# VOLUME II: MEASURED AND DERIVED GEOTECHNICAL PARAMETERS AND FINAL RESULTS

## AO5 Bretagne Offshore Geotechnical Investigation

Prepared for: DGEC

MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE

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**Geoquip Marine Operations AG**
Multergasse 1-3
P.O. Box 743
9001 St. Gallen
Switzerland

Tel +41 71 227 40 00
Fax +41 71 227 40 04
geoquip-marine.com

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Signatory Legend:

| | |
|---|---|
| CFI | Cameron Finlay |
| MP | Matthew Proto |
| JDM | Jordan Millman |
| CBL | Chris Brandish-Lowe |
| OS | Oliver Sirett |

Geoquip Marine Operations AG designated contact for any queries regarding this document:

| Name | Job Title | Email |
|---|---|---|
| Chris Brandish-Lowe | Head of Engineering | chris.brandish-lowe@geoquip-marine.com |

## EXECUTIVE SUMMARY

Geoquip Marine Operations AG (Geoquip) has been contracted by DGEC (COMPANY) for the provision of the AO5 Bretagne Offshore Geotechnical Site Investigation for the Offshore Wind Farms (OWF's). The A05 Bretagne-Sud site is located off the south coast of the administrative department of Morbihan area within Bretagne, north-west France, approximately 50 km south of Lorient, located in an Exclusive Economic Zone (EEZ) and in the Territorial Waters. Water depths ranged from 27 to 98m (ZH), this is inclusive of all designated sites (EC, OSS and OWF).

The scope of the fieldwork operations for this project were conducted from the GEOQUIP owned and operated vessel MV Geoquip Seehorn, utilising the permanently installed drill rig GMR602, also GEOQUIP owned and operated.

The purpose of the preliminary site investigation is to allow for a basic understanding of the soil/rock characteristics at designated locations across the proposed development sites.

The scope of work for the OWF survey area is detailed below.

**A05 OWF Scope of Work**

| Borehole Qty | Borehole Type (-) | Target depth (m bsl) |
|---|---|---|
| Phase 1 | | |
| 4 | PCPT | 20.0 |
| 7 | Sampling | 20.0 |
| 2 | Composite | 20.0 |
| Phase 2 | | |
| 2 | PCPT | 20.0 |
| 11 | Sampling | 20.0 |

Phase 1 mobilisation commenced on 20th June 2022, in Port of Lorient, Brittany region, north western France. However, due to a problem with the vessel engine, the project was demobilised on 1st July. After rectification of vessel engine completed on 13th July 2022, the vessel was remobilised on 14th July 2022 at the Port of Lorient. Phase 1 scope for OWF was completed on 18th September 2022. An extended scope of work was added to OWF area as Phase 2 work commenced on 3rd November 2022 with the vessel starting preparations to resume project activity. Phase 2 fieldwork for OWF was completed on 27th December 2022.

A suite of classification, rock strength and soil strength testing have been completed at the Geoquip Marine laboratory, Bristol, United Kingdom. The summary of completed laboratory for the locations covered in this factual report is as follows:

- Total Classification tests completed - 506
- Total Strength test complete - 38
- Total Consolidation tests completed - 0
- Rock Tests completed - 284
- Total Chemical and other tests completed - 158

## OVERVIEW MAP

### AO5 Bretagne Offshore Geotechnical Investigation

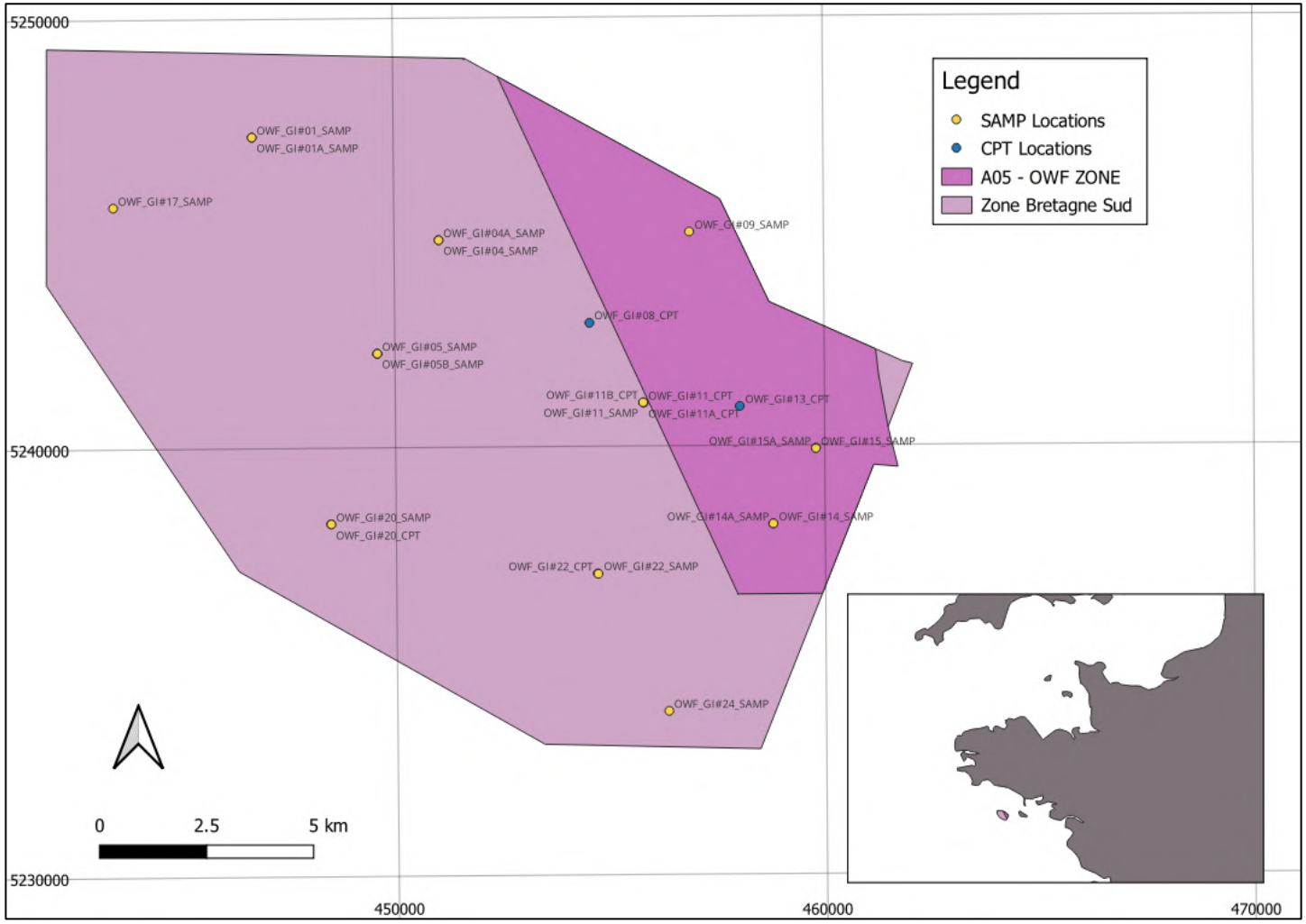


**Figure 1 – OWF Investigated locations.**

## REPORTING STRUCTURE

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| **Chapter 2:** Log of drilling operations |
| **Chapter 3:** In-situ testing operations, procedures and preliminary results |
| **Chapter 4:** Sampling operations, procedures and preliminary results including inventory of recovered samples and onshore laboratory test programmes |
| **Chapter 5:** Field laboratory operations, procedures, and test results |
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# LIST OF ABBREVIATIONS AND DEFINITIONS

## English

| | |
|---|---|
| $B_q$ | pore pressure ratio |
| $D_r$ | relative density |
| $f_s$ | sleeve friction |
| m | metre |
| $q_c$ | measured cone resistance |
| $q_{net}$ | net cone resistance |
| $q_t$ | corrected cone resistance |
| $R_f$ | friction ratio |
| $s_u$ | undrained shear strength |
| $u_2$ | measured pore pressure |
| z | test depth below bottom of the borehole |
| Ic | Soil behaviour type index |

## Greek

| | |
|---|---|
| $\alpha$ | net area ratio of cone |
| $\gamma'$ | submerged unit weight |
| $\gamma_w$ | unit weight of water, assumed to be 9.81kN/m$^3$ |
| $\Delta u$ | excess pore pressure |
| $\sigma_{v0}$ | *in-situ* vertical total stress |

## Abbreviations

| | |
|---|---|
| ATNS | Abortive Test Notice |
| BHA | Bottom Hole Assembly |
| bsf | Below Seafloor |
| COMPANY | DGEC |
| CID | Consolidated Isotropically drained |
| CIUc | Consolidated Isotropically undrained (Compression) |
| EC | Export Cable |
| EEZ | Exclusive Economic Zone |
| PCPT | Piezocone Penetration Test with pore pressure measurement |
| GEOQUIP | Geoquip Marine Operations AG |
| GMR | Geoquip Marine Single Derrick Rig |
| HSE | Health Safety and Environment |
| LAT | Lowest Astronomical Tide |
| OSS | Offshore Sub Station |
| PSD | Particle Size Distribution |
| SoW | Scope of Work |
| UU | Unconsolidated Undrained Triaxial |

# 1. SCOPE OF FIELD OPERATIONS

## 1.1 Overview

Geoquip Marine Operations AG (Geoquip) has been contracted by DGEC (COMPANY) for the provision of the AO5 Bretagne Offshore Geotechnical Site Investigation for Offshore Wind Farms (OWF). The A05 Bretagne-Sud site is located off the south coast of the administrative department of Morbihan area within Bretagne, north-west France, approximately 50 km south of Lorient, located in an Exclusive Economic Zone (EEZ) and in the Territorial Waters. Water depths ranged from 27 to 98m (ZH), this is inclusive of all designated sites (EC, OSS and OWF). Within the A05 site there were three designated survey areas; the Export Cable (EC), the offshore sub-station (OSS) and the offshore wind farm (OWF). Geoquip has undertaken geotechnical investigation work in all the areas, however this report will only detail the Scope of Work (SoW) for the OWF area conducted by Geoquip.

Drilling operations were commenced within the work site on 20th June 2022 with the GEOQUIP rig GMR602 installed on the GEOQUIP owned MV Geoquip Seehorn. The completed Scope of Works is outlined in Table 1-2.

Mobilisation for phase one took place in June and then again in November for the second phase. The OWF scope of work was completed for the second phase on 27th December 2022, where the vessel demobilised from COMPANY scope of work.

## 1.2 Related Documents

Further documents that apply to this project, and which may be referenced herein, include:

- Contract between COMPANY and GEOQUIP
- GEOQUIP Project Safety Plan (GMOP21-G-019-PSP-01) including Emergency Response plan and COMPANY HSE Bridging Document
- GEOQUIP Project Execution Plan (GMOP21-G-019-PEP-01)
- GEOQUIP Laboratory Testing Strategy (GMOP21-G-019-LTS-01)
- GEOQUIP Field Report (GMOP21-G-019-01)
- ERS-01-A - Protocol for thermal resistivity measurement
- SVY-ERS-03 – Employer’s Requirements Marine Operations

## 1.3 Summary of Fieldworks

The following table, Table 1-1, presents the completed nominal scope of work. The detailed completed scope of work including coordinates and measured water depth is presented in Table 1-2:

**Table 1-1 Scope of Work**

| Site | Borehole Qty | Borehole Type (-) | Target depth (m bsl) | Comments (-) |
|---|---|---|---|---|
| Phase 1 | | | | |
| OWF | 4 | PCPT | 20.0 | Changes to the scope: it should be noted that OWF_GI#08_CPT and OWF_GI#13_CPT have been changed to composite boreholes. |
| OWF | 5 | Sampling | 20.0 | |
| OWF | 13 | PCPT | 20.0 | Option to undertake extended scope |
| OWF | 7 | Sampling | 20.0 | Option to undertake extended scope |
| Phase 2 | | | | |
| OWF | 1 | PCPT | 20.0 | 9 PCPT cancelled and GI#05 abandoned at 5.70m |
| OWF | 11 | Sampling (including bump-over locations) | 20.0 | 2 locations cancelled. |
| OWF | 1 | Composite | 20.0 | GI#22_CPT changed to composite. |

Changes in the scope were agreed on 7th September 2022, where 2 No. PCPT locations in the OWF area were changed to Composite regime.

Changes in the phase 2 scope were agreed on 2nd December 2022, where 6 No. PCPT locations and 2No. Sampling locations were cancelled. Additionally, on 22nd December 2022 3 No. PCPT locations were cancelled with the location GI#05 abandoned at 5.70m. The scope for GI#22_CPT was changed from PCPT to composite location due to time constraints.

**Table 1-2 Completed Scope of Work**

| Borehole ID | Target Location (ETRS89 – UTM30N) | | Actual Borehole Location (ETRS89 – UTM30N) | | Date Commenced | Measured Drill String Water depth in MSL (m) | Measured Echosounder Water depth in MSL (m) | Water depth in bathyelli V2 LAT (m) |
|---|---|---|---|---|---|---|---|---|
| | Easting | Northing | Easting | Northing | | | | |
| Phase 1 | | | | | | | | |
| OWF_GI#11_CPT | 455783.49 | 5241008.70 | 455783.39 | 5241007.95 | 17/07/2022 | 91.47 | 91.41 | 89.66 |
| OWF_GI#15_SAMP | 459794.19 | 5239923.03 | 459794.32 | 5239923.33 | 27/07/2022 | 87.84 | 87.70 | 85.45 |
| OWF_GI#15A_SAMP | 459794.19 | 5239923.03 | 459791.15 | 5239926.25 | 18/08/2022 | 88.97 | 88.80 | 85.47 |
| OWF_GI#09_SAMP | 456871.44 | 5244987.59 | 456875.32 | 5244986.35 | 21/08/2022 | 87.44 | 87.20 | 83.52 |
| OWF_GI#11_SAMP | 455774.44 | 5241013.73 | 455775.40 | 5241016.78 | 02/09/2022 | 91.87 | 91.61 | 89.63 |
| OWF_GI#11A_CPT | 455783.49 | 5241008.70 | 455783.46 | 5241012.53 | 03/09/2022 | 92.42 | 92.27 | 89.63 |
| OWF_GI#12_SAMP | 456756.53 | 5242756.94 | 456756.34 | 5242757.06 | 11/09/2022 | 87.97 | 88.03 | 86.77 |
| OWF_GI#12_CPT | 456767.85 | 5242749.86 | 456768.12 | 5242750.08 | 12/09/2022 | 91.97 | 91.89 | 86.79 |
| OWF_GI#08_CPT | 454537.72 | 5242876.41 | 454537.39 | 5242876.75 | 13/09/2022 | 93.67 | 93.51 | 87.50 |
| OWF_GI#11B_CPT | 455783.49 | 5241008.70 | 455778.89 | 5241009.80 | 14/09/2022 | 94.57 | 94.48 | 89.68 |
| OWF_GI#13_CPT | 458026.62 | 5240916.14 | 458026.80 | 5240916.20 | 15/09/2022 | 93.28 | 93.34 | 89.65 |
| OWF_GI#14_SAMP | 458791.12 | 5238171.61 | 458791.15 | 5238171.69 | 17/09/2022 | 90.68 | 90.63 | 87.74 |
| OWF_GI#14A_SAMP | 458791.12 | 5238171.61 | 458787.03 | 5238170.15 | 17/09/2022 | 90.48 | 90.67 | 87.81 |
| Phase 2 | | | | | | | | |
| OWF_GI#05_SAMP | 449588.25 | 5242194.27 | 449591.42 | 5242196.67 | 13/11/2022 | 99.14 | 98.95 | 95.68 |
| OWF_GI#04_SAMP | 451039.48 | 5244829.61 | 451040.42 | 5244828.54 | 02/12/2022 | 91.00 | 90.53 | 87.53 |
| OWF_GI#04A_SAMP | 451039.48 | 5244829.61 | 451036.53 | 5244832.06 | 04/12/2022 | 91.20 | 91.01 | 87.50 |
| OWF_GI#22_SAMP | 454702.49 | 5237025.81 | 454703.24 | 5237026.70 | 06/12/2022 | 97.36 | 97.10 | 93.65 |
| OWF_GI#22_CPT[2] | 454688.31 | 5237033.20 | 454688.01 | 5237034.58 | 07/12/2022 | 97.26 | 97.06 | 93.65 |
| OWF_GI#24_SAMP | 456332.06 | 5233814.93 | 456333.24 | 5233817.19 | 08/12/2022 | 101.26 | 100.63 | 97.40 |
| OWF_GI#20_SAMP | 448486.55 | 5238225.12 | 448486.96 | 5238226.41 | 09/12/2022 | 100.56 | 100.37 | 96.78 |
| OWF_GI#20_CPT | 448481.87 | 5238225.58 | 448480.58 | 5238230.19 | 09/12/2022 | 100.36 | 100.20 | 96.78 |
| OWF_GI#17_SAMP | 443468.55 | 5245633.16 | 443469.12 | 5245633.12 | 10/12/2022 | 98.56 | 98.36 | 95.12 |
| OWF_GI#01_SAMP | 446709.18 | 5247255.49 | 446710.82 | 5247256.22 | 11/12/2022 | 91.80 | 91.65 | 88.36 |
| OWF_GI#01A_SAMP | 446709.18 | 5247255.49 | 446708.98 | 5247253.75 | 17/12/2022 | 91.80 | 91.66 | 88.23 |
| OWF_GI#05A_SAMP | 449588.25 | 5242194.27 | 449589.57 | 5242193.54 | 18/12/2022 | 99.26 | 99.08 | 95.70 |
| OWF_GI#05B_SAMP | 449588.25 | 5242194.27 | 449585.38 | 5242198.33 | 27/12/2022 | 99.16 | 98.88 | 95.67 |

## 1.4 Water Depth

The water depth at each borehole location was measured at the start of operations using the drill string and by a survey-standard echosounder fitted into the vessel's moonpool.

In addition, COMPANY requested that water depths be provided in Bathyelli V2 LAT. To conduct this, GEOQUIP provided the water depths by drill string in MSL to Tecnoambiente who were able to convert these depths in to the Bathyelli V2 “zéro hydrographique”. Then based on the values outlined in SHOM “Références Altimétriques Maritimes” GEOQUIP were able to use a vertical offset of +0.1m taken from the port of Lorient to convert the water depths to Bathyelli V2 LAT. These are the water depths shown in the report and on the logs presented in the appendices.

## 1.5 Geotechnical Drill Rig

All boreholes were completed using the geotechnical drill rig, the GMR602 installed on MV Geoquip Seehorn. The GMR602 is a heave-compensated marine drill rig and is located over a central moonpool. The main details of the rig are summarised in the following table:

**Table 1-3 GMR602 Drilling Rig Details**

| | |
|---|---|
| Type | Rotary marine drill |
| Top Drive/Power Swivel | Fraste R41D150<br>6,900N.m-1 160rpm and 13,800N.m-1 90rpm<br>Load capacity 30t.<br>• Max torque: 13,800Nm<br>• Max speed: 160rpm<br>• 30 Mt Derrick |
| Drill String | 6⅝” API drill string |
| Seabed Frame | 12t, with hydraulic clamps and compensation up to 4.0m |
| Heave Compensation | Effective drill string compensation 0m to 4m. Seabed frame and seabed CPT unit heave compensation with an effective stroke from 0m to 4m |
| Mud | 4,000l mix tank, 8,000l storage tank guar gum seawater miscible |
| Downhole Sampling | Wireline piston / push sampler, percussion / heavy duty percussion sampler |
| Downhole in situ Testing Tools | APB Wison: sampling and penetration testing with pore water pressure and seismic velocity measurements |
| Coring | • 100mm SQ triple tube core barrels |
| Pipe Handling | Range two drill pipe handling using a proprietary mechanical handling system. Handles pipe with minimum manual intervention and hence improved safety |
| Drill Control Cabin | Control cabin for remote control via hydraulic / electric interface of all drilling and sampling operations. Allows driller, assistant driller and PCPT operator coordinated control of all drilling / sampling operations. Rig specific DMS recording |
| Drill Rig Workshop | Fully equipped workshop, tools, and equipment. 220V supply |
| Equipment Winches | Draw-works winch |

| | |
|---|---|
| Type | Rotary marine drill |
| | Seabed frame winch<br>AH Winch (BSL 300wx / Sl30 wx Hydraulic)<br>Tow works Winch (BSL 300wx / Sl30 wx Hydraulic) |

## 1.6 Vessel Specification

Brief details of the vessel are given in Table 1-4 below.

**Table 1-4 MV Geoquip Seehorn**

| | |
|---|---|
| Length Overall | 83.45 m |
| Beam | 18.00 m |
| Maximum Loaded Draft | 5.55 m |
| Main Engines | 4 x MTU-16V 4000, 18,000 BHP |
| Four Point Mooring | Kongsberg Simrad SPD 21 (DP II+) 2x Seatex MRU-M |
| Accommodation (Berths) | 43 No. |

## 1.7 Project Organization

A summary of the various parties involved in the offshore aspects of this site investigation are summarised in Table 1-5.

**Table 1-5 Project Organisation**

| Party | Role | Asset Provision/Responsibility |
|---|---|---|
| DGEC (COMPANY) | Client | Offshore Client Representative<br>Project Management<br>Decisions regarding scope of work |
| DNV | Contractor | Client geotechnical Consultants |
| Geoquip Marine Operations AG (GEOQUIP) | Main Contractor | Vessel owner and operator<br>Provision of geotechnical drill rig, drilling personnel and geotechnical personnel, positioning equipment and positioning personnel<br>Production of geotechnical reporting<br>Project Management<br>Onshore Laboratory |

# 2. FINAL BOREHOLE LOGS

## 2.1 Overview

All PCPT data and sampling data is presented on the borehole logs presented in Appendix A.

Data is presented separately with Borehole, Processed and Derived in-situ Logs for each completed borehole.

The water depths shown on the logs are as measured by the drill string at commencement of the borehole, corrected to Bathyelli V2 LAT, as described in Section 1.4.

The following are presented on respective logs:

1. Borehole Log
    a. PCPT and sampling key
    b. Fracture state
    c. Soil Layering
    d. Raw Results
        i. Depth
        ii. Sleeve Friction
    e. Derived Results
        i. Net Cone Resistance
        ii. Pore Pressure Ratio
        iii. Undrained Shear Strengths from $q_{net}$
        iv. Relative Density derived from $q_t$
    f. Offshore and Onshore laboratory test results
        i. Water Content and Bulk and Dry Densities
        ii. Undrained Shear Strength from UU, Pocket Penetrometer,
        iii. Rock Strength from Unconfined Compression Strength (UCS)
2. Logs of Raw in-situ Test Results
    a. PCPT key
    b. Raw Results
        i. Depth
        ii. Cone Resistance
        iii. Sleeve Friction
        iv. Excess Pore Pressure
3. Logs of Derived in-situ Test Results
    a. PCPT key
    b. Raw Results

i. Depth

ii. Sleeve Friction

c. Derived Results

i. Net Cone Resistance

ii. Pore Pressure Ratio

iii. Friction Ratio

Raw and derived Logs are presented in Appendix A. A summary of the calculations used are presented in Appendix C.

## 2.2 Sample Descriptions and Layering

The layer descriptions presented on the borehole logs are based on the field descriptions of recovered samples updated using the onshore laboratory results and interpretations of the PCPT data. The sample description methodology is presented in Appendix C, which is based on the recommendations in BS5930, ISO 14688-1, ISO14688-2 and ISO 14689.

When assigning characteristic strength values to soil layers, the precedence will be given to test performed on samples with larger size of undisturbed samples. Therefore, if an Unconsolidated Undrained Triaxial or a Consolidated Isotropically Undrained were conducted in the layer, this has taken precedence over the index strength testing (Pocket Penetrometer).

Rock strength description has been based on UCS results (BS 5930 and BS EN ISO 14689). Where there are no results available the description has been based on the field tests.

Borehole schematization is presented in Appendix A.

### 2.2.1 Undrained Shear Strength

Undrained Shear Strength ($s_u$) has been empirically derived from PCPT data using $N_{kt}$ factors, using the following relationship (Lunne et al., 1997).

$$s_u = \frac{q_{net}}{N_{kt}}$$

where:

$s_u$ = Undrained shear strength

$q_{net}$ = net cone resistance

$N_{kt}$ = cone factor

Due to limited data sets of PCPT and undrained shear strength results, a $N_{kt}$ range of 15 to 20 has been used for the entire site.

### 2.2.2 Relative Density

The relative density shown on the logs is calculated using the Jamiolkowski et al. (2003) equation which is based on the vertical effective stress.

$$D_R = \frac{1}{3.10} \cdot ln\left(\frac{q_t/pa}{17.68 \cdot (\sigma'_{v0}/pa)^{0.50}}\right) \cdot 100$$

where:

$D_R$ = relative density

$q_t$ = corrected cone resistance

$\sigma_{vo}'$ = in-situ vertical effective stress

pa = atmospheric pressure – taken as 100kPa

A graphical representation of the relative density is presented on the borehole logs presented in Appendix A.

## 2.3 Site Overview

The site is located in the bay of Biscay, some 20km from the coast of Lorient. The area of interest is approximately 25 x 13km and is presented in Figure 1. Water depths at the site vary from 85 to 97m (ZH).

## 2.4 Regional Geology

The surveyed area has a geological history ranging from the late Cretaceous period through to the Plio-Quaternary. The Cretaceous is expressed by alternating layers of nummulitic limestone, chalks, and dolomites. Locally within these units marls may be present and have been observed in the south eastern portion of the site. Stratigraphically above these Cretaceous units are Eocene sandstones, which can also include large foraminifera and a notable glauconitic component, representing a deep marine environment of deposition. These units are overlain by a Plio-Quaternary “veneer” of fine sands and gravelly sands. In some areas the Cretaceous units will cut through the overlying units and outcrop at seabed, creating a rocky seabed in places (Tecnoambiente, 2021).

# 3. IN-SITU TEST RESULTS AND PROFILES

## 3.1 Overview

A total of six PCPT boreholes with an additional two composite boreholes have been completed. A total number of 82 PCPT pushes were completed across site, totalling 166.97m. Coring was also undertaken within the PCPT locations in-order to progress the boreholes quickly, rather than destructively drill the rock out.

## 3.2 Equipment Calibrations and Verifications

All PCPT cones were calibrated and verified prior to the project and are presented in Volume I - Field Operations and Preliminary Results Report Reference No. GMOP21-G-019-FLD-01.

## 3.3 Equipment and Results Overview

All downhole CPTU testing was completed using the GEOQUIP downhole PCPT tool. Several PCPT cones were made available during the project which included a choice of 10cm² (both subtraction and compression). Two tool stroke lengths were available: 1.5m and 3.0m, with the 1.5m tool being the most frequently used due to ground conditions.

During testing, all data was observed topside in real time. The following channels were recorded during testing:

The following were recorded during testing:

- Penetration depth
- Cone resistance
- Local friction/Sleeve friction
- Pore water pressure

The initial test depth is referenced using the measured drill string depth below seafloor.

Presentation of PCPT results is discussed in Section 2.

## 3.4 PCPT Testing Procedure

All CPTU testing was conducted by the Tool Operators with direction from the Geotechnical Engineers. CPTU testing is conducted with a rate of penetration of approximately 2cm/s. During a test it may be necessary for the tool operator terminate the test before the full stroke. This refusal of a test may occur for a variety of reason including but not limited to avoidance of equipment damage and to ensure data integrity.

The testing was completed in accordance with ISO 19901-8 (2014) and with GEOQUIP procedures. Cones were serviced or replaced if consecutive tests were out of class, further detailed in Section 3.5.

## 3.5 Commentary on PCPT Performance

Due to the regional geology of the site, rock was encountered from mudline. This caused issues for being able to obtain full pushes with numerous instant refusals are seen. During the fieldworks the pure sampling hole was conducted first. This allowed the engineers, in conjunction with the client representative, to predetermine layers where PCPT could be conducted to gather data without instant refusal. However, where this was not possible, PCPT pushes were determined when the driller identified that the drill string had entered a possible weaker layer.

In order for Geoquip to efficiently progress the borehole, the rock was cored in the PCPT locations rather than destructively drilled. All of the rock recovered was logged and shipped back to the laboratory for storage.

PCPT within the Limestone in OWF area was possible but proved to be challenging with some immediate refusals and recoveries of less than 0.3m penetration. This was due to the highly interbedded nature of the softer limestone/soils and competent rocks. These immediate refusals resulted in the cone offsets drifting out of class, and in some cases physically damaging the cones and the equipment where the hard ground was encountered.

Out of the 114 PCPT pushes 86 of those refused either on the tip or sleeve, with most of them being stopped in-order to not damage any equipment due to sudden increases on those channels.

The class of each test was assessed after each test analysing the deck-to-deck baseline readings against ISO 19901-8 (2014), Table 2. The table below outlines the quantity of classes on each channel for the scope of work.

**Table 3-3 PCPT Application Class**

| Class | Tip | Sleeve | Pore Pressure |
|---|---|---|---|
| 1 | 113 | 104 | 111 |
| 2 | 0 | 1 | 2 |
| 3 | 0 | 1 | 0 |
| 4 | 1 | 8 | 1 |

# 4. SAMPLING OPERATIONS

## 4.1 Overview

A total of 18 sampling boreholes and 2 composite boreholes were completed to a target depth. A total number of 167 push/piston/hammer samples and 297 core runs were conducted across site.

The composite borehole regime was determined by identifying sections of the stratigraphy already investigated in the pure sampling locations. These are then the sections within the composite boreholes where PCPT has been carried out.

## 4.2 Equipment Overview

The equipment combinations available offshore are detailed in Table 4-1.

**Table 4-1 Sampling Equipment Overview**

| Sampling Tool | Shelby Tube | | | | | General soil conditions |
|---|---|---|---|---|---|---|
| | Shelby | $D_O$ (mm) | $D_i$ (mm) | Stroke Length (m) | Catcher | |
| Push | Thick-wall | 76.2<br>76.2 | 66.2<br>63.6 | 0.45<br>1 | Rigid/plastic | Very dense sands/gravels |
| | Medium-wall | 76.2 | 70.4 | 1 | Rigid/plastic | Medium to extremely high strength clays/sands |
| Piston | Thin-wall | 76.2 | 72.2 | 1 | No | Very soft to soft clays |
| | Medium-wall | 76.2 | 70.4 | 1 | No | Medium strength clays/sands |
| Hammer | N/A | 76.2 | 66.2 | 0.3 | Rigid/plastic | Very dense sands/gravel, weathered rock |
| | N/A | 50.8 | 40.8 | 0.3 | Rigid/plastic | |
| Triple Tube Core Barrel | N/A | N/A | 80.0 | 1-3 | Steel | Rock / Extremely high strength clay |

Notes:

$D_O$ = Outer diameter

$D_i$ = Inner diameter

Further details on wireline sampling and wireline coring are present in Appendix C

## 4.3 Sample and Rock Handling Procedure

Sample handling was performed by the laboratory technicians and geotechnical engineers on board the vessel with the use of the dedicated soils laboratory on board in accordance with BS5930, ISO 14688-1 and 14688-2 and the guidelines presented in Appendix C. Soil sample handling, logging and testing was conducted in accordance with relevant standards and with the GEOQUIP procedure GM-MSP-OI-5-3-3. The rock was described in accordance with ISO 14689 and with GEOQUIP procedure GM-MSP-OI-5-3-4. The procedure is summarised in Table 4-2.

**Table 4-2 Sampling Handling Procedure**

| Item | Procedure |
|---|---|
| General | Sampling conducted in general to BS5930, ISO 14688-1 and 14688-2 and in accordance with GEOQUIP procedures<br>Recover Shelby tube from drill team<br>Proceed to laboratory |
| Cohesive material | Inspection of sample to determine if laboratory vane is suitable<br>Samples were extruded offshore<br>All samples were photographed prior to further processing<br>Undisturbed samples were preserved in wax and quart tubes<br>Disturbed samples were stored in bags |
| Granular material | Samples were extruded offshore<br>All samples were photographed prior to further processing<br>Disturbed samples were stored in bags |
| Rock | Core liner split, rock logged, photographed, and tested<br>Selected Rock core preserved in wax and quart tubes<br>Sealed back up and shipped back to the onshore laboratory |

## 4.4 Commentary on Sampling Operations

Sampling operations were completed successfully, generally yielding good quality samples. All boreholes were commenced with the use of the push or piston sample tool with a medium wall Shelby tube. The push was also utilised for Shelby tubes with a catcher. Thin wall Shelby tubes were not used due to the risk of encountering gravel or rock at any depth throughout the borehole. The thin wall Shelby tubes are more easily damaged by gravel which can lead to sample disturbance and can also result in the sample tool becoming stuck downhole.

# 5. LABORATORY TEST RESULTS

## 5.1 Laboratory Testing Overview

Both offshore and onshore testing were conducted on recovered samples. Upon completion of boreholes, the samples have been offloaded during downtime windows. The samples have been delivered to GEOQUIP Laboratory, Bristol, United Kingdom. For each offload of samples, a chain of Custody was signed by the OPM, Captain and Courier. The onshore laboratory testing schedules were drafted by GEOQUIP and COMPANY have approved prior to testing.

Table 5-1 shows an overview of the laboratory testing conducted both offshore and onshore. The methodology for the offshore testing is outlined in Appendix C.3.

**Table 5-1 Overview of laboratory testing**

| Test Category | Test Type | Offshore | Onshore | | | Total |
|---|---|---|---|---|---|---|
| | | | Ordered | Aborted | Received | |
| Classification | Water Content | 118 | 0 | 0 | 0 | 118 |
| | Bulk density | 243 | 0 | 0 | 0 | 243 |
| | Particle Density | 0 | 0 | 0 | 0 | 0 |
| | Sieve | 0 | 65 | 2 | 63 | 63 |
| | Hydrometer | 0 | 0 | 0 | 28 | 28 |
| | Min & Max Density | 0 | 7 | 1 | 6 | 6 |
| | Atterberg Limits | 0 | 54 | 6 | 49 | 49 |
| Strength Index | Pocket Penetrometer | 17 | 0 | 0 | 0 | 17 |
| | Torvane | 0 | 0 | 0 | 0 | 0 |
| | Miniature Laboratory Vane - Undisturbed | 0 | 0 | 0 | 0 | 0 |
| | Miniature Laboratory Vane - Remoulded | 0 | 0 | 0 | 0 | 0 |
| Strength | UU - Undisturbed | 0 | 7 | 6 | 1 | 1 |
| | UU - Remoulded | 0 | 7 | 6 | 1 | 1 |
| | CID Triaxial | 0 | 12 | 1 | 11 | 11 |
| | CIUc Triaxial | 0 | 13 | 10 | 3 | 3 |
| | Bender Element | 0 | 17 | 12 | 5 | 5 |
| Rock Testing | Petrographic Analysis | 0 | 68 | 2 | 66 | 66 |
| | ISRM water content porosity and density | 0 | 86 | 6 | 80 | 80 |
| | Unconfined Compression Test (UCS) | 0 | 47 | 25 | 22 | 22 |
| | Point Load (PLT) | 101 | 111 | 12 | 99 | 200 |
| | Rock Shear Test | 0 | 28 | 11 | 17 | 17 |
| Consolidation | Constant Rate of Strain (CRS) | 0 | 5 | 5 | 0 | 0 |
| Chemical & Conductivity | Carbonate Content | 0 | 65 | 0 | 65 | 65 |
| | Chloride Content | 0 | 65 | 0 | 65 | 65 |
| | Sulphate Reducing Bacteria (SRB) | 23 | 0 | 0 | 0 | 23 |
| | Thermal Resistivity | 20 | 0 | 0 | 0 | 20 |
| | Total | 522 | 657 | 105 | 581 | 1103 |

The laboratory that was used for each test, and the procedure or standard used for each test type is described in the table below.

**Table 5-2 Laboratory Testing Standards**

| Description | Testing Standard | Laboratory |
|---|---|---|
| Water Content | BS EN ISO 17892-1 | GQM Laboratory |
| Bulk & Dry Density | BS EN ISO 17892-2 | GQM Laboratory |
| Particle Density | BS EN ISO 17892-3 | GQM Laboratory |
| Sieve | ISO 17892-4 | GQM Laboratory |
| Hydrometer | ISO 17892-4 | GQM Laboratory |
| Atterberg Limits | BS EN ISO 17892-12 | GQM Laboratory |
| UU Triaxial | BS EN ISO 17892-8 | GQM Laboratory |
| Remoulded UU Triaxial | BS EN ISO 17892-8 | GQM Laboratory |
| CID Triaxial (set of 3) | BS EN ISO 17892-9 | GQM Laboratory |
| CIUc Triaxial | BS EN ISO 17892-9 | GQM Laboratory |
| Bender Element | ASTM D8295 | GQM Laboratory |
| Constant Rate of Strain Consolidation (CRS) | BS EN ISO 17892-5 | GQM Laboratory |
| Chloride Content | BS1377-3 | DETS |
| Carbonate Content | BS1377-3 | DETS |
| Thermal Conductivity (Soil) | ASTM D5334 | GQM Laboratory |
| Unconfined Compression Test | ISRM Suggested Method | GQM Laboratory |
| Point Load Index | ISRM Suggested Method | GQM Laboratory |
| Unit Weight (Rock) | ISRM Suggested Method | GQM Laboratory |
| Water Content (Rock) | ISRM Suggested Method | GQM Laboratory |
| Direct Shear Test (Rock) | ISRM Suggested Method | GQM Laboratory |
| Porosity (Rock) | ISRM Suggested Method | GQM Laboratory |
| Petrographic Analysis | In-House method based on ISRM Suggested Methods | Geolabs, UK |

## 5.2 Non-Conformance Reports

Non-Conformance Reports (NCR) were generated by the laboratory and submitted to GEOQUIP. These were reviewed and suggested actions passed to COMPANY for approval. They are presented in Appendix B.

## 5.3 Soil Classification Tests

This group of tests are used to classify the principal soil type including the material plasticity and particle characteristics as appropriate.

### 5.3.1 Water Content

Moisture content tests were carried out shortly after extrusion on samples recovered in the field and will be provided as part of the results received for triaxial tests. The results are plotted against depth on the borehole logs presented in Appendix A and in tabular form in Appendix B.

### 5.3.2 Density

Bulk (or wet) and dry density was determined on appropriate extruded samples in the field in accordance with ISO 17892-2, measuring bulk density by mass of soil per unit volume and dry density by measuring mass of oven dried soil per unit volume of material. These will be provided as part of the results received for triaxial tests. The results are plotted against depth on the borehole logs presented in Appendix A and in tabular form in Appendix B.

### 5.3.3 Particle Size Distribution

Particle size distribution tests have been carried out in the onshore laboratory. The mechanical analysis of soil using sieves (as recommended in EN ISO 17892-4) is to determine the size distribution of non-cohesive (sand and gravel) materials and the total of fines content (silt and clay combined). The grading of finer materials has been determined using a hydrometer. For soils containing both coarse and fine particles, greater than 15%, composite tests using both sieving and hydrometer have been performed where appropriate. PSD results are presented in the form of curves and in tabular form in Appendix B. Fines content results are plotted against depth on the borehole logs presented in Appendix A.

The results received have been used to update the specimen and layer descriptions in the borehole logs.

### 5.3.4 Atterberg Limits

Atterberg Limits have been completed in the onshore laboratory on fine grain samples in accordance with EN ISO 17892-12, which uses the fall cone for determination of the liquid limit. Plasticity indices are plotted against depth on the borehole logs presented in Appendix A. Liquid and plastic limits are presented in tabular form in Appendix B along with plots of plasticity index versus liquid limit.

The results received have been used to update the specimen and layer descriptions in the borehole logs.

Plasticity index and liquidity index have been calculated according to the following relationships:

$$I_L = \frac{w - w_P}{I_P}$$

where:

$I_L$ = liquidity index

$w$ = water content

$$I_P = w_L - w_P$$

where:

$I_P$ = plasticity index

$w_L$ = liquid limit

$w_P$ = plastic limit

## 5.4 Soil Strength Tests

### 5.4.1 Pocket Penetrometer

Pocket penetrometer tests were performed in the field on cohesive soil samples to estimate the undrained shear strength. The results are plotted against depth on the borehole logs presented in Appendix A and in tabular form in Appendix B.

### 5.4.2 Unconsolidated Undrained Triaxial

Unconsolidated Undrained triaxial (UU) tests were conducted on cohesive soil samples in the offshore laboratory and were scheduled to be completed onshore laboratory in accordance with BS EN ISO 17892-8 to determine the undrained shear strength.

UU tests ran to 20% axial strain and were conducted with confining pressures equal to the total in situ vertical stress.

The results are plotted against depth on the borehole logs presented in Appendix A and in tabular form in Appendix B.

### 5.4.3 Unconsolidated Undrained Remoulded Triaxial

Unconsolidated Undrained remoulded (UUr) triaxial tests have been performed in the onshore laboratory. In order to calculate the sensitivity of the cohesive material, the tests were conducted on samples where UU tests had already been conducted, either offshore or onshore. The samples were remoulded to bulk density measured on the undisturbed UU tests, and tested at a confining pressure equal to the undisturbed UU test. All triaxial tests have been completed in line with BS EN ISO 17892-8. Individual test reports and summary tables are presented in Appendix B.

### 5.4.4 Consolidated Isotropically Undrained (Compression) Triaxial

Consolidated Isotropically Undrained compression triaxial (CIUc) tests have been completed in the onshore laboratory in accordance with BS EN ISO 17892-9.

Prior to shearing, all samples will be saturated to at least a B-value of 0.95 and consolidated to calculated in situ effective vertical stress. The results are plotted against depth on the borehole logs presented in Appendix A, and individual test reports and summary tables are presented in Appendix B.

### 5.4.5 Consolidated Isotropically Drained Triaxial

Consolidated Isotopically Drained (CID) Triaxial tests have been completed in the onshore laboratory on granular materials in accordance with EN ISO 17892-9. The samples have been recompacted following the Ladd under-compaction method (Ladd, R, S., 1978) to a representative dry density obtained from the dry density readings measured offshore.

Three tests at different confining pressures have been completed, equal to $0.5\sigma'_{vc}$, $\sigma'_{vc}$ and $2\sigma'_{vc}$.

Individual test reports and summary tables are presented in Appendix B.

### 5.4.6 Bender Element Tests

Measurements of shear wave velocity using Bender Elements (BE) were completed at the onshore laboratory on undisturbed cohesive samples scheduled for CIUc and on non-cohesive samples scheduled for CID tests. The measurements were taken after saturation and consolidation stage prior to shearing, for the CID tests BE tests were

only scheduled on the stage equal to the estimated vertical stress. Shear wave velocity measurements from Bender Elements were conducted using an agreed in-house method, based upon ASTM D8295. All BE measurements were taken in vertical orientation, denoted as Svh. The tests were run using a range of frequencies in order to determine which produced the more reliable results. Shear modulus (Gmax) is also calculated using the post consolidation bulk density of the specimen. For the summary table, GEOQUIP has assessed which frequency is believed to be the most reliable and presented that result. However, within the test result sheets from the onshore laboratory all frequencies are shown along with the resulting shear wave velocity (Vs) and Gmax values.

| BH ID | **Sample ID** | **Depth (m)** | **S-Wave velocity (m/s)** | **Consolidated Bulk Density ($Mg/m^3$)** | **Shear Modulus (MPa)** |
|---|---|---|---|---|---|
| OWF_GI#11_SAMP | PU03-B1 | 2.00 | 150 | 1.79 | 40 |
| OWF_GI#12_SAMP | PU05-B1 | 2.30 | 142 | 1.81 | 36 |
| OWF_GI#15A_SAMP | PU08-Q1 | 11.30 | 269 | 2.18 | 158 |
| OWF_GI#20_SAMP | PU02-B1 | 0.80 | 161 | 1.95 | 51 |
| OWF_GI#22_SAMP | PU06-B1 | 2.70 | 160 | 1.99 | 51 |

With all Bender Element tests there has been interpretation to pick the first arrivals. Therefore, it is recommended that the results above be used with caution and that further shear wave or Gmax values should be measured to support the values before considering for design.

Individual test reports and summary table are presented in Appendix B.

## 5.5 Consolidation

One dimensional consolidation tests would have been conducted on undisturbed cohesive samples to provide stress history and stiffness parameters for engineering purposes.

### 5.5.1 Constant Rate of Strain Tests

Constant Rate of Strain (CRS) tests would have been completed in the onshore laboratory on undisturbed cohesive samples, each test would have comprised of one loading stage, one unloading stage and then a final loading stage, however due to the presence of rock where the CRS tests were scheduled, no tests were able to be run.

The NCRs for the scheduled CRS tests are presented in Appendix B.

## 5.6 Rock Classification Tests

### 5.6.1 Petrographic Examination

Petrographic Examinations have been conducted on rock core samples to provide a detailed visual examination. A representative area of the rock core is selected for the preparation of thin sections depending on the size and homogeneity of the core. The thin sections are then used to carry out a detailed examination using a high-powered optical microscope.

The results are reported in a factual certificate which will include sample photographs, cross-section scans and photomicrographs.

This examination has carried out in accordance to ISRM standards.

The results have been used to update the stratigraphy descriptions on the Borehole logs presented in Appendix A. Results of the Petrographic Analysis are presented in Appendix B.

### 5.6.2 ISRM Water Content, Porosity and Density of Rock

A suite of tests (water content, Porosity and Density) have been carried out on the rock samples collected on the campaign. The results are present graphically on the borehole log in Appendix A and tabulated in Appendix B.

## 5.7 Rock Strength Tests

### 5.7.1 Point Load

Point load testing (PLT) is used to determine rock strength indexes. PLTs have been conducted in the offshore laboratory and were scheduled in the onshore laboratory on competent rock in accordance with ISRM Suggested Method for Determining Point Load Strength (1985).

The results are presented in Appendix B.

### 5.7.2 Unconfined Compression Test

Unconfined Compression Strength tests have been conducted to derive the Compressive Strength of rock samples. The sample were prepared so that they have a length/diameter Ratio between 2.00 – 3.00.

The results are plotted against depth on the borehole logs presented in Appendix A. Individual test reports are summarised in in tabular form in Appendix B.

### 5.7.3 Rock Direct Shear Testing (Constant Normal Load)

Rock Shear testing have been completed in the onshore laboratory, COMPANY requested that these tests are being used to determine the tensile strength of the rock and not to be used to test the shearing along discontinuities. The tests are to be performed on intact specimens, single stage. The orientation is taken from the ground.

Results are presented in Appendix B.

## 5.8 Chemical & Resistivity

### 5.8.1 Sulphate Reducing Bacteria (SRB)

Sulphate Reducing Bacteria tests were scheduled to be completed during fieldworks on soil samples, however as rock was present from mudline in the majority of location very limited SRB tests were conducted.

### 5.8.2 Chloride Content

Chloride content tests were conducted on both the soil and rock samples collected offshore. The results are presented in Appendix B.

### 5.8.3 Carbonate Content

Carbonate Content tests were conducted on both the soil and rock samples collected offshore. The results are presented in Appendix B.

Results received from the laboratory are provided in C02, however as per ISO standard these have been converted to $CaC0_3$ for use in the sample descriptions. The equation for this conversion is provided below.

$$CaC0_3 = C0_2 * 2.2727$$

Conversion to $CaCO_3$ can sometimes give results above 100% due to the measurement uncertainty and associated experimental error margins in the methodology used for this analysis. In these cases the results have been reported as 100% in the Summary Tables in Appendix B, and presented on the borehole log in Appendix A.

### 5.8.4 Thermal Resistivity

Thermal Resistivity tests were scheduled to be completed during fieldworks in accordance with ASTM D5334 on soil samples, however as rock was present from mudline in the majority of location very limited thermal conductivity tests were conducted.

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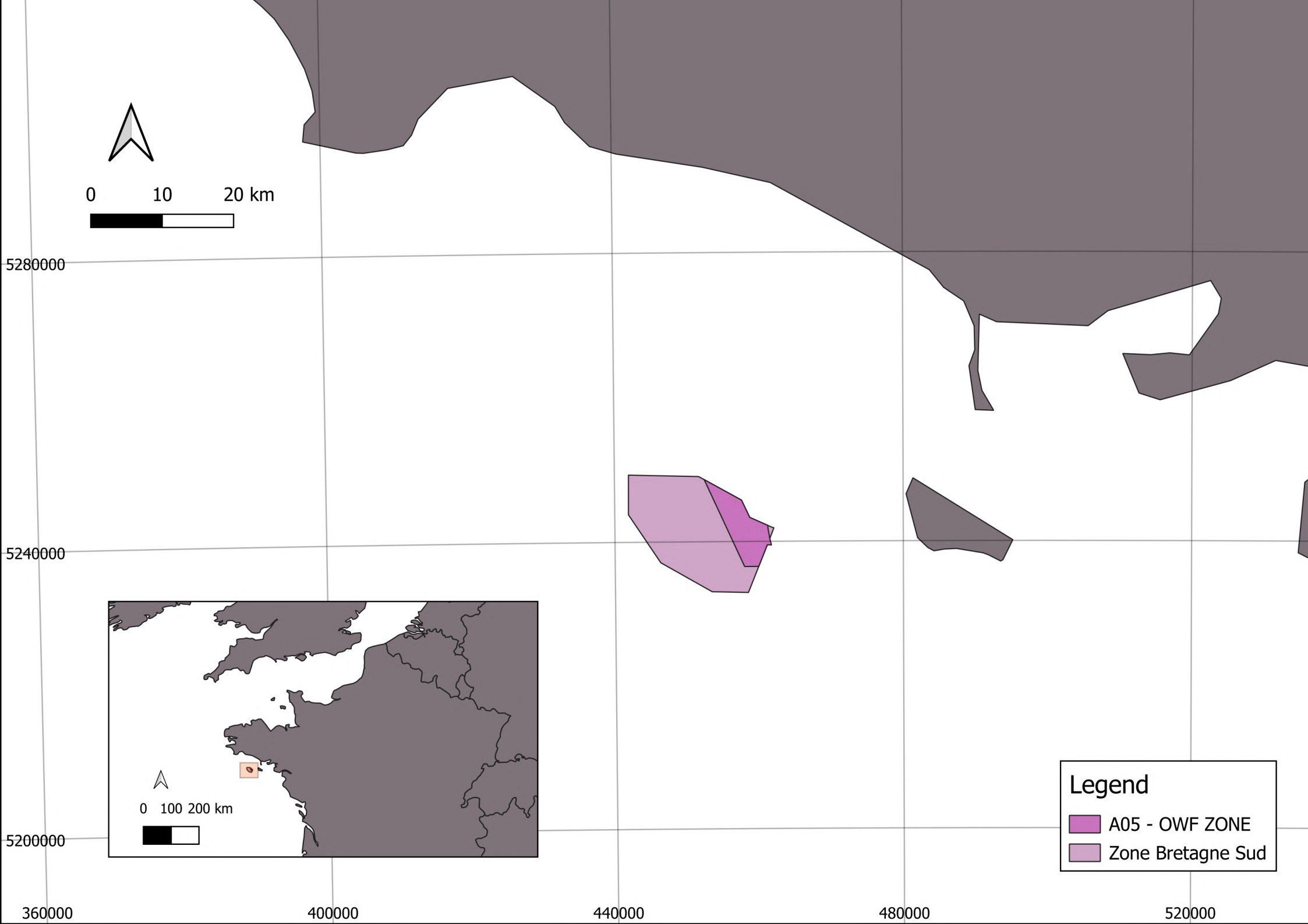
# FIGURES

**Figure 1** **General Location Map**


0 10 20 km
5280000
5240000
5200000
360000
400000
440000
480000
520000
0 100 200 km
Legend
A05 - OWF ZONE
Zone Bretagne Sud

# TABLES

## Table 1 Borehole Location Summary

| Borehole ID | Target Location (ETRS89 – UTM30N) | | Actual Borehole Location (ETRS89 – UTM30N) | | Date Commenced | Measured Drill String Water depth in MSL (m) | Measured Echosounder Water depth in MSL (m) | Water depth in bathyelli V2 LAT (m) |
|---|---|---|---|---|---|---|---|---|
| | Easting | Northing | Easting | Northing | | | | |
| Phase 1 | | | | | | | | |
| OWF_GI#11_CPT | 455783.49 | 5241008.70 | 455783.39 | 5241007.95 | 17/07/2022 | 91.47 | 91.41 | 89.66 |
| OWF_GI#15_SAMP | 459794.19 | 5239923.03 | 459794.32 | 5239923.33 | 27/07/2022 | 87.84 | 87.70 | 85.45 |
| OWF_GI#15A_SAMP | 459794.19 | 5239923.03 | 459791.15 | 5239926.25 | 18/08/2022 | 88.97 | 88.80 | 85.47 |
| OWF_GI#09_SAMP | 456871.44 | 5244987.59 | 456875.32 | 5244986.35 | 21/08/2022 | 87.44 | 87.20 | 83.52 |
| OWF_GI#11_SAMP | 455774.44 | 5241013.73 | 455775.40 | 5241016.78 | 02/09/2022 | 91.87 | 91.61 | 89.63 |
| OWF_GI#11A_CPT | 455783.49 | 5241008.70 | 455783.46 | 5241012.53 | 03/09/2022 | 92.42 | 92.27 | 89.63 |
| OWF_GI#12_SAMP | 456756.53 | 5242756.94 | 456756.34 | 5242757.06 | 11/09/2022 | 87.97 | 88.03 | 86.77 |
| OWF_GI#12_CPT | 456767.85 | 5242749.86 | 456768.12 | 5242750.08 | 12/09/2022 | 91.97 | 91.89 | 86.79 |
| OWF_GI#08_CPT | 454537.72 | 5242876.41 | 454537.39 | 5242876.75 | 13/09/2022 | 93.67 | 93.51 | 87.50 |
| OWF_GI#11B_CPT | 455783.49 | 5241008.70 | 455778.89 | 5241009.80 | 14/09/2022 | 94.57 | 94.48 | 89.68 |
| OWF_GI#13_CPT | 458026.62 | 5240916.14 | 458026.80 | 5240916.20 | 15/09/2022 | 93.28 | 93.34 | 89.65 |
| OWF_GI#14_SAMP | 458791.12 | 5238171.61 | 458791.15 | 5238171.69 | 17/09/2022 | 90.68 | 90.63 | 87.74 |
| OWF_GI#14A_SAMP | 458791.12 | 5238171.61 | 458787.03 | 5238170.15 | 17/09/2022 | 90.48 | 90.67 | 87.81 |
| Phase 2 | | | | | | | | |
| OWF_GI#05_SAMP | 449588.25 | 5242194.27 | 449591.42 | 5242196.67 | 13/11/2022 | 99.14 | 98.95 | 95.68 |
| OWF_GI#04_SAMP | 451039.48 | 5244829.61 | 451040.42 | 5244828.54 | 02/12/2022 | 91.00 | 90.53 | 87.53 |
| OWF_GI#04A_SAMP | 451039.48 | 5244829.61 | 451036.53 | 5244832.06 | 04/12/2022 | 91.20 | 91.01 | 87.50 |
| OWF_GI#22_SAMP | 454702.49 | 5237025.81 | 454703.24 | 5237026.70 | 06/12/2022 | 97.36 | 97.10 | 93.65 |
| OWF_GI#22_CPT[2] | 454688.31 | 5237033.20 | 454688.01 | 5237034.58 | 07/12/2022 | 97.26 | 97.06 | 93.65 |
| OWF_GI#24_SAMP | 456332.06 | 5233814.93 | 456333.24 | 5233817.19 | 08/12/2022 | 101.26 | 100.63 | 97.40 |
| OWF_GI#20_SAMP | 448486.55 | 5238225.12 | 448486.96 | 5238226.41 | 09/12/2022 | 100.56 | 100.37 | 96.78 |
| OWF_GI#20_CPT | 448481.87 | 5238225.58 | 448480.58 | 5238230.19 | 09/12/2022 | 100.36 | 100.20 | 96.78 |
| OWF_GI#17_SAMP | 443468.55 | 5245633.16 | 443469.12 | 5245633.12 | 10/12/2022 | 98.56 | 98.36 | 95.12 |
| OWF_GI#01_SAMP | 446709.18 | 5247255.49 | 446710.82 | 5247256.22 | 11/12/2022 | 91.80 | 91.65 | 88.36 |
| OWF_GI#01A_SAMP | 446709.18 | 5247255.49 | 446708.98 | 5247253.75 | 17/12/2022 | 91.80 | 91.66 | 88.23 |
| OWF_GI#05A_SAMP | 449588.25 | 5242194.27 | 449589.57 | 5242193.54 | 18/12/2022 | 99.26 | 99.08 | 95.70 |
| OWF_GI#05B_SAMP | 449588.25 | 5242194.27 | 449585.38 | 5242198.33 | 27/12/2022 | 99.16 | 98.88 | 95.67 |

**Table 2 Cone Summary**

| Cone No. | Cone Type[1] | Tip Area ($cm^2$) | Sleeve Area ($cm^2$) | Cone Ratio | Total Meterage (m) |
|---|---|---|---|---|---|
| 120927 | Subtraction | 10 | 150 | 0.74 | 13.3 |
| 160107 | Subtraction | 10 | 150 | 0.74 | 3.34 |
| 180602 | Subtraction | 10 | 150 | 0.80 | 2.68 |
| 180702 | Subtraction | 10 | 150 | 0.80 | 1.52 |
| 180807 | Subtraction | 10 | 150 | 0.85 | 8.20 |
| 190409 | Subtraction | 10 | 150 | 0.72 | 5.42 |
| 190410 | Subtraction | 10 | 150 | 0.80 | 2.66 |
| 190720 | Subtraction | 10 | 150 | 0.72 | 4.3 |
| 220605 | Subtraction | 10 | 150 | 0.80 | 0.10 |

# APPENDIX A BOREHOLE LOGS AND PARAMETERS

# Appendix A.1 Borehole Log Legend

# A05 Bretagne Offshore GI

| Client: | Project Number: | Report Reference: |
|---|---|---|
| RTE_DGEC | GMOP21-G-019 | GMOP21-G-019-FAC |

GEOQUIPMARINE

## Samples and Tests

Soil Sample

*In Situ* PCPT

Core Run

## Sampling/Testing Method

| | |
|---|---|
| PU/P | Push/piston with Shelby Tube |
| H | Hammer |
| CR | Core Run |
| C | PCPT |

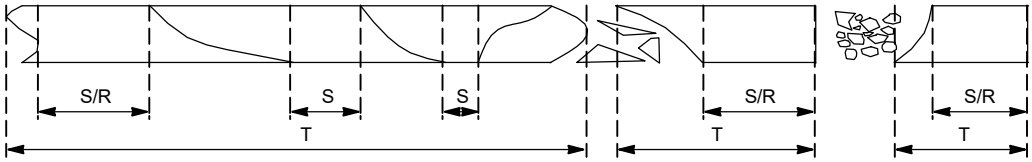
All lengths of sample or test represent actual recovery or tested depth range

## Legend of Soil Types

| | | | | | |
|---|---|---|---|---|---|
| CLAY | | MUDSTONE | | DOLOMITE | |
| SILT | | SILTSTONE | | | |
| SAND | | SANDSTONE | | | |
| GRAVEL | | LIMESTONE / CALCAREOUS / CARBONATE ROCKS | | | |
| PEAT | | IGNEOUS ROCKS | | | |
| SCHIST | | CALCARENITE | | | |

## Rock Core Recovery

(based on BS EN ISO 14689-1)




| *Term* | *Definition* |
|---|---|
| TCR | Core Recovered (**Σ**T) / Length Drilled |
| SCR | Core Recovered at Full Diam. (**Σ**S) / Length Drilled |
| RQD | Core Recovered at Full Diam., >0.1m in length (**Σ**R) / Length Drilled |

| *Strength* | *UCS(MPa)* |
|---|---|
| Extremely Weak | < 1.0 |
| Very Weak | 1.0 - 5.0 |
| Weak | 5.0 - 12.5 |
| Moderately Weak | 12.5 - 25.0 |
| Medium Strong | 25.0 - 50.0 |
| Strong | 50.0 - 100.0 |
| Very Strong | 100.0 - 250.0 |
| Extremely Strong | > 250.0 |

## Strength of Fine Grained Soils

(based on BS EN ISO 14688-2)

| *Strength* | *Su(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 |

## Relative Density of Coarse Grained Soils

(based on Lunne and Chrstoffersen, 1983)

| *Density* | *Relative Density (%)* |
|---|---|
| Very Loose | < 15 |
| Loose | 15 - 35 |
| Medium Dense | 35 - 65 |
| Dense | 65 - 85 |
| Very Dense | > 85 |

# Borehole Log Legend

## Appendix A.2 Borehole Logs

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#01_SAMP | 11/12/2022 | 446711mE | 5247256mN | 88.36m |
| OWF_GI#01A_SAMP | 17/12/2022 | 446709mE | 5247254mN | 88.23m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND | STRATA DESCRIPTION | FRACTURE STATE (RQD / SCR / TCR) | CONE PENETROMETER TEST (Net Cone Resistance $q_{net}$ (MPa); Sleeve Friction $f_s$ (MPa); Pore Pressure Ratio, Bq) | ROCK COMPRESSIVE STRENGTH (MPa)[4] (UCS) | UNDRAINED SHEAR STRENGTH (kPa) (Torvane; Pocket Penetrometer; Undrained Triaxial Test; Laboratory Vane; CIU Triaxial; $S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.) | DENSITY (Mg/m$^3$) (Bulk Density; Dry Density) | CLASSIFICATION (%) (Water Content; Carbonate Content; Fines Content; Plasticity Index; Relative Density[3])

00.00m Very strong to extremely strong (based on field tests) yellowish brown (10YR 5/4) very highly calcareous slightly weathered fine-grained DOLOMITE with rare voids (5mm-20mm) and white staining on core surface. Discontinuities are closely spaced subhorizontal to vertical planar to undulating rough open to moderately wide with brown silt infill and rare orange staining.

03.20m Moderately weak greyish orange (10YR 7/4) very highly calcareous slightly weathered fine-grained DOLOMITE with white staining on core surface. Discontinuities are very closely to closely spaced subhorizontal undulating rough to smooth open to moderately wide clean.

09.25m Very strong (based on field tests) yellowish brown (10YR 5/4) very highly calcareous slightly weathered fine-grained DOLOMITE with rare voids (2mm-30mm) and white staining on core surface. Discontinuities are closely spaced subhorizontal to vertical planar to undulating rough open to moderately wide clean with rare brown silt infill and rare orange staining.

12.50m Very pale orange (10YR 8/2) weathered slightly silty sandy very highly calcareous LIMESTONE with frequent fossils (1mm-30mm)

15.60m Very strong yellowish brown (10YR 5/4) very highly calcareous slightly weathered fine-grained DOLOMITE with numerous fossils (2mm-10mm). Discontinuities are closely spaced subhorizontal planar to undulating rough open clean and white staining on core surface.

17.00m Medium strong medium to high density very pale orange (10YR 8/2) very highly calcareous slightly weathered silty slightly sandy SHELLY LIMESTONE with frequent fossils (1mm-30mm).

End of borehole at 20.10m

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#04_SAMP | 02/12/2022 | 451040mE | 5244829mN | 87.53m |
| OWF_GI#04A_SAMP | 04/12/2022 | 451037mE | 5244832mN | 87.5m |

GEOQUIPMARINE

DEPTH (m)

SAMPLE: PU01, PU01A, PU02, PU02A, PU03, PU03A, CR01, CR03, CR02, PU04, CR04, CR03, CR05, CR06, CR07, CR08, PU03, PU04, PU05, CR09, PU06, PU07, CR10, CR11, PU08, PU09, PU10, PU11, PU12, PU13, PU14, CR12, CR13, CR14, CR15

*IN SITU* TEST

LEGEND

STRATA DESCRIPTION

00.00m Yellowish brown (10YR 5/4) calcareous very gravelly medium to coarse SAND with frequent shell fragments (1mm-10mm). Gravel is subangular to subrounded.

01.30m Very strong to extremely strong (based on field tests) greyish orange (10YR 7/4) slightly calcareous slightly weathered fine-grained DOLOMITE with white staining on core surface. Discontinuities are closely spaced subhorizontal undulating rough open clean with frequent orange surface staining.

03.80m - becoming greyish orange (10YR 7/4)

08.30m Very weak to weak (based on field tests) medium to high density pale yellowish orange (10YR 8/6) highly calcareous SHELLY LIMESTONE composed of sand and gravel and with frequent fossils (1mm-30mm).

15.30m Weak to medium strong (based on field tests) medium to high density pale yellowish orange (10YR 8/6) highly calcareous SHELLY LIMESTONE with frequent fossils (1mm-30mm).

16.90m Strong (based on field tests) high to very high density very pale orange (10YR 8/2) highly calcareous FOSSILIFEROUS DOLOMITE with numerous fossils (3mm-30mm). Discontinuities are very closely to medium spaced subhorizontal undulating rough open clean with occasional orange staining.

18.00m Medium strong to strong (based on field tests) high to very high density very pale orange (10YR 8/2) highly calcareous slightly weathered SHELLY LIMESTONE with numerous fossils (2mm-35mm). Discontinuities are very closely to closely spaced subhorizontal undulating rough open clean with occasional orange staining.

End of borehole at 19.85m

FRACTURE STATE
RQD / SCR / TCR
30 60 90

CONE PENETROMETER TEST
Net Cone Resistance $q_{net}$ (MPa)
Sleeve Friction $f_s$ (MPa)
1.25 2.50 3.75 5.00 6.25 7.50 8.75
0.625 1.250 1.875
Pore Pressure Ratio, Bq
0.0 0.5 1.0

ROCK COMPRESSIVE STRENGTH (MPa)[4]
UCS
25 50

UNDRAINED SHEAR STRENGTH (kPa)
Torvane
Pocket Penetrometer
Undrained Triaxial Test
* Hollow symbols represent offshore results
Laboratory Vane
CIU Triaxial
$S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.
200 400 600 800 1000

DENSITY (Mg/m$^3$)
Bulk Density
Dry Density
* Hollow symbols represent offshore results
1.3 1.8 2.3

CLASSIFICATION (%)
Water Content
Carbonate Content
Fines Content
Plasticity Index
Relative Density[3]
25 50 75

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#05_SAMP | 13/11/2022 | 449591mE | 5242197mN | 95.68m |
| OWF_GI#05A_SAMP | 18/12/2022 | 449590mE | 5242194mN | 95.7m |
| OWF_GI#05B_SAMP | 26/12/2022 | 449585mE | 5242198mN | 95.67m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND | STRATA DESCRIPTION | FRACTURE STATE (RQD / SCR / TCR, 30 60 90) | CONE PENETROMETER TEST (Net Cone Resistance $q_{net}$ (MPa); Sleeve Friction $f_s$ (MPa); 12.5 25.0 37.5 50.0 62.5 75.0 87.5; 0.625 1.250 1.875; Pore Pressure Ratio, Bq 0.0 0.5 1.0) | ROCK COMPRESSIVE STRENGTH (MPa)[4] (UCS; 25 50) | UNDRAINED SHEAR STRENGTH (kPa) (Torvane; Pocket Penetrometer; Undrained Triaxial Test; Laboratory Vane; CIU Triaxial; $S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.; * Hollow symbols represent offshore results; 100 200 300 400 500) | DENSITY (Mg/m$^3$) (Bulk Density; Dry Density; * Hollow symbols represent offshore results; 1.5 2.0 2.5) | CLASSIFICATION (%) (Water Content; Carbonate Content; Fines Content; Plasticity Index; Relative Density[3]; 25 50 75)

PU01
PU01A
CR01
CR02
CR03
CR04
CR05
PU02
CR01
CR02
CR03
CR04
CR05

00.00m Dark olive grey (5Y 3/2) highly calcareous gravelly silty fine to medium SAND (grsi(f-m)Sa) with frequent shell fragments (1mm-30mm). Gravel is fine to medium
00.35m to 00.40m - with subrounded to subangular coarse gravel with voids (2mm-15mm)

00.50m Medium strong to strong (based on field tests) pale yellowish brown (10YR 6/2) very highly calcareous, slightly weathered fine grained SHELLY LIMESTONE with rare voids (2mm-10mm). Discontinuities are closely spaced subhorizontal undulating rough open clean with frequent white and orange surface staining

02.50m Medium strong to strong (based on field tests) pale yellowish brown (10YR 6/2) highly calcareous, slightly weathered fine grained FOSSILIFEROUS GLAUCONITE LIMESTONE with rare voids (2mm-10mm). Discontinuities are closely spaced subhorizontal undulating rough open clean.

03.90m Very high strength very dark greenish grey (GLEY 1 5GY 3/1) slightly sandy silty high plasticity CLAY (sasi(ClH)). Sand is fine
04.50m to 05.10m - high to very high strength clay

05.60m Moderately weak dark greenish grey (5GY 4/1) very highly calcareous slightly weathered GLAUCONITE DOLOMITE. Discontinuities are very closely to closely spaced subhorizontal undulating rough open with frequent very dark grey clay infill

06.60m Dark greenish grey (5GY 4/1) non-calcareous slightly gravelly slightly sandy silty high plasticity CLAY (grsaClV). Gravel is subrounded to subangular

08.00m Dark greenish grey (5GY 4/1) non-calcareous slightly sandy clayey high plasticity SILT (Sacl(SiH))

08.75m Greenish grey (5GY 6/1) calcareous slightly sandy very silty high plasticity CLAY (Sasi(ClH))
10.40m to 10.50m - with frequent fossils (1mm-5mm)

End of borehole at 10.50m

72
28
29
38
63
30
24

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project No.: GMOP21-G-019
Location: A05 OWF

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#08_CPT | 13/09/2022 | 454537mE | 5242877mN | 87.5m |

GEOQUIPMARINE

DEPTH (m)

SAMPLE: CR01 CR02 CR03 CR04 CR05 CR06 CR07 PU01 CR08 CR09 CR10 CR11 CR12 CR13 PU02 CR14 CR15 CR16 CR17 CR18

*IN SITU* TEST: C01 190410; C02 190410; C03 190410; C04 190410; C05 190410; C06 190409; C07 190409

LEGEND

STRATA DESCRIPTION

00.00m Dense to very dense SAND

01.50m Extremely strong dark yellowish orange (10Y R6/6) slightly weathered fine grained DOLOMITE with frequent voids (10mm-20mm) and fossils (10m-20mm). Discontinuities are sub-horizontal to diagonal (5-45°) closely spaced rough undulating moderately wide to wide clean.

03.50m Extremely strong pale yellowish brown (10YR 6/2) slightly calcareous slightly weathered DOLOMITE with occasional voids (2mm-5mm) and occasional shell fragments (2mm-3mm). Discontinuities are very closely to closely spaced subhorizontal (5-10°) undulating rough open with silt infill and occasional orange staining

03.85m - subvertical discontinuity (45°), likely drilling induced

05.50m Weak to medium strong pale yellowish orange (10YR 8/6) highly calcareous LIMESTONE with frequent fossils (2mm-25mm) Discontinuities are very closely spaced horizontal to subhorizontal (0-15°) undulating rough open with silt infill and frequent orange staining.

10.50m - becoming very strong high density with occasional fossils (2mm-10mm)

15.50m Yellow (2.5Y 8/6) slightly gravelly sandy silty LIMESTONE with frequent fossils (2mm-20mm). Gravel is subrounded fine to coarse

16.50m Strong yellow (2.5Y 8/6) highly calcareous LIMESTONE with frequent fossils (2mm-20mm). Discontinuities are closely spaced sub-horizontal (0-15°) undulating rough moderately wide with silt infill.

16.75m - thin bed of limestone with frequent voids (2mm-15mm)

17.50m Extremely strong yellowish grey (5Y 7/2) slightly calcareous slightly weathered DOLOMITE with frequent voids (10mm-20mm) and fossils (10mm-20mm). Discontinuities are very closely to closely spaced subhorizontal to subvertical (5-45°) rough undulating moderately wide clean with orange staining

20.50m - medium bed of mudstone

End of borehole at 20.80m

FRACTURE STATE
RQD / SCR / TCR
30 60 90

CONE PENETROMETER TEST
Net Cone Resistance $q_{net}$ (MPa)
Sleeve Friction $f_s$ (MPa)
12.5 25.0 37.5 50.0 62.5 75.0 87.5
0.625 1.250 1.875
Pore Pressure Ratio, Bq
0.0 0.5 1.0

ROCK COMPRESSIVE STRENGTH (MPa)[4]
UCS
25 50

UNDRAINED SHEAR STRENGTH (kPa)
Torvane
Pocket Penetrometer
Undrained Triaxial Test
* Hollow symbols represent offshore results
Laboratory Vane
CIU Triaxial
$S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.
200 400 600 800 1000

DENSITY (Mg/m$^3$)
Bulk Density
Dry Density
* Hollow symbols represent offshore results
1.3 1.8 2.3

CLASSIFICATION (%)
Water Content
Carbonate Content
Fines Content
Plasticity Index
Relative Density[3]
25 50 75

[1] Local Geodetic Datum: ETRS89 / UTMN30
[2] Water Depth: LAT
[3] Relative densities derived from Jamiolkowski et al. (2001)

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project No.: GMOP21-G-019
Location: A05 OWF

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#09_SAMP | 21/08/2022 | 456875mE | 5244986mN | 83.52m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND

**STRATA DESCRIPTION**

00.00m Medium strong dark yellowish orange (10YR 6/6) very highly calcareous fine to medium grained DOLOMITE with white staining on core surface. Discontinuities are medium spaced undulating smooth wide clean

06.00m - becoming medium strong to strong

14.35m Medium strong dark yellowish orange (10YR 6/6) slightly calcareous fine to medium grained DOLOMITE with white staining on core surface. Discontinuities are medium spaced undulating smooth wide clean

16.00m Medium strong (from field tests) dark yellowish orange (10YR 6/6) very highly calcareous fine to medium grained SHELLY LIMESTONE with numerous fossils (1mm-20mm). Discontinuities are very close to closely spaced horizontal (0-5°) planar rough open clean.

17.00m to 20.70m - moderately weak

End of borehole at 20.70m

**FRACTURE STATE**
RQD / SCR / TCR
30 60 90

**CONE PENETROMETER TEST**
Net Cone Resistance $q_{net}$ (MPa)
Sleeve Friction $f_s$ (MPa)
12.5 25.0 37.5 50.0 62.5 75.0 87.5
0.625 1.250 1.875
Pore Pressure Ratio, Bq
0.0 0.5 1.0

**ROCK COMPRESSIVE STRENGTH (MPa)[4]**
UCS
25 50

**UNDRAINED SHEAR STRENGTH (kPa)**
Torvane
Pocket Penetrometer
Undrained Triaxial Test
* Hollow symbols represent offshore results
Laboratory Vane
CIU Triaxial
$S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.
200 400 600 800 1000

**DENSITY (Mg/m³)**
Bulk Density
Dry Density
* Hollow symbols represent offshore results
1.3 1.8 2.3

**CLASSIFICATION (%)**
Water Content
Carbonate Content
Fines Content
Plasticity Index
Relative Density[3]
25 50 75

[1] Local Geodetic Datum: ETRS89 / UTMN30
[2] Water Depth: LAT
[3] Relative densities derived from Jamiolkowski et al. (2001)

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#11_CPT | 17/07/2022 | 455783mE | 5241008mN | 89.66m |
| OWF_GI#11_SAMP | 02/09/2022 | 455775mE | 5241017mN | 89.63m |
| OWF_GI#11A_CPT | 03/09/2022 | 455783mE | 5241013mN | 89.63m |
| OWF_GI#11B_CPT | 14/09/2022 | 455779mE | 5241010mN | 89.68m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND | STRATA DESCRIPTION | FRACTURE STATE (RQD / SCR / TCR) | CONE PENETROMETER TEST (Net Cone Resistance $q_{net}$ (MPa); Sleeve Friction $f_s$ (MPa); Pore Pressure Ratio, Bq) | ROCK COMPRESSIVE STRENGTH (MPa)[4] (UCS) | UNDRAINED SHEAR STRENGTH (kPa) (Torvane; Pocket Penetrometer; Undrained Triaxial Test; Laboratory Vane; CIU Triaxial; $S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.) | DENSITY (Mg/m$^3$) (Bulk Density; Dry Density) | CLASSIFICATION (%) (Water Content; Carbonate Content; Fines Content; Plasticity Index; Relative Density[3])

00.00m Dense to very dense greenish grey (GLEY 1 10Y 5/1) highly calcareous slightly gravelly uniformly graded fine to medium SAND (gr(f-m)Sa) with frequent shell fragments (1mm-10mm)

03.05m - thin bed of medium dense sandy silt

04.10m Medium strong greyish orange (10 YR 7/4) highly calcareous slightly sandy DOLOMITE with frequent voids (1mm-2mm) and shell fragments (1mm-5mm). Discontinuities are very closely spaced dippings (5-15°) stepped to undulating rough open to moderate

05.75m - medium bed of silty slightly weathered sandstone

08.50m Weak very high density moderate yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with frequent shell fragments (2mm-5mm) and rare fossils (2mm). Discontinuities are very close to closely spaced sub horizontal dipping (0-20°) planar rough surface with voids (5mm).

11.50m Medium strong high density yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with occasional shell fragments (2mm-3mm) and fossils (3mm-5mm). Discontinuities are closely spaced sub horizontal dipping (0-20°) undulating rough open to moderately wide clean with occasional voids (3mm-5mm).

14.50m - becoming white (N9)

15.50m Moderately weak greyish green (10GY 4/2) highly calcareous silty fine GLAUCONITE DOLOMITE. Discontinuities are medium spaced dipping (0-5°) stepped to undulating rough open with silty sand infill and rare orange staining

16.50m - discontinuities becoming very closely to closely spaced

End of borehole at 19.90m

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#12_CPT | 12/09/2022 | 456768mE | 5242750mN | 86.79m |
| OWF_GI#12_SAMP | 11/09/2022 | 456756mE | 5242757mN | 86.77m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND

**STRATA DESCRIPTION**

00.00m Dense to very dense very (5Y 6/1) calcareous uniformly graded silty clayey fine to medium SAND (sicl(f-m)Sa) with frequent shell fragments (1mm-4mm)

01.21m - medium bed of fine to coarse subrounded to subangular gravel

01.20m Very dense grey (5Y 6/1) highly calcareous gravelly medium graded fine to coarse SAND (gr(f-c)Sa) with frequent shell fragments (2mm to 5mm) and mica (2mm). Gravel is fine to medium subangular

02.80m Strong yellowish brown (10YR 5/6) slightly calcareous silty fine-grained slightly weathered DOLOMITE. Discontinuities are very close to closely spaced horizontal undulating rough open no infill

08.30m Very strong to extremely strong dusky red (10R 2/2) very highly calcareous slightly weathered DOLOMITE. Discontinuities are wide spaced subhorizontal (0-10°) rough open with yellowish brown silt infill

11.30m Weak (based on field tests) medium density yellowish grey (5Y 8/1) highly calcareous SHELLY LIMESTONE with frequent shell fragments (1mm-5mm). Discontinuities are closely spaced subhorizontal (0-5°) undulating rough open clean with occasional yellowish staining

16.30m Weak medium density yellowish grey (5Y 8/1) highly calcareous coarse GLAUCONITE DOLOMITE. Discontinuities are very closely spaced subhorizontal (0-5°) rough open clean

18.40m Strong dark greenish grey (5G 4/1) very highly calcareous fine to medium grained moderately weathered DOLOMITE with occasional voids (2mm-5mm), fossils (5mm) and rare shell fragments (3mm). Discontinuities are closely spaced subhorizontal (0-20°) undulating

End of borehole at 19.65m

FRACTURE STATE — RQD / SCR / TCR (30 60 90)

CONE PENETROMETER TEST — Net Cone Resistance $q_{net}$ (MPa) 12.5 25.0 37.5 50.0 62.5 75.0 87.5; Sleeve Friction $f_s$ (MPa) 0.625 1.250 1.875; Pore Pressure Ratio, Bq 0.0 0.5 1.0

ROCK COMPRESSIVE STRENGTH (MPa)[4] — UCS 33 67

UNDRAINED SHEAR STRENGTH (kPa) — Torvane; Pocket Penetrometer; Undrained Triaxial Test; Laboratory Vane; CIU Triaxial; $S_u$ from $q_{net}$. For $N_{kt}$ values please see the report. (* Hollow symbols represent offshore results) 200 400 600 800 1000

DENSITY (Mg/m$^3$) — Bulk Density; Dry Density (* Hollow symbols represent offshore results) 1.3 1.8 2.3

CLASSIFICATION (%) — Water Content; Carbonate Content; Fines Content; Plasticity Index; Relative Density[3] 25 50 75

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#13_CPT | 15/09/2022 | 458027mE | 5240916mN | 89.65m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND | STRATA DESCRIPTION | FRACTURE STATE (RQD / SCR / TCR) | CONE PENETROMETER TEST (Net Cone Resistance $q_{net}$ (MPa); Sleeve Friction $f_s$ (MPa); Pore Pressure Ratio, Bq) | ROCK COMPRESSIVE STRENGTH (MPa)[4] | UNDRAINED SHEAR STRENGTH (kPa) | DENSITY (Mg/m$^3$) | CLASSIFICATION (%)

**STRATA DESCRIPTION**

00.00m Loose to medium dense brown (7.5YR 5/4) fine to medium SAND

00.20m - becoming dense to very dense

01.00m Very strong greyish orange (10YR 7/4) slightly calcareous slightly weathered fine grained DOLOMITE with rare voids (2mm-3mm). Discontinuities are closely to medium spaced horizontal (0-5°) undulating rough open with silt infill.

03.25m - becoming extremely strong. Discontinuities becoming subhorizontal to diagonal (5-75°)

04.00m - becoming moderate brown (5YR 4/4)

04.55m Strong moderate brown (5YR 4/4) slightly calcareous slightly weathered DOLOMITE with frequent voids (2mm-5mm). Discontinuities are closely to medium spaced subhorizontal (0-20°) undulating rough open with silt infill

06.00m Recovered as non-intact subrounded fragments (10mm-30mm) of yellowish grey (5YR 8/1) highly calcareous highly weathered LIMESTONE with frequent fossils (2mm-5mm)

09.00m Very strong white (N9) highly calcareous highly weathered LIMESTONE with frequent voids (2mm-15mm) and fossils (2mm-6mm). Discontinuities are very closely to closely spaced sub-horizontal (0-20°), open with silty clay infill and occasional orange staining

10.00m - discontinuities becoming close to medium spaced. (CIRIA Grade C2/3)

10.00m Very strong very high density white (N9) highly calcareous highly weathered LIMESTONE with frequent voids (2mm-15mm) and fossils (2mm-6mm). Discontinuities are closely to medium spaced sub-horizontal (0-20°), open with silty clay infill and occasional orange staining

12.00m Strong dusky yellow green (5G Y5/2) highly calcareous slightly weathered DOLOMITE with occasional shell fragments (2mm-5mm), fossils (2mm-5mm) and rare closely to medium spaced thin beds of silty fine sand. Discontinuities are very closely spaced sub-horizontal (5-10°) rough undulating open with fine sandy silt infill

14.35m Strong dusky yellowish green (10G Y3/2) slightly calcareous clayey SILTSTONE with frequent shell fragments (2mm-5mm) and fossils (2mm-5mm). Discontinuities are medium to widely spaced horizontal (0-5°) undulating rough open with silt infill

15.00m - becoming light brownish grey (5YR 6/1)

16.05m Medium strong dusky yellowish green (10GY 3/2) MUDSTONE with rare thin beds of limestone and frequent shell fragment (5mm-10mm). Discontinuities are very closely spaced horizontal undulating rough open with silt infill

18.00m - medium spaced thin beds of clay

19.60m - medium bed of very strong slightly calcareous slightly weathered limestone

End of borehole at 20.00m

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#14_SAMP | 17/09/2022 | 458791mE | 5238172mN | 87.74m |
| OWF_GI#14A_SAMP | 17/09/2022 | 458787mE | 5238170mN | 87.81m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND | STRATA DESCRIPTION | FRACTURE STATE (RQD / SCR / TCR) | CONE PENETROMETER TEST (Net Cone Resistance $q_{net}$ (MPa); Sleeve Friction $f_s$ (MPa); Pore Pressure Ratio, Bq) | ROCK COMPRESSIVE STRENGTH (MPa)[4] (UCS) | UNDRAINED SHEAR STRENGTH (kPa) (Torvane; Pocket Penetrometer; Undrained Triaxial Test; Laboratory Vane; CIU Triaxial; $S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.) | DENSITY (Mg/m$^3$) (Bulk Density; Dry Density) | CLASSIFICATION (%) (Water Content; Carbonate Content; Fines Content; Plasticity Index; Relative Density[3])

00.00m Strong to very strong (based on field test), pale yellow orange(10Y R8/6) slightly weathered SHELLY LIMESTONE with occasional fossils (2-20mm) and rare voids (2-10mm). Discontinuities are closed to medium spaced sub-horizontal (10-15*) rough undulating open with silt infill.

01.50m Extremely weak to weak pale yellow orange (10Y R8/6) slightly weathered FOSSILIFEROUS DOLOMITE with occasional fossils (2-20mm) and rare voids (2-10mm). Discontinuities are closed to medium spaced sub-horizontal(10-15*) rough undulating open with silt infill.

02.25m - medium bed of dolomite

03.00m Weak to moderately weak dusky green (5G 3/2) slightly weathered GLAUCONITE DOLOMITE with occasional voids (2mm-20mm)

04.50m to 05.50m - Very thick bed of dusky green (5G 3/2) gravelly clayey silty coarse SAND (grclsi(c)Sa). Gravel is fine

06.75m - becoming highly calcareous with frequent fossils (0.5-2mm)

07.50m Very dark greenish grey (GLEY 1 3/1) slightly clayey very sandy medium plasticity SILT (clsa(SiM)). Sand is fine

10.00m Moderately weak dusky green (5G 3/2) highly calcareous GLAUCONITE DOLOMITE with rare voids and fossils

18.50m Greenish grey (5GY 5/1) calcareous gravelly uniformly graded fine SAND (grSa) with frequent tiny fossils and rare weakly cemented pockets of sand

End of borehole at 20.10m

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#15_SAMP | 26/07/2022 | 459794mE | 5239923mN | 85.45m |
| OWF_GI#15A_SAMP | 18/08/2022 | 459791mE | 5239926mN | 85.47m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND | STRATA DESCRIPTION | FRACTURE STATE (RQD / SCR / TCR) | CONE PENETROMETER TEST (Net Cone Resistance $q_{net}$ (MPa); Sleeve Friction $f_s$ (MPa); Pore Pressure Ratio, Bq) | ROCK COMPRESSIVE STRENGTH (MPa)[4] (UCS) | UNDRAINED SHEAR STRENGTH (kPa) (Torvane; Pocket Penetrometer; Undrained Triaxial Test; Laboratory Vane; CIU Triaxial; $S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.) | DENSITY (Mg/m$^3$) (Bulk Density; Dry Density) | CLASSIFICATION (%) (Water Content; Carbonate Content; Fines Content; Plasticity Index; Relative Density[3])

00.00m Very strong to extremely strong yellowish brown (10YR 5/6) slightly calcareous fine to medium grained DOLOMITE. Discontinuities are medium spaced planar smooth wide with clean aperture

02.00m to 02.20m - thin bed of clay

02.20m Weak low density light brown (7.5YR 6/4) very highly calcareous SHELLY LIMESTONE composed of well graded sandy gravel with occasional yellow staining and numerous fossils (1-20mm). Discontinuities are very closely to closely spaced horizontal (0-5°) planar rough open clean

06.10m Weak dark greenish grey (GLEY 1 10GY 4/1) highly calcareous fine to medium grained GLAUCONITE DOLOMITE. Discontinuities are closely to medium spaced subhorizontal (0-15°) planar smooth with open infilled with silt

10.00m Extremely strong dark greenish grey (GLEY 1 5GY 4/1) non-calcareous sandy very high plasticity very silty CLAY (siCIV) with rare shell fragments (<1mm). Sand is fine

12.00m Medium strong to strong dark greenish grey (GLEY 1 10GY 4/1) highly calcareous SILTSTONE with frequent fossils (1mm-5mm). Discontinuities are closely spaced planar smooth with wide infilled silt

15.00m Extremely strong dark greenish grey (GLEY 1 10GY 4/1) medium plasticity slightly sandy silty CLAY (sisaCIM) with medium spaced thin to medium beds of medium grained sandstone and occasional shell fragments (1mm-10mm)

18.60m Medium strong to strong (based on field tests) dark greenish grey (GLEY 1 10GY 4/1) slightly calcareous medium grained slightly sandy clayey fine to coarse SILT (sacl(f-c)Si) with medium spaced with thin to medium beds of mudstone and frequent fossils (1mm-10mm). Discontinuities are closely spaced planar smooth with wide clean aperture

End of borehole at 20.50m

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project No.: GMOP21-G-019
Location: A05 OWF

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#17_SAMP | 10/12/2022 | 443469mE | 5245633mN | 95.12m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND

**STRATA DESCRIPTION**

00.00m Dark greenish grey (10Y 4/1) highly calcareous slightly silty uniformly graded fine to medium SAND (si(f-m)Sa) with rare shell fragments (1mm-5mm)

00.80m - becoming greenish grey (5GY 5/1) fine

04.50m - becoming very silty sand

05.60m Strong to very strong pale yellowish brown (10YR 6/2) highly calcareous silty slightly sandy SHELLY LIMESTONE with frequent fossils (3mm-50mm). Discontinuities are closely spaced subhorizontal planar to undulating rough partly open to open clean (possibly drilling induced?). Core potentially breaks in more silty beds.

07.00m Medium strong high density very pale orange (10YR 8/2) slightly weathered highly calcareous slightly silty slightly sandy FOSSILIFEROUS GLAUCONITE LIMESTONE with frequent fossils (1mm-3mm).

11.70m Moderately weak medium density very pale orange (10YR 8/2) highly calcareous FOSSILIFEROUS GLAUCONITE LIMESTONE with abundant fossils (1mm-3mm)

12.70m to 13.00m - medium strong to strong

16.70m Very weak low to medium density very pale orange (10YR 8/2) highly weathered highly calcareous sandy silty FOSSILIFEROUS GLAUCONITE LIMESTONE with numerous fossils (1mm-3mm)

End of borehole at 20.30m

**FRACTURE STATE**
RQD / SCR / TCR
30 60 90

**CONE PENETROMETER TEST**
Net Cone Resistance $q_{net}$ (MPa)
Sleeve Friction $f_s$ (MPa)
12.5 25.0 37.5 50.0 62.5 75.0 87.5
0.625 1.250 1.875
Pore Pressure Ratio, Bq
0.0 0.5 1.0

**ROCK COMPRESSIVE STRENGTH (MPa)[4]**
UCS
25 50

**UNDRAINED SHEAR STRENGTH (kPa)**
Torvane
Pocket Penetrometer
Undrained Triaxial Test
* Hollow symbols represent offshore results
Laboratory Vane
CIU Triaxial
$S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.
200 400 600 800 1000

**DENSITY (Mg/m$^3$)**
Bulk Density
Dry Density
* Hollow symbols represent offshore results
1.5 2.0 2.5

**CLASSIFICATION (%)**
Water Content
Carbonate Content
Fines Content
Plasticity Index
Relative Density[3]
25 50 75

[1] Local Geodetic Datum: ETRS89 / UTMN30
[2] Water Depth: LAT
[3] Relative densities derived from Jamiolkowski et al. (2001)

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#20_CPT | 09/12/2022 | 448481mE | 5238230mN | 96.78m |
| OWF_GI#20_SAMP | 09/12/2022 | 448487mE | 5238226mN | 96.78m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND | STRATA DESCRIPTION | FRACTURE STATE (RQD / SCR / TCR) | CONE PENETROMETER TEST (Net Cone Resistance $q_{net}$ (MPa); Sleeve Friction $f_s$ (MPa); Pore Pressure Ratio, Bq) | ROCK COMPRESSIVE STRENGTH (MPa)[4] (UCS) | UNDRAINED SHEAR STRENGTH (kPa) (Torvane; Pocket Penetrometer; Undrained Triaxial Test; Laboratory Vane; CIU Triaxial; $S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.) | DENSITY (Mg/m$^3$) (Bulk Density; Dry Density) | CLASSIFICATION (%) (Water Content; Carbonate Content; Fines Content; Plasticity Index; Relative Density[3])

00.00m Very dense dark olive grey (5Y 3/2) uniformly graded highly calcareous silty fine to medium SAND (si(f-m)Sa) with frequent shell fragments (1mm-10mm)

00.30m - becoming Dark greenish grey (10Y 4/1)

04.70m Medium strong to strong (based on field tests) very pale orange (10YR 8/2) slightly silty sandy moderately weathered calcareous LIMESTONE with rare shell fragments (1mm-5mm) and voids (1mm-3mm).

06.70m Very weak low to medium density very pale orange (10YR 8/2) highly weathered slightly silty sandy SHELLY LIMESTONE with shell fragments (1mm-3mm)

11.50m Strong medium density very pale orange (10YR 8/2) slightly weathered very highly calcareous LIMESTONE predominantly made of fossils (1mm-3mm) and rare coarse quartz grains. Discontinuities are very closely to closely spaced subhorizontal planar to undulating rough to smooth open clean. Recovered as rock biscuits.

13.00m Very weak low to medium density very pale orange (10YR 8/2) highly weathered LIMESTONE with shell fragments and fossils (1mm-3mm)

15.00m Medium strong to strong medium density very pale orange (10YR 8/2) slightly weathered highly calcareous SHELLY LIMESTONE predominantly made of fossils (1mm-3mm) and rare fine to medium quartz grains. Discontinuities are very closely to closely spaced subhorizontal planar to undulating rough to smooth open clean. Partly recovered as rock biscuits.

End of borehole at 19.30m

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#22_CPT | 07/12/2022 | 454688mE | 5237035mN | 93.65m |
| OWF_GI#22_SAMP | 06/12/2022 | 454703mE | 5237027mN | 93.65m |

GEOQUIPMARINE

DEPTH (m)

SAMPLE: PU01, PU02, PU03, CR01, PU04, PU05, PU06, PU07, PU08, PU09, CR01, CR02, CR03, CR04, CR05, PU11, CR04, CR06, CR07, CR05, CR08, CR06, CR09, CR10, PU12, CR07, CR11, CR08, CR12, CR09, CR10, PU14, CR13, CR11, CR14, CR12, CR15, CR13, CR16, CR14, PU15, PU16, CR15, PU17

*IN SITU* TEST: C01 180807, C02 180807, C03 180807, C04 180807, C05 180807, C06 180807, C07 180807, C08 180807, C09 180807, C10 180807, C11 180807, C12 180807, C13 180807

LEGEND

STRATA DESCRIPTION

00.00m Medium to high density dark olive grey (5Y 3/2) calcareous silty poorly graded fine to medium SAND (si(f-m)Sa) with frequent shell fragments (1mm - 10mm)

00.80m Very high density dark olive grey (5Y 3/2) highly calcareous coarse slightly silty gravelly poorly graded fine to coarse SAND (sigr(f-c)Sa) with frequent shell fragments (1mm - 10mm). Gravel is fine.

03.80m to 03.90m - thin bed of clay

04.50m Very strong (based on field tests) high to very high density very pale orange (10YR 8/2) slightly weathered highly calcareous silty DOLOMITE with frequent fossils (3mm-20mm). Discontinuities are closely to medium spaced subhorizontal planar to undulating rough open clean with occasional orange staining

07.00m - medium bed of weak dolomite

08.00m Very strong (based on field tests) very pale orange (10YR 8/2) to medium dark grey (N4) slightly weathered very highly calcareous slightly silty SHELLY LIMESTONE with occasional fossils (1mm-10mm), rare voids and white staining on the core surface. Discontinuities are very closely to closely spaced subhorizontal planar to undulating rough open clean with occasional orange staining

10.50m to 11.30m - thick bed of highly weathered weak limestone

13.50m to 13.80m - medium bed of silty clay

17.00m Dense very pale brown (10YR 8/2) highly calcareous slightly to moderately cemented slightly clayey silty well graded fine to coarse SAND (casi(f-c)Sa) with frequent shell fragments (1-3 mm)

End of borehole at 20.10m

FRACTURE STATE
RQD / SCR / TCR
30 60 90

CONE PENETROMETER TEST
Net Cone Resistance $q_{net}$ (MPa)
Sleeve Friction $f_s$ (MPa)
12.5 25.0 37.5 50.0 62.5 75.0 87.5
0.625 1.250 1.875
Pore Pressure Ratio, Bq
0.0 0.5 1.0

ROCK COMPRESSIVE STRENGTH (MPa)[4]
UCS
25 50

UNDRAINED SHEAR STRENGTH (kPa)
Torvane
Pocket Penetrometer
Undrained Triaxial Test
* Hollow symbols represent offshore results
Laboratory Vane
CIU Triaxial
$S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.
200 400 600 800 1000

DENSITY (Mg/m$^3$)
Bulk Density
Dry Density
* Hollow symbols represent offshore results
1.5 2.0 2.5

CLASSIFICATION (%)
Water Content
Carbonate Content
Fines Content
Plasticity Index
Relative Density[3]
25 50 75

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project No.: GMOP21-G-019
Location: A05 OWF

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#24_SAMP | 08/12/2022 | 456333mE | 5233817mN | 97.4m |

GEOQUIPMARINE

DEPTH (m) | SAMPLE | *IN SITU* TEST | LEGEND | STRATA DESCRIPTION | FRACTURE STATE (RQD / SCR / TCR) | CONE PENETROMETER TEST (Net Cone Resistance $q_{net}$ (MPa); Sleeve Friction $f_s$ (MPa); Pore Pressure Ratio, Bq) | ROCK COMPRESSIVE STRENGTH (MPa)[4] (UCS) | UNDRAINED SHEAR STRENGTH (kPa) (Torvane; Pocket Penetrometer; Undrained Triaxial Test; Laboratory Vane; CIU Triaxial; $S_u$ from $q_{net}$. For $N_{kt}$ values please see the report.) | DENSITY (Mg/m$^3$) (Bulk Density; Dry Density) | CLASSIFICATION (%) (Water Content; Carbonate Content; Fines Content; Plasticity Index; Relative Density[3])

| Depth (m) | Sample | Strata description |
|---|---|---|
| 0 | PU01 | 00.00m Dark olive grey (5Y 3/2) highly calcareous slightly silty slightly clayey well graded fine to coarse SAND (sicl(f-c)Sa) with frequent shell fragments (1mm-10mm) |
| 1 | PU02 | |
| 1 | PU03 | |
| 1 | CR01 | 00.20m to 00.40m - with abundant shell fragments (1mm-30mm) |
| 2 | CR02 | 00.80m - subangular cobble of limestone |
| 3 | CR03 | 01.10m Very strong (based on field tests) very pale orange (10YR 8/2) to greyish orange (10YR 7/4) moderately weathered very highly calcareous SHELLY LIMESTONE with occasional fossils. Discontinuities are very closely to closely spaced subhorizontal occasionally subvertical planar to undulating rough open to moderately wide clean partly soil infill with frequent orange staining. |
| 4 | CR04 | |
| 5 | CR05 | |
| 6 | CR06 | 05.10m Very strong (based on field tests) very pale orange (10YR 8/2) to greyish orange (10YR 7/4) moderately weathered very highly calcareous SHELLY LIMESTONE with occasional fossils. Discontinuities are very closely to closely spaced subhorizontal occasionally subvertical planar to undulating rough open to moderately wide clean partly soil infill with frequent orange staining. |
| 7 | CR07 | |
| 8 | CR08 | |
| 9 | CR09 | |
| 10 | CR10 | 07.50m Medium strong medium to high density very pale orange (10YR 8/2) slightly weathered highly calcareous SHELLY LIMESTONE with occasional fossils. Discontinuities are closely spaced subhorizontal undulating rough to smooth open clean. |
| 11 | CR11 | |
| 12 | CR12 | |
| 13 | CR13 | |
| 14 | PU04 | |
| 14 | CR14 | |
| 15 | CR15 | |
| 16 | CR16 | |
| 17 | PU05 | |
| 17 | CR17 | |
| 18 | PU06 | 18.00m Strong to very strong medium density very pale orange (10YR 8/2) slightly weathered highly calcareous SHELLY LIMESTONE with occasional fossils and shell fragments (1mm-10mm) |
| 18 | PU07 | |
| 19 | CR18 | |
| 20 | CR19 | |
| 21 | | End of borehole at 20.05m |
| 22 | | |

[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

[3] Relative densities derived from Jamiolkowski et al. (2001)

# Appendix A.3 Borehole Stratigraphic Tables

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#01_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 446710.82<br>Northing - 5247256.22 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 3.2 | 14-DOLOMITE | Very strong to extremely strong (based on field tests) yellowish brown (10YR 5/4) very highly calcareous slightly weathered fine-grained DOLOMITE with rare voids (5mm-20mm) and white staining on core surface. Discontinuities are closely spaced subhorizontal to vertical planar to undulating rough open to moderately wide with brown silt infill and rare orange staining. |
| 3.2 | 9.25 | 14-DOLOMITE | Moderately weak greyish orange (10YR 7/4) very highly calcareous slightly weathered fine-grained DOLOMITE with white staining on core surface. Discontinuities are very closely to closely spaced subhorizontal undulating rough to smooth open to moderately wide clean. |
| 9.25 | 12.5 | 14-DOLOMITE | Very strong (based on field tests) yellowish brown (10YR 5/4) very highly calcareous slightly weathered fine-grained DOLOMITE with rare voids (2mm-30mm) and white staining on core surface. Discontinuities are closely spaced subhorizontal to vertical planar to undulating rough open to moderately wide clean with rare brown silt infill and rare orange staining. |
| 12.5 | 15.6 | 08-LIMESTONE | Very pale orange (10YR 8/2) weathered slightly silty sandy very highly calcareous LIMESTONE with frequent fossils (1mm-30mm) |
| 15.6 | 17 | 14-DOLOMITE | Very strong yellowish brown (10YR 5/4) very highly calcareous slightly weathered fine-grained DOLOMITE with numerous fossils (2mm-10mm). Discontinuities are closely spaced subhorizontal planar to undulating rough open clean and white staining on core surface. |
| 17 | 20.1 | 08-LIMESTONE | Medium strong medium to high density very pale orange (10YR 8/2) very highly calcareous slightly weathered silty slightly sandy SHELLY LIMESTONE with frequent fossils (1mm-30mm). |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#01A_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 446708.98<br>Northing - 5247253.75 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 3.2 | 14-DOLOMITE | Very strong to extremely strong (based on field tests) yellowish brown (10YR 5/4) very highly calcareous slightly weathered fine-grained DOLOMITE with rare voids (5mm-20mm) and white staining on core surface. Discontinuities are closely spaced subhorizontal to vertical planar to undulating rough open to moderately wide with brown silt infill and rare orange staining. |
| 3.2 | 9.25 | 14-DOLOMITE | Moderately weak greyish orange (10YR 7/4) very highly calcareous slightly weathered fine-grained DOLOMITE with white staining on core surface. Discontinuities are very closely to closely spaced subhorizontal undulating rough to smooth open to moderately wide clean. |
| 9.25 | 12.5 | 14-DOLOMITE | Very strong (based on field tests) yellowish brown (10YR 5/4) very highly calcareous slightly weathered fine-grained DOLOMITE with rare voids (2mm-30mm) and white staining on core surface. Discontinuities are closely spaced subhorizontal to vertical planar to undulating rough open to moderately wide clean with rare brown silt infill and rare orange staining. |
| 12.5 | 15.6 | 08-LIMESTONE | Very pale orange (10YR 8/2) weathered slightly silty sandy very highly calcareous LIMESTONE with frequent fossils (1mm-30mm) |
| 15.6 | 17 | 14-DOLOMITE | Very strong yellowish brown (10YR 5/4) very highly calcareous slightly weathered fine-grained DOLOMITE with numerous fossils (2mm-10mm). Discontinuities are closely spaced subhorizontal planar to undulating rough open clean and white staining on core surface. |
| 17 | 20.1 | 08-LIMESTONE | Medium strong medium to high density very pale orange (10YR 8/2) very highly calcareous slightly weathered silty slightly sandy SHELLY LIMESTONE with frequent fossils (1mm-30mm). |

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| Client: | RTE_DGEC | Location: | OWF_GI#04_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 451040.42<br>Northing - 5244828.54 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 1.3 | 03-SAND | Yellowish brown (10YR 5/4) calcareous very gravelly medium to coarse SAND with frequent shell fragments (1mm-10mm). Gravel is subangular to subrounded. |
| 1.3 | 8.3 | 14-DOLOMITE | Very strong to extremely strong (based on field tests) greyish orange (10YR 7/4) slightly calcareous slightly weathered fine-grained DOLOMITE with white staining on core surface. Discontinuities are closely spaced subhorizontal undulating rough open clean with frequent orange surface staining. |
| 8.3 | 15.3 | 08-LIMESTONE | Very weak to weak (based on field tests) medium to high density pale yellowish orange (10YR 8/6) highly calcareous SHELLY LIMESTONE composed of sand and gravel and with frequent fossils (1mm-30mm). |
| 15.3 | 16.9 | 08-LIMESTONE | Weak to medium strong (based on field tests) medium to high density pale yellowish orange (10YR 8/6) highly calcareous SHELLY LIMESTONE with frequent fossils (1mm-30mm). |
| 16.9 | 18 | 14-DOLOMITE | Strong (based on field tests) high to very high density very pale orange (10YR 8/2) highly calcareous FOSSILIFEROUS DOLOMITE with numerous fossils (3mm-30mm). Discontinuities are very closely to medium spaced subhorizontal undulating rough open clean with occasional orange staining. |
| 18 | 19.85 | 08-LIMESTONE | Medium strong to strong (based on field tests) high to very high density very pale orange (10YR 8/2) highly calcareous slightly weathered SHELLY LIMESTONE with numerous fossils (2mm-35mm). Discontinuities are very closely to closely spaced subhorizontal undulating rough open clean with occasional orange staining. |

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| Client: | RTE_DGEC | Location: | OWF_GI#04A_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 451036.53<br>Northing - 5244832.06 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 1.3 | 03-SAND | Yellowish brown (10YR 5/4) calcareous very gravelly medium to coarse SAND with frequent shell fragments (1mm-10mm). Gravel is subangular to subrounded. |
| 1.3 | 8.3 | 14-DOLOMITE | Very strong to extremely strong (based on field tests) greyish orange (10YR 7/4) slightly calcareous slightly weathered fine-grained DOLOMITE with white staining on core surface. Discontinuities are closely spaced subhorizontal undulating rough open clean with frequent orange surface staining. |
| 8.3 | 15.3 | 08-LIMESTONE | Very weak to weak (based on field tests) medium to high density pale yellowish orange (10YR 8/6) highly calcareous SHELLY LIMESTONE composed of sand and gravel and with frequent fossils (1mm-30mm). |
| 15.3 | 16.9 | 08-LIMESTONE | Weak to medium strong (based on field tests) medium to high density pale yellowish orange (10YR 8/6) highly calcareous SHELLY LIMESTONE with frequent fossils (1mm-30mm). |
| 16.9 | 18 | 14-DOLOMITE | Strong (based on field tests) high to very high density very pale orange (10YR 8/2) highly calcareous FOSSILIFEROUS DOLOMITE with numerous fossils (3mm-30mm). Discontinuities are very closely to medium spaced subhorizontal undulating rough open clean with occasional orange staining. |
| 18 | 19.85 | 08-LIMESTONE | Medium strong to strong (based on field tests) high to very high density very pale orange (10YR 8/2) highly calcareous slightly weathered SHELLY LIMESTONE with numerous fossils (2mm-35mm). Discontinuities are very closely to closely spaced subhorizontal undulating rough open clean with occasional orange staining. |

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| Client: | RTE_DGEC | Location: | OWF_GI#05_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 449591.42<br>Northing - 5242196.67 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 0.5 | 03-SAND | Dark olive grey (5Y 3/2) highly calcareous gravelly silty fine to medium SAND (grsi(f-m)Sa) with frequent shell fragments (1mm-30mm). Gravel is fine to medium |
| 0.5 | 2.5 | 08-LIMESTONE | Medium strong to strong (based on field tests) pale yellowish brown (10YR 6/2) very highly calcareous, slightly weathered fine grained SHELLY LIMESTONE with rare voids (2mm-10mm). Discontinuities are closely spaced subhorizontal undulating rough open clean with frequent white and orange surface staining |
| 2.5 | 3.9 | 08-LIMESTONE | Medium strong to strong (based on field tests) pale yellowish brown (10YR 6/2) highly calcareous, slightly weathered fine grained FOSSILIFEROUS GLAUCONITE LIMESTONE with rare voids (2mm-10mm). Discontinuities are closely spaced subhorizontal undulating rough open clean. |
| 3.9 | 5.6 | 01-CLAY | Very high strength very dark greenish grey (GLEY 1 5GY 3/1) slightly sandy silty high plasticity CLAY (sasi(ClH)). Sand is fine |
| 5.6 | 6.6 | 14-DOLOMITE | Moderately weak dark greenish grey (5GY 4/1) very highly calcareous slightly weathered GLAUCONITE DOLOMITE. Discontinuities are very closely to closely spaced subhorizontal undulating rough open with frequent very dark grey clay infill |
| 6.6 | 8 | 01-CLAY | Dark greenish grey (5GY 4/1) non-calcareous slightly gravelly slightly sandy silty high plasticity CLAY (grsaClV). Gravel is subrounded to subangular |
| 8 | 8.75 | 02-SILT | Dark greenish grey (5GY 4/1) non-calcareous slightly sandy clayey high plasticity SILT (Sacl(SiH)) |
| 8.75 | 10.5 | 01-CLAY | Greenish grey (5GY 6/1) calcareous slightly sandy very silty high plasticity CLAY (Sasi(ClH)) |

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|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#05A_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 449589.57<br>Northing - 5242193.54 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 0.5 | 03-SAND | Dark olive grey (5Y 3/2) highly calcareous gravelly silty fine to medium SAND (grsi(f-m)Sa) with frequent shell fragments (1mm-30mm). Gravel is fine to medium |
| 0.5 | 2.5 | 08-LIMESTONE | Medium strong to strong (based on field tests) pale yellowish brown (10YR 6/2) very highly calcareous, slightly weathered fine grained SHELLY LIMESTONE with rare voids (2mm-10mm). Discontinuities are closely spaced subhorizontal undulating rough open clean with frequent white and orange surface staining |
| 2.5 | 3.9 | 08-LIMESTONE | Medium strong to strong (based on field tests) pale yellowish brown (10YR 6/2) highly calcareous, slightly weathered fine grained FOSSILIFEROUS GLAUCONITE LIMESTONE with rare voids (2mm-10mm). Discontinuities are closely spaced subhorizontal undulating rough open clean. |
| 3.9 | 5.6 | 01-CLAY | Very high strength very dark greenish grey (GLEY 1 5GY 3/1) slightly sandy silty high plasticity CLAY (sasi(ClH)). Sand is fine |
| 5.6 | 6.6 | 14-DOLOMITE | Moderately weak dark greenish grey (5GY 4/1) very highly calcareous slightly weathered GLAUCONITE DOLOMITE. Discontinuities are very closely to closely spaced subhorizontal undulating rough open with frequent very dark grey clay infill |
| 6.6 | 8 | 01-CLAY | Dark greenish grey (5GY 4/1) non-calcareous slightly gravelly slightly sandy silty high plasticity CLAY (grsaClV). Gravel is subrounded to subangular |
| 8 | 8.75 | 02-SILT | Dark greenish grey (5GY 4/1) non-calcareous slightly sandy clayey high plasticity SILT (Sacl(SiH)) |
| 8.75 | 10.5 | 01-CLAY | Greenish grey (5GY 6/1) calcareous slightly sandy very silty high plasticity CLAY (Sasi(ClH)) |

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|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#05B_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 449585.38<br>Northing - 5242198.33 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 0.5 | 03-SAND | Dark olive grey (5Y 3/2) highly calcareous gravelly silty fine to medium SAND (grsi(f-m)Sa) with frequent shell fragments (1mm-30mm). Gravel is fine to medium |
| 0.5 | 2.5 | 08-LIMESTONE | Medium strong to strong (based on field tests) pale yellowish brown (10YR 6/2) very highly calcareous, slightly weathered fine grained SHELLY LIMESTONE with rare voids (2mm-10mm). Discontinuities are closely spaced subhorizontal undulating rough open clean with frequent white and orange surface staining |
| 2.5 | 3.9 | 08-LIMESTONE | Medium strong to strong (based on field tests) pale yellowish brown (10YR 6/2) highly calcareous, slightly weathered fine grained FOSSILIFEROUS GLAUCONITE LIMESTONE with rare voids (2mm-10mm). Discontinuities are closely spaced subhorizontal undulating rough open clean. |
| 3.9 | 5.6 | 01-CLAY | Very high strength very dark greenish grey (GLEY 1 5GY 3/1) slightly sandy silty high plasticity CLAY (sasi(ClH)). Sand is fine |
| 5.6 | 6.6 | 14-DOLOMITE | Moderately weak dark greenish grey (5GY 4/1) very highly calcareous slightly weathered GLAUCONITE DOLOMITE. Discontinuities are very closely to closely spaced subhorizontal undulating rough open with frequent very dark grey clay infill |
| 6.6 | 8 | 01-CLAY | Dark greenish grey (5GY 4/1) non-calcareous slightly gravelly slightly sandy silty high plasticity CLAY (grsaClV). Gravel is subrounded to subangular |
| 8 | 8.75 | 02-SILT | Dark greenish grey (5GY 4/1) non-calcareous slightly sandy clayey high plasticity SILT (Sacl(SiH)) |
| 8.75 | 10.5 | 01-CLAY | Greenish grey (5GY 6/1) calcareous slightly sandy very silty high plasticity CLAY (Sasi(ClH)) |

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|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#08_CPT |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 454537.39<br>Northing - 5242876.75 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 1.5 | 03-SAND | Dense to very dense SAND |
| 1.5 | 3.5 | 14-DOLOMITE | Extremely strong dark yellowish orange (10Y R6/6) slightly weathered fine grained DOLOMITE with frequent voids (10mm-20mm) and fossils (10m-20mm). Discontinuities are sub-horizontal to diagonal (5-45°) closely spaced rough undulating moderately wide to wide clean. |
| 3.5 | 5.5 | 14-DOLOMITE | Extremely strong pale yellowish brown (10YR 6/2) slightly calcareous slightly weathered DOLOMITE with occasional voids (2mm-5mm) and occasional shell fragments (2mm-3mm). Discontinuities are very closely to closely spaced subhorizontal (5-10°) undulating rough open with silt infill and occasional orange staining |
| 5.5 | 15.5 | 08-LIMESTONE | Weak to medium strong pale yellowish orange (10YR 8/6) highly calcareous LIMESTONE with frequent fossils (2mm-25mm) Discontinuities are very closely spaced horizontal to subhorizontal (0-15°) undulating rough open with silt infill and frequent orange staining. |
| 15.5 | 16.5 | 02-SILT | Yellow (2.5Y 8/6) slightly gravelly sandy silty LIMESTONE with frequent fossils (2mm-20mm). Gravel is subrounded fine to coarse |
| 16.5 | 17.5 | 08-LIMESTONE | Strong yellow (2.5Y 8/6) highly calcareous LIMESTONE with frequent fossils (2mm-20mm). Discontinuities are closely spaced sub-horizontal (0-15°) undulating rough moderately wide with silt infill. |
| 17.5 | 20.8 | 14-DOLOMITE | Extremely strong yellowish grey (5Y 7/2) slightly calcareous slightly weathered DOLOMITE with frequent voids (10mm-20mm) and fossils (10mm-20mm). Discontinuities are very closely to closely spaced subhorizontal to subvertical (5-45°) rough undulating moderately wide clean with orange staining |

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|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#09_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 456875.32<br>Northing - 5244986.35 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 14.35 | 14-DOLOMITE | Medium strong dark yellowish orange (10YR 6/6) very highly calcareous fine to medium grained DOLOMITE with white staining on core surface. Discontinuities are medium spaced undulating smooth wide clean |
| 14.35 | 16 | 14-DOLOMITE | Medium strong dark yellowish orange (10YR 6/6) slightly calcareous fine to medium grained DOLOMITE with white staining on core surface. Discontinuities are medium spaced undulating smooth wide clean |
| 16 | 20.7 | 08-LIMESTONE | Medium strong (from field tests) dark yellowish orange (10YR 6/6) very highly calcareous fine to medium grained SHELLY LIMESTONE with numerous fossils (1mm-20mm). Discontinuities are very close to closely spaced horizontal (0-5°) planar rough open clean. |

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| Client: | RTE_DGEC | Location: | OWF_GI#11_CPT |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 455783.39<br>Northing - 5241007.95 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 4.1 | 03-SAND | Dense to very dense greenish grey (GLEY 1 10Y 5/1) highly calcareous slightly gravelly uniformly graded fine to medium SAND (gr(f-m)Sa) with frequent shell fragments (1mm-10mm) |
| 4.1 | 8.5 | 14-DOLOMITE | Medium strong greyish orange (10 YR 7/4) highly calcareous slightly sandy DOLOMITE with frequent voids (1mm-2mm) and shell fragments (1mm-5mm). Discontinuities are very closely spaced dippings (5-15°) stepped to undulating rough open to moderate |
| 8.5 | 11.5 | 08-LIMESTONE | Weak very high density moderate yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with frequent shell fragments (2mm-5mm) and rare fossils (2mm). Discontinuities are very close to closely spaced sub horizontal dipping (0-20°) planar rough surface with voids (5mm). |
| 11.5 | 15.5 | 08-LIMESTONE | Medium strong high density yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with occasional shell fragments (2mm-3mm) and fossils (3mm-5mm). Discontinuities are closely spaced sub horizontal dipping (0-20°) undulating rough open to moderately wide clean with occasional voids (3mm-5mm). |
| 15.5 | 19.9 | 14-DOLOMITE | Moderately weak greyish green (10GY 4/2) highly calcareous silty fine GLAUCONITE DOLOMITE. Discontinuities are medium spaced dipping (0-5°) stepped to undulating rough open with silty sand infill and rare orange staining |

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| Client: | RTE_DGEC | Location: | OWF_GI#11_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 455775.4<br>Northing - 5241016.78 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 4.1 | 03-SAND | Dense to very dense greenish grey (GLEY 1 10Y 5/1) highly calcareous slightly gravelly uniformly graded fine to medium SAND (gr(f-m)Sa) with frequent shell fragments (1mm-10mm) |
| 4.1 | 8.5 | 14-DOLOMITE | Medium strong greyish orange (10 YR 7/4) highly calcareous slightly sandy DOLOMITE with frequent voids (1mm-2mm) and shell fragments (1mm-5mm). Discontinuities are very closely spaced dippings (5-15°) stepped to undulating rough open to moderate |
| 8.5 | 11.5 | 08-LIMESTONE | Weak very high density moderate yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with frequent shell fragments (2mm-5mm) and rare fossils (2mm). Discontinuities are very close to closely spaced sub horizontal dipping (0-20°) planar rough surface with voids (5mm). |
| 11.5 | 15.5 | 08-LIMESTONE | Medium strong high density yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with occasional shell fragments (2mm-3mm) and fossils (3mm-5mm). Discontinuities are closely spaced sub horizontal dipping (0-20°) undulating rough open to moderately wide clean with occasional voids (3mm-5mm). |
| 15.5 | 19.9 | 14-DOLOMITE | Moderately weak greyish green (10GY 4/2) highly calcareous silty fine GLAUCONITE DOLOMITE. Discontinuities are medium spaced dipping (0-5°) stepped to undulating rough open with silty sand infill and rare orange staining |

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|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#11A_CPT |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 455783.46<br>Northing - 5241012.53 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 4.1 | 03-SAND | Dense to very dense greenish grey (GLEY 1 10Y 5/1) highly calcareous slightly gravelly uniformly graded fine to medium SAND (gr(f-m)Sa) with frequent shell fragments (1mm-10mm) |
| 4.1 | 8.5 | 14-DOLOMITE | Medium strong greyish orange (10 YR 7/4) highly calcareous slightly sandy DOLOMITE with frequent voids (1mm-2mm) and shell fragments (1mm-5mm). Discontinuities are very closely spaced dippings (5-15°) stepped to undulating rough open to moderate |
| 8.5 | 11.5 | 08-LIMESTONE | Weak very high density moderate yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with frequent shell fragments (2mm-5mm) and rare fossils (2mm). Discontinuities are very close to closely spaced sub horizontal dipping (0-20°) planar rough surface with voids (5mm). |
| 11.5 | 15.5 | 08-LIMESTONE | Medium strong high density yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with occasional shell fragments (2mm-3mm) and fossils (3mm-5mm). Discontinuities are closely spaced sub horizontal dipping (0-20°) undulating rough open to moderately wide clean with occasional voids (3mm-5mm). |
| 15.5 | 19.9 | 14-DOLOMITE | Moderately weak greyish green (10GY 4/2) highly calcareous silty fine GLAUCONITE DOLOMITE. Discontinuities are medium spaced dipping (0-5°) stepped to undulating rough open with silty sand infill and rare orange staining |

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| Client: | RTE_DGEC | Location: | OWF_GI#11B_CPT |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 455778.89<br>Northing - 5241009.8 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 4.1 | 03-SAND | Dense to very dense greenish grey (GLEY 1 10Y 5/1) highly calcareous slightly gravelly uniformly graded fine to medium SAND (gr(f-m)Sa) with frequent shell fragments (1mm-10mm) |
| 4.1 | 8.5 | 14-DOLOMITE | Medium strong greyish orange (10 YR 7/4) highly calcareous slightly sandy DOLOMITE with frequent voids (1mm-2mm) and shell fragments (1mm-5mm). Discontinuities are very closely spaced dippings (5-15°) stepped to undulating rough open to moderate |
| 8.5 | 11.5 | 08-LIMESTONE | Weak very high density moderate yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with frequent shell fragments (2mm-5mm) and rare fossils (2mm). Discontinuities are very close to closely spaced sub horizontal dipping (0-20°) planar rough surface with voids (5mm). |
| 11.5 | 15.5 | 08-LIMESTONE | Medium strong high density yellow (5Y 7/6) very highly calcareous highly weathered SHELLY LIMESTONE with occasional shell fragments (2mm-3mm) and fossils (3mm-5mm). Discontinuities are closely spaced sub horizontal dipping (0-20°) undulating rough open to moderately wide clean with occasional voids (3mm-5mm). |
| 15.5 | 19.9 | 14-DOLOMITE | Moderately weak greyish green (10GY 4/2) highly calcareous silty fine GLAUCONITE DOLOMITE. Discontinuities are medium spaced dipping (0-5°) stepped to undulating rough open with silty sand infill and rare orange staining |

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| Client: | RTE_DGEC | Location: | OWF_GI#12_CPT |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 456768.12<br>Northing - 5242750.08 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 1.2 | 03-SAND | Dense to very dense very (5Y 6/1) calcareous uniformly graded silty clayey fine to medium SAND (sicl(f-m)Sa) with frequent shell fragments (1mm-4mm) |
| 1.2 | 2.8 | 03-SAND | Very dense grey (5Y 6/1) highly calcareous gravelly medium graded fine to coarse SAND (gr(f-c)Sa) with frequent shell fragments (2mm to 5mm) and mica (2mm). Gravel is fine to medium subangular |
| 2.8 | 8.3 | 14-DOLOMITE | Strong yellowish brown (10YR 5/6) slightly calcareous silty fine-grained slightly weathered DOLOMITE. Discontinuities are very close to closely spaced horizontal undulating rough open no infill |
| 8.3 | 11.3 | 14-DOLOMITE | Very strong to extremely strong dusky red (10R 2/2) very highly calcareous slightly weathered DOLOMITE. Discontinuities are wide spaced subhorizontal (0-10°) rough open with yellowish brown silt infill |
| 11.3 | 16.3 | 08-LIMESTONE | Weak (based on field tests) medium density yellowish grey (5Y 8/1) highly calcareous SHELLY LIMESTONE with frequent shell fragments (1mm-5mm). Discontinuities are closely spaced subhorizontal (0-5°) undulating rough open clean with occasional yellowish staining |
| 16.3 | 18.4 | 14-DOLOMITE | Weak medium density yellowish grey (5Y 8/1) highly calcareous coarse GLAUCONITE DOLOMITE. Discontinuities are very closely spaced subhorizontal (0-5°) rough open clean |
| 18.4 | 19.65 | 14-DOLOMITE | Strong dark greenish grey (5G 4/1) very highly calcareous fine to medium grained moderately weathered DOLOMITE with occasional voids (2mm-5mm), fossils (5mm) and rare shell fragments (3mm). Discontinuities are closely spaced subhorizontal (0-20°) undulating |

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| Client: | RTE_DGEC | Location: | OWF_GI#12_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 456756.34<br>Northing - 5242757.06 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 1.2 | 03-SAND | Dense to very dense very (5Y 6/1) calcareous uniformly graded silty clayey fine to medium SAND (sicl(f-m)Sa) with frequent shell fragments (1mm-4mm) |
| 1.2 | 2.8 | 03-SAND | Very dense grey (5Y 6/1) highly calcareous gravelly medium graded fine to coarse SAND (gr(f-c)Sa) with frequent shell fragments (2mm to 5mm) and mica (2mm). Gravel is fine to medium subangular |
| 2.8 | 8.3 | 14-DOLOMITE | Strong yellowish brown (10YR 5/6) slightly calcareous silty fine-grained slightly weathered DOLOMITE. Discontinuities are very close to closely spaced horizontal undulating rough open no infill |
| 8.3 | 11.3 | 14-DOLOMITE | Very strong to extremely strong dusky red (10R 2/2) very highly calcareous slightly weathered DOLOMITE. Discontinuities are wide spaced subhorizontal (0-10°) rough open with yellowish brown silt infill |
| 11.3 | 16.3 | 08-LIMESTONE | Weak (based on field tests) medium density yellowish grey (5Y 8/1) highly calcareous SHELLY LIMESTONE with frequent shell fragments (1mm-5mm). Discontinuities are closely spaced subhorizontal (0-5°) undulating rough open clean with occasional yellowish staining |
| 16.3 | 18.4 | 14-DOLOMITE | Weak medium density yellowish grey (5Y 8/1) highly calcareous coarse GLAUCONITE DOLOMITE. Discontinuities are very closely spaced subhorizontal (0-5°) rough open clean |
| 18.4 | 19.65 | 14-DOLOMITE | Strong dark greenish grey (5G 4/1) very highly calcareous fine to medium grained moderately weathered DOLOMITE with occasional voids (2mm-5mm), fossils (5mm) and rare shell fragments (3mm). Discontinuities are closely spaced subhorizontal (0-20°) undulating |

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|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#13_CPT |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 458026.8<br>Northing - 5240916.2 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 1 | 03-SAND | Loose to medium dense brown (7.5YR 5/4) fine to medium SAND |
| 1 | 4.55 | 14-DOLOMITE | Very strong greyish orange (10YR 7/4) slightly calcareous slightly weathered fine grained DOLOMITE with rare voids (2mm-3mm). Discontinuities are closely to medium spaced horizontal (0-5°) undulating rough open with silt infill. |
| 4.55 | 6 | 14-DOLOMITE | Strong moderate brown (5YR 4/4) slightly calcareous slightly weathered DOLOMITE with frequent voids (2mm-5mm). Discontinuities are closely to medium spaced subhorizontal (0-20°) undulating rough open with silt infill |
| 6 | 9 | 08-LIMESTONE | Recovered as non-intact subrounded fragments (10mm-30mm) of yellowish grey (5YR 8/1) highly calcareous highly weathered LIMESTONE with frequent fossils (2mm-5mm) |
| 9 | 10 | 08-LIMESTONE | Very strong white (N9) highly calcareous highly weathered LIMESTONE with frequent voids (2mm-15mm) and fossils (2mm-6mm). Discontinuities are very closely to closely spaced sub-horizontal (0-20°), open with silty clay infill and occasional orange staining |
| 10 | 12 | 08-LIMESTONE | Very strong very high density white (N9) highly calcareous highly weathered LIMESTONE with frequent voids (2mm-15mm) and fossils (2mm-6mm). Discontinuities are closely to medium spaced sub-horizontal (0-20°), open with silty clay infill and occasional orange staining |
| 12 | 14.35 | 14-DOLOMITE | Strong dusky yellow green (5G Y5/2) highly calcareous slightly weathered DOLOMITE with occasional shell fragments (2mm-5mm), fossils (2mm-5mm) and rare closely to medium spaced thin beds of silty fine sand. Discontinuities are very closely spaced sub-horizontal (5-10°) rough undulating open with fine sandy silt infill |
| 14.35 | 16.05 | 06-SILTSTONE | Strong dusky yellowish green (10G Y3/2) slightly calcareous clayey SILTSTONE with frequent shell fragments (2mm-5mm) and fossils (2mm-5mm). Discontinuities are medium to widely spaced horizontal (0-5°) undulating rough open with silt infill |
| 16.05 | 20 | 07-MUDSTONE | Medium strong dusky yellowish green (10GY 3/2) MUDSTONE with rare thin beds of limestone and frequent shell fragment (5mm-10mm). Discontinuities are very closely spaced horizontal undulating rough open with silt infill |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#14_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 458791.15<br>Northing - 5238171.69 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 1.5 | 08-LIMESTONE | Strong to very strong (based on field test), pale yellow orange(10Y R8/6) slightly weathered SHELLY LIMESTONE with occasional fossils (2-20mm) and rare voids (2-10mm). Discontinuities are closed to medium spaced sub-horizontal (10-15*) rough undulating open with silt infill. |
| 1.5 | 3 | 14-DOLOMITE | Extremely weak to weak pale yellow orange (10Y R8/6) slightly weathered FOSSILIFEROUS DOLOMITE with occasional fossils (2-20mm) and rare voids (2-10mm). Discontinuities are closed to medium spaced sub-horizontal(10-15*) rough undulating open with silt infill. |
| 3 | 7.5 | 14-DOLOMITE | Weak to moderately weak dusky green (5G 3/2) slightly weathered GLAUCONITE DOLOMITE with occasional voids (2mm-20mm) |
| 7.5 | 10 | 02-SILT | Very dark greenish grey (GLEY 1 3/1) slightly clayey very sandy medium plasticity SILT (clsa(SiM)). Sand is fine |
| 10 | 18.5 | 14-DOLOMITE | Moderately weak dusky green (5G 3/2) highly calcareous GLAUCONITE DOLOMITE with rare voids and fossils |
| 18.5 | 20.1 | 03-SAND | Greenish grey (5GY 5/1) calcareous gravelly uniformly graded fine SAND (grSa) with frequent tiny fossils and rare weakly cemented pockets of sand |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#14A_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 458787.03<br>Northing - 5238170.15 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 1.5 | 08-LIMESTONE | Strong to very strong (based on field test), pale yellow orange(10Y R8/6) slightly weathered SHELLY LIMESTONE with occasional fossils (2-20mm) and rare voids (2-10mm). Discontinuities are closed to medium spaced sub-horizontal (10-15*) rough undulating open with silt infill. |
| 1.5 | 3 | 14-DOLOMITE | Extremely weak to weak pale yellow orange (10Y R8/6) slightly weathered FOSSILIFEROUS DOLOMITE with occasional fossils (2-20mm) and rare voids (2-10mm). Discontinuities are closed to medium spaced sub-horizontal(10-15*) rough undulating open with silt infill. |
| 3 | 7.5 | 14-DOLOMITE | Weak to moderately weak dusky green (5G 3/2) slightly weathered GLAUCONITE DOLOMITE with occasional voids (2mm-20mm) |
| 7.5 | 10 | 02-SILT | Very dark greenish grey (GLEY 1 3/1) slightly clayey very sandy medium plasticity SILT (clsa(SiM)). Sand is fine |
| 10 | 18.5 | 14-DOLOMITE | Moderately weak dusky green (5G 3/2) highly calcareous GLAUCONITE DOLOMITE with rare voids and fossils |
| 18.5 | 20.1 | 03-SAND | Greenish grey (5GY 5/1) calcareous gravelly uniformly graded fine SAND (grSa) with frequent tiny fossils and rare weakly cemented pockets of sand |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#15_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 459794.19 |
| Project Number: | GMOP21-G-019 | | Northing - 5239923.025 |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 2.2 | 14-DOLOMITE | Very strong to extremely strong yellowish brown (10YR 5/6) slightly calcareous fine to medium grained DOLOMITE. Discontinuities are medium spaced planar smooth wide with clean aperture |
| 2.2 | 6.1 | 08-LIMESTONE | Weak low density light brown (7.5YR 6/4) very highly calcareous SHELLY LIMESTONE composed of well graded sandy gravel with occasional yellow staining and numerous fossils (1-20mm). Discontinuities are very closely to closely spaced horizontal (0-5°) planar rough open clean |
| 6.1 | 10 | 14-DOLOMITE | Weak dark greenish grey (GLEY 1 10GY 4/1) highly calcareous fine to medium grained GLAUCONITE DOLOMITE. Discontinuities are closely to medium spaced subhorizontal (0-15°) planar smooth with open infilled with silt |
| 10 | 12 | 01-CLAY | Extremely strong dark greenish grey (GLEY 1 5GY 4/1) non-calcareous sandy very high plasticity very silty CLAY (siCIV) with rare shell fragments (<1mm). Sand is fine |
| 12 | 15 | 06-SILTSTONE | Medium strong to strong dark greenish grey (GLEY 1 10GY 4/1) highly calcareous SILTSTONE with frequent fossils (1mm-5mm). Discontinuities are closely spaced planar smooth with wide infilled silt |
| 15 | 18.6 | 01-CLAY | Extremely strong dark greenish grey (GLEY 1 10GY 4/1) medium plasticity slightly sandy silty CLAY (sisaCIM) with medium spaced thin to medium beds of medium grained sandstone and occasional shell fragments (1mm-10mm) |
| 18.6 | 20.5 | 02-SILT | Medium strong to strong (based on field tests) dark greenish grey (GLEY 1 10GY 4/1) slightly calcareous medium grained slightly sandy clayey fine to coarse SILT (sacl(f-c)Si) with medium spaced with thin to medium beds of mudstone and frequent fossils (1mm-10mm). Discontinuities are closely spaced planar smooth with wide clean aperture |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#15A_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 459791.15<br>Northing - 5239926.25 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 2.2 | 14-DOLOMITE | Very strong to extremely strong yellowish brown (10YR 5/6) slightly calcareous fine to medium grained DOLOMITE. Discontinuities are medium spaced planar smooth wide with clean aperture |
| 2.2 | 6.1 | 08-LIMESTONE | Weak low density light brown (7.5YR 6/4) very highly calcareous SHELLY LIMESTONE composed of well graded sandy gravel with occasional yellow staining and numerous fossils (1-20mm). Discontinuities are very closely to closely spaced horizontal (0-5°) planar rough open clean |
| 6.1 | 10 | 14-DOLOMITE | Weak dark greenish grey (GLEY 1 10GY 4/1) highly calcareous fine to medium grained GLAUCONITE DOLOMITE. Discontinuities are closely to medium spaced subhorizontal (0-15°) planar smooth with open infilled with silt |
| 10 | 12 | 01-CLAY | Extremely strong dark greenish grey (GLEY 1 5GY 4/1) non-calcareous sandy very high plasticity very silty CLAY (siCIV) with rare shell fragments (<1mm). Sand is fine |
| 12 | 15 | 06-SILTSTONE | Medium strong to strong dark greenish grey (GLEY 1 10GY 4/1) highly calcareous SILTSTONE with frequent fossils (1mm-5mm). Discontinuities are closely spaced planar smooth with wide infilled silt |
| 15 | 18.6 | 01-CLAY | Extremely strong dark greenish grey (GLEY 1 10GY 4/1) medium plasticity slightly sandy silty CLAY (sisaCIM) with medium spaced thin to medium beds of medium grained sandstone and occasional shell fragments (1mm-10mm) |
| 18.6 | 20.5 | 02-SILT | Medium strong to strong (based on field tests) dark greenish grey (GLEY 1 10GY 4/1) slightly calcareous medium grained slightly sandy clayey fine to coarse SILT (sacl(f-c)Si) with medium spaced with thin to medium beds of mudstone and frequent fossils (1mm-10mm). Discontinuities are closely spaced planar smooth with wide clean aperture |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#17_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 443469.12<br>Northing - 5245633.12 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 5.6 | 03-SAND | Dark greenish grey (10Y 4/1) highly calcareous slightly silty uniformly graded fine to medium SAND (si(f-m)Sa) with rare shell fragments (1mm-5mm) |
| 5.6 | 7 | 08-LIMESTONE | Strong to very strong pale yellowish brown (10YR 6/2) highly calcareous silty slightly sandy SHELLY LIMESTONE with frequent fossils (3mm-50mm). Discontinuities are closely spaced subhorizontal planar to undulating rough partly open to open clean (possibly drilling induced?). Core potentially breaks in more silty beds. |
| 7 | 11.7 | 08-LIMESTONE | Medium strong high density very pale orange (10YR 8/2) slightly weathered highly calcareous slightly silty slightly sandy FOSSILIFEROUS GLAUCONITE LIMESTONE with frequent fossils (1mm-3mm). |
| 11.7 | 16.7 | 08-LIMESTONE | Moderately weak medium density very pale orange (10YR 8/2) highly calcareous FOSSILIFEROUS GLAUCONITE LIMESTONE with abundant fossils (1mm-3mm) |
| 16.7 | 20.3 | 08-LIMESTONE | Very weak low to medium density very pale orange (10YR 8/2) highly weathered highly calcareous sandy silty FOSSILIFEROUS GLAUCONITE LIMESTONE with numerous fossils (1mm-3mm) |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#20_CPT |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 448480.58<br>Northing - 5238230.19 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 4.7 | 03-SAND | Very dense dark olive grey (5Y 3/2) uniformly graded highly calcareous silty fine to medium SAND (si(f-m)Sa) with frequent shell fragments (1mm-10mm) |
| 4.7 | 6.7 | 08-LIMESTONE | Medium strong to strong (based on field tests) very pale orange (10YR 8/2) slightly silty sandy moderately weathered calcareous LIMESTONE with rare shell fragments (1mm-5mm) and voids (1mm-3mm). |
| 6.7 | 11.5 | 08-LIMESTONE | Very weak low to medium density very pale orange (10YR 8/2) highly weathered slightly silty sandy SHELLY LIMESTONE with shell fragments (1mm-3mm) |
| 11.5 | 13 | 08-LIMESTONE | Strong medium density very pale orange (10YR 8/2) slightly weathered very highly calcareous LIMESTONE predominantly made of fossils (1mm-3mm) and rare coarse quartz grains. Discontinuities are very closely to closely spaced subhorizontal planar to undulating rough to smooth open clean. Recovered as rock biscuits. |
| 13 | 15 | 08-LIMESTONE | Very weak low to medium density very pale orange (10YR 8/2) highly weathered LIMESTONE with shell fragments and fossils (1mm-3mm) |
| 15 | 19.3 | 08-LIMESTONE | Medium strong to strong medium density very pale orange (10YR 8/2) slightly weathered highly calcareous SHELLY LIMESTONE predominantly made of fossils (1mm-3mm) and rare fine to medium quartz grains. Discontinuities are very closely to closely spaced subhorizontal planar to undulating rough to smooth open clean. Partly recovered as rock biscuits. |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#20_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 448486.96<br>Northing - 5238226.41 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 4.7 | 03-SAND | Very dense dark olive grey (5Y 3/2) uniformly graded highly calcareous silty fine to medium SAND (si(f-m)Sa) with frequent shell fragments (1mm-10mm) |
| 4.7 | 6.7 | 08-LIMESTONE | Medium strong to strong (based on field tests) very pale orange (10YR 8/2) slightly silty sandy moderately weathered calcareous LIMESTONE with rare shell fragments (1mm-5mm) and voids (1mm-3mm). |
| 6.7 | 11.5 | 08-LIMESTONE | Very weak low to medium density very pale orange (10YR 8/2) highly weathered slightly silty sandy SHELLY LIMESTONE with shell fragments (1mm-3mm) |
| 11.5 | 13 | 08-LIMESTONE | Strong medium density very pale orange (10YR 8/2) slightly weathered very highly calcareous LIMESTONE predominantly made of fossils (1mm-3mm) and rare coarse quartz grains. Discontinuities are very closely to closely spaced subhorizontal planar to undulating rough to smooth open clean. Recovered as rock biscuits. |
| 13 | 15 | 08-LIMESTONE | Very weak low to medium density very pale orange (10YR 8/2) highly weathered LIMESTONE with shell fragments and fossils (1mm-3mm) |
| 15 | 19.3 | 08-LIMESTONE | Medium strong to strong medium density very pale orange (10YR 8/2) slightly weathered highly calcareous SHELLY LIMESTONE predominantly made of fossils (1mm-3mm) and rare fine to medium quartz grains. Discontinuities are very closely to closely spaced subhorizontal planar to undulating rough to smooth open clean. Partly recovered as rock biscuits. |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#22_CPT |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 454688.01<br>Northing - 5237034.58 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 0.8 | 03-SAND | Medium to high density dark olive grey (5Y 3/2) calcareous silty poorly graded fine to medium SAND (si(f-m)Sa) with frequent shell fragments (1mm - 10mm) |
| 0.8 | 4.5 | 03-SAND | Very high density dark olive grey (5Y 3/2) highly calcareous coarse slightly silty gravelly poorly graded fine to coarse SAND (sigr(f-c)Sa) with frequent shell fragments (1mm - 10mm). Gravel is fine. |
| 4.5 | 8 | 14-DOLOMITE | Very strong (based on field tests) high to very high density very pale orange (10YR 8/2) slightly weathered highly calcareous silty DOLOMITE with frequent fossils (3mm-20mm). Discontinuities are closely to medium spaced subhorizontal planar to undulating rough open clean with occasional orange staining |
| 8 | 17 | 08-LIMESTONE | Very strong (based on field tests) very pale orange (10YR 8/2) to medium dark grey (N4) slightly weathered very highly calcareous slightly silty SHELLY LIMESTONE with occasional fossils (1mm-10mm), rare voids and white staining on the core surface. Discontinuities are very closely to closely spaced subhorizontal planar to undulating rough open clean with occasional orange staining |
| 17 | 20.1 | 03-SAND | Dense very pale brown (10YR 8/2) highly calcareous slightly to moderately cemented slightly clayey silty well graded fine to coarse SAND (casi(f-c)Sa) with frequent shell fragments (1-3 mm) |

| | | | |
|---|---|---|---|
| Client: | RTE_DGEC | Location: | OWF_GI#22_SAMP |
| Project Name: | A05 Bretagne Offshore GI | Local Co-ordinates: | Easting - 454703.24<br>Northing - 5237026.7 |
| Project Number: | GMOP21-G-019 | | |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 0.8 | 03-SAND | Medium to high density dark olive grey (5Y 3/2) calcareous silty poorly graded fine to medium SAND (si(f-m)Sa) with frequent shell fragments (1mm - 10mm) |
| 0.8 | 4.5 | 03-SAND | Very high density dark olive grey (5Y 3/2) highly calcareous coarse slightly silty gravelly poorly graded fine to coarse SAND (sigr(f-c)Sa) with frequent shell fragments (1mm - 10mm). Gravel is fine. |
| 4.5 | 8 | 14-DOLOMITE | Very strong (based on field tests) high to very high density very pale orange (10YR 8/2) slightly weathered highly calcareous silty DOLOMITE with frequent fossils (3mm-20mm). Discontinuities are closely to medium spaced subhorizontal planar to undulating rough open clean with occasional orange staining |
| 8 | 17 | 08-LIMESTONE | Very strong (based on field tests) very pale orange (10YR 8/2) to medium dark grey (N4) slightly weathered very highly calcareous slightly silty SHELLY LIMESTONE with occasional fossils (1mm-10mm), rare voids and white staining on the core surface. Discontinuities are very closely to closely spaced subhorizontal planar to undulating rough open clean with occasional orange staining |
| 17 | 20.1 | 03-SAND | Dense very pale brown (10YR 8/2) highly calcareous slightly to moderately cemented slightly clayey silty well graded fine to coarse SAND (casi(f-c)Sa) with frequent shell fragments (1-3 mm) |

| | | | |
|---|---|---|---|
| Client: RTE_DGEC<br>Project Name: A05 Bretagne Offshore GI<br>Project Number: GMOP21-G-019 | | Location: OWF_GI#24_SAMP<br>Local Co-ordinates: Easting - 456333.24<br>Northing - 5233817.19 | GEOQUIPMARINE |

| Top Depth (m) | Base Depth (m) | Material | Layer Description |
|---|---|---|---|
| 0 | 1.1 | 03-SAND | Dark olive grey (5Y 3/2) highly calcareous slightly silty slightly clayey well graded fine to coarse SAND (sicl(f-c)Sa) with frequent shell fragments (1mm-10mm) |
| 1.1 | 5.1 | 08-LIMESTONE | Very strong (based on field tests) very pale orange (10YR 8/2) to greyish orange (10YR 7/4) moderately weathered very highly calcareous SHELLY LIMESTONE with occasional fossils. Discontinuities are very closely to closely spaced subhorizontal occasionally subvertical planar to undulating rough open to moderately wide clean partly soil infill with frequent orange staining. |
| 5.1 | 7.5 | 08-LIMESTONE | Very strong (based on field tests) very pale orange (10YR 8/2) to greyish orange (10YR 7/4) moderately weathered very highly calcareous SHELLY LIMESTONE with occasional fossils. Discontinuities are very closely to closely spaced subhorizontal occasionally subvertical planar to undulating rough open to moderately wide clean partly soil infill with frequent orange staining. |
| 7.5 | 18 | 08-LIMESTONE | Medium strong medium to high density very pale orange (10YR 8/2) slightly weathered highly calcareous SHELLY LIMESTONE with occasional fossils. Discontinuities are closely spaced subhorizontal undulating rough to smooth open clean. |
| 18 | 20.5 | 08-LIMESTONE | Strong to very strong medium density very pale orange (10YR 8/2) slightly weathered highly calcareous SHELLY LIMESTONE with occasional fossils and shell fragments (1mm-10mm) |

## Appendix A.4 In-Situ Application Class Assessments

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF
Application Class: ISO 19901-8 (2014)

GEOQUIPMARINE

| Borehole / Location | Test No. | Test Depth (m) | Stroke (m) | Cone No. | Zero Drift | | | Appication Class | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tip (MPa) | Sleeve (MPa) | Pore (kPa) | Tip (-) | Sleeve (-) | Pore (-) | Overall (-) | |
| OWF_GI#08_CPT | C01 | 0.00 | 1.10 | 190410 | -0.005 | -70.795 | -7 | 1 | 4 | 1 | 4 | Tip refusal |
| OWF_GI#08_CPT | C02 | 1.50 | 0.30 | 190410 | -0.010 | -0.001 | -6 | 1 | 1 | 1 | 1 | Tip refusal > 90MPa |
| OWF_GI#08_CPT | C03 | 6.50 | 0.18 | 190410 | -0.030 | -0.001 | 0 | 1 | 1 | 1 | 1 | Tip refusal >80MPa |
| OWF_GI#08_CPT | C04 | 8.50 | 1.00 | 190410 | 0.031 | -0.001 | 1 | 1 | 1 | 1 | 1 | Tip refusal >80MPa |
| OWF_GI#08_CPT | C05 | 9.50 | 0.08 | 190410 | 0.098 | -0.487 | 2 | 1 | 4 | 1 | 4 | Tip refusal > 90 Mpa |
| OWF_GI#08_CPT | C06 | 10.50 | 0.14 | 190409 | 0.040 | 0.001 | 1 | 1 | 1 | 1 | 1 | Tip refusal > 80 MPa. Cone changed due to damage of sleeve and out of application class |
| OWF_GI#08_CPT | C07 | 16.50 | 0.32 | 190409 | -0.003 | 0.000 | 0 | 1 | 1 | 1 | 1 | Tip refusal > 100 MPa |
| OWF_GI#11_CPT | C01 | 0.00 | 1.50 | 190720 | 0.005 | 0.000 | -5 | 1 | 1 | 1 | 1 | Danger of buckling |
| OWF_GI#11_CPT | C02 | 2.00 | 2.50 | 190720 | 0.046 | 0.000 | 1 | 1 | 1 | 1 | 1 | Max system thrust |
| OWF_GI#11_CPT | C04 | 4.50 | 0.20 | 190720 | 0.010 | 0.001 | 8 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#11_CPT | C05 | 5.00 | 0.10 | 190720 | 0.100 | 0.206 | 7 | 1 | 4 | 1 | 4 | Sleeve refusal  cone damage |
| OWF_GI#11_CPT | C06 | 5.50 | 0.30 | 180702 | 0.080 | 0.000 | 6 | 1 | 1 | 1 | 1 | |
| OWF_GI#11_CPT | C07 | 9.30 | 0.96 | 180702 | 0.018 | 0.003 | 0 | 1 | 1 | 1 | 1 | |
| OWF_GI#11_CPT | C08 | 10.30 | 0.26 | 180702 | 0.029 | 0.019 | 2 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#11A_CPT | C01 | 8.60 | 0.10 | 220605 | 0.140 | 0.226 | -7 | 1 | 3 | 1 | 3 | Sleeve refusal. Cone damaged. |
| OWF_GI#11B_CPT | C01 | 10.00 | 0.44 | 160107 | 0.006 | -0.001 | -6 | 1 | 1 | 1 | 1 | Tip refusal >80MPa |
| OWF_GI#11B_CPT | C02 | 11.00 | 1.04 | 160107 | -0.280 | 0.001 | -3 | 1 | 1 | 1 | 1 | |
| OWF_GI#11B_CPT | C03 | 12.00 | 1.16 | 160107 | 0.024 | -0.001 | 5 | 1 | 1 | 1 | 1 | |
| OWF_GI#11B_CPT | C04 | 13.50 | 0.52 | 160107 | 0.011 | -0.001 | -2 | 1 | 1 | 1 | 1 | Tip refusal >90 Mpa |
| OWF_GI#11B_CPT | C05 | 16.50 | 0.08 | 160107 | -0.020 | -0.002 | 1 | 1 | 1 | 1 | 1 | Tip refusal>90MPa |
| OWF_GI#11B_CPT | C06 | 17.50 | 0.10 | 160107 | -0.012 | -0.363 | 27 | 1 | 4 | 2 | 4 | Sleeve refusal > 1 Mpa |
| OWF_GI#12_CPT | C01 | 0.00 | 1.38 | 180602 | 0.021 | -0.001 | -7 | 1 | 1 | 1 | 1 | |

# CPTU TEST CLASS SUMMARY

Ref: GMOP21-G-019-FAC

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF
Application Class: ISO 19901-8 (2014)

| Borehole / Location | Test No. | Test Depth (m) | Stroke (m) | Cone No. | Zero Drift | | | Appication Class | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tip (MPa) | Sleeve (MPa) | Pore (kPa) | Tip (-) | Sleeve (-) | Pore (-) | Overall (-) | |
| OWF_GI#12_CPT | C02 | 1.50 | 1.22 | 190409 | -0.011 | -0.001 | 0 | 1 | 1 | 1 | 1 | Cone changed due to weak sleeve response |
| OWF_GI#12_CPT | C03 | 3.00 | 0.50 | 190409 | 0.034 | 0.001 | -2 | 1 | 1 | 1 | 1 | Tip refusal >90MPa |
| OWF_GI#12_CPT | C04 | 3.50 | 0.10 | 190409 | -0.040 | -0.001 | 6 | 1 | 1 | 1 | 1 | Tip refusal > 80MPa |
| OWF_GI#12_CPT | C05 | 11.50 | 0.36 | 190409 | 0.011 | 0.005 | -1 | 1 | 1 | 1 | 1 | Tip refusal > 80MPa |
| OWF_GI#12_CPT | C06 | 14.00 | 0.94 | 190409 | -0.062 | 0.001 | -1 | 1 | 1 | 1 | 1 | Tip refusal >80MPa |
| OWF_GI#12_CPT | C07 | 15.00 | 0.52 | 190409 | 0.021 | -0.001 | -5 | 1 | 1 | 1 | 1 | Tip refusal > 80MPa |
| OWF_GI#12_CPT | C08 | 17.00 | 0.82 | 190409 | 0.004 | -0.001 | 1 | 1 | 1 | 1 | 1 | |
| OWF_GI#12_CPT | C09 | 18.00 | 0.50 | 190409 | 0.010 | 0.000 | -4 | 1 | 1 | 1 | 1 | Tip refusal >90MPa |
| OWF_GI#13_CPT | C01 | 0.00 | 0.76 | 180602 | -0.030 | 0.000 | 0 | 1 | 1 | 1 | 1 | Tip refusal >80MPa |
| OWF_GI#13_CPT | C02 | 8.00 | 0.36 | 180602 | 0.085 | 0.030 | 4 | 1 | 1 | 1 | 1 | Tip refusal > 75 Mpa. Tidal swell and cuttings cropped off |
| OWF_GI#13_CPT | C03 | 14.00 | 0.18 | 180602 | 0.000 | 0.007 | -2 | 1 | 2 | 1 | 2 | Tip refusal |
| OWF_GI#20_CPT | C01 | 0.00 | 0.80 | 120927 | 0.015 | 0.001 | 1 | 1 | 1 | 1 | 1 | |
| OWF_GI#20_CPT | C02 | 1.60 | 1.28 | 120927 | 0.019 | 0.003 | 3 | 1 | 1 | 1 | 1 | |
| OWF_GI#20_CPT | C03 | 3.10 | 1.36 | 120927 | 0.002 | 0.002 | 1 | 1 | 1 | 1 | 1 | |
| OWF_GI#20_CPT | C04 | 4.70 | 0.36 | 120927 | -0.017 | 0.000 | 1 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#20_CPT | C05 | 6.30 | 1.36 | 120927 | 0.014 | 0.000 | 5 | 1 | 1 | 1 | 1 | |
| OWF_GI#20_CPT | C06 | 7.90 | 0.88 | 120927 | -0.008 | 0.000 | 2 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#20_CPT | C07 | 9.00 | 1.34 | 120927 | -0.008 | 0.002 | 5 | 1 | 1 | 1 | 1 | |
| OWF_GI#20_CPT | C08 | 10.50 | 1.18 | 120927 | -0.004 | 0.000 | 4 | 1 | 1 | 1 | 1 | |
| OWF_GI#20_CPT | C09 | 12.90 | 1.32 | 120927 | -0.010 | 0.003 | 1 | 1 | 1 | 1 | 1 | |
| OWF_GI#20_CPT | C10 | 14.40 | 1.32 | 120927 | 0.011 | 0.001 | 4 | 1 | 1 | 1 | 1 | |
| OWF_GI#20_CPT | C11 | 15.90 | 1.38 | 120927 | 0.000 | 0.001 | 4 | 1 | 1 | 1 | 1 | |

# CPTU TEST CLASS SUMMARY

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF
Application Class: ISO 19901-8 (2014)

GEOQUIPMARINE

| Borehole / Location | Test No. | Test Depth (m) | Stroke (m) | Cone No. | Zero Drift | | | Appication Class | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tip (MPa) | Sleeve (MPa) | Pore (kPa) | Tip (-) | Sleeve (-) | Pore (-) | Overall (-) | |
| OWF_GI#20_CPT | C12 | 17.50 | 0.72 | 120927 | 0.003 | 0.001 | 2 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#22_CPT | C01 | 0.00 | 1.40 | 180807 | -0.012 | 0.001 | 3 | 1 | 1 | 1 | 1 | |
| OWF_GI#22_CPT | C02 | 1.60 | 1.36 | 180807 | 0.012 | 0.001 | 3 | 1 | 1 | 1 | 1 | |
| OWF_GI#22_CPT | C03 | 3.20 | 0.78 | 180807 | -0.010 | 0.001 | 3 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#22_CPT | C04 | 4.10 | 0.16 | 180807 | -0.015 | 0.000 | 2 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#22_CPT | C05 | 4.50 | 0.32 | 180807 | 0.002 | 0.000 | 3 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#22_CPT | C06 | 6.00 | 0.14 | 180807 | -0.002 | 0.000 | 3 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#22_CPT | C07 | 10.50 | 0.80 | 180807 | -0.001 | 0.000 | 5 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#22_CPT | C08 | 13.00 | 0.58 | 180807 | 0.001 | 0.000 | 2 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#22_CPT | C09 | 13.80 | 0.10 | 180807 | -0.003 | -0.001 | 1 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#22_CPT | C10 | 17.00 | 1.02 | 180807 | -0.002 | 0.000 | 5 | 1 | 1 | 1 | 1 | |
| OWF_GI#22_CPT | C11 | 18.20 | 1.30 | 180807 | 0.002 | 0.000 | 3 | 1 | 1 | 1 | 1 | |
| OWF_GI#22_CPT | C12 | 19.50 | 0.18 | 180807 | 0.002 | 0.000 | -1 | 1 | 1 | 1 | 1 | Tip refusal |
| OWF_GI#22_CPT | C13 | 20.00 | 0.06 | 180807 | 0.012 | 0.000 | -1 | 1 | 1 | 1 | 1 | Tip refusal |

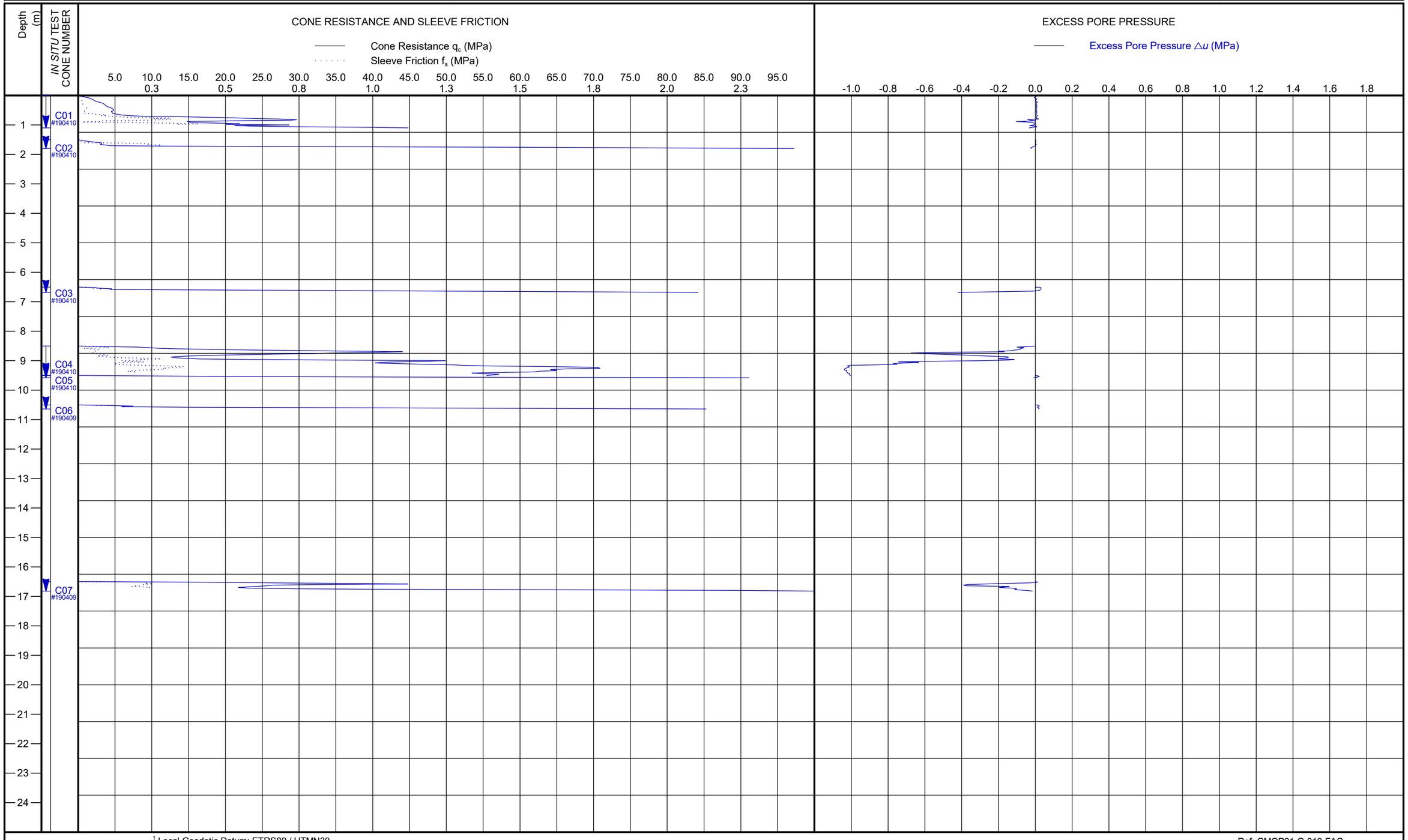
# CPTU TEST CLASS SUMMARY

## Appendix A.5 Processed In-Situ Test Results

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#08_CPT | 13/09/2022 | 454537mE | 5242877mN | 87.5m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

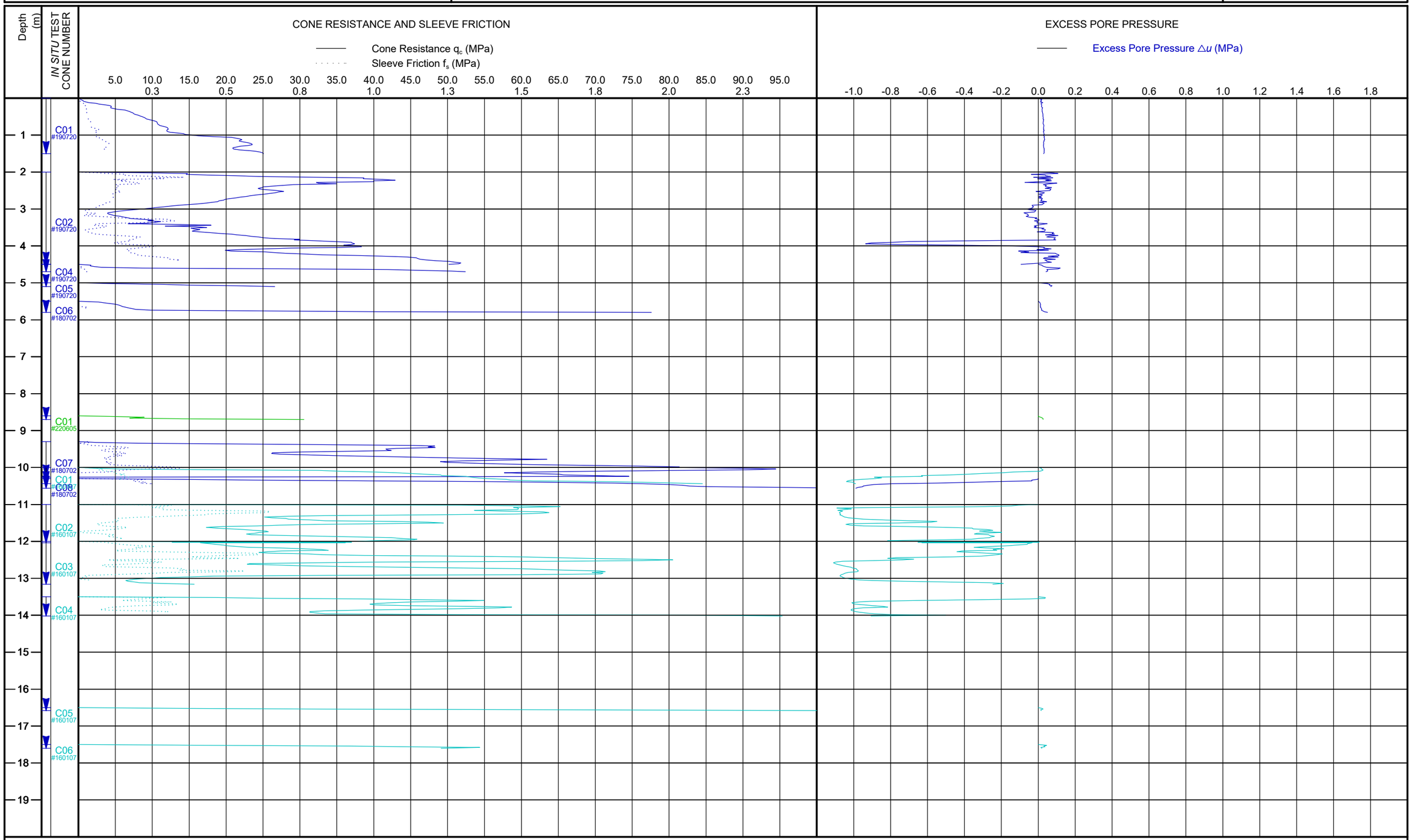
# RAW PCPT RESULTS

Ref: GMOP21-G-019-FAC

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#11_CPT | 17/07/2022 | 455783mE | 5241008mN | 89.66m |
| OWF_GI#11_SAMP | 02/09/2022 | 455775mE | 5241017mN | 89.63m |
| OWF_GI#11A_CPT | 03/09/2022 | 455783mE | 5241013mN | 89.63m |
| OWF_GI#11B_CPT | 14/09/2022 | 455779mE | 5241010mN | 89.68m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

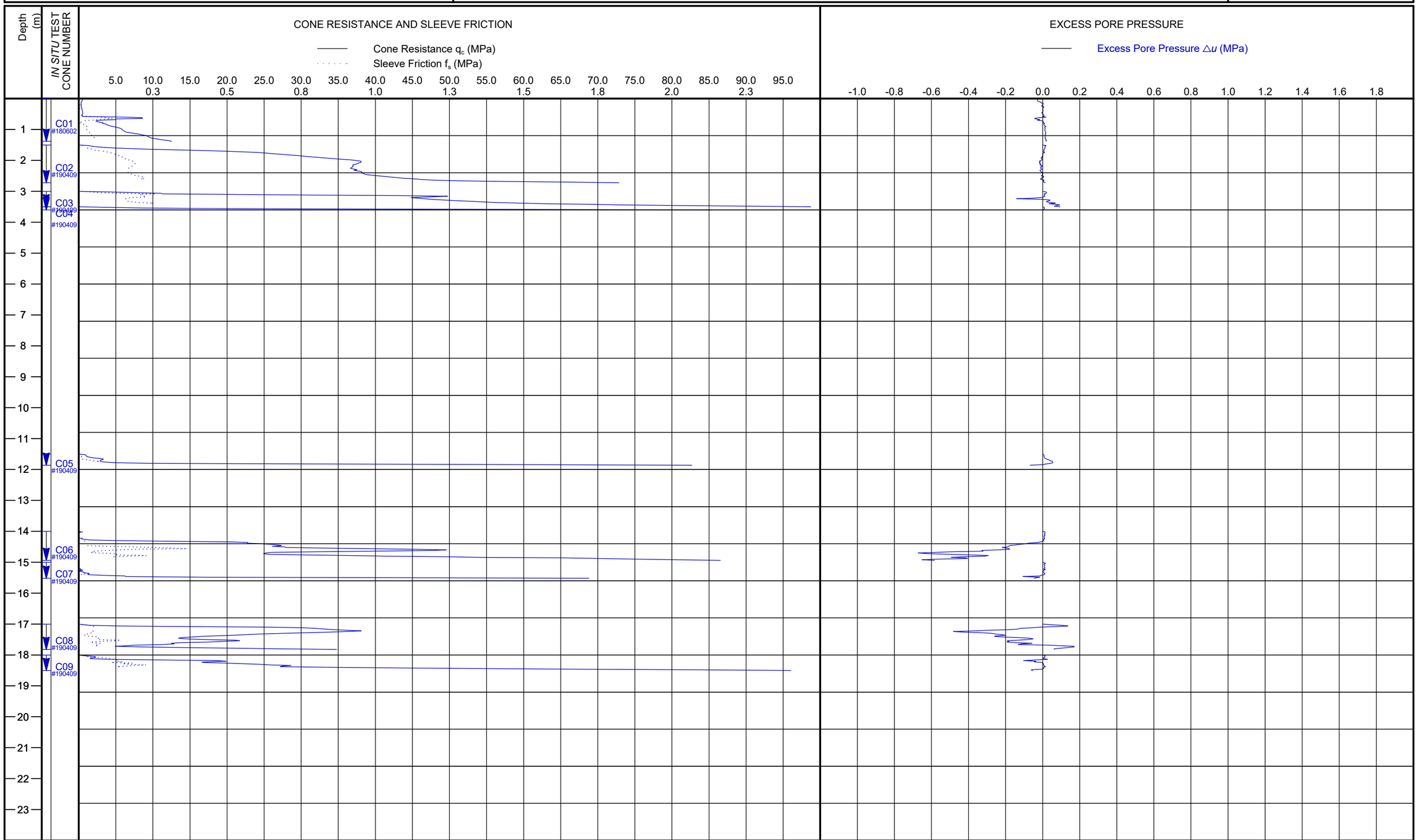
[2] Water Depth: LAT

# RAW PCPT RESULTS

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#12_CPT | 12/09/2022 | 456768mE | 5242750mN | 86.79m |
| OWF_GI#12_SAMP | 11/09/2022 | 456756mE | 5242757mN | 86.77m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

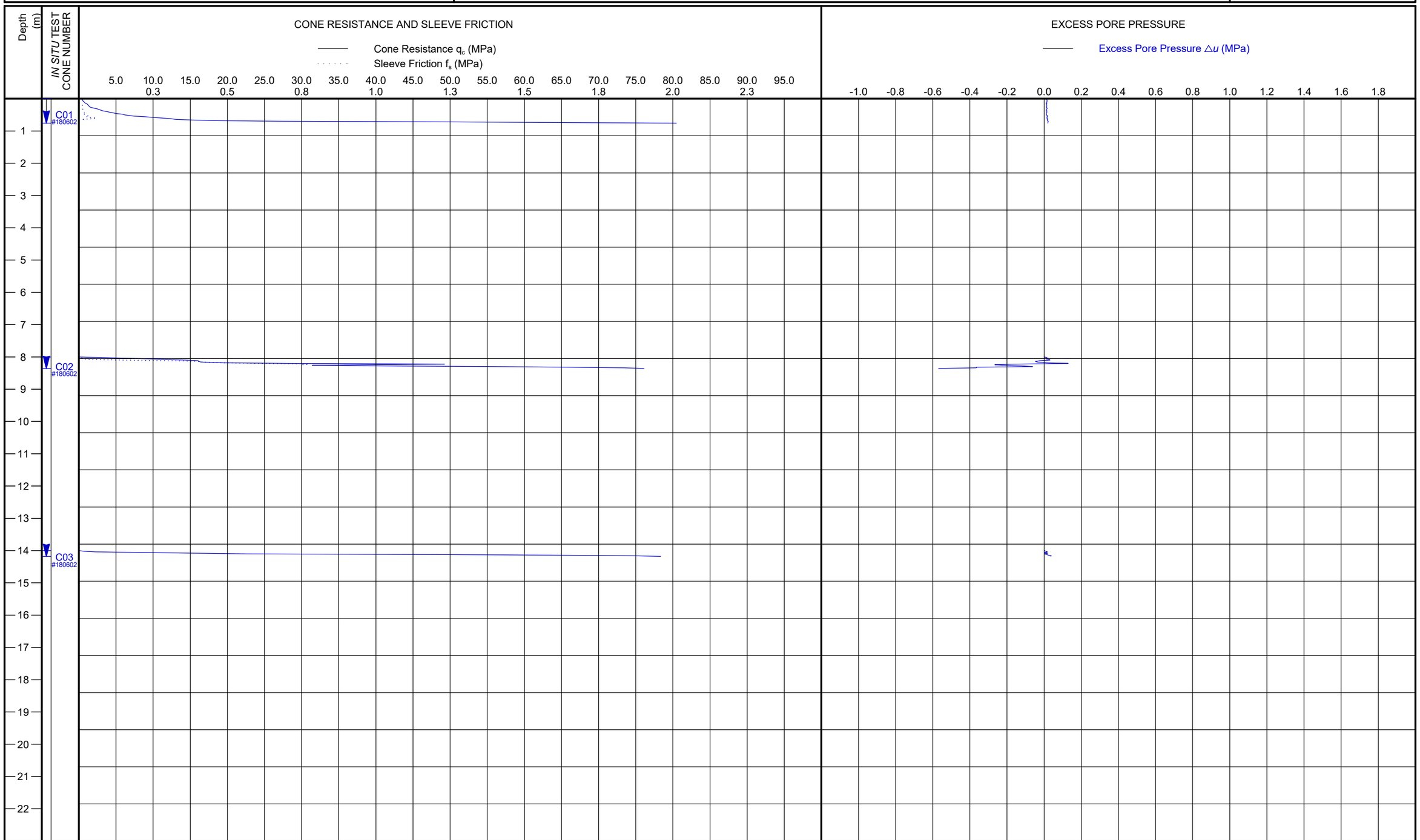
[2] Water Depth: LAT

# RAW PCPT RESULTS

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#13_CPT | 15/09/2022 | 458027mE | 5240916mN | 89.65m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

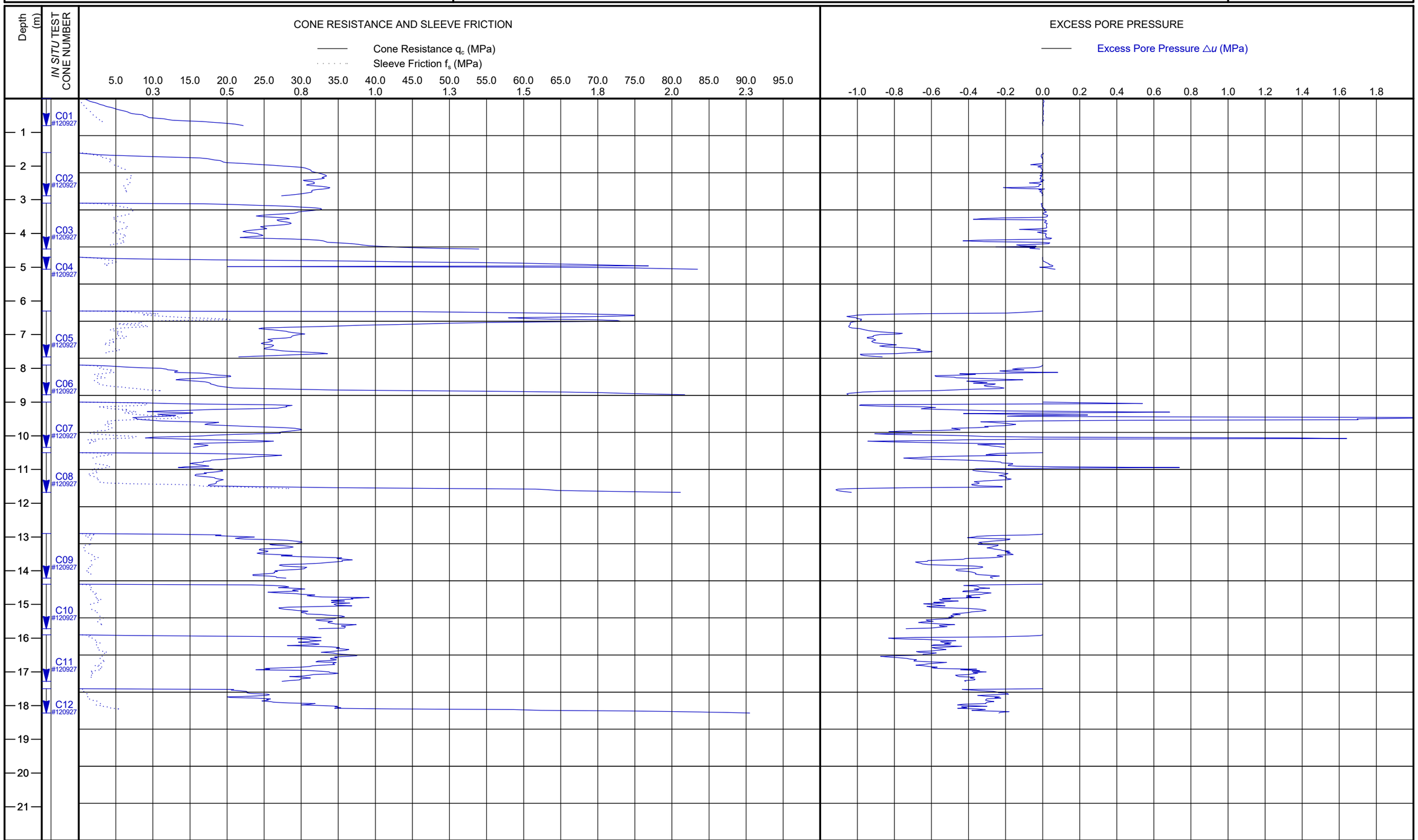
# RAW PCPT RESULTS

Ref: GMOP21-G-019-FAC

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#20_CPT | 09/12/2022 | 448481mE | 5238230mN | 96.78m |
| OWF_GI#20_SAMP | 09/12/2022 | 448487mE | 5238226mN | 96.78m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

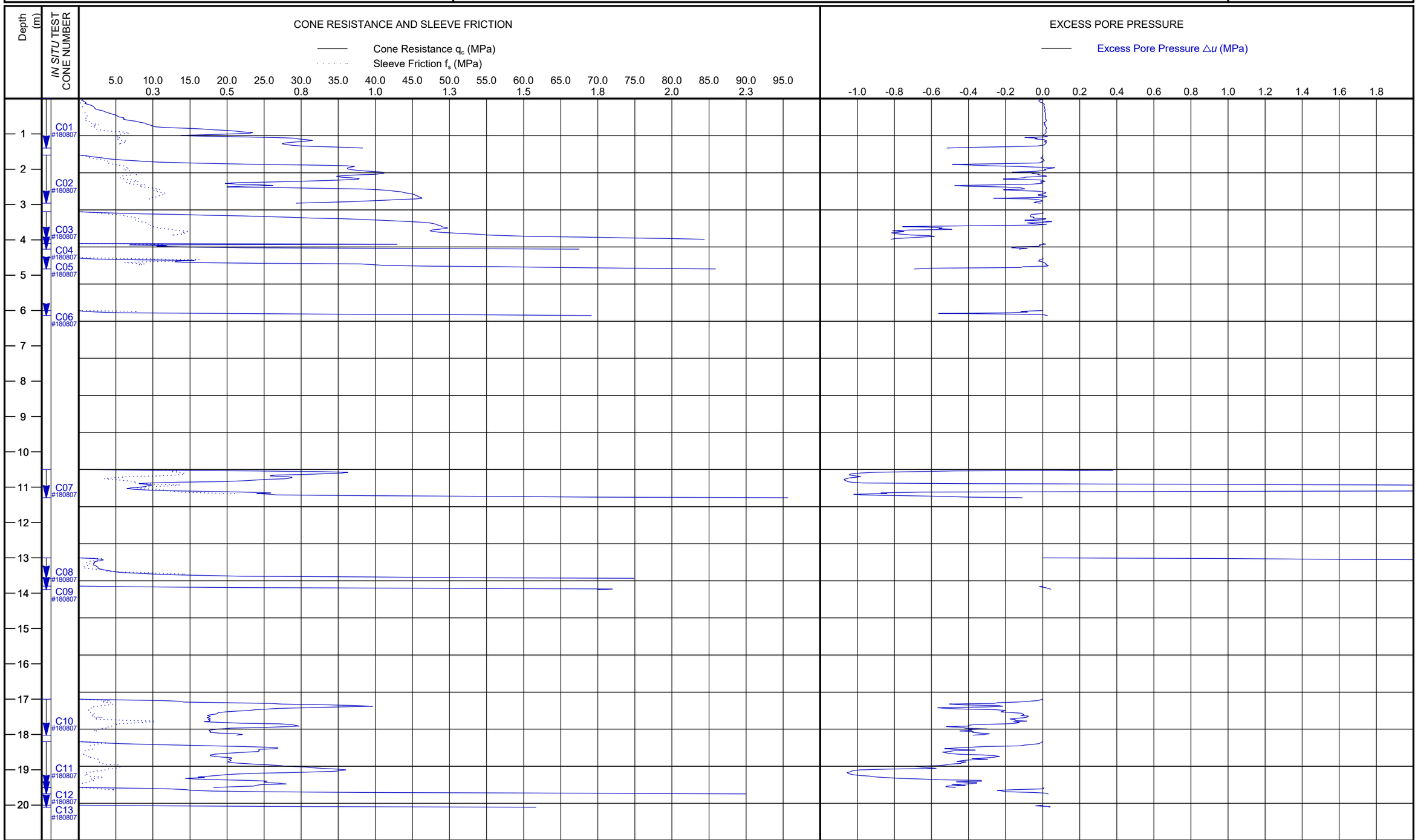
[2] Water Depth: LAT

# RAW PCPT RESULTS

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#22_CPT | 07/12/2022 | 454688mE | 5237035mN | 93.65m |
| OWF_GI#22_SAMP | 06/12/2022 | 454703mE | 5237027mN | 93.65m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

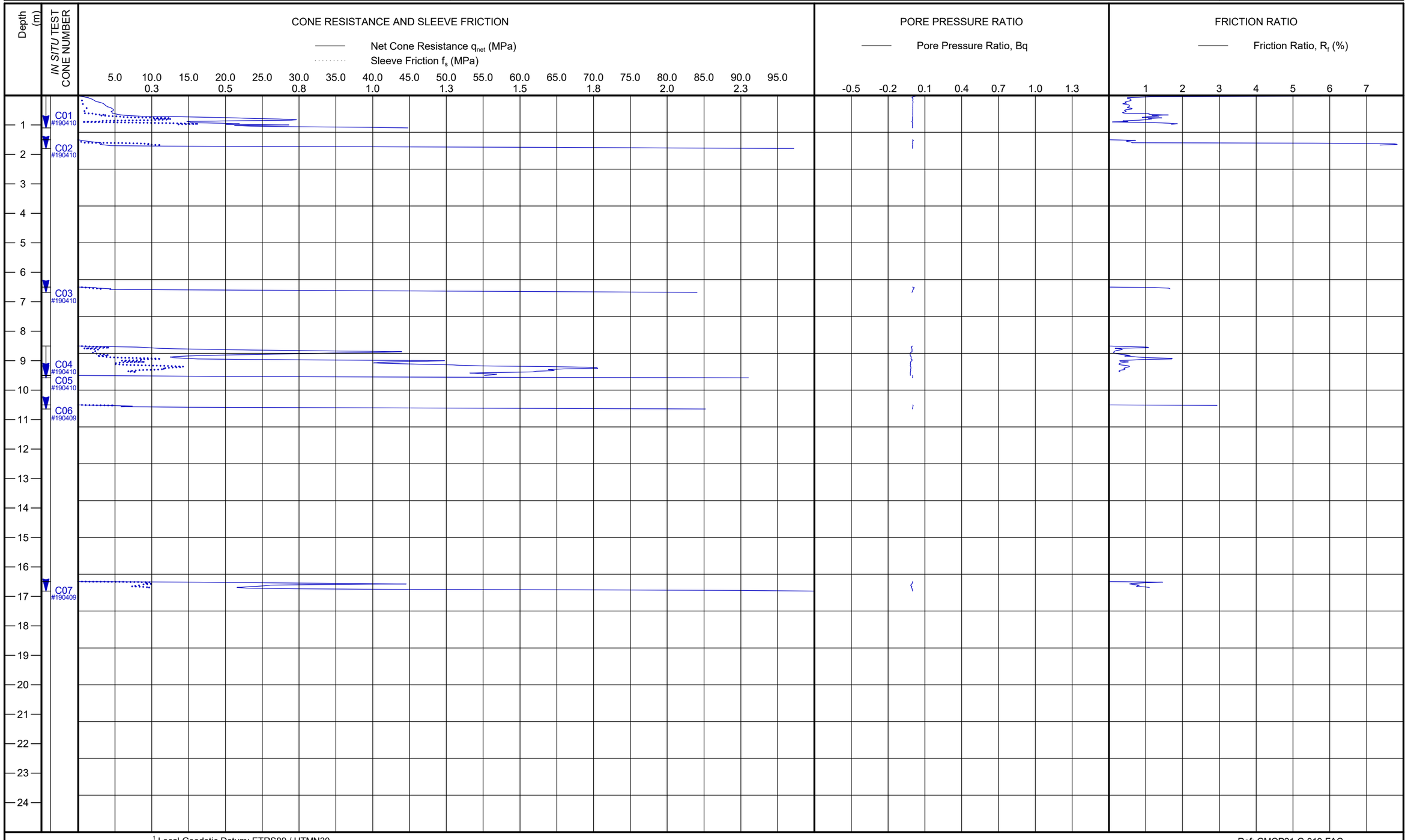
# RAW PCPT RESULTS

# Appendix A.6 Derived In-Situ Test Results

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#08_CPT | 13/09/2022 | 454537mE | 5242877mN | 87.5m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

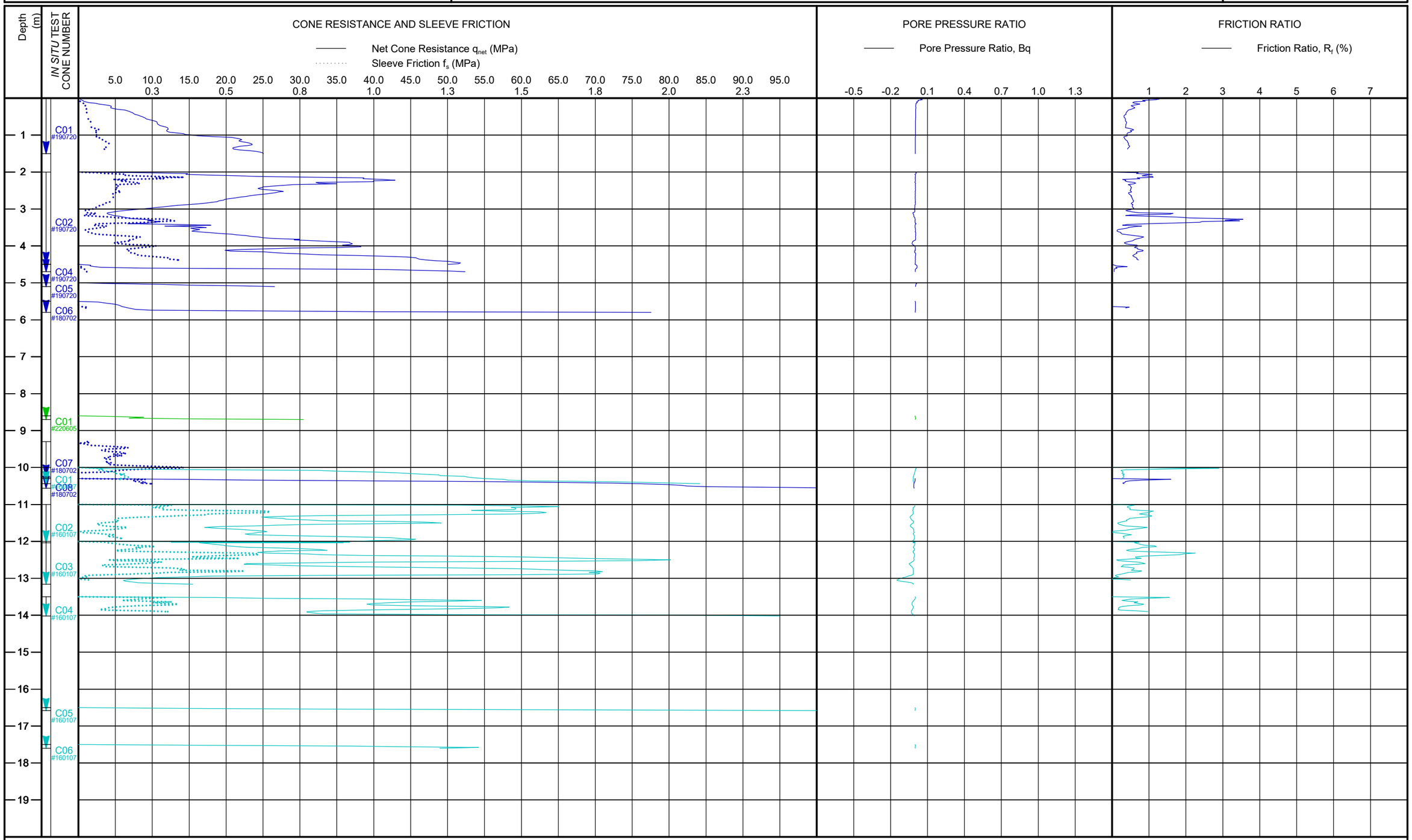
[2] Water Depth: LAT

# DERIVED PCPT RESULTS

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#11_CPT | 17/07/2022 | 455783mE | 5241008mN | 89.66m |
| OWF_GI#11_SAMP | 02/09/2022 | 455775mE | 5241017mN | 89.63m |
| OWF_GI#11A_CPT | 03/09/2022 | 455783mE | 5241013mN | 89.63m |
| OWF_GI#11B_CPT | 14/09/2022 | 455779mE | 5241010mN | 89.68m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

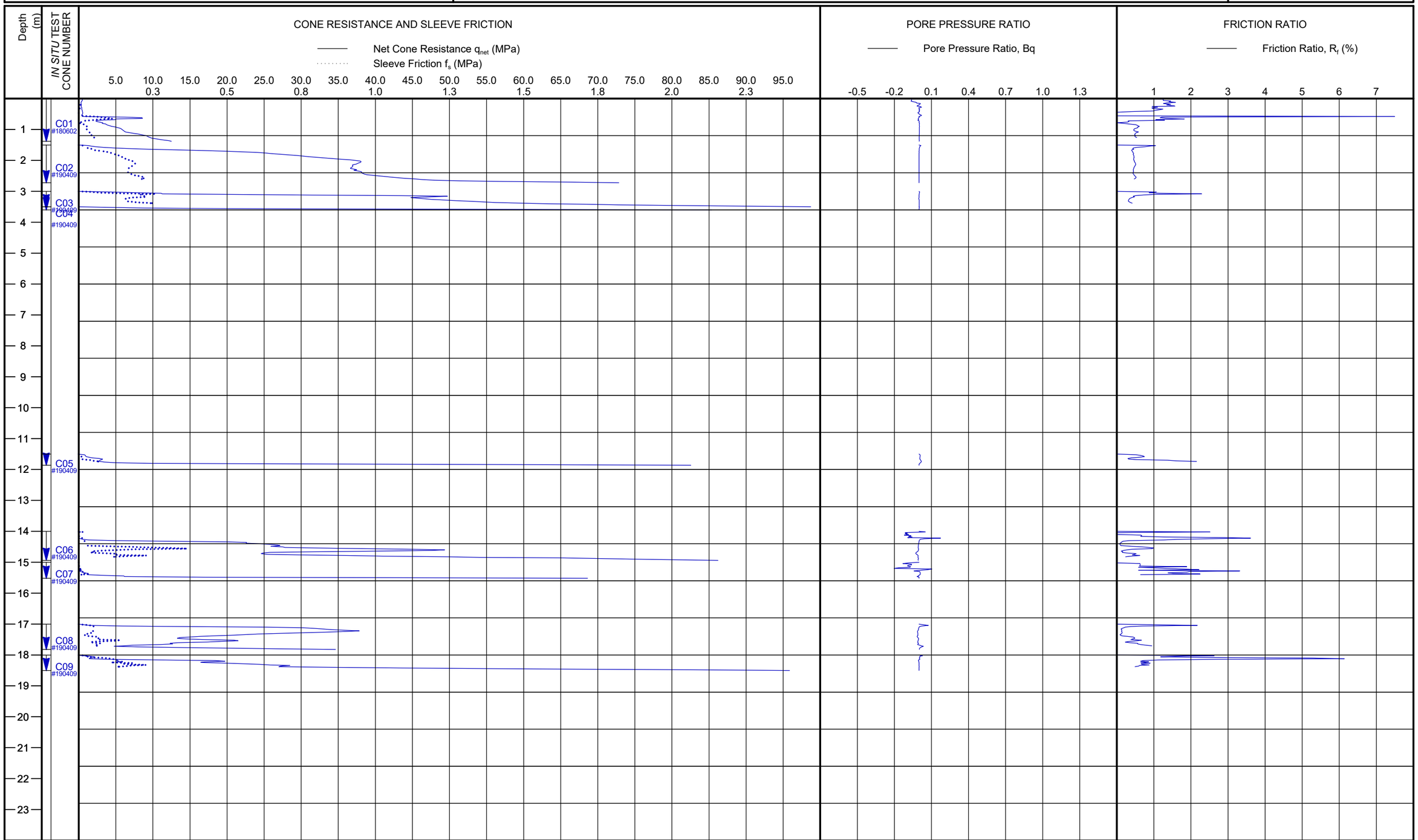
# DERIVED PCPT RESULTS

Ref: GMOP21-G-019-FAC

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#12_CPT | 12/09/2022 | 456768mE | 5242750mN | 86.79m |
| OWF_GI#12_SAMP | 11/09/2022 | 456756mE | 5242757mN | 86.77m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

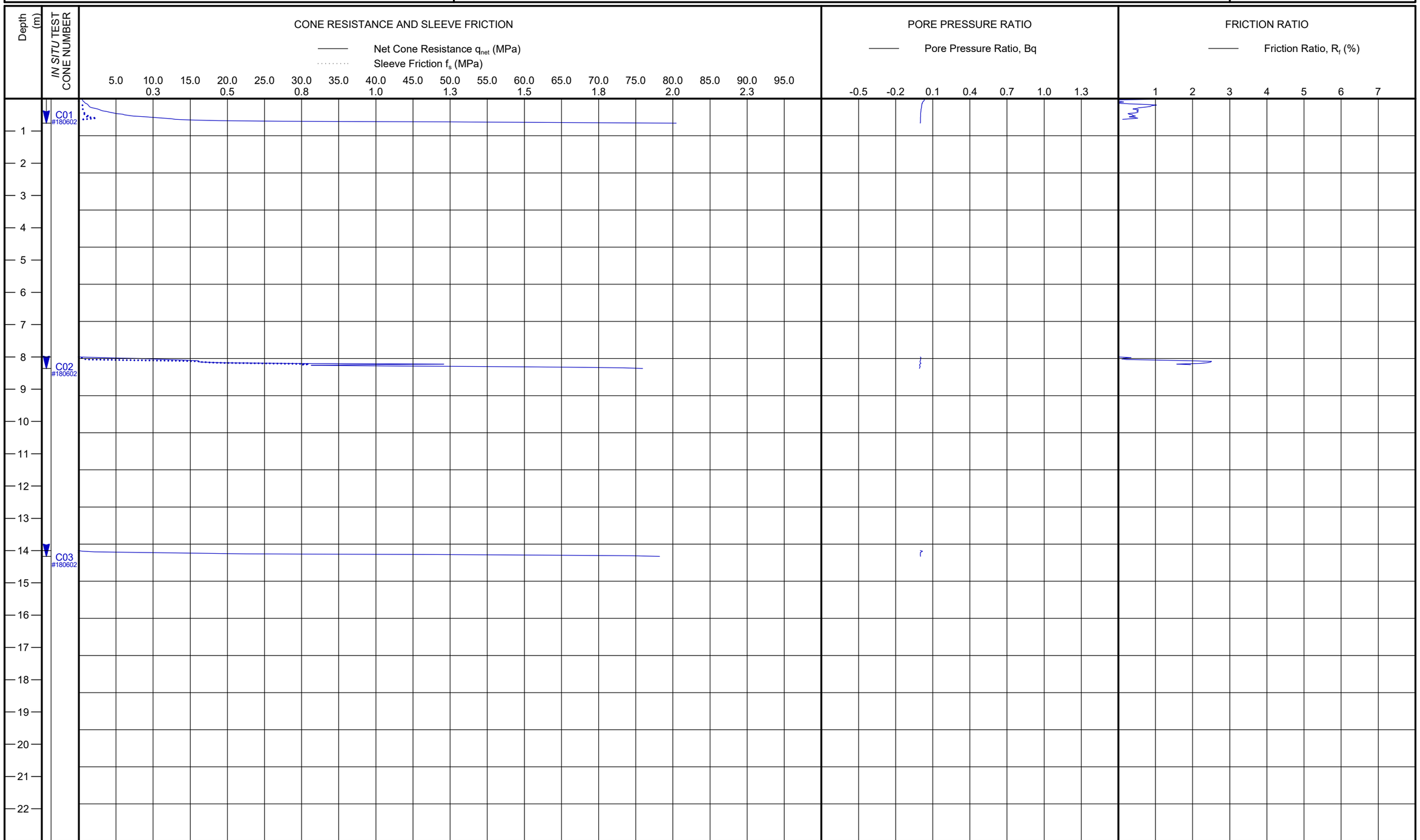
[2] Water Depth: LAT

# DERIVED PCPT RESULTS

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#13_CPT | 15/09/2022 | 458027mE | 5240916mN | 89.65m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

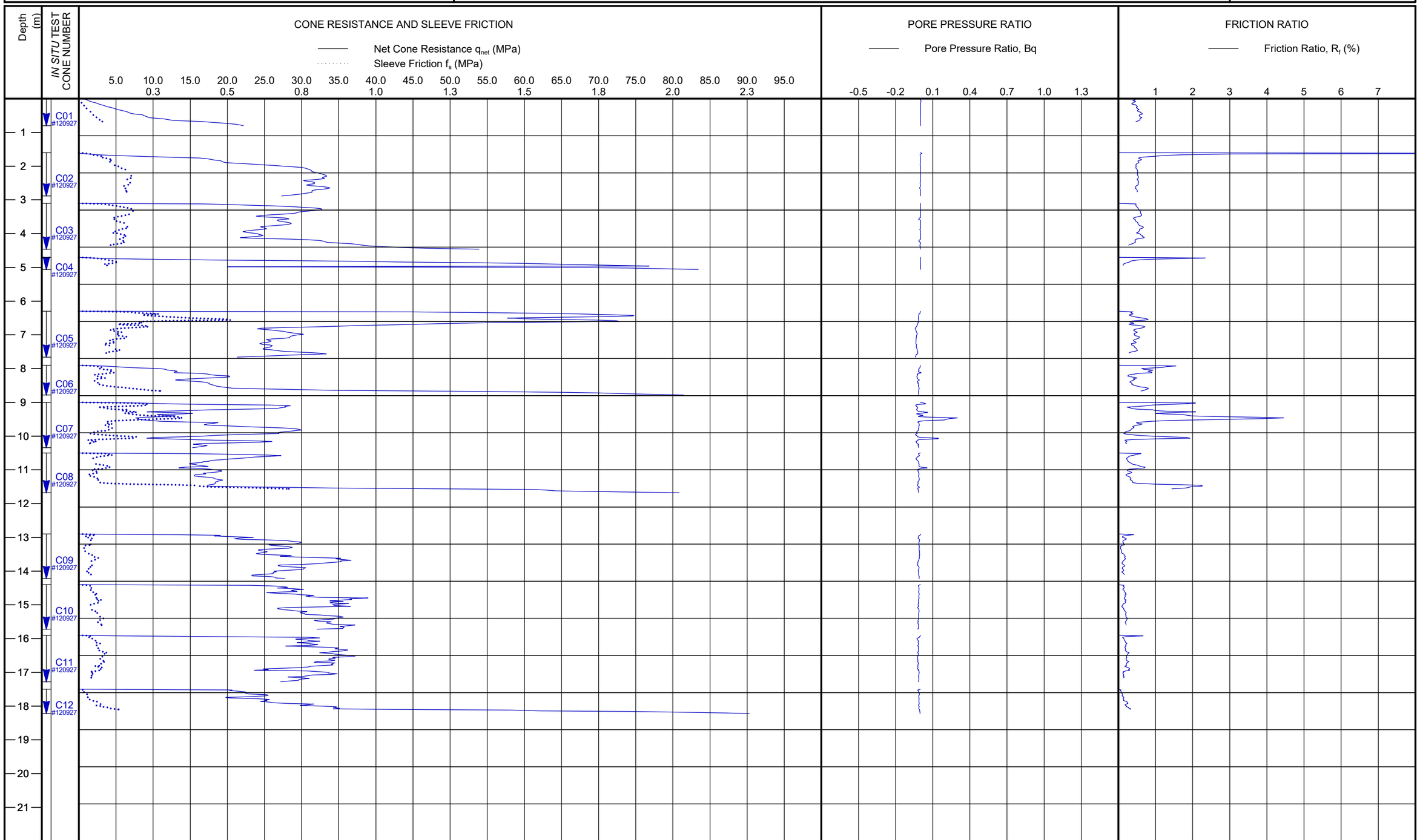
[2] Water Depth: LAT

# DERIVED PCPT RESULTS

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#20_CPT | 09/12/2022 | 448481mE | 5238230mN | 96.78m |
| OWF_GI#20_SAMP | 09/12/2022 | 448487mE | 5238226mN | 96.78m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

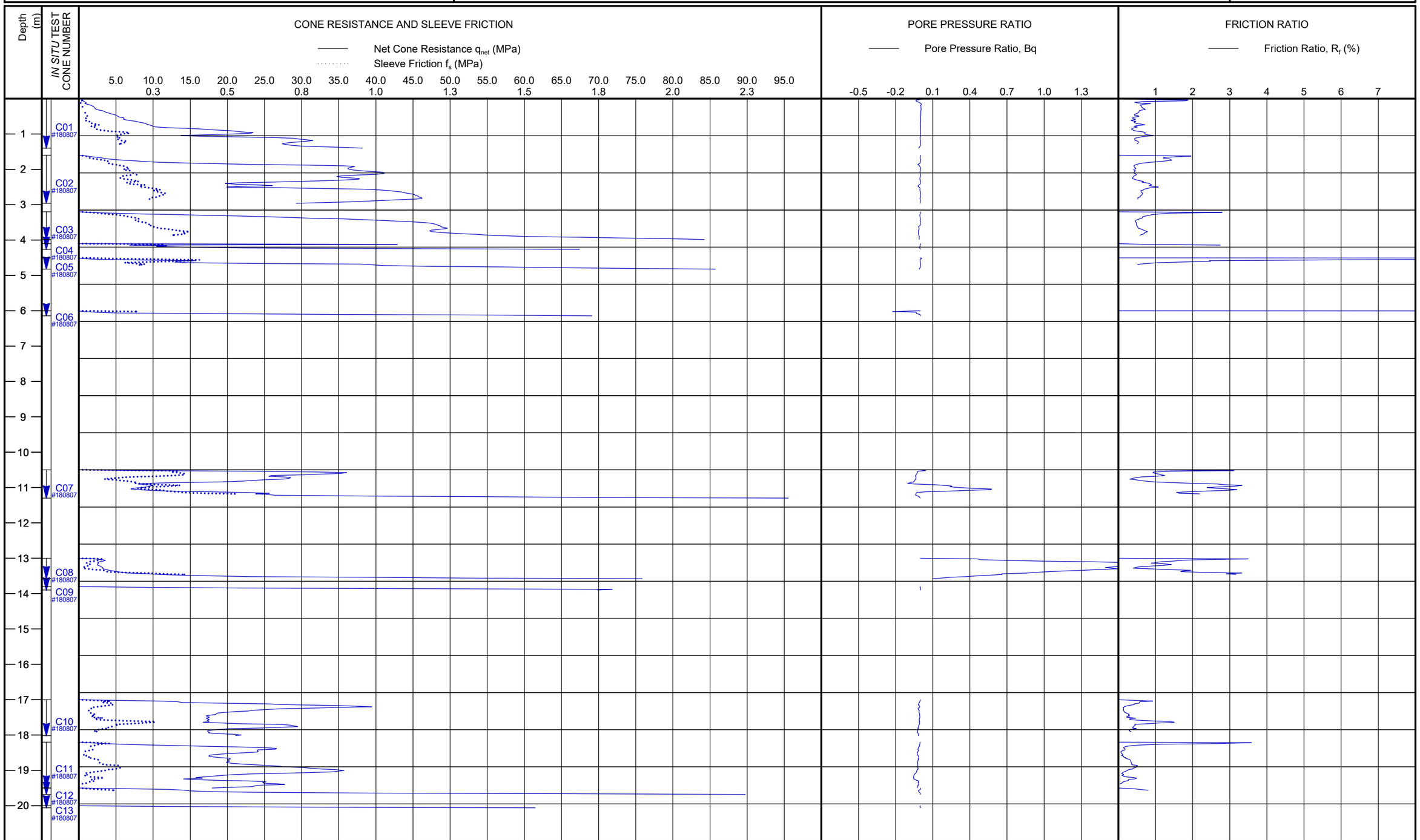
[2] Water Depth: LAT

# DERIVED PCPT RESULTS

| | |
|---|---|
| Client: | RTE_DGEC |
| Project Name: | A05 Bretagne Offshore GI |
| Project No.: | GMOP21-G-019 |
| Location: | A05 OWF |

| Borehole No.: | Date Commenced: | Coordinates[1]: | | Water Depth[2]: |
|---|---|---|---|---|
| OWF_GI#22_CPT | 07/12/2022 | 454688mE | 5237035mN | 93.65m |
| OWF_GI#22_SAMP | 06/12/2022 | 454703mE | 5237027mN | 93.65m |

GEOQUIPMARINE




[1] Local Geodetic Datum: ETRS89 / UTMN30

[2] Water Depth: LAT

# DERIVED PCPT RESULTS

# APPENDIX B SAMPLING AND LABORATORY TESTING

# Appendix B.1 Non-Conformance Reports

# Sample Non-Conformance Number: 104

| | | | |
|---|---|---|---|
| Technician Name: Arthur McLaughlin | | Date: | 02/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#17_SAMP |
| Sample Description including mass of available material: | | Sample Number: | PU14 IS |
| White cemented SAND | | Depth (m): | 17.5 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PSD | |
| Insufficient material for testing | □ | ATT | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is mostly chalk, not suitable for testing

Signed: Arthur McLaughlin Position: Stores Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | x | **Specify:** | Add UCS to PU14-Q1 |
| Alternative test | x | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 06/03/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 105

| | | |
|---|---|---|
| Technician Name: Arthur McLaughlin | Date: | 02/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#04A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR13 Q1 |
| White cemented Chalk | Depth (m): | 17.4 |
| | Sample Type: | Q |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | ATT | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is mostly chalk, not suitable for testing

Signed: Arthur McLaughlin Position: Stores Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to UCS |
| Alternative test | x | Lab: | UCS not possible |
| Non standard test | □ | 28.06.23 | Change to Point Load |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Oliver Sirett Position: Graduate Geotechnical Engineer

Date: 28/06/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 106

| | | | |
|---|---|---|---|
| Technician Name: Arthur McLaughlin | | Date: | 02/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#12_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR14 Q1 |
| White cemented Chalk | | Depth (m): | 16.85 |
| | | Sample Type: | Q |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | ATT | |
| Insufficient material for testing | □ | PSD | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is mostly chalk, not suitable for testing

Signed: Arthur McLaughlin Position: Stores Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | x | **Specify:** | Change to UCS if sample is long enough |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 06/03/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 111

| | | |
|---|---|---|
| Technician Name: Jacob Morgan | Date: | 02/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#20_SAMP |
| Sample Description including mass of available material: | Sample Number: | PU01 B1 |
| Greyish brown SAND | Depth (m): | 0 |
| | Sample Type: | B1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Att | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is SAND

Signed: Jacob Morgan Position: Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | x | | |

**Engineer comments:**

Signed: Joradn Millman Position: Project Engineer

Date: 06/03/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 112

| | | |
|---|---|---|
| Technician Name: Jacob Morgan | Date: | 02/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#11_SAMP |
| Sample Description including mass of available material: | Sample Number: | PU01B B1 |
| Greyish brown SAND | Depth (m): | 0 |
| | Sample Type: | B1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Att | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is SAND

Signed: Jacob Morgan Position: Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel Test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | x | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 06/03/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 131

| | | | |
|---|---|---|---|
| Technician Name: peter webster | | Date: | 09/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#17_SAMP |
| Sample Description including mass of available material: | | Sample Number: | P10 IS |
| | | Depth (m): | 10.5 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | CIUc | |
| Insufficient material for testing | □ | BE | |
| Sample lost in the laboratory | □ | UU | |
| Sample is unsuitable for testing | x | UUR | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is unsuitable for testing, fractured so no 140mm sample available, sample type is chalk, recommend point load testing

Signed: peter webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 132

| | | | |
|---|---|---|---|
| Technician Name: peter webster | | Date: | 09/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#20_SAMP |
| Sample Description including mass of available material: | | Sample Number: | P11 IS |
| | | Depth (m): | 6.7 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | CIUc | |
| Insufficient material for testing | □ | BE | |
| Sample lost in the laboratory | □ | UU | |
| Sample is unsuitable for testing | x | UUR | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is unsuitable for testing, sample type is chalk, recommend point load testing

Signed: peter webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 133

| | | | |
|---|---|---|---|
| Technician Name: peter webster | | Date: | 09/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#20_SAMP |
| Sample Description including mass of available material: | | Sample Number: | P14 IS |
| | | Depth (m): | 9.7 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | CIUc | |
| Insufficient material for testing | □ | BE | |
| Sample lost in the laboratory | □ | UU | |
| Sample is unsuitable for testing | x | UUR | |
| Other | □ | CRS | |

Technician Comments, please include mass of material required if insufficient:

Sample is unsuitable for testing, sample type is chalk, recommend point load testing

Signed: peter webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 134

| | | | |
|---|---|---|---|
| Technician Name: peter webster | | Date: | 09/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#20_SAMP |
| Sample Description including mass of available material: | | Sample Number: | P18 IS |
| | | Depth (m): | 13.8 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | CIUc | |
| Insufficient material for testing | □ | BE | |
| Sample lost in the laboratory | □ | CRS | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is unsuitable for testing, sample type is chalk, recommend point load testing

Signed: peter webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 135

| | | | |
|---|---|---|---|
| Technician Name: Jacob Morgan | | Date: | 09/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#20_SAMP |
| Sample Description including mass of available material: | | Sample Number: | PU01 B1 |
| Greyish brown silty SAND | | Depth (m): | 0 |
| | | Sample Type: | B1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Min Max | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Fines content too high for NGI min max method.

Signed: Jacob Morgan Position: Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 136

| | | | |
|---|---|---|---|
| Technician Name: peter webster | | Date: | 09/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#17_SAMP |
| Sample Description including mass of available material: | | Sample Number: | PU13 Q1 |
| White page 8.5 N Cemented sand / chalk | | Depth (m): | 16.7 |
| | | Sample Type: | q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UU | |
| Insufficient material for testing | □ | UUR | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample fractured, cemented sand / chalk recommend for PL

Signed: peter webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 137

| | | |
|---|---|---|
| Technician Name: peter webster | Date: | 09/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#17_SAMP |
| Sample Description including mass of available material: | Sample Number: | PU13 Q2 |
| White page 8.5 N Cemented sand / chalk | Depth (m): | 16.8 |
| | Sample Type: | q2 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | CRS | |
| Insufficient material for testing | □ | CIU | |
| Sample lost in the laboratory | □ | BE | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Cemented sand / weak rock recommend UCS or PL

Signed: peter webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to UCS |
| Alternative test | X | Lab update: | Not suitable for UCS |
| Non standard test | □ | Alternative: | **Change to PLT** |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Oliver Sirett Position: Project Engineer

Date: 11/04/2023 06/07/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 138

| | | |
|---|---|---|
| Technician Name: peter webster | Date: | 09/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#20_SAMP |
| Sample Description including mass of available material: | Sample Number: | PU17 Q1 |
| White page 9.5/N White Cemented sand / chalk | Depth (m): | 13 |
| | Sample Type: | q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UU | |
| Insufficient material for testing | □ | UUR | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Cancel and put in for PL / flat on onside

Signed: peter webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | Lab Update: | Not suitable for PLT |
| Non standard test | □ | Alternative: | **Cancel Test** |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Oliver Sirett Position: Project Engineer

Date: 11/04/2023 06/07/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 139

| | | |
|---|---|---|
| Technician Name: peter webster | Date: | 09/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#17_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR02 Q1 |
| GLEY 1 3/1 Very dark Grey Limestone | Depth (m): | 4.9 |
| | Sample Type: | q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UU | |
| Insufficient material for testing | □ | UUR | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Dark Chalk / cemented sand recommend UCS

Signed: peter webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to UCS |
| Alternative test | X | Lab Update: | Not suitable for UCS |
| Non standard test | □ | Alternative: | **Change to PLT** |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Oliver Sirett Position: Project Engineer

Date: 11/04/2023 06/07/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 140

| | | |
|---|---|---|
| Technician Name: peter webster | Date: | 09/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#22_SAMP |
| Sample Description including mass of available material: | Sample Number: | PU13 Q1 |
| White page 8.5 N white siltly cemented sand | Depth (m): | 13.5 |
| | Sample Type: | q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | CIUc | |
| Insufficient material for testing | □ | BE | |
| Sample lost in the laboratory | □ | CRS | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Top half cememented sand, bottom half silty and very soft, would recomment UU

Signed: peter webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to UU |
| Alternative test | X | Lab Update: | Sample unsuitable - consists of particles of rock |
| Non standard test | □ | Update: | Cancel Test |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Oliver Sirett Position: Project Engineer

Date: 11/04/2023 06/07/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 141

| | | | |
|---|---|---|---|
| Technician Name: Jacob Morgan | | Date: | 15/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#12_SAMP |
| Sample Description including mass of available material: | | Sample Number: | PU02 B2 |
| Greyish brown SAND, containing gravel and shell fragments | | Depth (m): | 1.2 |
| | | Sample Type: | B2 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Att | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is SAND

Signed: Jacob Morgan Position: Quality Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 142

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 20/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#01_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR02 Q1 |
| | | Depth (m): | 1.4 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 143

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 20/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#01A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR09 Q1 |
| | | Depth (m): | 7.45 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 144

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 20/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#04_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR01 B1 |
| | | Depth (m): | 1.3 |
| | | Sample Type: | B1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Porosity | |
| Insufficient material for testing | □ | Density | |
| Sample lost in the laboratory | □ | Moisture Content | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for porosity test, samples are non-intact and insufficient

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 145

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 20/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#04A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR04 Q1 |
| | | Depth (m): | 3.5 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 146

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 20/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#04A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR05 IS |
| | Depth (m): | 4.7 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PLT | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for PLT test, non-intact

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 147

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 20/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#04A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR14 Q1 |
| | Depth (m): | 18.2 |
| | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 148

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 20/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#05A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR03 Q1 |
| | Depth (m): | 2.7 |
| | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, Cohesive and slightly disturbed

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 149

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 20/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#05A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR04 IS |
| | Depth (m): | 3.55 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Petrographic | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for Petrographic test, Cohesive sample

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 150

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 20/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#05A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR04 Q1 |
| | Depth (m): | 3.9 |
| | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | Porosity | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for scheduled test, Cohesive sample, Alt test: PLT

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 151

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#09_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR05 IS |
| | Depth (m): | 4 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PLT | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for PLT test, non-intact

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 152

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#09_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR21 Q1 |
| | Depth (m): | 20.3 |
| | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT/ Rock Shear

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test or Rock Shear |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 153

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#11_SAMP |
| Sample Description including mass of available material: | Sample Number: | PU03 B1 |
| | Depth (m): | 2 |
| | Sample Type: | B1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Porosity | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for porosity test

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 154

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 21/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#11_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR11 Q1 |
| | | Depth (m): | 12.85 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT/ Rock Shear

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Loading Test or Rock Shear |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 155

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#14A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR02 Q1 |
| | Depth (m): | 1.5 |
| | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT/ Rock Shear

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test or Rock Shear |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 156

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#14A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR02 IS |
| | Depth (m): | 1.7 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PLT | |
| Insufficient material for testing | □ | Rock Shear added 11-5 | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for PLT test, non-intact, alt sample: CR02-Q1 at 1.50m

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | X | **Specify:** | Change sample to CR02-Q1 at 1.5m |
| Alternative test | x | Lab Update: | a) No Sufficient sample of CR02-IS@1.7m for rock shear test. Samples found in core lines are mostly non-intacts. b) UCS of CR02 Q1@1.5m was reported as NCF155 and it was replied to do the Point Load over the Rock Shear. |
| Non standard test | □ | | |
| Dismiss test | □ | | |
| | | Alternative: | **Cancel Test** |

**Engineer comments:**

Signed: Jordan Millman Oliver Sirett Position: Project Engineer

Date: 11/04/2023 06/07/2023

Lab actions complete signed: Date:

## Sample Non-Conformance Number: 157

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#14A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR11 IS |
| | Depth (m): | 12.25 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT/ Rock Shear

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test or Rock Shear |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 158

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#15A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR07 IS |
| | Depth (m): | 8.8 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PLT | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for PLT, Cohesive sample

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 159

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 21/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR07 Q1 |
| | | Depth (m): | 8.6 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS, Cohesive sample

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Atterberg and PSD |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 160

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 21/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR05 IS |
| | | Depth (m): | 6.5 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Porosity | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Dissintegrates during saturation period. Not suitable for porosity test

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 161

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 21/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR09 IS |
| | | Depth (m): | 12.1 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Petrographic | |
| Insufficient material for testing | □ | Porosity | |
| Sample lost in the laboratory | □ | PLT | |
| Sample is unsuitable for testing | x | UCS | |
| Other | □ | Rock Shear | |

Technician Comments, please include mass of material required if insufficient:

Not possible for scheduled test, Cohesive sample

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Atterberg and PSD |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 162

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#15A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR10 IS |
| | Depth (m): | 13.4 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | PLT | |
| Sample lost in the laboratory | □ | Rock Shear | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for scheduled test, Cohesive sample

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Atterberg and PSD |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 163

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 21/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR11 IS |
| | | Depth (m): | 14.2 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Porosity | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for porosity test, Cohesive sample

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 164

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 21/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#17_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR03 Q1 |
| | | Depth (m): | 6.25 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | x | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT/ Rock Shear

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test or Rock Shear |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 165

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#20_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR06 Q1 |
| | Depth (m): | 16.4 |
| | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | x | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT/ Rock Shear

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load or Rock Shear |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 166

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 21/03/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#20_SAMP |
| Sample Description including mass of available material: | Sample Number: | PU20 IS |
| | Depth (m): | 18 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PLT | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for PLT test, non-intact

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel Test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 167

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 21/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#22_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR11 IS |
| | | Depth (m): | 11.8 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 168

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 21/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#24_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR01 Q1 |
| | | Depth (m): | 1.1 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PLT | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for PLT, Cohesive sample

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Atterberg and PSD |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 169

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 21/03/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#24_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR04 IS |
| | | Depth (m): | 4.1 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test, insufficient length (<160mm), Alt test: PLT/ Rock Shear

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test or Rock Shear |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 170

| | | |
|---|---|---|
| Technician Name: Ed Allan | Date: | 03/04/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OSS_GI#17_SAMP |
| Sample Description including mass of available material: | Sample Number: | PU07 B1 |
| Green grey fine SAND with many large and whole shell fragments. | Depth (m): | 3.9 |
| | Sample Type: | B |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | CID | |
| Insufficient material for testing | □ | BE | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Majority of sample is large shell fragments which would need to be removed for test. Sample would therefore not be representative when tested. Let me know if we should abort the test or proceed with test after large particles removed.

Signed: Ed Allan Position: Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 171

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 04/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OSS_GI#17_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR10 IS |
| | | Depth (m): | 13.7 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Rock Shear | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Rock sample is extremely weak. Get crushed during consolidation test making the rock shear test invalid

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 172

| | | | |
|---|---|---|---|
| Technician Name: Peter Webster | | Date: | 06/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| AO5 Bretange Offshore GI | | Location Name: | OWF_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | PU07_Q1 |
| Green Brown exteremely stiff Sandy clay | | Depth (m): | 10.50M |
| | | Sample Type: | Quart |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | CRS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample is unsuitable for testing, due to its sandy nature, sample is also too stiff to cut into the ring and when cut into the ring fractures due to the pressure needed

Signed: Peter Webster Position: advanced Lab tech

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 11/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 173

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 06/04/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#11_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR12 Q1 |
| | Depth (m): | 13.9 |
| | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Rock Shear | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Insufficient length for rock shear test (<80mm)

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel Test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 174

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 06/04/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#14_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR02 IS |
| | Depth (m): | 1.1 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Rock Shear | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Insufficient length for rock shear test (<80mm)

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | x | Update 29.06 | : Change to Point Load |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Oliver Sirett Position: Graduate Geotechnical Engineer

Date: 29/06/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 175

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 06/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR07 IS |
| | | Depth (m): | 8.4 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Rock Shear | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Cohesive-core sample broken during sample preparation and moulding stage

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Oliver Sirett Position: Graduate Geotechnical Engineer

Date: 29/06/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 175

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 06/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR07 IS |
| | | Depth (m): | 8.4 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Rock Shear | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Cohesive-core sample broken during sample preparation and moulding stage

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 176

| | | | |
|---|---|---|---|
| Technician Name: Jacob Morgan | | Date: | 18/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#24_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR07 IS |
| White very stiff chalky CLAY | | Depth (m): | 7 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Att | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Insufficient material could be washed through 425 micron sieve for test

Signed: Jacob Morgan Position: Quality Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 177

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 18/04/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#05A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR04 IS |
| | Depth (m): | 3.6 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Rock Shear | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not suitable for Rock shear test (<80mm). Alternative test: PLT

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 178

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 18/04/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#12_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR14 Q1 |
| | Depth (m): | 16.85 |
| | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

With reference to NCF106, not possible for UCS test (<160mm)

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 179

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 18/04/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#14_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR04 IS |
| 100mm length very stiff stiff clay | Depth (m): | 3.3 |
| | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Rock Shear | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not suitable for Rock Shear test, cohesive

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | Update 29.06 | Cohesive sample - Change to CIU |
| Non standard test | □ | Update 19.07 | Cancel test |
| Dismiss test | x | | |

**Engineer comments:**

UPDATE 19/7/23-Insuffiicient material for CIU/Unsuitable for CIU sample is very stiff CLAY

Signed: Oliver Sirett Oliver Sirett Position: Graduate Geotechnical Engineer

Date: 29/06/2023 19/07/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 180

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 18/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#14A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR10 B1 |
| | | Depth (m): | 11.05 |
| | | Sample Type: | B1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PLT | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

No possible for PLT, non-intact core sample

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 181

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 18/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#17_SAMP |
| Sample Description including mass of available material: | | Sample Number: | PU14 Q1 |
| | | Depth (m): | 17.7 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS test (<160mm), ALT Test: PLT

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 182

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 18/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#22_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR07 B1 |
| | | Depth (m): | 8 |
| | | Sample Type: | B1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PLT | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not suitable for PLT (non-intact)

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | X | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 183

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 18/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#24_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR19 Q1 |
| | | Depth (m): | 19.8 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | UCS | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for UCS (<160mm). ALT test: Rock shear/PLT

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test or Rock Shear |
| Alternative test | X | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/04/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 184

| | | | |
|---|---|---|---|
| Technician Name: Seigfred R. Ocio | | Date: | 25/04/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | CR05 IS |
| | | Depth (m): | 6.5 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Rock Shear | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Not possible for Rock Shear (<80mm).

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load test |
| Alternative test | x | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/05/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 185

| | | |
|---|---|---|
| Technician Name: Seigfred R. Ocio | Date: | 28/04/2023 |
| Project Name: | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | Location Name: | OWF_GI#05A_SAMP |
| Sample Description including mass of available material: | Sample Number: | CR04 Q1 |
| | Depth (m): | 3.9 |
| | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | PLT | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Core sample is cohesive, Alt test: PSD/hydro/Att

Signed: Seigfred R. Ocio Position: Senior Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to PSD, Atterberg and CIU |
| Alternative test | x | | |
| Non standard test | □ | Update 19.07 | Cancel CIU (classificaiton already completed) |
| Dismiss test | □ | | |

**Engineer comments:**

LAB UPDATE-Sample unsuitable/insufficient for CIU test.

