2,80	10,39	
3,50	11,99	
4,20	13,60	
4,90	15,20	
5,60	16,81	
6,30	18,42	
7,00	20,00	

Calibration factor: 2,28571 mA/bar

Calibration factor:



Parameters of measuring equipment: mA

Offset:	Factor:	Zero:	A-time:	pV-value: 8,72

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

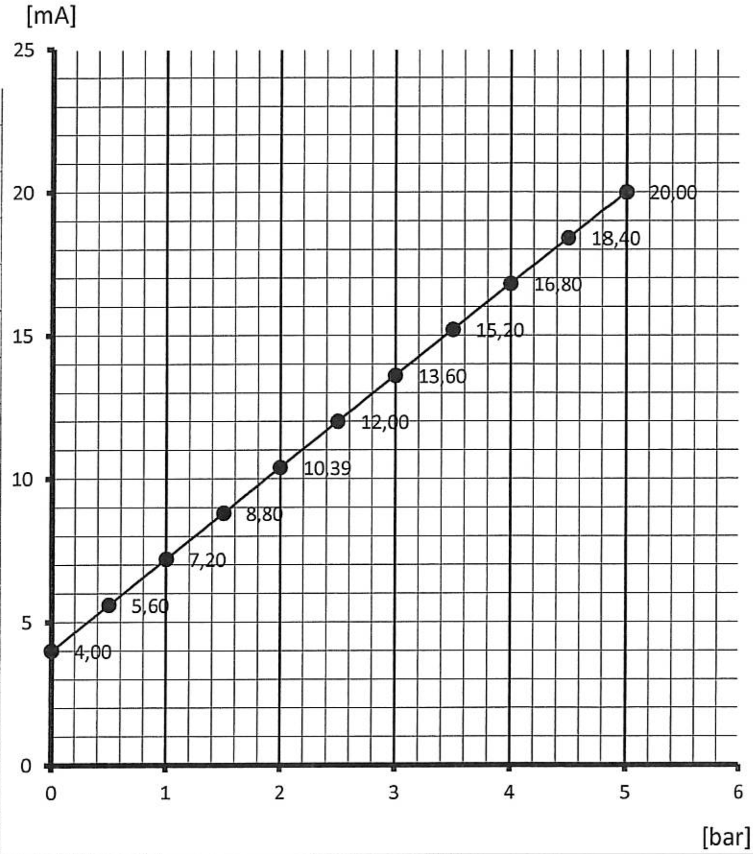
Advanced Solutions GLÖTZL

EPE/P AI 7/14 K5 Name of measuring point: **PWD**

Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Porenwasserdruck**			Responsible: Stab
Serial No.: 16 24703	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-5 bar	Transducer: PA-8-10 / 3	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 3,2 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,50	5,60	
1,00	7,20	
1,50	8,80	
2,00	10,39	
2,50	12,00	
3,00	13,60	
3,50	15,20	
4,00	16,80	
4,50	18,40	
5,00	20,00	



Calibration factor: 3,2 mA/bar

Calibration factor:

Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

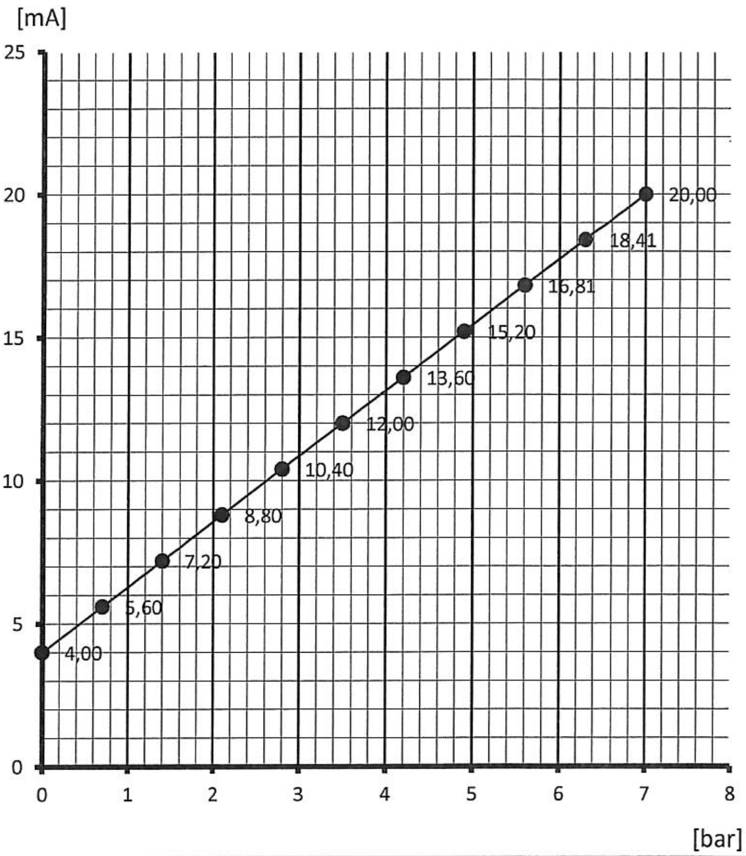
EPE/P AI 7/14 K5

Name of measuring point: **EE**

Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Erddruck**			Stab
Serial No.:	Client / Project:			Date:
16 24704	Norwegian Geotechnical Institute			28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-7 bar	Transducer: PA-8-10 / 103	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: -25 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 2,28571 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,70	5,60	
1,40	7,20	
2,10	8,80	
2,80	10,40	
3,50	12,00	
4,20	13,60	
4,90	15,20	
5,60	16,81	
6,30	18,41	
7,00	20,00	



Calibration factor: 2,28571 mA/bar

Calibration factor:

Parameters of measuring equipment: mA

Offset:	Factor:	Zero:	A-time:	pV-value: 8,66

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet Advanced Solutions GLÖTZL

EPE/P AI 7/14 K5

Name of measuring point: **PWD**

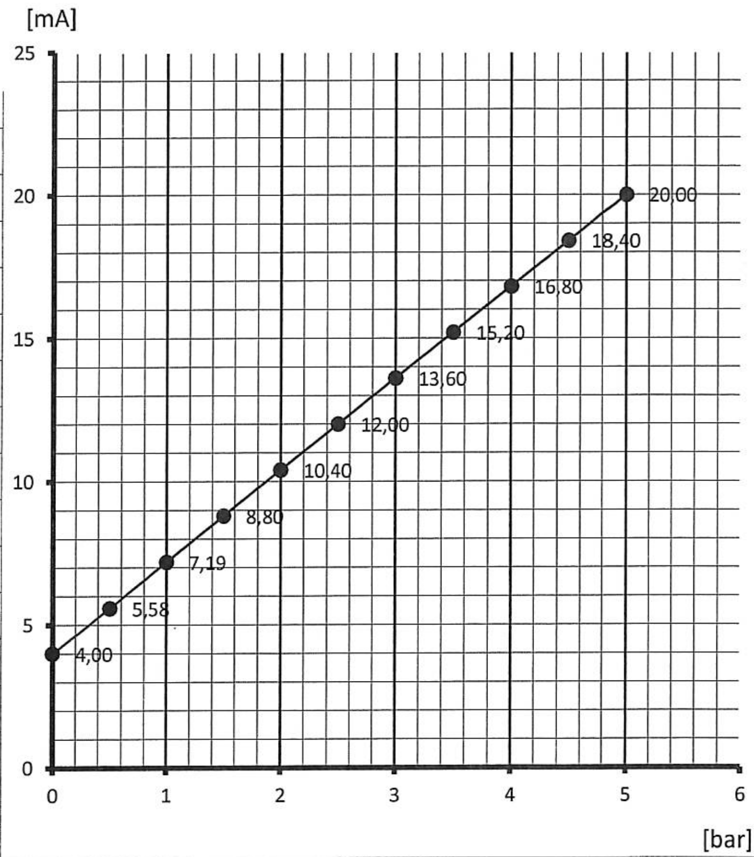
Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Porenwasserdruck**			Responsible: Stab
Serial No.: 16 24705	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-5 bar	Transducer: PA-8-10 / 31	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 3,2 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,50	5,58	
1,00	7,19	
1,50	8,80	
2,00	10,40	
2,50	12,00	
3,00	13,60	
3,50	15,20	
4,00	16,80	
4,50	18,40	
5,00	20,00	

Calibration factor: 3,2 mA/bar

Calibration factor:



Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

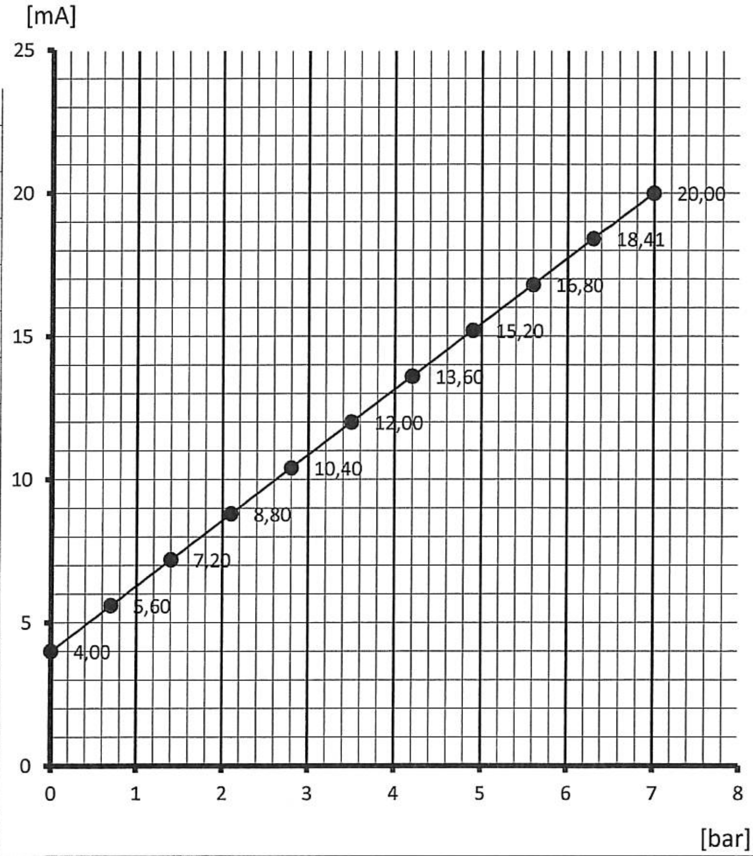
Advanced Solutions GLÖTZL

EPE/P AI 7/14 K5 Name of measuring point: **EE**

Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Erddruck**			Stab
Serial No.: 16 24706	Client / Project: Norwegian Geotechnical Institute			Date: 28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-7 bar	Transducer: PA-8-10 / 103	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: -25 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 2,28571 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,70	5,60	
1,40	7,20	
2,10	8,80	
2,80	10,40	
3,50	12,00	
4,20	13,60	
4,90	15,20	
5,60	16,80	
6,30	18,41	
7,00	20,00	



Calibration factor: 2,28571 mA/bar

Calibration factor:

Parameters of measuring equipment: mA

Offset:	Factor:	Zero:	A-time:	pV-value: 8,81

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

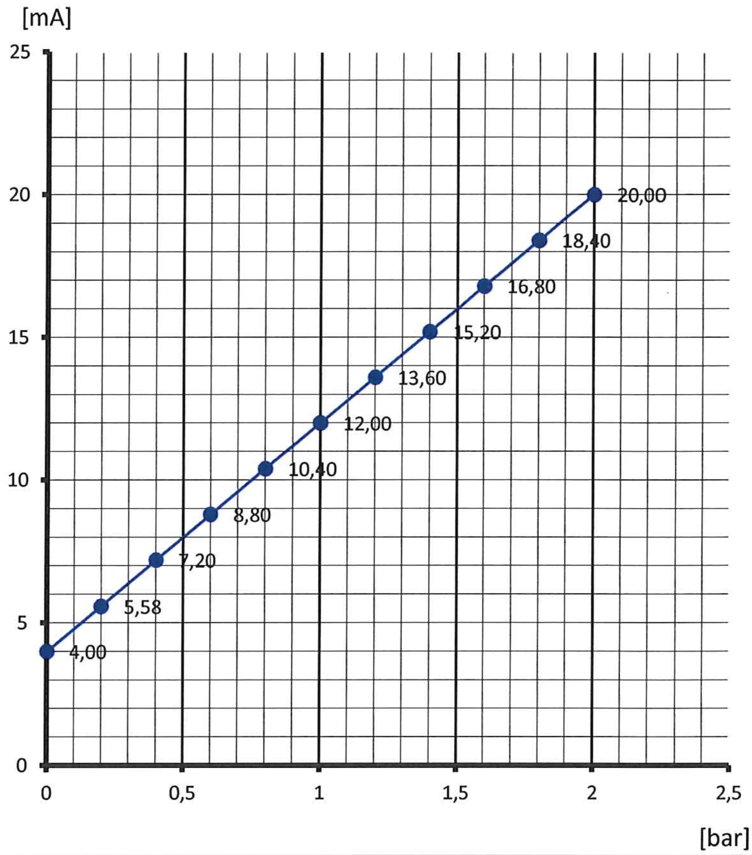
EPE/P AI 7/14 K2

Name of measuring point: **PWD**

Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Porenwasserdruck**			Stab
Serial No.:	Client / Project:			Date:
16 24707	Norwegian Geotechnical Institute			27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-2 bar	Transducer: PA-10-5 / 392	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 8 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	**Measured value in** [mA]	
0,00	4,00	
0,20	5,58	
0,40	7,20	
0,60	8,80	
0,80	10,40	
1,00	12,00	
1,20	13,60	
1,40	15,20	
1,60	16,80	
1,80	18,40	
2,00	20,00	



Calibration factor: 8 mA/bar

Calibration factor:

Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

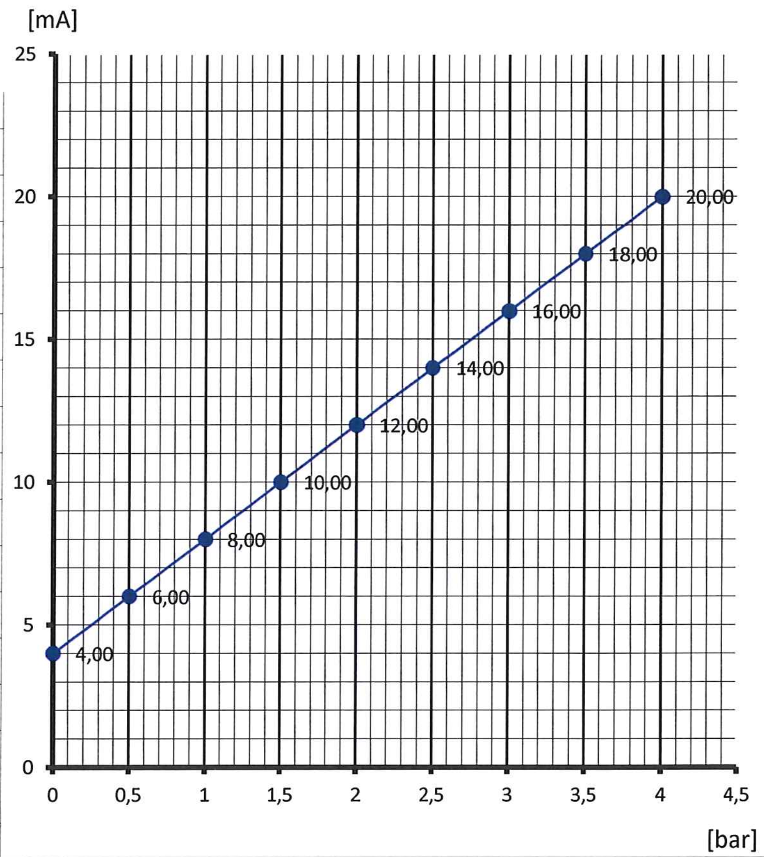
EPE/P AI 7/14 K2

Name of measuring point: **EE**

Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Erddruck**			Stab
Serial No.:	Client / Project:			Date:
16 24708	Norwegian Geotechnical Institute			28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-4 bar	Transducer: PA-8-5 / 434	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: -25 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 4 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	**Measured value in** [mA]	
0,00	4,00	
0,50	6,00	
1,00	8,00	
1,50	10,00	
2,00	12,00	
2,50	14,00	
3,00	16,00	
3,50	18,00	
4,00	20,00	



Calibration factor: 4 mA/bar

Calibration factor:

Parameters of measuring equipment: mA

Offset:	Factor:	Zero:	A-time:	pV-value: 11,71

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

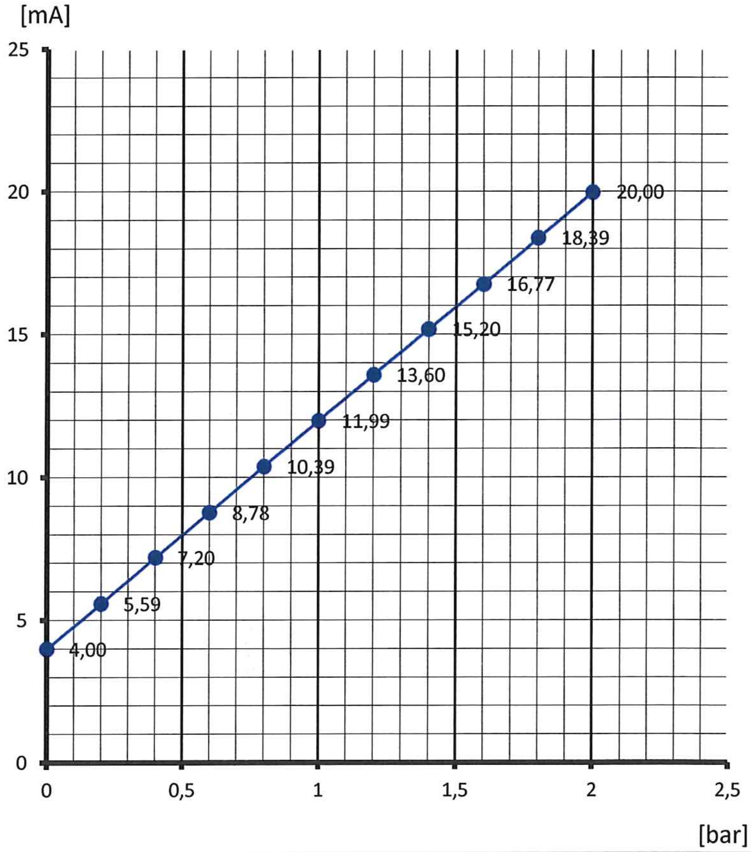
EPE/P AI 7/14 K2

Name of measuring point: **PWD**

Order No.: **26537/3**	Cell / Transducer for: **Einpressgeber Porenwasserdruck**			Responsible: Stab
Serial No.: 16 24709	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-2 bar	Transducer: PA-10-5 / 426	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 8 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	**Measured value in** [mA]	
0,00	4,00	
0,20	5,59	
0,40	7,20	
0,60	8,78	
0,80	10,39	
1,00	11,99	
1,20	13,60	
1,40	15,20	
1,60	16,77	
1,80	18,39	
2,00	20,00	



Calibration factor: 8 mA/bar

Calibration factor:

Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

EPE/P AI 7/14 K2

Name of measuring point: **EE**

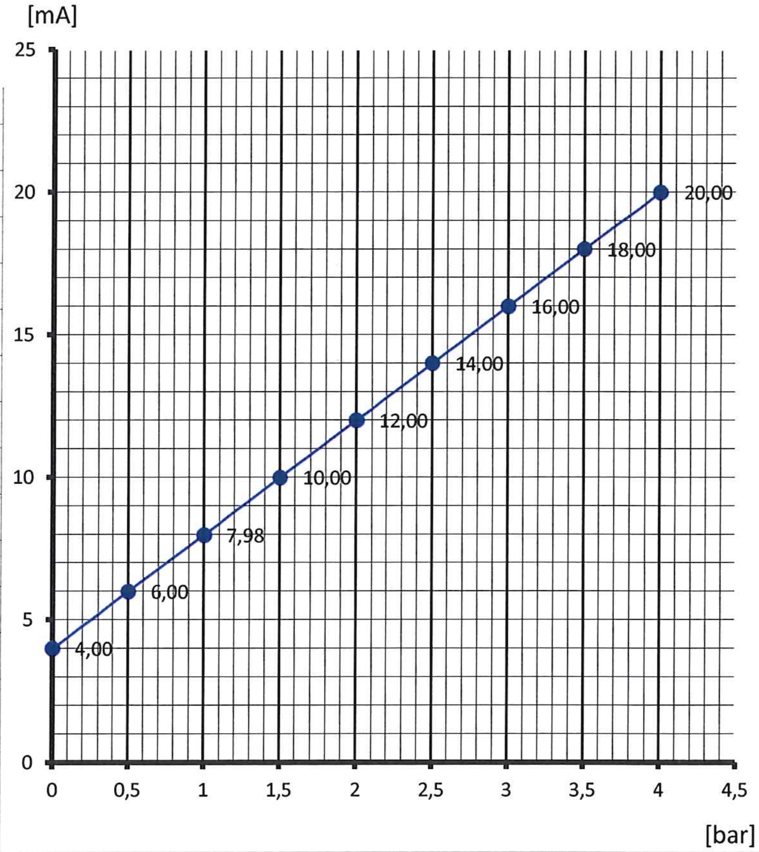
Order No.: 26537/3	Cell / Transducer for: Einpressgeber Erddruck			Responsible: Stab
Serial No.: 16 24710	Client / Project: Norwegian Geotechnical Institute			Date: 28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-4 bar	Transducer: PA-8-5 / 405	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: -25 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 4 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
0,50	6,00	
1,00	7,98	
1,50	10,00	
2,00	12,00	
2,50	14,00	
3,00	16,00	
3,50	18,00	
4,00	20,00	

Calibration factor: 4 mA/bar

Calibration factor:



Parameters of measuring equipment: mA

Offset:	Factor:	Zero:	A-time:	pV-value: 7,86

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

EPE/P AI 7/14 K10

Name of measuring point: **PWD**

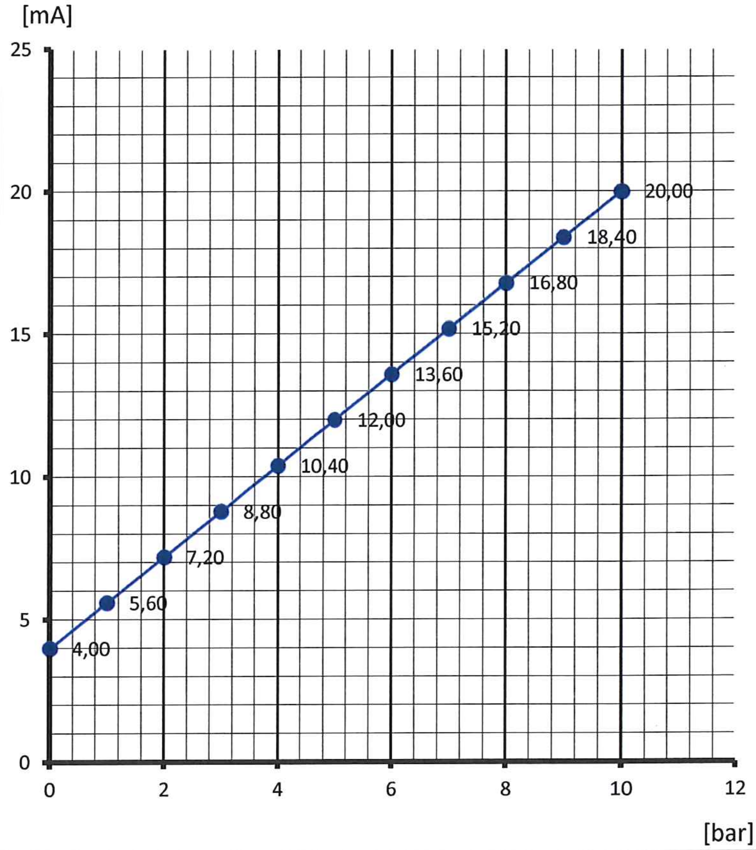
Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Porenwasserdruck**			Stab
Serial No.: 16 24711	Client / Project: Norwegian Geotechnical Institute			Date: 27.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-10 bar	Transducer: PA-8-10 / 3	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested: [signature]
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: +5 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 1,6 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds.** **Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	**Measured value in** [mA]	
0,00	4,00	
1,00	5,60	
2,00	7,20	
3,00	8,80	
4,00	10,40	
5,00	12,00	
6,00	13,60	
7,00	15,20	
8,00	16,80	
9,00	18,40	
10,00	20,00	

Calibration factor: 1,6 mA/bar

Calibration factor:



Parameters of measuring equipment:

Offset:	Factor:	Zero:	A-time:	pV-value:

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Calibration Data Sheet

Advanced Solutions GLÖTZL

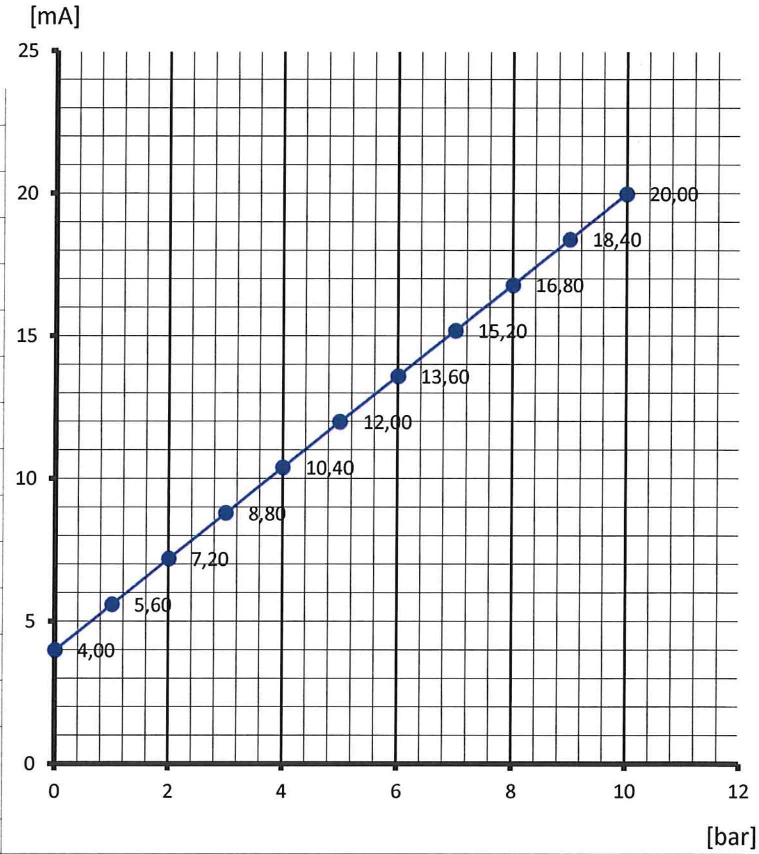
EPE/P AI 7/14 K10

Name of measuring point: **EE**

Order No.:	Cell / Transducer for:			Responsible:
26537/3	**Einpressgeber Erddruck**			Stab
Serial No.: 16 24712	Client / Project: Norwegian Geotechnical Institute			Date: 28.09.2016
Surrounding parameter: 23°C / 1000 mbar	Measuring range: 0-10 bar	Transducer: PA-8-20 / 102	Cable / Length [m]: PE 2(4)x0,5 / 20	Tested:
Linearity: < ± 0,5 %v.E.	Testing equipment: DPI 610 / FMG 2 K-T		Temperature coefficient: <0,5 % / °C v.E.	Temperature range: -25 . . . +60 °C
Supply: 15 - 30 A	Output signal: 4 - 20 mA	Load:	Mean sensitivity: 1,6 mA/bar	Overload security: 20%
Remarks:	**Initialization time of the sensor is 6 seconds. Please take over the measuring value only after init. has been finished.**			

Calibration:

Basis in [bar]	Measured value in [mA]	
0,00	4,00	
1,00	5,60	
2,00	7,20	
3,00	8,80	
4,00	10,40	
5,00	12,00	
6,00	13,60	
7,00	15,20	
8,00	16,80	
9,00	18,40	
10,00	20,00	



Calibration factor: 1,6 mA/bar

Calibration factor:

Parameters of measuring equipment: mA

Offset:	Factor:	Zero:	A-time:	pV-value: 7,11

Grouping plan:

Temp.- MV	Resistivity	Pin con-figuration	Connection line Color	Number	Main cable Grouping		Terminator	Measuring device Connection	Channel
		Supply +	red						
		Supply -	blue						
		Screen	transp.						

Instruction manual: Glötzl pressure cells for horizontal earth pressure

The pressure cells contains two sensors; pore water pressure and earth pressure as shown in the image below. The instrument is inserted vertically using bore rods so that the large sides of the pressure pad are aligned with the gravity vector. Measuring the porewater pressure at the same time allows for compensation of the water pressure and calculating only the horizontal earth pressure.

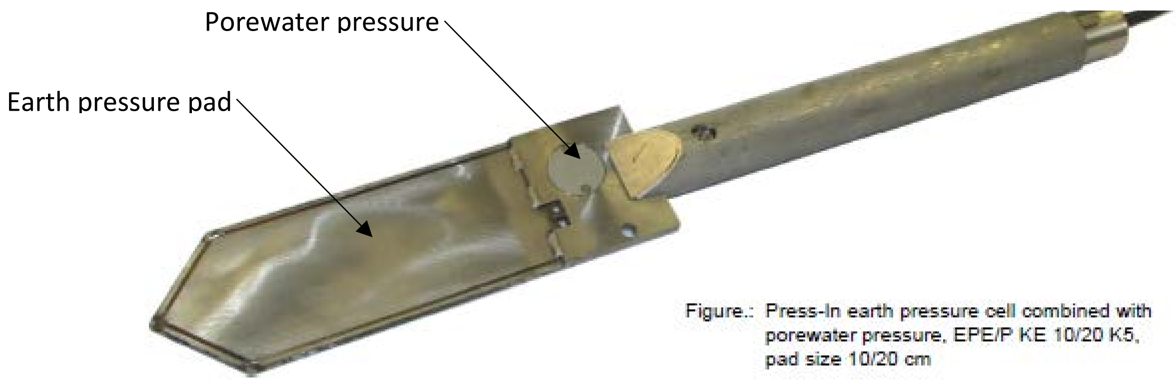
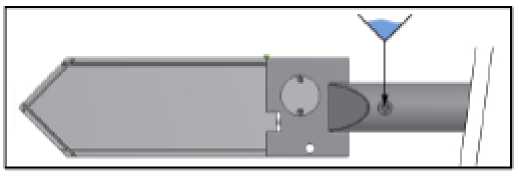


Figure.: Press-In earth pressure cell combined with porewater pressure, EPE/P KE 10/20 K5, pad size 10/20 cm

Consult the calibration sheets to find a pressure cell with the correct measurement range (e.g. 0-2 bar, 0-5 bar or 0-10 bar). The calibration sheets contains parameters necessary for converting raw data to engineering values, so print a copy to bring with you. The serial number of each sensor can be found on a sticker on the pressure pad, or on a sticker near the end of the cables.

Preparations before usage

Make sure that the space behind the porewater pressure filter is filled with water. Remove the filling screw (see image below) and fill as described in the data sheet and water filling instructions. Tap water may contain oily or calcium components that can block the filter. Use either water provided by Glötzl or Milli-Q water from the NGI chemistry lab. If the sensor is to be used in below zero temperatures, pure glycol may be added to the water to avoid freezing. The pressure cells are delivered from Glötzl with a pivot shaft connection without threads. The NGI workshop has added a 5/4" threaded bore rod connection. The data cables have to pass through the bore rods all the way to the surface.



Measurements

Data read out is done with a handheld measurement device (HMG), see operation manual. The earth pressure and pore water pressure is read from different data cables, locate the sticker with serial number near the end of the cable to identify the sensor. Use the grey wire clamps to connect the HMG to the sensor you want to read. Connect the red wire with the red wire from the sensor, and the blue wire with the blue wire from the sensor. The other wires (green, white) can stay disconnected.

After connecting the HMG, one push on the button will start the data read out from channel 1. Channel 2 is for temperature read out, and is not in use on the pressure cells. Normal operation is that the HMG will power down after a few minutes. If you want to avoid this, a long push on the button will enter 'always on' mode.

The raw value range of both earth and pore water pressure sensors is 4-20mA, with a corresponding pressure value in bar, see the calibration sheet for the particular sensor.

Insertion

The sensors should not be exposed to pressures exceeding 150% of full range. For insertion into hard soils or at great depths, this could be an issue. Make sure to read the pressure during insertion and use a sensor with adequate range.

NB! Take care to avoid horizontal movement while inserting the pressure cell. This may bend or damage the sensor.

Raw data conversion example

Consult the calibration sheet. The **pore water cell** with serial no. 1624703 has a calibration factor of 3.2 mA/bar. Air pressure at the time of insertion is 1024.3 hpa = 1.0243 bar. The sensor measurement in air is 4.02 mA = (4.02-4.0)mA/3.2mA/bar = 0.0625 bar. Sensor measurement after insertion is 15.6mA = (15.6-4)mA/3.2mA/bar = 3.625 bar. 1.0 bar is 10.2 meter water level. If desired, this can then be compensated for air pressure changes if the air pressure is measured simultaneously with another sensor.

The earth pressure cells have a pre-excitation from the welding of the sensor plates. This is quantified by the pV value in the calibration sheet. For the **earth pressure cell** with serial no. 1624702, we have pV = 8.72mA. The calibration factor is 2.28571mA/bar. (The zero-point of this cell is (8.72-3.98)mA/2.28571mA ≈ 2.074bar, which means that the zero point of the measuring value is 2.074bar.) To compute earth pressure after insertion, subtract the pV value from the measurement, and divide by the calibration factor. Say we measure 12.0mA after insertion. Earth pressure is then (12.0 mA– 8.72mA)/2.28571mA/bar ≈ 1.435 bar.

Appendix K

REPORT ON SELF-BORING PRESSURE METER TESTING

PROJECT: NGI - Halden & Onsøy SBP

PRESSUREMETER TESTING

FACTUAL REPORT

CLIENT: Norwegian Geotechnical Institute (NGI)

CONTRACT No.: P1170112

Issue	Date	Description	Prepared	Checked	Approved
01	20/10/17	Draft	RC	MT	DW

Date: 20th October 2017
Our Ref: P1170112

NGI
P.O. Box. 3930
Ullevål Stadion
N-0806
Oslo

Penetration House, 13 Vale Road,
Battle, East Sussex, TN33 0HE.
Tel: 0845 862 0558
Fax: 0845 862 0559
Email: mail@insitusi.com
www.insitusi.com
Company Reg No.: 6339499
VAT No.: 922 3561 41

Attention: Tom Lunne

PRESSUREMETER TESTING AT
NGI - HALDEN & ONSØY

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

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

Yours faithfully,
In Situ Site Investigation Limited

Darren Ward
Director

Contents

1.0 INTRODUCTION

1.1 Site Details

At the request of NGI, In Situ Site Investigation Limited (In Situ S.I.) carried out pressuremeter testing at the Halden and Onsøy sites, Norway.

Both Halden and Onsøy are NGI research sites in south eastern Norway. Halden is located close to the Sweden-Norway border and is characterised by thick deposits of post-glacial SILT to approximately 15m depth. The SILT is normally consolidated and considered to be marine to fjord marine in origin. Onsøy is located approximately 3km to the north west of the city of Fredrikstad. The site is characterised by over 20m thickness of marine CLAY, which is normally consolidated, and of medium to high plasticity.

The pressuremeter testing was carried out between 16th and 23rd September 2017.

This report presents the factual records of the pressuremeter testing, together with an interpretation of the test results to derive material parameters.

2.0 FIELDWORK

2.1 General

In total fifteen pressuremeter tests were attempted. Five tests were attempted in one borehole at Halden, whilst ten tests were carried out in a single borehole at Onsøy. The boreholes at both sites were constructed using rotary drilling rigs operated by NGI. The tests were carried out using a self boring pressuremeter (SBP). The testing was carried out in general accordance with BS EN ISO 22476-5 (2012) and BS 5930 (2015). The test depths were scheduled by NGI. A summary table of the tests carried out is presented below:

Table 2.1. *Summary of pressuremeter tests.*

Borehole Reference	Test Reference	Date	Test Depth	Probe	Operator	Drilling Time	Remarks
HALDEN SITE							
HALP01	T01	16/09/2017	6.10m	SBP Beatrice	D Lewins	3mins	Fish tail bit used
HALP01	T02	16/09/2017	8.00m	SBP Beatrice	D Lewins	6mins	Drilled on from T01
HALP01	T03	16/09/2017	10.00m	SBP Beatrice	D Lewins	2mins	Drilled on from T02
HALP01	T04	18/09/2017	12.00m	SBP Beatrice	D Lewins	3mins	Fish tail bit used
HALP01	T05	18/09/2017	13.50m	SBP Beatrice	D Lewins	3mins	Drilled on from T04
ONSØY SITE							
ONSP01	T01	20/09/2017	5.00m	SBP Beatrice	D Lewins	3mins	Fish tail bit used
ONSP01	T02	20/09/2017	6.10m	SBP Beatrice	D Lewins	1min	Drilled on from T01
ONSP01	T03	20/09/2017	7.10m	SBP Beatrice	D Lewins	2mins	Drilled on from T02
ONSP01	T04	21/09/2017	8.00m	SBP Beatrice	D Lewins	2mins	Fish tail bit used
ONSP01	T05	21/09/2017	9.10m	SBP Beatrice	D Lewins	2mins	Drilled on from T04
ONSP01	T06	21/09/2017	10.20m	SBP Beatrice	D Lewins	2mins	Drilled on from T05
ONSP01	T07	22/09/2017	12.10m	SBP Beatrice	D Lewins	2mins	Fish tail bit used
ONSP01	T08	22/09/2017	14.00m	SBP Beatrice	D Lewins	2mins	Drilled on from T07
ONSP01	T09	22/09/2017	16.30m	SBP Beatrice	D Lewins	3mins	Drilled on from T08
ONSP01	T10	23/09/2017	18.00m	SBP Beatrice	D Lewins	15mins	Fish tail bit used

2.2 Self Boring Pressuremeter (SBP)

The SBP comprises a cylindrical instrument with integral cutter that is drilled into the ground using a top drive rotary drilling rig. The rotary rig provides rotation to the SBP cutter through inner rods (RW size), and thrust to advance the pressuremeter, via the non-rotating outer rods (2 inch diameter). Water or drilling mud is flushed by the rotary rig pump down the inner rods, and back up through the inner/outer rod annulus to remove the cuttings, and provide lubrication and cooling to the cutter. The outside of the pressuremeter remains in contact with the ground during insertion and the test pocket is, in theory, less disturbed than for other pressuremeters which are inserted into pre-bored test sections.

The probe, approximately 1.20m in length, has a central section which is covered by a natural rubber membrane. Pressure applied to the inside of the instrument, via compressed air, forces the membrane to expand against the test pocket wall. The radial displacement of the inside boundary of the membrane is measured at six points equally distributed around the centre of the expanding section by free moving arms. This displacement, and the pressure necessary to cause the movement of the membrane, is continuously monitored by transducers contained within the instrument. The SBP is linked to the ground surface via a combined pressure hose and electrical power/communication umbilical cable which connects the instrument to the pressure source and readout unit.

Analogue to digital conversion of the displacement and pressure transducers is carried out within the pressuremeter electronics package. The pressuremeter output comprises a multiplexed signal which connects through the pressuremeter interface unit to a laptop computer. Software, supplied by Cambridge InSitu Ltd, is used to record the data, convert the received signals to engineering units, using the pressure and displacement transducer calibrations, and display these in real time on the laptop computer to allow control of the test by the operator. Plotting these readings of displacement against pressure produces a loading curve for the material being tested. A number of mathematical analyses are applied to translate this loading curve into material strength and stiffness parameters.

The testing on this project was undertaken using a 6-arm probe, manufactured by Cambridge InSitu Ltd. Details of the instrument are provided below. Instrument calibrations were carried out prior to and after the testing program. Corrections measured for membrane stiffness (essentially resistance to inflation in air) were carried out prior to testing. Only a single SBP membrane was used during the testing program.

Table 2.2. *SBP instrument details.*

Instrument	Diameter (mm)	Pressure Capacity (MPa)	Displacement Measurement	Serial No.
SBP	89.1	10	6 arms at 60° 3 opposite pairs	Beatrice

2.3 SBP Testing Procedure

The boreholes were constructed by rotary drilling using conventional open holing techniques via an auger bit at a nominal size of 120mm at Halden and 98mm ay Onsøy, using water flush. Temporary steel casing was used at both sites from the ground surface to stabilise the borehole sequence. At Halden, the casing was advanced to 11.50m, after the first three tests had been carried out. At Onsøy, the casing was advanced to 7.30m after the first three tests. It was then advanced to 11.50m after the completion of test T06. After test T09, the casing was advanced to 15.00m, prior to drilling in the SBP for T10.

The SBP was lowered to the base of the hole at the start of each day and self bored to the required test depth. The cutter position and rate of progress were optimised to achieve minimum disturbance during installation. The fish tail bit was set 10mm behind the shoe edge. Following the completion of the first test of the day, the SBP was immediately advanced to the next required test depth. The instrument was not removed from the borehole during the daily testing operations, such that up to three tests could be completed on each day.

The pressuremeter tests were carried out in a stress controlled manner using a manually operated gas control box to pressurise the SBP at an appropriate rate for the ground conditions. During the tests a number of unload-reload loops were performed. The loading was continued until either the ground had failed or maximum arm displacement had occurred.

3.0 TEST INTERPRETATION

3.1 Introduction

The pressure / cavity strain curve has been analysed to determine various parameters as appropriate including:

In situ horizontal stress	σ_{ho}
Initial shear modulus	G_i
Yield	Pf
Unload-reload shear modulus	G_{ur}
Circumferential strain at cavity wall (cavity strain range, %)	ε_c
Undrained shear strength	s_u
Limit Pressure	P_L

The analysis methodologies used have followed accepted practice for interpretation of pressuremeter tests (e.g. Clarke, 1996; Mair & Wood, 1987).

3.2 In Situ Horizontal Stress

The act of drilling into ground relieves the in situ horizontal stress. This is effectively restored as a pressuremeter is pressurised against the surrounding ground, and in affect the cavity pressure (p_o) recorded by the instrument approximates to the in situ horizontal stress. During initial pressurisation, a linear pressure / displacement curve is anticipated as the pressure is re-instated and then exceeds the in situ horizontal stress. In theory, the SBP is inserted into the ground with no disturbance, and in situ horizontal stress should be readily apparent. In reality, however, there is often some indication of small scale disturbance to the ground around the instrument. This disturbance must be carefully assessed to ensure that any method of interpreting in situ horizontal stress from the initial loading curve is realistic.

Three methods can be used to assess the in situ horizontal stress. The first is lift-off, whereby after initial pressurisation of the SBP, the internal cavity pressure (p_o) exceeds in situ horizontal stress, and as cavity expansion starts to occur, radial movement of the membrane is recorded by the arms. Use of lift off can be problematic in cases where insertion of the SBP has disturbed the surrounding ground, such that the estimated p_o

merely reflects the membrane pushing against the disturbed zone. Often a second linear increase in pressure and arm displacement can be seen when undisturbed material is reached. In some cases the derived in situ horizontal stress may be slightly under- or over-estimated, depending on the width of the disturbed zone.

Marsland and Randolph (1977) proposed that in the vicinity of in situ horizontal stress, soil behaves elastically and therefore the initial loading curve is linear. This elastic behaviour will cease when the undrained shear strength of the soil in the cavity wall is reached, and hence the loading curve derived from the SBP will then begin to curve away from linearity. The point at which the loading curve becomes non-linear (or the onset of yield, Pf), represents the in situ horizontal stress plus the undrained shear strength at this point:

$$Pf = \sigma_{ho} + s_u.$$

A third method proposed to estimate in situ horizontal stress is a comparison of pore pressure data against total test pressure, obtained from the SBP. A relationship is suggested (Wroth, 1982) whereby excess pore pressure is generated as the cavity wall material starts to deform during initial loading. This method is highly susceptible to disturbance, and is often not able to provide reliable results, consistent with those from the above two methods. For this project, it is noted that the data from pore pressure cell A was much more reliable during the testing program than that from cell B.

3.3 Shear Modulus

A pressuremeter test, in an elastic, perfectly plastic material, imparts a pure shear failure, hence it is normal to report shear modulus in preference to an elastic modulus. Shear modulus is determined from the initial loading curve, and from unload reload loops, performed at intervals during the test. The relationship used to determine shear modulus (G) is:

$$G = \frac{1}{2} \cdot \frac{dp}{d\varepsilon_c}$$

The various plots for both initial loading shear modulus (G_i) and the shear modulus derived from unload reload loops (G_{ur}) are presented graphically in the test results.

Note is also made that in clays and sands, some hysteresis is generally evident, and it is possible to determine a secant modulus from the unloading or reloading portion of an unload reload loop. A high degree of consistency is often possible when plotting secant shear modulus results from individual tests. This may be further extended to a series of tests in a geological formation by normalising by undrained shear strength, or in situ stress.

Pressuremeter tests determine shear modulus (G). This can be converted to an undrained elastic modulus (E_u) by use of the following relationship:

$$E_u = 2.G(1 + \upsilon) \qquad \text{Where } \upsilon = \text{Poisson's ratio}$$

Individual loops have also been analysed to determine small strain stiffness. This has been achieved by taking a secant modulus from the base of the loop, to the points on the reloading curve. Plotting the cavity strain range against shear modulus, gives an indication of how stiffness varies with strain. A Bolton and Whittle (1999) analysis has also been performed to investigate the non linear elastic / plastic behaviour. Plots of calculated secant modulus values at varying shear strain % are provided within the analysis results.

3.4 Strength

Undrained shear strength has been determined using Gibson and Anderson (1961). This is the generally accepted method for the determination of strength and is based on the assumption of an elastic - perfectly plastic material. The analysis also provides a Limit Pressure (P_L). This is a limiting pressure defined as the pressure at which the change in volume (ΔV) divided by the current volume (V) is equal to one. While this is not achieved in practice, it can be determined by extrapolation. Note is also made that the definition of P_L is different to that associated with a Ménard Limit Pressure, and the two should not be interchanged.

3.5 Note on Groundwater Levels

The estimation of groundwater levels during SBP testing can be problematic due to the necessity of using water flush during insertion. For almost all the tests carried out, the water level as noted by the operator was shallow, generally <2.00m depth. Estimation of the test water level can be attempted from the membrane inflation or deflation characteristics, although the assessment of groundwater level from this data is not without its problems, largely due to any disturbance around the instrument affecting its accurate interpretation. Groundwater, or ambient pore pressure, values used to determine effective stress parameters are those calculated from assumed hydrostatic water levels at the sites. At Halden a groundwater level of 2.00m has been assumed, whilst at Onsøy, a value of 0.80m has been used. Some caution should be applied to the effective stress values provided and their further use, due to uncertainty as to the true ambient pore pressure values. Total vertical stress has been calculated via the assumption of a constant increase in overburden at 18kPa per metre, i.e. vertical stress = test depth x 18.

3.6 Summary of Results

A summary of the results is presented in Appendix A, followed by the full graphical analysis.

3.7 Notes on Individual Tests

Halden - Borehole HALP01

Test 1 – This test was conducted at 6.10m. During initial drilling there was a good seal around the instrument, with an insertion time of 3 minutes.

Arm lift off at the start of linear loading was good, with slight variance seen on arms 3 and 4. Initial expansion of the membrane is indicated at 59kPa (test water level of 0.08mbgl), which is similar to an initial pore pressure response at 57kPa. Average arm lift off is interpreted at 79kPa, with this value being use as the cavity reference pressure. The linear loading path was relatively short with interpreted yield at 120kPa. The overall pressure-displacement response during the test was good with only arm 5 indicating some circumferential variability in the material around the instrument. Four unload-reload loops were attempted over the length of the loading curve. The derived modulus values are in the range 8.3 to 9.7MPa, with lower values following the yield point, at increasing cavity strain ranges. Derived undrained shear strengths are identical at 41kPa.

Test 2 – This test was conducted at 8.00m. The instrument was bored to test depth immediately after completion of Test 1. During drilling there was a good seal around the instrument, with the insertion time to depth of 6 minutes.

Arm lift off at the start of linear loading was good, with slight variance seen on arms 2 and 4. Initial expansion of the membrane is indicated at 73kPa (test water level of 0.56mbgl), which is similar to an initial pore pressure response at 76kPa. Average arm lift off is interpreted at 100kPa, with this value being use as the cavity reference pressure. The linear loading path was relatively short with interpreted yield at 148kPa, unfortunately coinciding with the onset of the first unload-reload loop. The overall pressure-displacement response during the test was good with only arm 5 again indicating some circumferential variability in the material around the instrument. Four unload-reload loops were attempted over the length of the loading curve, with a single loop carried out on the unload section. The derived modulus values are in the range 9.5 to 11.8MPa. Derived undrained shear strengths are in the range 56 to 64kPa.

Test 3 – This test was conducted at 10.00m. The instrument was bored to test depth immediately after completion of Test 2. During drilling there was a good seal around the instrument, with the insertion time to depth of 2 minutes.

Arm lift off at the start of linear loading was good, with very slight variance seen on arms 1 and 2. Initial expansion of the membrane is indicated at 97kPa (groundwater 0.11mbgl), which is similar to an initial pore pressure response at 99kPa. Average arm lift off is interpreted at 147kPa, with this value being use as the cavity reference pressure. The linear loading path was relatively short with interpreted yield at 198kPa, coinciding with the onset of the first unload-reload loop. The overall pressure-displacement response during the test was good with some variability seen in arms 2, 3 and 5. Four unload-reload loops were attempted over the length of the loading curve, with a single loop carried out on the unload section. The derived modulus values are in the range 12.2 to 14.6MPa. Derived undrained shear strengths are in the range 51 to a possible over estimate of 78kPa.

Test 4 – This test was conducted at 12.00m. The instrument was initially lowered down the cased borehole to 11.50m and then bored to the test depth. The insertion time to depth was 3 minutes.

Unfortunately at the start of the test arms 5 and 6 were offline. This was later investigated and was a result of some water ingress into the probe, via the top membrane clamping ring. Arm lift off at the start of linear loading was good for the remaining 4 arms. Initial expansion of the membrane is indicated at 115kPa (test water level of 0.27mbgl), which is slightly different to the initial pore pressure response at 130kPa. Average arm lift off is well defined at 175kPa, with this value being use as the cavity reference pressure. The linear loading path was relatively short with interpreted yield at 226kPa. The overall pressure-displacement response during the test was good with some variability seen in arms 1 and 2. The shape of the loading curve is consistent with possible increased granular component in the tested material. Three unload-reload loops were attempted over the length of the loading curve.

The derived modulus values increase from 10.0 to 14.1MPa. Derived undrained shear strengths are in the range 51 to a possible over estimate of 78kPa.

Test 5 – This test was conducted at 13.50m. The instrument was bored to test depth immediately after completion of Test 4. During drilling there was a good seal around the instrument, with the insertion time to depth of 3 minutes.

As in Test 4, at the start of the test arms 5 and 6 were offline. Arm lift off at the start of linear loading was good, although some slight variance was seen on arm 1. Initial expansion of the membrane is indicated at 131kPa (test water level of 0.14mbgl), which is slightly different to the initial pore pressure response at 145kPa. Average arm lift off is reasonably defined at 212kPa, with this value being use as the cavity reference pressure. The linear loading path was relatively short with interpreted yield at 262kPa. The overall pressure-displacement response during the test was slightly variable on all working arms, which together with the shape of the loading curve is consistent with possible increased granular component in the tested material. Features of the test also point to probable disturbance around the instrument. Three unload-reload loops were attempted over the length of the loading curve, with derived modulus values increasing from 7.0 to 12.5MPa. Derived undrained shear strengths are in the range 50 to a possible over estimate of 89kPa.

Onsøy - Borehole ONSP01

Test 1 – This test was conducted at 5.00m. During initial drilling there was a good seal around the instrument, with an insertion time of 3 minutes.

Arm lift off at the start of linear loading was good, with slight variance seen on arms 3 and 4. Initial expansion of the membrane is indicated at 43kPa (test water level of 0.62mbgl). The initial pore pressure response is higher at around 90kPa, which is close to the average arm lift off interpreted at 85kPa, with this value being use as the cavity reference pressure. The linear loading path was relatively short with a well defined yield at 110kPa. The overall pressure-displacement response during the test was very good with only arm 5 being slightly variable. Two unload-reload loops were attempted over the length of the loading curve, with a single loop on the unloading. The derived modulus values are in the close range of 1.1 to 1.8MPa, at increasing cavity strain ranges. Derived undrained shear strengths are close at 19 to 25kPa.

Test 2 – This test was conducted at 6.10m. The instrument was bored to test depth immediately after completion of Test 1. During drilling there was a good seal around the instrument, with the insertion time to depth of only 1 minute.

Arm lift off at the start of linear loading was good, with slight variance seen on arms 4 and 5. Initial expansion of the membrane is indicated at around 51kPa (test water level of 0.90mbgl). The initial pore pressure response is higher at around 105kPa, which is close to the average arm lift off interpreted at 98kPa, with this value being use as the cavity reference pressure. The linear loading path was relatively short with a well defined yield at 125kPa. The overall pressure-displacement response during the test was very good with again only arm 5 being slightly variable. Three unload-reload loops were attempted over the length of the loading curve. The derived modulus values are in the close range of 1.8 to 2.3MPa, at increasing cavity strain ranges. Derived undrained shear strengths are close at 15 to 28kPa.

Test 3 – This test was conducted at 7.10m. The instrument was bored to test depth immediately after completion of Test 2. During drilling there was a good seal around the instrument, with the insertion time to depth of 2 minutes.

Arm lift off at the start of linear loading was good, with slight variance seen on arms 3 and 4. Initial expansion of the membrane is indicated at around 61kPa (test water level of 0.88mbgl). The initial pore pressure response is higher at around 119kPa, which is close to the average arm lift off interpreted at 115kPa, with this value being use as the cavity reference pressure. The linear loading path was relatively short with a well defined yield at 146kPa. The overall pressure-displacement response during the test was good with arms 1, 2 and 5 being slightly variable at large displacement. Five unload-reload loops were attempted over the length of the loading curve. The derived modulus values are in the close range of 1.6 to 2.4MPa. Derived undrained shear strengths are reasonably close at 17 to 31kPa.

Test 4 – This test was conducted at 8.00m. The instrument was initially lowered down the cased borehole to 7.30m and then bored to the test depth. The insertion time to depth was 2 minutes.

Arm lift off at the start of linear loading was good, with slight variance seen on arm 4. Initial expansion of the membrane is indicated at around 65kPa (test water level of 1.37mbgl). The initial pore pressure response is higher at around 100kPa, which is close to the average arm lift off interpreted at 105kPa, with this value being use as the cavity reference pressure. There is some suggestion of disturbance around the instrument. The linear loading path was relatively short with a reasonably defined yield at 134kPa. The overall pressure-displacement response during the test was variable at large displacements, further indicating some material variation, or probable disturbance. Three unload-reload loops were attempted over the length of the loading curve. The derived modulus values are in the close range of 3.0 to 3.8MPa, at increasing cavity strain. Derived undrained shear strengths are reasonably close at 22 to 29kPa.

Test 5 – This test was conducted at 9.10m. The instrument was bored to test depth immediately after completion of Test 4. During drilling there was a good seal around the instrument, with the insertion time to depth of 2 minutes.

Arm lift off at the start of linear loading was good, with variance seen on arm 4. Initial expansion of the membrane is indicated at around 72kPa (test water level of 1.76mbgl). The initial pore pressure response is higher at around 106kPa, which is close to the average arm lift off interpreted at 110kPa, with this value being use as the cavity reference pressure. There is some suggestion of disturbance around the instrument. The linear loading path was relatively short with interpreted yield at 142kPa. The overall pressure-displacement response during the test was variable at large displacements, further indicating some material variation, or probable disturbance. Four unload-reload loops were attempted over the length of the loading curve, with a single loop on the unloading. The derived modulus values are in the range of 3.1 to 5.1MPa. Derived undrained shear strengths are very close at 31 to 32kPa.

Test 6 – This test was conducted at 10.20m. The instrument was bored to test depth immediately after completion of Test 5. During drilling there was a good seal around the instrument, with the insertion time to depth of 2 minutes.

Arm lift off at the start of linear loading was good, with some variance seen on arms 4 and 5. Initial expansion of the membrane is indicated at around 83kPa (test water level of 1.74mbgl). The initial pore pressure response is higher at around 125kPa, which is close to the average arm lift off interpreted at 130kPa, with this value being use as the cavity reference pressure. There is some suggestion of disturbance around the instrument. The linear loading path was relatively short with interpreted yield at 160kPa. The overall pressure-displacement response during the test was slightly variable at large displacements, with arms 5, 6 and 1 indicating some material variation, or probable disturbance. Three unload-reload loops were attempted over the length of the loading curve, with a single loop on the unloading. The derived modulus values are in the range of 2.6 to 5.0MPa. Derived undrained shear strengths are very close at 28 to 30kPa.

Test 7 – This test was conducted at 12.10m. The instrument was initially lowered down the cased borehole to 11.50m and then bored to the test depth. The insertion time to depth was 2 minutes.

Arm lift off at the start of linear loading was good, with some slight variance seen on arm 5. Initial expansion of the membrane is indicated at around 105kPa (test water level of 1.39mbgl). The initial pore pressure response is not particularly well defined, presumably due to disturbance. There is a response at around 185kPa, although this should treated with caution. Average arm lift off is interpreted at 170kPa, with this value being use as the cavity reference pressure. There is some suggestion of disturbance around the instrument. The linear loading path was relatively short with interpreted yield at 217Pa. The overall pressure-displacement response during the test was variable at large displacements, with all arms showing some variation. Three unload-reload loops were attempted over the length of the loading curve, with a single loop on the unloading. The derived modulus values are in the range of 3.3 to 6.1MPa. Derived undrained shear strengths are variable at 35 to 47kPa.

Test 8 – This test was conducted at 14.00m. The instrument was bored to test depth immediately after completion of Test 7. During drilling there was a good seal around the instrument, with the insertion time to depth of 2 minutes.

Arm lift off at the start of linear loading was variable on most arms. Initial expansion of the membrane is indicated at 120kPa (test water level of 1.76mbgl). The initial pore pressure response is higher at around 175kPa, which is close to the average arm lift off interpreted at 172kPa, with this value being use as the cavity reference pressure. There is some clear suggestion of disturbance around the instrument. The linear loading path was relatively short with interpreted yield at 210kPa. The overall pressure-displacement response during the test was variable at large displacements. Three unload-reload loops were attempted over the length of the loading curve, with a single loop on the unloading. The derived modulus values are in the range of 3.9 to 8.7MPa. Derived undrained shear strengths are close at 38 to 48kPa.

Test 9 – This test was conducted at 16.30m. The instrument was bored to test depth immediately after completion of Test 8. During drilling there was a good seal around the instrument, with the insertion time to depth of 3 minutes.

Arm lift off at the start of linear loading was variable on arms 5, 6 and 1. Initial expansion of the membrane is indicated at 137kPa (test water level of 2.33mbgl). The initial pore pressure response is higher at around 180kPa, which is close to the average arm lift off interpreted at 187kPa, with this value being use as the cavity reference pressure. There is some clear suggestion of disturbance around the instrument. The linear loading path was relatively short with interpreted yield at 231kPa. The overall pressure-displacement response during the test was reasonable, with variation at large displacements seen in arms 2 and 5. Three unload-reload loops were attempted over the length of the loading curve, with a single loop on the unloading. The derived modulus values are in the range of 4.6 to 7.9MPa. Derived undrained shear strengths are close at 44 to 46kPa.

Test 10 – This test was conducted at 18.00m. The instrument was initially lowered down the cased borehole to 15.00m and then bored to the test depth. The insertion time to depth was 15 minutes. This greater insertion time is attributed to the increased depth to self bore, and the observation of fine gravel and sand in the penetrated material.

Arm lift off at the start of linear loading was variable with differing response seen on most arms. Initial expansion of the membrane is vaguely indicated at around 155kPa (test water level of 2.19mbgl). The pore pressure response is not defined during the test, as unfortunately pore pressure cell A provided a wildly fluctuating output, whilst cell B was relatively unresponsive. Average arm lift off is interpreted at 268kPa, with this value being use as the cavity reference pressure. There are clear indications of disturbance around the instrument. The linear loading path was relatively short with interpreted yield at 325kPa. The overall pressure-displacement response during the test was reasonable, although arms 1 and 4 showed highly variable displacement. Three unload-reload loops were attempted over the length of the loading curve with the derived modulus values in the range of 7.1 to 10.6MPa. Following completion of the third loop, leakage occurred from the membrane and the test was halted. Upon inspection when recovered back to the ground surface, the membrane was seen to have partially pulled out from the clamping ring at the bottom end of the instrument. Derived undrained shear strengths are very close at 56 to 57kPa.

4.0 REFERENCES

Bolton, M.D. & Whittle, R.W. (1999) A non-linear elastic/perfectly plastic analysis for plane strain undrained expansion tests. Géotechnique, 49, No. 1, pp. 133-141.

BS EN ISO 22476-5 (2012) Geotechnical investigation and testing - Field testing. Part 5: Flexible dilatometer test. British Standards Institution.

BS 5930 (2015) Code of practice for site investigations. British Standards Institution.

Clarke, B.G. (1996) Pressuremeters in geotechnical design. London: Blackie Academic and Professional.

Davidson, R.R. & Bodine, D.G. (1986) Analysis and verification of Louisiana pile foundation design based on pressuremeter results. The Pressuremeter and its Marine Applications. ASTM, STP 950.

Gibson, R.E. & Anderson, W.F. (1961) In situ measurement of soil properties with the pressuremeter. *Civil Engineering and Public Works Review*, Vol. 56, No. 658 May, 615-618.

Haberfield, C.M. & Johnston, I.W. (1993) Factors influencing the interpretation of pressuremeter tests in soft rock, Proc. Symp. on Geotechnical Engineering of Hard Soils — Soft Rocks, Athens, Volume 1, Balkema, Rotterdam, pp. 525-532.

Hughes, J.M.O., Wroth, C.P. & Windle, D. (1977) Pressuremeter tests in sands. Géotechnique, 27, No. 4, pp. 455-477.

Mair, R.J. & Wood, D.M. (1987) Pressuremeter testing: methods and interpretation. CIRIA Ground Engineering Report: In-situ Testing. London.

Marsland, A. & Randolph, M.F. (1977) Comparison of the results from pressuremeter tests and large in situ plate tests in London Clay. Géotechnique, 27, No. 2, pp. 217-243.

Palmer, A.C. (1972) Undrained plane-strain expansion of a cylindrical cavity in clay : a simple interpretation of the pressuremeter test. Géotechnique, 22, No. 2, pp. 451-457.

Wroth,C.P. (1982) British experience with the self-boring pressuremeter. Proc. Symp. on The Pressuremeter and its Marine Applications. Paris, 37, pp. 143-164.

APPENDIX A

Test Data Analysis

Description	Figure No.
Pressuremeter Results Summary	HALP01 & ONSP01
Pressuremeter Shear Modulus Plot & Undrained Shear Strength Plot - Halden	1
Pressuremeter In Situ Horizontal Stress, Yield & Limit Pressure Plot - Halden	2
Pressuremeter Stress Plot - Halden	3
Pressuremeter Shear Modulus Plot & Undrained Shear Strength Plot - Onsøy	4
Pressuremeter In Situ Horizontal Stress, Yield & Limit Pressure Plot - Onsøy	5
Pressuremeter Stress Plot - Onsøy	6
Pressuremeter Results Summary - Stress	7
Pressuremeter Test Analysis	
HALP01	T01 – T05
ONSP01	T01 - T10

Project: NGI - Halden Site

Client: NGI

Project No.: P11170112

Pressuremeter Results Summary

Test	Depth (m)	Material description from borehole log	Head water (kPa)	Water depth (mbgl)	p_o (kPa)	Undrained strength $S_{u\,(M\&R)}$ (kPa)	Undrained strength S_u (kPa)	Undrained strength P_L (kPa)	G_i (MPa)	Loop No.	G_{ur} (MPa)	ε_c (%)	Non linear stiffness α (MPa)	Non linear stiffness β	Secant shear modulus G (MPa), Shear strain 0.1%	Secant shear modulus G (MPa), Shear strain 0.01%	Secant shear modulus G (MPa), Shear strain 0.001%
HALP01																	
1	6.10	SILT	59	0.08	79	41	41	287	3.3	1	9.4	0.105	0.298	0.540	7	21	59
										2	9.7	0.125	0.566	0.605	9	21	53
										3	9.2	0.173	0.681	0.621	9	22	53
										4	8.3	0.210	0.690	0.628	9	21	50
2	8.00	SILT	73	0.56	100	48	64	404	4.8	1	9.5	0.133	0.367	0.554	8	22	63
										2	10.1	0.171	0.633	0.601	10	25	62
										3	11.4	0.167	0.734	0.606	11	28	68
										4	11.8	0.176	0.908	0.624	12	29	69
										5	10.5	0.298	0.914	0.625	12	29	69
3	10.00	SILT	97	0.11	147	51	78	514	5.6	1	12.2	0.145	0.441	0.536	11	32	92
										2	12.9	0.185	0.719	0.576	13	36	94
										3	13.9	0.196	0.935	0.600	15	37	94
										4	14.6	0.190	0.817	0.580	15	39	103
										5	14.3	0.215	1.016	0.617	14	35	84
4	12.00	SILT	115	0.27	175	51	91	597	7.2	1	10.0	0.286	0.315	0.474	12	40	135
										2	12.1	0.287	0.562	0.529	15	43	127
										3	14.1	0.243	0.599	0.529	16	46	136
5	13.50	SILT	131	0.14	212	50	89	561	2.9	1	7.0	0.290	0.114	0.390	8	31	127
										2	9.1	0.312	0.224	0.439	11	39	142
										3	12.5	0.280	0.384	0.475	14	48	161

IN SITU
SITE INVESTIGATION

Figure No.: HALP01

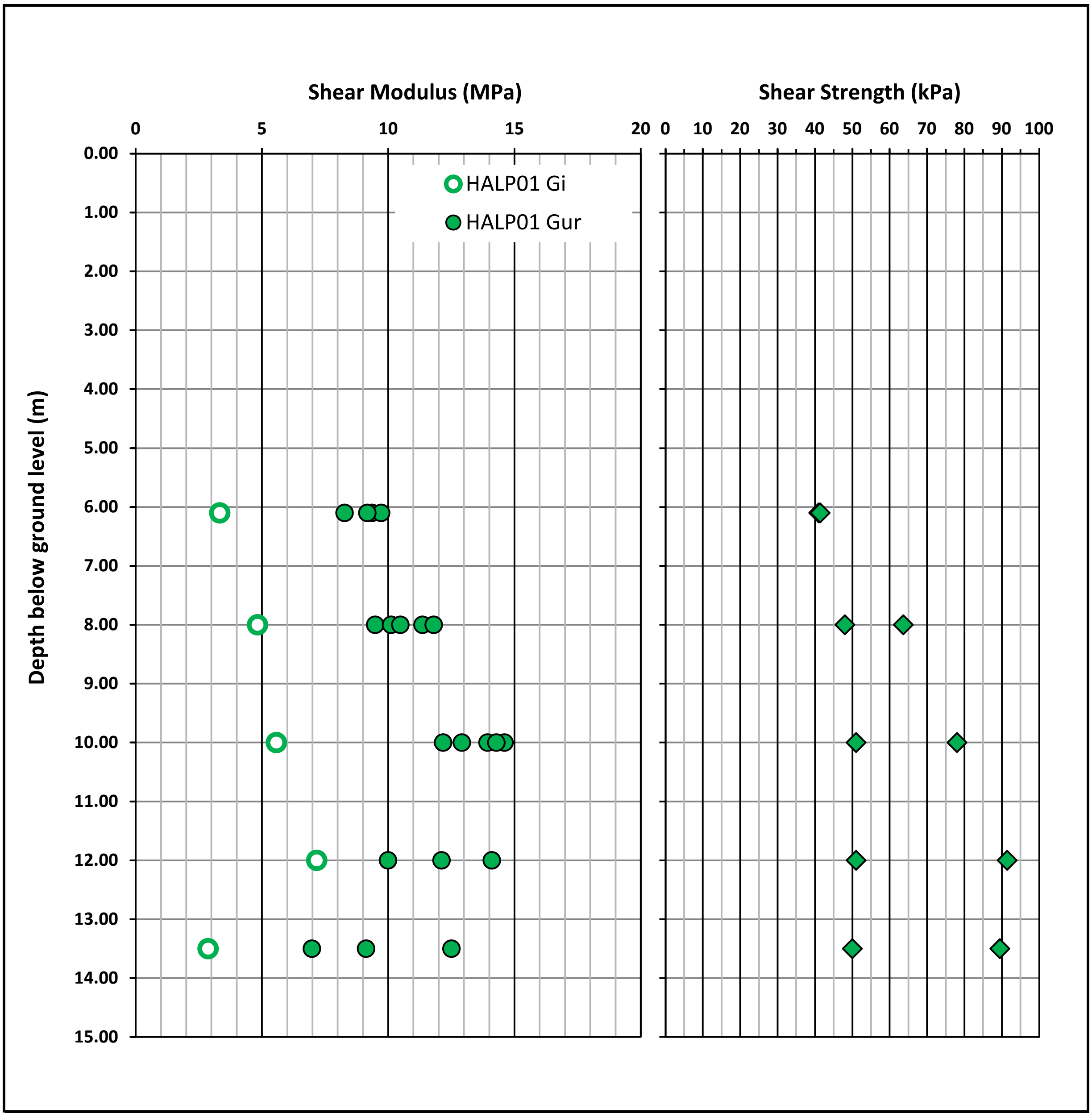
Pressuremeter Results Summary

Project: NGI - Onsøy Site
Client: NGI
Project No.: P1170112
Figure No.: ONSP01

Test	Depth (m)	Material description from borehole log	Head water (kPa)	Water depth (mbgl)	p_o (kPa)	Undrained strength $S_{u\,(M\&R)}$ (kPa)	Undrained strength S_u (kPa)	Undrained strength P_L (kPa)	G_i (MPa)	Loop No.	G_{ur} (MPa)	ε_c (%)	Non linear stiffness α (MPa)	Non linear stiffness β	Secant shear modulus G (MPa), Shear strain 0.1%	0.01%	0.001%
ONSP01																	
1	5.00	CLAY	43	0.62	85	25	19	188	2.1	1	1.8	0.439	0.241	0.660	3	6	12
										2	1.6	0.650	0.215	0.647	2	6	12
										3	1.1	1.183	0.161	0.618	2	5	13
2	6.10	CLAY	51	0.90	98	28	15	197	3.9	1	2.3	0.479	0.230	0.616	3	8	19
										2	1.9	0.639	0.189	0.598	3	8	19
										3	1.8	0.724	0.185	0.601	3	7	18
3	7.10	CLAY	61	0.88	115	31	17	229	5.0	1	2.4	0.558	0.291	0.633	4	9	20
										2	2.1	0.594	0.236	0.617	3	8	19
										3	1.9	0.797	0.249	0.626	3	8	19
										4	1.6	1.244	0.185	0.599	3	7	19
										5	1.8	0.765	0.185	0.591	3	8	21
4	8.00	CLAY	65	1.37	105	29	22	251	8.1	1	3.8	0.390	0.615	0.700	5	10	20
										2	3.1	0.498	0.447	0.668	4	9	20
										3	3.0	0.601	0.452	0.666	5	10	21
5	9.10	CLAY	72	1.76	110	32	31	307	8.9	1	5.1	0.358	0.670	0.675	6	13	28
										2	3.7	0.571	0.469	0.643	6	13	29
										3	3.6	0.518	0.442	0.642	5	12	27
										4	3.0	0.639	0.301	0.597	5	12	31
										5	3.1	0.572	0.390	0.632	5	12	27
6	10.20	CLAY	83	1.74	130	30	28	319	9.4	1	5.0	0.320	0.565	0.655	6	14	30
										2	4.0	0.412	0.382	0.618	5	13	31
										3	3.6	0.542	0.415	0.629	5	13	30
										4	2.6	0.887	0.295	0.600	5	12	30
7	12.10	CLAY	105	1.39	170	47	35	387	6.1	1	6.1	0.440	0.876	0.656	9	21	46
										2	4.9	0.492	0.553	0.634	7	16	38
										3	4.4	0.552	0.541	0.640	6	15	34
										4	3.3	0.845	0.402	0.616	6	14	33
8	14.00	CLAY	120	1.76	172	38	48	464	9.5	1	8.7	0.330	1.191	0.680	11	23	47
										2	5.5	0.573	0.621	0.622	8	20	48
										3	5.3	0.627	0.564	0.607	9	21	52
										4	3.9	1.027	0.433	0.586	8	20	51
9	16.30	CLAY	137	2.33	187	44	46	497	12.2	1	7.9	0.371	0.974	0.660	10	22	49
										2	6.9	0.427	0.856	0.655	9	21	46
										3	5.9	0.510	0.634	0.623	9	20	49
										4	4.6	0.750	0.474	0.598	8	19	49
10	18.00	CLAY	155	2.19	268	57	56	613	10.2	1	10.6	0.274	1.311	0.673	13	27	57
										2	8.2	0.426	1.050	0.657	11	25	54
										3	7.1	0.470	0.830	0.638	10	23	54

Pressuremeter Shear Modulus & Undrained Shear Strength Plot

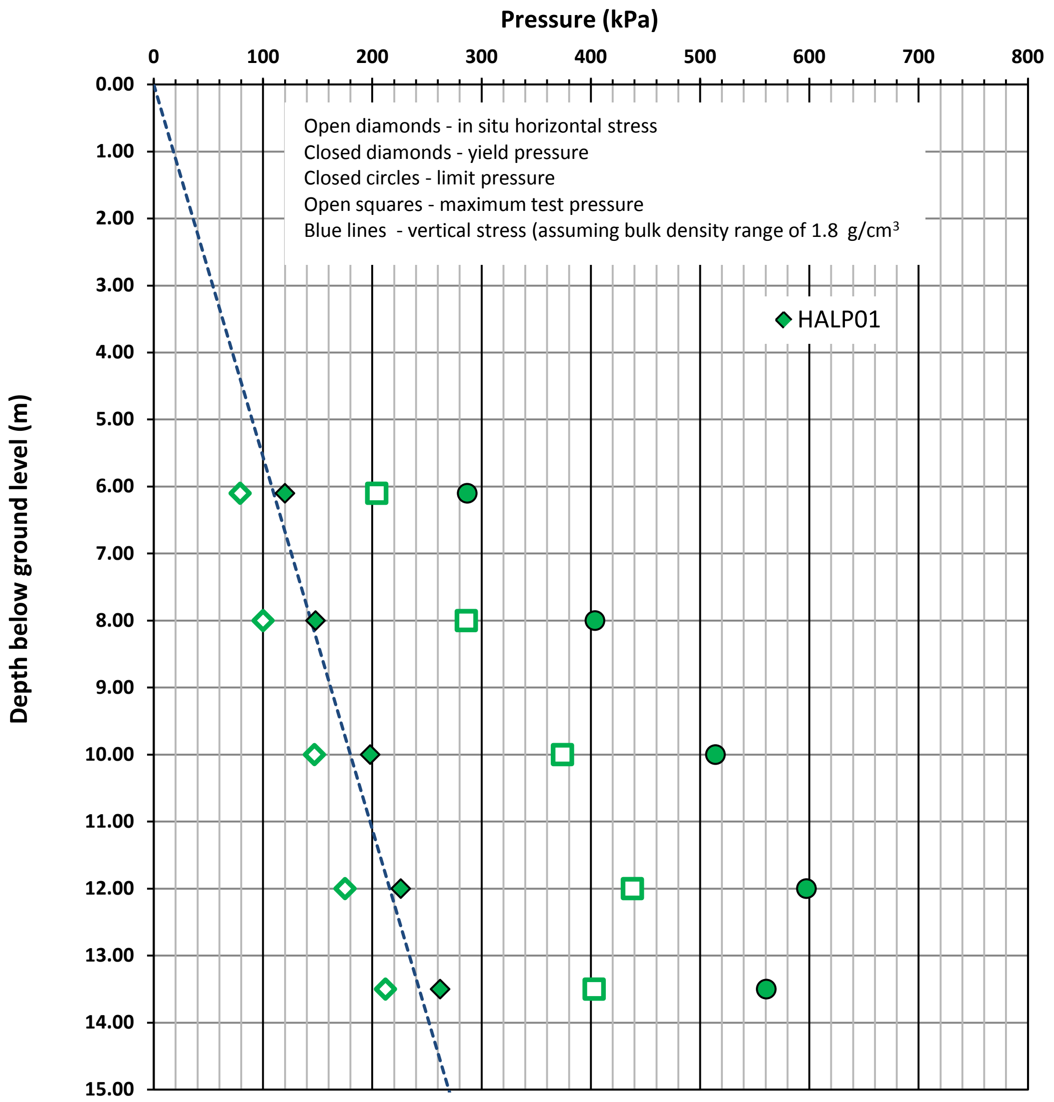
IN SITU
SITE INVESTIGATION



Project	NGI - Halden Site	**Figure No.**	1
Client	NGI		
Project No.	P1170112		

Pressuremeter In Situ Horizontal Stress, Yield & Limit Pressure Plot

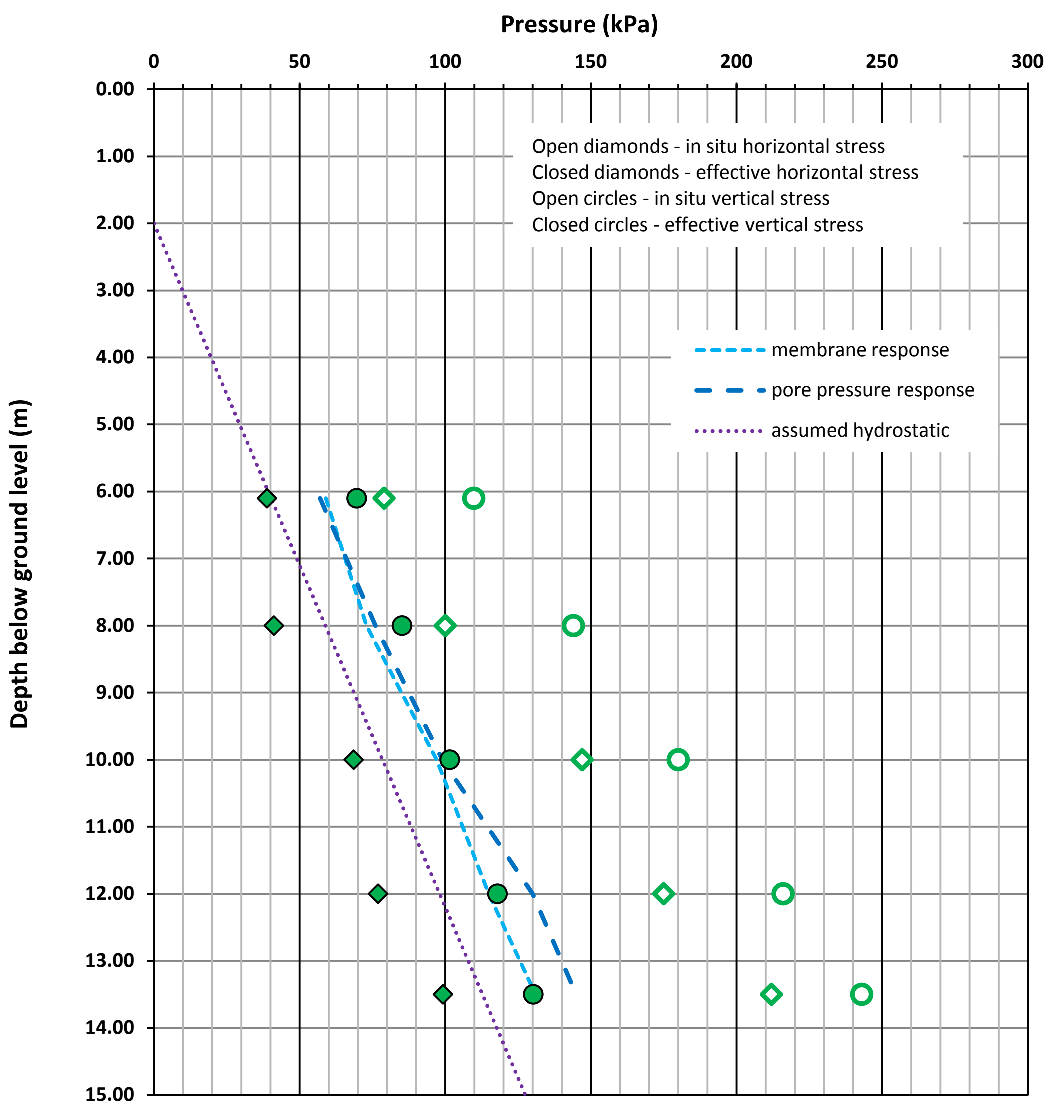
IN SITU
SITE INVESTIGATION



Project	NGI - Halden Site	**Figure No.**	2
Client	NGI		
Project No.	P1170112		

Pressuremeter Stress Plot

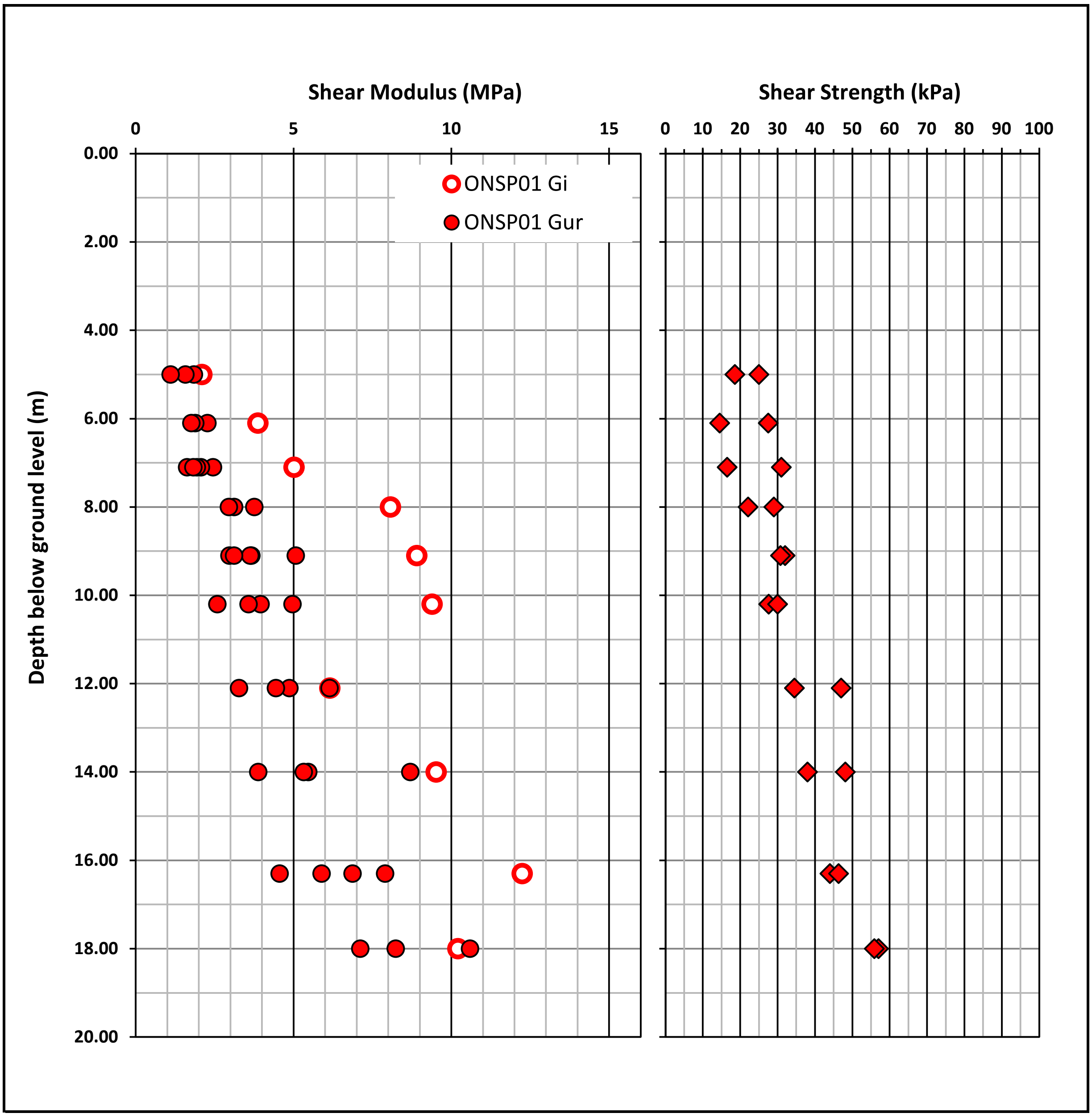
IN SITU SITE INVESTIGATION



Project	NGI - Halden Site	**Figure No.**	3
Client	NGI		
Project No.	P1170112		

Pressuremeter Shear Modulus & Undrained Shear Strength Plot

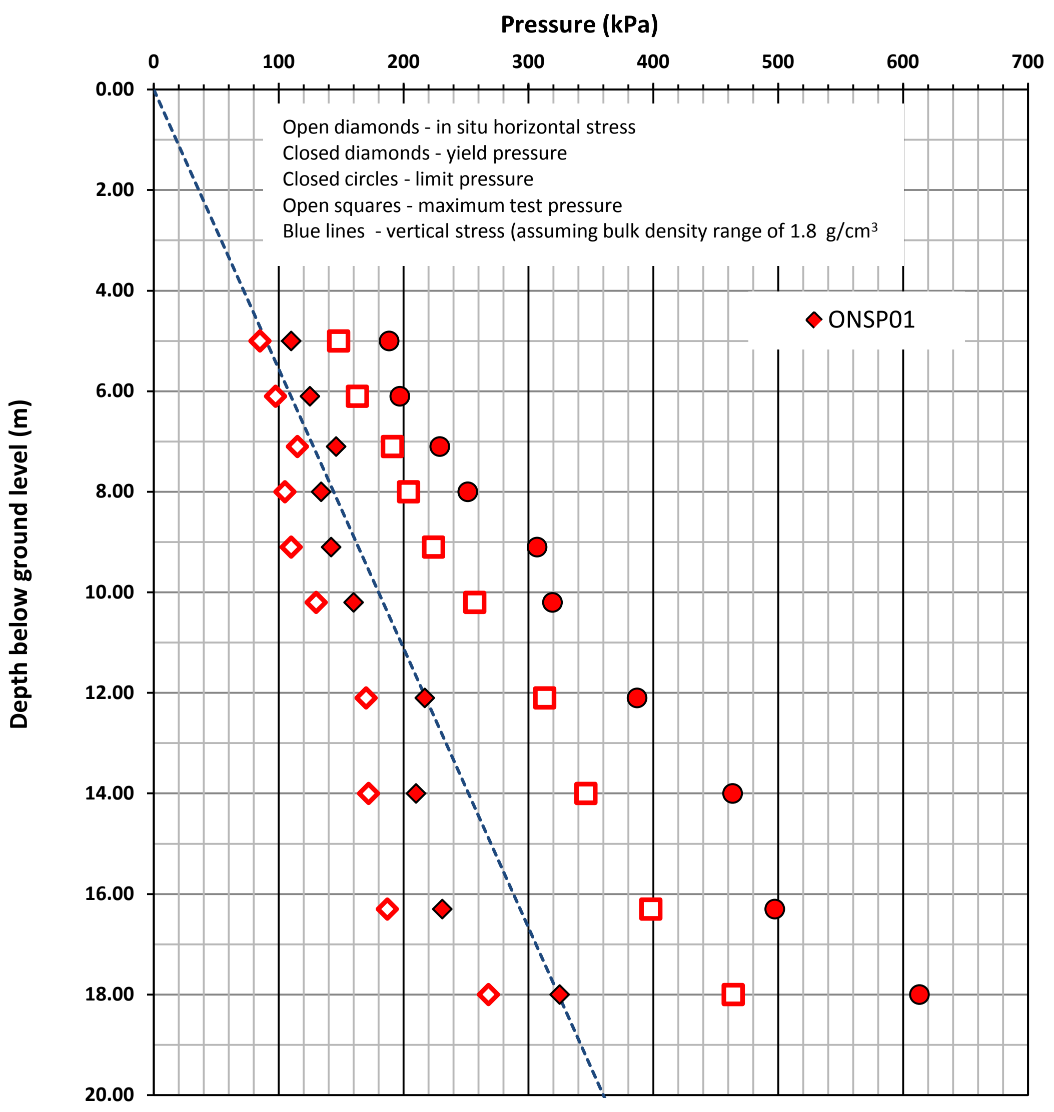
IN SITU
SITE INVESTIGATION



Project	NGI - Onsøy Site	**Figure No.**	4
Client	NGI		
Project No.	P1170112		

Pressuremeter In Situ Horizontal Stress, Yield & Limit Pressure Plot

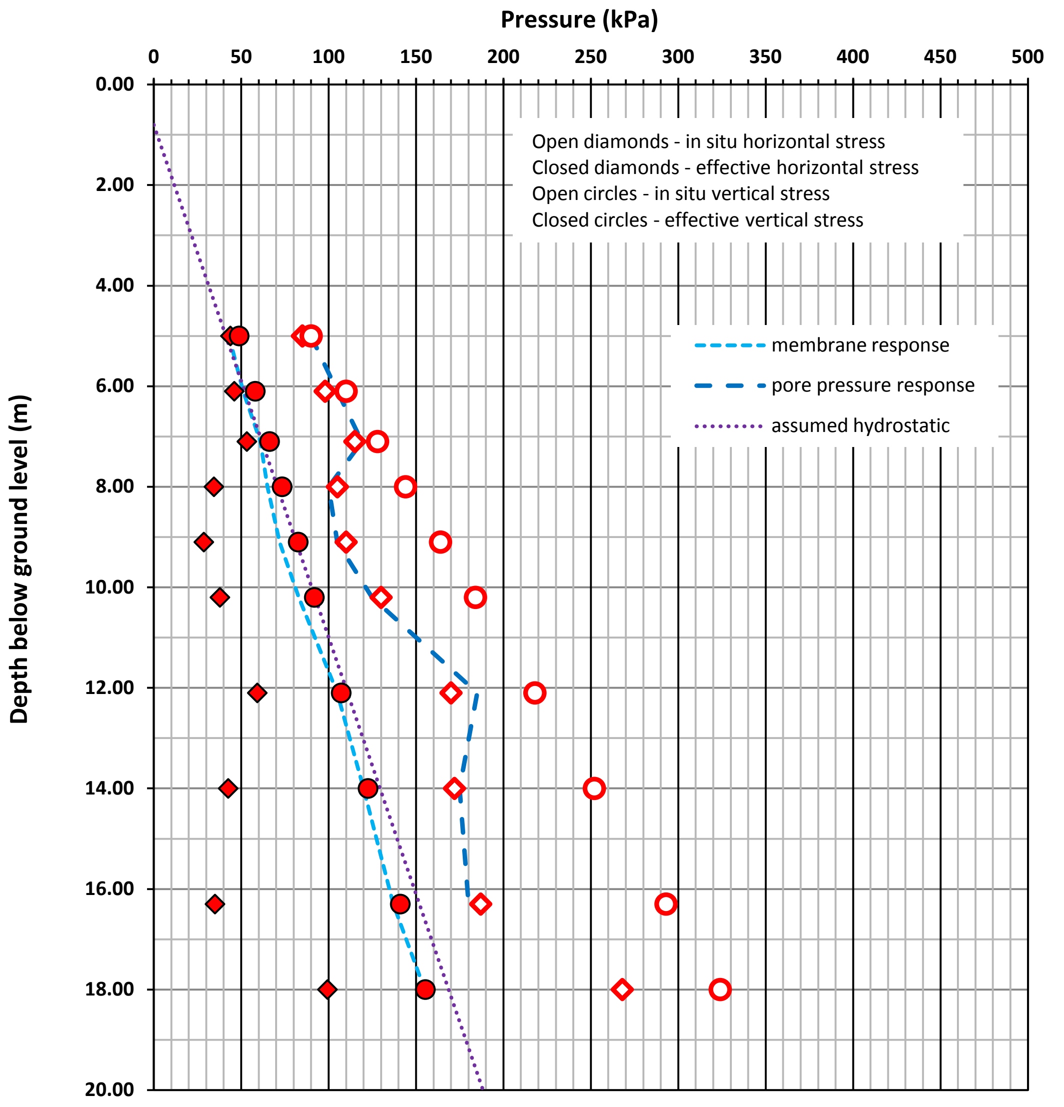
IN SITU
SITE INVESTIGATION



Project	NGI - Onsøy Site	**Figure No.**	5
Client	NGI		
Project No.	P1170112		

Pressuremeter Stress Plot

IN SITU SITE INVESTIGATION



Project	NGI - Halden Site	**Figure No.**	6
Client	NGI		
Project No.	P1170112		

Pressuremeter Results Summary - Stress

Test	Depth (m)	Initial membrane response (kPa)	Test water level (mbgl)	Pore pressure response (kPa)	Groundwater level* (kPa)	σ_{ho} (kPa)	$\sigma_{ho'}$ (kPa)	σ_{vo} (kPa)	$\sigma_{vo'}$ (kPa)	Yield Pf (kPa)	Yield Pf' (kPa)
HALP01											
1	6.10	59	0.08	57	40	79	39	110	70	120	80
2	8.00	73	0.56	76	59	100	41	144	85	148	89
3	10.00	97	0.11	99	78	147	69	180	102	198	120
4	12.00	115	0.27	130	98	175	77	216	118	226	128
5	13.50	131	0.14	145	113	212	99	243	130	262	149
ONSP01											
1	5.00	43	0.62	90	41	85	44	90	49	110	69
2	6.10	51	0.90	105	52	98	46	110	58	125	73
3	7.10	61	0.88	119	62	115	53	128	66	146	84
4	8.00	65	1.37	100	71	105	34	144	73	134	63
5	9.10	72	1.76	105	81	110	29	164	83	142	61
6	10.20	83	1.74	125	92	130	38	184	92	160	68
7	12.10	105	1.39	185	111	170	59	218	107	217	106
8	14.00	120	1.76	175	129	172	43	252	123	210	81
9	16.30	137	2.33	180	152	187	35	293	141	231	79
10	18.00	155	2.17	n/a	169	268	99	324	155	325	156

