

Measured and Derived Geotechnical Parameters and Final Results

Golfe du Lion Geotechnical Site Investigation Ouest (Z3) | Mediterranean Sea

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Direction Générale de l'Énergie et du Climat - DGEC



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17 October 2025

Attention: Jérôme MINVIELLE

Dear Mr MINVIELLE

Please find below the interim Measured and Derived Geotechnical Parameters and Final Results. It was prepared by Mira Richa and Tilio Le Guilly under the supervision of Kah Jun Lee, in accordance with Call-Off n° 1406589329 between Direction Générale de l'Énergie et du Climat – DGEC and Fugro France SAS.

If you require any additional information or clarification, please do not hesitate to contact us.

Thank you for the opportunity to participate in this project.

Yours sincerely

Mira Richa

Geotechnical engineer

Reporting Structure

Operational Report Measured and Derived Geotechnical Measured and Derived Geotechnical Measured and Derived Geotechnical Parameters and Final Results Parameters and Final Results **Parameters and Final Results** GL GSI Ouest (Z3) GL GSI Est (Z4) GL GSI Centre (Z5) Document No. F254727-REP-001 Document No. F254727-OPS-001 Document No. F254727-REP-002 Document No. F254727-REP-003 Date 11 February 2025 Date 17 October 2025 Date 17 October 2025 Date 17 October 2025 Issue 04 Issue 04 Issue 02 Issue 04 Status IFE Status IFE Status IFE Status IFE **Executive Summary Executive Summary Executive Summary Executive Summary** 1. **Project Information Project Information** 1. **Project Information** 2. **Drilling Data** Geotechnical Description and Profiles 2. Geotechnical Description and 2. Geotechnical Description and **Profiles Profiles** 3. In Situ Test Data Sampling Data 3. 3. In Situ Test Data In Situ Test Data 4. Sampling Data Laboratory Test Data Sampling Data 4. Sampling Data 4. 5. Laboratory Test Data References Laboratory Test Data 5. 5. Laboratory Test Data 6. Log of Activities Symbols and Terms 6. References 6. References 7. Health, Safety, Security and List of Plates 7. Symbols and Terms Environment Symbols and Terms Appendices References List of Plates List of Plates List of Plates **Appendices Appendices Appendices**



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Executive Summary

Introduction

Direction Générale de l'Énergie et du Climat – DGEC contracted Fugro France to carry out a geotechnical site investigation and provide ground information at the floating windfarm locations of the development area in Golfe du Lion Ouest (Z3), Est (Z4) and Centre (Z5), France. Fieldwork was performed from the MV Fugro Quest from 11 January to 27 January 2025.

This report details the measured and derived geotechnical parameters and final results for the investigated locations in Golfe du Lion Ouest (Z3). It presents:

- 1. A description of the geotechnical site investigation;
- 2. Geotechnical logs and descriptions of the soil strata;
- 3. Results of the sampling, and laboratory testing;
- 4. Positioning and water depth measurements.

Fieldwork

Table S.1 shows the number of test locations.

Table S.1: Summary of test locations

Test Type	Total No. of Test Locations	No. of Retest Locations
Downhole Mode		
Sampling Borehole	3	0



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Abbreviations

вна	Bottom-hole assembly
BSF	Below seafloor
CID	Consolidated isotropically drained triaxial
CIU	Consolidated isotropically undrained triaxial
LAT	Lowest astronomical tide
MM	Maximum and minimum density
MV	Marine vessel
OCR	Overconsolidation ratio
PD	Particle density
PI	Plasticity index
PP	Pocket penetrometer
PSD	Particle size distribution
SB	Shear box
SRB	Sulphate reducing bacteria
TRT	Thermal resistivity test
TV	Torvane
UU	Unconsolidated undrained triaxial
UUr	Unconsolidated undrained triaxial remoulded
UTM	Universal Transverse Mercator
WIP	Wireline push



1. Project Information

1.1 Introduction

Direction Générale de l'Énergie et du Climat – DGEC contracted Fugro France to carry out a geotechnical site investigation and provide ground information at the floating windfarm locations of the development area in Golfe du Lion Ouest (Z3), Est (Z4) and Centre (Z5), France. Fieldwork was performed from the MV Fugro Quest from 11 January to 27 January 2025.

This report details the measured and derived geotechnical parameters and final results for the investigated locations in Golfe du Lion Ouest (Z3) site.

Plate 1.1 is a map showing the general location of the investigated area. Plate 1.2 is the detailed plan of the investigated locations for Golfe du Lion Ouest (Z3).

1.2 Scope of Report

This report presents:

- 1. A description of the geotechnical site investigation;
- 2. Geotechnical logs and descriptions of the soil strata;
- 3. Results of the sampling, and laboratory testing;
- 4. Positioning and water depth measurements.

1.3 Summary of Fieldwork

Table 1.1 summarises the fieldwork carried out during the site investigation. For full details, see Operational Report (Fugro, 2025).

Table 1.1: Summary of fieldwork

Location	Final Recovery [m BSF]	Sampling and Testing Details
Z3_OWF_BH01-SAMP 20.00		21 WIPs
Z3_OWF_BH06-SAMP	20.65	24 WIPs
Z3_OWF_BH13-SAMP 20.50		23 WIPs
Notes BSF = Below seafloor WIP = Wireline push samp	le	

1.4 Data Sources

The data used in the preparation of this report were obtained during the offshore site investigation, which included laboratory testing, and the subsequent onshore laboratory test programme.



1.5 Geodetic Data

Appendix D summarises the borehole coordinates and water depths of the investigated locations. The coordinates presented in these positioning reports are the calculated location coordinates. Coordinates for all boreholes are expressed using the Universal Transverse Mercator (UTM) projection 31 N, World Geodetic System 1984, International Spheroid, with a central meridian of 3° east.

Measured water depths were reduced to the Lowest astronomical tide (LAT) based on chart datum FR Bathyelli.

The user must consider the accuracy of all measurements, particularly where use may differ from original intentions. For example, water depths presented are indicative only and should not be used for design purposes, such as estimating current or wave forces on platforms.

1.6 Guidelines on Use of Report

Appendix A outlines the limitations of this report in terms of a range of considerations including, but not limited to, its purpose, its scope, the data on which it is based, its use by third parties, possible future changes in design procedures and possible changes in the conditions at the site over time. It represents a clear exposition of the constraints which apply to all reports issued by Fugro. It should be noted that these guidelines do not in any way supersede the terms and conditions of the contract between Fugro and DGEC.



2. Geotechnical Description and Profiles

2.1 Introduction

This section presents geotechnical logs for the Golfe du Lion Ouest (Z3). Based on laboratory test results, the logs indicate measured and inferred:

- Sample depths;
- Soil layering, including classifications of undrained shear strength (s_u) in fine-grained cohesive soils;
- Measured (s_u) values from strength tests;
- Measured water content, unit weight (γ), plasticity index (PI) and particle size distribution (PSD) data;
- Measured carbonate content and organic matter results.

Plate 2.1 defines the symbols and terms used in the geotechnical logs.

2.2 Discussion of Results

Plates 2.2 to 2.7 present geotechnical logs for the tested locations. The soil profiles shown are based on visual descriptions of recovered samples, and the results of offshore and onshore laboratory testing.

Soil descriptions are based on BS 5930:2015+A1:2020 (BSI, 2015a), ISO 14688-1:2017 (ISO, 2017a) and ISO 14688-2:2017 (ISO, 2017b). The limits of consistency in predominantly cohesive soils follow BSI 5930:2015+A1:2020, and in predominantly coarse-grained soils Lambe and Whitman (1969). Appendix B details the limits of consistency used.

The description of the carbonate content presented on the geotechnical logs was carried out in accordance with ISO 14688-1:2017 (ISO, 2017a) and ISO 14688-2:2017 (ISO, 2017b). A first qualitative determination was done during sample description by the application of droplets of dilute hydrochloric acid (10% HCI). Some specific samples were then selected to perform carbonate content determination during onshore laboratory testing phase. Modifications to the carbonate content description of the soil were carried out according to the results of the tests performed onshore.

The description of the organic matter presented on the geotechnical logs was carried out in accordance with ISO 14688-1:2017 (ISO, 2017a) and ISO 14688-2:2017 (ISO, 2017b) following onshore laboratory testing phase.

Modifications on main soil types and secondary fractions were carried out on the log descriptions based on particle size distribution test and plasticity index results. In case of a discrepancy between these test outcomes, priority is given to the plasticity index results, as it determines the main soil behaviour. In accordance with ISO 14688-1:2017 (ISO, 2017a), the



intermediate terms of "silty CLAY" or "clayey SILT" are used for material that is borderline in behaviour between clay and silt.

Soil strength classifications are based on the results of soil strength tests, and advanced laboratory strength tests. Consistency was assessed in the field following ISO 14688-1:2017 (ISO, 2017a) and BS 5930:2015+A1:2020 (BSI, 2015a). Terms of s_u always take precedence when considering the strata described and should not be confused with consistency. Consistency and s_u of the soil are not directly comparable; large differences between the two can be due to several factors, including soil fabric, sample quality and moisture content. Consistency descriptions are not included in the geotechnical logs as they are more applicable to individual samples than to an entire soil layer.



3. Sampling Data

3.1 Overview

Sixty-eight (68) downhole wireline push (WIP) samples were taken from three (3) sampling geotechnical boreholes.

Plates 3.1 to 3.68 presents the photographs of the acquired samples and Plates 3.69 to 3.74 summarise the samples acquired during the fieldwork, the testing performed offshore and the scheduled onshore testing.

3.2 Downhole Samples

Table 3.1 summarises the downhole sampling equipment used during the fieldwork.

Table 3.1: Sampling equipment

Sampler Type	Inside Diameter D ₁ [mm]	Outside Diameter D ₂ [mm]	Inside Diameter D₃ [mm]	Wall Thickness [mm]	Tube Length* [mm]	Sample Length* [mm]	Rate of Penetration [†] [mm/s]
Thin-walled 3" tube	72.0	76.0	72.0	2.0	1028.0	950.0	20.0
Thick-walled 3" tube	72.0	80.0	72.0	4.0	1028.0	950.0	20.0
Thick-walled 2" tube	53.0	60.3	53.1	3.6	1028	950	20.0

Notes

 D_1 = Inside diameter of cutting shoe

 D_2 = Greatest outside diameter of sample tube and/or cutting shoe

 D_3 = Inside diameter of flush portion of sample tube or liner

3.2.1 Downhole Piston and Push Samples

Most of the downhole push samples were taken using Fugro's wireline WIPSAMPLER in combination with seamless 3" WIP thin-walled tubes. To prevent buckling, 2" and 3" WIP thick-walled tubes were used where dense to very dense sand soils (2" tubes) or very high strength clay soils (3" tubes) were expected. In cohesionless material, a core catcher was used in conjunction with the 3" WIP thin-walled and 2" WIP thick-walled tubes to prevent the sample from slipping out of the tube during recovery to deck.

A core catcher was used with thin-walled 3" (72 mm) and thick-walled 2" (53 mm) tubes in cohesionless material, to prevent the sample from slipping out of the tube during recovery to deck. The thick-walled 2" (53 mm) tube was only used for dense cohesionless material. The sample tube was pushed into the soil at a constant rate of 20 mm/s using the reaction obtained by clamping the drill pipe at seafloor with the Fugro SEACLAM® system.



^{* =} Stated manufactured length. If cutting edge becomes blunted during sampling process, tubes may be trimmed to sharpen it

3.2.2 Operational Constraints

The fieldwork was performed successfully with no operational constraints.

3.3 Practice for Sample Handling

Immediately after recovery, the samples were extruded from their tubes and visually described. In clay, some sections were first selected for intact preservation for further testing in onshore laboratory. Some basic index tests were performed based on this visual description, including moisture content determination, bulk and dry density determination, index strength tests (pocket penetrometer, torvane) and thermal resistivity tests in shallow sediments up to 6 m BSF. Additional tests included unconsolidated undrained triaxial and sulphate reducing bacteria tests. Any remaining lengths are preserved in bags.

In coarse grained soil, basic tests included moisture content determination and bulk and dry density determination. Any remaining lengths are preserved in bags.

All soil samples were stored in a reefer container at 7°C.

Full visual descriptions were made of the recovered samples in accordance with BS 5930:2015+A1:2020 (BSI, 2015), ISO 14688-1:2017 (ISO, 2017a) and ISO 14688 2:2017 (ISO, 2017b) and Munsell Colour (2009).

Table 3.2 summarises the procedures for sample handling.

Table 3.2: Practice for handling seabed samples

Stage	Process	Description
Initial sample	Initial handling	Detach sample tube from WIPSAMPLER
handling	Push samples	Transfer to site laboratory
Site geotechnical laboratory	Push samples	 Extrude sample from sample tube Measure recovery Photograph sample Make visual geotechnical description of sample Test soil where appropriate (e.g. water content, unit weight, pocket penetrometer, torvane, fall cone, reaction to 10 % hydrochloric acid) Thermal resistivity tests (TRT) to be conducted at frequency agreed on board according to procedure defined in Fugro document F254727-TN-002 02 (Fugro, 2024a) Sulphate reducing bacteria (SRB) measurement was conducted at frequency agreed on board according to protocol defined in Fugro document F254727-TN-003 02 (Fugro, 2024b)
Comple protection	Packaging of disturbed material (bag subsamples)	Pack disturbed material in double bulk bagsLabel each bag
Sample protection	Packaging of undisturbed material (wax subsamples)	Wrap in cling film (add label)Wrap in aluminium foil



Stage	Process	Description
		 Insert in cardboard tube (add label)
		 Add wax to seal sample in tube
		 Insert waxed sample into inflatable packaging (add label)
Onboard sample storage	n/a	Samples stored in a reefer container
Sample transport	n/a	Pack samples into wooden crates and strap to palletWrap pallets in heavy-duty shrink film
Notes n/a = Not applicable		



4. Laboratory Test Data

4.1 Introduction

Laboratory tests were carried out in accordance with the standards listed in Appendix C where it is also noted which tests are accredited. The results relate only to the samples tested and are considered to be representative of those samples.

The summary of laboratory test results sheets (Plates 4.1 to 4.10) present tabulated results from the offshore and onshore laboratory testing.

Table 4.1 summarises the performed tests offshore and onshore according to the soil type and the preservation condition necessary for the tests to be performed.

Table 4.1: Summary of offshore and onshore laboratory tests

Tests	Soil Type	Sample Type	Condition
Offshore			
Index soil strength pocket penetrometer (PP) & torvane (TV)	Cohesive soil	-	Undisturbed
Moisture content & bulk density	Cohesive and cohesionless soil	-	Disturbed
Unconsolidated undrained triaxial (UU)	Cohesive soil	-	Undisturbed
Thermal resistivity test (TRT)	Cohesive and fine cohesionless soil - non gravelly	Performed in Shelby tube immediately after sampling	Undisturbed
Sulphate reducing bacteria (SRB)	Cohesive and cohesionless soil	-	Undisturbed
Onshore			
Plasticity index (PI)	Cohesive soil	Wax/Bag	Undisturbed/Disturbed
Particle size distribution (PSD)	Cohesive and cohesionless soil	Wax/Bag	Disturbed
Particle density (PD)	Cohesive and cohesionless soil	Wax/Bag	Disturbed
Maximum and minimum density (MM)	Cohesionless soil	Bag	Disturbed
Incremental loading oedometer	Cohesive soil	Wax	Undisturbed
Permeability in permeameter (constant head method)	Cohesive and cohesionless soil	Wax/Bag	Disturbed, recompacted



Tests	Soil Type	Sample Type	Condition
Permeability in triaxial cell (constant head method)	Cohesive soil	Wax	Undisturbed
Unconsolidated undrained triaxial (UU)	Cohesive soil	Wax	Undisturbed
Unconsolidated undrained triaxial remoulded (UU _r)	Cohesive soil	Bag (when UU done offshore) / remoulded from Wax (when UU done onshore)	Disturbed
Consolidated isotropically drained triaxial (CID)	Cohesionless soil	Bag	Disturbed, recompacted
Consolidated isotropically undrained triaxial (CIU)	Cohesive soil	Wax	Undisturbed
Shear box (SB)	Cohesionless soil	Bag	Disturbed, recompacted
Chemical tests	Cohesive and cohesionless soil	Wax/Bag	Undisturbed/Disturbed
Notes - = Not applicable			

Refer to the summary of laboratory test results for full sample descriptions. The geotechnical descriptions given in the individual test reports are indicative only of the specimens tested.

4.2 Index Laboratory Tests

Basic index laboratory tests completed offshore on soils obtained during the site investigation included soil description, colour identification using Munsell Colour (2009) charts, water content (w), unit weight (γ) and dry unit weight (γ_d), pocket penetrometer (PP), torvane (TV), and unconsolidated undrained triaxial (UU).

Decisions to perform PP and TV tests were based on soil type, soil strength, and gravel and shell fragments contents.

Except for sulphate reducing bacteria (SRB) and thermal resistivity tests (TRT), the test results are presented in the geotechnical logs (Plates 2.2 to 2.7) and the summary of laboratory test results sheets (Plates 4.1 to 4.10).

Further index tests were performed onshore. These include particle size distribution (PSD), plasticity index (PI), particle density (PD), maximum and minimum density (MM) and further UU triaxial tests.



4.2.1 Water Content and Wet and Dry Density Determination

Water content^{*} (w) (also called moisture content) and unit weight (γ) were measured in representative samples from the investigated locations. Dry unit weight (γ_d) was then inferred from the measured γ and w content values.

The geotechnical logs (Plates 2.2 to 2.7) and the summary of laboratory test results sheets (Plates 4.1 to 4.10) present the individual test results.

4.2.2 Index Soil Strength

Index undrained shear strength (s_u) for cohesive soil samples was measured using PP and TV tests. The summary of laboratory test results sheets (Plates 4.1 to 4.10) present tables showing the individual test results. The geotechnical logs (Plates 2.2 to 2.7) present the individual test results graphically.

4.2.3 Plasticity Index

Fourteen (14) liquid and plastic limit tests were conducted on selected specimens of finegrained soils to assess plasticity. Plate 4.11 summarises the test results and Plate 4.12 presents the plasticity chart.

Most of the samples were classified as low plasticity. Six (6) samples were non-plastic, as Table 4.2 shows. Non-plastic samples were determined by the possibility of rolling 3 mm threads according to ISO 17892-12:2018.

Table 4.2: Summary of non-plastic samples

Location	Sample	Depth BSF [m]
Z3_OWF_BH01_SAMP	15-1	13.00
Z3_OWF_BH01-SAMP	15-3	13.30
Z3_OWF_BH06-SAMP	01-2	0.30
Z3_OWF_BH06_SAMP	02-1	1.00
Z3_OWF_BH06-SAMP	03-1	2.00
Z3_OWF_BH06_SAMP	06-1	5.00
Notes BSF = Below Seafloor		

4.2.4 Particle Size Distribution

Twenty (20) wet sieving and seventeen (17) sedimentation tests were conducted on selected samples to confirm the geotechnical descriptions made offshore. Plate 4.13 summarises the test results and plates 4.14 to 4.35 present the composite PSD curves. The PSD results largely

^{*} The terms 'water content' and 'moisture content' may both be used in this report depending on the terminology of the applicable standard.



confirmed the descriptions made offshore; a few minor adjustments were made regarding the secondary soil constituent.

Variations might be noted between the PSD curves and the sample description, particularly concerning gravel content. In some PSD tests, gravel content is present where shells and shell fragments were visually described, in such cases, no modifications were made to the soil description. Similarly, no changes were made where the soil description indicated a heterogeneous (lamination or pockets of clay) constitution, as the PSD test result would not be representative of the soil layer.

Where the fine fraction was <10% the sedimentation by pipette method was cancelled. Conversely where <10% dry mass was retained on a 2 mm sieve during wet sieving, the sieving was cancelled. In accordance with the ISO 17892-4 standard for PSD test, the laboratory has the flexibility to decide the appropriate sieve size according to the type of soil encountered, with the objective of ensuring continuity of the PSD grading curve. In this project, when the soil sample was assessed as containing high fine contents, only three sieve sizes were used for the coarse-grained fraction (sieves corresponding to coarse, medium and fine sand).

In total two (2) wet sieving and five (5) sedimentation tests were cancelled.

One (1) test was performed on batched samples due to insufficient material in borehole $Z3_OWF_BH06-SAMP$ bags 08-1 + 08-2 + 08-3 starting at 7.00 m BSF. The batched bag samples were selected based on similar soil description and depth proximity.

4.2.5 Particle Density

PD tests were performed using the fluid pycnometer method. Thirteen (13) PD tests were conducted on selected cohesionless and cohesive soil samples. Plate 4.36. summarises the test results.

One (1) test was repeated for having high PD results in borehole Z3_OWF_BH01-SAMP sample 15-3 at 13.30 m BSF. The re-test gave values within the expected range.

Values of particle density display average values of 2.69 Mg/m³ for sand samples and 2.74 Mg/m³ for clay samples. To be noted that all clay samples were slightly sandy to sandy.

One (1) test was performed on batched samples due to insufficient material in borehole $Z3_OWF_BH06-SAMP$ bags 08-1 + 08-2 + 08-3 starting at 7.00 m BSF. The batched bag samples were selected based on similar soil description and depth proximity.

4.2.6 Maximum and Minimum Density

Four (4) maximum and minimum density (MM) tests were conducted on selected cohesionless soil samples. Plate 4.37 summarises the test results.

Tests were performed according to the method developed by the Norwegian Geotechnical Institute (NGI) and Geolabs (NGI Geolabs, 2019a and 2019b). The method accepts a



maximum of 12% fines. As a significant fines content was expected, based on soil descriptions, it was agreed with the Client to extend this maximum value to 20% and to identify test results that were performed on sample with more than 12% fines.

Two (2) MM samples were unsuitable due to the high fines content, higher than 20%.

One (1) test was performed on batched samples due to insufficient material in borehole $Z3_OWF_BH06-SAMP$ bags 08-1 + 08-2 + 08-3 starting at 7.00 m BSF. The batched bag samples were selected based on similar soil description and depth proximity.

4.3 Consolidation Tests

Oedometer tests to provide stress history, drained stiffness and time-dependent behaviour of the soils data under one-dimensional consolidation were carried out to assist engineering design. Undisturbed test specimens were loaded beyond their estimated pre-consolidation pressure (p'_c) to enable measurement of the actual p'_c and other settlement parameters. Casagrande's (1936) construction method was used to estimate p'_c .

4.3.1 Incremental Oedometer Tests

Seven (7) undisturbed incremental oedometer tests were conducted on selected cohesive soil samples. Plate 4.38 summarises the results and Plates 4.39 to 4.45 show the individual results.

In borehole Z3_OWF_BH13-SAMP sample 20-3 at 18.40 m BSF presents an OCR of 0.84 which would classify this sample as slightly underconsolidated. Interpretation of this test should be considered with caution.

In borehole Z3_OWF_BH06-SAMP sample 02-2 at 1.40 m BSF presents an OCR of 7.48. This test is to be considered with caution as PSD test showed 44% SAND, PI test showed a non-plastic behaviour thus was re-classified as very clayey SAND.

4.3.2 Sample Quality Assessments

The quality of the samples used in the consolidation tests is evaluated based on the changes in void ratio noted between the start of each test and at the estimated in situ effective overburden pressure (p'_0), as recommended by Lunne et al. (1998) and summarised in Table 4.3. The estimated overconsolidation ratio (OCR) is based on the ratio of the estimated p'_0 and p'_c .

Sample quality was only assessed for oedometer test samples where the OCR was estimated to be between 1 and 4. It is of very poor (vp) quality. The apparent deterioration may have been caused by stress relaxation rather than handling. In addition, despite plasticity index results classify the cohesive soil as clay, PSD indicate higher proportion of silt particles compared to clay particles. Also, significant sand content (between 10% and 20%) is noted in PSD tests performed in the vicinity of the oedometer tests.



Table 4.3: Proposed criteria for evaluation of sample disturbance (after Lunne et al., 1998)

Oversanselidation	Δe/e ₀			
Overconsolidation Ratio	Very Good to Excellent	Good to Fair	Poor	Very Poor
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

4.4 Triaxial Tests

This section describes the following tests:

- Unconsolidated undrained triaxial undisturbed and remoulded (UU and UUr);
- Consolidated isotropically undrained triaxial (CIU);
- Consolidated isotropically drained triaxial (CID);

4.4.1 Unconsolidated Undrained Triaxial Tests

Six (6) undisturbed UU tests were conducted offshore and six (6) onshore. Twelve (12) remoulded UU (UUr) tests were carried out onshore to help determine soil sensitivity. The geotechnical logs (Plates 2.2 to 2.7) present the test results. Plate 4.46 summarises the UU data performed offshore and plates 4.47 to 4.58 present the individual test results of offshore results.

Plate 4.59 summarises the UU data performed onshore and plates 4.60 to 4.77 present the individual test results of onshore results.

At location Z3_OWF_BH01-SAMP sample 07-04 at 6.00 m BSF has a higher Su value. PSD indicate higher proportion of silt particles compared to clay particles (70% silt and 19% clay). Also, significant sand content (10%) is noted in the PSD test performed in the vicinity of the test (Z3_OWF_BH01-SAMP sample 06-01).

The UU results are considered to be representative of the soils tested. They agree well with the full range of index strengths measured. Failure was taken at 20% axial strain unless the deviator stress peaked at a lower strain.

4.4.2 Consolidated Isotropically Undrained Triaxial Tests

Six (6) CIU triaxial tests were conducted on selected samples. Plate 4.78 summarises the test results and plates 4.79 to 4.137 present the individual results.

Samples were consolidated to a best estimate of their in situ stress conditions, based on estimates of the overburden and lateral earth pressures. As per standard Fugro practice, CIU test failure is taken at 10% axial strain except where the peak deviator stress occurred at a lower axial strain.

The laboratory test results are considered to be representative of the soils tested and are within the expected range, based on estimates of the overburden and lateral earth pressures which the samples were prepared. Most of the CIU triaxial tests indicate s_u values higher than



index strength tests and UU triaxial tests. This is commonly observed in sandy clay as the consolidation phase tends to avoid potential shear along weakness plans created by sand.

At location Z3_OWF_BH01-SAMP sample 12-03 at 10.35 m BSF, CIU test shows significantly high value, this result is to be used with caution.

In total two (2) tests were cancelled (Table 4.4). The test at location Z3_OWF_BH01-SAMP sample 18-2 at 16.1 m BSF was still processed and is included in the report at the request of the client.

Table 4.4: Cancelled CIU tests

Location	Sample	Depth BSF [m]	Cancelled reason
Z3_OWF_BH01-SAMP	06-2	4.85	Load cell malfunction
Z3_OWF_BH01-SAMP	18-2	16.10	Error in saving data beyond 6.5% of the shear.
Notes BSF = Below Seafloor			

4.4.3 Consolidated Isotropically Drained Triaxial Tests

Eight (8) set-of-three CID tests were conducted to assess soil behaviour under drained conditions. Plate 4.138 to 4.139 summarises the test results and plates 4.140 to 4.205 present the individual results.

The test specimens were prepared to an initial dry density based on relative density and minimum and maximum dry density test results, if these were not available, dry density was calculated from dry density measured offshore. Alternatively, reconstituted samples are compacted to the maximum achievable density if the sand layer was defined with Dr higher than 80%.

The results include an effective apparent cohesion (c') and effective internal friction (ϕ') value based on best-fit line through the set-of-three test. However, the c' and ϕ' are dependent on the vertical stress and are not therefore constant values for the given soils type.

The laboratory test results are considered to be representative of the soils tested and are within the expected range, based on the initial relative density to which the samples were prepared. Three (3) tests showed high ϕ' values as shown in Table 4.5. The high ϕ' is possibly due to an over-compaction as max achievable density. A contractive behaviour during shearing is also observed (negative volumetric strain) in the tests performed to the maximum achievable density.

While CIDs present a dilatant behaviour, this contractive behaviour would tend to confirm that these samples were more compacted than in situ conditions resulting in an overestimated ϕ' . Therefore, these results are likely not representative of the ground conditions.



Table 4.5: CID test results with high ϕ' and c'

Location	Sample	Depth BSF [m]	φ′ [°]	c' [kPa]
Z3_OWF_BH06-SAMP	11-1	10.00	47.00	9
Z3_OWF_BH06-SAMP	19-1	15.00	46.50	37
Z3_OWF_BH13-SAMP	10-2	8.15	47.50	6
Notes BSF = Below Seafloor				

Six (6) tests were repeated for having high values of c' and ϕ' . Three (3) of the re-tests still show high values as shown in Table 4.6.

Table 4.6: Repeated CID tests

Location	Sample	Depth	φ′ [°]	c' [kPa]
Z3_OWF_BH06-SAMP	01-1	0.00	34.5	0
Z3_OWF_BH06-SAMP	11-1	10.00	47.0	9
Z3_OWF_BH06-SAMP	19-1	15.00	46.5	37
Z3_OWF_BH13-SAMP	10-2	8.15	34.5	4
Z3_OWF_BH13-SAMP	17-2	15.45	47.5	6
Z3_OWF_BH13-SAMP	13-1	11.00	34.0	0
Notes BSF = Below Seafloor				

4.5 Shear Box Tests

Six (6) set-of-three shear box (SB) tests were scheduled using a soil–soil interface. Plate 4.206 summarises the test results and plates 4.207 to 4.230 present the individual results.

The test specimens are prepared to an initial dry density based on relative density and minimum and maximum dry density test results, if these were not available, dry density was obtained from dry density measured offshore. Alternatively, reconstituted samples are compacted to the maximum achievable density if the sand layer was defined with Dr higher than 80%.

The results include a c' and ϕ' value based on best-fit line through the set-of-three test. However, the c' and ϕ' are dependent on the vertical stress and are not therefore constant values for the given soils type.

The laboratory test results are considered to be representative of the soils tested and are within the expected range, based on the initial relative density to which the samples were prepared. One (1) test showed high c' value of 45 kPa at location Z3_OWF_BH06-SAMP sample 20-1 at 16.00 m. The high c' is possibly due to an over-compaction as max achievable density was used and possibly resulting in an overestimated c'. This unexpectedly high value should be used with caution.



Two (2) tests were repeated for having high values of c' and ϕ' . One (1) of the re-tests still show high values of c' as shown in Table 4.7.

Table 4.7: Repeated SB tests

Location	Sample	Depth	φ′ [°]	c^\prime [kPa]
Z3_OWF_BH06-SAMP	20-1	16.00	33.0	45
Z3_OWF_BH13-SAMP	16-2	14.40	29.0	33
Notes BSF = Below Seafloor				

4.6 Permeability Tests

Permeameter permeability tests measure the coefficient of permeability in sand and silty sand soil types and triaxial permeability tests measure the coefficient of permeability in undisturbed clay samples.

Permeability is calculated in accordance with Darcy's equation for laminar flow (ISO 17892-11:2019). Darcy's law applies to laminar (non-turbulent) flow conditions.

Darcy's law (Equation 4.1) states that the volumetric flow rate, Q, is proportional to: (1) the difference in hydraulic head along a length interval, l; (2) a coefficient K (hydraulic conductivity), which accounts for restriction to flow imposed by the solid medium and for the density and viscosity of the fluid flowing through the porous medium (i.e. water through sand); and (3) the cross-sectional area perpendicular to the flow direction:

$$Q = -K \frac{(h_2 - h_1)}{l} A$$
 Equation 4.1

The hydraulic gradient i as shown in Equation 4.2 is the ratio between Δh which is the water elevations in the piezometers and l the distance between the piezometers.

$$i = \frac{(h_2 - h_1)}{I} = \frac{\Delta h}{I}$$
 Equation 4.2

Darcy's law can therefore be expressed as Equation 4.3:

$$Q = -K i A$$
 Equation 4.3

Plate 4.231 summarises the test results of all permeability tests.

4.6.1 Permeameter Permeability Tests

Three (3) permeameter tests were performed to measure the coefficient of permeability in sand and silty sand soil types. Plates 4.232 to 4.235 present the individual results.



The test specimens are prepared to an initial dry density based on relative density and minimum and maximum dry density test results, if these were not available, dry density was obtained from dry density measured offshore. Alternatively, reconstituted samples are compacted to the maximum achievable density if the sand layer was defined with Dr higher than 80%.

The laboratory test results are considered to be representative of the soils tested and are within the expected range, based on the initial relative density to which the samples were prepared.

All three (3) tests were performed on batched samples due to insufficient material. The batched bag samples were selected based on similar soil description and depth proximity.

Two (2) tests were cancelled and presented in Table 4.8

Table 4.8: Cancelled Permeameter tests

Location	Sample	Depth BSF [m]	Cancelled reason
Z3_OWF_BH01-SAMP	01-01	0.00	High fine content (14,3%) and density target too low, sample doesn't saturate even after 2 days
Z3_OWF_BH13-SAMP	18-2	16.00	High fine content (46,4%)
Notes BSF = Below Seafloor			

4.6.2 Triaxial Permeability Tests

Four (4) triaxial permeability tests were conducted to measure the coefficient of permeability in undisturbed clay samples. Plates 4.236 to 4.247 present the individual results.

Samples were consolidated to a best estimate of their in situ stress conditions, based on estimates of the overburden and lateral earth pressures. The laboratory test results are considered to be representative of the soils tested and are within the expected range.

4.7 Thermal Resistivity Tests

Thermal resistivity tests are conducted to measure the capacity of the ground to conduct or to dissipate heat. A total of three (3) tests were performed offshore, three (3) tests were performed onshore, on selected soil samples within the top 6.00 m BSF.

TEMPOS Thermal Properties analyser package kit was used for both offshore and onshore thermal conductivity tests.

Plates 4.248 to 4.250 summarise the tests performed offshore. Plate 4.251 summarises the test results performed onshore and plates 4.252 to 4.254 present the individual onshore results.

Values of thermal resistivity vary between 0.558 (m.K)/W and 0.679 (m.K)/W.



4.8 Chemical Testing

Chemical testing was carried out at third-party laboratories. The results relate only to the samples tested and are considered to be representative of those samples.

Appendix C lists the laboratory testing standards and statements used for the chemical tests.

4.8.1 Carbonate Content

Thirteen (13) tests were conducted on selected soil samples. Plate 4.255 summarises the test results.

The carbonate content of CO₂ measured ranged between 7.0 % and 14.0%. A conversion is required to get the actual amount of calcium carbonate (% CaCO₃) present in the soil and is presented in Table 4.9. The carbonate content of CaCO₃ measured ranged between 15.9 % and 31.8 %.

With the CaCO₃ carbonate content, corresponding layers descriptions were updated accordingly as mentioned in section 2.2.

Variations might be noted between the carbonate content CaCO₃ and the sample description. In some tests, calcareous soil, shells and shell fragments were present in occasional amounts and visually described, in such cases, no modifications were made to the soil description.

Table 4.9: Summary of the CaCO₃ carbonate content converted from CO₂

Location	Sample	Depth BSF [m]	CO ₂ [%]	CaCO₃ [%]
Z3_OWF_BH01-SAMP	02-02	1.00	14.0	31.8
Z3_OWF_BH01-SAMP	07-05	6.20	11.0	25.0
Z3_OWF_BH01-SAMP	13-1	11.00	10.0	22.7
Z3_OWF_BH01-SAMP	18-1	16.00	11.0	25.0
Z3_OWF_BH06-SAMP	02-3	1.60	8.7	19.8
Z3_OWF_BH06-SAMP	06-3	5.40	13.0	29.6
Z3_OWF_BH06-SAMP	10-2	9.50	12.0	27.3
Z3_OWF_BH06-SAMP	17-2	13.25	9.3	21.1
Z3_OWF_BH06-SAMP	22-1	18.00	7.8	17.7
Z3_OWF_BH13-SAMP	04-1	3.00	12.0	27.3
Z3_OWF_BH13-SAMP	10-1	8.00	7.0	15.9
Z3_OWF_BH13-SAMP	15-1	13.00	8.2	18.6
Z3_OWF_BH13-SAMP	19-2	17.50	9.0	20.5
Notes BSF = Below seafloor				



4.8.2 Organic Content

Thirteen (13) loss on ignition tests were conducted to measure the organic content on selected soil samples. Plate 4.256 summarises the test results. One (1) sample presented organic content higher than 6%, corresponding layer description was updated accordingly as mentioned in section 2.2.

4.8.3 Chloride Content

Thirteen (13) water soluble chloride tests were conducted on selected soil samples. Plate 4.257 summarises the test results. The chloride content ranges from 0.34% and 0.56%.

4.8.4 Sulphate Content and pH

Thirteen (13) total sulphate content tests were conducted on selected soil samples. Plate 4.258 summarises the test results. The sulphate content measured as total acid soluble sulphate (SO₄) ranges from 595 mg/l to 1270 mg/l and the pH ranges from 8.40 to 8.90.

4.9 Sulphate Reducing Bacteria tests

A total of twelve (12) sulphate reducing bacteria tests were conducted offshore on selected soil samples and residual soil of weathered rock to determine the presence of sulphate reducing bacteria at approximately every 5 m and when presence of organic matter, along the borehole. Sig Sulphide ® SRB kits from Echa were used for these tests. Test results are presented in Plates 4.259 to 4.270. Table 4.10 summarises the SRB tests qualitative interpretation after six days.

Table 4.10: Summary of SRB test results

Table 4.10: Summary of SI	RB test results			
Location	Sample	Depth BSF [m]	Qualitative interpretation – Day 6	SRB Concentration [SRB/ml]
Z3_OWF_BH01-SAMP	W03	1.70	Light Contamination	<10
Z3_OWF_BH01-SAMP	W09	7.60	Light Contamination	<10
Z3_OWF_BH01-SAMP	W14	12.00	Light Contamination	<10
Z3_OWF_BH01-SAMP	W18	17.50	Light Contamination	<10
Z3_OWF_BH06-SAMP	W05	4.00	Light Contamination	10-100
Z3_OWF_BH06-SAMP	W09	10.50	Light Contamination	10-100
Z3_OWF_BH06-SAMP	W17	13.50	Light Contamination	10-100
Z3_OWF_BH06-SAMP	W22	18.10	Light Contamination	10-100
Z3_OWF_BH13-SAMP	W05	4.60	Light Contamination	<10
Z3_OWF_BH13-SAMP	W12	10.40	Light Contamination	10-100
Z3_OWF_BH13-SAMP	W17	15.40	Light Contamination	10-100
Z3_OWF_BH13-SAMP	W21	19.40	Light Contamination	10-100
Notes BSF = Below seafloor				



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6. Symbols and Terms

Every effort is made to avoid duplication or inconsistency in the use of symbols and terms in this report. However, this is not always possible as some different terms are commonly represented by the same symbol; similarly, some terms have multiple representations.

For example, I_p and PI both mean plasticity index, and I_L and LI both mean liquidity index, while a can mean both acceleration and net area ratio of cone penetrometer, depending on the context.

Table 6.1 presents symbols and terms that may be used in this report.

Table 6.1: Symbols and terms

Symbol	Unit	Full Term or Definition
	Onit	Tull Term of Deminion
General		
A	m ²	Area
а	m/s ²	Acceleration
В	m	Width
D	m	Diameter
d	m	Depth
g	m/s ²	Acceleration due to gravity [$g = 9.81 \text{ m/s}^2$]
h	m	Height or thickness
h_{sf}	m	Height of reference point above seafloor
i	-	Inclination
L	m	Length
ln	-	Natural logarithm
log	-	Logarithm base 10
m	kg	Mass
t	S	Time
V	m ³	Volume
v	m/s	Velocity
W	kN	Weight
w or MC	%	Moisture content
W50	-	WIP sample in sample tube of 50 mm internal diameter
W72		WIP sample in sample tube of 72 mm internal diameter
z	m	Penetration or depth below reference level (usually ground surface) or height above seafloor for drilling mode in situ probe zero reference readings
Stress Strain		
E	MPa	Modulus of linear deformation (Young's modulus)



Symbol	Unit	Full Term or Definition
E_u	МРа	Modulus of linear deformation (Young's modulus for undrained stress change)
E_d	MPa	Modulus of linear deformation (Young's modulus for drained stress change)
G	MPa	Modulus of shear deformation (shear modulus)
G_{max}	MPa	Shear modulus at small strain or initial (small strain) shear modulus
U	MPa	Pore-water pressure
u_0	MPa	Hydrostatic pore pressure relative to seafloor or phreatic surface
u_f	kPa	Pore-water pressure at failure
Δu	kPa	Change in pore-water pressure
$\Delta\sigma_v$	kPa	Change in total vertical stress
$\Delta \sigma'_{v}$	kPa	Change in effective vertical stress
ε	%	Linear strain
ε_1 , ε_2 , ε_3 ,	%	Principal strains
ε_{50}	%	Vertical strain at half the maximum deviator stress
ε_v	%	Vertical strain
ε_{vf}	%	Vertical strain at failure
γ	%	Shear strain
μ	-	Coefficient of friction
ν	-	Poisson's ratio
v_u	-	Poisson's ratio for undrained stress change
v_d	-	Poisson's ratio for drained stress change
σ	kPa	Total stress
σ'	kPa	Effective stress
σ_1 , σ_2 , σ_3	kPa	Principal stresses
σ'_h	kPa	Effective horizontal stress
σ'_{h0}	kPa	In situ horizontal effective stress
σ'_v	kPa	Effective vertical stress
σ_{v0}	kPa	Total vertical stress relative to ground surface or phreatic surface
σ'_{v0} or ${p'}_0$	kPa	In situ vertical effective stress
σ'_{vc}	kPa	Vertical effective consolidation stress
σ'_r	kPa	Radial effective stress
τ	kPa	Shear stress
Physical Ground Ch	aracteristics	
Density and Unit W	eights	
γ	kN/m³	Unit weight of ground (or bulk unit weight or total unit weight)
	_	

Unit weight of dry ground



 kN/m^3

Symbol	Unit	Full Term or Definition
γ_s	kN/m³	Unit weight of solid particles
Yw	kN/m³	Unit weight of water
γ_{dmin}	kN/m³	Minimum index (dry) unit weight
γ_{dmax}	kN/m³	Maximum index (dry) unit weight
γ' or γ_{sub}	kN/m³	Unit weight of submerged ground or soil
ρ	Mg/m³ [= t/m³]	Density of ground/soil or bulk density
$ ho_d$	Mg/m³ [= t/m³]	Density of dry ground/soil or dry density
$ ho_s$	Mg/m³ [= t/m³]	Density of solid particles
σ_{ω}	Mg/m³ [= t/m³]	Density of water
D_r	-, %	Relative density [= γ_{dmax} (γ_d - γ_{dmin})/ γ_d (γ_{dmax} - γ_{dmin})]
e	-	Void ratio
e_0	-	Initial void ratio
G_{S}	-	Specific gravity of solid particle
l_d	-, %	Density index $[=(\gamma_d - \gamma_{dmin})/\gamma_d(\gamma_{dmax} - \gamma_{dmin})]$
n	-, %	Porosity
w	%	Water content
S_r	%	Degree of saturation
Consistency		
w_L	%	Liquid limit
W_P	%	Plastic limit
I _P or PI	%	Plasticity index $[= w_L - w_P]$
I_L or LI	%	Liquidity index [= $(w - w_P)/(w_L - w_P)$]
$I_{\mathcal{C}}$	%	Consistency index $[=(w_L - w)/(w_L - w_P)]$
Particle Size		
D	mm	Particle diameter
D_n	mm	n% diameter $[n% < D]$
C_u	-	Uniformity coefficient [= D_{60}/D_{10}]
C_c	-	Curvature coefficient [= $(D_{30})2/D_{10}D_{60}$]
Hydraulic Propertie	es	
k	m/s	Coefficient of permeability
k_v	m/s	Coefficient of vertical permeability
k_h	m/s	Coefficient of horizontal permeability
Mechanical Ground	Characteristics	
Cone Penetration T	est	
A_c	mm ²	Cross-sectional projected area of the cone
A_n	mm ²	Cross-sectional area of load cell or shaft
A_s	mm ²	Surface area of friction sleeve



Symbol	Unit	Full Term or Definition
а	-	Net area ratio of the cone penetrometer
B_q	-	Pore pressure ratio
Δ_{u1} , Δ_{u2} , Δ_{u3}	MPa	Excess pore pressure at filter locations 1, 2 and 3
F_r	%	Normalised friction ratio [= f_t/q_n]
f_s	MPa	Sleeve friction or measured sleeve friction
f_t	МРа	Measured sleeve friction corrected for pore pressure effects
i	0	Inclination
K	-	Adjustment factor for ratio of pore pressure at u_1 to u_2 location
l	m	Penetration length
N_c	-	Cone factor between q_c and s_u or c_u
N_k	-	Cone factor between q_n and s_u or c_u
Q_t	-	Normalised cone resistance [= q_n/σ'_{v0}]
q_c	MPa	Cone resistance or measured cone resistance
q_n	MPa	Net cone resistance
q_t	МРа	Corrected cone resistance (i.e. total cone resistance) or cone penetration resistance corrected for pore-water pressure effects
R_f	%	Friction ratio
R_{ft}	%	Corrected friction ratio [= f_s/q_t or f_t/q_t]
R_{ftn}	%	Net friction ratio
U	-	Normalised excess pore pressure
и	MPa	Pore pressure
u_0	MPa	In situ pore pressure
u_1, u_2, u_3	MPa	Pore pressure measured at locations 1, 2 and 3
u_i	MPa	Measured pore pressure at the start of the dissipation test
u_t	MPa	Measured pore pressure at time t during a dissipation test
α	-	Ratio of the cone shaft to the area of the cone face
β	-	Pore-water pressure correction factor (CPTu)
Strength of Soil		
s_u or c_u	kPa	Undrained shear strength or undrained (undisturbed) shear strength of soil
S_{ufv}	kPa	Shear strength by field vane testing
$S_{ufv,rem}$	kPa	Remoulded shear strength by field vane testing
$S_{ufv,res}$	kPa	Residual shear strength by field vane testing
s_{uu} or s_{u}	kPa	Undrained shear strength from UU test or static unconsolidated undrained triaxial shear strength
s_u/σ'_{v0} or c_u/σ'_{v0}	-	Undrained strength ratio
φ' or φ'	° (degree)	Effective angle of internal friction
$arepsilon_{50}$	%	Strain at 50% of peak deviator stress (or ε_c)
1	I .	i de la companya de



Symbol	Unit	Full Term or Definition
E ₅₀	MPa	Young's modulus at 50% of peak deviator stress
$c_{u;r}$ or $s_u(R)$	kPa	Undrained shear strength of remoulded soil
C_R	kPa	Undrained residual shear strength
S_t	-	Soil sensitivity [= $c_u/c_{u;r}$ or $s_u/s_u(R)$]
tan ϕ	° (degree)	Internal friction
ϕ_u	° (degree)	Undrained friction angle
ϕ_d	° (degree)	Drained friction angle
Consolidation (One-Dimensional)	
C_c	-	Compression index
C_s	-	Swelling index (or recompression)
c_v	m²/s	Coefficient of consolidation
e	-	Void ratio
m_v	m²/MN	Coefficient of compressibility
OCR	-	Overconsolidation ratio $[=\sigma'_p/\sigma'_{vo}$ or $p'_c/p'_0]$
p	kPa	Vertical pressure
$p'_c = \sigma'_p$	kPa	Preconsolidation stress
YSR	-	Yield stress ratio [= $\sigma'_{vy}/\sigma'_{v0}$]
Dp	kPa	$p'_{c} - p'_{0}$
σ_{vy}	kPa	Effective vertical yield stress in oedometer compression
σ'_{v0}	kPa	Effective in situ vertical stress (or p'_0)
Geotechnical D	esign	
Earth Pressure		
δ	° (degree)	Angle of interface friction (between ground and foundation)
K	-	Coefficient of lateral earth pressure
K_a	-	Coefficient of active earth pressure
K_p	-	Coefficient of passive earth pressure
K_0	-	Coefficient of earth pressure at rest [= $\sigma'_{h0}/\sigma'_{v0}$]
$K_{0,nc}$	-	K_0 for normally consolidated soil
$K_{0,oc}$	_	K_0 for overconsolidated soil



List of Plates

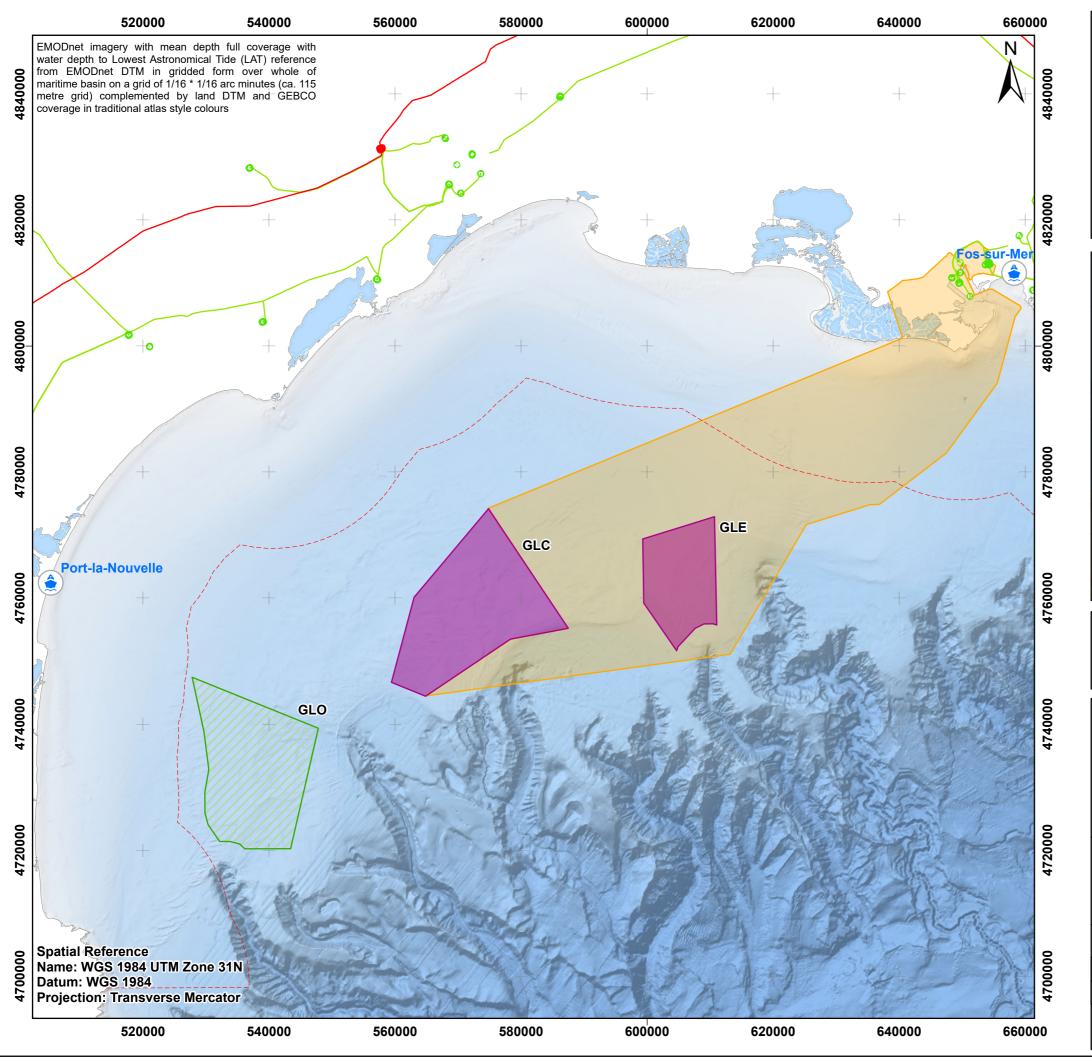
- 1. Project Information
- 2. Geotechnical Description and Profiles
- 3. Sampling Data
- 4. Laboratory Test Data

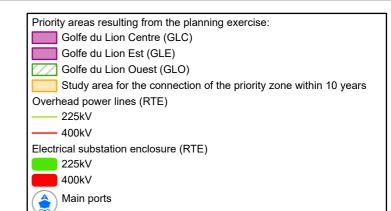


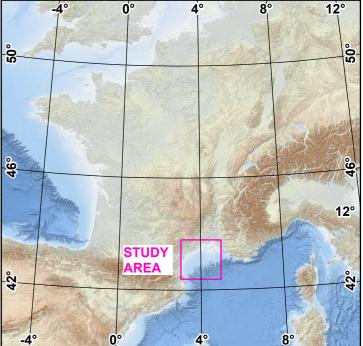
1. Project Information

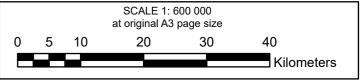
Title	Plate No.
Vicinity Map	1.1
General Location Plan	1.2











Golfe du Lion Site Investigation - Vicinity Map

Project name: Golfe du Lion Site Investigation

Project no. F254727

Report no. F254727-REP-001



Client:

MINISTÈRE

DE LA TRANSITION

ÉNERGÉTIQUE

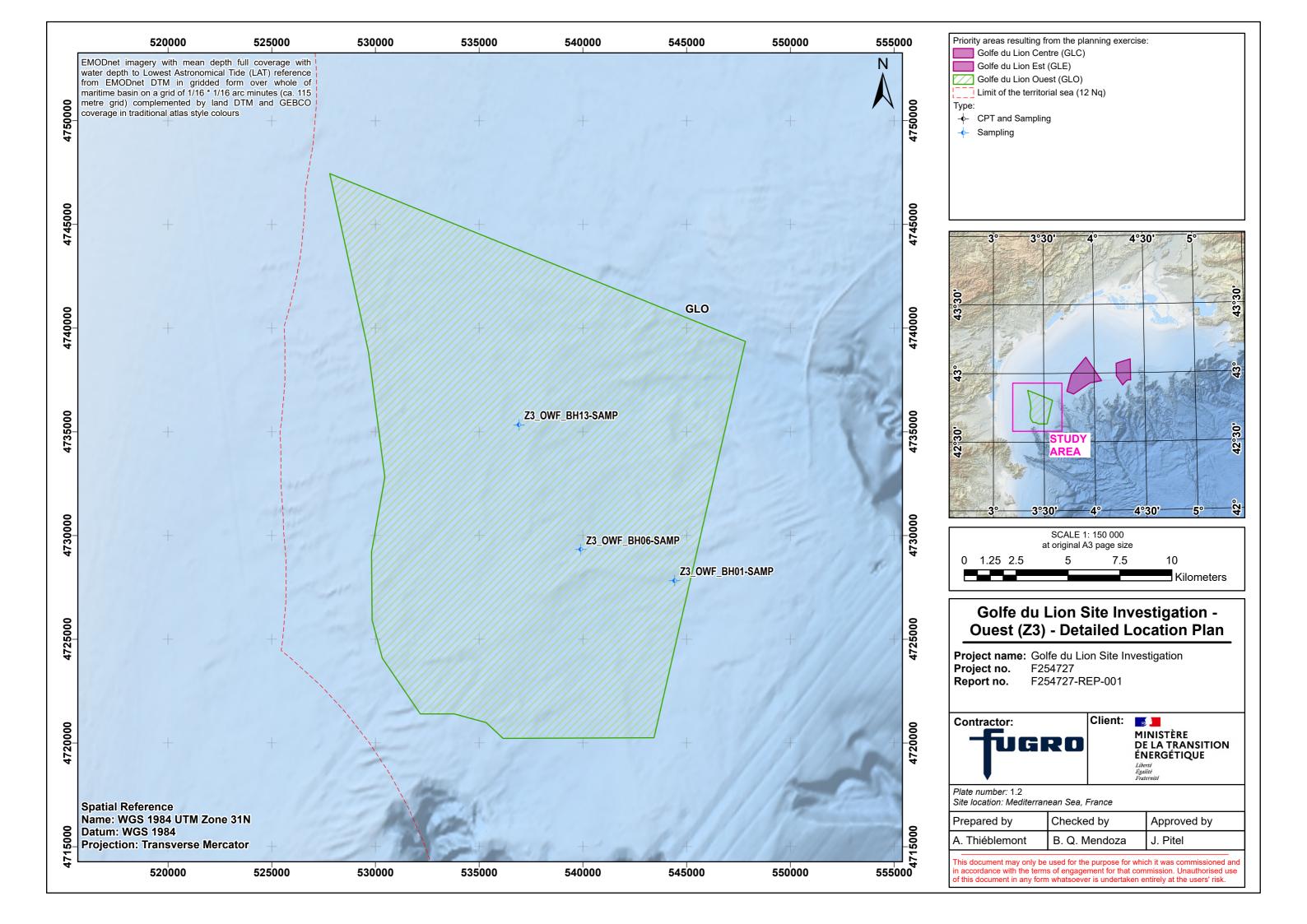
Liberté

Plate number: 1.1

Site location: Mediterranean Sea, France

Prepared by	Checked by	Approved by
A. Thiéblemont	B. Q. Mendoza	J. Pitel

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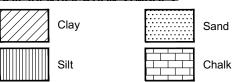


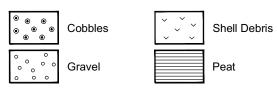
2. Geotechnical Description and Profiles

Title	Plate No.
List of Symbols and Classification Systems Used	2.1
Geotechnical Logs	2.2 to 2.7



SOIL IDENTIFICATION SYMBOLS





Note:

These soil identification symbols differ from BS 5930 (1999) but they are used to conform with those generally adopted for offshore purposes Vertical symbols on the log indicate a soil mixture of primary, secondary and tertiary constituents as presented in the soil descriptions

SOIL STRUCTURE SYMBOLS



A Interbedded/laminated Soil A and Soil B

A Bed of Soil A in layer of Soil B

Note:

- 1. Pockets are not continuous through the sample
- 2. Partings are 1 to 2 grains thick
- 3. Thinly laminated is under 6 mm thick
- 4. Thickly laminated is from 6 mm to 20 mm thick
- 5. Very thinly bedded is from 20 mm to 60 mm thick
- 6. Thinly bedded is from 60 mm to 200 mm thick
- 7. Medium bedded is from 200 mm to 600 mm thick
- 8. Thickly bedded is from 600 mm to 2000 mm thick
- 9. Very thickly bedded is over 2000 mm thick

SOIL STRATIFICATION SYMBOLS



Bed of Soil A found in layer of Soil B detected by sampling



Layer of Soil A detected during drilling

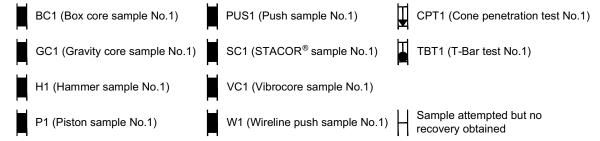


Layer change from Soil A to Soil B detected during cone penetration test

Note

Depth and thickness of layers detected during drilling are less accurate than those determined by sampling or cone penetration tests

SOIL SAMPLING AND TESTING SYMBOLS



TERMS FOR SOIL STRENGTH AND DENSITY

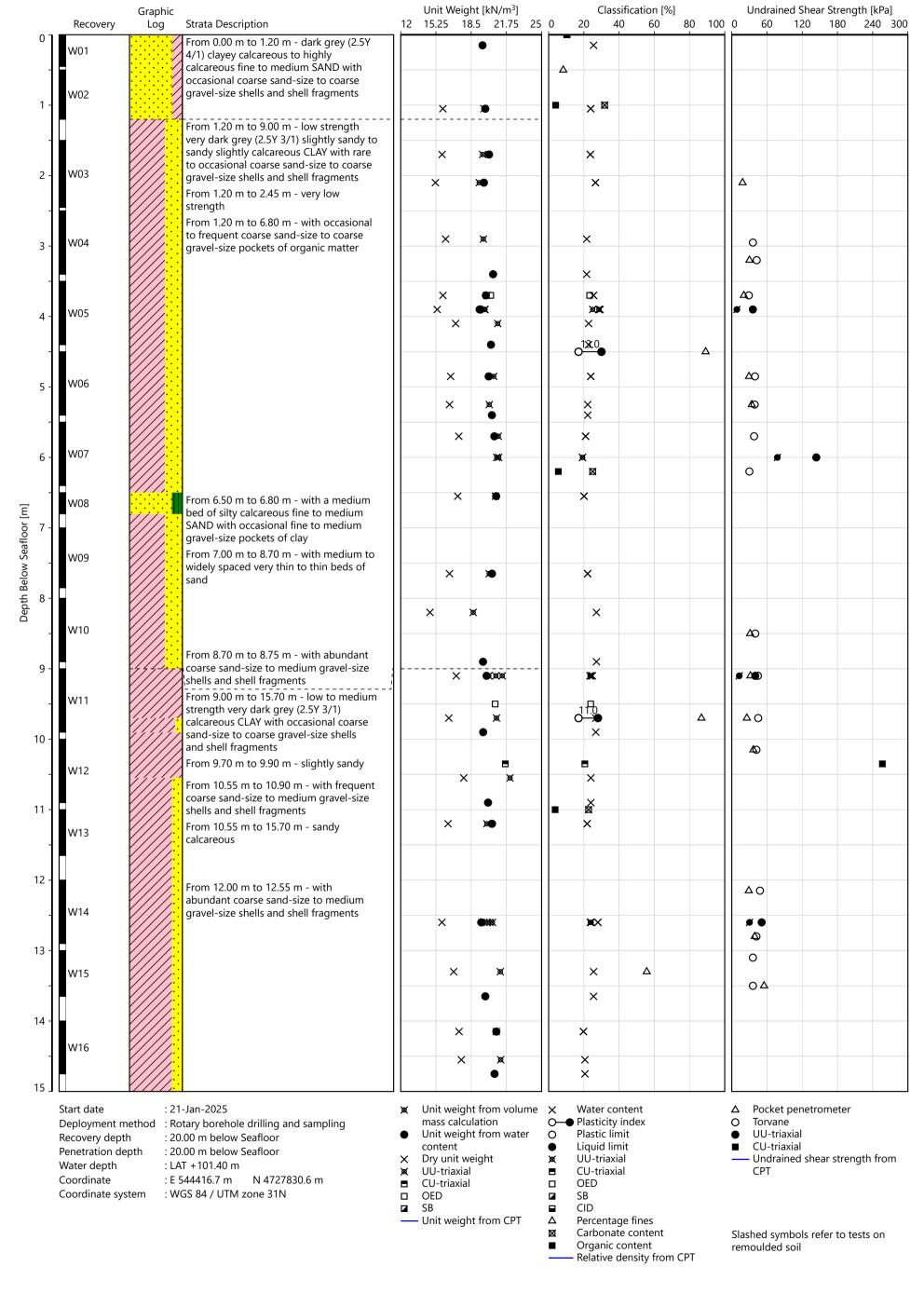
Fine-grained Soils

Term	Undrained Shear Strength [kPa]	
Extremely low	< 10	
Very low	10 – 20	
Low	20 – 40	
Medium	40 – 75	
High	75 – 150	
Very high	150 – 300	
Extremely high	300 – 600	
Ultra high	> 600	

Coarse-grained Soils

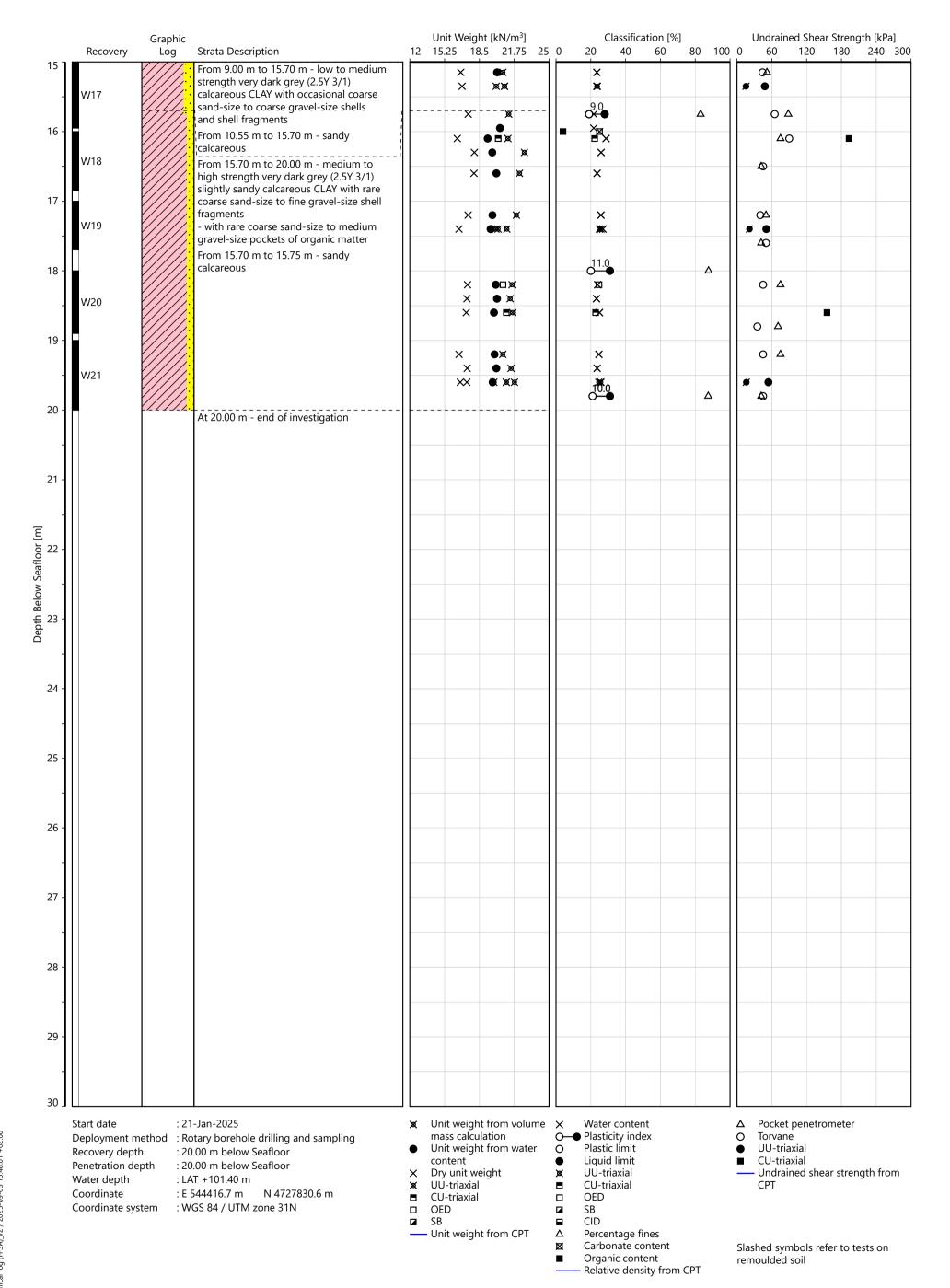
Godioc grained Golio		
Term	Estimated Relative Density [%]	
Very loose	0 – 15	
Loose	15 – 35	
Medium dense	35 – 65	
Dense	65 – 85	
Very dense	85 – 100	





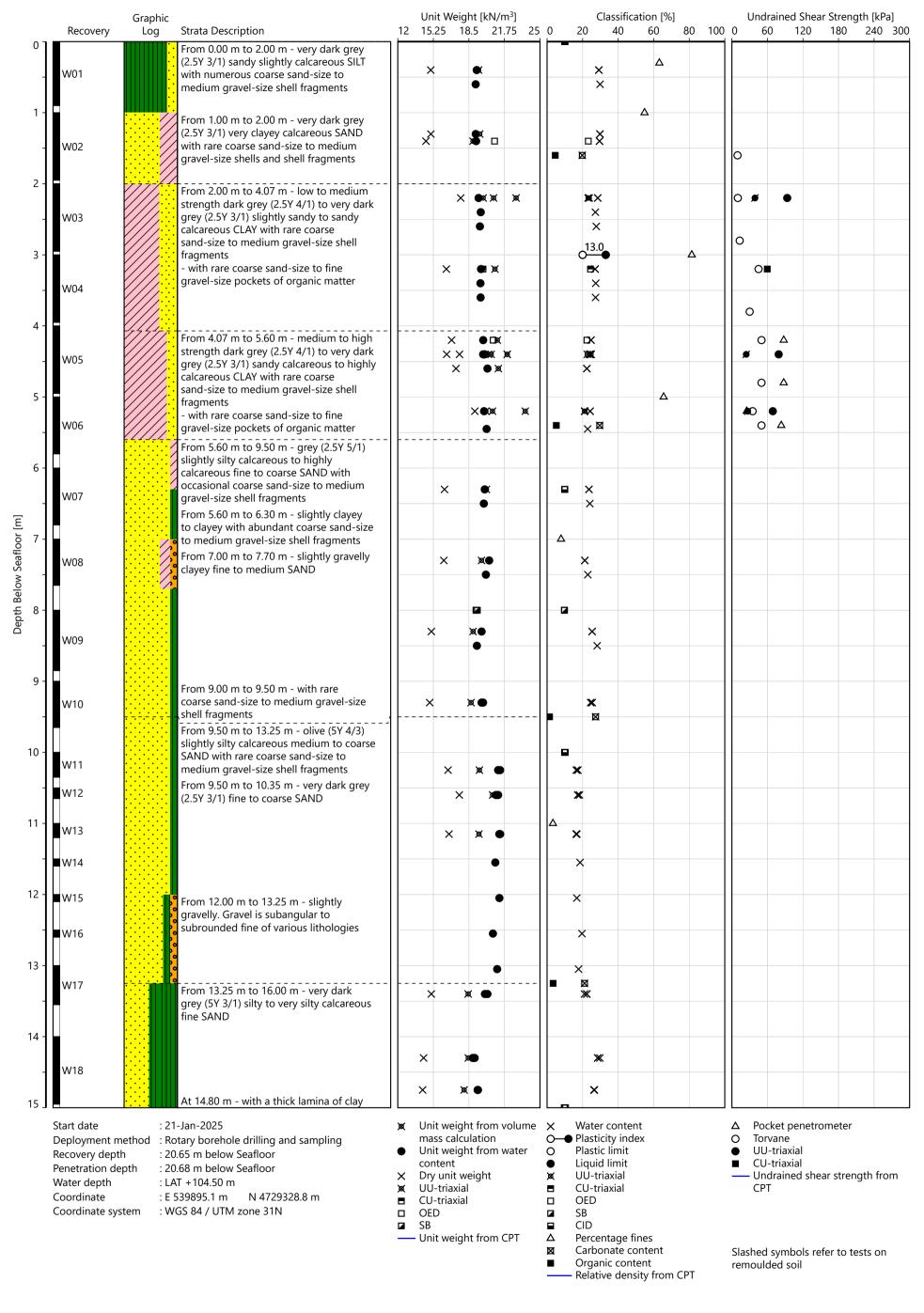
Geotechnical Log Z3_OWF_BH01-SAMP





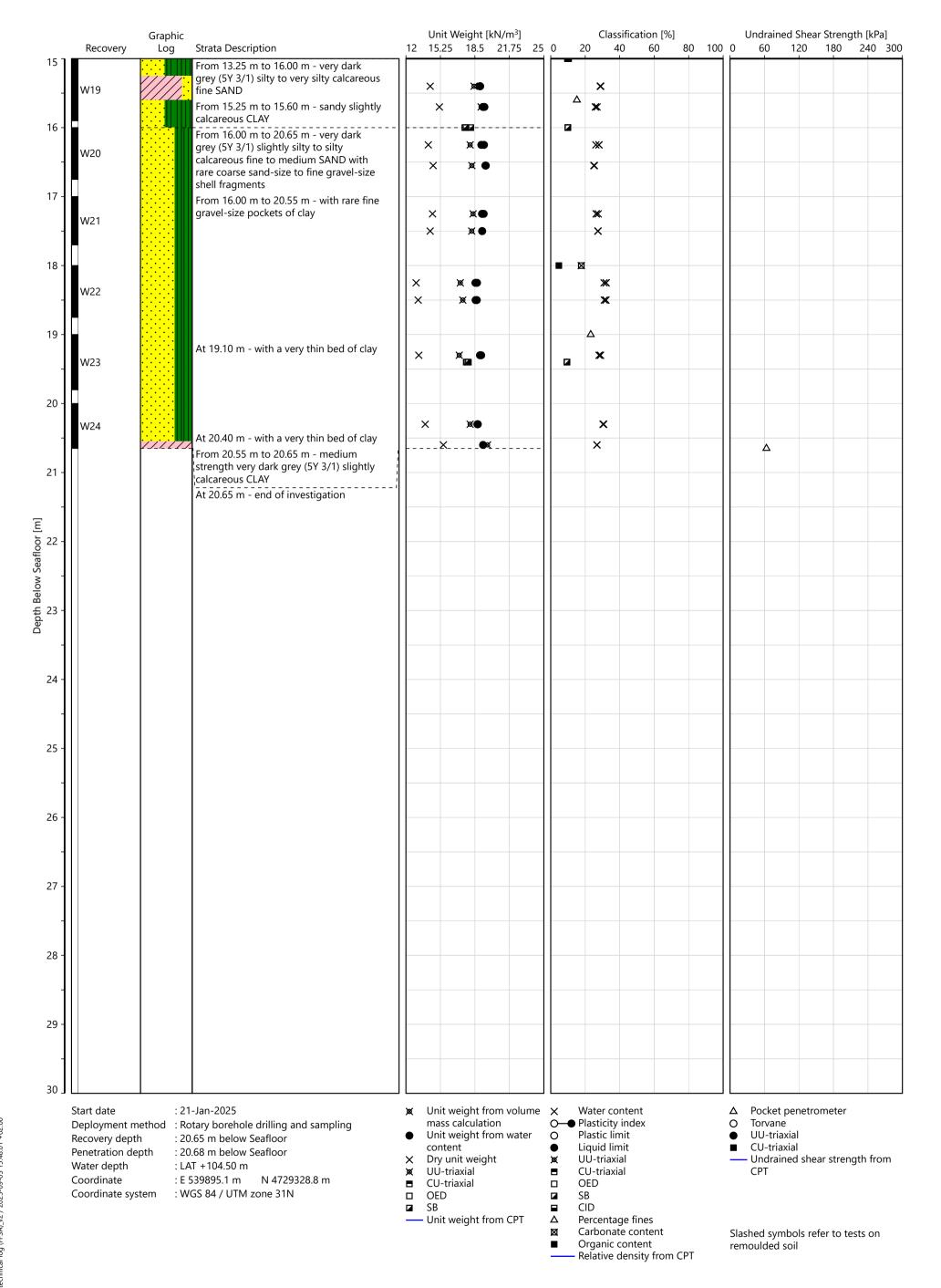
Geotechnical Log Z3_OWF_BH01-SAMP





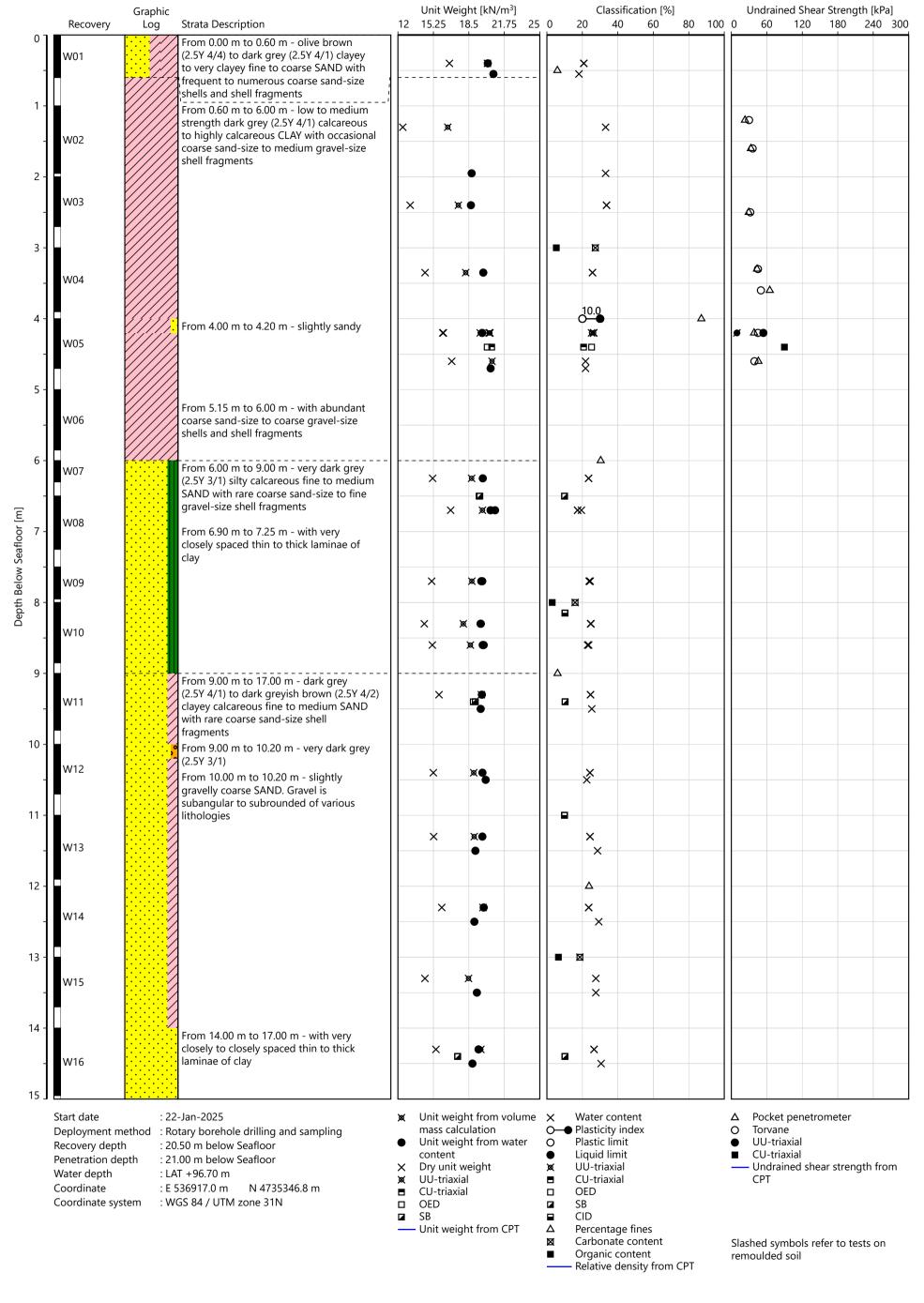
Geotechnical Log Z3_OWF_BH06-SAMP





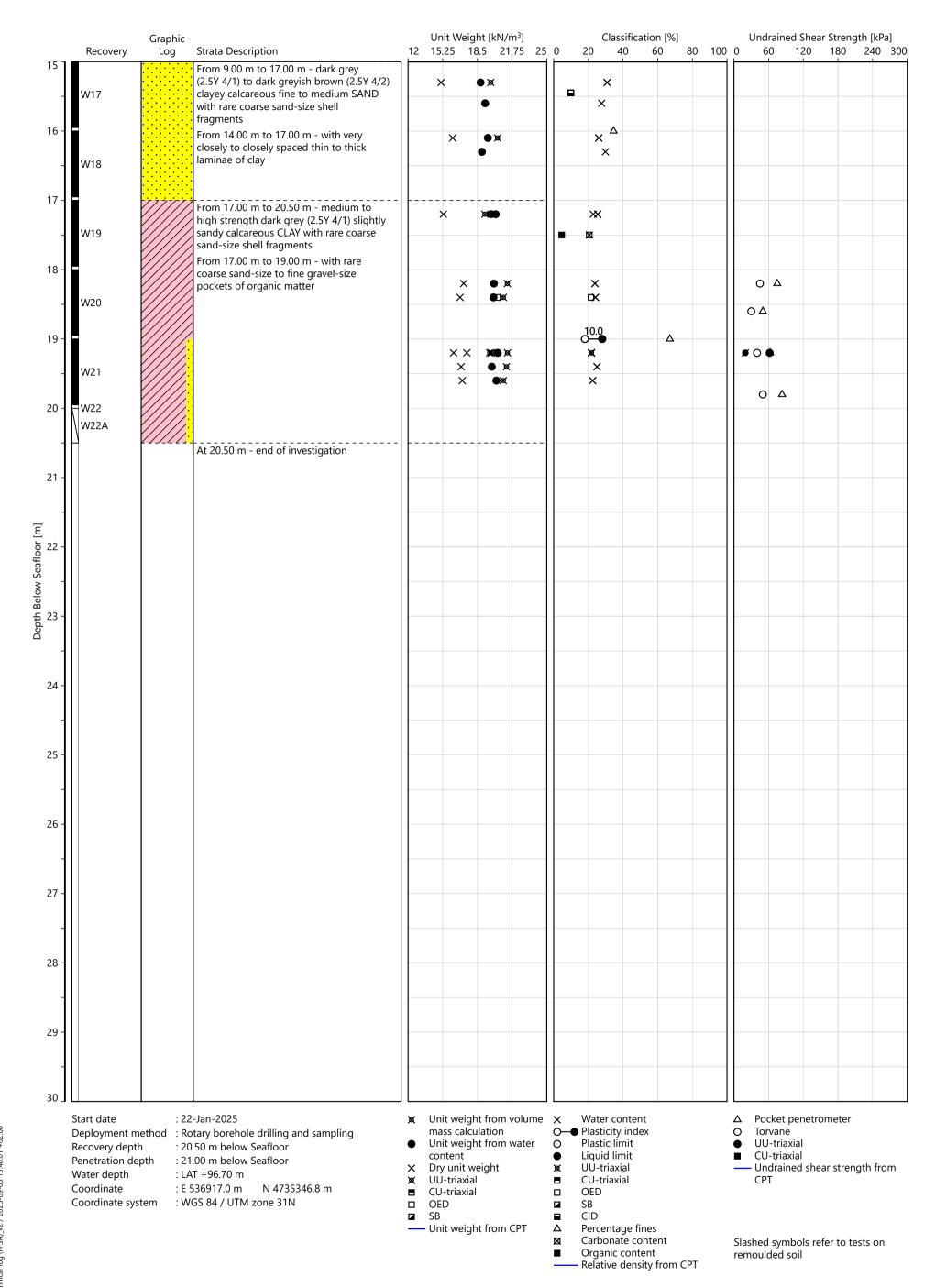
Geotechnical Log Z3_OWF_BH06-SAMP











Geotechnical Log Z3_OWF_BH13-SAMP



3. Sampling Data

Title	Plate No.
Sample Photographs	3.1 to 3.68
Sample List and Laboratory Testing Schedule	3.69 to 3.74





Sample : W01
Depth [m BSF] : 0.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W01
Depth [m BSF] : 0.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W02 Depth [m BSF] : 0.50 Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W02
Depth [m BSF] : 0.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W03
Depth [m BSF] : 1.50
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W03
Depth [m BSF] : 1.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W04
Depth [m BSF] : 2.50
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W04
Depth [m BSF] : 2.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W05
Depth [m BSF] : 3.50
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W05
Depth [m BSF] : 3.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W06
Depth [m BSF] : 4.50
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W06
Depth [m BSF] : 4.50
Note(s) : Split

SAMPLE PHOTOGRAPHS

No photograph available

Location : Z3_OWF_BH01-SAMP

Sample : W07 Depth [m BSF] : 5.50



Location : Z3_OWF_BH01-SAMP

Sample : W07
Depth [m BSF] : 5.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W08
Depth [m BSF] : 6.50
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W08
Depth [m BSF] : 6.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W09
Depth [m BSF] : 7.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W09
Depth [m BSF] : 7.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W10
Depth [m BSF] : 8.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W10
Depth [m BSF] : 8.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W11
Depth [m BSF] : 9.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W11
Depth [m BSF] : 9.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W12
Depth [m BSF] : 10.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

 Sample
 : W12

 Depth [m BSF]
 : 10.00

 Note(s)
 : Split

SAMPLE PHOTOGRAPHS



Sample : W13
Depth [m BSF] : 11.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W13
Depth [m BSF] : 11.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W14
Depth [m BSF] : 12.00
Note(s) : Intact

No photograph available

Location : Z3_OWF_BH01-SAMP

Sample : W14 Depth [m BSF] : 12.00

SAMPLE PHOTOGRAPHS



Sample : W15
Depth [m BSF] : 13.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W15
Depth [m BSF] : 13.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W16
Depth [m BSF] : 14.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W16
Depth [m BSF] : 14.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W17
Depth [m BSF] : 15.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W17
Depth [m BSF] : 15.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W18
Depth [m BSF] : 16.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W18
Depth [m BSF] : 16.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W19
Depth [m BSF] : 17.00
Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W19
Depth [m BSF] : 17.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W20 Depth [m BSF] : 18.00 Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W20
Depth [m BSF] : 18.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W21 Depth [m BSF] : 19.00 Note(s) : Intact



Location : Z3_OWF_BH01-SAMP

Sample : W21
Depth [m BSF] : 19.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W01
Depth [m BSF] : 0.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W01
Depth [m BSF] : 0.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W02 Depth [m BSF] : 1.00 Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W02
Depth [m BSF] : 1.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W03
Depth [m BSF] : 2.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W03
Depth [m BSF] : 2.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W04
Depth [m BSF] : 3.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W04
Depth [m BSF] : 3.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



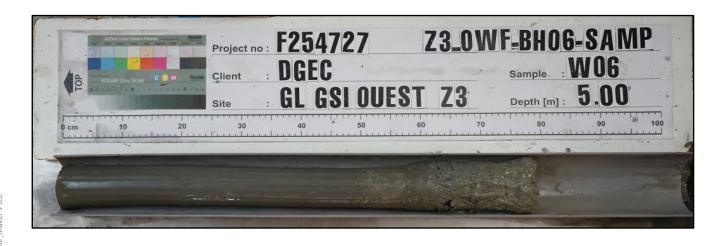
Sample : W05
Depth [m BSF] : 4.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W05
Depth [m BSF] : 4.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W06
Depth [m BSF] : 5.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W06
Depth [m BSF] : 5.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W07
Depth [m BSF] : 6.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W07
Depth [m BSF] : 6.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W08
Depth [m BSF] : 7.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W08
Depth [m BSF] : 7.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W09
Depth [m BSF] : 8.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W09
Depth [m BSF] : 8.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W10
Depth [m BSF] : 9.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W10
Depth [m BSF] : 9.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W11
Depth [m BSF] : 10.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W11
Depth [m BSF] : 10.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W12 Depth [m BSF] : 10.50 Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W12
Depth [m BSF] : 10.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W13
Depth [m BSF] : 11.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W13
Depth [m BSF] : 11.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W14
Depth [m BSF] : 11.50
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W14
Depth [m BSF] : 11.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W15
Depth [m BSF] : 12.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W15
Depth [m BSF] : 12.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W16
Depth [m BSF] : 12.50
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W16
Depth [m BSF] : 12.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W17
Depth [m BSF] : 13.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W17
Depth [m BSF] : 13.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W18
Depth [m BSF] : 14.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W18
Depth [m BSF] : 14.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W19
Depth [m BSF] : 15.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W19
Depth [m BSF] : 15.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W20 Depth [m BSF] : 16.00 Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W20
Depth [m BSF] : 16.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W21
Depth [m BSF] : 17.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W21
Depth [m BSF] : 17.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W22
Depth [m BSF] : 18.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W22
Depth [m BSF] : 18.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W23
Depth [m BSF] : 19.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W23
Depth [m BSF] : 19.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W24
Depth [m BSF] : 20.00
Note(s) : Intact



Location : Z3_OWF_BH06-SAMP

Sample : W24
Depth [m BSF] : 20.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W01
Depth [m BSF] : 0.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W01
Depth [m BSF] : 0.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W02 Depth [m BSF] : 1.00 Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W02
Depth [m BSF] : 1.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W03 Depth [m BSF] : 2.00 Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W03
Depth [m BSF] : 2.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W04
Depth [m BSF] : 3.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W04
Depth [m BSF] : 3.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W05
Depth [m BSF] : 4.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W05
Depth [m BSF] : 4.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W06
Depth [m BSF] : 5.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W06
Depth [m BSF] : 5.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W07
Depth [m BSF] : 6.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W07
Depth [m BSF] : 6.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W08
Depth [m BSF] : 6.50
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W08
Depth [m BSF] : 6.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W09
Depth [m BSF] : 7.50
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W09
Depth [m BSF] : 7.50
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W10
Depth [m BSF] : 8.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W10
Depth [m BSF] : 8.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W11
Depth [m BSF] : 9.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W11
Depth [m BSF] : 9.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W12 Depth [m BSF] : 10.00 Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W12
Depth [m BSF] : 10.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W13
Depth [m BSF] : 11.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W13
Depth [m BSF] : 11.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W14
Depth [m BSF] : 12.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W14
Depth [m BSF] : 12.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W15
Depth [m BSF] : 13.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W15
Depth [m BSF] : 13.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W16
Depth [m BSF] : 14.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W16
Depth [m BSF] : 14.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W17
Depth [m BSF] : 15.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W17
Depth [m BSF] : 15.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W18
Depth [m BSF] : 16.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W18
Depth [m BSF] : 16.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W19
Depth [m BSF] : 17.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W19
Depth [m BSF] : 17.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W20 Depth [m BSF] : 18.00 Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W20
Depth [m BSF] : 18.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W21
Depth [m BSF] : 19.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W21
Depth [m BSF] : 19.00
Note(s) : Split

SAMPLE PHOTOGRAPHS



Sample : W22 Depth [m BSF] : 20.00

Note(s) : No sample recovery.