Signed: Jordan Millman Oliver Sirett Position: Project Engineer

Date: 19/05/2023 19/07/2023

Lab actions complete signed: Daniel Smith Date: 19/07/2023

# Sample Non-Conformance Number: 187

| | | | |
|---|---|---|---|
| Technician Name: Peter Webster | | Date: | 11/05/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#04A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | PU01A B1 |
| | | Depth (m): | 0 |
| | | Sample Type: | B1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | BE | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:

Sample too coarse to test at 70mm, able to test the CID at 50mm, recommend to scrap BE

Signed: Peter Webster Position: Advanced Laboratory Technician

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to CID at 50mm, cancel BE |
| Alternative test | x | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/05/2023

Lab actions complete signed: Date:

# NCF188

| | | | |
|---|---|---|---|
| Technician Name: Daniel Smith | | Date: | 16/05/2023 |
| Project Name: Bretagne | | Project Number: | GMOP21-G-019 |
| | | Location Name: | OWF_GI#12_Samp |
| Sample Description including mass of available material: | | Sample Number: | CR16 |
| Limestone | | Depth (m): | 18.95 |
| | | Sample Type: | IS |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Rock shear | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | □ | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:
Encapsulating material failed during test, unable to report data

Signed: Daniel Smith Position: Laboratory manager

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Change to Point Load Test |
| Alternative test | x | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/05/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 189

| | | | |
|---|---|---|---|
| Technician Name: Peter Webster | | Date: | 17/05/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | PU06 Q1 |
| Quart | | Depth (m): | 10.2 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Bender Element | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | x | | |
| Other | □ | | |

Technician Comments, please include mass of material required if insufficient:
Bender data corrupted-unable to recover

Signed: Daniel Smith Position: Laboratory manager

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | Cancel test |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | x | | |

**Engineer comments:**

Signed: Jordan Millman Position: Project Engineer

Date: 19/05/2023

Lab actions complete signed: Date:

# Sample Non-Conformance Number: 190

| | | | |
|---|---|---|---|
| Technician Name: Peter Webster | | Date: | 23/05/2023 |
| Project Name: | | Project Number: | GMOP21-G-019 |
| GMOP21-G-019 -Bretagne offshore | | Location Name: | OWF_GI#15A_SAMP |
| Sample Description including mass of available material: | | Sample Number: | PU12 |
| Quart | | Depth (m): | 18.1 |
| | | Sample Type: | Q1 |

| Reason for non-conformance | | Test aborted | Test aborted |
|---|---|---|---|
| Sample not received | □ | Bender Element | |
| Insufficient material for testing | □ | | |
| Sample lost in the laboratory | □ | | |
| Sample is unsuitable for testing | | | |
| Other | X | | |

Technician Comments, please include mass of material required if insufficient:
Bender data corrupted-unable to recover

Signed: Daniel Smith Position: Laboratory manager

**Engineer requirements**

| | | | |
|---|---|---|---|
| Alternative sample | □ | **Specify:** | CANCEL TEST |
| Alternative test | □ | | |
| Non standard test | □ | | |
| Dismiss test | □ | | |

**Engineer comments:**

Signed: Position:

Date:

Lab actions complete signed: Date:

## Appendix B.2 Summary Table of Laboratory Tests

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#01_SAMP | CR01 | 0.55 | | 2.70 | 2.60 | | | | | | | | | | |
| OWF_GI#01_SAMP | CR02 | 2.4 | | 2.54 | 2.31 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR01 | 0.35 | | 2.79 | 2.54 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR02 | 1.4 | | 2.81 | 2.73 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR03 | 1.7 | 14.0 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR05 | 3.2 | 16.0 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR06 | 4.2 | 19.0 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR07 | 5.2 | | 2.40 | 1.88 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR09 | 7.45 | | 2.35 | 2.03 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR10 | 8.65 | | 2.43 | 2.17 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR10 | 9.3 | | 2.78 | 2.67 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR11 | 10 | | 2.66 | 2.58 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR12 | 11.5 | 10.0 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR13 | 12.5 | 15.0 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | PU02A | 14.5 | | 2.12 | 1.71 | | | | | 30.74 | 24.90 | 7.4 | | | |
| OWF_GI#01A_SAMP | PU03 | 15 | | 2.04 | 1.67 | | | | | 68.35 | 9.23 | | | | |
| OWF_GI#01A_SAMP | CR15 | 16.1 | | 2.19 | 1.99 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR16 | 17.35 | 21.0 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR17 | 18.65 | | 2.09 | 1.83 | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR18 | 20 | 15.0 | | | | | | | | | | | | |
| OWF_GI#04_SAMP | PU01A | 0 | | | | | | | | 25.38 | 2.95 | | | | |
| OWF_GI#04_SAMP | PU01A | 0.4 | | 2.11 | 1.77 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Ref: GMOP21-G-019-FAC

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#04_SAMP | PU02 | 0.7 | | | | | | | | | | | 1.3 | 1.87 | |
| OWF_GI#04_SAMP | PU02 | 1 | | 1.96 | 1.64 | | | | | | | | | | |
| OWF_GI#04_SAMP | CR01 | 1.4 | 1.0 | | | | | | | | | | | | |
| OWF_GI#04_SAMP | CR03 | 4.1 | 6.0 | | | | | | | | | | | | |
| OWF_GI#04_SAMP | CR05 | 5.8 | 5.0 | | | | | | | | | | | | |
| OWF_GI#04_SAMP | CR06 | 6.4 | | 2.51 | 2.46 | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU01A | 0.1 | | 1.53 | 1.32 | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU01A | 0.2 | | 1.59 | 1.37 | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR02 | 1.5 | 0.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR03 | 2.5 | 2.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR04 | 3.5 | | 2.11 | 2.05 | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR06 | 5.5 | | 2.76 | 2.56 | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU03 | 8.3 | | | | | | | | 44.71 | 16.90 | 4.4 | | | |
| OWF_GI#04A_SAMP | PU03 | 8.5 | 19.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU04 | 9.4 | 27.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU05 | 9.8 | | 2.07 | 1.74 | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU05 | 10 | | | | | | | | 59.73 | 11.02 | | | | |
| OWF_GI#04A_SAMP | PU05 | 10.1 | 22.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU06 | 11.3 | 27.0 | | | | | | | 58.79 | 12.28 | | | | |
| OWF_GI#04A_SAMP | PU07 | 11.8 | 12.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR10 | 11.9 | 24.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR10 | 12.05 | | 2.18 | 1.76 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Ref: GMOP21-G-019-FAC

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#04A_SAMP | PU08 | 13.9 | 23.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU09 | 14.2 | | | | | | | | 72.84 | 7.58 | | | | |
| OWF_GI#04A_SAMP | PU09 | 14.5 | 23.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU10 | 15 | 19.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU11 | 15.4 | 21.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU12 | 15.8 | 22.0 | 2.06 | 1.69 | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU13 | 16.1 | 31.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | PU14 | 14.4 | 18.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR12 | 14.5 | | 2.59 | 2.11 | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR13 | 16.4 | | 2.18 | 1.91 | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR14 | 18.5 | | 2.38 | 2.00 | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR15 | 19.7 | | 2.35 | 2.18 | | | | | | | | | | |
| OWF_GI#05_SAMP | PU01A | 0.2 | 16.0 | | | | | | | | | | | | |
| OWF_GI#05_SAMP | PU01A | 0.3 | 5.0 | | | | | | | | | | | | |
| OWF_GI#05A_SAMP | PU01A | 0 | | | | | | | | 36 | 5.84 | | | | |
| OWF_GI#05A_SAMP | PU01A | 0.1 | | 1.97 | 1.66 | | | | | | | | | | |
| OWF_GI#05A_SAMP | CR01 | 0.8 | | 2.56 | 2.39 | | | | | | | | | | |
| OWF_GI#05A_SAMP | CR01 | 1 | 5.0 | | | | | | | | | | | | |
| OWF_GI#05A_SAMP | CR02 | 1.7 | 8.0 | | | | | | | | | | | | |
| OWF_GI#05A_SAMP | CR03 | 2.7 | | 2.55 | 2.41 | | | | | | | | | | |
| OWF_GI#05A_SAMP | CR03 | 3.4 | 22.0 | | | | | | | | | | | | |
| OWF_GI#05A_SAMP | CR04 | 3.65 | | 2.59 | 2.35 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#05A_SAMP | CR04 | 3.9 | | 2.12 | 1.46 | | 100 | 28 | 72 | 0 | 72.91 | 22.0 | | | |
| OWF_GI#05A_SAMP | CR05 | 4.5 | | | | | 56 | 28 | 28 | 0.08 | 87.26 | 27.6 | | | |
| OWF_GI#05A_SAMP | CR05 | 4.7 | | 2.01 | 1.51 | | | | | | | | | | |
| OWF_GI#05A_SAMP | CR05 | 4.95 | | 2.00 | 1.50 | | | | | | | | | | |
| OWF_GI#05A_SAMP | PU02 | 5.5 | | | | | 52 | 23 | 29 | 1.24 | 90.35 | 18.7 | | | |
| OWF_GI#05A_SAMP | PU02 | 5.6 | 33.0 | | | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR01 | 5.6 | | 2.40 | 2.11 | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR02 | 6.5 | | | | | 61 | 23 | 38 | 12.93 | 76.33 | 16.4 | | | |
| OWF_GI#05B_SAMP | CR02 | 6.8 | | 2.25 | 1.64 | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR03 | 7.5 | | | | | | | | 28.12 | 61.67 | 16.6 | | | |
| OWF_GI#05B_SAMP | CR03 | 7.6 | | | | | 87 | 24 | 63 | | | | | | |
| OWF_GI#05B_SAMP | CR03 | 7.85 | | 2.02 | 1.55 | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR03 | 8 | | 2.17 | 1.89 | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR04 | 8.5 | | | | | 62 | 32 | 30 | 0 | 94.98 | 17.8 | | | |
| OWF_GI#05B_SAMP | CR04 | 8.65 | | 2.27 | 1.97 | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR05 | 9.5 | | | | | 52 | 28 | 24 | 0.085 | 82.74 | 13.9 | | | |
| OWF_GI#05B_SAMP | CR05 | 10.2 | | 2.06 | 1.67 | | | | | | | | | | |
| OWF_GI#08_CPT | CR01 | 1.55 | | 2.34 | 2.05 | | | | | | | | | | |
| OWF_GI#08_CPT | CR02 | 2.6 | | 2.45 | 2.17 | | | | | | | | | | |
| OWF_GI#08_CPT | CR03 | 4 | | 2.53 | | | | | | | | | | | |
| OWF_GI#08_CPT | CR06 | 6.55 | 13.0 | | | | | | | | | | | | |
| OWF_GI#08_CPT | CR07 | 3 | | 1.93 | 1.64 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#08_CPT | CR08 | 9.5 | 12.0 | | | | | | | | | | | | |
| OWF_GI#08_CPT | CR09 | 10.75 | | 2.17 | 1.89 | | | | | | | | | | |
| OWF_GI#08_CPT | CR10 | 11.55 | | 2.62 | 2.20 | | | | | | | | | | |
| OWF_GI#08_CPT | CR10 | 11.65 | | 2.12 | 1.81 | | | | | | | | | | |
| OWF_GI#08_CPT | CR11 | 13 | | 2.30 | 1.95 | | | | | | | | | | |
| OWF_GI#08_CPT | CR12 | 13.65 | | 1.94 | 1.60 | | | | | | | | | | |
| OWF_GI#08_CPT | CR12 | 14.05 | | 2.47 | 2.25 | | | | | | | | | | |
| OWF_GI#08_CPT | CR13 | 14.6 | | 2.37 | 2.21 | | | | | | | | | | |
| OWF_GI#08_CPT | PU02 | 15.7 | | 1.53 | 1.11 | | | | | | | | | | |
| OWF_GI#08_CPT | PU02 | 16 | | 1.60 | 1.16 | | | | | | | | | | |
| OWF_GI#08_CPT | CR14 | 16.7 | | 1.89 | 1.59 | | | | | | | | | | |
| OWF_GI#08_CPT | CR15 | 17.65 | | 2.35 | 2.18 | | | | | | | | | | |
| OWF_GI#08_CPT | CR16 | 18.7 | | 2.22 | 2.16 | | | | | | | | | | |
| OWF_GI#08_CPT | CR17 | 19.75 | | 2.63 | 2.48 | | | | | | | | | | |
| OWF_GI#08_CPT | CR17 | 20.45 | | 2.10 | 1.88 | | | | | | | | | | |
| OWF_GI#08_CPT | CR18 | 20.65 | 37.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR01 | 0.2 | | 2.48 | 2.02 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR02 | 1.2 | | 2.63 | 2.29 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR04 | 3.1 | 16.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR05 | 4.1 | 16.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR06 | 5.1 | 12.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR07 | 6 | 9.0 | | | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#09_SAMP | CR09 | 8.3 | | 1.74 | 1.54 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR10 | 9.3 | | 2.34 | 2.11 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR11 | 10.35 | | 1.73 | 1.45 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR12 | 11 | | 2.11 | 1.74 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR13 | 12 | 22.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR14 | 13 | | 1.79 | 1.49 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR15 | 14 | | 2.70 | 2.62 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR16 | 15.1 | | 1.84 | 1.82 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR17 | 16.1 | 12.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR18 | 17.1 | 12.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR19 | 18.1 | 8.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR20 | 19.1 | 12.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR20 | 19.4 | | 1.60 | 1.34 | | | | | | | | | | |
| OWF_GI#09_SAMP | CR21 | 20.1 | 15.0 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR21 | 20.3 | | 1.96 | 1.57 | | | | | | | | | | |
| OWF_GI#11_SAMP | PU01B | 0 | | | | | | | | 2.61 | 3.96 | | 1.28 | 1.68 | |
| OWF_GI#11_SAMP | PU01B | 0.2 | | 2.01 | 1.62 | | | | | | | | | | |
| OWF_GI#11_SAMP | PU01B | 0.4 | | 1.86 | 1.51 | | | | | | | | | | |
| OWF_GI#11_SAMP | PU01B | 0.6 | 24.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | PU02A | 1.1 | | 1.65 | 1.50 | | | | | | | | | | |
| OWF_GI#11_SAMP | PU02A | 1.4 | 11.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | PU02A | 1.3 | | 1.86 | 1.58 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#11_SAMP | PU03 | 2 | | | | | | | | | | | 1.25 | 1.77 | |
| OWF_GI#11_SAMP | PU03 | 2.1 | | 1.79 | 1.46 | | | | | | | | | | |
| OWF_GI#11_SAMP | PU03 | 2.3 | 23.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | PU06 | 4.05 | 25.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR04 | 4.55 | | 2.09 | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR05 | 5.55 | 22.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR06 | 7.1 | 7.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR08 | 9.05 | | 2.41 | 2.11 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR09 | 9.8 | | 2.23 | 1.89 | | | | | | | | | | |
| OWF_GI#11_SAMP | PU07 | 11.6 | 22.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | PU08 | 12.25 | | | | | | | | 72.85 | 7.11 | | | | |
| OWF_GI#11_SAMP | PU08 | 12.3 | | 1.73 | 1.42 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR11 | 13.2 | | 1.82 | 1.53 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR12 | 13.9 | | 1.92 | 1.68 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR13 | 14.7 | | 2.22 | 1.93 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR13 | 15 | | 2.14 | 1.89 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR14 | 16.1 | 15.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR15 | 16.5 | | 2.62 | 2.24 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR15 | 17 | | 2.50 | 2.16 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR16 | 17.5 | | 2.66 | 2.22 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR16 | 17.85 | | | | | 30 | 21 | 9 | 16.37 | 19.83 | 9.2 | | | |
| OWF_GI#11_SAMP | CR16 | 17.9 | | 1.68 | 1.34 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#11_SAMP | CR17 | 18.5 | | 2.55 | 2.22 | | | | | | | | | | |
| OWF_GI#11_SAMP | CR17 | 18.75 | | | | | 31 | 17 | 14 | 23.43 | 47.29 | 14.8 | | | |
| OWF_GI#11_SAMP | CR17 | 19 | 26.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR18 | 19.7 | | 2.20 | 1.88 | | | | | | | | | | |
| OWF_GI#12_SAMP | P01 | 0 | | | | | | | | 0.55 | 4.42 | | | | |
| OWF_GI#12_SAMP | P01 | 0.1 | | 1.86 | 1.50 | | | | | | | | | | |
| OWF_GI#12_SAMP | PU01 | 0.5 | | | | | | | | | | | 1.22 | 1.62 | |
| OWF_GI#12_SAMP | PU01A | 0.5 | | | | | | | | | | | 1.22 | 1.62 | |
| OWF_GI#12_SAMP | PU01A | 0.6 | | 1.86 | 1.52 | | | | | | | | | | |
| OWF_GI#12_SAMP | PU01A | 0.9 | | 1.93 | 1.64 | | | | | | | | | | |
| OWF_GI#12_SAMP | PU02 | 1.1 | | 1.79 | 1.39 | | | | | | | | | | |
| OWF_GI#12_SAMP | PU02 | 1.2 | | | | | | | | 32.91 | 1.96 | | | | |
| OWF_GI#12_SAMP | PU02 | 1.4 | | 1.76 | 1.59 | | | | | | | | | | |
| OWF_GI#12_SAMP | PU03 | 1.55 | 7.0 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | PU03 | 1.7 | | 1.83 | 1.53 | | | | | | | | | | |
| OWF_GI#12_SAMP | PU04 | 2.1 | | 1.81 | 1.45 | | | | | | | | | | |
| OWF_GI#12_SAMP | PU05 | 2.4 | | 1.80 | 1.47 | | | | | | | | | | |
| OWF_GI#12_SAMP | PU07 | 3.9 | | | | | | | | 76.92 | 9.21 | | | | |
| OWF_GI#12_SAMP | PU07 | 4 | 11.0 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR02 | 4.35 | | 2.59 | 2.23 | | | | | | | | | | |
| OWF_GI#12_SAMP | CR05 | 7.45 | | 2.67 | 2.38 | | | | | | | | | | |
| OWF_GI#12_SAMP | CR06 | 8.36 | 1.0 | | | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#12_SAMP | CR07 | 9.62 | 1.0 | 2.73 | 2.65 | | | | | | | | | | |
| OWF_GI#12_SAMP | CR09 | 12 | | 2.33 | 1.96 | | | | | | | | | | |
| OWF_GI#12_SAMP | CR10 | 13.85 | 20.0 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR12 | 14.35 | 7.0 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR12 | 14.6 | 20.0 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR12 | 14.75 | | 1.58 | 1.48 | | | | | | | | | | |
| OWF_GI#12_SAMP | PU10 | 16.3 | | 1.34 | 1.14 | | | | | | | | | | |
| OWF_GI#12_SAMP | CR14 | 16.4 | 17.0 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | PU11 | 18.3 | 13.0 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR16 | 19 | | 2.45 | 2.36 | | | | | | | | | | |
| OWF_GI#12_SAMP | CR17 | 19.55 | | 2.10 | 2.06 | | | | | | | | | | |
| OWF_GI#13_CPT | PU01 | 0.1 | 18.0 | | | | | | | | | | | | |
| OWF_GI#13_CPT | CR01 | 1.4 | | 2.11 | 1.97 | | | | | | | | | | |
| OWF_GI#13_CPT | CR02 | 2.4 | | 1.92 | 1.66 | | | | | | | | | | |
| OWF_GI#13_CPT | CR03 | 3.3 | | 2.42 | 1.36 | | | | | | | | | | |
| OWF_GI#13_CPT | CR04 | 4 | | 2.61 | | | | | | | | | | | |
| OWF_GI#13_CPT | CR05 | 5.45 | | 2.55 | 2.38 | | | | | | | | | | |
| OWF_GI#13_CPT | CR06 | 6.25 | 19.0 | | | | | | | | | | | | |
| OWF_GI#13_CPT | CR07 | 7.15 | 10.0 | | | | | | | | | | | | |
| OWF_GI#13_CPT | CR09 | 9.1 | | 2.44 | 2.12 | | | | | | | | | | |
| OWF_GI#13_CPT | CR10 | 10.6 | | 2.39 | 1.98 | | | | | | | | | | |
| OWF_GI#13_CPT | CR10 | 10.75 | | 2.60 | 1.32 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#13_CPT | CR12 | 12.05 | 18.0 | | | | | | | | | | | | |
| OWF_GI#13_CPT | CR13 | 13 | | 1.68 | 1.09 | | | | | | | | | | |
| OWF_GI#13_CPT | CR13 | 13.1 | | 2.21 | 2.03 | | | | | | | | | | |
| OWF_GI#13_CPT | CR14 | 14.1 | | 1.99 | 1.76 | | | | | | | | | | |
| OWF_GI#13_CPT | CR15 | 15.3 | | 2.33 | 1.99 | | | | | | | | | | |
| OWF_GI#13_CPT | CR16 | 16.6 | | 2.18 | 1.91 | | | | | | | | | | |
| OWF_GI#13_CPT | CR17 | 17.5 | | 2.11 | 1.69 | | | | | | | | | | |
| OWF_GI#13_CPT | CR18 | 18.75 | | 2.14 | 1.84 | | | | | | | | | | |
| OWF_GI#13_CPT | CR19 | 19.7 | 14.0 | | | | | | | | | | | | |
| OWF_GI#14_SAMP | CR01 | 0.3 | 12.0 | | | | | | | | | | | | |
| OWF_GI#14_SAMP | CR02 | 1.3 | | 2.21 | 1.99 | | | | | | | | | | |
| OWF_GI#14_SAMP | CR03 | 2.2 | 7.0 | 2.73 | 2.55 | | | | | | | | | | |
| OWF_GI#14_SAMP | CR03 | 2.4 | 12.0 | | | | | | | | | | | | |
| OWF_GI#14_SAMP | CR04 | 3 | | 2.51 | 2.01 | | | | | | | | | | |
| OWF_GI#14_SAMP | CR04 | 3.8 | | 2.75 | 2.25 | | | | | | | | | | |
| OWF_GI#14_SAMP | PU01 | 4 | | 2.21 | 1.91 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR01 | 0.45 | | 2.27 | 2.08 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR02 | 2.3 | | 2.25 | 1.97 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR04 | 4.6 | | | | | 48 | 23 | 25 | 10.73 | 34.27 | 16.5 | | | |
| OWF_GI#14A_SAMP | CR08 | 8.5 | | | | | 35 | 25 | 10 | 0.15 | 31.01 | 10.2 | | | |
| OWF_GI#14A_SAMP | CR08 | 8.25 | | 2.61 | 2.33 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR08 | 8.75 | | 2.61 | 2.33 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#14A_SAMP | CR08 | 9.05 | | 1.88 | 1.52 | | | | | | | | | | |
| OWF_GI#14A_SAMP | PU02 | 9.55 | | 2.08 | 1.63 | | | | | | | | | | |
| OWF_GI#14A_SAMP | PU02 | 9.6 | 28.0 | | | | 38 | 25 | 13 | 0.01 | 41.79 | 13.4 | | | |
| OWF_GI#14A_SAMP | CR09 | 10.2 | | 2.56 | 2.44 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR10 | 11.05 | | 2.68 | 2.55 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR11 | 12.05 | | 2.92 | 2.65 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR11 | 12.55 | | 2.78 | 2.60 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR12 | 12.4 | | 2.51 | 2.16 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR13 | 14.5 | | 2.50 | 2.21 | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR13 | 14.7 | | 2.65 | 2.39 | | | | | | | | | | |
| OWF_GI#14A_SAMP | PU08 | 18.7 | | | | | | | | 6.46 | 6.42 | | | | |
| OWF_GI#14A_SAMP | PU08 | 18.8 | | 1.75 | 1.37 | | | | | | | | | | |
| OWF_GI#14A_SAMP | PU09 | 19.3 | | 1.56 | 1.28 | | | | | | | | | | |
| OWF_GI#14A_SAMP | PU10 | 19.6 | | 1.65 | 1.31 | | | | | | | | | | |
| OWF_GI#14A_SAMP | PU11 | 20.05 | | 1.62 | 1.31 | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR01 | 0.1 | | 2.31 | 2.03 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU02 | 2 | | | | | 46 | 22 | 24 | 25.09 | 56.37 | 26.2 | | | |
| OWF_GI#15A_SAMP | PU02 | 2.1 | | 1.80 | 1.28 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU03 | 2.55 | | 1.51 | 1.17 | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR03 | 3.3 | 11.0 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR03 | 3.05 | 18.0 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR04 | 4 | | | | | | | | 82.27 | 4.58 | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#15A_SAMP | CR04 | 4.1 | 17.0 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU04 | 5 | | 1.90 | 1.56 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU05 | 5.5 | 25.0 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR05 | 6 | 20.0 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR06 | 7 | | | | | 41 | 24 | 17 | 0.52 | 78.84 | 16.9 | | | |
| OWF_GI#15A_SAMP | CR06 | 7.4 | | 2.04 | 1.47 | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR07 | 8.6 | | 2.13 | 1.85 | | 61 | 26 | 35 | 0.02 | 78.00 | 14.3 | | | |
| OWF_GI#15A_SAMP | CR08 | 9.3 | 38.0 | | | | | | | 8.57 | 56.37 | 7.4 | | | |
| OWF_GI#15A_SAMP | CR08 | 9.4 | | 1.82 | 1.36 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU06 | 10 | | | | | 91 | 27 | 64 | 0.16 | 97.73 | 26.6 | | | |
| OWF_GI#15A_SAMP | PU06 | 10.2 | | 1.90 | 1.56 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU07 | 10.5 | | 2.31 | 1.53 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU07 | 10.6 | | 2.07 | 1.39 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU08 | 11.05 | 53.0 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU08 | 11.3 | | 2.13 | 1.61 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU09 | 11.55 | 5.0 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR09 | 12.1 | | | | | 57 | 29 | 28 | 1.39 | 91.30 | 14.4 | | | |
| OWF_GI#15A_SAMP | CR09 | 12.8 | | 1.94 | 1.41 | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR10 | 13.2 | 28.0 | 1.85 | 1.36 | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR10 | 13.4 | | | | | 53 | 20 | 33 | 13.11 | 52.78 | 10.6 | | | |
| OWF_GI#15A_SAMP | CR11 | 14.1 | | 1.32 | 1.08 | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR12 | 15 | | | | | 48 | 21 | 27 | 4.8 | 75.93 | 23.1 | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#15A_SAMP | CR12 | 15.5 | | 2.05 | 1.50 | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR13 | 16.25 | | | | | 61 | 24 | 37 | 0.02 | 95.52 | 33.8 | | | |
| OWF_GI#15A_SAMP | CR13 | 16.5 | | 1.97 | 1.54 | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR14 | 17.3 | | 2.03 | 1.48 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU12 | 18 | | | | | 65 | 25 | 40 | 0.14 | 95.23 | 41.6 | | | |
| OWF_GI#15A_SAMP | PU12 | 18.1 | | 2.08 | 1.66 | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU13 | 18.6 | 28.0 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR15 | 18.6 | | | | | 43 | 28 | 15 | 85.12 | 8.54 | | | | |
| OWF_GI#15A_SAMP | CR15 | 19.2 | | 1.70 | 1.23 | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR16 | 19.5 | | | | | 48 | 25 | 23 | 3.88 | 78.33 | 29.4 | | | |
| OWF_GI#15A_SAMP | CR16 | 19.9 | | 1.84 | 1.39 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU01 | 0 | | 1.75 | 1.49 | | | | | 0.38 | 14.90 | 7.3 | | | |
| OWF_GI#17_SAMP | PU01 | 0.6 | | 1.64 | 1.38 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU02 | 0.8 | | 1.79 | 1.47 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU02 | 1.3 | | 1.92 | 1.56 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU04 | 2.5 | | | | | | | | 0.5 | 5.44 | | | | |
| OWF_GI#17_SAMP | PU04 | 2.6 | | 1.92 | 1.54 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU05 | 2.9 | | | | | | | | | | | 1.32 | 1.74 | |
| OWF_GI#17_SAMP | PU05 | 3.1 | | 1.93 | 1.60 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU06A | 3.5 | | | | | | | | 16.33 | 8.45 | | | | |
| OWF_GI#17_SAMP | PU06A | 3.7 | | 1.69 | 1.38 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU07 | 4.2 | | 1.89 | 1.49 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#17_SAMP | PU08 | 4.7 | | 1.75 | 1.39 | | | | | | | | | | |
| OWF_GI#17_SAMP | CR02 | 5.6 | | 2.32 | 1.92 | | | | | | | | | | |
| OWF_GI#17_SAMP | CR02 | 5.8 | | | | | | | | 68.87 | 16.10 | 6.6 | | | |
| OWF_GI#17_SAMP | CR03 | 6.25 | | 2.02 | 1.57 | | | | | | | | | | |
| OWF_GI#17_SAMP | CR04 | 7.1 | 7.0 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR05 | 7.6 | | 2.21 | 1.97 | | | | | | | | | | |
| OWF_GI#17_SAMP | CR06 | 8.5 | 13.0 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | PU10 | 10.5 | | 2.02 | 1.60 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU10 | 10.6 | | | | | | | | 18.89 | 25.80 | 7.3 | | | |
| OWF_GI#17_SAMP | PU11 | 11.5 | 21.0 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | PU12 | 11.8 | 14.0 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR08 | 11.8 | | 2.02 | 1.73 | | | | | | | | | | |
| OWF_GI#17_SAMP | CR09 | 13.1 | | 2.04 | 1.73 | | | | | | | | | | |
| OWF_GI#17_SAMP | CR10 | 14.2 | | 1.79 | 1.40 | | | | | | | | | | |
| OWF_GI#17_SAMP | CR11 | 15 | | 1.82 | 1.49 | | | | | | | | | | |
| OWF_GI#17_SAMP | CR12 | 15.9 | 28.0 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | PU13 | 16.7 | | | | | | | | 36.94 | 13.01 | | | | |
| OWF_GI#17_SAMP | PU13 | 16.8 | | 1.94 | 1.52 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU14 | 17.7 | | 2.00 | 1.57 | | | | | | | | | | |
| OWF_GI#17_SAMP | PU15 | 18.4 | 24.0 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR13 | 19.1 | 18.0 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR14 | 19.9 | 29.0 | | | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#20_CPT | CR01 | 5.4 | 18.0 | | | | | | | | | | | | |
| OWF_GI#20_CPT | CR01 | 5.6 | | 2.00 | 1.61 | | | | | | | | | | |
| OWF_GI#20_CPT | CR02 | 12 | 17.0 | | | | | | | | | | | | |
| OWF_GI#20_CPT | CR03 | 18.7 | | 2.47 | 2.08 | | | | | | | | | | |
| OWF_GI#20_CPT | CR03 | 18.9 | | 1.94 | 1.60 | | | | | | | | | | |
| OWF_GI#20_CPT | CR04 | 19.5 | | 1.92 | 1.54 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU01 | 0 | | | | | | | | 0.64 | 11.42 | | | | |
| OWF_GI#20_SAMP | PU01 | 0.1 | | 1.90 | 1.53 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU01 | 0.5 | | 1.82 | 1.51 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU02 | 0.9 | | 1.87 | 1.56 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU02 | 1.2 | | 1.70 | 1.39 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU03 | 1.7 | | 1.77 | 1.47 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU05 | 2.4 | | 1.74 | 1.40 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU07 | 3.2 | | | | | | | | 0.81 | 4.33 | | | | |
| OWF_GI#20_SAMP | PU07 | 3.4 | | 1.71 | 1.38 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU08 | 4 | | 1.85 | 1.52 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU11 | 6.7 | | | | | | | | 76.47 | 4.56 | | | | |
| OWF_GI#20_SAMP | PU11 | 7 | 24.0 | | | | | | | | | | | | |
| OWF_GI#20_SAMP | PU12 | 8.2 | | 1.99 | 1.50 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU13 | 9.4 | | 1.88 | 1.65 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU14 | 9.7 | | | | | | | | 7.6 | 21.60 | 5.1 | | | |
| OWF_GI#20_SAMP | PU14 | 10.4 | | 1.89 | 1.51 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#20_SAMP | PU15 | 11.2 | | 1.82 | 1.38 | | | | | | | | | | |
| OWF_GI#20_SAMP | CR03 | 11.7 | | 2.07 | 1.88 | | | | | | | | | | |
| OWF_GI#20_SAMP | CR04 | 12 | 32.0 | | | | | | | | | | | | |
| OWF_GI#20_SAMP | PU17 | 13 | | | | | | | | 49.7 | 6.88 | | | | |
| OWF_GI#20_SAMP | PU17 | 13.35 | | 1.82 | 1.44 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU18 | 13.8 | | | | | | | | 70 | 5.41 | | | | |
| OWF_GI#20_SAMP | PU18 | 14.6 | | 2.03 | 1.64 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU19 | 15 | | 2.61 | 2.19 | | | | | | | | | | |
| OWF_GI#20_SAMP | CR05 | 15.55 | | 2.00 | 1.50 | | | | | | | | | | |
| OWF_GI#20_SAMP | CR06 | 16.4 | | 2.11 | 1.69 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU20 | 18 | | 2.18 | 1.72 | | | | | | | | | | |
| OWF_GI#20_SAMP | PU21 | 18.3 | 16.0 | | | | | | | | | | | | |
| OWF_GI#20_SAMP | CR08 | 19 | | 1.90 | 1.48 | | | | | | | | | | |
| OWF_GI#22_CPT | CR01 | 5.25 | | 2.07 | 2.03 | | | | | | | | | | |
| OWF_GI#22_CPT | CR03 | 6.1 | 7.0 | | | | | | | | | | | | |
| OWF_GI#22_CPT | CR04 | 7.1 | 28.0 | | | | | | | | | | | | |
| OWF_GI#22_CPT | CR05 | 8 | 5.0 | | | | | | | | | | | | |
| OWF_GI#22_CPT | CR06 | 9 | | 2.58 | 2.30 | | | | | | | | | | |
| OWF_GI#22_CPT | CR07 | 11.35 | 3.0 | | | | | | | | | | | | |
| OWF_GI#22_CPT | CR08 | 12.65 | | 2.42 | 2.14 | | | | | | | | | | |
| OWF_GI#22_CPT | CR09 | 13.6 | 29.0 | | | | | | | | | | | | |
| OWF_GI#22_CPT | CR10 | 14.2 | | 2.31 | 2.10 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#22_CPT | CR11 | 15.1 | | 2.38 | 2.02 | | | | | | | | | | |
| OWF_GI#22_CPT | CR12 | 16 | | 1.87 | 1.47 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU01 | 0 | | | | | | | | 2.04 | 5.24 | | 1.27 | 1.73 | |
| OWF_GI#22_SAMP | PU01 | 0.1 | | 1.98 | 1.65 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU01 | 0.3 | | 1.73 | 1.60 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU02 | 0.8 | | 1.72 | 1.37 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU06 | 2.7 | | | | | | | | 2.25 | 3.03 | | | | |
| OWF_GI#22_SAMP | PU06 | 2.9 | | 1.88 | 1.62 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU06 | 3 | | 1.89 | 1.59 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU07 | 3.3 | | | | | | | | 5.82 | 4.38 | | | | |
| OWF_GI#22_SAMP | PU07 | 3.4 | | 1.82 | 1.54 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU07 | 3.5 | | 1.83 | 1.57 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU08 | 3.9 | | 2.07 | 1.70 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU08 | 4.1 | | | | | | | | 0.2 | 7.45 | | | | |
| OWF_GI#22_SAMP | PU08 | 4.2 | 22.0 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | CR03 | 5.5 | 15.0 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | CR07 | 8 | | 2.25 | 2.05 | | | | | | | | | | |
| OWF_GI#22_SAMP | CR08 | 8.5 | 5.0 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | CR09 | 9.6 | | 2.62 | 2.30 | | | | | | | | | | |
| OWF_GI#22_SAMP | CR11 | 11.8 | | 2.46 | 2.39 | | | | | | | | | | |
| OWF_GI#22_SAMP | CR12 | 12.5 | | 2.73 | 2.53 | | | | | | | | | | |
| OWF_GI#22_SAMP | CR12 | 12.7 | 8.0 | | | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#22_SAMP | PU13 | 13.5 | | | | | 32 | 25 | 7 | 4.4 | 60.40 | 29.1 | | | |
| OWF_GI#22_SAMP | PU13 | 13.6 | 27.0 | 2.01 | 1.43 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU13 | 13.8 | | 1.98 | 1.40 | | | | | | | | | | |
| OWF_GI#22_SAMP | CR13 | 14.3 | 9.0 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | CR15 | 16.3 | 9.0 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | PU15 | 18.2 | | 1.86 | 1.48 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU15 | 18.3 | | 2.10 | 1.67 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU15 | 18.4 | | | | | | | | 16.27 | 22.39 | 4.8 | | | |
| OWF_GI#22_SAMP | PU15 | 18.5 | 26.0 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | PU16 | 18.9 | | 1.98 | 1.60 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU16 | 19.2 | 24.0 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | PU16 | 19.3 | | 2.09 | 1.69 | | | | | | | | | | |
| OWF_GI#22_SAMP | PU17 | 19.9 | 20.0 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | PU17 | 19.95 | | 2.02 | 1.68 | | | | | | | | | | |
| OWF_GI#24_SAMP | PU01 | 0 | | | | | | | | 1.97 | 17.47 | 7.9 | | | |
| OWF_GI#24_SAMP | PU01 | 0.1 | | 1.89 | 1.45 | | | | | | | | | | |
| OWF_GI#24_SAMP | PU01 | 0.4 | | | | | | | | 3.08 | 49.19 | 24.6 | | | |
| OWF_GI#24_SAMP | PU01 | 0.5 | | 1.71 | 1.31 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR01 | 1.1 | | | | | 23 | 16 | 7 | 11.8 | 42.72 | 26.0 | | | |
| OWF_GI#24_SAMP | CR01 | 1.2 | | 2.06 | 1.82 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR02 | 2.2 | 5.0 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR03 | 3.2 | | 2.84 | 2.51 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole | Sample No. | Test Depth (m) | Water Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Specific Gravity | Atterberg Limits | | | Particle Size Distribution | | | Relative Density | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LL (%) | PL (%) | PI (%) | Gravel Content (%) | Fines Content (%) | Clay Content (%) | Min. Density ($Mg/m^3$) | Max. Density ($Mg/m^3$) | Relative Density (%) |
| OWF_GI#24_SAMP | CR04 | 4.35 | | 1.92 | 1.49 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR05 | 5.2 | | 2.21 | 2.07 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR06 | 6.1 | | 2.08 | 1.84 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR07 | 7 | | | | | | | | 7.11 | 66.73 | 35.1 | | | |
| OWF_GI#24_SAMP | CR07 | 7.5 | | 2.04 | 1.79 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR07 | 7.7 | | 2.65 | 2.23 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR08 | 8 | 14.0 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR10 | 10 | | 2.11 | 1.94 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR11 | 11 | 10.0 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR12 | 12.1 | | 2.41 | 1.90 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR13 | 13 | | 2.69 | 2.56 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR14 | 14 | 23.0 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR15 | 15 | 22.0 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR16 | 16.1 | | 3.02 | 2.72 | | | | | | | | | | |
| OWF_GI#24_SAMP | CR17 | 17 | 9.0 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | PU06 | 18 | 14.0 | | | | | | | 61.38 | 13.37 | | | | |
| OWF_GI#24_SAMP | PU07 | 18.5 | 11.0 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR18 | 18.7 | 10.0 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR19 | 19.8 | | 1.81 | 1.55 | | | | | | | | | | |

# CLASSIFICATION RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Test Type | Test Stage Number | ϕ' (°) | c' (kPa) | Su (kPa) | ε50 (%) | K0 | Effective Stress (kPa) | Initial Bulk Density (Mg/m3) | Initial Moisture Content (%) | Deviator Stress (kPa) | Axial Strain at Failure (%) | Failure Mode | Minor Principle Stress at Failure (kPa) | Major Principle Stress at Failure (kPa) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#04_SAMP | PU02 | 0.70 | CD | 1 | 38.50 | 4 | | | | | 1.80 | 9.89 | 98 | 11.2 | Compound | 25.0 | 122.9 | |
| OWF_GI#04_SAMP | PU02 | 0.70 | CD | 2 | 38.50 | 4 | | | | | 1.80 | 9.97 | 186 | 5.7 | Compound | 50.0 | 236.0 | |
| OWF_GI#04_SAMP | PU02 | 0.70 | CD | 3 | 38.50 | 4 | | | | | 1.80 | 9.74 | 344 | 3.3 | Compound | 100.3 | 443.9 | |
| OWF_GI#04A_SAMP | PU01A | 0.00 | CD | 1 | 41.60 | 0 | | | | 25 | 1.46 | 10 | 85 | 15.0 | Compound | 25.0 | 110.0 | |
| OWF_GI#04A_SAMP | PU01A | 0.00 | CD | 2 | 41.60 | 0 | | | | 50 | 1.46 | 10 | 189 | 4.3 | Compound | 50.0 | 239.2 | |
| OWF_GI#04A_SAMP | PU01A | 0.00 | CD | 3 | 41.60 | 0 | | | | 100 | 1.48 | 10 | 402 | 5.3 | Compound | 100.0 | 501.9 | |
| OWF_GI#11_SAMP | PU02A | 1.15 | CD | 1 | 36.80 | 4 | | | | | 1.74 | 11 | 87 | 2.6 | Compound | 25.0 | 112.0 | |
| OWF_GI#11_SAMP | PU02A | 1.15 | CD | 2 | 36.80 | 4 | | | | | 1.74 | 10 | 156 | 4.0 | Compound | 50.0 | 206.2 | |
| OWF_GI#11_SAMP | PU02A | 1.15 | CD | 3 | 36.80 | 4 | | | | | 1.74 | 10 | 308 | 3.3 | Compound | 100.1 | 407.9 | |
| OWF_GI#11_SAMP | PU03 | 2.00 | CD | 1 | 23.90 | 10 | 31 | | | 25 | 1.619.6956740442655962 | | | 12.5 | Plastic | 25.0 | 87.0 | |
| OWF_GI#11_SAMP | PU03 | 2.00 | CD | 2 | 23.90 | 10 | 49 | | | 50 | 1.60 | 10 | 98 | 15.0 | Plastic | 50.0 | 147.7 | |
| OWF_GI#11_SAMP | PU03 | 2.00 | CD | 3 | 23.90 | 10 | 106 | | | 100 | 1.61 | 10 | 212 | 12.0 | Compound | 100.0 | 265.0 | |
| OWF_GI#12_SAMP | PU02 | 1.20 | CD | 1 | 36.70 | 5 | | | | | 1.75 | 10 | 91 | 6.2 | Compound | 25.3 | 116.3 | |
| OWF_GI#12_SAMP | PU02 | 1.20 | CD | 2 | 36.70 | 5 | | | | | 1.75 | 10 | 169 | 7.3 | Compound | 50.0 | 218.7 | |
| OWF_GI#12_SAMP | PU02 | 1.20 | CD | 3 | 36.70 | 5 | | | | | 1.75 | 10 | 313 | 2.6 | Compound | 100.0 | 413.1 | |
| OWF_GI#12_SAMP | PU05 | 2.30 | CD | 1 | 32.50 | 3 | | | | 25 | 1.6210.141313383208678 | | | 15.0 | Plastic | 25.0 | 103.0 | |
| OWF_GI#12_SAMP | PU05 | 2.30 | CD | 2 | 32.50 | 3 | | | | 50 | 1.61 | 10 | 114 | 12.2 | Compound | 50.0 | 163.7 | |
| OWF_GI#12_SAMP | PU05 | 2.30 | CD | 3 | 32.50 | 3 | | | | 100 | 1.62 | 10 | 246 | 9.7 | Plastic | 100.0 | 346.0 | |
| OWF_GI#15A_SAMP | PU06 | 10.20 | CU | 1 | | | 370 | | | 100 | 2.12 | 19.7 | 740 | 18.3 | Compound | 266.0 | 1007.0 | |
| OWF_GI#15A_SAMP | PU08 | 11.30 | CU | 1 | | | 393 | | | 115 | 2.15 | 19.1 | 785 | 10.8 | Compound | 290.0 | 1074.0 | |
| OWF_GI#15A_SAMP | PU12 | 18.10 | CU | 1 | | | 239 | | | 175 | 2.08 | 24.7 | 478 | 4.3 | Compound | 109.0 | 587.0 | |
| OWF_GI#17_SAMP | PU02 | 0.80 | CD | 1 | 39.50 | 4 | | | | | 1.62 | 10 | 100 | 3.2 | Compound | 25.0 | 125.0 | |

$\varepsilon_{50}$ - Strain at half max. deviator stress ; CU - Isotropically Consolidated Undrained Triaxial ; CAUc/e - Anisotropically Consolidated Undrained Triaxial (compression/extension) ; CIDC - Consolidated Drained Triaxial

Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# STRENGTH RESULTS - TRIAXIAL EFFECTIVE

Ref: GMOP21-G-019-FAC

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Test Type | Test Stage Number | φ' (°) | c' (kPa) | Su (kPa) | $\varepsilon_{50}$ (%) | K0 | Effective Stress (kPa) | Initial Bulk Density (Mg/m3) | Initial Moisture Content (%) | Deviator Stress (kPa) | Axial Strain at Failure (%) | Failure Mode | Minor Principle Stress at Failure (kPa) | Major Principle Stress at Failure (kPa) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#17_SAMP | PU02 | 0.80 | CD | 2 | 39.50 | 4 | | | | | 1.62 | 10 | 185 | 1.6 | Compound | 50.0 | 235.0 | |
| OWF_GI#17_SAMP | PU02 | 0.80 | CD | 3 | 39.50 | 4 | | | | | 1.62 | 10 | 359 | 3.3 | Compound | 100.0 | 459.0 | |
| OWF_GI#20_SAMP | PU02 | 0.80 | CD | 1 | 33.90 | 0 | | | | 25 | 1.70 | 10 | 62 | 2.6 | Plastic | 25.0 | 87.0 | |
| OWF_GI#20_SAMP | PU02 | 0.80 | CD | 2 | 33.90 | 0 | | | | 50 | 1.70 | 10 | 122 | 2.5 | Plastic | 50.0 | 172.0 | |
| OWF_GI#20_SAMP | PU02 | 0.80 | CD | 3 | 33.90 | 0 | | | | 100 | 1.71 | 10 | 254 | 9.9 | Plastic | 100.0 | 354.4 | |
| OWF_GI#20_SAMP | PU05 | 2.20 | CD | 1 | 33.30 | 1 | | | | | 1.54 | 10 | 59 | 2.0 | Compound | 25.0 | 84.2 | |
| OWF_GI#20_SAMP | PU05 | 2.20 | CD | 2 | 33.30 | 1 | | | | | 1.54 | 9.92 | 121 | 1.4 | Compound | 50.0 | 171.0 | |
| OWF_GI#20_SAMP | PU05 | 2.20 | CD | 3 | 33.30 | 1 | | | | | 1.54 | 9.92 | 241 | 3.5 | Compound | 100.0 | 341.4 | |
| OWF_GI#22_SAMP | PU06 | 2.70 | CD | 1 | 32.70 | 2 | | | | 25 | 1.79 | 10 | 65 | 8.8 | Plastic | 25.0 | 90.0 | |
| OWF_GI#22_SAMP | PU06 | 2.70 | CD | 2 | 32.70 | 2 | | | | 50 | 1.80 | 10 | 122 | 2.5 | Plastic | 50.0 | 172.1 | |
| OWF_GI#22_SAMP | PU06 | 2.70 | CD | 3 | 32.70 | 2 | | | | 100 | 1.80 | 10 | 241 | 4.1 | Plastic | 100.0 | 341.0 | |
| OWF_GI#22_SAMP | PU08 | 3.90 | CD | 1 | 30.00 | 7 | | | | | 1.87 | 10 | 73 | 5.3 | Plastic | 25.0 | 98.4 | |
| OWF_GI#22_SAMP | PU08 | 3.90 | CD | 2 | 30.00 | 7 | | | | | 1.87 | 10 | 124 | 19.8 | Plastic | 50.0 | 174.2 | |
| OWF_GI#22_SAMP | PU08 | 3.90 | CD | 3 | 30.00 | 7 | | | | | 1.87 | 10 | 225 | 13.9 | Plastic | 100.0 | 325.4 | |

$\varepsilon_{50}$ - Strain at half max. deviator stress ; CU - Isotropically Consolidated Undrained Triaxial ; CAUc/e - Anisotropically Consolidated Undrained Triaxial (compression/extension) ; CIDC - Consolidated Drained Triaxial

Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# STRENGTH RESULTS - TRIAXIAL EFFECTIVE

Ref: GMOP21-G-019-FAC

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

GEOQUIPMARINE

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#01_SAMP | CR01 | 0.30 | 24100 | | 79 | 60 | 1.17 | Axial | 5.60 | GM Lab | | | | | | |
| OWF_GI#01_SAMP | CR01 | 0.55 | 17200 | | 78 | 35 | 1.08 | Axial | 5.33 | Offshore | | | | | | |
| OWF_GI#01_SAMP | CR02 | 1.40 | 3550 | 78 | 0 | 75.46 | 1.20 | Diametral | 0.80 | GM Lab | | | | | | |
| OWF_GI#01_SAMP | CR04 | 3.50 | 34200 | | | 78.8 | 1.19 | Diametral | 7.40 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR01 | 0.00 | 25800 | | | 75.3 | 1.17 | Diametral | 6.00 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR02 | 0.70 | 39800 | | | 77.15 | 1.19 | Diametral | 8.90 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR05 | 3.20 | 6250 | | 76.6 | 66.2 | 1.19 | Axial | 1.40 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR06 | 4.20 | 3100 | | | 75 | 1.14 | Diametral | 0.80 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR07 | 5.20 | 4100 | | | 76 | 1.14 | Diametral | 1.00 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR07 | 5.20 | 3000 | | 76 | 55.1 | 1.15 | Axial | 0.70 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR07 | 5.35 | 1500 | | 76 | 34 | 1.06 | Axial | 0.48 | Offshore | | | | | | |
| OWF_GI#01A_SAMP | CR09 | 7.20 | 13550 | | | 77.5 | 1.17 | Diametral | 3.10 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR09 | 7.45 | 7800 | 78 | 0 | 74.94 | 1.20 | Diametral | 1.70 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR09 | 7.60 | 5800 | | 77 | 40 | 1.11 | Axial | 1.64 | Offshore | | | | | | |
| OWF_GI#01A_SAMP | CR09 | 7.65 | 13550 | 77.5 | 0 | 70.98 | 1.17 | Diametral | 3.10 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR10 | 9.25 | 33500 | | 77 | 45 | 1.14 | Axial | 8.63 | Offshore | | | | | | |
| OWF_GI#01A_SAMP | CR10 | 9.30 | 28050 | | 78.4 | 52 | 1.16 | Axial | 6.70 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR10 | 9.30 | 22700 | | | 78.4 | 1.20 | Diametral | 4.80 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR11 | 9.90 | 4000 | | 78 | 55 | 1.19 | Axial | 0.87 | Offshore | | | | | | |
| OWF_GI#01A_SAMP | CR11 | 10.00 | 26850 | | | 77.8 | 1.16 | Diametral | 6.50 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR11 | 10.00 | 23750 | | | 77.8 | 1.20 | Diametral | 5.00 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR12 | 11.00 | 5450 | | 77.41 | 68.5 | 1.20 | Axial | 1.10 | GM Lab | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Ref: GMOP21-G-019-FAC

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#01A_SAMP | CR15 | 16.10 | 6800 | | 78 | 65 | 1.24 | Axial | 1.30 | Offshore | | | | | | |
| OWF_GI#01A_SAMP | CR16 | 17.00 | 2150 | | | 79 | 1.20 | Diametral | 0.50 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR16 | 17.35 | 1600 | | 76 | 30 | 1.03 | Axial | 0.57 | Offshore | | | | | | |
| OWF_GI#01A_SAMP | CR17 | 18.50 | 2850 | | 76.8 | 51 | 1.12 | Axial | 0.80 | GM Lab | | | | | | |
| OWF_GI#01A_SAMP | CR17 | 18.65 | 1400 | | 77 | 45 | 1.14 | Axial | 0.36 | Offshore | | | | | | |
| OWF_GI#04_SAMP | CR03 | 3.80 | 17600 | | 56 | 48 | 1.04 | Axial | 6.10 | GM Lab | | | | | | |
| OWF_GI#04_SAMP | CR06 | 6.40 | 19650 | | | 79.55 | 1.22 | Diametral | 4.00 | GM Lab | | | | | | |
| OWF_GI#04_SAMP | CR06 | 6.40 | 9550 | | 79.55 | 32 | 1.03 | Axial | 3.50 | GM Lab | | | | | | |
| OWF_GI#04A_SAMP | CR04 | 3.50 | 15650 | 79 | 0 | 69.42 | 1.16 | Diametral | 3.80 | GM Lab | | | | | | |
| OWF_GI#04A_SAMP | CR04 | 3.70 | 11300 | | | 91.64 | 1.25 | Diametral | 2.10 | GM Lab | | | | | | |
| OWF_GI#04A_SAMP | CR04 | 3.70 | 11650 | | 98.64 | 63 | 1.28 | Axial | 2.00 | GM Lab | | | | | | |
| OWF_GI#04A_SAMP | CR05 | 4.60 | 13110 | 112 | | 78 | 1.22 | Diametral | 2.63 | Offshore | | | | | | |
| OWF_GI#04A_SAMP | CR06 | 5.85 | 24960 | 112 | | 78 | 1.22 | Diametral | 5.01 | Offshore | | | | | | |
| OWF_GI#04A_SAMP | CR10 | 11.90 | 1100 | | 78 | 68 | 1.25 | Axial | 0.20 | Offshore | | | | | | |
| OWF_GI#04A_SAMP | CR10 | 12.05 | 750 | | | 77 | 1.18 | Diametral | 0.20 | GM Lab | | | | | | |
| OWF_GI#04A_SAMP | PU12 | 15.80 | 763 | | 78 | 76 | 1.28 | Axial | 0.13 | Offshore | | | | | | |
| OWF_GI#04A_SAMP | PU13 | 16.10 | 238 | | 75 | 45 | 1.13 | Axial | 0.06 | Offshore | | | | | | |
| OWF_GI#04A_SAMP | CR12 | 16.50 | 3010 | | 73 | 43 | 1.11 | Axial | 0.84 | Offshore | | | | | | |
| OWF_GI#04A_SAMP | CR13 | 17.40 | 6700 | | | 76.93 | 1.19 | Diametral | 1.50 | GM Lab | | | | | | |
| OWF_GI#04A_SAMP | CR13 | 17.40 | 5500 | | 76.93 | 65.8 | 1.22 | Axial | 1.10 | GM Lab | | | | | | |
| OWF_GI#04A_SAMP | CR13 | 17.55 | 1230 | | 74 | 45 | 1.13 | Axial | 0.33 | Offshore | | | | | | |
| OWF_GI#04A_SAMP | CR14 | 18.00 | 6350 | | | 76.5 | 1.17 | Diametral | 1.50 | GM Lab | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory |
|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#04A_SAMP | CR14 | 18.00 | 8650 | | 76.5 | 53 | 1.14 | Axial | 2.20 | GM Lab |
| OWF_GI#04A_SAMP | CR14 | 18.15 | 5.89 | | 77 | 52 | 1.17 | Axial | 0.00 | Offshore |
| OWF_GI#04A_SAMP | CR14 | 18.20 | 6800 | 78 | 0 | 74.94 | 1.20 | Diametral | 1.50 | GM Lab |
| OWF_GI#04A_SAMP | CR14 | 18.40 | 6350 | 76.5 | 0 | 71.11 | 1.17 | Diametral | 1.50 | GM Lab |
| OWF_GI#04A_SAMP | CR15 | 19.00 | 12400 | | | 79.35 | 1.21 | Diametral | 2.60 | GM Lab |
| OWF_GI#04A_SAMP | CR15 | 19.00 | 17500 | | 79.35 | 65 | 1.22 | Axial | 3.50 | GM Lab |
| OWF_GI#04A_SAMP | CR15 | 19.25 | 12400 | 79.35 | 0 | 76.11 | 1.21 | Diametral | 2.60 | GM Lab |
| OWF_GI#04A_SAMP | CR15 | 19.70 | 6060 | | 78 | 43 | 1.13 | Axial | 1.60 | Offshore |
| OWF_GI#05A_SAMP | CR01 | 0.50 | 11700 | | 76.8 | 52 | 1.09 | Axial | 3.40 | GM Lab |
| OWF_GI#05A_SAMP | CR01 | 0.50 | 9600 | | | 76.8 | 1.19 | Diametral | 2.10 | GM Lab |
| OWF_GI#05A_SAMP | CR01 | 0.70 | 13990 | | 76.5 | 54.7 | 1.19 | Axial | 3.11 | Offshore |
| OWF_GI#05A_SAMP | CR01 | 0.80 | 9600 | 76.8 | 0 | 73.32 | 1.19 | Diametral | 2.10 | GM Lab |
| OWF_GI#05A_SAMP | CR01 | 1.00 | 7670 | | 77.1 | 50.4 | 1.17 | Axial | 1.81 | Offshore |
| OWF_GI#05A_SAMP | CR02 | 1.50 | 7550 | | 78.37 | 37 | 1.04 | Axial | 2.60 | GM Lab |
| OWF_GI#05A_SAMP | CR02 | 1.70 | 12600 | | 75.4 | 58.8 | 1.20 | Axial | 2.68 | Offshore |
| OWF_GI#05A_SAMP | CR03 | 2.50 | 800 | | | 76 | 1.20 | Diametral | 0.20 | GM Lab |
| OWF_GI#05A_SAMP | CR03 | 2.50 | 300 | | 76 | 52 | 1.14 | Axial | 0.10 | GM Lab |
| OWF_GI#05A_SAMP | CR03 | 2.90 | 800 | 76 | 0 | 74.48 | 1.20 | Diametral | 0.20 | GM Lab |
| OWF_GI#05A_SAMP | CR04 | 3.55 | 1400 | | 77 | 58 | 1.20 | Axial | 0.30 | Offshore |
| OWF_GI#05A_SAMP | CR04 | 3.60 | 4350 | | 75.75 | 47.89 | 1.13 | Axial | 1.10 | GM Lab |
| OWF_GI#05B_SAMP | CR01 | 5.50 | 8050 | | 48.8 | 63 | 1.09 | Axial | 2.40 | GM Lab |
| OWF_GI#05B_SAMP | CR01 | 6.00 | 9700 | | 77 | 76 | 1.28 | Axial | 1.66 | Offshore |

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# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#05B_SAMP | CR02 | 6.95 | 400 | | 77 | 70 | 1.26 | Axial | 0.07 | Offshore | | | | | | |
| OWF_GI#05B_SAMP | CR04 | 8.65 | 3200 | | 78 | 74 | 1.27 | Axial | 0.55 | Offshore | | | | | | |
| OWF_GI#05B_SAMP | CR05 | 10.40 | 400 | | 78 | 74 | 1.27 | Axial | 0.07 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR02 | 2.50 | 8800 | | 78 | 69 | 1.25 | Axial | 1.61 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR03 | 3.95 | 7800 | 98 | | 80 | 1.24 | Diametral | 1.51 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR07 | 7.65 | 1480 | | 75 | 38 | 1.09 | Axial | 0.44 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR10 | 11.50 | 5220 | | 70 | 60 | 1.19 | Axial | 1.16 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR11 | 13.00 | 2720 | | 70 | 45 | 1.11 | Axial | 0.75 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR12 | 13.65 | 600 | | 77 | 50 | 1.16 | Axial | 0.14 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR12 | 14.10 | 5100 | | 80 | 80 | 1.30 | Axial | 0.82 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR13 | 14.55 | 5500 | | 80 | 45 | 1.15 | Axial | 1.38 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR15 | 17.50 | 14200 | 112 | | 78 | 1.22 | Diametral | 2.85 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR16 | 18.60 | 13100 | 110 | | 78 | 1.22 | Diametral | 2.63 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR17 | 19.75 | 12500 | | 78 | 66 | 1.24 | Axial | 2.37 | Offshore | | | | | | |
| OWF_GI#08_CPT | CR17 | 20.40 | 3100 | | 78 | 48 | 1.16 | Axial | 0.75 | Offshore | | | | | | |
| OWF_GI#09_SAMP | CR01 | 0.00 | 20450 | | | 77.8 | 1.20 | Diametral | 4.30 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR02 | 1.00 | 8550 | | 78.85 | 62 | 1.20 | Axial | 1.80 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR04 | 3.00 | 11600 | | 77.7 | 64 | 1.12 | Axial | 3.10 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR09 | 8.30 | 4000 | | 78.5 | 60 | 1.15 | Axial | 1.00 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR12 | 11.00 | 9650 | | | 79.5 | 1.16 | Diametral | 2.30 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR12 | 11.00 | 9950 | | 79.5 | 42 | 1.07 | Axial | 3.10 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR15 | 14.10 | 15500 | | | 79 | 1.20 | Diametral | 3.40 | GM Lab | | | | | | |

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# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#09_SAMP | CR16 | 15.00 | 32050 | | | 79.5 | 1.18 | Diametral | 7.20 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR16 | 15.00 | 30250 | | 79.5 | 50 | 1.12 | Axial | 8.20 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR16 | 15.30 | 32050 | 79.5 | 0 | 72.44 | 1.18 | Diametral | 7.20 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR20 | 19.40 | 1650 | | | 75.7 | 1.17 | Diametral | 0.40 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR21 | 20.00 | 2350 | | 78 | 72 | 1.22 | Axial | 0.50 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR21 | 20.00 | 1600 | | | 76.71 | 1.12 | Diametral | 0.40 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR21 | 20.30 | 2200 | 77.5 | 0 | 73.65 | 1.19 | Diametral | 0.50 | GM Lab | | | | | | |
| OWF_GI#09_SAMP | CR21 | 20.50 | 1600 | 76.71 | 0 | 64.95 | 1.12 | Diametral | 0.40 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR04 | 4.50 | 16250 | | | 77.43 | 1.19 | Diametral | 3.60 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR04 | 4.50 | 9850 | | 77.43 | 46 | 1.11 | Axial | 2.70 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR08 | 8.50 | 1850 | | 76.5 | 71 | 1.20 | Axial | 0.40 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR09 | 9.50 | 2700 | | | 75 | 1.17 | Diametral | 0.60 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR09 | 9.50 | 2300 | | 75 | 42 | 1.07 | Axial | 0.70 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR11 | 12.50 | 3750 | | | 76.7 | 1.16 | Diametral | 0.90 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR11 | 12.85 | 6500 | 78.2 | 0 | 73.99 | 1.19 | Diametral | 1.40 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR11 | 13.00 | 3750 | 76.7 | 0 | 70.06 | 1.16 | Diametral | 0.90 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR12 | 13.90 | 7750 | | | 67.18 | 1.14 | Diametral | 2.00 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR12 | 13.90 | 7100 | | 79.18 | 73.1 | 1.19 | Axial | 1.60 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR14 | 15.50 | 7050 | | 79.75 | 54.05 | 1.19 | Axial | 1.60 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR16 | 17.50 | 7600 | | | 77.8 | 1.18 | Diametral | 1.70 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR16 | 17.50 | 5450 | | 77.8 | 35 | 1.05 | Axial | 1.90 | GM Lab | | | | | | |
| OWF_GI#11_SAMP | CR16 | 17.95 | 7600 | 77.8 | 0 | 72.74 | 1.18 | Diametral | 1.70 | GM Lab | | | | | | |

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# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory |
|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#12_SAMP | CR02 | 4.30 | 18850 | | | 83.5 | 1.20 | Diametral | 4.00 | GM Lab |
| OWF_GI#12_SAMP | CR02 | 4.30 | 11750 | | 83.3 | 54 | 1.17 | Axial | 2.80 | GM Lab |
| OWF_GI#12_SAMP | CR02 | 4.35 | 11250 | | 75 | 58 | 1.20 | Axial | 2.43 | Offshore |
| OWF_GI#12_SAMP | CR05 | 7.30 | 12000 | | | 84.36 | 1.19 | Diametral | 2.60 | GM Lab |
| OWF_GI#12_SAMP | CR05 | 7.30 | 8300 | | 84.3 | 58 | 1.20 | Axial | 1.80 | GM Lab |
| OWF_GI#12_SAMP | CR06 | 8.30 | 14550 | | 79.39 | 53 | 1.17 | Axial | 3.40 | GM Lab |
| OWF_GI#12_SAMP | CR06 | 8.30 | 28150 | | | 79.39 | 1.21 | Diametral | 5.80 | GM Lab |
| OWF_GI#12_SAMP | CR07 | 9.62 | 26300 | | 80 | 60 | 1.22 | Axial | 5.26 | Offshore |
| OWF_GI#12_SAMP | CR08 | 10.30 | 23050 | | | 79 | 1.20 | Diametral | 4.90 | GM Lab |
| OWF_GI#12_SAMP | CR08 | 10.30 | 19500 | | 79 | 47 | 1.11 | Axial | 5.40 | GM Lab |
| OWF_GI#12_SAMP | CR09 | 12.05 | 6650 | | | 73 | 1.17 | Diametral | 1.50 | GM Lab |
| OWF_GI#12_SAMP | CR09 | 12.05 | 5950 | | 73 | 55 | 1.13 | Axial | 1.50 | GM Lab |
| OWF_GI#12_SAMP | CR09 | 12.08 | 4900 | | 80 | 60 | 1.22 | Axial | 0.98 | Offshore |
| OWF_GI#12_SAMP | CR12 | 14.30 | 2100 | | 80 | 60 | 1.22 | Axial | 0.42 | Offshore |
| OWF_GI#12_SAMP | CR14 | 16.85 | 10300 | 146.35 | | 78.3 | 1.15 | Diametral | 2.50 | GM Lab |
| OWF_GI#12_SAMP | CR14 | 16.85 | 7300 | | 78.3 | 65 | 1.21 | Axial | 1.50 | GM Lab |
| OWF_GI#12_SAMP | CR16 | 18.30 | 26900 | | | 79.4 | 1.20 | Diametral | 5.70 | GM Lab |
| OWF_GI#12_SAMP | CR16 | 18.30 | 11850 | | 79.4 | 32 | 1.02 | Axial | 4.40 | GM Lab |
| OWF_GI#12_SAMP | CR16 | 18.30 | 34950 | | | 79.4 | 1.20 | Diametral | 7.50 | GM Lab |
| OWF_GI#12_SAMP | CR16 | 18.95 | 4510 | 157 | | 80 | 1.24 | Diametral | 0.87 | Offshore |
| OWF_GI#12_SAMP | CR17 | 19.30 | 22750 | | 77.82 | 58 | 1.08 | Axial | 6.90 | GM Lab |
| OWF_GI#12_SAMP | CR17 | 19.45 | 2830 | 95 | | 80 | 1.24 | Diametral | 0.55 | Offshore |

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# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory |
|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#13_CPT | CR01 | 1.40 | 4220 | 130 | | 80 | 1.24 | Diametral | 0.81 | Offshore |
| OWF_GI#13_CPT | CR04 | 4.00 | 13040 | 102 | | 77 | 1.21 | Diametral | 2.67 | Offshore |
| OWF_GI#13_CPT | CR05 | 5.45 | 8180 | 110 | | 80 | 1.24 | Diametral | 1.58 | Offshore |
| OWF_GI#13_CPT | CR09 | 9.10 | 4030 | | 75 | 60 | 1.21 | Axial | 0.85 | Offshore |
| OWF_GI#13_CPT | CR10 | 10.60 | 4620 | | 70 | 55 | 1.16 | Axial | 1.10 | Offshore |
| OWF_GI#13_CPT | CR10 | 10.75 | 3850 | | 70 | 40 | 1.08 | Axial | 1.17 | Offshore |
| OWF_GI#13_CPT | CR12 | 12.50 | 1600 | | 75.7 | 52.3 | 1.17 | Axial | 0.37 | Offshore |
| OWF_GI#13_CPT | CR13 | 13.05 | 2900 | | 78 | 71 | 1.26 | Axial | 0.52 | Offshore |
| OWF_GI#13_CPT | CR14 | 14.15 | 1900 | | 78 | 56 | 1.20 | Axial | 0.41 | Offshore |
| OWF_GI#13_CPT | CR15 | 15.30 | 1730 | | 78 | 48 | 1.16 | Axial | 0.42 | Offshore |
| OWF_GI#13_CPT | CR16 | 16.60 | 1950 | | 78 | 69 | 1.25 | Axial | 0.36 | Offshore |
| OWF_GI#13_CPT | CR17 | 17.50 | 190 | | 78 | 68 | 1.25 | Axial | 0.04 | Offshore |
| OWF_GI#13_CPT | CR18 | 18.75 | 330 | | 78 | 42 | 1.12 | Axial | 0.09 | Offshore |
| OWF_GI#13_CPT | CR19 | 19.70 | 3950 | | 78 | 57 | 1.20 | Axial | 0.84 | Offshore |
| OWF_GI#14_SAMP | CR01 | 0.00 | 15900 | | 76 | 56 | 1.16 | Axial | 3.80 | GM Lab |
| OWF_GI#14_SAMP | CR02 | 1.10 | 6000 | | | 78.9 | 1.20 | Diametral | 1.30 | GM Lab |
| OWF_GI#14_SAMP | CR02 | 1.30 | 3120 | | 80 | 75 | 1.29 | Axial | 0.53 | Offshore |
| OWF_GI#14_SAMP | CR02 | 1.40 | 13550 | | | 78 | 1.17 | Diametral | 3.20 | GM Lab |
| OWF_GI#14_SAMP | CR02 | 1.40 | 7350 | | 78 | 50 | 1.14 | Axial | 1.90 | GM Lab |
| OWF_GI#14_SAMP | CR03 | 2.00 | 27050 | | 78.95 | 66 | 1.21 | Axial | 5.50 | GM Lab |
| OWF_GI#14_SAMP | CR03 | 2.00 | 19650 | | | 78.96 | 1.21 | Diametral | 4.00 | GM Lab |
| OWF_GI#14_SAMP | CR04 | 3.00 | 420 | 85 | | 75 | 1.20 | Diametral | 0.09 | Offshore |

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# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory |
|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#14_SAMP | CR04 | 3.15 | 2000 | | 75.5 | 45 | 1.09 | Axial | 0.60 | GM Lab |
| OWF_GI#14_SAMP | CR04 | 3.80 | 4100 | 150 | | 75 | 1.20 | Diametral | 0.87 | Offshore |
| OWF_GI#14A_SAMP | CR01 | 0.45 | 3450 | | 76 | 55 | 1.19 | Axial | 0.77 | Offshore |
| OWF_GI#14A_SAMP | CR02 | 1.50 | 11000 | 77.8 | 0 | 73.8 | 1.19 | Diametral | 2.40 | GM Lab |
| OWF_GI#14A_SAMP | CR02 | 2.10 | 18650 | | | 78.83 | 1.21 | Diametral | 3.90 | GM Lab |
| OWF_GI#14A_SAMP | CR02 | 2.10 | 20850 | | | 78.83 | 1.21 | Diametral | 4.30 | GM Lab |
| OWF_GI#14A_SAMP | CR03 | 4.00 | 2310 | | | 79.2 | 1.20 | Diametral | 0.50 | GM Lab |
| OWF_GI#14A_SAMP | CR05 | 5.50 | 12250 | | | 80 | 1.20 | Diametral | 2.60 | GM Lab |
| OWF_GI#14A_SAMP | CR05 | 5.50 | 9100 | | 80 | 42 | 1.10 | Axial | 2.60 | GM Lab |
| OWF_GI#14A_SAMP | CR05 | 5.70 | 12250 | 80 | 0 | 74.83 | 1.20 | Diametral | 2.60 | GM Lab |
| OWF_GI#14A_SAMP | CR08 | 8.75 | 1110 | | 78 | 55 | 1.19 | Axial | 0.24 | Offshore |
| OWF_GI#14A_SAMP | CR09 | 10.00 | 8550 | | | 76.8 | 1.20 | Diametral | 1.80 | GM Lab |
| OWF_GI#14A_SAMP | CR09 | 10.00 | 6400 | | 76.8 | 47 | 1.11 | Axial | 1.80 | GM Lab |
| OWF_GI#14A_SAMP | CR09 | 10.10 | 6100 | 85 | | 76 | 1.21 | Diametral | 1.28 | Offshore |
| OWF_GI#14A_SAMP | CR10 | 11.05 | 5800 | | 75 | 65 | 1.23 | Axial | 1.15 | Offshore |
| OWF_GI#14A_SAMP | CR11 | 12.00 | 4820 | | 75 | 75 | 1.27 | Axial | 0.85 | Offshore |
| OWF_GI#14A_SAMP | CR11 | 12.10 | 4300 | | | 76 | 1.19 | Diametral | 0.90 | GM Lab |
| OWF_GI#14A_SAMP | CR11 | 12.10 | 6800 | | 76 | 38 | 1.06 | Axial | 2.20 | GM Lab |
| OWF_GI#14A_SAMP | CR11 | 12.25 | 1550 | 77.3 | 0 | 75.12 | 1.20 | Diametral | 0.30 | GM Lab |
| OWF_GI#14A_SAMP | CR11 | 12.50 | 8520 | 135 | | 75 | 1.20 | Diametral | 1.82 | Offshore |
| OWF_GI#14A_SAMP | CR12 | 13.40 | 1110 | 105 | | 75 | 1.20 | Diametral | 0.24 | Offshore |
| OWF_GI#14A_SAMP | CR12 | 13.50 | 1900 | | | 78.5 | 1.19 | Diametral | 0.40 | GM Lab |

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# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory |
|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#14A_SAMP | CR12 | 13.50 | 3100 | | | 78.5 | 1.17 | Diametral | 0.70 | GM Lab |
| OWF_GI#14A_SAMP | CR13 | 14.50 | 2060 | 190 | | 75 | 1.20 | Diametral | 0.44 | Offshore |
| OWF_GI#14A_SAMP | CR13 | 14.70 | 1180 | 98 | | 75 | 1.20 | Diametral | 0.25 | Offshore |
| OWF_GI#15_SAMP | CR01 | 0.00 | 14350 | | 60 | 53 | 1.07 | Axial | 4.50 | GM Lab |
| OWF_GI#15A_SAMP | CR01 | 0.10 | 34800 | 10.7 | | 80 | 1.24 | Diametral | 6.72 | Offshore |
| OWF_GI#15A_SAMP | CR02 | 1.00 | 29300 | | 78 | 72 | 1.25 | Axial | 5.40 | GM Lab |
| OWF_GI#15A_SAMP | CR05 | 6.10 | 1400 | | | 80.1 | 1.20 | Diametral | 0.30 | GM Lab |
| OWF_GI#17_SAMP | CR02 | 5.60 | 9700 | 77 | 0 | 73.42 | 1.19 | Diametral | 2.10 | GM Lab |
| OWF_GI#17_SAMP | CR03 | 6.00 | 11500 | | 77 | 72 | 1.26 | Axial | 2.06 | Offshore |
| OWF_GI#17_SAMP | CR03 | 6.05 | 8250 | | | 76.2 | 1.17 | Diametral | 1.90 | GM Lab |
| OWF_GI#17_SAMP | CR03 | 6.25 | 1500 | 75.7 | 0 | 74.34 | 1.20 | Diametral | 0.30 | GM Lab |
| OWF_GI#17_SAMP | CR04 | 7.00 | 650 | | 76 | 45 | 1.13 | Axial | 0.17 | Offshore |
| OWF_GI#17_SAMP | CR05 | 7.50 | 6150 | | 79.9 | 58 | 1.10 | Axial | 1.80 | GM Lab |
| OWF_GI#17_SAMP | CR05 | 7.60 | 1300 | | 78 | 66 | 1.24 | Axial | 0.25 | Offshore |
| OWF_GI#17_SAMP | CR05 | 7.65 | 6150 | 58 | 79.9 | 62.18 | 1.10 | Axial | 1.80 | GM Lab |
| OWF_GI#17_SAMP | CR06 | 8.50 | 5300 | | 78 | 43 | 1.13 | Axial | 1.40 | Offshore |
| OWF_GI#17_SAMP | PU10 | 10.60 | 100 | 59 | 0 | 56.96 | 1.06 | Diametral | 0.00 | GM Lab |
| OWF_GI#17_SAMP | CR08 | 11.80 | 1350 | | 76.35 | 35 | 1.02 | Axial | 0.50 | GM Lab |
| OWF_GI#17_SAMP | CR08 | 11.90 | 1920 | | 77 | 67.6 | 1.25 | Axial | 0.36 | Offshore |
| OWF_GI#17_SAMP | CR08 | 12.00 | 1350 | 35 | 76.35 | 52.17 | 1.02 | Axial | 0.50 | GM Lab |
| OWF_GI#17_SAMP | CR09 | 13.10 | 2317 | | 75 | 56.5 | 1.19 | Axial | 0.51 | Offshore |
| OWF_GI#17_SAMP | CR10 | 14.20 | 1334 | | 75 | 57.6 | 1.19 | Axial | 0.29 | Offshore |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#17_SAMP | CR11 | 14.70 | 500 | | | 72 | 1.15 | Diametral | 0.10 | GM Lab | | | | | | |
| OWF_GI#17_SAMP | CR11 | 15.00 | 1566 | | 74 | 73 | 1.26 | Axial | 0.29 | Offshore | | | | | | |
| OWF_GI#17_SAMP | PU13 | 16.90 | 250 | 66 | 0 | 62.93 | 1.11 | Diametral | 0.10 | GM Lab | | | | | | |
| OWF_GI#17_SAMP | PU13 | 17.10 | 600 | 69 | 0 | 62.16 | 1.10 | Diametral | 0.20 | GM Lab | | | | | | |
| OWF_GI#17_SAMP | PU14 | 17.70 | 700 | | 66.99 | 48.64 | 1.07 | Axial | 0.20 | GM Lab | | | | | | |
| OWF_GI#17_SAMP | CR13 | 18.80 | 4350 | | 78.4 | 60 | 1.18 | Axial | 1.00 | GM Lab | | | | | | |
| OWF_GI#20_CPT | CR02 | 11.90 | 6400 | | 75 | 50 | 1.16 | Axial | 1.55 | Offshore | | | | | | |
| OWF_GI#20_CPT | CR04 | 19.70 | 1852 | | 75 | 72 | 1.26 | Axial | 0.34 | Offshore | | | | | | |
| OWF_GI#20_SAMP | PU11 | 6.70 | 350 | 50 | 67 | 62.64 | 1.11 | Axial | 0.10 | GM Lab | | | | | | |
| OWF_GI#20_SAMP | PU14 | 9.70 | 200 | 64 | 70 | 66.76 | 1.14 | Axial | 0.10 | GM Lab | | | | | | |
| OWF_GI#20_SAMP | CR03 | 11.50 | 1900 | | 75 | 45 | 1.13 | Axial | 0.50 | Offshore | | | | | | |
| OWF_GI#20_SAMP | PU18 | 13.80 | 300 | 76 | 0 | 74.48 | 1.20 | Diametral | 0.10 | GM Lab | | | | | | |
| OWF_GI#20_SAMP | PU19 | 15.00 | 1900 | | 70 | 40 | 1.08 | Axial | 0.58 | Offshore | | | | | | |
| OWF_GI#20_SAMP | CR05 | 15.05 | 800 | | 76 | 51 | 1.11 | Axial | 0.20 | GM Lab | | | | | | |
| OWF_GI#20_SAMP | CR05 | 15.50 | 200 | | 75 | 68 | 1.24 | Axial | 0.04 | Offshore | | | | | | |
| OWF_GI#20_SAMP | CR06 | 16.00 | 650 | | 76 | 51 | 1.15 | Axial | 0.20 | GM Lab | | | | | | |
| OWF_GI#20_SAMP | CR06 | 16.00 | 500 | | | 76.1 | 1.18 | Diametral | 0.10 | GM Lab | | | | | | |
| OWF_GI#20_SAMP | CR06 | 16.05 | 500 | | 75 | 35 | 1.07 | Axial | 0.16 | Offshore | | | | | | |
| OWF_GI#20_SAMP | CR06 | 16.10 | 500 | 76.1 | 0 | 72.46 | 1.18 | Diametral | 0.10 | GM Lab | | | | | | |
| OWF_GI#20_SAMP | CR06 | 16.40 | 1250 | 76 | 0 | 71.89 | 1.18 | Diametral | 0.30 | GM Lab | | | | | | |
| OWF_GI#20_SAMP | CR08 | 19.00 | 750 | | | 76.1 | 1.18 | Diametral | 0.20 | GM Lab | | | | | | |
| OWF_GI#20_SAMP | CR08 | 19.00 | 1200 | | 76.1 | 61 | 1.16 | Axial | 0.30 | GM Lab | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#20_SAMP | CR08 | 19.10 | 1000 | | 77 | 67 | 1.24 | Axial | 0.19 | Offshore | | | | | | |
| OWF_GI#22_CPT | CR01 | 4.50 | 10950 | | 76 | 48 | 1.15 | Axial | 2.71 | Offshore | | | | | | |
| OWF_GI#22_CPT | CR08 | 12.65 | 9800 | | 77 | 52 | 1.17 | Axial | 2.26 | Offshore | | | | | | |
| OWF_GI#22_CPT | CR10 | 14.20 | 12000 | 60 | | 77.9 | 1.22 | Diametral | 2.41 | Offshore | | | | | | |
| OWF_GI#22_CPT | CR11 | 15.30 | 10280 | | 77.9 | 60 | 1.22 | Axial | 2.10 | Offshore | | | | | | |
| OWF_GI#22_CPT | CR12 | 16.10 | 2780 | | 78.1 | 42 | 1.12 | Axial | 0.75 | Offshore | | | | | | |
| OWF_GI#22_SAMP | CR04 | 6.00 | 39210 | 45.5 | | 71 | 1.17 | Diametral | 9.11 | Offshore | | | | | | |
| OWF_GI#22_SAMP | CR07 | 8.00 | 602 | | 78 | 71 | 1.26 | Axial | 0.11 | Offshore | | | | | | |
| OWF_GI#22_SAMP | CR09 | 9.60 | 26700 | | | 78 | 1.20 | Diametral | 5.80 | GM Lab | | | | | | |
| OWF_GI#22_SAMP | CR09 | 9.60 | 29600 | | 78 | 48 | 1.12 | Axial | 8.00 | GM Lab | | | | | | |
| OWF_GI#22_SAMP | CR11 | 11.80 | 18100 | 79 | 0 | 77.49 | 1.22 | Diametral | 3.70 | GM Lab | | | | | | |
| OWF_GI#22_SAMP | CR12 | 12.50 | 13750 | | | 76.3 | 1.20 | Diametral | 2.90 | GM Lab | | | | | | |
| OWF_GI#22_SAMP | CR12 | 12.60 | 14800 | | 78 | 52.2 | 1.18 | Axial | 3.36 | Offshore | | | | | | |
| OWF_GI#22_SAMP | CR15 | 16.20 | 8150 | | 77.6 | 50 | 1.12 | Axial | 2.20 | GM Lab | | | | | | |
| OWF_GI#22_SAMP | CR15 | 16.20 | 12150 | | | 77.61 | 1.16 | Diametral | 2.90 | GM Lab | | | | | | |
| OWF_GI#24_SAMP | CR04 | 4.10 | 650 | 75.5 | 0 | 71.12 | 1.17 | Diametral | 0.20 | GM Lab | | | | | | |
| OWF_GI#24_SAMP | CR05 | 5.10 | 11210 | 95 | | 77 | 1.21 | Diametral | 2.30 | Offshore | | | | | | |
| OWF_GI#24_SAMP | CR05 | 5.20 | 18950 | | 77.4 | 64 | 1.18 | Axial | 4.30 | GM Lab | | | | | | |
| OWF_GI#24_SAMP | CR06 | 6.10 | 100 | | 77 | 44 | 1.13 | Axial | 0.03 | Offshore | | | | | | |
| OWF_GI#24_SAMP | CR07 | 7.70 | 33130 | 110 | | 78 | 1.22 | Diametral | 6.65 | Offshore | | | | | | |
| OWF_GI#24_SAMP | CR10 | 10.00 | 5650 | | | 76.5 | 1.17 | Diametral | 1.30 | GM Lab | | | | | | |
| OWF_GI#24_SAMP | CR12 | 12.10 | 1200 | | 77 | 50 | 1.16 | Axial | 0.28 | Offshore | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | Failure Load (N) | Length (mm) | Width (mm) | Diameter or Length (mm) | Correction Ratio | Test Type | Is50 (MPa) | Testing Laboratory | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#24_SAMP | CR13 | 13.00 | 9420 | | 77 | 35 | 1.07 | Axial | 2.95 | Offshore | | | | | | |
| OWF_GI#24_SAMP | CR16 | 16.00 | 8100 | | 76 | 43 | 1.12 | Axial | 2.18 | Offshore | | | | | | |
| OWF_GI#24_SAMP | CR18 | 18.50 | 7350 | | 76 | 60 | 1.19 | Axial | 1.60 | GM Lab | | | | | | |
| OWF_GI#24_SAMP | CR18 | 18.70 | 4400 | | 77 | 41 | 1.11 | Axial | 1.22 | Offshore | | | | | | |
| OWF_GI#24_SAMP | CR19 | 19.80 | 1400 | | 76.6 | 58 | 1.09 | Axial | 0.40 | GM Lab | | | | | | |
| OWF_GI#24_SAMP | CR19 | 19.80 | 4500 | | 77 | 40 | 1.11 | Axial | 1.27 | Offshore | | | | | | |
| OWF_GI#24_SAMP | CR19 | 19.80 | 2450 | | | 76.6 | 1.19 | Diametral | 0.50 | GM Lab | | | | | | |
| OWF_GI#24_SAMP | CR19 | 19.80 | 450 | | | 76.6 | 1.19 | Diametral | 0.10 | GM Lab | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#01_SAMP | 0.00 | 1.00 | 0.70 | 0.25 | 0 | 70 | 25 | 0 | | Offshore | | | | |
| OWF_GI#01_SAMP | 1.00 | 2.00 | 0.80 | 0.5 | 0.15 | 80 | 50 | 15 | | Offshore | | | | |
| OWF_GI#01_SAMP | 2.00 | 3.50 | 0.05 | 0 | 0 | 3 | 0 | 0 | | Offshore | | | | |
| OWF_GI#01_SAMP | 3.50 | 4.00 | 0.10 | 0.1 | 0 | 20 | 20 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 0.00 | 0.70 | 0.50 | 0.35 | 0.15 | 71 | 50 | 21 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 0.70 | 1.70 | 0.90 | 0.4 | 0.1 | 90 | 40 | 10 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 1.70 | 2.70 | 0.10 | 0.05 | 0 | 10 | 5 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 2.70 | 3.20 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#01A_SAMP | 3.20 | 4.20 | 0.20 | 0.05 | 0 | 20 | 5 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 4.20 | 5.20 | 0.20 | 0.05 | 0 | 20 | 5 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 5.20 | 6.20 | 0.55 | 0.25 | 0 | 55 | 25 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 6.20 | 7.20 | 0.05 | 0.05 | 0 | 5 | 5 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 7.20 | 8.50 | 0.65 | 0.4 | 0.17 | 50 | 31 | 13 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 8.50 | 9.50 | 1.00 | 1 | 0.8 | 100 | 100 | 80 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 9.50 | 11.00 | 0.85 | 0.65 | 0.55 | 57 | 43 | 37 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 11.00 | 12.50 | 0.55 | 0.2 | 0 | 37 | 13 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 12.50 | 13.50 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 13.50 | 14.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#01A_SAMP | 16.00 | 17.00 | 0.40 | 0.1 | 0 | 40 | 10 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 17.00 | 18.50 | 0.65 | 0.2 | 0 | 43 | 13 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 18.50 | 20.00 | 0.40 | 0.05 | 0 | 27 | 3 | 0 | | Offshore | | | | |
| OWF_GI#01A_SAMP | 20.00 | 20.10 | 0.10 | 0 | 0 | 100 | 0 | 0 | | Offshore | | | | |

# ROCK CORING RESULTS

Ref: GMOP21-G-019-FAC

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#04_SAMP | 1.30 | 2.80 | 0.20 | 0 | 0 | 13 | 0 | 0 | | Offshore | | | | |
| OWF_GI#04_SAMP | 2.80 | 3.80 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#04_SAMP | 3.80 | 4.80 | 0.40 | 0 | 0 | 40 | 0 | 0 | | Offshore | | | | |
| OWF_GI#04_SAMP | 4.80 | 5.80 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#04_SAMP | 5.80 | 6.30 | 0.10 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#04_SAMP | 6.30 | 6.80 | 0.20 | 0.2 | 0.1 | 40 | 40 | 20 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 0.50 | 1.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#04A_SAMP | 1.50 | 2.50 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 2.50 | 3.50 | 0.10 | 0 | 0 | 10 | 0 | 0 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 3.50 | 4.50 | 0.50 | 0.4 | 0.4 | 50 | 40 | 40 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 4.50 | 5.50 | 0.60 | 0.1 | 0 | 60 | 10 | 0 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 5.50 | 6.50 | 0.45 | 0.3 | 0.3 | 45 | 30 | 30 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 6.50 | 7.30 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#04A_SAMP | 7.30 | 8.30 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#04A_SAMP | 10.30 | 11.30 | 0.10 | 0.1 | 0.1 | 10 | 10 | 10 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 11.90 | 12.90 | 0.30 | 0.3 | 0.15 | 30 | 30 | 15 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 12.90 | 13.90 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#04A_SAMP | 16.40 | 16.90 | 0.35 | 0.1 | 0 | 70 | 20 | 0 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 16.90 | 18.00 | 0.85 | 0.6 | 0.35 | 77 | 55 | 32 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 18.00 | 19.00 | 0.55 | 0.5 | 0.3 | 55 | 50 | 30 | | Offshore | | | | |
| OWF_GI#04A_SAMP | 19.00 | 20.00 | 0.85 | 0.7 | 0.3 | 85 | 70 | 30 | | Offshore | | | | |
| OWF_GI#05A_SAMP | 0.50 | 1.50 | 0.80 | 0.5 | 0.25 | 80 | 50 | 25 | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#05A_SAMP | 1.50 | 2.50 | 0.30 | 0.2 | 0 | 30 | 20 | 0 | | Offshore | | | | |
| OWF_GI#05A_SAMP | 2.50 | 3.50 | 1.00 | 0.75 | 0.55 | 100 | 75 | 55 | | Offshore | | | | |
| OWF_GI#05A_SAMP | 3.50 | 4.50 | 0.70 | 0.45 | 0.35 | 70 | 45 | 35 | | Offshore | | | | |
| OWF_GI#05A_SAMP | 4.50 | 5.50 | 0.60 | 0.55 | 0.45 | 60 | 55 | 45 | | Offshore | | | | |
| OWF_GI#05B_SAMP | 5.50 | 6.50 | 0.90 | 0.33 | 0.22 | 90 | 33 | 22 | | Offshore | | | | |
| OWF_GI#05B_SAMP | 6.50 | 7.50 | 0.55 | 0.45 | 0.45 | 55 | 45 | 45 | | Offshore | | | | |
| OWF_GI#05B_SAMP | 7.50 | 8.50 | 0.70 | 0.55 | 0.55 | 70 | 55 | 55 | | Offshore | | | | |
| OWF_GI#05B_SAMP | 8.50 | 9.50 | 0.70 | 0.7 | 0.7 | 70 | 70 | 70 | | Offshore | | | | |
| OWF_GI#05B_SAMP | 9.50 | 10.50 | 1.00 | 1 | 1 | 100 | 100 | 100 | | Offshore | | | | |
| OWF_GI#08_CPT | 1.50 | 2.50 | 0.50 | 0.4 | 0.12 | 50 | 40 | 12 | | Offshore | | | | |
| OWF_GI#08_CPT | 2.50 | 3.50 | 0.85 | 0.71 | 0.42 | 85 | 71 | 42 | | Offshore | | | | |
| OWF_GI#08_CPT | 3.50 | 4.50 | 0.55 | 0.21 | 0.13 | 55 | 21 | 13 | | Offshore | | | | |
| OWF_GI#08_CPT | 4.50 | 5.50 | 0.35 | 0 | 0 | 35 | 0 | 0 | | Offshore | | | | |
| OWF_GI#08_CPT | 5.50 | 6.50 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#08_CPT | 6.50 | 7.50 | 0.25 | 0 | 0 | 25 | 0 | 0 | | Offshore | | | | |
| OWF_GI#08_CPT | 7.50 | 8.50 | 0.30 | 0.05 | 0 | 30 | 5 | 0 | | Offshore | | | | |
| OWF_GI#08_CPT | 9.50 | 10.50 | 0.10 | 0 | 0 | 10 | 0 | 0 | | Offshore | | | | |
| OWF_GI#08_CPT | 10.50 | 11.50 | 0.30 | 0.06 | 0 | 30 | 6 | 0 | | Offshore | | | | |
| OWF_GI#08_CPT | 11.50 | 12.50 | 0.60 | 0.12 | 0 | 60 | 12 | 0 | | Offshore | | | | |
| OWF_GI#08_CPT | 12.50 | 13.50 | 0.55 | 0.05 | 0 | 55 | 5 | 0 | | Offshore | | | | |
| OWF_GI#08_CPT | 13.50 | 14.50 | 0.85 | 0.255 | 0.13 | 85 | 26 | 13 | | Offshore | | | | |
| OWF_GI#08_CPT | 14.50 | 15.50 | 0.35 | 0.02 | 0 | 35 | 2 | 0 | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#08_CPT | 16.50 | 17.50 | 0.40 | 0.3 | 0.15 | 40 | 30 | 15 | | Offshore | | | | |
| OWF_GI#08_CPT | 17.50 | 18.50 | 0.35 | 0.18 | 0 | 35 | 18 | 0 | | Offshore | | | | |
| OWF_GI#08_CPT | 18.50 | 19.50 | 0.55 | 0.35 | 0.32 | 55 | 35 | 32 | | Offshore | | | | |
| OWF_GI#08_CPT | 19.50 | 20.50 | 1.00 | 0.95 | 0.7 | 100 | 95 | 70 | | Offshore | | | | |
| OWF_GI#08_CPT | 20.50 | 21.50 | 0.30 | 0 | 0 | 30 | 0 | 0 | | Offshore | | | | |
| OWF_GI#09_SAMP | 0.00 | 1.00 | 0.75 | 0.75 | 0.4 | 75 | 75 | 40 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 1.00 | 2.00 | 0.80 | 0.6 | 0.3 | 80 | 60 | 30 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 3.00 | 4.00 | 0.30 | 0 | 0 | 30 | 0 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 4.00 | 5.00 | 0.50 | 0.2 | 0.2 | 50 | 20 | 20 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 5.00 | 6.00 | 0.30 | 0.1 | 0 | 30 | 10 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 6.00 | 7.00 | 0.20 | 0 | 0 | 20 | 0 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 7.00 | 8.00 | 0.05 | 0 | 0 | 5 | 0 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 8.00 | 9.00 | 0.40 | 0.1 | 0.1 | 40 | 10 | 10 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 9.00 | 10.00 | 0.35 | 0 | 0 | 35 | 0 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 10.00 | 11.00 | 0.50 | 0.1 | 0 | 50 | 10 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 11.00 | 12.00 | 0.70 | 0.2 | 0.2 | 70 | 20 | 20 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 12.00 | 13.00 | 0.10 | 0 | 0 | 10 | 0 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 13.00 | 14.00 | 0.50 | 0.2 | 0.2 | 50 | 20 | 20 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 14.00 | 15.00 | 0.90 | 0.9 | 0.9 | 90 | 90 | 90 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 15.00 | 16.00 | 1.00 | 0.8 | 0.8 | 100 | 80 | 80 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 16.00 | 17.00 | 0.50 | 0.2 | 0 | 50 | 20 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 17.00 | 18.00 | 0.40 | 0.1 | 0 | 40 | 10 | 0 | 80 | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#09_SAMP | 18.00 | 19.00 | 0.40 | 0.1 | 0 | 40 | 10 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 19.00 | 20.00 | 0.60 | 0.22 | 0 | 60 | 22 | 0 | 80 | Offshore | | | | |
| OWF_GI#09_SAMP | 20.00 | 20.70 | 0.70 | 0.6 | 0.28 | 100 | 86 | 40 | 80 | Offshore | | | | |
| OWF_GI#11_CPT | 5.50 | 6.20 | 0.51 | 0.215 | 0 | 73 | 31 | 0 | 70 | Offshore | | | | |
| OWF_GI#11_CPT | 6.20 | 7.80 | 1.34 | 0.55 | 0.32 | 84 | 34 | 20 | 70 | Offshore | | | | |
| OWF_GI#11_CPT | 7.80 | 9.30 | 0.23 | 0.07 | 0 | 15 | 5 | 0 | 70 | Offshore | | | | |
| OWF_GI#11_CPT | 10.30 | 11.50 | 0.50 | 0.31 | 0.22 | 42 | 26 | 18 | 70 | Offshore | | | | |
| OWF_GI#11_SAMP | 4.50 | 5.50 | 0.25 | 0.15 | 0.1 | 25 | 15 | 10 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 5.50 | 6.50 | 0.50 | 0.4 | 0.4 | 50 | 40 | 40 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 6.50 | 7.50 | 0.75 | 0.6 | 0.55 | 75 | 60 | 55 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 7.50 | 8.50 | 0.10 | 0 | 0 | 10 | 0 | 0 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 8.50 | 9.50 | 0.65 | 0.14 | 0.11 | 65 | 14 | 11 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 9.50 | 10.50 | 0.35 | 0.17 | 0 | 35 | 17 | 0 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 10.50 | 11.50 | 0.06 | 0.04 | 0 | 6 | 4 | 0 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 12.50 | 13.50 | 0.80 | 0.25 | 0.15 | 80 | 25 | 15 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 13.50 | 14.50 | 0.70 | 0.1 | 0 | 70 | 10 | 0 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 14.50 | 15.50 | 0.60 | 0.17 | 0 | 60 | 17 | 0 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 15.50 | 16.50 | 0.73 | 0.55 | 0.52 | 73 | 55 | 52 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 16.50 | 17.50 | 0.65 | 0.475 | 0.265 | 65 | 48 | 27 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 17.50 | 18.50 | 0.72 | 0.4 | 0.4 | 72 | 40 | 40 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 18.50 | 19.50 | 1.00 | 0.24 | 0.2 | 100 | 24 | 20 | 80 | Offshore | | | | |
| OWF_GI#11_SAMP | 19.50 | 20.50 | 0.40 | 0.36 | 0.18 | 40 | 36 | 18 | 80 | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#11B_CPT | 5.50 | 7.00 | 0.65 | 0.42 | 0.35 | 43 | 28 | 23 | | Offshore | | | | |
| OWF_GI#11B_CPT | 7.00 | 8.50 | 0.86 | 0.4 | 0.23 | 57 | 27 | 15 | | Offshore | | | | |
| OWF_GI#11B_CPT | 8.50 | 10.00 | 0.75 | 0.335 | 0.17 | 50 | 22 | 11 | | Offshore | | | | |
| OWF_GI#11B_CPT | 10.00 | 11.00 | 0.33 | 0 | 0 | 33 | 0 | 0 | | Offshore | | | | |
| OWF_GI#11B_CPT | 13.50 | 14.50 | 0.60 | 0.53 | 0.45 | 60 | 53 | 45 | | Offshore | | | | |
| OWF_GI#11B_CPT | 14.50 | 15.50 | 1.00 | 0.405 | 0.24 | 100 | 41 | 24 | | Offshore | | | | |
| OWF_GI#11B_CPT | 15.50 | 16.50 | 0.65 | 0.45 | 0.45 | 65 | 45 | 45 | | Offshore | | | | |
| OWF_GI#11B_CPT | 16.50 | 17.50 | 0.35 | 0.065 | 0 | 35 | 7 | 0 | | Offshore | | | | |
| OWF_GI#11B_CPT | 17.50 | 18.50 | 0.65 | 0.36 | 0.22 | 65 | 36 | 22 | | Offshore | | | | |
| OWF_GI#11B_CPT | 18.50 | 19.50 | 0.35 | 0.35 | 0.3 | 35 | 35 | 30 | | Offshore | | | | |
| OWF_GI#11B_CPT | 19.50 | 20.50 | 0.06 | 0.06 | 0 | 6 | 6 | 0 | | Offshore | | | | |
| OWF_GI#12_CPT | 3.50 | 4.50 | 0.35 | 0 | 0 | 35 | 0 | 0 | | Offshore | | | | |
| OWF_GI#12_CPT | 4.50 | 5.50 | 0.75 | 0.56 | 0.29 | 75 | 56 | 29 | | Offshore | | | | |
| OWF_GI#12_CPT | 5.50 | 6.50 | 0.85 | 0.52 | 0.52 | 85 | 52 | 52 | | Offshore | | | | |
| OWF_GI#12_CPT | 6.50 | 7.50 | 0.60 | 0.44 | 0.44 | 60 | 44 | 44 | | Offshore | | | | |
| OWF_GI#12_CPT | 7.50 | 8.50 | 0.85 | 0.49 | 0.45 | 85 | 49 | 45 | | Offshore | | | | |
| OWF_GI#12_CPT | 8.50 | 10.00 | 1.10 | 0.69 | 0.6 | 73 | 46 | 40 | | Offshore | | | | |
| OWF_GI#12_CPT | 10.00 | 11.50 | 1.05 | 0.945 | 0.72 | 70 | 63 | 48 | | Offshore | | | | |
| OWF_GI#12_CPT | 12.00 | 13.00 | 0.30 | 0 | 0 | 30 | 0 | 0 | | Offshore | | | | |
| OWF_GI#12_CPT | 13.00 | 14.00 | 0.40 | 0.27 | 0 | 40 | 27 | 0 | | Offshore | | | | |
| OWF_GI#12_CPT | 14.00 | 15.00 | 0.05 | 0 | 0 | 5 | 0 | 0 | | Offshore | | | | |
| OWF_GI#12_CPT | 15.00 | 16.00 | 0.50 | 0.295 | 0.15 | 50 | 30 | 15 | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#12_CPT | 16.00 | 17.00 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#12_CPT | 18.00 | 19.00 | 0.20 | 0.06 | 0.06 | 20 | 6 | 6 | | Offshore | | | | |
| OWF_GI#12_CPT | 19.00 | 20.50 | 1.05 | 0.9 | 0.615 | 70 | 60 | 41 | | Offshore | | | | |
| OWF_GI#12_SAMP | 2.80 | 3.80 | 0.15 | 0 | 0 | 15 | 0 | 0 | | Offshore | | | | |
| OWF_GI#12_SAMP | 4.30 | 5.30 | 0.44 | 0.32 | 0.14 | 44 | 32 | 14 | | Offshore | | | | |
| OWF_GI#12_SAMP | 5.30 | 6.30 | 0.30 | 0.06 | 0 | 30 | 6 | 0 | | Offshore | | | | |
| OWF_GI#12_SAMP | 7.30 | 8.30 | 0.35 | 0.24 | 0.2 | 35 | 24 | 20 | | Offshore | | | | |
| OWF_GI#12_SAMP | 8.30 | 9.30 | 0.50 | 0.42 | 0.42 | 50 | 42 | 42 | | Offshore | | | | |
| OWF_GI#12_SAMP | 9.30 | 10.30 | 0.45 | 0.37 | 0 | 45 | 37 | 0 | | Offshore | | | | |
| OWF_GI#12_SAMP | 11.30 | 12.30 | 0.85 | 0.52 | 0 | 85 | 52 | 0 | | Offshore | | | | |
| OWF_GI#12_SAMP | 12.30 | 13.30 | 0.65 | 0.1 | 0 | 65 | 10 | 0 | | Offshore | | | | |
| OWF_GI#12_SAMP | 13.30 | 14.30 | 0.15 | 0.08 | 0 | 15 | 8 | 0 | | Offshore | | | | |
| OWF_GI#12_SAMP | 14.30 | 15.30 | 0.45 | 0 | 0 | 45 | 0 | 0 | | Offshore | | | | |
| OWF_GI#12_SAMP | 16.30 | 17.30 | 0.75 | 0.31 | 0.17 | 75 | 31 | 17 | | Offshore | | | | |
| OWF_GI#12_SAMP | 18.30 | 19.30 | 1.00 | 0.77 | 0.77 | 100 | 77 | 77 | | Offshore | | | | |
| OWF_GI#12_SAMP | 19.30 | 20.30 | 0.35 | 0.06 | 0 | 35 | 6 | 0 | | Offshore | | | | |
| OWF_GI#13_CPT | 1.00 | 2.00 | 0.50 | 0.1 | 0.1 | 50 | 10 | 10 | | Offshore | | | | |
| OWF_GI#13_CPT | 2.00 | 3.00 | 0.50 | 0.1 | 0.1 | 50 | 10 | 10 | | Offshore | | | | |
| OWF_GI#13_CPT | 3.00 | 4.00 | 0.75 | 0.5 | 0.5 | 75 | 50 | 50 | | Offshore | | | | |
| OWF_GI#13_CPT | 4.00 | 5.00 | 0.70 | 0.33 | 0.33 | 70 | 33 | 33 | | Offshore | | | | |
| OWF_GI#13_CPT | 5.00 | 6.00 | 0.55 | 0.25 | 0.21 | 55 | 25 | 21 | | Offshore | | | | |
| OWF_GI#13_CPT | 6.00 | 7.00 | 0.30 | 0 | 0 | 30 | 0 | 0 | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#13_CPT | 7.00 | 8.00 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#13_CPT | 8.00 | 9.00 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#13_CPT | 9.00 | 10.00 | 0.70 | 0.14 | 0 | 70 | 14 | 0 | | Offshore | | | | |
| OWF_GI#13_CPT | 10.00 | 11.00 | 1.00 | 0.68 | 0.65 | 100 | 68 | 65 | | Offshore | | | | |
| OWF_GI#13_CPT | 11.00 | 12.00 | 0.05 | 0 | 0 | 5 | 0 | 0 | | Offshore | | | | |
| OWF_GI#13_CPT | 12.00 | 13.00 | 0.60 | 0.46 | 0.35 | 60 | 46 | 35 | | Offshore | | | | |
| OWF_GI#13_CPT | 13.00 | 14.00 | 0.25 | 0.07 | 0 | 25 | 7 | 0 | | Offshore | | | | |
| OWF_GI#13_CPT | 14.00 | 15.00 | 0.70 | 0.6 | 0.6 | 70 | 60 | 60 | | Offshore | | | | |
| OWF_GI#13_CPT | 15.00 | 16.00 | 0.55 | 0.55 | 0.55 | 55 | 55 | 55 | | Offshore | | | | |
| OWF_GI#13_CPT | 16.00 | 17.00 | 0.65 | 0.53 | 0.26 | 65 | 53 | 26 | | Offshore | | | | |
| OWF_GI#13_CPT | 17.00 | 18.00 | 0.55 | 0.45 | 0.45 | 55 | 45 | 45 | | Offshore | | | | |
| OWF_GI#13_CPT | 18.00 | 19.00 | 1.00 | 0.65 | 0.65 | 100 | 65 | 65 | | Offshore | | | | |
| OWF_GI#13_CPT | 19.00 | 20.00 | 0.67 | 0.58 | 0.39 | 67 | 58 | 39 | | Offshore | | | | |
| OWF_GI#14_SAMP | 0.00 | 1.00 | 0.40 | 0 | 0 | 40 | 0 | 0 | | Offshore | | | | |
| OWF_GI#14_SAMP | 1.00 | 2.00 | 0.65 | 0.31 | 0.25 | 65 | 31 | 25 | | Offshore | | | | |
| OWF_GI#14_SAMP | 2.00 | 3.00 | 0.65 | 0.4 | 0.4 | 65 | 40 | 40 | | Offshore | | | | |
| OWF_GI#14_SAMP | 3.00 | 4.00 | 0.95 | 0.91 | 0.91 | 95 | 91 | 91 | | Offshore | | | | |
| OWF_GI#14_SAMP | 4.30 | 5.50 | 0.30 | 0 | 0 | 25 | 0 | 0 | | Offshore | | | | |
| OWF_GI#14_SAMP | 5.50 | 6.50 | 0.70 | 0.41 | 0.38 | 70 | 41 | 38 | | Offshore | | | | |
| OWF_GI#14_SAMP | 6.50 | 7.50 | 0.35 | 0.25 | 0.25 | 35 | 25 | 25 | | Offshore | | | | |
| OWF_GI#14_SAMP | 7.50 | 8.50 | 0.15 | 0 | 0 | 15 | 0 | 0 | | Offshore | | | | |
| OWF_GI#14_SAMP | 8.50 | 9.50 | 0.65 | 0.09 | 0 | 65 | 9 | 0 | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#14_SAMP | 10.00 | 11.00 | 0.30 | 0.3 | 0.1 | 30 | 30 | 10 | | Offshore | | | | |
| OWF_GI#14_SAMP | 11.00 | 12.00 | 0.65 | 0.22 | 0 | 65 | 22 | 0 | | Offshore | | | | |
| OWF_GI#14_SAMP | 12.00 | 13.00 | 0.65 | 0.62 | 0.57 | 65 | 62 | 57 | | Offshore | | | | |
| OWF_GI#14_SAMP | 13.00 | 14.00 | 0.65 | 0.28 | 0.24 | 65 | 28 | 24 | | Offshore | | | | |
| OWF_GI#14_SAMP | 14.00 | 15.00 | 0.95 | 0.34 | 0.34 | 95 | 34 | 34 | | Offshore | | | | |
| OWF_GI#14_SAMP | 15.00 | 16.50 | 0.53 | 0 | 0 | 35 | 0 | 0 | | Offshore | | | | |
| OWF_GI#14_SAMP | 16.50 | 17.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#14_SAMP | 17.50 | 18.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#14A_SAMP | 0.00 | 1.50 | 0.33 | 0.06 | 0 | 22 | 4 | 0 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 1.50 | 3.00 | 0.70 | 0.49 | 0.43 | 47 | 33 | 29 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 3.00 | 4.30 | 0.96 | 0.9 | 0.85 | 74 | 69 | 65 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 4.30 | 5.50 | 0.30 | 0 | 0 | 25 | 0 | 0 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 5.50 | 6.50 | 0.70 | 0.41 | 0.38 | 70 | 41 | 38 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 6.50 | 7.50 | 0.35 | 0.25 | 0.25 | 35 | 25 | 25 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 7.50 | 8.50 | 0.15 | 0 | 0 | 15 | 0 | 0 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 8.50 | 9.50 | 0.65 | 0.09 | 0 | 65 | 9 | 0 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 10.00 | 11.00 | 0.30 | 0.3 | 0.1 | 30 | 30 | 10 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 11.00 | 12.00 | 0.65 | 0.22 | 0 | 65 | 22 | 0 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 12.00 | 13.00 | 0.65 | 0.62 | 0.57 | 65 | 62 | 57 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 13.00 | 14.00 | 0.65 | 0.28 | 0.24 | 65 | 28 | 24 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 14.00 | 15.00 | 0.95 | 0.34 | 0.34 | 95 | 34 | 34 | | Offshore | | | | |
| OWF_GI#14A_SAMP | 15.00 | 16.50 | 0.80 | 0 | 0 | 53 | 0 | 0 | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#14A_SAMP | 16.50 | 17.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#14A_SAMP | 17.50 | 18.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#15_SAMP | 0.00 | 1.00 | 0.40 | 0.125 | 0 | 40 | 13 | 0 | 70 | Offshore | | | | |
| OWF_GI#15_SAMP | 1.00 | 2.00 | 0.65 | 0.1 | 0 | 65 | 10 | 0 | 70 | Offshore | | | | |
| OWF_GI#15_SAMP | 2.00 | 2.30 | 0.30 | 0.1 | 0 | 100 | 33 | 0 | 70 | Offshore | | | | |
| OWF_GI#15A_SAMP | 0.00 | 1.00 | 0.30 | 0.1 | 0.1 | 30 | 10 | 10 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 1.00 | 2.00 | 0.35 | 0.1 | 0 | 35 | 10 | 0 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 3.00 | 4.00 | 0.40 | 0.1 | 0 | 40 | 10 | 0 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 4.00 | 5.00 | 0.15 | 0 | 0 | 15 | 0 | 0 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 6.00 | 7.00 | 0.90 | 0.6 | 0.6 | 90 | 60 | 60 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 7.00 | 8.00 | 0.60 | 0.6 | 0.4 | 60 | 60 | 40 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 8.00 | 9.00 | 0.95 | 0.95 | 0.6 | 95 | 95 | 60 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 9.00 | 10.00 | 0.60 | 0.6 | 0.4 | 60 | 60 | 40 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 12.00 | 13.00 | 0.90 | 0.9 | 0.9 | 90 | 90 | 90 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 13.00 | 14.00 | 1.00 | 1 | 0.8 | 100 | 100 | 80 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 14.00 | 15.00 | 0.85 | 0.75 | 0.7 | 85 | 75 | 70 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 15.00 | 16.00 | 0.90 | 0.9 | 0.9 | 90 | 90 | 90 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 16.00 | 17.00 | 0.75 | 0.75 | 0.75 | 75 | 75 | 75 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 17.00 | 18.00 | 1.00 | 1 | 1 | 100 | 100 | 100 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 18.60 | 19.50 | 0.75 | 0.7 | 0.7 | 83 | 78 | 78 | 80 | Offshore | | | | |
| OWF_GI#15A_SAMP | 19.50 | 20.50 | 1.00 | 1 | 0.9 | 100 | 100 | 90 | 80 | Offshore | | | | |
| OWF_GI#17_SAMP | 1.50 | 2.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#17_SAMP | 4.90 | 6.00 | 0.40 | 0.175 | 0.175 | 36 | 16 | 16 | | Offshore | | | | |
| OWF_GI#17_SAMP | 6.00 | 7.00 | 0.60 | 0.6 | 0.52 | 60 | 60 | 52 | | Offshore | | | | |
| OWF_GI#17_SAMP | 7.00 | 7.50 | 0.15 | 0.15 | 0 | 30 | 30 | 0 | | Offshore | | | | |
| OWF_GI#17_SAMP | 7.50 | 8.50 | 0.35 | 0.1 | 0 | 35 | 10 | 0 | | Offshore | | | | |
| OWF_GI#17_SAMP | 8.50 | 9.50 | 0.30 | 0.1 | 0 | 30 | 10 | 0 | | Offshore | | | | |
| OWF_GI#17_SAMP | 9.50 | 10.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#17_SAMP | 11.70 | 12.70 | 0.70 | 0.7 | 0 | 70 | 70 | 0 | | Offshore | | | | |
| OWF_GI#17_SAMP | 12.70 | 13.70 | 0.60 | 0.55 | 0.3 | 60 | 55 | 30 | | Offshore | | | | |
| OWF_GI#17_SAMP | 13.70 | 14.70 | 0.80 | 0.65 | 0.15 | 80 | 65 | 15 | | Offshore | | | | |
| OWF_GI#17_SAMP | 14.70 | 15.70 | 0.50 | 0.45 | 0 | 50 | 45 | 0 | | Offshore | | | | |
| OWF_GI#17_SAMP | 15.70 | 16.70 | 0.40 | 0.1 | 0 | 40 | 10 | 0 | | Offshore | | | | |
| OWF_GI#17_SAMP | 18.80 | 19.80 | 0.70 | 0.15 | 0 | 70 | 15 | 0 | | Offshore | | | | |
| OWF_GI#17_SAMP | 19.80 | 20.30 | 0.50 | 0.15 | 0 | 100 | 30 | 0 | | Offshore | | | | |
| OWF_GI#20_CPT | 5.30 | 6.30 | 0.60 | 0.55 | 0.4 | 60 | 55 | 40 | | Offshore | | | | |
| OWF_GI#20_CPT | 11.90 | 12.90 | 0.20 | 0.05 | 0 | 20 | 5 | 0 | | Offshore | | | | |
| OWF_GI#20_CPT | 18.40 | 19.40 | 0.80 | 0.55 | 0.25 | 80 | 55 | 25 | | Offshore | | | | |
| OWF_GI#20_CPT | 19.40 | 20.40 | 0.90 | 0.85 | 0.15 | 90 | 85 | 15 | | Offshore | | | | |
| OWF_GI#20_SAMP | 4.70 | 5.70 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#20_SAMP | 5.70 | 6.70 | 0.10 | 0 | 0 | 10 | 0 | 0 | | Offshore | | | | |
| OWF_GI#20_SAMP | 11.50 | 12.00 | 0.30 | 0.25 | 0 | 60 | 50 | 0 | | Offshore | | | | |
| OWF_GI#20_SAMP | 12.00 | 13.00 | 0.05 | 0 | 0 | 5 | 0 | 0 | | Offshore | | | | |
| OWF_GI#20_SAMP | 15.00 | 16.00 | 0.70 | 0.55 | 0 | 70 | 55 | 0 | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#20_SAMP | 16.00 | 17.00 | 0.60 | 0.5 | 0.22 | 60 | 50 | 22 | | Offshore | | | | |
| OWF_GI#20_SAMP | 17.00 | 18.00 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#20_SAMP | 18.30 | 19.30 | 0.50 | 0.2 | 0.12 | 50 | 20 | 12 | | Offshore | | | | |
| OWF_GI#22_CPT | 4.50 | 5.50 | 0.80 | 0.33 | 0.33 | 80 | 33 | 33 | | Offshore | | | | |
| OWF_GI#22_CPT | 5.50 | 6.00 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#22_CPT | 6.00 | 7.00 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#22_CPT | 7.00 | 8.00 | 0.30 | 0.1 | 0 | 30 | 10 | 0 | | Offshore | | | | |
| OWF_GI#22_CPT | 8.00 | 9.00 | 0.40 | 0.2 | 0.2 | 40 | 20 | 20 | | Offshore | | | | |
| OWF_GI#22_CPT | 9.00 | 10.50 | 0.35 | 0.2 | 0.2 | 23 | 13 | 13 | | Offshore | | | | |
| OWF_GI#22_CPT | 10.50 | 12.00 | 0.65 | 0.25 | 0.15 | 43 | 17 | 10 | | Offshore | | | | |
| OWF_GI#22_CPT | 12.00 | 13.00 | 0.70 | 0.3 | 0.25 | 70 | 30 | 25 | | Offshore | | | | |
| OWF_GI#22_CPT | 13.00 | 13.80 | 0.20 | 0.2 | 0 | 25 | 25 | 0 | | Offshore | | | | |
| OWF_GI#22_CPT | 13.80 | 15.00 | 0.50 | 0.4 | 0.4 | 42 | 33 | 33 | | Offshore | | | | |
| OWF_GI#22_CPT | 15.00 | 16.00 | 0.40 | 0.35 | 0.13 | 40 | 35 | 13 | | Offshore | | | | |
| OWF_GI#22_CPT | 16.00 | 17.00 | 0.35 | 0.35 | 0.11 | 35 | 35 | 11 | | Offshore | | | | |
| OWF_GI#22_CPT | 17.00 | 18.20 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#22_CPT | 18.20 | 19.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#22_CPT | 19.50 | 20.00 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#22_SAMP | 1.40 | 2.40 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#22_SAMP | 4.50 | 5.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#22_SAMP | 5.50 | 6.00 | 0.10 | 0.05 | 0 | 20 | 10 | 0 | | Offshore | | | | |
| OWF_GI#22_SAMP | 6.00 | 6.50 | 0.10 | 0.05 | 0 | 20 | 10 | 0 | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#22_SAMP | 6.50 | 7.00 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#22_SAMP | 7.00 | 8.00 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#22_SAMP | 8.00 | 8.50 | 0.10 | 0.1 | 0 | 20 | 20 | 0 | | Offshore | | | | |
| OWF_GI#22_SAMP | 8.50 | 9.50 | 0.20 | 0.2 | 0 | 20 | 20 | 0 | | Offshore | | | | |
| OWF_GI#22_SAMP | 9.50 | 10.50 | 0.30 | 0.1 | 0 | 30 | 10 | 0 | | Offshore | | | | |
| OWF_GI#22_SAMP | 10.50 | 11.50 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#22_SAMP | 11.50 | 12.50 | 0.50 | 0.3 | 0.2 | 50 | 30 | 20 | | Offshore | | | | |
| OWF_GI#22_SAMP | 12.50 | 13.50 | 0.60 | 0.35 | 0.2 | 60 | 35 | 20 | | Offshore | | | | |
| OWF_GI#22_SAMP | 14.20 | 15.20 | 0.20 | 0.1 | 0 | 20 | 10 | 0 | | Offshore | | | | |
| OWF_GI#22_SAMP | 15.20 | 16.20 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#22_SAMP | 16.20 | 17.20 | 0.30 | 0.2 | 0 | 30 | 20 | 0 | | Offshore | | | | |
| OWF_GI#22_SAMP | 17.20 | 18.20 | 0.10 | 0.1 | 0 | 10 | 10 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 1.10 | 2.10 | 0.20 | 0.2 | 0.2 | 20 | 20 | 20 | | Offshore | | | | |
| OWF_GI#24_SAMP | 2.10 | 3.10 | 0.40 | 0.25 | 0.15 | 40 | 25 | 15 | | Offshore | | | | |
| OWF_GI#24_SAMP | 3.10 | 4.10 | 0.30 | 0.15 | 0 | 30 | 15 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 4.10 | 5.10 | 0.60 | 0.55 | 0.35 | 60 | 55 | 35 | | Offshore | | | | |
| OWF_GI#24_SAMP | 5.10 | 6.10 | 0.60 | 0.2 | 0 | 60 | 20 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 6.10 | 7.00 | 0.10 | 0 | 0 | 11 | 0 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 7.00 | 8.00 | 1.00 | 0.95 | 0.9 | 100 | 95 | 90 | | Offshore | | | | |
| OWF_GI#24_SAMP | 8.00 | 9.00 | 0.20 | 0.1 | 0 | 20 | 10 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 9.00 | 10.00 | 0.00 | 0 | 0 | 0 | | | | Offshore | | | | |
| OWF_GI#24_SAMP | 10.00 | 11.00 | 0.35 | 0.25 | 0.13 | 35 | 25 | 13 | | Offshore | | | | |

# ROCK CORING RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Top Depth (m) | Base Depth (m) | TCR Length (m) | SCR Length (m) | RQD Length (m) | TCR (%) | SCR (%) | RQD (%) | Diameter (mm) | Testing Laboratory | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#24_SAMP | 11.00 | 12.00 | 0.05 | 0 | 0 | 5 | 0 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 12.00 | 13.00 | 0.30 | 0.15 | 0 | 30 | 15 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 13.00 | 14.00 | 0.10 | 0 | 0 | 10 | 0 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 14.00 | 15.00 | 0.15 | 0 | 0 | 15 | 0 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 15.00 | 16.00 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 16.00 | 17.00 | 0.20 | 0 | 0 | 20 | 0 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 17.00 | 18.00 | 0.10 | 0 | 0 | 10 | 0 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 18.50 | 19.50 | 0.40 | 0.15 | 0 | 40 | 15 | 0 | | Offshore | | | | |
| OWF_GI#24_SAMP | 19.50 | 20.50 | 0.55 | 0.3 | 0.2 | 55 | 30 | 20 | | Offshore | | | | |

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | UCS (MPa) | Water Content (%) | Dry Density ($Mg/m^3$) | Porosity (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#01_SAMP | CR01 | 0.30 | | | 2.60 | 7.4 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR01 | 0.00 | | | 2.62 | 7.1 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR05 | 3.20 | | | 2.15 | 24.3 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR06 | 4.20 | | | 1.91 | 33.2 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR07 | 5.20 | | | 1.71 | 40.0 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR09 | 7.20 | | | 2.05 | 27.8 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR10 | 8.65 | | | 2.05 | 26.7 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR10 | 8.80 | 24.30 | | | | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR10 | 9.30 | | | 2.75 | 2.4 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR11 | 9.50 | | | 2.38 | 15.8 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR15 | 16.15 | | | 2.28 | 19.5 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR16 | 17.00 | | | 1.91 | 29.5 | | | | | | | | | | | | |
| OWF_GI#01A_SAMP | CR17 | 18.50 | | | 2.01 | 25.9 | | | | | | | | | | | | |
| OWF_GI#04_SAMP | CR03 | 3.80 | | | 2.59 | 7.8 | | | | | | | | | | | | |
| OWF_GI#04_SAMP | CR06 | 6.40 | | | 2.49 | 10.6 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR04 | 3.70 | | | 2.26 | 20.8 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR05 | 4.70 | | | 2.42 | 15.2 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR10 | 11.90 | | | 1.43 | 47.6 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR13 | 16.90 | | | 1.86 | 31.2 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR14 | 18.00 | | | 2.13 | 21.0 | | | | | | | | | | | | |
| OWF_GI#04A_SAMP | CR15 | 19.25 | | | 2.31 | 15.2 | | | | | | | | | | | | |
| OWF_GI#05A_SAMP | CR01 | 0.50 | | | 2.30 | 14.5 | | | | | | | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Ref: GMOP21-G-019-FAC

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | UCS (MPa) | Water Content (%) | Dry Density ($Mg/m^3$) | Porosity (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#05A_SAMP | CR02 | 1.50 | | | 2.32 | 14.1 | | | | | | | | | | | | |
| OWF_GI#05A_SAMP | CR03 | 2.90 | | | 1.82 | 34.5 | | | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR01 | 5.50 | 16.00 | | 2.35 | 16.6 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR01 | 0.00 | | | 2.56 | 10.1 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR01 | 0.20 | 27.10 | | | | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR02 | 1.20 | 46.20 | | | | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR05 | 4.00 | | | 2.08 | 26.6 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR12 | 11.10 | | | 1.91 | 32.7 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR14 | 13.00 | 28.50 | | | | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR14 | 13.10 | | | 2.18 | 22.8 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR15 | 14.00 | 32.30 | | | | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR15 | 14.10 | | | 2.66 | 5.6 | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR16 | 15.10 | 34.70 | | | | | | | | | | | | | | | |
| OWF_GI#09_SAMP | CR17 | 16.00 | | | 1.70 | 37.5 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR04 | 4.50 | | | 2.23 | 21.5 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR05 | 5.50 | 43.40 | | | | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR06 | 6.50 | | | 2.45 | 13.2 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR08 | 8.50 | | | 1.94 | 28.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR11 | 12.50 | | | 1.97 | 23.9 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR12 | 13.50 | | | 2.27 | 15.9 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR14 | 15.50 | 49.10 | | 2.13 | 24.0 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR15 | 16.55 | 11.80 | | | | | | | | | | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | UCS (MPa) | Water Content (%) | Dry Density ($Mg/m^3$) | Porosity (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#11_SAMP | CR15 | 16.75 | | | 1.95 | 30.5 | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR16 | 17.50 | 35.10 | | | | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR17 | 18.50 | 14.60 | | | | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR18 | 19.60 | 21.70 | | | | | | | | | | | | | | | |
| OWF_GI#11_SAMP | CR18 | 19.80 | | | 2.24 | 19.8 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR01 | 2.80 | | | 1.96 | 30.2 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR02 | 4.40 | | | 2.14 | 23.9 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR05 | 7.45 | 59.60 | | | | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR06 | 8.30 | 52.00 | | 2.57 | 8.5 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR09 | 11.30 | | | 2.05 | 25.6 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR14 | 16.30 | | | 1.77 | 35.1 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR16 | 18.95 | | | 2.37 | 14.9 | | | | | | | | | | | | |
| OWF_GI#12_SAMP | CR16 | 19.10 | 88.90 | | | | | | | | | | | | | | | |
| OWF_GI#14_SAMP | CR02 | 1.10 | | | 2.26 | 15.8 | | | | | | | | | | | | |
| OWF_GI#14_SAMP | CR03 | 2.10 | | | 2.18 | 23.1 | | | | | | | | | | | | |
| OWF_GI#14_SAMP | CR04 | 3.30 | 1.94 | | | | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR02 | 1.70 | | | 2.14 | 20.3 | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR02 | 2.10 | | | 2.71 | 4.4 | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR03 | 3.10 | 11.60 | | | | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR03 | 3.30 | | | 1.99 | 30.2 | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR03 | 4.00 | | | 2.50 | 12.4 | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR04 | 4.30 | | | 2.42 | 14.3 | | | | | | | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | UCS (MPa) | Water Content (%) | Dry Density ($Mg/m^3$) | Porosity (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#14A_SAMP | CR05 | 5.70 | 17.00 | | | | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR09 | 10.10 | | | 2.29 | 17.6 | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR10 | 11.20 | | | 2.00 | 28.5 | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR11 | 12.50 | | | 2.42 | 12.9 | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR12 | 13.00 | | | 1.83 | 31.4 | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR13 | 14.00 | | | 1.93 | 29.2 | | | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR13 | 14.75 | 18.20 | | | | | | | | | | | | | | | |
| OWF_GI#15_SAMP | CR01 | 0.00 | | | 2.58 | 8.2 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR01 | 0.00 | | | 2.74 | 2.4 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR03 | 3.10 | | | 1.83 | 32.3 | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR05 | 6.50 | 6.76 | | | | | | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR07 | 8.00 | | | 2.19 | 23.0 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR03 | 6.45 | | | 2.20 | 18.2 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR06 | 8.50 | | | 2.20 | 18.4 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR08 | 12.00 | | | 1.77 | 33.9 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR09 | 12.70 | 15.30 | | | | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR10 | 13.70 | | | 1.53 | 42.6 | | | | | | | | | | | | |
| OWF_GI#17_SAMP | CR14 | 19.80 | | | 1.57 | 41.1 | | | | | | | | | | | | |
| OWF_GI#20_SAMP | CR03 | 11.50 | | | 1.92 | 27.4 | | | | | | | | | | | | |
| OWF_GI#20_SAMP | CR05 | 15.05 | | | 2.37 | 11.9 | | | | | | | | | | | | |
| OWF_GI#20_SAMP | CR06 | 16.10 | | | 1.54 | 42.8 | | | | | | | | | | | | |
| OWF_GI#20_SAMP | CR08 | 18.80 | | | 1.58 | 40.6 | | | | | | | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Test Depth (m) | UCS (MPa) | Water Content (%) | Dry Density ($Mg/m^3$) | Porosity (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#22_SAMP | CR08 | 8.50 | | | 2.54 | 4.7 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | CR11 | 11.80 | | | 2.47 | 7.6 | | | | | | | | | | | | |
| OWF_GI#22_SAMP | CR12 | 12.70 | | | 2.42 | 9.9 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR03 | 3.10 | | | 2.45 | 7.7 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR05 | 5.20 | | | 2.50 | 7.2 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR10 | 10.00 | | | 2.29 | 15.1 | | | | | | | | | | | | |
| OWF_GI#24_SAMP | CR18 | 18.50 | | | 2.15 | 19.7 | | | | | | | | | | | | |

TXL - Hoek Triaxial

# ROCK TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#01_SAMP | CR01 | B1 | 0.55 | 4 | 2.70 | 2.60 | | | | | |
| OWF_GI#01_SAMP | CR02 | Q1 | 2.40 | 10 | 2.54 | 2.31 | | | | | |
| OWF_GI#01A_SAMP | CR01 | IS | 0.35 | 10 | 2.79 | 2.54 | | | | | |
| OWF_GI#01A_SAMP | CR02 | IS | 1.40 | 3 | 2.81 | 2.73 | | | | | |
| OWF_GI#01A_SAMP | CR03 | B1 | 1.70 | 14 | | | | | | | |
| OWF_GI#01A_SAMP | CR05 | IS | 3.20 | 16 | | | | | | | |
| OWF_GI#01A_SAMP | CR06 | IS | 4.20 | 19 | | | | | | | |
| OWF_GI#01A_SAMP | CR07 | IS | 5.20 | 28 | 2.40 | 1.88 | | | | | |
| OWF_GI#01A_SAMP | CR09 | Q1 | 7.45 | 16 | 2.35 | 2.03 | | | | | |
| OWF_GI#01A_SAMP | CR10 | Q1 | 8.65 | 12 | 2.43 | 2.17 | | | | | |
| OWF_GI#01A_SAMP | CR10 | Q2 | 9.30 | 4 | 2.78 | 2.67 | | | | | |
| OWF_GI#01A_SAMP | CR11 | Q1 | 10.00 | 3 | 2.66 | 2.58 | | | | | |
| OWF_GI#01A_SAMP | CR12 | IS | 11.50 | 10 | | | | | | | |
| OWF_GI#01A_SAMP | CR13 | IS | 12.50 | 15 | | | | | | | |
| OWF_GI#01A_SAMP | PU02A | IS | 14.50 | 24 | 2.12 | 1.71 | | | | | |
| OWF_GI#01A_SAMP | PU03 | IS | 15.00 | 22 | 2.04 | 1.67 | | | | | |
| OWF_GI#01A_SAMP | CR15 | B1 | 16.10 | 10 | 2.19 | 1.99 | | | | | |
| OWF_GI#01A_SAMP | CR16 | B1 | 17.35 | 21 | | | | | | | |
| OWF_GI#01A_SAMP | CR17 | B1 | 18.65 | 14 | 2.09 | 1.83 | | | | | |
| OWF_GI#01A_SAMP | CR18 | B1 | 20.00 | 15 | | | | | | | |
| OWF_GI#04_SAMP | PU01A | B1 | 0.40 | 19 | 2.11 | 1.77 | | | | | |
| OWF_GI#04_SAMP | PU02 | B1 | 1.00 | 20 | 1.96 | 1.64 | | | | | |

PP - Pocket Penetrometer UU - Undrained Unconsolidated Triaxial $\varepsilon_{50}$ - Strain at half max. deviator stress

Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#04_SAMP | CR01 | B1 | 1.40 | 1 | | | | | | | |
| OWF_GI#04_SAMP | CR03 | IS | 4.10 | 6 | | | | | | | |
| OWF_GI#04_SAMP | CR05 | B1 | 5.80 | 5 | | | | | | | |
| OWF_GI#04_SAMP | CR06 | Q1 | 6.40 | 2 | 2.51 | 2.46 | | | | | |
| OWF_GI#04A_SAMP | PU01A | B1 | 0.10 | 16 | 1.53 | 1.32 | | | | | |
| OWF_GI#04A_SAMP | PU01A | B1 | 0.20 | 16 | 1.59 | 1.37 | | | | | |
| OWF_GI#04A_SAMP | CR02 | B1 | 1.50 | 0 | | | | | | | |
| OWF_GI#04A_SAMP | CR03 | B1 | 2.50 | 2 | | | | | | | |
| OWF_GI#04A_SAMP | CR04 | Q1 | 3.50 | 3 | 2.11 | 2.05 | | | | | |
| OWF_GI#04A_SAMP | CR06 | Q1 | 5.50 | 8 | 2.76 | 2.56 | | | | | |
| OWF_GI#04A_SAMP | PU03 | B1 | 8.50 | 19 | | | | | | | |
| OWF_GI#04A_SAMP | PU04 | B1 | 9.40 | 27 | | | | | | | |
| OWF_GI#04A_SAMP | PU05 | Q1 | 9.80 | 19 | 2.07 | 1.74 | | | | | |
| OWF_GI#04A_SAMP | PU05 | B1 | 10.10 | 22 | | | | | | | |
| OWF_GI#04A_SAMP | PU06 | B1 | 11.30 | 27 | | | | | | | |
| OWF_GI#04A_SAMP | PU07 | B1 | 11.80 | 12 | | | | | | | |
| OWF_GI#04A_SAMP | CR10 | B1 | 11.90 | 24 | | | | | | | |
| OWF_GI#04A_SAMP | CR10 | Q1 | 12.05 | 24 | 2.18 | 1.76 | | | | | |
| OWF_GI#04A_SAMP | PU08 | IS | 13.90 | 23 | | | | | | | |
| OWF_GI#04A_SAMP | PU09 | IS | 14.50 | 23 | | | | | | | |
| OWF_GI#04A_SAMP | PU10 | B1 | 15.00 | 19 | | | | | | | |
| OWF_GI#04A_SAMP | PU11 | IS | 15.40 | 21 | | | | | | | |

PP - Pocket Penetrometer UU - Undrained Unconsolidated Triaxial $\varepsilon_{50}$ - Strain at half max. deviator stress

Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#04A_SAMP | PU12 | B1 | 15.80 | 22 | 2.06 | 1.69 | | | | | |
| OWF_GI#04A_SAMP | PU13 | B1 | 16.10 | 31 | | | | | | | |
| OWF_GI#04A_SAMP | PU14 | B1 | 14.40 | 18 | | | | | | | |
| OWF_GI#04A_SAMP | CR12 | B1 | 14.50 | 23 | 2.59 | 2.11 | | | | | |
| OWF_GI#04A_SAMP | CR13 | Q1 | 16.40 | 14 | 2.18 | 1.91 | | | | | |
| OWF_GI#04A_SAMP | CR14 | B1 | 18.50 | 19 | 2.38 | 2.00 | | | | | |
| OWF_GI#04A_SAMP | CR15 | B1 | 19.70 | 8 | 2.35 | 2.18 | | | | | |
| OWF_GI#05_SAMP | PU01A | B1 | 0.20 | 16 | | | | | | | |
| OWF_GI#05_SAMP | PU01A | B2 | 0.30 | 5 | | | | | | | |
| OWF_GI#05A_SAMP | PU01A | B1 | 0.10 | 18 | 1.97 | 1.66 | | | | | |
| OWF_GI#05A_SAMP | CR01 | IS | 0.80 | 7 | 2.56 | 2.39 | | | | | |
| OWF_GI#05A_SAMP | CR01 | B2 | 1.00 | 5 | | | | | | | |
| OWF_GI#05A_SAMP | CR02 | B1 | 1.70 | 8 | | | | | | | |
| OWF_GI#05A_SAMP | CR03 | Q1 | 2.70 | 6 | 2.55 | 2.41 | | | | | |
| OWF_GI#05A_SAMP | CR03 | IS | 3.40 | 22 | | | | | | | |
| OWF_GI#05A_SAMP | CR04 | IS | 3.65 | 10 | 2.59 | 2.35 | | | | | |
| OWF_GI#05A_SAMP | CR04 | Q1 | 3.90 | 45 | 2.12 | 1.46 | | | | | |
| OWF_GI#05A_SAMP | CR05 | B1 | 4.70 | 33 | 2.01 | 1.51 | | | | | |
| OWF_GI#05A_SAMP | CR05 | B1 | 4.95 | 33 | 2.00 | 1.50 | | | | | |
| OWF_GI#05A_SAMP | CR05 | Q1 | 4.70 | 30 | 1.90 | 1.46 | | | | 165.00 | |
| OWF_GI#05A_SAMP | CR05 | Q1 | 4.71 | | | | | | | 129.00R | |
| OWF_GI#05A_SAMP | CR05 | Q1 | 4.90 | | | | | 150 | | | |

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[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#05A_SAMP | CR05 | Q1 | 4.90 | | | | | 163 | | | |
| OWF_GI#05A_SAMP | CR05 | Q2 | 5.10 | | | | | 188 | | | |
| OWF_GI#05A_SAMP | CR05 | Q2 | 5.10 | | | | | 175 | | | |
| OWF_GI#05A_SAMP | PU02 | B1 | 5.60 | 33 | | | | | | | |
| OWF_GI#05B_SAMP | CR01 | IS | 5.60 | 14 | 2.40 | 2.11 | | | | | |
| OWF_GI#05B_SAMP | CR02 | IS | 6.80 | 37 | 2.25 | 1.64 | | | | | |
| OWF_GI#05B_SAMP | CR03 | Q1 | 7.85 | 30 | 2.02 | 1.55 | | | | | |
| OWF_GI#05B_SAMP | CR03 | Q2 | 8.00 | 15 | 2.17 | 1.89 | | | | | |
| OWF_GI#05B_SAMP | CR04 | B1 | 8.65 | 15 | 2.27 | 1.97 | | | | | |
| OWF_GI#05B_SAMP | CR05 | Q1 | 10.20 | 23 | 2.06 | 1.67 | | | | | |
| OWF_GI#08_CPT | CR01 | B1 | 1.55 | 14 | 2.34 | 2.05 | | | | | |
| OWF_GI#08_CPT | CR02 | IS | 2.60 | 13 | 2.45 | 2.17 | | | | | |
| OWF_GI#08_CPT | CR03 | B1 | 4.00 | | 2.53 | | | | | | |
| OWF_GI#08_CPT | CR06 | IS | 6.55 | 13 | | | | | | | |
| OWF_GI#08_CPT | CR07 | B1 | 3.00 | 18 | 1.93 | 1.64 | | | | | |
| OWF_GI#08_CPT | CR08 | B1 | 9.50 | 12 | | | | | | | |
| OWF_GI#08_CPT | CR09 | Q1 | 10.75 | 15 | 2.17 | 1.89 | | | | | |
| OWF_GI#08_CPT | CR10 | B1 | 11.55 | 19 | 2.62 | 2.20 | | | | | |
| OWF_GI#08_CPT | CR10 | Q1 | 11.65 | 17 | 2.12 | 1.81 | | | | | |
| OWF_GI#08_CPT | CR11 | B1 | 13.00 | 18 | 2.30 | 1.95 | | | | | |
| OWF_GI#08_CPT | CR12 | B1 | 13.65 | 21 | 1.94 | 1.60 | | | | | |
| OWF_GI#08_CPT | CR12 | B2 | 14.05 | 10 | 2.47 | 2.25 | | | | | |

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Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#08_CPT | CR13 | B1 | 14.60 | 7 | 2.37 | 2.21 | | | | | |
| OWF_GI#08_CPT | PU02 | B1 | 15.70 | 37 | 1.53 | 1.11 | | | | | |
| OWF_GI#08_CPT | PU02 | B1 | 16.00 | 37 | 1.60 | 1.16 | | | | | |
| OWF_GI#08_CPT | CR14 | B1 | 16.70 | 19 | 1.89 | 1.59 | | | | | |
| OWF_GI#08_CPT | CR15 | B1 | 17.65 | 8 | 2.35 | 2.18 | | | | | |
| OWF_GI#08_CPT | CR16 | B1 | 18.70 | 3 | 2.22 | 2.16 | | | | | |
| OWF_GI#08_CPT | CR17 | B1 | 19.75 | 6 | 2.63 | 2.48 | | | | | |
| OWF_GI#08_CPT | CR17 | B2 | 20.45 | 12 | 2.10 | 1.88 | | | | | |
| OWF_GI#08_CPT | CR18 | IS | 20.65 | 37 | | | | | | | |
| OWF_GI#09_SAMP | CR01 | Q1 | 0.20 | 23 | 2.48 | 2.02 | | | | | |
| OWF_GI#09_SAMP | CR02 | Q1 | 1.20 | 15 | 2.63 | 2.29 | | | | | |
| OWF_GI#09_SAMP | CR04 | IS | 3.10 | 16 | | | | | | | |
| OWF_GI#09_SAMP | CR05 | IS | 4.10 | 16 | | | | | | | |
| OWF_GI#09_SAMP | CR06 | IS | 5.10 | 12 | | | | | | | |
| OWF_GI#09_SAMP | CR07 | IS | 6.00 | 9 | | | | | | | |
| OWF_GI#09_SAMP | CR09 | Q1 | 8.30 | 13 | 1.74 | 1.54 | | | | | |
| OWF_GI#09_SAMP | CR10 | Q1 | 9.30 | 11 | 2.34 | 2.11 | | | | | |
| OWF_GI#09_SAMP | CR11 | Q1 | 10.35 | 19 | 1.73 | 1.45 | | | | | |
| OWF_GI#09_SAMP | CR12 | Q1 | 11.00 | 21 | 2.11 | 1.74 | | | | | |
| OWF_GI#09_SAMP | CR13 | B1 | 12.00 | 22 | | | | | | | |
| OWF_GI#09_SAMP | CR14 | Q1 | 13.00 | 20 | 1.79 | 1.49 | | | | | |
| OWF_GI#09_SAMP | CR15 | Q1 | 14.00 | 3 | 2.70 | 2.62 | | | | | |

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Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#09_SAMP | CR16 | Q1 | 15.10 | 1 | 1.84 | 1.82 | | | | | |
| OWF_GI#09_SAMP | CR17 | IS | 16.10 | 12 | | | | | | | |
| OWF_GI#09_SAMP | CR18 | IS | 17.10 | 12 | | | | | | | |
| OWF_GI#09_SAMP | CR19 | IS | 18.10 | 8 | | | | | | | |
| OWF_GI#09_SAMP | CR20 | IS | 19.10 | 12 | | | | | | | |
| OWF_GI#09_SAMP | CR20 | Q1 | 19.40 | 19 | 1.60 | 1.34 | | | | | |
| OWF_GI#09_SAMP | CR21 | IS | 20.10 | 15 | | | | | | | |
| OWF_GI#09_SAMP | CR21 | Q1 | 20.30 | 25 | 1.96 | 1.57 | | | | | |
| OWF_GI#11_SAMP | PU01B | B1 | 0.20 | 24 | 2.01 | 1.62 | | | | | |
| OWF_GI#11_SAMP | PU01B | B2 | 0.40 | 23 | 1.86 | 1.51 | | | | | |
| OWF_GI#11_SAMP | PU01B | B2 | 0.60 | 24 | | | | | | | |
| OWF_GI#11_SAMP | PU02A | B1 | 1.10 | 10 | 1.65 | 1.50 | | | | | |
| OWF_GI#11_SAMP | PU02A | B1 | 1.40 | 11 | | | | | | | |
| OWF_GI#11_SAMP | PU02A | B2 | 1.30 | 17 | 1.86 | 1.58 | | | | | |
| OWF_GI#11_SAMP | PU03 | B1 | 2.00 | 22 | 1.79 | | | | | | |
| OWF_GI#11_SAMP | PU03 | B1 | 2.10 | 23 | 1.79 | 1.46 | | | | | |
| OWF_GI#11_SAMP | PU03 | B1 | 2.30 | 23 | | | | | | | |
| OWF_GI#11_SAMP | PU06 | B1 | 4.05 | 25 | | | | | | | |
| OWF_GI#11_SAMP | CR04 | IS | 4.55 | | 2.09 | | | | | | |
| OWF_GI#11_SAMP | CR05 | IS | 5.55 | 22 | | | | | | | |
| OWF_GI#11_SAMP | CR06 | IS | 7.10 | 7 | | | | | | | |
| OWF_GI#11_SAMP | CR08 | Q1 | 9.05 | 14 | 2.41 | 2.11 | | | | | |

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Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#11_SAMP | CR09 | IS | 9.80 | 18 | 2.23 | 1.89 | | | | | |
| OWF_GI#11_SAMP | PU07 | B1 | 11.60 | 22 | | | | | | | |
| OWF_GI#11_SAMP | PU08 | B2 | 12.30 | 22 | 1.73 | 1.42 | | | | | |
| OWF_GI#11_SAMP | CR11 | IS | 13.20 | 19 | 1.82 | 1.53 | | | | | |
| OWF_GI#11_SAMP | CR12 | Q1 | 13.90 | 14 | 1.92 | 1.68 | | | | | |
| OWF_GI#11_SAMP | CR13 | IS | 14.70 | 15 | 2.22 | 1.93 | | | | | |
| OWF_GI#11_SAMP | CR13 | IS | 15.00 | 13 | 2.14 | 1.89 | | | | | |
| OWF_GI#11_SAMP | CR14 | B1 | 16.10 | 15 | | | | | | | |
| OWF_GI#11_SAMP | CR15 | IS | 16.50 | 17 | 2.62 | 2.24 | | | | | |
| OWF_GI#11_SAMP | CR15 | IS | 17.00 | 16 | 2.50 | 2.16 | | | | | |
| OWF_GI#11_SAMP | CR16 | IS | 17.50 | 20 | 2.66 | 2.22 | | | | | |
| OWF_GI#11_SAMP | CR16 | B1 | 17.90 | 26 | 1.68 | 1.34 | | | | | |
| OWF_GI#11_SAMP | CR17 | Q1 | 18.50 | 15 | 2.55 | 2.22 | | | | | |
| OWF_GI#11_SAMP | CR17 | B1 | 19.00 | 26 | | | | | | | |
| OWF_GI#11_SAMP | CR18 | IS | 19.70 | 17 | 2.20 | 1.88 | | | | | |
| OWF_GI#12_SAMP | P01 | B1 | 0.10 | 24 | 1.86 | 1.50 | | | | | |
| OWF_GI#12_SAMP | PU01A | B1 | 0.60 | 22 | 1.86 | 1.52 | | | | | |
| OWF_GI#12_SAMP | PU01A | B1 | 0.90 | 18 | 1.93 | 1.64 | | | | | |
| OWF_GI#12_SAMP | PU02 | B1 | 1.10 | 29 | 1.79 | 1.39 | | | | | |
| OWF_GI#12_SAMP | PU02 | B2 | 1.40 | 11 | 1.76 | 1.59 | | | | | |
| OWF_GI#12_SAMP | PU03 | B1 | 1.55 | 7 | | | | | | | |
| OWF_GI#12_SAMP | PU03 | B2 | 1.70 | 20 | 1.83 | 1.53 | | | | | |

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[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#12_SAMP | PU04 | B1 | 2.10 | 25 | 1.81 | 1.45 | | | | | |
| OWF_GI#12_SAMP | PU05 | B1 | 2.30 | 25.8 | 1.81 | | | | | | |
| OWF_GI#12_SAMP | PU05 | B1 | 2.40 | 23 | 1.80 | 1.47 | | | | | |
| OWF_GI#12_SAMP | PU07 | B2 | 4.00 | 11 | | | | | | | |
| OWF_GI#12_SAMP | CR02 | B1 | 4.35 | 16 | 2.59 | 2.23 | | | | | |
| OWF_GI#12_SAMP | CR05 | Q1 | 7.45 | 12 | 2.67 | 2.38 | | | | | |
| OWF_GI#12_SAMP | CR06 | IS | 8.36 | 1 | | | | | | | |
| OWF_GI#12_SAMP | CR07 | B1 | 9.62 | 1 | 2.73 | 2.65 | | | | | |
| OWF_GI#12_SAMP | CR09 | B1 | 12.00 | 19 | 2.33 | 1.96 | | | | | |
| OWF_GI#12_SAMP | CR10 | IS | 13.85 | 20 | | | | | | | |
| OWF_GI#12_SAMP | CR12 | IS | 14.35 | 7 | | | | | | | |
| OWF_GI#12_SAMP | CR12 | IS | 14.60 | 20 | | | | | | | |
| OWF_GI#12_SAMP | CR12 | B1 | 14.75 | 7 | 1.58 | 1.48 | | | | | |
| OWF_GI#12_SAMP | PU10 | B1 | 16.30 | 18 | 1.34 | 1.14 | | | | | |
| OWF_GI#12_SAMP | CR14 | IS | 16.40 | 17 | | | | | | | |
| OWF_GI#12_SAMP | PU11 | B1 | 18.30 | 13 | | | | | | | |
| OWF_GI#12_SAMP | CR16 | B1 | 19.00 | 4 | 2.45 | 2.36 | | | | | |
| OWF_GI#12_SAMP | CR17 | B1 | 19.55 | 2 | 2.10 | 2.06 | | | | | |
| OWF_GI#13_CPT | PU01 | B1 | 0.10 | 18 | | | | | | | |
| OWF_GI#13_CPT | CR01 | B1 | 1.40 | 7 | 2.11 | 1.97 | | | | | |
| OWF_GI#13_CPT | CR02 | Q1 | 2.40 | 16 | 1.92 | 1.66 | | | | | |
| OWF_GI#13_CPT | CR03 | Q1 | 3.30 | 78 | 2.42 | 1.36 | | | | | |

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[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#13_CPT | CR04 | B1 | 4.00 | | 2.61 | | | | | | |
| OWF_GI#13_CPT | CR05 | B1 | 5.45 | 7 | 2.55 | 2.38 | | | | | |
| OWF_GI#13_CPT | CR06 | IS | 6.25 | 19 | | | | | | | |
| OWF_GI#13_CPT | CR07 | IS | 7.15 | 10 | | | | | | | |
| OWF_GI#13_CPT | CR09 | B1 | 9.10 | 15 | 2.44 | 2.12 | | | | | |
| OWF_GI#13_CPT | CR10 | B1 | 10.60 | 21 | 2.39 | 1.98 | | | | | |
| OWF_GI#13_CPT | CR10 | B2 | 10.75 | 97 | 2.60 | 1.32 | | | | | |
| OWF_GI#13_CPT | CR12 | B1 | 12.05 | 18 | | | | | | | |
| OWF_GI#13_CPT | CR13 | B1 | 13.00 | 54 | 1.68 | 1.09 | | | | | |
| OWF_GI#13_CPT | CR13 | B2 | 13.10 | 9 | 2.21 | 2.03 | | | | | |
| OWF_GI#13_CPT | CR14 | B1 | 14.10 | 13 | 1.99 | 1.76 | | | | | |
| OWF_GI#13_CPT | CR15 | B1 | 15.30 | 17 | 2.33 | 1.99 | | | | | |
| OWF_GI#13_CPT | CR16 | B1 | 16.60 | 14 | 2.18 | 1.91 | | | | | |
| OWF_GI#13_CPT | CR17 | B1 | 17.50 | 25 | 2.11 | 1.69 | | | | | |
| OWF_GI#13_CPT | CR18 | Q1 | 18.00 | | | | | 450 | | | |
| OWF_GI#13_CPT | CR18 | B1 | 18.75 | 16 | 2.14 | 1.84 | | | | | |
| OWF_GI#13_CPT | CR19 | B1 | 19.70 | 14 | | | | | | | |
| OWF_GI#14_SAMP | CR01 | IS | 0.30 | 12 | | | | | | | |
| OWF_GI#14_SAMP | CR02 | B1 | 1.30 | 11 | 2.21 | 1.99 | | | | | |
| OWF_GI#14_SAMP | CR03 | IS | 2.20 | 7 | 2.73 | 2.55 | | | | | |
| OWF_GI#14_SAMP | CR03 | IS | 2.40 | 12 | | | | | | | |
| OWF_GI#14_SAMP | CR04 | B1 | 3.00 | 25 | 2.51 | 2.01 | | | | | |

PP - Pocket Penetrometer UU - Undrained Unconsolidated Triaxial $\varepsilon_{50}$ - Strain at half max. deviator stress

Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#14_SAMP | CR04 | B2 | 3.80 | 22 | 2.75 | 2.25 | | | | | |
| OWF_GI#14_SAMP | PU01 | B1 | 4.00 | 16 | 2.21 | 1.91 | | | | | |
| OWF_GI#14A_SAMP | CR01 | B1 | 0.45 | 9 | 2.27 | 2.08 | | | | | |
| OWF_GI#14A_SAMP | CR02 | B1 | 2.30 | 14 | 2.25 | 1.97 | | | | | |
| OWF_GI#14A_SAMP | CR08 | B2 | 8.25 | 12 | 2.61 | 2.33 | | | | | |
| OWF_GI#14A_SAMP | CR08 | B2 | 8.75 | 12 | 2.61 | 2.33 | | | | | |
| OWF_GI#14A_SAMP | CR08 | B3 | 9.05 | 24 | 1.88 | 1.52 | | | | | |
| OWF_GI#14A_SAMP | PU02 | B1 | 9.55 | 28 | 2.08 | 1.63 | | | | | |
| OWF_GI#14A_SAMP | PU02 | B1 | 9.60 | 28 | | | | | | | |
| OWF_GI#14A_SAMP | CR09 | B1 | 10.20 | 5 | 2.56 | 2.44 | | | | | |
| OWF_GI#14A_SAMP | CR10 | B1 | 11.05 | 5 | 2.68 | 2.55 | | | | | |
| OWF_GI#14A_SAMP | CR11 | B1 | 12.05 | 10 | 2.92 | 2.65 | | | | | |
| OWF_GI#14A_SAMP | CR11 | B2 | 12.55 | 7 | 2.78 | 2.60 | | | | | |
| OWF_GI#14A_SAMP | CR12 | B1 | 12.40 | 16 | 2.51 | 2.16 | | | | | |
| OWF_GI#14A_SAMP | CR13 | B1 | 14.50 | 13 | 2.50 | 2.21 | | | | | |
| OWF_GI#14A_SAMP | CR13 | B1 | 14.70 | 11 | 2.65 | 2.39 | | | | | |
| OWF_GI#14A_SAMP | PU08 | B1 | 18.80 | 27 | 1.75 | 1.37 | | | | | |
| OWF_GI#14A_SAMP | PU09 | B1 | 19.30 | 22 | 1.56 | 1.28 | | | | | |
| OWF_GI#14A_SAMP | PU10 | B1 | 19.60 | 26 | 1.65 | 1.31 | | | | | |
| OWF_GI#14A_SAMP | PU11 | B1 | 20.05 | 24 | 1.62 | 1.31 | | | | | |
| OWF_GI#15A_SAMP | CR01 | B1 | 0.10 | 14 | 2.31 | 2.03 | | | | | |
| OWF_GI#15A_SAMP | PU02 | B2 | 2.10 | 40 | 1.80 | 1.28 | | | | | |

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[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#15A_SAMP | PU03 | B1 | 2.55 | 29 | 1.51 | 1.17 | | | | | |
| OWF_GI#15A_SAMP | CR03 | IS | 3.30 | 11 | | | | | | | |
| OWF_GI#15A_SAMP | CR03 | B1 | 3.05 | 18 | | | | | | | |
| OWF_GI#15A_SAMP | CR04 | IS | 4.10 | 17 | | | | | | | |
| OWF_GI#15A_SAMP | PU04 | Q1 | 5.00 | 22 | 1.90 | 1.56 | | | | | |
| OWF_GI#15A_SAMP | PU05 | B1 | 5.50 | 25 | | | | | | | |
| OWF_GI#15A_SAMP | CR05 | B1 | 6.00 | 20 | | | | | | | |
| OWF_GI#15A_SAMP | CR06 | Q1 | 7.40 | 39 | 2.04 | 1.47 | | | | | |
| OWF_GI#15A_SAMP | CR07 | Q1 | 8.60 | 15 | 2.13 | 1.85 | | | | | |
| OWF_GI#15A_SAMP | CR08 | B1 | 9.30 | 38 | | | | | | | |
| OWF_GI#15A_SAMP | CR08 | Q1 | 9.40 | 34 | 1.82 | 1.36 | | | | | |
| OWF_GI#15A_SAMP | PU06 | Q1 | 10.20 | 22 | 1.90 | 1.56 | | 800 | | | |
| OWF_GI#15A_SAMP | PU07 | Q1 | 10.50 | 51 | 2.31 | 1.53 | | 800 | | | |
| OWF_GI#15A_SAMP | PU07 | Q2 | 10.50 | | | | | 800 | | | |
| OWF_GI#15A_SAMP | PU07 | Q2 | 10.60 | 49 | 2.07 | 1.39 | | | | | |
| OWF_GI#15A_SAMP | PU08 | B1 | 11.05 | 53 | | | | | | | |
| OWF_GI#15A_SAMP | PU08 | Q1 | 11.30 | 32 | 2.13 | 1.61 | | 800 | | | |
| OWF_GI#15A_SAMP | PU09 | B1 | 11.55 | 5 | | | | | | | |
| OWF_GI#15A_SAMP | CR09 | Q1 | 12.80 | 38 | 1.94 | 1.41 | | | | | |
| OWF_GI#15A_SAMP | CR10 | Q1 | 13.20 | 36 | 1.85 | 1.36 | | | | | |
| OWF_GI#15A_SAMP | CR10 | B1 | 13.20 | 28 | | | | | | | |
| OWF_GI#15A_SAMP | CR11 | Q1 | 14.10 | 22 | 1.32 | 1.08 | | | | | |

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Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#15A_SAMP | CR12 | IS | 15.40 | | | | | 400 | | | |
| OWF_GI#15A_SAMP | CR12 | Q1 | 15.50 | 37 | 2.05 | 1.50 | | | | | |
| OWF_GI#15A_SAMP | CR12 | Q1 | 15.60 | | | | | 450 | | | |
| OWF_GI#15A_SAMP | CR13 | Q1 | 16.50 | 28 | 1.97 | 1.54 | | 400 | | | |
| OWF_GI#15A_SAMP | CR13 | Q1 | 16.70 | | | | | 400 | | | |
| OWF_GI#15A_SAMP | CR14 | Q1 | 17.30 | 37 | 2.03 | 1.48 | | 450 | | | |
| OWF_GI#15A_SAMP | CR14 | Q1 | 17.50 | | | | | 450 | | | |
| OWF_GI#15A_SAMP | PU12 | Q1 | 18.10 | 25 | 2.08 | 1.66 | | | | | |
| OWF_GI#15A_SAMP | PU13 | B1 | 18.60 | 28 | | | | | | | |
| OWF_GI#15A_SAMP | CR15 | Q1 | 19.20 | 38 | 1.70 | 1.23 | | | | | |
| OWF_GI#15A_SAMP | CR16 | Q1 | 19.90 | 32 | 1.84 | 1.39 | | | | | |
| OWF_GI#17_SAMP | PU01 | B1 | 0.00 | 17 | 1.75 | 1.49 | | | | | |
| OWF_GI#17_SAMP | PU01 | B2 | 0.60 | 19 | 1.64 | 1.38 | | | | | |
| OWF_GI#17_SAMP | PU02 | B1 | 0.80 | 22 | 1.79 | 1.47 | | | | | |
| OWF_GI#17_SAMP | PU02 | B2 | 1.30 | 23 | 1.92 | 1.56 | | | | | |
| OWF_GI#17_SAMP | PU04 | B1 | 2.60 | 24 | 1.92 | 1.54 | | | | | |
| OWF_GI#17_SAMP | PU05 | B1 | 3.10 | 21 | 1.93 | 1.60 | | | | | |
| OWF_GI#17_SAMP | PU06A | B1 | 3.70 | 22 | 1.69 | 1.38 | | | | | |
| OWF_GI#17_SAMP | PU07 | B1 | 4.20 | 27 | 1.89 | 1.49 | | | | | |
| OWF_GI#17_SAMP | PU08 | B1 | 4.70 | 26 | 1.75 | 1.39 | | | | | |
| OWF_GI#17_SAMP | CR02 | Q1 | 5.60 | 21 | 2.32 | 1.92 | | | | | |
| OWF_GI#17_SAMP | CR03 | Q1 | 6.25 | 29 | 2.02 | 1.57 | | | | | |

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# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#17_SAMP | CR04 | B1 | 7.10 | 7 | | | | | | | |
| OWF_GI#17_SAMP | CR05 | B1 | 7.60 | 12 | 2.21 | 1.97 | | | | | |
| OWF_GI#17_SAMP | CR06 | IS | 8.50 | 13 | | | | | | | |
| OWF_GI#17_SAMP | PU10 | Q1 | 10.50 | 26 | 2.02 | 1.60 | | | | | |
| OWF_GI#17_SAMP | PU11 | IS | 11.50 | 21 | | | | | | | |
| OWF_GI#17_SAMP | PU12 | B1 | 11.80 | 14 | | | | | | | |
| OWF_GI#17_SAMP | CR08 | IS | 11.80 | 17 | 2.02 | 1.73 | | | | | |
| OWF_GI#17_SAMP | CR09 | B1 | 13.10 | 18 | 2.04 | 1.73 | | | | | |
| OWF_GI#17_SAMP | CR10 | B1 | 14.20 | 28 | 1.79 | 1.40 | | | | | |
| OWF_GI#17_SAMP | CR11 | B1 | 15.00 | 22 | 1.82 | 1.49 | | | | | |
| OWF_GI#17_SAMP | CR12 | IS | 15.90 | 28 | | | | | | | |
| OWF_GI#17_SAMP | PU13 | B1 | 16.80 | 28 | 1.94 | 1.52 | | | | | |
| OWF_GI#17_SAMP | PU14 | Q1 | 17.70 | 27 | 2.00 | 1.57 | | | | | |
| OWF_GI#17_SAMP | PU15 | IS | 18.40 | 24 | | | | | | | |
| OWF_GI#17_SAMP | CR13 | IS | 19.10 | 18 | | | | | | | |
| OWF_GI#17_SAMP | CR14 | IS | 19.90 | 29 | | | | | | | |
| OWF_GI#20_CPT | CR01 | IS | 5.40 | 18 | | | | | | | |
| OWF_GI#20_CPT | CR01 | IS | 5.60 | 24 | 2.00 | 1.61 | | | | | |
| OWF_GI#20_CPT | CR02 | B1 | 12.00 | 17 | | | | | | | |
| OWF_GI#20_CPT | CR03 | IS | 18.70 | 19 | 2.47 | 2.08 | | | | | |
| OWF_GI#20_CPT | CR03 | IS | 18.90 | 21 | 1.94 | 1.60 | | | | | |
| OWF_GI#20_CPT | CR04 | IS | 19.50 | 25 | 1.92 | 1.54 | | | | | |

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# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#20_SAMP | PU01 | B1 | 0.10 | 24 | 1.90 | 1.53 | | | | | |
| OWF_GI#20_SAMP | PU01 | B3 | 0.50 | 21 | 1.82 | 1.51 | | | | | |
| OWF_GI#20_SAMP | PU02 | B1 | 0.90 | 20 | 1.87 | 1.56 | | | | | |
| OWF_GI#20_SAMP | PU02 | B2 | 1.20 | 22 | 1.70 | 1.39 | | | | | |
| OWF_GI#20_SAMP | PU03 | B1 | 1.70 | 20 | 1.77 | 1.47 | | | | | |
| OWF_GI#20_SAMP | PU05 | B1 | 2.40 | 24 | 1.74 | 1.40 | | | | | |
| OWF_GI#20_SAMP | PU07 | B1 | 3.40 | 24 | 1.71 | 1.38 | | | | | |
| OWF_GI#20_SAMP | PU08 | B1 | 4.00 | 22 | 1.85 | 1.52 | | | | | |
| OWF_GI#20_SAMP | PU11 | IS | 7.00 | 24 | | | | | | | |
| OWF_GI#20_SAMP | PU12 | IS | 8.20 | 33 | 1.99 | 1.50 | | | | | |
| OWF_GI#20_SAMP | PU13 | IS | 9.40 | 14 | 1.88 | 1.65 | | | | | |
| OWF_GI#20_SAMP | PU14 | IS | 10.40 | 25 | 1.89 | 1.51 | | | | | |
| OWF_GI#20_SAMP | PU15 | Q1 | 11.20 | 32 | 1.82 | 1.38 | | | | | |
| OWF_GI#20_SAMP | CR03 | IS | 11.70 | 10 | 2.07 | 1.88 | | | | | |
| OWF_GI#20_SAMP | CR04 | B1 | 12.00 | 32 | | | | | | | |
| OWF_GI#20_SAMP | PU17 | Q1 | 13.35 | 26 | 1.82 | 1.44 | | | | | |
| OWF_GI#20_SAMP | PU18 | Q1 | 14.60 | 24 | 2.03 | 1.64 | | | | | |
| OWF_GI#20_SAMP | PU19 | B1 | 15.00 | 19 | 2.61 | 2.19 | | | | | |
| OWF_GI#20_SAMP | CR05 | Q1 | 15.55 | 33 | 2.00 | 1.50 | | | | | |
| OWF_GI#20_SAMP | CR06 | Q1 | 16.40 | 25 | 2.11 | 1.69 | | | | | |
| OWF_GI#20_SAMP | PU20 | IS | 18.00 | 27 | 2.18 | 1.72 | | | | | |
| OWF_GI#20_SAMP | PU21 | B1 | 18.30 | 16 | | | | | | | |

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# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#20_SAMP | CR08 | Q1 | 19.00 | 28 | 1.90 | 1.48 | | | | | |
| OWF_GI#22_CPT | CR01 | IS | 5.25 | 2 | 2.07 | 2.03 | | | | | |
| OWF_GI#22_CPT | CR03 | IS | 6.10 | 7 | | | | | | | |
| OWF_GI#22_CPT | CR04 | IS | 7.10 | 28 | | | | | | | |
| OWF_GI#22_CPT | CR05 | IS | 8.00 | 5 | | | | | | | |
| OWF_GI#22_CPT | CR06 | IS | 9.00 | 12 | 2.58 | 2.30 | | | | | |
| OWF_GI#22_CPT | CR07 | IS | 11.35 | 3 | | | | | | | |
| OWF_GI#22_CPT | CR08 | IS | 12.65 | 13 | 2.42 | 2.14 | | | | | |
| OWF_GI#22_CPT | CR09 | IS | 13.60 | 29 | | | | | | | |
| OWF_GI#22_CPT | CR10 | IS | 14.20 | 10 | 2.31 | 2.10 | | | | | |
| OWF_GI#22_CPT | CR11 | IS | 15.10 | 18 | 2.38 | 2.02 | | | | | |
| OWF_GI#22_CPT | CR12 | IS | 16.00 | 27 | 1.87 | 1.47 | | | | | |
| OWF_GI#22_SAMP | PU01 | B1 | 0.10 | 20 | 1.98 | 1.65 | | | | | |
| OWF_GI#22_SAMP | PU01 | B1 | 0.30 | 8 | 1.73 | 1.60 | | | | | |
| OWF_GI#22_SAMP | PU02 | B1 | 0.80 | 26 | 1.72 | 1.37 | | | | | |
| OWF_GI#22_SAMP | PU06 | B1 | 2.90 | 16 | 1.88 | 1.62 | | | | | |
| OWF_GI#22_SAMP | PU06 | B1 | 3.00 | 19 | 1.89 | 1.59 | | | | | |
| OWF_GI#22_SAMP | PU07 | B1 | 3.40 | 18 | 1.82 | 1.54 | | | | | |
| OWF_GI#22_SAMP | PU07 | B1 | 3.50 | 17 | 1.83 | 1.57 | | | | | |
| OWF_GI#22_SAMP | PU08 | Q1 | 3.90 | 22 | 2.07 | 1.70 | | | | | |
| OWF_GI#22_SAMP | PU08 | B2 | 4.20 | 22 | | | | | | | |
| OWF_GI#22_SAMP | CR03 | B1 | 5.50 | 15 | | | | | | | |

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# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#22_SAMP | CR07 | B1 | 8.00 | 10 | 2.25 | 2.05 | | | | | |
| OWF_GI#22_SAMP | CR08 | B1 | 8.50 | 5 | | | | | | | |
| OWF_GI#22_SAMP | CR09 | Q1 | 9.60 | 14 | 2.62 | 2.30 | | | | | |
| OWF_GI#22_SAMP | CR11 | IS | 11.80 | 3 | 2.46 | 2.39 | | | | | |
| OWF_GI#22_SAMP | CR12 | IS | 12.50 | 8 | 2.73 | 2.53 | | | | | |
| OWF_GI#22_SAMP | CR12 | IS | 12.70 | 8 | | | | | | | |
| OWF_GI#22_SAMP | PU13 | B1 | 13.60 | 27 | | | | | | | |
| OWF_GI#22_SAMP | PU13 | Q1 | 13.60 | 41 | 2.01 | 1.43 | | | | | |
| OWF_GI#22_SAMP | PU13 | Q2 | 13.80 | 41 | 1.98 | 1.40 | | | | | |
| OWF_GI#22_SAMP | CR13 | IS | 14.30 | 9 | | | | | | | |
| OWF_GI#22_SAMP | CR15 | IS | 16.30 | 9 | | | | | | | |
| OWF_GI#22_SAMP | PU15 | Q1 | 18.20 | 26 | 1.86 | 1.48 | | | | | |
| OWF_GI#22_SAMP | PU15 | Q2 | 18.30 | 26 | 2.10 | 1.67 | | | | | |
| OWF_GI#22_SAMP | PU15 | B1 | 18.50 | 26 | | | | | | | |
| OWF_GI#22_SAMP | PU16 | Q1 | 18.90 | 24 | 1.98 | 1.60 | | | | | |
| OWF_GI#22_SAMP | PU16 | B1 | 19.20 | 24 | | | | | | | |
| OWF_GI#22_SAMP | PU16 | Q2 | 19.30 | 24 | 2.09 | 1.69 | | | | | |
| OWF_GI#22_SAMP | PU17 | B1 | 19.90 | 20 | | | | | | | |
| OWF_GI#22_SAMP | PU17 | Q1 | 19.95 | 20 | 2.02 | 1.68 | | | | | |
| OWF_GI#24_SAMP | PU01 | B1 | 0.10 | 30 | 1.89 | 1.45 | | | | | |
| OWF_GI#24_SAMP | PU01 | B3 | 0.50 | 31 | 1.71 | 1.31 | | | | | |
| OWF_GI#24_SAMP | CR01 | Q1 | 1.20 | 13 | 2.06 | 1.82 | | | | | |

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# SUMMARY OF OFFSHORE TEST RESULTS

Client: RTE_DGEC
Project Name: A05 Bretagne Offshore GI
Project Number: GMOP21-G-019

Location: A05 OWF

| Borehole / Location | Sample No. | Subample Type | Test Depth (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Torvane Su (kPa) | PP Su (kPa) | Lab Vane Su (kPa) | UU $Su_{UU}$ (kPa) | UU $\varepsilon_{50}$ (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#24_SAMP | CR02 | IS | 2.20 | 5 | | | | | | | |
| OWF_GI#24_SAMP | CR03 | IS | 3.20 | 13 | 2.84 | 2.51 | | | | | |
| OWF_GI#24_SAMP | CR04 | IS | 4.35 | 29 | 1.92 | 1.49 | | | | | |
| OWF_GI#24_SAMP | CR05 | B1 | 5.20 | 7 | 2.21 | 2.07 | | | | | |
| OWF_GI#24_SAMP | CR06 | B1 | 6.10 | 13 | 2.08 | 1.84 | | | | | |
| OWF_GI#24_SAMP | CR07 | Q1 | 7.50 | 14 | 2.04 | 1.79 | | | | | |
| OWF_GI#24_SAMP | CR07 | B1 | 7.70 | 19 | 2.65 | 2.23 | | | | | |
| OWF_GI#24_SAMP | CR08 | IS | 8.00 | 14 | | | | | | | |
| OWF_GI#24_SAMP | CR10 | IS | 10.00 | 9 | 2.11 | 1.94 | | | | | |
| OWF_GI#24_SAMP | CR11 | B1 | 11.00 | 10 | | | | | | | |
| OWF_GI#24_SAMP | CR12 | B1 | 12.10 | 27 | 2.41 | 1.90 | | | | | |
| OWF_GI#24_SAMP | CR13 | B1 | 13.00 | 5 | 2.69 | 2.56 | | | | | |
| OWF_GI#24_SAMP | CR14 | B1 | 14.00 | 23 | | | | | | | |
| OWF_GI#24_SAMP | CR15 | B1 | 15.00 | 22 | | | | | | | |
| OWF_GI#24_SAMP | CR16 | B1 | 16.10 | 11 | 3.02 | 2.72 | | | | | |
| OWF_GI#24_SAMP | CR17 | B1 | 17.00 | 9 | | | | | | | |
| OWF_GI#24_SAMP | PU06 | IS | 18.00 | 14 | | | | | | | |
| OWF_GI#24_SAMP | PU07 | B1 | 18.50 | 11 | | | | | | | |
| OWF_GI#24_SAMP | CR18 | B1 | 18.70 | 10 | | | | | | | |
| OWF_GI#24_SAMP | CR19 | Q1 | 19.80 | 17 | 1.81 | 1.55 | | | | | |

PP - Pocket Penetrometer UU - Undrained Unconsolidated Triaxial $\varepsilon_{50}$ - Strain at half max. deviator stress

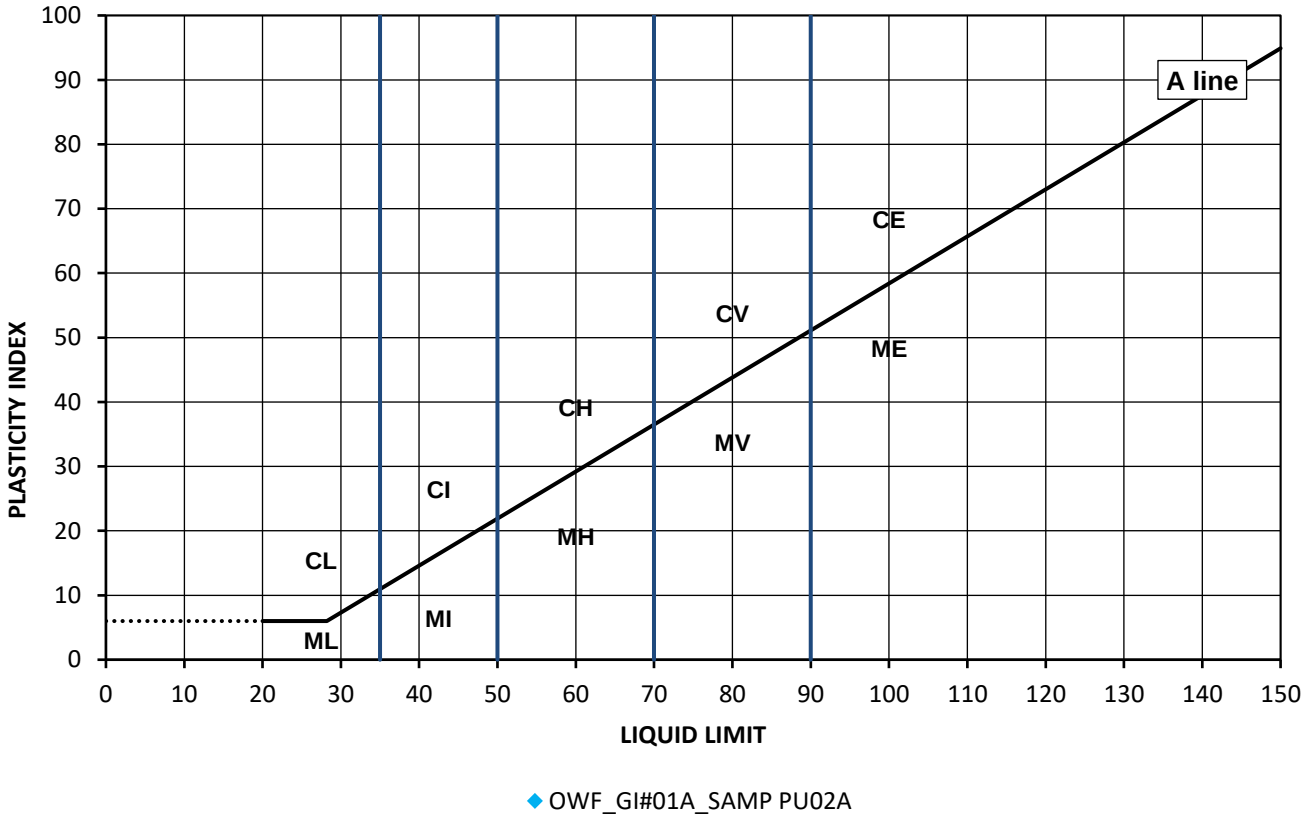
Note: The letter 'R' denotes a remoulded/residual test

[1] Local Geodetic Datum: ETRS89 / UTMN30, Actual Coordinates

# SUMMARY OF OFFSHORE TEST RESULTS

# Appendix B.3 Classification Test Results

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU02A |
| Specimen Reference | IS | Specimen Depth | 14.5 | m | Depth | 14.5 |
| Date started | 16/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023022733 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 18/04/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

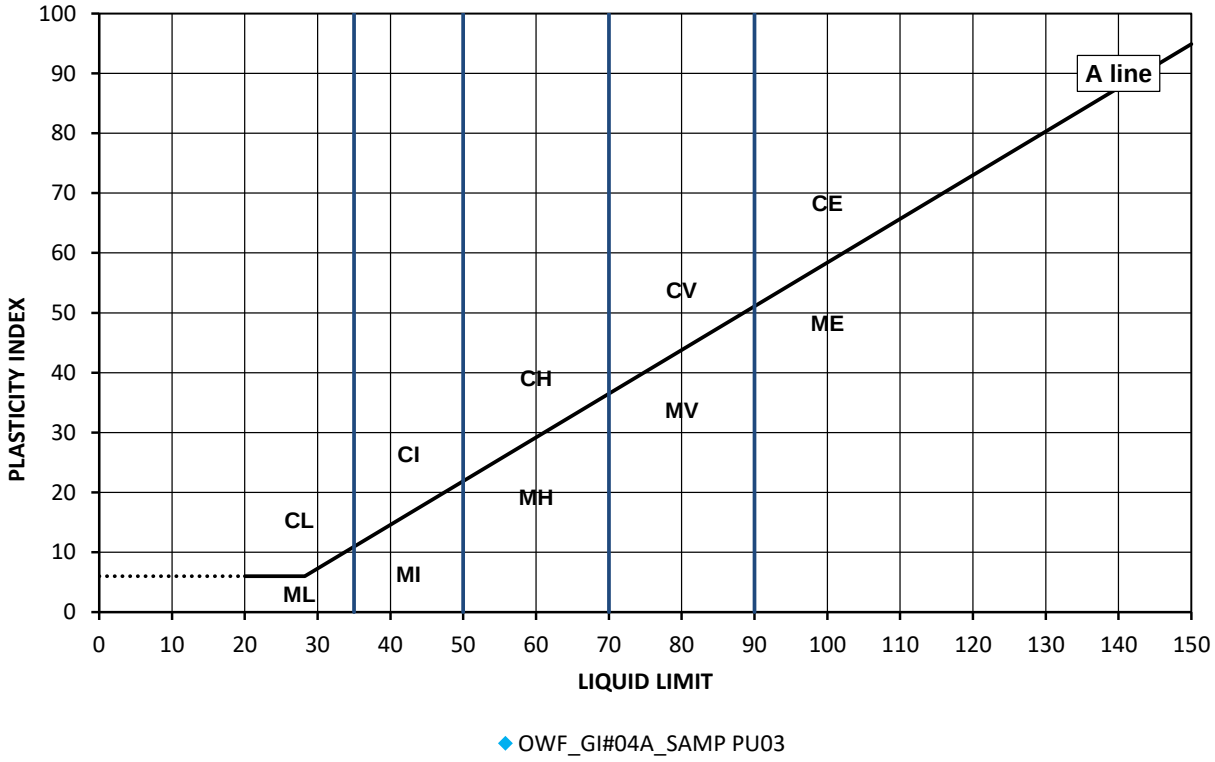
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#01 A_SAMP | PU02A | 14.50 | IS | NP | NP | | 17.6 | | 57 | 3 | 4 Point Method | Very pale yellow, white page 2.6y/2-9 silty, clayey, gravelly SAND | Specimen cannot roll - Non-plastic specimen |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By |
|---|---|
| 18/04/2023 | D.Smith |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU03 |
| Specimen Reference | B1 | Specimen Depth | 8.3 | m | Depth | 8.3 |
| Date started | 17/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023022765 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

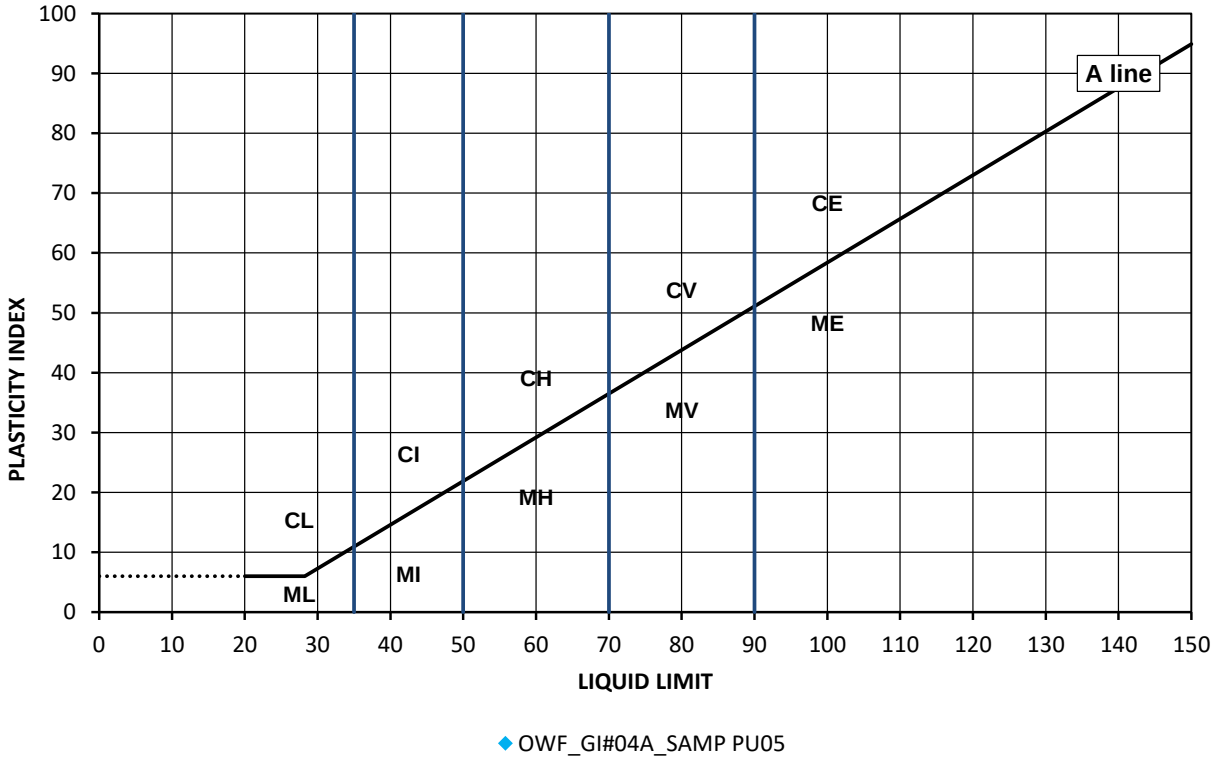
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#04 A_SAMP | PU03 | 8.30 | B1 | NP | NP | | 22.2 | | 51 | 3 | 4 Point Method | white page 2.5y 9/2 Very pale yellow silty SAND with gravel and clay | Too sandy to roll, sample non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU05 |
| Specimen Reference | B1 | Specimen Depth | 10 | m | Depth | 10 |
| Date started | 17/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023022769 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

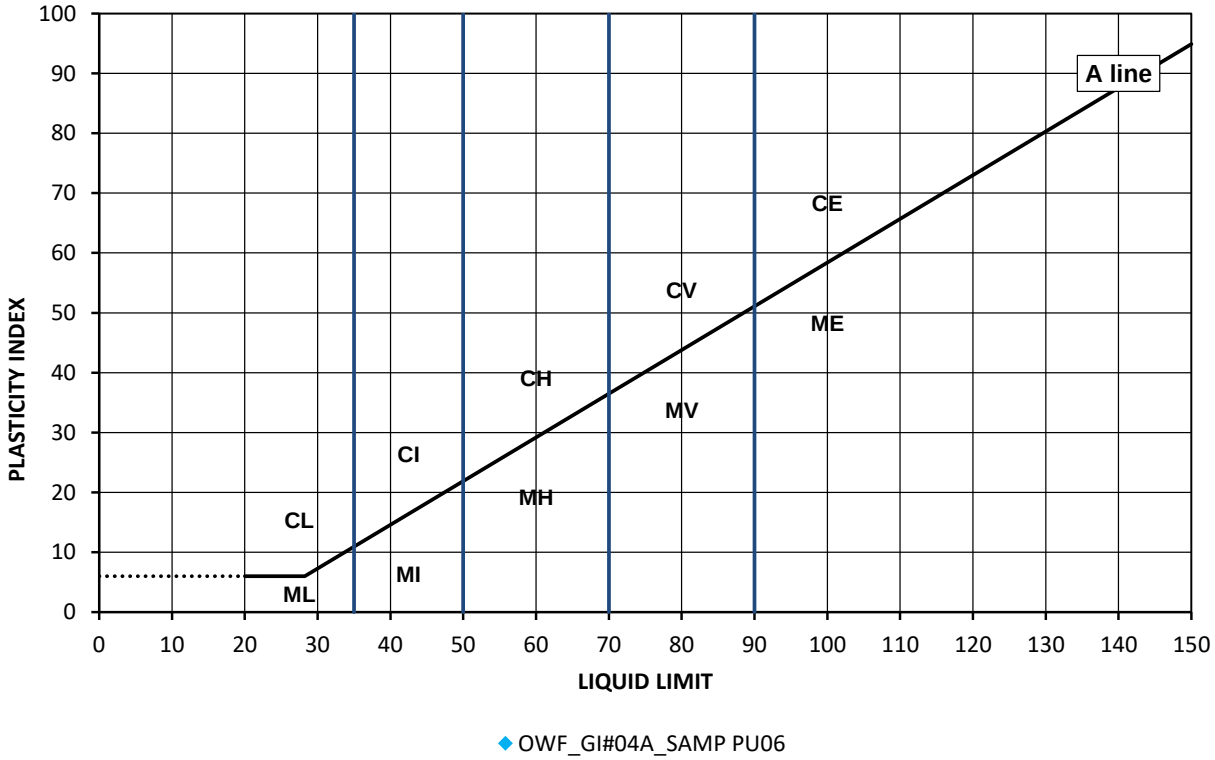
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#04 A_SAMP | PU05 | 10.00 | B1 | NP | NP | | 24.1 | | 53 | 3 | 4 Point Method | 2.5y 9/2 Very pale yellow silty, sandy, GRAVEL | Too sandy to roll, report as non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU06 |
| Specimen Reference | B1 | Specimen Depth | 11.3 | m | Depth | 11.3 |
| Date started | 15/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023022771 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

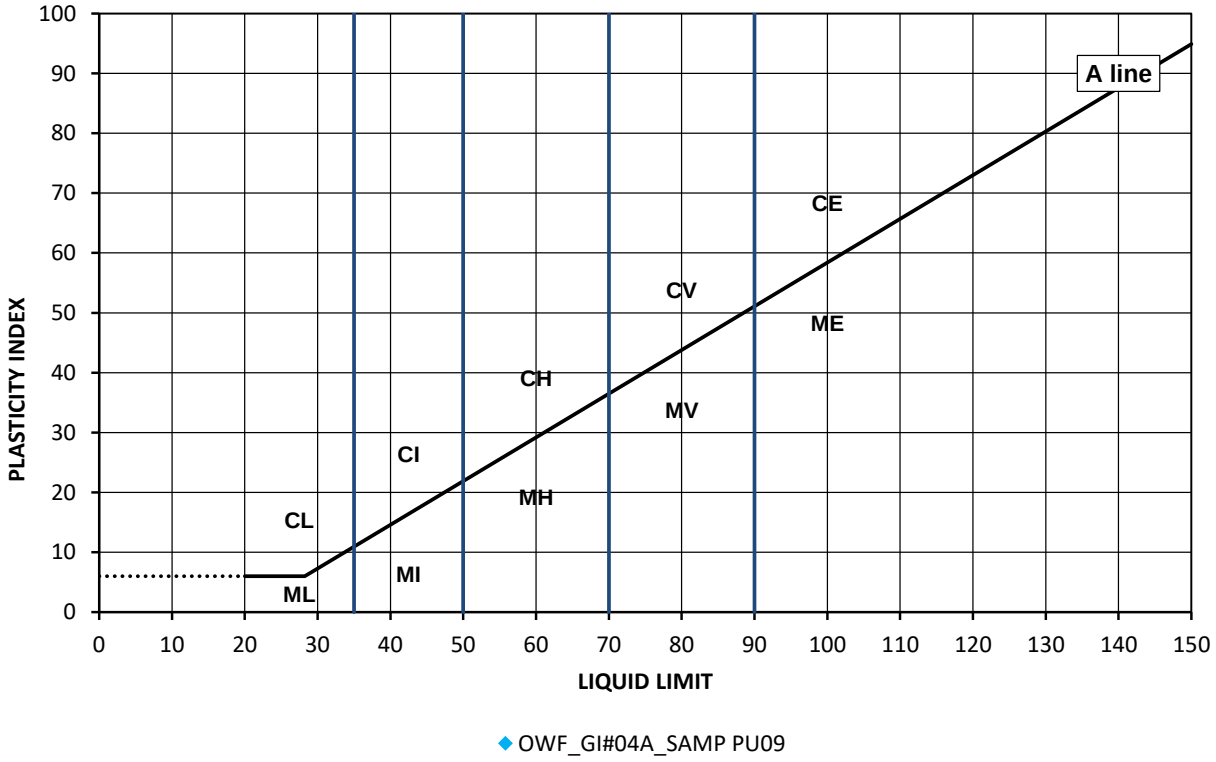
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#04 A_SAMP | PU06 | 11.30 | B1 | NP | NP | | 23.4 | | 42 | 3 | 4 Point Method | Very pale yellow white page 2.5y 9/2 silty, sandy, GRAVEL including cemented sand | Specimen cannot roll - non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU09 |
| Specimen Reference | IS | Specimen Depth | 14.2 | m | Depth | 14.2 |
| Date started | 15/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023022776 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

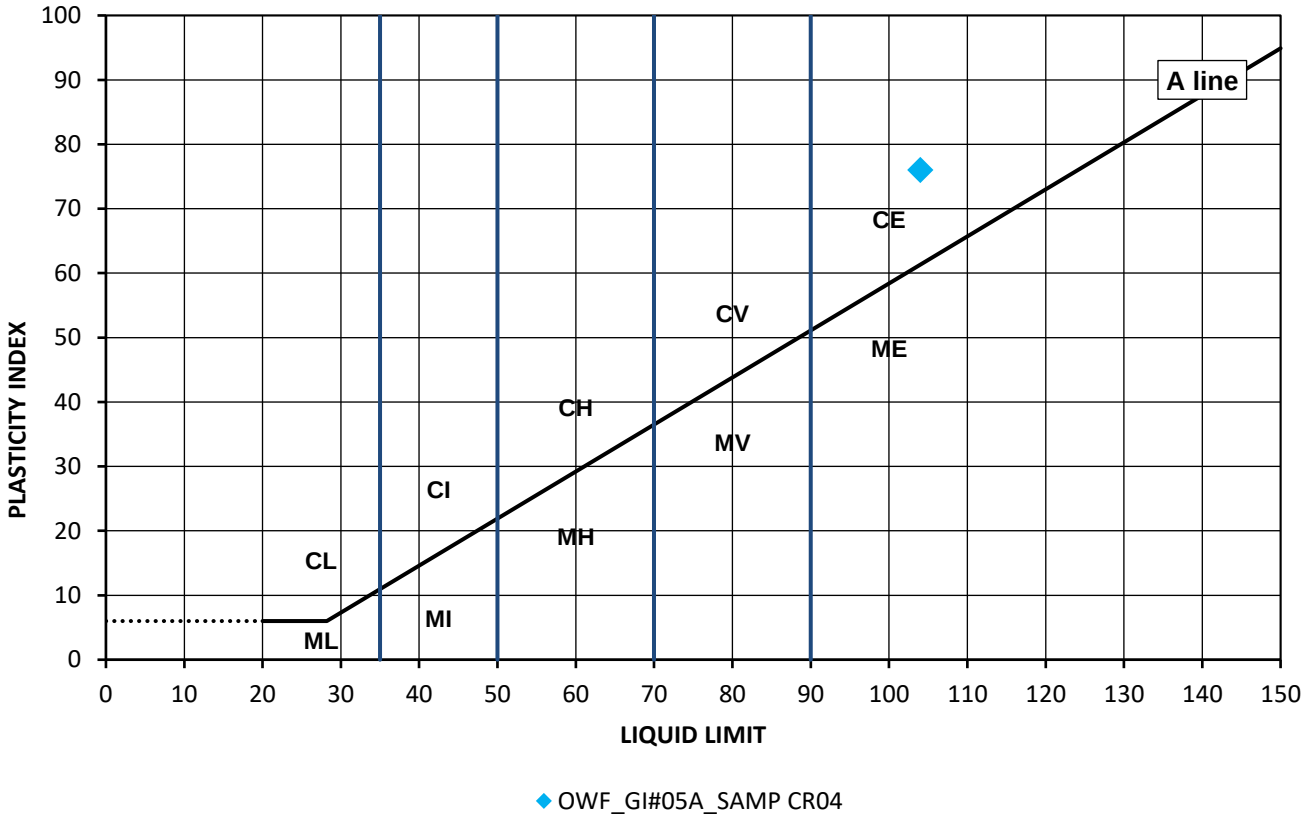
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#04 A_SAMP | PU09 | 14.20 | IS | NP | NP | | 17.1 | | 29 | 3 | 4 Point Method | Very pale yellow, white page 2.5y 9/2 silty sandy, GRAVEL including shell fragments and cemented sand | Specimen cannot roll - non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR04 |
| Specimen Reference | Q1 | Specimen Depth | 3.9 | m | Depth | 3.9 |
| Date started | 03/05/2023 | | | | Sample Type | Q1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227112 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 29/06/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

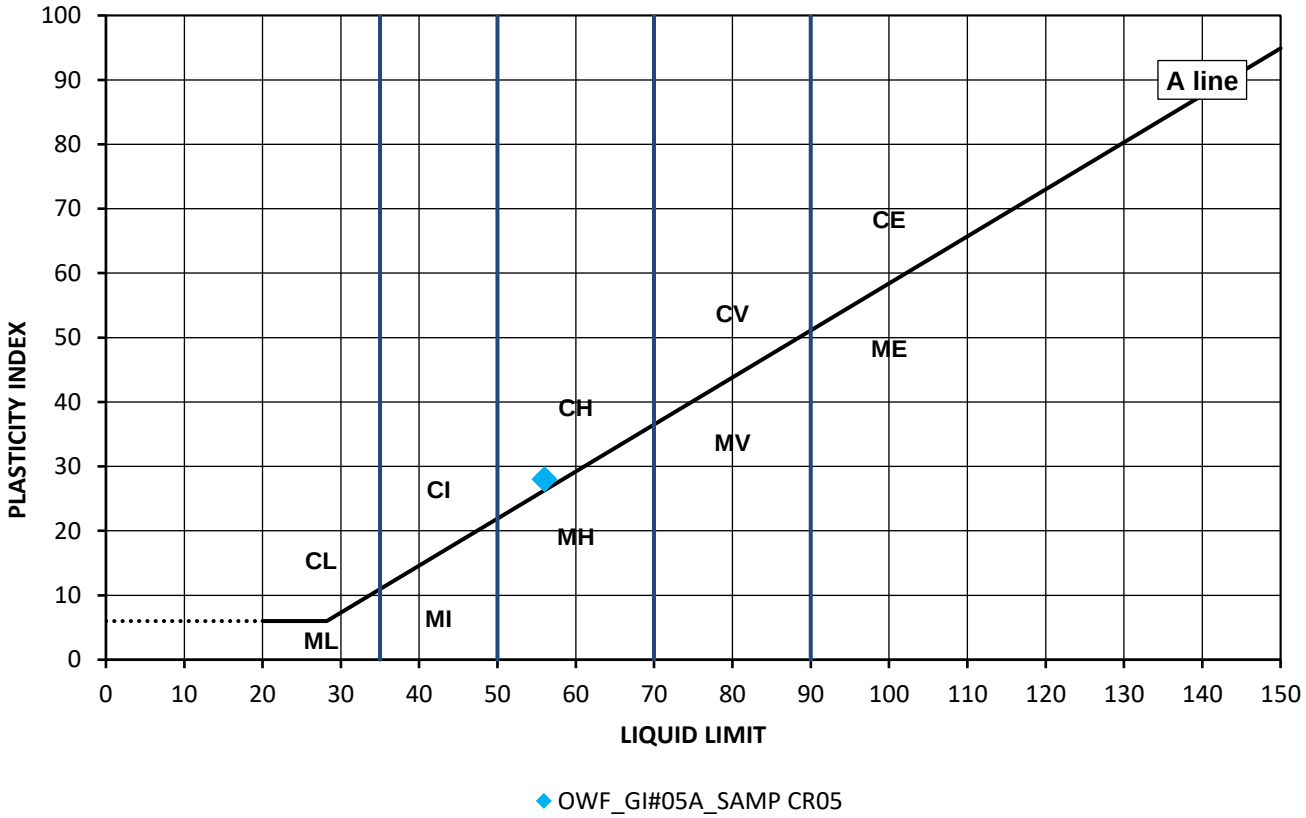
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#05 A_SAMP | CR04 | 3.90 | Q1 | 104 | 28 | 76 | 37.6 | 0.13 | 100 | 1 | 4 Point Method | Green sandy, silty, CLAY | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 29/06/2023

Approved By: D.Smith

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Specimen Reference | B1 | Specimen Depth | 4.5 | m | Depth | 4.5 |
| Date started | 06/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227114 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 18/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

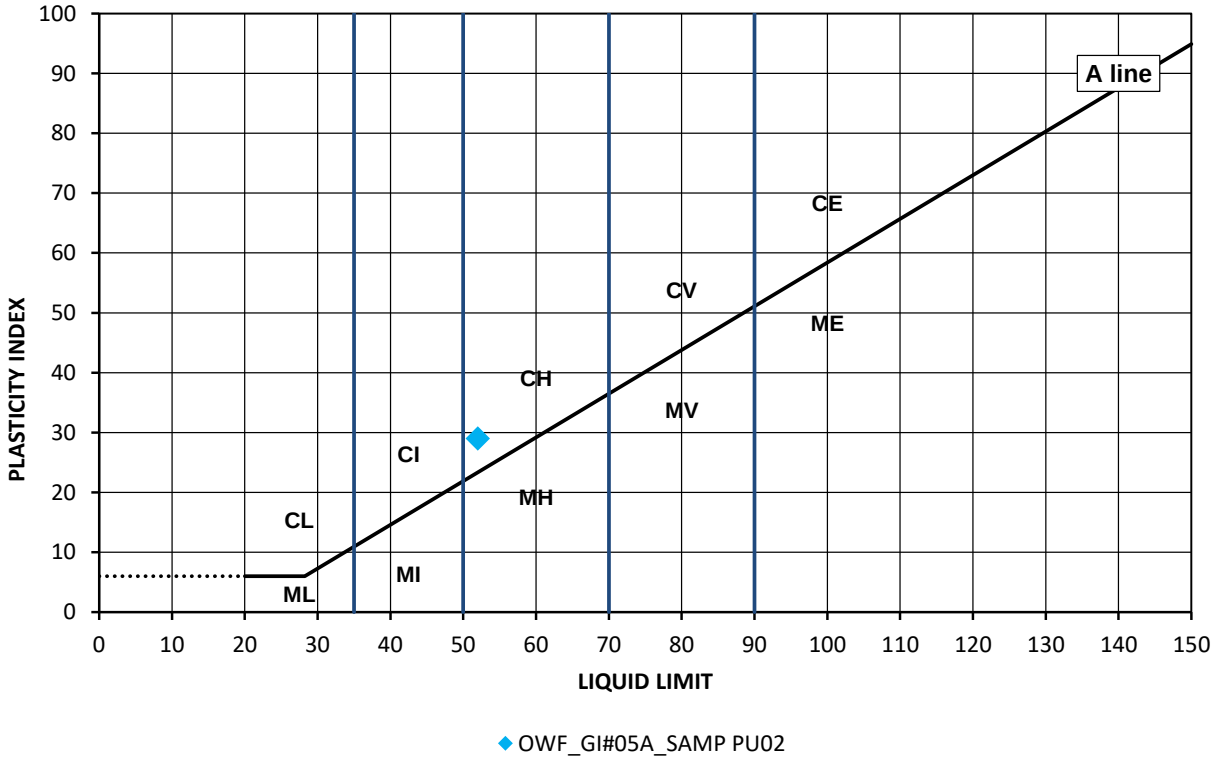
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#05 A_SAMP | CR05 | 4.50 | B1 | 56 | 28 | 28 | 33.3 | 0.19 | 100 | 1 | 4 Point Method | GLEY 1 5GY 2.5/1 Greenish black slightly gravelly, sandy, CLAY | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By |
|---|---|
| 18/04/2023 | U. Mazhar |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU02 |
| Specimen Reference | B1 | Specimen Depth | 5.5 | m | Depth | 5.5 |
| Date started | 21/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227117 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

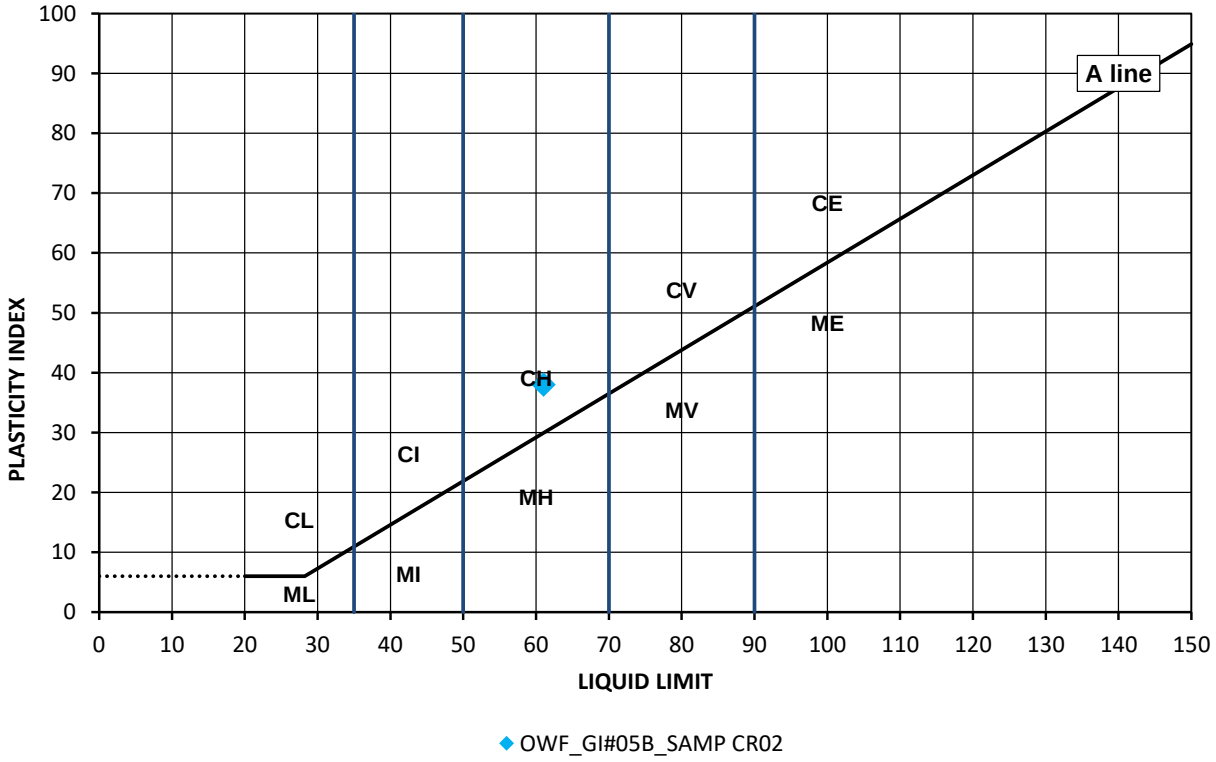
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#05 A_SAMP | PU02 | 5.50 | B1 | 52 | 23 | 29 | 25.2 | 0.08 | 100 | 1 | 4 Point Method | 10y-5Gy 6/2 10y Light greyish olive sandy, gravelly silty CLAY | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Specimen Reference | IS | Specimen Depth | 6.5 | m | Depth | 6.5 |
| Date started | 21/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227121 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

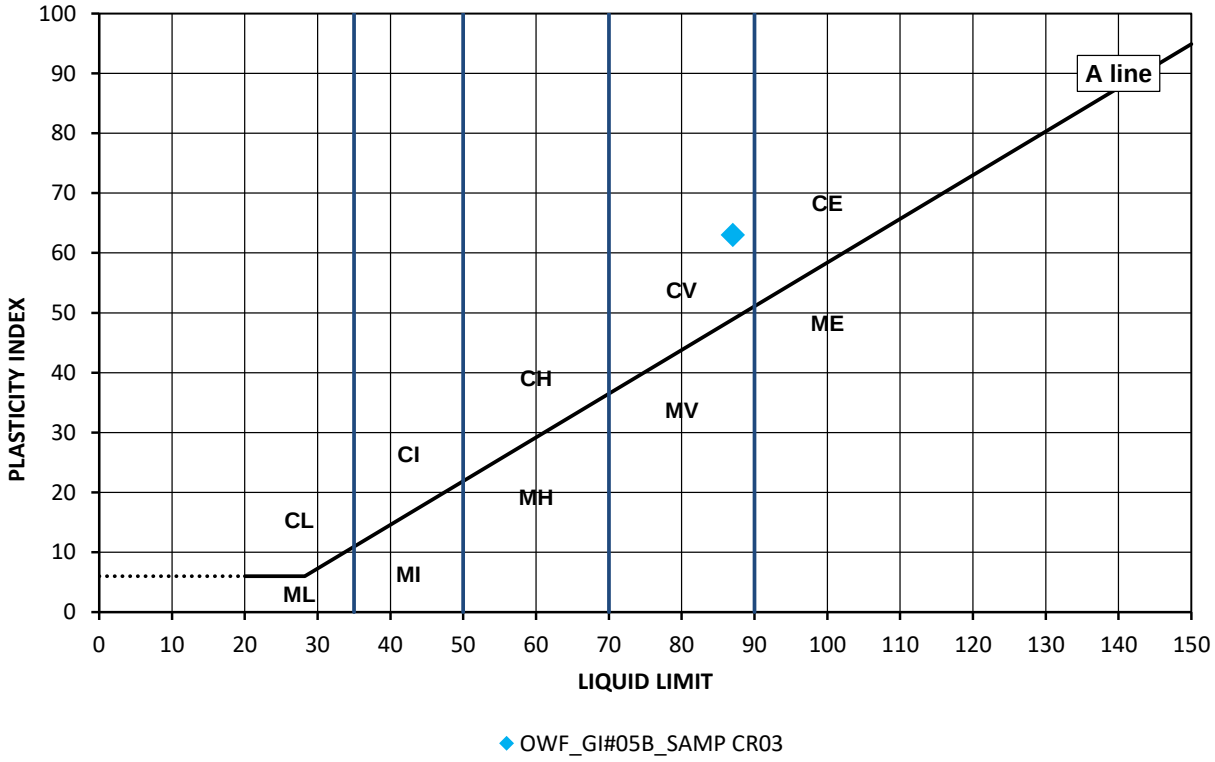
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR02 | 6.50 | IS | 61 | 23 | 38 | 28.1 | 0.13 | 97 | 3 | 4 Point Method | 10y 3/2 Very dark greyish olive gravelly, sandy, CLAY with shell fragments | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR03 |
| Specimen Reference | IS | Specimen Depth | 7.6 | m | Depth | 7.6 |
| Date started | 16/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227125 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 04/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

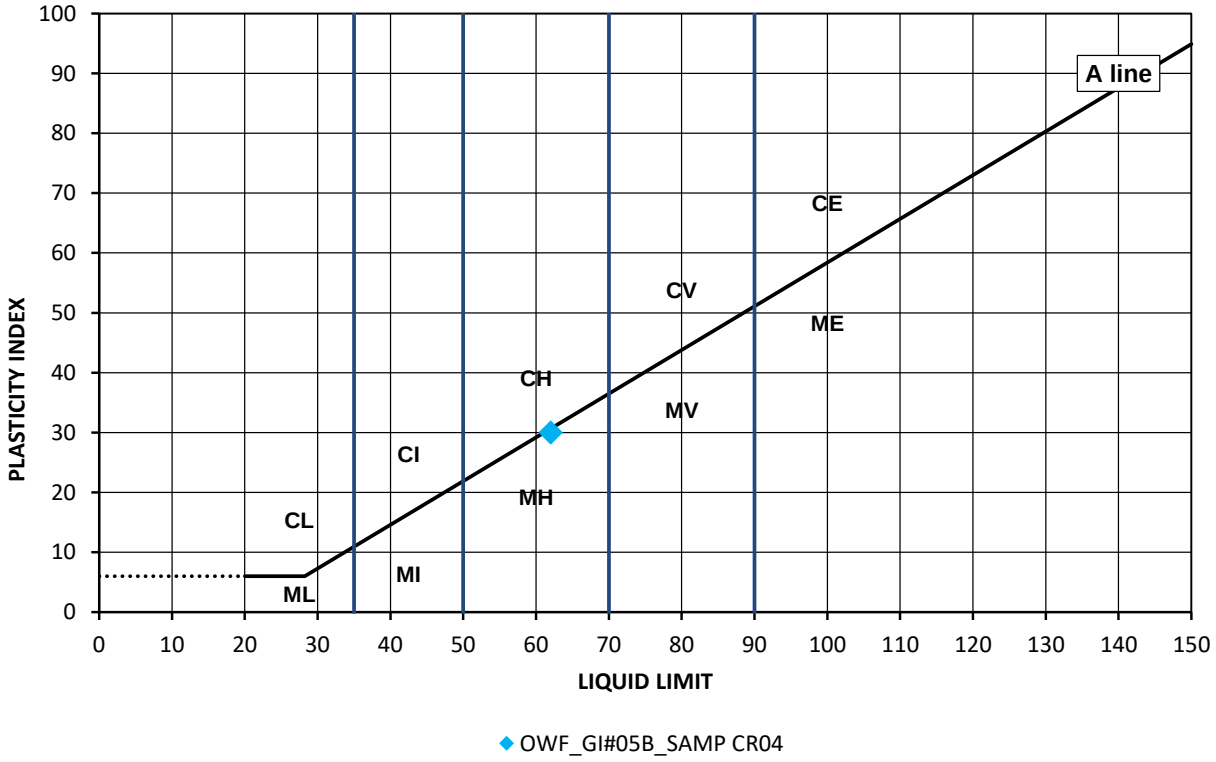
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR03 | 7.60 | IS | 87 | 24 | 63 | 26.2 | 0.04 | 90 | 3 | 4 Point Method | 10y 4/2 Dark greyish olive very stiff CLAY with shell fragments | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 04/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR04 |
| Specimen Reference | IS | Specimen Depth | 8.5 | m | Depth | 8.5 |
| Date started | 21/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227128 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

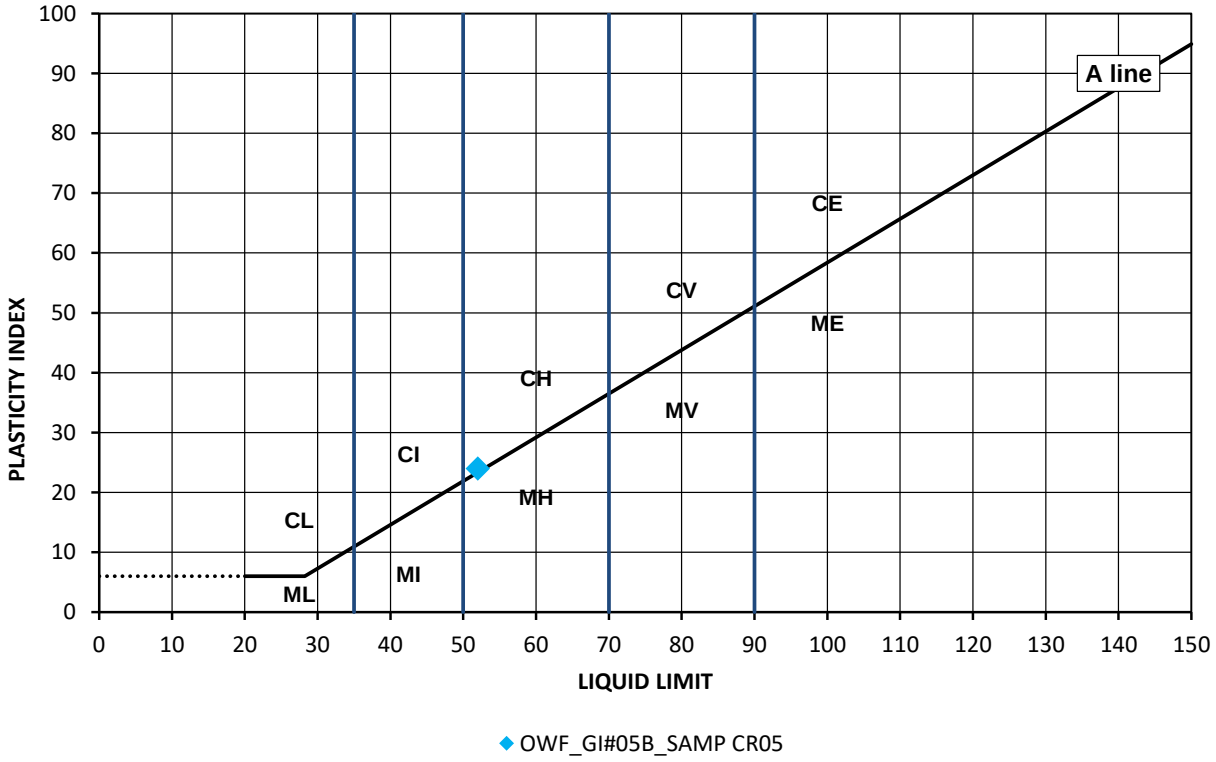
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#05B_SAMP | CR04 | 8.50 | IS | 62 | 32 | 30 | 22.5 | -0.32 | 100 | 1 | 4 Point Method | 5Gy 6/2 Light greyish green very stiff, clayey SILT | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Specimen Reference | IS | Specimen Depth | 9.5 | m | Depth | 9.5 |
| Date started | 21/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227131 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

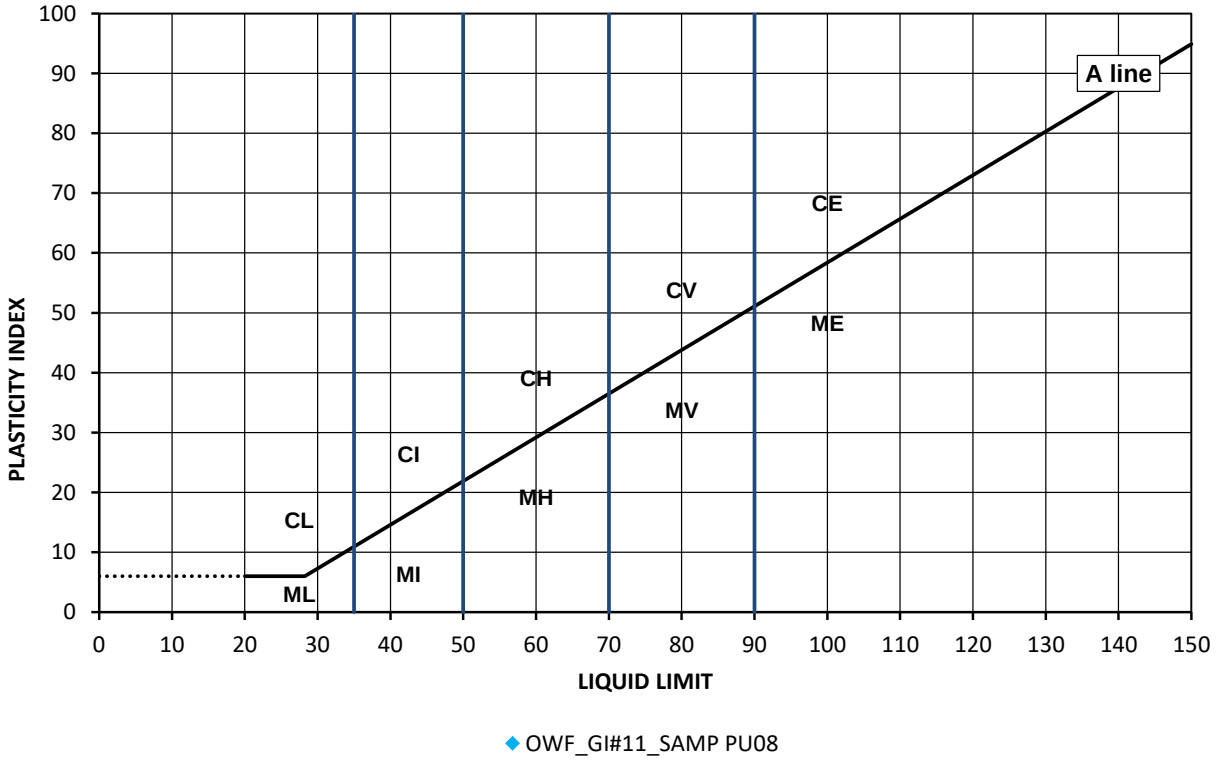
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#05 B_SAMP | CR05 | 9.50 | IS | 52 | 28 | 24 | 19.7 | -0.35 | 100 | 1 | 4 Point Method | 5Gy 6/2 Light greyish green silty CLAY with few shell fragments and stones | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU08 |
| Specimen Reference | | Specimen Depth | m | Depth | 12.25 |
| Date started | 16/03/2023 | | | Sample Type | B2 |
| Test Method | ISO 17892-12 | | | Keylab ID | BH0120230227193 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

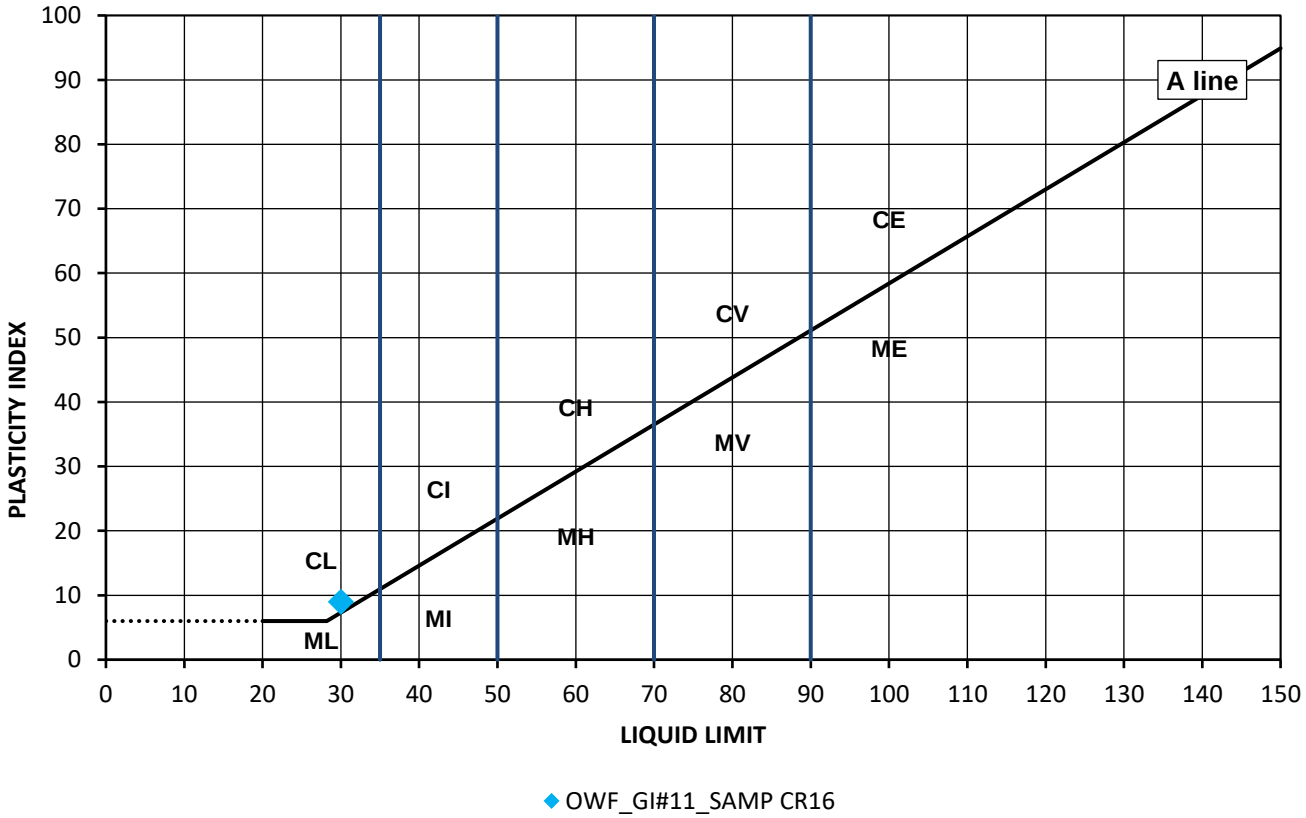
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#11_SAMP | PU08 | 12.25 | B2 | NP | NP | | 16.5 | | 28 | 3 | 4 Point Method | Very pale yellow, white page 2.5y 9/2 silty, very sandy, GRAVEL including cemented sand | Cannot roll - Non-plastic specimen |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Specimen Reference | B1 | Specimen Depth | 17.85 | m | Depth | 17.85 |
| Date started | 13/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227207 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 19/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

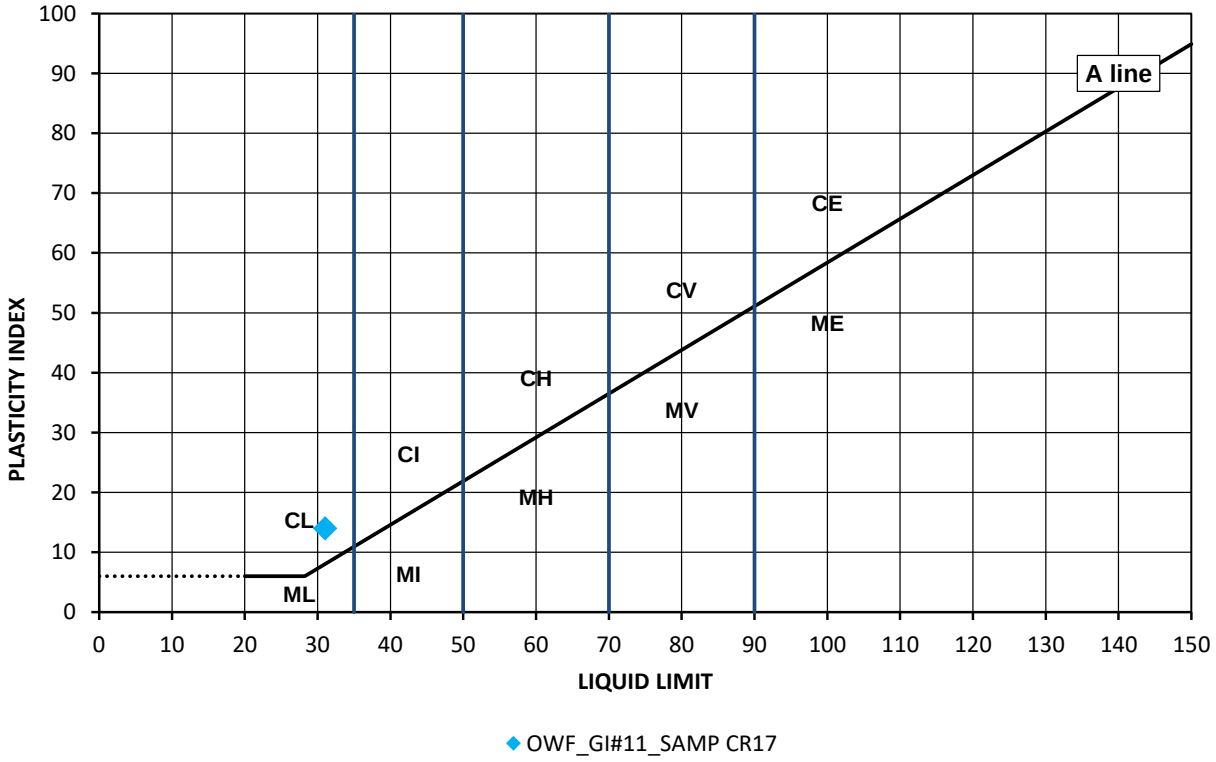
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#11_SAMP | CR16 | 17.85 | B1 | 30 | 21 | 9 | 21.9 | 0.1 | 67 | 3 | 4 Point Method | 5GY 4/2 Dark greyish green silty wet gravelly, silty, clayey, SAND | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By | |
|---|---|---|
| 19/04/2023 | U. Mazhar | |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR17 |
| Specimen Reference | B1 | Specimen Depth | 18.75 | m | Depth | 18.75 |
| Date started | | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227210 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

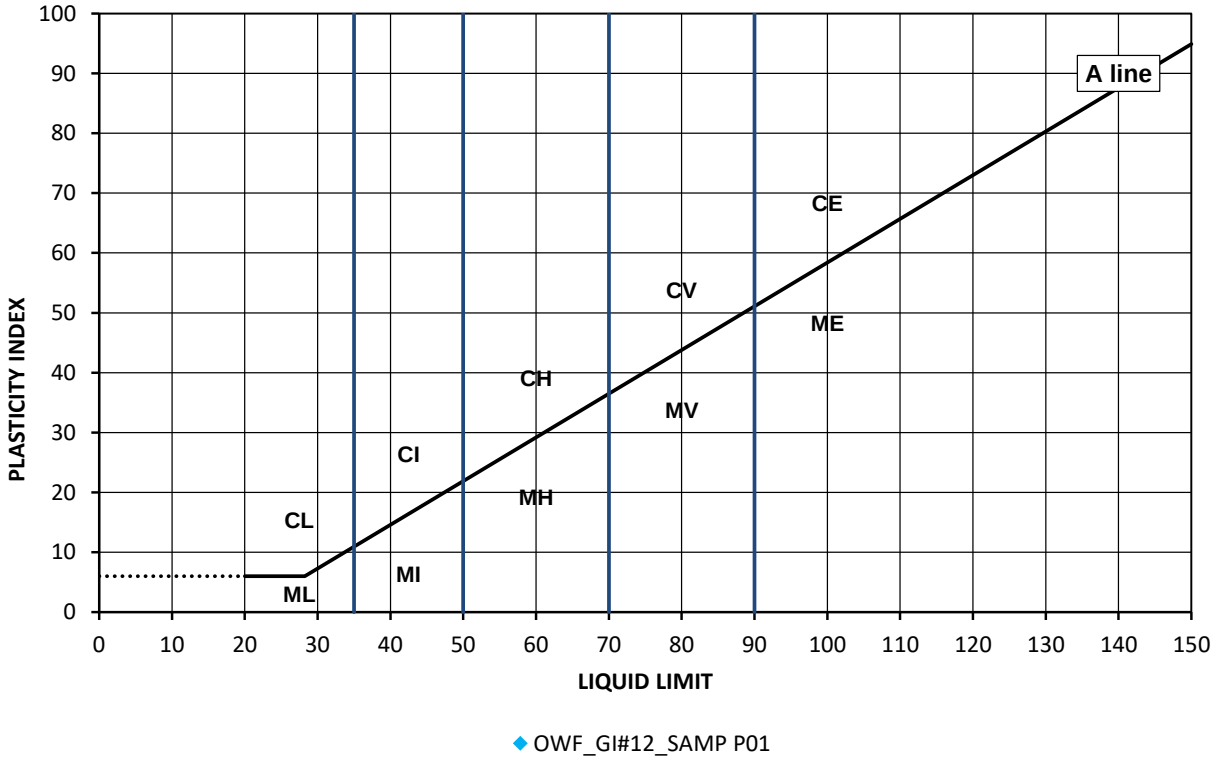
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#11_SAMP | CR17 | 18.75 | B1 | 31 | 17 | 14 | 31.8 | 1.06 | 71 | 3 | 4 Point Method | 5GY 6/2 Light greyish gravelly, sandy, CLAY with shell fragments | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | P01 |
| Specimen Reference | B1 | Specimen Depth | 0 | m | Depth | 0 |
| Date started | 17/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227214 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

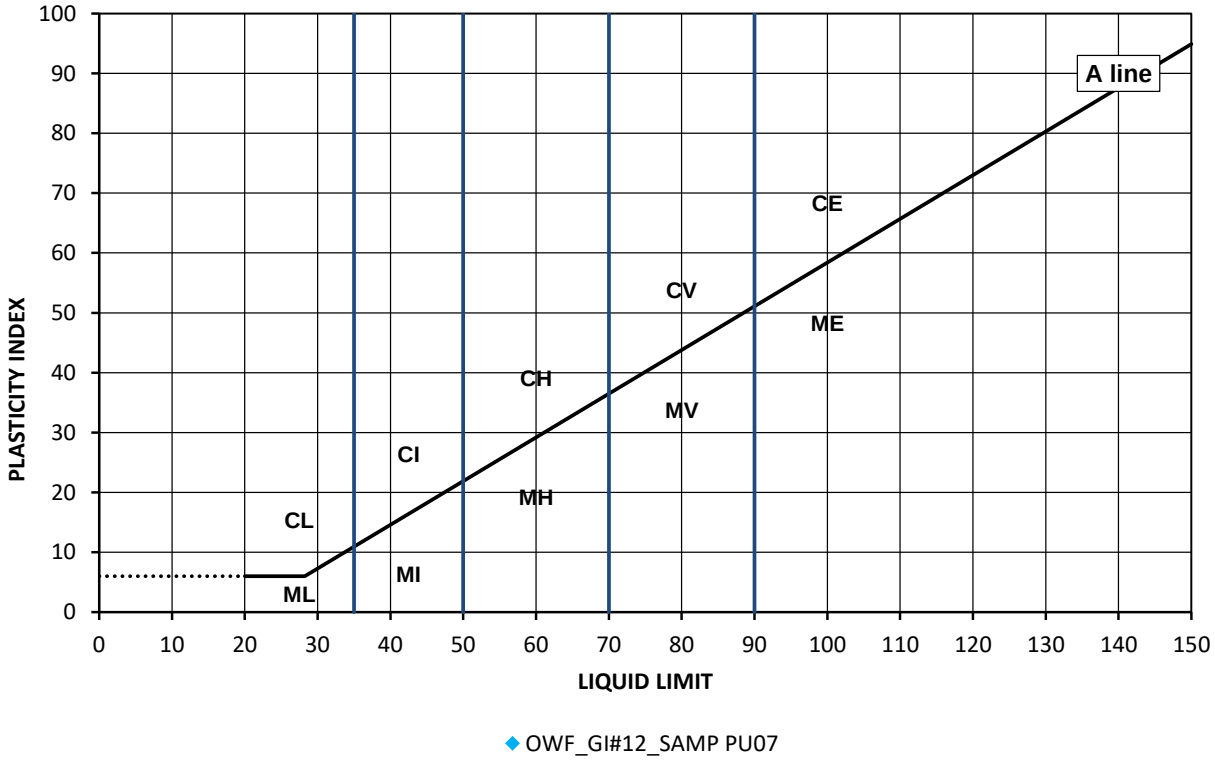
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#12_SAMP | P01 | 0.00 | B1 | NP | NP | | 22.1 | | 96 | 3 | 4 Point Method | 2.5y 4/4 Olive brown silty SAND with shell fragments | Too sandy to roll. Report as non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU07 |
| Specimen Reference | B2 | Specimen Depth | 3.9 | m | Depth | 3.9 |
| Date started | 13/03/2023 | | | | Sample Type | B2 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227225 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

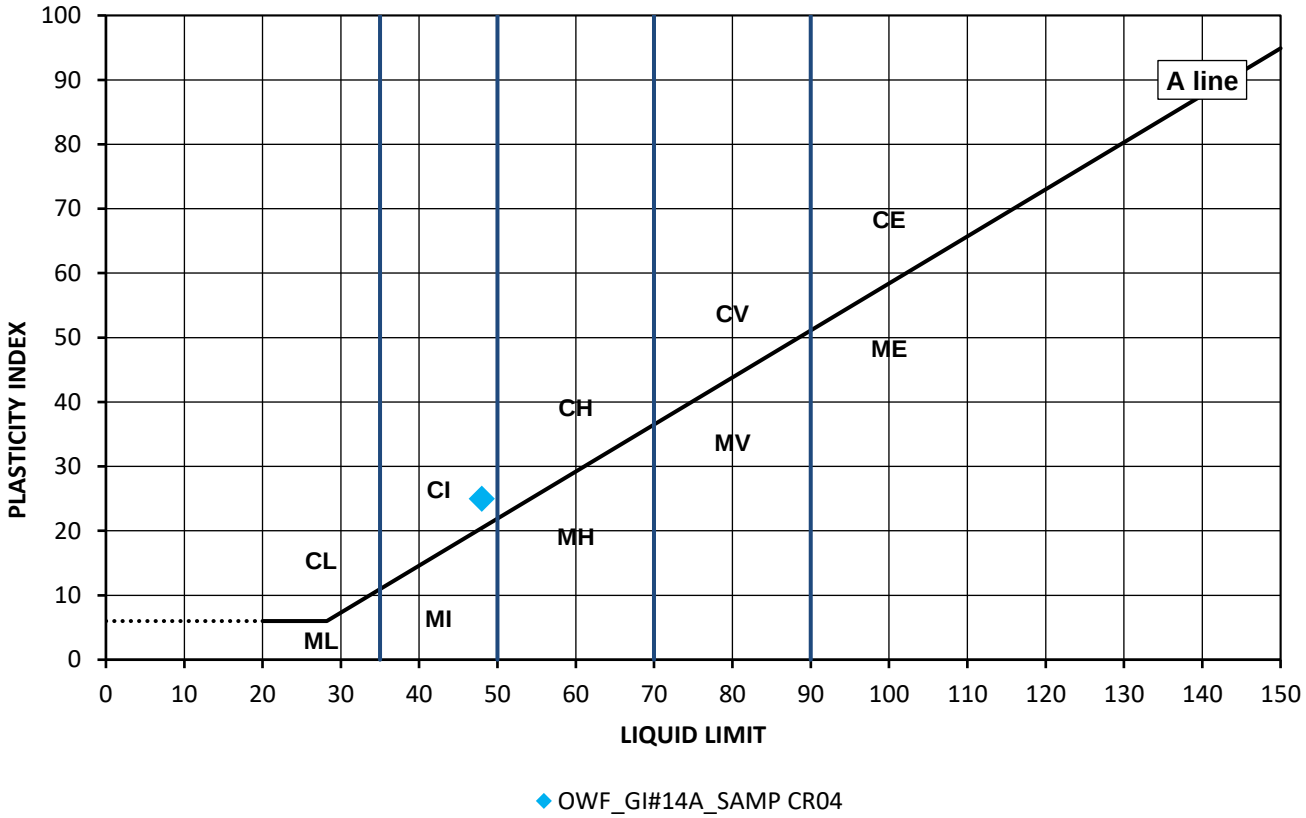
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#12_SAMP | PU07 | 3.90 | B2 | NP | NP | | 22.8 | | 33 | 3 | 4 Point Method | Yellow 2.5y 7/8 , sandy, GRAVEL including cemented sand | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR04 |
| Specimen Reference | B2 | Specimen Depth | 4.6 | m | Depth | 4.6 |
| Date started | 21/03/2023 | | | | Sample Type | B2 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227290 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 17/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

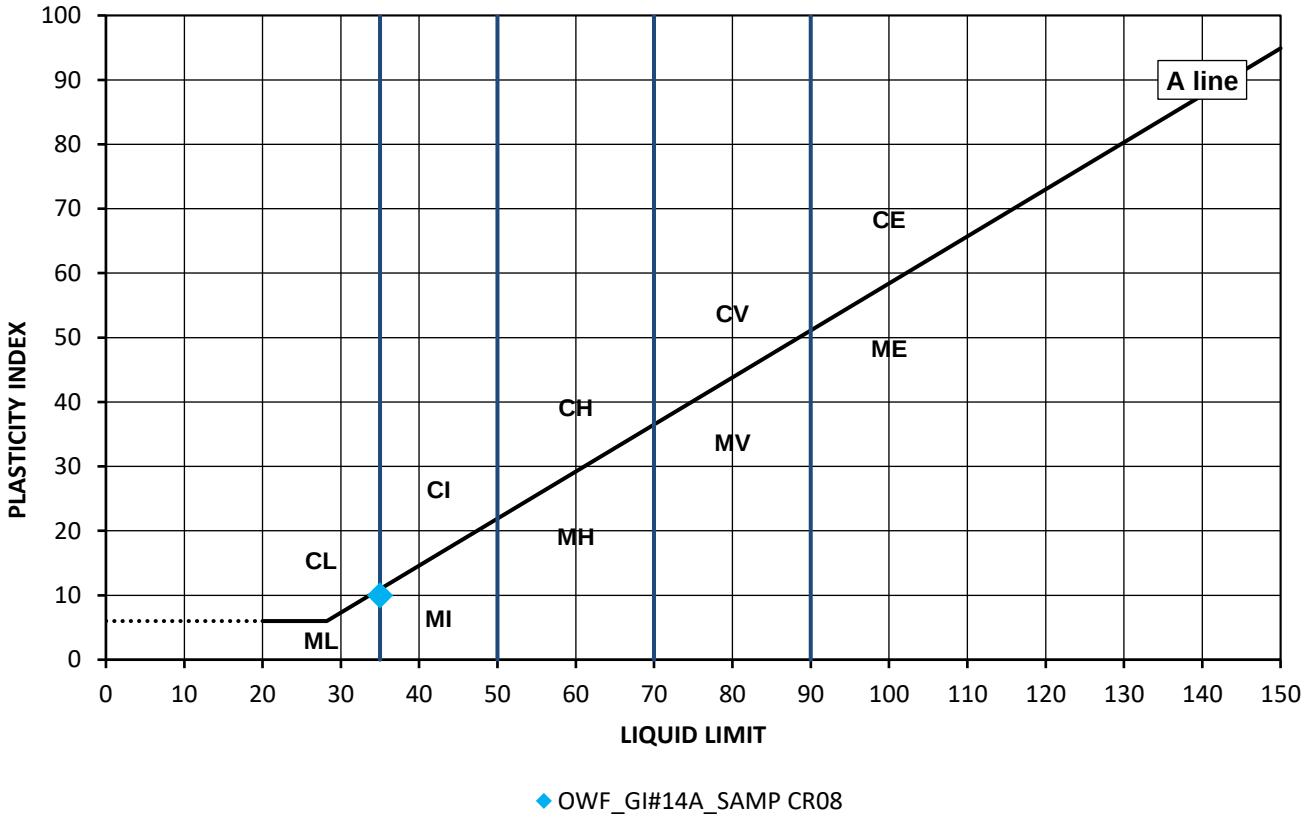
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#14 A_SAMP | CR04 | 4.60 | B2 | 48 | 23 | 25 | 30.5 | 0.3 | 50 | 3 | 4 Point Method | 10y 5/2 greyish olive silty, CLAY including shell fragments | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By | |
|---|---|---|
| 17/04/2023 | U. Mazhar | |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR08 |
| Specimen Reference | B1 | Specimen Depth | 8.5 | m | Depth | 8.5 |
| Date started | 13/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227300 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 17/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

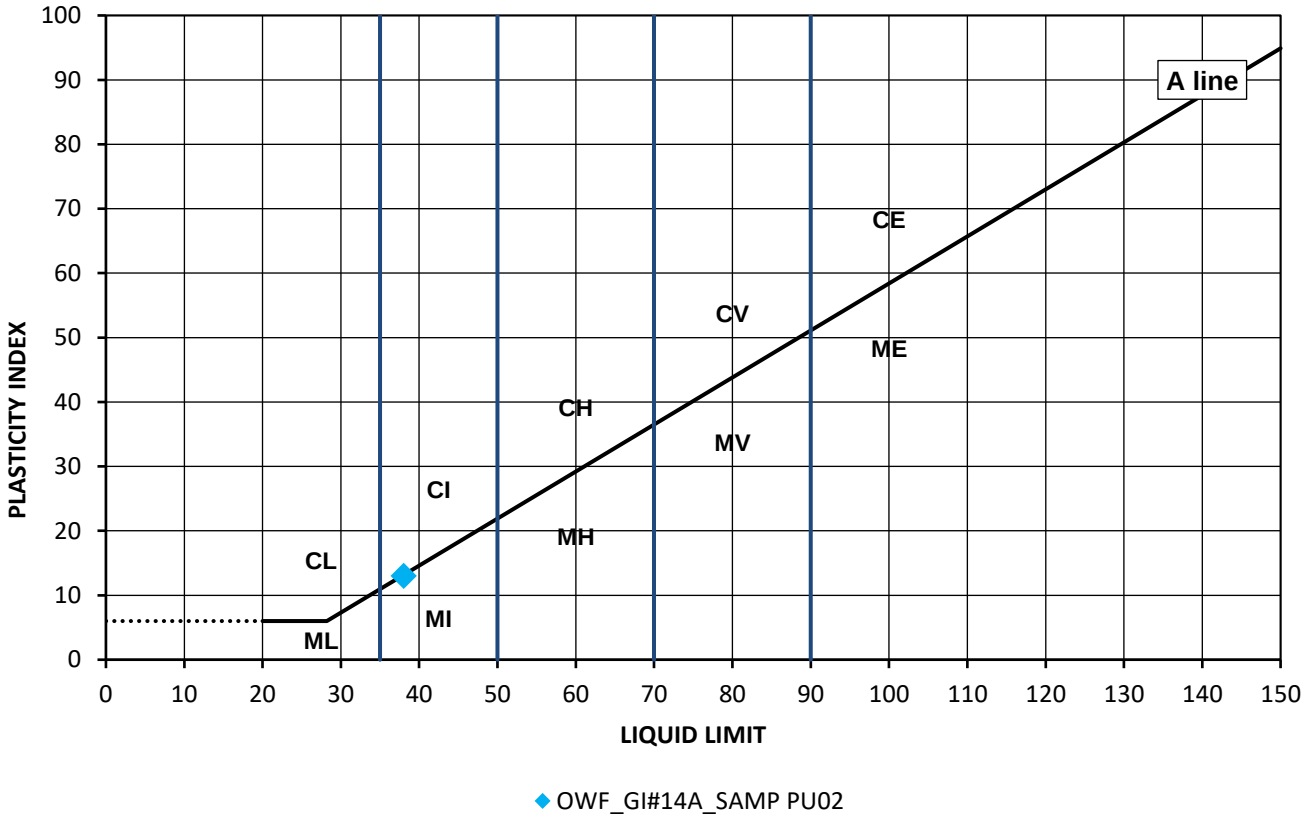
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#14A_SAMP | CR08 | 8.50 | B1 | 35 | 25 | 10 | 36.9 | 1.19 | 98 | 3 | 4 Point Method | 5Gy 3/2 Very dark greyish green slightly gravelly, clayey, silty SAND. | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By | |
|---|---|---|
| 17/04/2023 | U. Mazhar | |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU02 |
| Specimen Reference | B1 | Specimen Depth | 9.6 | m | Depth | 9.6 |
| Date started | 21/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227304 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 17/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