* At Halden, hydrostatic groundwater level of 2.00m assumed

* At Onsøy, hydrostatic groundwater level of 0.80m assumed

IN SITU SITE INVESTIGATION

Project: NGI - Halden and Onsøy

Client: NGI

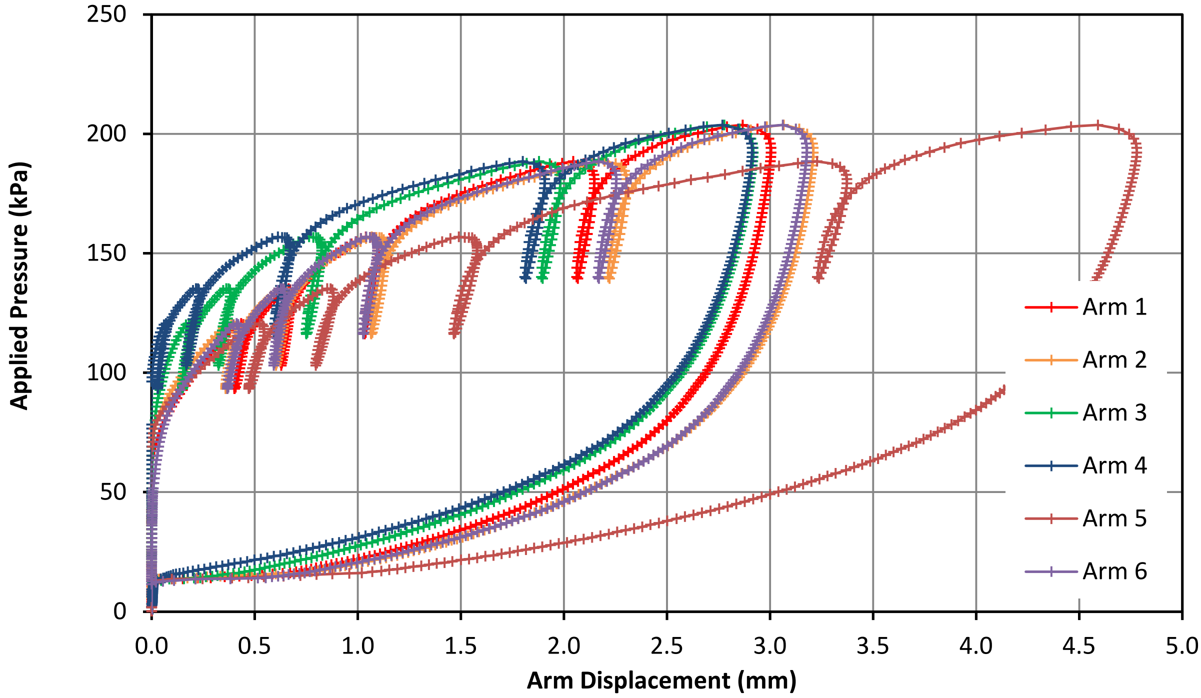
Project No. P1170112

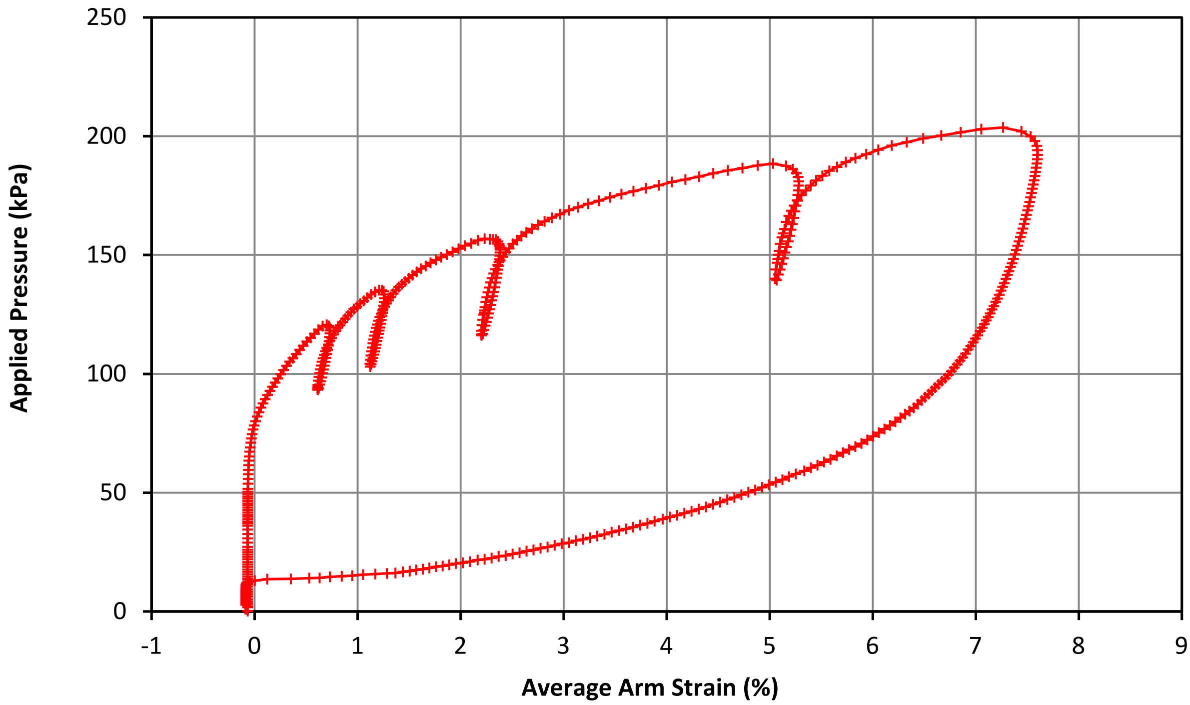
Figure No. 7

Pressuremeter Test Overview

IN SITU
SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	1
Borehole	HALP01	**Test Depth (m)**	6.10





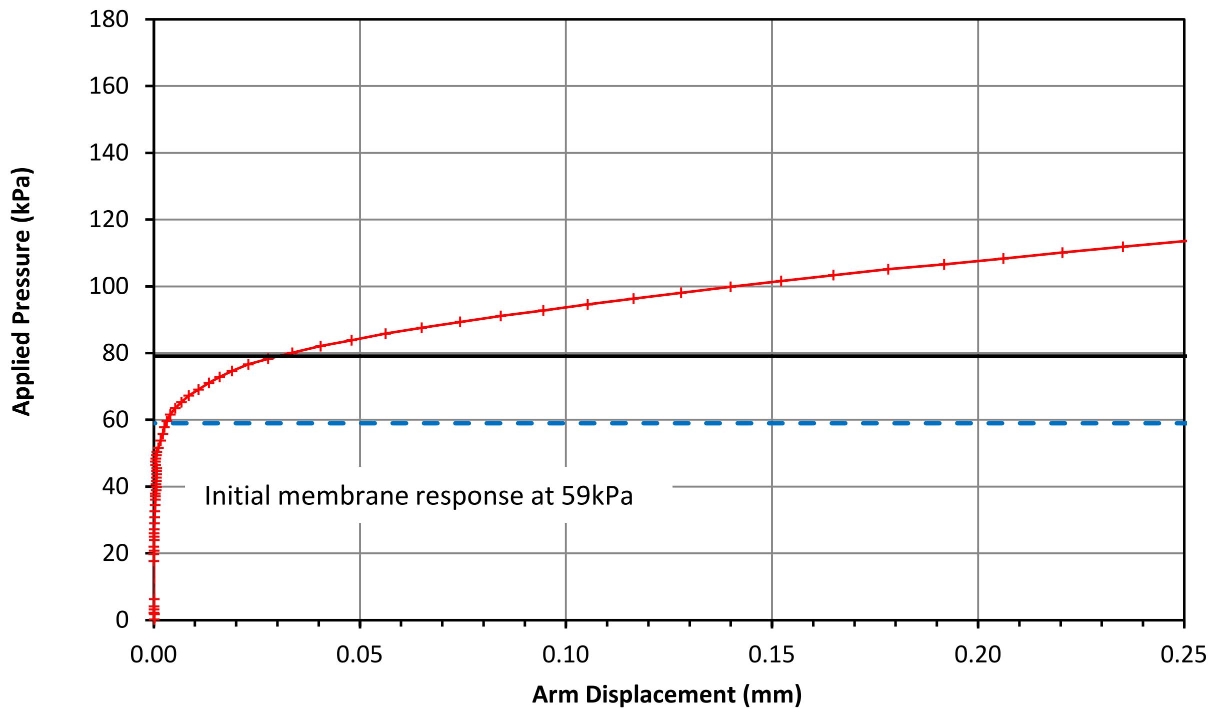
Comments

Project	NGI - Halden Site	**Figure No.**	**HALP01** **T01 - 01**
Client	NGI		
Project No.	P1170112		

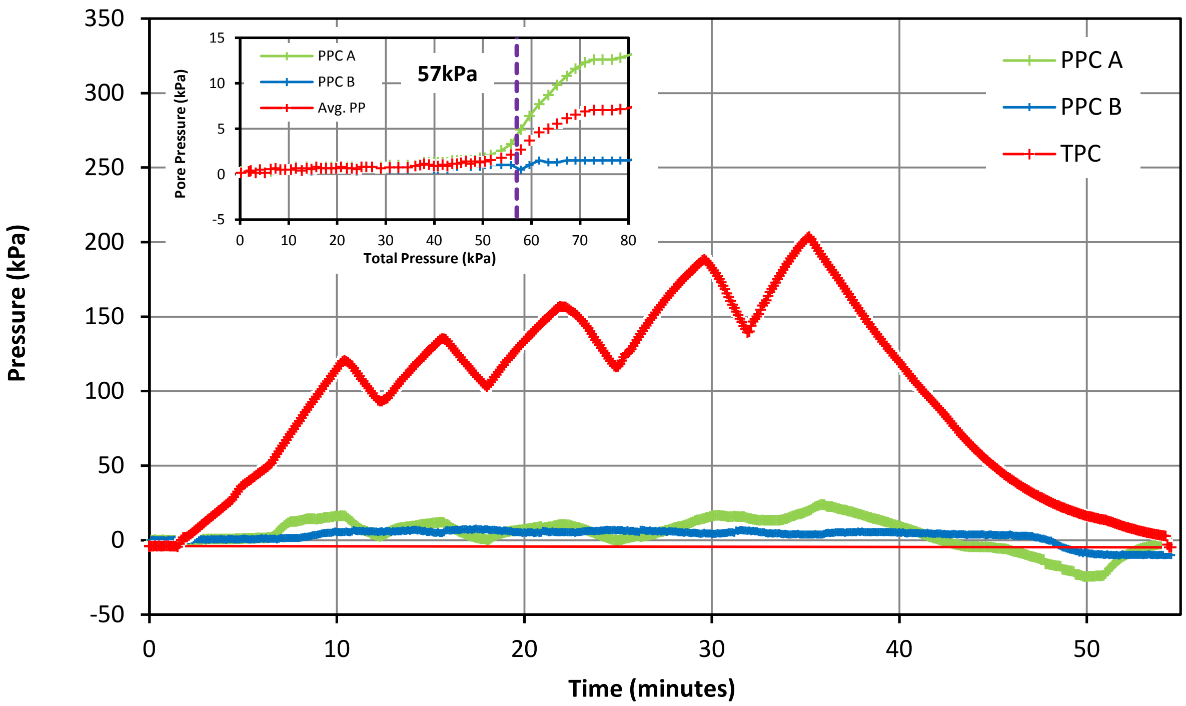
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	Test No.	1
Borehole	HALP01	Test Depth (m)	6.10



Lift Off Stress (Po)	79 kPa

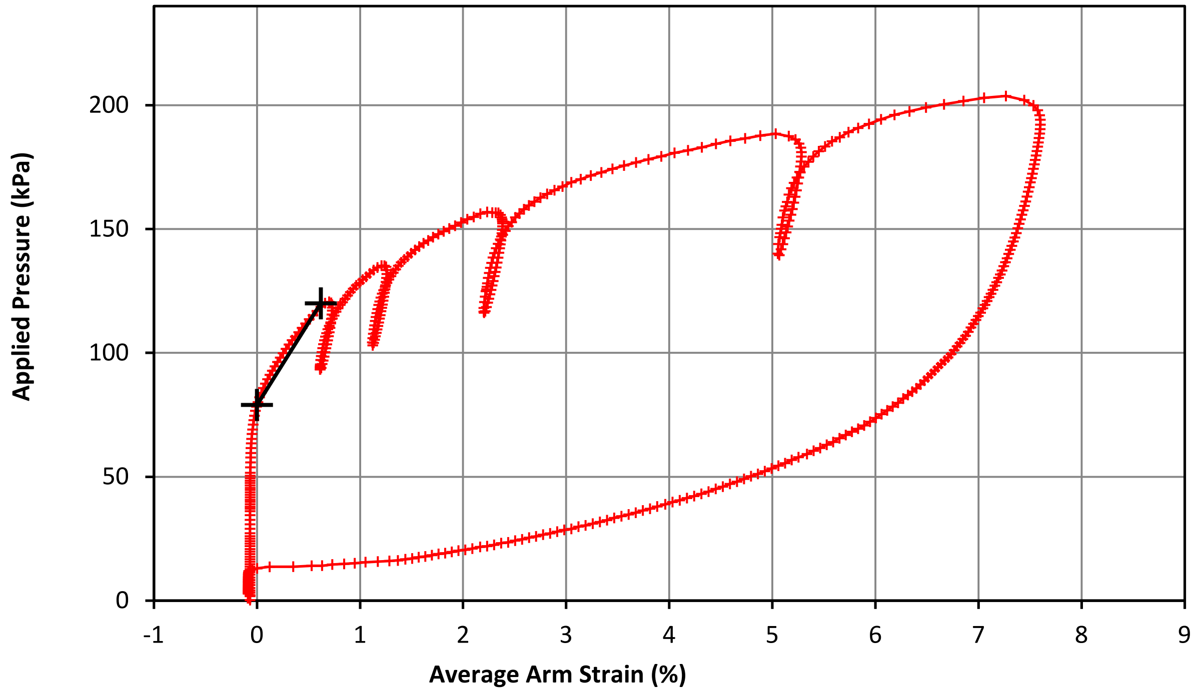


Project	NGI - Halden Site	Figure No.	HALP01 T01 - 02
Client	NGI		
Project No.	P1170112		

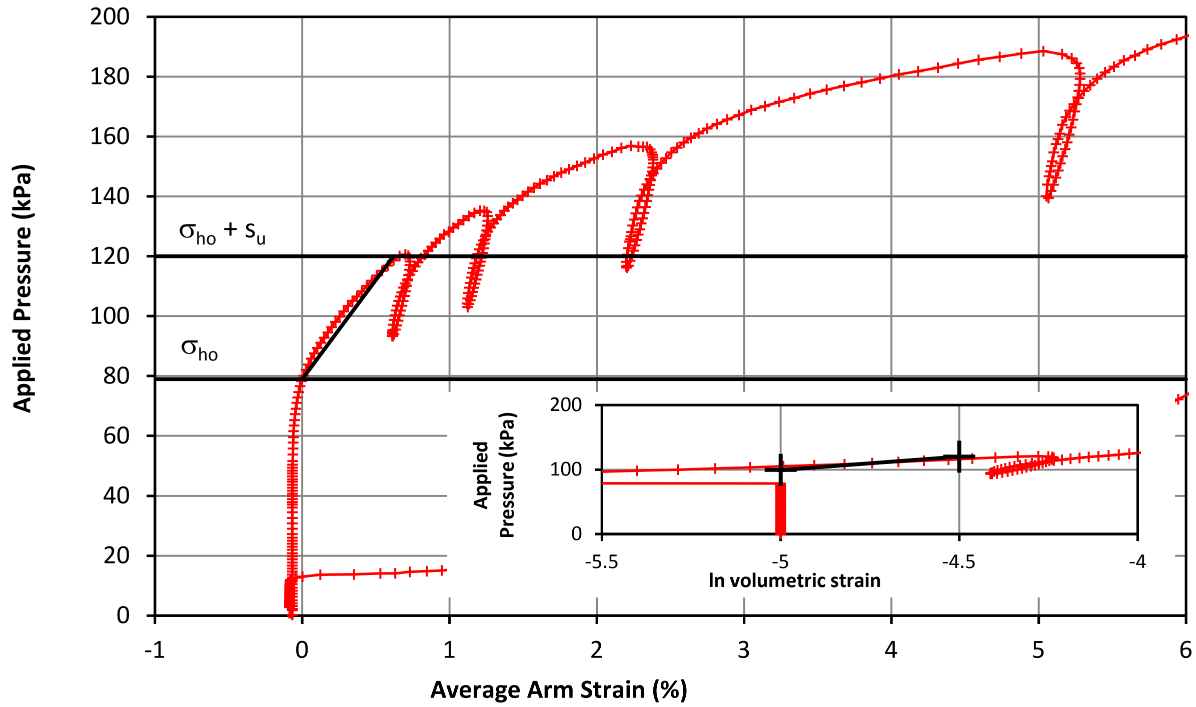
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	1
Borehole	HALP01	**Test Depth (m)**	6.10



Initial Modulus	Shear Modulus	3.3 MPa



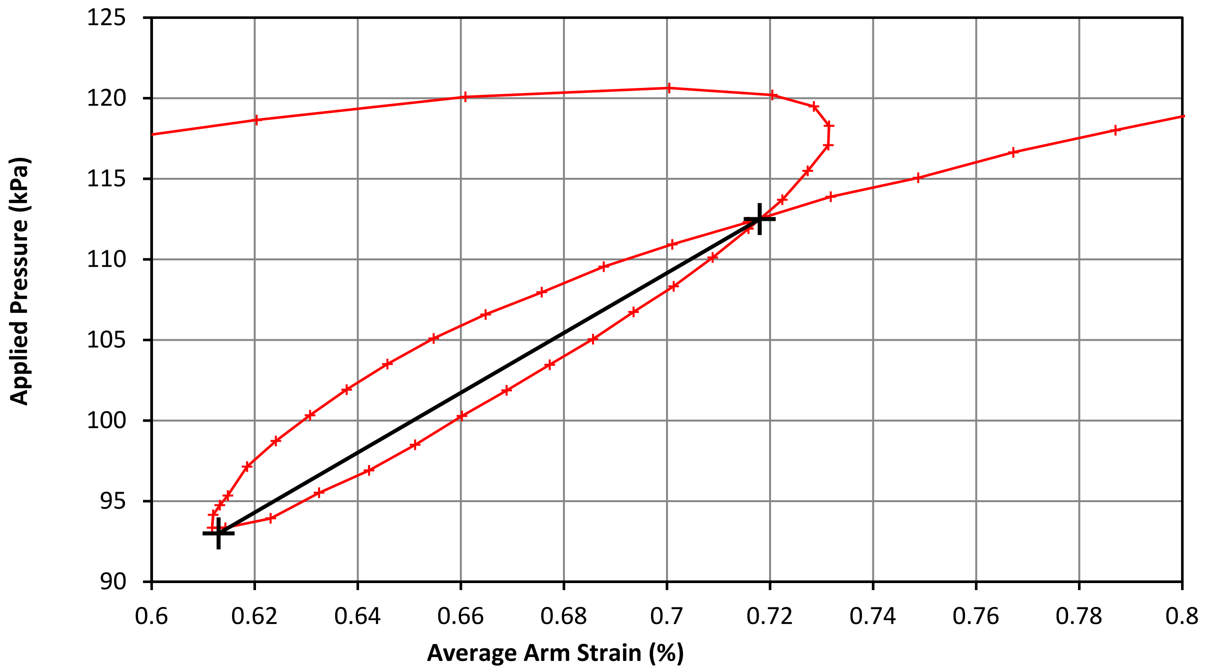
Marsland & Randolph	In situ horizontal stress	79 kPa
	Undrained Strength	41 kPa

Project	NGI - Halden Site	**Figure No.**	**HALP01 T01 - 03**
Client	NGI		
Project No.	P1170112		

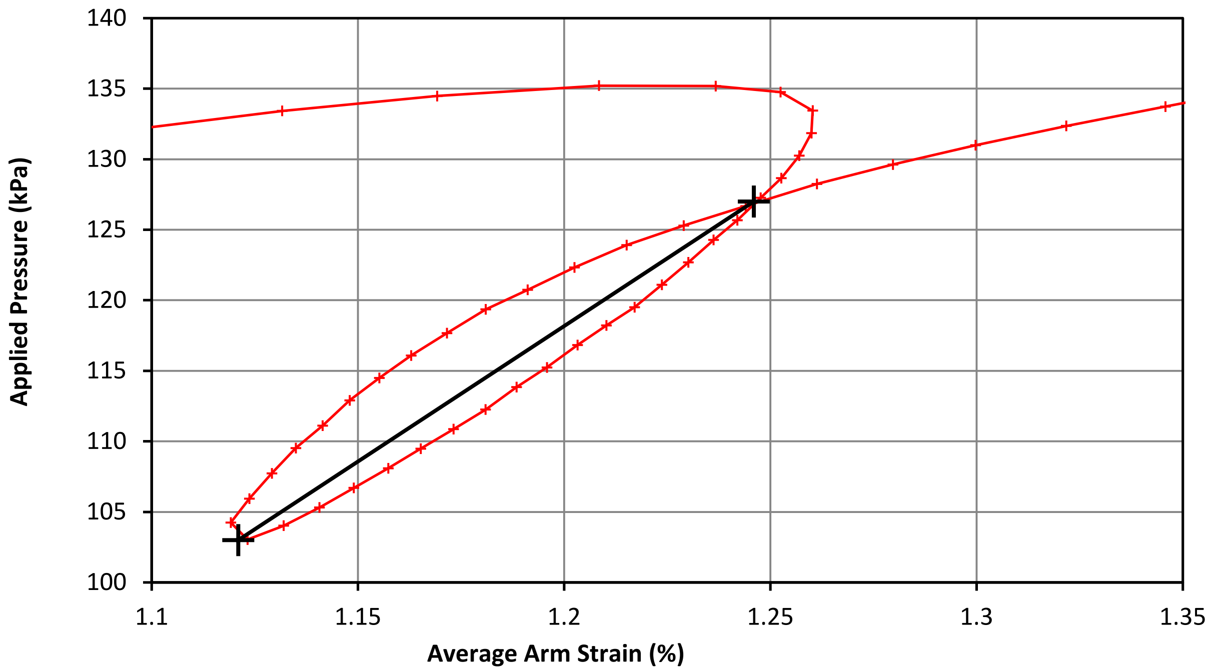
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	Test No.	1
Borehole	HALP01	Test Depth (m)	6.10



Loop 1	Shear Modulus	9.4	MPa
	Cavity Strain Range	0.105	%

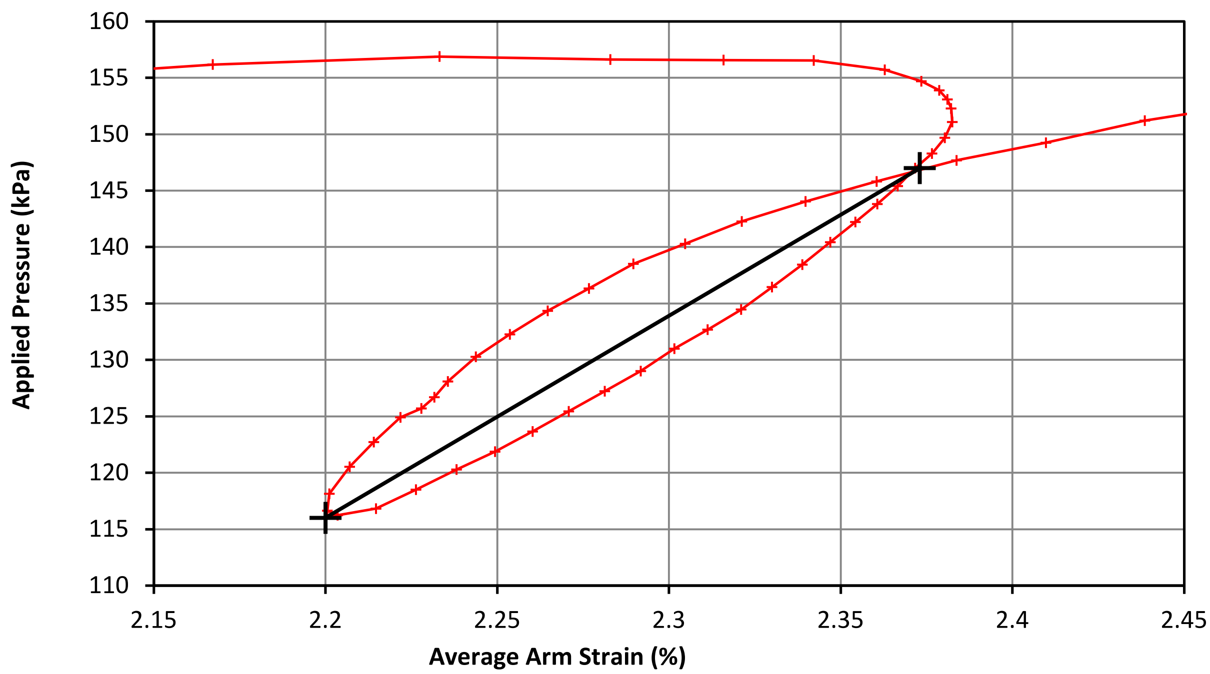


Loop 2	Shear Modulus	9.7	MPa
	Cavity Strain Range	0.125	%

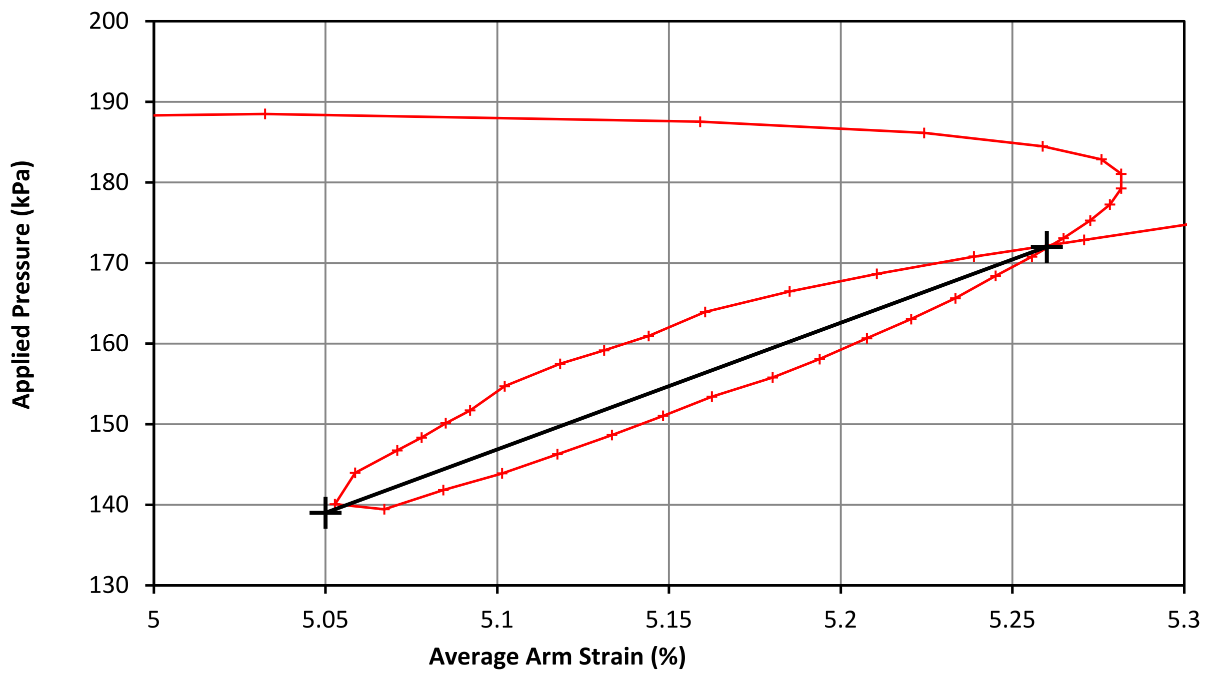
Project	NGI - Halden Site	Figure No.	HALP01 T01 - 04
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

Test Date	16/09/2017	**Test No.**	1
Borehole	HALP01	**Test Depth (m)**	6.10



Loop 3	Shear Modulus	9.2	MPa
	Cavity Strain Range	0.173	%



Loop 4	Shear Modulus	8.3	MPa
	Cavity Strain Range	0.210	%

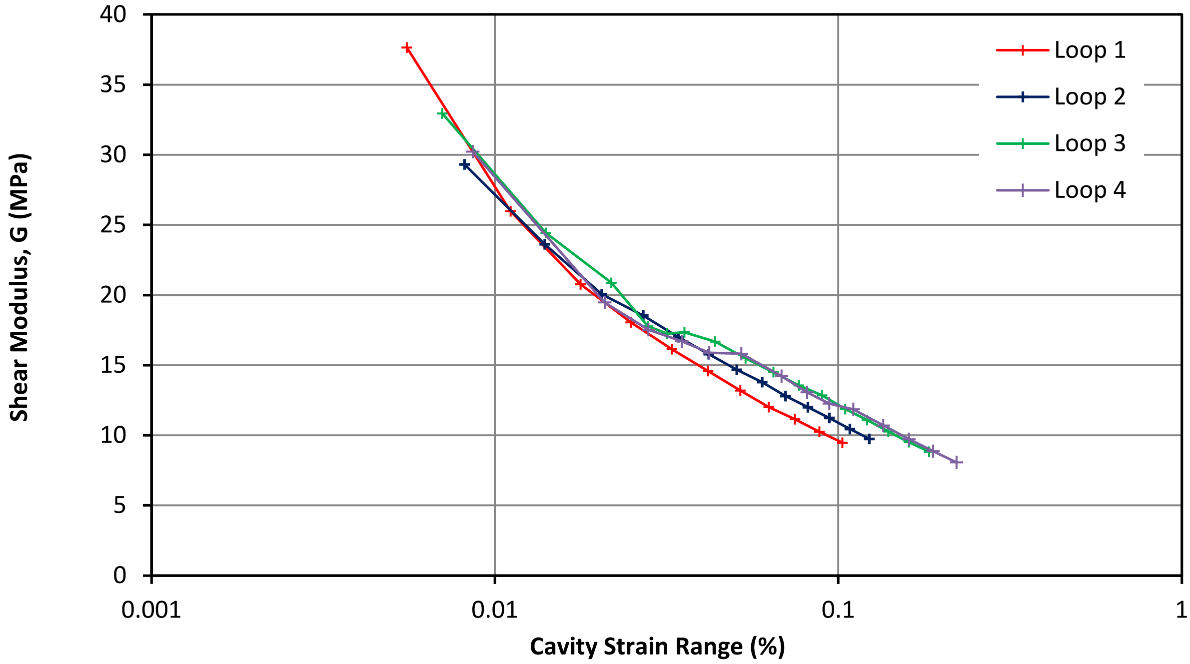
Project	NGI - Halden Site	**Figure No.**	HALP01 T01 - 05
Client	NGI		
Project No.	P1170112		

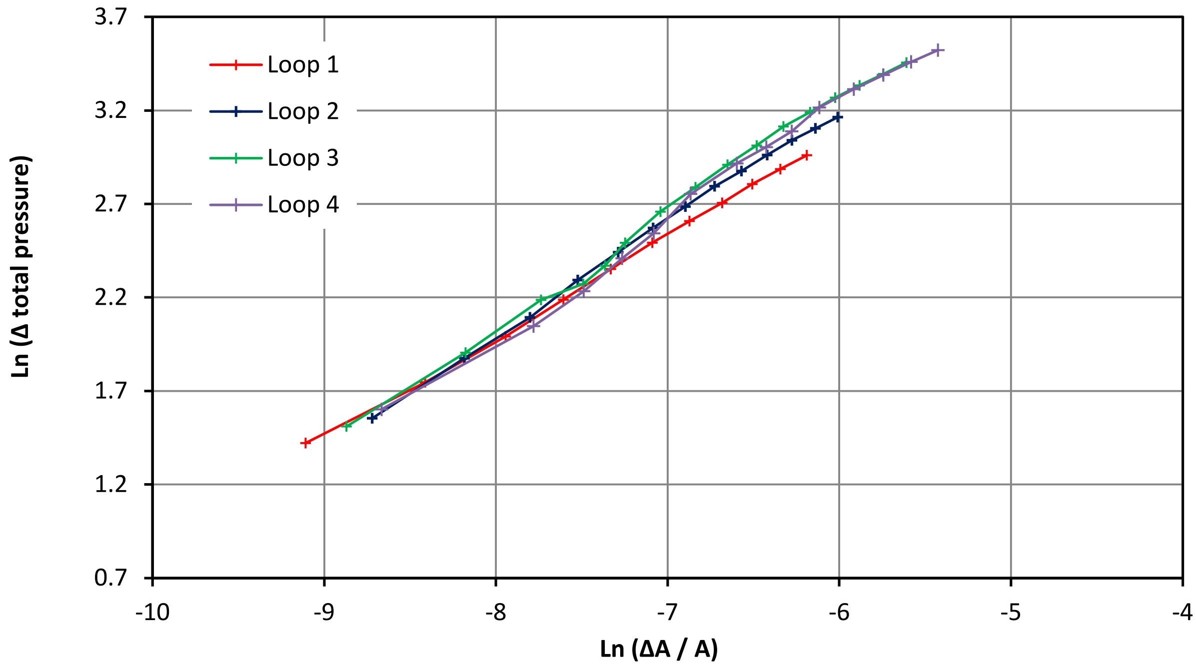
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	1
Borehole	HALP01	**Test Depth (m)**	6.10





Loop 1		Loop 2		Loop 3		Loop 4	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.540	0.551 (MPa)	0.605	0.935 (MPa)	0.621	1.096 (MPa)	0.628	1.098 (MPa)

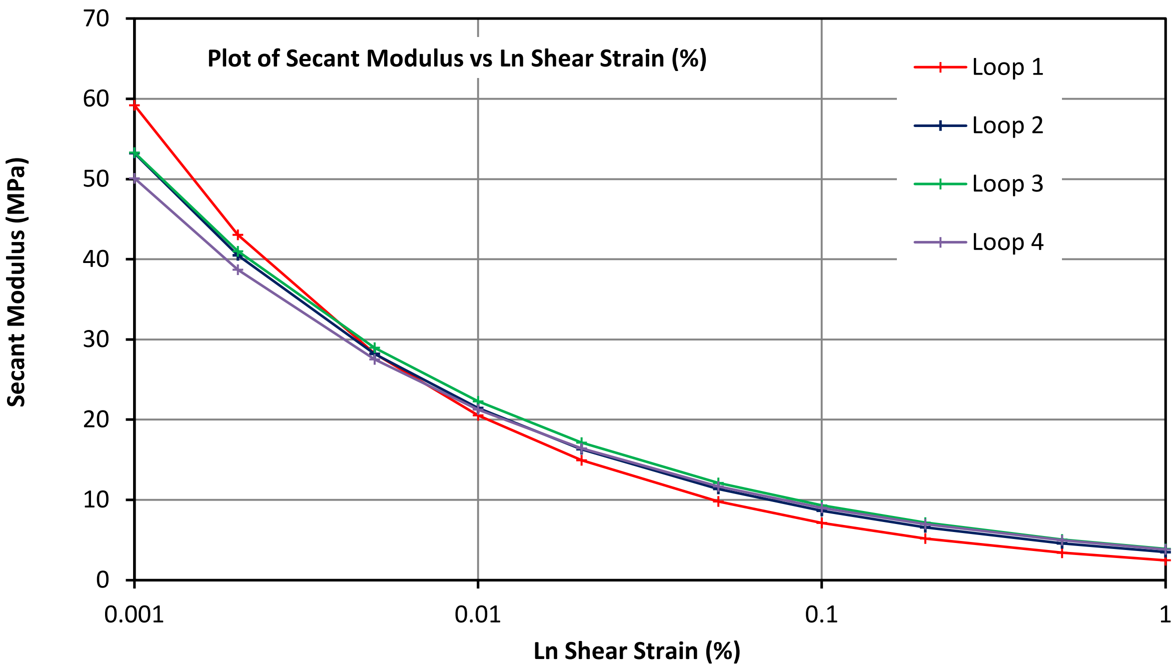
Project	NGI - Halden Site	**Figure No.**	**HALP01 T01 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU
SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	1
Borehole	HALP01	**Test Depth (m)**	6.10

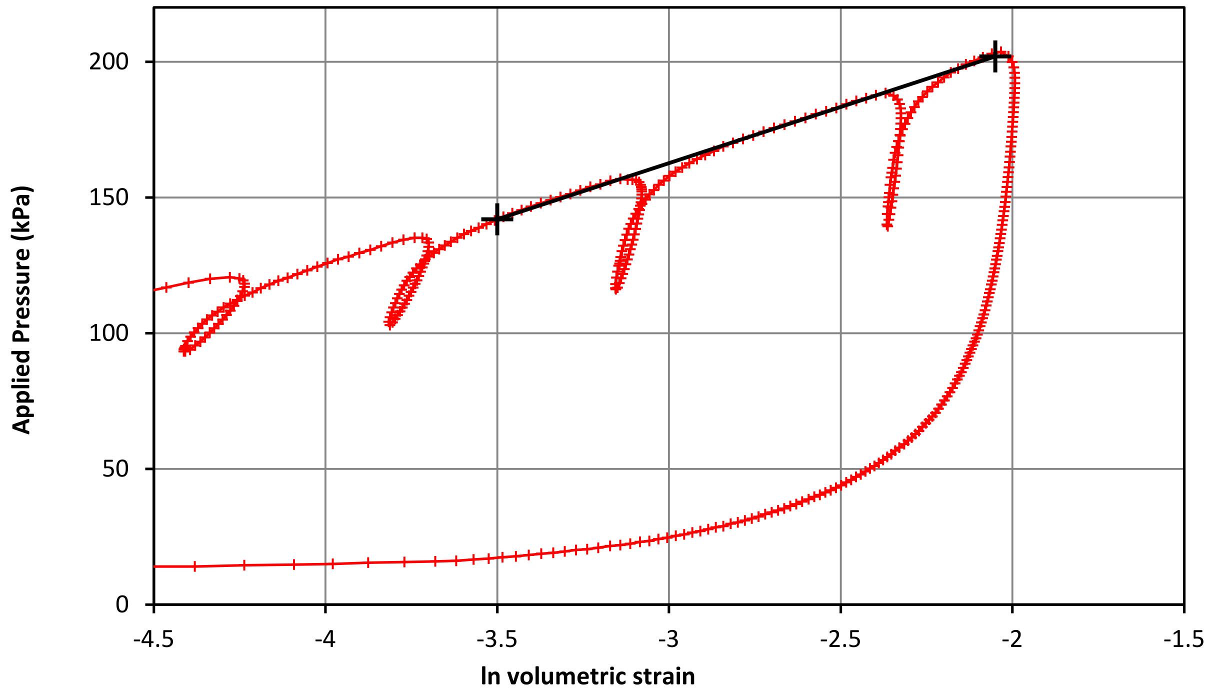


Shear Strain	Loop 1	Loop 2	Loop 3	Loop 4
0.001%	**59**	**53**	**53**	**50**
0.002%	43	40	41	39
0.005%	28	28	29	28
0.010%	**21**	**21**	**22**	**21**
0.020%	15	16	17	16
0.050%	10	11	12	12
0.100%	**7**	**9**	**9**	**9**
0.200%	5	7	7	7
0.500%	3	5	5	5
1.000%	**2**	**3**	**4**	**4**

Project	NGI - Halden Site	**Figure No.**	**HALP01 T01 - 07**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

Test Date	16/09/2017	**Test No.**	1
Borehole	HALP01	**Test Depth (m)**	6.10



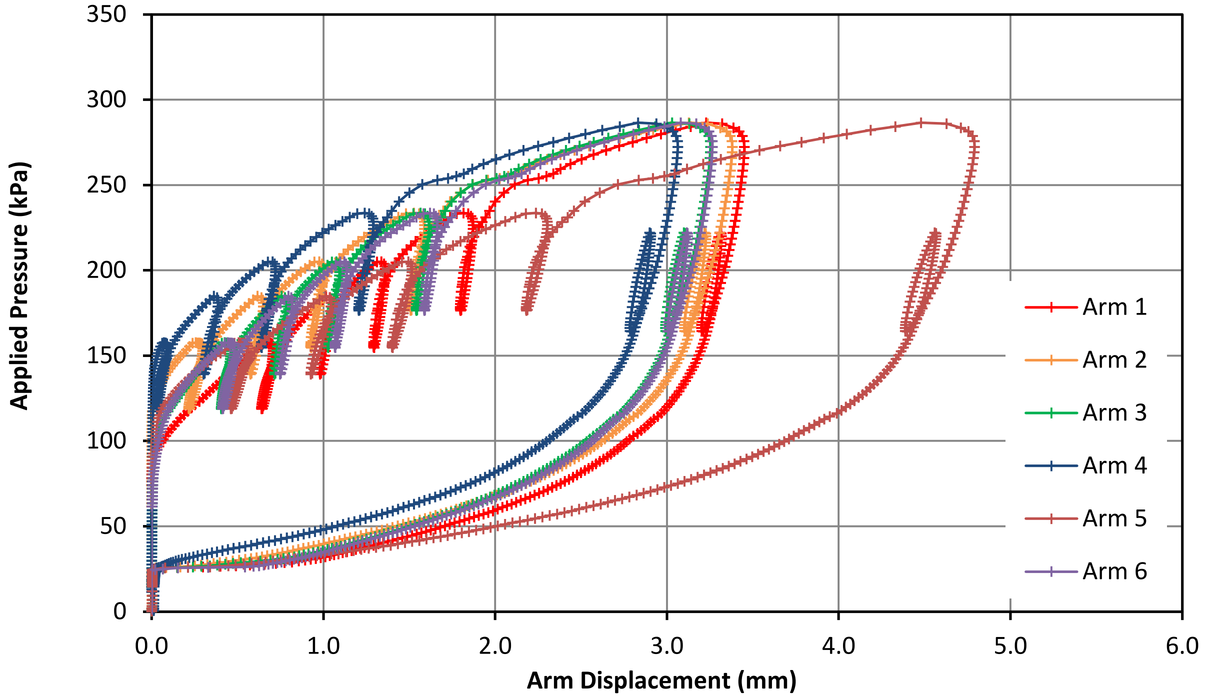
Strength	Undrained Shear	41	kPa
	Limit Pressure	287	kPa

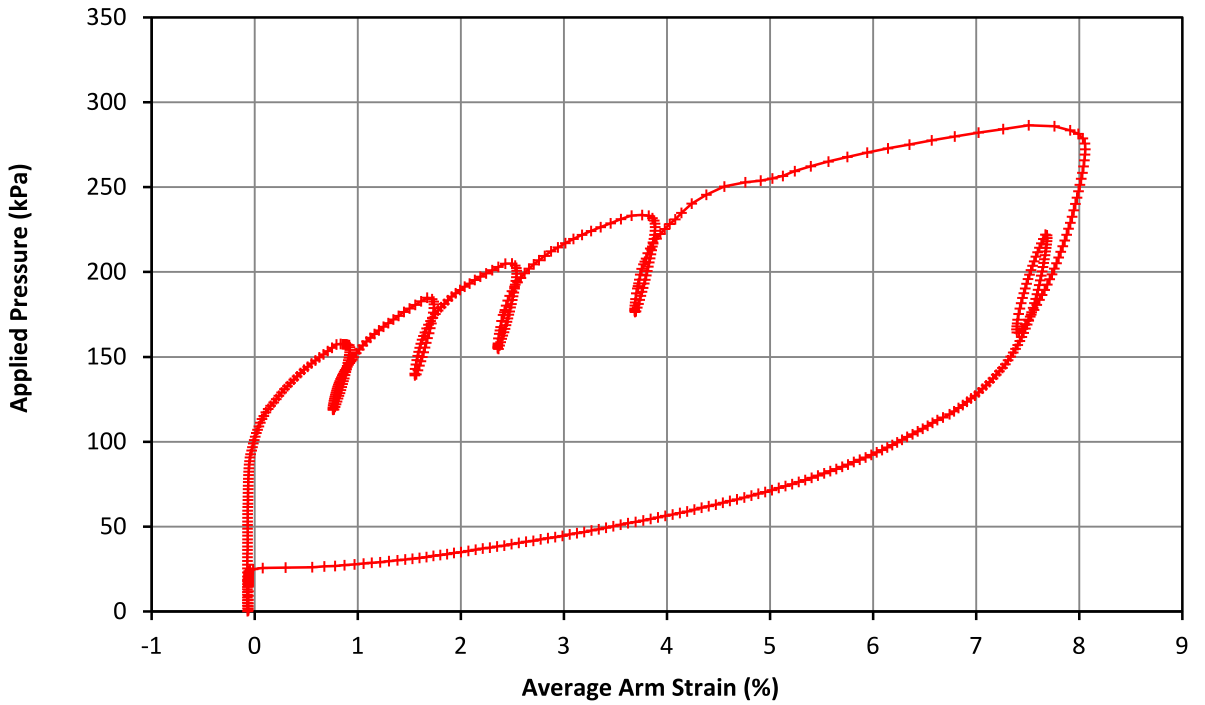
Project	NGI - Halden Site	**Figure No.**	**HALP01 T01 - 08**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU
SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	2
Borehole	HALP01	**Test Depth (m)**	8.00





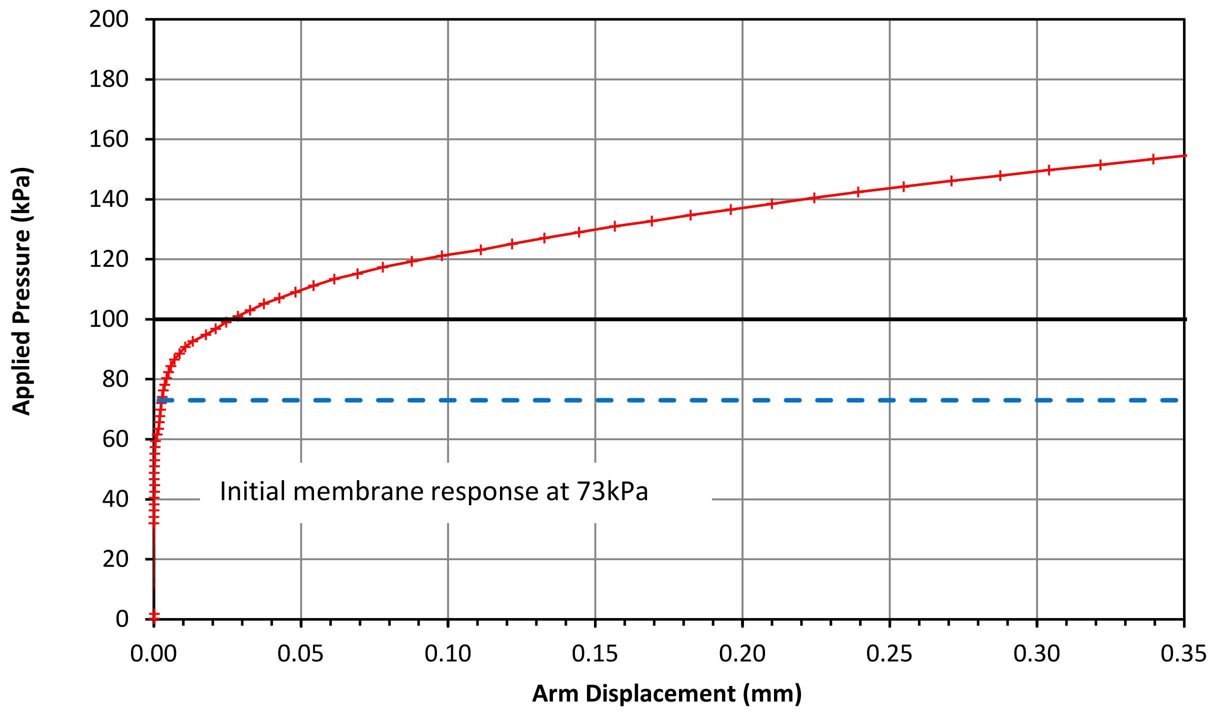
Comments

Project	NGI - Halden Site	**Figure No.**	**HALP01** **T02 - 01**
Client	NGI		
Project No.	P1170112		

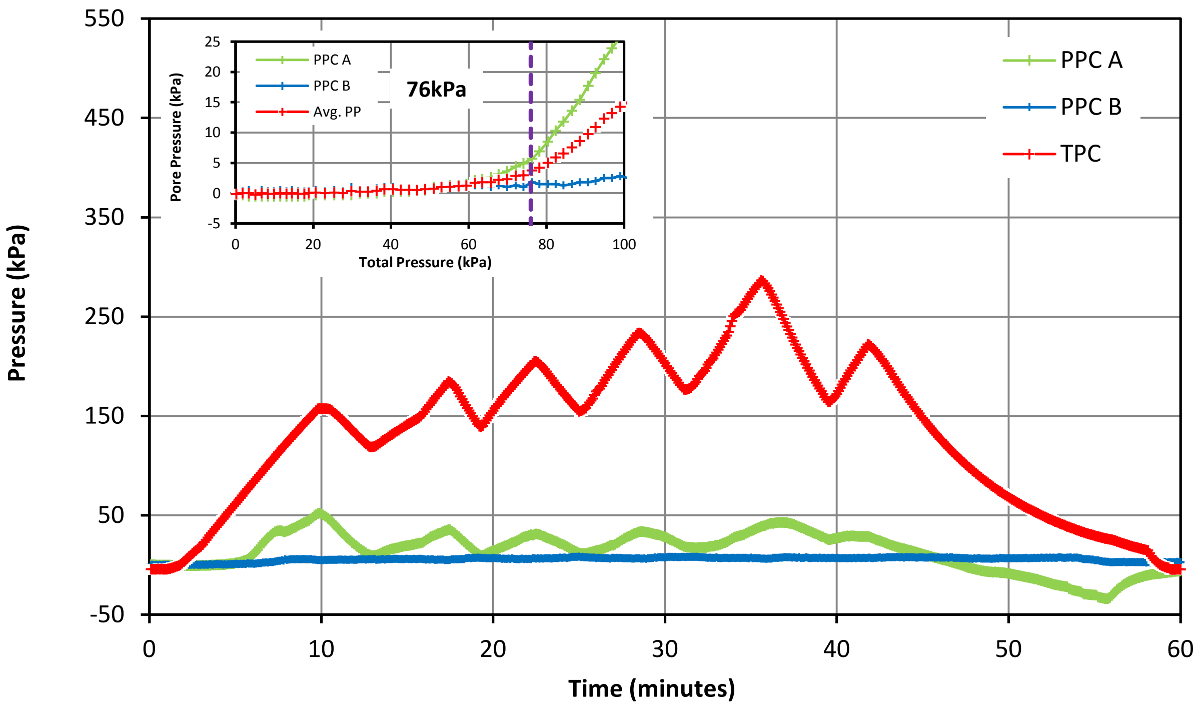
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	2
Borehole	HALP01	**Test Depth (m)**	8.00



Lift Off Stress (Po)	100 kPa

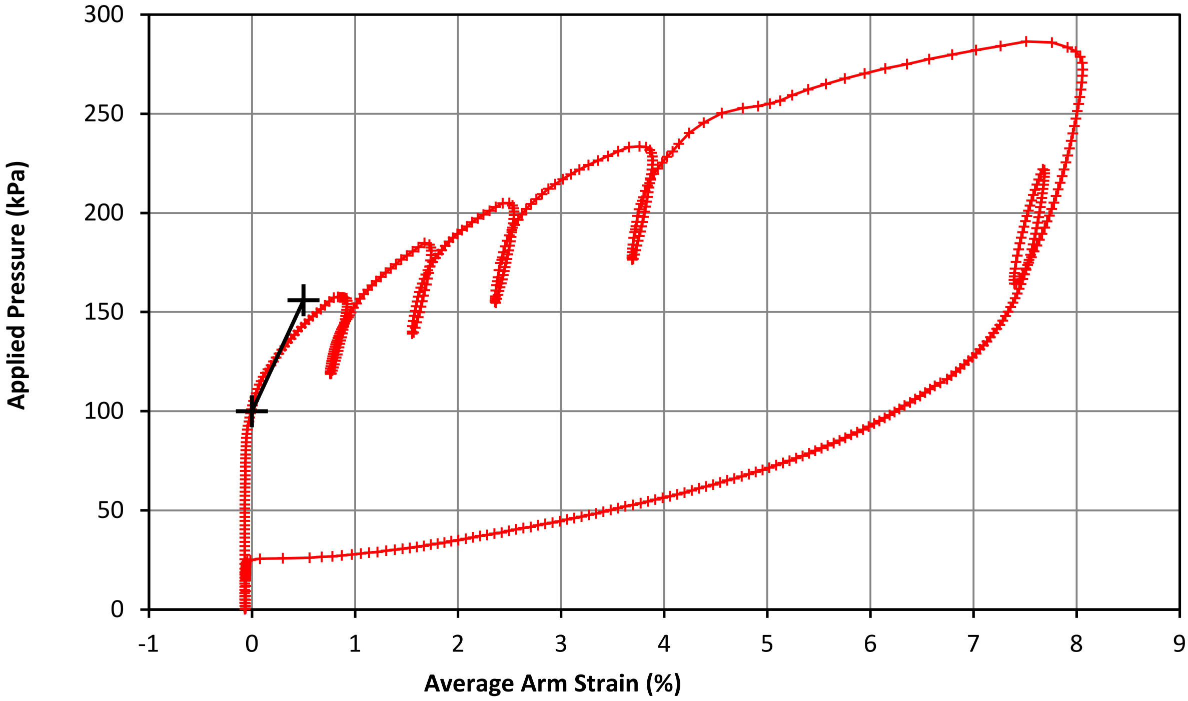


Project	NGI - Halden Site	**Figure No.**	**HALP01 T02 - 02**
Client	NGI		
Project No.	P1170112		

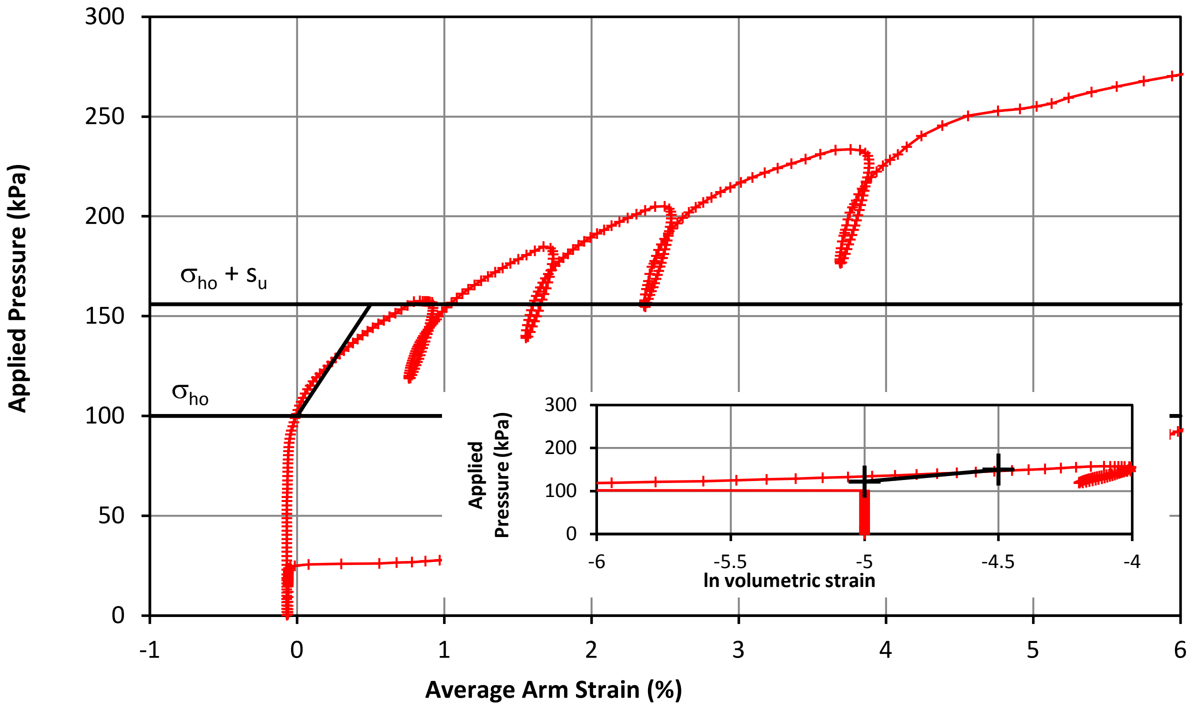
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	2
Borehole	HALP01	**Test Depth (m)**	8.00



Initial Modulus	Shear Modulus	5.6 MPa



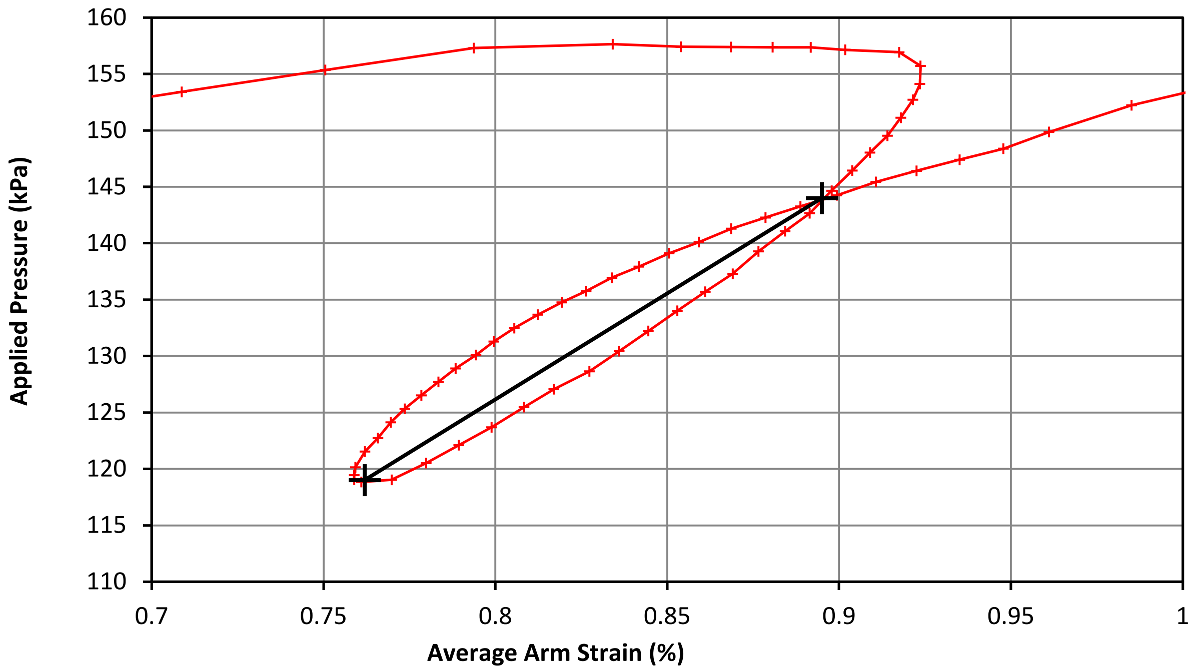
Marsland & Randolph	In situ horizontal stress	100 kPa
	Undrained Strength	56 kPa

Project	NGI - Halden Site	**Figure No.**	HALP01 T02 - 03
Client	NGI		
Project No.	P1170112		

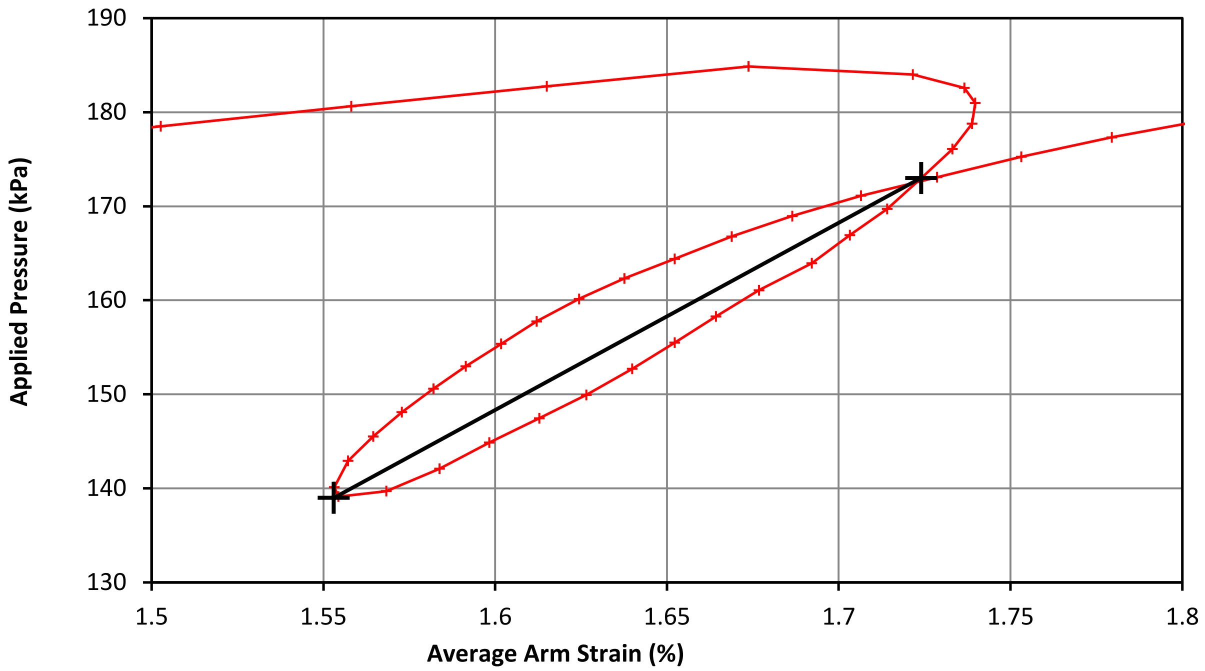
Pressuremeter Test Unload Reload Loop

IN SITU
SITE INVESTIGATION

Test Date	16/09/2017	Test No.	2
Borehole	HALP01	Test Depth (m)	8.00



Loop 1	Shear Modulus	9.5 MPa
	Cavity Strain Range	0.133 %



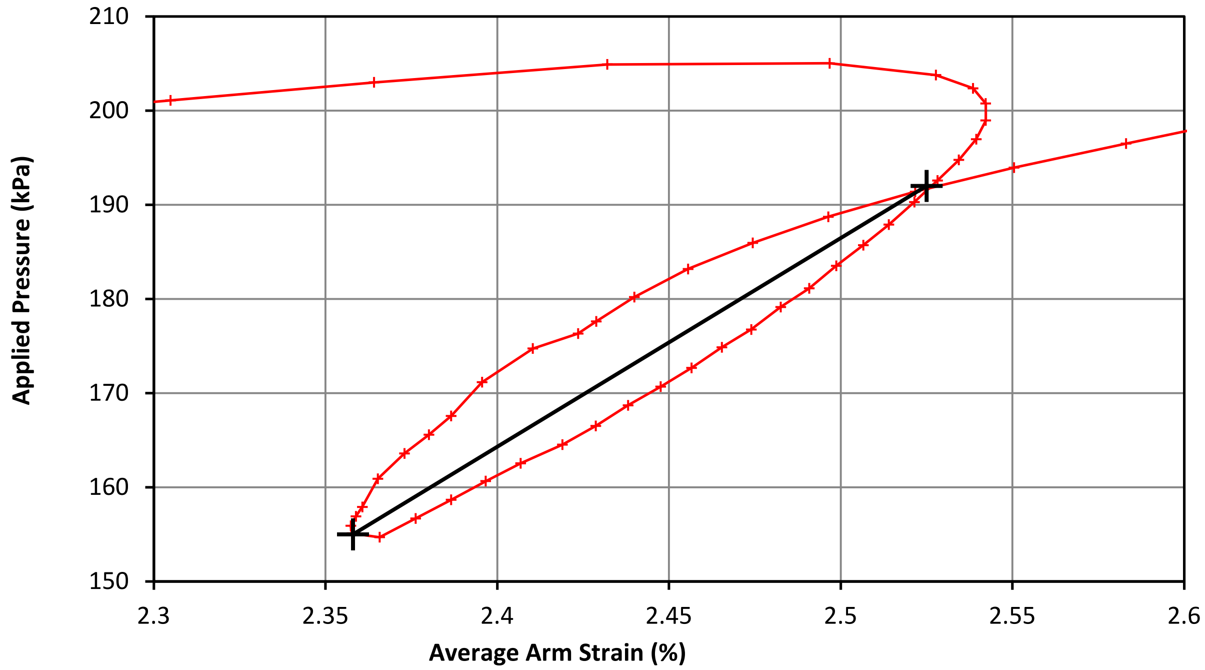
Loop 2	Shear Modulus	10.1 MPa
	Cavity Strain Range	0.171 %

Project	NGI - Halden Site	Figure No.	HALP01 T02 - 04
Client	NGI		
Project No.	P1170112		

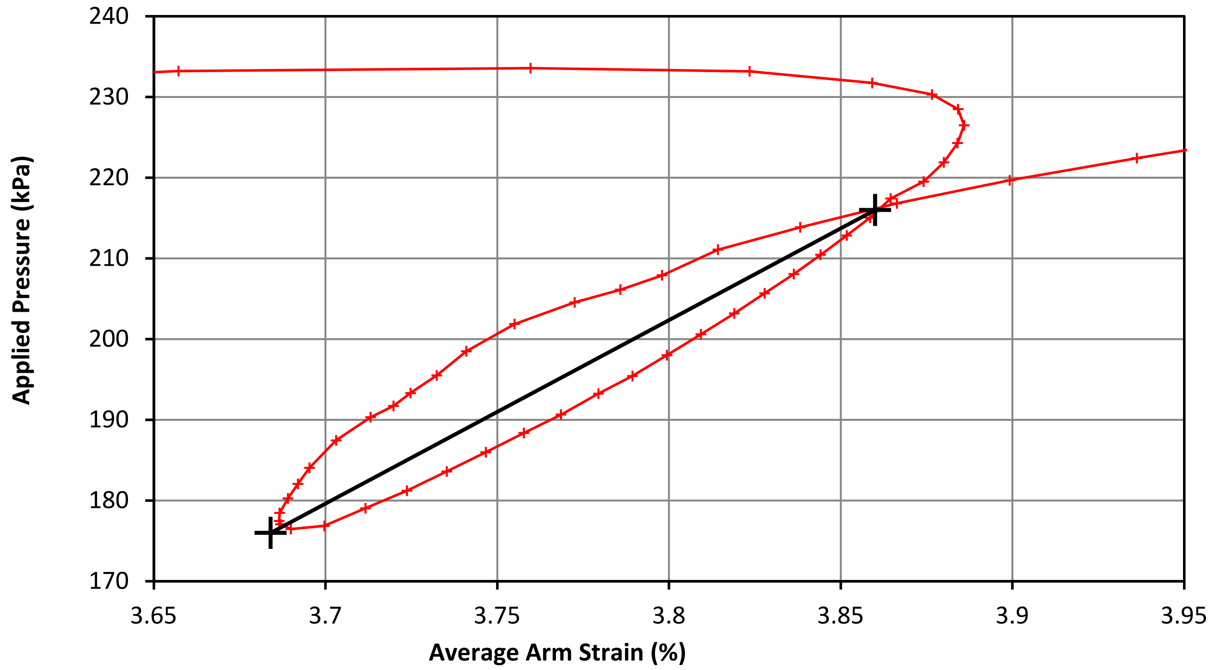
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	Test No.	2
Borehole	HALP01	Test Depth (m)	8.00



Loop 3	Shear Modulus	11.4 MPa
	Cavity Strain Range	0.167 %



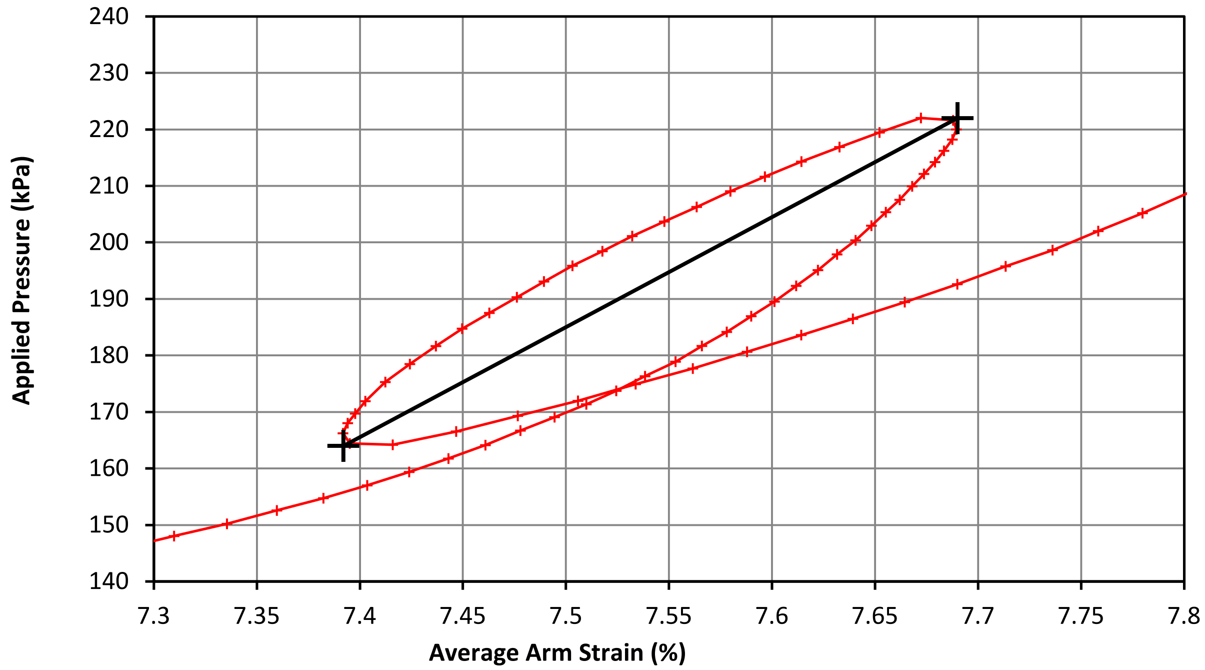
Loop 4	Shear Modulus	11.8 MPa
	Cavity Strain Range	0.176 %

Project	NGI - Halden Site	Figure No.	HALP01 T02 - 05
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	2
Borehole	HALP01	**Test Depth (m)**	8.00



Loop 5	Shear Modulus	10.5	MPa
	Cavity Strain Range	0.298	%

Loop 6	Shear Modulus	27.9	MPa
	Cavity Strain Range	0.148	%

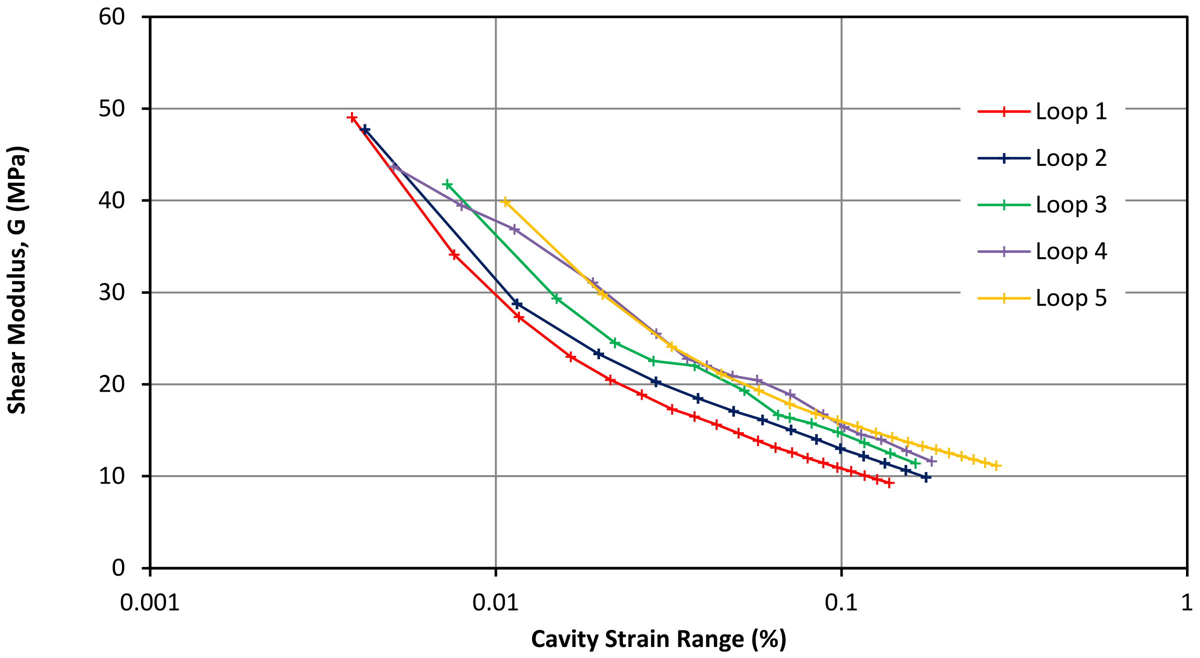
Project	NGI - Halden Site	**Figure No.**	**HALP01 T02 - 06**
Client	NGI		
Project No.	P1170112		

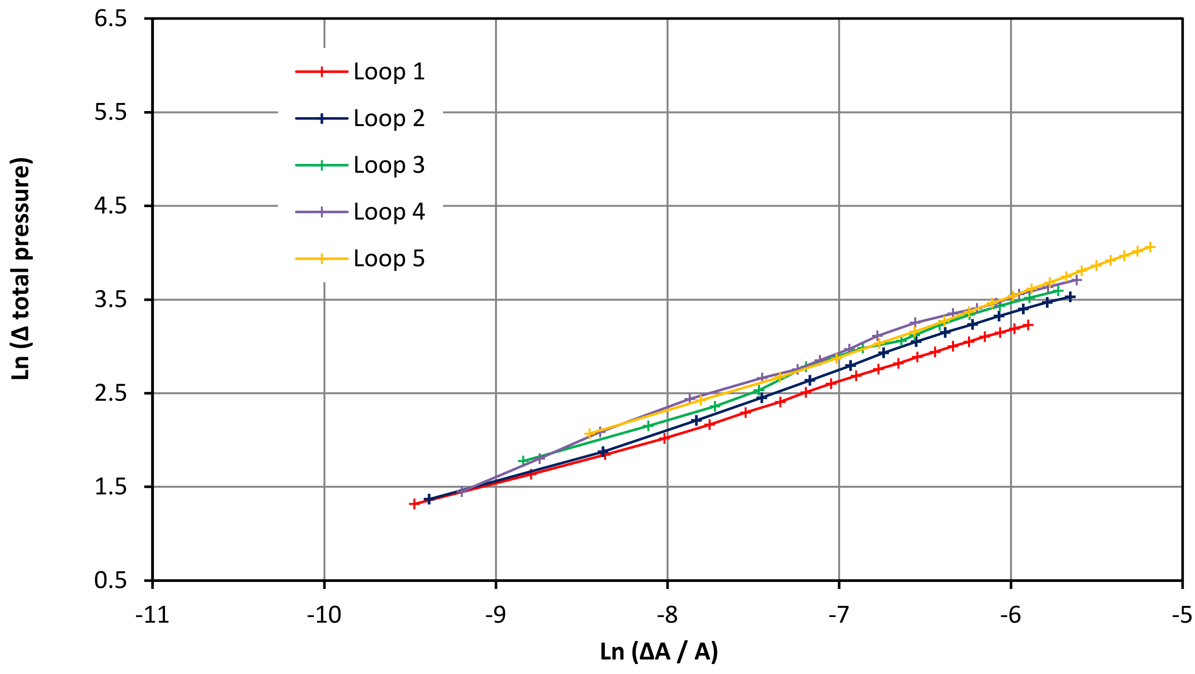
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU
SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	2
Borehole	HALP01	**Test Depth (m)**	8.00





Loop 1		**Loop 2**		**Loop 3**		**Loop 4**		**Loop 5**	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.554	0.663 (MPa)	0.601	1.053 (MPa)	0.606	1.210 (MPa)	0.624	1.456 (MPa)	0.625	1.462 (MPa)

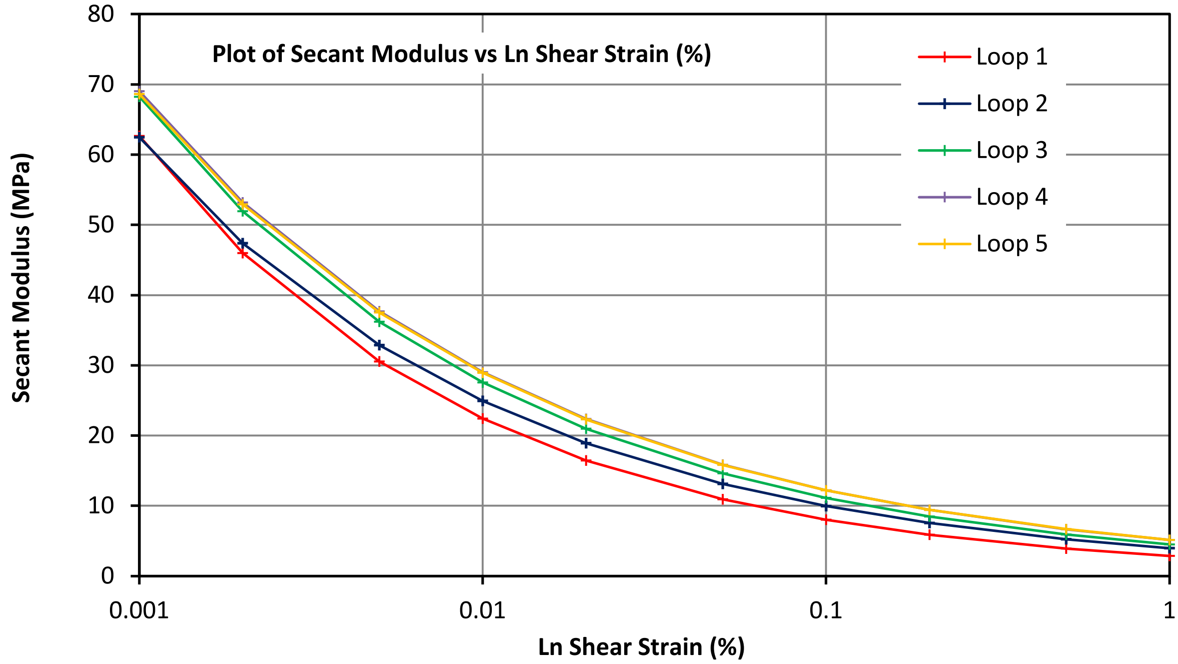
Project	NGI - Halden Site	**Figure No.**	**HALP01 T02 - 07**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	2
Borehole	HALP01	**Test Depth (m)**	8.00

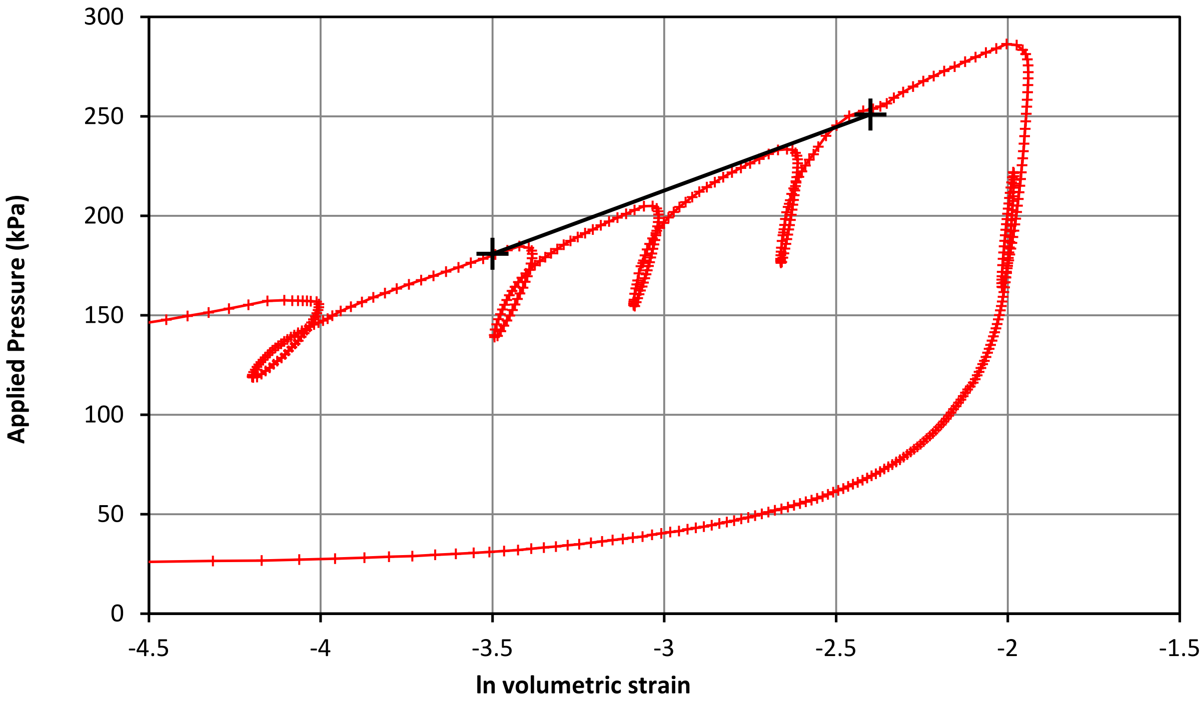


Shear Strain	Loop 1	Loop 2	Loop 3	Loop 4	Loop 5
0.001%	**63**	**62**	**68**	**69**	**69**
0.002%	46	47	52	53	53
0.005%	31	33	36	38	38
0.010%	**22**	**25**	**28**	**29**	**29**
0.020%	16	19	21	22	22
0.050%	11	13	15	16	16
0.100%	**8**	**10**	**11**	**12**	**12**
0.200%	6	8	8	9	9
0.500%	4	5	6	7	7
1.000%	**3**	**4**	**4**	**5**	**5**