Location : Z3_OWF_BH13-SAMP

Sample : W22 Depth [m BSF] : 20.00

Note(s) : No sample recovery.

SAMPLE PHOTOGRAPHS



Sample : W22A
Depth [m BSF] : 20.00
Note(s) : Intact



Location : Z3_OWF_BH13-SAMP

Sample : W22A
Depth [m BSF] : 20.00
Note(s) : Split

SAMPLE PHOTOGRAPHS

	CLIENT:	DOEC																															Drawn hw	
		Golfe de Lio	o Coo	toohn	iool (Cito Invo	action (Ouget	(72)		_																						Drawn by: MRI/BQM	4
	JOB NO:	E254727	i Geo	lecili	licai	Site inve	estigation	Ouesi	(23)		-																						Date:	
	00B NO.	1254121									_																						10/2/2025	4
		Total number	of offs	hore t	tests	(#)					177	169 90	93	10	4	0	0	0	0	0 0	0	0	0	6	0	0	0	0	0	0 0	0	0	10,2,2020	
		Total number	of ons	shore	tests	(/)					0	0 0	0	0	1	2	11 :	22 2	22 1	13 6	4	7	6	6	12	4	8	7	13 1	3 1	3 13	13	1	
															ity	itut					nsı					adj								
														Bacteria	Thermal Conductivity/Resistivity	Reconstitu					Permeameter Permeability [Cons					Permeability [constant head]			٠,	ء ا ٰٰٰ	, ;	ater		
											Ħ			act	Resi	Seco	Ų		_	2	<u></u>					tant	sts)		ءً ا ء		of S	×		
				1	E E						nte	sity		J Br	ity/F	. S	g	1	Ē	i.	ap		×		말	Suc	ţ			3 3	i ti	and Water		
<u>_</u>			(8)	Sample Lengin (cm)			-				Moisture Content	Bulk Density PP	2	Sulphate Reducing	ctiv	Conductivity	Plasticity Index	Sieve	Sedimentation	PD Min/Max Density	i i	OED	Shear Box	n	UU remould	ر ا	CIDc (set of 3 tests)	CIUc	Loss on ignition	Water Soluble Chloride	Carbonate Content of Soil	Soil		
3orehole Number		Ê	4		sample Diameter		Vallingford / LLN	Sample received	<u>.</u>	dn pesn	ture	국 교	-	Sed	npu	onp		is Si	≟ נ	<u>ء</u> ج	P _e	Ö	hea	\cap	Jre	bilit	set	ਹ	no s		e C	of S		
Ž Ž		<u>ت</u> ج	l ype	E E	ш		/ p.	<u>.ee</u>	cat	sed	lois	Bn		Ite F	Col	Ö i	Bas	3	Sec	Į.	ete		S			леа	၁		SO-	2 2	nat	Value		
<u>e</u>	Φ	Į Į	 0 0	ם כ	<u>е</u>	(g)	gfol	9	<u>e</u>	n e	2			pha	mal	nal				-	am					Je m	ᇹ		ا -	Vat.	i de	Va		
e h	Sample	Depth from (m)	Sample		E E	Mass (g)	ili Li	m d	Sample location	Sample				Sul	heri	Thermal					l E					TXL F				_ _	. ၂ ပ္	Hd		
					_		Š	Sa	S	Sa					-	È					Pe					Ê							Soil Type	Remarks
Z3_OWF_BH01-SAMP	01-01	0 Ba		_	69	2395					#										/						/						SAND	
Z3_OWF_BH01-SAMP	02-01	0.5 Ba		_	69	2975												/	/	/ /													SAND	Disturbed
Z3_OWF_BH01-SAMP	02-02	1 Ba	_	_	69	1683					#	#					_	_	_	_									/	/ /	/	/	SAND	
Z3_OWF_BH01-SAMP	03-01	1.5 Ba	_	_	69	1555		-			#	#					_		_										-	-			CLAY	
Z3_OWF_BH01-SAMP Z3_OWF_BH01-SAMP	03-02 03-03	1.8 Ba	_	_	69	2252 2209					#	# #		#			_	_	_											-			CLAY	
Z3_OWF_BH01-SAMP	03-03	2.1 Ba	_	_	69 72	2513		-			#	# #		-	#		-				+		-						-	-			CLAY	
Z3_OWF_BH01-SAMP	04-01	2.5 Ba		_	72	1536				+		# #	#		#				_		+									-			CLAY	
Z3_OWF_BH01-SAMP	04-03	3.1 Ba		_	72	2505					#	# #	#					_	_	_										-			CLAY	
Z3_OWF_BH01-SAMP	05-01	3.5 Ba	_	_	72	1140					#	# #	#					-		-	+						- 			+			CLAY	
Z3 OWF BH01-SAMP	05-02	3.7 W	_	_	72	1744					#	# #	#									/				/							CLAY	
Z3 OWF BH01-SAMP	05-03	3.9 Ba		_	72	1696					#	# #												#	/								CLAY	UU
Z3_OWF_BH01-SAMP	05-04	4.1 Ba	_	_	72	2059					#	# #																					CLAY	
Z3_OWF_BH01-SAMP	06-01	4.5 Ba		_	72	2490					#	# #	#				1	/	/	/													CLAY	
Z3_OWF_BH01-SAMP	06-02	4.85 W	ах	20	72	1729					#	# #	#															/					CLAY	
Z3_OWF_BH01-SAMP	06-03	5.05 W	ax	20	72	1714						# #	#																				CLAY	
Z3_OWF_BH01-SAMP	06-04	5.25 Ba	ag	_	72	949					#	# #	#																				CLAY	
Z3_OWF_BH01-SAMP	07-01	5.5 Ba	_	_	72	1326					#	# #	#																				CLAY	
Z3_OWF_BH01-SAMP	07-02	5.7 W		_	72	1773					#	# #	#																				CLAY	
Z3_OWF_BH01-SAMP	07-03	5.9 Ba		_	72	798																								_			CLAY	
Z3_OWF_BH01-SAMP	07-04	6 W		_	72	1785						# #	#							_				/	/								CLAY	
Z3_OWF_BH01-SAMP	07-05	6.2 Ba	_	_	72	1549					#	# #	#					_									_		/	/ /	/	/	CLAY	
Z3_OWF_BH01-SAMP	08-01	6.5 Ba	_	_	72	2144					#	#																					SAND	
Z3_OWF_BH01-SAMP	09-01	7 Ba	_		69	1606		_								_		_		_	-												CLAY	
Z3_OWF_BH01-SAMP	09-02	7.25 Ba		_	69	2148					.						-	-	-											+			CLAY	000
Z3_OWF_BH01-SAMP	09-03 10-01	7.5 Ba	_	_	69	1995					#	#		#																			CLAY	SRB
Z3_OWF_BH01-SAMP Z3_OWF_BH01-SAMP	10-01	8 Ba	_		69 69	2045 2150						#	#						-		-									-			CLAY	
Z3_OWF_BH01-SAMP	10-02	8.3 Ba			69 69	2150					#	#	#		1			-		-										-			CLAY	
Z3_OWF_BH01-SAMP	11-01	9 Ba	_	_	72	437					#	# #	#					-		-	+									+			CLAY	
ZO_OVVI _DI IU I-GAIVIF	1101	3 00	49	10	12	401					#	# #	#																				CLAT	

SITE: Golfe de Lion Geotechnical Site Investigation Ouest (Z3) JOB NO: F254727 Total number of orishore tests (#) Total number of orishore tests		CLIENT:	DOEC																															Drawn hw	
Section Part				ion Go	notor	hnigal	Cito Inv	octigation	Ouget	(72)		_																						Drawn by:	
Total number of cells have lesses (9) Total number of cells have less (9) Tot				UII GE	eolec	JIIIICai	Site inve	estigation	Ouesi	(23)		_																							
Trial reviewer of efficience tasks (e)		JOB NO.	1 234121									_																							
Remarks			Total number	er of o	ffsho	re tests	s (#)					177	169 90	93	10	4	0 (0 0	0 0) (0 0	0	0	0	6	0 (0 0	0	0	0	0	0	0	.0/2/2020	
Solity S			Total numb	er of o	nsho	re tests	s (/)					0	0 0	0	0	1	2 1	1 2	2 22	2 1	3 6	4	7	6	6 1	12 4	4 8	7	13	13	13	13	13		
Solity S																ity	ţ					nsı				7	2								
Solity S	per				(cm) ר	ter (mm)		3	pə	ڍ	Q.	ire Content	Density PP	\T	educing Bacteria	ductivity/Resistiv	luctivity Reconst	Icity Index	mentation	PD	ax Density	Permeability [Co	OED	ear Box	nn	remould	at of 3 tests)	CIUc	on Ignition	ohate Content	luble Chloride	Content of Soil	Soil		
23 OWF BHO1-SAMP 11-02 9-1 Wax 20 72 1760	Borehole Numi	Sample	Depth from (m)	Sample Type	Sample Length	Sample Diame	Mass (g)	Wallingford / Ll	Sample receive	Sample locatio	Sample used u	Moistu	Bulk		Sulphate Re	Thermal Conc	Thermal Cond	Plasti 0	Sedir	5	Min/M	Permeameter I	0	She					Loss	Total Sulp	Water So	Carbonate	Value	Soil Type	Remarks
23_OWF_BH01-SAMP 11-04 9.5 Wax 20 72 1687			9.1 \							,		#	# #	#											1	/									
23 OWF BHOI-SAMP 11-05 9.7 Bag 20 72 1328	Z3_OWF_BH01-SAMP	11-03	9.3	Bag	20	72	1760																											CLAY	
23 OWF BH01-SAMP 12-01 10 Bag 15 72 1011		11-04	9.5 \	Wax	20	72	1687						# #	#									/											CLAY	
23 OWF_BH01-SAMP 12-02 10.15 Bag 20 72 1618	Z3_OWF_BH01-SAMP	11-05	9.7	Bag	20	72	1328					#	# #	#				/ /	/ /	/ /	/													CLAY	
23_OWF_BH01-SAMP	Z3_OWF_BH01-SAMP	12-01	10 E	Bag	15	72	1011						#	#																				CLAY	
Z3_OWF_BH01-SAMP 12-04 10.55 Bag 20 72 1661	Z3_OWF_BH01-SAMP		10.15	Bag			1618						#	#																				CLAY	Invalid UU, because the material is too soft
Z3_OWF_BH01-SAMP 13-0 11.0 11		12-03	10.35 \	Wax	20	72	1779						#															/						CLAY	
Z3_OWF_BH01-SAMP 13-1					20	_	1661						#																					CLAY	
Z3_OWF_BH01-SAMP 13-2 11.2 Bag 20 72 1512		12-05	10.75 E	Bag	15	_						#																							
Z3_OWF_BH01-SAMP 13-3				_		_						#	#																/	/	/	/	/		
Z3_OWF_BH01-SAMP 14-1 12 Bag 30 72 2537						_						#	#																						
Z3_OWF_BH01-SAMP 14-2 12.3 Bag 30 72 2177						_																													
The image of the						_							#	#	#																				SRB
Z3_OWF_BH01-SAMP 14-4 12.8 Bag 10 72 261						_	2177					#	#																					CLAY	
The color of the						_						#	# #	#											/	/									
The first color of the first c					10	_							#	#																					
Z3_OWF_BH01-SAMP						_								#																					
Z3_OWF_BH01-SAMP 15-4 13.5 Bag 15 72 1495						_							#	#																					
Z3_OWF_BH01-SAMP 16-1				_		_							# #	#				/ /	/ /	/ /	/														
Z3_OWF_BH01-SAMP 16-2						_						+	#	#																					
Z3_OWF_BH01-SAMP 16-3 14.35 Wax 20 72 1880 # # CLAY CL				_		_							#																						
Z3_OWF_BH01-SAMP												#	#																						
Z3_OWF_BH01-SAMP 17-1 15 Bag 15 72 958 # # # # # # CLAY	Z3_OWF_BH01-SAMP		14.35 \	Wax	20	72	1880						#																					CLAY	
			14.55	Bag	20	_						#	#																						
Z3_OWF_BH01-SAMP 17-2			15	Bag		_						#	# #	#																					
			15.15	Wax		_	1729					#	# #	#																				CLAY	
Z3_OWF_BH01-SAMP 17-3 15.35 Bag 20 72 1718 # # # # CLAY UU				_		_							#			#									#	/									UU
Z3_OWF_BH01-SAMP 17-4 15.55 Wax 20 72 1722 # # # # # CLAY			15.55	Wax	20	_	1722						# #	#																				CLAY	
Z3_OWF_BH01-SAMP 17-5 15.75 Bag 20 72 1157 # # # # # / / / / CLAY						_						#	# #	#				/ /	/ /	/															
Z3_OWF_BH01-SAMP 18-1 16 Bag 10 72 412 # # # # # # / / / / /	Z3_OWF_BH01-SAMP	18-1	16	Bag	10	72	412					#	# #	#															/	/	/	/	/	CLAY	

	CLIENT:																							Drawn by:	
	SITE:	Golfe de Lion Geotechnical Site Investigation Ouest (Z3)																						MRI/BQM	
	JOB NO:	F254727																						Date:	
							_																, 	10/2/2025	
		· ·	177	169 90	93 10			0			0 0	_	0	0	6	0	0	0		0 (_	0		
		Total number of onshore tests (/)	0	0 0	0 0	1	2	11	22	22	13 6	4	7	6	6	12	4	8	7 1	3 1	3 13	3 13	13		
					0	į.	tifut					suc					ad						1_		
					Bacteria	sisti	Reconstitu					5					¥	_		*	<u> </u>	Soil	and Water		
			aut		Bac	Res	Sec	×		ے ا	. <u>≥</u>	. ∰					star	sts)		= {		o			
		(m (m m)	Content	sity	DQ.	į	ity	nde	_	atio	ens	eak		XO		밁	Ö	3 te	3] ວົ	ten	au		
<u> </u>			Ое	Den	>	lcti	ctiv	Ξź	Sieve	ent	ax D	erm	OED	ar B	n	SW	ty C	ō	CIUC	g 5	aldi	l lo	Soil		
Borehole Number		Depth from (m) Sample Type Sample Length (cm) Sample Diameter (m Mass (g) Wallingford / LLN Sample received Sample location	Moisture	Bulk Der	TV Sulphate Reducing	Thermal Conductivity/Resistivity	Conductivity	Plasticity Index	S	Sedimentation	PD Min/Max Density	Permeameter Permeability [Cons	0	Shear Box	_	UU remould	Permeability [constant head	CIDc (set of 3 tests)	ပ	Total Sulphate Content	Water Soluble Chloride	Carbonate Content of Soil	o		
Ž) in join join join join join join join j	Jois	M M	ate	ပိ	Ö	Ва		Se	Ę.	Jete		0)		\supset	nes	2	3			ona	Value of		
olo	<u>0</u>		_		hal	. Lu	mal				-	ean					Pen	ᄗ		Ì	Nat N	arb	> =		
oreh	Sample	Depth from (m) Sample Type Sample Length Sample Diamet Mass (g) Wallingford / LL Sample receive Sample location			Su	her	Thermal					Ē					¥					0	F		
							_					ď					F							Soil Type	Remarks
Z3_OWF_BH01-SAMP	18-2		#	# #	#														/	_				CLAY	
Z3_OWF_BH01-SAMP Z3_OWF_BH01-SAMP	18-3 18-4		#	# #	# #				-	-						-	-			-				CLAY CLAY	SRB
Z3_OWF_BH01-SAMP	18-5		#	# #	# #												\dashv			+				CLAY	JND.
Z3_OWF_BH01-SAMP	19-1	 	#	# #	#															_				CLAY	
Z3 OWF BH01-SAMP	19-2	, , , , , , , , , , , , , , , , , , , 	#	# #	#															1				CLAY	
Z3 OWF BH01-SAMP	19-3	, , , , , , , , , , , , , , , , , , , 	#	# #	#										/	/				1				CLAY	
Z3_OWF_BH01-SAMP	19-4	17.6 Bag 10 72 734		#	#																			CLAY	
Z3_OWF_BH01-SAMP	20-1		#	# #	#			/	/	/														CLAY	
Z3_OWF_BH01-SAMP	20-2	18.2 Wax 20 72 NaN	#	# #	#								/				/							CLAY	
Z3_OWF_BH01-SAMP	20-3	1011 Tun 20 12 Tunt	#	#																				CLAY	
Z3_OWF_BH01-SAMP	20-4		#	# #	#														/					CLAY	
Z3_OWF_BH01-SAMP	20-5	18.8 Bag 10 72 454		#	#																			CLAY	
Z3_OWF_BH01-SAMP	21-1	10 = 10 1	#	# #	#								-											CLAY	4
Z3_OWF_BH01-SAMP	21-2	1912 11911 - 12 12 11911	#	# #	#															_				CLAY	
Z3_OWF_BH01-SAMP	21-3 21-4	1911 11911 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1	#	#		-						-					-			-	-			CLAY	
Z3_OWF_BH01-SAMP Z3_OWF_BH01-SAMP	21-4	19.6 Bag 20 72 1293 19.8 Bag 20 72 1493	#	# #	#			,	,	,	1	-	+		#	/				_	-		-	CLAY CLAY	UU
Z3 OWF BH06-SAMP	01-1	0 Bag 30 72 1677		#	#	+			/	/	/							,		+				SAND	
Z3_OWF_BH06-SAMP	01-2		#	#					,	,	, ,		1					/	-	_				SAND	
Z3_OWF_BH06-SAMP	01-3	+ + *+ + + + + + + + + + + + + + + + +	#	"		+	,				, ,					- 		<u>_</u>		-				SAND	
Z3_OWF_BH06-SAMP	02-1		#	#				/	/	/														CLAY	
Z3_OWF_BH06-SAMP	02-2		#	#	#								/											CLAY	
Z3_OWF_BH06-SAMP	02-3	1.6 Bag 35 69 2514			#															/ .	, ,	/	/	CLAY	
Z3_OWF_BH06-SAMP	03-1	, , , , , , , , , , , , , , , , , , , 	#	# #	#																			CLAY	
Z3_OWF_BH06-SAMP	03-2	2.2 Wax 20 69 NaN	#	# #	#										/	/								CLAY	
Z3_OWF_BH06-SAMP	03-3	2.4 Wax 20 69 NaN	#	#																				CLAY	
Z3_OWF_BH06-SAMP	03-4		#	#	#																			CLAY	
Z3_OWF_BH06-SAMP	03-5	2.8 Bag 15 69 882			#																			CLAY	
Z3_OWF_BH06-SAMP	04-1	9	#	# #	#			/	/	/	/						4							CLAY	
Z3_OWF_BH06-SAMP	04-2		#	# #	#	/													/					CLAY	
Z3_OWF_BH06-SAMP	04-3		#	#							_		-											CLAY	
Z3_OWF_BH06-SAMP	04-4	5.5 Trun 25 55 Tro	#	#	#			-									\dashv			+	-			CLAY	
Z3_OWF_BH06-SAMP	04-5 05-1	3.8 Bag 15 69 723 4 Bag 20 72 1238	,,	,, ,,	#								-											CLAY CLAY	
Z3_OWF_BH06-SAMP Z3_OWF_BH06-SAMP	05-1		#	# #	#				-				,				,			+				CLAY	
Z3_OWF_BH06-SAMP	05-2	, , , , , , , , , , , , , , , , , , , 	#	# #	#					-+	+		/		#	,	/			+				CLAY	UU
ZJ_UWF_DHUU-SAIVIP	03-3	4.4 Day 20 12 1010	#	#											#	1								CLAT	00

	CLIENT:	DOEO																															Danier hier	
			Lion G	ootoc	hnical	Site Inve	estigation (Tupet /	73)																								Drawn by: MRI/BQM	
	JOB NO:		LIUIT G	eolec	IIIIICai	Site inve	estigation	Juest	(23)																								Date:	
		1201121									_																						10/2/2025	
		Total num	ber of c	offshor	e tests	s (#)					177	169 90	93	10	4	0	0	0	0 (0 0	0	0	0	6	0	0	0	0	0	0 (0	0		
		Total num	ber of o	onsho	re test	s (/)					0	0 0	0	0	1	2 1	1 :	22 2	22 1	3 6	4	7	6	6	12	4	8	7	13	13 1	3 13	13		
															ty	ţ					ısı					ad]								
Borehole Number	Sample	Depth from (m)	Sample Type	Sample Length (cm)	Sample Diameter (mm)	Mass (g)	/allingford / LLN	Sample received	Sample location	Sample used up	Moisture Content	Bulk Density PP	\ <u></u>	Sulphate Reducing Bacteria	Conductivity	Thermal Conductivity Reconstitu	Flasticity index	Sieve	Sedimentation	Min/Max Density	Permeameter Permeability [Cons	OED	Shear Box	UU		TXL Permeability [constant head]	CIDc (set of 3 tests)	CIUc	Loss on Ignition	Mater Soluble Obloride	Carbonate Content of Soil	pH Value of Soil and Water	0.17	
Z3_OWF_BH06-SAMP	တ 05-4	4.6	ဟ Wax		თ 72	≥ 1634	5	S	<u> </u>	S	#	# #	#				_				_					_							Soil Type CLAY	Remarks
Z3 OWF BH06-SAMP	05-4	4.8	Bag		72	1154					#	# #	#					+			1								+	+			CLAY	
Z3_OWF_BH06-SAMP	06-1	5	Bag		69	987					#	# #	#				,	,	/														CLAY	
Z3_OWF_BH06-SAMP	06-1	5.2	Wax		69	1501					#	# #	_				,		,					,	,								CLAY	
Z3_OWF_BH06-SAMP	06-3	5.4	Bag		69	1155					#	# #	#			_				_				,					/	, ,	, ,	,	CLAY	
Z3_OWF_BH06-SAMP	06-4	5.6	Bag		69	2034					"	"	"																_	, ,		,	SAND	
Z3_OWF_BH06-SAMP	07-1	6	Bag	30	53	1305					#	#						-			1									-			SAND	
Z3_OWF_BH06-SAMP	07-2	6.3	Bag	50	53	1995					#	#															/						SAND	
Z3 OWF BH06-SAMP	08-1	7	Bag	20	53	975																							1				SAND	
Z3 OWF BH06-SAMP	08-2	7.2	Bag	25	53	494					#	#					7	/	/	/ /													SAND	
Z3 OWF BH06-SAMP	08-3	7.45	Bag	25	53	1163					#						7																SAND	
Z3 OWF BH06-SAMP	09-1	8	Bag	45	53	1778					#	#											/										SAND	
Z3_OWF_BH06-SAMP	09-2	8.45	Bag		53	1701					#			#							/												SAND	
Z3 OWF BH06-SAMP	10-1	9	Bag		53	1947					#	#																					SAND	
Z3_OWF_BH06-SAMP	10-2	9.5	Bag	15	53	739																							/	/ /	/	/	SAND	
Z3_OWF_BH06-SAMP	11-1	10	Bag	35	53	1436					#	#															/						SAND	
Z3_OWF_BH06-SAMP	12-1	10.5	Bag	15	53	342					#	#																					SAND	
Z3_OWF_BH06-SAMP	13-1	11	Bag	20	53	825					#	#						/	/	/													SAND	
Z3_OWF_BH06-SAMP	14-1	11.5	Bag	10	53	270					#																						SAND	
Z3_OWF_BH06-SAMP	15-1	12	Bag	10	53	206					#																						SAND	
Z3_OWF_BH06-SAMP	16-1	12.5	Bag	10	53	225					#																						SAND	
Z3_OWF_BH06-SAMP	17-1	13	Bag	25	53	911					#																						SAND	
Z3_OWF_BH06-SAMP	17-2	13.25	Bag	30	53	905					#	#		#															/	/ /	/	/	SAND	SRB
Z3_OWF_BH06-SAMP	18-1	14	Bag	50	53	1728					#	#																					SAND	
Z3_OWF_BH06-SAMP	18-2	14.5	Bag		53	1542					#	#								/													SAND	
Z3_OWF_BH06-SAMP	19-1	15	Bag	25	53	1225																					/						SAND	
Z3_OWF_BH06-SAMP	19-2	15.25	Bag	35	53	1140					#	#																					CLAY	
Z3_OWF_BH06-SAMP	19-3	15.6	Bag	30	53	790					#	#						/	/ .	/													SAND	
Z3_OWF_BH06-SAMP	20-1	16	Bag	40	53	1360					#	#											/										SAND	
Z3_OWF_BH06-SAMP	20-2	16.4	Bag	35	53	1254					#	#																					SAND	
Z3_OWF_BH06-SAMP	21-1	17	Bag		53	1135					#	#																					SAND	
Z3_OWF_BH06-SAMP	21-2	17.35	Bag	35	53	1180					#	#																					SAND	
Z3_OWF_BH06-SAMP	22-1	18	Bag		53	1332					#	#		#															/	/	/	/	SAND	SRB
Z3_OWF_BH06-SAMP	22-2	18.35	Bag		53	1450					#	#									/												SAND	
Z3_OWF_BH06-SAMP	23-1	19	Bag	40	53	1696					#	#						/	/														SAND	
Z3_OWF_BH06-SAMP	23-2	19.4	Bag	40	53	1522																	/										SAND	
Z3_OWF_BH06-SAMP	24-1	20	Bag	30	53	1153					#	#																					SAND	

	CLIENT:										_																						Drawn by:	
	SITE:	Golfe de l	Lion G	eotec	hnical	Site Inve	estigation	Ouest	(Z3)		_																						MRI/BQM	
	JOB NO:	F254727									_																						Date:	
													_	_						_											_	_	10/2/2025	
		Total num									177	169 90	4		4		0	-		0 0	_	0	0	6	0	0	0		0 0		4	0		
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														a	vity	titu					ons					ead					_	L		
														Bacteria	Thermal Conductivity/Resistivity	Reconstitu					Permeameter Permeability [Cons					Permeability [constant head			ţ	e e	Carbonate Content of Soil	and Water		
					_						ent			Вас	Res	Rec	×		_	. <u>≥</u>	l ij					star	sts	5	- d	lori	ţo ţ	∫Ş		
				_	(mm)						Content	sity		bu	/ity/		nde	_	atio	ens	eat		X		밁	Ö	3 te		2	ဉ်	tent			
<u>-</u>				(cm			z	-	_		e C	PP	2	duc	ıcti	ctiv	آغ	Sieve	ent	요 X	erm	OED	ar E	nn	Ĕ.	± €	ot	CIUc	ر ا عاد عاد	eqr	18	Soil		
Borehole Number		Ê	an an	Sample Length (cm)	Sample Diameter		Vallingford / LLN	Sample received	Sample location	Sample used up	Moisture	Bulk Den	Ι'	Sulphate Reducing	ndt	Conductivity	Plasticity Index	S	Sedimentation	PD Min/Max Density	<u>ا</u>	0	Shear Box	_	UU remould	iliq	CIDc (set of 3 tests)	O	Total Sulphate Content	Water Soluble Chloride	te (
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ole	<u>e</u>	fro fro	le l	le l] ele	(g)	ngfc	ole r	<u>e</u>	le c	_			lph	ma	mal					ean					Per	ਹ		Ę	Wai	arb	l ×		
orek	Sample	Depth from (m)	Sample Type	mg	am p	Mass (g)	a a	amp	amp.	l mg				Su	her	Thermal					l l					Z					10	pH		
							\$	Ø	Ø	Ö						-					ď					_							Soil Type	Remarks
Z3_OWF_BH06-SAMP Z3 OWF BH06-SAMP	24-2 24-3	20.3	Bag Bag	25 10	53 53	794 419				1	#	# #		1					_		1	1					-		-				SAND CLAY	
Z3_OWF_BH13-SAMP	01-1	0	Bag		69	1764					#	# #										1							-				SAND	
Z3_OWF_BH13-SAMP	01-2	0.25	Bag	25	69	1884					#	#				/																	SAND	
Z3_OWF_BH13-SAMP	01-3	0.5	Bag		69	1175					#							/	/														SAND	
Z3_OWF_BH13-SAMP	02-1	1	Bag		69	1482						# #	#																				CLAY	
Z3_OWF_BH13-SAMP	02-2	1.3	Bag		69	2096						# #	#																				CLAY	
Z3_OWF_BH13-SAMP	02-3	1.6	Bag	35	69	1825					#	#	#																				CLAY	
Z3_OWF_BH13-SAMP	03-1	2	Bag	35	69	1888																											CLAY	
Z3_OWF_BH13-SAMP	03-2	2.35	Bag		69	2253					#	# #	#																				CLAY	
Z3_OWF_BH13-SAMP	04-1	3	Bag	30	69	1662						#	#																/ /	/	/	/	CLAY	
Z3_OWF_BH13-SAMP	04-2	3.3	Bag		69	2216				<u> </u>	#	# #	#									<u> </u>											CLAY	
Z3_OWF_BH13-SAMP	04-3	3.6	Bag		69	1724				-		#	_	-					_		1	-							_				CLAY	
Z3_OWF_BH13-SAMP	05-1	4	Bag		72	1266				+	#	# #	#	1			/	/	/	/	1	1							-				CLAY	
Z3_OWF_BH13-SAMP Z3_OWF_BH13-SAMP	05-2 05-3	4.2 4.4	Bag Wax		72 72	1387 1695					#	# #	#								-	,		#	/			,					CLAY CLAY	UU
Z3 OWF BH13-SAMP	05-3	4.4	Bag		72	899				+	#	# #	#	- 4					-		+	/						/	-				CLAY	SRB
Z3_OWF_BH13-SAMP	06-1	5	Bag		72	2058					#	" "	#	#	#							1							-				CLAY	TR
Z3_OWF_BH13-SAMP	06-2	5.3	Bag		72	2747									п							1			t								CLAY	- IX
Z3_OWF_BH13-SAMP	06-3	5.6	Bag		72	2192																1											CLAY	
Z3_OWF_BH13-SAMP	07-1	6	Bag	30	72	1751					#	#						/	/														SAND	
Z3_OWF_BH13-SAMP	08-1	6.5	Bag	40	53	1485					#	#											/										SAND	
Z3_OWF_BH13-SAMP	08-2	6.9	Bag	35	53	1501																											SAND	
Z3_OWF_BH13-SAMP	09-1	7.5	Bag	45	53	1515					#	#								/													SAND	
Z3_OWF_BH13-SAMP	10-1	8	Bag	15	53	543																							/ /	/	/	/	SAND	
Z3_OWF_BH13-SAMP	10-2	8.15	Bag		53	1381					#	#															/						SAND	
Z3_OWF_BH13-SAMP	10-3	8.5	Bag	35	53	1184					#	#																					SAND	
Z3_OWF_BH13-SAMP	11-1	9	Bag	40	53	1430				<u> </u>	#	#						/	/			<u> </u>											SAND	
Z3_OWF_BH13-SAMP	11-2	9.4	Bag	40	53	1530					#												/		_		4						SAND	
Z3_OWF_BH13-SAMP	12-1	10	Bag	20	53	974																											SAND	
Z3_OWF_BH13-SAMP	12-2 13-1	10.2	Bag	50	53	1768					#	#		#						/							_			+			SAND	
Z3_OWF_BH13-SAMP Z3_OWF_BH13-SAMP	13-1	11 11.45	Bag	45 45	53 53	1821 1672					#	#				-	4		-	+					-	\dashv	/		+				SAND SAND	
Z3_OWF_BH13-SAMP	14-1	11.45	Bag		53	1672					#	,,						,	,	,													SAND	
Z3_OWF_BH13-SAMP	14-1	12.4	Bag	45	53	1838					#	#						/	/	1							-		+				SAND	
Z3_OWF_BH13-SAMP	15-1	13	Bag	30	53	1364					#	#																	, ,	1	/	/	SAND	
Z3_OWF_BH13-SAMP	15-2	13.3	Bag	40	53	1630					#	#														\exists				+		,	SAND	
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Total number of orthorn tents (s)		CLIENT:																																Drawn by:	
Total number of orthone leads (f) Total number of				Lion G	eotec	chnica	Site Inve	estigation	Ouest	(Z3)																								MRI/BQM	
Total numbers of childrone leasts (r) Total numbers of children		JOB NO:	F254727																																
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23 OWF_BH13-SAMP 16-1 14 Bag 40 53 1612	rehole Number	mple	pth from (m)	mple Type	mple Length (cm)	Diameter	(b) sss	allingford / LLN	mple received	mple location	mple used up	Moisture Content	Bulk Density PP	2	Sulphate Reducing Bacteria	Conductivity	Conductivity	Plasticity Index	Sociation	PD	Min/Max Density	rmeameter Permeability [Cons	OED	Shear Box	UU remould	Permeability [constant	CIDc (set of 3 tests)	CIUc	Loss on Ignition	Total Sulphate Content	Water Soluble Chloride	Carbonate Content of Soil	Value of Soil		
23_OWF_BH13-SAMP 16-2 14.4 8ag 55 53 2059	<u> </u>							Š	Sa	S	Sa					⊥	È					Pe				Ê									Remarks
Z3_OWF_BH13-SAMP												#	#						_																
23_OWF_BH13-SAMP 17-2 15.45 Bag 50 53 2015				_								#							_					/											
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Z3_OWF_BH13-SAMP 19-1 17 Bag 50 53 2040	Z3_OWF_BH13-SAMP	18-1	16			53	1839					#	#					/	٠ .	/		/												SAND	
Z3_OWF_BH13-SAMP 19-2 17.5 Bag 45 53 1976	Z3_OWF_BH13-SAMP	18-2	16.5	Bag	45	53	2009																											SAND	
Z3_OWF_BH13-SAMP Z0-1 18 Bag Z0 72 1550	Z3_OWF_BH13-SAMP	19-1	17	Bag	50	53	2040					#	#																					CLAY	
The color of the	Z3_OWF_BH13-SAMP	19-2	17.5	Bag	45	53	1976																						/	/	/	/	/	CLAY	
Taylow T	Z3_OWF_BH13-SAMP	20-1	18	Bag	20	72	1550					#	# #	#																				CLAY	
The color of the	Z3_OWF_BH13-SAMP	20-2	18.2	Wax	20	72	1728					#	# #	#														/						CLAY	
The color of the	Z3 OWF BH13-SAMP	20-3	18.4	Wax	20	72	1631					#	# #	#									/			/								CLAY	
Z3_OWF_BH13-SAMP 21-1 19 Bag 20 72 1415 #	Z3 OWF BH13-SAMP	20-4	18.6	Bag	35	72	2368						#	#																				CLAY	
Z3_OWF_BH13-SAMP 21-2 19.2 Bag 20 72 1243 # <t< td=""><td></td><td>21-1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>#</td><td># #</td><td>#</td><td></td><td></td><td></td><td>/ /</td><td></td><td>/ /</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		21-1										#	# #	#				/ /		/ /															
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173 OWE BH13-SAMP 22A-2 20 25 Bag 25 69 1637	Z3_OWF_BH13-SAMP	22A-2	20.25	Bag			1637										-						-											CLAY	

4. Laboratory Test Data

Title	Plate No.
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Summary of Plasticity Index Test Results	4.11
Plasticity Chart	4.12
Summary of Particle Size Distribution Test Results	4.13
Particle Size Distribution Test Results	4.14 to 4.35
Summary of Particle Density Test Results	4.36.
Summary of Minimum and Maximum Density Test Results	4.37
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One Dimensional Consolidation Test Results	4.39 to 4.45
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Unconsolidated Undrained Triaxial Test Results - Offshore	4.47 to 4.58
Summary of Unconsolidated Undrained Triaxial Test Results – Onshore	4.59
Unconsolidated Undrained Triaxial Test Results – Onshore	4.60 to 4.77
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Consolidated Isotropically Undrained Triaxial in Compression Test Results	4.79 to 4.137
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Consolidated Isotropically Drained Triaxial in Compression Test Results	4.140 to 4.205
Summary of Shear Box Test Results	4.206
Shear Box Test Results	4.207 to 4.230
Summary of Permeability Test Results	4.231
Permeameter Permeability Test Results	4.232 to 4.235
Triaxial Permeability Test Results	4.236 to 4.247
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Summary of Thermal Resistivity Test Results - Onshore	4.251
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Summary of Carbonate Content Test Results	4.255
Summary of Organic Content Test Results	4.256
Summary of Chloride Content Test Results	4.257
Summary of Sulphate Content and pH Test Results	4.258
Sulphate Reducing Bacteria Test Results	4.259 to 4.270



Direction générale de l'énergie et du climat

Laboratory Classification Test Results Z3_OWF_BH01-SAMP

	Sample	Depth		Un	it Weig	ht [kN/	m³]				Atte	rberg Li	mits		U	ndraine	d Shear	Streng	th
No	Ground Description	BSF		γ-w	γ	$\gamma_{d,min}$	$\gamma_{\text{d,max}}$	ρ_{s}	CC	OC	W _P	W _L	I _P	Fines	PP	TV	FC	LV	UU
		[m]	[%]					[Mg/m ³]	[%]	[%]	[%]	[%]	[%]	[%]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
01	From 0.00 m to 0.45 m - dark grey (2.5Y 4/1) clayey	0.00																	
	slightly calcareous fine to medium SAND with occasional coarse sand-size to medium gravel-size shells and shell fragments	0.15	25.5	19.5															
02	From 0.50 m to 1.20 m - dark grey (2.5Y 4/1) clayey	0.50				11.9	18.0	2.67						8.3					
	slightly calcareous fine to medium SAND with occasional coarse sand-size to coarse gravel-size shells and shell	1.00							31.8	4.0									
	fragments From 1.15 m to 1.20 m - with a very thin bed of clay	1.05	23.9	19.8	19.7														
03	From 1.50 m to 2.45 m - soft very low strength very	1.50																	
	dark grey (2.5Y 3/1) sandy slightly calcareous CLAY	1.70	23.7	20.2	19.6														
	- with frequent fine gravel-size pockets of organic matter	2.10	26.6	19.7	19.2										18				
	At 2.30 m - with a thick lamina of sand																		
04	From 2.50 m to 3.40 m - firm low to medium strength	2.50																	
	very dark grey (2.5Y 3/1) sandy slightly calcareous CLAY with occasional coarse sand-size to coarse gravel-size	2.90			19.6														
	shells and shell fragments	2.95														36			
	- with frequent fine to coarse gravel-size pockets of	3.20													30	43			
	organic matter	3.40	21.6	20.5															
05	From 3.50 m to 4.40 m - firm low strength very dark	3.50																	
	grey (2.5Y 3/1) sandy slightly calcareous CLAY with occasional coarse sand-size to coarse gravel-size	3.70	25.5	19.9	19.9										21	29			
	shells and shell fragments	3.90	28.5	19.4	19.8														36
	- with frequent fine to coarse gravel-size pockets of	3.90	29.2	19.3															
	organic matter	4.10			20.9														
		4.40	22.7	20.3															
06	From 4.50 m to 5.40 m - firm low strength very dark	4.50						2.74			17.0	30.0	13.0	89.2					
	grey (2.5Y 3/1) sandy slightly calcareous CLAY with	4.85	23.9	20.1	20.6										29	40			
	occasional coarse sand-size to coarse gravel-size shells and shell fragments	5.25			20.2										34	39			
	- with occasional fine to coarse gravel-size pockets of	5.40	22.2	20.4															
	organic matter																		
07	From 5.50 m to 6.40 m - firm low to medium strength	5.50																	
	very dark grey (2.5Y 3/1) sandy slightly calcareous CLAY with occasional coarse sand-size to coarse gravel-size	5.70	21.0	20.6	21.0											38			
	shells and shell fragments	6.20							25.0	5.5						30			
	- with occasional fine to coarse gravel-size pockets of																		
	organic matter																		

Notes

w: Water contentCC: CaCO3 contentPP: Pocket penetrometer 10^r : refers to test on remoulded soil γ -w: Unit weight derived from water contentOC: Organic contentTV: Torvane 10^d : d refers to test on disturbed soil γ : Unit weight from volume mass calculation w_p : Plastic limitFC: Fall cone 10^s : Residual undrained shear strength

 $\gamma_{d,min}$: Minimum index dry unit weight w_L : Liquid limit LV: Laboratory vane BSF: Below seafloor

Laboratory Classification Test Results Z3_OWF_BH01-SAMP

	Sample	Depth		Ur	it Weig	ht [kN/ı	m³]				Atte	rberg Li	mits		U	ndraine	d Shear	Strengt	:h
No	Ground Description	BSF [m]	w [%]	γ-w	γ	$\gamma_{d,min}$	$\gamma_{d,\text{max}}$	$ ho_{s}$ [Mg/m 3]	CC [%]	OC [%]	w _P [%]	w _L [%]	Ι _Ρ [%]	Fines [%]	PP [kPa]	TV [kPa]	FC [kPa]	LV [kPa]	UU [kPa]
08	From 6.50 m to 6.80 m - very dark grey (2.5Y 3/1) silty calcareous fine to medium SAND with occasional coarse sand-size to coarse gravel-size shells and shell fragments - with occasional fine to coarse gravel-size pockets of organic matter - with occasional fine to medium gravel-size pockets of clay	6.50 6.55	20.1	20.8	20.7														
09	From 7.00 m to 7.85 m - low strength very dark grey (2.5Y 3/1) sandy calcareous CLAY with occasional coarse sand-size to coarse gravel-size shells and shell fragments At 7.05 m - with a thin bed of sand At 7.45 m - with a very thin bed of sand	7.00 7.65	22.2	20.4	20.2														
10	From 8.00 m to 8.90 m - firm low strength very dark grey (2.5Y 3/1) slightly sandy slightly calcareous CLAY with occasional coarse sand-size to coarse gravel-size shells and shell fragments At 8.25 m - with a very thin bed of sand At 8.55 m - with a very thin bed of sand From 8.70 m to 8.75 m - with abundant coarse sand-size to medium gravel-size shells and shell fragments	8.00 8.20 8.50 8.90	27.1	19.6	18.7										31	40			
11	From 9.00 m to 9.90 m - firm low to medium strength very dark grey (2.5Y 3/1) slightly calcareous CLAY with occasional coarse sand-size to coarse gravel-size shells and shell fragments	9.00 9.10 9.70 9.90	24.8 26.8	19.9 19.6	21.4 20.8			2.75			17.0	28.0	11.0	86.8	32 26	45 45			
12	From 10.00 m to 10.90 m - firm low to medium strength very dark grey (2.5Y 3/1) slightly calcareous CLAY with occasional coarse sand-size to coarse gravel-size shells and shell fragments From 10.55 m to 10.90 m - sandy with frequent coarse sand-size to medium gravel-size shells and shell fragments	10.00 10.15 10.55 10.90	24.0	20.1	22.1										37	42			
13	From 11.00 m to 11.65 m - firm very dark grey (2.5Y 3/1) sandy calcareous CLAY with occasional coarse sand-size to medium gravel-size shells and shell fragments	11.00 11.20	21.9	20.4	19.9				22.7	3.7									
14 Note	From 12.00 m to 12.90 m - firm low to medium strength very dark grey (2.5Y 3/1) sandy calcareous CLAY with occasional coarse sand-size to medium gravel-size shells and shell fragments From 12.00 m to 12.55 m - with abundant coarse sand-size to medium gravel-size shells and shell fragments	12.00 12.15 12.60 12.80	28.0	19.4	20.2										29 39	48 42			

Notes

w : Water content γ : Unit weight derived from water content γ : Unit weight from volume mass calculation γ : Plastic limit γ : Pocket penetrometer γ : Torvane γ : Torvane γ : Torvane γ : Plastic limit γ : Torvane γ : Fall cone γ : Residual undrained shear strength

 $\gamma_{d,min}$: Minimum index dry unit weight w_L : Liquid limit LV: Laboratory vane BSF: Below seafloor

 $\gamma_{d,max}\text{: Maximum index dry unit weight} \qquad \qquad I_{p} \quad \text{: Plasticity index} \qquad \qquad \text{UU} \quad \text{: Unconsolidated undrained triaxial} \qquad \text{W} \quad \text{: WIP}$

 ho_s : Particle density Fines : Mass percentage of material passing 63 μ m or 75 μ m sieve RC : Rock Core

Direction générale de l'énergie et du climat

Laboratory Classification Test Results Z3_OWF_BH01-SAMP

	Sample	Depth		Un	it Weig	ht [kN/r	m³]				Atte	rberg Li	mits		U	ndraine	d Shear	Strengt	h
No	Ground Description	BSF	W	γ-w	γ	$\gamma_{d,min}$	$\gamma_{\text{d,max}}$	$\rho_{\rm s}$	CC	OC	W _P	W _L	I _P	Fines	PP	TV	FC	LV	UU
15	From 13.00 m to 13.65 m - firm low to medium strength very dark grey (2.5Y 3/1) sandy calcareous CLAY with	[m] 13.00 13.10	[%]					[Mg/m³]	[%]	[%]	[%] NP	[%] NP	[%] NP	[%]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
	occasional coarse sand-size to coarse gravel-size shells and shell fragments	13.30			21.2			2.71			NP	NP	NP	55.7					
		13.50 13.65	25.5	19.8											55	36			.
16	From 14.00 m to 14.75 m - firm very dark grey (2.5Y	14.00	23.3	13.0															
	3/1) sandy calcareous CLAY with occasional coarse sand-size to coarse gravel-size shells and shell	14.15	19.8	20.8	20.8														.
	fragments	14.55 14.75	20.6	20.7	21.2														
17	From 15.00 m to 15.95 m - firm medium to high	15.00	20.0	20.7															
	strength very dark grey (2.5Y 3/1) sandy calcareous CLAY with occasional coarse sand-size to coarse	15.15	23.5	20.1	20.7										52	44			
	gravel-size shells and shell fragments	15.35			20.8						10.0	20.0	0.0	02.1	00	CF			48
		15.75 15.95	21.7	20.4	21.2						19.0	28.0	9.0	83.1	88	65			
18	From 16.00 m to 16.85 m - firm medium to high	16.00		20					25.0	4.0									
	strength very dark grey (2.5Y 3/1) slightly sandy calcareous CLAY with rare coarse sand-size to fine	16.10	28.8	19.3	21.2										75	90			
	gravel-size shell fragments - with rare coarse sand-size to fine gravel-size pockets	16.30 16.50	25.9	19.7	22.7										42	45			
	of organic matter	16.60	23.6	20.1	22.2										42	43			
19	From 17.00 m to 17.70 m - firm medium strength very	17.00																	
	dark grey (2.5Y 3/1) slightly sandy calcareous CLAY with frequent coarse sand-size to fine gravel-size shell	17.20 17.40	25.8 26.9	19.7 19.5	21.9 21.1										50	40			
	fragments - with rare coarse sand-size to fine gravel-size pockets	17.40	20.9	19.5	21.1										42	50			
20	of organic matter From 18.00 m to 18.90 m - firm medium strength very	18.00									20.0	31.0	11.0	87.7					
	dark grey (2.5Y 3/1) slightly sandy calcareous CLAY with	18.20	23.9	20.0	21.5						20.0	31.0	11.0	0,.,	75	45			,
	rare coarse sand-size shell fragments - with rare coarse sand-size to medium gravel-size	18.40	23.2	20.1	21.4														
	pockets of organic matter	18.60	25.0	19.9	21.6										71	25			
21	From 19.00 m to 20.00 m - firm medium strength dark	18.80 19.00													71	35			
	grey (2.5Y 4/1) slightly sandy calcareous CLAY with rare coarse sand-size shell fragments	19.20	24.6	19.9	20.7										75	45			
	- with rare coarse sand-size pockets of organic matter	19.40	23.6	20.1	21.5														
		19.60 19.60	25.7	19.7	21.8 21.0														54
		19.80			21.0			2.72			21.0	31.0	10.0	87.5	42	45			
Notes		19.80									21.0	31.0	10.0						

Notes

CC : CaCO₃ content : Pocket penetrometer 10^r: r refers to test on remoulded soil : Water content $\gamma\text{-w}\;$: Unit weight derived from water content OC : Organic content : Torvane 10d: d refers to test on disturbed soil : Fall cone : Unit weight from volume mass calculation : Plastic limit 10^s: Residual undrained shear strength

 $\gamma_{\text{d,min}}.$ Minimum index dry unit weight : Liquid limit BSF: Below seafloor : Laboratory vane

 $\gamma_{\text{d,max}}\!\!:$ Maximum index dry unit weight W:WIP : Plasticity index UU : Unconsolidated undrained triaxial RC: Rock Core $\rho_s \quad : \text{Particle density}$ Fines : Mass percentage of material passing 63 μm or 75 μm sieve

Direction générale de l'énergie et du climat

Laboratory Classification Test Results Z3_OWF_BH06-SAMP

	Sample	Depth		Un	it Weig	ht [kN/r	m ³]				Atte	rberg Li	mits		U	ndraine	d Shear	Strengt	th
No	Ground Description	BSF		γ-w	γ	$\gamma_{d,min}$	$\gamma_{d,\text{max}}$	$\rho_{\rm s}$	CC	OC	W _P	W _L	I _P	Fines	PP	TV	FC	LV	UU
0.1	5 000 + 000 L L (25)(2/4)	[m]	[%]					[Mg/m³]	[%]	[%]	[%]	[%]	[%]	[%]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
01	From 0.00 m to 0.90 m - very dark grey (2.5Y 3/1) clayey slightly calcareous fine to medium SAND with	0.00						2.72						62.0					
	numerous coarse sand-size to medium gravel-size shell	0.30	20.4	10.0	10.4			2.72			NP	NP	NP	63.2					1
	fragments	0.40	29.1	19.2	19.4														
00	5 100 + 105 (25)(2(4)	0.60	29.8	19.1							NP	NP	NP	54.8					
02	From 1.00 m to 1.95 m - dark grey (2.5Y 3/1) sandy calcareous CLAY with rare coarse sand-size to medium	1.00	20.0	10.1	40.5						NP	NP	NP	54.8					
	gravel-size shells and shell fragments	1.30	29.8	19.1	19.5														
		1.40	29.5	19.2	18.9				40.0							40			
00	5 000 1 005	1.60							19.8	4.6						10			
03	From 2.00 m to 2.95 m - very soft extremely low to very low strength very dark grey (2.5Y 3/1) sandy	2.00									NP	NP	NP						
	calcareous CLAY with rare coarse sand-size shell	2.20	28.5	19.4	22.8											10			
	fragments	2.40	27.2	19.6															
		2.60	27.7	19.5															
		2.80														13			
04	From 3.00 m to 3.95 m - soft low to medium strength dark grey (2.5Y 4/1) sandy calcareous CLAY with rare	3.00						2.74			20.0	33.0	13.0	81.4					
	coarse sand-size to medium gravel-size shell fragments	3.00									20.0	33.0	13.0						
	- with rare coarse sand-size pockets of organic matter	3.20	27.0	19.6	20.9											45			
		3.40	27.4	19.6															
		3.60	27.3	19.6															
		3.80														30			
05	From 4.00 m to 4.95 m - soft medium to high strength dark grey (2.5Y 4/1) sandy calcareous CLAY with	4.00																	
	occasional coarse sand-size shell fragments	4.20	24.7	19.8	21.1										88	50			
	- with rare coarse sand-size to fine gravel-size pockets	4.40	24.7	19.8	20.5														79
	of organic matter	4.40	24.3	19.9	22.0														
		4.40	23.8	20.0															
		4.60	22.4	20.2	21.2														
NI-t-		4.80													88	50			

Notes

w : Water content

 γ -w : Unit weight derived from water content : Unit weight from volume mass calculation

 $\gamma_{\text{d,min}}.$ Minimum index dry unit weight

 $\gamma_{\text{d,max}}\!\!:$ Maximum index dry unit weight

 ρ_s : Particle density

CC : CaCO₃ content : Pocket penetrometer

OC : Organic content TV : Torvane : Plastic limit : Fall cone

: Liquid limit

: Plasticity index

: Laboratory vane

UU : Unconsolidated undrained triaxial

W:WIP Fines: Mass percentage of material passing 63 μm or 75 μm sieve RC: Rock Core

10^r: r refers to test on remoulded soil

10^d: d refers to test on disturbed soil

BSF: Below seafloor

10s: Residual undrained shear strength



Laboratory Classification Test Results Z3_OWF_BH06-SAMP

	Sample	Depth		Ur	iit Weig	ht [kN/ı	m³]				Atte	rberg Li	mits		U	ndraine	d Shear	Strengt	th
No	Ground Description	BSF	W	γ-w		$\gamma_{d,min}$	$\gamma_{d,\text{max}}$	ρ_{s}	CC	OC	W _P	W _L		Fines	PP	TV	FC	LV	UU
		[m]	[%]					[Mg/m³]	[%]	[%]	[%]	[%]	[%]	[%]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
06	From 5.00 m to 5.40 m - soft low strength dark grey	5.00									NP	NP	NP	65.6					
	(2.5Y 4/1) sandy calcareous CLAY with occasional coarse sand-size shell fragments	5.20	24.2	19.9	23.7										25	35			
	- with rare coarse sand-size to fine gravel-size pockets	5.40							29.6	5.2					83	50			
	of organic matter	5.45	22.8	20.1															
	From 5.40 m to 5.60 m - firm medium to high strength very dark grey (2.5Y 3/1) very sandy calcareous CLAY with coarse sand-size to medium gravel-size shell fragments																		
	From 5.60 m to 5.80 m - grey (2.5Y 5/1) clayey slightly calcareous fine to medium SAND with abundant coarse sand-size to coarse gravel-size shells and shell fragments																		
07	From 6.00 m to 6.30 m - very dark grey (2.5Y 3/1)	6.00																	
	slightly clayey slightly calcareous fine to medium SAND	6.30	23.6	20.0	20.1														
	with abundant coarse sand-size to medium gravel-size shells and shell fragments	6.50	24.1	19.9															
	From 6.30 m to 6.80 m - very dark grey (2.5Y 3/1) slightly silty slightly calcareous fine to medium SAND with occasional coarse sand-size shell fragments																		
08	From 7.00 m to 7.65 m - very dark grey (5Y 3/1) slightly	7.00				13.3	18.6	2.69						7.9					
	calcareous fine to coarse SAND with occasional coarse	7.30	21.2	20.4	19.7														
	sand-size to fine gravel-size shell fragments	7.50	22.9	20.1															
09	From 8.00 m to 8.85 m - very dark grey (2.5Y 3/1)	8.00																	
	slightly silty slightly calcareous fine to medium SAND	8.30	25.3	19.7	18.9														
	with rare to numerous coarse sand-size to coarse gravel-size shell fragments	8.50	28.2	19.2															
10	From 9.00 m to 9.50 m - very dark grey (2.5Y 3/1)	9.00																	
	slightly silty slightly calcareous fine to medium SAND	9.30	24.5	19.8	18.7														
	with rare coarse sand-size to medium gravel-size shell fragments	9.30	25.3	19.7															
	3	9.50							27.3	1.4									
	From 9.50 m to 9.65 m - olive (5Y 4/3) slightly silty slightly calcareous fine to coarse SAND with rare coarse sand-size to medium gravel-size shell fragments																		
11	From 10.00 m to 10.35 m - olive (5Y 4/3) slightly silty	10.00																	
	calcareous fine to coarse SAND with rare coarse	10.25	16.4	21.4	19.5														
	sand-size to medium gravel-size shell fragments	10.25	17.3	21.2															
12	From 10.50 m to 10.65 m - olive (5Y 4/3) slightly silty	10.50																	
	calcareous medium to coarse SAND with rare coarse	10.60	18.2	21.0	20.7														
	sand-size to fine gravel-size shell fragments	10.60	17.3	21.2															
Notes																			

w : Water content $\gamma\text{-w}\;$: Unit weight derived from water content

: Unit weight from volume mass calculation

 $\gamma_{\text{d,min}}.$ Minimum index dry unit weight $\gamma_{\text{d,max}}\!\!:$ Maximum index dry unit weight

 ρ_s : Particle density

CC : CaCO₃ content PP : Pocket penetrometer

OC : Organic content : Plastic limit : Liquid limit

: Plasticity index

: Torvane : Fall cone

: Laboratory vane

10s: Residual undrained shear strength BSF: Below seafloor W:WIP

10^r: r refers to test on remoulded soil

10^d: d refers to test on disturbed soil

UU : Unconsolidated undrained triaxial

Fines: Mass percentage of material passing 63 μm or 75 μm sieve RC: Rock Core Note that both Rock Core (RC) and WIPS (W) were used for this location and the numbering is a reflection of switching between the different sampling method

Laboratory Classification Test Results Z3_OWF_BH06-SAMP

	Sample	Depth		Un	iit weigi	t Weight [kN/m³]					Atte	rberg Li	mits		U	ndraine	d Shear	Streng	th
No	Ground Description	BSF	W	γ-w	γ	$\gamma_{\text{d,min}}$	$\gamma_{\text{d,max}}$	ρ_{s}	CC	OC	W _P	W _L		Fines	PP	TV	FC	LV	UU
		[m]	[%]					[Mg/m ³]	[%]	[%]	[%]	[%]	[%]	[%]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
13	From 11.00 m to 11.20 m - olive (5Y 4/3) slightly silty	11.00						2.70						3.3					
	calcareous medium to coarse SAND with rare to numerous coarse sand-size to medium gravel-size shell	11.15	16.8	21.3	19.4														
	fragments	11.15	16.4	21.4															
14	From 11.50 m to 11.60 m - olive (5Y 4/3) slightly silty	11.50																	
	calcareous medium to coarse SAND with rare coarse sand-size shell fragments	11.55	18.5	20.9															
15	From 12.00 m to 12.10 m - olive (5Y 4/3) slightly	12.00																	
	gravelly slightly silty calcareous medium to coarse SAND with rare coarse sand-size shell fragments. Gravel is flat subangular to subrounded of various lithologies	12.05	16.7	21.3															
16	From 12.50 m to 12.60 m - olive (5Y 4/3) slightly	12.50																	
10	gravelly slightly silty calcareous medium to coarse SAND	12.55	19.6	20.7															
	with rare coarse sand-size to fine gravel-size shell	12.55	13.0	20.7															
	fragments. Gravel is flat subangular to subrounded of various lithologies																		
17	From 13.00 m to 13.25 m - olive (5Y 4/3) slightly	13.00																	
	gravelly slightly silty calcareous medium to coarse SAND with rare coarse sand-size to medium gravel-size shell	13.05	17.7	21.1															
	fragments. Gravel is flat subangular to subrounded of	13.25							21.1	3.4									
	various lithologies	13.40	21.0	20.2	18.4														
	At 13.20 m - with a thick lamina of clay	13.40	22.4	20.0															
	From 13.25 m to 13.55 m - very dark grey (5Y 3/1) very silty calcareous fine SAND																		
18	From 14.00 m to 14.95 m - very dark grey (5Y 3/1) very	14.00																	
	silty calcareous fine SAND	14.30	29.7	18.9	18.4														
	At 14.80 m - with a thick lamina of clay	14.30	28.5	19.0															
		14.50				11.5	17.5												
		14.75	26.4	19.3	18.1														
		14.75	26.6	19.3															
19	From 15.00 m to 15.25 m - very dark grey (5Y 3/1) very	15.00	20.0	13.3															
13	silty calcareous fine SAND	15.40	28.7	19.0	18.4														
					10.4														
	From 15.25 m to 15.60 m - firm very dark grey (5Y 3/1)	15.40	28.9	19.0															
	sandy slightly calcareous CLAY	15.60						2.69						15.2					
	From 15.60 m to 15.90 m - very dark grey (5Y 3/1) very	15.70	26.9	19.3	19.1														
	silty calcareous fine SAND	15.70	25.9	19.4															
20	From 16.00 m to 16.75 m - very dark grey (5Y 3/1)	16.00																	
	slightly silty slightly calcareous fine SAND with rare	16.25	26.2	19.4	18.1														
	coarse sand-size to fine gravel-size shell fragments	16.25	27.9	19.1															
	- with rare medium gravel-size pockets of clay	16.55	25.3	19.5	18.2														
		16.55	25.3	19.5	10.2														
		10.55	43.1	כ.כו	1					I		1		I	l				1

: Water content CC : CaCO₃ content : Pocket penetrometer 10^r: r refers to test on remoulded soil OC : Organic content γ -w : Unit weight derived from water content TV : Torvane 10^d: d refers to test on disturbed soil : Unit weight from volume mass calculation : Plastic limit : Fall cone 10^s: Residual undrained shear strength

 $\gamma_{\text{d,min}} .$ Minimum index dry unit weight : Liquid limit : Laboratory vane BSF: Below seafloor UU : Unconsolidated undrained triaxial W:WIP

 $\gamma_{\text{d.max}}\!\!:\!$ Maximum index dry unit weight : Plasticity index ρ_s : Particle density Fines: Mass percentage of material passing 63 μm or 75 μm sieve RC: Rock Core

Direction générale de l'énergie et du climat

Laboratory Classification Test Z3_OWF_BH06-SAMP

Sample				Unit Weight [kN/m³]							Atterberg Limits			Undrained Shear Strength					
No	Ground Description	BSF [m]	w [%]	γ-w	γ	$\gamma_{d,min}$	$\gamma_{d,\text{max}}$	$ ho_{s}$ [Mg/m 3]	CC [%]	OC [%]	w _P [%]	w _L [%]	l _P [%]	Fines [%]	PP [kPa]	TV [kPa]	FC [kPa]	LV [kPa]	UU [kPa]
21	From 17.00 m to 17.70 m - very dark grey (5Y 3/1)	17.00																	
	slightly slightly calcareous fine to medium SAND with rare coarse sand-size to fine gravel-size shell	17.25	27.5	19.2	18.3														
	fragments	17.25	26.4	19.3															
		17.50	27.4	19.2	18.2														
		17.50	27.4	19.2															
22	From 18.00 m to 18.75 m - very dark grey (5Y 3/1)	18.00							17.7	4.7									
	slightly slity slightly calcareous fine to medium SAND with rare coarse sand-size to fine gravel-size shell fragments		30.9	18.7	17.1														
			32.1	18.5															
		18.50	31.1	18.7	17.4														
		18.50	32.0	18.6															
23	From 19.00 m to 19.80 m - very dark grey (5Y 3/1)	19.00												23.2					
	slightly slightly calcareous fine to medium SAND with rare coarse sand-size to fine gravel-size shell	19.30	28.0	19.1	17.0														
	fragments	19.30	28.8	19.0															
	- with rare fine gravel-size pockets of clay At 19.10 m - with a very thin bed of clay																		
24	From 20.00 m to 20.55 m - very dark grey (5Y 3/1)	20.00																	
	slightly slightly calcareous fine to medium SAND with rare coarse sand-size to fine gravel-size shell	20.30	30.3	18.8	18.1														
	fragments	20.30	30.7	18.7															
	- with rare fine gravel-size pockets of clay	20.60	26.8	19.3	19.7														
	At 20.40 m - with a very thin bed of clay	20.65													63				
	From 20.55 m to 20.65 m - stiff medium strength slightly calcareous CLAY																		

Notes

w : Water content CC : CaCO₃ content : Pocket penetrometer 10^r: r refers to test on remoulded soil γ -w : Unit weight derived from water content OC : Organic content : Torvane 10^d: d refers to test on disturbed soil γ : Unit weight from volume mass calculation : Plastic limit : Fall cone 10^s: Residual undrained shear strength BSF: Below seafloor

 $\gamma_{\text{d,min}}.$ Minimum index dry unit weight : Liquid limit : Laboratory vane

 $\gamma_{\text{d,max}}\!\!:$ Maximum index dry unit weight : Plasticity index UU : Unconsolidated undrained triaxial W:WIP ρ_s : Particle density Fines : Mass percentage of material passing 63 μm or 75 μm sieve RC: Rock Core



Direction générale de l'énergie et du climat

Laboratory Classification Test Results Z3_OWF_BH13-SAMP

Sample				Unit Weight [kN/m³]						Atterberg Limits				Undrained Shear Strength				th	
No	Ground Description	BSF	W	γ-w	γ	$\gamma_{d,min}$	$\gamma_{d,max}$	ρ_{s}	CC	OC	W _P	W _L	l _P	Fines	PP	TV	FC	LV	UU
		[m]	[%]					[Mg/m ³]	[%]	[%]	[%]	[%]	[%]	[%]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
01	From 0.00 m to 0.50 m - dark grey (2.5Y 4/1) very	0.00																	
	clayey calcareous fine to medium SAND with numerous coarse sand-size to coarse gravel-size shells and shell	0.40	20.8	20.2	20.2														
	fragments	0.50												5.9					
		0.55	18.1	20.8															
	From 0.50 m to 0.60 m - olive brown (2.5Y 4/4) calcareous fine to medium SAND with frequent medium																		
	gravel-size shell fragments																		
02	From 1.00 m to 1.95 m - firm low strength dark grey	1.00																	
	(2.5Y 4/1) slightly calcareous CLAY with occasional	1.20													23	30			
	coarse sand-size to medium gravel-size shell fragments	1.30			16.6														
		1.60													33	36			
		1.95	33.1	18.8															
03	From 2.00 m to 2.70 m - firm low strength dark grey	2.00																	
	(2.5Y 4/1) slightly calcareous CLAY with occasional	2.40	33.6	18.7	17.5														
	coarse sand-size to medium gravel-size shell fragments	2.50													29	32			
04	From 3.00 m to 3.90 m - firm medium strength dark	3.00							27.3	5.3									
	grey (2.5Y 4/1) slightly calcareous CLAY with occasional coarse sand-size to medium gravel-size shell fragments	3.30													43	45			
	coarse sand-size to medium gravei-size snell fragments	3.35	25.7	19.8	18.2														
		3.60													65	50			
05	From 4.00 m to 4.70 m - firm low to medium strength	4.00						2.74			20.0	30.0	10.0	87.1					
	dark grey (2.5Y 4/1) slightly calcareous CLAY with occasional coarse sand-size to medium gravel-size	4.00									20.0	30.0	10.0						
	shell fragments	4.20	26.3	19.7	20.4										38	45			54
		4.20			20.3														
		4.60			20.6										46	39			
		4.70	21.8	20.5															
06	From 5.00 m to 5.85 m - firm dark grey (2.5Y 4/1)	5.00																	
	slightly calcareous CLAY From 5.15 m to 5.85 m - with abundant coarse																		
	sand-size to coarse gravel-size shells and shell																		
	fragments																		
07	From 6.00 m to 6.30 m - very dark grey (2.5Y 3/1) silty	6.00												30.3					
	calcareous fine to medium SAND with rare coarse sand-size to fine gravel-size shells and shell fragments	6.25	23.5	19.8	18.8														
Notes	3 3						1												

Notes

 $\gamma_{d,min} \text{: Minimum index dry unit weight} \qquad \qquad \text{w}_{L} \quad \text{: Liquid limit} \qquad \qquad \text{LV} \quad \text{: Laboratory vane} \qquad \qquad \text{BSF: Below seafloor}$



Laboratory Classification Test Results Z3_OWF_BH13-SAMP

Sample	Depth		Unit Weight [kN/m³]					Atte	rberg Li	mits		U	ndraine	d Shear	Strengt	th		
No Ground Description	BSF	W	γ-w	γ	$\gamma_{d,min}$	$\gamma_{d,\text{max}}$	ρ _s	CC	OC	W _P	W _L	I _P	Fines	PP	TV	FC	LV	UU
08 From 6.50 m to 6.90 m - very dark grey (2.5Y 3/1) silty	[m] 6.50	[%]					[Mg/m³]	[%]	[%]	[%]	[%]	[%]	[%]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
calcareous fine to medium SAND with rare coarse	6.70	17.3	20.9	19.7														
sand-size shell fragments From 6.60 m to 6.70 m - with frequent coarse	6.70	19.5	20.5															
sand-size to fine gravel-size shell fragments																		
From 6.90 m to 7.25 m - very dark grey (2.5Y 3/1) silty																		
calcareous fine to medium SAND with rare to occasional																		
coarse sand-size to fine gravel-size shell fragments - with very closely spaced thin to thick laminae of clay																		
From 7.00 m to 7.10 m - with frequent coarse																		
sand-size to fine gravel-size shell fragments																		
09 From 7.50 m to 7.95 m - very dark grey (2.5Y 3/1) silty calcareous fine to medium SAND with rare coarse	7.50																	
sand-size shell fragments	7.70	23.8	19.7	18.8														
	7.70	24.4	19.6															
10 From 8.00 m to 8.85 m - very dark grey (2.5Y 3/1) silty calcareous fine to medium SAND with rare coarse	8.00							15.9	3.0									
sand-size to fine gravel-size shell fragments	8.30	24.6	19.6	18.0														
At 8.20 m - with a thick lamina of clay	8.30	24.8	19.6															
	8.60	23.6	19.8	18.6														
	8.60	23.0	19.9															
11 From 9.00 m to 9.80 m - very dark grey (2.5Y 3/1) slightly calcareous fine to medium SAND with rare	9.00	246	40.7	10.6									6.0					
coarse sand-size shell fragments	9.30	24.6	19.7	19.6														
12 From 10.00 m to 10.20 m - very dark grey (2.5Y 3/1)	9.50	25.3	19.6															
From 10.00 m to 10.20 m - very dark grey (2.5Y 3/1) slightly gravelly slightly calcareous coarse SAND with	10.00				12.7	19.1												
frequent coarse sand-size to coarse gravel-size shell		24.3	19.7	18.9	12.7	19.1												
fragments. Gravel is subangular to subrounded of various lithologies	10.40 10.50	22.5	20.0	10.9														
various innologies	10.50	22.5	20.0															
From 10.20 m to 10.70 m - dark greyish brown (2.5Y																		
4/2) slightly silty slightly calcareous fine to medium SAND with rare coarse sand-size shell fragments																		
13 From 11.00 m to 11.90 m - dark greyish brown (2.5Y	11.00																	
4/2) slightly calcareous fine to medium SAND with rare	11.30	24.3	19.7	19.0														
coarse sand-size shell fragments	11.50	28.6	19.1	.5.5														
From 11.35 m to 11.50 m - with very closely spaced thick laminae of clay and occasional to numerous fine to																		
medium gravel-size pockets of clay																		
14 From 12.00 m to 12.85 m - dark grey (2.5Y 4/1) slightly	12.00						2.67						23.8					
calcareous fine to medium SAND with rare coarse sand-size to fine gravel-size shell fragments	12.30	23.6	19.9	19.8														
Sanu-Size to line graver-Size Shell fraginients	12.50	29.3	19.0															

Notes

w : Water content

γ-w: Unit weight derived from water content : Unit weight from volume mass calculation

 $\gamma_{d,min}$: Minimum index dry unit weight

 $\gamma_{\text{d,max}}\!\!:$ Maximum index dry unit weight ρ_s : Particle density

CC : CaCO₃ content

OC : Organic content : Plastic limit

: Liquid limit : Plasticity index : Pocket penetrometer

TV : Torvane FC : Fall cone

: Laboratory vane UU : Unconsolidated undrained triaxial

W:WIP RC: Rock Core

Note that both Rock Core (RC) and WIPS (W) were used for this location and the numbering is a reflection of switching between the different sampling method

Fines : Mass percentage of material passing 63 μm or 75 μm sieve

10^r: r refers to test on remoulded soil

10^d: d refers to test on disturbed soil 10s: Residual undrained shear strength

BSF: Below seafloor

Direction générale de l'énergie et du climat

Laboratory Classification Test Results Z3_OWF_BH13-SAMP

Unit Weight [kN/m³] Undrained Shear Strength Sample **Atterberg Limits** Ground Description $\gamma_{\rm d,min}$ [kPa] [kPa] [kPa] 15 From 13.00 m to 13.70 m - dark grey (2.5Y 4/1) slightly 18.6 6.5 13.00 calcareous fine to medium SAND 13.30 18.5 27.6 13.50 19.2 From 14.00 m to 14.95 m - dark grey (2.5Y 4/1) slightly 14.00 silty slightly calcareous fine to medium SAND 14.30 26.6 19.4 19.6 - with very closely to closely spaced thick laminae to 14.50 30.6 18.8 very thin beds of clay From 15.00 m to 15.95 m - dark grey (2.5Y 4/1) slightly 15.00 silty slightly calcareous fine to medium SAND 15.30 30.8 18.8 19.7 - with closely spaced very thin to thin beds of clay 15.60 27.7 19.2 From 16.00 m to 16.95 m - dark grey (2.5Y 4/1) slightly 34.6 16.00 silty slightly calcareous fine to medium SAND with rare 26.0 16.10 19.5 20.4 coarse sand-size to fine gravel-size shell fragments 29.8 18.9 16.30 - with very closely to closely spaced thin to medium beds of clay From 17.00 m to 17.95 m - very dark grey (2.5Y 3/1) 17.00 slightly sandy slightly calcareous CLAY with rare coarse 17.20 22.8 19.2 20.2 sand-size shell fragments 17.20 25.4 19.8 - with rare coarse sand-size to fine gravel-size pockets of organic matter 17.50 20.5 4.6 From 18.00 m to 18.95 m - firm medium strength very 18.00 dark grey (2.5Y 3/1) slightly sandy CLAY with rare 23.8 18.20 20.0 21.3 75 45 coarse sand-size shell fragments 24.1 18.40 20.0 20.9 - with rare coarse sand-size pockets of organic matter 18.60 50 30 19.00 28.0 From 19.00 m to 19.95 m - firm medium to high 2.72 18.0 10.0 67.0 strength dark grey (2.5Y 4/1) slightly sandy CLAY with 28.0 19.00 18.0 10.0 rare coarse sand-size to medium gravel-size shell 19.20 21.7 20.4 21.3 40 62 63 fragments 19.8 19.20 25.0 19.8 21.2 19.40 19.60 22.5 20.3 20.9 19.80 83 50 20.00 From 20.00 m to 20.00 m - No recovery From 20.00 m to 20.50 m - firm dark grey (2.5Y 4/1) 20.00 slightly sandy slightly calcareous CLAY with rare coarse sand-size to fine gravel-size shell fragments

Notes

w: Water contentCC: CaCO3 contentPP: Pocket penetrometer 10^r : r refers to test on remoulded soil γ -w: Unit weight derived from water contentOC: Organic contentTV: Torvane 10^d : d refers to test on disturbed soil γ : Unit weight from volume mass calculation w_p : Plastic limitFC: Fall cone 10^s : Residual undrained shear strength

 $\gamma_{d,min}$: Minimum index dry unit weight w_L : Liquid limit LV: Laboratory vane BSF: Below seafloor

Liquid Limit, Plastic Limit and Plasticity Index

ISO 17892-12:2018



									0919
No.	Test Date	Location	Sample	Depth [m]	Preparation Method (% passing 0.425 mm)	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	Laboratory
1	19/03/2025	Z3_OWF_BH01-SAMP	06-01	4.50	Natural soil	30	17	13	F
2	19/03/2025	Z3_OWF_BH01-SAMP	11-05	9.70	Natural soil	28	17	11	F
3	01/04/2025	Z3_OWF_BH01-SAMP	15-1	13.00	Natural soil	-	NP	-	F
4	28/03/2025	Z3_OWF_BH01-SAMP	15-3	13.30	Natural soil	-	NP	-	F
5	20/03/2025	Z3_OWF_BH01-SAMP	17-5	15.75	Natural soil	28	19	9	F
6	19/03/2025	Z3_OWF_BH01-SAMP	20-1	18.00	Natural soil	31	20	11	F
7	20/03/2025	Z3_OWF_BH01-SAMP	21-5	19.80	Natural soil	31	21	10	F
8	22/04/2025	Z3_OWF_BH06-SAMP	01-2	0.30	Natural soil	-	NP	-	F
9	28/03/2025	Z3_OWF_BH06-SAMP	02-1	1.00	Natural soil	-	NP	-	F
10	01/04/2025	Z3_OWF_BH06-SAMP	03-1	2.00	Natural soil	-	NP	-	F
11	19/03/2025	Z3_OWF_BH06-SAMP	04-1	3.00	Natural soil	33	20	13	F
12	28/03/2025	Z3_OWF_BH06-SAMP	06-1	5.00	Natural soil	-	NP	-	F
13	20/03/2025	Z3_OWF_BH13-SAMP	05-1	4.00	Natural soil	30	20	10	F
14	21/03/2025	Z3_OWF_BH13-SAMP	21-1	19.00	Natural soil	28	18	10	F

Fall cone method with 4 points, 80 gr/30° cone used and increasing water content NP=Non-plastic sample

Note: For sample descriptions, please refer to the report section presenting laboratory test results.