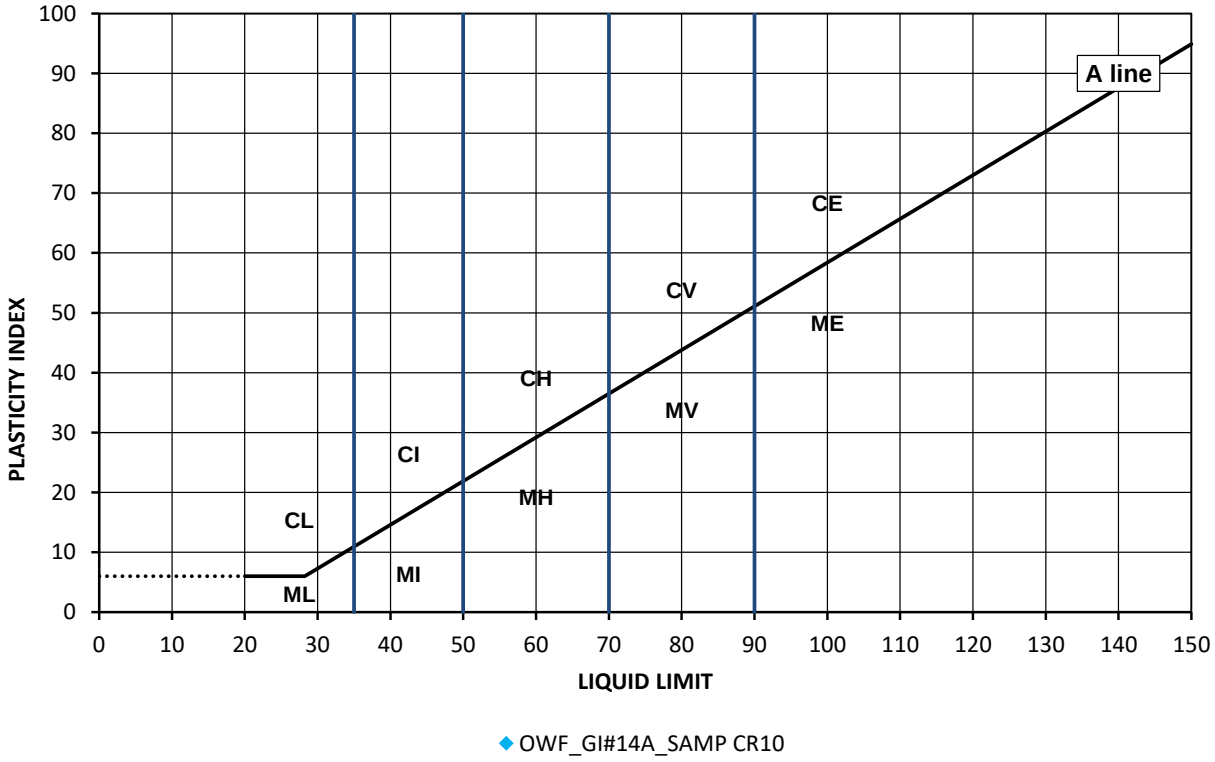
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#14 A_SAMP | PU02 | 9.60 | B1 | 38 | 25 | 13 | 22.5 | -0.19 | 97 | 3 | 4 Point Method | GLEY 1 10Gy 2.5/1 Greenish black clayey, silty, SAND | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 17/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR10 |
| Specimen Reference | B2 | Specimen Depth | 11.35 | m | Depth | 11.35 |
| Date started | 21/03/2023 | | | | Sample Type | B2 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227314 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| | |
|---|---|
| Project Name | A05 Bretagne Offshore GI |
| Project No. | GMOP21-G-019 |

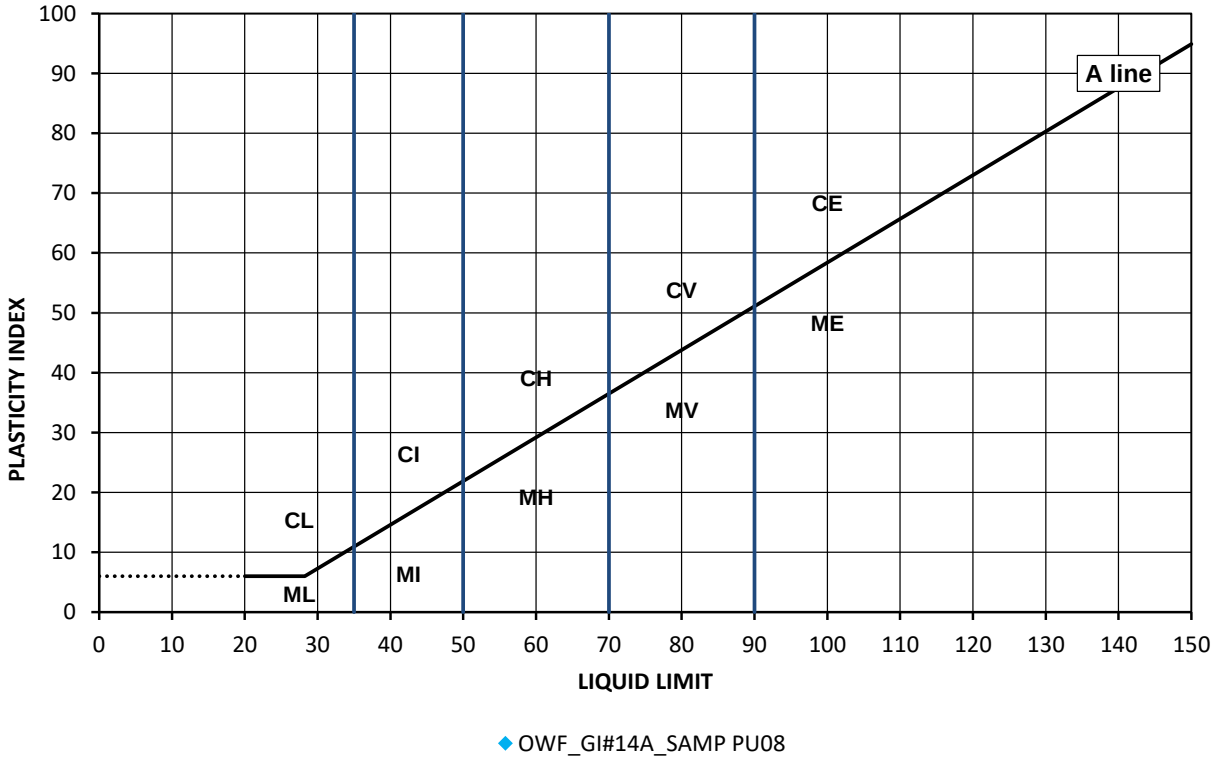
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#14 A_SAMP | CR10 | 11.35 | B2 | NP | NP | | 26.6 | | 86 | 3 | 4 Point Method | 5Gy 3/2 Very dark greyish green, gravelly, very sandy, clayey SILT with sparse shell fragments | Non-plastic, unable to roll specimen to 3mm thread |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU08 |
| Specimen Reference | B1 | Specimen Depth | 18.7 | m | Depth | 18.7 |
| Date started | 21/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227328 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

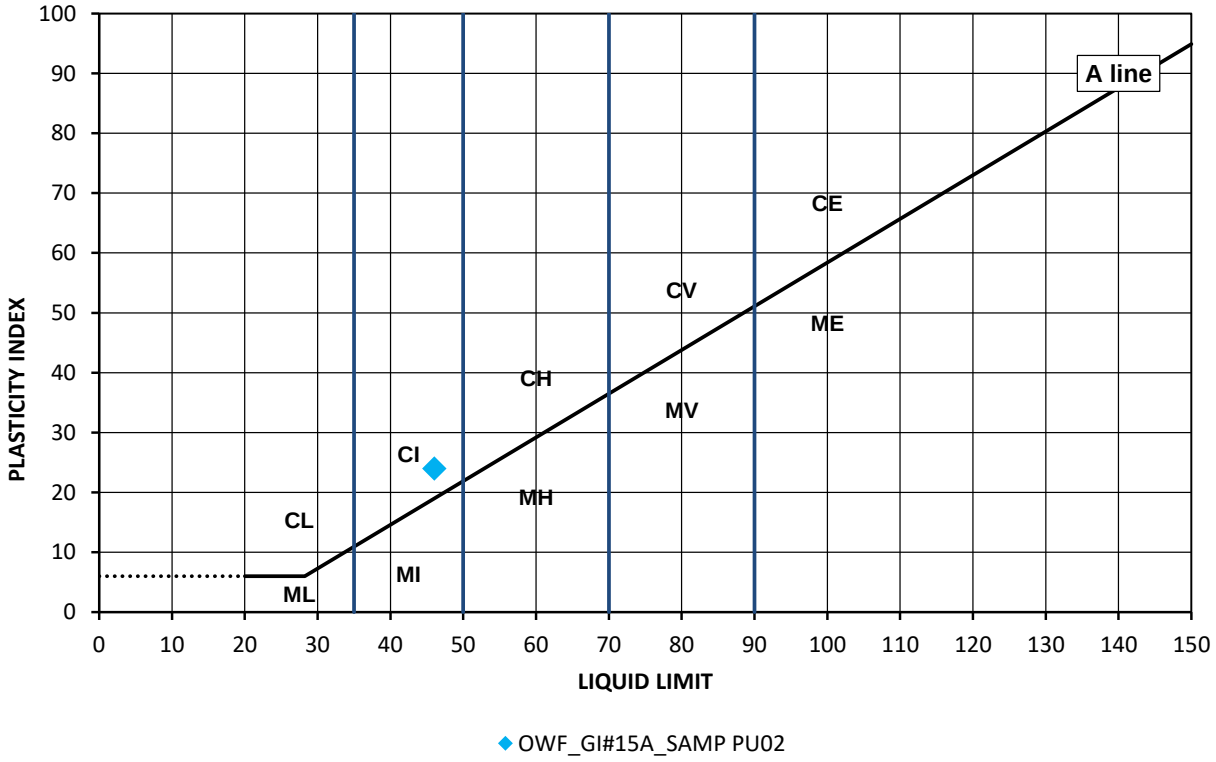
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#14 A_SAMP | PU08 | 18.70 | B1 | NP | NP | | 27.7 | | 90 | 3 | 4 Point Method | 10y 6/2 Light greyish olive silty SAND with small shell fragments | Too sandy to roll. Specimen non plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU02 |
| Specimen Reference | B1 | Specimen Depth | 2 | m | Depth | 2 |
| Date started | 15/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030711 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 05/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

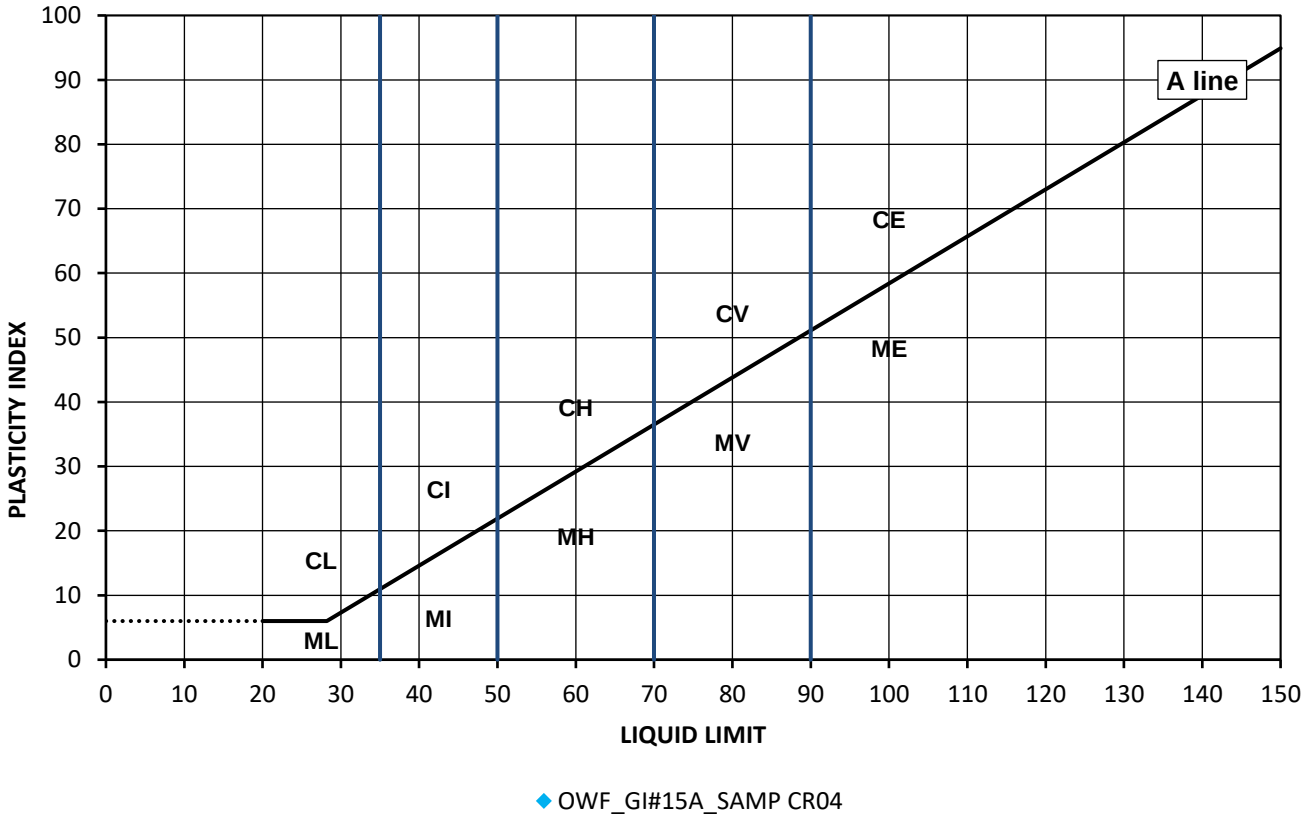
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15 A_SAMP | PU02 | 2.00 | B1 | 46 | 22 | 24 | 24.1 | 0.09 | 66 | 3 | 4 Point Method | Light brown, sandy and gravelly, CLAY with frequent shell fragments | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed
05/04/2023

Approved By
U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR04 |
| Specimen Reference | IS | Specimen Depth | 4 | m | Depth | 4 |
| Date started | 13/04/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030717 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 17/04/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

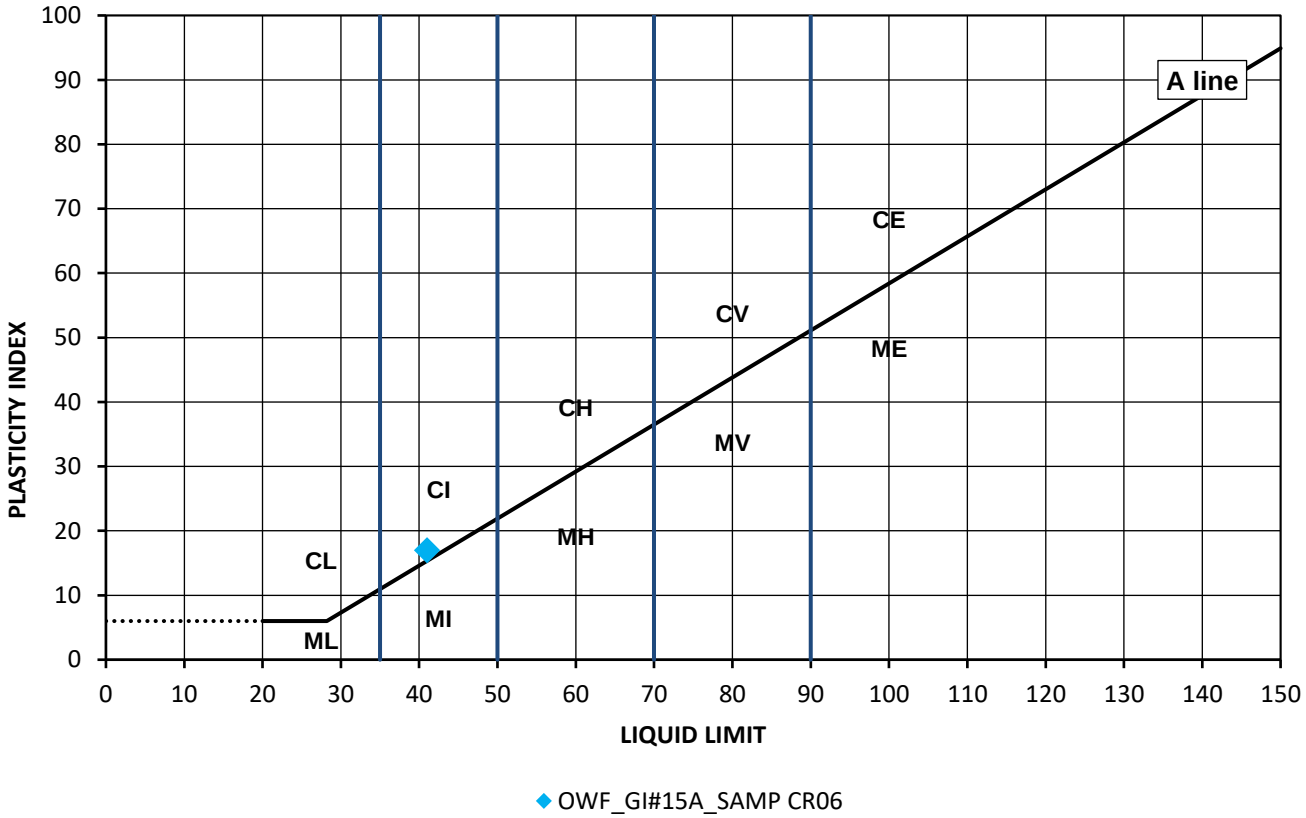
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR04 | 4.00 | IS | NP | NP | | 15.7 | | 22 | 3 | 4 Point Method | 5Y 8/2 Pale yellow, slightly silty, sandy GRAVEL | Non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By | |
|---|---|---|
| 17/04/2023 | D.Smith | |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Specimen Reference | IS | Specimen Depth | 7 | m | Depth | 7 |
| Date started | 21/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030724 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 17/04/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

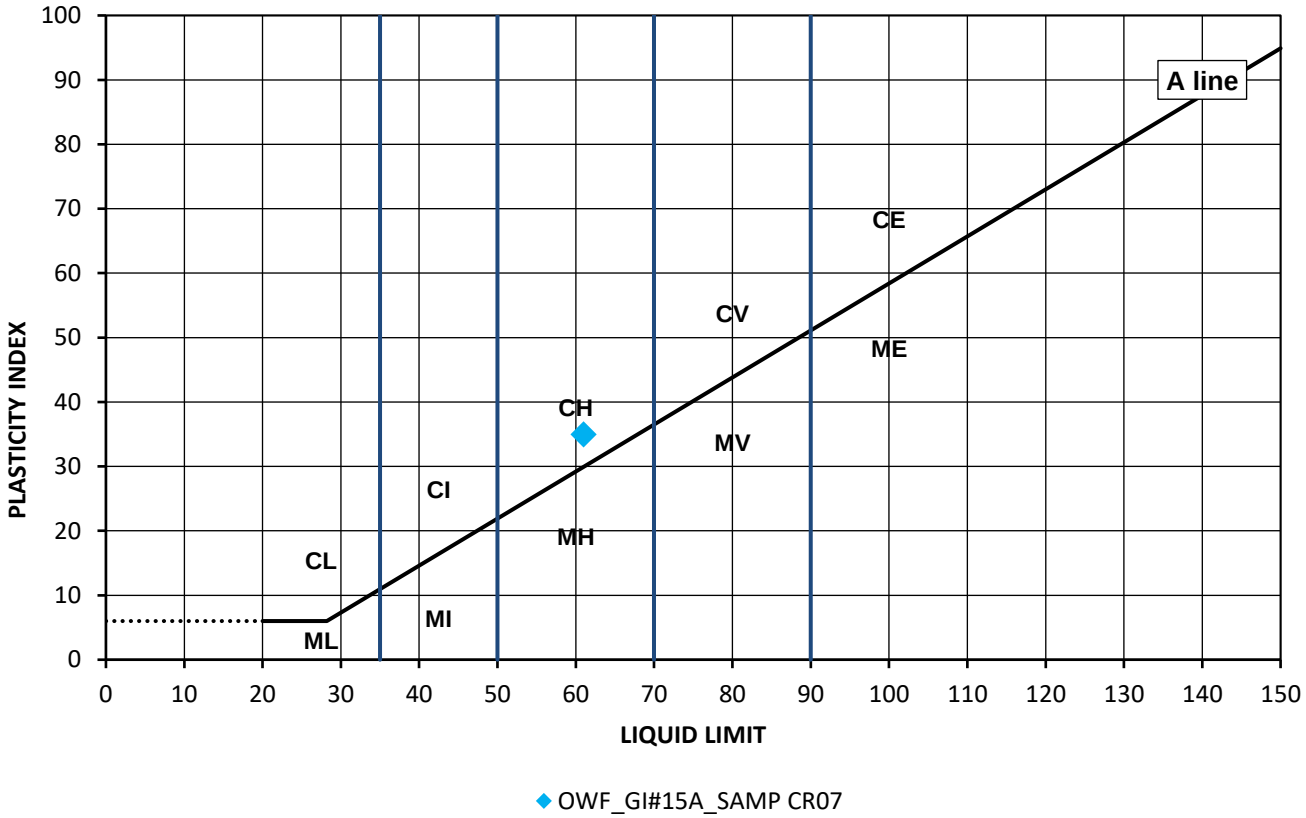
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR06 | 7.00 | IS | 41 | 24 | 17 | 21.8 | -0.13 | 99 | 3 | 4 Point Method | GLEY 1 4/1 Dark greyish green very stiff sandy, clayey, SILT with shell fragments | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By |
|---|---|
| 17/04/2023 | D.Smith |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR07 |
| Specimen Reference | Q1 | Specimen Depth | 8.6 | m | Depth | 8.6 |
| Date started | 03/05/2023 | | | | Sample Type | Q1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030730 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 24/05/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

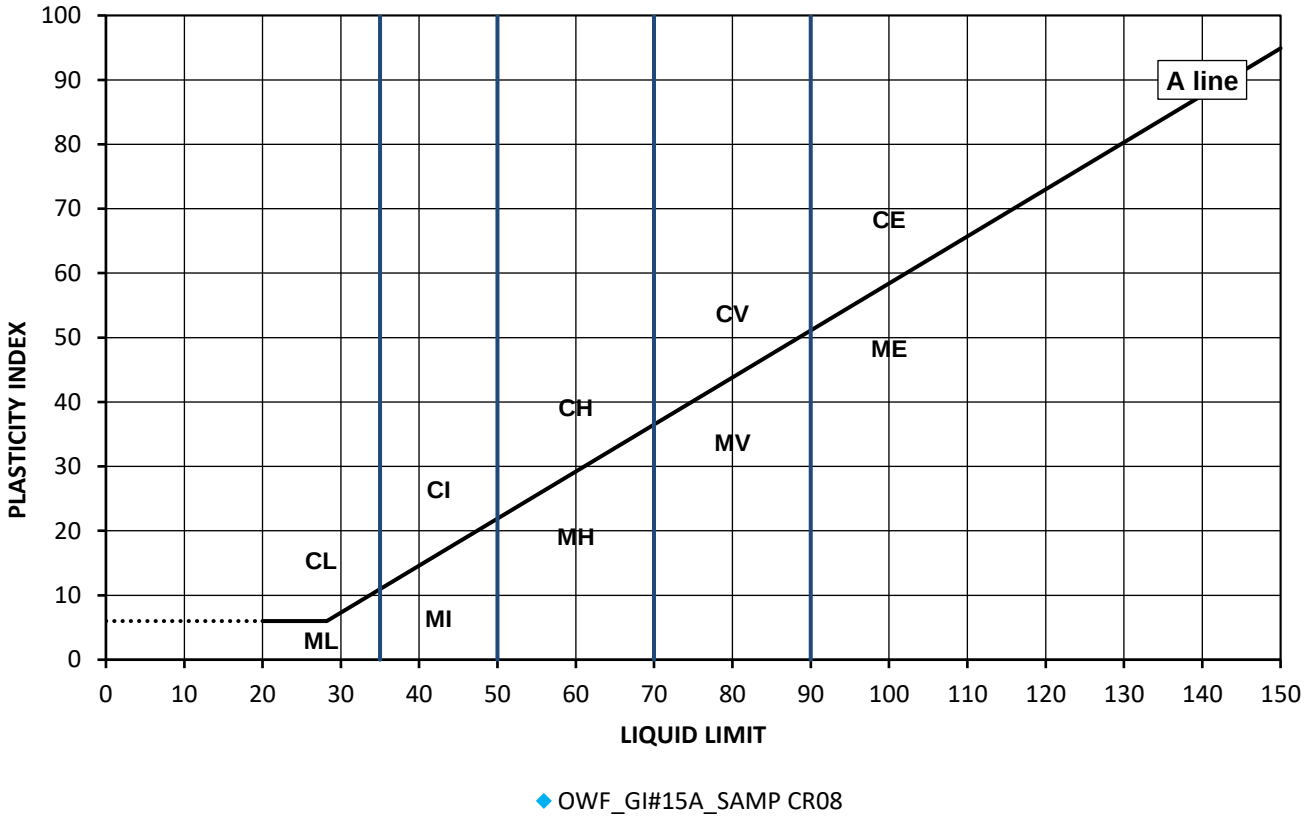
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15 A_SAMP | CR07 | 8.60 | Q1 | 61 | 26 | 35 | 21.4 | -0.13 | 100 | 1 | 4 Point Method | Dark brown sandy, clayey, SILT | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By |
|---|---|
| 24/05/2023 | D.Smith |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR08 |
| Specimen Reference | B1 | Specimen Depth | 9.3 | m | Depth | 9.3 |
| Date started | 20/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030733 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 17/04/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

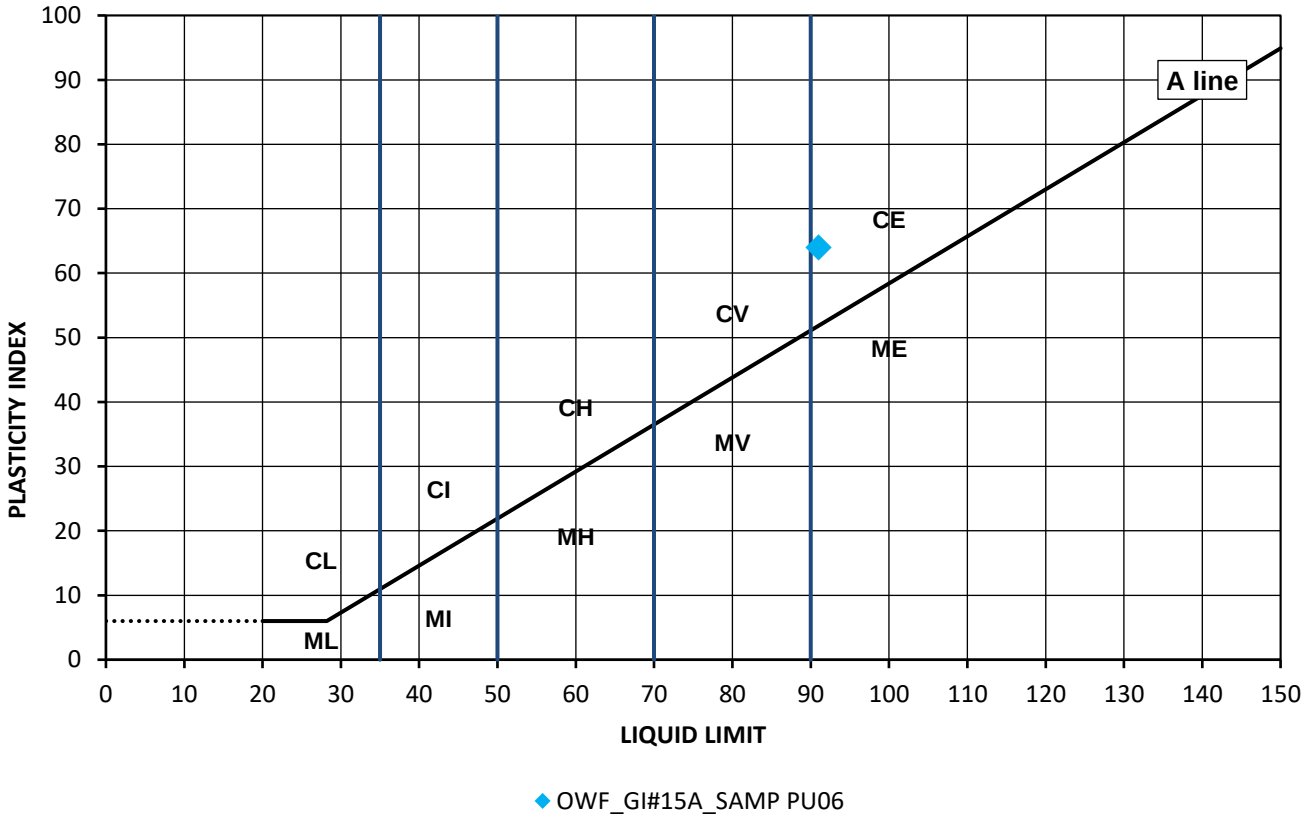
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR08 | 9.30 | B1 | NP | NP | | 17.9 | | 74 | 3 | 4 Point Method | GLEY 1 3/1 Very dark greenish grey gravelly, sandy, clayey, SILT including cemented sand | Cannot roll to 3mm thread, non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By |
|---|---|
| 17/04/2023 | D.Smith |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU06 |
| Specimen Reference | UU1 | Specimen Depth | 10 | m | Depth | 10 |
| Date started | 04/04/2023 | | | | Sample Type | UU1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030735 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 17/04/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

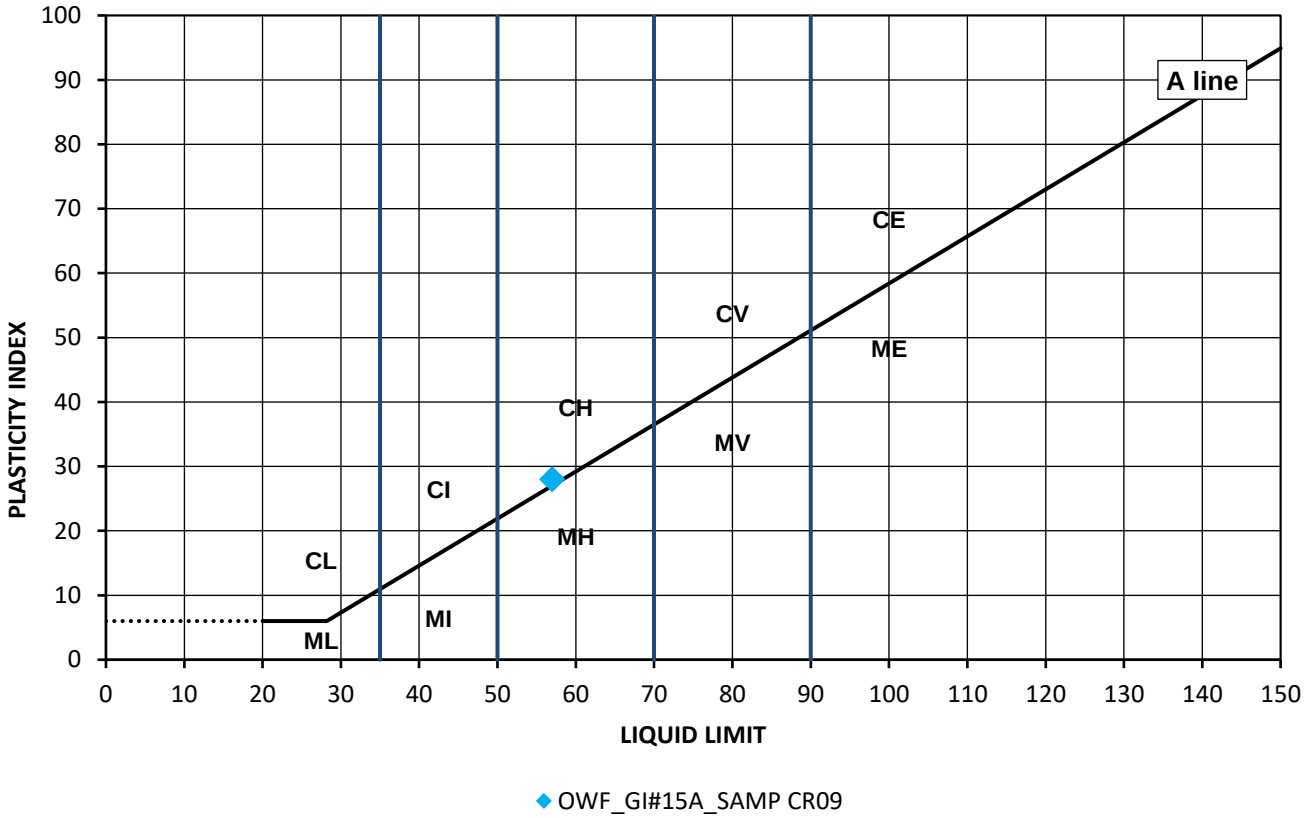
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU06 | 10.00 | UU1 | 91 | 27 | 64 | 31.5 | 0.07 | 100 | 1 | 4 Point Method | 2.5y 4/1 Dark grey, slightly gravelly, slightly sandy, CLAY | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By | |
|---|---|---|
| 17/04/2023 | D.Smith | |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR09 |
| Specimen Reference | IS | Specimen Depth | 12.1 | m | Depth | 12.1 |
| Date started | 28/04/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030744 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 24/05/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

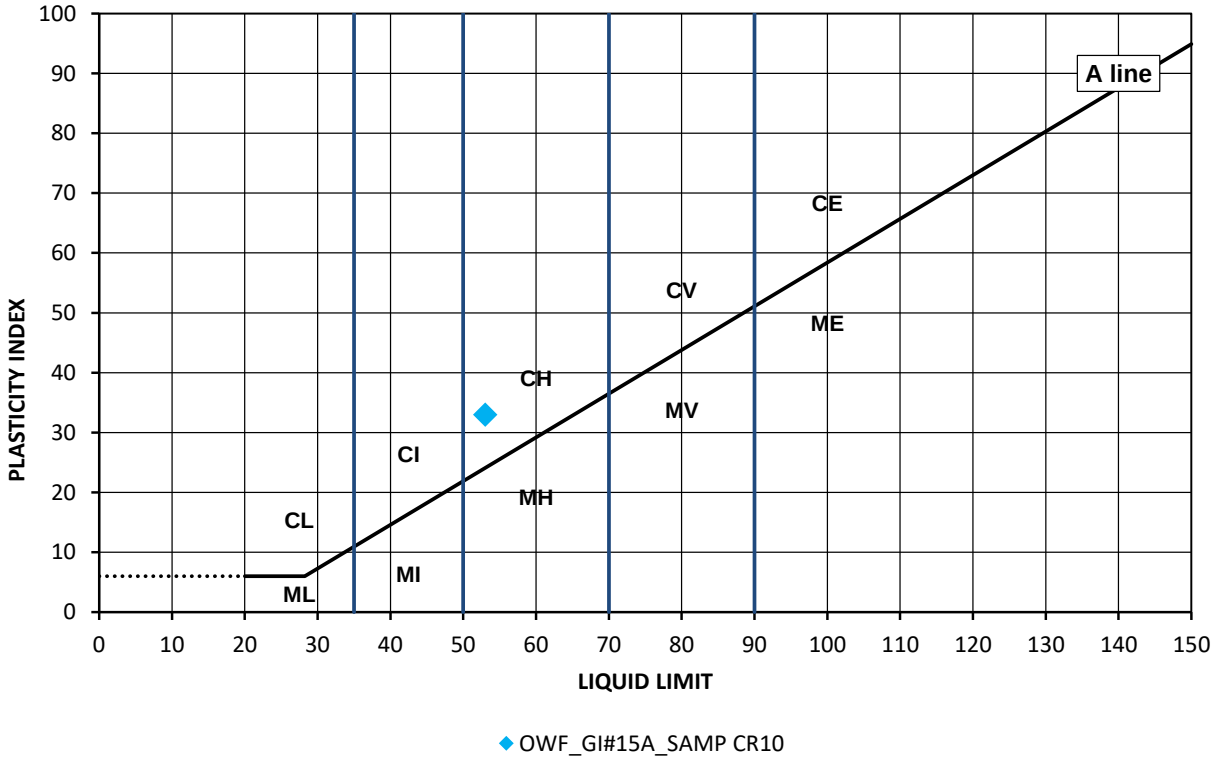
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15 A_SAMP | CR09 | 12.10 | IS | 57 | 29 | 28 | 28 | -0.04 | 100 | 2 | 4 Point Method | Greenish grey mottled greenish brown sandy, clayey, SILT with sparse shell fragments (<5mm) | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By | |
|---|---|---|
| 24/05/2023 | D.Smith | |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR10 |
| Specimen Reference | IS | Specimen Depth | 13.4 | m | Depth | 13.4 |
| Date started | 05/06/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030749 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | Test Technician |
|---|---|---|---|
| | 13/07/2023 | U. Mazhar | A Martin |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

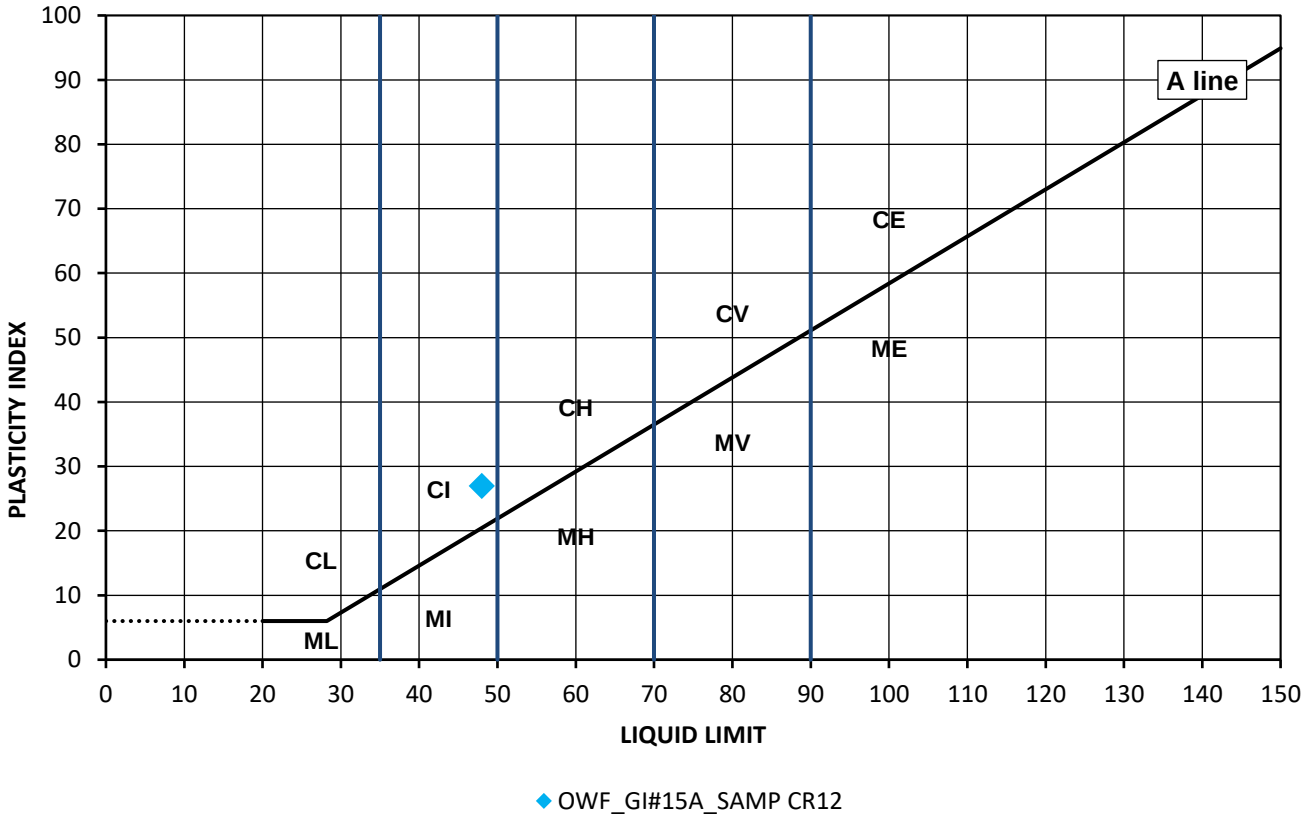
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15 A_SAMP | CR10 | 13.40 | IS | 53 | 20 | 33 | 36.1 | 0.49 | 100 | 3 | 4 Point Method | Greyish green gravelly, sandy, CLAY. | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 13/07/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR12 |
| Specimen Reference | IS | Specimen Depth | 15 | m | Depth | 15 |
| Date started | 13/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030753 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 17/04/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

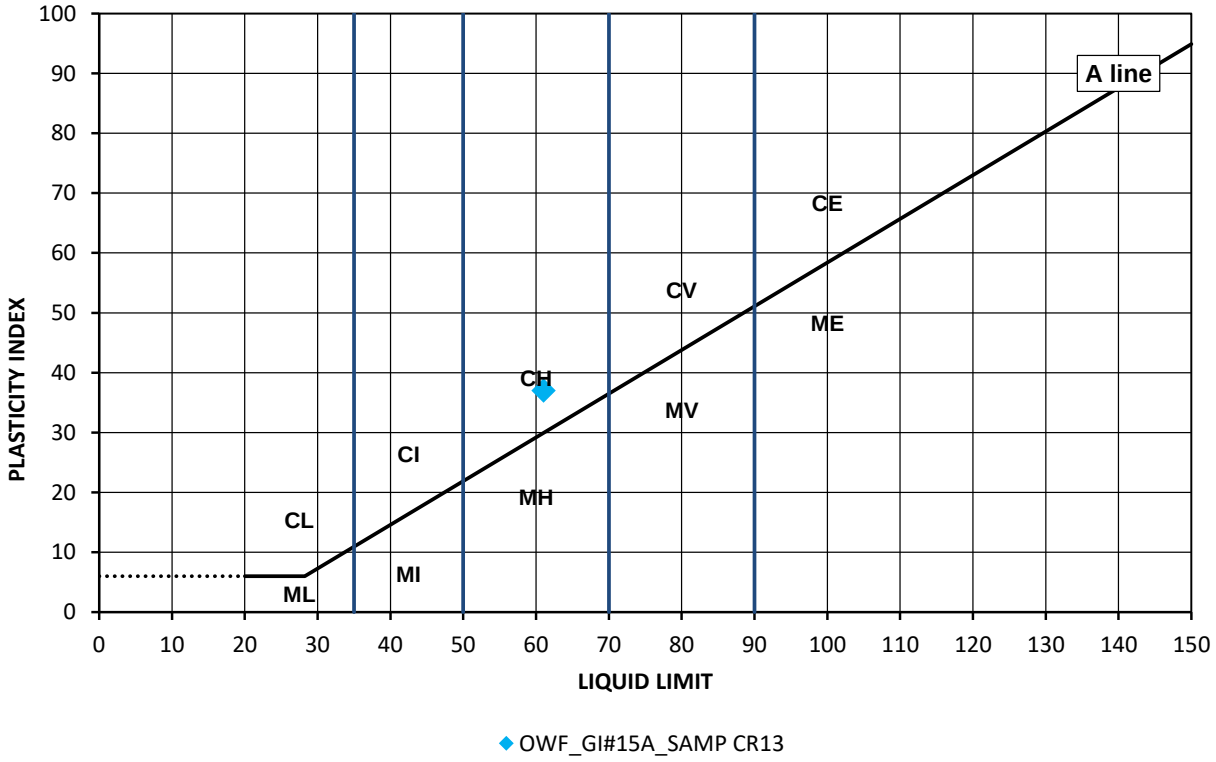
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15A_SAMP | CR12 | 15.00 | IS | 48 | 21 | 27 | 20.5 | -0.02 | 79 | 3 | 4 Point Method | GLEY 1 4/1 Dark greyish green, slightly gravelly, slightly sandy, CLAY | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By | |
|---|---|---|
| 17/04/2023 | D.Smith | |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR13 |
| Specimen Reference | IS | Specimen Depth | 16.25 | m | Depth | 16.25 |
| Date started | 15/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030760 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 04/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

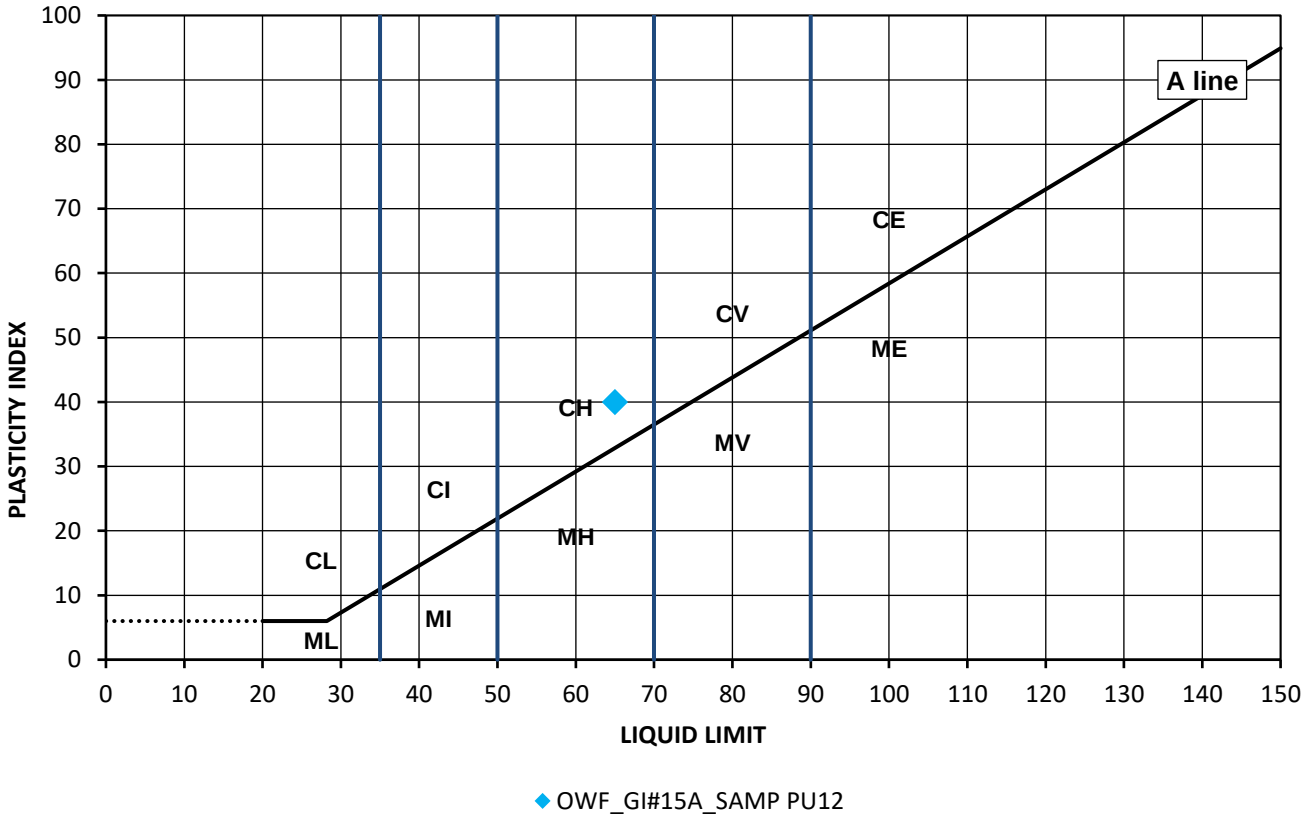
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15 A_SAMP | CR13 | 16.25 | IS | 61 | 24 | 37 | 30.5 | 0.18 | 100 | 3 | 4 Point Method | 5y 4/2 Olive grey CLAY | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 04/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU12 |
| Specimen Reference | B1 | Specimen Depth | 18 | m | Depth | 18 |
| Date started | 16/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030767 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 17/04/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

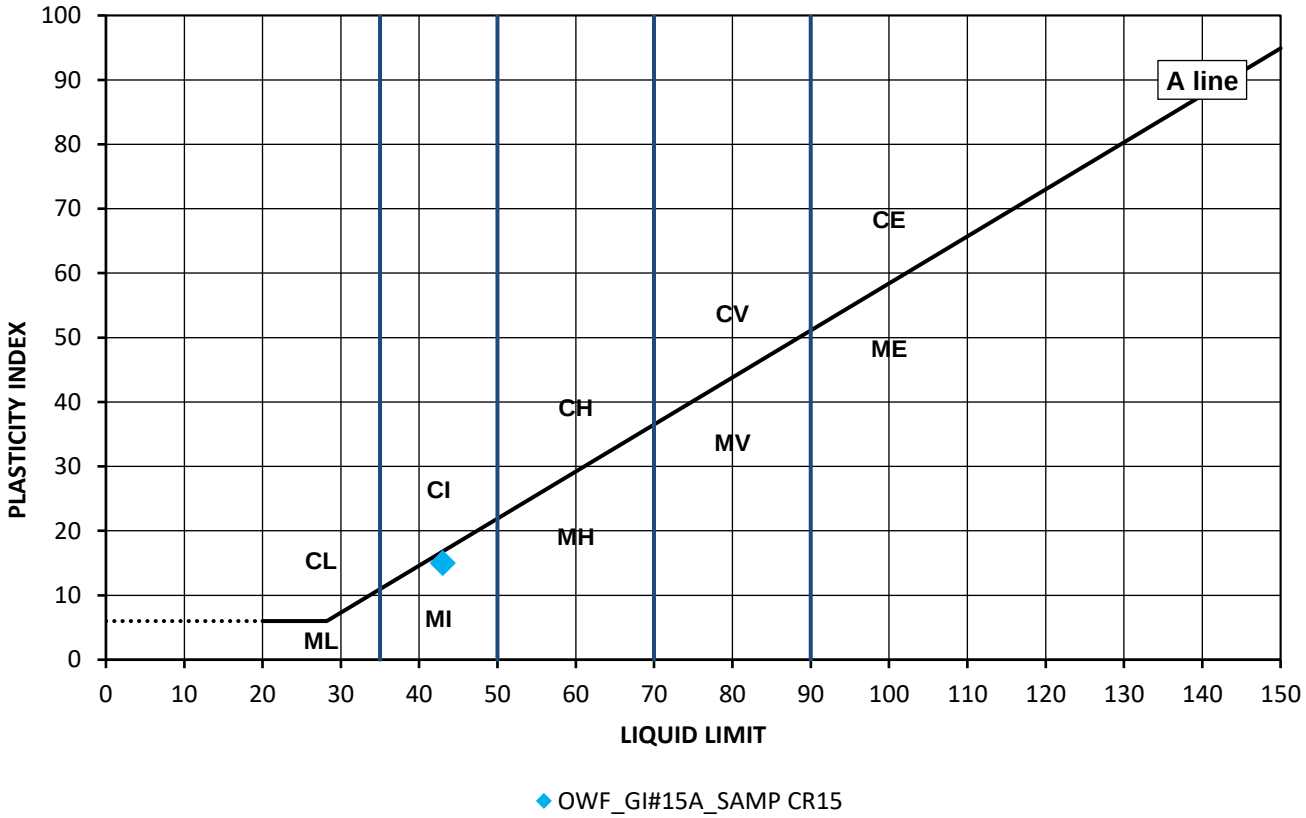
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15A_SAMP | PU12 | 18.00 | B1 | 65 | 25 | 40 | 43 | 0.45 | 100 | 2 | 4 Point Method | GLEY 1 5/1 Greenish grey sandy, silty, CLAY | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By | |
|---|---|---|
| 17/04/2023 | D.Smith | |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Specimen Reference | IS | Specimen Depth | 18.6 | m | Depth | 18.6 |
| Date started | 11/04/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030770 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 24/05/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

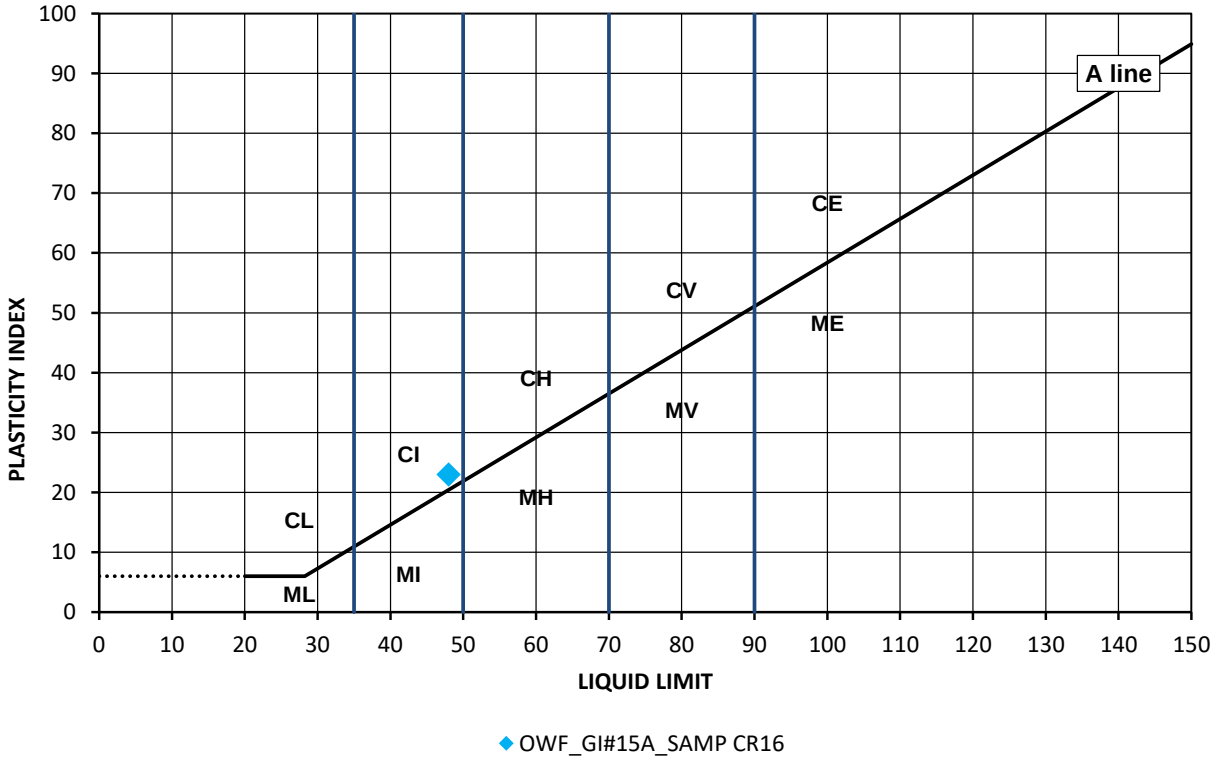
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15 A_SAMP | CR15 | 18.60 | IS | 43 | 28 | 15 | 17.7 | -0.69 | 84 | 3 | 4 Point Method | GLEY 1 6/1 Greenish grey, clayey, gravelly, SILT | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By |
|---|---|
| 24/05/2023 | D.Smith |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Specimen Reference | IS | Specimen Depth | 19.5 | m | Depth | 19.5 |
| Date started | 15/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH012023030773 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 04/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

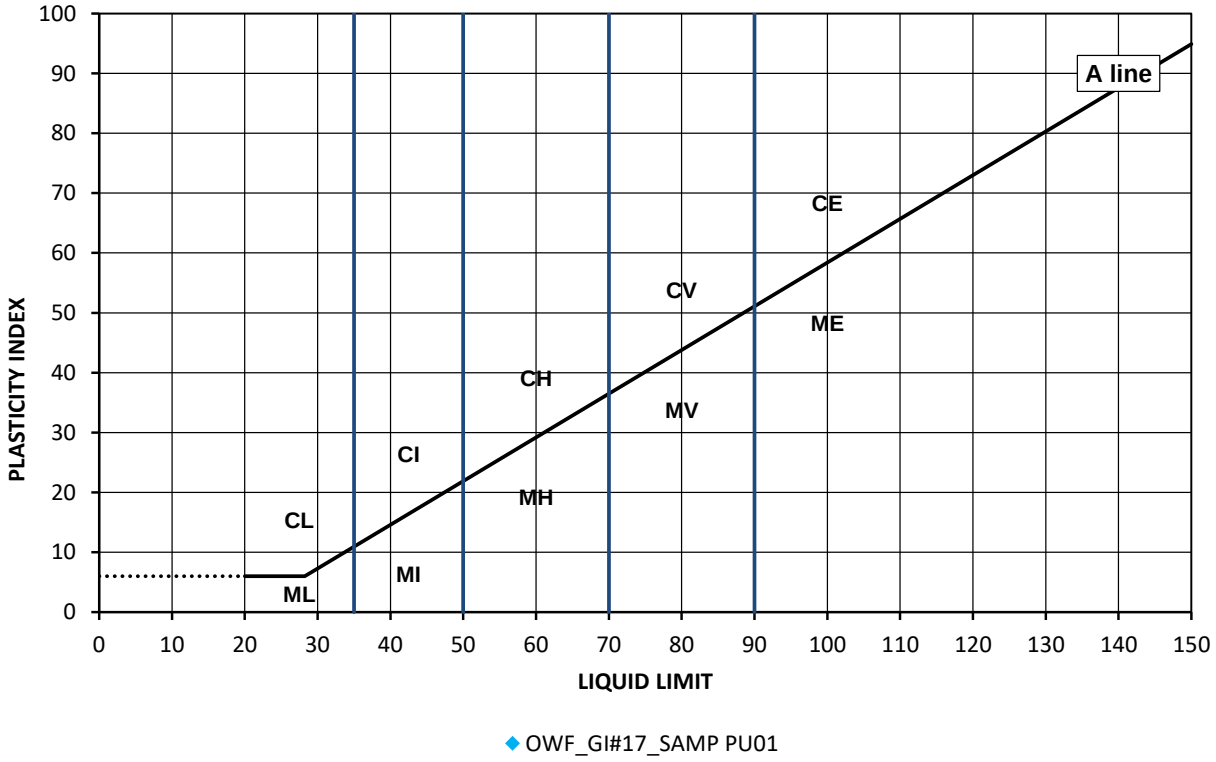
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#15 A_SAMP | CR16 | 19.50 | IS | 48 | 25 | 23 | 31.3 | 0.27 | 96 | 3 | 4 Point Method | GLEY 1 4/1 Dark greenish grey silty CLAY | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 04/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU01 |
| Specimen Reference | B1 | Specimen Depth | 0 | m | Depth | 0 |
| Date started | 14/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227332 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

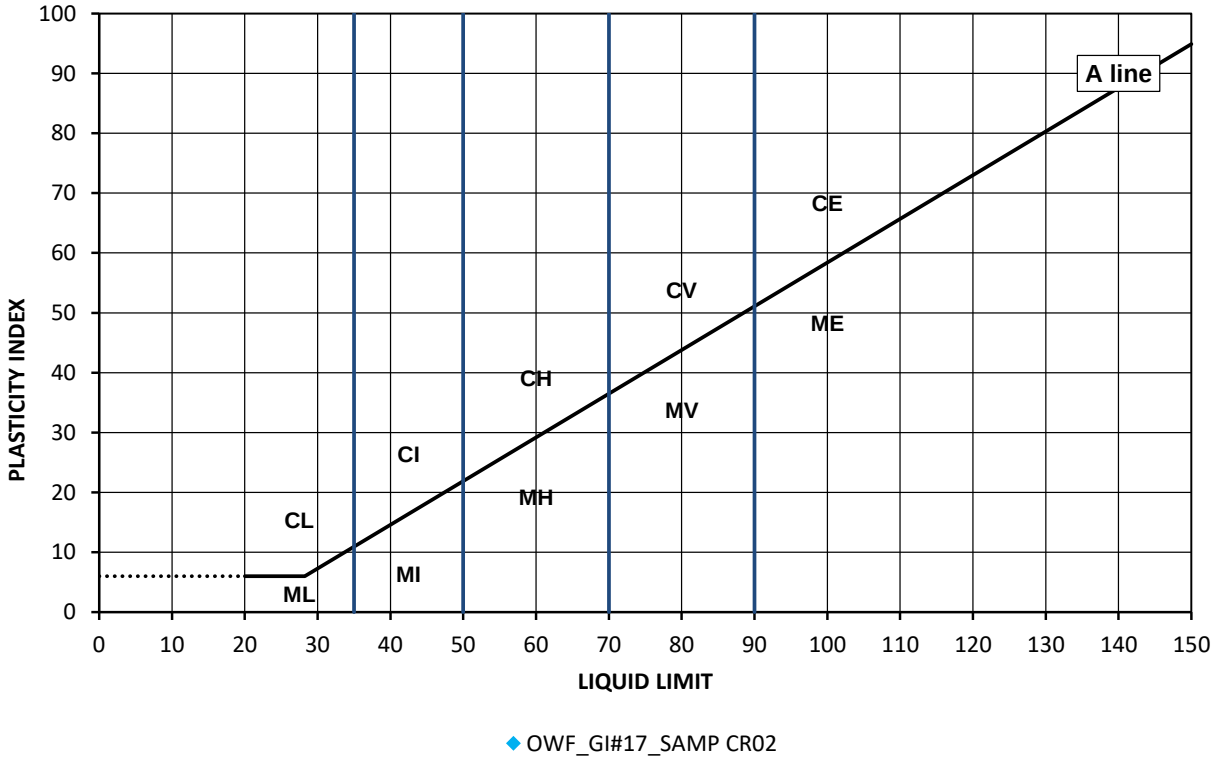
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#17_SAMP | PU01 | 0.00 | B1 | NP | NP | | 29.2 | | 97 | 3 | 4 Point Method | 5Y 4/2 Olive grey silty, SAND | Too sandy to roll. Specimen non plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Specimen Reference | CR02 | Specimen Depth | 5.8 | m | Depth | 5.8 |
| Date started | 26/04/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227342 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 16/05/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

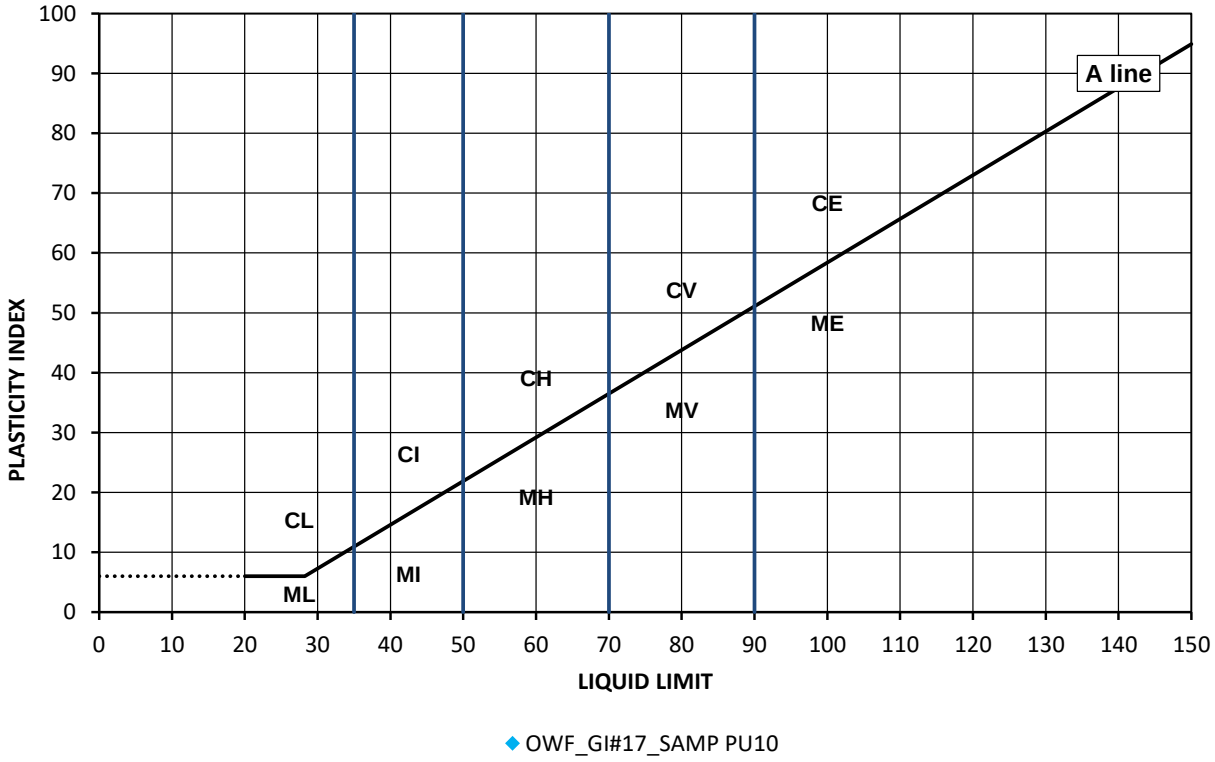
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#17_SAMP | CR02 | 5.80 | B1 | NP | NP | | 19.9 | | 38 | 3 | 4 Point Method | 5Y 6/2 Light olive grey wet clayey, silty, sandy GRAVEL including cemented sand | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 16/05/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU10 |
| Specimen Reference | PU10 | Specimen Depth | 10.6 | m | Depth | 10.6 |
| Date started | 26/04/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227353 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 16/05/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

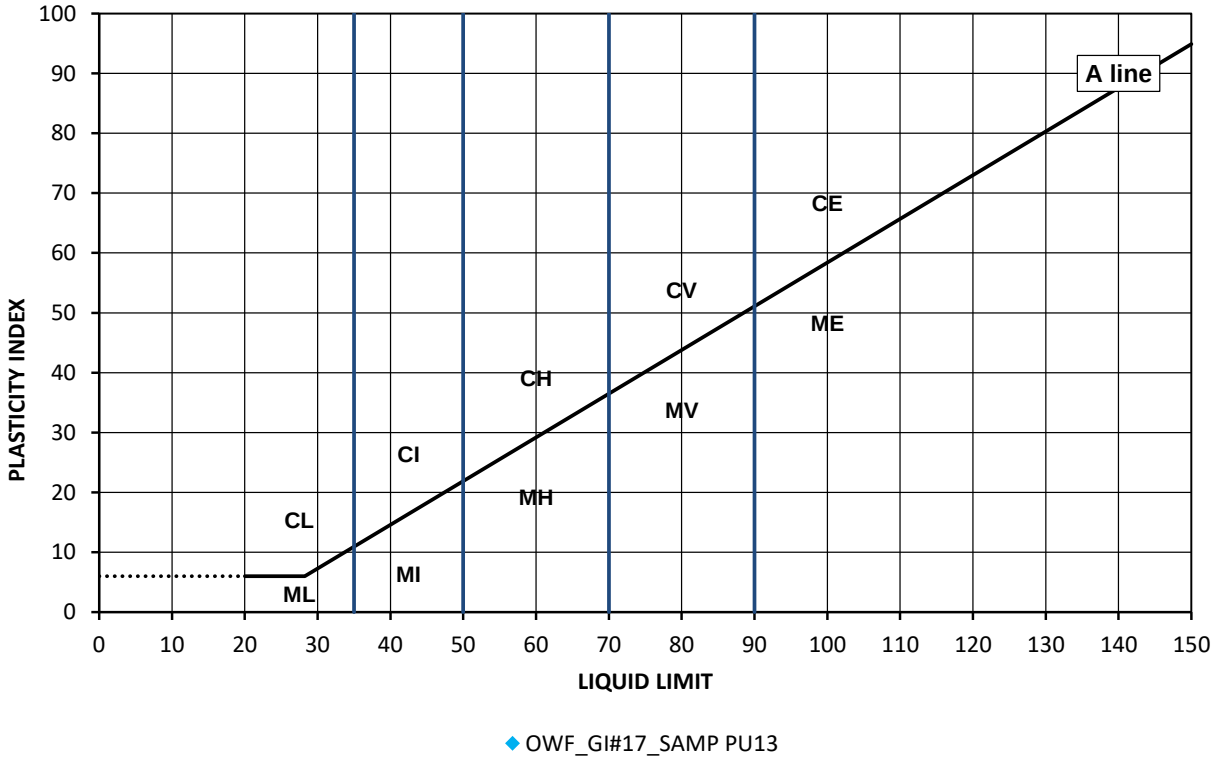
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#17_SAMP | PU10 | 10.60 | IS | NP | NP | | 24.4 | | 66 | 3 | 4 Point Method | 2.5y 7/3 Pale brown, clayey, silty and gravelly, SAND | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 16/05/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU13 |
| Specimen Reference | PU13 | Specimen Depth | 16.7 | m | Depth | 16.7 |
| Date started | 13/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227369 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 16/05/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

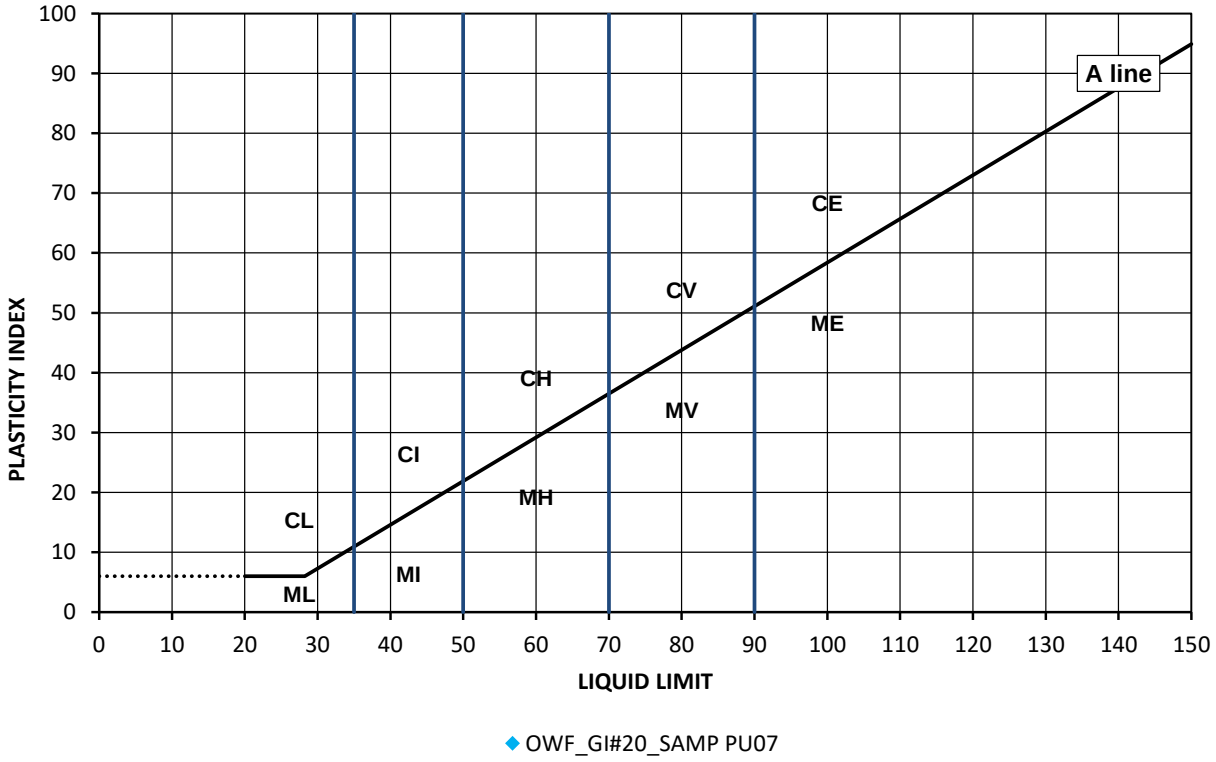
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#17_SAMP | PU13 | 16.70 | B1 | NP | NP | | 26.2 | | 48 | 3 | 4 Point Method | white page 2.5y 8/1 White cemented silty SAND | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 16/05/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU07 |
| Specimen Reference | B1 | Specimen Depth | 3.2 | m | Depth | 3.2 |
| Date started | 13/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227387 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

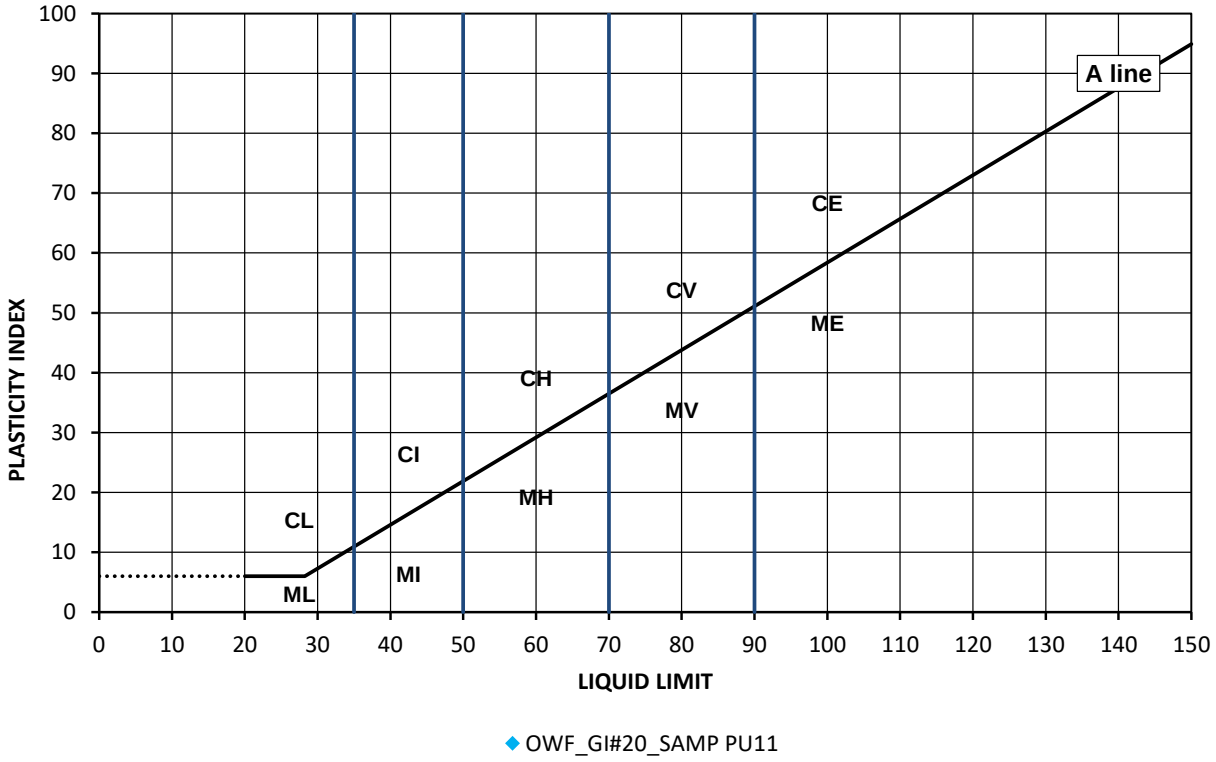
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#20_SAMP | PU07 | 3.20 | B1 | NP | NP | | 23.7 | | 99 | 3 | 4 Point Method | 2.5y 3/1 Very dark grey silty SAND | Too sandy to roll. Specimen non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU11 |
| Specimen Reference | PU11 | Specimen Depth | 6.7 | m | Depth | 6.7 |
| Date started | 16/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227391 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 16/05/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

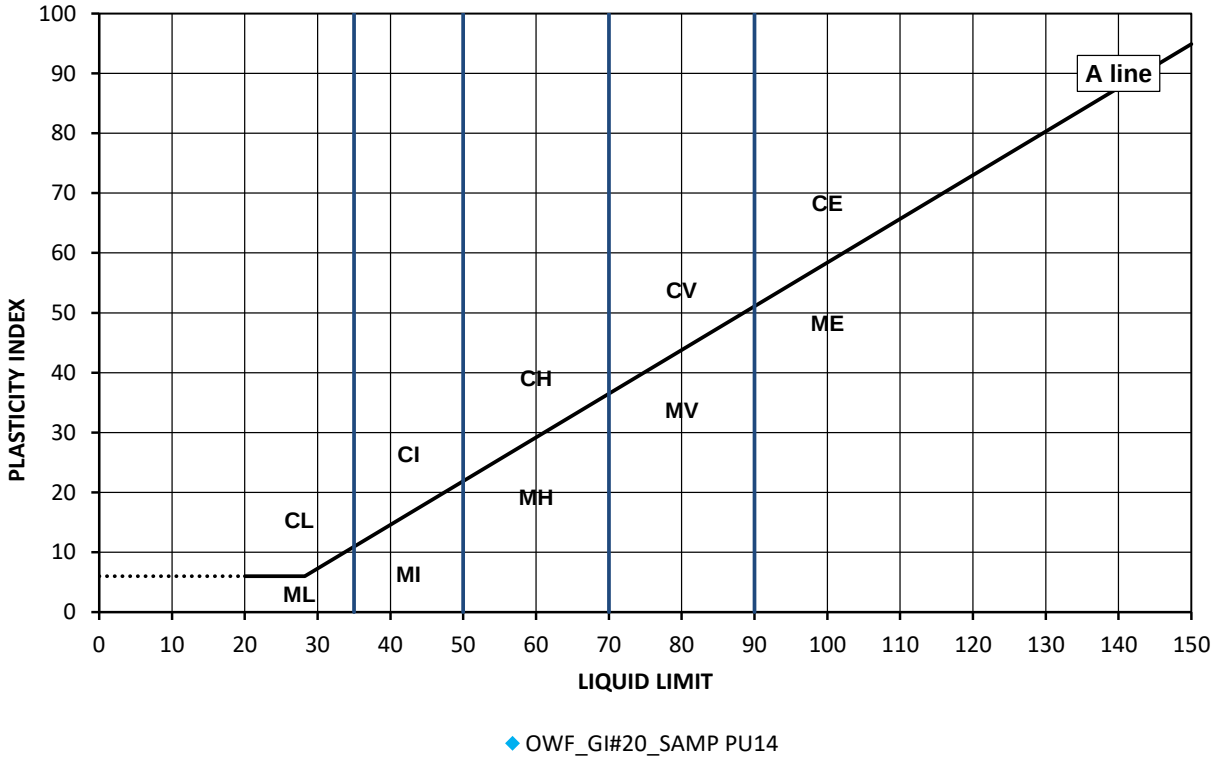
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#20_SAMP | PU11 | 6.70 | IS | NP | NP | | 27.9 | | 34 | 3 | 4 Point Method | 2.5y 7/3 pale brown cemented SAND | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 16/05/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU14 |
| Specimen Reference | PU14 | Specimen Depth | 9.7 | m | Depth | 9.7 |
| Date started | 16/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227394 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 16/05/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

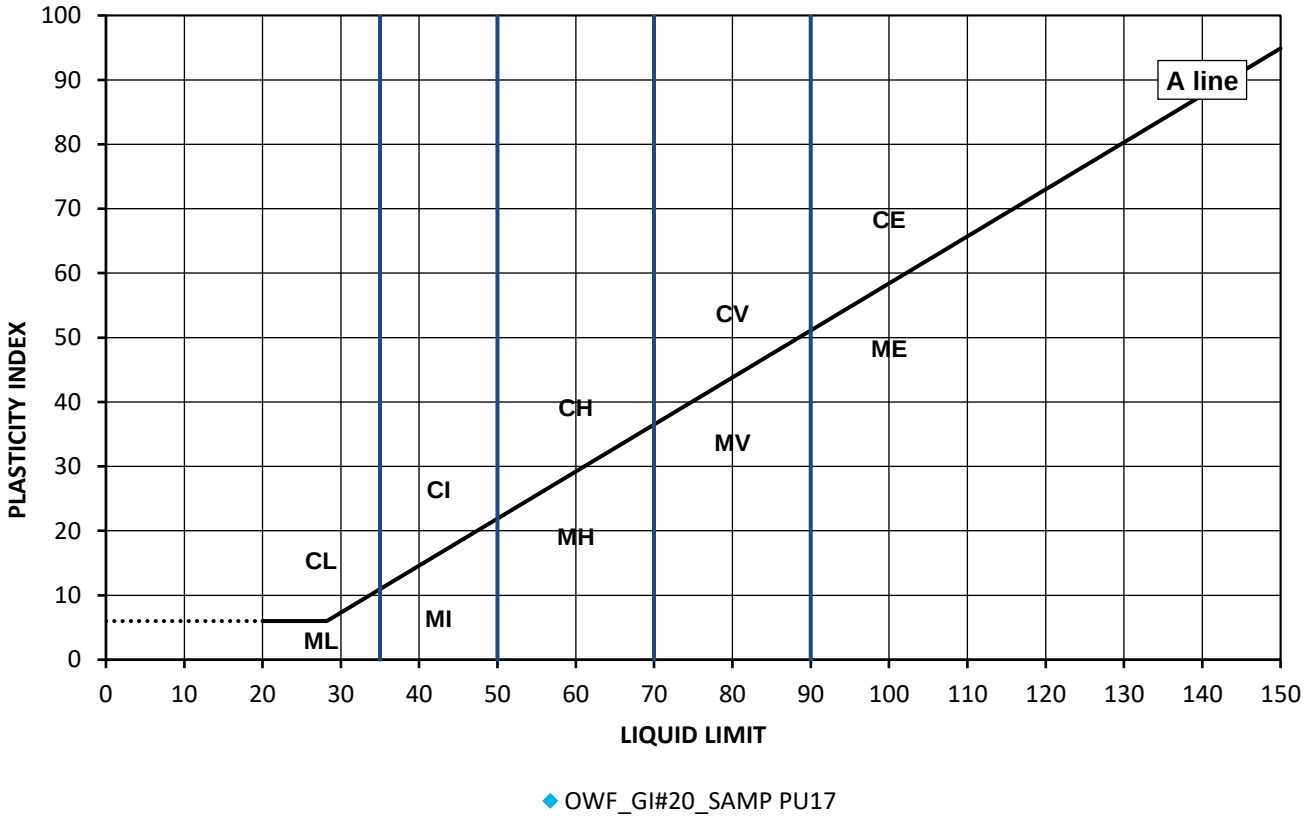
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#20_SAMP | PU14 | 9.70 | IS | NP | NP | | 31 | | 72 | 3 | 4 Point Method | 2.5y 7/3 Pale brown, clayey, silty, gravelly, SAND | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 16/05/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU17 |
| Specimen Reference | PU17 | Specimen Depth | 13 | m | Depth | 13 |
| Date started | 16/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227400 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 16/05/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

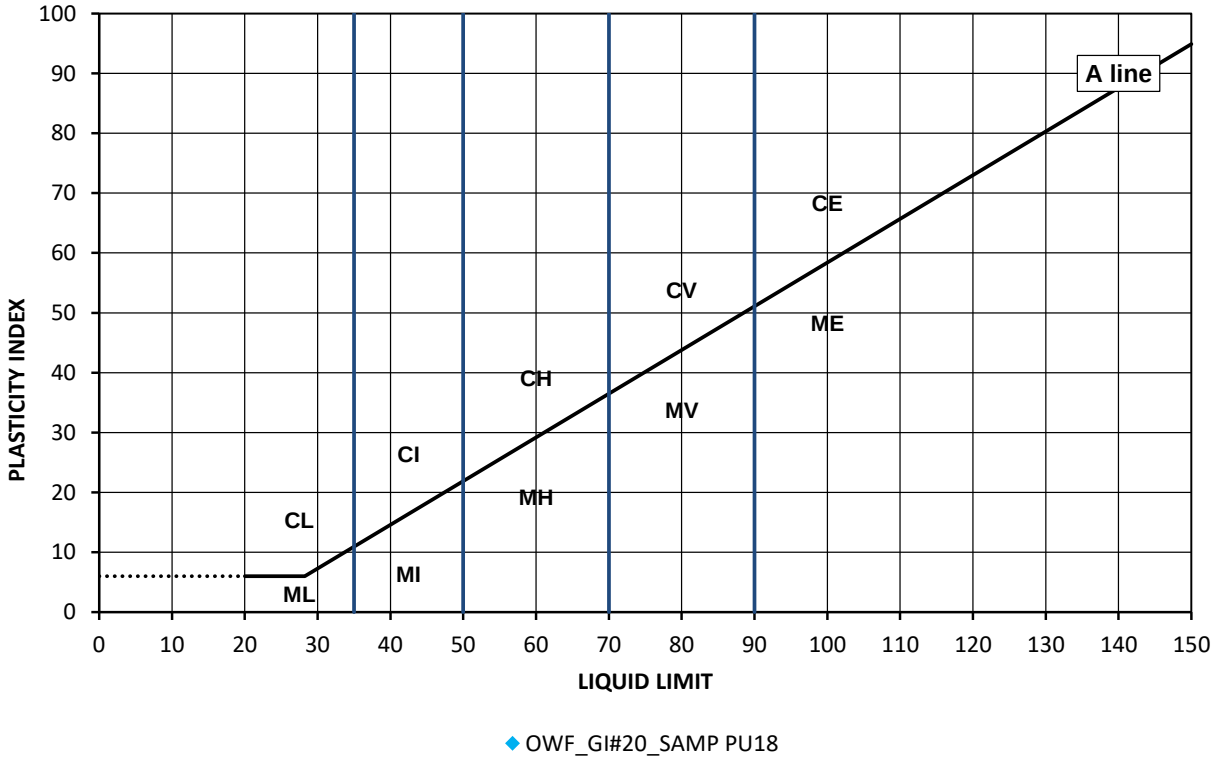
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#20_SAMP | PU17 | 13.00 | IS | NP | NP | | 25.2 | | 41 | 3 | 4 Point Method | 2.5y 7/3 pale brown, silty SAND | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By | |
|---|---|---|
| 16/05/2023 | U. Mazhar | |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU18 |
| Specimen Reference | IS | Specimen Depth | 13.8 | m | Depth | 13.8 |
| Date started | 09/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227403 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 16/05/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

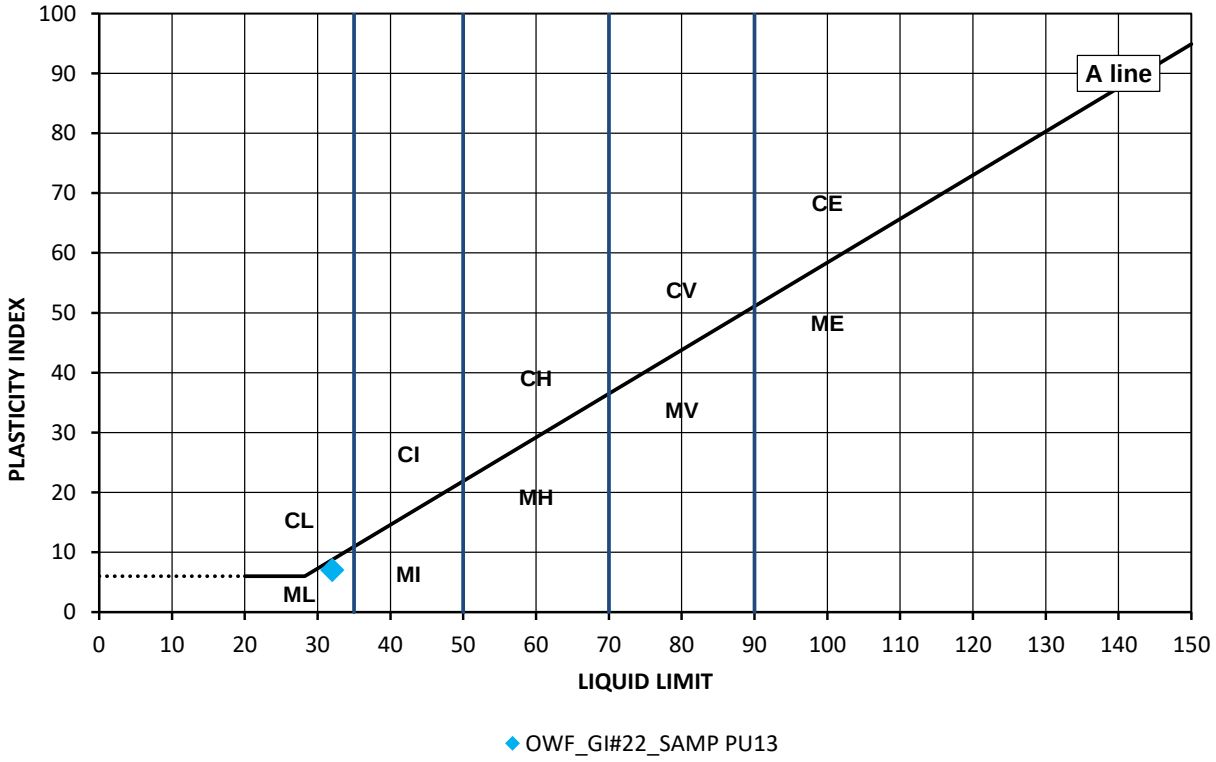
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#20_SAMP | PU18 | 13.80 | IS | NP | NP | | 25.3 | | 37 | 3 | 4 Point Method | 2.5y 7/3 Pale brown cemented SAND | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 16/05/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU13 |
| Specimen Reference | B1 | Specimen Depth | 13.5 | m | Depth | 13.5 |
| Date started | 20/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227443 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

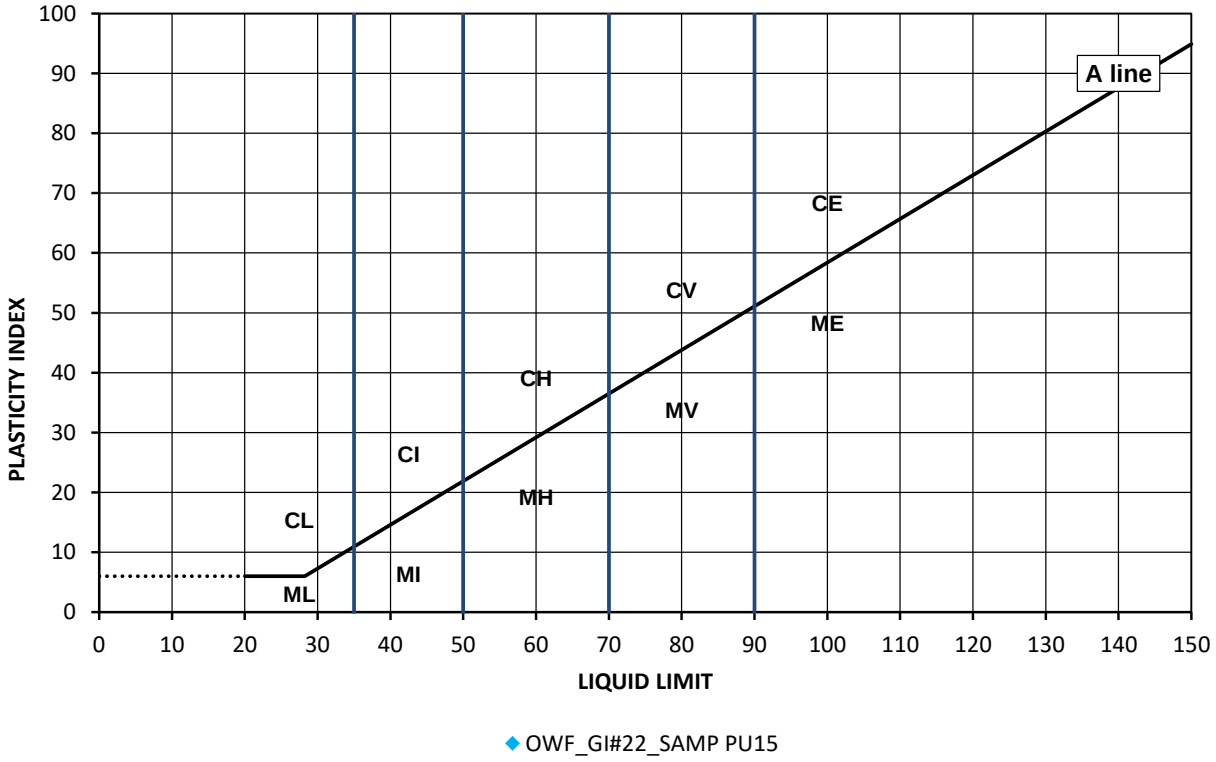
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#22_SAMP | PU13 | 13.50 | B1 | 32 | 25 | 7 | 29.5 | 0.65 | 94 | 3 | 4 Point Method | 2.5y 8/4 Pale brown, slightly gravelly, sandy, SILT | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU15 |
| Specimen Reference | B1 | Specimen Depth | 18.4 | m | Depth | 18.4 |
| Date started | 14/03/2023 | | | | Sample Type | B1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227452 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

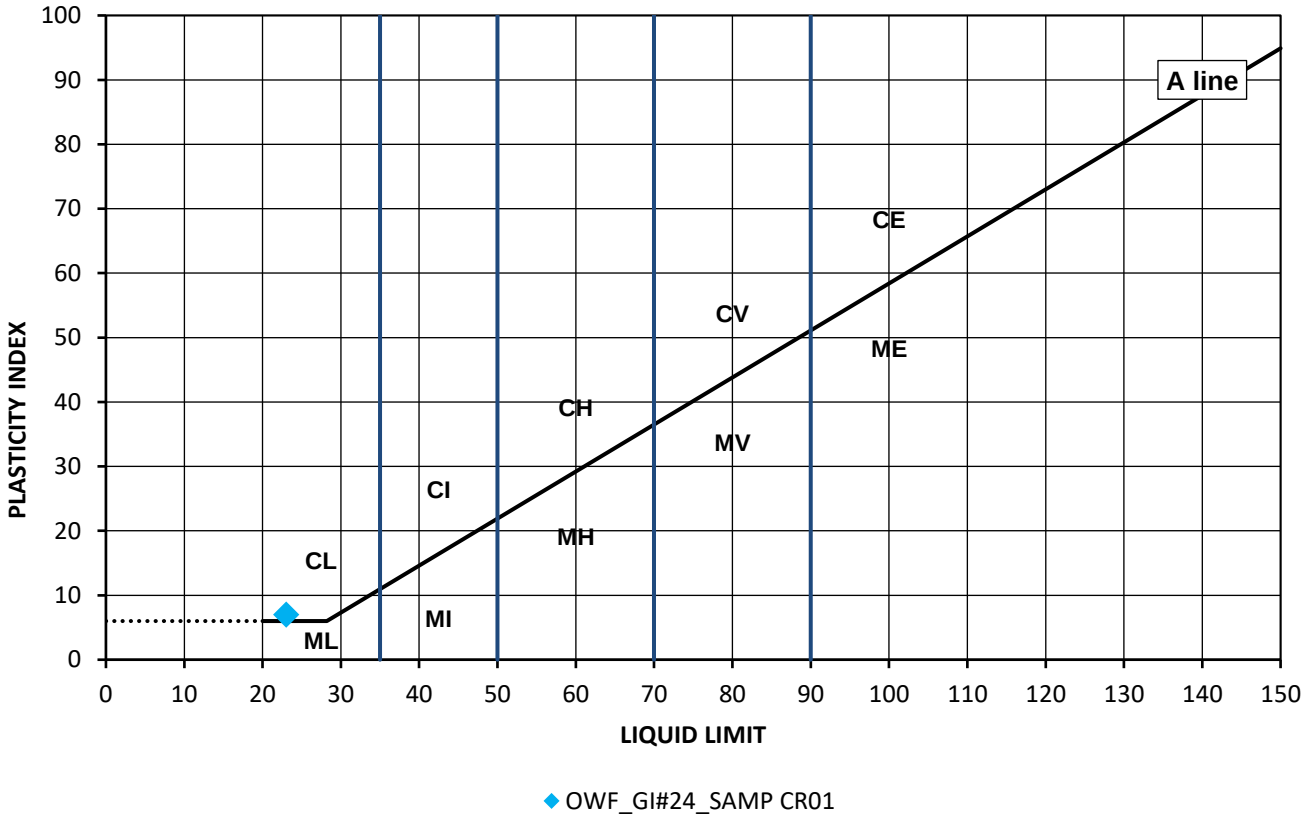
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#22_SAMP | PU15 | 18.40 | B1 | NP | NP | | 27.9 | | 67 | 3 | 4 Point Method | 2.5y 8/3 Pale brown, slightly clayey, silty, gravelly, SAND | Too sandy to roll. Specimen non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#24_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Specimen Reference | Q1 | Specimen Depth | 1.1 | m | Depth | 1.1 |
| Date started | 03/05/2023 | | | | Sample Type | Q1 |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227462 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 23/06/2023 | D.Smith | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

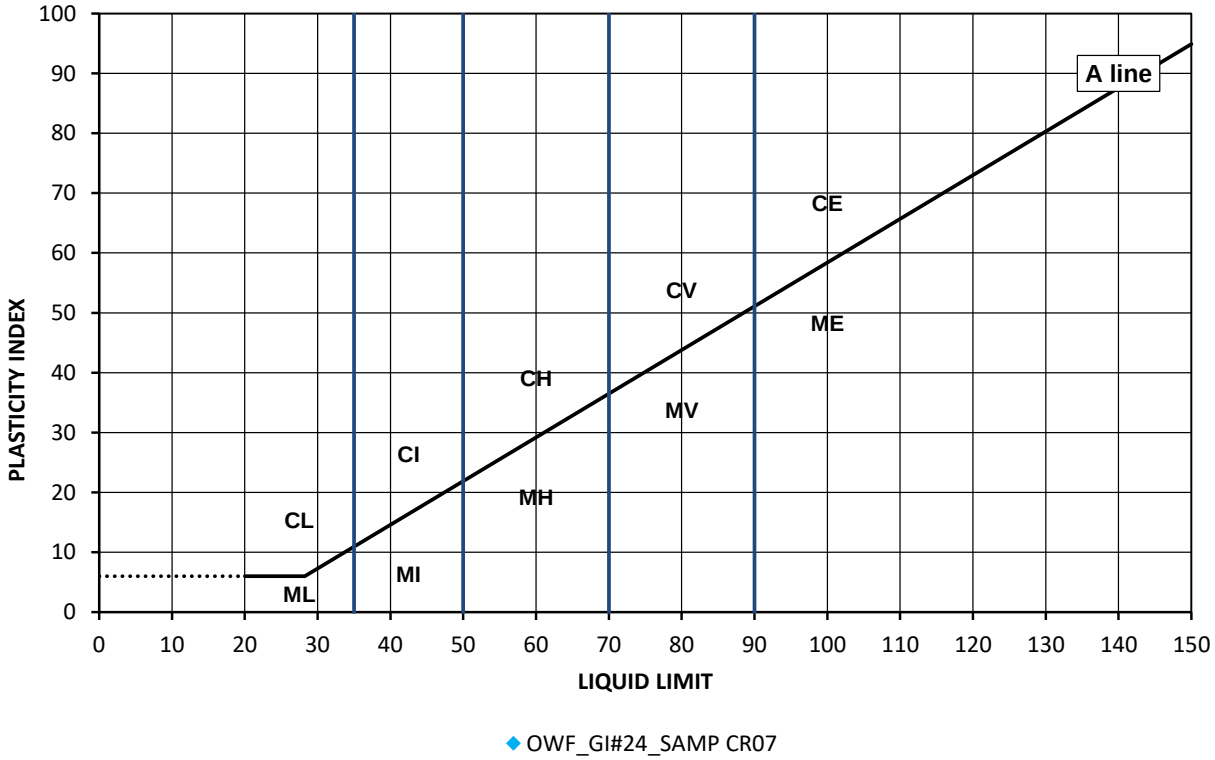
| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#24_SAMP | CR01 | 1.10 | Q1 | 23 | 16 | 7 | 12.3 | -0.52 | 79 | 3 | 4 Point Method | Greyish white slightly gravelly, clayey, silty, SAND | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

| Date Printed | Approved By |
|---|---|
| 23/06/2023 | D.Smith |

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#24_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR07 |
| Specimen Reference | CR07 | Specimen Depth | 7 | m | Depth | 7 |
| Date started | 26/04/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227470 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 16/05/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

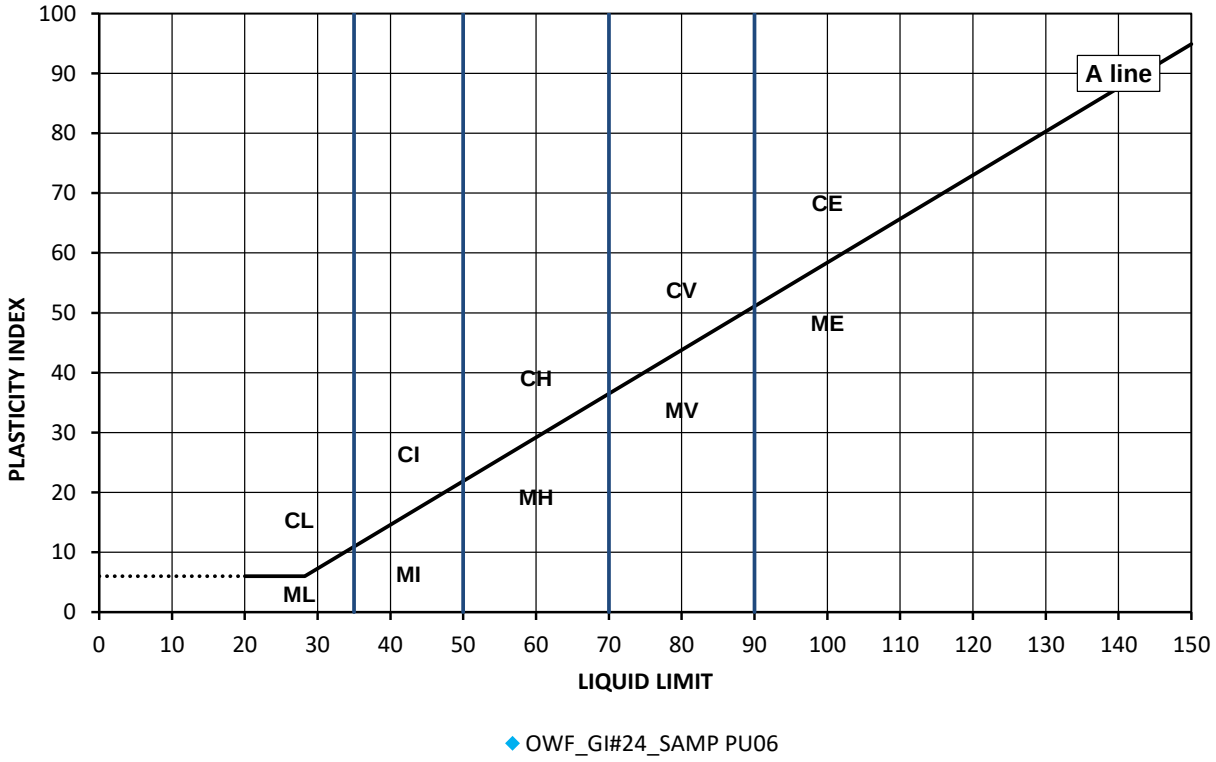
| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#24_SAMP | CR07 | 7.00 | IS | NP | NP | | 17.2 | | 87 | 3 | 4 Point Method | white page 2.5y 9/2 Pale yellow, slightly gravelly, slightly sandy, silty CLAY | |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 16/05/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | ISO Atterberg Plasticity ( A-line ) Chart | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#24_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU06 |
| Specimen Reference | IS | Specimen Depth | 18 | m | Depth | 18 |
| Date started | 02/03/2023 | | | | Sample Type | IS |
| Test Method | ISO 17892-12 | | | | Keylab ID | BH0120230227485 |




Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| C | Clay | L | Low | below 35 |
| M | Silt | I | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | 70 to 90 |
| | | E | Extremely high | exceeding 90 |
| | Organic | O | append to classification for organic material ( eg CHO ) | |

| Notes | Date Printed | Approved By | |
|---|---|---|---|
| | 14/04/2023 | U. Mazhar | |

# LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX SUMMARY (EN ISO 17892-12:2018)

| | |
|---|---|
| Project Name | A05 Bretagne Offshore GI |
| Project No. | GMOP21-G-019 |

| Location | Sample | | | Liquid Limit % | Plastic Limit % | Plasticity Index | Water Cont. % | Liquidity Index % | % Passing 0.425mm | Prep. Method | Test Method | Sample Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top Depth | Type | | | | | | | | | | |
| OWF_GI#24_SAMP | PU06 | 18.00 | IS | NP | NP | | 29.3 | | 44 | 3 | 4 Point Method | white page 2.5y 8/2 pale yellow sandy, GRAVEL including cemented sand | Cannot roll specimen - Non-plastic |

Notes
Testing to ISO 17892-12 4 point test.
Testing to ISO 17892-12 1 point test.
Cone Type 80g / 30Deg
NP = Non-Plastic Sample
All samples tested in sequence from driest point to the wettest point.
Legend
Preparation Method 1 = Tested in natural condition
Preparation Method 2 = Tested after >0.425mm removed by hand
Preparation Method 3 = Tested after washing to remove >0.425mm

Date Printed: 14/04/2023

Approved By: U. Mazhar

| GEOQUIPMARINE | Maximum and Minimum Dry Density Using NGI Geolabs Method | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#04_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU02 |
| Soil Description | 2.5y 6/8 Olive yellow SAND with shell fragments | | | | Depth m | 0.70 |
| Specimen Reference | B1 | Specimen Depth | 0.70 | m | Specimen Type | B1 |
| Specimen Description | 2.5y 6/8 Olive yellow SAND with shell fragments | | | | Unique ID | BH012023022747 |
| Test Method | NGI-Geolabs | | | | Date of test | 27/03/2023 |

**PERCENTAGE OF MATERIAL RETAINED ON THE 2 mm TEST SIEVE** 29.77 %

**MEAN MAXIMUM DRY DENSITY** 1.87 $Mg/m^3$

**SURCHARGE APPLICATION CONDITIONS**

| | Maximum Density Before Surcharge Application | | Maximum Density After Surcharge Application | |
|---|---|---|---|---|
| Run Number 1 | 1.81 | $Mg/m^3$ | 1.88 | $Mg/m^3$ |
| Run Number 2 | 1.80 | $Mg/m^3$ | 1.86 | $Mg/m^3$ |
| | | Tolerance (max 1.5%) | 0.91 | % |

**AMPLITUDE SETTING USED** 2.00 mm

**REMARKS**

**MEAN MINIMUM DRY DENSITY** 1.30 $g/cm^3$

**MASS OF SAND**

| | | | |
|---|---|---|---|
| Run Number 1 | | 575.30 | g |
| Run Number 2 | | 574.40 | g |
| Run Number 3 | | 576.90 | g |
| Run Number 4 | | 576.20 | g |
| Run Number 5 | | 577.20 | g |
| | Average | 576.00 | g |

**WATER CALIBRATED VOLUME OF THE MOULD** 442.00 $cm^3$

**WEIGHT OF THE MOULD** 982.90 g

**REMARKS**

| Test Technician | | | | |
|---|---|---|---|---|
| J. Morgan | Approved | D.Smith | Date Printed | 25/04/2023 15:56 |

Lab Sheet Reference : Minmax output 26-9-22

| GEOQUIPMARINE | Maximum and Minimum Dry Density Using NGI Geolabs Method | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU01B |
| Soil Description | Dark grey 2.5y 4/1 slightly gravelly, SAND | | | | Depth m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | 0.00 | m | Specimen Type | B1 |
| Specimen Description | 2.5y 4/1 Dark grey SAND | | | | Unique ID | BH0120230227173 |
| Test Method | NGI-Geolabs | | | | Date of test | 23/03/2023 |

**PERCENTAGE OF MATERIAL RETAINED ON THE 2 mm TEST SIEVE** 0.00 %

**MEAN MAXIMUM DRY DENSITY** 1.68 $Mg/m^3$

**SURCHARGE APPLICATION CONDITIONS**

| | Maximum Density Before Surcharge Application | | Maximum Density After Surcharge Application | |
|---|---|---|---|---|
| Run Number 1 | 1.64 | $Mg/m^3$ | 1.68 | $Mg/m^3$ |
| Run Number 2 | 1.62 | $Mg/m^3$ | 1.67 | $Mg/m^3$ |
| | | Tolerance (max 1.5%) | 0.15 | % |

**AMPLITUDE SETTING USED** 2.00 mm

**REMARKS**

**MEAN MINIMUM DRY DENSITY** 1.28 $g/cm^3$

**MASS OF SAND**

| | | |
|---|---|---|
| Run Number 1 | 566.90 | g |
| Run Number 2 | 565.10 | g |
| Run Number 3 | 565.60 | g |
| Run Number 4 | 565.70 | g |
| Run Number 5 | 565.50 | g |
| Average | 565.76 | g |

**WATER CALIBRATED VOLUME OF THE MOULD** 442.00 $cm^3$

**WEIGHT OF THE MOULD** 892.90 g

**REMARKS**

| Test Technician | | | | |
|---|---|---|---|---|
| J. Morgan | Approved | D.Smith | Date Printed | 25/04/2023 15:53 |

Lab Sheet Reference : Minmax output 26-9-22

| GEOQUIPMARINE | Maximum and Minimum Dry Density Using NGI Geolabs Method | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU03 |
| Soil Description | 2.5y 4/1 Dark grey silty SAND | | | | Depth m | 2.00 |
| Specimen Reference | B1 | Specimen Depth | 2.00 | m | Specimen Type | B1 |
| Specimen Description | 2.5y 4/1 Dark grey silty SAND | | | | Unique ID | BH0120230227178 |
| Test Method | NGI-Geolabs | | | | Date of test | 09/05/2023 |

**PERCENTAGE OF MATERIAL RETAINED ON THE 2 mm TEST SIEVE** 1.55 %

**MEAN MAXIMUM DRY DENSITY** 1.77 $Mg/m^3$

**SURCHARGE APPLICATION CONDITIONS**

| | Maximum Density Before Surcharge Application | | Maximum Density After Surcharge Application | |
|---|---|---|---|---|
| Run Number 1 | 1.73 | $Mg/m^3$ | 1.77 | $Mg/m^3$ |
| Run Number 2 | 1.70 | $Mg/m^3$ | 1.77 | $Mg/m^3$ |
| | | | Tolerance (max 1.5%) 0.16 | % |

**AMPLITUDE SETTING USED** 2.00 mm

**REMARKS**

**MEAN MINIMUM DRY DENSITY** 1.25 $g/cm^3$

**MASS OF SAND**

| | | |
|---|---|---|
| Run Number 1 | 549.30 | g |
| Run Number 2 | 547.40 | g |
| Run Number 3 | 552.50 | g |
| Run Number 4 | 552.70 | g |
| Run Number 5 | 550.00 | g |
| Average | 550.38 | g |

**WATER CALIBRATED VOLUME OF THE MOULD** 442.00 $cm^3$

**WEIGHT OF THE MOULD** 892.90 g

**REMARKS**

| Test Technician | | | | |
|---|---|---|---|---|
| J. Morgan | Approved | D.Smith | Date Printed | 23/05/2023 11:28 |

Lab Sheet Reference : Minmax output 26-9-22

| GEOQUIPMARINE | Maximum and Minimum Dry Density Using NGI Geolabs Method | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU01 |
| Soil Description | 2.5y 4/3 Olive brown SAND with shell fragments | | | | Depth m | 0.50 |
| Specimen Reference | B1 | Specimen Depth | 0.50 | m | Specimen Type | B1 |
| Specimen Description | 2.5y 4/3 Olive brown SAND with shell fragments | | | | Unique ID | BH0120230227215 |
| Test Method | NGI-Geolabs | | | | Date of test | 22/03/2023 |

**PERCENTAGE OF MATERIAL RETAINED ON THE 2 mm TEST SIEVE** 4.94 %

**MEAN MAXIMUM DRY DENSITY** 1.62 $Mg/m^3$

**SURCHARGE APPLICATION CONDITIONS**

| | Maximum Density Before Surcharge Application | | Maximum Density After Surcharge Application | |
|---|---|---|---|---|
| Run Number 1 | 1.58 | $Mg/m^3$ | 1.61 | $Mg/m^3$ |
| Run Number 2 | 1.61 | $Mg/m^3$ | 1.62 | $Mg/m^3$ |
| | | | Tolerance (max 1.5%) -0.55 | % |

**AMPLITUDE SETTING USED** 2.00 mm

**REMARKS**

**MEAN MINIMUM DRY DENSITY** 1.22 $g/cm^3$

**MASS OF SAND**

| | | |
|---|---|---|
| Run Number 1 | 539.60 | g |
| Run Number 2 | 535.60 | g |
| Run Number 3 | 539.70 | g |
| Run Number 4 | 537.40 | g |
| Run Number 5 | 539.80 | g |
| Average | 538.42 | g |

**WATER CALIBRATED VOLUME OF THE MOULD** 442.00 $cm^3$

**WEIGHT OF THE MOULD** 892.90 g

**REMARKS**

| Test Technician | | | | |
|---|---|---|---|---|
| J. Morgan | Approved | D.Smith | Date Printed | 25/04/2023 15:55 |

Lab Sheet Reference : Minmax output 26-9-22

| GEOQUIPMARINE | Maximum and Minimum Dry Density Using NGI Geolabs Method | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU05 |
| Soil Description | 5y 4/2 Olive grey SAND | | | | Depth m | 2.90 |
| Specimen Reference | B1 | Specimen Depth | 2.90 | m | Specimen Type | B1 |
| Specimen Description | 5y 4/2 Olive grey SAND | | | | Unique ID | BH0120230227337 |
| Test Method | NGI-Geolabs | | | | Date of test | 23/03/2023 |

**PERCENTAGE OF MATERIAL RETAINED ON THE 2 mm TEST SIEVE** 0.43 %

**MEAN MAXIMUM DRY DENSITY** 1.74 $Mg/m^3$

**SURCHARGE APPLICATION CONDITIONS**

| | Maximum Density Before Surcharge Application | | Maximum Density After Surcharge Application | |
|---|---|---|---|---|
| Run Number 1 | 1.73 | $Mg/m^3$ | 1.74 | $Mg/m^3$ |
| Run Number 2 | 1.71 | $Mg/m^3$ | 1.74 | $Mg/m^3$ |
| | | | Tolerance (max 1.5%) -0.14 | % |

**AMPLITUDE SETTING USED** 2.00 mm

**REMARKS**

**MEAN MINIMUM DRY DENSITY** 1.32 $g/cm^3$

**MASS OF SAND**

| | | |
|---|---|---|
| Run Number 1 | 586.60 | g |
| Run Number 2 | 585.70 | g |
| Run Number 3 | 585.10 | g |
| Run Number 4 | 582.90 | g |
| Run Number 5 | 586.30 | g |
| Average | 585.32 | g |

**WATER CALIBRATED VOLUME OF THE MOULD** 442.00 $cm^3$

**WEIGHT OF THE MOULD** 892.90 g

**REMARKS**

| Test Technician | | | | |
|---|---|---|---|---|
| J. Morgan | Approved | D.Smith | Date Printed | 25/04/2023 16:00 |

Lab Sheet Reference : Minmax output 26-9-22

| GEOQUIPMARINE | Maximum and Minimum Dry Density Using NGI Geolabs Method | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU01 |
| Soil Description | 2.5y 4/1 Dark grey wet SAND with small shell fragments | | | | Depth m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | 0.00 | m | Specimen Type | B1 |
| Specimen Description | 2.5y 4/1 Dark grey wet SAND with frequent shell fragments | | | | Unique ID | BH0120230227421 |
| Test Method | NGI-Geolabs | | | | Date of test | 20/03/2023 |

**PERCENTAGE OF MATERIAL RETAINED ON THE 2 mm TEST SIEVE** 0.00 %

**MEAN MAXIMUM DRY DENSITY** 1.73 Mg/m3

**SURCHARGE APPLICATION CONDITIONS**

| | Maximum Density Before Surcharge Application | | Maximum Density After Surcharge Application | |
|---|---|---|---|---|
| Run Number 1 | 1.70 | Mg/m3 | 1.72 | Mg/m3 |
| Run Number 2 | 1.69 | Mg/m3 | 1.73 | Mg/m3 |
| | | | Tolerance (max 1.5%) -0.51 | % |

**AMPLITUDE SETTING USED** 2.00 mm

**REMARKS**

**MEAN MINIMUM DRY DENSITY** 1.27 g/cm3

**MASS OF SAND**

| | | |
|---|---|---|
| Run Number 1 | 566.30 | g |
| Run Number 2 | 562.00 | g |
| Run Number 3 | 560.80 | g |
| Run Number 4 | 561.20 | g |
| Run Number 5 | 563.60 | g |
| Average | 562.78 | g |

**WATER CALIBRATED VOLUME OF THE MOULD** 442.00 cm3

**WEIGHT OF THE MOULD** 892.80 g

**REMARKS**

| Test Technician | | | | |
|---|---|---|---|---|
| J. Morgan | Approved | U. Mazhar | Date Printed | 05/04/2023 09:12 |

Lab Sheet Reference : Minmax output 26-9-22

Geolabs Ltd
+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

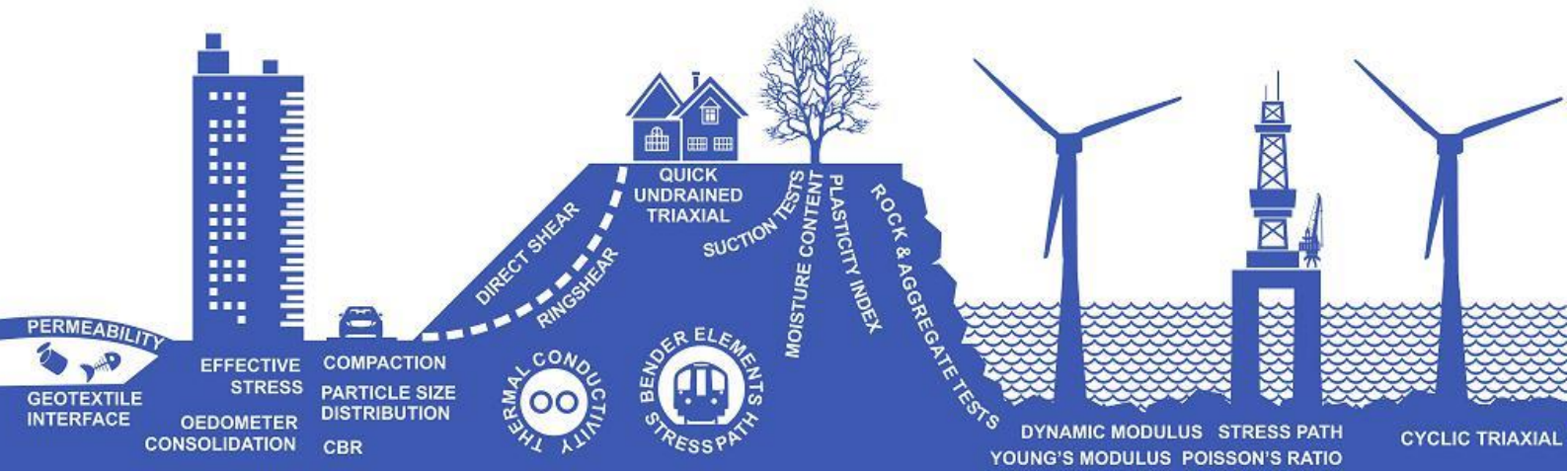
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#01_SAMP |
| **Sample ref** | : | CR01-IS |
| **Depth (m)** | : | 0.00 - 0.30 |
| **Geolabs Sample Id** | : | 479151 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

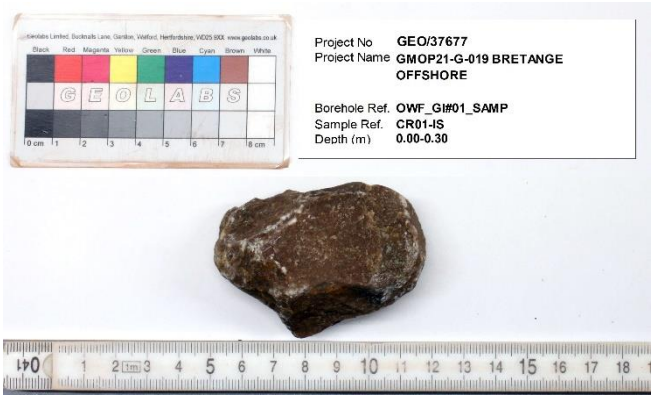


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (95.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (3%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (1.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 95.5 | 0.4-0.01 |
| Clay | 3 | <0.003 |
| Opaque Mineral | 1.5 | 0.2-0.1 |
| **Total** | 100 | - |

## FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (95.5%), clay (3%) and opaque mineral (1.5%).

## APPENDIX A: MICROPHOTOGRAPHS

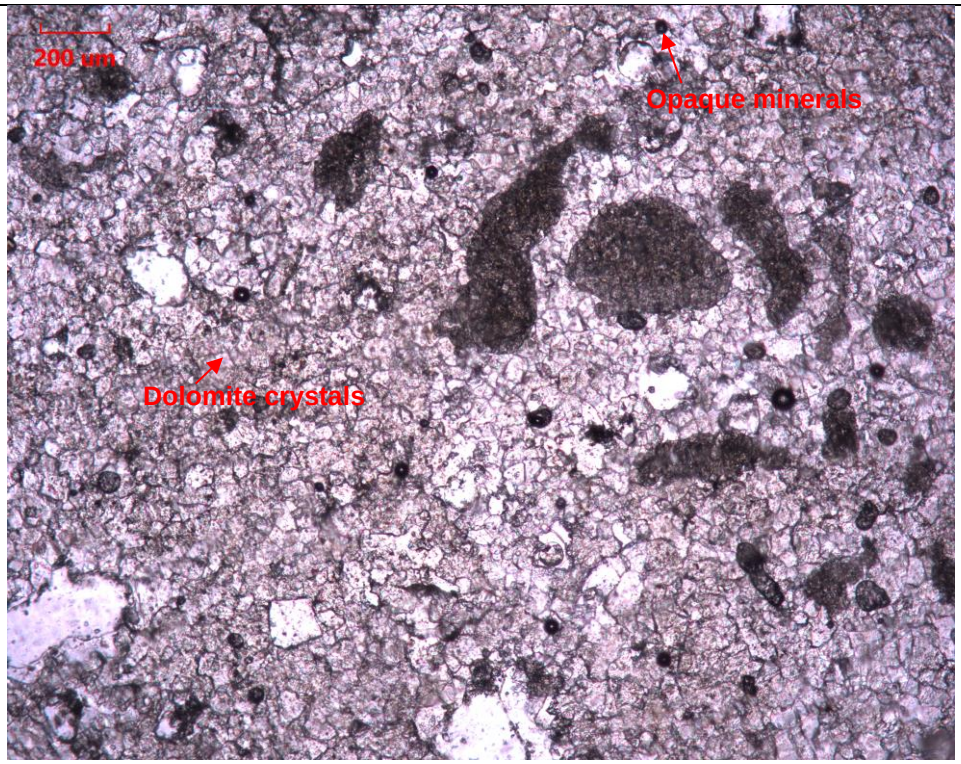
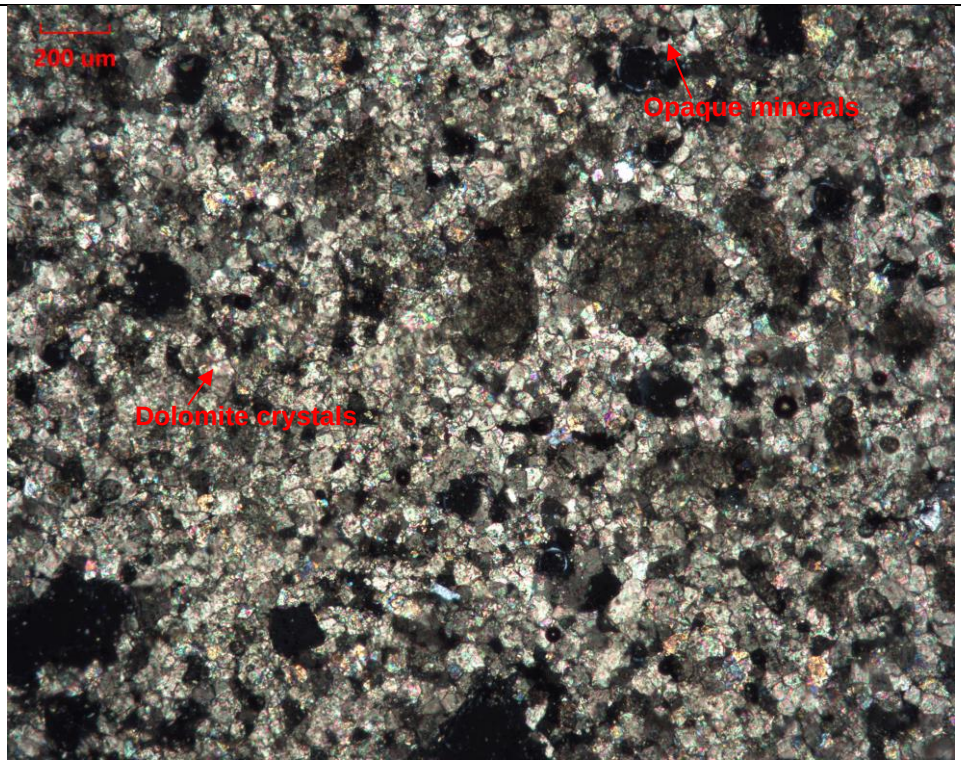
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

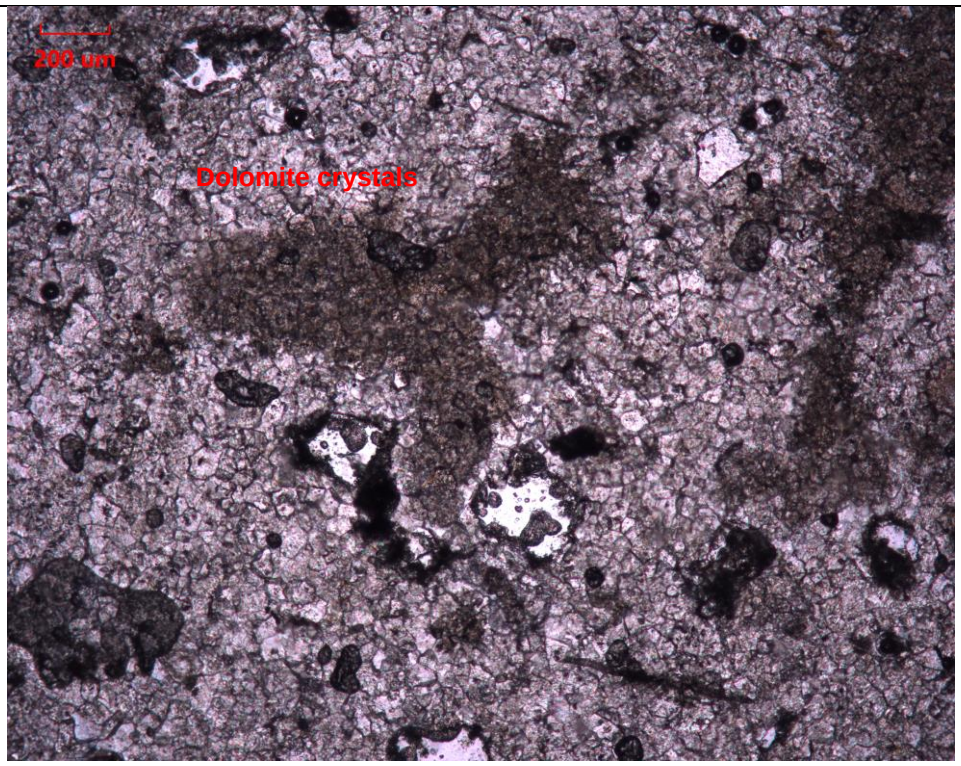
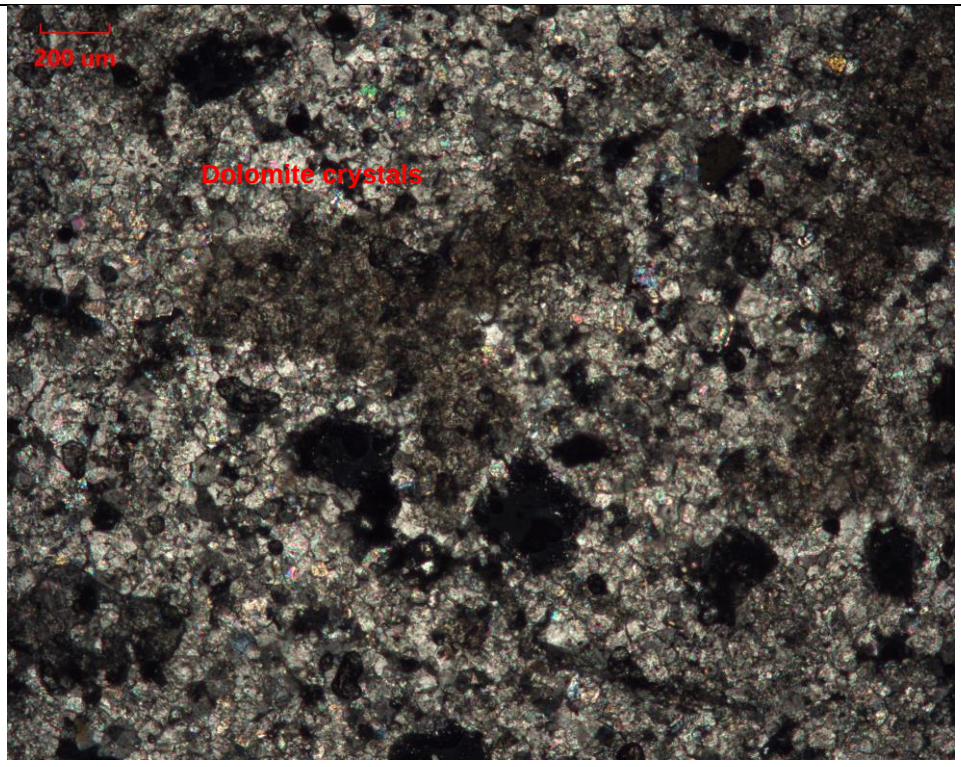
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

Geolabs Ltd
+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

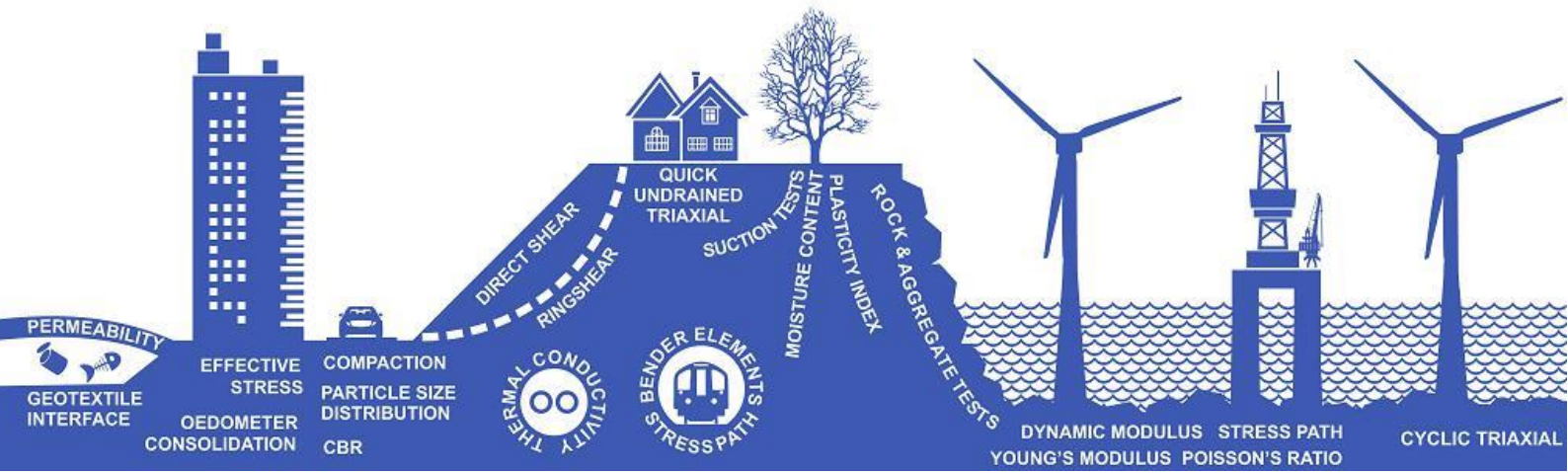
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#01A_SAMP |
| **Sample ref** | : | CR01-IS |
| **Depth (m)** | : | 0.00 - 0.00 |
| **Geolabs Sample Id** | : | 479157 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



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- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION


The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## A. MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (97.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (1%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (1.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 97.5 | 0.4-0.01 |
| Clay | 1 | <0.003 |
| Opaque Mineral | 1.5 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (97.5%), clay (1%) and opaque mineral (1.5%).

## APPENDIX A: MICROPHOTOGRAPHS

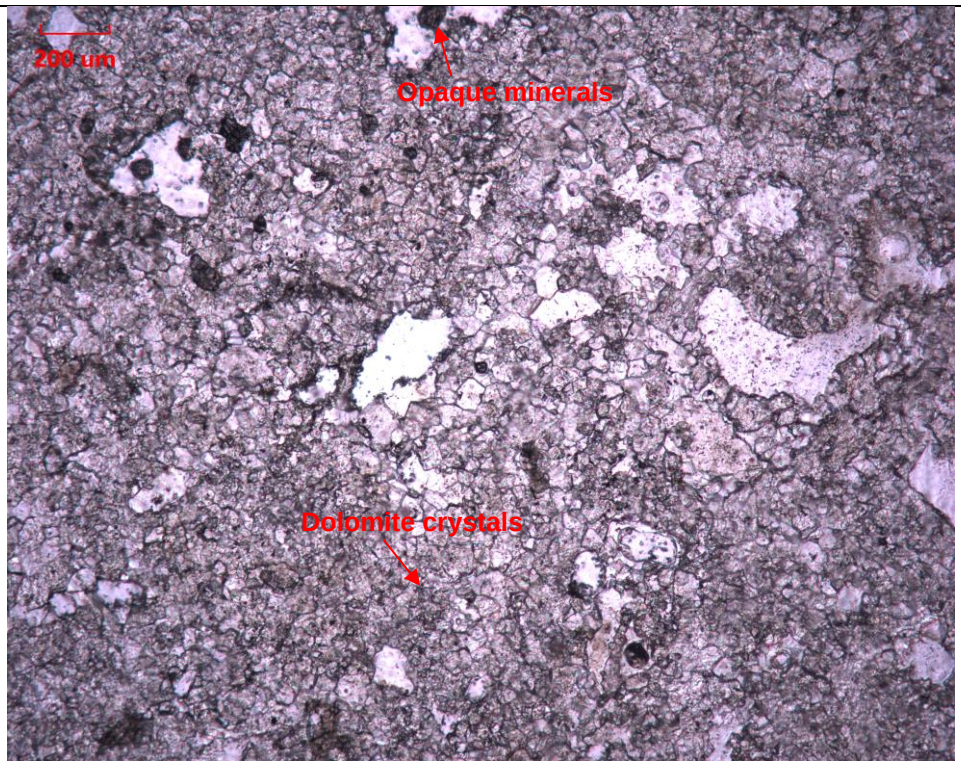
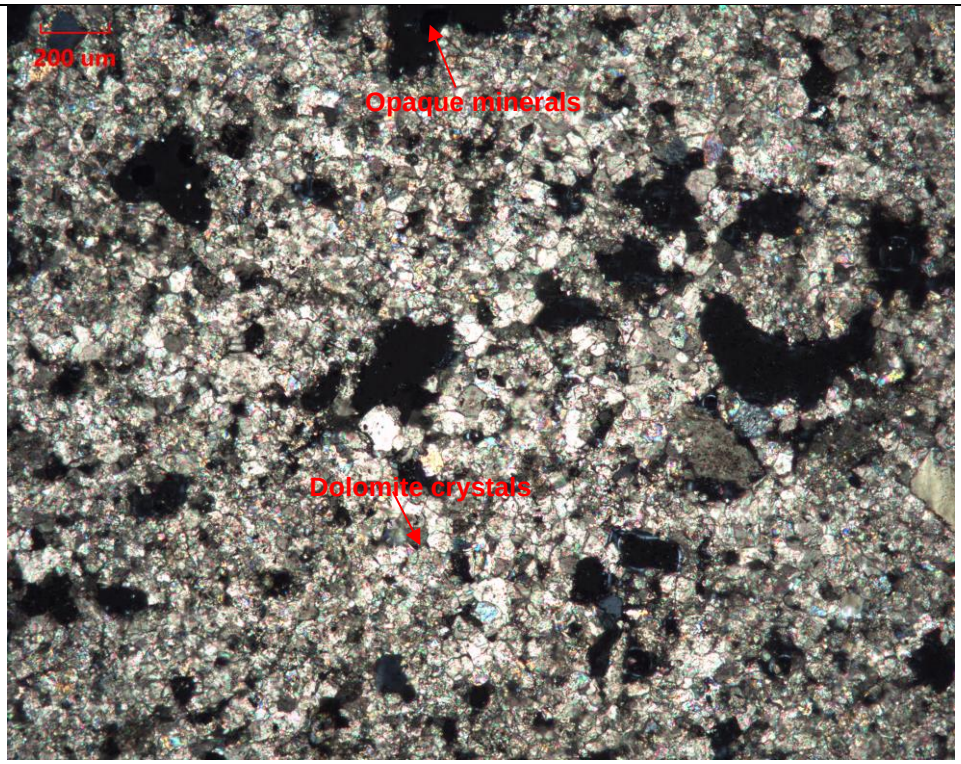
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

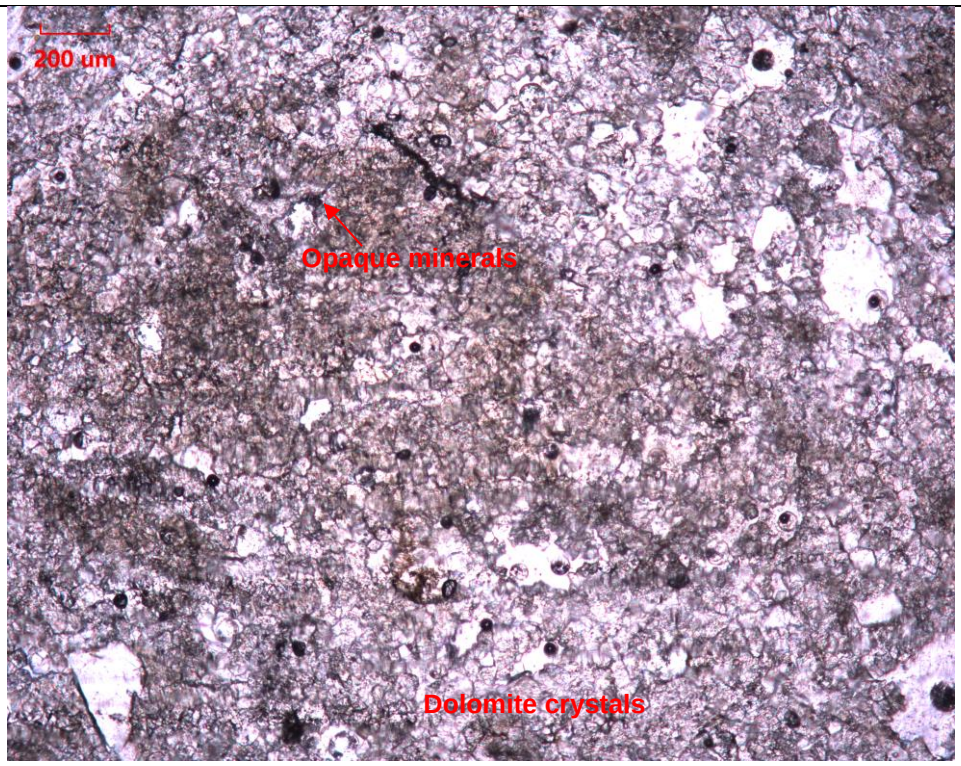
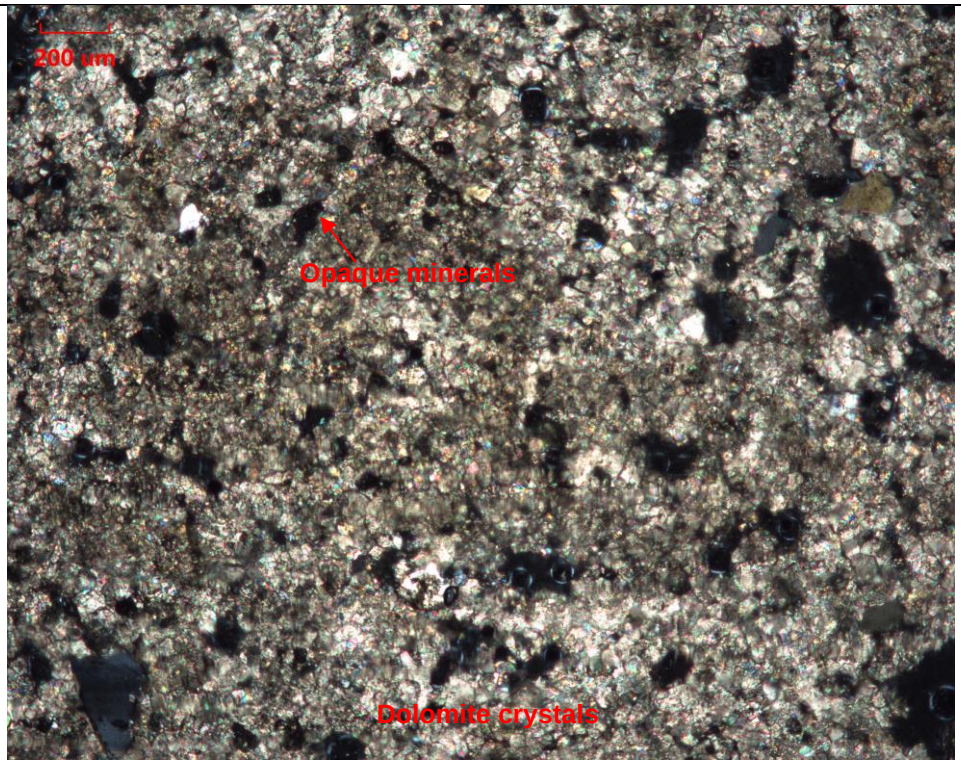
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

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Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

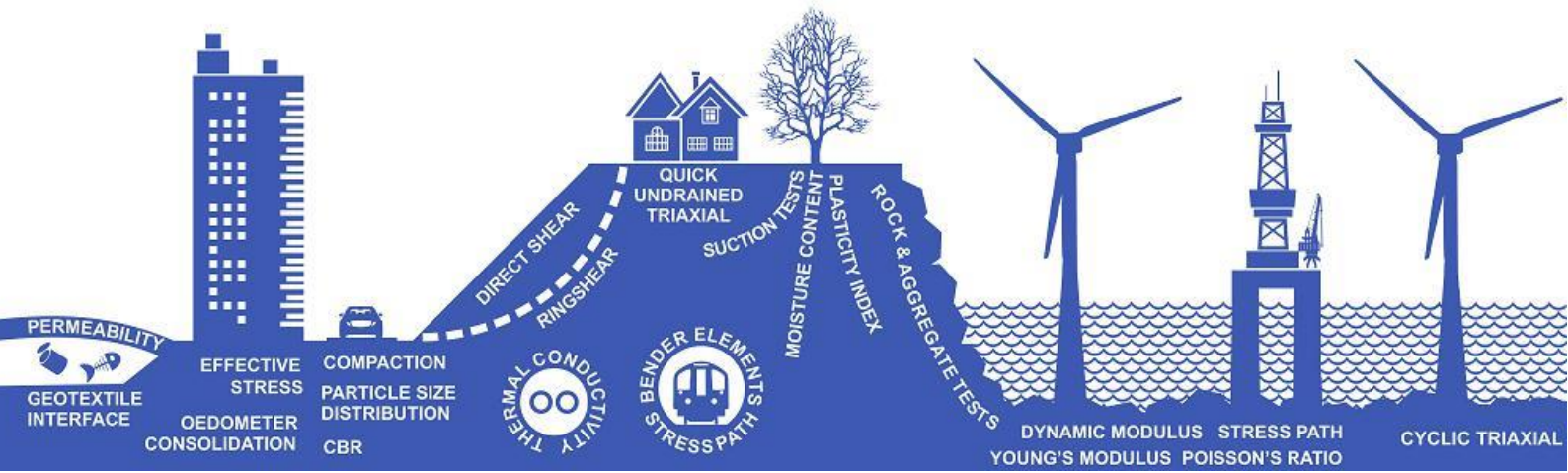
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#01A_SAMP |
| **Sample ref** | : | CR06-IS |
| **Depth (m)** | : | 4.20 - 4.20 |
| **Geolabs Sample Id** | : | 479154 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

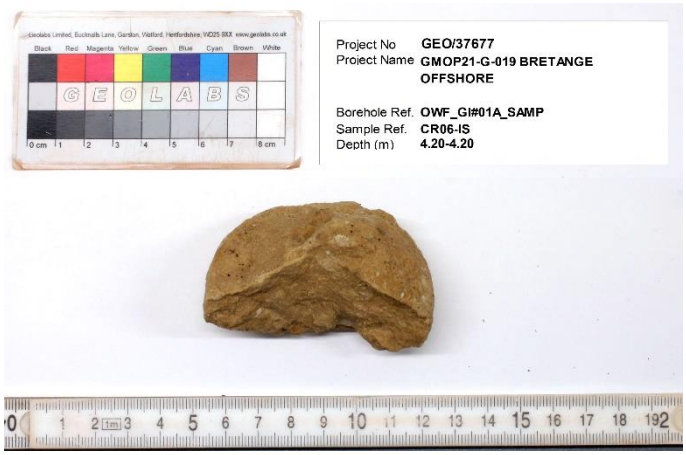


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

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**Clay (1%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 96.5 | 0.4-0.01 |
| Clay | 1 | <0.003 |
| Opaque Mineral | 2.5 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (96.5%), clay (1%) and opaque mineral (2.5%).

## APPENDIX A: MICROPHOTOGRAPHS

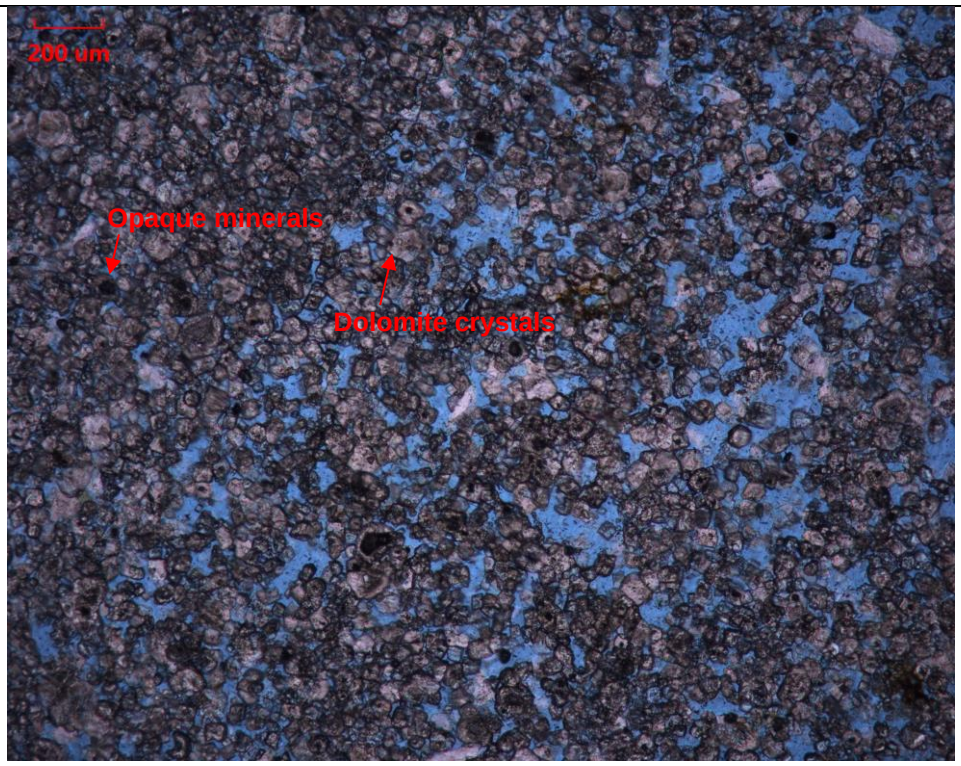
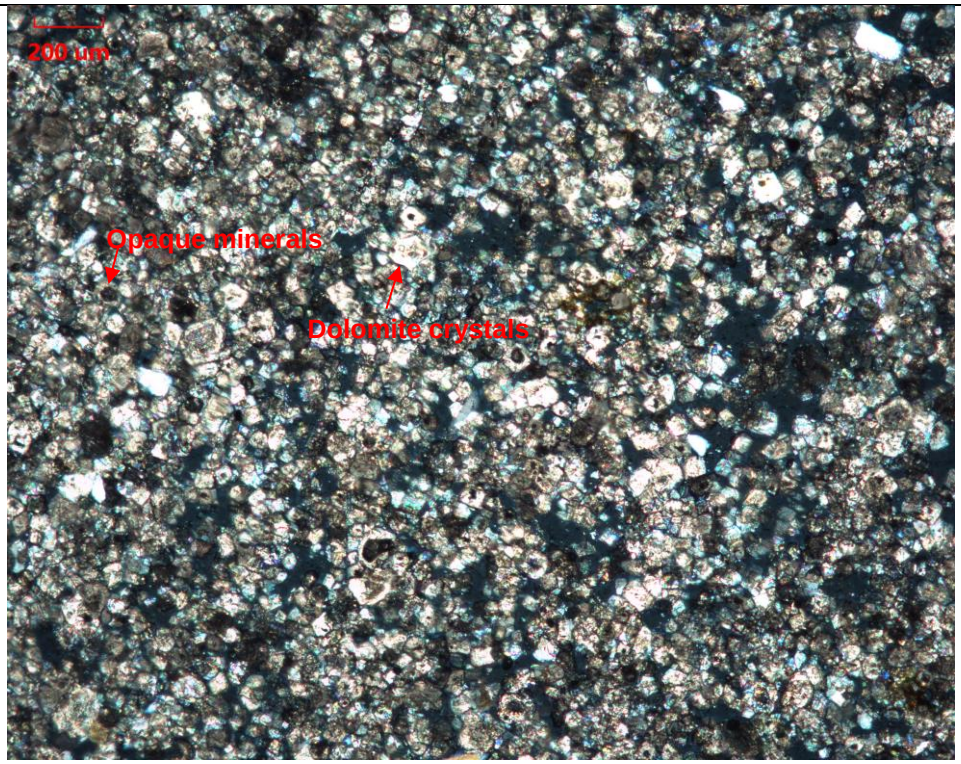
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

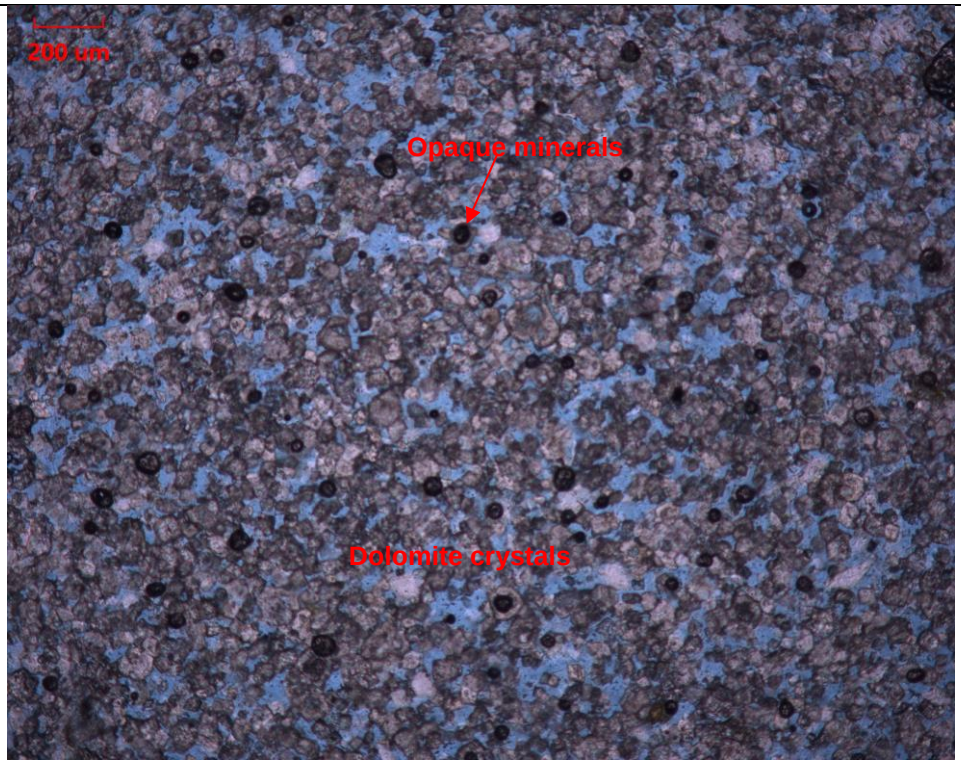
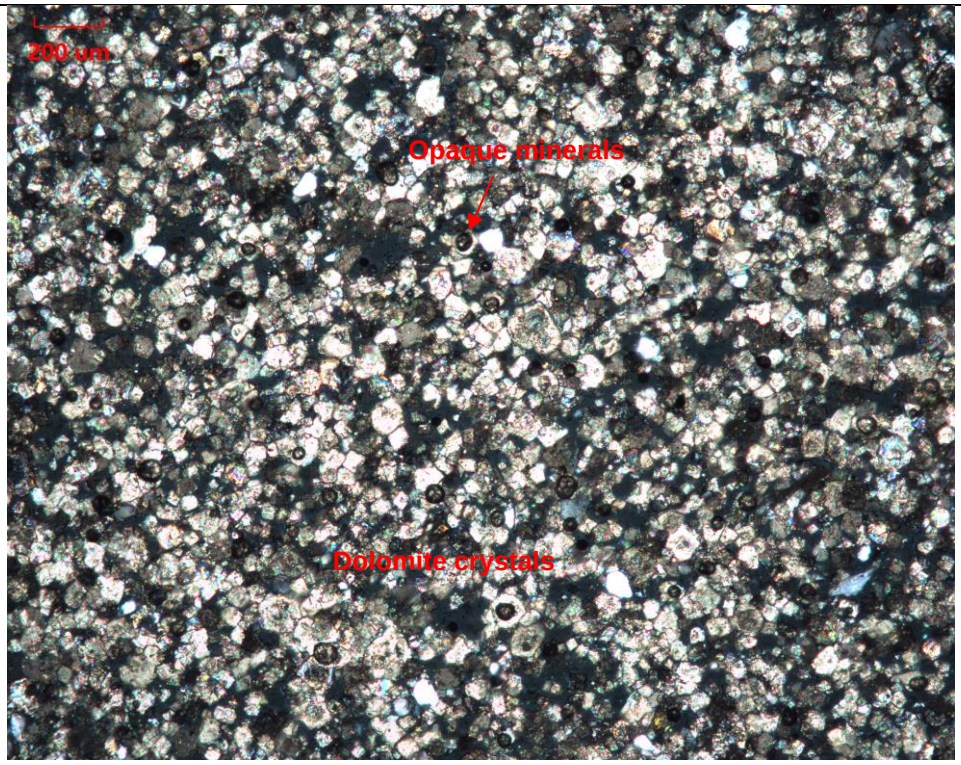
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

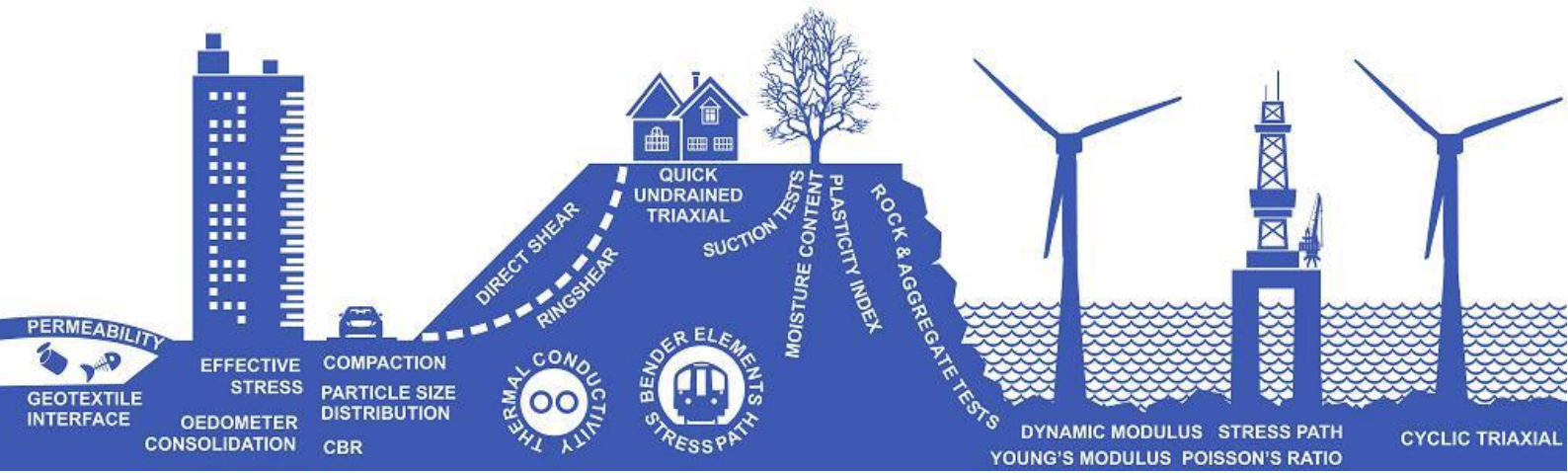
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#01A_SAMP |
| **Sample ref** | : | CR10-IS |
| **Depth (m)** | : | 8.50 - 8.80 |
| **Geolabs Sample Id** | : | 479159 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



## A. OBJECTIVE

Petrographic examination is made for the following purposes:

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The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

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**Opaque Mineral (2.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 96.5 | 0.4-0.01 |
| Clay | 1 | <0.003 |
| Opaque Mineral | 2.5 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (96.5%), clay (1%) and opaque mineral (2.5%).

## APPENDIX A: MICROPHOTOGRAPHS

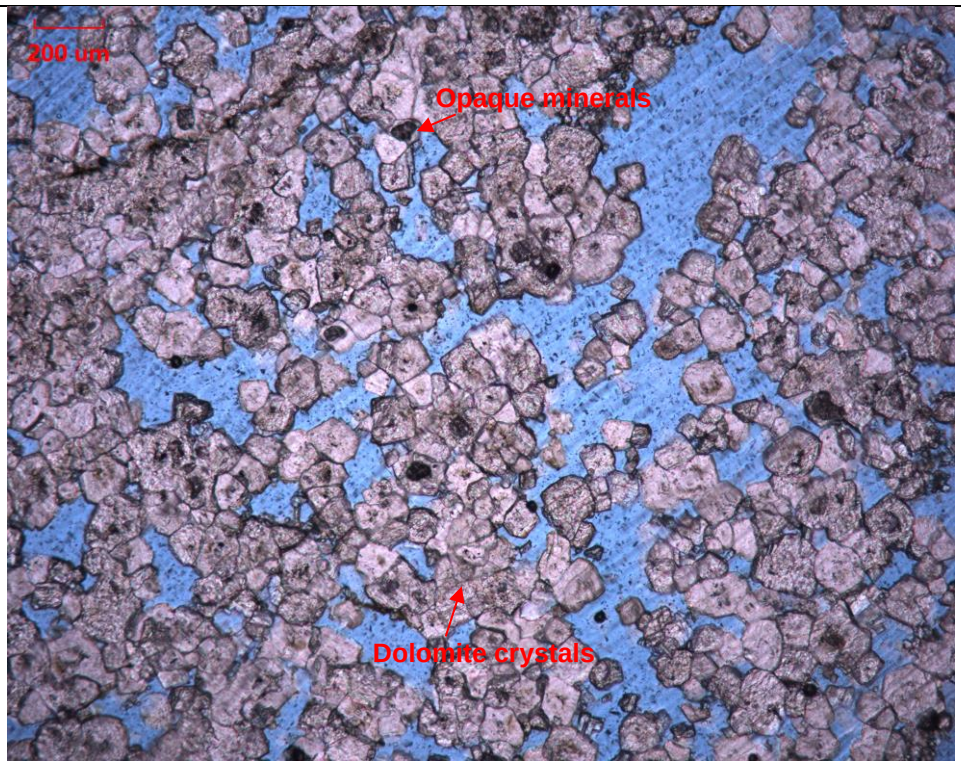
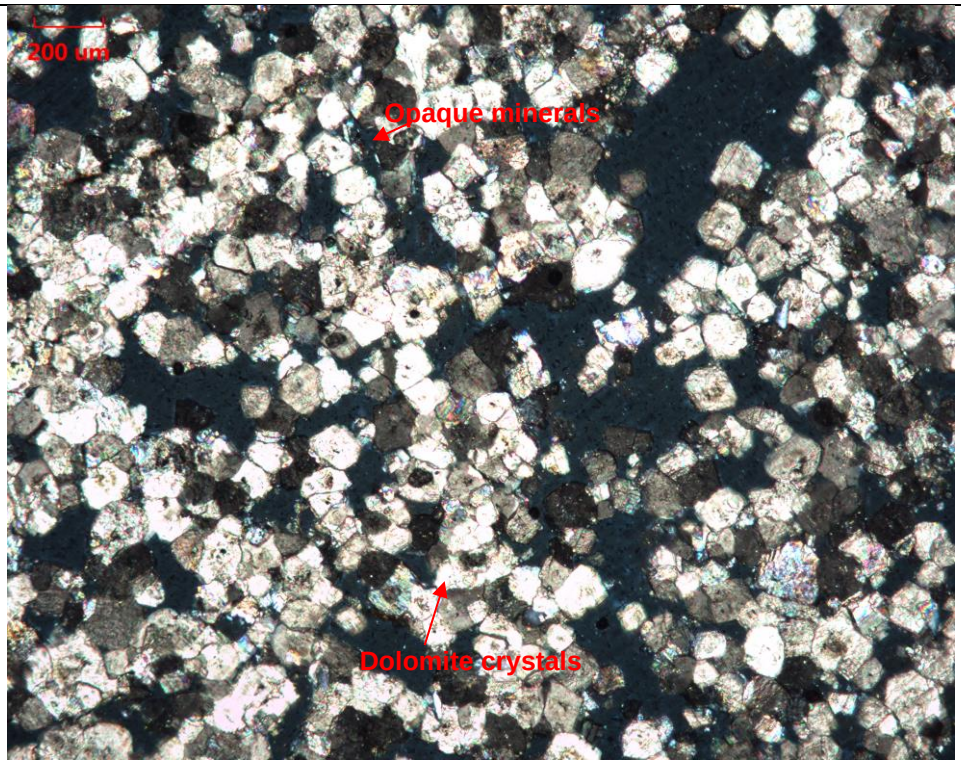
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

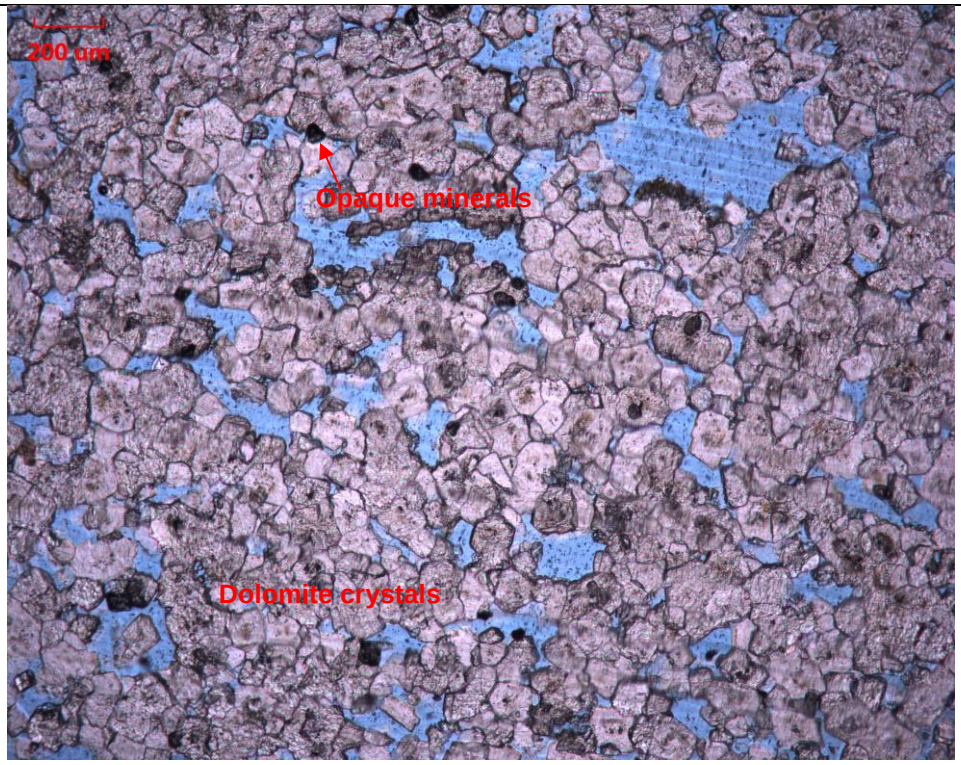
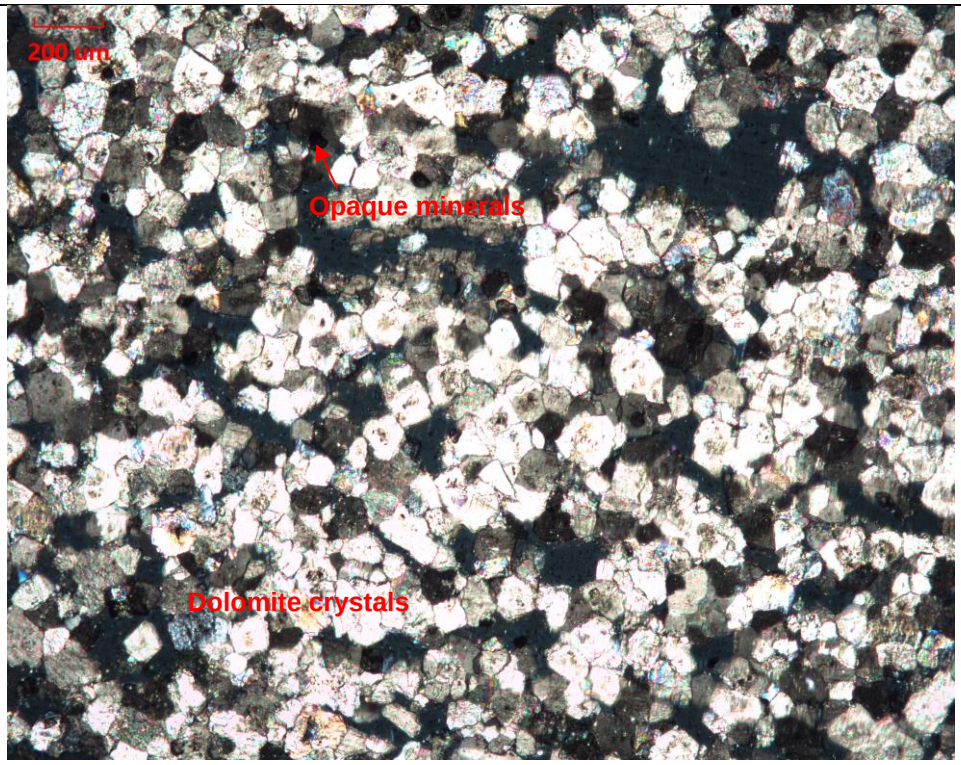
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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# Petrographic Description

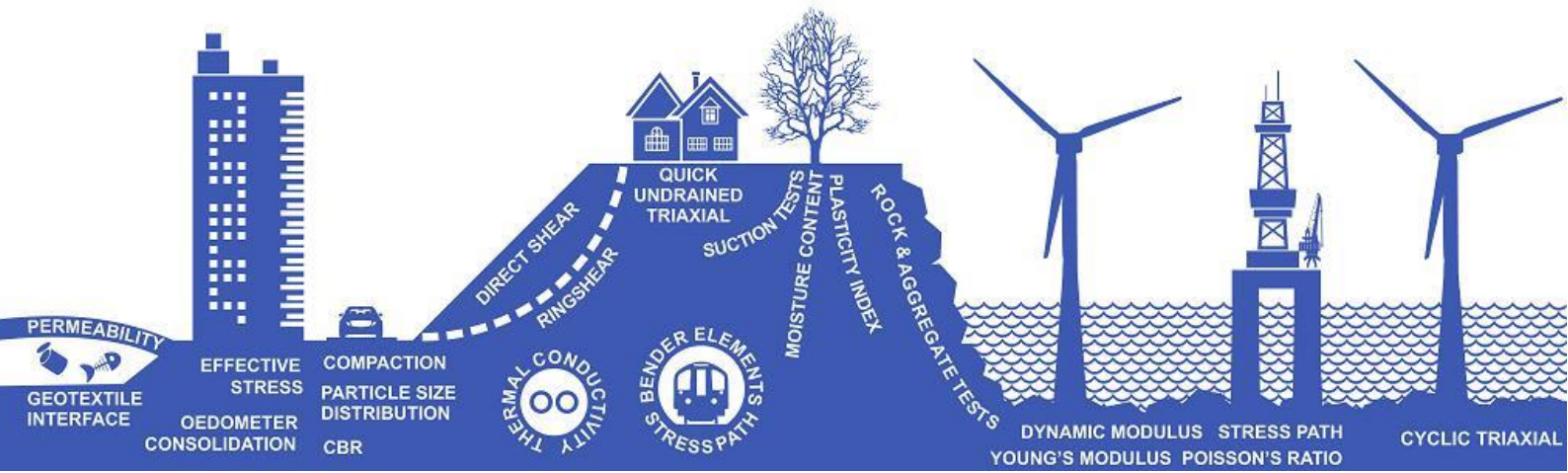
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#01A_SAMP |
| **Sample ref** | : | CR10-Q2 |
| **Depth (m)** | : | 8.50 - 9.30 |
| **Geolabs Sample Id** | : | 479152 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



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## B. MACRO EXAMINATION

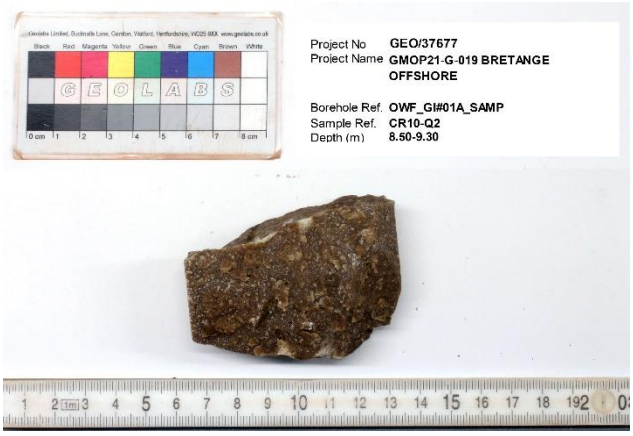


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*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 97.5 | 0.4-0.01 |
| Clay | 1 | <0.003 |
| Opaque Mineral | 1.5 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (97.5%), clay (1%) and opaque mineral (1.5%).

## APPENDIX A: MICROPHOTOGRAPHS

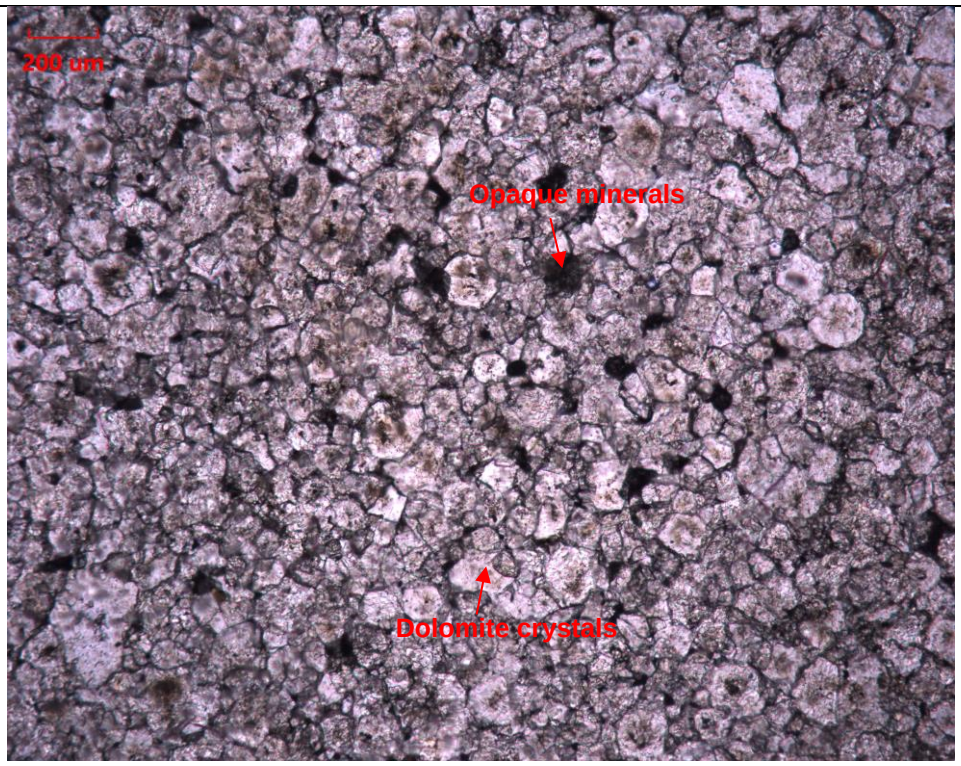
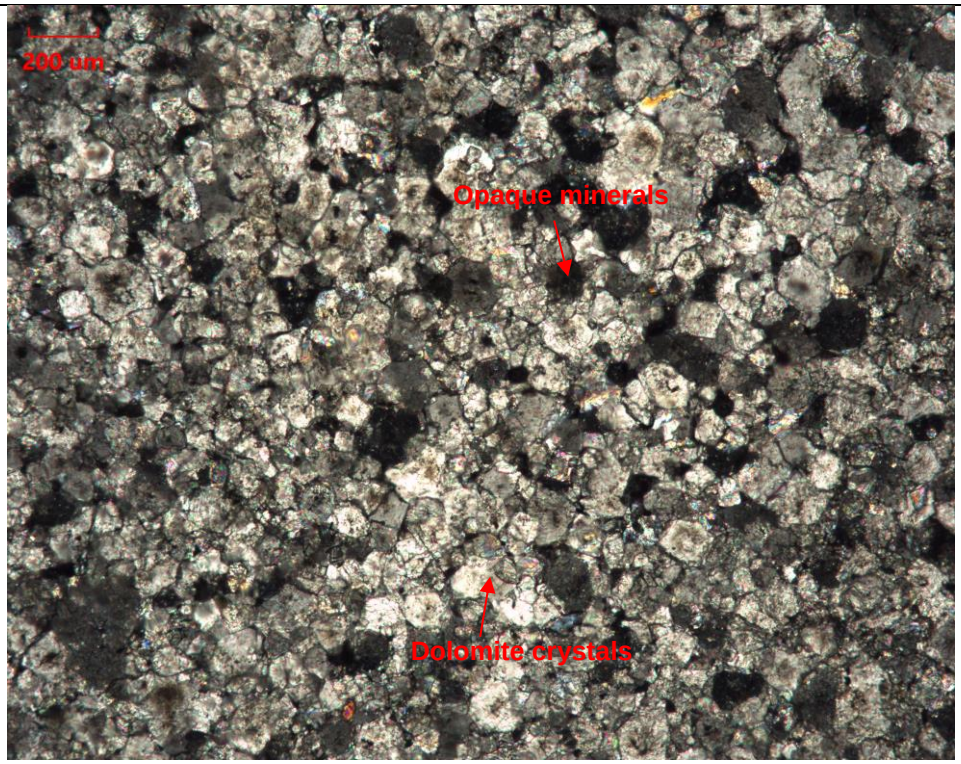
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

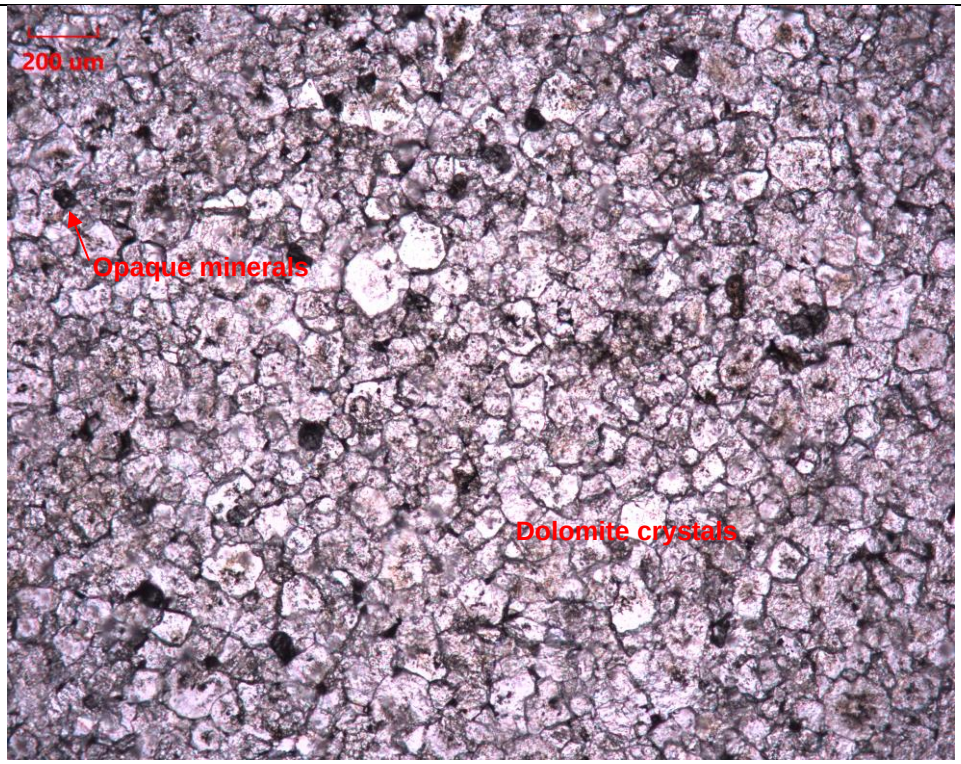
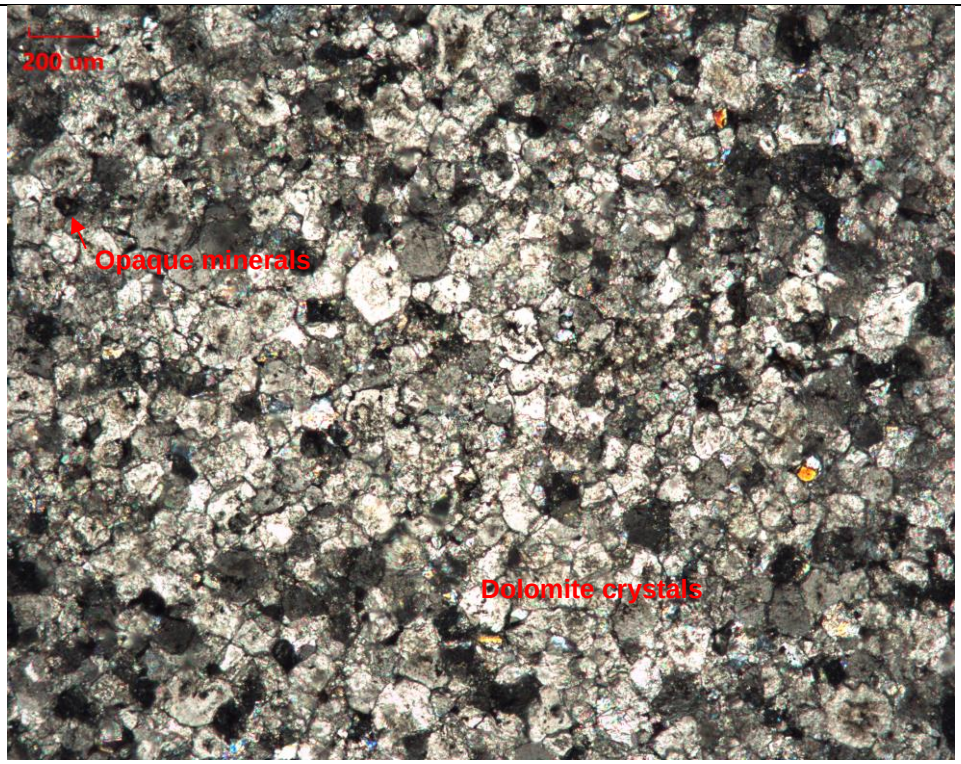
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
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Watford
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# Petrographic Description

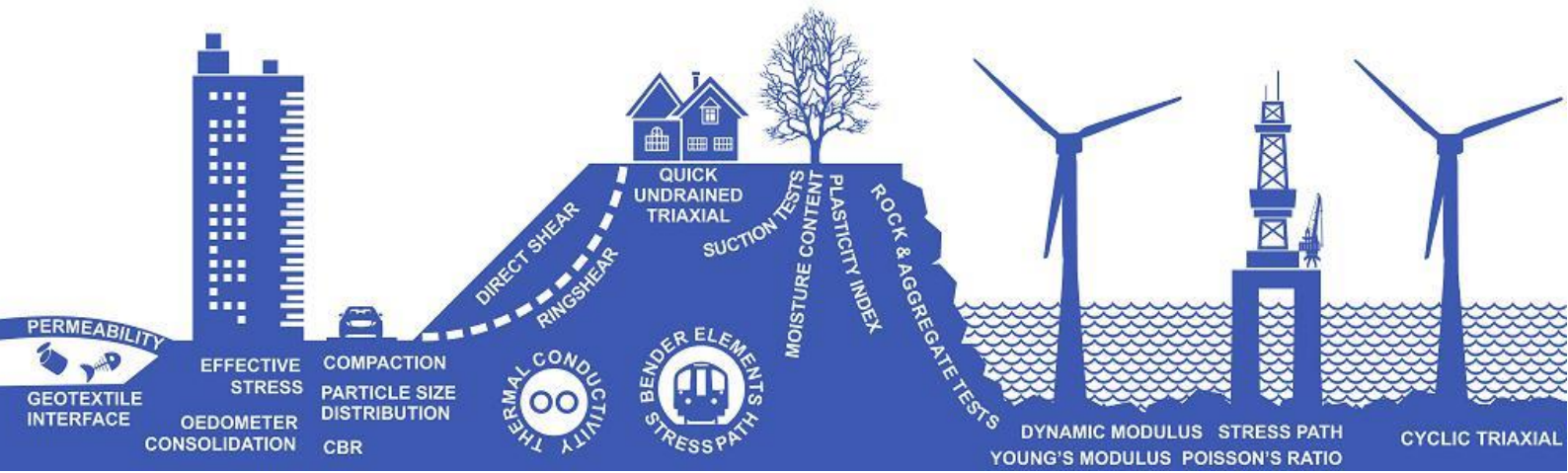
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#01A_SAMP |
| **Sample ref** | : | CR15-IS |
| **Depth (m)** | : | 16.00 - 16.15 |
| **Geolabs Sample Id** | : | 479153 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



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**Opaque Mineral (1.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

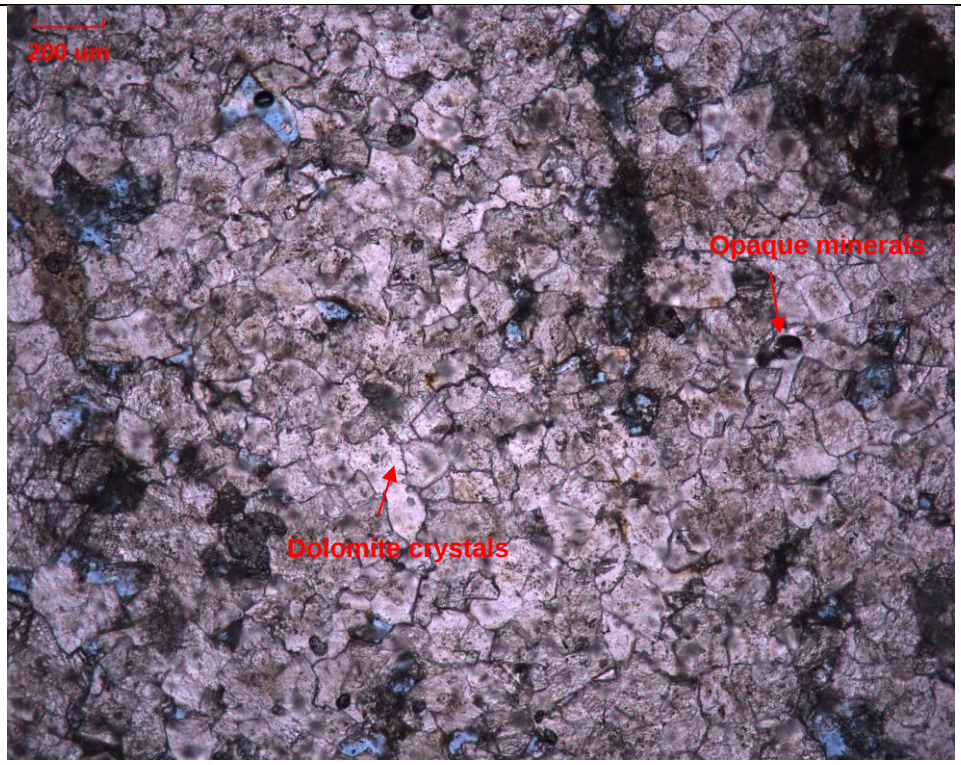
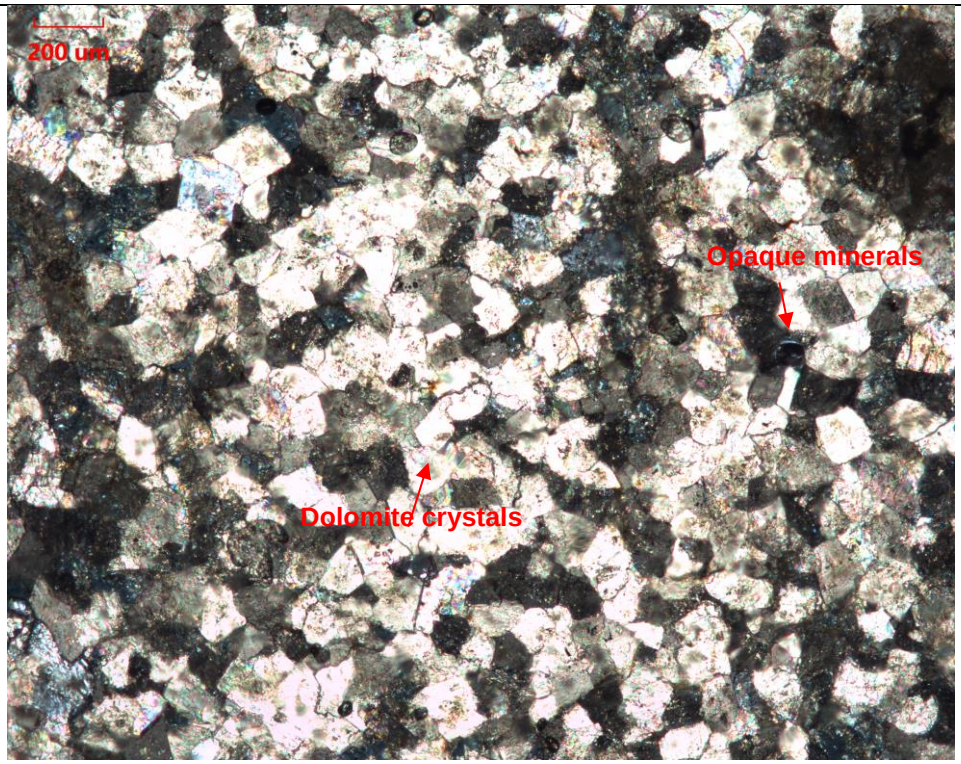
*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 95.5 | 0.4-0.01 |
| Clay | 3 | <0.003 |
| Opaque Mineral | 1.5 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (95.5%), clay (3%) and opaque mineral (1.5%).

## APPENDIX A: MICROPHOTOGRAPHS

| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |   |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |   |

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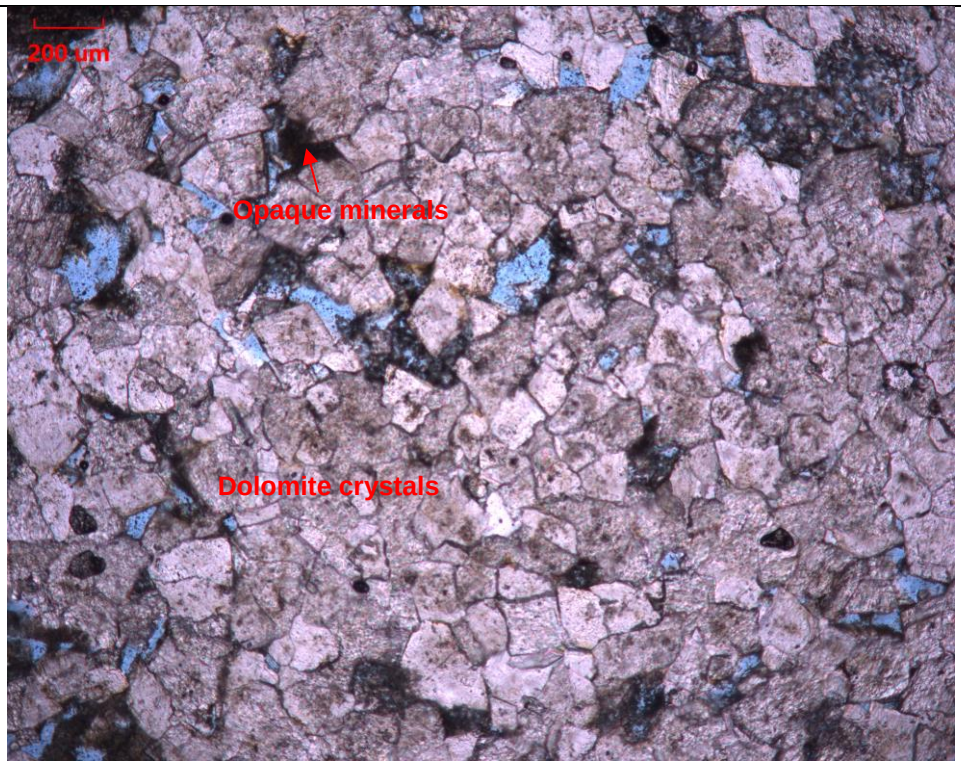
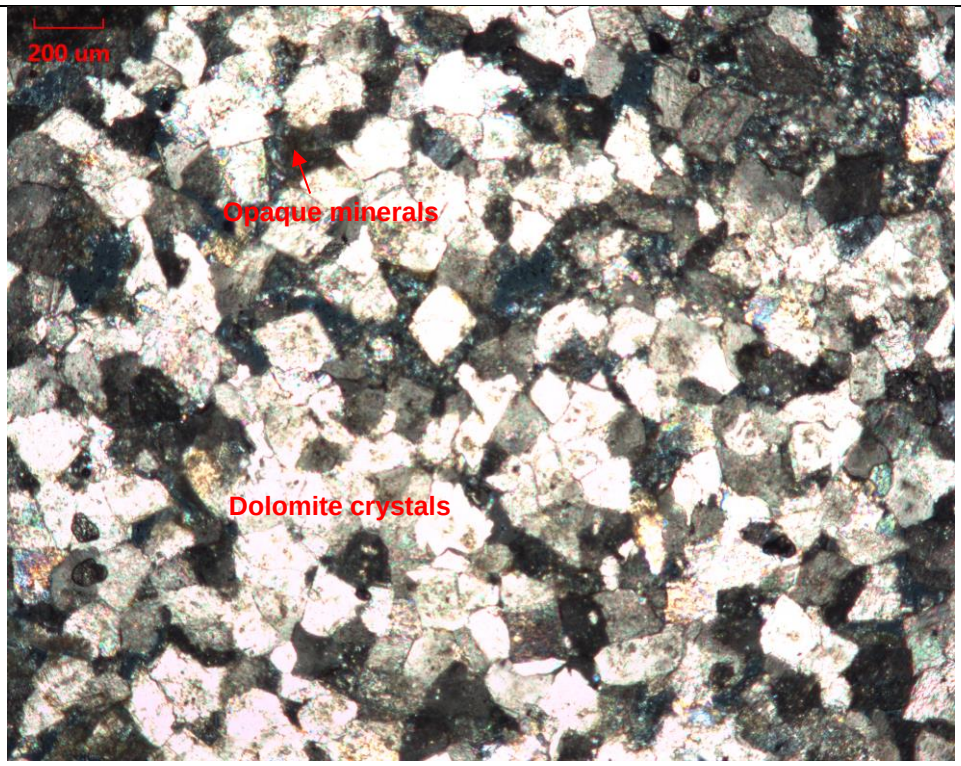
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |   |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |   |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
www.geolabs.co.uk

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WD25 9XX

# Petrographic Description

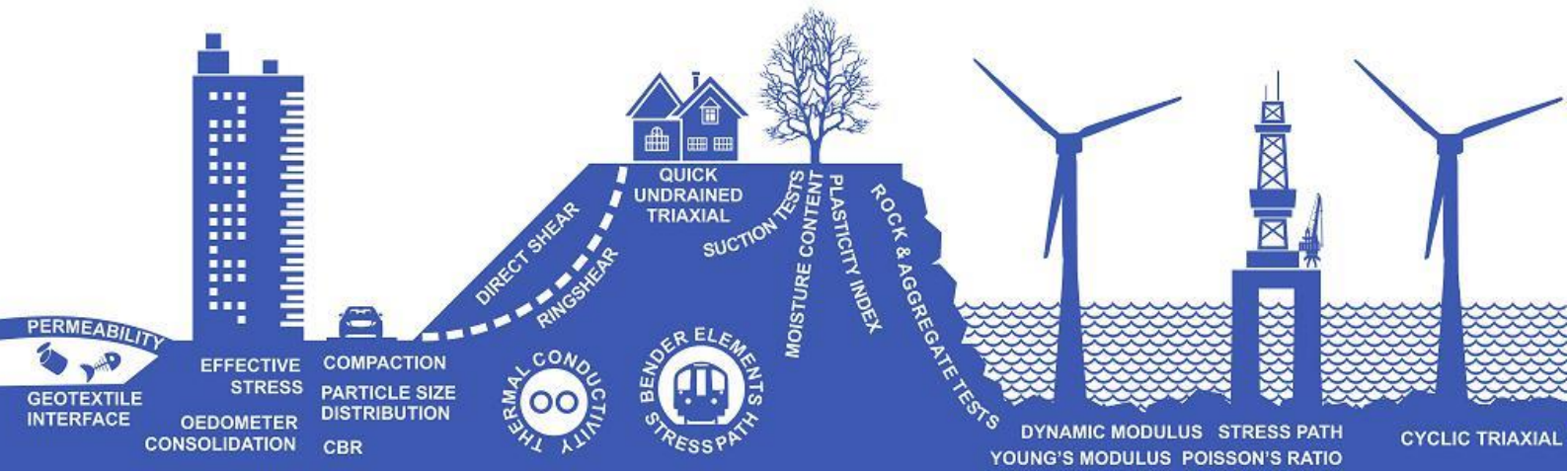
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#01A_SAMP |
| **Sample ref** | : | CR16-IS |
| **Depth (m)** | : | 17.00 - 17.00 |
| **Geolabs Sample Id** | : | 479158 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

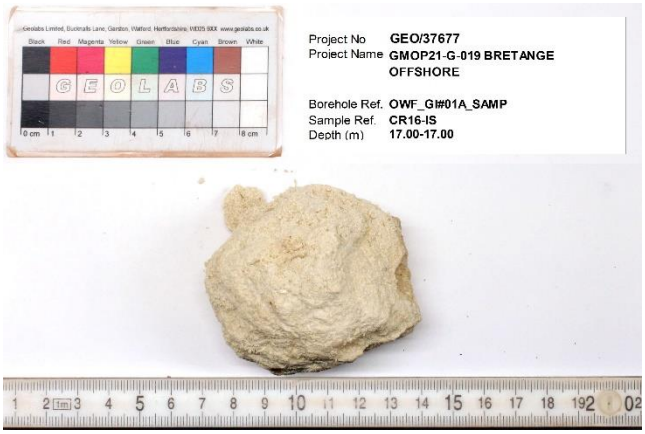


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared light grey / cream colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 2.0 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (64%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (20%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (14%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Shelly Limestone | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 64 | 1.8-0.01 |
| Calcite | 20 | 0.2-0.01 |
| Matrix | 14 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (64%), calcite (20%), matrix (14%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

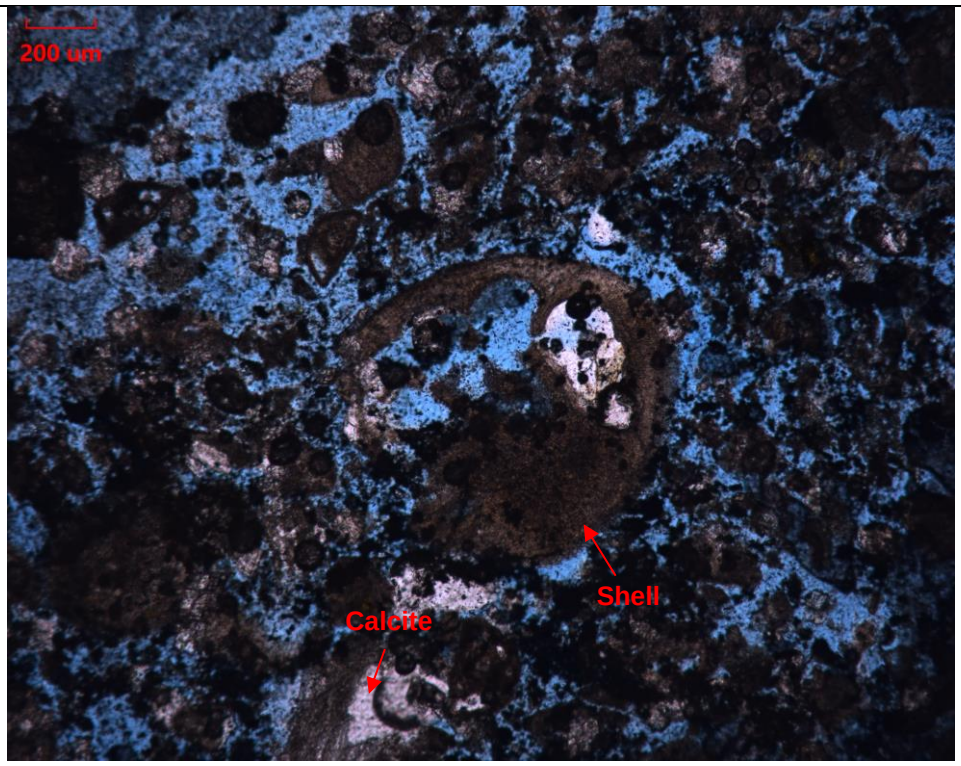
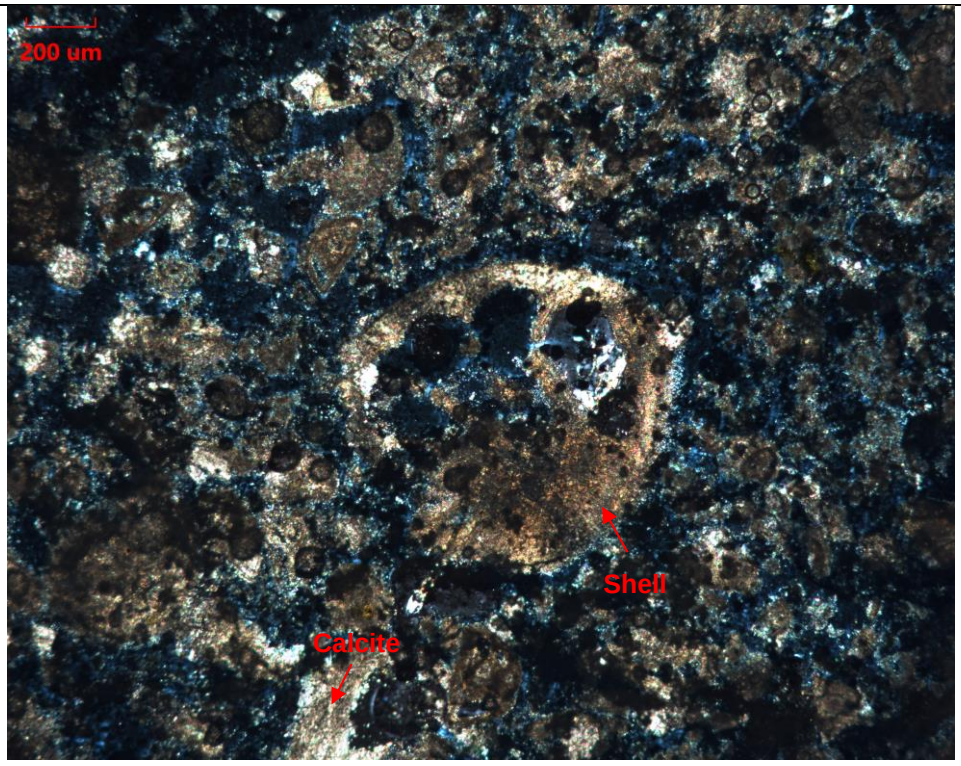
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

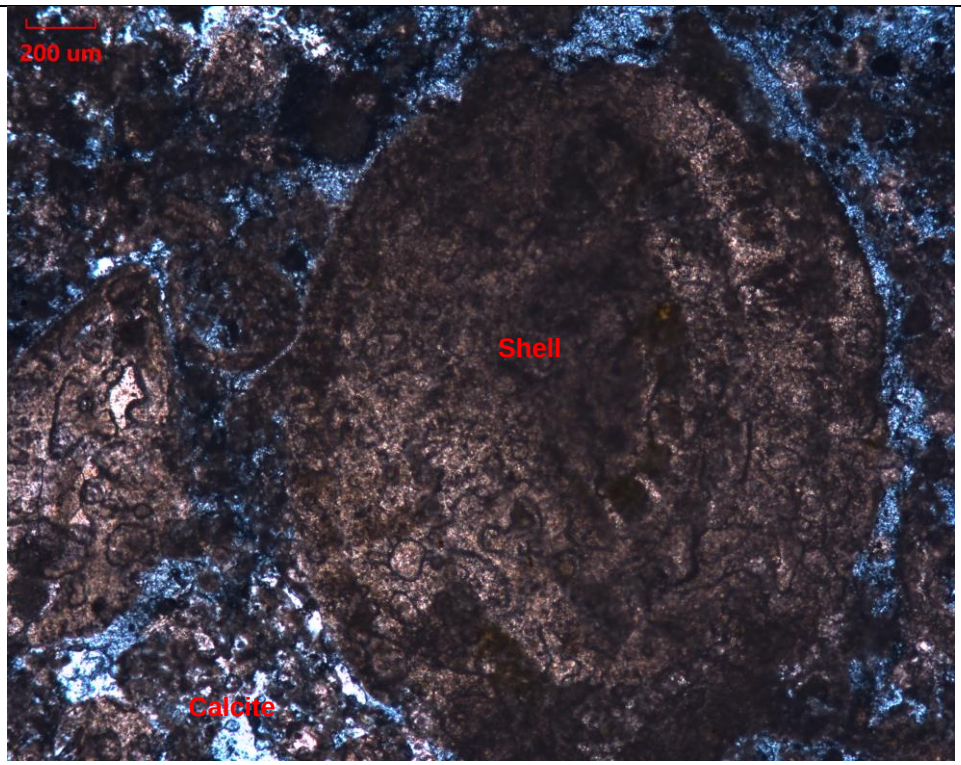
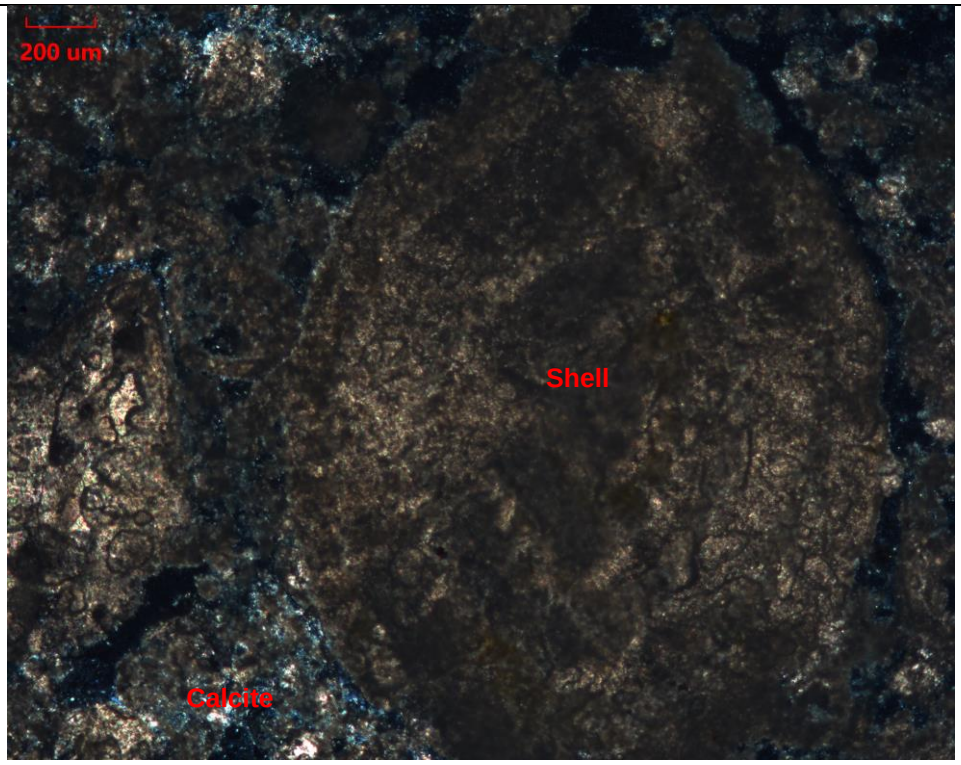
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

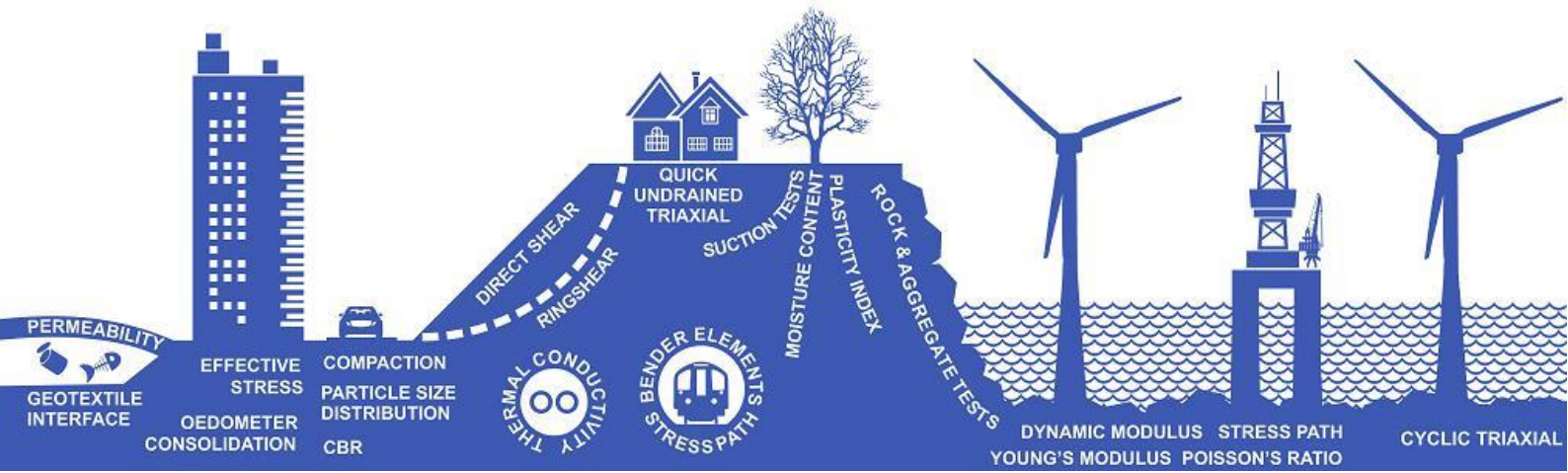
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#04_SAMP |
| **Sample ref** | : | CR01-B1 |
| **Depth (m)** | : | 1.30 - 1.30 |
| **Geolabs Sample Id** | : | 479186 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

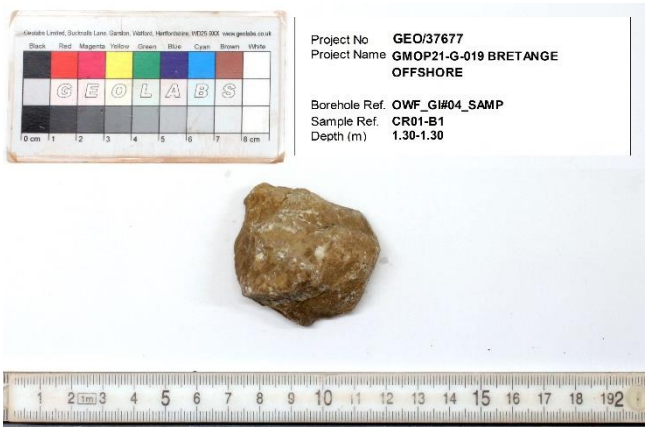


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## A. MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (95.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (2%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 95.5 | 0.4-0.01 |
| Clay | 2 | <0.003 |
| Opaque Mineral | 2.5 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (95.5%), clay (2%) and opaque mineral (2.5%).

## APPENDIX A: MICROPHOTOGRAPHS

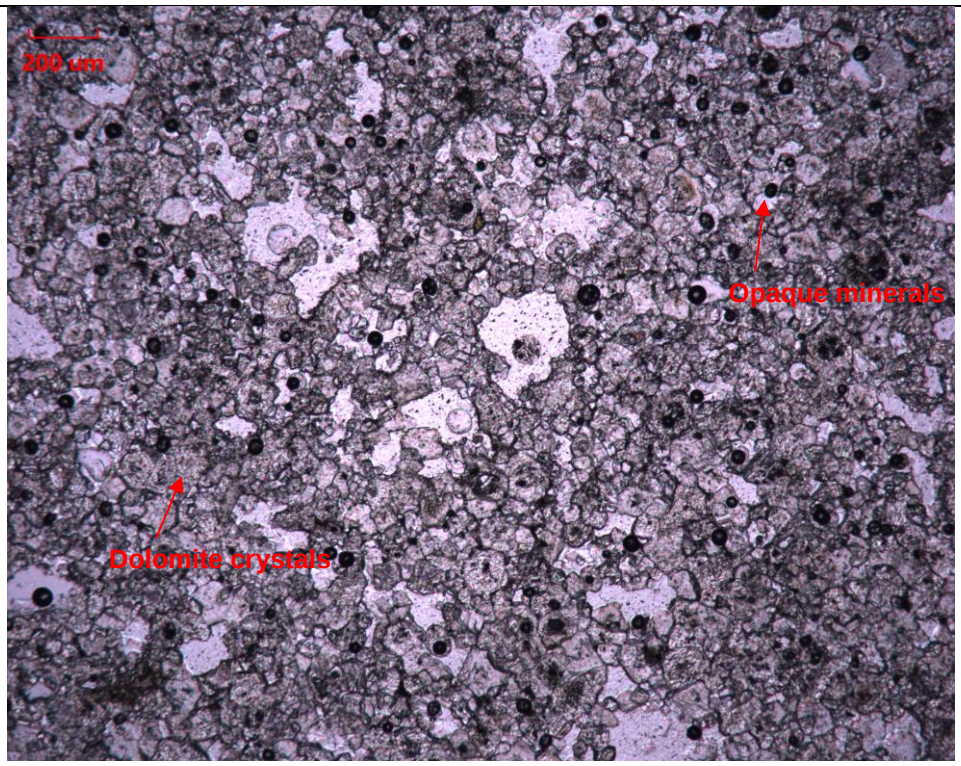
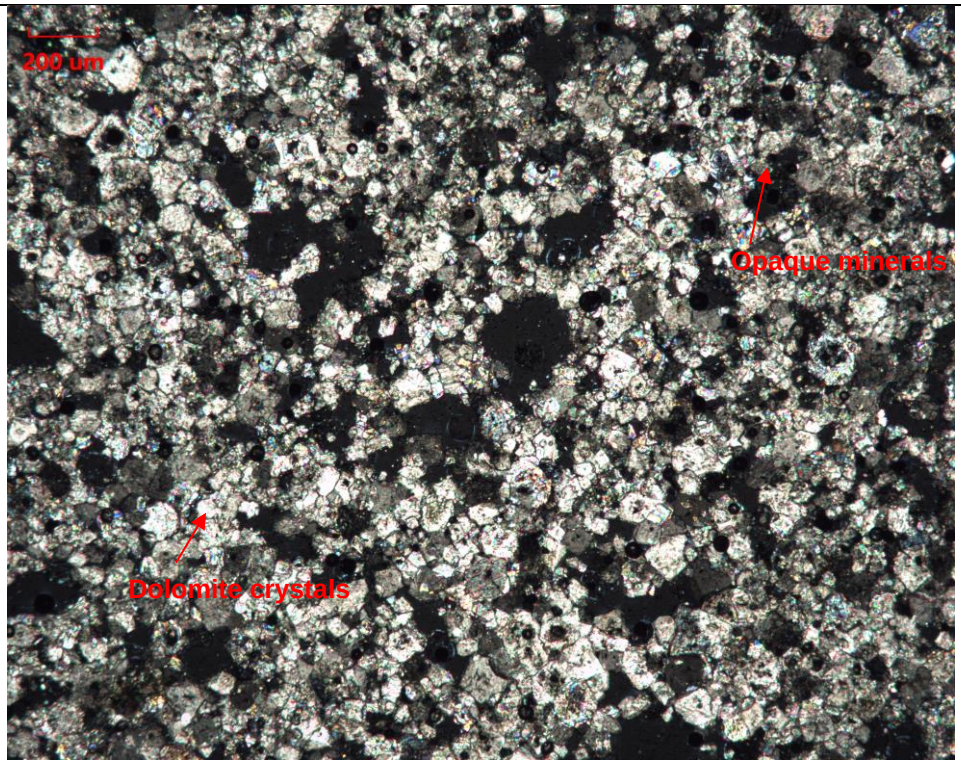
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

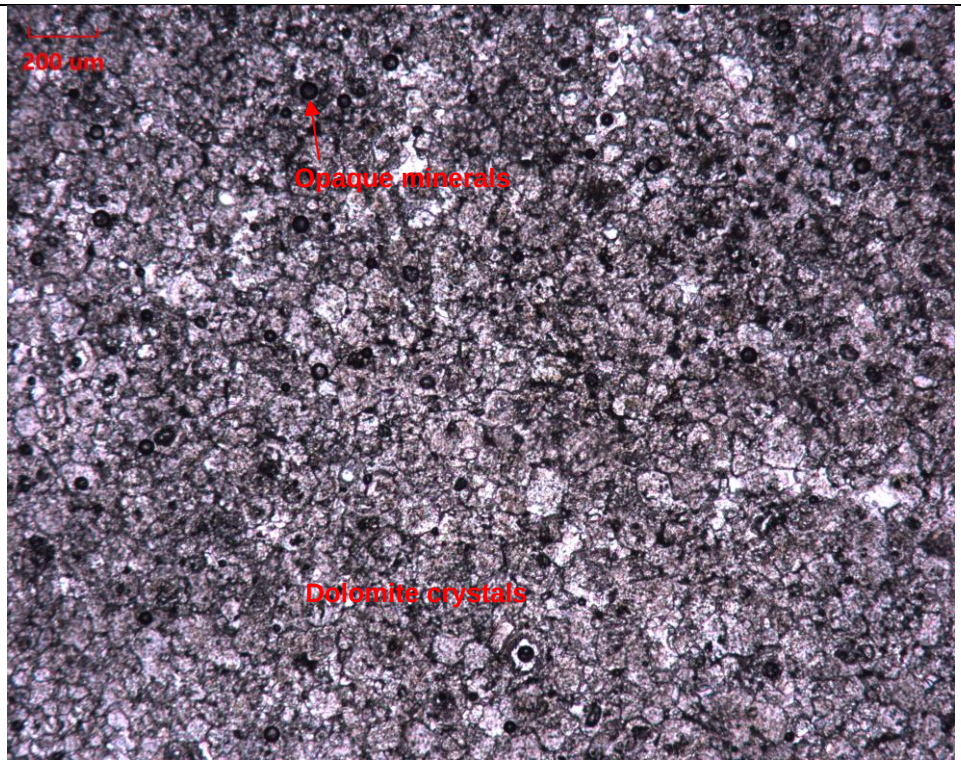
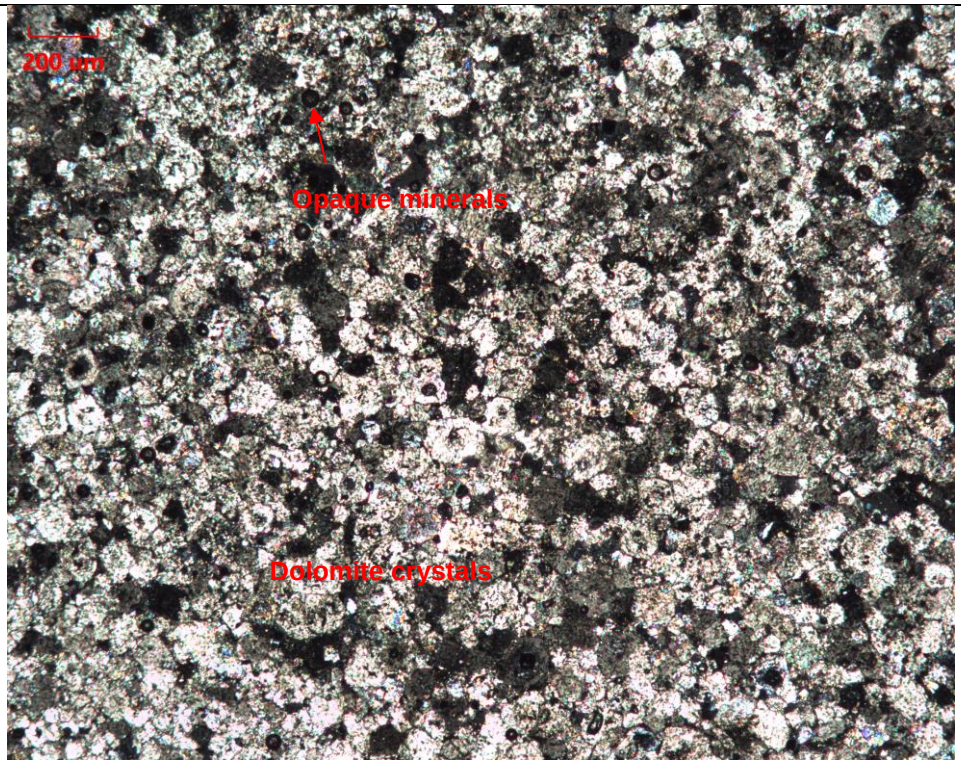
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

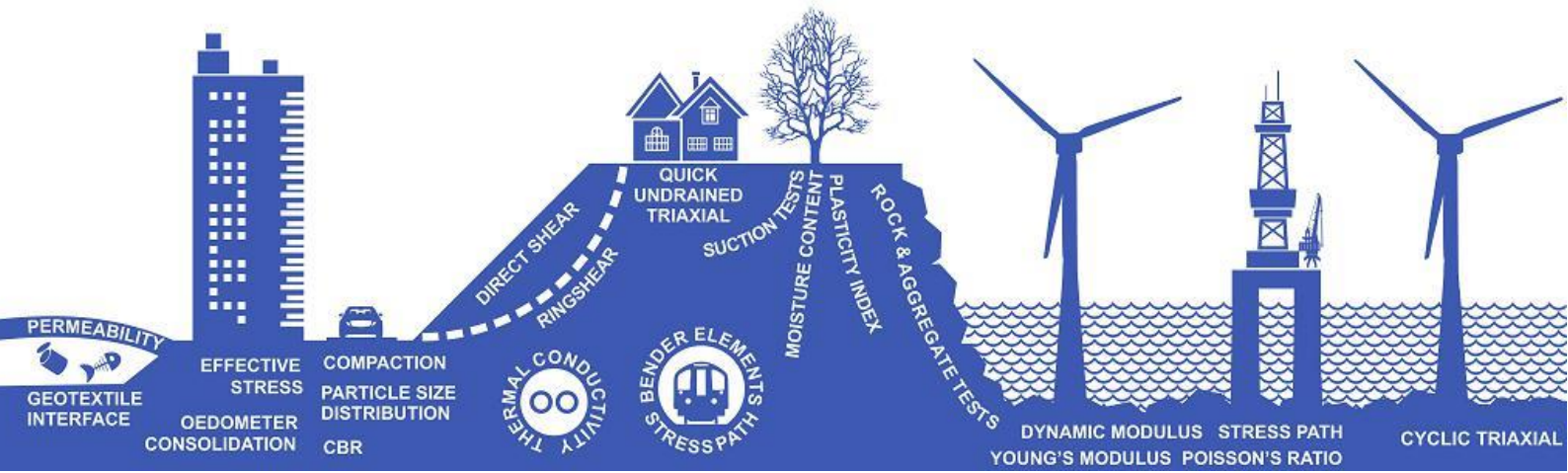
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#04A_SAMP |
| **Sample ref** | : | CR05-IS |
| **Depth (m)** | : | 4.50 - 4.70 |
| **Geolabs Sample Id** | : | 479150 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

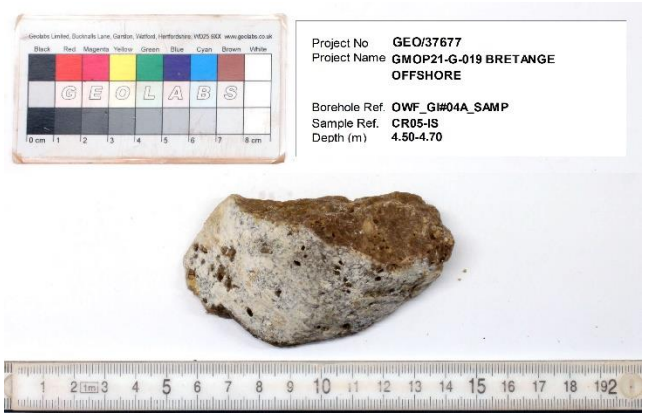


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## A. MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (94.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (2%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (3.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 94.5 | 0.4-0.01 |
| Clay | 2 | <0.003 |
| Opaque Mineral | 3.5 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (94.5%), clay (2%) and opaque mineral (3.5%).