Project	NGI - Halden Site	**Figure No.**	**HALP01 T02 - 08**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

Test Date	16/09/2017	Test No.	2
Borehole	HALP01	Test Depth (m)	8.00



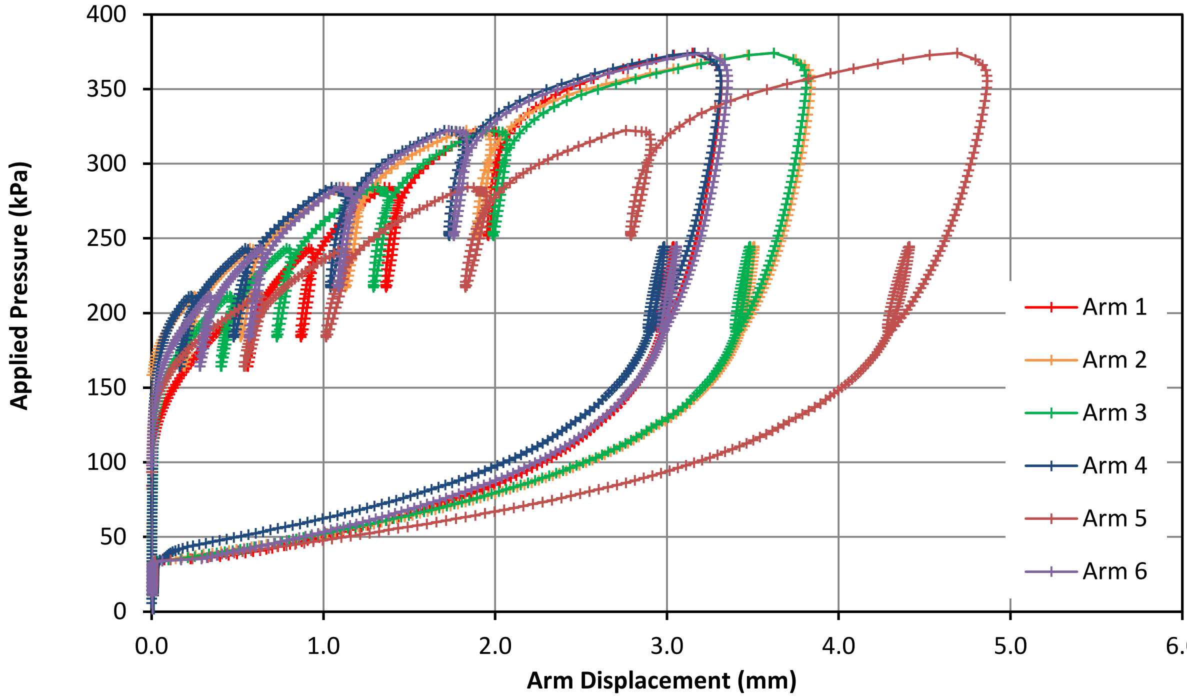
Strength	Undrained Shear	64	kPa
	Limit Pressure	404	kPa

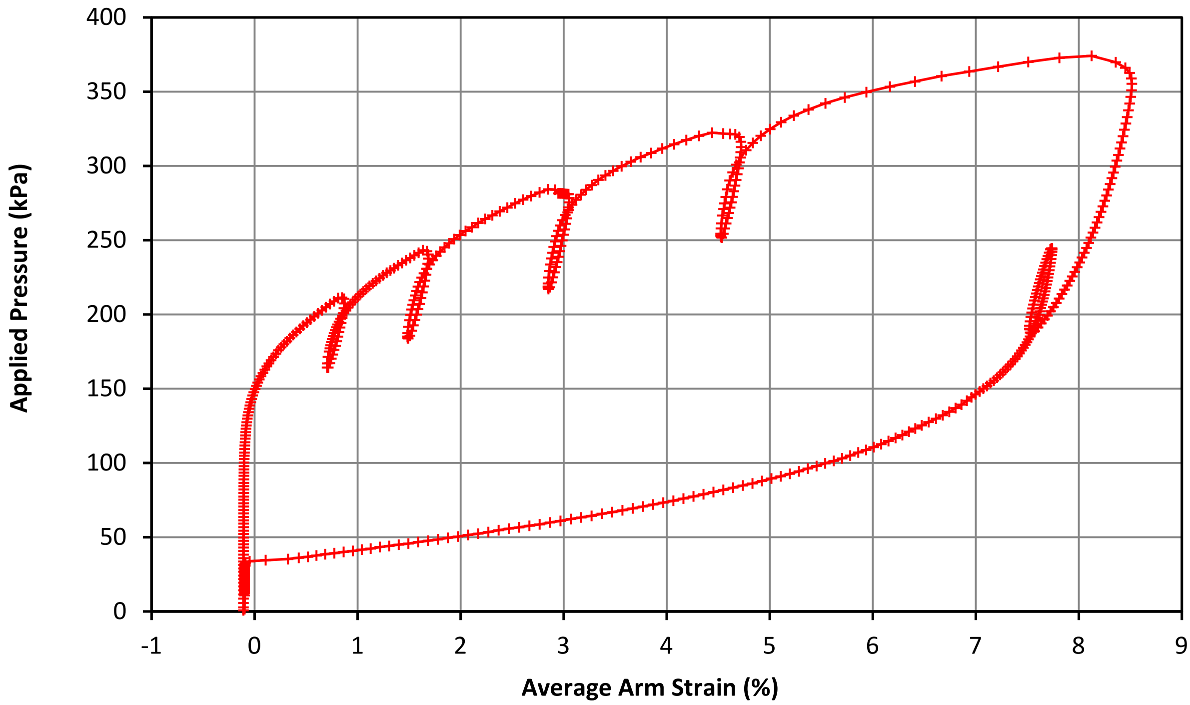
Project	NGI - Halden Site	Figure No.	HALP01 T02 - 09
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	3
Borehole	HALP01	**Test Depth (m)**	10.00





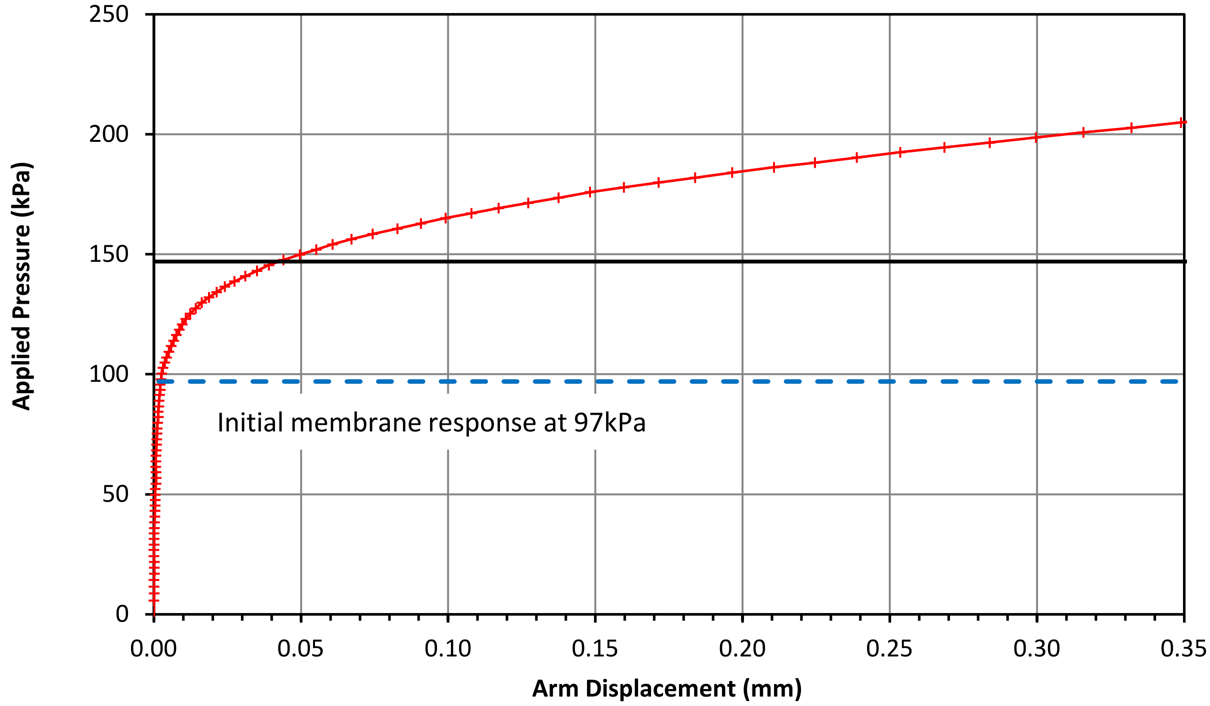
Comments

Project	NGI - Halden Site	**Figure No.**	**HALP01 T03 - 01**
Client	NGI		
Project No.	P1170112		

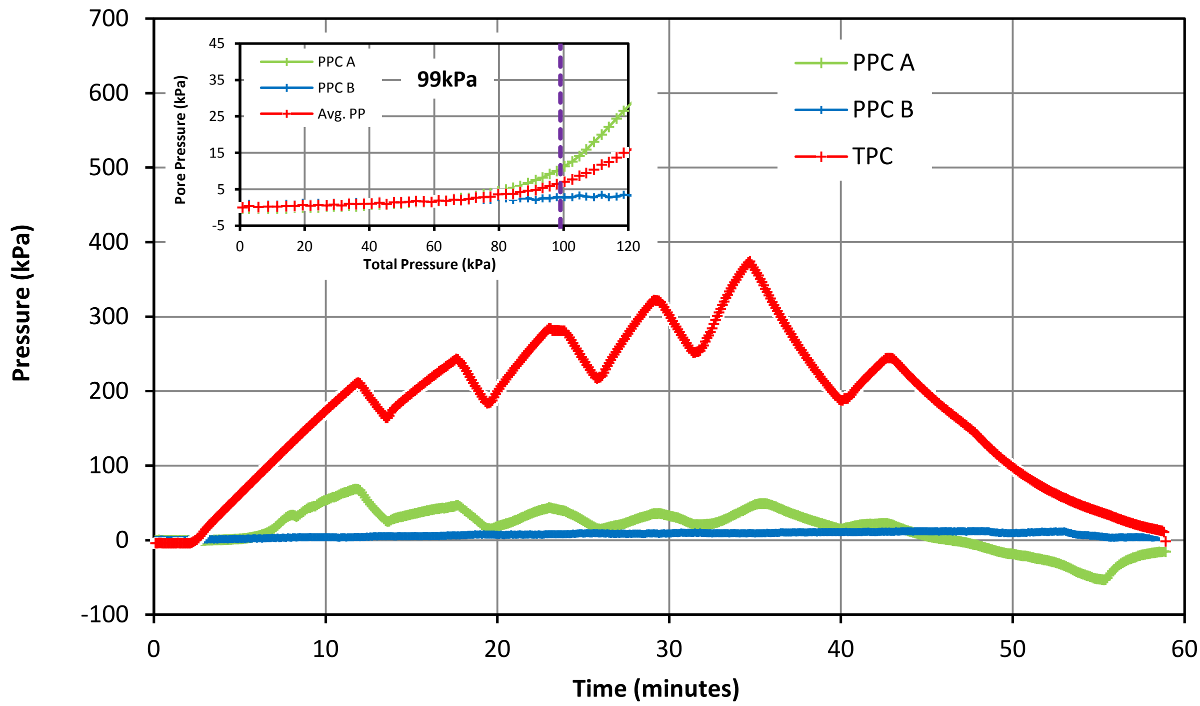
96

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	3
Borehole	HALP01	**Test Depth (m)**	10.00



Lift Off Stress (Po)	147 kPa

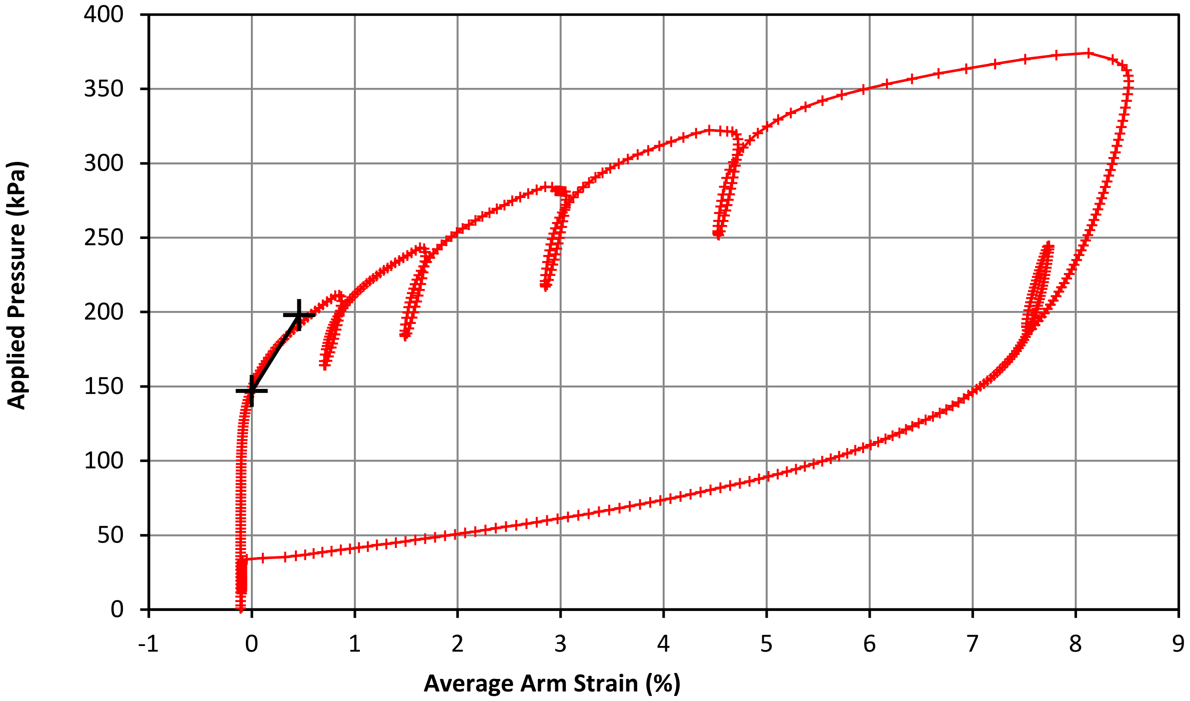


Project	NGI - Halden Site	**Figure No.**	HALP01 T03 - 02
Client	NGI		
Project No.	P1170112		

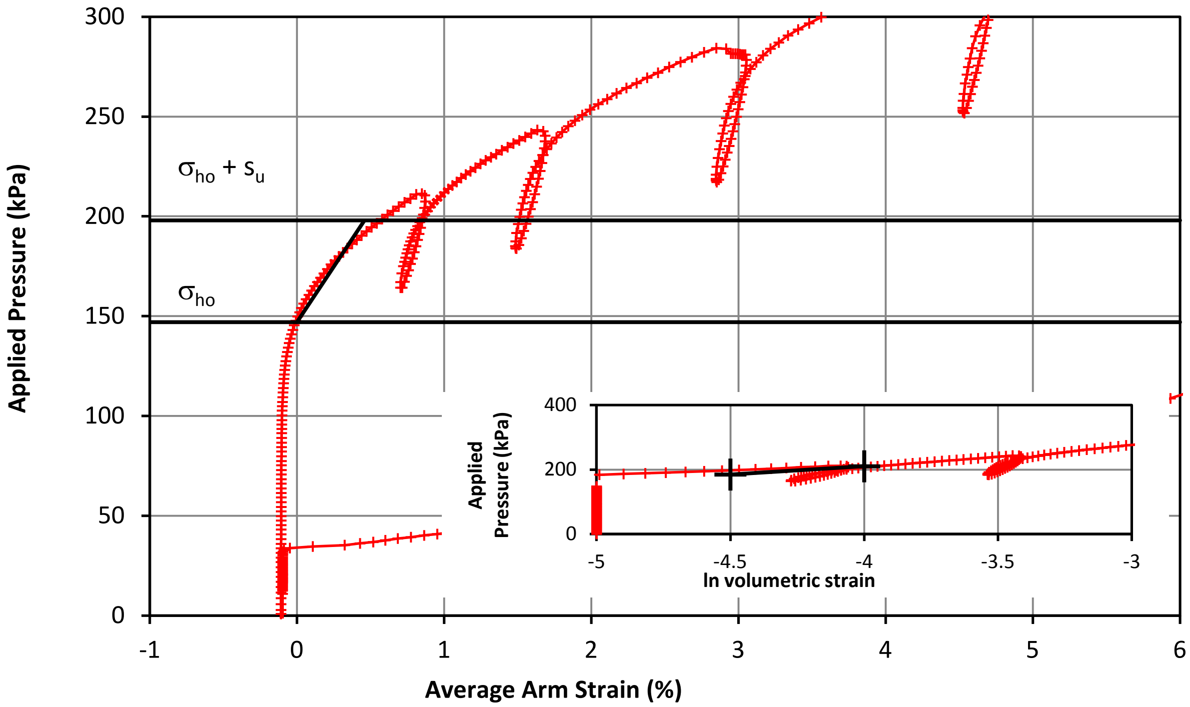
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	Test No.	3
Borehole	HALP01	Test Depth (m)	10.00



Initial Modulus	Shear Modulus	5.6 MPa



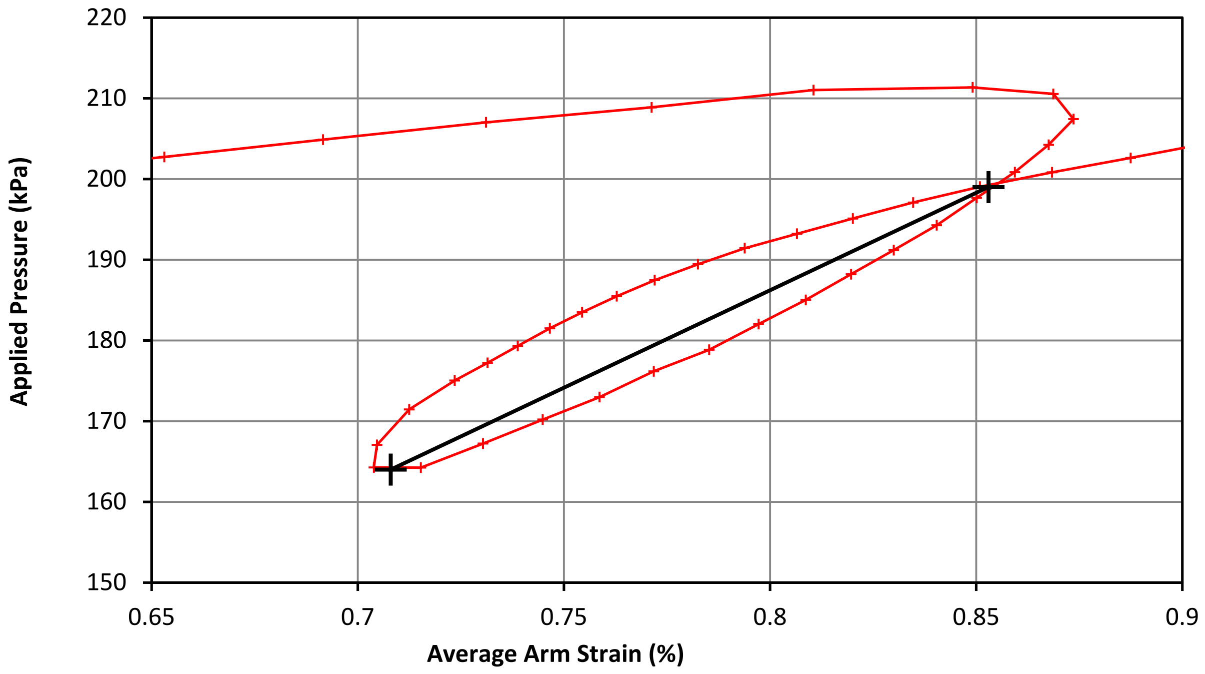
Marsland & Randolph	In situ horizontal stress	147 kPa
	Undrained Strength	51 kPa

Project	NGI - Halden Site	Figure No.	HALP01 T03 - 03
Client	NGI		
Project No.	P1170112		

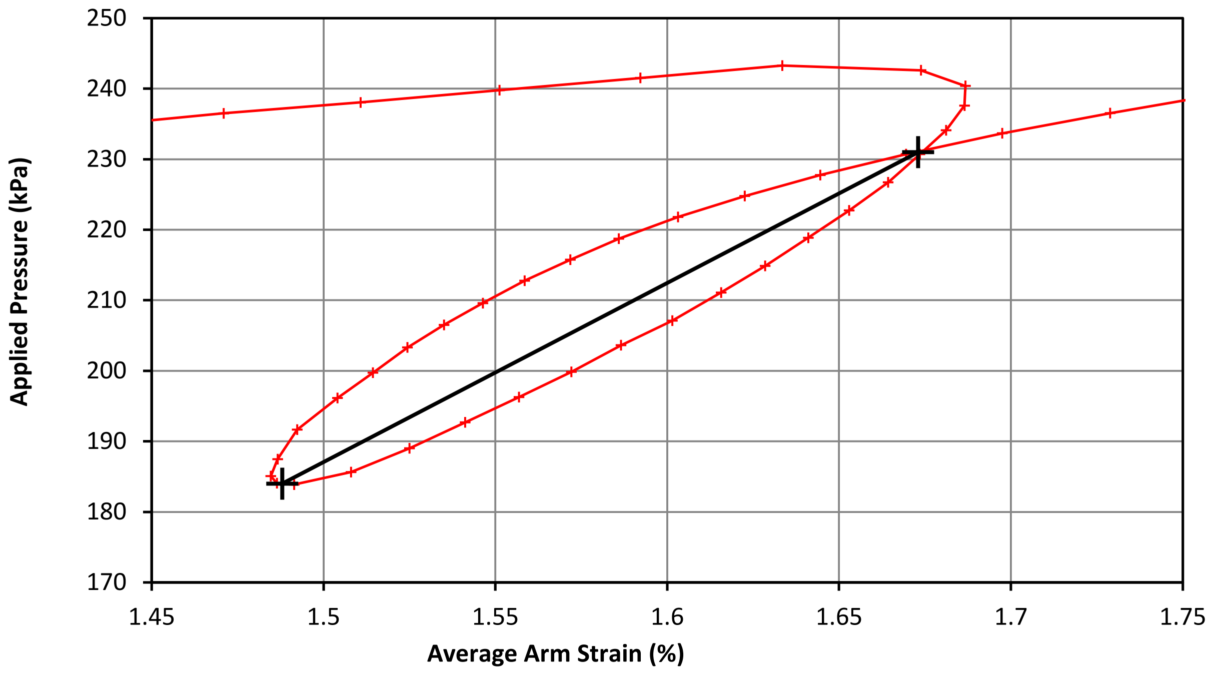
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	3
Borehole	HALP01	**Test Depth (m)**	10.00



Loop 1	Shear Modulus	12.2 MPa
	Cavity Strain Range	0.145 %



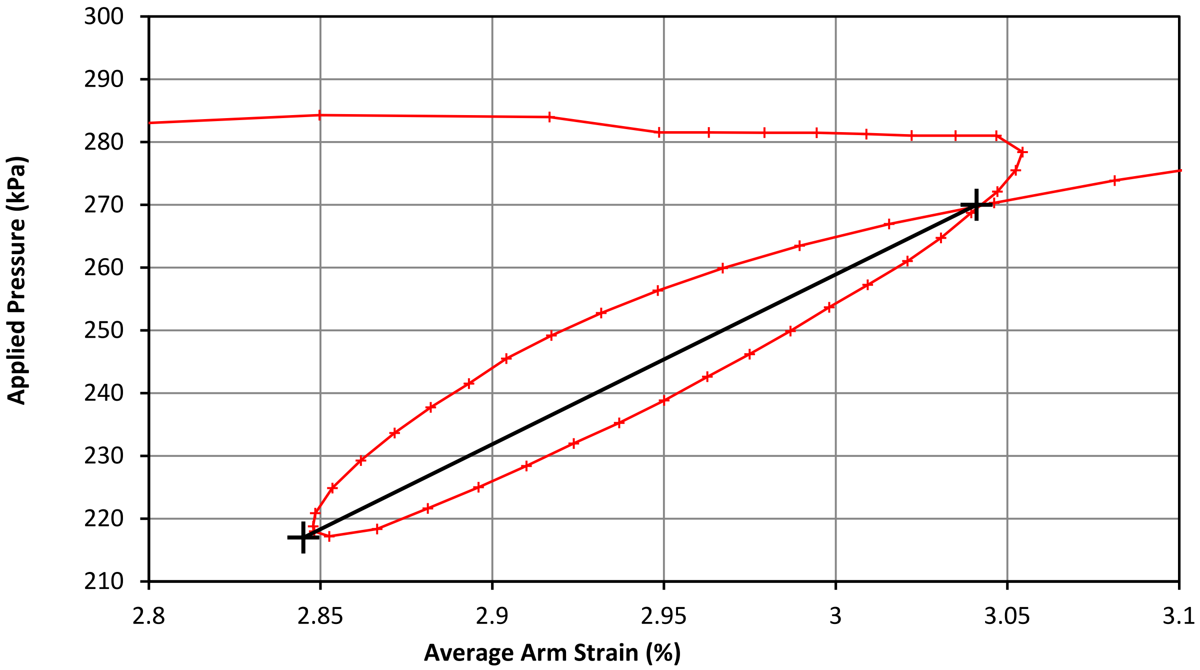
Loop 2	Shear Modulus	12.9 MPa
	Cavity Strain Range	0.185 %

Project	NGI - Halden Site	**Figure No.**	HALP01 T03 - 04
Client	NGI		
Project No.	P1170112		

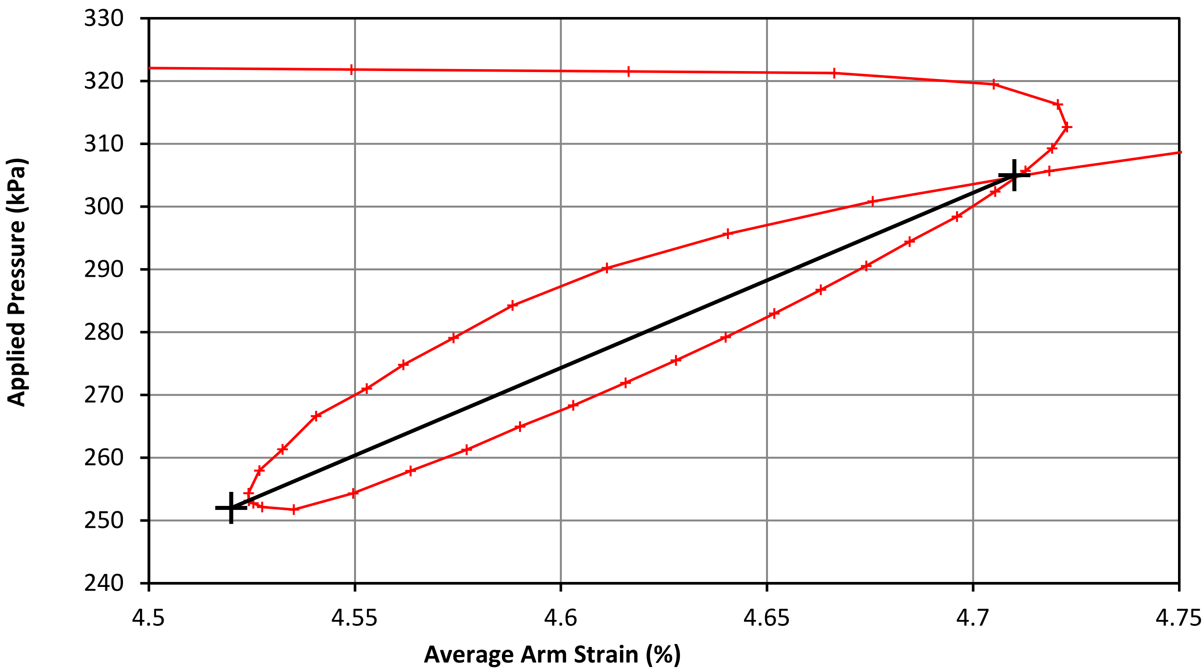
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	3
Borehole	HALP01	**Test Depth (m)**	10.00



Loop 3	Shear Modulus	13.9 MPa
	Cavity Strain Range	0.196 %



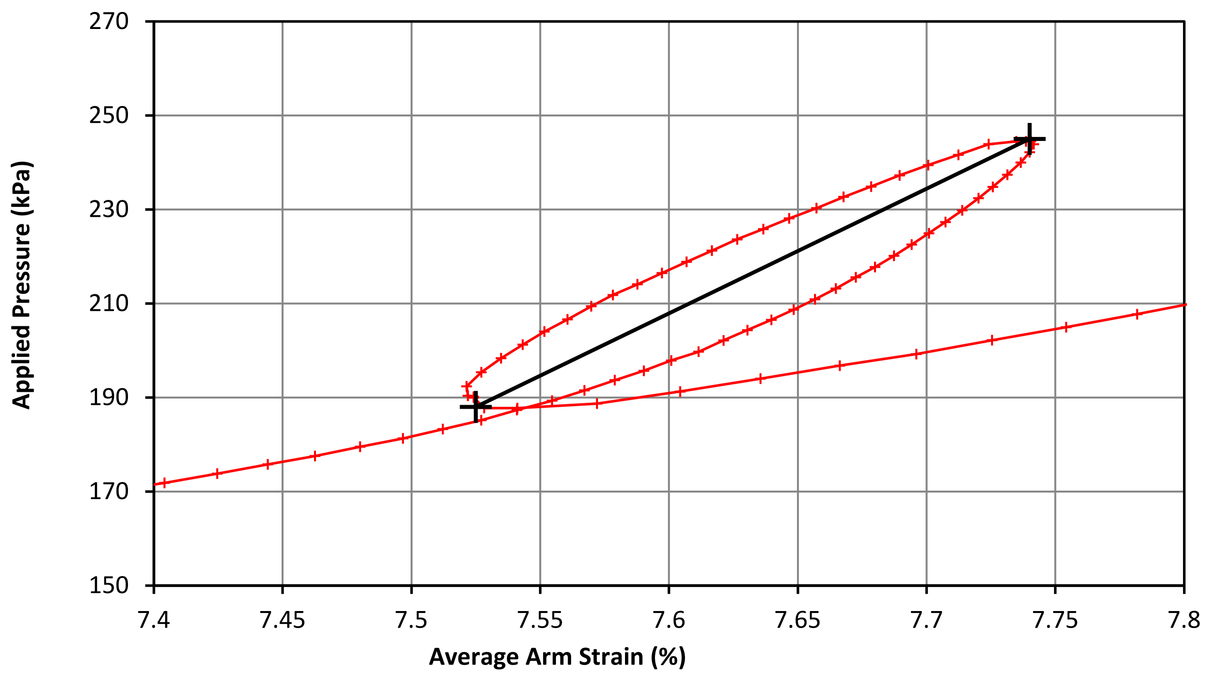
Loop 4	Shear Modulus	14.6 MPa
	Cavity Strain Range	0.190 %

Project	NGI - Halden Site	**Figure No.**	**HALP01 T03 - 05**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

IN SITU
SITE INVESTIGATION

Test Date	16/09/2017	Test No.	3
Borehole	HALP01	Test Depth (m)	10.00



Loop 5	Shear Modulus	14.3	MPa
	Cavity Strain Range	0.215	%

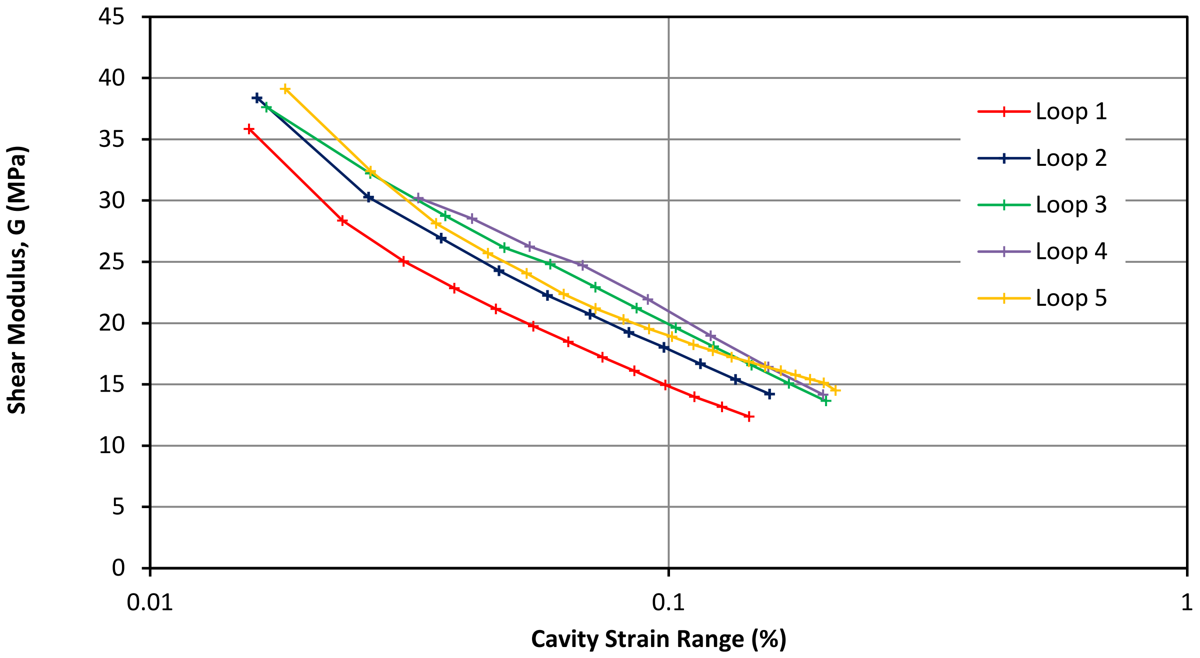
Project	NGI - Halden Site	Figure No.	HALP01 T03 - 06
Client	NGI		
Project No.	P1170112		

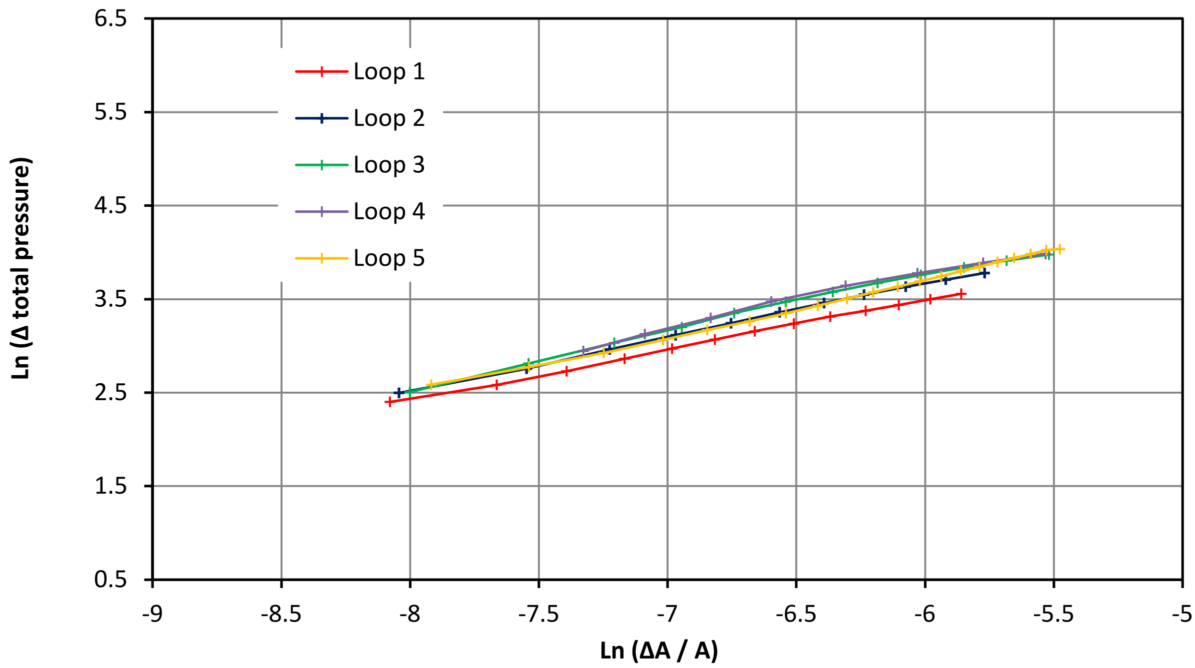
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	16/09/2017	**Test No.**	3
Borehole	HALP01	**Test Depth (m)**	10.00





Loop 1		**Loop 2**		**Loop 3**		**Loop 4**		**Loop 5**	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.536	0.822 (MPa)	0.576	1.247 (MPa)	0.600	1.559 (MPa)	0.580	1.409 (MPa)	0.617	1.648 (MPa)

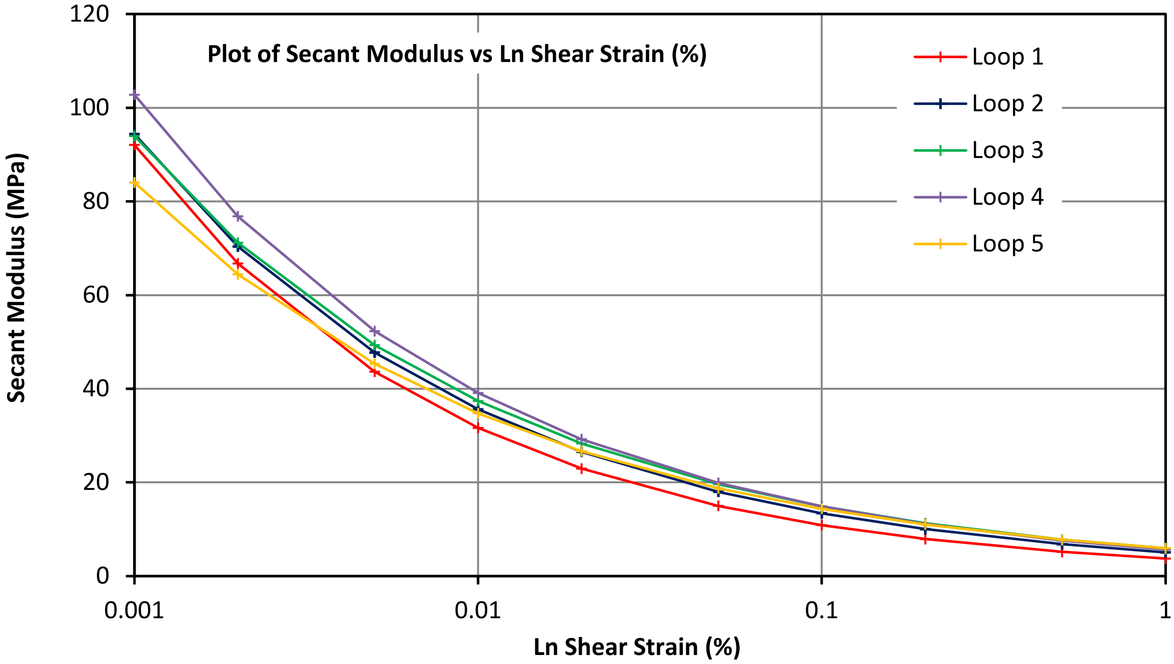
Project	NGI - Halden Site	**Figure No.**	**HALP01 T03 - 07**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU
SITE INVESTIGATION

Test Date	16/09/2017	Test No.	3
Borehole	HALP01	Test Depth (m)	10.00

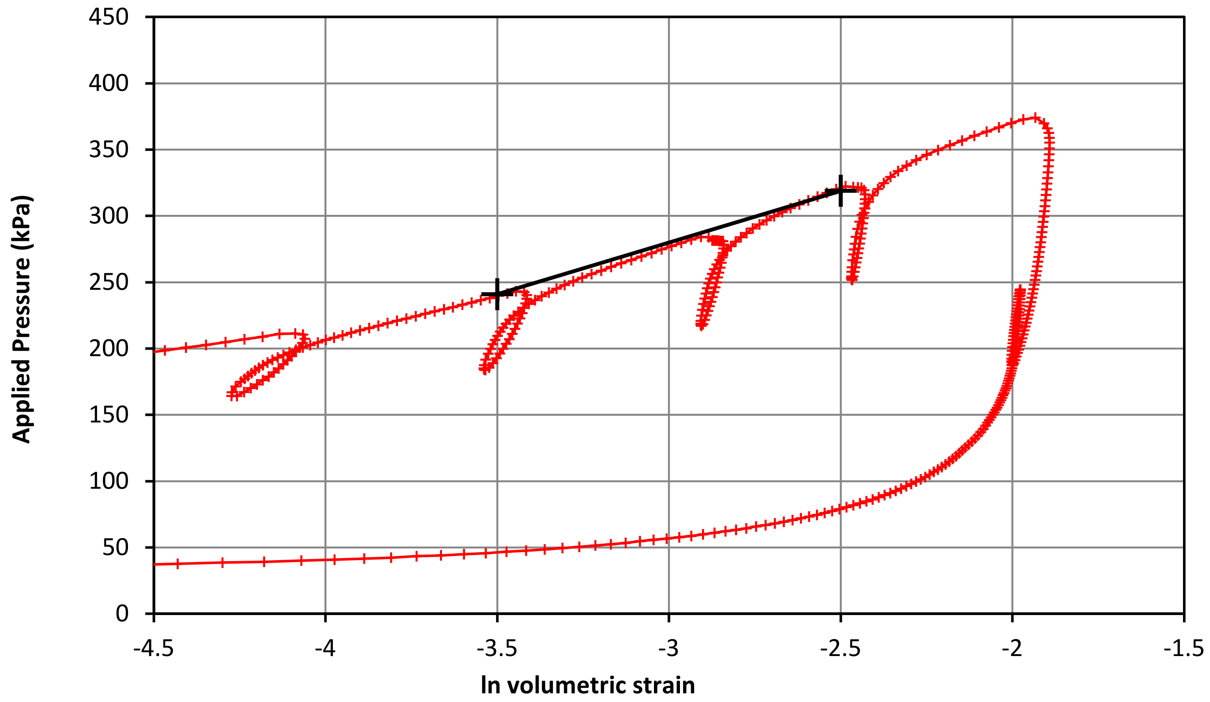


Shear Strain	Loop 1	Loop 2	Loop 3	Loop 4	Loop 5
0.001%	**92**	**94**	**94**	**103**	**84**
0.002%	67	70	71	77	64
0.005%	44	48	49	52	45
0.010%	**32**	**36**	**37**	**39**	**35**
0.020%	23	27	28	29	27
0.050%	15	18	20	20	19
0.100%	**11**	**13**	**15**	**15**	**14**
0.200%	8	10	11	11	11
0.500%	5	7	8	8	8
1.000%	**4**	**5**	**6**	**6**	**6**

Project	NGI - Halden Site	Figure No.	HALP01 T03 - 08
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

Test Date	16/09/2017	**Test No.**	3
Borehole	HALP01	**Test Depth (m)**	10.00



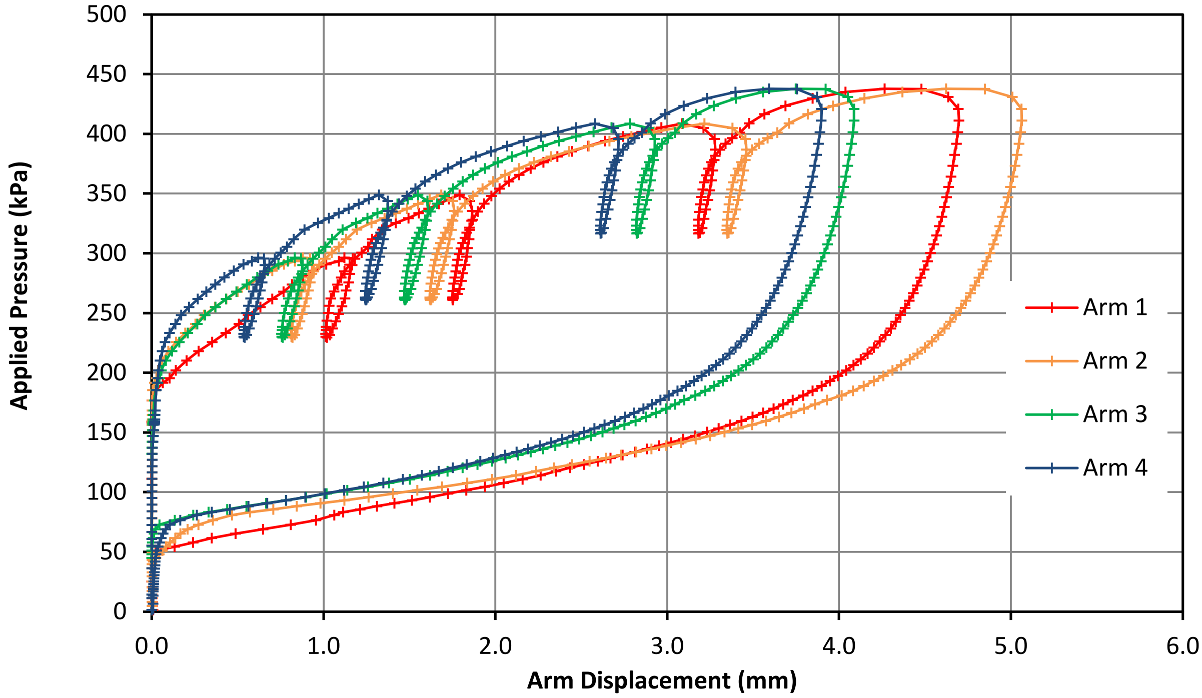
Strength	Undrained Shear	78	kPa
	Limit Pressure	514	kPa

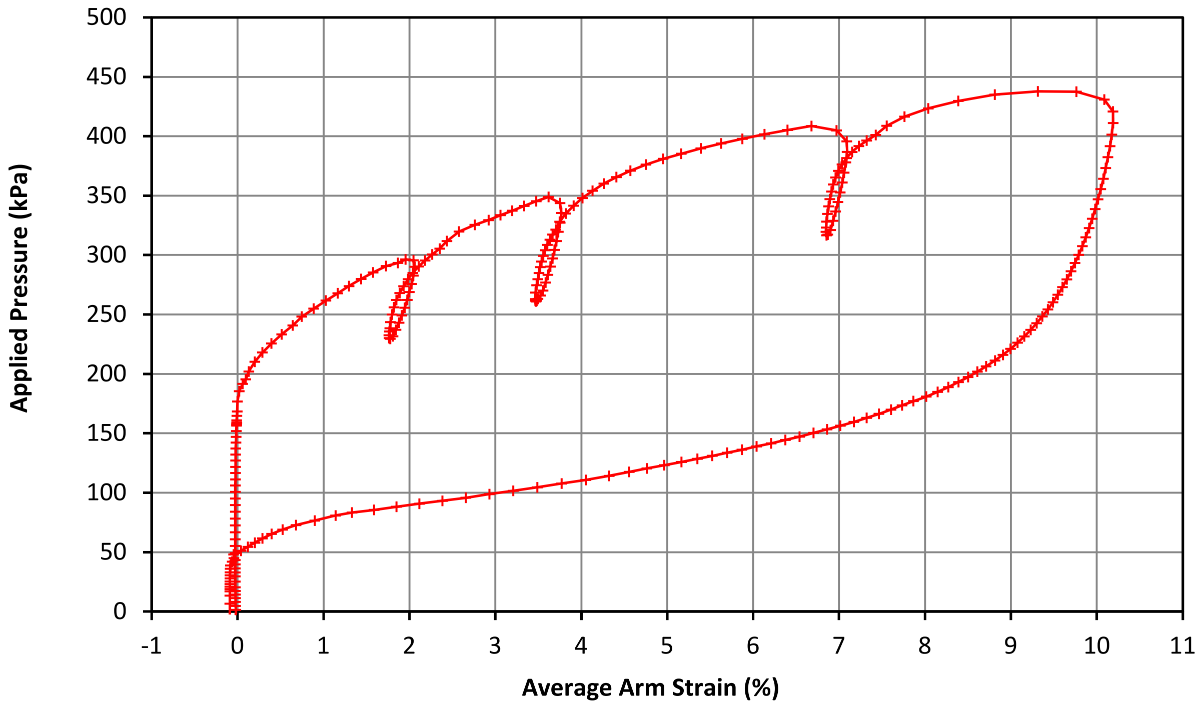
Project	NGI - Halden Site	**Figure No.**	**HALP01 T03 - 09**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU
SITE INVESTIGATION

Test Date	18/09/2017	**Test No.**	4
Borehole	HALP01	**Test Depth (m)**	12.00





Comments

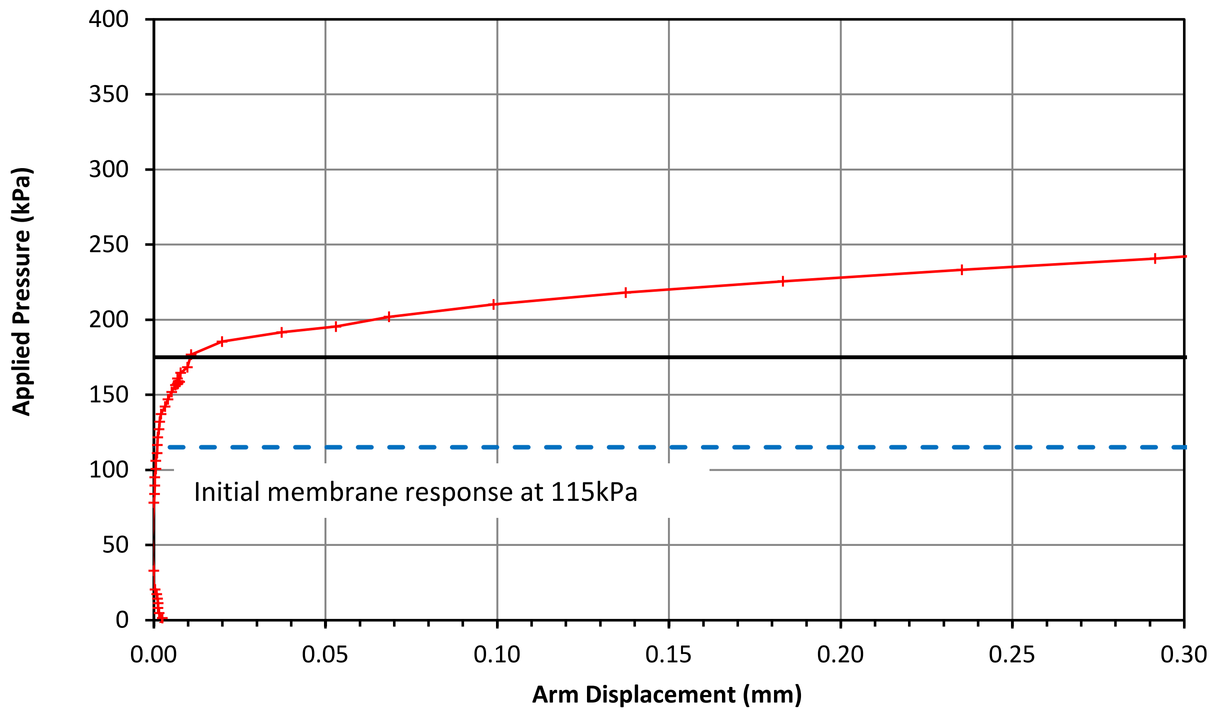
Arms 5 & 6 offline. Probable moisture ingress into probe.

Project	NGI - Halden Site	**Figure No.**	**HALP01 T04 - 01**
Client	NGI		
Project No.	P1170112		

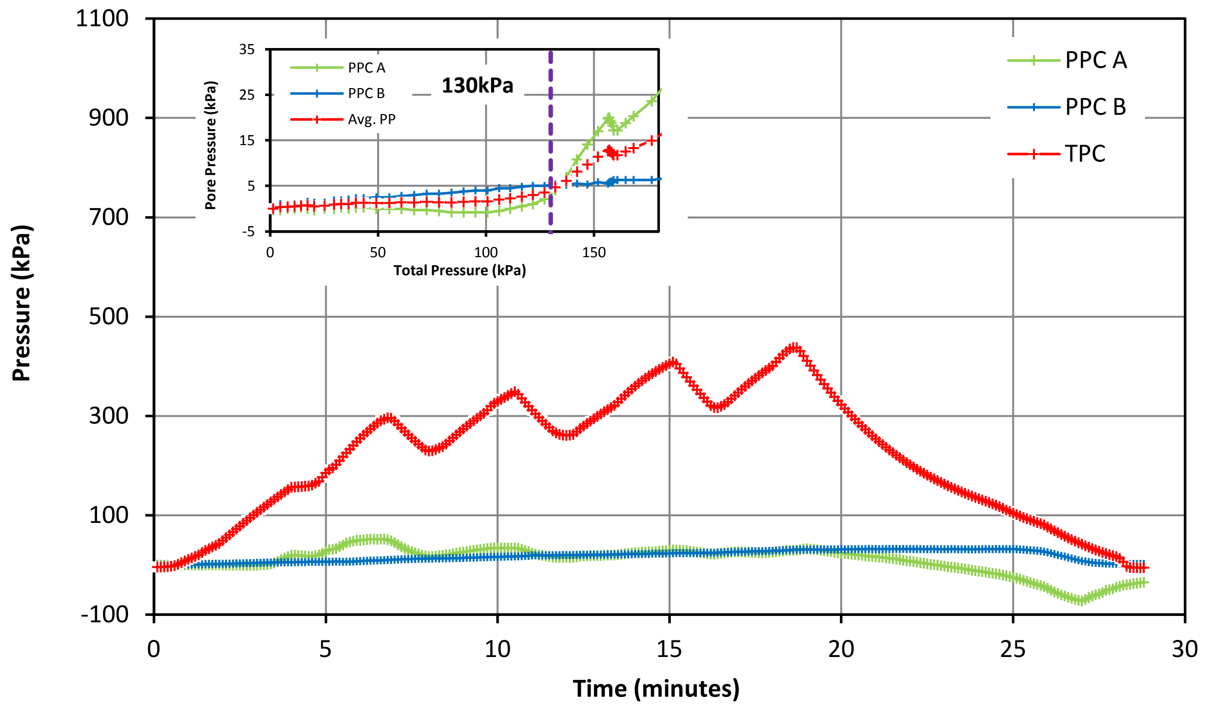
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	18/09/2017	Test No.	4
Borehole	HALP01	Test Depth (m)	12.00



Lift Off Stress (Po)	175 kPa

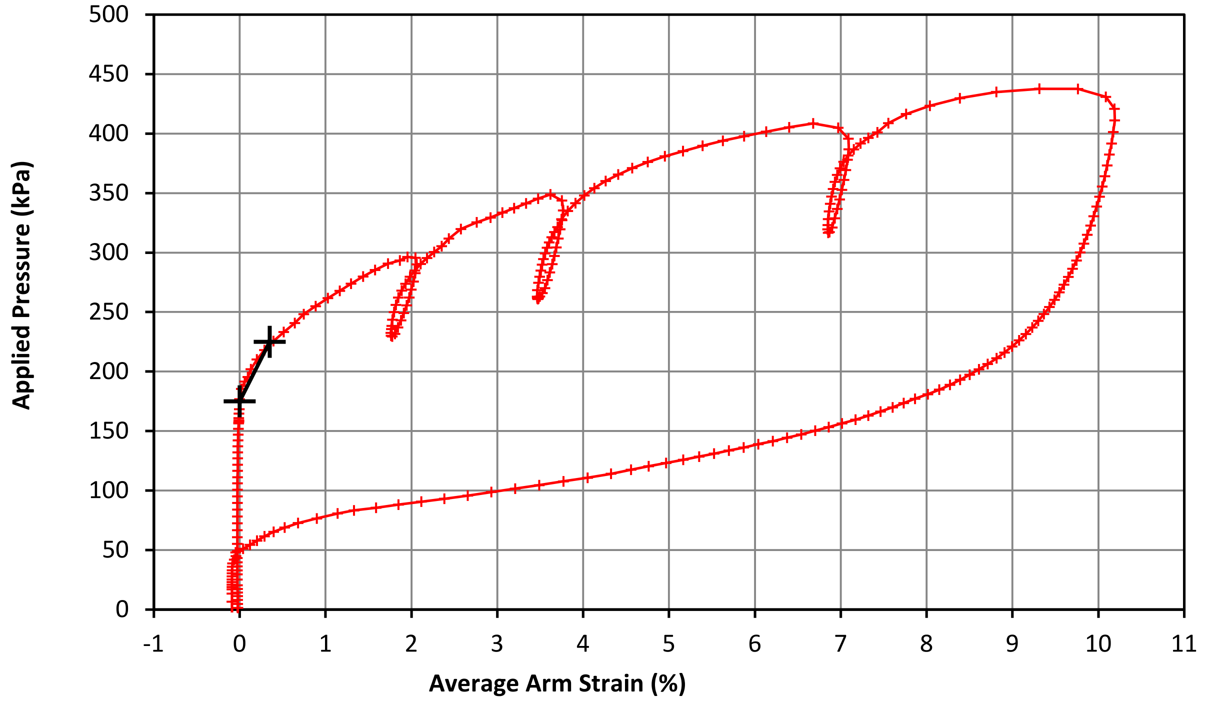


Project	NGI - Halden Site	Figure No.	HALP01 T04 - 02
Client	NGI		
Project No.	P1170112		

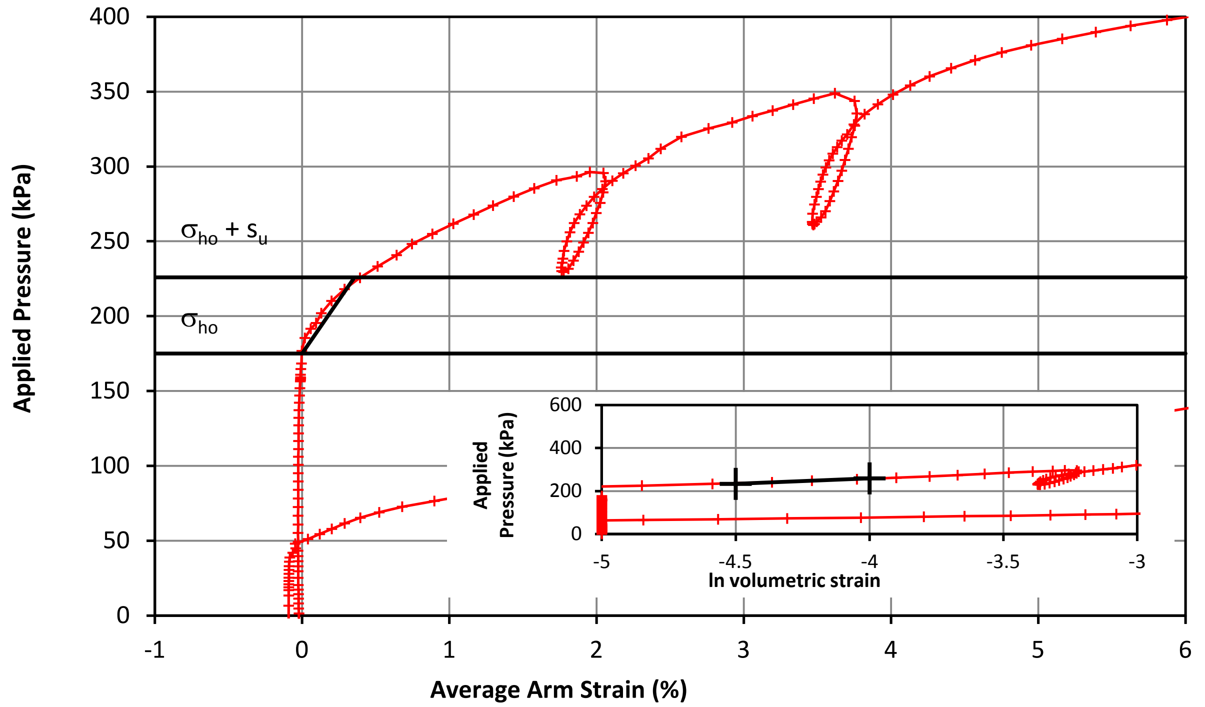
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	18/09/2017	Test No.	4
Borehole	HALP01	Test Depth (m)	12.00



Initial Modulus	Shear Modulus	7.2 MPa



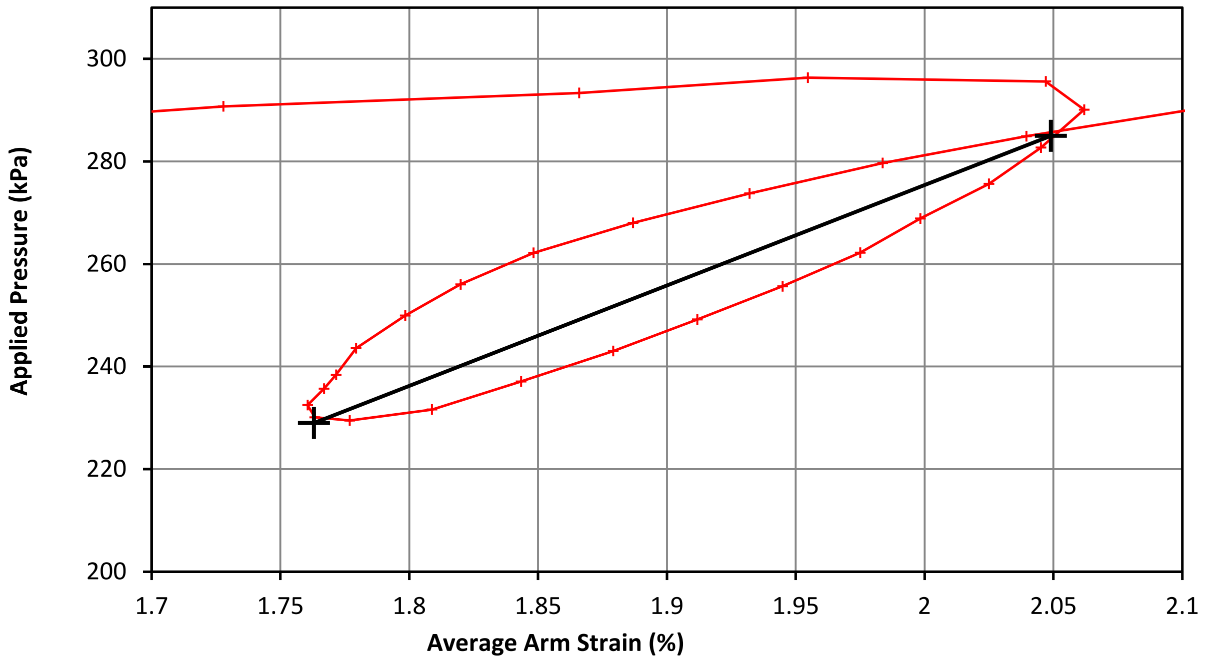
Marsland & Randolph	In situ horizontal stress	175 kPa
	Undrained Strength	51 kPa

Project	NGI - Halden Site	Figure No.	HALP01 T04 - 03
Client	NGI		
Project No.	P1170112		

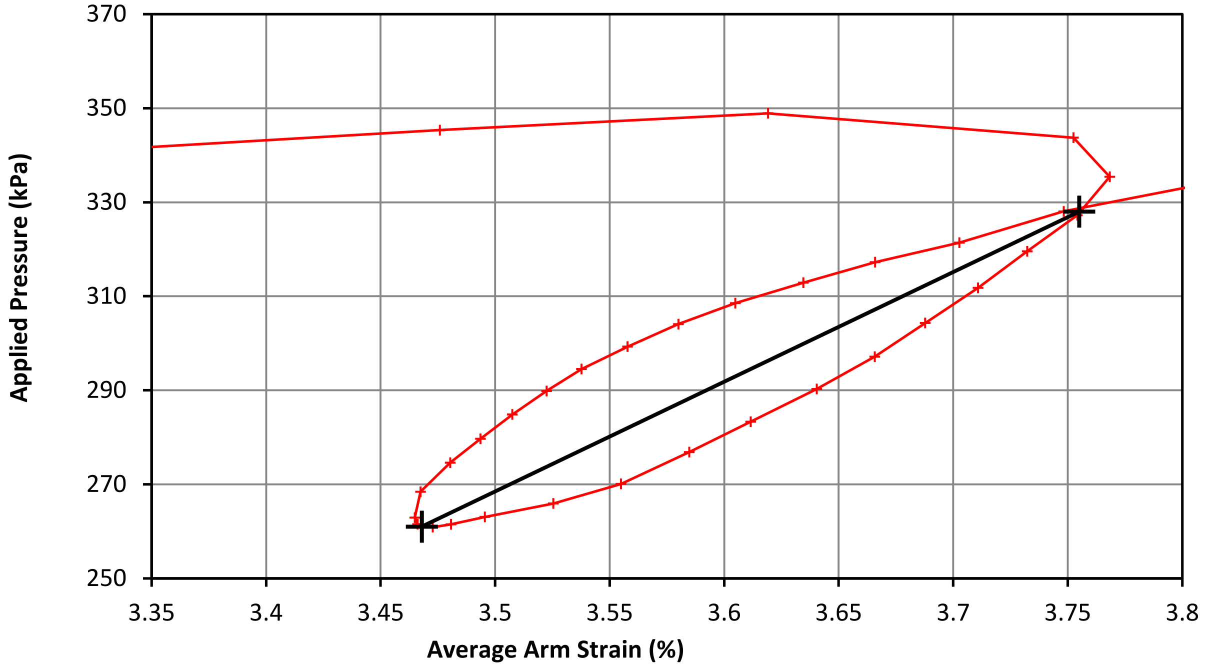
Pressuremeter Test Unload Reload Loop

IN SITU
SITE INVESTIGATION

Test Date	18/09/2017	**Test No.**	4
Borehole	HALP01	**Test Depth (m)**	12.00



Loop 1	Shear Modulus	10.0 MPa
	Cavity Strain Range	0.286 %

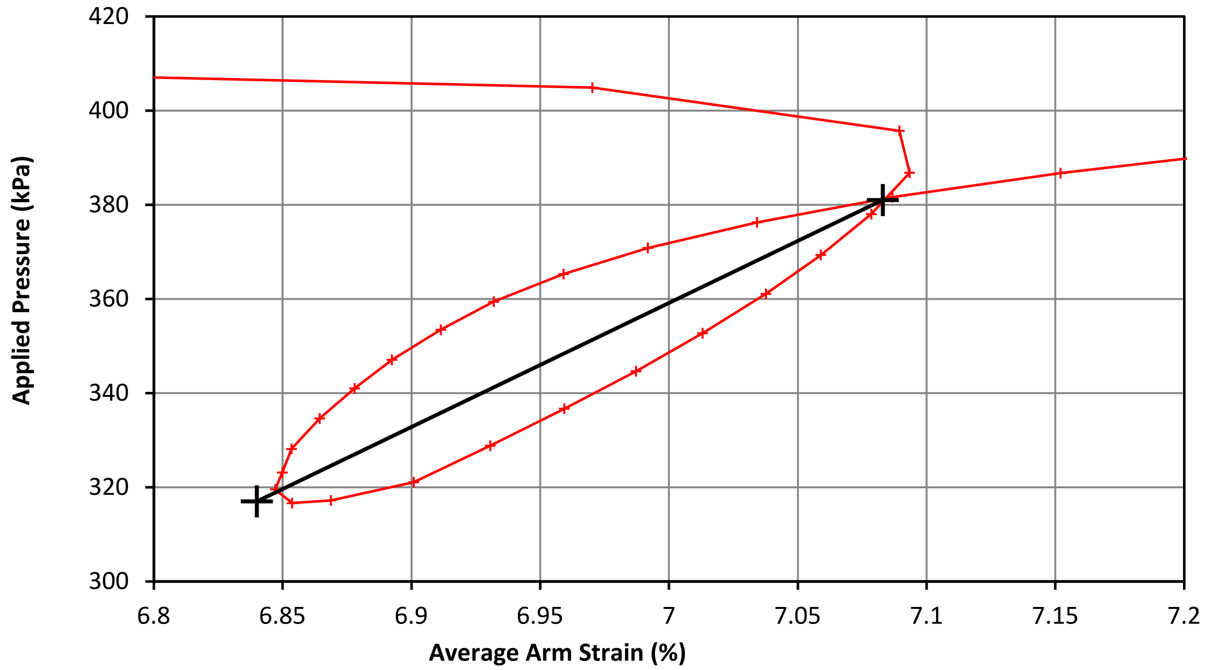


Loop 2	Shear Modulus	12.1 MPa
	Cavity Strain Range	0.287 %

Project	NGI - Halden Site	**Figure No.**	**HALP01 T04 - 04**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

Test Date	18/09/2017	**Test No.**	4
Borehole	HALP01	**Test Depth (m)**	12.00



Loop 3	Shear Modulus	14.1	MPa
	Cavity Strain Range	0.243	%

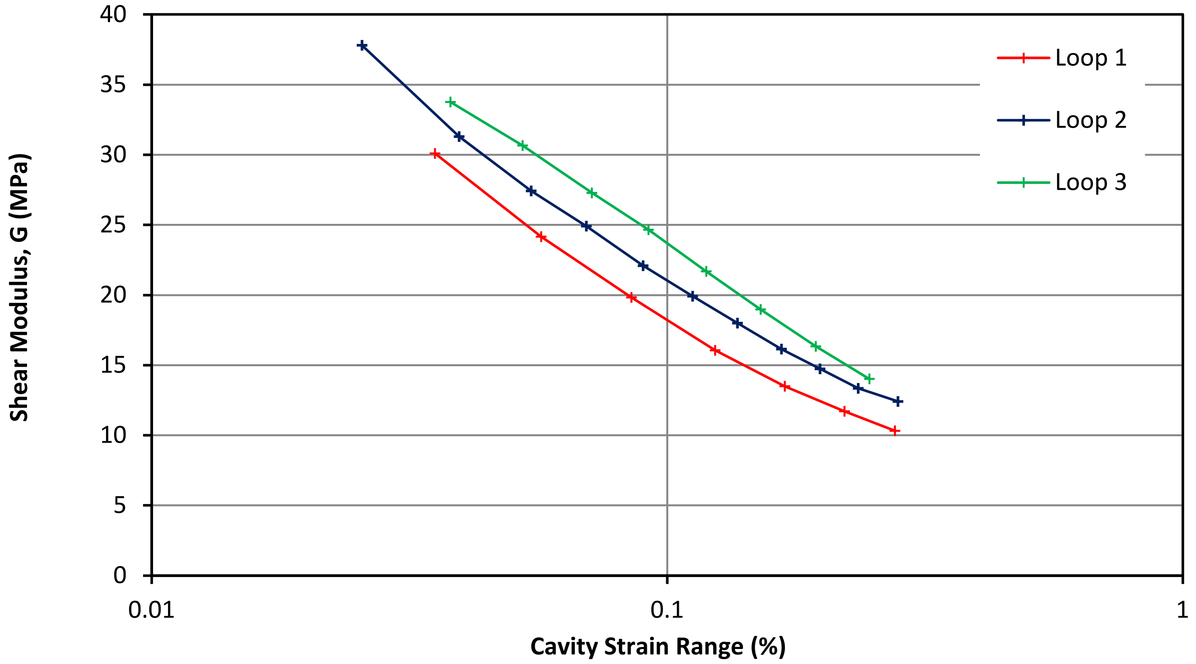
Project	NGI - Halden Site	**Figure No.**	**HALP01 T04 - 05**
Client	NGI		
Project No.	P1170112		

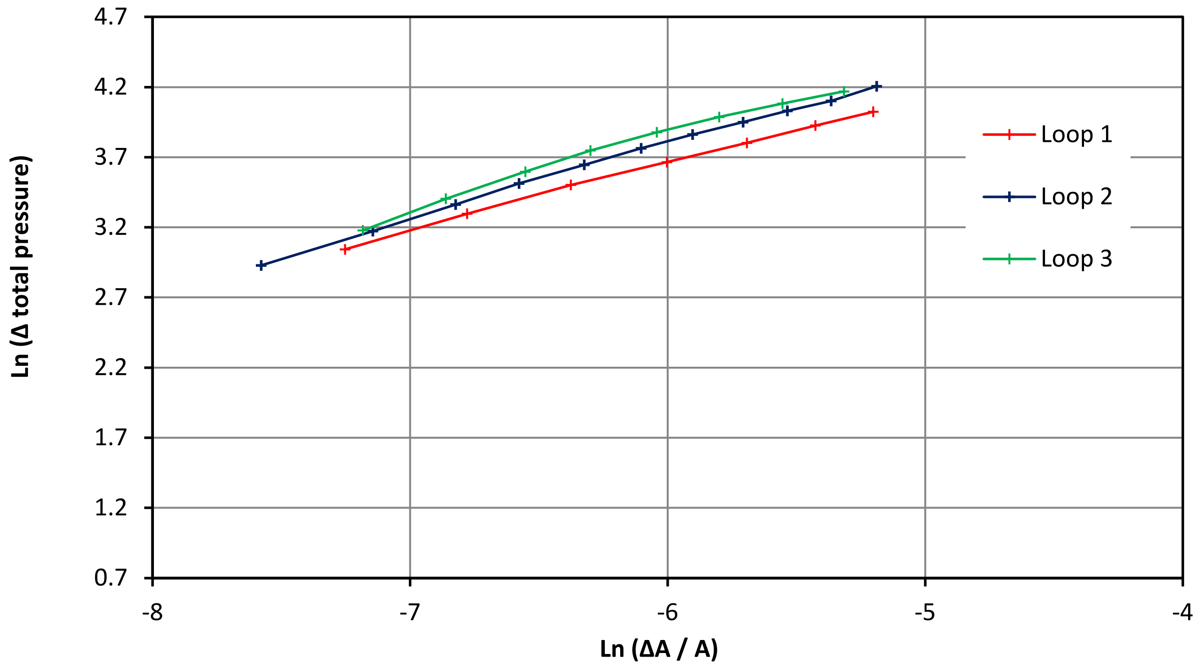
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	18/09/2017	**Test No.**	4
Borehole	HALP01	**Test Depth (m)**	12.00





Loop 1		**Loop 2**		**Loop 3**	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.474	0.666 (MPa)	0.529	1.063 (MPa)	0.529	1.133 (MPa)

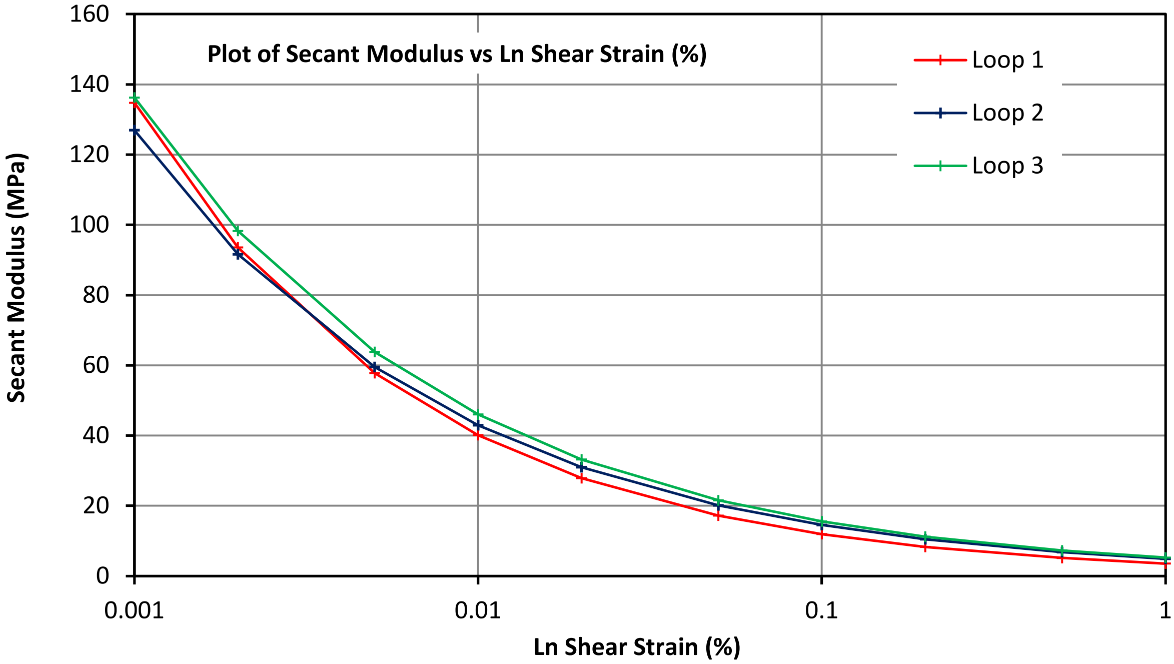
Project	NGI - Halden Site	**Figure No.**	**HALP01 T04 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU SITE INVESTIGATION

Test Date	18/09/2017	Test No.	4
Borehole	HALP01	Test Depth (m)	12.00



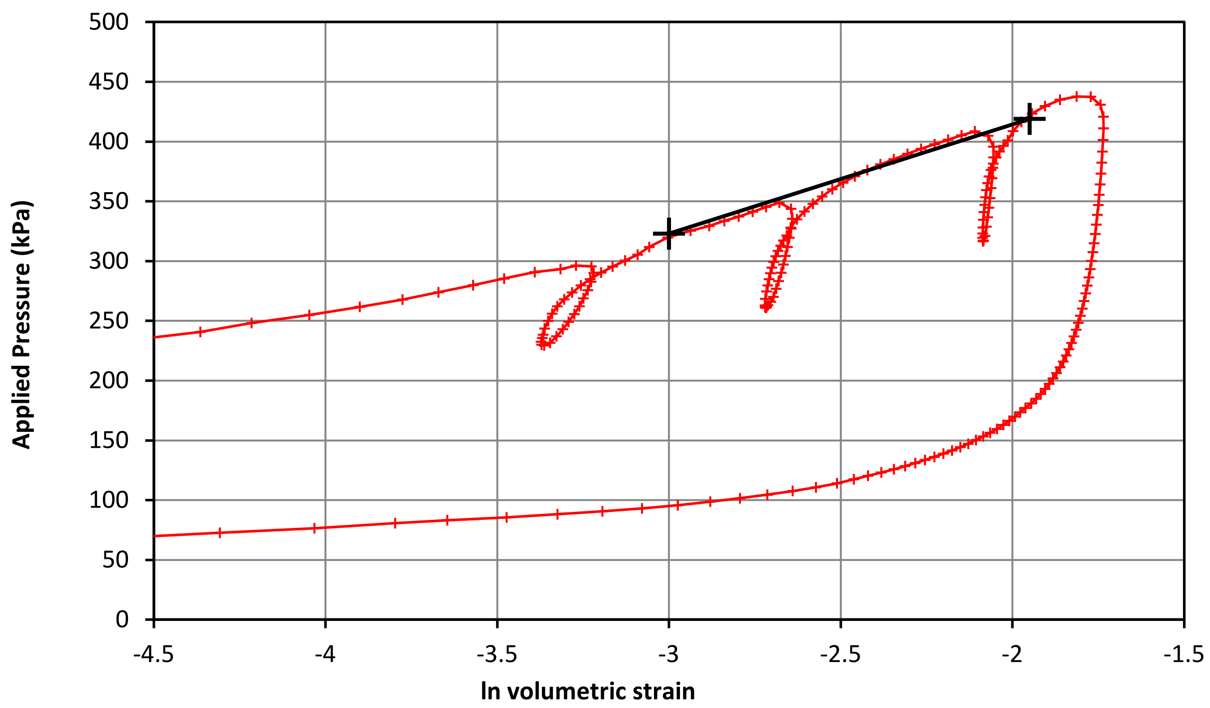
Shear Strain	Loop 1	Loop 2	Loop 3
0.001%	**135**	**127**	**136**
0.002%	94	92	98
0.005%	58	60	64
0.010%	**40**	**43**	**46**
0.020%	28	31	33
0.050%	17	20	22
0.100%	**12**	**15**	**16**
0.200%	8	10	11
0.500%	5	7	7
1.000%	**4**	**5**	**5**

Project	NGI - Halden Site	Figure No.	HALP01 T04 - 07
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

IN SITU SITE INVESTIGATION

Test Date	18/09/2017	**Test No.**	4
Borehole	HALP01	**Test Depth (m)**	12.00

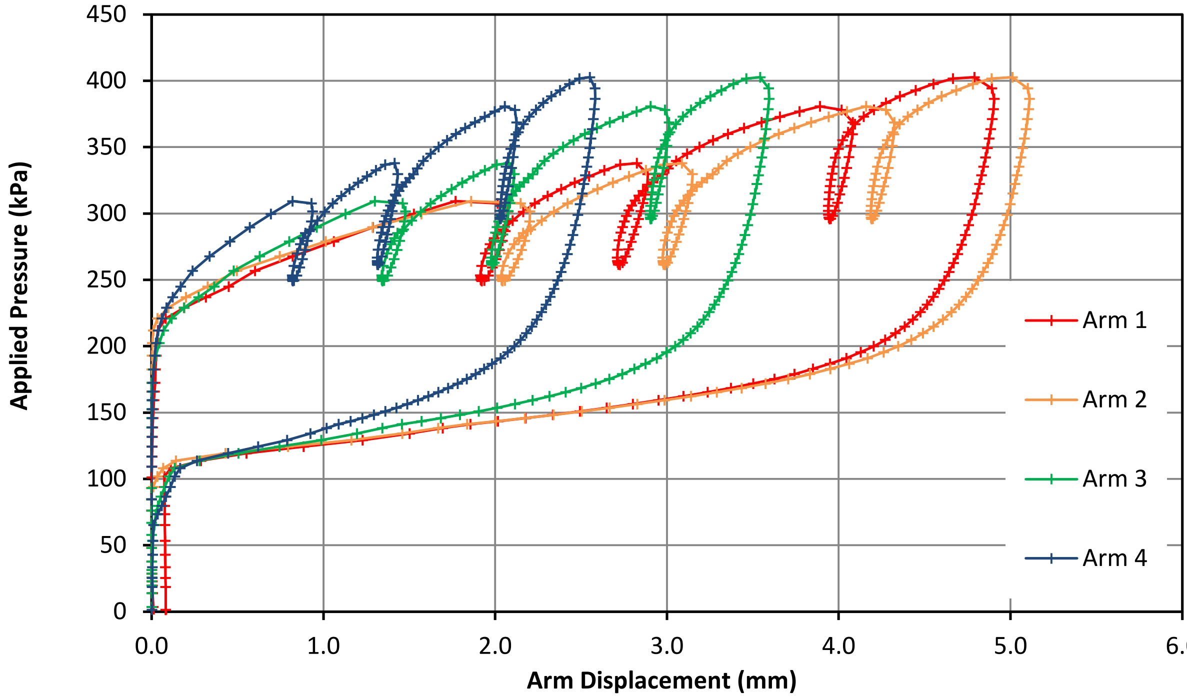


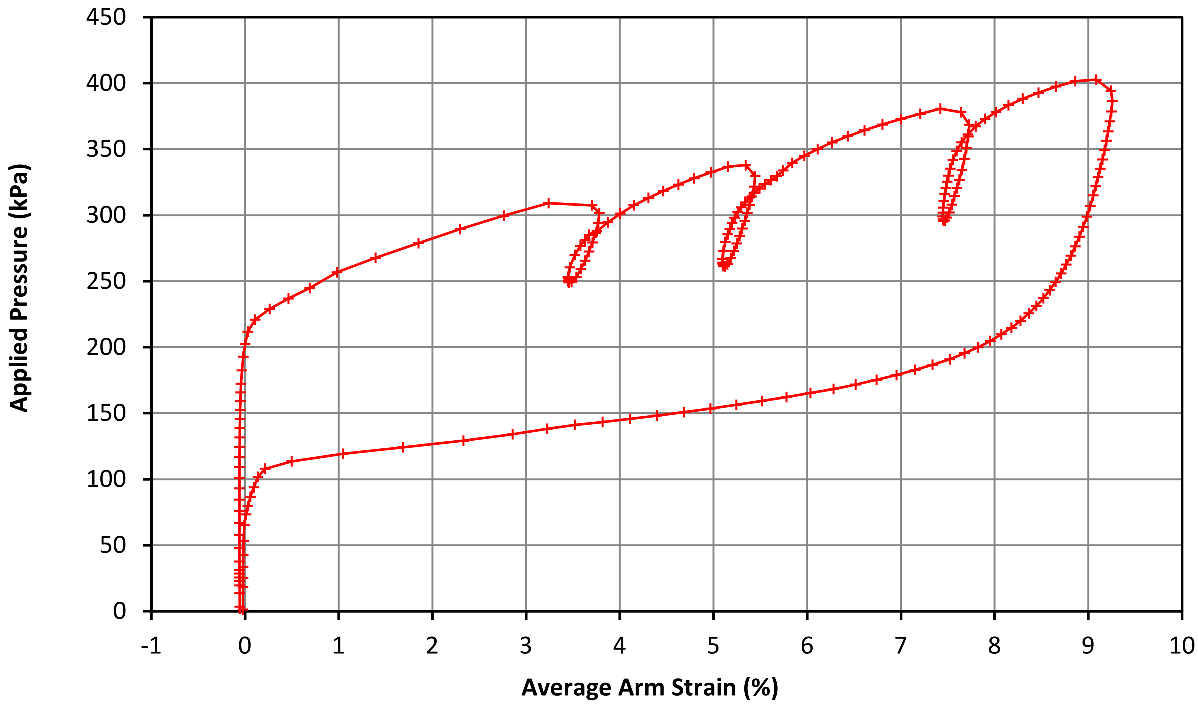
Strength	Undrained Shear	91	kPa
	Limit Pressure	597	kPa

Project	NGI - Halden Site	**Figure No.**	HALP01 T04 - 08
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

Test Date	18/09/2017	**Test No.**	5
Borehole	HALP01	**Test Depth (m)**	13.50



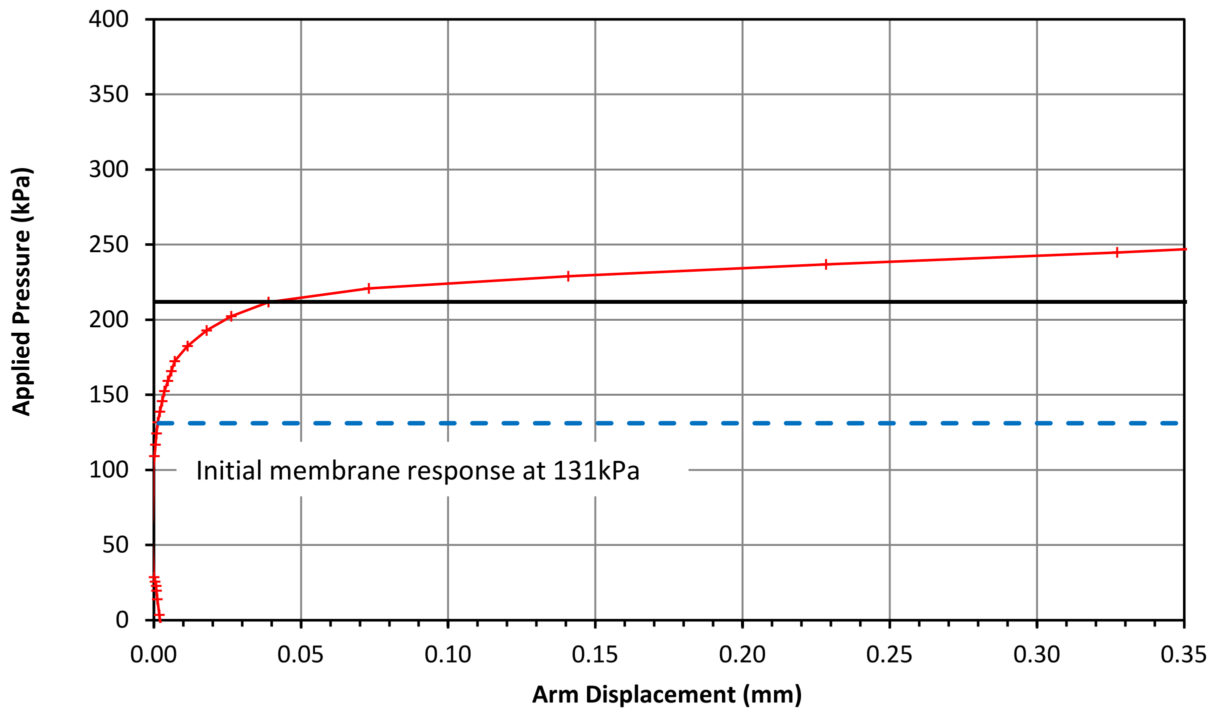


Comments

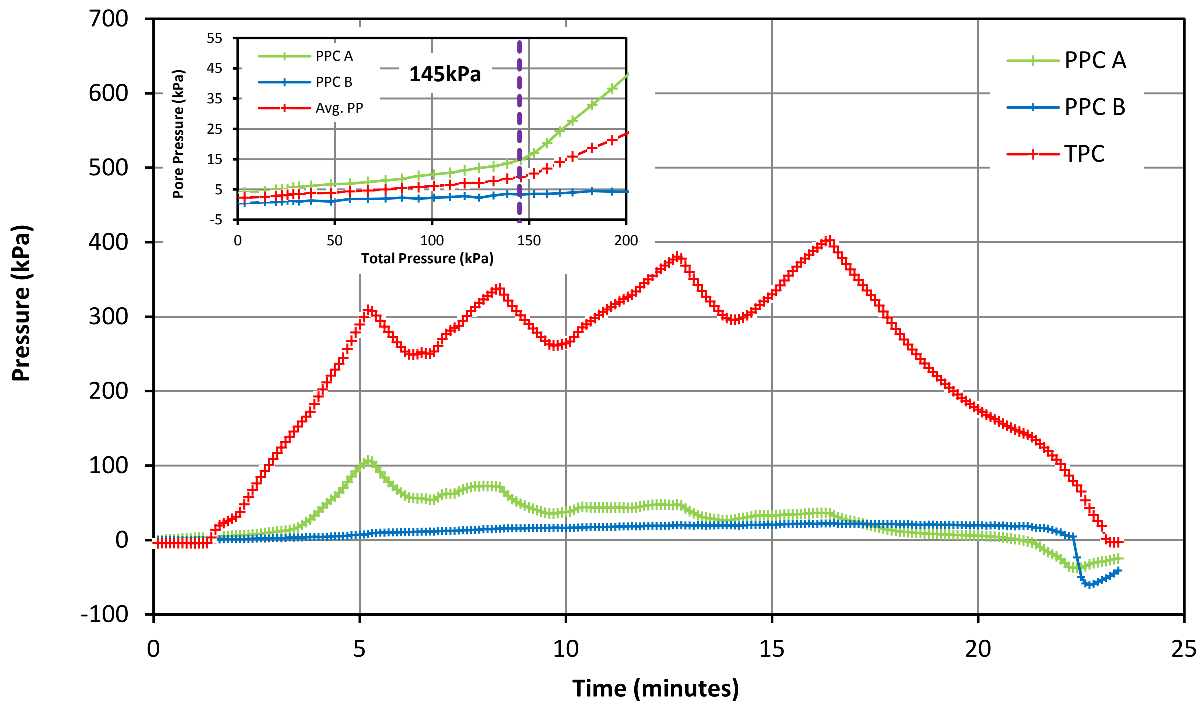
Arms 5 & 6 offline. Probable moisture ingress into probe.