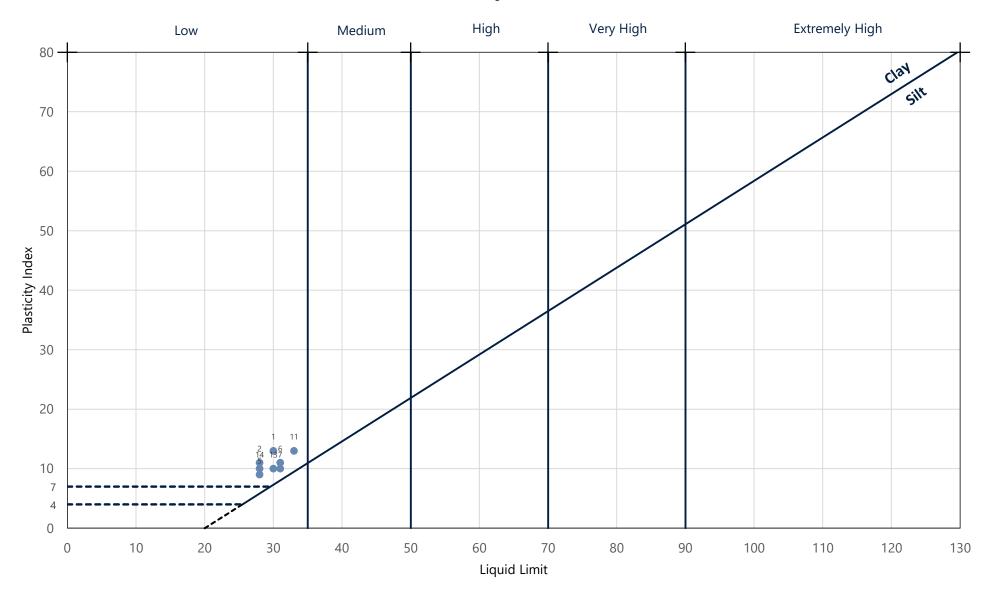
Test Page 1 / 2

A: Wallingford, UK F: Louvain-la-Neuve, Belgium

Approved by ET - 18/07/2025



Plasticity Chart



Project: 503387 - F254727 Test Page 2 / 2 A: Wallingford, UK F: Louvain-la-Neuve, Belgium



Location	Sample	Depth		Percent	tage So	il Types		D10	D30	D50	D60	Сс	Cu
ID	ID	[m]	Fines	Clay	Silt	Sand	Gravel	[mm]	[mm]	[mm]	[mm]	[-]	[-]
Z3_OWF_BH01-SAMP	02-1	0.50	8	-	-	87	5	0.067	0.134	0.18	0.2	1.3	3.0
Z3_OWF_BH01-SAMP	06-1	4.50	89	19	70	11	0	-	0.006	0.02	0.027	-	-
Z3_OWF_BH01-SAMP	11-5	9.70	87	19	67	13	-	-	0.005	0.013	0.021	-	-
Z3_OWF_BH01-SAMP	15-3	13.30	56	12	44	44	0	-	0.018	0.048	0.069	-	-
Z3_OWF_BH01-SAMP	17-5	15.75	83	19	64	17	0	-	0.006	0.022	0.03	-	-
Z3_OWF_BH01-SAMP	20-1	18.00	88	23	64	12	0	-	0.003	0.013	0.022	-	-
Z3_OWF_BH01-SAMP	21-5	19.80	87	21	67	13	0	-	0.005	0.019	0.026	-	-
Z3_OWF_BH06-SAMP	01-2	0.30	63	8	55	37	0	0.004	0.028	0.045	0.058	3.0	13.5
Z3_OWF_BH06-SAMP	02-1	1.00	55	7	48	44	1	0.009	0.032	0.055	0.07	1.6	7.9
Z3_OWF_BH06-SAMP	04-1	3.00	81	18	64	18	-	-	0.008	0.025	0.034	-	-
Z3_OWF_BH06-SAMP	06-1	5.00	66	11	55	34	0	-	0.012	0.033	0.05	-	-
Z3_OWF_BH06-SAMP	Batch_01	7.00	8	-	-	89	4	0.068	0.135	0.183	0.206	1.3	3.0
Z3_OWF_BH06-SAMP	13-1	11.00	3	-	-	88	9	0.158	0.264	0.503	0.676	0.6	4.3
Z3_OWF_BH06-SAMP	19-3	15.60	15	2	13	85	0	0.037	0.078	0.105	0.121	1.4	3.3
Z3_OWF_BH06-SAMP	23-1	19.00	23	10	13	76	1	-	0.071	0.101	0.12	-	-
Z3_OWF_BH13-SAMP	01-3	0.50	6	-	-	76	18	0.185	0.319	0.503	0.632	0.9	3.4
Z3_OWF_BH13-SAMP	05-1	4.00	87	23	64	13	0	-	0.004	0.016	0.025	-	-
Z3_OWF_BH13-SAMP	07-1	6.00	30	5	25	68	2	0.012	0.062	0.102	0.13	2.5	11.0
Z3_OWF_BH13-SAMP	11-1	9.00	6	-	-	94	0	0.071	0.126	0.164	0.175	1.3	2.5
Z3_OWF_BH13-SAMP	14-1	12.00	24	12	11	76	0	-	0.072	0.114	0.142	-	-
Z3_OWF_BH13-SAMP	18-1	16.00	35	11	23	63	3	-	0.032	0.087	0.108	-	-
Z3_OWF_BH13-SAMP	21-1	19.00	67	17	50	33	0	-	0.009	0.031	0.047	-	-

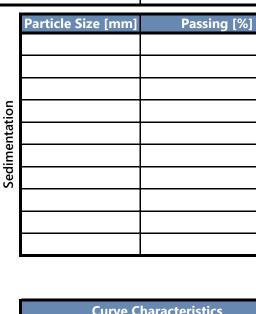
Test method : ISO 17892-4 (2016)



Particle Size Distribution

ISO 17892-4: 2016 - 5.2 - Sieving Method

Test Identification	ation		
Location	Z3_OWF_BH01-SAMP	Depth [m]	0.50
Sample	02-1	Test start date	30/04/2025



	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	99
sieving	10.0	99
Siev	6.3	98
	3.35	96
	2.00	95
	1.18	94
	0.630	92
	0.300	82
	0.212	65
	0.150	33
	0.063	8

	Curve C	haracteris	stics
D ₉₀	0.532 mm	Uniformit	y Coefficient
D ₆₀	0.200 mm	Cυ	2.99
D ₅₀	0.180 mm	Coefficien	t of Curvature
D ₃₀	0.134 mm	C _c	1.35
D ₁₀	0.067 mm		

Soil fracti	ions [%]
Cobbles	0
Gravel	5
Sand	87
Silt*	8
Clay	0

Particle Size(mm) 0.150 0.300 0.63 1.18 2.0 3.35 6.3 10 0.002 0.006 0.020 20 37.5 63 90125 0.063 100 90 80 -% Passing 70 % Passing % 30 20 10 0 Coarse Fine Medium Medium Coarse Fine Medium Coarse Fine CLAY SILT SAND GRAVEL **COBBLES**

Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Wallingford

Approved by: SW - 24/06/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Test Identification

Location

Particle Size Distribution

Z3_OWF_BH01-SAMP

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method

Depth [m] Test start date



Sam	ple	06-01		Т
	Particle S	Size [mm]	Passing [%]	Ī
ľ	12	5.0	100	1
l	90	0.0	100	1
ĺ	75	5.0	100	1
Ī	63	3.0	100	1
l	50	0.0	100	1
Ī	37	7.5	100	1
ĺ	28	3.0	100	1
ĺ	20	0.0	100	1
Sieving	1(0.0	100	1
Siev	6	.3	100	1
	3.	35	100	
ĺ	2.	00	100	1
	1.	18	100	
	0.6	530	100	
ĺ	0.3	300	100	

0.212

0.150

0.063

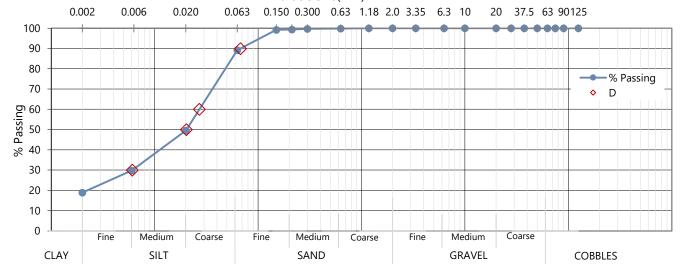
4.50

14/03/2025

Curve Characteristics				
D ₉₀ 0.068 mm		Uniformity Coefficient		
D ₆₀	0.027 mm	C _U -		
D ₅₀	0.020 mm	Coefficient of Curvature		
D ₃₀	0.006 mm	C _c -		
D ₁₀	-			

Soil fractions [%]		
Cobbles	0	
Gravel	0	
Sand	11	
Silt*	70	
Clay	19	

D	~ ·	/ \
Partic		



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

99

99

89

Note 2: Particle density for sedimentation is assumed to be $2.70 \ \text{Mg/m}^3$.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

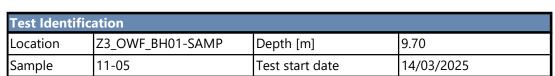
Approved by: ET - 15/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.4 - Sedimentation by Pipette Method





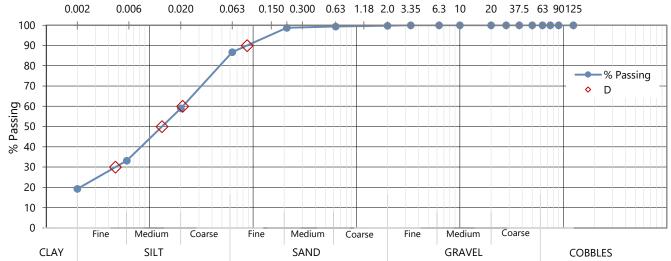
	Particle Size [mm]	Passing [%]	
	125.0	100	
Γ	90.0	100	
	75.0	100	
	63.0	100	
	50.0	100	
	37.5	100	
	28.0	100	
	20.0	100	
ıng	10.0	100	
sieving	6.3	100	
	3.35	100	
	2.00	100	
	0.630	99	
	0.212	99	
	0.063	87	
			1

Particle Size [mm]	Passing [%]
0.0200	59
0.0060	33
0.0020	19
	0.0200 0.0060

Curve Characteristics				
D ₉₀ 0.088 mm		Uniformity Coefficient		
D ₆₀	0.021 mm	C _U -		
D ₅₀	0.013 mm	Coefficient of Curvature		
D ₃₀	0.005 mm	C _C -		
D ₁₀	-			

Soil fractions [%]		
Cobbles	0	
Gravel	0	
Sand	13	
Silt*	68	
Clay	19	

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: ET - 15/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method



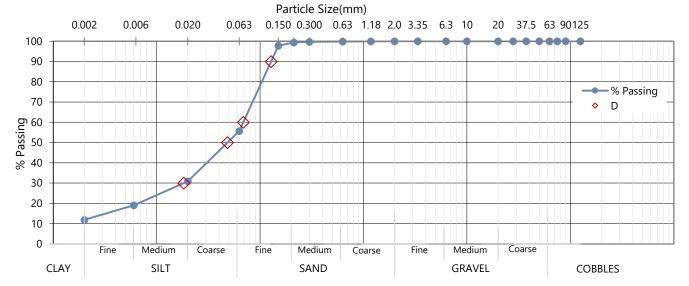
Test I	Test Identification					
Locati	ion	Z3_OWF_BH01-SAMP		Depth [m]		13.30
Samp	le	15-3		Test start date		14/03/2025
P	Particle S	Size [mm]	Passing [%]		Particle Size [mm]	Passing [%]
	12	5.0	100		0.0200	31

	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
sieving	10.0	100
S e	6.3	100
	3.35	100
	2.00	100
	1.18	100
	0.630	100
	0.300	100
	0.212	99
	0.150	98
	0.063	56

	Particle Size [mm]	Passing [%]
	0.0200	31
	0.0060	19
	0.0020	12
loi.		
ntat		
ше		
sedimentation		

Curve Characteristics			
D ₉₀	0.128 mm	Uniformity Coefficient	
D ₆₀	0.069 mm	C _U -	
D ₅₀	0.048 mm	Coefficient of Curvature	
D ₃₀	0.018 mm	C _C -	
D ₁₀	-		

Soil fractions [%]		
Cobbles 0		
Gravel	0	
Sand	44	
Silt*	44	
Clay	12	



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Test Page - 1/1

Approved by: ET - 15/04/2025

^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Test Identification

Location

Sample

Particle Size Distribution

Z3_OWF_BH01-SAMP

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method

Depth [m]

Test start date



	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
Sieving	10.0	100
Sie	6.3	100
	3.35	100
	2.00	100
	1.18	100
	0.630	100
	0.300	100
	0.212	99
	0.150	99
	0.063	83

	Particle Size [mm]	Passing [%]
	0.0200	47
	0.0060	30
	0.0020	19
Sedimentation		
ntat		
ime		
Sed		

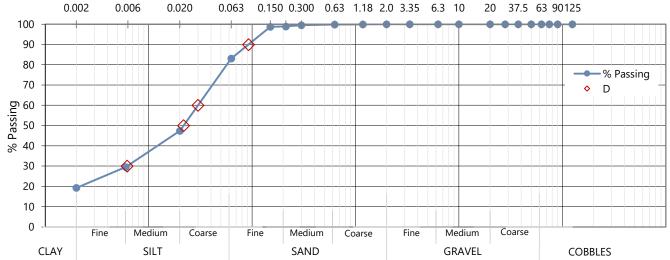
15.75

14/03/2025

Curve Characteristics			
D ₉₀	D ₉₀ 0.092 mm Uniformity Coefficient		
D ₆₀	0.030 mm	C _U -	
D ₅₀	0.022 mm	Coefficient of Curvature	
D ₃₀	0.006 mm	C _C -	
D ₁₀	-		

Soil fractions [%]		
Cobbles	0	
Gravel	0	
Sand	17	
Silt*	64	
Clay	19	

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be $2.70 \ \text{Mg/m}^3$.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: ET - 15/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method



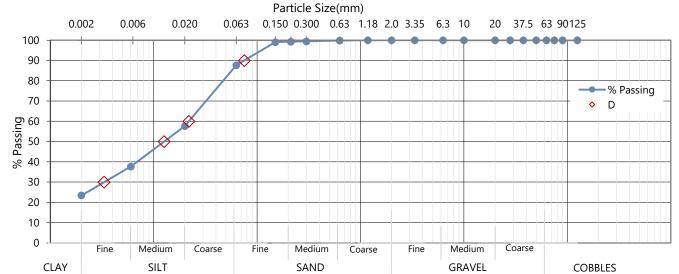
Test Identification						
Location Z3_OWF_		Z3_OWF_E	3H01-SAMP	Depth [m]		18.00
Sample 20-1		Test start date		14/03/2025		
			- 1 HO/H	1		
	Particle S	Size [mm]	Passing [%]	l	Particle Size [mm]	Passin
	12	5.0	100		0.0200	58
	90	0.0	100		0.0060	38
	75	5.0	100		0.0020	2:

	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
Sieving	10.0	100
	6.3	100
	3.35	100
	2.00	100
	1.18	100
	0.630	100
	0.300	99
	0.212	99
	0.150	99
	0.063	88

Particle Size [mm]	Passing [%]
0.0200	58
0.0060	38
0.0020	23
	0.0200 0.0060

Curve Characteristics			
D ₉₀	0.075 mm	Uniformity Coefficient	
D ₆₀	0.022 mm	C _U -	
D ₅₀	0.013 mm	Coefficient of Curvature	
D ₃₀	0.003 mm	C _C -	
D ₁₀	-		

Soil fractions [%]		
Cobbles	0	
Gravel	0	
Sand	12	
Silt*	65	
Clay	23	



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: ET - 15/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Test Identification

Location

Sample

Particle Size Distribution

Z3_OWF_BH01-SAMP

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method

Depth [m]

Test start date



	•	
	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
215	10.0	100
	6.3	100
	3.35	100
	2.00	100
	1.18	100
	0.630	100
	0.300	100
	0.212	100
	0.150	99
	0.063	87

Particle Size [mm]	Passing [%]
0.0200	51
0.0060	31
0.0020	21
	0.0200 0.0060

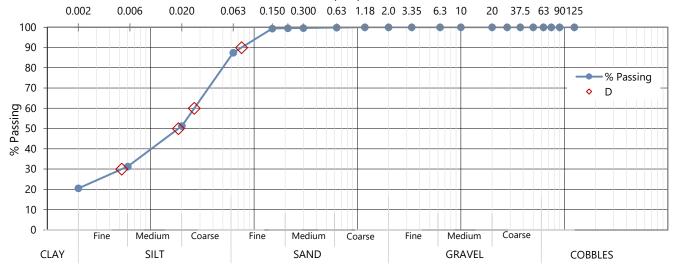
19.80

14/03/2025

Curve Characteristics				
D ₉₀	0.076 mm Uniformity Coefficient			
D ₆₀	0.026 mm	C _U -		
D ₅₀	0.019 mm	Coefficient of Curvature		
D ₃₀	0.005 mm	C _C -		
D ₁₀	-			

Soil fractions [%]		
0		
0		
13		
66		
21		

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be $2.70 \ \text{Mg/m}^3$.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: ET - 15/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method



Test Identification					
Location	Z3_OWF_E	BH06-SAMP	Dep	oth [m]	0.30
Sample	01-2		Test start date		09/04/2025
Particl	le Size [mm]	Passing [%]		Particle Size [mm]	Passing [%]
	125.0	100		0.0200	17

	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
sieving	20.0	100
	10.0	100
	6.3	100
	3.35	100
	2.00	100
	1.18	100
	0.630	100
	0.300	100
	0.212	100
	0.150	99
	0.063	63

	Particle Size [mm]	Passing [%]
	0.0200	17
	0.0060	11
	0.0020	8
0		
ווש		
= =		
sedimentation		
-		

Curve Characteristics			
D ₉₀	0.120 mm	Uniformity Coefficient	
D ₆₀	0.058 mm	Cυ	13.53
D ₅₀	0.045 mm	Coefficien	t of Curvature
D ₃₀	0.028 mm	C _c	3.03
D ₁₀	0.004 mm		

Soil fractions [%]		
Cobbles	0	
Gravel	0	
Sand	37	
Silt*	55	
Clay	8	
•	•	

0.002 0.006 0.020 0.150 0.300 0.63 1.18 2.0 3.35 6.3 10 20 37.5 63 90125 0.063 100 90 80 -% Passing 70 % Passing % 30 20 10 0 Coarse Medium Fine Medium Coarse Fine Medium Coarse Fine CLAY SILT SAND GRAVEL **COBBLES**

Particle Size(mm)

Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: SW - 30/06/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Test Identification

Location

Particle Size Distribution

Z3_OWF_BH06-SAMP

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method

Depth [m]



Sample		02-1		Test start date		ate
	Particle S	Size [mm]	Passing [%]	i i	Particle	e Si
	12	5.0	100		(0.02
	90	0.0	100		(0.00
	75	5.0	100		(0.00
	63	3.0	100	ion		
	50	0.0	100	Sedimentation		
	37	7.5	100	ime		
	28	3.0	100	Sed		
	20	0.0	100			
ing	10	0.0	100			
Sieving	6	.3	100			
	3.	35	100			
	2.	00	99			
	1.	18	98			
	0.6	530	98		D ₉₀	0.
	0.3	300	97		D ₆₀	0.
	0.2	212	96		D ₅₀	0.
	0.1	150	96		D ₃₀	0.

	Particle Size [mm]	Passing [%]
	0.0200	13
	0.0060	9
	0.0020	7
Sedimentation		
ntat		
ime		
Sed		
,		

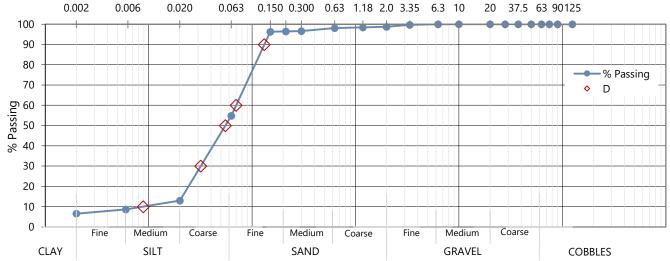
1.00

14/03/2025

Curve Characteristics					
D ₉₀	0.131 mm	Uniformity Coefficient			
D ₆₀	0.070 mm	C _U 7.92			
D ₅₀	0.055 mm	Coefficient of Curvature			
D ₃₀	0.032 mm	C _c	1.64		
D ₁₀	0.009 mm				

Soil fractions [%]		
Cobbles	0	
Gravel	1	
Sand	44	
Silt*	48	
Clay	7	

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

55

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

0.063

Laboratory: Louvain-la-Neuve

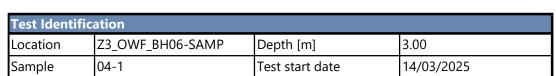
Approved by: ET - 15/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.4 - Sedimentation by Pipette Method





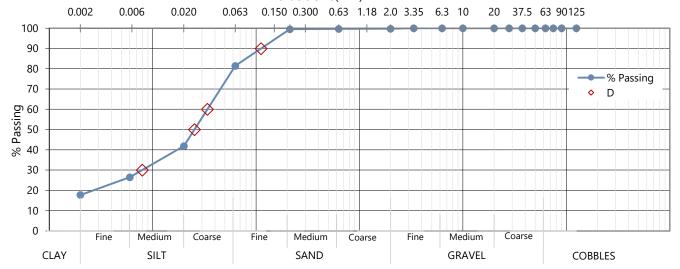
Particle Size [mm]	Passing [%]
125.0	100
90.0	100
75.0	100
63.0	100
50.0	100
37.5	100
28.0	100
20.0	100
10.0	100
6.3	100
3.35	100
2.00	100
0.630	100
0.212	100
0.063	81
	125.0 90.0 75.0 63.0 50.0 37.5 28.0 20.0 10.0 6.3 3.35 2.00 0.630

Particle Size [mm]	Passing [%]
0.0200	42
0.0060	26
0.0020	18
	0.0200 0.0060

Curve Characteristics				
D ₉₀ 0.112 mm		Uniformity Coefficient		
D ₆₀ 0.034 mm		C _U -		
D ₅₀	0.025 mm	Coefficient of Curvature		
D ₃₀	0.008 mm	C _C -		
D ₁₀	-			

Soil fractions [%]		
Cobbles 0		
0		
19		
63		
18		

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be $2.70 \ \text{Mg/m}^3$.

* Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: ET - 15/04/2025



Test Identification

Location

Particle Size Distribution

Z3_OWF_BH06-SAMP

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method

Depth [m]



Sample		06-1		Test start date		ate
	Particle S	Size [mm]	Passing [%]	1	Particle	e Si
		5.0	100	1		0.02
	90.0		100		(0.00
	75	5.0	100		(0.00
	63	3.0	100	ion		
	50	0.0	100	ntat		
	37	7.5	100	Sedimentation		
	28	3.0	100	Sed		
	20	0.0	100			
ing	10	0.0	100			
Sieving	6	.3	100			
	3	35	100	l '		
	2.	00	100			
	1.	18	99			
	0.6	30	99		D ₉₀	0.
	0.3	300	97		D ₆₀	0.
	0.2	212	90		D ₅₀	0.
	0.1	50	77		D ₂₀	0.

	Particle Size [mm]	Passing [%]
	0.0200	38
	0.0060	18
	0.0020	11
ion		
Sedimentation		
ime		
Sed		
• /		
ı		

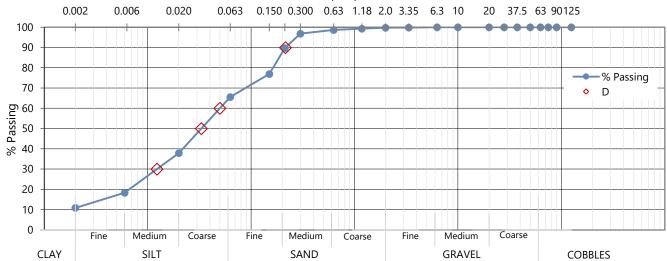
5.00

14/03/2025

Curve Characteristics				
D ₉₀ 0.215 mm		Uniformity Coefficient		
D ₆₀	D₆₀ 0.050 mm C _U -			
D ₅₀	0.033 mm	Coefficient of Curvature		
D ₃₀	0.012 mm	C _C -		
D ₁₀	-			

Soil fractions [%]		
Cobbles 0		
Gravel	0	
Sand	34	
Silt*	55	
Clay	11	

Particle Size(mm) 0.020 0.063



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

66

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

* Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Project: 503387 - F254727

0.063

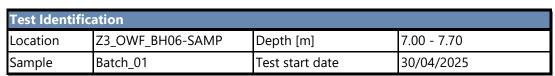
Laboratory: Louvain-la-Neuve

Approved by: ET - 15/04/2025



Particle Size Distribution

ISO 17892-4: 2016 - 5.2 - Sieving Method





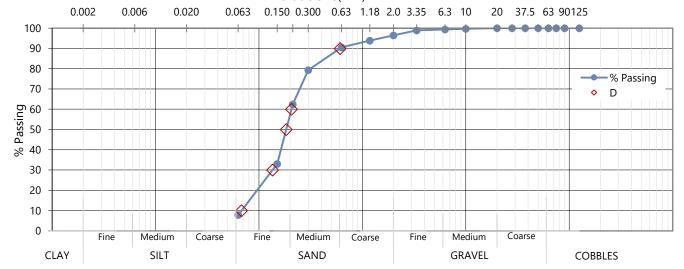
	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
واالعاد	10.0	100
ב כ	6.3	99
	3.35	99
	2.00	96
	1.18	94
	0.630	90
	0.300	79
	0.212	62
	0.150	33
	0.063	8

	Particle Size [mm]	Passing [%]
Sedimentation		
nta		
ime		
Sed		

Curve Characteristics			
D ₉₀	0.609 mm	Uniformity Coefficient	
D ₆₀	0.206 mm	Cu	3.04
D ₅₀	0.183 mm	Coefficient of Curvature	
D ₃₀	0.135 mm	C _c	1.31
D ₁₀	0.068 mm		

Soil fractions [%]		
Cobbles	0	
Gravel	4	
Sand	88	
Silt*	8	
Clay	0	
•	•	

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be $2.70 \ \text{Mg/m}^3$.

Project: 503387 - F254727

Laboratory: Wallingford

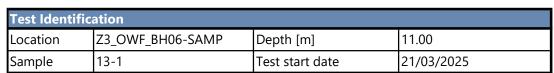
Approved by: SW - 24/06/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.2 - Sieving Method





	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
ıng	10.0	100
Sieving	6.3	97
	3.35	93
	2.00	91
	1.18	89
	0.630	56
	0.300	35
	0.212	21
	0.150	8
	0.063	3

	Particle Size [mm]	Passing [%]
Sedimentation		
ntat		
ime		
Sed		

Curve Characteristics			
D ₉₀	1.525 mm	Uniformity Coefficient	
D ₆₀	0.676 mm	Cυ	4.26
D ₅₀	0.503 mm	Coefficient of Curvature	
D ₃₀	0.264 mm	C _c	0.65
D ₁₀	0.158 mm		

Soil fractions [%]		

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be $2.70 \ \text{Mg/m}^3$.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

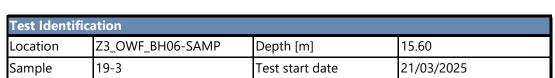
Approved by: ET - 15/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method





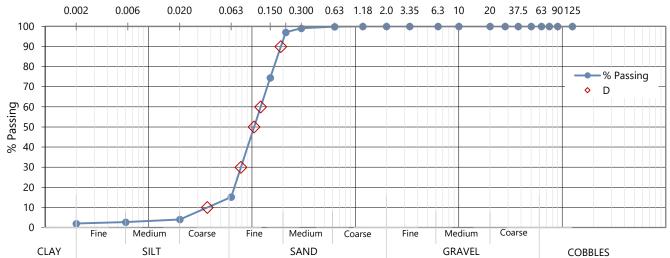
Particle Size [mm]	Passing [%]
125.0	100
90.0	100
75.0	100
63.0	100
50.0	100
37.5	100
28.0	100
20.0	100
10.0	100
6.3	100
3.35	100
2.00	100
1.18	100
0.630	100
0.300	99
0.212	97
0.150	74
0.063	15
	125.0 90.0 75.0 63.0 50.0 37.5 28.0 20.0 10.0 6.3 3.35 2.00 1.18 0.630 0.300 0.212 0.150

	Particle Size [mm]	Passing [%]
	0.0200	4
	0.0060	3
	0.0020	2
tion		
ntai		
ime		
Sedimentation		

Curve Characteristics			
D ₉₀	0.190 mm	Uniformity Coefficient	
D ₆₀	0.121 mm	Cu	3.27
D ₅₀	0.105 mm	Coefficient of Curvature	
D ₃₀	0.078 mm	C _c	1.36
D ₁₀	0.037 mm		

Soil fractions [%]		
Cobbles 0		
Gravel 0		
Sand	85	
Silt*	13	
Clay	2	

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: TG - 22/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Test Identification

Location

Particle Size Distribution

Z3_OWF_BH06-SAMP

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method

Depth [m]



Sample 23-1			Test	start da	ite	
	Particle S	Size [mm]	Passing [%]		Particle	e Si
		5.0	100			0.02
	90	0.0	100		C	0.00
	75	5.0	100		C	0.00
	63	3.0	100	ion		
	50	0.0	100	Sedimentation		
	37	7.5	100	ime		
	28	3.0	100	Sed		
	20	0.0	100			
ing	10).0	100			
Sieving	6	.3	100			
	3.	35	100			
	2.	00	99			
	1.	18	99			
	0.6	30	98		D ₉₀	0
	0.3	300	95		D ₆₀	0
	0.2	212	91		D ₅₀	0

0.150

0.063

Particle Size [mm]	Passing [%]
0.0200	20
0.0060	15
0.0020	10
	0.0200 0.0060

19.00

21/03/2025

Curve Characteristics					
D ₉₀	0.208 mm Uniformity Coefficient				
D ₆₀	0.120 mm	C _U -			
D ₅₀	0.101 mm	Coefficient of Curvature			
D ₃₀	0.071 mm	C _C -			
D ₁₀	-				

Soil fractions [%]		
Cobbles	0	
Gravel	1	
Sand	76	
Silt*	13	
Clay	10	

Particle Size(mm) 0.002 0.006 0.020 0.063 0.150 0.300 0.63 1.18 2.0 3.35 37.5 63 90125 6.3 10 20 100 90 80 -% Passing 70 D % Passing % 30 20 10 0 Fine Medium Coarse Medium Coarse Fine Medium Coarse CLAY SILT SAND **GRAVEL COBBLES**

Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

72

23

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

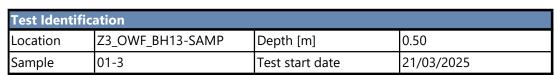
Approved by: TG - 31/05/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.2 - Sieving Method





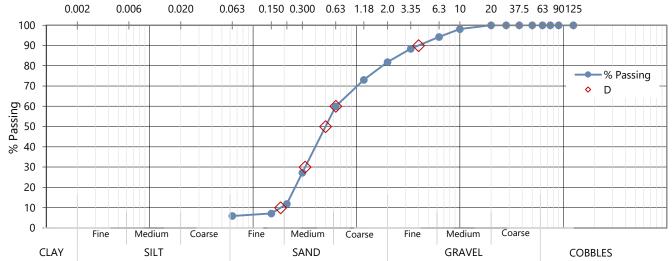
	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
Sieving	10.0	98
	6.3	94
	3.35	88
	2.00	82
	1.18	73
	0.630	60
	0.300	27
	0.212	12
	0.150	7
	0.063	6

	Particle Size [mm]	Passing [%]
ion		
Sedimentation		
mer		
edi		
S		

Curve Characteristics					
D ₉₀	3.988 mm	Uniformity Coefficient			
D ₆₀	0.632 mm	C _U 3.41			
D ₅₀	0.503 mm	Coefficient of Curvature			
D ₃₀	0.319 mm	C _c	0.87		
D ₁₀	0.185 mm				

ns [%]
0
18
76
6
0

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be $2.70 \ \text{Mg/m}^3$.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: ET - 15/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Test Identification

Location

Particle Size Distribution

Z3_OWF_BH13-SAMP

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method

Depth [m]



Sample 05-1		05-1		Test	t start date
	Particle S	Size [mm]	Passing [%]	1	Particle Si
	125.0		100	1	0.02
	90.0		100	1	0.00
	75.0		100		0.00
	63	3.0	100	ion	
	50.0		100	Sedimentation	
	37.5		100		
Sieving	28.0		100	Sedi	
	20.0		100	1	
	10.0		100		
	6.3		100		
	3.35		100		
	2.00		100	1	
	1.	18	100		
	0.6	530	99	1	D ₉₀ 0
				1	

0.300

0.212

0.150

0.063

Particle Size [mm]	Passing [%]
0.0200	54
0.0060	35
0.0020	23

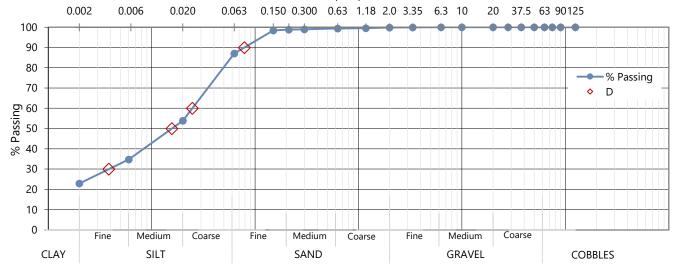
4.00

14/03/2025

Curve Characteristics				
D ₉₀	D ₉₀ 0.079 mm Uniformity Coefficient			
D ₆₀	0.025 mm	nm C u -		
D ₅₀	0.016 mm	Coefficient of Curvature		
D ₃₀	0.004 mm	C _C -		
D ₁₀	-			

Soil fractions [%]		
0		
0		
13		
64		
23		

Particle Si	7e(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

99

99

98

87

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

* Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: ET - 15/04/2025



Particle Size Distribution

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method



Test Identification			
Location	Z3_OWF_BH13-SAMP	Depth [m]	6.00
Sample	07-1	Test start date	21/03/2025
Particle Size [mm] Passing [%] Particle Size [mm] Passing [%]			

	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
Sieviily	10.0	100
ole.	6.3	99
	3.35	99
	2.00	98
	1.18	98
	0.630	97
	0.300	94
	0.212	88
	0.150	66
	0.063	30

	Particle Size [mm]	Passing [%]
	0.0200	12
	0.0060	8
	0.0020	5
Sedimentation		
ntai		
ime		
Sed		

Curve Characteristics			
D ₉₀	0.233 mm	Uniformity Coefficient	
D ₆₀	0.130 mm	C_{U}	11.04
D ₅₀	0.102 mm	Coefficient of Curvature	
D ₃₀	0.062 mm	C _C	2.48
D ₁₀	0.012 mm		

Soil fracti	ons [%]
Cobbles	0
Gravel	2
Sand	68
Silt*	25
Clay	5

Particle Size(mm) 0.002 0.006 0.020 $0.150\ 0.300\ 0.63\ 1.18\ 2.0\ 3.35\ 6.3\ 10$ 37.5 63 90125 0.063 100 90 80 -% Passing 70 D % Passing % 30 20 10 0 Fine Medium Coarse Medium Coarse Fine Medium Coarse CLAY SILT SAND **GRAVEL COBBLES**

Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727 Test Page - 1/1 Laboratory: Louvain-la-Neuve

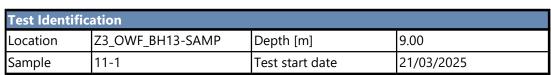
Approved by: TG - 22/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.2 - Sieving Method





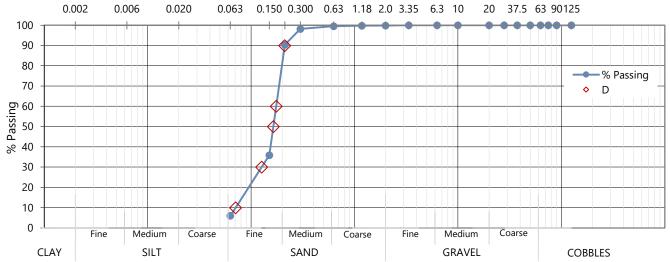
	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
sieving	10.0	100
sie/	6.3	100
	3.35	100
	2.00	100
	1.18	100
	0.630	100
	0.300	98
	0.212	90
	0.150	36
	0.063	6

	Particle Size [mm]	Passing [%]
_		
Sedimentation		
nta		
lime		
Sec		

Curve Characteristics			
D ₉₀	0.212 mm Uniformity Coefficient		
D ₆₀	0.175 mm	Cυ	2.47
D ₅₀	0.164 mm	Coefficien	t of Curvature
D ₃₀	0.126 mm	C _c	1.29
D ₁₀	0.071 mm		

Soil fractions [%]		
Cobbles	0	
Gravel	0	
Sand	94	
Silt*	6	
Clay	0	

Particle Size(mm)



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: ET - 15/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method



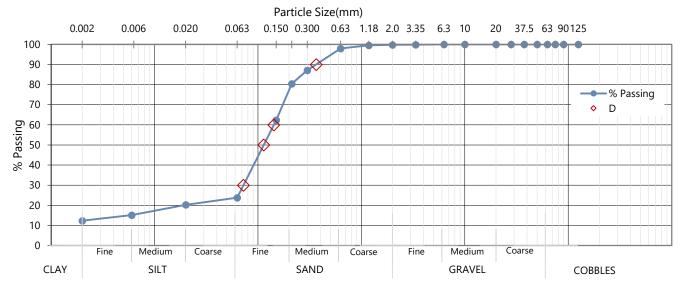
Test Identification			
Location	Z3_OWF_BH13-SAMP	Depth [m]	12.00
Sample	14-1	Test start date	21/03/2025

	Particle Size [mm]	Passing [%]
	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
JICVIIII	10.0	100
פֿע	6.3	100
	3.35	100
	2.00	100
	1.18	100
	0.630	98
	0.300	87
	0.212	80
	0.150	62
	0.063	24

Particle Size [mm]	Passing [%]
0.0200	20
0.0060	15
0.0020	12
	0.0200 0.0060

Curve Characteristics				
D ₉₀	D ₉₀ 0.366 mm Uniformity Coefficient			
D ₆₀	0.142 mm	C _U -		
D ₅₀	0.114 mm	Coefficient of Curvature		
D ₃₀	0.072 mm	C _C -		
D ₁₀	-			

Soil fractions [%]		
Cobbles	0	
Gravel	0	
Sand	76	
Silt*	12	
Clay	12	



Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: TG - 22/04/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Size Distribution

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method



Test Identification							
Locat	tion	Z3_OWF_E	H13-SAMP	Depth [m]		16.00	
Samp	ole	18-1		Test start date		05/05/2025	
	Particle S	Size [mm]	Passing [%]		Particle Size [mm]	Passing [%]	
	12	ΓΛ	100		0.0200	27	

	Particle Size [mm]	Passing [%]
125.0 90.0 75.0	125.0	100
	90.0	100
	75.0	100
	63.0	100
	50.0	100
	37.5	100
	28.0	100
	20.0	100
10.0	10.0	100
	6.3	99
	3.35	98
	2.00	97
	1.18	97
	0.630	95
	0.300	87
	0.212	82
	0.150	75
	0.063	35

Particle Size [mm]	Passing [%]
0.0200	27
0.0060	18
0.0020	11
	0.0200 0.0060

Curve Characteristics				
D ₉₀	0.404 mm Uniformity Coefficient			
D ₆₀	0.108 mm	C _U -		
D ₅₀	0.087 mm	Coefficient of Curvature		
D ₃₀	0.032 mm	C _C -		
D ₁₀	-			

Soil fractions [%]		
Cobbles	0	
Gravel	3	
Sand	62	
Silt*	24	
Clay	11	

Particle Size(mm) 0.002 0.006 0.020 0.150 0.300 0.63 1.18 2.0 3.35 37.5 63 90125 0.063 6.3 10 100 90 80 -% Passing 70 D % Passing % 30 20 10 0 Fine Medium Coarse Medium Coarse Fine Medium Coarse CLAY SILT SAND **GRAVEL COBBLES**

Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Project: 503387 - F254727

Laboratory: Louvain-la-Neuve

Approved by: TG - 31/05/2025



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Test Identification

Location

Particle Size Distribution

Z3_OWF_BH13-SAMP

ISO 17892-4: 2016 - 5.2 & 5.4 - Sieving & Sedimentation by Pipette Method

Depth [m]



Sam	nple	21-1		Test	start date
	Particle S	Size [mm]	Passing [%]	1	Particle Si
	125.0		100	1	0.02
	90	0.0	100		0.00
	75	5.0	100		0.00
	63	3.0	100	ion	
	50	0.0	100	ntat	
	37	7.5	100	Sedimentation	
Sieving	28.0		100	Sedi	
	20.0		100		
	10	0.0	100		
Siev	6	.3	100		
•	3.	35	100	 	
	2.	00	100	1	
	1.	18	100		
	0.6	530	100		D ₉₀ 0
	0.3	300	98		D ₆₀ 0
	0.2	212	98		D ₅₀ 0

0.150

0.063

0.006

0.002

	Particle Size [mm]	Passing [%]
	0.0200	40
	0.0060	26
	0.0020	17
lon		
וומו		
sedimentation		
sea		

19.00

14/03/2025

Curve Characteristics				
D ₉₀	0.124 mm Uniformity Coefficient			
D ₆₀	0.047 mm	C _U -		
D ₅₀	0.031 mm	Coefficient of Curvature		
D ₃₀	0.009 mm	C _C -		
D ₁₀	-			

Soil fractions [%]		
Cobbles 0		
Gravel	0	
Sand	33	
Silt*	50	
Clay	17	

20 37.5 63 90125

Coarse

100 90 80 70 Passing 0 0 0 10

Coarse

Fine

Medium

GRAVEL

0.150 0.300 0.63 1.18 2.0 3.35 6.3 10

Particle Size(mm)

Note 1: For sample descriptions, please refer to the report section presenting laboratory test results.

Coarse

96

67

0.063

0.020

Note 2: Particle density for sedimentation is assumed to be 2.70 Mg/m³.

Medium

SILT

Fine

Project: 503387 - F254727

Fine

Laboratory: Louvain-la-Neuve

Medium

SAND

Approved by: ET - 15/04/2025

COBBLES

Test Page - 1/1

0

CLAY



^{*} Where a sedimentation test was not carried out, this represents total fines, particles less than 0.063 mm.

Particle Density Fluid Pycnometer Method

ISO 17892-3:2015



						0919
No.	Test Date	Location	Sample	Depth [m]	Particle Density [Mg/m³]	Laboratory
1	10/03/2025	Z3_OWF_BH01-SAMP	02-01	0.50	2.67	А
2	21/03/2025	Z3_OWF_BH01-SAMP	06-1	4.50	2.74	F
3	21/03/2025	Z3_OWF_BH01-SAMP	11-05	9.70	2.75	F
4	09/04/2025	Z3_OWF_BH01-SAMP	15-3	13.30	2.71	F
5	21/03/2025	Z3_OWF_BH01-SAMP	21-5	19.80	2.72	F
6	27/02/2025	Z3_OWF_BH06-SAMP	01-2	0.30	2.72	А
7	21/03/2025	Z3_OWF_BH06-SAMP	04-1	3.00	2.74	F
8	25/03/2025	Z3_OWF_BH06-SAMP	13-1	11.00	2.70	F
9	26/03/2025	Z3_OWF_BH06-SAMP	19-3	15.60	2.69	F
10	27/02/2025	Z3_OWF_BH06-SAMP	Batch_01	7.00-7.70	2.69	А
11	20/03/2025	Z3_OWF_BH13-SAMP	05-1	4.00	2.74	F
12	26/03/2025	Z3_OWF_BH13-SAMP	14-1	12.00	2.67	F
13	21/03/2025	Z3_OWF_BH13-SAMP	21-1	19.00	2.72	F

Note: For sample descriptions, please refer to the report section presenting laboratory test results.

Project: 503387 - F254727 Test Page 1 / 1 A: Wallingford, UK F: Louvain-la-Neuve, Belgium Approved by ET - 15/07/2025



Maximum and Minimum Dry Densities

Norwegian Geotechnical Institute (NGI) and Geolabs Method

				Donth	Maximum Dry Density [Mg/m³]		/m³]	Maximum	Minimum			
No.	Test Date	Borehole	Sample	Depth [m]		urcharge	After Su	ırcharge	Dry Density		Location	
				[111]	Specimen 1	Specimen 2	Specimen 1	Specimen 2	[Mg/m ³]	[Mg/m ³]		
1	06/03/2025	Z3_OWF_BH01-SAMP	02-01	0.50	1.81	1.79	1.84	1.82	1.83	1.21	Α	
2	27/02/2025	Z3_OWF_BH06-SAMP	18-2	14.50	1.56	1.59	1.76	1.81	1.78	1.17	А	*
3	26/02/2025	Z3_OWF_BH06-SAMP	Batch_01	7.00-7.70	1.84	1.83	1.91	1.88	1.90	1.36	Α	
4	24/02/2025	Z3_OWF_BH13-SAMP	12-2	10.20	1.82	1.84	1.95	1.95	1.95	1.29	Α	

^{*} Indicative results as test was performed on a sample out of specification with more than 12 % fines Note: For sample descriptions, please refer to the report section presenting laboratory test results.

Project: 503387 - F254727

Test page no. 1 / 1

A: Wallingford, UK

F: Louvain-la-Neuve, Belgium

Tugro

Approved by ET 15/07/2025

Location	Sample	Depth BSF	Test	Sample			Index P	Property						Conso	lidation Para	meters			
	ID		Туре	Quality*	ρ	U_W	W_i	e_0	S _r	PD	P' ₀	P' _c	OCR	Сс	Cs	CR	Cv	М	Kv
		[m]			[Mg/m³]	[kN/m³]	[%]	[-]	[%]	[Mg/m ³]	[kPa]	[kPa]	[-]	[-]	[-]	[-]	At Est. P' ₀	At Est. P' ₀	At Est. P' ₀
																	[m²/year]	[Mn/m²]	[m/year]
Z3_OWF_BH01-SAMP	05-02	3.70	il	vp	2.07	20.3	23.3	0.609	100	2.70	37	97	2.65	0.121	0.012	0.075	5.704	1.369	0.041
Z3_OWF_BH01-SAMP	11-04	9.50	il	vp	2.11	20.7	23.9	0.584	100	2.70	95	116	1.22	0.095	0.014	0.060	17.771	3.965	0.044
Z3_OWF_BH01-SAMP	20-02	18.20	il	vp	2.11	20.7	24.7	0.596	100	2.70	181	271	1.50	0.125	0.003	0.078	18.033	5.923	0.030
Z3_OWF_BH06-SAMP	02-2	1.40	il	-	2.13	20.8	23.2	0.565	100	2.70	13	99	7.54	0.058	0.006	0.037	95.282	2.838	0.329
Z3_OWF_BH06-SAMP	05-2	4.20	il	-	2.11	20.7	22.4	0.564	100	2.70	40	191	4.78	0.104	0.005	0.066	18.988	2.434	0.077
Z3_OWF_BH13-SAMP	05-3	4.40	il	vp	2.06	20.2	25.2	0.643	100	2.70	42	145	3.43	0.168	0.021	0.102	3.381	1.587	0.021
Z3_OWF_BH13-SAMP	20-3	18.40	il	-	2.08	20.4	21.5	0.579	100	2.70	177	150	0.84	0.095	0.001	0.060	5.441	5.320	0.010
Notes																			

: Estimated sample quality based on Lune et al. (2006)

BSF

: Degree of saturation : Compression index : Constant rate of strain

: Bulk density PD: Particle density Cs : Swelling index

: Incremental loading

: Unit weight : In-situ pressure

: Coefficient of consolidation : Primary compression ratio

e₀ : Initial void ratio

: Water content

: Pre-consolidatio pressure

: Coefficient of volume compressibility

OCR : Over consolidation ratio

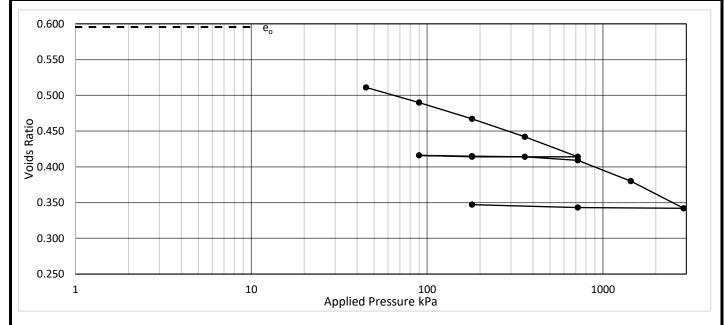
Kv : Permeability





BS EN ISO 17892-5:2017

Project Reference	F254727		Location ID	Z3_OWF_BH01-SAMP	
Project Name	Golfe du Lion		Depth Top [m]	18.20	
Specimen Description	Brown slightly gr	ravelly slightly sandy CLAY	Sample Type	Wax	
Specimen Reference		Specimen Depth [m]	18.29	Sample Reference	20-2



Applied Pressure kPa	Voids ratio	m _v m²/MN	C _v [t _{50/log}] m²/yr	C _v [t _{90, root}] m²/yr	C _{sec}
2.5	0.596	-	-	-	-
45	0.511	1.2	6.3	4.9	0.00140
90	0.490	0.32	8.0	5.3	0.00140
180	0.467	0.17	13	18	0.00190
360	0.442	0.093	18	22	0.00230
720	0.414	0.055	17	22	0.00200
180	0.414				
90	0.416				
180	0.415	0.0067	30	42	0.00017
360	0.414	0.0036	34	42	0.00026
720	0.409	0.011		38	0.00069
1,440	0.380	0.028	24	21	0.00250
2,880	0.342	0.020	26	21	0.00270
720	0.343				
180	0.347				

Date of Test
Preparation
Particle density
Average temperature for test
Swelling Pressure
Settlement on saturation
Degree of Saturation

Diameter
Height
Water Content
Bulk density
Dry density
Voids Ratio

17/04/2025	
Hand Trimming	
2.70	Mg/m³ °C
21	°C
	kPa %
	%
100	%

		-
Initial	Final	
49.93	1	mm
19.92	16.82	mm
24.7	17.8	%
2.11	2.36	Mg/m³
1.69	2.00	Mg/m³ Mg/m³
0.596	0.347	

Frame correction applied to height changes

Cv corrected to 20°C

* Negative Csec determination

Issue Date	09/05/2025	Certificate Reference	Issue 1	Authorised By	huntc
Client	DGEC			Authorised Date	08/05/2025 10:48
Remarks					

Fugro GB Limited. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW

Testing was performed at the Fugro GB Limited laboratory at the address shown above. Results relate only to the sample tested, having been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated otherwise the sample was tested in the condition it was received at the laboratory.

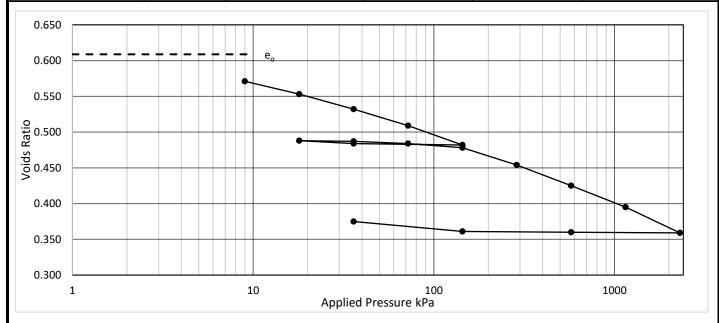


Standard 20 stage Oedometer ISO Output.xlsm - Rev 6



BS EN ISO 17892-5:2017

Project Reference	F254727		Location ID	Z3_OWF_BH01-SAMP	
Project Name	Golfe du Lion		Depth Top [m]	3.70	
Specimen Description	Grey slightly sand	dy CLAY	Sample Type	Wax	
Specimen Reference		Specimen Depth [m]	3.79	Sample Reference	05-02



Applied Pressure kPa	Voids ratio	m _v m²/MN	C _v [t _{50/log}]	C _v [t _{90, root}]	C_sec
2.5	0.609	III-/IVIIN	m²/yr	m²/yr	
			-	-	-
9.0	0.571	3.6	8.6	14	0.00110
18	0.553	1.3	2.9	3.2	0.00077
36	0.532	0.75	4.6	5.6	0.00120
72	0.509	0.41	7.0	8.8	0.00180
144	0.482	0.25	12	14	0.00230
36	0.484				
18	0.488				
36	0.487	0.044	52	60	0.00013
72	0.484	0.048	61	58	0.00022
144	0.478	0.057	61	39	0.00066
288	0.454	0.11	15	16	0.00250
576	0.425	0.069	15	16	0.00240
1,152	0.395	0.037	19	22	0.00280
2,304	0.359	0.022	24	22	0.00380
576	0.360				
144	0.361				
36	0.375				

Date of Test
Preparation
Particle density
Average temperature for test
Swelling Pressure
Settlement on saturation
Degree of Saturation

Diameter
Height
Water Content
Bulk density
Dry density
Voids Ratio

14/04/2025	
Hand Trimming	
2.70	Mg/m³ °C
21	°C
	kPa %
	%
100	%

		_
Initial	Final	
50.08	-	mm
20.07	17.15	mm
23.3	17.6	%
2.07	2.31	Mg/m³
1.68	1.96	Mg/m³
0.609	0.375	

Frame correction applied to height changes

Cv corrected to 20°C

* Negative Csec determination

Issue Date	09/05/2025	Certificate Reference	Issue 1	Authorised By	huntc
Client	DGEC		Authorised Date	06/05/2025 17:33	
Remarks					

Fugro GB Limited. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW

Testing was performed at the Fugro GB Limited laboratory at the address shown above. Results relate only to the sample tested, having been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated otherwise the sample was tested in the condition it was received at the laboratory.



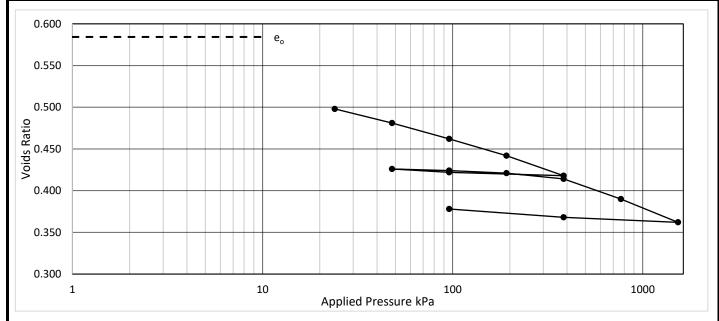
Page 1 of 1

Standard 20 stage Oedometer ISO Output.xlsm - Rev 6



BS EN ISO 17892-5:2017

Project Reference	F254727			Location ID	Z3_OWF_BH01-SAMP
Project Name	Golfe du Lion			Depth Top [m]	9.50
Specimen Description	Grey slightly sandy CLAY			Sample Type	Wax
Specimen Reference		Specimen Depth [m]	9.54	Sample Reference	11-04



Applied Pressure	Voids ratio	m _v	C _v [t _{50,log}]	C _v [t _{90, root}]	C_sec
kPa		m²/MN	m²/yr	m²/yr	
2.5	0.584	-	-	-	-
24	0.498	2.5	5.6	2.3	0.00270
48	0.481	0.49	8.8	5.3	0.00130
96	0.462	0.25	15	18	0.00150
192	0.442	0.15	21	24	0.00170
384	0.418	0.085	28	22	0.00190
96	0.422				
48	0.426				
96	0.424	0.023	33	45	0.00007
192	0.421	0.023	40	46	0.00019
384	0.414	0.026	42	40	0.00047
768	0.390	0.044	34	21	0.00200
1,536	0.362	0.027	31	20	0.00210
384	0.368				
96	0.378				

Date of Test
Preparation
Particle density
Average temperature for test
Swelling Pressure
Settlement on saturation
Degree of Saturation

Diameter
Height
Water Content
Bulk density
Dry density
Voids Ratio

19/03/2025	
Hand Trimming	
2.70	Mg/m³ °C
21	°C
	kPa %
	%
100	%

Initial	Final	
50.05	-	mm
20.04	17.43	mm
23.9	19.2	%
2.11	2.34	Mg/m
1.70	1.96	Mg/m
0.584	0.378	

Frame correction applied to height changes

Cv corrected to 20°C

* Negative Csec determination

Issue Date	09/05/2025	Certificate Reference	Issue 1	Authorised By	huntc
Client	DGEC		Authorised Date	17/04/2025 16:39	
Remarks					

Fugro GB Limited. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW

Testing was performed at the Fugro GB Limited laboratory at the address shown above. Results relate only to the sample tested, having been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated otherwise the sample was tested in the condition it was received at the laboratory.

otherwise the sample was tested in the condition it was received at the laboratory.

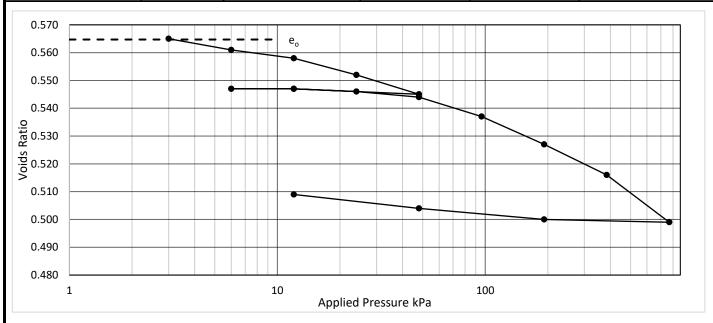
Standard 20 stage Oedometer ISO Output.xlsm - Rev 6





BS EN ISO 17892-5:2017

Project Reference	F254727			Location ID	Z3_OWF_BH06-SAMP
Project Name	Golfe du Lion			Depth Top [m]	1.40
Specimen Description	Grey slightly sand	Grey slightly sandy CLAY			Wax
Specimen Reference		Specimen Depth [m]	1.41	Sample Reference	02-2



Applied Pressure kPa	Voids ratio	m _v m²/MN	C _v [t _{50/log}] m²/yr	C _v [t _{90, root}] m²/yr	C_sec
2.5	0.565	-			_
3.0	0.565	0.12		450	*
6.0	0.561	0.73	35	41	0.00030
12	0.558	0.36	99	93	0.00039
24	0.552	0.31	110	110	0.00051
48	0.545	0.17	220	160	0.00061
12	0.547				
6.0	0.547				
12	0.547	0.040	20	160	0.00002
24	0.546	0.044	81	370	0.00007
48	0.544	0.054	44	400	0.00017
96	0.537	0.10	230	68	0.00071
192	0.527	0.064	150	220	0.00095
384	0.516	0.037	87	110	0.00093
768	0.499	0.029	94	72	0.00150
192	0.500				
48	0.504				
12	0.509				

Date of Test
Preparation
Particle density
Average temperature for test
Swelling Pressure
Settlement on saturation
Degree of Saturation

Diameter
Height
Water Content
Bulk density
Dry density
Voids Ratio

26/03/2025	
Hand Trimming	
2.70	Mg/m³ ℃
21	°C
	kPa %
	%
100	%

		-
Initial	Final	
49.91	1	mm
19.72	19.02	mm
23.2	22.1	%
2.13	2.18	Mg/m³
1.73	1.79	Mg/m³ Mg/m³
0.565	0.509	

Frame correction applied to height changes

Cv corrected to 20°C

* Negative Csec determination

Issue Date	09/05/2025	Certificate Reference	Issue 1	Authorised By	huntc
Client	DGEC	DGEC		Authorised Date	17/04/2025 09:53
Remarks					

Fugro GB Limited. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW

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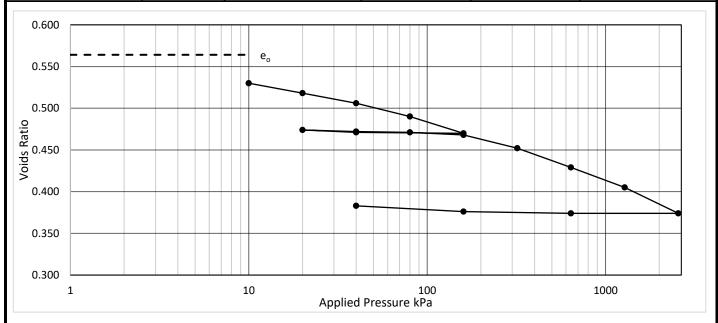


Standard 20 stage Oedometer ISO Output.xlsm - Rev 6



BS EN ISO 17892-5:2017

Project Reference	F254727			Location ID	Z3_OWF_BH06-SAMP
Project Name	Golfe du Lion			Depth Top [m]	4.20
Specimen Description	Grey brown slightly sandy SILT			Sample Type	Wax
Specimen Reference		Specimen Depth [m]	4.30	Sample Reference	05-2



Applied Pressure kPa	Voids ratio	m _v m²/MN	C _v [t _{50,log}] m²/yr	C _v [t _{90, root}] m²/yr	C _{sec}
2.5	0.564	-	-	-	-
10.0	0.530	2.9	9.8	5.8	0.00140
20	0.518	0.78	16	16	0.00088
40	0.506	0.41	25	19	0.00100
80	0.490	0.26	41	34	0.00100
160	0.470	0.17	61	61	0.00140
40	0.471				
20	0.474				
40	0.472	0.045	37	120	0.00008
80	0.471	0.030	110	110	0.00006
160	0.468	0.020	210	110	0.00038
320	0.452	0.070	77	79	0.00140
640	0.429	0.048	130	130	0.00200
1,280	0.405	0.027	130	130	0.00210
2,560	0.374	0.017	150	180	0.00230
640	0.374				
160	0.376				
40	0.383				

Date of Test
Preparation
Particle density
Average temperature for test
Swelling Pressure
Settlement on saturation
Degree of Saturation

Diameter
Height
Water Content
Bulk density
Dry density
Voids Ratio

14/04/2025	
Hand Trimmed	
2.70	Mg/m³ °C
21	°C
	kPa %
	%
100	%

Initial	Final	
50.04	-	mm
19.97	17.65	mm
22.4	18.4	%
2.11	2.31	Mg/m³
1.73	1.95	Mg/m³
0.564	0.383	

Frame correction applied to height changes

Cv corrected to 20°C

* Negative Csec determination

Issue Date	09/05/2025	Certificate Reference	Issue 1	Authorised By	huntc
Client	DGEC	DGEC		Authorised Date	08/05/2025 11:31
Remarks					

Fugro GB Limited. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW

Testing was performed at the Fugro GB Limited laboratory at the address shown above. Results relate only to the sample tested, having been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated otherwise the sample was tested in the condition it was received at the laboratory.

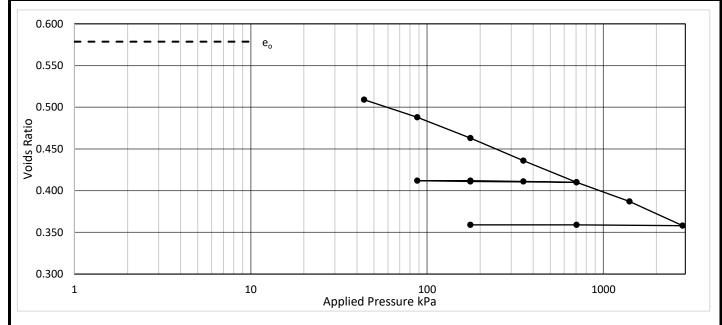


Standard 20 stage Oedometer ISO Output.xlsm - Rev 6



BS EN ISO 17892-5:2017

Project Reference	F254727			Location ID	Z3_OWF_BH13-SAMP
Project Name	Golfe du Lion			Depth Top [m]	18.40
Specimen Description	Grey brown slightly sandy SILT			Sample Type	Wax
Specimen Reference		Specimen Depth [m]	18.52	Sample Reference	20-3



Applied Pressure kPa	Voids ratio	m _v m²/MN	C _v [t _{50/log}] m²/yr	C _v [t _{90, root}] m²/yr	C_sec
2.5	0.579	-		-	_
44	0.509	1.1	4.3	5.4	0.00190
88	0.488	0.32	6.7	5.3	0.00140
176	0.463	0.19	8.9	5.3	0.00180
352	0.436	0.10	12	17	0.00230
704	0.410	0.053	13	20	0.00230
176	0.411				
88	0.412				
176	0.412	0.0030	22	39	0.00013
352	0.411	0.0015	31	40	0.00026
704	0.410	0.0029	33	41	0.00056
1,408	0.387	0.023	17	21	0.00270
2,816	0.358	0.015	18	22	0.00250
704	0.359				
176	0.359				

Date of Test
Preparation
Particle density
Average temperature for test
Swelling Pressure
Settlement on saturation
Degree of Saturation

Diameter
Height
Water Content
Bulk density
Dry density
Voids Ratio

14/04/2025	
Hand Trimming	
2.70	Mg/m³ °C
21	°C
	kPa %
	%
100	%

Initial	Final	
49.97	1	mm
20.03	17.25	mm
21.5	16.5	%
2.08	2.31	Mg/m³
1.71	1.99	Mg/m³
0.579	0.359	

Frame correction applied to height changes

Cv corrected to 20°C

* Negative Csec determination

Issue Date	09/05/2025 Certificate Reference Issue		Issue 1	Authorised By	huntc
Client	DGEC	DGEC			08/05/2025 17:31
Remarks					

Fugro GB Limited. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW

Testing was performed at the Fugro GB Limited laboratory at the address shown above. Results relate only to the sample tested, having been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated otherwise the sample was tested in the condition it was received at the laboratory.

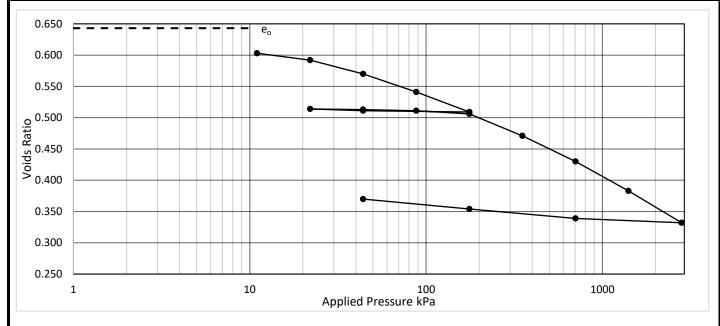


Standard 20 stage Oedometer ISO Output.xlsm - Rev 6



BS EN ISO 17892-5:2017

Project Reference	F254727			Location ID	Z3_OWF_BH13-SAMP
Project Name	Golfe du Lion		Depth Top [m]	4.40	
Specimen Description	Grey slightly san	dy CLAY	Sample Type	Wax	
Specimen Reference		Specimen Depth [m]	4.44	Sample Reference	05-3



Applied Pressure kPa	Voids ratio	m _v m²/MN	C _v [t _{50/log}] m²/yr	C _v [t _{90, root}] m²/yr	C_sec
2.5	0.643	-		-	_
11	0.603	2.8	1.8	2.0	0.00120
22	0.592	0.63	1.5	3.1	0.00098
44	0.570	0.63	2.3	3.4	0.00130
88	0.541	0.41	5.2	5.2	0.00140
176	0.509	0.24	4.6	4.8	0.00120
44	0.511				
22	0.514				
44	0.513	0.022	6.9	23	0.00007
88	0.511	0.035	22	37	0.00014
176	0.506	0.040	11	26	0.00030
352	0.471	0.13	5.1	4.8	0.00130
704	0.430	0.078	10	4.5	0.00300
1,408	0.383	0.047	13	16	0.00290
2,816	0.332	0.026	14	16	0.00340
704	0.339				
176	0.354				
44	0.370				

Date of Test
Preparation
Particle density
Average temperature for test
Swelling Pressure
Settlement on saturation
Degree of Saturation

Diameter
Height
Water Content
Bulk density
Dry density
Voids Ratio

19/03/2025	
Hand Trimming	
2.70	Mg/m³ °C
21	°C
	kPa %
	%
100	%

Initial	Final	
49.95	-	mm
20.08	16.74	mm
25.2	17.8	%
2.06	2.32	Mg/m³
1.64	1.97	Mg/m³
0.643	0.370	

Frame correction applied to height changes

Cv corrected to 20°C

* Negative Csec determination

Issue Date	09/05/2025 Certificate Reference Issue 1		Issue 1	Authorised By	huntc
Client	DGEC			Authorised Date	17/04/2025 10:21
Remarks					

Fugro GB Limited. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW

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Standard 20 stage Oedometer ISO Output.xlsm - Rev 6

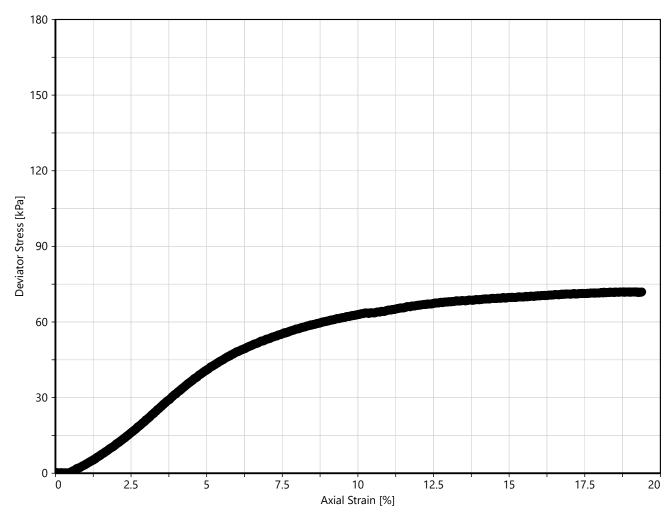
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Location	Sample ID	Depth BSF	Specimen Condition	w	ρ	$ ho_d$	S_r	P_c	s _u	$arepsilon_{50}$	$arepsilon_{f}$
		[m]		[%]	[Mg/m³]	[Mg/m³]	[%]	[kPa]	[kPa]	[%]	[%]
Z3_OWF_BH01-SAMP	05-3	3.90	Undisturbed	28.5	2.01	1.57	100	1088	36	4.41	19.40
Z3_OWF_BH01-SAMP	17-3	15.35	Undisturbed	23.5	2.13	1.72	100	1306	48	3.21	15.15
Z3_OWF_BH01-SAMP	21-4	19.60	Undisturbed	25.7	2.14	1.70	100	1386	54	4.74	14.51
Z3_OWF_BH06-SAMP	05-3	4.40	Undisturbed	24.7	2.24	1.80	100	1128	79	8.47	20.09
Z3_OWF_BH13-SAMP	05-2	4.20	Undisturbed	26.3	2.08	1.65	100	1047	54	3.36	14.15
Z3_OWF_BH13-SAMP	21-2	19.20	Undisturbed	21.7	2.02	1.66	92	1332	62	4.92	19.91

Notes

BSF : Below seafloor ρ : Bulk density ε_{50} : Axial strain at 50 % of maximum deviator stress

w : Water content ho_d : Dry density ho_c : Cell pressure ho_c : Degree of saturation ho_d : Undrained shear strength ho_c : Axial strain at failure



Curve	0− 0
INITIAL CONDITIONS	
Specimen condition	Undisturbed
Laboratory	Field laboratory
Specimen diameter [mm]	72.0
Specimen length [mm]	140.0
Unit weight [kN/m³]	19.8
Water content [%]	29
Membrane thickness [mm]	0.3
Membrane correction [kPa]	2.9
Strain Rate [%/h]	59.3
FAILURE CONDITIONS	
Cell pressure [kPa]	1088
Undrained shear strength, s _{.,} [kPa]	36
Axial strain at 50% of max deviator stress, ε_{50} [%]	4.4
Young's modulus at 50% of max deviator stress, E ₅₀ [MPa]	0.8
Axial strain at failure, ε_f [%]	19.4
Failure type	Bulge failure
Sample . OF 2	Tost mothod . ICO 17002 9 (2010)

Sample : 05-3 Test method : ISO 17892-8 (2018)

Test depth : 3.9 m

Visual identification : Firm low strength very dark grey (2.5Y 3/1) sandy slightly calcareous CLAY with occasional coarse sand-size to coarse gravel-size shells and shell fragments

- with frequent fine to coarse gravel-size pockets of organic matter

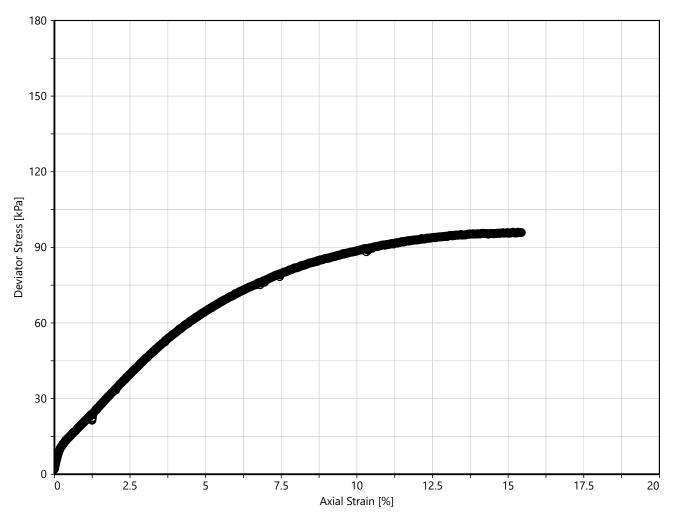
Uu-Triaxial Test Results Z3_OWF_BH01-SAMP











Curve	0−0	
INITIAL CONDITIONS		
Specimen condition	Undisturbed	
Laboratory	Field laboratory	
Specimen diameter [mm]	72.0	
Specimen length [mm]	144.0	
Unit weight [kN/m³]	20.8	
Water content [%]	23	
Membrane thickness [mm]	0.3	
Membrane correction [kPa]	2.3	
Strain Rate [%/h]	58.5	
FAILURE CONDITIONS		
Cell pressure [kPa]	1306	
Undrained shear strength, s _u [kPa]	48	
Axial strain at 50% of max deviator stress, ε_{50} [%]	3.2	
Young's modulus at 50% of max deviator stress, E ₅₀ [MPa]	1.5	
Axial strain at failure, $\varepsilon_{\rm f}$ [%]	15.2	
Failure type	Bulge failure	

Sample : 17-3 Test method : ISO 17892-8 (2018)

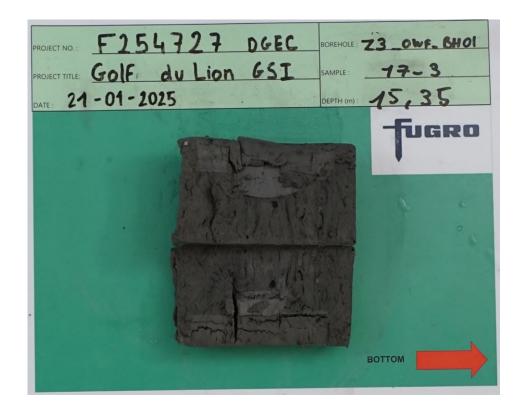
Test depth : 15.4 m

Visual identification : firm medium to high strength very dark grey (2.5Y 3/1) sandy calcareous CLAY

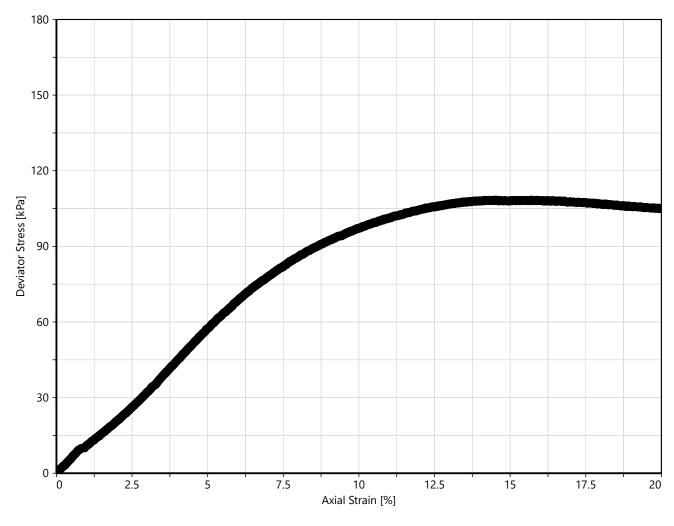
with occasional coarse sand-size to coarse gravel-size shells and shell fragmen











Curve	0—0
INITIAL CONDITIONS	
Specimen condition	Undisturbed
Laboratory	Field laboratory
Specimen diameter [mm]	72.0
Specimen length [mm]	143.0
Unit weight [kN/m³]	21.0
Water content [%]	26
Membrane thickness [mm]	0.3
Membrane correction [kPa]	2.2
Strain Rate [%/h]	59.1
FAILURE CONDITIONS	
Cell pressure [kPa]	1386
Undrained shear strength, s _{.,} [kPa]	54
Axial strain at 50% of max deviator stress, ε_{50} [%]	4.7
Young's modulus at 50% of max deviator stress, E ₅₀ [MPa]	1.1
Axial strain at failure, ε_f [%]	14.5
Failure type	Brittle failure
Cample . 21 4	Test method . ISO 17902 9 (2019)

Sample : 21-4 Test method : ISO 17892-8 (2018)

Test depth : 19.6 m

Visual identification : firm medium strength dark grey (2.5Y 4/1) slightly sandy calcareous CLAY

with rare coarse sand-size shell fragments - with rare coarse sand-size pockets of organic matter

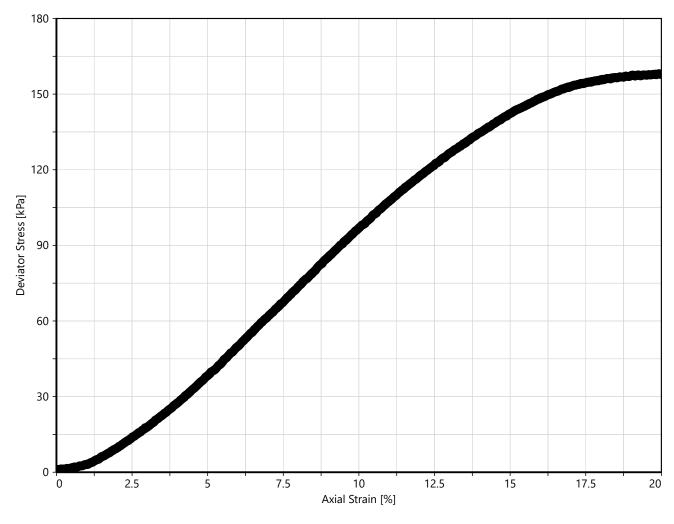












Curve	0—0
INITIAL CONDITIONS	
Specimen condition	Undisturbed
Laboratory	Field laboratory
Specimen diameter [mm]	68.5
Specimen length [mm]	138.6
Unit weight [kN/m³]	22.0
Water content [%]	25
Membrane thickness [mm]	0.3
Membrane correction [kPa]	3.1
Strain Rate [%/h]	61.9
FAILURE CONDITIONS	
Cell pressure [kPa]	1128
Undrained shear strength, s [kPa]	79
Axial strain at 50% of max deviator stress, ε_{50} [%]	8.5
Young's modulus at 50% of max deviator stress, E ₅₀ [MPa]	0.9
Axial strain at failure, $\varepsilon_{\rm f}$ [%]	20.1
Failure type	Bulge failure
ample : 05-3	Test method : ISO 17892-8 (2018)

Sample : 05-3 Test method : ISO 17892-8 (2018)

Test depth : 4.4 m

Visual identification : soft medium to high strength dark grey (2.5Y 4/1) sandy calcareous CLAY

with occasional coarse sand-size shell fragments - with rare coarse sand-size to

fine gravel-size pockets of organic matter

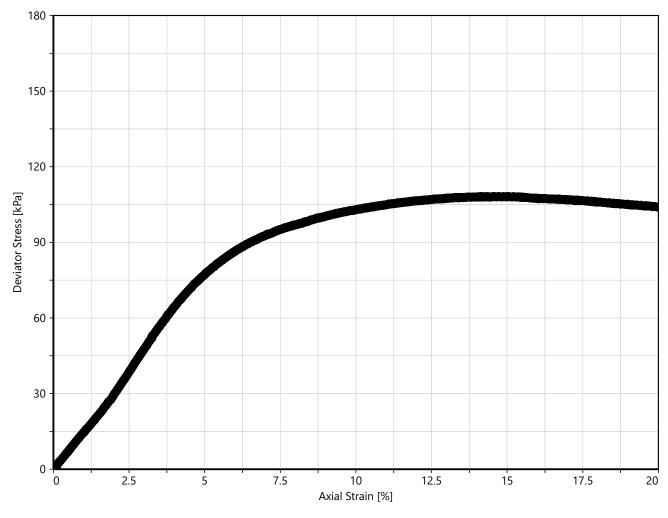












Curve	0−0	
INITIAL CONDITIONS		
Specimen condition	Undisturbed	
Laboratory	Field laboratory	
Specimen diameter [mm]	72.0	
Specimen length [mm]	144.0	
Unit weight [kN/m³]	20.4	
Water content [%]	26	
Membrane thickness [mm]	0.3	
Membrane correction [kPa]	0.5	
Strain Rate [%/h]	120.0	
FAILURE CONDITIONS		
Cell pressure [kPa]	1047	
Undrained shear strength, s _u [kPa]	54	
Axial strain at 50% of max deviator stress, ε_{50} [%]	3.4	
Young's modulus at 50% of max deviator stress, E ₅₀ [MPa]	1.6	
Axial strain at failure, $\varepsilon_{\rm f}$ [%]	14.1	
Failure type	Bulge failure	

Sample : 05-2 Test method : ISO 17892-8 (2018)

Test depth : 4.2 m

Visual identification : firm medium strength dark grey (2.5Y 4/1) slightly calcareous CLAY

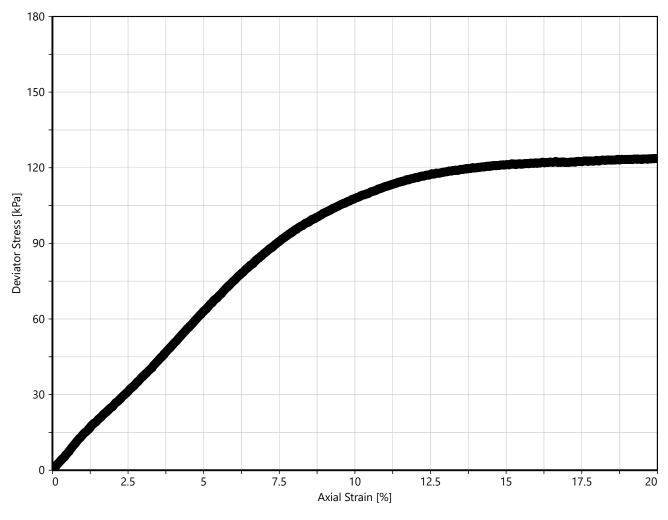
with occasional coarse sand-size to medium gravel-size shell fragments











Curve	⊙	
INITIAL CONDITIONS		
Specimen condition	Undisturbed	
Laboratory	Field laboratory	
Specimen diameter [mm]	72.0	
Specimen length [mm]	144.6	
Unit weight [kN/m³]	19.8	
Water content [%]	22	
Membrane thickness [mm]	0.3	
Membrane correction [kPa]	3.0	
Strain Rate [%/h]	59.8	
FAILURE CONDITIONS		
Cell pressure [kPa]	1332	
Undrained shear strength, s _{.,} [kPa]	62	
Axial strain at 50% of max deviator stress, ε_{50} [%]	4.9	
Young's modulus at 50% of max deviator stress, E ₅₀ [MPa]	1.3	
Axial strain at failure, $\varepsilon_{\rm f}$ [%]	19.9	
Failure type	Bulge failure	

Sample : 21-2 Test method : ISO 17892-8 (2018)

Test depth : 19.2 m

Visual identification : firm medium dark grey (2.5Y 4/1) sandy CLAY with rare coarse sand-size

to medium gravel-size shell fragments









: Axial strain at failure

Location	Sample ID	Depth BSF	Specimen Condition	W	ρ	$ ho_d$	S _r	P_c	s _u	$arepsilon_{50}$	$arepsilon_f$
		[m]		[%]	[Mg/m ³]	[Mg/m ³]	[%]	[kPa]	[kPa]	[%]	[%]
Z3_OWF_BH01-SAMP	05-03	3.90	REMOULDED	25.0	2.02	1.61	100	1092	9	6.19	20.06
Z3_OWF_BH01-SAMP	07-04	6.00	UNDISTURBED	19.2	2.14	1.80	100	1134	144	8.31	20.07
Z3_OWF_BH01-SAMP	07-04	6.00	REMOULDED	19.3	2.13	1.78	100	1134	78	9.69	20.05
Z3_OWF_BH01-SAMP	11-02	9.10	UNDISTURBED	23.9	2.12	1.71	100	1196	40	4.99	19.64
Z3_OWF_BH01-SAMP	11-02	9.10	REMOULDED	23.5	2.05	1.66	100	1196	13	9.69	20.06
Z3_OWF_BH01-SAMP	14-3	12.60	UNDISTURBED	24.2	2.09	1.68	100	1266	51	4.65	20.07
Z3_OWF_BH01-SAMP	14-3	12.60	REMOULDED	23.6	2.04	1.65	100	1266	30	7.84	20.07
Z3_OWF_BH01-SAMP	17-3	15.35	REMOULDED	23.8	2.05	1.65	100	1321	15	7.85	20.07
Z3_OWF_BH01-SAMP	19-3	17.40	UNDISTURBED	25.8	2.04	1.62	100	1362	51	4.84	17.89
Z3_OWF_BH01-SAMP	19-3	17.40	REMOULDED	24.9	2.06	1.65	100	1362	21	7.04	20.09
Z3_OWF_BH01-SAMP	21-4	19.60	REMOULDED	24.5	2.02	1.62	100	1406	16	8.19	20.08
Z3_OWF_BH06-SAMP	03-2	2.20	UNDISTURBED	23.7	2.12	1.71	100	1089	93	9.53	20.06
Z3_OWF_BH06-SAMP	03-2	2.20	REMOULDED	23.1	2.02	1.64	96	1089	39	12.33	20.06
Z3_OWF_BH06-SAMP	05-3	4.40	REMOULDED	22.6	2.07	1.69	100	1133	24	9.84	20.07
Z3_OWF_BH06-SAMP	06-2	5.20	UNDISTURBED	21.3	2.11	1.74	100	1149	69	5.84	20.06
Z3_OWF_BH06-SAMP	06-2	5.20	REMOULDED	21.1	2.04	1.69	95	1149	27	8.18	20.06
Z3_OWF_BH13-SAMP	05-2	4.20	REMOULDED	25.2	1.99	1.59	98	1051	9	8.50	20.03
Z3_OWF_BH13-SAMP	21-2	19.20	REMOULDED	21.8	2.00	1.64	92	1351	20	5.65	20.07

Notes

BSF : Below seafloor ho_d : Dry density

w: Water content s_u : Undrained shear strength

 S_r : Degree of saturation ε_{50} : Axial strain at 50 % of maximum deviator stress

: Bulk density P_c : Cell pressure

Summary of Unconsolidated Undrained Triaxial Test Results





		BS EN ISC	17892-8:2	2018		1		1	1483
Project Reference	F254727					Location ID)	Z3_OWF_BH	01-SAMP
Project Name	Golfe du Lion					Depth Top	[m]	3.90	
Specimen Description	Soft grey slightly	y sandy CLAY				Sample Ty	ре	В	
Specimen Reference		Specimen Depth [m]				Sample Re	ference	05-03	
20 Corrected Shear Stress [kPa] 15 0 0 0 10 10 10 10 10 10 10 10 10 10 10	2 4	6 8	10 Axial Stra	12	14	16	18	20	222
			140111		ľ				_
Test number				1 DEMOLIL DED					
Specimen Prep	aration			REMOULDED					_
Length [mm]				127.95					
Diameter [mm				73.11	_				_
Bulk Density [N				2.016					\dashv
Specimen Water				25.0	-				
	Water Content [%]			1.612					
Dry Density [N Initial Voids Ra			_	0.675					\dashv
Degree of Satu				100					
Application of De					1				\dashv
Cell Pressure [l				1092					
Specimen Heig				126.59					
	Shear [mm/min]			2.56		-			_
Peak Values					1		1		_
	ar Strength [kPa]			9					_
Strain at Failure	2 [70]			20.1					_
Failure Mode				Plastic					
ssue Date	14/04/2025	Certificate Referer	nce	Issue 1		Authorised	Ву	huntc	
Client	DGEC					Authorised	Date	25/03/2025	08:58
Remarks	1							•	

Page 1 of 1

otherwise the sample was tested in the condition it was received at the laboratory.