## APPENDIX A: MICROPHOTOGRAPHS

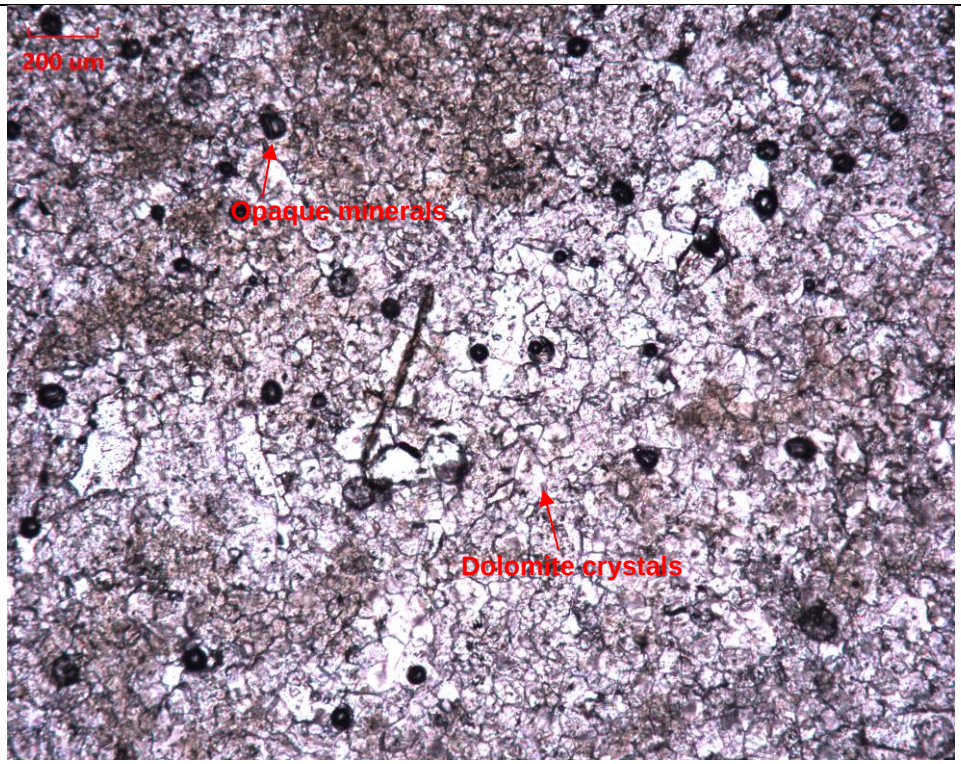
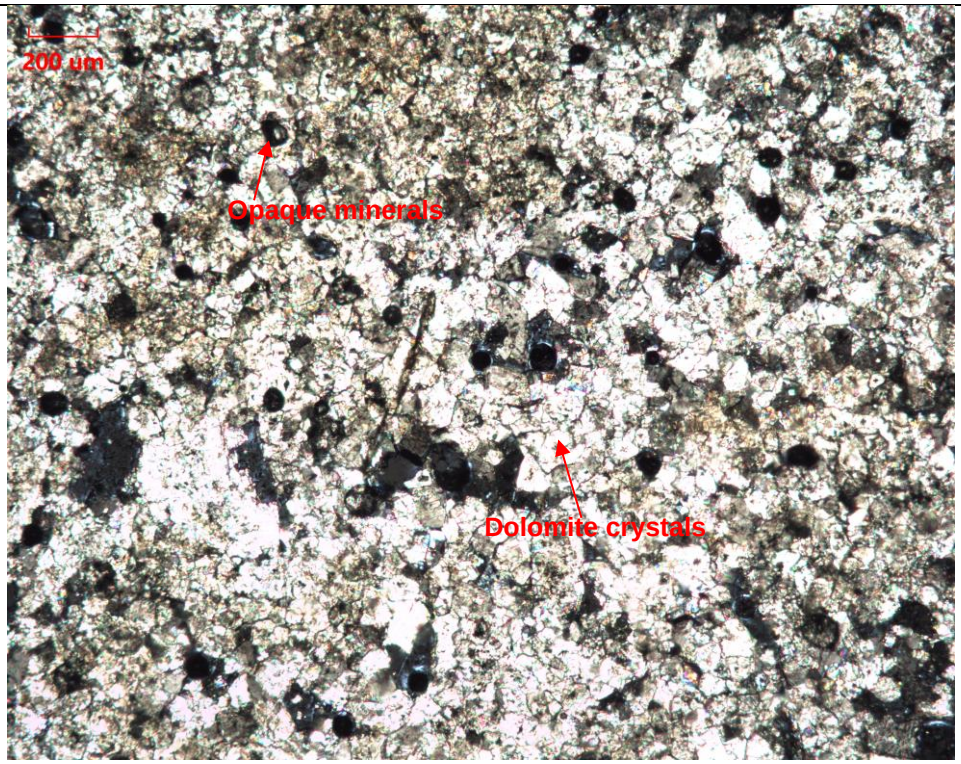
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

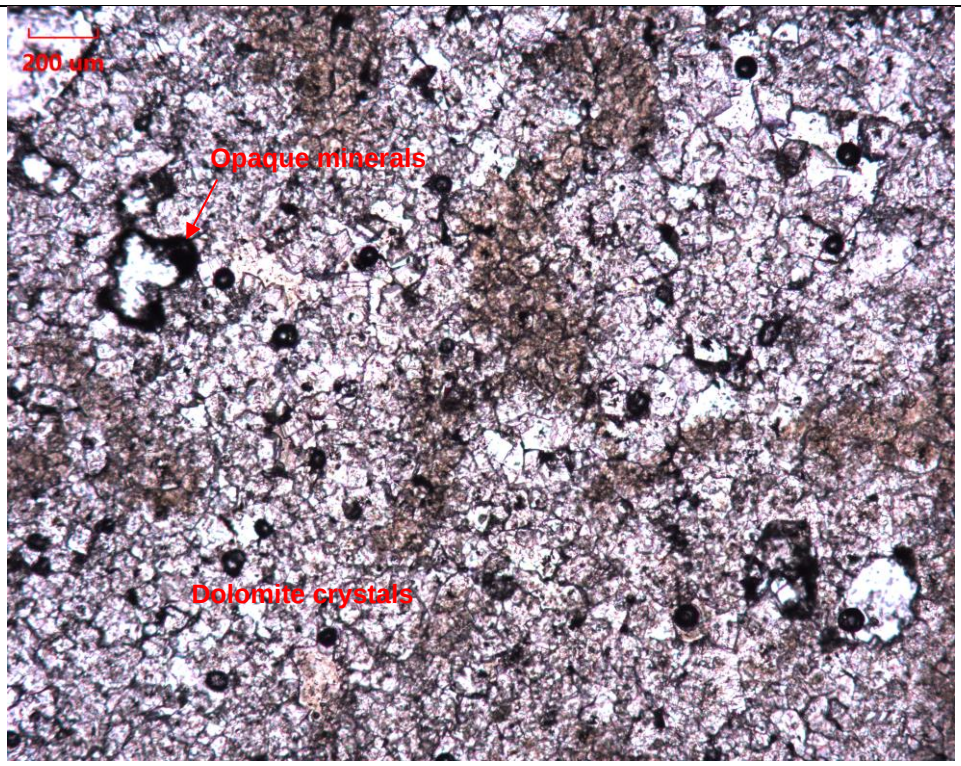
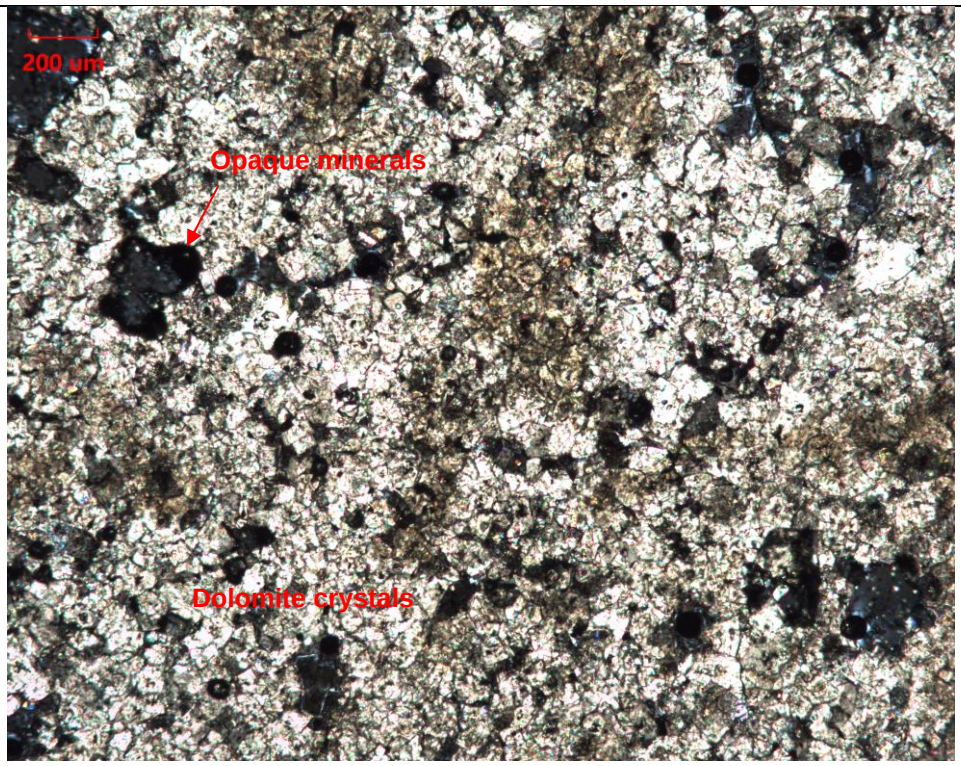
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

Geolabs Ltd
+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

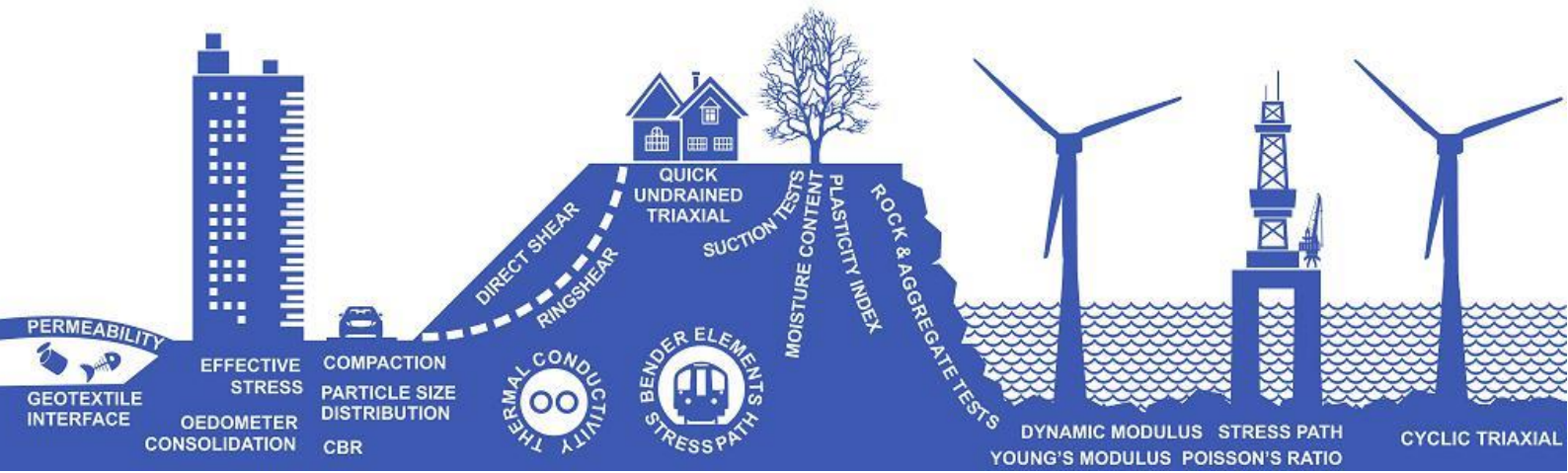
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#04A_SAMP |
| **Sample ref** | : | CR10-B1 |
| **Depth (m)** | : | 11.90 - 11.90 |
| **Geolabs Sample Id** | : | 479155 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

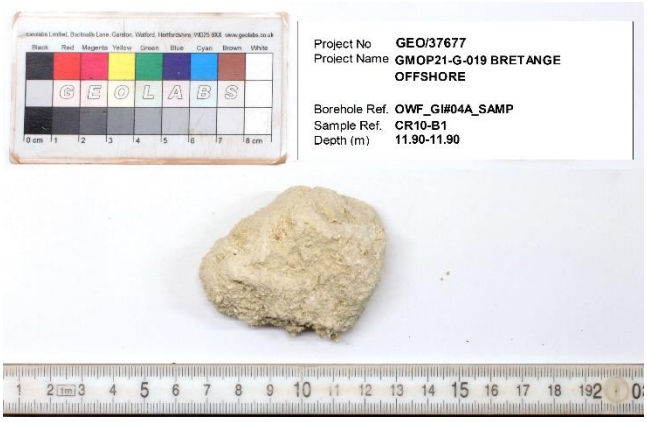


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared light grey / cream colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 1.2 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (53%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (28%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (17%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Shelly Limestone | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 53 | 2.2-0.01 |
| Calcite | 28 | 0.2-0.01 |
| Matrix | 17 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (53%), calcite (28%), matrix (17%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

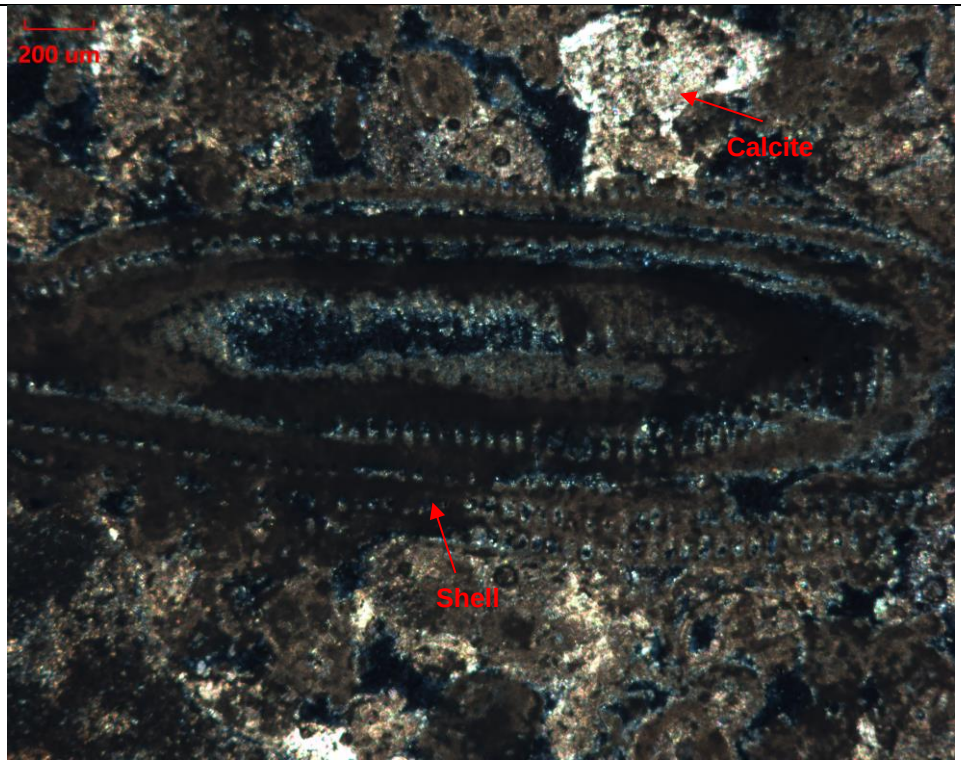
| | |
|---|---|
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral constituents, **50X.** |  |
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

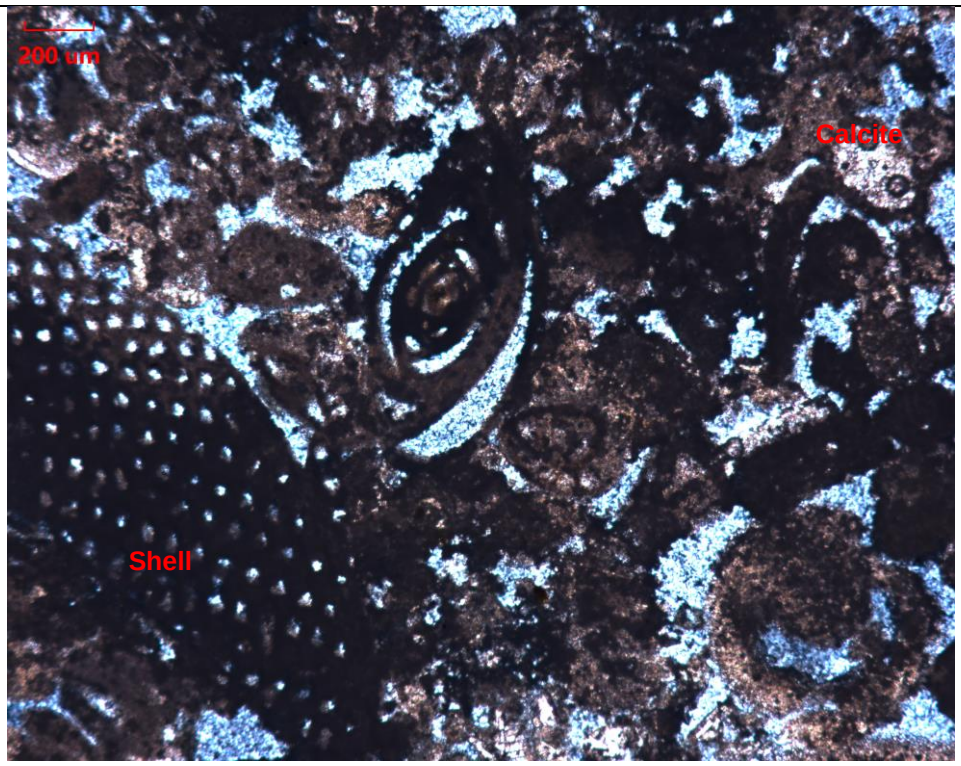
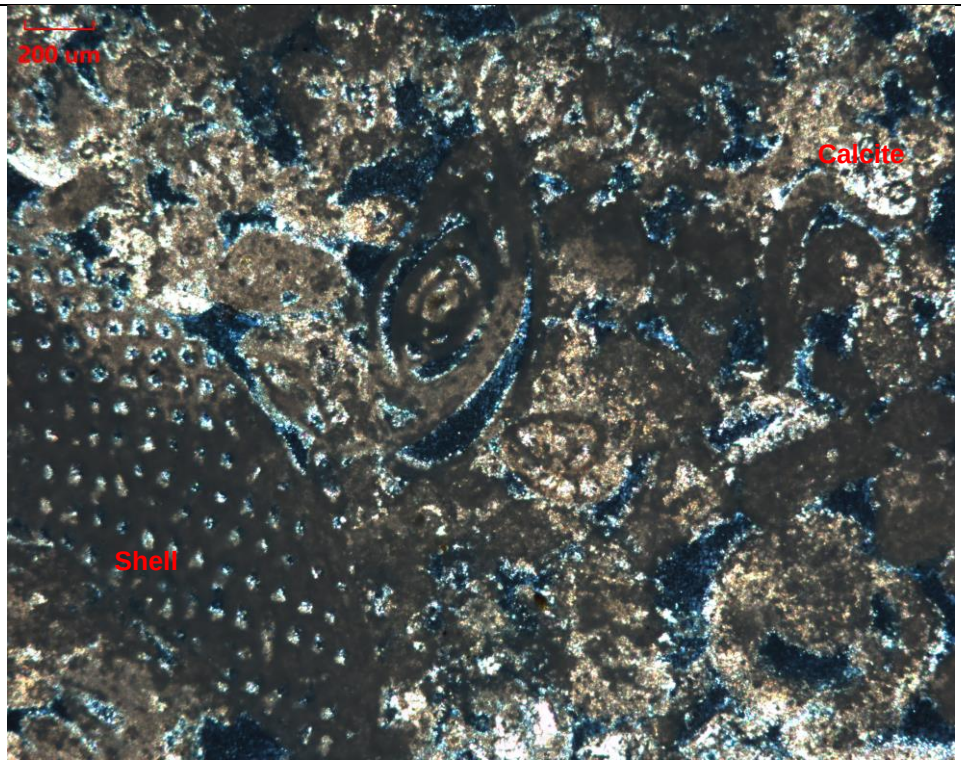
| | |
|---|---|
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral constituents, **50X.** |   |
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral constituents, **50X.** |   |

*Figure 2. Plane and crossed polarized photos*

Geolabs Ltd
+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
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WD25 9XX

# Petrographic Description

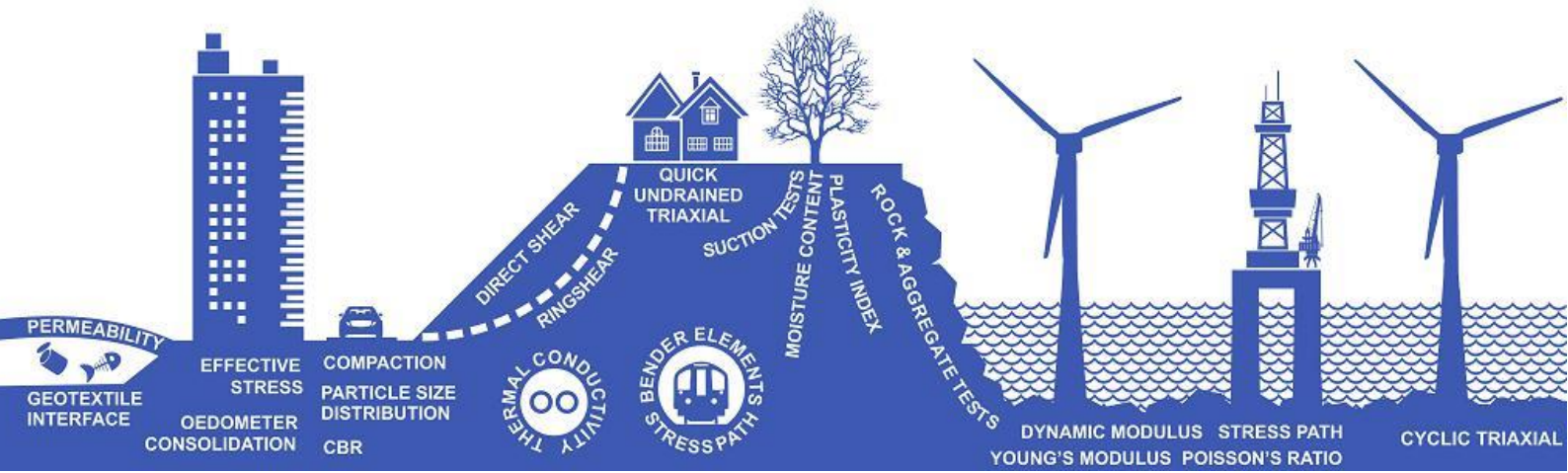
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#04A_SAMP |
| **Sample ref** | : | CR15-IS |
| **Depth (m)** | : | 19.00 - 19.25 |
| **Geolabs Sample Id** | : | 479156 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

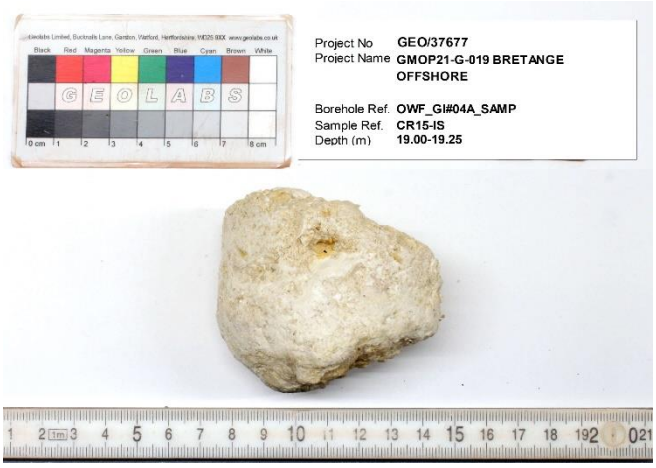


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared light grey / cream colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 1.2 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (63%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (18%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (17%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Shelly Limestone | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 63 | 2.5-0.01 |
| Calcite | 18 | 0.2-0.01 |
| Matrix | 17 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (63%), calcite (18%), matrix (17%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

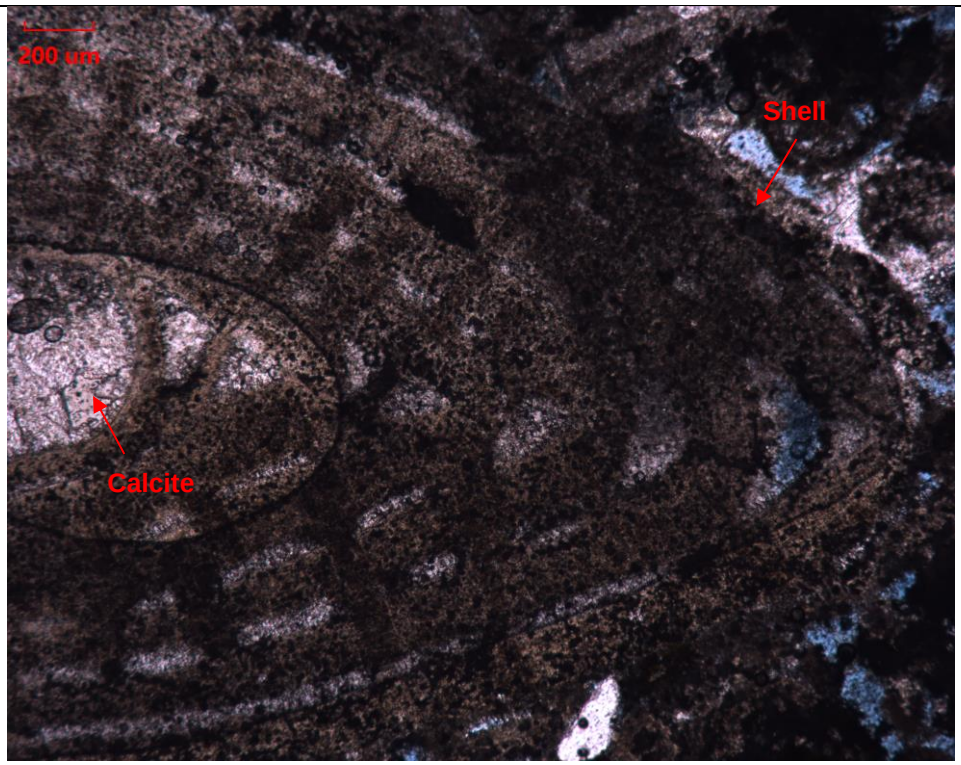
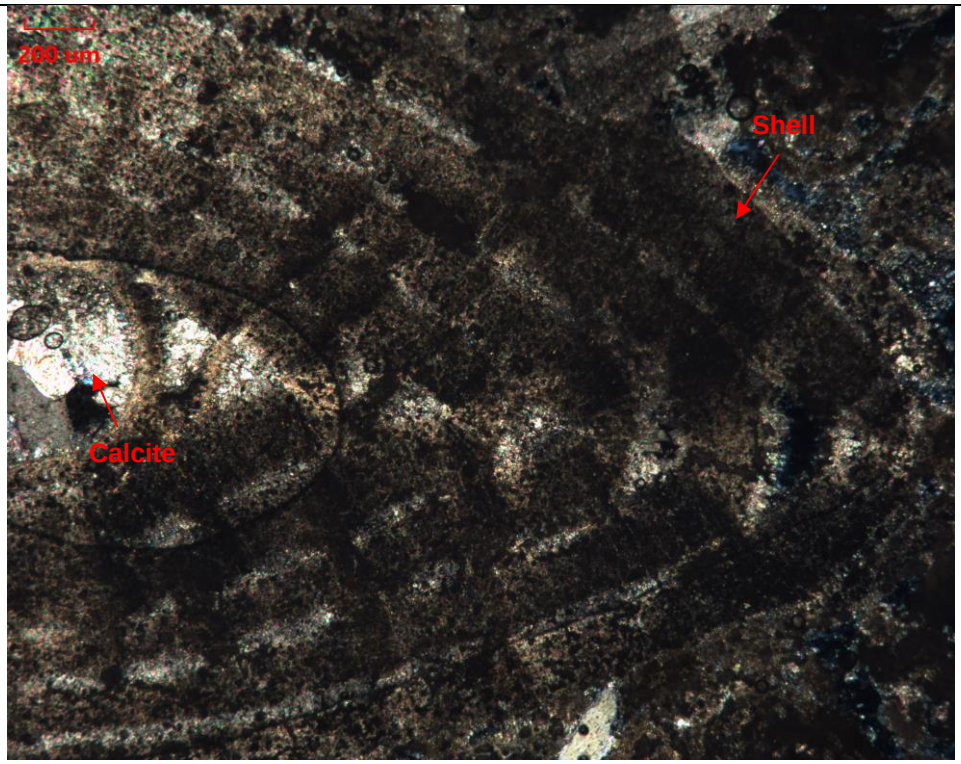
| | |
|---|---|
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral constituents, **50X.** |  |
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

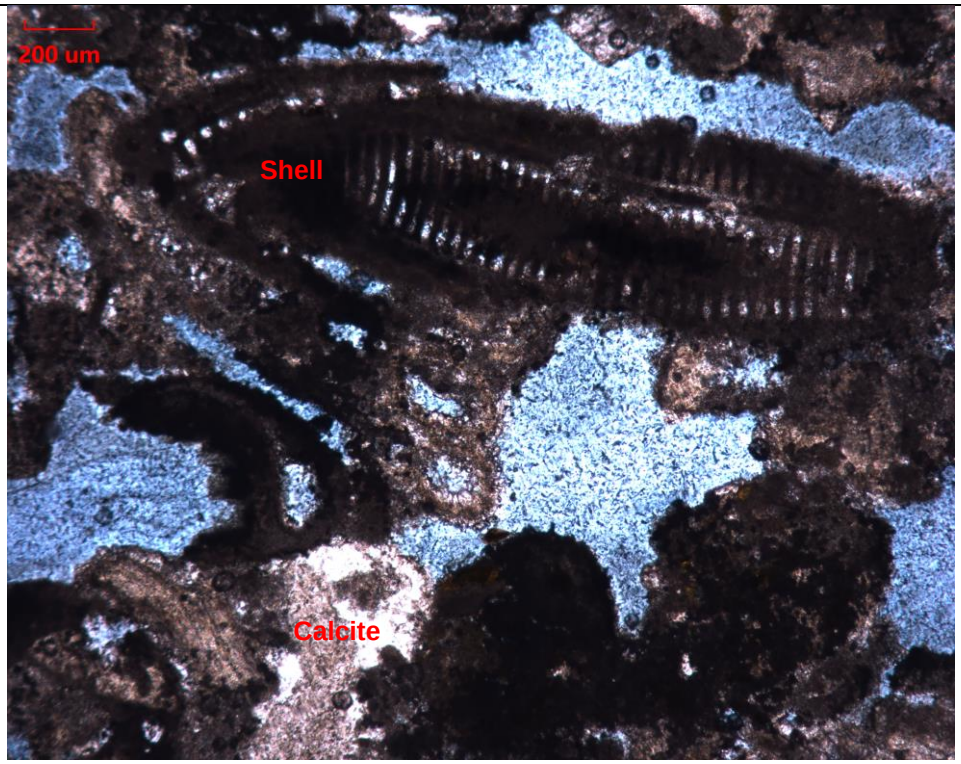
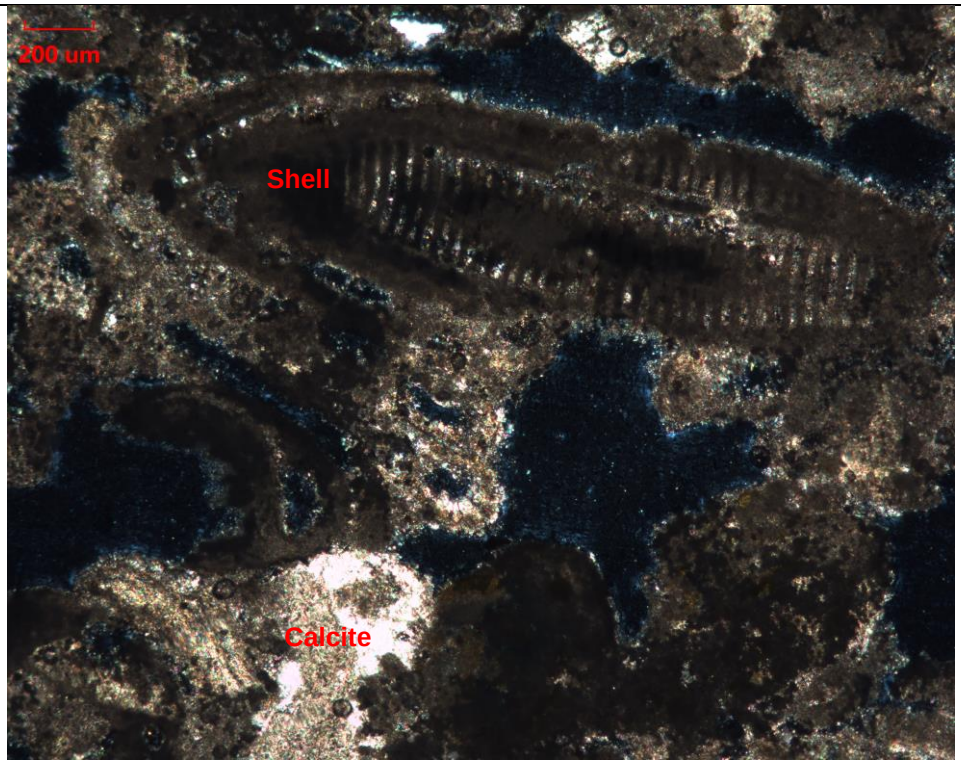
| | |
|---|---|
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral constituents, **50X.** |   |
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral constituents, **50X.** |   |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

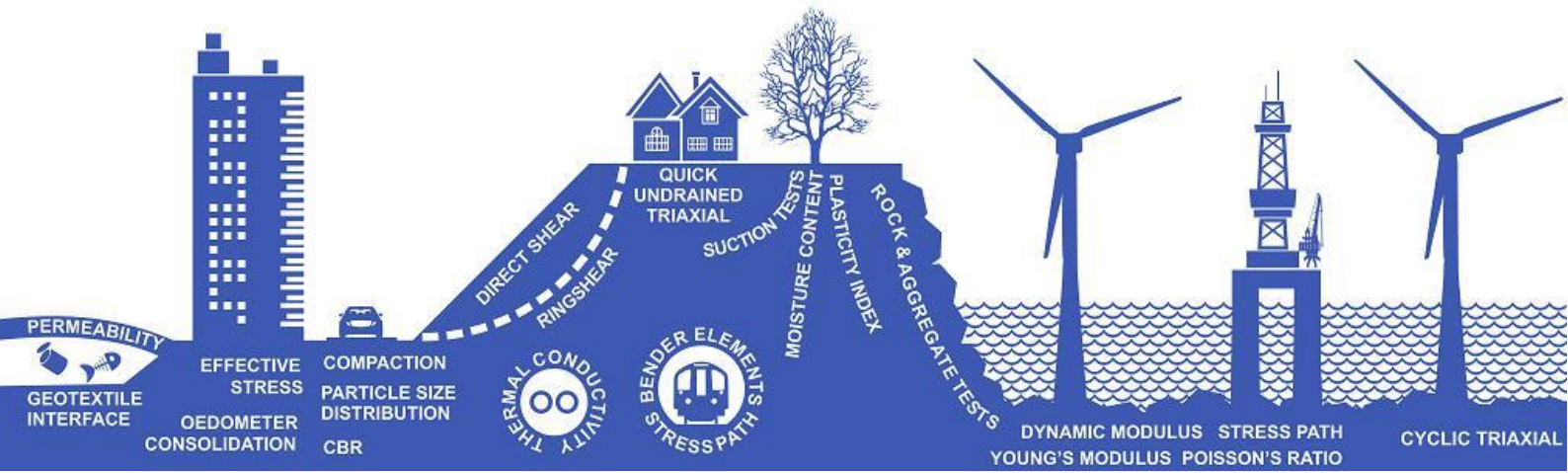
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#05A_SAMP |
| **Sample ref** | : | CR01-IS |
| **Depth (m)** | : | 0.50 - 0.50 |
| **Geolabs Sample Id** | : | 479192 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION


The submitted sample is generally appeared light grey / cream colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## C. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 2.0 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (64%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (15%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (19%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Shelly Limestone** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 64 | 2.0-0.01 |
| Calcite | 15 | 0.2-0.01 |
| Matrix | 19 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## D. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (64%), calcite (15%), matrix (19%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

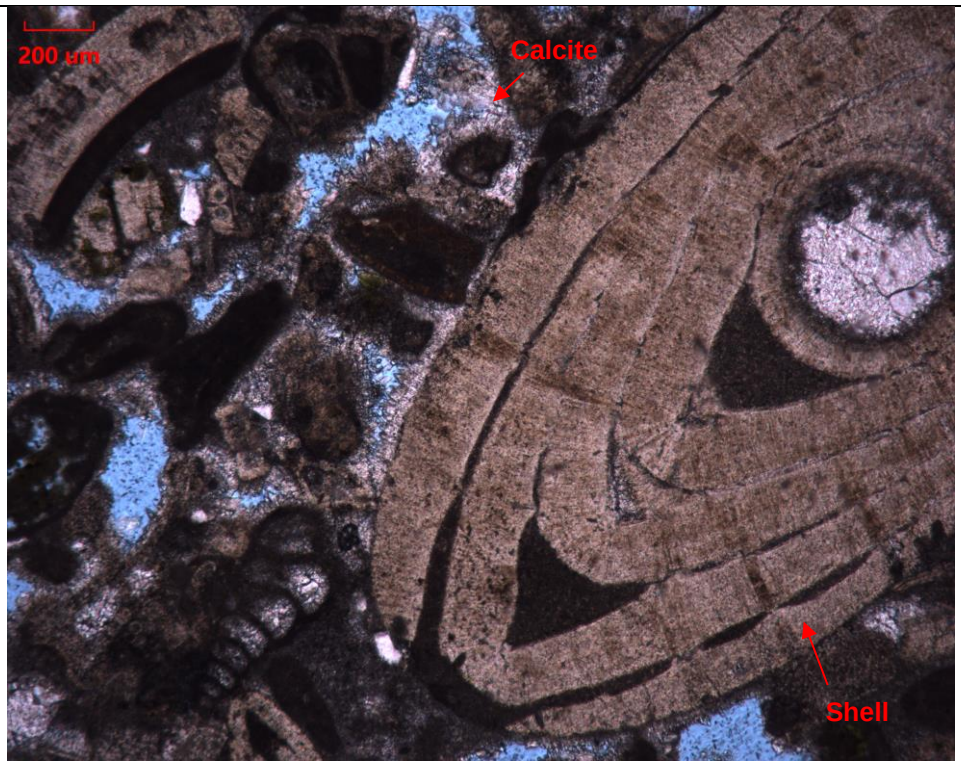
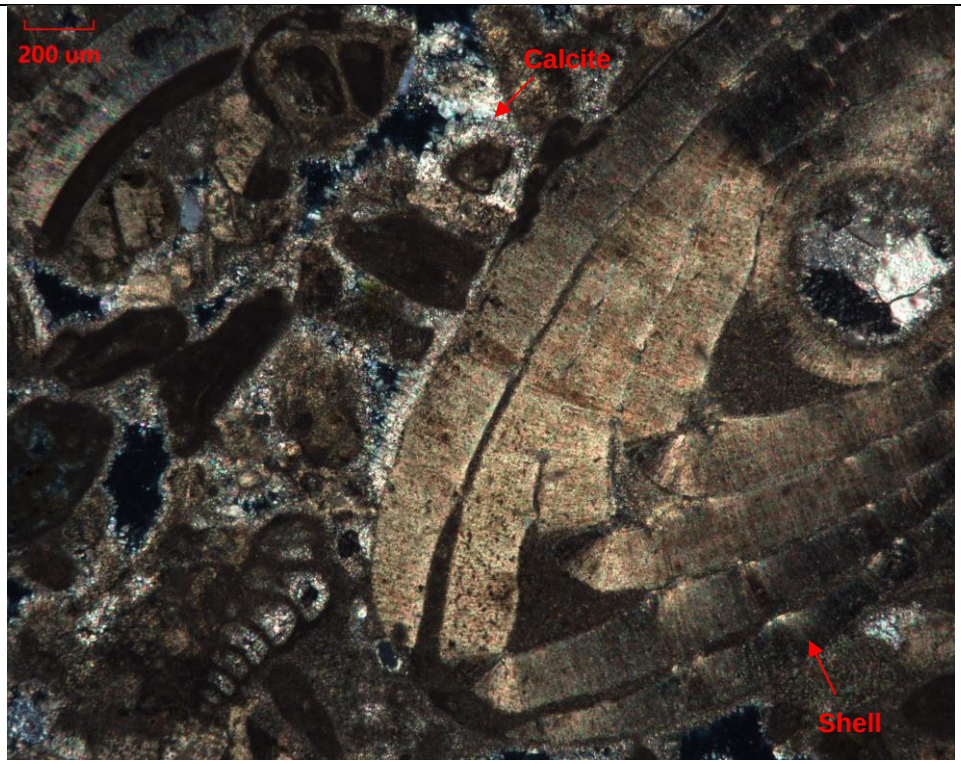
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

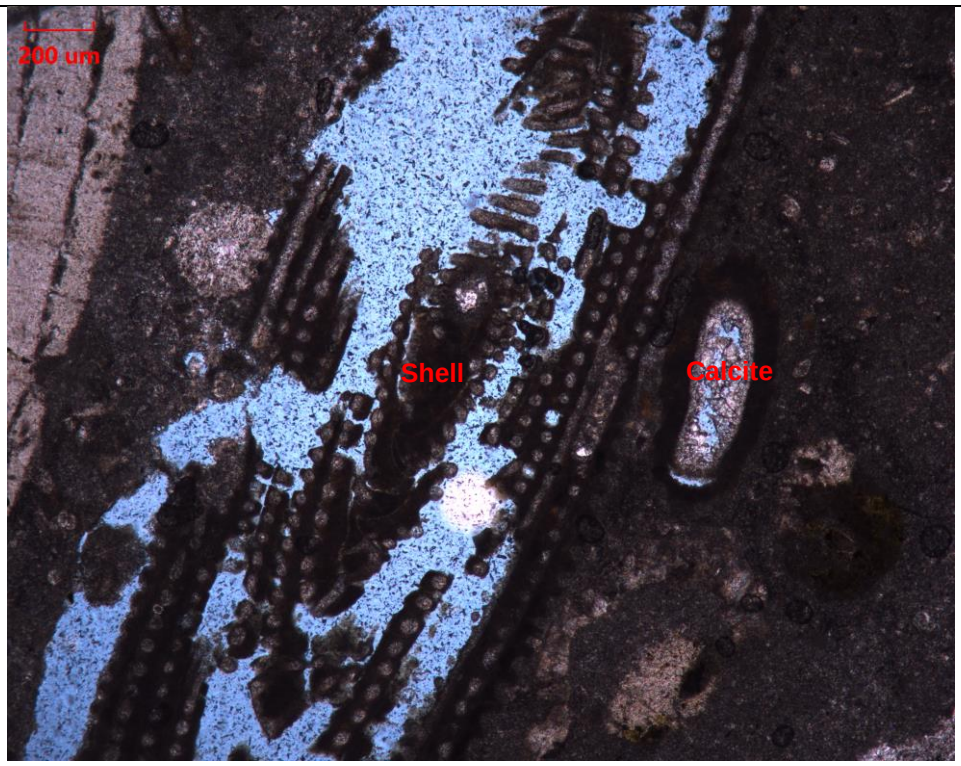
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

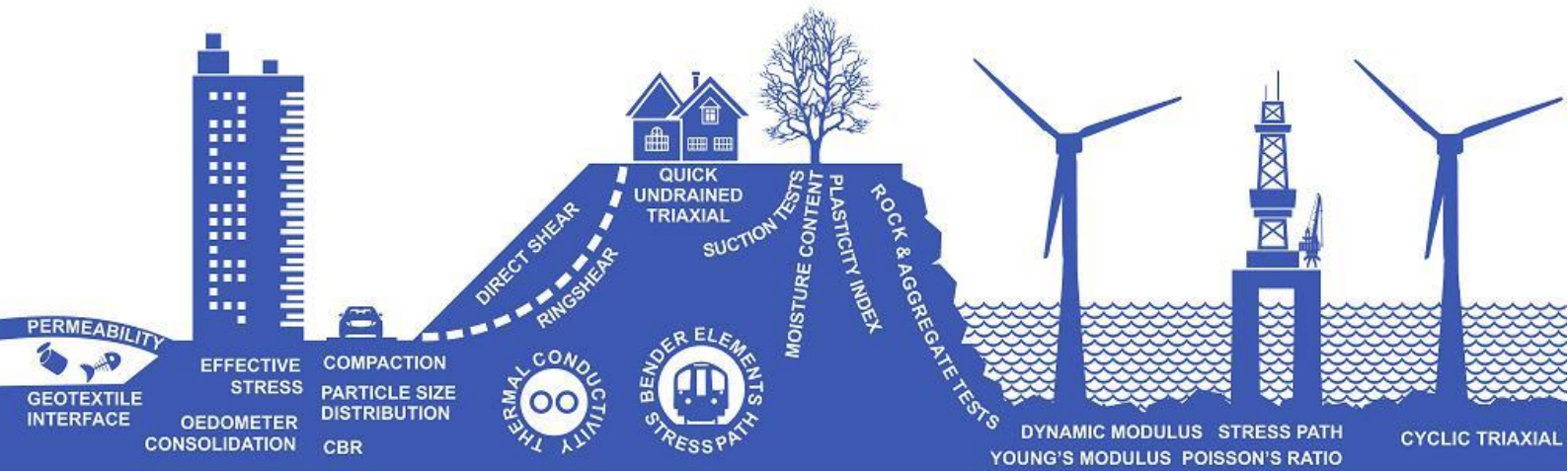
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#05A_SAMP |
| **Sample ref** | : | CR03-IS |
| **Depth (m)** | : | 2.50 - 2.90 |
| **Geolabs Sample Id** | : | 479193 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

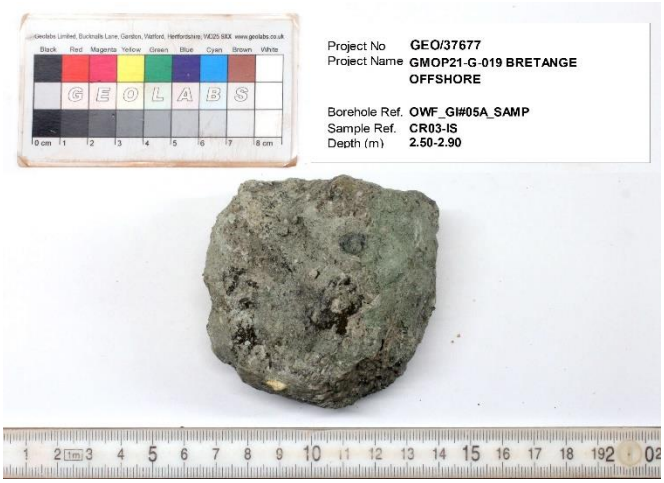


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared light grey/ green colour. The grain size of rock is classified as medium-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of matrix minerals and opaque minerals. The sample is highly weathered.

## MICRO EXAMINATION

### *Fossiliferous Glauconite Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 1.2 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms, glauconite and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (65%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (15%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Glauconite (10%)**: Well-rounded to sub-rounded, highly spherical grains of moderately soft to soft iron-rich marine clay.

**Matrix (9%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (1%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Shelly Limestone** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 65 | 1.2-0.01 |
| Calcite | 15 | 0.2-0.01 |
| Glauconite | 10 | 0.4-0.01 |
| Matrix | 9 | <0.003 |
| Opaque Mineral | 1 | 0.2-0.1 |
| **Total** | 100 | - |

## A. FINDINGS & CONCLUSIONS

The submitted rock sample is ***Fossiliferous Glauconite Limestone***. Mineral of the sample is predominantly fossil/shell (65%), calcite (15%), glauconite (10%), matrix (9%) and opaque mineral (1%).

## APPENDIX A: MICROPHOTOGRAPHS

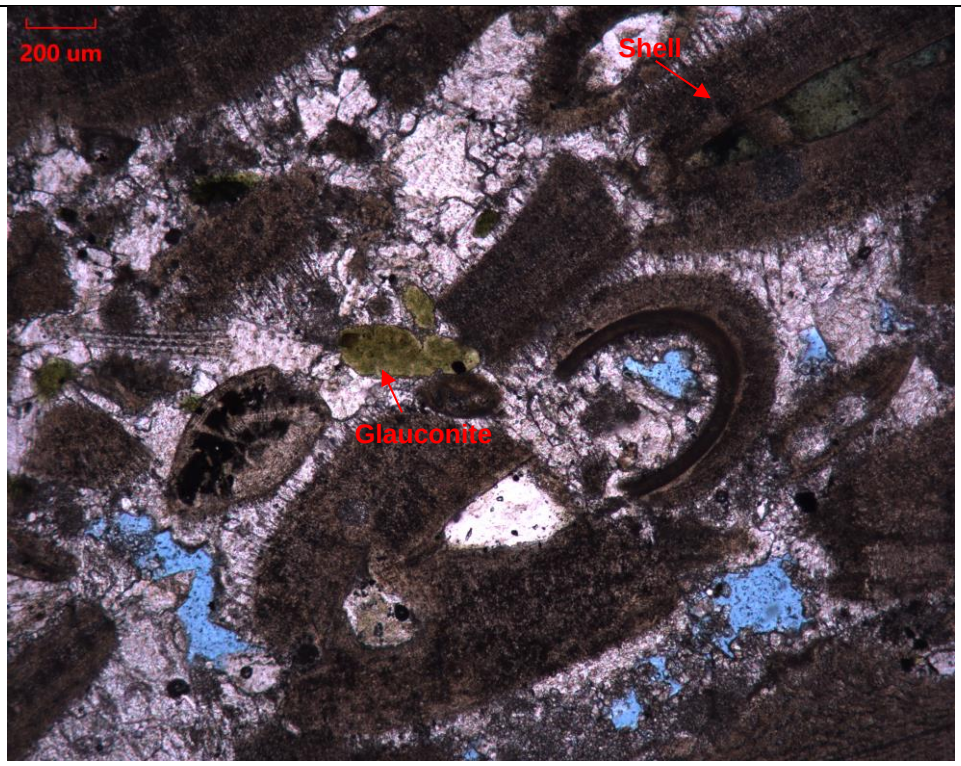
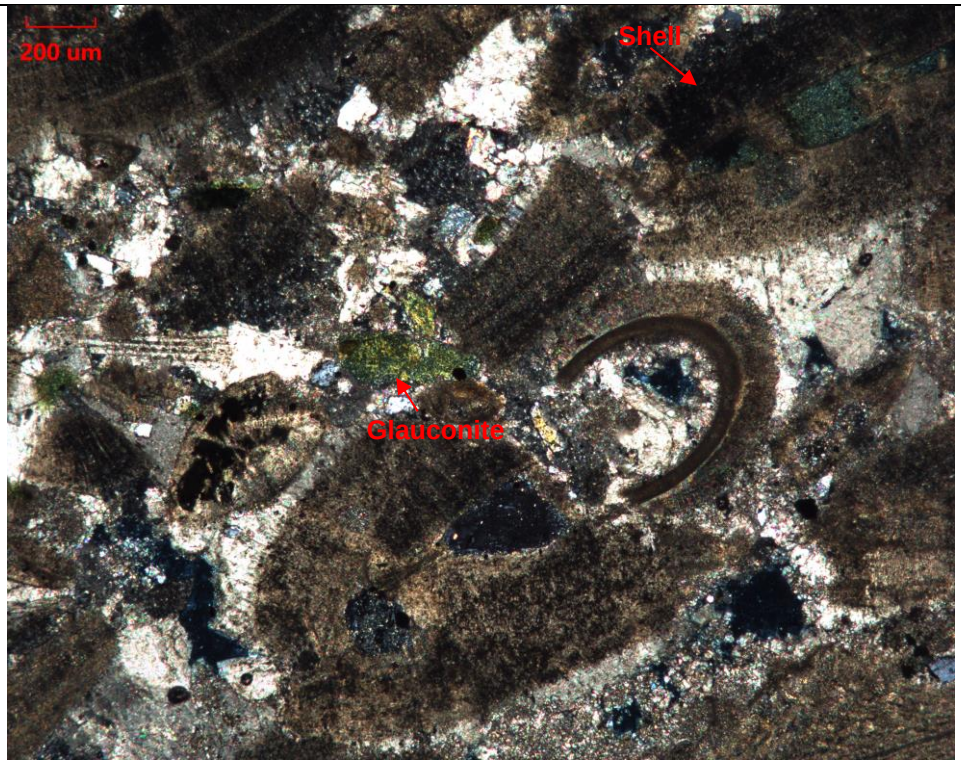
| | |
|---|---|
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral and glauconite constituents, **50X.** |  |
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral and glauconite constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

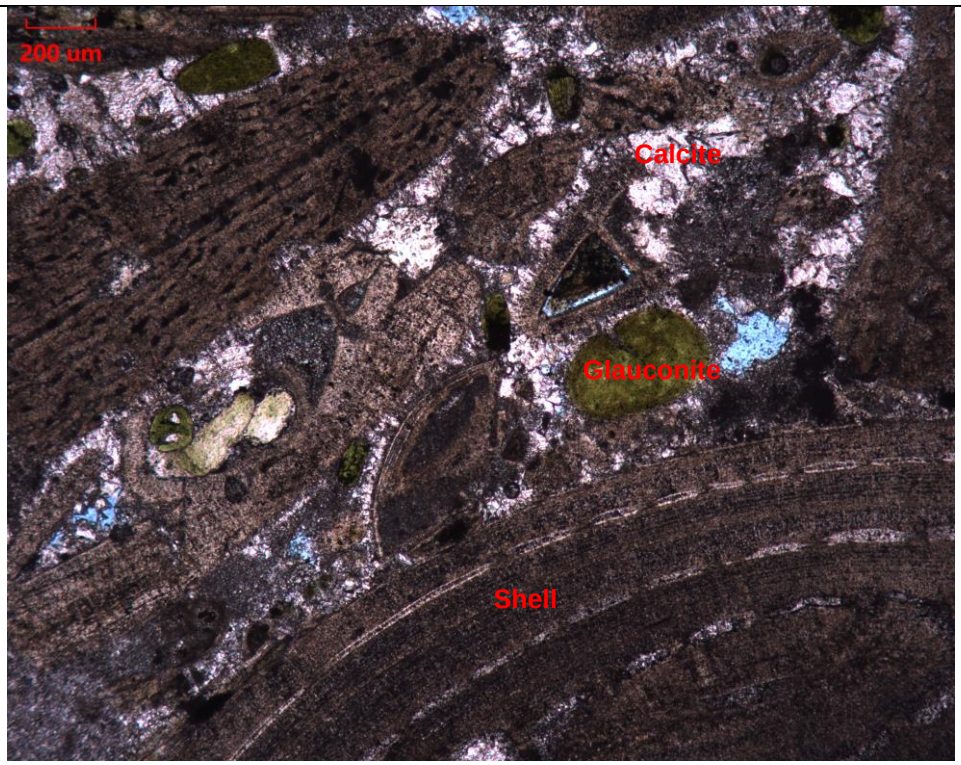
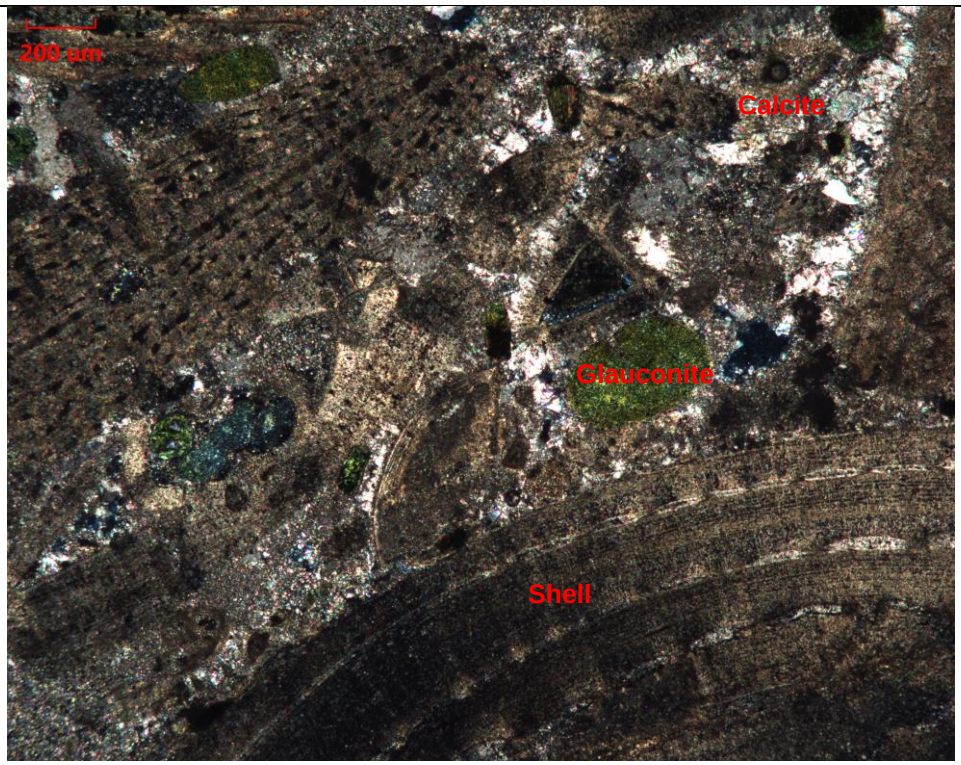
| | |
|---|---|
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral and glauconite constituents, **50X.** |  |
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral and glauconite constituents, **50X.** |  |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

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Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

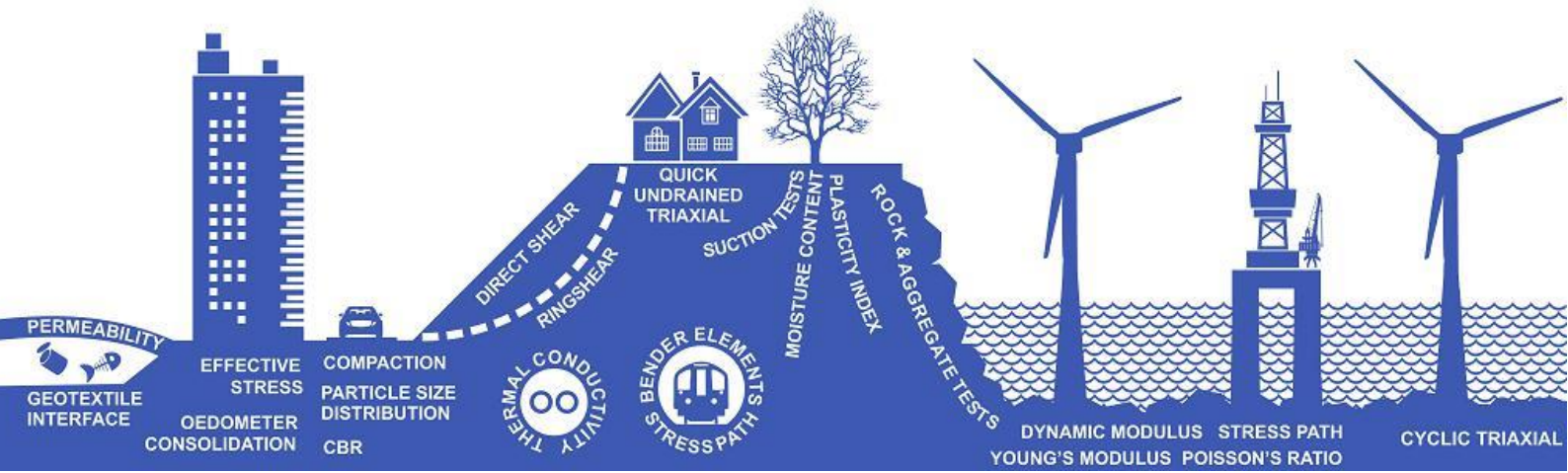
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#05B_SAMP |
| **Sample ref** | : | CR01-IS |
| **Depth (m)** | : | 5.50 - 5.50 |
| **Geolabs Sample Id** | : | 479191 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

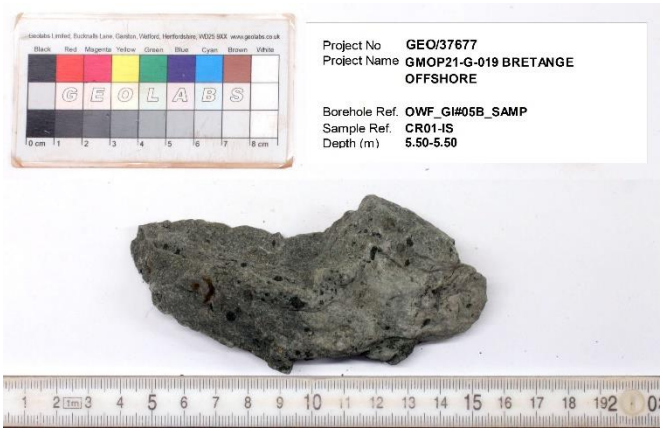


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared grey/ green colour. The grain size of rock is classified as medium-coarse grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is highly weathered.

## MICRO EXAMINATION

### *Glauconite Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.6 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals and glauconite. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (85%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Glauconite (13%)**: Well-rounded to sub-rounded, highly spherical grains of moderately soft to soft iron-rich marine clay.

**Clay (1%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (1%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 85 | 0.4-0.01 |
| Glauconite | 13 | 0.6-0.01 |
| Clay | 1 | <0.003 |
| Opaque Mineral | 1 | 0.2-0.1 |
| **Total** | 100 | - |

## FINDINGS & CONCLUSIONS

The submitted rock sample is ***Glauconite Dolomite***. Mineral of the sample is predominantly carbonate minerals (85%), glauconite (13%), clay (1%) and opaque mineral (1%).

## APPENDIX A: MICROPHOTOGRAPHS

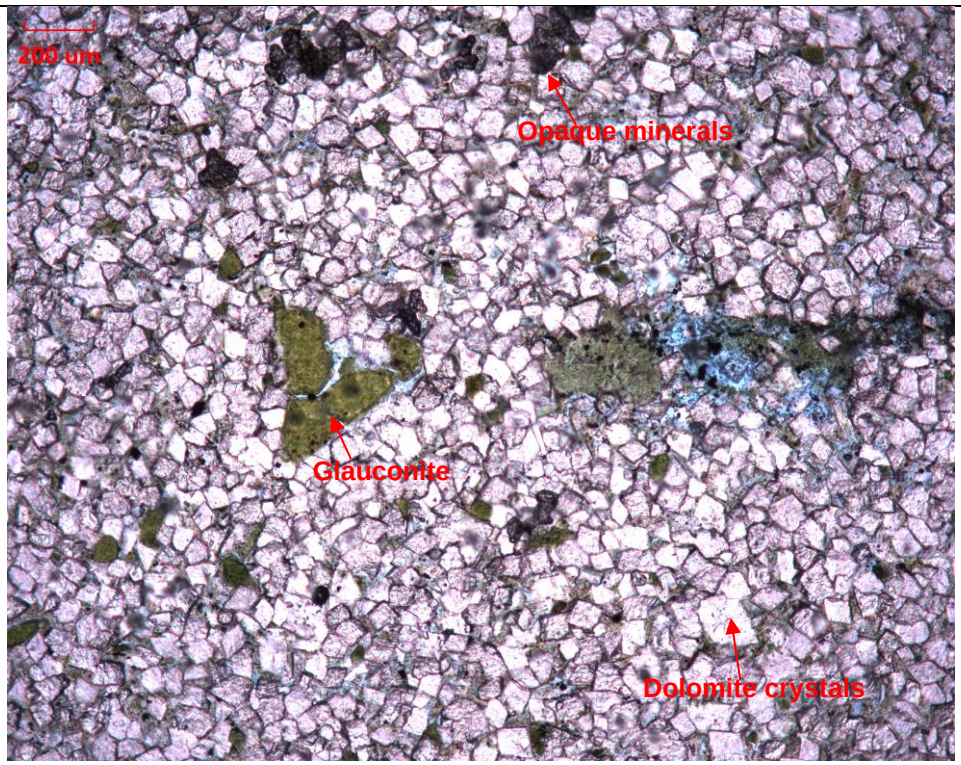
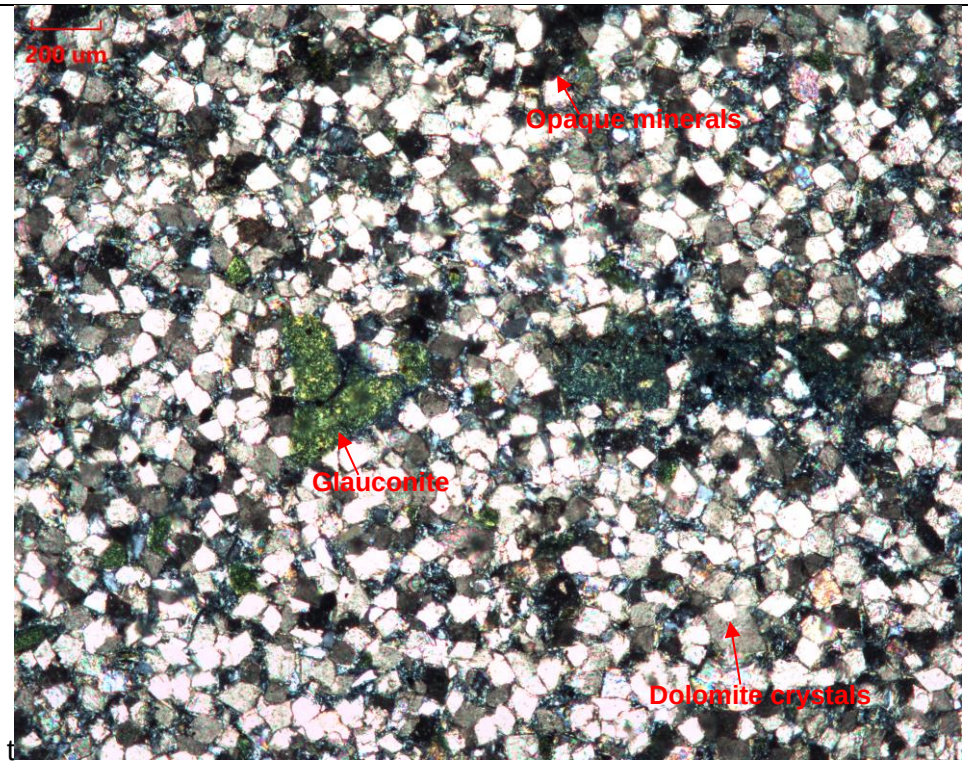
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals, glauconite, opaque minerals and clay constituents, **50X**. |   |
| Photomicrograph of carbonate minerals, dolomite crystals, glauconite, opaque minerals and clay constituents, **50X**. |   |

*Figure 1. Plane and crossed polarized photos*

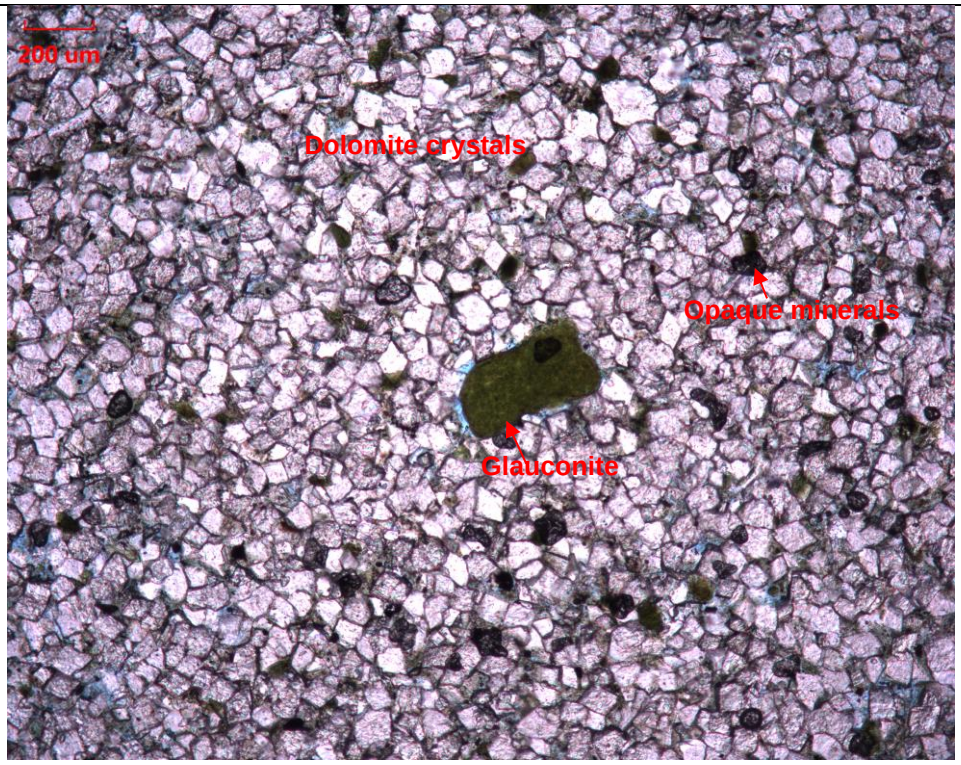
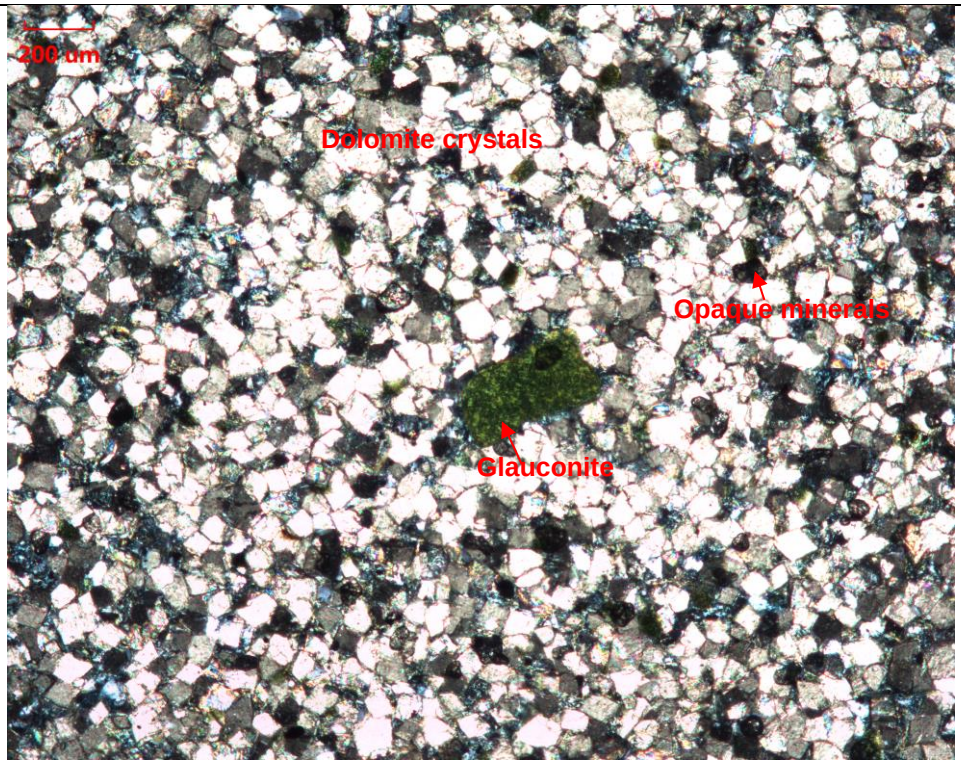
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals, glauconite, opaque minerals and clay constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals, glauconite, opaque minerals and clay constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

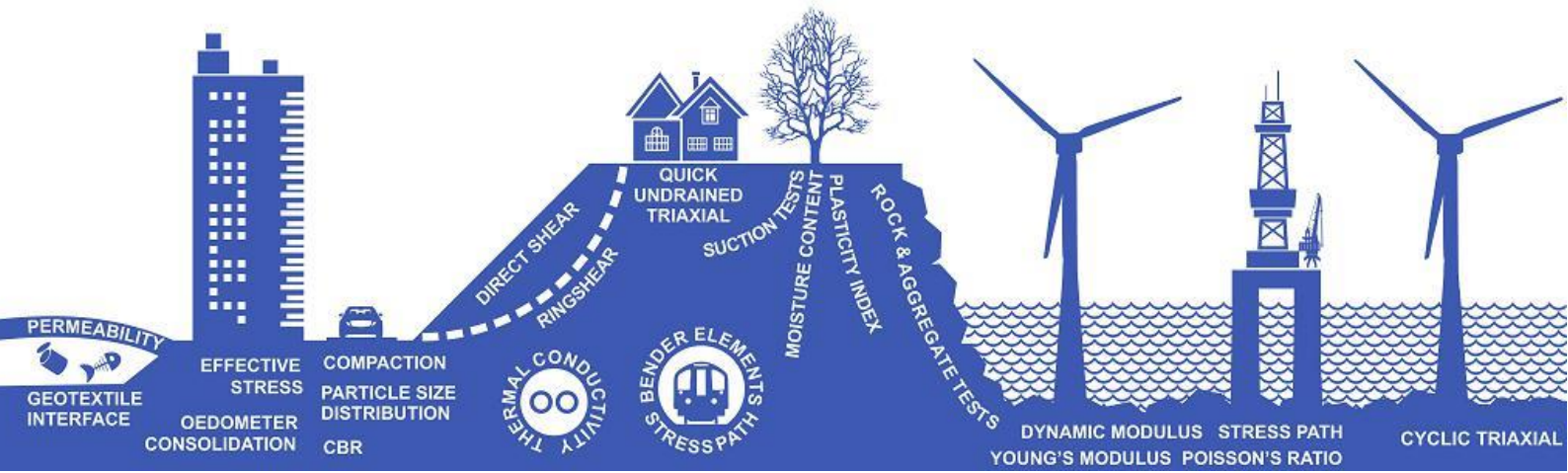
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#14_SAMP |
| **Sample ref** | : | CR03-IS |
| **Depth (m)** | : | 2.00 - 2.10 |
| **Geolabs Sample Id** | : | 479148 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION


The submitted sample is generally appeared grey/ green colour. The grain size of rock is classified as medium-coarse grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is highly weathered.

## MICRO EXAMINATION

### *Glauconite Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.6 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals and glauconite. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (92%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Glauconite (5%)**: Well-rounded to sub-rounded, highly spherical grains of moderately soft to soft iron-rich marine clay.

**Clay (1%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 92 | 0.4-0.01 |
| Glauconite | 5 | 0.6-0.01 |
| Clay | 1 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## FINDINGS & CONCLUSIONS

The submitted rock sample is ***Glauconite Dolomite***. Mineral of the sample is predominantly carbonate minerals (92%), glauconite (5%), clay (1%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

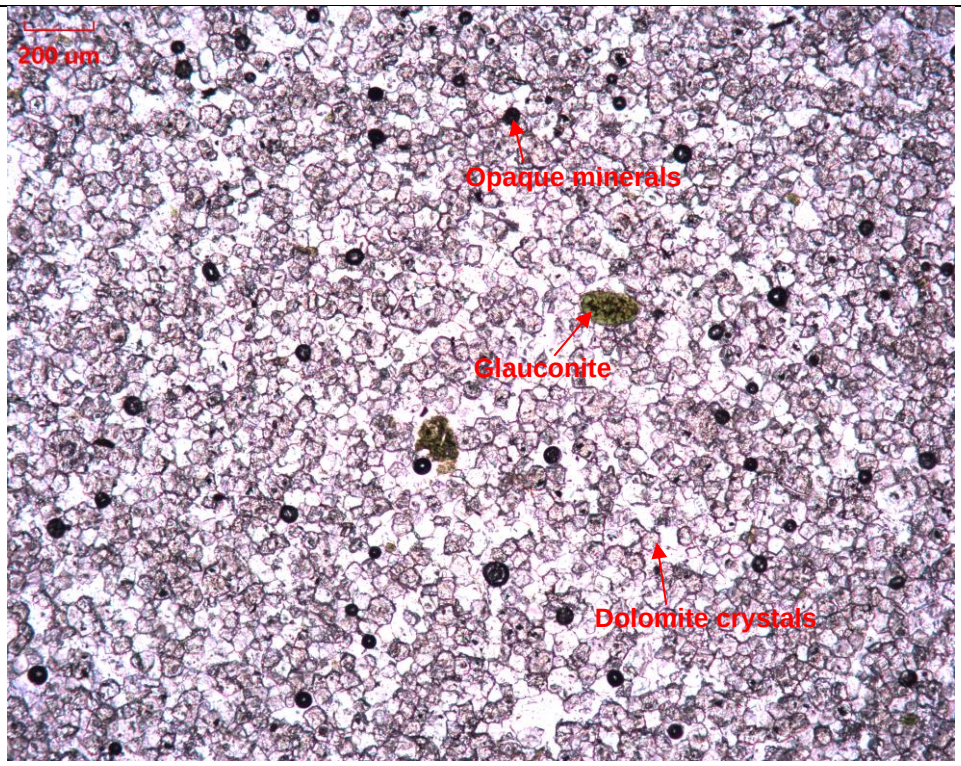
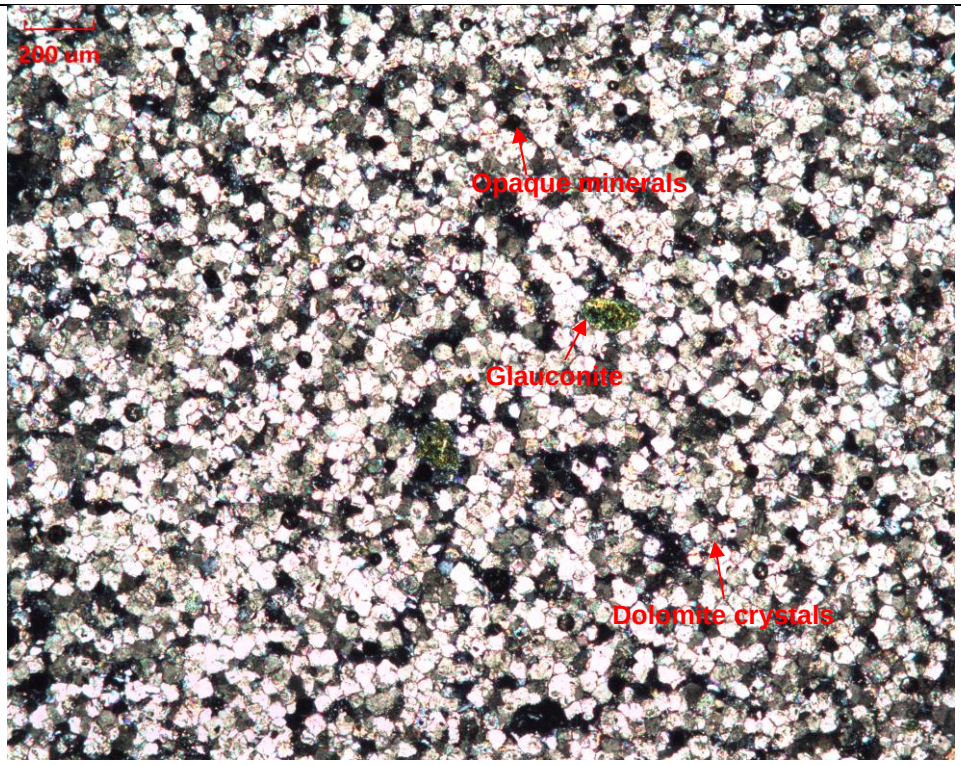
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals, glauconite, opaque minerals and clay constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals, glauconite, opaque minerals and clay constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

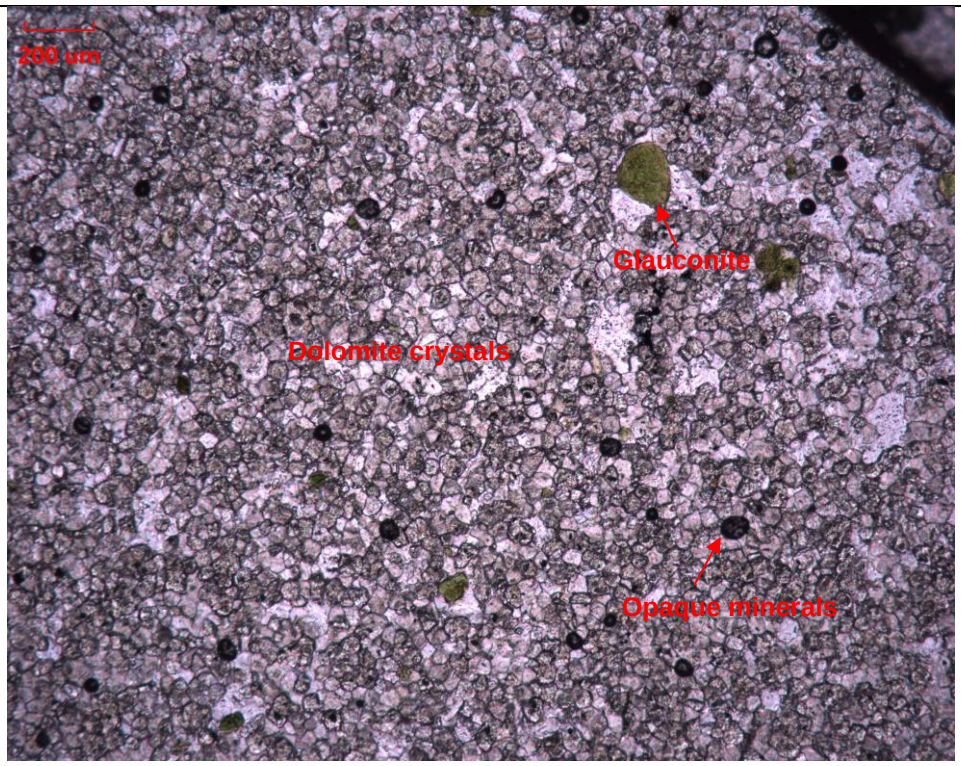
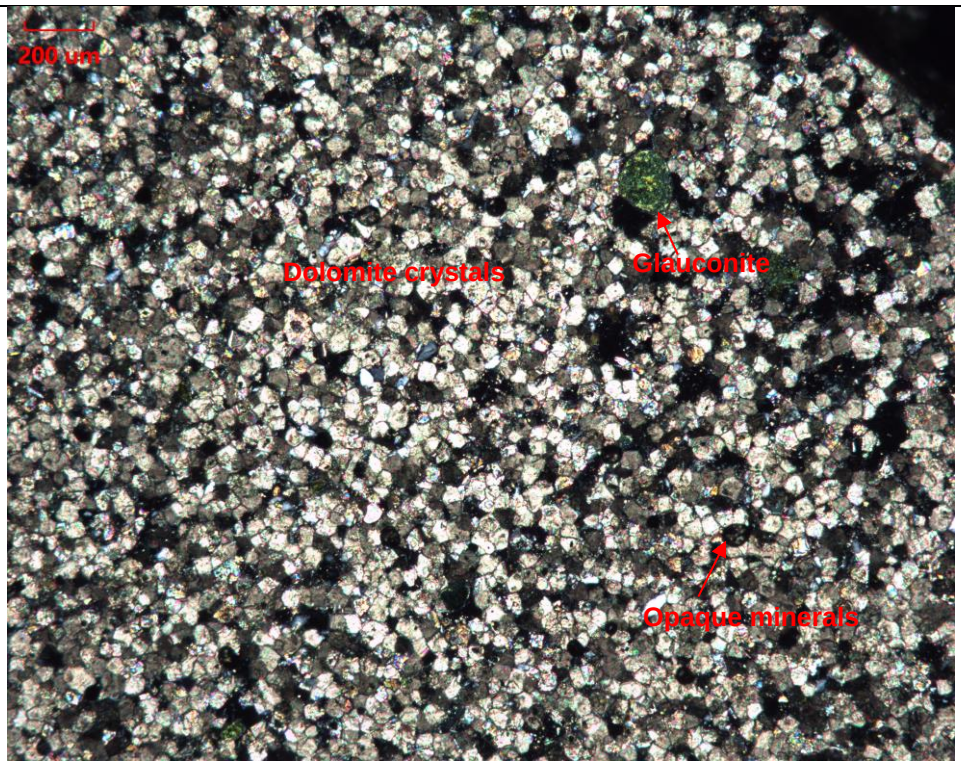
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals, glauconite, opaque minerals and clay constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals, glauconite, opaque minerals and clay constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

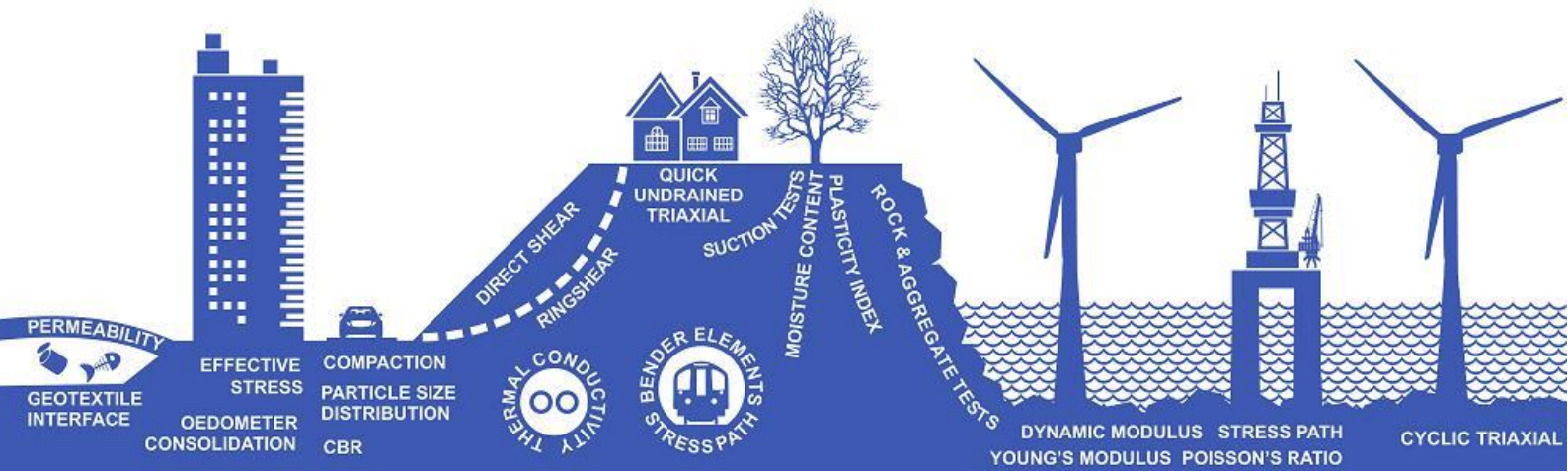
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#09_SAMP |
| **Sample ref** | : | CR01-IS |
| **Depth (m)** | : | 0.00 - 0.00 |
| **Geolabs Sample Id** | : | 479173 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION


The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## C. MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (94.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (3%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 94.5 | 0.4-0.01 |
| Clay | 3 | <0.003 |
| Opaque Mineral | 2.5 | 0.2-0.1 |
| **Total** | 100 | - |

## D. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (94.5%), clay (3%) and opaque mineral (2.5%).

## APPENDIX A: MICROPHOTOGRAPHS

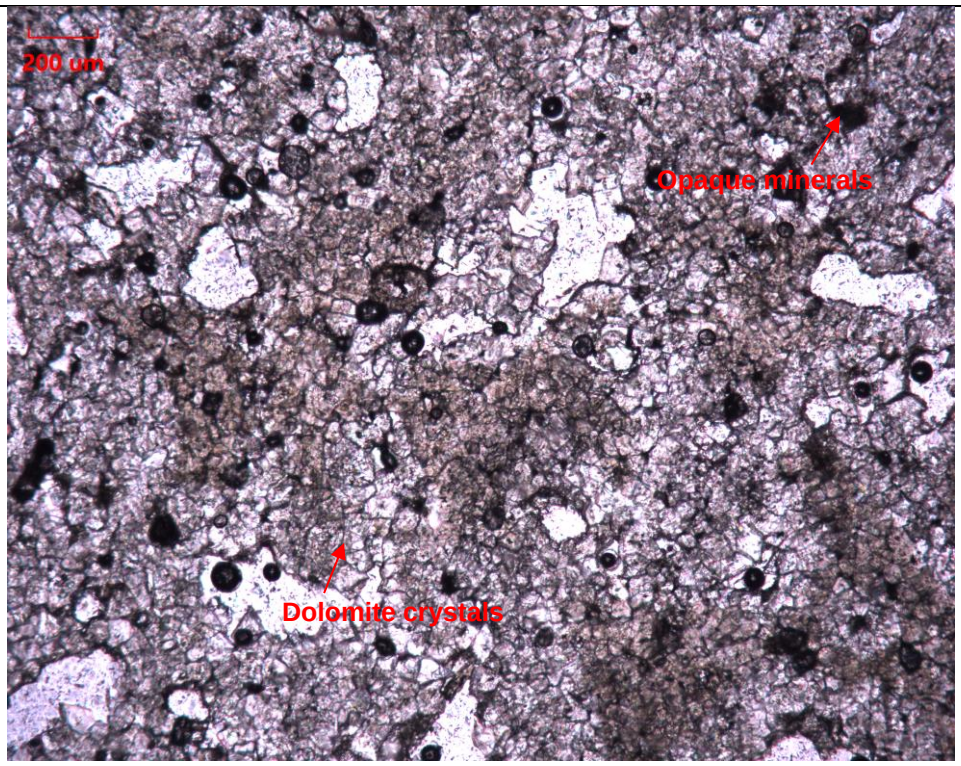
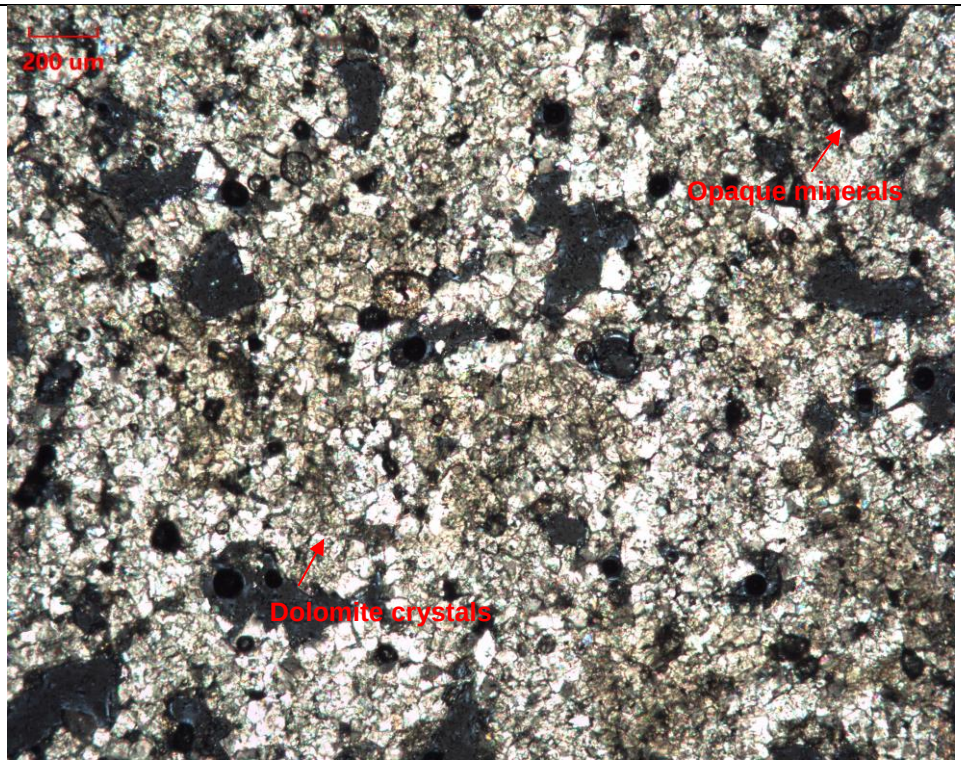
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

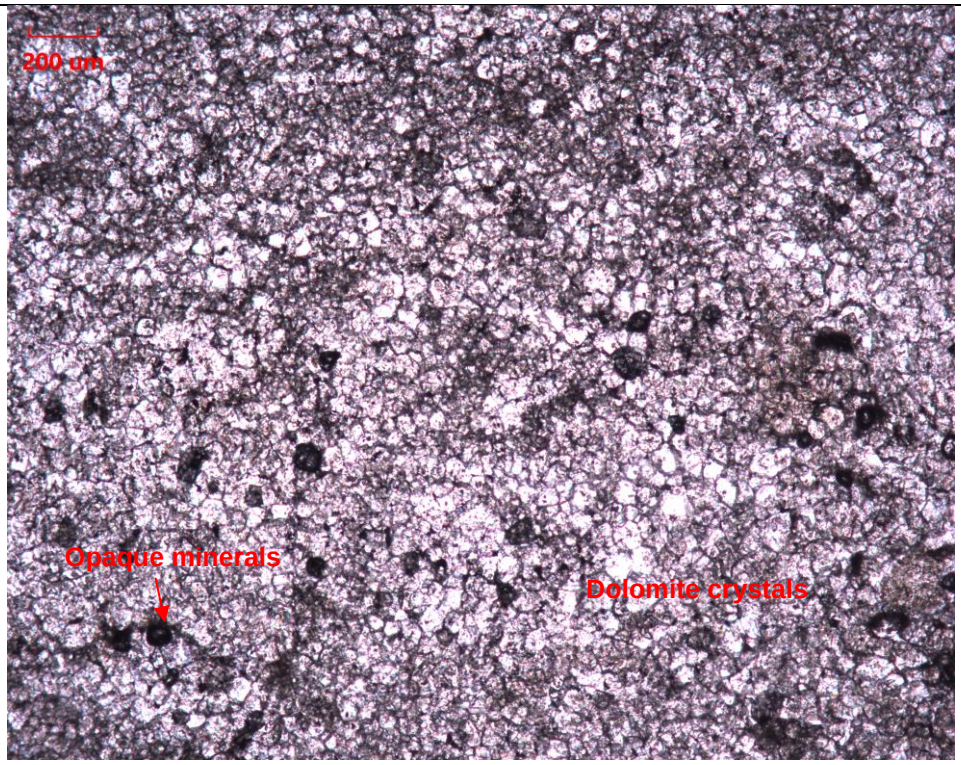
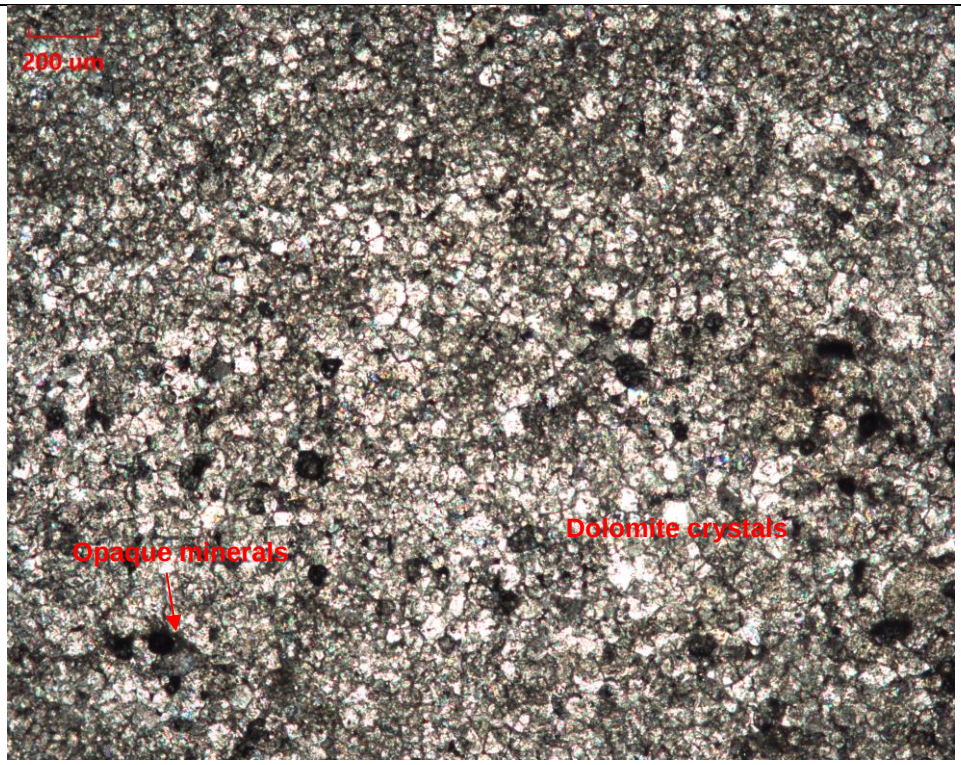
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |   |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |   |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
www.geolabs.co.uk

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Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

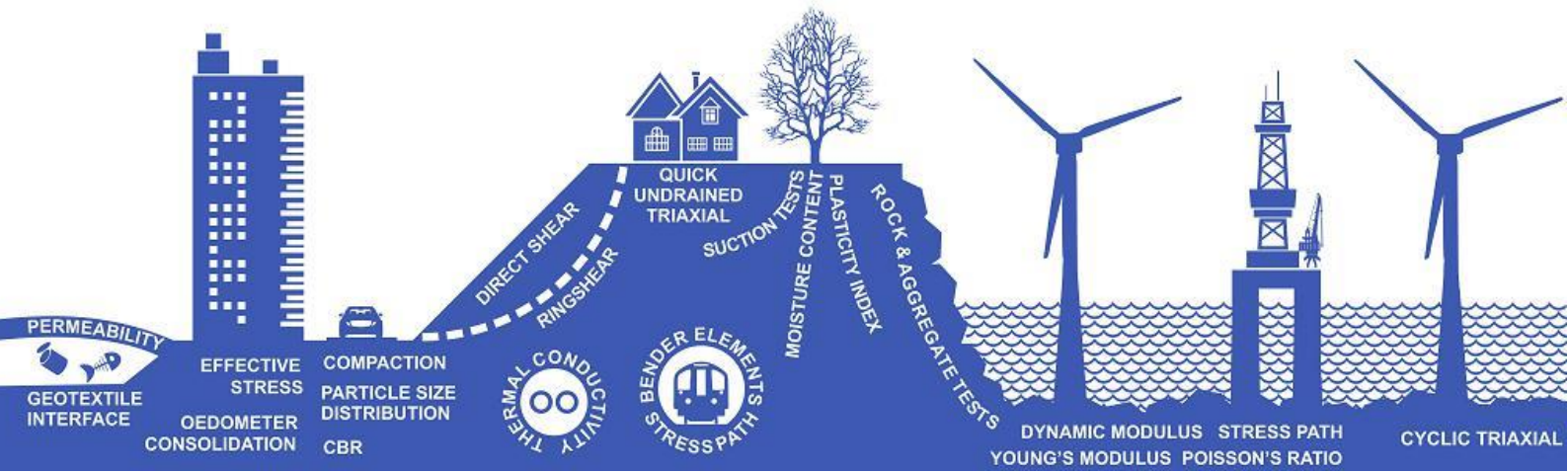
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#09_SAMP |
| **Sample ref** | : | CR05-IS |
| **Depth (m)** | : | 4.00 - 4.00 |
| **Geolabs Sample Id** | : | 479176 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

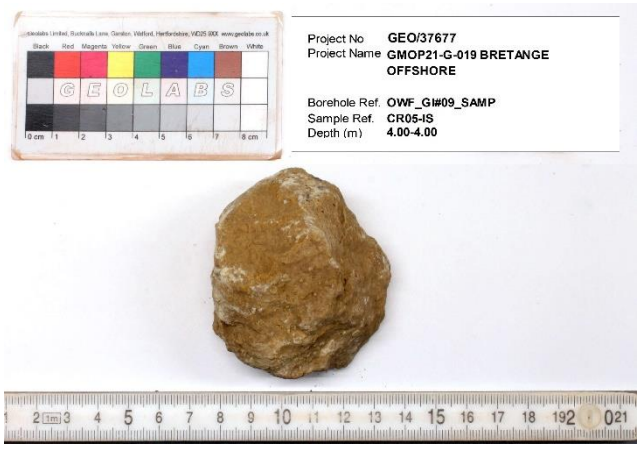


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## A. MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.2 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (95.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (2%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 95.5 | 0.2-0.01 |
| Clay | 2 | <0.003 |
| Opaque Mineral | 2.5 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (95.5%), clay (2%) and opaque mineral (2.5%).

## APPENDIX A: MICROPHOTOGRAPHS

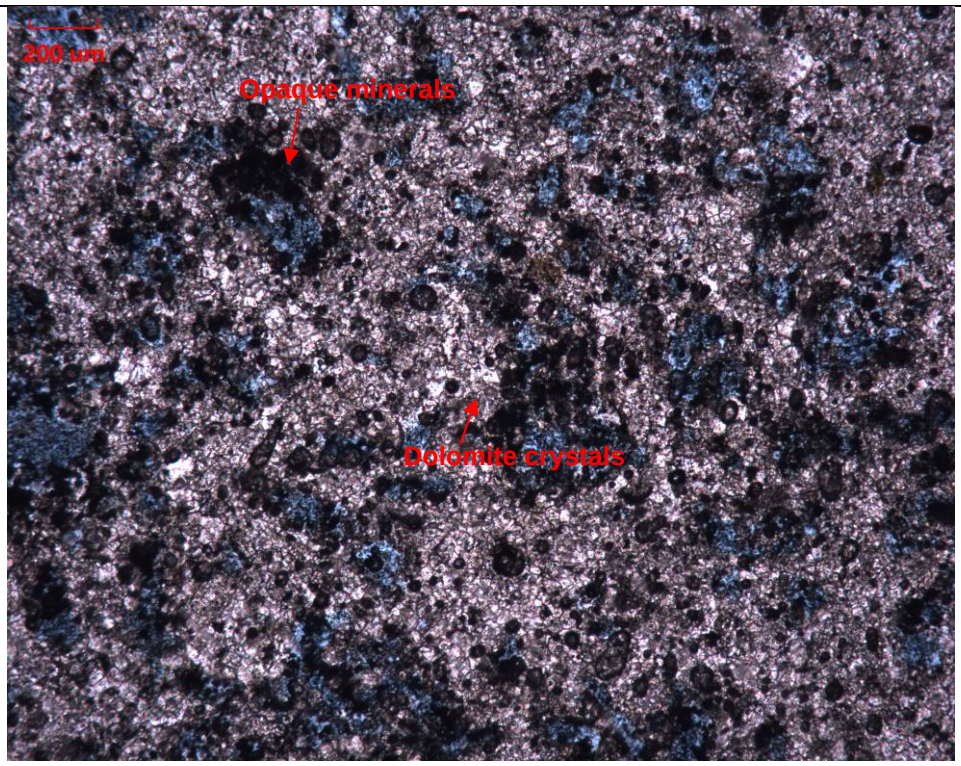
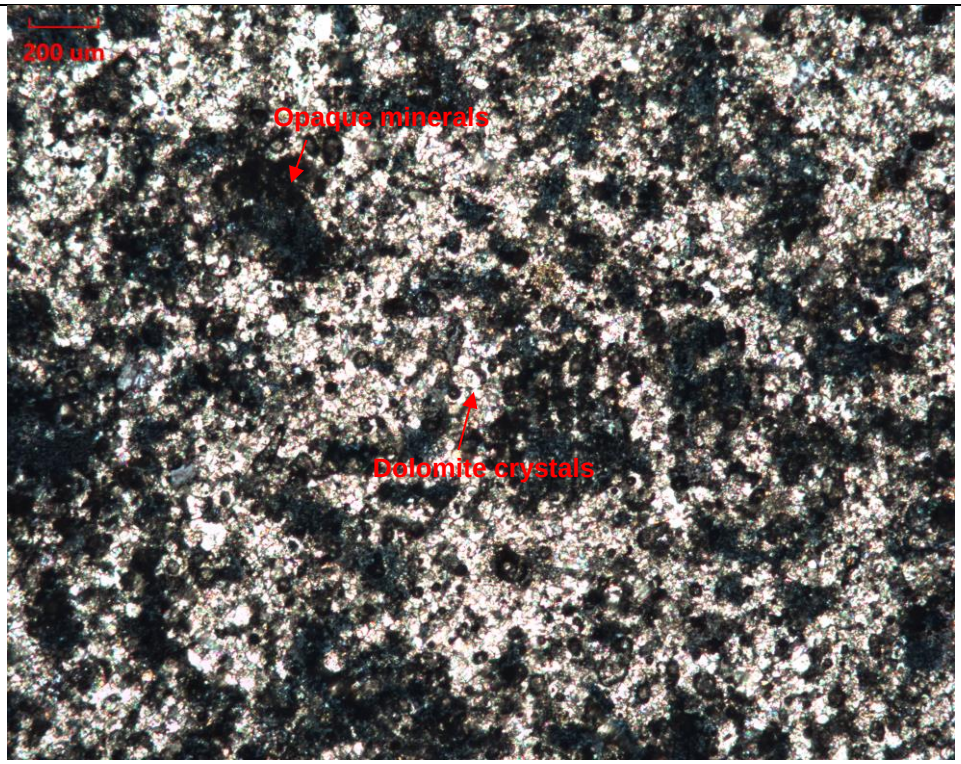
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

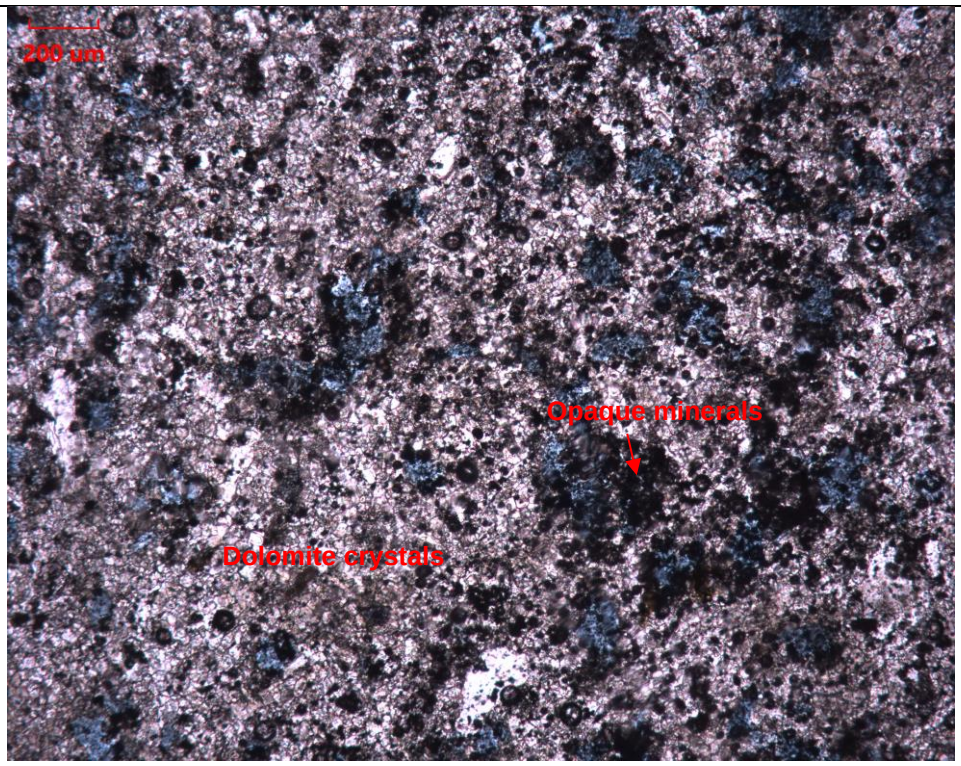
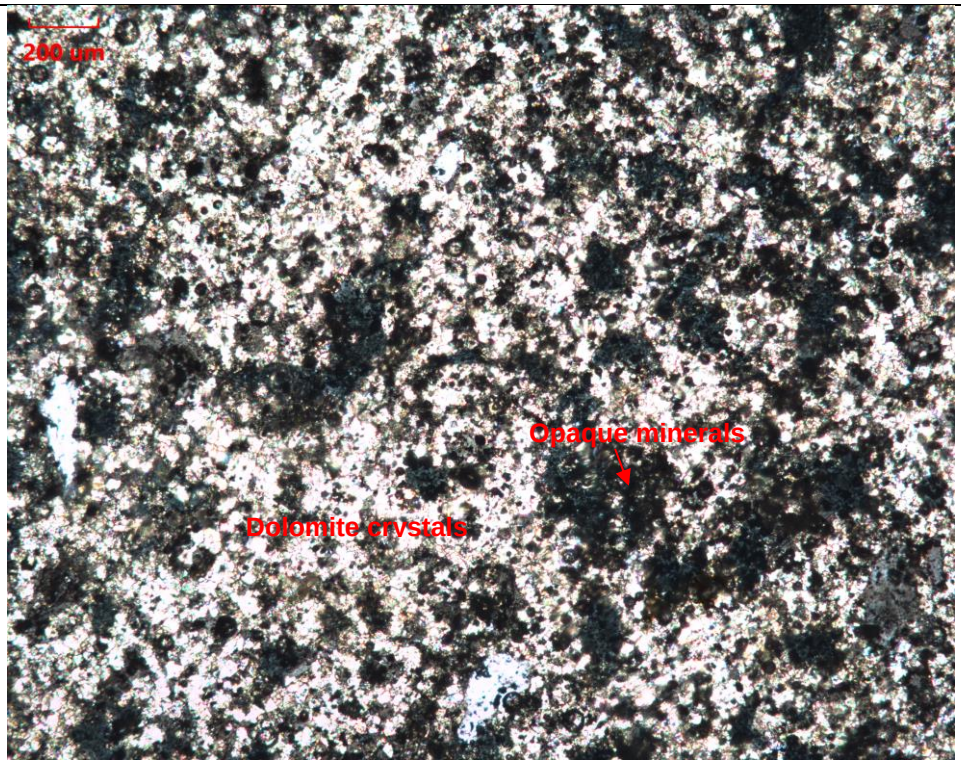
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
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Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

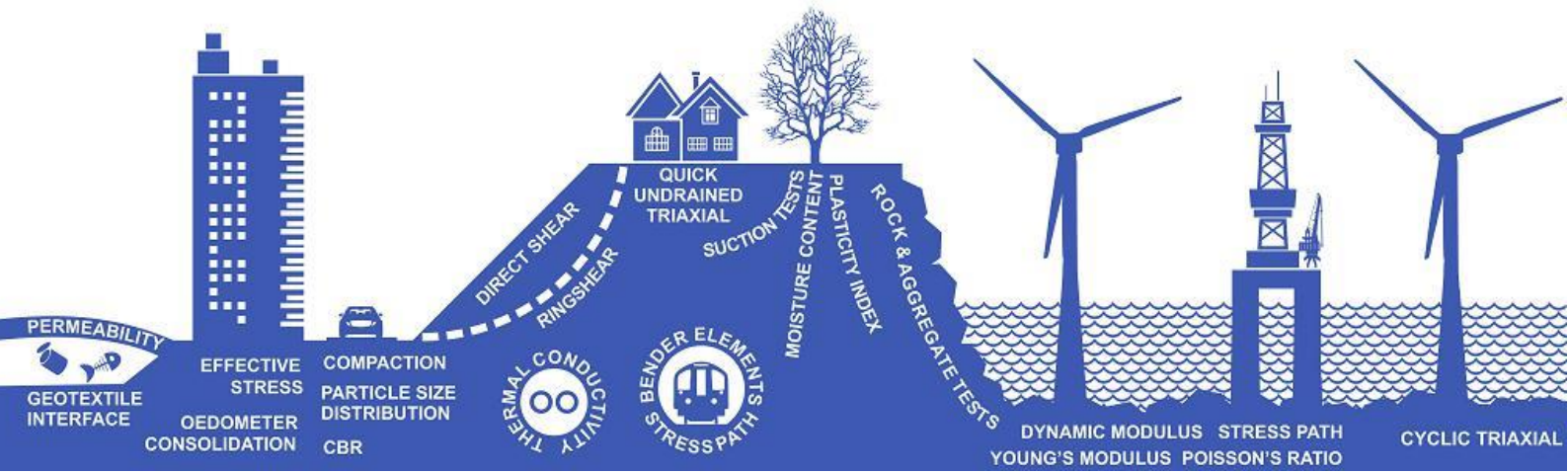
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#09_SAMP |
| **Sample ref** | : | CR12-IS |
| **Depth (m)** | : | 11.00 - 11.10 |
| **Geolabs Sample Id** | : | 479172 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

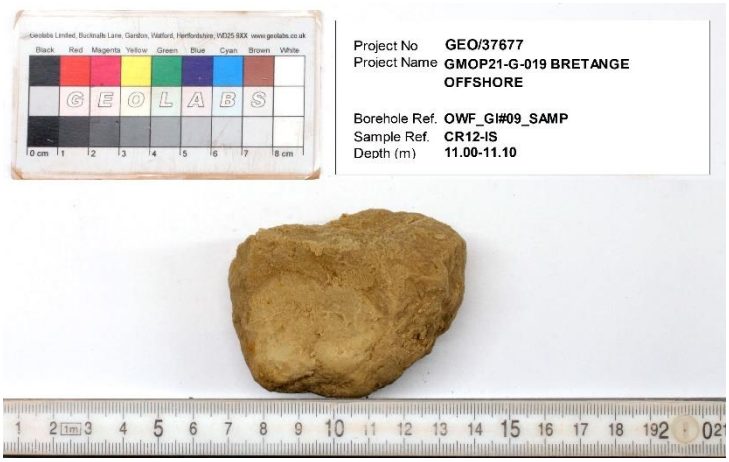


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (93.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (4%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Dolomite | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 93.5 | 0.4-0.01 |
| Clay | 4 | <0.003 |
| Opaque Mineral | 2.5 | 0.2-0.1 |
| **Total** | 100 | - |

## FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (93.5%), clay (4%) and opaque mineral (2.5%).

## APPENDIX A: MICROPHOTOGRAPHS

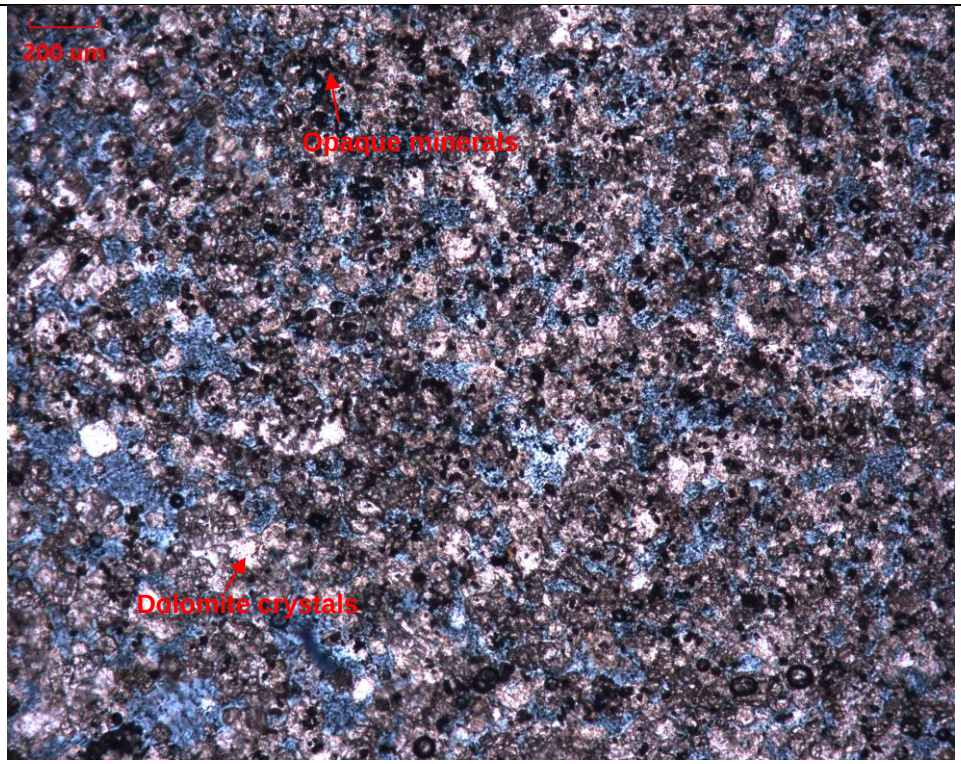
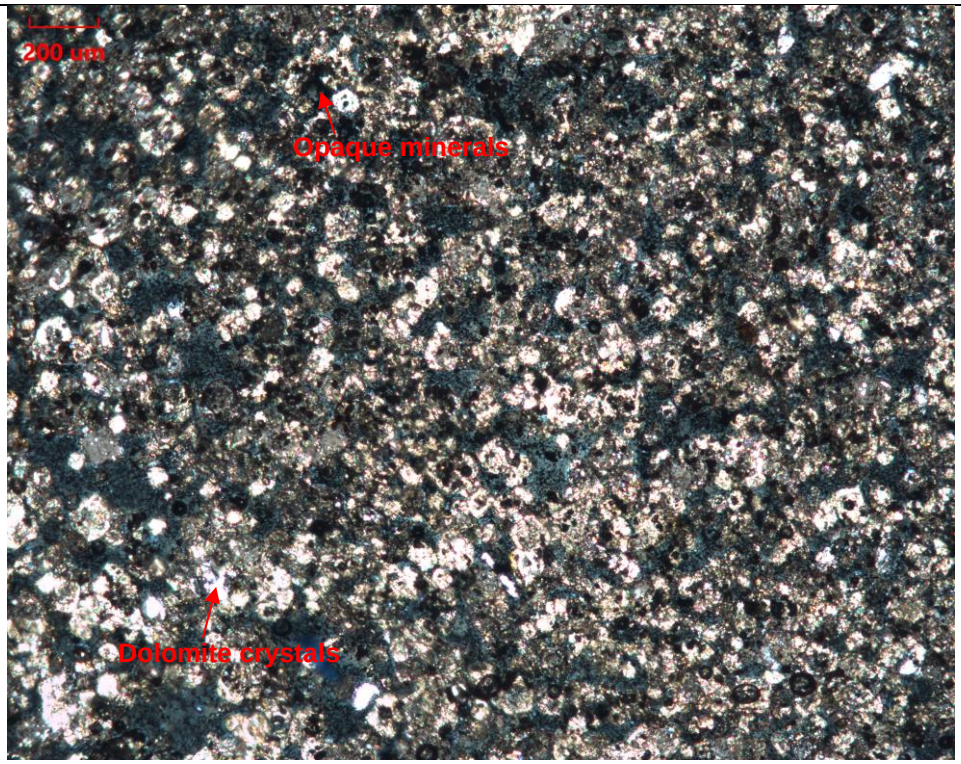
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

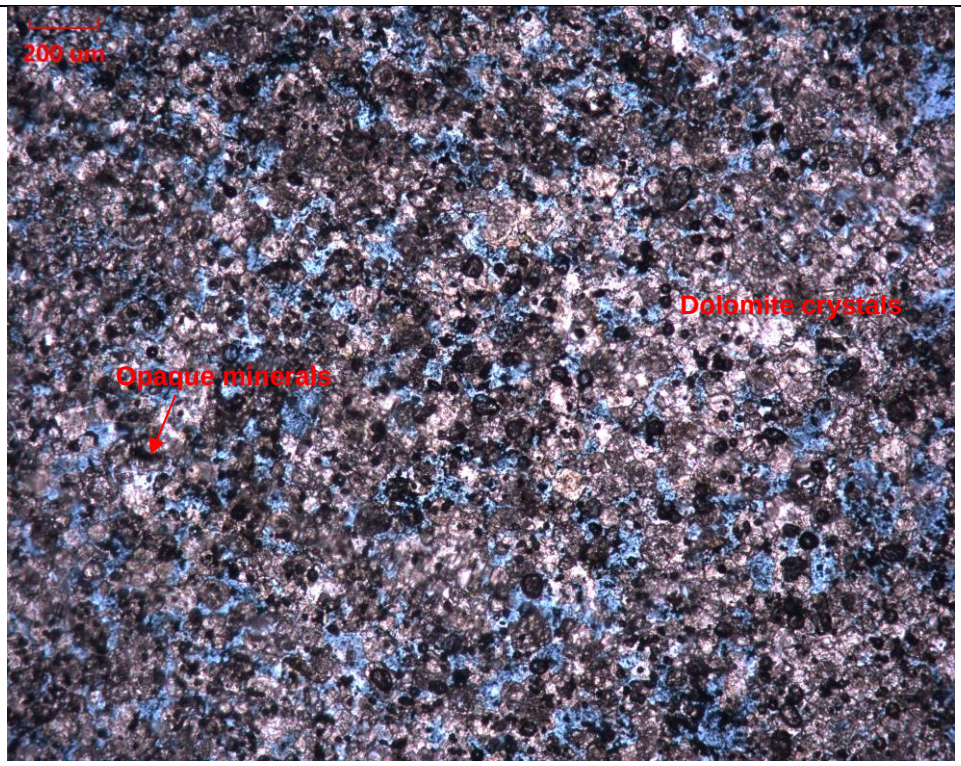
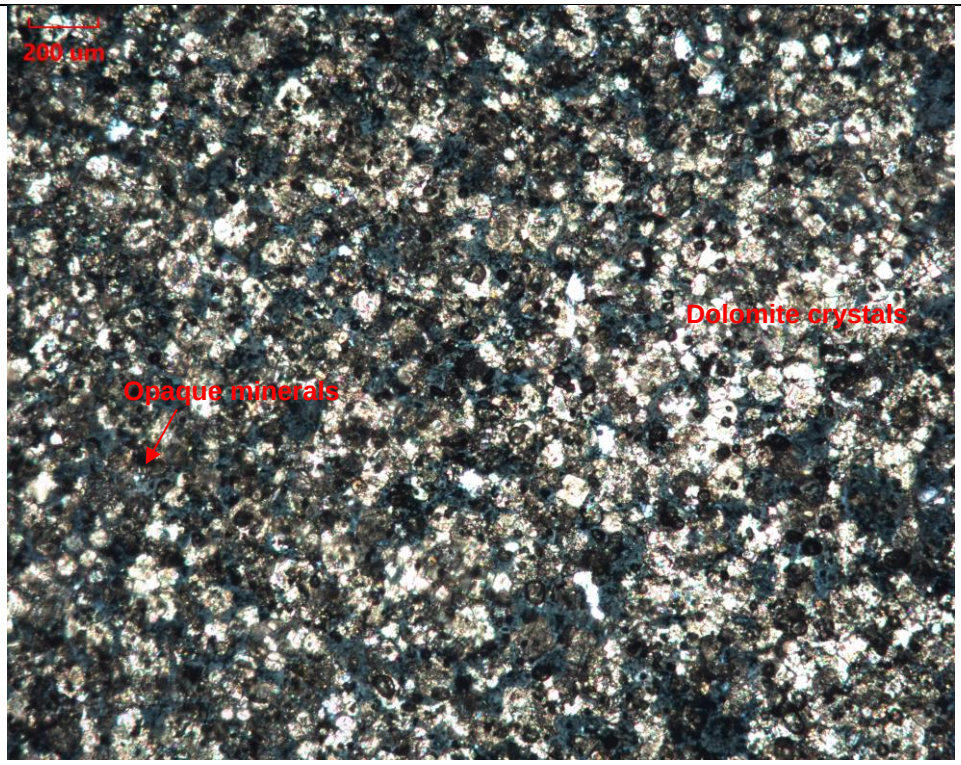
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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www.geolabs.co.uk

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Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

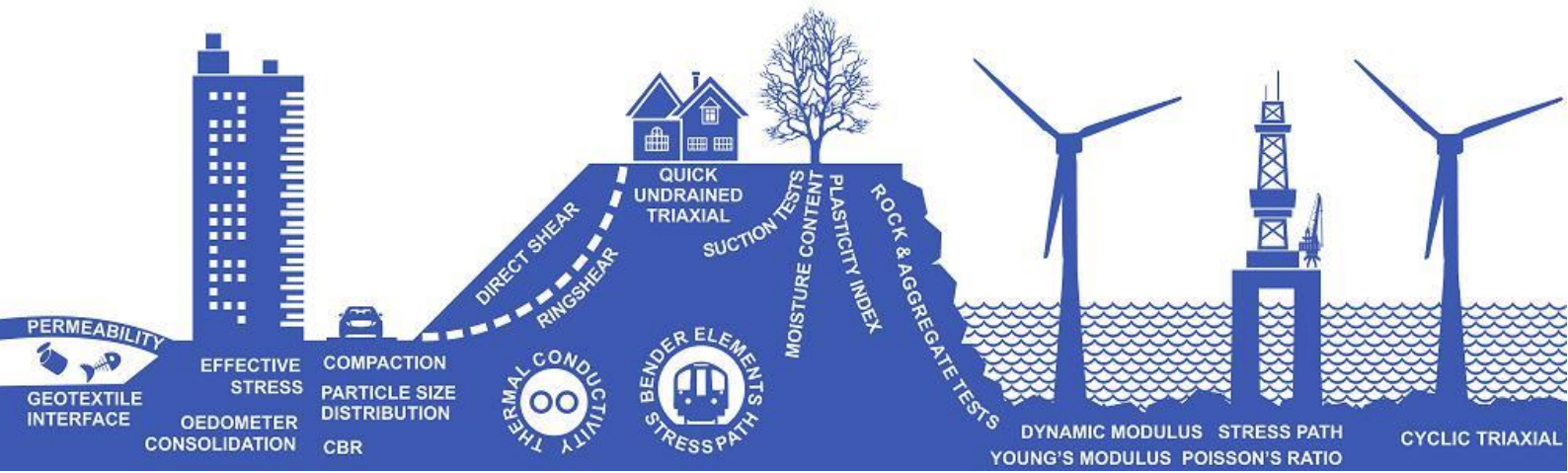
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#09_SAMP |
| **Sample ref** | : | CR14-IS |
| **Depth (m)** | : | 13.00 - 13.10 |
| **Geolabs Sample Id** | : | 479174 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

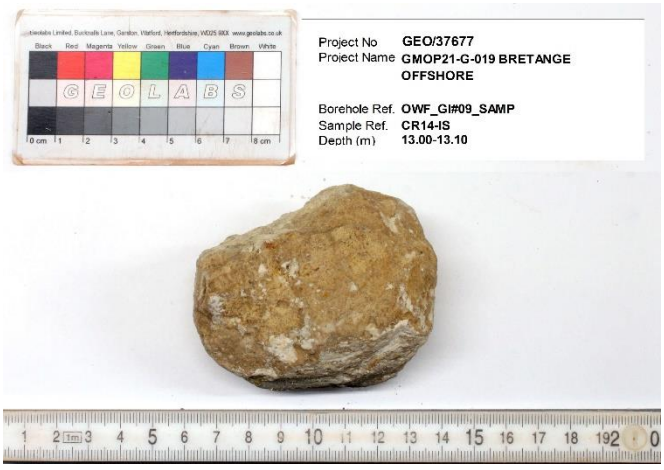


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## C. MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

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**Opaque Mineral (2.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Dolomite | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 94.5 | 0.4-0.01 |
| Clay | 3 | <0.003 |
| Opaque Mineral | 2.5 | 0.2-0.1 |
| **Total** | 100 | - |

## D. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (94.5%), clay (3%) and opaque mineral (2.5%).

## APPENDIX A: MICROPHOTOGRAPHS

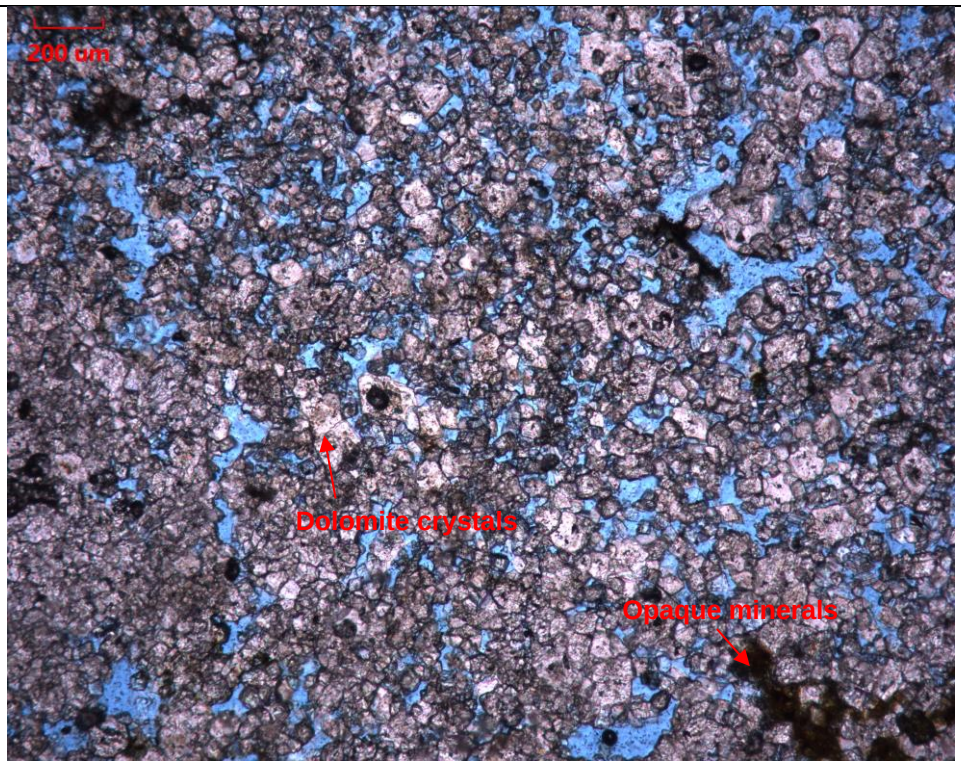
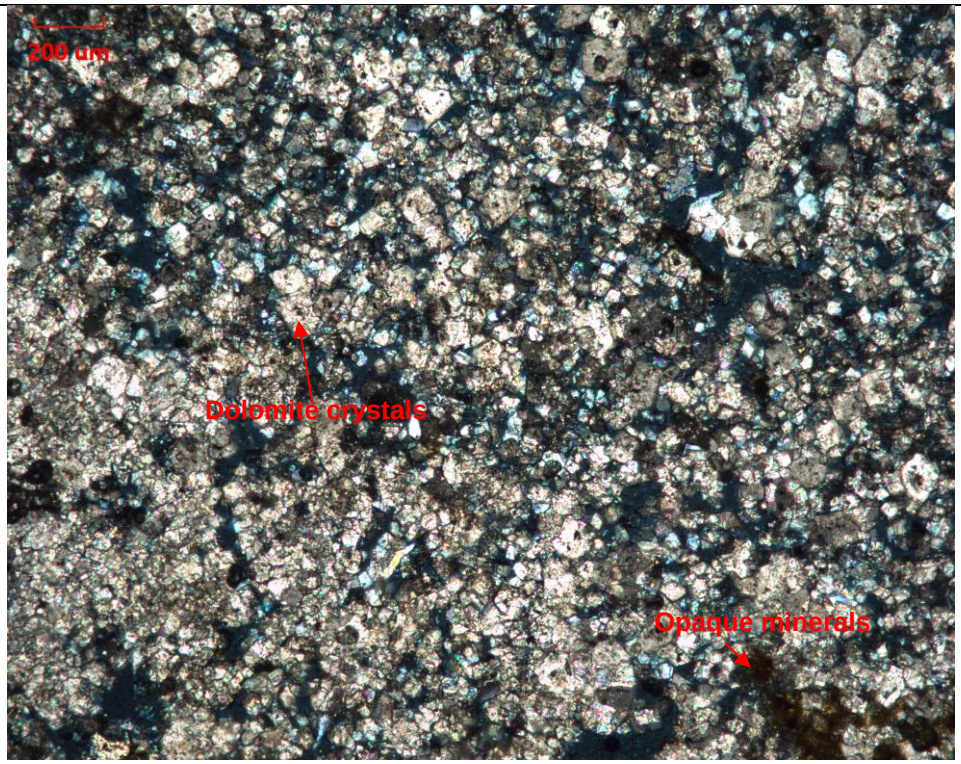
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

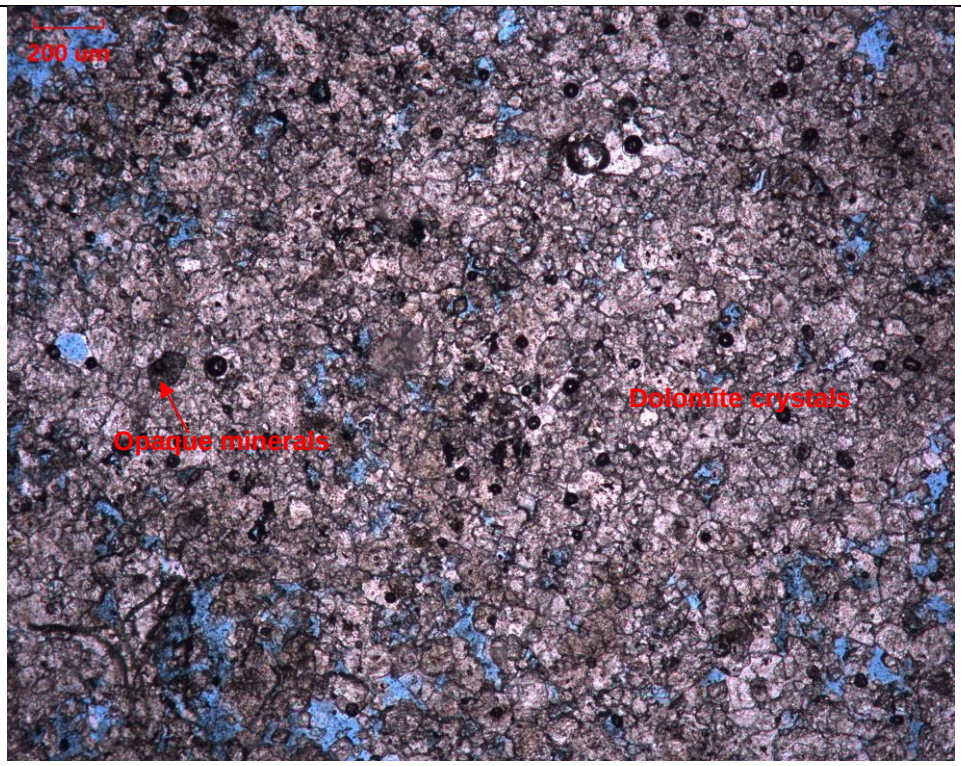
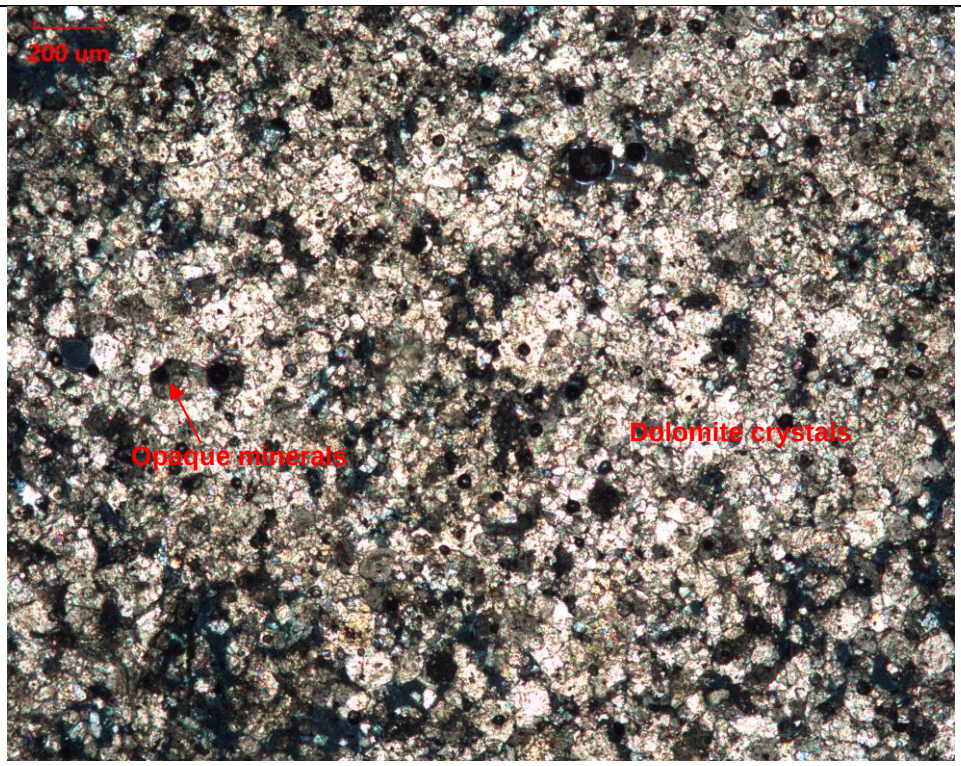
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

Geolabs Ltd
+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

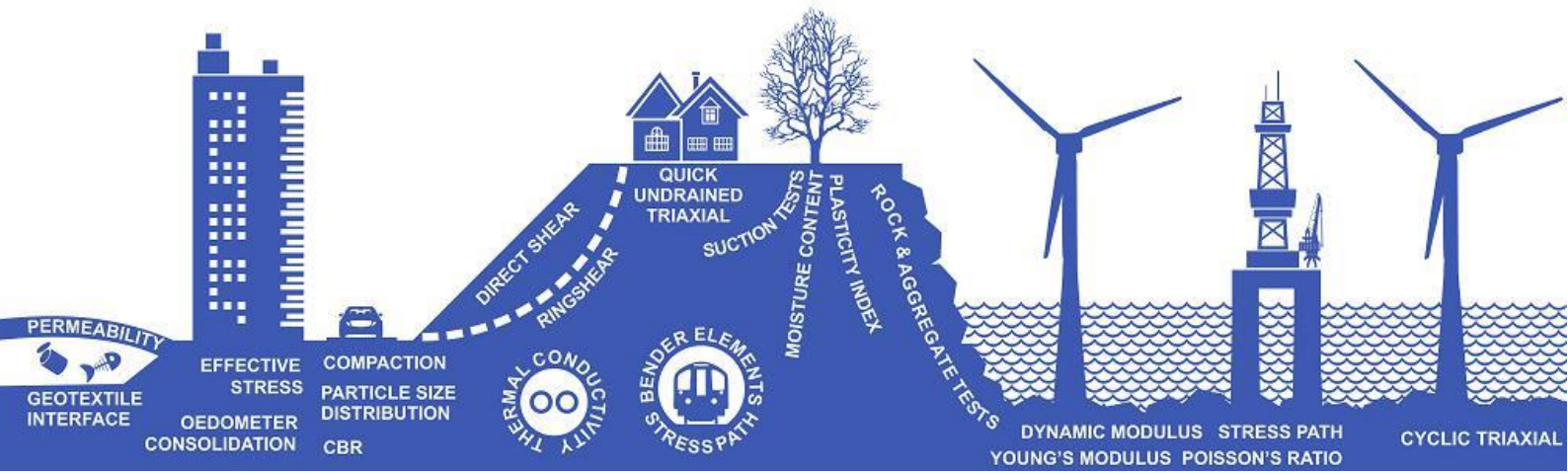
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#09_SAMP |
| **Sample ref** | : | CR15-IS |
| **Depth (m)** | : | 14.00 - 14.10 |
| **Geolabs Sample Id** | : | 479175 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

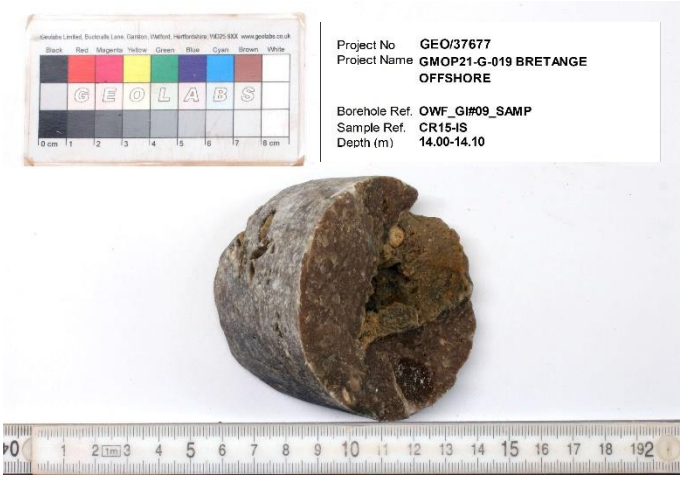


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared dark brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## C. MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (96.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (2%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (1.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 96.5 | 0.4-0.01 |
| Clay | 2 | <0.003 |
| Opaque Mineral | 1.5 | 0.2-0.1 |
| **Total** | 100 | - |

## D. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (96.5%), clay (2%) and opaque mineral (1.5%).

## APPENDIX A: MICROPHOTOGRAPHS

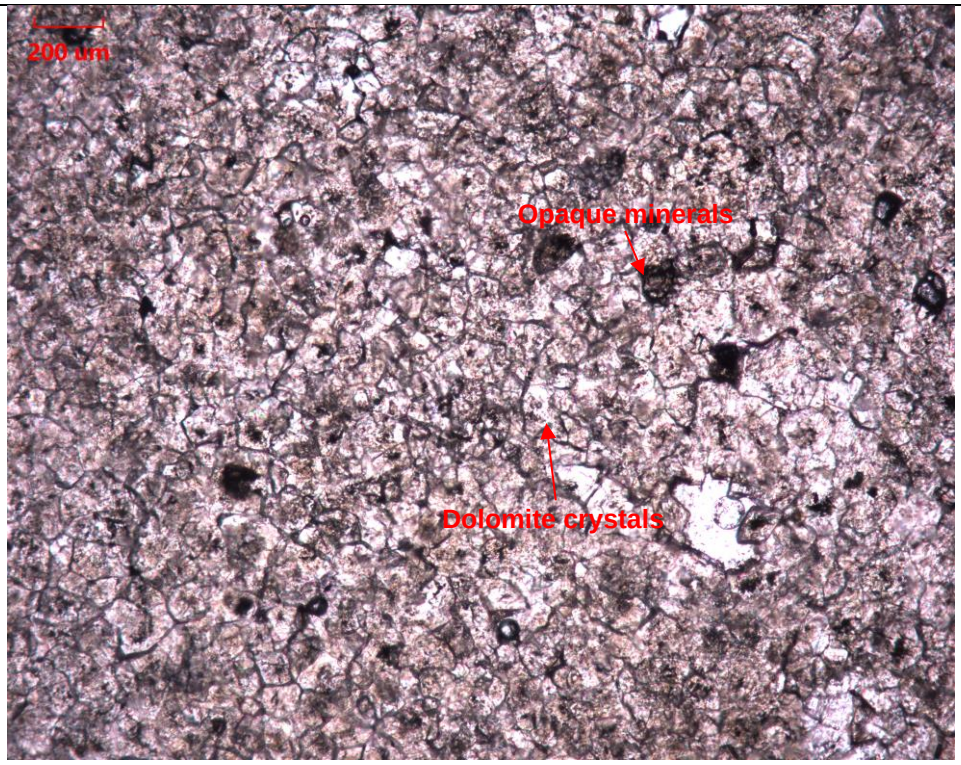
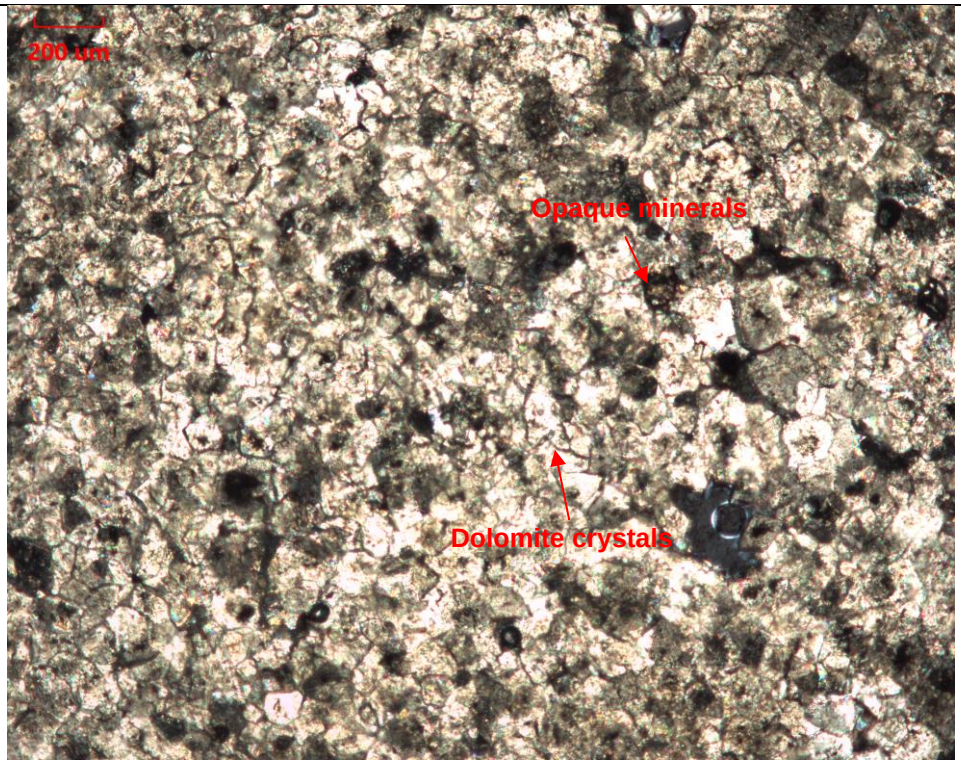
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

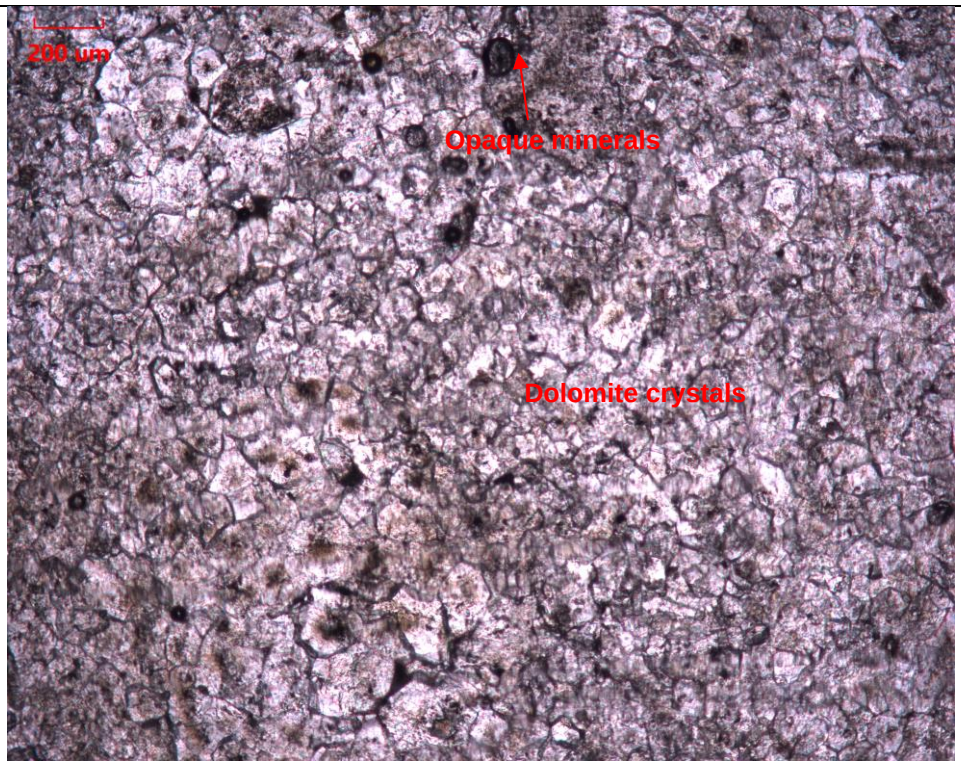
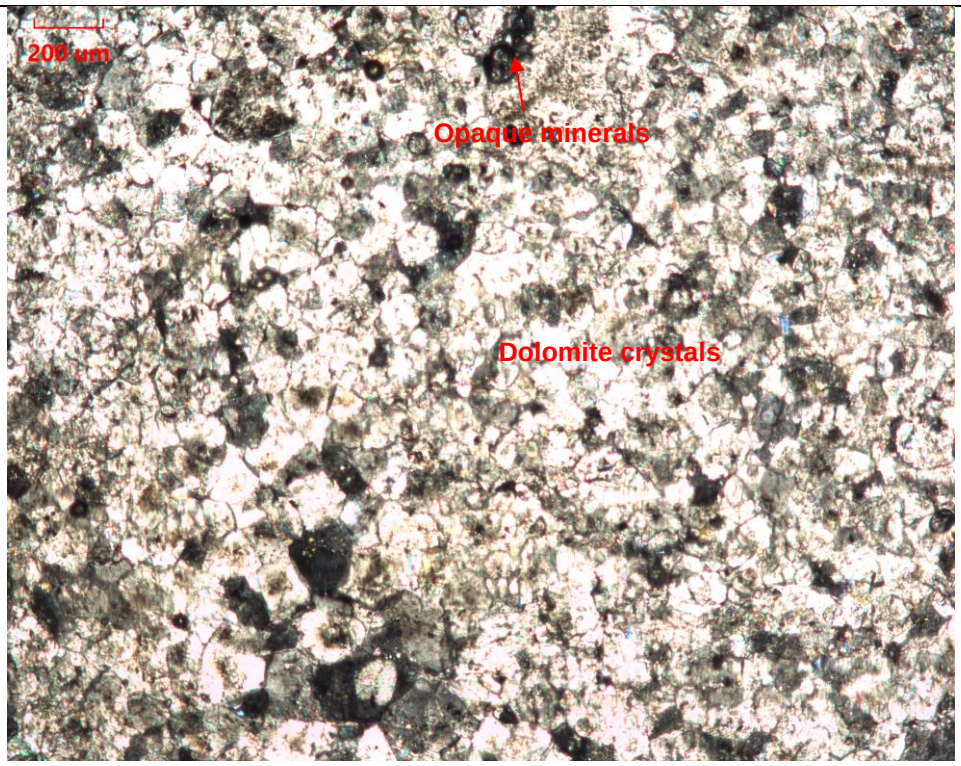
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

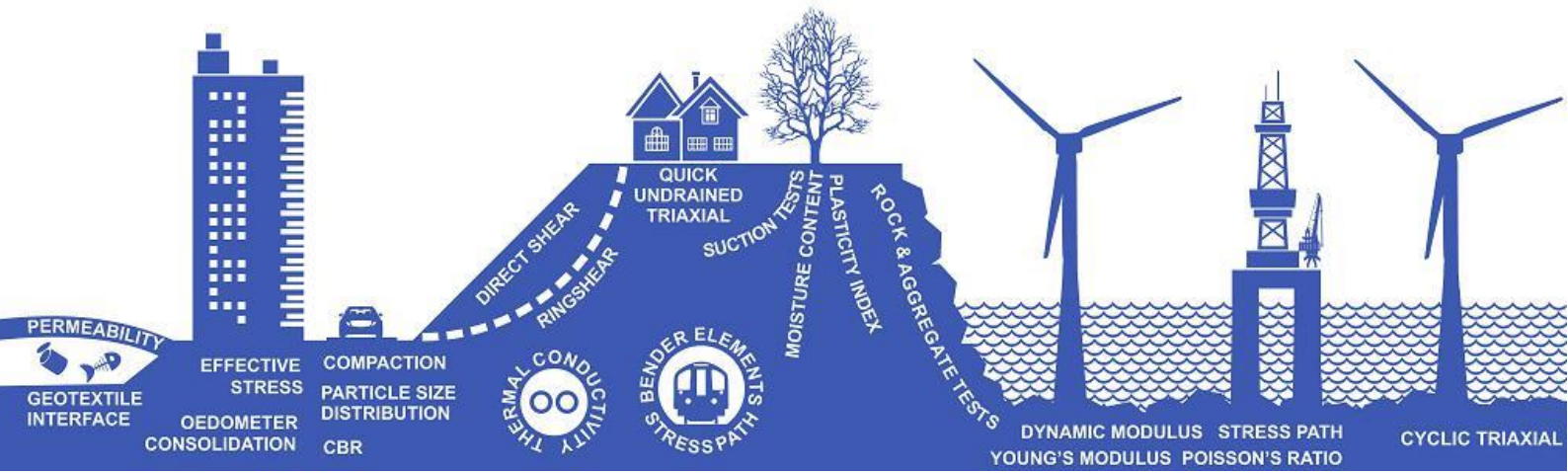
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#11_SAMP |
| **Sample ref** | : | CR04-IS |
| **Depth (m)** | : | 4.50 - 4.50 |
| **Geolabs Sample Id** | : | 479194 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

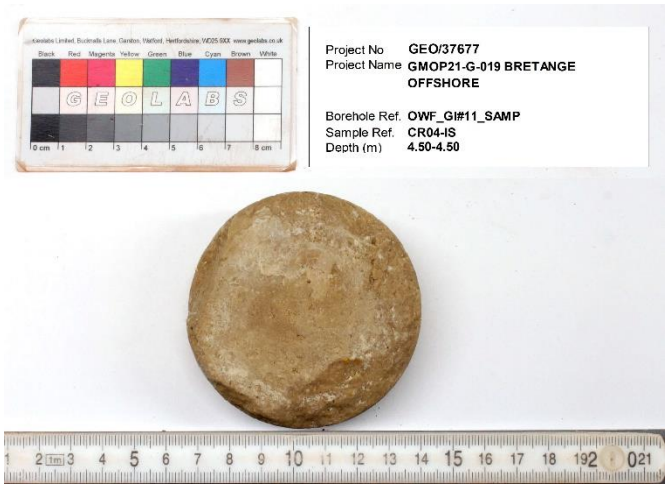


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared grey/ yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## A. MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.2 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (94.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (2%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (3.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Dolomite** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 94.5 | 0.2-0.01 |
| Clay | 2 | <0.003 |
| Opaque Mineral | 3.5 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (94.5%), clay (2%) and opaque mineral (3.5%).

## APPENDIX A: MICROPHOTOGRAPHS

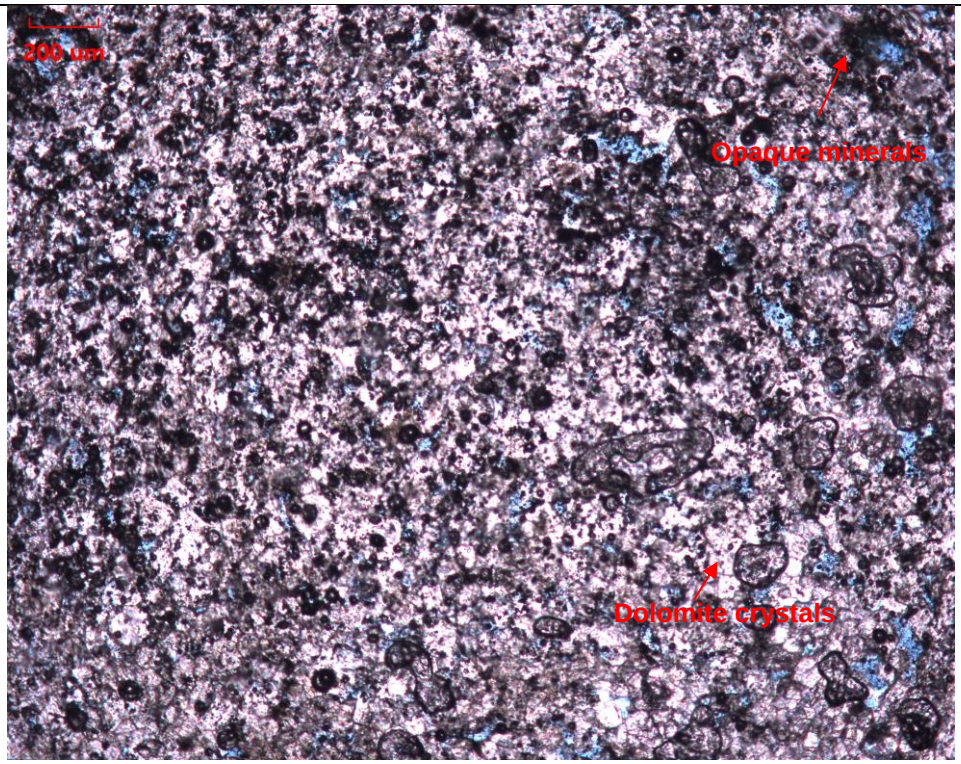
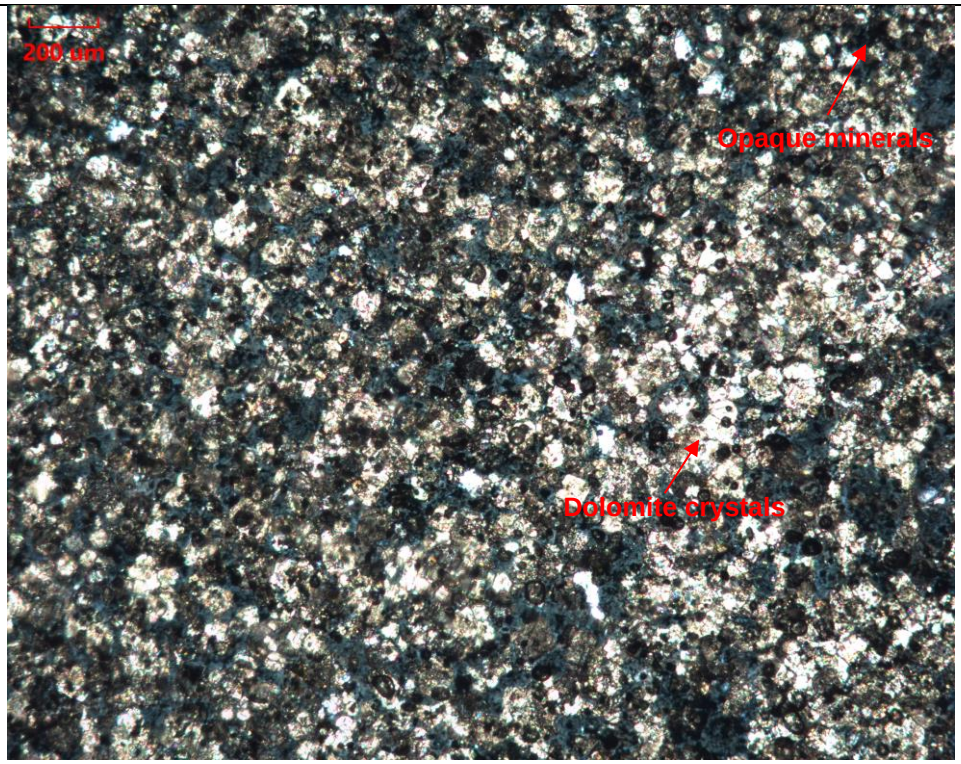
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

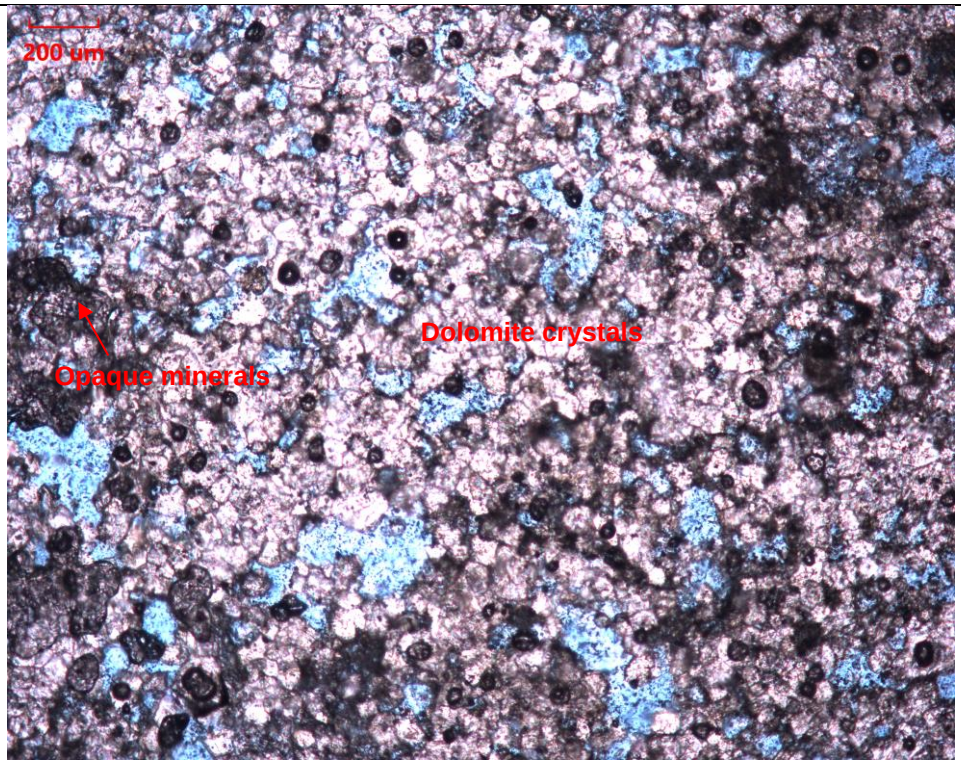
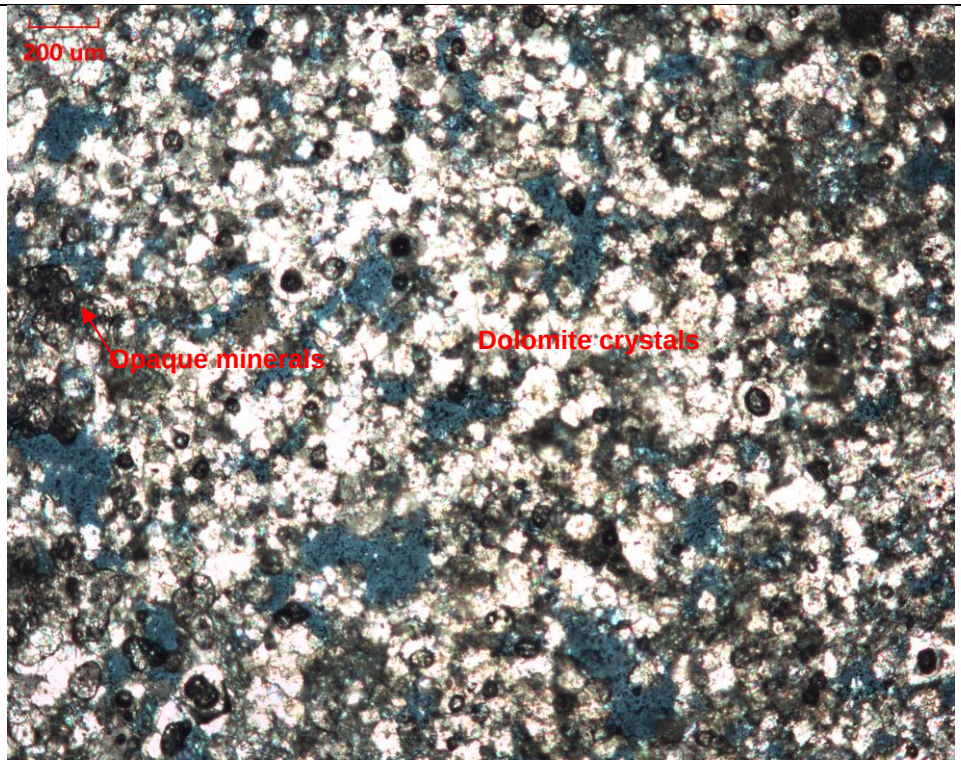
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

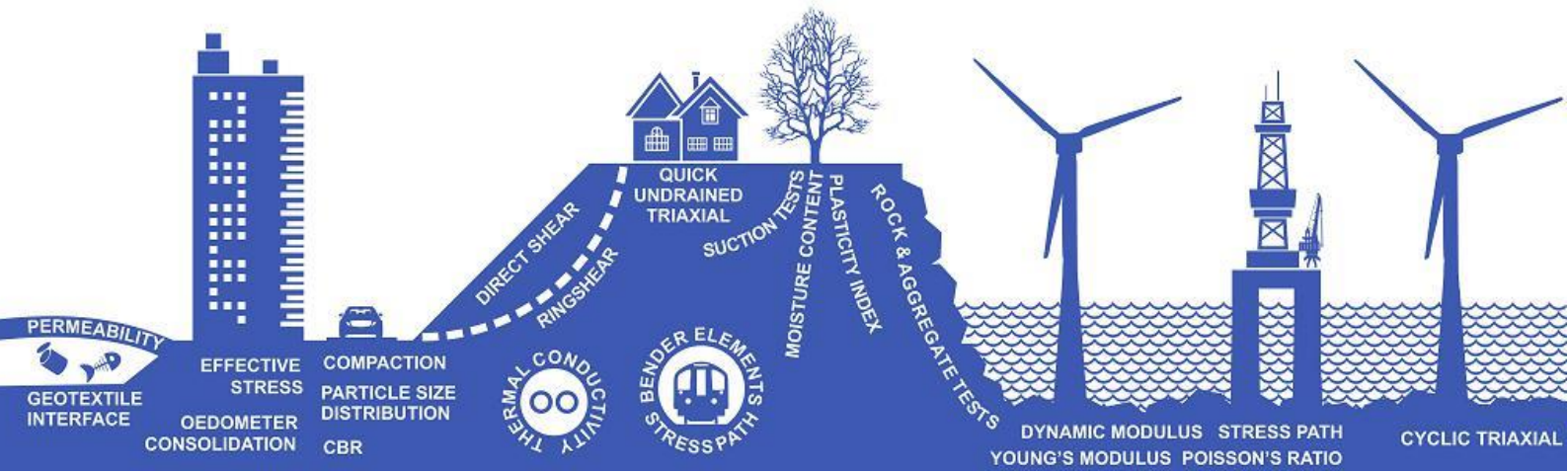
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#12_SAMP |
| **Sample ref** | : | CR06-IS |
| **Depth (m)** | : | 8.30 - 8.30 |
| **Geolabs Sample Id** | : | 479203 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION


The submitted sample is generally appeared yellowish brown colour. The grain size of rock is classified as fine-medium grained. The stone has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. When the samples were dripped into dilute hydrochloric acid, parts of the samples had bubbles and others had no violent bubbles. The sample is moderately weathered.

## C. MICRO EXAMINATION

### *Dolomite*

A type of sedimentary rock has a non-clastic texture, meaning that the rock is formed from the skeletons of organisms or by chemical solution and precipitation. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the dolomite consists mainly of carbonate minerals. The descriptions of its mineral constituents are as follow:

**Carbonate minerals (97.5%)**: The carbonate minerals have perfect rhombohedral cleavages. In the PPL view characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the cleavage.

**Clay (1%)**: Individual clay minerals are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (1.5%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Dolomite | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Carbonate minerals | 97.5 | 0.4-0.01 |
| Clay | 1 | <0.003 |
| Opaque Mineral | 1.5 | 0.2-0.1 |
| **Total** | 100 | - |

## D. FINDINGS & CONCLUSIONS

The submitted rock sample is **Dolomite**. Mineral of the sample is predominantly carbonate minerals (97.5%), clay (1%) and opaque mineral (1.5%).

## APPENDIX A: MICROPHOTOGRAPHS

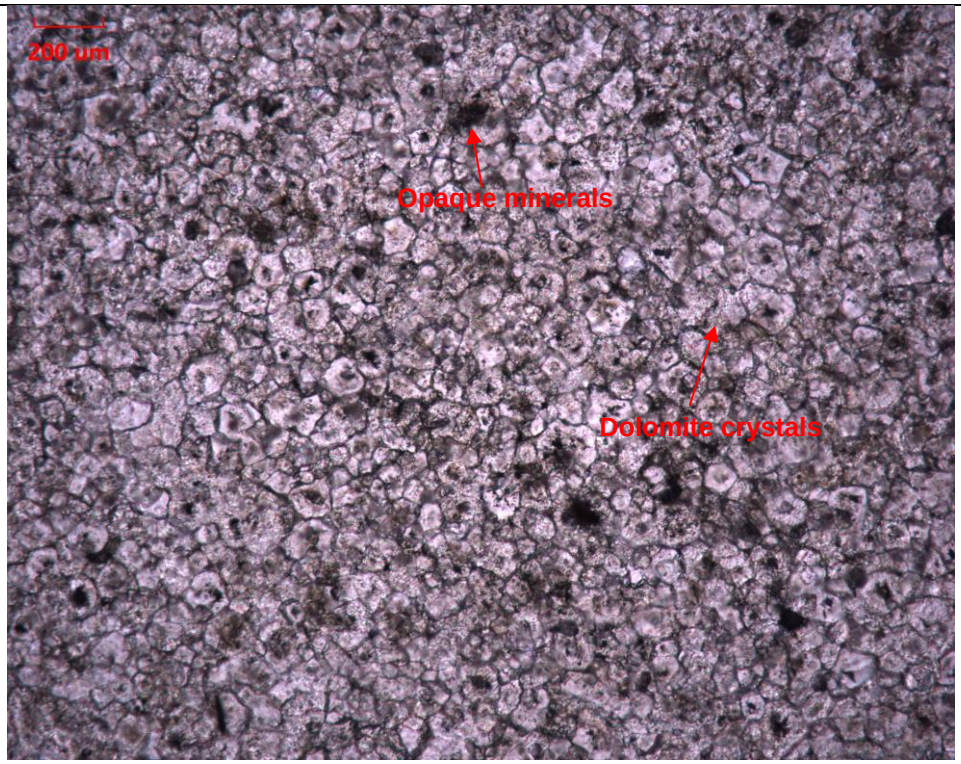
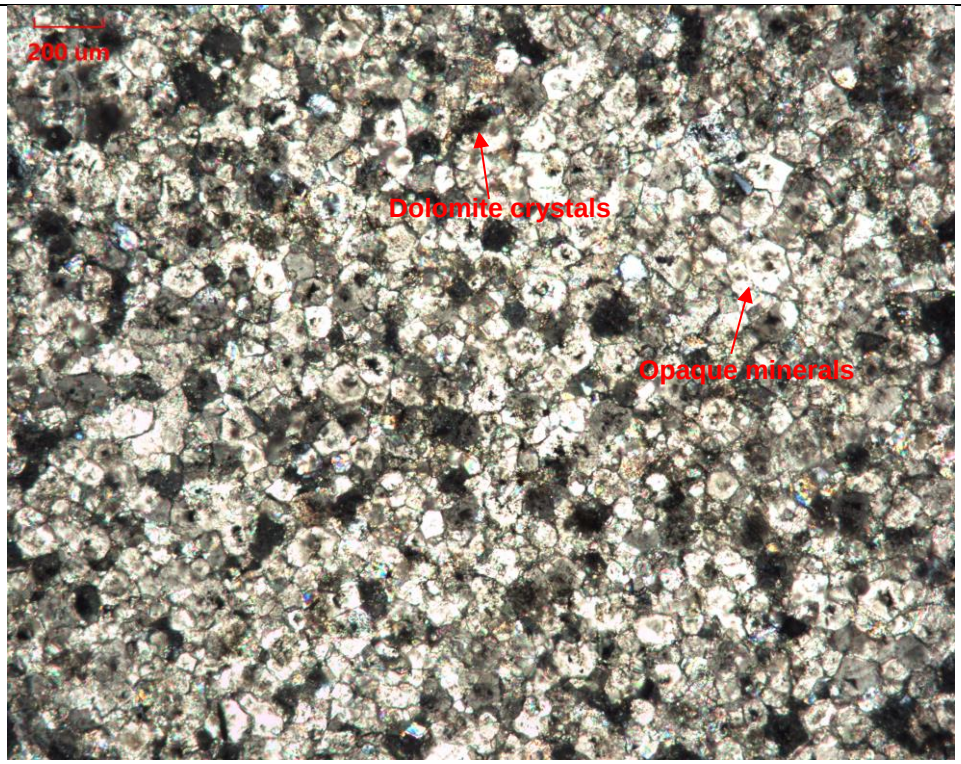
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 1. Plane and crossed polarized photos*

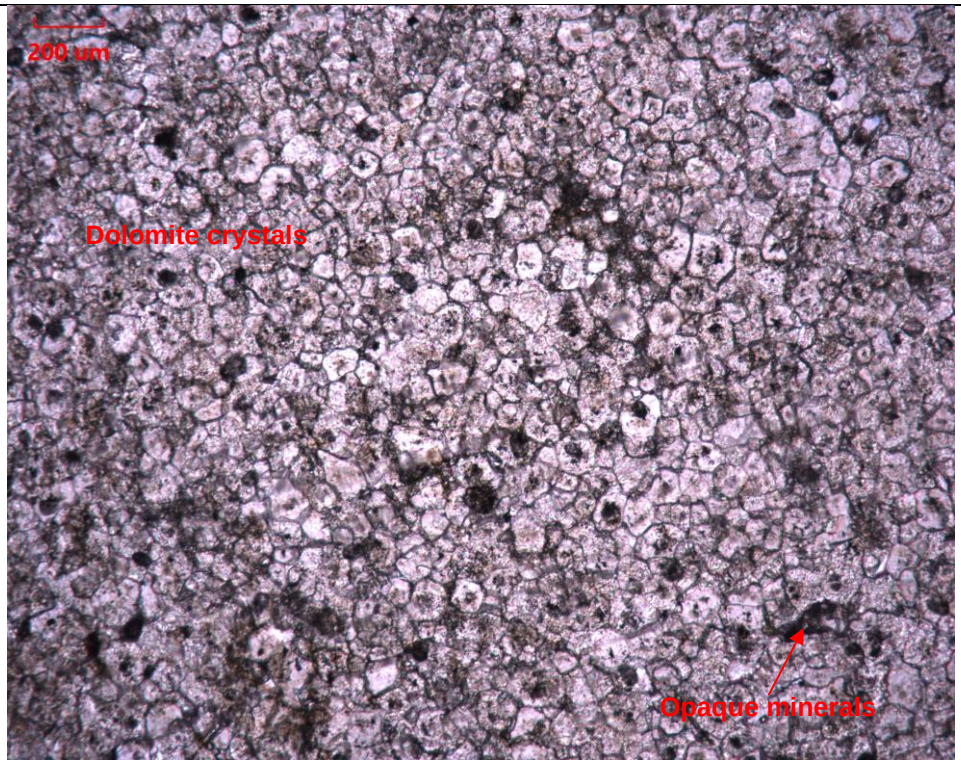
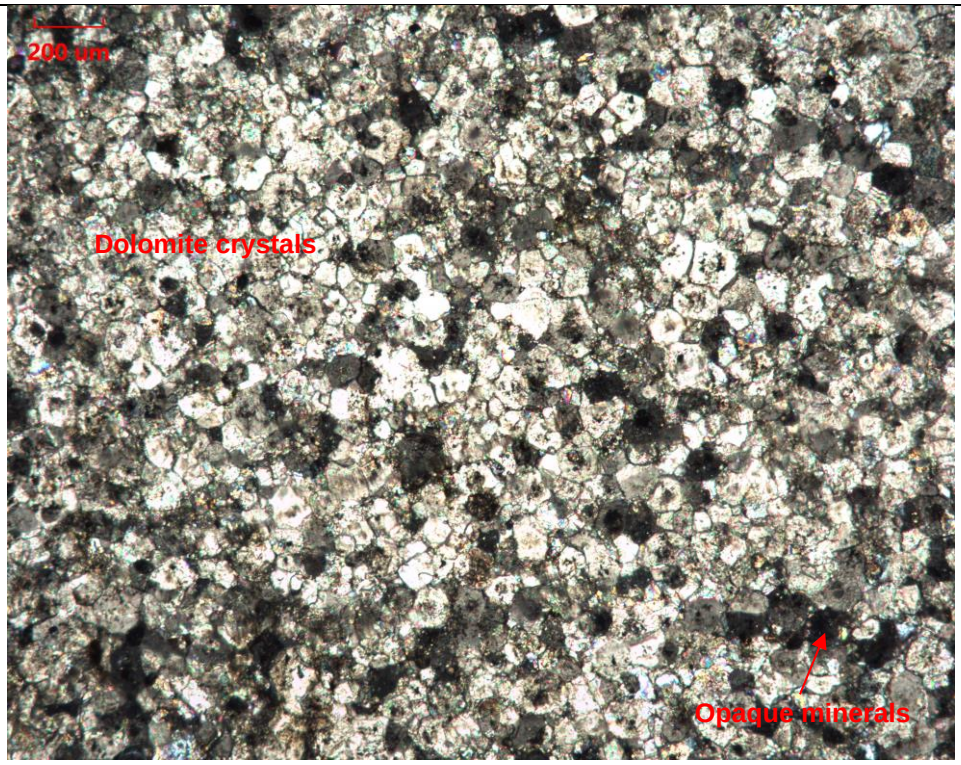
| | |
|---|---|
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |
| Photomicrograph of carbonate minerals, dolomite crystals and opaque minerals constituents, **50X**. |  |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
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Bucknalls Lane - Garston
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WD25 9XX

# Petrographic Description

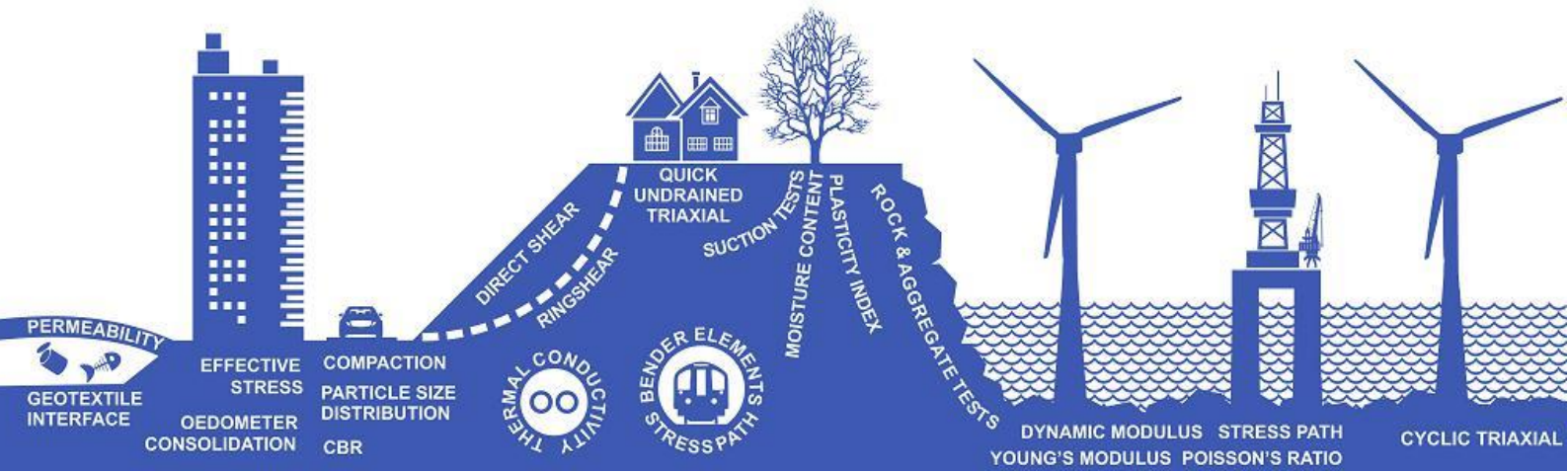
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#14A_SAMP |
| **Sample ref** | : | CR01-IS |
| **Depth (m)** | : | 0.00 - 0.00 |
| **Geolabs Sample Id** | : | 479182 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

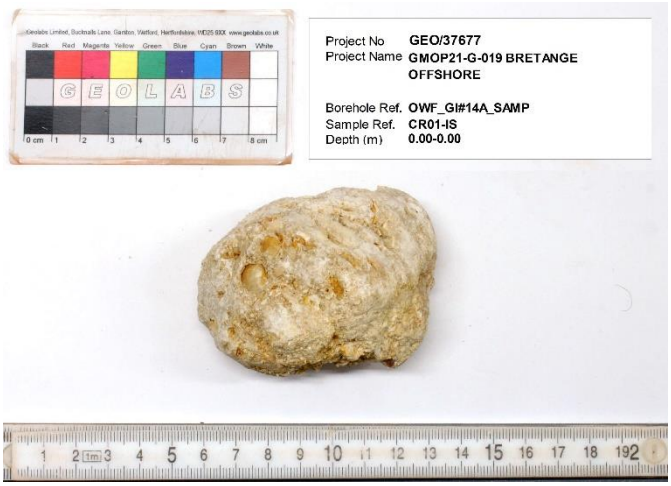


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared light cream colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 1.5 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (56%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (25%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (17%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Shelly Limestone | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 56 | 1.5-0.01 |
| Calcite | 25 | 0.4-0.01 |
| Matrix | 17 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (56%), calcite (25%), matrix (17%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

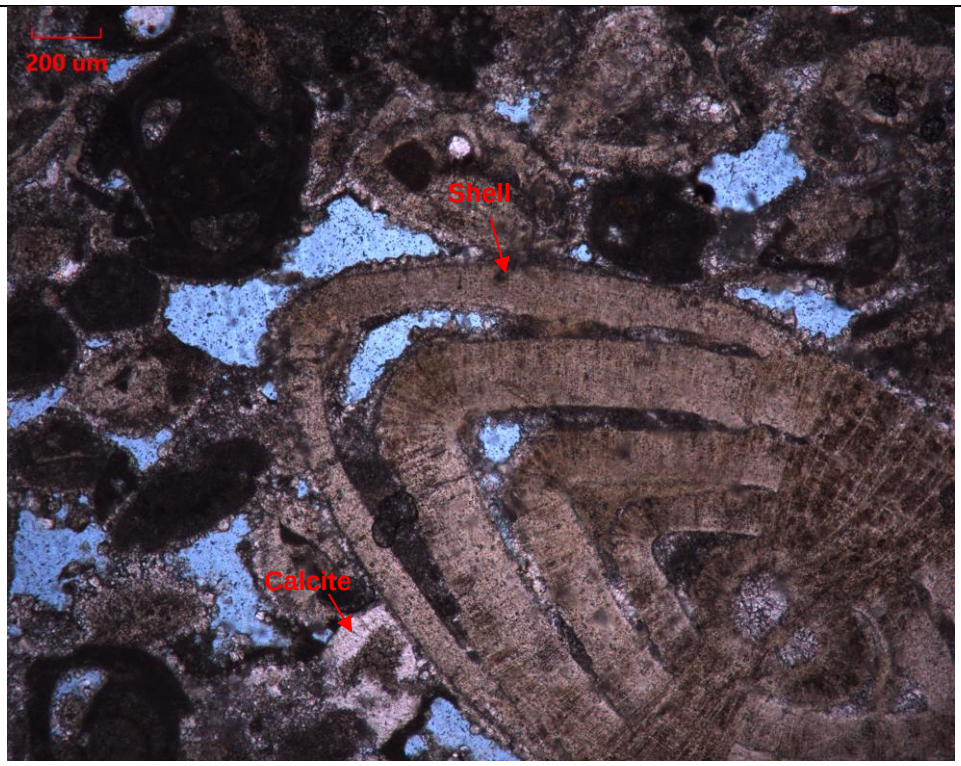
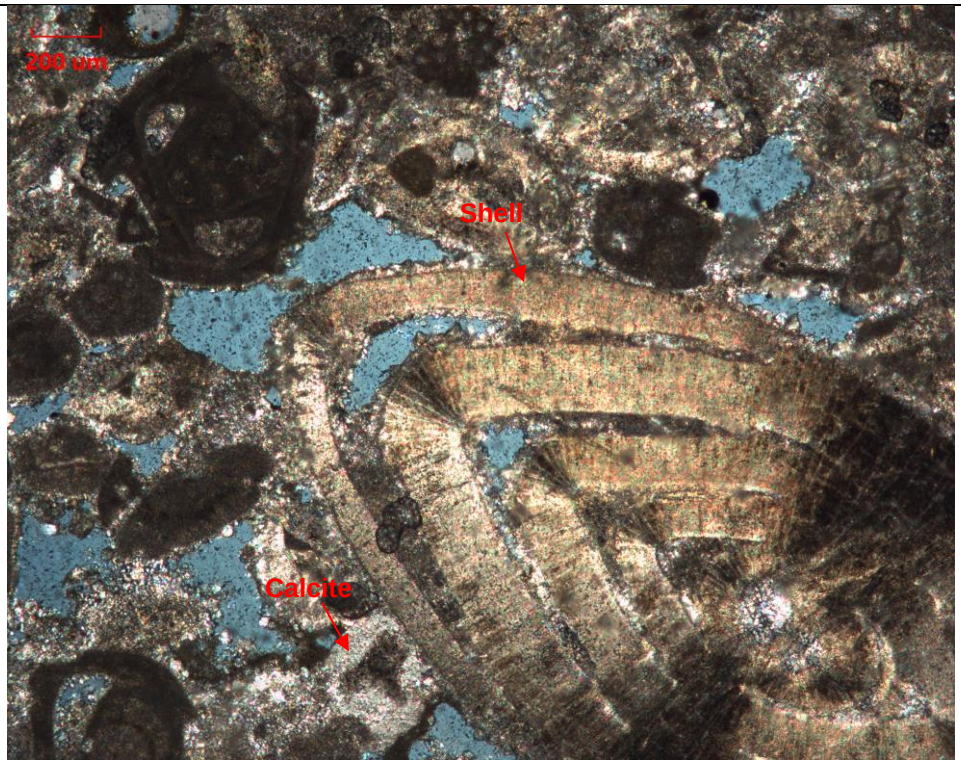
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |

*Figure 1. Plane and crossed polarized photos*

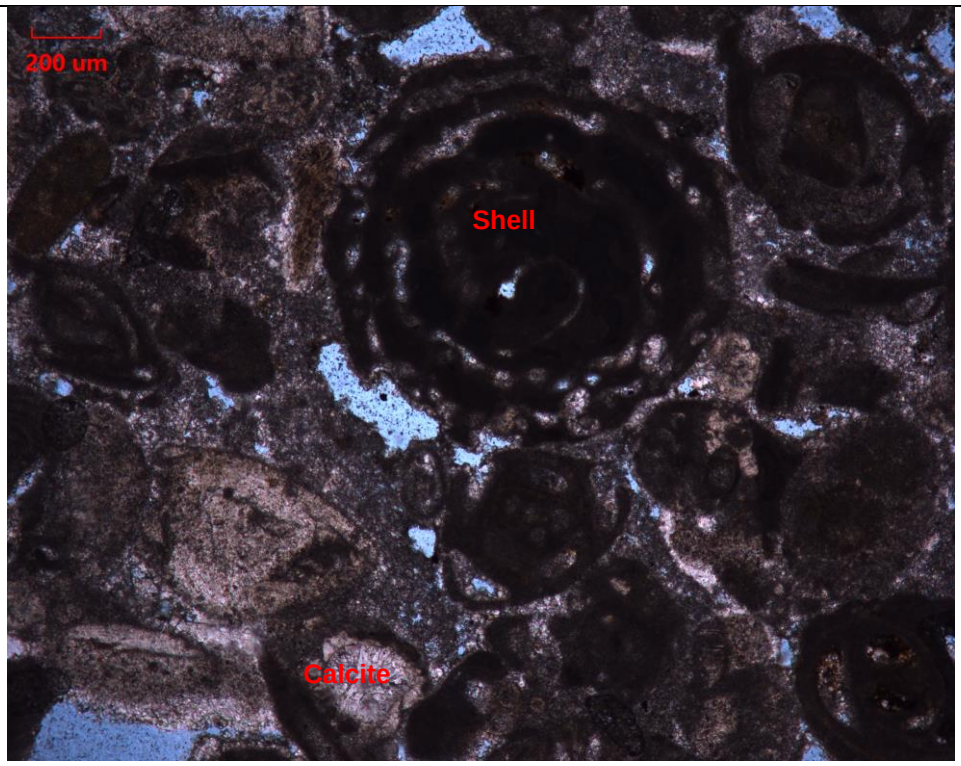
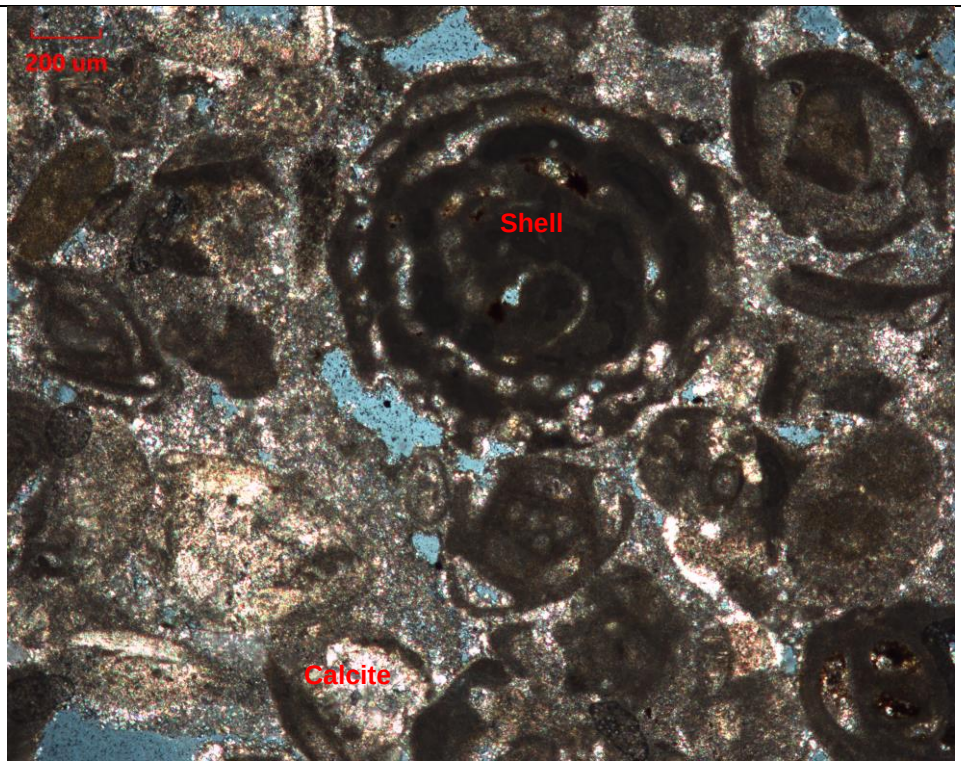
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

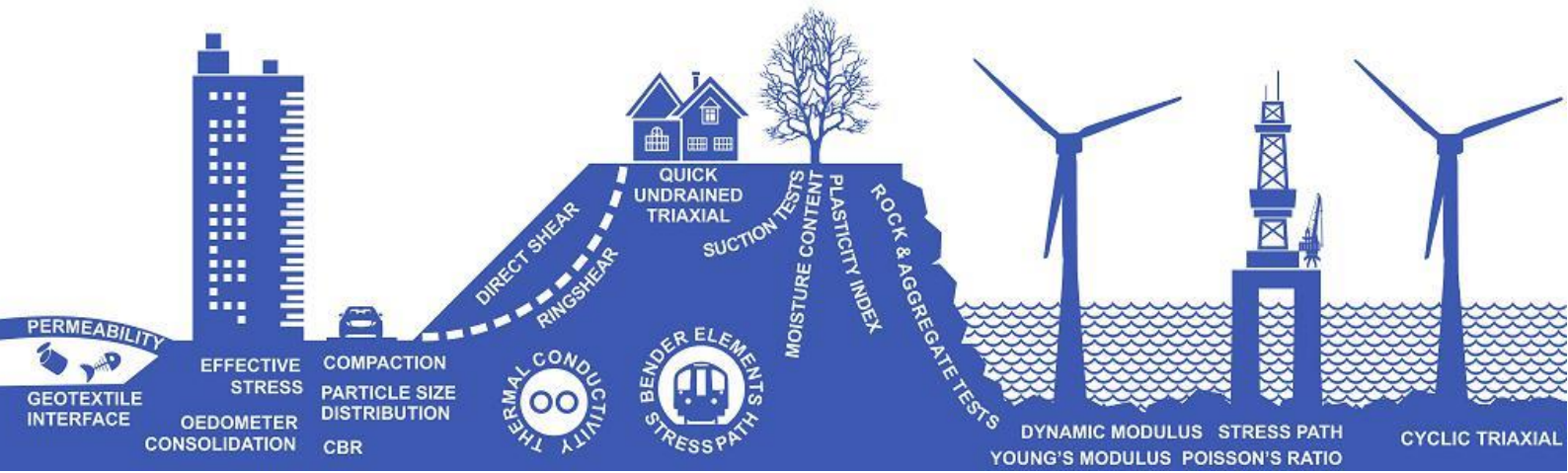
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#17_SAMP |
| **Sample ref** | : | CR03-IS |
| **Depth (m)** | : | 6.00 - 6.45 |
| **Geolabs Sample Id** | : | 479167 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

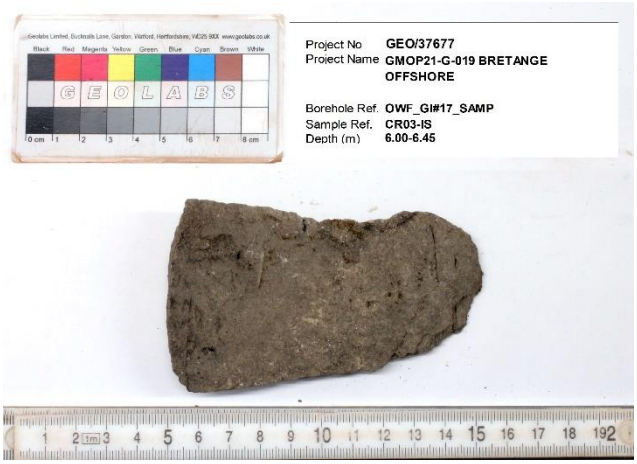


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared dark brown colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 0.8 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (54%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (20%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (24%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Shelly Limestone** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 54 | 0.8-0.01 |
| Calcite | 20 | 0.2-0.01 |
| Matrix | 24 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (54%), calcite (20%), matrix (24%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

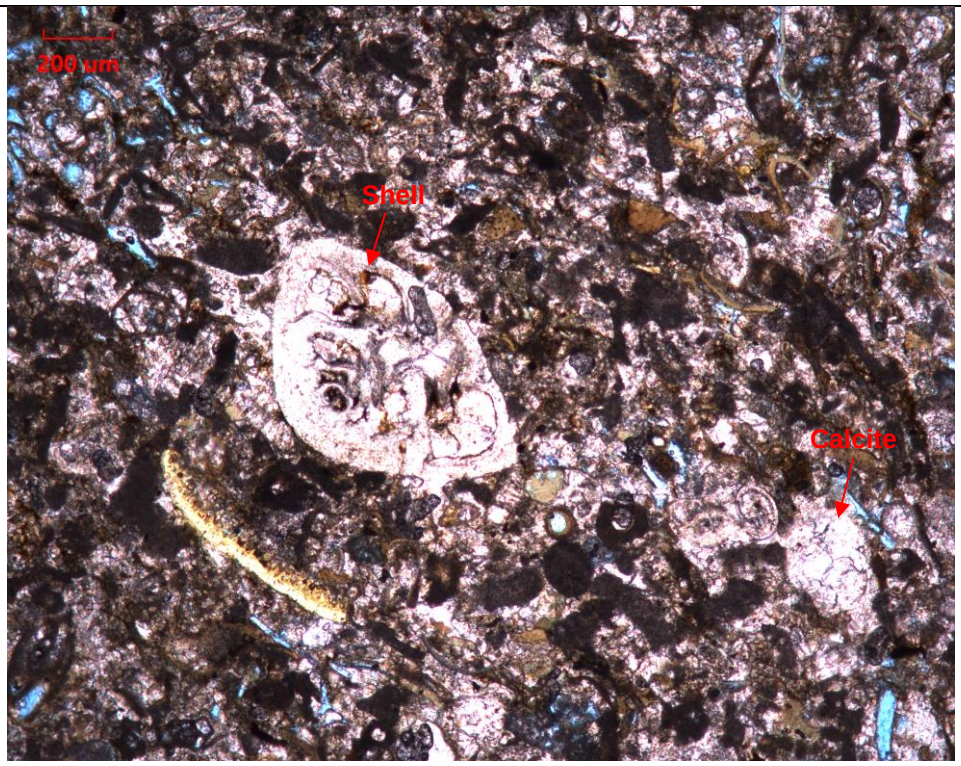
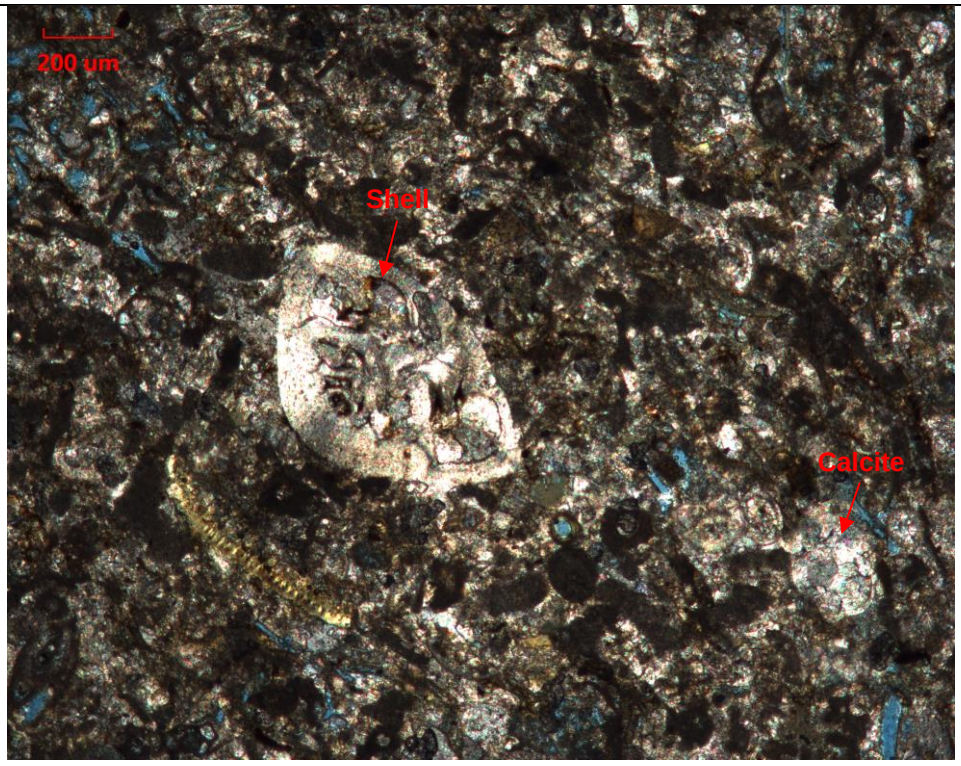
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

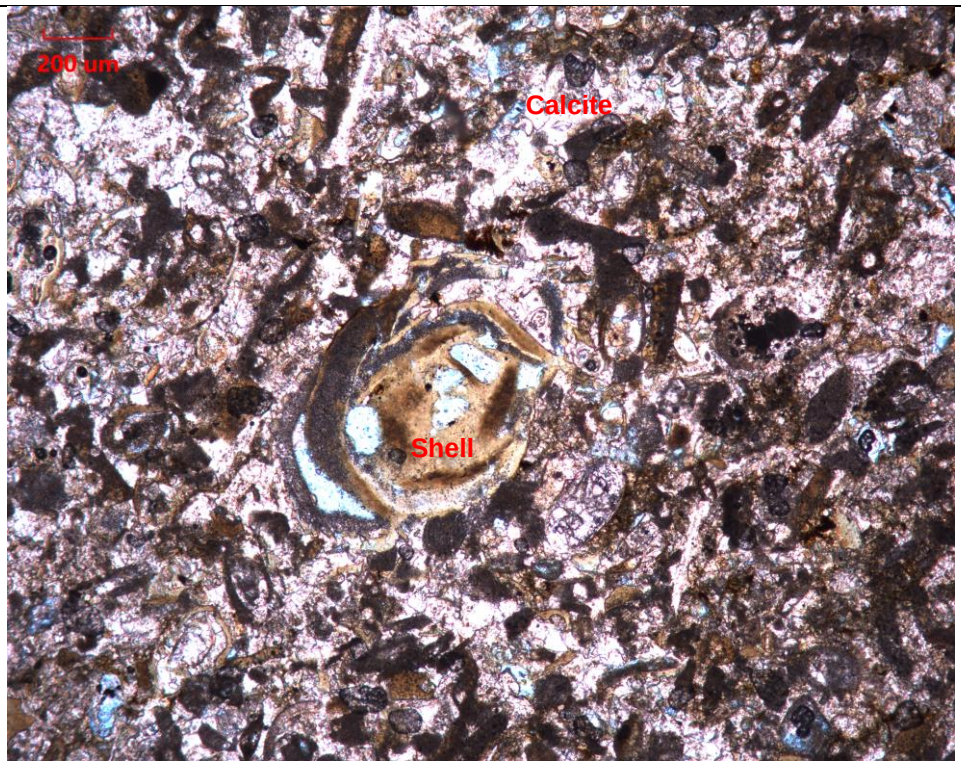
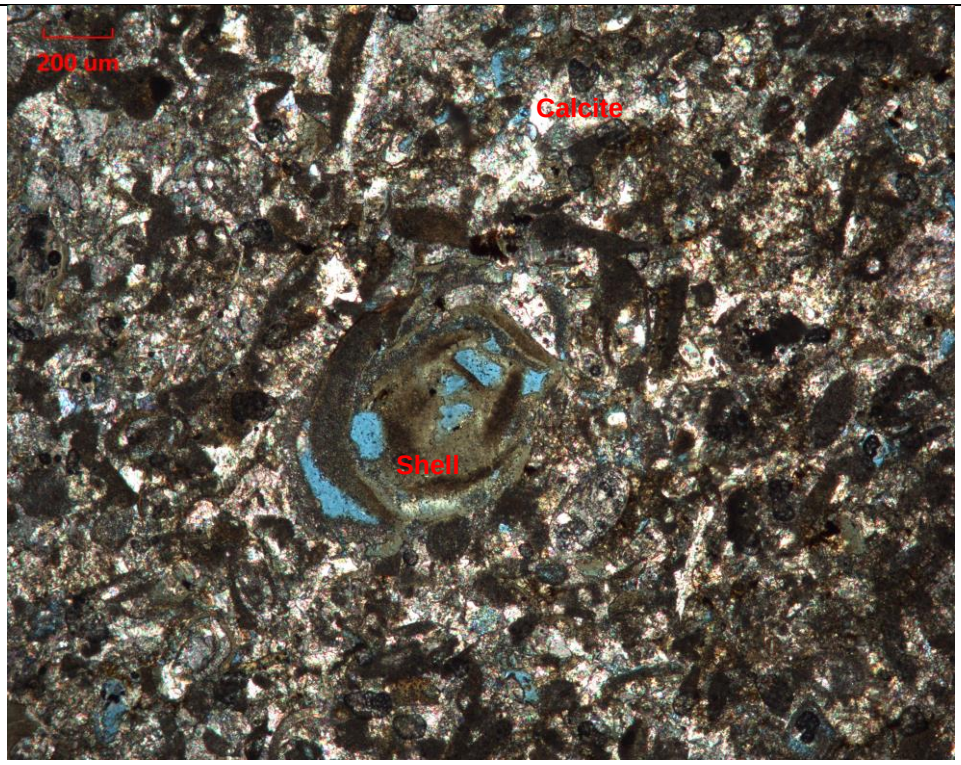
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
www.geolabs.co.uk

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Watford, Hertfordshire
WD25 9XX

# Petrographic Description

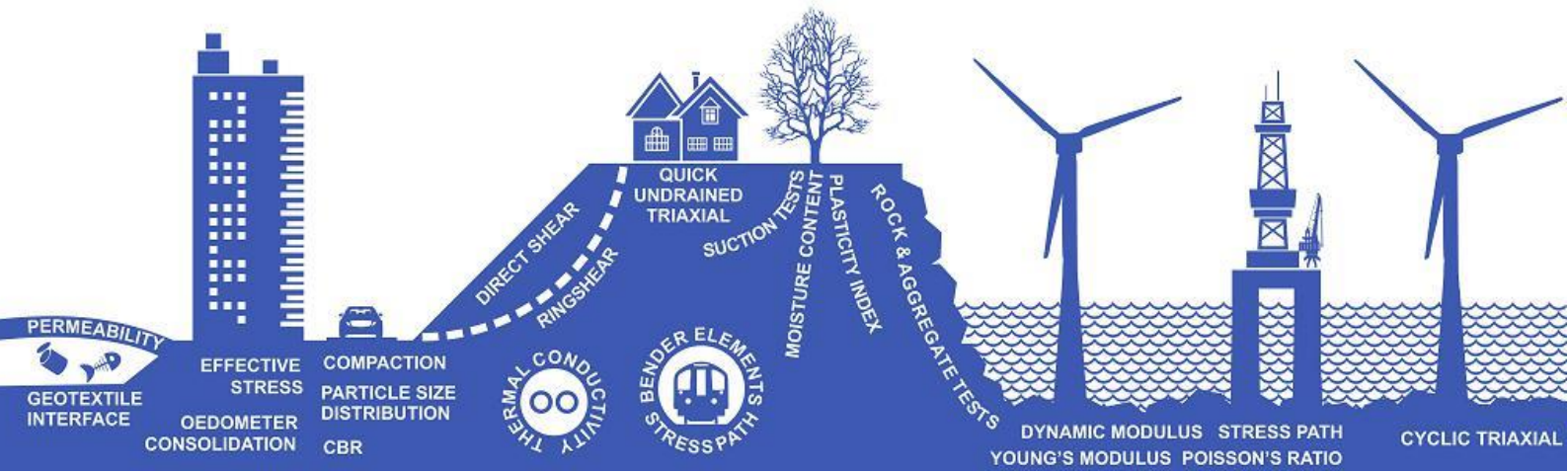
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#17_SAMP |
| **Sample ref** | : | CR14-IS |
| **Depth (m)** | : | 19.80 - 19.80 |
| **Geolabs Sample Id** | : | 479165 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

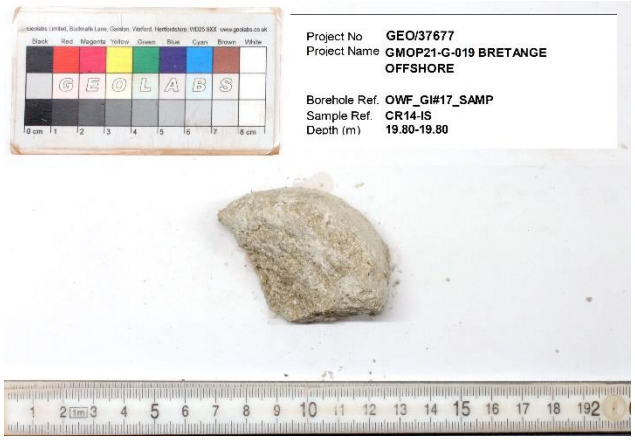


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared light grey/ green colour. The grain size of rock is classified as medium-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of matrix minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Fossiliferous Glauconite Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 1.8 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms, glauconite and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (51%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (29%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Glauconite (7%)**: Well-rounded to sub-rounded, highly spherical grains of moderately soft to soft iron-rich marine clay.

**Matrix (12%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (1%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Shelly Limestone** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 51 | 1.8-0.01 |
| Calcite | 29 | 0.2-0.01 |
| Glauconite | 7 | 0.2-0.01 |
| Matrix | 12 | <0.003 |
| Opaque Mineral | 1 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is ***Fossiliferous Glauconite Limestone***. Mineral of the sample is predominantly fossil/shell (51%), calcite (29%), glauconite (7%), matrix (12%) and opaque mineral (1%).

## APPENDIX A: MICROPHOTOGRAPHS

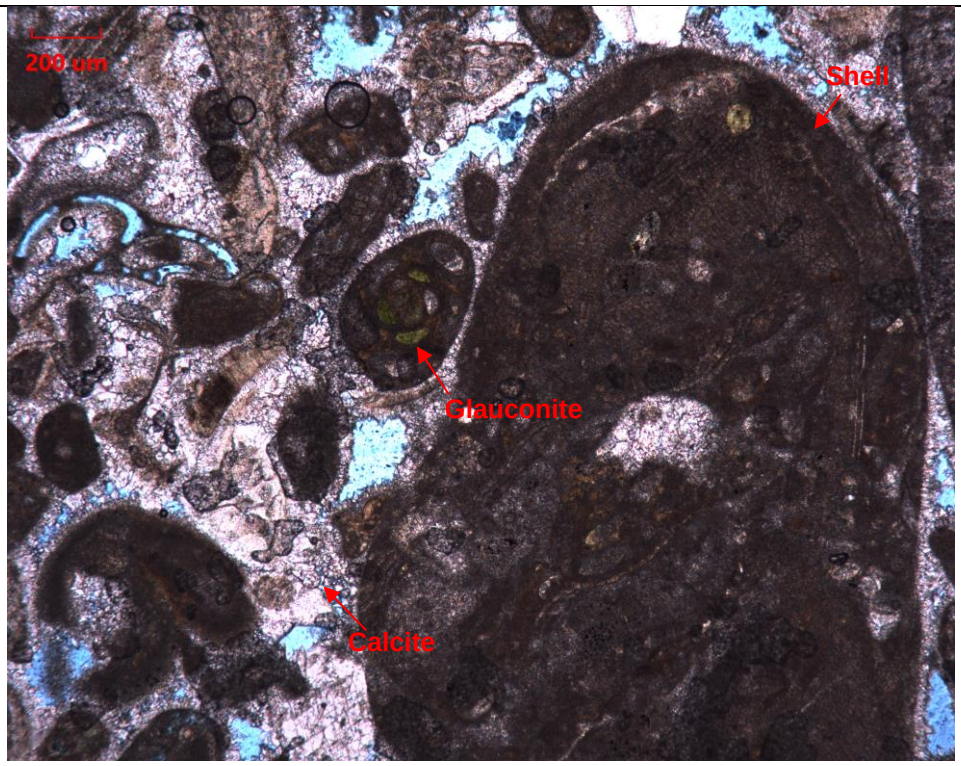
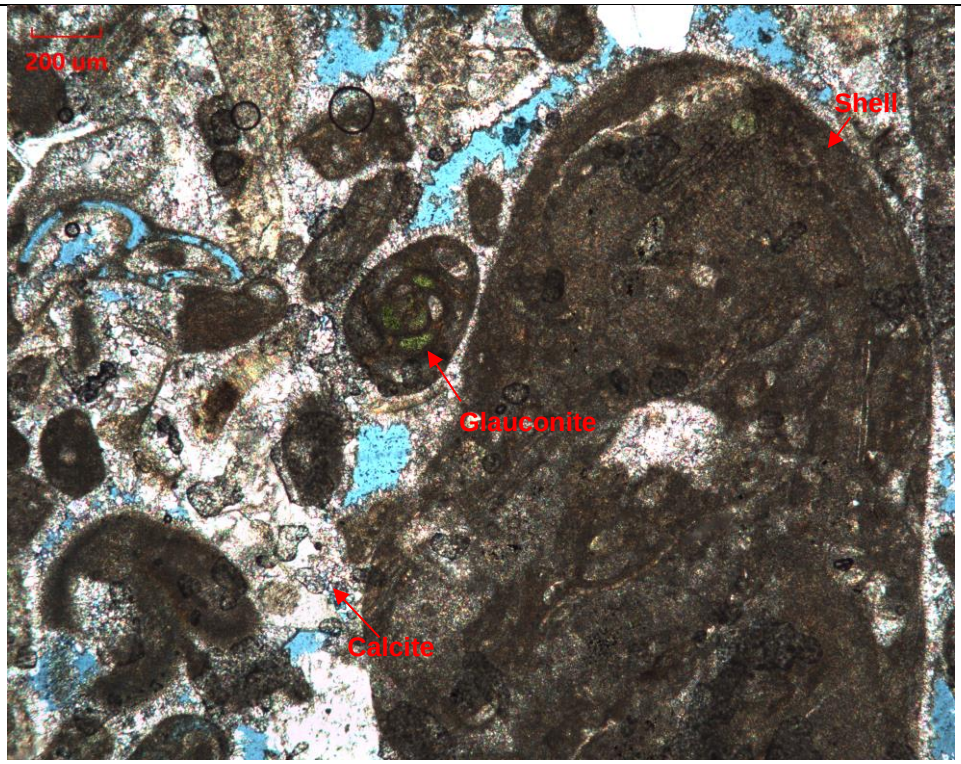
| | |
|---|---|
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral and glauconite constituents, **50X.** |  |
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral and glauconite constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

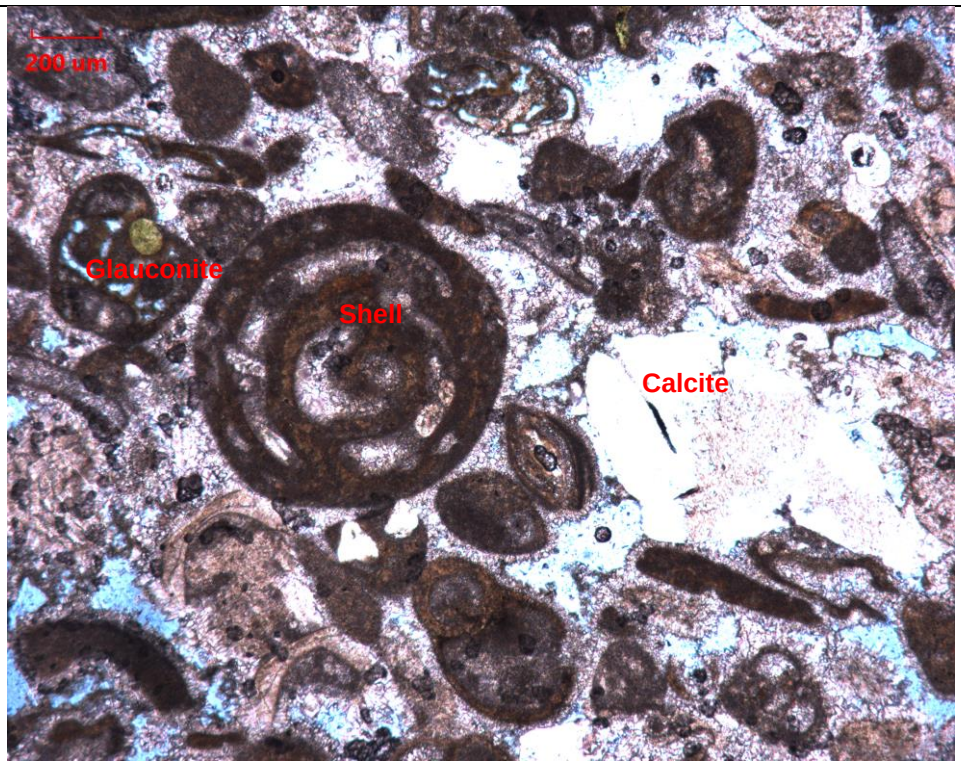
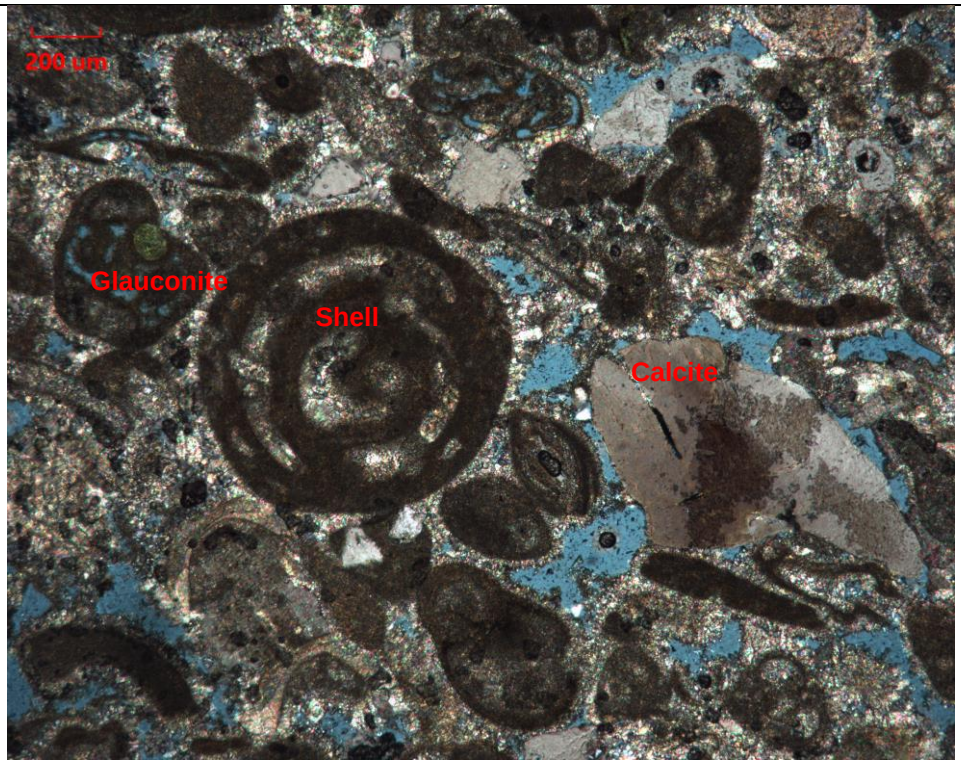
| | |
|---|---|
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral and glauconite constituents, **50X.** |  |
| Photomicrograph of fossil and calcite as Fossiliferous Limestone mineral and glauconite constituents, **50X.** |  |

*Figure 2. Plane and crossed polarized photos*

Geolabs Ltd
+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

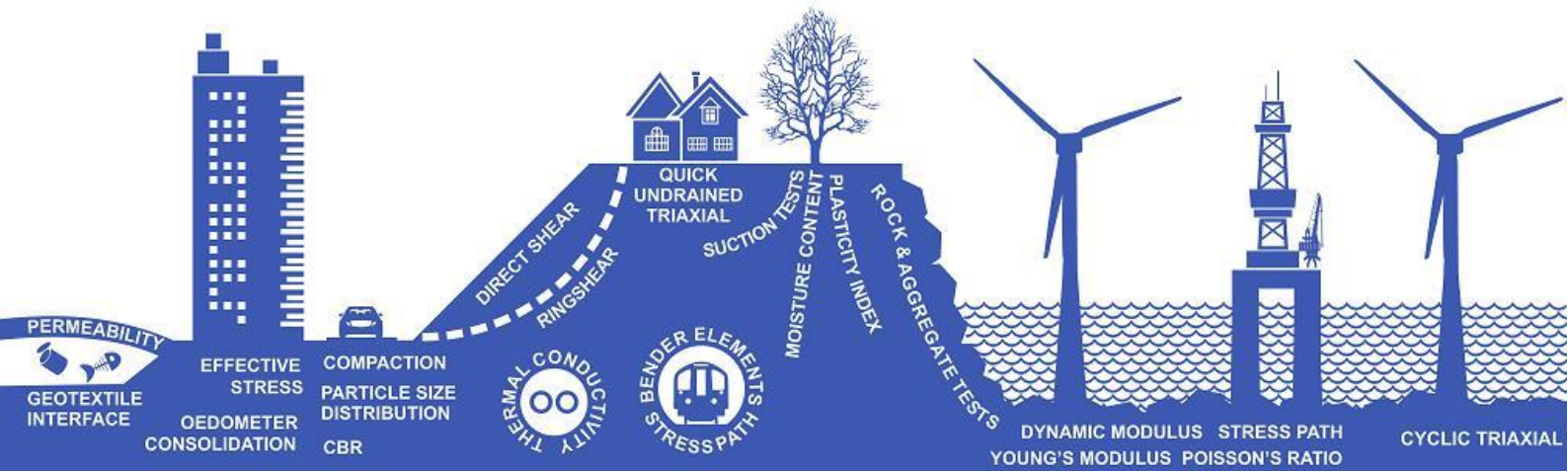
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#20_SAMP |
| **Sample ref** | : | CR03-IS |
| **Depth (m)** | : | 11.50 - 11.50 |
| **Geolabs Sample Id** | : | 479146 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION


The submitted sample is generally appeared light cream colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 1.5 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (46%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (35%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (17%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Shelly Limestone | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 56 | 1.5-0.01 |
| Calcite | 25 | 0.4-0.01 |
| Matrix | 17 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (56%), calcite (25%), matrix (17%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

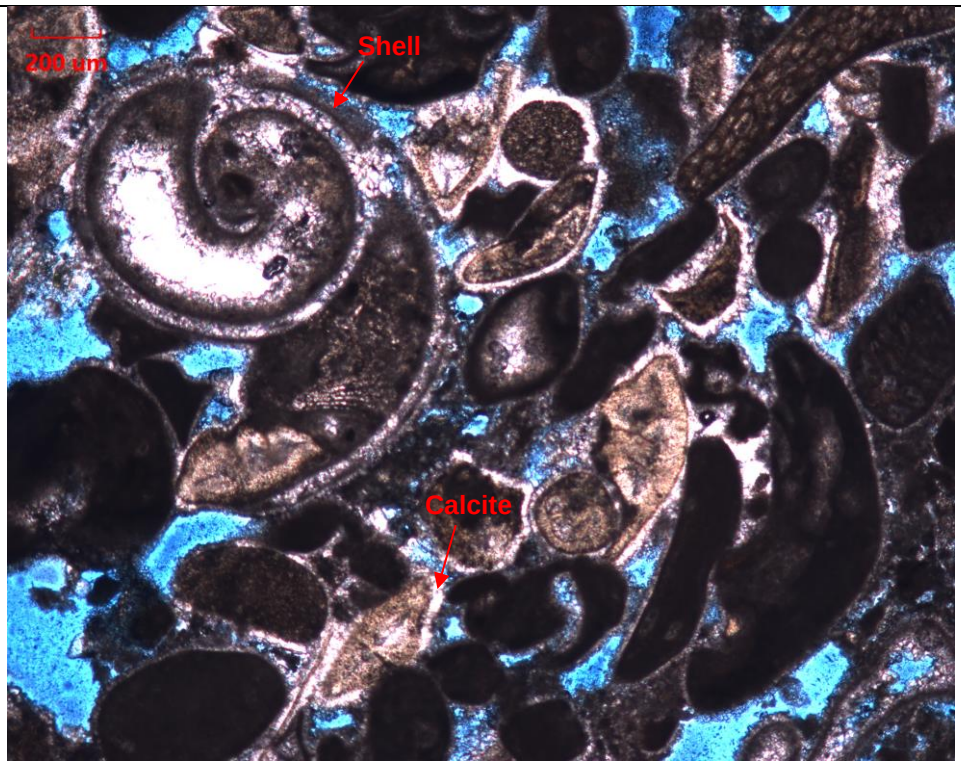
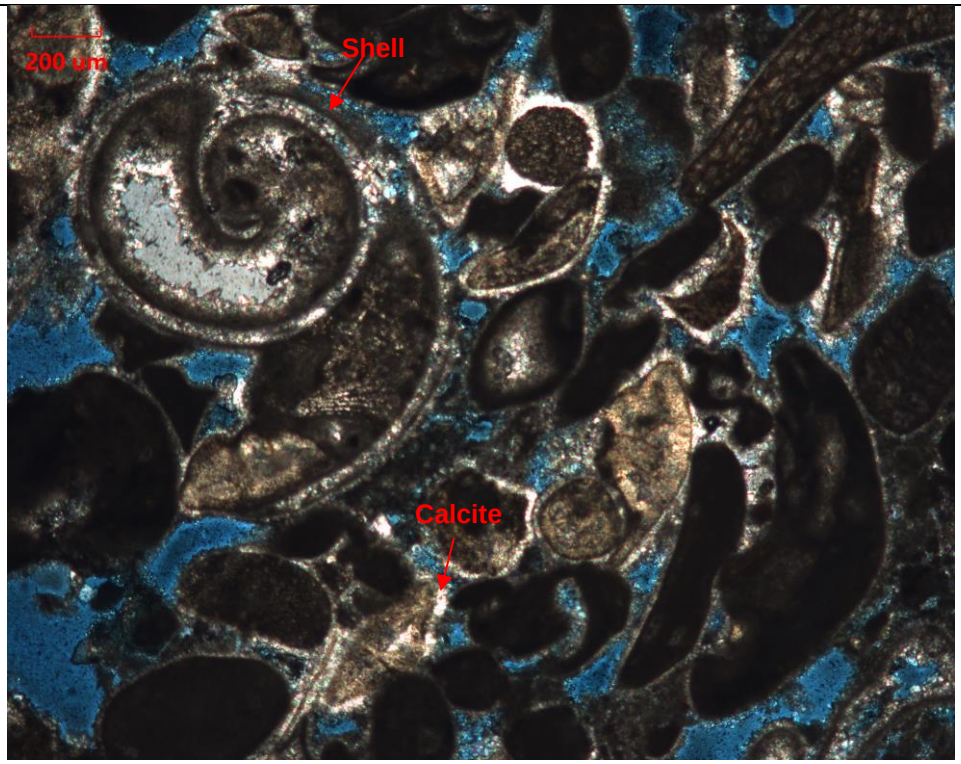
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

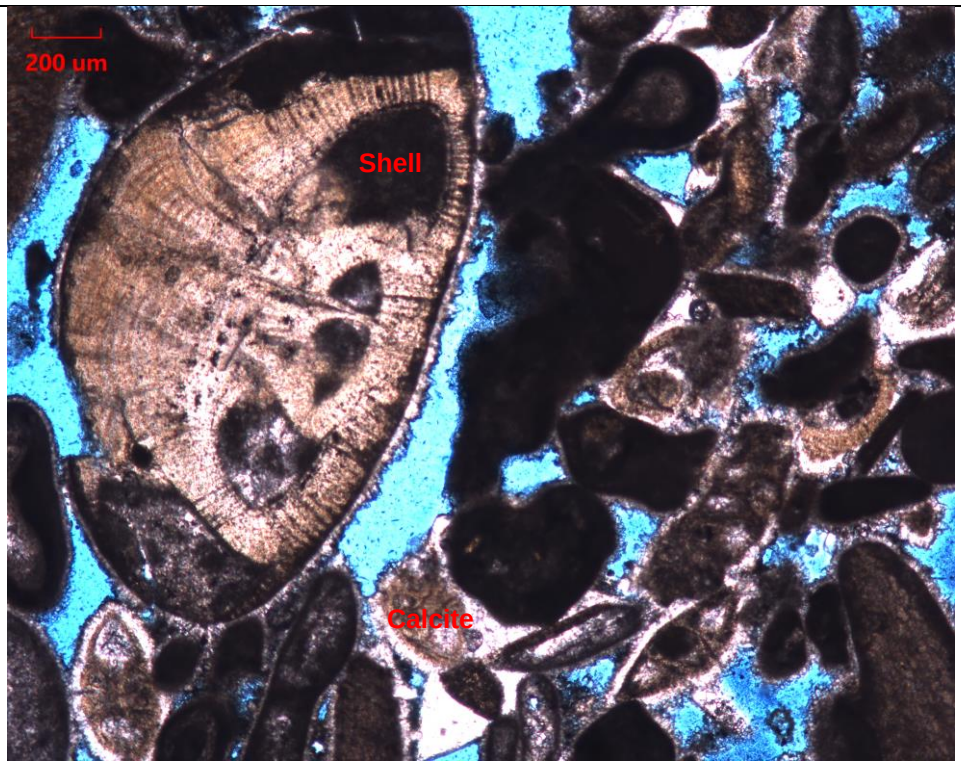
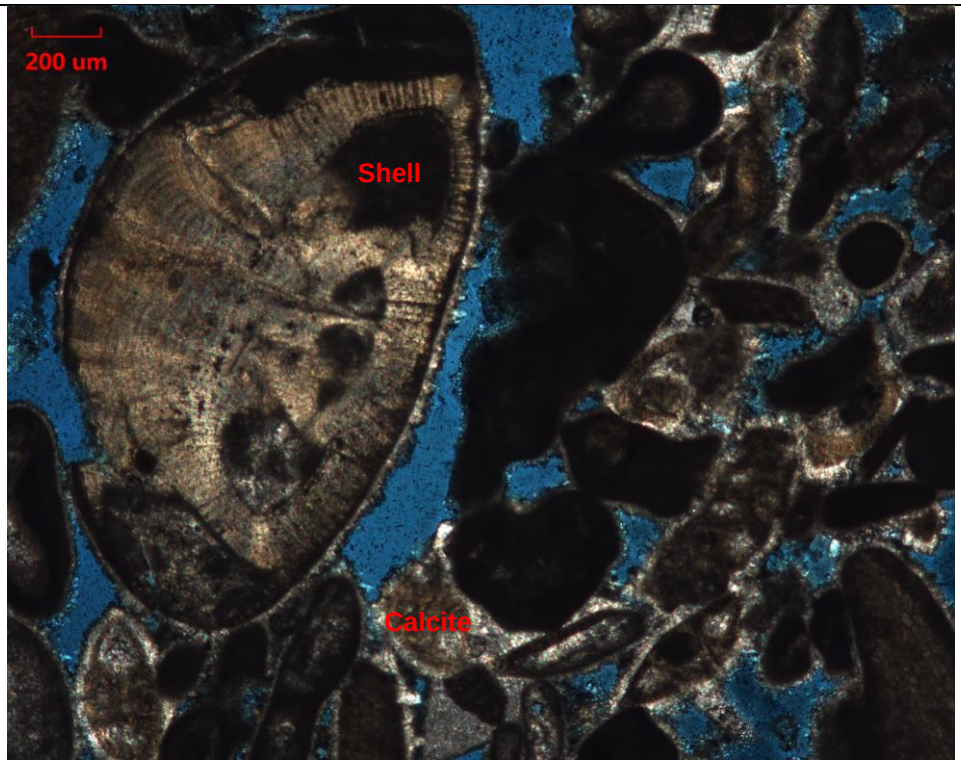
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |

*Figure 2. Plane and crossed polarized photos*

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+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

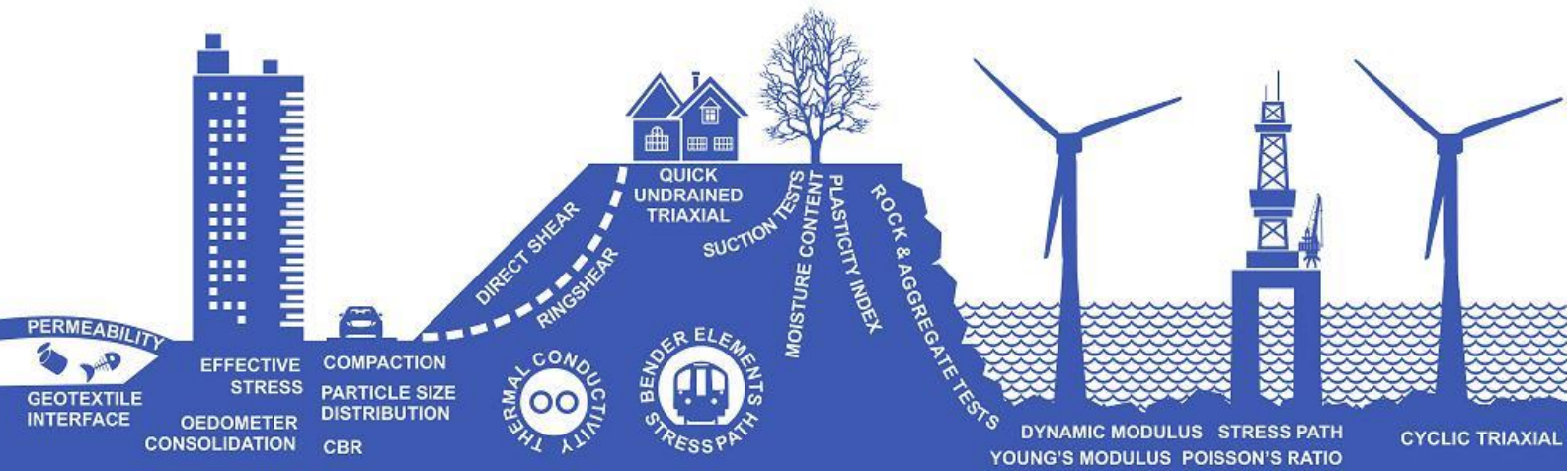
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#22_SAMP |
| **Sample ref** | : | CR08-B1 |
| **Depth (m)** | : | 8.50 - 8.50 |
| **Geolabs Sample Id** | : | 479171 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION


The submitted sample is generally appeared grey - brown colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 0.7 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (44%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (25%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (29%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Shelly Limestone** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 44 | 0.7-0.01 |
| Calcite | 25 | 0.1-0.01 |
| Matrix | 29 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (44%), calcite (25%), matrix (29%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

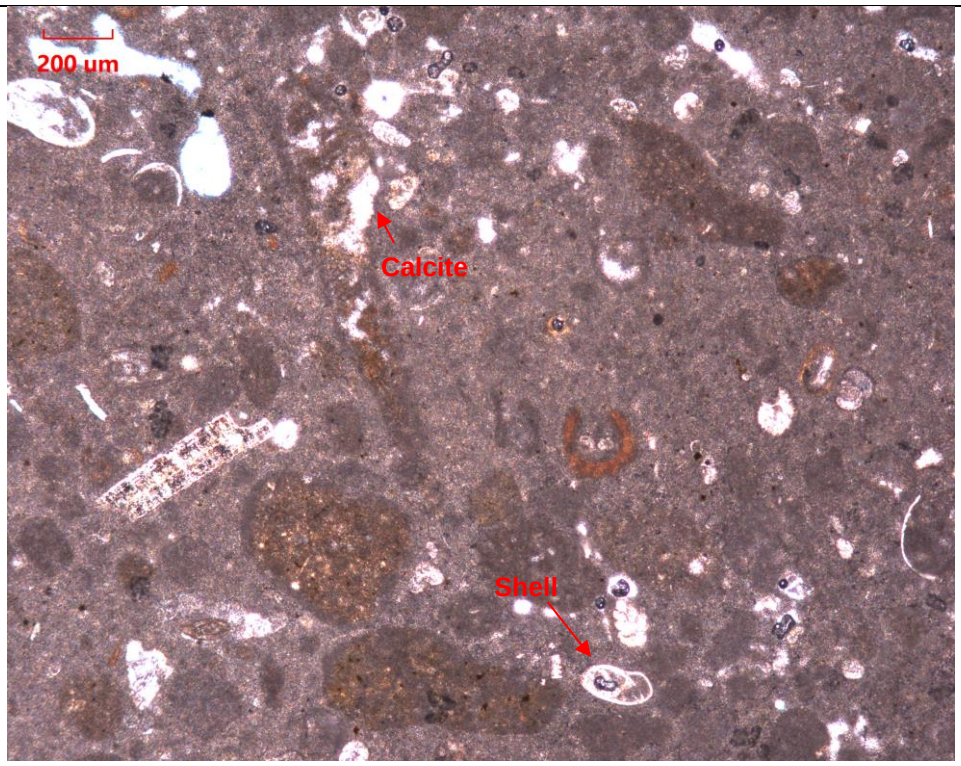
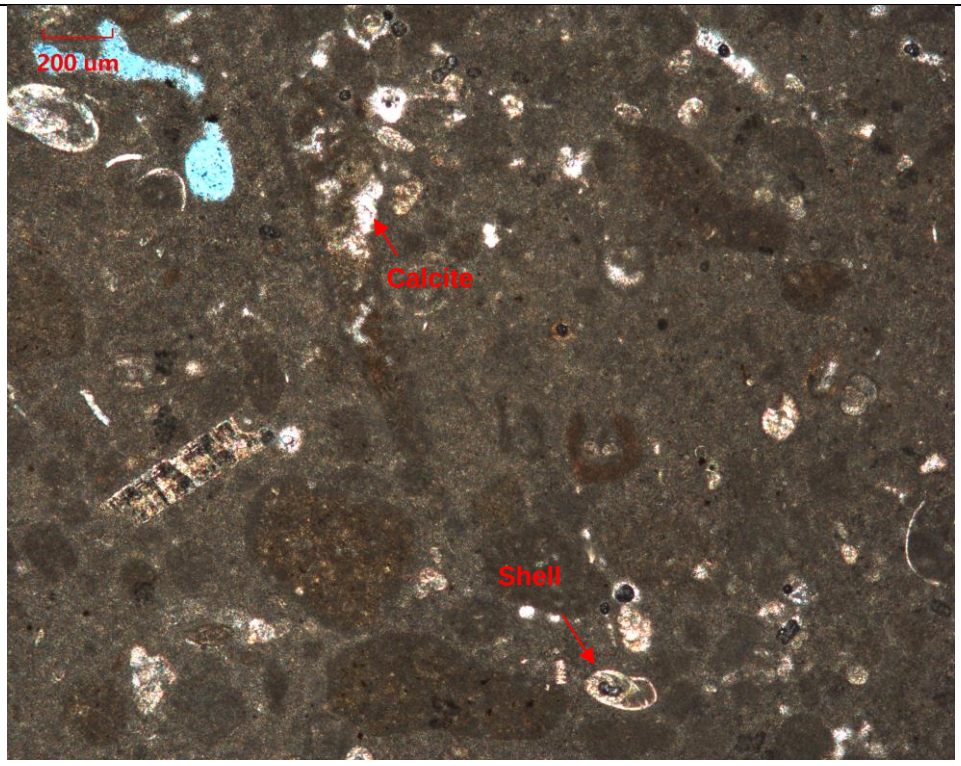
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

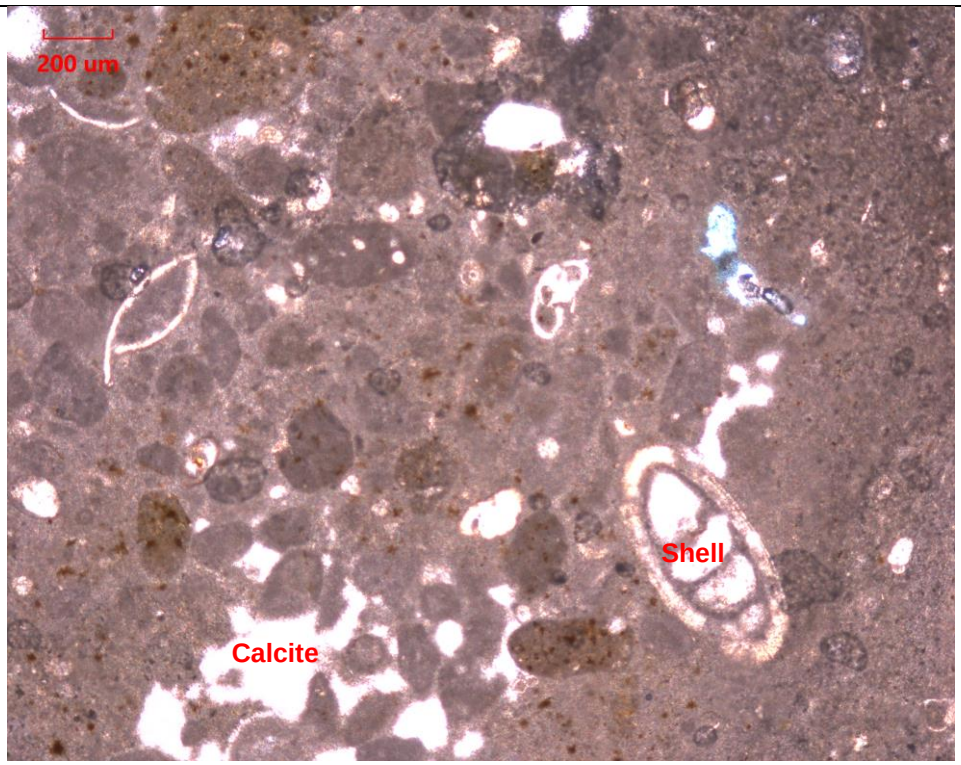
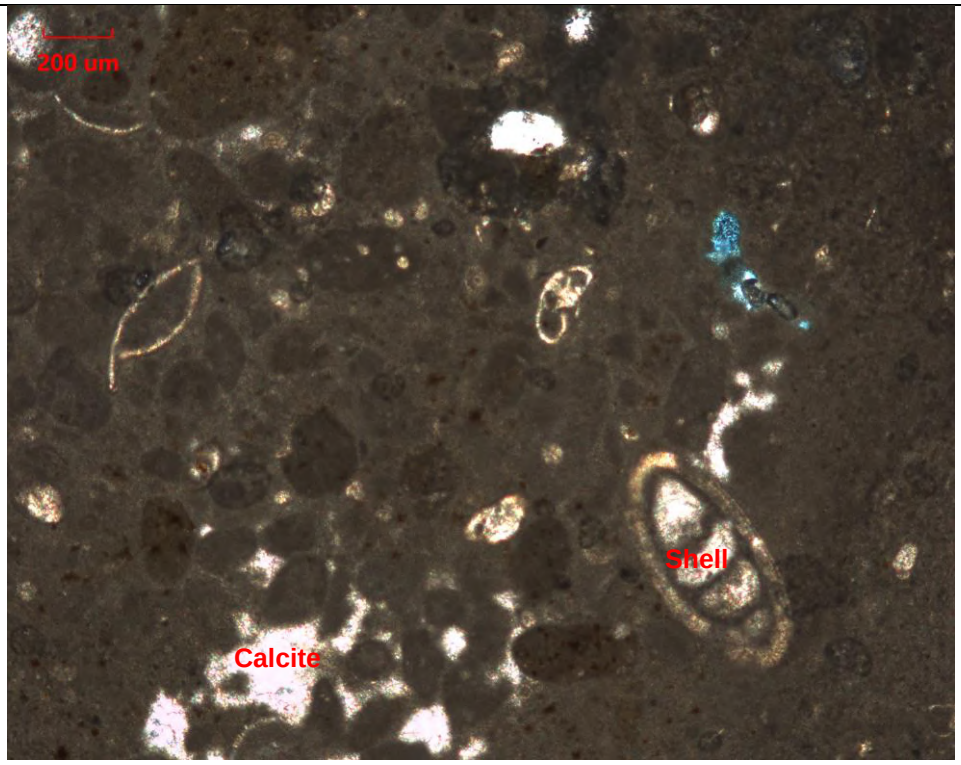
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |

*Figure 2. Plane and crossed polarized photos*

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admin@geolabs.co.uk
www.geolabs.co.uk

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Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

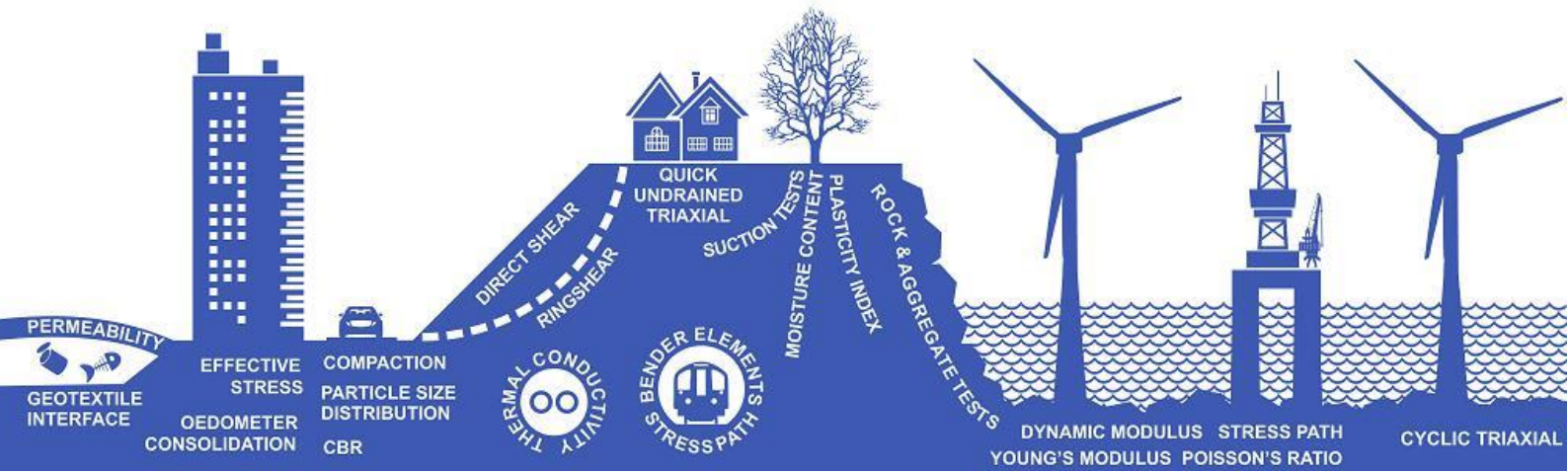
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#22_SAMP |
| **Sample ref** | : | CR12-IS |
| **Depth (m)** | : | 12.50 - 12.70 |
| **Geolabs Sample Id** | : | 479170 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

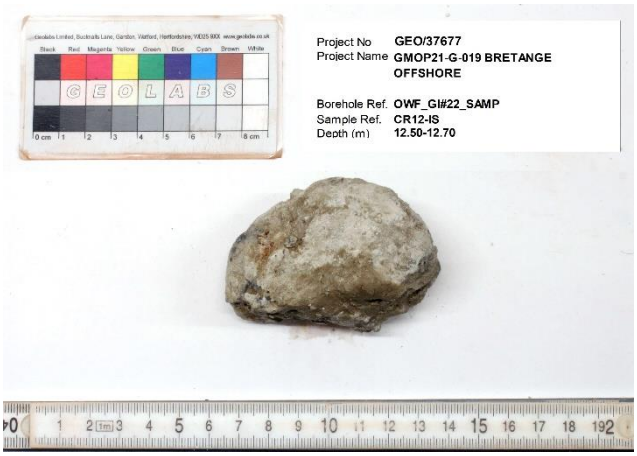


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared grey - brown colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 0.8 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (56%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (17%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (25%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Shelly Limestone | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 56 | 0.8-0.01 |
| Calcite | 17 | 0.4-0.01 |
| Matrix | 25 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (56%), calcite (17%), matrix (25%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

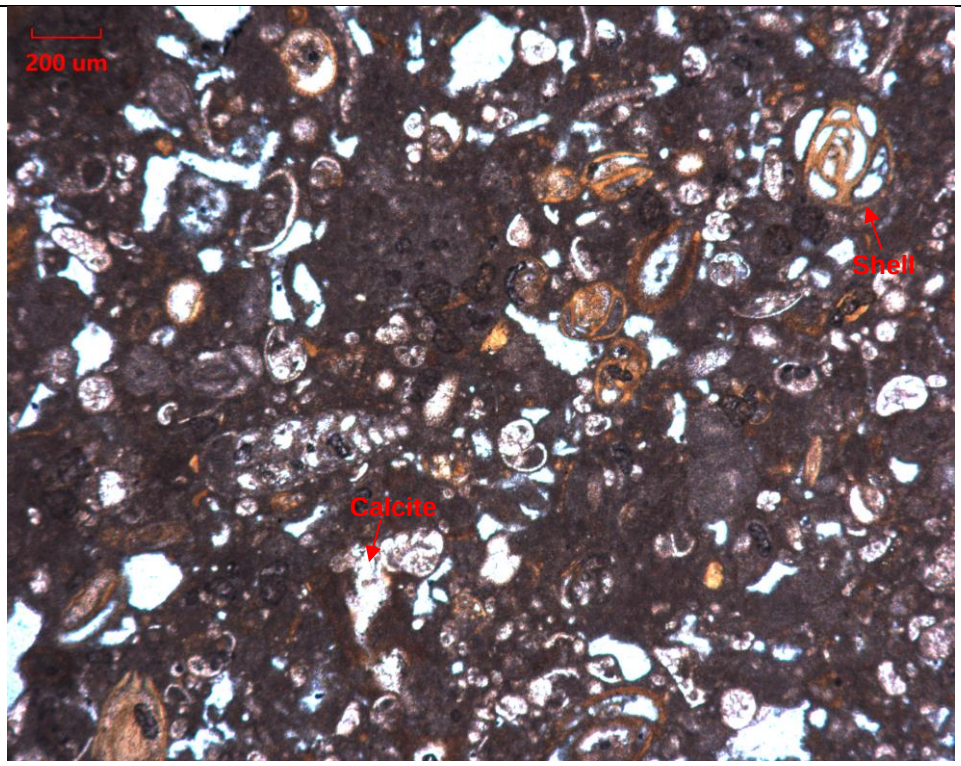
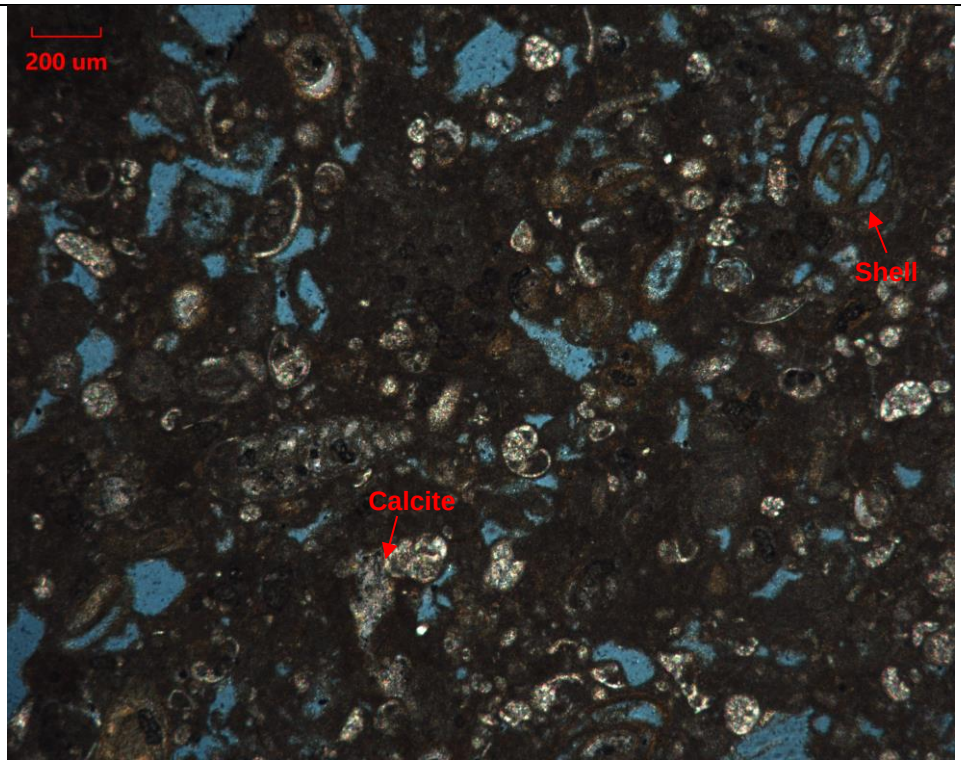
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

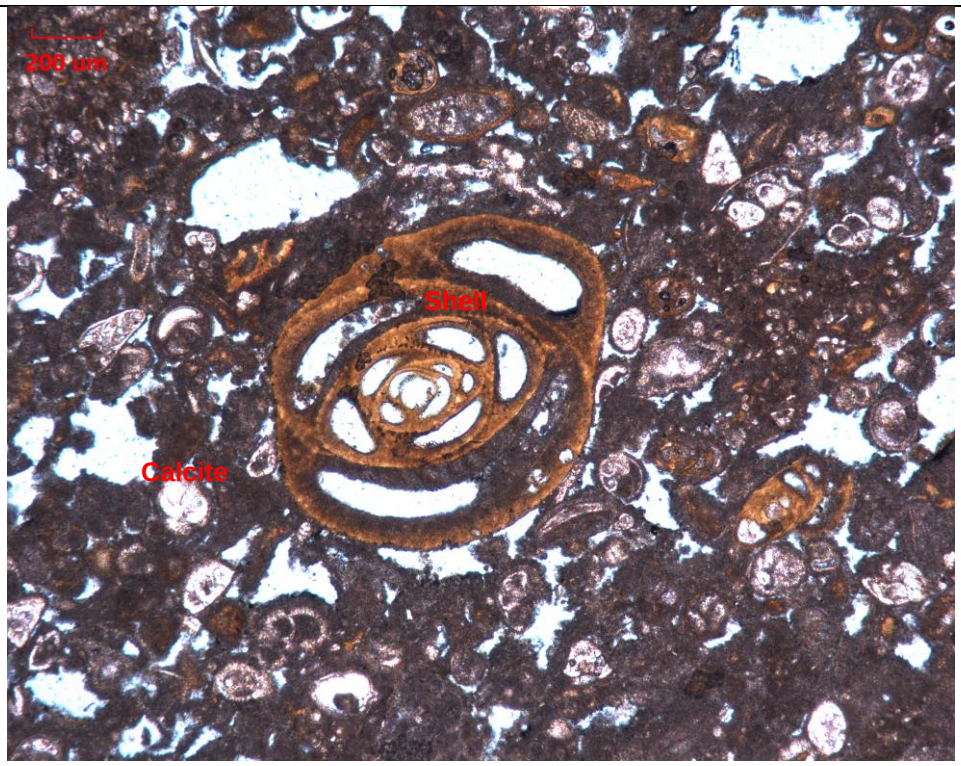
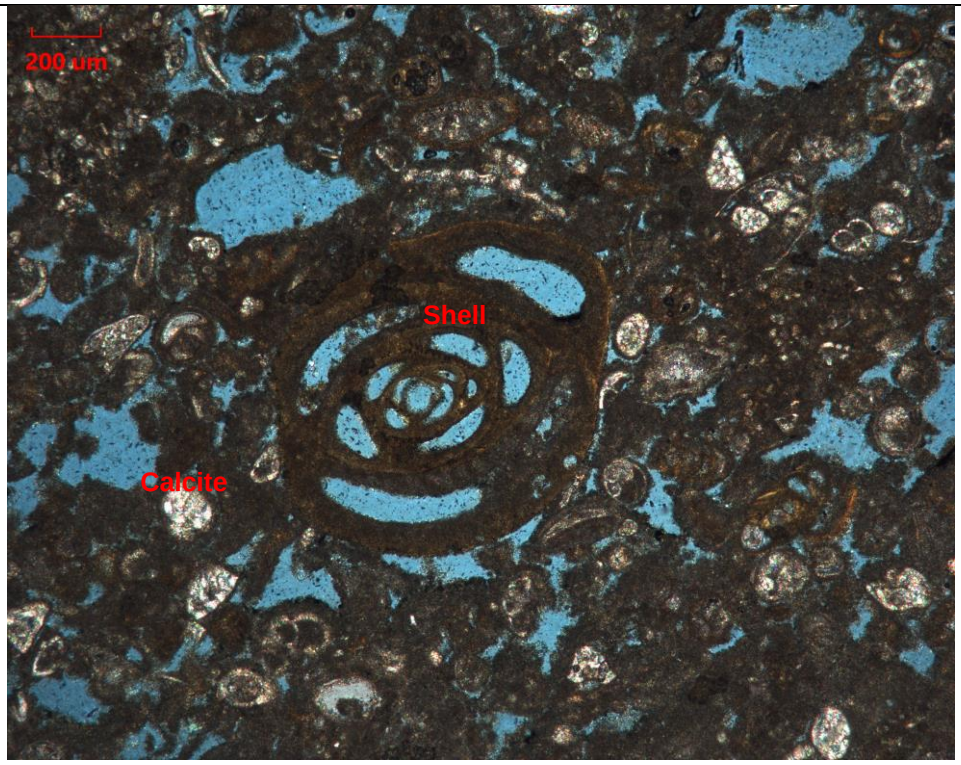
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |

*Figure 2. Plane and crossed polarized photos*

Geolabs Ltd
+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

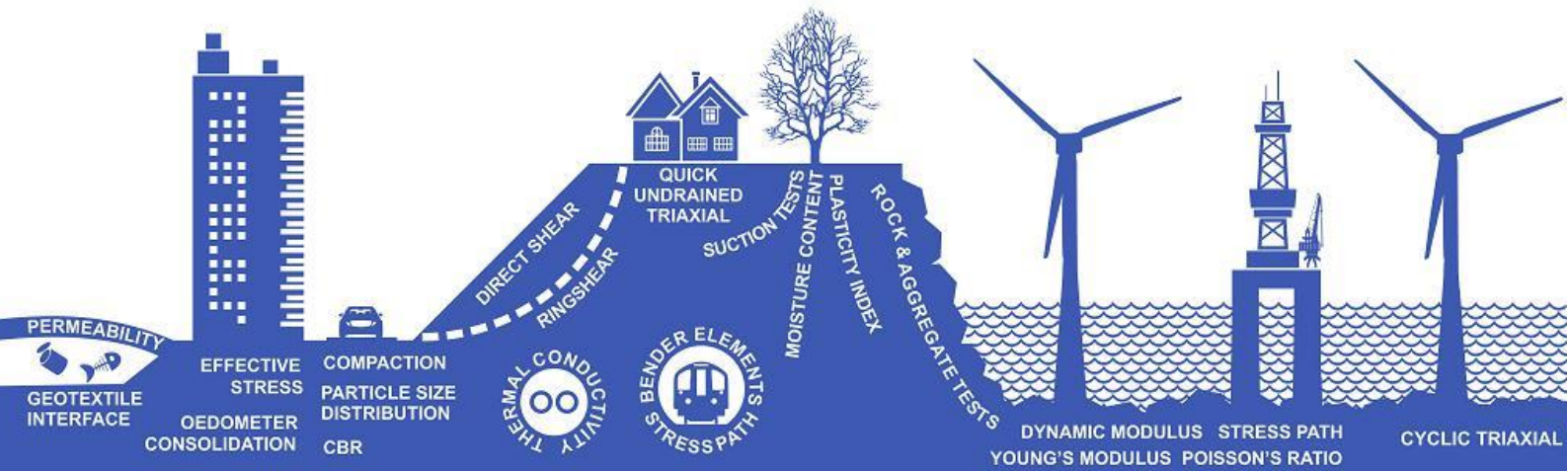
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#22_SAMP |
| **Sample ref** | : | CR15-IS |
| **Depth (m)** | : | 16.20 - 16.20 |
| **Geolabs Sample Id** | : | 479169 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department

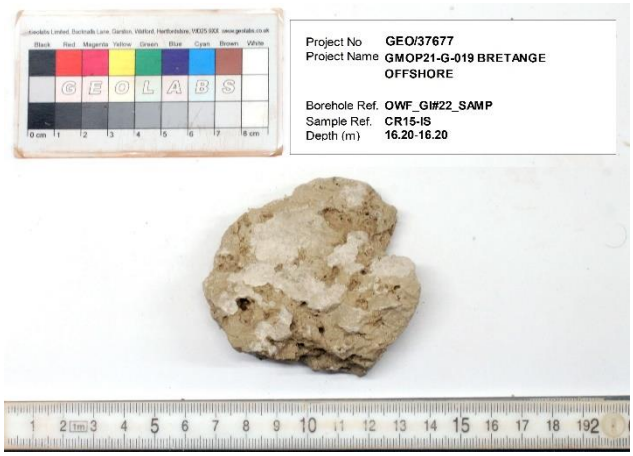


## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION




The submitted sample is generally appeared light cream colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## A. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 0.4 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (52%)**: Shell are almost always composed of Calcite (CaCO3) rather than Dolomite (CaMg(CO3)2). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (20%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (24%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (4%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| Rock / Minerals | Shelly Limestone | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 52 | 0.4-0.01 |
| Calcite | 20 | 0.2-0.01 |
| Matrix | 24 | <0.003 |
| Opaque Mineral | 4 | 0.2-0.1 |
| **Total** | 100 | - |

## B. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (52%), calcite (20%), matrix (24%) and opaque mineral (4%).

## APPENDIX A: MICROPHOTOGRAPHS

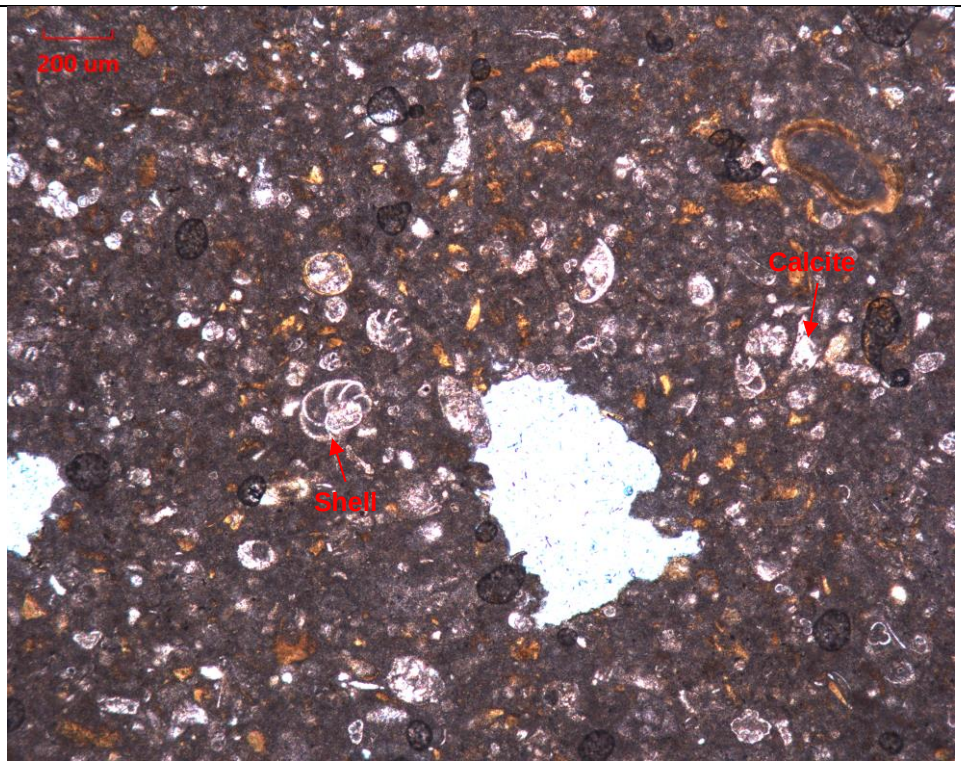
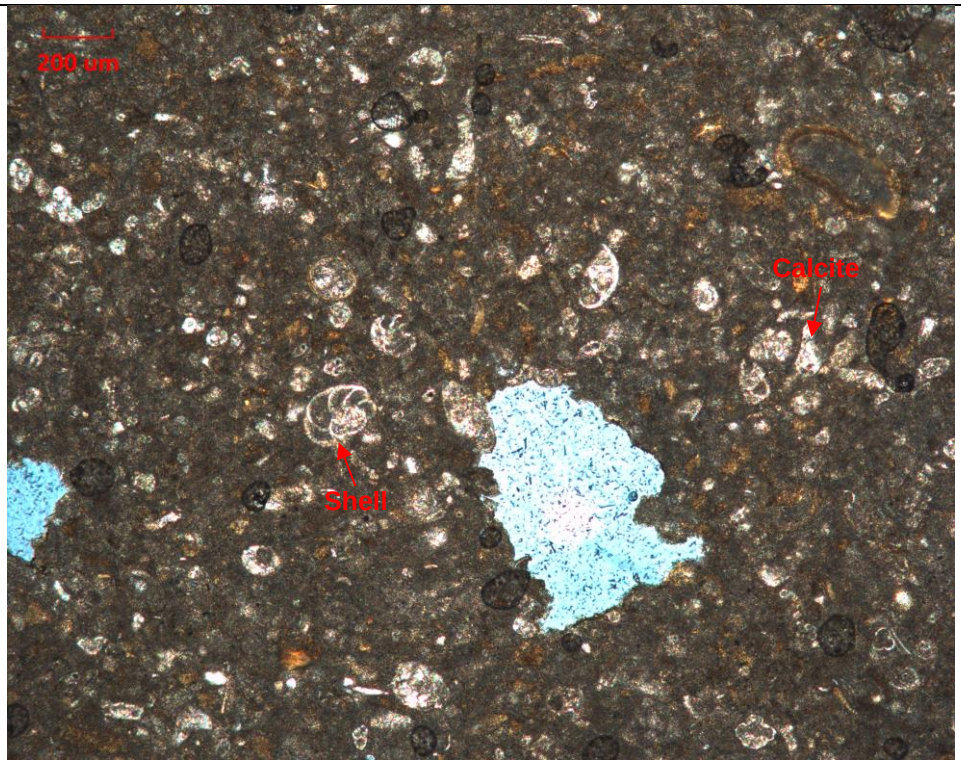
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |  |

*Figure 1. Plane and crossed polarized photos*

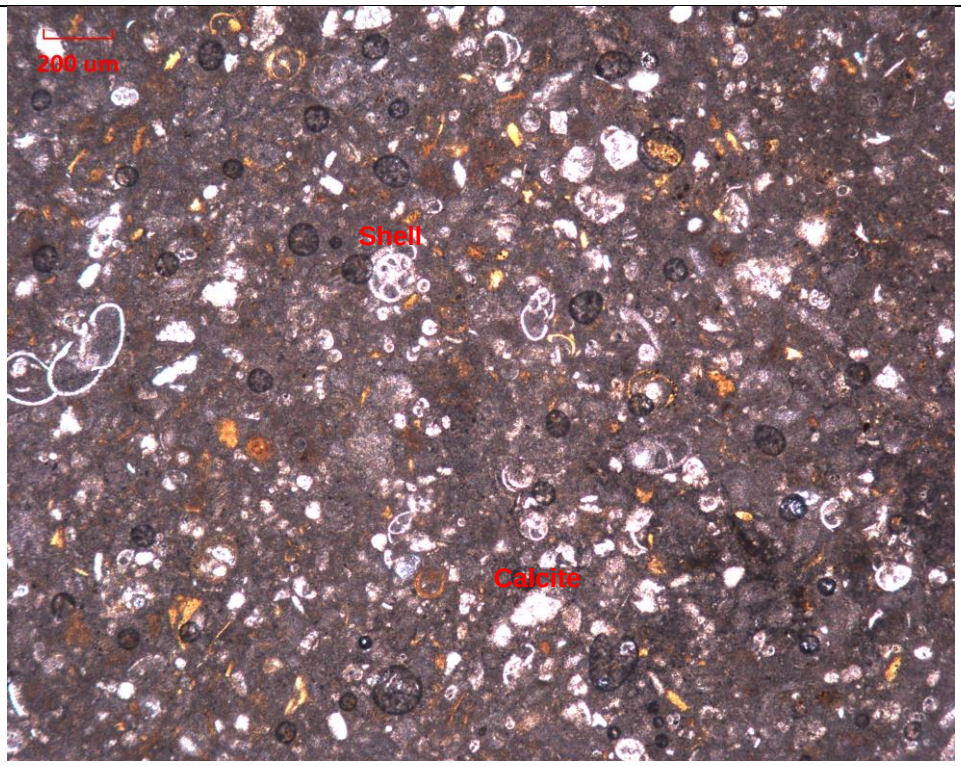
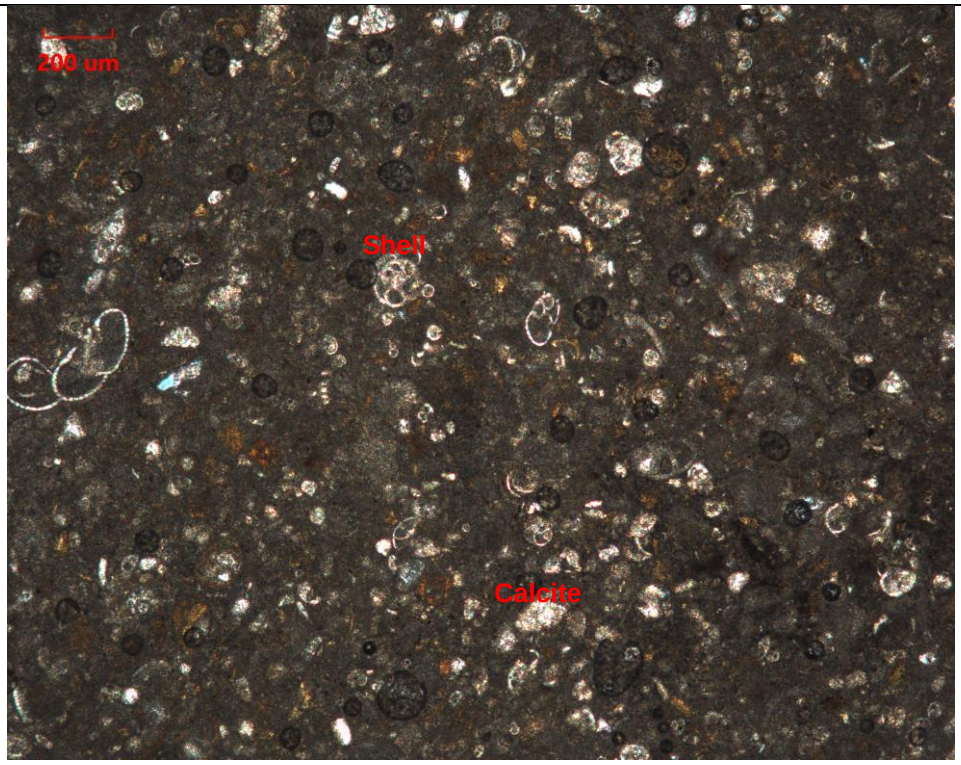
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X.** |   |

*Figure 2. Plane and crossed polarized photos*

Geolabs Ltd
+44 (0)1923 892 190
admin@geolabs.co.uk
www.geolabs.co.uk

Watford
Bucknalls Lane - Garston
Watford, Hertfordshire
WD25 9XX

# Petrographic Description

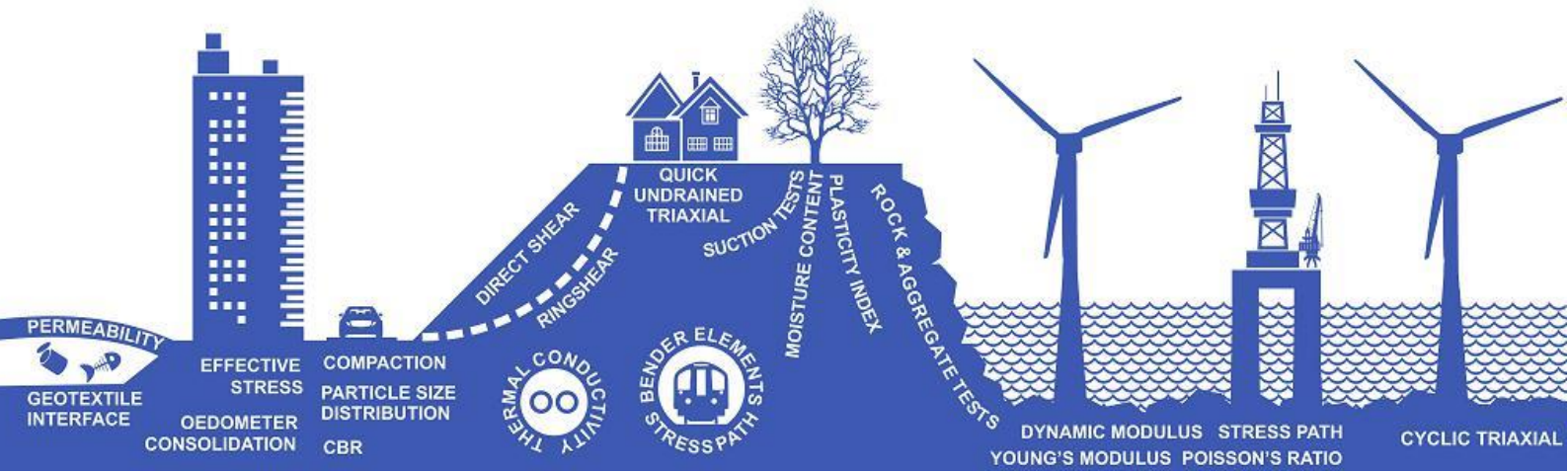
| | | |
|---|---|---|
| **Client** | : | Geoquip Marine Limited |
| **Project Number** | : | GEO/37677 |
| **Project Name** | : | GMOP21-G-019 Bretange Offshore |
| **Subject** | : | PETROGRAPHIC DESCRIPTION OF ROCKS |
| **Test Standard** | : | ISRM SUGGESTED METHODS |
| **Bh No / TP** | : | OWF_GI#24_SAMP |
| **Sample ref** | : | CR03-IS |
| **Depth (m)** | : | 3.10 - 3.10 |
| **Geolabs Sample Id** | : | 479188 |
| **Remarks** | : | - |

Prepared by

**Kristian Jovanov**
Senior Geologist

Reviewed by

**Christian Clergeaud**
Head of Department



## A. OBJECTIVE

Petrographic examination is made for the following purposes:

- To describe and determine the classification of the rock and its constituents

## B. MACRO EXAMINATION


The submitted sample is generally appeared light cream colour. The grain size of rock is classified as fine-grained. The rock has a non-clastic texture and consists of crystal of carbonate minerals which are appeared white, translucent and vitreous luster. Few dark speckles probably of clay minerals and opaque minerals. The sample is highly weathered.