Project	NGI - Halden Site	**Figure No.**	HALP01 T05 - 01
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Lift Off Stress & Pore Pressure Record		IN SITU SITE INVESTIGATION	
Test Date	18/09/2017	**Test No.**	5
Borehole	HALP01	**Test Depth (m)**	13.50



Lift Off Stress (Po)	212 kPa

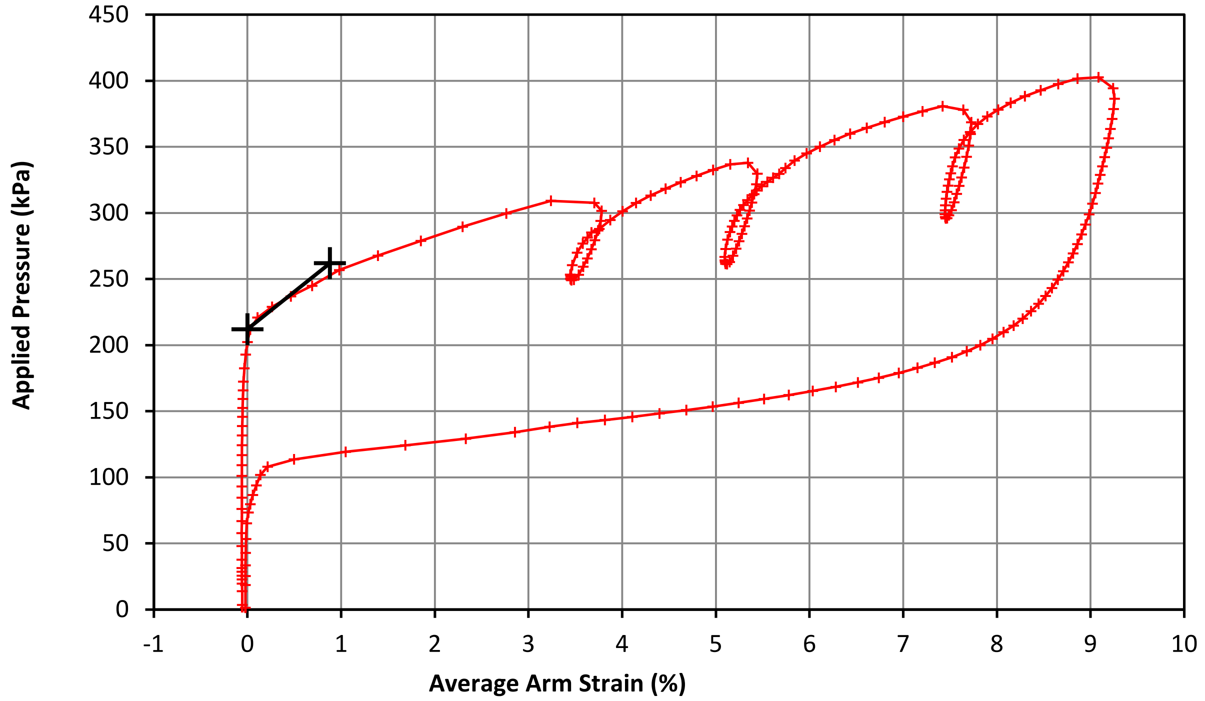


Project	NGI - Halden Site	**Figure No.**	**HALP01 T05 - 02**
Client	NGI		
Project No.	P1170112		

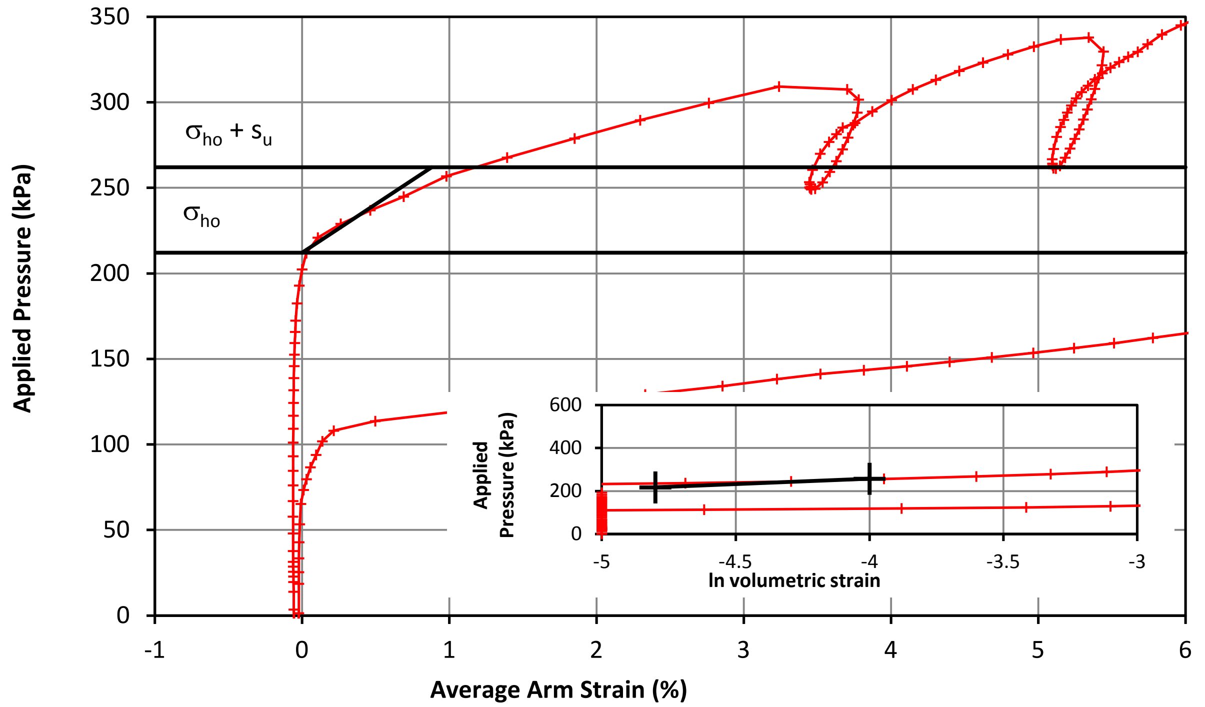
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU
SITE INVESTIGATION

Test Date	18/09/2017	**Test No.**	5
Borehole	HALP01	**Test Depth (m)**	13.50



Initial Modulus	Shear Modulus	2.9 MPa



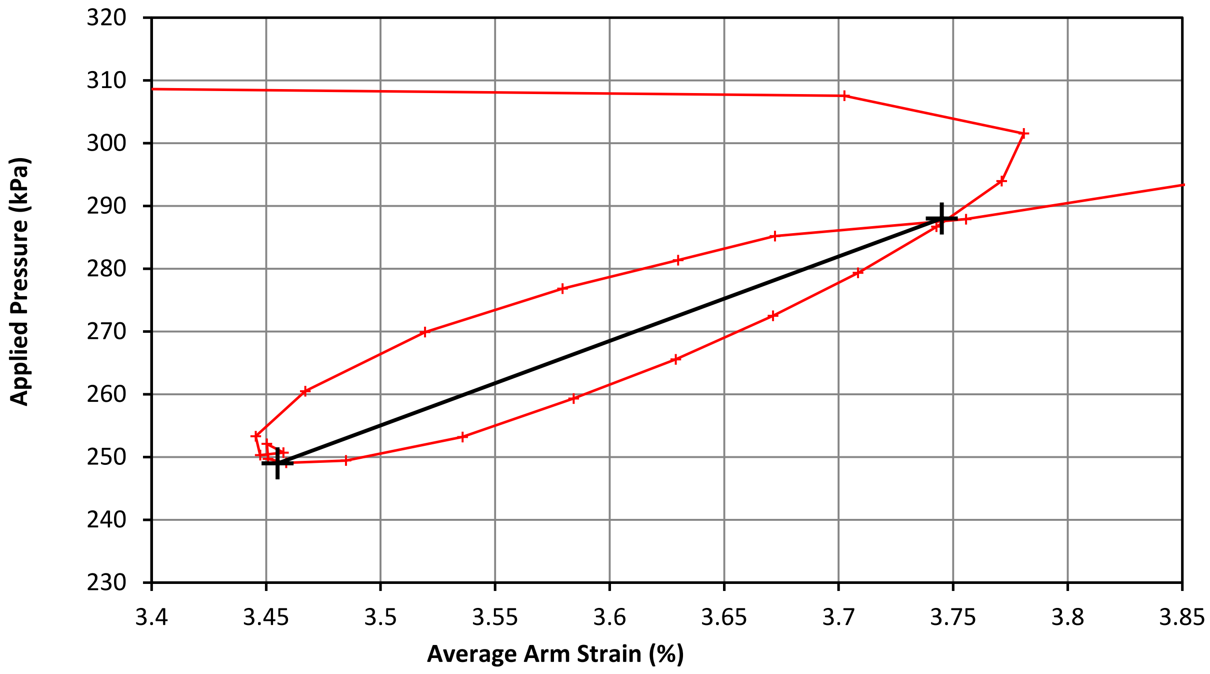
Marsland & Randolph	In situ horizontal stress	212 kPa
	Undrained Strength	50 kPa

Project	NGI - Halden Site	**Figure No.**	**HALP01**
Client	NGI		**T05 - 03**
Project No.	P1170112		

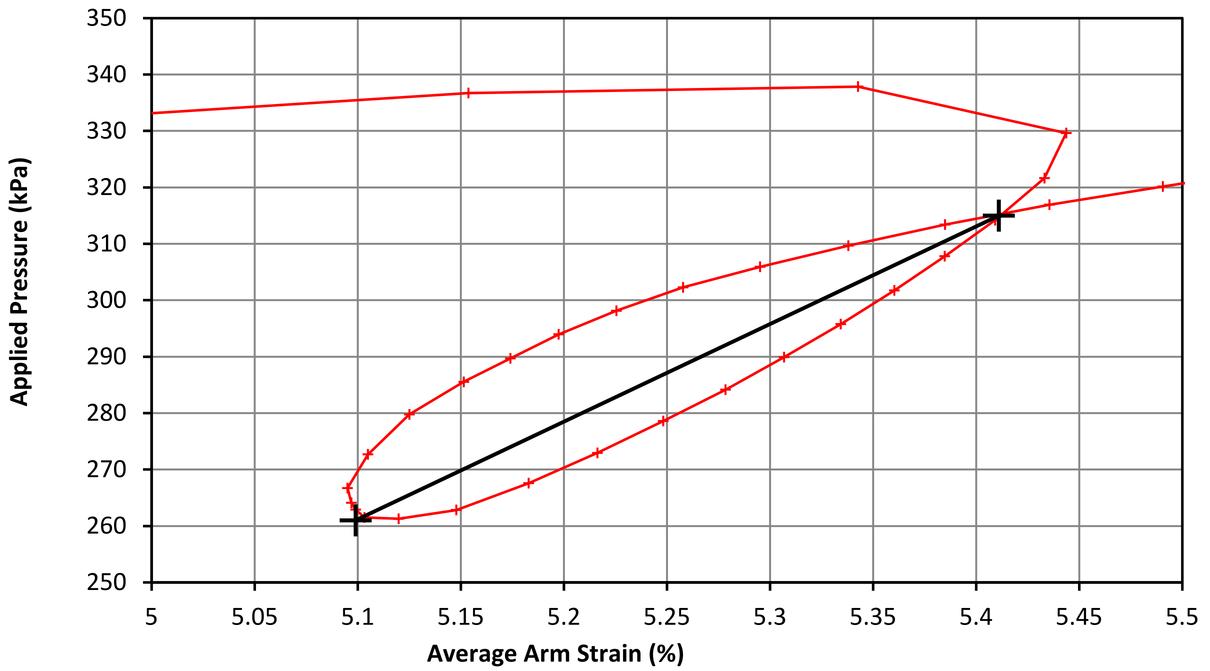
Pressuremeter Test Unload Reload Loop

IN SITU
SITE INVESTIGATION

Test Date	18/09/2017	Test No.	5
Borehole	HALP01	Test Depth (m)	13.50



Loop 1	Shear Modulus	7.0 MPa
	Cavity Strain Range	0.290 %



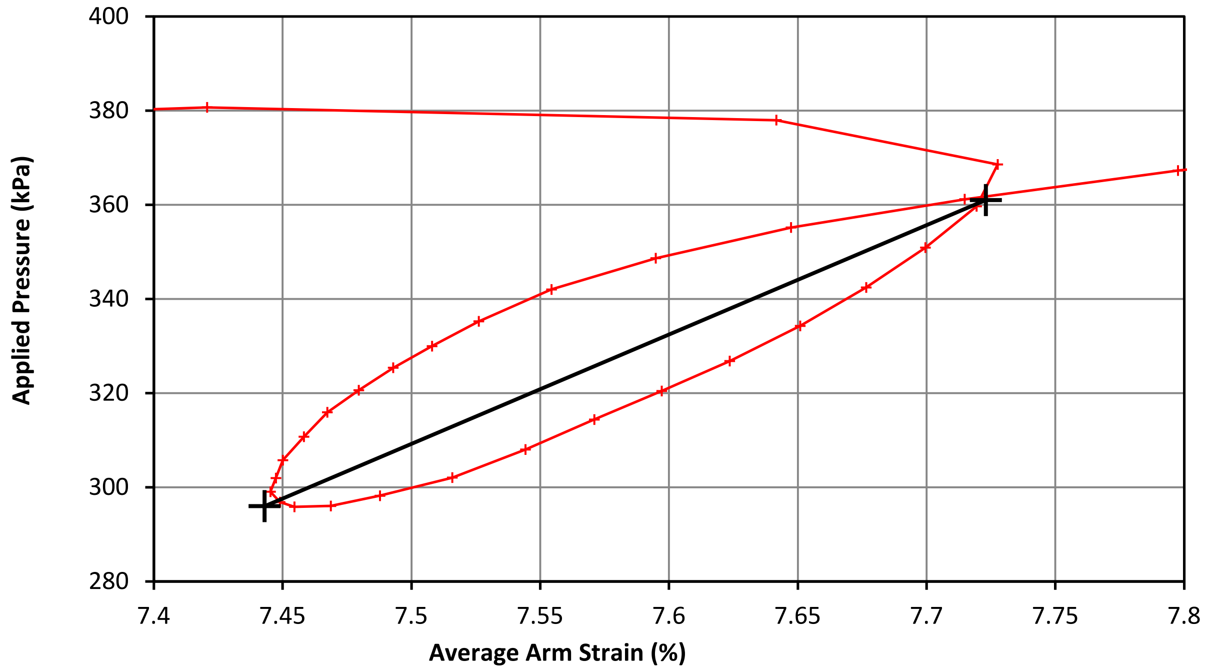
Loop 2	Shear Modulus	9.1 MPa
	Cavity Strain Range	0.312 %

Project	NGI - Halden Site	Figure No.	HALP01 T05 - 04
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	18/09/2017	**Test No.**	5
Borehole	HALP01	**Test Depth (m)**	13.50



Loop 3	Shear Modulus	12.5	MPa
	Cavity Strain Range	0.280	%

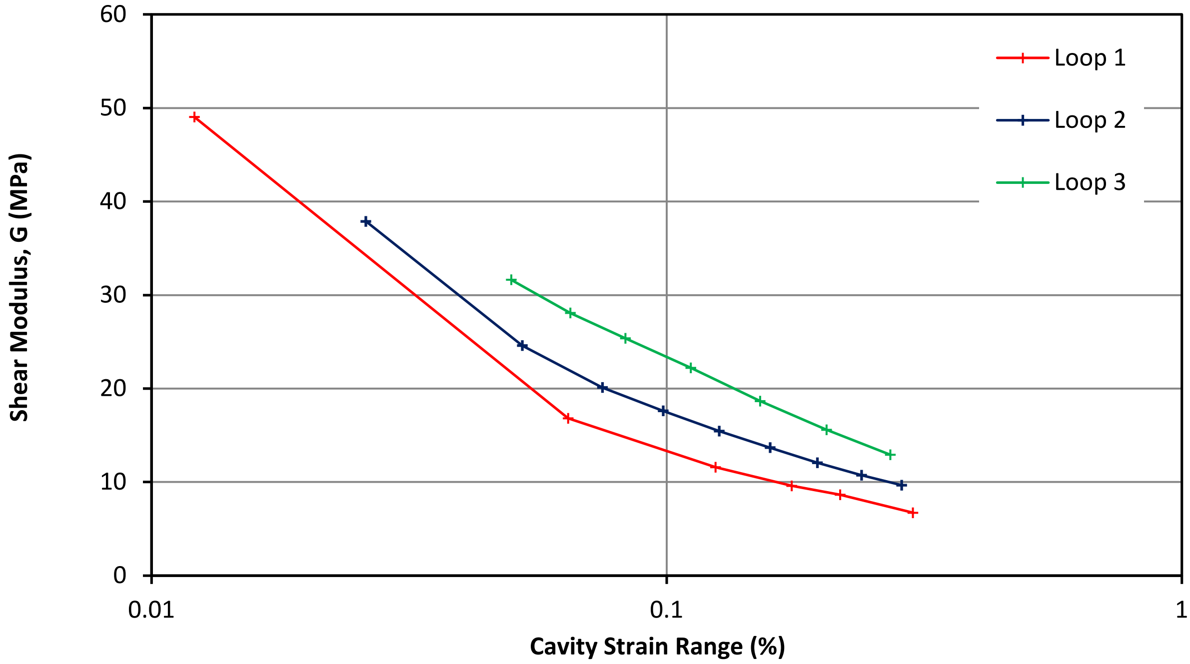
Project	NGI - Halden Site	**Figure No.**	**HALP01 T05 - 05**
Client	NGI		
Project No.	P1170112		

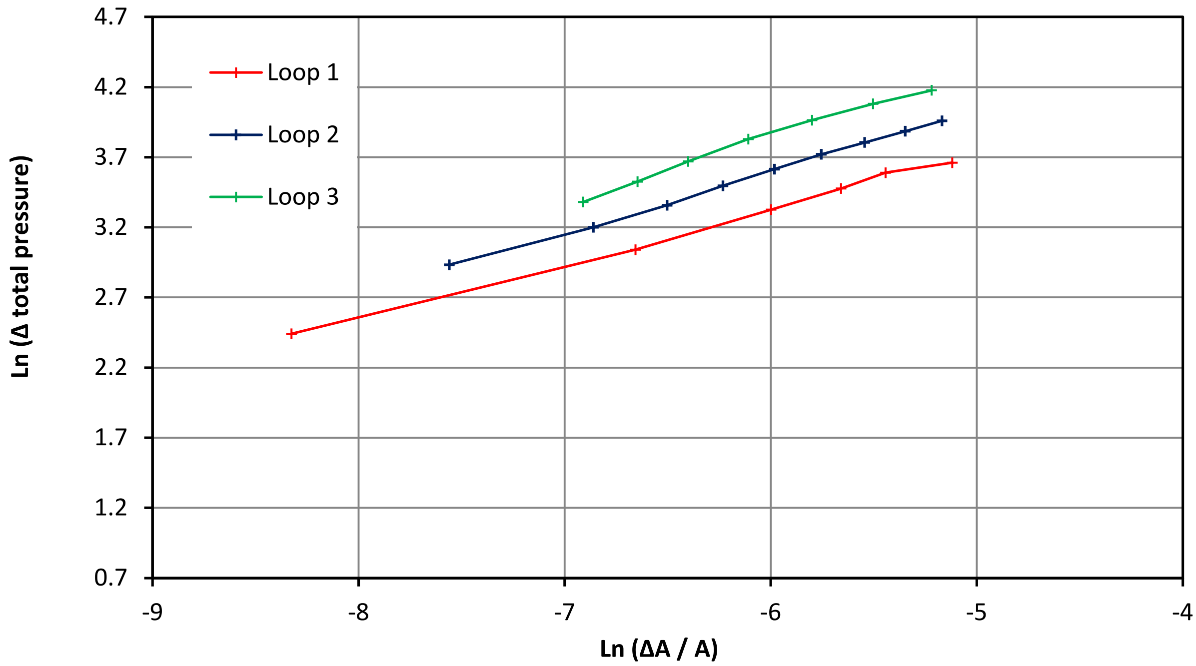
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	18/09/2017	**Test No.**	5
Borehole	HALP01	**Test Depth (m)**	13.50





Loop 1		**Loop 2**		**Loop 3**	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.390	0.291 (MPa)	0.439	0.510 (MPa)	0.475	0.809 (MPa)

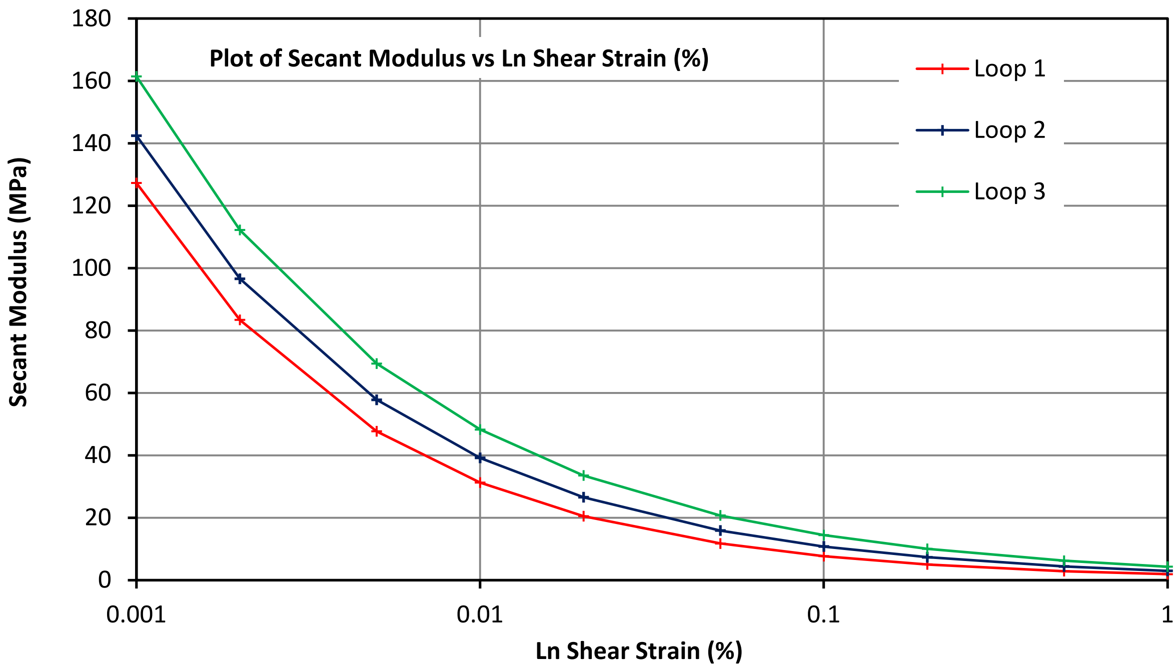
Project	NGI - Halden Site	**Figure No.**	**HALP01 T05 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU
SITE INVESTIGATION

Test Date	18/09/2017	**Test No.**	5
Borehole	HALP01	**Test Depth (m)**	13.50



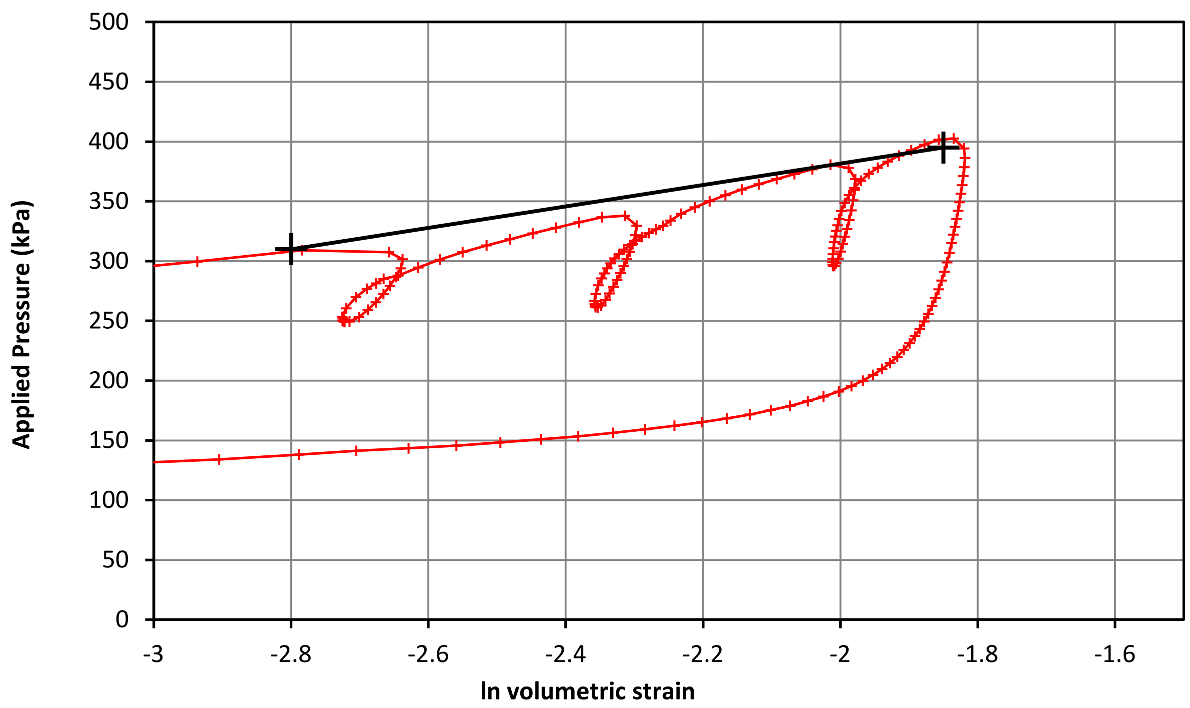
Shear Strain	Loop 1	Loop 2	Loop 3
0.001%	**127**	**142**	**161**
0.002%	83	97	112
0.005%	48	58	69
0.010%	**31**	**39**	**48**
0.020%	20	27	34
0.050%	12	16	21
0.100%	**8**	**11**	**14**
0.200%	5	7	10
0.500%	3	4	6
1.000%	**2**	**3**	**4**

Project	NGI - Halden Site	**Figure No.**	**HALP01 T05 - 07**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

IN SITU SITE INVESTIGATION

Test Date	18/09/2017	**Test No.**	5
Borehole	HALP01	**Test Depth (m)**	13.50



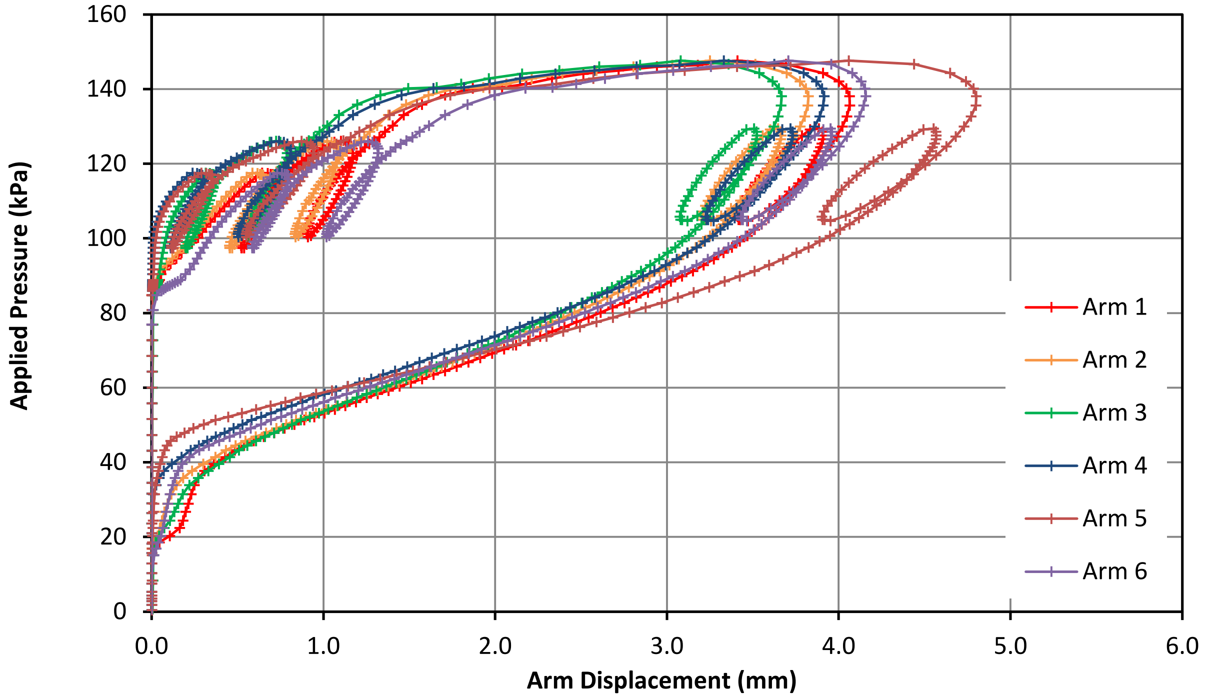
Strength	Undrained Shear	89	kPa
	Limit Pressure	561	kPa

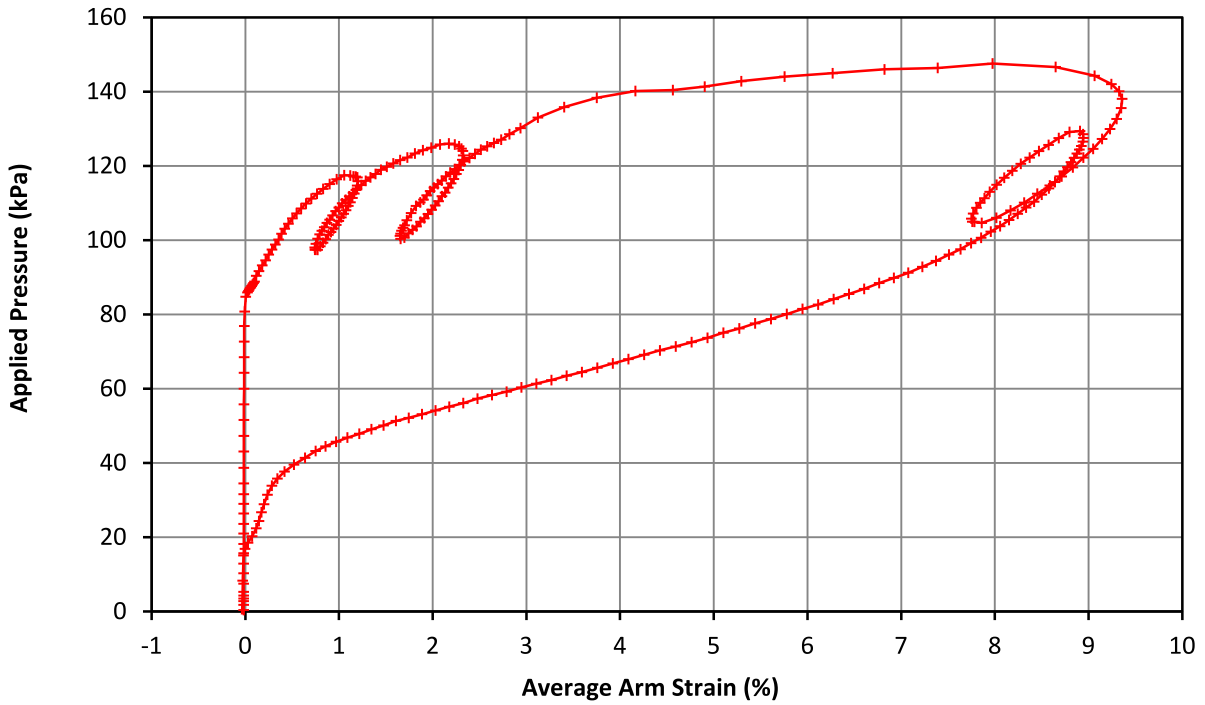
Project	NGI - Halden Site	**Figure No.**	**HALP01 T05 - 08**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU
SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	1
Borehole	ONSP01	**Test Depth (m)**	5.00



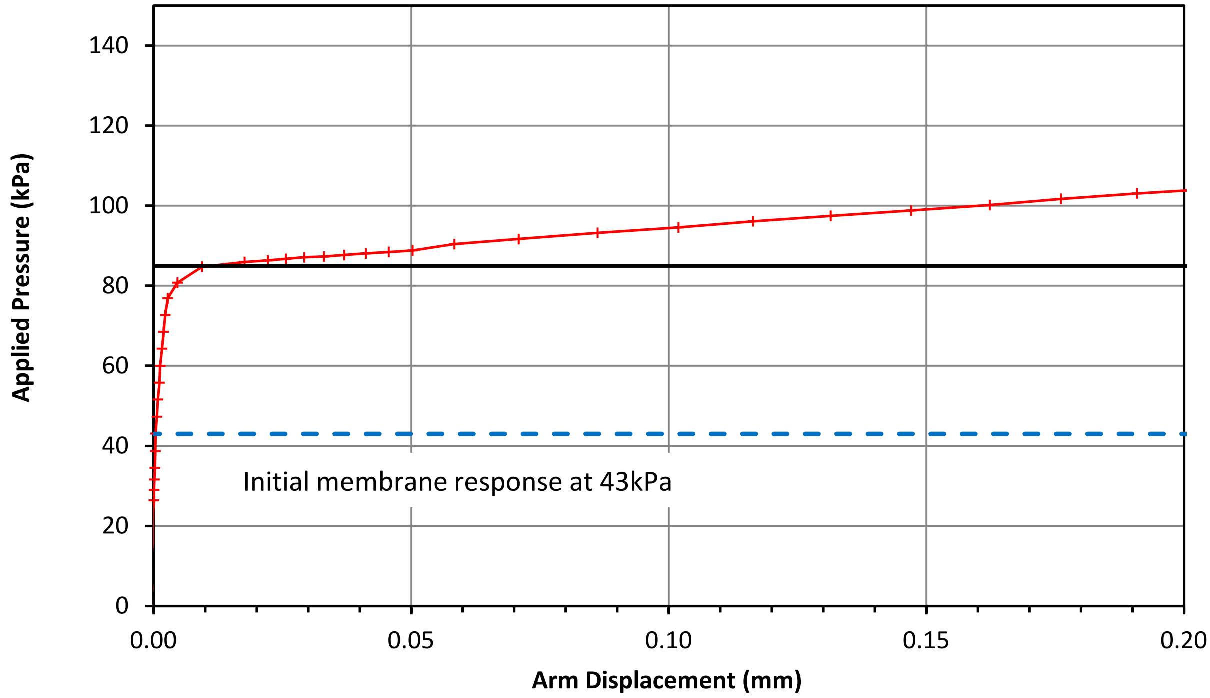


Comments

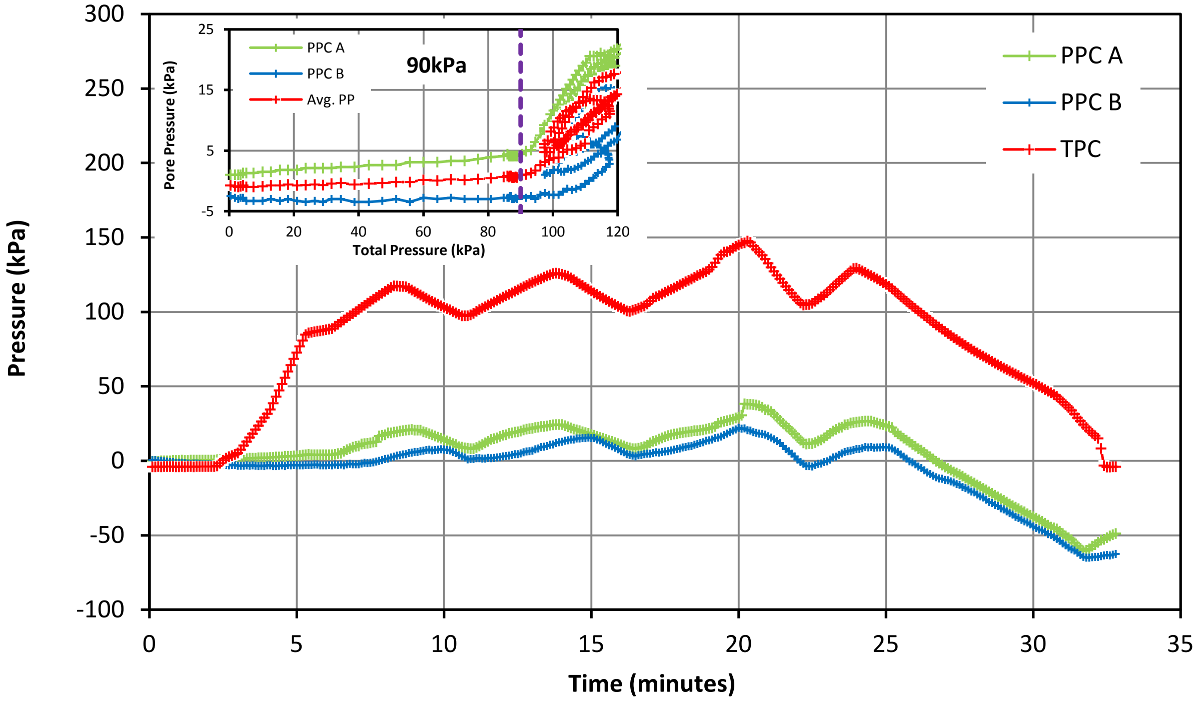
Project	NGI - Onsøy Site	**Figure No.**	ONSP01 T01 - 01
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Lift Off Stress & Pore Pressure Record

Test Date	20/09/2017	**Test No.**	1
Borehole	ONSP01	**Test Depth (m)**	5.00



Lift Off Stress (Po)	85 kPa

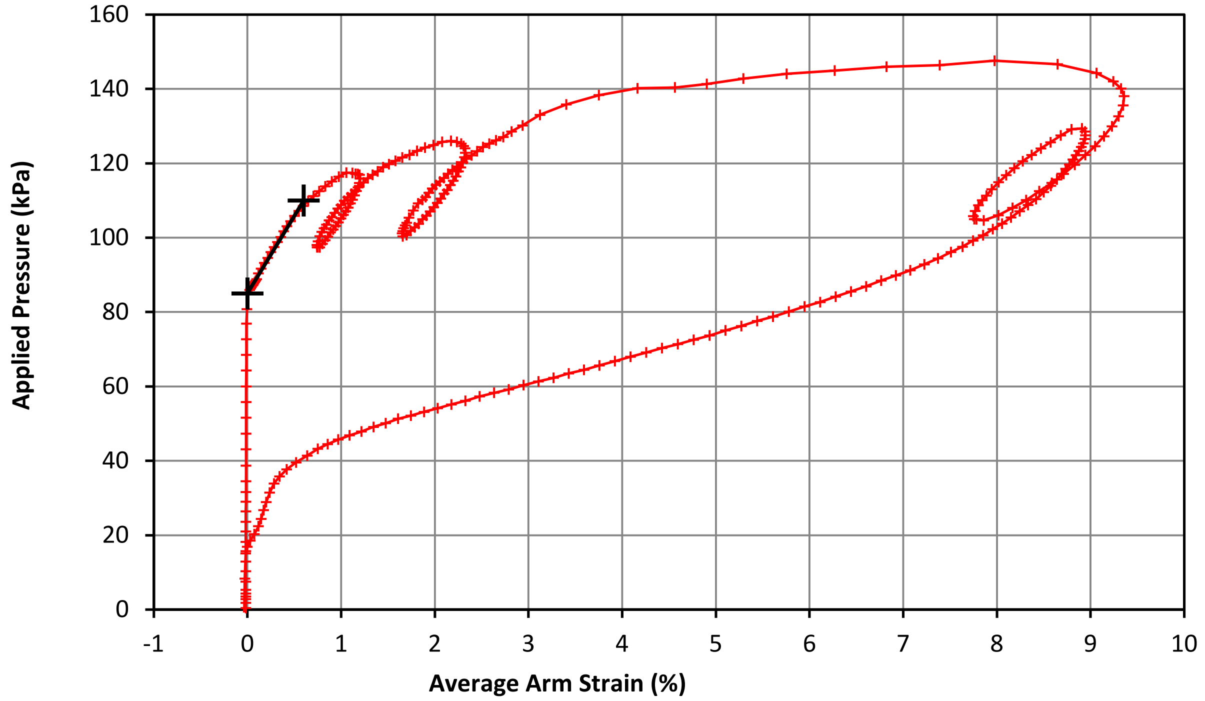


Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T01 - 02**
Client	NGI		
Project No.	P1170112		

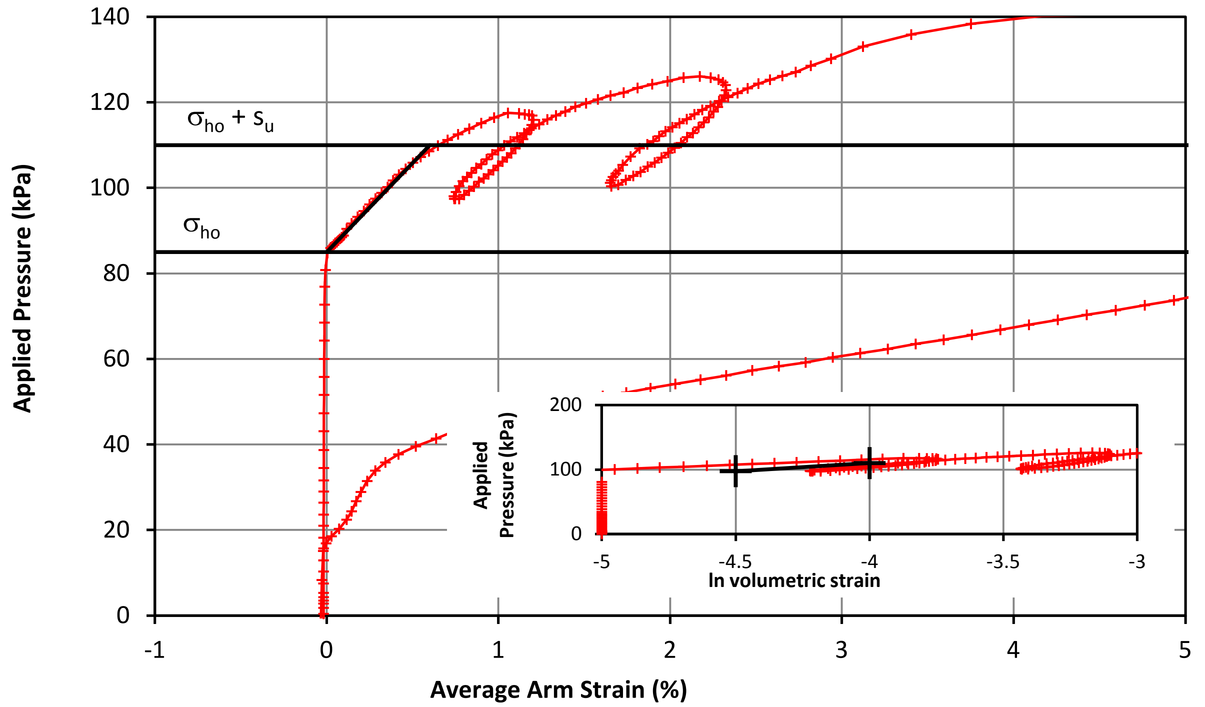
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	Test No.	1
Borehole	ONSP01	Test Depth (m)	5.00



Initial Modulus	Shear Modulus	2.1 MPa



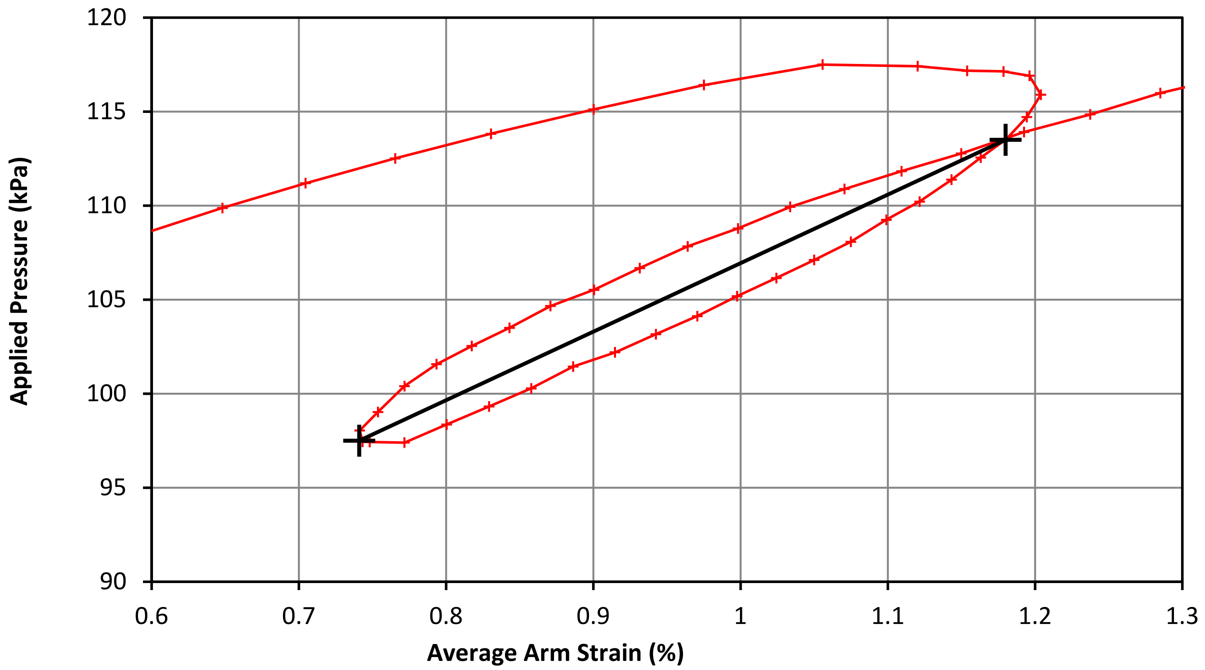
Marsland & Randolph	In situ horizontal stress	85 kPa
	Undrained Strength	25 kPa

Project	NGI - Onsøy Site	Figure No.	ONSP01 T01 - 03
Client	NGI		
Project No.	P1170112		

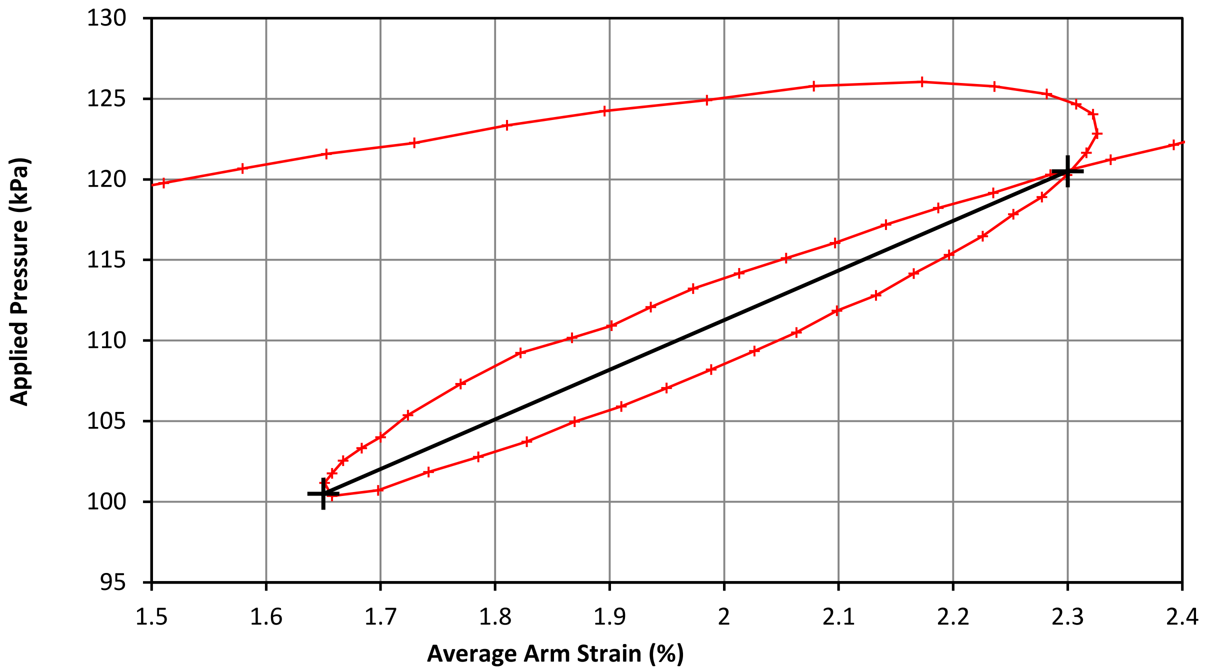
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	Test No.	1
Borehole	ONSP01	Test Depth (m)	5.00



Loop 1		
	Shear Modulus	1.8 MPa
	Cavity Strain Range	0.439 %



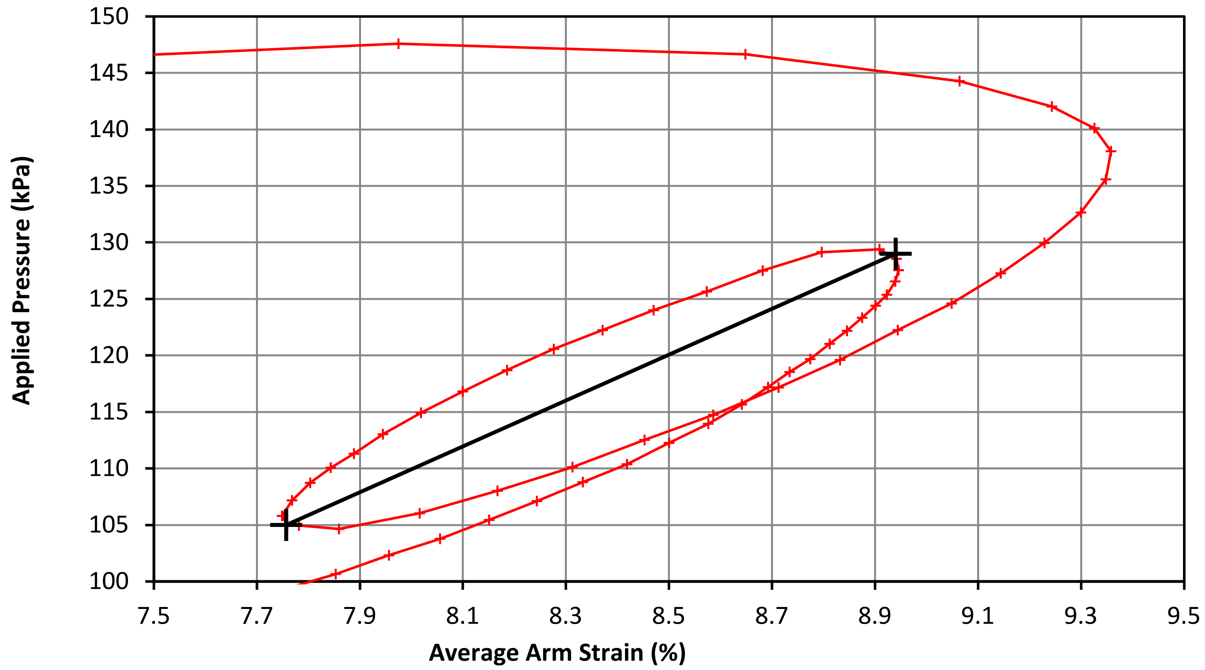
Loop 2		
	Shear Modulus	1.6 MPa
	Cavity Strain Range	0.650 %

Project	NGI - Onsøy Site	Figure No.	ONSP01 T01 - 04
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	1
Borehole	ONSP01	**Test Depth (m)**	5.00



Loop 3	Shear Modulus	1.1	MPa
	Cavity Strain Range	1.183	%

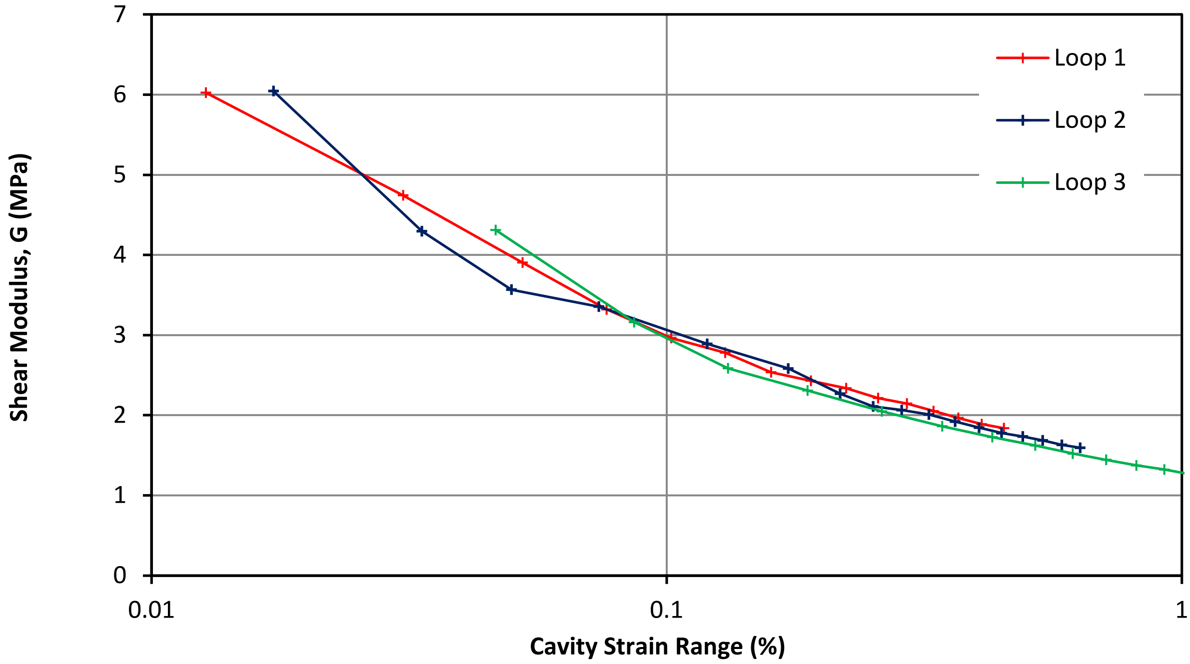
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T01 - 05**
Client	NGI		
Project No.	P1170112		

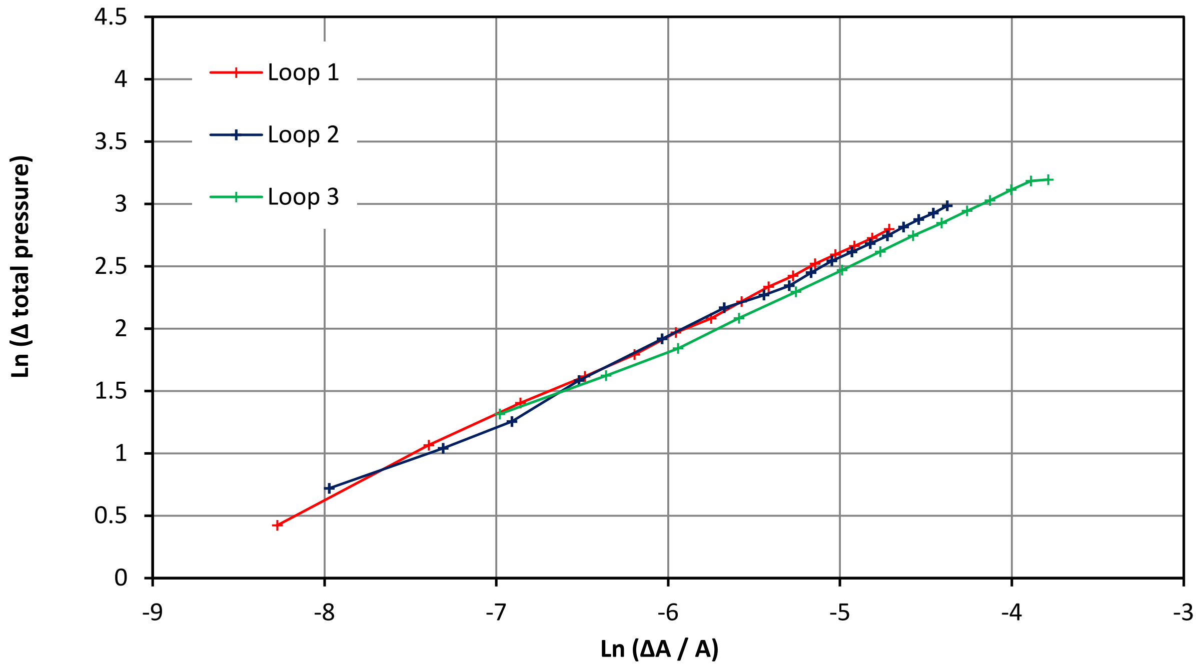
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	1
Borehole	ONSP01	**Test Depth (m)**	5.00





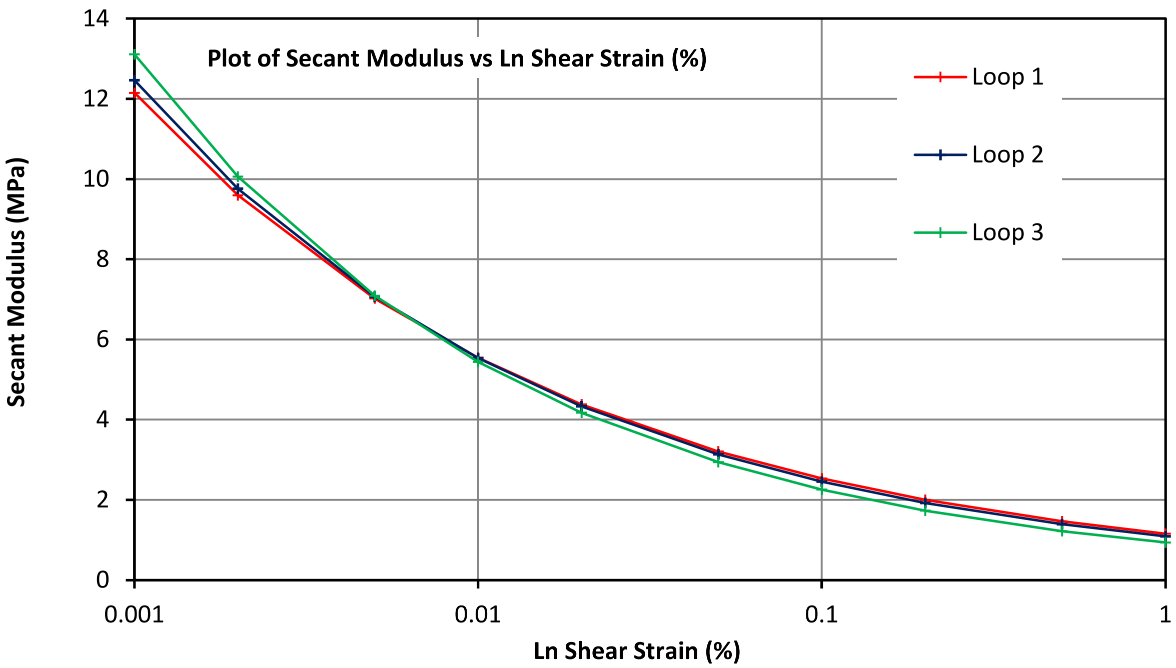
Loop 1		Loop 2		Loop 3	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.660	0.366 (MPa)	0.647	0.332 (MPa)	0.618	0.261 (MPa)

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T01 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis
Secant Modulus - Shear Strain (%)

IN SITU
SITE INVESTIGATION

Test Date	20/09/2017	Test No.	1
Borehole	ONSP01	Test Depth (m)	5.00

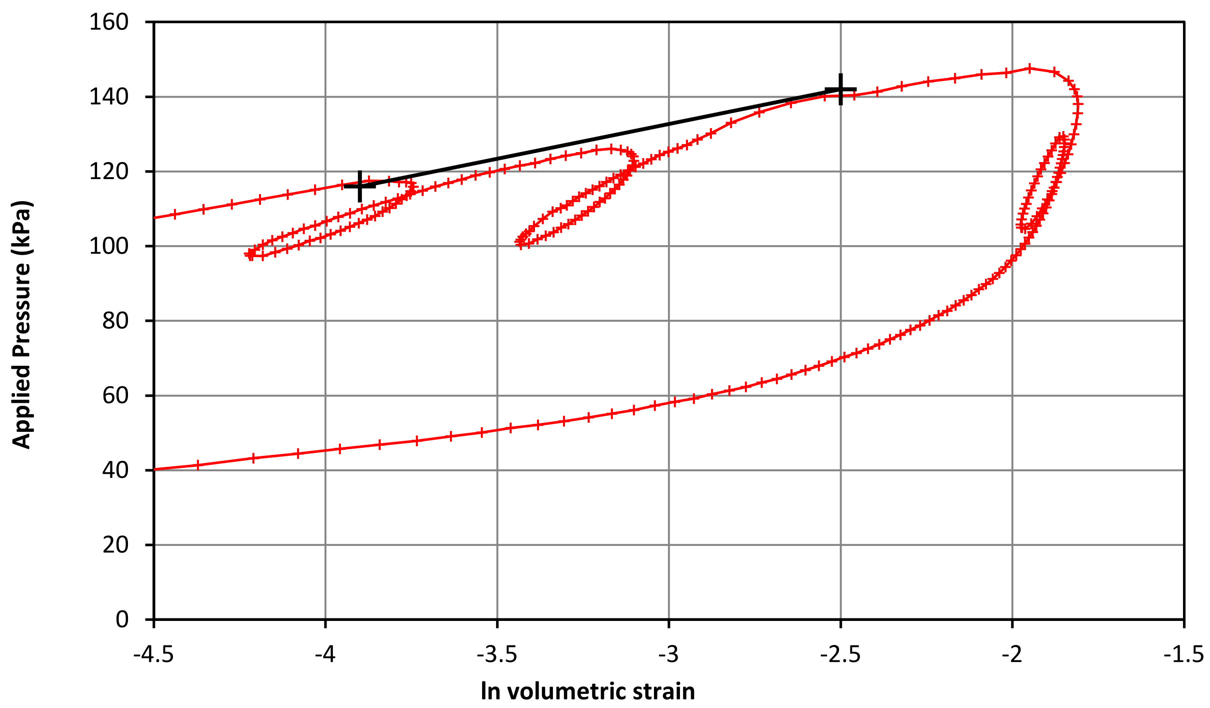


Shear Strain	Loop 1	Loop 2	Loop 3
0.001%	**12**	**12**	**13**
0.002%	10	10	10
0.005%	7	7	7
0.010%	**6**	**6**	**5**
0.020%	4	4	4
0.050%	3	3	3
0.100%	**3**	**2**	**2**
0.200%	2	2	2
0.500%	1	1	1
1.000%	**1**	**1**	**1**

Project	NGI - Onsøy Site	Figure No.	ONSP01 T01 - 07
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

Test Date	20/09/2017	Test No.	1
Borehole	ONSP01	Test Depth (m)	5.00



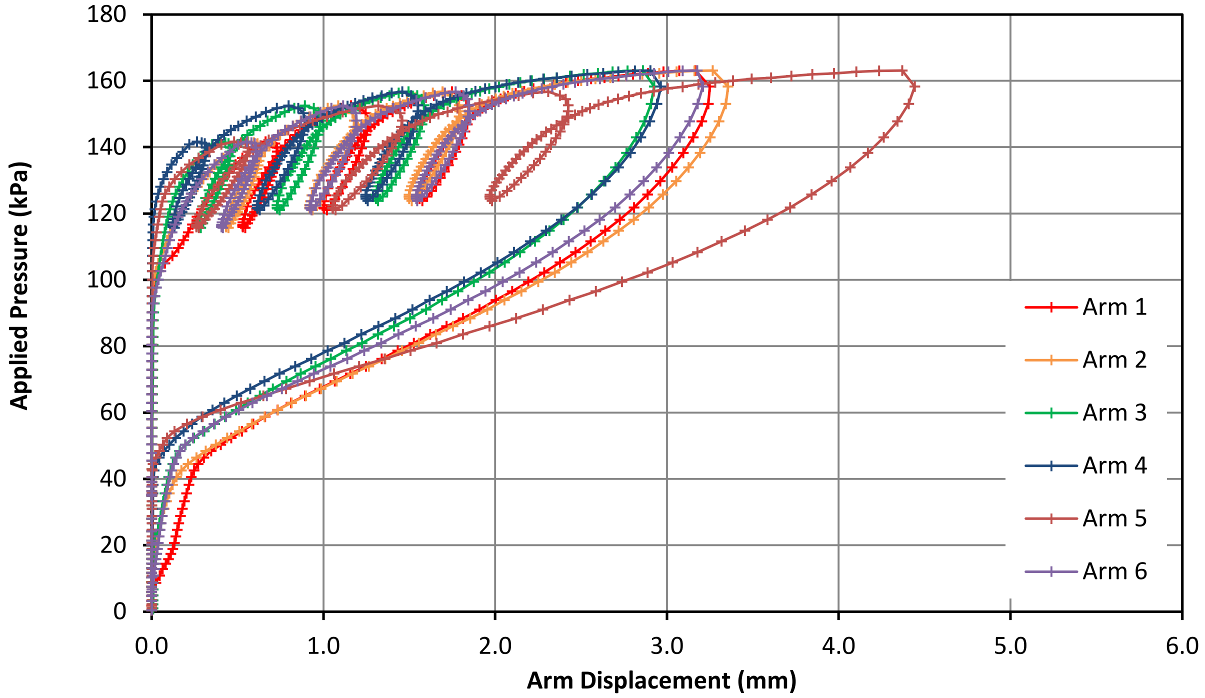
Strength	Undrained Shear	19	kPa
	Limit Pressure	188	kPa

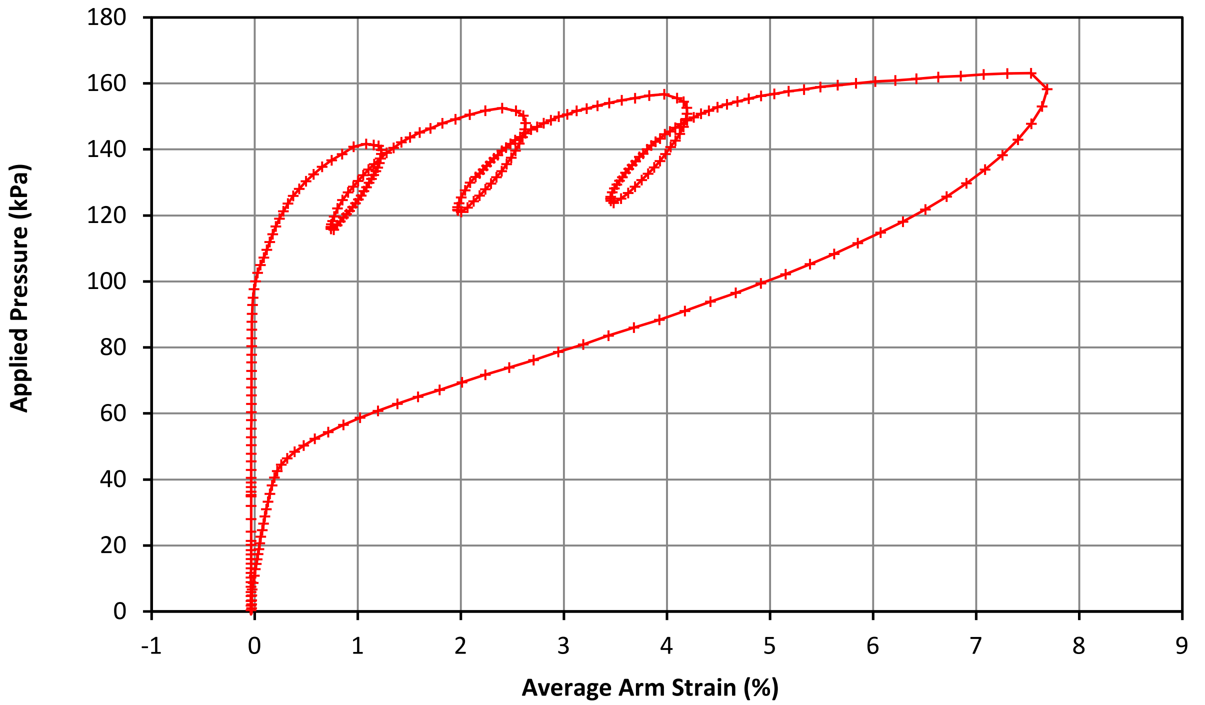
Project	NGI - Onsøy Site	Figure No.	ONSP01 T01 - 08
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	Test No.	2
Borehole	ONSP01	Test Depth (m)	6.10





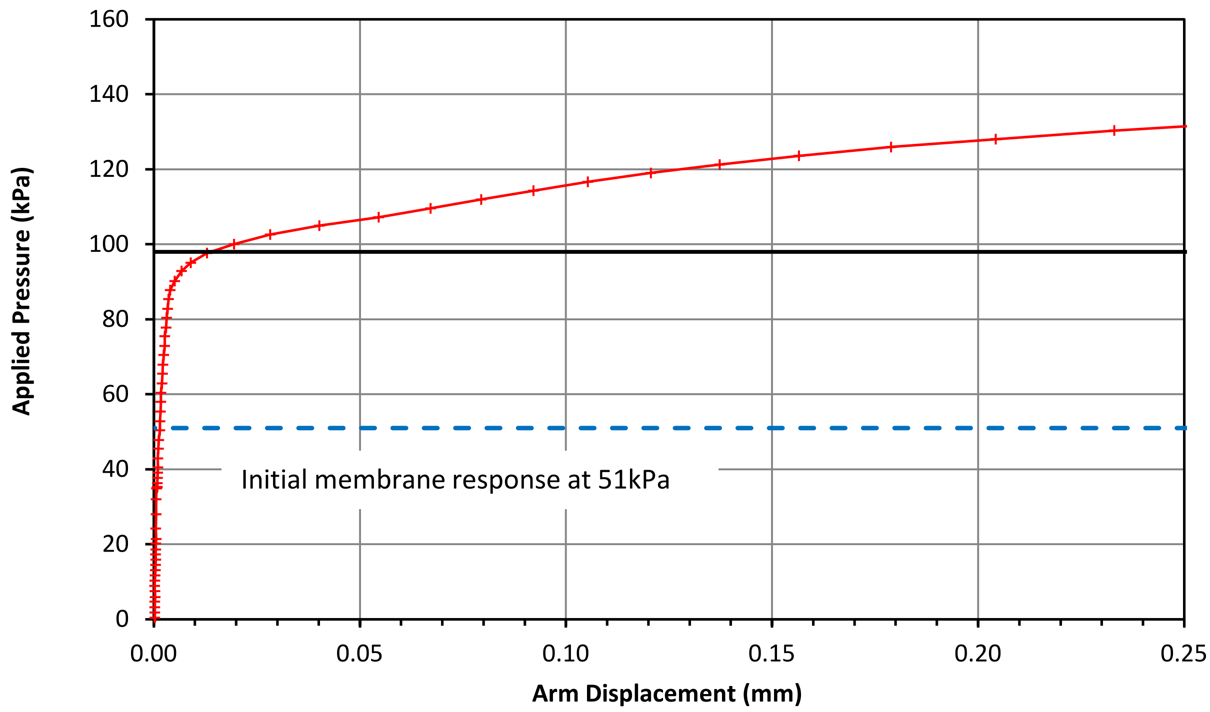
Comments

Project	NGI - Onsøy Site	Figure No.	ONSP01 T02 - 01
Client	NGI		
Project No.	P1170112		

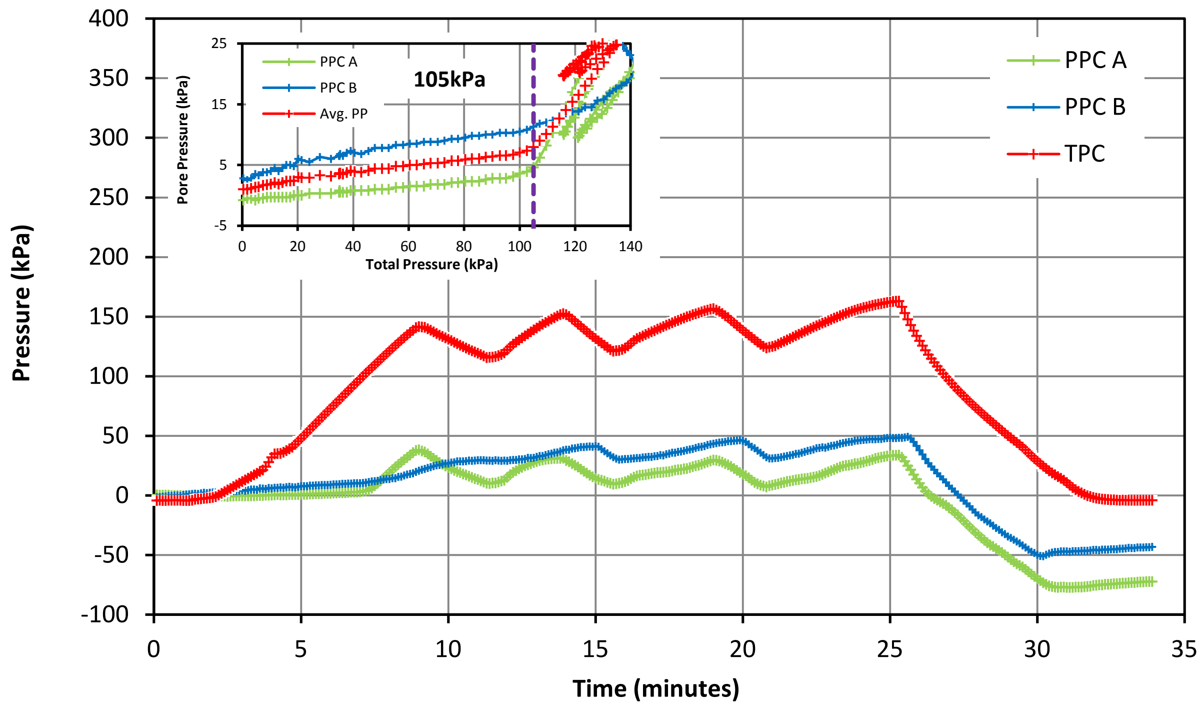
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	2
Borehole	ONSP01	**Test Depth (m)**	6.10



Lift Off Stress (Po)	98 kPa

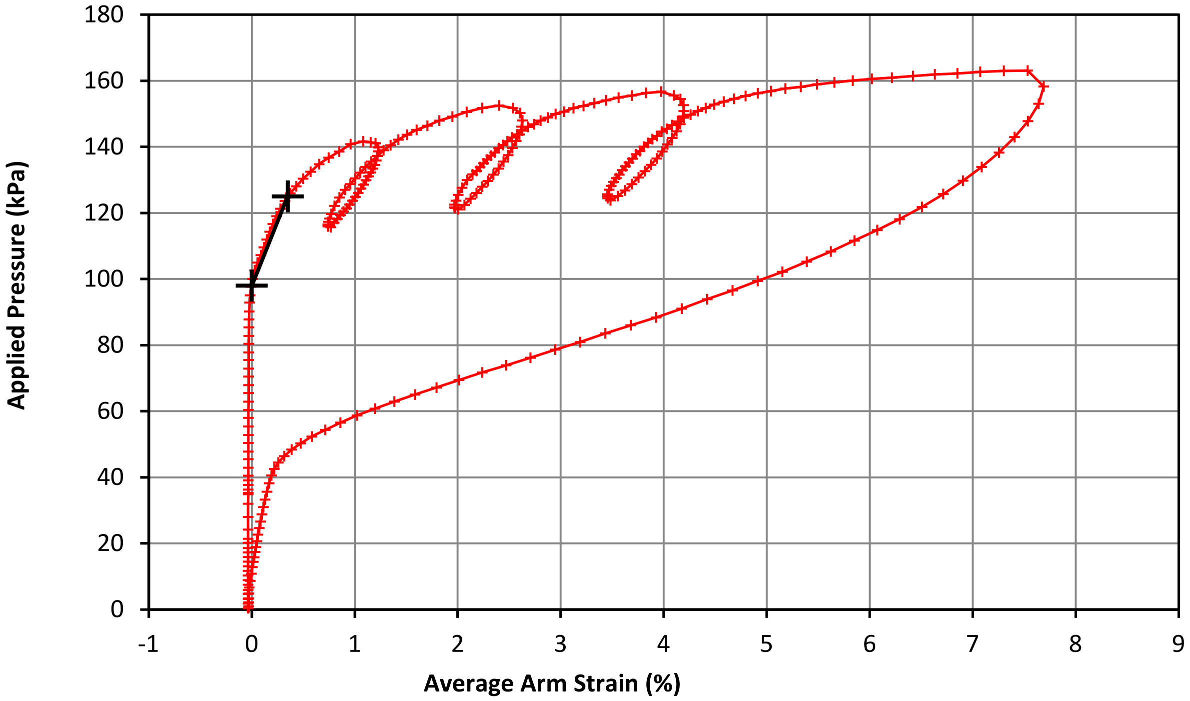


Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T02 - 02**
Client	NGI		
Project No.	P1170112		

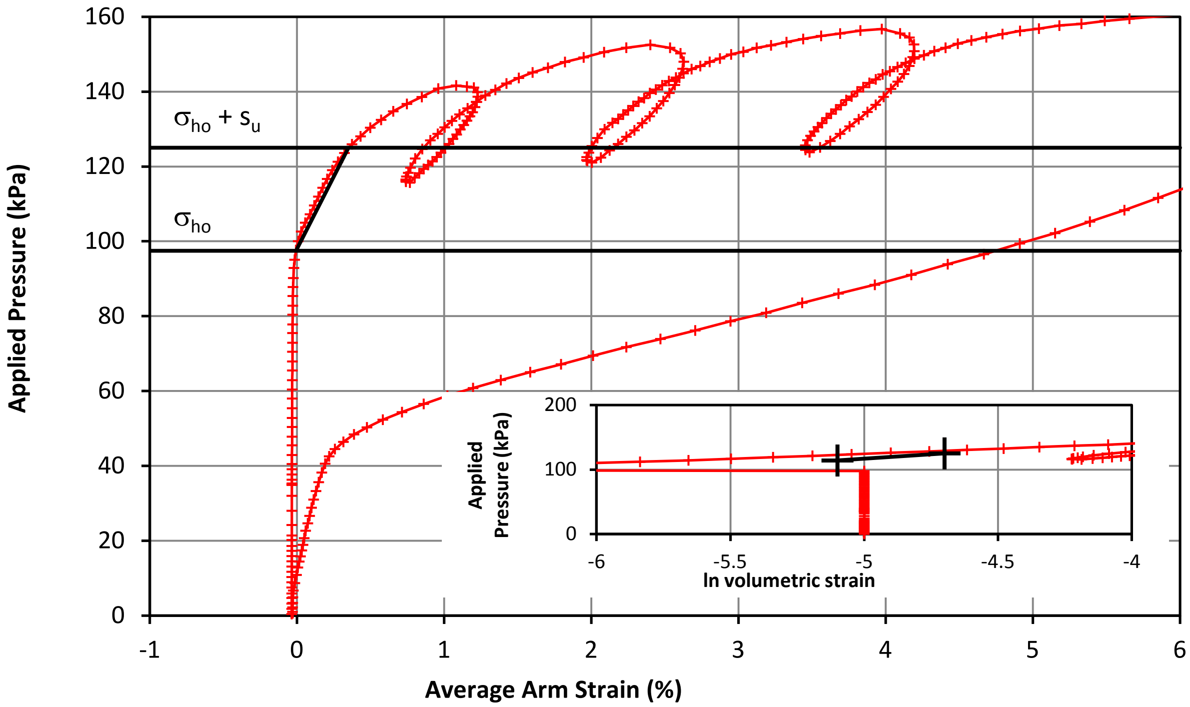
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	Test No.	2
Borehole	ONSP01	Test Depth (m)	6.10



Initial Modulus	Shear Modulus	3.9 MPa



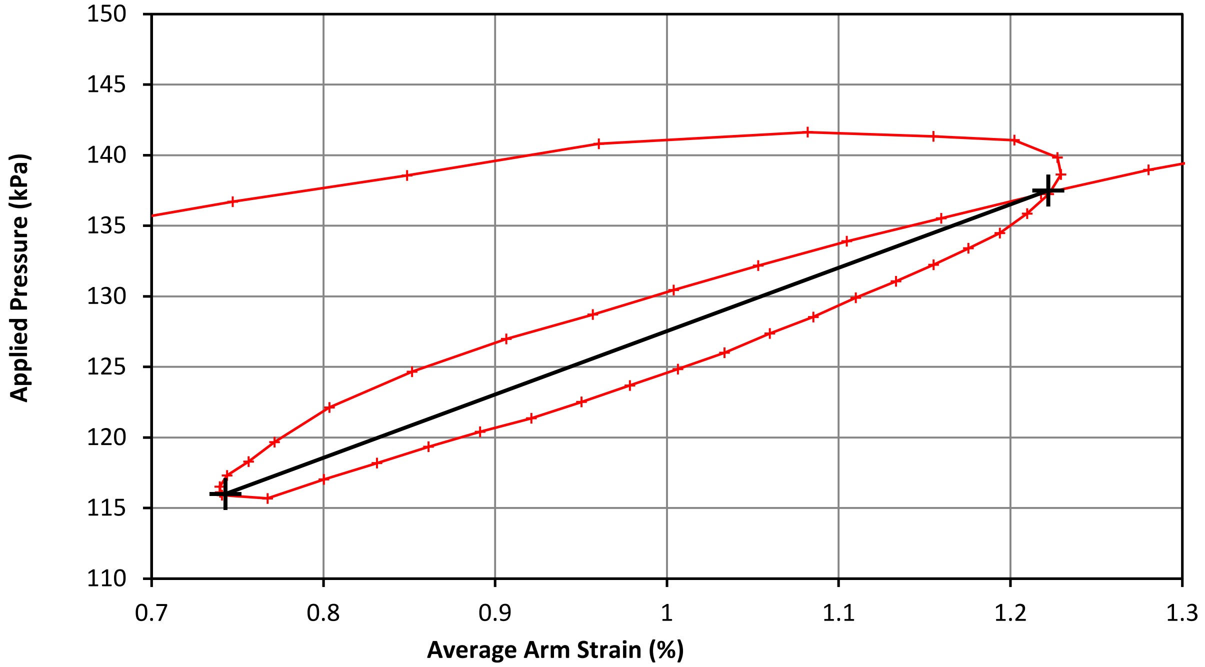
Marsland & Randolph	In situ horizontal stress	98 kPa
	Undrained Strength	28 kPa

Project	NGI - Onsøy Site	Figure No.	ONSP01 T02 - 03
Client	NGI		
Project No.	P1170112		

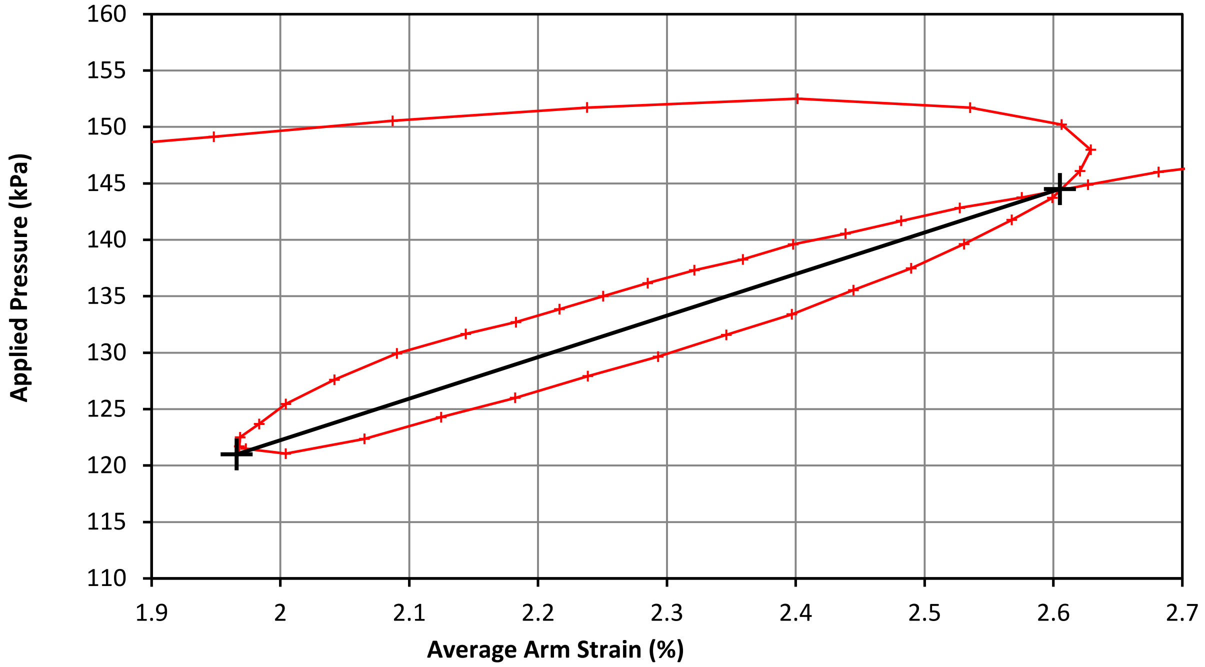
Pressuremeter Test Unload Reload Loop

IN SITU
SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	2
Borehole	ONSP01	**Test Depth (m)**	6.10