Project Reference	F254727			Location ID	Z3_OWF_BH01-SAMP	
Project Name	Golfe du Lion			Depth Top [m]	6.00	
Specimen Description	Firm grey sandy	SILT with occasional shell fra	agments	Sample Type	Wax	
Specimen Reference	1	Specimen Depth [m]	6.01	Sample Reference	07-04	
300						
등 쓰 240						
Corrected Deviator Stress [kPa]						
الم الم الم الم الم الم الم الم الم الم الم 						
viato						
ည် 120 -						
ar 60 +						
Cor						
0						
0	2 4	6 8	10 12 al Strain [%]	14 16 18	20 22	
150		AXI	ar Strain [%]			
골 120						
Stree						
Corrected Shear Stress [kPa]		′				
55 60 	/			/		
30 -	//			,		
-						
0 	1095 1140	1185 1230	1275 1320	1365 1410	1455 1500	
.050			Normal Stress [kPa]		1.55	
Test number			1		1	
Specimen Prep	paration		UNDISTURBED			
Length [mm]			136.01			
Diameter [mn			73.55			
Bulk Density [Specimen Wat	er Content [%]		2.145 19.2			
Failure Surface	Water Content [%]					
Dry Density [N			1.799 0.501			
Initial Voids Ra Degree of Satu			100			
Application of D	eviator Stress					
Cell Pressure			1134 130.64			
Specimen Heig Mean Rate of	int [mm] Shear [mm/min]		2.72			
Peak Values			·			
	ear Strength [kPa]		144			
	e [%]		20.1 Plastic			
Strain at Failur						
Strain at Failur	28/08/2025	Certificate Reference	Issue 2	Authorised By	lindsayc	
Strain at Failur Failure Mode	28/08/2025 DGEC	Certificate Reference	Issue 2	Authorised By Authorised Date	lindsayc 28/08/2025 09:35	
Strain at Failur Failure Mode		Certificate Reference	Issue 2		<u> </u>	

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otherwise the sample was tested in the condition it was received at the laboratory.

been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated



		Г	BS EN ISC	17892-8:	2018		1			1483
roject Re	ference	F254727					Location ID Z3_OW		VF_BH01-SAMP	
Project Na	ame	Golfe du Lion					Depth	Top [m]	6.00	
Specimen	Description	Grey sandy SIL	T with occasional shell t	fragments			Sample Type Sample Reference		Wax	
Specimen	Reference	2	Specimen Depth	[m]					07-04	07-04
	200									
Corrected Deviator Stress [kPa]	160 -									
ator St	120									
Devia	80									
ected	40									
Corr	40									
	0	2 4	6 8	10	12	14	16	18	20	22
	90	-	0 0	Axial Str		17	10	10	20	
Pa]										
Corrected Shear Stress [kPa]	72									
ar Stre	54		, or other states of the state				11/1			
l Shea	36						``,			
ected	10									
Con	18		/					\		
	0 1070	1097 1124	1151 117	78 1	1205	1232	1259	1286	1313	1340
	.0.0	1.21			mal Stress [kP			.200	.5.5	.5.0
İ	Test number			1	1					
	Specimen Pre	eparation			REMOULDE	D				
	Length [mm]				135.45 71.35					
	Diameter [m Bulk Density				2.126					
	Specimen Wa	ater Content [%]			19.3					
	Failure Surface Dry Density	ce Water Content [%]			1.783					
	Initial Voids F				0.515					
	Degree of Sa	turation [%]			100					
	Application of I			1	1134					
	Cell Pressure Specimen He				134.16					
		f Shear [mm/min]			2.71					
	Peak Values									
		near Strength [kPa]			78					
	Strain at Failu Failure Mode				20.0 Plastic					
	i aliule Mode	•			i iastic					
Issue Date	2	28/08/2025	Certificate Referer	nce	Issue 2		Author	ised By	lindsay	ус
Client		DGEC	•		•		Author	ised Date	28/08/	/2025 09:35
Remarks							ļ			
Fuaro GR	Limited Unit 43	Number One Industri	al Estate, Medomsley R	oad Conse	tt DH8 6TW					
r ugro GB	Limited. Uffit 43,	ivamber One maustri	ai Estate, ivieuomsiey Ri	oau, Conse	עוס סווע וויס טווע				_ - -	iice

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otherwise the sample was tested in the condition it was received at the laboratory.



	F254727			Location I	Z3_OWF_BH01-SAMP			
Project Name	Golfe du Lion				Depth Top	[m]	9.10	
Specimen Description	Firm grey sand	dy CLAY with occasional shell	fragments		Sample Type Sample Reference		Wax 11-02	
Specimen Reference	1	Specimen Depth [m]	9.12					
80								
Corrected Shear Stress [kPa] Corrected Deviator Stress [kPa] O O O O O O O O O O O O O	2 4	6 8 Ax	10 12 ial Strain [%]	14	16	18	20 22	
	1175 1190	1205 1220	1235 1250	1265	1280) 129	5 1310	
			Normal Stress [kPa]					
Test number	paration		1					
Test number Specimen Prep	paration		1 UNDISTURBED					
Test number Specimen Prep Length [mm]			1					
Test number Specimen Prep	n]		1 UNDISTURBED 135.82					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [i	n] Mg/m³] er Content [%]		1 UNDISTURBED 135.82 72.70					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [l Specimen Wate Failure Surface	n] Mg/m³] er Content [%] • Water Content [%]		1 UNDISTURBED 135.82 72.70 2.118 23.9					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wat Failure Surface Dry Density [N	n] Mg/m³] er Content [%] Water Content [%] Mg/m³]		1 UNDISTURBED 135.82 72.70 2.118 23.9					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wat Failure Surface Dry Density [N Initial Voids Ra	n] Mg/m³] er Content [%] · Water Content [%] Mg/m³] itio		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu	n] Mg/m³] er Content [%] Water Content [%] Mg/m³] Itio uration [%]		1 UNDISTURBED 135.82 72.70 2.118 23.9					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De	mg/m³] er Content [%] Water Content [%] Mg/m³] stio uration [%] eviator Stress		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [mg/m³] er Content [%] Water Content [%] Mg/m³] Itio Irration [%] eviator Stress		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig	mg/m³] er Content [%] water Content [%] Mg/m³] atio uration [%] eviator Stress kPa] ght [mm]		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig	mg/m³] er Content [%] Water Content [%] Mg/m³] Itio Irration [%] eviator Stress		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values Undrained She	Mg/m³] er Content [%] Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min]		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100 1196 134.30 2.71					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [in Specimen Wate Failure Surface Dry Density [in Initial Voids Rade Degree of Satu Application of Degree of Satu Application of Degree Mean Rate of Signature Specimen Heig Mean Rate of Signature Strain at Failure Specimen Application of Signature Sig	Mg/m³] er Content [%] Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min]		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100 1196 134.30 2.71					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values Undrained She	Mg/m³] er Content [%] Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min]		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100 1196 134.30 2.71					
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values Undrained She Strain at Failure Failure Mode	mg/m³] er Content [%] ewater Content [%] Mg/m³] attio uration [%] eviator Stress kPa] ght [mm] Shear [mm/min] ear Strength [kPa] e [%]		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100 1196 134.30 2.71 40 19.6 Plastic		Authorise	d By	lindsayc	
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values Undrained She Strain at Failur Failure Mode	Mg/m³] er Content [%] Water Content [%] Mg/m³] sitio uration [%] eviator Stress kPa] ght [mm] Shear [mm/min] er Strength [kPa] e [%]	Certificate Reference	1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100 1196 134.30 2.71		Authorised		lindsayc 28/08/2025 09:35	
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values Undrained She Strain at Failure Failure Mode	mg/m³] er Content [%] ewater Content [%] Mg/m³] attio uration [%] eviator Stress kPa] ght [mm] Shear [mm/min] ear Strength [kPa] e [%]		1 UNDISTURBED 135.82 72.70 2.118 23.9 1.710 0.579 100 1196 134.30 2.71 40 19.6 Plastic		Authorised		lindsayc 28/08/2025 09:35	

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been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated otherwise the sample was tested in the condition it was received at the laboratory.

Testing was performed at the Fugro GB Limited laboratory at the address shown above. Results relate only to the sample tested, having

Standard UUTX Single Stage ISO Output.xlsm - Rev 7

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		BS	EN ISO 178	92-8:2018	3		1		1	1483
Project Reference	F254727						Location	on ID	Z3_OV	VF_BH01-SAMP
Project Name	Golfe du Lion						Depth Top [m] 9.			
Specimen Description	Grey sandy CLA	Y with occasio	nal shell frag	ments			Sampl	е Туре	Wax	
Specimen Reference	2	Specimen	Depth [m]				Sample Reference 11-02			
Corrected Deviator Stress [kPa]	2 4	6	8	10	12	14	16		20	22
20			Ax	xial Strain [[%]					
Corrected Shear Stress [kPa]										
0										
0	176 1182	1188 1	194 12	Normal S	tress [kPa]	212	1218	1224	1230	1236
0 1170 11 Test number Specimen Prep		1188 1	194 12	Normal S	tress [kPa] 1 MOULDED	212	1218	1224	1230	1236
0 1170 11 Test number Specimen Prep Length [mm]	paration	1188 1	194 12	Normal S	1 MOULDED 131.96	212	1218	1224	1230	1236
0 1170 11 Test number Specimen Prep	paration	1188 1	194 12	Normal S	tress [kPa] 1 MOULDED	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [i	paration n] Mg/m³] er Content [%]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface	paration n] Mg/m³] er Content [%] water Content [%]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [I Specimen Wate Failure Surface Dry Density [N	paration Mg/m³] er Content [%] water Content [%] Mg/m³]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5	2212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [i Specimen Wat Failure Surface Dry Density [i Initial Voids Ra	paration Mg/m³] er Content [%] water Content [%] Mg/m³] atio	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [i Specimen Wat Failure Surface Dry Density [i Initial Voids Ra Degree of Satu	paration Mg/m³] er Content [%] water Content [%] Mg/m³] atio uration [%]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [l Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5 1.661 0.625 100	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [l Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig	paration mg/m³] er Content [%] e Water Content [%] mg/m³] atio uration [%] eviator Stress [kPa] ght [mm]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5 1.661 0.625 100	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5 1.661 0.625 100	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [l Specimen Wat Failure Surface Dry Density [l Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5 1.661 0.625 100 1196 126.77 2.64	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values Undrained She	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5 1.661 0.625 100	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [l Specimen Wat Failure Surface Dry Density [l Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5 1.661 0.625 100 1196 126.77 2.64	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values Undrained She Strain at Failure	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1188 1	194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5 1.661 0.625 100 126.77 2.64 13 20.1	212	1218	1224	1230	1236
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [I Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig Mean Rate of S Peak Values Undrained She Strain at Failure	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]		194 12	Normal S	1 MOULDED 131.96 72.70 2.051 23.5 1.661 0.625 100 126.77 2.64 13 20.1	212		1224	1230	
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [i Specimen Wate Failure Surface Dry Density [i Initial Voids Rate Degree of Satu Application of December of Section Pressure [i Specimen Heig Mean Rate of Section Peak Values Undrained She Strain at Failure Failure Mode	paration Mg/m³] er Content [%] Water Content [%] Mg/m³] atio Uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa] e [%]			Normal S	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	212	Autho		lindsay	

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otherwise the sample was tested in the condition it was received at the laboratory.



		BS EN ISO 178	92-8:2018					148
Project Reference	F254727				Location ID		Z3_OWF_	BH01-SAMP
Project Name	Golfe du Lion				Depth Top	[m]	12.60	
Specimen Description	Firm grey slight	ly sandy CLAY with occasion	nal shell fragemnts		Sample Typ	e	Wax	
Specimen Reference	1	Specimen Depth [m] 12.62 Samp		Sample Ref	erence	14-3		
200								
[a]								
Corrected Deviator Stress [kPa]								
St. 120								
iator								
80 <u>De</u>								
ected								
ē. 40 -								
0								
0	2 4	6 8	10 12	14	16	18	20	22
60		Ax	xial Strain [%]					
Corrected Shear Stress [kPa]				*****				
Stress		por ent						
ear		proces						
· 도 24								
12 		/			N.			
⊆ 16 1					\ <u>`</u>			
Ō		/			,	1		
0								
	1238 1256	1274 1292	1310 1328 Normal Stress [kPa]	134	46 1364	138	82 140	00
0	1238 1256	1274 1292	1310 1328 Normal Stress [kPa]	134	46 1364	133	82 140	00
0	1238 1256	1274 1292		134	46 1364	133	82 140	00
0 1220		1274 1292	Normal Stress [kPa] 1 UNDISTURBED	134	46 1364	136	82 140	000
1220 Test number Specimen Pre Length [mm]	eparation	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65	132	46 1364	. 13	82 140	000
Test number Specimen Pre Length [mm] Diameter [m	eparation m]	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23	134	46 1364	13:	82 140	000
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa	eparation m] [Mg/m³] ater Content [%]	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65	134	46 1364	133	82 140	000
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa	eparation m] [Mg/m³] ater Content [%] the Water Content [%]	1274 1292	1 UNDISTURBED 139.65 73.23 2.086 24.2	134	46 1364	13:	82 140	000
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density	eparation m] [Mg/m³] ater Content [%] we Water Content [%] [Mg/m³]	1274 1292	1 UNDISTURBED 139.65 73.23 2.086	134	46 1364	133	82 140	000
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa	eparation [m] [Mg/m³] ater Content [%] We Water Content [%] [Mg/m³] Ratio	1274 1292	1 UNDISTURBED 139.65 73.23 2.086 24.2	134	46 1364	136	82 140	000
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I	eparation [Mg/m³] ater Content [%] Be Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100	134	46 1364	13:	82 140	000
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure	eparation [Mg/m³] ater Content [%] be Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa]	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100	134	46 1364	133	82 140	000
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure Specimen He	eparation [Mg/m³] ater Content [%] be Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa]	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100	134	46 1364	134	82 140	00
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure Specimen He Mean Rate of Peak Values	eparation [Mg/m³] ater Content [%] Be Water Content [%] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min]	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100 1266 136.32 2.79	134	46 1364	13:	82 140	00
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure Specimen He Mean Rate of Peak Values Undrained Sh	eparation [Mg/m³] ater Content [%] the Water Content [%] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min] mear Strength [kPa]	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100 1266 136.32 2.79	134	46 1364	133	82 140	000
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure Specimen He Mean Rate of Peak Values	eparation [Mg/m³] ater Content [%] the Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min] hear Strength [kPa] ure [%]	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100 1266 136.32 2.79	134	46 1364	134	82 140	00
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure Specimen He Mean Rate of Peak Values Undrained Sh Strain at Failu	eparation [Mg/m³] ater Content [%] the Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min] hear Strength [kPa] ure [%]	1274 1292	Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100 1266 136.32 2.79	134	46 1364	13:	82 140	
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure Specimen He Mean Rate of Peak Values Undrained Sh Strain at Failu	eparation [Mg/m³] ater Content [%] the Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min] hear Strength [kPa] ure [%]	1274 1292 Certificate Reference	Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100 1266 136.32 2.79	134	46 1364 Authorised		82 140	
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure Specimen He Mean Rate of Peak Values Undrained Sh Strain at Failu Failure Mode	eparation [Mg/m³] ater Content [%] the Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min] hear Strength [kPa] ure [%]		Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100 1266 136.32 2.79 51 20.1 Plastic	134		Ву		
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure Specimen He Mean Rate of Peak Values Undrained Sh Strain at Failu Failure Mode	eparation [Mg/m³] ater Content [%] Ew Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min] near Strength [kPa] are [%] 28/08/2025		Normal Stress [kPa] 1 UNDISTURBED 139.65 73.23 2.086 24.2 1.680 0.607 100 1266 136.32 2.79 51 20.1 Plastic	134	Authorised	Ву	lindsayc	

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otherwise the sample was tested in the condition it was received at the laboratory.



RS FN ISO 17892-8-2018

roject Referen	nce	F254727						Location	ıID	Z3_OWF_BH	H01-SAMP	
roject Name		Golfe du Lion						Depth T	op [m]	12.60		
Specimen Desc	ription	Grey slightly sa	ndy CLAY with o	occasional she	ell fragme	ents		Sample		Wax	Wax	
Specimen Refe		2	Specimen		-			Sample Reference 14-3				
Specimen Kere	rence	2	Specimen					Sample	Reference	14-3		
70												
Corrected Deviator Stress [kPa]												
SS 23												
or St												
eviatc 35												
ed D												
tj 18												
S												
0	0	2	-	-	10	12	14	16	10	20		
	0	2 4	6	8 Axi	al Strain	12 [%]	14	16	18	20	22	
600						1.43						
kPa]												
450												
Stre												
900 a												
Corrected Shear Stress [kPa] 300 120												
) 150 C												
ٽ 0								,				
	0 15	0 300	450 60	0 750		00 1050 Stress [kPa]	1 12	200 13	50 1500) 1650	1800	
	number					1						
	pecimen Prepa ength [mm]	aration			KE	MOULDED 136.74						
	iameter [mm]	 				71.79						
	ulk Density [M					2.038						
	pecimen Wate	r Content [%] Water Content [%]				23.6						
	ry Density [M					1.649						
	nitial Voids Rat					0.638						
	egree of Satur					100						
	ell Pressure [k					1266						
	pecimen Heigl					135.22						
	lean Rate of Sl k Values	hear [mm/min]				2.73						
		nr Strength [kPa]				30						
St	train at Failure					20.1						
Fa	ailure Mode					Plastic						
Issue Date		14/04/2025	Certificate	Reference		Issue 1		Authoris	ed By	huntc		
Client		DGEC	Ŧ					Authoris	ed Date	14/04/2025	10:49	
Remarks		Prepared to ma	ximum achieval	ble density				!		1		
Remarks												
Remarks										1		

Page 1 of 1

otherwise the sample was tested in the condition it was received at the laboratory.

been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated



		BS EN ISO 1789	2-8:2018		1483
Project Reference	F254727			Location ID	Z3_OWF_BH01-SAMP
Project Name	Golfe du Lion			Depth Top [m]	15.35
Specimen Description	Soft grey slightly	sandy CLAY		Sample Type	В
Specimen Reference		Specimen Depth [m]		Sample Reference	17-3
Test number Specimen Prepai Length [mm] Diameter [mm] Bulk Density [M Specimen Water	aration Ag/m³] r Content [%] Water Content [%] g/m³] io ation [%] wiator Stress Pa] nt [mm] near [mm/min] r Strength [kPa]	318 1324 133	10 12 14 al Strain [%] 10 1336 1342 Normal Stress [kPa] 1 REMOULDED 138.54 72.26 2.045 23.8 1.653 0.633 100 1321 136.53 2.77		20 22
	28/08/2025	Certificate Reference	Issue 2	Authorised By	lindsayc
Issue Date	•			i .	Ī.
Client	DGEC	num achievable density		Authorised Date	28/08/2025 09:35

Page 1 of 1

otherwise the sample was tested in the condition it was received at the laboratory.



Specimen Description Specimen Reference 200 200 200 200 200 200 200 2	4	y sandy CLAY with occas Specimen Depth [m 6 8	T	17.41	14	Samp	n Top [m] le Type le Referenc	18	23_OV 17.40 Wax 19-3	WF_BH01	222
Specimen Reference 200 200 160 120 0 2 60 124 48 36 124 12 1320 1338 Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	Firm grey slightly 1	Specimen Depth [m	10 Axial Strai	17.41	14	Samp	le Type		Wax 19-3		222
200 [Fed 2] 160 120 0 2 120 0 2 1320 1338 Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	4	Specimen Depth [m	10 Axial Strai	17.41	14	Samp	le Referenc		19-3		222
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	4	6 8	10 Axial Strai	12	14						222
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			Axial Strai		14	10	5	18	20		222
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			Axial Strai		14	10	5	18	20		222
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			Axial Strai		14	10	5	18	20		222
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			Axial Strai		14	10	5	18	20		222
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			Axial Strai		14	10		18	20		222
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			Axial Strai		14	10	5	18	20		22
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			Axial Strai		14	10		18	20		222
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			Axial Strai		14	10	5	18	20		22
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			Axial Strai		14	10		18	20		22
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	1356	1374 1392		n [%]							
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	1356	1374 1392	141								
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	1356	1374 1392	141								
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	1356	1374 1392	141				\				
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	1356	1374 1392	141				\				
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	1356	1374 1392	141			`					
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	1356	1374 1392	141								1
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	1356	1374 1392	141				1				
Test number Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r	1356	1374 1392	1/1				- 1				┙
Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r				0 14. al Stress [kPa		446	1464	148	2	1500	
Specimen Preparati Length [mm] Diameter [mm] Bulk Density [Mg/r			NOTH	ai Stiess [KF	aj						
Length [mm] Diameter [mm] Bulk Density [Mg/r				1							٦
Diameter [mm] Bulk Density [Mg/r	ion		U	INDISTURBE	ED						1
Bulk Density [Mg/r				139.55]
	31		-	73.74 2.042							-
Specimen Water Co				25.8							_
Failure Surface Wat											1
Dry Density [Mg/m				1.624							1
Initial Voids Ratio				0.663							
Degree of Saturatio				100							
Application of Deviate											4
Cell Pressure [kPa]				1362							4
Specimen Height [i Mean Rate of Shear			-	137.21 2.79							4
Peak Values	i [mm/mm]			2.19							4
Undrained Shear St	trength [kPa]		1	51							1
Strain at Failure [%				17.9	_						-
Failure Mode	=			Plastic							-
											_
Issue Date	28/08/2025	Certificate Reference	e	Issue 2		Autho	orised By		lindsay	ус	
Client	DGEC		!			Autho	orised Date	:	28/08/	/2025 09:	.35
Davis and a						ļ		ļ	<u> </u>		
Remarks											

Testing was performed at the Fugro GB Limited laboratory at the address shown above. Results relate only to the sample tested, having been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated otherwise the sample was tested in the condition it was received at the laboratory.

Standard UUTX Single Stage ISO Output.xlsm - Rev 7

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Project Reference	F254727	BS EN ISO 178	Location ID	Z3_OWF_BH01-SAMP	
Project Name	Golfe du Lion			Depth Top [m]	17.40
Specimen Description		ndy CLAY with occasional sh	nell fragments	Sample Type	Wax
Specimen Reference	2	Specimen Depth [m]		Sample Reference	19-3
50 -					
Corrected Shear Stress [kPa] O O O O O O O O O O O O O	2 4	6 8 A	10 12 xial Strain [%]	14 16 18	20 22
0	1339 1348	1357 1366	1375 1384 13 Normal Stress [kPa]	93 1402 1411	1420 1429
0 1330 1		1357 1366	Normal Stress [kPa]	93 1402 1411	1420 1429
1330 1 Test number Specimen Prep		1357 1366	Normal Stress [kPa] 1 REMOULDED	93 1402 1411	1420 1429
1330 1 Test number Specimen Prep Length [mm]	paration	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mm]	paration n]	1357 1366	Normal Stress [kPa] 1 REMOULDED	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn] Bulk Density [paration n] [Mg/m³]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn] Bulk Density [Specimen Wat	paration n]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn] Bulk Density [Specimen Wat	paration n] [Mg/m³] ter Content [%] e Water Content [%]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn] Bulk Density [Specimen Wat Failure Surface	paration n] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu	paration n] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] deviator Stress	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of D Cell Pressure	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] peviator Stress [kPa]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of D Cell Pressure Specimen Heig	paration n] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] veviator Stress [kPa] ght [mm]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100 1362 133.23	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn] Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of D Cell Pressure Specimen Heig Mean Rate of	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] peviator Stress [kPa]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of D Cell Pressure Specimen Heig Mean Rate of Peak Values	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] reviator Stress [kPa] ght [mm] Shear [mm/min]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100 1362 133.23 2.71	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of D Cell Pressure Specimen Heig Mean Rate of Peak Values Undrained She	paration m] [Mg/m³] ter Content [%] e Water Content [%] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100 1362 133.23 2.71	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn] Bulk Density [Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of D Cell Pressure Specimen Heig Mean Rate of Peak Values Undrained She Strain at Failur	paration m] [Mg/m³] ter Content [%] e Water Content [%] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100 1362 133.23 2.71 21 20.1	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of D Cell Pressure Specimen Heig Mean Rate of Peak Values Undrained She	paration m] [Mg/m³] ter Content [%] e Water Content [%] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1357 1366	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100 1362 133.23 2.71	93 1402 1411	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn] Bulk Density [Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of D Cell Pressure Specimen Heig Mean Rate of Peak Values Undrained She Strain at Failur	paration m] [Mg/m³] ter Content [%] e Water Content [%] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1357 1366 Certificate Reference	Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100 1362 133.23 2.71 21 20.1	93 1402 1411 Authorised By	1420 1429
Test number Specimen Prep Length [mm] Diameter [mn Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satt Application of D Cell Pressure Specimen Heig Mean Rate of: Peak Values Undrained She Strain at Failur Failure Mode	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa] re [%]		Normal Stress [kPa] 1 REMOULDED 135.31 70.98 2.063 24.9 1.651 0.635 100 1362 133.23 2.71 21 20.1 Plastic		

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		BS EN ISO 1789	92-8:2018			1483
Project Reference	F254727				Location ID	Z3_OWF_BH01-SAMP
Project Name	Golfe du Lion				Depth Top [m]	19.60
Specimen Description	n Soft grey sandy	CLAY			Sample Type	В
Specimen Reference		Specimen Depth [m]			Sample Reference	21-4
40						
Corrected Deviator Stress [kPa]						
Corrected De						
0 1	2 4	6 8 Axi	10 12 ial Strain [%]	14	16 18	20 22
[kPa]						
Corrected Shear Stress [kPa]						
d Shear						
150 -						
0	150 300	450 600 750	900 1050) 12	00 1350 15	500 1650 1800
			Normal Stress [kPa]			
Test numb	per		1			
	en Preparation		138.61			
Length Diamet	er [mm]		72.53			
	ensity [Mg/m³]		2.023			
	en Water Content [%]		24.5			
	Surface Water Content [%] nsity [Mg/m³]		1.624	-		
	oids Ratio		0.662	_		
	of Saturation [%]		100			
Application	on of Deviator Stress					
	ssure [kPa]		1406			
	en Height [mm] late of Shear [mm/min]		137.11 2.77	_		
Peak Valu		<u> </u>	2.11			
	ned Shear Strength [kPa]		16			
	t Failure [%]		20.1			
Failure	Mode		Plastic			
Issue Date	14/04/2025	Certificate Reference	lssue 1		Authorised By	huntc
Client	DGEC	<u> </u>	<u> </u>		Authorised Date	14/04/2025 10:53
Remarks	Prepared to max	imum achievable density				
	nit 43, Number One Industrial	<u> </u>				_ fugeo
Tocting was parfered	ad at the Eugra CR Limited Ia	haratan, at the address sha	wn above Possilte relate	only to	ha cample tacted have	_

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otherwise the sample was tested in the condition it was received at the laboratory.



	1	BS EN ISO 1789	2-8:2018		T	1483	
Project Reference	F254727				Location ID	Z3_OWF_BH06-SAMP	
Project Name	Golfe du Lion				Depth Top [m]	2.20	
Specimen Description	Firm grey sandy	SILT with occasional shell fra	agments		Sample Type	Wax	
Specimen Reference	1	Specimen Depth [m]	2.21		Sample Reference	03-2	
200							
[B 본 160 							
Corrected Deviator Stress [kPa]							
ž 120 -							
08 Deviat							
ted D							
9L 40 -							
0							
0	2 4	6 8	10 12	14	16 18	20 22	
100		Axia	al Strain [%]				
≥ 80					***		
ts 60 		· · · · · · · · · · · · · · · · · · ·					
S 40	<u> </u>	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
ted 40	/						
	i						
20	/				\		
Corrected Shear Stress [kPa]					\		
0	1060 1090	1120 1150	1180 1210	0	1240 1270	1300 1330	
0	1060 1090		1180 1210 Normal Stress [kPa]	0	1240 1270	1300 1330	
0 1030	1060 1090		Normal Stress [kPa]	0	1240 1270	1300 1330	
0				0	1240 1270	1300 1330	
1030 Test number Specimen Prep Length [mm]	paration		Normal Stress [kPa] 1 UNDISTURBED 137.84	0	1240 1270	1300 1330	
Test number Specimen Prepulation [mm] Diameter [mm]	paration n]		Normal Stress [kPa] 1 UNDISTURBED 137.84 67.68	0	1240 1270	1300 1330	
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density	paration n] [Mg/m³]		1 UNDISTURBED 137.84 67.68 2.116	0	1240 1270	1300 1330	
Test number Specimen Preplement [mm] Diameter [mm] Bulk Density Specimen Wat	paration m] [Mg/m³] ter Content [%]		Normal Stress [kPa] 1 UNDISTURBED 137.84 67.68	0	1240 1270	1300 1330	
Test number Specimen Preplement [mm] Diameter [mm] Bulk Density Specimen Wat	paration m] [Mg/m³] ter Content [%] e Water Content [%]		1 UNDISTURBED 137.84 67.68 2.116	0	1240 1270	1300 1330	
Test number Specimen Prel Length [mm] Diameter [mn] Bulk Density Specimen Wat Failure Surface Dry Density [I	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio		1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579	0	1240 1270	1300 1330	
Test number Specimen Prel Length [mm] Diameter [mn Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids Ri Degree of Sati	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%]		1 UNDISTURBED 137.84 67.68 2.116 23.7	0	1240 1270	1300 1330	
Test number Specimen Prel Length [mm] Diameter [mn Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids Ri Degree of Sati	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] deviator Stress		1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100	0	1240 1270	1300 1330	
Test number Specimen Prey Length [mm] Diameter [mm] Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids R. Degree of Sate Application of D Cell Pressure	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] reviator Stress [kPa]		1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100	0	1240 1270	1300 1330	
Test number Specimen Prey Length [mm] Diameter [mm] Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids R. Degree of Satt Application of D Cell Pressure Specimen Heis	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] veviator Stress [kPa] ght [mm]		1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100	0	1240 1270	1300 1330	
Test number Specimen Prey Length [mm] Diameter [mm] Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids R. Degree of Satt Application of D Cell Pressure Specimen Heis	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] reviator Stress [kPa]		1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100	0	1240 1270	1300 1330	
Test number Specimen Prey Length [mm] Diameter [mm Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids R: Degree of Satt Application of D Cell Pressure Specimen Heid Mean Rate of Peak Values	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] veviator Stress [kPa] ght [mm]		1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100	0	1240 1270	1300 1330	
Test number Specimen Prey Length [mm] Diameter [mn] Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids Ra Degree of Sate Application of D Cell Pressure Specimen Heid Mean Rate of Peak Values Undrained She Strain at Failure	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] reviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]		1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100 1089 135.42 2.76		1240 1270	1300 1330	
Test number Specimen Prey Length [mm] Diameter [mm] Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids Rat Degree of Sate Application of D Cell Pressure Specimen Heig Mean Rate of Peak Values Undrained She	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] reviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]		1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100 1089 135.42 2.76		1240 1270	1300 1330	
Test number Specimen Prey Length [mm] Diameter [mn] Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids Ra Degree of Sate Application of D Cell Pressure Specimen Heid Mean Rate of Peak Values Undrained She Strain at Failure	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] reviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]		1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100 1089 135.42 2.76				
Test number Specimen Prey Length [mm] Diameter [mn] Bulk Density Specimen Wat Failure Surface Dry Density [I Initial Voids R: Degree of Satt Application of D Cell Pressure Specimen Heie Mean Rate of Peak Values Undrained She Strain at Failur Failure Mode	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa] re [%]		Normal Stress [kPa] 1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100 1089 135.42 2.76 93 20.1 Plastic		Authorised By	lindsayc	
Test number Specimen Preplement Failure Surface Dry Density [Initial Voids Range of Sate Application of Date of Peak Values Undrained She Strain at Failure Mode	paration m] [Mg/m³] ter Content [%] e Water Content [%] Mg/m³] atio uration [%] deviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa] re [%]		Normal Stress [kPa] 1 UNDISTURBED 137.84 67.68 2.116 23.7 1.710 0.579 100 1089 135.42 2.76 93 20.1 Plastic				

Testing was performed at the Fugro GB Limited laboratory at the address shown above. Results relate only to the sample tested, having been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated otherwise the sample was tested in the condition it was received at the laboratory. Standard UUTX Single Stage ISO Output.xlsm - Rev 7



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		BS EN ISO 17892	2-8:2018		1483
Project Reference	F254727			Location ID	Z3_OWF_BH06-SAMP
Project Name	Golfe du Lion			Depth Top [m]	2.20
Specimen Description	Grey sandy SILT	with occasional shell fragme	nts	Sample Type	Wax
Specimen Reference	2	Specimen Depth [m]		Sample Reference	03-2
80					
Pa]					
Corrected Deviator Stress [kPa]					
Stree					
ia. 40 -					
Devi					
9 ti 20					
Corre					
0					
	2 4	6 8		14 16 18	20 22
400		Axia	al Strain [%]		<u></u>
400					
장 300 년 장					
ress 300					
Corrected Shear Stress [kPa]					
1 She					
100					
Corre					
0					
0 10	00 200	300 400 500	600 700	800 900 1000	1100 1200
		1	Normal Stress [kPa]		
Test number		———	1		
Specimen Prepa	aration		REMOULDED		
Length [mm]			144.53		
Diameter [mm] Bulk Density [N			70.20 2.019		
Specimen Wate			23.1		
Failure Surface	Water Content [%]				
Dry Density [M Initial Voids Rat			1.640 0.646		
Degree of Satur			96		
Application of De	eviator Stress				
Cell Pressure [k Specimen Heigl			1089 138.41		
Mean Rate of S			2.89		
Peak Values					
Undrained Shea Strain at Failure	ar Strength [kPa]		39 20.1		
Failure Mode	[70]		Plastic		
Issue Date	14/04/2025	Certificate Reference	Issue 1	Authorised By	huntc
Client	DGEC	,		Authorised Date	14/04/2025 10:56
Remarks	Prepared to max	ximum achievable density			
		Estata Madamalan Baad C	- TOTAL DUO CTAN		
Fugro GB Limited. Unit 43, No	umbar ()na Inductrial				

otherwise the sample was tested in the condition it was received at the laboratory.

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BS FN ISO 17892-8:2018

		BS EN ISO 1789	92-8:2018		1483
Project Reference	F254727			Location ID	Z3_OWF_BH06-SAMP
Project Name	Golfe du Lion			Depth Top [m]	4.40
Specimen Description	Soft grey sandy	CLAY		Sample Type	В
Specimen Reference		Specimen Depth [m]		Sample Reference	05-3
50					
ଜ୍					
볼 40 +					
ress					
요 30 					
Corrected Deviator Stress [kPa]					
<u>စ်</u> 20 –					
92 10 -					
Corr					
0					
0	2 4	6 8	10 12	14 16 18	20 22
		Ax	ial Strain [%]		
30					
Corrected Shear Stress [kPa]					
. ess					
호 18 					
Shea		, par			
5 12 		/		\	
6		/		\	
S					
0 +				1	
1110 1	119 1128	1137 1146	1155 1164 Normal Stress [kPa]	1173 1182 1191	1200 1209
			Normal Stress [Kraj		
Test number			1		
Specimen Prep	aration		REMOULDED		
Length [mm]			133.22		
Diameter [mm			72.04		
Bulk Density [2.069		
	er Content [%] Water Content [%]		22.6		
Dry Density [N			1.688		
Initial Voids Ra	tio		0.600		
Degree of Satu			100		
Application of December 1			1133	1	
Cell Pressure Specimen Heio			128.75		
	Shear [mm/min]		2.66		
Peak Values					
	ar Strength [kPa]		24		
Strain at Failur Failure Mode	e [%]		20.1 Plastic		
rallure iviode			Plastic		
-	20 (00 (2025	Contificate Deferre	Jacob 2	A alt = . d = . d D	lindanı
Janua Data		Certificate Reference	Issue 2	Authorised By	lindsayc
Issue Date	28/08/2025	ļ			<u> </u>
Issue Date	28/08/2025 DGEC	<u> </u>		Authorised Date	28/08/2025 09:35
	DGEC	rimum achievable dencity		Authorised Date	28/08/2025 09:35
	DGEC	ximum achievable density		Authorised Date	28/08/2025 09:35
Client	DGEC	imum achievable density		Authorised Date	28/08/2025 09:35

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F254727-REP-001 04 | Measured and Derived Geotechnical Parameters and Final Results

otherwise the sample was tested in the condition it was received at the laboratory.



roject Reference	F254727	BS EN ISO 1789	92-0.2010	Location ID	Z3_OWF_BH06-SAMP		
Project Name	Golfe du Lion			Depth Top [m]	5.20		
Specimen Description	Firm grey sandy	CLAY with some shell fragn	nents	Sample Type	Wax		
Specimen Reference	1	Specimen Depth [m]	5.21	Sample Reference	06-2		
200							
[F 보 160 							
ress							
Corrected Deviator Stress [kPa]							
Devia 08 Pevia							
cted							
₫ 40 -							
0							
0	2 4	6 8	10 12	14 16 18	20 22		
80		Ax	ial Strain [%]				
[ed 실 건 64 -							
ess [
15 48 		process and the same of the sa					
8 32 -							
tec		/		\ \			
9 16		<i>i</i>		\			
Corrected Shear Stress [kPa]		/		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
0	1114 1120	1162 1196	1210 1224	1359 1393	1206 1220		
0	1114 1138	1162 1186	1210 1234 Normal Stress [kPa]	1258 1282	1306 1330		
1090	1114 1138	1162 1186		1258 1282	1306 1330		
0 1090		1162 1186	Normal Stress [kPa]	1258 1282	1306 1330		
0 1090 Test number Specimen Prep		1162 1186	Normal Stress [kPa] 1 UNDISTURBED	1258 1282	1306 1330		
0 1090	paration	1162 1186	Normal Stress [kPa]	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [paration n] Mg/m³]	1162 1186	1 UNDISTURBED 139.73 68.55 2.106	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat	paration n] Mg/m³] er Content [%]	1162 1186	Normal Stress [kPa] 1 UNDISTURBED 139.73 68.55	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat Failure Surface	paration n] Mg/m³] er Content [%] water Content [%]	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [Specimen Wat Failure Surface Dry Density [N	paration mg/m³] er Content [%] www.exer Content [%] mg/m³]	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra	paration mg/m³] er Content [%] e Water Content [%] Mg/m³] atio	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%]	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra	paration mg/m³] er Content [%] e Water Content [%] mg/m³] atio uration [%] eviator Stress	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of De Cell Pressure [Specimen Heig	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm]	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555 100	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of Dr Cell Pressure Specimen Heig Mean Rate of S	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa]	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555 100 1149	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of Dr Cell Pressure [Specimen Heig Mean Rate of Seate Values	paration mg/m³] er Content [%] e Water Content [%] mg/m³] atio furation [%] eviator Stress [kPa] ght [mm] Shear [mm/min]	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555 100 1149 138.12 2.80	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of Dr Cell Pressure [Specimen Heig Mean Rate of Seak Values Undrained She	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555 100 1149 138.12 2.80	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of Dr Cell Pressure Specimen Heig Mean Rate of Seak Values Undrained She Strain at Failur	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1162 1186	Normal Stress [kPa] 1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555 100 1149 138.12 2.80 69 20.1	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of Dr Cell Pressure [Specimen Heig Mean Rate of Seak Values Undrained She	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1162 1186	1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555 100 1149 138.12 2.80	1258 1282	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wate Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of Dr Cell Pressure Specimen Heig Mean Rate of Seak Values Undrained She Strain at Failur	paration Mg/m³] er Content [%] e Water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa]	1162 1186 Certificate Reference	Normal Stress [kPa] 1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555 100 1149 138.12 2.80 69 20.1	1258 1282 Authorised By	1306 1330		
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of Dr Cell Pressure Specimen Heig Mean Rate of : Peak Values Undrained She Strain at Failur Failure Mode	paration Mg/m³] er Content [%] water Content [%] Mg/m³] atio uration [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa] e [%]		Normal Stress [kPa] 1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555 100 1149 138.12 2.80 69 20.1 Plastic				
Test number Specimen Prep Length [mm] Diameter [mm] Bulk Density [Specimen Wat Failure Surface Dry Density [N Initial Voids Ra Degree of Satu Application of Dr Cell Pressure Specimen Heig Mean Rate of : Peak Values Undrained She Strain at Failur Failure Mode	paration Mg/m³] er Content [%] Water Content [%] Water Content [%] water Content [%] eviator Stress [kPa] ght [mm] Shear [mm/min] ear Strength [kPa] e [%]		Normal Stress [kPa] 1 UNDISTURBED 139.73 68.55 2.106 21.3 1.736 0.555 100 1149 138.12 2.80 69 20.1 Plastic	Authorised By	lindsayc		

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BS FN ISO 17892-8:2018

Project Nam	ne	Golfe du Lion								1	
		Goile dd Lloii						Depth Top	[m]	5.20	
Specimen D	escription	Grey sandy CLA	Y with some sh	ell fragments	5			Sample Type	9	Wax	
Specimen Re	eference	2	Specimen	Depth [m]				Sample Refe	rence	06-2	
i	60										\neg
kPa]											
Corrected Deviator Stress [kPa]	45										
or Str											
eviato	30										
G D											
orrect	15										
ŏ	0										
	0	2 4	6	8	10	12	14	16	18	20	22
-	00			Ax	ial Strain	[%]					
	00										
<u>설</u> 4!	50										
Stress											
ear 30	00										
Corrected Shear Stress [kPa]											
nrect	50										
Ö							,,				
	0 1	150 300	450 60	0 750	9(00 1050) 12	00 1350	1500	1650	1800
					Normal :	Stress [kPa]					
ΓŦ	est number					1					
	Specimen Pre	paration			RE	MOULDED					
_	Length [mm] Diameter [mr	ກໄ				144.53 70.20					
	Bulk Density					2.044					
		ter Content [%]				21.1					
	Dry Density [I	e Water Content [%] Mg/m³]				1.688					
	Initial Voids R	atio				0.599					
	Degree of Sat				<u> </u>	95					
	Cell Pressure	[kPa]				1149					
	Specimen Hei	ght [mm] Shear [mm/min]				141.19 2.89					
P	eak Values	onear [IIIII/IIIII]				۵.03					
	Undrained Sh	ear Strength [kPa]				27					
	Strain at Failure	re [%]				20.1 Plastic					
Issue Date		14/04/2025	Certificate	Reference		Issue 1		Authorised I	Ву	huntc	
Client		DGEC						Authorised [Date	14/04/202	5 10:57
Domarka		Prepared to ma	ximum achieva	ble density						1	
Remarks				-							

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otherwise the sample was tested in the condition it was received at the laboratory.

been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated



Project Reference F254727	Project Name Specimen Description Specimen Reference	Golfe du Lion	-	onal shell fragments			
Specimen Description Brown grey slightly sandy CLAV with occasional shell fragments Sample Type B	Specimen Description Specimen Reference		-	onal shell fragments	Depth Top [m]	4.20	
Specimen Reference Specimen Depth (m) Sample Reference 05-2	Specimen Reference	Brown grey slight	-	onal shell fragments		4.20	
Test number	20		Specimen Denth [m]		Sample Type	В	
Test number			Specimen Depth [m]		Sample Reference	05-2	
Client DGEC Authorised Date 14/04/2025 10:58 Prepared to maximum achievable density	Test number Specimen Preparat Length [mm] Diameter [mm] Bulk Density [Mg/s Specimen Water C Failure Surface Wa Dry Density [Mg/r Initial Voids Ratio Degree of Saturati Application of Deviar Cell Pressure [kPa] Specimen Height Mean Rate of Shear Peak Values Undrained Shear S Strain at Failure [9]	tion 200 3 tion Content [%] ater Content [%] ion [%] itor Stress i] [mm] ar [mm/min] Strength [kPa]	Ax	10 12 14 xial Strain [%] 1 REMOULDED 144.53 70.20 1.992 25.2 1.591 0.697 98 1051 141.24 2.89			
Prepared to maximum achievable density	ssue Date	14/04/2025	Certificate Reference	Issue 1	Authorised By	huntc	
Prepared to maximum achievable density	Client			•	Authorised Date	14/04/2025 10:58	
Remarks Properties to maximum define ratios definity	Remarks	Prepared to maxii	mum achievable density				

Page 1 of 1

otherwise the sample was tested in the condition it was received at the laboratory.



roject Reference	F254727				Location ID		Z3_OWF_BH	13-SAMP	
Project Name	Golfe du Lion				Depth Top [m]		19.20		
Specimen Description	Brown grey sligh	tly sandy CLAY			Sample Type			В	
Specimen Reference		Specimen Depth [m]			Sample Referen	ce	21-2		
Corrected Shear Stress [kPa] 20 Corrected Deviator Stress [kPa] 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4	6 8 Ax	10 12 iial Strain [%]	14	16	18	20	22	
Test number Specimen Pre Length [mm] Diameter [m	eparation m]	450 600 750	Normal Stress [kPa 1 REMOULDED 141.21 70.20		200 1350	1500	1650	1800	
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I	eparation [Mg/m³] ater Content [%] atew Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress	450 600 750	Normal Stress [kPa] 1 REMOULDED 141.21 70.20 2.002 21.8 1.644 0.642 92		200 1350	1500	1650	1800	
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sar Application of I Cell Pressure Specimen He Mean Rate of Peak Values Undrained Sh Strain at Failu	eparation [Mg/m³] ater Content [%] Ew Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min] near Strength [kPa] ure [%]	450 600 750	Normal Stress [kPa] 1 REMOULDED 141.21 70.20 2.002 21.8 1.644 0.642 92 1351 135.55 2.82		200 1350	1500	1650	1800	
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sa Application of I Cell Pressure Specimen He Mean Rate of Peak Values Undrained Sh	eparation [Mg/m³] ater Content [%] Ew Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min] near Strength [kPa] ure [%]	450 600 750	Normal Stress [kPa] 1 REMOULDED 141.21 70.20 2.002 21.8 1.644 0.642 92 1351 135.55 2.82		200 1350	1500	1650	1800	
Test number Specimen Pre Length [mm] Diameter [m Bulk Density Specimen Wa Failure Surfac Dry Density Initial Voids F Degree of Sar Application of I Cell Pressure Specimen He Mean Rate of Peak Values Undrained Sh Strain at Failu	eparation [Mg/m³] ater Content [%] Ew Water Content [%] [Mg/m³] Ratio turation [%] Deviator Stress [kPa] ight [mm] f Shear [mm/min] near Strength [kPa] ure [%]	Certificate Reference	Normal Stress [kPa] 1 REMOULDED 141.21 70.20 2.002 21.8 1.644 0.642 92 1351 135.55 2.82		200 1350 Authorised By	1500	huntc	1800	

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otherwise the sample was tested in the condition it was received at the laboratory. Standard UUTX Single Stage ISO Output.xlsm - Rev 7 F254727-REP-001 04 | Measured and Derived Geotechnical Parameters and Final Results

Location	Sample	Depth BSF	Test	Specimen			Ir	nitial Condition	ıs*						Consolida	tion Stage [†]			
	ID		Туре	Condition	D	h	W	ρ	$ ho_{\sf d}$	e_0	S _r	W	ρ	ρ_d	е	σ'_{rc}	σ'_{vc}	$arepsilon_{vol}$	$arepsilon_{_{V}}$
		[m]			[mm]	[mm]	[%]	[Mg/m ³]	[Mg/m³]	[-]	[%]	[%]	[Mg/m³]	[Mg/m³]	[-]	[kPa]	[kPa]	[%]	[%]
Z3_OWF_BH01-SAMP	12-03	10.35	CIU02	Undisturbed	72.7	132.3	20.6	2.21	1.83	0.475	100	15.4	2.23	1.93	0.399	75	75	5.14	2.59
Z3_OWF_BH01-SAMP	18-2	16.10	CIU03	Undisturbed	71.1	138.0	22.2	2.06	1.69	0.599	100	20.0	2.11	1.75	0.540	102	102	3.69	0.62
Z3_OWF_BH01-SAMP	20-4	18.60	CIU04	Undisturbed	72.1	134.6	22.8	2.14	1.74	0.548	100	18.1	2.14	1.82	0.487	118	118	3.91	1.75
Z3_OWF_BH06-SAMP	04-2	3.20	CIU05	Undisturbed	50.7	98.0	24.4	2.02	1.62	0.665	99	23.8	2.03	1.64	0.649	32	32	0.94	0.28
Z3_OWF_BH13-SAMP	05-3	4.40	CIU06	Undisturbed	70.9	137.1	20.7	2.10	1.74	0.553	100	19.0	2.13	1.79	0.506	43	43	3.02	0.65
Z3_OWF_BH13-SAMP	20-2	18.22	CIU07	Undisturbed	70.6	139.2	21.2	2.21	1.83	0.475	100	8.0	2.06	1.91	0.412	112	112	4.23	1.45

Location	Sample	Depth BSF	Test	Specimen		Shea	r Stage				Final Co	nditions [‡]		Bender	Element
	ID	[m]	Туре	Condition	q [kPa]	ε ₅₀ [%]	E ₅₀ [kPa]		ε _f [%]	<i>w</i> [%]	$ ho$ [Mg/m 3]	$ ho_d$ [Mg/m 3]	e [-]	ν _s [m/s]	G _{max} [MPa]
Z3_OWF_BH01-SAMP	12-03	10.35	CIU02	Undisturbed	513	4.24	6055		10.00	15.4	2.23	1.93	0.399	-	-
Z3_OWF_BH01-SAMP	18-2	16.10	CIU03	Undisturbed	386	3.02	6400		10.00	20.0	2.11	1.75	0.540	-	-
Z3_OWF_BH01-SAMP	20-4	18.60	CIU04	Undisturbed	310	2.95	5254		10.00	18.1	2.14	1.82	0.487	-	-
Z3_OWF_BH06-SAMP	04-2	3.20	CIU05	Undisturbed	119	1.52	3928		10.00	23.8	2.03	1.64	0.649	-	-
Z3_OWF_BH13-SAMP	05-3	4.40	CIU06	Undisturbed	180	2.56	3502		10.00	19.0	2.13	1.79	0.506	-	-
Z3_OWF_BH13-SAMP	20-2	18.22	CIU07	Undisturbed	169	0.99	8535		5.20	8.0	2.06	1.91	0.412	-	-
Notes															
: Below seafloor					D : Diamete	r		е	: Void ratio			E ₅₀	: Secant modulus at $arepsilon_5$	0	
: Specimen cond	tions after preparation	and before saturati	on		h : Height			σ'_{rc}	: Radial effecti	ive consolidation stre	SS	\mathcal{E}_f	: Axial strain at failure		
: Specimen cond	tions after last consolic	dation and before sh	nearing		w : Water co	ntent		σ'_{vc}	: Vertical effec	ctive consolidation str	ess	V	: Shear wave velocity a	fter last consolidation	
: Specimen cond	tions after testing				ρ : Bulk den	sity		***	: Volumetric st	train		G_{max}	: Small strain shear mo	dulus after last conso	idation
·	nsolidated undrained				ρ_d : Dry dens			101	: Vertical strain	n		mux			
' '	consolidated undrained	1			e _o : Initial vo	,		a	: Deviator stre	ess at failure					
/e : In compression,					S : Dearee o	of saturation		1		at 50 % of q_{max}					
	measurements				1	rded/assigned		SU		ı max					



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Test Identification							
Location	Z3_OWF_BH01-SAMP						
Sample	12-03						
Depth [m]	10.35						
Test number	CIU02						

Specimen Visual Description

Firm medium strength dark grey silty CLAY with frequent shell fragments

Initial Specimen Conditions	
Test start date	20/05/2025
Type of sample	Undisturbed
Diameter [mm]	72.7
Height [mm]	132.3
Water content [%]	20.6
Bulk density [Mg/m³]	2.21
Dry density [Mg/m³]	1.83
Void ratio [-]	0.475
Degree of saturation [%]	100
Particle density - Assumed [Mg/m³]	2.70
Torvane [kPa]	-
Pocket penetrometer [kPa]	83
Type of drains	Radial (spiral) & one end only

Project: 503387 - F254727 Laboratory: Wallingford, UK Approved by: ET - 08/07/2025

Z3_OWF_BH01-SAMP_12-03_CIU02



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Saturation								
Pressure increments applied [kPa]	100							
Differential pressure used [kPa]	N/A							
Cell pressure [kPa]	1317							
Base PWP [kPa]	1317							
Mid height PWP [kPa]	-							
B value achieved [-]	1.00							

Isotropic Consolidation	
Cell pressure [kPa]	1392
Back pressure [kPa]	1317
Base PWP [kPa]	1317
Mid height PWP [kPa]	-
Effective radial pressure [kPa]	75
Effective axial pressure [kPa]	75
Deviator stress [kPa]	0
Volumetric strain [%]	5.14
Volumetric strain rate - end of stage [%/hr]	0.01
External axial strain [%]	2.59
Local axial strain [%]	-
Local radial strain [%]	-
Water content [%]	15.4
Bulk density [Mg/m³]	2.23
Dry density [Mg/m³]	1.93
Void ratio [-]	0.399
Degree of saturation [%]	100

Project: 503387 - F254727 Laboratory: Wallingford, UK Approved by: ET - 08/07/2025

Z3_OWF_BH01-SAMP_12-03_CIU02



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

130 17892-9.2016	0919
Shearing Stage	
Initial effective radial pressure [kPa]	75
Initial effective axial pressure [kPa]	75
Rate of strain [%/hour]	0.31
At peak deviator stress	
Corrected deviator stress [kPa]	635
Membrane correction applied [kPa]	5
Drain correction applied [kPa]	0
External axial strain [%]	20.30
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	-163
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	238
Effective axial pressure [kPa]	873
Principal effective stress ratio [-]	3.67
ε ₅₀ [%]	5.26
Secant modulus (E_{50}) at ϵ_{50} [kPa]	6035
At peak principal effective stress ratio	
Corrected deviator stress [kPa]	262
Membrane correction applied [kPa]	1
Drain correction applied [kPa]	0
External axial strain [%]	4.32
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	3
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	72
Effective axial pressure [kPa]	334
Principal effective stress ratio [-]	4.63
At 10% external axial strain	
Corrected deviator stress [kPa]	513
Membrane correction applied [kPa]	2
Drain correction applied [kPa]	0
External axial strain [%]	10.00
Excess base PWP [kPa]	-90
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	165
Effective axial pressure [kPa]	678
Principal effective stress ratio [-]	4.11
ε ₅₀ [%]	4.24
Secant modulus (E_{50}) at ϵ_{50} [kPa]	6055

Project: 503387 - F254727

Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_12-03_CIU02



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Specimen Photographs





FINAL CONDITIONS	
Water content [%]	15.4
Bulk density [Mg/m³]	2.23
Dry density [Mg/m³]	1.93
Void ratio [-]	0.399

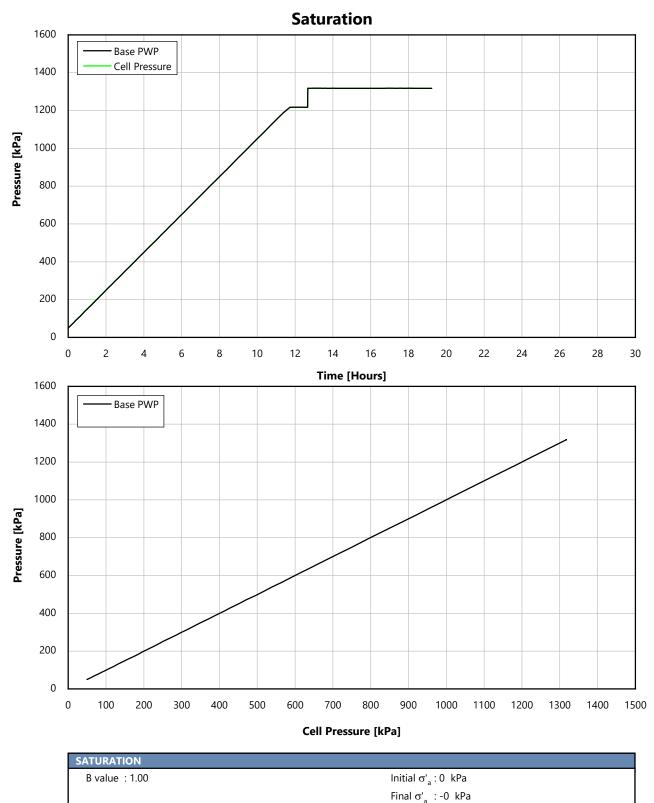
Project: 503387 - F254727 Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_12-03_CIU02



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018



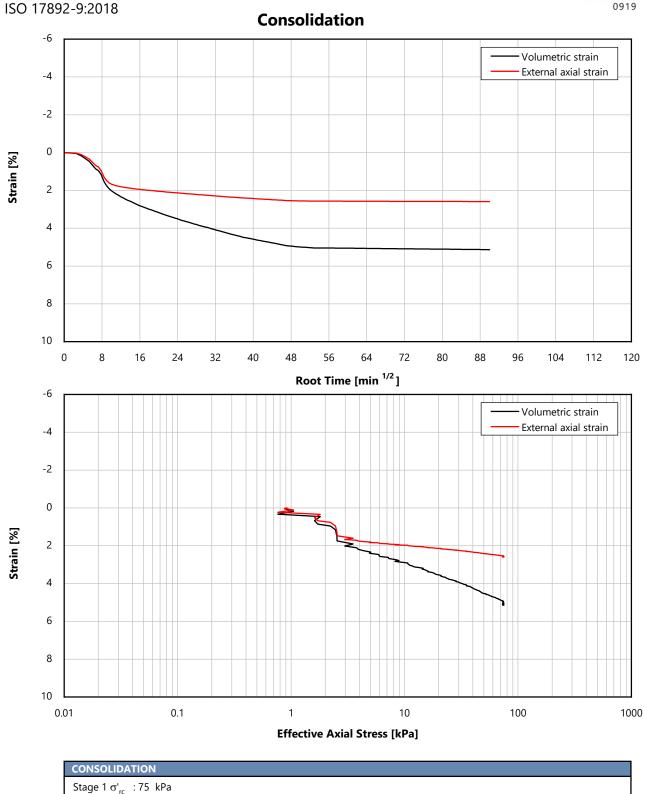
Project: 503387 - F254727

Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_12-03_CIU02



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387 - F254727

Stage 1 σ'_{ac} : 75 kPa

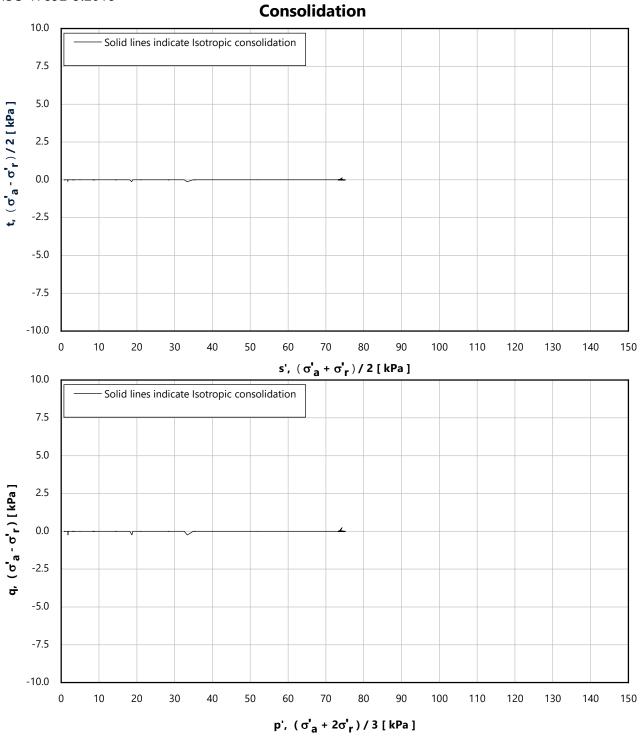
Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_12-03_CIU02



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018



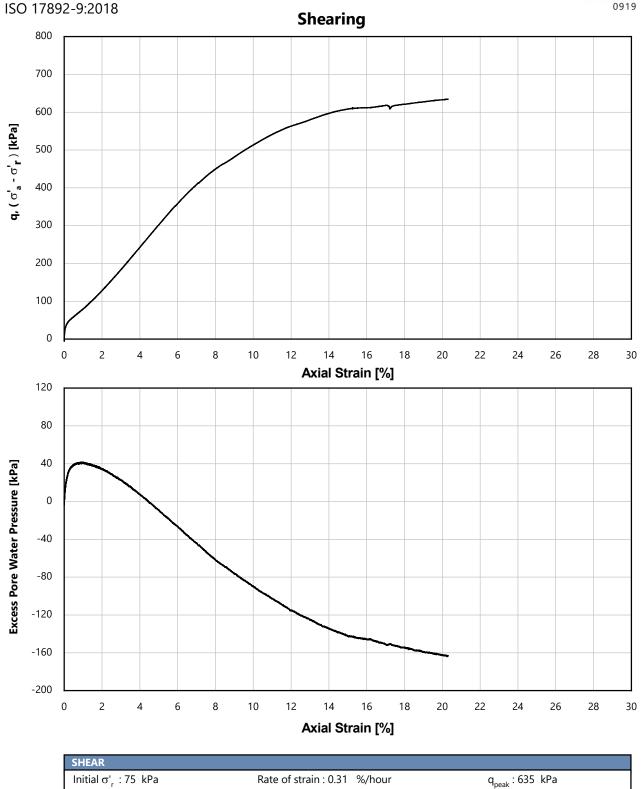
CONSOLIDATION Stage 1 σ'_{rc} : 75 kPa Stage 1 σ'_{ac} : 75 kPa

Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_12-03_CIU02



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387 - F254727

Initial σ'_a : 75 kPa

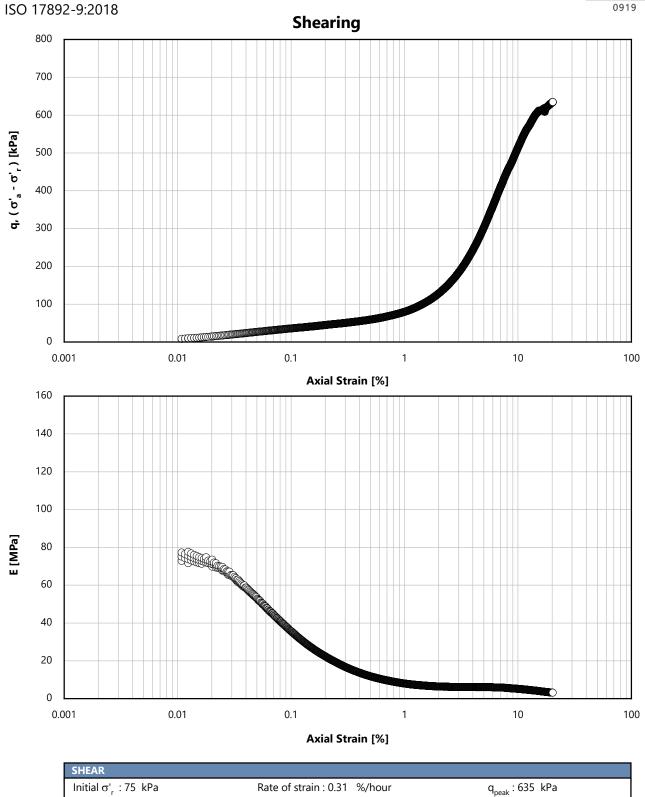
Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_12-03_CIU02

Ext. ϵ at q_{peak} : 20.30 $\,\%$



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387 - F254727

Initial σ'_a : 75 kPa

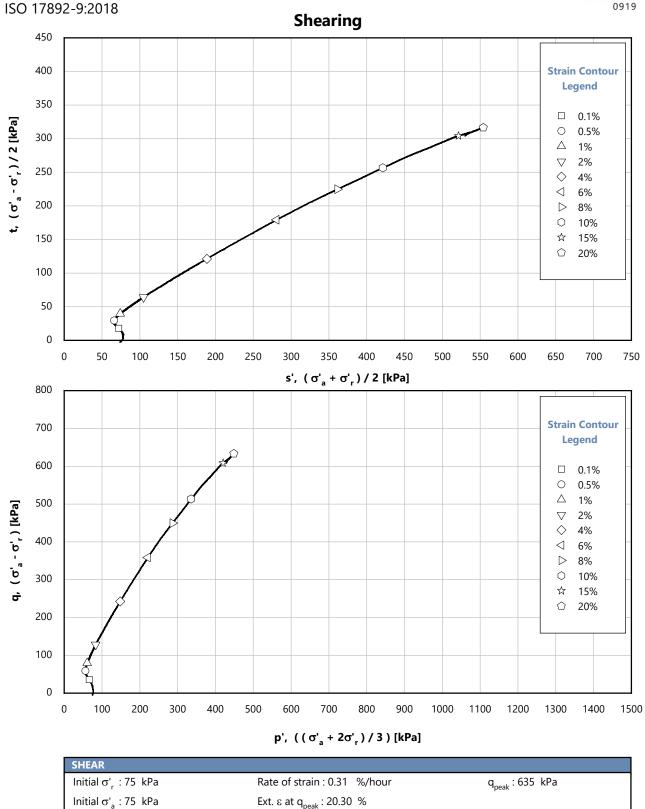
Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_12-03_CIU02

Ext. ε at q_{peak} : 20.30 %



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387 - F254727

Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_12-03_CIU02



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Test Identification	
Location	Z3_OWF_BH01-SAMP
Sample	18-2
Depth [m]	16.10
Test number	CIU03

Specimen Visual Description	
Firm medium strength silty grey CLAY	

Initial Specimen Conditions	
Test start date	13/05/2025
Type of sample	Undisturbed
Diameter [mm]	71.1
Height [mm]	138.0
Water content [%]	22.2
Bulk density [Mg/m³]	2.06
Dry density [Mg/m³]	1.69
Void ratio [-]	0.599
Degree of saturation [%]	100
Particle density - Assumed [Mg/m³]	2.70
Torvane [kPa]	-
Pocket penetrometer [kPa]	116
Type of drains	Radial (spiral) & one end only

Project: 503387 Laboratory: Wallingford, UK Approved by: ET - 17/06/2025

Z3_OWF_BH01-SAMP_18-2_CIUc03



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Saturation	
Pressure increments applied [kPa]	100
Differential pressure used [kPa]	N/A
Cell pressure [kPa]	1432
Base PWP [kPa]	1430
Mid height PWP [kPa]	-
B value achieved [-]	0.99

Isotropic Consolidation	
Cell pressure [kPa]	1532
Back pressure [kPa]	1430
Base PWP [kPa]	1430
Mid height PWP [kPa]	-
Effective radial pressure [kPa]	102
Effective axial pressure [kPa]	102
Deviator stress [kPa]	0
Volumetric strain [%]	3.69
Volumetric strain rate - end of stage [%/hr]	0.00
External axial strain [%]	0.62
Local axial strain [%]	-
Local radial strain [%]	-
Water content [%]	20.0
Bulk density [Mg/m³]	2.11
Dry density [Mg/m³]	1.75
Void ratio [-]	0.540
Degree of saturation [%]	100

Project: 503387 Laboratory: Wallingford, UK Approved by: ET - 17/06/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

	0919
Shearing Stage	
Initial effective radial pressure [kPa]	102
Initial effective axial pressure [kPa]	102
Rate of strain [%/hour]	0.30
At peak deviator stress	
Corrected deviator stress [kPa]	493
Membrane correction applied [kPa]	5
Drain correction applied [kPa]	0
External axial strain [%]	20.06
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	-79
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	181
Effective axial pressure [kPa]	674
Principal effective stress ratio [-]	3.72
ε ₅₀ [%]	4.37
Secant modulus (E_{50}) at ε_{50} [kPa]	5633
At peak principal effective stress ratio	
Corrected deviator stress [kPa]	246
Membrane correction applied [kPa]	1
Drain correction applied [kPa]	0
External axial strain [%]	4.37
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	23
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	79
Effective axial pressure [kPa]	326
Principal effective stress ratio [-]	4.11
At 10% external axial strain	
Corrected deviator stress [kPa]	386
Membrane correction applied [kPa]	2
Drain correction applied [kPa]	0
External axial strain [%]	10.00
Excess base PWP [kPa]	-28
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	130
Effective axial pressure [kPa]	516
Principal effective stress ratio [-]	3.97
ε ₅₀ [%]	3.02
Secant modulus (E_{50}) at ϵ_{50} [kPa]	6400

Laboratory: Wallingford, UK Project: 503387

Approved by: ET - 17/06/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Specimen Photographs





FINAL CONDITIONS	
Water content [%]	20.0
Bulk density [Mg/m³]	2.11
Dry density [Mg/m³]	1.75
Void ratio [-]	0.540

Project: 503387 Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_18-2_CIUc03

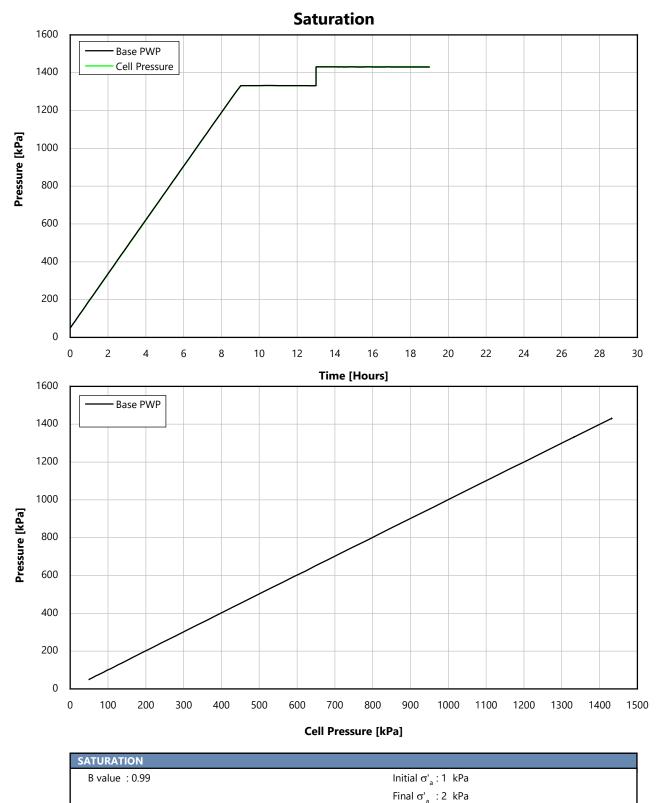
Approved by: ET - 17/06/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



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Project: 503387

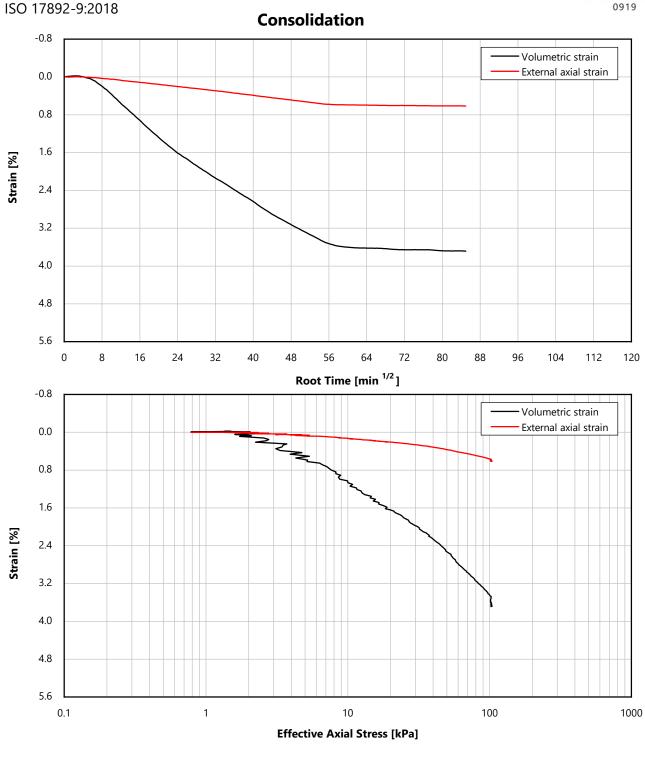
Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_18-2_CIUc03

Approved by: ET 17/06/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

CONSOLIDATION

Stage 1 σ'_{rc} : 102 kPa

Stage 1 σ'_{ac} : 102 kPa

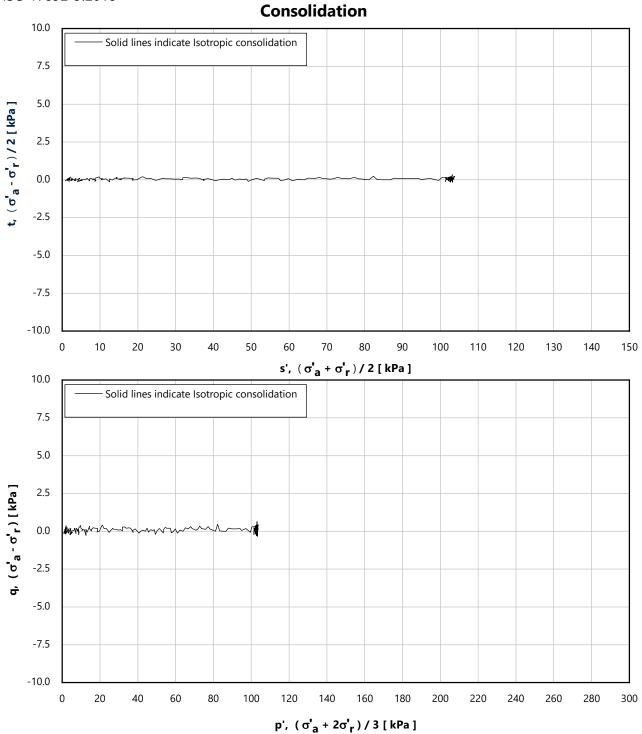
Laboratory: Wallingford, UK
Z3_OWF_BH01-SAMP_18-2_CIUc03



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018



CONSOLIDATION

Stage 1 σ'_{rc} : 102 kPa

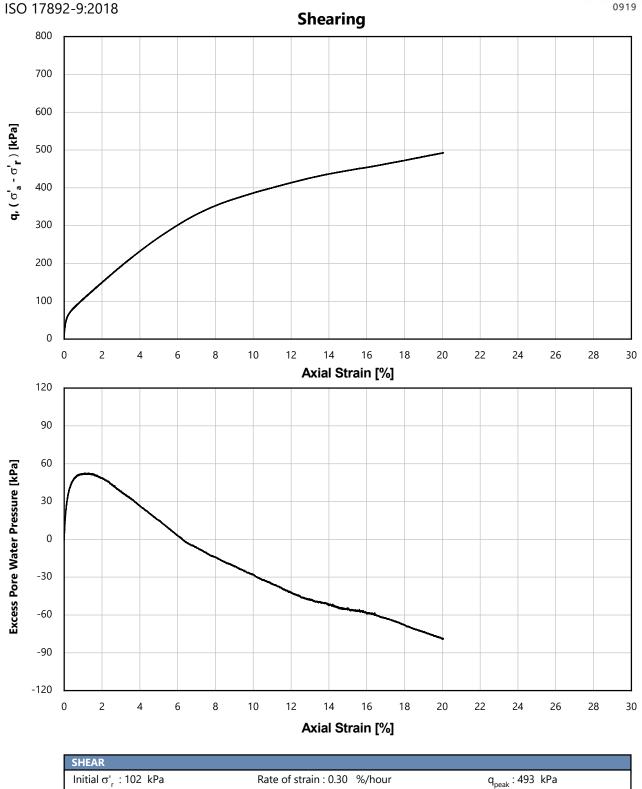
Stage 1 σ'_{ac} : 102 kPa

Laboratory: Wallingford, UK
Z3_OWF_BH01-SAMP_18-2_CIUc03



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

Initial σ'_a : 102 kPa

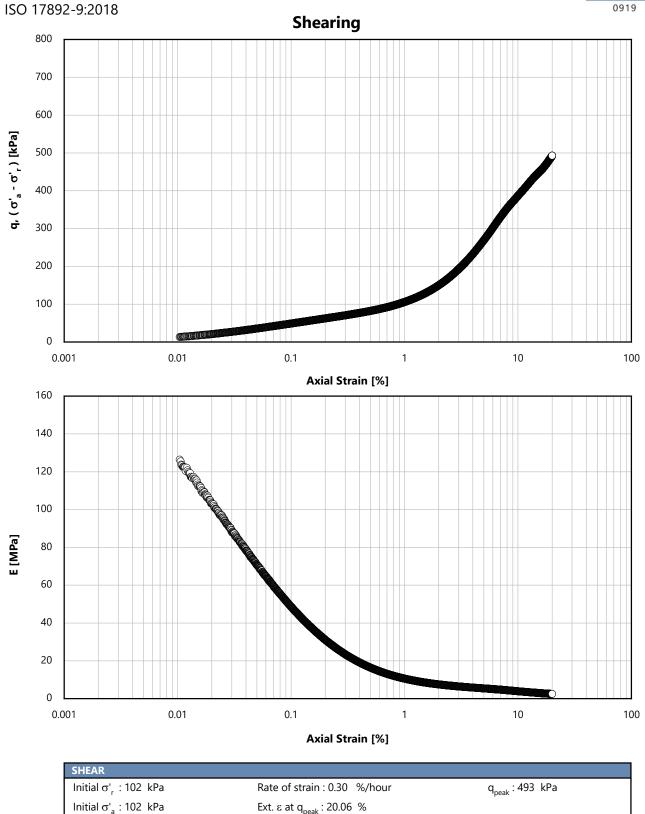
Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_18-2_CIUc03

Ext. ϵ at q_{peak} : 20.06 $\,\%$



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





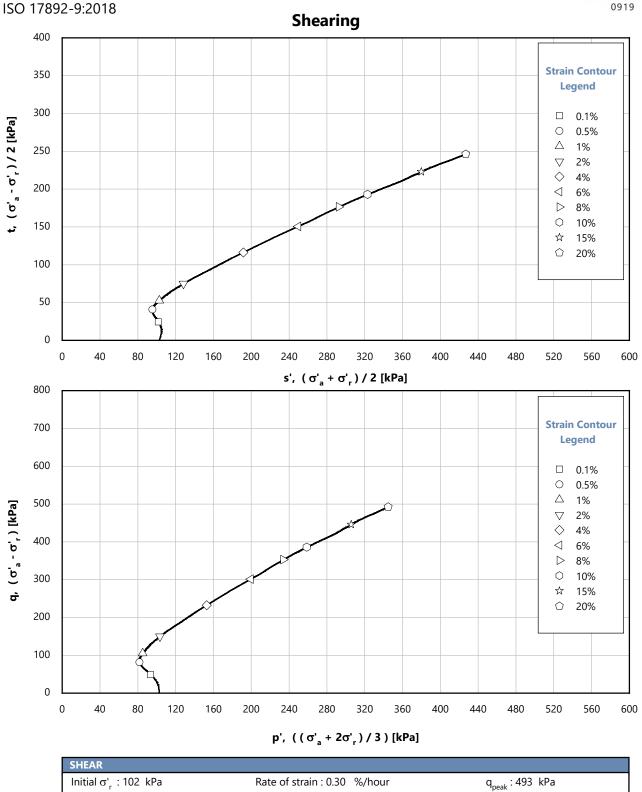
Project: 503387

Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_18-2_CIUc03



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

Initial σ'_a : 102 kPa

Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP_18-2_CIUc03

Ext. ϵ at q_{peak} : 20.06 %



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Test Identification	
Location	Z4_OWF_BH05-SAMP
Sample	20-4
Depth [m]	18.60
Test number	CIU04

Specimen Visual Description	
Firm medium strength dark grey silty CLAY	

Initial Specimen Conditions	
Test start date	30/05/2025
Type of sample	Undisturbed
Diameter [mm]	72.1
Height [mm]	134.6
Water content [%]	22.8
Bulk density [Mg/m³]	2.14
Dry density [Mg/m³]	1.74
Void ratio [-]	0.548
Degree of saturation [%]	100
Particle density - Assumed [Mg/m³]	2.70
Torvane [kPa]	65
Pocket penetrometer [kPa]	42
Type of drains	Radial (spiral) & one end only

Project: 503387 - F254727 Laboratory: Wallingford, UK Approved by: ET - 03/07/2025

Z4_OWF_BH05-SAMP_20-4_CIU04



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Saturation	
Pressure increments applied [kPa]	100
Differential pressure used [kPa]	N/A
Cell pressure [kPa]	1482
Base PWP [kPa]	1479
Mid height PWP [kPa]	-
B value achieved [-]	1.00

Isotropic Consolidation	
Cell pressure [kPa]	1597
Back pressure [kPa]	1479
Base PWP [kPa]	1479
Mid height PWP [kPa]	-
Effective radial pressure [kPa]	118
Effective axial pressure [kPa]	118
Deviator stress [kPa]	0
Volumetric strain [%]	3.91
Volumetric strain rate - end of stage [%/hr]	0.00
External axial strain [%]	1.75
Local axial strain [%]	-
Local radial strain [%]	-
Water content [%]	18.1
Bulk density [Mg/m³]	2.14
Dry density [Mg/m³]	1.82
Void ratio [-]	0.487
Degree of saturation [%]	100

Project: 503387 - F254727 Laboratory: Wallingford, UK Approved by: ET - 03/07/2025 Z4_OWF_BH05-SAMP_20-4_CIU04

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Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

	0919
Shearing Stage	
Initial effective radial pressure [kPa]	118
Initial effective axial pressure [kPa]	118
Rate of strain [%/hour]	0.30
At peak deviator stress	
Corrected deviator stress [kPa]	359
Membrane correction applied [kPa]	5
Drain correction applied [kPa]	0
External axial strain [%]	19.55
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	-33
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	151
Effective axial pressure [kPa]	509
Principal effective stress ratio [-]	3.38
ε ₅₀ [%]	3.71
Secant modulus (E_{50}) at ε_{50} [kPa]	4839
At peak principal effective stress ratio	
Corrected deviator stress [kPa]	212
Membrane correction applied [kPa]	1
Drain correction applied [kPa]	0
External axial strain [%]	4.82
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	45
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	73
Effective axial pressure [kPa]	284
Principal effective stress ratio [-]	3.91
At 10% external axial strain	
Corrected deviator stress [kPa]	310
Membrane correction applied [kPa]	2
Drain correction applied [kPa]	0
External axial strain [%]	10.00
Excess base PWP [kPa]	2
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	116
Effective axial pressure [kPa]	426
Principal effective stress ratio [-]	3.67
ε ₅₀ [%]	2.95
Secant modulus (E_{50}) at ε_{50} [kPa]	5254

Project: 503387 - F254727

Laboratory: Wallingford, UK Z4_OWF_BH05-SAMP_20-4_CIU04



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Specimen Photographs





FINAL CONDITIONS	
Water content [%]	18.1
Bulk density [Mg/m³]	2.14
Dry density [Mg/m³]	1.82
Void ratio [-]	0.487