## C. MICRO EXAMINATION

### *Shelly Limestone*

A sedimentary rock because it is made up of fragments. To be shelly, it is full of broken shells which are "glued" together with calcite. The grain size is varying from approximately 0.8 to 0.01 mm (majority to minority). From the photomicrographs in Appendix A it can be seen that the shelly limestone consists mainly of fossilized organisms and calcite. The descriptions of its mineral constituents are as follow:

**Fossil/Shell (52%)**: Shell are almost always composed of Calcite ($CaCO_3$) rather than Dolomite ($CaMg(CO_3)_2$). It usually can be seen mechanical twining that is observed with vigorous effervescence in cold dilute hydrochloric acid

**Calcite (18%)**: The calcite has perfect rhombohedral cleavages. In the PPL view calcites are characterized by colourless and twinkling. Taken under crossed polars, the interference colours extend up to high white. Sometimes, it can be seen mechanical twining of the calcite.

**Matrix (28%)**: Individual clay or silt minerals which are usually too small to be resolved in the optical microscope. Clay minerals include Kaolin group, Smectite group, Illite group and Chlorite group etc. In this thin section, clay minerals usually filled in voids of fossil fragments.

**Opaque Mineral (2%)**: Both in the PPL view and CPL view the opaque mineral show black colour.

*Table I: Composition of Minerals in the Rock*

| **Rock** / **Minerals** | **Shelly Limestone** | |
|---|---|---|
| | **Average Percent** (%) | **Average Diameter** (mm) |
| Fossils/Shells | 52 | 0.8-0.01 |
| Calcite | 18 | 0.2-0.01 |
| Matrix | 28 | <0.003 |
| Opaque Mineral | 2 | 0.2-0.1 |
| **Total** | 100 | - |

## D. FINDINGS & CONCLUSIONS

The submitted rock sample is **Shelly Limestone**. Mineral of the sample is predominantly fossil/shell (52%), calcite (18%), matrix (28%) and opaque mineral (2%).

## APPENDIX A: MICROPHOTOGRAPHS

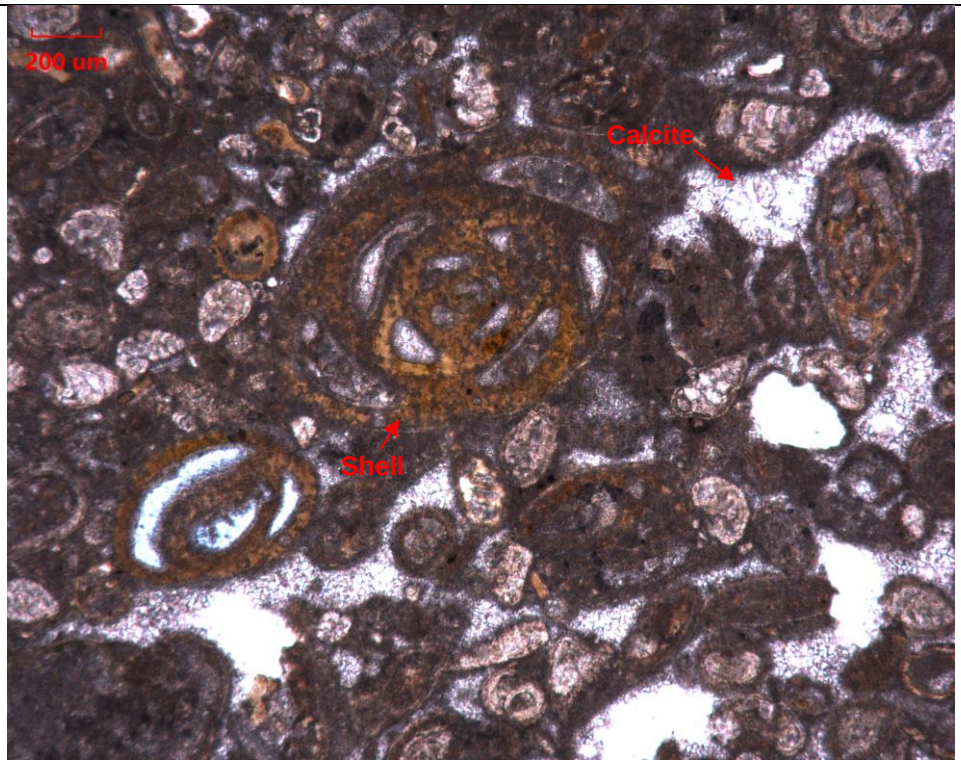
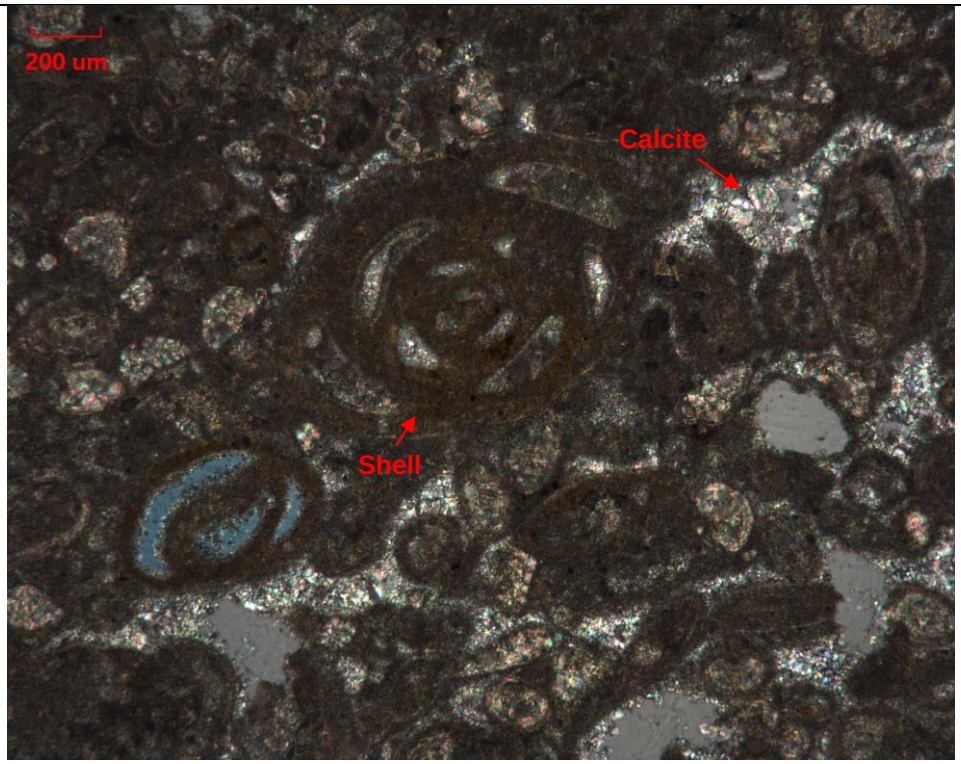
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X**. |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X**. |   |

*Figure 1. Plane and crossed polarized photos*

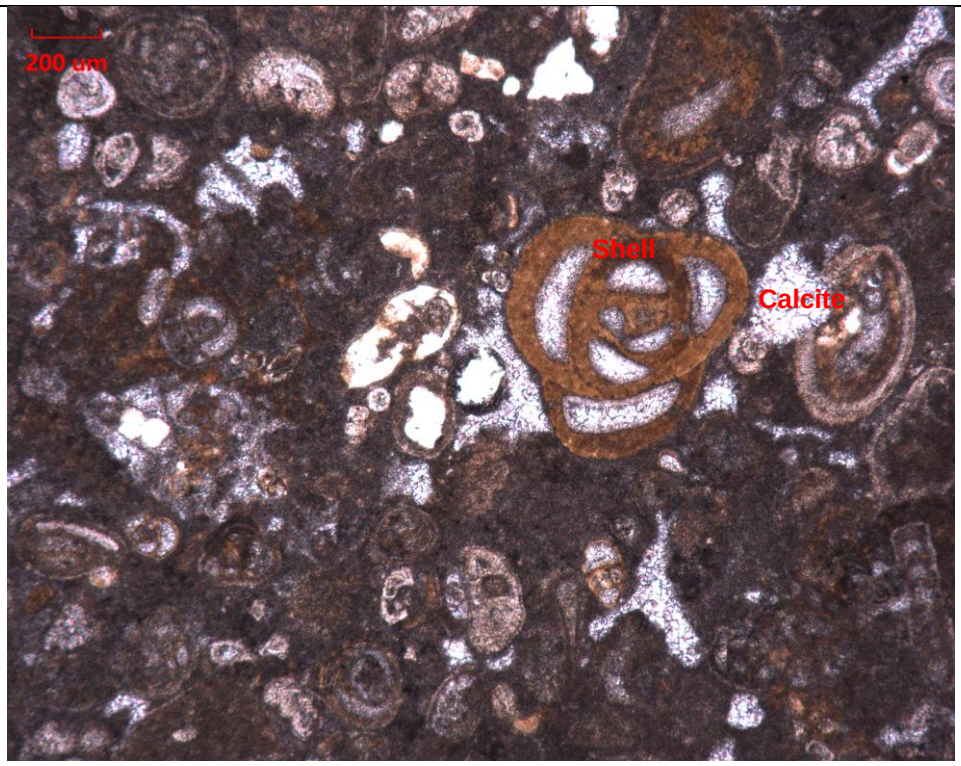
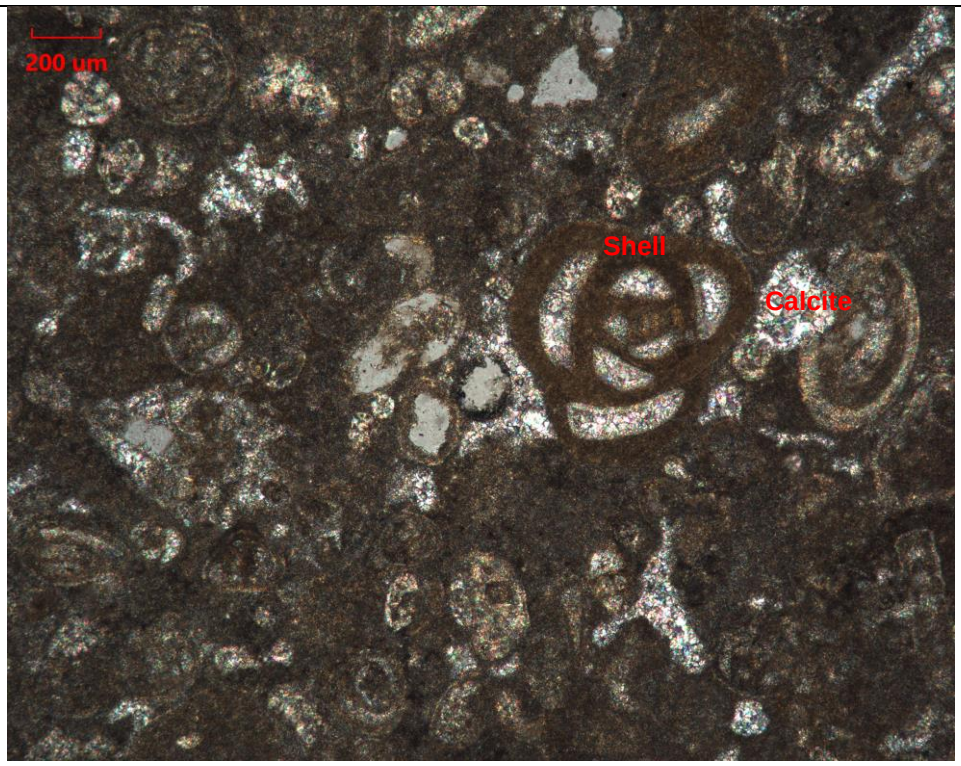
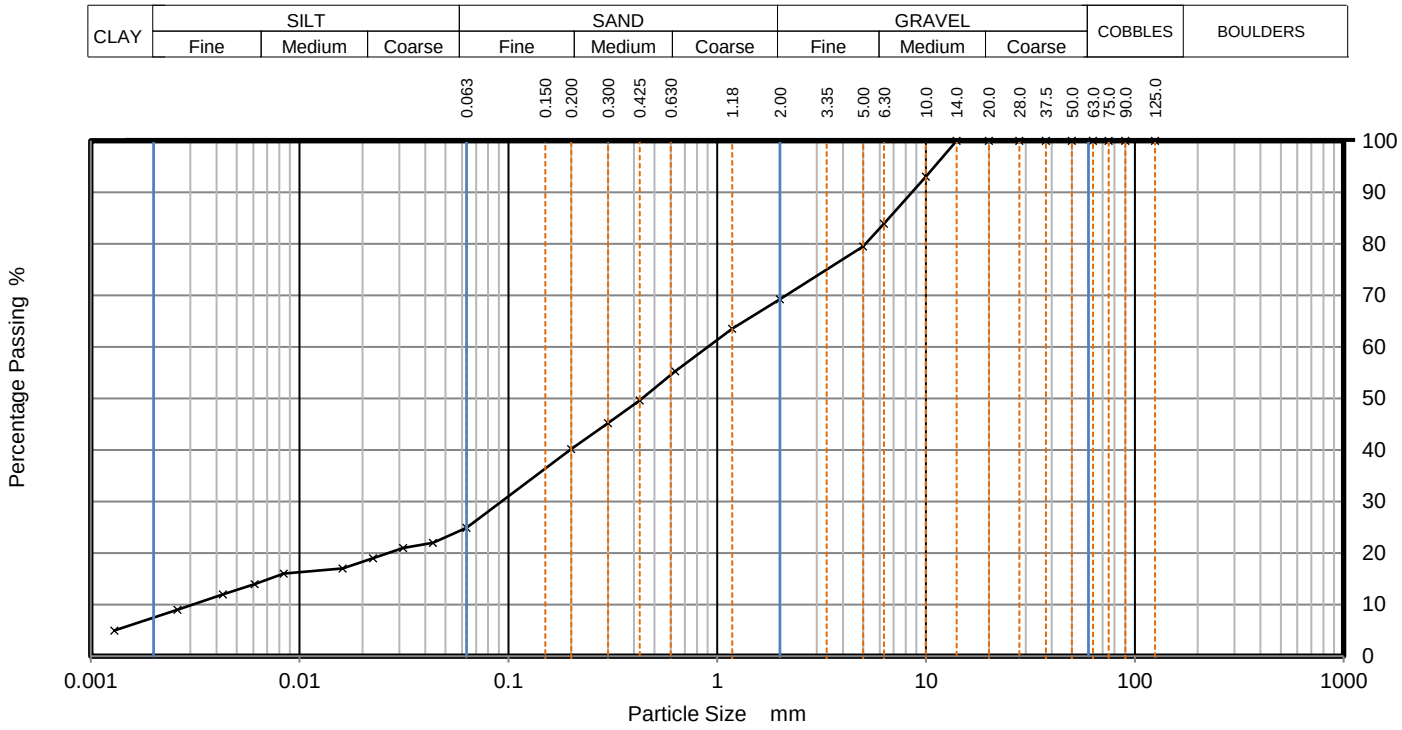
| | |
|---|---|
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X**. |   |
| Photomicrograph of shell and calcite as Shelly Limestone mineral constituents, **50X**. |   |

*Figure 2. Plane and crossed polarized photos*

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU02A |
| Sample Description | Very pale yellow, white page 2.6y/2-9 silty, clayey, gravelly SAND | | | Depth, m | 14.50 |
| Specimen Reference | IS | Specimen Depth | 14.5 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023022733 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0435 | 22 |
| | | 0.0313 | 21 |
| 125 | 100 | 0.0225 | 19 |
| 90 | 100 | 0.0161 | 17 |
| 75 | 100 | 0.0084 | 16 |
| 63 | 100 | 0.0061 | 14 |
| 50 | 100 | 0.0043 | 12 |
| 37.5 | 100 | 0.0026 | 9 |
| 28 | 100 | 0.0013 | 5 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 93 | | |
| 6.3 | 84 | | |
| 5 | 80 | | |
| 2 | 69 | | |
| 1.18 | 64 | Particle density | |
| 0.63 | 55 | 2.65 | Mg/m3 |
| 0.425 | 50 | | |
| 0.300 | 45 | | |
| 0.200 | 40 | | |
| | | | |
| 0.063 | 25 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 30.74 |
| Sand | 44.37 |
| Silt | 17.53 |
| Clay | 7.37 |

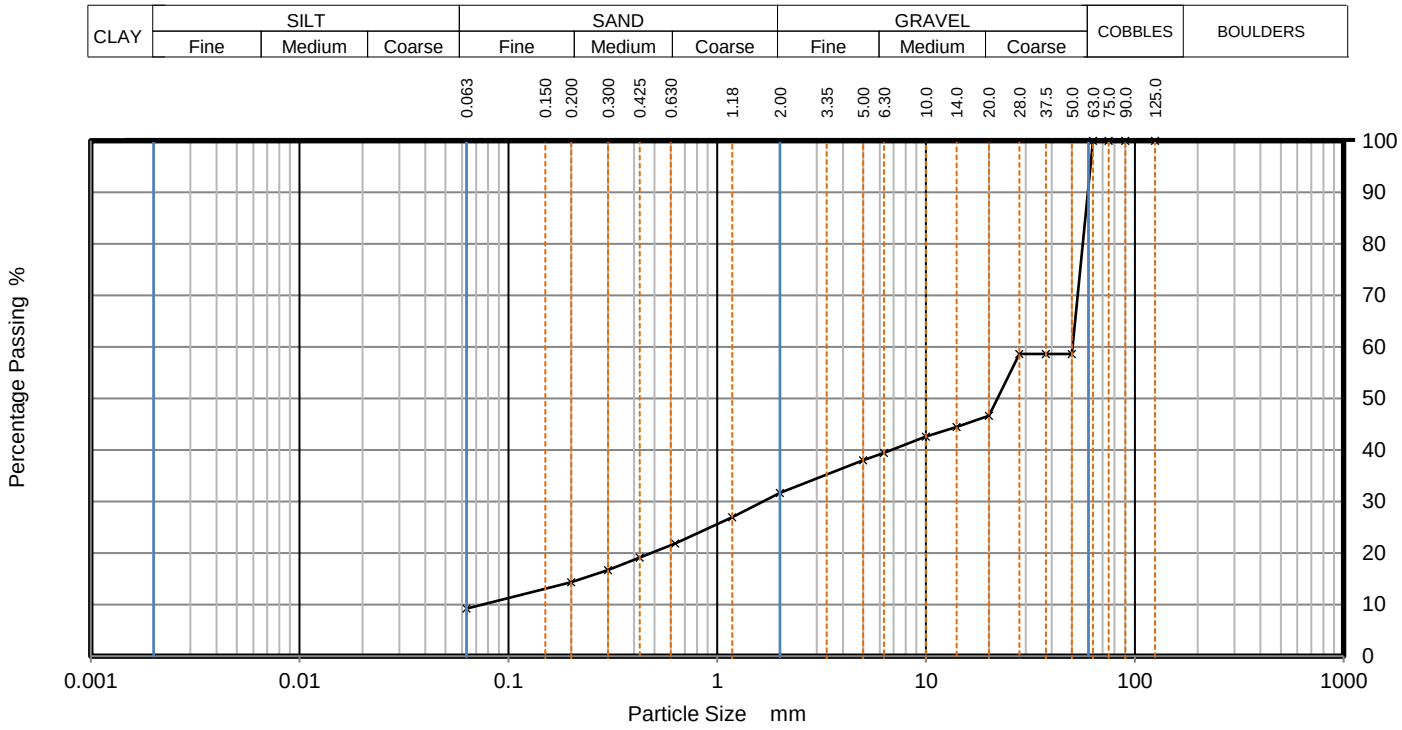
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 8.566 |
| $D_{60}$ | mm | 0.902 |
| $D_{50}$ | mm | 0.436 |
| $D_{30}$ | mm | 0.093 |
| $D_{10}$ | mm | 0.003 |
| Uniformity Coefficient | | 289.10 |
| Curvature Coefficient | | 3.05 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | D.Smith | | 06/04/2023 11:14 | 16/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU03 |
| Sample Description | White page 2.5y_/2-9/ Very pale yellow silty, sandy, GRAVEL including cemented sand | | | Depth, m | 15.00 |
| Specimen Reference | IS | Specimen Depth | 15 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH012023022734 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 59 | | |
| 37.5 | 59 | | |
| 28 | 59 | | |
| 20 | 47 | | |
| 14 | 44 | | |
| 10 | 43 | | |
| 6.3 | 39 | | |
| 5 | 38 | | |
| 2 | 32 | | |
| 1.18 | 27 | | |
| 0.63 | 22 | | |
| 0.425 | 19 | | |
| 0.300 | 17 | | |
| 0.200 | 14 | | |
| | | | |
| 0.063 | 9 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 68.35 |
| Sand | 22.42 |
| | |
| Fines <0.063mm | 9.23 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 59.579 |
| $D_{60}$ | mm | 50.391 |
| $D_{50}$ | mm | 21.976 |
| $D_{30}$ | mm | 1.660 |
| $D_{10}$ | mm | 0.075 |
| Uniformity Coefficient | | 672.20 |
| Curvature Coefficient | | 0.73 |

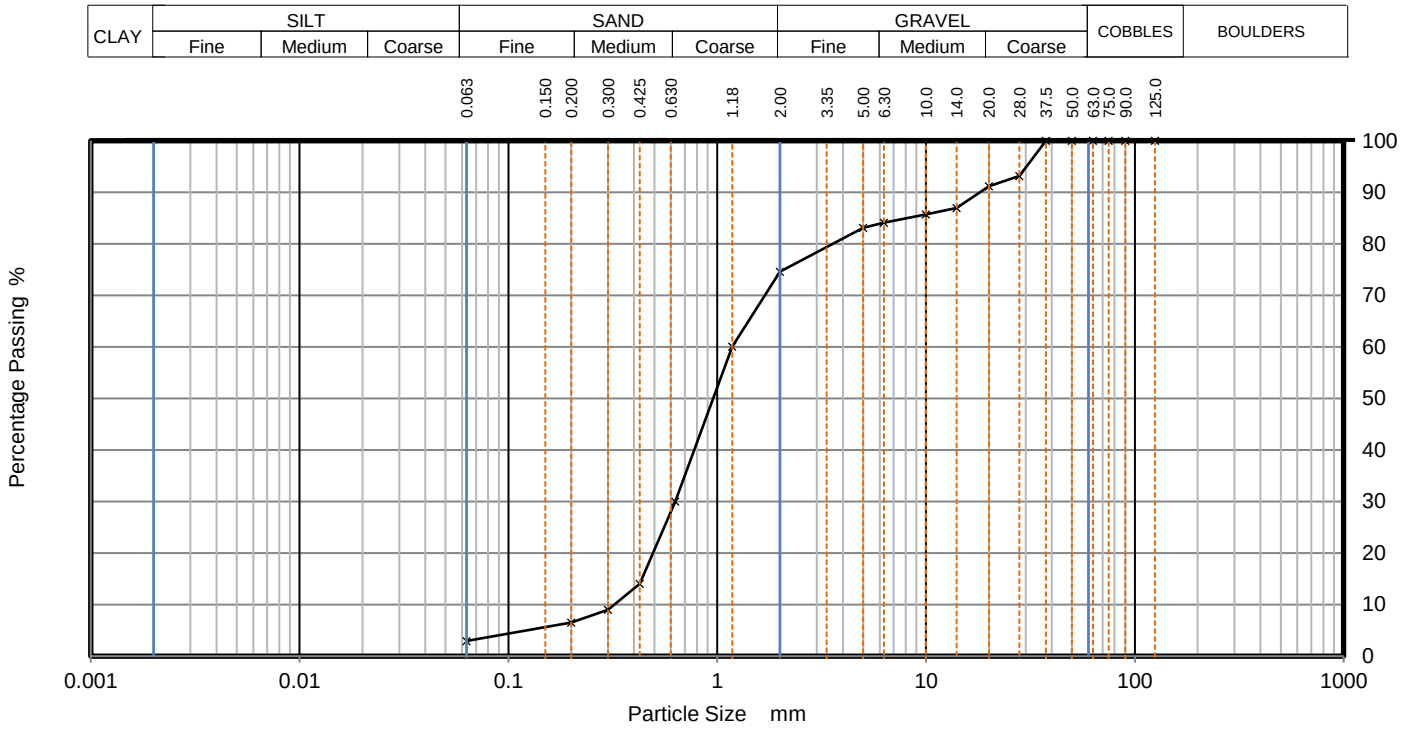
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Minimum soil mass used, test not to standard

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | U. Mazhar | 18/04/2023 11:16 | 16/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#04_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU01A |
| Sample Description | 10yR 5/6 Yellowish brown gravelly, SAND | | | Depth, m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | 0 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH012023022746 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 93 | | |
| 20 | 91 | | |
| 14 | 87 | | |
| 10 | 86 | | |
| 6.3 | 84 | | |
| 5 | 83 | | |
| 2 | 75 | | |
| 1.18 | 60 | | |
| 0.63 | 30 | | |
| 0.425 | 14 | | |
| 0.300 | 9 | | |
| 0.200 | 7 | | |
| | | | |
| 0.063 | 3 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 25.38 |
| Sand | 71.67 |
| | |
| Fines <0.063mm | 2.95 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 18.124 |
| $D_{60}$ | mm | 1.179 |
| $D_{50}$ | mm | 0.957 |
| $D_{30}$ | mm | 0.630 |
| $D_{10}$ | mm | 0.321 |
| Uniformity Coefficient | | 3.67 |
| Curvature Coefficient | | 1.05 |

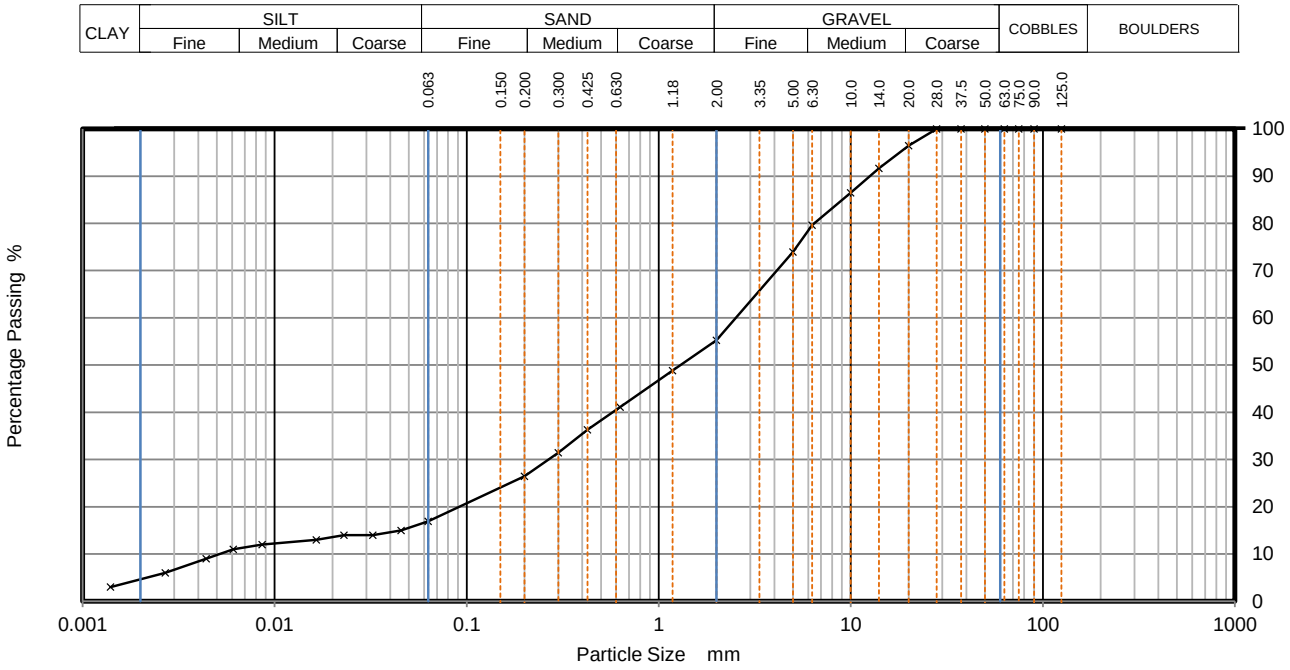
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant test-non standard test completed

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | D.Smith | | 06/04/2023 13:28 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU03 |
| Sample Description | white page 2.5y 9/2 Very pale yellow silty SAND with gravel and clay | | | Depth, m | 8.30 |
| Specimen Reference | B1 | Specimen Depth | 8.3 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023022765 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0456 | 15 |
| | | 0.0325 | 14 |
| 125 | 100 | 0.0230 | 14 |
| 90 | 100 | 0.0165 | 13 |
| 75 | 100 | 0.0086 | 12 |
| 63 | 100 | 0.0061 | 11 |
| 50 | 100 | 0.0044 | 9 |
| 37.5 | 100 | 0.0027 | 6 |
| 28 | 100 | 0.0014 | 3 |
| 20 | 96 | | |
| 14 | 92 | | |
| 10 | 87 | | |
| 6.3 | 80 | | |
| 5 | 74 | | |
| 2 | 55 | | |
| 1.18 | 49 | Particle density (assumed) | |
| 0.63 | 41 | 2.65 Mg/m3 | |
| 0.425 | 36 | | |
| 0.300 | 31 | | |
| 0.200 | 26 | | |
| | | | |
| 0.063 | 17 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 44.71 |
| Sand | 38.39 |
| Silt | 12.49 |
| Clay | 4.41 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 12.545 |
| $D_{60}$ | mm | 2.521 |
| $D_{50}$ | mm | 1.299 |
| $D_{30}$ | mm | 0.267 |
| $D_{10}$ | mm | 0.005 |
| Uniformity Coefficient | | 506.40 |
| Curvature Coefficient | | 5.66 |

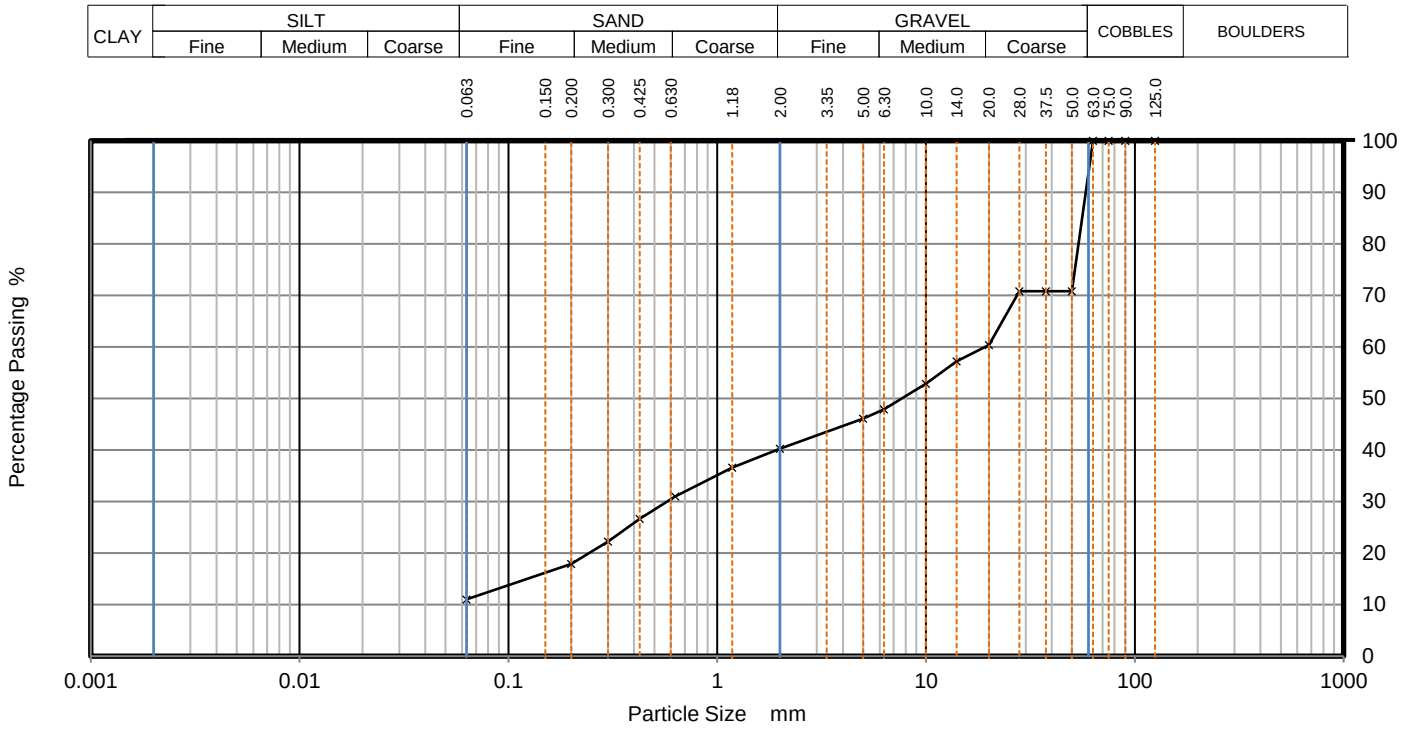
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Specimen mass not adequate - non-standard test

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 14/04/2023 12:54 | 15/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU05 |
| Sample Description | 2.5y 9/2 Very pale yellow silty, sandy, GRAVEL | | | Depth, m | 10.00 |
| Specimen Reference | B1 | Specimen Depth | 10 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH012023022769 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 71 | | |
| 37.5 | 71 | | |
| 28 | 71 | | |
| 20 | 60 | | |
| 14 | 57 | | |
| 10 | 53 | | |
| 6.3 | 48 | | |
| 5 | 46 | | |
| 2 | 40 | | |
| 1.18 | 37 | | |
| 0.63 | 31 | | |
| 0.425 | 27 | | |
| 0.300 | 22 | | |
| 0.200 | 18 | | |
| | | | |
| 0.063 | 11 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 59.73 |
| Sand | 29.24 |
| | |
| Fines <0.063mm | 11.02 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 91.356 |
| $D_{60}$ | mm | 19.168 |
| $D_{50}$ | mm | 7.668 |
| $D_{30}$ | mm | 0.575 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

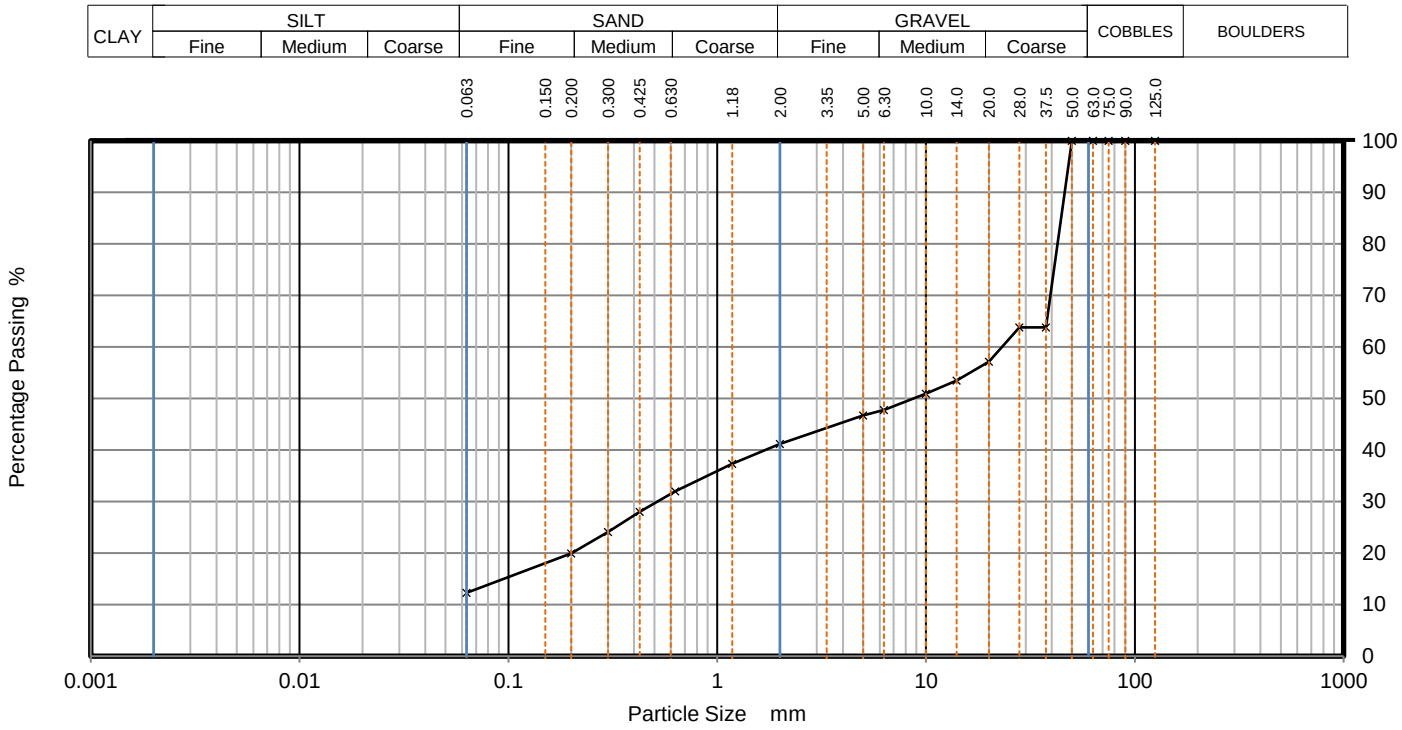
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant test-non-standard test completed

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 13:29 | 13/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU06 |
| Sample Description | Very pale yellow white page 2.5y 9/2 silty, sandy, GRAVEL including cemented sand | | | Depth, m | 11.30 |
| Specimen Reference | B1 | Specimen Depth | 11.3 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH012023022771 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 64 | | |
| 28 | 64 | | |
| 20 | 57 | | |
| 14 | 53 | | |
| 10 | 51 | | |
| 6.3 | 48 | | |
| 5 | 47 | | |
| 2 | 41 | | |
| 1.18 | 37 | | |
| 0.63 | 32 | | |
| 0.425 | 28 | | |
| 0.300 | 24 | | |
| 0.200 | 20 | | |
| | | | |
| 0.063 | 12 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 58.79 |
| Sand | 28.92 |
| | |
| Fines <0.063mm | 12.28 |

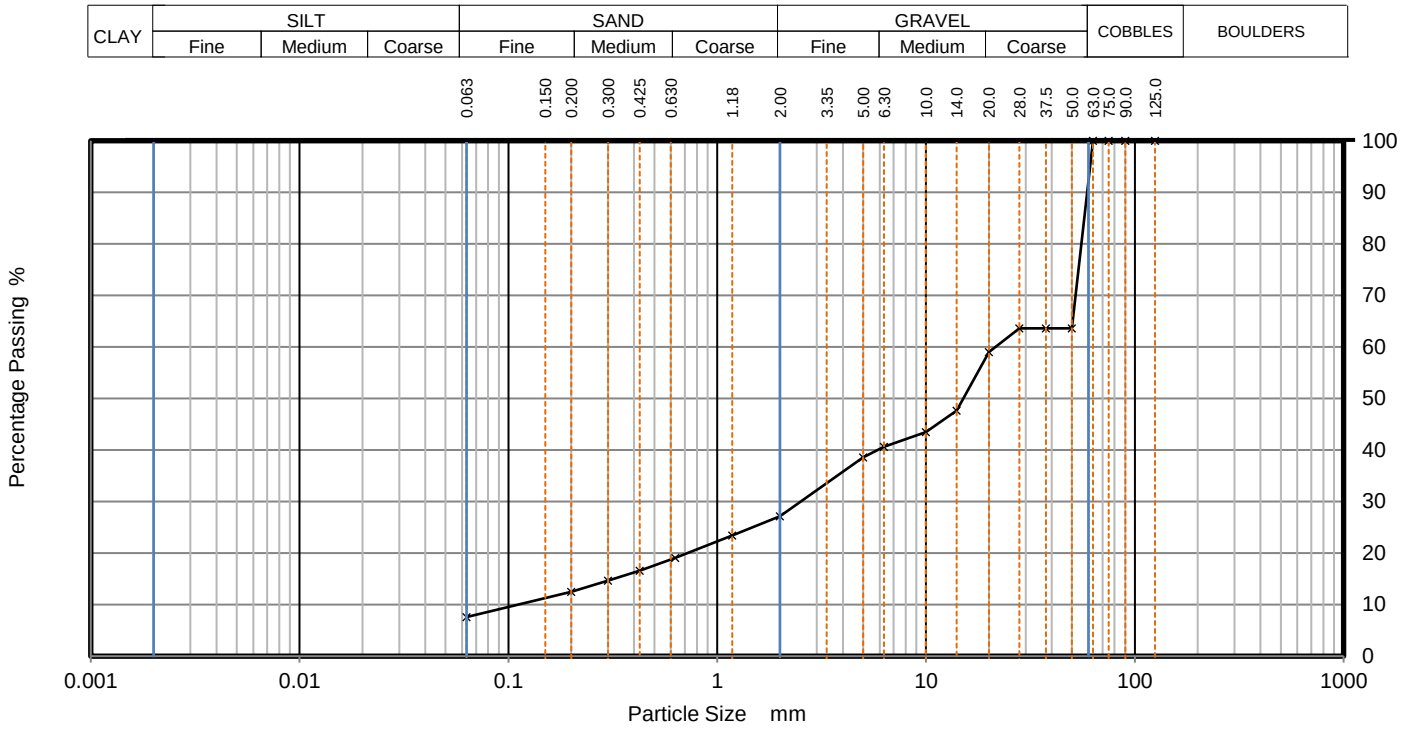
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 89.660 |
| $D_{60}$ | mm | 23.123 |
| $D_{50}$ | mm | 8.745 |
| $D_{30}$ | mm | 0.517 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 13:33 | 16/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU09 |
| Sample Description | Very pale yellow, white page 2.5y 9/2 silty sandy, GRAVEL including shell fragments and cemented sand | | | Depth, m | 14.20 |
| Specimen Reference | IS | Specimen Depth | 14.2 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH012023022776 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 64 | | |
| 37.5 | 64 | | |
| 28 | 64 | | |
| 20 | 59 | | |
| 14 | 48 | | |
| 10 | 43 | | |
| 6.3 | 41 | | |
| 5 | 39 | | |
| 2 | 27 | | |
| 1.18 | 23 | | |
| 0.63 | 19 | | |
| 0.425 | 17 | | |
| 0.300 | 15 | | |
| 0.200 | 12 | | |
| | | | |
| 0.063 | 8 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 72.84 |
| Sand | 19.57 |
| | |
| Fines <0.063mm | 7.58 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 97.178 |
| $D_{60}$ | mm | 21.524 |
| $D_{50}$ | mm | 15.070 |
| $D_{30}$ | mm | 2.514 |
| $D_{10}$ | mm | 0.111 |
| Uniformity Coefficient | | 193.60 |
| Curvature Coefficient | | 2.64 |

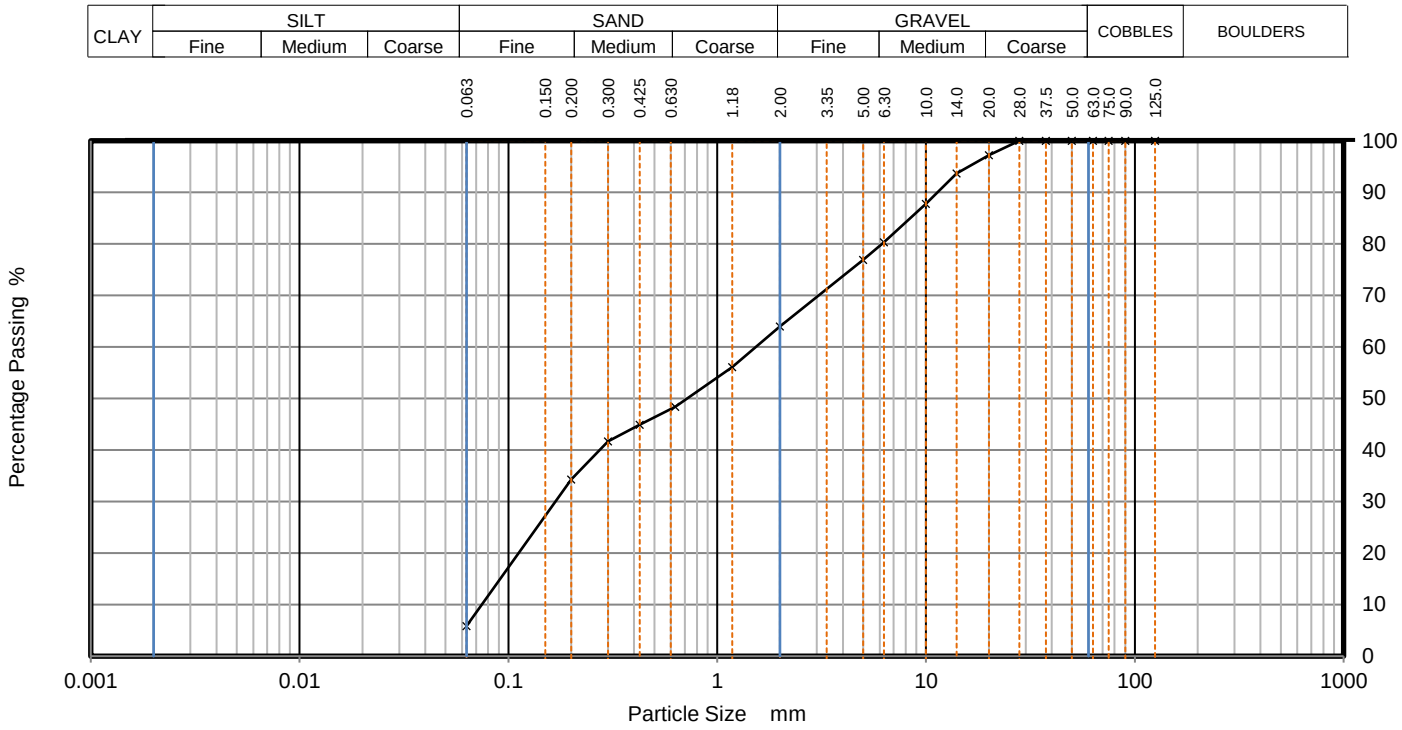
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant test-non standard test completed

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 13:30 | 13/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU01A |
| Sample Description | 5y 4/2 Olive grey fine SAND with gravel and shell fragments | | | Depth, m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | 0 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH012023022798 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 97 | | |
| 14 | 94 | | |
| 10 | 88 | | |
| 6.3 | 80 | | |
| 5 | 77 | | |
| 2 | 64 | | |
| 1.18 | 56 | | |
| 0.63 | 48 | | |
| 0.425 | 45 | | |
| 0.300 | 42 | | |
| 0.200 | 34 | | |
| | | | |
| 0.063 | 6 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 36.00 |
| Sand | 58.15 |
| | |
| Fines <0.063mm | 5.84 |

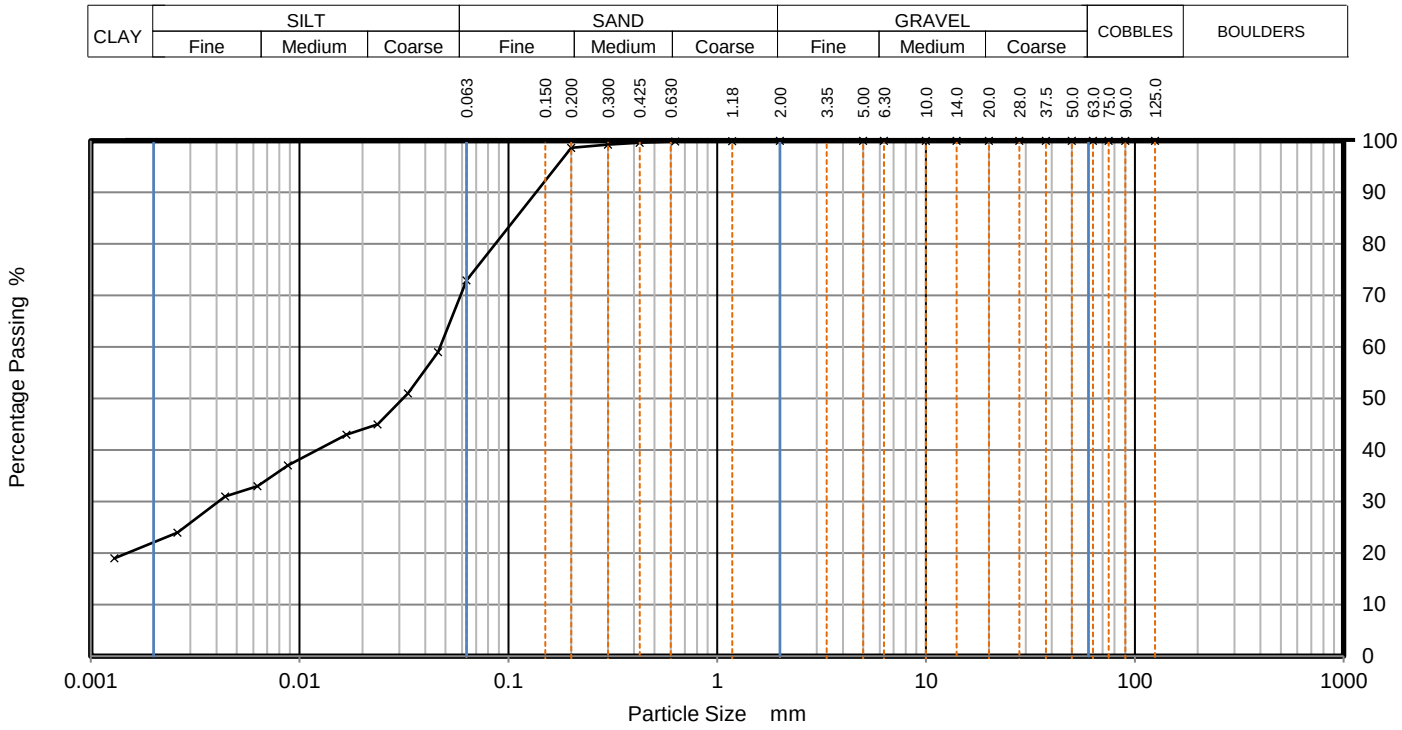
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 11.351 |
| $D_{60}$ | mm | 1.530 |
| $D_{50}$ | mm | 0.719 |
| $D_{30}$ | mm | 0.168 |
| $D_{10}$ | mm | 0.075 |
| Uniformity Coefficient | | 20.52 |
| Curvature Coefficient | | 0.25 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 11:21 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR04 |
| Sample Description | Green sandy, silty, CLAY | | | Depth, m | 3.90 |
| Specimen Reference | Q1 | Specimen Depth | 3.9 m | Sample Type | Q1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227112 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0460 | 59 |
| | | 0.0331 | 51 |
| 125 | 100 | 0.0236 | 45 |
| 90 | 100 | 0.0168 | 43 |
| 75 | 100 | 0.0088 | 37 |
| 63 | 100 | 0.0063 | 33 |
| 50 | 100 | 0.0044 | 31 |
| 37.5 | 100 | 0.0026 | 24 |
| 28 | 100 | 0.0013 | 19 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | Particle density | (assumed) |
| 0.63 | 100 | 2.65 | Mg/m3 |
| 0.425 | 100 | Test sample mass (g) | 298.13 |
| 0.300 | 99 | | |
| 0.200 | 99 | | |
| | | | |
| 0.063 | 73 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.00 |
| Sand | 27.09 |
| Silt | 50.89 |
| Clay | 22.02 |

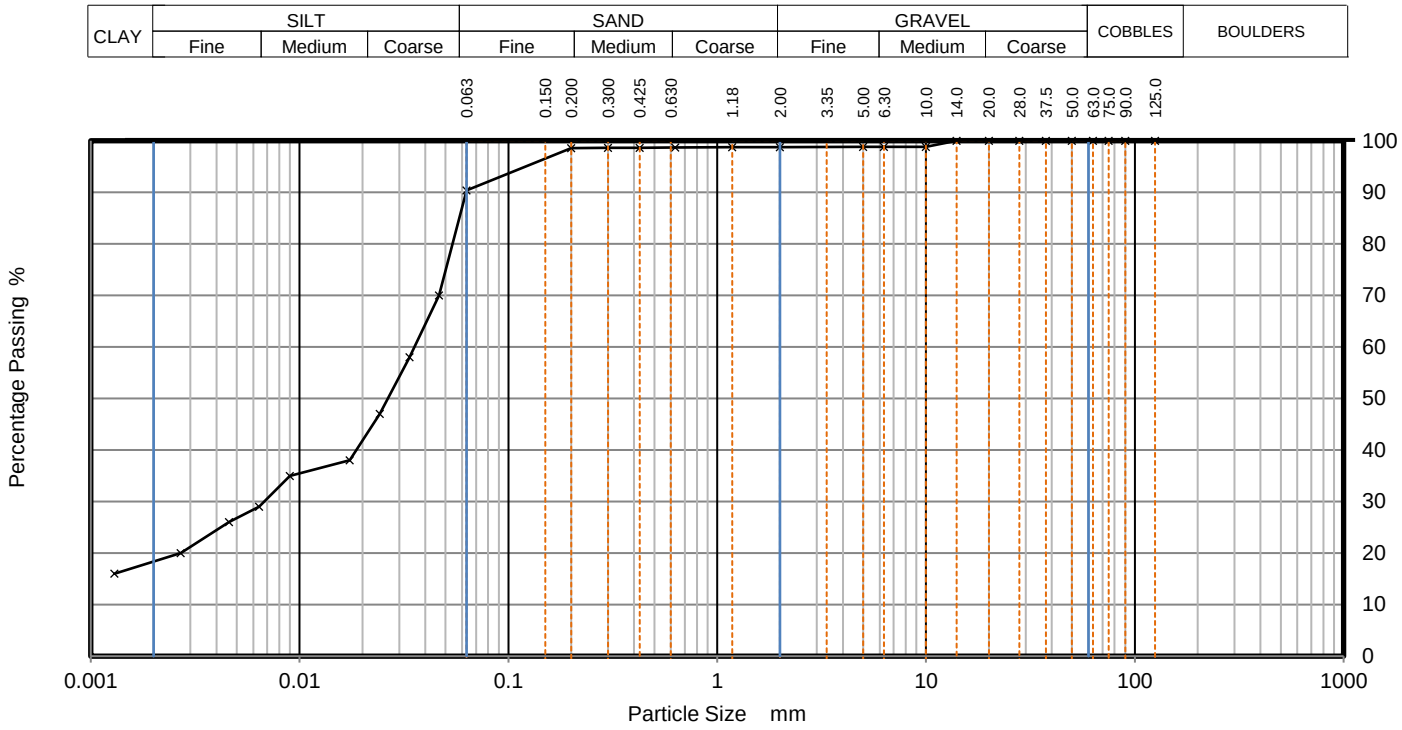
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.136 |
| $D_{60}$ | mm | 0.047 |
| $D_{50}$ | mm | 0.032 |
| $D_{30}$ | mm | 0.004 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| E Allan.Edward | D.Smith | 27/06/2023 10:07 | 04/05/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU02 |
| Sample Description | 10y-5Gy 6/2 10y Light greyish olive sandy, gravelly silty CLAY | | | Depth, m | 5.50 |
| Specimen Reference | B1 | Specimen Depth | 5.5 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227117 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0465 | 70 |
| | | 0.0336 | 58 |
| 125 | 100 | 0.0242 | 47 |
| 90 | 100 | 0.0174 | 38 |
| 75 | 100 | 0.0090 | 35 |
| 63 | 100 | 0.0064 | 29 |
| 50 | 100 | 0.0046 | 26 |
| 37.5 | 100 | 0.0027 | 20 |
| 28 | 100 | 0.0013 | 16 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 99 | | |
| 6.3 | 99 | | |
| 5 | 99 | | |
| 2 | 99 | | |
| 1.18 | 99 | Particle density | (assumed) |
| 0.63 | 99 | 2.65 | Mg/m3 |
| 0.425 | 99 | | |
| 0.300 | 99 | | |
| 0.200 | 99 | | |
| | | | |
| 0.063 | 90 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 1.24 |
| Sand | 8.41 |
| Silt | 71.61 |
| Clay | 18.74 |

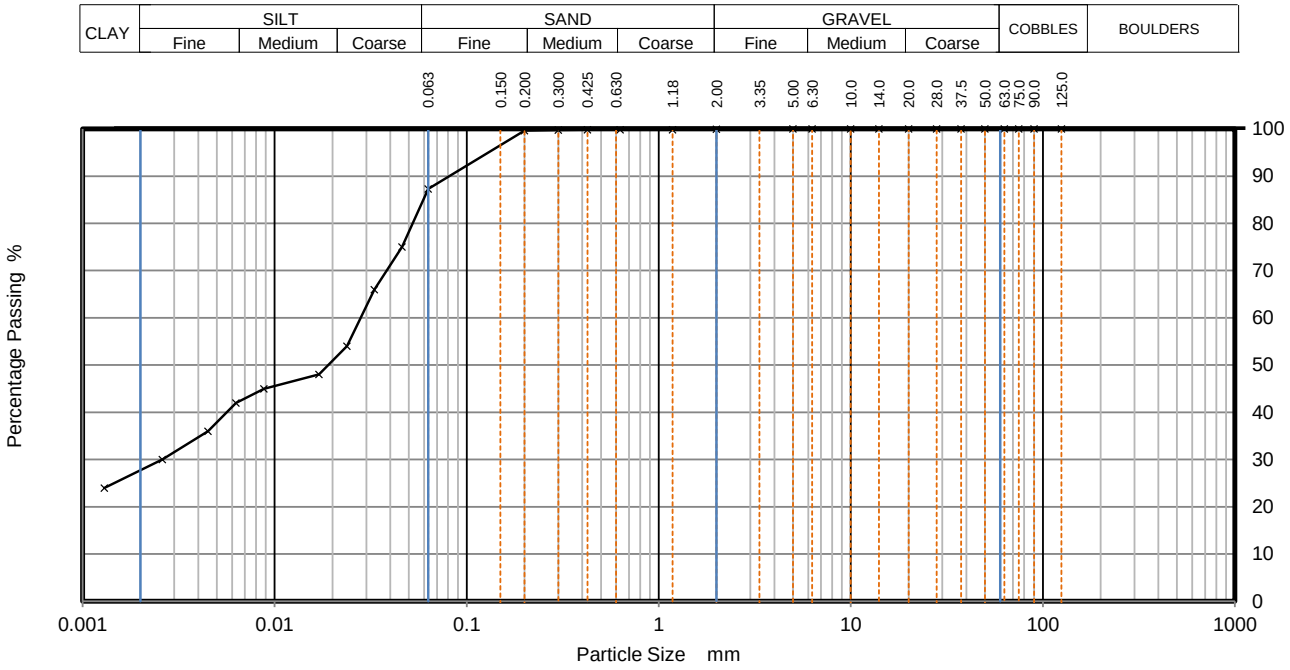
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.063 |
| $D_{60}$ | mm | 0.035 |
| $D_{50}$ | mm | 0.027 |
| $D_{30}$ | mm | 0.007 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 11:21 | 15/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR05 |
| Sample Description | GLEY 1 5GY 2.5/1 Greenish black slightly gravelly, sandy, clayey SILT | | | Depth, m | 4.50 |
| Specimen Reference | B1 | Specimen Depth | 4.5 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227114 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0460 | 75 |
| | | 0.0330 | 66 |
| 125 | 100 | 0.0238 | 54 |
| 90 | 100 | 0.0170 | 48 |
| 75 | 100 | 0.0088 | 45 |
| 63 | 100 | 0.0063 | 42 |
| 50 | 100 | 0.0045 | 36 |
| 37.5 | 100 | 0.0026 | 30 |
| 28 | 100 | 0.0013 | 24 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.63 | 100 | | |
| 0.425 | 100 | | |
| 0.300 | 100 | | |
| 0.200 | 100 | | |
| | | | |
| 0.063 | 87 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.08 |
| Sand | 12.65 |
| Silt | 59.67 |
| Clay | 27.59 |

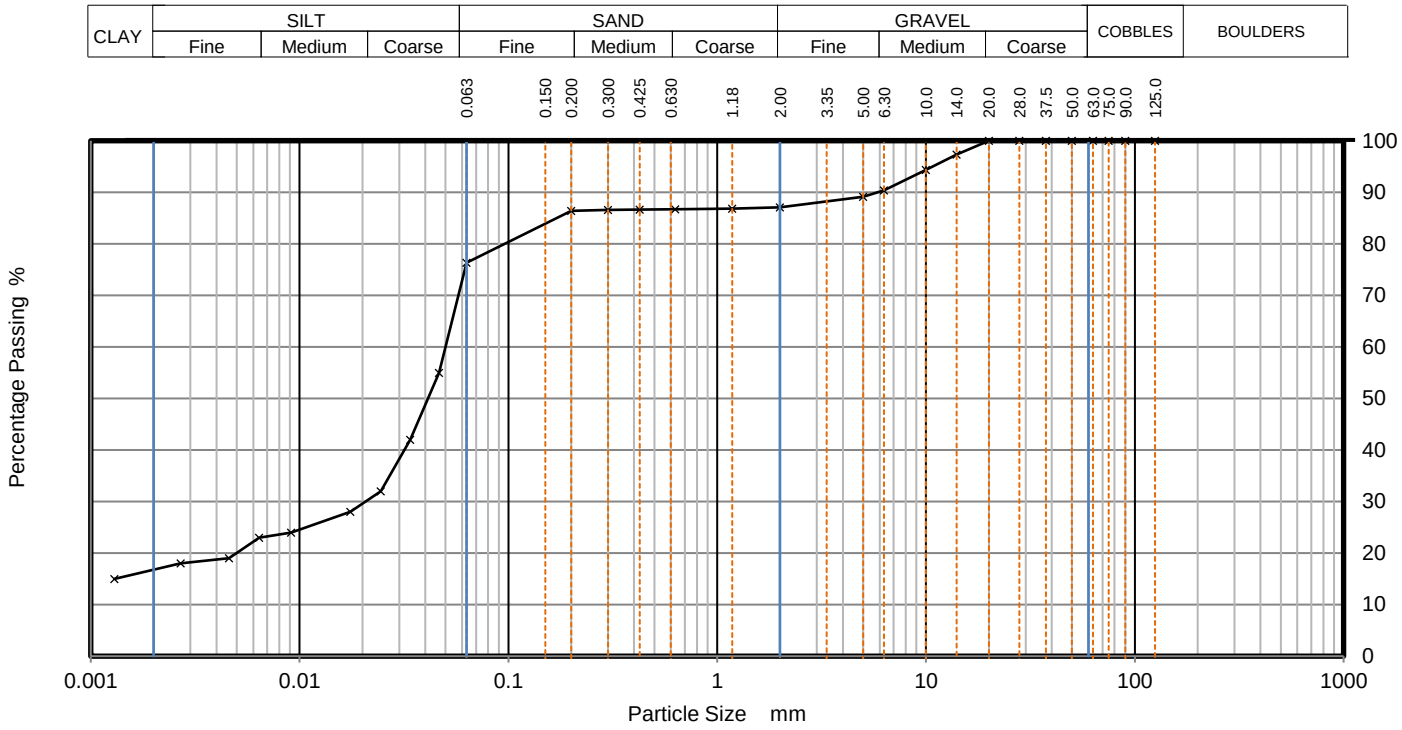
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.081 |
| $D_{60}$ | mm | 0.028 |
| $D_{50}$ | mm | 0.019 |
| $D_{30}$ | mm | 0.003 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 04/04/2023 13:05 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR02 |
| Sample Description | 10y 3/2 Very dark greyish olive gravelly, sandy, clayey, SILT with shell fragments | | | Depth, m | 6.50 |
| Specimen Reference | IS | Specimen Depth | 6.5 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227121 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0465 | 55 |
| | | 0.0339 | 42 |
| 125 | 100 | 0.0245 | 32 |
| 90 | 100 | 0.0175 | 28 |
| 75 | 100 | 0.0091 | 24 |
| 63 | 100 | 0.0064 | 23 |
| 50 | 100 | 0.0046 | 19 |
| 37.5 | 100 | 0.0027 | 18 |
| 28 | 100 | 0.0013 | 15 |
| 20 | 100 | | |
| 14 | 97 | | |
| 10 | 94 | | |
| 6.3 | 90 | | |
| 5 | 89 | | |
| 2 | 87 | | |
| 1.18 | 87 | Particle density | |
| 0.63 | 87 | 2.65 | Mg/m3 |
| 0.425 | 87 | | |
| 0.300 | 87 | | |
| 0.200 | 86 | | |
| | | | |
| 0.063 | 76 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 12.93 |
| Sand | 10.73 |
| Silt | 59.92 |
| Clay | 16.41 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 5.884 |
| $D_{60}$ | mm | 0.050 |
| $D_{50}$ | mm | 0.041 |
| $D_{30}$ | mm | 0.021 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

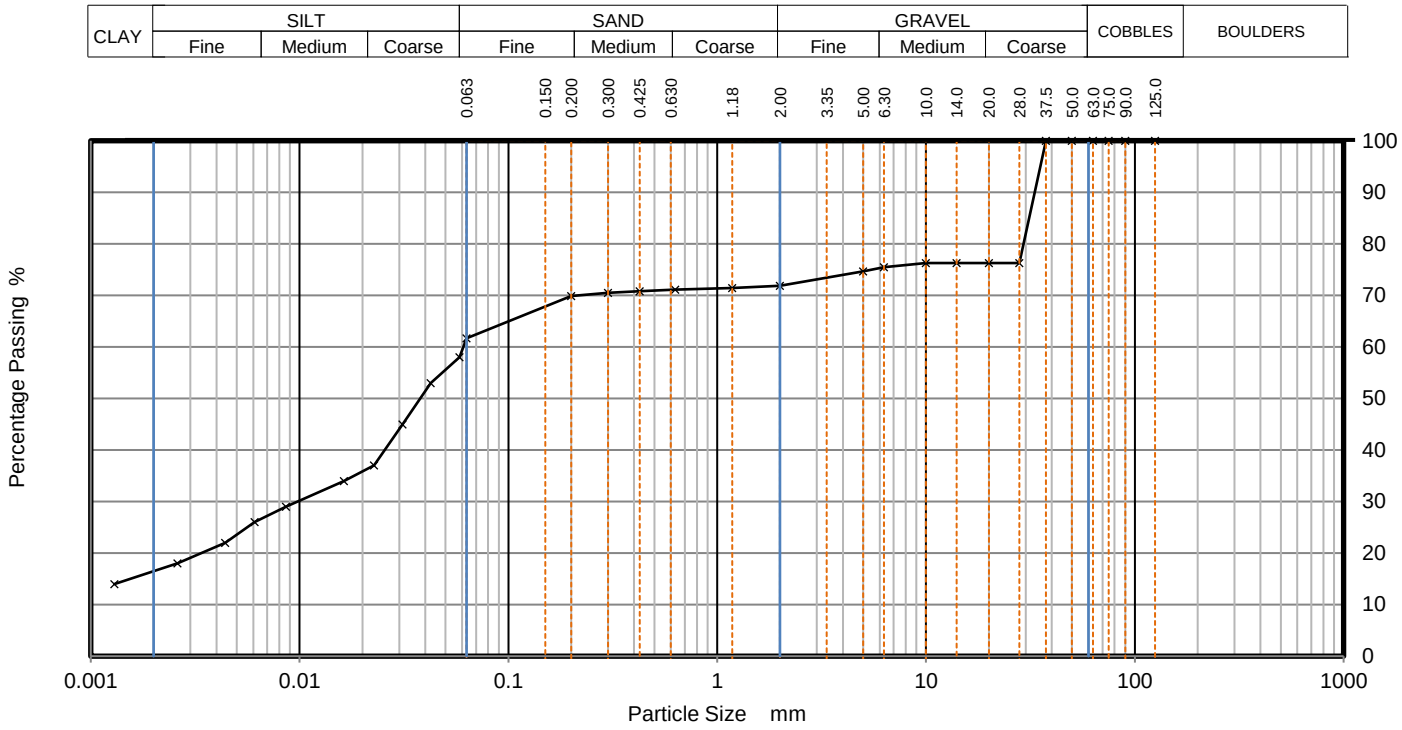
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant test-non standard test completed

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 13:45 | 15/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR03 |
| Sample Description | 10y 4/2 Dark greyish olive gravelly, sandy, clayey,SILT with shell fragments | | | Depth, m | 7.60 |
| Specimen Reference | IS | Specimen Depth | 7.6 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227125 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0584 | 58 |
| | | 0.0424 | 53 |
| 125 | 100 | 0.0311 | 45 |
| 90 | 100 | 0.0227 | 37 |
| 75 | 100 | 0.0163 | 34 |
| 63 | 100 | 0.0086 | 29 |
| 50 | 100 | 0.0061 | 26 |
| 37.5 | 100 | 0.0044 | 22 |
| 28 | 76 | 0.0026 | 18 |
| 20 | 76 | 0.0013 | 14 |
| 14 | 76 | | |
| 10 | 76 | | |
| 6.3 | 75 | | |
| 5 | 75 | | |
| 2 | 72 | | |
| 1.18 | 71 | Particle density | |
| 0.63 | 71 | 2.65 | Mg/m3 |
| 0.425 | 71 | | |
| 0.300 | 71 | | |
| 0.200 | 70 | | |
| | | | |
| 0.063 | 62 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 28.12 |
| Sand | 10.20 |
| Silt | 45.06 |
| Clay | 16.61 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 66.492 |
| $D_{60}$ | mm | 0.061 |
| $D_{50}$ | mm | 0.038 |
| $D_{30}$ | mm | 0.010 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

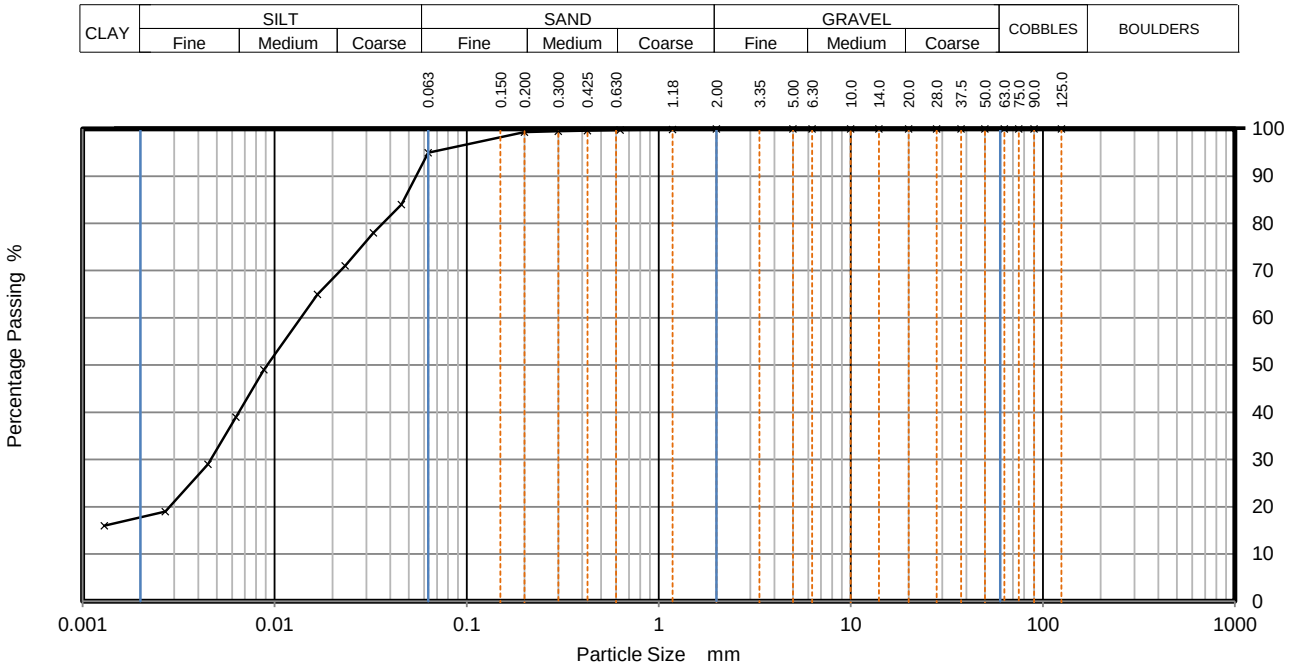
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

cemented large particles present-Insufficient material for compliant test-non standard completed

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | D.Smith | | 06/04/2023 11:24 | 13/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR04 |
| Sample Description | 5Gy 6/2 Light greyish green very stiff, clayey SILT | | | Depth, m | 8.50 |
| Specimen Reference | IS | Specimen Depth | 8.5 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227128 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0457 | 84 |
| | | 0.0327 | 78 |
| 125 | 100 | 0.0233 | 71 |
| 90 | 100 | 0.0167 | 65 |
| 75 | 100 | 0.0088 | 49 |
| 63 | 100 | 0.0063 | 39 |
| 50 | 100 | 0.0045 | 29 |
| 37.5 | 100 | 0.0027 | 19 |
| 28 | 100 | 0.0013 | 16 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.63 | 100 | | |
| 0.425 | 100 | | |
| 0.300 | 100 | | |
| 0.200 | 99 | | |
| | | | |
| 0.063 | 95 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.00 |
| Sand | 5.02 |
| Silt | 77.17 |
| Clay | 17.81 |

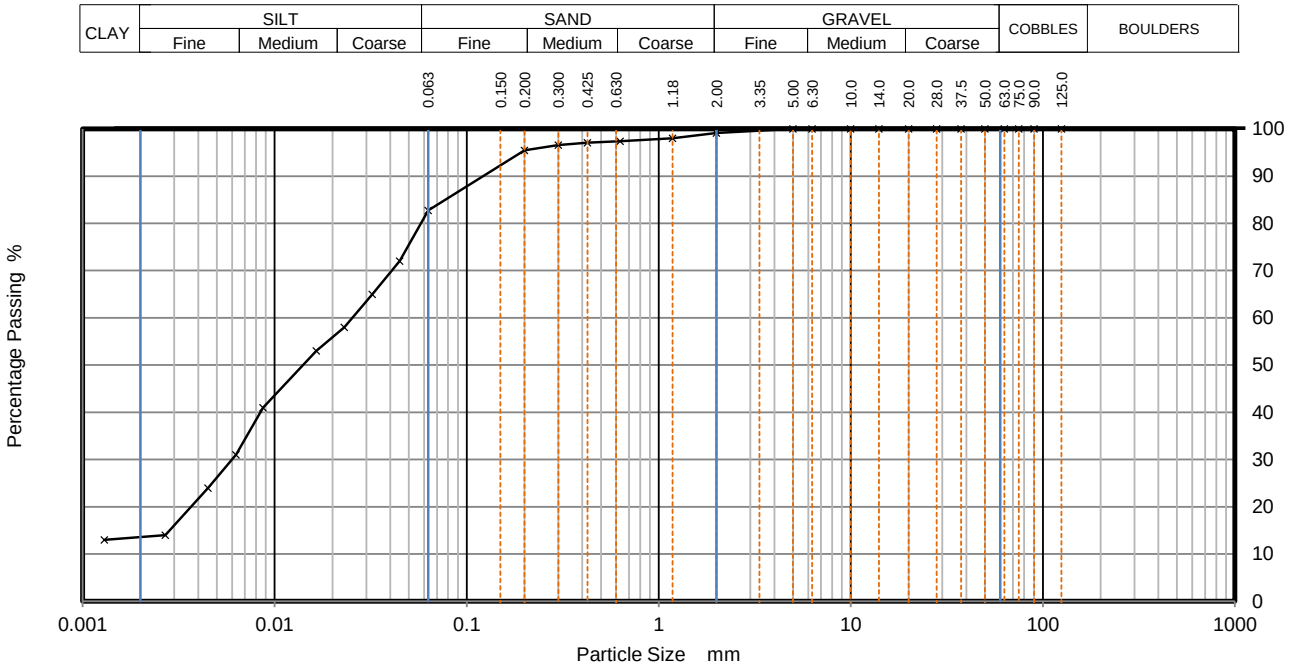
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.054 |
| $D_{60}$ | mm | 0.014 |
| $D_{50}$ | mm | 0.009 |
| $D_{30}$ | mm | 0.005 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 04/04/2023 13:01 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR05 |
| Sample Description | 5Gy 6/2 Light greyish green silty CLAY with few shell fragments and stones | | | Depth, m | 9.50 |
| Specimen Reference | IS | Specimen Depth | 9.5 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227131 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0447 | 72 |
| | | 0.0322 | 65 |
| 125 | 100 | 0.0231 | 58 |
| 90 | 100 | 0.0165 | 53 |
| 75 | 100 | 0.0087 | 41 |
| 63 | 100 | 0.0063 | 31 |
| 50 | 100 | 0.0045 | 24 |
| 37.5 | 100 | 0.0027 | 14 |
| 28 | 100 | 0.0013 | 13 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 99 | | |
| 1.18 | 98 | | |
| 0.63 | 97 | | |
| 0.425 | 97 | | |
| 0.300 | 97 | | |
| 0.200 | 95 | | |
| | | | |
| 0.063 | 83 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.85 |
| Sand | 16.41 |
| Silt | 68.87 |
| Clay | 13.87 |

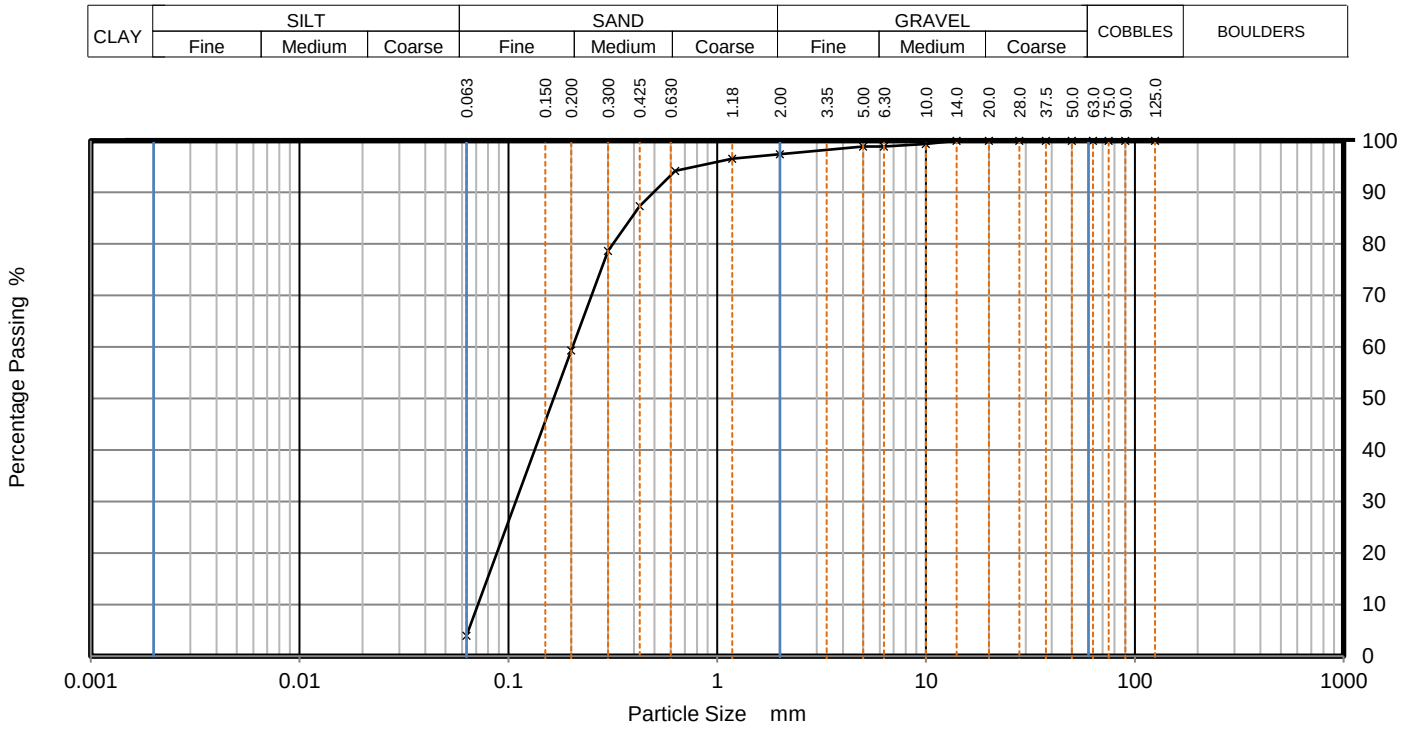
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.122 |
| $D_{60}$ | mm | 0.025 |
| $D_{50}$ | mm | 0.014 |
| $D_{30}$ | mm | 0.006 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 04/04/2023 12:55 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU01B |
| Sample Description | Dark grey 2.5y 4/1 slightly gravelly, SAND | | | Depth, m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | 0 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227173 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 99 | | |
| 6.3 | 99 | | |
| 5 | 99 | | |
| 2 | 97 | | |
| 1.18 | 97 | | |
| 0.63 | 94 | | |
| 0.425 | 87 | | |
| 0.300 | 79 | | |
| 0.200 | 59 | | |
| | | | |
| 0.063 | 4 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 2.61 |
| Sand | 93.43 |
| | |
| Fines <0.063mm | 3.96 |

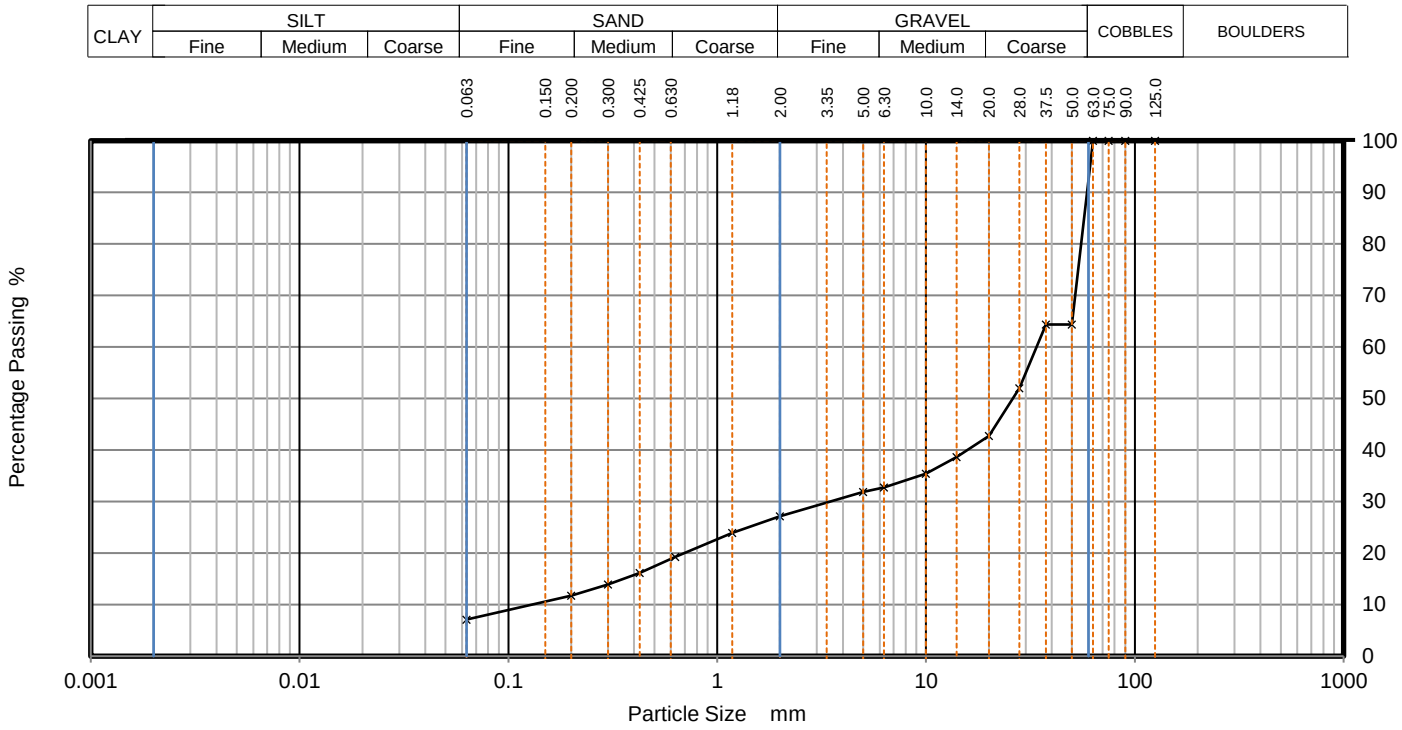
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.496 |
| $D_{60}$ | mm | 0.203 |
| $D_{50}$ | mm | 0.165 |
| $D_{30}$ | mm | 0.108 |
| $D_{10}$ | mm | 0.071 |
| Uniformity Coefficient | | 2.84 |
| Curvature Coefficient | | 0.81 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 13:35 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU08 |
| Sample Description | Very pale yellow, white page 2.5y 9/2 silty, very sandy, GRAVEL including cemented sand | | | Depth, m | 12.25 |
| Specimen Reference | B2 | Specimen Depth | 12.25 m | Sample Type | B2 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227193 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 64 | | |
| 37.5 | 64 | | |
| 28 | 52 | | |
| 20 | 43 | | |
| 14 | 39 | | |
| 10 | 35 | | |
| 6.3 | 33 | | |
| 5 | 32 | | |
| 2 | 27 | | |
| 1.18 | 24 | | |
| 0.63 | 19 | | |
| 0.425 | 16 | | |
| 0.300 | 14 | | |
| 0.200 | 12 | | |
| | | | |
| 0.063 | 7 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 72.85 |
| Sand | 20.05 |
| | |
| Fines <0.063mm | 7.11 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 59.045 |
| $D_{60}$ | mm | 33.825 |
| $D_{50}$ | mm | 26.024 |
| $D_{30}$ | mm | 3.484 |
| $D_{10}$ | mm | 0.129 |
| Uniformity Coefficient | | 261.50 |
| Curvature Coefficient | | 2.77 |

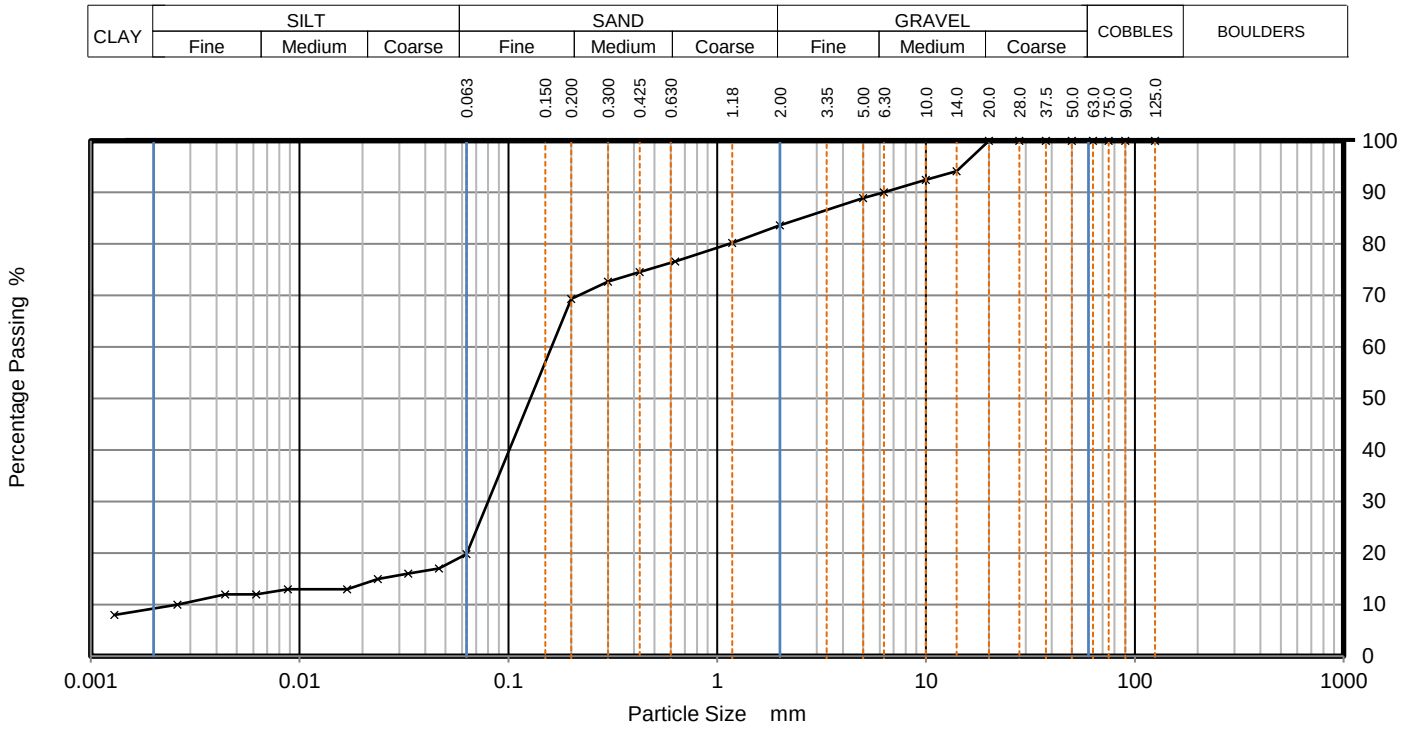
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant tet-non standard test completed

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 13:37 | 16/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR16 |
| Sample Description | 5GY 4/2 Dark greyish green silty wet gravelly, silty, clayey, SAND | | | Depth, m | 17.85 |
| Specimen Reference | B1 | Specimen Depth | 17.85 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227207 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0465 | 17 |
| | | 0.0332 | 16 |
| 125 | 100 | 0.0237 | 15 |
| 90 | 100 | 0.0169 | 13 |
| 75 | 100 | 0.0088 | 13 |
| 63 | 100 | 0.0062 | 12 |
| 50 | 100 | 0.0044 | 12 |
| 37.5 | 100 | 0.0026 | 10 |
| 28 | 100 | 0.0013 | 8 |
| 20 | 100 | | |
| 14 | 94 | | |
| 10 | 92 | | |
| 6.3 | 90 | | |
| 5 | 89 | | |
| 2 | 84 | | |
| 1.18 | 80 | Particle density | |
| 0.63 | 77 | 2.65 | Mg/m3 |
| 0.425 | 75 | | |
| 0.300 | 73 | | |
| 0.200 | 69 | | |
| | | | |
| 0.063 | 20 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 16.37 |
| Sand | 63.80 |
| Silt | 10.60 |
| Clay | 9.23 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 6.268 |
| $D_{60}$ | mm | 0.161 |
| $D_{50}$ | mm | 0.127 |
| $D_{30}$ | mm | 0.080 |
| $D_{10}$ | mm | 0.002 |
| Uniformity Coefficient | | 64.89 |
| Curvature Coefficient | | 15.98 |

Remarks

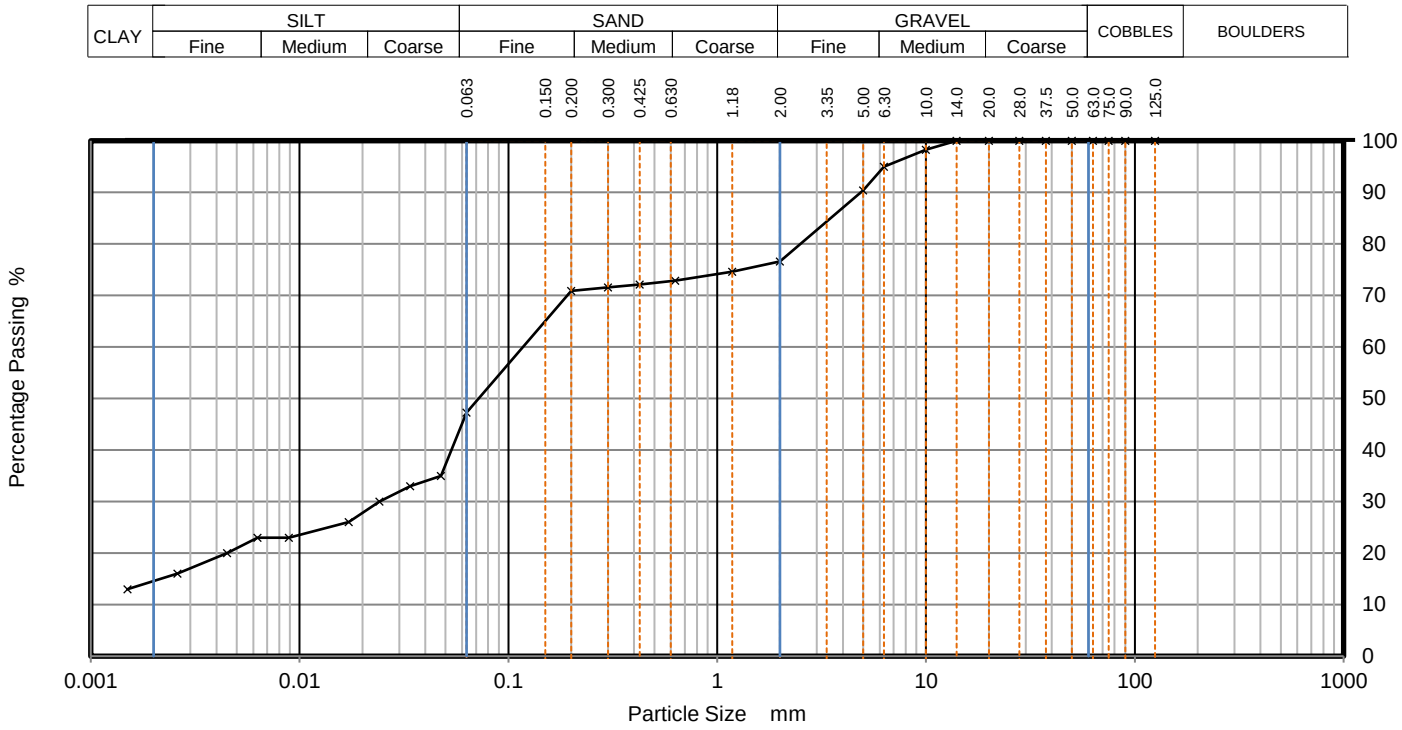
Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Not enough sample to MC

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 11:31 | 09/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

| | | | | | |
|---|---|---|---|---|---|
| | | | | Job Ref | **GMOP21-G-019** |
| | | | | Borehole No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR17 |
| Sample Description | 5GY 6/2 Light greyish gravelly, sandy, clayey, SILT with shell fragments | | | Depth, m | 18.75 |
| Specimen Reference | B1 | Specimen Depth | 18.75 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227210 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0476 | 35 |
| | | 0.0339 | 33 |
| 125 | 100 | 0.0241 | 30 |
| 90 | 100 | 0.0172 | 26 |
| 75 | 100 | 0.0089 | 23 |
| 63 | 100 | 0.0063 | 23 |
| 50 | 100 | 0.0045 | 20 |
| 37.5 | 100 | 0.0026 | 16 |
| 28 | 100 | 0.0015 | 13 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 98 | | |
| 6.3 | 95 | | |
| 5 | 90 | | |
| 2 | 77 | | |
| 1.18 | 75 | Particle density | |
| 0.63 | 73 | 2.65 | Mg/m3 |
| 0.425 | 72 | | |
| 0.300 | 72 | | |
| 0.200 | 71 | | |
| | | | |
| 0.063 | 47 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 23.43 |
| Sand | 29.28 |
| Silt | 32.50 |
| Clay | 14.79 |

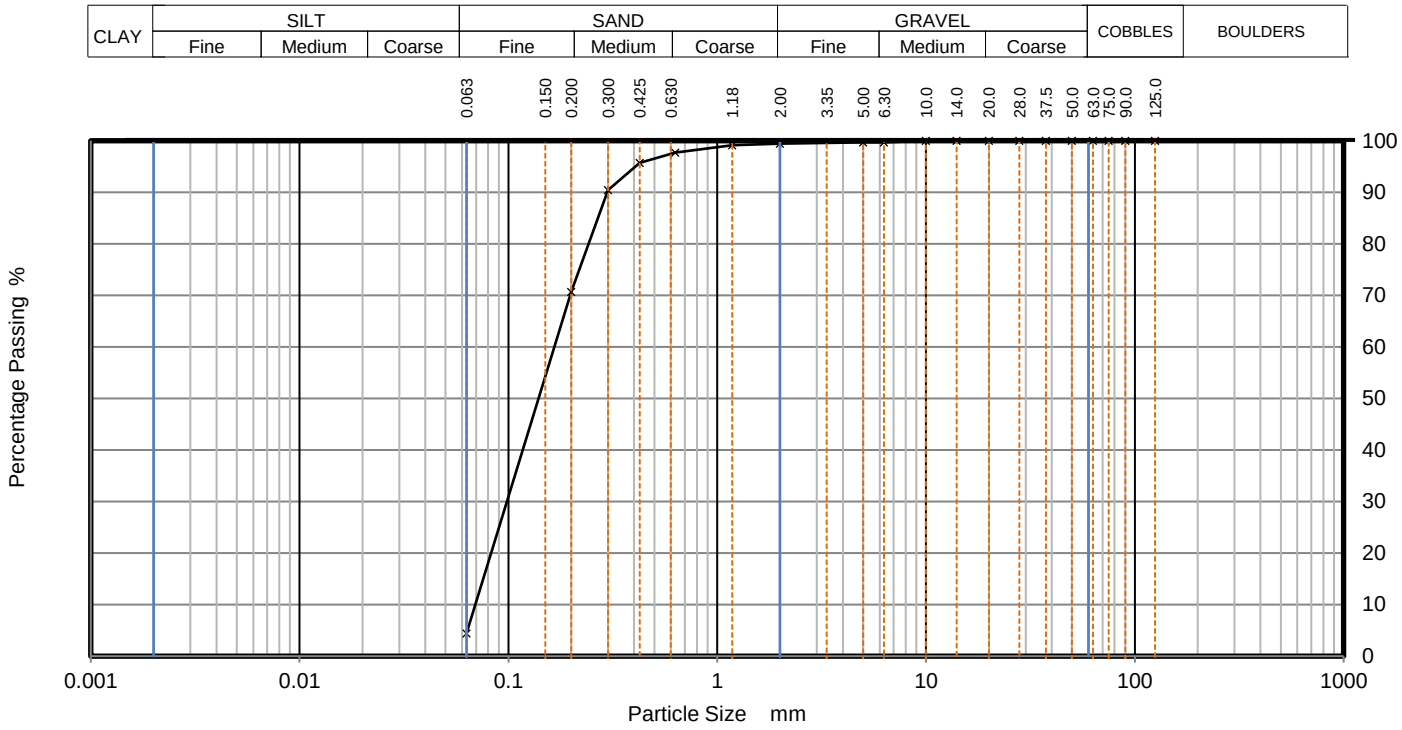
| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 4.881 |
| $D_{60}$ | mm | 0.117 |
| $D_{50}$ | mm | 0.072 |
| $D_{30}$ | mm | 0.024 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 11:31 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | P01 |
| Sample Description | 2.5y 4/4 Olive brown silty SAND with shell fragments | | | Depth, m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | 0 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227214 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 99 | | |
| 1.18 | 99 | | |
| 0.63 | 98 | | |
| 0.425 | 96 | | |
| 0.300 | 90 | | |
| 0.200 | 71 | | |
| | | | |
| 0.063 | 4 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.55 |
| Sand | 95.03 |
| | |
| Fines <0.063mm | 4.42 |

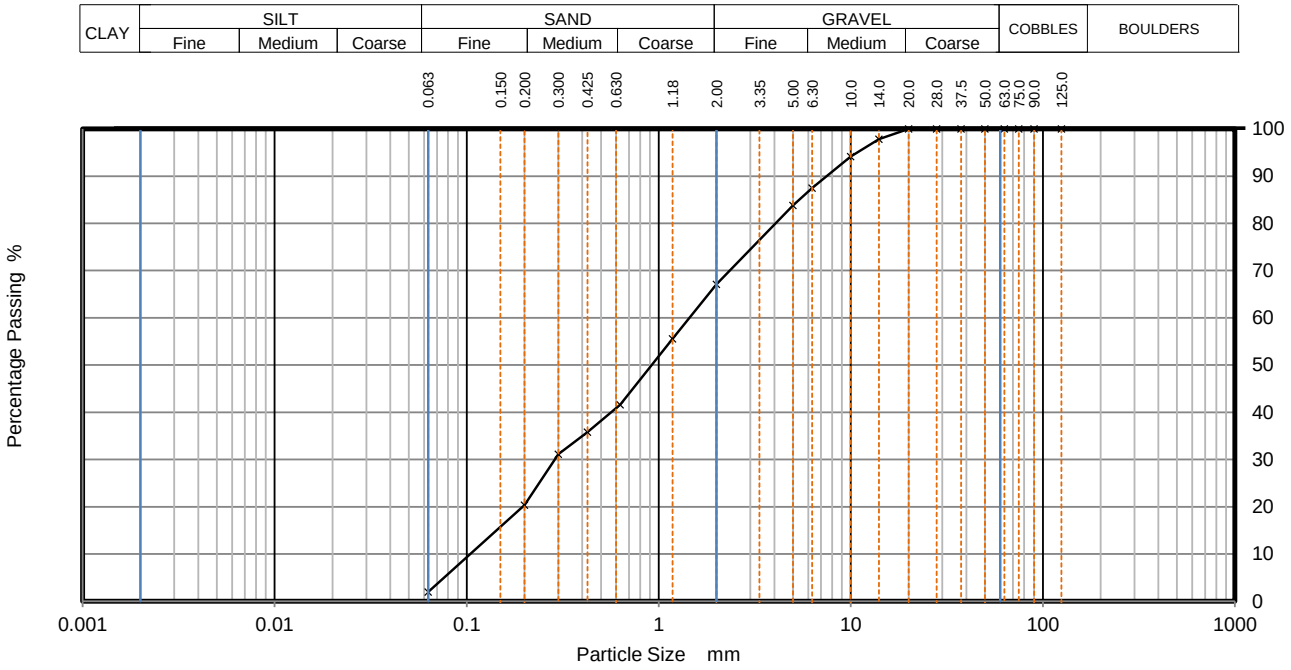
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.297 |
| $D_{60}$ | mm | 0.166 |
| $D_{50}$ | mm | 0.139 |
| $D_{30}$ | mm | 0.098 |
| $D_{10}$ | mm | 0.069 |
| Uniformity Coefficient | | 2.39 |
| Curvature Coefficient | | 0.84 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 11:35 | 13/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU02 |
| Sample Description | 2.5y 4/3 Olive brown SAND with shell fragments | | | | Depth, m | 1.20 |
| Specimen Reference | B2 | Specimen Depth | 1.2 | m | Sample Type | B2 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | | Unique ID | BH0120230227218 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 98 | | |
| 10 | 94 | | |
| 6.3 | 87 | | |
| 5 | 84 | | |
| 2 | 67 | | |
| 1.18 | 56 | | |
| 0.63 | 42 | | |
| 0.425 | 36 | | |
| 0.300 | 31 | | |
| 0.200 | 20 | | |
| | | | |
| 0.063 | 2 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 32.91 |
| Sand | 65.13 |
| | |
| Fines <0.063mm | 1.96 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 7.497 |
| $D_{60}$ | mm | 1.445 |
| $D_{50}$ | mm | 0.918 |
| $D_{30}$ | mm | 0.288 |
| $D_{10}$ | mm | 0.104 |
| Uniformity Coefficient | | 13.85 |
| Curvature Coefficient | | 0.55 |

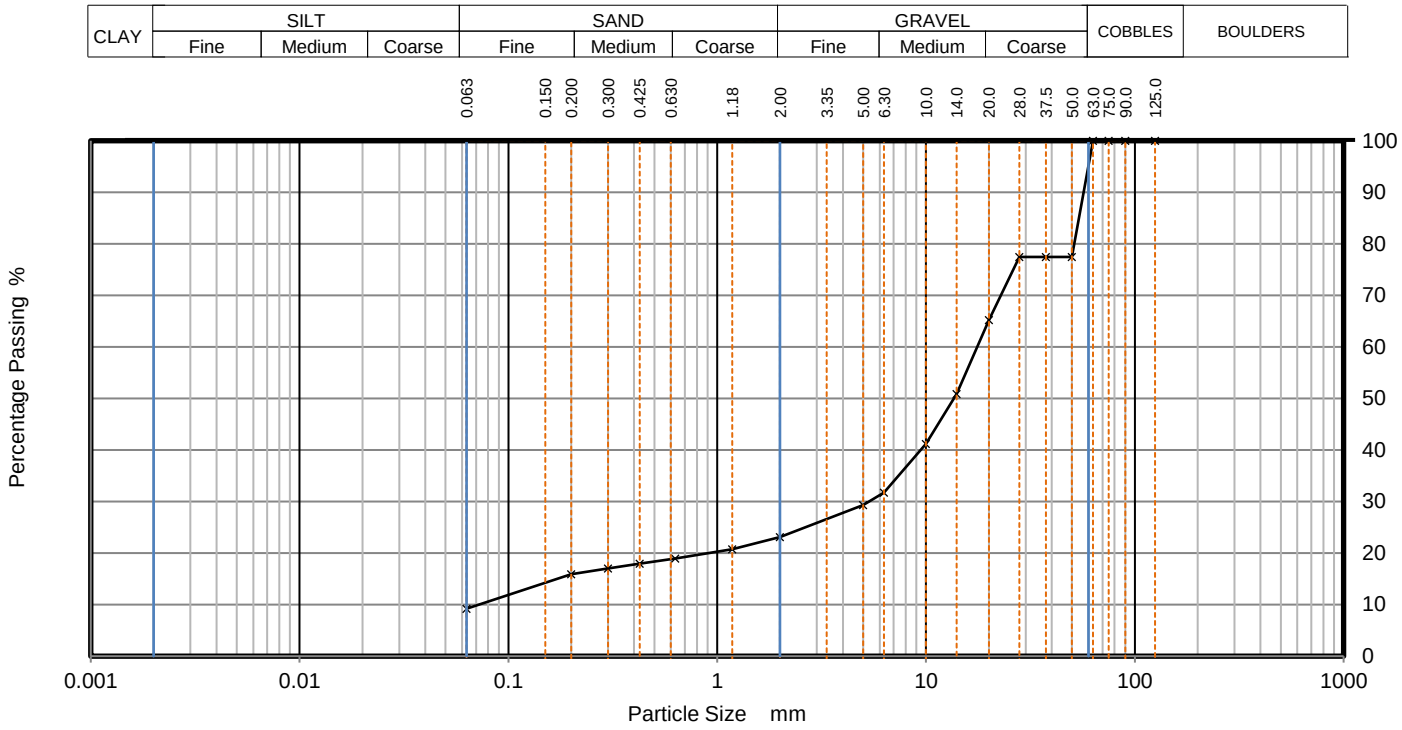
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient mass for standard test - non standard test done

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 14/04/2023 13:31 | 15/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU07 |
| Sample Description | Yellow 2.5y 7/8 , sandy, GRAVEL including cemented sand | | | Depth, m | 3.90 |
| Specimen Reference | B2 | Specimen Depth | 3.9 m | Sample Type | B2 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227225 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 77 | | |
| 37.5 | 77 | | |
| 28 | 77 | | |
| 20 | 65 | | |
| 14 | 51 | | |
| 10 | 41 | | |
| 6.3 | 32 | | |
| 5 | 29 | | |
| 2 | 23 | | |
| 1.18 | 21 | | |
| 0.63 | 19 | | |
| 0.425 | 18 | | |
| 0.300 | 17 | | |
| 0.200 | 16 | | |
| | | | |
| 0.063 | 9 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 76.92 |
| Sand | 13.87 |
| | |
| Fines <0.063mm | 9.21 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 56.867 |
| $D_{60}$ | mm | 17.576 |
| $D_{50}$ | mm | 13.593 |
| $D_{30}$ | mm | 5.327 |
| $D_{10}$ | mm | 0.072 |
| Uniformity Coefficient | | 243.50 |
| Curvature Coefficient | | 22.37 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

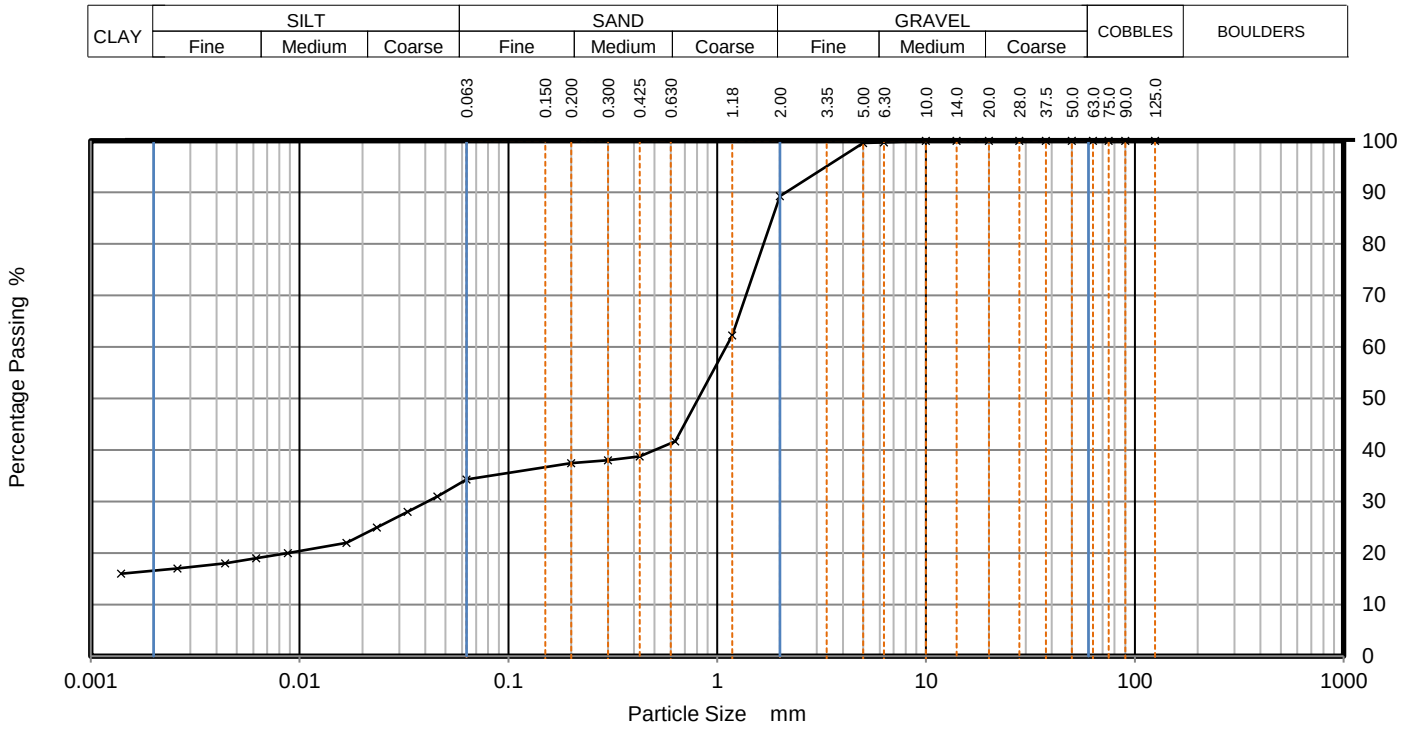
Insufficient material for compliant test-non standard test completed

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 06/04/2023 13:47 | 02/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

GEOQUIPMARINE

| | | | | | |
|---|---|---|---|---|---|
| Job Ref | | | | | **GMOP21-G-019** |
| Borehole No. | | | | | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR04 |
| Sample Description | 10y 5/2 greyish olive silty, clayey wet CLAY including shell fragments | | | Depth, m | 4.60 |
| Specimen Reference | B2 | Specimen Depth | 4.6 m | Sample Type | B2 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227290 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0458 | 31 |
| | | 0.0329 | 28 |
| 125 | 100 | 0.0235 | 25 |
| 90 | 100 | 0.0168 | 22 |
| 75 | 100 | 0.0088 | 20 |
| 63 | 100 | 0.0062 | 19 |
| 50 | 100 | 0.0044 | 18 |
| 37.5 | 100 | 0.0026 | 17 |
| 28 | 100 | 0.0014 | 16 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 89 | | |
| 1.18 | 62 | Particle density | |
| 0.63 | 42 | 2.65 | Mg/m3 |
| 0.425 | 39 | | |
| 0.300 | 38 | | |
| 0.200 | 37 | | |
| | | | |
| 0.063 | 34 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 10.73 |
| Sand | 55.00 |
| Silt | 17.74 |
| Clay | 16.53 |

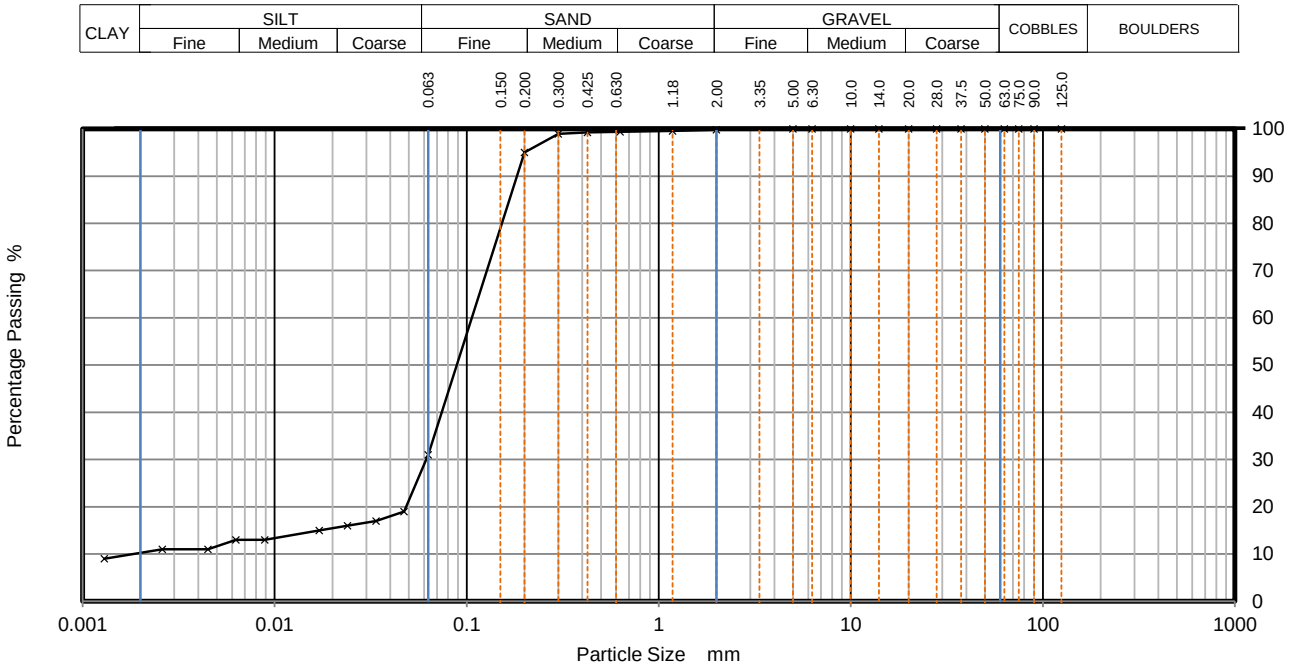
| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 2.135 |
| $D_{60}$ | mm | 1.102 |
| $D_{50}$ | mm | 0.812 |
| $D_{30}$ | mm | 0.040 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:48 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR08 |
| Sample Description | 5Gy 3/2 Very dark greyish green slightly gravelly, clayey, silty SAND. | | | Depth, m | 8.50 |
| Specimen Reference | B1 | Specimen Depth | 8.5 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227300 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0472 | 19 |
| | | 0.0338 | 17 |
| 125 | 100 | 0.0240 | 16 |
| 90 | 100 | 0.0171 | 15 |
| 75 | 100 | 0.0089 | 13 |
| 63 | 100 | 0.0063 | 13 |
| 50 | 100 | 0.0045 | 11 |
| 37.5 | 100 | 0.0026 | 11 |
| 28 | 100 | 0.0013 | 9 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.63 | 99 | | |
| 0.425 | 99 | | |
| 0.300 | 99 | | |
| 0.200 | 95 | | |
| | | | |
| 0.063 | 31 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.15 |
| Sand | 68.84 |
| Silt | 20.78 |
| Clay | 10.23 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.183 |
| $D_{60}$ | mm | 0.106 |
| $D_{50}$ | mm | 0.089 |
| $D_{30}$ | mm | 0.061 |
| $D_{10}$ | mm | 0.002 |
| Uniformity Coefficient | | 58.29 |
| Curvature Coefficient | | 19.47 |

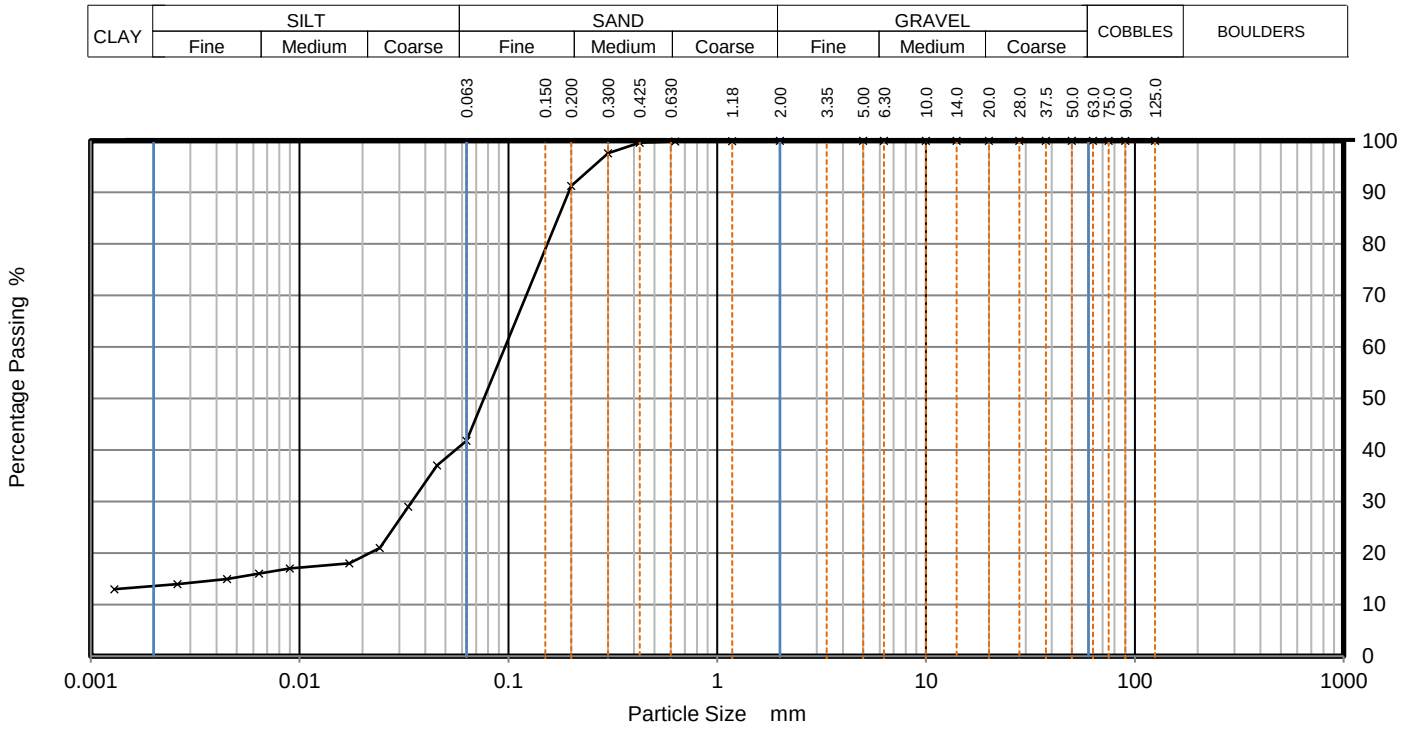
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 04/04/2023 12:42 | 09/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

| | | | | | |
|---|---|---|---|---|---|
| | | | | Job Ref | **GMOP21-G-019** |
| | | | | Borehole No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU02 |
| Sample Description | GLEY 1 10Gy 2.5/1 Greenish black clayey, silty, SAND | | | Depth, m | 9.60 |
| Specimen Reference | B1 | Specimen Depth | 9.6 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227304 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0455 | 37 |
| | | 0.0332 | 29 |
| 125 | 100 | 0.0242 | 21 |
| 90 | 100 | 0.0173 | 18 |
| 75 | 100 | 0.0090 | 17 |
| 63 | 100 | 0.0064 | 16 |
| 50 | 100 | 0.0045 | 15 |
| 37.5 | 100 | 0.0026 | 14 |
| 28 | 100 | 0.0013 | 13 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | Particle density | |
| 0.63 | 100 | 2.65 | Mg/m3 |
| 0.425 | 100 | | |
| 0.300 | 98 | | |
| 0.200 | 91 | | |
| | | | |
| 0.063 | 42 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.01 |
| Sand | 58.21 |
| Silt | 28.43 |
| Clay | 13.36 |

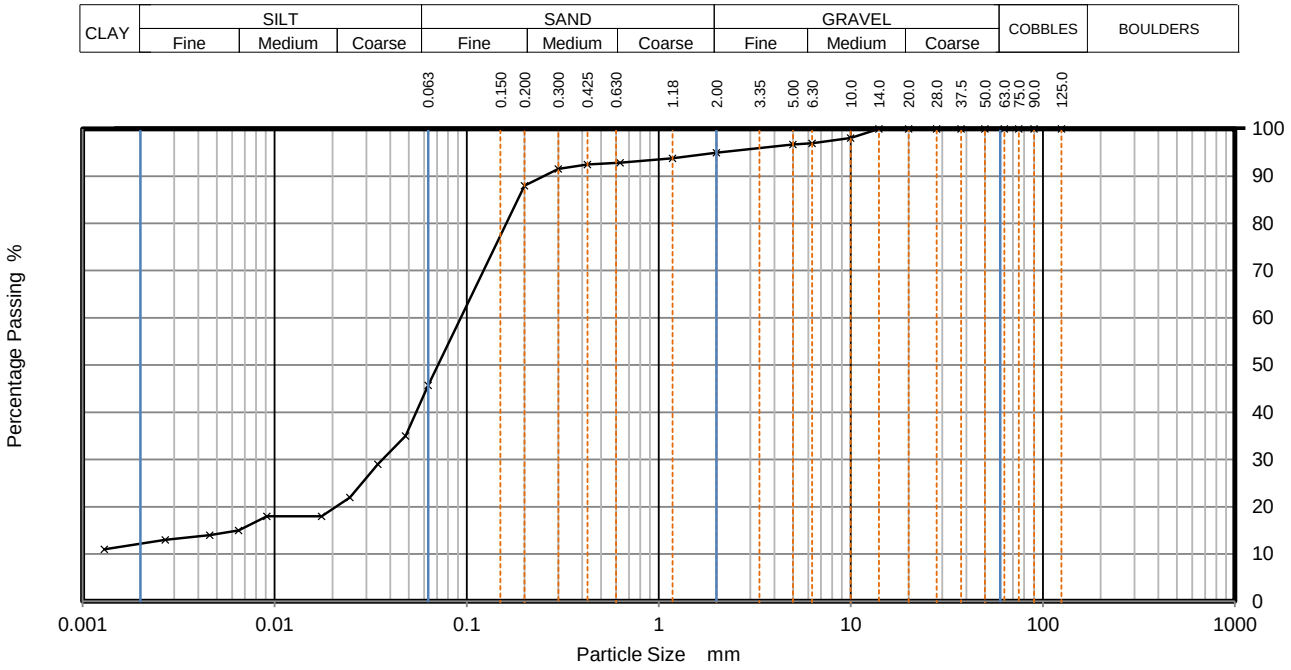
| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 0.194 |
| $D_{60}$ | mm | 0.096 |
| $D_{50}$ | mm | 0.076 |
| $D_{30}$ | mm | 0.035 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:48 | 15/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR10 |
| Sample Description | 5Gy 3/2 Very dark greyish green, gravelly, very sandy, clayey SILT with sparse shell fragments | | | Depth, m | 11.35 |
| Specimen Reference | B2 | Specimen Depth | 11.35 m | Sample Type | B2 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227314 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0481 | 35 |
| | | 0.0345 | 29 |
| 125 | 100 | 0.0247 | 22 |
| 90 | 100 | 0.0176 | 18 |
| 75 | 100 | 0.0091 | 18 |
| 63 | 100 | 0.0065 | 15 |
| 50 | 100 | 0.0046 | 14 |
| 37.5 | 100 | 0.0027 | 13 |
| 28 | 100 | 0.0013 | 11 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 98 | | |
| 6.3 | 97 | | |
| 5 | 97 | | |
| 2 | 95 | | |
| 1.18 | 94 | | |
| 0.63 | 93 | | |
| 0.425 | 92 | | |
| 0.300 | 92 | | |
| 0.200 | 88 | | |
| | | | |
| 0.063 | 46 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 5.05 |
| Sand | 49.22 |
| Silt | 33.28 |
| Clay | 12.45 |

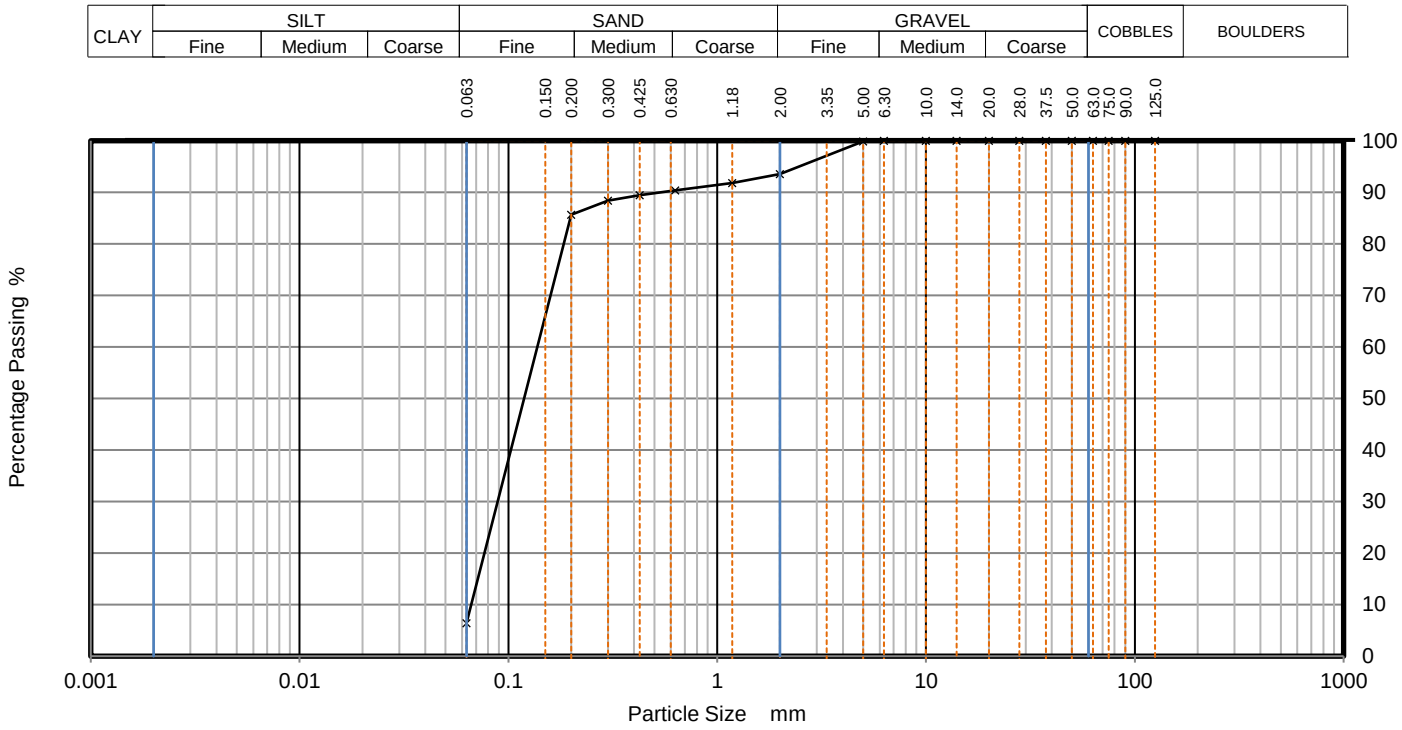
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.251 |
| $D_{60}$ | mm | 0.093 |
| $D_{50}$ | mm | 0.071 |
| $D_{30}$ | mm | 0.037 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 04/04/2023 12:39 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU08 |
| Sample Description | 10y 6/2 Light greyish olive silty SAND with small shell fragments | | | Depth, m | 18.70 |
| Specimen Reference | B1 | Specimen Depth | 18.7 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227328 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 94 | | |
| 1.18 | 92 | | |
| 0.63 | 90 | | |
| 0.425 | 89 | | |
| 0.300 | 88 | | |
| 0.200 | 86 | | |
| | | | |
| 0.063 | 6 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 6.46 |
| Sand | 87.13 |
| | |
| Fines <0.063mm | 6.42 |

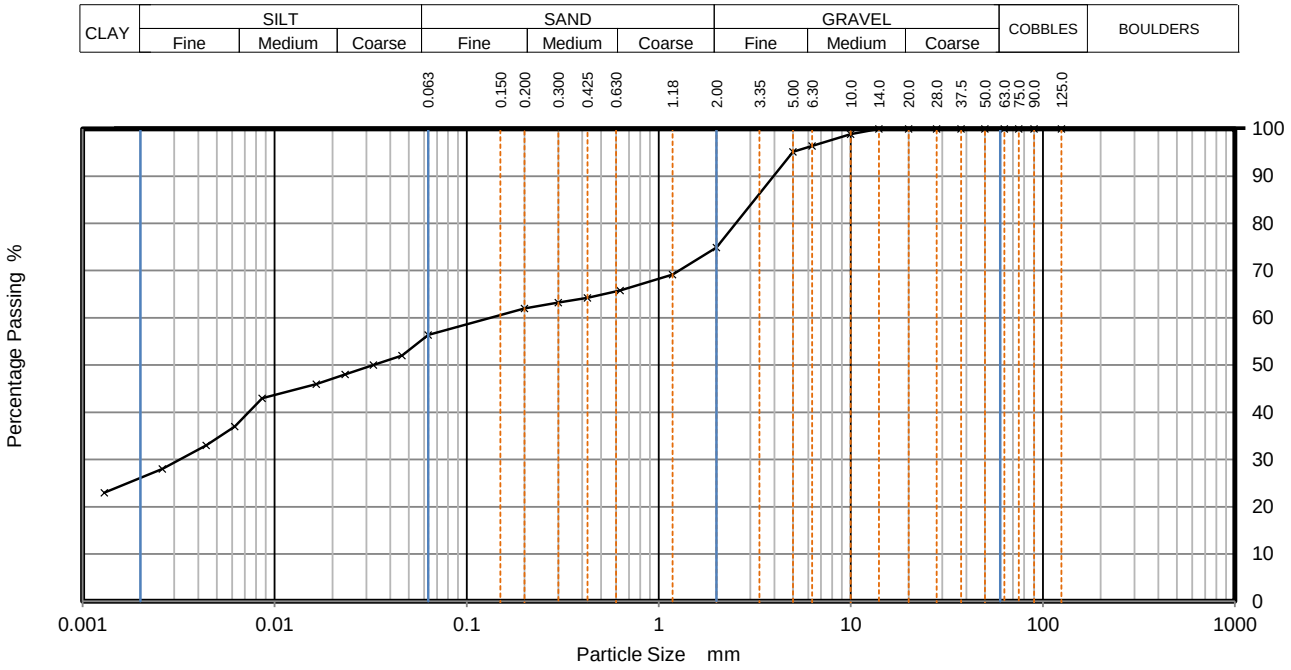
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.538 |
| $D_{60}$ | mm | 0.138 |
| $D_{50}$ | mm | 0.119 |
| $D_{30}$ | mm | 0.089 |
| $D_{10}$ | mm | 0.066 |
| Uniformity Coefficient | | 2.07 |
| Curvature Coefficient | | 0.86 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:48 | 09/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU02 |
| Sample Description | Light brown, sandy and gravelly, CLAY with frequent shell fragments | | | Depth, m | 2.00 |
| Specimen Reference | B1 | Specimen Depth | 2 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030711 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0461 | 52 |
| | | 0.0327 | 50 |
| 125 | 100 | 0.0233 | 48 |
| 90 | 100 | 0.0165 | 46 |
| 75 | 100 | 0.0086 | 43 |
| 63 | 100 | 0.0062 | 37 |
| 50 | 100 | 0.0044 | 33 |
| 37.5 | 100 | 0.0026 | 28 |
| 28 | 100 | 0.0013 | 23 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 99 | | |
| 6.3 | 96 | | |
| 5 | 95 | | |
| 2 | 75 | | |
| 1.18 | 69 | Particle density (assumed) | |
| 0.63 | 66 | 2.65 Mg/m3 | |
| 0.425 | 64 | | |
| 0.300 | 63 | | |
| 0.200 | 62 | | |
| | | | |
| 0.063 | 56 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 25.09 |
| Sand | 18.54 |
| Silt | 30.22 |
| Clay | 26.15 |

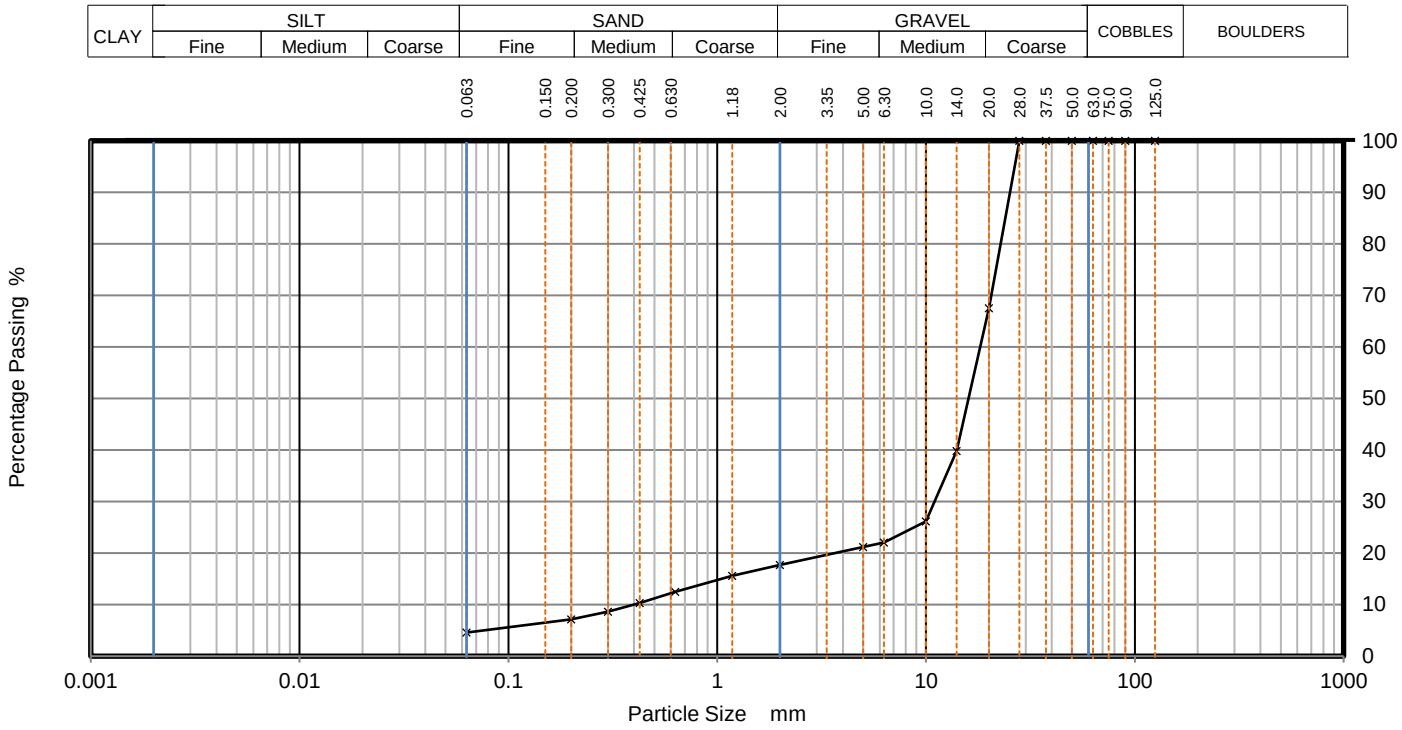
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 3.961 |
| $D_{60}$ | mm | 0.133 |
| $D_{50}$ | mm | 0.031 |
| $D_{30}$ | mm | 0.003 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 05/04/2023 10:08 | 13/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR04 |
| Sample Description | 5Y 8/2 Pale yellow, slightly silty, sandy GRAVEL | | | Depth, m | 4.00 |
| Specimen Reference | IS | Specimen Depth | 4 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH012023030717 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 68 | | |
| 14 | 40 | | |
| 10 | 26 | | |
| 6.3 | 22 | | |
| 5 | 21 | | |
| 2 | 18 | | |
| 1.18 | 16 | | |
| 0.63 | 12 | | |
| 0.425 | 10 | | |
| 0.300 | 9 | | |
| 0.200 | 7 | | |
| | | | |
| 0.063 | 5 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 82.27 |
| Sand | 13.15 |
| | |
| Fines <0.063mm | 4.58 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 25.245 |
| $D_{60}$ | mm | 18.155 |
| $D_{50}$ | mm | 15.962 |
| $D_{30}$ | mm | 10.989 |
| $D_{10}$ | mm | 0.398 |
| Uniformity Coefficient | | 45.61 |
| Curvature Coefficient | | 16.71 |

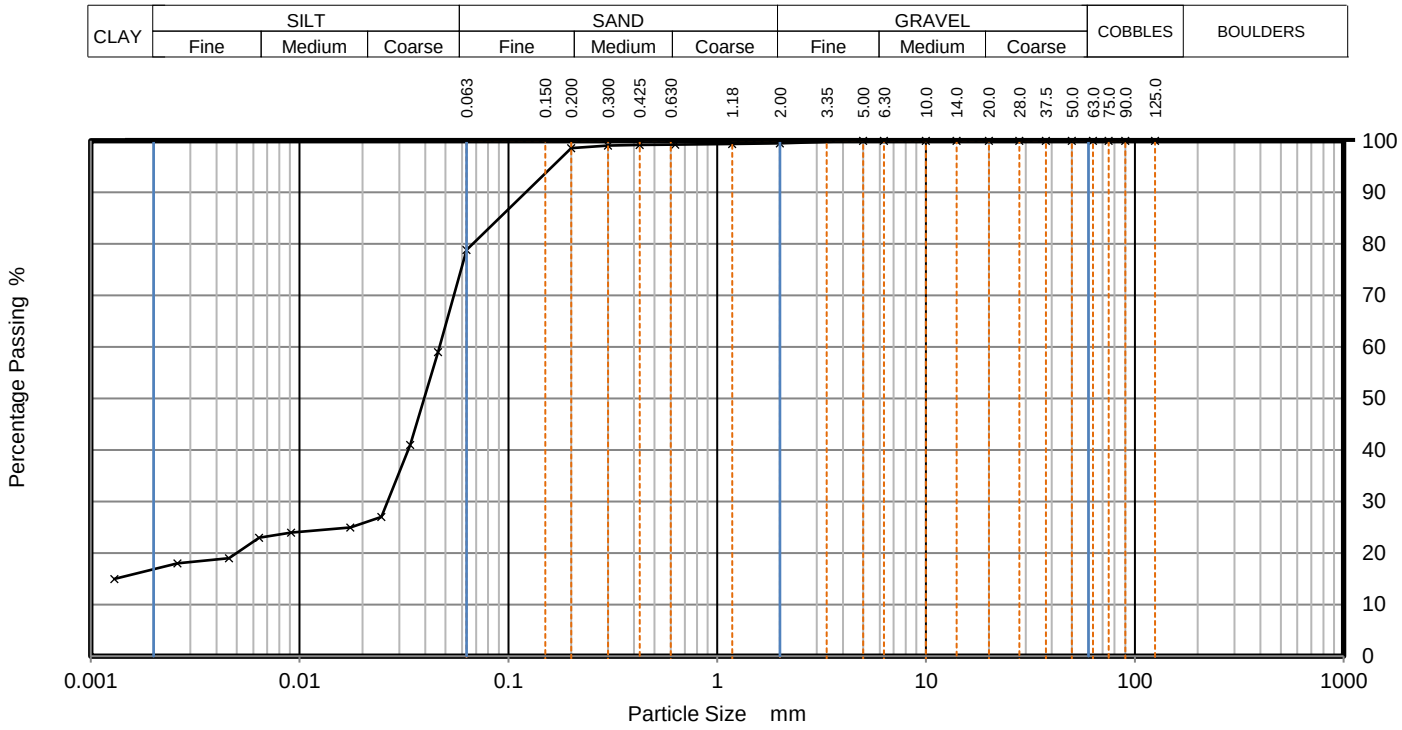
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | U. Mazhar | 17/04/2023 14:18 | 15/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

| | | | | | |
|---|---|---|---|---|---|
| | | | | Job Ref | **GMOP21-G-019** |
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR06 |
| Sample Description | GLEY 1 4/1 Dark greyish green very stiff sandy, clayey, SILT with shell fragments | | | Depth, m | 7.00 |
| Specimen Reference | IS | Specimen Depth | 7 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030724 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0460 | 59 |
| | | 0.0339 | 41 |
| 125 | 100 | 0.0247 | 27 |
| 90 | 100 | 0.0175 | 25 |
| 75 | 100 | 0.0091 | 24 |
| 63 | 100 | 0.0064 | 23 |
| 50 | 100 | 0.0046 | 19 |
| 37.5 | 100 | 0.0026 | 18 |
| 28 | 100 | 0.0013 | 15 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 99 | | |
| 1.18 | 99 | Particle density | |
| 0.63 | 99 | 2.65 | Mg/m3 |
| 0.425 | 99 | | |
| 0.300 | 99 | | |
| 0.200 | 99 | | |
| | | | |
| 0.063 | 79 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.52 |
| Sand | 20.64 |
| Silt | 61.98 |
| Clay | 16.86 |

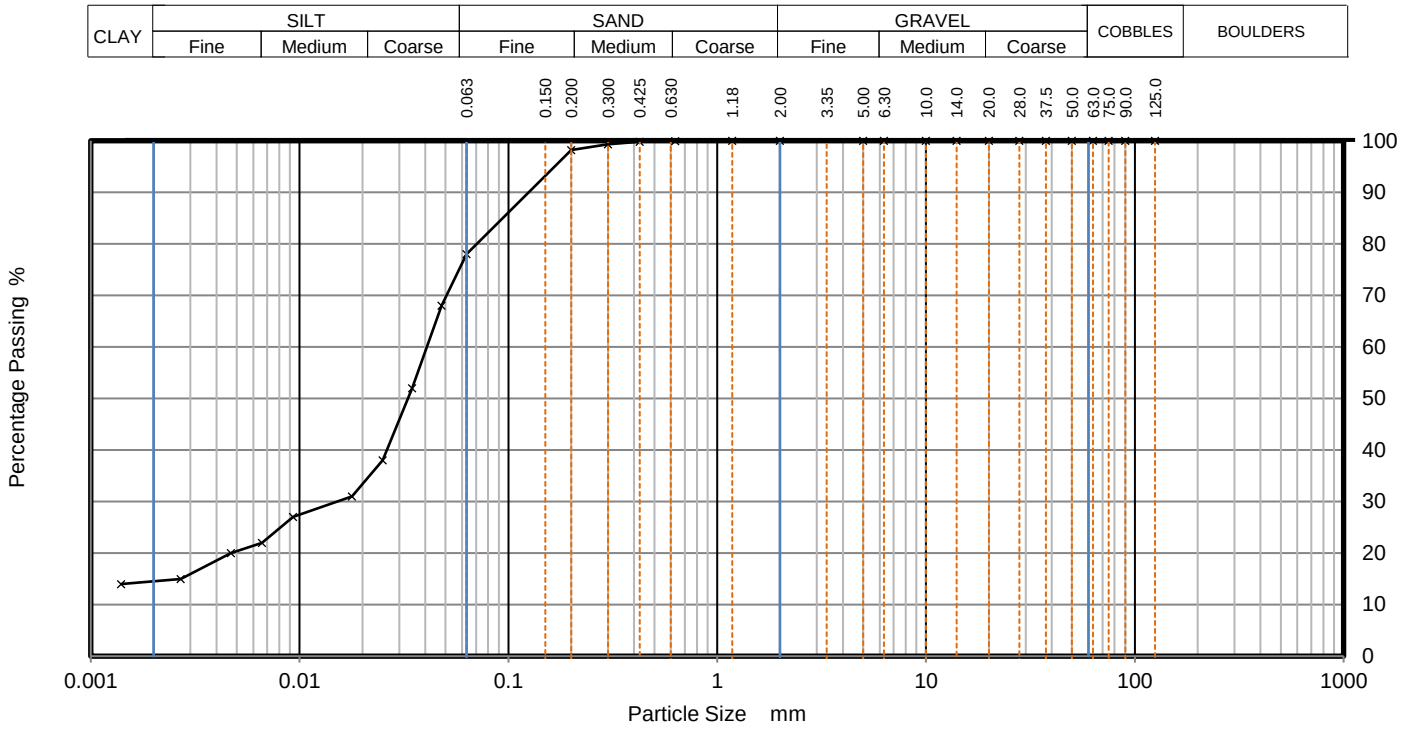
| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 0.121 |
| $D_{60}$ | mm | 0.047 |
| $D_{50}$ | mm | 0.039 |
| $D_{30}$ | mm | 0.026 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 11:19 | 15/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR07 |
| Sample Description | Dark brown sandy, clayey, SILT | | | Depth, m | 8.60 |
| Specimen Reference | Q1 | Specimen Depth | 8.6 m | Sample Type | Q1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030730 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0479 | 68 |
| | | 0.0346 | 52 |
| 125 | 100 | 0.0250 | 38 |
| 90 | 100 | 0.0178 | 31 |
| 75 | 100 | 0.0093 | 27 |
| 63 | 100 | 0.0066 | 22 |
| 50 | 100 | 0.0047 | 20 |
| 37.5 | 100 | 0.0027 | 15 |
| 28 | 100 | 0.0014 | 14 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | Particle density | (assumed) |
| 0.63 | 100 | 2.65 | Mg/m3 |
| 0.425 | 100 | | |
| 0.300 | 99 | | |
| 0.200 | 98 | | |
| | | | |
| 0.063 | 78 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.02 |
| Sand | 21.98 |
| Silt | 63.66 |
| Clay | 14.34 |

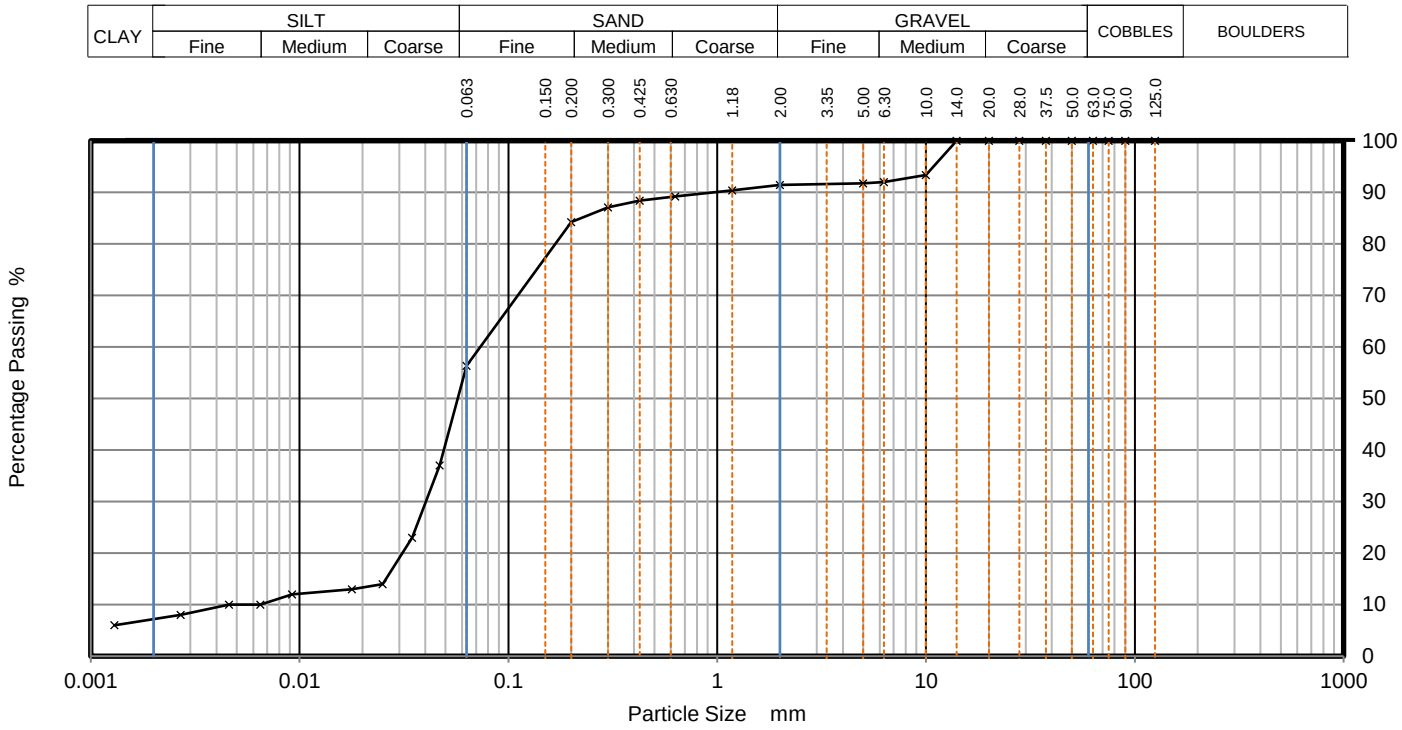
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.125 |
| $D_{60}$ | mm | 0.041 |
| $D_{50}$ | mm | 0.033 |
| $D_{30}$ | mm | 0.015 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| E Allan.Edward | D.Smith | 24/05/2023 16:22 | 28/04/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR08 |
| Sample Description | GLEY 1 3/1 Very dark greenish grey gravelly, sandy, clayey, SILT including cemented sand | | | Depth, m | 9.30 |
| Specimen Reference | B1 | Specimen Depth | 9.3 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030733 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0468 | 37 |
| | | 0.0346 | 23 |
| 125 | 100 | 0.0250 | 14 |
| 90 | 100 | 0.0178 | 13 |
| 75 | 100 | 0.0092 | 12 |
| 63 | 100 | 0.0065 | 10 |
| 50 | 100 | 0.0046 | 10 |
| 37.5 | 100 | 0.0027 | 8 |
| 28 | 100 | 0.0013 | 6 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 93 | | |
| 6.3 | 92 | | |
| 5 | 92 | | |
| 2 | 91 | | |
| 1.18 | 90 | Particle density | |
| 0.63 | 89 | 2.65 | Mg/m3 |
| 0.425 | 88 | | |
| 0.300 | 87 | | |
| 0.200 | 84 | | |
| | | | |
| 0.063 | 56 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 8.57 |
| Sand | 35.07 |
| Silt | 48.99 |
| Clay | 7.38 |

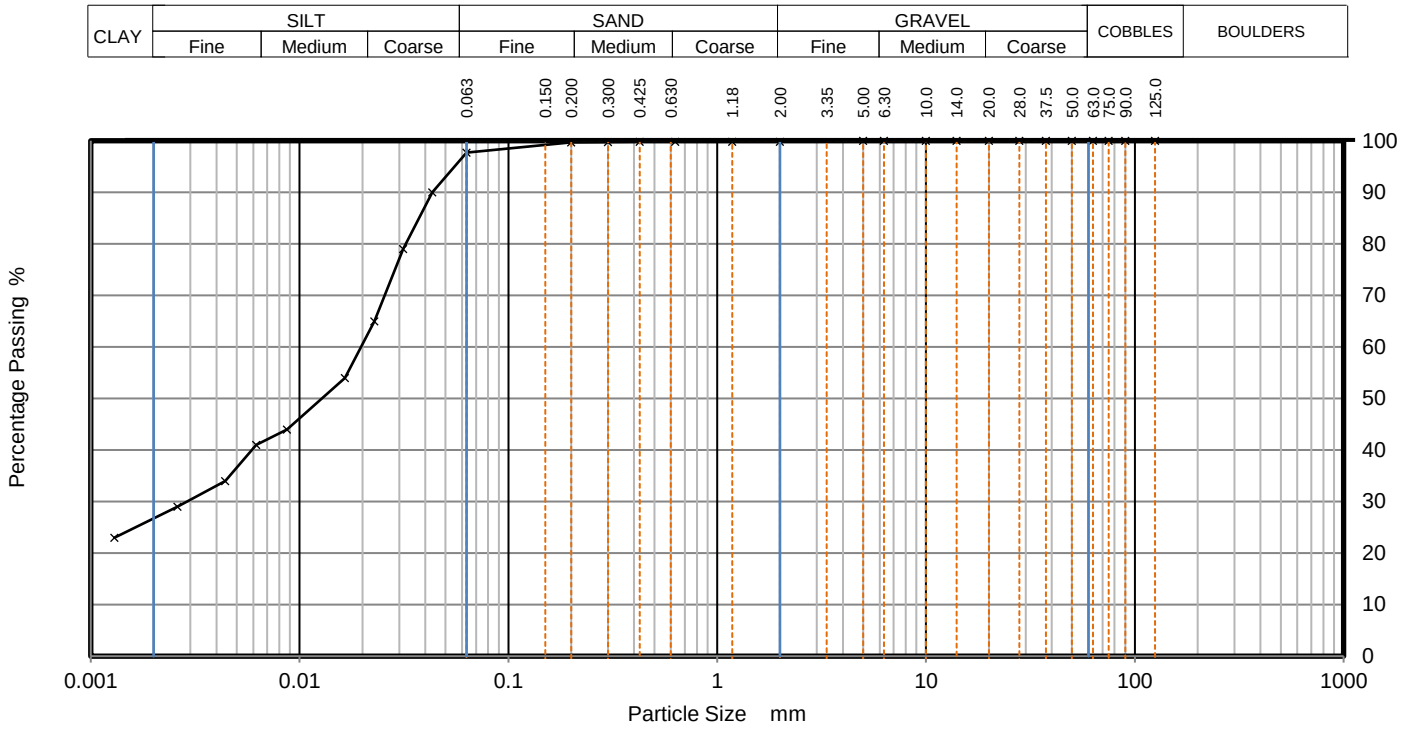
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.969 |
| $D_{60}$ | mm | 0.073 |
| $D_{50}$ | mm | 0.057 |
| $D_{30}$ | mm | 0.040 |
| $D_{10}$ | mm | 0.006 |
| Uniformity Coefficient | | 13.16 |
| Curvature Coefficient | | 4.01 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 11:19 | 15/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU06 |
| Sample Description | 2.5y 4/1 Dark grey, slightly gravelly, slightly sandy, CLAY | | | Depth, m | 10.00 |
| Specimen Reference | UU1 | Specimen Depth | 10 m | Sample Type | UU1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030735 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0432 | 90 |
| | | 0.0313 | 79 |
| 125 | 100 | 0.0228 | 65 |
| 90 | 100 | 0.0165 | 54 |
| 75 | 100 | 0.0087 | 44 |
| 63 | 100 | 0.0062 | 41 |
| 50 | 100 | 0.0044 | 34 |
| 37.5 | 100 | 0.0026 | 29 |
| 28 | 100 | 0.0013 | 23 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | Particle density | |
| 0.63 | 100 | 2.65 | Mg/m3 |
| 0.425 | 100 | | |
| 0.300 | 100 | | |
| 0.200 | 100 | | |
| | | | |
| 0.063 | 98 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.16 |
| Sand | 2.12 |
| Silt | 71.14 |
| Clay | 26.59 |

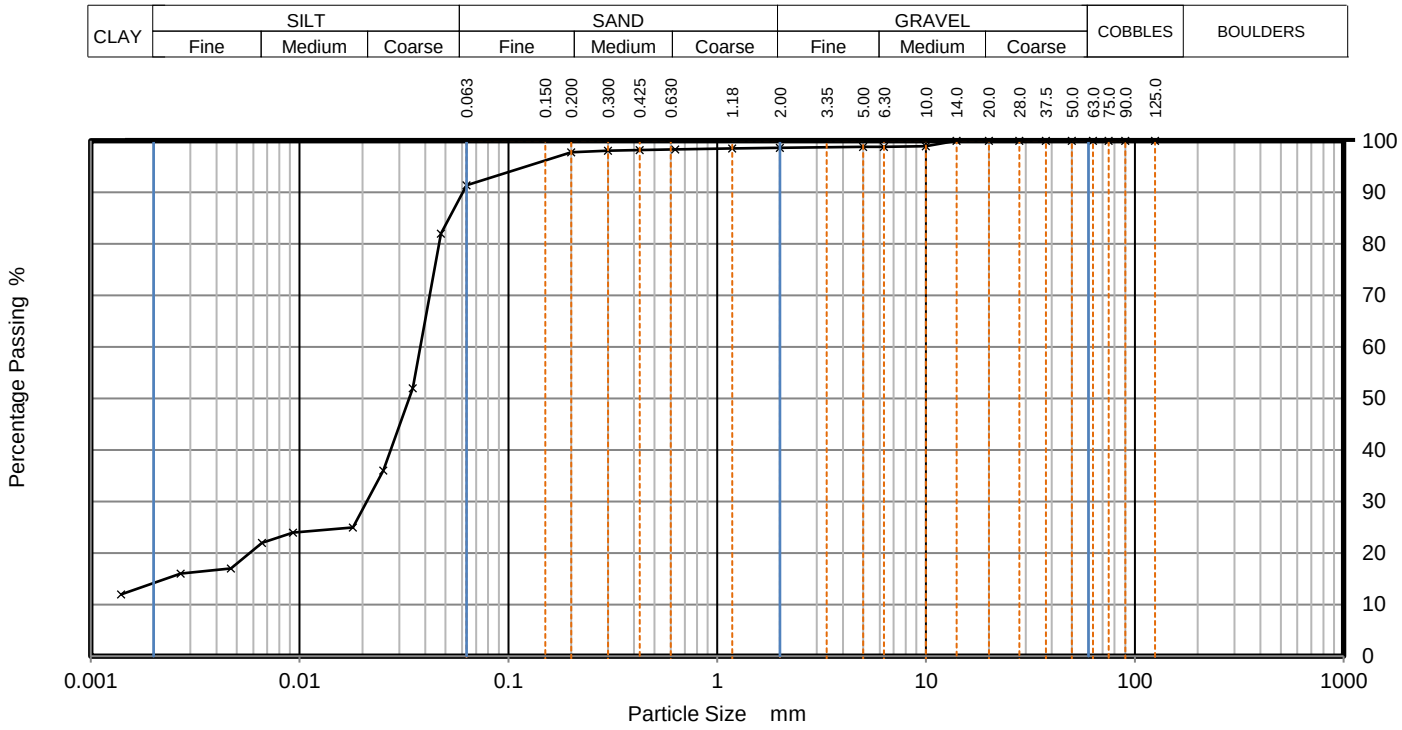
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.044 |
| $D_{60}$ | mm | 0.019 |
| $D_{50}$ | mm | 0.013 |
| $D_{30}$ | mm | 0.003 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | U. Mazhar | 17/04/2023 14:18 | 04/04/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR09 |
| Sample Description | Greenish grey mottled greenish brown sandy, clayey, SILT with sparse shell fragments (<5mm) | | | Depth, m | 12.10 |
| Specimen Reference | IS | Specimen Depth | 12.1 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030744 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0475 | 82 |
| | | 0.0349 | 52 |
| 125 | 100 | 0.0252 | 36 |
| 90 | 100 | 0.0180 | 25 |
| 75 | 100 | 0.0093 | 24 |
| 63 | 100 | 0.0066 | 22 |
| 50 | 100 | 0.0047 | 17 |
| 37.5 | 100 | 0.0027 | 16 |
| 28 | 100 | 0.0014 | 12 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 99 | | |
| 6.3 | 99 | | |
| 5 | 99 | | |
| 2 | 99 | | |
| 1.18 | 98 | Particle density | (assumed) |
| 0.63 | 98 | 2.65 | Mg/m3 |
| 0.425 | 98 | | |
| 0.300 | 98 | | |
| 0.200 | 98 | | |
| | | | |
| 0.063 | 91 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 1.39 |
| Sand | 7.27 |
| Silt | 76.92 |
| Clay | 14.42 |

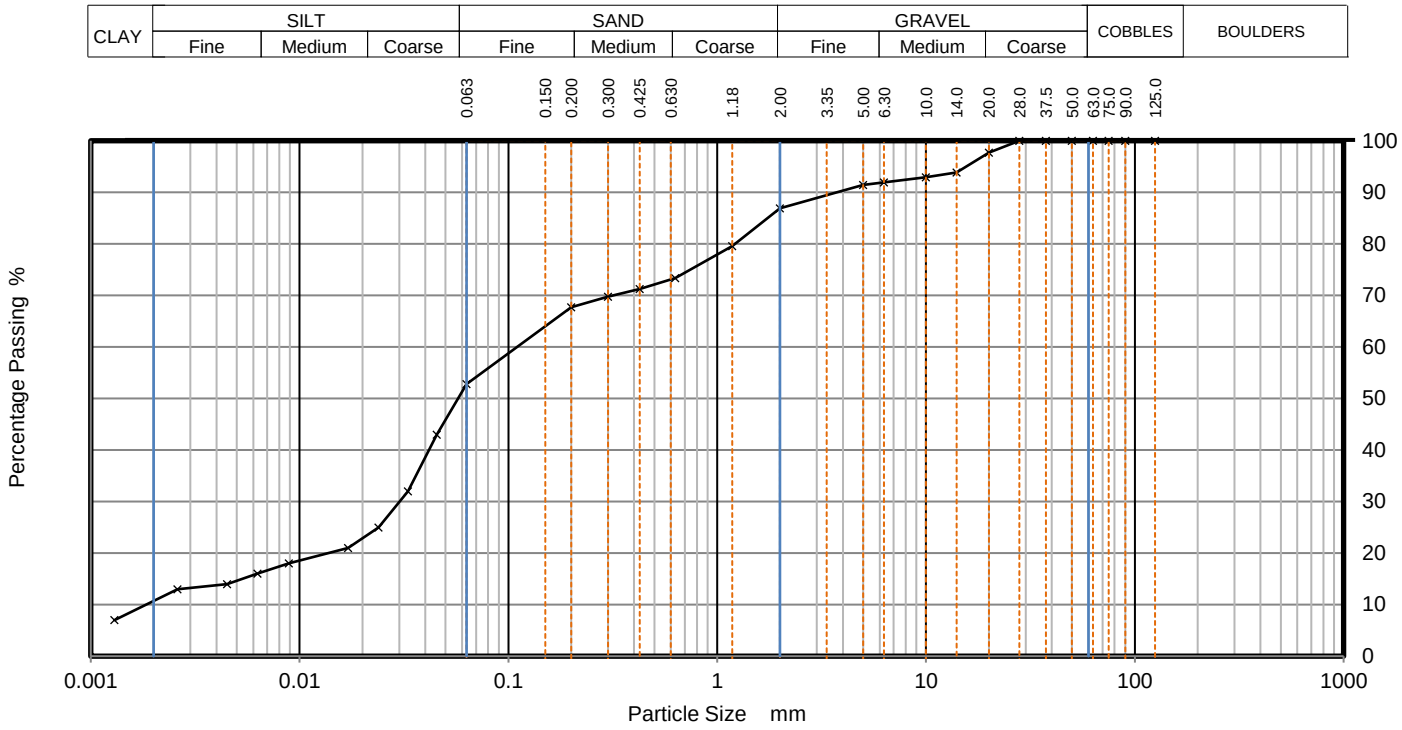
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.060 |
| $D_{60}$ | mm | 0.038 |
| $D_{50}$ | mm | 0.033 |
| $D_{30}$ | mm | 0.021 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| E Allan.Edward | D.Smith | 24/05/2023 16:23 | 27/04/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR10 |
| Sample Description | Greyish green gravelly, sandy, clayey, SILT | | | Depth, m | 13.40 |
| Specimen Reference | IS | Specimen Depth | 13.4 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030749 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0454 | 43 |
| | | 0.0331 | 32 |
| 125 | 100 | 0.0239 | 25 |
| 90 | 100 | 0.0171 | 21 |
| 75 | 100 | 0.0089 | 18 |
| 63 | 100 | 0.0063 | 16 |
| 50 | 100 | 0.0045 | 14 |
| 37.5 | 100 | 0.0026 | 13 |
| 28 | 100 | 0.0013 | 7 |
| 20 | 98 | | |
| 14 | 94 | | |
| 10 | 93 | | |
| 6.3 | 92 | | |
| 5 | 91 | | |
| 2 | 87 | | |
| 1.18 | 80 | Particle density (assumed) | |
| 0.63 | 73 | 2.65 | Mg/m3 |
| 0.425 | 71 | Test sample mass (g) | 383.8 |
| 0.300 | 70 | | |
| 0.200 | 68 | | |
| | | | |
| 0.063 | 53 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 13.11 |
| Sand | 34.11 |
| Silt | 42.21 |
| Clay | 10.57 |

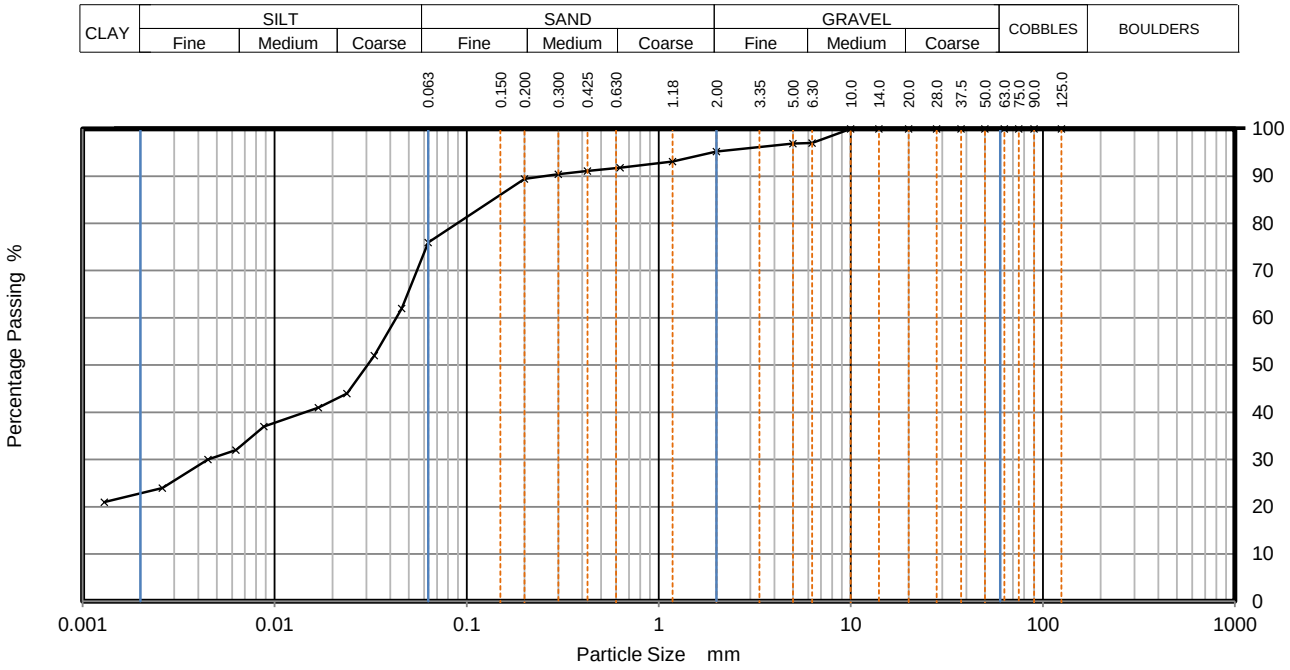
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 3.733 |
| $D_{60}$ | mm | 0.110 |
| $D_{50}$ | mm | 0.058 |
| $D_{30}$ | mm | 0.031 |
| $D_{10}$ | mm | 0.002 |
| Uniformity Coefficient | | 59.10 |
| Curvature Coefficient | | 4.53 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 04/07/2023 16:47 | 21/06/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR12 |
| Sample Description | GLEY 1 4/1 Dark greyish green, slightly gravelly, slightly sandy, CLAY | | | Depth, m | 15.00 |
| Specimen Reference | IS | Specimen Depth | 15 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030753 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0459 | 62 |
| | | 0.0331 | 52 |
| 125 | 100 | 0.0238 | 44 |
| 90 | 100 | 0.0169 | 41 |
| 75 | 100 | 0.0088 | 37 |
| 63 | 100 | 0.0063 | 32 |
| 50 | 100 | 0.0045 | 30 |
| 37.5 | 100 | 0.0026 | 24 |
| 28 | 100 | 0.0013 | 21 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 97 | | |
| 5 | 97 | | |
| 2 | 95 | | |
| 1.18 | 93 | | |
| 0.63 | 92 | | |
| 0.425 | 91 | | |
| 0.300 | 90 | | |
| 0.200 | 89 | | |
| | | | |
| 0.063 | 76 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 4.80 |
| Sand | 19.27 |
| Silt | 52.84 |
| Clay | 23.09 |

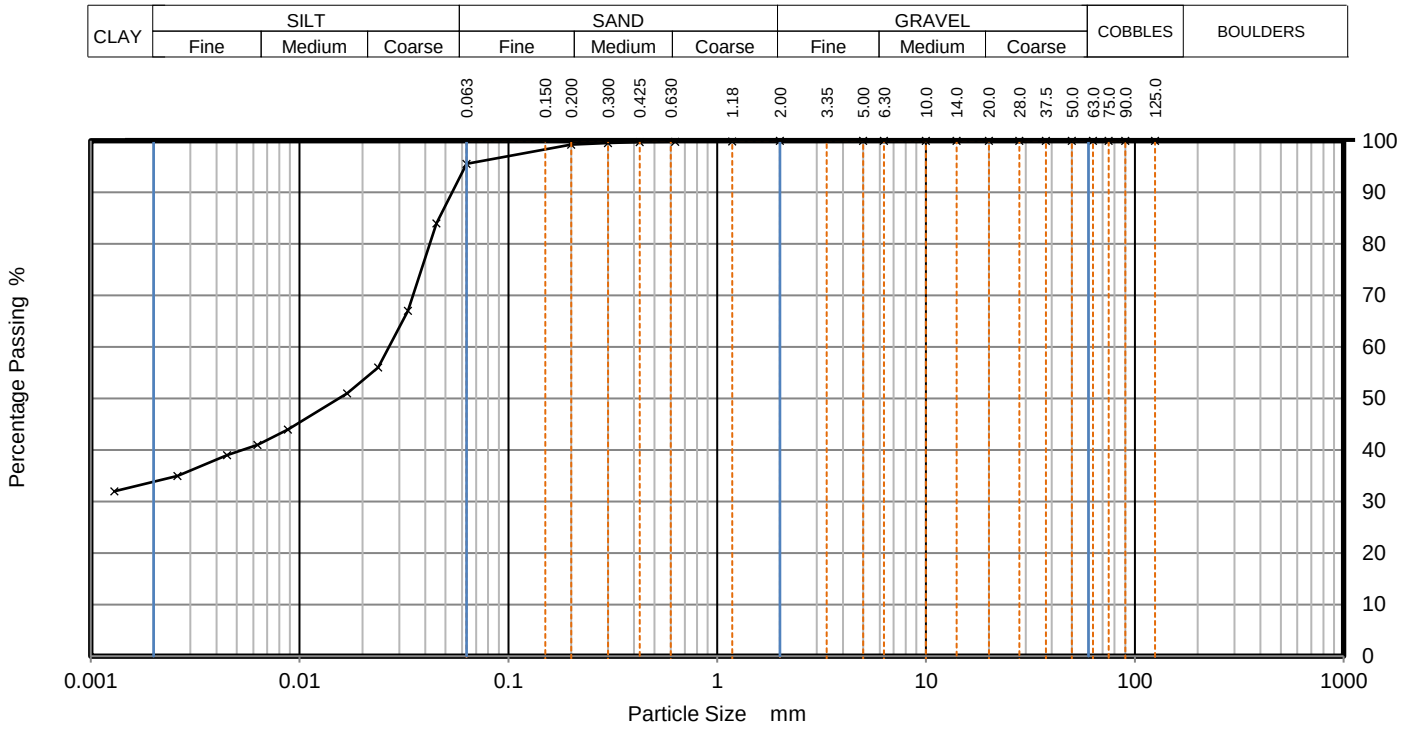
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.254 |
| $D_{60}$ | mm | 0.043 |
| $D_{50}$ | mm | 0.030 |
| $D_{30}$ | mm | 0.005 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 04/04/2023 12:50 | 09/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR13 |
| Sample Description | 5y 4/2 Olive grey, slightly sandy CLAY | | | Depth, m | 16.25 |
| Specimen Reference | IS | Specimen Depth | 16.25 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030760 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0453 | 84 |
| | | 0.0330 | 67 |
| 125 | 100 | 0.0238 | 56 |
| 90 | 100 | 0.0169 | 51 |
| 75 | 100 | 0.0088 | 44 |
| 63 | 100 | 0.0063 | 41 |
| 50 | 100 | 0.0045 | 39 |
| 37.5 | 100 | 0.0026 | 35 |
| 28 | 100 | 0.0013 | 32 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | Particle density | |
| 0.63 | 100 | 2.65 | Mg/m3 |
| 0.425 | 100 | | |
| 0.300 | 100 | | |
| 0.200 | 99 | | |
| | | | |
| 0.063 | 96 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.02 |
| Sand | 4.46 |
| Silt | 61.71 |
| Clay | 33.81 |

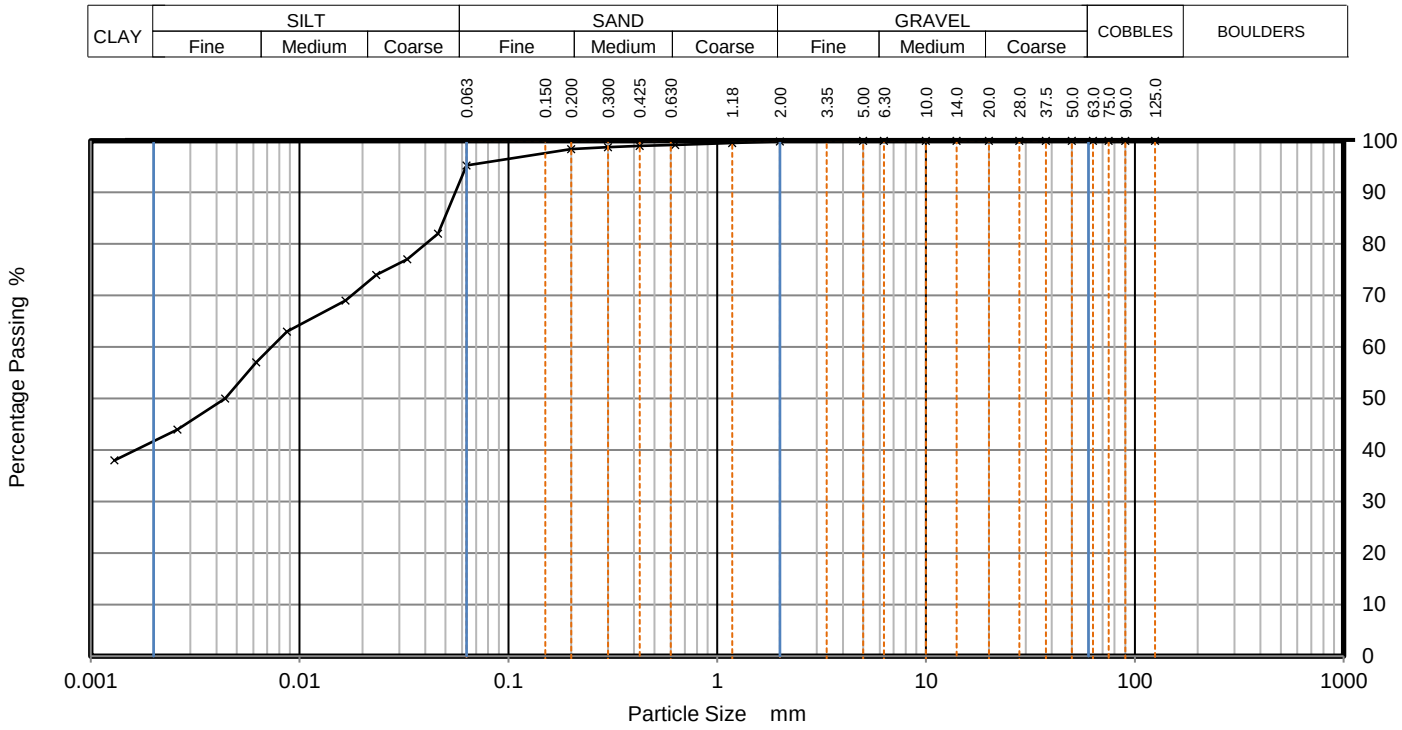
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.054 |
| $D_{60}$ | mm | 0.027 |
| $D_{50}$ | mm | 0.015 |
| $D_{30}$ | mm | 0.000 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | U. Mazhar | 17/04/2023 14:18 | 13/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU12 |
| Sample Description | GLEY 1 5/1 Greenish grey sandy, clayey, SILT | | | Depth, m | 18.00 |
| Specimen Reference | B1 | Specimen Depth | 18 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030767 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0460 | 82 |
| | | 0.0328 | 77 |
| 125 | 100 | 0.0233 | 74 |
| 90 | 100 | 0.0166 | 69 |
| 75 | 100 | 0.0087 | 63 |
| 63 | 100 | 0.0062 | 57 |
| 50 | 100 | 0.0044 | 50 |
| 37.5 | 100 | 0.0026 | 44 |
| 28 | 100 | 0.0013 | 38 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | Particle density | |
| 0.63 | 99 | 2.65 | Mg/m3 |
| 0.425 | 99 | | |
| 0.300 | 99 | | |
| 0.200 | 98 | | |
| | | | |
| 0.063 | 95 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.14 |
| Sand | 4.63 |
| Silt | 53.60 |
| Clay | 41.63 |

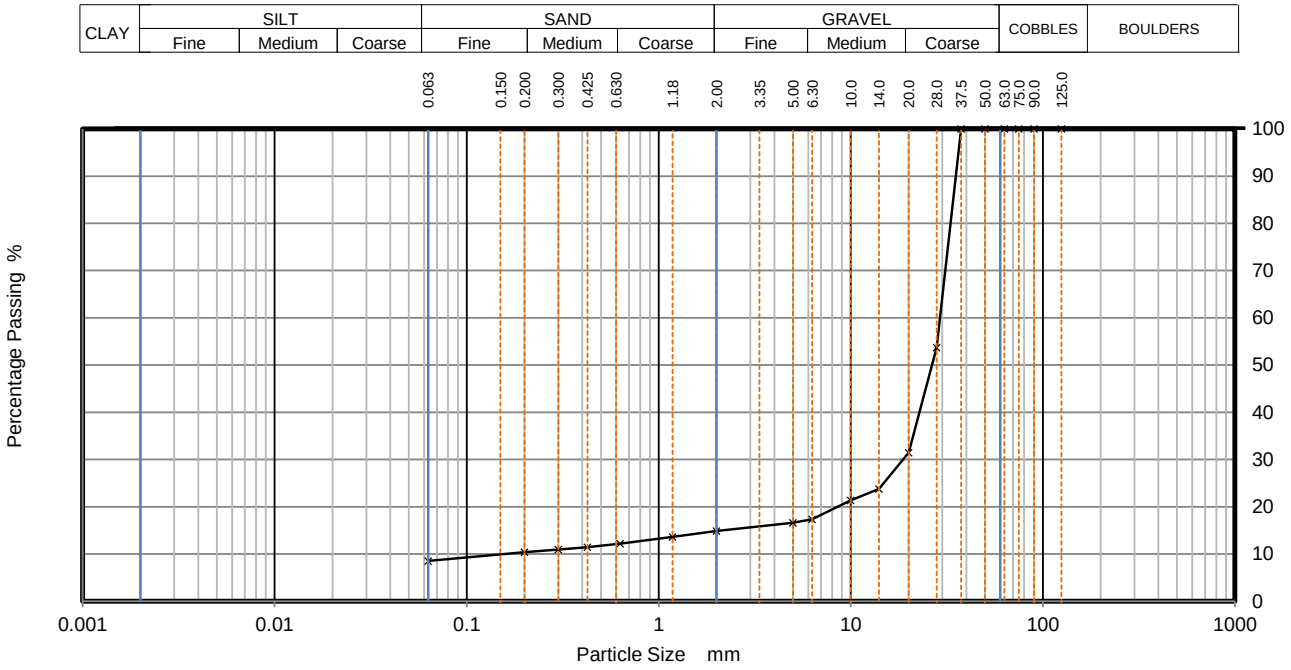
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.056 |
| $D_{60}$ | mm | 0.007 |
| $D_{50}$ | mm | 0.004 |
| $D_{30}$ | mm | 0.000 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | D.Smith | | 13/04/2023 11:19 | 15/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR15 |
| Sample Description | GLEY 1 6/1 Greenish grey, clayey and sandy GRAVEL | | | Depth, m | 18.60 |
| Specimen Reference | IS | Specimen Depth | 18.6 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH012023030770 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 54 | | |
| 20 | 31 | | |
| 14 | 24 | | |
| 10 | 21 | | |
| 6.3 | 17 | | |
| 5 | 17 | | |
| 2 | 15 | | |
| 1.18 | 14 | | |
| 0.63 | 12 | | |
| 0.425 | 11 | | |
| 0.300 | 11 | | |
| 0.200 | 10 | | |
| | | | |
| 0.063 | 9 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 85.12 |
| Sand | 6.34 |
| | |
| Fines <0.063mm | 8.54 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 35.207 |
| $D_{60}$ | mm | 29.136 |
| $D_{50}$ | mm | 26.477 |
| $D_{30}$ | mm | 18.693 |
| $D_{10}$ | mm | 0.157 |
| Uniformity Coefficient | | 185.90 |
| Curvature Coefficient | | 76.52 |

Remarks

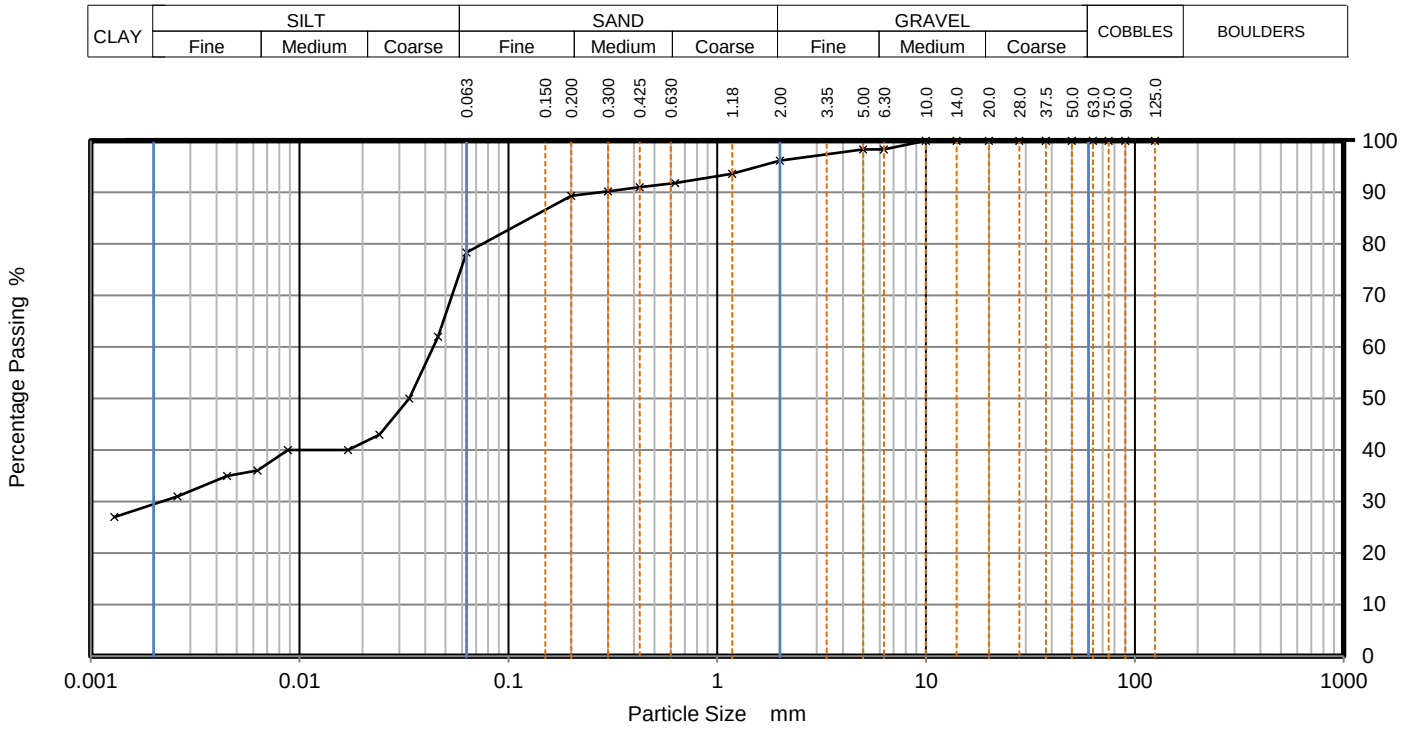
Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 05/04/2023 10:42 | 15/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

GEOQUIPMARINE

| | | | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | | | | |
| Borehole No. | OWF_GI#15A_SAMP | | | | |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR16 |
| Sample Description | GLEY 1 4/1 Dark greenish grey, slightly gravelly, sandy, silty, CLAY | | | Depth, m | 19.50 |
| Specimen Reference | IS | Specimen Depth | 19.5 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH012023030773 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0461 | 62 |
| | | 0.0335 | 50 |
| 125 | 100 | 0.0241 | 43 |
| 90 | 100 | 0.0171 | 40 |
| 75 | 100 | 0.0088 | 40 |
| 63 | 100 | 0.0063 | 36 |
| 50 | 100 | 0.0045 | 35 |
| 37.5 | 100 | 0.0026 | 31 |
| 28 | 100 | 0.0013 | 27 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 98 | | |
| 5 | 98 | | |
| 2 | 96 | | |
| 1.18 | 94 | Particle density | |
| 0.63 | 92 | 2.65 | Mg/m3 |
| 0.425 | 91 | | |
| 0.300 | 90 | | |
| 0.200 | 89 | | |
| | | | |
| 0.063 | 78 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 3.88 |
| Sand | 17.79 |
| Silt | 48.95 |
| Clay | 29.38 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.275 |
| $D_{60}$ | mm | 0.043 |
| $D_{50}$ | mm | 0.033 |
| $D_{30}$ | mm | 0.002 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

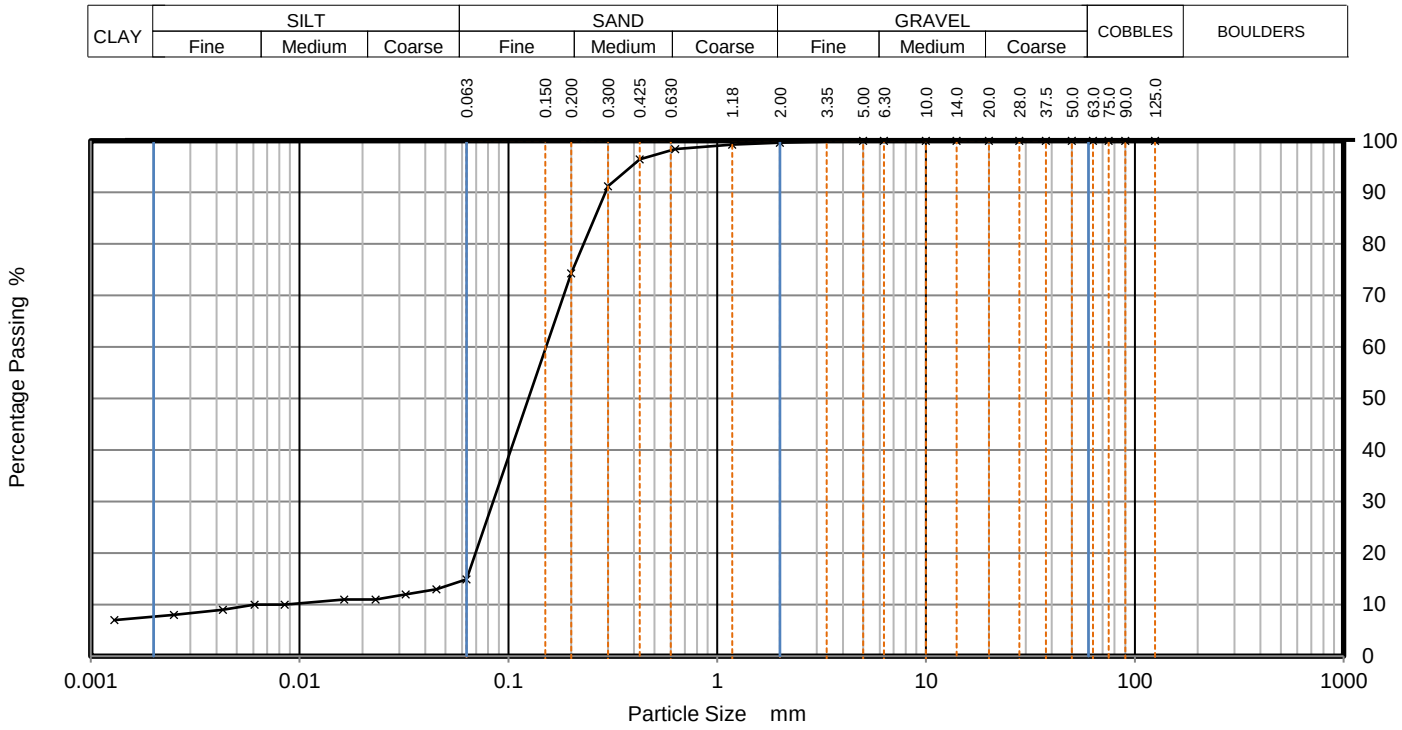
Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | U. Mazhar | 17/04/2023 14:18 | 13/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

GEOQUIPMARINE

| | | | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | | | | |
| Borehole No. | OWF_GI#17_SAMP | | | | |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU01 |
| Sample Description | 5Y 4/2 Olive grey silty wet SAND | | | Depth, m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | 0 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227332 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0452 | 13 |
| | | 0.0323 | 12 |
| 125 | 100 | 0.0231 | 11 |
| 90 | 100 | 0.0164 | 11 |
| 75 | 100 | 0.0085 | 10 |
| 63 | 100 | 0.0061 | 10 |
| 50 | 100 | 0.0043 | 9 |
| 37.5 | 100 | 0.0025 | 8 |
| 28 | 100 | 0.0013 | 7 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 99 | Particle density | |
| 0.63 | 98 | 2.65 | Mg/m3 |
| 0.425 | 96 | | |
| 0.300 | 91 | | |
| 0.200 | 74 | | |
| | | | |
| 0.063 | 15 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.38 |
| Sand | 84.74 |
| Silt | 7.59 |
| Clay | 7.30 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.292 |
| $D_{60}$ | mm | 0.151 |
| $D_{50}$ | mm | 0.125 |
| $D_{30}$ | mm | 0.085 |
| $D_{10}$ | mm | 0.008 |
| Uniformity Coefficient | | 17.96 |
| Curvature Coefficient | | 5.59 |

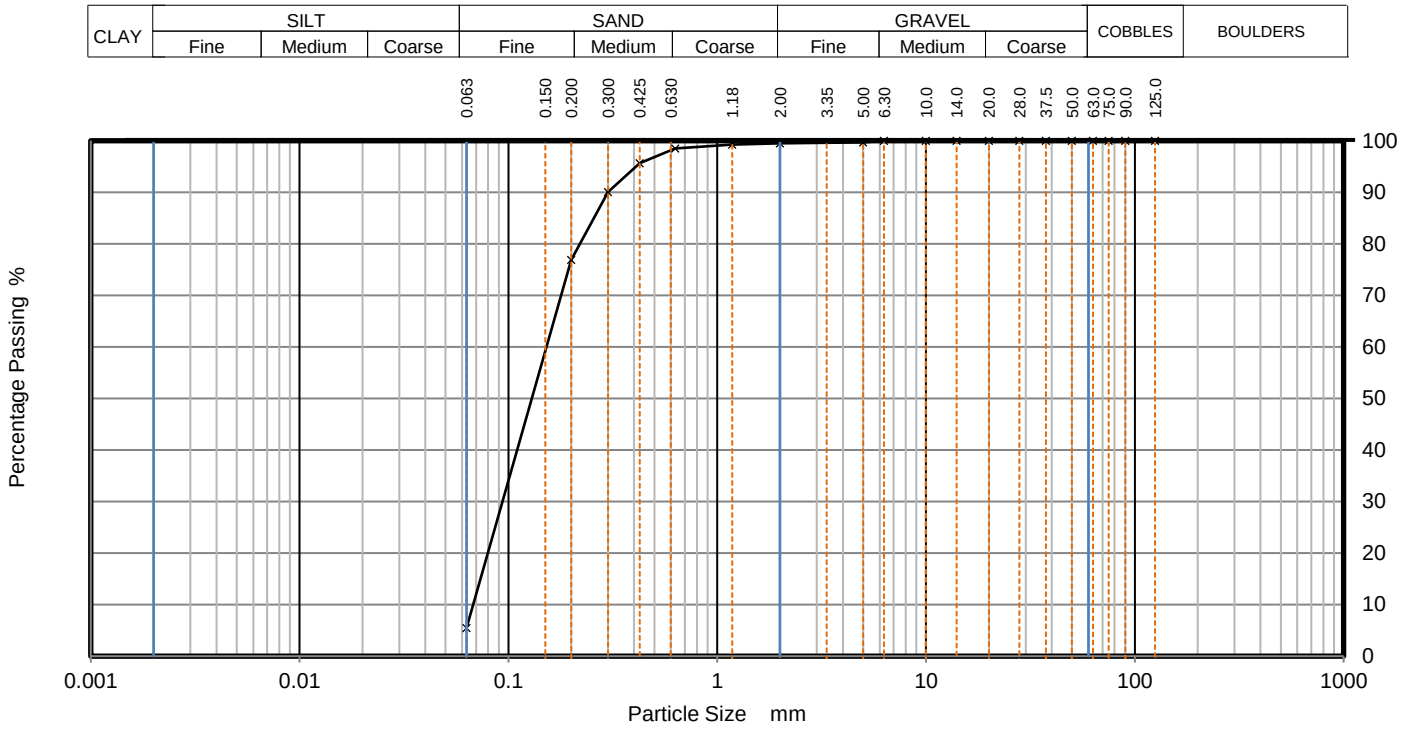
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:54 | 09/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

| | | | | | |
|---|---|---|---|---|---|
| | | | | Job Ref | **GMOP21-G-019** |
| | | | | Borehole No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU04 |
| Sample Description | 5y 4/2 Olive grey silty wet SAND | | | Depth, m | 2.50 |
| Specimen Reference | B1 | Specimen Depth | 2.5 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227336 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 99 | | |
| 1.18 | 99 | | |
| 0.63 | 98 | | |
| 0.425 | 96 | | |
| 0.300 | 90 | | |
| 0.200 | 77 | | |
| | | | |
| 0.063 | 5 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.50 |
| Sand | 94.05 |
| | |
| Fines <0.063mm | 5.44 |

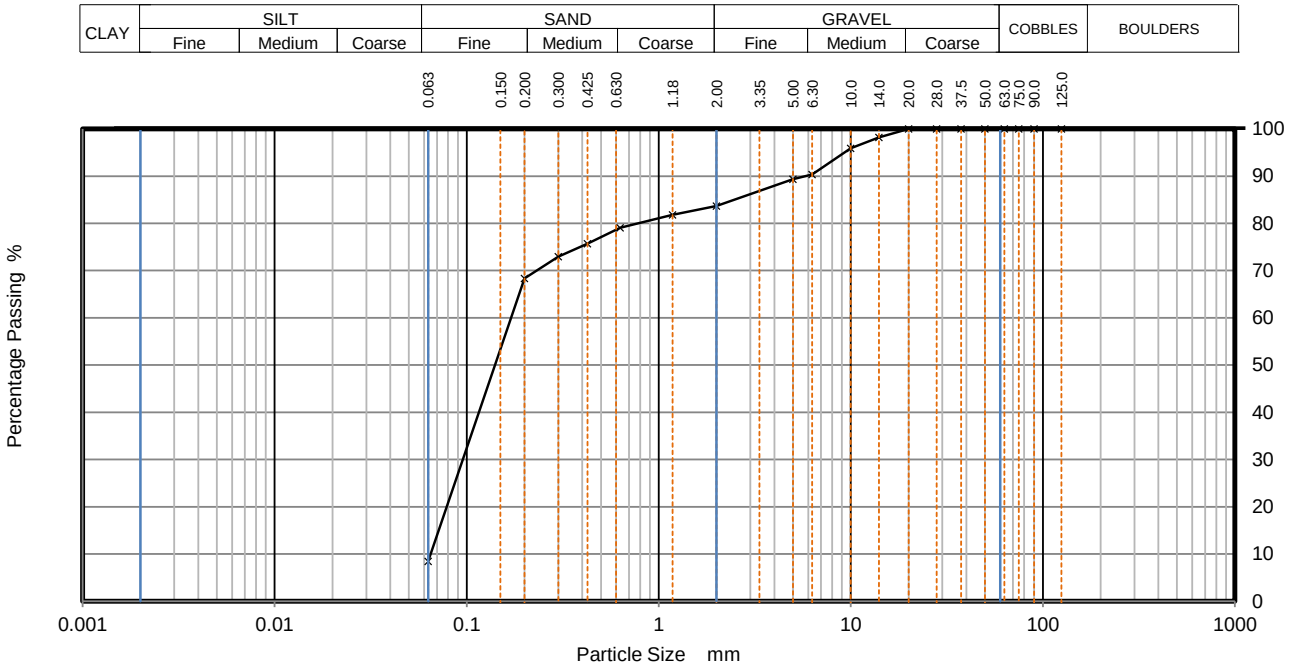
| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 0.299 |
| $D_{60}$ | mm | 0.152 |
| $D_{50}$ | mm | 0.129 |
| $D_{30}$ | mm | 0.094 |
| $D_{10}$ | mm | 0.068 |
| Uniformity Coefficient | | 2.24 |
| Curvature Coefficient | | 0.85 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:54 | 09/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU06A |
| Sample Description | 5y 4/2 Olive grey, silty, gravelly SAND with shell fragments | | | | Depth, m | 3.50 |
| Specimen Reference | B1 | Specimen Depth | 3.5 | m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | | Unique ID | BH0120230227338 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 98 | | |
| 10 | 96 | | |
| 6.3 | 90 | | |
| 5 | 89 | | |
| 2 | 84 | | |
| 1.18 | 82 | | |
| 0.63 | 79 | | |
| 0.425 | 76 | | |
| 0.300 | 73 | | |
| 0.200 | 68 | | |
| | | | |
| 0.063 | 8 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 16.33 |
| Sand | 75.21 |
| | |
| Fines <0.063mm | 8.45 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 5.828 |
| $D_{60}$ | mm | 0.170 |
| $D_{50}$ | mm | 0.140 |
| $D_{30}$ | mm | 0.095 |
| $D_{10}$ | mm | 0.065 |
| Uniformity Coefficient | | 2.62 |
| Curvature Coefficient | | 0.82 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

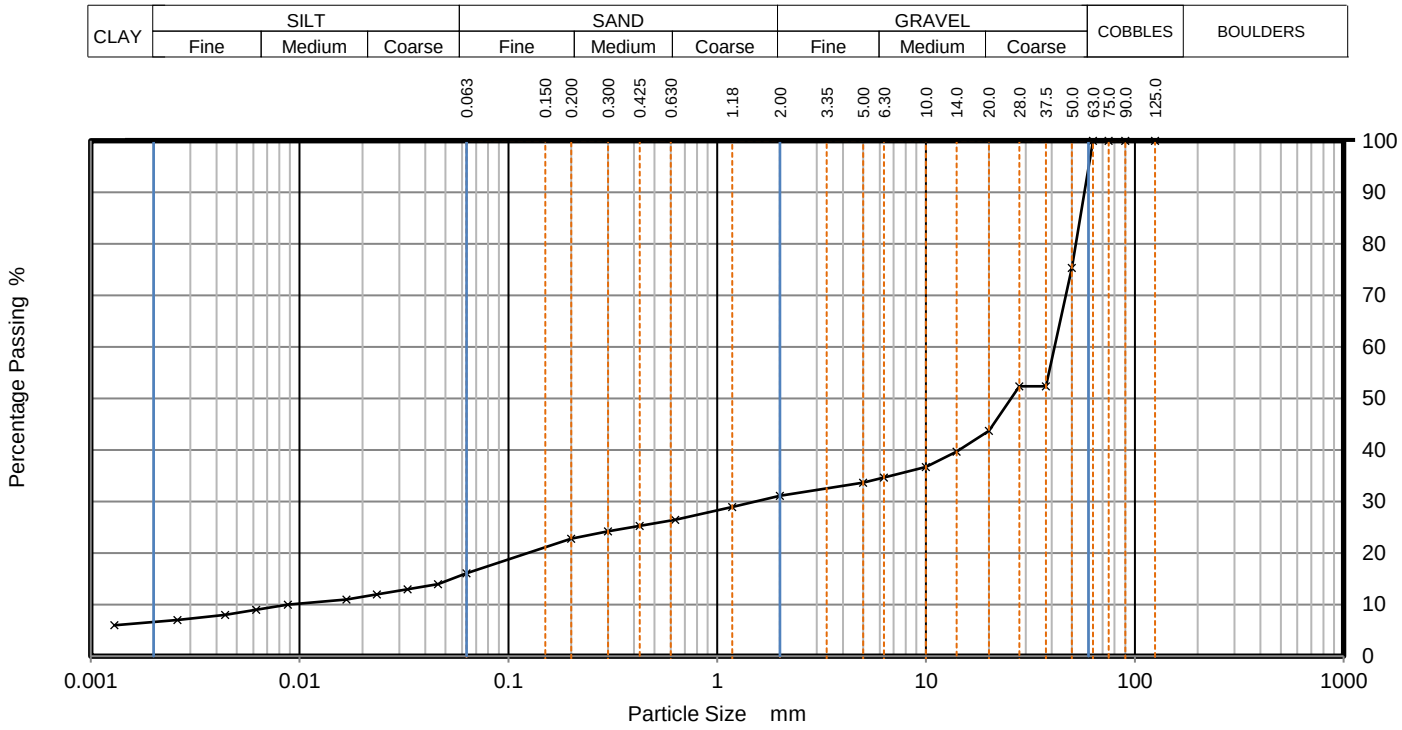
Minimum specimen mass not adequate - non-standard test

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 14/04/2023 12:52 | 02/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