Loop 1	Shear Modulus	2.3	MPa
	Cavity Strain Range	0.479	%



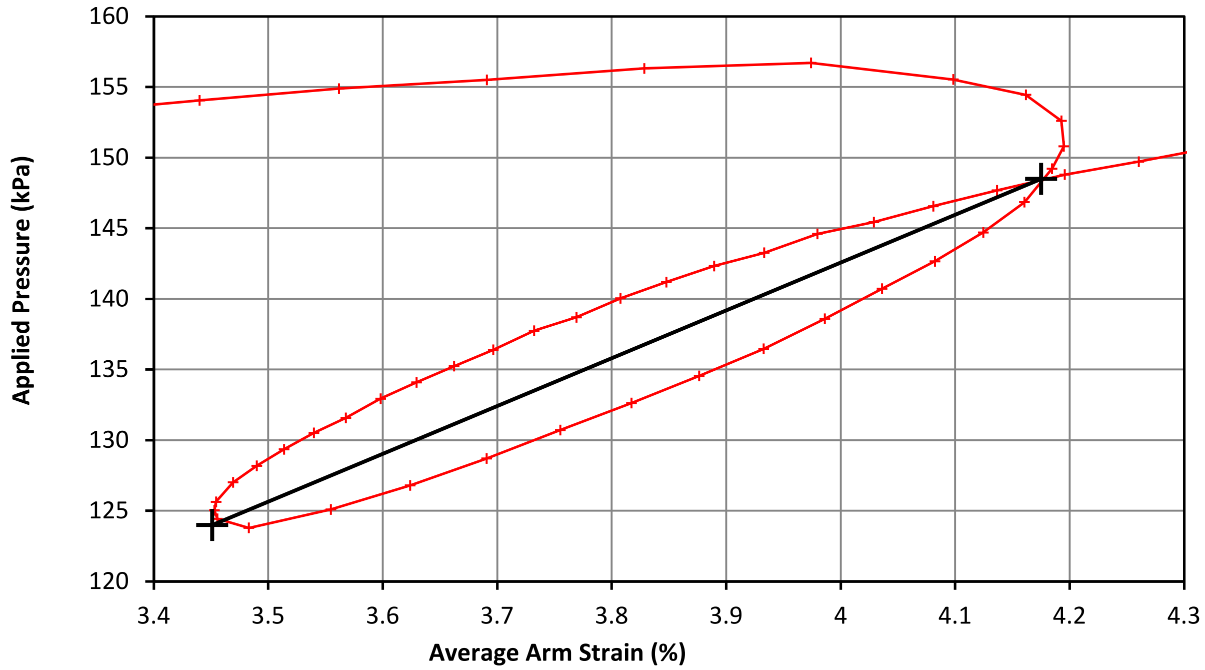
Loop 2	Shear Modulus	1.9	MPa
	Cavity Strain Range	0.639	%

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T02 - 04**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	2
Borehole	ONSP01	**Test Depth (m)**	6.10



Loop 3	Shear Modulus	1.8 MPa
	Cavity Strain Range	0.724 %

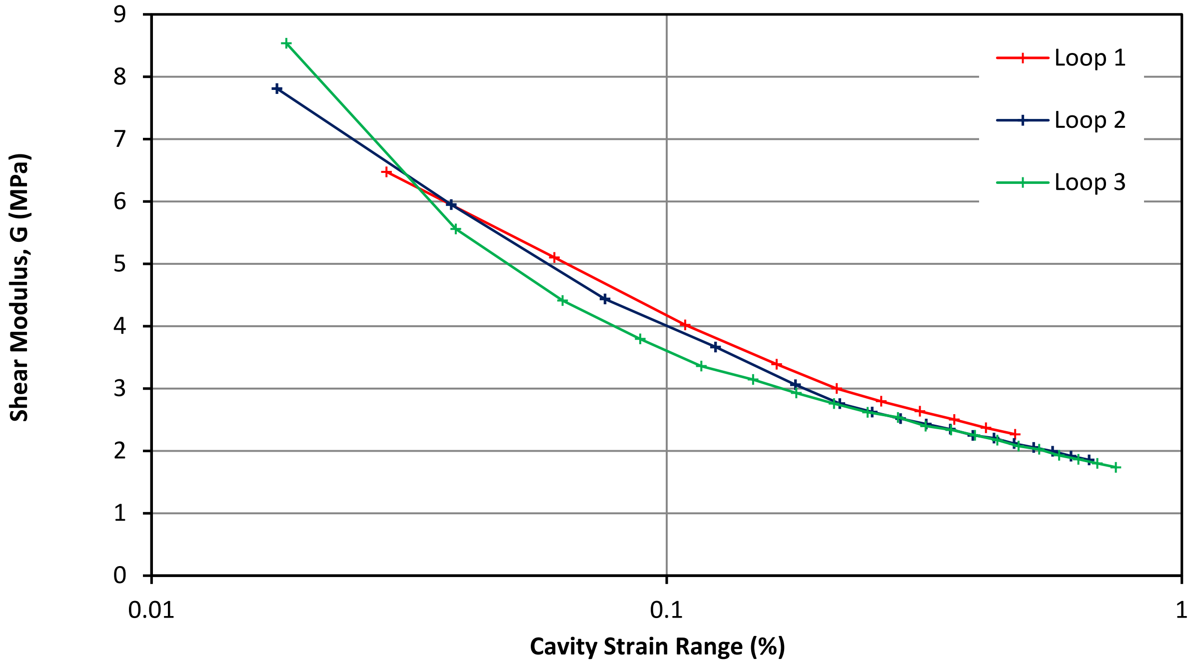
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T02 - 05**
Client	NGI		
Project No.	P1170112		

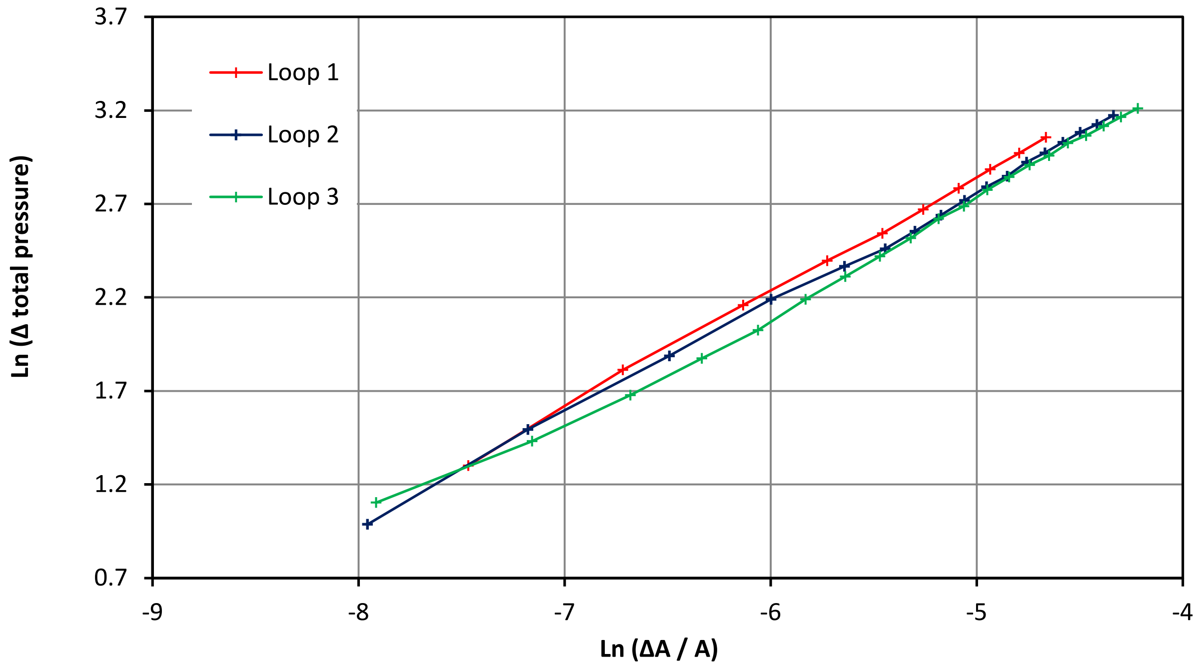
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	2
Borehole	ONSP01	**Test Depth (m)**	6.10





Loop 1		Loop 2		Loop 3	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.616	0.374 (MPa)	0.598	0.316 (MPa)	0.601	0.309 (MPa)

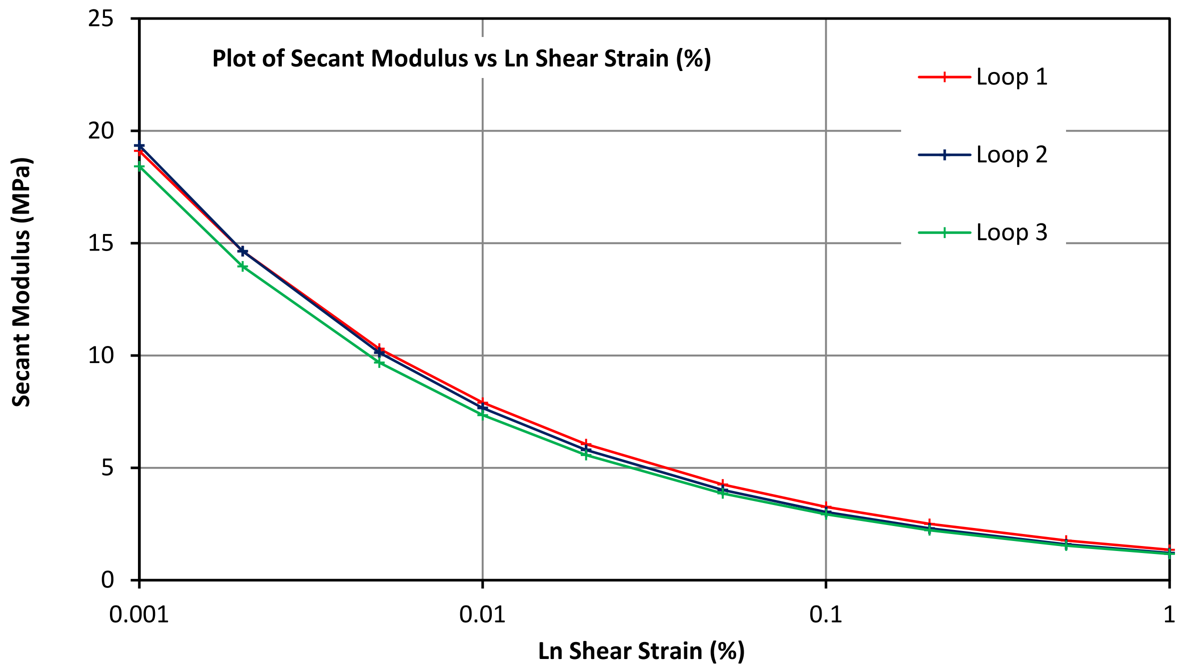
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T02 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	Test No.	2
Borehole	ONSP01	Test Depth (m)	6.10



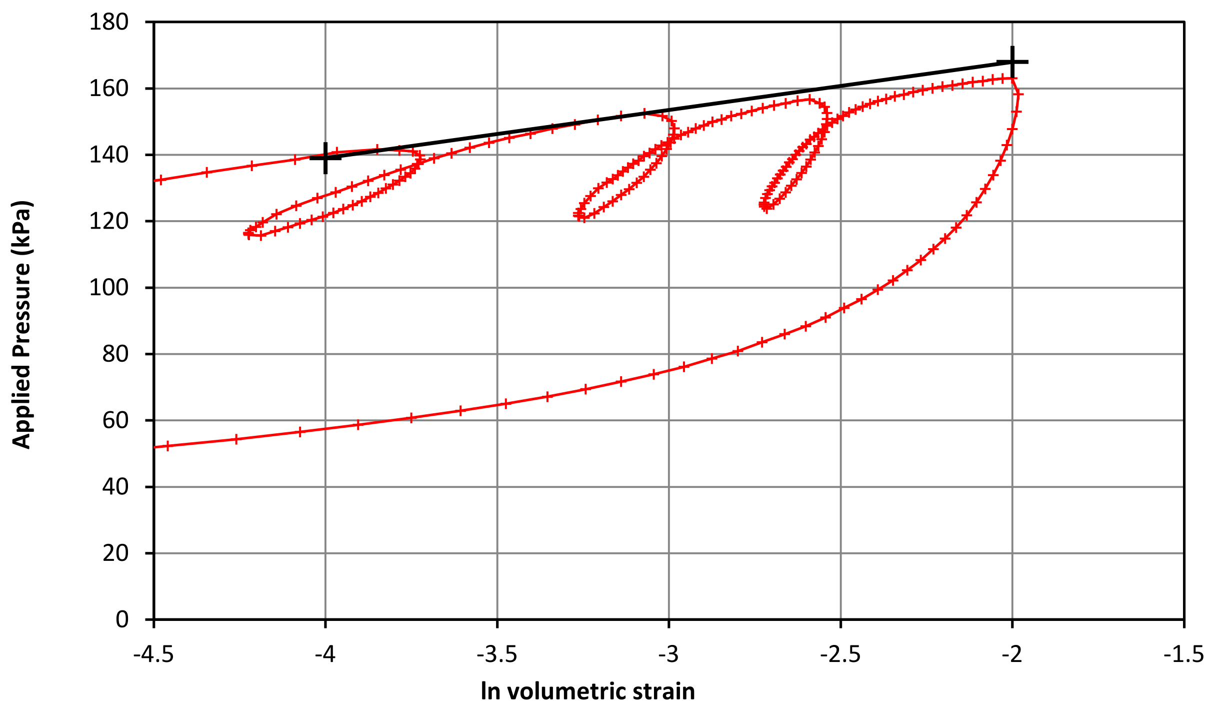
Shear Strain	Loop 1	Loop 2	Loop 3
0.001%	**19**	**19**	**18**
0.002%	15	15	14
0.005%	10	10	10
0.010%	**8**	**8**	**7**
0.020%	6	6	6
0.050%	4	4	4
0.100%	**3**	**3**	**3**
0.200%	3	2	2
0.500%	2	2	2
1.000%	**1**	**1**	**1**

Project	NGI - Onsøy Site	Figure No.	ONSP01 T02 - 07
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	2
Borehole	ONSP01	**Test Depth (m)**	6.10



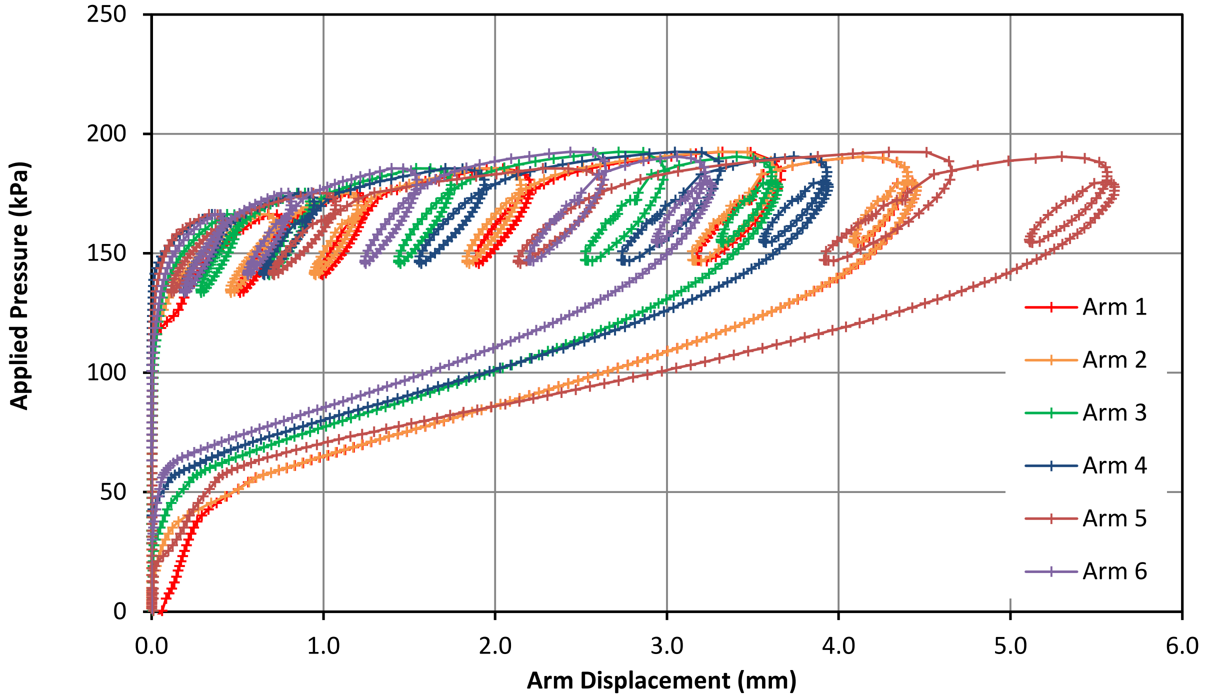
Strength	Undrained Shear	15	kPa
	Limit Pressure	197	kPa

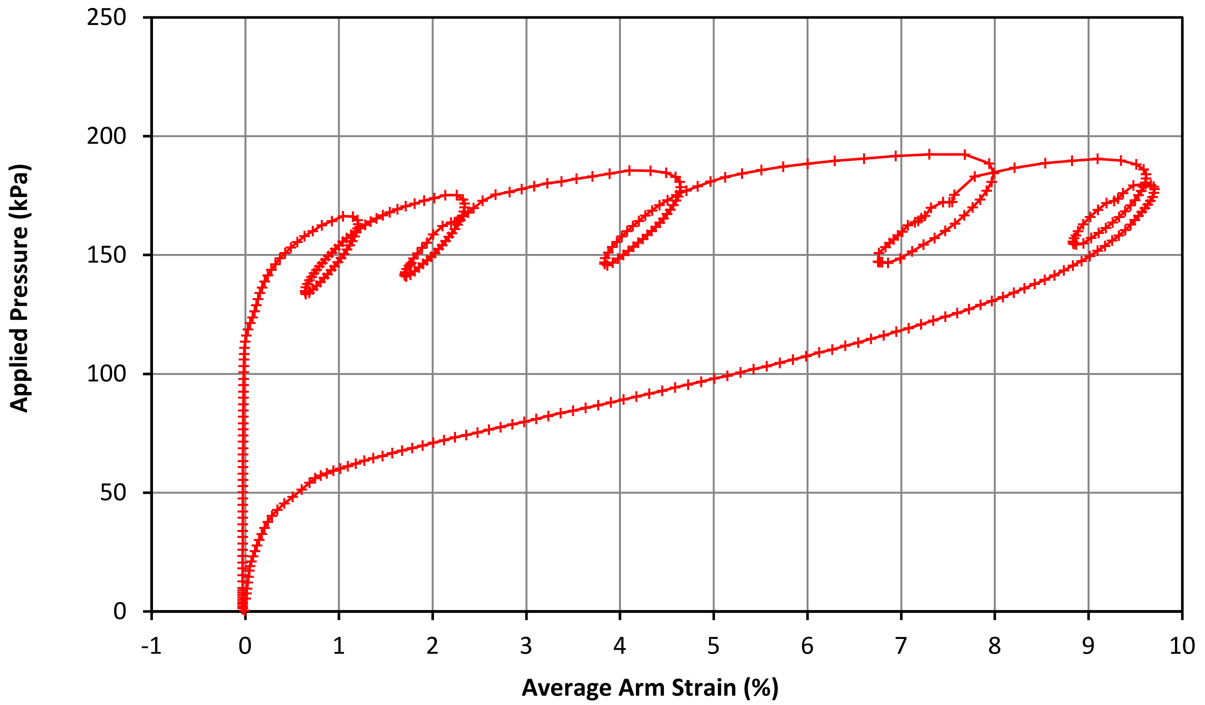
Project	NGI - Onsøy Site	**Figure No.**	ONSP01 T02 - 08
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	Test No.	3
Borehole	ONSP01	Test Depth (m)	7.10





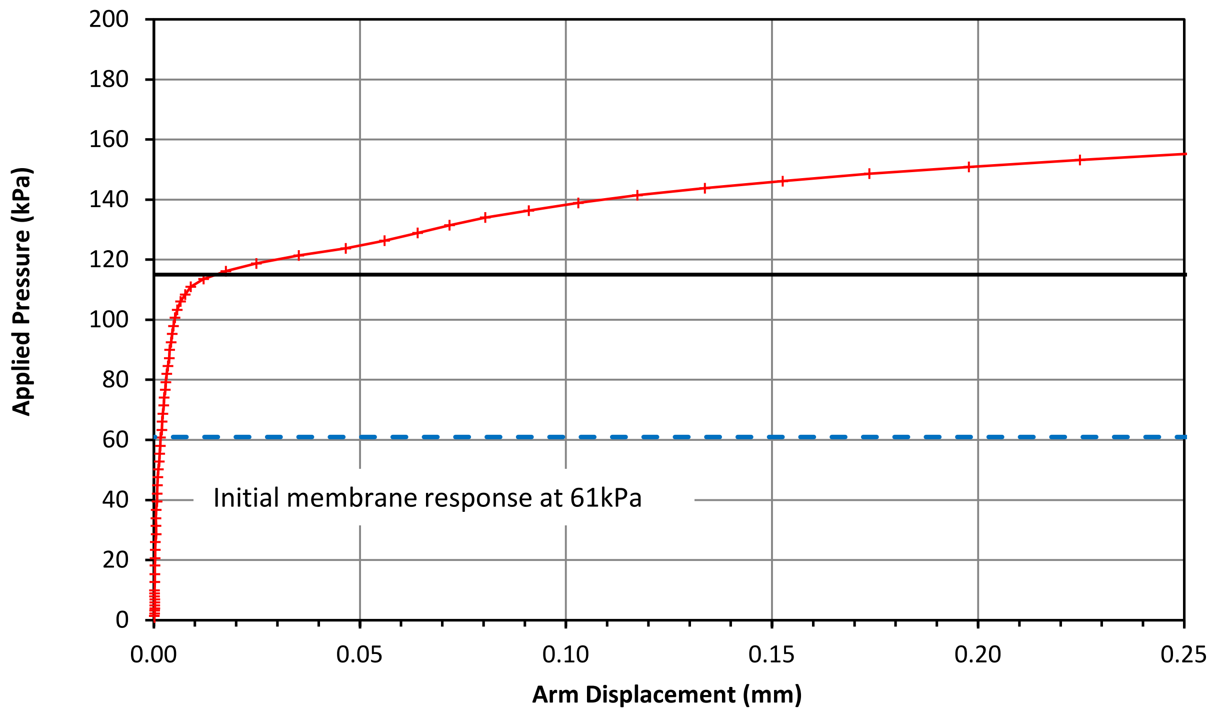
Comments

Project	NGI - Onsøy Site	Figure No.	ONSP01 T03 - 01
Client	NGI		
Project No.	P1170112		

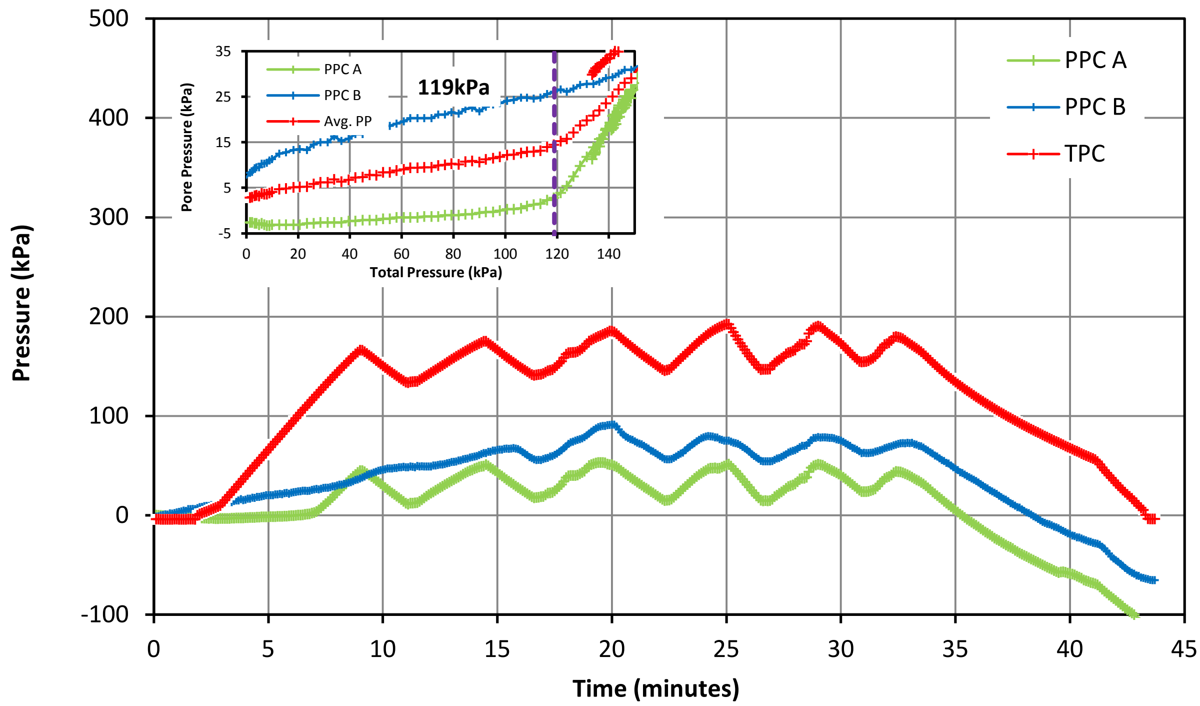
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	3
Borehole	ONSP01	**Test Depth (m)**	7.10



Lift Off Stress (Po)	115 kPa

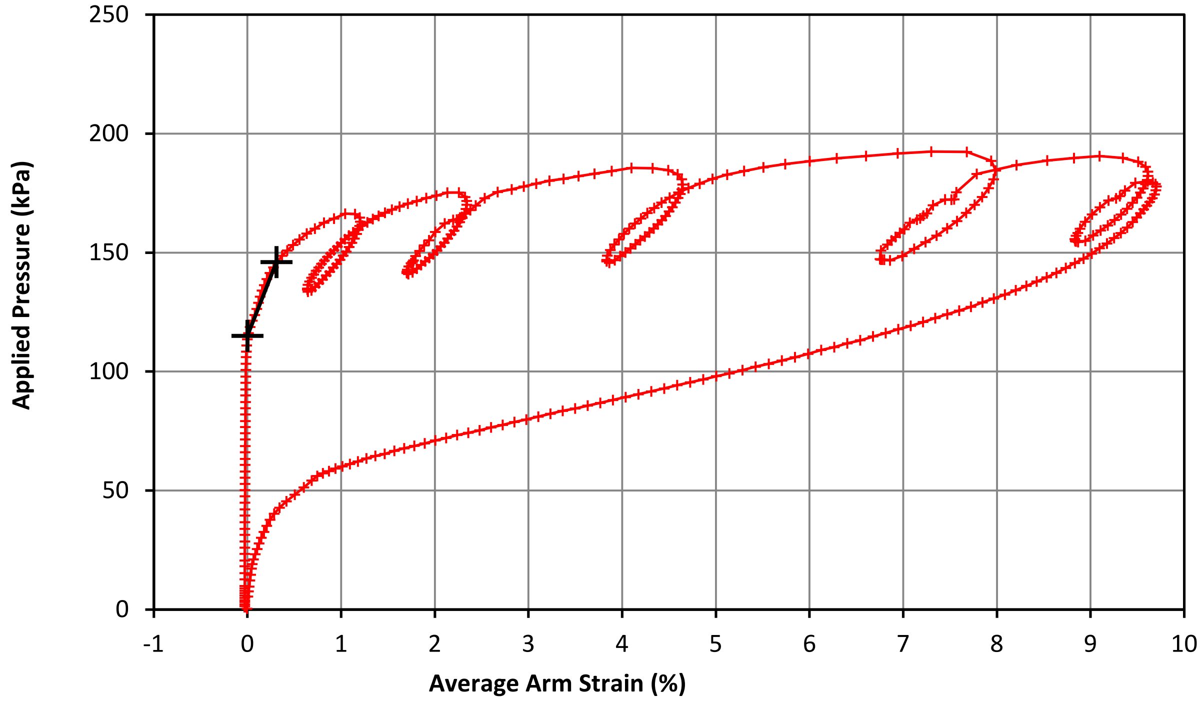


Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T03 - 02**
Client	NGI		
Project No.	P1170112		

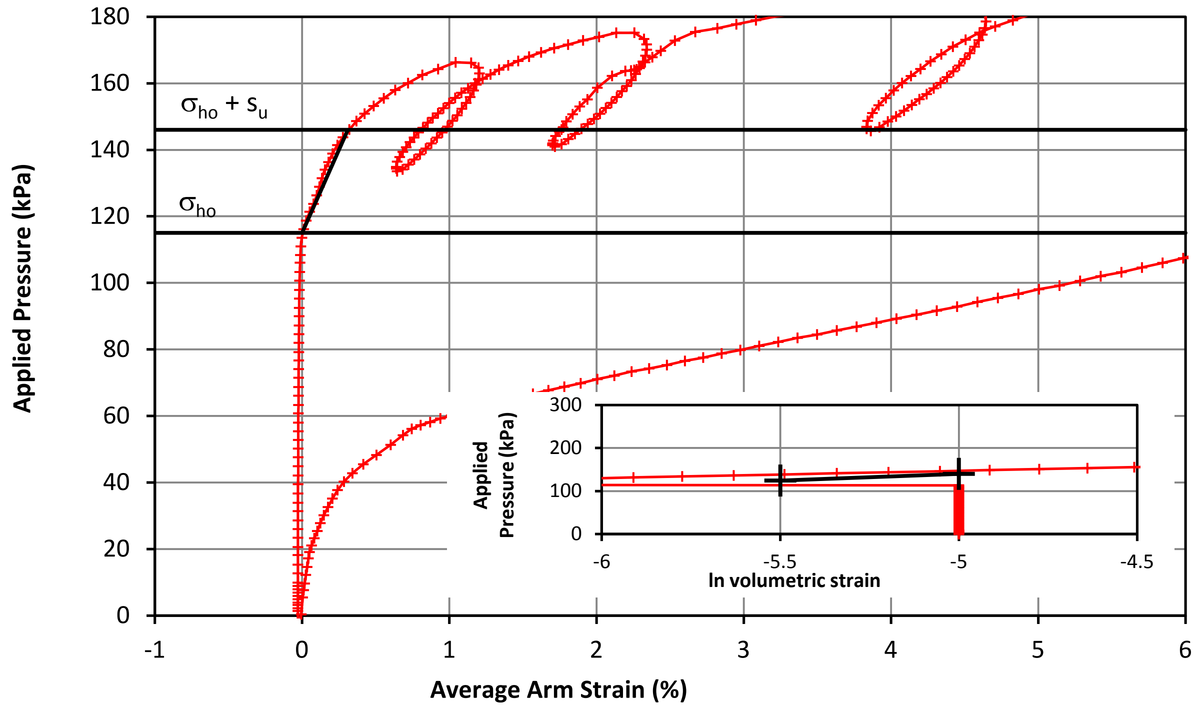
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	3
Borehole	ONSP01	**Test Depth (m)**	7.10



Initial Modulus	Shear Modulus	5.0 MPa



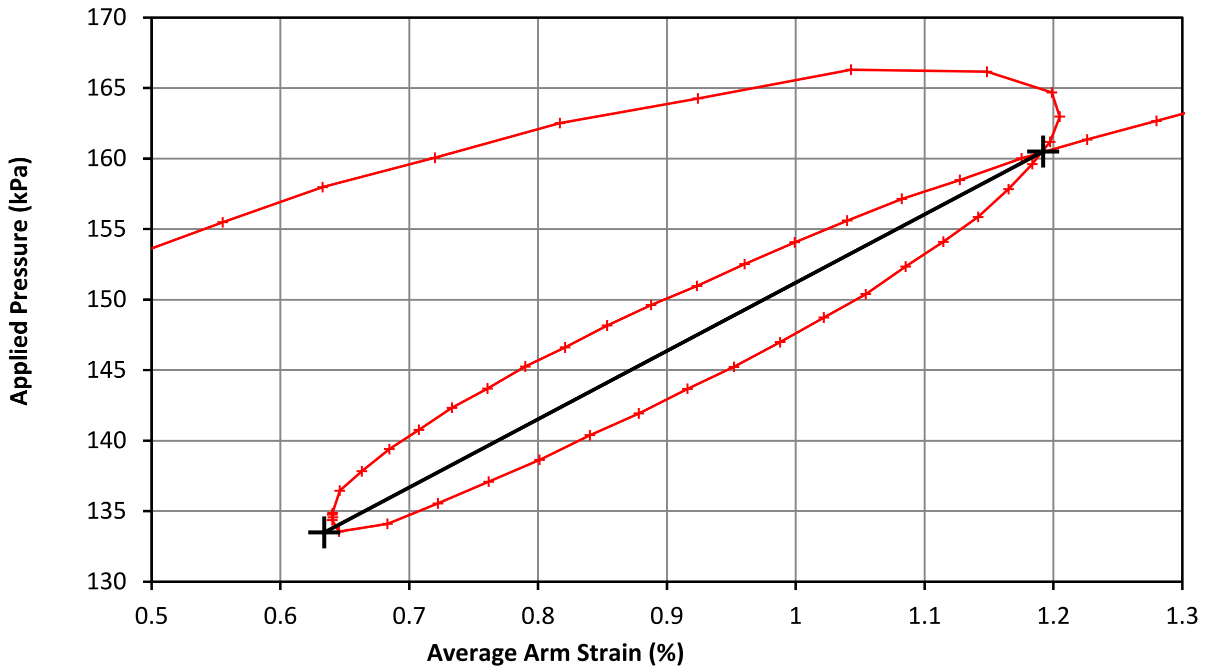
Marsland & Randolph	In situ horizontal stress	115 kPa
	Undrained Strength	31 kPa

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T03 - 03**
Client	NGI		
Project No.	P1170112		

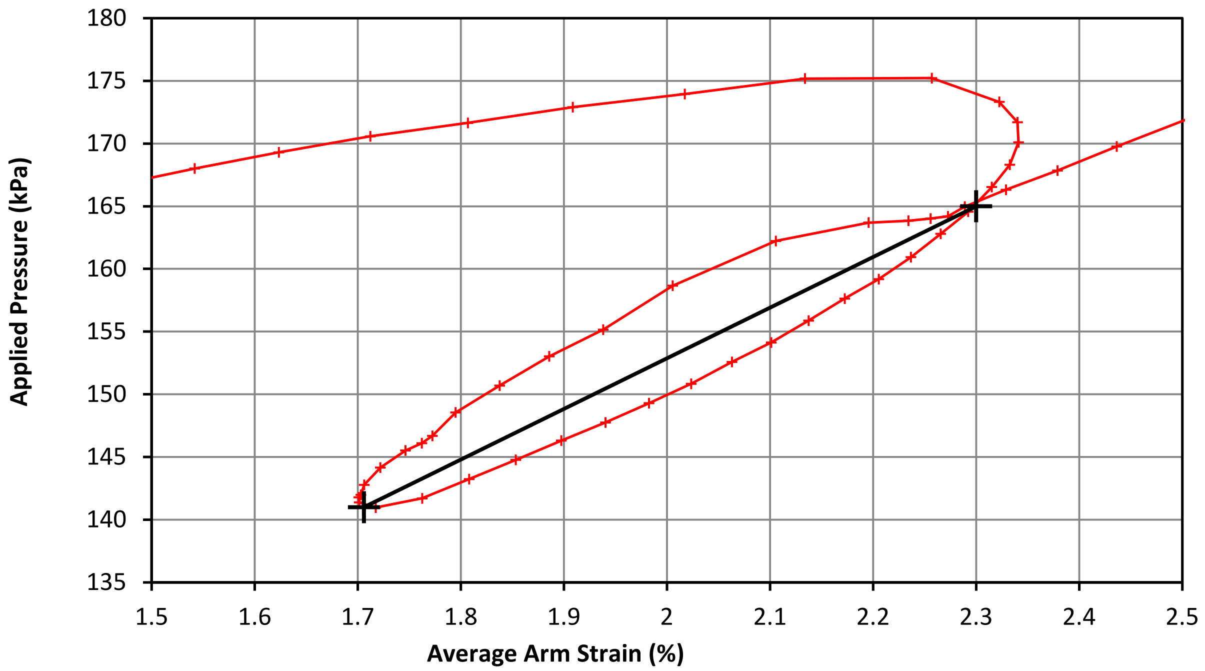
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	3
Borehole	ONSP01	**Test Depth (m)**	7.10



Loop 1	Shear Modulus	2.4	MPa
	Cavity Strain Range	0.558	%



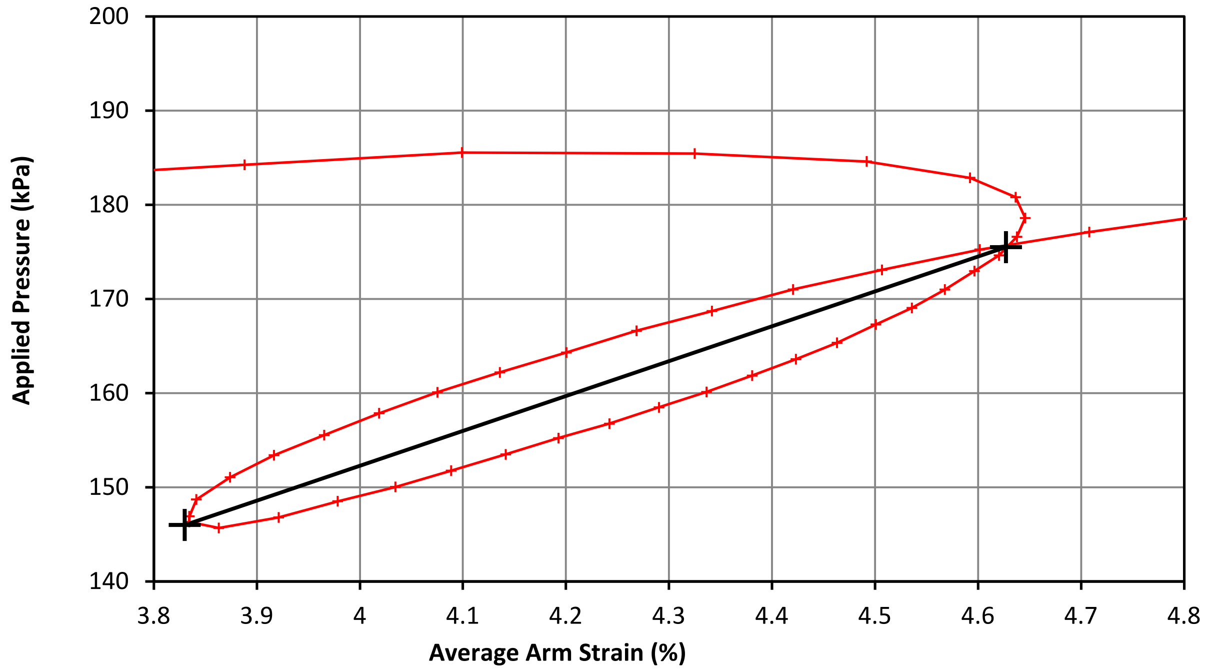
Loop 2	Shear Modulus	2.1	MPa
	Cavity Strain Range	0.594	%

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T03 - 04**
Client	NGI		
Project No.	P1170112		

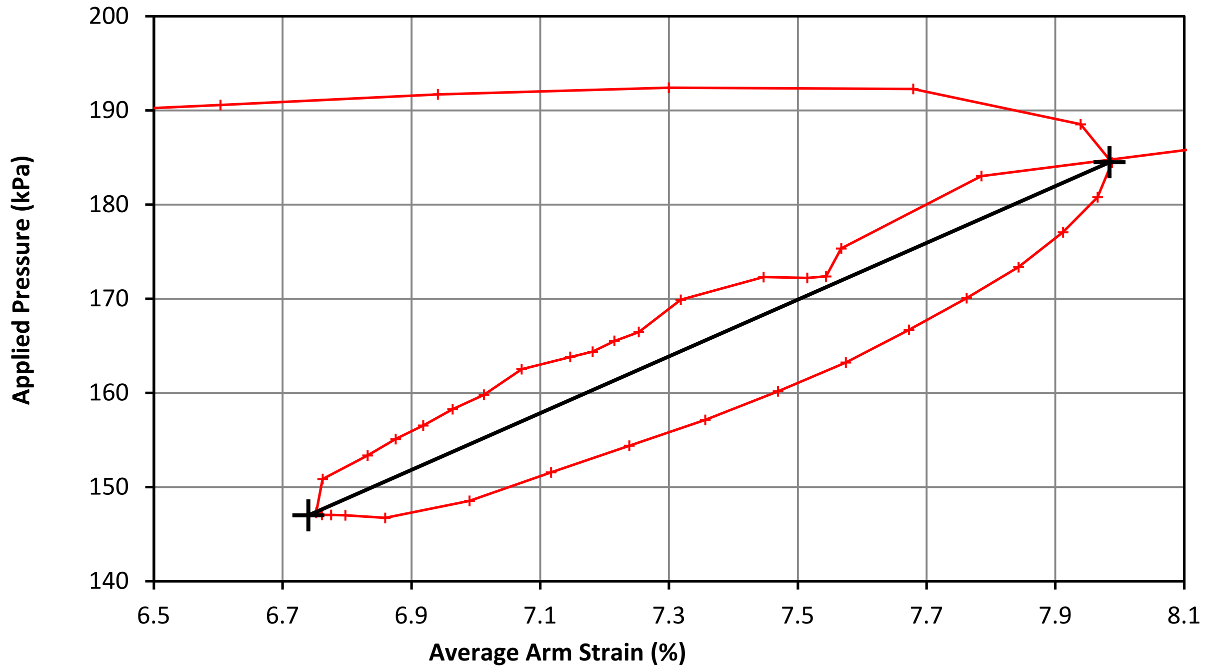
Pressuremeter Test Unload Reload Loop

IN SITU
SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	3
Borehole	ONSP01	**Test Depth (m)**	7.10



Loop 3	Shear Modulus	1.9	MPa
	Cavity Strain Range	0.797	%



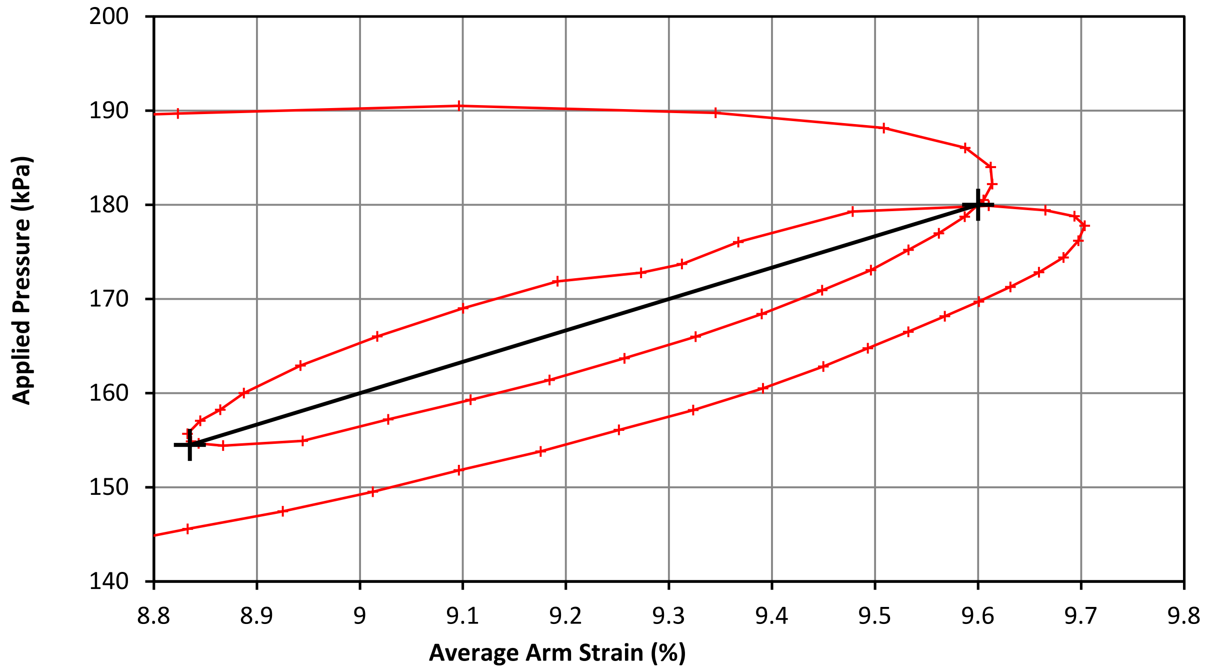
Loop 4	Shear Modulus	1.6	MPa
	Cavity Strain Range	1.244	%

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T03 - 05**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	20/09/2017	Test No.	3
Borehole	ONSP01	Test Depth (m)	7.10



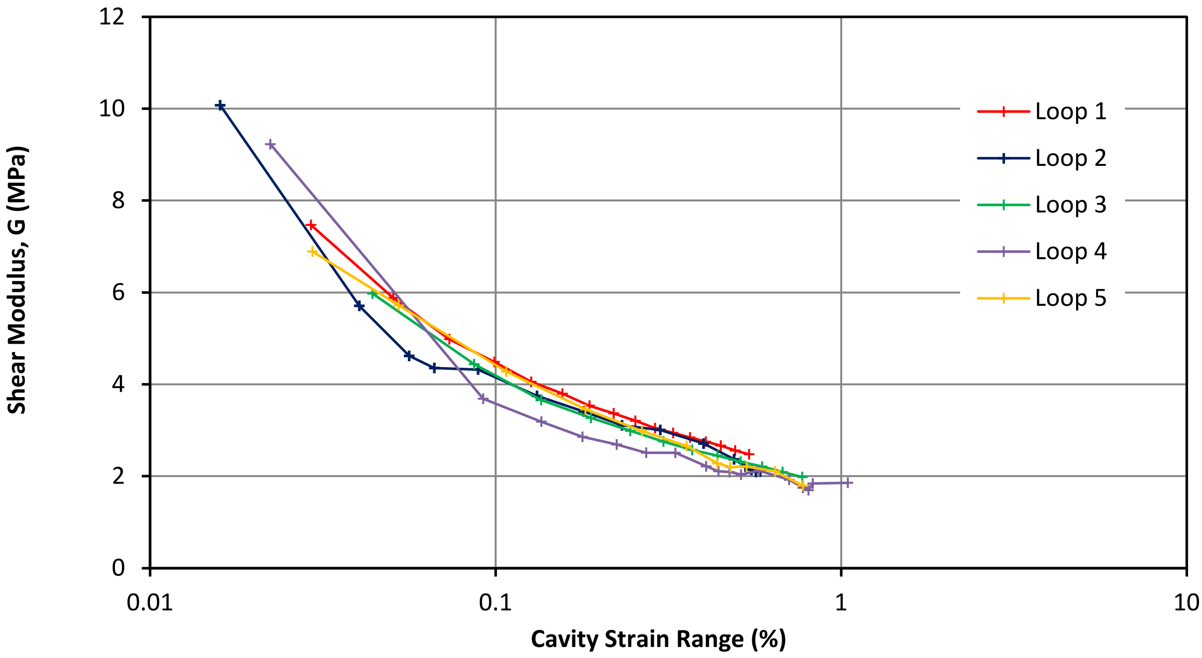
Loop 5	Shear Modulus	1.8	MPa
	Cavity Strain Range	0.765	%

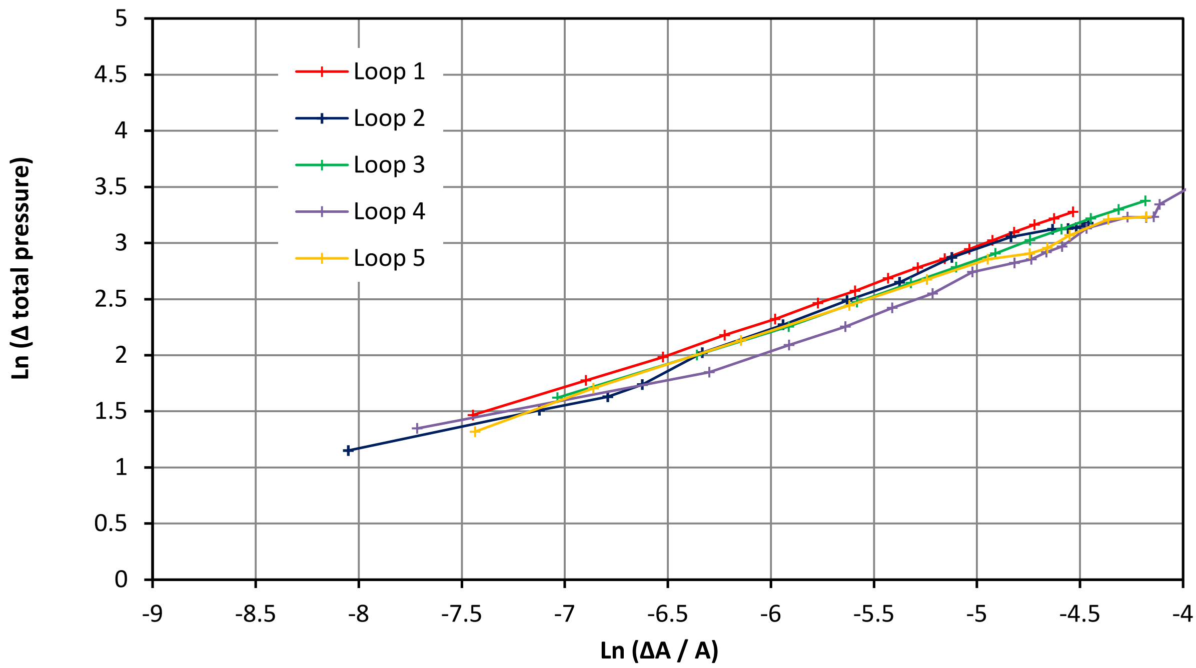
Project	NGI - Onsøy Site	Figure No.	ONSP01 T03 - 06
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis
Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU
SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	3
Borehole	ONSP01	**Test Depth (m)**	7.10





Loop 1		**Loop 2**		**Loop 3**		**Loop 4**		**Loop 5**	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.633	0.460 (MPa)	0.617	0.383 (MPa)	0.626	0.399 (MPa)	0.599	0.310 (MPa)	0.591	0.314 (MPa)

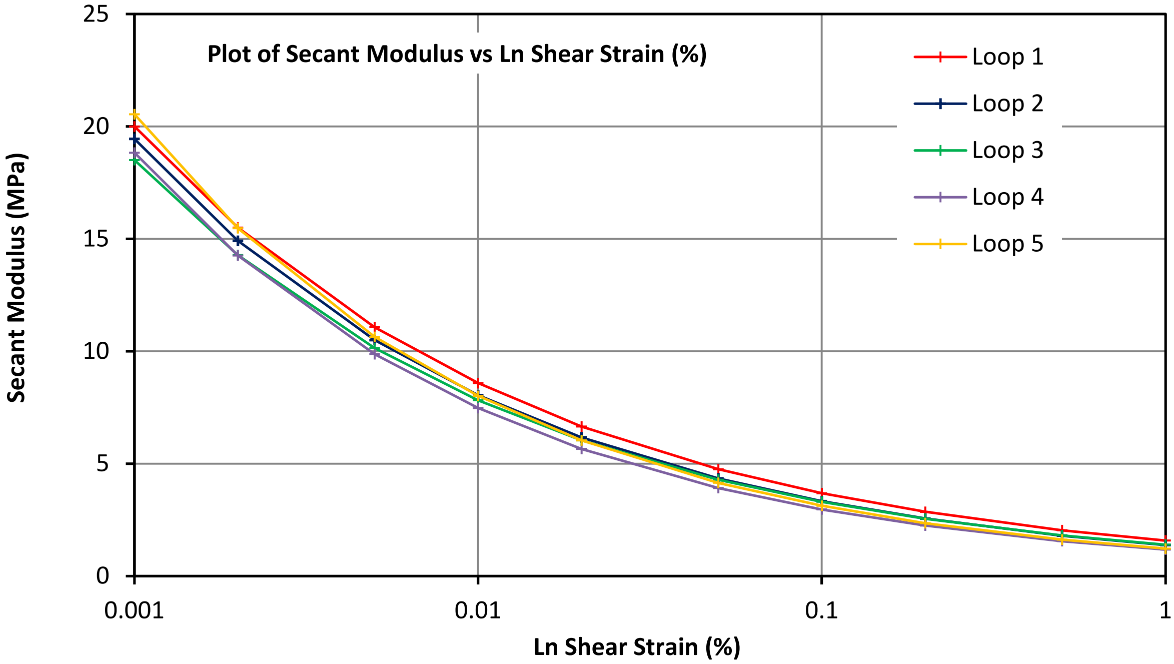
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T03 - 07**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU
SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	3
Borehole	ONSP01	**Test Depth (m)**	7.10



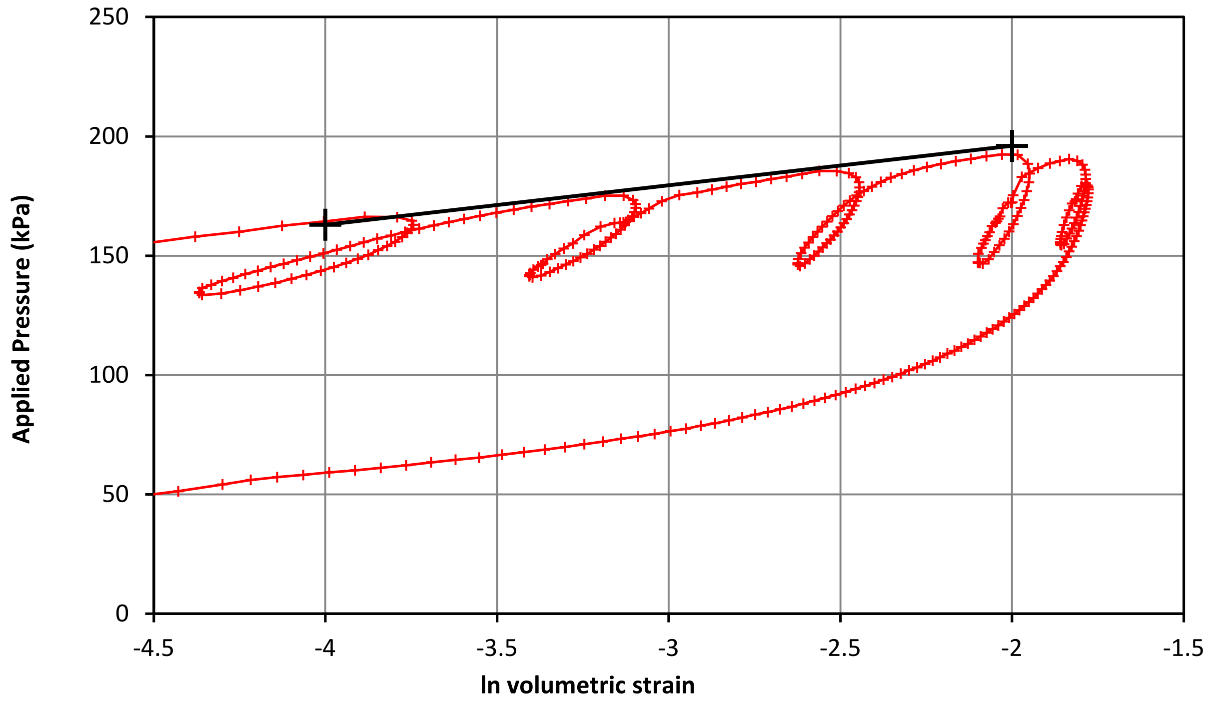
Shear Strain	Loop 1	Loop 2	Loop 3	Loop 4	Loop 5
0.001%	**20**	**19**	**19**	**19**	**21**
0.002%	16	15	14	14	15
0.005%	11	10	10	10	11
0.010%	**9**	**8**	**8**	**7**	**8**
0.020%	7	6	6	6	6
0.050%	5	4	4	4	4
0.100%	**4**	**3**	**3**	**3**	**3**
0.200%	3	3	3	2	2
0.500%	2	2	2	2	2
1.000%	**2**	**1**	**1**	**1**	**1**

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T03 - 08**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

IN SITU
SITE INVESTIGATION

Test Date	20/09/2017	**Test No.**	3
Borehole	ONSP01	**Test Depth (m)**	7.10



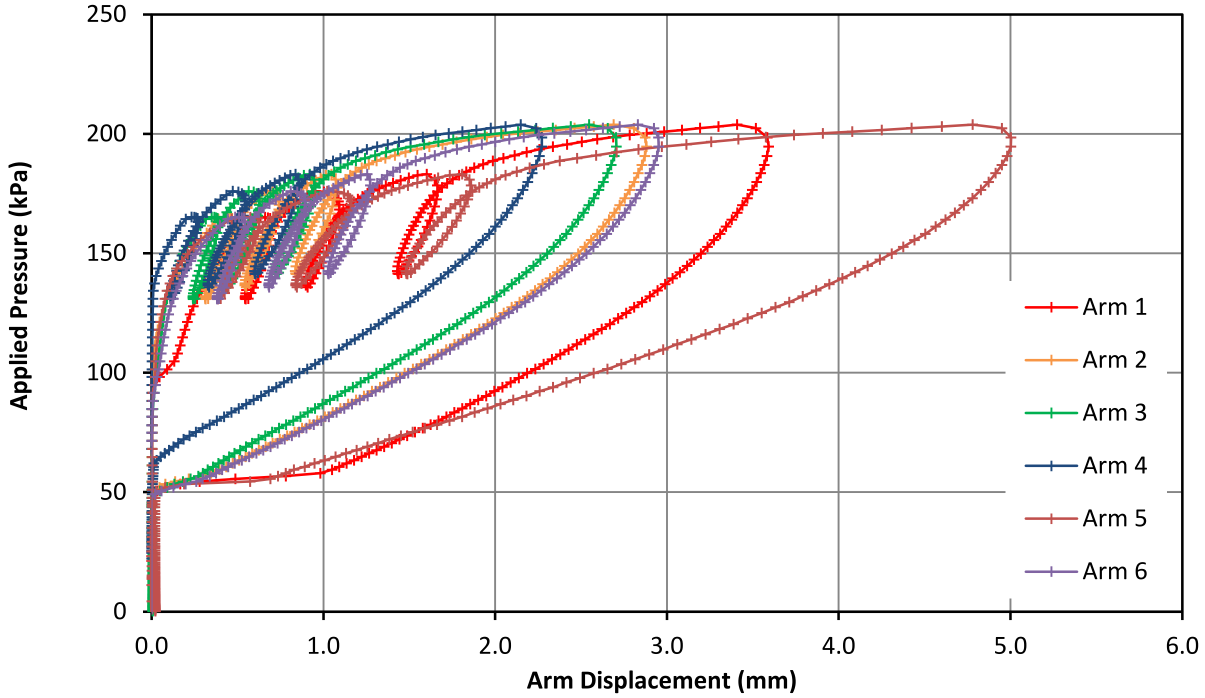
Strength	Undrained Shear	17	kPa
	Limit Pressure	229	kPa

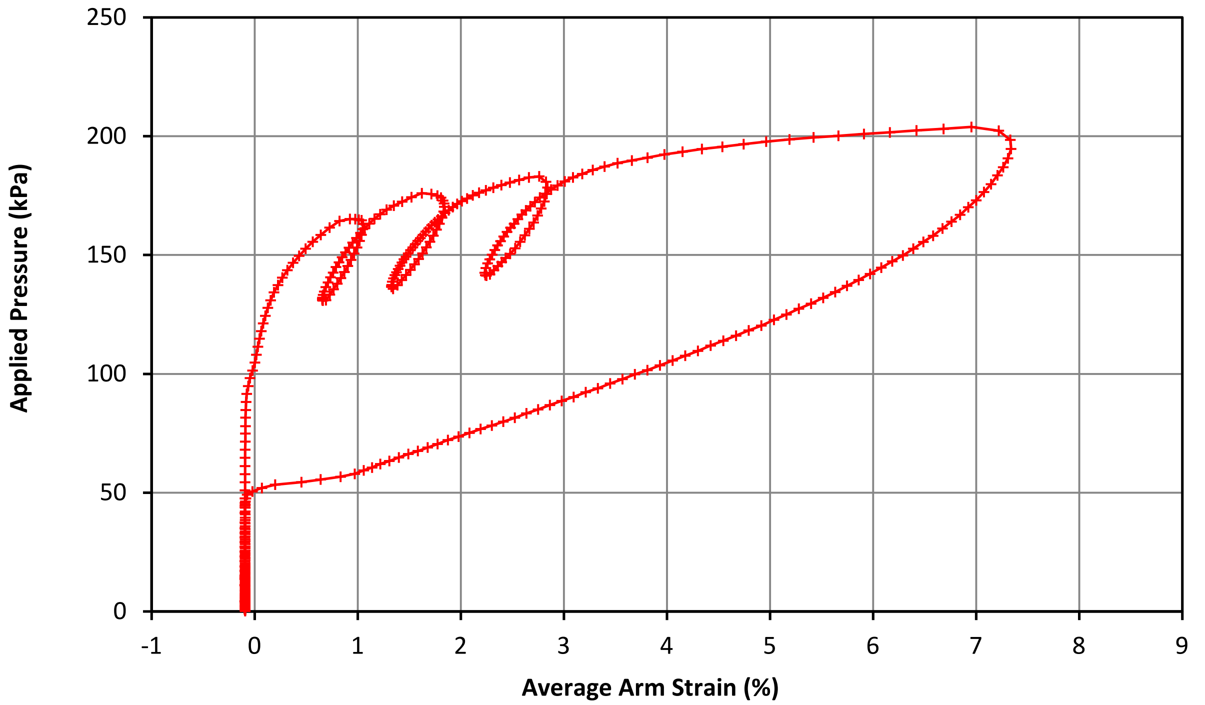
Project	NGI - Onsøy Site	**Figure No.**	ONSP01 T03 - 09
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	4
Borehole	ONSP01	**Test Depth (m)**	8.00





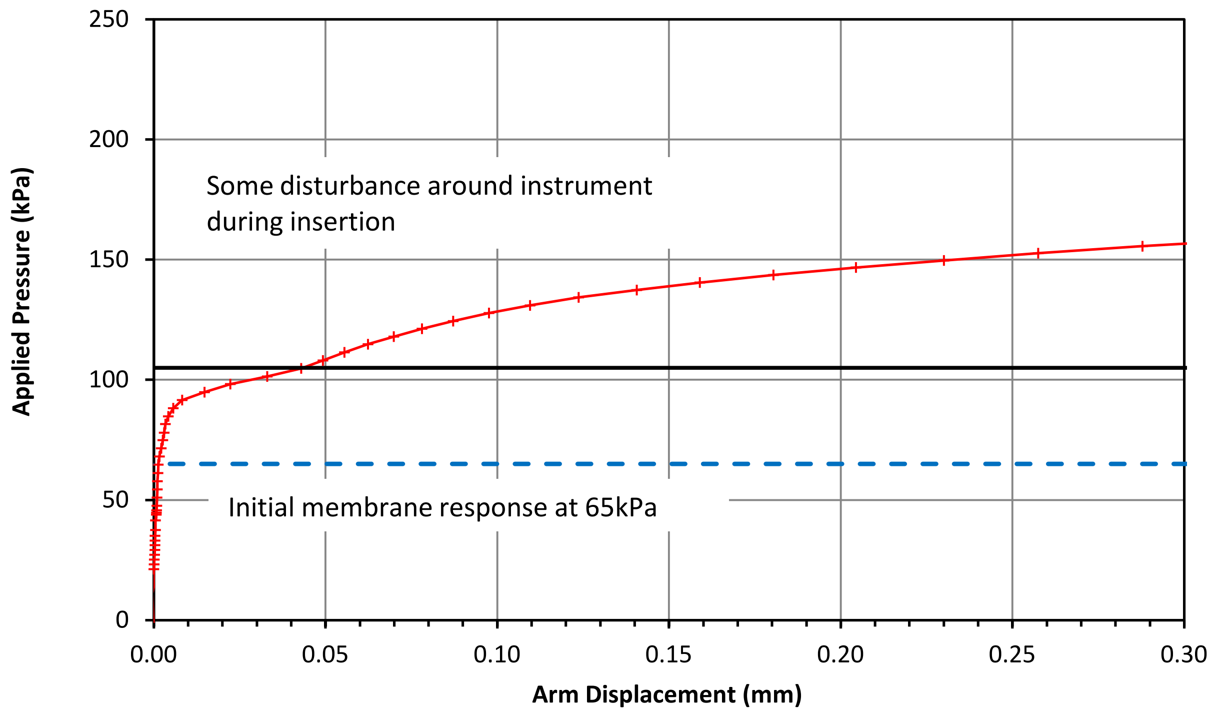
Comments

Project	NGI - Onsøy Site	**Figure No.**	ONSP01 T04 - 01
Client	NGI		
Project No.	P1170112		

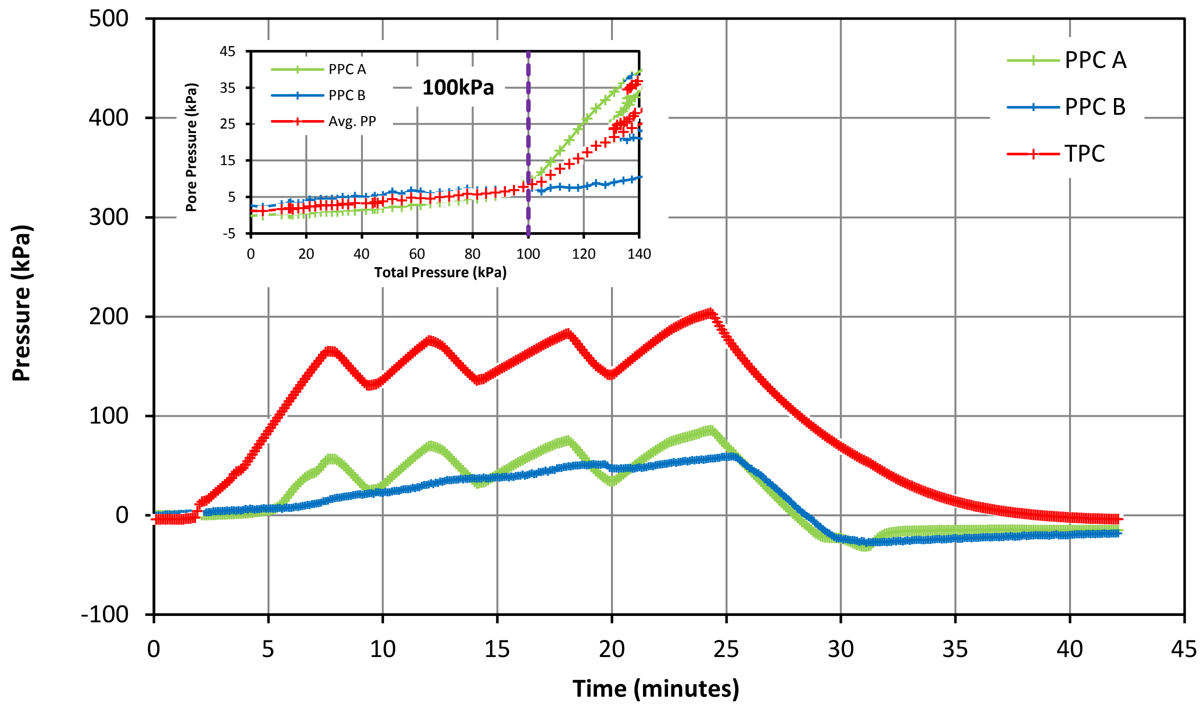
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	Test No.	4
Borehole	ONSP01	Test Depth (m)	8.00



Lift Off Stress (Po)	105 kPa

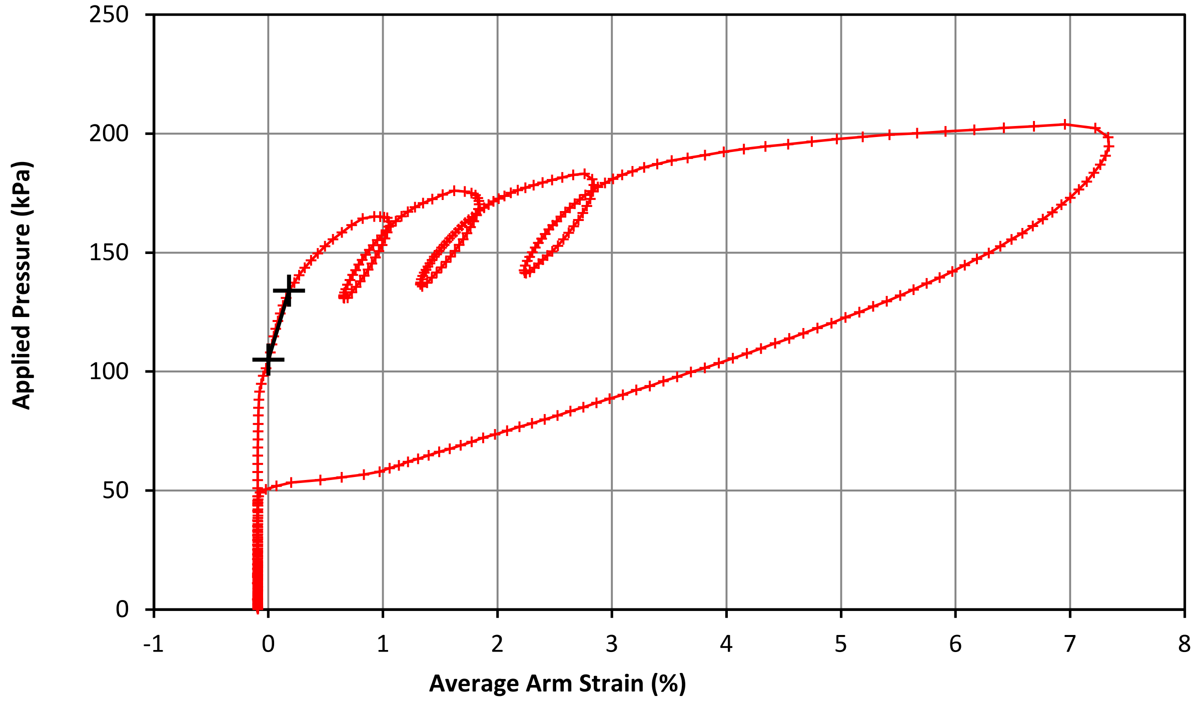


Project	NGI - Onsøy Site	Figure No.	ONSP01 T04 - 02
Client	NGI		
Project No.	P1170112		

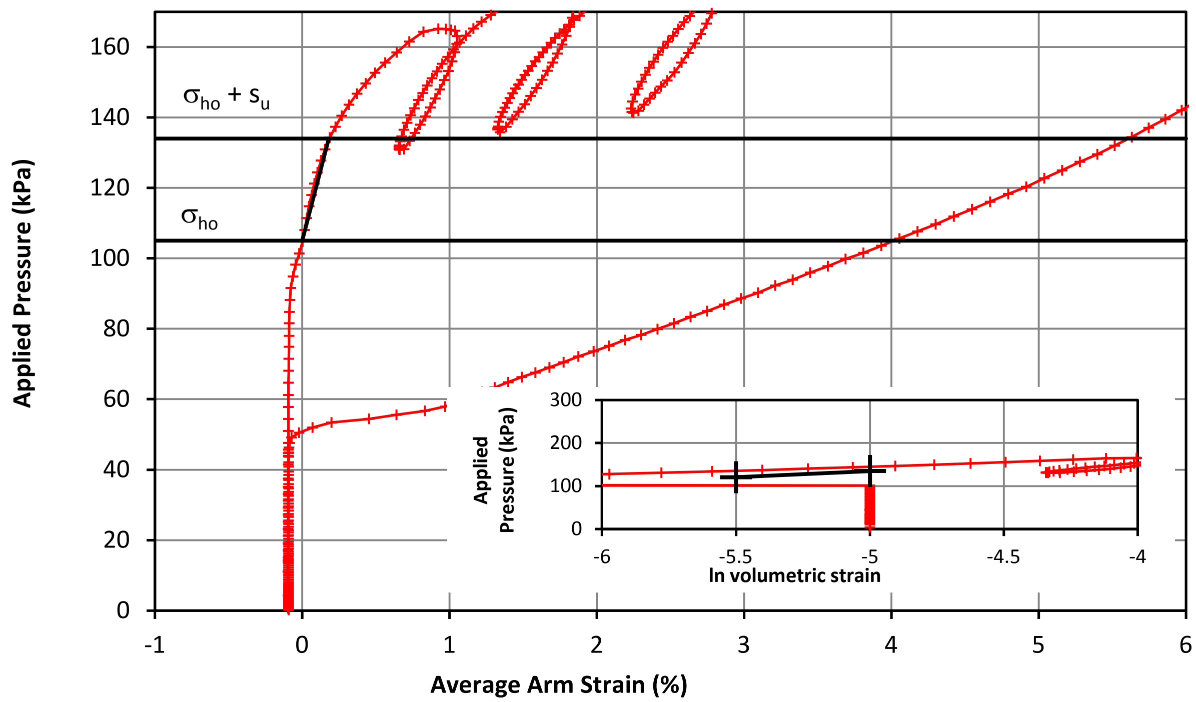
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	4
Borehole	ONSP01	**Test Depth (m)**	8.00



Initial Modulus	Shear Modulus	8.1 MPa



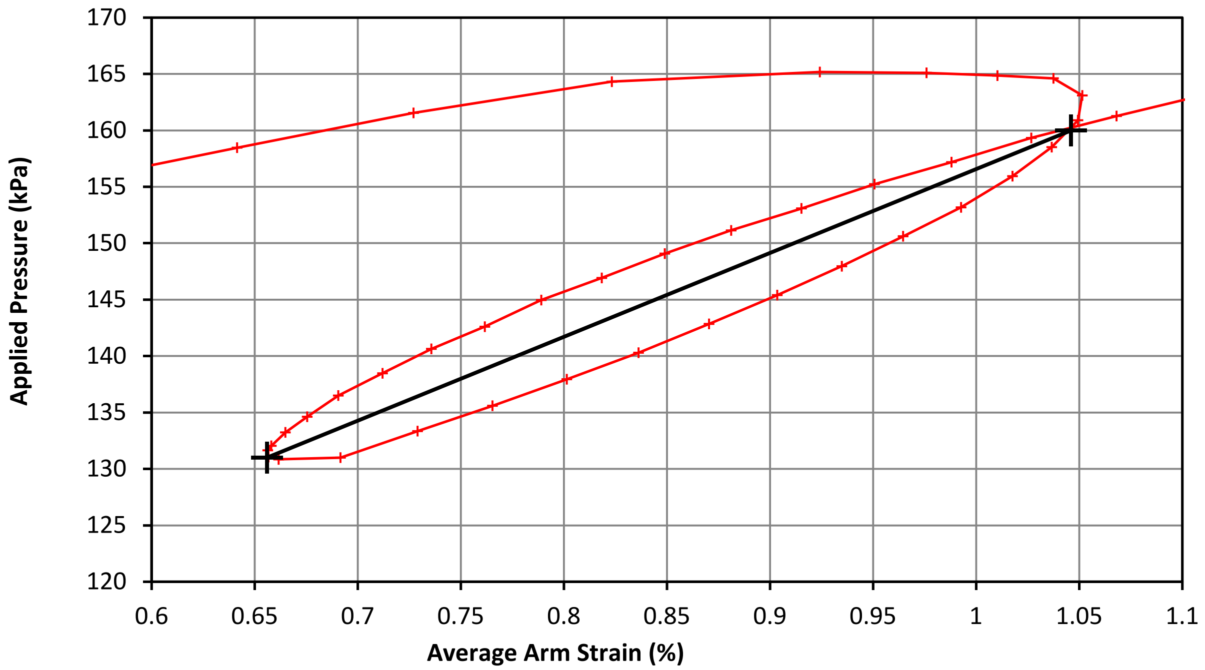
Marsland & Randolph	In situ horizontal stress	105 kPa
	Undrained Strength	29 kPa

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T04 - 03**
Client	NGI		
Project No.	P1170112		

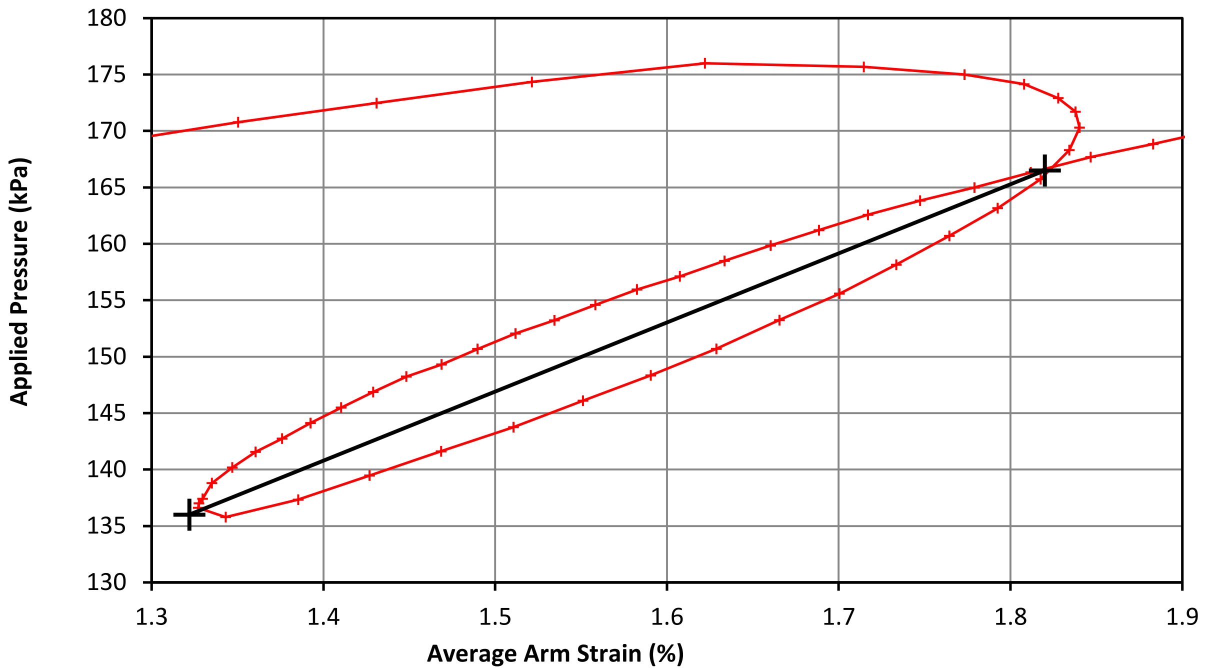
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	Test No.	4
Borehole	ONSP01	Test Depth (m)	8.00



Loop 1	Shear Modulus	3.8 MPa
	Cavity Strain Range	0.390 %



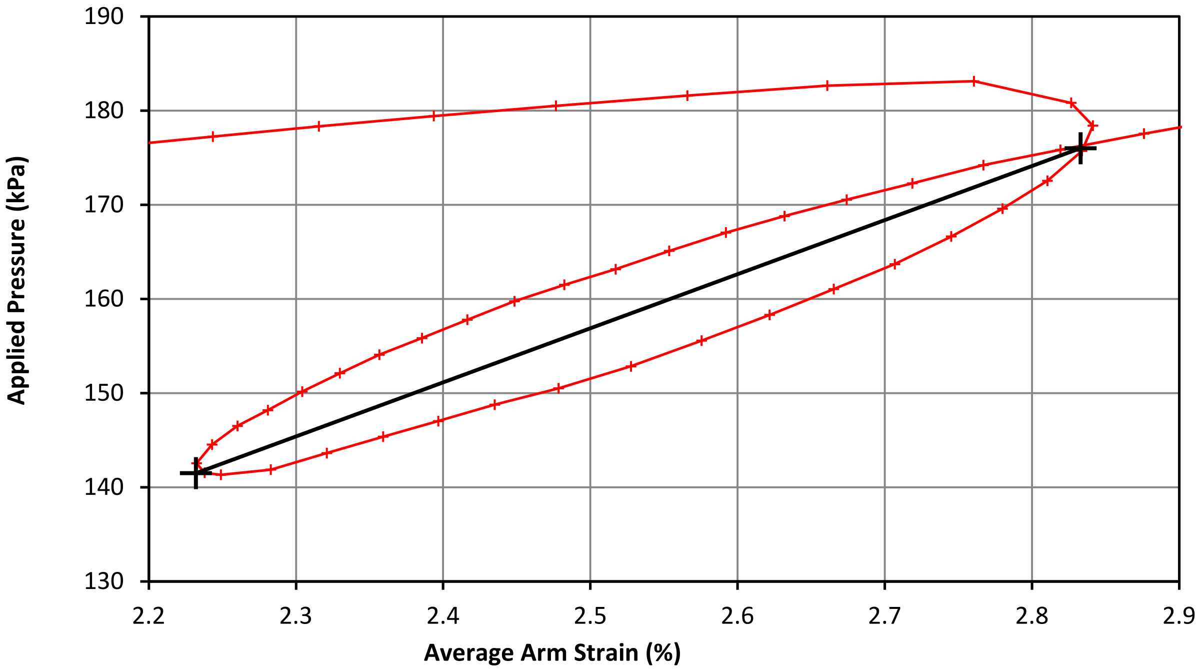
Loop 2	Shear Modulus	3.1 MPa
	Cavity Strain Range	0.498 %

Project	NGI - Onsøy Site	Figure No.	ONSP01 T04 - 04
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	4
Borehole	ONSP01	**Test Depth (m)**	8.00



Loop 3	Shear Modulus	3.0	MPa
	Cavity Strain Range	0.601	%

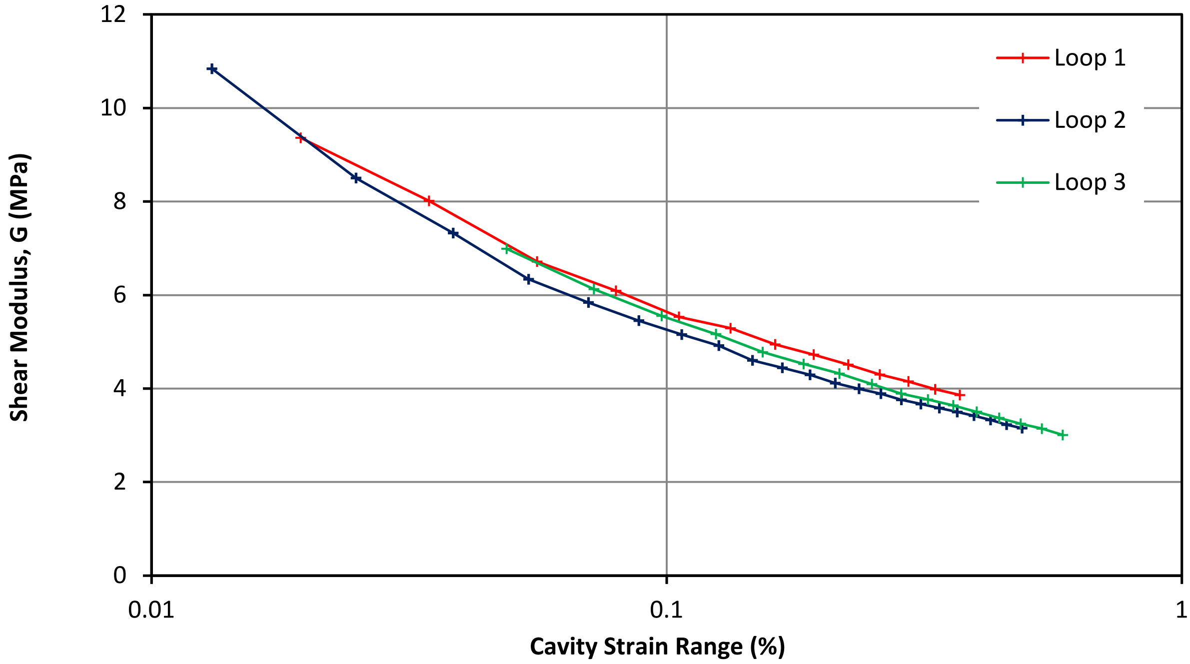
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T04 - 05**
Client	NGI		
Project No.	P1170112		

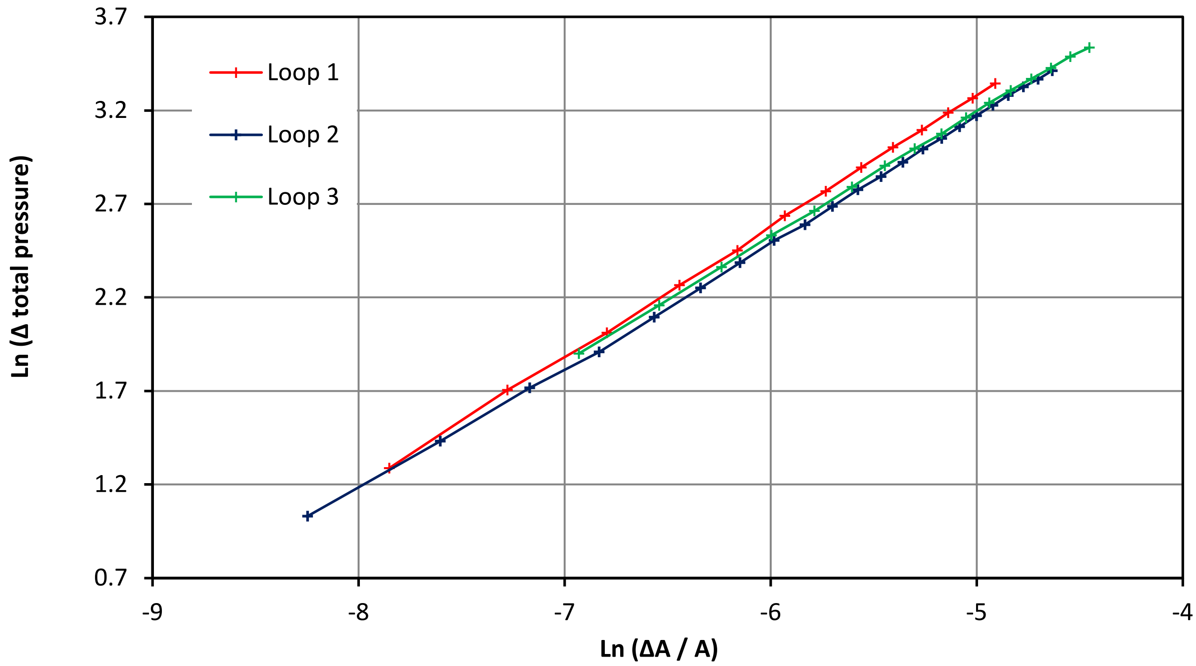
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	4
Borehole	ONSP01	**Test Depth (m)**	8.00





Loop 1		Loop 2		Loop 3	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.700	0.880 (MPa)	0.668	0.669 (MPa)	0.666	0.679 (MPa)