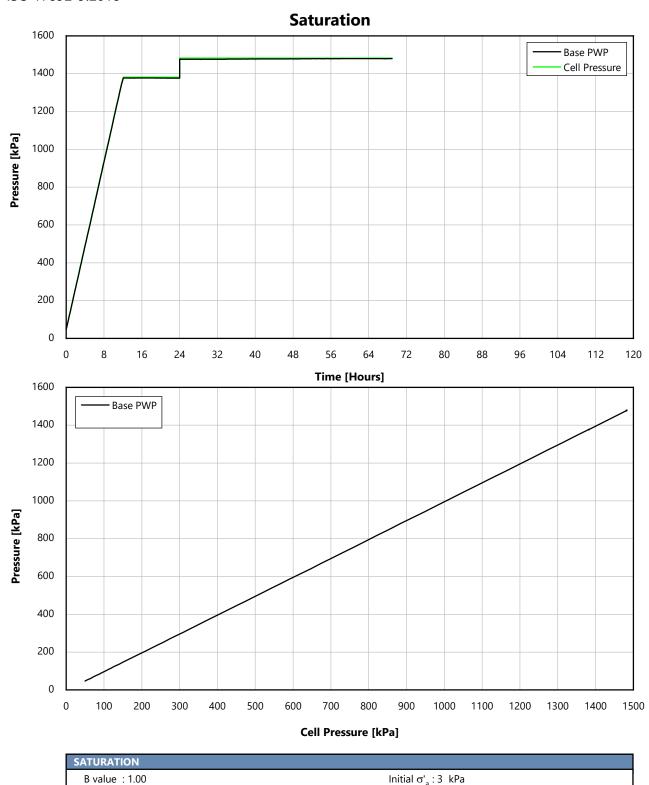
Project: 503387 - F254727 Laboratory: Wallingford, UK Z4_OWF_BH05-SAMP_20-4_CIU04



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018



Project: 503387 - F254727

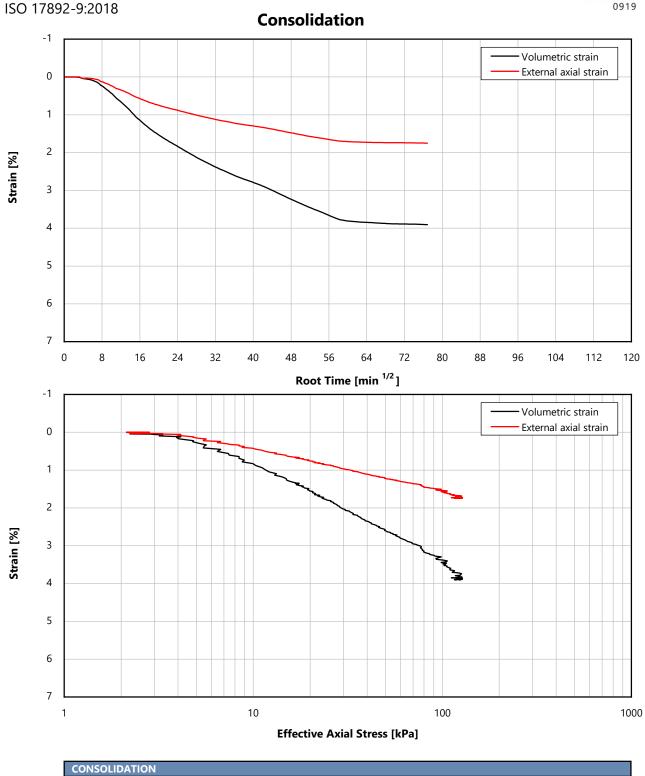
Laboratory: Wallingford, UK Z4_OWF_BH05-SAMP_20-4_CIU04

Final σ'_a : 3 kPa



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387 - F254727

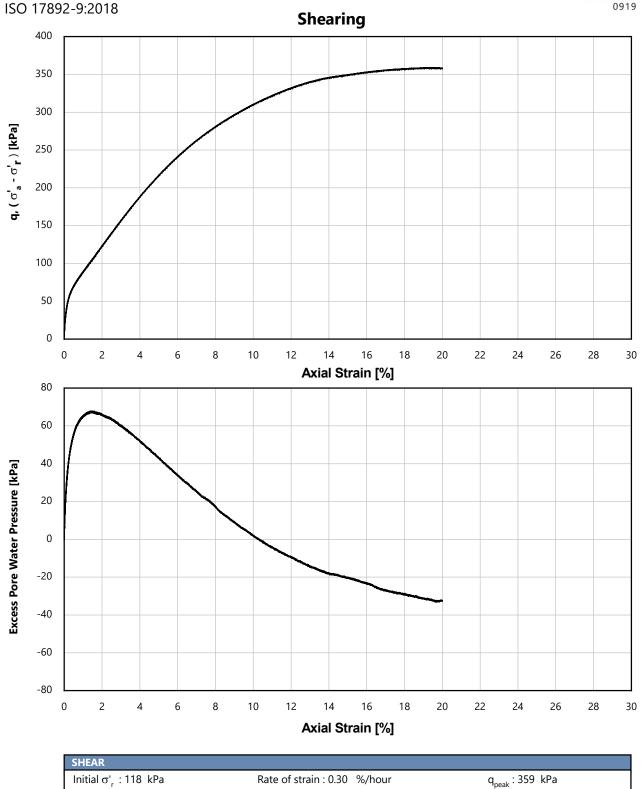
Stage 1 σ'_{rc} : 118 kPa Stage 1 σ'_{ac} : 118 kPa

Laboratory: Wallingford, UK Z4_OWF_BH05-SAMP_20-4_CIU04



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387 - F254727

Initial σ'_a : 118 kPa

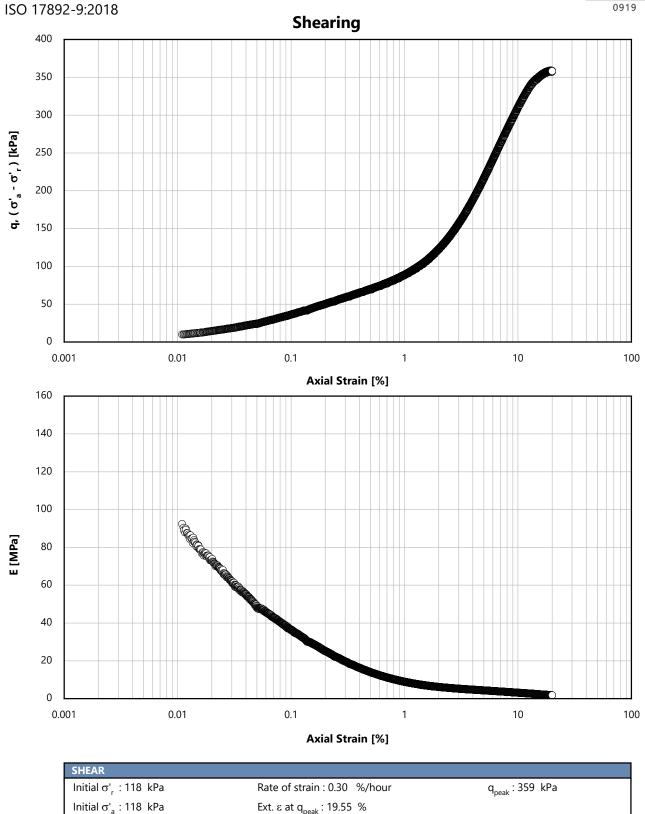
Laboratory: Wallingford, UK Z4_OWF_BH05-SAMP_20-4_CIU04

Ext. ϵ at q_{peak} : 19.55 $\,\,\%$



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





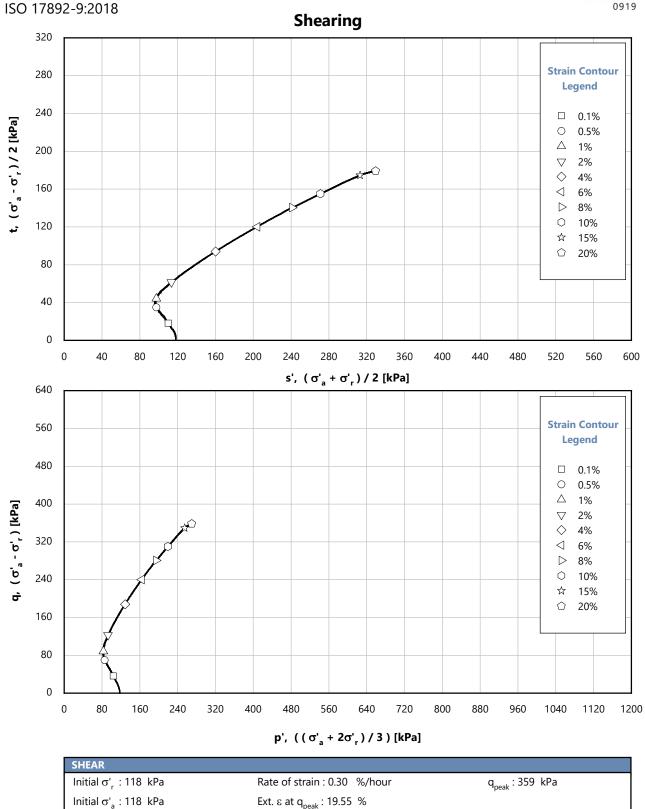
Project: 503387 - F254727

Laboratory: Wallingford, UK Z4_OWF_BH05-SAMP_20-4_CIU04



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387 - F254727

Laboratory: Wallingford, UK Z4_OWF_BH05-SAMP_20-4_CIU04



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

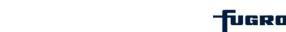
Test Identification	
Location	Z3_OWF_BH06-SAMP
Sample	04-2
Depth [m]	3.20
Test number	CIU05

Specimen Visual Description

Stiff high strength very dark grey silty CLAY with rare fine shell fragments

Initial Specimen Conditions	
Test start date	04/06/2025
Type of sample	Undisturbed
Diameter [mm]	50.7
Height [mm]	98.0
Water content [%]	24.4
Bulk density [Mg/m³]	2.02
Dry density [Mg/m³]	1.62
Void ratio [-]	0.665
Degree of saturation [%]	99
Particle density - Assumed [Mg/m³]	2.70
Torvane [kPa]	-
Pocket penetrometer [kPa]	85
Type of drains	Radial (spiral) & one end only

Project: 503387 Laboratory: Wallingford, UK Approved by: ET - 20/06/2025 Z3_OWF_BH06_SAMP_04-2_CIU05



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Saturation	
Pressure increments applied [kPa]	100
Differential pressure used [kPa]	N/A
Cell pressure [kPa]	1214
Base PWP [kPa]	1206
Mid height PWP [kPa]	-
B value achieved [-]	1.00

Isotropic Consolidation	
Cell pressure [kPa]	1236
Back pressure [kPa]	1204
Base PWP [kPa]	1204
Mid height PWP [kPa]	-
Effective radial pressure [kPa]	32
Effective axial pressure [kPa]	32
Deviator stress [kPa]	0
Volumetric strain [%]	0.94
Volumetric strain rate - end of stage [%/hr]	0.01
External axial strain [%]	0.28
Local axial strain [%]	-
Local radial strain [%]	-
Water content [%]	23.8
Bulk density [Mg/m³]	2.03
Dry density [Mg/m³]	1.64
Void ratio [-]	0.649
Degree of saturation [%]	99

Project: 503387 Laboratory: Wallingford, UK Approved by: ET - 20/06/2025 Z3_OWF_BH06_SAMP_04-2_CIU05



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

	0919
Shearing Stage	
Initial effective radial pressure [kPa]	32
Initial effective axial pressure [kPa]	32
Rate of strain [%/hour]	0.30
At peak deviator stress	
Corrected deviator stress [kPa]	123
Membrane correction applied [kPa]	7
Drain correction applied [kPa]	0
External axial strain [%]	12.37
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	-15
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	47
Effective axial pressure [kPa]	170
Principal effective stress ratio [-]	3.64
ε ₅₀ [%]	1.60
Secant modulus (E ₅₀) at ε ₅₀ [kPa]	3841
At peak principal effective stress ratio	
Corrected deviator stress [kPa]	64
Membrane correction applied [kPa]	1
Drain correction applied [kPa]	0
External axial strain [%]	1.70
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	13
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	19
Effective axial pressure [kPa]	84
Principal effective stress ratio [-]	4.32
At 10% external axial strain	
Corrected deviator stress [kPa]	119
Membrane correction applied [kPa]	6
Drain correction applied [kPa]	0
External axial strain [%]	10.00
Excess base PWP [kPa]	-12
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	44
Effective axial pressure [kPa]	164
Principal effective stress ratio [-]	3.70
ε ₅₀ [%]	1.52
Secant modulus (E ₅₀) at ε ₅₀ [kPa]	3928

Project: 503387 Laboratory: Wallingford, UK



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018 **Specimen Photographs**





FINAL CONDITIONS	
Water content [%]	23.8
Bulk density [Mg/m³]	2.03
Dry density [Mg/m³]	1.64
Void ratio [-]	0.649

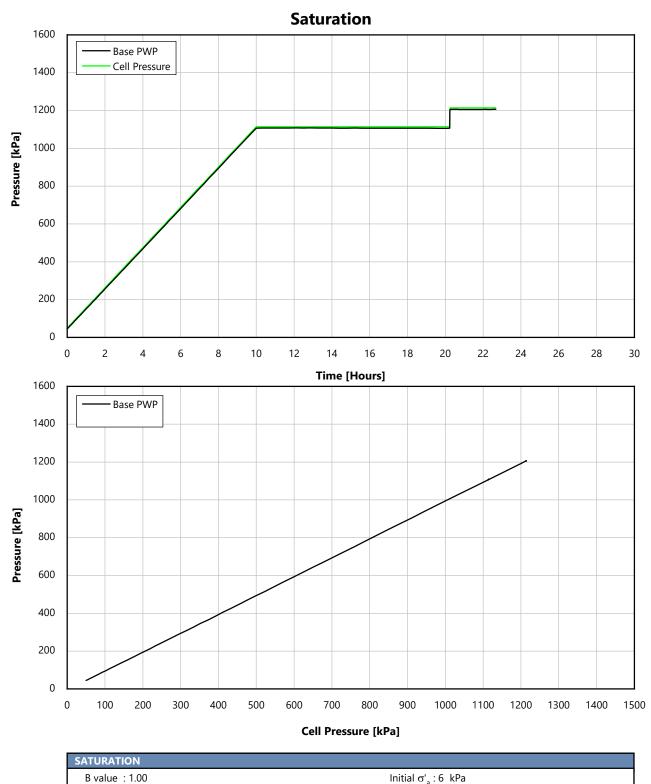
Project: 503387 Laboratory: Wallingford, UK Z3_OWF_BH06_SAMP_04-2_CIU05



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018



Project: 503387 Laboratory: Wallingford, UK Z3_OWF_BH06_SAMP_04-2_CIU05

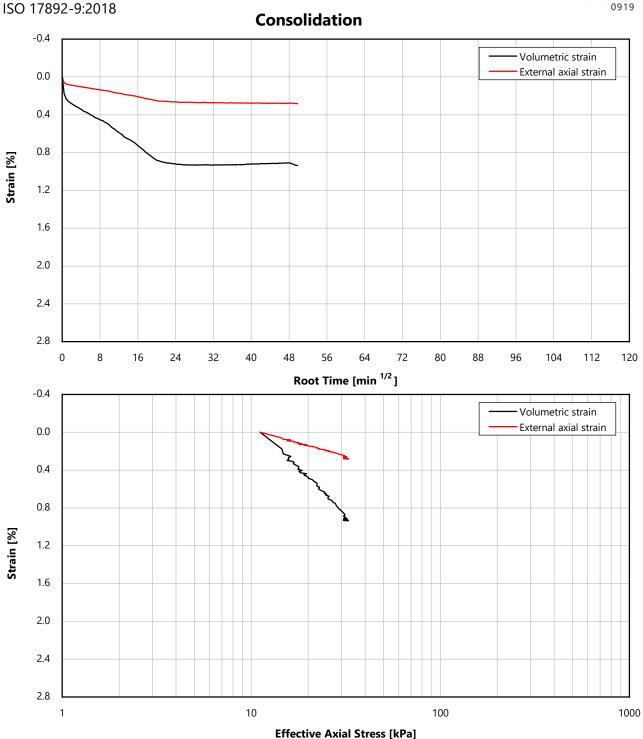
Approved by: ET 20/06/2025

Final σ'_a : 8 kPa



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

CONSOLIDATION
Stage 1 σ'_{rc} : 32 kPa
Stage 1 σ'_{ac} : 32 kPa

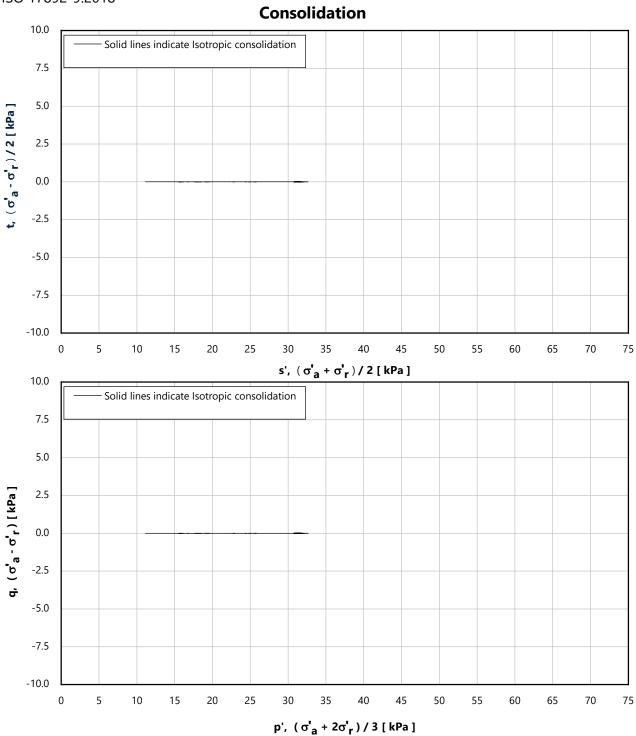
Laboratory: Wallingford, UK Z3_OWF_BH06_SAMP_04-2_CIU05



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018



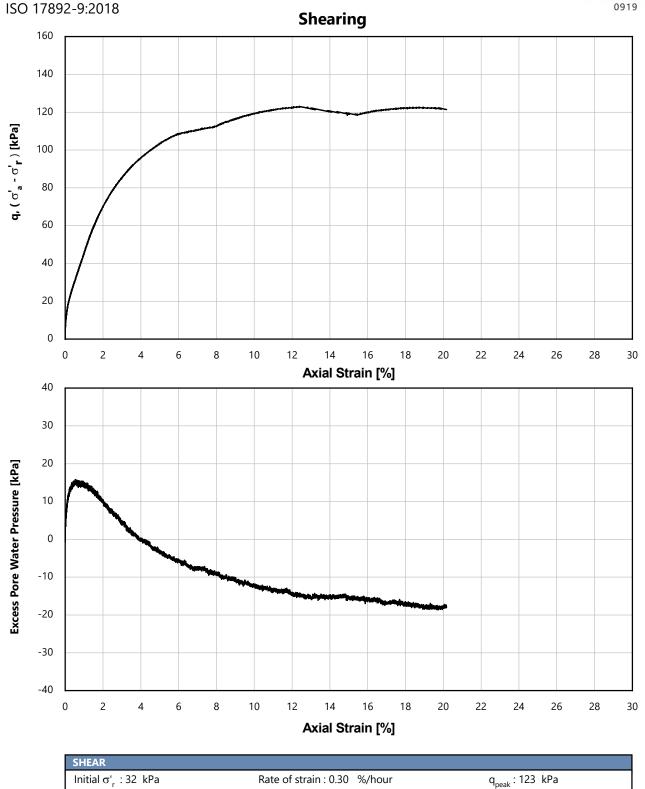
Stage 1 σ'_{ac} : 32 kPa

Laboratory: Wallingford, UK Z3_OWF_BH06_SAMP_04-2_CIU05



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

Initial σ'_a : 32 kPa

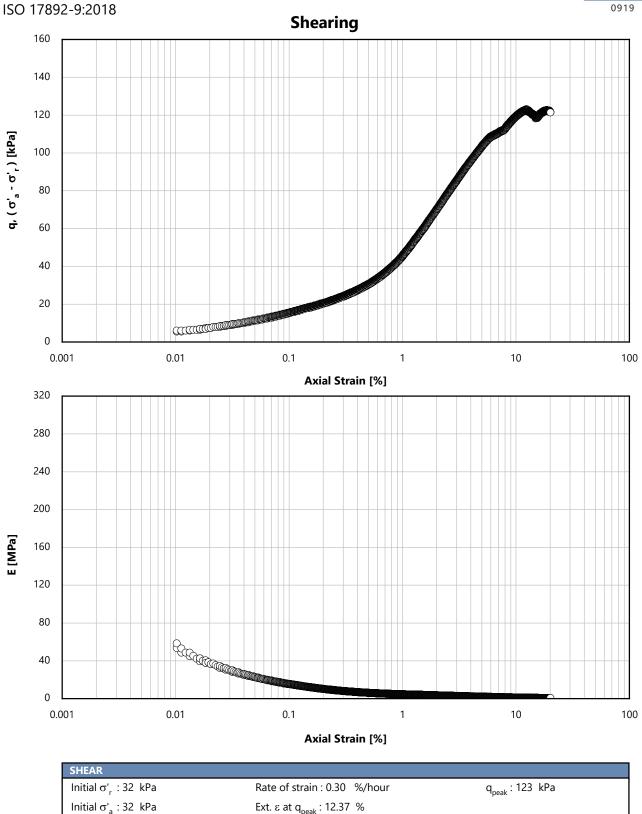
Laboratory: Wallingford, UK Z3_OWF_BH06_SAMP_04-2_CIU05

Ext. ϵ at q_{peak} : 12.37 %



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





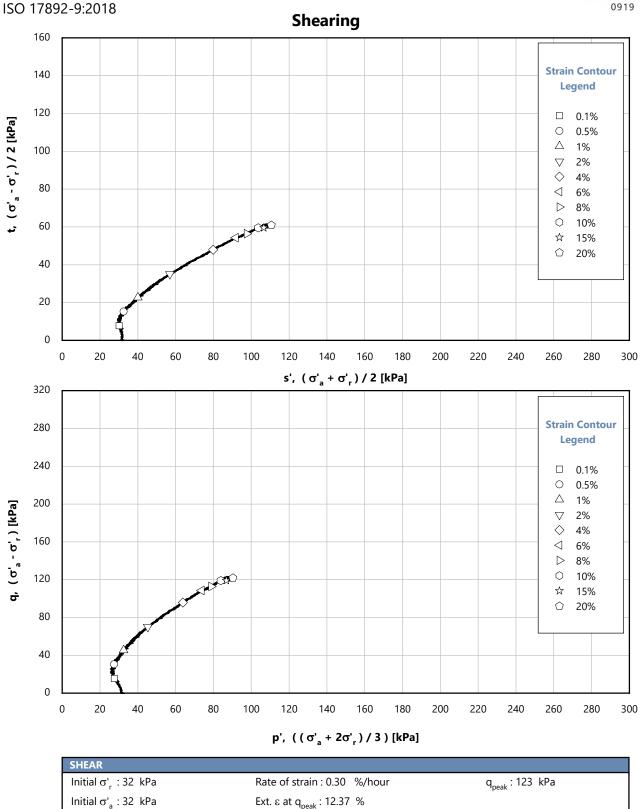
Project: 503387

Laboratory: Wallingford, UK Z3_OWF_BH06_SAMP_04-2_CIU05



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

Laboratory: Wallingford, UK Z3_OWF_BH06_SAMP_04-2_CIU05



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Test Identification	
Location	Z3_OWF_BH13-SAMP
Sample	05-3
Depth [m]	4.40
Test number	CIU06

Specimen Visual Description

Soft low strength grey sandy CLAY with shell fragments

Initial Specimen Conditions	
Test start date	10/06/2025
Type of sample	Undisturbed
Diameter [mm]	70.9
Height [mm]	137.1
Water content [%]	20.7
Bulk density [Mg/m³]	2.10
Dry density [Mg/m³]	1.74
Void ratio [-]	0.553
Degree of saturation [%]	100
Particle density - Assumed [Mg/m³]	2.70
Torvane [kPa]	28
Pocket penetrometer [kPa]	25
Type of drains	Radial (spiral) & one end only

Project: 503387 Laboratory: Wallingford, UK Approved by: ET - 20/06/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Saturation	
Pressure increments applied [kPa]	100
Differential pressure used [kPa]	N/A
Cell pressure [kPa]	1158
Base PWP [kPa]	1159
Mid height PWP [kPa]	-
B value achieved [-]	1.00

Isotropic Consolidation	
Cell pressure [kPa]	1201
Back pressure [kPa]	1158
Base PWP [kPa]	1158
Mid height PWP [kPa]	-
Effective radial pressure [kPa]	43
Effective axial pressure [kPa]	43
Deviator stress [kPa]	0
Volumetric strain [%]	3.02
Volumetric strain rate - end of stage [%/hr]	0.01
External axial strain [%]	0.65
Local axial strain [%]	-
Local radial strain [%]	-
Water content [%]	19.0
Bulk density [Mg/m³]	2.13
Dry density [Mg/m³]	1.79
Void ratio [-]	0.506
Degree of saturation [%]	100

Project: 503387 Laboratory: Wallingford, UK Approved by: ET - 20/06/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

	0919
Shearing Stage	
Initial effective radial pressure [kPa]	43
Initial effective axial pressure [kPa]	43
Rate of strain [%/hour]	0.30
At peak deviator stress	
Corrected deviator stress [kPa]	201
Membrane correction applied [kPa]	6
Drain correction applied [kPa]	0
External axial strain [%]	20.03
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	-32
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	75
Effective axial pressure [kPa]	276
Principal effective stress ratio [-]	3.68
ε ₅₀ [%]	3.04
Secant modulus (E ₅₀) at ε ₅₀ [kPa]	3302
At peak principal effective stress ratio	
Corrected deviator stress [kPa]	107
Membrane correction applied [kPa]	1
Drain correction applied [kPa]	0
External axial strain [%]	3.33
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	14
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	29
Effective axial pressure [kPa]	136
Principal effective stress ratio [-]	4.71
At 10% external axial strain	
Corrected deviator stress [kPa]	180
Membrane correction applied [kPa]	3
Drain correction applied [kPa]	0
External axial strain [%]	10.00
Excess base PWP [kPa]	-17
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	60
Effective axial pressure [kPa]	239
Principal effective stress ratio [-]	4.00
ε ₅₀ [%]	2.56
Secant modulus (E_{50}) at ε_{50} [kPa]	3502

Laboratory: Wallingford, UK Project: 503387



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Specimen Photographs



FINAL CONDITIONS	
Water content [%]	19.0
Bulk density [Mg/m³]	2.13
Dry density [Mg/m³]	1.79
Void ratio [-]	0.506

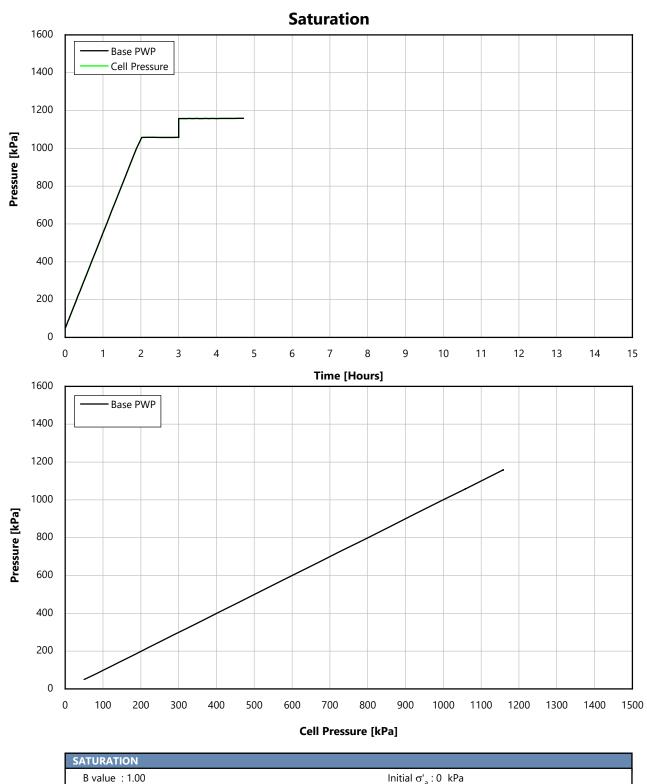
Project: 503387 Laboratory: Wallingford, UK
Z3_OWF_BH13_SAMP_05-3_CIU06



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



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Project: 503387

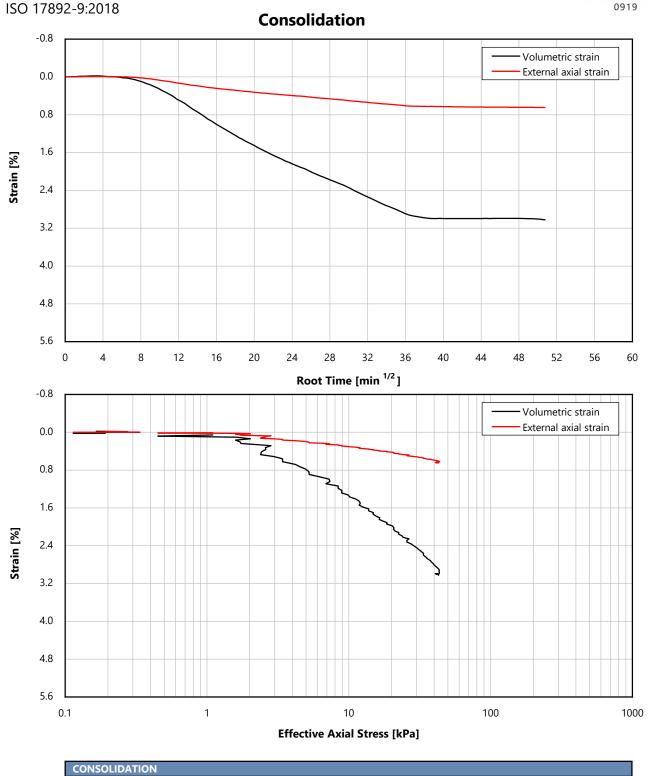
Laboratory: Wallingford, UK Z3_OWF_BH13_SAMP_05-3_CIU06

Final σ'_a : -1 kPa



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Stage 1 σ'_{rc} : 43 kPa
Stage 1 σ'_{ac} : 43 kPa

Project: 503387

Laboratory: Wallingford, UK Z3_OWF_BH13_SAMP_05-3_CIU06



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Consolidation 10.0 Solid lines indicate Isotropic consolidation 7.5 t, $(\sigma'_{a} - \sigma'_{r}) / 2 [kPa]$ 5.0 2.5 0.0 -2.5 -5.0 -7.5 -10.0 30 5 10 15 20 25 35 40 45 50 55 60 65 70 75 s', $(\sigma'_a + \sigma'_r)/2$ [kPa] 10.0 Solid lines indicate Isotropic consolidation 7.5 5.0 q, (σ'_a - σ'_r)[kPa] 2.5 0.0 -2.5 -5.0 -7.5 -10.0 10 15 25 55 65 75 p', $(\sigma'_a + 2\sigma'_r)/3$ [kPa]

CONSOLIDATION

Stage 1 σ'_{rc} : 43 kPa

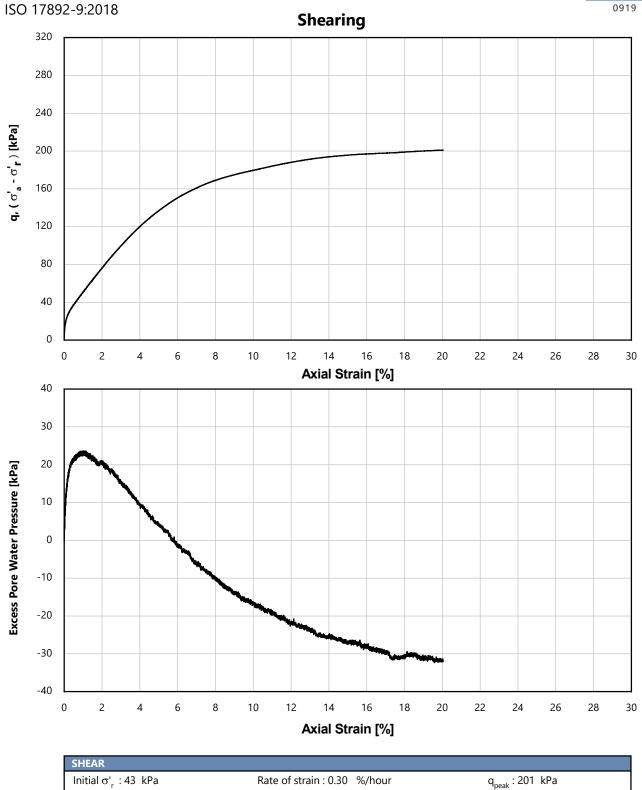
Stage 1 σ'_{ac} : 43 kPa

Laboratory: Wallingford, UK Z3_OWF_BH13_SAMP_05-3_CIU06



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

Initial σ'_a : 43 kPa

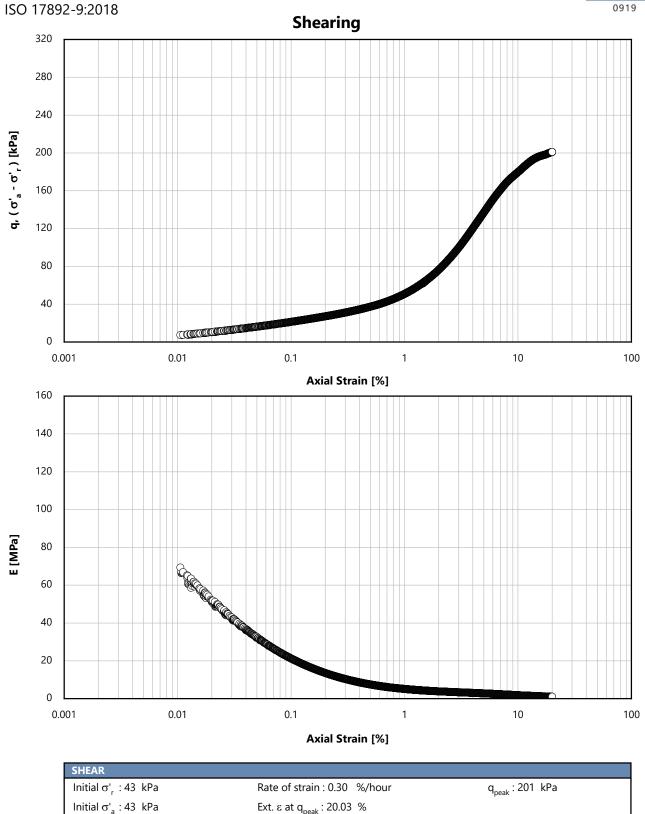
Laboratory: Wallingford, UK Z3_OWF_BH13_SAMP_05-3_CIU06

Ext. ϵ at q_{peak} : 20.03 $\,\%$



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





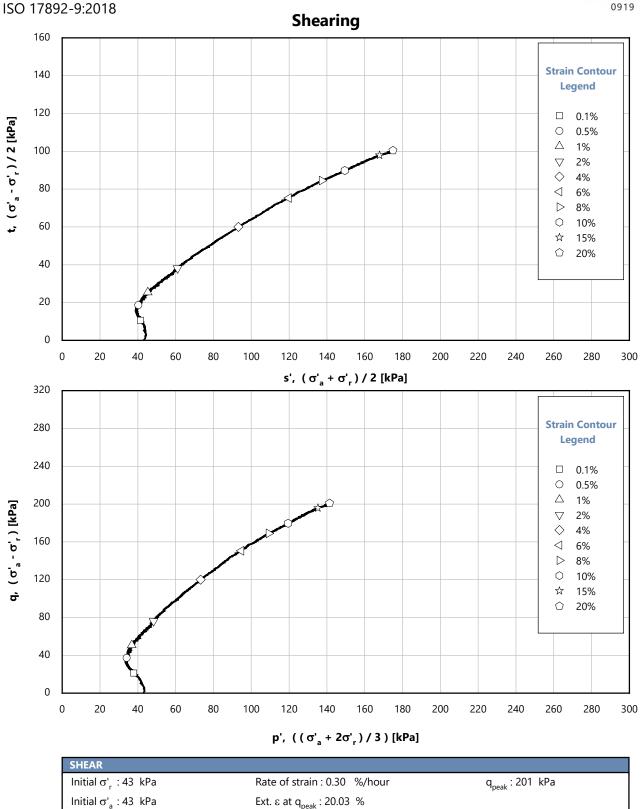
Project: 503387

Laboratory: Wallingford, UK Z3_OWF_BH13_SAMP_05-3_CIU06



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

Laboratory: Wallingford, UK Z3_OWF_BH13_SAMP_05-3_CIU06



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Test Identification	
Location	Z3_OWF_BH13-SAMP
Sample	20-2
Depth [m]	18.22
Test number	CIU07

Specimen Visual Description

Firm medium strength dark grey slightly silty CLAY with pockets of sand

Initial Specimen Conditions	
Test start date	13/05/2025
Type of sample	Undisturbed
Diameter [mm]	70.6
Height [mm]	139.2
Water content [%]	21.2
Bulk density [Mg/m³]	2.21
Dry density [Mg/m³]	1.83
Void ratio [-]	0.475
Degree of saturation [%]	100
Particle density - Assumed [Mg/m³]	2.70
Torvane [kPa]	-
Pocket penetrometer [kPa]	55
Type of drains	Radial (spiral) & one end only

Project: 503387 Laboratory: Wallingford, UK Approved by: - 00/01/1900

Z3_OWF_BH13-SAMP_20-2_CIU07



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Saturation	
Pressure increments applied [kPa]	100
Differential pressure used [kPa]	N/A
Cell pressure [kPa]	1434
Base PWP [kPa]	1434
Mid height PWP [kPa]	-
B value achieved [-]	1.00

Isotropic Consolidation	
Cell pressure [kPa]	1545
Back pressure [kPa]	1433
Base PWP [kPa]	1433
Mid height PWP [kPa]	-
Effective radial pressure [kPa]	112
Effective axial pressure [kPa]	112
Deviator stress [kPa]	0
Volumetric strain [%]	4.23
Volumetric strain rate - end of stage [%/hr]	0.00
External axial strain [%]	1.45
Local axial strain [%]	-
Local radial strain [%]	-
Water content [%]	8.0
Bulk density [Mg/m³]	2.06
Dry density [Mg/m³]	1.91
Void ratio [-]	0.412
Degree of saturation [%]	52

Project: 503387 Laboratory: Wallingford, UK Approved by: - 00/01/1900



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

	0919
Shearing Stage	
Initial effective radial pressure [kPa]	112
Initial effective axial pressure [kPa]	111
Rate of strain [%/hour]	0.08
At peak deviator stress	
Corrected deviator stress [kPa]	169
Membrane correction applied [kPa]	0
Drain correction applied [kPa]	0
External axial strain [%]	5.20
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	54
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	58
Effective axial pressure [kPa]	227
Principal effective stress ratio [-]	3.91
ε ₅₀ [%]	0.99
Secant modulus (E_{50}) at ε_{50} [kPa]	8535
At peak principal effective stress ratio	
Corrected deviator stress [kPa]	155
Membrane correction applied [kPa]	0
Drain correction applied [kPa]	0
External axial strain [%]	4.25
Local axial strain [%]	-
Local radial strain [%]	-
Excess base PWP [kPa]	59
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	53
Effective axial pressure [kPa]	207
Principal effective stress ratio [-]	3.94
At 10% external axial strain	
Corrected deviator stress [kPa]	-
Membrane correction applied [kPa]	-
Drain correction applied [kPa]	-
External axial strain [%]	-
Excess base PWP [kPa]	-
Excess mid height PWP [kPa]	-
Effective radial pressure [kPa]	-
Effective axial pressure [kPa]	-
Principal effective stress ratio [-]	-
ε ₅₀ [%]	-
Secant modulus (E_{50}) at ϵ_{50} [kPa]	-

Laboratory: Wallingford, UK Project: 503387

Approved by: - 00/01/1900



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

130 17032 3.2010	0919
Specimen Photographs	
Photograph unavailable	
EINAL CONDITIONS	
FINAL CONDITIONS Water content [%]	8.0
Bulk density [Mg/m³]	2.06
Dry density [Mg/m³]	1.91
Void ratio [-]	0.412
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Project: 503387 Laboratory: Wallingford, UK

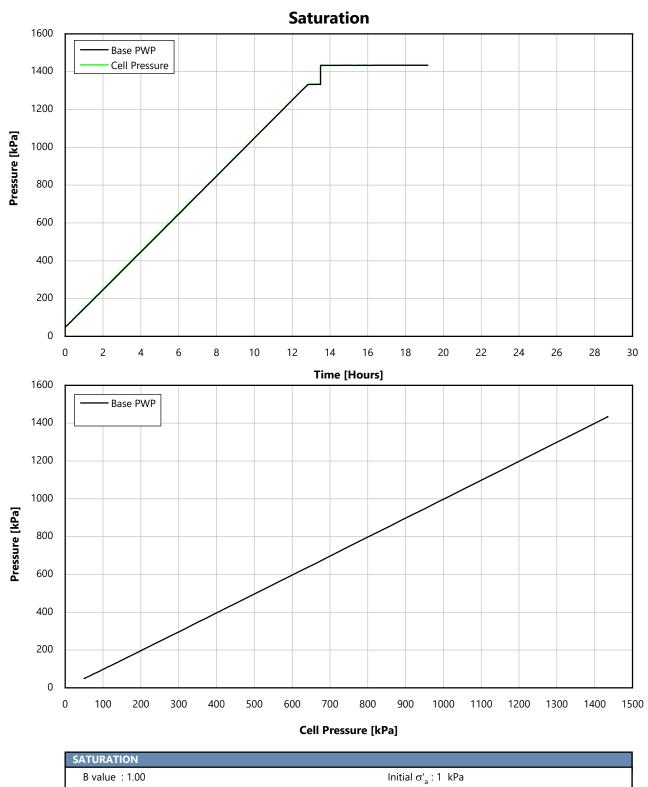
Approved by: - 00/01/1900



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018



Project: 503387

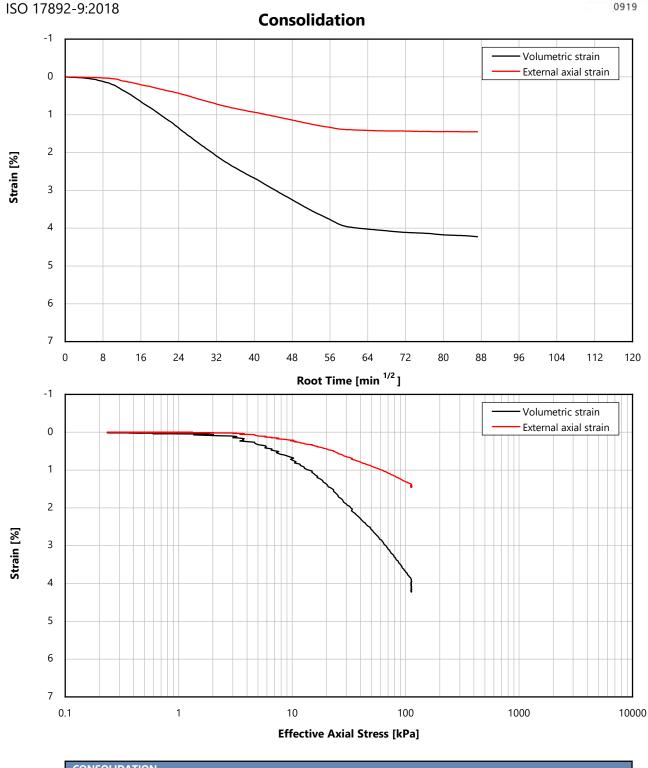
Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP_20-2_CIU07

Final $\sigma'_a:0$ kPa



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





CONSOLIDATION Stage 1 σ'_{rc} : 112 kPa Stage 1 σ'_{ac} : 112 kPa

Project: 503387

Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP_20-2_CIU07



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)



ISO 17892-9:2018

Consolidation 40 Solid lines indicate Isotropic consolidation 30 20 t, (σ'_a - σ'_r)/2 [kPa] 10 0 -10 -20 -30 -40 0 10 20 30 40 50 60 70 80 100 110 120 130 140 150 s', $(\sigma'_a + \sigma'_r)/2$ [kPa] 40 Solid lines indicate Isotropic consolidation 30 20 q, (σ'_a - σ'_r)[kPa] 10 0 -10 -20 -30 -40 10 20 30 100 110 120 130 140 150 p', $(\sigma'_a + 2\sigma'_r)/3$ [kPa]

CONSOLIDATION

Stage 1 σ'_{rc} : 112 kPa

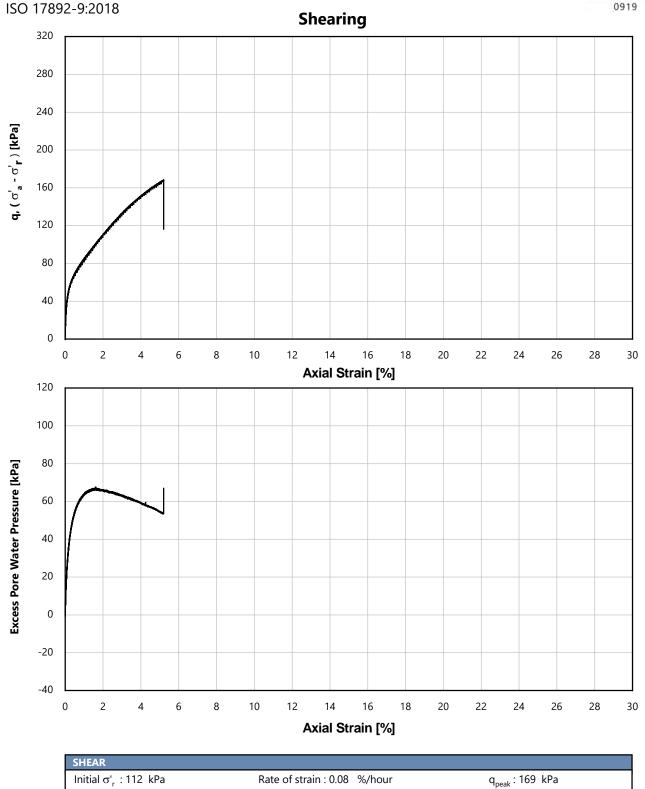
Stage 1 σ'_{ac} : 112 kPa

Laboratory: Wallingford, UK
Z3_OWF_BH13-SAMP_20-2_CIU07



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

Initial σ'_a : 111 kPa

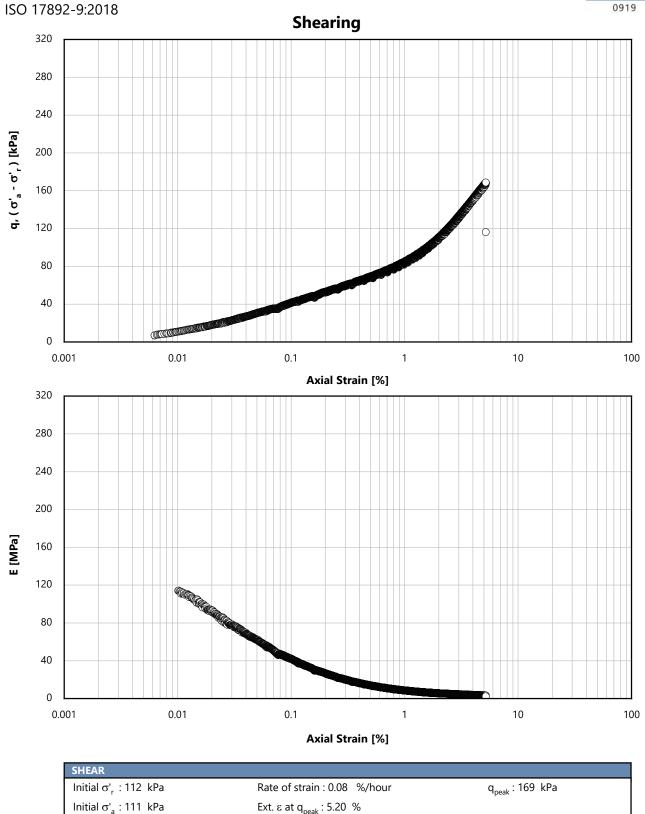
Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP_20-2_CIU07

Ext. ϵ at q_{peak} : 5.20 $\,\%$



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





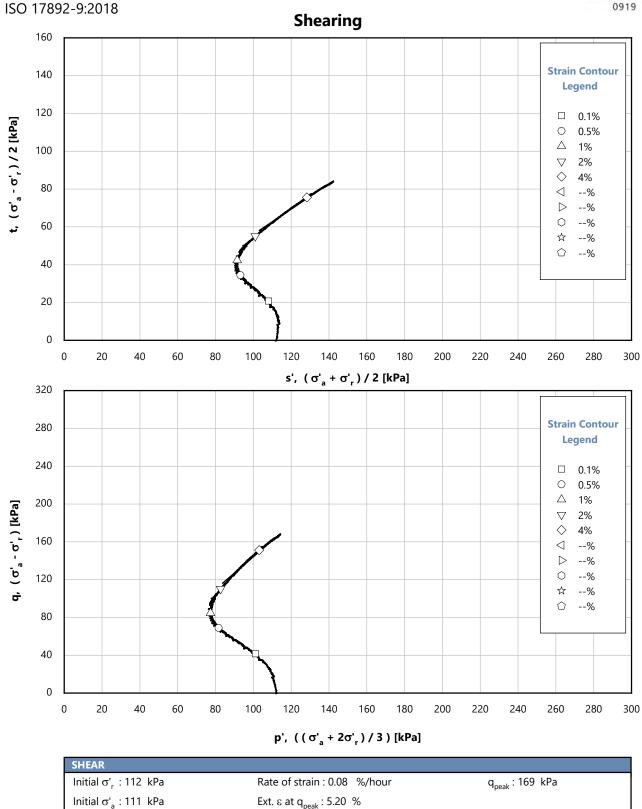
Project: 503387

Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP_20-2_CIU07



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Undrained (CIUc)





Project: 503387

Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP_20-2_CIU07



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Location	Sample	Depth BSF	Specimen	Specimen			I	Initial Conditions	*			В		Co	onsolidation Sta	ge [†]	
	ID		Condition	ID	D	h		ρ	$ ho_{\sf d}$	e_0	S _r		е	σ'_{rc}	σ'_{vc}	$arepsilon_{vol}$	ε_{v}
		[m]			[mm]	[mm]	[%]	[Mg/m³]	[Mg/m³]	[-]	[%]	[-]	[-]	[kPa]	[kPa]	[%]	[%]
Z3_OWF_BH01-SAMP	01-01	0.00	Recompacted	CID01a	51.2	100.0	10.4	1.58	1.43	0.855	32	0.98	0.851	15	15	0.27	0.03
Z3_OWF_BH01-SAMP	01-01	0.00	Recompacted	CID01b	51.2	100.0	10.3	1.58	1.43	0.851	32	0.99	0.838	23	23	0.92	0.21
Z3_OWF_BH01-SAMP	01-01	0.00	Recompacted	CID01c	51.2	100.0	10.4	1.58	1.43	0.856	32	0.96	0.841	38	38	0.79	0.34
Z3_OWF_BH06-SAMP	01-1	0.00	Recompacted	CID02a	50.5	95.0	10.2	1.69	1.54	0.725	37	0.95	0.721	15	15	0.20	0.07
Z3_OWF_BH06-SAMP	01-1	0.00	Recompacted	CID02b	50.8	95.0	9.8	1.68	1.53	0.728	36	0.95	0.722	23	23	0.39	0.13
Z3_OWF_BH06-SAMP	01-1	0.00	Recompacted	CID02c	50.8	95.0	9.8	1.68	1.53	0.728	36	0.95	0.717	38	38	0.66	0.22
Z3_OWF_BH06-SAMP	07-2	6.30	Recompacted	CID03a	50.5	95.0	9.9	1.72	1.56	0.697	38	0.97	0.694	40	40	0.17	0.06
Z3_OWF_BH06-SAMP	07-2	6.30	Recompacted	CID03b	50.5	95.0	9.9	1.72	1.57	0.692	38	0.96	0.685	60	60	0.40	0.13
Z3_OWF_BH06-SAMP	07-2	6.30	Recompacted	CID03c	50.5	95.0	10.0	1.71	1.56	0.701	38	0.92	0.690	100	100	0.69	0.23
Z3_OWF_BH06-SAMP	11-1	10.00	Recompacted	CID04a	50.8	95.0	10.3	2.09	1.90	0.398	68	0.94	0.391	66	66	0.53	0.18
Z3_OWF_BH06-SAMP	11-1	10.00	Recompacted	CID04b	50.8	95.0	10.0	2.09	1.90	0.394	67	0.96	0.383	99	99	0.84	0.28
Z3_OWF_BH06-SAMP	11-1	10.00	Recompacted	CID04c	50.8	95.0	9.8	2.09	1.90	0.392	66	0.96	0.373	165	165	1.39	0.46
Z3_OWF_BH06-SAMP	19-1	15.00	Recompacted	CID05a	50.8	95.0	10.4	2.09	1.90	0.397	69	0.96	0.384	98	98	0.92	0.31
Z3_OWF_BH06-SAMP	19-1	15.00	Recompacted	CID05b	50.8	95.0	9.7	2.09	1.90	0.395	65	0.94	0.378	147	147	1.16	0.39
Z3_OWF_BH06-SAMP	19-1	15.00	Recompacted	CID05c	50.8	95.0	9.7	2.09	1.90	0.392	66	0.98	0.368	245	245	1.68	0.56
Z3_OWF_BH13-SAMP	10-2	8.15	Recompacted	CID06a	50.8	95.0	10.2	1.66	1.51	0.758	36	0.92	0.752	52	52	0.39	0.13
Z3_OWF_BH13-SAMP	10-2	8.15	Recompacted	CID06b	50.8	95.0	10.2	1.66	1.51	0.758	36	0.96	0.748	78	78	0.59	0.20
Z3_OWF_BH13-SAMP	10-2	8.15	Recompacted	CID06c	50.8	95.0	10.2	1.66	1.51	0.758	36	0.92	0.743	131	131	0.88	0.29

Location	Sample	Depth BSF	Specimen			Shear Stage			Mohr E	invelope	Bender Element	
	ID	[m]	ID	q _{max} [kPa]	$arepsilon_{vol}$ [%]	$arepsilon_{v}$ [%]	σ' _ν / σ' _h [-]	Rate of Strain [%/hour]	φ' [°]	c' [kPa]	ν _s [m/s]	G _{max} [MPa]
Z3_OWF_BH01-SAMP	01-01	0.00	CID01a	40	3.76	19.91	3.66	1.30	31.0	2.0	-	-
Z3_OWF_BH01-SAMP	01-01	0.00	CID01b	51	2.90	14.94	3.33	1.31			-	-
Z3_OWF_BH01-SAMP	01-01	0.00	CID01c	89	3.55	19.27	3.30	1.30			-	-
Z3_OWF_BH06-SAMP	01-1	0.00	CID02a	25	2.21	19.25	3.19	1.30	34.5	0.0	-	-
Z3_OWF_BH06-SAMP	01-1	0.00	CID02b	55	1.41	12.27	3.50	1.30			-	-
Z3_OWF_BH06-SAMP	01-1	0.00	CID02c	105	2.90	14.75	3.68	1.30			-	-
Z3_OWF_BH06-SAMP	07-2	6.30	CID03a	107	-0.18	2.20	3.69	1.30	37.5	0.0	-	-
Z3_OWF_BH06-SAMP	07-2	6.30	CID03b	189	-0.41	2.00	4.14	1.30			-	-
Z3_OWF_BH06-SAMP	07-2	6.30	CID03c	330	-0.47	3.50	4.18	1.30			-	-
Z3_OWF_BH06-SAMP	11-1	10.00	CID04a	390	-1.11	2.60	7.02	1.30	47.0	9.0	-	-
Z3_OWF_BH06-SAMP	11-1	10.00	CID04b	619	-1.01	3.01	7.17	1.30			-	-
Z3_OWF_BH06-SAMP	11-1	10.00	CID04c	962	-0.61	2.44	6.73	1.30			-	-
Z3_OWF_BH06-SAMP	19-1	15.00	CID05a	750	-1.35	3.27	8.33	1.30	46.5	37.0	-	-
Z3_OWF_BH06-SAMP	19-1	15.00	CID05b	959	-0.90	2.91	7.37	1.30			-	-
Z3_OWF_BH06-SAMP	19-1	15.00	CID05c	1507	-0.80	2.84	7.06	1.30			-	-
Z3_OWF_BH13-SAMP	10-2	8.15	CID06a	158	-0.09	5.15	3.90	1.30	34.5	4.0	-	-
Z3_OWF_BH13-SAMP	10-2	8.15	CID06b	213	0.08	7.39	3.75	1.30			-	-
Z3_OWF_BH13-SAMP	10-2	8.15	CID06c	348	0.41	7.25	3.72	1.30			-	-

Notes

BSF : Specimen conditions after preparation and before saturation : Specimen conditions after consolidation and before shearing : Isotropically consolidated drained

: In compression/extension : Bender element measurements : Diameter

: Height

: Water content : Bulk density : Dry density : Initial void ratio : Degree of saturation

: Skempton parameter

: Radial effective consolidation stress : Vertical effective consolidation stress : Volumetric strain : Vertical strain

 q_{max} Maximum deviator stress

 σ'_{v}/σ'_{h} : Effective stress ratio

arphi : Effective angle of internal friction : Effective cohesion

: Shear wave velocity : Small strain shear modulus



Location	Sample	Depth BSF	Specimen	Specimen		Initial Conditions*						В	Consolidation Stage [†]				
	ID		Condition	ID [D	h		ρ	$ ho_{\sf d}$	e_0	S_r			σ'_{rc}	σ'_{vc}	$arepsilon_{vol}$	
		[m]			[mm]	[mm]	[%]	[Mg/m³]	[Mg/m³]	[-]	[%]	[-]	[-]	[kPa]	[kPa]	[%]	[%]
Z3_OWF_BH13-SAMP	13-1	11.00	Recompacted	CID07a	50.8	95.0	10.0	2.09	1.90	0.395	67	0.96	0.388	70	70	0.52	0.17
Z3_OWF_BH13-SAMP	13-1	11.00	Recompacted	CID07b	50.8	95.0	9.9	2.09	1.90	0.397	66	0.96	0.388	105	105	0.61	0.20
Z3_OWF_BH13-SAMP	13-1	11.00	Recompacted	CID07c	50.8	95.0	10.0	2.09	1.90	0.395	67	0.96	0.381	175	175	0.96	0.32
Z3_OWF_BH13-SAMP	17-2	15.45	Recompacted	CID08a	50.8	95.0	9.9	1.90	1.73	0.529	50	0.96	0.464	99	99	4.26	1.42
Z3_OWF_BH13-SAMP	17-2	15.45	Recompacted	CID08b	50.5	95.0	9.9	1.90	1.73	0.532	49	0.98	0.479	148	148	3.46	1.15
Z3_OWF_BH13-SAMP	17-2	15.45	Recompacted	CID08c	50.5	95.0	9.9	1.90	1.73	0.533	49	0.92	0.411	247	247	7.94	2.65

Location	Sample	Depth BSF	Specimen				Shear Stage				Mohr	Envelope	Bender I	lement
	ID	[m]	ID	q _{max} [kPa]		ε _{vol} [%]	$arepsilon_{_{m{v}}}$ [%]	σ' _v / σ [-]	h	Rate of Strain [%/hour]	φ' [°]	c' [kPa]	ν _s [m/s]	G _{max} [MPa]
Z3_OWF_BH13-SAMP	13-1	11.00	CID07a	361		-0.81	2.00	6.24		1.30	47.5	6.0	-	-
Z3_OWF_BH13-SAMP	13-1	11.00	CID07b	728		-1.09	2.50	7.82		1.30			-	-
Z3_OWF_BH13-SAMP	13-1	11.00	CID07c	992		-0.84	2.46	6.62		1.30			-	-
Z3_OWF_BH13-SAMP	17-2	15.45	CID08a	238		4.43	18.97	3.42		1.30	33.5	0.0	-	-
3_OWF_BH13-SAMP	17-2	15.45	CID08b	353		4.11	14.84	3.36		1.30			-	-
Z3_OWF_BH13-SAMP	17-2	15.45	CID08c	627		5.00	19.03	3.53		1.30			-	-
Votes														
: Below seafloor					h	: Height		е	: Void rat	tio		σ'_{v}/σ'_{h} : Effective	e stress ratio	
: Specimen cond	tions after pre	paration and before	e saturation		W	: Water content		σ'_{rc}	: Radial e	effective consolidation stress	S	arphi : Effective	angle of internal friction	
: Specimen cond	tions after con	solidation and befo	re shearing		ρ	: Bulk density		σ'_{vc}	: Vertical	effective consolidation stre	ess	c' : Effective	cohesion	
ID : Isotropically co					ρ_d	: Dry density		$arepsilon_{vol}$: Volume	tric strain		v _s : Shear w	ave velocity	
/e : In compression,	'extension				e_0	: Initial void ratio		\mathcal{E}_{v}	: Vertical	strain		G _{max} : Small str	rain shear modulus	
E : Bender element	measurement	S			S_r	: Degree of saturation	on	q_{max}	Maximu	n deviator stress		FF PARTS		
D : Diameter					В	: Skempton paramet	ter							

Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Test Identification	Specimen 1	Specimen 2	Specimen 3		
Location	Z3_OWF_BH01-SAMP	Z3_OWF_BH01-SAMP	Z3_OWF_BH01-SAMP		
Sample	01-01	01-01	01-01		
Depth [m]	0.00	0.00	0.00		
Test number	CID01a	CID01b	CID01c		

Specimen Visual Description

Dark brown slightly silty fine to medium SAND with shell fragments

Initial Specimen Conditions	Specimen 1	Specimen 2	Specimen 3
Test start date	05/06/2025	06/06/2025	05/06/2025
Type of sample	Re-compacted	Re-compacted	Re-compacted
Diameter [mm]	51.2	51.2	51.2
Height [mm]	100.0	100.0	100.0
Water content [%]	10.4	10.3	10.4
Bulk density [Mg/m³]	1.58	1.58	1.58
Dry density [Mg/m³]	1.43	1.43	1.43
Void ratio [-]	0.855	0.851	0.856
Degree of saturation [%]	32	32	32
Type of drains	One end only	One end only	One end only

Project: 503387 - F254727 Laboratory: Wallingford, UK Approved by: LB - 02/07/2025

Z3_OWF_BH01-SAMP / 01-01 / 0



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Saturation	Specimen 1	Specimen 2	Specimen 3
Pressure increments applied [kPa]	100	100	100
Differential pressure used [kPa]	10	10	10
Pore presure on completion [kPa]	692	693	684
Cell pressure on completion [kPa]	700	700	700
B value achieved [-]	0.98	0.99	0.96

Consolidation: Isotropic	Specimen 1	Specimen 2	Specimen 3
Cell pressure [kPa]	706	716	722
Back pressure [kPa]	691	693	684
Effective axial pressure [kPa]	15	23	38
Pore presure on completion [kPa]	691	693	684
Pore presure dissipation [kPa]	-	-	-
Water content [%]	32.1	31.8	31.7
Bulk density [Mg/m³]	1.89	1.90	1.90
Dry density [Mg/m³]	1.43	1.44	1.44
Void ratio [-]	0.851	0.838	0.841
Degree of saturation [%]	100	100	100
Axial strain [%]	0.03	0.21	0.34
Volumetric strain [%]	0.27	0.92	0.79
Volumetric strain rate-end of stage [%/hr]	-0.02	-0.01	-0.01

Project: 503387 - F254727 Laboratory: Wallingford, UK Approved by: LB - 02/07/2025

Z3_OWF_BH01-SAMP / 01-01 / 0



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Shearing	Specimen 1	Specimen 2	Specimen 3
Initial pore pressure [kPa]	691	693	684
Initial effective cell pressure [kPa]	15	23	38
Rate of strain [%/hour]	1.30	1.31	1.30
At peak deviator stress			
Corrected deviator stress [kPa]	40	51	89
Membrane correction applied [kPa]	9.5	7.1	9.2
Drain correction applied [kPa]	0	0	0
Axial strain [%]	19.91	14.94	19.27
Volumetric strain [%]	3.76	2.90	3.55
Major principal effective stress [kPa]	55	73	127
Minor principal effective stress [kPa]	15	22	39
Principal effective stress ratio [-]	3.66	3.33	3.30
ε ₅₀ [%]	1.07	1.14	1.56
Secant modulus (E50) at ε ₅₀ [kPa]	1857	2246	2835
At peak principal effective stress ratio			
Corrected deviator stress [kPa]	39	50	88
Membrane correction applied [kPa]	9.2	9.3	8.4
Drain correction applied [kPa]	0	0	0
Axial strain [%]	19.23	19.82	17.49
Volumetric strain [%]	3.73	3.05	3.50
Major principal effective stress [kPa]	53	71	125
Minor principal effective stress [kPa]	14	21	37
Principal effective stress ratio [-]	3.76	3.39	3.36
At 10% axial strain			
Corrected deviator stress [kPa]	36	49	83
Membrane correction applied [kPa]	4.9	4.8	4.9
Drain correction applied [kPa]	0	0	0
Axial strain [%]	9.99	9.99	10.00
Volumetric strain [%]	2.94	2.49	3.02
Major principal effective stress [kPa]	51	71	120
Minor principal effective stress [kPa]	15	22	37
Principal effective stress ratio [-]	3.43	3.26	3.22

Project: 503387 - F254727 Laboratory: Wallingford, UK Approved by: LB - 02/07/2025

Z3_OWF_BH01-SAMP / 01-01 / 0

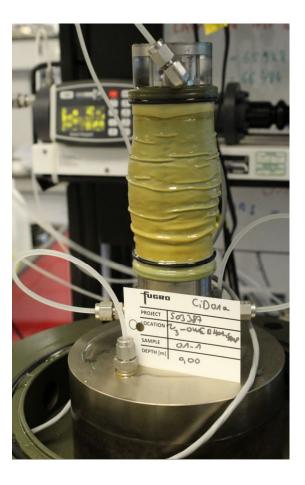


Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Specimen Photographs - 1



Final Conditions - Specimen 1				
Water content [%]	29.5			
Bulk density [Mg/m³]	1.93			
Dry density [Mg/m³]	1.49			
Mode of failure	Compound failure			

 Approved by: LB - 02/07/2025



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018 Specimen Photographs - 2 CiDonb PROJECT SU3387 Final Conditions - Specimen 2 Water content [%] 29.7 1.93 Bulk density [Mg/m³] Dry density [Mg/m³] 1.49

Project: 503387 - F254727 Laboratory: Wallingford, UK A_I Z3_OWF_BH01-SAMP / 01-01 / 0

Approved by: LB - 02/07/2025

Compound failure



Mode of failure

Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Specimen Photographs - 3



Final Conditions - Specimen 3				
Water content [%]	29.2			
Bulk density [Mg/m³]	1.93			
Dry density [Mg/m³]	1.49			
Mode of failure	Compound failure			

Project: 503387 - F254727 Laboratory: Wallingford, UK Approved

Z3_OWF_BH01-SAMP / 01-01 / 0

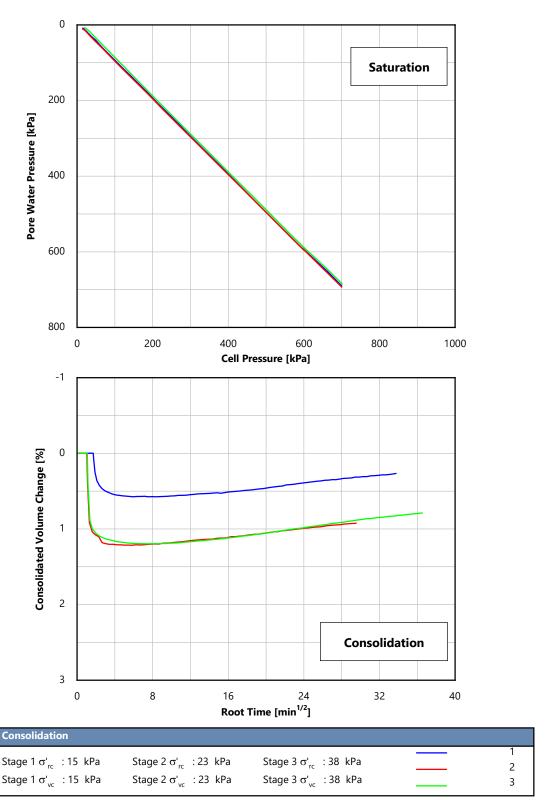
Approved by: LB - 02/07/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Project: 503387 - F254727 CID01a

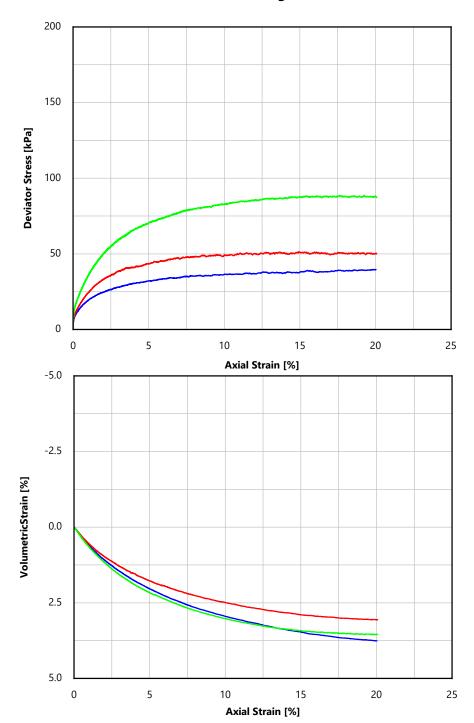
Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP / 01-01 / 0

Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests

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Shearing



Consolidation			
Stage 1 σ' _{rc} : 15 kPa	Stage 2 σ' _{rc} : 23 kPa	Stage 3 σ'_{rc} : 38 kPa	 1
Stage 1 σ' _{vc} : 15 kPa	Stage 2 σ'_{vc} : 23 kPa	Stage 3 σ'_{vc} : 38 kPa	 2
Vc · · ·	vc · · ·	vc · · · ·	 3

Project: 503387 - F254727 CID01a

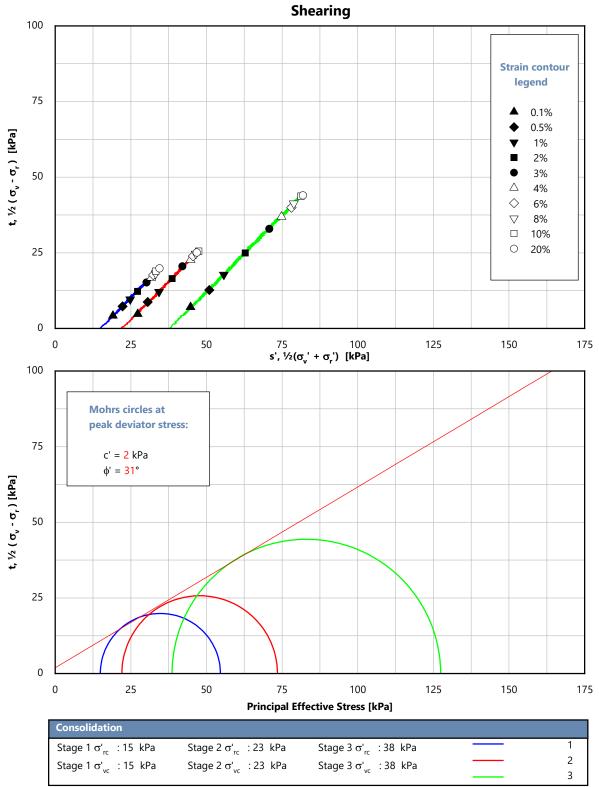
Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP / 01-01 / 0 Approved by: LB 02/07/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Project: 503387 - F254727 CID01a Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP / 01-01 / 0

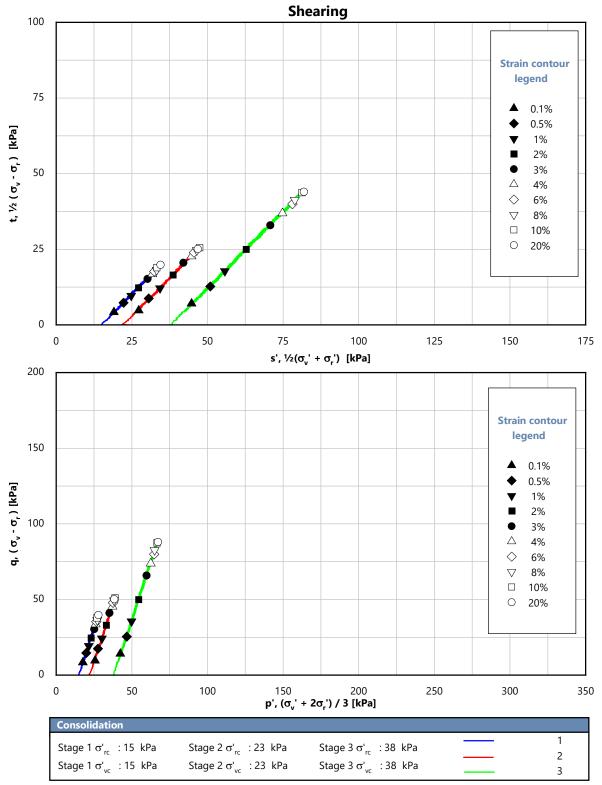
Approved by: LB 02/07/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Project: 503387 - F254727 CID01a Laboratory: Wallingford, UK Z3_OWF_BH01-SAMP / 01-01 / 0

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Test Identification	Specimen 1	Specimen 2	Specimen 3
Location	3_OWF_BH06-SAM	3_OWF_BH06-SAM	3_OWF_BH06-SAM
Sample	01-1	01-1	01-1
Depth [m]	0.00	0.00	0.00
Test number	CID02a	CID02b	CID02c

Specimen Visual Description

Very dark grey fine silty SAND

Initial Specimen Conditions	Specimen 1	Specimen 2	Specimen 3
Test start date	03/07/2025	07/04/2025	07/04/2025
Type of sample	Recompacted	Recompacted	Recompacted
Diameter [mm]	50.5	50.8	50.8
Length [mm]	95.0	95.0	95.0
Water content [%]	10.2	9.8	9.8
Bulk density [Mg/m³]	1.69	1.68	1.68
Dry density [Mg/m³]	1.54	1.53	1.53
Void ratio [-]	0.725	0.728	0.728
Degree of saturation [%]	37	36	36
Type of drains fitted	One end	One end	One end

Project: 503387 - F254727 Test page CID02-1/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 01-1 / 0

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Saturation	Specimen 1	Specimen 2	Specimen 3
Pressure increments applied [kPa]	15	20	30
Differential pressure used [kPa]	5	5	5
Pore pressure on completion [kPa]	315	435	355
Cell pressure on completion [kPa]	320	440	360
B value achieved	0.95	0.95	0.95

Consolidation: Isotropic	Specimen 1	Specimen 2	Specimen 3
Cell pressure [kPa]	335	463	398
Back pressure [kPa]	320	440	360
Effective cell pressure [kPa]	15	23	38
Pore pressure on completion [kPa]	320	440	360
Pore pressure dissipation [%]	100	100	100
Water content [%]	27.2	27.2	27.0
Bulk density [Mg/m³]	1.96	1.96	1.96
Dry density [Mg/m³]	1.54	1.54	1.54
Void ratio [-]	0.721	0.722	0.717
Degree of saturation [%]	100	100	100
Axial strain [%]	0.07	0.13	0.22
Volumetric strain [%]	0.20	0.39	0.65
Volumetric strain rate-end of stage [%/hr]	0.08	0.05	0.06

Project: 503387 - F254727 Test page CID02-2/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 01-1 / 0

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

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Shearing	Specimen 1	Specimen 2	Specimen 3
Initial pore pressure [kPa]	320	440	360
Initial effective cell pressure [kPa]	15	23	38
Rate of strain [%/hour]	1.30	1.30	1.30
At peak deviator stress			
Corrected deviator stress [kPa]	25	55	105
Membrane correction applied [kPa]	3.5	2.6	2.9
Drain correction applied [kPa]	0	0	0
Axial strain [%]	19.25	12.27	14.75
Volumetric strain [%]	2.21	1.41	2.90
Major principal effective stress [kPa]	36	77	145
Minor principal effective stress [kPa]	11	22	39
Principal effective stress ratio	3.19	3.50	3.68
ε ₅₀ [%]	0.35	0.41	1.05
Secant modulus (E_{50}) at ϵ_{50} [kPa]	3473	6807	5036
At peak principal effective stress ratio			
Corrected deviator stress [kPa]	25	55	105
Membrane correction applied [kPa]	3.6	2.3	2.7
Drain correction applied [kPa]	0	0	0
Axial strain [%]	20.00	11.01	13.50
Volumetric strain [%]	2.21	1.39	2.85
Major principal effective stress [kPa]	35	77	144
Minor principal effective stress [kPa]	11	22	39
Principal effective stress ratio	3.27	3.51	3.70
At 10% axial strain			
Corrected deviator stress [kPa]	23	55	102
Membrane correction applied [kPa]	2.2	2.2	2.2
Drain correction applied [kPa]	0	0	0
Axial strain [%]	10.00	10.00	10.00
Volumetric strain [%]	1.86	1.37	2.64
Major principal effective stress [kPa]	34	77	141
Minor principal effective stress [kPa]	11	22	39
Principal effective stress ratio	3.04	3.46	3.61

Project: 503387 - F254727 Test page CID02-3/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 01-1 / 0

Approved by: ET - 14/08/2025



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Photographs				
Specimen 1	Specimen 2	Specimen 3		
Photograph Unavailable	Photograph Unavailable	Photograph Unavailable		

Final Conditions	Specimen 1	Specimen 2	Specimen 3
Water content [%]	25.8	27.2	27.0
Bulk density [Mg/m³]	1.98	1.96	1.96
Dry density [Mg/m³]	1.57	1.54	1.54
Mode of failure	Compound failure	Compound failure	Compound failure

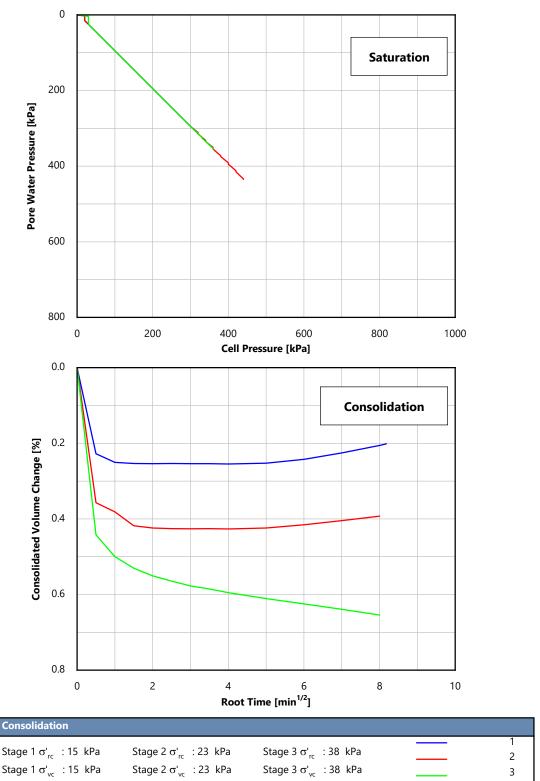
Project: 503387 - F254727 Test page CID02-4/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 01-1 / 0 Approved by: ET - 14/08/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests







Project: 503387 - F254727 CID02

Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 01-1 / 0

Approved by: ET 14/08/2025

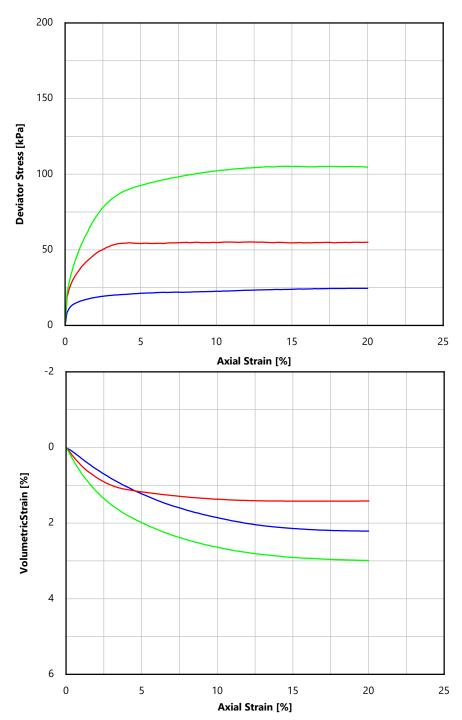


Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests

ISO 17892-9:2018







Consolidation			
Stage 1 σ' _{rc} : 15 kPa	Stage 2 σ'_{rc} : 23 kPa	Stage 3 σ'_{rc} : 38 kPa	 1 2
Stage 1 σ' _{vc} : 15 kPa	Stage 2 σ'_{vc} : 23 kPa	Stage 3 σ'_{vc} : 38 kPa	 3

Project: 503387 - F254727 CID02

Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 01-1 / 0

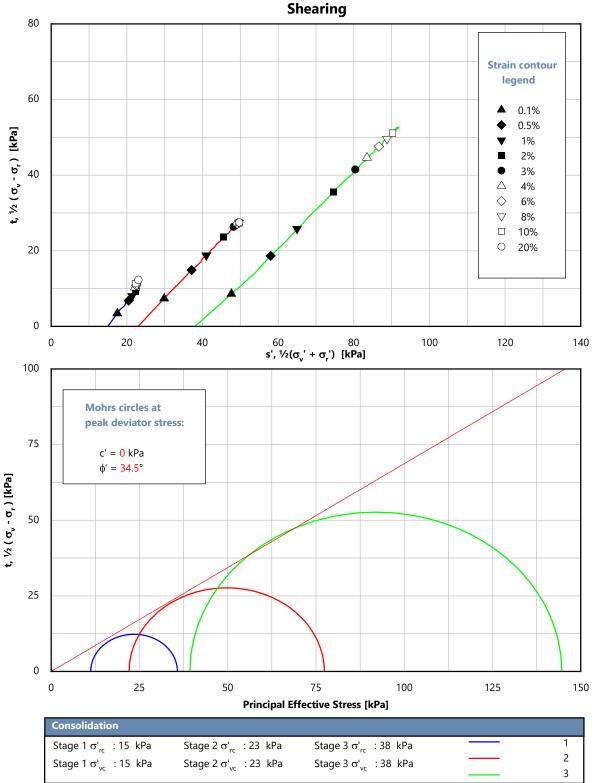
Approved by: ET 14/08/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



Project: 503387 - F254727 CID02

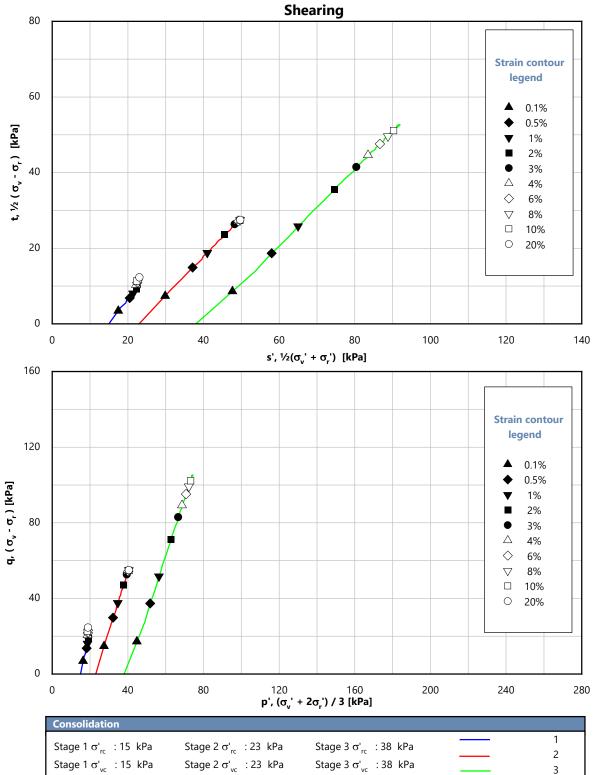
Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 01-1 / 0