GEOQUIPMARINE

| | | | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | | | | |
| Borehole No. | OWF_GI#17_SAMP | | | | |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR02 |
| Sample Description | 5Y 6/2 Light olive grey wet clayey, silty, sandy GRAVEL including cemented sand | | | Depth, m | 5.80 |
| Specimen Reference | B1 | Specimen Depth | 5.8 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227342 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0460 | 14 |
| | | 0.0329 | 13 |
| 125 | 100 | 0.0235 | 12 |
| 90 | 100 | 0.0168 | 11 |
| 75 | 100 | 0.0088 | 10 |
| 63 | 100 | 0.0062 | 9 |
| 50 | 75 | 0.0044 | 8 |
| 37.5 | 52 | 0.0026 | 7 |
| 28 | 52 | 0.0013 | 6 |
| 20 | 44 | | |
| 14 | 40 | | |
| 10 | 37 | | |
| 6.3 | 35 | | |
| 5 | 34 | | |
| 2 | 31 | | |
| 1.18 | 29 | Particle density | |
| 0.63 | 26 | 2.65 | Mg/m3 |
| 0.425 | 25 | | |
| 0.300 | 24 | | |
| 0.200 | 23 | | |
| | | | |
| 0.063 | 16 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 68.87 |
| Sand | 15.03 |
| Silt | 9.54 |
| Clay | 6.55 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 57.362 |
| $D_{60}$ | mm | 41.260 |
| $D_{50}$ | mm | 25.530 |
| $D_{30}$ | mm | 1.520 |
| $D_{10}$ | mm | 0.009 |
| Uniformity Coefficient | | 4530.00 |
| Curvature Coefficient | | 6.15 |

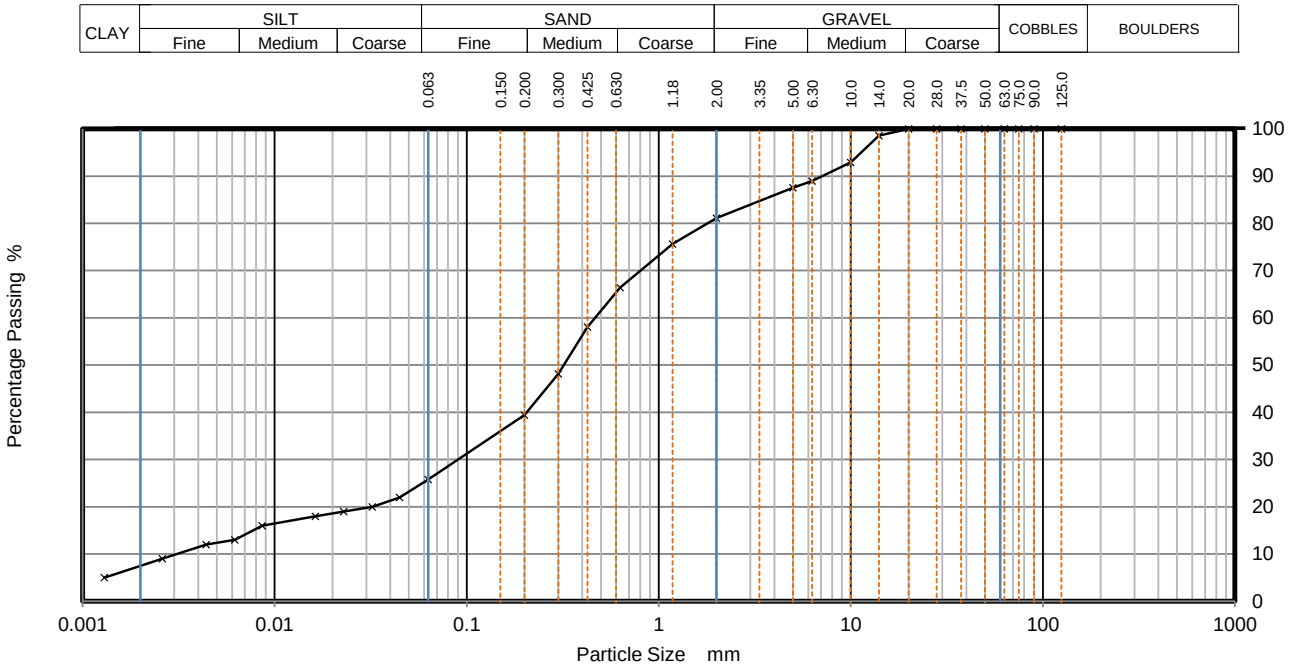
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant test-non standard test completed

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | D.Smith | | 13/04/2023 09:55 | 09/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU10 |
| Sample Description | 2.5y 7/3 Pale brown, clayey, silty and gravelly, SAND | | | Depth, m | 10.60 |
| Specimen Reference | IS | Specimen Depth | 10.6 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227353 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0447 | 22 |
| | | 0.0322 | 20 |
| 125 | 100 | 0.0229 | 19 |
| 90 | 100 | 0.0163 | 18 |
| 75 | 100 | 0.0086 | 16 |
| 63 | 100 | 0.0062 | 13 |
| 50 | 100 | 0.0044 | 12 |
| 37.5 | 100 | 0.0026 | 9 |
| 28 | 100 | 0.0013 | 5 |
| 20 | 100 | | |
| 14 | 99 | | |
| 10 | 93 | | |
| 6.3 | 89 | | |
| 5 | 88 | | |
| 2 | 81 | | |
| 1.18 | 76 | | |
| 0.63 | 66 | | |
| 0.425 | 58 | | |
| 0.300 | 48 | | |
| 0.200 | 39 | | |
| | | | |
| 0.063 | 26 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 18.89 |
| Sand | 55.31 |
| Silt | 18.48 |
| Clay | 7.32 |

| Grading Analysis | | |
|---|---|---|
| D90 | mm | 7.104 |
| D60 | mm | 0.465 |
| D50 | mm | 0.320 |
| D30 | mm | 0.090 |
| D10 | mm | 0.003 |
| Uniformity Coefficient | | 149.10 |
| Curvature Coefficient | | 5.57 |

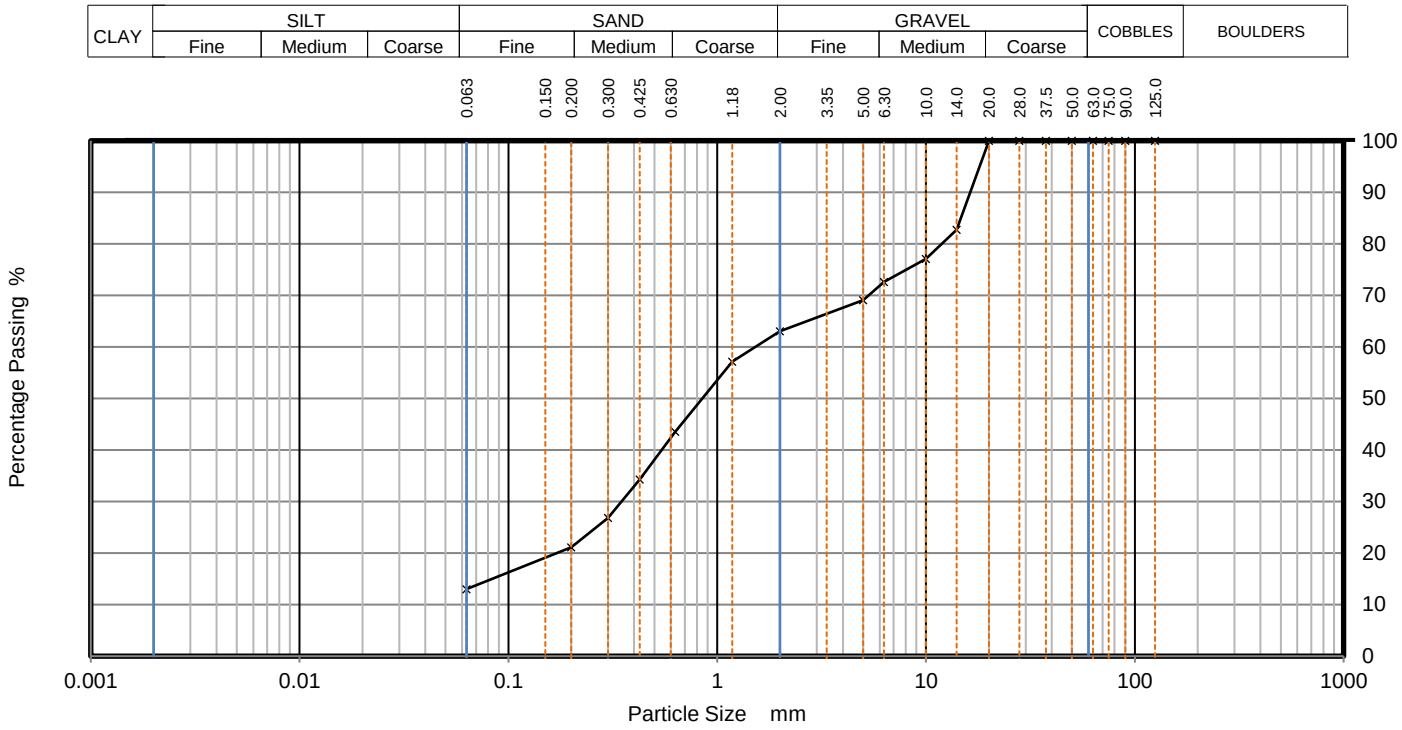
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 04/04/2023 12:47 | 02/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | | | | Job Ref | **GMOP21-G-019** |
| | | | | Borehole No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU13 |
| Sample Description | white page 2.5y 8/1 White cemented silty SAND | | | Depth, m | 16.70 |
| Specimen Reference | B1 | Specimen Depth | 16.7 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227369 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 83 | | |
| 10 | 77 | | |
| 6.3 | 73 | | |
| 5 | 69 | | |
| 2 | 63 | | |
| 1.18 | 57 | | |
| 0.63 | 44 | | |
| 0.425 | 34 | | |
| 0.300 | 27 | | |
| 0.200 | 21 | | |
| | | | |
| 0.063 | 13 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 36.94 |
| Sand | 50.04 |
| | |
| Fines <0.063mm | 13.01 |

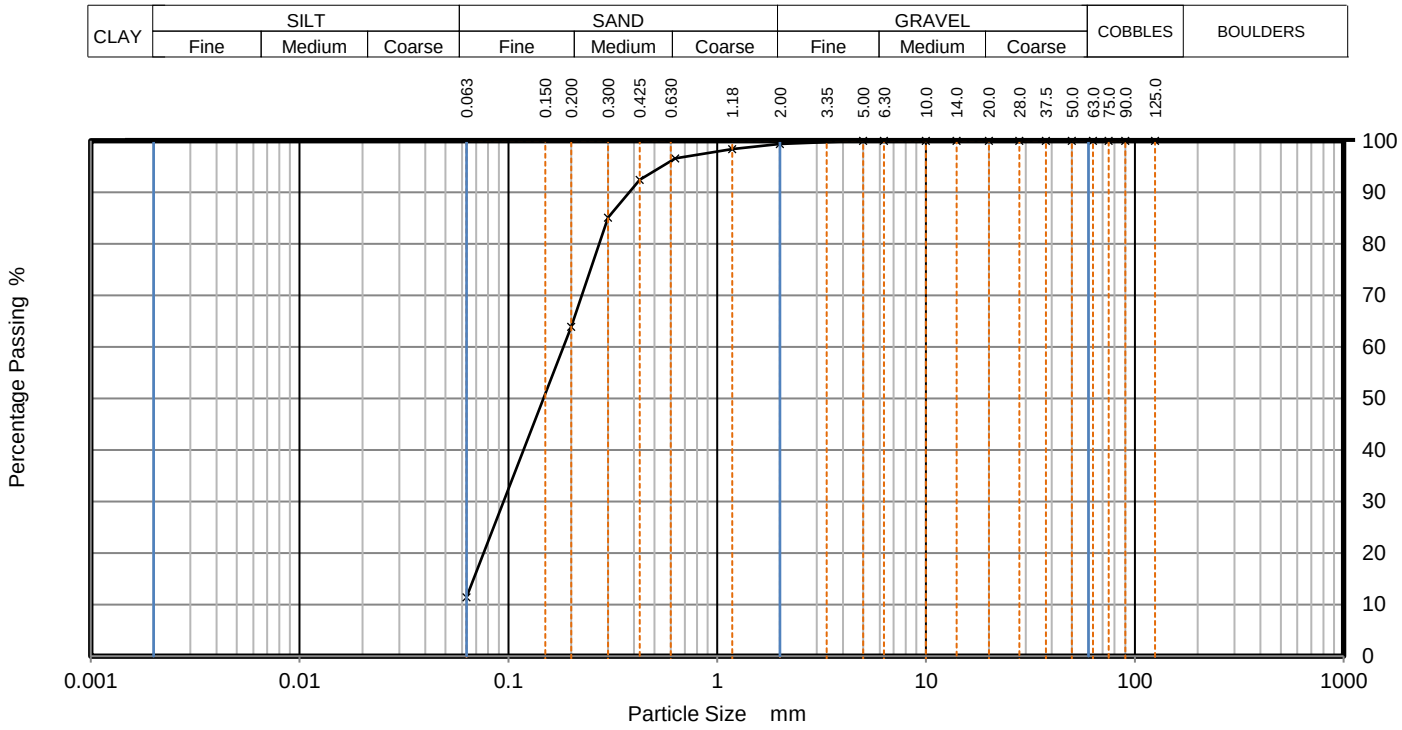
| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 16.266 |
| $D_{60}$ | mm | 1.524 |
| $D_{50}$ | mm | 0.849 |
| $D_{30}$ | mm | 0.348 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:55 | 13/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU01 |
| Sample Description | 2.5y 4/3 Olive brown silty SAND with small shell fragments | | | Depth, m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | 0 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227378 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 99 | | |
| 1.18 | 98 | | |
| 0.63 | 97 | | |
| 0.425 | 92 | | |
| 0.300 | 85 | | |
| 0.200 | 64 | | |
| | | | |
| 0.063 | 11 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.64 |
| Sand | 87.94 |
| | |
| Fines <0.063mm | 11.42 |

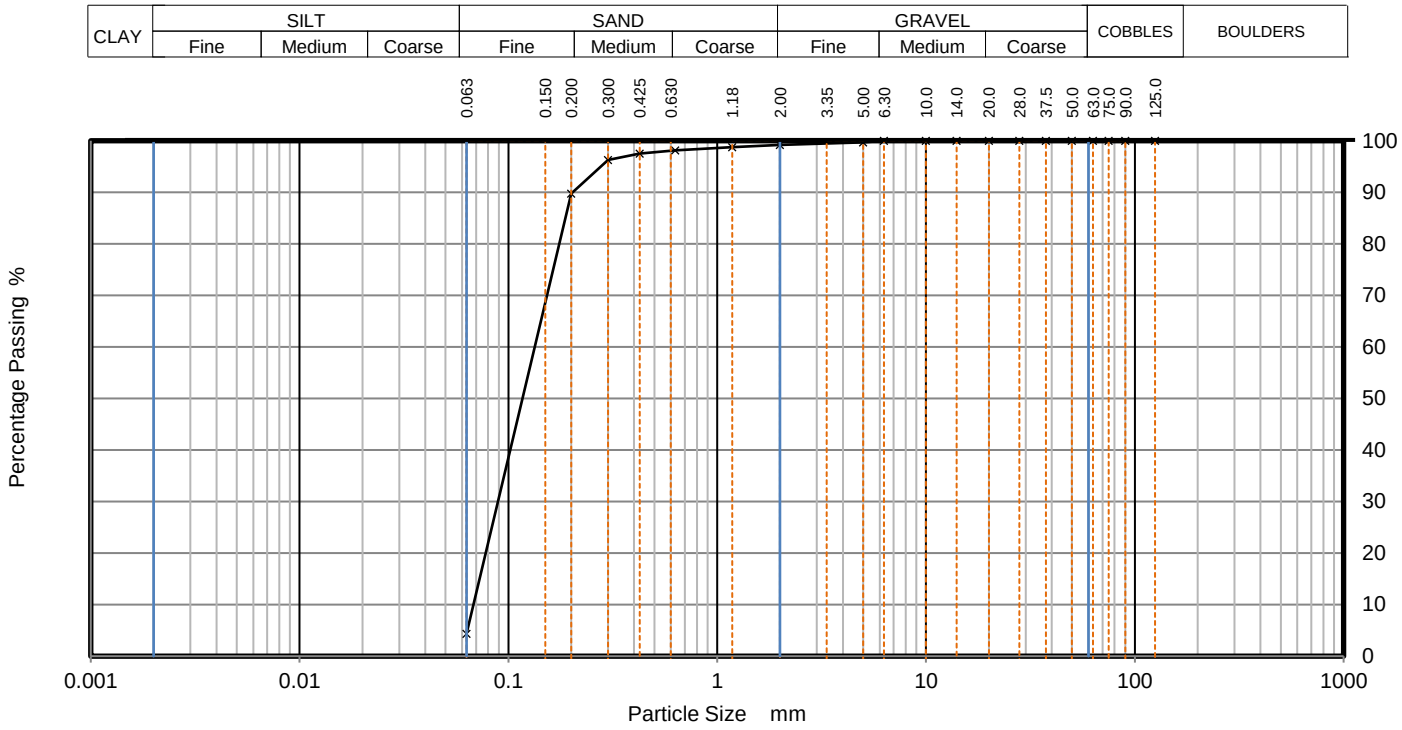
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.379 |
| $D_{60}$ | mm | 0.184 |
| $D_{50}$ | mm | 0.147 |
| $D_{30}$ | mm | 0.095 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:59 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU07 |
| Sample Description | 2.5y 3/1 Very dark grey silty SAND | | | Depth, m | 3.20 |
| Specimen Reference | B1 | Specimen Depth | 3.2 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227387 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 99 | | |
| 1.18 | 99 | | |
| 0.63 | 98 | | |
| 0.425 | 97 | | |
| 0.300 | 96 | | |
| 0.200 | 90 | | |
| | | | |
| 0.063 | 4 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.81 |
| Sand | 94.86 |
| | |
| Fines <0.063mm | 4.33 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.203 |
| $D_{60}$ | mm | 0.134 |
| $D_{50}$ | mm | 0.117 |
| $D_{30}$ | mm | 0.089 |
| $D_{10}$ | mm | 0.068 |
| Uniformity Coefficient | | 1.97 |
| Curvature Coefficient | | 0.87 |

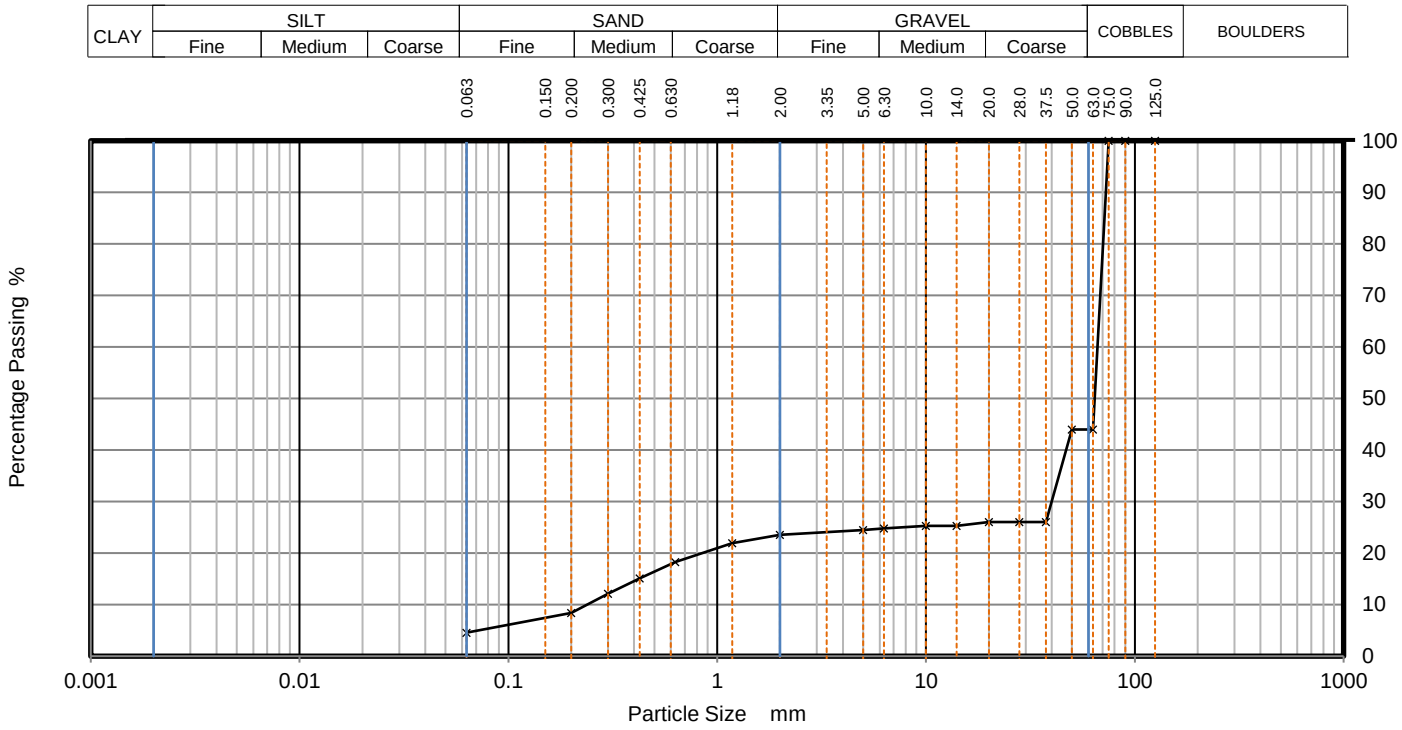
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:59 | 13/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

| | | | | | |
|---|---|---|---|---|---|
| | | | | Job Ref | **GMOP21-G-019** |
| | | | | Borehole No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU11 |
| Sample Description | 2.5y 7/3 pale brown cemented SAND | | | Depth, m | 6.70 |
| Specimen Reference | IS | Specimen Depth | 6.7 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227391 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 44 | | |
| 50 | 44 | | |
| 37.5 | 26 | | |
| 28 | 26 | | |
| 20 | 26 | | |
| 14 | 25 | | |
| 10 | 25 | | |
| 6.3 | 25 | | |
| 5 | 24 | | |
| 2 | 24 | | |
| 1.18 | 22 | | |
| 0.63 | 18 | | |
| 0.425 | 15 | | |
| 0.300 | 12 | | |
| 0.200 | 8 | | |
| | | | |
| 0.063 | 5 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 76.47 |
| Sand | 18.96 |
| | |
| Fines <0.063mm | 4.56 |

| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 72.701 |
| $D_{60}$ | mm | 66.219 |
| $D_{50}$ | mm | 64.189 |
| $D_{30}$ | mm | 39.967 |
| $D_{10}$ | mm | 0.238 |
| Uniformity Coefficient | | 278.20 |
| Curvature Coefficient | | 101.30 |

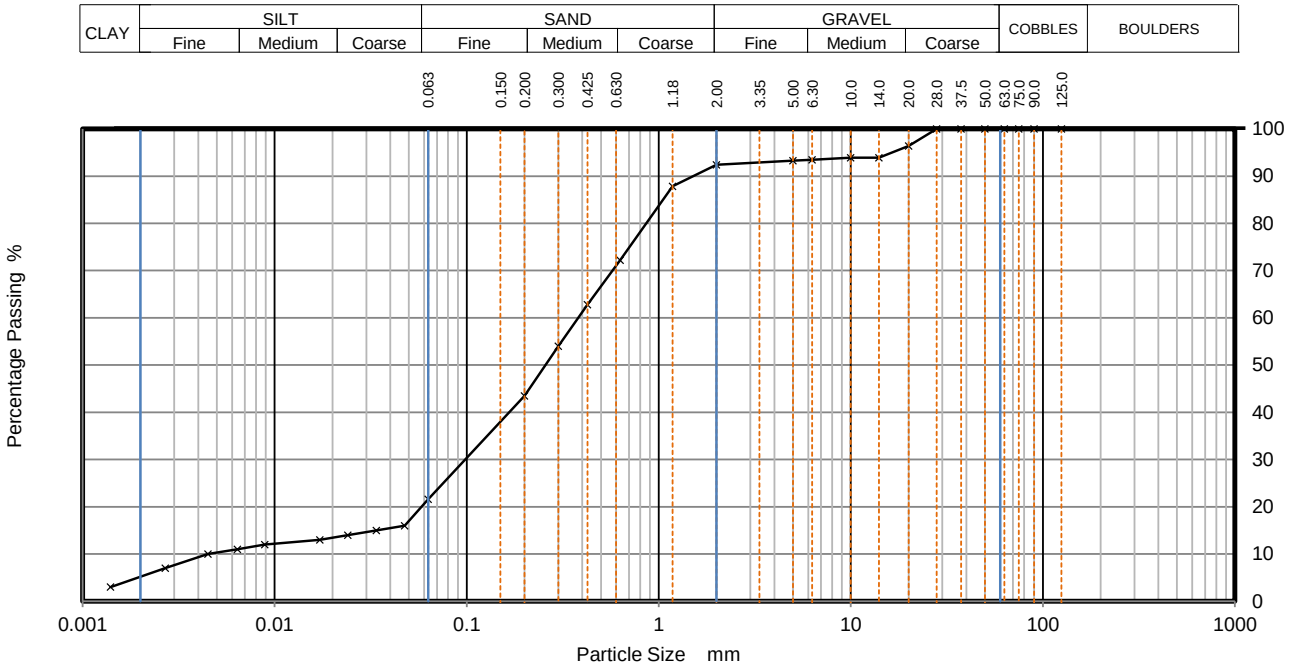
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant test-non standard test completed

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:59 | 16/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU14 |
| Sample Description | 2.5y 7/3 Pale brown, clayey, silty, gravelly, SAND | | | Depth, m | 9.70 |
| Specimen Reference | IS | Specimen Depth | 9.7 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227394 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0476 | 16 |
| | | 0.0339 | 15 |
| 125 | 100 | 0.0241 | 14 |
| 90 | 100 | 0.0172 | 13 |
| 75 | 100 | 0.0089 | 12 |
| 63 | 100 | 0.0064 | 11 |
| 50 | 100 | 0.0045 | 10 |
| 37.5 | 100 | 0.0027 | 7 |
| 28 | 100 | 0.0014 | 3 |
| 20 | 96 | | |
| 14 | 94 | | |
| 10 | 94 | | |
| 6.3 | 93 | | |
| 5 | 93 | | |
| 2 | 92 | | |
| 1.18 | 88 | Particle density (assumed) | |
| 0.63 | 72 | 2.65 Mg/m3 | |
| 0.425 | 63 | | |
| 0.300 | 54 | | |
| 0.200 | 43 | | |
| | | | |
| 0.063 | 22 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 7.60 |
| Sand | 70.78 |
| Silt | 16.52 |
| Clay | 5.10 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 1.512 |
| $D_{60}$ | mm | 0.380 |
| $D_{50}$ | mm | 0.257 |
| $D_{30}$ | mm | 0.098 |
| $D_{10}$ | mm | 0.004 |
| Uniformity Coefficient | | 87.36 |
| Curvature Coefficient | | 5.81 |

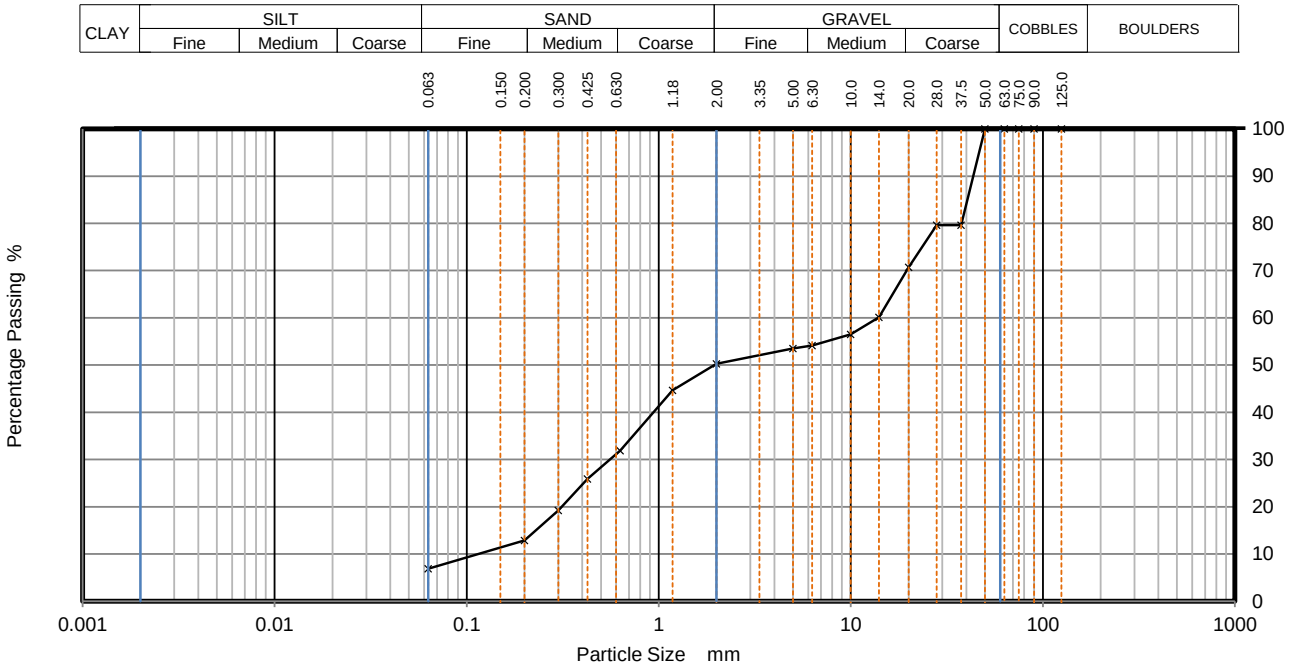
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Minimum dry mass not adequate - Non-standard test

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| O Atitebi | U. Mazhar | | 14/04/2023 13:02 | 16/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU17 |
| Sample Description | 2.5y 7/3 Pale brown stiff silty SAND | | | | Depth, m | 13.00 |
| Specimen Reference | IS | Specimen Depth | 13 | m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | | Unique ID | BH0120230227400 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 80 | | |
| 28 | 80 | | |
| 20 | 71 | | |
| 14 | 60 | | |
| 10 | 56 | | |
| 6.3 | 54 | | |
| 5 | 53 | | |
| 2 | 50 | | |
| 1.18 | 45 | | |
| 0.63 | 32 | | |
| 0.425 | 26 | | |
| 0.300 | 19 | | |
| 0.200 | 13 | | |
| | | | |
| 0.063 | 7 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 49.70 |
| Sand | 43.42 |
| | |
| Fines <0.063mm | 6.88 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 43.418 |
| $D_{60}$ | mm | 13.808 |
| $D_{50}$ | mm | 1.945 |
| $D_{30}$ | mm | 0.556 |
| $D_{10}$ | mm | 0.115 |
| Uniformity Coefficient | | 119.80 |
| Curvature Coefficient | | 0.19 |

Remarks

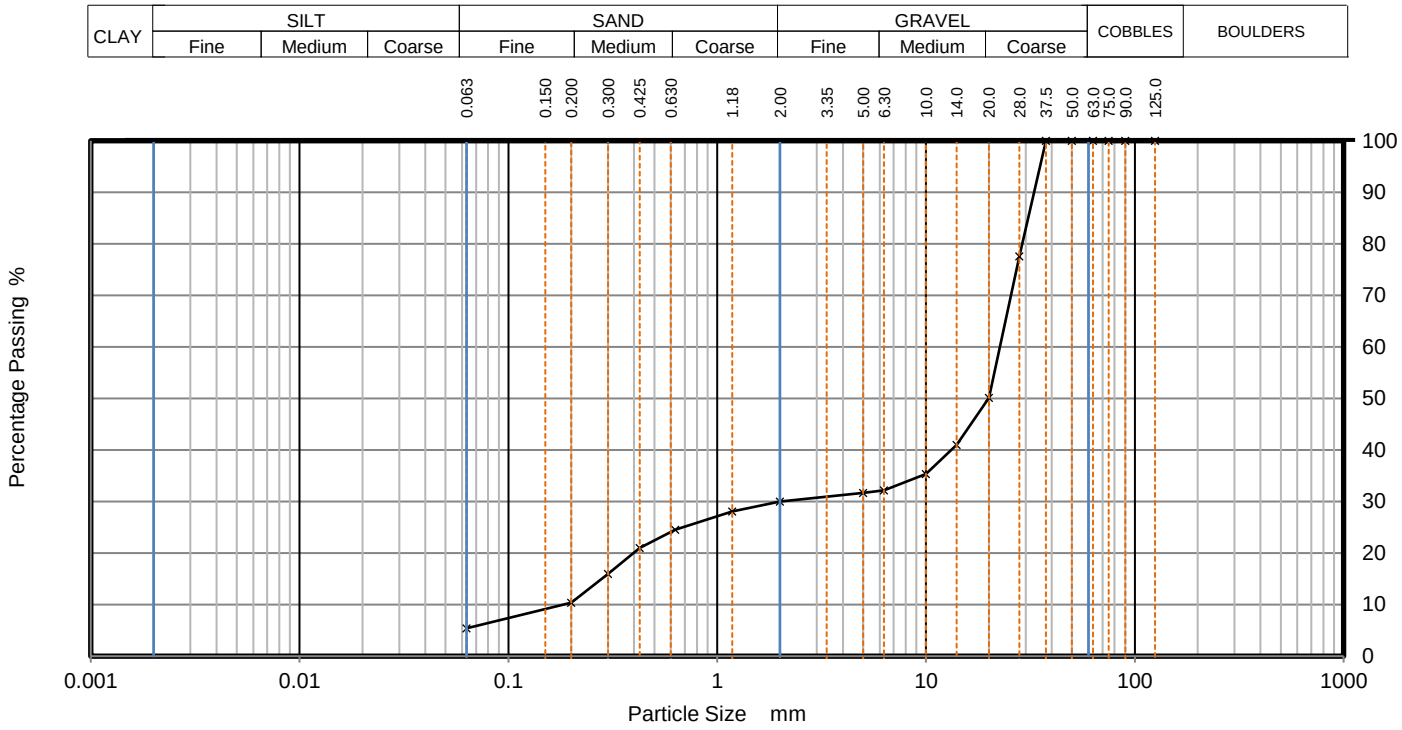
Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant test - test is non standard

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 13/04/2023 14:28 | 16/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

| | | | | | |
|---|---|---|---|---|---|
| | | | | Job Ref | **GMOP21-G-019** |
| | | | | Borehole No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU18 |
| Sample Description | 2.5y 7/3 Pale brown cemented SAND | | | Depth, m | 13.80 |
| Specimen Reference | IS | Specimen Depth | 13.8 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227403 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 78 | | |
| 20 | 50 | | |
| 14 | 41 | | |
| 10 | 35 | | |
| 6.3 | 32 | | |
| 5 | 32 | | |
| 2 | 30 | | |
| 1.18 | 28 | | |
| 0.63 | 25 | | |
| 0.425 | 21 | | |
| 0.300 | 16 | | |
| 0.200 | 10 | | |
| | | | |
| 0.063 | 5 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 70.00 |
| Sand | 24.59 |
| | |
| Fines <0.063mm | 5.41 |

| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 32.921 |
| $D_{60}$ | mm | 22.576 |
| $D_{50}$ | mm | 19.913 |
| $D_{30}$ | mm | 2.004 |
| $D_{10}$ | mm | 0.182 |
| Uniformity Coefficient | | 123.90 |
| Curvature Coefficient | | 0.98 |

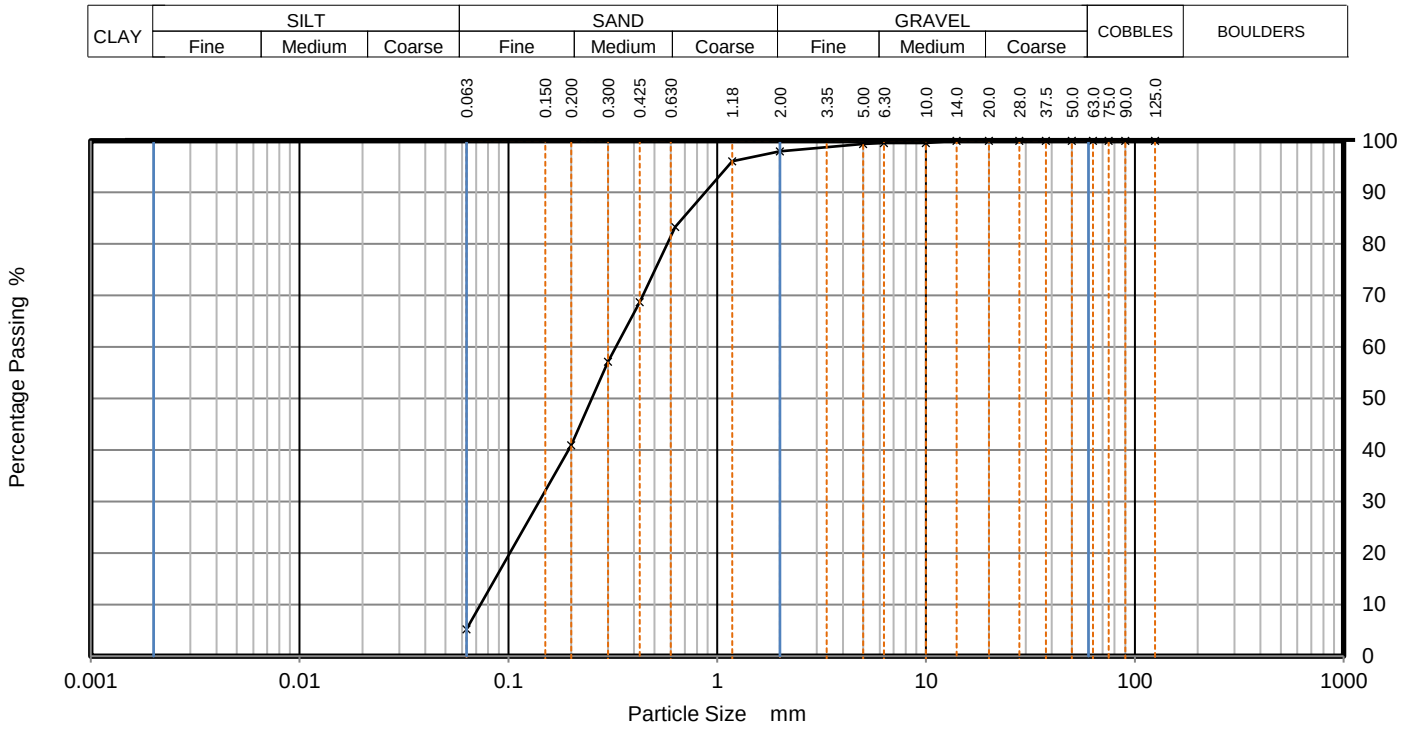
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant test-non standard test completed

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 09:59 | 09/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU01 |
| Sample Description | 2.5y 4/1 Dark grey wet slightly silty, SAND with small shell fragments | | | Depth, m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | B1 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227421 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 99 | | |
| 2 | 98 | | |
| 1.18 | 96 | | |
| 0.63 | 83 | | |
| 0.425 | 69 | | |
| 0.300 | 57 | | |
| 0.200 | 41 | | |
| | | | |
| 0.063 | 5 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 2.04 |
| Sand | 92.73 |
| | |
| Fines <0.063mm | 5.24 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.878 |
| $D_{60}$ | mm | 0.327 |
| $D_{50}$ | mm | 0.251 |
| $D_{30}$ | mm | 0.140 |
| $D_{10}$ | mm | 0.073 |
| Uniformity Coefficient | | 4.45 |
| Curvature Coefficient | | 0.82 |

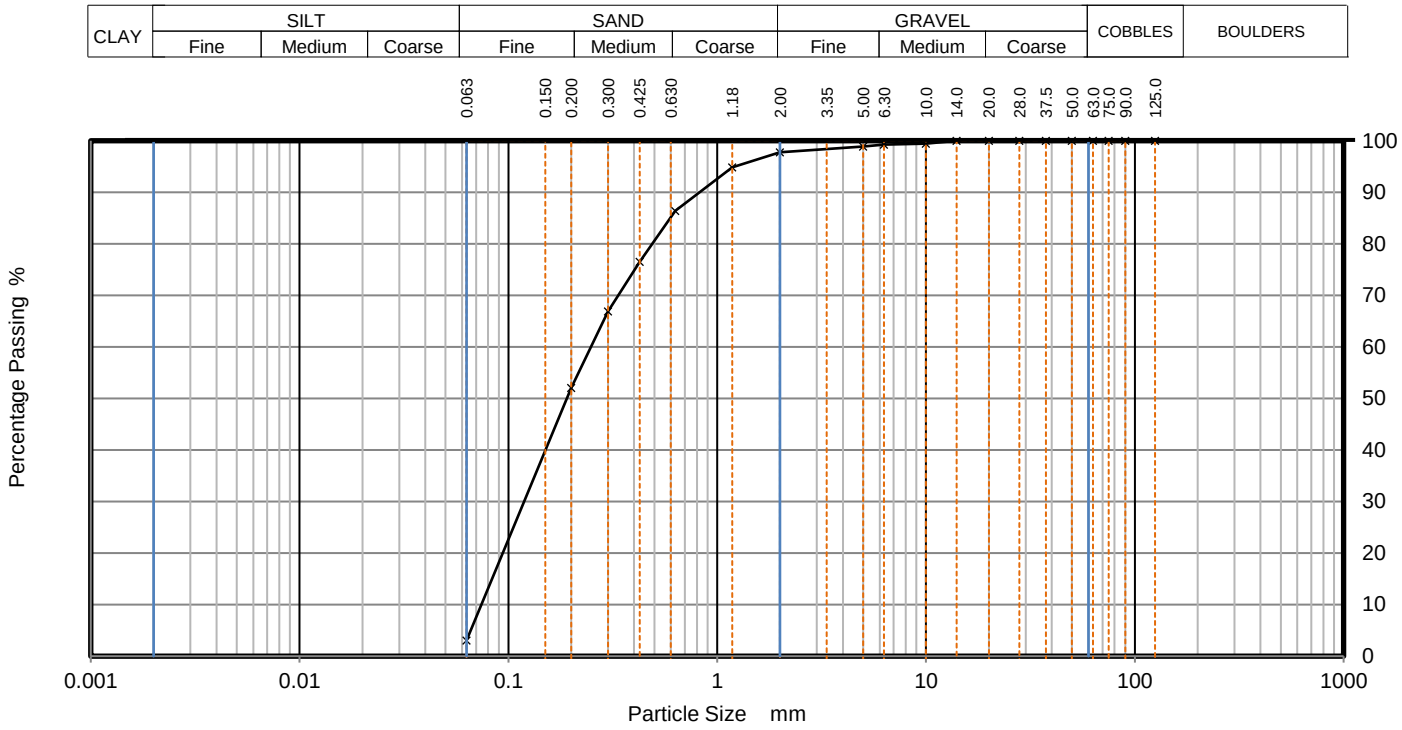
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 10:06 | 02/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

| | | | | | |
|---|---|---|---|---|---|
| | | | | Job Ref | **GMOP21-G-019** |
| | | | | Borehole No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU06 |
| Sample Description | 2.5y 4/2 Dark greyish brown SAND including sparse shell fragments | | | Depth, m | 2.70 |
| Specimen Reference | B1 | Specimen Depth | 2.7 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on pre-dried or dry sample | | | Unique ID | BH0120230227425 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 99 | | |
| 6.3 | 99 | | |
| 5 | 99 | | |
| 2 | 98 | | |
| 1.18 | 95 | | |
| 0.63 | 86 | | |
| 0.425 | 77 | | |
| 0.300 | 67 | | |
| 0.200 | 52 | | |
| | | | |
| 0.063 | 3 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 2.25 |
| Sand | 94.71 |
| | |
| Fines <0.063mm | 3.03 |

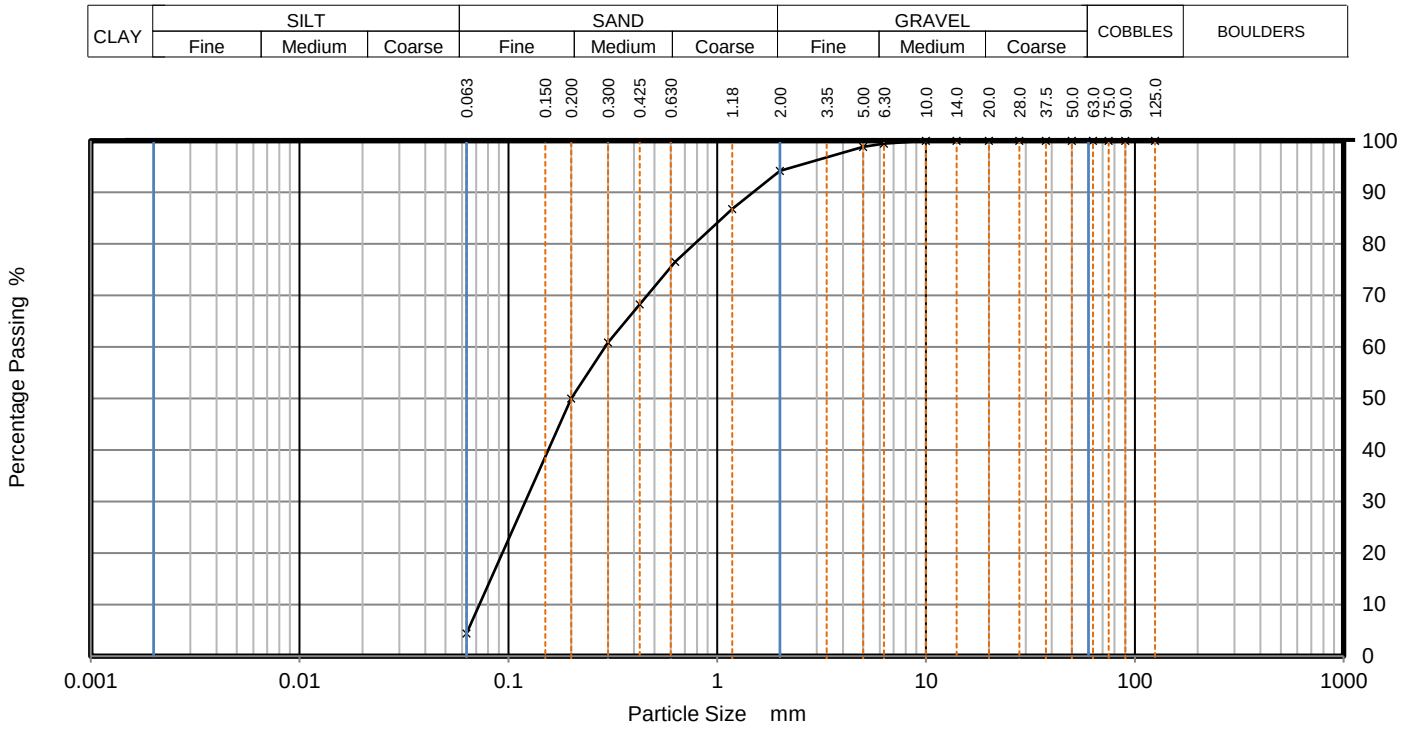
| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 0.824 |
| $D_{60}$ | mm | 0.248 |
| $D_{50}$ | mm | 0.190 |
| $D_{30}$ | mm | 0.119 |
| $D_{10}$ | mm | 0.074 |
| Uniformity Coefficient | | 3.35 |
| Curvature Coefficient | | 0.77 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| E Allan.Edward | D.Smith | 24/05/2023 16:10 | 28/04/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU07 |
| Sample Description | 2.5y 4/2 Dark greyish brown slightly gravelly, slightly silty, SAND | | | Depth, m | 3.30 |
| Specimen Reference | B1 | Specimen Depth | 3.3 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227426 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 99 | | |
| 5 | 99 | | |
| 2 | 94 | | |
| 1.18 | 87 | | |
| 0.63 | 77 | | |
| 0.425 | 68 | | |
| 0.300 | 61 | | |
| 0.200 | 50 | | |
| | | | |
| 0.063 | 4 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 5.82 |
| Sand | 89.80 |
| | |
| Fines <0.063mm | 4.38 |

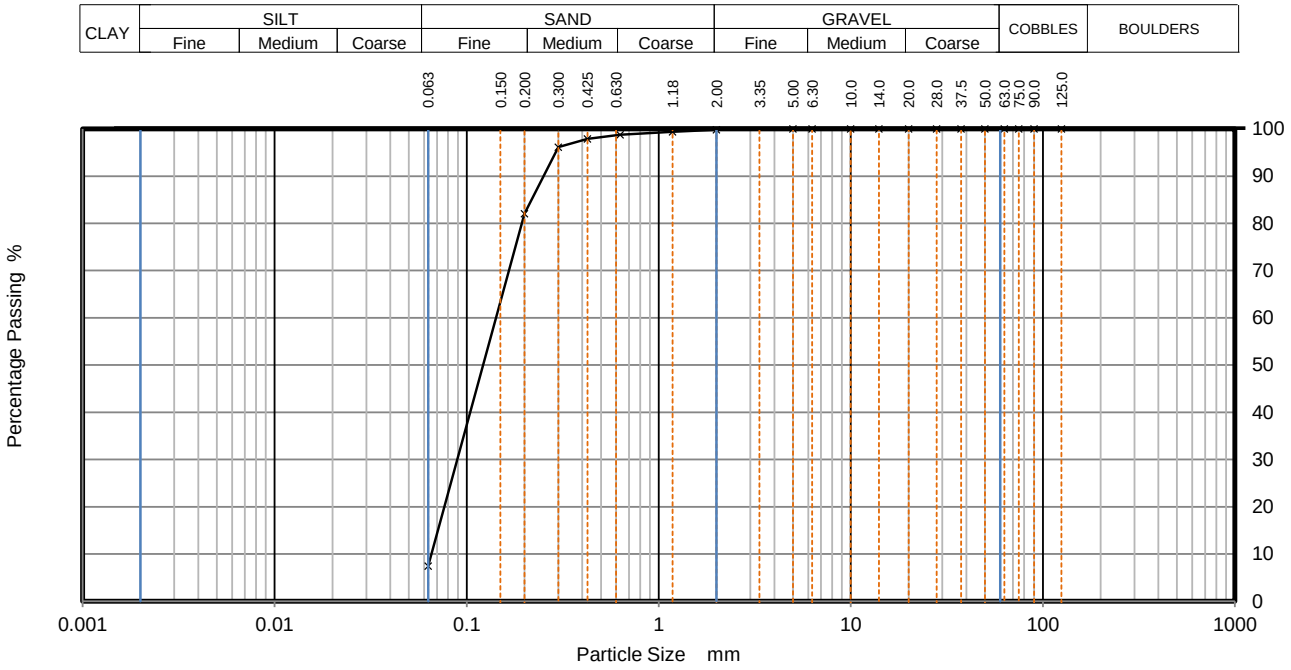
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 1.486 |
| $D_{60}$ | mm | 0.291 |
| $D_{50}$ | mm | 0.200 |
| $D_{30}$ | mm | 0.120 |
| $D_{10}$ | mm | 0.073 |
| Uniformity Coefficient | | 4.00 |
| Curvature Coefficient | | 0.69 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 10:06 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU08 |
| Sample Description | 2.5y 5/2 Greyish brown silty SAND | | | | Depth, m | 4.10 |
| Specimen Reference | B2 | Specimen Depth | 4.1 | m | Sample Type | B2 |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | | Unique ID | BH0120230227429 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 100 | | |
| 1.18 | 99 | | |
| 0.63 | 99 | | |
| 0.425 | 98 | | |
| 0.300 | 96 | | |
| 0.200 | 82 | | |
| | | | |
| 0.063 | 7 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 0.20 |
| Sand | 92.36 |
| | |
| Fines <0.063mm | 7.45 |

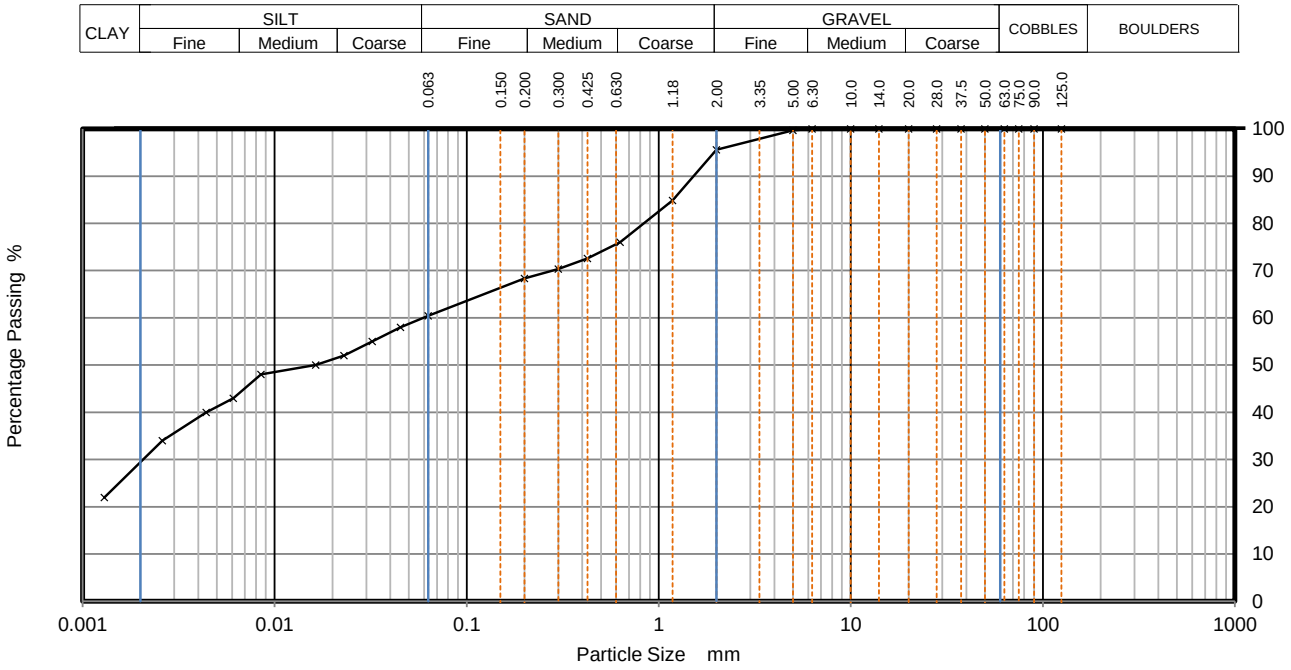
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.251 |
| $D_{60}$ | mm | 0.142 |
| $D_{50}$ | mm | 0.122 |
| $D_{30}$ | mm | 0.089 |
| $D_{10}$ | mm | 0.066 |
| Uniformity Coefficient | | 2.17 |
| Curvature Coefficient | | 0.86 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 04/04/2023 12:28 | 13/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU13 |
| Sample Description | 2.5y 8/4 Pale brown, slightly gravelly, sandy, SILT | | | | Depth, m | 13.50 |
| Specimen Reference | B1 | Specimen Depth | 13.5 | m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | | Unique ID | BH0120230227443 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0452 | 58 |
| | | 0.0323 | 55 |
| 125 | 100 | 0.0230 | 52 |
| 90 | 100 | 0.0164 | 50 |
| 75 | 100 | 0.0085 | 48 |
| 63 | 100 | 0.0061 | 43 |
| 50 | 100 | 0.0044 | 40 |
| 37.5 | 100 | 0.0026 | 34 |
| 28 | 100 | 0.0013 | 22 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 96 | | |
| 1.18 | 85 | Particle density (assumed) | |
| 0.63 | 76 | 2.65 Mg/m3 | |
| 0.425 | 73 | | |
| 0.300 | 70 | | |
| 0.200 | 68 | | |
| | | | |
| 0.063 | 60 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 4.40 |
| Sand | 35.19 |
| Silt | 31.30 |
| Clay | 29.10 |

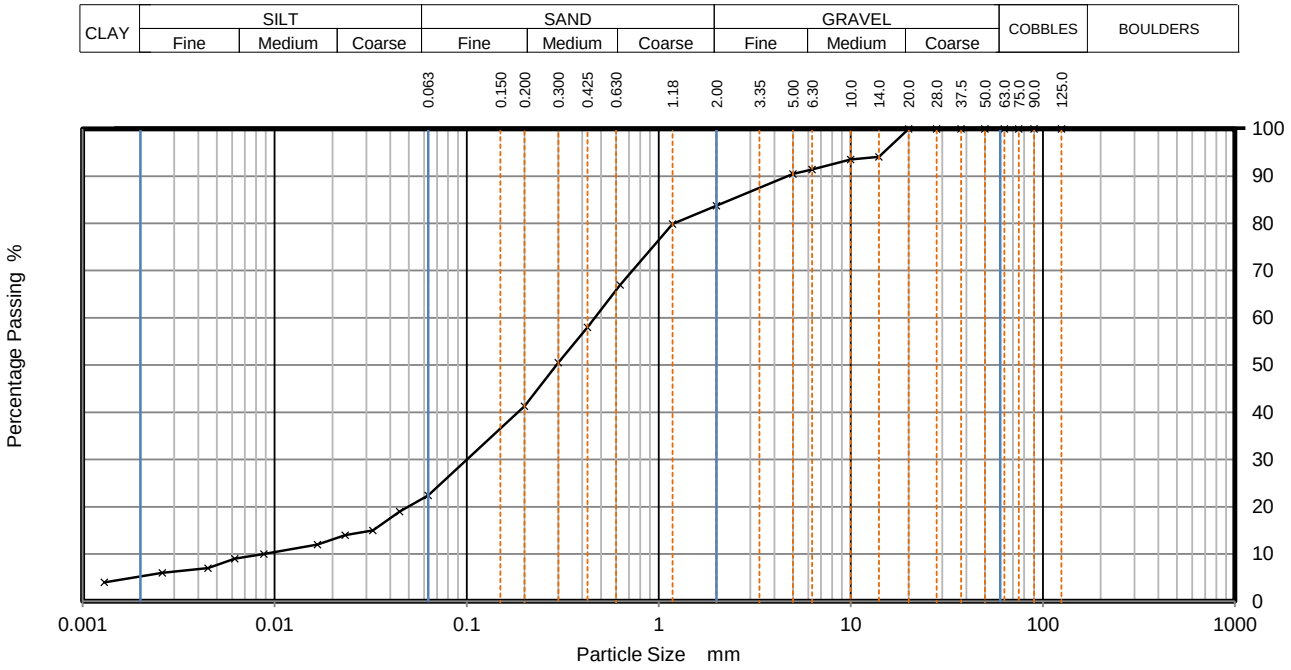
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 1.520 |
| $D_{60}$ | mm | 0.059 |
| $D_{50}$ | mm | 0.015 |
| $D_{30}$ | mm | 0.002 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 14/04/2023 11:34 | 15/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU15 |
| Sample Description | 2.5y 8/3 Pale brown, slightly clayey, silty, gravelly, SAND | | | Depth, m | 18.40 |
| Specimen Reference | B1 | Specimen Depth | 18.4 m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227452 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0448 | 19 |
| | | 0.0325 | 15 |
| 125 | 100 | 0.0233 | 14 |
| 90 | 100 | 0.0167 | 12 |
| 75 | 100 | 0.0088 | 10 |
| 63 | 100 | 0.0062 | 9 |
| 50 | 100 | 0.0045 | 7 |
| 37.5 | 100 | 0.0026 | 6 |
| 28 | 100 | 0.0013 | 4 |
| 20 | 100 | | |
| 14 | 94 | | |
| 10 | 94 | | |
| 6.3 | 91 | | |
| 5 | 90 | | |
| 2 | 84 | | |
| 1.18 | 80 | Particle density (assumed) | |
| 0.63 | 67 | 2.65 Mg/m3 | |
| 0.425 | 58 | | |
| 0.300 | 51 | | |
| 0.200 | 41 | | |
| | | | |
| 0.063 | 22 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 16.27 |
| Sand | 61.34 |
| Silt | 17.58 |
| Clay | 4.81 |

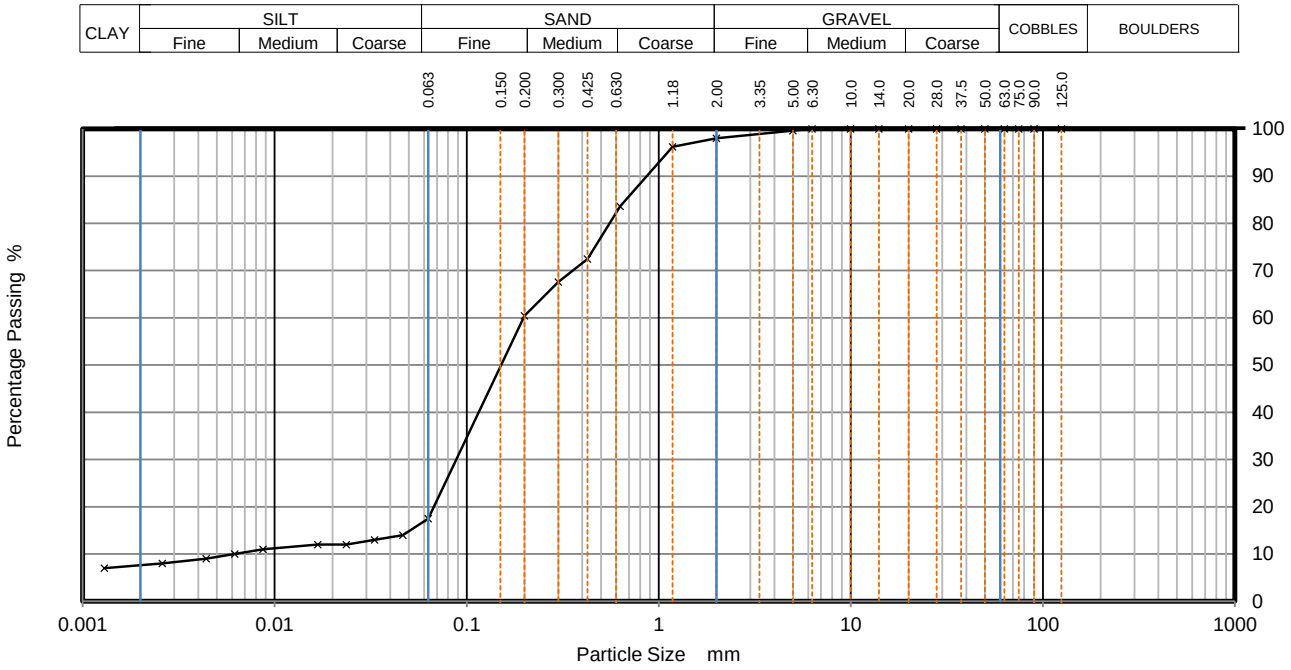
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 4.684 |
| $D_{60}$ | mm | 0.464 |
| $D_{50}$ | mm | 0.293 |
| $D_{30}$ | mm | 0.100 |
| $D_{10}$ | mm | 0.010 |
| Uniformity Coefficient | | 48.26 |
| Curvature Coefficient | | 2.26 |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 04/04/2023 12:28 | 09/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole No. | OWF_GI#24_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU01 |
| Sample Description | 5y 4/3 Olive, slightly gravelly, clayey and silty, SAND. | | | | Depth, m | 0.00 |
| Specimen Reference | B1 | Specimen Depth | 0 | m | Sample Type | B1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | | Unique ID | BH0120230227458 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0465 | 14 |
| | | 0.0332 | 13 |
| 125 | 100 | 0.0236 | 12 |
| 90 | 100 | 0.0168 | 12 |
| 75 | 100 | 0.0087 | 11 |
| 63 | 100 | 0.0062 | 10 |
| 50 | 100 | 0.0044 | 9 |
| 37.5 | 100 | 0.0026 | 8 |
| 28 | 100 | 0.0013 | 7 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 2 | 98 | | |
| 1.18 | 96 | Particle density (assumed) | |
| 0.63 | 84 | 2.65 Mg/m3 | |
| 0.425 | 72 | | |
| 0.300 | 68 | | |
| 0.200 | 60 | | |
| | | | |
| 0.063 | 17 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 1.97 |
| Sand | 80.55 |
| Silt | 9.61 |
| Clay | 7.87 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 0.867 |
| $D_{60}$ | mm | 0.198 |
| $D_{50}$ | mm | 0.151 |
| $D_{30}$ | mm | 0.088 |
| $D_{10}$ | mm | 0.006 |
| Uniformity Coefficient | | 34.93 |
| Curvature Coefficient | | 6.95 |

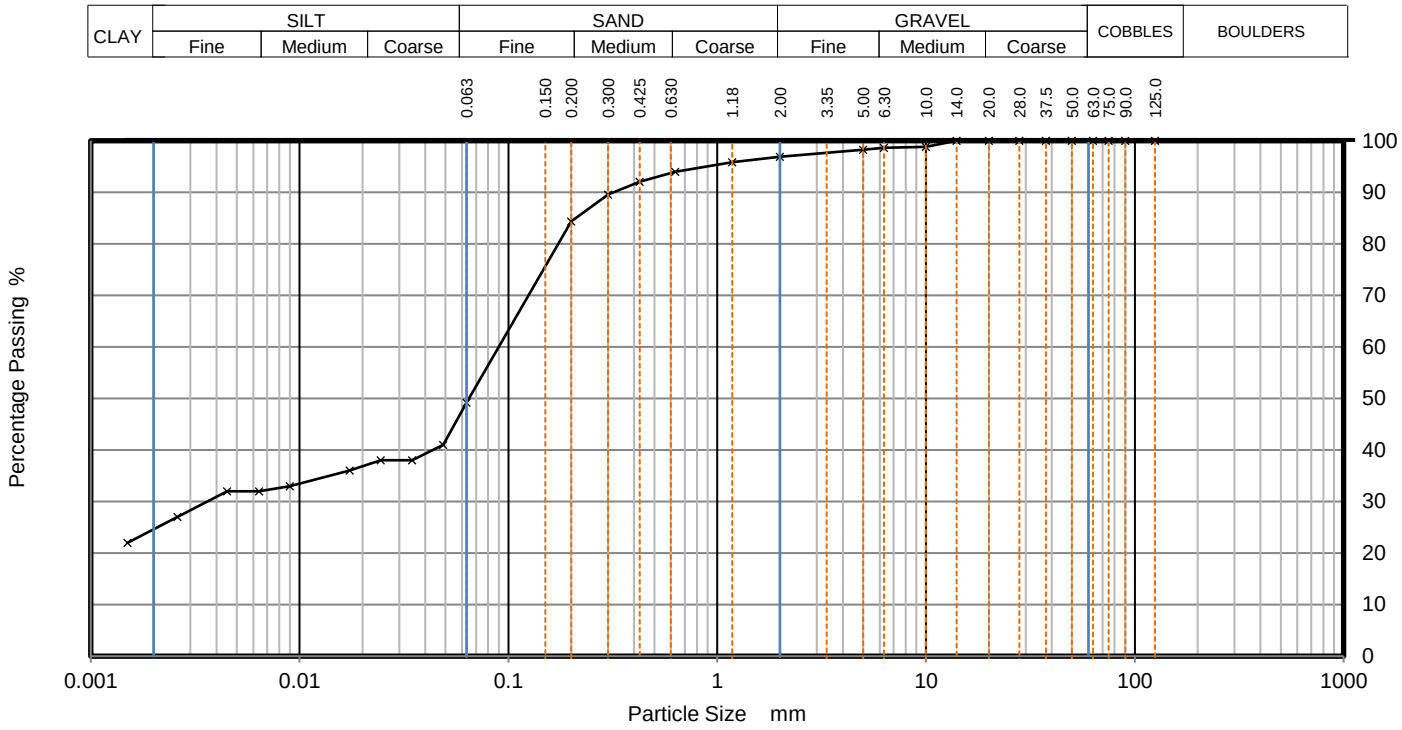
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 14/04/2023 11:16 | 13/03/2023 |

# ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016)

| | | | | | |
|---|---|---|---|---|---|
| | | | | Job Ref | **GMOP21-G-019** |
| | | | | Borehole No. | OWF_GI#24_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU01 |
| Sample Description | 5y 4/2 Olive grey clayey, silty, SAND | | | Depth, m | 0.40 |
| Specimen Reference | B3 | Specimen Depth | 0.4 m | Sample Type | B3 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227460 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0487 | 41 |
| | | 0.0346 | 38 |
| 125 | 100 | 0.0245 | 38 |
| 90 | 100 | 0.0174 | 36 |
| 75 | 100 | 0.0090 | 33 |
| 63 | 100 | 0.0064 | 32 |
| 50 | 100 | 0.0045 | 32 |
| 37.5 | 100 | 0.0026 | 27 |
| 28 | 100 | 0.0015 | 22 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 99 | | |
| 6.3 | 99 | | |
| 5 | 98 | | |
| 2 | 97 | | |
| 1.18 | 96 | Particle density | |
| 0.63 | 94 | 2.65 | Mg/m3 |
| 0.425 | 92 | | |
| 0.300 | 90 | | |
| 0.200 | 84 | | |
| | | | |
| 0.063 | 49 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 3.08 |
| Sand | 47.72 |
| Silt | 24.58 |
| Clay | 24.61 |

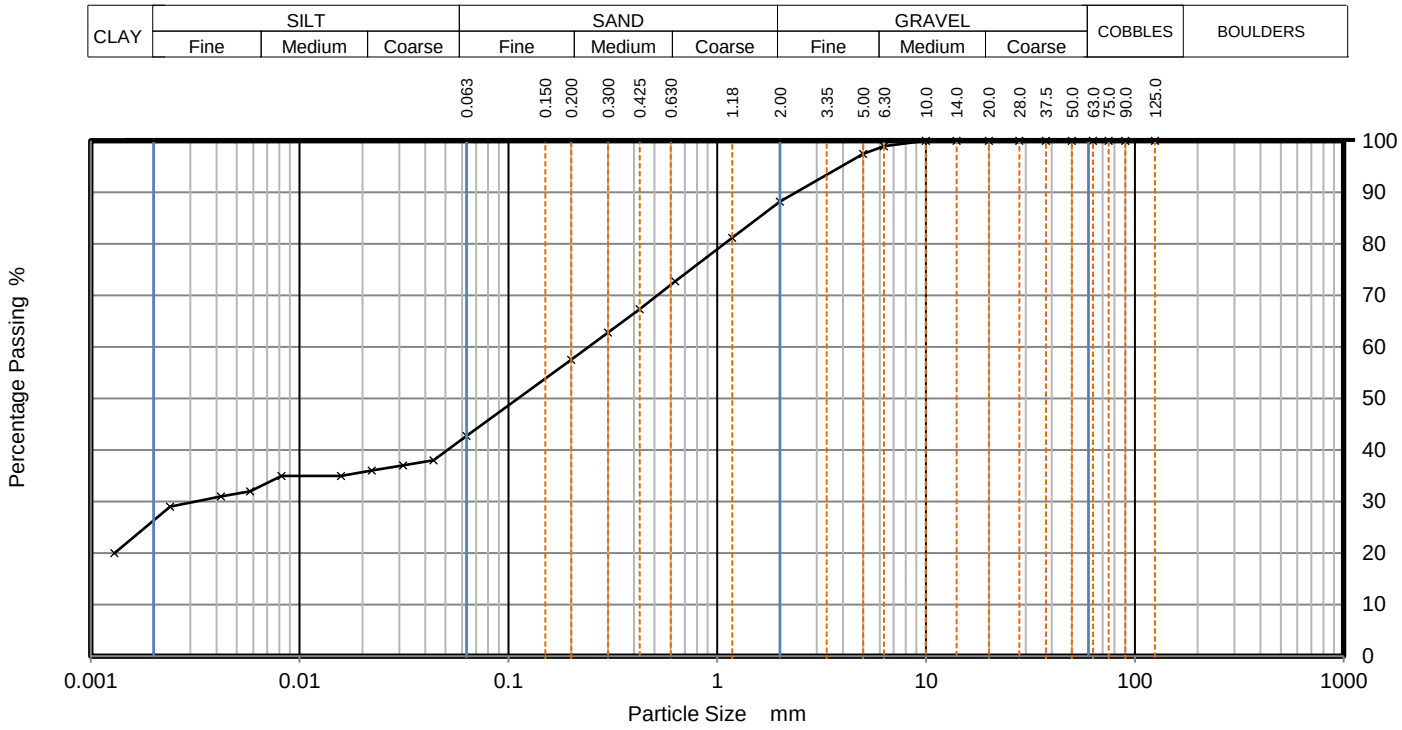
| **Grading Analysis** | | |
|---|---|---|
| $D_{90}$ | mm | 0.319 |
| $D_{60}$ | mm | 0.090 |
| $D_{50}$ | mm | 0.065 |
| $D_{30}$ | mm | 0.004 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| J. Morgan | D.Smith | 13/04/2023 11:05 | 02/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#24_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR01 |
| Sample Description | Greyish white slightly gravelly, clayey, silty, SAND | | | Depth, m | 1.10 |
| Specimen Reference | Q1 | Specimen Depth | 1.1 m | Sample Type | Q1 |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227462 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0439 | 38 |
| | | 0.0313 | 37 |
| 125 | 100 | 0.0222 | 36 |
| 90 | 100 | 0.0158 | 35 |
| 75 | 100 | 0.0082 | 35 |
| 63 | 100 | 0.0058 | 32 |
| 50 | 100 | 0.0042 | 31 |
| 37.5 | 100 | 0.0024 | 29 |
| 28 | 100 | 0.0013 | 20 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 99 | | |
| 5 | 97 | | |
| 2 | 88 | | |
| 1.18 | 81 | Particle density | (assumed) |
| 0.63 | 73 | 2.65 | Mg/m3 |
| 0.425 | 67 | | |
| 0.300 | 63 | | |
| 0.200 | 58 | | |
| | | | |
| 0.063 | 43 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 11.80 |
| Sand | 45.48 |
| Silt | 16.69 |
| Clay | 26.03 |

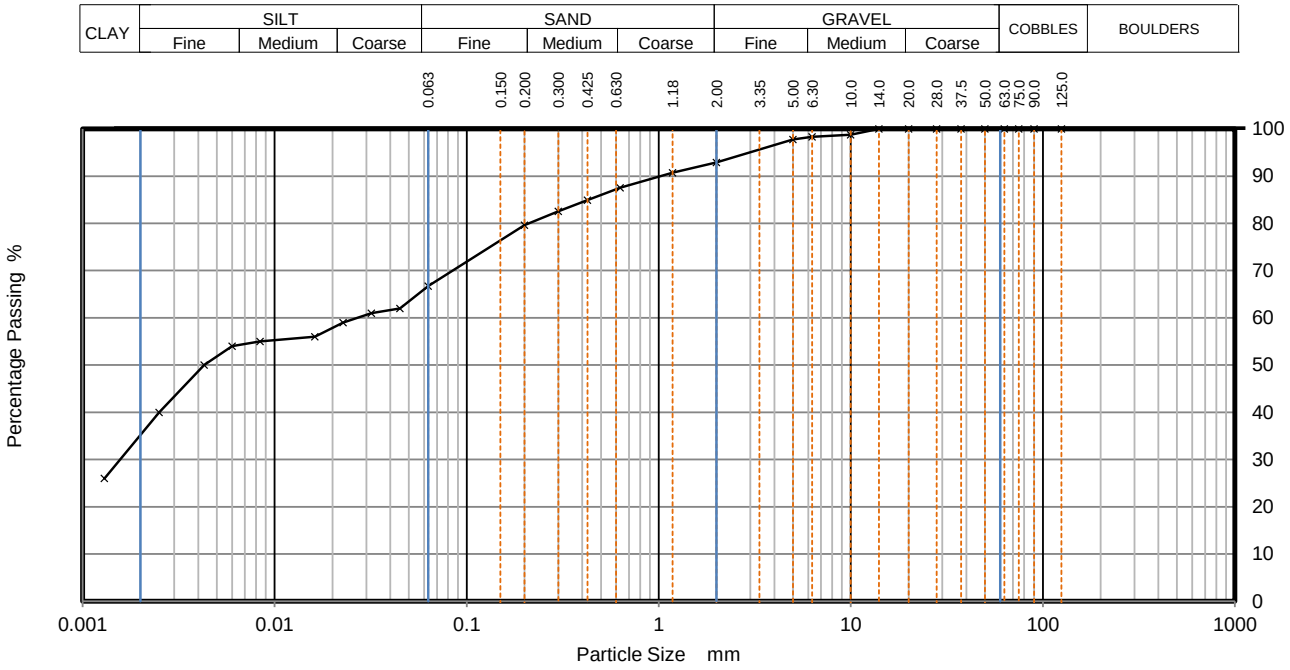
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 2.389 |
| $D_{60}$ | mm | 0.242 |
| $D_{50}$ | mm | 0.111 |
| $D_{30}$ | mm | 0.004 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | Sheet printed | Date tested |
|---|---|---|---|
| E Allan.Edward | D.Smith | 24/05/2023 15:55 | 28/04/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#24_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR07 |
| Sample Description | white page 2.5y 9/2 Pale yellow, slightly gravelly, slightly sandy, silty CLAY | | | Depth, m | 7.00 |
| Specimen Reference | IS | Specimen Depth | 7 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving and hydrometer sedimentation | | | Unique ID | BH0120230227470 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | 0.0450 | 62 |
| | | 0.0319 | 61 |
| 125 | 100 | 0.0227 | 59 |
| 90 | 100 | 0.0162 | 56 |
| 75 | 100 | 0.0084 | 55 |
| 63 | 100 | 0.0060 | 54 |
| 50 | 100 | 0.0043 | 50 |
| 37.5 | 100 | 0.0025 | 40 |
| 28 | 100 | 0.0013 | 26 |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 99 | | |
| 6.3 | 98 | | |
| 5 | 98 | | |
| 2 | 93 | | |
| 1.18 | 91 | Particle density (assumed) | |
| 0.63 | 88 | 2.65 Mg/m3 | |
| 0.425 | 85 | | |
| 0.300 | 83 | | |
| 0.200 | 80 | | |
| | | | |
| 0.063 | 67 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 7.11 |
| Sand | 26.17 |
| Silt | 31.60 |
| Clay | 35.13 |

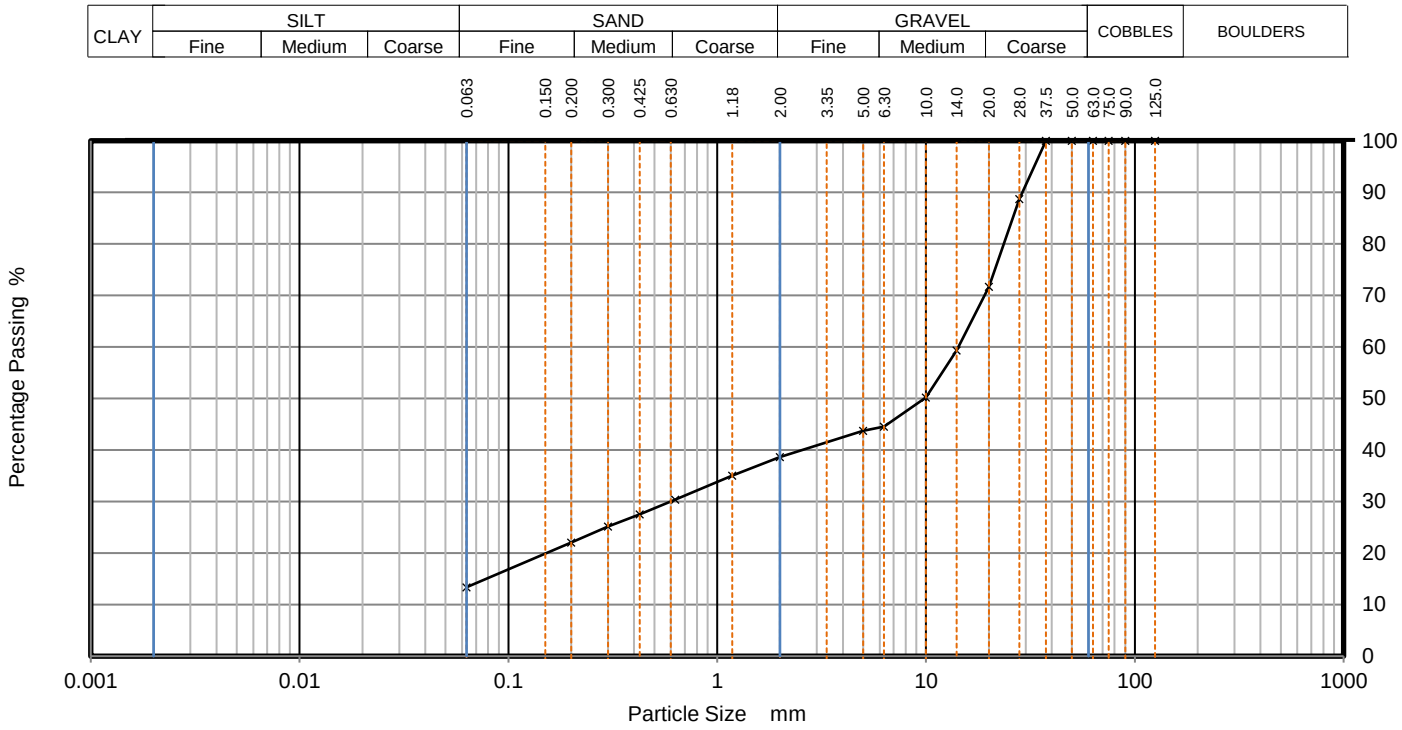
| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 1.021 |
| $D_{60}$ | mm | 0.026 |
| $D_{50}$ | mm | 0.004 |
| $D_{30}$ | mm | 0.002 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | U. Mazhar | | 14/04/2023 11:45 | 16/03/2023 |

| GEOQUIPMARINE | ISO PARTICLE SIZE DISTRIBUTION (ISO 17892-4:2016) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#24_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU06 |
| Sample Description | white page 2.5y 8/2 pale yellow sandy, GRAVEL including cemented sand | | | Depth, m | 18.00 |
| Specimen Reference | IS | Specimen Depth | 18 m | Sample Type | IS |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | Unique ID | BH0120230227485 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| | | | |
| | | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 89 | | |
| 20 | 72 | | |
| 14 | 59 | | |
| 10 | 50 | | |
| 6.3 | 45 | | |
| 5 | 44 | | |
| 2 | 39 | | |
| 1.18 | 35 | | |
| 0.63 | 30 | | |
| 0.425 | 28 | | |
| 0.300 | 25 | | |
| 0.200 | 22 | | |
| | | | |
| 0.063 | 13 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0.00 |
| Gravel | 61.38 |
| Sand | 25.25 |
| | |
| Fines <0.063mm | 13.37 |

| Grading Analysis | | |
|---|---|---|
| $D_{90}$ | mm | 33.380 |
| $D_{60}$ | mm | 14.288 |
| $D_{50}$ | mm | 9.853 |
| $D_{30}$ | mm | 0.600 |
| $D_{10}$ | mm | 0.000 |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Insufficient material for compliant test-non standard test completed

| Test Technician | Approved | | Sheet printed | Date tested |
|---|---|---|---|---|
| J. Morgan | D.Smith | | 13/04/2023 11:05 | 02/03/2023 |

# Appendix B.4 Chemical and Other Test Results

# Certificate of Analysis

| | | | |
|---|---|---|---|
| *Certificate Number* | 23-08466 | *Issued:* | 20-Apr-23 |

*Client* Geoquip Marine
Floor 6
Vintry Building
Wine Street
Bristol
BS1 2BD

| | |
|---|---|
| *Our Reference* | 23-08466 |
| *Client Reference* | GMOP21-G-019 |
| *Order No* | (not supplied) |
| *Contract Title* | A05 Brittany Offshore |
| *Description* | 3 Soil samples. |
| *Date Received* | 11-Apr-23 |
| *Date Started* | 11-Apr-23 |
| *Date Completed* | 20-Apr-23 |
| *Test Procedures* | Identified by prefix DETSn (details on request). |

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

*Approved By*

Kirk Bridgewood
General Manager

2139

# Summary of Chemical Analysis
# Soil Samples

*Our Ref* 23-08466
*Client Ref* GMOP21-G-019
*Contract Title* A05 Brittany Offshore

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | **Lab No** | 2153706 | 2153707 | 2153708 |
| | | | **.Sample ID** | OWF_GI#09_SAMP | OWF_GI#09_SAMP | OWF_GI#09_SAMP |
| | | | **Depth** | 0.40 | 5.00 | 10.00 |
| | | | **Other ID** | CR01 IS | CR06 IS | CR11 IS |
| | | | **Sample Type** | SOIL | SOIL | SOIL |
| | | | **Sampling Date** | n/s | n/s | n/s |
| | | | **Sampling Time** | n/s | n/s | n/s |
| **Test** | **Method** | **LOD** | **Units** | | | |
| **Inorganics** | | | | | | |
| Carbonate (as CO2) | DETSC 2005 | 1 | % | 37 | 39 | 41 |
| Chloride Aqueous Extract (2:1) | DETSC 2055 | 1 | mg/l | 550 | 1700 | 1800 |

Key: n/s -not supplied.

# Certificate of Analysis

| | | | |
|---|---|---|---|
| *Certificate Number* | 23-07829-1 | *Issued:* | 11-May-23 |

*Client* Geoquip Marine
Floor 6
Vintry Building
Wine Street
Bristol
BS1 2BD

| | |
|---|---|
| *Our Reference* | 23-07829-1 |
| *Client Reference* | GMP021-G-019 |
| *Order No* | PO-006657 |
| *Contract Title* | A05 Brittany Offshore |
| *Description* | 62 Soil samples. |
| *Date Received* | 03-Apr-23 |
| *Date Started* | 03-Apr-23 |
| *Date Completed* | 11-May-23 |
| *Test Procedures* | Identified by prefix DETSn (details on request). |

*Notes* **This report supersedes 23-07829, testing added.**

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

*Approved By*

Kirk Bridgewood
General Manager

2139

# Summary of Chemical Analysis
# Soil Samples

*Our Ref* 23-07829-1
*Client Ref* GMP021-G-019
*Contract Title* A05 Brittany Offshore

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **Lab No** | 2150170 | 2150171 | 2150172 | 2150173 | 2150174 | 2150175 | 2150176 | 2150177 | 2150178 | 2150179 | 2150180 |
| | | | | **.Sample ID** | OWF_GI#01_SAMP | OWF_GI#01A_SAMP | OWF_GI#01A_SAMP | OWF_GI#01A_SAMP | OWF_GI#01A_SAMP | OWF_GI#01A_SAMP | OWF_GI#01A_SAMP | OWF_GI#04_SAMP | OWF_GI#04A_SAMP | OWF_GI#04A_SAMP | OWF_GI#04A_SAMP |
| | | | | **Depth** | 1.00 | 0.70 | 5.40 | 10.15 | 12.50 | 16.15 | 17.35 | 0.70 | 1.50 | 9.30 | 14.90 |
| | | | | **Other ID** | CR02 IS | CR02 IS | CR07 IS | CR11 IS | CR13 IS | CR15 IS | CR16 B1 | PU02 B1 | CR02 B1 | PU04 B1 | PU10 B1 |
| | | | | **Sample Type** | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | **Sampling Date** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| | | | | **Sampling Time** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| **Test** | **Method** | **LOD** | **Units** | | | | | | | | | | | | |
| **Inorganics** | | | | | | | | | | | | | | | |
| Carbonate (as CO2) | DETSC 2005 | 1 | % | | 28 | 30 | 30 | 32 | 38 | 35 | 32 | 31 | 32 | 32 | 31 |
| Chloride Aqueous Extract (2:1) | DETSC 2055 | 1 | mg/l | | 1100 | 540 | 280 | 850 | 2400 | 1200 | 1600 | 820 | 570 | 1000 | 1700 |

Key: n/s -not supplied.

# Summary of Chemical Analysis
# Soil Samples

*Our Ref* 23-07829-1
*Client Ref* GMP021-G-019
*Contract Title* A05 Brittany Offshore

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Lab No** | 2150181 | 2150182 | 2150183 | 2150184 | 2150185 | 2150186 | 2150187 | 2150188 | 2150189 | 2150190 | 2150191 |
| | | | **.Sample ID** | OWF_GI#04 A_SAMP | OWF_GI#05 A_SAMP | OWF_GI#05 A_SAMP | OWF_GI#05 B_SAMP | OWF_GI#09 _SAMP | OWF_GI#09 _SAMP | OWF_GI#11 _SAMP | OWF_GI#11 _SAMP | OWF_GI#11 _SAMP | OWF_GI#11 _SAMP | OWF_GI#11 _SAMP |
| | | | **Depth** | 16.55 | 1.10 | 4.70 | 6.10 | 15.30 | 17.00 | 1.00 | 6.50 | 7.50 | 9.05 | 14.50 |
| | | | **Other ID** | CR12 IS | CR01 IS | CR05 Q1 | CR01 IS | CR16 IS | CR18 IS | PU02A B1 | CR06 IS | CR07 B1 | CR08 Q1 | CR13 IS |
| | | | **Sample Type** | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | **Sampling Date** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| | | | **Sampling Time** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| **Test** | **Method** | **LOD** | **Units** | | | | | | | | | | | |
| **Inorganics** | | | | | | | | | | | | | | |
| Carbonate (as CO2) | DETSC 2005 | 1 | % | 30 | 42 | 41 | 40 | 35 | 35 | 16 | 32 | 33 | 46 | 48 |
| Chloride Aqueous Extract (2:1) | DETSC 2055 | 1 | mg/l | 1100 | 680 | 1800 | 1800 | 410 | 1400 | 23 | 720 | 460 | 1700 | 1300 |

Key: n/s -not supplied.

# Summary of Chemical Analysis
# Soil Samples

*Our Ref* 23-07829-1
*Client Ref* GMP021-G-019
*Contract Title* A05 Brittany Offshore

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Lab No** | 2150192 | 2150193 | 2150194 | 2150195 | 2150196 | 2150197 | 2150198 | 2150199 | 2150200 | 2150201 | 2150202 |
| | | | **.Sample ID** | OWF_GI#11_SAMP | OWF_GI#12_SAMP | OWF_GI#12_SAMP | OWF_GI#12_SAMP | OWF_GI#12_SAMP | OWF_GI#12_SAMP | OWF_GI#12_SAMP | OWF_GI#14_SAMP | OWF_GI#14_SAMP | OWF_GI#14A_SAMP | OWF_GI#14A_SAMP |
| | | | **Depth** | 17.50 | 1.00 | 3.80 | 9.30 | 12.08 | 18.30 | 19.45 | 1.30 | 3.80 | 0.00 | 4.15 |
| | | | **Other ID** | CR16 IS | PU02 B1 | PU07 B1 | CR07 IS | CR09 B1 | PU11 B1 | PU17 B1 | CR02 B1 | CR04 B2 | CR01 IS | CR03 IS |
| | | | **Sample Type** | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | **Sampling Date** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| | | | **Sampling Time** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| **Test** | **Method** | **LOD** | **Units** | | | | | | | | | | | |
| **Inorganics** | | | | | | | | | | | | | | |
| Carbonate (as CO2) | DETSC 2005 | 1 | % | 19 | 10 | 38 | 35 | 43 | 43 | 31 | 41 | 6.8 | 45 | 15 |
| Chloride Aqueous Extract (2:1) | DETSC 2055 | 1 | mg/l | 1600 | 1800 | 1100 | 870 | 1200 | 1200 | 2400 | 940 | 1600 | 1000 | 680 |

Key: n/s -not supplied.

# Summary of Chemical Analysis
# Soil Samples

*Our Ref* 23-07829-1
*Client Ref* GMP021-G-019
*Contract Title* A05 Brittany Offshore

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Lab No** | 2150203 | 2150204 | 2150205 | 2150206 | 2150207 | 2150208 | 2150209 | 2150210 | 2150211 | 2150212 | 2150213 |
| | | | **.Sample ID** | OWF_GI#14A_SAMP | OWF_GI#14A_SAMP | OWF_GI#14A_SAMP | OWF_GI#14A_SAMP | OWF_GI#17_SAMP | OWF_GI#17_SAMP | OWF_GI#17_SAMP | OWF_GI#17_SAMP | OWF_GI#20_SAMP | OWF_GI#20_SAMP | OWF_GI#20_SAMP |
| | | | **Depth** | 8.75 | 12.10 | 14.50 | 19.20 | 0.30 | 6.45 | 11.30 | 16.70 | 1.10 | 7.70 | 11.70 |
| | | | **Other ID** | CR08 B2 | CR11 Q1 | CR13 B1 | PU09 B1 | PU01 B2 | CR03 IS | PU11 IS | PU13 B1 | PU02 B2 | PU12 IS | CR03 B1 |
| | | | **Sample Type** | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | **Sampling Date** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| | | | **Sampling Time** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| **Test** | **Method** | **LOD** | **Units** | | | | | | | | | | | |
| **Inorganics** | | | | | | | | | | | | | | |
| Carbonate (as CO2) | DETSC 2005 | 1 | % | 8.4 | 17 | 18 | 4.5 | 14 | 31 | 39 | 42 | 9.4 | 41 | 41 |
| Chloride Aqueous Extract (2:1) | DETSC 2055 | 1 | mg/l | 1700 | 640 | 2200 | < 20.00 | 1900 | 2900 | 2000 | 1800 | 2400 | 2900 | 1600 |

Key: n/s -not supplied.

# Summary of Chemical Analysis
# Soil Samples

*Our Ref* 23-07829-1
*Client Ref* GMP021-G-019
*Contract Title* A05 Brittany Offshore

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **Lab No** | 2150214 | 2150215 | 2150216 | 2150217 | 2150218 | 2150219 | 2150220 | 2150221 | 2150222 | 2150223 | 2150224 |
| | | | | **.Sample ID** | OWF_GI#20_SAMP | OWF_GI#20_SAMP | OWF_GI#22_SAMP | OWF_GI#22_SAMP | OWF_GI#22_SAMP | OWF_GI#22_SAMP | OWF_GI#22_SAMP | OWF_GI#24_SAMP | OWF_GI#24_SAMP | OWF_GI#24_SAMP | OWF_GI#24_SAMP |
| | | | | **Depth** | 15.05 | 18.80 | | 5.50 | 11.80 | 13.60 | 14.20 | 0.40 | 1.10 | 5.20 | 6.15 |
| | | | | **Other ID** | CR05 IS | CR08 IS | PU01 B1 | CR03 B1 | CR11 IS | PU13 Q1 | CR13 IS | PU01 B3 | CR01 Q1 | CR05 IS | CR06 B1 |
| | | | | **Sample Type** | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | **Sampling Date** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| | | | | **Sampling Time** | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| **Test** | **Method** | **LOD** | **Units** | | | | | | | | | | | | |
| **Inorganics** | | | | | | | | | | | | | | | |
| Carbonate (as CO2) | DETSC 2005 | 1 | % | | 40 | 43 | 8.5 | 18 | 42 | 40 | 40 | 9.1 | 30 | 40 | 39 |
| Chloride Aqueous Extract (2:1) | DETSC 2055 | 1 | mg/l | | 2200 | 2400 | < 20.00 | 1700 | 1100 | 1000 | 12000 | 2600 | 1100 | 380 | 710 |

Key: n/s -not supplied.

# Summary of Chemical Analysis
# Soil Samples

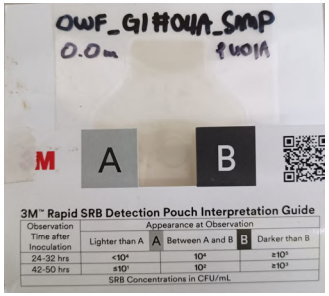
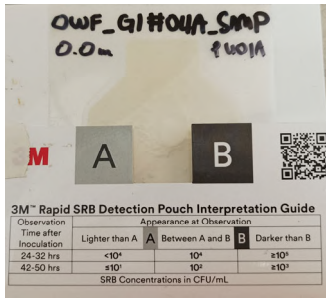
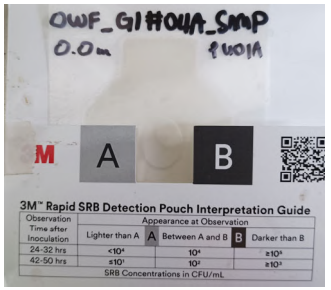
*Our Ref* 23-07829-1
*Client Ref* GMP021-G-019
*Contract Title* A05 Brittany Offshore

| | Lab No | 2150225 | 2150226 | 2150227 | 2150228 | 2150229 | 2150230 | 2150231 |
|---|---|---|---|---|---|---|---|---|
| | .Sample ID | OWF_GI#24_SAMP | OWF_GI#24_SAMP | OWF_GI#15_SAMP | OWF_GI#15A_SAMP | OWF_GI#15A_SAMP | OWF_GI#15A_SAMP | OWF_GI#15A_SAMP |
| | Depth | 12.00 | 18.75 | 1.00 | 1.2 | 6.00 | 11.00 | 14.2 |
| | Other ID | CR12 IS | CR18 IS | CR02 IS | CR02 IS | CR05 B1 | PU08 B1 | CR11 IS |
| | Sample Type | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | Sampling Date | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| | Sampling Time | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| **Test** | **Method** | **LOD** | **Units** | | | | | |
| **Inorganics** | | | | | | | | |
| Carbonate (as CO2) | DETSC 2005 | 1 | % | 41 | 42 | 42 | 42 | 41 | 8.2 | 13 |
| Chloride Aqueous Extract (2:1) | DETSC 2055 | 1 | mg/l | 1400 | 790 | 280 | 210 | 990 | 2000 | 750 |

Key: n/s -not supplied.

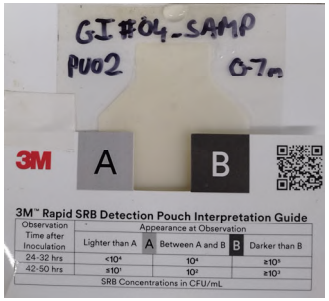
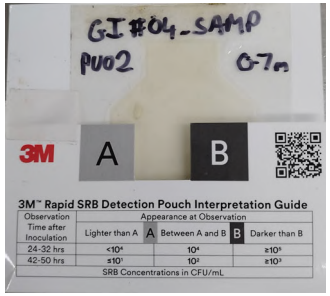
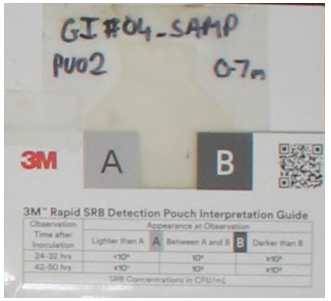
**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#04A_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: ≤101 |
| Sample Number: PU01A | Depth: 0.00m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-0129-FLD | | |

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#04_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |

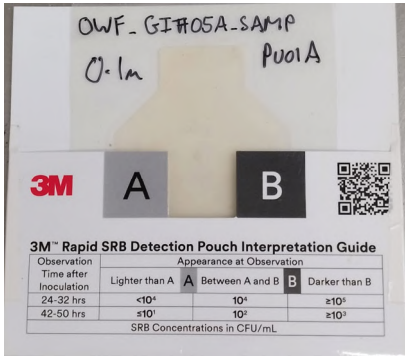
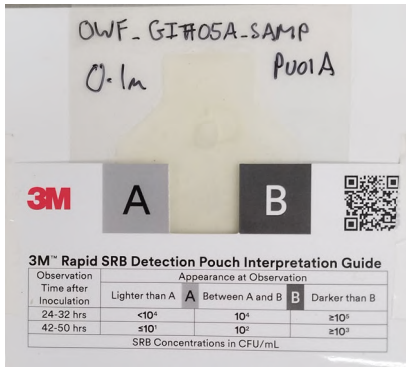
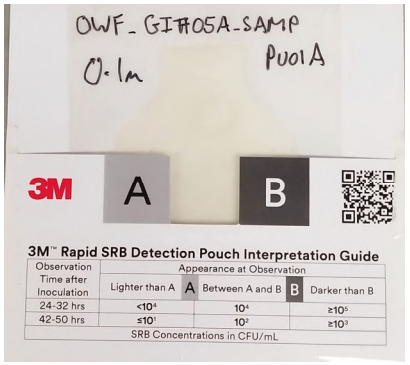
| | |
|---|---|
| Sample Number: PU02 | Depth: 0.70m |

SRB PHOTO LOG

Ref.: GMOP21-G-019-FLD

# SRB Photo Log

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#05A_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |

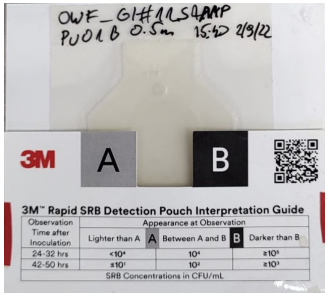
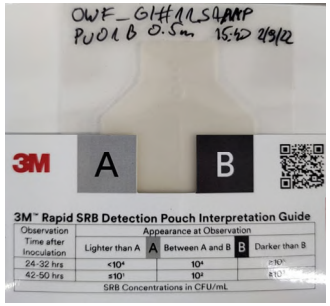
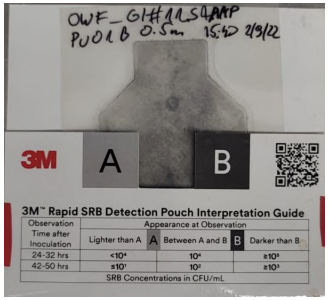
| | |
|---|---|
| Sample Number: PU01A | Depth: 0.1m |

SRB PHOTO LOG

Ref.: GMOP21-G-0129-FLD

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: AO5 BRITTANY OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: AO5 OWF<br>Borehole No.: OWF_GI#11_SAMP | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $10^2$ |

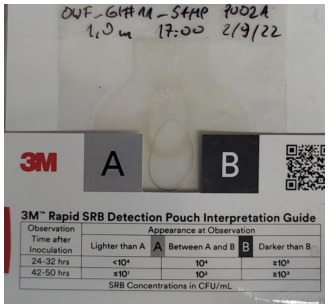
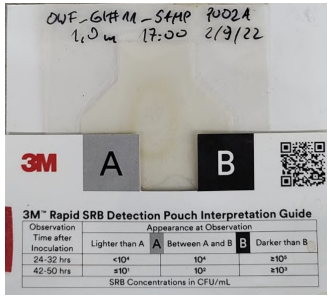
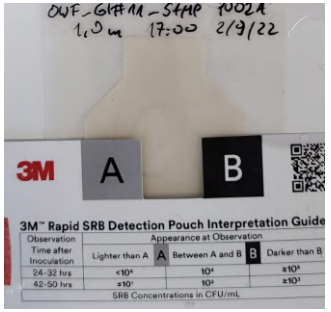
| | |
|---|---|
| Sample Number: PU01B_SRB01 | Depth: 0.5 m |

SRB PHOTO LOG

Ref.: GMOP21-G-019-FLD

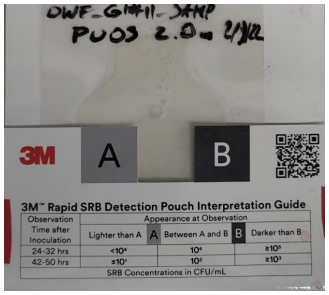
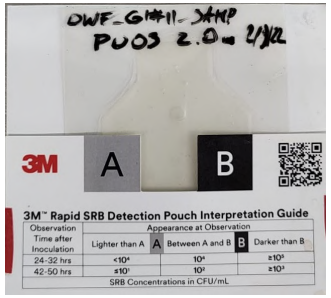
**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: AO5 BRITTANY OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: AO5 OWF<br>Borehole No.: OWF_GI#11_SAMP | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |
| Sample Number: PU02A_SRB01 | Depth: 1.0 m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-019-FLD | | |

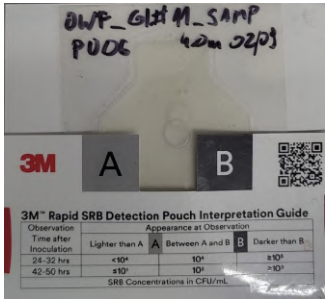
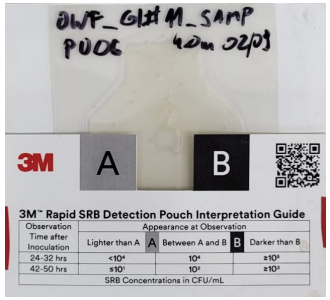
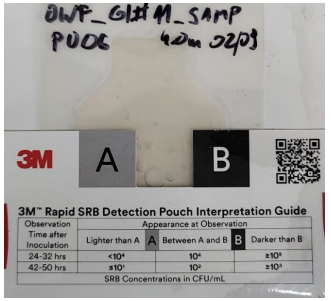
**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: AO5 BRITTANY OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: AO5 OWF<br>Borehole No.: OWF_GI#11_SAMP | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |
| Sample Number: PU03_SRB01 | Depth: 2.0 m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-019-FLD | | |

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: AO5 BRITTANY OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: AO5 OWF<br>Borehole No.: OWF_GI#11_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |

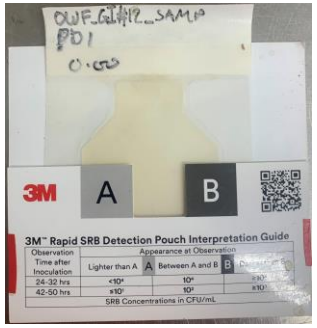
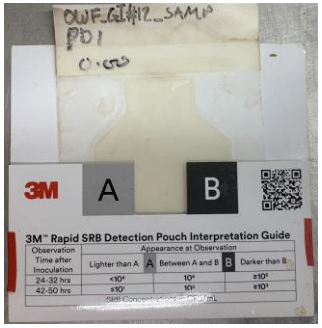
| | |
|---|---|
| Sample Number: PU06_SRB01 | Depth: 4.0 m |

SRB PHOTO LOG

Ref.: GMOP21-G-019-FLD

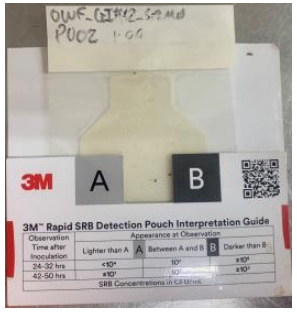
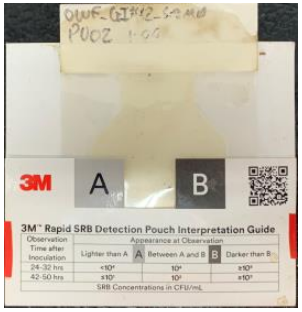
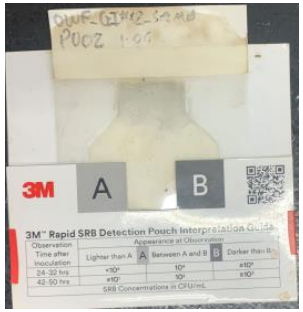
**SRB Photo Log**

| | | |
|---|---|---|
| Client: RTE/DGEC<br>Project Name: A05 BRITTANY OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#08_CPT | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |
| Sample Number: P01_SRB01 | Depth: 0.00m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-019-FLD | | |

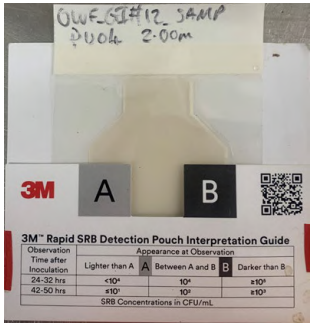
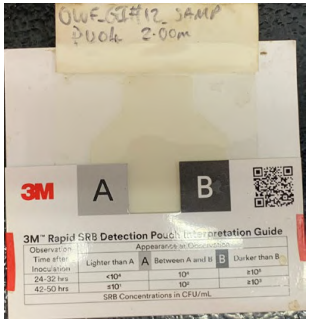
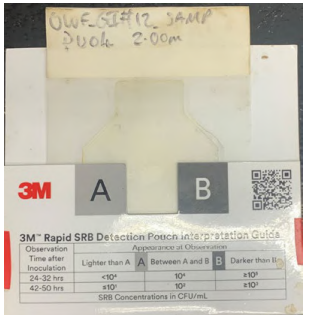
**SRB Photo Log**

| | | |
|---|---|---|
| Client: RTE/DGEC<br>Project Name: A05 BRITTANY OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#08_CPT | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |
| Sample Number: PU02_SRB01 | Depth: 1.00m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-019-FLD | | |

**SRB Photo Log**

| | | |
|---|---|---|
| Client: RTE/DGEC<br>Project Name: A05 BRITTANY OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#08_CPT | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |

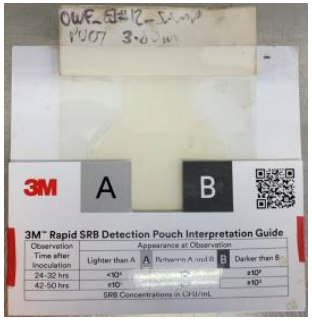
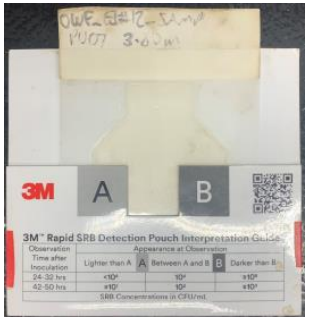
| | |
|---|---|
| Sample Number: PU04_SRB01 | Depth: 2.00m |

SRB PHOTO LOG

Ref.: GMOP21-G-019-FLD

**SRB Photo Log**

| | | |
|---|---|---|
| Client: RTE/DGEC<br>Project Name: A05 BRITTANY OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#08_CPT | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |

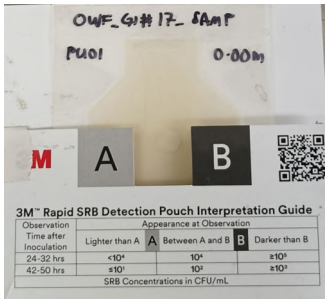
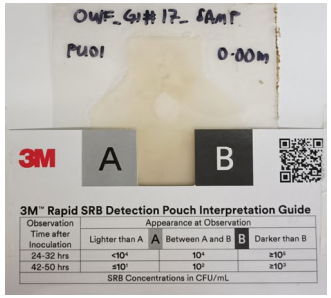
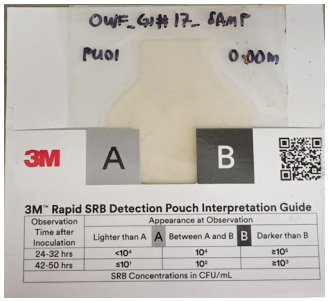
| | |
|---|---|
| Sample Number: PU07_SRB01 | Depth: 3.80m |

SRB PHOTO LOG

Ref.: GMOP21-G-019-FLD

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#17_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL:<$10^4$ | SRB/mL:<$10^4$ | SRB/mL0:≤$10^1$ |

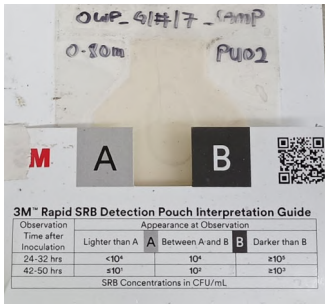
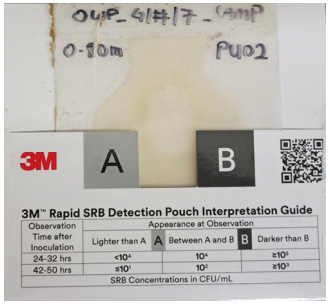
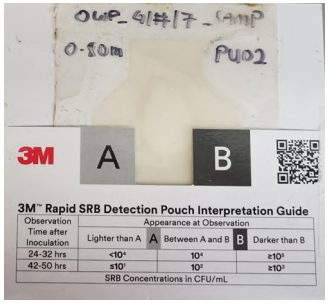
| | |
|---|---|
| Sample Number: PU01 | Depth: 0.00 |

SRB PHOTO LOG

Ref.: GMOP21-G-0129-FLD

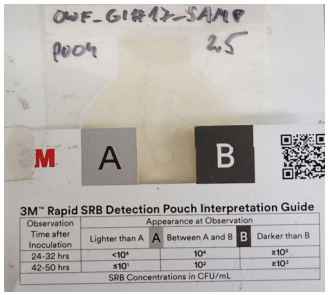
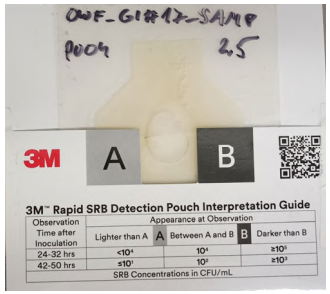
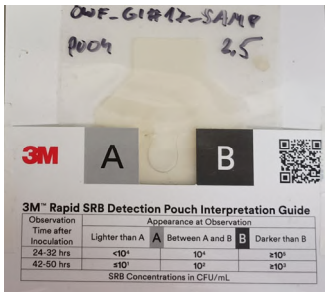
**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#17_SAMP | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL:<$10^4$ | SRB/mL:<$10^4$ | SRB/mL0:≤10 [1] |
| Sample Number: PU02 | Depth: 0.80m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-0129-FLD | | |

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#17_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL:<$10^4$ | SRB/mL:<$10^4$ | SRB/mL0:≤$10^1$ |

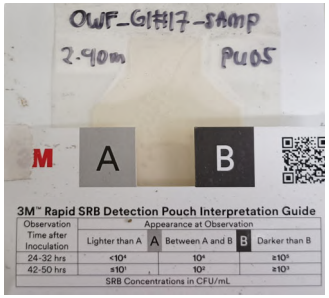
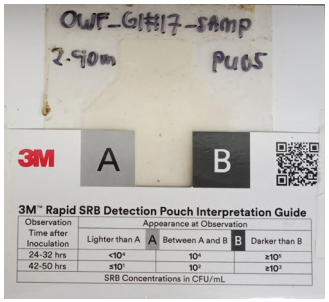
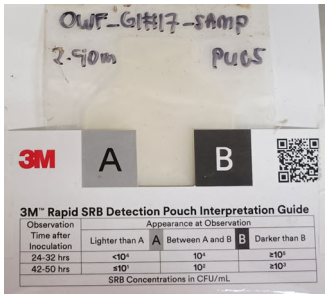
| | |
|---|---|
| Sample Number: PU04 | Depth: 2.50m |

SRB PHOTO LOG

Ref.: GMOP21-G-0129-FLD

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#17_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL:<$10^4$ | SRB/mL:<$10^4$ | SRB/mL0:≤$10^1$ |

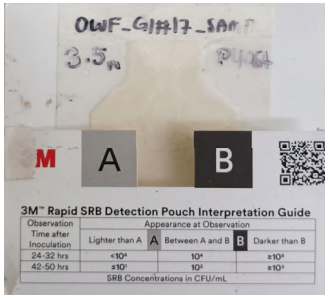
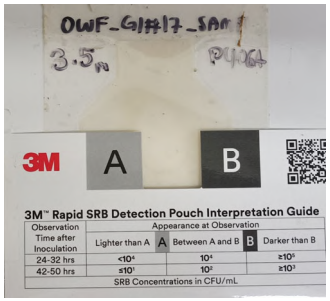
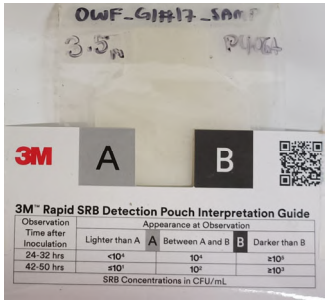
| | |
|---|---|
| Sample Number: PU05 | Depth: 2.90m |

SRB PHOTO LOG

Ref.: GMOP21-G-0129-FLD

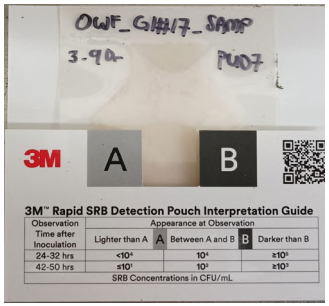
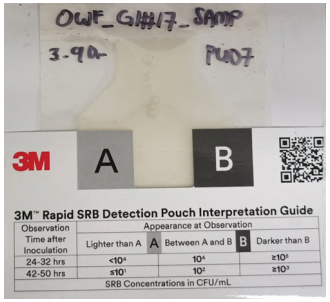
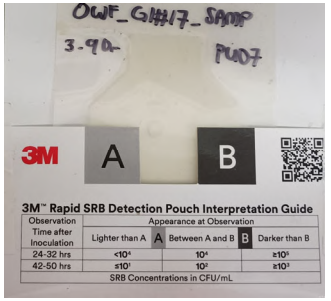
**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#17_SAMP | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL:$<10^4$ | SRB/mL:$<10^4$ | SRB/mL0:$\leq 10^1$ |
| Sample Number: PU06A | Depth: 3.50m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-0129-FLD | | |

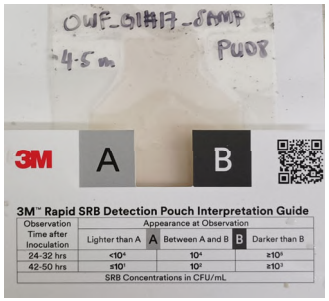
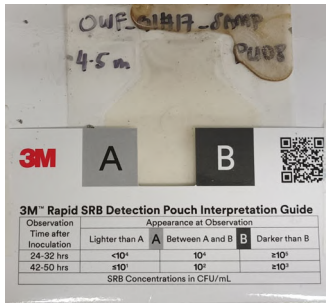
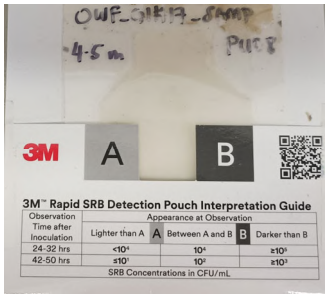
**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#17_SAMP | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL:$<10^4$ | SRB/mL:$<10^4$ | SRB/mL0:$\leq 10$ [1] |
| Sample Number: PU07 | Depth: 3.90m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-0129-FLD | | |

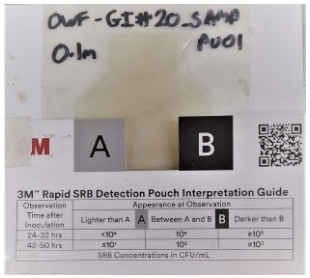
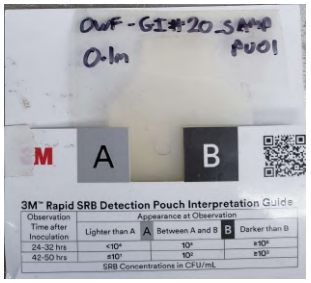
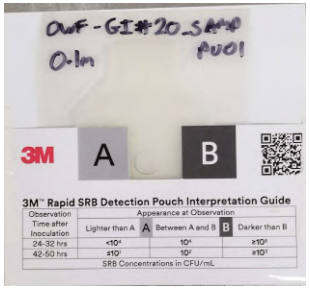
# SRB Photo Log

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#17_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL:<$10^4$ | SRB/mL:<$10^4$ | SRB/mL0:≤10 [1] |
| Sample Number: PU08 | Depth: 4.50m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-0129-FLD | | |

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#20_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |

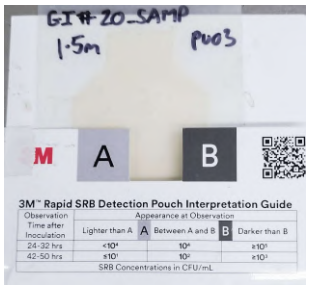
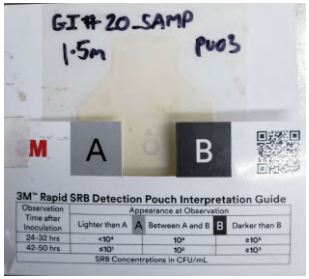
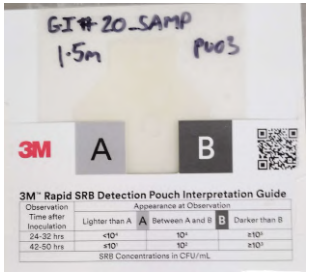
| | |
|---|---|
| Sample Number: PU01 | Depth: 0.1m |

SRB PHOTO LOG

Ref.: GMOP21-G-0129-FLD

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#20_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^{M}$ |

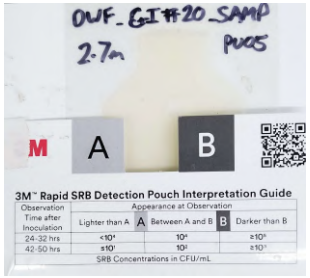
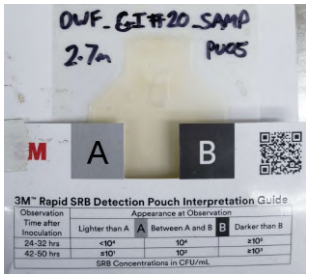
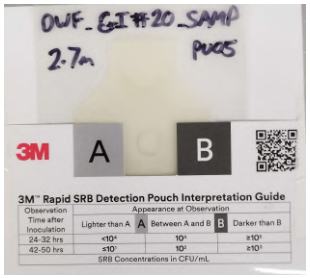
| | |
|---|---|
| Sample Number: PU03 | Depth: 1.5m |

SRB PHOTO LOG

Ref.: GMOP21-G-0129-FLD

# SRB Photo Log

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#20_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^{M}$ |

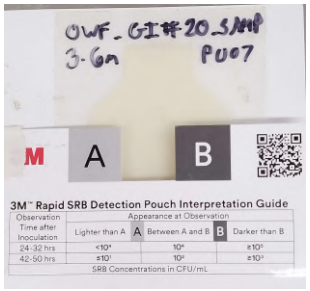
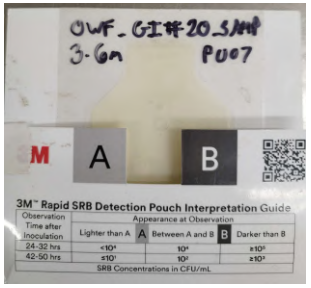
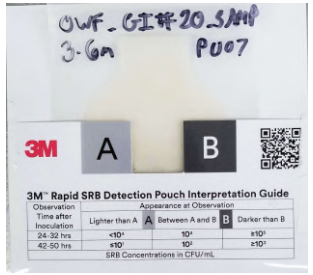
| | |
|---|---|
| Sample Number: PU05 | Depth: 2.7m |

SRB PHOTO LOG

Ref.: GMOP21-G-0129-FLD

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#20_SAMP | |

| Day 0 (0 hrs) | Day 1 (24-32 hrs) | Day 2 (43-50 hrs) |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^{M}$ |

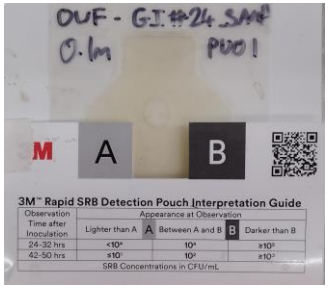
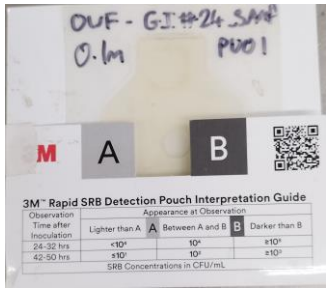
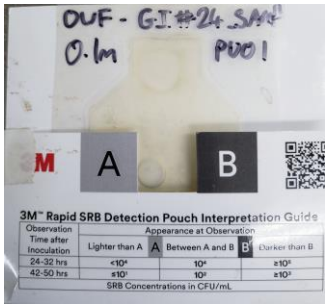
| | |
|---|---|
| Sample Number: PU07 | Depth: 3.6m |

SRB PHOTO LOG

Ref.: GMOP21-G-0129-FLD

**SRB Photo Log**

| | | |
|---|---|---|
| Client: DGEC<br>Project Name: A05 BRETAGNE OFFSHORE GI<br>Project Number: GMOP21-G-019 | Location: A05 OWF<br>Borehole No.: OWF_GI#24_SAMP | |

| **Day 0 (0 hrs)** | **Day 1 (24-32 hrs)** | **Day 2 (43-50 hrs)** |
|---|---|---|
|  |  |  |
| SRB/mL: $<10^4$ | SRB/mL: $<10^4$ | SRB/mL: $\leq 10^1$ |
| Sample Number: PU01 | Depth: 0.1m | |
| SRB PHOTO LOG<br>Ref.: GMOP21-G-0129-FLD | | |

## Appendix B.5 Strength Test Results

| GEOQUIPMARINE | Shear Wave Velocity by Bender Element | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | BH0120230227178 |
| Soil Description | 2.5y 4/1 Dark grey silty SAND | | | | Depth m | 2.00 |
| Specimen Reference | PU03 | Specimen Depth | 2.00 | m | Sample Type | B1 |
| Specimen Description | 2.5y 4/1 Dark grey silty SAND | | | | Unique ID | PU03 |
| Test Method | ASTM D8295-19 | | | | Date started | 24/04/2023 |
| Preparation | Isotropically consolidatd 50kPa | | | | | |

**Testing Conditions**

| | | |
|---|---|---|
| Capture Time | 5 | ms |
| Burst Count | 1 | |
| Amplitude | 10 | V |
| No. of Runs | 10 | |
| Interval between Runs | 5 | seconds |

**Sample Information**

| | | |
|---|---|---|
| Moisture Content | 22 | % |
| Bulk Density | 1.79 | Mg/m3 |
| Dry Density | 1.45 | Mg/m3 |
| Height | 139.69 | mm |
| Diameter | 70 | mm |
| Mass | 958.83 | g |
| Bender Element Length | 7 | mm |

**Results**

**S-wave Vertical: Peak to Peak**

| Frequency | | 5 kHz | 6 kHz | 7 kHz | 8 kHz | |
|---|---|---|---|---|---|---|
| Time, ms | | 0.000887 | 0.000886 | 0.000875 | 0.000875 | |
| Shear Wave Velocity, m/s | | 149.93 | 148.99 | 151.55 | 151.20 | |
| Shear Modulus, Gmax | MPa | 40.24 | 39.73 | 41.11 | 40.92 | |

**S-wave Vertical: Start to Start**

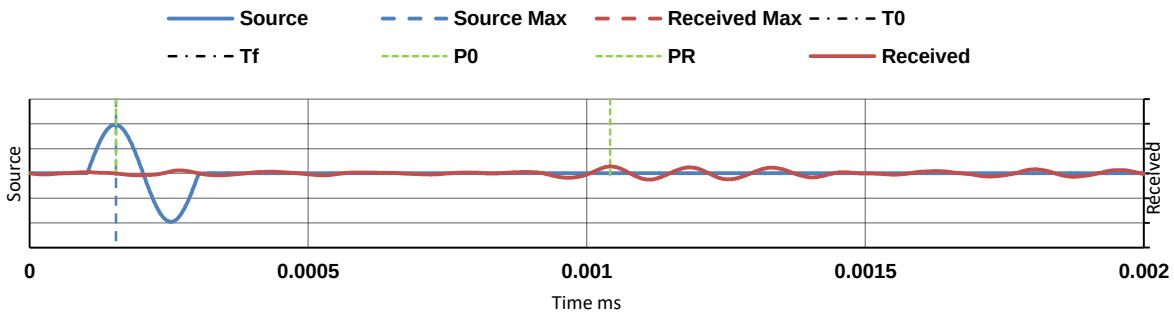
| Frequency | | 5 kHz | 6 kHz | 7 kHz | 8 kHz | |
|---|---|---|---|---|---|---|
| Time, ms | | | | | | |
| Shear Wave Velocity, m/s | | | | | | |
| Shear Modulus, Gmax | MPa | | | | | |

Remarks: Sample information is Post-Consolidation Calculated values, All Gmaxs are derived from Post Consolidation Densities, Bender Element taken from Height of sample

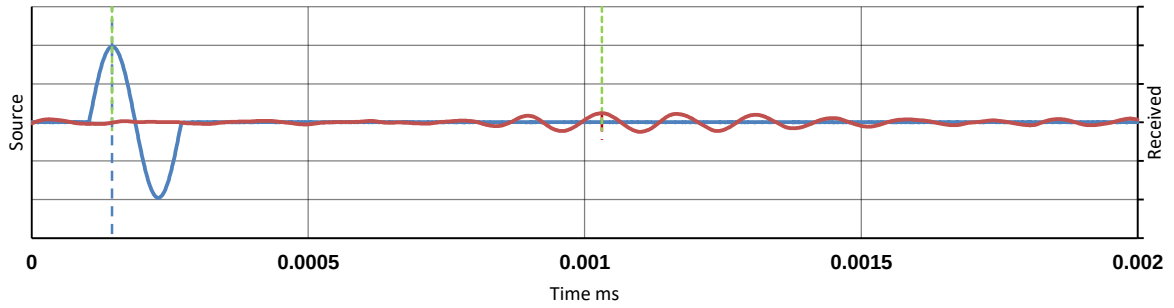
| | Approved | Date | |
|---|---|---|---|
| | D.Smith | 23/05/2023 10:34 | |

| GEOQUIPMARINE | Shear Wave Velocity by Bender Element<br>Graphical Results | | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | BH0120230227178 | Sample Type | B1 |
| Borehole/Pit No. | OWF_GI#11_SAMP | Depth m | 2.00 | Unique ID | PU03 |

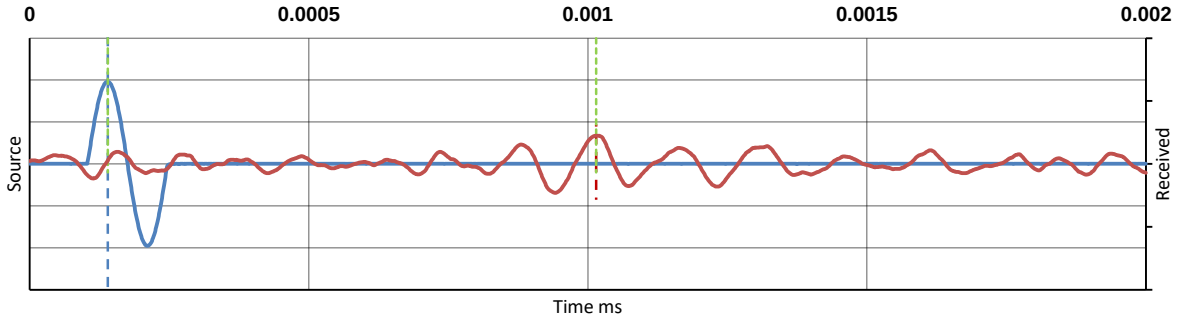
**$v_s$ Frequency 5 kHz**




**$v_s$ Frequency 6 kHz**



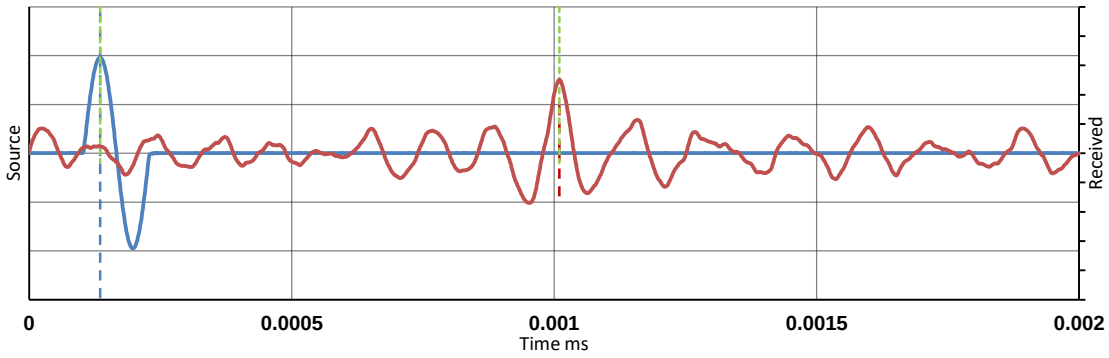

**$v_s$ Frequency 7 kHz**



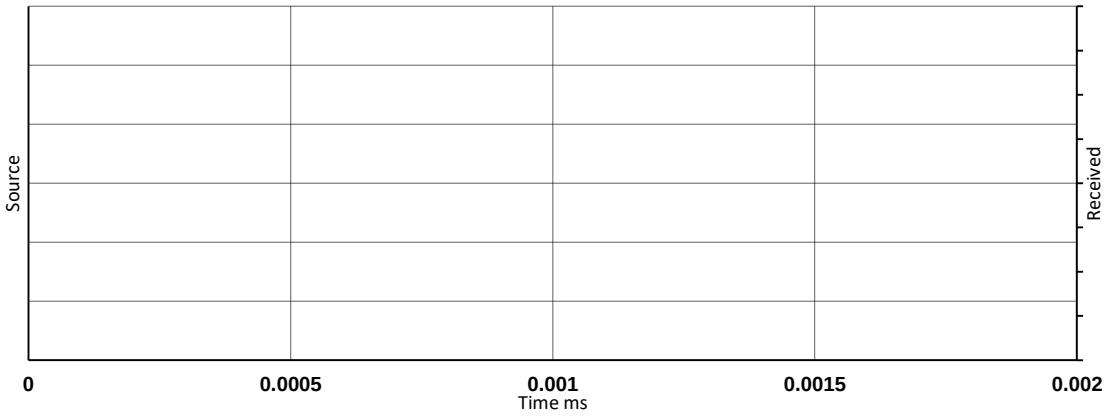

| | Approved | Date |
|---|---|---|
| | D.Smith | 23/05/2023 10:34 |

| GEOQUIPMARINE | | Shear Wave Velocity by Bender Element<br>Graphical Results | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | BH0120230227178 | Sample Type | B1 |
| Borehole/Pit No. | OWF_GI#11_SAMP | Depth m | 2.00 | Unique ID | PU03 |

**$v_s$ Frequency** **8 kHz**




**$v_s$ Frequency**




| | Approved | Date | |
|---|---|---|---|
| | D.Smith | 23/05/2023 10:34 | |

| GEOQUIPMARINE | Shear Wave Velocity by Bender Element | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | BH0120230227222 |
| Soil Description | 2.5y 4/3 Olive brown SAND | | | | Depth m | 2.30 |
| Specimen Reference | B1 | Specimen Depth | 2.30 | m | Sample Type | B1 |
| Specimen Description | Green grey sand with gravels and shell fragments | | | | Unique ID | PU05 |
| Test Method | ASTM D8295-19 | | | | Date started | 22/05/2023 |
| Preparation | | | | | | |

**Testing Conditions**

| | | |
|---|---|---|
| Capture Time | 5 | ms |
| Burst Count | 1 | |
| Amplitude | 10 | V |
| No. of Runs | 10 | |
| Interval between Runs | 5 | seconds |

**Sample Information**

| | | |
|---|---|---|
| Moisture Content | 25.8 | % |
| Bulk Density | 1.81 | Mg/m3 |
| Dry Density | 1.45 | Mg/m3 |
| Height | 132.77 | mm |
| Diameter | 70 | mm |
| Mass | 975.66 | g |
| Bender Element Length | 7 | mm |

**Results**

**S-wave Vertical: Peak to Peak**

| Frequency | | 3 kHz | 4 kHz | 5 kHz | | |
|---|---|---|---|---|---|---|
| Time, ms | | 0.000953 | 0.000933 | 0.000907 | | |
| Shear Wave Velocity, m/s | | 138.51 | 141.48 | 145.54 | | |
| Shear Modulus, Gmax | MPa | 34.73 | 36.23 | 38.34 | | |

**S-wave Vertical: Start to Start**

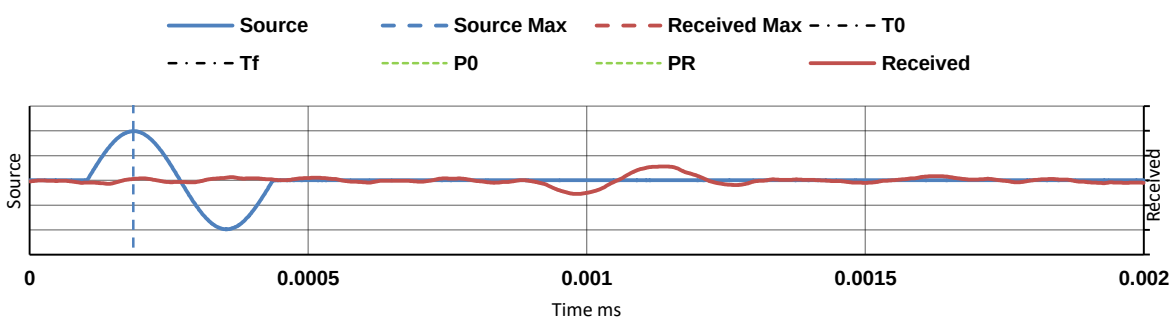
| Frequency | | 3 kHz | 4 kHz | 5 kHz | | |
|---|---|---|---|---|---|---|
| Time, ms | | | | | | |
| Shear Wave Velocity, m/s | | | | | | |
| Shear Modulus, Gmax | MPa | | | | | |

Remarks: Sample information is Post-Consolidation Calculated values, All Gmaxs are derived from Post Consolidation Densities, Bender Element taken from Height of sample

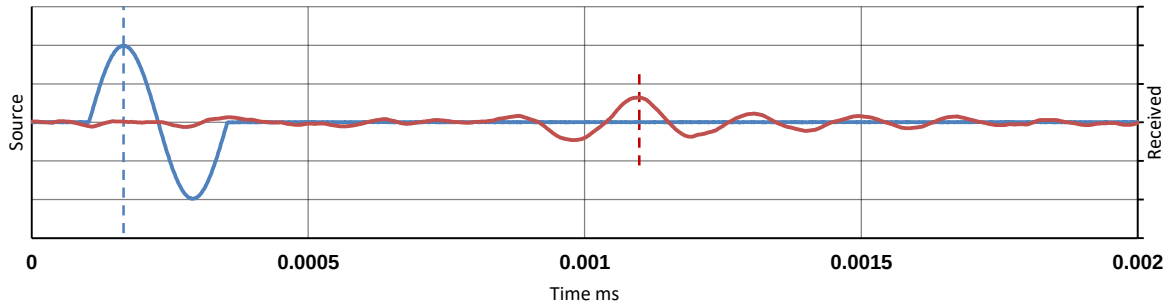
| | Approved | Date | |
|---|---|---|---|
| | D.Smith | 23/05/2023 12:09 | |

| GEOQUIPMARINE | | Shear Wave Velocity by Bender Element<br>Graphical Results | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | BH0120230227222 | Sample Type | B1 |
| Borehole/Pit No. | OWF_GI#12_SAMP | Depth m | 2.30 | Unique ID | PU05 |

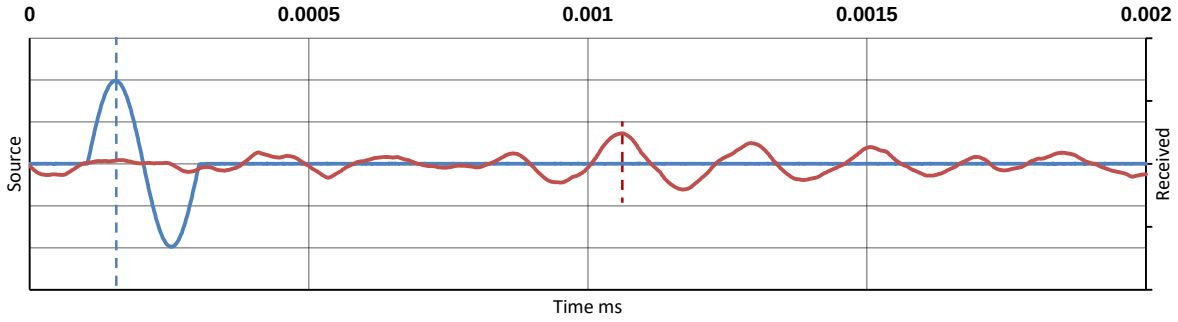
**$v_s$ Frequency 3 kHz**




**$v_s$ Frequency 4 kHz**



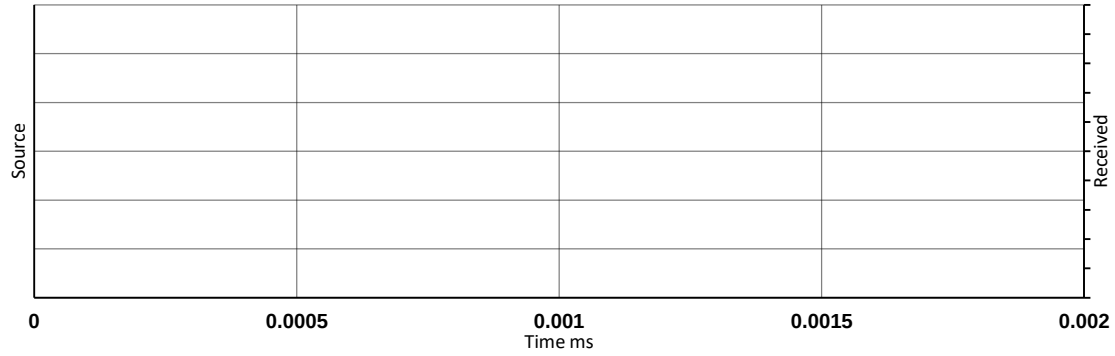

**$v_s$ Frequency 5 kHz**



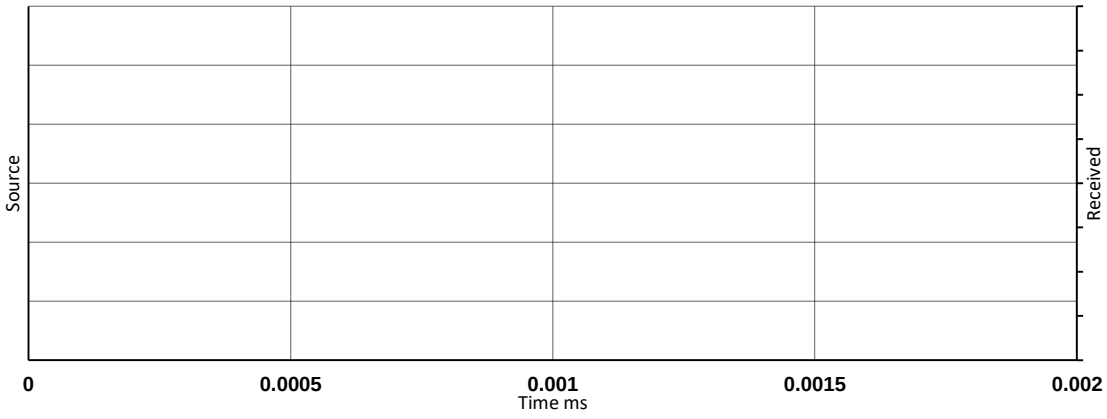

| | Approved | Date |
|---|---|---|
| | D.Smith | 23/05/2023 12:09 |

| GEOQUIPMARINE | | Shear Wave Velocity by Bender Element<br>Graphical Results | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | BH0120230227222 | Sample Type | B1 |
| Borehole/Pit No. | OWF_GI#12_SAMP | Depth m | 2.30 | Unique ID | PU05 |

**$v_s$ Frequency**




**$v_s$ Frequency**




| | Approved | Date | |
|---|---|---|---|
| | D.Smith | 23/05/2023 12:09 | |

| GEOQUIPMARINE | Shear Wave Velocity by Bender Element | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | BH012023030741 |
| Soil Description | Grey brown silty CLAY | | | | Depth m | 11.30 |
| Specimen Reference | Q1 | Specimen Depth | 11.30 | m | Sample Type | Q1 |
| Specimen Description | Grey brown silty CLAY | | | | Unique ID | PU08 |
| Test Method | ASTM D8295-19 | | | | Date started | 03/05/2023 |
| Preparation | Isotropically Consolidated to 115kPa | | | | | |

**Testing Conditions**

| | | |
|---|---|---|
| Capture Time | 5 | ms |
| Burst Count | 1 | |
| Amplitude | 10 | V |
| No. of Runs | 10 | |
| Interval between Runs | 5 | seconds |

**Sample Information**

| | | |
|---|---|---|
| Moisture Content | 20.4 | % |
| Bulk Density | 2.18 | Mg/m3 |
| Dry Density | 1.81 | Mg/m3 |
| Height | 139.97 | mm |
| Diameter | 70 | mm |
| Mass | 1169.55 | g |
| Bender Element Length | 7 | mm |

**Results**

**S-wave Vertical: Peak to Peak**

| Frequency | | 2 kHz | 3 kHz | 4 kHz | 5 kHz | 6 kHz |
|---|---|---|---|---|---|---|
| Time, ms | | 0.000499 | 0.000492 | 0.000491 | 0.000495 | 0.000477 |
| Shear Wave Velocity, m/s | | 264.46 | 268.34 | 268.58 | 266.74 | 276.71 |
| Shear Modulus, Gmax | MPa | 152.47 | 156.98 | 157.25 | 155.10 | 166.92 |

**S-wave Vertical: Start to Start**

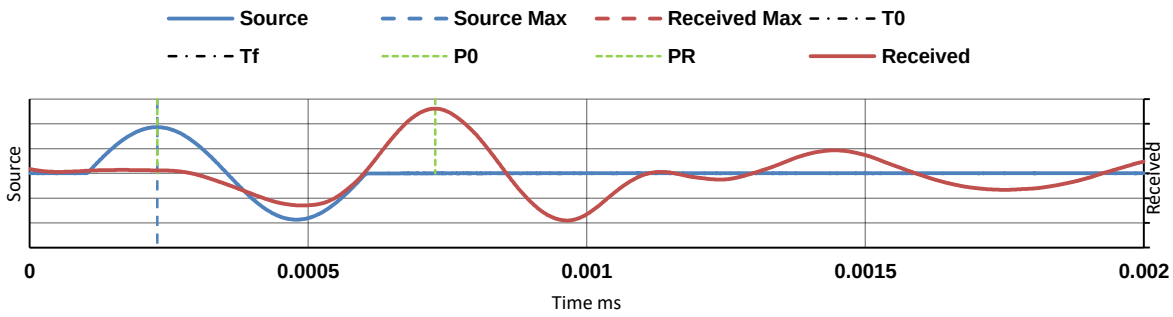
| Frequency | | 2 kHz | 3 kHz | 4 kHz | 5 kHz | 6 kHz |
|---|---|---|---|---|---|---|
| Time, ms | | | | | | |
| Shear Wave Velocity, m/s | | | | | | |
| Shear Modulus, Gmax | MPa | | | | | |

Remarks: Sample information is Post-Consolidation Calculated values, All Gmaxs are derived from Post Consolidation Densities, Bender Element taken from Height of sample

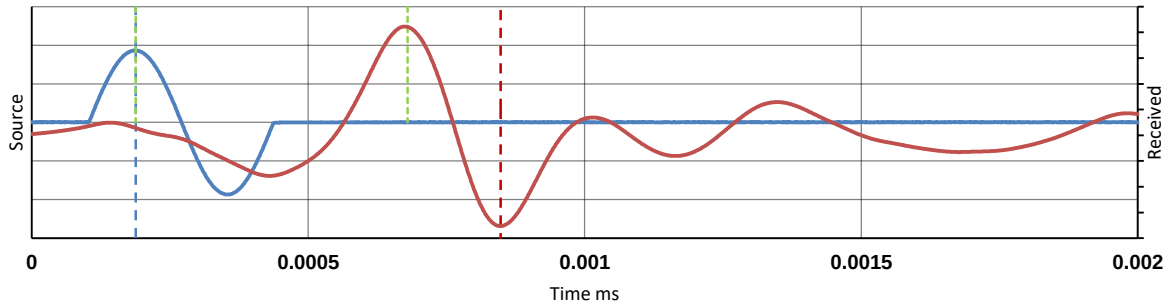
| | Approved | Date | |
|---|---|---|---|
| | D.Smith | 19/05/2023 16:53 | |

| GEOQUIPMARINE | Shear Wave Velocity by Bender Element<br>Graphical Results | | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | BH012023030741 | Sample Type | Q1 |
| Borehole/Pit No. | OWF_GI#15A_SAMP | Depth m | 11.30 | Unique ID | PU08 |

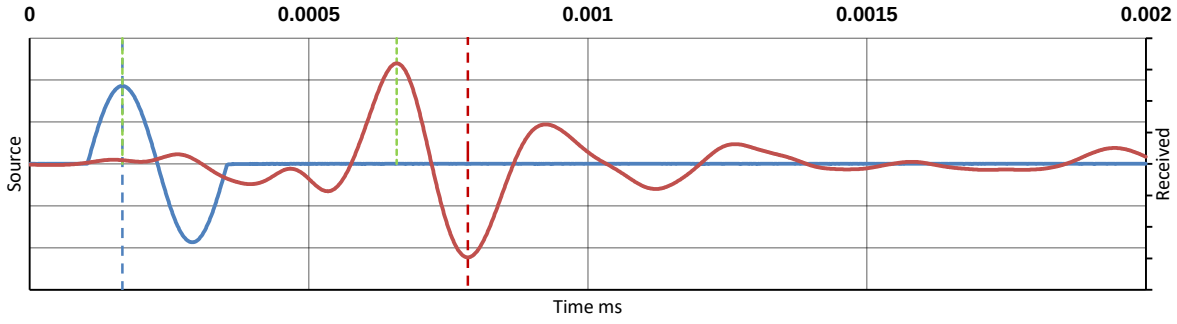
**$v_s$ Frequency 2 kHz**




**$v_s$ Frequency 3 kHz**



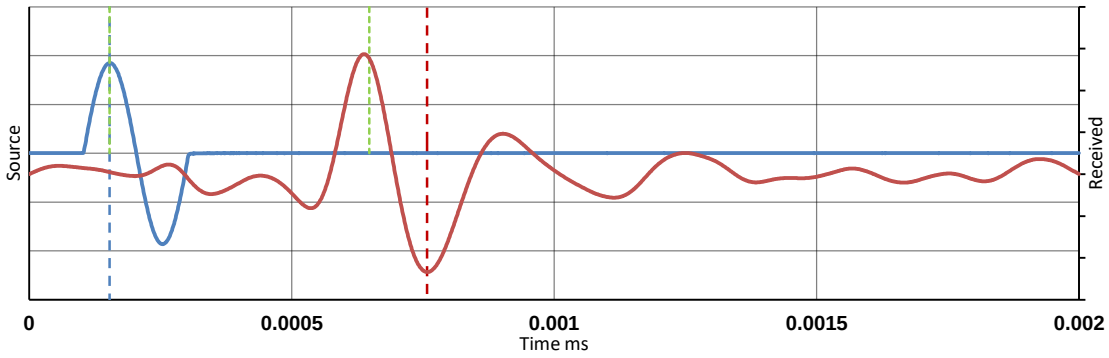

**$v_s$ Frequency 4 kHz**



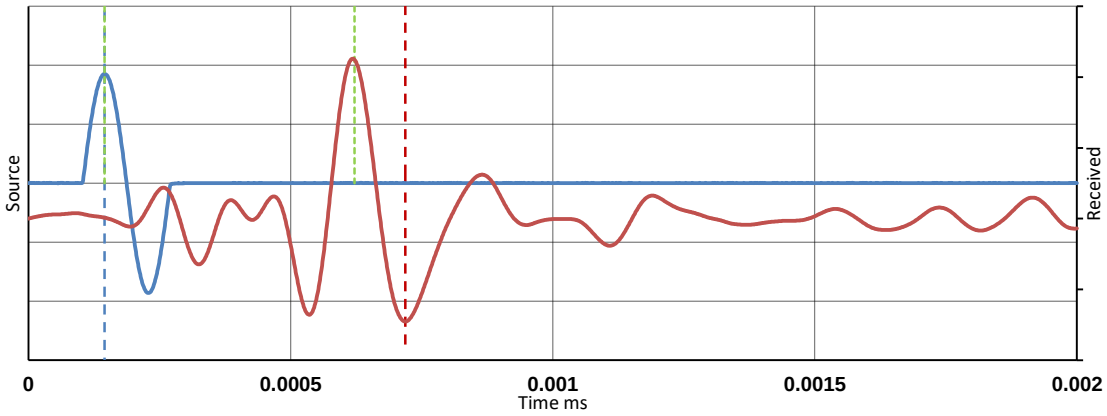

| | Approved | Date |
|---|---|---|
| | D.Smith | 19/05/2023 16:53 |

| GEOQUIPMARINE | | Shear Wave Velocity by Bender Element<br>Graphical Results | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | BH012023030741 | Sample Type | Q1 |
| Borehole/Pit No. | OWF_GI#15A_SAMP | Depth m | 11.30 | Unique ID | PU08 |

**$v_s$ Frequency 5 kHz**




**$v_s$ Frequency 6 kHz**




| | Approved | Date |
|---|---|---|
| | D.Smith | 19/05/2023 16:53 |

| GEOQUIPMARINE | Shear Wave Velocity by Bender Element | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU02 |
| Soil Description | 2.5y 4/2 Dark greyish brown silty SAND | | | | Depth m | 0.80 |
| Specimen Reference | PU02 | Specimen Depth | 0.80 | m | Sample Type | B1 |
| Specimen Description | 2.5y 4/2 Dark greyish brown silty SAND | | | | Unique ID | BH0120230227381 |
| Test Method | ASTM D8295-19 | | | | Date started | 04/05/2023 |
| Preparation | 50 kPa Isotropically consolidated | | | | | |

**Testing Conditions**

| | | |
|---|---|---|
| Capture Time | 5 | ms |
| Burst Count | 1 | |
| Amplitude | 10 | V |
| No. of Runs | 10 | |
| Interval between Runs | 5 | seconds |

**Sample Information**

| | | |
|---|---|---|
| Moisture Content | 27.8 | % |
| Bulk Density | 1.95 | Mg/m3 |
| Dry Density | 1.54 | Mg/m3 |
| Height | 140.4 | mm |
| Diameter | 70.1 | mm |
| Mass | 1053.47 | g |
| Bender Element Length | 7 | mm |

**Results**

**S-wave Vertical: Peak to Peak**

| Frequency | | 6 kHz | 7 kHz | 8 kHz | | |
|---|---|---|---|---|---|---|
| Time, ms | | 0.000823 | 0.000822 | 0.000817 | | |
| Shear Wave Velocity, m/s | | 160.39 | 160.59 | 161.57 | | |
| Shear Modulus, Gmax | MPa | 50.16 | 50.29 | 50.90 | | |

**S-wave Vertical: Start to Start**

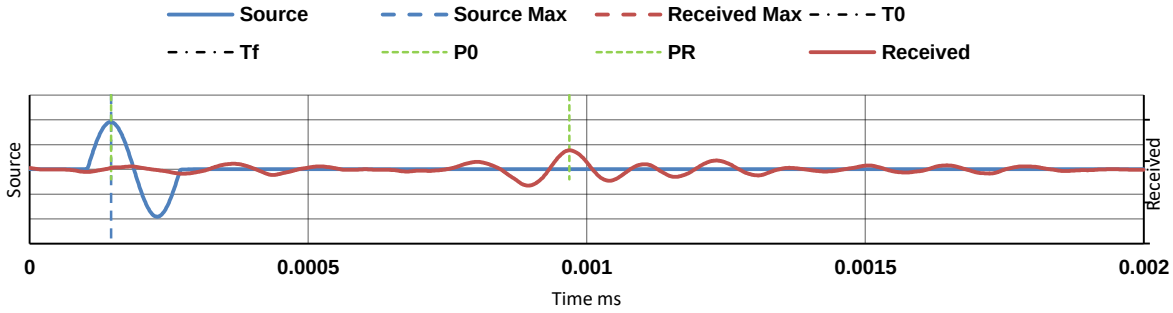
| Frequency | | 6 kHz | 7 kHz | 8 kHz | | |
|---|---|---|---|---|---|---|
| Time, ms | | | | | | |
| Shear Wave Velocity, m/s | | | | | | |
| Shear Modulus, Gmax | MPa | | | | | |

Remarks: Sample information is Post-Consolidation Calculated values, All Gmaxs are derived from Post Consolidation Densities, Bender Element taken from Height of sample

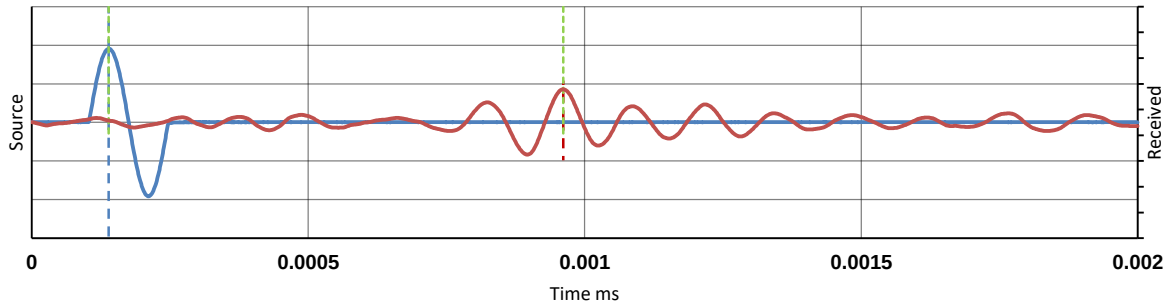
| | Approved | Date | |
|---|---|---|---|
| | D.Smith | 27/07/2023 12:43 | |

| GEOQUIPMARINE | Shear Wave Velocity by Bender Element<br>Graphical Results | | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | PU02 | Sample Type | B1 |
| Borehole/Pit No. | OWF_GI#20_SAMP | Depth m | 0.80 | Unique ID | BH0120230227381 |

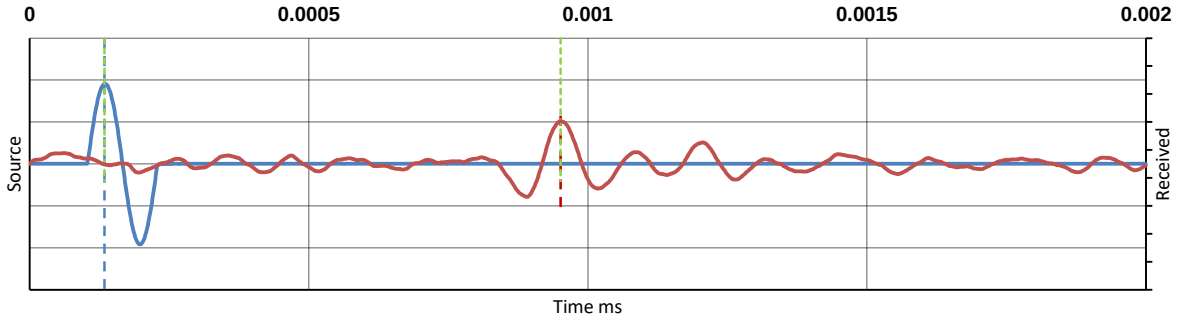
**$v_s$ Frequency 6 kHz**




**$v_s$ Frequency 7 kHz**



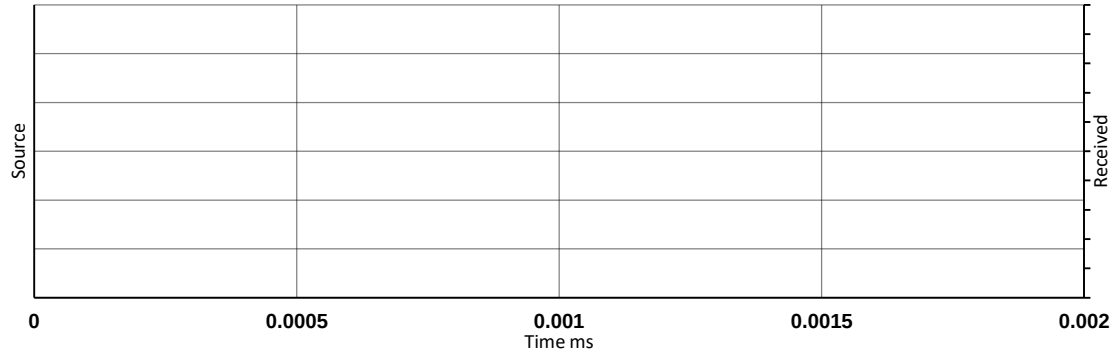

**$v_s$ Frequency 8 kHz**



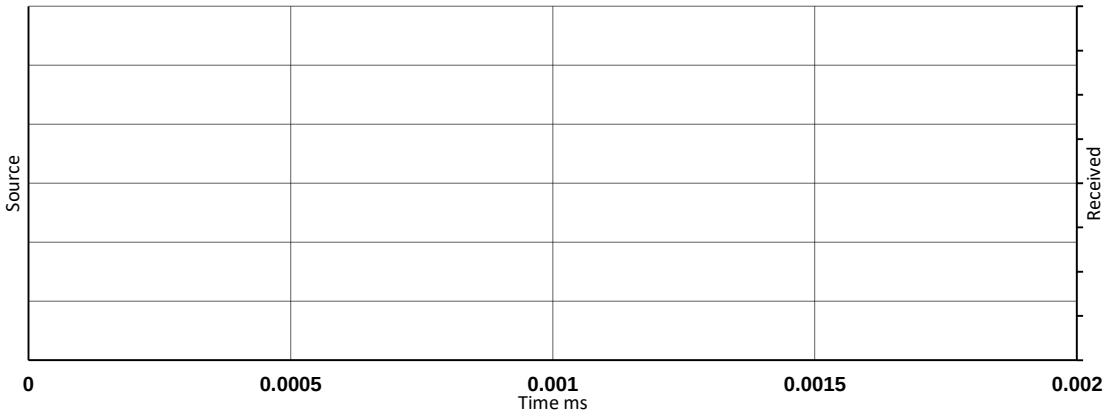

| | Approved | Date |
|---|---|---|
| | D.Smith | 27/07/2023 12:43 |

| GEOQUIPMARINE | | Shear Wave Velocity by Bender Element<br>Graphical Results | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | PU02 | Sample Type | B1 |
| Borehole/Pit No. | OWF_GI#20_SAMP | Depth m | 0.80 | Unique ID | BH0120230227381 |

**$v_s$ Frequency**




**$v_s$ Frequency**




| | Approved | Date | |
|---|---|---|---|
| | D.Smith | 27/07/2023 12:43 | |

# Shear Wave Velocity by Bender Element

| | | | | | |
|---|---|---|---|---|---|
| | | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole/Pit No. | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU06 |
| Soil Description | 2.5y 4/2 Dark greyish brown SAND including sparse shell fragments | | | Depth m | 2.70 |
| Specimen Reference | PU06 | Specimen Depth | 2.70 m | Sample Type | B1 |
| Specimen Description | 2.5y 4/2 Dark greyish brown SAND including sparse shell fragments | | | Unique ID | BH0120230227425 |
| Test Method | ASTM D8295-19 | | | Date started | 04/05/2023 |
| Preparation | 50kPa Isotropic Consolidation | | | | |

**Testing Conditions**

| | | |
|---|---|---|
| Capture Time | 5 | ms |
| Burst Count | 1 | |
| Amplitude | 10 | V |
| No. of Runs | 10 | |
| Interval between Runs | 5 | seconds |

**Sample Information**

| | | |
|---|---|---|
| Moisture Content | 25.7 | % |
| Bulk Density | 1.99 | Mg/m3 |
| Dry Density | 1.62 | Mg/m3 |
| Height | 140.1 | mm |
| Diameter | 70.01 | mm |
| Mass | 1070.10 | g |
| Bender Element Length | 7 | mm |

**Results**

**S-wave Vertical: Peak to Peak**

| Frequency | | 4 kHz | 5 kHz | 7 kHz | | |
|---|---|---|---|---|---|---|
| Time, ms | | 0.008364 | 0.008262 | 0.000804 | | |
| Shear Wave Velocity, m/s | | 157.82 | 159.78 | 164.18 | | |
| Shear Modulus, Gmax | MPa | 49.57 | 50.80 | 53.64 | | |

**S-wave Vertical: Start to Start**

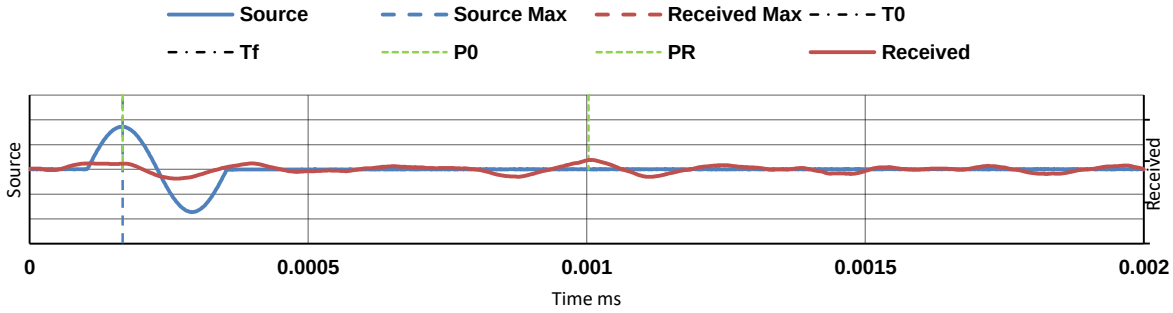
| Frequency | | 4 kHz | 5 kHz | 7 kHz | | |
|---|---|---|---|---|---|---|
| Time, ms | | | | | | |
| Shear Wave Velocity, m/s | | | | | | |
| Shear Modulus, Gmax | MPa | | | | | |

Remarks: Sample information is Post-Consolidation Calculated values, All Gmaxs are derived from Post Consolidation Densities, Bender Element taken from Height of sample

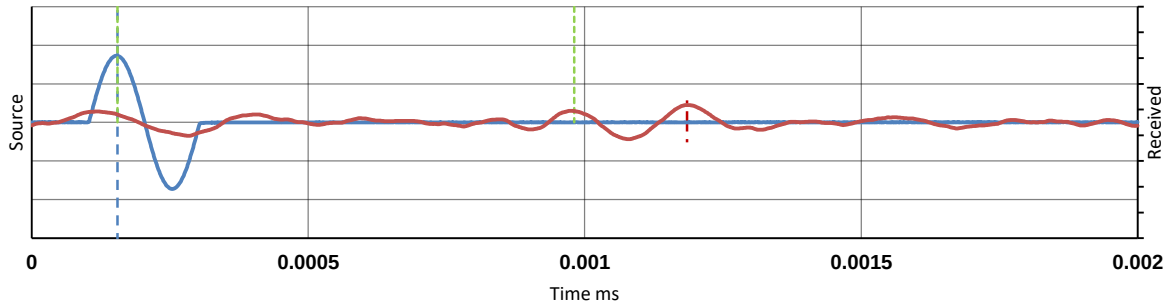
| | Approved | Date | |
|---|---|---|---|
| | D.Smith | 27/07/2023 12:42 | |

| GEOQUIPMARINE | Shear Wave Velocity by Bender Element<br>Graphical Results | | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | PU06 | Sample Type | B1 |
| Borehole/Pit No. | OWF_GI#22_SAMP | Depth m | 2.70 | Unique ID | BH0120230227425 |

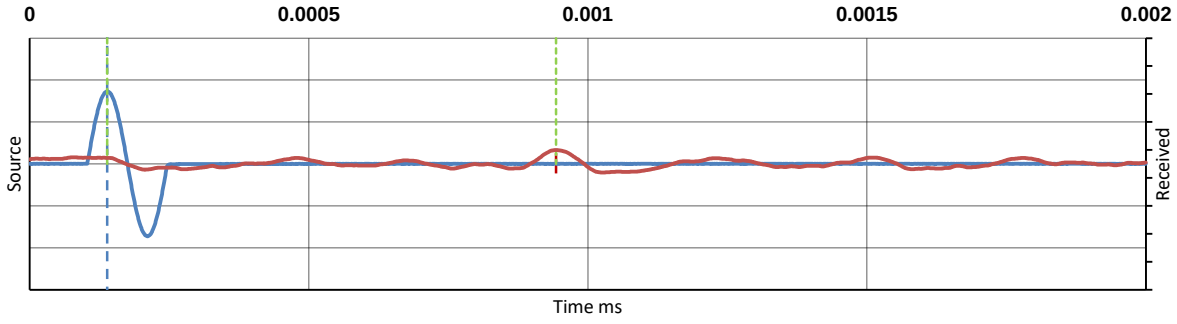
**$v_s$ Frequency 4 kHz**




**$v_s$ Frequency 5 kHz**



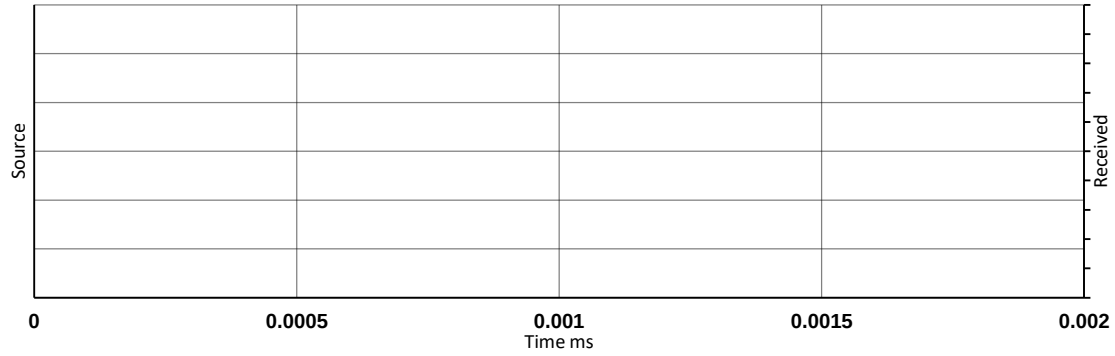

**$v_s$ Frequency 7 kHz**



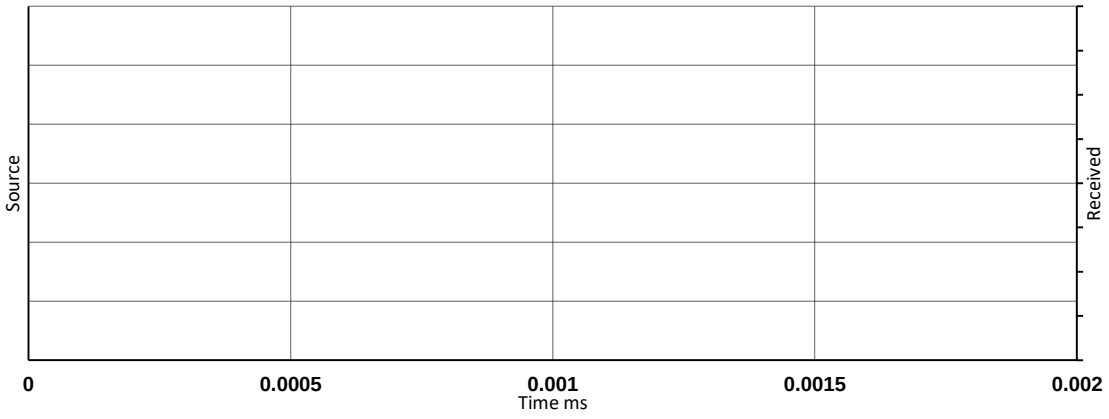

| | Approved | Date |
|---|---|---|
| | D.Smith | 27/07/2023 12:42 |

| GEOQUIPMARINE | | Shear Wave Velocity by Bender Element<br>Graphical Results | | | |
|---|---|---|---|---|---|
| Job Ref | GMOP21-G-019 | Sample No. | PU06 | Sample Type | B1 |
| Borehole/Pit No. | OWF_GI#22_SAMP | Depth m | 2.70 | Unique ID | BH0120230227425 |

**$v_s$ Frequency**




**$v_s$ Frequency**




| | Approved | Date | |
|---|---|---|---|
| | D.Smith | 27/07/2023 12:42 | |

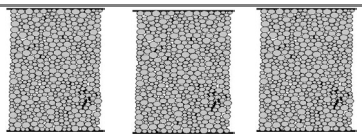
# Effective Stress Triaxial Compression

## Consolidated Drained

**Summary Report**

**Sample Details**

*sketch showing specimen location in original sample*



| | |
|---|---|
| Depth | 0.70m |
| Description | Brown slightly gravelly course SAND. |
| Type | Recompacted to 1.64 DD, 10% moisture content. |

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Sample Length | $L_0$ | (mm) | 76.0 | 76.0 | 76.0 |
| Initial Sample Diameter | $D_0$ | (mm) | 38.0 | 38.0 | 38.0 |
| Initial Sample Weight | $W_0$ | (gr) | 155.5 | 155.5 | 155.5 |
| Initial Bulk Density | $\rho_0$ | (Mg/m3) | 1.80 | 1.80 | 1.80 |
| Particle Density | $\rho_s$ | (Mg/m3) | 2.66 | 2.66 | 2.66 |

**Initial Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_{3i}$ | (kPa) | 1075 | 1150 | 1300 |
| Initial Back Pressure | $U_{bi}$ | (kPa) | 1050 | 1100 | 1200 |
| Membrane Thickness | $m_b$ | (mm) | 0.400 | 0.400 | 0.400 |
| Displacement Input | $L_{IP}$ | (mm) | CH 2 | CH 2 | CH 2 |
| Load Input | $N_{IP}$ | (N) | CH 1 | CH 1 | CH 1 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | CH 3 | CH 3 | CH 3 |
| Sample Volume | $V$ | (cc) | CH 6 | CH 6 | CH 6 |
| Initial Moisture | $\omega_i$ | (%) | 9.89 | 9.97 | 9.74 |
| Initial Dry Density | $\rho_{di}$ | (Mg/m3) | 1.64 | 1.64 | 1.64 |
| Initial Voids Ratio | $e_i$ | . | 0.620 | 0.622 | 0.618 |
| Initial Degree of Saturation | $S_i$ | (%) | 42 | 43 | 42 |
| B Value | $B$ | . | 0.96 | 0.95 | 0.95 |

**Final Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Final Moisture | $\omega_f$ | (%) | 26 | 25 | 24 |
| Final Dry Density | $\rho_{df}$ | (Mg/m3) | 1.64 | 1.64 | 1.66 |
| Final Voids Ratio | $e_f$ | . | 0.619 | 0.619 | 0.607 |
| Final Degree of Saturation | $S_f$ | (%) | 100.0 | 100.0 | 100.0 |
| Failure Criteria | | . | Max. Dev. Stress | Max. Dev. Stress | Max. Dev. Stress |
| Strain At Failure | $\varepsilon_f$ | (%) | 11.15 | 5.68 | 3.31 |
| Stress At Failure | $(\sigma_1-\sigma_3)_f$ | (kPa) | 97.9 | 186.0 | 343.6 |
| Minor Stress At Failure | $\sigma_3'$ | (kPa) | 25.0 | 50.0 | 100.3 |
| Major Stress At Failure | $\sigma_1'$ | (kPa) | 122.9 | 236.0 | 443.9 |
| Principal Stress Ratio At Failure | $\sigma_1'/\sigma_3'$ | | 4.915 | 4.720 | 4.427 |
| PwP At Failure Criteria | $u_f$ | (kPa) | 1050.0 | 1100.0 | 1198.0 |

**Notes**

*Compound*

PSL PROFESSIONAL SOILS LABORATORY — UKAS TESTING 4043

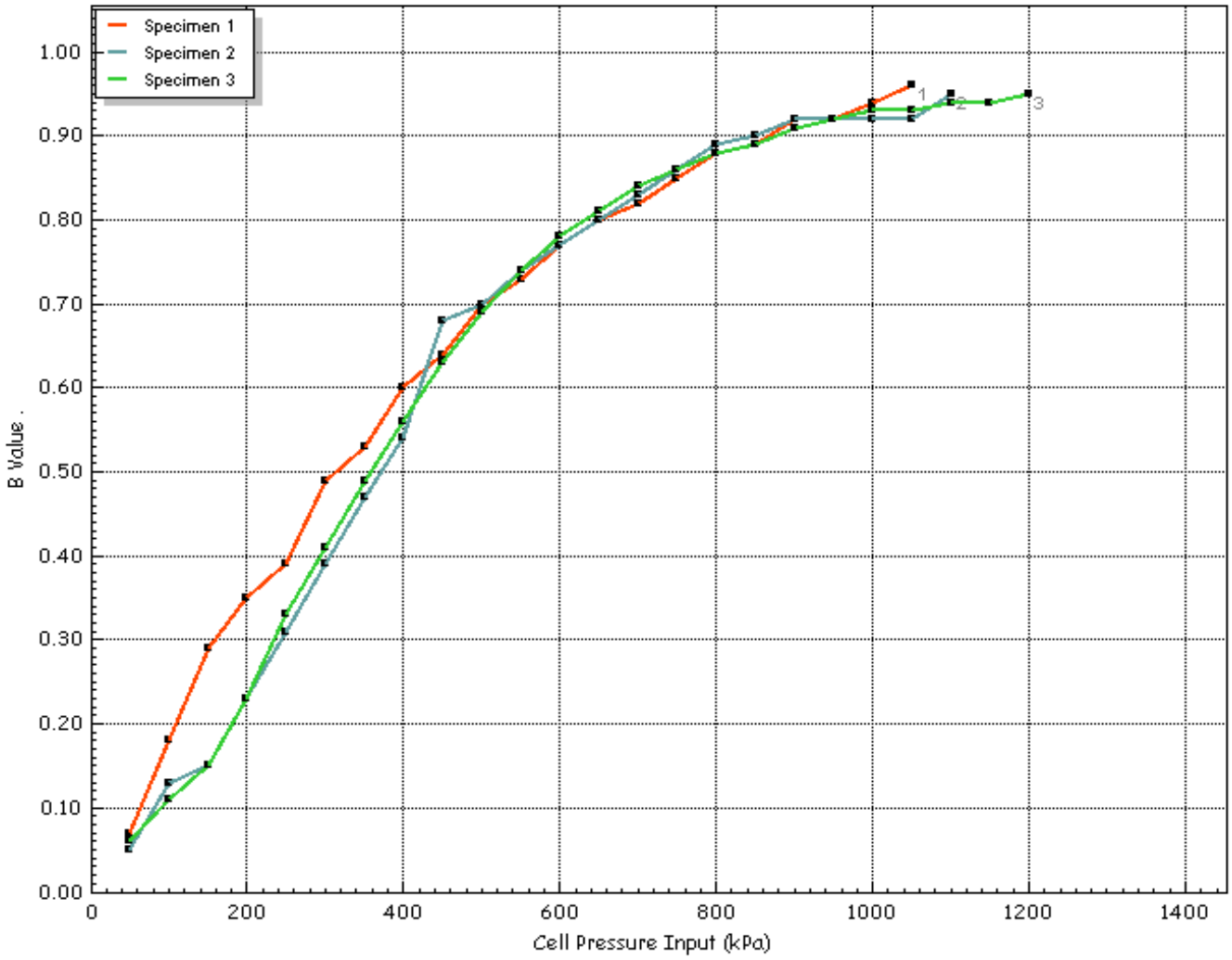
| | | | | | |
|---|---|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | | | Test Name | OWF__GI-04_Samp 0.70m P02 B1 |
| | | | | Test Date | 19/04/2023 |
| Jobfile | GMOP21-G-019 A05 Bretagne off shore | | | Borehole | OWF_GI-04_Samp |
| | | | | Sample | 0.70m P02 B1 |
| Client | Geoquip Marine | | | Depth | 0.70m |
| Operator | D.Burton | Checked | S.Royle | Approved | S.Royle |

# Effective Stress Triaxial Compression

## Consolidated Drained

**Saturation Plots**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Saturation Method | | | Stepped | Stepped | Stepped |
| Cell Pressure Input | σ | (kPa) | 1050 | 1100 | 1200 |
| Pore Water Pressure Input | u pwp | (kPa) | 1043 | 1075 | 1186 |
| B Value | B | . | 0.96 | 0.95 | 0.95 |




| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF__GI-04_Samp 0.70m P02 B1 |
| | | | | Test Date | 19/04/2023 |
| UKAS TESTING 4043 | Jobfile | GMOP21-G-019 A05 Bretagne off shore | | Borehole | OWF_GI-04_Samp |
| | | | | Sample | 0.70m P02 B1 |
| | Client | Geoquip Marine | | Depth | 0.70m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

# Effective Stress Triaxial Compression

## Consolidated Drained

**Consolidation Plots**

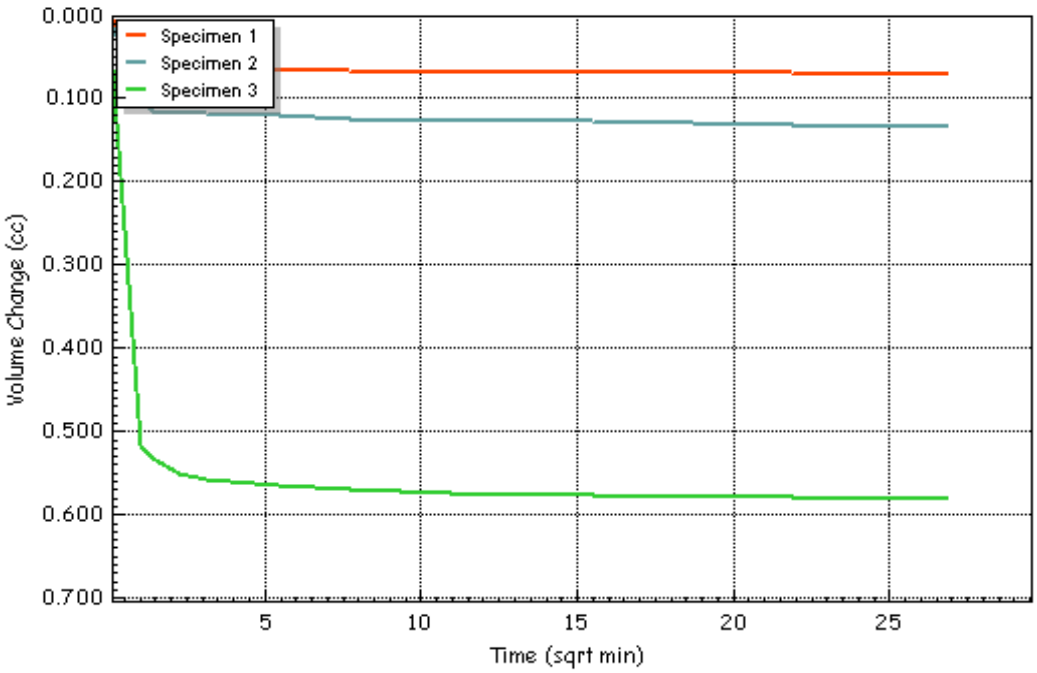
### Initial Conditions

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_3$ | (kPa) | 1075 | 1150 | 1300 |
| Initial Back Pressure | $u_{bi}$ | (kPa) | 1050 | 1100 | 1200 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | 1058 | 1128 | 1257 |
| Drainage Method | | | From One End | From One End | From One End |

### Final Conditions

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| PWP Dissipation % | U% | (%) | 100.00 | 100.00 | 100.00 |
| Volumetric Strain | $\varepsilon_v$% | (%) | 0.08 | 0.16 | 0.67 |
| Corrected Length | $L_c$ | (mm) | 76.0 | 76.0 | 75.8 |
| Corrected Area | $A_c$ | (cm2) | 11.34 | 11.33 | 11.29 |
| Corrected Volume | $V_c$ | (cc) | 86.123 | 86.059 | 85.612 |
| t100 | $t_{100}$ | (min) | 6.25 | 5.03 | 2.65 |
| Consolidation | $c_v$ | (m2/year | 3.815 | 4.738 | 8.961 |
| Compressibility | $m_v$ | (m2/MN) | 0.101 | 0.055 | 0.119 |
| Test Time | $t_F$ | (h:m:s) | 02:00:00 | 02:00:00 | 02:00:00 |
| Estimated Strain to Failure | $\varepsilon$% | (%) | 5.0 | 5.0 | 5.0 |
| Shear Machine Speed | $d_r$ | (mm/min | 0.03166 | 0.03165 | 0.03160 |

**Notes**

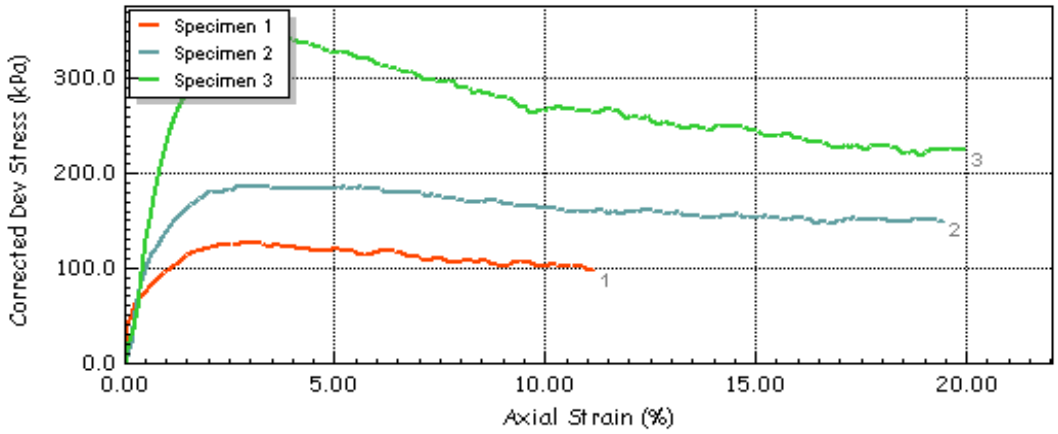


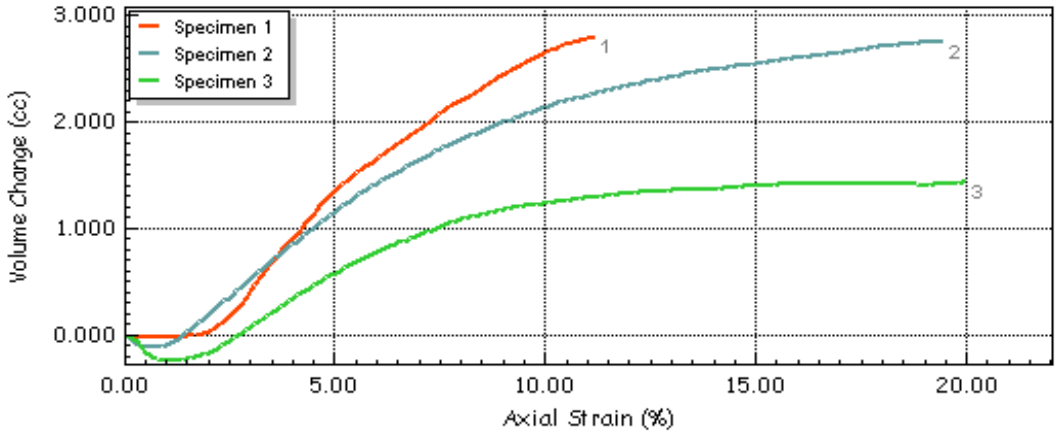

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF__GI-04_Samp 0.70m P02 B1 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne off shore | | Borehole | OWF_GI-04_Samp |
| | | | | Sample | 0.70m P02 B1 |
| | Client | Geoquip Marine | | Depth | 0.70m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

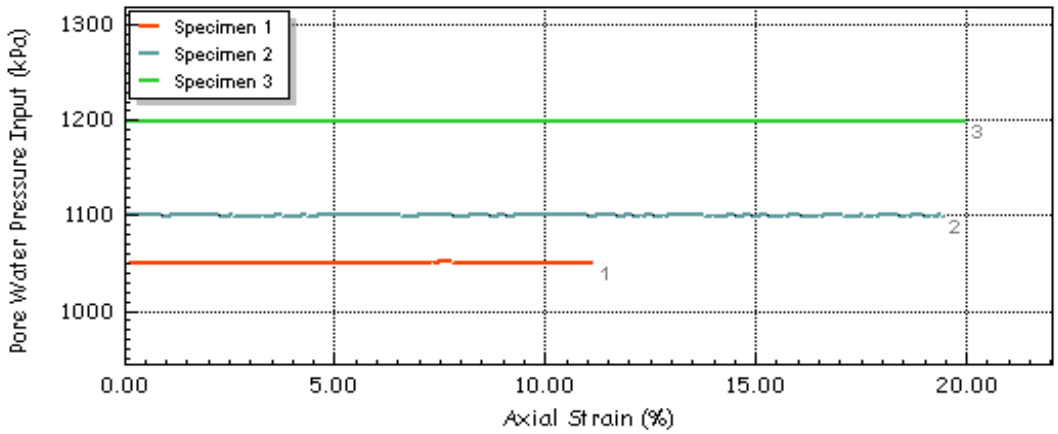
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**



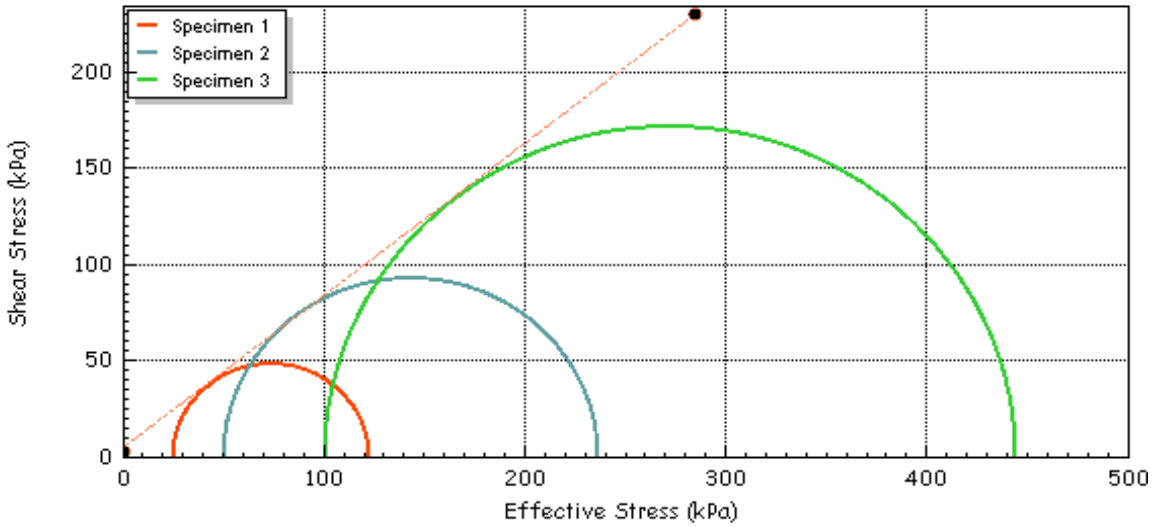

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY UKAS TESTING 4043 | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF__GI-04_Samp 0.70m P02 B1 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne off shore | | Borehole | OWF_GI-04_Samp |
| | | | | Sample | 0.70m P02 B1 |
| | Client | Geoquip Marine | | Depth | 0.70m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

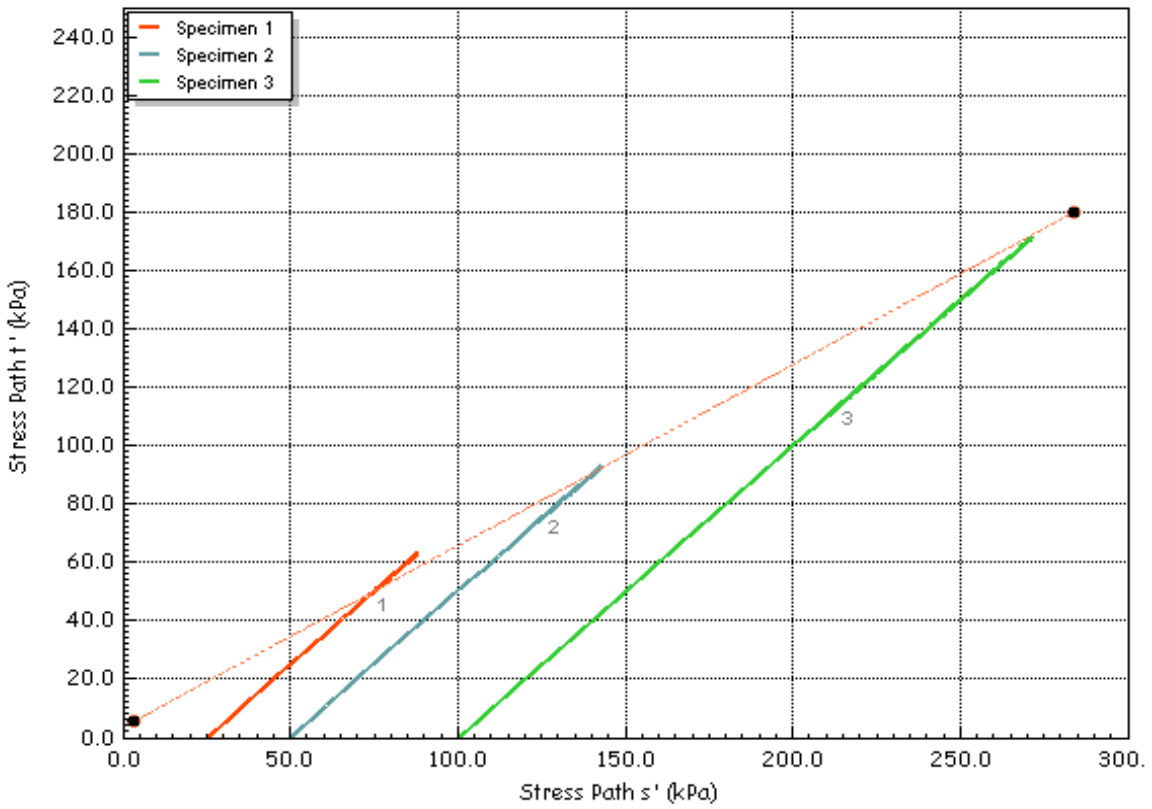
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Effective | c' | (kPa) | 3.77 | Effective Cohesion | c' | (kPa) | 3.77 |
| Effective Friction | ϕ' | (deg) | 38.5 | Effective Friction | ϕ' | (deg) | 38.5 |



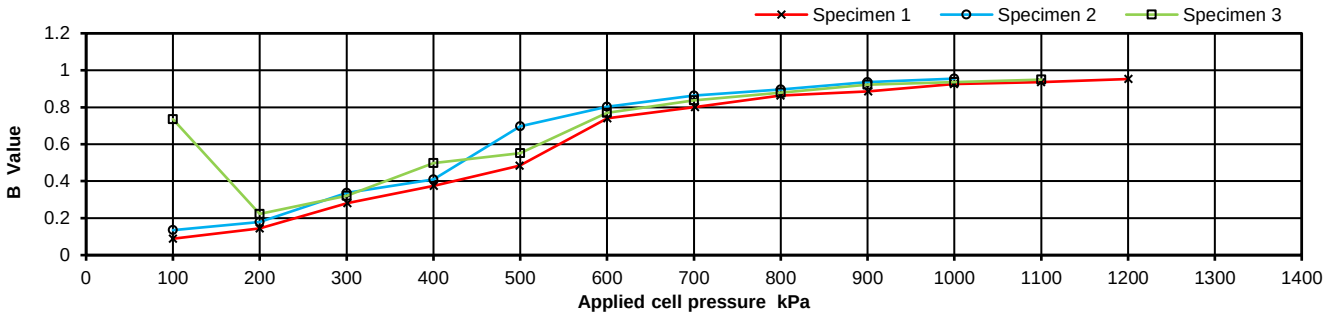

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | Test Name | OWF__GI-04_Samp 0.70m P02 B1 | |
| | | | Test Date | 19/04/2023 | |
| | Jobfile | GMOP21-G-019 A05 Bretagne off shore | Borehole | OWF_GI-04_Samp | |
| | | | Sample | 0.70m P02 B1 | |
| | Client | Geoquip Marine | Depth | 0.70m | |
| | Operator | D.Burton | Checked | S.Royle | Approved S.Royle |

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Isotropic Drained Triaxial Compression Test with measurement of volume change** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU01A |
| Soil Description | 2.5y 5/6 Light olive brown SAND with shell fragments | | | Depth m | 0.00 |
| Specimen Reference | PU01A | Specimen Depth | 0.00 m | Sample Type | B1 |
| Specimen Description | 2.5y 5/6 Light olive brown SAND including shell fragments | | | KeyLAB ID | BH012023022753 |
| Test Method | BS EN ISO 17892 Part 9: Consolidated Trixial Compression Tests | | | | |

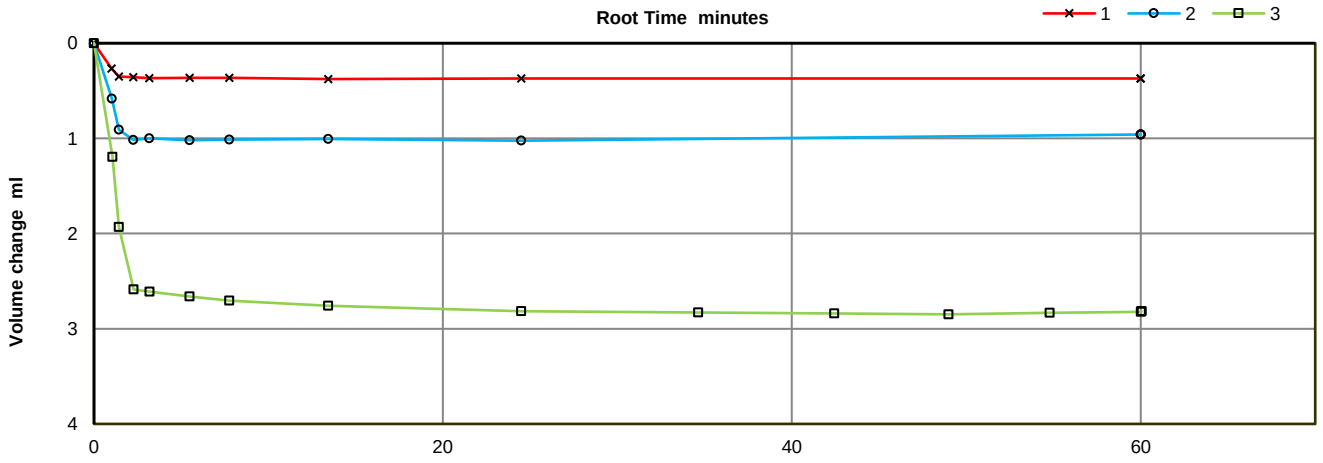
| | |
|---|---|
| Specimen Type/Preparation | REMOULDED 1.32DD 25/50/100 kPa |

| **Specimen Details** | | | 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial | Height | mm | 99.9 | 100.0 | 100.0 |
| | Diameter | mm | 50.0 | 50.0 | 50.0 |
| | Bulk Density | Mg/m³ | 1.46 | 1.46 | 1.48 |
| | Water Content | % | 10.0 | 10.0 | 10.0 |
| | Dry density | Mg/m³ | 1.33 | 1.33 | 1.35 |
| Final | Bulk Density | Mg/m³ | 1.64 | 1.68 | 1.70 |
| | Water Content | % | 23.0 | 19.9 | 21.7 |
| | Dry density | Mg/m³ | 1.32 | 1.32 | 1.35 |

| **Saturation Details** | | 1 | 2 | 3 |
|---|---|---|---|---|
| Method | | Back pressure method | Back pressure method | Back pressure method |
| Cell pressure increments | kPa | 100 | 100 | 100 |
| Differential Pressure | kPa | 10 | 10 | 10 |
| Final Cell Pressure | kPa | 1400 | 1400 | 1100 |
| Final pore water pressure | kPa | 1291 | 1290 | 990 |
| Final B Value | | 0.96 | 0.96 | 0.95 |
| Time Taken to saturate | Day | 2.00 | 2.00 | 2.00 |



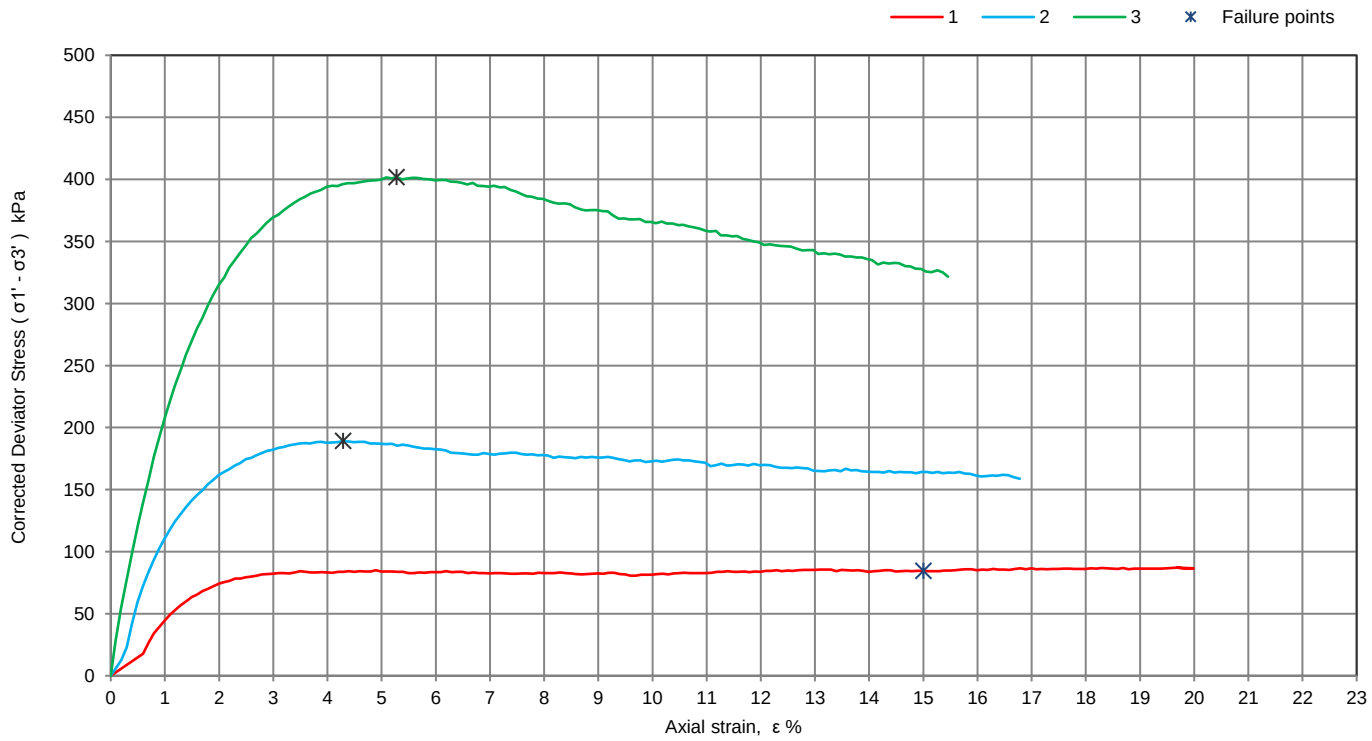

| **Consolidation Details** | | | | | |
|---|---|---|---|---|---|
| Specimen No. | 1 | 2 | 3 | | |
| Time Taken to consolidate | 1 | 1 | 1 | Days | |
| Drainage Conditions | One end | One end | One end | | |
| Cell Pressure applied | 1225 | 1050 | 1200 | kPa | |
| Back Pressure applied | 1200 | 1000 | 1100 | kPa | |
| Effective Pressure | 25 | 50 | 100 | kPa | |
| Pore pressure at start of consolidation | 1212 | 1037 | 1181 | kPa | |
| Pore pressure at end of consolidation | 1203 | 1004 | 1101 | kPa | |
| Pore pressure dissipation at end of consolidation | 72 | 89 | 99 | % | |

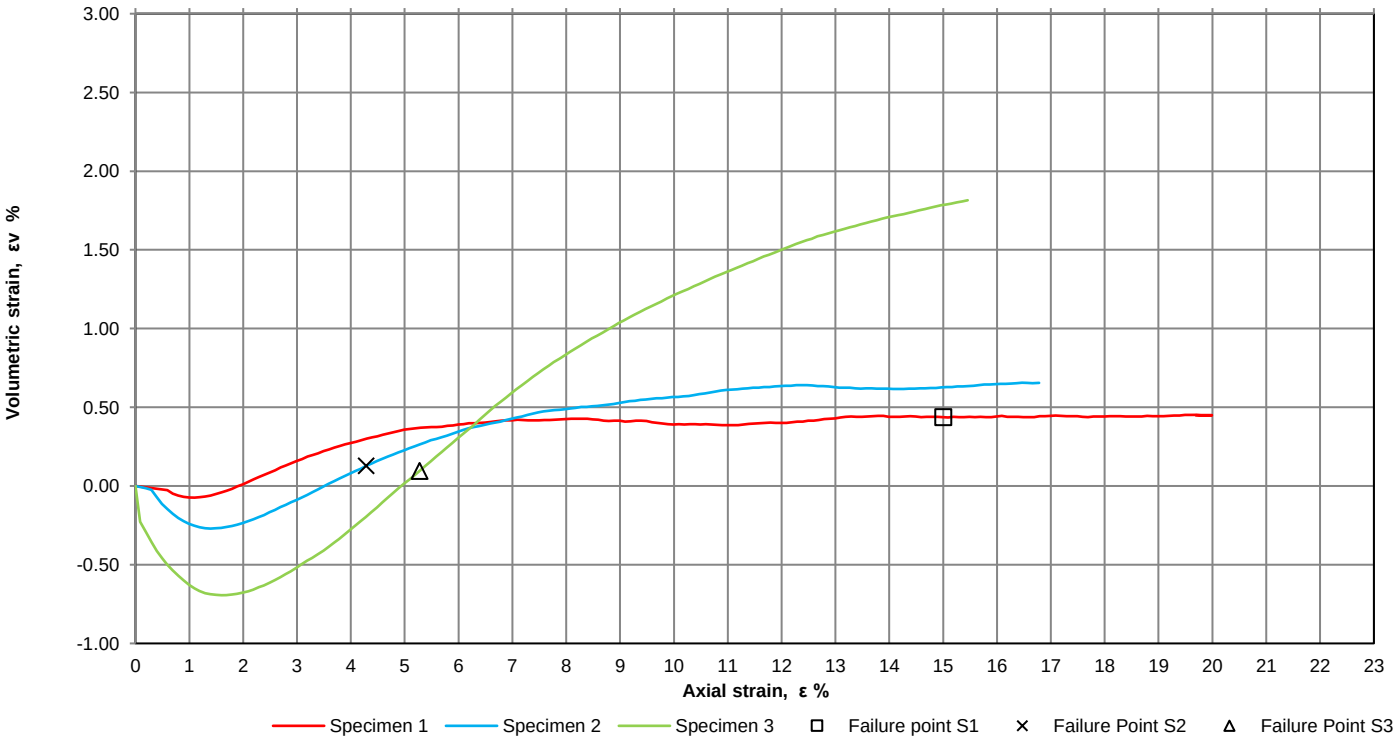



| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 27/07/2023 10:54 | D.Smith | Sheet No. | 1 of 3 |

Lab Sheet Reference : GM-L-TSR-46

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU01A |
| Specimen Reference | PU01A | Specimen Depth | 0.00 | m | Depth m | 0.00 |
| Compression stages - graphical data | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH012023022753 |




| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 27/07/2023 10:54 | D.Smith | Sheet No. | 2 of 3 |

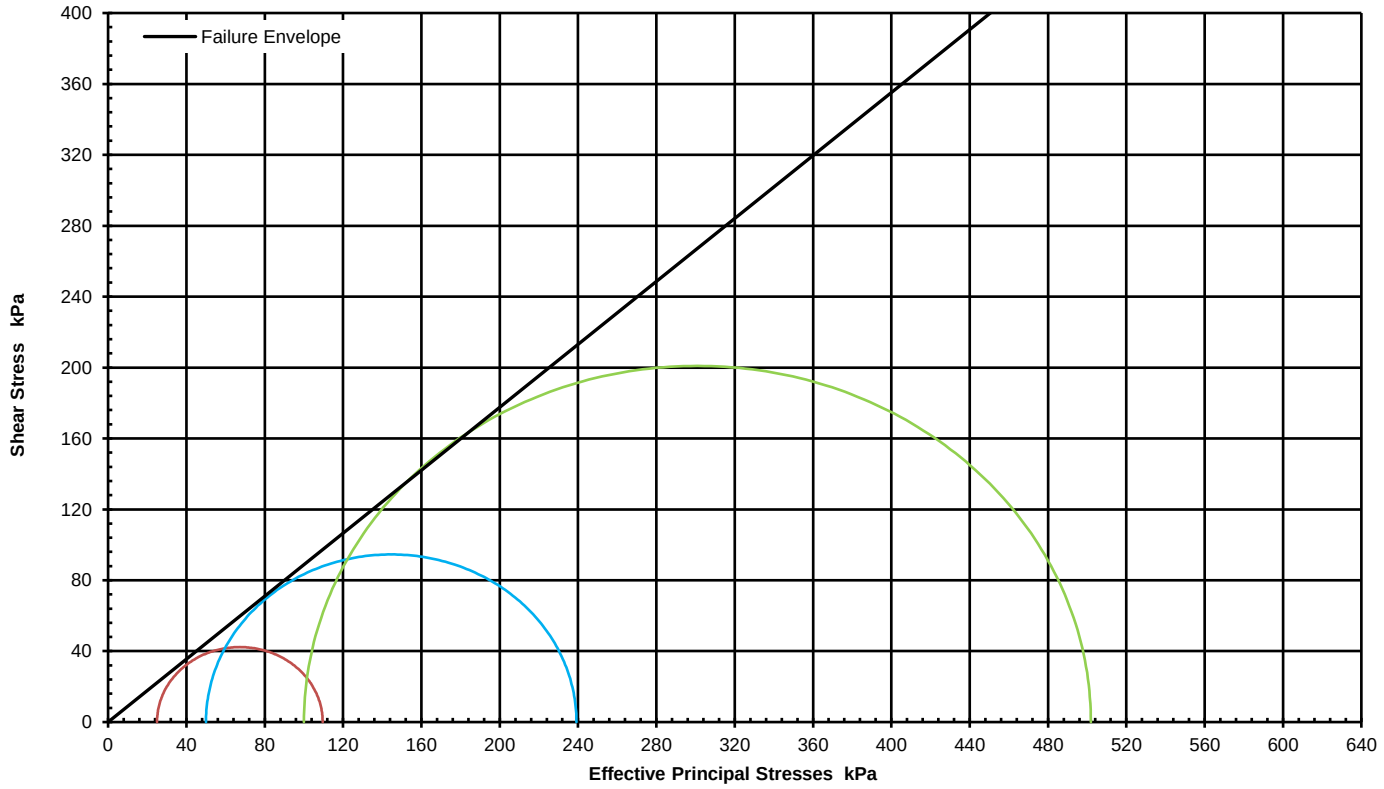
Lab Sheet Reference : GM-L-TSR-46

| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU01A |
| Specimen Reference | PU01A | Specimen Depth | 0.00 | m | Depth m | 0.00 |
| Compression stages - table of results and interpretation | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH012023022753 |

At maximum deviator stress ( failure )

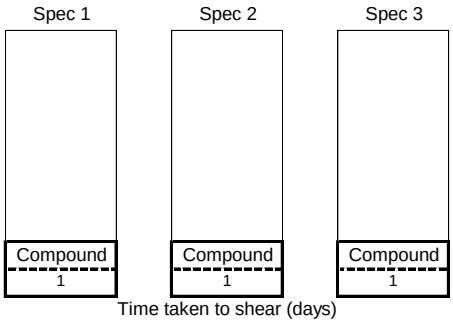
| Specimen | Cell pressure kPa | Initial pwp kPa | Initial $\sigma_3'$ kPa | Rate of strain %/hr | Axial strain, $\varepsilon_f$ % | $(\sigma_1' - \sigma_3')_f$ kPa | Volumetric strain, $\varepsilon_v$ % per hr | $\sigma_3'_f$ kPa | $\sigma_1'_f$ kPa | Specimen Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1225 | 1200 | 25 | 2.00 | 15.0 | 85 | 0.4 | 25 | 110 | |
| 2 | 1050 | 1000 | 50 | 2.00 | 4.3 | 189 | 0.1 | 50 | 239 | |
| 3 | 1200 | 1100 | 100 | 2.00 | 5.3 | 402 | 0.1 | 100 | 502 | |

**Mohr Circles**




| Shear Strength Parameters | | Linear regression | Manual re-assessment |
|---|---|---|---|
| c ' | kPa | [ -4.8 ] | 0 |
| Ø ' | degrees | [ 42.8 ] | 41.6 |

Mode of failure




Time taken to shear (days)

**General Remarks**

Deviator stresses corrected for area change, and up to 0.25 mm thick rubber membrane/

| Total Time of test: | 4.00 | 4.00 | 4.00 | 12.00 | Days |
|---|---|---|---|---|---|
| | S1 | S2 | S3 | All spec | |

f Denotes at failure

Positive volume changes indicate water out of specimen ( consolidation )

Lab Sheet Reference : GM-L-TSR-46

| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 27/07/2023 10:54 | D.Smith | Sheet No. | 3 of 3 |

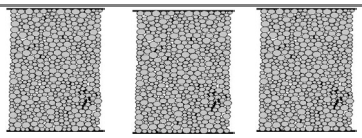
# Effective Stress Triaxial Compression

## Consolidated Drained

**Summary Report**

**Sample Details**

*sketch showing specimen location in original sample*



| | |
|---|---|
| Depth | 1.15m |
| Description | Brown slightly gravelly fine SAND. |
| Type | Recompacted at 1.58 DD, 10% moisture content. |

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Sample Length | $L_0$ | (mm) | 76.0 | 76.0 | 76.0 |
| Initial Sample Diameter | $D_0$ | (mm) | 38.0 | 38.0 | 38.0 |
| Initial Sample Weight | $W_0$ | (gr) | 150.0 | 150.0 | 150.0 |
| Initial Bulk Density | $\rho_0$ | (Mg/m3) | 1.74 | 1.74 | 1.74 |
| Particle Density | $\rho_s$ | (Mg/m3) | 2.66 | 2.66 | 2.66 |

**Initial Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_{3i}$ | (kPa) | 1275 | 1300 | 1350 |
| Initial Back Pressure | $U_{bi}$ | (kPa) | 1250 | 1250 | 1250 |
| Membrane Thickness | $m_b$ | (mm) | 0.400 | 0.400 | 0.400 |
| Displacement Input | $L_{IP}$ | (mm) | CH 2 | CH 2 | CH 2 |
| Load Input | $N_{IP}$ | (N) | CH 4 | CH 4 | CH 4 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | CH 3 | CH 3 | CH 3 |
| Sample Volume | $V$ | (cc) | CH 6 | CH 6 | CH 6 |
| Initial Moisture | $\omega_i$ | (%) | 11 | 10 | 10 |
| Initial Dry Density | $\rho_{di}$ | (Mg/m3) | 1.57 | 1.58 | 1.58 |
| Initial Voids Ratio | $e_i$ | . | 0.689 | 0.687 | 0.688 |
| Initial Degree of Saturation | $S_i$ | (%) | 41 | 40 | 40 |
| B Value | $B$ | . | 0.98 | 0.99 | 0.99 |

**Final Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Final Moisture | $\omega_f$ | (%) | 31 | 28 | 28 |
| Final Dry Density | $\rho_{df}$ | (Mg/m3) | 1.58 | 1.58 | 1.59 |
| Final Voids Ratio | $e_f$ | . | 0.686 | 0.682 | 0.677 |
| Final Degree of Saturation | $S_f$ | (%) | 100.0 | 100.0 | 100.0 |
| Failure Criteria | | . | Max. Dev. Stress | Max. Dev. Stress | Max. Dev. Stress |
| Strain At Failure | $\varepsilon_f$ | (%) | 2.61 | 4.03 | 3.34 |
| Stress At Failure | $(\sigma_1-\sigma_3)_f$ | (kPa) | 87.0 | 156.2 | 307.7 |
| Minor Stress At Failure | $\sigma_3'$ | (kPa) | 25.0 | 50.0 | 100.1 |
| Major Stress At Failure | $\sigma_1'$ | (kPa) | 112.0 | 206.2 | 407.9 |
| Principal Stress Ratio At Failure | $\sigma_1'/\sigma_3'$ | | 4.482 | 4.125 | 4.073 |
| PwP At Failure Criteria | $u_f$ | (kPa) | 1246.0 | 1245.1 | 1251.8 |

**Notes**

*Compound*

| | | | |
|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | Test Name | OWF_GI-11_Samp 1.15m PU02A |
| | | Test Date | 19/04/2023 |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | Borehole | OWF_GI-11_Samp |
| | | Sample | 1.15m PU02A B2 |
| Client | Geoquip Marine | Depth | 1.15m |
| Operator | D.Burton | Checked | S.Royle |
| | | Approved | S.Royle |

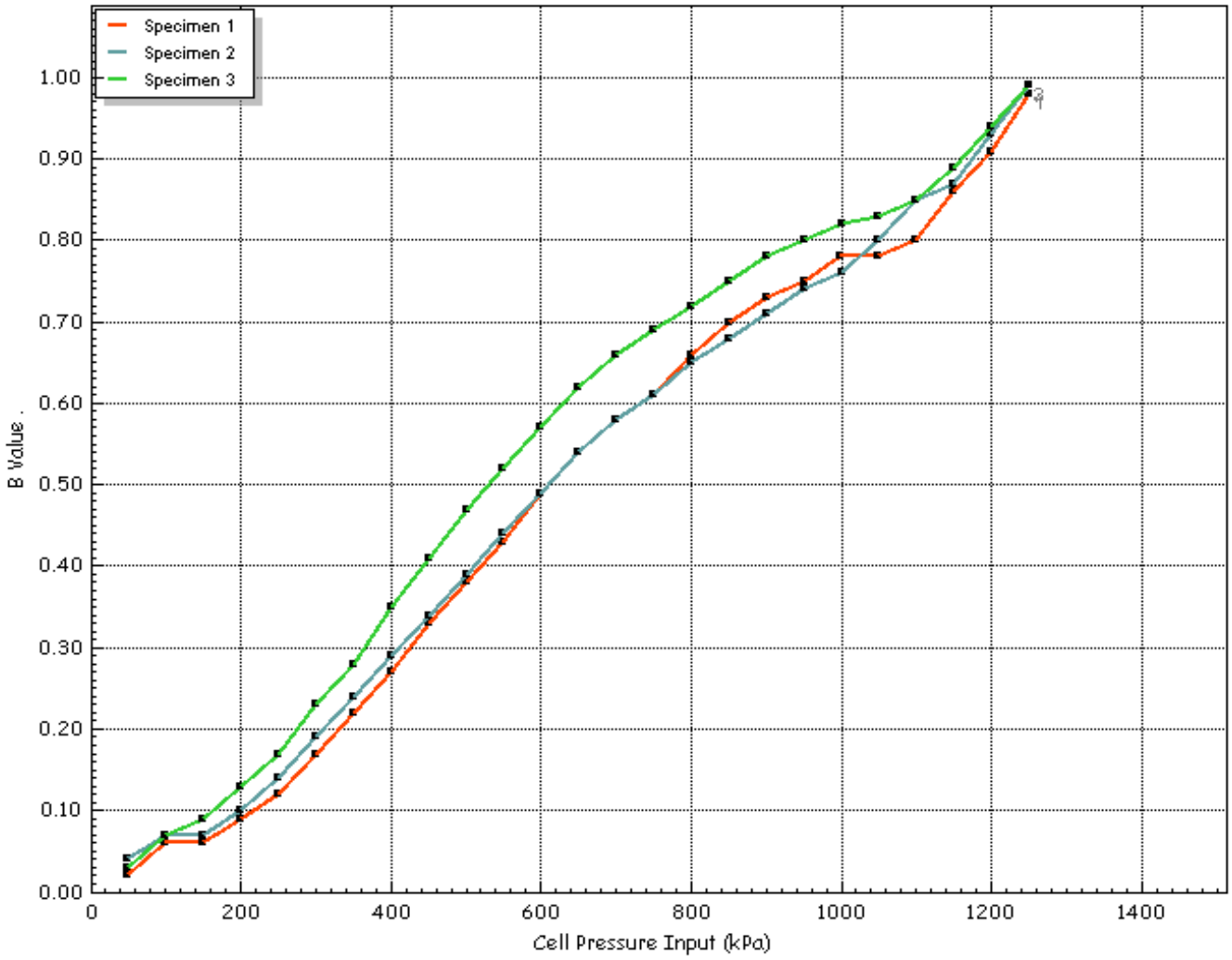
PSL PROFESSIONAL SOILS LABORATORY — UKAS TESTING 4043

# Effective Stress Triaxial Compression

## Consolidated Drained

**Saturation Plots**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Saturation Method | | | Stepped | Stepped | Stepped |
| Cell Pressure Input | σ | (kPa) | 1249 | 1250 | 1250 |
| Pore Water Pressure Input | u pwp | (kPa) | 1234 | 1235 | 1242 |
| B Value | B | . | 0.98 | 0.99 | 0.99 |




| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-11_Samp 1.15m PU02A |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-11_Samp |
| | | | | Sample | 1.15m PU02A B2 |
| UKAS TESTING 4043 | Client | Geoquip Marine | | Depth | 1.15m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

# Effective Stress Triaxial Compression

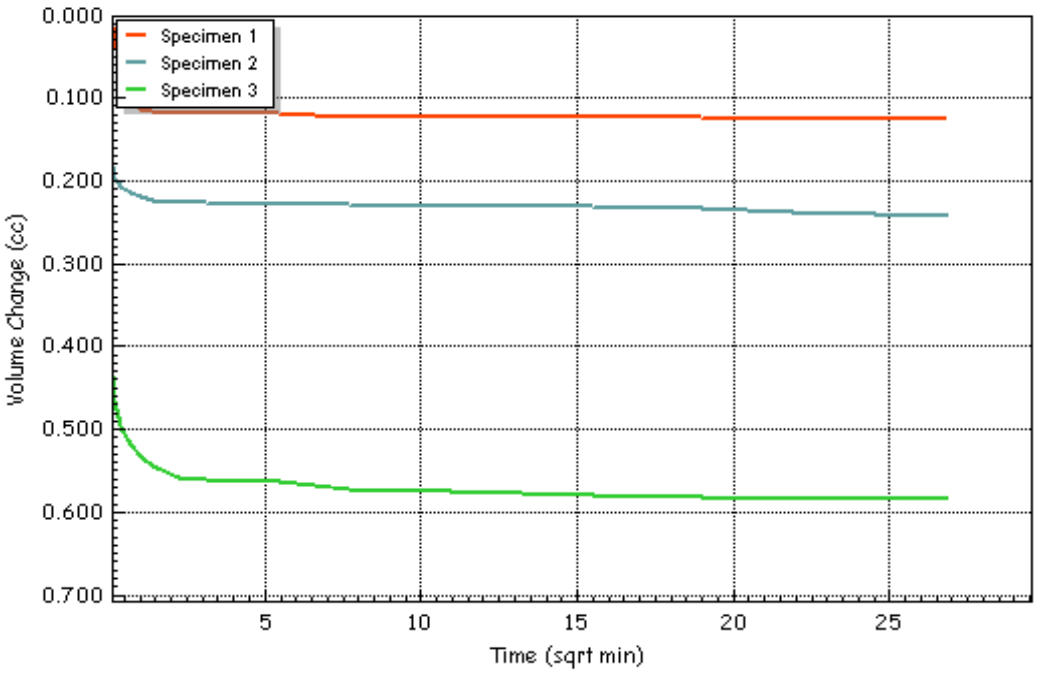
## Consolidated Drained

**Consolidation Plots**

| **Initial Conditions** | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_3$ | (kPa) | 1275 | 1300 | 1350 |
| Initial Back Pressure | $u_{bi}$ | (kPa) | 1250 | 1250 | 1250 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | 1260 | 1278 | 1330 |
| Drainage Method | | | From One End | From One End | From One End |

| **Final Conditions** | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| PWP Dissipation % | U% | (%) | 100.00 | 100.00 | 100.00 |
| Volumetric Strain | $\varepsilon_v$% | (%) | 0.15 | 0.28 | 0.68 |
| Corrected Length | $L_c$ | (mm) | 76.0 | 75.9 | 75.8 |
| Corrected Area | $A_c$ | (cm2) | 11.33 | 11.32 | 11.29 |
| Corrected Volume | $V_c$ | (cc) | 86.068 | 85.952 | 85.610 |
| t100 | $t_{100}$ | (min) | 0.85 | 2.93 | 2.68 |
| Consolidation | $c_v$ | (m2/year | 28.037 | 8.126 | 8.861 |
| Compressibility | $m_v$ | (m2/MN) | 0.145 | 0.100 | 0.085 |
| Test Time | $t_F$ | (h:m:s) | 02:00:00 | 02:00:00 | 02:00:00 |
| Estimated Strain to Failure | $\varepsilon$% | (%) | 5.0 | 5.0 | 5.0 |
| Shear Machine Speed | $d_r$ | (mm/min | 0.03165 | 0.03164 | 0.03160 |

**Notes**

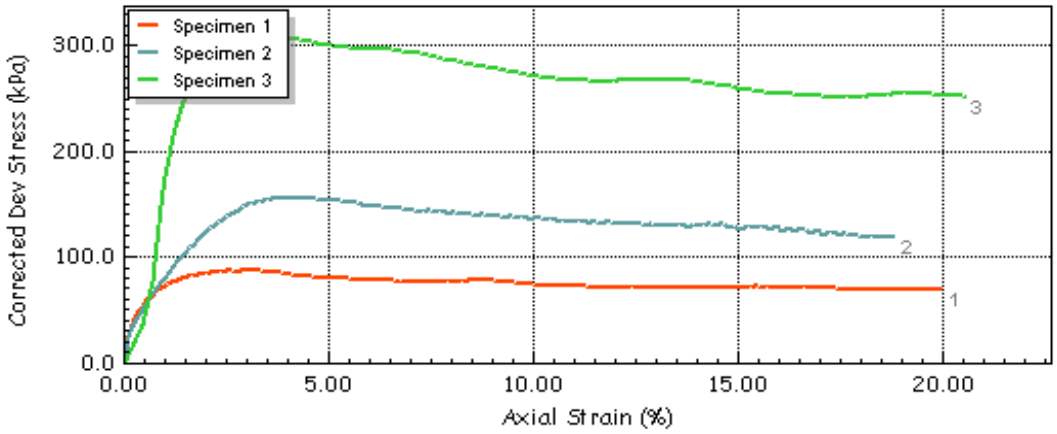


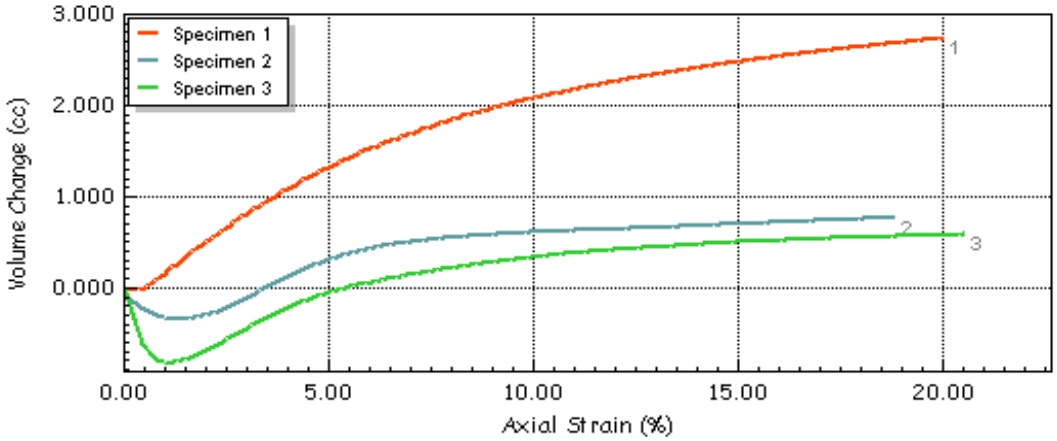

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-11_Samp 1.15m PU02A |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-11_Samp |
| | | | | Sample | 1.15m PU02A B2 |
| | Client | Geoquip Marine | | Depth | 1.15m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

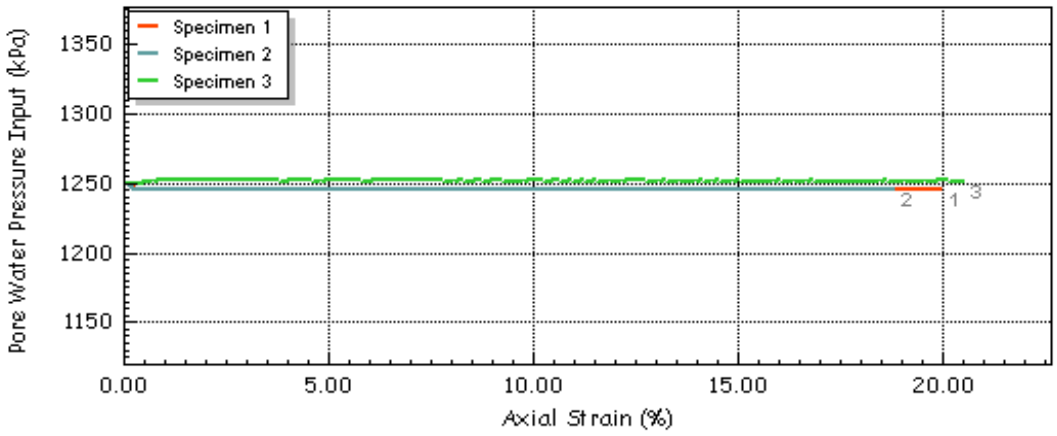
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**



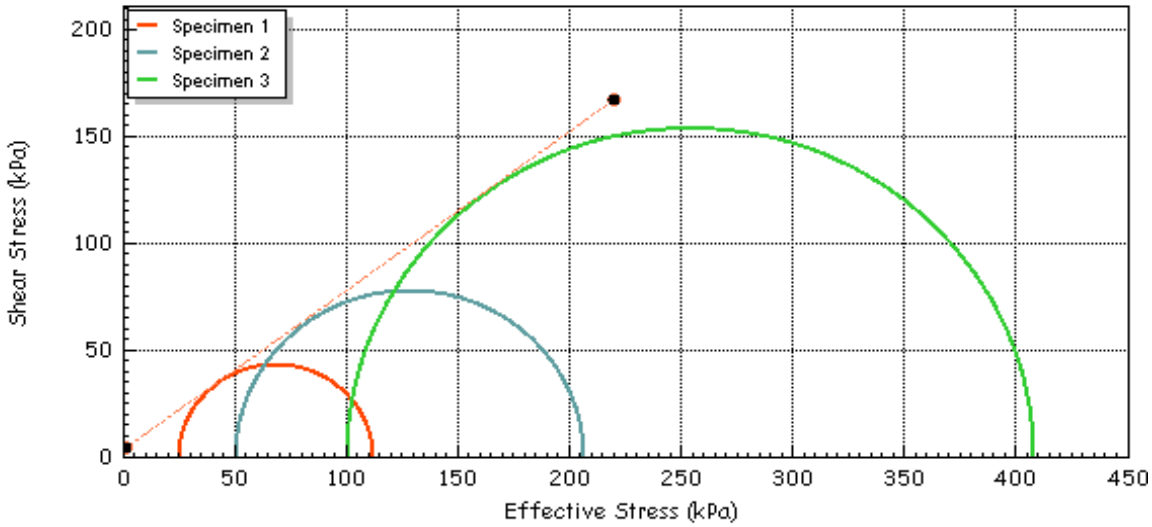

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY — UKAS TESTING 4043 | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-11_Samp 1.15m PU02A B2 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-11_Samp |
| | | | | Sample | 1.15m PU02A B2 |
| | Client | Geoquip Marine | | Depth | 1.15m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

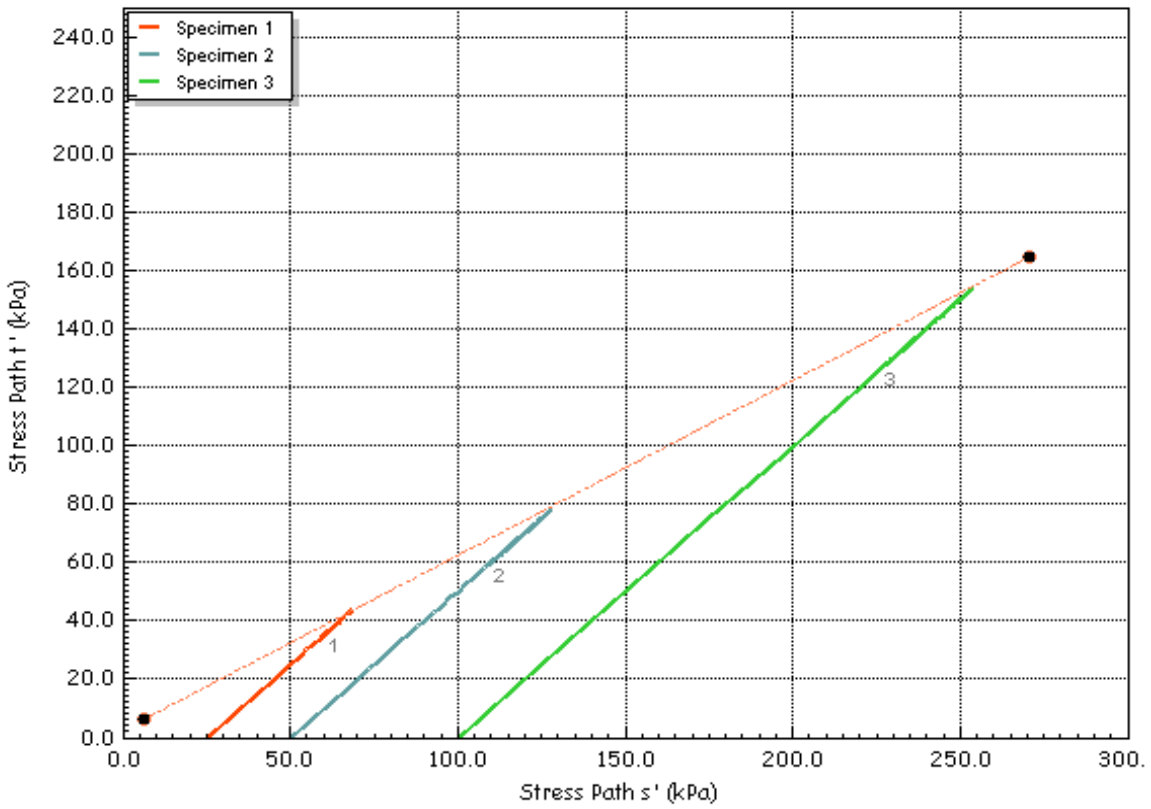
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Effective | c' | (kPa) | 3.09 | Effective Cohesion | c' | (kPa) | 3.09 |
| Effective Friction | ϕ' | (deg) | 36.8 | Effective Friction | ϕ' | (deg) | 36.8 |