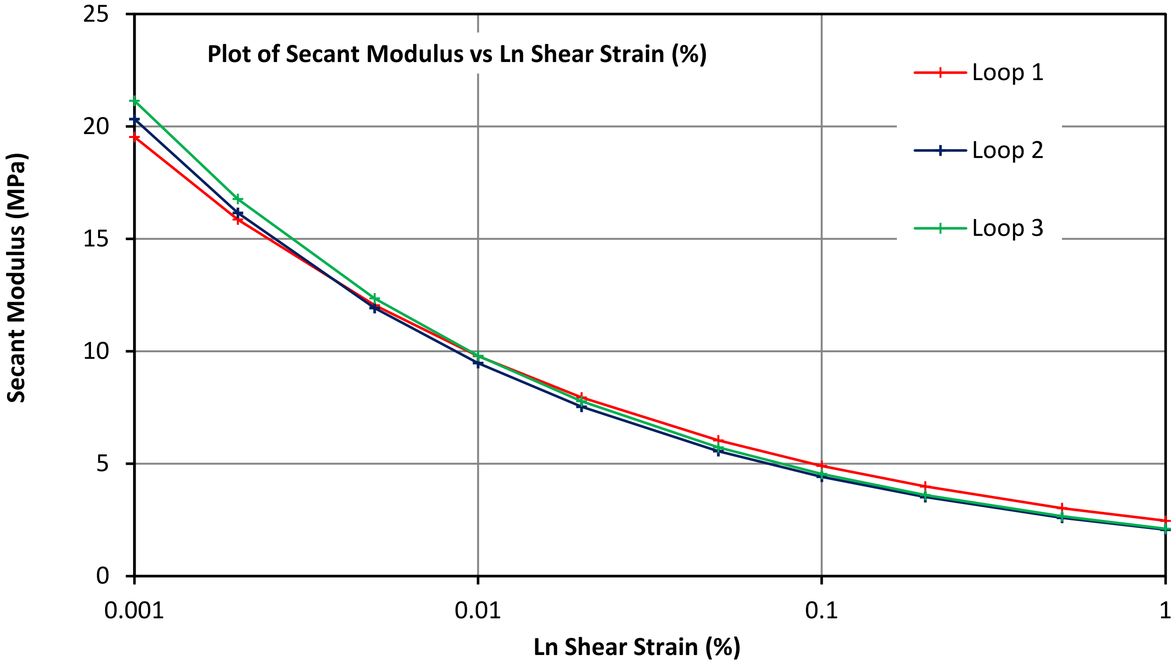
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T04 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	4
Borehole	ONSP01	**Test Depth (m)**	8.00

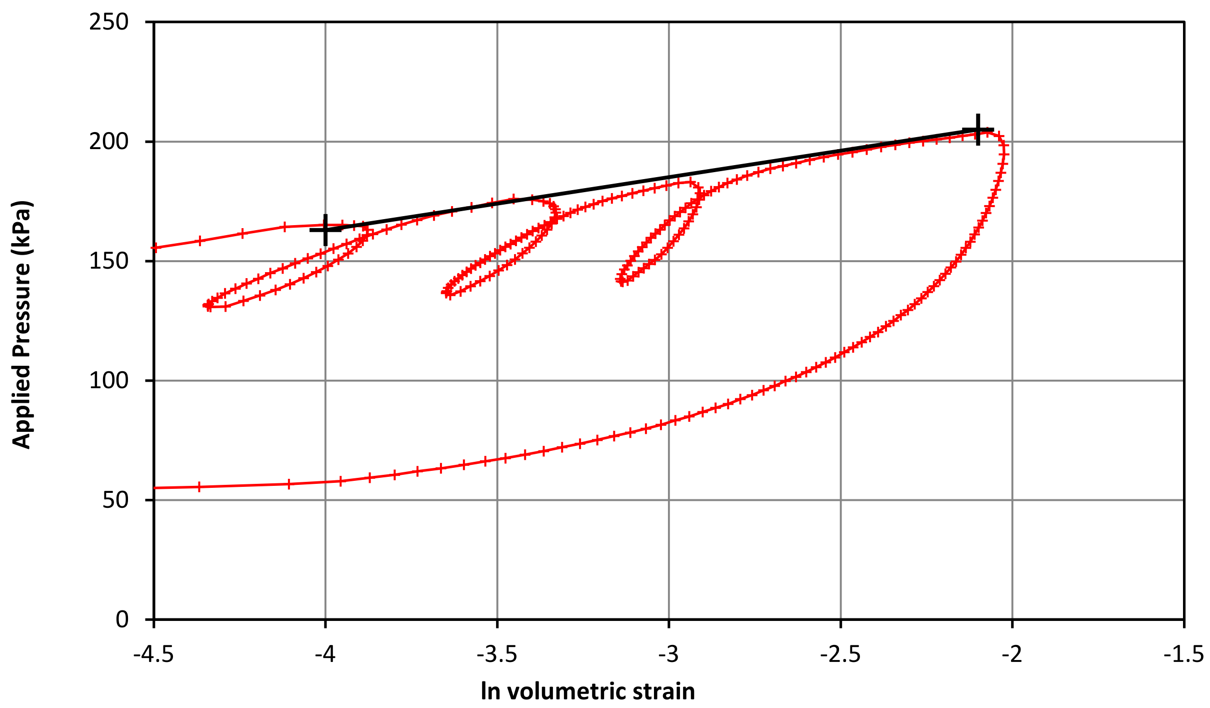


Shear Strain	Loop 1	Loop 2	Loop 3
0.001%	**20**	**20**	**21**
0.002%	16	16	17
0.005%	12	12	12
0.010%	**10**	**9**	**10**
0.020%	8	8	8
0.050%	6	6	6
0.100%	**5**	**4**	**5**
0.200%	4	4	4
0.500%	3	3	3
1.000%	**2**	**2**	**2**

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T04 - 07**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

Test Date	21/09/2017	**Test No.**	4
Borehole	ONSP01	**Test Depth (m)**	8.00



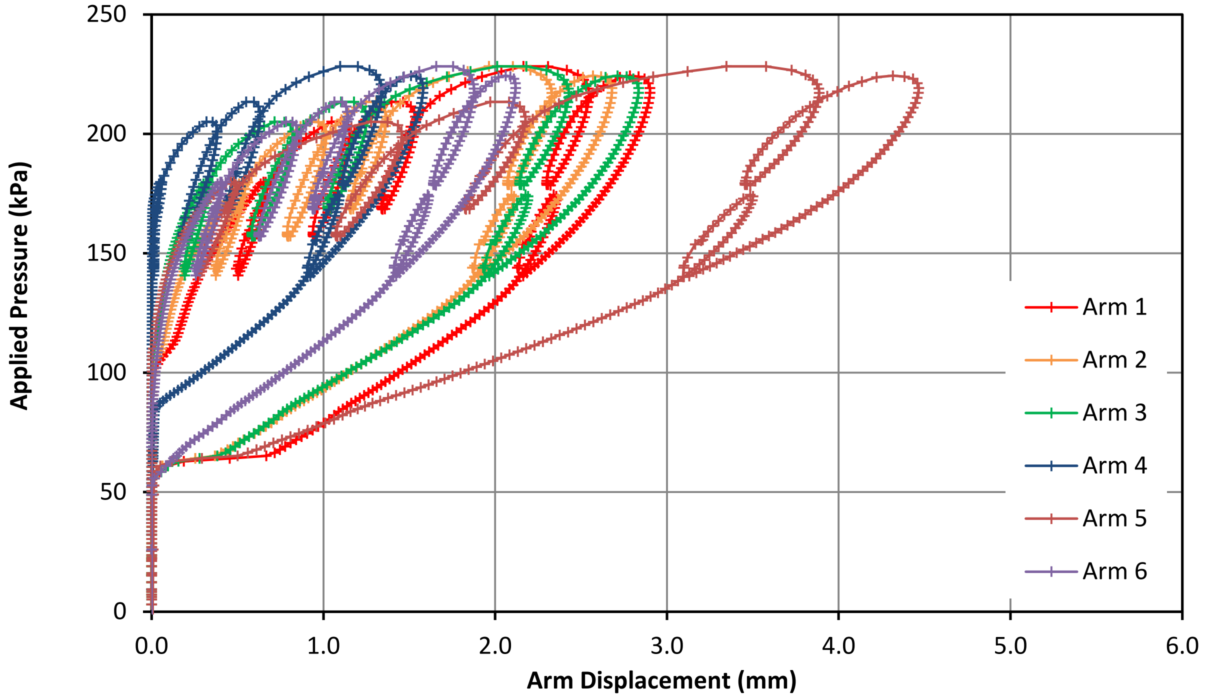
Strength	Undrained Shear	22	kPa
	Limit Pressure	251	kPa

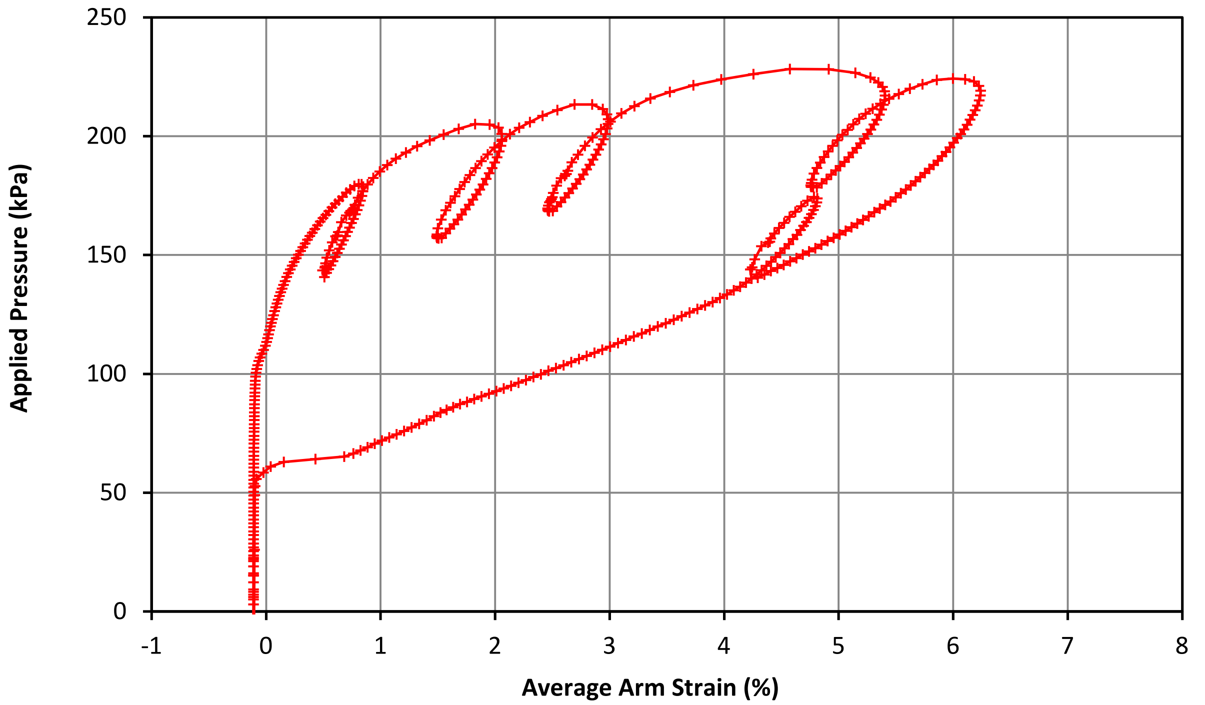
Project	NGI - Onsøy Site	**Figure No.**	ONSP01 T04 - 08
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	5
Borehole	ONSP01	**Test Depth (m)**	9.10





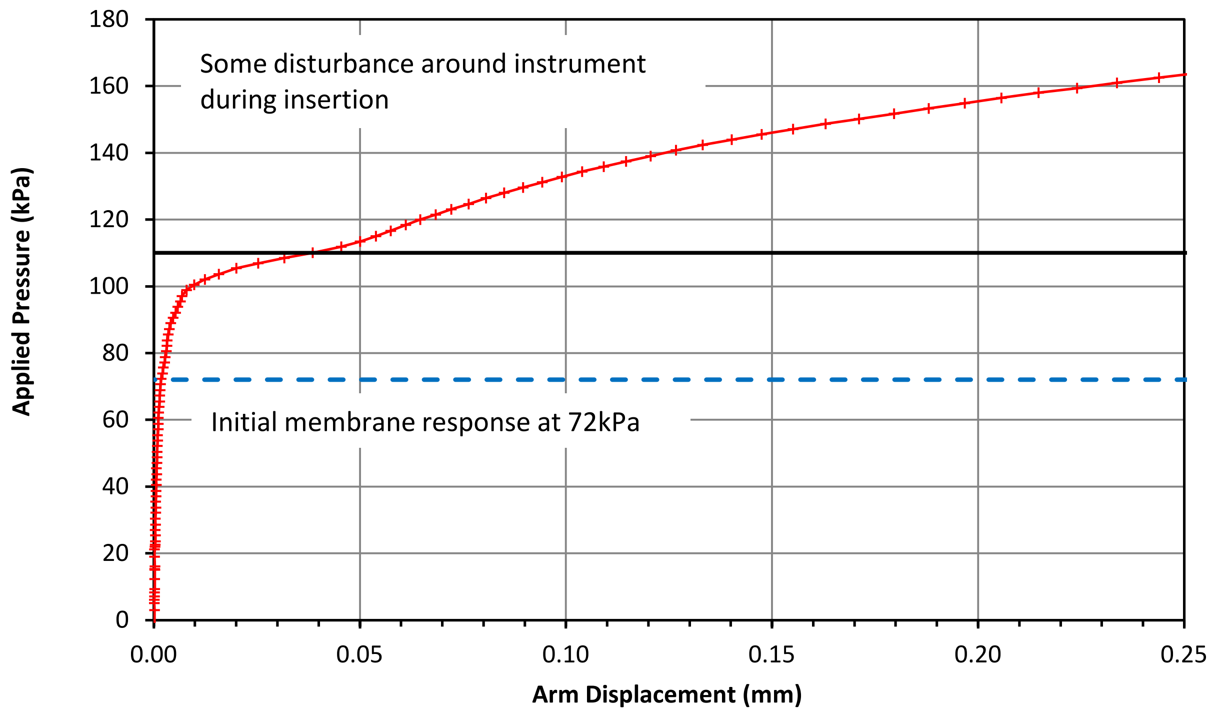
Comments

Project	NGI - Onsøy Site	**Figure No.**	ONSP01 T05 - 01
Client	NGI		
Project No.	P1170112		

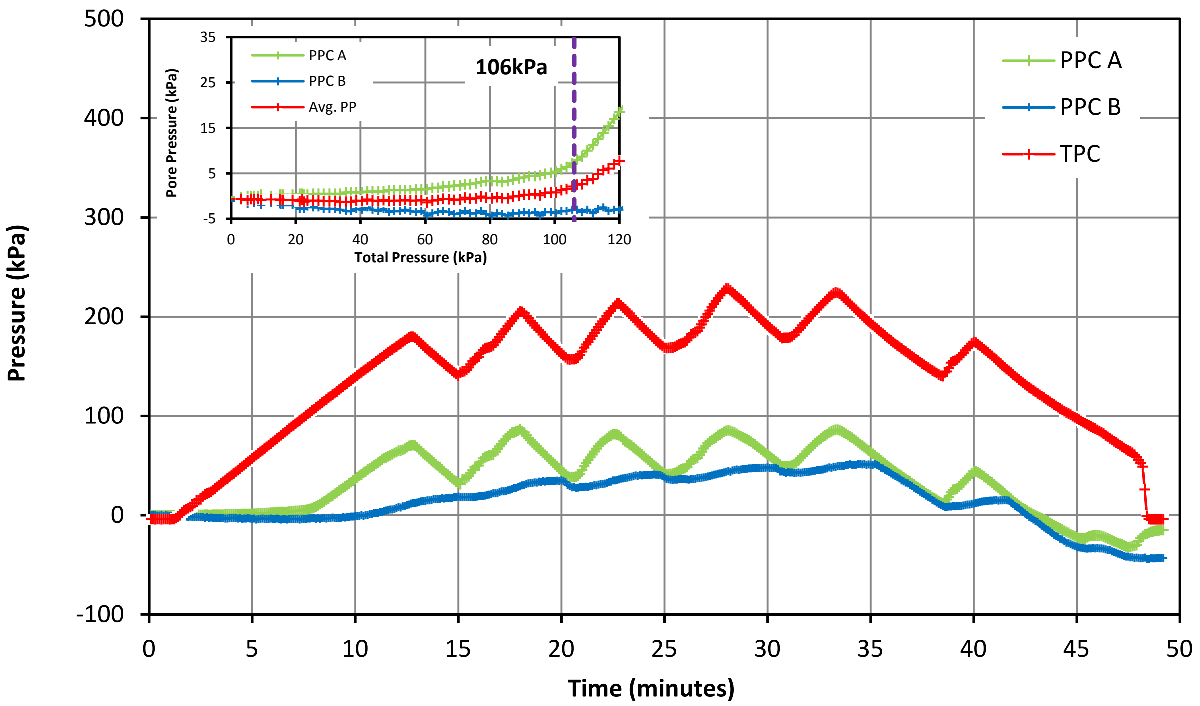
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	5
Borehole	ONSP01	**Test Depth (m)**	9.10



Lift Off Stress (Po)	110 kPa

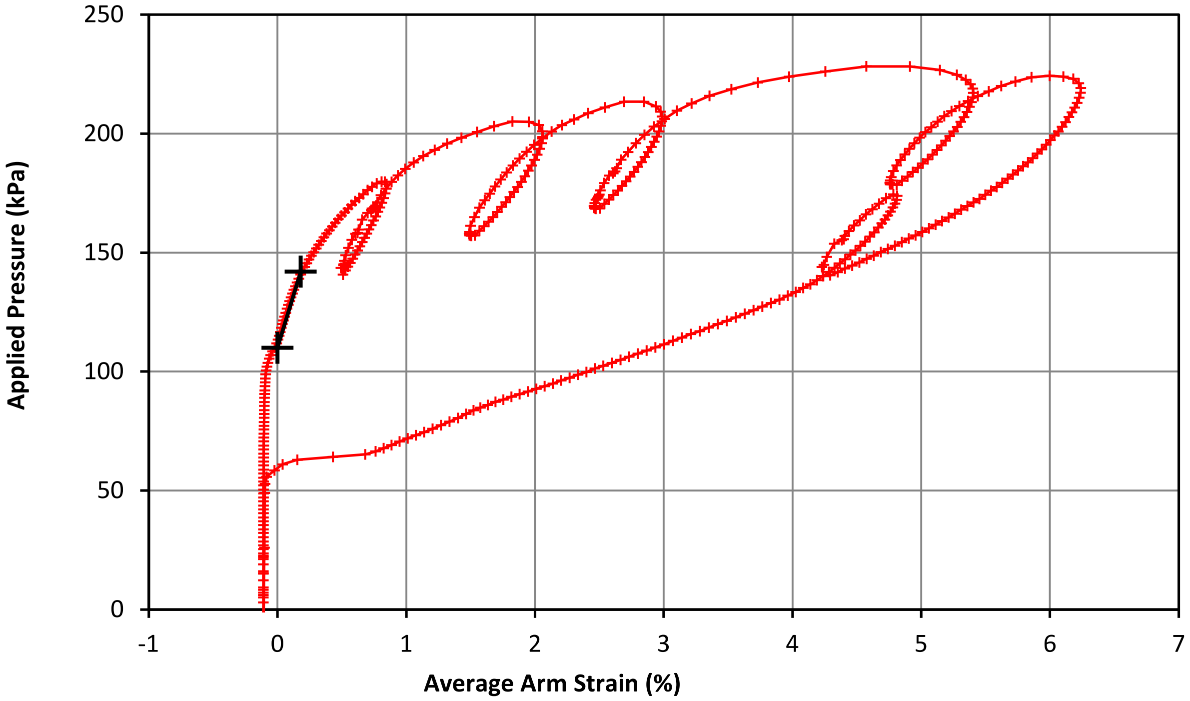


Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T05 - 02**
Client	NGI		
Project No.	P1170112		

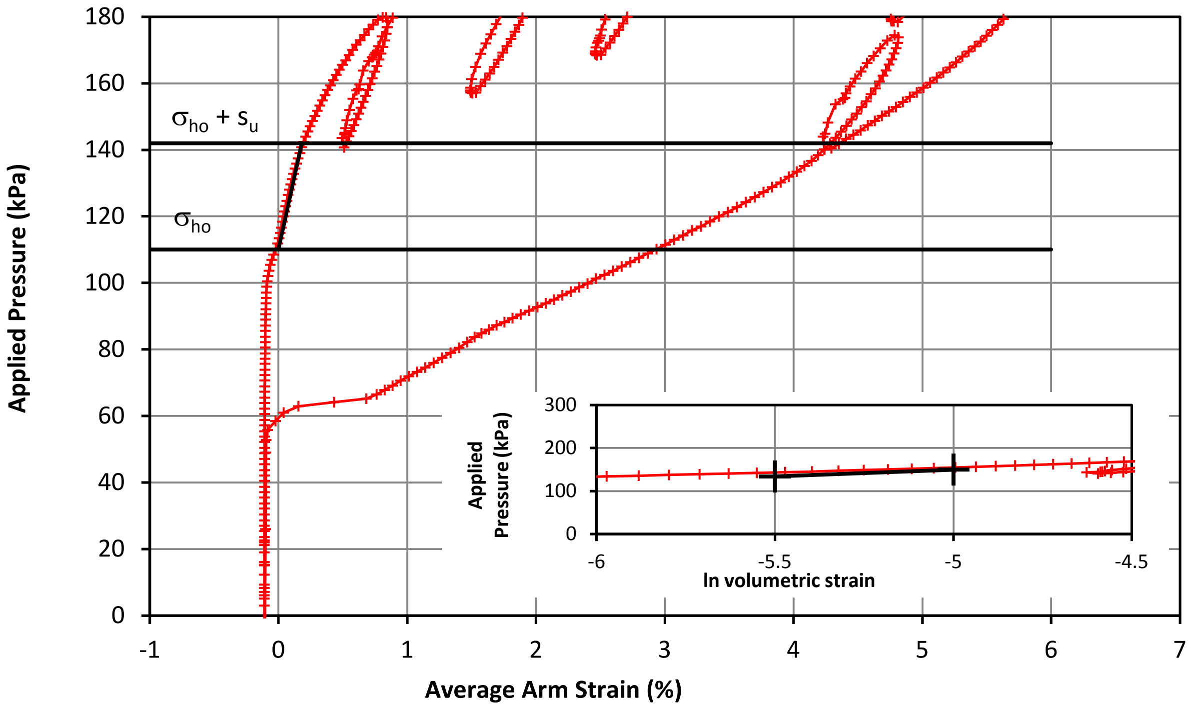
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU
SITE INVESTIGATION

Test Date	21/09/2017	Test No.	5
Borehole	ONSP01	Test Depth (m)	9.10



Initial Modulus	Shear Modulus	8.9 MPa



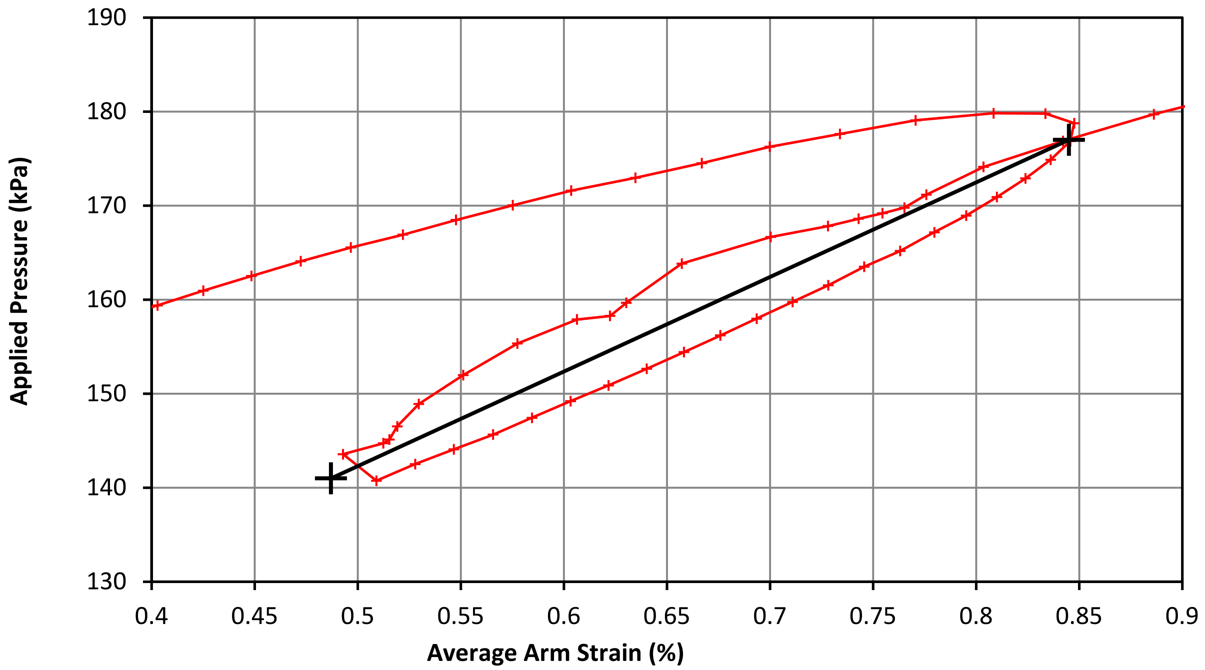
Marsland & Randolph	In situ horizontal stress	110 kPa
	Undrained Strength	32 kPa

Project	NGI - Onsøy Site	Figure No.	ONSP01 T05 - 03
Client	NGI		
Project No.	P1170112		

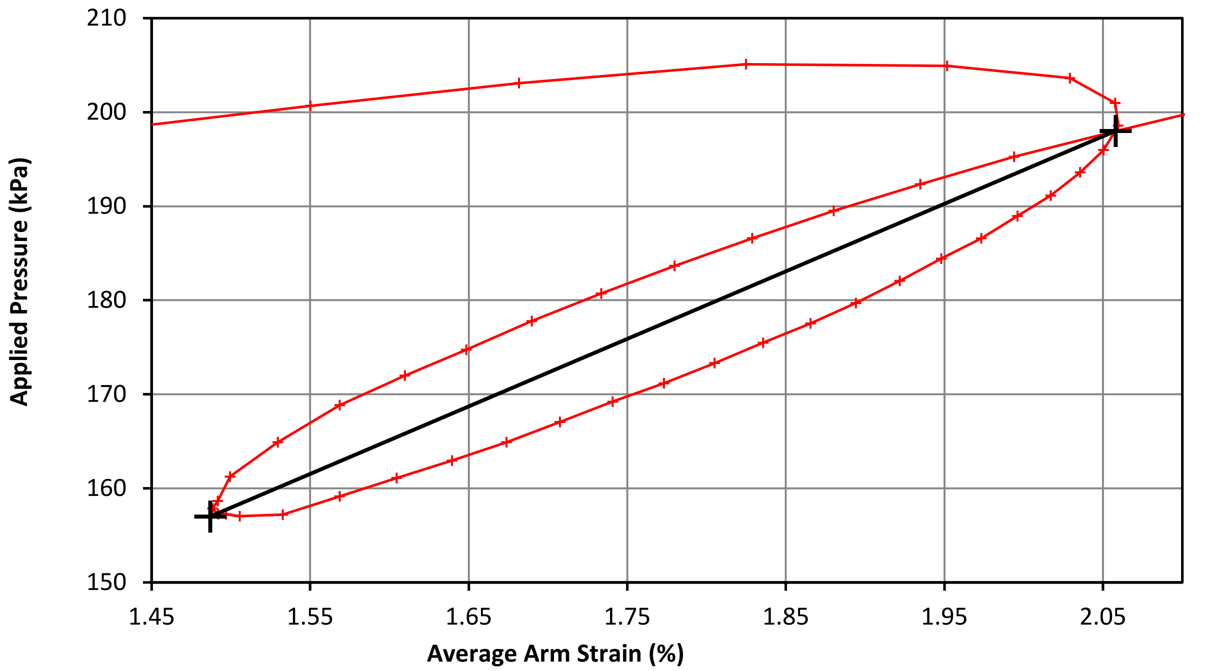
Pressuremeter Test Unload Reload Loop

IN SITU
SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	5
Borehole	ONSP01	**Test Depth (m)**	9.10



Loop 1	Shear Modulus	5.1 MPa
	Cavity Strain Range	0.358 %



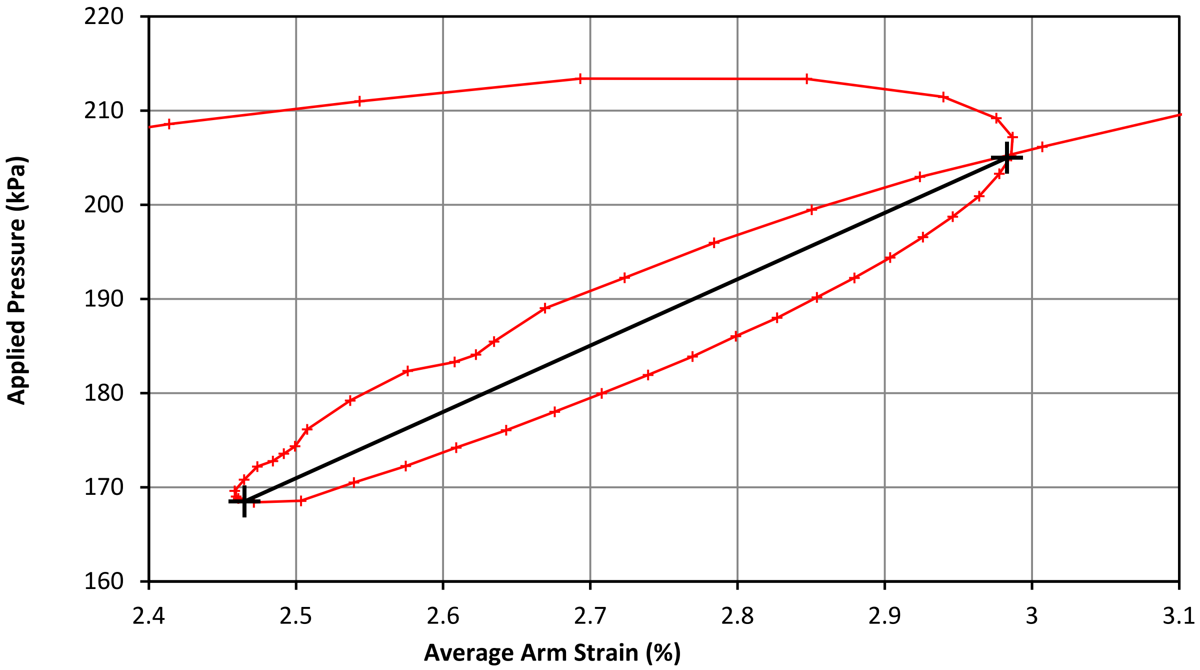
Loop 2	Shear Modulus	3.7 MPa
	Cavity Strain Range	0.571 %

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T05 - 04**
Client	NGI		
Project No.	P1170112		

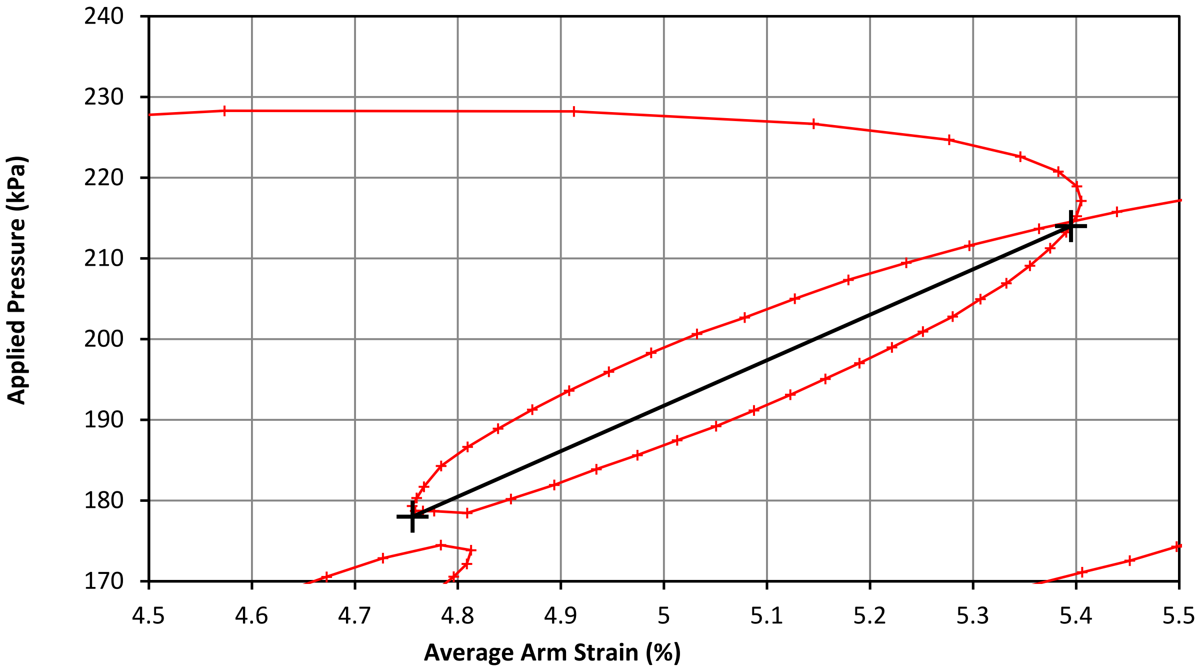
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	5
Borehole	ONSP01	**Test Depth (m)**	9.10



Loop 3	Shear Modulus	3.6 MPa
	Cavity Strain Range	0.518 %



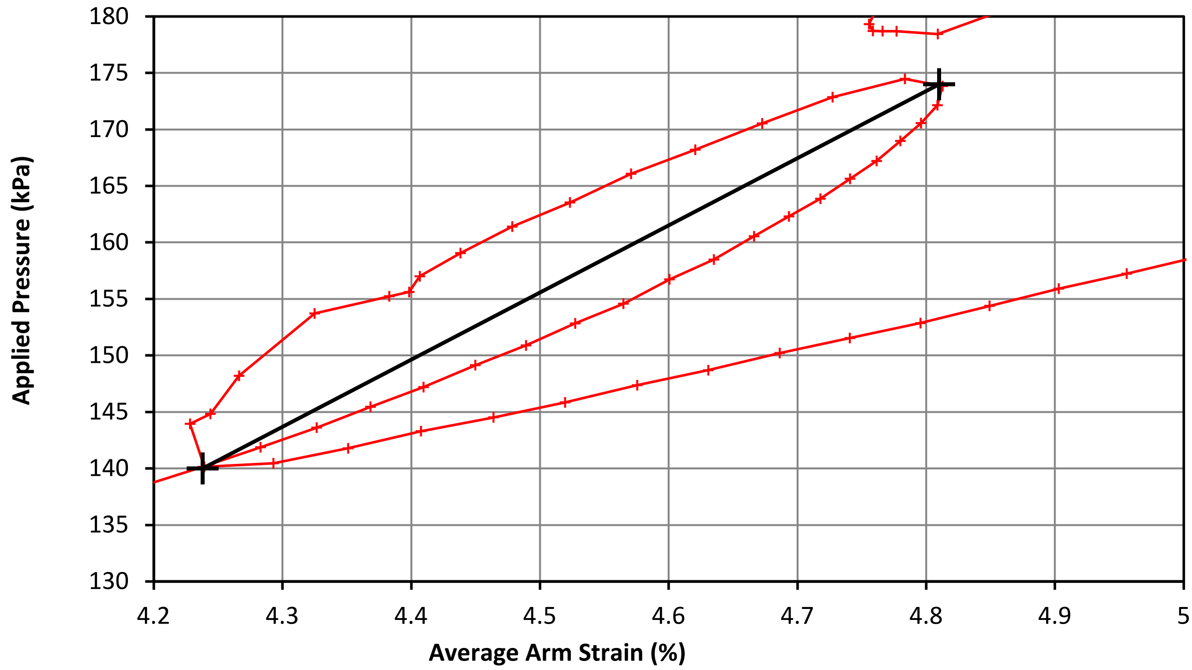
Loop 4	Shear Modulus	3.0 MPa
	Cavity Strain Range	0.639 %

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T05 - 05**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	5
Borehole	ONSP01	**Test Depth (m)**	9.10



Loop 5	Shear Modulus	3.1 MPa
	Cavity Strain Range	0.572 %

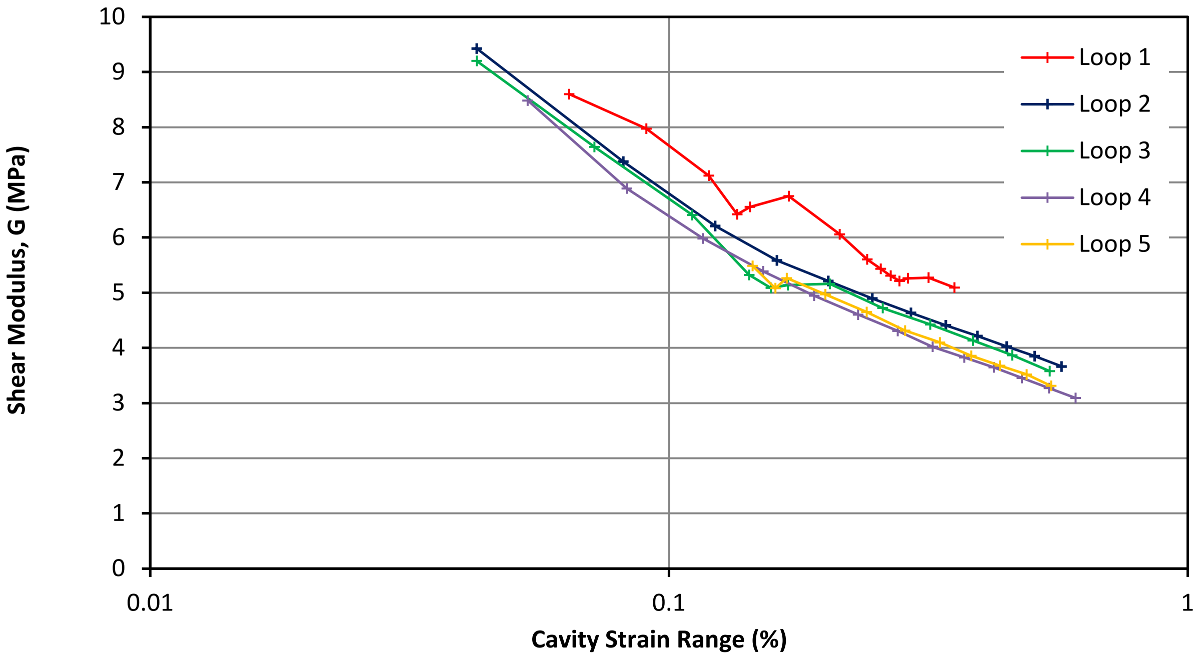
Project	NGI - Onsøy Site	**Figure No.**	ONSP01 T05 - 06
Client	NGI		
Project No.	P1170112		

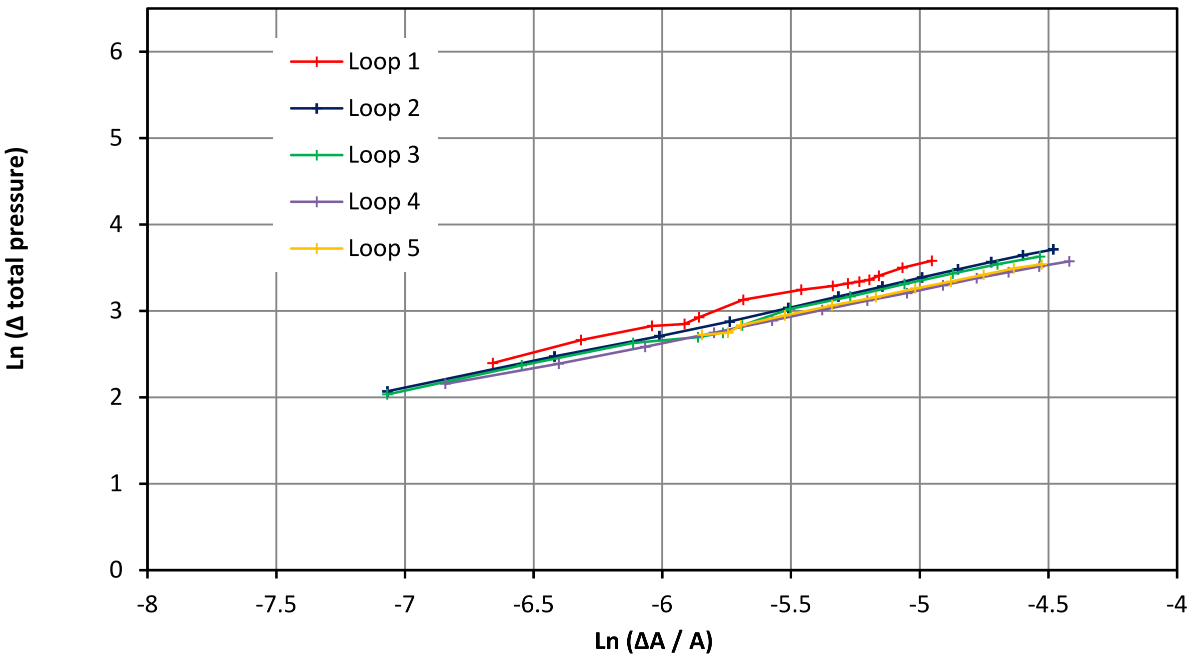
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU
SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	5
Borehole	ONSP01	**Test Depth (m)**	9.10





Loop 1		Loop 2		Loop 3		Loop 4		Loop 5	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.675	0.992 (MPa)	0.643	0.729 (MPa)	0.642	0.689 (MPa)	0.597	0.504 (MPa)	0.632	0.616 (MPa)

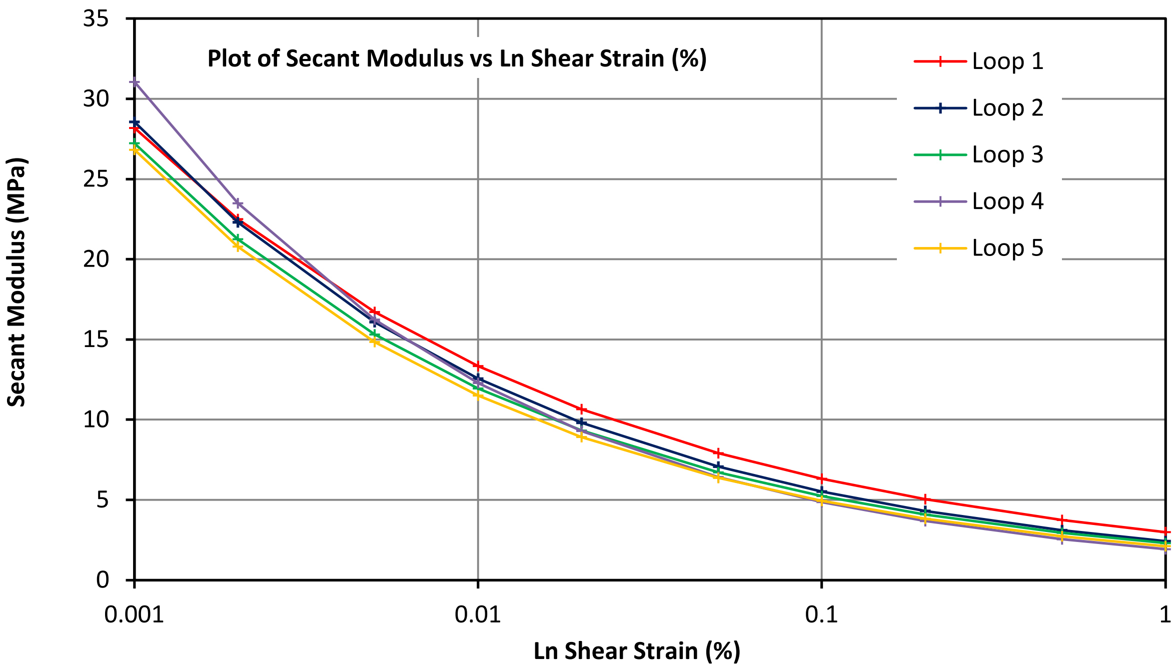
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T05 - 07**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	5
Borehole	ONSP01	**Test Depth (m)**	9.10



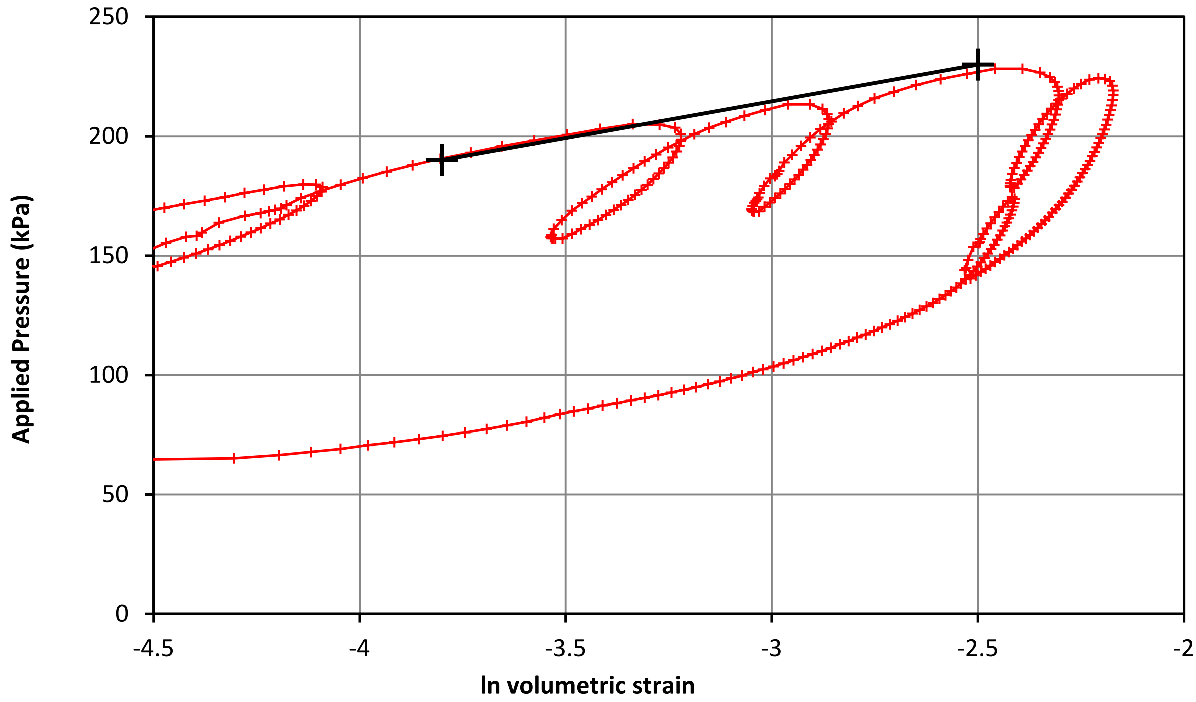
Shear Strain	Loop 1	Loop 2	Loop 3	Loop 4	Loop 5
0.001%	**28**	**29**	**27**	**31**	**27**
0.002%	23	22	21	23	21
0.005%	17	16	15	16	15
0.010%	**13**	**13**	**12**	**12**	**12**
0.020%	11	10	9	9	9
0.050%	8	7	7	6	6
0.100%	**6**	**6**	**5**	**5**	**5**
0.200%	5	4	4	4	4
0.500%	4	3	3	3	3
1.000%	**3**	**2**	**2**	**2**	**2**

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T05 - 08**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

IN SITU
SITE INVESTIGATION

Test Date	21/09/2017	Test No.	5
Borehole	ONSP01	Test Depth (m)	9.10

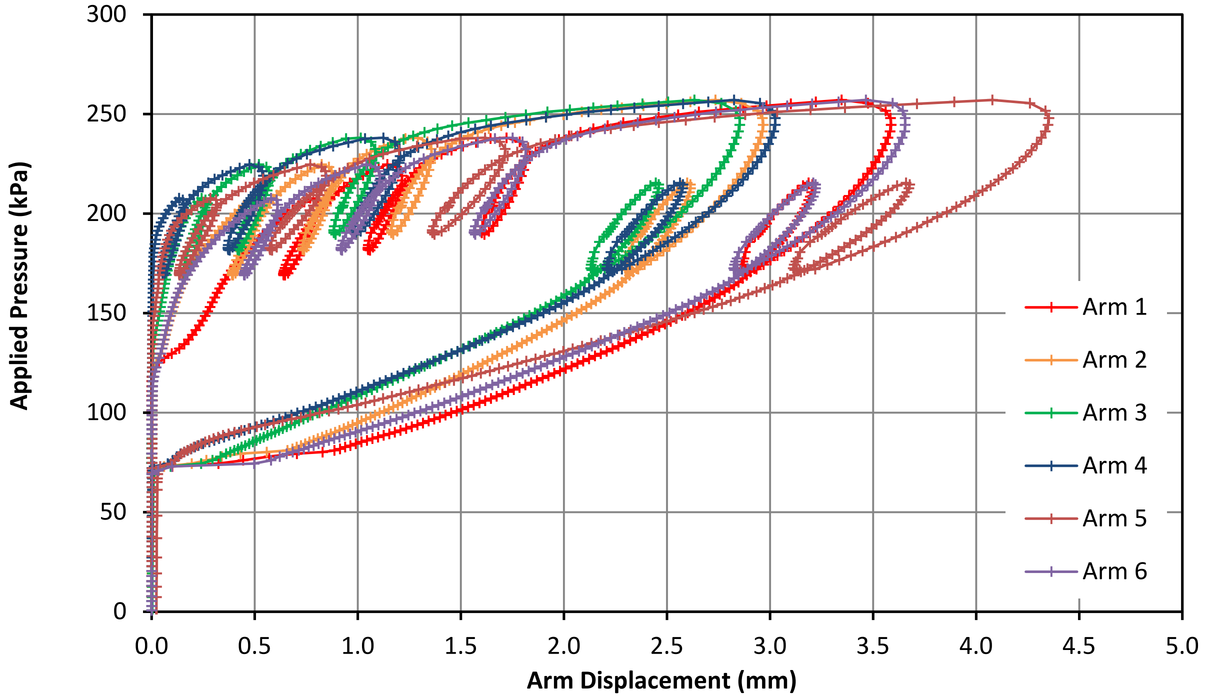


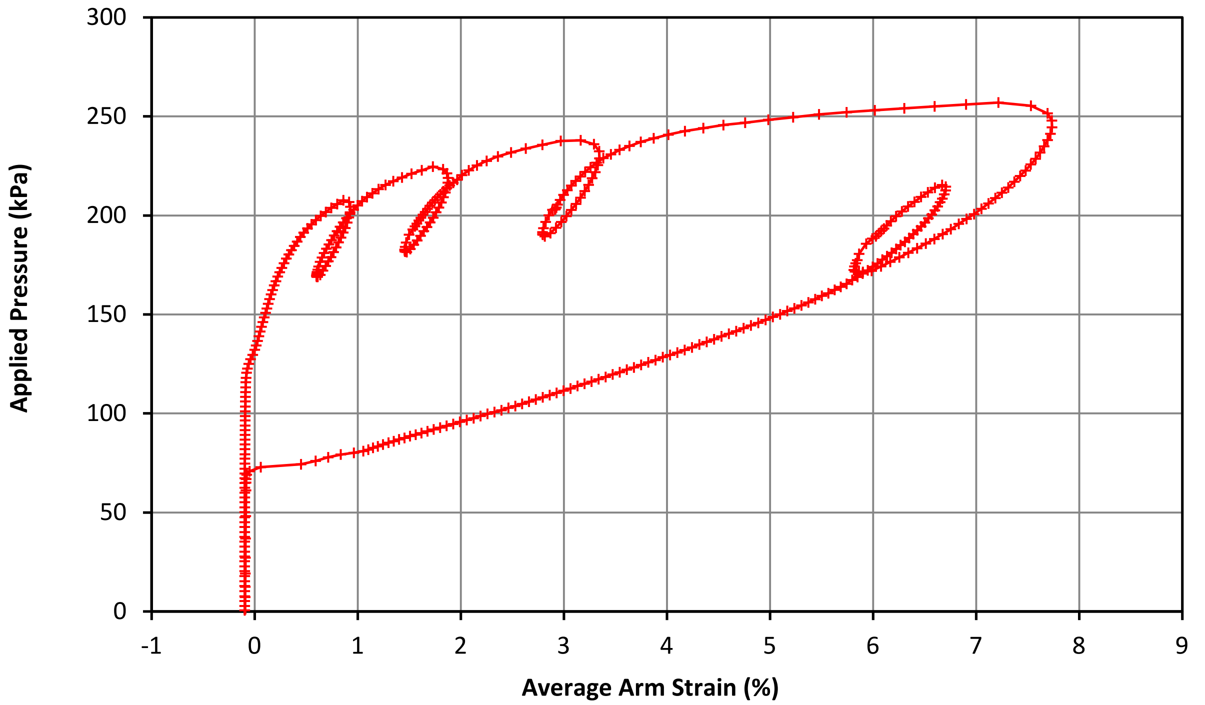
Strength	Undrained Shear	31 kPa
	Limit Pressure	307 kPa

Project	NGI - Onsøy Site	Figure No.	ONSP01 T05 - 09
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

Test Date	21/09/2017	**Test No.**	6
Borehole	ONSP01	**Test Depth (m)**	10.20





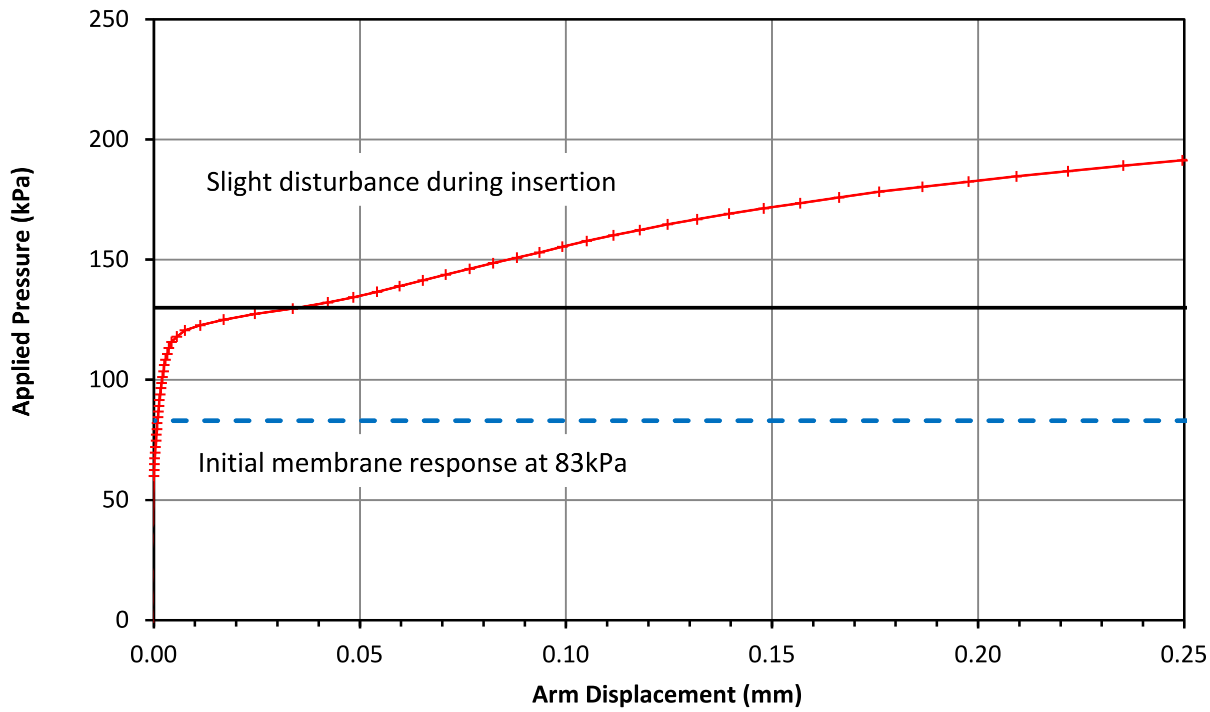
Comments

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T06 - 01**
Client	NGI		
Project No.	P1170112		

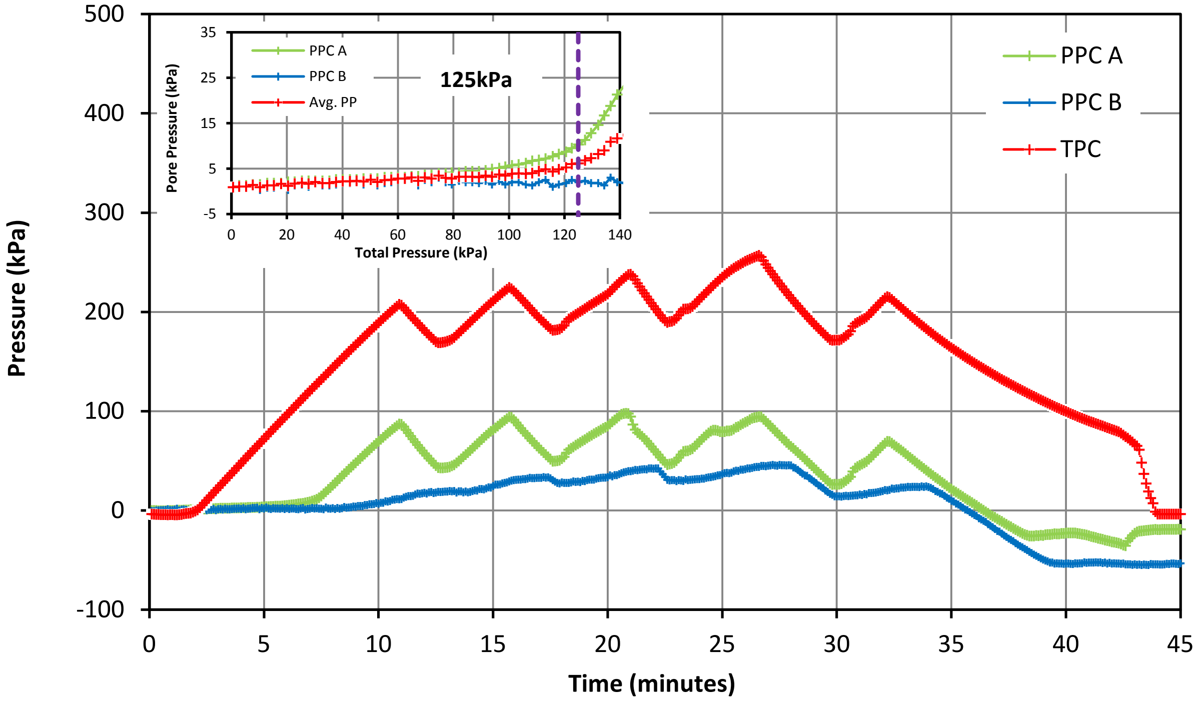
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU
SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	6
Borehole	ONSP01	**Test Depth (m)**	10.20



Lift Off Stress (Po)	130 kPa

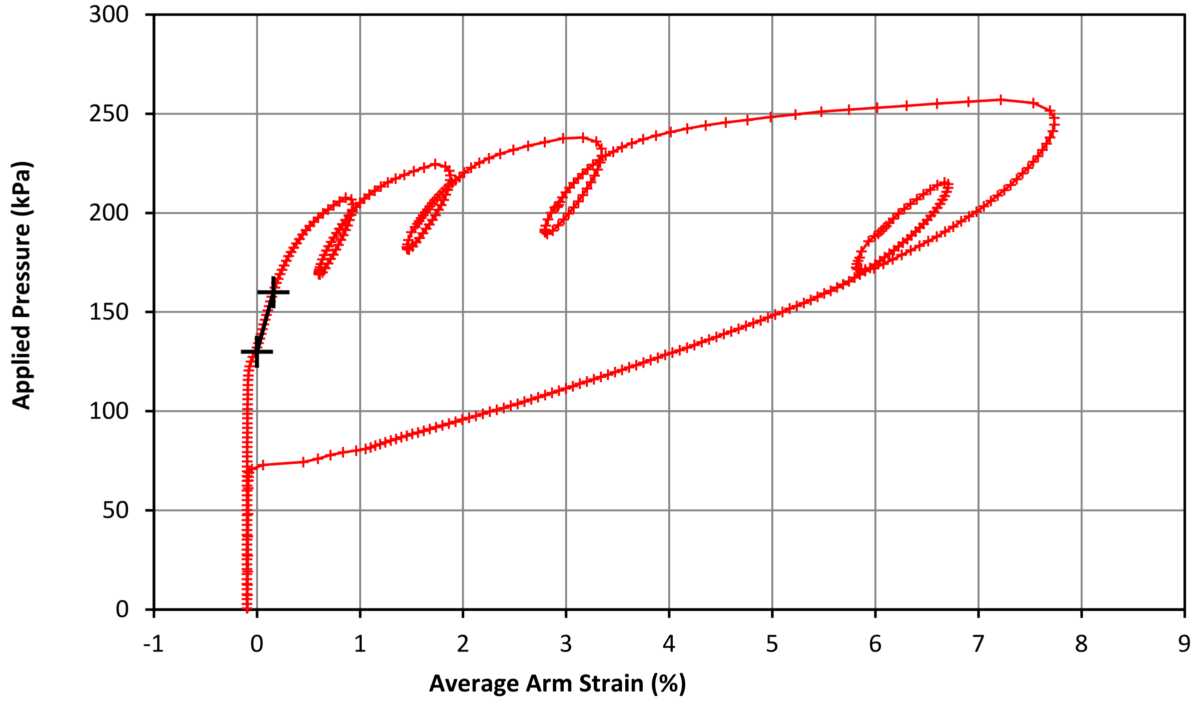


Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T06 - 02**
Client	NGI		
Project No.	P1170112		

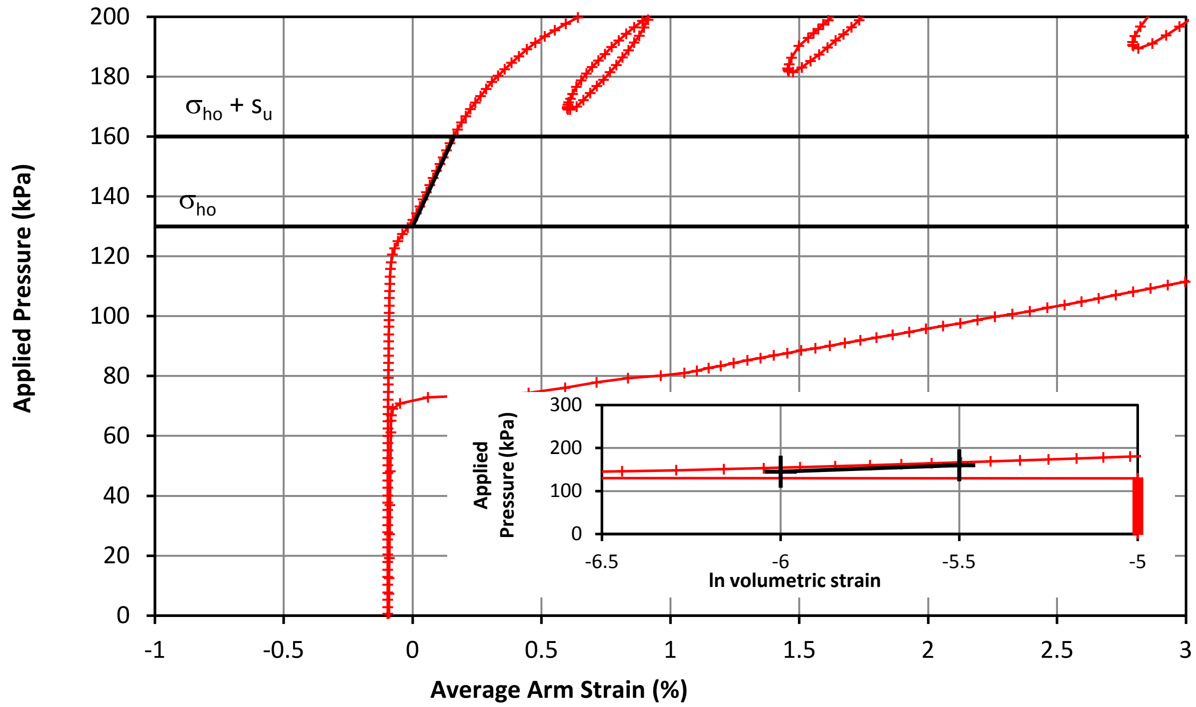
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	6
Borehole	ONSP01	**Test Depth (m)**	10.20



Initial Modulus	Shear Modulus	9.4 MPa

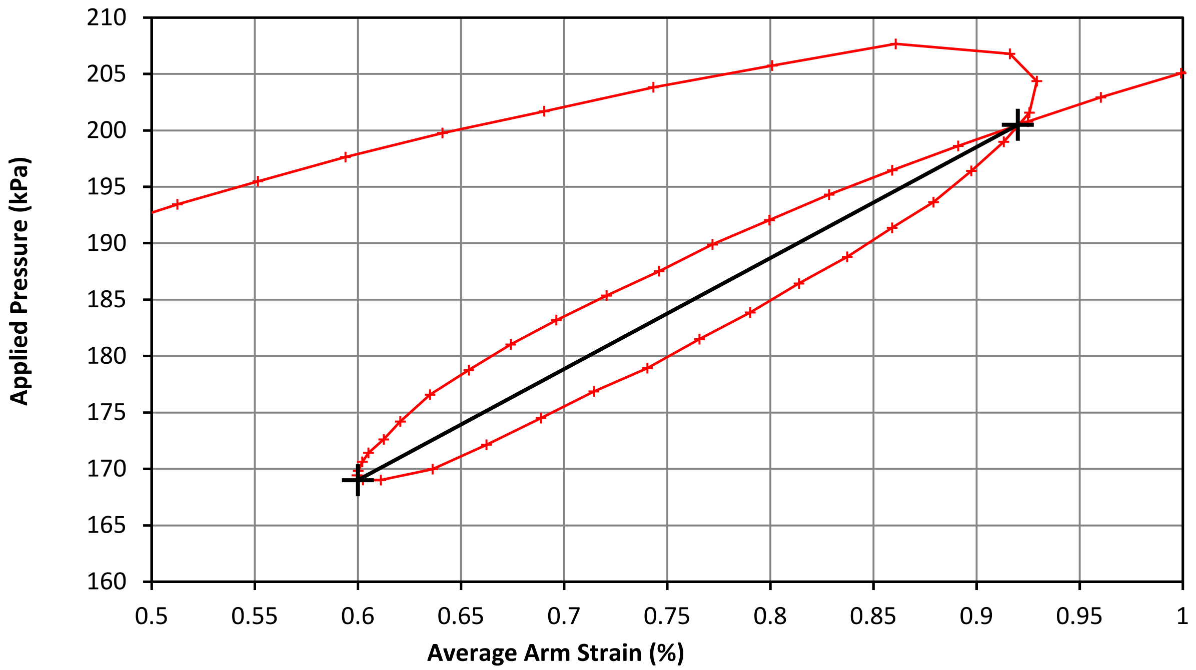


Marsland & Randolph	In situ horizontal stress	130 kPa
	Undrained Strength	30 kPa

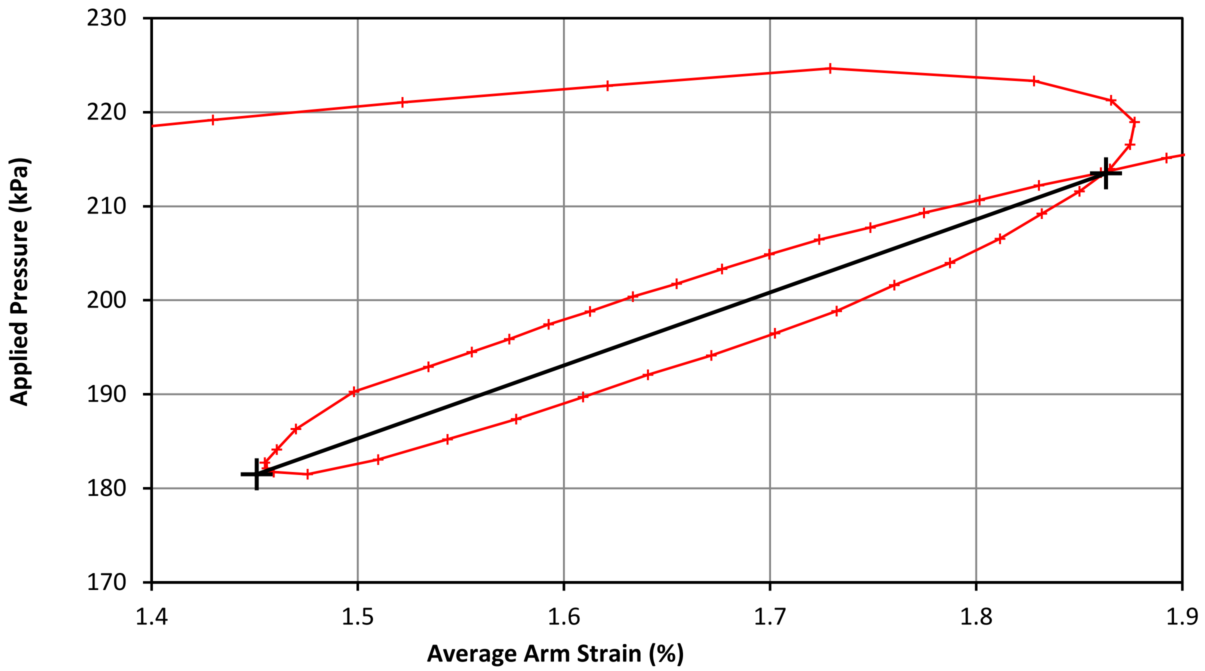
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01**
Client	NGI		**T06 - 03**
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

Test Date	21/09/2017	**Test No.**	6
Borehole	ONSP01	**Test Depth (m)**	10.20



Loop 1	Shear Modulus	5.0 MPa
	Cavity Strain Range	0.320 %



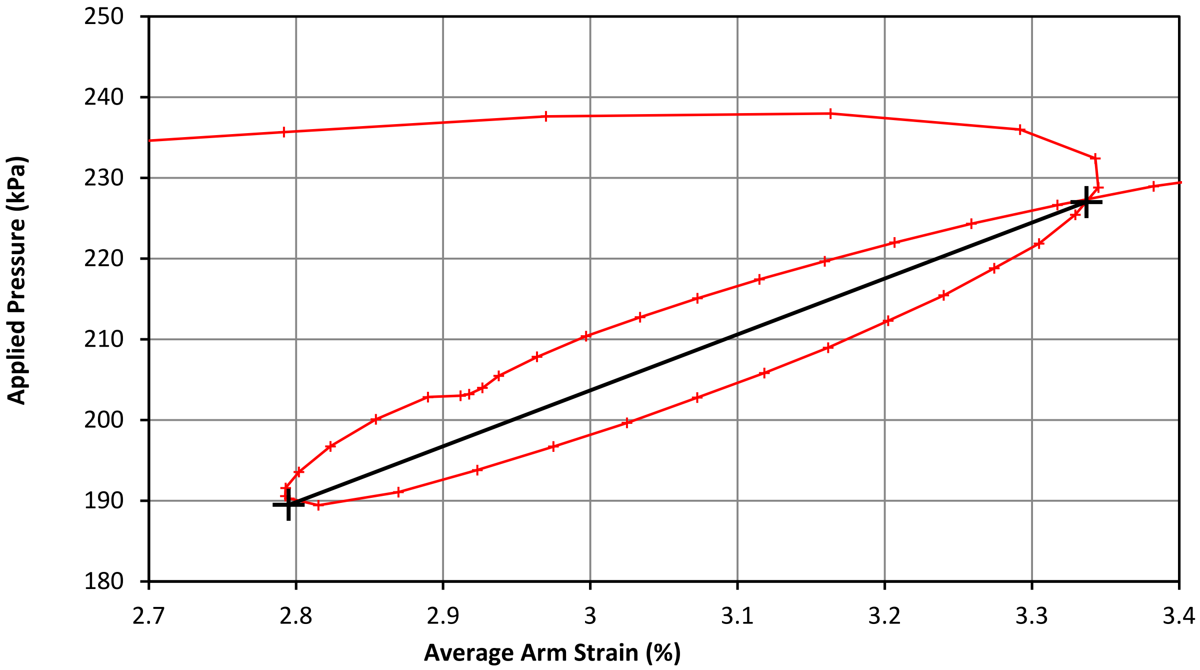
Loop 2	Shear Modulus	4.0 MPa
	Cavity Strain Range	0.412 %

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T06 - 04**
Client	NGI		
Project No.	P1170112		

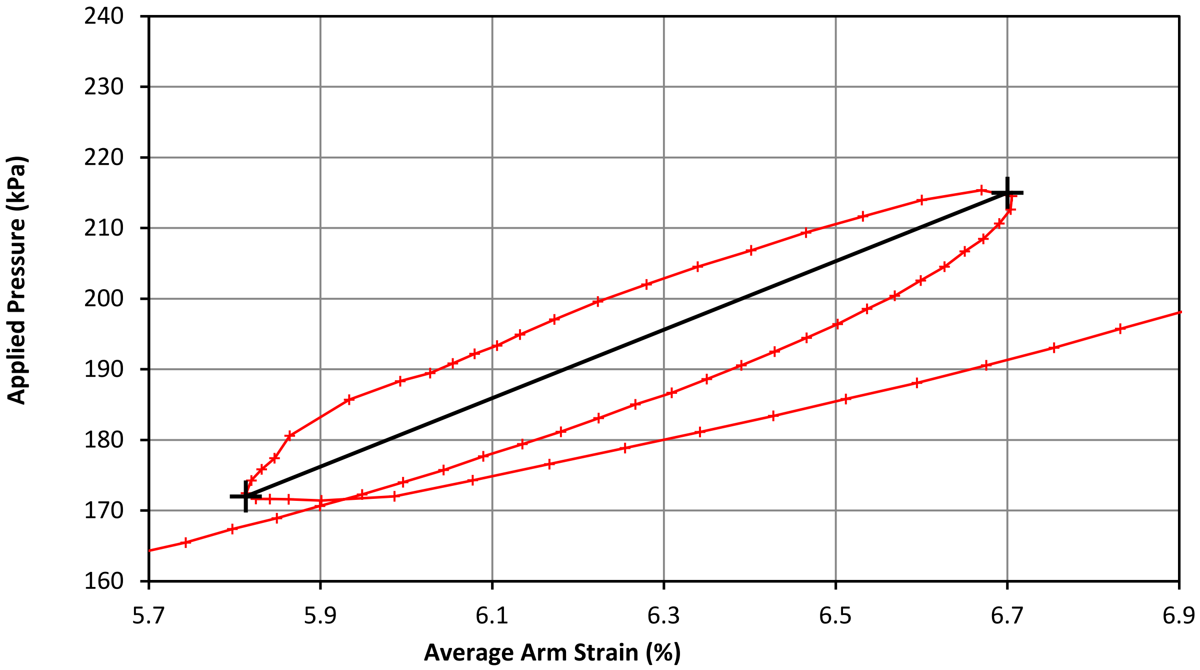
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	6
Borehole	ONSP01	**Test Depth (m)**	10.20



Loop 3	Shear Modulus	3.6	MPa
	Cavity Strain Range	0.542	%



Loop 4	Shear Modulus	2.6	MPa
	Cavity Strain Range	0.887	%

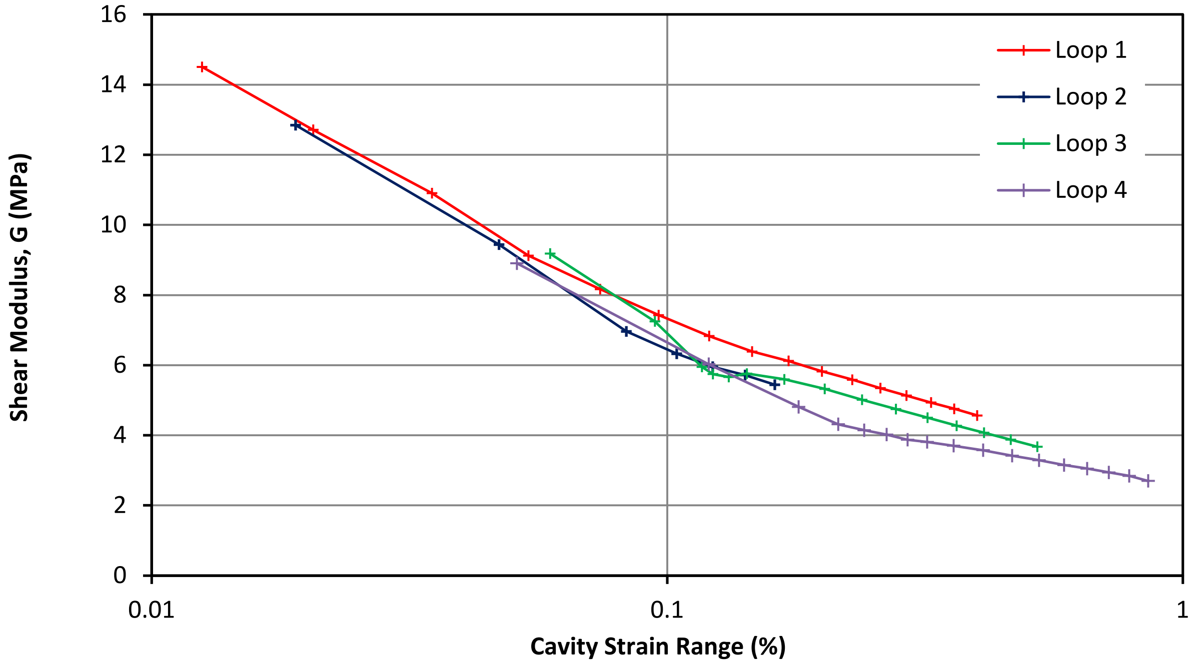
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T06 - 05**
Client	NGI		
Project No.	P1170112		

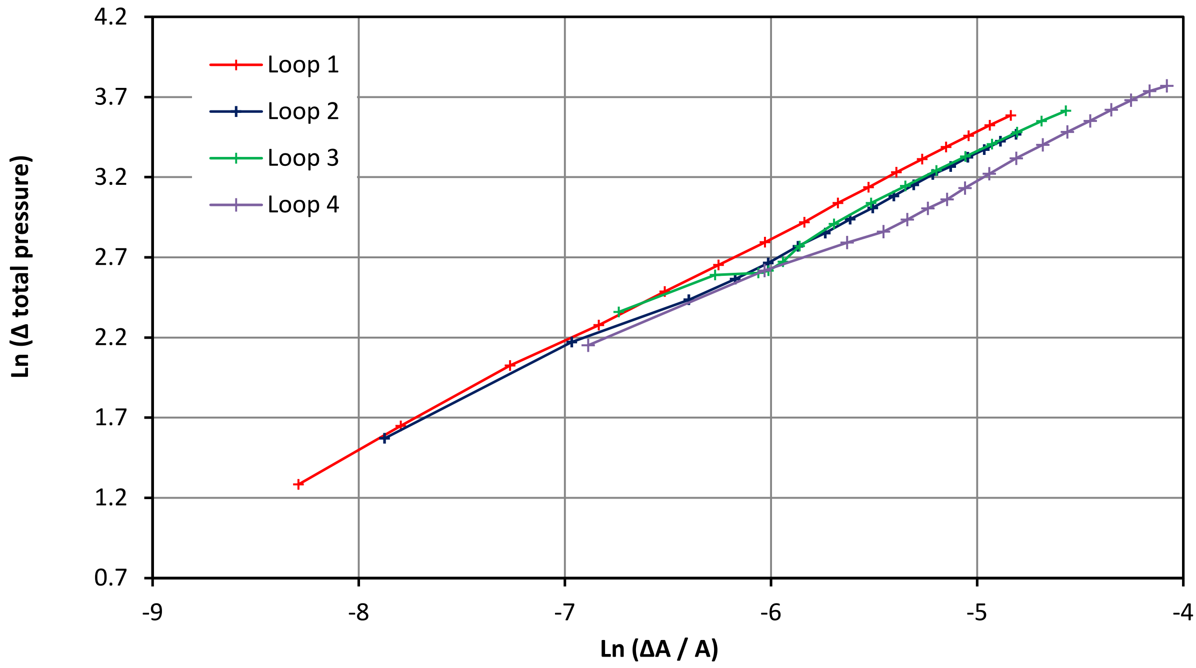
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	21/09/2017	**Test No.**	6
Borehole	ONSP01	**Test Depth (m)**	10.20





Loop 1		Loop 2		Loop 3		Loop 4	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.660	0.883 (MPa)	0.621	0.628 (MPa)	0.631	0.664 (MPa)	0.601	0.495 (MPa)

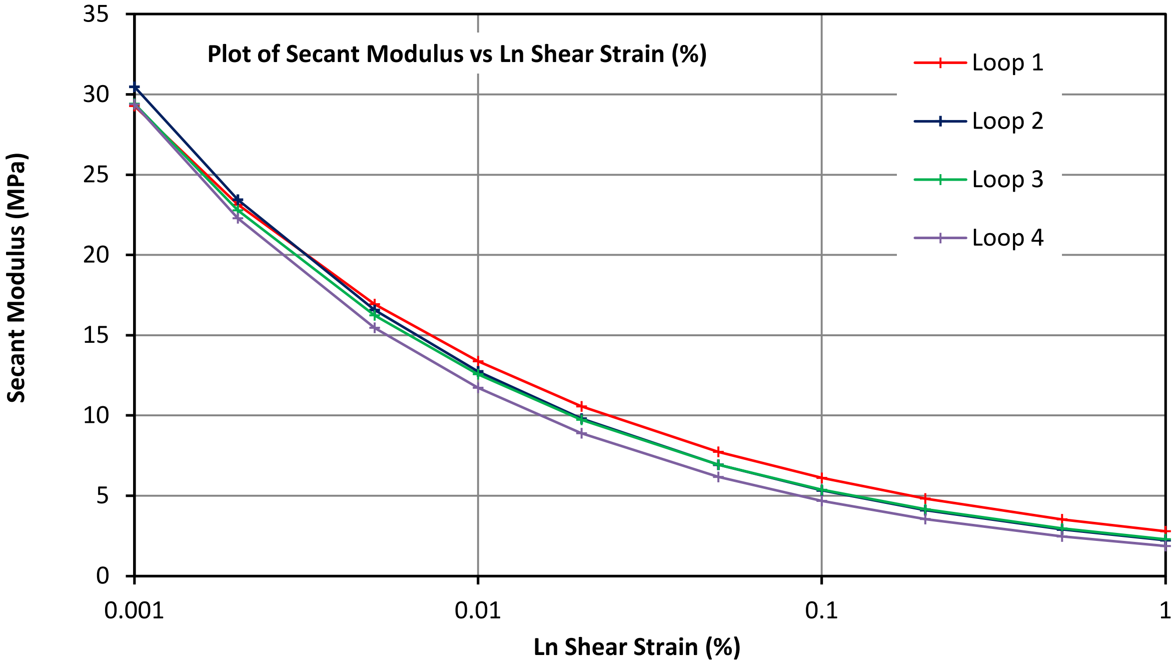
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T06 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU
SITE INVESTIGATION

Test Date	21/09/2017	Test No.	6
Borehole	ONSP01	Test Depth (m)	10.20

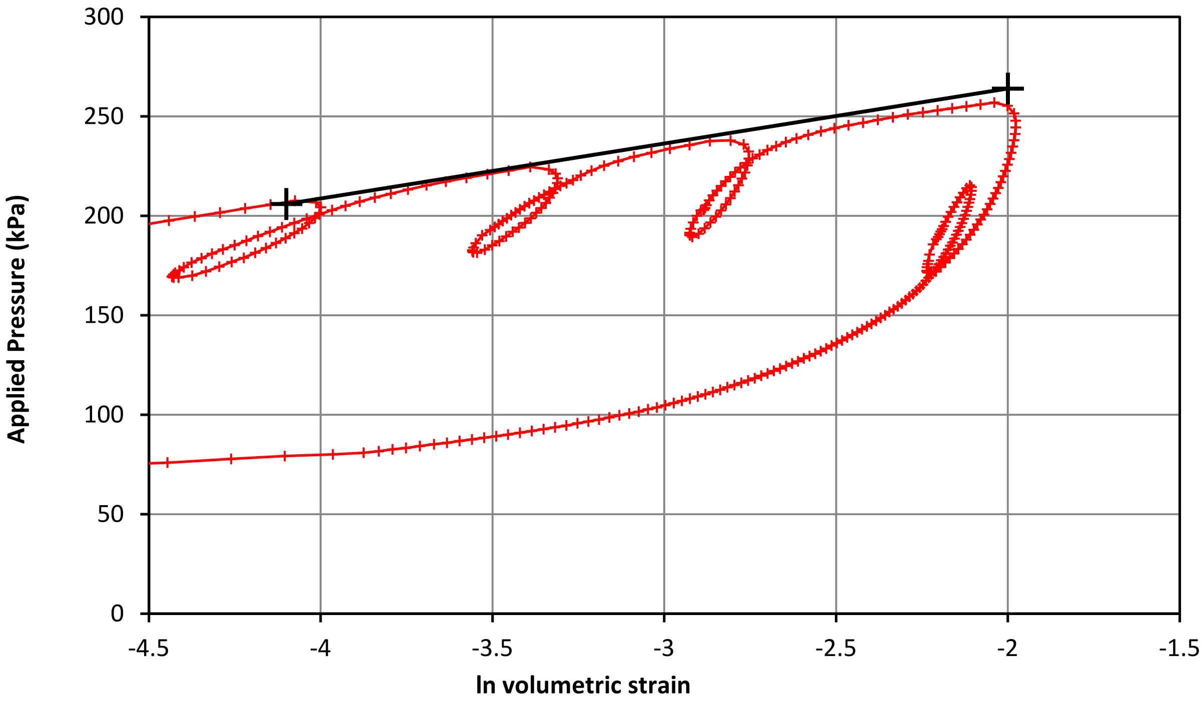


Shear Strain	Loop 1	Loop 2	Loop 3	Loop 4
0.001%	**29**	**30**	**29**	**29**
0.002%	23	23	23	22
0.005%	17	17	16	15
0.010%	**13**	**13**	**13**	**12**
0.020%	11	10	10	9
0.050%	8	7	7	6
0.100%	**6**	**5**	**5**	**5**
0.200%	5	4	4	4
0.500%	4	3	3	2
1.000%	**3**	**2**	**2**	**2**

Project	NGI - Onsøy Site	Figure No.	ONSP01 T06 - 07
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

Test Date	21/09/2017	**Test No.**	6
Borehole	ONSP01	**Test Depth (m)**	10.20



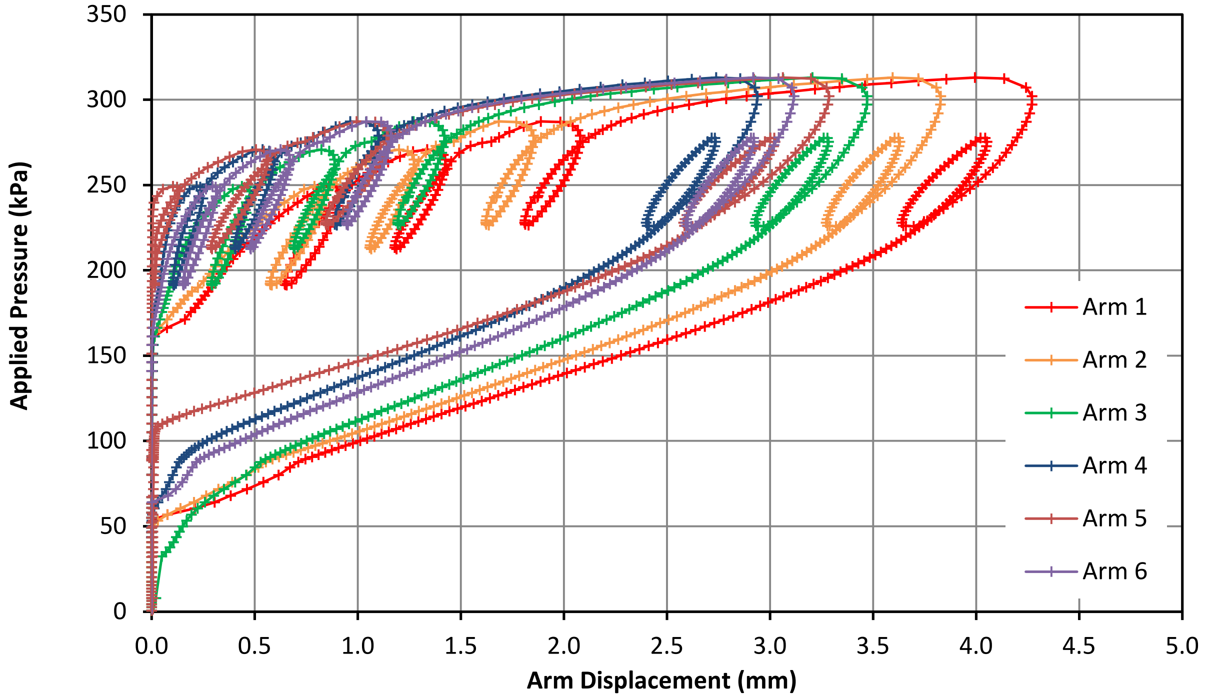
Strength	Undrained Shear	28	kPa
	Limit Pressure	319	kPa