Approved by: ET 14/08/2025

Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



Project: 503387 - F254727 CID02

Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 01-1 / 0

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Test Identification	Specimen 1	Specimen 2	Specimen 3
Location	Z3_OWF_BH06-SAMP	Z3_OWF_BH06-SAMP	Z3_OWF_BH06-SAMP
Sample	07-2	07-2	07-2
Depth [m]	6.30	6.30	6.30
Test number	CID03a	CID03b	CID03c

Specimen Visual Description

Greyish brown fine to medium SAND

Initial Specimen Conditions	Specimen 1	Specimen 2	Specimen 3
Test start date	19/05/2025	19/05/2025	08/05/2025
Type of sample	Recompacted	Recompacted	Recompacted
Diameter [mm]	50.5	50.5	50.5
Length [mm]	95.0	95.0	95.0
Water content [%]	9.9	9.9	10.0
Bulk density [Mg/m³]	1.72	1.72	1.71
Dry density [Mg/m³]	1.56	1.57	1.56
Void ratio [-]	0.697	0.692	0.701
Degree of saturation [%]	38	38	38
Type of drains fitted	One end	One end	One end

Project: 503387 - F254727 Test page CID03-1/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 07-2 / 6.3



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Saturation	Specimen 1	Specimen 2	Specimen 3
Pressure increments applied [kPa]	35	50	50
Differential pressure used [kPa]	10	10	10
Pore pressure on completion [kPa]	375	390	540
Cell pressure on completion [kPa]	385	400	550
B value achieved	0.97	0.96	0.92

Consolidation: Isotropic	Specimen 1	Specimen 2	Specimen 3
Cell pressure [kPa]	425	460	650
Back pressure [kPa]	385	400	550
Effective cell pressure [kPa]	40	60	100
Pore pressure on completion [kPa]	385	400	550
Pore pressure dissipation [%]	100	100	100
Water content [%]	26.2	25.9	26.0
Bulk density [Mg/m³]	1.97	1.98	1.98
Dry density [Mg/m³]	1.56	1.57	1.57
Void ratio [-]	0.694	0.685	0.690
Degree of saturation [%]	100	100	100
Axial strain [%]	0.06	0.13	0.23
Volumetric strain [%]	0.17	0.40	0.69
Volumetric strain rate-end of stage [%/hr]	0.04	0.01	0.02

Project: 503387 - F254727 Test page CID03-2/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 07-2 / 6.3



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

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Shearing	Specimen 1	Specimen 2	Specimen 3
Initial pore pressure [kPa]	385	400	550
Initial effective cell pressure [kPa]	40	60	100
Rate of strain [%/hour]	1.30	1.30	1.30
At peak deviator stress			
Corrected deviator stress [kPa]	107	189	330
Membrane correction applied [kPa]	0.6	0.5	0.9
Drain correction applied [kPa]	0	0	0
Axial strain [%]	2.20	2.00	3.50
Volumetric strain [%]	-0.18	-0.41	-0.47
Major principal effective stress [kPa]	147	249	434
Minor principal effective stress [kPa]	40	60	104
Principal effective stress ratio	3.69	4.14	4.18
ε ₅₀ [%]	0.49	0.25	0.55
Secant modulus (E_{50}) at ϵ_{50} [kPa]	10936	38053	29988
At peak principal effective stress ratio			
Corrected deviator stress [kPa]	107	189	330
Membrane correction applied [kPa]	0.6	0.5	0.9
Drain correction applied [kPa]	0	0	0
Axial strain [%]	2.20	2.00	3.50
Volumetric strain [%]	-0.18	-0.41	-0.47
Major principal effective stress [kPa]	147	249	434
Minor principal effective stress [kPa]	40	60	104
Principal effective stress ratio	3.69	4.14	4.18
At 10% axial strain			
Corrected deviator stress [kPa]	91	159	270
Membrane correction applied [kPa]	2.3	2.3	2.3
Drain correction applied [kPa]	0	0	0
Axial strain [%]	10.00	10.00	10.00
Volumetric strain [%]	-0.67	-1.70	-2.11
Major principal effective stress [kPa]	131	220	374
Minor principal effective stress [kPa]	40	61	104
Principal effective stress ratio	3.27	3.62	3.59

Project: 503387 - F254727 Test page CID03-3/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 07-2 / 6.3

Approved by: ET - 25/06/2025



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Photographs Specimen 1 Specimen 2 Specimen 3				
Specimen i	Specimen 2	Specimen 3		
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Final Conditions	Specimen 1	Specimen 2	Specimen 3
Water content [%]	26.7	25.9	26.0
Bulk density [Mg/m³]	1.97	1.98	1.98
Dry density [Mg/m³]	1.55	1.57	1.57
Mode of failure	Compound failure	Compound failure	Compound failure

Project: 503387 - F254727 Test page CID03-4/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 07-2 / 6.3

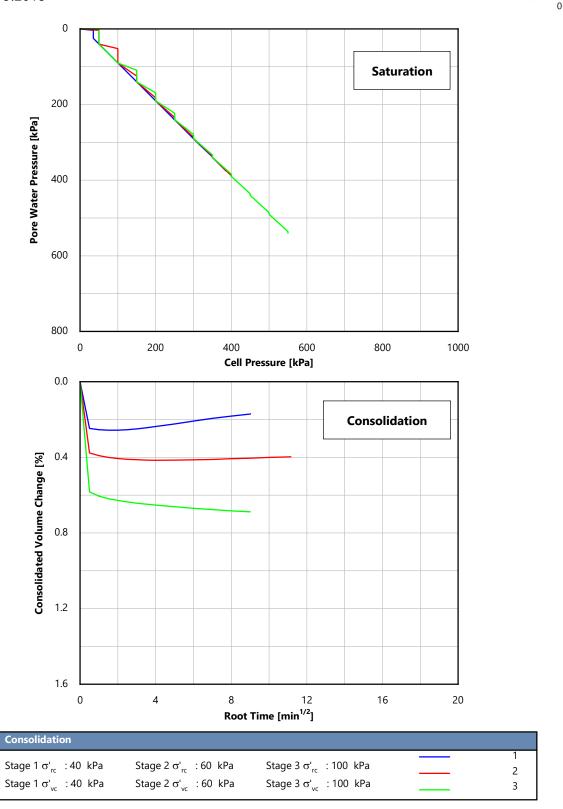
Approved by: ET - 25/06/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests

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ISO 17892-9:2018



Project: 503387 - F254727 CID03 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 07-2 / 6.3

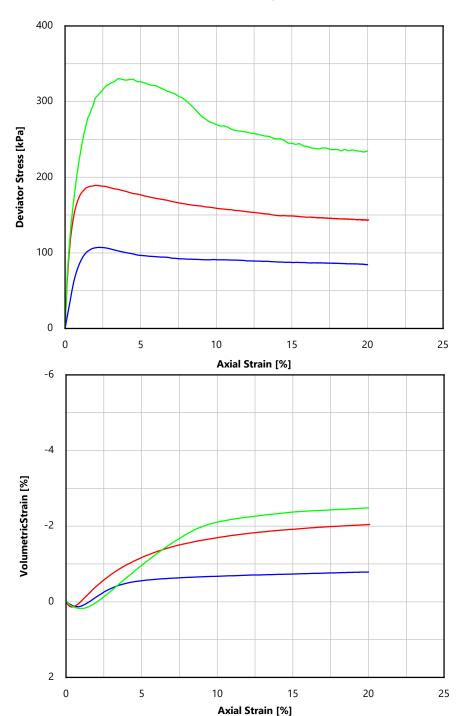
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Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests

ISO 17892-9:2018







Consolidation			
Stage 1 σ' _{rc} : 40 kPa	Stage 2 σ' _{rc} : 60 kPa	Stage 3 σ'_{rc} : 100 kPa	 1 2
Stage 1 σ' _{vc} : 40 kPa	Stage 2 σ'_{vc} : 60 kPa	Stage 3 σ'_{vc} : 100 kPa	 3

Project: 503387 - F254727 CID03

Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 07-2 / 6.3

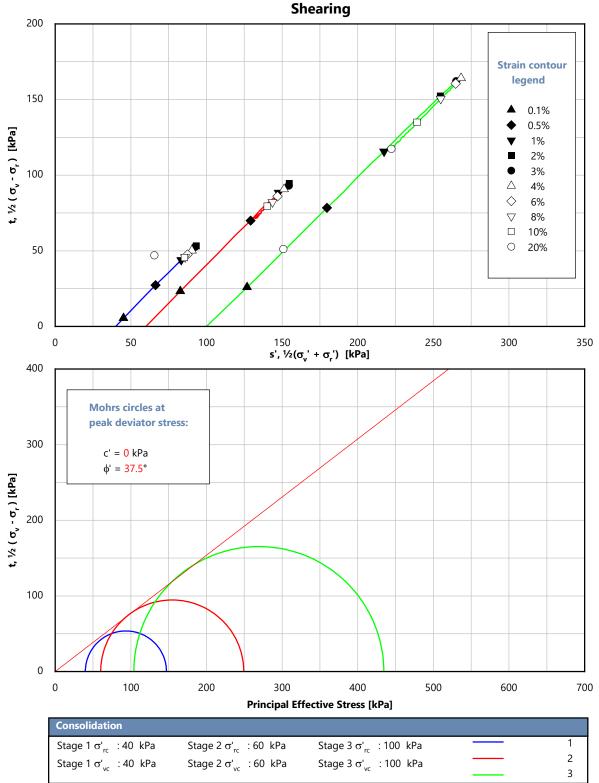
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Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



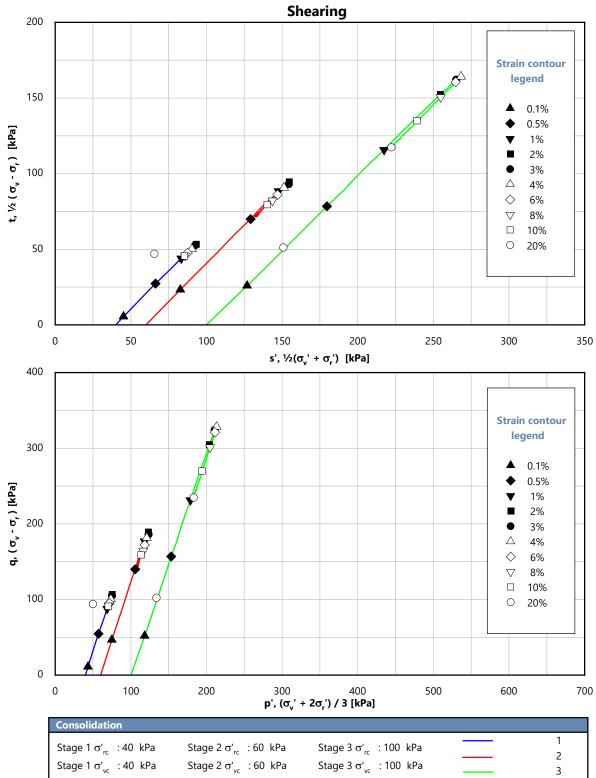
Project: 503387 - F254727 CID03 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 07-2 / 6.3

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Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



Project: 503387 - F254727 CID03

Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 07-2 / 6.3

Approved by: ET 25/06/2025



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Test Identification	Specimen 1	Specimen 2	Specimen 3
Location	Z3_OWF_BH06-SAMP	Z3_OWF_BH06-SAMP	Z3_OWF_BH06-SAMP
Sample	11-1	11-1	11-1
Depth [m]	10.00	10.00	10.00
Test number	CID04a	CID04b	CID04c

Specimen Visual Description

Dark grey coarse SAND

Initial Specimen Conditions	Specimen 1	Specimen 2	Specimen 3
Test start date	01/04/2025	19/03/2025	25/03/2025
Type of sample	Recompacted	Recompacted	Recompacted
Diameter [mm]	50.8	50.8	50.8
Length [mm]	95.0	95.0	95.0
Water content [%]	10.2	9.9	9.8
Bulk density [Mg/m³]	2.09	2.09	2.09
Dry density [Mg/m³]	1.90	1.90	1.90
Void ratio [-]	0.398	0.394	0.392
Degree of saturation [%]	68	67	66
Type of drains fitted	One end	One end	One end

Project: 503387 - F254727 Test page CID04-1/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 11-1 / 10

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Saturation	Specimen 1	Specimen 2	Specimen 3
Pressure increments applied [kPa]	50	50	50
Differential pressure used [kPa]	10	10	10
Pore pressure on completion [kPa]	340	390	340
Cell pressure on completion [kPa]	350	400	350
B value achieved	0.94	0.96	0.96

Consolidation: Isotropic	Specimen 1	Specimen 2	Specimen 3
Cell pressure [kPa]	416	499	515
Back pressure [kPa]	350	400	350
Effective cell pressure [kPa]	66	99	165
Pore pressure on completion [kPa]	350	400	350
Pore pressure dissipation [%]	100	100	100
Water content [%]	14.7	14.4	14.1
Bulk density [Mg/m³]	2.19	2.19	2.20
Dry density [Mg/m³]	1.91	1.92	1.93
Void ratio [-]	0.391	0.383	0.373
Degree of saturation [%]	100	100	100
Axial strain [%]	0.18	0.28	0.46
Volumetric strain [%]	0.53	0.84	1.39
Volumetric strain rate-end of stage [%/hr]	0.00	0.02	0.06

Project: 503387 - F254727 Test page CID04-2/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 11-1 / 10



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

			0919
Shearing	Specimen 1	Specimen 2	Specimen 3
Initial pore pressure [kPa]	350	400	350
Initial effective cell pressure [kPa]	66	99	165
Rate of strain [%/hour]	1.30	1.30	1.30
At peak deviator stress			
Corrected deviator stress [kPa]	390	619	962
Membrane correction applied [kPa]	0.7	0.8	0.6
Drain correction applied [kPa]	0	0	0
Axial strain [%]	2.60	3.01	2.44
Volumetric strain [%]	-1.11	-1.01	-0.61
Major principal effective stress [kPa]	455	719	1130
Minor principal effective stress [kPa]	65	100	168
Principal effective stress ratio	7.02	7.17	6.73
ε ₅₀ [%]	0.62	1.14	0.70
Secant modulus (E_{50}) at ϵ_{50} [kPa]	31649	27077	68593
At peak principal effective stress ratio			
Corrected deviator stress [kPa]	390	619	962
Membrane correction applied [kPa]	0.7	0.8	0.6
Drain correction applied [kPa]	0	0	0
Axial strain [%]	2.60	3.01	2.44
Volumetric strain [%]	-1.11	-1.01	-0.61
Major principal effective stress [kPa]	455	719	1130
Minor principal effective stress [kPa]	65	100	168
Principal effective stress ratio	7.02	7.17	6.73
At 10% axial strain			
Corrected deviator stress [kPa]	205	297	492
Membrane correction applied [kPa]	2.2	2.2	2.2
Drain correction applied [kPa]	0	0	0
Axial strain [%]	10.00	10.00	10.00
Volumetric strain [%]	-3.99	-3.75	-1.92
Major principal effective stress [kPa]	270	397	660
Minor principal effective stress [kPa]	65	101	168
Principal effective stress ratio	4.16	3.95	3.93

Project: 503387 - F254727 Test page CID04-3/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 11-1 / 10

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

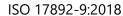
Specimen 1 Specimen 2 Specimen 3 Photograph unavailable. Photograph unavailable.			Photographs
Photograph unavailable. Photograph unavailable.	Specimen 3	Specimen 2	Specimen 1
FUERD PROJECT SOSS 8 7 LOCATION Z3_CWF_2HOS SAMPE 11-1 DEPTH [m] 10.00	Photograph unavailable.	CIDOUB FUGRO PROJECT 503387 LOCATION Z3_OWF_2HOCS SAMP SAMPLE 11-1	Specimen 1

Final Conditions	Specimen 1	Specimen 2	Specimen 3
Water content [%]	14.7	16.7	15.2
Bulk density [Mg/m³]	2.19	2.14	2.18
Dry density [Mg/m³]	1.91	1.84	1.89
Mode of failure	Compound failure	Compound failure	Compound failure

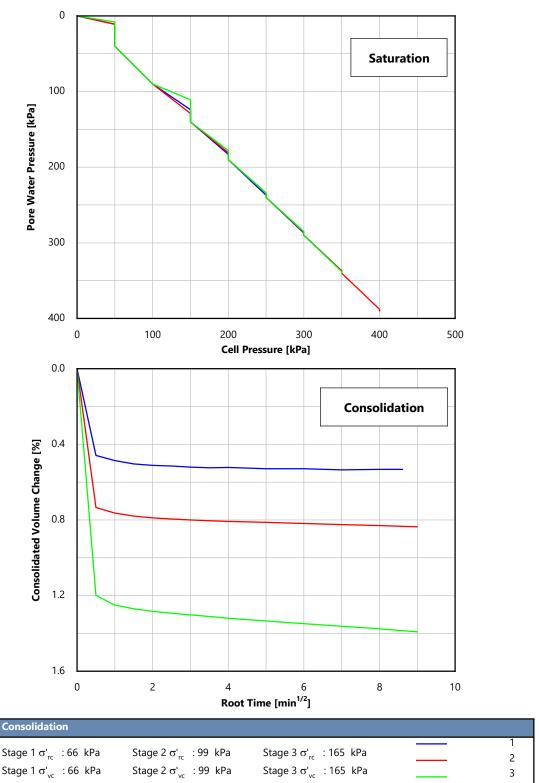
Project: 503387 - F254727 Test page CID04-4/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 11-1 / 10



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests







Project: 503387 - F254727 CID04

Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 11-1 / 10

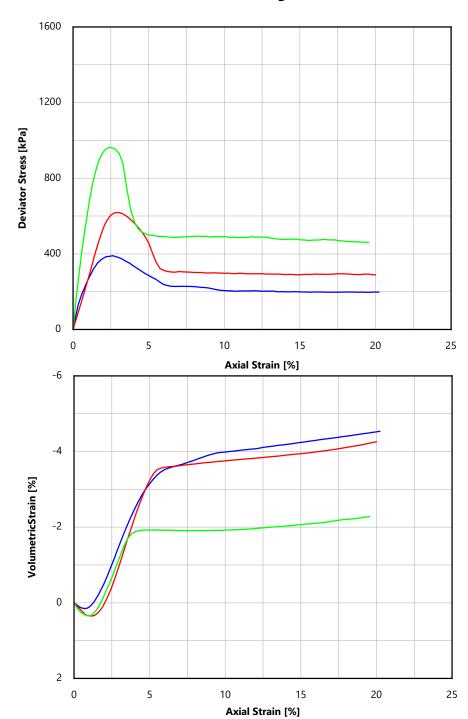


Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests

ISO 17892-9:2018



Shearing



Consolidation			
Stage 1 σ'_{rc} : 66 kPa	Stage 2 σ' _{rc} : 99 kPa	Stage 3 σ'_{rc} : 165 kPa	 1 2
Stage 1 σ' _{vc} : 66 kPa	Stage 2 σ'_{vc} : 99 kPa	Stage 3 σ' _{vc} : 165 kPa	 3

Project: 503387 - F254727 CID04

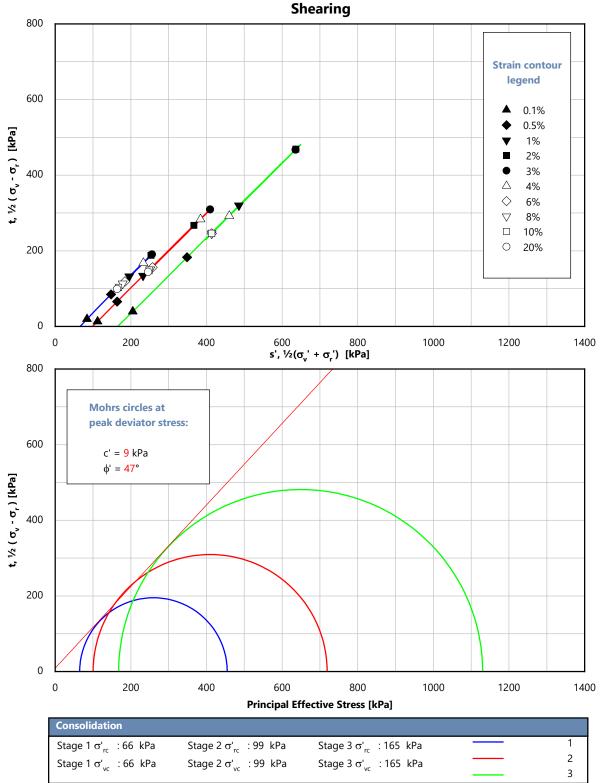
Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 11-1 / 10



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



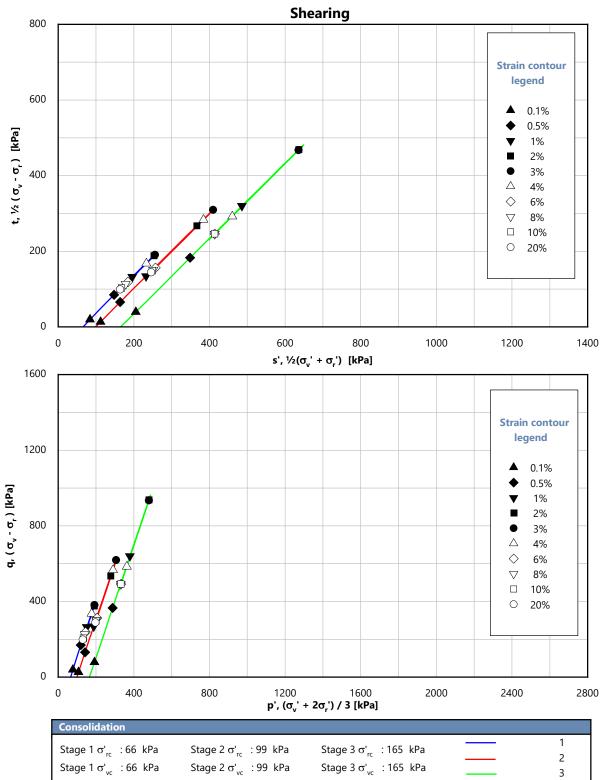
Project: 503387 - F254727 CID04 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 11-1 / 10



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



Project: 503387 - F254727 CID04 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 11-1 / 10



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Test Identification	Specimen 1	Specimen 2	Specimen 3
Location	Z3_OWF_BH06-SAMP	Z3_OWF_BH06-SAMP	Z3_OWF_BH06-SAMP
Sample	19-1	19-1	19-1
Depth [m]	15.00	15.00	15.00
Test number	CID05a	CID05b	CID05c

Specimen Visual Description	
Grey fine SAND	

Initial Specimen Conditions	Specimen 1	Specimen 2	Specimen 3
Test start date	27/03/2025	01/04/2025	02/04/2025
Type of sample	Recompacted	Recompacted	Recompacted
Diameter [mm]	50.8	50.8	50.8
Length [mm]	95.0	95.0	95.0
Water content [%]	10.4	9.7	9.7
Bulk density [Mg/m³]	2.09	2.09	2.09
Dry density [Mg/m³]	1.90	1.90	1.90
Void ratio [-]	0.397	0.395	0.392
Degree of saturation [%]	69	65	66
Type of drains fitted	One end	One end	One end

Project: 503387 - F254727 Test page CID05-1/8

Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 19-1 / 15

Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Saturation	Specimen 1	Specimen 2	Specimen 3
Pressure increments applied [kPa]	50	50	50
Differential pressure used [kPa]	10	10	10
Pore pressure on completion [kPa]	390	440	440
Cell pressure on completion [kPa]	400	450	450
B value achieved	0.96	0.94	0.98

Consolidation: Isotropic	Specimen 1	Specimen 2	Specimen 3
Cell pressure [kPa]	498	597	695
Back pressure [kPa]	400	450	450
Effective cell pressure [kPa]	98	147	245
Pore pressure on completion [kPa]	400	450	450
Pore pressure dissipation [%]	100	100	100
Water content [%]	14.5	14.3	13.9
Bulk density [Mg/m³]	2.19	2.20	2.21
Dry density [Mg/m³]	1.91	1.92	1.94
Void ratio [-]	0.384	0.378	0.368
Degree of saturation [%]	100	100	100
Axial strain [%]	0.31	0.39	0.56
Volumetric strain [%]	0.92	1.16	1.68
Volumetric strain rate-end of stage [%/hr]	0.05	0.01	0.00

Project: 503387 - F254727 Test page CID05-2/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 19-1 / 15



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Claration	C	C	0919
Shearing	Specimen 1	Specimen 2	Specimen 3
Initial pore pressure [kPa]	400	450	450
Initial effective cell pressure [kPa]	98	147	245
Rate of strain [%/hour]	1.30	1.30	1.30
At peak deviator stress			
Corrected deviator stress [kPa]	750	959	1507
Membrane correction applied [kPa]	0.8	0.7	0.7
Drain correction applied [kPa]	0	0	0
Axial strain [%]	3.27	2.91	2.84
Volumetric strain [%]	-1.35	-0.90	-0.80
Major principal effective stress [kPa]	852	1110	1756
Minor principal effective stress [kPa]	102	151	249
Principal effective stress ratio	8.33	7.37	7.06
ε ₅₀ [%]	1.35	1.19	1.24
Secant modulus (E_{50}) at ε_{50} [kPa]	27775	40336	60842
At peak principal effective stress ratio			
Corrected deviator stress [kPa]	749	959	1507
Membrane correction applied [kPa]	0.8	0.7	0.7
Drain correction applied [kPa]	0	0	0
Axial strain [%]	3.02	2.91	2.84
Volumetric strain [%]	-0.98	-0.90	-0.80
Major principal effective stress [kPa]	851	1110	1756
Minor principal effective stress [kPa]	102	151	249
Principal effective stress ratio	8.36	7.37	7.06
At 10% axial strain			
Corrected deviator stress [kPa]	373	505	857
Membrane correction applied [kPa]	2.2	2.2	2.2
Drain correction applied [kPa]	0	0	0
Axial strain [%]	10.00	10.00	10.00
Volumetric strain [%]	-3.01	-2.51	-2.84
Major principal effective stress [kPa]	475	656	1105
Minor principal effective stress [kPa]	102	150	249
Principal effective stress ratio	4.66	4.37	4.44

Project: 503387 - F254727 Test page CID05-3/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 19-1 / 15

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Photographs		
Specimen 1	Specimen 2	Specimen 3
TUGRD CIOCA- PROJECT SO3387 OCATION ELOWE-DHGG-SAMP SAMPLE 14-1 DEPTH (m) 15-00-13-ES	Photograph Unavailable	Photograph Unavailable

Final Conditions	Specimen 1	Specimen 2	Specimen 3
Water content [%]	16.2	15.9	15.6
Bulk density [Mg/m³]	2.15	2.16	2.17
Dry density [Mg/m³]	1.85	1.86	1.88
Mode of failure	Compound failure	Compound failure	Compound failure

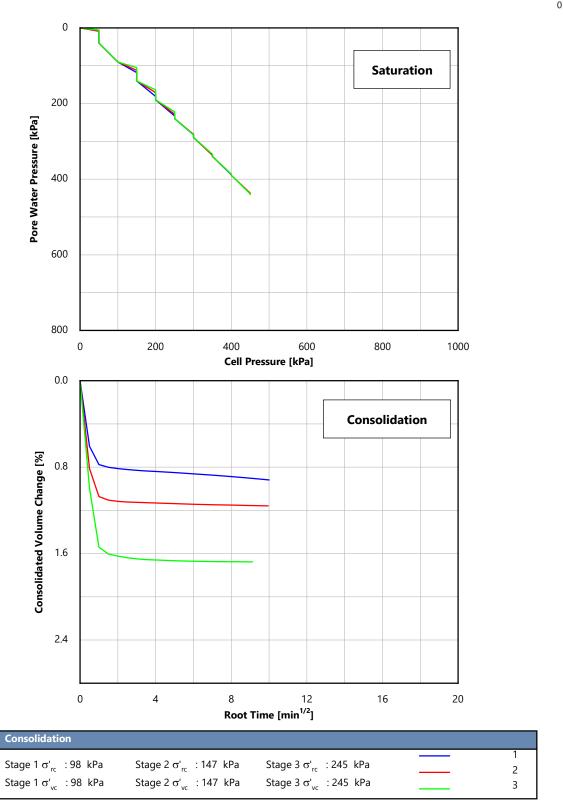
Project: 503387 - F254727 Test page CID05-4/8 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 19-1 / 15



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



Project: 503387 - F254727 CID05 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 19-1 / 15

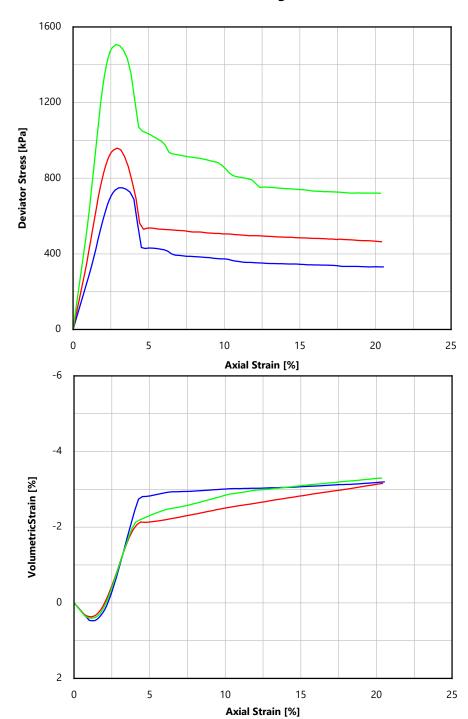
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Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests

ISO 17892-9:2018



Shearing



Consolidation			
Stage 1 σ'_{rc} : 98 kPa	Stage 2 σ' _{rc} : 147 kPa	Stage 3 σ' _{rc} : 245 kPa	 1 2
Stage 1 σ' _{vc} : 98 kPa	Stage 2 σ'_{vc} : 147 kPa	Stage 3 σ'_{vc} : 245 kPa	 3

Project: 503387 - F254727 CID05

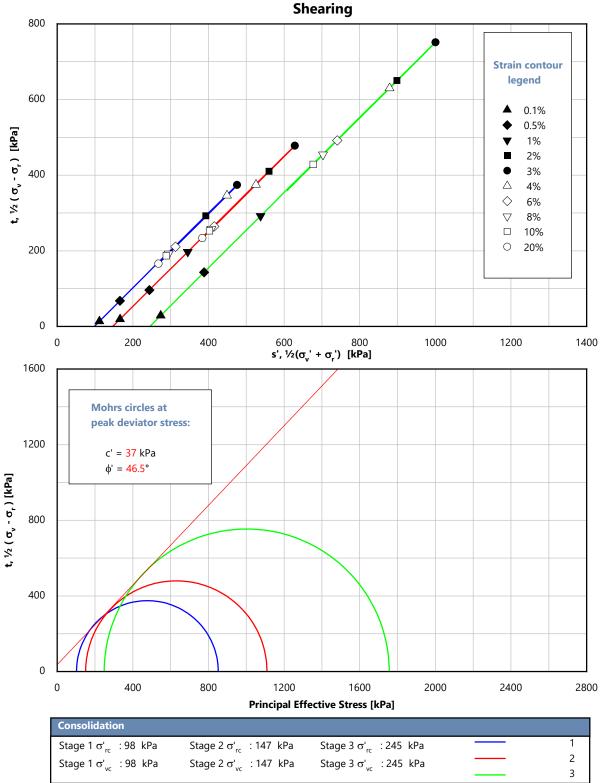
Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 19-1 / 15



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



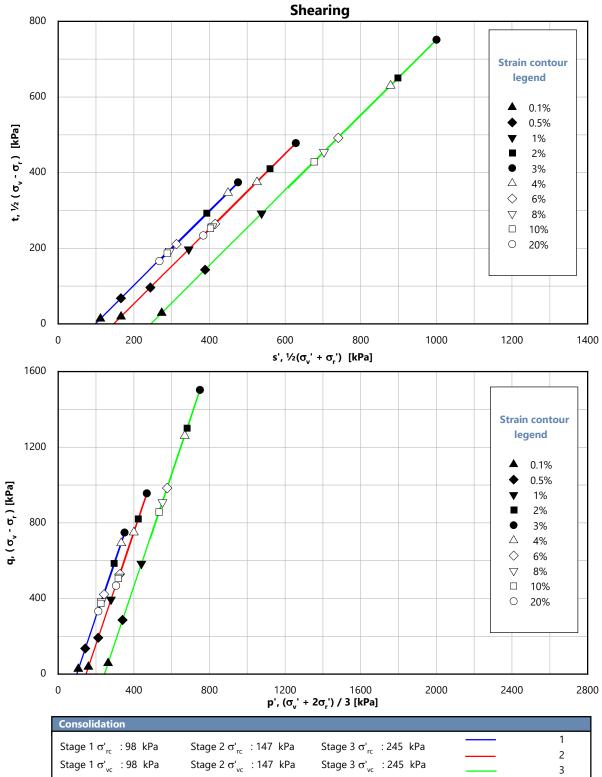
Project: 503387 - F254727 CID05 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 19-1 / 15

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Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



Project: 503387 - F254727 CID05 Laboratory: Wallingford, UK Z3_OWF_BH06-SAMP / 19-1 / 15



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Test Identification	Specimen 1	Specimen 2	Specimen 3
Location	Z3_OWF_BH13-SAMF	Z3_OWF_BH13-SAMP	Z3_OWF_BH13-SAMP
Sample	10-2	10-2	10-2
Depth [m]	8.15	8.15	8.15
Test number	CID06a	CID06b	CID06c

Specimen Visual Description

Olive brown fine SAND

Initial Specimen Conditions	Specimen 1	Specimen 2	Specimen 3
Test start date	21/03/2025	23/03/2025	23/03/2025
Type of sample	Recompacted	Recompacted	Recompacted
Diameter [mm]	50.8	50.8	50.8
Length [mm]	95.0	95.0	95.0
Water content [%]	10.2	10.2	10.2
Bulk density [Mg/m³]	1.66	1.66	1.66
Dry density [Mg/m³]	1.51	1.51	1.51
Void ratio [-]	0.758	0.758	0.758
Degree of saturation [%]	36	36	36
Type of drains fitted	One end	One end	One end

Project: 503387 - F254727 Test page CID06-1/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 10-2 / 8.15

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Saturation	Specimen 1	Specimen 2	Specimen 3
Pressure increments applied [kPa]	50	50	50
Differential pressure used [kPa]	10	10	10
Pore pressure on completion [kPa]	540	390	590
Cell pressure on completion [kPa]	550	400	600
B value achieved	0.92	0.96	0.92

Consolidation: Isotropic	Specimen 1	Specimen 2	Specimen 3
Cell pressure [kPa]	602	478	731
Back pressure [kPa]	550	400	600
Effective cell pressure [kPa]	52	78	131
Pore pressure on completion [kPa]	550	400	600
Pore pressure dissipation [%]	100	100	100
Water content [%]	28.4	28.2	28.0
Bulk density [Mg/m³]	1.94	1.94	1.95
Dry density [Mg/m³]	1.51	1.52	1.52
Void ratio [-]	0.752	0.748	0.743
Degree of saturation [%]	100	100	100
Axial strain [%]	0.13	0.20	0.29
Volumetric strain [%]	0.39	0.59	0.88
Volumetric strain rate-end of stage [%/hr]	0.00	0.04	0.06

Project: 503387 - F254727 Test page CID06-2/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 10-2 / 8.15



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

			0919
Shearing	Specimen 1	Specimen 2	Specimen 3
Initial pore pressure [kPa]	550	400	600
Initial effective cell pressure [kPa]	52	78	131
Rate of strain [%/hour]	1.30	1.30	1.30
At peak deviator stress			
Corrected deviator stress [kPa]	158	213	348
Membrane correction applied [kPa]	1.3	1.9	1.8
Drain correction applied [kPa]	0	0	0
Axial strain [%]	5.15	7.39	7.25
Volumetric strain [%]	-0.09	0.08	0.41
Major principal effective stress [kPa]	212	290	476
Minor principal effective stress [kPa]	54	77	128
Principal effective stress ratio	3.90	3.75	3.72
ε ₅₀ [%]	0.66	0.53	0.61
Secant modulus (E_{50}) at ϵ_{50} [kPa]	11895	20201	28541
At peak principal effective stress ratio			
Corrected deviator stress [kPa]	157	213	347
Membrane correction applied [kPa]	1.2	1.9	1.8
Drain correction applied [kPa]	0	0	0
Axial strain [%]	4.40	7.39	7.00
Volumetric strain [%]	0.00	0.08	0.42
Major principal effective stress [kPa]	211	290	475
Minor principal effective stress [kPa]	54	77	128
Principal effective stress ratio	3.91	3.75	3.72
At 10% axial strain			
Corrected deviator stress [kPa]	144	212	343
Membrane correction applied [kPa]	2.4	2.4	2.4
Drain correction applied [kPa]	0	0	0
Axial strain [%]	10.00	10.00	10.00
Volumetric strain [%]	-0.48	-0.04	0.34
Major principal effective stress [kPa]	200	290	472
Minor principal effective stress [kPa]	55	78	129
Principal effective stress ratio	3.62	3.73	3.66

Project: 503387 - F254727 Test page CID06-3/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 10-2 / 8.15

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Photographs Specimen 1					
Specimen i	Specimen 2	Specimen 3			
Photograph unavailable	Photograph unavailable	CIDOGC FIGRO PROJECT SO3387 LOCATION 23 OWF. 8H 13 -SAMPLE 10 - 2 DEPTH [m] 815 - 8-50			

Final Conditions	Specimen 1	Specimen 2	Specimen 3
Water content [%]	28.8	28.2	28.0
Bulk density [Mg/m³]	1.94	1.94	1.95
Dry density [Mg/m³]	1.50	1.52	1.52
Mode of failure	Compound failure	Barrel	Compound failure

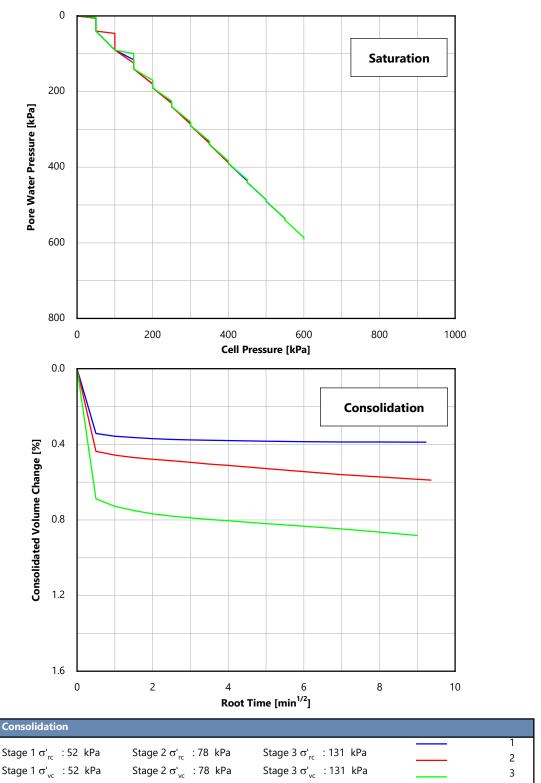
Project: 503387 - F254727 Test page CID06-4/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 10-2 / 8.15



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests







Project: 503387 - F254727 CID06 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 10-2 / 8.15

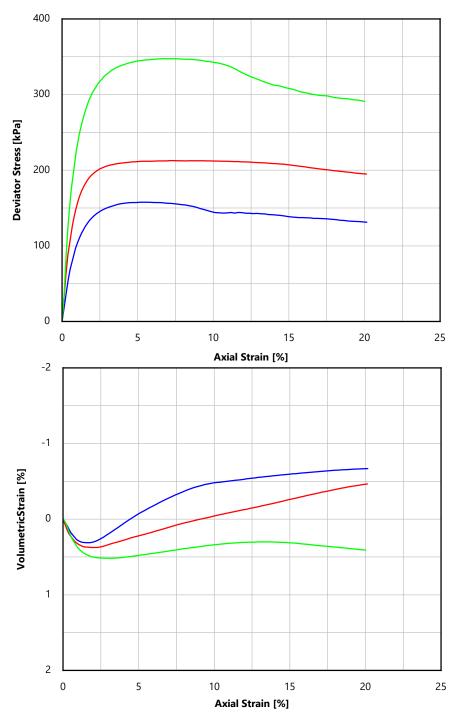


Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests

ISO 17892-9:2018







Consolidation			
Stage 1 σ' _{rc} : 52 kPa	Stage 2 σ' _{rc} : 78 kPa	Stage 3 σ' _{rc} : 131 kPa	 1 2
Stage 1 σ' _{vc} : 52 kPa	Stage 2 σ'_{vc} : 78 kPa	Stage 3 σ'_{vc} : 131 kPa	 3

Project: 503387 - F254727 CID06

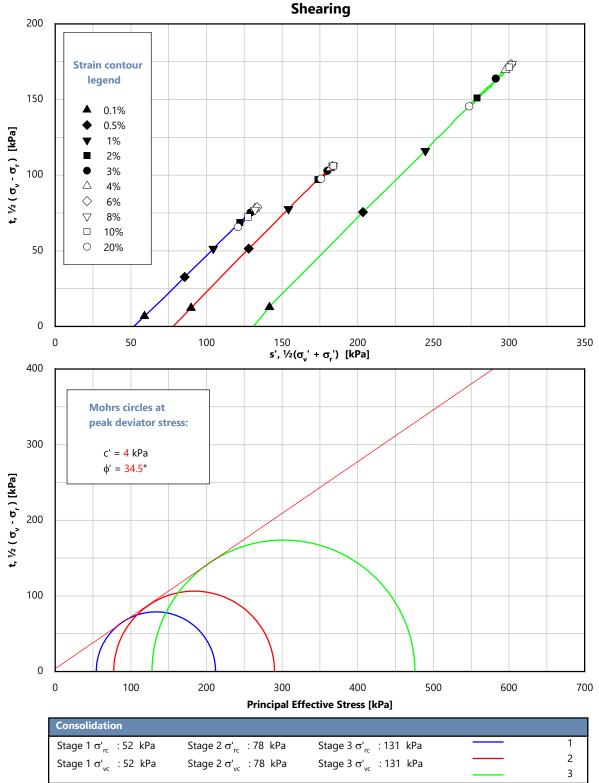
Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 10-2 / 8.15



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



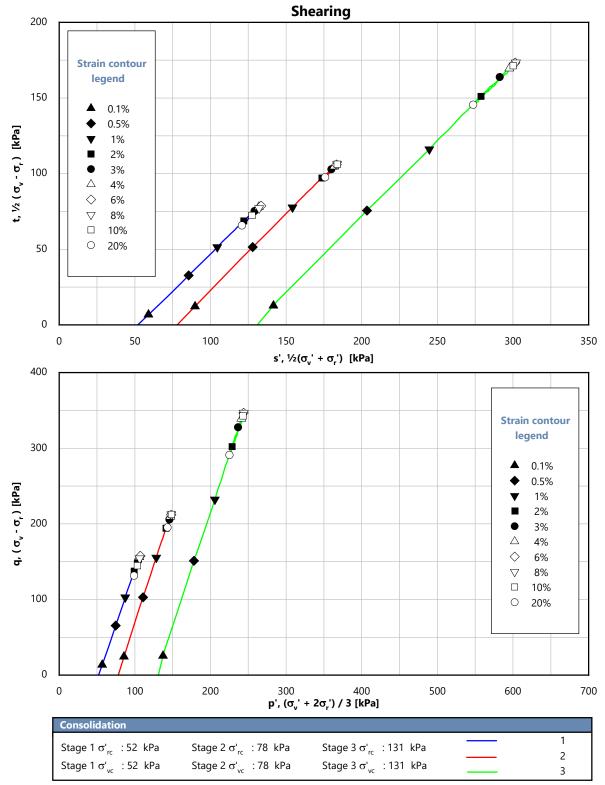
Project: 503387 - F254727 CID06 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 10-2 / 8.15



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



Project: 503387 - F254727 CID06 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 10-2 / 8.15



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Test Identification	Specimen 1	Specimen 2	Specimen 3
Location	Z3_OWF_BH13-SAMP	Z3_OWF_BH13-SAMP	Z3_OWF_BH13-SAMP
Sample	13-1	13-1	13-1
Depth [m]	11.00	11.00	11.00
Test number	CID07a	CID07b	CID07c

Specimen Visual Description

Olive borwn fine SAND

Initial Specimen Conditions	Specimen 1	Specimen 2	Specimen 3
Test start date	19/03/2025	26/03/2025	19/03/2025
Type of sample	Recompacted	Recompacted	Recompacted
Diameter [mm]	50.8	50.8	50.8
Length [mm]	95.0	95.0	95.0
Water content [%]	10.0	9.9	10.0
Bulk density [Mg/m³]	2.09	2.09	2.09
Dry density [Mg/m³]	1.90	1.90	1.90
Void ratio [-]	0.395	0.397	0.395
Degree of saturation [%]	67	66	67
Type of drains fitted	One end	One end	One end

Project: 503387 - F254727 Test page CID07-1/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 13-1 / 11

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Saturation	Specimen 1	Specimen 2	Specimen 3
Pressure increments applied [kPa]	50	50	50
Differential pressure used [kPa]	10	10	10
Pore pressure on completion [kPa]	390	540	440
Cell pressure on completion [kPa]	400	550	450
B value achieved	0.96	0.96	0.96

Consolidation: Isotropic	Specimen 1	Specimen 2	Specimen 3
Cell pressure [kPa]	470	655	625
Back pressure [kPa]	400	550	450
Effective cell pressure [kPa]	70	105	175
Pore pressure on completion [kPa]	400	550	450
Pore pressure dissipation [%]	100	100	100
Water content [%]	14.6	14.6	14.4
Bulk density [Mg/m³]	2.19	2.19	2.19
Dry density [Mg/m³]	1.91	1.91	1.92
Void ratio [-]	0.388	0.388	0.381
Degree of saturation [%]	100	100	100
Axial strain [%]	0.17	0.20	0.32
Volumetric strain [%]	0.52	0.61	0.96
Volumetric strain rate-end of stage [%/hr]	0.00	0.00	0.01

Project: 503387 - F254727 Test page CID07-2/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 13-1 / 11



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

			0919
Shearing	Specimen 1	Specimen 2	Specimen 3
Initial pore pressure [kPa]	400	550	450
Initial effective cell pressure [kPa]	70	105	175
Rate of strain [%/hour]	1.30	1.30	1.30
At peak deviator stress			
Corrected deviator stress [kPa]	361	727	992
Membrane correction applied [kPa]	0.4	0.5	0.5
Drain correction applied [kPa]	0	0	0
Axial strain [%]	2.00	2.50	2.46
Volumetric strain [%]	-0.81	-1.09	-0.84
Major principal effective stress [kPa]	430	834	1169
Minor principal effective stress [kPa]	69	107	176
Principal effective stress ratio	6.24	7.82	6.62
ε ₅₀ [%]	0.47	1.04	0.93
Secant modulus (E_{50}) at ϵ_{50} [kPa]	38288	34818	53439
At peak principal effective stress ratio			
Corrected deviator stress [kPa]	361	725	991
Membrane correction applied [kPa]	0.4	0.5	0.5
Drain correction applied [kPa]	0	0	0
Axial strain [%]	2.00	2.37	2.34
Volumetric strain [%]	-0.81	-0.91	-0.72
Major principal effective stress [kPa]	430	831	1167
Minor principal effective stress [kPa]	69	106	176
Principal effective stress ratio	6.24	7.84	6.63
At 10% axial strain			
Corrected deviator stress [kPa]	241	364	570
Membrane correction applied [kPa]	1.8	1.8	1.8
Drain correction applied [kPa]	0	0	0
Axial strain [%]	10.00	10.00	10.00
Volumetric strain [%]	-3.51	-4.35	-3.12
Major principal effective stress [kPa]	311	471	746
Minor principal effective stress [kPa]	70	107	177
Principal effective stress ratio	4.44	4.39	4.23

Project: 503387 - F254727 Test page CID07-3/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 13-1 / 11

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Photographs				
Specimen 1	Specimen 2	Specimen 3		
Photograph unavailable	Photograph unavailable	Photograph unavailable		

Final Conditions	Specimen 1	Specimen 2	Specimen 3
Water content [%]	14.6	17.2	16.2
Bulk density [Mg/m³]	2.19	2.13	2.16
Dry density [Mg/m³]	1.91	1.82	1.86
Mode of failure	Barrel	Compound failure	Compound failure

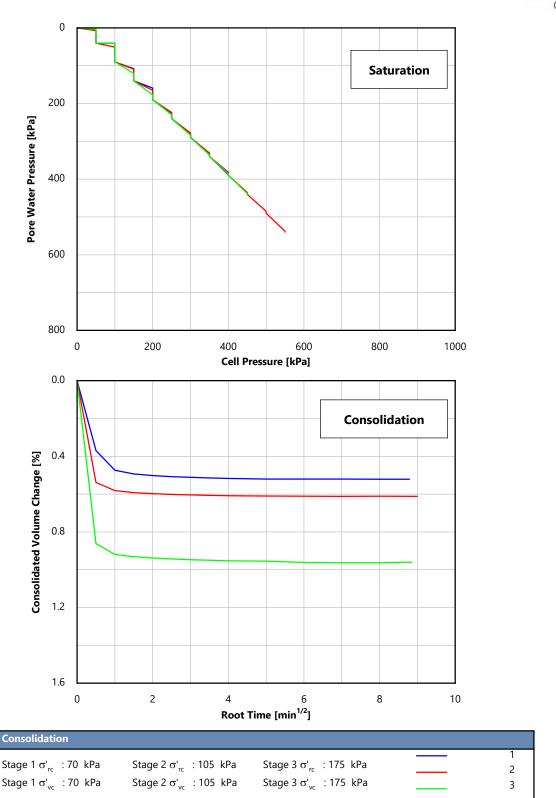
Project: 503387 - F254727 Test page CID07-4/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 13-1 / 11 Approved by: ET - 22/05/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Project: 503387 - F254727 CID07

Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 13-1 / 11

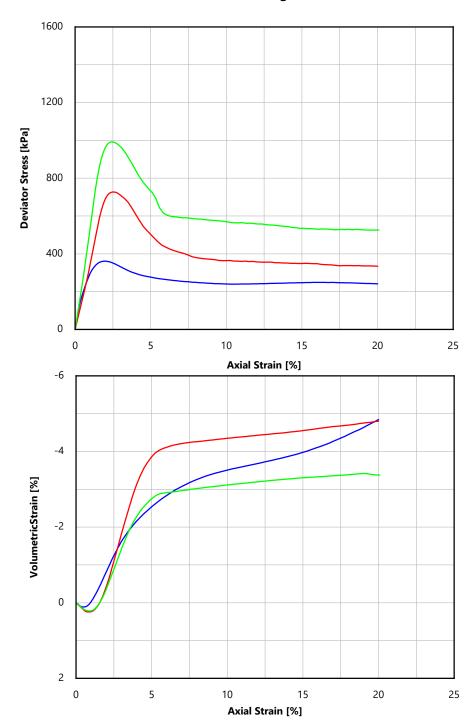


Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests

ISO 17892-9:2018



Shearing



Consolidation			
C: 4 70 D	6: 0 1 105 15	6. 2 4 475 18	 1
Stage 1 σ' _{rc} : 70 kPa	Stage 2 σ'_{rc} : 105 kPa	Stage 3 σ'_{rc} : 175 kPa	 2
Stage 1 σ' _{vc} : 70 kPa	Stage 2 σ'_{vc} : 105 kPa	Stage 3 σ'_{vc} : 175 kPa	 3

Project: 503387 - F254727 CID07

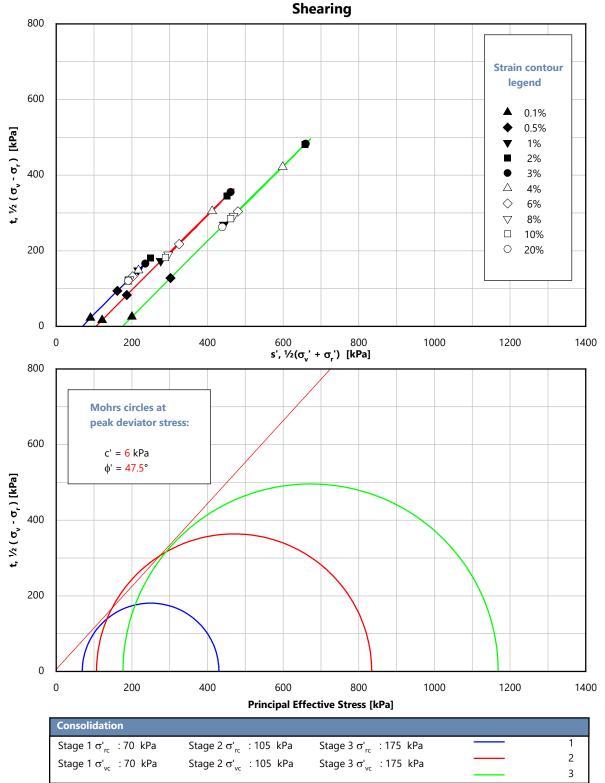
Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 13-1 / 11



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Project: 503387 - F254727 CID07

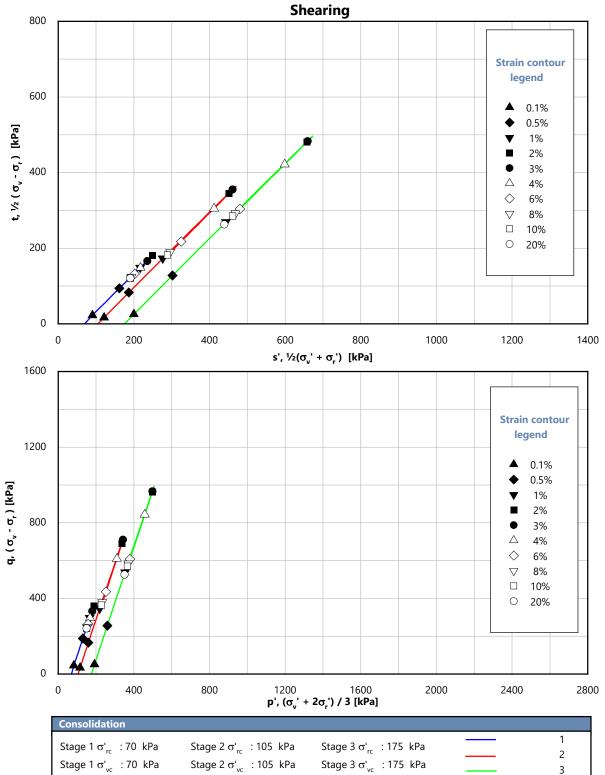
Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 13-1 / 11



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



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Project: 503387 - F254727 CID07

Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 13-1 / 11

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Test Identification	Specimen 1	Specimen 2	Specimen 3
Location	Z3_OWF_BH13-SAMP	Z3_OWF_BH13-SAMP	Z3_OWF_BH13-SAMP
Sample	17-2	17-2	17-2
Depth [m]	15.45	15.45	15.45
Test number	CID08a	CID08b	CID08c

Specimen Visual Description

Very dark grey silty SAND

Initial Specimen Conditions	Specimen 1	Specimen 2	Specimen 3
Test start date	23/06/2025	25/04/2025	25/04/2025
Type of sample	Recompacted	Recompacted	Recompacted
Diameter [mm]	50.8	50.5	50.5
Length [mm]	95.0	95.0	95.0
Water content [%]	9.9	9.9	9.9
Bulk density [Mg/m³]	1.90	1.90	1.90
Dry density [Mg/m³]	1.73	1.73	1.73
Void ratio [-]	0.529	0.532	0.533
Degree of saturation [%]	50	49	49
Type of drains fitted	One end	One end	One end

Project: 503387 - F254727 Test page CID08-1/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 17-2 / 15.45

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Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Saturation	Specimen 1	Specimen 2	Specimen 3
Pressure increments applied [kPa]	50	50	50
Differential pressure used [kPa]	10	10	10
Pore pressure on completion [kPa]	390	490	640
Cell pressure on completion [kPa]	400	500	650
B value achieved	0.96	0.98	0.92

Consolidation: Isotropic	Specimen 1	Specimen 2	Specimen 3
Cell pressure [kPa]	499	648	897
Back pressure [kPa]	400	500	650
Effective cell pressure [kPa]	99	148	247
Pore pressure on completion [kPa]	400	500	650
Pore pressure dissipation [%]	100	100	100
Water content [%]	17.5	18.1	15.5
Bulk density [Mg/m³]	2.13	2.12	2.17
Dry density [Mg/m³]	1.81	1.79	1.88
Void ratio [-]	0.464	0.479	0.411
Degree of saturation [%]	100	100	100
Axial strain [%]	1.42	1.15	2.65
Volumetric strain [%]	4.26	3.46	7.94
Volumetric strain rate-end of stage [%/hr]	0.03	0.05	0.00

Project: 503387 - F254727 Test page CID08-2/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 17-2 / 15.45



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Cl	C	C	0919
Shearing	Specimen 1	Specimen 2	Specimen 3
Initial pore pressure [kPa]	400	500	650
Initial effective cell pressure [kPa]	99	148	247
Rate of strain [%/hour]	1.30	1.30	1.30
At peak deviator stress			
Corrected deviator stress [kPa]	238	353	627
Membrane correction applied [kPa]	3.3	2.8	3.3
Drain correction applied [kPa]	0	0	0
Axial strain [%]	18.97	14.84	19.03
Volumetric strain [%]	4.43	4.11	5.00
Major principal effective stress [kPa]	336	502	875
Minor principal effective stress [kPa]	98	149	248
Principal effective stress ratio	3.42	3.36	3.53
ε ₅₀ [%]	2.70	2.14	3.29
Secant modulus (E_{50}) at ε_{50} [kPa]	4399	8234	9534
	.555	3_3 .	
At peak principal effective stress ratio			
Corrected deviator stress [kPa]	237	352	626
Membrane correction applied [kPa]	3.2	2.7	3.3
Drain correction applied [kPa]	0	0	0
Axial strain [%]	18.47	14.09	18.78
Volumetric strain [%]	4.42	4.06	4.99
Major principal effective stress [kPa]	335	501	874
Minor principal effective stress [kPa]	98	149	248
Principal effective stress ratio	3.43	3.37	3.53
At 10% axial strain			
Corrected deviator stress [kPa]	208	335	540
Membrane correction applied [kPa]	2.1	2.1	2.1
Drain correction applied [kPa]	0	0	0
Axial strain [%]	10.00	10.00	10.00
Volumetric strain [%]	3.78	3.66	4.24
Major principal effective stress [kPa]	303	483	785
Minor principal effective stress [kPa]	95	148	244
Principal effective stress ratio	3.19	3.27	3.21

Project: 503387 - F254727 Test page CID08-3/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 17-2 / 15.45 Approved by: ET - 02/07/2025



Consolidated Triaxial Compression Test on Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018

Photographs					
Specimen 1	Specimen 2	Specimen 3			
Photograph Unavailable	Photograph Unavailable	Photograph Unavailable			

Final Conditions	Specimen 1	Specimen 2	Specimen 3
Water content [%]	15.1	18.1	15.5
Bulk density [Mg/m³]	2.18	2.12	2.17
Dry density [Mg/m³]	1.89	1.79	1.88
Mode of failure	Compound failure	Compound failure	Barrel

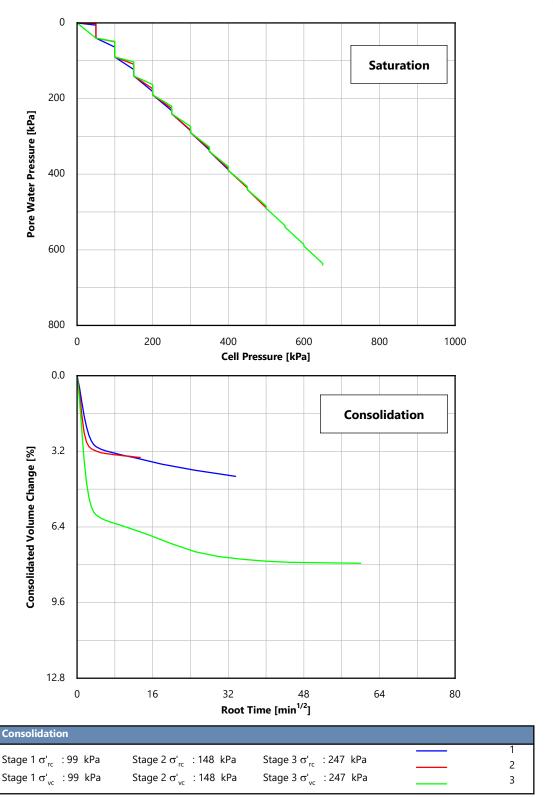
Project: 503387 - F254727 Test page CID08-4/8 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 17-2 / 15.45 Approved by: ET - 02/07/2025



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



Project: 503387 - F254727 CID08 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 17-2 / 15.45

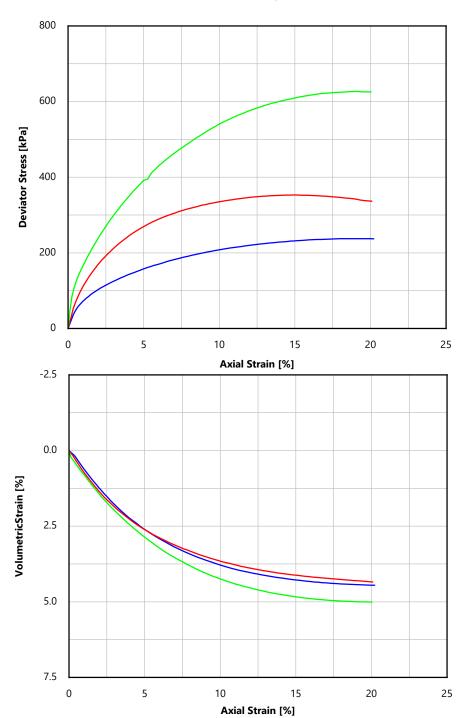


Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests

ISO 17892-9:2018







Consolidation			
Stage 1 σ' _{rc} : 99 kPa	Stage 2 σ' _{rc} : 148 kPa	Stage 3 σ' _{rc} : 247 kPa	 1 2
Stage 1 σ' _{vc} : 99 kPa	Stage 2 σ'_{vc} : 148 kPa	Stage 3 σ'_{vc} : 247 kPa	 3

Project: 503387 - F254727 CID08

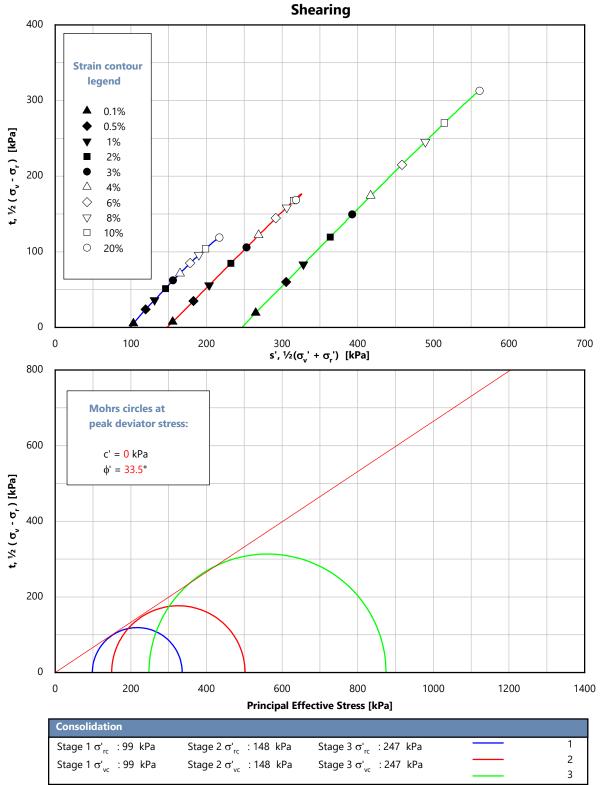
Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 17-2 / 15.45



Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



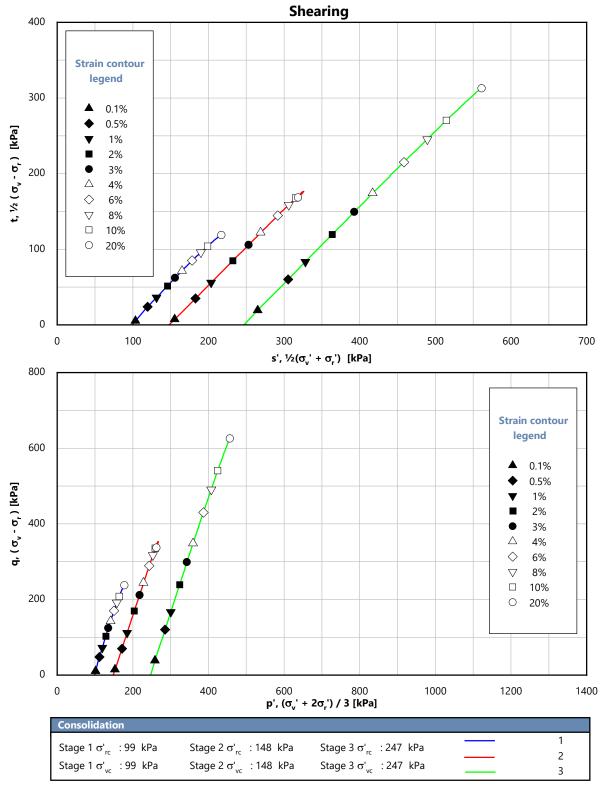
Project: 503387 - F254727 CID08

Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 17-2 / 15.45

Consolidated Triaxial Compression Test On Water Saturated Soils Isotropic, Drained - Set of three (3) tests



ISO 17892-9:2018



Project: 503387 - F254727 CID08 Laboratory: Wallingford, UK Z3_OWF_BH13-SAMP / 17-2 / 15.45

-fucen



: Effective angle of internal friction

: Effective cohesion intercept

W

Location	Sample	Depth BSF		l.	nitial Conditions	5*		Shear	⁻ Stage	φ '	<i>C</i> '
	ID		W	ρ	ρ_d	e_0	S_r	σ_{v}	$ au_{peak}$		
		[m]	[%]	[Mg/m ³]	[Mg/m³]	[-]	[%]	[kPa]	[kPa]	[°]	[kPa]
Z3_OWF_BH06-SAMP	09-1	8.00	9.8	1.96	1.79	0.480	54	39	38	42.5	11.0
			9.8	1.95	1.78	0.491	53	77	83		
			9.8	1.95	1.78	0.491	53	155	154	1	
Z3_OWF_BH06-SAMP	20-1	16.00	10.0	1.79	1.63	0.629	42	78	76	33.0	45.0
			10.0	1.85	1.68	0.578	46	156	126	1	
			10.0	1.80	1.64	0.619	43	312	257	1	
Z3_OWF_BH06-SAMP	23-2	19.40	9.4	1.82	1.67	0.590	42	94	85	34.0	24.5
			9.4	1.80	1.65	0.609	41	187	154		
			9.4	1.81	1.65	0.602	41	373	274		
Z3_OWF_BH13-SAMP 08-1	08-1	6.50	10.0	1.98	1.80	0.471	56	31	33	42.0	6.0
			10.0	1.98	1.80	0.470	56	63	64	1	
			10.0	1.99	1.81	0.466	57	125	119	1	
Z3_OWF_BH13-SAMP	11-2	9.40	10.3	1.93	1.75	0.517	53	45	43	43.5	0.0
			10.3	1.95	1.76	0.503	54	90	84	1	
			10.3	1.95	1.76	0.502	54	180	171	1	
Z3_OWF_BH13-SAMP	16-2	14.40	10.1	1.78	1.62	0.638	42	69	49	29.0	33.0
_		10.1	1.78	1.62	0.638	42	138	112	1		
		10.1	1.78	1.62	0.639	42	276	186	1		
Notes			1	1		1			1		1
BSF : Below seafloor				,	o_d : Dry der	nsity		$ au_{peak}$: Peal	k shear stress		

: Initial void ratio

: Void ratio

: Degree of saturation

: Total vertical stress

 e_0

 S_r

Summary of Direct Shear - Shear Box Test Results
Soil-Soil Interface



: Specimen conditions after preparation and before consolidation

: Specimen conditions after consolidation and before shearing

: Water content

: Bulk density

Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



	00		

Test Identification	
Location	Z3_OWF_BH06-SAMP
Sample	09-1
Depth [m]	8.00

Specimen Visual Description

Dark grey fine to medium SAND

Initial Specimen Conditions	1	2	3
Test start date	09/04/2025	09/04/2025	09/04/2025
Length [mm]	60.0	60.1	60.0
Width [mm]	60.0	60.0	60.0
Water content [%]	9.8	9.8	9.8
Bulk density [Mg/m³]	1.96	1.95	1.95
Dry density [Mg/m³]	1.79	1.78	1.78
Void ratio [-]	0.480	0.489	0.491
Degree of saturation [%]	54	53	53
Assumed particle density [Mg/m³]	2.65	2.65	2.65

End of Consolidation	1	2	3
Normal stress [kPa]	39	77	155
Void ratio [-]	0.446	0.439	0.416
Vertical displacement [mm]	0.52	0.75	1.13
Degree of saturation [%]	100	100	100

Shear Stage	1	2	3
Rate of displacement [mm/min]	0.45	0.45	0.45
Normal stress [kPa]	39	77	155
Shear stress at failure [kPa]	38	83	154
Horizontal displacement at failure [mm]	1.02	1.02	1.38
Vertical displacement at failure [mm]	0.03	0.14	0.00
Void ratio at the end of the test [-]	0.444	0.430	0.416

Notes

Sample tested submerged

Square sample

Project: 503387 - F254727

Test page SB01-1/4

Laboratory: Wallingford, UK

Approved by: SW - 03/06/2025



Direct Shear Test Shear Box, Soil:Soil Interface

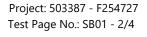
ISO 17892-10:2018

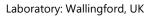


Consolidation Stage -0.2 0.0 Vertical Displacement [mm] 0.2 0.4 0.6 8.0 1.0 1.2 1.4 2 0 1 3 5 6

Square Root Time [min^{1/2}]

—— Specimen 1: Normal stress 30 kPa —— Specimen 2: Normal stress 77 kPa —— Specimen 3: Normal stress 155 kPa







Direct Shear Test Shear Box, Soil:Soil Interface



ISO 17892-10:2018

Shear Stage 160 120 Shear Stress [kPa] 80 40 0 2 10 0 4 12 14 **Horizontal Displacement [mm]** -0.4 Vertical Displacement [mm] 0.0 0.2 0.4 4 10 12 14 **Horizontal Displacement [mm]**



Project: 503387 - F254727 Test Page No.: SB01 - 3/4

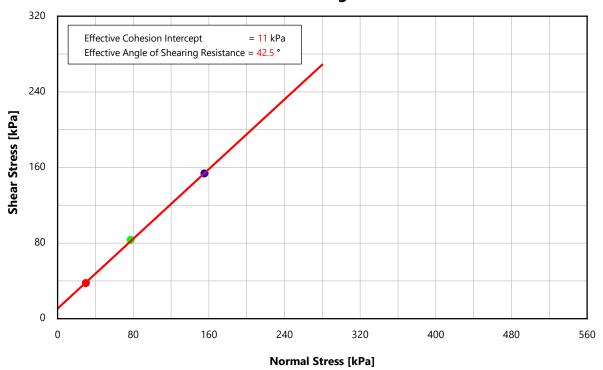
Laboratory: Wallingford, UK

Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Friction Angle



—— Specimen 1: Normal stress 30 kPa —— Specimen 2: Normal stress 77 kPa —— Specimen 3: Normal stress 155 kPa



Approved by: SW - 03/06/2025

Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



0919

Test Identification	
Location	Z3_OWF_BH06-SAMP
Sample	20-1
Depth [m]	16.00

Specimen Visual Description

Dark grey medium SAND

Initial Specimen Conditions	1	2	3
Test start date	11/04/2025	05/06/2025	11/04/2025
Length [mm]	60.0	60.0	60.0
Width [mm]	60.0	60.0	60.0
Water content [%]	10.0	10.0	10.0
Bulk density [Mg/m³]	1.79	1.85	1.80
Dry density [Mg/m³]	1.63	1.68	1.64
Void ratio [-]	0.629	0.578	0.619
Degree of saturation [%]	42	46	43
Assumed particle density [Mg/m³]	2.65	2.65	2.65

End of Consolidation	1	2	3
Normal stress [kPa]	78	156	312
Void ratio [-]	0.560	0.517	0.561
Vertical displacement [mm]	1.05	0.93	0.89
Degree of saturation [%]	100	100	100

Shear Stage	1	2	3
Rate of displacement [mm/min]	0.45	0.45	0.45
Normal stress [kPa]	78	156	312
Shear stress at failure [kPa]	76	126	257
Horizontal displacement at failure [mm]	1.02	1.38	1.49
Vertical displacement at failure [mm]	0.04	-0.04	-0.07
Void ratio at the end of the test [-]	0.558	0.519	0.565

Notes

Sample tested submerged

Square sample

Project: 503387 - F254727

Test page SB02r-1/4

Laboratory: Wallingford, UK

Approved by: SW - 19/06/2025

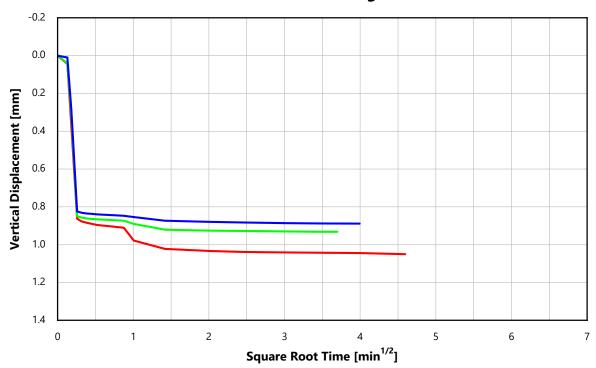


Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Consolidation Stage



Specimen 1: Normal stress 30 kPa Specimen 2: Normal stress 156 kPa Specimen 3: Normal stress 312 kPa



Direct Shear Test Shear Box, Soil:Soil Interface



ISO 17892-10:2018

Shear Stage 320 240 Shear Stress [kPa] 160 80 0 2 4 10 0 12 14 **Horizontal Displacement [mm]** -0.4 Vertical Displacement [mm] 0.0 0.2 0.4 4 10 12 14 **Horizontal Displacement [mm]**

Specimen 1: Normal stress 30 kPa Specimen 2: Normal stress 156 kPa Specimen 3: Normal stress 312 kPa

Project: 503387 - F254727 Test Page No.: SB02r - 3/4

Laboratory: Wallingford, UK

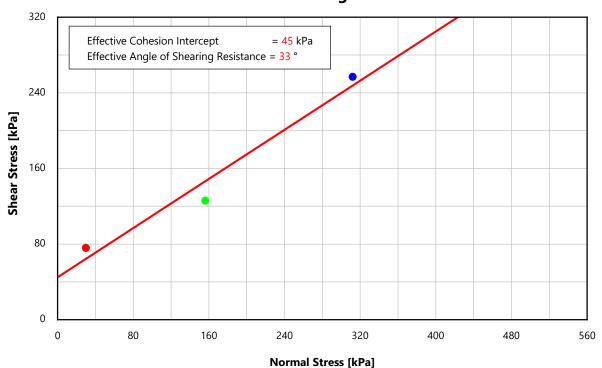
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Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Friction Angle



—— Specimen 1: Normal stress 30 kPa —— Specimen 2: Normal stress 156 kPa —— Specimen 3: Normal stress 312 kPa



Approved by: SW - 19/06/2025

Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



0919

Test Identification	
Location	Z3_OWF_BH06-SAMP
Sample	23-2
Depth [m]	19.40

Specimen Visual Description

Dark grey fine to medium SAND

Initial Specimen Conditions	1	2	3
Test start date	20/06/2025	20/06/2025	11/04/2025
Length [mm]	59.5	60.0	60.0
Width [mm]	60.0	60.0	60.0
Water content [%]	9.4	9.4	9.4
Bulk density [Mg/m³]	1.82	1.80	1.81
Dry density [Mg/m³]	1.67	1.65	1.65
Void ratio [-]	0.590	0.609	0.602
Degree of saturation [%]	42	41	41
Assumed particle density [Mg/m³]	2.65	2.65	2.65

End of Consolidation	1	2	3
Normal stress [kPa]	94	187	373
Void ratio [-]	0.542	0.567	0.550
Vertical displacement [mm]	0.73	0.65	0.80
Degree of saturation [%]	100	100	100

Shear Stage	1	2	3
Rate of displacement [mm/min]	0.45	0.45	0.45
Normal stress [kPa]	94	187	373
Shear stress at failure [kPa]	85	154	274
Horizontal displacement at failure [mm]	1.14	1.43	2.03
Vertical displacement at failure [mm]	-0.03	-0.08	-0.05
Void ratio at the end of the test [-]	0.544	0.572	0.553

Notes

Sample tested submerged

Square sample

Project: 503387 - F254727 Test page SB03r-1/4 Laboratory: Wallingford, UK

Approved by: SW - 28/06/2025

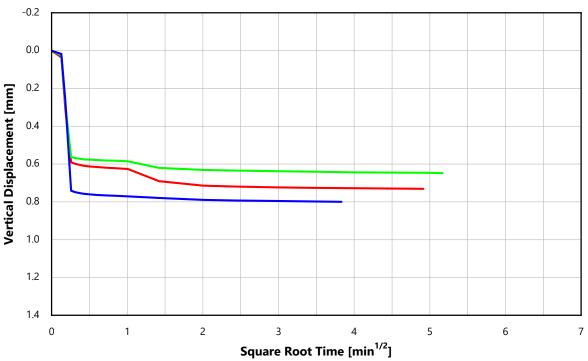


Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Consolidation Stage



— Specimen 1: Normal stress 93 kPa — Specimen 2: Normal stress 187 kPa — Specimen 3: Normal stress 373 kPa



Direct Shear Test Shear Box, Soil:Soil Interface



ISO 17892-10:2018

Shear Stage 320 240 Shear Stress [kPa] 160 80 0 2 4 10 0 12 14 **Horizontal Displacement [mm]** -0.4 Vertical Displacement [mm] 0.0 0.2 0.4 4 10 12 14

—— Specimen 1: Normal stress 93 kPa —— Specimen 2: Normal stress 187 kPa —— Specimen 3: Normal stress 373 kPa

Horizontal Displacement [mm]

Project: 503387 - F254727 Test Page No.: SB03r - 3/4

Laboratory: Wallingford, UK

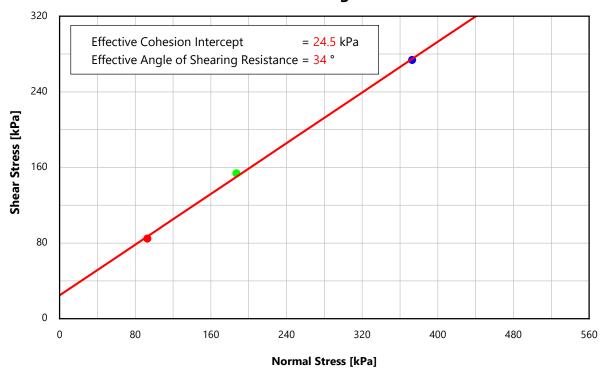
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Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Friction Angle



Specimen 1: Normal stress 93 kPa —— Specimen 2: Normal stress 187 kPa —— Specimen 3: Normal stress 373 kPa



Approved by: SW - 28/06/2025

Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



0919

Test Identification			
Location	Z3_OWF_BH13-SAMP		
Sample	08-1		
Depth [m]	6.50		

Specimen Visual Description

Dark grey fine to medium SAND

Initial Specimen Conditions	1	2	3
Test start date	10/04/2025	10/04/2025	10/04/2025
Length [mm]	60.0	60.1	60.0
Width [mm]	60.0	60.1	60.1
Water content [%]	10.0	10.0	10.0
Bulk density [Mg/m³]	1.98	1.98	1.99
Dry density [Mg/m³]	1.80	1.80	1.81
Void ratio [-]	0.471	0.470	0.466
Degree of saturation [%]	56	56	57
Assumed particle density [Mg/m³]	2.65	2.65	2.65

End of Consolidation	1	2	3
Normal stress [kPa]	31	63	125
Void ratio [-]	0.395	0.411	0.402
Vertical displacement [mm]	1.15	0.89	0.97
Degree of saturation [%]	100	100	100

Shear Stage	1	2	3
Rate of displacement [mm/min]	0.45	0.45	0.45
Normal stress [kPa]	31	63	125
Shear stress at failure [kPa]	33	64	119
Horizontal displacement at failure [mm]	0.78	0.84	1.20
Vertical displacement at failure [mm]	-0.03	0.13	-0.04
Void ratio at the end of the test [-]	0.398	0.403	0.404

Notes

Sample tested submerged

Square sample

Project: 503387 - F254727

Test page SB04-1/4

Laboratory: Wallingford, UK

Approved by: SW - 03/06/2025

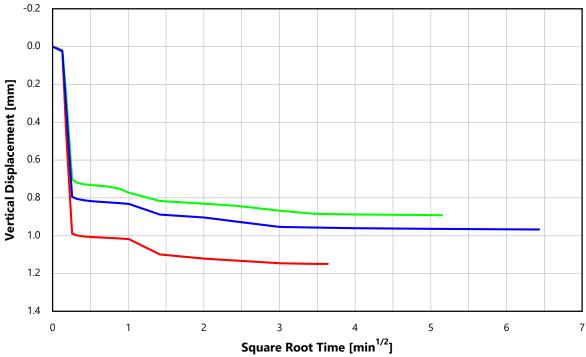


Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Consolidation Stage



Specimen 1: Normal stress 30 kPa Specimen 2: Normal stress 63 kPa Specimen 3: Normal stress 125 kPa



Approved by: SW - 03/06/2025

Direct Shear Test Shear Box, Soil:Soil Interface



ISO 17892-10:2018

Shear Stage 160 120 Shear Stress [kPa] 80 40 0 2 10 0 4 12 14 **Horizontal Displacement [mm]** -0.4 Vertical Displacement [mm] 0.0 0.2 0.4 4 10 12 14 **Horizontal Displacement [mm]**



Project: 503387 - F254727 Test Page No.: SB04 - 3/4

Laboratory: Wallingford, UK

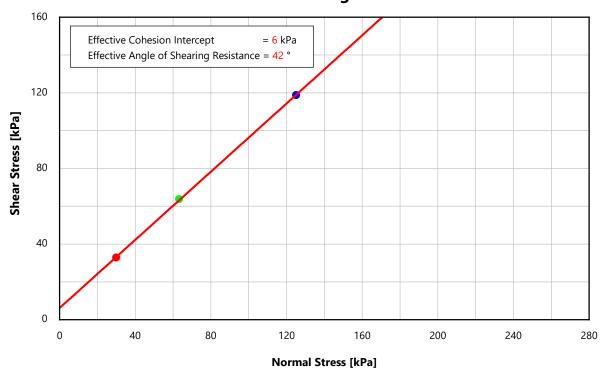
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Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Friction Angle



Specimen 1: Normal stress 30 kPa Specimen 2: Normal stress 63 kPa Specimen 3: Normal stress 125 kPa



Approved by: SW - 03/06/2025

Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



0919

Test Identification			
Location	Z3_OWF_BH13-SAMP		
Sample	11-2		
Depth [m]	9.40		

Specimen Visual Description

Dark grey fine to medium SAND

Initial Specimen Conditions	1	2	3
Test start date	08/04/2025	08/04/2025	SSP01
Length [mm]	60.0	60.0	60.0
Width [mm]	60.0	60.0	60.0
Water content [%]	10.3	10.3	10.3
Bulk density [Mg/m³]	1.93	1.95	1.95
Dry density [Mg/m³]	1.75	1.76	1.76
Void ratio [-]	0.517	0.503	0.502
Degree of saturation [%]	53	54	54
Assumed particle density [Mg/m³]	2.65	2.65	2.65

End of Consolidation	1	2	3
Normal stress [kPa]	45	90	180
Void ratio [-]	0.490	0.437	0.432
Vertical displacement [mm]	0.40	0.99	1.07
Degree of saturation [%]	100	100	100

Shear Stage	1	2	3
Rate of displacement [mm/min]	0.45	0.45	0.45
Normal stress [kPa]	45	90	180
Shear stress at failure [kPa]	43	84	171
Horizontal displacement at failure [mm]	1.37	1.44	1.43
Vertical displacement at failure [mm]	-0.06	-0.08	-0.05
Void ratio at the end of the test [-]	0.494	0.442	0.435

Notes

Sample tested submerged

Square sample

Project: 503387 - F254727 Test page SB05-1/4 Laboratory: Wallingford, UK

Approved by: SW - 10/06/2025

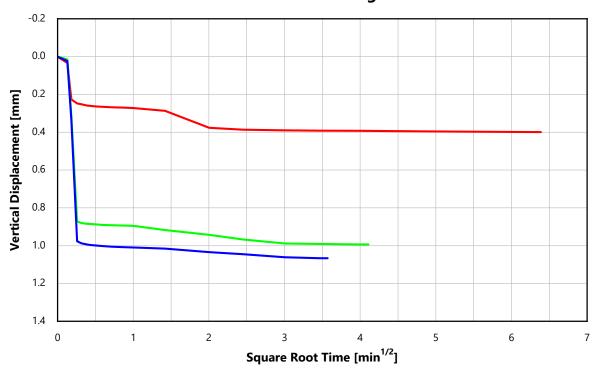


Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Consolidation Stage



Specimen 1: Normal stress 45 kPa Specimen 2: Normal stress 90 kPa Specimen 3: Normal stress 180 kPa

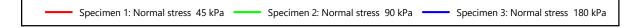


Direct Shear Test Shear Box, Soil:Soil Interface



ISO 17892-10:2018

Shear Stage 320 240 Shear Stress [kPa] 160 80 0 2 10 0 4 12 14 **Horizontal Displacement [mm]** -0.4 Vertical Displacement [mm] 0.0 0.2 0.4 4 10 12 14 **Horizontal Displacement [mm]**



Project: 503387 - F254727 Test Page No.: SB05 - 3/4

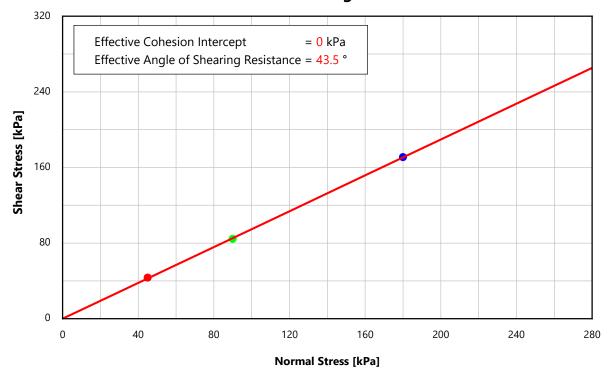
Laboratory: Wallingford, UK

Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Friction Angle



Specimen 1: Normal stress 45 kPa —— Specimen 2: Normal stress 90 kPa —— Specimen 3: Normal stress 180 kPa



Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



09	1	9	

Test Identification	
Location	Z3_OWF_BH13-SAMP
Sample	16-2
Depth [m]	14.4

Specimen Visual Description

Dark grey fine to medium silty SAND

Initial Specimen Conditions	1	2	3
Test start date	25/04/2025	20/08/2025	20/08/2025
Length [mm]	60.0	60.0	60.0
Width [mm]	60.0	60.0	60.0
Water content [%]	10.1	10.1	10.1
Bulk density [Mg/m³]	1.78	1.78	1.78
Dry density [Mg/m³]	1.62	1.62	1.62
Void ratio [-]	0.638	0.638	0.639
Degree of saturation [%]	42	42	42
Assumed particle density [Mg/m³]	2.65	2.65	2.65

End of Consolidation	1	2	3
Normal stress [kPa]	69	138	276
Void ratio [-]	0.621	0.601	0.512
Vertical displacement [mm]	0.25	0.53	1.87
Degree of saturation [%]	91	84	97

Shear Stage	1	2	3
Rate of displacement [mm/min]	0.45	0.45	0.45
Normal stress [kPa]	69	139	276
Shear stress at failure [kPa]	49	112	186
Horizontal displacement at failure [mm]	6.23	10.00	9.76
Vertical displacement at failure [mm]	-0.03	0.15	0.75
Void ratio at the end of the test [-]	0.623	0.591	0.461

Notes

Sample tested submerged

Square sample

Project: 503387 - F254727 Test page SB06rr-1/4 Laboratory: Wallingford, UK

Approved by: ET - 22/08/2025



Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Consolidation Stage -0.4 0.0 Vertical Displacement [mm] 0.4 0.8 1.2 1.6 2.0 2.4 2.8 2 0 1 3 5 6 Square Root Time [min^{1/2}]

Specimen 1: Normal stress 30 kPa Specimen 2: Normal stress 138 kPa Specimen 3: Normal stress 276 kPa



Direct Shear Test Shear Box, Soil:Soil Interface



ISO 17892-10:2018

Shear Stage 320 240 Shear Stress [kPa] 160 80 0 2 4 10 0 12 14 **Horizontal Displacement [mm]** -1.6 Vertical Displacement [mm] 0.0 0.8 1.6 4 10 12 14

Specimen 1: Normal stress 30 kPa Specimen 2: Normal stress 138 kPa Specimen 3: Normal stress 276 kPa

Horizontal Displacement [mm]

Project: 503387 - F254727 Test Page No.: SB06rr - 3/4

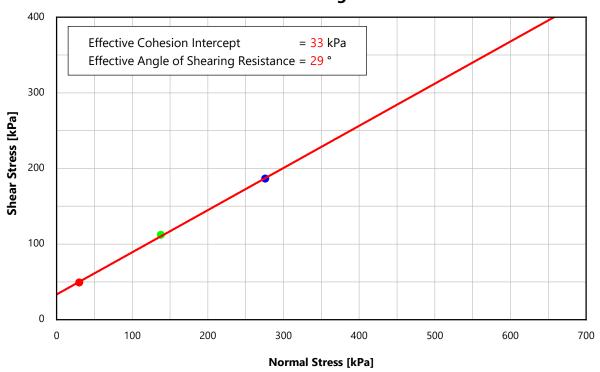
Laboratory: Wallingford, UK

Direct Shear Test Shear Box, Soil:Soil Interface

ISO 17892-10:2018



Friction Angle



Specimen 1: Normal stress 30 kPa Specimen 2: Normal stress 138 kPa Specimen 3: Normal stress 276 kPa



Approved by: ET - 22/08/2025

					Index Pro	pertie	es			
Location	Sample	Depth	Test Type	ρ_{bulk}	ρ_{dry}	Wi	W_{f}	S_{ri}	Effective	k
	No.								Pressure	
[-]	[-]	[m]	[-]	[Mg/m ³]	[Mg/m ³]		[%]	[%]	[kPa]	[m/s]
Z3_OWF_BH01-SAMP	05-02	3.70	Constant head Triaxial	2.03	1.65	23.2	22.4	98	36	1.70E-09
Z3_OWF_BH01-SAMP	20-2	18.20	Constant head Triaxial	2.07	1.66	24.7	23.9	100	115	1.00E-09
Z3_OWF_BH06-SAMP	05-2	4.20	Constant head Triaxial	2.07	1.67	23.5	22.3	100	42	4.20E-09
Z3_OWF_BH06-SAMP	Batch_06	8.45 - 9.50	Constant head Permeameter	1.88	1.71	10.3	-	67	-	3.42E-06
Z3_OWF_BH06-SAMP	Batch_05	18.35-19.40	Constant head Permeameter	1.74	1.59	10.0	-	51	-	4.27E-06
Z3_OWF_BH13-SAMP	06-1	5.00	Constant head Permeameter	1.52	1.38	10.5	-	37	-	1.16E-04
Z3_OWF_BH13-SAMP	10-3	8.50	Constant head Permeameter	1.71	1.55	10.3	-	50	-	3.86E-05
Z3_OWF_BH13-SAMP	20-3	18.40	Constant head Triaxial	2.03	1.65	22.7	21.4	97	113	1.80E-09
Notes:										

SUMMARY OF PERMEABILITY TEST RESULTS



= Data not available

Permeability tests - Rigid Wall Permeameter

ISO 17892-11:2019, clause 6.3.1.