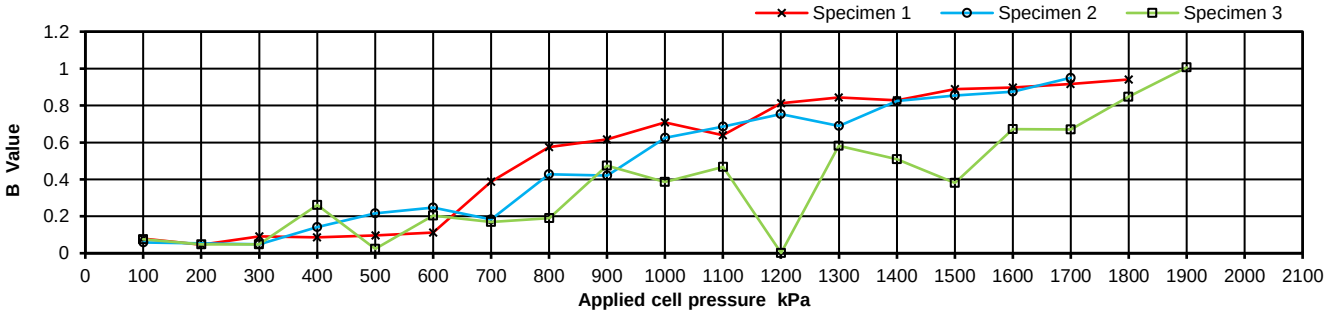

| | | | | | |
|---|---|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-11_Samp 1.15m PU02A | |
| | | | Test Date | 19/04/2023 | |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-11_Samp | |
| | | | Sample | 1.15m PU02A B2 | |
| Client | Geoquip Marine | | Depth | 1.15m | |
| Operator | D.Burton | Checked S.Royle | Approved | S.Royle | |

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU03 |
| Soil Description | 2.5y 4/1 Dark grey silty SAND | | | Depth m | 2.00 |
| Specimen Reference | B1 | Specimen Depth | 2.00 m | Sample Type | B1 |
| Specimen Description | 2.5y 4/1 Dark grey silty SAND | | | KeyLAB ID | BH0120230227178 |
| Test Method | BS EN ISO 17892 Part 9: Consolidated Trixial Compression Tests | | | | |

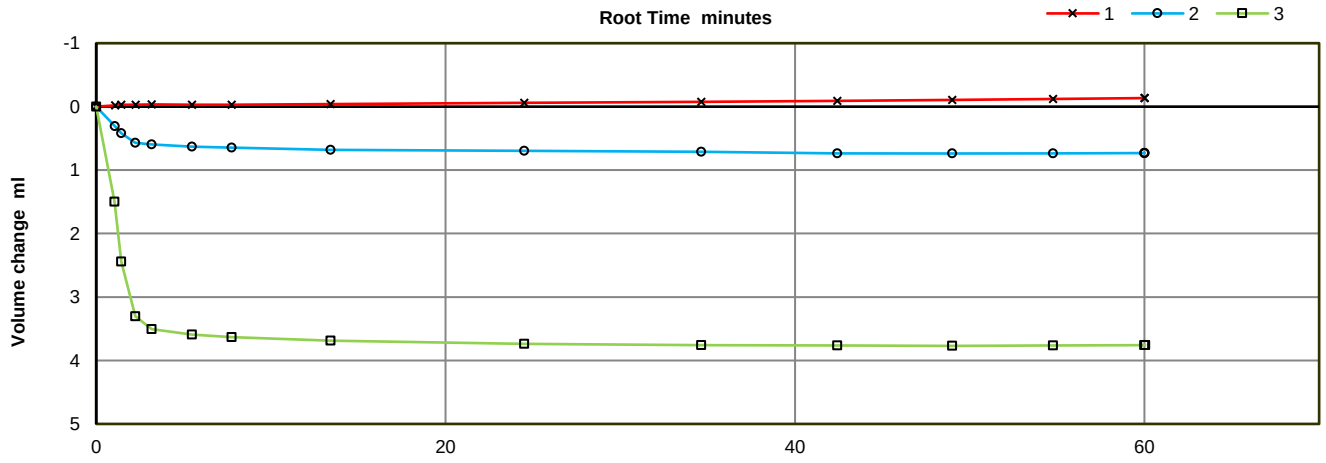
| | |
|---|---|
| Specimen Type/Preparation | REMOULDED 1.46DD 25/50/100 kPa 10% MC |

| **Specimen Details** | | | 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial | Height | mm | 100.0 | 139.9 | 100.0 |
| | Diameter | mm | 50.0 | 70.0 | 50.0 |
| | Bulk Density | Mg/m³ | 1.61 | 1.60 | 1.61 |
| | Water Content | % | 9.7 | 10.0 | 10.0 |
| | Dry density | Mg/m³ | 1.47 | 1.46 | 1.46 |
| Final | Bulk Density | Mg/m³ | 1.70 | 1.78 | 1.82 |
| | Water Content | % | 23.5 | 22.0 | 24.6 |
| | Dry density | Mg/m³ | 1.46 | 1.45 | 1.47 |

| **Saturation Details** | | 1 | 2 | 3 |
|---|---|---|---|---|
| Method | | Back pressure method | Back pressure method | Back pressure method |
| Cell pressure increments | kPa | 100 | 100 | 100 |
| Differential Pressure | kPa | 20 | 20 | 20 |
| Final Cell Pressure | kPa | 1800 | 1700 | 1900 |
| Final pore water pressure | kPa | 1680 | 1581 | 1853 |
| Final B Value | | 0.94 | 0.95 | 1.01 |



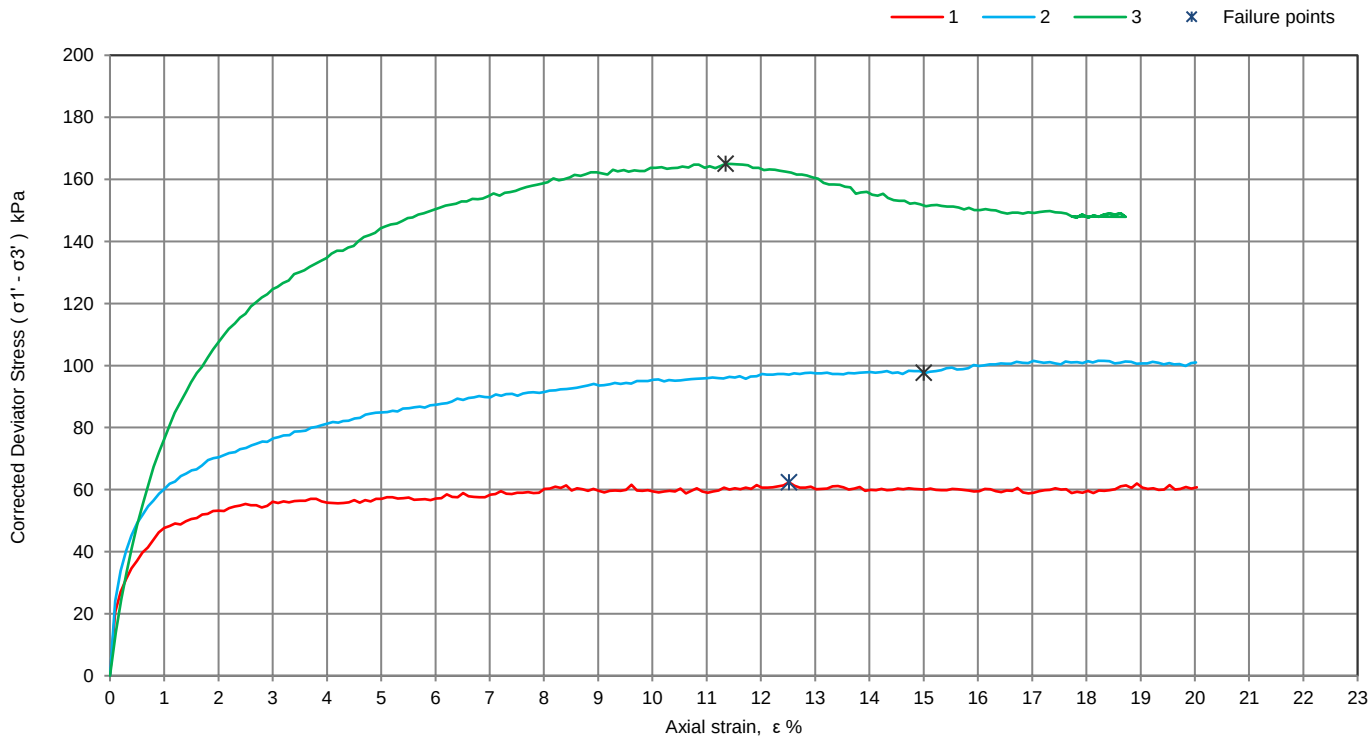

| **Consolidation Details** | Specimen No. | 1 | 2 | 3 | |
|---|---|---|---|---|---|
| | Drainage Conditions | One end | One end | One end | |
| | Cell Pressure applied | 1825 | 1750 | 2050 | kPa |
| | Back Pressure applied | 1800 | 1701 | 1950 | kPa |
| | Effective Pressure | 25 | 50 | 100 | kPa |
| | Pore pressure at start of consolidation | 1799 | 1723 | 2060 | kPa |
| | Pore pressure at end of consolidation | 1803 | 1701 | 1961 | kPa |
| | Pore pressure dissipation at end of consolidation | 478 | 100 | 90 | % |

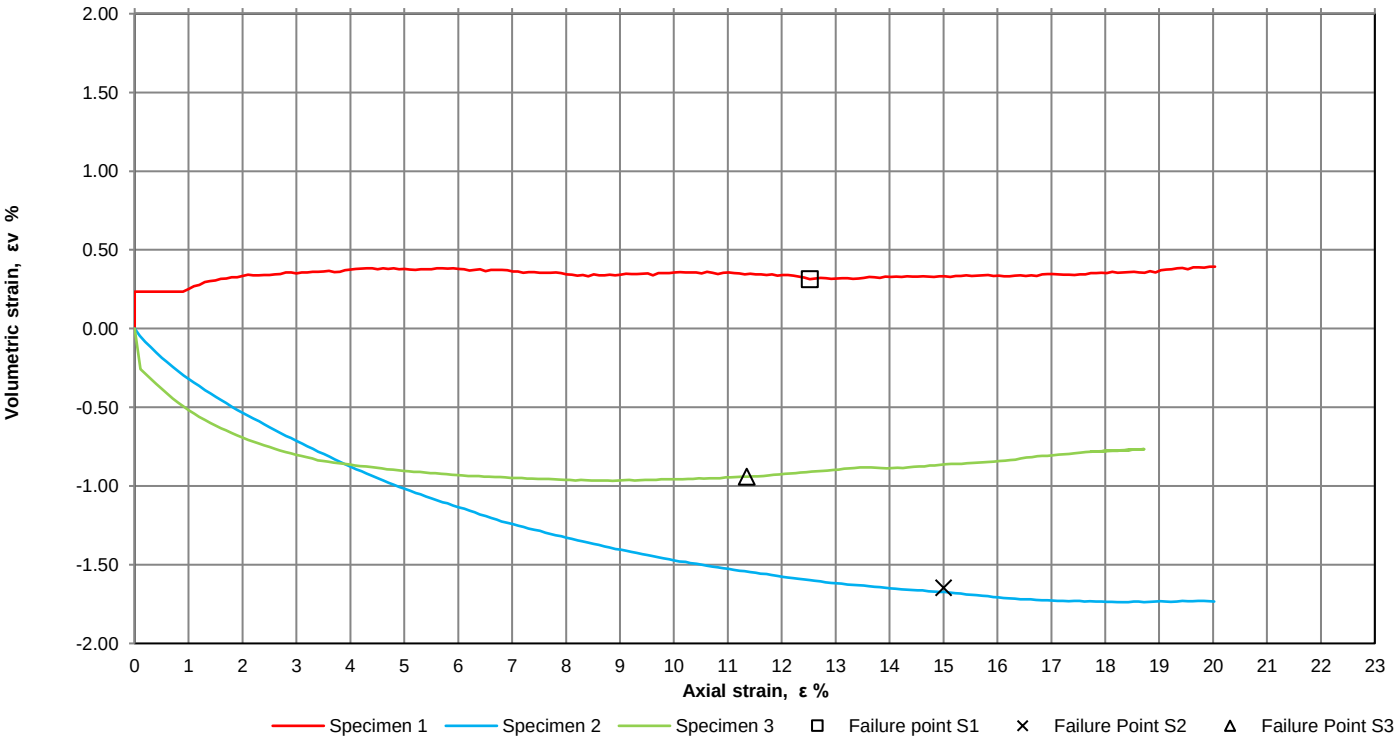



| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 23/05/2023 15:10 | D.Smith | Sheet No. | 1 of 3 |

Lab Sheet Reference :

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU03 |
| Specimen Reference | B1 | Specimen Depth | 2.00 | m | Depth m | 2.00 |
| Compression stages - graphical data | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH0120230227178 |




Lab Sheet Reference :

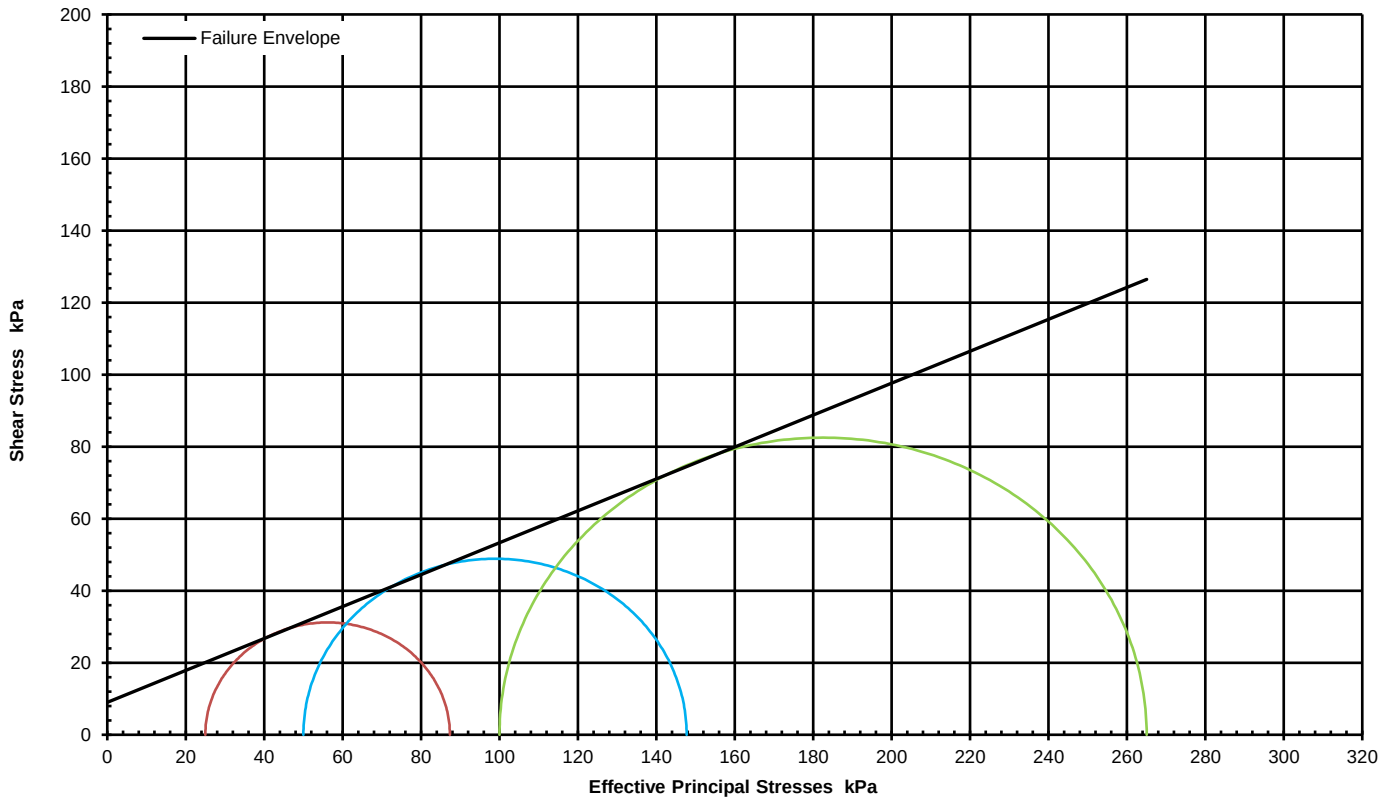
| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 23/05/2023 15:10 | D.Smith | Sheet No. | 2 of 3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU03 |
| Specimen Reference | B1 | Specimen Depth | 2.00 | m | Depth m | 2.00 |
| Compression stages - table of results and interpretation | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH0120230227178 |

At maximum deviator stress ( failure )

| Specimen | Cell pressure kPa | Initial pwp kPa | Initial $\sigma_3'$ kPa | Rate of strain %/hr | Axial strain, $\varepsilon_f$ % | $(\sigma_1' - \sigma_3')_f$ kPa | Volumetric strain, $\varepsilon_v$ % per hr | $\sigma_{3f}'$ kPa | $\sigma_{1f}'$ kPa | Specimen Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1825 | 1800 | 25 | 1.00 | 12.5 | 62 | 0.3 | 25 | 87 | |
| 2 | 1750 | 1701 | 50 | 1.00 | 15.0 | 98 | -1.6 | 50 | 148 | |
| 3 | 2050 | 1950 | 100 | 1.00 | 11.4 | 165 | -0.9 | 100 | 265 | |

**Mohr Circles**




| Shear Strength Parameters | | Linear regression | Manual re-assessment |
|---|---|---|---|
| c ' | kPa | 9.3 | - |
| Ø ' | degrees | 23.9 | - |

Mode of failure

| Plastic | Plastic | Compound |
|---|---|---|
| | | |

**General Remarks**

Deviator stresses corrected for area change, and up to 0.25 mm thick rubber membrane/Specimen 1 Swelled

f Denotes at failure

Positive volume changes indicate water out of specimen ( consolidation )

Lab Sheet Reference :

| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 23/05/2023 15:10 | D.Smith | Sheet No. | 3 of 3 |

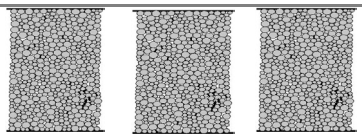
# Effective Stress Triaxial Compression

## Consolidated Drained

**Summary Report**

**Sample Details**

*sketch showing specimen location in original sample*



| | |
|---|---|
| Depth | 1.20m |
| Description | Brown slightly gravelly SAND. |
| Type | Recompacted at 1.59 DD, 10% moisture content. |

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Sample Length | $L_0$ | (mm) | 76.0 | 76.0 | 76.0 |
| Initial Sample Diameter | $D_0$ | (mm) | 38.0 | 38.0 | 38.0 |
| Initial Sample Weight | $W_0$ | (gr) | 151.0 | 151.0 | 151.0 |
| Initial Bulk Density | $\rho_0$ | (Mg/m3) | 1.75 | 1.75 | 1.75 |
| Particle Density | $\rho_s$ | (Mg/m3) | 2.66 | 2.66 | 2.66 |

**Initial Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_{3i}$ | (kPa) | 1225 | 950 | 1150 |
| Initial Back Pressure | $U_{bi}$ | (kPa) | 1200 | 900 | 1050 |
| Membrane Thickness | $m_b$ | (mm) | 0.400 | 0.400 | 0.400 |
| Displacement Input | $L_{IP}$ | (mm) | CH 2 | CH 2 | CH 2 |
| Load Input | $N_{IP}$ | (N) | CH 4 | CH 4 | CH 4 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | CH 3 | CH 3 | CH 3 |
| Sample Volume | $V$ | (cc) | CH 6 | CH 6 | CH 6 |
| Initial Moisture | $\omega_i$ | (%) | 10 | 10 | 10 |
| Initial Dry Density | $\rho_{di}$ | (Mg/m3) | 1.59 | 1.59 | 1.59 |
| Initial Voids Ratio | $e_i$ | . | 0.674 | 0.674 | 0.674 |
| Initial Degree of Saturation | $S_i$ | (%) | 40 | 40 | 40 |
| B Value | $B$ | . | 0.98 | 1.07 | 0.98 |

**Final Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Final Moisture | $\omega_f$ | (%) | 22 | 21 | 21 |
| Final Dry Density | $\rho_{df}$ | (Mg/m3) | 1.59 | 1.60 | 1.60 |
| Final Voids Ratio | $e_f$ | . | 0.670 | 0.664 | 0.659 |
| Final Degree of Saturation | $S_f$ | (%) | 88.4 | 85.6 | 83.1 |
| Failure Criteria | | . | Max. Dev. Stress | Max. Dev. Stress | Max. Dev. Stress |
| Strain At Failure | $\varepsilon_f$ | (%) | 6.21 | 7.31 | 2.59 |
| Stress At Failure | $(\sigma_1-\sigma_3)_f$ | (kPa) | 91.0 | 168.7 | 313.1 |
| Minor Stress At Failure | $\sigma_3'$ | (kPa) | 25.3 | 50.0 | 100.0 |
| Major Stress At Failure | $\sigma_1'$ | (kPa) | 116.3 | 218.7 | 413.1 |
| Principal Stress Ratio At Failure | $\sigma_1'/\sigma_3'$ | | 4.597 | 4.373 | 4.131 |
| PwP At Failure Criteria | $u_f$ | (kPa) | 1201.5 | 900.0 | 1047.0 |

**Notes**

*Compound*

PSL PROFESSIONAL SOILS LABORATORY — A PHENNA GROUP COMPANY — UKAS TESTING 4043

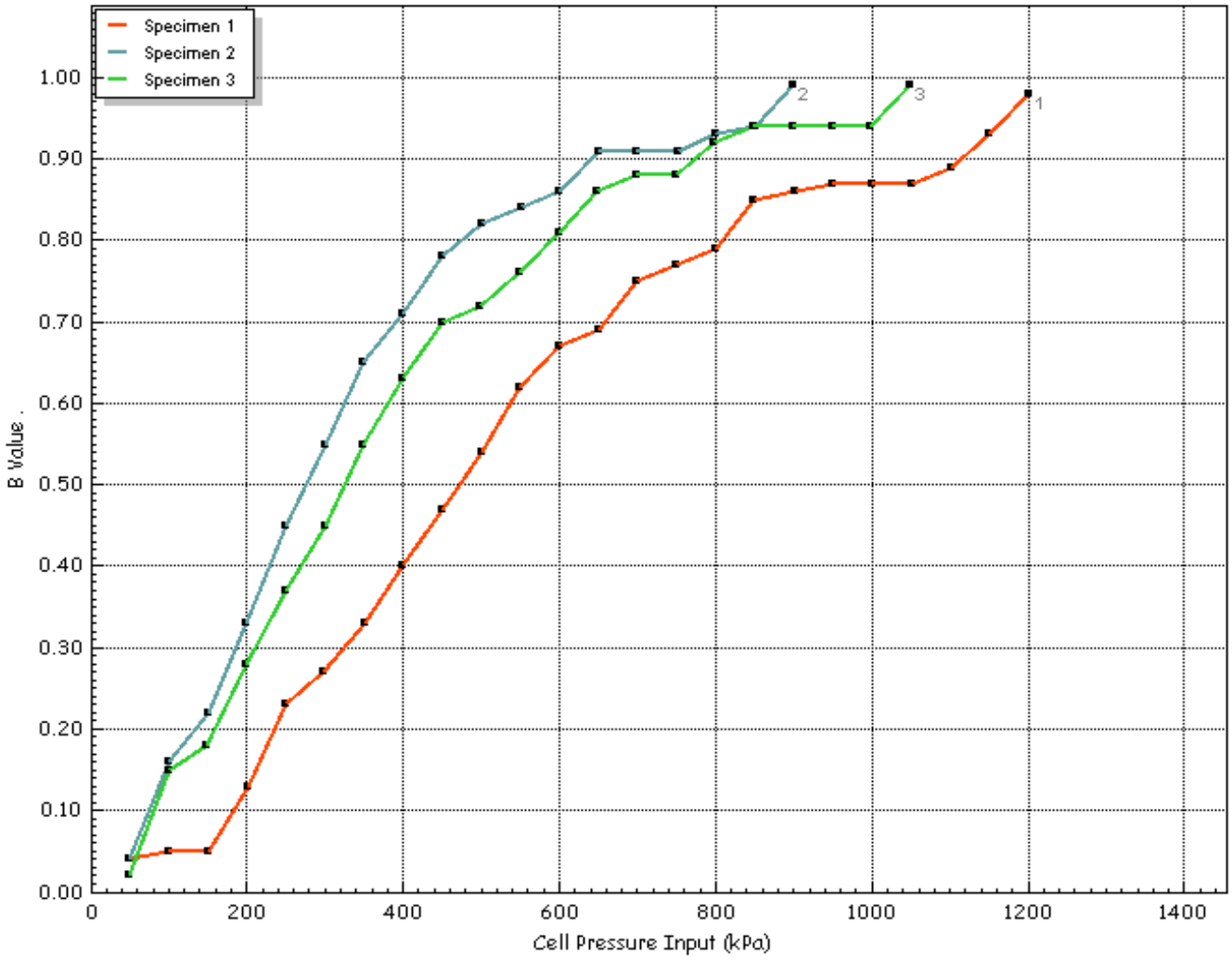
| | | | | | |
|---|---|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | | | Test Name | OWF_GI-12_Samp 1.20m PU02 B2 |
| | | | | Test Date | 19/04/2023 |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | | | Borehole | OWF_GI-12_Samp |
| | | | | Sample | 1.20m PU02 B2 |
| Client | Geoquip Marine | | | Depth | 1.20m |
| Operator | D.Burton | Checked | S.Royle | Approved | S.Royle |

# Effective Stress Triaxial Compression

## Consolidated Drained

**Saturation Plots**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Saturation Method | | | Stepped | Stepped | Stepped |
| Cell Pressure Input | σ | (kPa) | 1201 | 900 | 1049 |
| Pore Water Pressure Input | u pwp | (kPa) | 1176 | 895 | 1029 |
| B Value | B | . | 0.98 | 0.99 | 0.99 |




| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-12_Samp 1.20m PU02 B2 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-12_Samp |
| | | | | Sample | 1.20m PU02 B2 |
| UKAS TESTING 4043 | Client | Geoquip Marine | | Depth | 1.20m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

# Effective Stress Triaxial Compression

## Consolidated Drained

**Consolidation Plots**

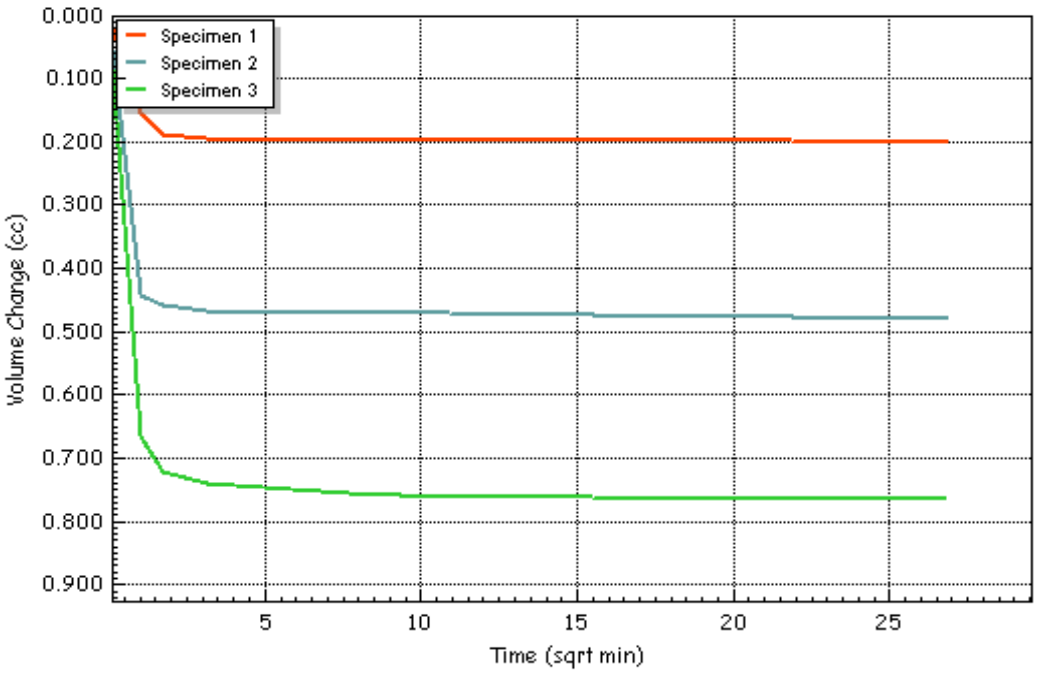
### Initial Conditions

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_3$ | (kPa) | 1225 | 950 | 1150 |
| Initial Back Pressure | $u_{bi}$ | (kPa) | 1200 | 900 | 1050 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | 1209 | 938 | 1122 |
| Drainage Method | | | From One End | From One End | From One End |

### Final Conditions

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| PWP Dissipation % | U% | (%) | 100.00 | 100.00 | 100.00 |
| Volumetric Strain | $\varepsilon_v$% | (%) | 0.23 | 0.55 | 0.89 |
| Corrected Length | $L_c$ | (mm) | 75.9 | 75.9 | 75.8 |
| Corrected Area | $A_c$ | (cm2) | 11.32 | 11.30 | 11.27 |
| Corrected Volume | $V_c$ | (cc) | 85.994 | 85.714 | 85.428 |
| t100 | $t_{100}$ | (min) | 3.37 | 2.81 | 4.18 |
| Consolidation | $c_v$ | (m2/year | 7.068 | 8.458 | 5.673 |
| Compressibility | $m_v$ | (m2/MN) | 0.257 | 0.145 | 0.123 |
| Test Time | $t_F$ | (h:m:s) | 02:00:00 | 02:00:00 | 02:00:00 |
| Estimated Strain to Failure | $\varepsilon_f$ | (%) | 5.0 | 5.0 | 5.0 |
| Shear Machine Speed | $d_r$ | (mm/min | 0.03164 | 0.03161 | 0.03157 |

**Notes**

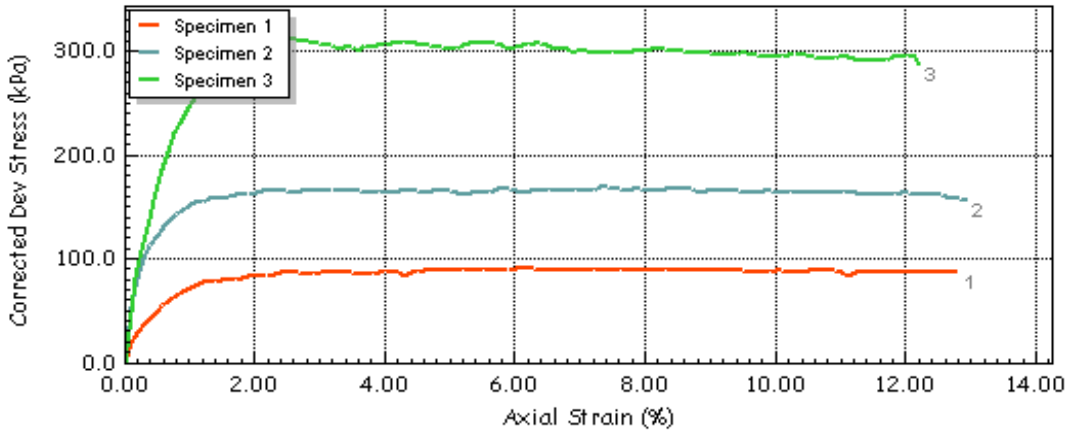


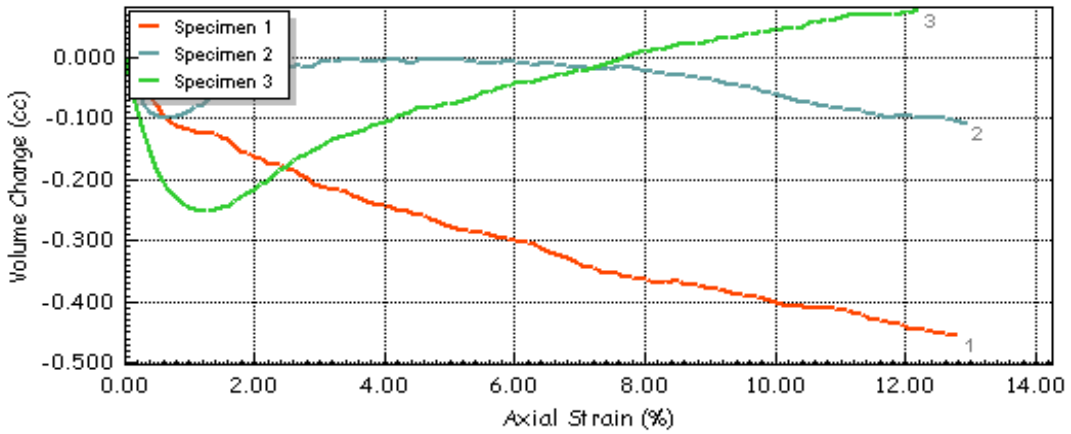

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-12_Samp 1.20m PU02 B2 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-12_Samp |
| | | | | Sample | 1.20m PU02 B2 |
| | Client | Geoquip Marine | | Depth | 1.20m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

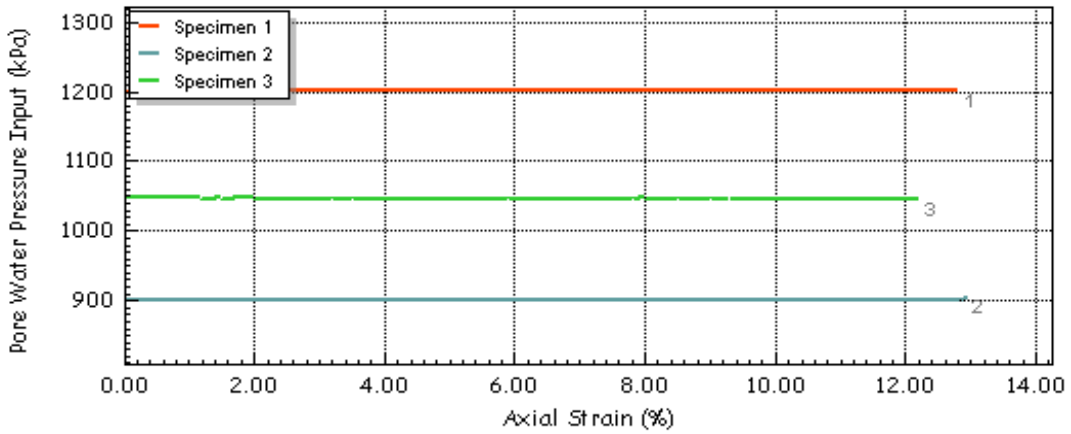
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**



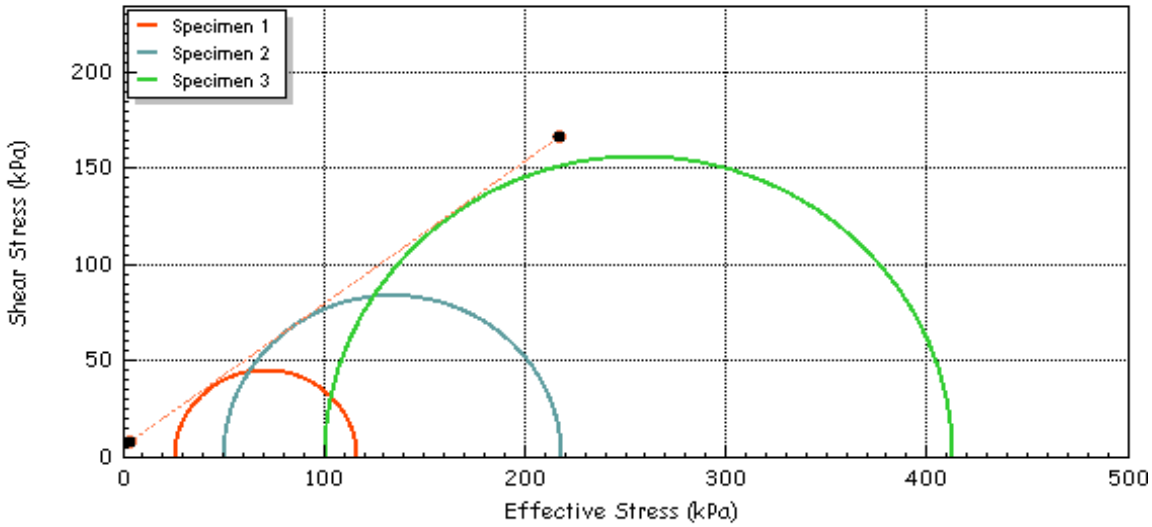

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY UKAS TESTING 4043 | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-12_Samp 1.20m PU02 B2 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-12_Samp |
| | | | | Sample | 1.20m PU02 B2 |
| | Client | Geoquip Marine | | Depth | 1.20m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

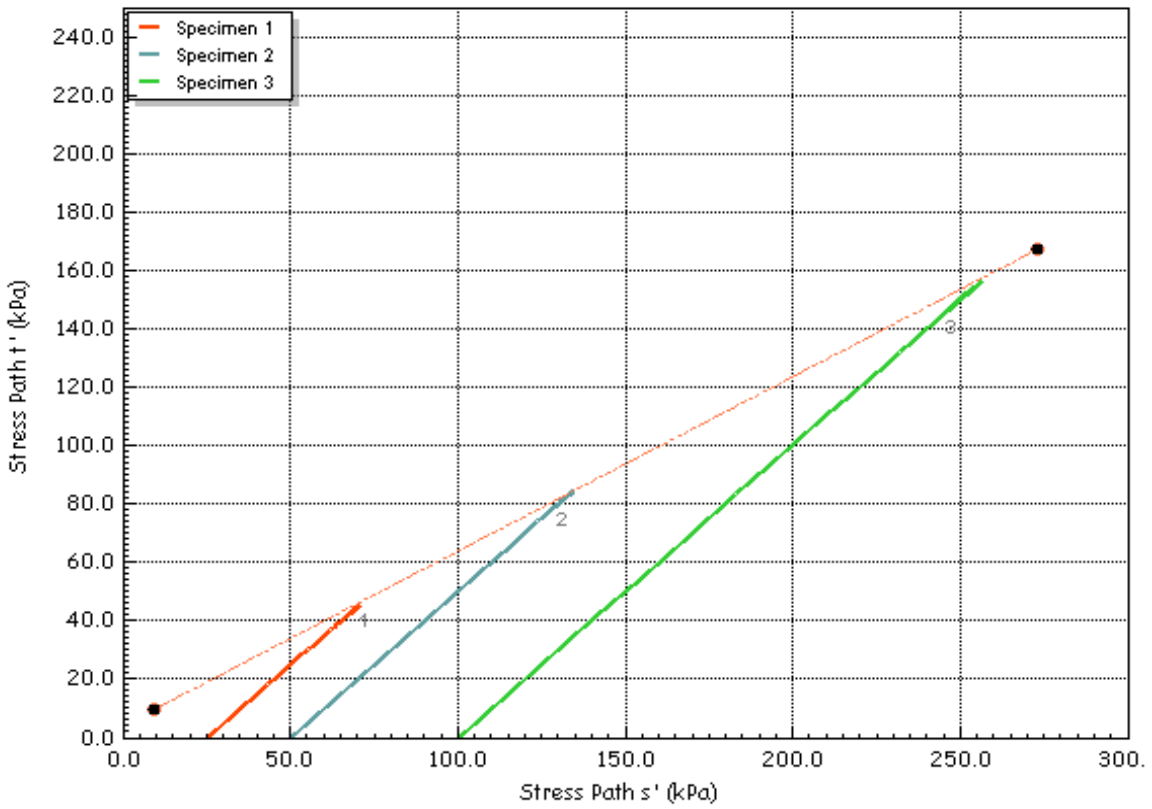
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Effective | c' | (kPa) | 4.81 | Effective Cohesion | c' | (kPa) | 4.81 |
| Effective Friction | ϕ' | (deg) | 36.7 | Effective Friction | ϕ' | (deg) | 36.7 |



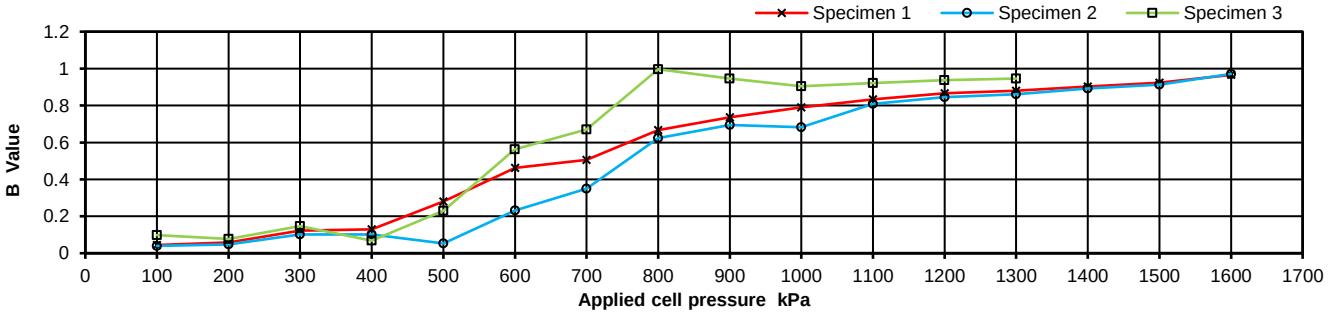

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | Test Name | OWF_GI-12_Samp 1.20m PU02 B2 | |
| | | | Test Date | 19/04/2023 | |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | Borehole | OWF_GI-12_Samp | |
| | | | Sample | 1.20m PU02 B2 | |
| | Client | Geoquip Marine | Depth | 1.20m | |
| | Operator | D.Burton | Checked | S.Royle | Approved S.Royle |

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU05 |
| Soil Description | 2.5y 4/3 Olive brown SAND | | | Depth m | 2.30 |
| Specimen Reference | B1 | Specimen Depth | 2.30 m | Sample Type | B1 |
| Specimen Description | 2.5y 4/3 Olive brown SAND | | | KeyLAB ID | BH0120230227222 |
| Test Method | BS EN ISO 17892 Part 9: Consolidated Trixial Compression Tests | | | | |

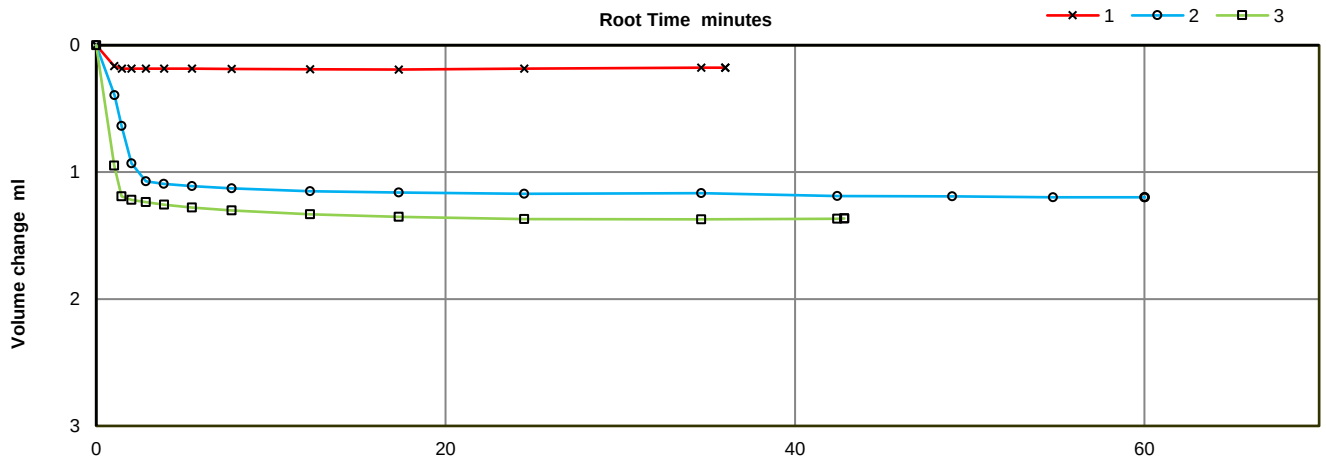
| | |
|---|---|
| Specimen Type/Preparation | REMOULDED 1.47DD 25/50/100 kPa 10% MC |

| **Specimen Details** | | | 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial | Height | mm | 100.0 | 140.0 | 100.0 |
| | Diameter | mm | 50.0 | 70.0 | 50.0 |
| | Bulk Density | Mg/m³ | 1.62 | 1.61 | 1.62 |
| | Water Content | % | 10.1 | 10.0 | 10.0 |
| | Dry density | Mg/m³ | 1.47 | 1.47 | 1.47 |
| Final | Bulk Density | Mg/m³ | 1.73 | 1.81 | 1.84 |
| | Water Content | % | 24.9 | 25.8 | 25.6 |
| | Dry density | Mg/m³ | 1.45 | 1.45 | 1.47 |

| **Saturation Details** | | 1 | 2 | 3 |
|---|---|---|---|---|
| Method | | Back pressure method | Back pressure method | Back pressure method |
| Cell pressure increments | kPa | 100 | 100 | 100 |
| Differential Pressure | kPa | 20 | 20 | 20 |
| Final Cell Pressure | kPa | 1600 | 1600 | 1300 |
| Final pore water pressure | kPa | 1490 | 1490 | 1189 |
| Final B Value | | 0.97 | 0.97 | 0.95 |



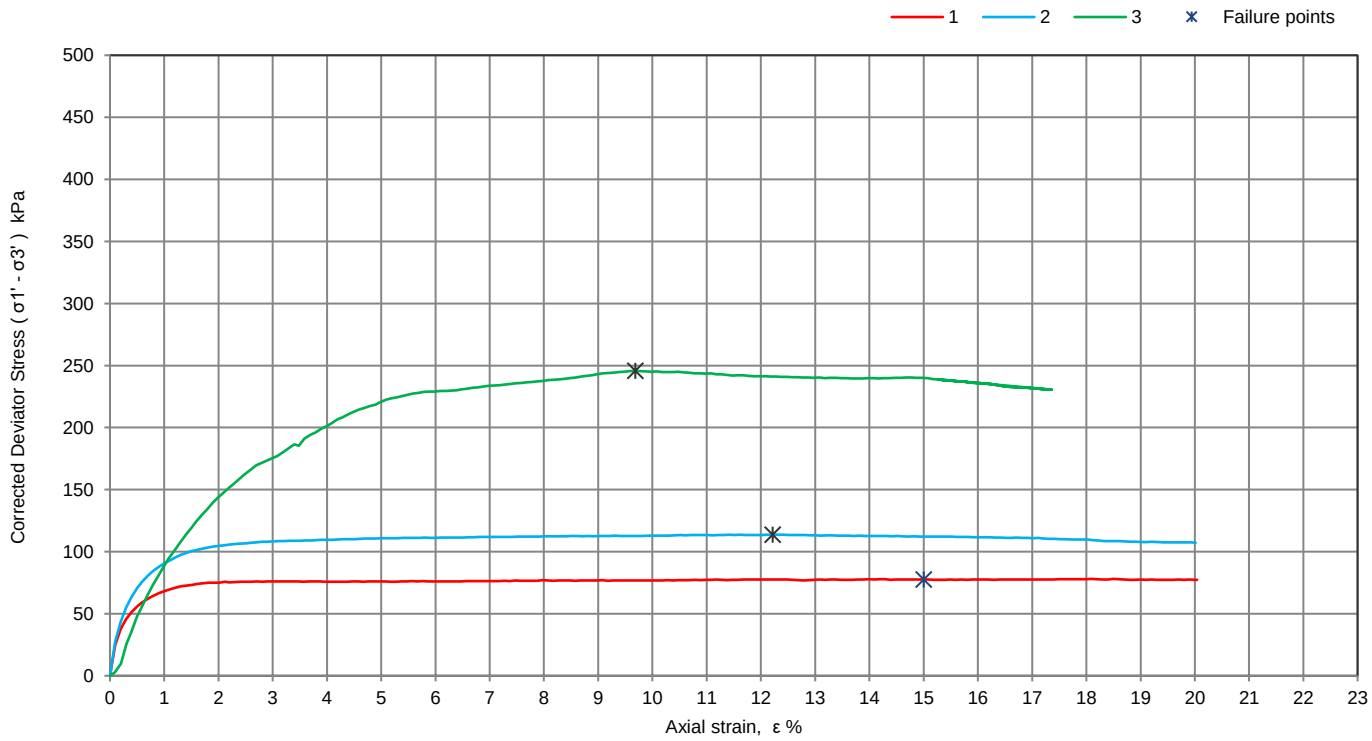

| **Consolidation Details** | Specimen No. | 1 | 2 | 3 | |
|---|---|---|---|---|---|
| | Drainage Conditions | One end | | | |
| | Cell Pressure applied | 1625 | 1650 | 1500 | kPa |
| | Back Pressure applied | 1600 | 1600 | 1400 | kPa |
| | Effective Pressure | 25 | 50 | 100 | kPa |
| | Pore pressure at start of consolidation | 1605 | 1642 | 1475 | kPa |
| | Pore pressure at end of consolidation | 1595 | 1606 | 1401 | kPa |
| | Pore pressure dissipation at end of consolidation | 198 | 86 | 98 | % |

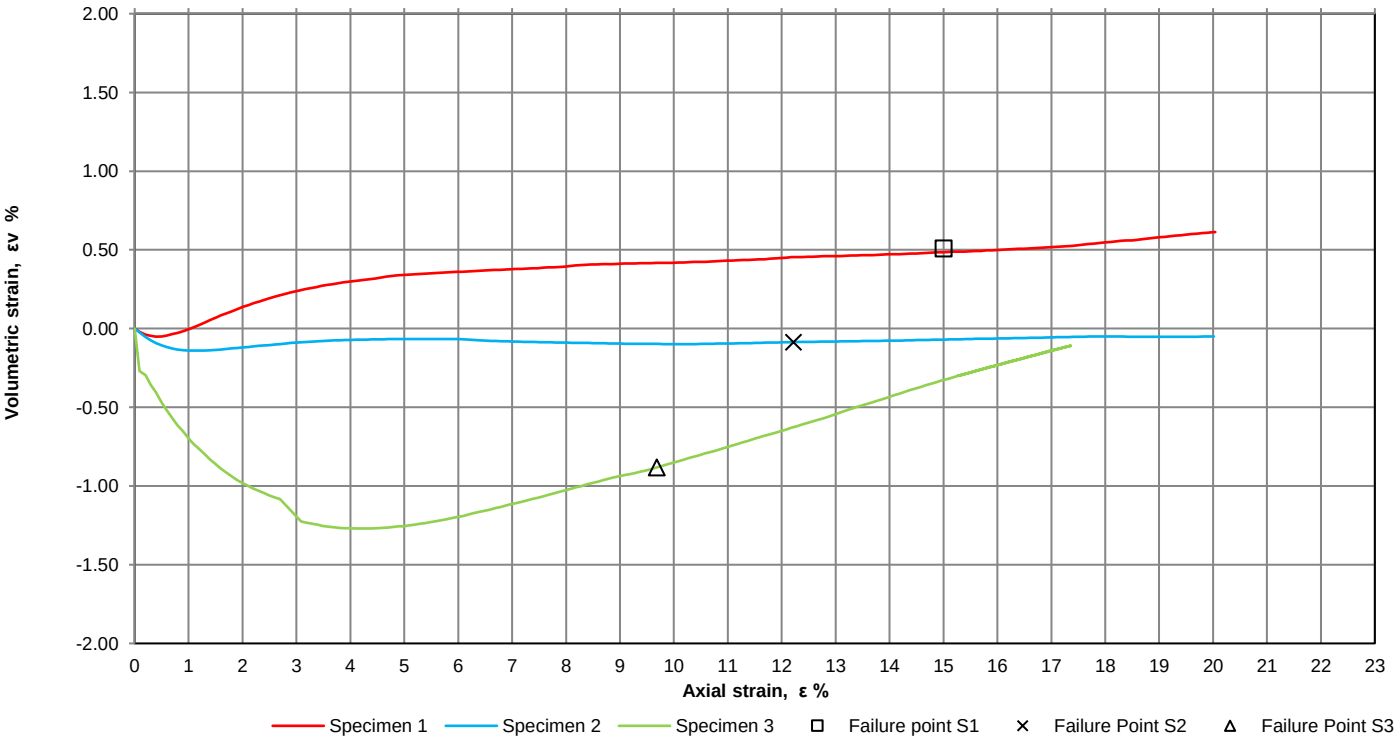



| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 23/05/2023 12:04 | D.Smith | Sheet No. | 1 of 3 |

Lab Sheet Reference :

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU05 |
| Specimen Reference | B1 | Specimen Depth | 2.30 | m | Depth m | 2.30 |
| Compression stages - graphical data | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH0120230227222 |




| | | | |
|---|---|---|---|
| Date Printed | Approved | Fig. No. | 1 |
| 23/05/2023 12:04 | D.Smith | Sheet No. | 2 of 3 |

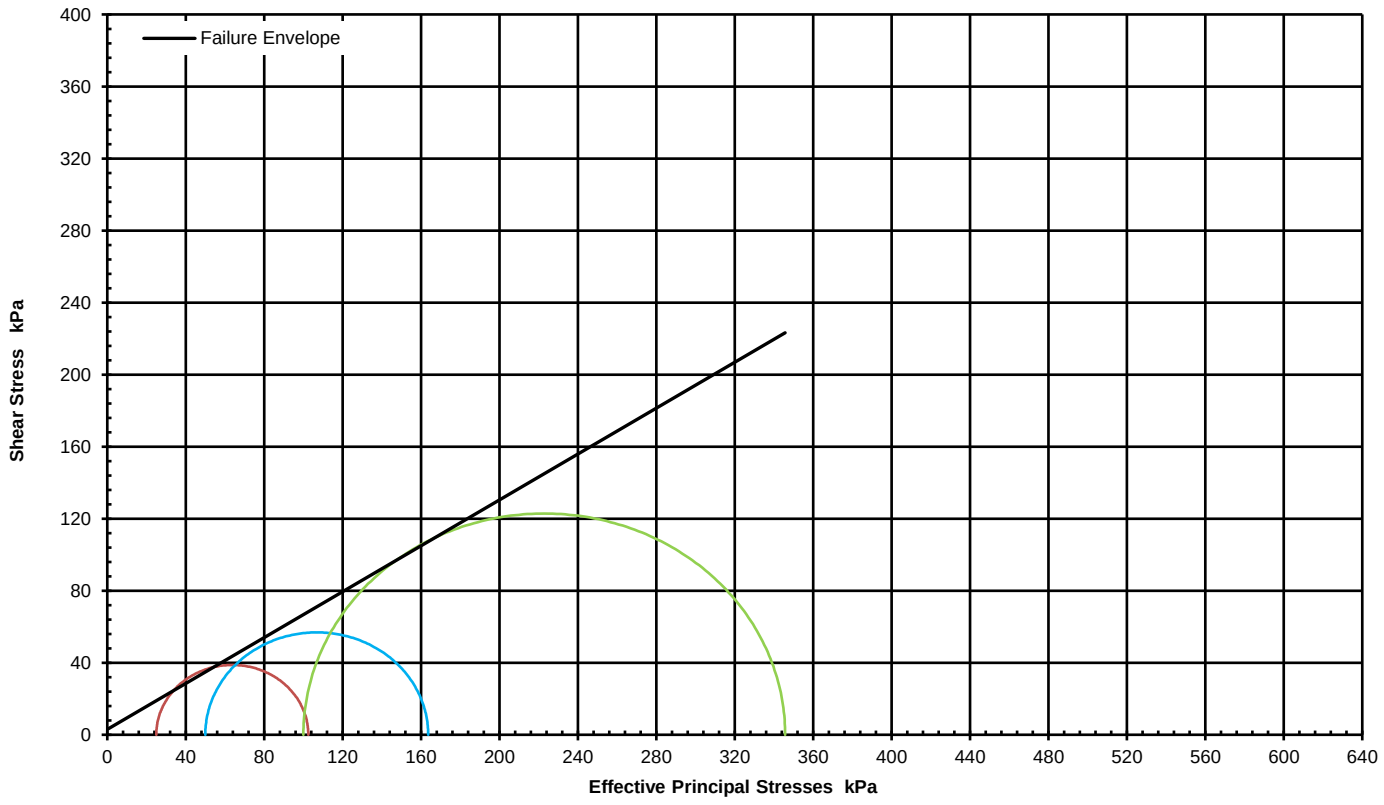
Lab Sheet Reference :

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU05 |
| Specimen Reference | B1 | Specimen Depth | 2.30 | m | Depth m | 2.30 |
| Compression stages - table of results and interpretation | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH0120230227222 |

At maximum deviator stress ( failure )

| Specimen | Cell pressure kPa | Initial pwp kPa | Initial $\sigma_3'$ kPa | Rate of strain %/hr | Axial strain, $\varepsilon_f$ % | $(\sigma_1' - \sigma_3')_f$ kPa | Volumetric strain, $\varepsilon_v$ % per hr | $\sigma_{3f}'$ kPa | $\sigma_{1f}'$ kPa | Specimen Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1625 | 1600 | 25 | 1.00 | 15.0 | 78 | 0.5 | 25 | 103 | |
| 2 | 1650 | 1600 | 50 | 1.00 | 12.2 | 114 | -0.1 | 50 | 164 | |
| 3 | 1500 | 1400 | 100 | 1.00 | 9.7 | 246 | -0.9 | 100 | 346 | |

**Mohr Circles**




| Shear Strength Parameters | | Linear regression | Manual re-assessment |
|---|---|---|---|
| c ' | kPa | 2.8 | - |
| Ø ' | degrees | 32.5 | - |

Mode of failure

| Plastic | Compound | Plastic |
|---|---|---|
| | | |

**General Remarks**

Deviator stresses corrected for area change, and up to 0.25 mm thick rubber membrane/

f Denotes at failure

Positive volume changes indicate water out of specimen ( consolidation )

| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 23/05/2023 12:04 | D.Smith | Sheet No. | 3 of 3 |

Lab Sheet Reference :

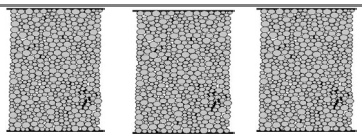
# Effective Stress Triaxial Compression

## Consolidated Drained

**Summary Report**

**Sample Details**

*sketch showing specimen location in original sample*



| | |
|---|---|
| Depth | 0.80m |
| Description | Greyish brown slightly gravelly SAND. |
| Type | Recompacted at 1.47 DD, 10% moisture content. |

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Sample Length | $L_0$ | (mm) | 76.0 | 76.0 | 76.0 |
| Initial Sample Diameter | $D_0$ | (mm) | 38.0 | 38.0 | 38.0 |
| Initial Sample Weight | $W_0$ | (gr) | 139.5 | 139.5 | 139.5 |
| Initial Bulk Density | $\rho_0$ | (Mg/m3) | 1.62 | 1.62 | 1.62 |
| Particle Density | $\rho_s$ | (Mg/m3) | 2.66 | 2.66 | 2.66 |

**Initial Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_{3i}$ | (kPa) | 1425 | 1450 | 1500 |
| Initial Back Pressure | $U_{bi}$ | (kPa) | 1400 | 1400 | 1400 |
| Membrane Thickness | $m_b$ | (mm) | 0.400 | 0.400 | 0.400 |
| Displacement Input | $L_{IP}$ | (mm) | CH 2 | CH 2 | CH 2 |
| Load Input | $N_{IP}$ | (N) | CH 1 | CH 1 | CH 1 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | CH 3 | CH 3 | CH 3 |
| Sample Volume | $V$ | (cc) | CH 2 | CH 2 | CH 2 |
| Initial Moisture | $\omega_i$ | (%) | 10 | 10 | 10 |
| Initial Dry Density | $\rho_{di}$ | (Mg/m3) | 1.47 | 1.47 | 1.47 |
| Initial Voids Ratio | $e_i$ | . | 0.812 | 0.812 | 0.812 |
| Initial Degree of Saturation | $S_i$ | (%) | 34 | 34 | 34 |
| B Value | $B$ | . | 0.98 | 0.98 | 0.97 |

**Final Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Final Moisture | $\omega_f$ | (%) | 32 | 30 | 27 |
| Final Dry Density | $\rho_{df}$ | (Mg/m3) | 1.47 | 1.47 | 1.48 |
| Final Voids Ratio | $e_f$ | . | 0.811 | 0.807 | 0.801 |
| Final Degree of Saturation | $S_f$ | (%) | 100.0 | 97.5 | 89.3 |
| Failure Criteria | | . | Max. Dev. Stress | Max. Dev. Stress | Max. Dev. Stress |
| Strain At Failure | $\varepsilon_f$ | (%) | 3.20 | 1.55 | 3.32 |
| Stress At Failure | $(\sigma_1-\sigma_3)_f$ | (kPa) | 99.9 | 184.8 | 359.4 |
| Minor Stress At Failure | $\sigma_3'$ | (kPa) | 25.0 | 50.0 | 100.0 |
| Major Stress At Failure | $\sigma_1'$ | (kPa) | 124.9 | 234.8 | 459.4 |
| Principal Stress Ratio At Failure | $\sigma_1'/\sigma_3'$ | | 4.995 | 4.696 | 4.594 |
| PwP At Failure Criteria | $u_f$ | (kPa) | 1400.0 | 1399.0 | 1402.0 |

**Notes**

*Compound*

PSL PROFESSIONAL SOILS LABORATORY — A PHENNA GROUP COMPANY — UKAS TESTING 4043

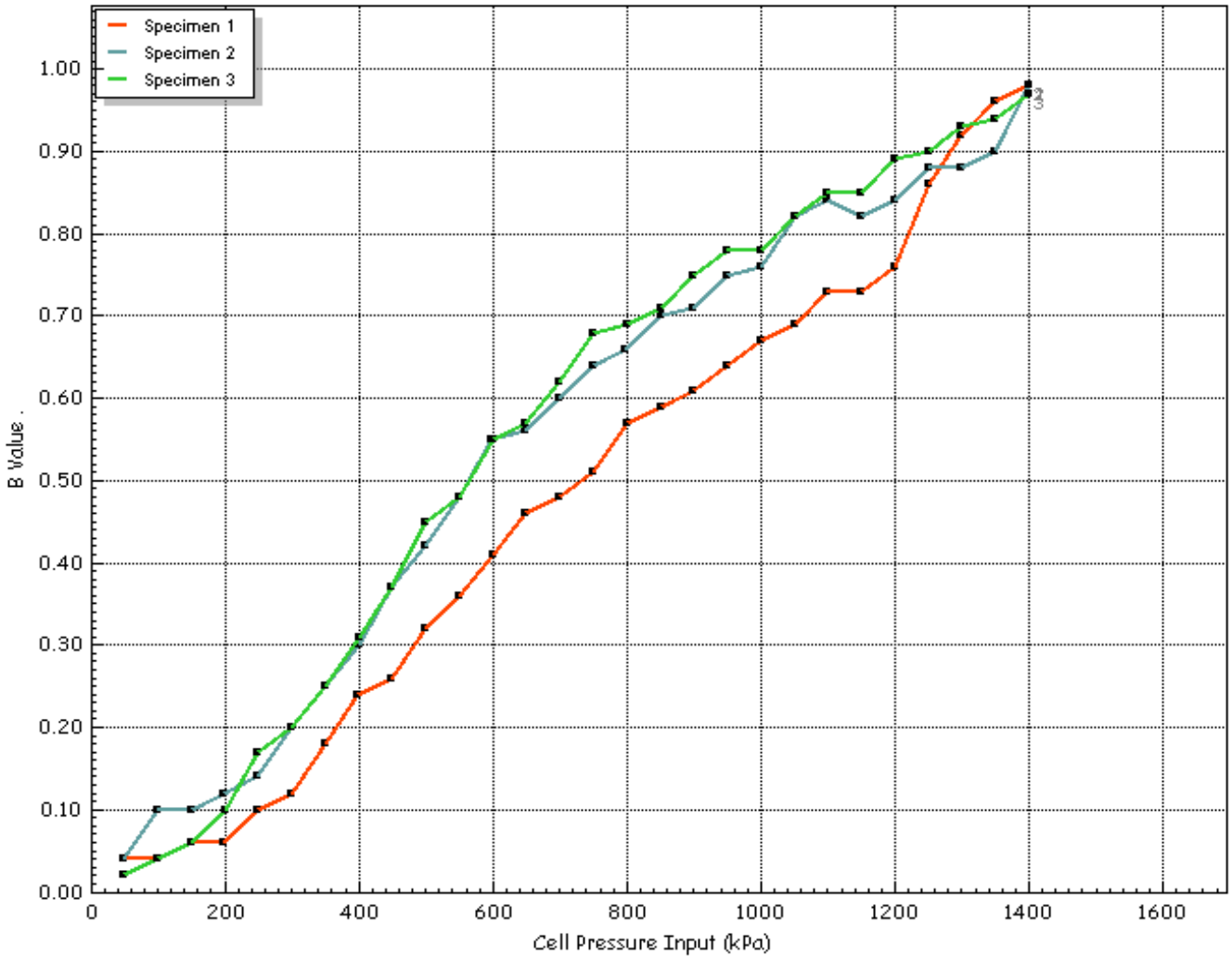
| | | | | | |
|---|---|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | | | Test Name | OWF_GI-17_samp 0.80m PU02 B1 |
| | | | | Test Date | 19/04/2023 |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | | | Borehole | OWF_GI-17_samp |
| | | | | Sample | 0.80m PU02 B1 |
| Client | Geoquip Marine | | | Depth | 0.80m |
| Operator | D.Burton | Checked | S.Royle | Approved | S.Royle |

# Effective Stress Triaxial Compression

## Consolidated Drained

**Saturation Plots**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Saturation Method | | | Stepped | Stepped | Stepped |
| Cell Pressure Input | σ | (kPa) | 1400 | 1400 | 1400 |
| Pore Water Pressure Input | u pwp | (kPa) | 1371 | 1384 | 1382 |
| B Value | B | . | 0.98 | 0.98 | 0.97 |




| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-17_samp 0.80m PU02 B1 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-17_samp |
| | | | | Sample | 0.80m PU02 B1 |
| UKAS TESTING 4043 | Client | Geoquip Marine | | Depth | 0.80m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

# Effective Stress Triaxial Compression

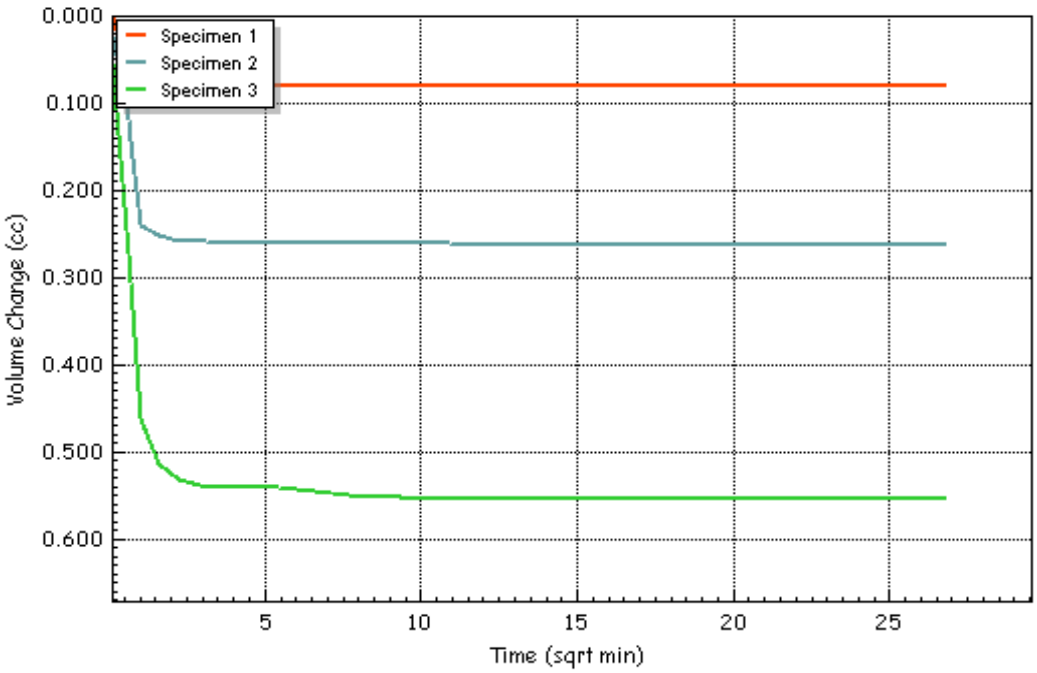
## Consolidated Drained

**Consolidation Plots**

| **Initial Conditions** | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_3$ | (kPa) | 1425 | 1450 | 1500 |
| Initial Back Pressure | $u_{bi}$ | (kPa) | 1400 | 1400 | 1400 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | 1408 | 1431 | 1477 |
| Drainage Method | | | From One End | From One End | From One End |

| **Final Conditions** | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| PWP Dissipation % | U% | (%) | 100.00 | 100.00 | 100.00 |
| Volumetric Strain | $\varepsilon_v$% | (%) | 0.10 | 0.31 | 0.64 |
| Corrected Length | $L_c$ | (mm) | 76.0 | 75.9 | 75.8 |
| Corrected Area | $A_c$ | (cm2) | 11.33 | 11.32 | 11.29 |
| Corrected Volume | $V_c$ | (cc) | 86.111 | 85.929 | 85.639 |
| t100 | $t_{100}$ | (min) | 1.47 | 1.27 | 1.63 |
| Consolidation | $c_v$ | (m2/year | 16.218 | 18.745 | 14.572 |
| Compressibility | $m_v$ | (m2/MN) | 0.119 | 0.099 | 0.083 |
| Test Time | $t_F$ | (h:m:s) | 02:00:00 | 02:00:00 | 02:00:00 |
| Estimated Strain to Failure | $\varepsilon$% | (%) | 5.0 | 5.0 | 5.0 |
| Shear Machine Speed | $d_r$ | (mm/min | 0.03166 | 0.03163 | 0.03160 |

**Notes**

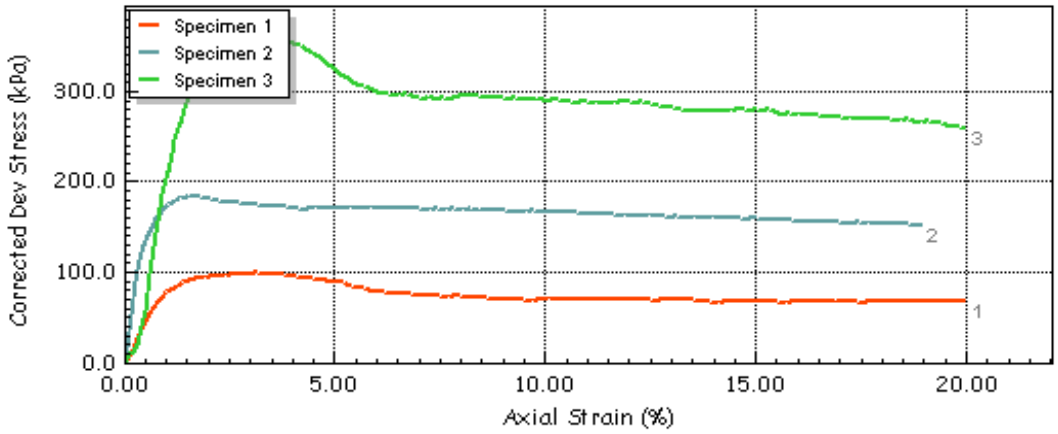


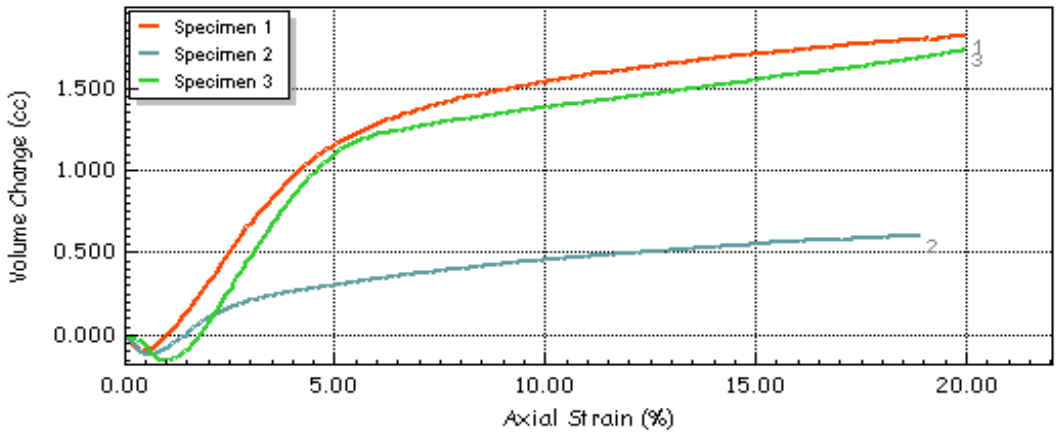

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-17_samp 0.80m PU02 B1 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-17_samp |
| | | | | Sample | 0.80m PU02 B1 |
| | Client | Geoquip Marine | | Depth | 0.80m |
| | Operator | D.Burton | Checked | S.Royle | Approved S.Royle |

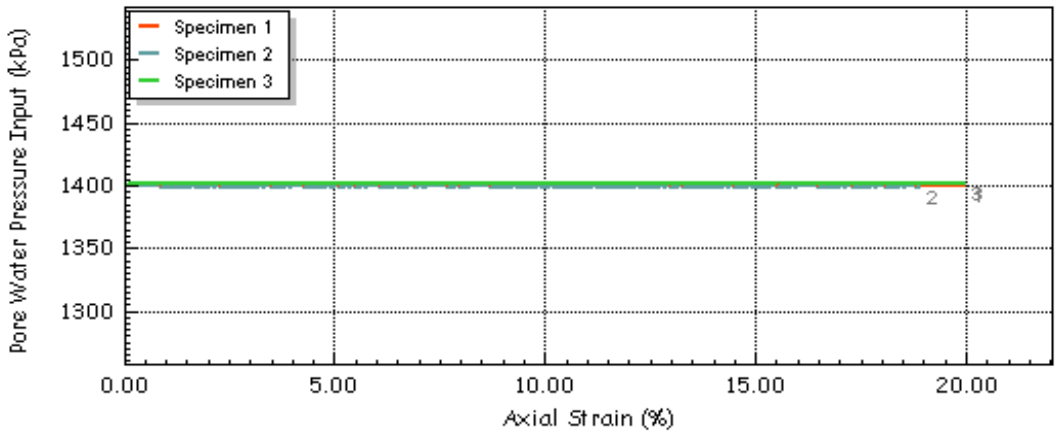
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**



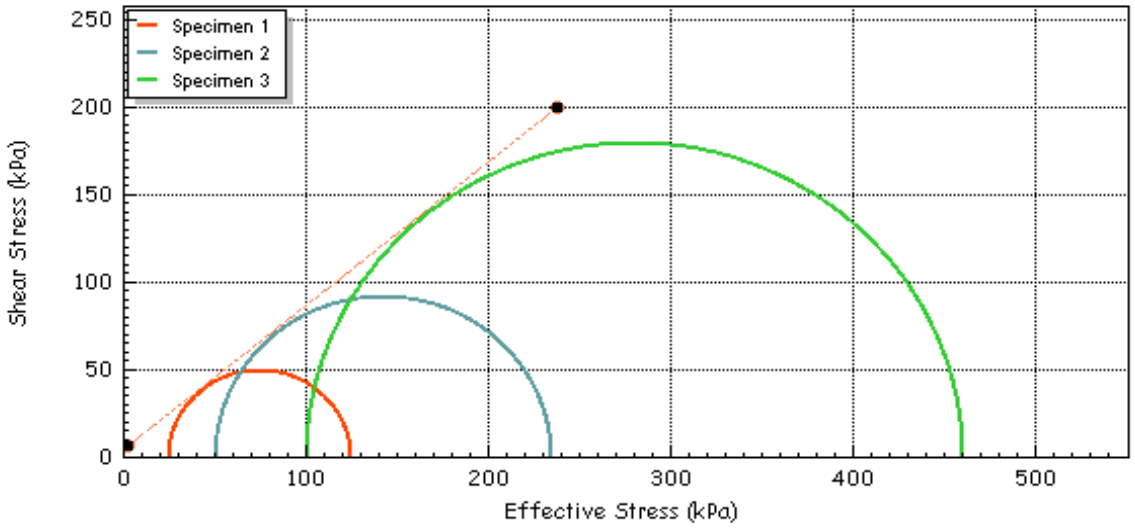

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY UKAS TESTING 4043 | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-17_samp 0.80m PU02 B1 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-17_samp |
| | | | | Sample | 0.80m PU02 B1 |
| | Client | Geoquip Marine | | Depth | 0.80m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

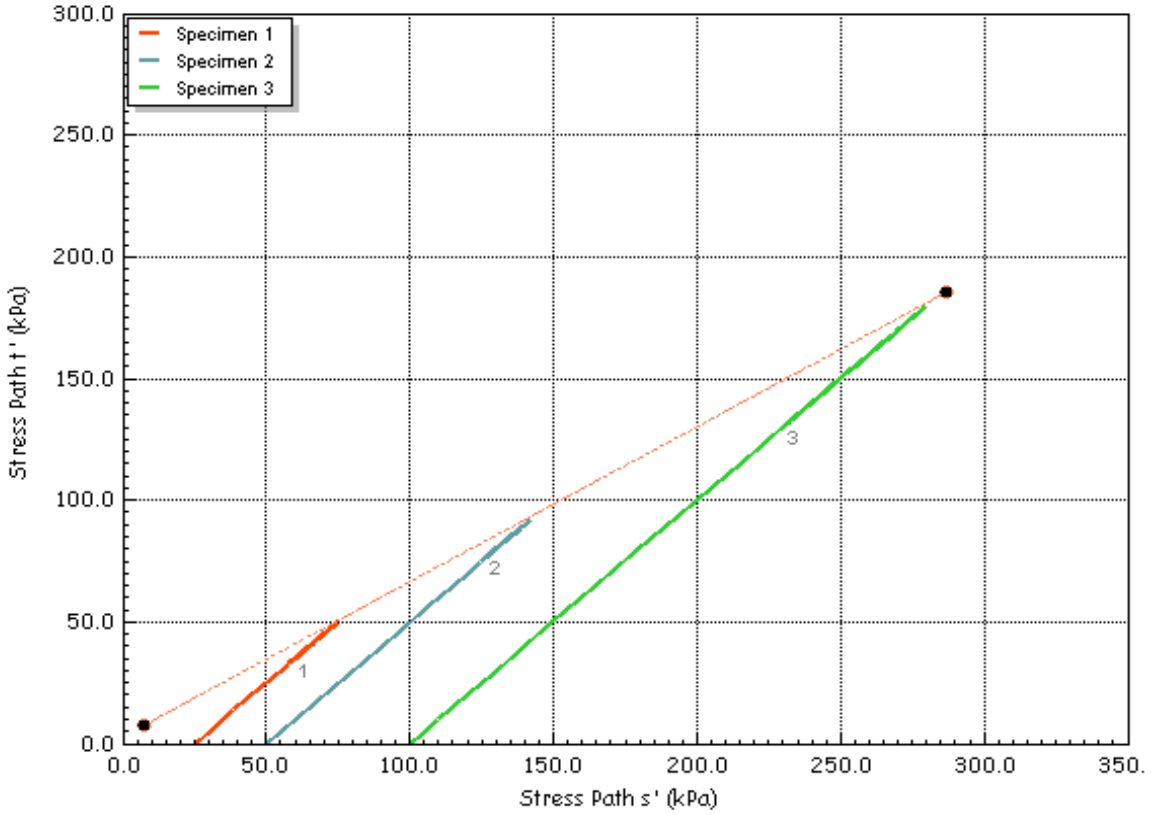
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Effective | c' | (kPa) | 3.56 | Effective Cohesion | c' | (kPa) | 3.56 |
| Effective Friction | ϕ' | (deg) | 39.5 | Effective Friction | ϕ' | (deg) | 39.5 |



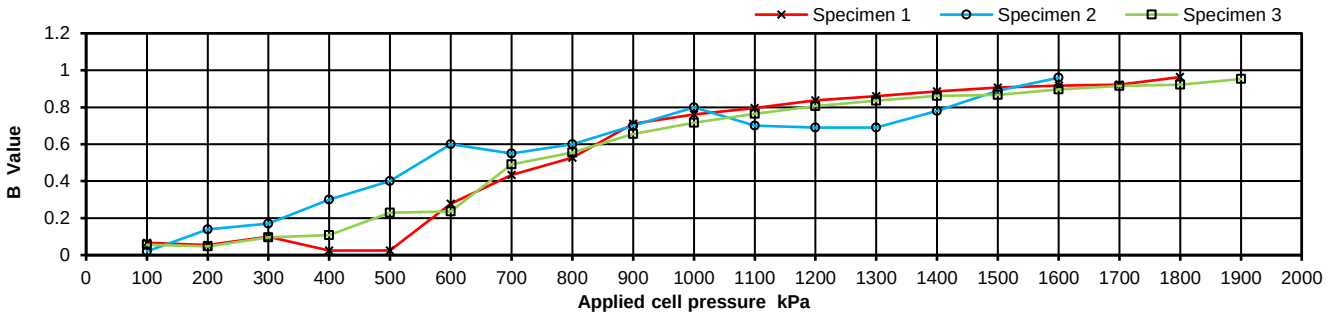

| | | | | | |
|---|---|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-17_samp 0.80m PU02 B1 | |
| | | | Test Date | 19/04/2023 | |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-17_samp | |
| | | | Sample | 0.80m PU02 B1 | |
| Client | Geoquip Marine | | Depth | 0.80m | |
| Operator | D.Burton | Checked S.Royle | | Approved | S.Royle |

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Isotropic Drained Triaxial Compression Test with measurement of volume change** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU02 |
| Soil Description | 2.5y 4/2 Dark greyish brown silty SAND | | | Depth m | 0.80 |
| Specimen Reference | PU02 | Specimen Depth | 0.80 m | Sample Type | B1 |
| Specimen Description | 2.5y 4/2 Dark greyish brown silty SAND | | | KeyLAB ID | BH0120230227381 |
| Test Method | BS EN ISO 17892 Part 9: Consolidated Trixial Compression Tests | | | | |

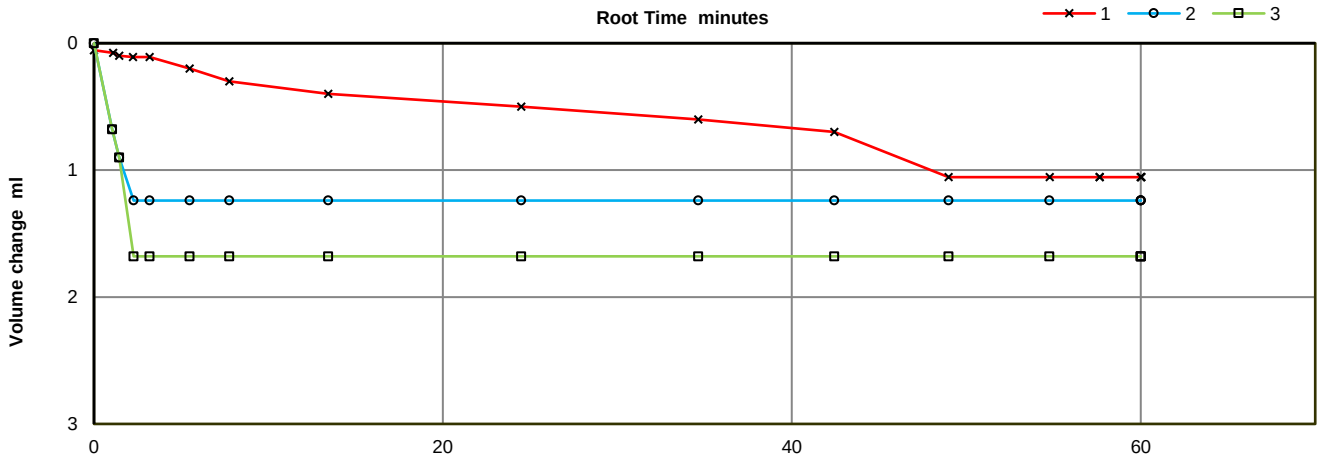
| | |
|---|---|
| Specimen Type/Preparation | REMOULDED 25/50/100 kPa 1.56 DD @ 10% MC |

| **Specimen Details** | | | 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial | Height | mm | 100.0 | 140.0 | 100.0 |
| | Diameter | mm | 50.0 | 70.1 | 50.0 |
| | Bulk Density | Mg/m³ | 1.70 | 1.70 | 1.71 |
| | Water Content | % | 10.0 | 10.0 | 10.0 |
| | Dry density | Mg/m³ | 1.55 | 1.55 | 1.55 |
| Final | Bulk Density | Mg/m³ | 1.91 | 1.95 | 1.98 |
| | Water Content | % | 23.6 | 27.8 | 26.0 |
| | Dry density | Mg/m³ | 1.54 | 1.54 | 1.55 |

| **Saturation Details** | | 1 | 2 | 3 |
|---|---|---|---|---|
| Method | | Back pressure method | Back pressure method | Back pressure method |
| Cell pressure increments | kPa | 100 | 100 | 100 |
| Differential Pressure | kPa | 20 | 20 | 20 |
| Final Cell Pressure | kPa | 1800 | 1600 | 1900 |
| Final pore water pressure | kPa | 1680 | 1580 | 1781 |
| Final B Value | | 0.96 | 0.96 | 0.95 |
| Time Taken to saturate | Day | 2.00 | 2.00 | 2.00 |



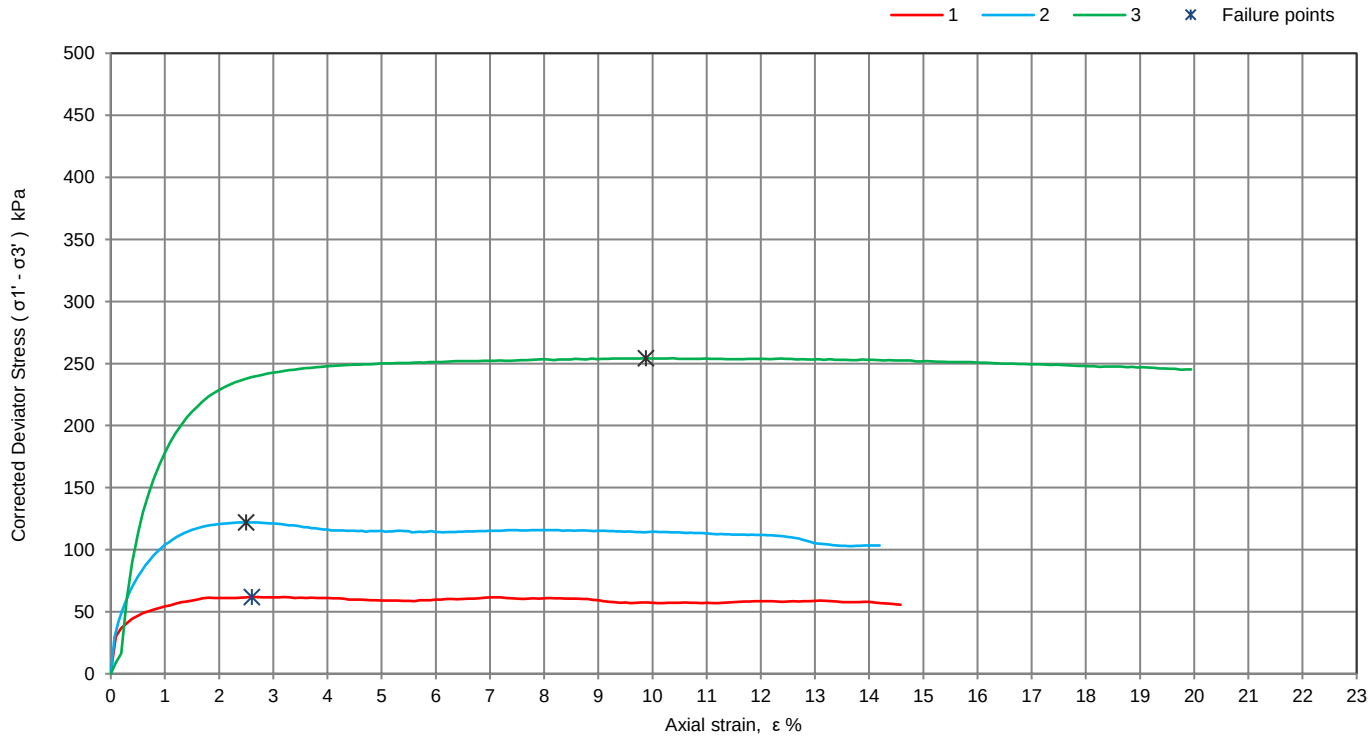

| **Consolidation Details** | Specimen No. | 1 | 2 | 3 | |
|---|---|---|---|---|---|
| | Time Taken to consolidate | 1 | 1 | 1 | Days |
| | Drainage Conditions | One end | One end | One end | |
| | Cell Pressure applied | 1800 | 1650 | 2000 | kPa |
| | Back Pressure applied | 1775 | 1600 | 1900 | kPa |
| | Effective Pressure | 25 | 50 | 100 | kPa |
| | Pore pressure at start of consolidation | 1802 | 1644 | 1964 | kPa |
| | Pore pressure at end of consolidation | 1706 | 1602 | 1895 | kPa |
| | Pore pressure dissipation at end of consolidation | 355 | 95 | 108 | % |

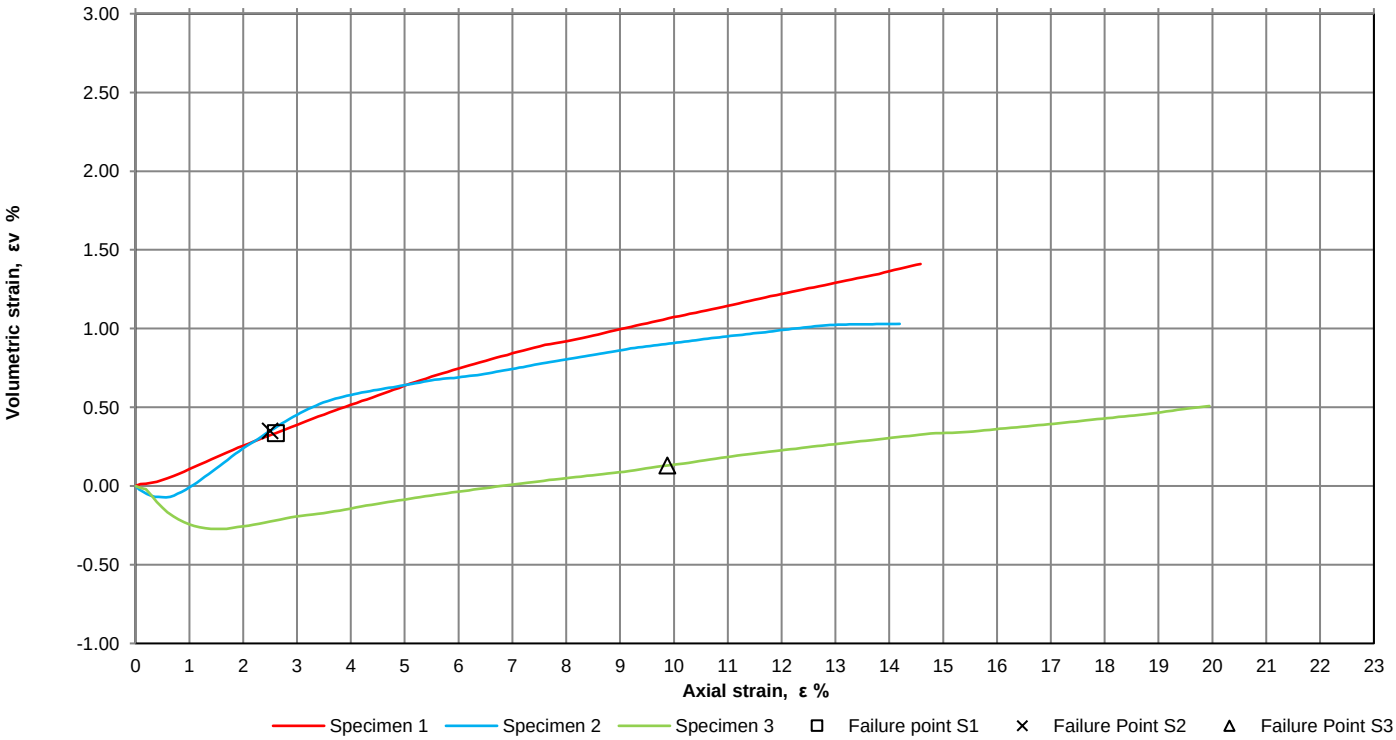



| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 27/07/2023 11:00 | D.Smith | Sheet No. | 1 of 3 |

Lab Sheet Reference : GM-L-TSR-46

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU02 |
| Specimen Reference | PU02 | Specimen Depth | 0.80 | m | Depth m | 0.80 |
| Compression stages - graphical data | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH0120230227381 |




| | | | |
|---|---|---|---|
| Date Printed | Approved | Fig. No. | 1 |
| 27/07/2023 11:00 | D.Smith | Sheet No. | 2 of 3 |

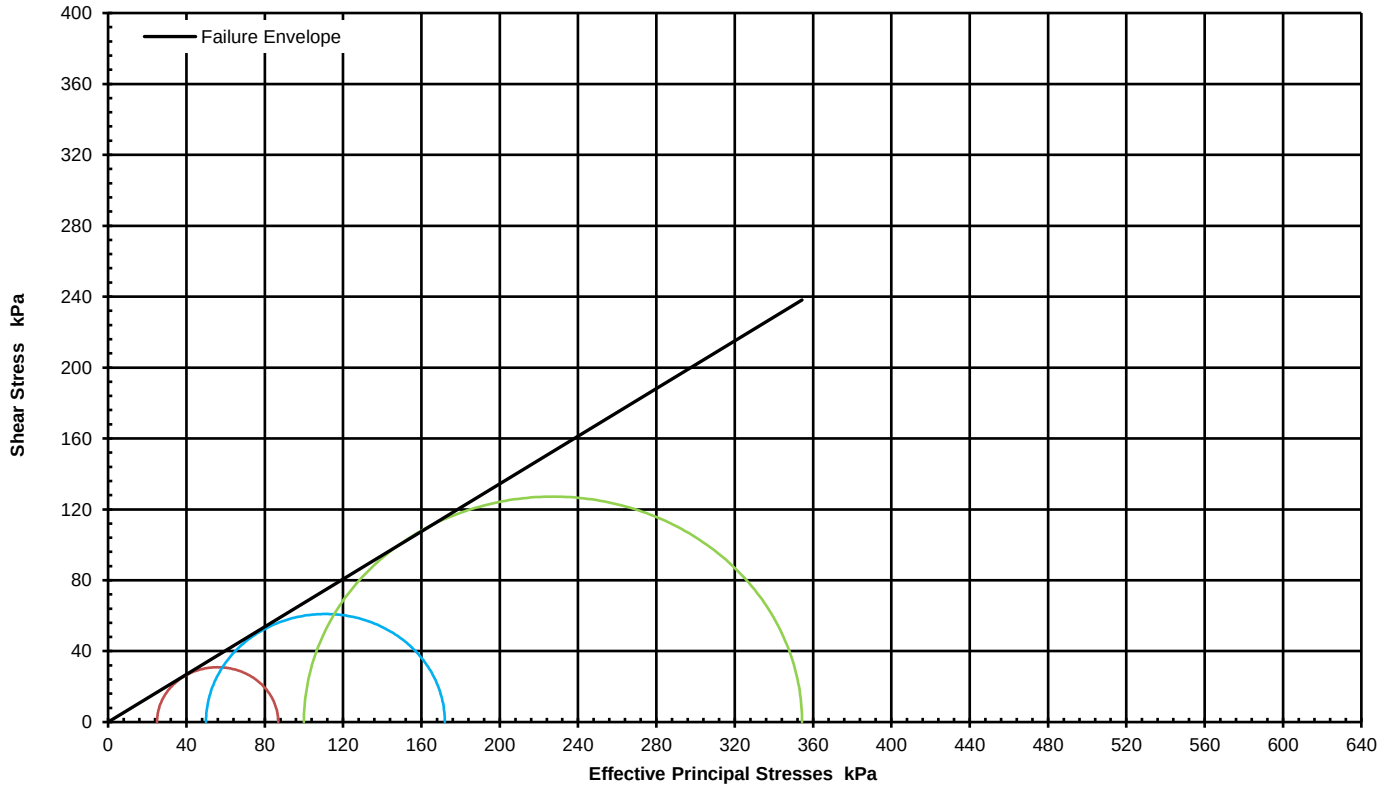
Lab Sheet Reference : GM-L-TSR-46

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole | OWF_GI#20_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU02 |
| Specimen Reference | PU02 | Specimen Depth | 0.80 | m | Depth m | 0.80 |
| Compression stages - table of results and interpretation | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH0120230227381 |

At maximum deviator stress ( failure )

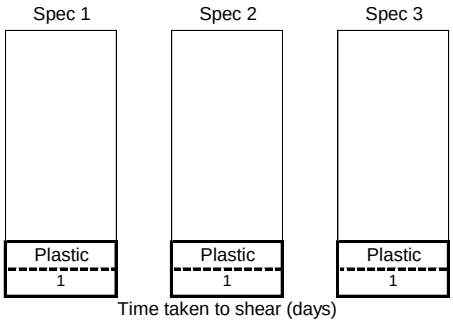
| Specimen | Cell pressure kPa | Initial pwp kPa | Initial $\sigma_3'$ kPa | Rate of strain %/hr | Axial strain, $\varepsilon_f$ % | $(\sigma_1' - \sigma_3')_f$ kPa | Volumetric strain, $\varepsilon_v$ % per hr | $\sigma_3'_f$ kPa | $\sigma_1'_f$ kPa | Specimen Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1800 | 1775 | 25 | 2.00 | 2.6 | 62 | 0.3 | 25 | 87 | |
| 2 | 1650 | 1600 | 50 | 2.00 | 2.5 | 122 | 0.3 | 50 | 172 | |
| 3 | 2000 | 1900 | 100 | 2.00 | 9.9 | 254 | 0.1 | 100 | 354 | |

**Mohr Circles**




| Shear Strength Parameters | | Linear regression | Manual re-assessment |
|---|---|---|---|
| c ' | kPa | [ -1.2 ] | 0 |
| Ø ' | degrees | [ 34.3 ] | 33.9 |

Mode of failure




**General Remarks**

Deviator stresses corrected for area change, and up to 0.3 mm thick rubber membrane/Specimen 1 Back tap was left shut during consolidation , rapid loss of PWP caused by the opening

| | | | | | |
|---|---|---|---|---|---|
| Total Time of test: | 4.00 | 4.00 | 4.00 | 12.00 | Days |
| | S1 | S2 | S3 | All spec | |

f Denotes at failure

Positive volume changes indicate water out of specimen ( consolidation )

Lab Sheet Reference : GM-L-TSR-46

| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 27/07/2023 11:00 | D.Smith | Sheet No. | 3 of 3 |

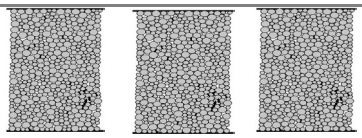
# Effective Stress Triaxial Compression

## Consolidated Drained

**Summary Report**

**Sample Details**

*sketch showing specimen location in original sample*



| | |
|---|---|
| Depth | 2.20m |
| Description | Brownish grey slightly gravelly SAND. |
| Type | Recompacted at 1.40 DD, 10% moisture content. |

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Sample Length | $L_0$ | (mm) | 76.0 | 76.0 | 76.0 |
| Initial Sample Diameter | $D_0$ | (mm) | 38.0 | 38.0 | 38.0 |
| Initial Sample Weight | $W_0$ | (gr) | 133.0 | 133.0 | 133.0 |
| Initial Bulk Density | $\rho_0$ | (Mg/m3) | 1.54 | 1.54 | 1.54 |
| Particle Density | $\rho_s$ | (Mg/m3) | 2.66 | 2.66 | 2.66 |

**Initial Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_{3i}$ | (kPa) | 1525 | 1550 | 1550 |
| Initial Back Pressure | $U_{bi}$ | (kPa) | 1500 | 1500 | 1450 |
| Membrane Thickness | $m_b$ | (mm) | 0.400 | 0.400 | 0.400 |
| Displacement Input | $L_{IP}$ | (mm) | CH 2 | CH 2 | CH 2 |
| Load Input | $N_{IP}$ | (N) | CH 4 | CH 4 | CH 4 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | CH 3 | CH 5 | CH 3 |
| Sample Volume | $V$ | (cc) | CH 6 | CH 6 | CH 6 |
| Initial Moisture | $\omega_i$ | (%) | 10 | 9.92 | 9.92 |
| Initial Dry Density | $\rho_{di}$ | (Mg/m3) | 1.40 | 1.40 | 1.40 |
| Initial Voids Ratio | $e_i$ | . | 0.903 | 0.895 | 0.895 |
| Initial Degree of Saturation | $S_i$ | (%) | 31 | 29 | 29 |
| B Value | $B$ | . | 0.96 | 0.96 | 0.96 |

**Final Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Final Moisture | $\omega_f$ | (%) | 35 | 34 | 33 |
| Final Dry Density | $\rho_{df}$ | (Mg/m3) | 1.40 | 1.41 | 1.41 |
| Final Voids Ratio | $e_f$ | . | 0.900 | 0.889 | 0.885 |
| Final Degree of Saturation | $S_f$ | (%) | 100.0 | 100.0 | 99.9 |
| Failure Criteria | | . | Max. Dev. Stress | Max. Dev. Stress | Max. Dev. Stress |
| Strain At Failure | $\varepsilon_f$ | (%) | 2.01 | 1.41 | 3.46 |
| Stress At Failure | $(\sigma_1-\sigma_3)_f$ | (kPa) | 59.2 | 121.0 | 241.4 |
| Minor Stress At Failure | $\sigma_3'$ | (kPa) | 25.0 | 50.0 | 100.0 |
| Major Stress At Failure | $\sigma_1'$ | (kPa) | 84.2 | 171.0 | 341.4 |
| Principal Stress Ratio At Failure | $\sigma_1'/\sigma_3'$ | | 3.368 | 3.421 | 3.414 |
| PwP At Failure Criteria | $u_f$ | (kPa) | 1500.0 | 1500.0 | 1450.0 |

**Notes**

*Compound*

| | | | |
|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | Test Name | OWF_GI-20_samp 2.20m PU05 |
| | | Test Date | 19/04/2023 |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | Borehole | OWF_GI-20_samp |
| | | Sample | 2.20m PU05 B1 |
| Client | Geoquip Marine | Depth | 2.20m |
| Operator | D.Burton | Checked | S.Royle |
| | | Approved | S.Royle |

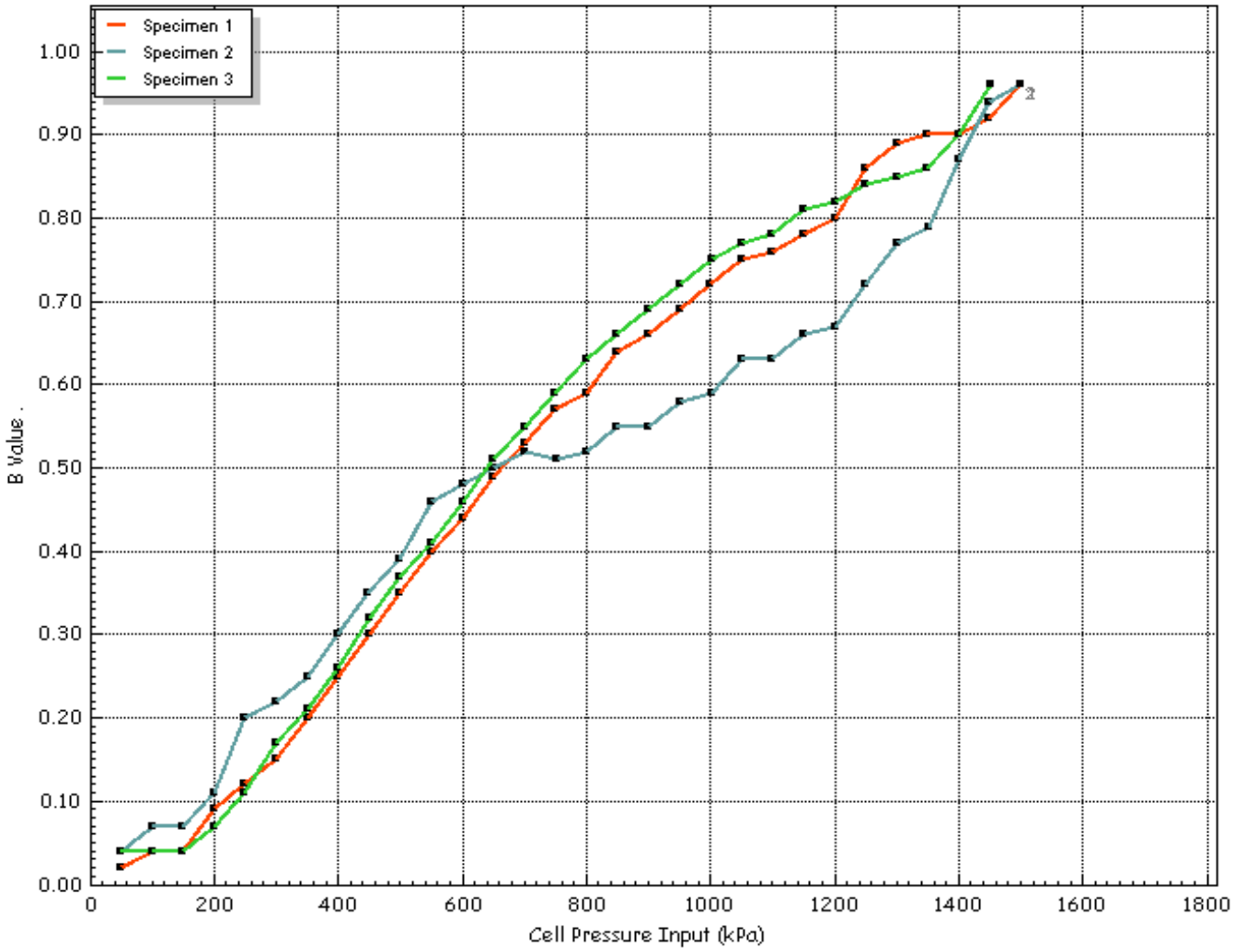
PSL PROFESSIONAL SOILS LABORATORY — UKAS TESTING 4043

# Effective Stress Triaxial Compression

## Consolidated Drained

**Saturation Plots**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Saturation Method | | | Stepped | Stepped | Ramped |
| Cell Pressure Input | σ | (kPa) | 1500 | 1500 | 1451 |
| Pore Water Pressure Input | u pwp | (kPa) | 1478 | 1498 | 1431 |
| B Value | B | . | 0.96 | 0.96 | 0.96 |




| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY UKAS TESTING 4043 | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-20_samp 2.20m PU05 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-20_samp |
| | | | | Sample | 2.20m PU05 B1 |
| | Client | Geoquip Marine | | Depth | 2.20m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

# Effective Stress Triaxial Compression

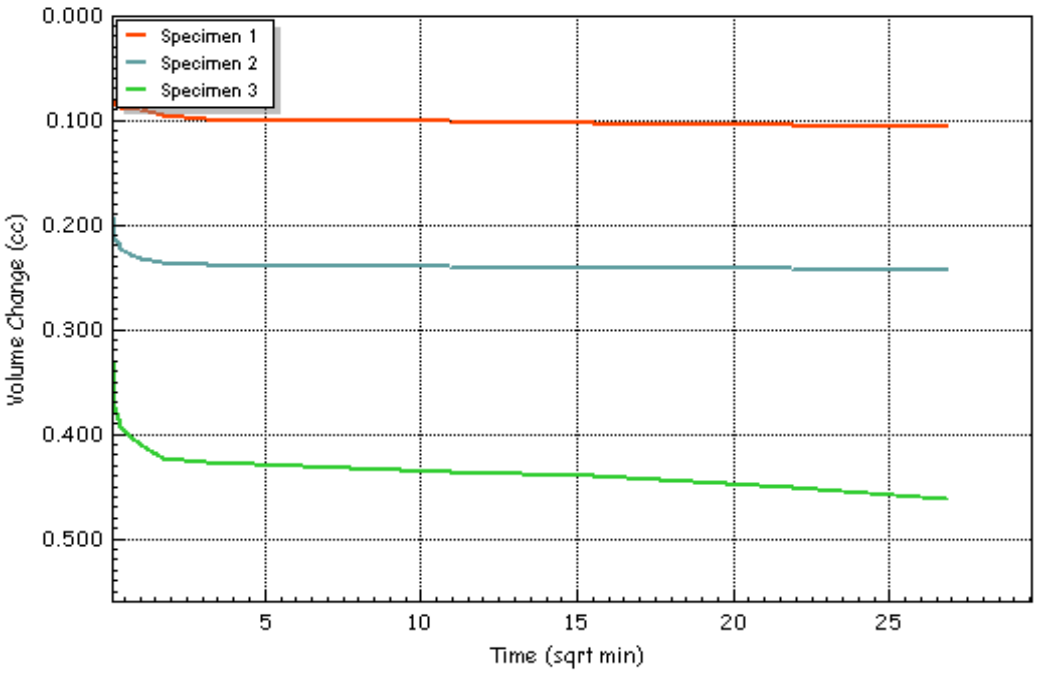
## Consolidated Drained

**Consolidation Plots**

| **Initial Conditions** | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_3$ | (kPa) | 1525 | 1550 | 1550 |
| Initial Back Pressure | $u_{bi}$ | (kPa) | 1500 | 1500 | 1450 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | 1506 | 1524 | 1521 |
| Drainage Method | | | From One End | From One End | From One End |

| **Final Conditions** | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| PWP Dissipation % | U% | (%) | 100.00 | 100.00 | 100.00 |
| Volumetric Strain | $\varepsilon_v$% | (%) | 0.12 | 0.28 | 0.54 |
| Corrected Length | $L_c$ | (mm) | 76.0 | 75.9 | 75.9 |
| Corrected Area | $A_c$ | (cm2) | 11.33 | 11.32 | 11.30 |
| Corrected Volume | $V_c$ | (cc) | 86.087 | 85.949 | 85.731 |
| t100 | $t_{100}$ | (min) | 2.79 | 0.50 | 1.59 |
| Consolidation | $c_v$ | (m2/year | 8.543 | 47.620 | 14.949 |
| Compressibility | $m_v$ | (m2/MN) | 0.205 | 0.118 | 0.075 |
| Test Time | $t_F$ | (h:m:s) | 02:00:00 | 02:00:00 | 02:00:00 |
| Estimated Strain to Failure | $\varepsilon$% | (%) | 5.0 | 5.0 | 5.0 |
| Shear Machine Speed | $d_r$ | (mm/min | 0.03165 | 0.03164 | 0.03161 |

**Notes**

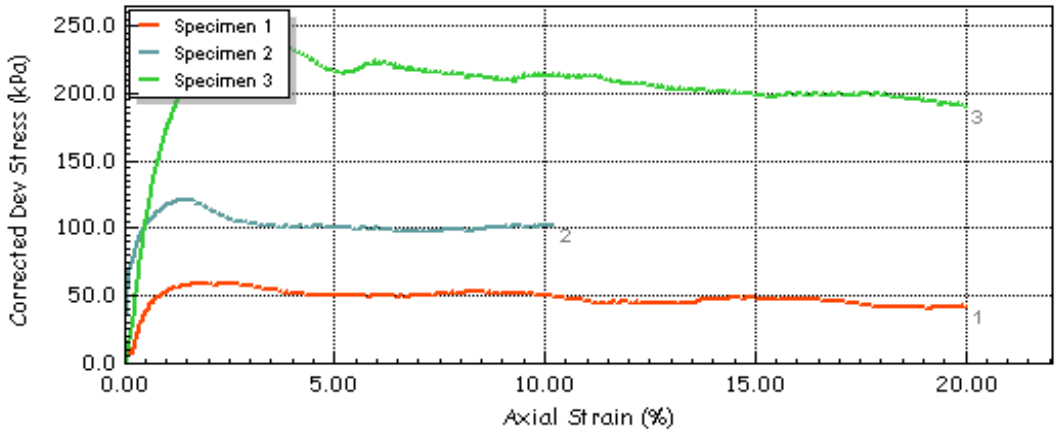


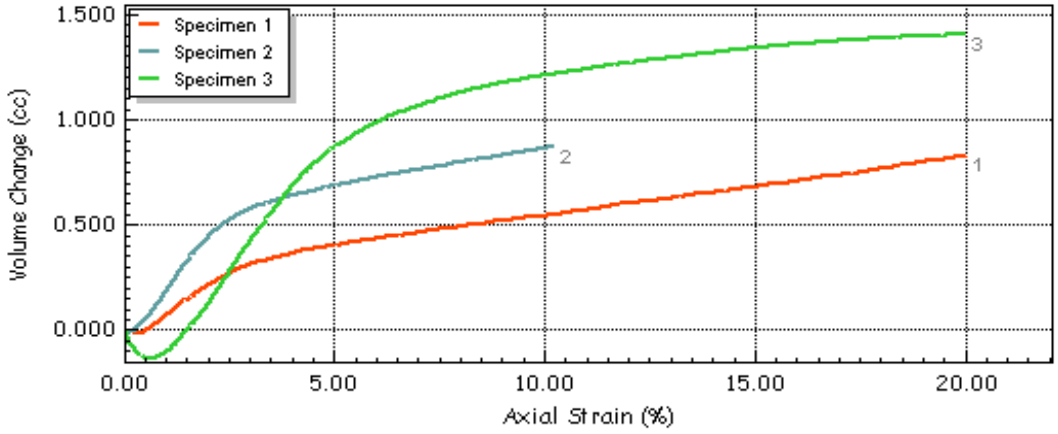

| | | | | | |
|---|---|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-20_samp 2.20m PU05 | |
| | | | Test Date | 19/04/2023 | |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-20_samp | |
| | | | Sample | 2.20m PU05 B1 | |
| Client | Geoquip Marine | | Depth | 2.20m | |
| Operator | D.Burton | Checked | S.Royle | Approved | S.Royle |

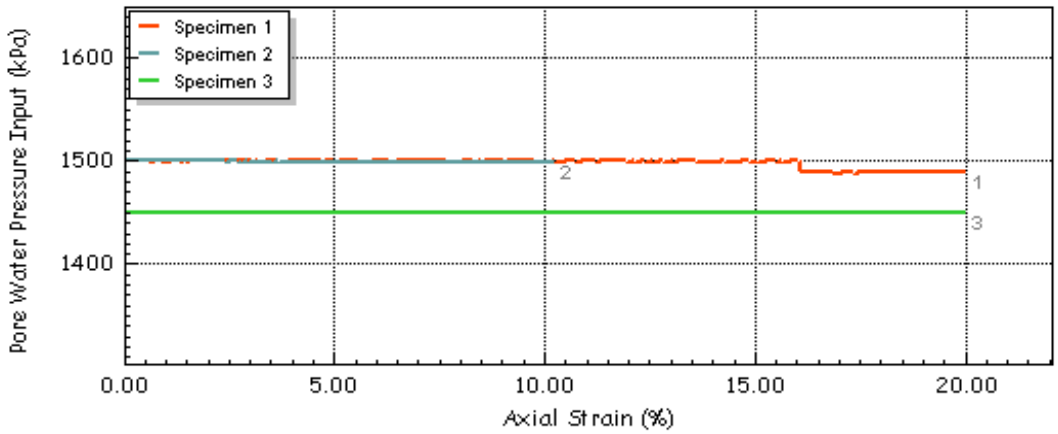
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**



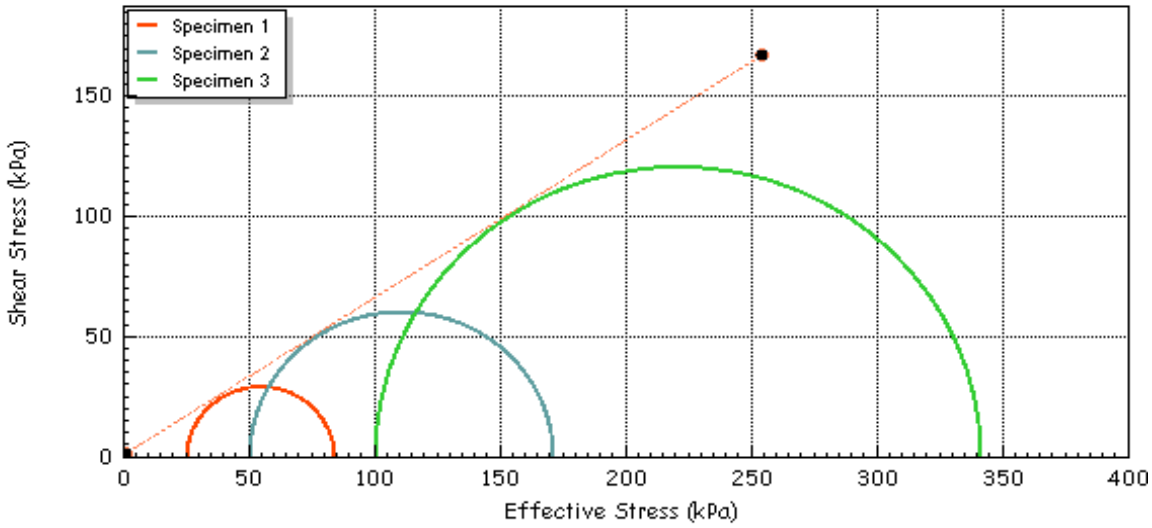

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY UKAS TESTING 4043 | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-20_samp 2.20m PU05 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-20_samp |
| | | | | Sample | 2.20m PU05 B1 |
| | Client | Geoquip Marine | | Depth | 2.20m |
| | Operator | D.Burton | Checked | S.Royle | Approved S.Royle |

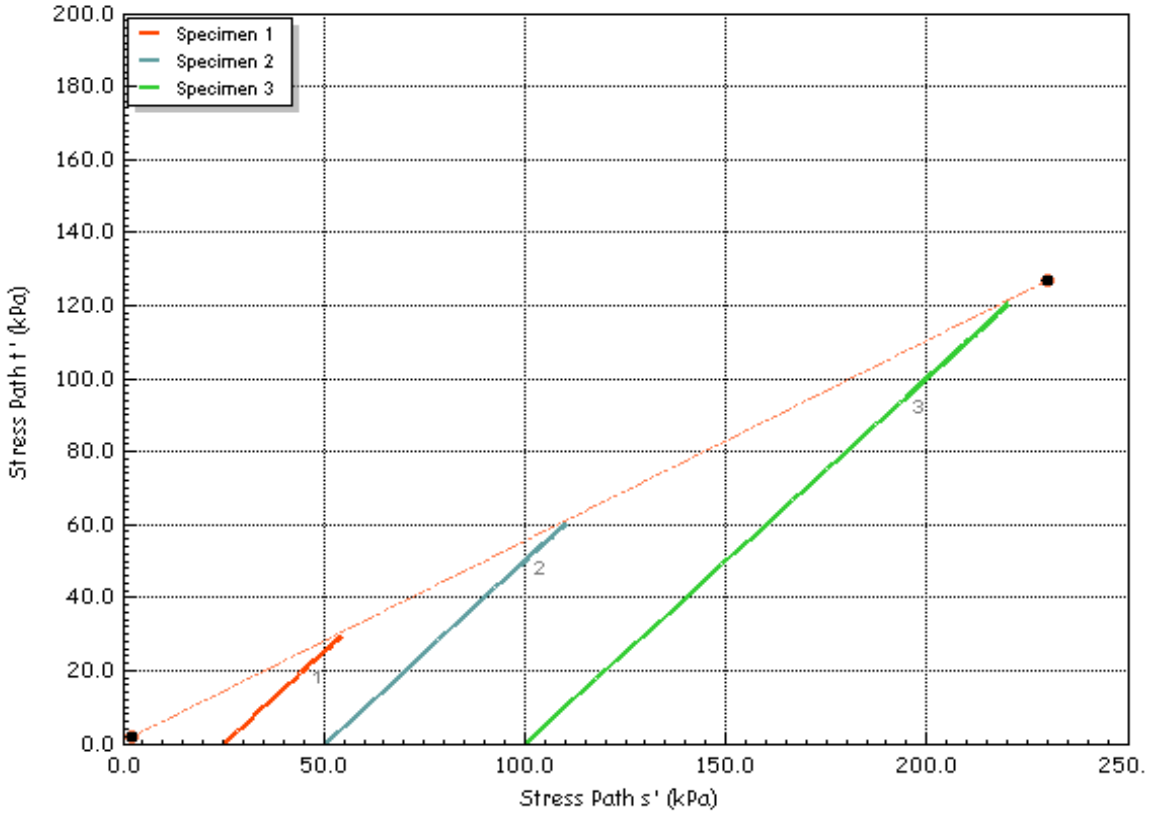
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Effective | c' | (kPa) | 0.55 | Effective Cohesion | c' | (kPa) | 0.55 |
| Effective Friction | ϕ' | (deg) | 33.3 | Effective Friction | ϕ' | (deg) | 33.3 |



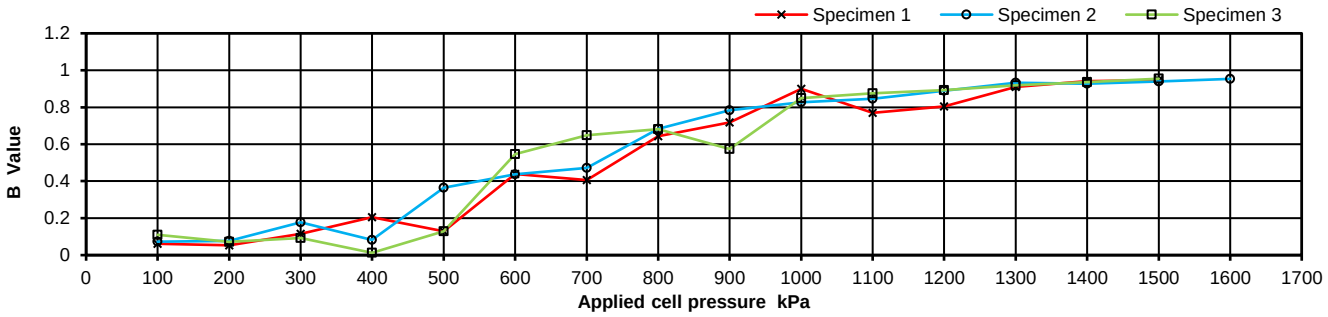

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | Test Name | OWF_GI-20_samp 2.20m PU05 | |
| | | | Test Date | 19/04/2023 | |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | Borehole | OWF_GI-20_samp | |
| | | | Sample | 2.20m PU05 B1 | |
| | Client | Geoquip Marine | Depth | 2.20m | |
| | Operator | D.Burton | Checked | S.Royle | Approved S.Royle |

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Isotropic Drained Triaxial Compression Test with measurement of volume change** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | PU06 |
| Soil Description | 2.5y 4/2 Dark greyish brown SAND including sparse shell fragments | | | Depth m | 2.70 |
| Specimen Reference | B1 | Specimen Depth | 2.70 m | Sample Type | B1 |
| Specimen Description | 2.5y 4/2 Dark greyish brown SAND including sparse shell fragments | | | KeyLAB ID | BH0120230227425 |
| Test Method | BS EN ISO 17892 Part 9: Consolidated Trixial Compression Tests | | | | |

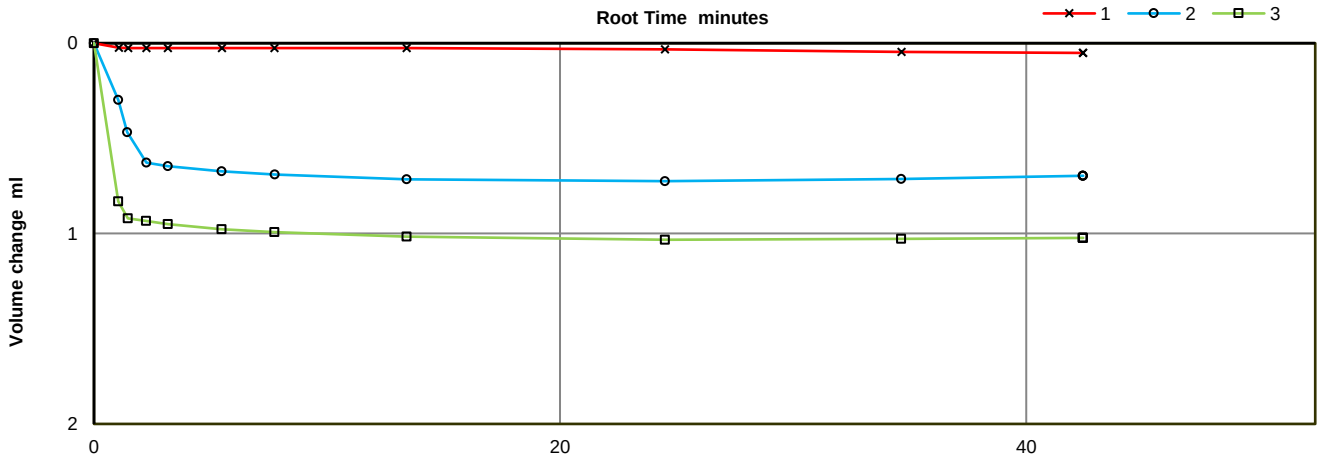
| | |
|---|---|
| Specimen Type/Preparation | REMOULDED 25/50/100 kPa 1.62DD @ 10% MC |

| **Specimen Details** | | | 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial | Height | mm | 100.0 | 140.0 | 100.1 |
| | Diameter | mm | 50.0 | 70.1 | 50.0 |
| | Bulk Density | Mg/m³ | 1.79 | 1.80 | 1.80 |
| | Water Content | % | 10.0 | 10.0 | 10.0 |
| | Dry density | Mg/m³ | 1.63 | 1.64 | 1.64 |
| Final | Bulk Density | Mg/m³ | 1.97 | 1.99 | 2.06 |
| | Water Content | % | 21.8 | 25.7 | 26.2 |
| | Dry density | Mg/m³ | 1.61 | 1.62 | 1.63 |

| **Saturation Details** | | 1 | 2 | 3 |
|---|---|---|---|---|
| Method | | Back pressure method | Back pressure method | Back pressure method |
| Cell pressure increments | kPa | 100 | 100 | 100 |
| Differential Pressure | kPa | 20 | 20 | 20 |
| Final Cell Pressure | kPa | 1500 | 1600 | 1500 |
| Final pore water pressure | kPa | 1381 | 1480 | 1380 |
| Final B Value | | 0.95 | 0.95 | 0.95 |
| Time Taken to saturate | Day | 2.00 | 2.00 | 2.00 |



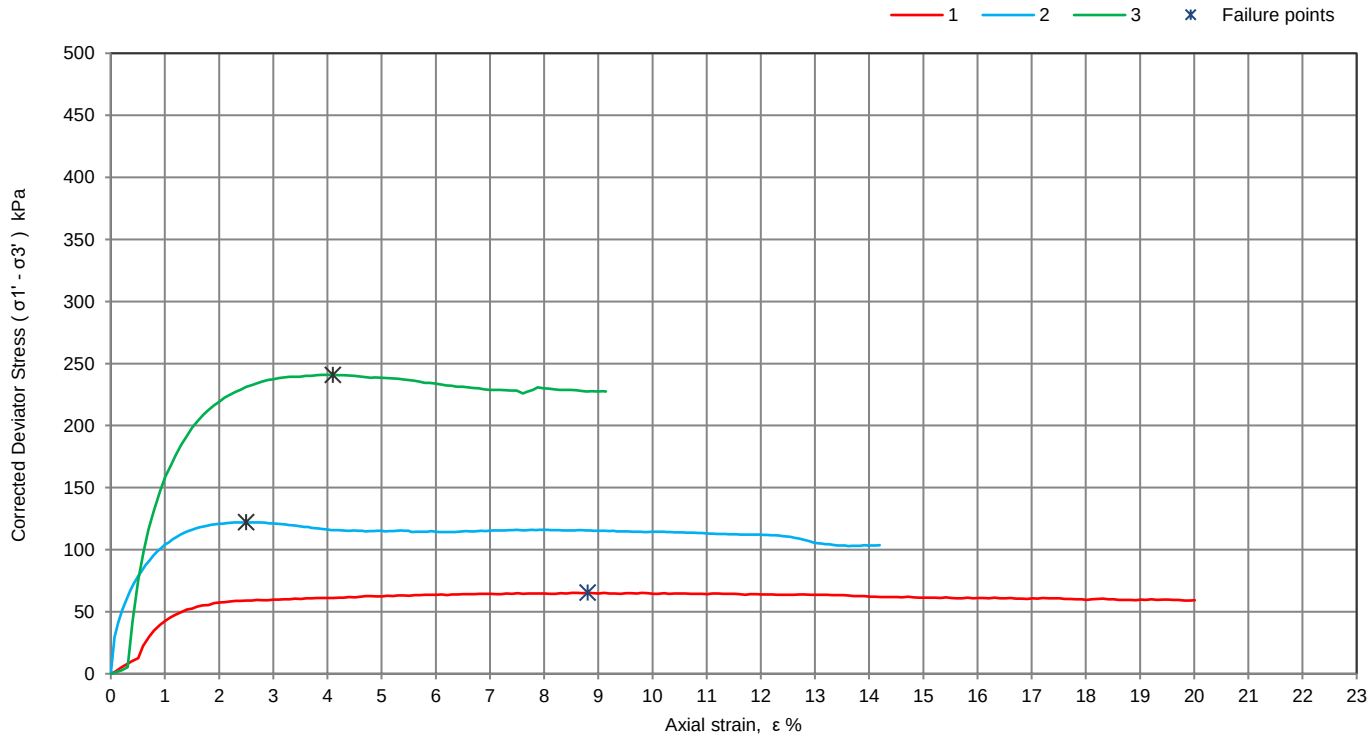

| **Consolidation Details** | Specimen No. | 1 | 2 | 3 | |
|---|---|---|---|---|---|
| | Time Taken to consolidate | 1 | 1 | 1 | Days |
| | Drainage Conditions | One end | One end | One end | |
| | Cell Pressure applied | 1500 | 1650 | 1600 | kPa |
| | Back Pressure applied | 1475 | 1600 | 1500 | kPa |
| | Effective Pressure | 25 | 50 | 100 | kPa |
| | Pore pressure at start of consolidation | 1493 | 1630 | 1578 | kPa |
| | Pore pressure at end of consolidation | 1485 | 1606 | 1503 | kPa |
| | Pore pressure dissipation at end of consolidation | 44 | 79 | 97 | % |

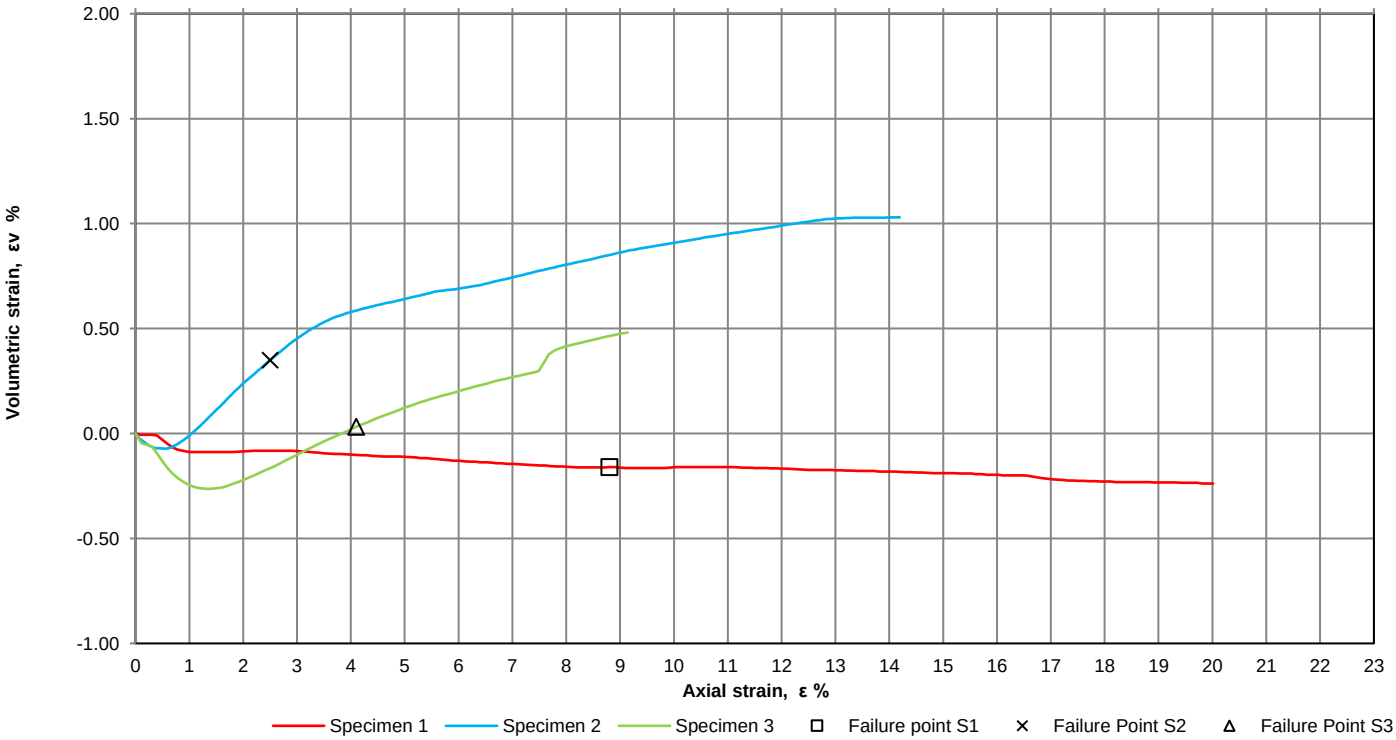



| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 27/07/2023 10:48 | D.Smith | Sheet No. | 1 of 3 |

Lab Sheet Reference : GM-L-TSR-46

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Drained Triaxial Compression Test with measurement of volume change** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU06 |
| Specimen Reference | B1 | Specimen Depth | 2.70 | m | Depth m | 2.70 |
| Compression stages - graphical data | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH0120230227425 |




| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 27/07/2023 10:48 | D.Smith | Sheet No. | 2 of 3 |

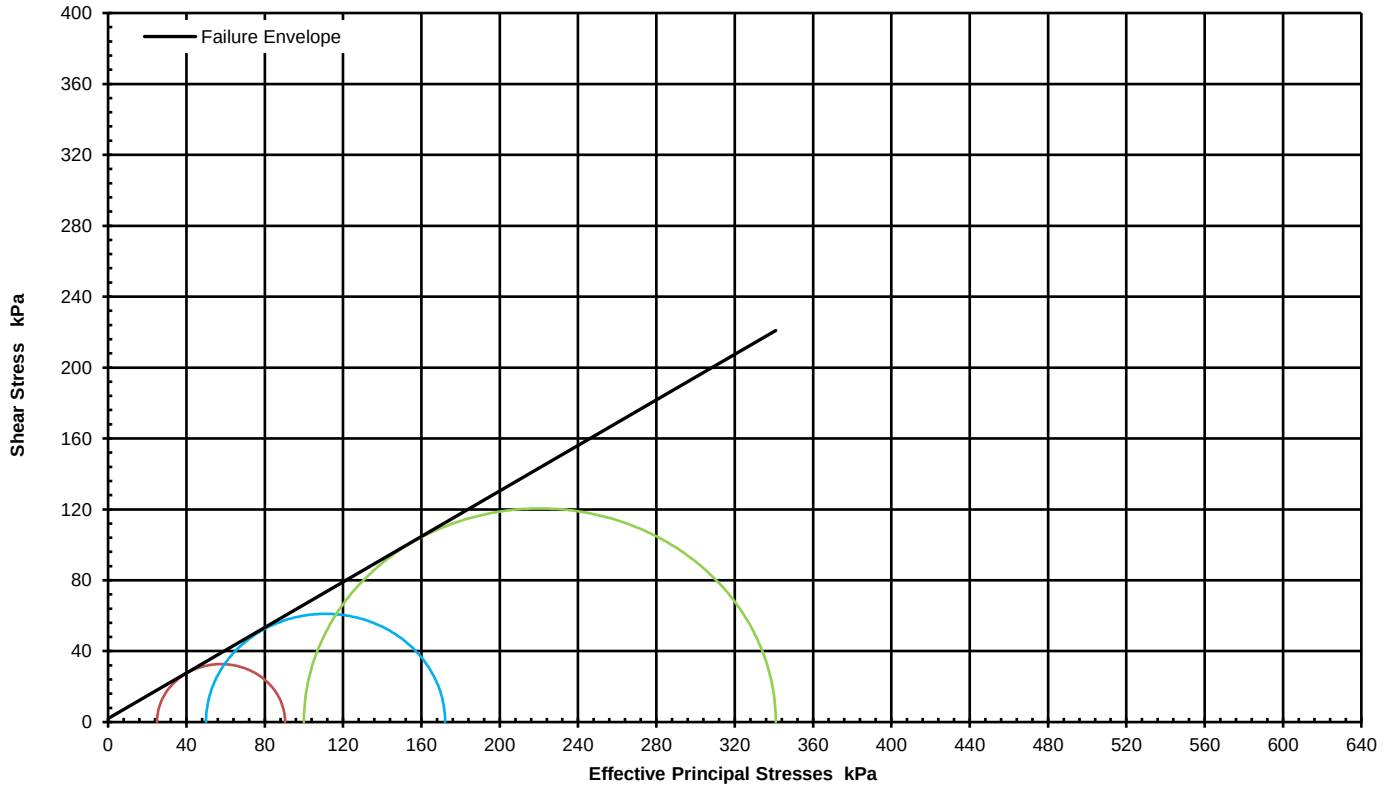
Lab Sheet Reference : GM-L-TSR-46

| GEOQUIPMARINE | Consolidated Drained Triaxial Compression Test with measurement of volume change | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole | OWF_GI#22_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | PU06 |
| Specimen Reference | B1 | Specimen Depth | 2.70 | m | Depth m | 2.70 |
| Compression stages - table of results and interpretation | | | | | Sample Type | B1 |
| | | | | | KeyLAB ID | BH0120230227425 |

At maximum deviator stress ( failure )

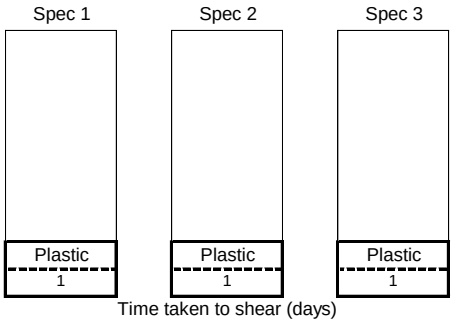
| Specimen | Cell pressure kPa | Initial pwp kPa | Initial $\sigma_3'$ kPa | Rate of strain %/hr | Axial strain, $\varepsilon_f$ % | $(\sigma_1' - \sigma_3')_f$ kPa | Volumetric strain, $\varepsilon_v$ % per hr | $\sigma_3'_f$ kPa | $\sigma_1'_f$ kPa | Specimen Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1500 | 1475 | 25 | 2.00 | 8.8 | 65 | -0.2 | 25 | 90 | |
| 2 | 1650 | 1600 | 50 | 2.00 | 2.5 | 122 | 0.4 | 50 | 172 | |
| 3 | 1600 | 1500 | 100 | 2.00 | 4.1 | 241 | 0.0 | 100 | 341 | |

**Mohr Circles**




| Shear Strength Parameters | | Linear regression | Manual re-assessment |
|---|---|---|---|
| c ' | kPa | 1.6 | - |
| Ø ' | degrees | 32.7 | - |

Mode of failure




**General Remarks**

Deviator stresses corrected for area change, and up to 0.3 mm thick rubber membrane/

| | | | | | |
|---|---|---|---|---|---|
| Total Time of test: | 4.00 | 4.00 | 4.00 | 12.00 | Days |
| | S1 | S2 | S3 | All spec | |

f Denotes at failure

Positive volume changes indicate water out of specimen ( consolidation )

Lab Sheet Reference : GM-L-TSR-46

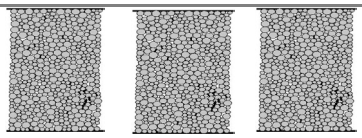
| Date Printed | Approved | Fig. No. | 1 |
|---|---|---|---|
| 27/07/2023 10:48 | D.Smith | Sheet No. | 3 of 3 |

# Effective Stress Triaxial Compression

## Consolidated Drained

**Summary Report**

**Sample Details** *sketch showing specimen location in original sample*



| | | | | | |
|---|---|---|---|---|---|
| Depth | 3.90m | | | | |
| Description | Brown slightly gravelly sandy CLAY. | | | | |
| Type | Recompacted at 1.70 DD, 10% moisture content. | | | | |
| | | | Spm. 1 | 2 | 3 |
| Initial Sample Length | $L_0$ | (mm) | 76.0 | 76.0 | 76.0 |
| Initial Sample Diameter | $D_0$ | (mm) | 38.0 | 38.0 | 38.0 |
| Initial Sample Weight | $W_0$ | (gr) | 161.4 | 161.4 | 161.4 |
| Initial Bulk Density | $\rho_0$ | (Mg/m3) | 1.87 | 1.87 | 1.87 |
| Particle Density | $\rho_s$ | (Mg/m3) | 2.66 | 2.66 | 2.66 |

**Initial Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_{3i}$ | (kPa) | 875 | 900 | 950 |
| Initial Back Pressure | $U_{bi}$ | (kPa) | 850 | 850 | 850 |
| Membrane Thickness | $m_b$ | (mm) | 0.400 | 0.400 | 0.400 |
| Displacement Input | $L_{IP}$ | (mm) | CH 2 | CH 2 | CH 2 |
| Load Input | $N_{IP}$ | (N) | CH 4 | CH 4 | CH 4 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | CH 3 | CH 3 | CH 3 |
| Sample Volume | $V$ | (cc) | CH 6 | CH 6 | CH 6 |
| Initial Moisture | $\omega_i$ | (%) | 10 | 10 | 10 |
| Initial Dry Density | $\rho_{di}$ | (Mg/m3) | 1.70 | 1.70 | 1.70 |
| Initial Voids Ratio | $e_i$ | . | 0.568 | 0.568 | 0.568 |
| Initial Degree of Saturation | $S_i$ | (%) | 49 | 49 | 49 |
| B Value | $B$ | . | 0.96 | 0.95 | 0.95 |

**Final Conditions**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Final Moisture | $\omega_f$ | (%) | 22 | 22 | 19 |
| Final Dry Density | $\rho_{df}$ | (Mg/m3) | 1.70 | 1.72 | 1.77 |
| Final Voids Ratio | $e_f$ | . | 0.564 | 0.544 | 0.501 |
| Final Degree of Saturation | $S_f$ | (%) | 100.0 | 100.0 | 100.0 |
| Failure Criteria | | . | Max. Dev. Stress | Max. Dev. Stress | Max. Dev. Stress |
| Strain At Failure | $\varepsilon_f$ | (%) | 5.30 | 19.80 | 13.94 |
| Stress At Failure | $(\sigma_1-\sigma_3)_f$ | (kPa) | 73.4 | 124.2 | 225.4 |
| Minor Stress At Failure | $\sigma_3'$ | (kPa) | 25.0 | 50.0 | 100.0 |
| Major Stress At Failure | $\sigma_1'$ | (kPa) | 98.4 | 174.2 | 325.4 |
| Principal Stress Ratio At Failure | $\sigma_1'/\sigma_3'$ | | 3.938 | 3.484 | 3.255 |
| PwP At Failure Criteria | $u_f$ | (kPa) | 847.0 | 849.0 | 844.2 |

**Notes**

*Plastic*

| | | | | | |
|---|---|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | | | Test Name | OWF_GI-22-Samp 3.90m PU08 Q1 |
| | | | | Test Date | 19/04/2023 |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | | | Borehole | OWF_GI-222-Samp |
| | | | | Sample | 3.90m PU08 Q1 |
| Client | Geoquip Marine | | | Depth | 3.90m |
| Operator | D.Burton | Checked | S.Royle | Approved | S.Royle |

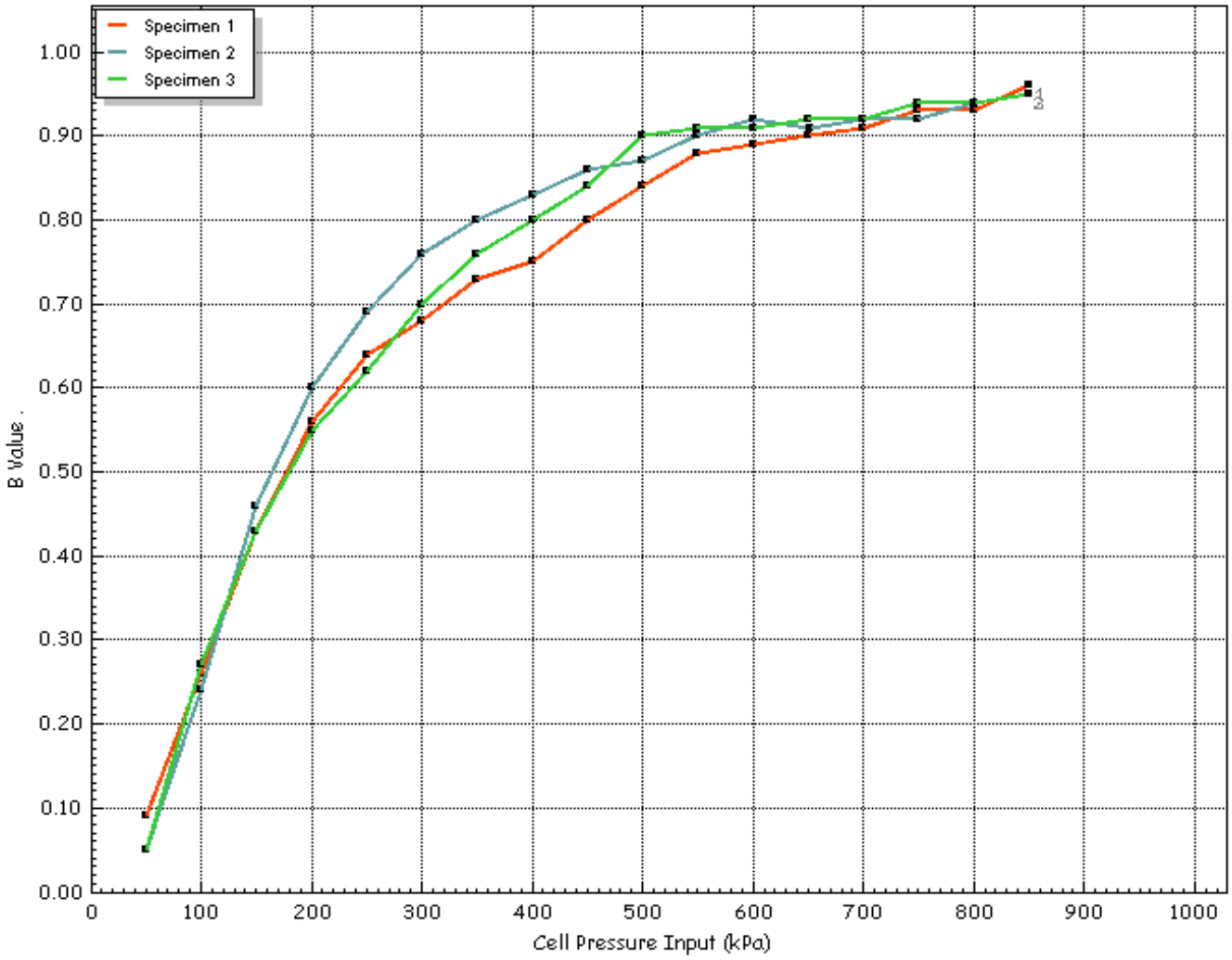
PSL PROFESSIONAL SOILS LABORATORY — UKAS TESTING 4043

# Effective Stress Triaxial Compression

## Consolidated Drained

**Saturation Plots**

| | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Saturation Method | | | Stepped | Stepped | Stepped |
| Cell Pressure Input | σ | (kPa) | 850 | 850 | 850 |
| Pore Water Pressure Input | u pwp | (kPa) | 833 | 831 | 833 |
| B Value | B | . | 0.96 | 0.95 | 0.95 |




| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-22-Samp 3.90m PU08 Q1 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-222-Samp |
| | | | | Sample | 3.90m PU08 Q1 |
| | Client | Geoquip Marine | | Depth | 3.90m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

# Effective Stress Triaxial Compression

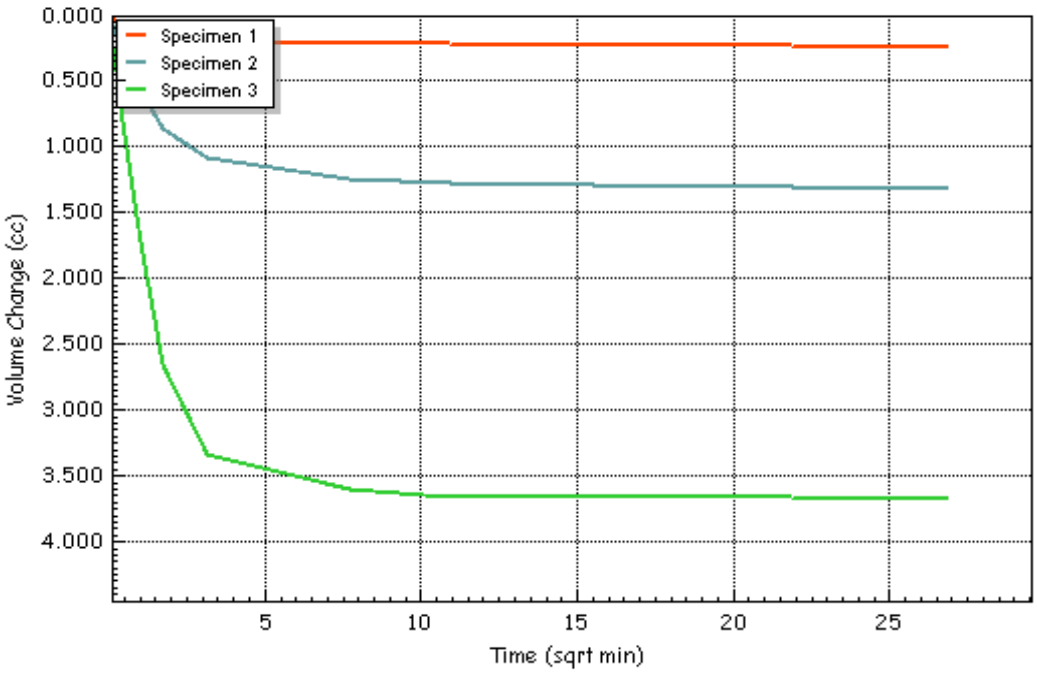
## Consolidated Drained

**Consolidation Plots**

| **Initial Conditions** | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| Initial Cell Pressure | $\sigma_3$ | (kPa) | 875 | 900 | 950 |
| Initial Back Pressure | $u_{bi}$ | (kPa) | 850 | 850 | 850 |
| Pore Water Pressure Input | $u_{pwp}$ | (kPa) | 855 | 871 | 929 |
| Drainage Method | | | From One End | From One End | From One End |

| **Final Conditions** | | | Spm. 1 | 2 | 3 |
|---|---|---|---|---|---|
| PWP Dissipation % | U% | (%) | 100.00 | 100.00 | 100.00 |
| Volumetric Strain | $\varepsilon_v$% | (%) | 0.28 | 1.53 | 4.26 |
| Corrected Length | $L_c$ | (mm) | 75.9 | 75.6 | 74.9 |
| Corrected Area | $A_c$ | (cm2) | 11.32 | 11.23 | 11.02 |
| Corrected Volume | $V_c$ | (cc) | 85.956 | 84.878 | 82.517 |
| t100 | $t_{100}$ | (min) | 2.02 | 5.02 | 6.24 |
| Consolidation | $c_v$ | (m2/year | 11.788 | 4.704 | 3.714 |
| Compressibility | $m_v$ | (m2/MN) | 0.522 | 0.740 | 0.542 |
| Test Time | $t_F$ | (h:m:s) | 02:00:00 | 02:00:00 | 02:00:00 |
| Estimated Strain to Failure | $\varepsilon$% | (%) | 5.0 | 5.0 | 5.0 |
| Shear Machine Speed | $d_r$ | (mm/min | 0.03164 | 0.03151 | 0.03122 |

**Notes**

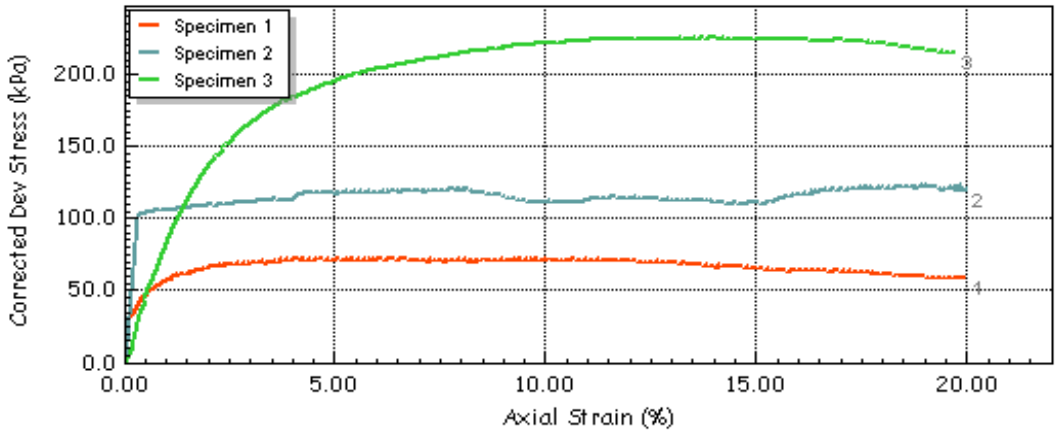


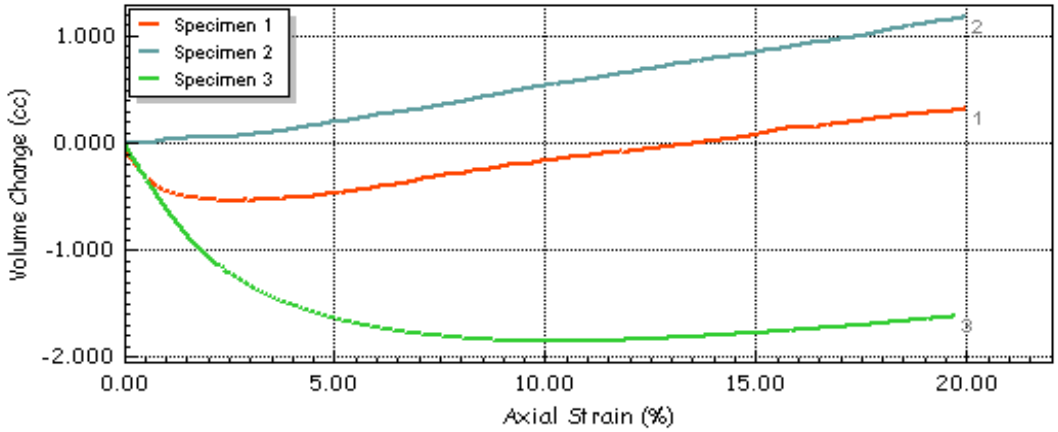

| | | | | | |
|---|---|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-22-Samp 3.90m PU08 Q1 | |
| | | | Test Date | 19/04/2023 | |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-222-Samp | |
| | | | Sample | 3.90m PU08 Q1 | |
| Client | Geoquip Marine | | Depth | 3.90m | |
| Operator | D.Burton | Checked | S.Royle | Approved | S.Royle |

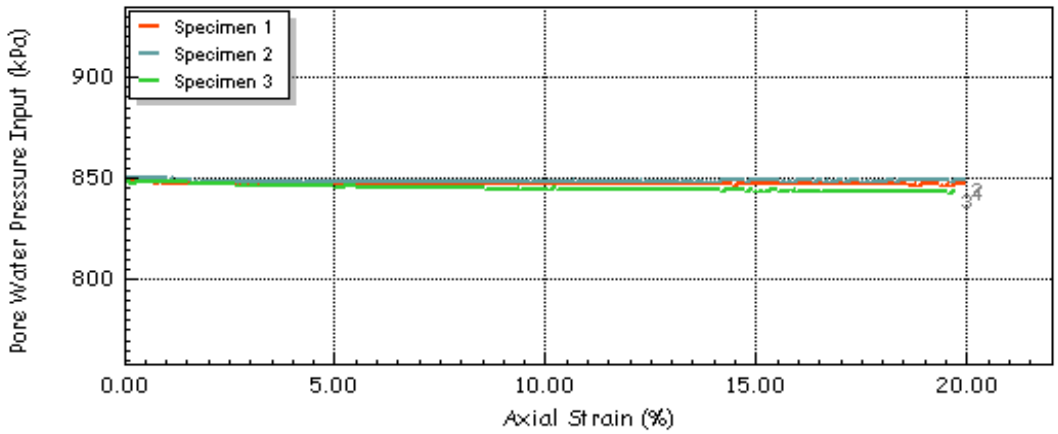
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**



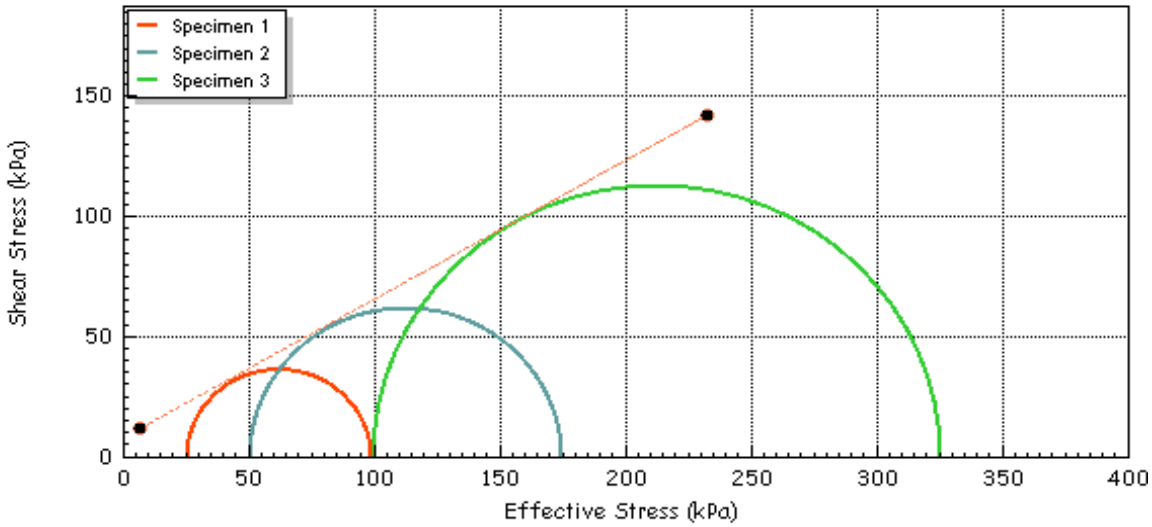

| | | | | | |
|---|---|---|---|---|---|
| PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY UKAS TESTING 4043 | Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-22-Samp 3.90m PU08 Q1 |
| | | | | Test Date | 19/04/2023 |
| | Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-222-Samp |
| | | | | Sample | 3.90m PU08 Q1 |
| | Client | Geoquip Marine | | Depth | 3.90m |
| | Operator | D.Burton | Checked S.Royle | Approved | S.Royle |

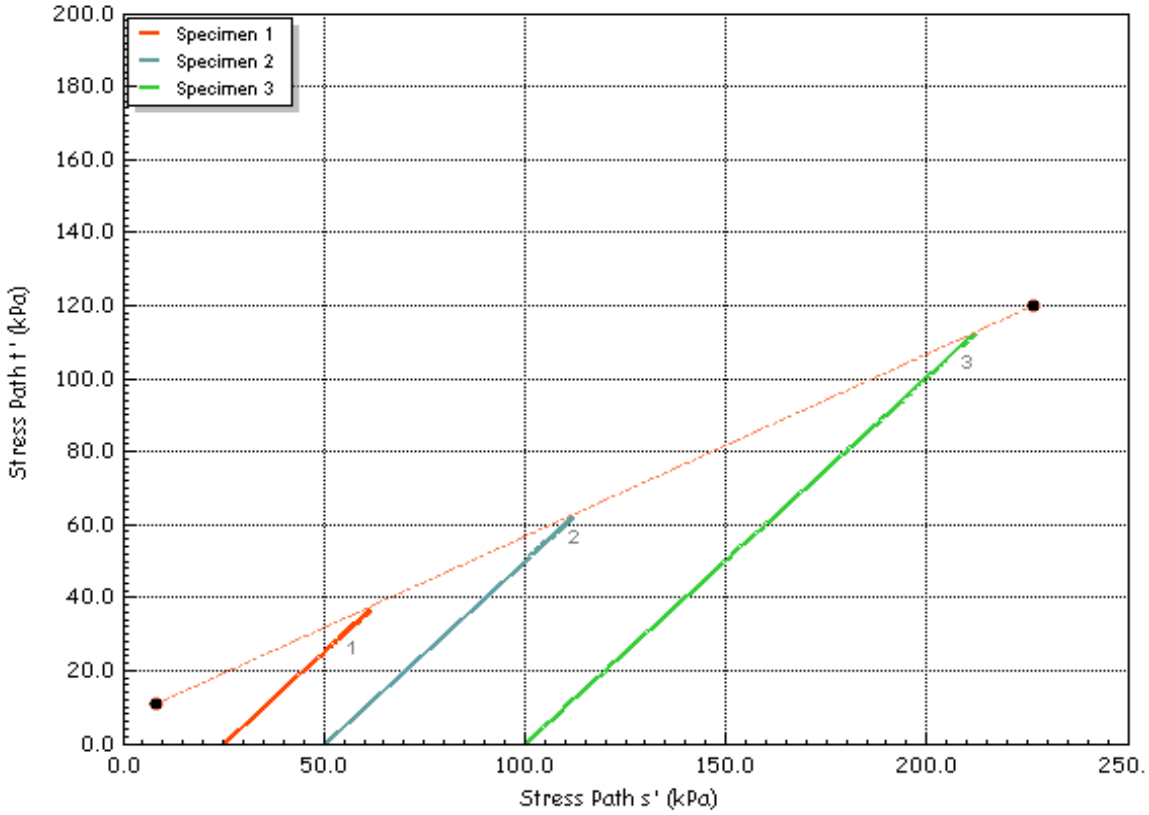
# Effective Stress Triaxial Compression

## Consolidated Drained

**Shear Stage Plots**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Effective | c' | (kPa) | 7.44 | Effective Cohesion | c' | (kPa) | 7.44 |
| Effective Friction | ϕ' | (deg) | 30.0 | Effective Friction | ϕ' | (deg) | 30.0 |



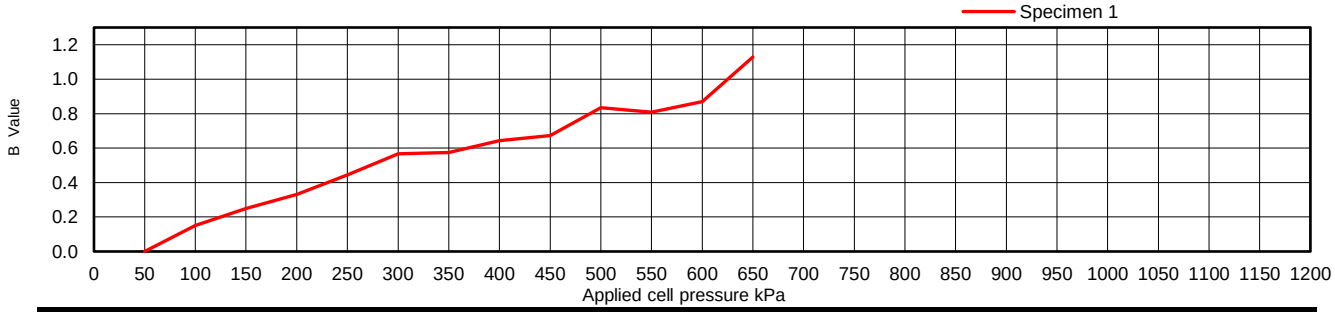

| | | | | | |
|---|---|---|---|---|---|
| Test Method | BS EN ISO 17892-9:2018 | | Test Name | OWF_GI-22-Samp 3.90m PU08 Q1 | |
| | | | Test Date | 19/04/2023 | |
| Jobfile | GMOP21-G-019 A05 Bretagne offshore | | Borehole | OWF_GI-222-Samp | |
| | | | Sample | 3.90m PU08 Q1 | |
| Client | Geoquip Marine | | Depth | 3.90m | |
| Operator | D.Burton | Checked | S.Royle | Approved | S.Royle |

| | | | |
|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Undrained Triaxial Compression Test with measurement of pore pressure** | Job Ref | GMOP21-G-019 |
| | | Borehole | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | Sample No. | PU06 |
| Sample Description | Extremely high strength 10YR (3/1) very dark greyish brown, CLAY. | Depth m | 10.20 |
| Specimen Description | Extremely high strength 10YR (3/1) very dark greyish brown, CLAY. | Sample Type | Q1 |
| | | KeyLAB ID | BH012023030736 |
| Test Method | BS EN ISO 17892 PART 9: Consolidated trixial compression tests | | |

| | |
|---|---|
| Specimen Type/Preparation | UNDISTURBED 100kPa |

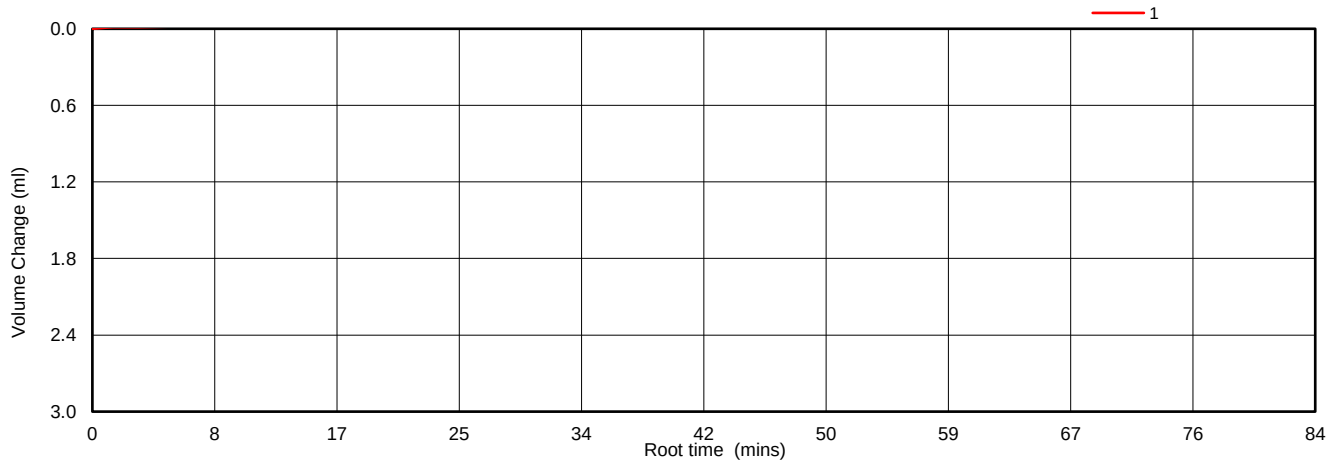
| **Specimen Details** | | | 1 |
|---|---|---|---|
| Initial | Height | mm | 124.4 |
| | Diameter | mm | 70.6 |
| | Bulk Density | Mg/m³ | 2.12 |
| | Water Content | % | 19.7 |
| | Dry density | Mg/m³ | 1.77 |
| Final | Bulk Density | Mg/m³ | 2.19 |
| | Water Content | % | 19.5 |
| | Dry density | Mg/m³ | 1.83 |

| **Saturation Details** | | 1 |
|---|---|---|
| Method | | Increments of cell pressure only |
| Cell pressure increments | kPa | 50 |
| Differential Pressure | kPa | 5 |
| Final Cell Pressure | kPa | 650 |
| Final pore water pressure | kPa | 645 |
| Final B Value | | 1.13 |




| | |
|---|---|
| Saturation Remarks | |

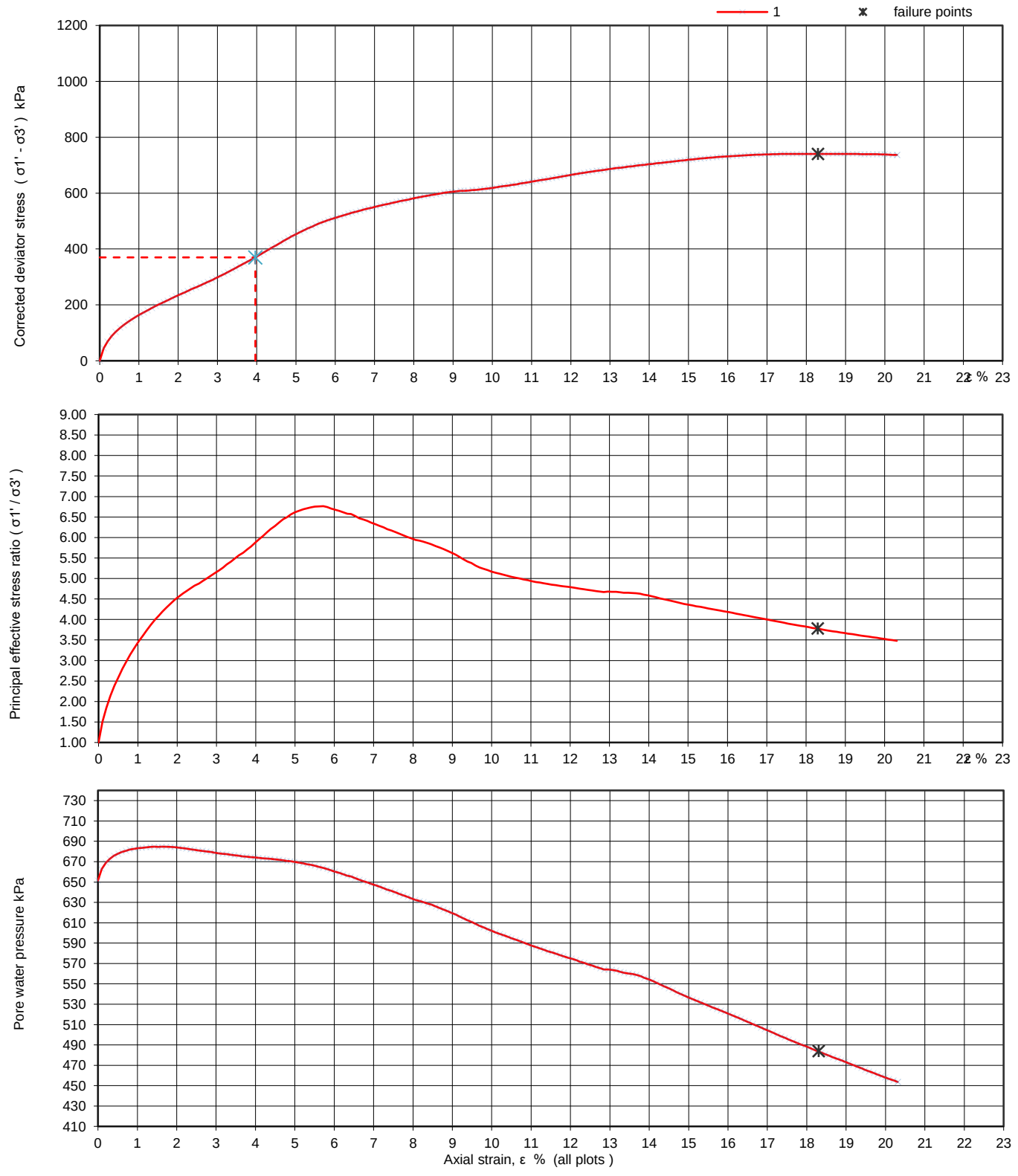
| **Consolidation Details** | | | |
|---|---|---|---|
| | Specimen No. | 1 | |
| | Drainage Conditions | Radial+1 end | |
| | Cell Pressure applied | 750 | kPa |
| | Back Pressure applied | 650 | kPa |
| | Effective Pressure | 100 | kPa |
| | Pore pressure at start of consolidation | 640 | kPa |
| | Pore pressure at end of consolidation | 650 | kPa |
| | Pore pressure dissipation at end of consolidation | 93 | % |




| Date Printed | Approved | | 1 |
|---|---|---|---|
| 23/05/2023 15:08 | D.Smith | Sheet No. | 1 of 3 |

Lab Sheet Reference :

| GEOQUIPMARINE | **Consolidated Undrained Triaxial Compression Test with measurement of pore pressure** | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | Sample No. | PU06 |
| Compression stages - graphical data | | Depth m | 10.20 |
| | | Sample Type | Q1 |
| | | KeyLAB ID | BH012023030736 |




| Date Printed | Approved | | |
|---|---|---|---|
| 23/05/2023 15:08 | D.Smith | Sheet No. | 2 of 3 |

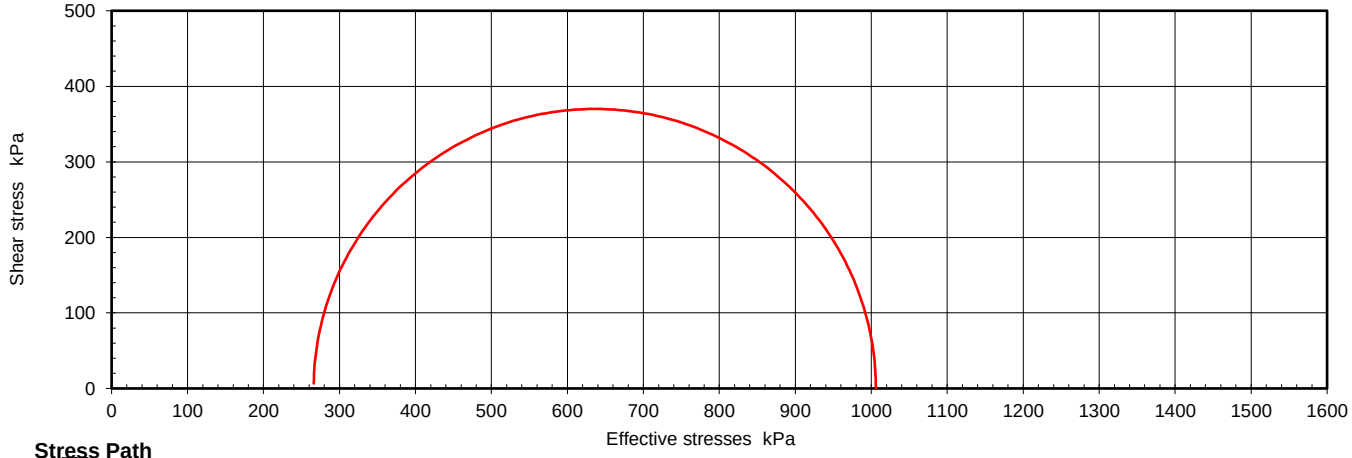
Lab Sheet Reference :

| | | | |
|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Undrained Triaxial Compression Test with measurement of pore pressure** | Job Ref | GMOP21-G-019 |
| | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | Sample No. | PU06 |
| Compression stages - table of results and interpretation | | Depth m | 10.20 |
| | | Sample Type | Q1 |
| | | KeyLAB ID | BH012023030736 |

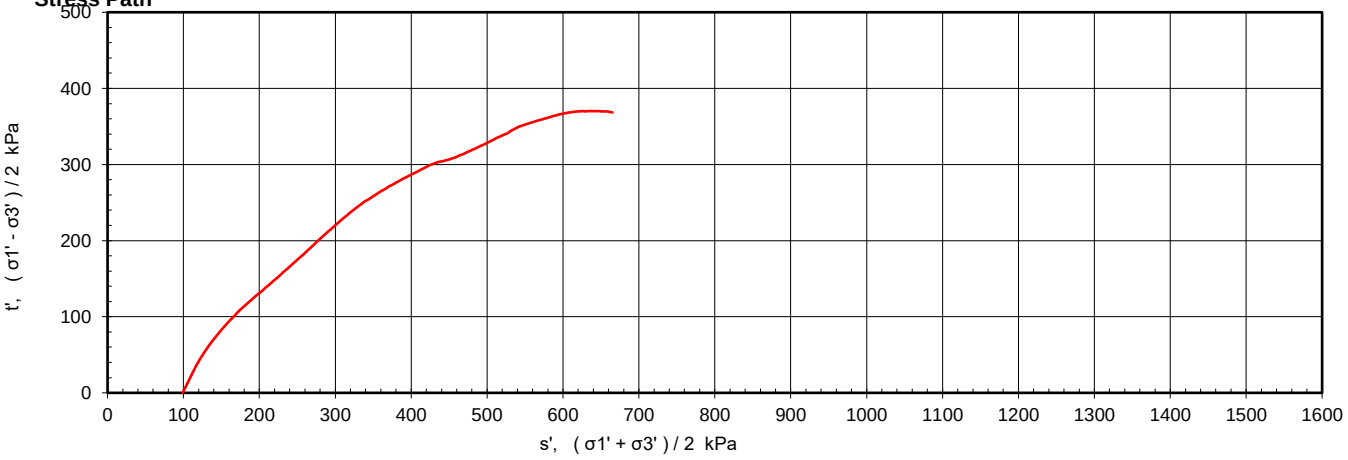
Failure criterion : Maximum deviator stress

| Specimen | Cell pressure kPa | Initial pwp kPa | Initial $\sigma_3'$ kPa | Rate of strain %/hr | Axial strain, $\varepsilon_f$ % | $(\sigma_1'/\sigma_3')_f$ | $(\sigma_1'-\sigma_3')_f$ kPa | $u_f$ kPa | $\sigma_3'_f$ kPa | $\sigma_1'_f$ kPa | $A_f$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 750 | 650 | 100 | 2.00 | 18.3 | 3.78 | 740 | 484 | 266 | 1007 | -0.23 |

**Mohr Circles**




**Stress Path**




| **Shear Strength Parameters** | | | Shear Strength |
|---|---|---|---|
| At Maximum deviator stress | Su | kPa | 370.00 |
| Shear Strength at 15% | | kPa | 359.67 |
| Epsilon 50 | | % | 3.96 |

Mode of failure

Compound

**Remarks**
General

Deviator stresses corrected for area change, spiral side drains and up to 0.3 mm thick rubber membrane/Swelled during consolidation/specimen deviating from standard due to being too short

All symbols used above are defined in BS1377

| Date Printed | Approved | | |
|---|---|---|---|
| 23/05/2023 15:08 | D.Smith | Sheet No. | 3 of 3 |

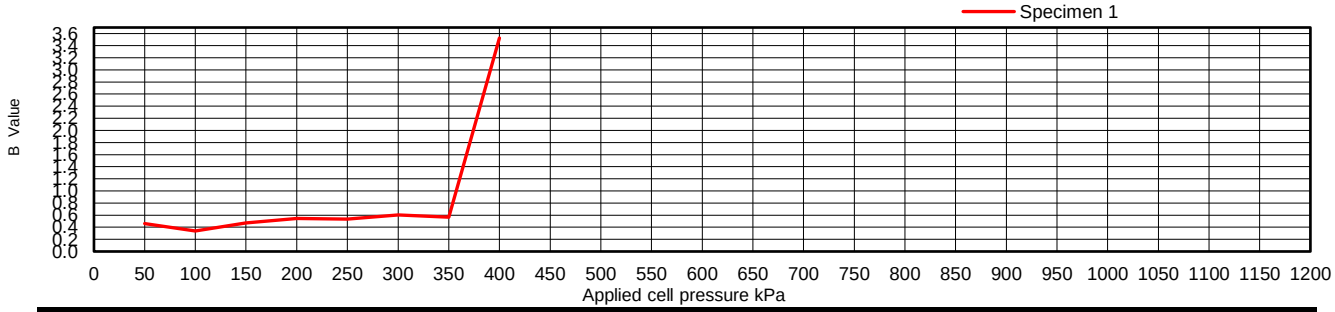
Lab Sheet Reference :

| | | | |
|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Undrained Triaxial Compression Test with measurement of pore pressure** | Job Ref | GMOP21-G-019 |
| | | Borehole | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | Sample No. | PU08 |
| Sample Description | Grey brown silty CLAY | Depth m | 11.30 |
| Specimen Description | Extremely high strength 10YR (3/1) very dark greyish brown silty CLAY | Sample Type | Q1 |
| | | KeyLAB ID | BH012023030741 |
| Test Method | BS EN ISO 17892 PART 9: Consolidated trixial compression tests | | |

| | |
|---|---|
| Specimen Type/Preparation | UNDISTURBED 115kPa |

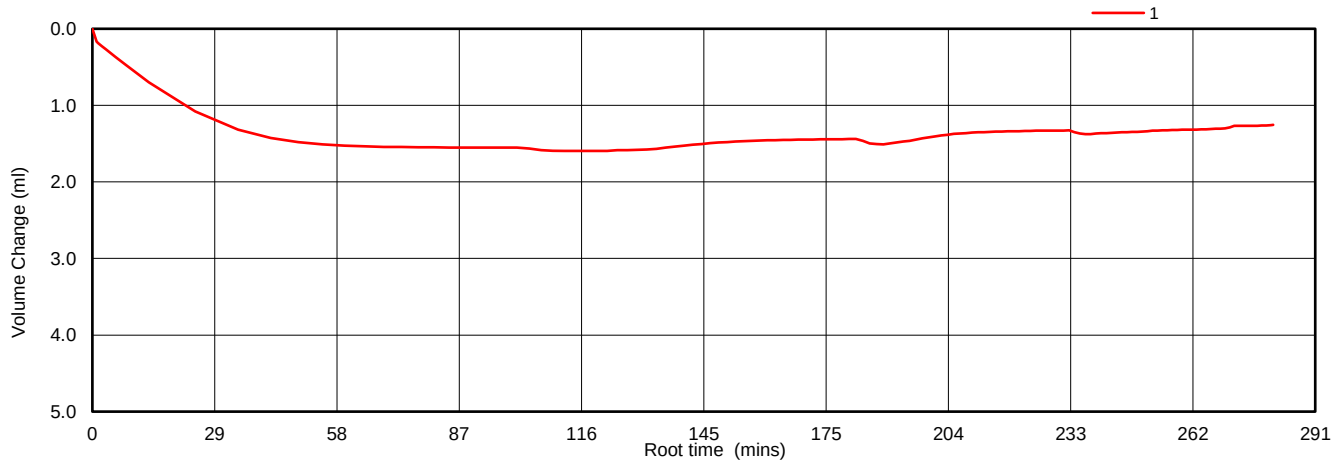
| **Specimen Details** | | | 1 |
|---|---|---|---|
| Initial | Height | mm | 140.0 |
| | Diameter | mm | 70.0 |
| | Bulk Density | Mg/m³ | 2.15 |
| | Water Content | % | 19.1 |
| | Dry density | Mg/m³ | 1.81 |
| Final | Bulk Density | Mg/m³ | 2.18 |
| | Water Content | % | 20.4 |
| | Dry density | Mg/m³ | 1.81 |

| **Saturation Details** | | 1 |
|---|---|---|
| Method | | Increments of cell pressure only |
| Cell pressure increments | kPa | 50 |
| Differential Pressure | kPa | 5 |
| Final Cell Pressure | kPa | 400 |
| Final pore water pressure | kPa | 345 |
| Final B Value | | 0.95 |




| | |
|---|---|
| Saturation Remarks | |

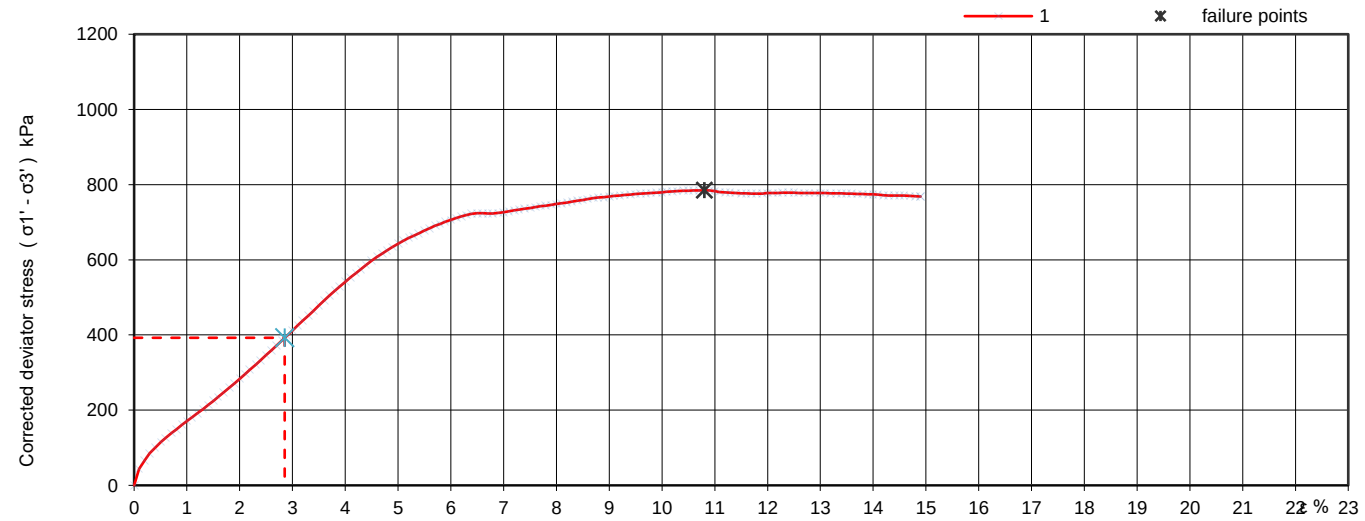
| **Consolidation Details** | | | |
|---|---|---|---|
| | Specimen No. | 1 | |
| | Drainage Conditions | Radial+1 end | |
| | Cell Pressure applied | 515 | kPa |
| | Back Pressure applied | 400 | kPa |
| | Effective Pressure | 115 | kPa |
| | Pore pressure at start of consolidation | 446 | kPa |
| | Pore pressure at end of consolidation | 402 | kPa |
| | Pore pressure dissipation at end of consolidation | 96 | % |

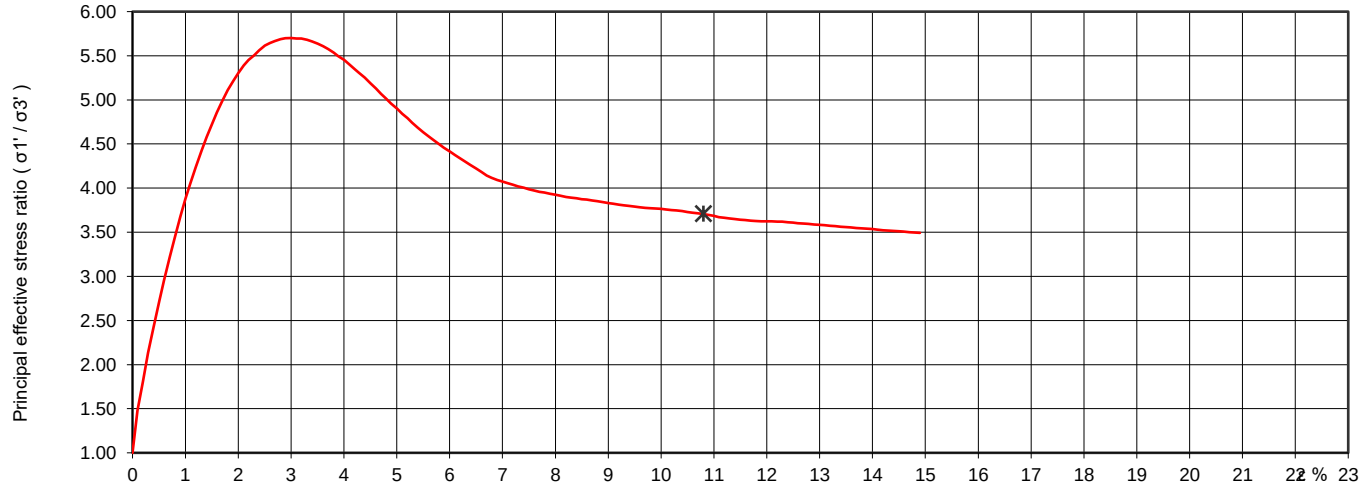


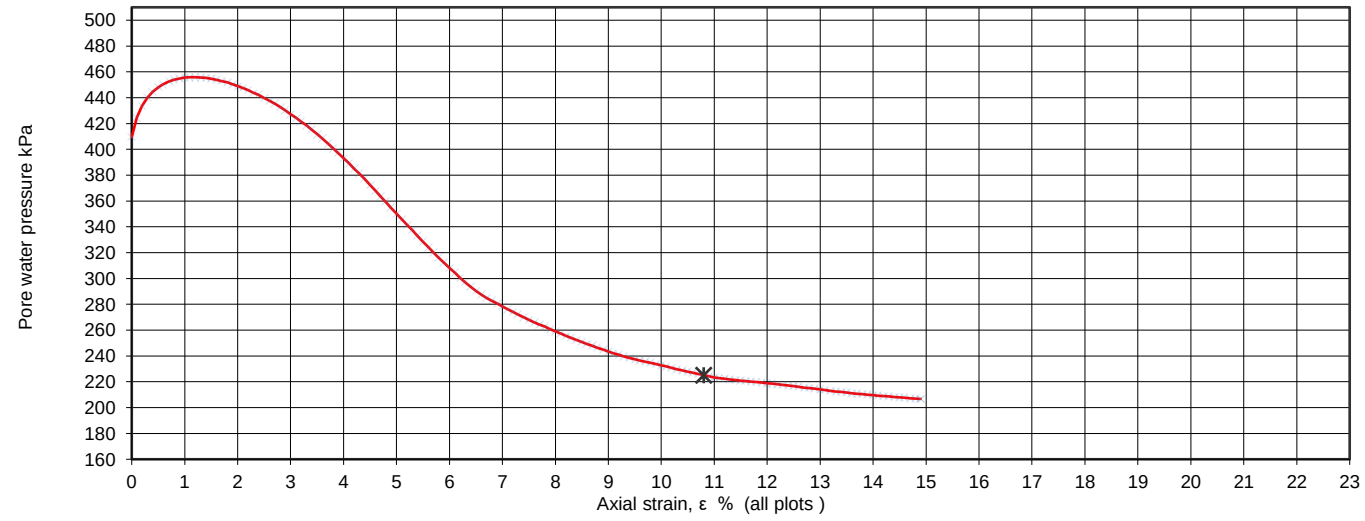

| Date Printed | Approved | | 1 |
|---|---|---|---|
| 19/05/2023 15:21 | D.Smith | Sheet No. | 1 of 3 |

Lab Sheet Reference :

| | | | |
|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Undrained Triaxial Compression Test with measurement of pore pressure** | Job Ref | GMOP21-G-019 |
| | | Borehole | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | Sample No. | PU08 |
| Compression stages - graphical data | | Depth m | 11.30 |
| | | Sample Type | Q1 |
| | | KeyLAB ID | BH012023030741 |




| Date Printed | Approved | | |
|---|---|---|---|
| 19/05/2023 15:21 | D.Smith | Sheet No. | 2 of 3 |

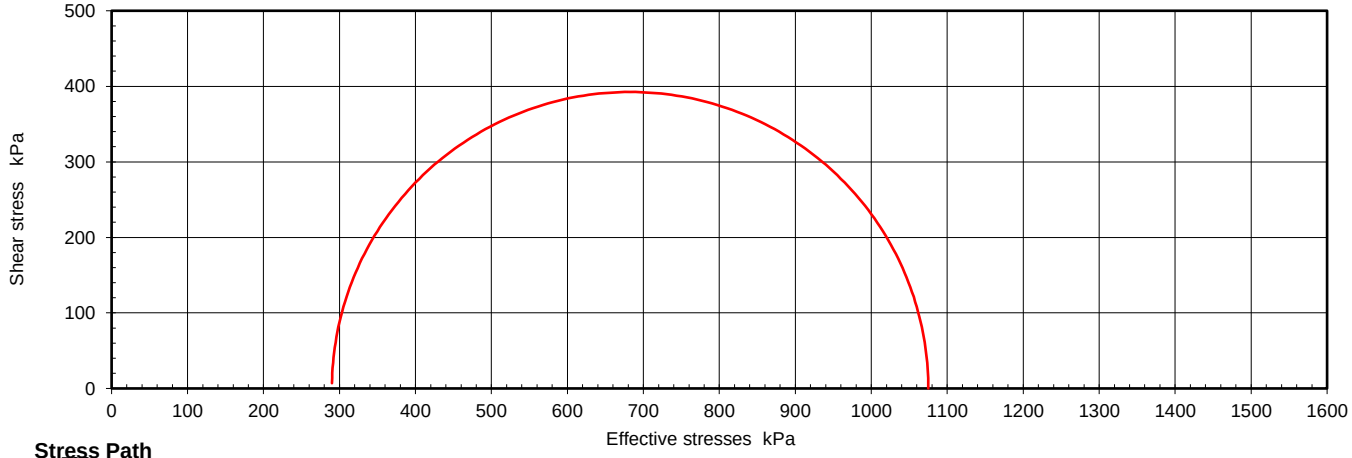
Lab Sheet Reference :

| | | | |
|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Undrained Triaxial Compression Test with measurement of pore pressure** | Job Ref | GMOP21-G-019 |
| | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | Sample No. | PU08 |
| Compression stages - table of results and interpretation | | Depth m | 11.30 |
| | | Sample Type | Q1 |
| | | KeyLAB ID | BH012023030741 |

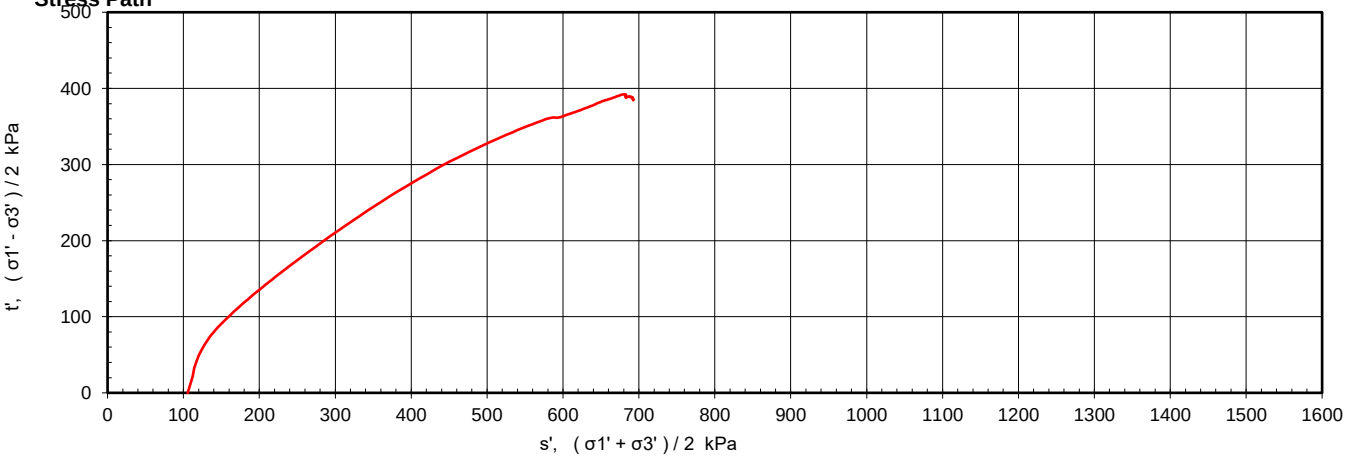
Failure criterion : Maximum deviator stress

| Specimen | Cell pressure kPa | Initial pwp kPa | Initial $\sigma_3'$ kPa | Rate of strain %/hr | Axial strain, $\varepsilon_f$ % | $(\sigma_1'/\sigma_3')_f$ | $(\sigma_1'-\sigma_3')_f$ kPa | $u_f$ kPa | $\sigma_3'_f$ kPa | $\sigma_1'_f$ kPa | $A_f$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 515 | 400 | 115 | 1.00 | 10.8 | 3.71 | 785 | 225 | 290 | 1074 | -0.23 |

**Mohr Circles**




**Stress Path**




| **Shear Strength Parameters** | | | Shear Strength |
|---|---|---|---|
| At Maximum deviator stress | Su | kPa | 392.50 |
| Shear Strength at 15% | | kPa | |
| Epsilon 50 | | % | 2.85 |

Mode of failure

Compound

**Remarks**
General

Deviator stresses corrected for area change, spiral side drains and up to 0.3 mm thick rubber membrane/Sample Saturated, Final B-value is due to jump in PWP from previous stage

All symbols used above are defined in BS1377

| Date Printed | Approved | | |
|---|---|---|---|
| 19/05/2023 15:21 | D.Smith | Sheet No. | 3 of 3 |

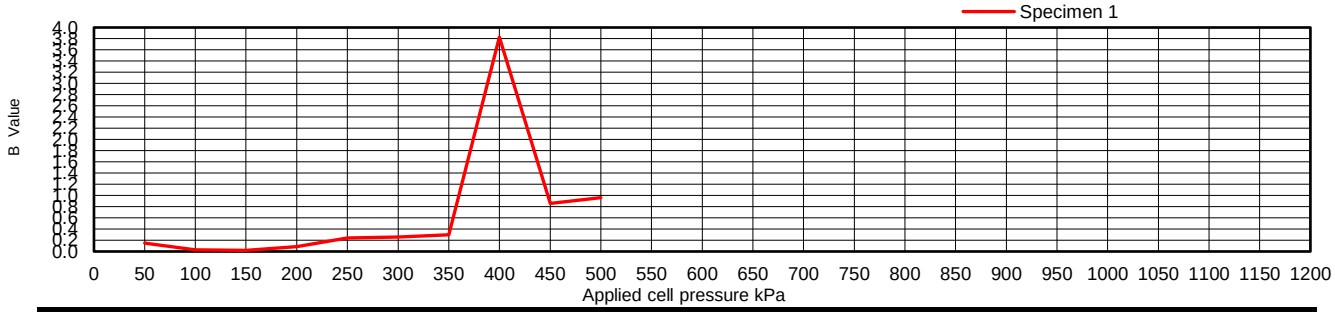
Lab Sheet Reference :

| | | | |
|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Undrained Triaxial Compression Test with measurement of pore pressure** | Job Ref | GMOP21-G-019 |
| | | Borehole | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | Sample No. | PU12 |
| Sample Description | Very high strength, gley 1 (6/1) greenish grey CLAY. | Depth m | 18.10 |
| Specimen Description | Very high strength, gley 1 (6/1) greenish grey CLAY | Sample Type | Q1 |
| | | KeyLAB ID | BH012023030768 |
| Test Method | BS EN ISO 17892 PART 9: Consolidated trixial compression tests | | |

| | |
|---|---|
| Specimen Type/Preparation | UNDISTURBED 175 kpa Consolidation |

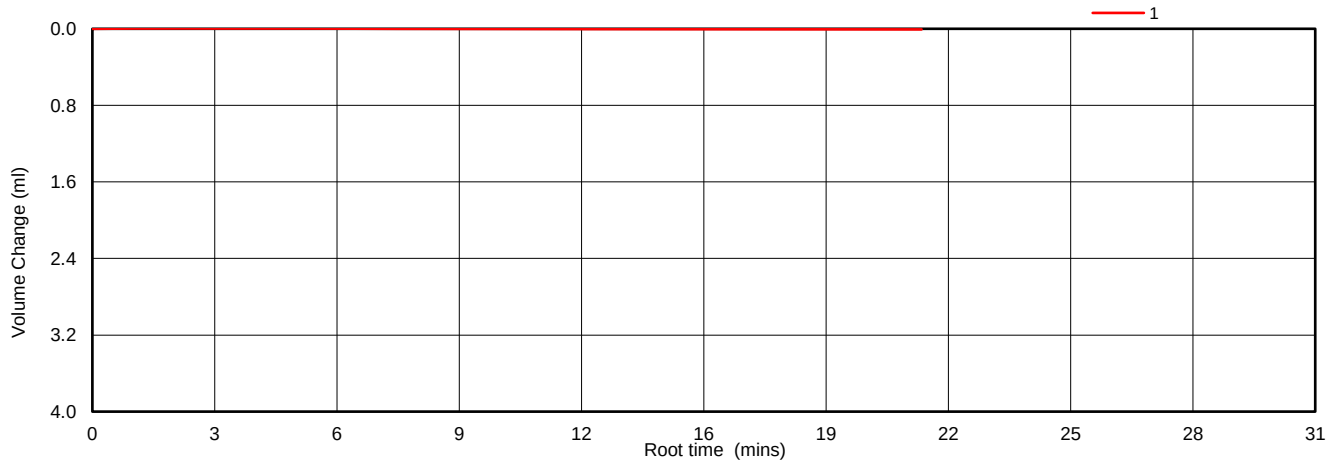
| **Specimen Details** | | | 1 |
|---|---|---|---|
| Initial | Height | mm | 140.4 |
| | Diameter | mm | 70.5 |
| | Bulk Density | Mg/m³ | 2.08 |
| | Water Content | % | 24.7 |
| | Dry density | Mg/m³ | 1.67 |
| Final | Bulk Density | Mg/m³ | 2.11 |
| | Water Content | % | 23.3 |
| | Dry density | Mg/m³ | 1.71 |

| **Saturation Details** | | 1 |
|---|---|---|
| Method | | Increments of cell pressure only |
| Cell pressure increments | kPa | 50 |
| Differential Pressure | kPa | 5 |
| Final Cell Pressure | kPa | 500 |
| Final pore water pressure | kPa | 445 |
| Final B Value | | 0.95 |




| | |
|---|---|
| Saturation Remarks | |

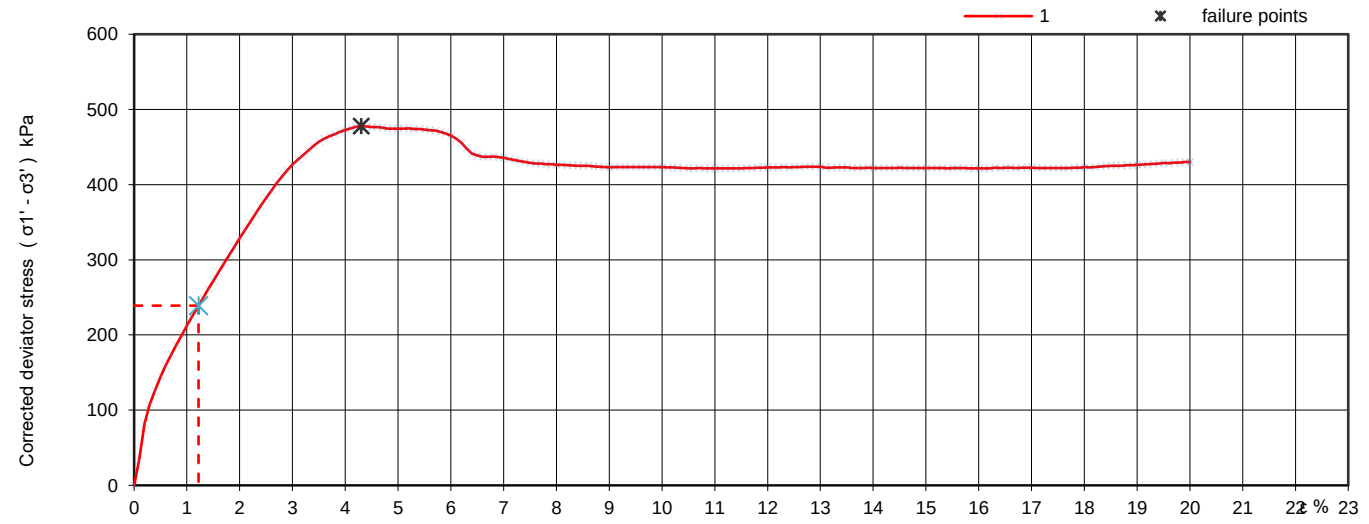
| **Consolidation Details** | | | |
|---|---|---|---|
| | Specimen No. | 1 | |
| | Drainage Conditions | One end | |
| | Cell Pressure applied | 625 | kPa |
| | Back Pressure applied | 450 | kPa |
| | Effective Pressure | 175 | kPa |
| | Pore pressure at start of consolidation | 450 | kPa |
| | Pore pressure at end of consolidation | 450 | kPa |
| | Pore pressure dissipation at end of consolidation | 80 | % |

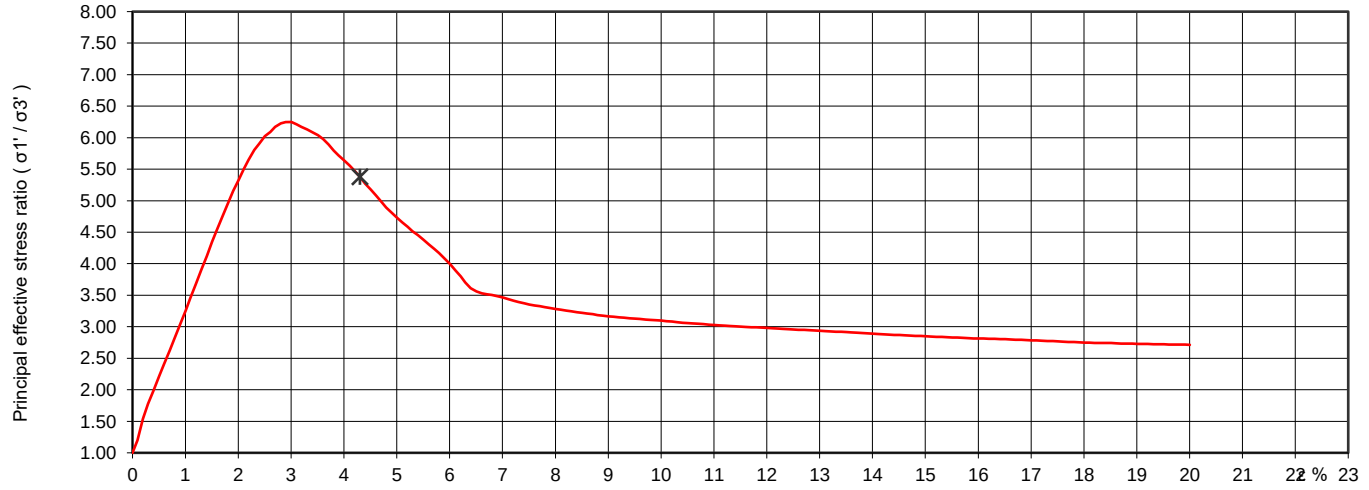


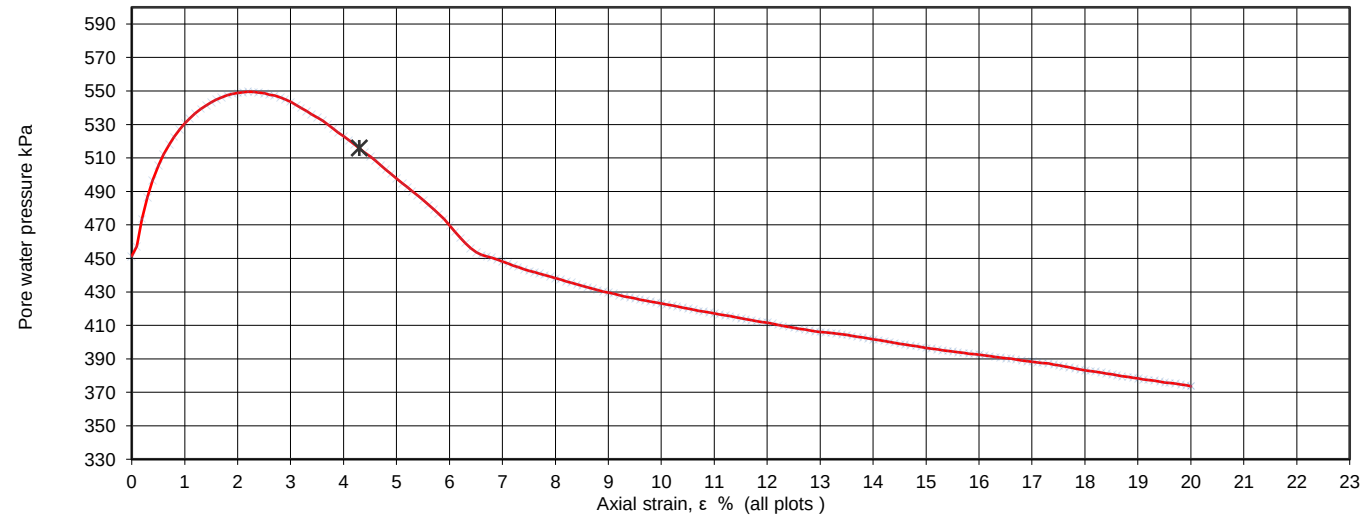

| Date Printed | Approved | | 1 |
|---|---|---|---|
| 22/05/2023 15:39 | D.Smith | Sheet No. | 1 of 3 |

Lab Sheet Reference :

| | | | |
|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Undrained Triaxial Compression Test with measurement of pore pressure** | Job Ref | GMOP21-G-019 |
| | | Borehole | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | Sample No. | PU12 |
| Compression stages - graphical data | | Depth m | 18.10 |
| | | Sample Type | Q1 |
| | | KeyLAB ID | BH012023030768 |




| Date Printed | Approved | | |
|---|---|---|---|
| 22/05/2023 15:39 | D.Smith | Sheet No. | 2 of 3 |

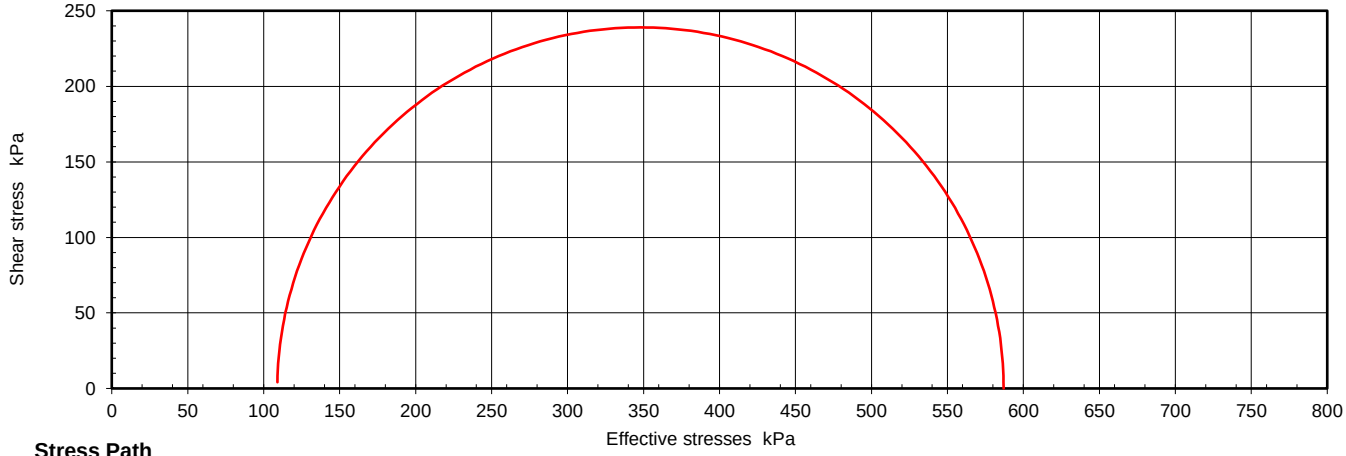
Lab Sheet Reference :

| | | | |
|---|---|---|---|
| GEOQUIPMARINE | **Consolidated Undrained Triaxial Compression Test with measurement of pore pressure** | Job Ref | GMOP21-G-019 |
| | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | Sample No. | PU12 |
| Compression stages - table of results and interpretation | | Depth m | 18.10 |
| | | Sample Type | Q1 |
| | | KeyLAB ID | BH012023030768 |

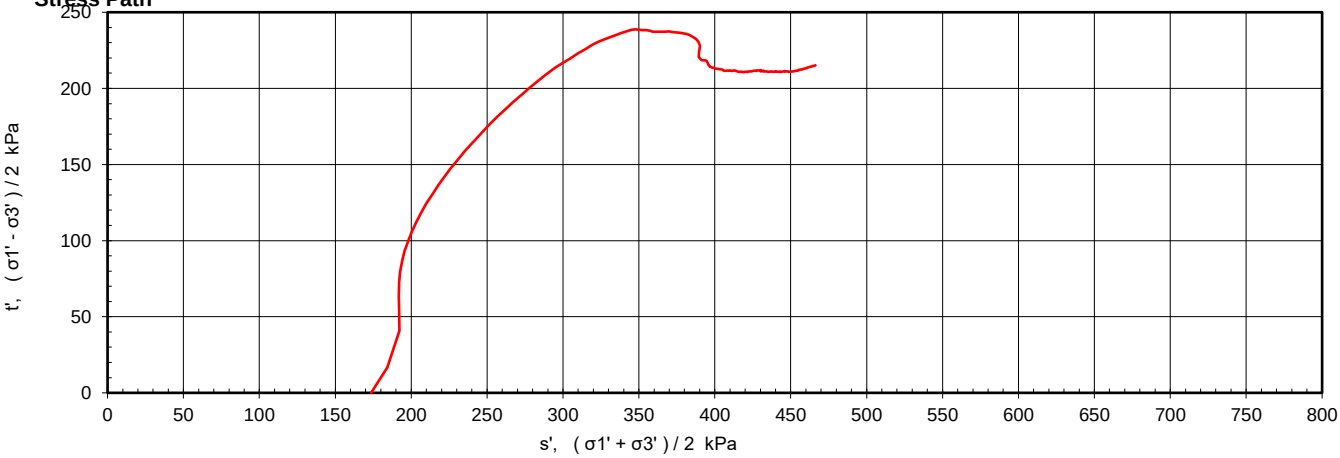
Failure criterion : Maximum deviator stress

| Specimen | Cell pressure kPa | Initial pwp kPa | Initial $\sigma_3'$ kPa | Rate of strain %/hr | Axial strain, $\varepsilon_f$ % | $(\sigma_1'/\sigma_3')_f$ | $(\sigma_1'-\sigma_3')_f$ kPa | $u_f$ kPa | $\sigma_{3f}'$ kPa | $\sigma_{1f}'$ kPa | $A_f$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 625 | 450 | 175 | 2.00 | 4.3 | 5.38 | 478 | 516 | 109 | 587 | 0.14 |

**Mohr Circles**




**Stress Path**




| **Shear Strength Parameters** | | | Shear Strength |
|---|---|---|---|
| At Maximum deviator stress | Su | kPa | 239.00 |
| Shear Strength at 15% | | kPa | 211.06 |
| Epsilon 50 | | % | 1.22 |

Mode of failure

Compound

**Remarks**
General

Deviator stresses corrected for area change, spiral side drains and up to 0.3 mm thick rubber membrane/effective pressure too low, sample swelled during consolidation

All symbols used above are defined in BS1377

| Date Printed | Approved | | |
|---|---|---|---|
| 22/05/2023 15:39 | D.Smith | Sheet No. | 3 of 3 |

Lab Sheet Reference :

# ISRM SM 1985 Point Load Test

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample Ref | Sample Top Depth | Sample Type | Rock type including orientation* | P (kN) | D (mm) | W (mm) | De2 (mm) | F | Is (Mpa) | Is50 (Mpa) | Test Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#01A_SAMP | CR01 | 0.00 | IS | | 25.80 | 75.30 | | 71.08 | 1.17 | 5.1 | 6.0 | D |
| OWF_GI#09_SAMP | CR01 | 0.00 | IS | | 20.45 | 77.80 | | 75.36 | 1.20 | 3.6 | 4.3 | D |
| OWF_GI#14_SAMP | CR01 | 0.00 | IS | | 15.90 | 56.00 | 76.00 | 69.56 | 1.16 | 3.3 | 3.8 | A |
| OWF_GI#15_SAMP | CR01 | 0.00 | IS | | 14.35 | 53.00 | 60.00 | 58.63 | 1.07 | 4.2 | 4.5 | A |
| OWF_GI#01_SAMP | CR01 | 0.30 | IS | | 24.10 | 60.00 | 79.00 | 70.92 | 1.17 | 4.8 | 5.6 | A |
| OWF_GI#01A_SAMP | CR02 | 0.70 | IS | | 39.80 | 77.15 | | 72.96 | 1.19 | 7.5 | 8.9 | D |
| OWF_GI#05A_SAMP | CR01 | 0.80 | IS | | 9.60 | 76.80 | | 73.32 | 1.19 | 1.8 | 2.1 | D |
| OWF_GI#05A_SAMP | CR01 | 0.80 | IS | | 11.70 | 52.00 | 76.80 | 60.96 | 1.09 | 3.1 | 3.4 | A |
| OWF_GI#09_SAMP | CR02 | 1.00 | IS | | 8.55 | 62.00 | 78.85 | 74.98 | 1.20 | 1.5 | 1.8 | A |
| OWF_GI#15A_SAMP | CR02 | 1.00 | IS | | 29.30 | 72.00 | 78.00 | 82.24 | 1.25 | 4.3 | 5.4 | A |
| OWF_GI#14_SAMP | CR02 | 1.10 | IS | LIMESTONE. Random orientation. | 6.00 | 78.90 | | 74.32 | 1.20 | 1.1 | 1.3 | D |
| OWF_GI#01_SAMP | CR02 | 1.40 | Q1 | | 3.55 | 78.00 | | 75.46 | 1.20 | 0.6 | 0.8 | D |
| OWF_GI#01_SAMP | CR02 | 1.40 | Q1 | | 6.70 | 78.00 | | 75.46 | 1.20 | 1.2 | 1.4 | D |
| OWF_GI#01_SAMP | CR02 | 1.40 | Q1 | | 11.50 | 78.00 | | 75.46 | 1.20 | 2.0 | 2.4 | D |
| OWF_GI#14_SAMP | CR02 | 1.40 | Q1 | | 13.55 | 78.00 | | 70.65 | 1.17 | 2.7 | 3.2 | D |
| OWF_GI#14_SAMP | CR02 | 1.40 | Q1 | | 7.35 | 50.00 | 78.00 | 66.85 | 1.14 | 1.6 | 1.9 | A |
| OWF_GI#05A_SAMP | CR02 | 1.50 | IS | SANDSTONE | 7.55 | 37.00 | 78.37 | 54.71 | 1.04 | 2.5 | 2.6 | A |
| OWF_GI#14A_SAMP | CR02 | 1.50 | Q1 | | 11.00 | 77.80 | | 73.80 | 1.19 | 2.0 | 2.4 | D |
| OWF_GI#14A_SAMP | CR02 | 1.50 | Q1 | | 9.00 | 40.00 | 77.80 | 58.88 | 1.08 | 2.6 | 2.8 | A |
| OWF_GI#14_SAMP | CR03 | 2.00 | Q1 | | 19.65 | 78.96 | | 76.95 | 1.21 | 3.3 | 4.0 | D |
| OWF_GI#14_SAMP | CR03 | 2.00 | Q1 | | 27.05 | 66.00 | 78.95 | 77.01 | 1.21 | 4.6 | 5.5 | A |
| OWF_GI#14A_SAMP | CR02 | 2.10 | Q2 | | 20.85 | 78.83 | | 76.89 | 1.21 | 3.5 | 4.3 | D |
| OWF_GI#14A_SAMP | CR02 | 2.10 | Q2 | | 18.65 | 78.83 | | 75.86 | 1.21 | 3.2 | 3.9 | D |
| OWF_GI#05A_SAMP | CR03 | 2.90 | IS | | 0.80 | 76.00 | | 74.48 | 1.20 | 0.1 | 0.2 | D |
| OWF_GI#05A_SAMP | CR03 | 2.90 | IS | | 0.30 | 52.00 | 76.00 | 67.44 | 1.14 | 0.1 | 0.1 | A |

Notes

Test type key

A Axial

D Diametral

Sheet Reference:

All tests completed at natural moisture content*

| Tested by | Date Printed | Approved By | |
|---|---|---|---|
| S Ocio | 12/08/2022 00:00 | D.Smith | |

# ISRM SM 1985 Point Load Test

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample Ref | Sample Top Depth | Sample Type | Rock type including orientation* | P (kN) | D (mm) | W (mm) | De2 (mm) | F | Is (Mpa) | Is50 (Mpa) | Test Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#09_SAMP | CR04 | 3.00 | IS | | 11.60 | 64.00 | 77.70 | 64.46 | 1.12 | 2.8 | 3.1 | A |
| OWF_GI#14_SAMP | CR04 | 3.15 | Q1 | | 2.00 | 45.00 | 75.50 | 60.44 | 1.09 | 0.5 | 0.6 | A |
| OWF_GI#01A_SAMP | CR05 | 3.20 | IS | | 6.25 | 66.20 | 76.60 | 73.24 | 1.19 | 1.2 | 1.4 | A |
| OWF_GI#01_SAMP | CR04 | 3.50 | Q1 | | 34.20 | 78.80 | | 74.27 | 1.19 | 6.2 | 7.4 | D |
| OWF_GI#04A_SAMP | CR04 | 3.50 | Q1 | | 15.65 | 79.00 | | 69.42 | 1.16 | 3.2 | 3.8 | D |
| OWF_GI#04A_SAMP | CR04 | 3.50 | Q1 | | 17.60 | 79.00 | | 74.36 | 1.20 | 3.2 | 3.8 | D |
| OWF_GI#05A_SAMP | CR04 | 3.60 | IS | | 4.35 | 47.89 | 75.75 | 65.88 | 1.13 | 1.0 | 1.1 | A |
| OWF_GI#04A_SAMP | CR04 | 3.70 | IS | | 11.30 | 91.64 | | 81.79 | 1.25 | 1.7 | 2.1 | D |
| OWF_GI#04A_SAMP | CR04 | 3.70 | IS | | 11.65 | 63.00 | 98.64 | 86.08 | 1.28 | 1.6 | 2.0 | A |
| OWF_GI#04_SAMP | CR03 | 3.80 | IS | | 17.60 | 48.00 | 56.00 | 54.72 | 1.04 | 5.9 | 6.1 | A |
| OWF_GI#14A_SAMP | CR03 | 4.00 | Q2 | | 2.31 | 79.20 | | 74.46 | 1.20 | 0.4 | 0.5 | D |
| OWF_GI#24_SAMP | CR04 | 4.10 | IS | | 0.65 | 75.50 | | 71.12 | 1.17 | 0.1 | 0.2 | D |
| OWF_GI#01A_SAMP | CR06 | 4.20 | IS | | 3.10 | 75.00 | | 67.08 | 1.14 | 0.7 | 0.8 | D |
| OWF_GI#12_SAMP | CR02 | 4.40 | IS | | 18.85 | 83.50 | | 75.35 | 1.20 | 3.3 | 4.0 | D |
| OWF_GI#12_SAMP | CR02 | 4.40 | IS | | 11.75 | 54.00 | 83.30 | 70.60 | 1.17 | 2.4 | 2.8 | A |
| OWF_GI#11_SAMP | CR04 | 4.50 | IS | | 16.25 | 77.43 | | 73.09 | 1.19 | 3.0 | 3.6 | D |
| OWF_GI#11_SAMP | CR04 | 4.50 | IS | | 9.85 | 46.00 | 77.43 | 63.58 | 1.11 | 2.4 | 2.7 | A |
| OWF_GI#24_SAMP | CR05 | 5.20 | IS | | 18.95 | 64.00 | 77.40 | 72.27 | 1.18 | 3.6 | 4.3 | A |
| OWF_GI#01A_SAMP | CR07 | 5.20 | IS | | 4.10 | 76.00 | | 67.53 | 1.14 | 0.9 | 1.0 | D |
| OWF_GI#01A_SAMP | CR07 | 5.20 | IS | | 3.00 | 55.10 | 76.00 | 68.86 | 1.15 | 0.6 | 0.7 | A |
| OWF_GI#17_SAMP | CR02 | 5.60 | Q1 | (CIUc) | 9.70 | 77.00 | | 73.42 | 1.19 | 1.8 | 2.1 | D |
| OWF_GI#17_SAMP | CR02 | 5.60 | Q1 | (CIUc) | 6.15 | 77.00 | | 73.94 | 1.19 | 1.1 | 1.3 | D |
| OWF_GI#17_SAMP | CR02 | 5.60 | Q1 | (CIUc) | 4.30 | 77.00 | | 73.42 | 1.19 | 0.8 | 0.9 | D |
| OWF_GI#14A_SAMP | CR05 | 5.70 | IS | Moderately weak greenish grey (5GY 4/1) MUDSTONE | 12.25 | 80.00 | | 74.83 | 1.20 | 2.2 | 2.6 | D |
| OWF_GI#14A_SAMP | CR05 | 5.70 | IS | Moderately weak greenish grey (5GY 4/1) MUDSTONE | 9.10 | 42.00 | 80.00 | 61.39 | 1.10 | 2.4 | 2.6 | A |

Notes

Test type key

A Axial

D Diametral

Sheet Reference:

All tests completed at natural moisture content*

| Tested by | Date Printed | Approved By | |
|---|---|---|---|
| S Ocio | 12/08/2022 00:00 | D.Smith | |

# ISRM SM 1985 Point Load Test

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample Ref | Sample Top Depth | Sample Type | Rock type including orientation* | P (kN) | D (mm) | W (mm) | De2 (mm) | F | Is (Mpa) | Is50 (Mpa) | Test Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#17_SAMP | CR03 | 6.05 | IS | | 8.25 | 76.20 | | 70.38 | 1.17 | 1.7 | 1.9 | D |
| OWF_GI#05B_SAMP | CR01 | 6.10 | IS | | 8.05 | 63.00 | 48.80 | 61.06 | 1.09 | 2.2 | 2.4 | A |
| OWF_GI#17_SAMP | CR03 | 6.25 | Q1 | | 1.50 | 75.70 | | 74.34 | 1.20 | 0.3 | 0.3 | D |
| OWF_GI#04_SAMP | CR06 | 6.40 | Q1 | | 19.65 | 79.55 | | 77.24 | 1.22 | 3.3 | 4.0 | D |
| OWF_GI#04_SAMP | CR06 | 6.40 | Q1 | | 9.55 | 32.00 | 79.55 | 53.25 | 1.03 | 3.4 | 3.5 | A |
| OWF_GI#15A_SAMP | CR05 | 6.50 | IS | Weak greenish grey (5Gy 5/1) MUDSTONE | 1.40 | 80.10 | | 74.88 | 1.20 | 0.2 | 0.3 | D |
| OWF_GI#20_SAMP | PU11 | 6.70 | IS | 2.5y 7/3 pale brown cemented SAND | 0.35 | 50.00 | 67.00 | 62.64 | 1.11 | 0.1 | 0.1 | A |
| OWF_GI#12_SAMP | CR05 | 7.30 | IS | | 12.00 | 84.36 | | 74.05 | 1.19 | 2.2 | 2.6 | D |
| OWF_GI#12_SAMP | CR05 | 7.30 | IS | | 8.30 | 58.00 | 84.30 | 75.42 | 1.20 | 1.5 | 1.8 | A |
| OWF_GI#01A_SAMP | CR09 | 7.45 | Q1 | | 7.80 | 78.00 | | 74.94 | 1.20 | 1.4 | 1.7 | D |
| OWF_GI#01A_SAMP | CR09 | 7.45 | Q1 | | 4.90 | 78.00 | | 74.42 | 1.20 | 0.9 | 1.1 | D |
| OWF_GI#01A_SAMP | CR09 | 7.45 | Q1 | | 8.50 | 78.00 | | 74.42 | 1.20 | 1.5 | 1.8 | D |
| OWF_GI#17_SAMP | CR05 | 7.65 | IS | | 6.15 | 58.00 | 79.90 | 62.18 | 1.10 | 1.6 | 1.8 | A |
| OWF_GI#01A_SAMP | CR09 | 7.65 | IS | | 13.55 | 77.50 | | 70.98 | 1.17 | 2.7 | 3.1 | D |
| OWF_GI#12_SAMP | CR06 | 8.30 | IS | Strong brown (10YR 5/3) LIMESTONE | 28.15 | 79.39 | | 76.65 | 1.21 | 4.8 | 5.8 | D |
| OWF_GI#12_SAMP | CR06 | 8.30 | IS | Strong brown (10YR 5/3) LIMESTONE | 14.55 | 53.00 | 79.39 | 71.09 | 1.17 | 2.9 | 3.4 | A |
| OWF_GI#09_SAMP | CR09 | 8.30 | Q1 | | 4.00 | 60.00 | 78.50 | 68.54 | 1.15 | 0.9 | 1.0 | A |
| OWF_GI#11_SAMP | CR08 | 8.50 | IS | | 1.85 | 71.00 | 76.50 | 75.16 | 1.20 | 0.3 | 0.4 | A |
| OWF_GI#01A_SAMP | CR10 | 9.30 | Q2 | | 22.70 | 78.40 | | 75.65 | 1.20 | 4.0 | 4.8 | D |
| OWF_GI#01A_SAMP | CR10 | 9.30 | Q2 | | 28.05 | 52.00 | 78.40 | 69.94 | 1.16 | 5.7 | 6.7 | A |
| OWF_GI#11_SAMP | CR09 | 9.50 | IS | | 2.70 | 75.00 | | 70.36 | 1.17 | 0.5 | 0.6 | D |
| OWF_GI#11_SAMP | CR09 | 9.50 | IS | | 2.30 | 42.00 | 75.00 | 58.63 | 1.07 | 0.7 | 0.7 | A |
| OWF_GI#22_SAMP | CR09 | 9.60 | Q1 | | 26.70 | 78.00 | | 74.42 | 1.20 | 4.8 | 5.8 | D |
| OWF_GI#22_SAMP | CR09 | 9.60 | Q1 | | 29.60 | 48.00 | 78.00 | 64.58 | 1.12 | 7.1 | 8.0 | A |
| OWF_GI#20_SAMP | PU14 | 9.70 | IS | 2.5y 7/3 Pale brown, clayey, silty, gravelly, SAND | 0.20 | 64.00 | 70.00 | 66.76 | 1.14 | 0.0 | 0.1 | A |

Notes

Test type key

A Axial

D Diametral

Sheet Reference:

All tests completed at natural moisture content*

| Tested by | Date Printed | Approved By | |
|---|---|---|---|
| S Ocio | 12/08/2022 00:00 | D.Smith | |