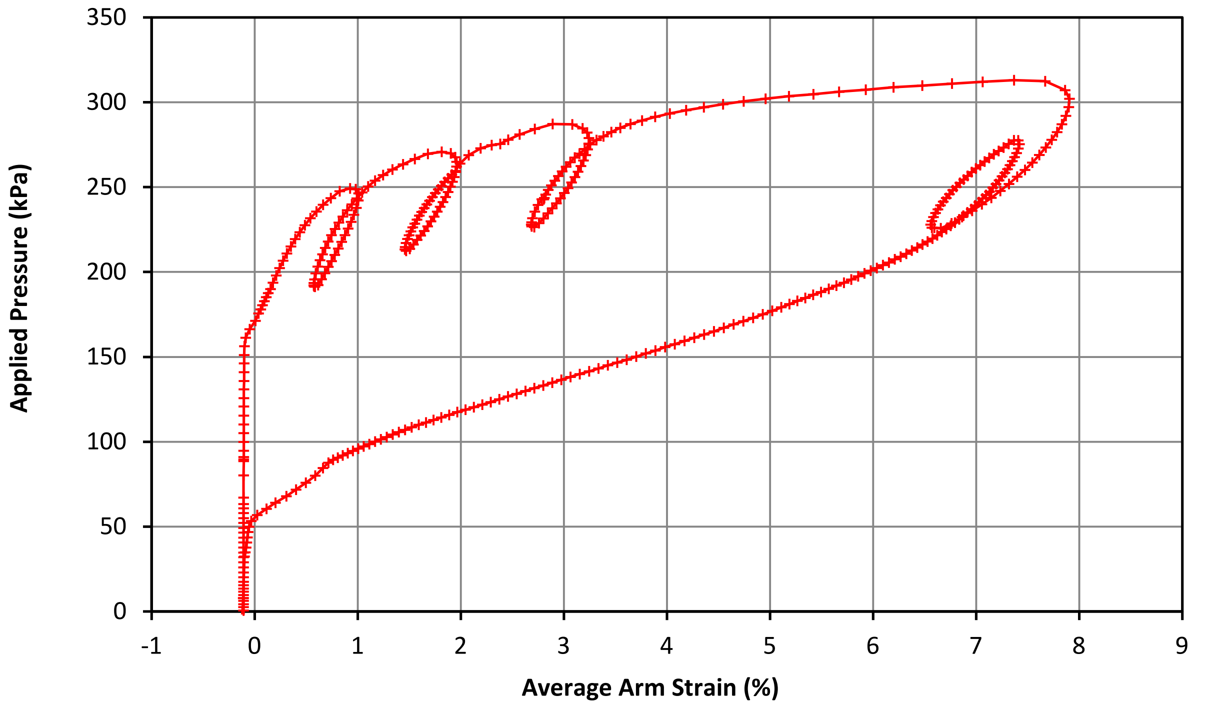
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T06 - 08**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	7
Borehole	ONSP01	**Test Depth (m)**	12.10





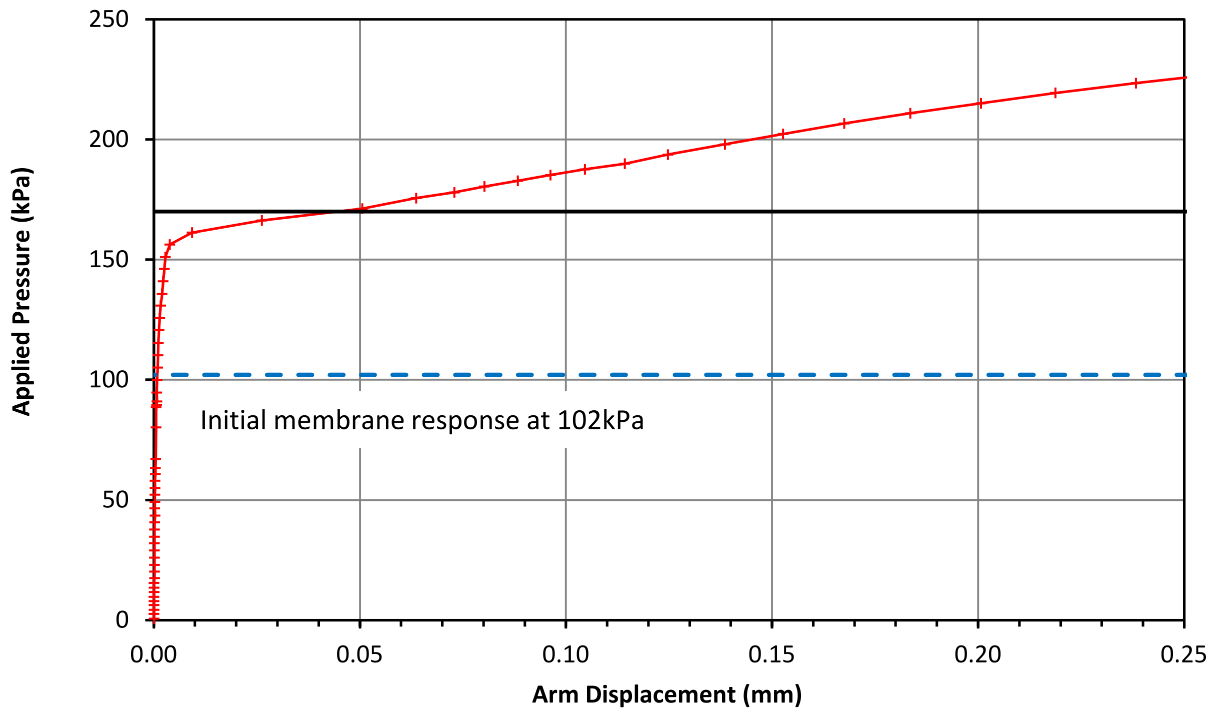
Comments

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T07 - 01**
Client	NGI		
Project No.	P1170112		

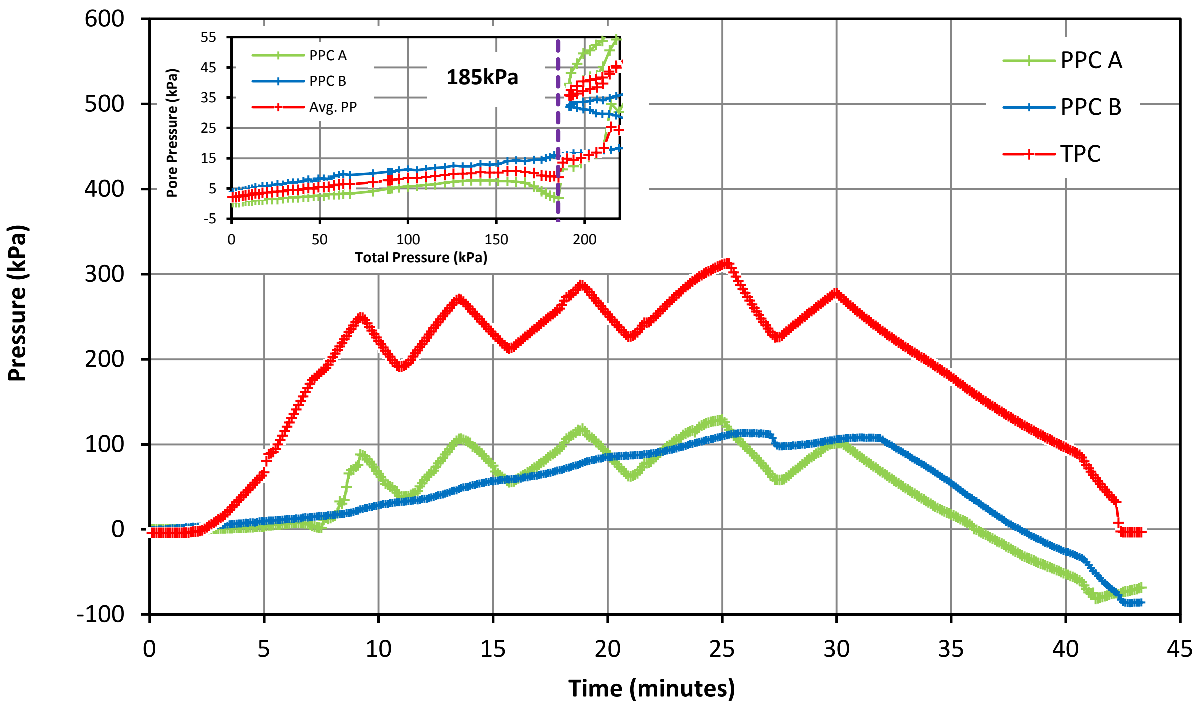
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU
SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	7
Borehole	ONSP01	**Test Depth (m)**	12.10



Lift Off Stress (Po)	170 kPa

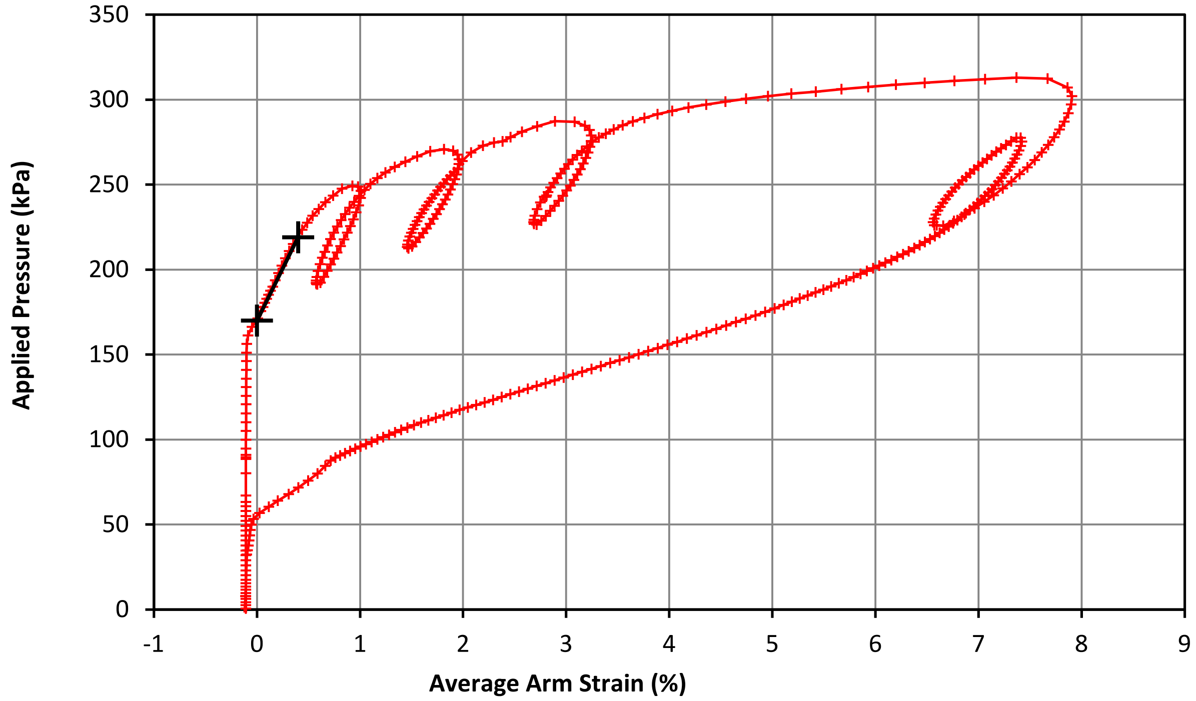


Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T07 - 02**
Client	NGI		
Project No.	P1170112		

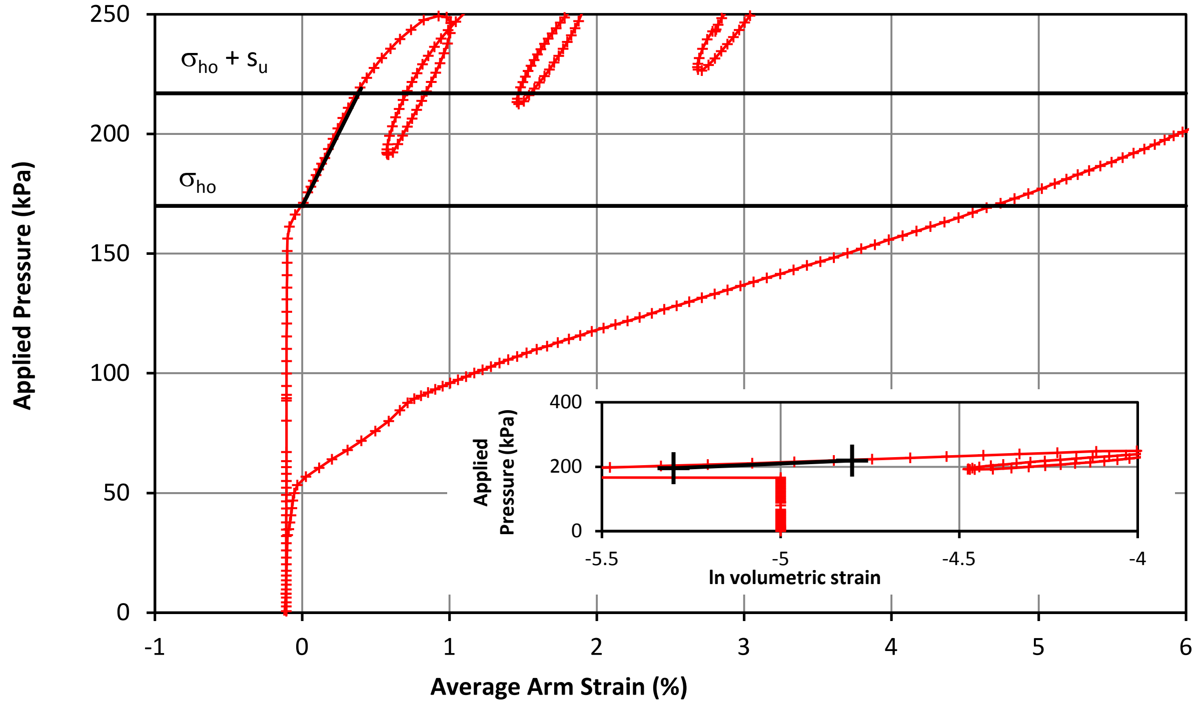
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	Test No.	7
Borehole	ONSP01	Test Depth (m)	12.10



Initial Modulus	Shear Modulus	6.1 MPa



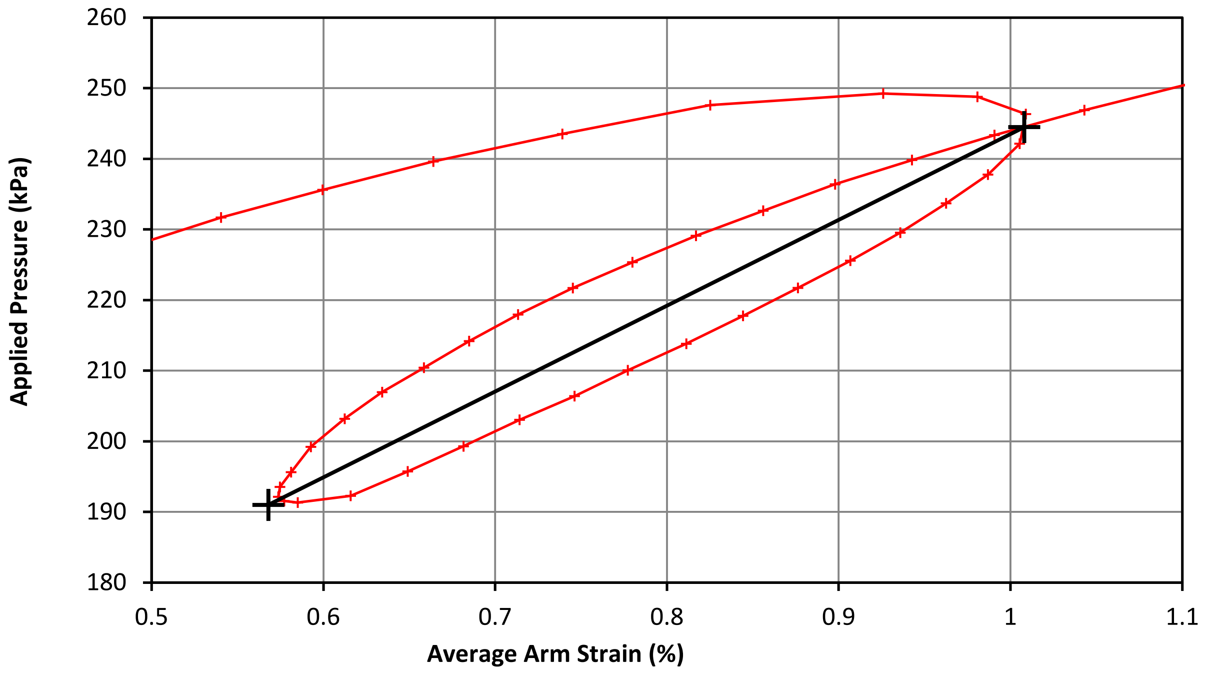
Marsland & Randolph	In situ horizontal stress	170 kPa
	Undrained Strength	47 kPa

Project	NGI - Onsøy Site	Figure No.	ONSP01 T07 - 03
Client	NGI		
Project No.	P1170112		

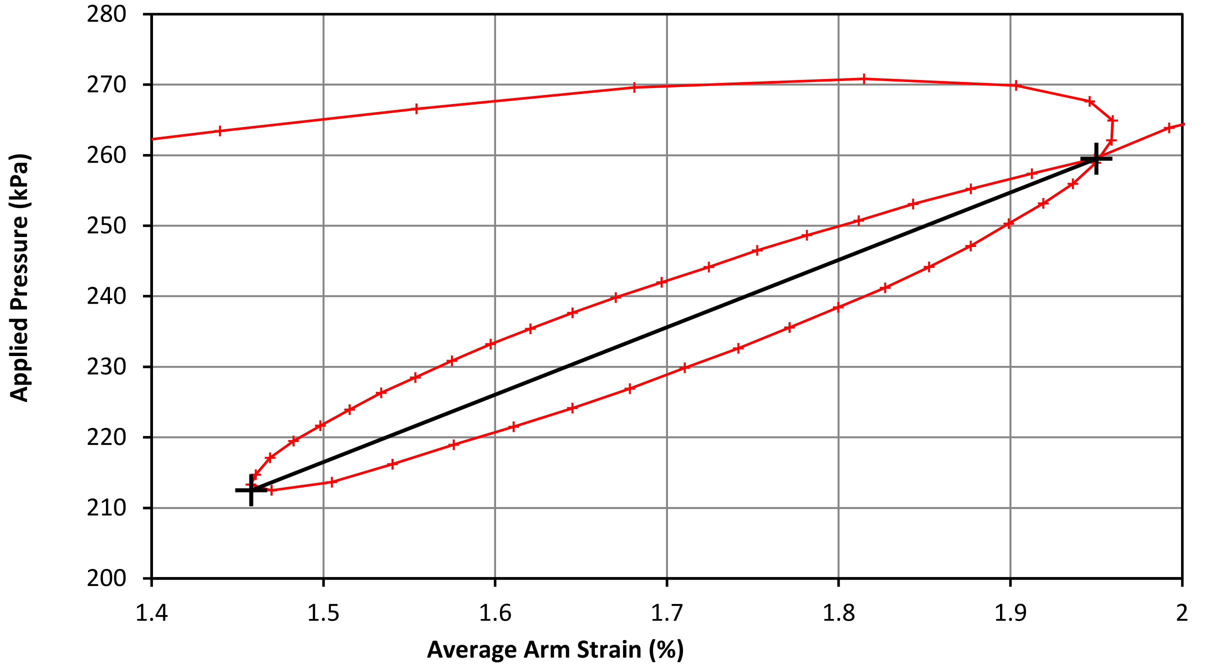
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	Test No.	7
Borehole	ONSP01	Test Depth (m)	12.10



Loop 1	Shear Modulus	6.1 MPa
	Cavity Strain Range	0.440 %



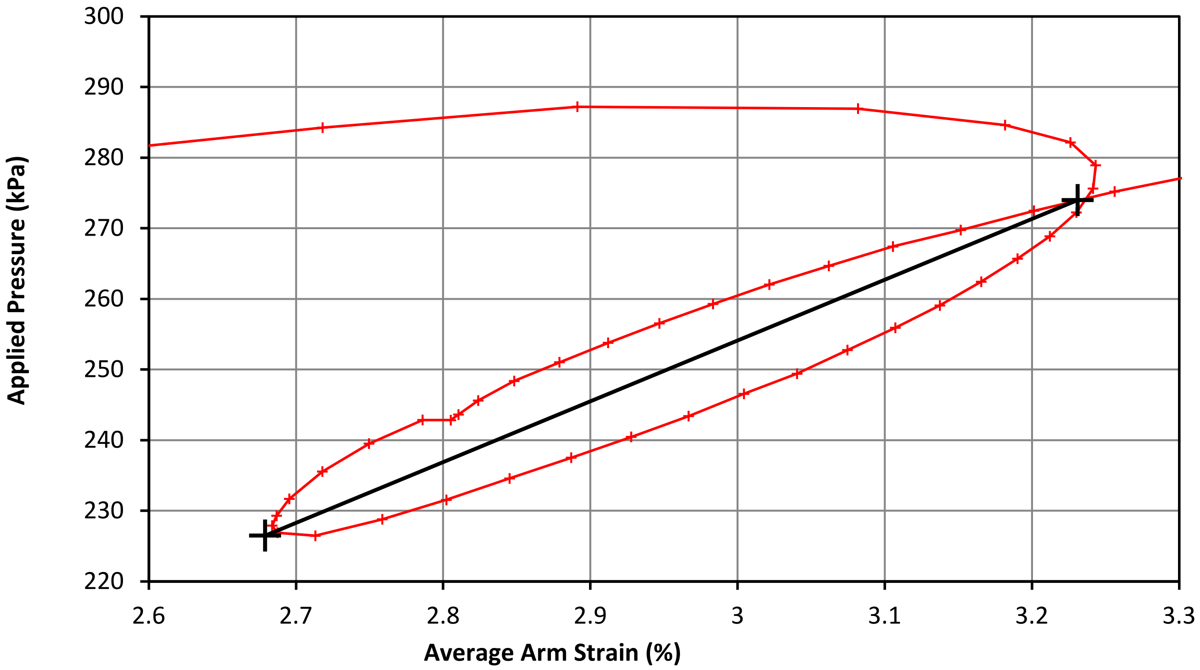
Loop 2	Shear Modulus	4.9 MPa
	Cavity Strain Range	0.492 %

Project	NGI - Onsøy Site	Figure No.	ONSP01 T07 - 04
Client	NGI		
Project No.	P1170112		

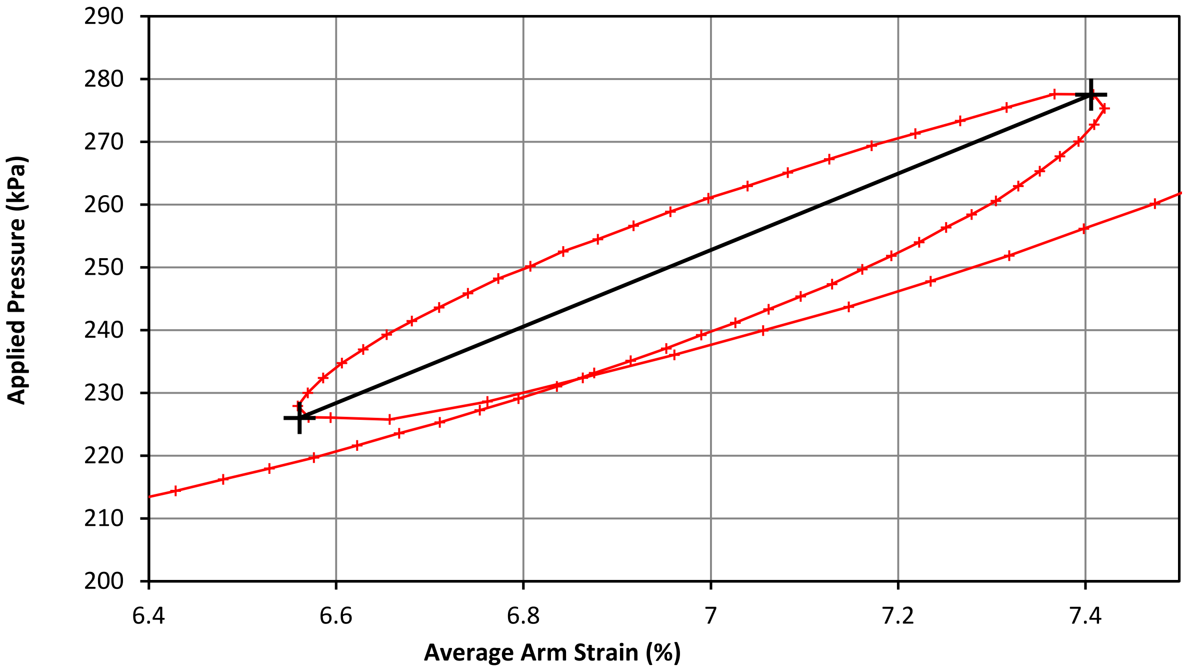
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	7
Borehole	ONSP01	**Test Depth (m)**	12.10



Loop 3	Shear Modulus	4.4	MPa
	Cavity Strain Range	0.552	%



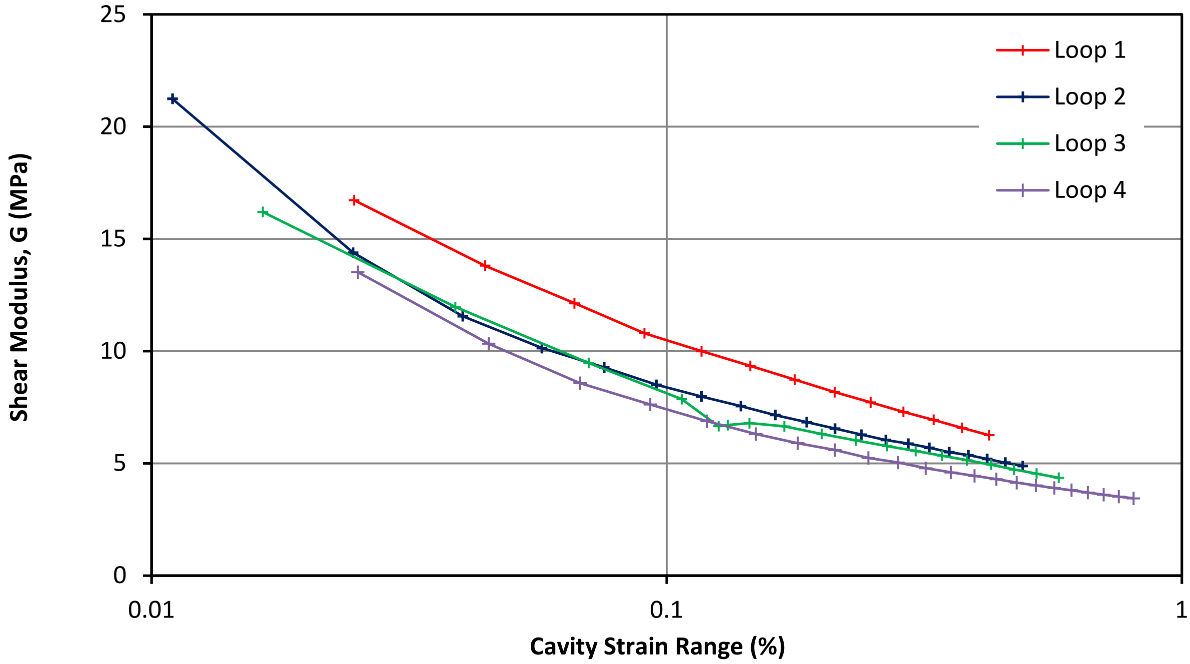
Loop 4	Shear Modulus	3.3	MPa
	Cavity Strain Range	0.845	%

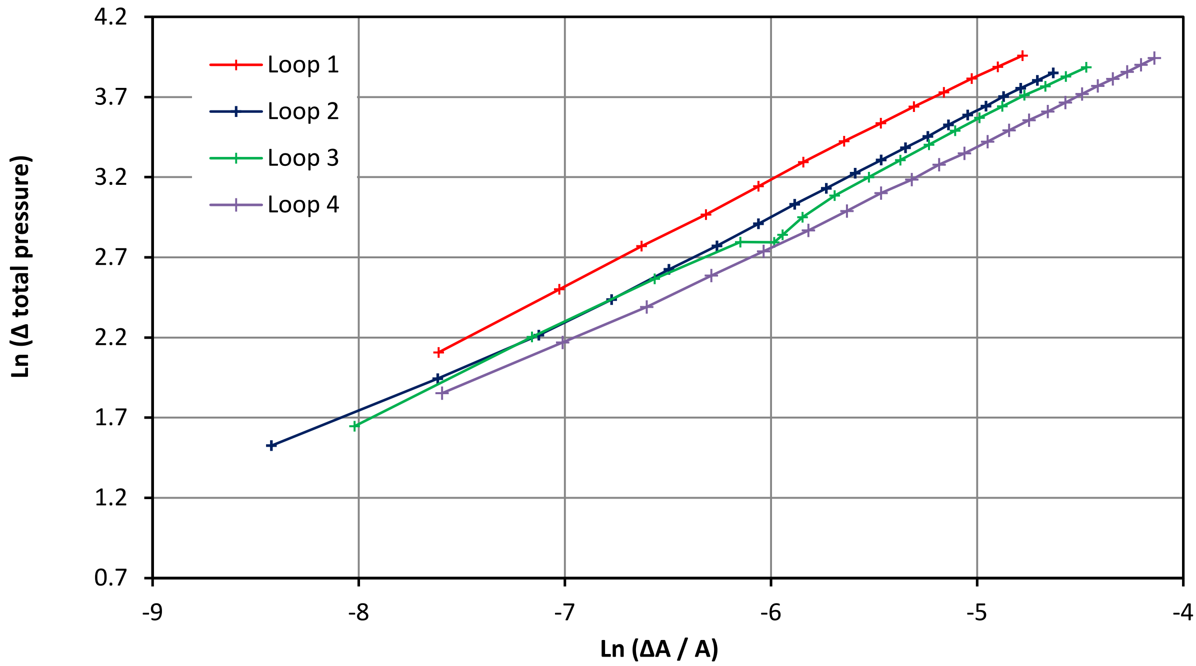
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T07 - 05**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

Test Date	22/09/2017	**Test No.**	7
Borehole	ONSP01	**Test Depth (m)**	12.10





Loop 1		Loop 2		Loop 3		Loop 4	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.656	1.334 (MPa)	0.634	0.872 (MPa)	0.640	0.845 (MPa)	0.616	0.652 (MPa)

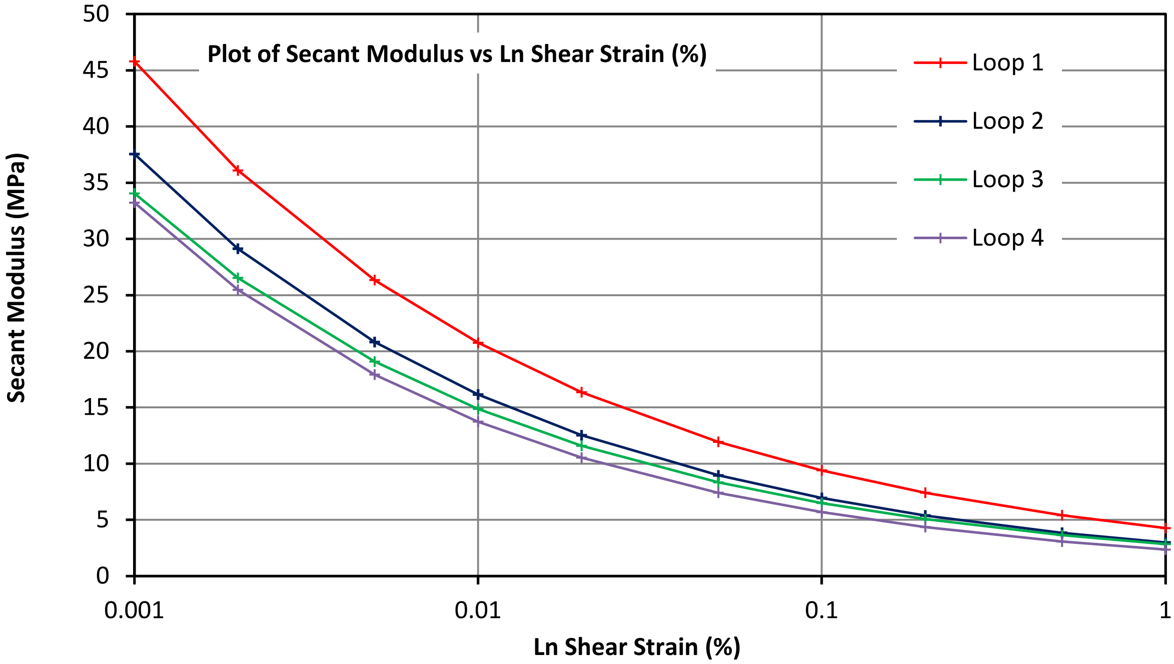
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T07 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	Test No.	7
Borehole	ONSP01	Test Depth (m)	12.10



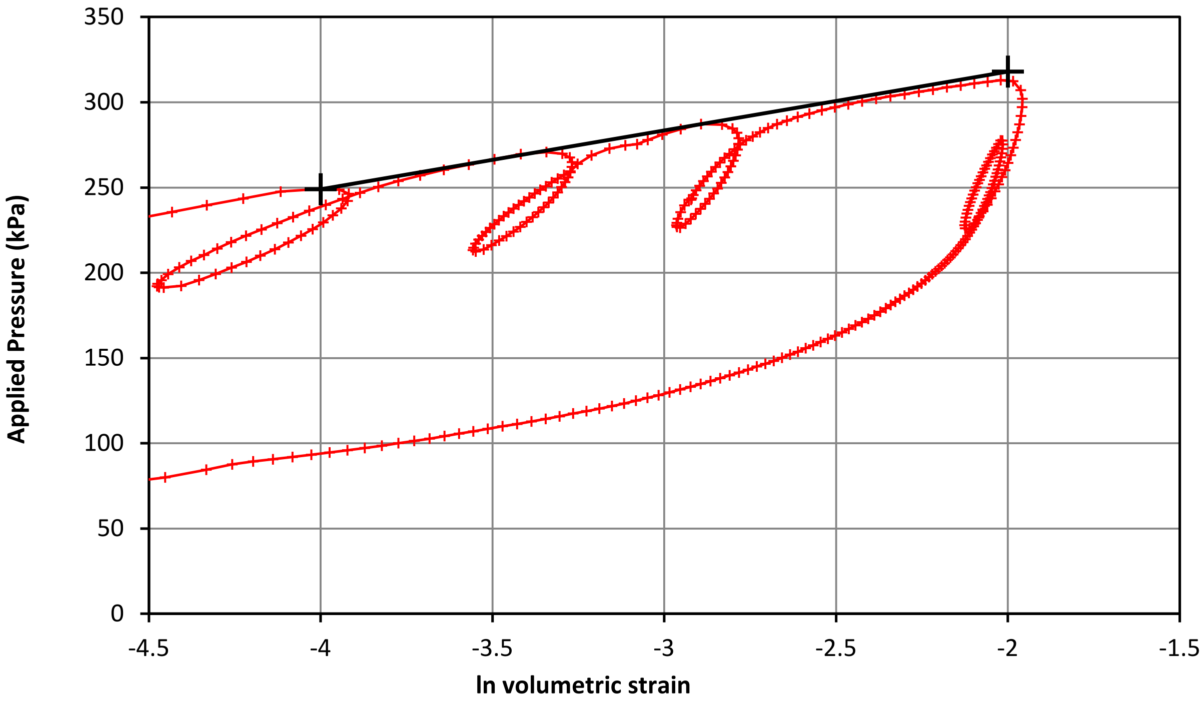
Shear Strain	Loop 1	Loop 2	Loop 3	Loop 4
0.001%	**46**	**38**	**34**	**33**
0.002%	36	29	27	25
0.005%	26	21	19	18
0.010%	**21**	**16**	**15**	**14**
0.020%	16	13	12	11
0.050%	12	9	8	7
0.100%	**9**	**7**	**6**	**6**
0.200%	7	5	5	4
0.500%	5	4	4	3
1.000%	**4**	**3**	**3**	**2**

Project	NGI - Onsøy Site	Figure No.	ONSP01 T07 - 07
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	Test No.	7
Borehole	ONSP01	Test Depth (m)	12.10



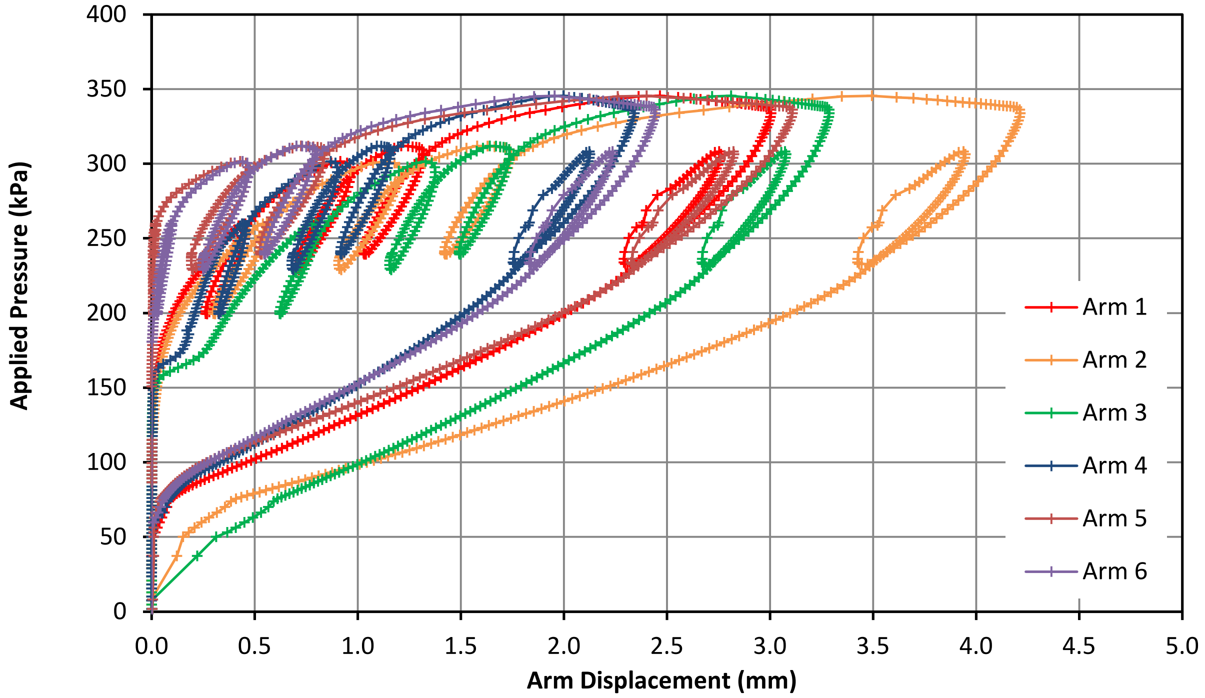
Strength	Undrained Shear	35 kPa
	Limit Pressure	387 kPa

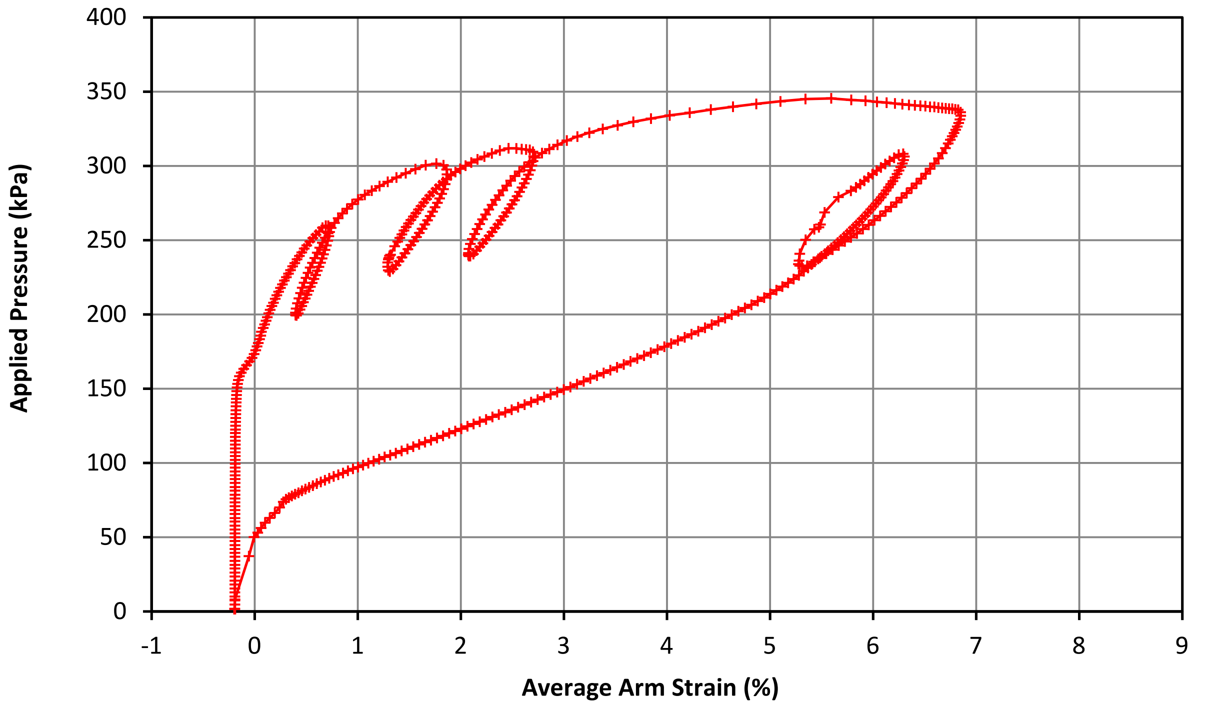
Project	NGI - Onsøy Site	Figure No.	ONSP01 T07 - 08
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	Test No.	8
Borehole	ONSP01	Test Depth (m)	14.00





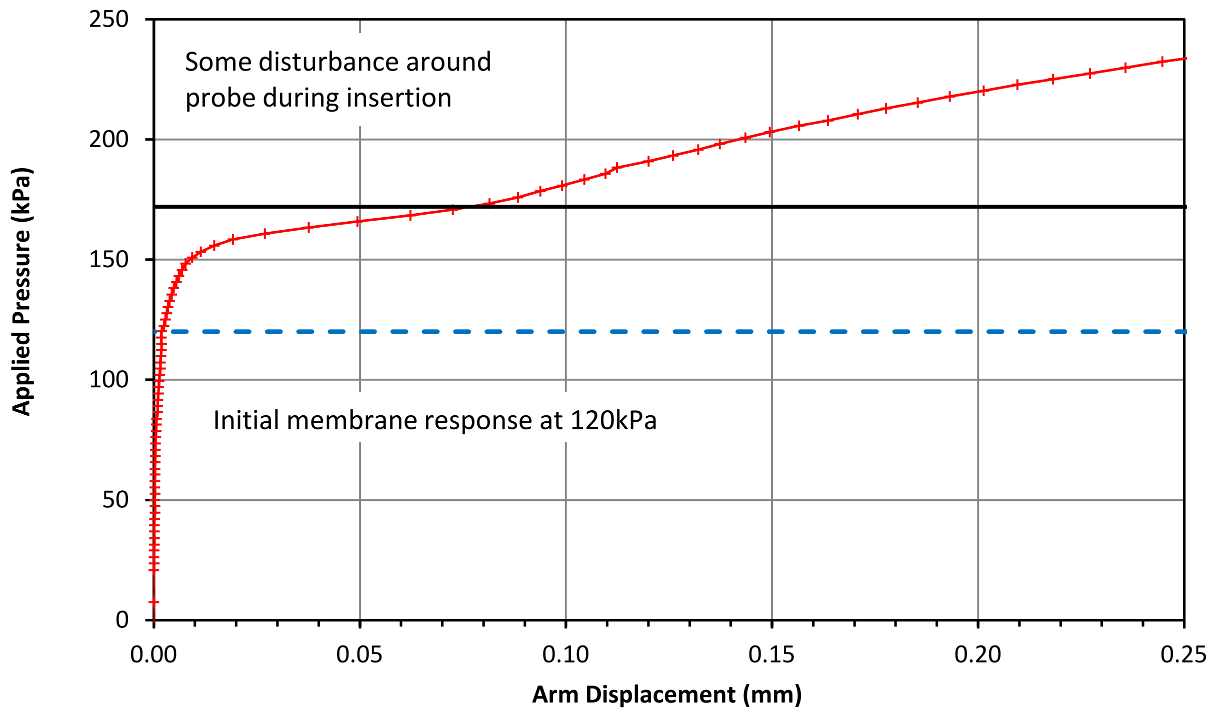
Comments

Project	NGI - Onsøy Site	Figure No.	ONSP01 T08 - 01
Client	NGI		
Project No.	P1170112		

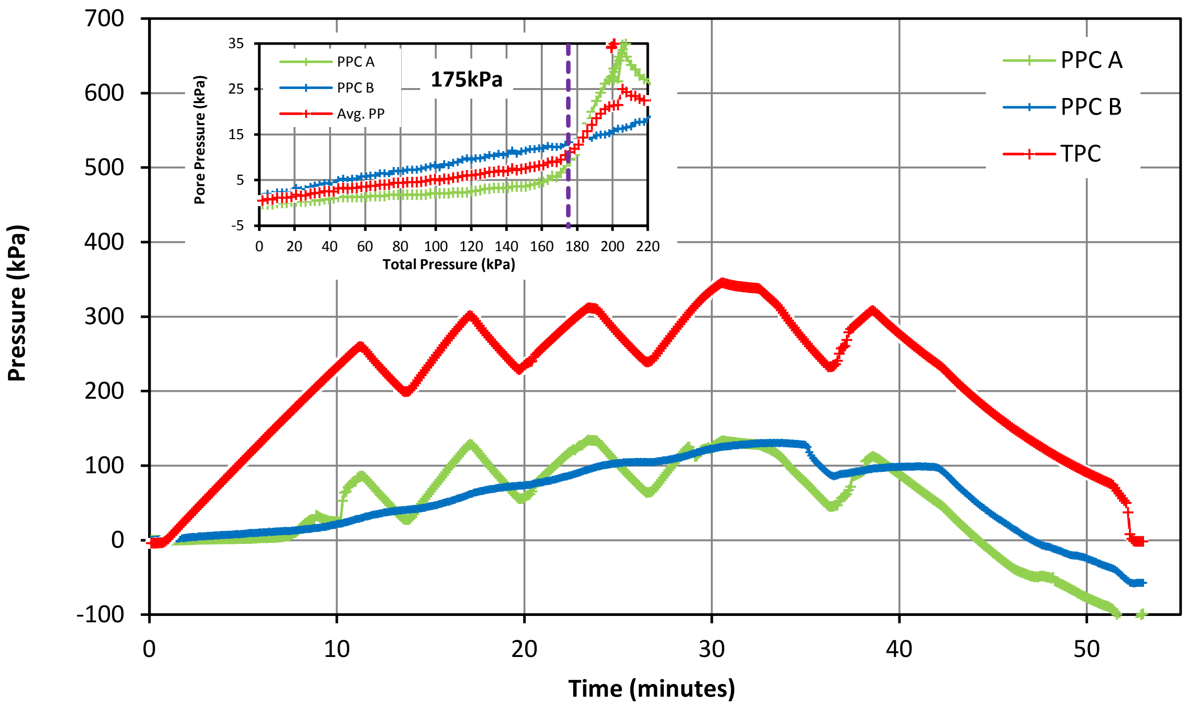
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	8
Borehole	ONSP01	**Test Depth (m)**	14.00



Lift Off Stress (Po)	172 kPa

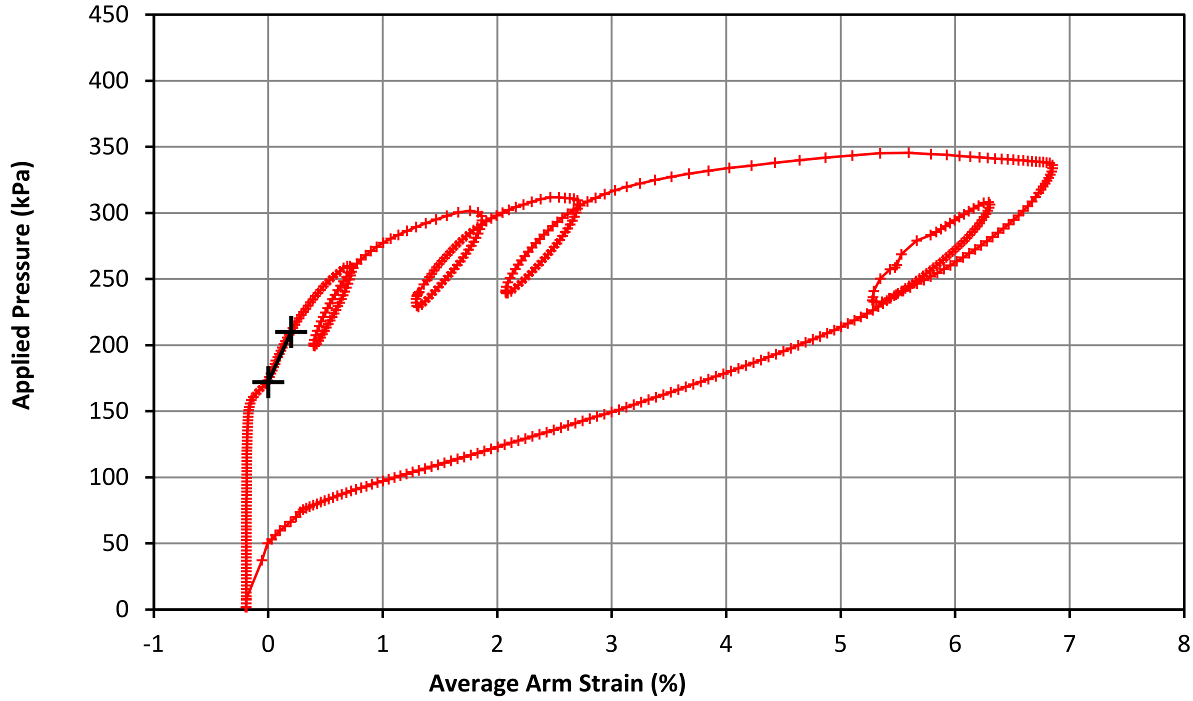


Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T08 - 02**
Client	NGI		
Project No.	P1170112		

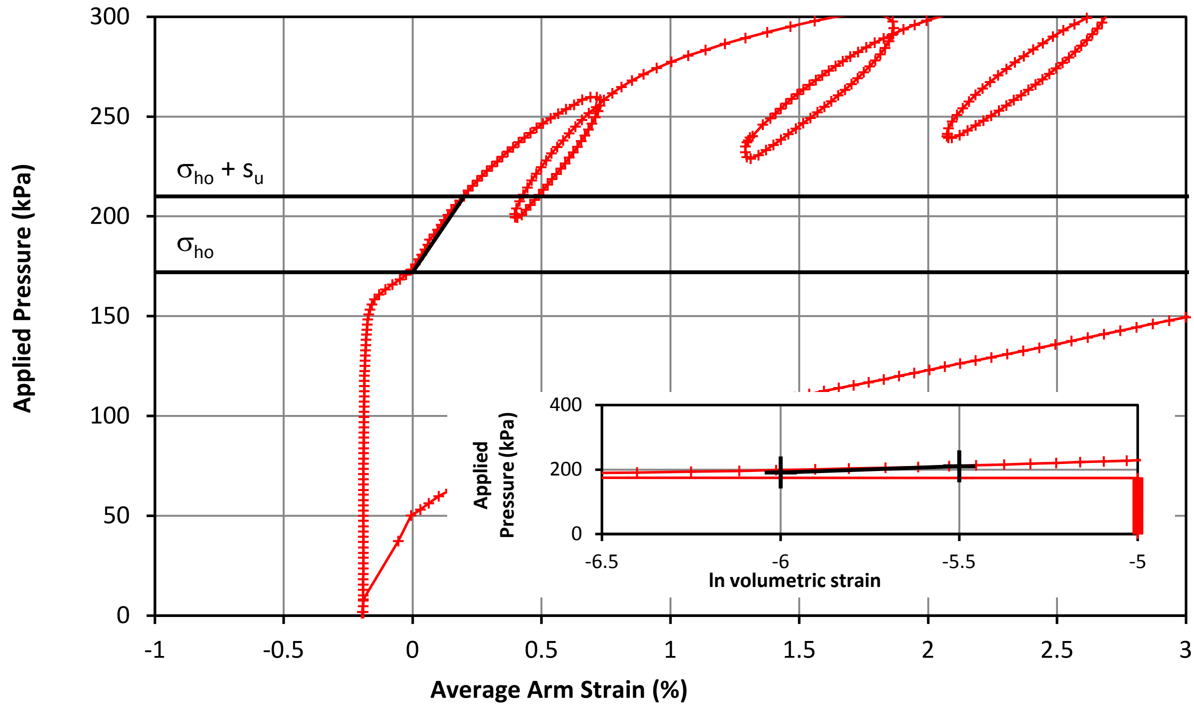
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	Test No.	8
Borehole	ONSP01	Test Depth (m)	14.00



Initial Modulus	Shear Modulus	9.5 MPa



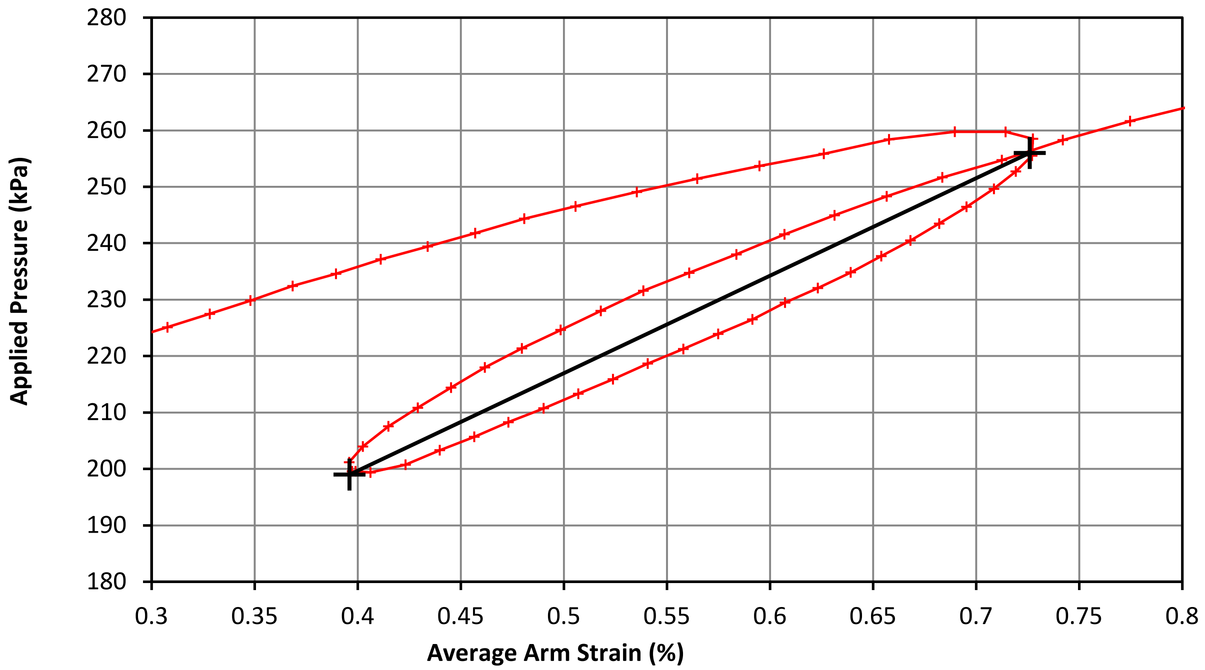
Marsland & Randolph	In situ horizontal stress	172 kPa
	Undrained Strength	38 kPa

Project	NGI - Onsøy Site	Figure No.	ONSP01 T08 - 03
Client	NGI		
Project No.	P1170112		

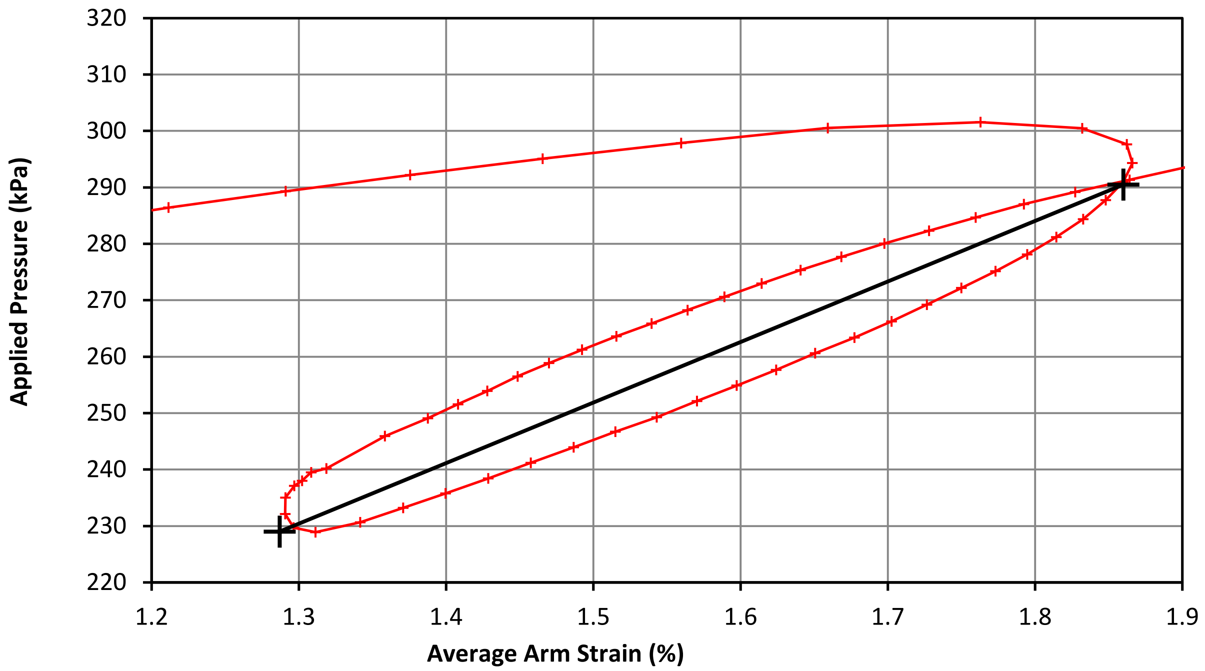
Pressuremeter Test Unload Reload Loop

IN SITU
SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	8
Borehole	ONSP01	**Test Depth (m)**	14.00



Loop 1	Shear Modulus	8.7	MPa
	Cavity Strain Range	0.330	%



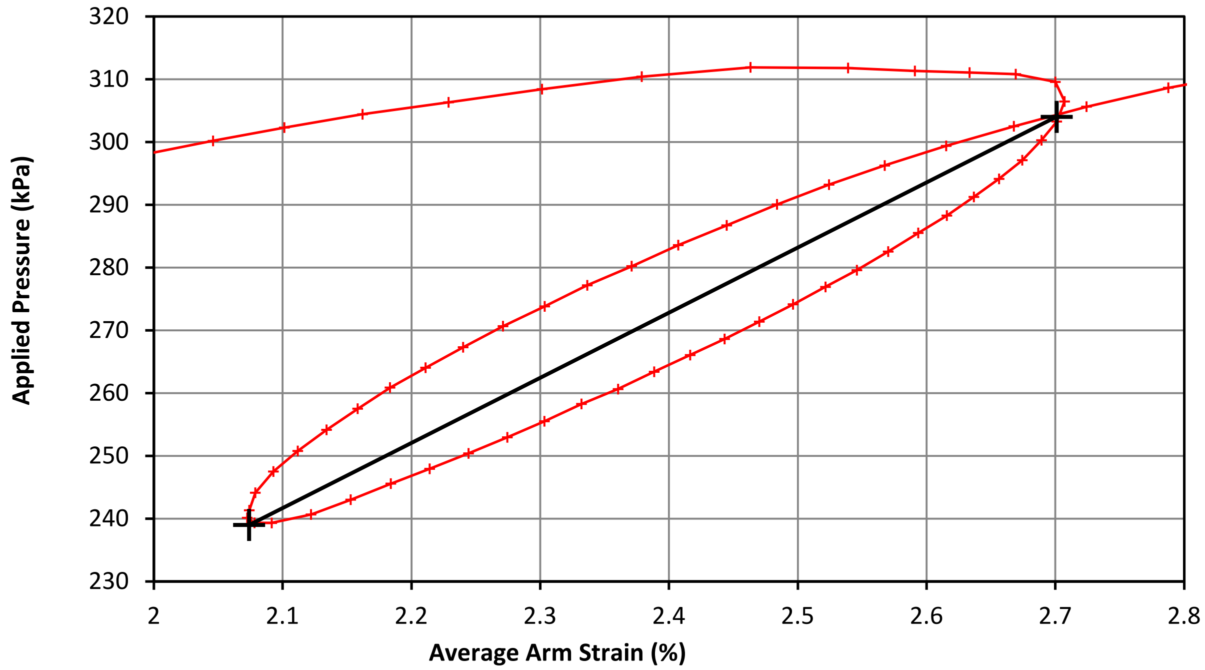
Loop 2	Shear Modulus	5.5	MPa
	Cavity Strain Range	0.573	%

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T08 - 04**
Client	NGI		
Project No.	P1170112		

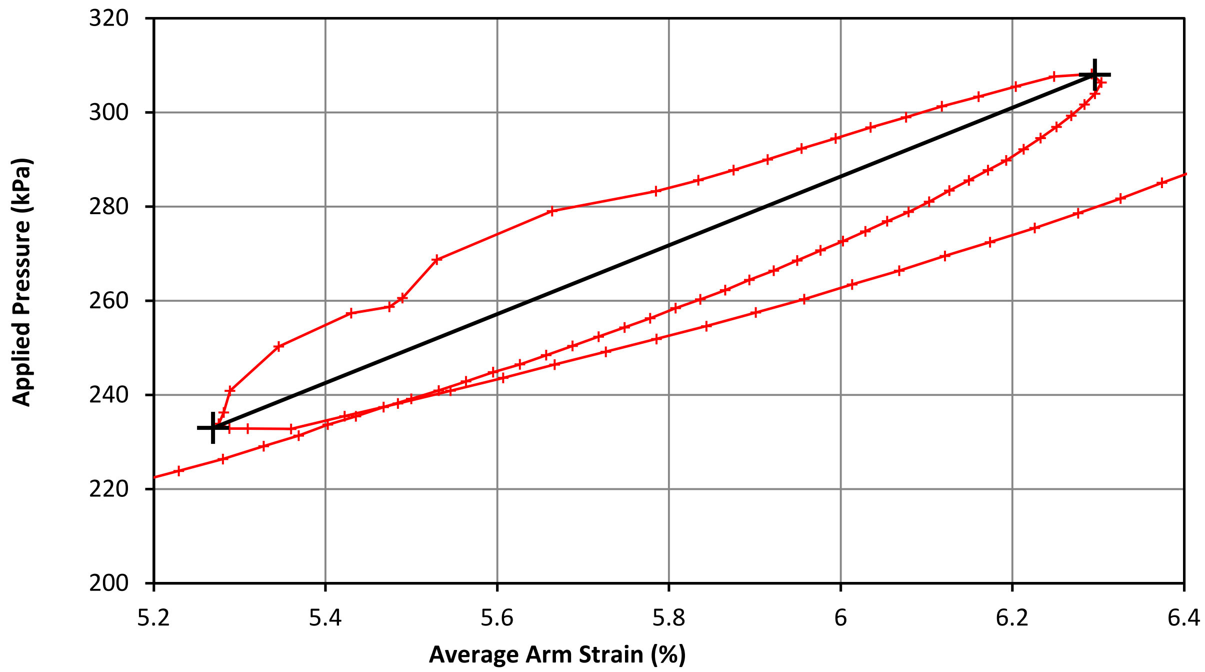
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	8
Borehole	ONSP01	**Test Depth (m)**	14.00



Loop 3	Shear Modulus	5.3 MPa
	Cavity Strain Range	0.627 %



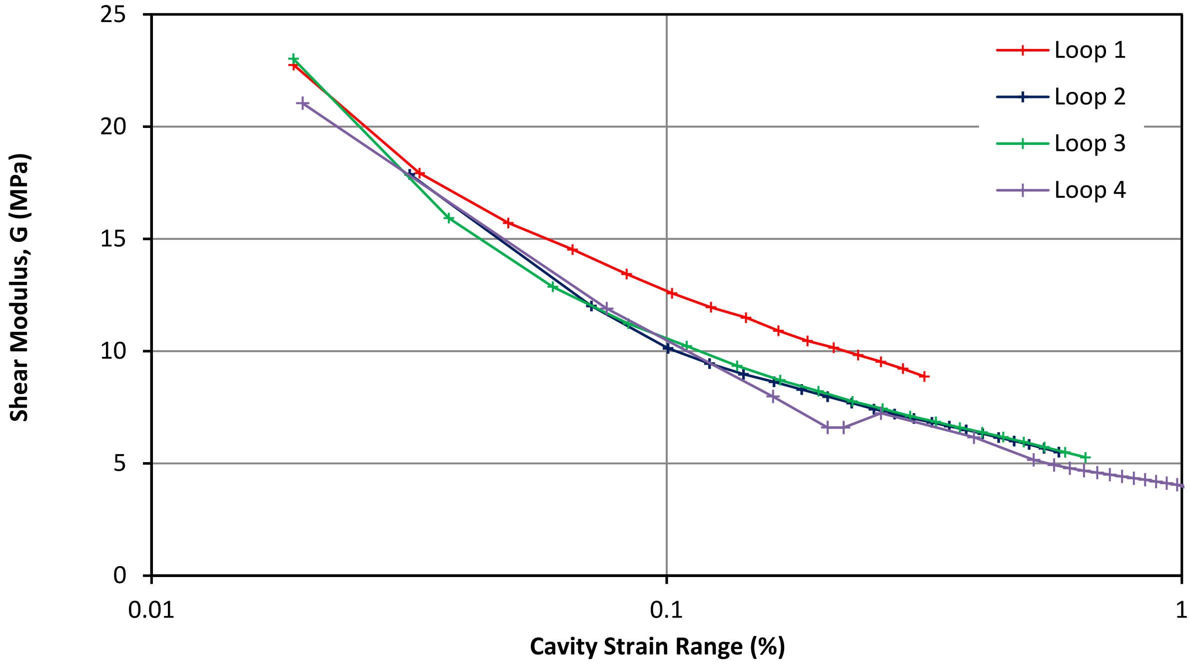
Loop 4	Shear Modulus	3.9 MPa
	Cavity Strain Range	1.027 %

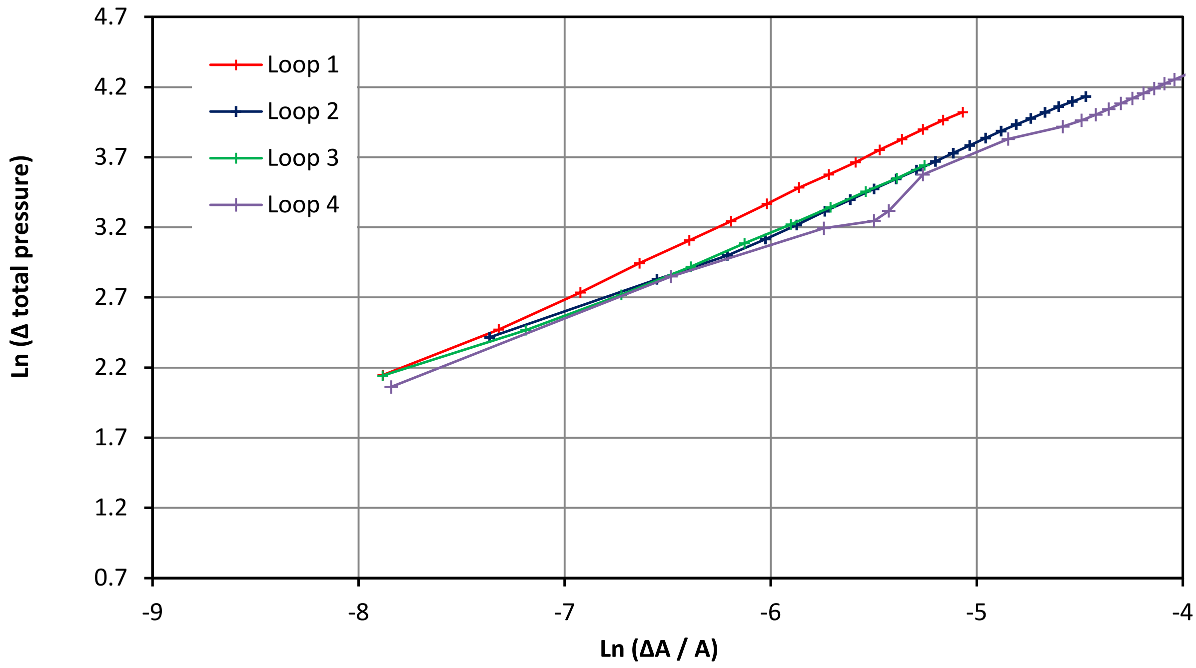
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T08 - 05**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis
Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	Test No.	8
Borehole	ONSP01	Test Depth (m)	14.00





Loop 1		Loop 2		Loop 3		Loop 4	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.680	1.751 (MPa)	0.622	0.999 (MPa)	0.607	0.929 (MPa)	0.586	0.739 (MPa)

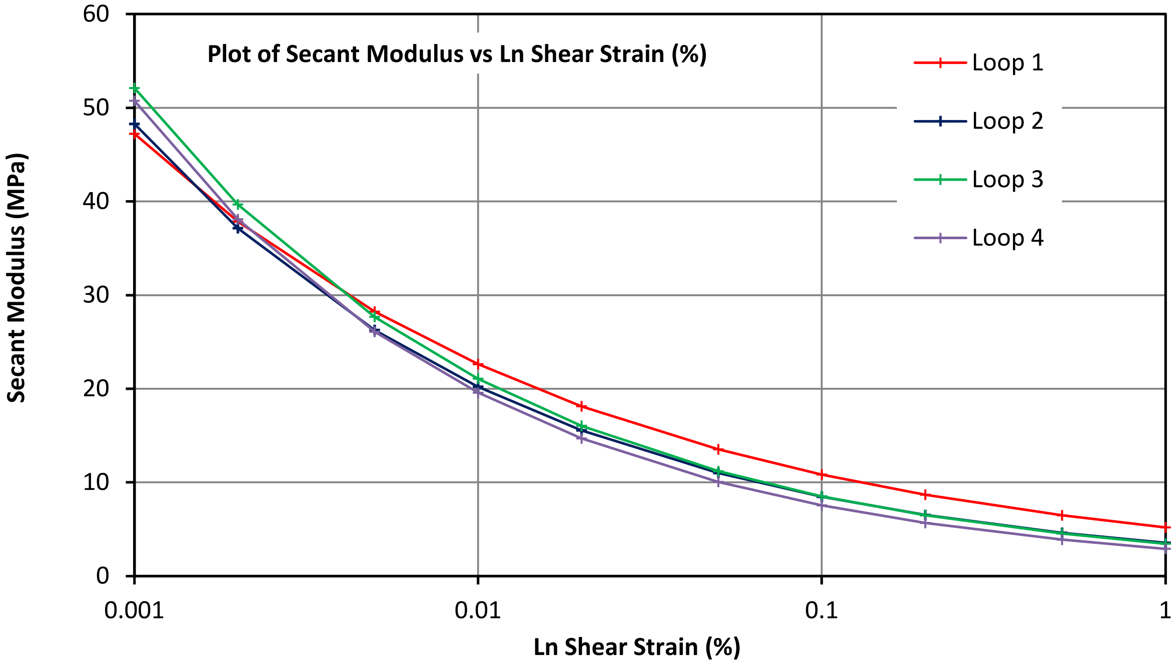
Project	NGI - Onsøy Site	Figure No.	ONSP01 T08 - 06
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU
SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	8
Borehole	ONSP01	**Test Depth (m)**	14.00



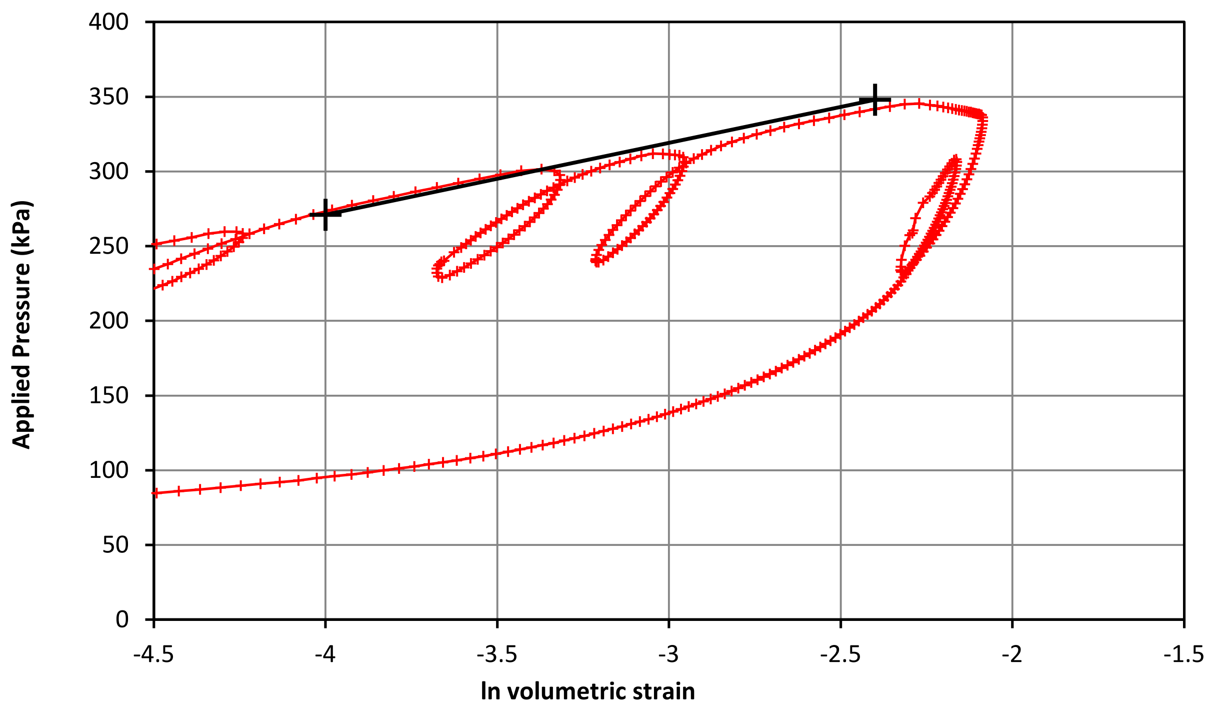
Shear Strain	Loop 1	Loop 2	Loop 3	Loop 4
0.001%	**47**	**48**	**52**	**51**
0.002%	38	37	40	38
0.005%	28	26	28	26
0.010%	**23**	**20**	**21**	**20**
0.020%	18	16	16	15
0.050%	14	11	11	10
0.100%	**11**	**8**	**9**	**8**
0.200%	9	7	6	6
0.500%	6	5	5	4
1.000%	**5**	**4**	**3**	**3**

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T08 - 07**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	8
Borehole	ONSP01	**Test Depth (m)**	14.00



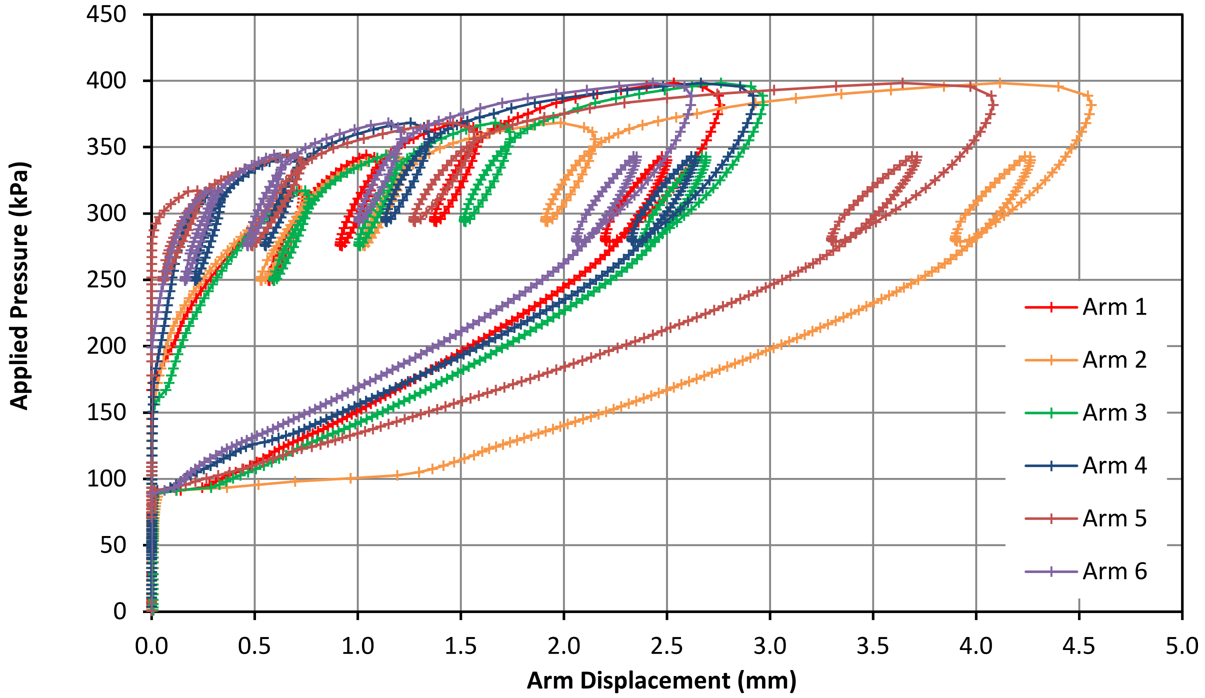
Strength	Undrained Shear	48	kPa
	Limit Pressure	464	kPa

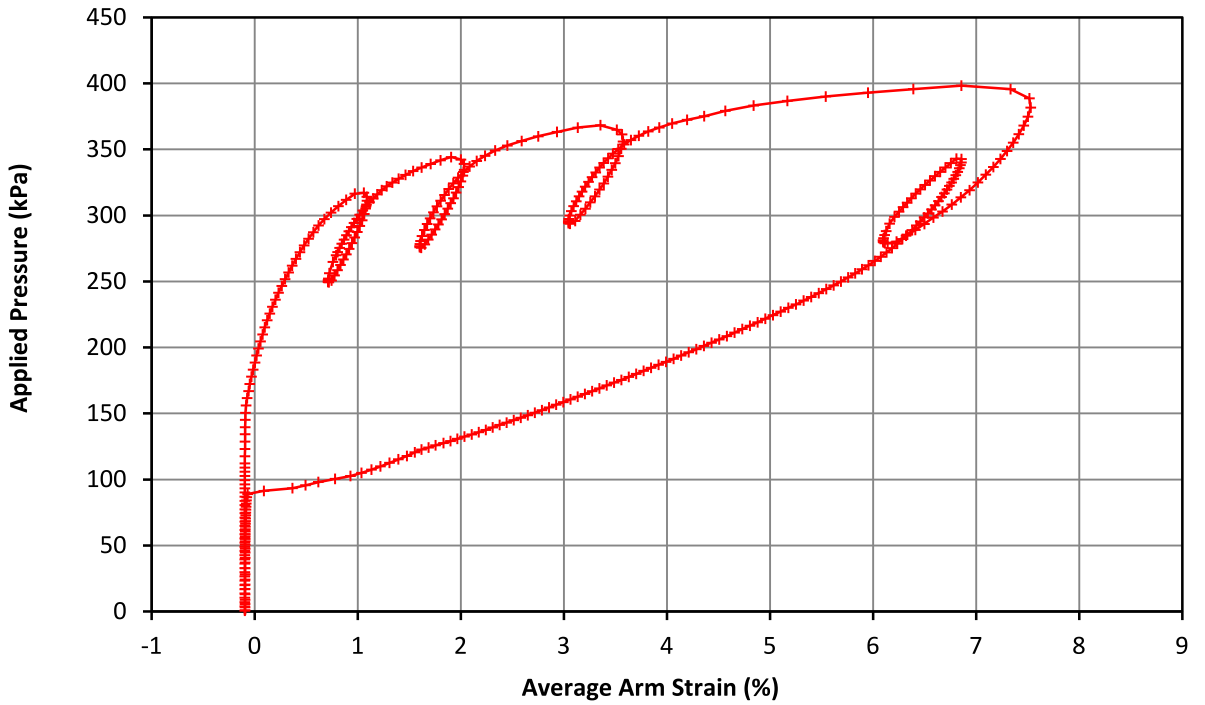
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T08 - 08**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	9
Borehole	ONSP01	**Test Depth (m)**	16.30





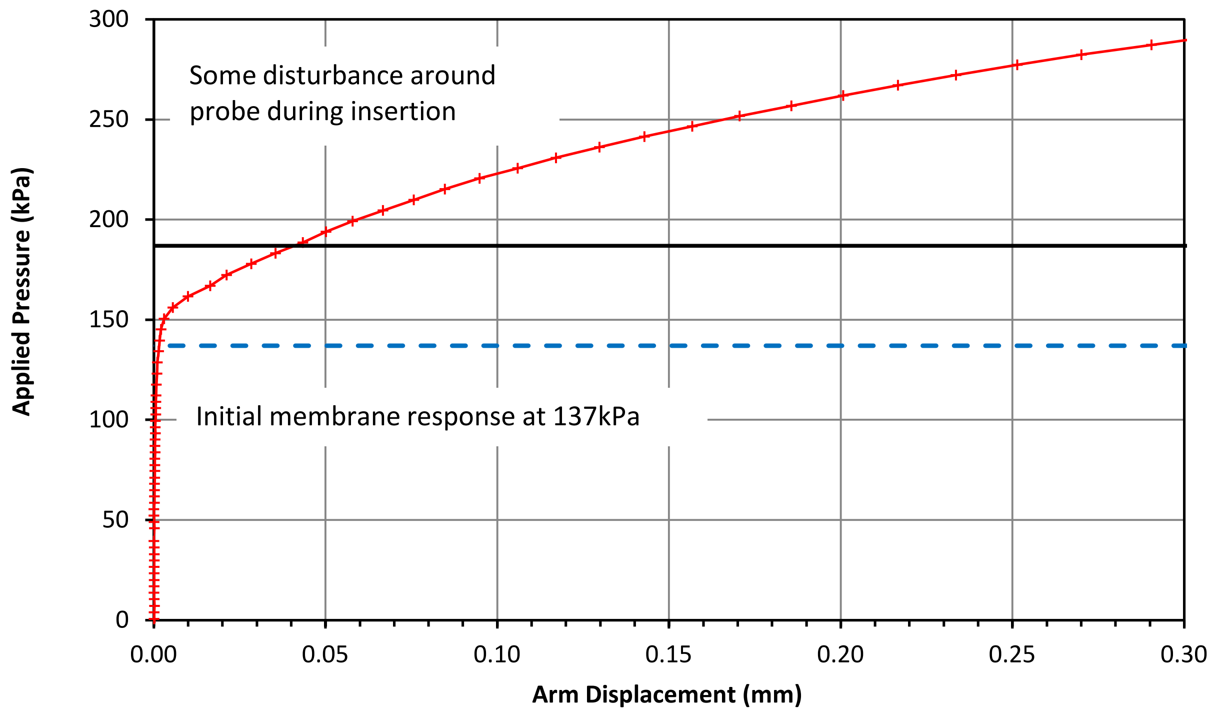
Comments

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T09 - 01**
Client	NGI		
Project No.	P1170112		

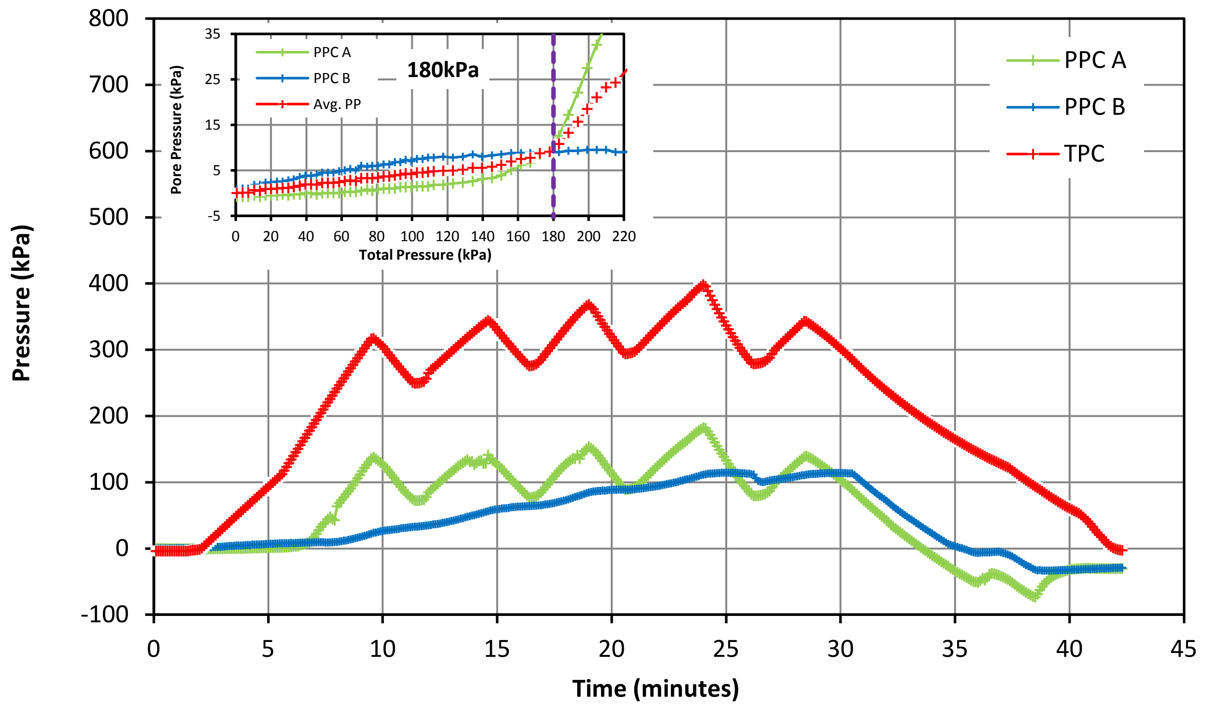
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	9
Borehole	ONSP01	**Test Depth (m)**	16.30