Test Identification	
Location	Z3_OWF_BH06-SAMP
Sample	Batch_05
Depth [m]	18.35 - 19.40
Specimen condition	Disturbed - Recompacted

Specimen Visual Description

Greyish brown SAND with few shell fragments and gravel

Initial Specimen Conditions			
Test start date	19/06/2025		
Diameter [mm]	101.39		
Height [mm]	116.41		
Water content [%]	9.96		
Bulk density [Mg/m³]	1.743		
Dry density [Mg/m³]	1.585		
Void ratio [-]	0.521		
Degree of saturation [%]	51		
Particle density - assumed [Mg/m³]	2.65		
Preparation method	Blow compaction to target density		

Test Conditions				
Apparatus	Rigid wall (cylindrical) permeameter			
Test type	Constant head permeability			
Average temperature [°C]	26			
Hydraulic gradient	8.6			
Water used	Deaired water			

Test Results	
Hydraulic gradient applied [-]	8.59E+00
Coefficient of permeability corrected at 20°C [m/s]	4.27E-06

Project: 503387 - F254727

Test Page PERM03-1 of 1

Approved by: SW 24/06/2025



########

Permeability tests - Rigid Wall Permeameter

ISO 17892-11:2019, clause 6.3.1.



Test Identification	
Location	Z3_OWF_BH06-SAMP
Sample	Batch_06
Depth [m]	8.45 - 9.50
Specimen condition	Disturbed - Recompacted

Specimen Visual Description

Grey slightly silty SAND with shell fragments

Initial Specimen Conditions			
Test start date	13/05/2025		
Diameter [mm]	101.40		
Height [mm]	116.41		
Water content [%]	10.29		
Bulk density [Mg/m³]	1.881		
Dry density [Mg/m³]	1.705		
Void ratio [-]	0.409		
Degree of saturation [%]	67		
Particle density - assumed [Mg/m³]	2.65		
Preparation method	Blow compaction to target density		

Test Conditions				
Apparatus	Rigid wall (cylindrical) permeameter			
Test type	Constant head permeability			
Average temperature [°C]	27			
Hydraulic gradient	8.6			
Water used	Deaired water			

Test Results		
Hydraulic gradient applied [-]	8.59E+00	
Coefficient of permeability corrected at 20°C [m/s]	3.42E-06	

Project: 503387 - F254727 Test Page PERM02-1 of 1 ########

Approved by: SW 24/06/2025



Permeability tests - Rigid Wall Permeameter

ISO 17892-11:2019, clause 6.3.1.



Test Identification		
Location Z3_OWF_BH13-SAMP		
Sample 06-1		
Depth [m] 5.00		
Specimen condition Disturbed - Recompacted		

Specimen Visual Description

Greyish brown SAND with shell fragments

Initial Specimen Conditions		
Test start date 27/06/2025		
Diameter [mm]	72.41	
Height [mm]	70.81	
Water content [%]	10.45	
Bulk density [Mg/m³]	1.522	
Dry density [Mg/m³]	1.378	
Void ratio [-]	0.741	
Degree of saturation [%]	37	
Particle density - assumed [Mg/m³]	2.65	
Preparation method Blow compaction to target density		

Test Conditions		
Apparatus Rigid wall (cylindrical) permeameter		
Test type	Constant head permeability	
Average temperature [°C]	21	
Hydraulic gradient	24.9	
Water used	Deaired water	

Test Results		
Hydraulic gradient applied [-]	2.49E+01	
Coefficient of permeability corrected at 20°C [m/s]	1.16E-04	

Project: 503387 - F254727 Test Page PERM17-1 of 1 ########

Approved by: SW 30/06/2025



Permeability tests - Rigid Wall Permeameter

ISO 17892-11:2019, clause 6.3.1.



Test Identification		
Location Z3_OWF_BH13-SAMP		
Sample 10-3		
Depth [m] 8.50		
Specimen condition Disturbed - Recompacted		

Specimen Visual Description

Greyish brown SAND with shell fragments

Initial Specimen Conditions		
Test start date 26/06/2025		
Diameter [mm]	72.49	
Height [mm]	70.91	
Water content [%]	10.29	
Bulk density [Mg/m³]	1.710	
Dry density [Mg/m³]	1.550	
Void ratio [-]	0.550	
Degree of saturation [%]	50	
Particle density - assumed [Mg/m³]	2.65	
Preparation method Blow compaction to target density		

Test Conditions		
Apparatus Rigid wall (cylindrical) permeameter		
Test type	Constant head permeability	
Average temperature [°C]	21	
Hydraulic gradient	24.9	
Water used	Deaired water	

Test Results		
Hydraulic gradient applied [-]	2.49E+01	
Coefficient of permeability corrected at 20°C [m/s]	3.86E-05	

Project: 503387 - F254727

Test Page PERM16-1 of 1

-fugeo

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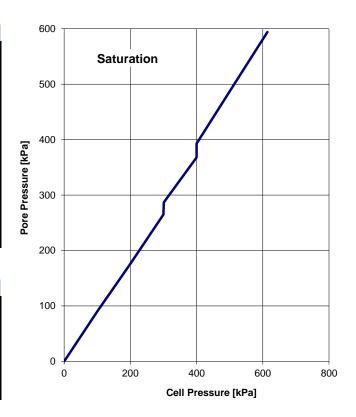
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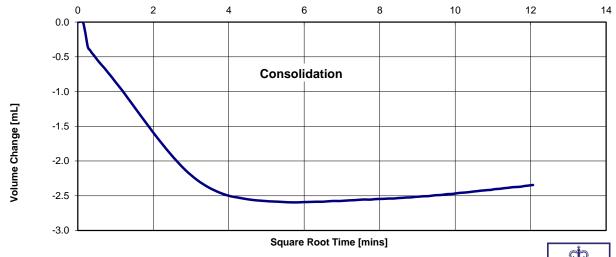
		SUMMARY OF TRIAXIAL PERMEABILITY TEST SINGLESTAGE TEST		Project Reference	F254727	
	-fugeo			Location ID	Z3_OWF_BH01-SAMP	
		Con	stant Head Conditions	Depth Top [m]	18.20	
	Project Name	DGEC Firm grey slightly sandy CLAY with occasional shell fragments		Sample Reference	20-2	
	Specimen Description			Sample Type	Wax	
	•	Specimen set-up	BS EN ISO 17892-11:2019 Clause 6.2	Date started	01/04/2025	İ
	Test Method	Saturation	BS EN ISO 17892-11:2019 Clause 6.3	Date Started	01/04/2023	i
	i est ivietilou	Consolidation-Iso.	BS EN ISO 17892-11:2019 Clause 6.3	Medium	Tap water	i
		Permeability	BS EN ISO 17892-11:2019 Clause 6.4	Wiedidili	rap water	ĺ

Initial Conditions		
Sample orientation		Vertical
Specimen preparation		Undisturbed
Specimen depth	[m]	18.21
Diameter	[mm]	70.08
Length	[mm]	70.36
Water content (trimmings)	[%]	24.7
Bulk density	[Mg/m³]	2.07
Dry density	[Mg/m³]	1.66
Particle density ¹	[Mg/m³]	#2.7
Voids ratio e	-	0.630
Degree of saturation	[%]	100
Drainage conditions		Both ends

¹ # denotes assumed

Saturation Stage		
Saturation method -	Cell/ba	ick pres. Incr.
Final cell pressure	[kPa]	614
Final pore pressure	[kPa]	594
Press. Increm./ Diff. press.	[kPa]	50-100 / 12-4
B value achieved	[%]	94
Duration	[days]	3





Remarks

TESTING

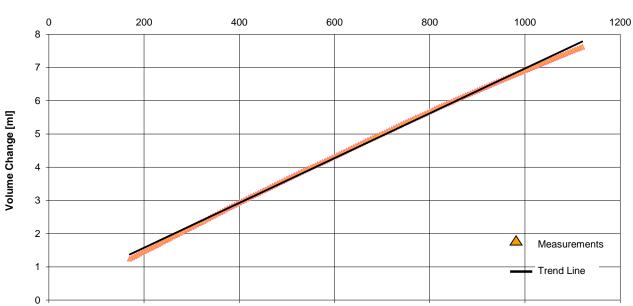
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-fuceo	SUMMARY OF TRIAXIAL PERMEABILITY TEST	Project Reference	F254727
	SINGLESTAGE TEST Constant Head Conditions	Location ID	Z3_OWF_BH01-SAMP
		Depth Top [m]	18.20
Project Name	DGEC	Sample Reference	20-2

Consolidation Stage					
Cell pressure	[kPa]	615			
Back pressure	[kPa]	500			
Effective pressure	[kPa]	115			
Final pore pressure	[kPa]	301			
Final pore pressure dissipation	[%]	100			
Duration	[days]	1			

Permeability Stage					
Pressure difference across specimen	[kPa]	20			
Mean effective stress	[kPa]	115			
Rate of flow	[ml/min]	0.008			
Hydraulic gradient		29.08			
Duration	[kPa]	1			

Time [mins]



COEFFICIENT OF PERMEABILITY AT 20 °C, 1.0E-09 [m/s]

	SUMMARY OF TRIAXIAL PERMEABILITY TEST	Project Reference	F254727
-fuceso	SINGLESTAGE TEST	Location ID	Z3_OWF_BH01-SAMP
9.000	Constant Head Conditions	Depth Top [m]	18.20
Project Name	DGEC	Sample Reference	20-2

Final Conditions			
Moisture content	[%]	23.9	
Bulk density	[Mg/m³]	2.07	
Total duration	[days]	5	

Specimen Photographs





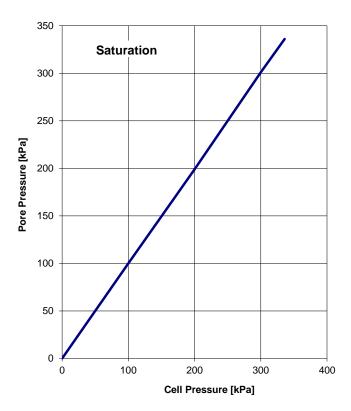
Checked by: M.G. 16/04/2025 Approved by: C.H. 17/04/2025 Laboratory: Consett UK Page 3/3

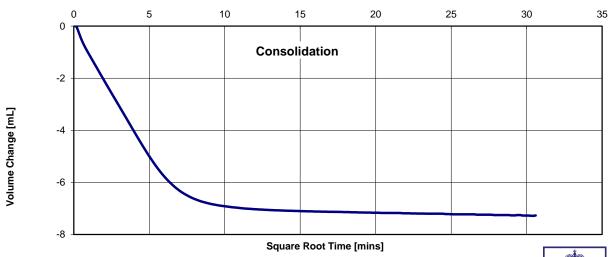
	SUMMARY OF TRIAXIAL PERMEABILITY TEST		Project Reference	F254727	
-fueso		SINGLESTAGE TEST	Location ID	Z3_OWF_BH01-SAMP	
	Constant Head Conditions		Depth Top [m]	3.70	
Project Name	DGEC		Sample Reference	05-02	
Specimen Description	Firm grey slightly sand	dy CLAY	Sample Type	Wax	
	Specimen set-up	BS EN ISO 17892-11:2019 Clause 6.2	Date started	01/04/2025	
Test Method	Saturation	BS EN ISO 17892-11:2019 Clause 6.3	Date Started	01/04/2023	
i est ivietriou	Consolidation-Iso.	olidation-Iso. BS EN ISO 17892-11:2019 Clause 6.3		Tan water	
	Permeability	BS EN ISO 17892-11:2019 Clause 6.4	- Medium	Tap water	

Initial Conditions		
Sample orientation		Vertical
Specimen preparation		Undisturbed
Specimen depth	[m]	3.72
Diameter	[mm]	71.10
Length	[mm]	70.10
Water content (trimmings)	[%]	23.2
Bulk density	[Mg/m³]	2.03
Dry density	[Mg/m³]	1.65
Particle density ¹	[Mg/m³]	#2.7
Voids ratio e	-	0.641
Degree of saturation	[%]	98
Drainage conditions		Both ends

¹ # denotes assumed

Saturation Stage		
Saturation method -	Const. N	loist. Content
Final cell pressure	[kPa]	336
Final pore pressure	[kPa]	336
Press. Increm./ Diff. press.	[kPa]	50-100 / -
B value achieved	[%]	100
Duration	[days]	1





Remarks TESTING

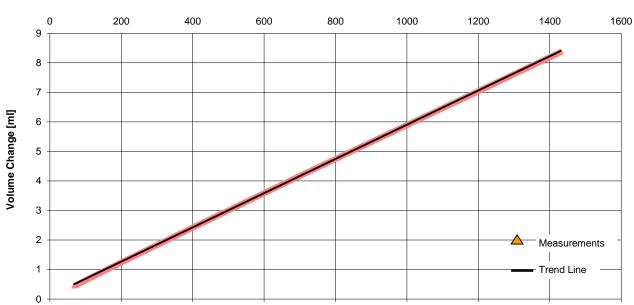
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	SUMMARY OF TRIAXIAL PERMEABILITY TEST	Project Reference	F254727
-fugeo	SINGLESTAGE TEST		Z3_OWF_BH01-SAMP
	Constant Head Conditions	Depth Top [m]	3.70
Project Name	DGEC	Sample Reference	05-02

Consolidation Stage			
Cell pressure	[kPa]	336	
Back pressure	[kPa]	300	
Effective pressure	[kPa]	36	
Final pore pressure	[kPa]	301	
Final pore pressure dissipation	[%]	100	
Duration	[days]	1	

Permeability Stage			
Pressure difference across specimen	[kPa]	10	
Mean effective stress	[kPa]	36	
Rate of flow	[ml/min]	0.006	
Hydraulic gradient		14.68	
Duration	[kPa]	1	





COEFFICIENT OF PERMEABILITY AT 20 °C, 1.7E-09 [m/s]

	SUMMARY OF TRIAXIAL PERMEABILITY TEST	Project Reference	F254727
SINGLESTAGE TEST		Location ID	Z3_OWF_BH01-SAMP
	Constant Head Conditions	Depth Top [m]	3.70
Project Name	DGEC	Sample Reference	05-02

Final Conditions			
Moisture content	[%]	22.4	
Bulk density	[Mg/m ³]	2.05	
Total duration	[days]	3	

Specimen Photographs





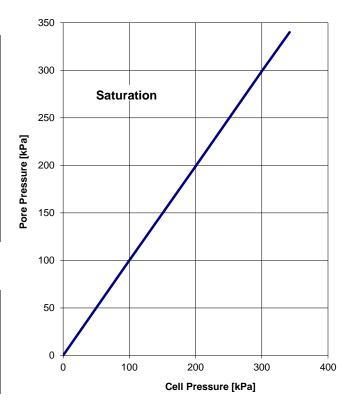
Checked by: M.G. 16/04/2025 Approved by: C.H. 17/04/2025 Laboratory: Consett UK Page 3/3

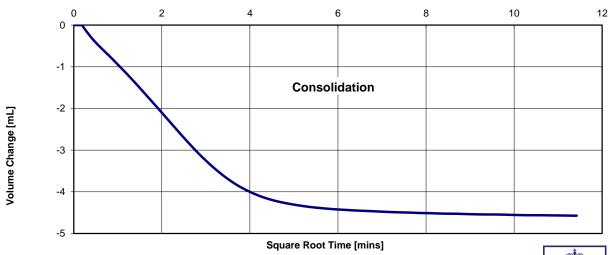
	SUMMARY O	F TRIAXIAL PERMEABILITY TEST	Project Reference	F254727	
-fugro	9	SINGLESTAGE TEST	Location ID	Z3_OWF_BH06-SAMP	
	Constant Head Conditions		Depth Top [m]	4.20	
Project Name	DGEC		Sample Reference	05-2	
Specimen Description	Firm grey slightly sand	ly SILT with occasional shell fragments	Sample Type	Wax	
	Specimen set-up	BS EN ISO 17892-11:2019 Clause 6.2	Date started	03/04/2025	
Test Method	Saturation	BS EN ISO 17892-11:2019 Clause 6.3	Date started	03/04/2023	
i est ivietnou	Consolidation-Iso.	BS EN ISO 17892-11:2019 Clause 6.3	Medium	Tan water	
	Permeability	BS EN ISO 17892-11:2019 Clause 6.4	ivieululli	Tap water	

Initial Conditions		
Sample orientation		Vertical
Specimen preparation		Undisturbed
Specimen depth	[m]	4.21
Diameter	[mm]	69.18
Length	[mm]	68.96
Water content (trimmings)	[%]	23.5
Bulk density	[Mg/m³]	2.07
Dry density	[Mg/m³]	1.67
Particle density ¹	[Mg/m³]	#2.7
Voids ratio e	-	0.613
Degree of saturation	[%]	100
Drainage conditions		Both ends

¹ # denotes assumed

Saturation Stage		
Saturation method -	Const. N	loist. Content
Final cell pressure	[kPa]	342
Final pore pressure	[kPa]	340
Press. Increm./ Diff. press.	[kPa]	50-100 / -
B value achieved	[%]	100
Duration	[days]	1





Remarks TESTING

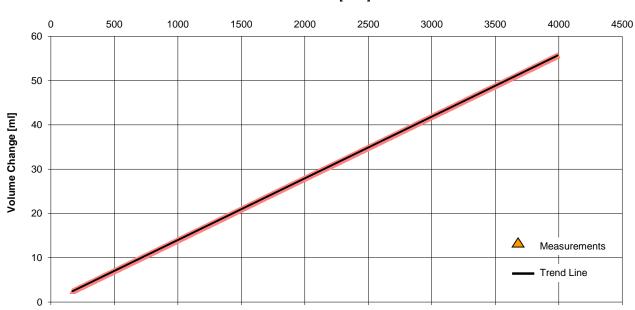
Checked by: M.G. 17/04/2025 Approved by: C.H. 17/04/2025 Laboratory: Consett UK Page 1/3

SUMMARY OF TRIAXIAL PERMEABILITY TEST	Project Reference	F254727	
-fugeo	SINGLESTAGE TEST	Location ID	Z3_OWF_BH06-SAMP
Constant Head Conditions	Depth Top [m]	4.20	
Project Name	DGEC	Sample Reference	05-2

Consolidation Stage			
Cell pressure	[kPa]	342	
Back pressure	[kPa]	300	
Effective pressure	[kPa]	42	
Final pore pressure	[kPa]	301	
Final pore pressure dissipation	[%]	100	
Duration	[days]	1	

Permeability Stage			
Pressure difference across specimen	[kPa]	10	
Mean effective stress	[kPa]	42	
Rate of flow	[ml/min]	0.014	
Hydraulic gradient		14.88	
Duration	[kPa]	3	

Time [mins]



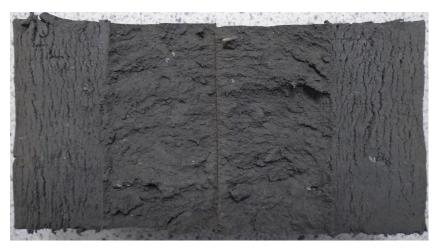
COEFFICIENT OF PERMEABILITY AT 20 °C, 4.2E-09 [m/s]

SUMMARY OF TRIAXIAL PERMEABILITY TEST	Project Reference	F254727	
Tucko	SINGLESTAGE TEST	Location ID	Z3_OWF_BH06-SAMP
Constant Head Conditions	Depth Top [m]	4.20	
Project Name	DGEC	Sample Reference	05-2

Final Conditions			
Moisture content	[%]	22.3	
Bulk density	[Mg/m³]	2.07	
Total duration	[days]	5	

Specimen Photographs





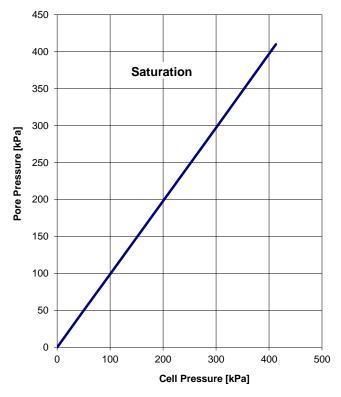
Checked by: M.G. 17/04/2025 Approved by: C.H. 17/04/2025 Laboratory: Consett UK Page 3/3

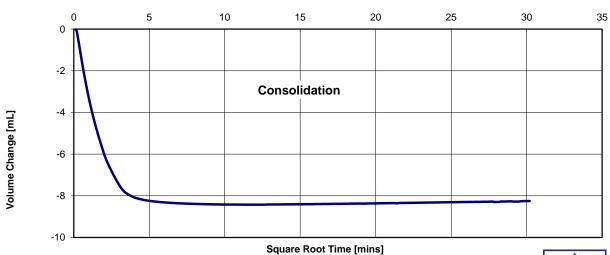
	SUMMARY OF TRIAXIAL PERMEABILITY TEST		SUMMARY OF TRIAXIAL PERMEABILITY TEST		Project Reference	F254727
Tugro			Location ID	Z3_OWF_BH13-SAMP		
	Con	Constant Head Conditions		18.40		
Project Name	DGEC		Sample Reference	20-3		
Specimen Description	Firm brown sandy SIL	Т	Sample Type	Wax		
	Specimen set-up BS EN ISO 17892-11:2019 Clause 6.2		Date started	08/04/2025		
Test Method	Saturation	Saturation BS EN ISO 17892-11:2019 Clause 6.3		06/04/2023		
rest Metriod	Consolidation-Iso. BS EN ISO 17892-11:2019 Clause 6.3		Medium	Tap water		
	Permeability	BS EN ISO 17892-11:2019 Clause 6.4	Medium	rap water		

Initial Conditions		
Sample orientation		Vertical
Specimen preparation		Undisturbed
Specimen depth	[m]	18.43
Diameter	[mm]	70.08
Length	[mm]	70.80
Water content (trimmings)	[%]	22.7
Bulk density	[Mg/m³]	2.03
Dry density	[Mg/m³]	1.65
Particle density ¹	[Mg/m³]	#2.7
Voids ratio e	-	0.632
Degree of saturation	[%]	97
Drainage conditions		Both ends

¹ # denotes assumed

Saturation Stage		
Saturation method -	Const. N	loist. Content
Final cell pressure	[kPa]	413
Final pore pressure	[kPa]	410
Press. Increm./ Diff. press.	[kPa]	50-100 / -
B value achieved	[%]	100
Duration	[days]	1





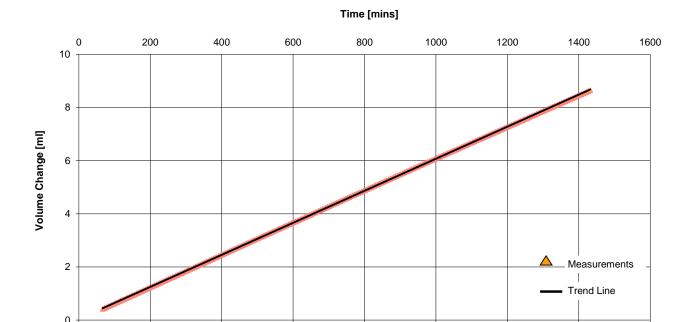
Remarks TESTING 1483

Checked by: M.G. 17/04/2025 Approved by: C.H. 17/04/2025 Laboratory: Consett UK Page 1/3

SUMMARY OF TRIAXIAL PERMEABILITY TEST	Project Reference	F254727	
-fugeo	SINGLESTAGE TEST	Location ID	Z3_OWF_BH13-SAMP
Constant Head Conditions	Depth Top [m]	18.40	
Project Name	DGEC	Sample Reference	20-3

Consolidation Stage			
Cell pressure	[kPa]	413	
Back pressure	[kPa]	300	
Effective pressure	[kPa]	113	
Final pore pressure	[kPa]	301	
Final pore pressure dissipation	[%]	100	
Duration	[days]	1	

Permeability Stage			
Pressure difference across specimen	[kPa]	10	
Mean effective stress	[kPa]	113	
Rate of flow	[ml/min]	0.006	
Hydraulic gradient		14.55	
Duration	[kPa]	1	



COEFFICIENT OF PERMEABILITY AT 20 °C, 1.8E-09 [m/s]

	SUMMARY OF TRIAXIAL PERMEABILITY TEST	Project Reference	F254727
-fugeo	SINGLESTAGE TEST	Location ID	Z3_OWF_BH13-SAMP
	Constant Head Conditions	Depth Top [m]	18.40
Project Name	DGEC	Sample Reference	20-3

Final Conditions			
Moisture content	[%]	21.4	
Bulk density	[Mg/m ³]	2.06	
Total duration	[days]	3	

Specimen Photographs





Checked by: M.G. 17/04/2025 Approved by: C.H. 17/04/2025 Laboratory: Consett UK Page 3/3

PROJECT No.	: F254727	
PROJECT TITLE	: Golfe du Lion Geotechnical Site Investig	ation
CLIENT	: DGEC	
Location	: GL GSI OUEST Z3	
Easting	: 544417 m	WGS84 UTM31N
Northing	: 4727831 m	WG304 UTIVISTIN
Water depth	: 101.40 m	LAT FR Bathyelli

SAMPLE II	DENTIFICAT	ION	A ⁻	SAMPLE	COLLECTION	SAMPLE CHARA	CTERISTICS						MEASL	REMENT CON	DITIONS				THE	RMAL RESULTS			SAMPLE TE		
	Sample iD	Test depth [m BSB]	Date		Ambient Temp. [°C]	Description	Condition	Moisture content [%]	Wet Unit Weight [kN/m³]	Dry Unit Weight [kN/m³]	Test No.	Date		Kit Serial No.	Probe used	Serial		TC [W/(m.k)]	TR [(m.K)/W]	TR Mean value	Deviation	Error rate (r²)	Temp	Mean value	Remarks
Z3_OWF_BH01-	W01	0.30	21/01/25	4:55		3 1 1 1 3 1	Undisturbed	26	20	16	1	21/01/25	5:11	8905-0011	TR-3	01075	22.0	1.589	0.629			0.0069	16.3		-
SAMP						SAND with occasional coarse sand-size to medium gravel-size shells and shell fragments					2	21/01/25	5:27	8905-0011	TR-3	01075	21.9	1.839	0.544	0.559	20.0%	0.0023	17.6	17.4	-
						shells and shell fragments					3	21/01/25	5:43	8905-0011	TR-3	01075	21.5	1.986	0.504			0.0013	18.3		-
Z3_OWF_BH01-	W04	3.05	21/01/25	6:53		3 , , , , , , , , , , , , , , , , , , ,	Undisturbed	22	20	17	1	21/01/25	07:10	8905-0011	TR-3	01075	21.4	1.600	0.625			0.0050	16.6		-
SAMP						slightly calcareous CLAY with occasional coarse sand-size to					2	21/01/25	07:30	8905-0011	TR-3	01075	21.5	1.830	0.546	0.568	15.0%	0.0016	17.5	17.4	-
						coarse gravel-size shells and shell fragments					3	21/01/25	7:46	8905-0011	TR-3	01075	21.7	1.882	0.531			0.0012	18.0		-



PROJECT No.	: F254727	
PROJECT TITLE	: Golfe du Lion Geotechnical Site Investigation	n
CLIENT	: DGEC	
Location	: GL GSI OUEST Z3	
Easting	: 539895.12	-WGS84 UTM31N
Northing	: 4729328.78	- WG304 UTIVISTIN
Water depth	: 104.50 m	LAT FR Bathyelli

SAMPLE ID	ENTIFICAT	ION	AT S	SAMPLE CO	OLLECTION	SA	AMPLE CHARA	CTERISTICS					MEASU	REMENT CON	NDITIONS				THE	RMAL RESULTS			SAMPLE TI	EMPERATURE	
BH name	Sample iD	Test dept		Time	Ambient Temp. [°C]	Description	Condition	Moisture content [%]	Wet Unit Weight [kN/m³]	Dry Unit Weight [kN/m³]	Test No.	Date	Time	Kit Serial No.	Probe used		Ambient Temp. [°C]	TC [W/(m.k)]	TR [(m.K)/W]	TR Mean value	Deviation	Error rate (r²)	Temp	Mean value	Remarks
Z3_OWF_BH06- SAMP	W02	1.20	21/01/2025	19:25		very sandy calcareous CLAY with fine to medium gravel-size shells	Undisturbed	30	19	15	1	21/01/2025	19:25	8905-0011	TR-3	01075	23.5	1.395	0.717			0.0061	17.7		-
						and shell fragments					2	21/01/2025	19:40	8905-0011	TR-3	01075	23.5	1.626	0.615	0.642	17.1%	0.0021	19.0	18.8	-
											3	21/01/2025	19:55	8905-0011	TR-3	01075	23.5	1.683	0.594			0.0012	19.6		-
Z3_OWF_BH06- SAMP	W05	4.00	21/01/2025	21:30		soft medium to high strength sandy calcareous CLAY with	Undisturbed	25	20	16	1	21/01/2025	21:40	8905-0011	TR-3	01075	23.0	1.460	0.685			0.0067	16.6		-
						occasional coarse sand-size shell fragments - with rare coarse sand- size to fine gravel-size pockets of					2	21/01/2025	21:55	8905-0011	TR-3	01075	23.0	1.731	0.578	0.608	18.3%	0.0016	18.0	17.7	-
						organic matter					3	21/01/2025	22:15	8905-0011	TR-3	01075	23.0	1.786	0.560			0.0009	18.6		-



PROJECT No.	: F254727	
PROJECT TITLE	: Golfe du Lion Geotechnical Site Inve	estigation
CLIENT	: DGEC	
Location	: GL GSI OUEST Z3	
Easting	: 536917 m	WGS84 UTM31N
Northing	: 4735347 m	WG364 01W31W
Water depth	: 96.70 m	LAT FR Bathyelli

SAMPLE ID	ENTIFICAT	TION	AT S	AMPLE C	OLLECTION	SAMPL	LE CHARACTE	RISTICS						REMENT CON					THE	RMAL RESULT	5		SAMPLE T	EMPERATURE	
BH name		Test depth [m BSB]	Date	Time	Ambient Temp. [°C]	Description	Condition	Moisture content [%]	Wet Unit Weight [kN/m³]	Dry Unit Weight [kN/m³]	Test No.	Date	Time	Kit Serial No.	Probe used	Probe Serial No.	Ambient Temp. [°C]	TC [W/(m.k)]	TR [(m.K)/W]	TR Mean value	Deviation	Error rate (r ²)	Temp	Mean value	Remarks
Z3_OWF_BH13-	W03	2.20	22/01/2025	8:12	21.6	firm low strength dark grey (2.5Y 4/1)	Undisturbed	34	18	13	1	22/01/2025	8:30	8905-0011	TR-3	01075	21.5	1.395	0.717			0.0059	16.3		=
SAMP						slightly calcareous CLAY with occasional					2	22/01/2025	8:45	8905-0011	TR-3	01075	21.6	1.489	0.672	0.679	9.7%	0.0040	17.3	17.1	-
						coarse sand-size to medium gravel-size shell fragments					3	22/01/2025	9:00	8905-0011	TR-3	01075	21.6	1.545	0.647			0.0009	17.8		-
Z3_OWF_BH13-	W06	5.10	22/01/2025	10:10	21.4	firm dark grey (2.5Y 4/1) slightly	Undisturbed	24	19	15	1	22/01/2025	10:30	8905-0011	TR-3	01075	21.4	1.640	0.610			0.0045	16.7		=
SAMP						calcareous CLAY with abundant coarse					2	22/01/2025	10:45	8905-0012	TR-4	01076	21.4	1.619	0.618	0.614	1.3%	0.0046	17.6	17.2	-
						sand-size to coarse gravel-size shells and				-	3	-	-	-	-	-	-	-	-			-	-		-



Thermal Conductivity by Thermal Needle Probe Procedure

ASTM D5334-22



									,	0919	
			Double	Cail_	Camanla	Water	Dry	Void	Therm	al Cond	uctivity
No.	Borehole	Sample*	Depth	Soil	Sample	Content	Density	Ratio		[W/m.K]	
			[m]	Type	Condition	[%]	[Mg/m ³]		No.1	No.2	No.3
1	Z3_OWF_BH06-SAMP	01-3	0.60	SILT	Reconstituted		1.46	0.84	1.60	1.60	1.60
2	Z3_OWF_BH06-SAMP	04-3	3.40	SILT	Wax	23.69	1.64	0.63	1.74	1.77	1.73
	Z3_OWF_BH13-SAMP	01-2	0.25	SAND	Reconstituted	21.18	1.54	0.72	1.79	1.78	1.79
	25_0 *** _5*****	012	0.23	371112	Reconstituted	21.10	1.5 1	0.7 2	1.75	1.70	1.75
1			l	ĺ						I	

^{*} Detailed sample descriptions can be found in the "Summary of Laboratory Test Results" of the report.

Project: 503387 - F254727 Location: Wallingford, UK Approved by JP 14/05/2025

Test Page 1 of 1



Thermal Conductivity by Thermal Needle Probe

ASTM D5334-22a^{ε1}



Test Identification			
Borehole	Z3_OWF_BH06-SAMP	Sample Depth [m]	0.60
Sample	01-3	Test Depth [m]	0.60

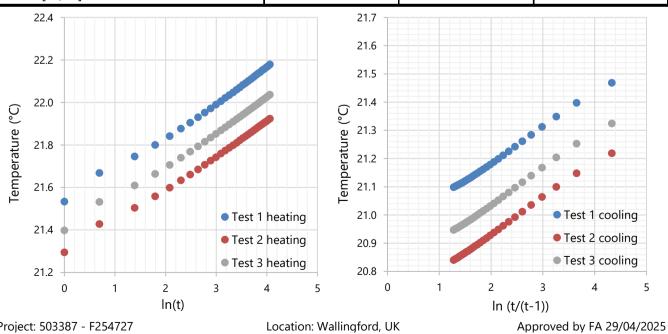
Visual Description

olive grey sandy calcareous SILT with rare medium sand-size to coarse sand-size shell fragments with rare mica

Specimen Conditions			
Sample condition	Reconstituted	Water content [%]	29.8
Wet mass [g]	1397.5	Dry density [g/cm³]	1.46
Diameter [mm]	71.4	Bulk density [g/cm³]	1.89
Length [mm]	184.9	Target wet density [g/cm³]	1.54

Test Conditions			
Room Temperature [°C]	20.6	Needle diameter [mm]	2.4
Needle	TR-3	Needle length [mm]	100
Heating time [min]	2.5	Insertion type	Pushed
Cooling time [min]	2.5	Calculation method	Inbuilt

Test Results	Test 1	Test 2	Test 3
Thermal Conductivity [W/mK]	1.60	1.60	1.60
Sample Temperature [°C]	20.94	20.71	20.81
Error	0.002	0.001	0.001
Power [W/m]	3.58	3.58	3.58



Project: 503387 - F254727

Note(s): Test Page 1/1



Thermal Conductivity by Thermal Needle Probe



Test Identification			
Borehole	Z3_OWF_BH06-SAMP	Sample Depth [m]	3.40
Sample	04-3	Test Depth [m]	3.40

Visual Description

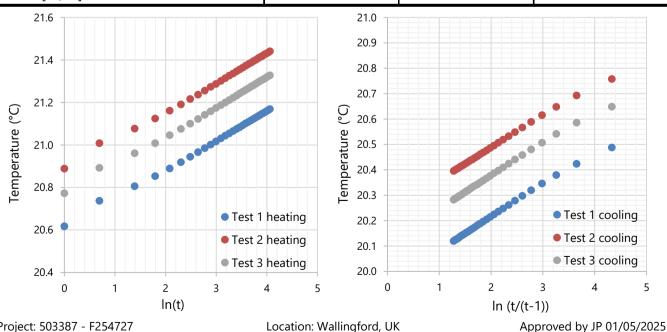
ASTM D5334-22a^{ε1}

dark grey slightly sandy slightly calcareous SILT with occasional medium to coarse sand-size shell fragments

Specimen Conditions			
Sample condition	Wax	Water content [%]	23.7
Wet mass [g]	1178.1	Dry density [g/cm³]	1.64
Diameter [mm]	64.1	Bulk density [g/cm³]	2.03
Length [mm]	179.4	Target wet density [g/cm³]	-

Test Conditions			
Room Temperature [°C]	21.8	Needle diameter [mm]	2.4
Needle	TR-3	Needle length [mm]	100
Heating time [min]	2.5	Insertion type	Pushed
Cooling time [min]	2.5	Calculation method	Inbuilt

Test Results	Test 1	Test 2	Test 3
Thermal Conductivity [W/mK]	1.74	1.77	1.73
Sample Temperature [°C]	20.05	20.32	20.20
Error	0.001	0.002	0.002
Power [W/m]	3.59	3.59	3.59



Project: 503387 - F254727

Note(s): Test Page 1/1



Thermal Conductivity by Thermal Needle Probe

ASTM D5334-22a^{ε1}



Test Identification			
Borehole	Z3_OWF_BH13-SAMP	Sample Depth [m]	0.25
Sample	01-2	Test Depth [m]	0.25

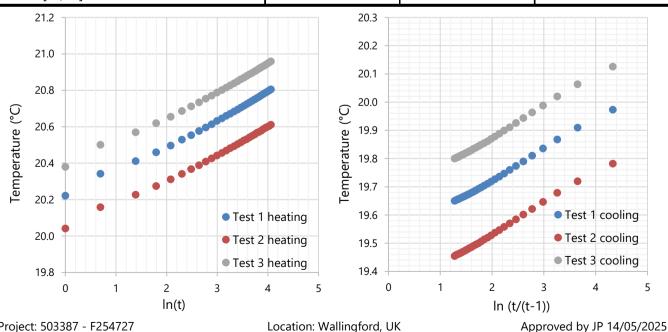
Visual Description

greyish brown silty medium to coarse calcareous SAND with occasional medium sand-size to coarse sand-size shell fragments

Specimen Conditions			
Sample condition	Reconstituted	Water content [%]	21.2
Wet mass [g]	1154.8	Dry density [g/cm³]	1.54
Diameter [mm]	71.4	Bulk density [g/cm³]	1.86
Length [mm]	154.9	Target wet density [g/cm³]	1.35

Test Conditions			
Room Temperature [°C]	20	Needle diameter [mm]	2.4
Needle	TR-3	Needle length [mm]	100
Heating time [min]	2.5	Insertion type	Pushed
Cooling time [min]	2.5	Calculation method	Inbuilt

Test Results	Test 1	Test 2	Test 3
Thermal Conductivity [W/mK]	1.79	1.78	1.79
Sample Temperature [°C]	19.50	19.32	19.66
Error	0.001	0.002	0.001
Power [W/m]	3.59	3.59	3.59



Project: 503387 - F254727

Note(s): Test Page 1/1



Carbonate Content of Soil by Rapid Titration

BS1377-3: 2018, Section 8.3

Location	Sample	Depth [m]	Carbonate Content 1 [% as CO ₂]	Carbonate Content 2 $[\% \text{ as CO}_3]$	Carbonate Content 3 [% as CaCO ₃]
Z3_OWF_BH01-SAMP	02-02	1.00	14.00		
Z3_OWF_BH01-SAMP	07-05	6.20	11.00		
Z3_OWF_BH01-SAMP	13-1	11.00	10.00		
Z3_OWF_BH01-SAMP	18-1	16.00	11.00		
Z3_OWF_BH06-SAMP	02-3	1.60	8.70		
Z3_OWF_BH06-SAMP	06-3	5.40	13.00		
Z3_OWF_BH06-SAMP	10-2	9.50	12.00		
Z3_OWF_BH06-SAMP	17-2	13.25	9.30		
Z3_OWF_BH06-SAMP	22-1	18.00	7.80		
Z3_OWF_BH13-SAMP	04-1	3.00	12.00		
Z3_OWF_BH13-SAMP	10-1	8.00	7.00		
Z3_OWF_BH13-SAMP	15-1	13.00	8.20		
Z3_OWF_BH13-SAMP	19-2	17.50	9.00		
	Z3_OWF_BH01-SAMP Z3_OWF_BH01-SAMP Z3_OWF_BH01-SAMP Z3_OWF_BH06-SAMP Z3_OWF_BH06-SAMP Z3_OWF_BH06-SAMP Z3_OWF_BH06-SAMP Z3_OWF_BH06-SAMP Z3_OWF_BH06-SAMP Z3_OWF_BH06-SAMP Z3_OWF_BH13-SAMP Z3_OWF_BH13-SAMP Z3_OWF_BH13-SAMP	Z3_OWF_BH01-SAMP 02-02 23_OWF_BH01-SAMP 13-1 13-1 23_OWF_BH06-SAMP 02-3 23_OWF_BH06-SAMP 10-2 23_OWF_BH06-SAMP 23_OWF_BH06-SAMP 23_OWF_BH06-SAMP 23_OWF_BH13-SAMP 23_OWF_BH13-SAMP 10-1 23_OWF_BH13-SAMP 15-1 23_OWF_BH13-SAMP 15-1 23_OWF_BH13-SAMP 15-1 23_OWF_BH13-SAMP 15-2 19-2 10-2	Z3_OWF_BH01-SAMP 02-02 1.00 Z3_OWF_BH01-SAMP 07-05 6.20 Z3_OWF_BH01-SAMP 13-1 11.00 Z3_OWF_BH01-SAMP 18-1 16.00 Z3_OWF_BH06-SAMP 02-3 1.60 Z3_OWF_BH06-SAMP 06-3 5.40 Z3_OWF_BH06-SAMP 10-2 9.50 Z3_OWF_BH06-SAMP 17-2 13.25 Z3_OWF_BH06-SAMP 22-1 18.00 Z3_OWF_BH13-SAMP 04-1 3.00 Z3_OWF_BH13-SAMP 10-1 8.00 Z3_OWF_BH13-SAMP 15-1 13.00	Z3_OWF_BH01-SAMP 02-02 1.00 14.00 14.00 23_OWF_BH01-SAMP 07-05 6.20 11.00 10.00 23_OWF_BH01-SAMP 13-1 11.00 10.00 11.00 23_OWF_BH01-SAMP 18-1 16.00 11.00 23_OWF_BH06-SAMP 02-3 1.60 8.70 23_OWF_BH06-SAMP 06-3 5.40 13.00 23_OWF_BH06-SAMP 10-2 9.50 12.00 23_OWF_BH06-SAMP 17-2 13.25 9.30 23_OWF_BH06-SAMP 22-1 18.00 7.80 23_OWF_BH13-SAMP 04-1 3.00 12.00 23_OWF_BH13-SAMP 10-1 8.00 7.00 23_OWF_BH13-SAMP 10-1 8.00 7.00 23_OWF_BH13-SAMP 15-1 13.00 8.20	Z3_OWF_BH01-SAMP 02-02 1.00 14.00 14.00 23_OWF_BH01-SAMP 07-05 6.20 11.00 10.00 23_OWF_BH01-SAMP 13-1 11.00 10.00 11.00 23_OWF_BH01-SAMP 18-1 16.00 11.00 23_OWF_BH06-SAMP 02-3 1.60 8.70 23_OWF_BH06-SAMP 06-3 5.40 13.00 23_OWF_BH06-SAMP 10-2 9.50 12.00 23_OWF_BH06-SAMP 17-2 13.25 9.30 23_OWF_BH06-SAMP 22-1 18.00 7.80 23_OWF_BH13-SAMP 04-1 3.00 12.00 23_OWF_BH13-SAMP 10-1 8.00 7.00 23_OWF_BH13-SAMP 10-1 8.00 7.00 23_OWF_BH13-SAMP 15-1 13.00 8.20

Note: This test was not performed by Fugro and was subcontracted.

Project: 503387 - F254727

Test Page 1 / 1

Organic Matter of Soil

BS1377-3: 2018, Section 4 and 6

No.	Location	Sample	Depth [m]	Organic Matter [%]	Organic Matter - Loss On Ignition [%]
1	Z3_OWF_BH01-SAMP	02-02	1.00		4.00
2	Z3_OWF_BH01-SAMP	07-05	6.20		5.50
3	Z3_OWF_BH01-SAMP	13-1	11.00		3.70
4	Z3_OWF_BH01-SAMP	18-1	16.00		4.00
5	Z3_OWF_BH06-SAMP	02-3	1.60		4.60
6	Z3_OWF_BH06-SAMP	06-3	5.40		5.20
7	Z3_OWF_BH06-SAMP	10-2	9.50		1.40
8	Z3_OWF_BH06-SAMP	17-2	13.25		3.40
9	Z3_OWF_BH06-SAMP	22-1	18.00		4.70
10	Z3_OWF_BH13-SAMP	04-1	3.00		5.30
11	Z3_OWF_BH13-SAMP	10-1	8.00		3.00
12	Z3_OWF_BH13-SAMP	15-1	13.00		6.50
13	Z3_OWF_BH13-SAMP	19-2	17.50		4.60

Note: This test was not performed by Fugro and was subcontracted.

Project: 503387 - F254727 Test Page 1 / 1

Chloride Content of Soil

BS1377-3: 2018, Section 9.2 and 9.3

No.	Location	Sample	Depth [m]	Water Soluble Chloride [%]	Acid Soluble Chloride [%]
1	Z3_OWF_BH01-SAMP	02-02	1.00	0.41	
2	Z3_OWF_BH01-SAMP	07-05	6.20	0.51	
3	Z3_OWF_BH01-SAMP	13-1	11.00	0.36	
4	Z3_OWF_BH01-SAMP	18-1	16.00	0.41	
5	Z3_OWF_BH06-SAMP	02-3	1.60	0.43	
6	Z3_OWF_BH06-SAMP	06-3	5.40	0.41	
7	Z3_OWF_BH06-SAMP	10-2	9.50	0.34	
8	Z3_OWF_BH06-SAMP	17-2	13.25	0.35	
9	Z3_OWF_BH06-SAMP	22-1	18.00	0.56	
10	Z3_OWF_BH13-SAMP	04-1	3.00	0.53	
11	Z3_OWF_BH13-SAMP	10-1	8.00	0.47	
12	Z3_OWF_BH13-SAMP	15-1	13.00	0.50	
13	Z3_OWF_BH13-SAMP	19-2	17.50	0.47	

Note: This test was not performed by Fugro and was subcontracted.

Project: 503387 - F254727 Test Page 1 / 1

Total Acid Soluble Sulphate and pH

BS1377-3: 2018, Section 7.5 and 12

No.	Location	Sample	Depth [m]	Total Acid Soluble Sulphate [mg/l as SO ₄]	рН
1	Z3_OWF_BH01-SAMP	02-02	1.00	1240.00	8.80
2	Z3_OWF_BH01-SAMP	07-05	6.20	1220.00	8.50
3	Z3_OWF_BH01-SAMP	13-1	11.00	595.00	8.80
4	Z3_OWF_BH01-SAMP	18-1	16.00	1210.00	8.50
5	Z3_OWF_BH06-SAMP	02-3	1.60	1210.00	8.40
6	Z3_OWF_BH06-SAMP	06-3	5.40	761.00	8.50
7	Z3_OWF_BH06-SAMP	10-2	9.50	944.00	8.40
8	Z3_OWF_BH06-SAMP	17-2	13.25	684.00	8.60
9	Z3_OWF_BH06-SAMP	22-1	18.00	1110.00	8.70
10	Z3_OWF_BH13-SAMP	04-1	3.00	599.00	8.70
11	Z3_OWF_BH13-SAMP	10-1	8.00	1030.00	8.90
12	Z3_OWF_BH13-SAMP	15-1	13.00	1270.00	8.90
13	Z3_OWF_BH13-SAMP	19-2	17.50	1170.00	8.90

Note: This test was not performed by Fugro and was subcontracted.

Project: 503387 - F254727 Test Page 1 / 1

Project No.

F254727

Location

Z3_OWF_BH01-SAMP W03

Depth

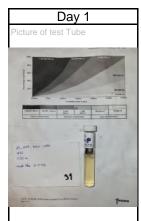
1.7 m BSF

Sample No. SRB Test Kit

Sig Sulphide®

Date of test

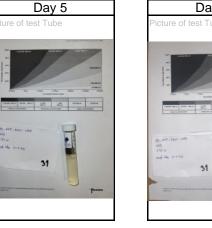
21/01/2025













Tube Appearance:

No Visible Reaction

Tube Appearance:

SRB Concentration

No Visible Reaction

< 10 SRB/ml

Qualitative

Interpretation

Tube Appearance:

No Visible Reaction

No Visible Reaction

Tube Appearance:

No Visible Reaction

No Visible Reaction

Tube Appearance:

SRB Concentration

< 10 SRB/ml

SRB Concentration

< 10 SRB/ml

SRB Concentration

< 10 SRB/ml

SRB Concentration < 10 SRB/ml

SRB Concentration < 10 SRB/ml

Qualitative Interpretation

Light Contamination Light Contamination

Qualitative Interpretation

Light Contamination Light Contamination

Qualitative Interpretation

Interpretation **Light Contamination**

Qualitative

Qualitative Interpretation



Project No.

F254727

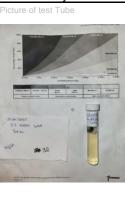
W09

Location Z3_OWF_BH01-SAMP Sample No.

SRB Test Kit Sig Sulphide® Depth Date of test

7.6 m BSF 21/01/2025

Day 1



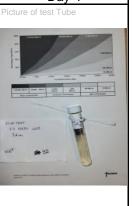
Day 2



Day 3



Day 4



Day 5



Day 6

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation



Project No. Location

F254727 Z3_OWF_BH01-SAMP

W14

Depth

12 m BSF

Sample No. SRB Test Kit

Sig Sulphide®

Date of test 21/01/2025

Day 1



Day 2



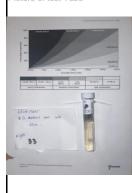
Day 3



Day 5



Day 6



Tube Appearance:

No Visible Reaction

Tube Appearance:

SRB Concentration

No Visible Reaction

< 10 SRB/ml

Tube Appearance: No Visible Reaction **Tube Appearance:**

SRB Concentration

No Visible Reaction

Tube Appearance: Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

SRB Concentration

< 10 SRB/ml

SRB Concentration

SRB Concentration

Qualitative

< 10 SRB/ml

Qualitative Qualitative Interpretation

Light Contamination

No Visible Reaction

< 10 SRB/ml

< 10 SRB/ml

Qualitative Interpretation

Qualitative Interpretation **Light Contamination**

Interpretation

Light Contamination

Qualitative Interpretation

33

Light Contamination

Interpretation **Light Contamination**



Project No. Location

Sample No.

SRB Test Kit

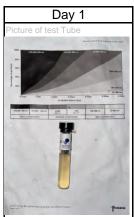
F254727 Z3_OWF_BH01-SAMP

W18

Sig Sulphide®

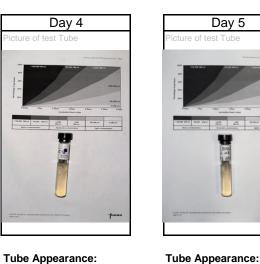
Depth Date of test

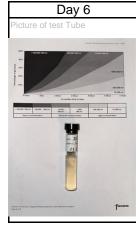
17.5 m BSF 21/01/2025

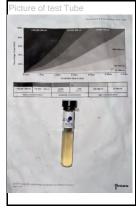














No Visible Reaction

No Visible Reaction

No Visible Reaction **SRB Concentration**

SRB Concentration < 10 SRB/ml

Qualitative Interpretation

Tube Appearance: No Visible Reaction

SRB Concentration < 10 SRB/ml

> Qualitative Interpretation **Light Contamination**

SRB Concentration

Tube Appearance:

< 10 SRB/ml

No Visible Reaction

Qualitative Interpretation

Light Contamination

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

SRB Concentration

Tube Appearance:

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Qualitative Interpretation

< 10 SRB/ml

Light Contamination **Light Contamination**



Project No. Location

F254727 Z3_OWF_BH06-SAMP

Depth

4 m BSF

Sample No. SRB Test Kit

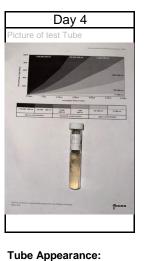
W05 Sig Sulphide®

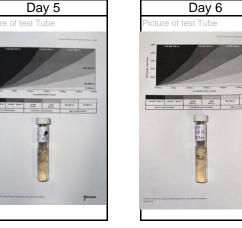
Date of test 21/01/2025

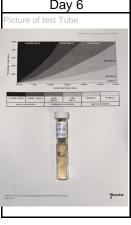
Day 1











Tube Appearance:

No Visible Reaction

No Visible Reaction

Tube Appearance:

SRB Concentration

No Visible Reaction

< 10 SRB/ml

Light Grey

SRB Concentration

Tube Appearance: Light Grey

Tube Appearance: Light Grey

SRB Concentration

< 10 SRB/ml

SRB Concentration

Tube Appearance:

10 - 100 SRB/ml

SRB Concentration

Qualitative Interpretation **Light Contamination**

Qualitative Interpretation

< 10 SRB/ml

Light Contamination Light Contamination

Qualitative Interpretation

Light Contamination

Qualitative

Interpretation

10 - 100 SRB/ml Qualitative

Interpretation **Light Contamination** **SRB Concentration** 10 - 100 SRB/ml

> Qualitative Interpretation



Project No. : Location :

Sample No.

SRB Test Kit

F254727 Z3_OWF_BH06-SAMP

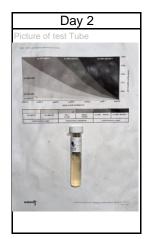
W09

Sig Sulphide®

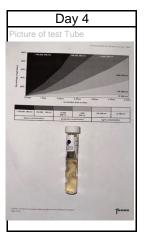
Depth :

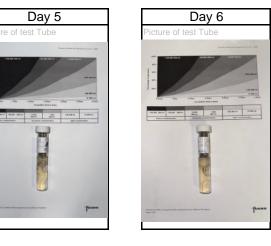
10.5 m BSF 21/01/2025

Picture of test Tube











No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation



Project No. Location

F254727 Z3_OWF_BH06-SAMP W17

Depth

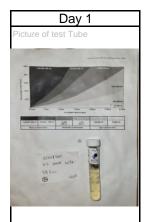
13.5 m BSF

Sample No. SRB Test Kit

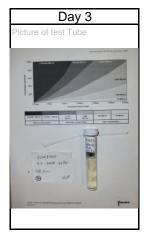
Sig Sulphide®

Date of test

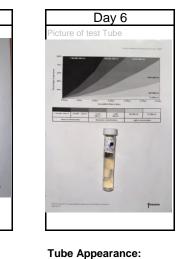
22/01/2025











Tube Appearance:

No Visible Reaction

No Visible Reaction

Tube Appearance:

Tube Appearance: Light Grey

Light Grey

Tube Appearance:

Light Grey

Day 5

Light Grey

SRB Concentration

< 10 SRB/ml

SRB Concentration SRB Concentration

10 - 100 SRB/ml

SRB Concentration 10 - 100 SRB/ml

Qualitative

Interpretation

SRB Concentration 10 - 100 SRB/ml

10 - 100 SRB/ml

Qualitative Interpretation

Qualitative Interpretation

Light Contamination

Qualitative Interpretation

Light Contamination

SRB Concentration

Qualitative Interpretation

Light Contamination

Light Contamination

Qualitative Interpretation **Light Contamination**

< 10 SRB/ml



Project No. Location

F254727 Z3_OWF_BH06-SAMP

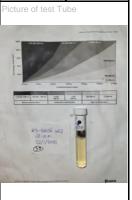
W22

SRB Test Kit Sig Sulphide® Depth Date of test 18.1 m BSF

22/01/2025

Day 1

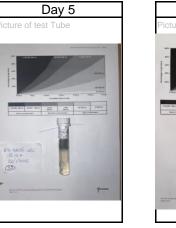
Sample No.

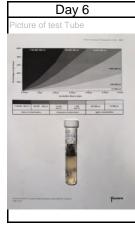


Day 2









Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation Light Contamination **Tube Appearance:**

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation



Project No.

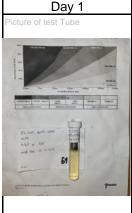
Location Z3_OWF_BH13-SAMP

Sample No. SRB Test Kit

Sig Sulphide®

Depth Date of test

4.6 m BSF 22/01/2025



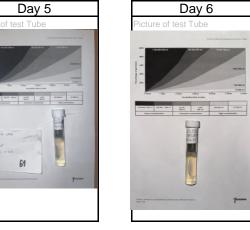


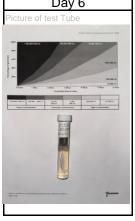
F254727

W05









Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

SRB Concentration

< 10 SRB/ml

Qualitative Interpretation



Project No. Location

F254727 Z3_OWF_BH13-SAMP W12

Date of test

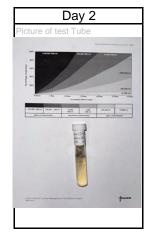
Depth

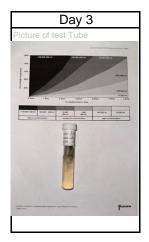
10.4 m BSF 22/01/2025

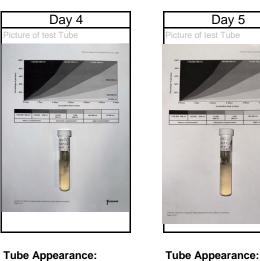
Sample No. SRB Test Kit

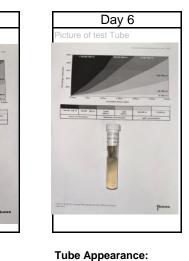
Sig Sulphide®











Tube Appearance:

No Visible Reaction

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative

Tube Appearance:

Light Grey

10 - 100 SRB/ml

Qualitative

Interpretation

Light Grey

Light Grey

Light Grey

SRB Concentration

< 10 SRB/ml

SRB Concentration

Tube Appearance:

SRB Concentration 10 - 100 SRB/ml **SRB Concentration**

10 - 100 SRB/ml 10 - 100 SRB/ml

Qualitative Interpretation **Light Contamination**

Interpretation

Light Contamination Light Contamination

Qualitative Interpretation

Light Contamination

Qualitative Interpretation

Light Contamination

SRB Concentration

Interpretation **Light Contamination**

Qualitative



Project No. Location

F254727 Z3_OWF_BH13-SAMP

W17

Date of test

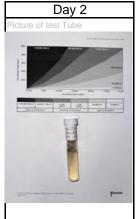
Depth

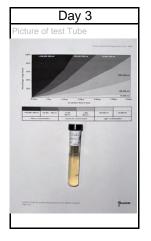
15.4 m BSF 22/01/2025

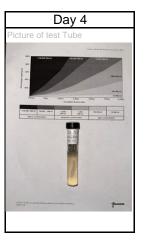
Sample No. SRB Test Kit

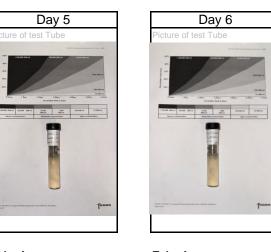
Sig Sulphide®

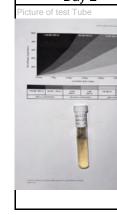
Day 1

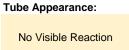












No Visible Reaction

Tube Appearance:

Tube Appearance: Light Grey

SRB Concentration

Tube Appearance: Light Grey **SRB Concentration**

10 - 100 SRB/ml

Tube Appearance: Light Grey **SRB Concentration**

SRB Concentration < 10 SRB/ml

Qualitative

Interpretation

Light Contamination

Tube Appearance:

No Visible Reaction

Qualitative Interpretation **Light Contamination**

SRB Concentration SRB Concentration < 10 SRB/ml < 10 SRB/ml

> Qualitative Interpretation **Light Contamination**

Qualitative Interpretation Light Contamination

10 - 100 SRB/ml

Qualitative Interpretation **Light Contamination**

Qualitative Interpretation **Light Contamination**

10 - 100 SRB/ml

Project No. Location

F254727 Z3_OWF_BH13-SAMP W21

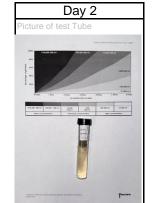
Date of test

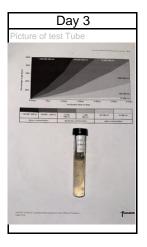
Depth 19.4 m BSF 22/01/2025

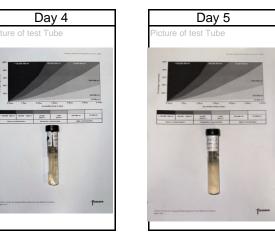
Sample No. SRB Test Kit

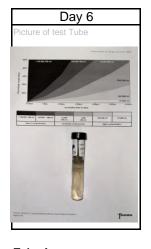
Sig Sulphide®

Day 1











SRB Concentration

No Visible Reaction

< 10 SRB/ml

Qualitative

Interpretation

Light Contamination

SRB Concentration

10 - 100 SRB/ml

Light Grey

Qualitative Interpretation

Light Contamination

Tube Appearance: Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation

Light Contamination

Tube Appearance:

Light Grey

SRB Concentration

10 - 100 SRB/ml

Qualitative Interpretation



Appendices

Appendix A Guidelines on Use of Report

A.1 Guidelines on Use of Report

Appendix B Geotechnical Classification Systems

B.1 Soil Classification Systems

Appendix C Laboratory Standards

- C.1 Laboratory Testing Methods: Standards and Statements
- C.2 Laboratory Accreditations

Appendix D Positioning and Water Depth Data

D.1 Positioning and Water Depth Data

Appendix E Digital Data

E.1 Digital Data



Appendix A

Guidelines on Use of Report



A.1 Guidelines on Use of Report

This report (the 'Report') was prepared as part of the services (the 'Services') provided by Fugro France SAS ('Fugro') for its client (the 'Client') under the terms of the relevant contract between the two parties (the 'Contract'). The Services were performed by Fugro based on the requirements of the Client set out in the Contract or otherwise made known by the Client to Fugro at the time.

Fugro's obligations and liabilities to the Client or any other party in respect of the Services and this Report are limited in time and value as defined in Contract (or in the absence of any express provision in the Contract as implied by the law of the Contract) and Fugro provides no other representation or warranty whether express or implied, in relation to the Services or for the use of this Report for any other purpose. Furthermore, Fugro has no obligation to update or revise this Report based on changes in conditions or information which emerge following issue of this Report unless expressly required by the Contract.

The Services were performed by Fugro exclusively for the Client and any other party identified in the Contract for the purpose set out therein. Any use and/or reliance on the Report or the Services for purposes not expressly stated in the Contract, by the Client or any other party is that party's risk and Fugro accepts no liability whatsoever for any such use and/or reliance.



Appendix B

Geotechnical Classification Systems



B.1 Soil Classification Systems

Soil description and classification during the site investigation followed two standards:

- ISO 14688-1:2017 Geotechnical investigation and testing. Identification and classification of soil. Identification and description (ISO, 2017a);
- ISO 14688-2:2017 Geotechnical investigation and testing. Identification and classification of soil. Principles for a classification (ISO, 2017b).

Based on these two standards, the consistency of cohesive soils was determined offshore as outlined in Table B.1.

Table B.1: Definitions of consistency used in soil descriptions

Consistency Term	Field Assessment
Very soft	Exudes between the fingers when squeezed in the hand
Soft	Can be moulded by light finger pressure
Firm	Cannot be moulded by the fingers but can be rolled in the hand to 3 mm thick threads without breaking or crumbling
Stiff	Crumbles and breaks when rolled to 3 mm thick threads but is still sufficiently moist to be moulded to a lump again
Very stiff	Soil has dried out and is mostly light coloured. Cannot be moulded but crumbles under pressure. Can be indented by the thumbnail

Undrained shear strength of fine soils is defined using the results of basic laboratory and field tests. Table B.2 explains the terms for characterising undrained shear strength. An additional range for ultra high strength soils is included to cover the full range of soil strengths.

Table B.2: Definitions of undrained shear strength of fine soils used in soil descriptions

Strength Term	Undrained Shear Strength [kPa]
Extremely low	< 10
Very low	10–20
Low	20–40
Medium	40–75
High	75–150
Very high	150–300
Extremely high	300–600
Ultra high	> 600

Table B.3 presents the ranges of relative density (Lambe & Whitman, 1969) on which the limits of consistency adopted in sand soils are based.



Table B.3: Definitions of relative density used in soil descriptions

Relative Density Term	Relative Density [%]
Very loose	0–15
Loose	15–35
Medium dense	35–65
Dense	65–85
Very dense	85–100

Fugro has a standard code of practice that aims to standardise soil descriptions in accordance with BS 5930:2015+A1:2020 (BSI, 2015a), and has adopted equivalent qualitative terms for tertiary constituents. These are listed in Table B.4.

Table B.4: Standard terms used in soil descriptions for tertiary constituents

BS 5930:2015 Suggested Term	Fugro Standard Term	% by Volume*
Rare	With trace	< 1
Occasional	With a few	1–5
n/a	With	> 5–15
Frequent	With many	> 15

Notes

n/a = Not applicable: the BSI does not have a suggested term that equates to 'with'



^{* =} Estimated visually

Appendix C

Laboratory Standards



C.1 Laboratory Testing Methods: Standards and Statements

Table C.1 lists the standards and procedures for laboratory tests performed by Fugro during this project. Non-standard laboratory test procedures (i.e. Fugro in-house testing procedures) are included; where tests were performed according to national or international standards, only the applicable standard number is referenced. Accredited tests are noted in the tables below. Tests performed offshore do not fall under the accreditation.

Table C.1: Laboratory method standards and statements

Laboratory Tests	Standard Reference or Fugro Document Number
Classification Tests	
Moisture content*	ISO 17892-1:2014 (ISO, 2014)
Bulk and dry density*	ISO 17892-2:2014 (ISO, 2014a)
Torvane	L-M-011
Pocket penetrometer	L-M-015
Plastic and liquid limits*	ISO 17892-12:2018 (ISO, 2018c)
Particle density*	ISO 17892-3:2015 (ISO, 2015)
Maximum and minimum density	NGI GEOLABS (2019a, 2019b)
Particle size distribution*	ISO 17892-4:2016 (ISO, 2016)
Conductivity Tests	
Thermal conductivity*	ASTM D5334-22 (ASTM International, 2022)
Consolidation Tests	
Incremental loading oedometer*	ISO 17892-5:2017 (ISO, 2017)
Permeability Tests	
Permeability*	ISO 17892-11:2019 (ISO, 2019)
Permeability in triaxial cell*	ISO 17892-11:2019 (ISO, 2019)
Shear Strength Tests – Total Stress	
Unconsolidated undrained triaxial*	ISO 17892-8:2018 (ISO, 2018)
Direct shear, shear box*	ISO 17892-10:2018 (ISO, 2018b)
Shear Strength Tests – Effective Stress	
Consolidated triaxial compression on water saturated soils*	ISO 17892-9:2018 (ISO, 2018a)
Notes * = Accredited test	

Table C.2 lists additional tests that were subcontracted to a third-party laboratory and not performed by Fugro.

Table C.2: Subcontracted tests: method standards and statements

Laboratory Tests	Standard or Method Statement
Carbonate content of soil by rapid titration *	BS 1377-3:2018 (BSI, 2018)
Chloride content *	BS 1377-3:2018 (BSI, 2018)



Laboratory Tests	Standard or Method Statement
Organic matter by loss on ignition *	BS 1377-3:2018 (BSI, 2018)
pH value *	BS 1377-3:2018 (BSI, 2018)
Sulphate content *	BS 1377-3:2018 (BSI, 2018)
Notes * = Accredited test	

C.2 Laboratory Accreditations

Laboratory accreditations are provided in the below section for the following laboratories:

- Fugro GB Marine Limited (Wallingford and Louvain-la-Neuve laboratory);
- Fugro GeoServices Limited (Consett laboratory);
- Derwentside Environmental Testing Services Ltd.



Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK



0919

Accredited to ISO/IEC 17025:2017

Fugro GB Limited

Issue No: 051 Issue date: 05 June 2025

Fugro House Hithercroft Road Wallingford Oxon

OX10 9RB

Contact: Ms S Burns
Tel: +44 (0)131 4495030
E-Mail: s.burns@fugro.com
Website: www.fugro.com

Testing performed by the Organisation at the locations specified

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address Fugro House Hithercroft Road Wallingford Oxon OX10 9RB	Local contact: Ms A Miliopoulou Tel: +44 (0)1491 820443 Email: a.miliopoulou@fugro.com Website: www.fugro.com	Support Functions: Quality System Quality Audit Administration Construction: Soils – Physical and Mechanical Testing	A
Address Victory House Unit 16 Trafalgar Wharf Hamilton Road Portchester Hampshire PO6 4PX	Local contact: Mr A Addleton Tel: +44 (0)23 92205577 Email: a.addleton@fugro.com Website: www.fugro.com	Support Functions: Quality System Quality Audit Administration Sampling and Testing: Sediment Physical Testing Water Testing	В
Address 1-9 The Curve 32 Research Avenue North Heriot-Watt Research Park Edinburgh EH14 4AP	Local contact Mr A Matkin Tel: +44 (0)131 4495030 Email: a.matkin@fugro.com Website: www.fugro.com	Support Functions: Quality System Quality Audit Administration Chemical Testing: Sediment Testing Soils Testing Water Testing	С
Address Fugro Belgium SRL, Rue du Bosquet 9 1348 Louvain-La-Neuve, Belgium	Local contact Ms A Miliopoulou Tel: +44 (0)1491 820443 Email: a.miliopoulou@fugro.com Website: www.fugro.com	Support Functions: Quality System Quality Audit Administration Construction: Soils – Physical and Mechanical Testing	F

Site activities performed away from location B listed above:

Assessment Manager: JH7 Page 1 of 7



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United Kingdom Accreditation Service
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Fugro GB Limited

Issue No: 051 Issue date: 05 June 2025

Testing performed by the Organisation at the locations specified

Location details	Activity	Location code
Premises including domestic, commercial and industrial	Sampling for Microbiological Testing	D
Customer Locations - Marine and transitional water environments	Sampling for macrofaunal taxonomy and Physio- chemical analysis of sediments and water	Е

Assessment Manager: JH7 Page 2 of 7



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Fugro GB Limited

Issue No: 051 Issue date: 05 June 2025

Testing performed by the Organisation at the locations specified

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS for civil engineering purposes	Moisture content - oven drying method	BS 1377:Part 2:1990	A
	Electrical Resistivity – Cylindrical Samples	BS 1377-3: 2018 Clause 13.3	А
	One-dimensional consolidation properties of saturated cohesive soils using controlled-strain loading	ASTM D4186-12: 2020	A, F
SOIL and SOFT ROCK	Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe	ASTM D5334-22	A
ROCK	Water Content	ASTM D2216-19 The Complete ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 – 2006, Editors: R Ulusay & J A Hudson	A A
	Determination of the Point Load Strength Index of Rock	ASTM D5731-16 The Complete ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 – 2006, Editors: R Ulusay & J A Hudson	A A
GEOTECHNICAL INVESTIGATION and TESTING	Water content	BS EN ISO 17892-1:2014 DIN EN ISO 17892-1:2014	A, F
- Laboratory testing of soil	Bulk density - linear measurement method	BS EN ISO 17892-2:2014 DIN EN ISO 17892-2:2014	A, F
	Particle density - fluid pycnometer method	BS EN ISO 17892-3:2015 DIN EN ISO 17892-3:2015	A, F
	Particle size distribution - sieving method	BS EN ISO 17892-4:2016 DIN EN ISO 17892-4:2016	A, F
	Particle size distribution - pipette method	BS EN ISO 17892-4:2016 DIN EN ISO 17892-4:2016	A, F

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Fugro GB Limited

Issue No: 051 Issue date: 05 June 2025

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
GEOTECHNICAL INVESTIGATION and TESTING	Particle size distribution - hydrometer method	BS EN ISO 17892-4:2016 DIN EN ISO 17892-4:2016	F
- Laboratory testing of soil (cont'd)	Incremental loading oedometer test	BS EN ISO 17892-5:2017 DIN EN ISO 17892-5:2017	A, F
	Unconsolidated undrained triaxial test	BS EN ISO 17892-8:2018 DIN EN ISO 17892-8:2018	A, F
	Consolidated triaxial compression tests on water saturated soils: Isotropic consolidation (CIU and CID)	BS EN ISO 17892-9:2018 Clause 6.4 DIN EN ISO 17892-9:2018 Clause 6.4	A, F
	Consolidated triaxial compression tests on water saturated soils: Anisotropic consolidation (CAU and CAD)	BS EN ISO 17892-9:2018 Clause 6.5 DIN EN ISO 17892-9:2018 Clause 6.5	A, F
	Triaxial Extension Tests – Consolidated triaxial extension tests on water saturated soils: Isotropic tests	Documented in-house method UK-MLB-TCH-PR-711 Triaxial Extension Tests Issue 1.0 01/01/2023	A, F
	Triaxial Extension Tests – Consolidated triaxial extension tests on water saturated soils: Anisotropic tests	Documented in-house method UK-MLB-TCH-PR-711 Triaxial Extension Tests Issue 1.0 01/01/2023	A, F
	Direct shear – shear box test	BS EN ISO 17892-10:2018 DIN EN ISO 17892-10:2018	A, F
	Direct shear – ring shear test	BS EN ISO 17892-10:2018 DIN EN ISO 17892-10:2018	A, F
	Soil-steel interface (ICP) ring shear test	ICP design methods for driven piles in sands and clays' –Jardine et al 2005 (Appendix A)	A, F
	Permeability tests - Rigid wall permeameter	BS EN ISO 17892-11:2019 DIN EN ISO 17892-11:2019	A, F

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Fugro GB Limited

Issue No: 051 Issue date: 05 June 2025

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
GEOTECHNICAL INVESTIGATION and TESTING	Permeability tests - Flexible wall permeameter	BS EN ISO 17892-11:2019 DIN EN ISO 17892-11:2019	A, F
- Laboratory testing of soil (cont'd)	Liquid limit by fall cone method: four-point test	BS EN ISO 17892-12:2018 DIN EN ISO 17892-12:2018	A, F
	Plastic limit	BS EN ISO 17892-12:2018 DIN EN ISO 17892-12:2018	A, F
	Plasticity index	BS EN ISO 17892-12:2018 DIN EN ISO 17892-12:2018	A, F
	Physical Tests	Documented In-House Methods	
SEDIMENTS - Marine and freshwater sediments	Particle size distribution	UK-SED-TCH-WI-001 Particle Size Distribution based on NMBAQC's best practice guidance – Particle Size Analysis (PSA) for Supporting Biological Analysis 2022 using a dry sieving method	В
		UK-SED-TCH-WI-002 Particle Size Distribution based on BS 1377 Parts 1: 2016 and 2: 1990 using a dry sieving method	
	Particle size distribution	UK-SED-TCH-WI-006 Particle Size Distribution by Laser Diffraction / 0.02um to 2000um by Laser Diffraction based on NMBAQC'S Best Practice Guidance – Particle Size Analysis (PSA) for Supporting Biological Analysis 2022 and BS ISO 13320:2020	В
WATERS - Saline and Freshwaters	Suspended solids (Glass fibre paper (1.2 µm) filtration method)	UK-SED-TCH-WI-010 – Total Suspended Solids based on HMSO Methods 1980 and BS 872:2005 using gravimetric weighing	В

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Fugro GB Limited

Issue No: 051 Issue date: 05 June 2025

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SEDIMENTS - Sediments from Marine and Transitional Waters	Ecological Tests Marine soft-bottom sediment macrofaunal taxonomy	UK-BEN-TCH-WI-001 - Macrobenthic Sample Analysis	В
	Chemical Tests		
MARINE SEDIMENTS SOILS	Total Petroleum Hydrocarbons C ₁₀ to C ₄₀	UK-CHM-TCH-WI-003 - Extraction and Clean-up of Aliphatic and Aromatic Hydrocarbons from Sediments and Soils	С
		UK-CHM-TCH-WI-005 - Analysis of Total and Aliphatic Hydrocarbons from Sediments, Soils and Waters	
WATERS - Saline and Freshwaters	Total Petroleum Hydrocarbons C ₁₀ to C ₄₀	UK-CHM-TCH-WI-004 - Extraction and Clean-up of Aliphatic and Aromatic Hydrocarbons from Water	С
		UK-CHM-TCH-WI-005 - Analysis of Total and Aliphatic Hydrocarbons from Sediments, Soils and Waters	
SEDIMENTS (marine, estuarine etc.)	Metals: Aluminium; Barium; Iron Manganese; Phosphorus	UK-CHM-TCH-WI-032 Aqua Regia Microwave Digestion of Sediments and Soils	С
	Titanium; Vanadium	UK-CHM-TCH-WI-033 ICP-OES Analysis of Major and Trace Elements in Sediments Soils after an Aqua Regia Digest	
	Metals: Antimony; Arsenic; Cadmium Chromium; Cobalt;	UK-CHM-TCH-WI-032 Aqua Regia Microwave Digestion of Sediments and Soils	С
	Copper; Lead; Lithium Mercury; Molybdenum Nickel; Silver; Strontium; Zinc	UK-CHM-TCH-WI-034 ICP-MS Analysis of Trace Elements in Sediments and Soils after an Aqua Regia Digest	

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Schedule of Accreditation issued by

United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Fugro GB Limited

Issue No: 051 Issue date: 05 June 2025

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS	Sampling and subsequent analysis by an ISO/IEC 17025 accredited laboratory for	Documented In-House Methods	
RECREATIONAL - Swimming Pools/SPA's	Microbiological Testing	UK-WQS-TCH-WI-001 - Bacteriological Sampling	D
POTABLE - Non-Regulatory sampling (Hot and cold water supply)	Microbiological Testing	UK-WQS-TCH-WI-001 - Bacteriological Sampling	D
SEDIMENTS	Sampling and subsequent analysis by an ISO/IEC 17025 accredited laboratory for	Documented In-House Methods	
Sediments from Marine and Transitional Waters	Macrofaunal taxonomy and to determine physio-chemical properties of the marine sediment collected by means of grab sampler or corer	UK-ESR-OPL-PR-001 - Ecology Group Survey Methods and Procedures (based on ISO 5667- 19:2004 and BS EN ISO 16665:2013).	E
	END		•

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Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK



1483

Accredited to ISO/IEC 17025:2017

Fugro GB Limited

Issue No: 038 Issue date: 01 August 2025

Armstrong House

Unit 43

Number One Industrial Estate

Medomsley Road

Consett

Co Durham

DH8 6TW

Contact: Ms Shona Burns

Tel: +44 (0)1207-581120 Fax: +44 (0)1207-581609

E-Mail: s.burns@fugro.com

Website: www.fugro.com

Testing performed at the above address only

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ROCK	End preparation of rock specimens for compressive strength	ASTM D 4543-19
	Point load strength and anisotropy indices	The Complete ISRM Suggested Methods for Rock Characterisation, Testing and
	Water content	Monitoring:1974-2006. Editors: R Ulusay & J A Hudson
	Porosity and density - by saturation and calliper techniques	
	Porosity and density - by saturation and buoyancy techniques	
	Slake-durability index	
	Uniaxial compressive strength	
	Deformability of rock materials in uniaxial compression (Young's modulus & Poisson's ratio)	
	Shore hardness	
	Dynamic Indirect Tensile Strength - by Brazilian Test	ISRM Suggested Methods for Rock Characterization Testing and Monitoring2007-2014. Editors R. Ulusay
	Sound velocity	
	Abrasiveness of Rock using the CERCHAR Method	ASTM D7625-10
	Direct Shear Strength Tests of Rock Specimens Under Constant Normal Force	ASTM D5607-16

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Schedule of Accreditation issued by

United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Fugro GB Limited

Issue No: 038 Issue date: 01 August 2025

Testing performed at main address only

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
SOILS for civil engineering purposes	Particle density - gas jar method	BS 1377-2:1990
	Determination of Linear Shrinkage	BS1377-2 :2022
	Dry density/moisture content relationship (2.5 kg rammer) (4.5 kg rammer) (vibrating hammer	BS 1377-4:1990
	Determination of maximum and minimum dry densities for granular soils	BS 1377-4:1990
	Moisture condition value (MCV)	BS 1377-4:1990
	Determination of MCV / moisture content relation of a soil	BS 1377-4:1990
	Chalk crushing value	BS 1377-4:1990
	California Bearing Ratio (CBR)	BS 1377-4:1990
		BS 1377-4:1990
	Shear strength by laboratory vane	BS 1377-7:1990
	Undrained shear strength - triaxial compression with multistage loading and without measurement of pore pressure	BS 1377-7:1990
	Consolidated undrained triaxial compression test with the measurement of pore water pressure using multistage loading	Documented In-House Method LTPMS 41: Feb 2016
	Consolidated drained triaxial compression test with measurement of volume change using multistage loading	Documented In-House Method LTPMS 42: Feb 2016
	Hand held shear vane	New Zealand Geotechnical Society Guidelines for Hand Held Shear Vane Test, August 2001
	Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe	ASTM D5334-14
	Calculating Thermal Diffusivity of Rock and Soil	ASTM D5334-14 / ASTM D4612-16
	Measurement of settlement on saturation	BS1377-2:2022

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Schedule of Accreditation issued by

United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Fugro GB Limited

Issue No: 038 Issue date: 01 August 2025

Testing performed at main address only

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
SOILS for civil engineering purposes – cont'd	Measurement of swelling pressure	BS1377-2:2022
	Measurement of swelling	BS1377-2:2022
	Determination of electrical resistivity Undisturbed cylindrical samples	BS1377-3:2018+A1:2021
GEOTECHNICAL INVESTIGATION and TESTING - Laboratory testing of soil	Water content	BS EN ISO 17892-1:2014 DIN EN ISO 17892-1:2014
	Bulk density - linear measurement method - immersion in fluid method - fluid displacement method	BS EN ISO 17892-2:2014 DIN EN ISO 17892-2:2014
	Determination of particle density - fluid pycnometer method	BS EN ISO 17892-3:2015 DIN EN ISO 17892-3:2015
	Determination of particle size distribution - sieving method - pipette method	BS EN ISO 17892-4:2016 DIN EN ISO 17892-4:2016
	Incremental loading oedometer test	BS EN ISO 17892-5:2017 DIN EN ISO 17892-5:2017
	Unconfined compression test	BS EN ISO 17892-7:2018 DIN EN ISO 17892-7:2018
	Unconsolidated undrained triaxial test	BS EN ISO 17892-8:2018 DIN EN ISO 17892-8:2018
	Isotropically consolidated undrained triaxial compression test	BS EN ISO 17892-9:2018 DIN EN ISO 17892-9:2018
	Isotropically consolidated drained triaxial compression test	BS EN ISO 17892-9:2018 DIN EN ISO 17892-9:2018
	Determination of direct shear - small shearbox - large shearbox	BS EN ISO 17892-10:2018 DIN EN ISO 17892-10:2018
	Permeability in a triaxial cell	BS EN ISO 17892-11:2019 DIN EN ISO 17892-11:2019

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Schedule of Accreditation issued by

United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Fugro GB Limited

Issue No: 038 Issue date: 01 August 2025

Testing performed at main address only

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
GEOTECHNICAL INVESTIGATION and TESTING - Laboratory testing of soil – cont'd	Determination of plastic limit	BS EN ISO 17892-12:2018 +A2:2022 DIN EN ISO 17892-12:2018 +A2:2022
	Determination of plasticity index	BS EN ISO 17892-12:2018 +A2:2022 DIN EN ISO 17892-12:2018 +A2:2022
	Determination of liquid limit - fall cone method	BS EN ISO 17892-12:2018 +A2:2022 DIN EN ISO 17892-12:2018 +A2:2022
	END	'

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Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK



2139

Accredited to ISO/IEC 17025:2017

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Unit 2 Contact: Mr J Coffer

Park Road Industrial Estate

Consett

Co Durham

Tel: +44 (0)1207 582333

E-Mail: info@dets.co.uk

Website: www.dets.co.uk

DH8 5PY

Testing performed by the Organisation at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address Unit 2 Park Road Industrial Estate Consett Co Durham DH8 5PY	Local contact Mr J Coffer	Environmental Analysis Health and Hygiene Asbestos – All Support Functions	A

Site activities performed away from the locations listed above:

Location details	Activity	Location code
Client Premises	Sampling	В

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Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
LEACHATES	<u>Analysis</u>		
WATER, PROCESS WATER, SALINE/SEA WATER, WASTE WATER, NATURAL	pH value	Documented In-House Method No DETCS 2008 based on BS 1377:Part 3:1990	А
	Electrical Conductivity	Documented In-House Method No DETCS 2009	A
	Alkalinity	Documented In-House Method No DETSC 2030 based on Standing Committee of Analysts Methods (HMSO) ISBN 011 751 6015	А
	Chemical Oxygen Demand	Documented In-House Method No DETSC 2032 based on Standing Committee of Analysts Method (HMSO) ISBN 011 751 9154, 1986, by colorimetry	А
	Suspended Solids	Documented In-House Method No DETSC 2034 based on Standing Committee of Analysts Method (HMSO) ISBN 011 751 957 X, 1980	А
	Total Dissolved Solids	Documented In-House Method No DETSC 2035 based on Standing Committee of Analysts Method (HMSO) ISBN 011 751 957 X, 1980	А
	Chloride content	Documented In-House Method No DETSC 2006 based on BS 1377:Part 3:1990	A
LEACHATES, WATER, PROCESS, WATER, SALINE/SEA, WATER, WASTE, WATER, NATURAL, TRADE EFFLUENTS	Biochemical Oxygen Demand	Documented In-House Method No DETSC 2031 based on Standing Committee of Analysts Method (HMSO) ISBN 011 752 2120, 1988, by meter	А

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Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
LEACHATES WATER, PROCESS	Analysis (cont'd)		
WATER, SALINE/SEA WATER, WASTE WATER, NATURAL	Boron (soluble)	Documented In-House Method No DETSC 2123 by colorimetry	A
	Anions, comprising: Chloride Nitrate Nitrite Phosphate Sulphate	Documented In-House Method No DETSC 2055 by ion chromatography based on EPA 9056A (Rev 1 November 2000)	А
Clean water (non-regulatory) Surface (River) water, Sewage Influent and	Mercury (Total and Dissolved)	Documented in house Method No DETSC 2324 by AFS	А
Sewage effluent	Low level Total and Dissolved Metals Aluminium	Documented in house Method No DETSC 2306 by ICPMS	A
	Phosphorous Chromium Iron Nickel Copper Zinc Cadmium Lead		

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Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Analysis (cont'd)		
Clean water (non-regulatory) River water, Groundwater, Trade effluent, prepared and Landfill leachate	Metals: Dissolved only: Aluminium Antimony Arsenic Barium Calcium Cadmium Cobalt Chromium Copper Iron Lead Mercury Potassium Magnesium Manganese Nickel Phosphorus Selenium Sodium Vanadium Zinc	Documented in house method No DETSC 2306 by ICP-MS	A
Clean water (non-regulatory) River water, Groundwater, prepared and Landfill leachate	Molybdenum		
Clean water (non-regulatory) River water, Groundwater, Trade effluent, prepared and Landfill leachate	Hardness by Calculation Calcium Hardness by Calculation	Documented in-House method DETSC 2303	A
Landini loaditate	Elemental Sulphur	Documented In-House Method No DETSC 3049 by HPLC based on standing committee of Analysts Method (HMSO) ISBN 011 751 726 7	A
	Oil and Grease (Hexane extractable material) Cyclohexane Extractable Material Toluene Extractable Material	Documented In-House Method No DETSC 3002 by extraction/ gravimetry	А
	Thiocyanate	Documented In-House Method No DETSC 2130 by Skalar	А

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Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

	T	T	1
Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Analysis (cont'd)		
Clean water (non-regulatory) River water, Groundwater, Trade effluent, prepared and	Cyanide (total)	Documented In-House Method No DETSC 2130 by Skalar	А
Landfill leachate (cont'd)	Cyanide (free)	Documented In-House Method No DETSC 2130 by Skalar	А
	Phenol (monohydric)	Documented In-House Method No DETSC 2130 by Skalar	А
	Low Level Cyanide (total)	Documented In-House Method No DETSC 2131 by Skalar	А
	Low Level Cyanide (free)	Documented In-House Method No DETSC 2131 by Skalar	А
	Low level Cyanide (Complex by Calculation)	Documented In-House Method No DETSC 2131 by Skalar	А
	Low Level Phenol (monohydric)	Documented In-House Method No DETSC 2131 by Skalar	А
	Volatile Organic Compounds (VOCs), specifically: Benzene Ethylbenzene Methyl-tert-butyl-ether (MTBE) Toluene o-Xylene (m+p)-Xylenes	Documented In-House Method No DETSC 3322 by GC-FID	A
	Extractable Petroleum Hydrocarbons (EPH) (C ₁₀ -C ₄₀)	Documented In-House Method No DETSC 3311 by GC-FID	
LEACHATES, TAP WATER (non-regulatory), RIVER WATER AND	Nitrite	Documented In-House Method No DETSC 2201 by KONELAB 60i	А
GROUNDWATER	TON	Documented In-House Method No DETSC 2202 by KONELAB 60i	А
	Hexavalent Chromium	Documented In-House Method No DETSC 2203 by KONELAB 60i	А
	Phosphorous (Soluble reactive)	Documented In-House Method No DETSC 2205 by KONELAB 60i	А

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United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

test/Properties ired/Range of asurement int'd)	Standard specifications/ Equipment/Techniques used	Location Code
nt'd)		
mmonia	Documented In-House Method No DETSC 2206 by KONELAB 60i	А
mmonia	Documented In-House Method No DETSC 2207 by KONELAB 60i	А
	Documented In-House Method No DETSC 2208 by KONELAB 60i	А
ange as (PRO) including C5-C10 tic C5-C10 -C6 6-C8 8-C10 tic C5-C10 -C7 -C7-C8 8-C10	Documented in house method No DETSC 3322 using GC-FID	A
lene ne ne e racene oranthene oranthene ene anthracene cd) pyrene oerylene	Documented in house method No DETSC 3304 using GC-MS	A
	e lene ne ne ne e racene pranthene e ranthene ene e anthracene cd) pyrene perylene sum of EPA 16)	lene ne ne e racene oranthene oranthene ene anthracene cd) pyrene

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Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
LEACHATES (from soils), TAP WATER (non- regulatory), EFFLUENT, RIVER WATER AND GROUNDWATER (cont'd)	Analysis (cont'd) Polychlorinated Biphenyls (PCB's) specifically: PCB 28 / 31 PCB 52 PCB 101 PCB 118 + PCB 123 PCB 153 PCB 138 PCB 180 PCB 105 PCB 114	Documented in house method No DETSC 3402 using GC-MS	А
TAP WATER (non-regulatory), RIVER	PCB 126 PCB 156 PCB 157 PCB 167 PCB 169 PCB 189 PCB 77 PCB 81 Total Organic Carbon (TOC) Range - 3 - 30mg/l	Documented In-House Method No DETSC 2033 by	A
WATER, GROUNDWATER AND LEACHATE	Range - 30 - 300mg/l	spectrophotometry	
Surface Water, Groundwater, Effluent, Landfill Leachates and Leachates from Soils	Total Organic Carbon Dissolved Organic Carbon	Documented in house method DETSC 2085 by Infra-red TOC Analyser	A

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Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

	Т		1
Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Analysis (cont'd)		
TAP WATER (non-regulatory) SURFACE (river) WATER, GROUNDWATER, TRADE EFFLUENT and PREPARED LEACHATE	Volatile Organic Compounds: Dichlorodifluoromethane Chloromethane vinyl chloride Bromomethane Chloroethane 1,1-dichloroethylene trans-1,2-dichloroethylene 1,1-dichloroethane cis 1,2-dichloroethylene Chloroform Bromochloromethane 1,1,1-trichloroethane 1,1-dichloropropene Carbon tetrachloride 1,2-dichloroethane Benzene 1,2-dichloropropane Dibromomethane Bromodichloromethane cis-1,3-dichloropropene Toluene trans-1,3-dichloropropene 1,1,2-trichloroethane Tetrachloroethylene 1,3-dichloropropane Dibromochloromethane 1,2-dibromoethane Chlorobenzene 1,1,1,2-tetrachloroethane Ethylbenzene m+p-Xylene o-Xylene Styrene Bromoform Isopropylbenzene 1,1,2,2-tetrachloroethane Bromobenzene 1,2,3-trichloropropane n-propylbenzene 2-chlorotoluene 1,3,5-trimethylbenzene 4-chlorotoluene Tert-butylbenzene	Documented in house method No DETSC 3432 by headspace GC-MS	A

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Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
TAP WATER (non-regulatory) SURFACE (river) WATER, GROUNDWATER, TRADE EFFLUENT and PREPARED LEACHATE (cont'd)	Analysis (cont'd) Volatile Organic Compounds: (cont'd) 1,2,4-trimethylbenzene sec-butylbenzene p-isopropyltoluene 1,3-dichlorobenzene 1,4-dichlorobenzene n-butylbenzene 1,2-dichlorobenzene 1,2-dibromo-3-chloropropane 1,2,4-trichlorobenzene Hexachlorobutadiene Naphthalene 1,2,3-trichlorobenzene		A
TAP WATER (non-regulatory) SURFACE WATER, GROUNDWATER, TRADE EFFLUENT and PREPARED LEACHATE LANDFILL LEACHATE	Acid Herbicides: Mecoprop Bentazone MCPA Clopyralid Dicamba 2,3,6-trichlorobenzoic acid Dichloprop Bromoxynil Fenoprop MCPB 2,4,5-T Fluroxypyr 2,4-DB loxynil	Documented In-House Method No DETSC 3448 by LC-MS-MS	A
LEACHATES, RIVER WATER AND GROUNDWATER	рН	Documented In-House Method No DETSC 2008 by voltammetry	А
S. OSINDIMITER	Conductivity	Documented In-House Method No DETSC 2009 by v oltammetry	А
	Alkalinity	Documented In-House Method No DETSC 2030 by voltammetry	A

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Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS	Chemical Analysis		
SEDIMENTS	pH value	Documented In-House Method No DETSC 2008 based on BS 1377:Part 3:1990	A
	Electrical Conductivity	Documented In-House Method No DETSC 2009	А
	Organic Matter Content	Documented In-House Method No DETSC 2002 based on BS 1377:Part 3:1990	A
	Loss on Ignition	Documented In-House Method No DETSC 2003 based on BS 1377:Part 3:1990	A
	Sulphate content	Documented In-House Method No DETSC 2004 based on BS 1377:Part 3:1990	А
	Water Soluble Chloride content	Documented In-House Method No DETSC 2006 based on BS 1377:Part 3:1990	А
	Acid Soluble Chloride content	Documented In-House Method No DETSC 2007 based on BS 1377:Part 3:1990	А
	Anions, comprising: Chloride Fluoride Nitrate Nitrite Phosphate Sulphate	Method No DETSC 2055 by ion chromatography based on EPA 9056A (Rev 1 November 2000)	А
SOILS only	Boron (water soluble)	Documented In-House Method No DETSC 2311 by ICP-OES	А

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Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS SEDIMENTS (cont'd)	Chemical Analysis (cont'd) Mercury	Documented In-House Method	A
	o.oary	No DETSC 2325 by atomic fluorescence	,,
SOILS only	Metals: Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Molybdenum Nickel Selenium Tin Vanadium Zinc	Documented In-House Method No DETSC 2301 by hotblock digestion and ICP-OES based on Standing Committee of Analysts Method (HMSO) ISBN 011 753 2444	A
	Sulphur (total)	Documented In-House Method No DETSC 2320 by hotblock digestion and ICP-OES	А
	Elemental Sulphur	Documented In-House Method No DETSC 3049 by HPLC based on standing committee of Analysts Method (HMSO) ISBN 011 751 726 7	А
	Volatile Organic Compounds (VOCs), specifically: Benzene Ethylbenzene Methyl-tert-butyl-ether (MTBE) Toluene o-Xylene (m+p)-Xylenes	Documented In-House Method No DETSC 3321 by GC-FID	A

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Schedule of Accreditation issued by

United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS SEDIMENTS (cont'd)	Chemical Analysis (cont'd)		
	Extractable Petroleum Hydrocarbons (EPH) (C ₁₀ -C ₄₀) Diesel Range (C ₁₀ -C ₂₄) Lube Oil range / Mineral Oil Range (C ₂₄ -C ₄₀)	Documented In-House Method No DETSC 3311 by GC-FID	A
	Polycyclic Aromatic Hydrocarbons (PAH's) specifically: Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz[a]anthracene Chrysene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene Dibenz[a,h]anthracene Total PAH (sum of EPA 16)	Documented In-House Method No DETSC 3301 by GC based on EPA 8100 and BG Soil Analysis 1999	A
	Polychlorinated Biphenyls (total)	Documented In-House Method No DETSC 3401 by GC-MS	А
SOILS	Analysis		
	Sulphate (acid soluble)	Documented In-House Method No DETSC 2321 by ICP-OES	А
	Sulphate (water soluble)	Documented In-House Method No DETSC 2076 (ICP-OES)	А
	Ammonia	Documented In-House Method No DETSC 2119 by spectrophotometry	А
	Thiocyanate	Documented In-House Method No DETSC 2130 by Skalar	А

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United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Derwentside Environmental Testing Services Ltd

Issue No: 066 Issue date: 22 August 2023

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Analysis (cont'd)		
	Cyanide (total) Cyanide (free) Phenol (monohydric)	Documented In-House Method No DETSC 2130 by Skalar	А
	Total Organic Carbon (TOC)	Documented In-House Method No DETSC 2084 by combustion and infra-red detection	А
	Loss on Drying at <30°C Moisture Content at 105°C	Documented In-House Method No DETSC 1004 by Gravimetry	A
	Fraction Organic Carbon by Calculation (Expressed as fraction of TOC)	Documented In-House Method No DETSC 2084	А
	Extractable Petroleum Hydrocarbons (EPH), C ₁₀ -C ₃₅ , specifically: Total EPH (C ₁₀ -C ₃₅)	Documented In-House Method DETSC 3072 by GC-FID	A
	Total Extractable Aliphatic Hydrocarbons (C ₁₀ -C ₃₅) C ₁₀ -C ₁₂ (aliphatic) C ₁₂ -C ₁₆ (aliphatic) C ₁₆ -C ₂₁ (aliphatic) C ₂₁ -C ₃₅ (aliphatic) Total Extractable Aromatic Hydrocarbons (C ₁₀ -C ₃₅) C ₁₀ -C ₁₂ (aromatic) C ₁₂ -C ₁₆ (aromatic) C ₁₆ -C ₂₁ (aromatic) C ₂₁ -C ₃₅ (aromatic)		
	Polychlorinated Biphenyls (total), comprising: PCB 28 / 31 PCB 52 PCB 101 PCB 118 PCB 138 PCB 153 PCB 180	Documented In-House Method No DETSC 3401 by GC-MS	A

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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Analysis (cont'd)		
	Polyaromatic Hydrocarbons, comprising: Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Dibenzo(a.h)anthracene Indeno(1,2,3-cd)pyrene Benzo(ghi)perylene Total PAH's (Sum of EPA 16)	Documented in house method No DETSC 3303 by GC-MS	A
	Gross Calorific value	Documented In-House Method No DETSC 5008 using Bomb calorimetry	A
	Net Calorific value	Documented in house calculation	А
Soils	Carbonate as Equivalent Carbon Dioxide	Documented in house method DETSC 2005 using titrimetry	А
Soils	Semi Volatile Organic Compounds: Phenol 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Bis(2-chloroisopropyl)ether Benzyl alcohol 2-Methyl phenol N-Nitrosodi-n-propylamine Hexachloroethane 4-Methyl phenol & 3- Methylphenol Nitrobenzene Isophorone	Documented in house method DETSC 3433 using GCMS	A

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			<u> </u>
Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Analysis (cont'd)		
	Semi Volatile Organic Compounds: (cont'd) 2-Nitrophenol 2,4-Dimethyl phenol Bis (2-chloroethoxy) methane 2,4-Dichlorophenol 1,2,4-Trichlorobenzene Naphthalene Hexachlorobutadiene 4-Chloro-3-methyl phenol 2-Methylnaphthalene 1-Methylnaphthalene 2,4,6-Trichlorophenol 2-Chloronaphthalene Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene Acenaphthene Dibenzofuran Diethylphthalate Fluorene Diphenylamine Azobenzene 4-Bromophenyl-1-phenylether Hexachlorobenzene Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Di-n-octylphthalate Benzo(b)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	Documented in house method DETSC 3433 using GCMS	A

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Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Analysis (cont'd)		
	Volatile Organic Compounds: Vinyl Chloride 1,1 Dichloroethylene Trans-1,2-dichloroethylene 1,1-dichloroethane Cis-1,2-dichloroethylene 2,2-dichloropropane Bromochloromethane Chloroform 1,1,1-trichloroethane 1,1-dichloropropene Carbon tetrachloride Benzene 1,2-dichloroethane Trichloroethylene 1,2-dichloropropane Dibromomethane Bromodichloromethane cis-1,3-dichloropropene Toluene trans-1,3-dichloropropene 1,1,2-trichloroethane Tetrachloroethylene 1,3-dichloropropane Dibromochloromethane 1,2-dibromoethane 1,2-dibromoethane 1,2-dibromoethane 1,2-dibromoethane 1,2,3-trichloropropane m+p-Xylene o-Xylene Bromoform Isopropylbenzene Bromobenzene 1,2,3-trichloropropane n-propylbenzene 2-chlorotoluene 1,3,5-trimethylbenzene 4-chlorotoluene Tert-butylbenzene 1,2,4-trimethylbenzene sec-butylbenzene p-isopropyltoluene 1,3-dichlorobenzene 1,4-dichlorobenzene n-butylbenzene	Documented in house method DETSC 3431 using Headspace GCMS	A

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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Analysis (cont'd)		
	Volatile Organic Compounds: (Cont'd) 1,2-dichlorobenzene 1,2-dibromo-3-chloropropane 1,2,4-trichlorobenzene Hexachlorobutadiene Naphthalene 1,2,3-trichlorobenzene	Documented in house method DETSC 3431 using Headspace GCMS	A
	Acid Herbicides, specifically: 2,4,5-TP (Fenoprop) Clopyralid Picloram 2,3,6-TBA Dicamba Benazolin Fluroxypyr Bentazone 2,4-D Bromoxynil MCPA Triclopyr Dichloprop loxynil Mecoprop 2,4,5-T 2,4-DB	Documented in house method DETSC 3447 ising LC-MS-MS	A

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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Analysis (cont'd)		
BIOMASS and SOLID RECOVERED FUELS	Total Moisture	Documented In-House Method No DETSC 5004 using gravimetric techniques	А
	Analysis Moisture	Documented In-House Method No DETSC 5005 using gravimetric techniques	А
	Volatile matter	Documented In-House Method No DETSC 5003 using gravimetric techniques	A
	Gross Calorific value	Documented In-House Method No DETSC 5007 using Bomb calorimetry	A
	Net Calorific value	Documented in house calculation	Α
	Ash Content	Documented In-House Method No DETSC 5002 using gravimetric techniques	А
	Mercury	Documented In-House Method No DETSC 5015 using hot block digestion and Cold Vapour Atomic Fluorescence	A

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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Analysis (cont'd)		
BIOMASS and SOLID RECOVERED FUELS (cont'd)	Metals Aluminium Arsenic Antimony Barium Beryllium Cadmium Calcium Cobalt Chromium Copper Iron Lead Magnesium Manganese Molybdenum Nickel Phosphorous Potassium Selenium Sodium Thallium Tin Titanium Vanadium Zinc	Documented In-House Method No DETSC 5014 using hot block digestion and ICP-OES	A
	Sulphur	Documented In-House Method No DETSC 5016 using hot block digestion and ICP-OES	А
	Chlorine Fluorine	Documented In-House Method No DETSC 5017 using Ion Chromatography	A
	Biomass Content	Documented In-House Method No DETSC 5012 based on BS EN ISO 21644:2021 using Gravimetry	А
	Carbon, Hydrogen, Nitrogen	Documented In-House Method No DETSC 5013 using CHN analyser	A

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Materials/Products tested	Materials/Products tested Type of test/Properties measured/Range of measurement		Location Code
	Analysis (cont'd)		
BIOMASS and SOLID RECOVERED FUELS (cont'd)	Oxygen (by calculation)	Documented In-House Method No DETSC 5013 by calculation	А
RECYCLED WASTE Trommel Fines	Loss on Ignition at 440°C	Documented in house method ref DETSC 5022 – using Gravimetric Analysis in accordance with HMRC Excise Notice LFT1 27 March 2015	А
	Health and Hygiene	Health and Safety Executive - Asbestos: The Analysts' Guide (HSG 248) – 2021	
ASBESTOS IN BULK MATERIALS including materials and products suspected of containing asbestos	Identification of: Amosite Chrysotile Crocidolite Fibrous Actinolite Fibrous Anthophyllite Fibrous Tremolite	Documented In-House Method DETSC 1101 using stereo- microscopy, polarised light optical microscopy and dispersion staining based on HSG 248.	А
ASBESTOS IN SOILS – The Identification of Asbestos fibres in bulk samples of Soil, specifically: Soil Aggregate Ballast	Identification of: Amosite Chrysotile Crocidolite Fibrous Actinolite Fibrous Anthophyllite Fibrous Tremolite	Documented In-House Method DETSC 1102 for identification using stereo-microscopy, polarised light optical microscopy and dispersion staining based on HSG 248.	А
ASBESTOS IN SOILS — The Identification and Quantification of Asbestos fibres in bulk samples of Soil, specifically: Soil Ballast Aggregate,	Identification and Quantification of Asbestos content of: Amosite Chrysotile Crocidolite Fibrous Actinolite Fibrous Tremolite	Documented In-House Method DETSC 1102 for identification using stereo-microscopy, polarised light optical microscopy and dispersion staining based on HSG 248 Documented In-House Method DETSC 1102 for quantification of asbestos using gravimetry and phase contrast microscopy	A
ASBESTOS CONTAINING MATERIALS	Water Absorption	Documented In-House Method DETSC 1103	А

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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS	<u>Analysis</u>	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil	
	pH value	Documented In-House Method No DETSC 2008 by voltammetry	А
	Loss on Ignition	Documented In-House Method No DETSC 2003 based on BS 1377:Part 3:1990	А
	Organic Matter Content	Documented In-House Method No DETSC 2002 based on BS 1377:Part 3:1990	A
	Total Organic Carbon (TOC)	Documented In-House Method No DETSC 2084 by combustion and infra-red detection	А
	Fraction Organic Carbon by Calculation (Expressed as fraction of TOC)	Documented In-House Method No DETSC 2084	А
	Sulphate (acid soluble)	Documented In-House Method No DETSC 2321 by ICP-OES	А
	Sulphate (water soluble)	Documented In-House Method No DETSC 2076 (ICP-OES)	А
	Sulphate (acid soluble)	Documented In-House Method No DETSC 2004	А
	Ammonia	Documented In-House Method No DETSC 2119	А
	Thiocyanate	Documented In-House Method No DETSC 2130	А
	Cyanide (total)	Documented In-House Method No DETSC 2130 by Skalar	А
	Cyanide (free)	Documented In-House Method No DETSC 2130 by Skalar	А

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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Analysis (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Boron (water soluble)	Documented In-House Method No DETSC 2311 by ICP-OES	А
	Mercury	Documented In-House Method No DETSC 2325 by hotblock digestion and atomic fluorescence	А
	Sulphur (elemental)	Documented In-House Method No DETSC 3049 by HPLC based on Standing Committee of Analysts Method (HMSO) ISBN 011 751 726 7	А
	Metals: Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Lead Manganese Molybdenum Nickel Selenium Vanadium Zinc	Documented In-House Method No DETSC 2301 by hotblock digestion and ICP-OES based on Standing Committee of Analysts Method (HMSO) ISBN 011 753 2444	A
	Phenol (monohydric)	Documented In-House Method No DETSC 2130	А
	Volatile Organic Compounds (VOCs), specifically: Benzene Ethylbenzene Toluene o-Xylene (m+p)-Xylenes	Documented In-House Method No DETSC 3321	A

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Materials/Products tested	Type of test/Properties	Standard specifications/	Location
iviaterials/Froducts tested	measured/Range of Equipment/Techniques used measurement		Code
SOILS (cont'd)	Analysis (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Extractable Petroleum Hydrocarbons (EPH) (C ₁₀ -C ₄₀) Diesel Range (C ₁₀ -C ₂₄) Lube Oil Range / Mineral Oil Range (C ₂₄ -C ₄₀)	Documented In-House Method No DETSC 3311 by GC-FID	A
	Extractable Petroleum Hydrocarbons (EPH), C ₁₀ -C ₃₅ , specifically: Total EPH (C ₁₀ -C ₃₅)	Documented In-House Method DETSC 3072 by GC-FID	А
	Total Extractable Aliphatic Hydrocarbons (C ₁₀ -C ₃₅) C ₁₀ -C ₁₂ (aliphatic) C ₁₂ -C ₁₆ (aliphatic) C ₁₆ -C ₂₁ (aliphatic) C ₂₁ -C ₃₅ (aliphatic)		
	Extractable Petroleum Hydrocarbons (EPH), C ₁₀ -C ₃₅ , specifically: Total Extractable Aromatic Hydrocarbons (C ₁₀ -C ₃₅) C ₁₀ -C ₁₂ (aromatic) C ₁₂ -C ₁₆ (aromatic) C ₁₆ -C ₂₁ (aromatic) C ₂₁ -C ₃₅ (aromatic)	Documented In-House Method DETSC 3072 by GC-FID	A

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Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
Analysis (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
Extractable Petroleum Hydrocarbons (EPH) specifically: >EC10-EC12 >EC12-EC16 >EC16-EC21 >EC21-EC35 >EC35-EC40 >EC10-C35 >EC10-C40 >EC10-C24 >EC24-C40 Total Extractable Aliphatic Hydrocarbons specifically: >EC10-EC12 >EC12-EC16 >EC16-EC21 >EC21-EC35 >EC35-EC40 >EC10-C35 >EC10-C40 Total Extractable Aromatic Hydrocarbons specifically: >EC10-EC12 >EC12-EC16 >EC10-C40 Total Extractable Aromatic Hydrocarbons specifically: >EC10-EC12 >EC12-EC16 >EC10-EC12 >EC12-EC16 >EC16-EC21 >EC21-EC35 >EC10-C35	Documented In-House Method DETSC 3521 by GC/GC-FID	A
	measured/Range of measurement Analysis (cont'd) Extractable Petroleum Hydrocarbons (EPH) specifically: >EC10-EC12 >EC12-EC16 >EC16-EC21 >EC21-EC35 >EC35-EC40 >EC10-C40 >EC10-C24 >EC24-C40 Total Extractable Aliphatic Hydrocarbons specifically: >EC10-EC12 >EC12-EC16 >EC16-EC21 >EC21-EC35 >EC35-EC40 >EC10-C24 >EC10-EC12 >EC10-EC12 >EC12-EC16 >EC10-EC12 >EC12-EC16 >EC16-EC21 >EC21-EC35 >EC35-EC40 >EC10-C40 Total Extractable Aromatic Hydrocarbons specifically: >EC10-EC12 >EC10-EC12 >EC10-EC12 >EC10-EC12 >EC10-EC12 >EC10-EC12 >EC12-EC16 >EC16-EC21 >EC11-EC35	Analysis (cont'd) Extractable Petroleum Hydrocarbons (EPH) Specifically: >EC10-EC12 > EC12-EC16 > EC10-C35 > EC10-C40

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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Analysis (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Polychlorinated Biphenyls (total), comprising: PCB 28 / 31 PCB 52 PCB 101 PCB 118 PCB 138 PCB 138 PCB 153 PCB 180	Documented In-House Method No DETSC 3401 by GC-MS	A
	Polyaromatic Hydrocarbons, comprising: Naphthalene Fluoranthene Acenaphthylene Acenaphthene Phenanthrene Pyrene Benzo(a)anthracene	Documented in house method No DETSC 3303 by GC-MS	A
	Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Dibenzo(a.h)anthracene Indeno(1,2,3-cd)pyrene Benzo(ghi)perylene		
WASTEWATERS	Analysis	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - sampling and chemical testing of untreated sewage, sewage effluent and trade effluent	
	Chemical Oxygen Demand	Method DETSC 2032 by Colorimetry	А
	END		

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Appendix D

Positioning and Water Depth Data



D.1 Positioning and Water Depth Data

Fugro report PE1088-GEOT-03 issue 2 summarises the borehole location coordinates and water depth measurements.

Target coordinates for all borehole locations were specified by Direction Générale de l'Énergie et du Climat – DGEC /Client Consultant and the actual coordinates were approved before borehole and cone penetration test operations. The coordinates presented in this positioning and data report are the calculated location coordinates. Coordinates for all boreholes are expressed using the Universal Transverse Mercator (UTM) projection 31 N, World Geodetic System 1984, International Spheroid, with a central meridian of 3° east

Measured water depths were reduced to the Lowest Astronomical Tide (LAT) based on chart datum CD FR Bathyelli. It should be noted that all water depth measurements made during this investigation are considered sufficiently accurate for geotechnical use but should not be used in isolation for design purposes.





Positioning Data for Fugro Quest

Final Report | DGEC France Golfe du Lion Offshore Windfarm Zone 3 | South Coast of France, Mediterranean Sea

PE1088-GEOT-03 Issue 2 | 23 January 2025 Issue for Approval

DGEC



Document Control

Document Information

Document Title	Positioning Data for Fugro Quest
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Client Information

Client	DGEC
Client Address	DGEC Tour Séquoia – 1 place Carpeaux 92055 LA DEFENSE CEDEX

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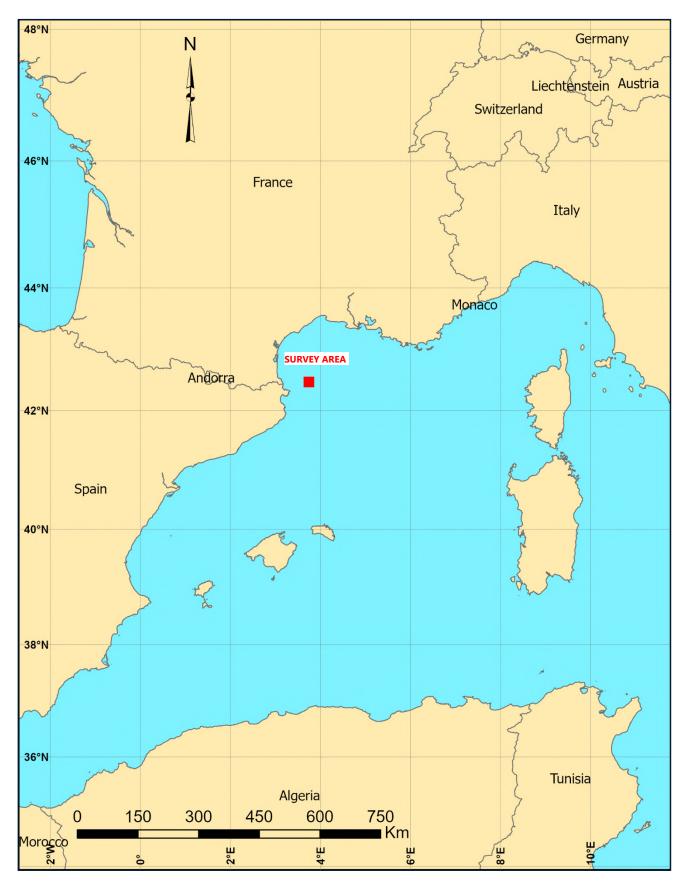
Issue	Date	Status	Prepared By	Checked By	Approved By
1	22 January 2025	Offshore Preliminary Issue	T. Sidney		
2	23 January 2025	Issue for Approval	D. Senthil Nathan	W. Peters	K. Sachinoglou

Report Amendment

Issue	Section	Page No.	Table No.	Figure No.	Description
2	Entire				Office QC



Location Map



Location of DGEC France Golfe du Lion Offshore Windfarm Zone 3, South Coast of France, Mediterranean Sea.



Executive Summary

Fugro was contracted by DGEC to supply navigation and positioning services for the geotechnical drilling vessel MV Fugro Quest at three sampling and/or in situ testing locations at DGEC France Golfe du Lion Offshore Windfarm Zone 3, South Coast of France, Mediterranean Sea.

The sampling and/or in situ testing was carried out between 20 and 22 January 2025.

Fugro navigated and positioned the geotechnical drill ship MV Fugro Quest to the intended positions given by the Client.

Two StarPack GNSS receivers for the surface positioning were used during the project. Underwater positioning was via the vessel's Kongsberg HiPAP 501 USBL system. All depths measurements were reduced to LAT (CD FR BATHYELLI). The real-time GNSS tides were used throughout the project.

Depths at each sample location were measured using the following techniques: USBL depth, pressure sensor and drill string.

During the operations speed of sound measurements were taken and the results were entered into the HiPAP 501 USBL system.

All positions and peripheral (gyrocompass, USBL, etc.) data were sent to the navigation computer which calculated offsets positions in the local geodesy and projection, WGS84/UTM Zone 31 N.



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Glossary

Accuracy	The accuracy of a measurement is its degree of closeness to its actual (true) value. Accuracy is the combination of the precision and reliability of an observation.
Augmentation Data	Additional information e.g. from a reference or tracking station, applied at a user receiver to improve the positioning solution. See also differential GNSS.
Azimuth	A horizontal angle measured from the spheroidal meridian clockwise from north through 360°. See also bearing and heading.
Bearing	Refers to a direction from one point to another on a chart right rotated from grid north (bearing = azimuth + convergence + arc to chord correction). See also azimuth and heading.
C-O Correction	Calculated minus observed correction. The difference found in a calibration procedure between a fixed value and an observation. The C O correction must always be added to the observation.
Chart Datum	Vertical Datum used in charting. Chart data e.g. Mean Sea Level (MSL), Lowest Astronomical Tide (LAT), Lowest Low Water Springs (LLWS), Normaal Amsterdams Peil (Amsterdam Ordnance Datum) (NAP), Normal Null (NN). See also Vertical Datum.
СМ	Central meridian, the meridian that defines the central line of longitude of the chart projection. It is a zone constant used in chart projections.
Convergence	Clockwise angle in a point between true north and grid north.
CRP	Common Reference Point is the origin of all vessel coordinates. It is also referred to as the vessel datum. It often corresponds to the drill string on drilling vessels.
Datum (Geodetic)	A mathematical model designed to best-fit part or all of the geoid. It is defined by an ellipsoid and the relationship between the ellipsoid and a point on the topographic surface established as the origin of datum. This relationship can be defined by six quantities, generally (but not necessarily) the geodetic latitude, longitude and the height of the origin, the two components of the deflection of the vertical at the origin, and the geodetic azimuth of a line, from the origin to some other point.
Datum Rotation (Geodetic)	Defined as the anti-clockwise rotation around the X-axis, Y-axis and Z-axis (Rx, Ry, and Rz) in the origin of two spheroids in terms of the Cartesian or geocentric coordinates. See also datum shift and scale.
Datum Shift (Geodetic)	Defined as the difference (ΔX , ΔY , ΔZ) in the origin of two spheroids in terms of the Cartesian or geocentric coordinates. See also datum rotation and scale.
Datum (Vessel)	The vessel datum is the origin of all vessel coordinates. It is referred to as the common reference point or CRP.
DGNSS	Augmentation technique requiring a GNSS receiver(s) to be placed at one or multiple known points from which GNSS observable (pseudo-range) corrections can be deduced. These corrections can then be applied to the offshore mobile receiver.
Differential Positioning	Determination of relative coordinates between two or more satellite receivers that are simultaneously tracking the same satellite signal.
DP	Dynamic positioning, mainly referring to a system keeping the vessel in one position compensating for current, wind and other natural influences, using a variety of positioning systems as reference.
	A technique of calibration on the heading and motion sensors that can be undertaken whilst in port, in transit or during production.
Dynamic Calibration	GNSS data from three GNSS antennas, placed in large separation along or athwart the vessel, are acquired while the sensor data are also logged. As a result, C-Os for heading, pitch and roll can be determined.



Ellipsoid/Spheroid	In geodesy, unless otherwise specified, a mathematical figure formed by revolving an ellipse about its minor axis. It is often used interchangeably with spheroid. Two quantities define an ellipsoid: these are usually given as the length of the semi-major axis, a, and the inverse flattening, $1/f = a / (a-b)$, where b is the length of the semi-minor axis. Prolate and triaxial ellipsoids are invariably described as such.
False Easting/False Northing	Defined projection coordinate offsets to the origin point of the projection.
Geoid	The particular equipotential surface with coincides with mean sea level, and which may be imagined to extend through the continents. This surface is perpendicular to the force of gravity everywhere.
GLONASS	Russian global navigation satellite system.
GPS	Global positioning system.
GNSS	Global navigation satellite system. A combination solution of GPS and GLONASS with provision for the future European Galileo space system.
HDOP	Horizontal dilution of precision. A measure of the magnitude of DOP errors in latitude and longitude.
Heading	Course of a vessel measured with a heading system, i.e. a gyrocompass, or a GPS vector heading system. If the heading is magnetic this will be stated. See also azimuth and bearing.
HiPAP	High precision acoustic positioning. A USBL system developed by Simrad - Kongsberg. See USBL definition.
HPR	Hydro acoustic positioning reference. See USBL definition.
Line Scale Factor	The ratio of a distance from point A to point B on the grid to the corresponding distance on the spheroid. K = plane distance/spheroidal distance 1/k=1/6(1/kA + 4/kM +1/kB). (kA, kB, kM being point scale factors at A, B, M. See also point scale factor)
Multifix	Multi reference differential global positioning system based on simultaneous calculated single DGPS positions for each reference station which solutions are then applied to a least squares calculation by which a new solution is created by weighting the single solutions on distance of the used reference station used in the single computations.
NTRIP	Networked Transport of RTCM via Internet Protocol. NTRIP is a protocol of streaming DGPS corrections over the internet.
Offset	A station offset from the main survey station. Must be defined by an azimuth and distance or ΔX , ΔY , ΔZ , or starboard/port, forward/aft, above/below.
OWF	Offshore Wind Farm.
PDOP	Position dilution of precision. A unit-less figure of merit expressing the relationship between the error in user position and the error in satellite position.
РРР	Precise Point Positioning. A global GNSS augmentation technique that corrects for GNSS satellite clock and orbit errors and employs additional modelling techniques to further correct and improve the point positioning accuracy.
Precision	A measure of the random errors in observations and estimated parameters.
Reference Station	A GNSS receiver located at a precisely known location and used to determine the differential corrections employed for DGNSS augmentation techniques.
Satellite Configuration	State of the satellite configuration at a specific time, relative to a specific user or set of users.
Satellite Constellation	The arrangement in space of the complete set of satellites of a system such as GPS.



Scale	Reduction/expansion used in datum-datum transformations. Unit: ppm (parts per million). See also datum shift and datum rotation.
Scale Factor (Point)	Ratio of an infinitesimal distance at a point on the grid to the corresponding distance on the spheroid. K = Δ (plane distance) / Δ (spheroidal distance).
S/CTD (probe)	Salinity or conductivity, temperature and depth probe. Used to determine speed of sound through the water column. Pressure to depth conversions may be applied to provide true depth values.
SD	Standard deviation. Measure of the dispersion of random errors about the mean value. If a large number of measurements or observations of the same quantity are made, the standard deviation is the square root of the sum of the squares of deviations from the mean value divided by the number of observations less one.
Starfix.G2	A decimetre accuracy integrated GNSS service which utilises Fugro's own global network of reference stations to measure carrier phase observations. This data is then processed, producing a corrections solution for each navigation satellite. These corrections are applied to the satellite time reference clock and ephemeris ("orbit") information, hence "clock and orbit corrections". This service utilises both GPS and GLONASS L1 and L2 frequencies, thereby providing an accurate measurement of variations in lonospheric thickness. This enables signal delay to be calculated more precisely, resulting in a more accurate satellite to antenna range, and hence a more accurate position solution. Starfix.G2 provides a high availability, high integrity, global solution to an accuracy of 10 cm (95 % confidence level) both horizontally and vertically.
Starfix.G2+/G4+	Ultra-precise (3 cm) GPS and GLONASS Global Positioning Service, using Clock and Orbit Corrections enhanced with carrier-phase corrections from the Fugro G4 Network. Starfix.G2+/G4+ is an enhancement of Starfix.G2 service (based on GPS and GLONASS) and utilises advanced GNSS augmentation algorithms developed in-house by Fugro. The code and carrier-phase signals transmitted by GPS and GLONASS satellites are monitored globally by Fugro's worldwide network of reference stations. These observations are processed centrally in real-time using the company's proprietary algorithms to generate precise corrections which are used to augment the standard signals broadcast by GPS and GLONASS satellites. Corrections are received via communications satellites, providing at least two independent G2+/G4+ data sources.
Starfix.G4	A GPS, GLONASS, Galileo and BeiDou positioning system that is based on orbit and clock corrections generated from Fugro's own expanded network of multiple system reference stations. Starfix.G4 utilises Precise Point Positioning (PPP) technology, which distinguishes itself from the traditional differential approach as satellite errors are not lumped together but estimated at source on a per satellite basis. The GPS, GLONASS, Galileo and BeiDou orbit and clock corrections are computed separately, free of ionospheric and tropospheric effects.
Starfix.HP	This service utilises the Fugro international network of approximately 100 land-based reference stations. Unlike standard L1, which uses code based measurements, Starfix.HP is based upon carrier phase measurements which provide a much higher resolution. This service utilises the GPS L1 and L2 frequencies, thereby providing an accurate measurement of lonospheric thickness. This results in a more accurate satellite to antenna range, and hence a more accurate position solution. At a distance of 1000 km from the nearest reference station Starfix.HP accuracies are typically 10 cm and 15 cm (95 % confidence level) in the horizontal and vertical planes respectively.



Starfix.XP2	This service utilises a third party global network of reference stations to measure carrier phase observations. This data is then processed, producing a corrections solution for each navigation satellite. These corrections are applied to the satellite time reference clock and ephemeris ("orbit") information, hence "clock and orbit corrections". This service utilises the GPS L1 and L2 frequencies, thereby providing an accurate measurement of variations in lonospheric thickness. This enables signal delay to be calculated more precisely, resulting in a more accurate satellite to antenna range, and hence a more accurate position solution. Starfix.XP2 provides a high performance global solution to an accuracy of 10 cm and 20 cm (95 % confidence level) in the horizontal and vertical planes respectively.
Starfix.L1	This service is a GPS positioning correction system using single frequency code correction data from the Fugro network of reference stations, delivered via both Inmarsat and SpotBeam satellites. These corrections, combined with a single frequency GPS receiver, can provide a positional accuracy of better than 1.5 m (95 %) horizontally at a distance of 500 km from the closest reference station.
Starfix.NG	Fugro's in-house advanced vessel and ROV positioning software system.
StarPack	A StarPack unit consists of a survey grade GNSS receiver and powerful processor, running Linux multi-tasking operating system. The receiver is capable of tracking all current (GPS, GLONASS) and future (Galileo) systems. A StarPack can be extended with a second receiver (in the same unit), to provide accurate, GNSS derived heading.
Transceiver	A device that can transmit and receive signals.
Transducer	A device that converts electrical energy to acoustic energy and vice-versa.
Transponder	A device that can detect a signal on a particular frequency and in response transmits signal on another frequency.
UTM	Universal Transverse Mercator. A special case of the transverse Mercator projection whereby the projection parameters are specified by worldwide agreement, abbreviated as the UTM grid. It consists of 60 north south zones, each 6 degrees of longitude wide with a unique central meridian.
USBL	Ultra-Short BaseLine acoustic positioning method involving the measurement of range and bearing from a vessel-based transceiver to subsea transponders. It generally operates through phase discrimination of an acoustic signal as it passes over three transducers placed at right angles to each other within the Transducer head. Using this method, a three dimensional position of the beacon(s) can be determined.
Vertical Datum	An arbitrarily assumed value for a particular benchmark or a measured value at sea level at a tide station, or a fixed adjustment of many such measurements in a common adjustment. See also chart datum.
WGS 84	World Geodetic System 1984. A rotational ellipsoid having the following dimensions: semi-major axis 6378137.000 m, semi-minor axis (derived) 6356752.314 m, flattening (derived) 1/298.257224. This ellipsoid reference model / datum is the surface from which GPS coordinates are computed.



1. Introduction

Fugro was contracted by DGEC to supply navigation and positioning services for the geotechnical drilling vessel MV Fugro Quest at three sampling and/or in situ testing locations at DGEC France Golfe du Lion Offshore Windfarm Zone 3, South Coast of France, Mediterranean Sea.

The positions and depths reported here were checked by Fugro offshore staff. Full quality control will be carried out by the Fugro office staff prior to the issues of the final report and, as such, some of the values reported in the final report may vary from the field issued report.

The sampling and/or in situ testing was carried out between 20 and 22 January 2025. The positioning results are given in Table 2.1 and Table 2.2.

System positioning performance parameters are outlined in Section 4.3.



2. Results

2.1 Field Locations

Table 2.1: Actual coordinates and water depths in local datum

Datum: WGS84/UTM Zone 31N, EPSG code: 32631				Depth LAT (CD FR BATHYELLI)*			
Location	Easting	Northing	Latitude	Longitude	Pressure Sensor	USBL	Drill String
	[m]	[m]	[North]	[East]	[m]	[m]	[m]
Z3_OWF_BH01-SAMP	544 416.74	4 727 830.63	42° 42′ 06.0587″	003° 32′ 32.3445″	101.4	101.5	101.5
Z3_OWF_BH06-SAMP	539 895.12	4 729 328.78	42° 42′ 55.5202″	003° 29′ 13.9832″	104.5	104.7	104.3
Z3_OWF_BH13-SAMP	536 917.01	4 735 346.81	42° 46′ 11.1534″	003° 27′ 04.4693″	96.7	96.8	96.6

Notes:

Table 2.2: Actual location details

Datum: WGS84/UTM Zone 31N, EPSG code: 32631				Standard Deviation		Proposed to Actual	
Location	Easting	Northing	Fixes	Easting	Northing	Distance	Bearing
	[m]	[m]		[m]	[m]	[m]	[°G]
Z3_OWF_BH01-SAMP	544 416.74	4 727 830.63	120	0.12	0.10	0.46	215.06
Z3_OWF_BH06-SAMP	539 895.12	4 729 328.78	120	0.05	0.06	4.78	001.41
Z3_OWF_BH13-SAMP	536 917.01	4 735 346.81	120	0.04	0.05	0.19	177.99



^{*:} Refer to Section 5 (Methodology) for details on the different water depth measurement

3. Operations

3.1 Scope of Work

Fugro was contracted to provide positioning support for navigation between the sampling and/or in situ testing locations and determination of the drill string position at each location. Sampling and/or in situ testing was planned to be carried out at three locations.

Table 3.1: Proposed coordinates in local datum

Datum: WGS84/UTM Zone 31N, EPSG code: 32631					
Location	Easting	Nothing	Latitude	Longitude	
	[m]	[m]	[North]	[East]	
Z3_OWF_BH01-SAMP	544 417.00	4 727 831.00	42° 42' 06.0708"	003° 32' 32.3561"	
Z3_OWF_BH06-SAMP	539 895.00	4 729 324.00	42° 42' 55.3652"	003° 29' 13.9768"	
Z3_OWF_BH13-SAMP	536 917.00	4 735 347.00	42° 46' 11.1597"	003° 27' 04.4691"	



3.2 Resources

Personnel	Name	From	То
Surveyor	ROC	20 January 2025	22 January 2025

Only equipment used is listed below; refer to Section 5 (Methodology) for procedural explanations.

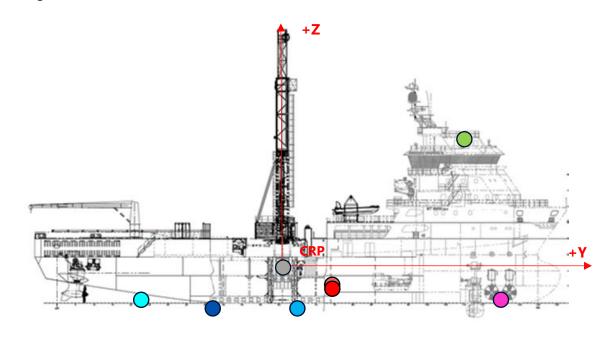
Positioning Equipment	
Navigation software	Starfix.NG 2024.1 R6 online navigation suite
Primary positioning	Port StarPack 334 with Starfix.G2+/G4+ solution, corrections via SASAT
Secondary positioning	Stbd StarPack 24 with Starfix.G2+/G4+ solution, corrections via ERSAT
Tertiary positioning	Port StarPack 334 with Starfix.XP2 solution, corrections via SASAT
Quaternary positioning	Stbd StarPack 24 with Starfix.XP2 solution, corrections via ERSAT
Quinary positioning	Port StarPack 334 with Starfix.HP solution, corrections via SASAT
Senary positioning	Stbd StarPack 24 with Starfix.HP solution, corrections via ERSAT
Acoustic positioning	Kongsberg HiPAP 501 USBL system (vessel)
Primary heading system	StarPack Starboard ProTrack
Secondary heading system	Raytheon Anschütz heading system – Gyro 1 (vessel)
Tertiary heading system	Raytheon Anschütz heading system – Gyro 2 (vessel)
Quinary heading system	Raytheon Anschütz heading system – Gyro 3 (vessel)
Reference stations	Leidschendam, Aberdeen, Jacou, Bergen, Brønnøysund
Spare correction source	NTRIP

Bathymetry Equipment	
Primary System	Sensordata SD204 Pressure Sensor
Secondary System	Kongsberg HiPAP 501 USBL system
Tertiary System	Drill string
Echo Sounder	Kongsberg EA640
Vertical Motion Compensator	Kongsberg Seatex MRU5 (2x) (vessel)
Atmospheric Pressure	Vaisala PTB210 Barometer
CTD sensor	Valeport Midas SVX2 (2x)
Sector Scan Sonar	Sonavision SV4040
Data Recording	Starfix.2024 online navigation suite



3.3 Offsets

3.3.1 MV Fugro Quest Vessel Offsets



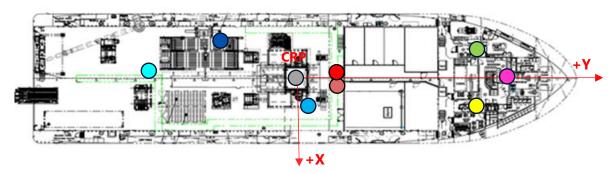


Figure 3.1: MV Fugro Quest offset diagram

Table 3.2: MV Fugro Quest vessel offsets

Offsets		Athwart (X) [m]	Along (Y) [m]	Height (Z) [m]
CRP (Drill String)	0	0.00	0.00	0.00
GNSS antenna Port		-4.64	31.11	20.22
GNSS antenna Starboard	0	4.65	31.10	20.22
Echo sounder transducer	•	-0.36	38.66	-7.41
HiPAP pole starboard		3.50	1.21	-9.83
HiPAP pole port		-6.38	-11.38	-9.16
ADCP	0	-1.84	-18.93	-7.44
MRU 3	•	-0.17	5.59	-3.88
MRU 2	0	0.10	5.59	-3.79



3.3.2 Seabed Frame Offsets

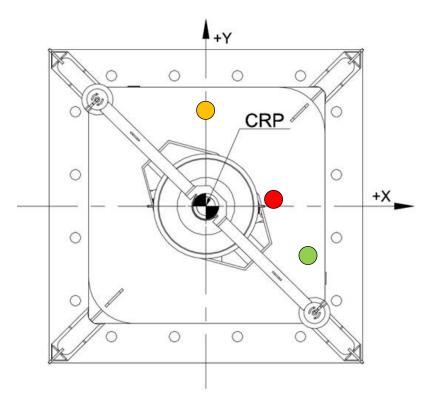


Figure 3.2: Seabed frame offset diagram

Table 3.3: Seabed frame offsets

Offsets		Athwart (X)	Along (Y)	Height (Z)
		[m]	[m]	[m]
CRP (Drill string centre)		0.00	0.00	0.00
USBL Beacon (M49)		1.22	-0.56	3.71
Pressure Sensor (Midas SVX2)		0.73	0.10	2.58
Sector Scan Sonar	0	0.00	1.02	2.27



3.4 Calibration Results

This section details the results of the system calibrations that were carried out prior to positioning operations. Refer to Section 5 (Methodology), for a detailed description of the calibration procedures. Detailed results of the calibrations are available on request.

3.4.1 Positioning Systems

A DGNSS positioning system verification was carried out on 9 January 2025, whilst the vessel was alongside Marseille-Fos, France, by means of Kinematic GNSS processing.

The results of the verification are presented in Table 3.4.

Table 3.4: Positioning system verification

Date	Location	Positioning System	ΔΕ	S.D.	ΔΝ	S.D.
			[m]	[m]	[m]	[m]
9 January 2025	Marseille-Fos	SP Port Starfix.G4+	0.00	0.02	-0.01	0.02
9 January 2025	Marseille-Fos	SP Starboard Starfix.G4+	0.01	0.02	0.00	0.02

To check the integrity of the positioning systems, a positioning system comparison was performed whilst the vessel was alongside Marseille-Fos, France, between 11:32 and 13:32 on 9 January 2025. The positioning system comparison was performed between the primary positioning system (SP port antenna, Starfix.G4+ solution) and the other positioning system solutions (Starfix.G4+ and Starfix.XP2) of the two StarPacks (SP Port and SP Starboard). From the antenna locations, with respect to the vessel primary heading source, positions of the vessel's datum point (CRP) were calculated and compared. The differences between the positioning systems were within the expected system accuracy. The results of the comparisons are presented in Table 3.5.

Table 3.5: Positioning system comparison

Date	Positioning systems	ΔΕ	S.D.	ΔΝ	S.D.
		[m]	[m]	[m]	[m]
9 January 2025	SP Port G4+ vs SP Stbd G4+	0.01	0.02	-0.03	0.02
9 January 2025	SP Port G4+ vs SP Port XP2	0.00	0.01	-0.01	0.01
9 January 2025	SP Port G4+ vs SP Stbd XP2	0.04	0.02	-0.05	0.03

3.4.2 Heading Systems Alignment Check

The heading and motion systems alignments were checked by dynamic calibration in Bergen, Norway, on 4 September 2024. After completion of the checks, the corrections were entered into the online navigation software. The results of the heading checks are presented in Table 3.6.



Table 3.6: Heading systems alignment check

Date	Location	Heading system	Method	C-O	S.D.
				[°]	[°]
4 September 2024	Bergen	SP Stbd ProTrack	Dynamic Calibration	89.95	0.03
4 September 2024	Bergen	SP Port ProTrack	Dynamic Calibration	-90.05	0.03
4 September 2024	Bergen	Gyro 1	Dynamic Calibration	-0.33	0.08
4 September 2024	Bergen	Gyro 2	Dynamic Calibration	-0.85	0.03
4 September 2024	Bergen	Gyro 3	Dynamic Calibration	-0.41	0.23

3.4.3 Speed of Sound and Water Density Measurements

Before the start of project data acquisition and at regular intervals during the project, conductivity, temperature and pressure measurements were taken to establish the local speed of sound profile and average water density. The speed of sound profile was entered into the Kongsberg HiPAP Ultra Short Baseline (USBL) system. The average water density was used for depth determination in conjunction with the pressure sensor. The results of these measurements are presented in Table 3.7.

Table 3.7: Speed of sound and water density measurements

Date	Location	Mean	Transducer	Seabed	Density
		[m/s]	[m/s]	[m/s]	[kg/m³]
21 January 2025	Z3_OWF_BH01-SAMP	1507.57	1507.76	1508.55	1029.18
22 January 2025	Z3_OWF_BH13-SAMP	1505.28	1505.48	1506.73	1029.08

3.4.4 Kongsberg HiPAP USBL System

The Kongsberg HiPAP system, installed on board the MV Fugro Quest, was interfaced to Starfix.NG as the subsea positioning system. A USBL Calibration was performed on 3 September 2024. The calibration was undertaken at Byfjorden, Norway, in a water depth of 228 m. The results of the calibration are presented in Table 3.8.

Table 3.8: Port USBL calibration results in Starfix.NG

System	Date	X Offset	Y Offset	Z Offset	Orientation	Scale	Pitch	Roll
		[m]	[m]	[m]	[°]		[°]	[°]
USBL Port	3 September 2024	-	-	-	0.72	1.00	-0.25	0.04
USBL Stbd	3 September 2024	-	-	-	-0.43	1.00	-0.58	-0.20



4. Datum and Tolerances

4.1 Geodetic and Projection Parameters

Table 4.1: Project geodetic and projection parameters

Name: WGS 84/UTM	zone 31N,CD FR(BATHYE	LLI) [Med v1.1 + V	ertical Offset -0.27]
------------------	-----------------------	--------------------	-----------------------

EPSG Code: 32631

Global Navigation Satellite System (GNSS) Geodetic Parameters*

Datum: World Geodetic System 1984 EPSG Code: 6326

Ellipsoid: WGS 84

Semi major axis: a = 6 378 137.00 mInverse Flattening: 1/f = 298.257 223 563

Local Datum Geodetic Parameters†

Datum: European Terrestrial Reference System 1989 EPSG Code: 6326

Ellipsoid: WGS 84

Semi major axis: a = 6 378 137.00 mInverse Flattening: 1/f = 298.257 223 563

Project Projection Parameters

Map Projection: Universal Transverse Mercator

Grid system: UTM Zone 31 North (UTM 31N) EPSG Code: 16031

Latitude of Origin: 00° 00′ 00″ North

Central Meridian: 003° 00′ 00″ East

False Easting: 500 000 m

False Northing: 0 m

Scale factor on Central Meridian: 0.9996

Units: Metre

Project Vertical Parameters

Vertical coordinate reference system:CD FR (BATHYELLI)FUGRO Code: 41068Datum:CD FR (BATHYELLI)FUGRO Code: 40935

Transformation: RGF93 v1 to CD FR (BATHYELLI) to Vertical Offset

Notes

* = Fugro Starfix navigation software always uses WGS 84 geodetic parameters as a primary datum for any geodetic calculations.

† = Source: Client



4.2 Vertical Control

Chart Datum	LAT - CD FR (BATHYELLI)
Tidal Data	Real time GNSS tides reduced to LAT based on the RGF93 v1 to CD FR (BATHYELLI) model
Barometric pressure variation	Factored in pressure to depth calculation
Effect of wind	Factored in GNSS elevation measurements

4.3 System Performance Parameters

Surface positioning	± 0.1 m
USBL positioning	1 % slant range
Bathymetry (absolute)	± 0.5 m absolute using predicted tides
Bathymetry (relative)	Pressure sensor ± 0.01 % of range
	Drill string - variable
GNSS 3D mode	5 satellites minimum, PDOP < 6, Elevation > 10°
GNSS 2D mode	4 satellites minimum, HDOP < 4, Elevation > 10°
Heading system	1°



5. Methodology

5.1 Introduction

Sections 5.2 to 5.4 inclusive describe the procedures for determining the coordinates and water depths of geotechnical sample and/or in situ testing locations. Section 5.5 describes the calibration procedures carried out for the heading system, surface and subsurface positioning systems, and the echo sounder. The use of subsurface positioning systems, primarily USBL, depends on the type of geotechnical sampling and/or in situ testing methods used, hence some descriptions in the sections below may not be applicable to this report.

5.2 Position Determination

The actual location may be determined by surface positioning alone or with additional use of USBL. The USBL determines the position of the centre of the seabed frame on the seafloor. Particularly in deeper water, use of USBL provides a more accurate position of the sample and/or in situ testing location since the seabed frame may be offset from the surface position of the drill string due to currents.

The position is determined as soon as the seabed frame makes contact with the seafloor. A minimum of 100 position fixes are logged at two-second intervals. Data outliers are then discarded in accordance with standard statistical procedures. To determine the final seabed position of a sample and/or in situ testing location the following general sequence applies:

- From the global navigation satellite system (GNSS) receiver, the antenna's latitude and longitude in WGS 84 are transmitted to the navigation computer and converted to Easting and Northing on the local projection by the navigation software;
- The grid heading and X and Y offsets from the antenna to the common reference point (CRP) are applied to the antenna Easting and Northing in order to compute the position of the CRP on the local projection. If the USBL system is not used then this corresponds to the sample and/or in situ testing location since the CRP has been defined as the centre of the drill string;
- The grid heading and X and Y offsets from the CRP to the USBL transducer, mounted on the vessel's hull, are applied to the CRP Easting and Northing to determine the transducer position on the local projection;
- The USBL system measures the slant range and relative bearing (measured clockwise from the vessel centreline) from the USBL transducer to the beacon, mounted on the seabed frame, and also the depth of the beacon relative to the transducer. These values are converted to ΔX , ΔY in the horizontal plane and ΔZ in the vertical plane by the USBL processor;
- The ΔX , ΔY and ΔZ values are transmitted to the navigation computer where the Z offset of the USBL transducer is applied;



■ The position of the beacon is computed in the local projection Easting and Northing and the beacon depth is computed relative to the water surface. The centre of the seabed frame, which corresponds to the seabed sample and/or in situ testing position, is derived from the USBL beacon position by applying the USBL beacons horizontal offsets. The heading of the frame is assumed to be the same as the vessel heading. When heading changes are implemented to the vessel after the location of the frame on the seafloor, the frame will be locked in its original heading by the use of a manual heading, derived from the position fix, in which heading information was logged.

5.3 System Configuration

5.3.1 DP Position System

The MV Fugro Quest is configured according to the classification "Offshore Supply DP Support Vessel, DP Class II". The vessel's DP system is fed with two independent DGPS positions. The system consists of two StarPack receivers. The position solutions are generated using different correction sources and calculation methods.

Position and correction data from the DP system are sent to the survey system by means of galvanic isolators. This enables survey personnel to monitor and compare the positional data from the DP system. All equipment is installed in 19" rack mount housings.

For safety reasons, changes to the DP positioning solution were restricted to changing the selection of the corrections satellite (i.e. SASAT & ERSAT) and shore reference stations when entering a new work area. The system was under the full control and responsibility of the DP Operator. Position details from the DP system were sent to the survey software. Quality control (QC) checks cannot be performed for this system and its performance was fully outside Fugro's responsibility.

5.3.1.1 DP1 Position

The DP1 position is a Starfix.G2+/G4+ calculated positions by using clock and orbit corrections from the Fugro G2 network for both GPS and the Russian Global Navigation Satellite System (GLONASS) space vehicles. These corrections were received by the StarPack via ERSAT transmissions.

5.3.1.2 DP2 Position

The DP2 position is also a Starfix.G2+/G4+ calculated positions by using clock and orbit corrections from the Fugro G2 network for both GPS and the Russian Global Navigation Satellite System (GLONASS) space vehicles. These corrections were received by the StarPack via EASAT transmissions.

5.3.2 Survey Position and Navigation Systems

The survey team used two StarPack GNSS Precise Point Positioning (PPP) receivers for the surface positioning during the project. The three single modus calculation position solutions



(Starfix.G2+/G4+, Starfix.XP2, and Starfix.HP) from the two StarPack receivers were interfaced to the survey computer by means of a galvanic isolated network connection and were made available for comparison and QC. Differential correction signal redundancy was achieved by cross-linking the two StarPack receivers to provide corrections from different satellite transmissions, if required. Both Starfix.G2+/G4+ solutions were fed into Starfix.NG by means of a UDP Broadcast (serial backup). All six position solutions, three per receiver, were fed into StarPack QC suite for QC purposes.

All positions and peripheral (heading system, USBL, etc.) data were sent to the navigation computer where all data transformations, offset and survey calculations, and data integration and logging were performed. All data can be graphically and numerically presented on the navigation computer or any other computer connected to the survey network. An off-line computer is available for the survey crew to post-process and report survey data.

The geodetic and the datum transformation parameters used are presented in Section 4.1.

5.3.2.1 Primary Positioning System

The primary survey positioning service used by the survey team was Starfix.G4+ solution generated from Port StarPack Receiver 334. Positions were calculated by using clock and orbit corrections enhanced with carrier-phase corrections from the Fugro Starfix.G4 Network. These corrections were received by the StarPack via SASAT transmissions and positions were output to the Starfix.NG software package.

5.3.2.2 Secondary Positioning System

The secondary survey positioning service used by the survey team was Starfix.G4+ solution generated from Starboard StarPack Receiver 24. Positions were calculated by using clock and orbit corrections enhanced with carrier-phase corrections from the Fugro Starfix.G4 Network. These corrections were received by the StarPack via ERSAT transmissions and positions were output to the Starfix.NG software package.

5.3.2.3 Tertiary Positioning System

The tertiary positioning service used by the survey team was Starfix.XP2 solution generated from Port StarPack Receiver 334. Positions were calculated using carrier phase corrections from the Fugro Starfix network. The corrections are received by the StarPack via SASAT satellite transmissions and positions are output to the Starfix.NG software package.

5.3.2.4 Quaternary Positioning System

The quaternary positioning service used by the survey team was Starfix.XP2 solution generated from Starboard StarPack Receiver 24. Positions were calculated by using carrier phase corrections from the Fugro Starfix network. The corrections were received by the StarPack via ERSAT satellite transmissions and positions were output to the Starfix.NG software package.



5.3.3 Quality Control

The DGNSS and GNSS PPP data were quality controlled using StarPackQC quality control monitoring application. Real-time QC information was displayed as Time Series graphs, tabulated data and graphical displays such as Sky Plots, Error Ellipses and Lock Time graphs depicting satellite lock status. The quality of DGNSS and GNSS PPP derived position fixing data was monitored whilst logging position data for individual locations and also throughout the entire project period.

An assessment of quality was made based on Position Time Series View with the following time series graphs available to display:

- Standard Deviations (Latitude, Longitude and Height);
- HDOP and VDOP;
- Number of SVs:
- Number of Stations;
- Deltas (Easting, Northing and Height);
- Correction Age;
- F-Test.

An assessment of quality was also made by:

- Data Table Views;
- Satellite Lock Time View;
- Error Ellipses View;
- Satellite Constellation Views.

Within the area of operations the accuracy and repeatability of the Starfix.G2+/G4+ system was designed to be 0.03 m in the horizontal plane and 0.06 m in the vertical plane with 95 % confidence level.

5.4 Depth Determination

The depth at each location was measured using a combination of the following techniques:

- Pressure sensor;
- Drill string reading;
- USBL depth reading.

5.4.1 Conductivity, Temperature, and Depth (CTD) probe

A CTD probe or pressure sensor is secured to the seabed frame to measure water pressure using a Digiquartz sensor. The output from this unit is absolute pressure, i.e. atmospheric pressure plus water pressure. The atmospheric pressure is recorded on deployment and not updated until the probe returns to the surface. Adjustments are therefore necessary to take into account the actual atmospheric pressure changes that occur during the measurement cycle. Barometric pressure is recorded manually at four hourly intervals using the vessel's



barometer. An UNESCO-recognised formula is then used to convert the raw pressure values to depth values. The CTD was mounted on the seabed frame.

5.4.2 Drill String Reading

This is a physical measurement made by the drilling personnel and is the total length of drill pipe used to reach the seabed. The measurement is corrected for the distance between the drill floor and the water surface (air gap) and corrected for local tidal variations. When operating in deep water, errors due to the effects of current may be induced in the drill string depth measurement.

5.4.3 USBL Reading

This is a measurement made by taking the Kongsberg HiPAP system USBL beacon Z-values (depth) and applying the vertical offset of the frame-mounted beacon above the seabed frame base.

5.5 System Calibration Procedures

Calibrations of all position and depth measuring equipment are carried out prior to sampling and/or in situ testing. This checks that all equipment is operating within acceptable limits and that the accuracy of the logged data is not compromised. Most equipment is permanently installed on the geotechnical drilling vessel and therefore not all calibrations are performed before the start of every sampling and/or in situ testing programme. The most recent calibrations of the equipment are assessed and new calibrations are carried out if deemed necessary.

5.5.1 Offset Measurements

At the start of the mobilisation, offsets from the vessel's datum (normally the centre of the drill string) to the various DGNSS antennas and other relevant offset points are measured. These measurements are compared with measurements taken from a scaled vessel plan or a previous vessel offset diagram. Seabed frame offsets from the frame's CRP to its transponder and the Z offset for the CTD probe are also measured. Offsets are entered into the navigation software. The USBL transducer offset is already corrected to the vessel's CRP by the vessel's APOS programme.

5.5.2 Heading System Alignment Check

Four methods are possible when performing a heading system alignment check alongside. The resulting differences between computed and observed headings are entered into the navigation software as the heading system's computed minus observed C-O correction.

5.5.2.1 Total Station

These methods of performing a heading system alignment check uses land survey techniques. Reflectors are placed at or near the bow and stern of the vessel on the centreline and their positions fixed at regular intervals. Simultaneous heading system readings and



heading observations are taken. The true bearing between the reflectors is calculated and compared to the observed heading system reading.

5.5.2.2 Sun Azimuth

Sun azimuth observations are performed with a total station and a sun filter when the sun is at a maximum elevation of approximately 30°. The vessel's heading is determined by measuring the angle between the vessel's centreline and the sun azimuth and applying this angle to the computed sun azimuth. The logged heading subtracted from the heading derived from the azimuth of the sun will give the heading system's C-O correction.

5.5.2.3 Taped Offsets

This method requires the known heading of the quay and two measurements are taken simultaneously from the quay to the vessel's centreline. The distance between the two measurements provides a baseline for calculating the angle of the vessel's centreline relative to the quay, which is then applied to the quay heading to derive the computed grid vessel heading. The convergence is applied to the computed grid heading to obtain the true heading which is compared with the observed heading system's reading in order to obtain the C-O correction.

5.5.2.4 Dynamic Calibration

For this method three GNSS antennas are installed on the vessel, one at the bow, one at starboard and one at vessel port side. The antennas are installed preferably at the same height and with minimum baselines of 15 m. GNSS antenna data are logged for a minimum of six hours, while simultaneously raw heading systems data are logged. All data are logged at a rate of 1 Hz.

The logged GNSS data are converted to RINEX format and processed using the Natural Resources Canada website, applying the CSRS (Canadian Spatial Reference System) PPP (Precise Point Positioning) method. Novatel GrafNav software is used for quality control of the resulting PPP data and calculates accurate 3D antenna positions. Finally the GrafNav results are combined with the logged raw vessel heading systems data in Fugro software to calculate the C-O values for the heading systems.

5.5.3 Positioning System

In order to determine the integrity and reliability of the surface positioning systems, two main procedures are followed:

5.5.3.1 Positioning Verification

The position of the primary DGNSS antenna, in local projection coordinates, is verified using two independent methods.

The first method involves comparing the DGNSS antenna position to that derived through land survey techniques. A total station measures directly to the DGNSS antenna from a



known point on the quay. The DGNSS antenna position and the position derived from the total station are logged simultaneously and should agree to better than 0.25 m. This method also validates the geodetic parameters entered into the online survey software.

The second method verifies the DGNSS antenna position by comparing logged SPK positions to results derived from kinematic GNSS processing. Raw GNSS data logged during operations is processed using the Natural Resources Canada website, applying the CSRS (Canadian Spatial Reference System) PPP (Precise Point Positioning) kinematic mode. The processed results are then compared to the SPK positions logged by Starfix.NG, ensuring agreement within 0.25 m and confirming the accuracy of the DGNSS antenna positioning.

Both methods provide independent verification to ensure precise and reliable positioning for geotechnical operations.

5.5.3.2 System Comparison

Once the position verification results are acceptable, a position comparison against all position computations is conducted. The antenna positions for all systems are logged and using the heading system and the measured antenna offsets are reduced to the vessel's CRP. The difference in the positions should agree to within 1 m and they are represented as Delta Easting (Δ E) and Delta Northing (Δ N).

5.5.4 Ultra-Short Baseline System

A USBL allows the measurement of range and bearing from a vessel-based transceiver to one or more subsea transponders. It generally operates through the phase discrimination of an acoustic signal recorded by three orthogonal transducers combined in one head. A USBL calibration is executed whenever work is carried out on the transducer and at least once a year. Calibrations are carried out in water depths slightly deeper than those in which the operations will occur.

5.5.4.1 Preparation

During the USBL calibration sequence, the vessel must be free to manoeuvre around a stationary transponder. Before starting the actual USBL calibration, it is assumed that:

- The vessel's positioning system has been verified;
- The vessel's heading system alignment has been checked;
- All relevant offsets, including the height of the transponder's transducer above the seabed, have been measured.

The actual water depth, measured by the echo sounder, and not corrected for tide, should also be known at the calibration site.

A speed of sound profile, determined at the calibration site, is entered into the USBL system before calibration data are collected.



For the USBL calibration a transponder, equipped with a remote controlled release mechanism or a surface buoy, is deployed, clear of all structures and pipelines, in an area with an approximate water depth slightly deeper than the proposed survey area. The surface positioning system is used to navigate the vessel during the calibration.

5.5.4.2 Range Scale, Orientation, Pitch and Roll

This phase of the calibration is carried out with the vessel positioned on the circumference of a circle of radius 1.5 to 2 times the water depth, centred on the beacon. The following describes a calibration with the vessel lying to the north, east, south, and west of the beacon with the vessel maintaining the same north heading. In the case of bad weather, this pattern may be rotated so that the vessel is heading into the current. The surface position of the vessel and the USBL position of the beacon are logged at each cardinal point. Generally a minimum of 100 fixes, at 5 second intervals, are logged at each cardinal point.

When the vessel is due north or south of the beacon and heading due north, roll errors are minimised and pitch errors are observed. Transducer alignment errors will plot the beacon offset to the east or west of its actual position. Range scaling errors will plot the beacon to the north or south of the actual position.

When the vessel moves to a position due east or west of the beacon, while still maintaining a heading of due north, roll errors are observed and pitch errors are minimised. Transducer alignment error will plot the beacon offset from its actual position. Range scaling errors will plot the beacon to the east or west of the actual position.

Any resultant errors will show the beacon plotted in four quadrants. If there are no errors, the beacon position will be shown as a circular scatter plot around the actual position.

The range error consists of a fixed error and the scalar multiplier. Overall it accounts for errors in ray path and speed of sound. The USBL module in Starfix.NG derives a range error value that contains and accounts for the range fixed error.

Starfix.NG computes the errors and displays the results as four parameters:

- Pitch error;
- Roll error;
- Transceiver misalignment;
- Range error.

5.5.4.3 Offset (Spin) Test

The first part of the calibration is carried out to verify the offsets between the USBL system and the navigation system. This is normally done by manoeuvring the vessel directly over a beacon deployed on the seabed and then rotating the vessel through 360° while logging the surface and USBL position. Any offset errors are displayed as a 'snail trail' showing the beacon position describing a circle around the intended beacon position. Alternatively, the



vessel is positioned directly over the beacon, and an equal number of fixes are logged while the vessel is heading in each of the four cardinal directions.

The Z-offset is checked by comparing the Z component of the USBL observation and the value from the echo sounder, allowing for beacon height above the seafloor. As the vessel is directly over the seafloor beacon, this minimises any errors due to Range Scale and USBL transducer misalignment.

5.5.4.4 Verification of Results

The calibration results are checked using one of two methods:

- 1. Two lines are run at right angles and in opposite directions over the top of the beacon;
- 2. A static spin test at a location in a distance of 10 % of water depth from the calibrated beacon position.

In both cases the beacon's position is continuously logged and should not deviate, within operational parameters, from its calibrated position. A reasonably tight, circular scatter plot a few metres across, depending on the navigation system performance, the USBL system performance, and the depth of water, is an indication of a good calibration result.



Appendix E

Digital Data



E.1 Digital Data

This section details the digital data deliverables associated with the investigated locations.

Description	Document/File Name
AGS4 Field data	F254727_GLO (Z3)_AGS4_Field Data_i02.ags
AGS4 Onshore Laboratory data – FGBL	F254727_GLO (Z3)_AGS4_FGBL_i01.ags
AGS4 Onshore Laboratory data – FGSL	F254727_GLO (Z3)_AGS4_FGSL_i01.ags
Processed Photos	F254727_GLO (Z3)_Photos_i03.zip
Excel Digital Laboratory Test Results	F254727_GLO (Z3)_Laboratory Digital Data_i01
GSI database	GDL_Z3_GTC_FEATURES_2025.gdb