Lift Off Stress (Po)	187 kPa

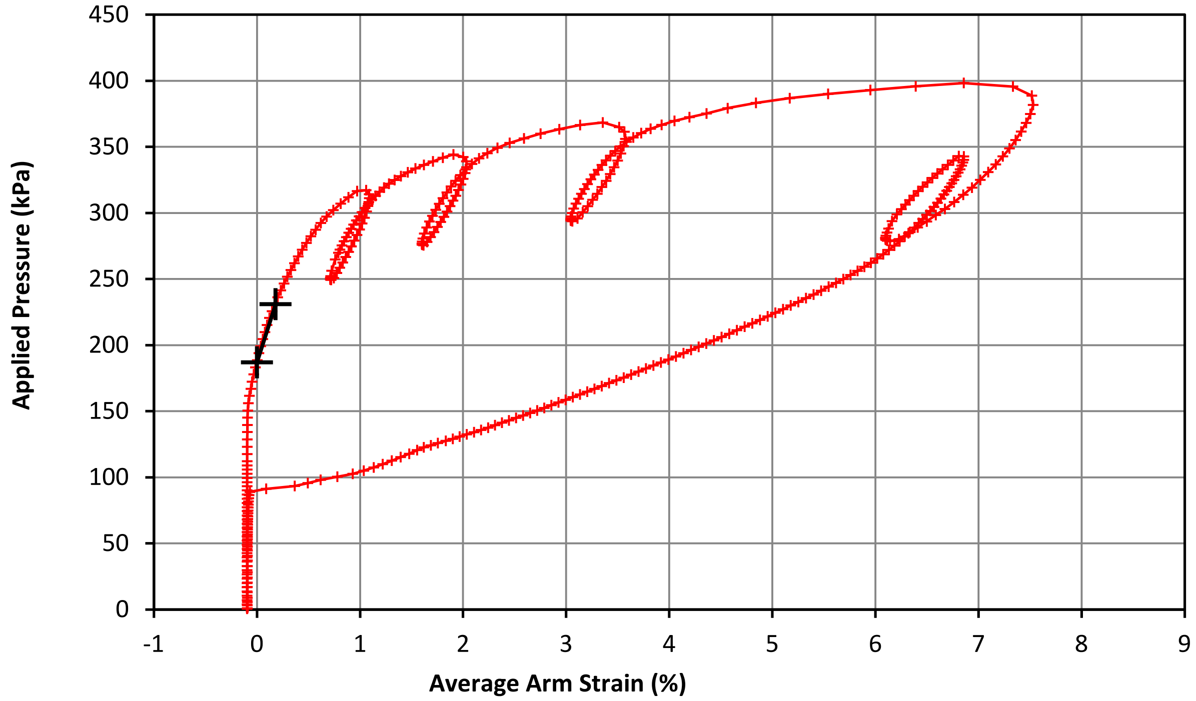


Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T09 - 02**
Client	NGI		
Project No.	P1170112		

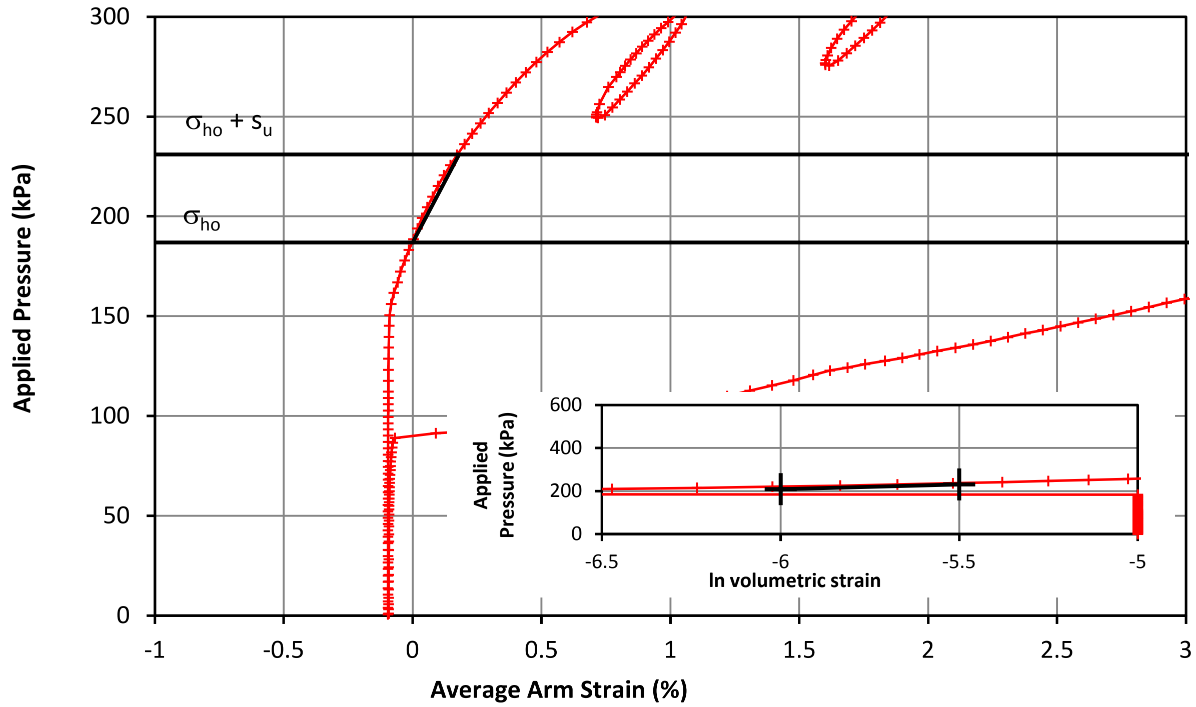
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	9
Borehole	ONSP01	**Test Depth (m)**	16.30



Initial Modulus	Shear Modulus	12.2 MPa



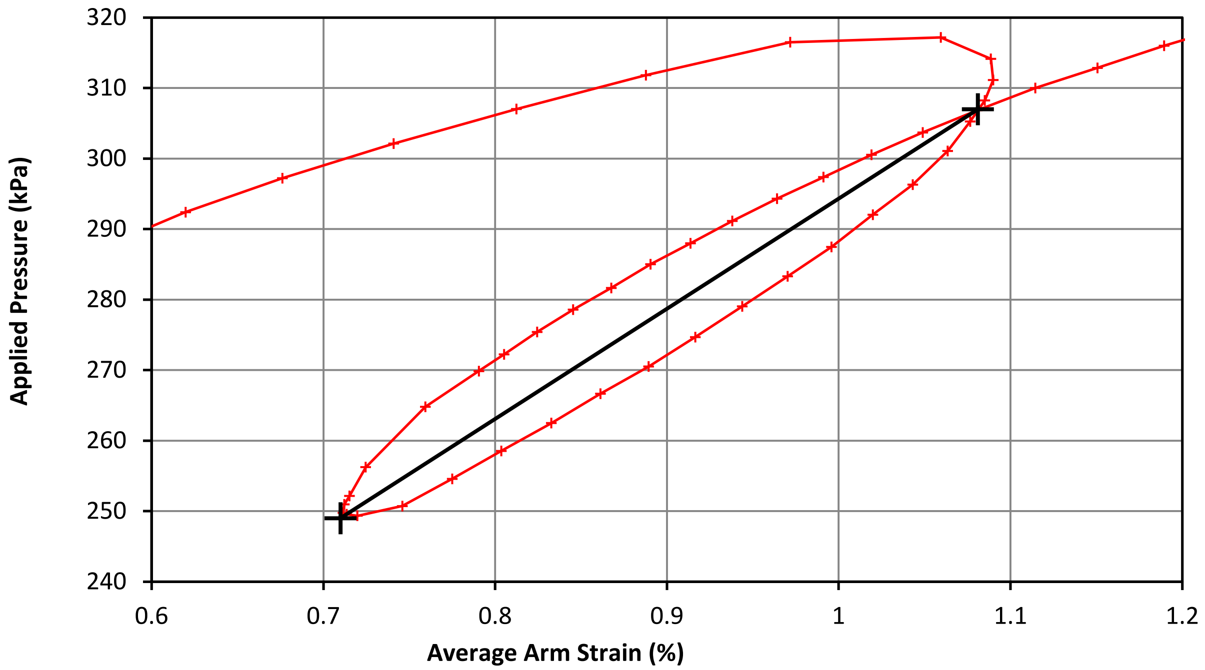
Marsland & Randolph	In situ horizontal stress	187 kPa
	Undrained Strength	44 kPa

Project	NGI - Onsøy Site	**Figure No.**	ONSP01 T09 - 03
Client	NGI		
Project No.	P1170112		

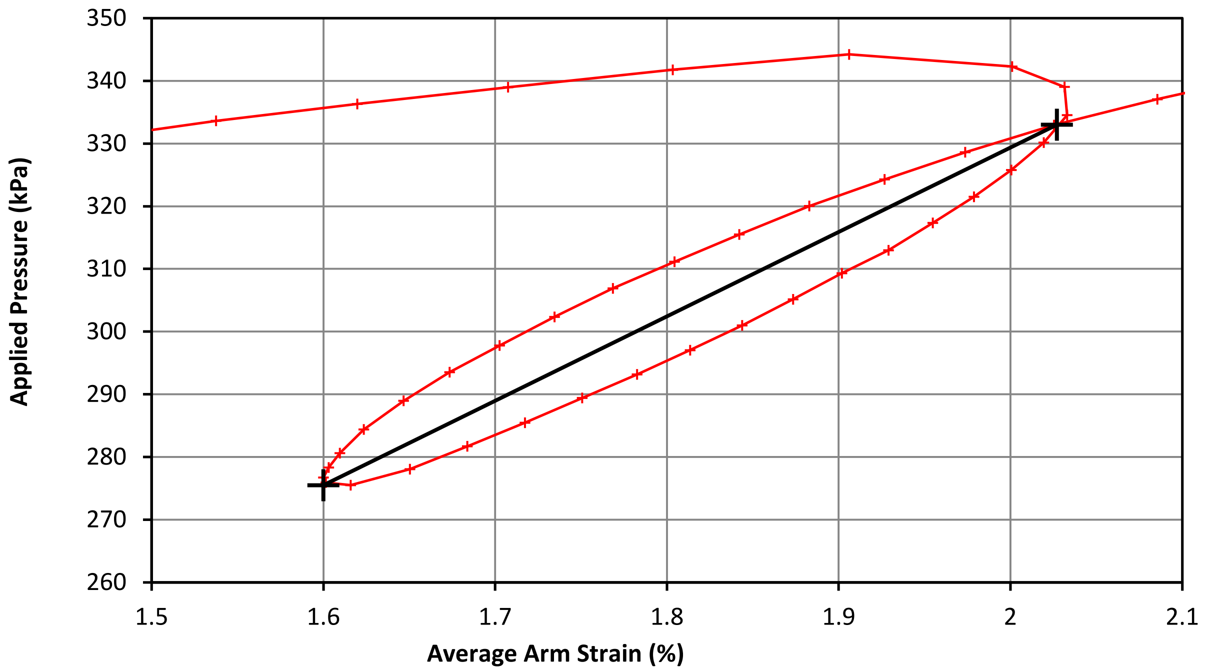
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	9
Borehole	ONSP01	**Test Depth (m)**	16.30



Loop 1	Shear Modulus	7.9 MPa
	Cavity Strain Range	0.371 %



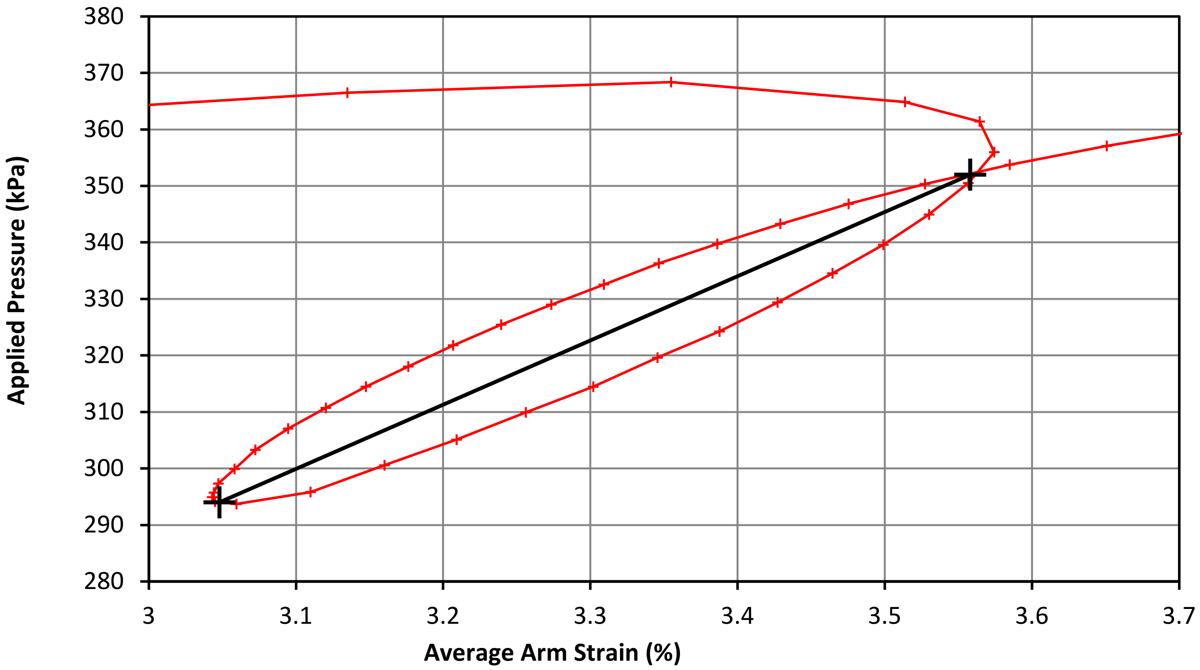
Loop 2	Shear Modulus	6.9 MPa
	Cavity Strain Range	0.427 %

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T09 - 04**
Client	NGI		
Project No.	P1170112		

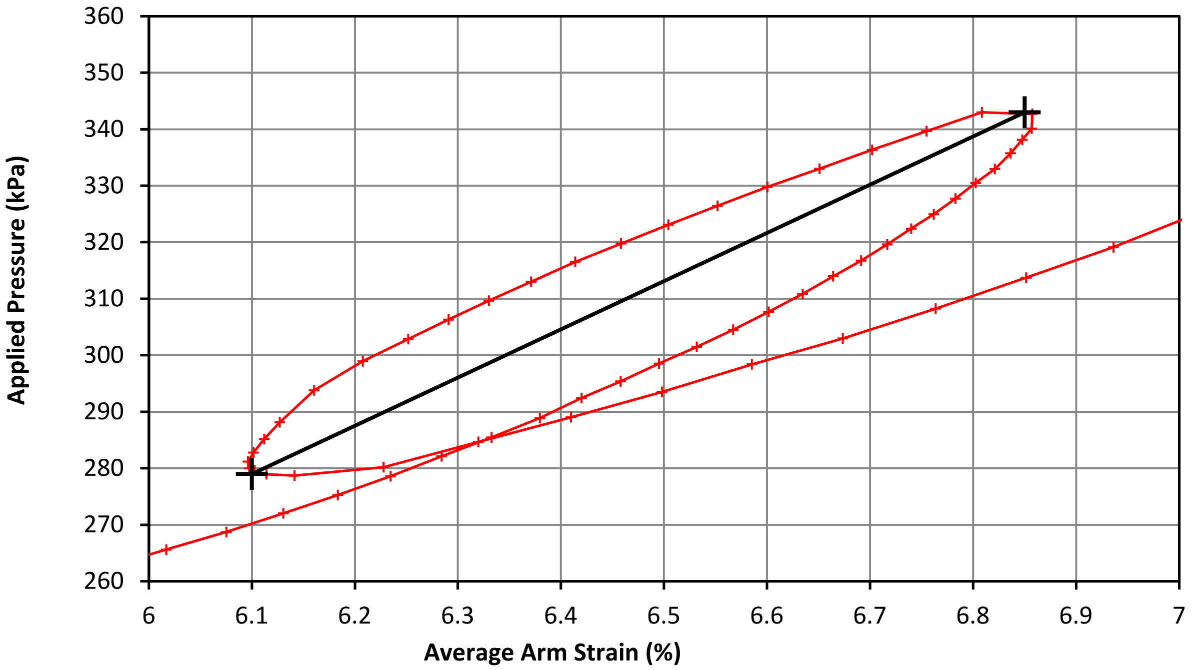
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	9
Borehole	ONSP01	**Test Depth (m)**	16.30



Loop 3	Shear Modulus	5.9 MPa
	Cavity Strain Range	0.510 %



Loop 4	Shear Modulus	4.6 MPa
	Cavity Strain Range	0.750 %

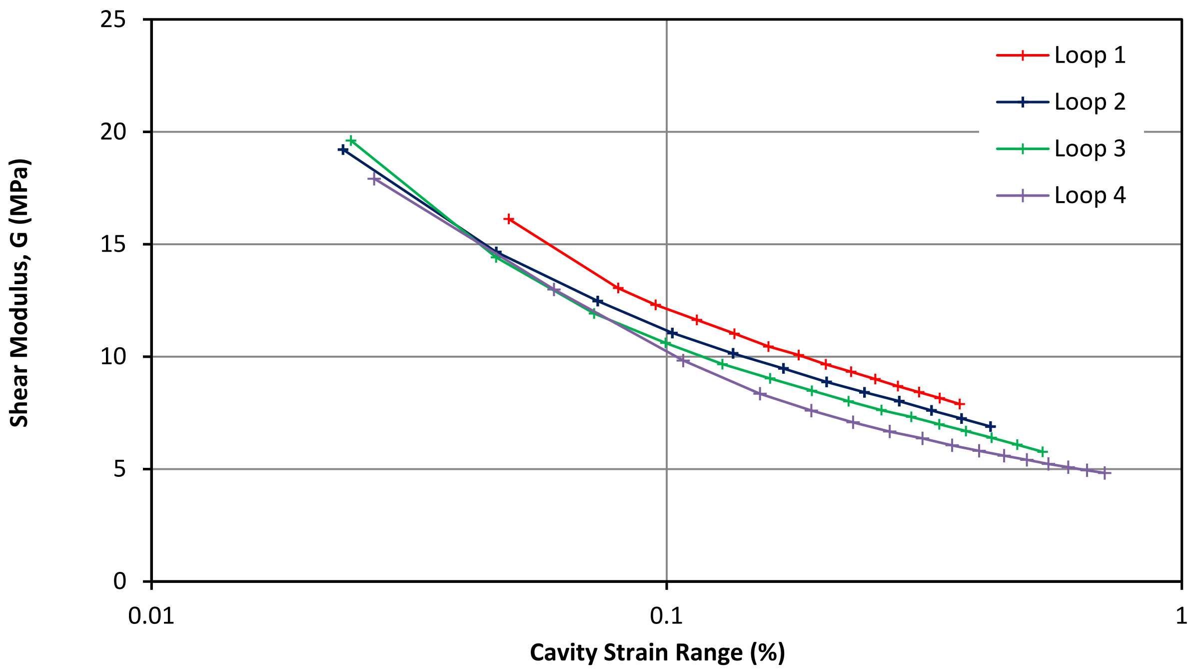
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T09 - 05**
Client	NGI		
Project No.	P1170112		

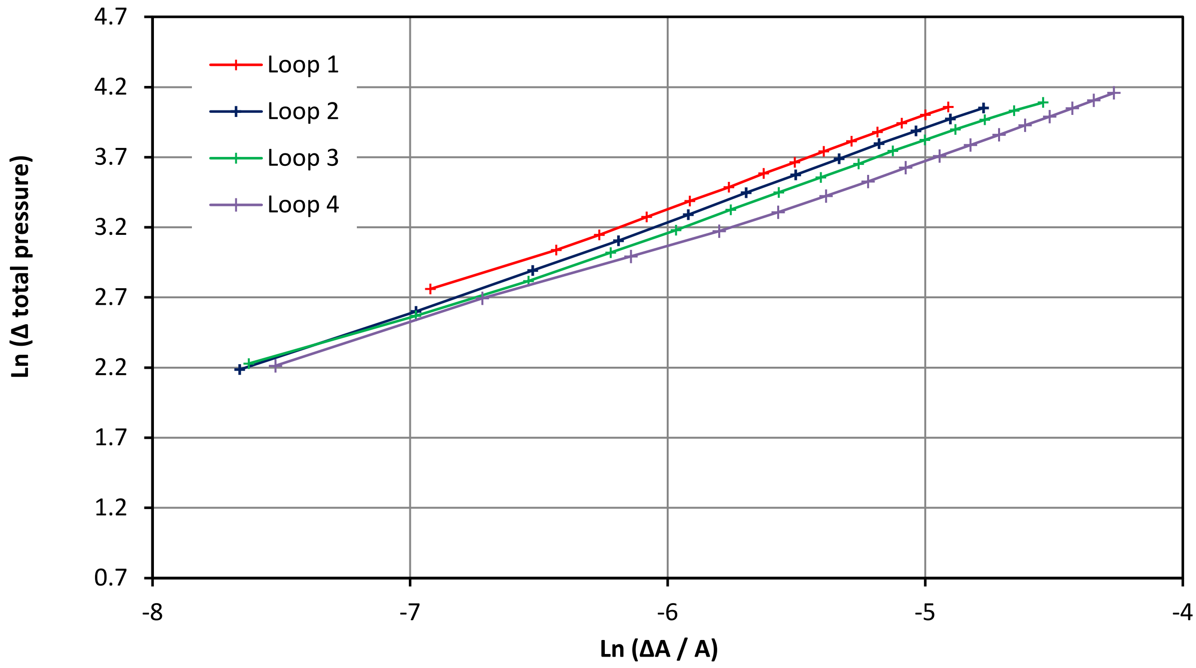
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU
SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	9
Borehole	ONSP01	**Test Depth (m)**	16.30





Loop 1		Loop 2		Loop 3		Loop 4	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.660	1.476 (MPa)	0.655	1.307 (MPa)	0.623	1.018 (MPa)	0.598	0.793 (MPa)

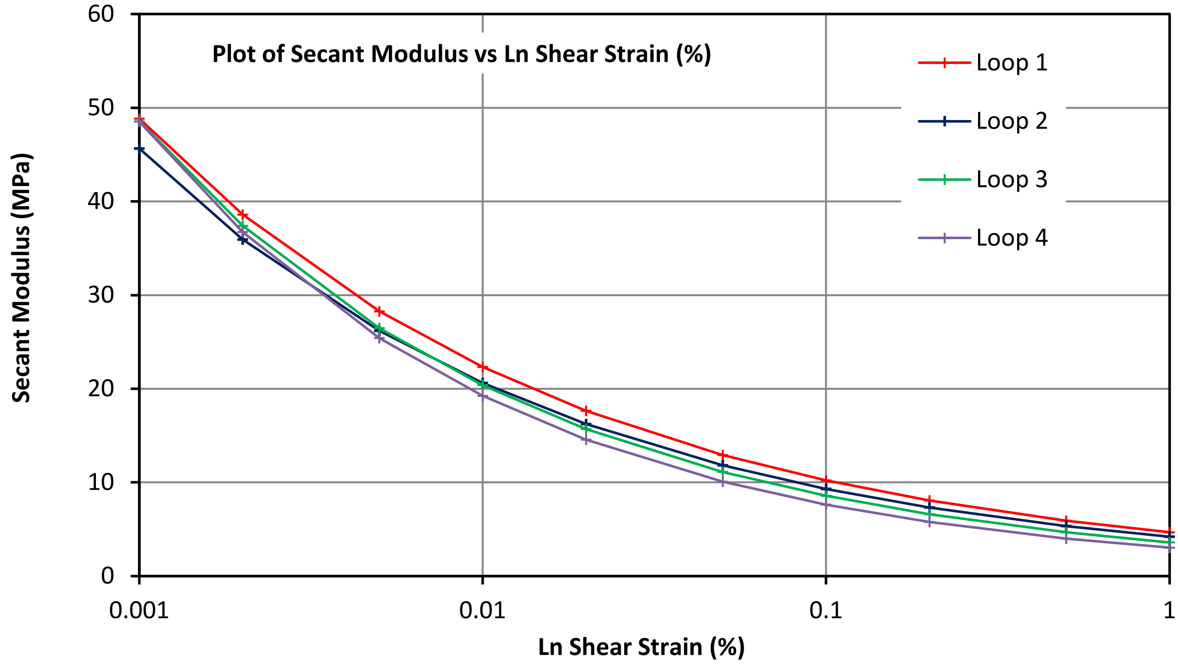
Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T09 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

IN SITU
SITE INVESTIGATION

Test Date	22/09/2017	Test No.	9
Borehole	ONSP01	Test Depth (m)	16.30



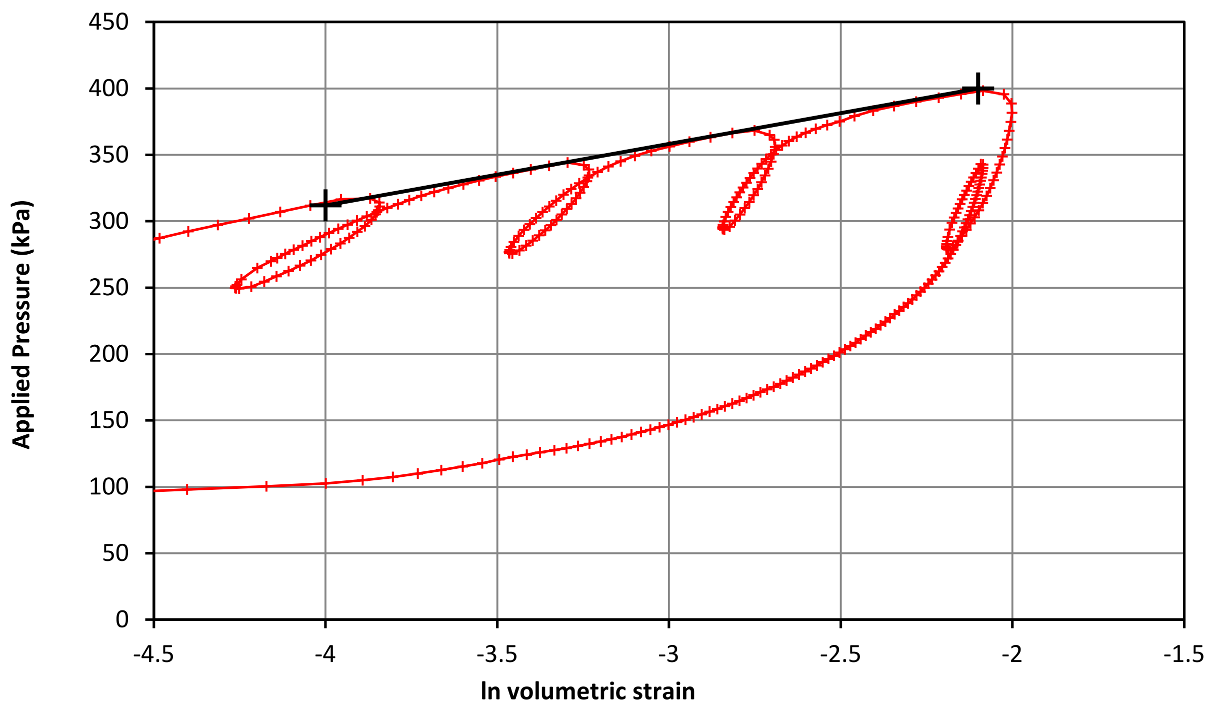
Shear Strain	Loop 1	Loop 2	Loop 3	Loop 4
0.001%	**49**	**46**	**49**	**49**
0.002%	39	36	37	37
0.005%	28	26	26	25
0.010%	**22**	**21**	**20**	**19**
0.020%	18	16	16	15
0.050%	13	12	11	10
0.100%	**10**	**9**	**9**	**8**
0.200%	8	7	7	6
0.500%	6	5	5	4
1.000%	**5**	**4**	**4**	**3**

Project	NGI - Onsøy Site	Figure No.	ONSP01 T09 - 07
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

IN SITU SITE INVESTIGATION

Test Date	22/09/2017	**Test No.**	9
Borehole	ONSP01	**Test Depth (m)**	16.30

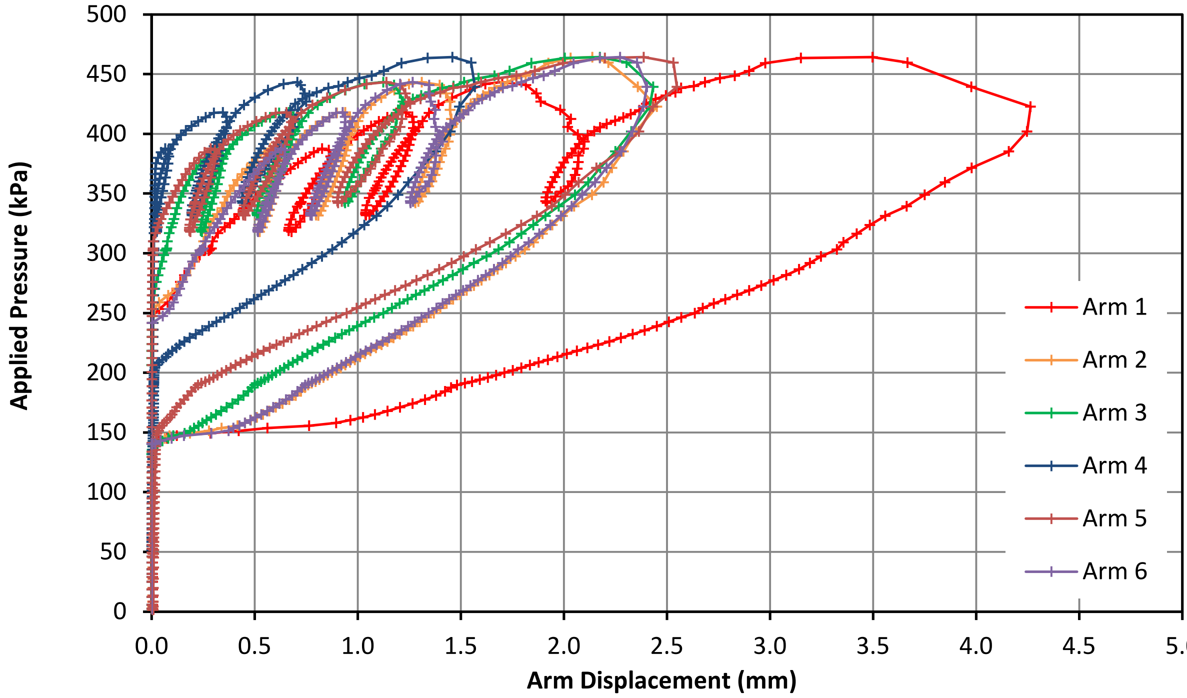


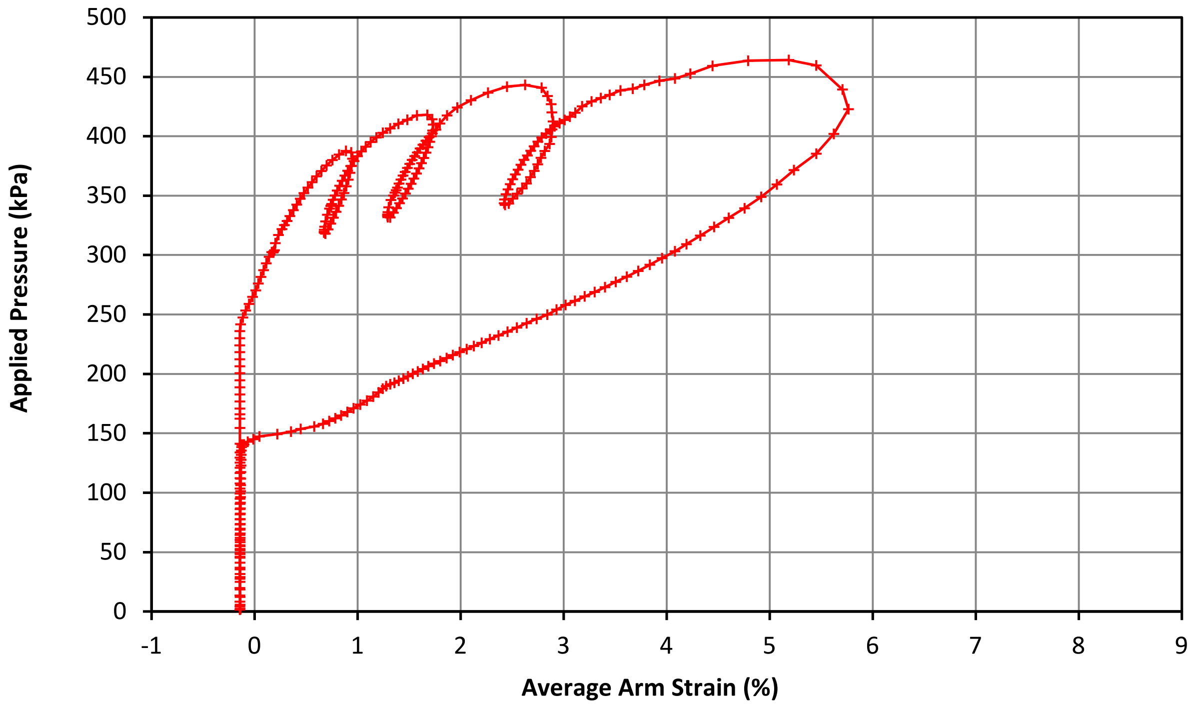
Strength	Undrained Shear	46	kPa
	Limit Pressure	497	kPa

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T09 - 08**
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Overview

Test Date	23/09/2017	**Test No.**	10
Borehole	ONSP01	**Test Depth (m)**	18.00





Comments

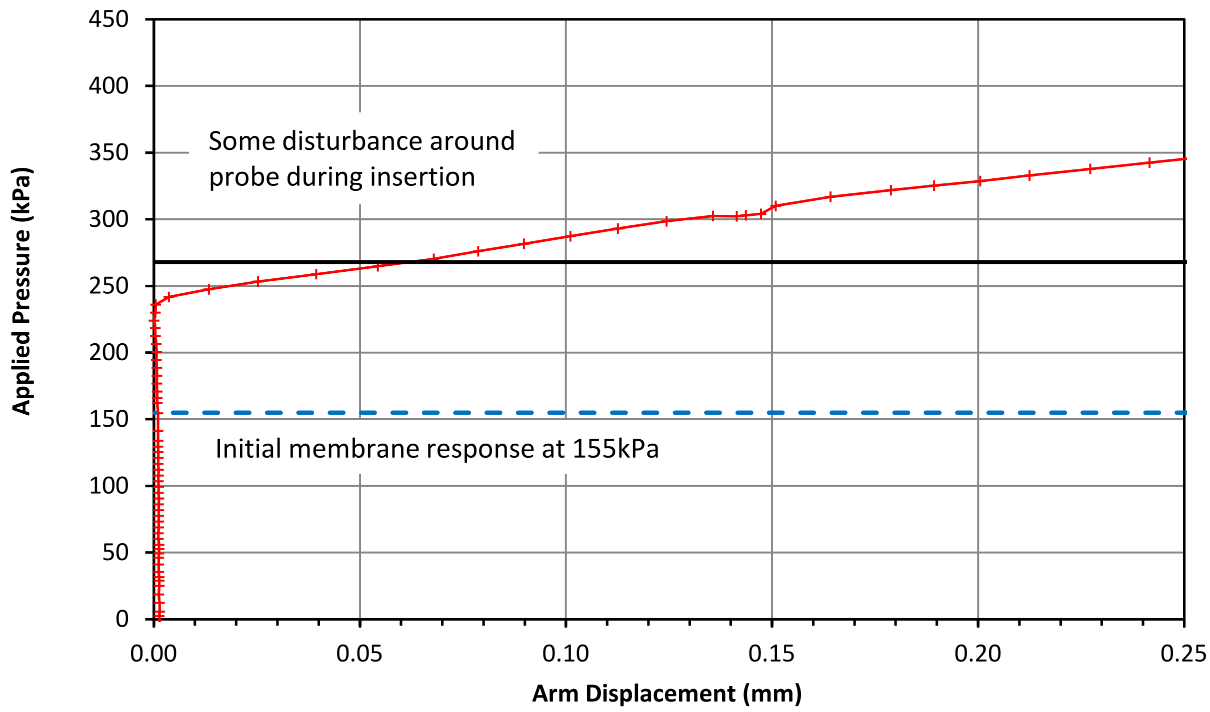
Large uneven displacement on arm 1, membrane pulled out of instrument.
Pore pressure cell A fluctuating.

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T10 - 01**
Client	NGI		
Project No.	P1170112		

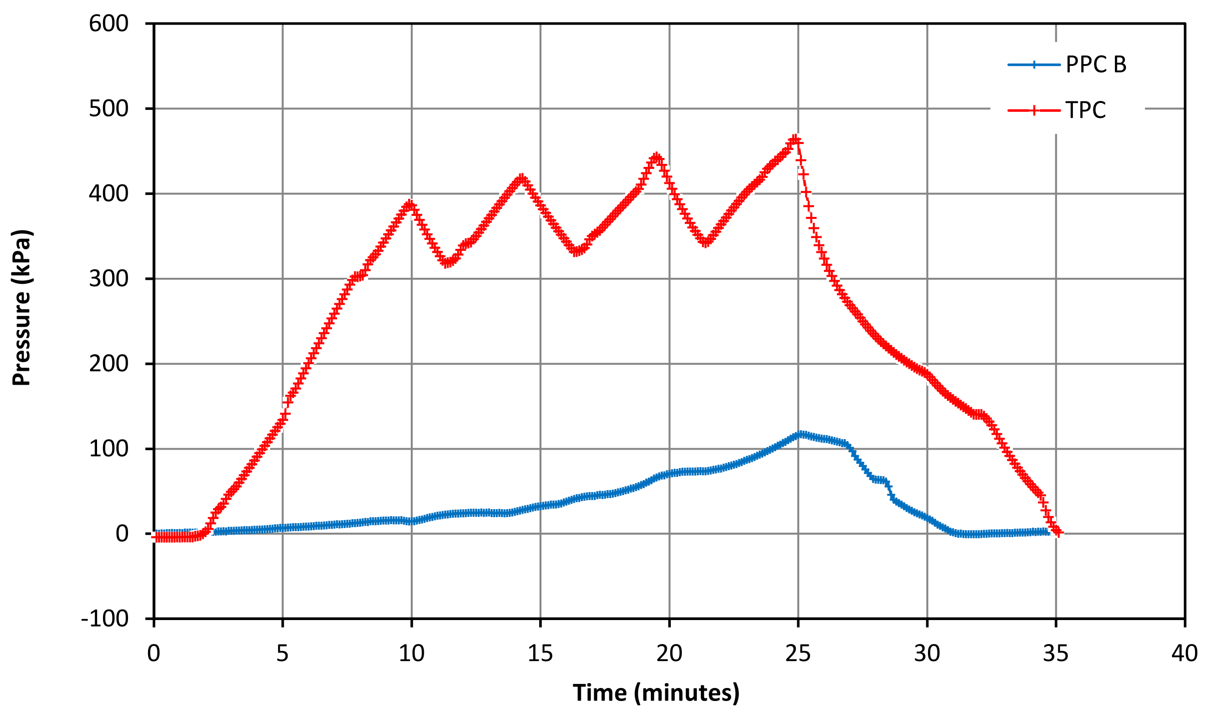
Pressuremeter Test - Lift Off Stress & Pore Pressure Record

IN SITU SITE INVESTIGATION

Test Date	23/09/2017	**Test No.**	10
Borehole	ONSP01	**Test Depth (m)**	18.00



Lift Off Stress (Po)	268 kPa

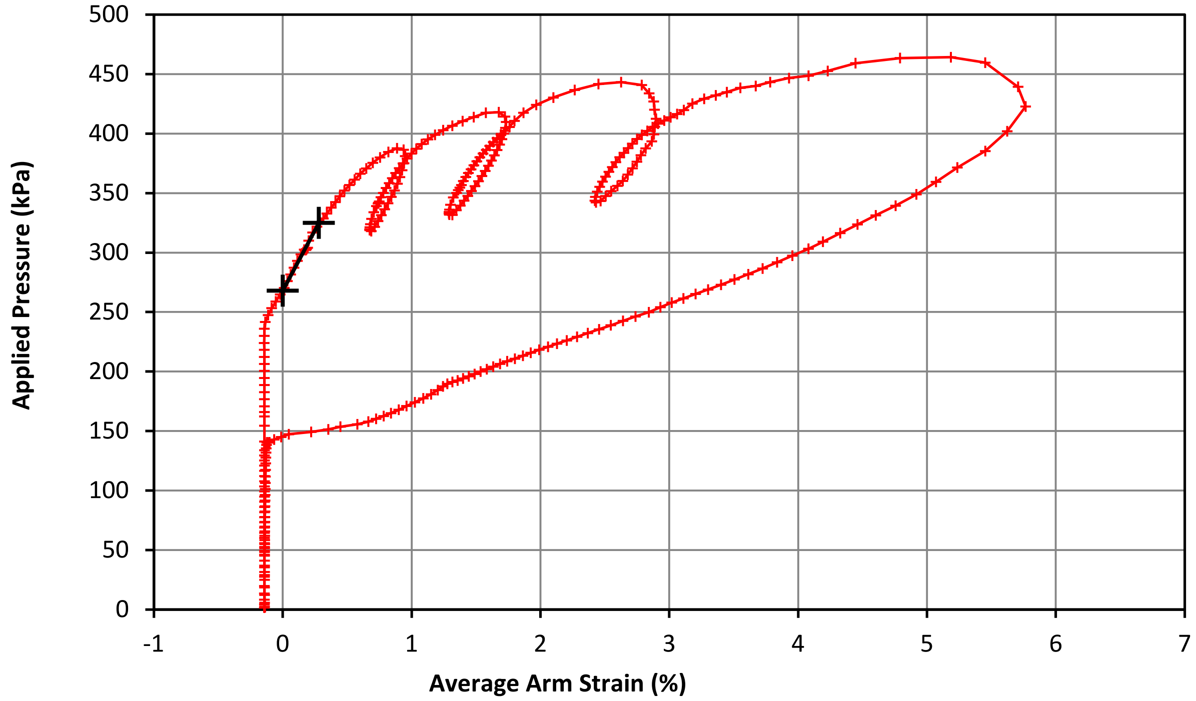


Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T10 - 02**
Client	NGI		
Project No.	P1170112		

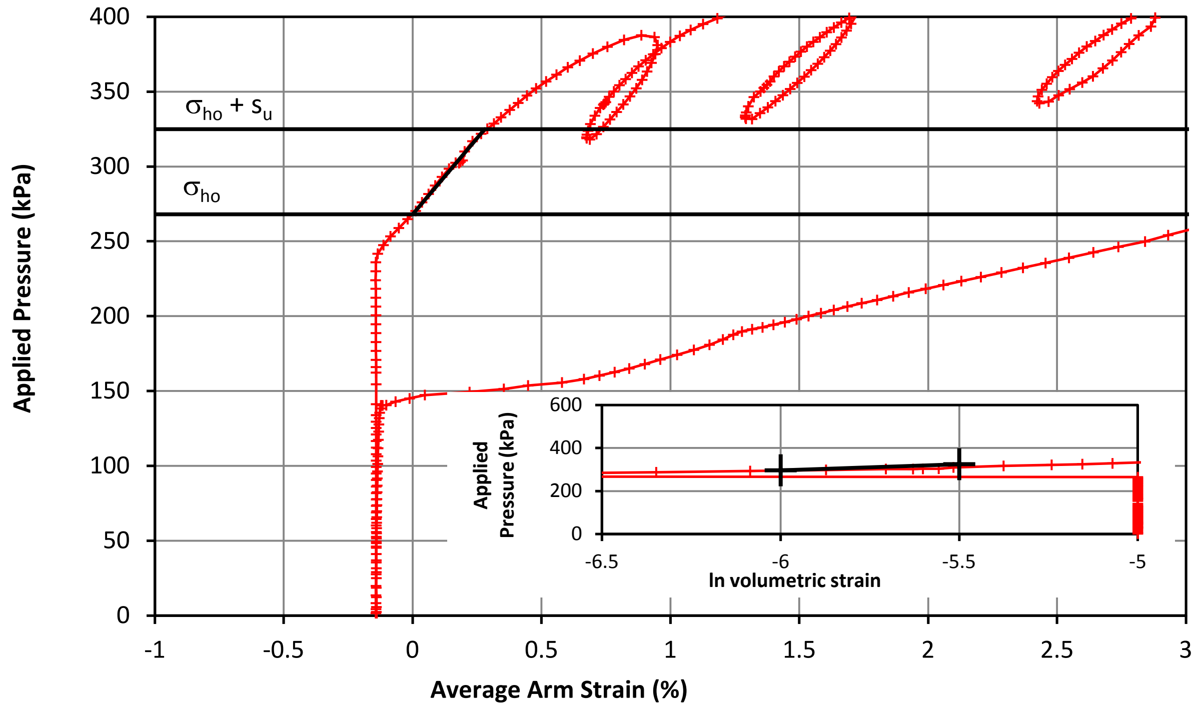
Pressuremeter Test Initial Modulus & In Situ Horizontal Stress

IN SITU SITE INVESTIGATION

Test Date	23/09/2017	Test No.	10
Borehole	ONSP01	Test Depth (m)	18.00



Initial Modulus	Shear Modulus	10.2 MPa



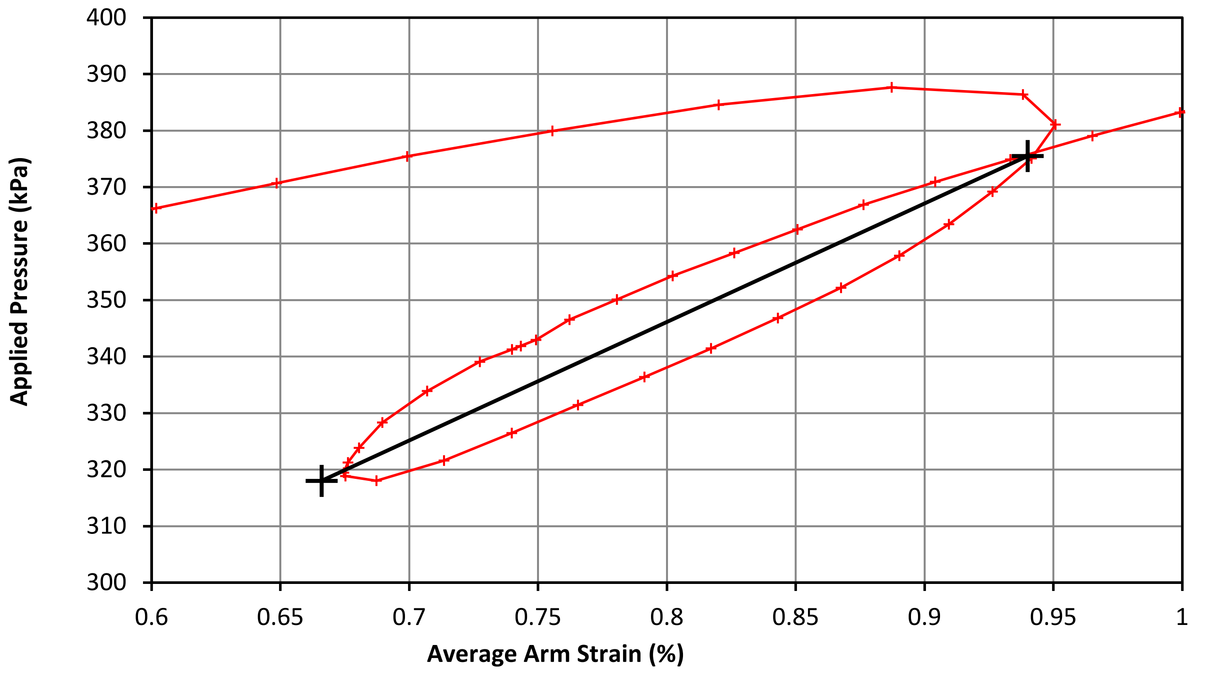
Marsland & Randolph	In situ horizontal stress	268 kPa
	Undrained Strength	57 kPa

Project	NGI - Onsøy Site	Figure No.	ONSP01 T10 - 03
Client	NGI		
Project No.	P1170112		

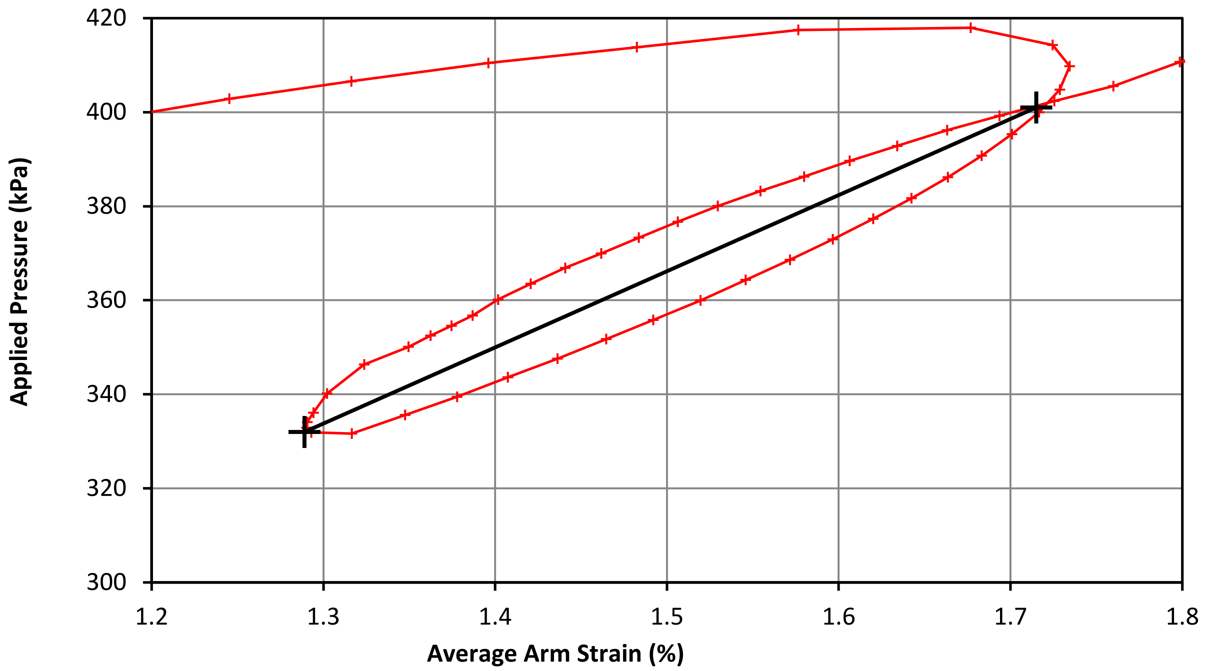
Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	23/09/2017	Test No.	10
Borehole	ONSP01	Test Depth (m)	18.00



Loop 1	Shear Modulus	10.6	MPa
	Cavity Strain Range	0.274	%



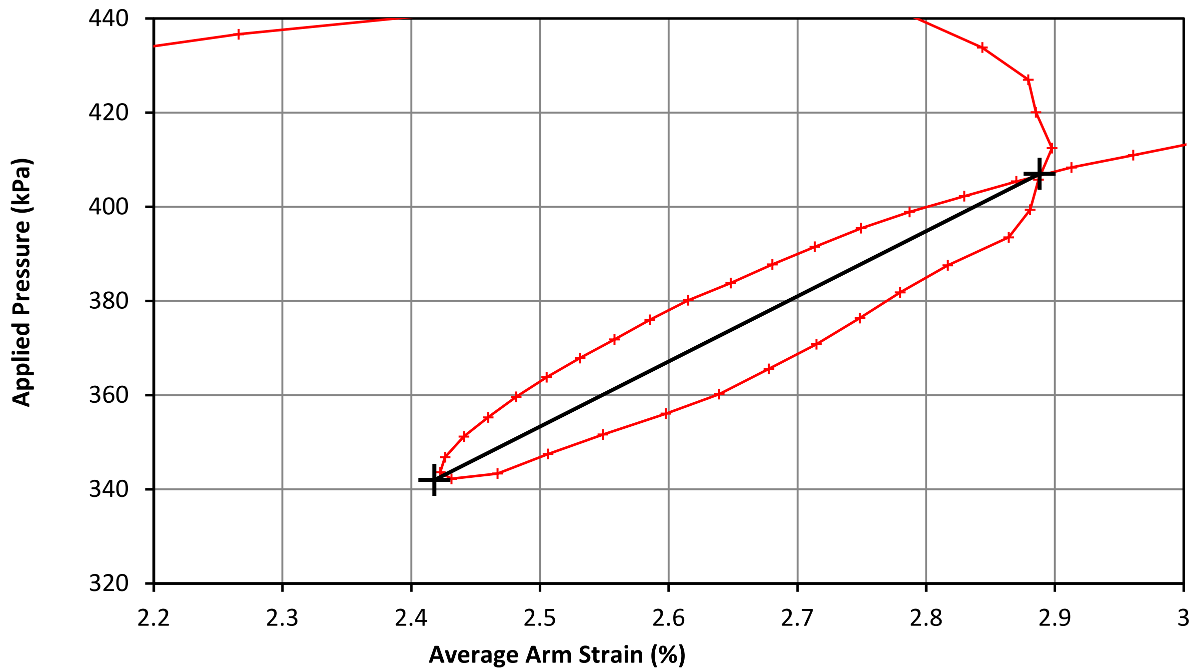
Loop 2	Shear Modulus	8.2	MPa
	Cavity Strain Range	0.426	%

Project	NGI - Onsøy Site	Figure No.	ONSP01 T10 - 04
Client	NGI		
Project No.	P1170112		

Pressuremeter Test Unload Reload Loop

IN SITU SITE INVESTIGATION

Test Date	23/09/2017	**Test No.**	10
Borehole	ONSP01	**Test Depth (m)**	18.00



Loop 3	Shear Modulus	7.1 MPa
	Cavity Strain Range	0.470 %

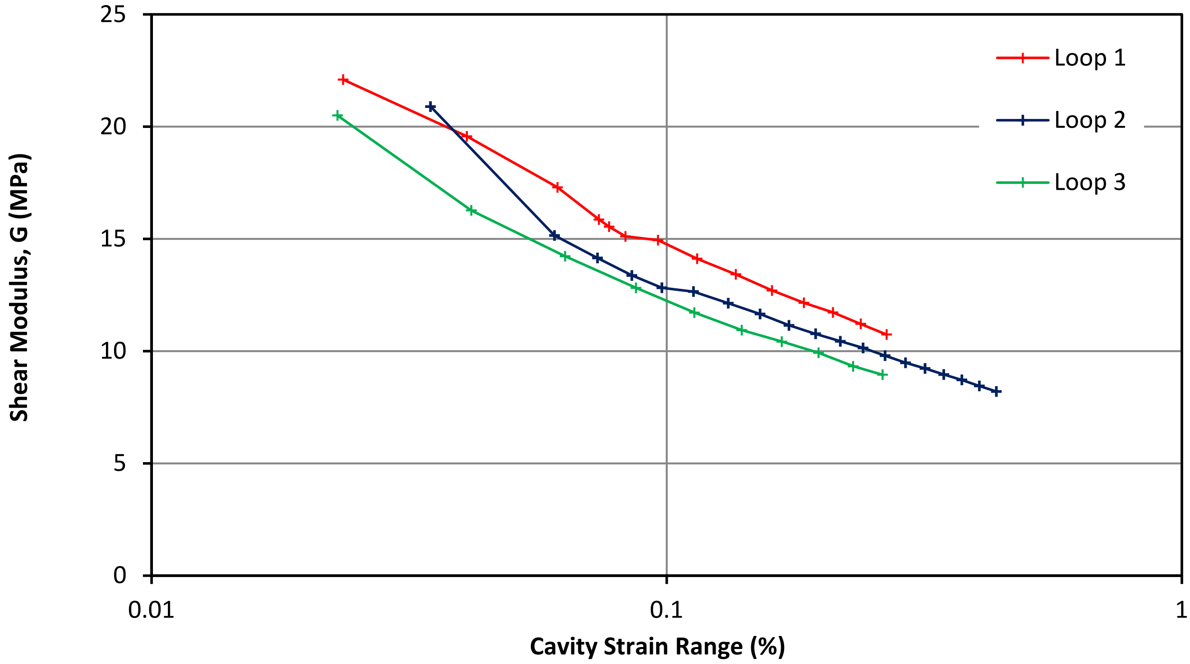
Project	NGI - Onsøy Site	**Figure No.**	ONSP01 T10 - 05
Client	NGI		
Project No.	P1170112		

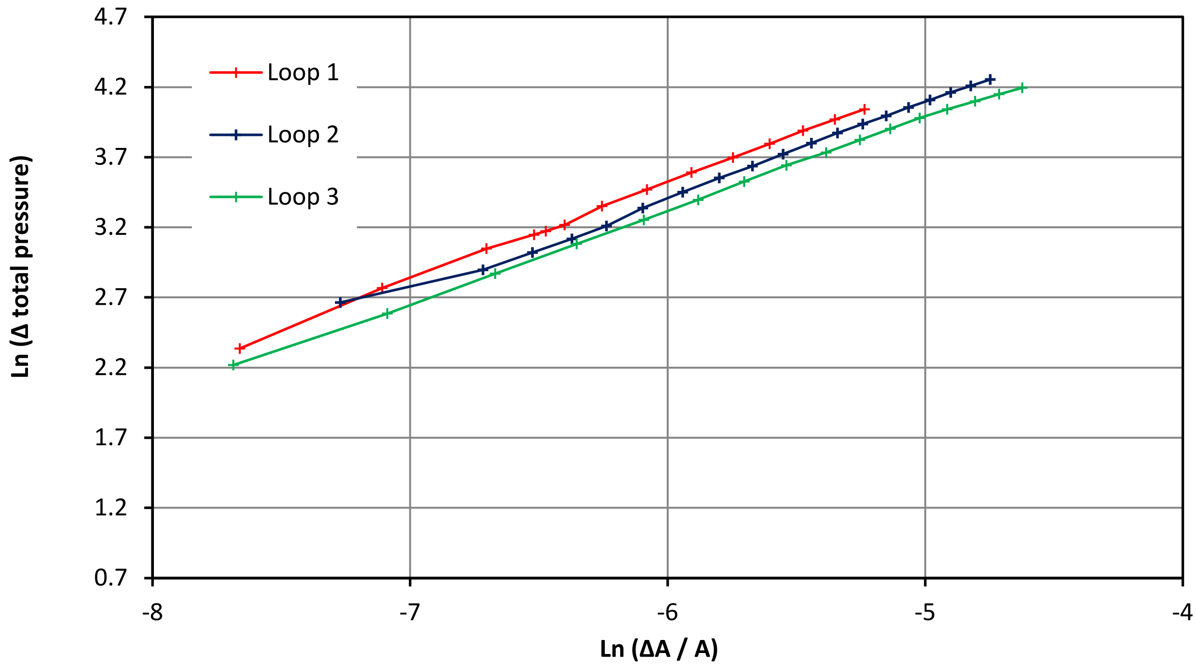
Pressuremeter Analysis

Small Strain Stiffness and Bolton and Whittle (1999)

IN SITU SITE INVESTIGATION

Test Date	23/09/2017	**Test No.**	10
Borehole	ONSP01	**Test Depth (m)**	18.00





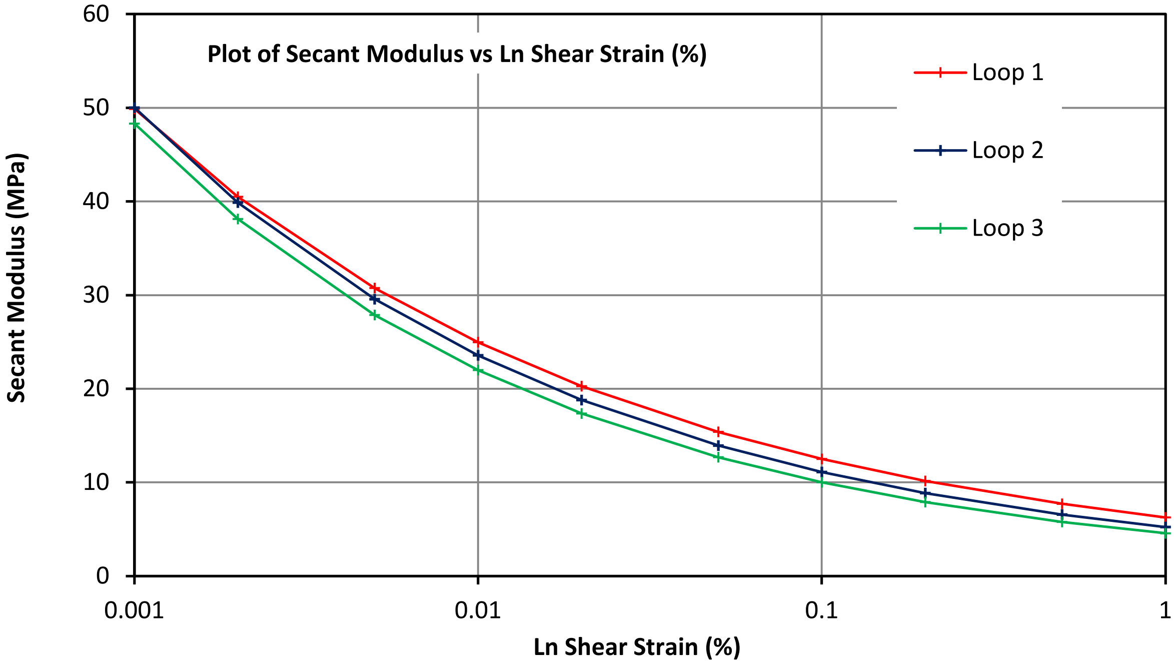
Loop 1		**Loop 2**		**Loop 3**	
Gradient(β)	Intercept	Gradient(β)	Intercept	Gradient(β)	Intercept
0.700	2.242 (MPa)	0.673	1.726 (MPa)	0.658	1.435 (MPa)

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T10 - 06**
Client	NGI		
Project No.	P1170112		

Pressuremeter Analysis

Secant Modulus - Shear Strain (%)

Test Date	23/09/2017	Test No.	10
Borehole	ONSP01	Test Depth (m)	18.00



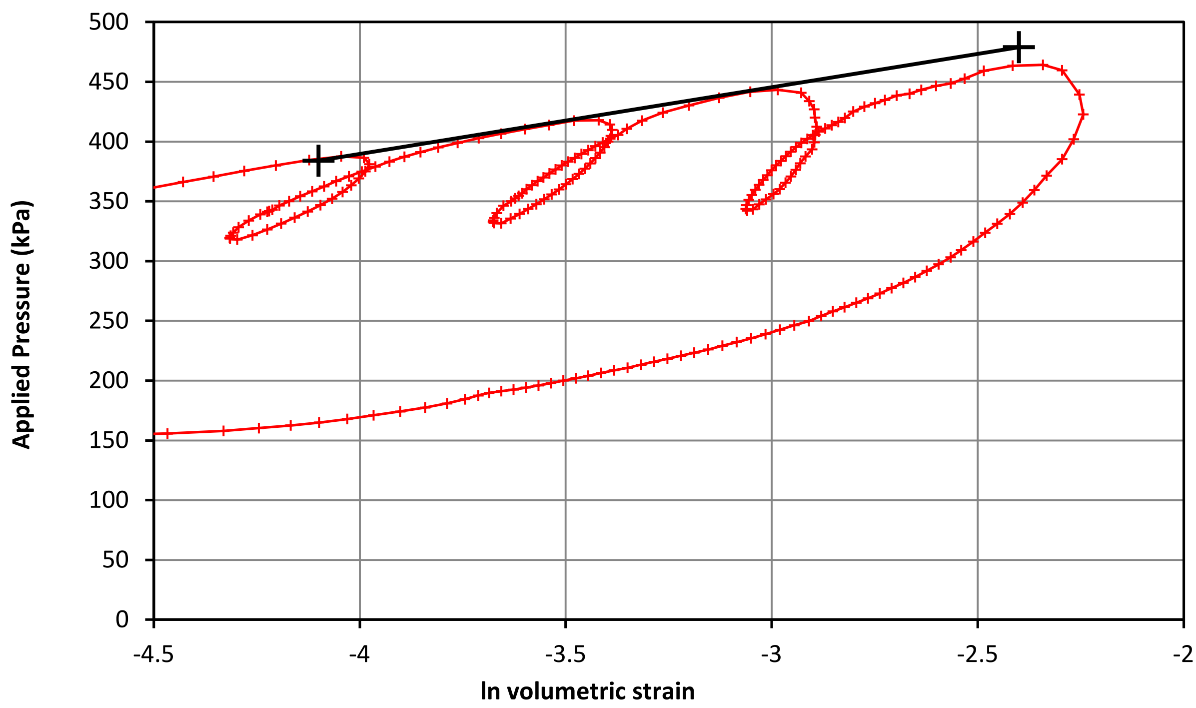
Shear Strain	Loop 1	Loop 2	Loop 3
0.001%	**50**	**50**	**48**
0.002%	40	40	38
0.005%	31	30	28
0.010%	**25**	**24**	**22**
0.020%	20	19	17
0.050%	15	14	13
0.100%	**12**	**11**	**10**
0.200%	10	9	8
0.500%	8	7	6
1.000%	**6**	**5**	**5**

Project	NGI - Onsøy Site	Figure No.	ONSP01 T10 - 07
Client	NGI		
Project No.	P1170112		

Pressuremeter Test - Strength

IN SITU
SITE INVESTIGATION

Test Date	23/09/2017	**Test No.**	10
Borehole	ONSP01	**Test Depth (m)**	18.00



Strength	Undrained Shear	56	kPa
	Limit Pressure	613	kPa

Project	NGI - Onsøy Site	**Figure No.**	**ONSP01 T10 - 08**
Client	NGI		
Project No.	P1170112		

APPENDIX B

Calibrations

Description	Date of Calibration
SBP - Beatrice (pre contract)	08/09/2017
SBP Membrane Calibration	15/09/2017

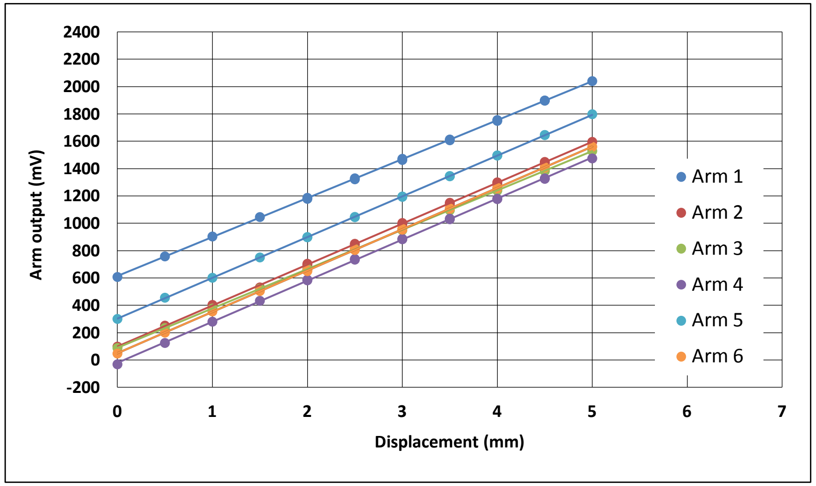
SBP ISSI

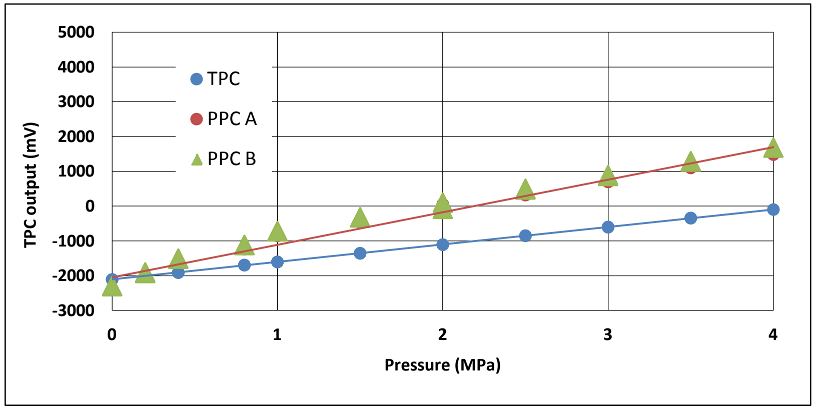
Beatrice - SBP01

IN SITU SITE INVESTIGATION

Arms	08/09/2017					
Displacement	Arm 1	Arm 2	Arm 3	Arm 4	Arm 5	Arm 6
mm	mV	mV	mV	mV	mV	mV
0	607.1	97.8	87.5	-31.7	300.3	47.1
0.5	757.7	251.4	233.7	124.4	455.5	199.9
1	903.2	402.9	376.6	280.1	601.4	354.7
1.5	1045.4	530.8	522.1	433.0	750.0	504.4
2	1186.2	703.9	667.1	587.2	899.2	656.7
2.5	1328.7	849.9	813.0	738.8	1046.6	809.7
3	1471.6	1001.9	955.4	886.1	1195.8	959.7
3.5	1612.7	1150.0	1099.9	1033.7	1345.7	1109.3
4	1755.1	1299.3	1242.8	1179.4	1496.5	1260.3
4.5	1898.2	1448.7	1382.5	1328.2	1645.9	1410.0
5	2039.8	1595.5	1528.6	1474.4	1797.6	1559.5
4.5	1896.5	1443.7	1381.2	1324.9	1645.1	1406.4
4	1749.0	1293.3	1238.5	1176.8	1495.2	1254.9
3.5	1607.2	1142.6	1094.7	1029.4	1343.6	1106.2
3	1463.0	993.5	948.9	883.0	1193.1	953.4
2.5	1321.6	843.8	807.1	733.8	1044.4	804.2
2	1178.6	694.7	662.1	582.6	897.4	649.9
1.5	1035.8	546.3	518.2	429.8	749.1	497.8
1	895.8	395.8	374.4	275.4	600.7	347.6
0.5	753.6	246.0	230.6	121.9	452.9	195.8
0	608.6	94.1	86.6	-33.9	305.8	45.1
Slope (mV/mm)	285.6	299.9	288.1	301.3	298.1	302.7
Zero (mV)	611.292	96.721	88.031	-24.123	302.596	47.526

Pressure Cells	08/09/2017		
Pressure	TPC	PPC A	PPC B
MPa	mV	mV	mV
0.0	-2111.0	-2394.4	-2300.9
0.2	-2011.9	-2001.0	-1903.2
0.4	-1912.0	-1616.2	-1511.5
0.8	-1699.3	-1231.0	-1116.1
1.0	-1602.6	-846.4	-718.9
1.5	-1360.1	-464.4	-326.0
2.0	-1110.2	-70.0	-80.0
2.5	-848.3	316.0	477.0
3.0	-608.8	693.0	866.0
3.5	-348.7	1097.0	1280.0
4.0	-99.2	1480.0	1682.0
3.5	-340.6	1106.5	1292.0
3.0	-598.1	717.0	892.0
2.5	-854.4	335.0	500.1
2.0	-1105.7	56.6	99.6
1.5	-1353.5	-464.5	-320.2
1.0	-1607.3	-858.0	-726.0
0.8	-1691.9	-1239.0	-1120.0
0.4	-1910.5	-1619.0	-1510.0
0.2	-2009.5	-2022.5	-1925.0
0.0	-2108.1	-2388.8	-2297.3
Slope (mV/MPa)	502.8	935.4	958.5
Zero (mV)	-2108.9	-2049.1	-1960.2



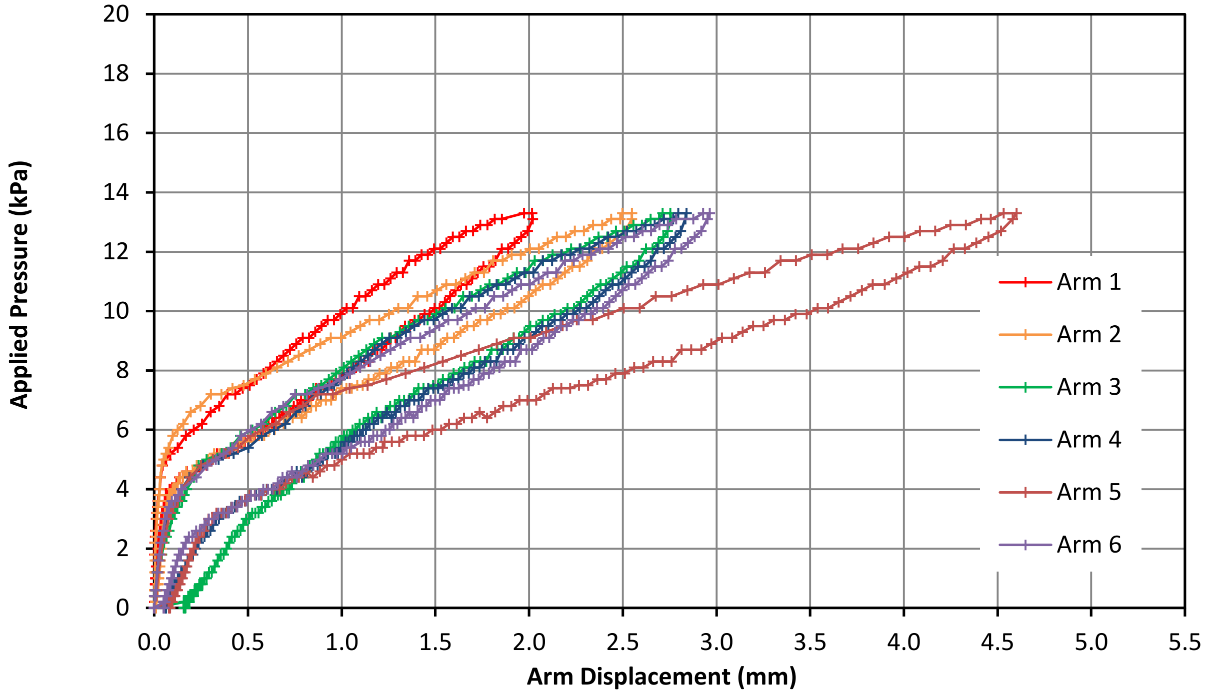


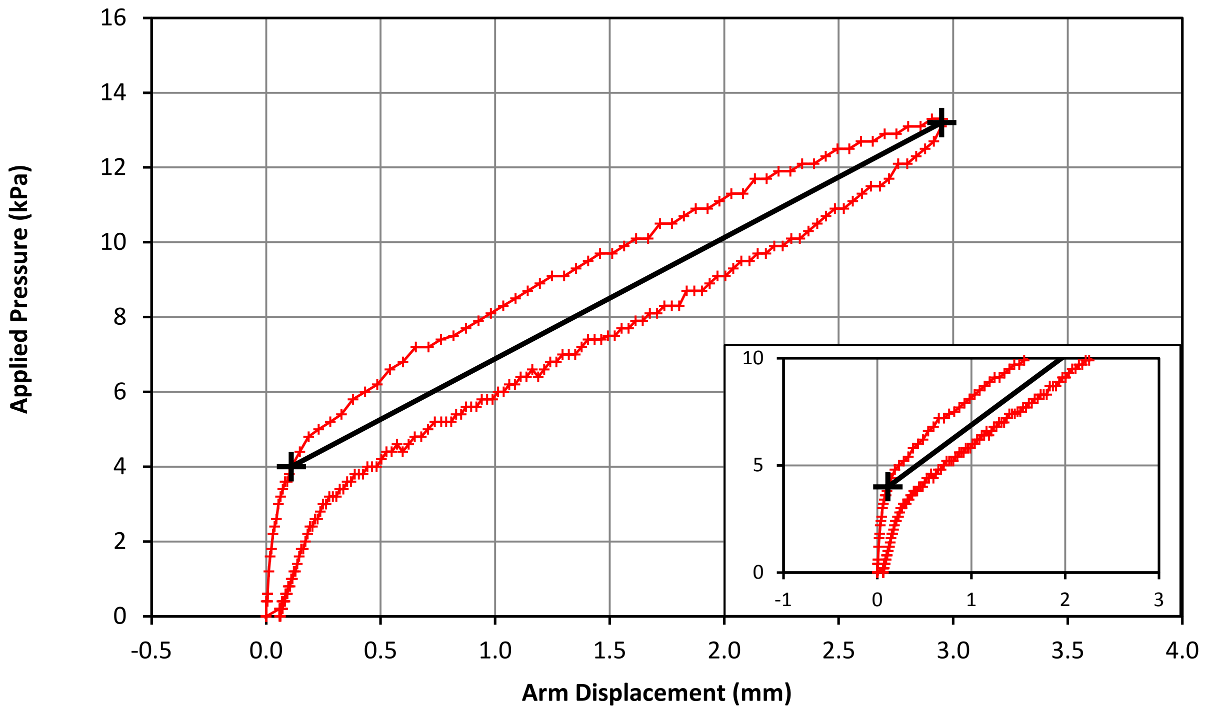
Calibrated by:	Dave Lewins
Calibrated at:	Rensihaw, Sheffield
Checked by:	Rob Cooke
Date:	08/09/2017

Membrane Calibration Beatrice (SBP01)

IN SITU SITE INVESTIGATION

Calibration Date	15/09/2017
Borehole	HALP01





Arm Lift Off	4.0 kPa
Slope	3.2 kPa/mm

Project	NGI - Halden Site	**Figure No.**	**HALP01 M01**
Client	NGI		
Project No.	P1170112		

Appendix L

REPORT ON MULTI SENSOR CORE LOGGING

NGI_Onsoy - Core logging at NGU
04-05/2017

Contact: lab@ngu.no,
Responsible for methods and core logging: Martin Klug, martin.klug@ngu.no,

Material

21 sediment cores with a total length of 16.8m (Table 1) were logged at the NGU core logging facilities. The plastic tubes containing the sediment have an outer diameter of 5.8 cm and single wall thickness of 0.165cm. All cores contained a piston on top of the sediment and were sealed at top and bottom with plastic caps. The latter were secured with a pipe clamps. Prior core logging the piston inside the core was replaced by a Styrofoam plug to preserve the sediment surface. To avoid interference of the metal pipe clamp with magnetic susceptibility (MS) measurements of sample material, all pipe clamps were removed and the cap surfaces cleaned from visible rust contamination. The cores were stored for at least one day in the core logging facilities to allow for thermal equilibration with the laboratory temperature.

Table 1: Core identification, individual length and measurements applied

No.	top (m)	bottom (m)	Core ID	Gamma/MS	XRI
1	1	1.8	ONS14-1	x	x
2	1.8	2.6	ONS14-2	x	x
3	2.6	3.4	ONS14-3-62	x	x
4	3.4	4.2	ONS14-4-A14	x	x
5	4.2	5	ONS14-5-F51	x	x
6	5	5.8	ONS14-6-Z3	x	x
7	5.8	6.6	ONS14-7-1662	x	x
8	6.6	7.4	ONS14-8-2A	x	x
9	7.4	8.2	ONS14-9-B18	x	x
10	8.2	9	ONS14-10-F38	x	x
11	9	9.8	ONS14-11-Z30	x	x
12	9.8	10.6	ONS14-12-A11	x	x
13	11	11.8	ONS14-13-A653	x	x
14	12	12.8	ONS14-14-T372	x	x
15	13	13.8	ONS14-15-1390	x	x
16	14	14.8	ONS14-16-F14	x	x
17	15	15.8	ONS14-17-V74	x	x
18	16	16.8	ONS14-18-K90	x	x
19	17	17.8	ONS14-19-8	x	x
20	18	18.8	ONS14-20-1764	x	x
21	19	19.8	ONS14-21-53	x	x

Methods

MultiSensorCoreLogging (MSCL)

Whole Core measurements

Whole core Gamma density, i.e. wet bulk density (WBD) and magnetic susceptibility (MS) were measured using the Standard MSCL-S core logger (GeoTek Ltd., UK) at 0.5 cm resolution with 5 sec exposure/measurement time and 0.5 cm collimator. During a measurement the section of a core is moved past the array of stationary sensors, and data is collected from all sensors when the core paused at a measurement point.

Gamma density

To measure sediment density based on emitted gamma ray attenuation a ^{137}Cs radioactive source and a NaI (TI) detector are used. Prior WBD measurements appropriate calibration measurements were conducted that facilitates the basis for counts per second to g/ccm conversion. Calibration is provided by the measurement of a defined aluminium body. The aluminium body is mounted in a water filled plastic tube similar to the sediment cores. Repetition of measurements and application of extended measurement time allow for a statistically reasonable calibration data set. Results of the calibration measurements are the basis for all data conversion facilitated by the GeoTek software. To measure the gamma density a 0.5 cm beam of gamma rays with a intensity (I_0) passes through the core. The intensity of the gamma rays is altered by several processes; predominantly by Compton scattering (Zolitschka et al. 2001 and refs therein). The intensity of gamma rays detected after passing the core depends on the source intensity, the sediment thickness, sediment bulk density and the mass absorption or Compton attenuation coefficient of the sediment core (Zolitschka et al. 2001). Details about Compton scattering and its effect on gamma density measurements are described elsewhere (e.g. Davidson et al. 1963; Ellis & Singer 2007; Evans & Cotterell 1970). Wet bulk density yields information on sediment properties such as grain size and mineralogy (St-Onge et al. 2007) but may also reflect compaction (i.e. water content) and some texture features like layering. Density data has been processed to clean core sections at top and bottom were air or water fills the liner. Overall the density show only minor fluctuations indicating relatively homogeneous sediment. Some deviations to lesser densities occur likely as result from sediment break during piston removal. Comparison with the X-ray images may help to identify the breaks.

Loop Sensor magnetic susceptibility

Magnetic susceptibility measurements for whole cores were taken with a Bartington MS2C loop sensor (Dearing 1994) with 100mm coil diameter. The MS2C loop sensor measurement represents data integrated over a distance equivalent to the sensor diameter which is symmetrically located before and behind the sensor along the core axis (see also Nowaczyk 2002). For calibration of the MS2C sensor a certified sample piece with known magnetic susceptibility were measured. Since the sample material is continuously moved through the sensor zeroing of the MS2C is only possible before a core. To correct any magnetic susceptibility drift blank measurements with empty core pieces before and after a sediment core were measured and linear drift correction applied to the results. The blank measurements furthermore allowed for sediment air interface correction. It corrects the core start and core end effects from loop sensor integration thus providing a recalculation of MS measurements in the effected transition zones.

The raw magnetic susceptibility data is processed to corrected volume specific magnetic susceptibility, which takes into account the relative effect of size of the core and the size of the loop sensor being used.

Although attention has been paid during cleaning of cores and end caps increased MS results of some cores indicate impurities likely due to small metal fragments or rust remains. In addition the MS data at core start and core end has been back-calculated to account for MS2C loop sensor integration at the sediment air interface. The back-calculation relies on the assumption that trends over sediment-air interfaces are linear which might not reflect the true MS variations in the sediment. The user is therefore advised to carefully interpret the core start and end MS_folded data and in case of doubt should rely on MS_unfolded data. The latter is also corrected volume specific magnetic susceptibility.

Fractional Porosity

Fractional porosity has been calculated from Gamma density with fluid density of 1g/ccm for fresh pore water, an assumed mineral grain density of 2.65 g/ccm. Fractional porosity can be used to assess the water content of the sediment. A more detailed description of fractional porosity is provided e.g. in Zolitschka et al. (2001) and refs. therein.

Visualisation

X-ray inspection

X-ray images of whole cores were taken with the Geotek MSCL-XCT (Geotek Ltd., UK). The Geotek MSCL-XCT is equipped with a Thermo Kevex PSX10-65W X-ray source (Thermo Fisher Scientific Inc., USA) and a Varian PAXScan 2520V (Varian Medical Systems, Inc., USA) with a 1920 x 1536 pixel array as X-ray detector. The micro-focal X-ray source was used with a voltage of 120 kV and a current of 100µA. The 1x1 0.5pF G4 10 fps detector-CCD-mode was used for highest resolution. 20 images per frame were taken and averaged to an image slice. Each image is then reproduced from adjacent image slices which were stitched with an overlap of 50% to the final product.
After loading the core repeated runs produced three 16bit greyscale images with 0, 45, and 90 degree axial orientation. X-ray imagines primarily reflect density changes where denser material attenuate more of the X-ray travelling through the sample resulting in darker areas of the image. The images are scaled to optimize the used gray value area and a ruler is added for depth orientation.

References

Davidson J.M., Biggar J.W., & Nielsen D.R. 1963. Gamma-radiation attenuation for measuring bulk density and transient water flow in porous materials. *Journal of Geophysical Research 68*, 4777–4783.

Dearing J.A. 1994. Environmental Magnetic Susceptibility: Using the Bartington MS2 System. Chi Publishing. 104 pp.

Ellis D.V. & Singer J.M. 2007. Well logging for earth scientists. Springer Science & Business Media.

Evans H.B. & Cotterell C.H. 1970. Gamma-ray attenuation density scanner. *Peterson, MNA, Edgar, NT, et al., Init. Repts. DSDP 2*, 442–54.

Nowaczyk N. 2002. Logging of magnetic susceptibility. *Tracking environmental change using lake sediments* 155–170.

St-Onge G., Mulder T., Francus P., & Long B. 2007. Chapter Two Continuous Physical Properties of Cored Marine Sediments. *Developments in Marine Geology*. Elsevier. pp. 63–98.

Zolitschka B., Mingram J., Van Der Gaast S., Jansen J.F., & Naumann R. 2001. Sediment logging techniques. *Tracking environmental change using lake sediments*. Springer. pp. 137–153.

Dokumentinformasjon/*Document information*		
Dokumenttittel/*Document title* Field and Laboratory Test Results from NGTS soft clay site – Onsøy		**Dokumentnr./*Document no.*** 20160154-10-R
Dokumenttype/*Type of document* Rapport / Report	**Oppdragsgiver/*Client*** Research Council of Norway (RCN)	**Dato/*Date*** 2016-12-23
Rettigheter til dokumentet iht kontrakt/ *Proprietary rights to the document according to contract* NGTS		**Rev.nr.&dato/*Rev.no.&date*** 2 / 2019-12-02
Distribusjon/*Distribution* ÅPEN: Skal tilgjengeliggjøres i åpent arkiv (BRAGE) / OPEN: To be published in open archives (BRAGE)		
Emneord/*Keywords* NGTS, Rotary Sounding, CPTU, Piezometer, Borehole sampling, Hydraulic Fracture Test, Laboratory Tests		

Stedfesting/*Geographical information*	
Land, fylke/*Country* Norway	**Havområde/*Offshore area***
Kommune/*Municipality* Fredrikstad	**Feltnavn/*Field name***
Sted/*Location* Onsøy	**Sted/*Location***
Kartblad/*Map*	**Felt, blokknr./*Field, Block No.***
UTM-koordinater/*UTM-coordinates* **Zone:** 32N **East:** 608 263 **North:** 6 566 441	**Koordinater/*Coordinates*** **Projection, datum: East: North:**

Dokumentkontroll/*Document control*
Kvalitetssikring i henhold til/*Quality assurance according to NS-EN ISO9001*

Rev/ *Rev.*	**Revisjonsgrunnlag/*Reason for revision***	**Egenkontroll av/ *Self review by:***	**Sidemanns-kontroll av/ *Colleague review by:***	**Uavhengig kontroll av/ *Independent review by:***	**Tverrfaglig kontroll av/ *Interdisciplinary review by:***
0	Original document	2016-12-22 Stein Strandvik	2016-12-22 Tom Lunne		
1	Updated with new soil investigation results	2018-12-10 Aleksander Gundersen	2018-12-04 Stein Strandvik		
2	Additional oedometer – and triaxial test, and updated ERT appendix	2019-12-02 Ragnhild Christin Hansen	2019-12-02 Aleksander Gundersen		

Dokument godkjent for utsendelse/ *Document approved for release*	**Dato/*Date*** 2 December 2019	**Prosjektleder/*Project Manager*** Jean-Sebastien L'Heureux