# ISRM SM 1985 Point Load Test

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample Ref | Sample Top Depth | Sample Type | Rock type including orientation* | P (kN) | D (mm) | W (mm) | De2 (mm) | F | Is (Mpa) | Is50 (Mpa) | Test Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#20_SAMP | PU14 | 9.70 | IS | 2.5y 7/3 Pale brown, clayey, silty, gravelly, SAND | 0.15 | 68.00 | | 65.45 | 1.13 | 0.0 | 0.0 | D |
| OWF_GI#20_SAMP | PU14 | 9.70 | IS | 2.5y 7/3 Pale brown, clayey, silty, gravelly, SAND | 0.40 | 50.00 | 68.00 | 55.83 | 1.05 | 0.1 | 0.1 | A |
| OWF_GI#14A_SAMP | CR09 | 10.00 | Q1 | | 8.55 | 76.80 | | 74.88 | 1.20 | 1.5 | 1.8 | D |
| OWF_GI#14A_SAMP | CR09 | 10.00 | Q1 | | 6.40 | 47.00 | 76.80 | 62.54 | 1.11 | 1.6 | 1.8 | A |
| OWF_GI#24_SAMP | CR10 | 10.00 | IS | | 5.65 | 76.50 | | 71.06 | 1.17 | 1.1 | 1.3 | D |
| OWF_GI#01A_SAMP | CR11 | 10.00 | Q1 | | 26.85 | 77.80 | | 69.45 | 1.16 | 5.6 | 6.5 | D |
| OWF_GI#01A_SAMP | CR11 | 10.00 | Q1 | | 23.75 | 77.80 | | 75.36 | 1.20 | 4.2 | 5.0 | D |
| OWF_GI#12_SAMP | CR08 | 10.30 | Q1 | | 23.05 | 79.00 | | 75.42 | 1.20 | 4.1 | 4.9 | D |
| OWF_GI#12_SAMP | CR08 | 10.30 | Q1 | | 19.50 | 47.00 | 79.00 | 63.43 | 1.11 | 4.8 | 5.4 | A |
| OWF_GI#17_SAMP | PU10 | 10.60 | IS | 2.5y 7/3 Pale brown, clayey, silty and gravelly, SAND | 0.10 | 59.00 | | 56.96 | 1.06 | 0.0 | 0.0 | D |
| OWF_GI#17_SAMP | PU10 | 10.60 | IS | 2.5y 7/3 Pale brown, clayey, silty and gravelly, SAND | 0.10 | 51.00 | 59.00 | 55.50 | 1.05 | 0.0 | 0.0 | A |
| OWF_GI#01A_SAMP | CR12 | 11.00 | IS | | 5.45 | 68.50 | 77.41 | 75.61 | 1.20 | 1.0 | 1.1 | A |
| OWF_GI#09_SAMP | CR12 | 11.00 | Q1 | | 9.65 | 79.50 | | 69.07 | 1.16 | 2.0 | 2.3 | D |
| OWF_GI#09_SAMP | CR12 | 11.00 | Q1 | | 9.95 | 42.00 | 79.50 | 58.66 | 1.07 | 2.9 | 3.1 | A |
| OWF_GI#20_SAMP | CR03 | 11.50 | IS | | 5.95 | 65.00 | 77.00 | 69.31 | 1.16 | 1.2 | 1.4 | A |
| OWF_GI#22_SAMP | CR11 | 11.80 | IS | | 18.10 | 79.00 | | 77.49 | 1.22 | 3.0 | 3.7 | D |
| OWF_GI#22_SAMP | CR11 | 11.80 | IS | | 12.70 | 79.00 | | 76.97 | 1.21 | 2.1 | 2.6 | D |
| OWF_GI#22_SAMP | CR11 | 11.80 | IS | | 8.70 | 35.00 | 79.00 | 54.01 | 1.04 | 3.0 | 3.1 | A |
| OWF_GI#17_SAMP | CR08 | 12.00 | IS | | 1.35 | 35.00 | 76.35 | 52.17 | 1.02 | 0.5 | 0.5 | A |
| OWF_GI#12_SAMP | CR09 | 12.05 | Q1 | | 6.65 | 73.00 | | 71.48 | 1.17 | 1.3 | 1.5 | D |
| OWF_GI#12_SAMP | CR09 | 12.05 | Q1 | | 5.95 | 55.00 | 73.00 | 66.09 | 1.13 | 1.4 | 1.5 | A |
| OWF_GI#04A_SAMP | CR10 | 12.05 | Q1 | | 0.75 | 77.00 | | 71.83 | 1.18 | 0.1 | 0.2 | D |
| OWF_GI#14A_SAMP | CR11 | 12.10 | Q1 | | 4.30 | 76.00 | | 74.02 | 1.19 | 0.8 | 0.9 | D |
| OWF_GI#14A_SAMP | CR11 | 12.10 | Q1 | | 6.80 | 38.00 | 76.00 | 57.36 | 1.06 | 2.1 | 2.2 | A |
| OWF_GI#14A_SAMP | CR11 | 12.25 | IS | | 1.55 | 77.30 | | 75.12 | 1.20 | 0.3 | 0.3 | D |

Notes

Test type key

A Axial

D Diametral

Sheet Reference:

All tests completed at natural moisture content*

| Tested by | Date Printed | Approved By | |
|---|---|---|---|
| S Ocio | 12/08/2022 00:00 | D.Smith | |

# ISRM SM 1985 Point Load Test

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample Ref | Sample Top Depth | Sample Type | Rock type including orientation* | P (kN) | D (mm) | W (mm) | De2 (mm) | F | Is (Mpa) | Is50 (Mpa) | Test Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#14A_SAMP | CR11 | 12.25 | IS | | 6.55 | 60.00 | 77.30 | 73.57 | 1.19 | 1.2 | 1.4 | A |
| OWF_GI#22_SAMP | CR12 | 12.50 | IS | | 13.75 | 76.30 | | 75.14 | 1.20 | 2.4 | 2.9 | D |
| OWF_GI#11_SAMP | CR11 | 12.85 | Q1 | | 6.50 | 78.20 | | 73.99 | 1.19 | 1.2 | 1.4 | D |
| OWF_GI#11_SAMP | CR11 | 12.85 | Q1 | | 6.25 | 50.00 | 78.20 | 63.11 | 1.11 | 1.6 | 1.7 | A |
| OWF_GI#11_SAMP | CR11 | 13.00 | IS | | 3.75 | 76.70 | | 70.06 | 1.16 | 0.8 | 0.9 | D |
| OWF_GI#14A_SAMP | CR12 | 13.50 | Q1 | | 1.90 | 78.50 | | 74.13 | 1.19 | 0.3 | 0.4 | D |
| OWF_GI#14A_SAMP | CR12 | 13.50 | Q1 | | 3.10 | 78.50 | | 70.32 | 1.17 | 0.6 | 0.7 | D |
| OWF_GI#20_SAMP | PU18 | 13.80 | IS | 2.5y 7/3 Pale brown cemented SAND | 0.30 | 76.00 | | 74.48 | 1.20 | 0.1 | 0.1 | D |
| OWF_GI#11_SAMP | CR12 | 13.90 | Q1 | | 7.75 | 79.18 | | 67.18 | 1.14 | 1.7 | 2.0 | D |
| OWF_GI#11_SAMP | CR12 | 13.90 | Q1 | | 7.10 | 65.15 | 79.18 | 73.10 | 1.19 | 1.3 | 1.6 | A |
| OWF_GI#09_SAMP | CR15 | 14.10 | IS | (Weak)Brown (10YR 4/3) LIMESTONE | 15.50 | 79.00 | | 74.36 | 1.20 | 2.8 | 3.4 | D |
| OWF_GI#17_SAMP | CR11 | 14.70 | IS | | 0.50 | 72.00 | | 68.41 | 1.15 | 0.1 | 0.1 | D |
| OWF_GI#20_SAMP | CR05 | 15.05 | IS | | 0.80 | 51.00 | 76.00 | 62.99 | 1.11 | 0.2 | 0.2 | A |
| OWF_GI#09_SAMP | CR16 | 15.30 | IS | (Weak)Brown (10YR 4/3) LIMESTONE | 32.05 | 79.50 | | 72.44 | 1.18 | 6.1 | 7.2 | D |
| OWF_GI#09_SAMP | CR16 | 15.30 | IS | (Weak)Brown (10YR 4/3) LIMESTONE | 30.25 | 50.00 | 79.50 | 64.42 | 1.12 | 7.3 | 8.2 | A |
| OWF_GI#11_SAMP | CR14 | 15.50 | IS | | 7.05 | 54.05 | 79.75 | 73.08 | 1.19 | 1.3 | 1.6 | A |
| OWF_GI#20_SAMP | CR06 | 16.10 | IS | | 0.50 | 76.10 | | 72.46 | 1.18 | 0.1 | 0.1 | D |
| OWF_GI#20_SAMP | CR06 | 16.10 | IS | | 0.65 | 51.00 | 76.00 | 68.15 | 1.15 | 0.1 | 0.2 | A |
| OWF_GI#22_SAMP | CR15 | 16.20 | IS | | 12.15 | 77.61 | | 69.37 | 1.16 | 2.5 | 2.9 | D |
| OWF_GI#22_SAMP | CR15 | 16.20 | IS | | 8.15 | 50.00 | 77.60 | 64.42 | 1.12 | 2.0 | 2.2 | A |
| OWF_GI#20_SAMP | CR06 | 16.40 | Q1 | | 1.25 | 76.00 | | 71.89 | 1.18 | 0.2 | 0.3 | D |
| OWF_GI#20_SAMP | CR06 | 16.40 | Q1 | | 0.90 | 58.00 | 76.00 | 69.56 | 1.16 | 0.2 | 0.2 | A |
| OWF_GI#20_SAMP | CR06 | 16.40 | Q1 | | 0.60 | 35.00 | 76.00 | 51.11 | 1.01 | 0.2 | 0.2 | A |
| OWF_GI#12_SAMP | CR14 | 16.85 | Q1 | CHALK | 10.30 | 78.30 | | 68.54 | 1.15 | 2.2 | 2.5 | D |
| OWF_GI#12_SAMP | CR14 | 16.85 | Q1 | CHALK | 7.30 | 65.00 | 78.30 | 76.11 | 1.21 | 1.3 | 1.5 | A |

Notes

Test type key

A Axial

D Diametral

Sheet Reference:

All tests completed at natural moisture content*

| Tested by | Date Printed | Approved By | |
|---|---|---|---|
| S Ocio | 12/08/2022 00:00 | D.Smith | |

# ISRM SM 1985 Point Load Test

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample Ref | Sample Top Depth | Sample Type | Rock type including orientation* | P (kN) | D (mm) | W (mm) | De2 (mm) | F | Is (Mpa) | Is50 (Mpa) | Test Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#17_SAMP | PU13 | 16.90 | Q1 | (UU) | 0.25 | 66.00 | | 62.93 | 1.11 | 0.1 | 0.1 | D |
| OWF_GI#17_SAMP | PU13 | 16.90 | Q1 | (UU) | 0.45 | 45.00 | 66.00 | 55.76 | 1.05 | 0.1 | 0.2 | A |
| OWF_GI#17_SAMP | PU13 | 16.90 | Q1 | (UU) | 0.45 | 67.00 | | 62.34 | 1.10 | 0.1 | 0.1 | D |
| OWF_GI#01A_SAMP | CR16 | 17.00 | IS | | 2.15 | 79.00 | | 74.36 | 1.20 | 0.4 | 0.5 | D |
| OWF_GI#17_SAMP | PU13 | 17.10 | Q2 | (CIU) | 0.60 | 69.00 | | 62.16 | 1.10 | 0.2 | 0.2 | D |
| OWF_GI#17_SAMP | PU13 | 17.10 | Q2 | (CIU) | 0.75 | 37.00 | 69.00 | 48.70 | 0.99 | 0.3 | 0.3 | A |
| OWF_GI#17_SAMP | PU13 | 17.10 | Q2 | (CIU) | 0.60 | 69.00 | | 62.71 | 1.11 | 0.2 | 0.2 | D |
| OWF_GI#04A_SAMP | CR13 | 17.40 | Q1 | White page 2.5y 9/2 Very pale yellow chalk piece | 6.70 | 76.93 | | 73.38 | 1.19 | 1.2 | 1.5 | D |
| OWF_GI#04A_SAMP | CR13 | 17.40 | Q1 | White page 2.5y 9/2 Very pale yellow chalk piece | 5.50 | 65.80 | 76.93 | 77.30 | 1.22 | 0.9 | 1.1 | A |
| OWF_GI#17_SAMP | PU14 | 17.70 | Q1 | | 0.70 | 48.64 | 66.99 | 58.41 | 1.07 | 0.2 | 0.2 | A |
| OWF_GI#11_SAMP | CR16 | 17.95 | IS | (Very Weak) Greenish grey (5GY 5/1) CLAYSTONE | 7.60 | 77.80 | | 72.74 | 1.18 | 1.4 | 1.7 | D |
| OWF_GI#11_SAMP | CR16 | 17.95 | IS | (Very Weak) Greenish grey (5GY 5/1) CLAYSTONE | 5.45 | 35.00 | 77.80 | 55.41 | 1.05 | 1.8 | 1.9 | A |
| OWF_GI#04A_SAMP | CR14 | 18.20 | Q1 | | 6.80 | 78.00 | | 74.94 | 1.20 | 1.2 | 1.5 | D |
| OWF_GI#04A_SAMP | CR14 | 18.20 | Q1 | | 3.75 | 41.00 | 78.00 | 56.37 | 1.06 | 1.2 | 1.2 | A |
| OWF_GI#04A_SAMP | CR14 | 18.20 | Q1 | | 6.05 | 78.00 | | 74.42 | 1.20 | 1.1 | 1.3 | D |
| OWF_GI#04A_SAMP | CR14 | 18.20 | Q1 | | 4.55 | 51.00 | 78.00 | 63.03 | 1.11 | 1.1 | 1.3 | A |
| OWF_GI#04A_SAMP | CR14 | 18.40 | IS | | 6.35 | 76.50 | | 71.11 | 1.17 | 1.3 | 1.5 | D |
| OWF_GI#04A_SAMP | CR14 | 18.40 | IS | | 8.65 | 53.00 | 76.50 | 66.94 | 1.14 | 1.9 | 2.2 | A |
| OWF_GI#01A_SAMP | CR17 | 18.50 | IS | | 2.85 | 51.00 | 76.80 | 64.09 | 1.12 | 0.7 | 0.8 | A |
| OWF_GI#24_SAMP | CR18 | 18.50 | IS | | 7.35 | 60.00 | 76.00 | 73.61 | 1.19 | 1.4 | 1.6 | A |
| OWF_GI#17_SAMP | CR13 | 18.80 | IS | | 4.35 | 60.00 | 78.40 | 72.74 | 1.18 | 0.8 | 1.0 | A |
| OWF_GI#12_SAMP | CR16 | 18.95 | IS | | 34.95 | 79.40 | | 74.55 | 1.20 | 6.3 | 7.5 | D |
| OWF_GI#12_SAMP | CR16 | 18.95 | IS | | 26.90 | 79.40 | | 75.61 | 1.20 | 4.7 | 5.7 | D |
| OWF_GI#12_SAMP | CR16 | 18.95 | IS | | 11.85 | 32.00 | 79.40 | 52.25 | 1.02 | 4.3 | 4.4 | A |
| OWF_GI#20_SAMP | CR08 | 19.00 | Q1 | | 0.75 | 76.10 | | 72.46 | 1.18 | 0.1 | 0.2 | D |

Notes

Test type key

A Axial

D Diametral

Sheet Reference:

All tests completed at natural moisture content*

| Tested by | Date Printed | Approved By | |
|---|---|---|---|
| S Ocio | 12/08/2022 00:00 | D.Smith | |

# ISRM SM 1985 Point Load Test

| Project Name | A05 Bretagne Offshore GI |
|---|---|
| Project No. | GMOP21-G-019 |

| Location | Sample Ref | Sample Top Depth | Sample Type | Rock type including orientation* | P (kN) | D (mm) | W (mm) | De2 (mm) | F | Is (Mpa) | Is50 (Mpa) | Test Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWF_GI#20_SAMP | CR08 | 19.00 | Q1 | | 1.20 | 61.00 | 76.10 | 69.60 | 1.16 | 0.2 | 0.3 | A |
| OWF_GI#04A_SAMP | CR15 | 19.25 | IS | | 12.40 | 79.35 | | 76.11 | 1.21 | 2.1 | 2.6 | D |
| OWF_GI#04A_SAMP | CR15 | 19.25 | IS | | 17.50 | 65.00 | 79.35 | 77.86 | 1.22 | 2.9 | 3.5 | A |
| OWF_GI#09_SAMP | CR20 | 19.40 | Q1 | | 1.65 | 75.70 | | 70.68 | 1.17 | 0.3 | 0.4 | D |
| OWF_GI#12_SAMP | CR17 | 19.55 | IS | | 22.75 | 58.00 | 77.82 | 59.72 | 1.08 | 6.4 | 6.9 | A |
| OWF_GI#24_SAMP | CR19 | 19.80 | Q1 | | 2.45 | 76.60 | | 73.75 | 1.19 | 0.5 | 0.5 | D |
| OWF_GI#24_SAMP | CR19 | 19.80 | Q1 | | 0.45 | 76.60 | | 74.26 | 1.19 | 0.1 | 0.1 | D |
| OWF_GI#24_SAMP | CR19 | 19.80 | Q1 | | 1.40 | 58.00 | 76.60 | 60.88 | 1.09 | 0.4 | 0.4 | A |
| OWF_GI#09_SAMP | CR21 | 20.00 | IS | | 2.35 | 72.00 | 78.00 | 77.19 | 1.22 | 0.4 | 0.5 | A |
| OWF_GI#09_SAMP | CR21 | 20.30 | Q1 | | 2.20 | 77.50 | | 73.65 | 1.19 | 0.4 | 0.5 | D |
| OWF_GI#09_SAMP | CR21 | 20.50 | IS | | 1.60 | 76.71 | | 64.95 | 1.12 | 0.4 | 0.4 | D |
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Notes

Test type key

A Axial

D Diametral

Sheet Reference:

All tests completed at natural moisture content*

| Tested by | Date Printed | Approved By | |
|---|---|---|---|
| S Ocio | 12/08/2022 00:00 | D.Smith | |

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#01A_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR10 |
| Soil Description | Moderately weak SANDSTONE | | | Depth m | 8.8 |
| Specimen Reference | IS | Specimen Depth | 8.80 m | Sample Type | IS |
| Specimen Description | (Weak) greyish olive (10YR 7/4) LIMESTONE. | | | KeyLAB ID | BH012023022723 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 11/04/2023 |

Sample details: Undulating, rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 87.89 | mm |
| | Average Diameter | 45.40 | mm |
| | Sample Ratio | 1.94 | |
| | Moisture Content | 9.93 | % |
| | Bulk Density | 2.35 | Mg/m³ |
| | Dry density | 2.14 | Mg/m³ |
| | Initial area | 1618.47 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1090.00 | KPa |
| | Change in height during consolidation* | -0.10 | mm |

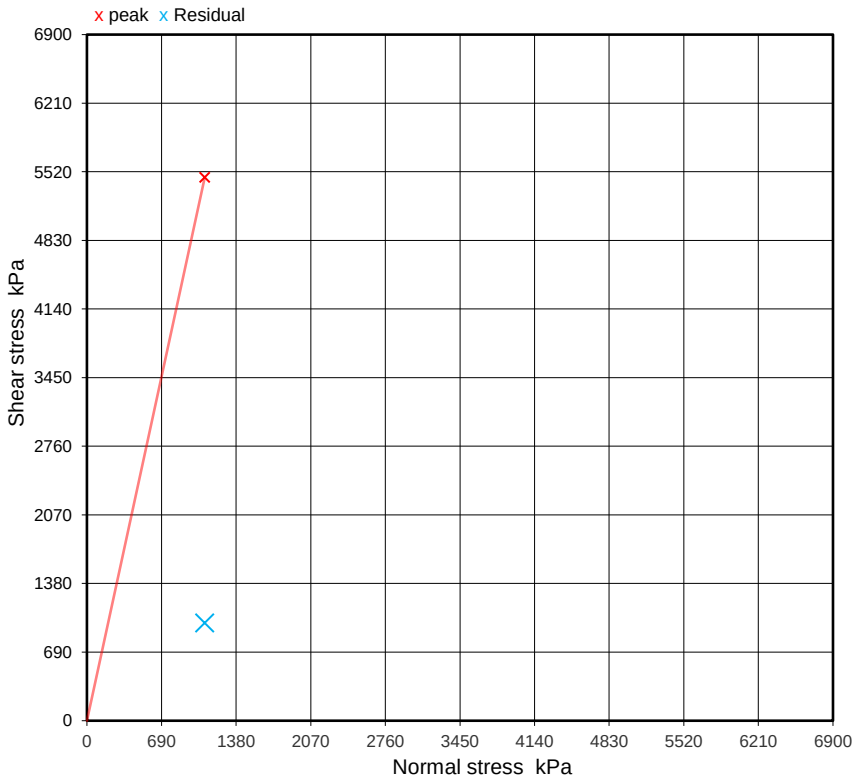
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 144.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.23 | mm |
| | Calculated Shear Rate | 0.32 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 4.10 | mm |
| | Shear stress | 5465.09 | KPa |
| | Vertical Movement at peak shear stress* | -3.01 | mm |
| Residual values | Shear stress | 981.69 | KPa |

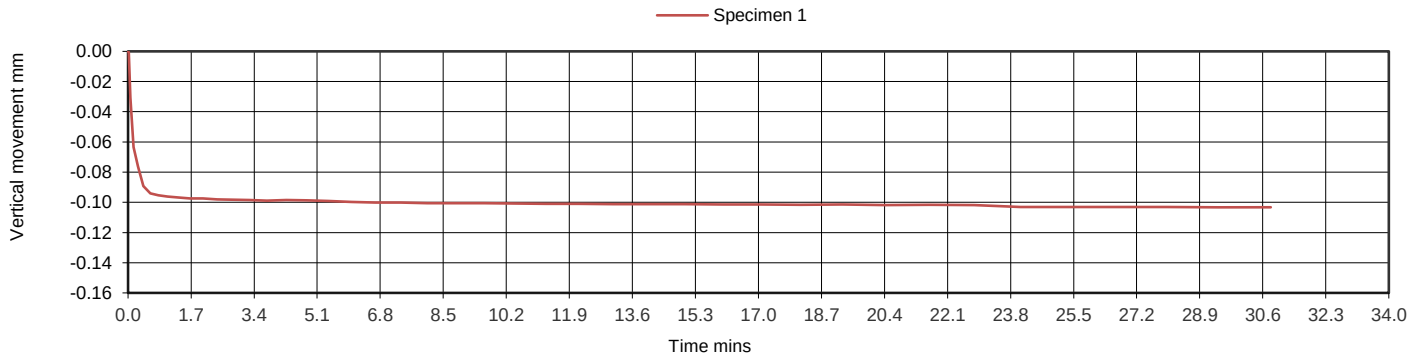



Remarks :

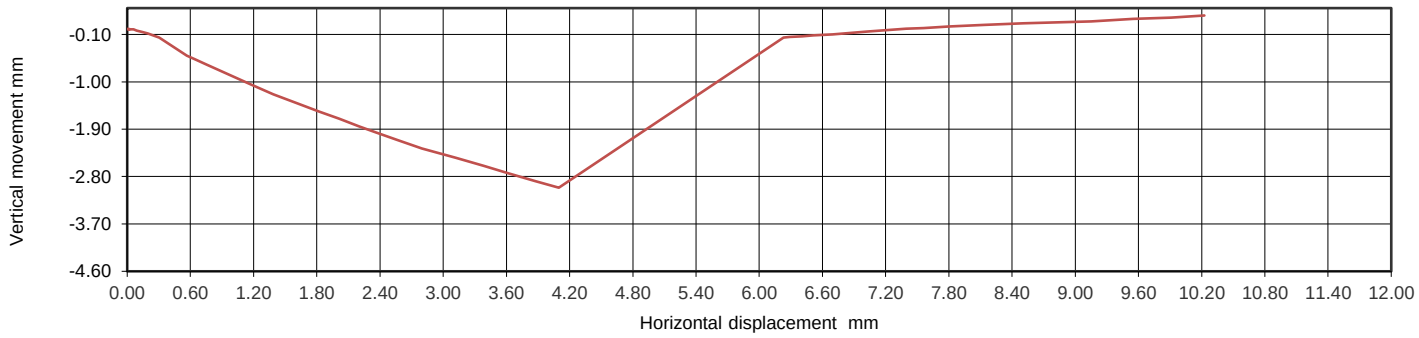
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 16/05/2023 10:05 | S Ocio |

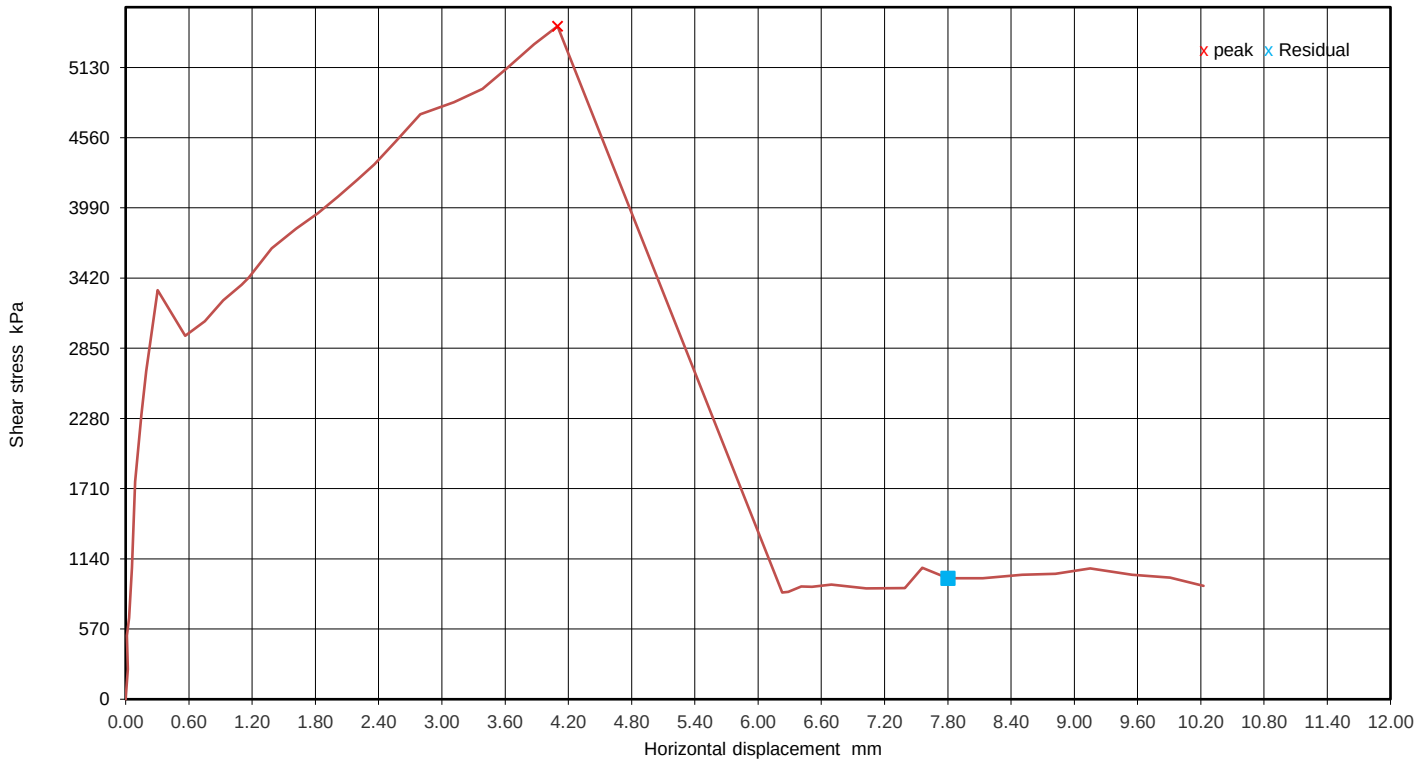
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR10 |
| Soil Description | Moderately weak SANDSTONE | | | | Depth m | 8.8 |
| Specimen Reference | IS | Specimen Depth | 8.8 | m | Sample Type | IS |
| Specimen Description | (Weak) greyish olive (10YR 7/4) LIMESTONE. | | | | KeyLAB ID | BH012023022723 |

**Consolidation stage(s)**




**Shearing stage(s)**




*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **ISRM 2007 SM Determining Shear Strength - 1974** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR10 |
| Soil Description | Moderately weak SANDSTONE | | | | Depth m | 8.8 |
| Specimen Reference | IS | Specimen Depth | 8.8 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022723 |

**Sample before test**

Photo is not available

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **ISRM 2007 SM Determining Shear Strength - 1974** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR10 |
| Soil Description | Moderately weak SANDSTONE | | | | Depth m | 8.8 |
| Specimen Reference | IS | Specimen Depth | 8.8 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022723 |

**Sample after test**

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#01A_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR11 |
| Soil Description | (Weak) moderate brown (5yR 4/4) SANDSTONE | | | Depth m | 9.5 |
| Specimen Reference | IS | Specimen Depth | 9.50 m | Sample Type | IS |
| Specimen Description | (Weak) moderate brown (5YR 4/4) SANDSTONE. | | | KeyLAB ID | BH012023022727 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 14/04/2023 |

Sample details: Undulating, rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 89.92 | mm |
| | Average Diameter | 45.71 | mm |
| | Sample Ratio | 1.97 | |
| | Moisture Content | 6.69 | % |
| | Bulk Density | 2.49 | Mg/m³ |
| | Dry density | 2.33 | Mg/m³ |
| | Initial area | 1640.66 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1105.00 | KPa |
| | Change in height during consolidation* | -0.12 | mm |

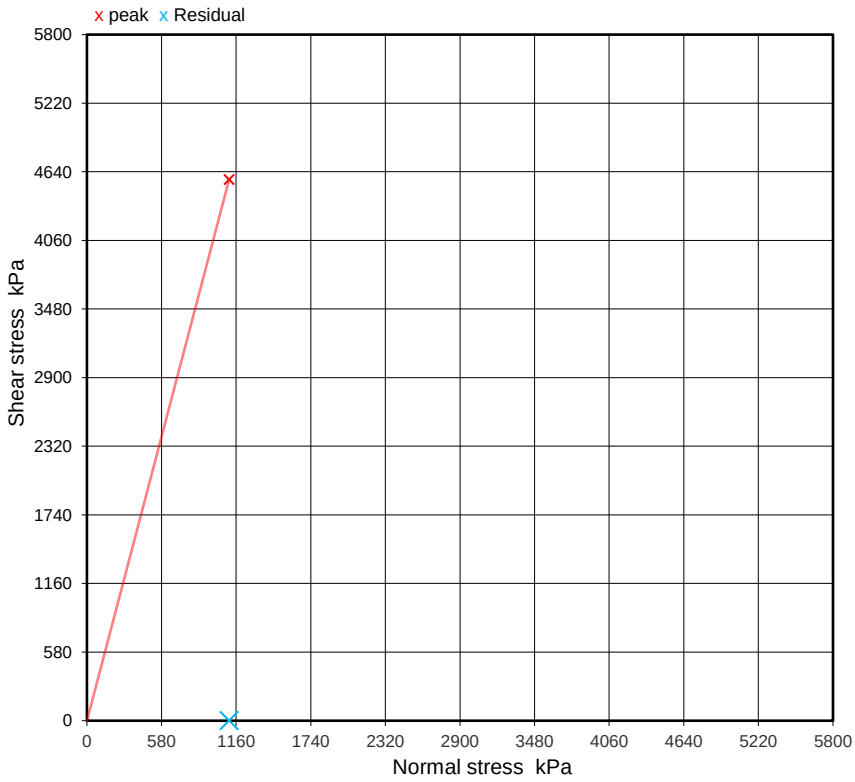
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 168.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.12 | mm |
| | Calculated Shear Rate | 0.34 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 2.94 | mm |
| | Shear stress | 4573.52 | KPa |
| | Vertical Movement at peak shear stress* | -1.78 | mm |
| Residual values | Shear stress | N/A | KPa |

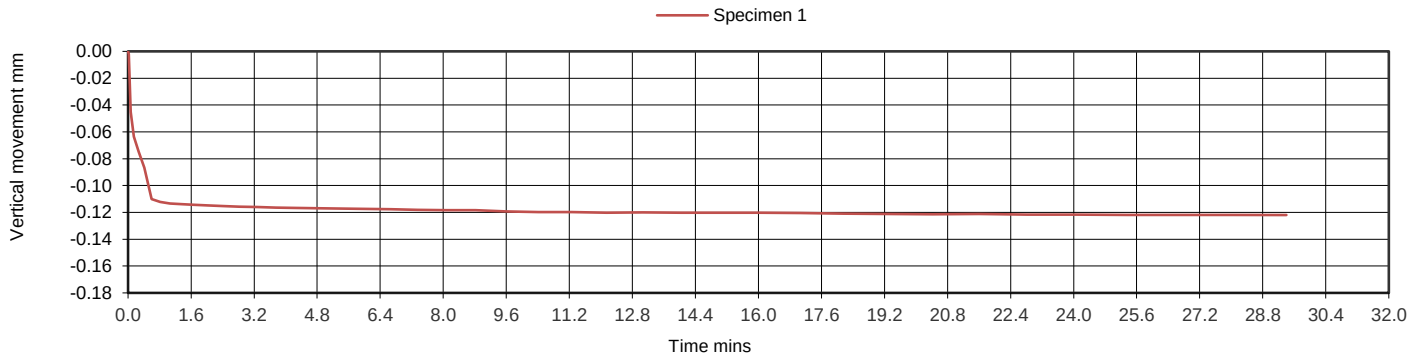



Remarks : Specimen 1 - Unable to measure residual shear stress

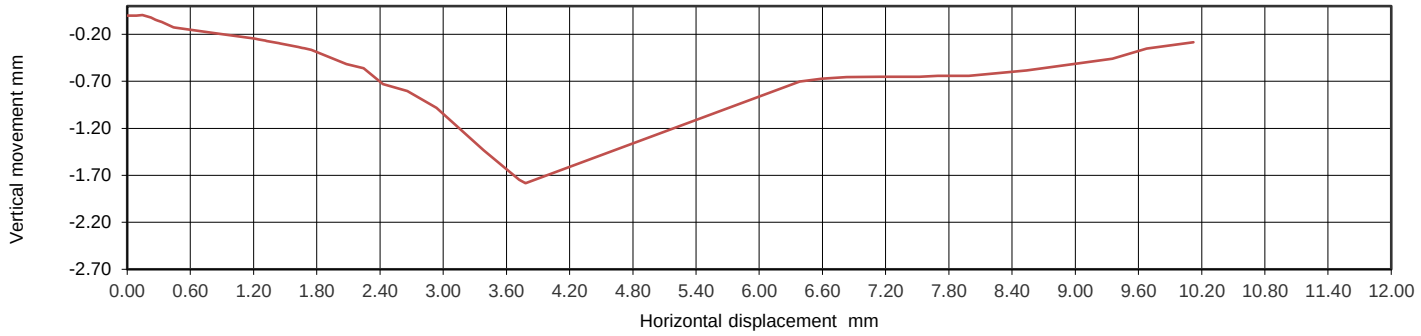
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 16/05/2023 14:19 | O Atitebi |

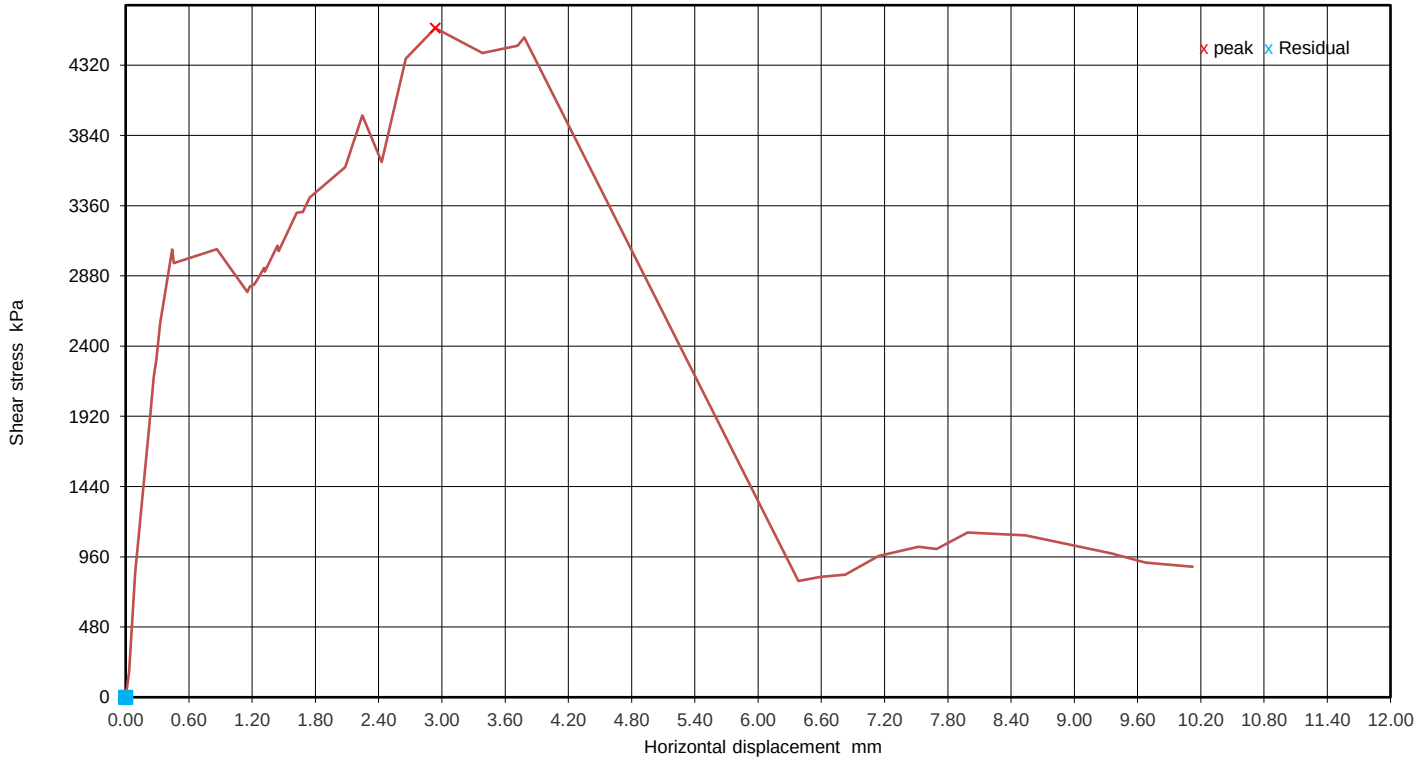
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR11 |
| Soil Description | (Weak) moderate brown (5yR 4/4) SANDSTONE | | | | Depth m | 9.5 |
| Specimen Reference | IS | Specimen Depth | 9.5 | m | Sample Type | IS |
| Specimen Description | (Weak) moderate brown (5YR 4/4) SANDSTONE. | | | | KeyLAB ID | BH012023022727 |

**Consolidation stage(s)**




**Shearing stage(s)**

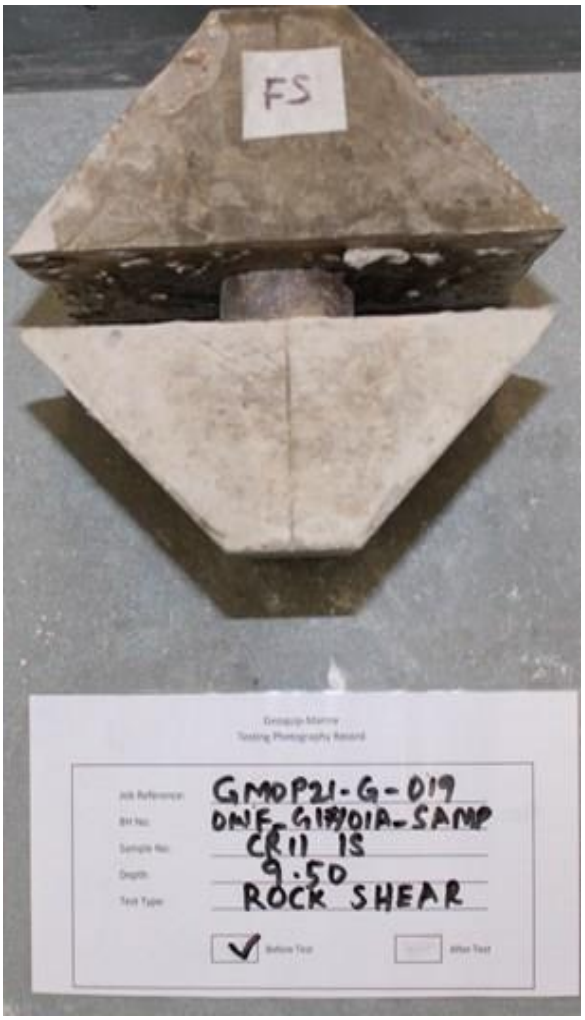



*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR11 |
| Soil Description | (Weak) moderate brown (5yR 4/4) SANDSTONE | | | | Depth m | 9.5 |
| Specimen Reference | IS | Specimen Depth | 9.5 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022727 |

**Sample before test**

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR11 |
| Soil Description | (Weak) moderate brown (5yR 4/4) SANDSTONE | | | | Depth m | 9.5 |
| Specimen Reference | IS | Specimen Depth | 9.5 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022727 |

**Sample after test**

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#04A_SAMP |

| | | | | | | |
|---|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Brown (10YR 4/3) LIMESTONE | | | | Depth m | 5.5 |
| Specimen Reference | Q1 | Specimen Depth | 5.50 | m | Sample Type | Q1 |
| Specimen Description | (Weak) Brown (10YR 4/3) LIMESTONE | | | | KeyLAB ID | BH012023022762 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Date of test | 03/04/2023 |

Sample details: Undulating, Rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 85.74 | mm |
| | Average Diameter | 45.63 | mm |
| | Sample Ratio | 1.88 | |
| | Moisture Content | 0.87 | % |
| | Bulk Density | 2.77 | Mg/m³ |
| | Dry density | 2.75 | Mg/m³ |
| | Initial area | 1635.28 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 985.00 | KPa |
| | Change in height during consolidation* | -0.17 | mm |

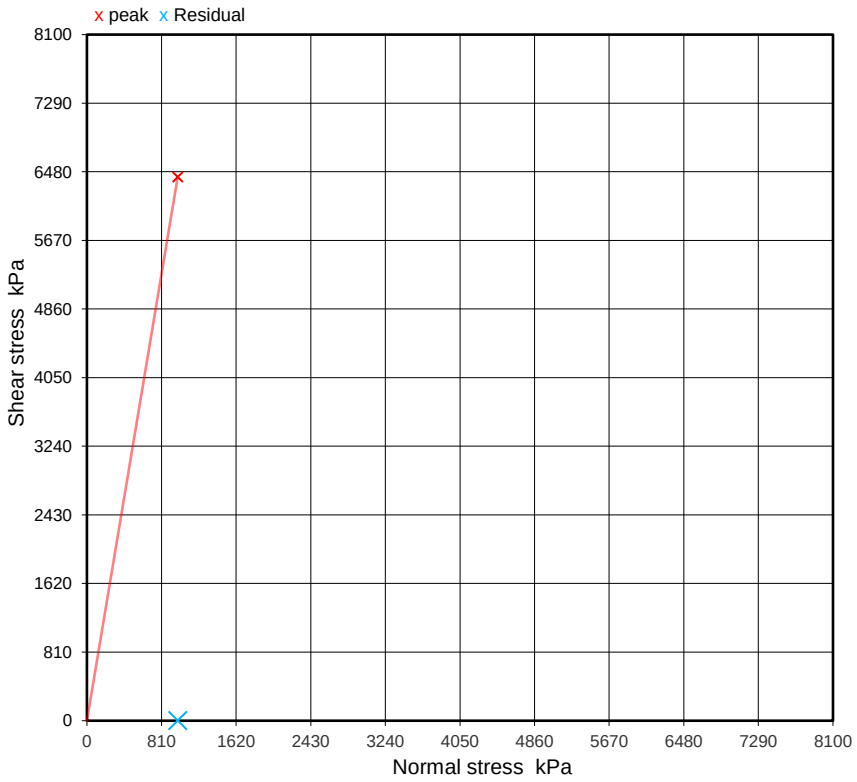
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 192.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.04 | mm |
| | Calculated Shear Rate | 0.31 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 2.95 | mm |
| | Shear stress | 6416.22 | KPa |
| | Vertical Movement at peak shear stress* | -2.70 | mm |
| Residual values | Shear stress | N/A | KPa |

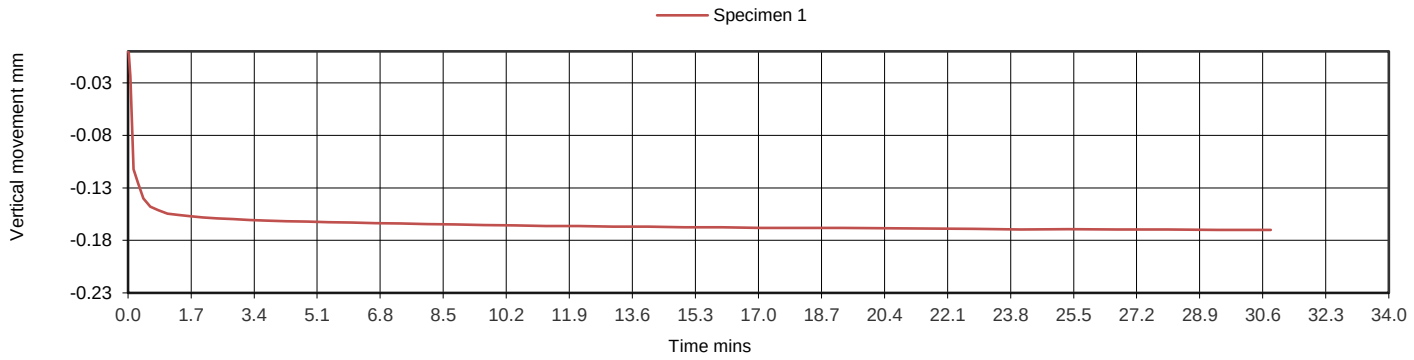



Remarks : Specimen 1 - Unable to measure residual shear

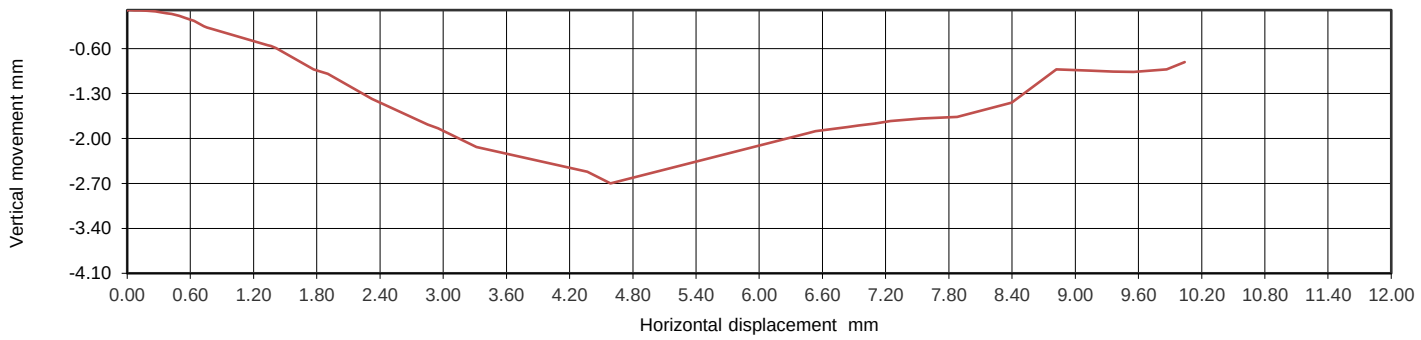
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 10/05/2023 09:58 | S Ocio |

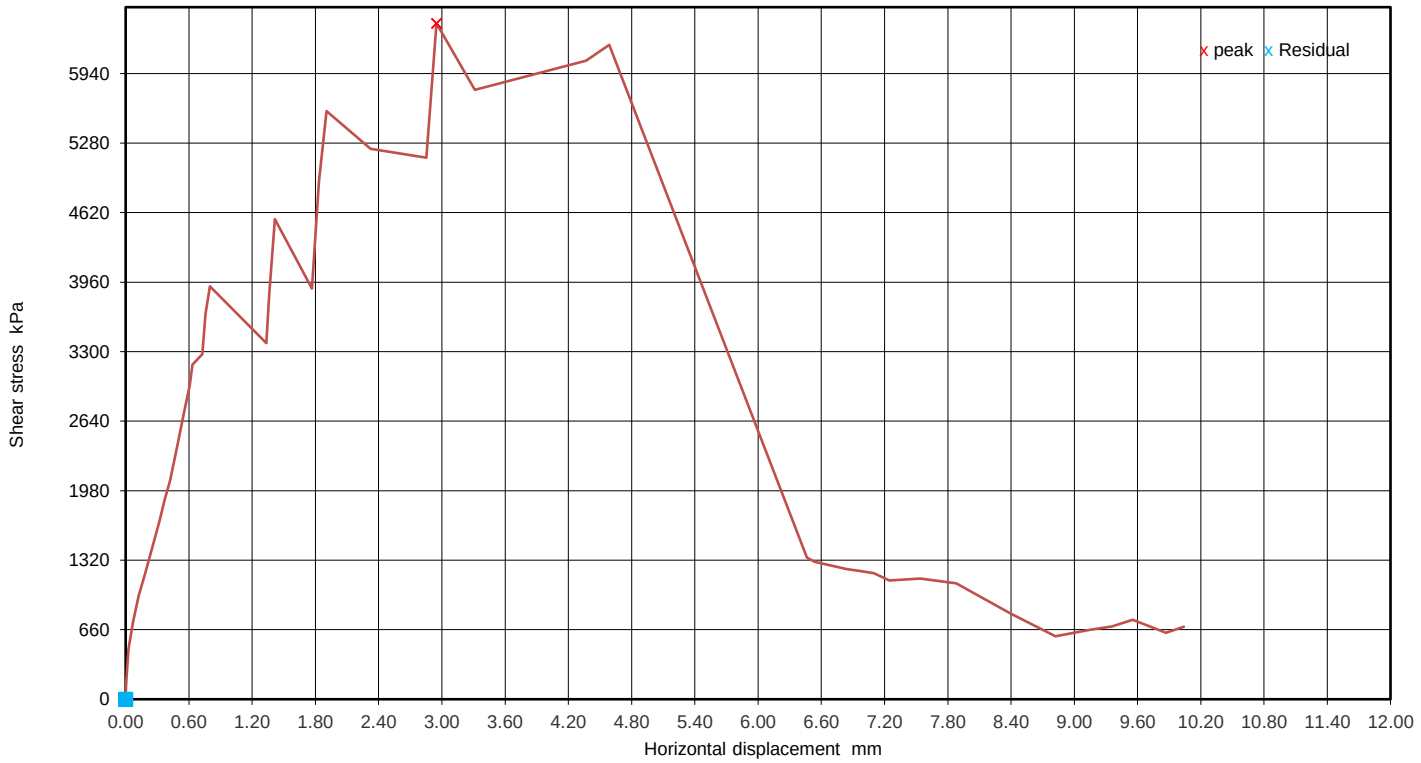
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Brown (10YR 4/3) LIMESTONE | | | | Depth m | 5.5 |
| Specimen Reference | Q1 | Specimen Depth | 5.5 | m | Sample Type | Q1 |
| Specimen Description | (Weak) Brown (10YR 4/3) LIMESTONE | | | | KeyLAB ID | BH012023022762 |

**Consolidation stage(s)**




**Shearing stage(s)**




*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Brown (10YR 4/3) LIMESTONE | | | | Depth m | 5.5 |
| Specimen Reference | Q1 | Specimen Depth | 5.5 | m | Sample Type | Q1 |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022762 |

**Sample before test**


| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **ISRM 2007 SM Determining Shear Strength - 1974** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Brown (10YR 4/3) LIMESTONE | | | | Depth m | 5.5 |
| Specimen Reference | Q1 | Specimen Depth | 5.5 | m | Sample Type | Q1 |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022762 |

**Sample after test**

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#04A_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR15 |
| Soil Description | (Weak) yellowish grey (5y 8/1) SANDSTONE | | | Depth m | 19.05 |
| Specimen Reference | Q1 | Specimen Depth | 19.05 m | Sample Type | Q1 |
| Specimen Description | (Weak) yellowish grey (5Y8/1) SANDSTONE. | | | KeyLAB ID | BH012023022794 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 13/04/2023 |

Sample details: Undulating, rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 88.49 | mm |
| | Average Diameter | 45.74 | mm |
| | Sample Ratio | 1.93 | |
| | Moisture Content | 5.35 | % |
| | Bulk Density | 2.47 | Mg/m³ |
| | Dry density | 2.34 | Mg/m³ |
| | Initial area | 1642.93 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1255.00 | KPa |
| | Change in height during consolidation* | -0.08 | mm |

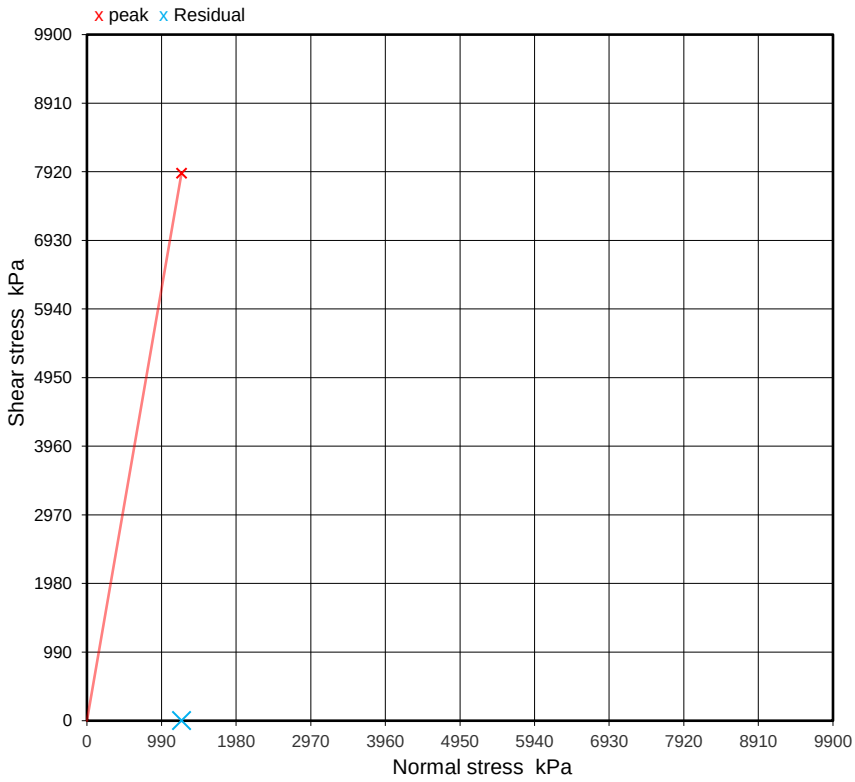
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 192.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 7.43 | mm |
| | Calculated Shear Rate | 0.31 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 5.53 | mm |
| | Shear stress | 7898.45 | KPa |
| | Vertical Movement at peak shear stress* | -3.40 | mm |
| Residual values | Shear stress | N/A | KPa |

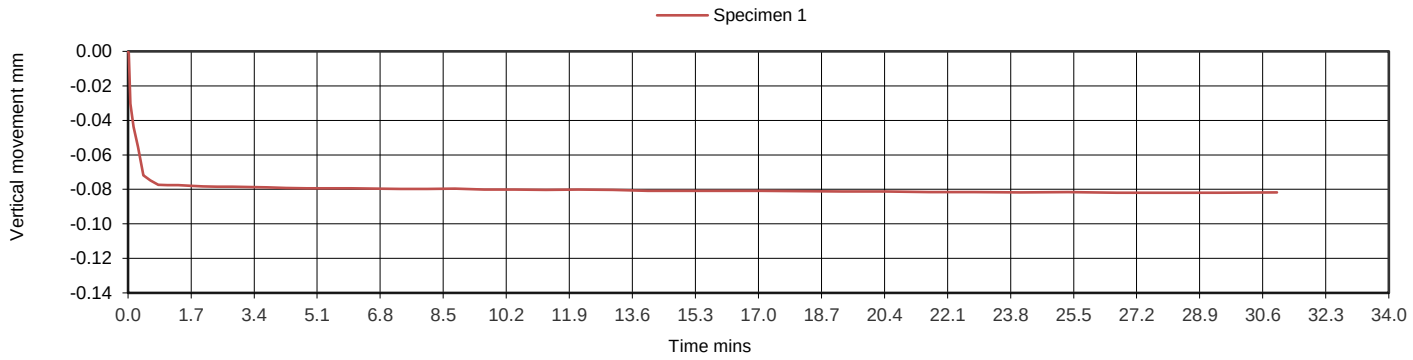



Remarks : Specimen 1 - Data trimmed at end of test- Unable to measure residual shear stress

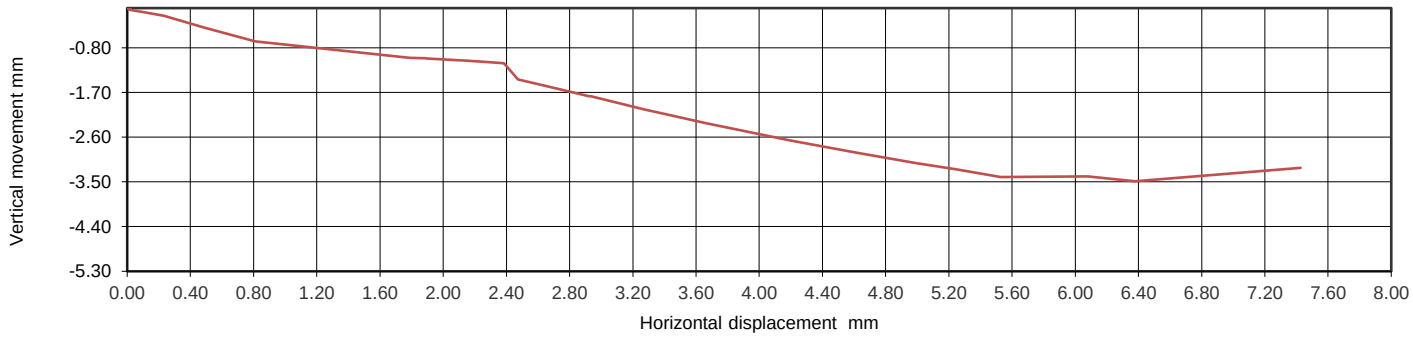
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 11/05/2023 09:14 | O Atitebi |

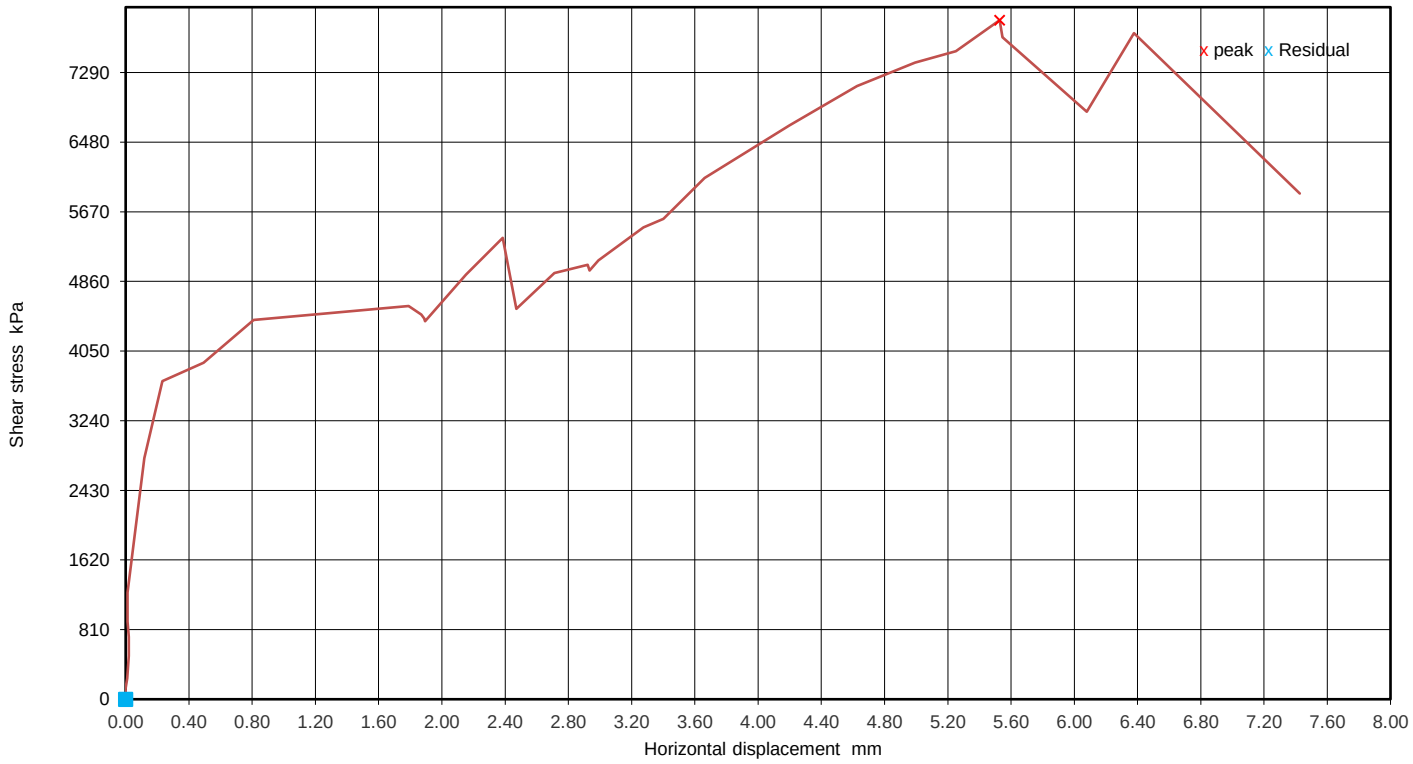
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Soil Description | (Weak) yellowish grey (5y 8/1) SANDSTONE | | | | Depth m | 19.05 |
| Specimen Reference | Q1 | Specimen Depth | 19.05 | m | Sample Type | Q1 |
| Specimen Description | (Weak) yellowish grey (5Y8/1) SANDSTONE. | | | | KeyLAB ID | BH012023022794 |

**Consolidation stage(s)**




**Shearing stage(s)**

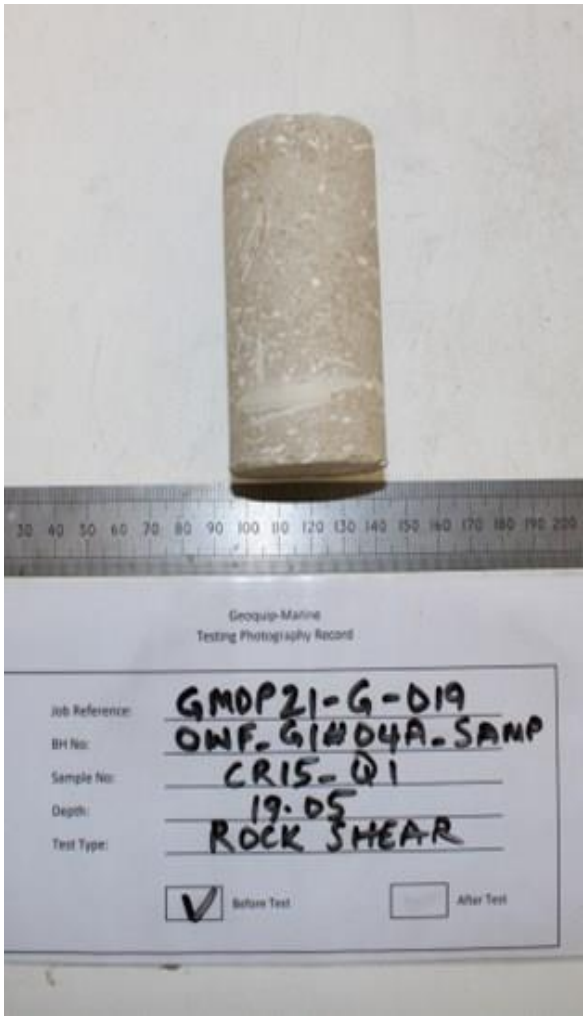



*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Soil Description | (Weak) yellowish grey (5y 8/1) SANDSTONE | | | | Depth m | 19.05 |
| Specimen Reference | Q1 | Specimen Depth | 19.05 | m | Sample Type | Q1 |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022794 |

**Sample before test**




| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#04A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Soil Description | (Weak) yellowish grey (5y 8/1) SANDSTONE | | | | Depth m | 19.05 |
| Specimen Reference | Q1 | Specimen Depth | 19.05 | m | Sample Type | Q1 |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022794 |

**Sample after test**

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#05A_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR01 |
| Soil Description | (Weak) Light greenish grey (10Y 7/1) LIMESTONE | | | Depth m | 0.5 |
| Specimen Reference | IS | Specimen Depth | 0.50 m | Sample Type | IS |
| Specimen Description | (Weak) Light greenish grey (10Y 7/1) LIMESTONE | | | KeyLAB ID | BH012023022799 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 03/04/2023 |

Sample details: Undulating, Rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 85.65 | mm |
| | Average Diameter | 45.68 | mm |
| | Sample Ratio | 1.87 | |
| | Moisture Content | 4.82 | % |
| | Bulk Density | 2.44 | Mg/m³ |
| | Dry density | 2.33 | Mg/m³ |
| | Initial area | 1639.10 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 965.00 | KPa |
| | Change in height during consolidation* | -0.11 | mm |

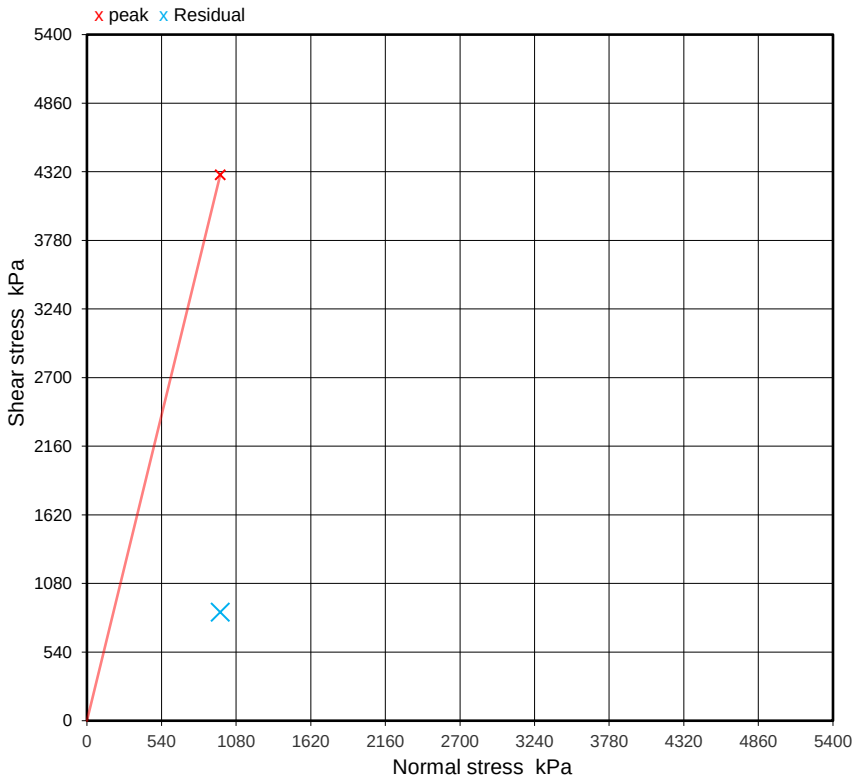
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 192.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.17 | mm |
| | Calculated Shear Rate | 0.32 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 0.82 | mm |
| | Shear stress | 4296.37 | KPa |
| | Vertical Movement at peak shear stress* | -0.96 | mm |
| Residual values | Shear stress | 853.71 | KPa |

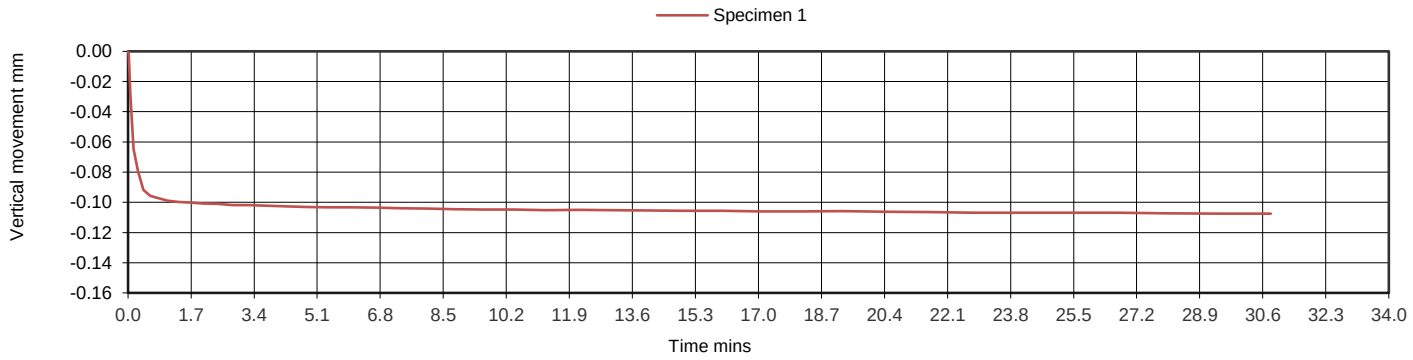



Remarks :

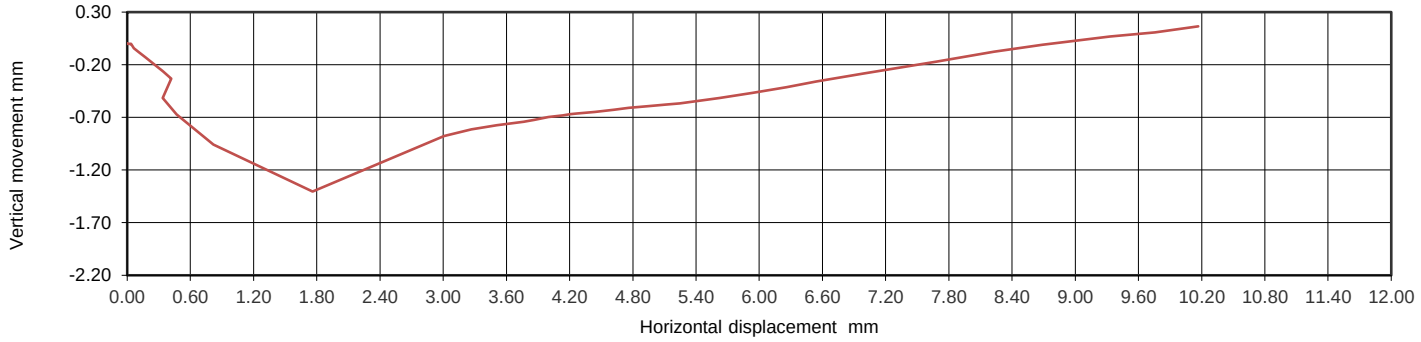
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 15/05/2023 13:36 | S Ocio |

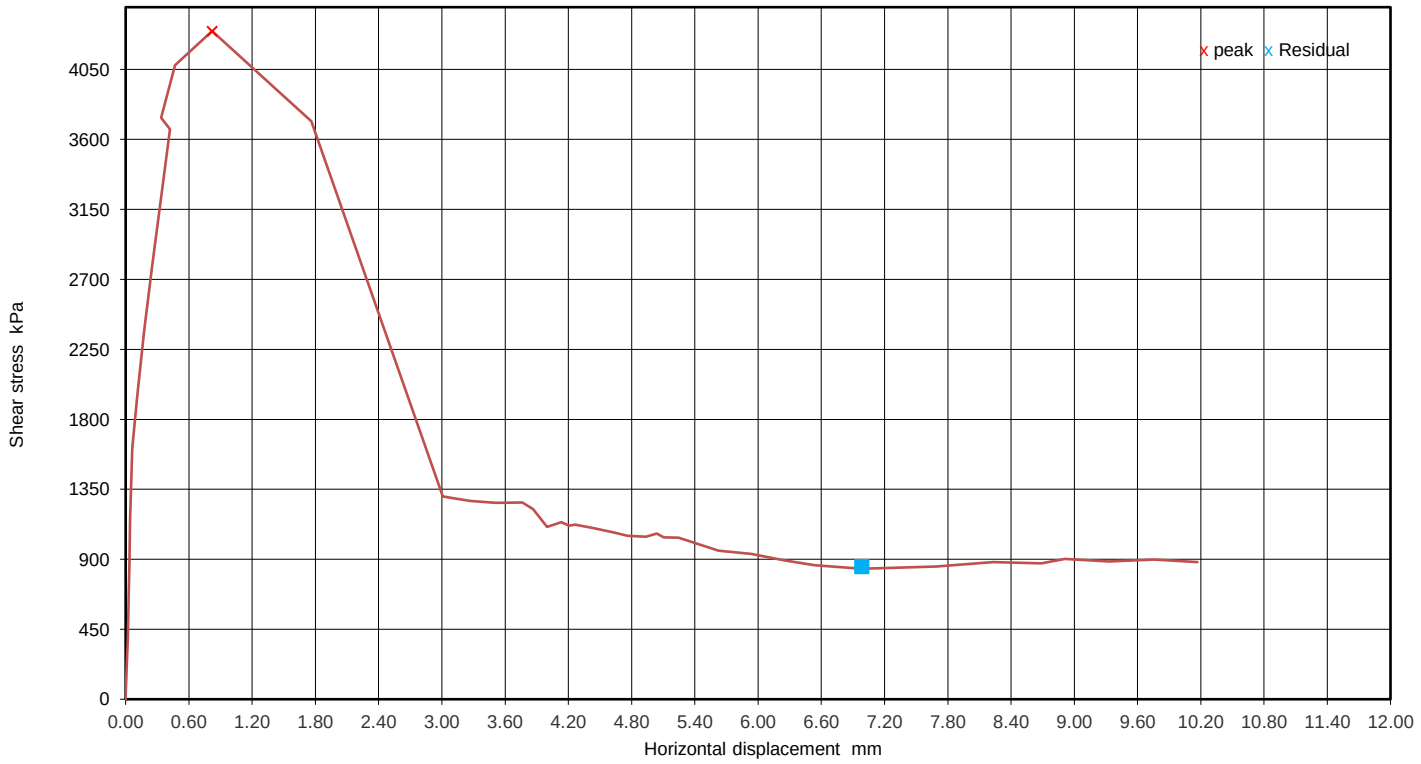
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Soil Description | (Weak) Light greenish grey (10Y 7/1) LIMESTONE | | | | Depth m | 0.5 |
| Specimen Reference | IS | Specimen Depth | 0.5 | m | Sample Type | IS |
| Specimen Description | (Weak) Light greenish grey (10Y 7/1) LIMESTONE | | | | KeyLAB ID | BH012023022799 |

**Consolidation stage(s)**




**Shearing stage(s)**



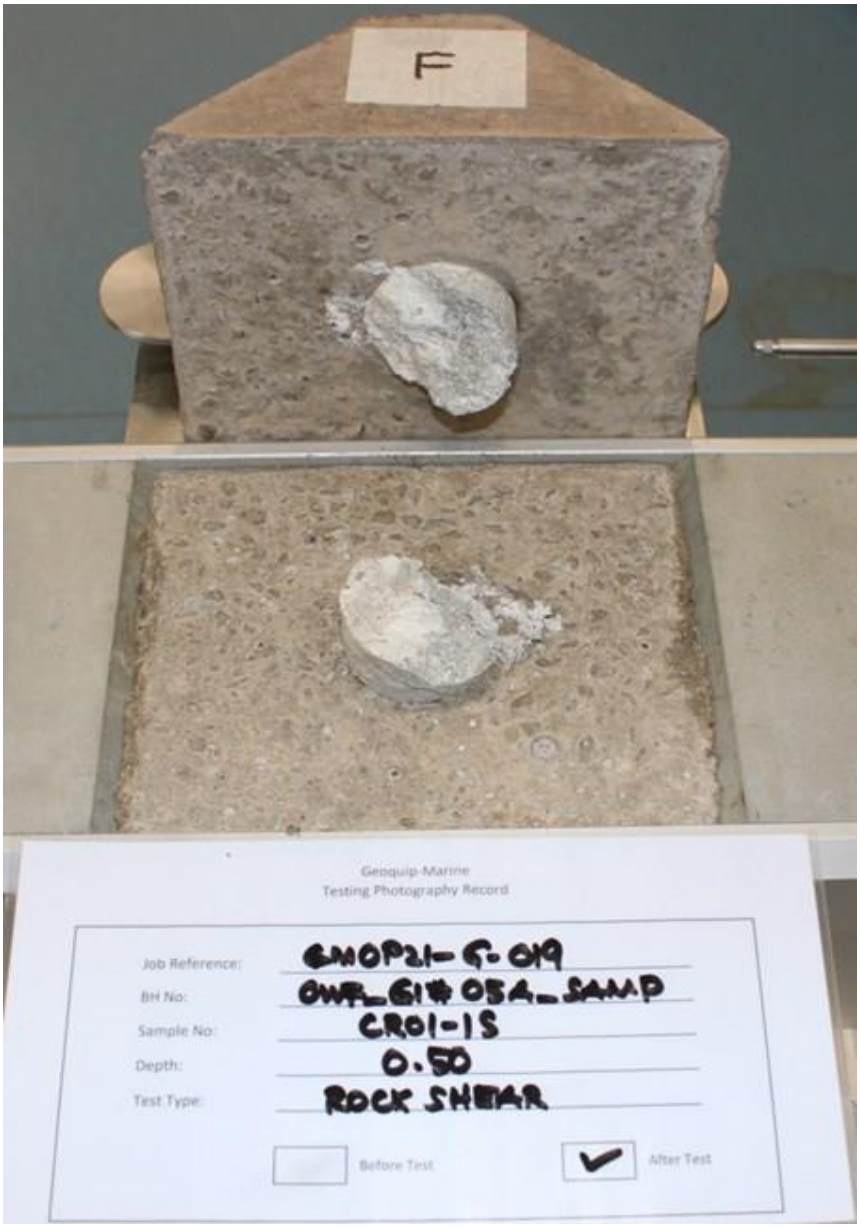

*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Soil Description | (Weak) Light greenish grey (10Y 7/1) LIMESTONE | | | | Depth m | 0.5 |
| Specimen Reference | IS | Specimen Depth | 0.5 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022799 |

**Sample before test**


| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **ISRM 2007 SM Determining Shear Strength - 1974** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#05A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Soil Description | (Weak) Light greenish grey (10Y 7/1) LIMESTONE | | | | Depth m | 0.5 |
| Specimen Reference | IS | Specimen Depth | 0.5 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH012023022799 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#09_SAMP |

| | | | | | | |
|---|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 0.4 |
| Specimen Reference | IS | Specimen Depth | 0.40 | m | Sample Type | IS |
| Specimen Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | KeyLAB ID | BH0120230227136 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Date of test | 21/03/2023 |

Sample details: Undulating, Rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 85.68 | mm |
| | Average Diameter | 45.62 | mm |
| | Sample Ratio | 1.88 | |
| | Moisture Content | 8.70 | % |
| | Bulk Density | 2.55 | Mg/m³ |
| | Dry density | 2.35 | Mg/m³ |
| | Initial area | 1634.56 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 845.00 | KPa |
| | Change in height during consolidation* | -0.13 | mm |

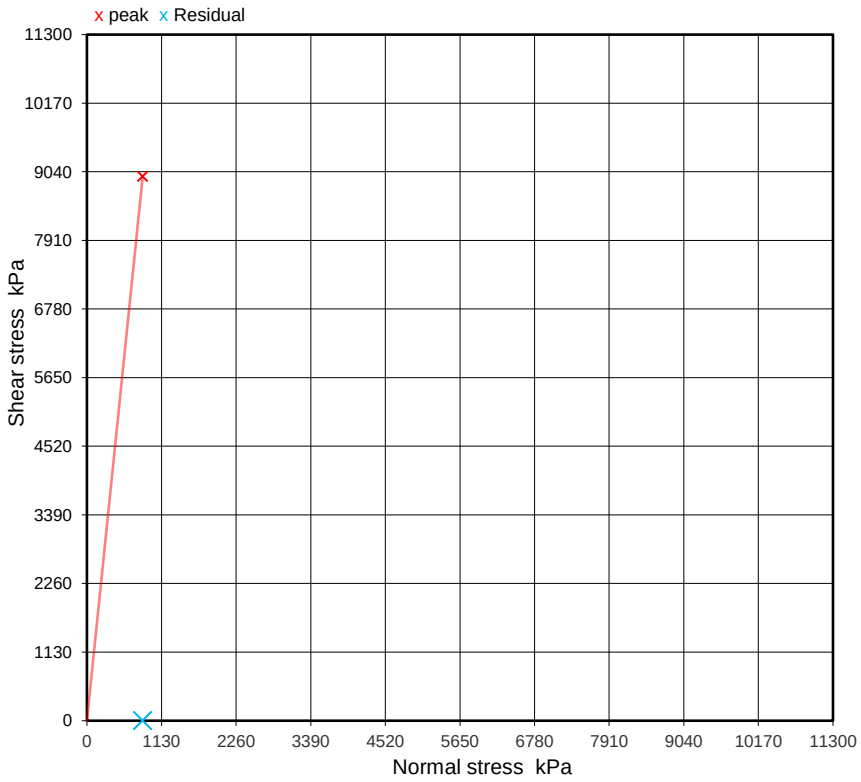
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 336.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.15 | mm |
| | Calculated Shear Rate | 0.31 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 5.79 | mm |
| | Shear stress | 8963.54 | KPa |
| | Vertical Movement at peak shear stress* | -3.85 | mm |
| Residual values | Shear stress | N/A | KPa |

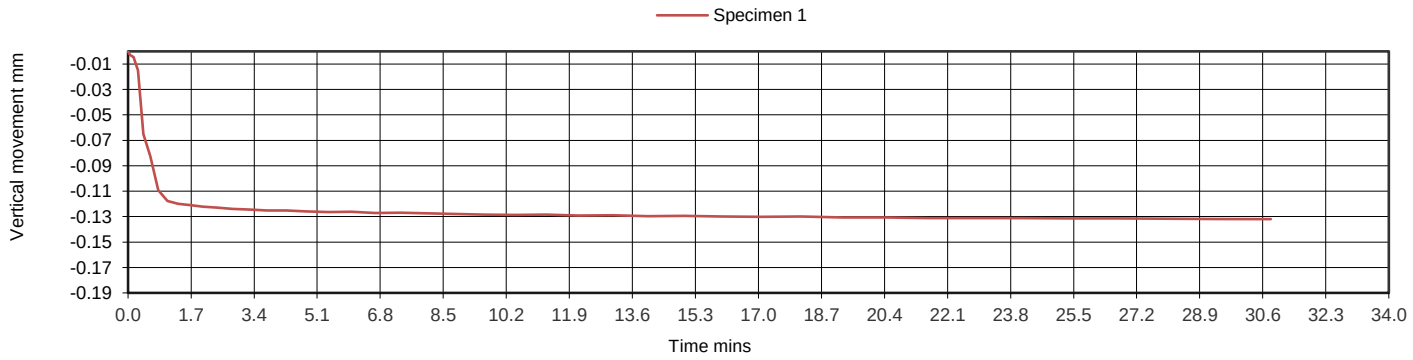



Remarks : Specimen 1 - Unable to measure resisual shear strength

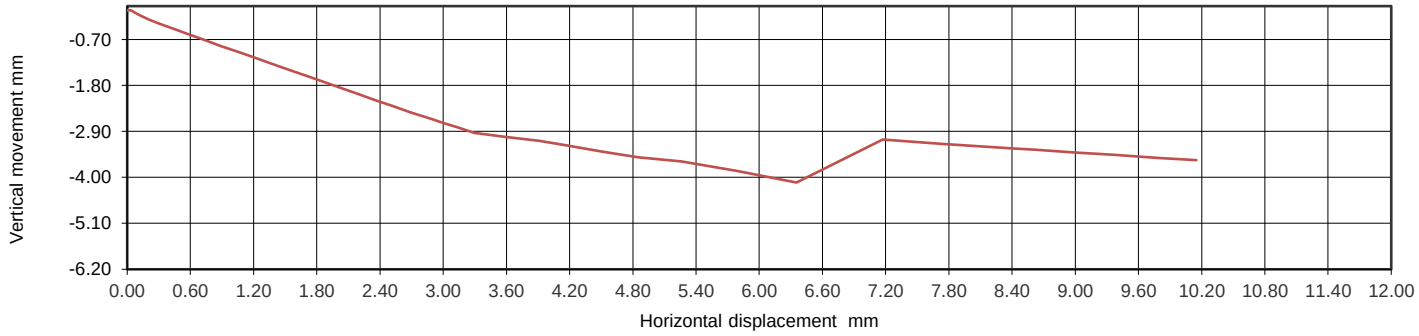
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 11/05/2023 11:38 | S Ocio |

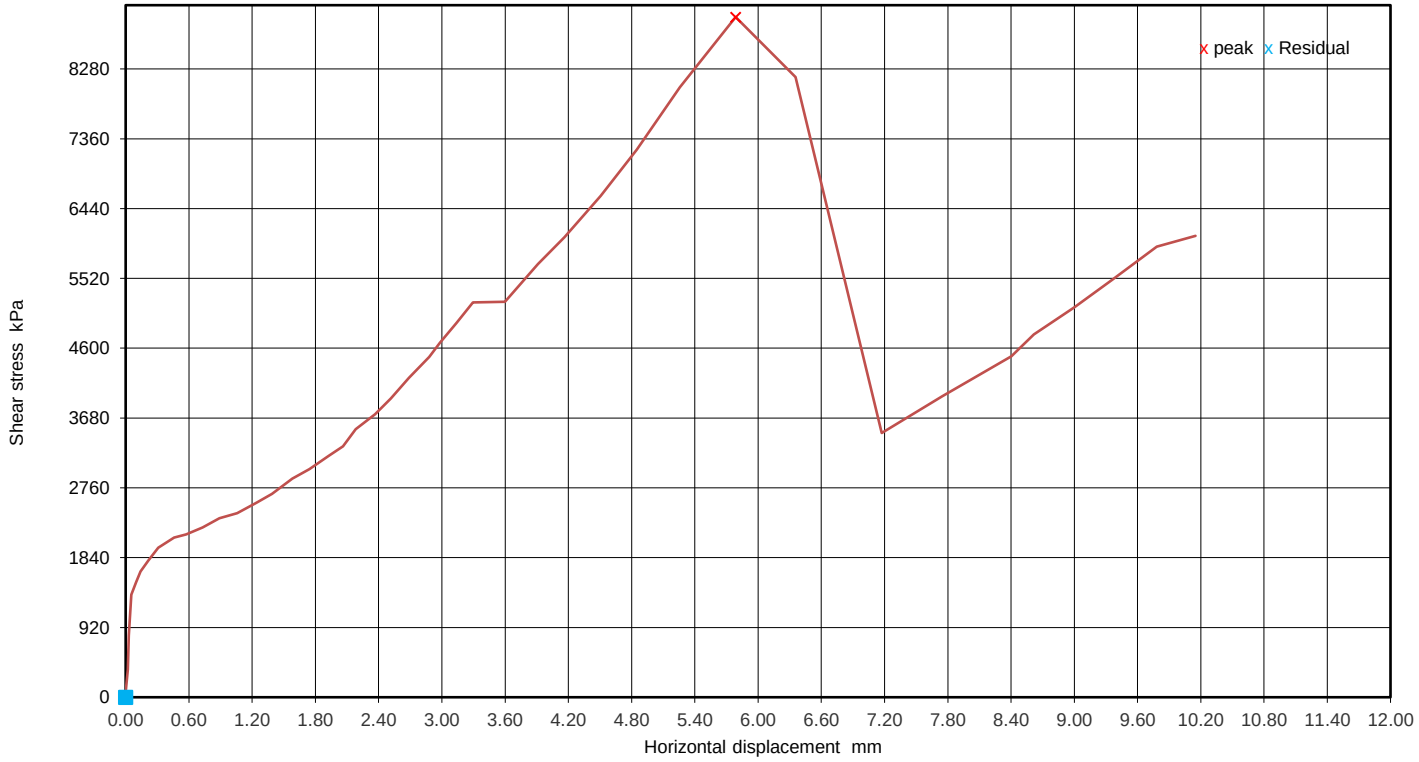
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 0.4 |
| Specimen Reference | IS | Specimen Depth | 0.4 | m | Sample Type | IS |
| Specimen Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | KeyLAB ID | BH0120230227136 |

**Consolidation stage(s)**




**Shearing stage(s)**

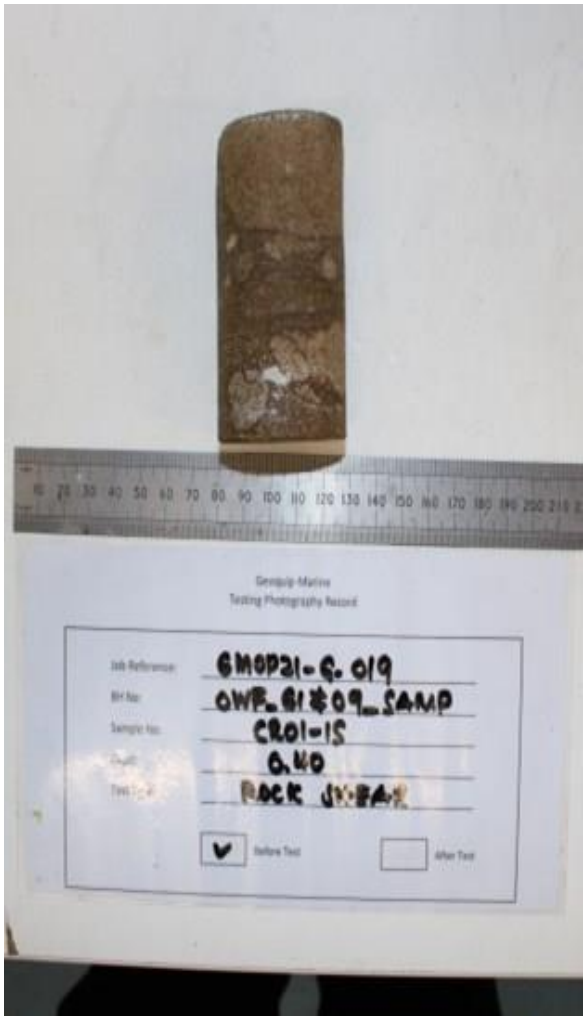



*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

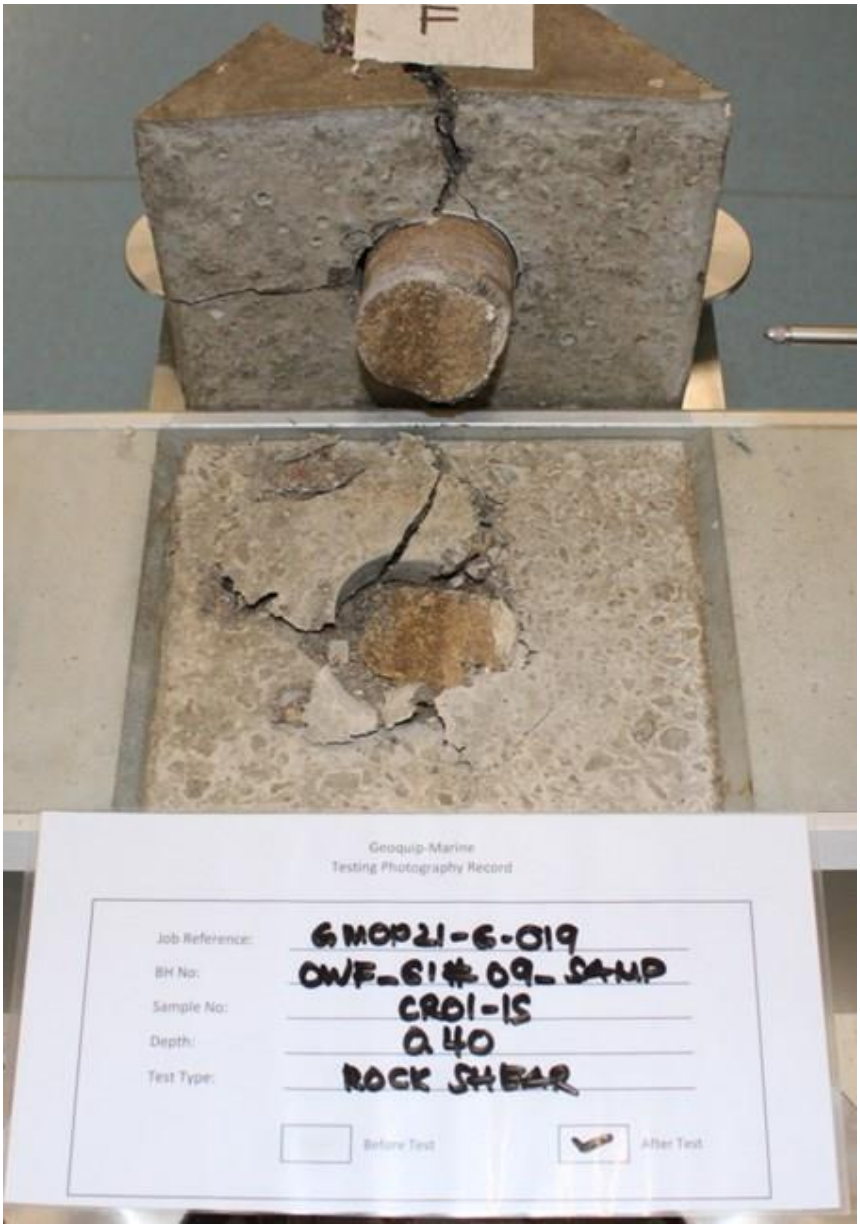
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 0.4 |
| Specimen Reference | IS | Specimen Depth | 0.4 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227136 |

**Sample before test**




| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 0.4 |
| Specimen Reference | IS | Specimen Depth | 0.4 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227136 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#09_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR02 |
| Soil Description | (Strong) greyish orange (10yR 7/4) SANDSTONE | | | Depth m | 1.4 |
| Specimen Reference | IS | Specimen Depth | 1.40 m | Sample Type | IS |
| Specimen Description | (Strong) greyish orange (10YR 7/4) SANDSTONE. | | | KeyLAB ID | BH0120230227139 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 14/04/2023 |

Sample details: Undulating, rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 92.44 | mm |
| | Average Diameter | 45.65 | mm |
| | Sample Ratio | 2.02 | |
| | Moisture Content | 8.94 | % |
| | Bulk Density | 2.37 | Mg/m³ |
| | Dry density | 2.18 | Mg/m³ |
| | Initial area | 1636.83 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 865.00 | KPa |
| | Change in height during consolidation* | -0.11 | mm |

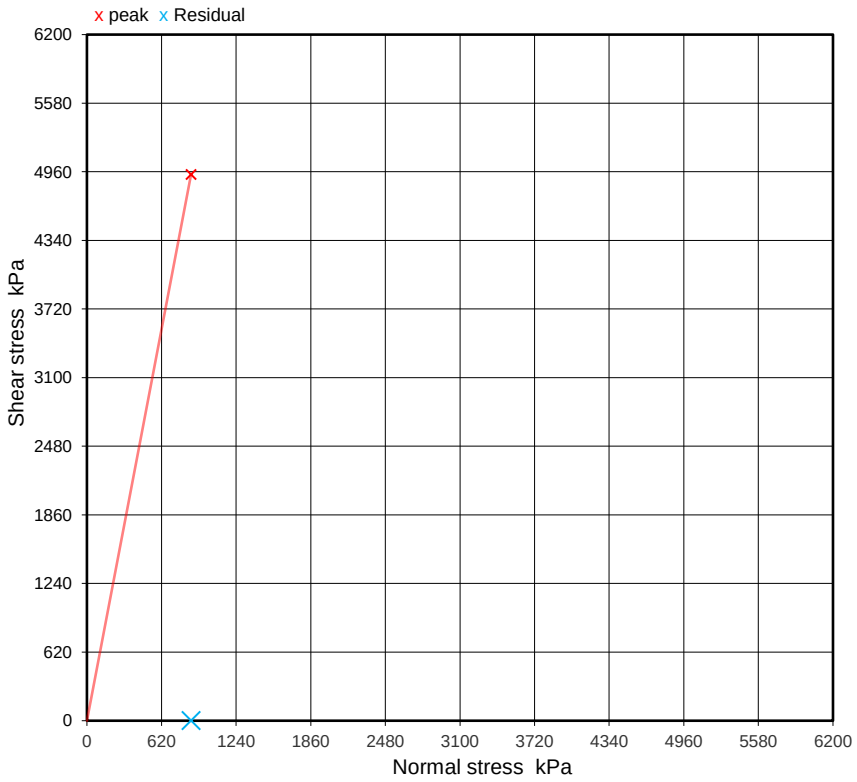
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 240.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.90 | mm |
| | Calculated Shear Rate | 0.37 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 5.76 | mm |
| | Shear stress | 4934.42 | KPa |
| | Vertical Movement at peak shear stress* | -3.62 | mm |
| Residual values | Shear stress | N/A | KPa |

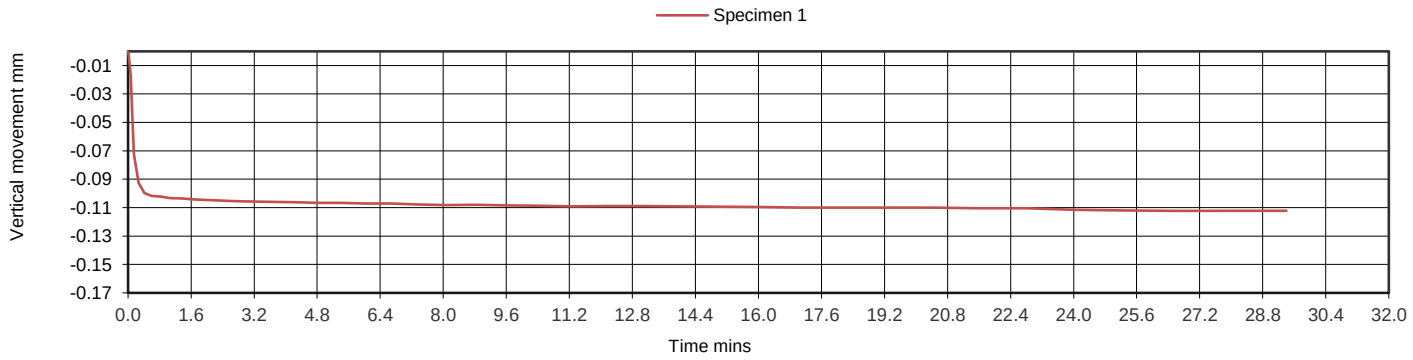



Remarks : Specimen 1 - Unable to measure residual shear strength

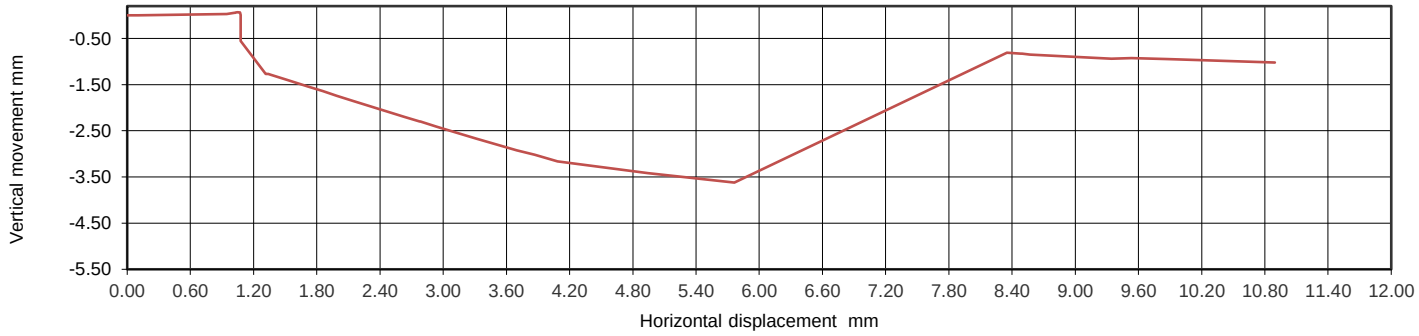
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 11/05/2023 11:21 | O Atitebi |

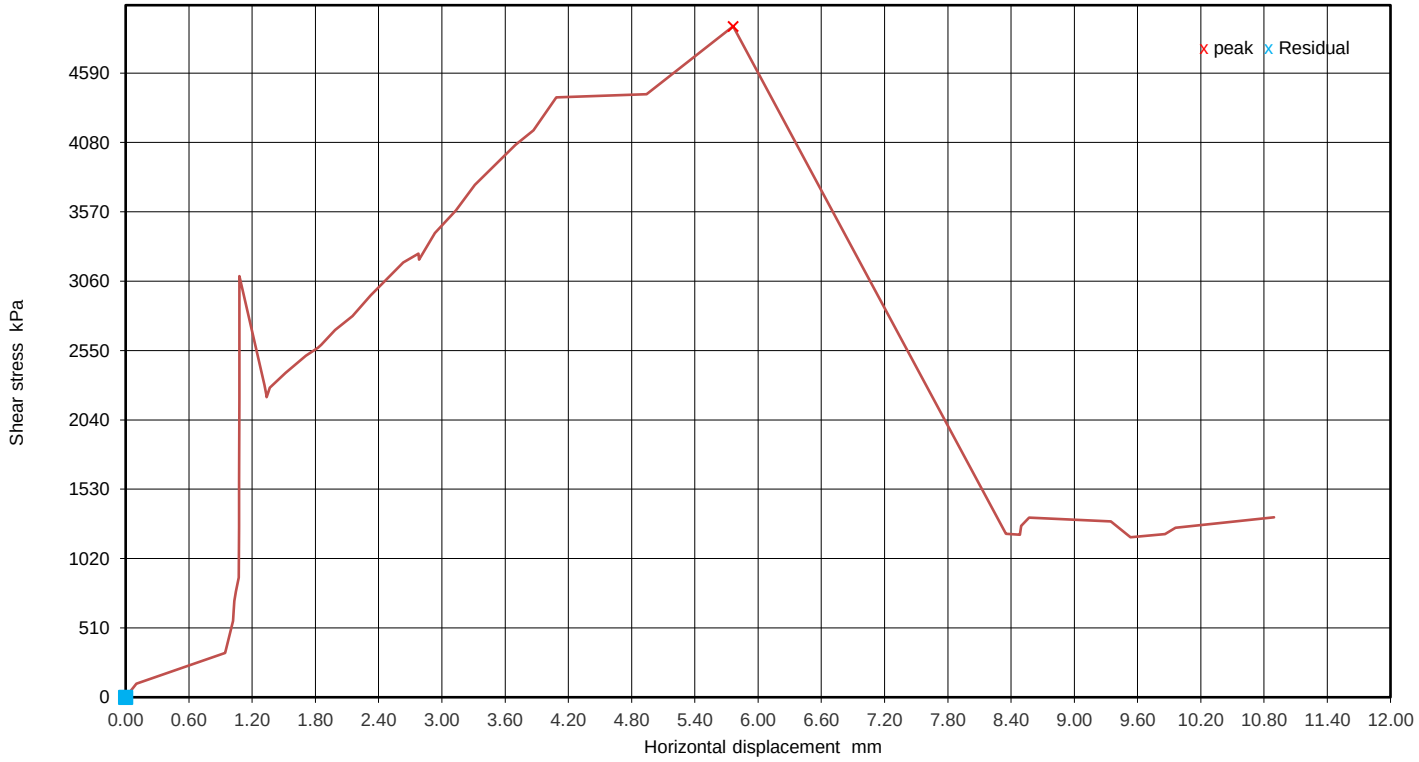
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Soil Description | (Strong) greyish orange (10yR 7/4) SANDSTONE | | | | Depth m | 1.4 |
| Specimen Reference | IS | Specimen Depth | 1.4 | m | Sample Type | IS |
| Specimen Description | (Strong) greyish orange (10YR 7/4) SANDSTONE. | | | | KeyLAB ID | BH0120230227139 |

**Consolidation stage(s)**




**Shearing stage(s)**



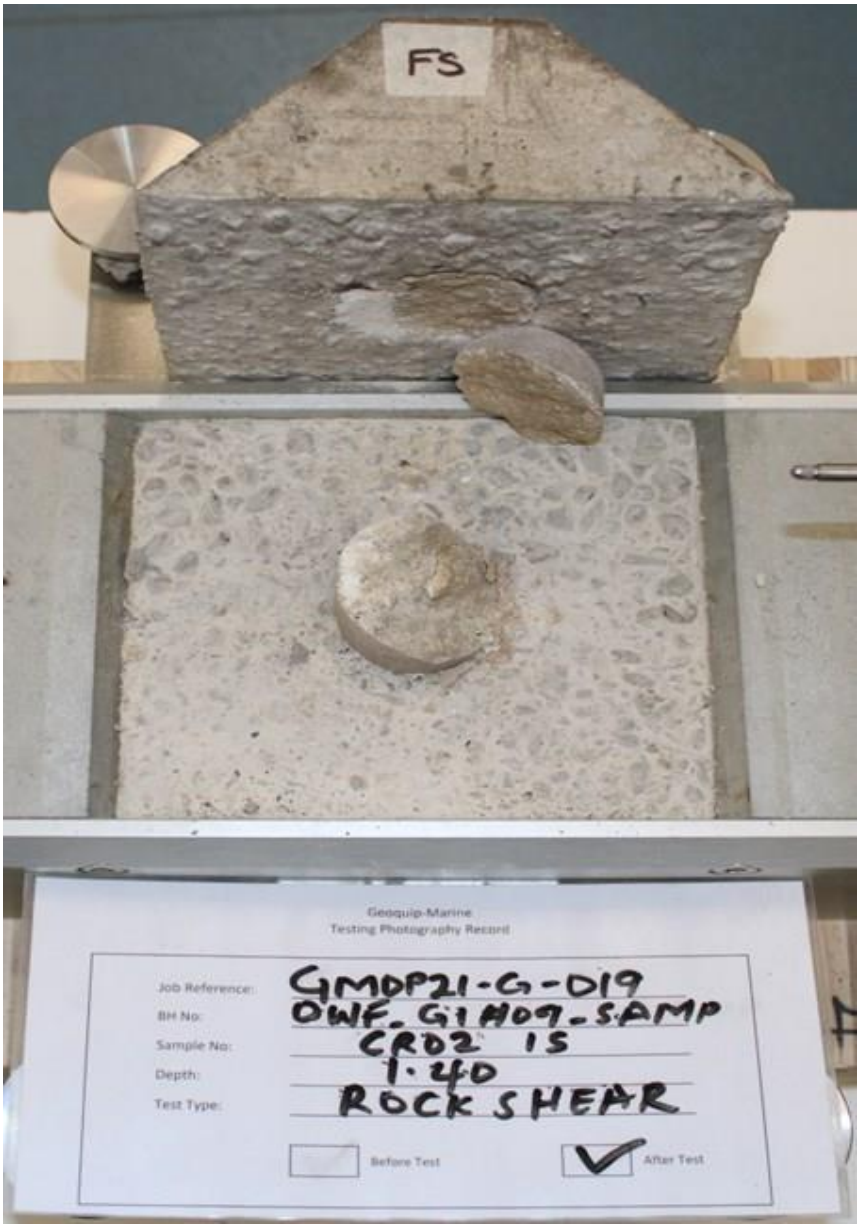

*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Soil Description | (Strong) greyish orange (10yR 7/4) SANDSTONE | | | | Depth m | 1.4 |
| Specimen Reference | IS | Specimen Depth | 1.4 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227139 |

**Sample before test**


| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Soil Description | (Strong) greyish orange (10yR 7/4) SANDSTONE | | | | Depth m | 1.4 |
| Specimen Reference | IS | Specimen Depth | 1.4 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227139 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#09_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR15 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | Depth m | 14.1 |
| Specimen Reference | IS | Specimen Depth | 14.10 m | Sample Type | IS |
| Specimen Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | KeyLAB ID | BH0120230227160 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 28/03/2023 |

Sample details: Undulating, Rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 86.61 | mm |
| | Average Diameter | 45.79 | mm |
| | Sample Ratio | 1.89 | |
| | Moisture Content | 2.00 | % |
| | Bulk Density | 2.53 | Mg/m³ |
| | Dry density | 2.48 | Mg/m³ |
| | Initial area | 1647.00 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1115.00 | KPa |
| | Change in height during consolidation* | -0.31 | mm |

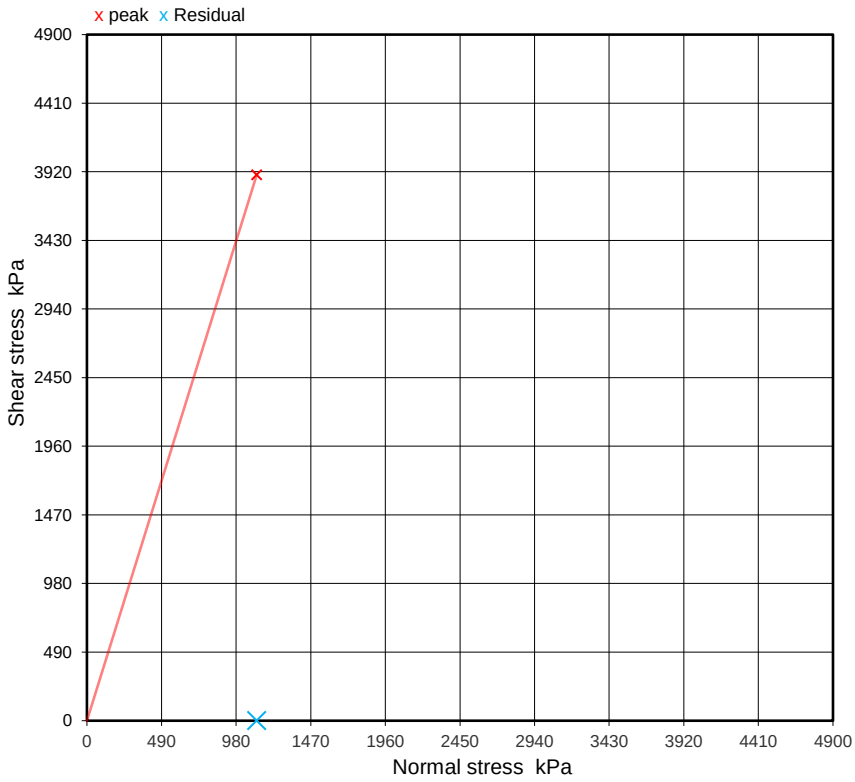
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 144.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.04 | mm |
| | Calculated Shear Rate | 0.31 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 1.85 | mm |
| | Shear stress | 3897.90 | KPa |
| | Vertical Movement at peak shear stress* | -1.22 | mm |
| Residual values | Shear stress | N/A | KPa |

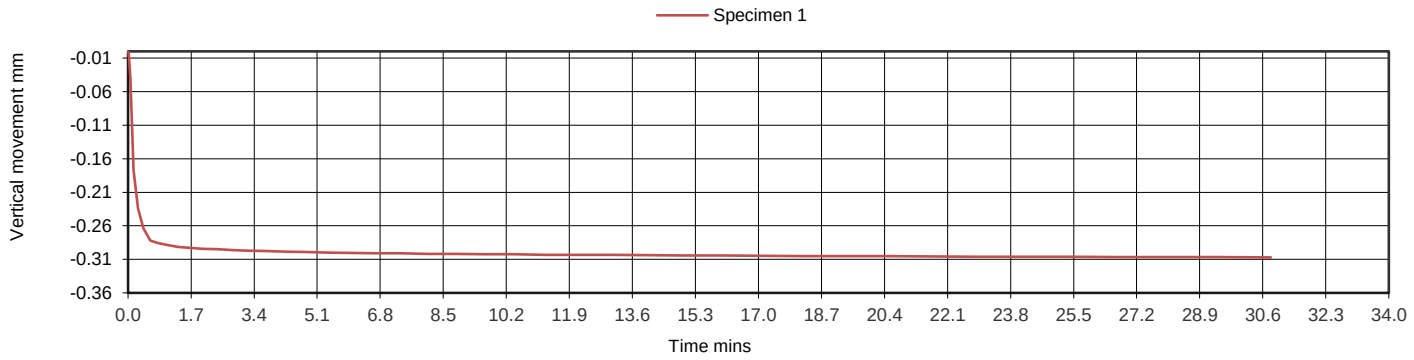



Remarks : Specimen 1 - Unable to measure Residual shear strength

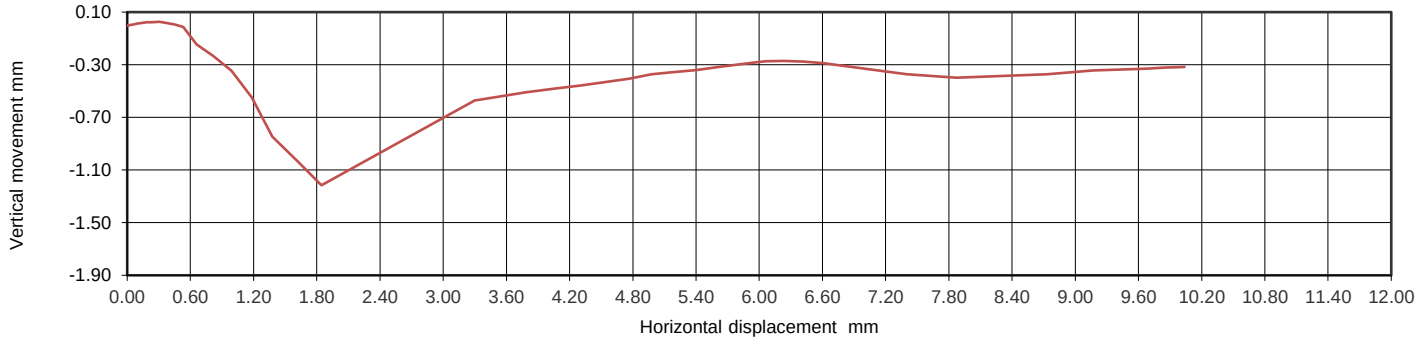
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 11/05/2023 11:31 | S Ocio |

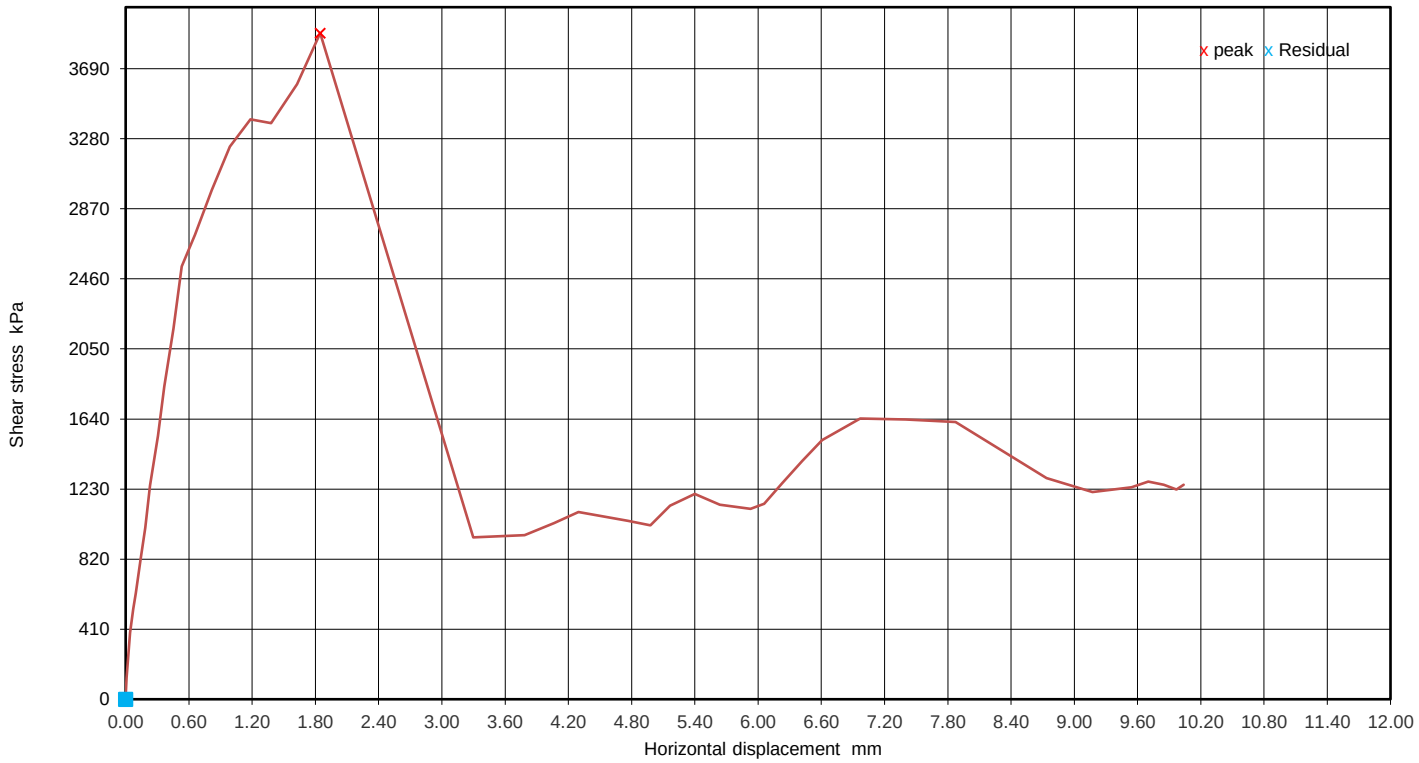
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 14.1 |
| Specimen Reference | IS | Specimen Depth | 14.1 | m | Sample Type | IS |
| Specimen Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | KeyLAB ID | BH0120230227160 |

**Consolidation stage(s)**




**Shearing stage(s)**

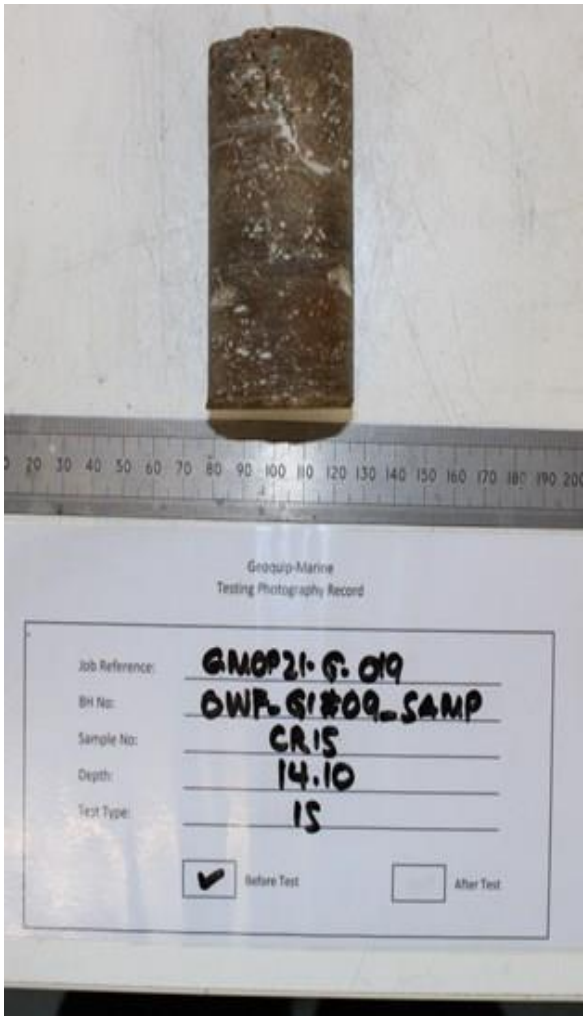


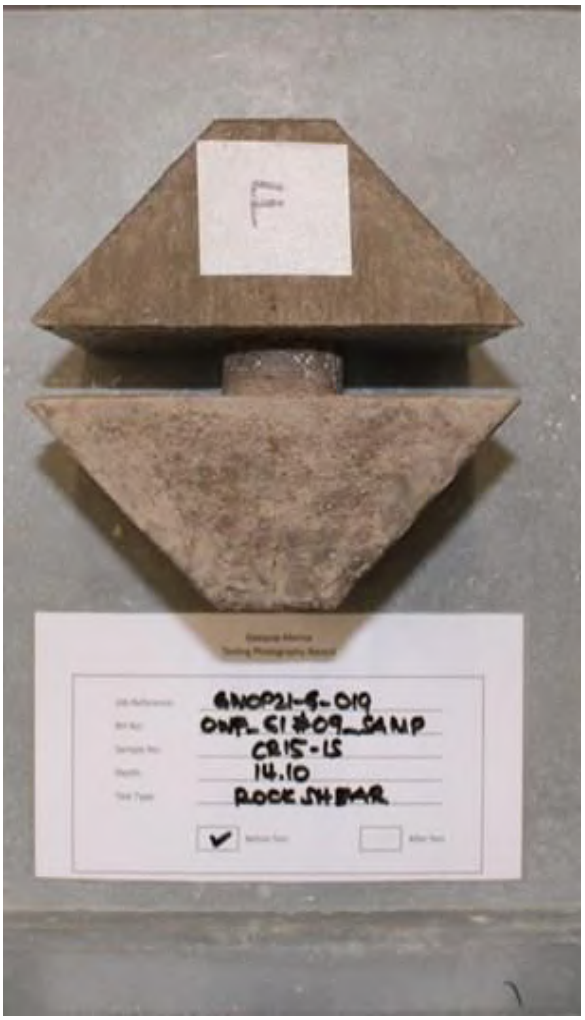




*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 14.1 |
| Specimen Reference | IS | Specimen Depth | 14.1 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227160 |

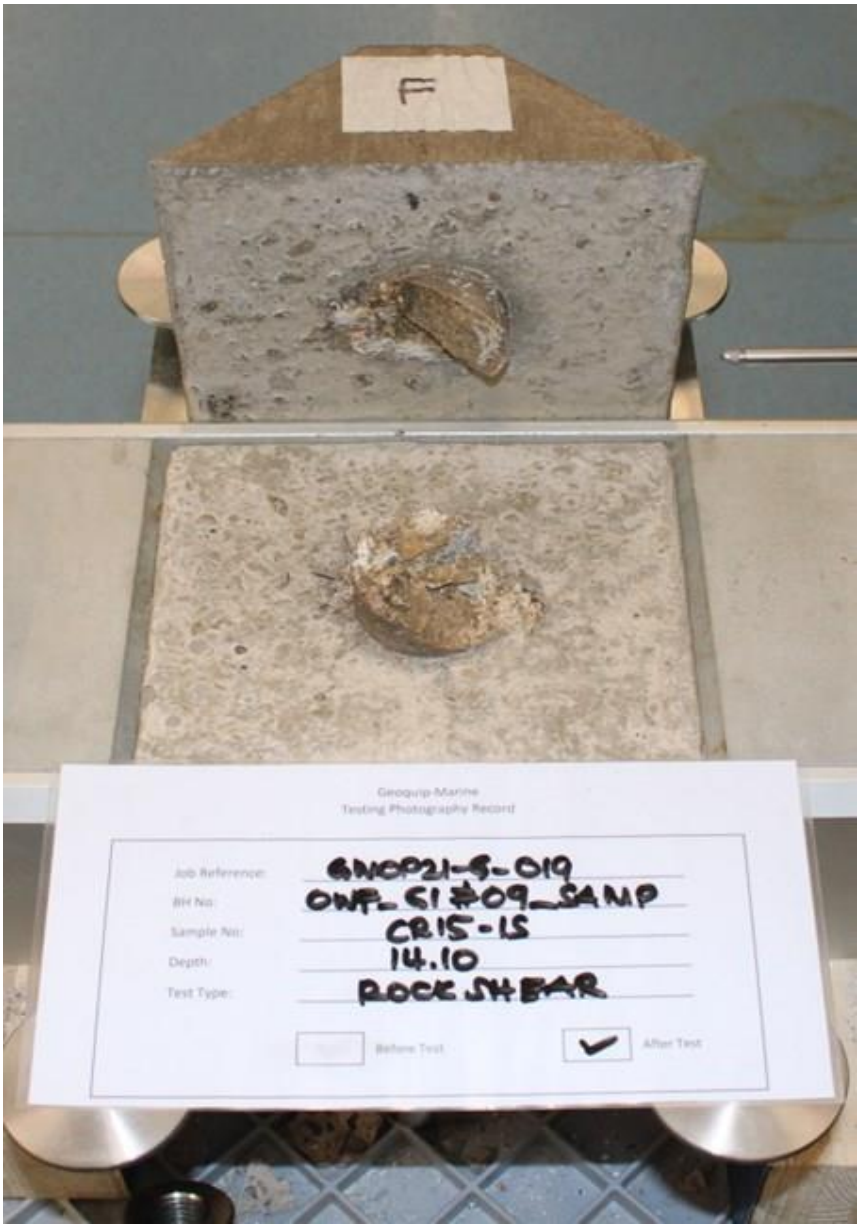
**Sample before test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 14.1 |
| Specimen Reference | IS | Specimen Depth | 14.1 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227160 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#09_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR16 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | Depth m | 15.3 |
| Specimen Reference | IS | Specimen Depth | 15.30 m | Sample Type | IS |
| Specimen Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | KeyLAB ID | BH0120230227163 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 29/03/2023 |

Sample details: Undulating, Rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 86.52 | mm |
| | Average Diameter | 45.79 | mm |
| | Sample Ratio | 1.89 | |
| | Moisture Content | 1.00 | % |
| | Bulk Density | 2.33 | Mg/m³ |
| | Dry density | 2.31 | Mg/m³ |
| | Initial area | 1646.52 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1140.00 | KPa |
| | Change in height during consolidation* | -0.09 | mm |

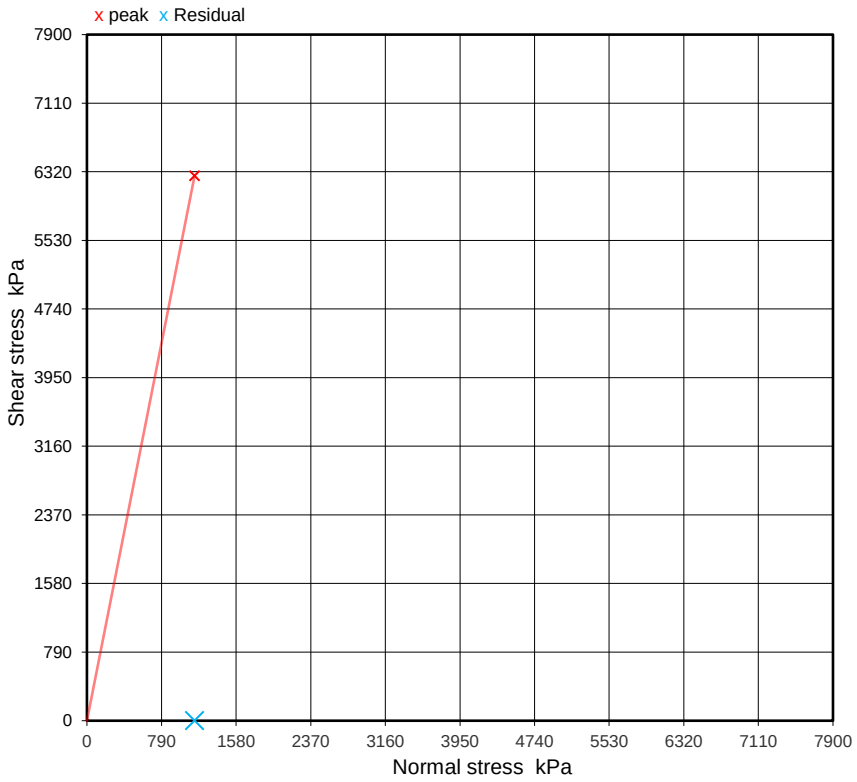
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 120.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.34 | mm |
| | Calculated Shear Rate | 0.32 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 4.49 | mm |
| | Shear stress | 6273.46 | KPa |
| | Vertical Movement at peak shear stress* | -3.03 | mm |
| Residual values | Shear stress | N/A | KPa |

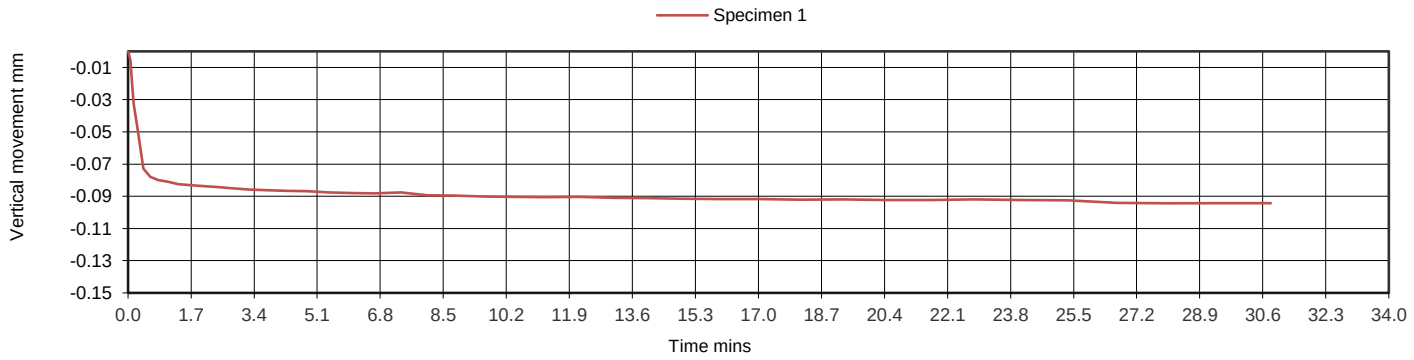



Remarks : Specimen 1 - Unable to measure residual shear strength

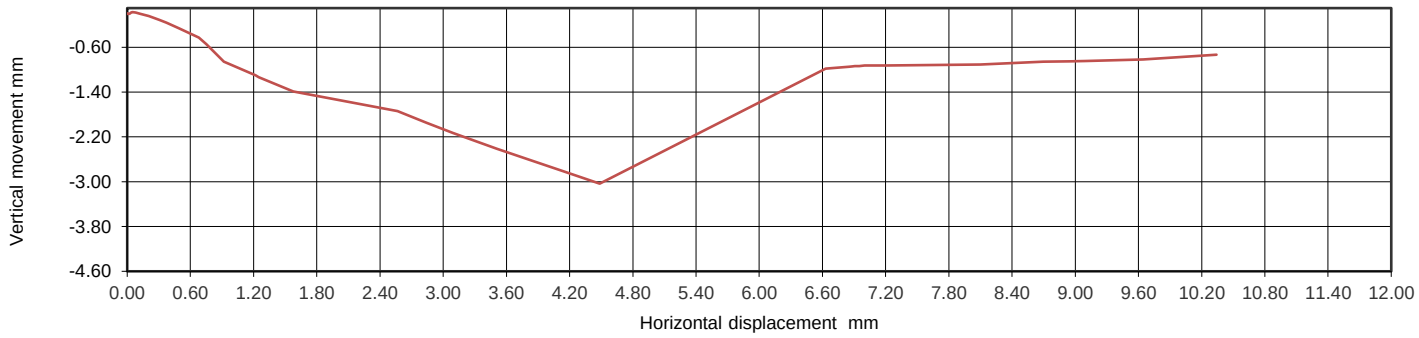
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 11/05/2023 11:23 | S Ocio |

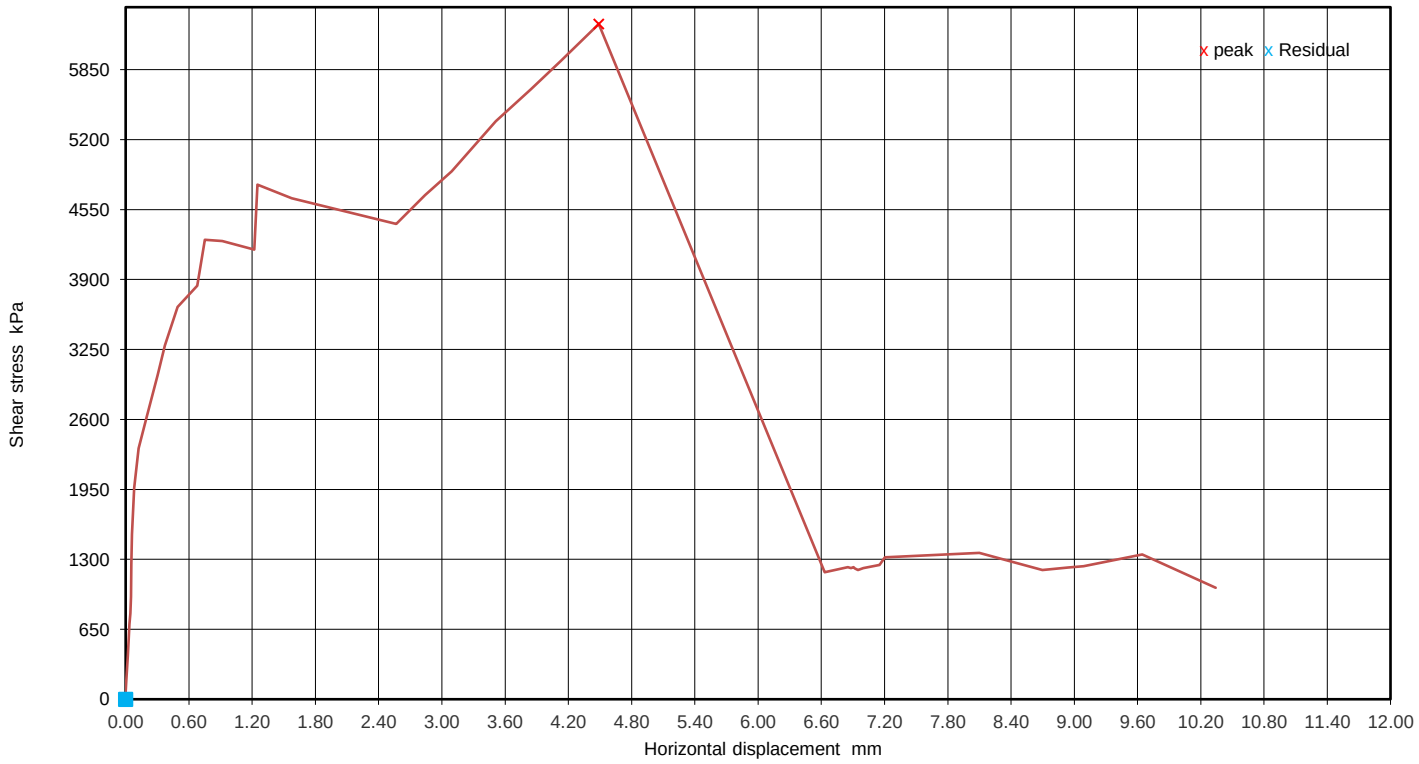
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 15.3 |
| Specimen Reference | IS | Specimen Depth | 15.3 | m | Sample Type | IS |
| Specimen Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | KeyLAB ID | BH0120230227163 |

**Consolidation stage(s)**




**Shearing stage(s)**



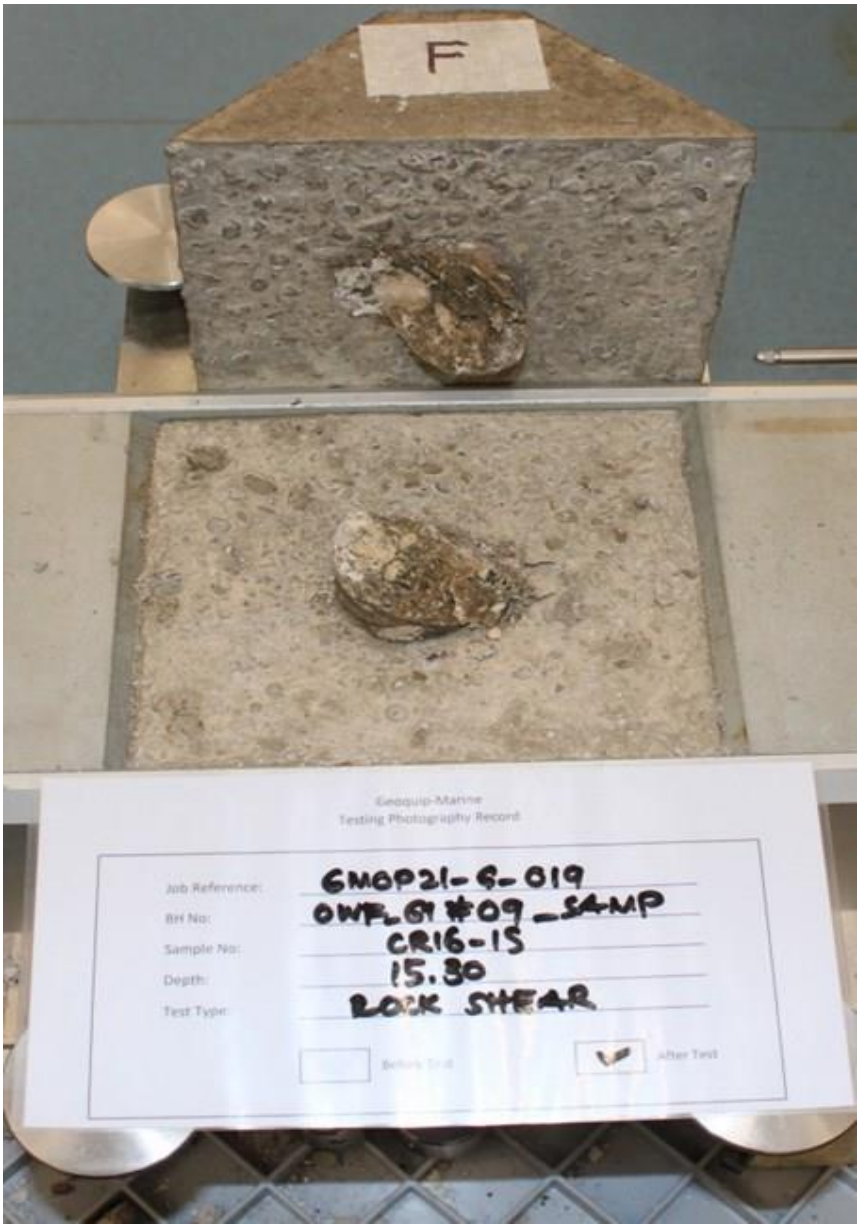

*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 15.3 |
| Specimen Reference | IS | Specimen Depth | 15.3 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227163 |

**Sample before test**


| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Soil Description | (Weak)Brown (10YR 4/3) LIMESTONE | | | | Depth m | 15.3 |
| Specimen Reference | IS | Specimen Depth | 15.3 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227163 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#11_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR06 |
| Soil Description | (Weak) Light brownish grey (10YR 6/2) LIMESTONE | | | Depth m | 6.5 |
| Specimen Reference | IS | Specimen Depth | 6.50 m | Sample Type | IS |
| Specimen Description | (Weak) Light brownish grey (10YR 6/2) LIMESTONE | | | KeyLAB ID | BH0120230227183 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 04/04/2023 |

Sample details: Undulating, Rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 90.22 | mm |
| | Average Diameter | 45.24 | mm |
| | Sample Ratio | 1.99 | |
| | Moisture Content | 1.49 | % |
| | Bulk Density | 2.46 | Mg/m³ |
| | Dry density | 2.42 | Mg/m³ |
| | Initial area | 1607.56 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1025.00 | KPa |
| | Change in height during consolidation* | -0.06 | mm |

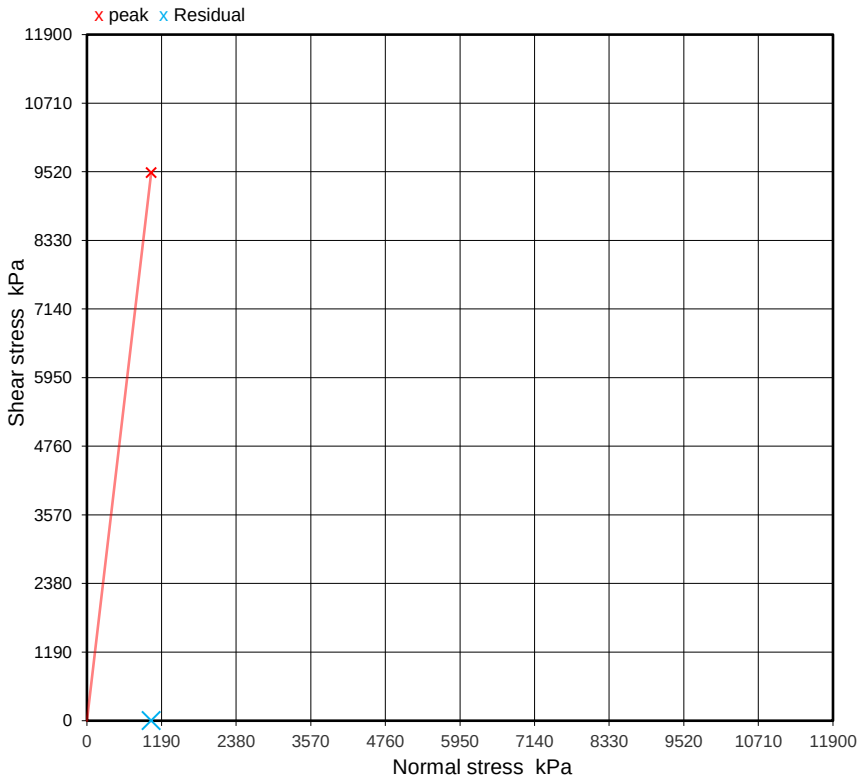
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 192.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.13 | mm |
| | Calculated Shear Rate | 0.33 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 6.33 | mm |
| | Shear stress | 9505.72 | KPa |
| | Vertical Movement at peak shear stress* | -4.24 | mm |
| Residual values | Shear stress | N/A | KPa |

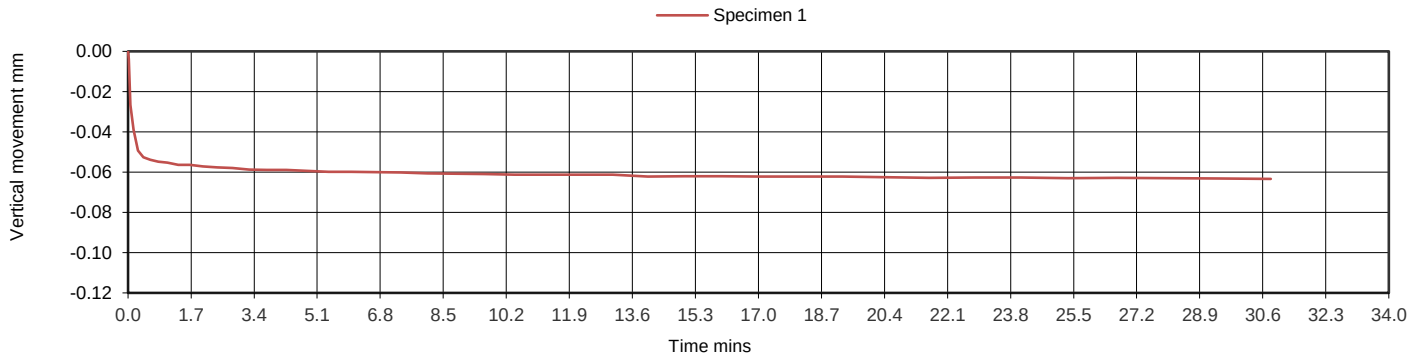



Remarks : Specimen 1 - Unable to measure residual shear stress

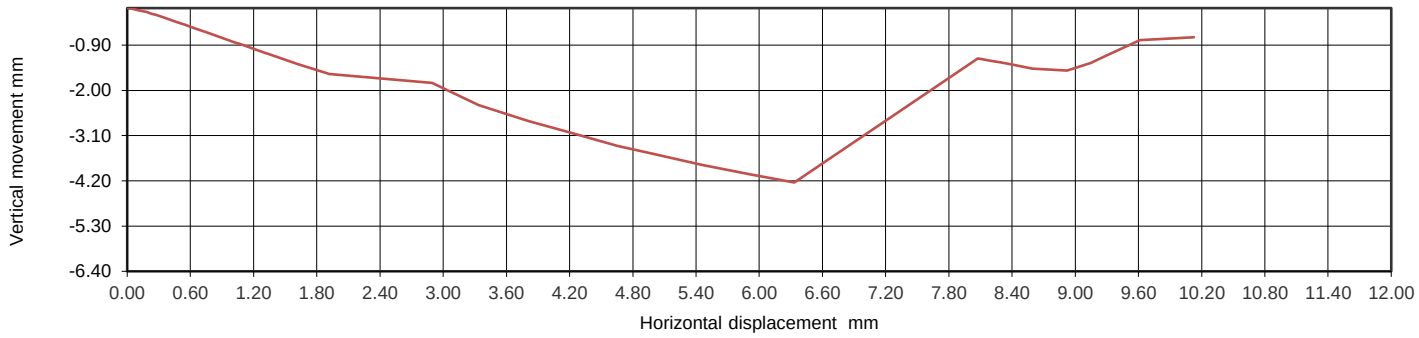
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 12/05/2023 15:22 | S Ocio |

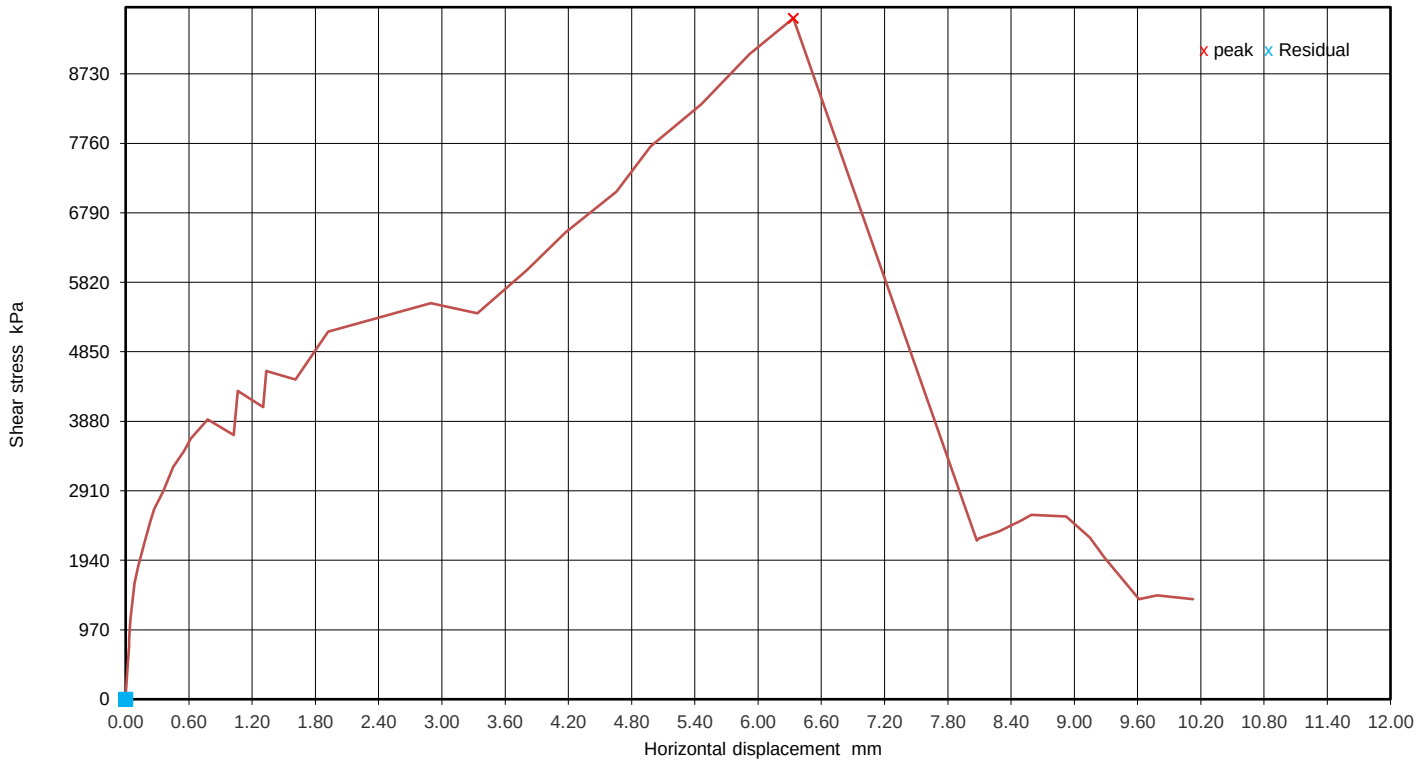
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Light brownish grey (10YR 6/2) LIMESTONE | | | | Depth m | 6.5 |
| Specimen Reference | IS | Specimen Depth | 6.5 | m | Sample Type | IS |
| Specimen Description | (Weak) Light brownish grey (10YR 6/2) LIMESTONE | | | | KeyLAB ID | BH0120230227183 |

**Consolidation stage(s)**




**Shearing stage(s)**



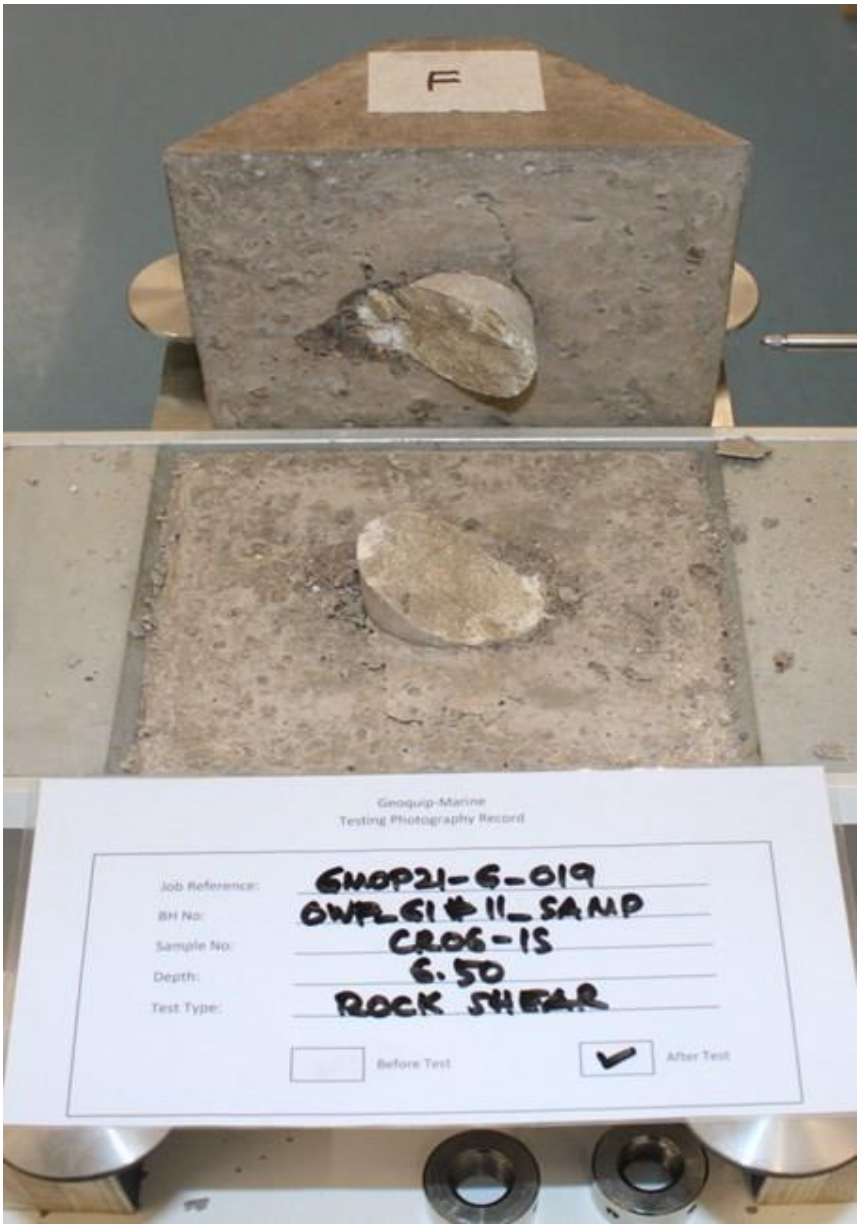

*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Light brownish grey (10YR 6/2) LIMESTONE | | | | Depth m | 6.5 |
| Specimen Reference | IS | Specimen Depth | 6.5 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227183 |

**Sample before test**


| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Light brownish grey (10YR 6/2) LIMESTONE | | | | Depth m | 6.5 |
| Specimen Reference | IS | Specimen Depth | 6.5 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227183 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#11_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR16 |
| Soil Description | (Very Weak) Greenish grey (5GY 5/1) CLAYSTONE | | | Depth m | 17.95 |
| Specimen Reference | IS | Specimen Depth | 17.95 m | Sample Type | IS |
| Specimen Description | (Very Weak) Greenish grey (5GY 5/1) CLAYSTONE | | | KeyLAB ID | BH0120230227208 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 06/03/2023 |

Sample details: Undulating, Rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 89.49 | mm |
| | Average Diameter | 77.87 | mm |
| | Sample Ratio | 1.15 | |
| | Moisture Content | 7.77 | % |
| | Bulk Density | 2.40 | Mg/m³ |
| | Dry density | 2.23 | Mg/m³ |
| | Initial area | 4761.84 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1255.00 | KPa |
| | Change in height during consolidation* | -0.21 | mm |

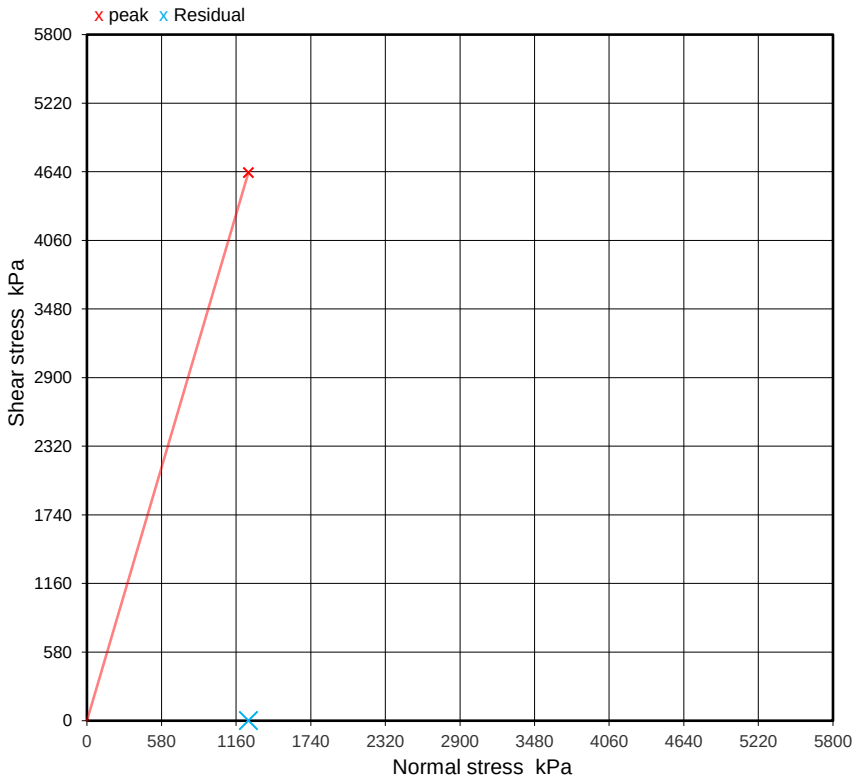
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 696.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.03 | mm |
| | Calculated Shear Rate | 0.28 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 2.11 | mm |
| | Shear stress | 4631.86 | KPa |
| | Vertical Movement at peak shear stress* | -1.68 | mm |
| Residual values | Shear stress | N/A | KPa |

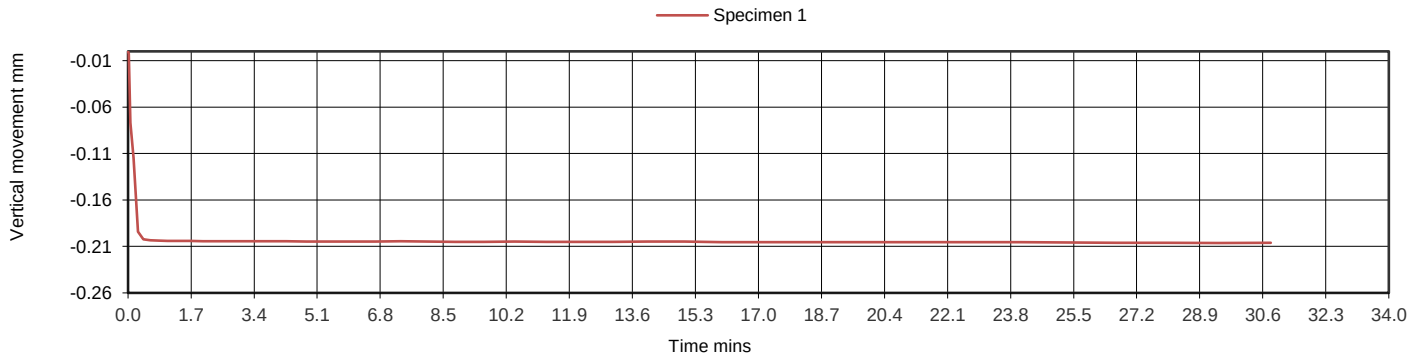



Remarks : Specimen 1 - Unable to measure residual shear stress

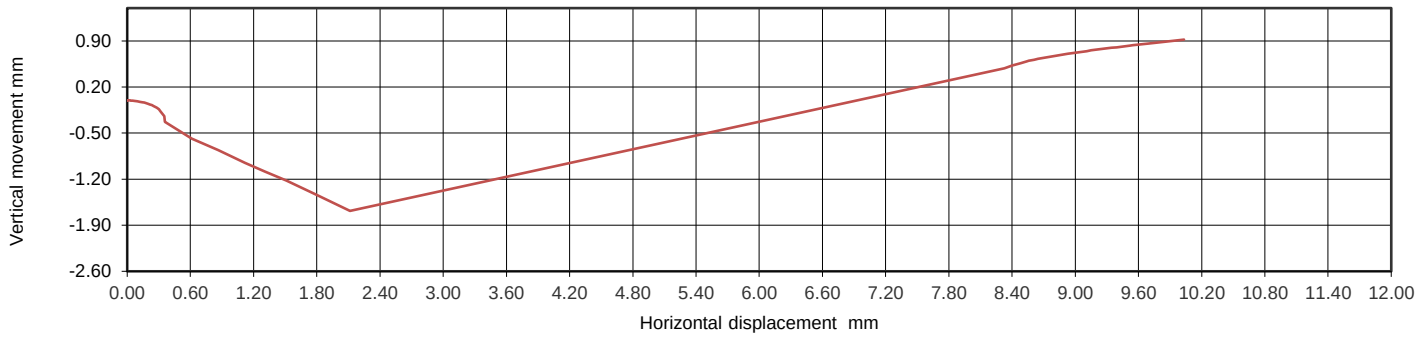
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 12/05/2023 15:23 | S Ocio |

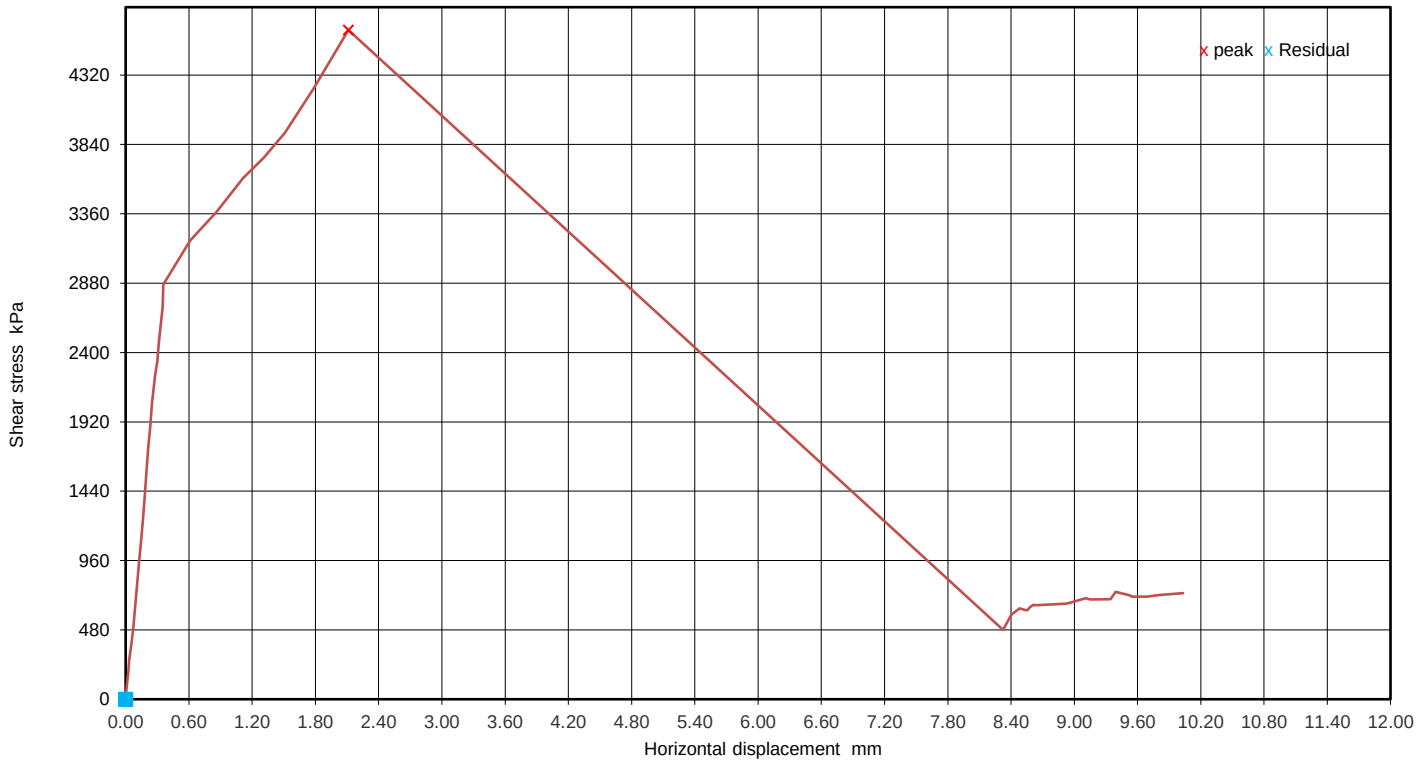
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Soil Description | (Very Weak) Greenish grey (5GY 5/1) CLAYSTONE | | | | Depth m | 17.95 |
| Specimen Reference | IS | Specimen Depth | 17.95 | m | Sample Type | IS |
| Specimen Description | (Very Weak) Greenish grey (5GY 5/1) CLAYSTONE | | | | KeyLAB ID | BH0120230227208 |

**Consolidation stage(s)**




**Shearing stage(s)**

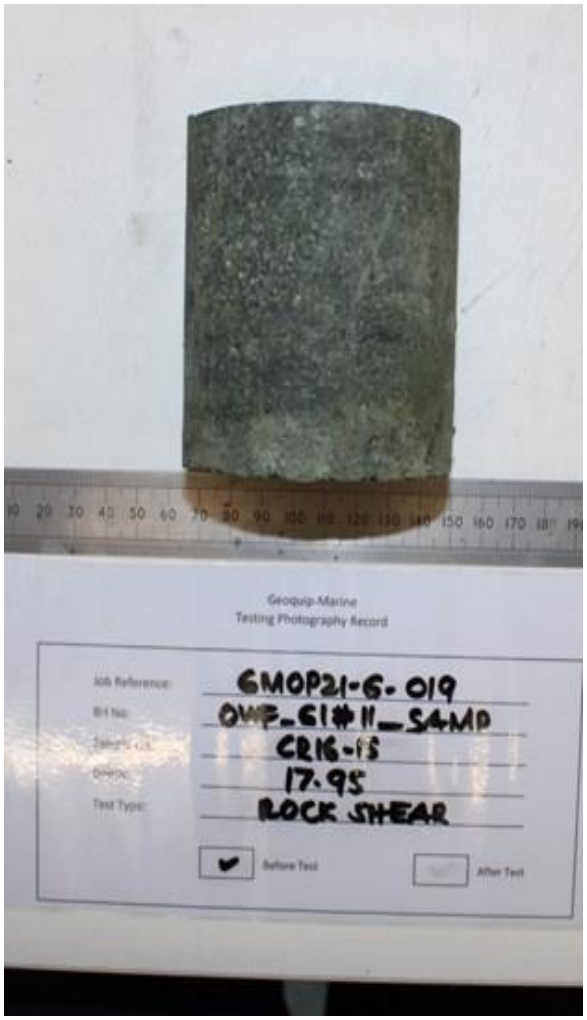



*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

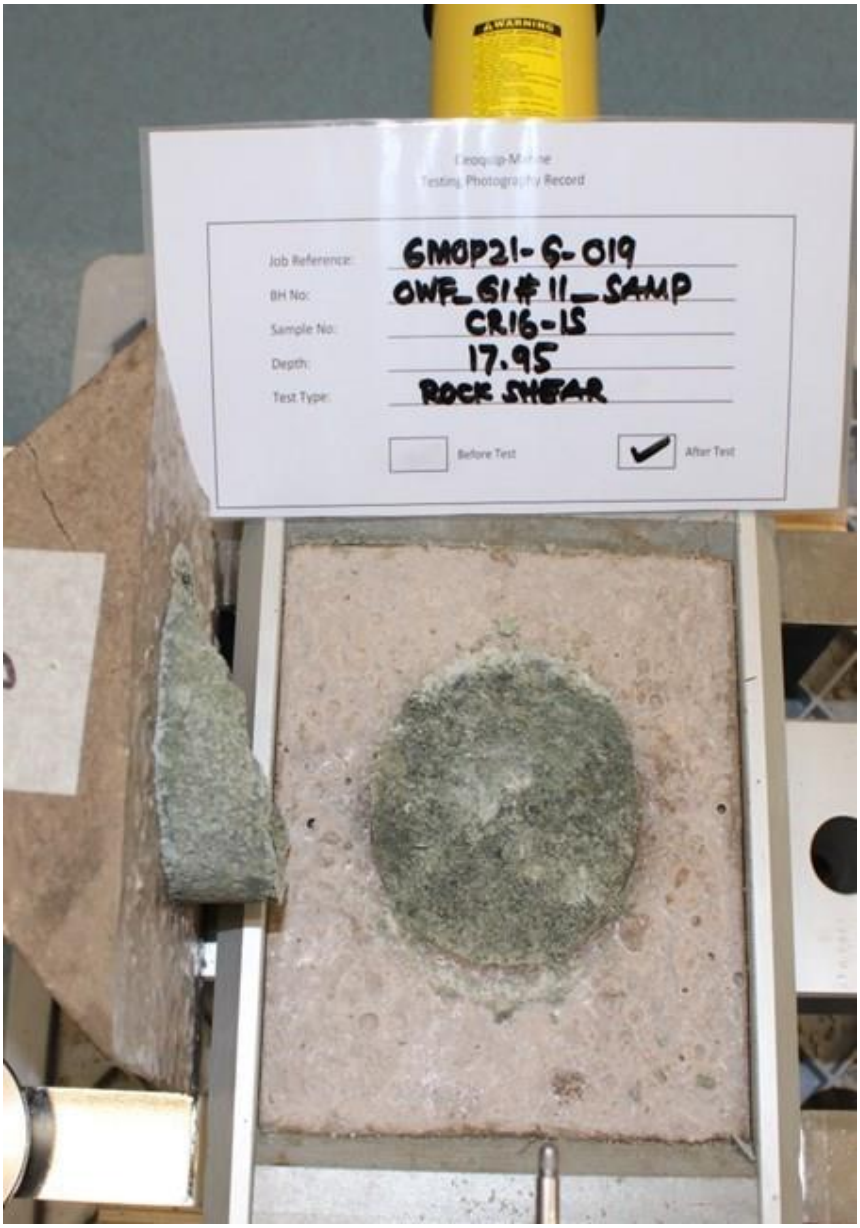
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Soil Description | (Very Weak) Greenish grey (5GY 5/1) CLAYSTONE | | | | Depth m | 17.95 |
| Specimen Reference | IS | Specimen Depth | 17.95 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227208 |

**Sample before test**




| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **ISRM 2007 SM Determining Shear Strength - 1974** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Soil Description | (Very Weak) Greenish grey (5GY 5/1) CLAYSTONE | | | | Depth m | 17.95 |
| Specimen Reference | IS | Specimen Depth | 17.95 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227208 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#12_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR02 |
| Soil Description | Greyish orange (10y 7/4) SANDSTONE | | | Depth m | 4.6 |
| Specimen Reference | Q1 | Specimen Depth | 4.60 m | Sample Type | Q1 |
| Specimen Description | Greyish orange (10Y 7/4) SANDSTONE. | | | KeyLAB ID | BH0120230227229 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 13/04/2023 |

Sample details: Undulating, rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 90.16 | mm |
| | Average Diameter | 45.55 | mm |
| | Sample Ratio | 1.98 | |
| | Moisture Content | 12.00 | % |
| | Bulk Density | 2.18 | Mg/m³ |
| | Dry density | 1.95 | Mg/m³ |
| | Initial area | 1629.55 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 980.00 | KPa |
| | Change in height during consolidation* | -0.07 | mm |

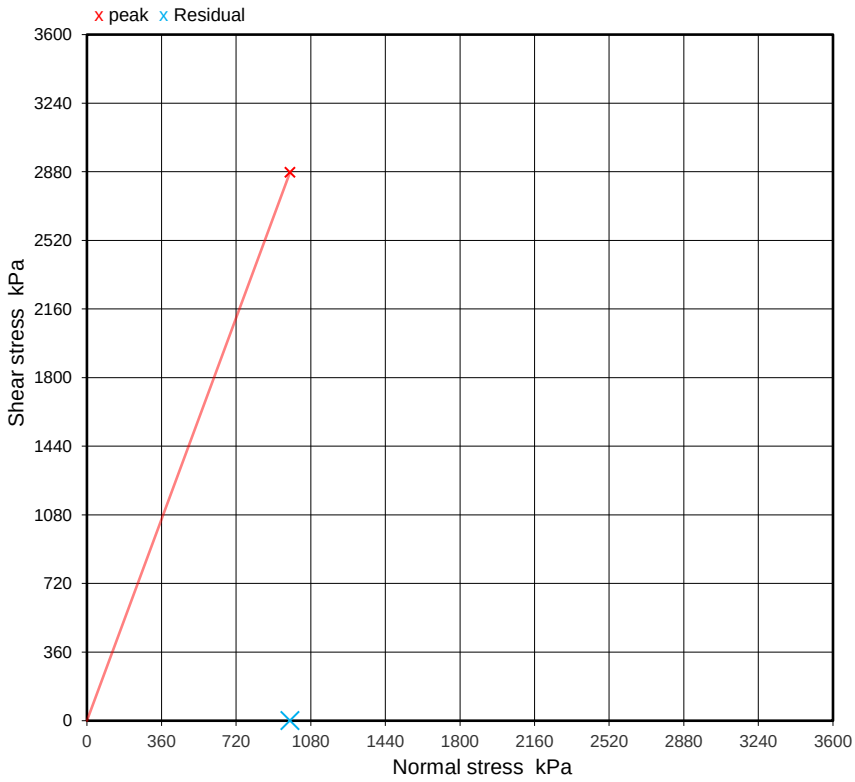
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 168.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 6.84 | mm |
| | Calculated Shear Rate | 0.28 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 6.47 | mm |
| | Shear stress | 2877.28 | KPa |
| | Vertical Movement at peak shear stress* | -1.34 | mm |
| Residual values | Shear stress | N/A | KPa |



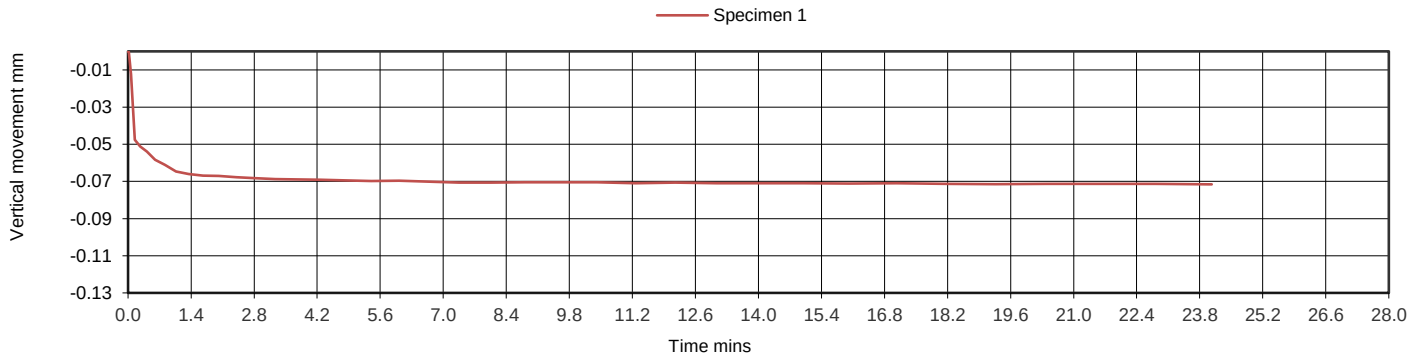

Remarks :

Specimen 1 - Unable to measure residual strength. Shear stress curve is non-typical and should be used with caution.

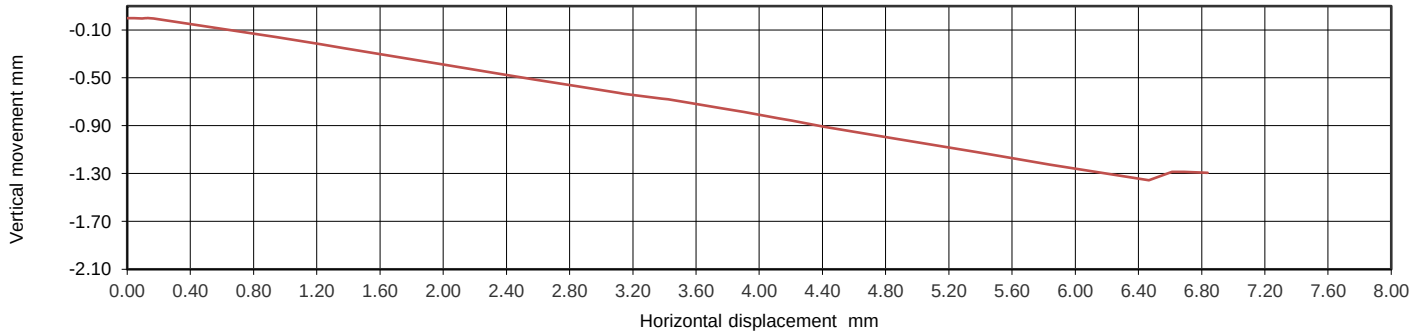
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 15/05/2023 16:59 | O Atitebi |

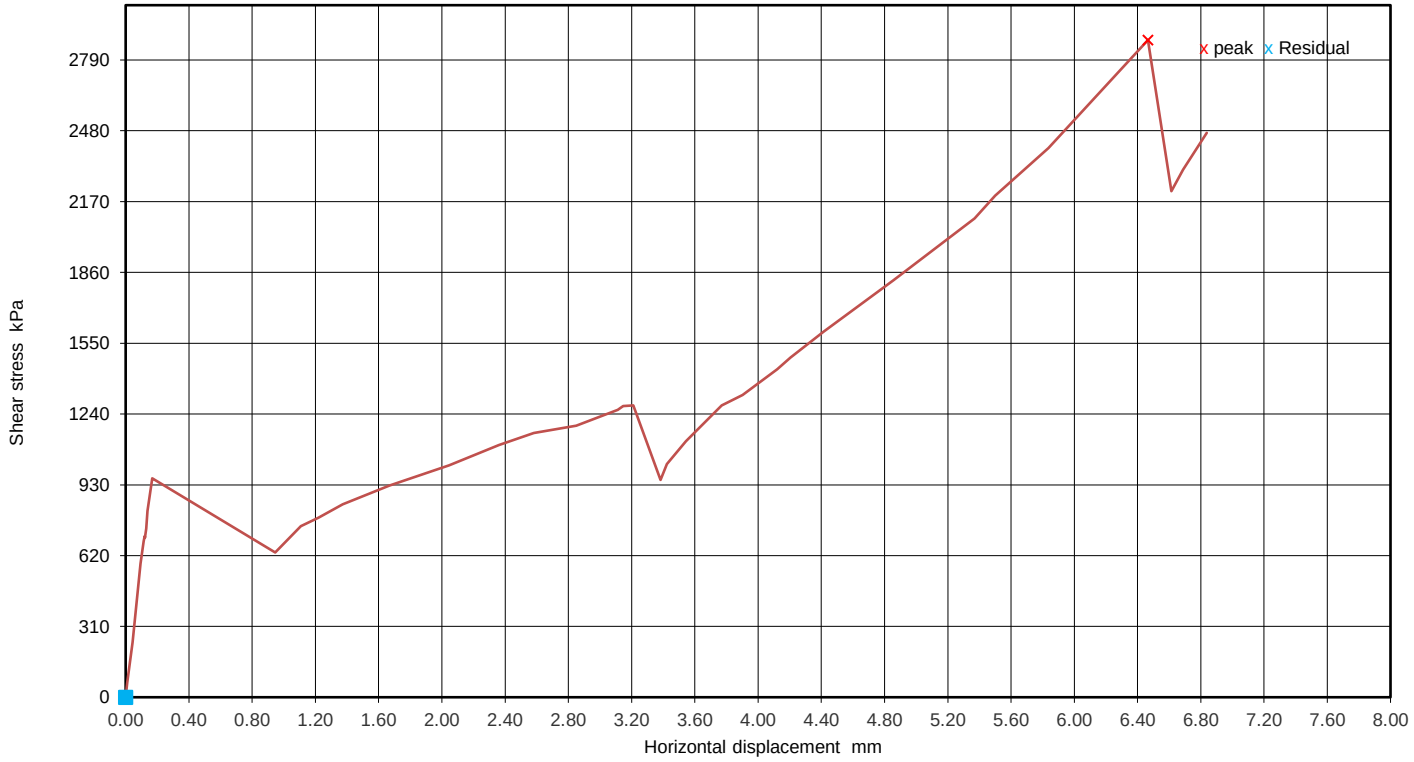
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Soil Description | Greyish orange (10y 7/4) SANDSTONE | | | | Depth m | 4.6 |
| Specimen Reference | Q1 | Specimen Depth | 4.6 | m | Sample Type | Q1 |
| Specimen Description | Greyish orange (10Y 7/4) SANDSTONE. | | | | KeyLAB ID | BH0120230227229 |

**Consolidation stage(s)**




**Shearing stage(s)**




*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **ISRM 2007 SM Determining Shear Strength - 1974** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Soil Description | Greyish orange (10y 7/4) SANDSTONE | | | | Depth m | 4.6 |
| Specimen Reference | Q1 | Specimen Depth | 4.6 | m | Sample Type | Q1 |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227229 |

**Sample before test**


| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Soil Description | Greyish orange (10y 7/4) SANDSTONE | | | | Depth m | 4.6 |
| Specimen Reference | Q1 | Specimen Depth | 4.6 | m | Sample Type | Q1 |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227229 |

**Sample after test**

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#12_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR06 |
| Soil Description | Strong brown (10YR 5/3) LIMESTONE | | | Depth m | 8.3 |
| Specimen Reference | IS | Specimen Depth | 8.30 m | Sample Type | IS |
| Specimen Description | Strong brown (10YR 5/3) LIMESTONE | | | KeyLAB ID | BH0120230227234 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 17/04/2023 |

Sample details: Undulating, rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 87.86 | mm |
| | Average Diameter | 45.44 | mm |
| | Sample Ratio | 1.93 | |
| | Moisture Content | 0.82 | % |
| | Bulk Density | 2.70 | Mg/m³ |
| | Dry density | 2.68 | Mg/m³ |
| | Initial area | 1621.80 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1090.00 | KPa |
| | Change in height during consolidation* | -0.20 | mm |

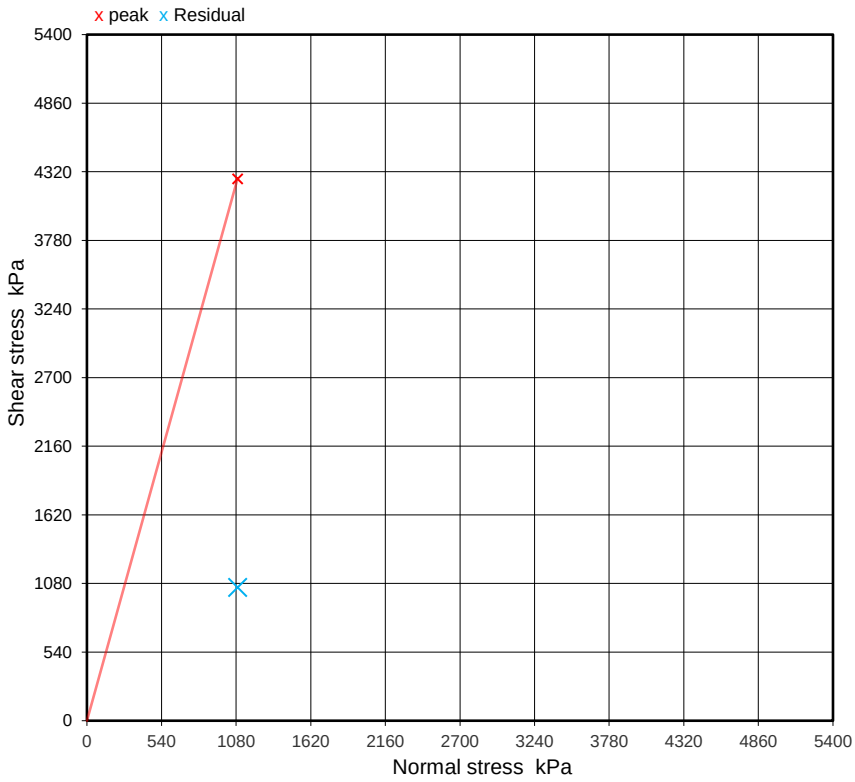
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 168.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.24 | mm |
| | Calculated Shear Rate | 0.35 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 1.19 | mm |
| | Shear stress | 4264.80 | KPa |
| | Vertical Movement at peak shear stress* | -0.69 | mm |
| Residual values | Shear stress | 1047.49 | KPa |

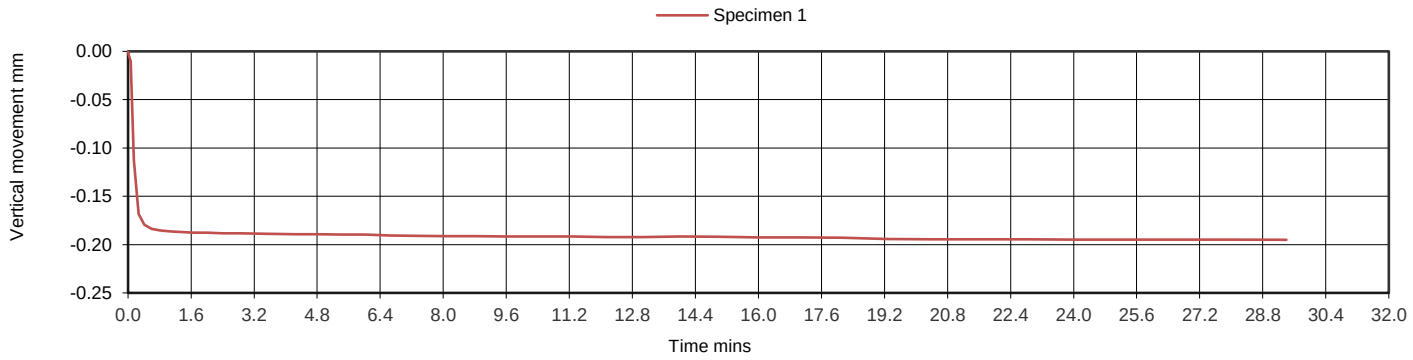



Remarks :

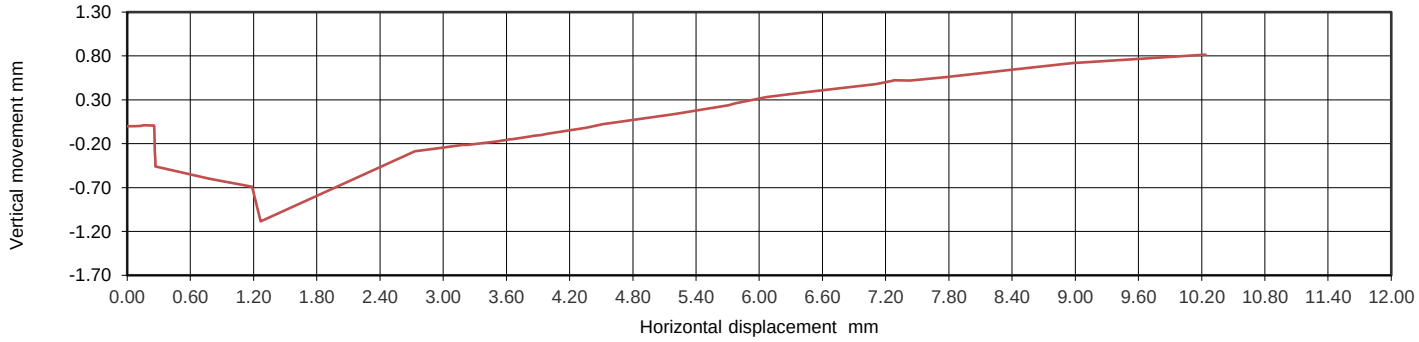
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 15/05/2023 16:59 | O Atitebi |

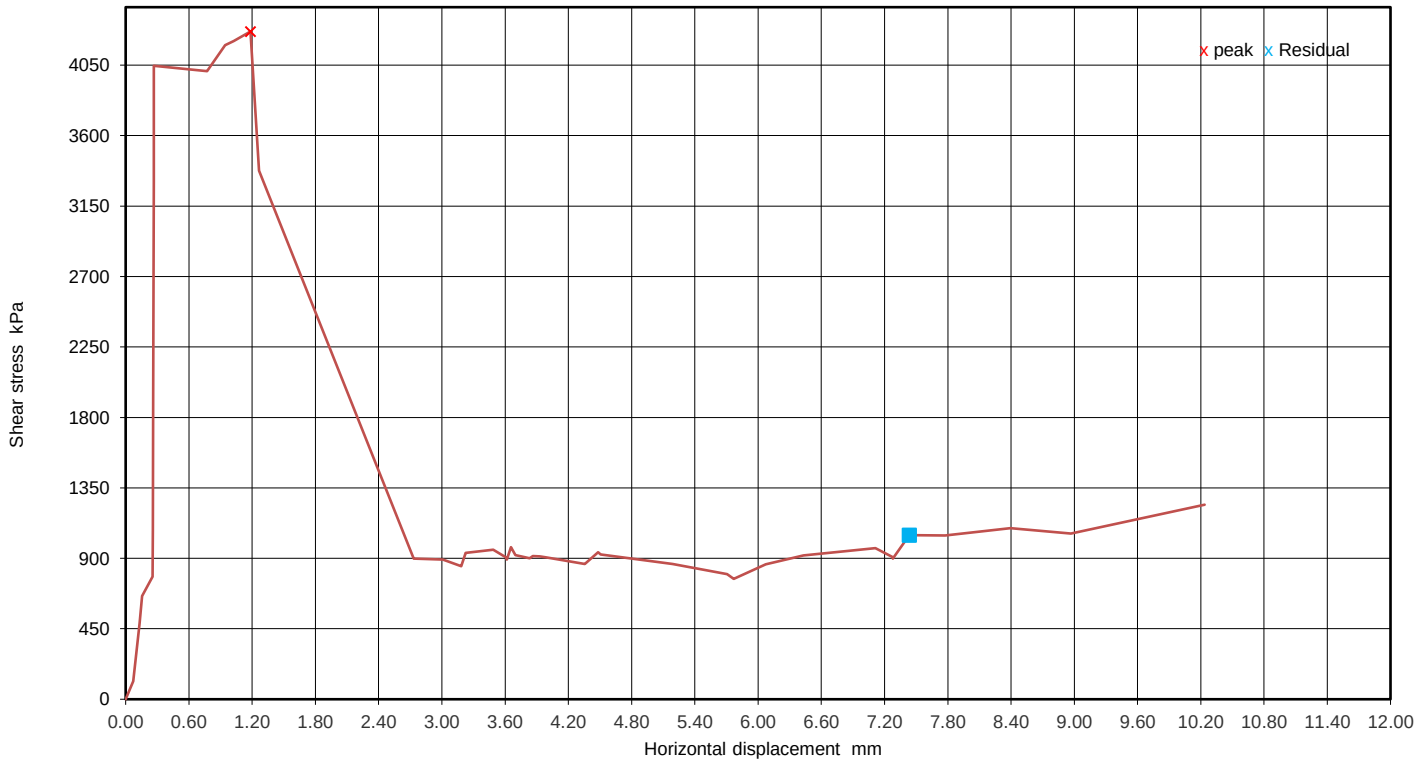
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 8.3 |
| Specimen Reference | IS | Specimen Depth | 8.3 | m | Sample Type | IS |
| Specimen Description | Strong brown (10YR 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227234 |

**Consolidation stage(s)**




**Shearing stage(s)**



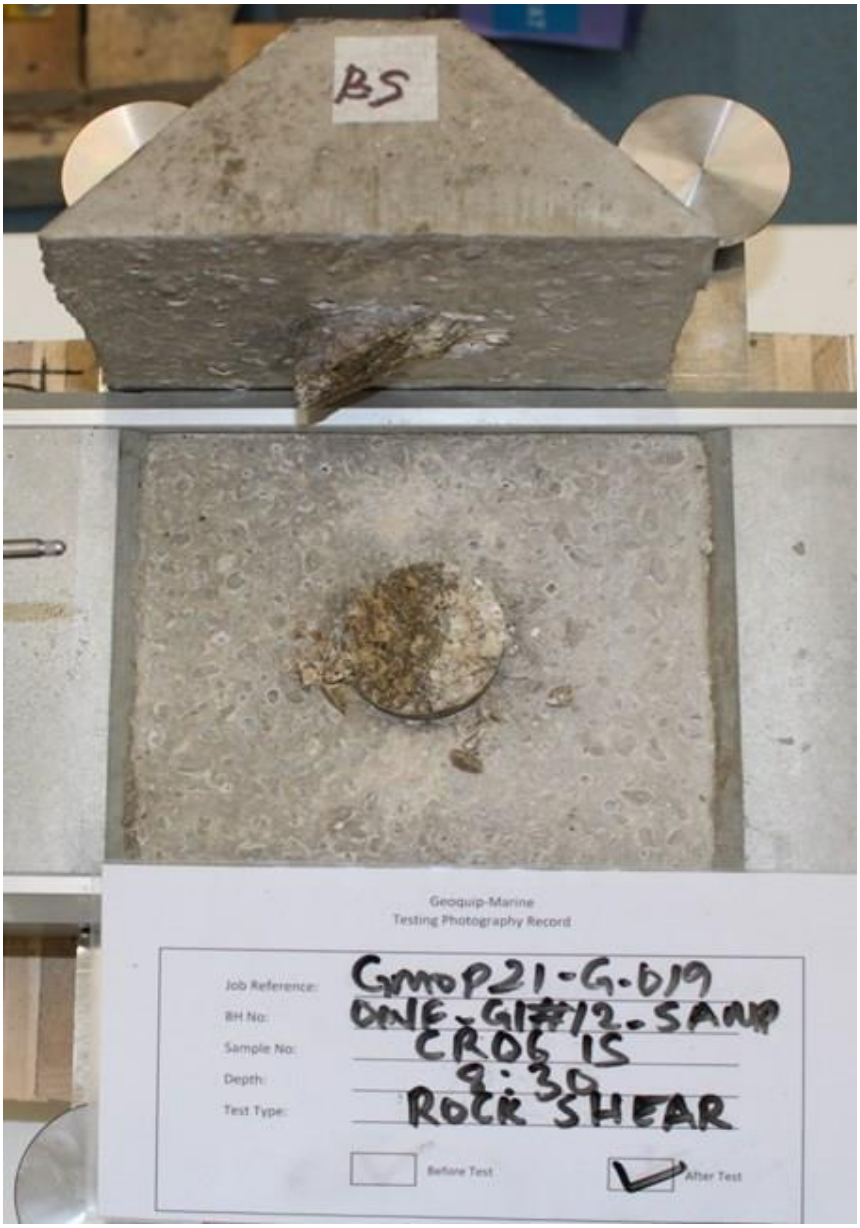

*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **ISRM 2007 SM Determining Shear Strength - 1974** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 8.3 |
| Specimen Reference | IS | Specimen Depth | 8.3 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227234 |

**Sample before test**


| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 8.3 |
| Specimen Reference | IS | Specimen Depth | 8.3 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227234 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#12_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR08 |
| Soil Description | (Strong) moderate brown (5yR 4/4) LIMESTONE | | | Depth m | 10.47 |
| Specimen Reference | IS | Specimen Depth | 10.47 m | Sample Type | IS |
| Specimen Description | (Strong) moderate brown (5yR 4/4) LIMESTONE | | | KeyLAB ID | BH0120230227239 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 17/04/2023 |

Sample details: Undulating, rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 87.77 | mm |
| | Average Diameter | 45.50 | mm |
| | Sample Ratio | 1.93 | |
| | Moisture Content | 1.32 | % |
| | Bulk Density | 2.70 | Mg/m³ |
| | Dry density | 2.66 | Mg/m³ |
| | Initial area | 1625.97 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1155.00 | KPa |
| | Change in height during consolidation* | -0.19 | mm |

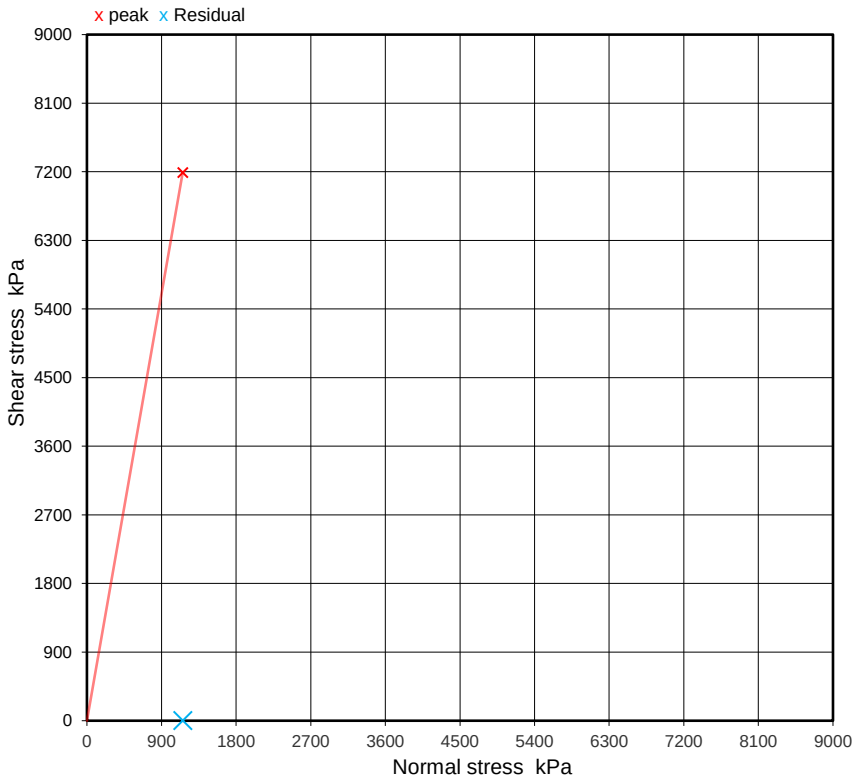
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 168.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.20 | mm |
| | Calculated Shear Rate | 0.35 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 3.66 | mm |
| | Shear stress | 7188.69 | KPa |
| | Vertical Movement at peak shear stress* | -2.36 | mm |
| Residual values | Shear stress | N/A | KPa |



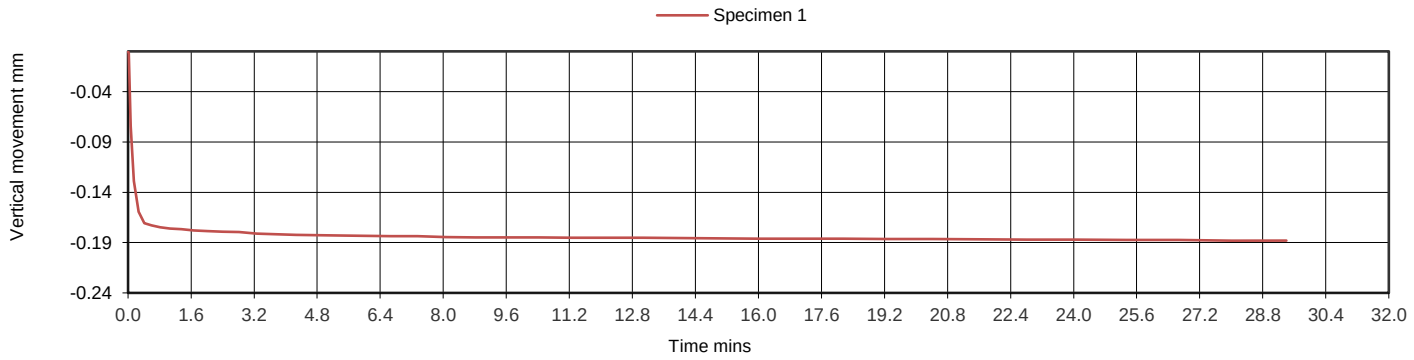

Remarks :

Specimen 1 - Encapsulting material weaker than sample, treat data with caution. Unable to measure residual shear strength

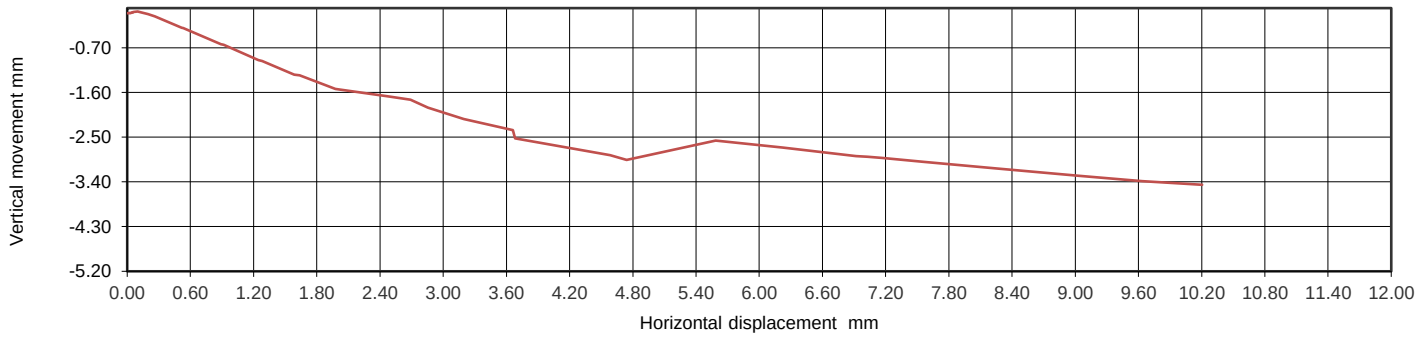
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 15/05/2023 16:59 | O Atitebi |

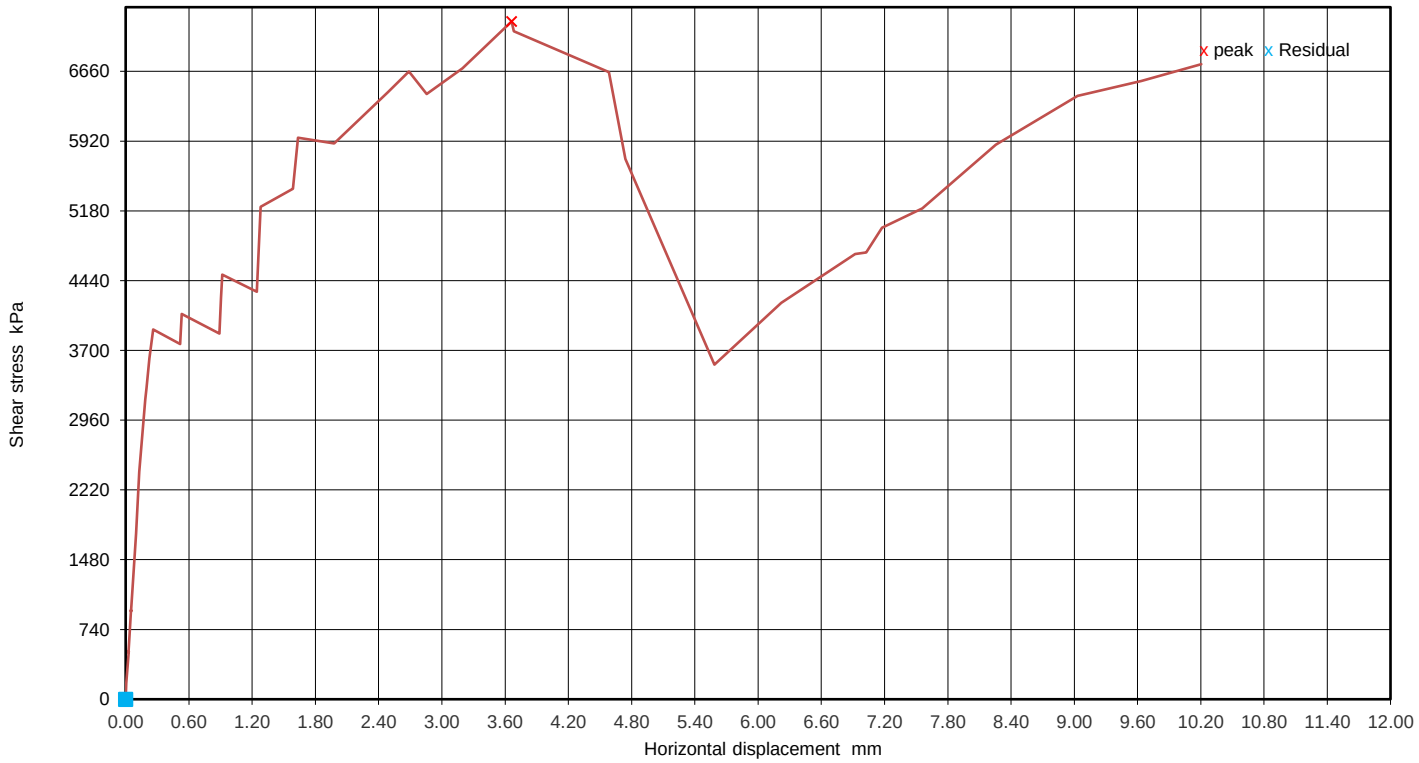
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR08 |
| Soil Description | (Strong) moderate brown (5yR 4/4) LIMESTONE | | | | Depth m | 10.47 |
| Specimen Reference | IS | Specimen Depth | 10.47 | m | Sample Type | IS |
| Specimen Description | (Strong) moderate brown (5yR 4/4) LIMESTONE | | | | KeyLAB ID | BH0120230227239 |

**Consolidation stage(s)**




**Shearing stage(s)**



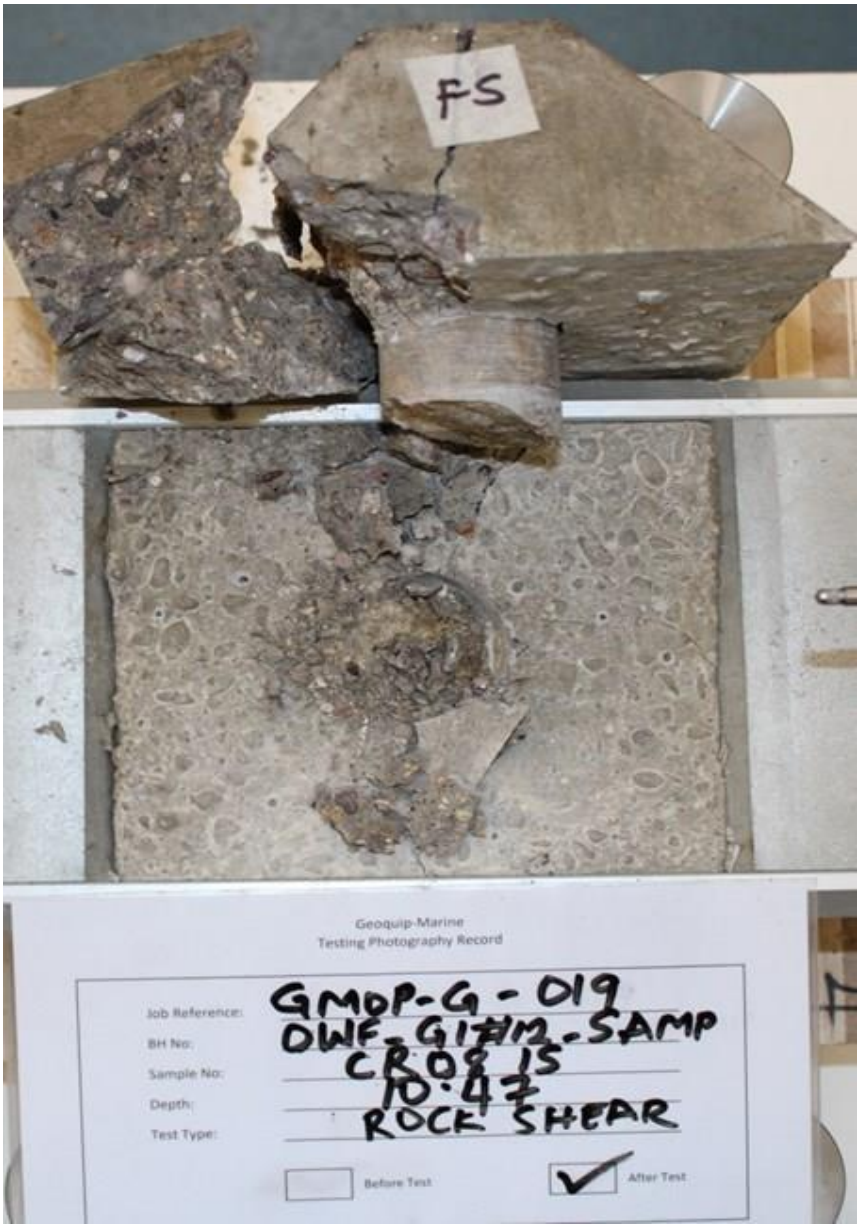

*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR08 |
| Soil Description | (Strong) moderate brown (5yR 4/4) LIMESTONE | | | | Depth m | 10.47 |
| Specimen Reference | IS | Specimen Depth | 10.47 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227239 |

**Sample before test**


| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR08 |
| Soil Description | (Strong) moderate brown (5yR 4/4) LIMESTONE | | | | Depth m | 10.47 |
| Specimen Reference | IS | Specimen Depth | 10.47 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227239 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#14A_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR03 |
| Soil Description | (Very weak) Greenish grey (5GY 5/1) MUDSTONE | | | Depth m | 3.3 |
| Specimen Reference | IS | Specimen Depth | 3.30 m | Sample Type | IS |
| Specimen Description | (Very weak) Greenish grey (5GY 5/1) MUDSTONE | | | KeyLAB ID | BH0120230227283 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 31/03/2023 |

Sample details: Undulating, Rough

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 90.57 | mm |
| | Average Diameter | 76.73 | mm |
| | Sample Ratio | 1.18 | |
| | Moisture Content | 12.40 | % |
| | Bulk Density | 2.42 | Mg/m³ |
| | Dry density | 2.15 | Mg/m³ |
| | Initial area | 4624.23 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 945.00 | KPa |
| | Change in height during consolidation* | -0.65 | mm |

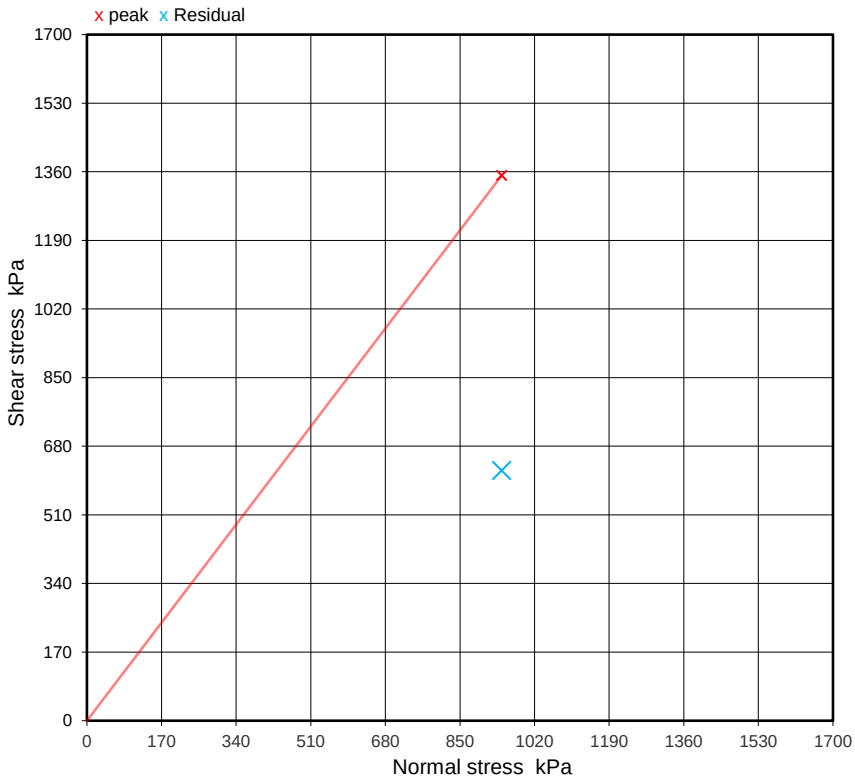
Plane of Weakness: none

Encapsulating Material: C40 Cement

Curing Time (hrs): 144.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.11 | mm |
| | Calculated Shear Rate | 0.27 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 1.95 | mm |
| | Shear stress | 1350.87 | KPa |
| | Vertical Movement at peak shear stress* | -0.28 | mm |
| Residual values | Shear stress | 619.85 | KPa |

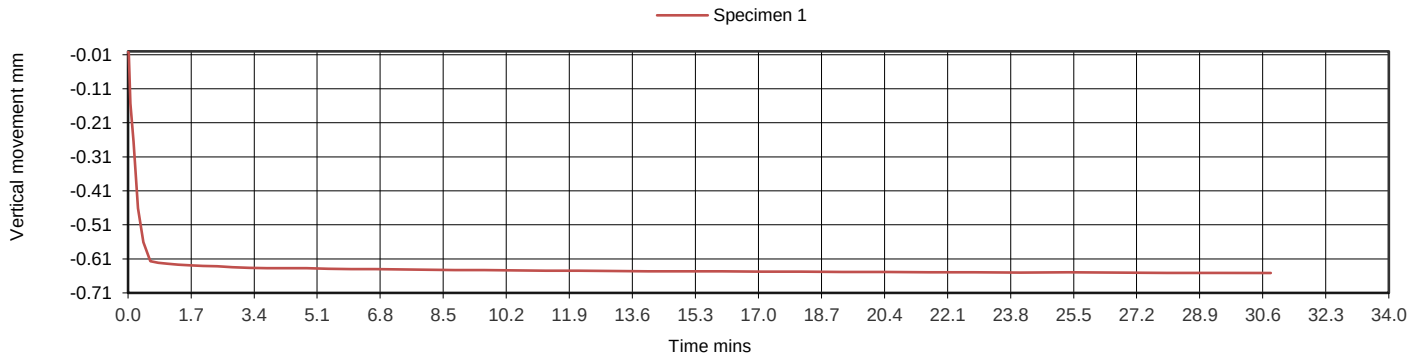



Remarks : Specimen 1 - Sample fractured during preparation-use data with caution

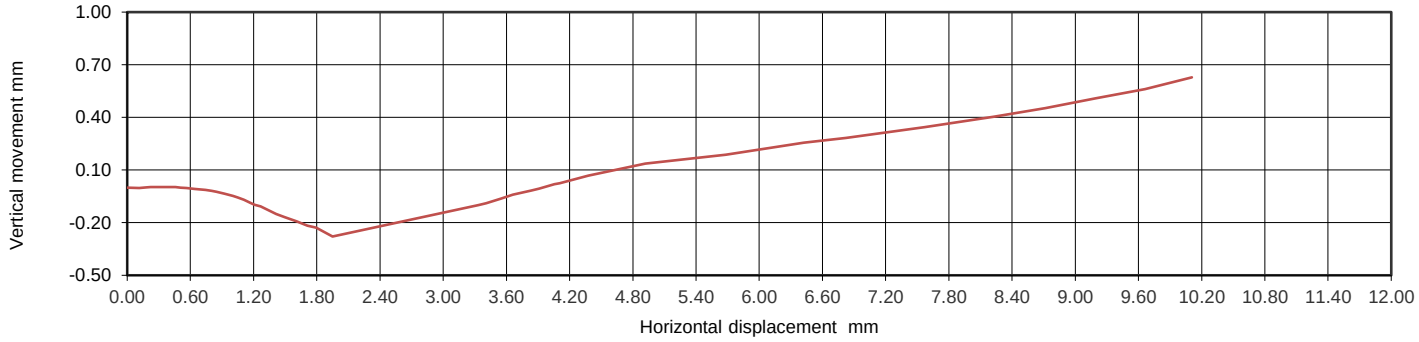
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 12/05/2023 14:47 | S Ocio |

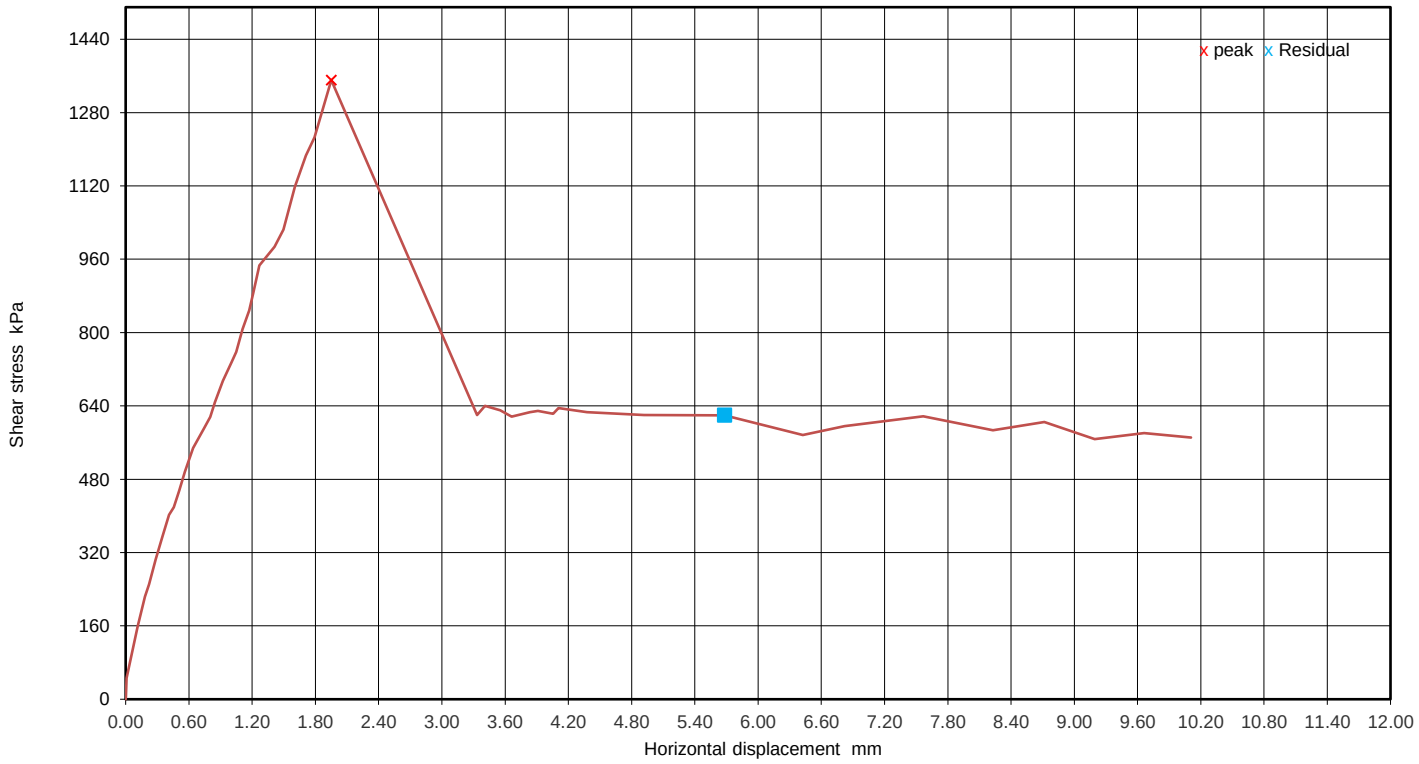
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR03 |
| Soil Description | (Very weak) Greenish grey (5GY 5/1) MUDSTONE | | | | Depth m | 3.3 |
| Specimen Reference | IS | Specimen Depth | 3.3 | m | Sample Type | IS |
| Specimen Description | (Very weak) Greenish grey (5GY 5/1) MUDSTONE | | | | KeyLAB ID | BH0120230227283 |

**Consolidation stage(s)**




**Shearing stage(s)**




*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR03 |
| Soil Description | (Very weak) Greenish grey (5GY 5/1) MUDSTONE | | | | Depth m | 3.3 |
| Specimen Reference | IS | Specimen Depth | 3.3 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227283 |

**Sample before test**

Photo is not available

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **ISRM 2007 SM Determining Shear Strength - 1974** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR03 |
| Soil Description | (Very weak) Greenish grey (5GY 5/1) MUDSTONE | | | | Depth m | 3.3 |
| Specimen Reference | IS | Specimen Depth | 3.3 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227283 |

**Sample after test**

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#14A_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR06 |
| Soil Description | (Weak) Greyish olive (10Y 5/2) LIMESTONE | | | Depth m | 6.6 |
| Specimen Reference | Q1 | Specimen Depth | 6.60 m | Sample Type | Q1 |
| Specimen Description | (Weak) Greyish olive (10Y 5/2) LIMESTONE | | | KeyLAB ID | BH0120230227296 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 04/04/2023 |

Sample details

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 90.82 | mm |
| | Average Diameter | 45.42 | mm |
| | Sample Ratio | 2.00 | |
| | Moisture Content | 7.48 | % |
| | Bulk Density | 2.40 | Mg/m³ |
| | Dry density | 2.23 | Mg/m³ |
| | Initial area | 1620.50 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1010.00 | KPa |
| | Change in height during consolidation* | -0.11 | mm |

Plane of Weakness:

none

Encapsulating Material:

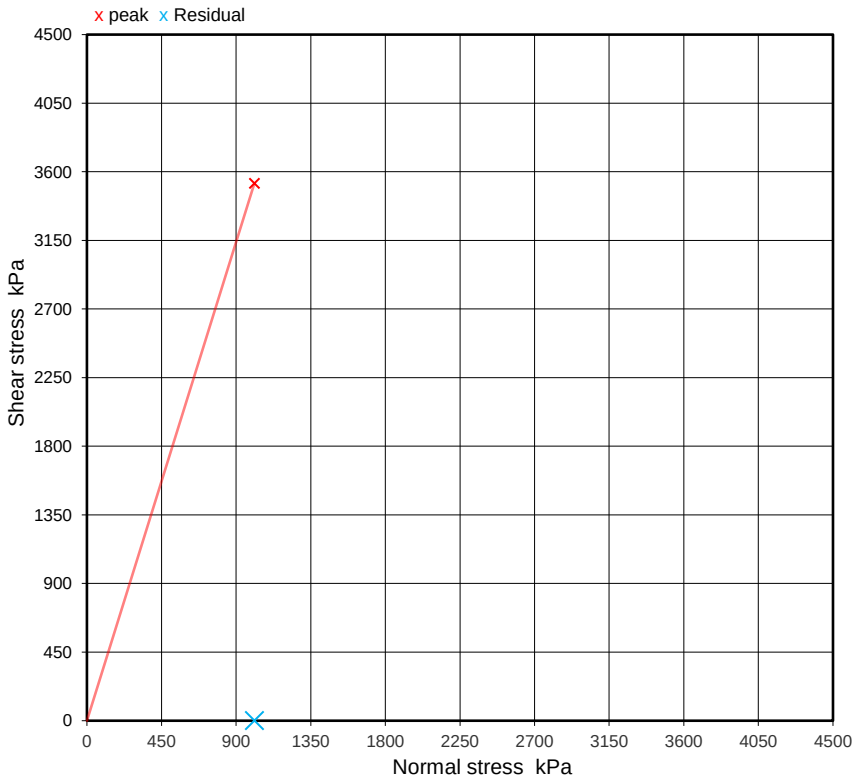
C40 Cement

Curing Time (hrs):

168.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.12 | mm |
| | Calculated Shear Rate | 0.31 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 0.49 | mm |
| | Shear stress | 3524.10 | KPa |
| | Vertical Movement at peak shear stress* | -0.29 | mm |
| Residual values | Shear stress | N/A | KPa |



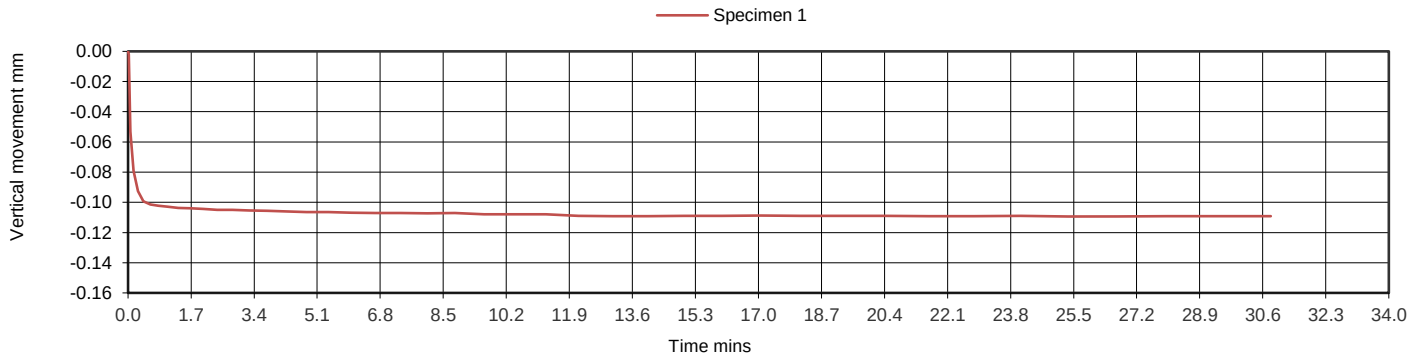

Remarks :

Specimen 1 - Unable to measure residual shear stress

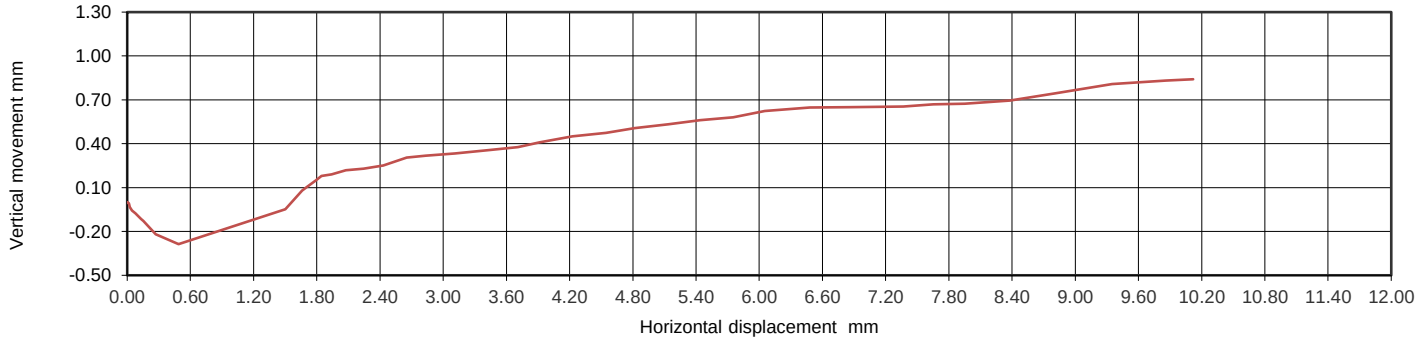
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 12/05/2023 14:47 | S Ocio |

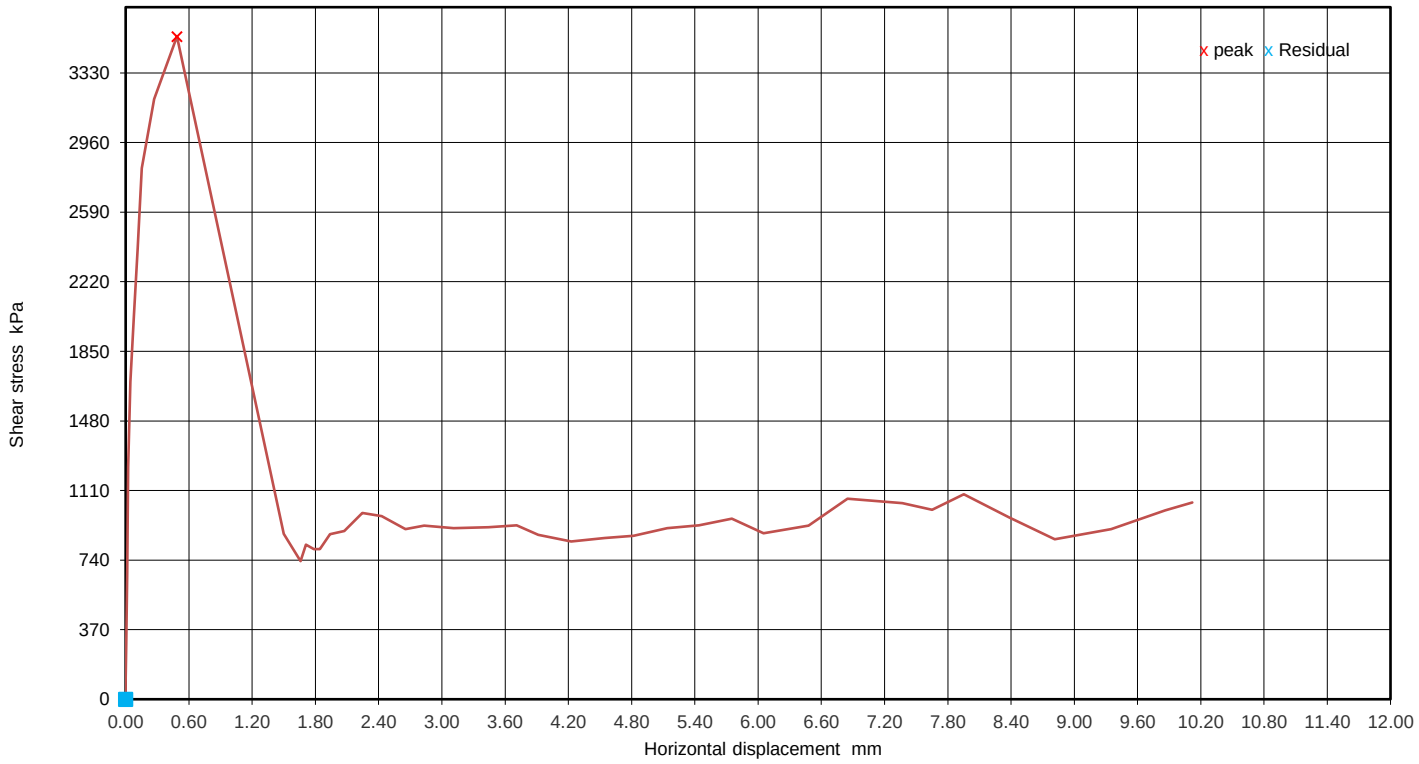
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Greyish olive (10Y 5/2) LIMESTONE | | | | Depth m | 6.6 |
| Specimen Reference | Q1 | Specimen Depth | 6.6 | m | Sample Type | Q1 |
| Specimen Description | (Weak) Greyish olive (10Y 5/2) LIMESTONE | | | | KeyLAB ID | BH0120230227296 |

**Consolidation stage(s)**




**Shearing stage(s)**

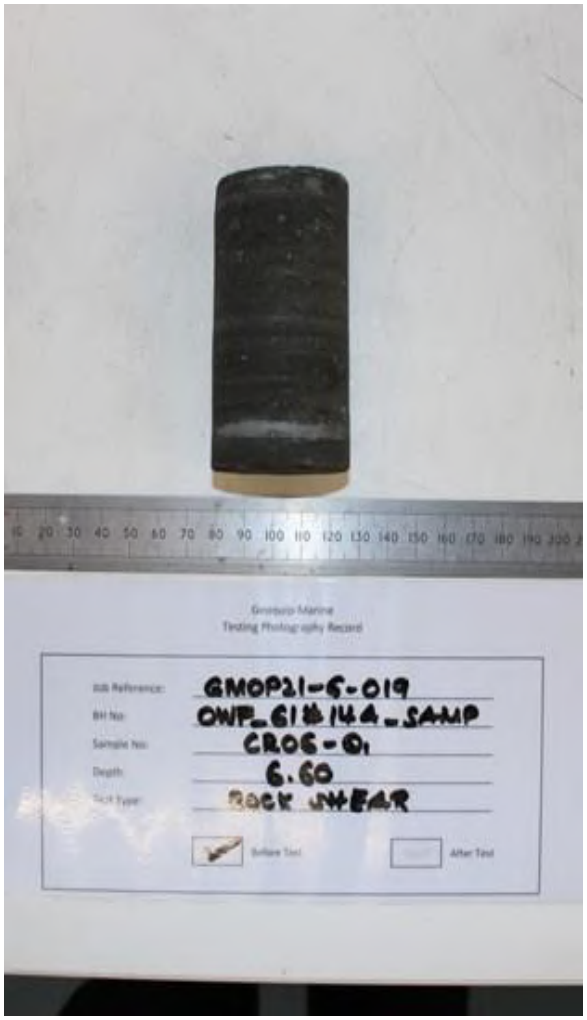



*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

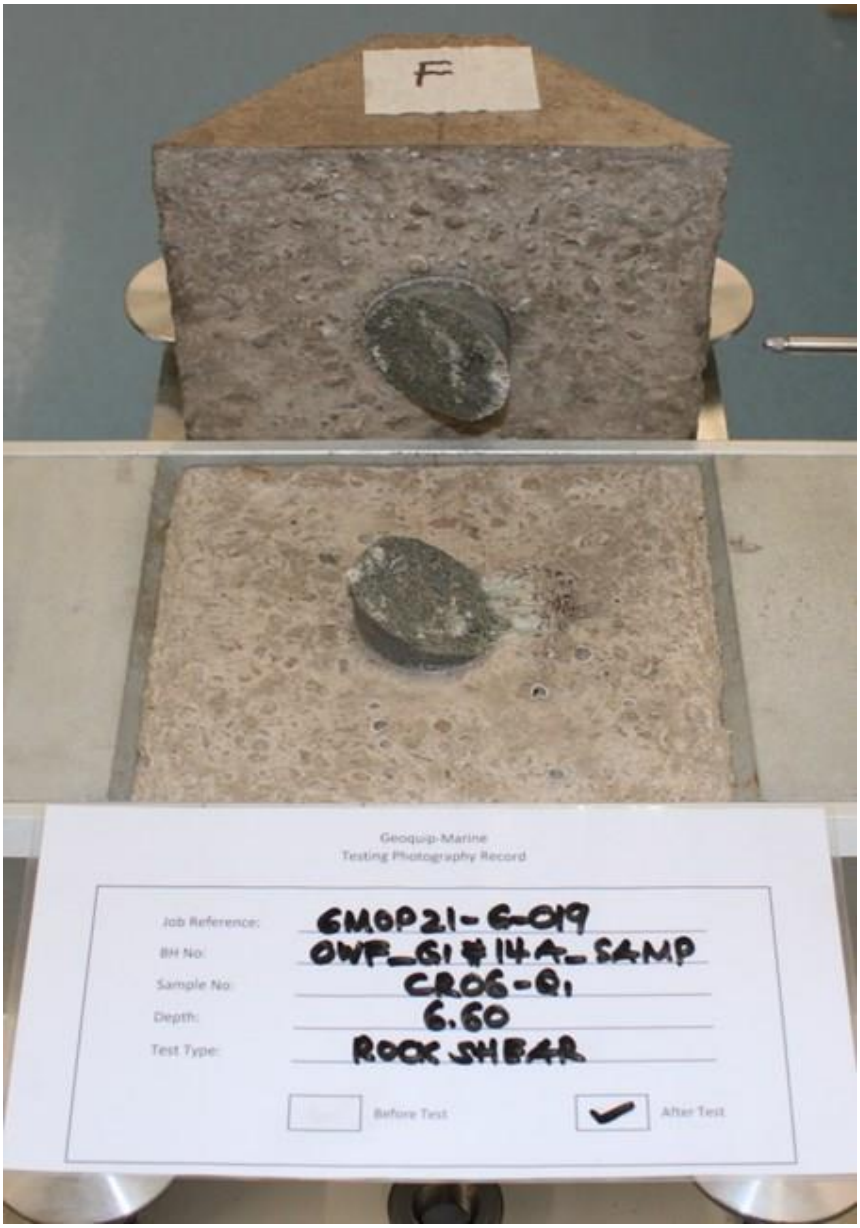
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Greyish olive (10Y 5/2) LIMESTONE | | | | Depth m | 6.6 |
| Specimen Reference | Q1 | Specimen Depth | 6.6 | m | Sample Type | Q1 |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227296 |

**Sample before test**




| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Soil Description | (Weak) Greyish olive (10Y 5/2) LIMESTONE | | | | Depth m | 6.6 |
| Specimen Reference | Q1 | Specimen Depth | 6.6 | m | Sample Type | Q1 |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227296 |

**Sample after test**



| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | Job Ref | GMOP21-G-019 |
|---|---|---|---|
| | | Borehole/Pit No. | OWF_GI#14A_SAMP |

| | | | | | |
|---|---|---|---|---|---|
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR13 |
| Soil Description | (Weak) Grey (2.5Y 5/1) SANDSTONE | | | Depth m | 14 |
| Specimen Reference | IS | Specimen Depth | 14.00 m | Sample Type | IS |
| Specimen Description | (Weak) Grey (2.5Y 5/1) SANDSTONE | | | KeyLAB ID | BH0120230227322 |
| Test Method | ISRM 2007 SM Determining Shear Strength - 1974 | | | Date of test | 06/04/2023 |

Sample details

**Specimen Details**

| | | | |
|---|---|---|---|
| Initial | Average Length | 93.45 | mm |
| | Average Diameter | 45.88 | mm |
| | Sample Ratio | 2.04 | |
| | Moisture Content | 12.07 | % |
| | Bulk Density | 2.03 | Mg/m³ |
| | Dry density | 1.81 | Mg/m³ |
| | Initial area | 1653.00 | mm² |
| Consolidation | Consolidation / Normal Stress applied | 1160.00 | KPa |
| | Change in height during consolidation* | -0.43 | mm |

Plane of Weakness:

none

Encapsulating Material:

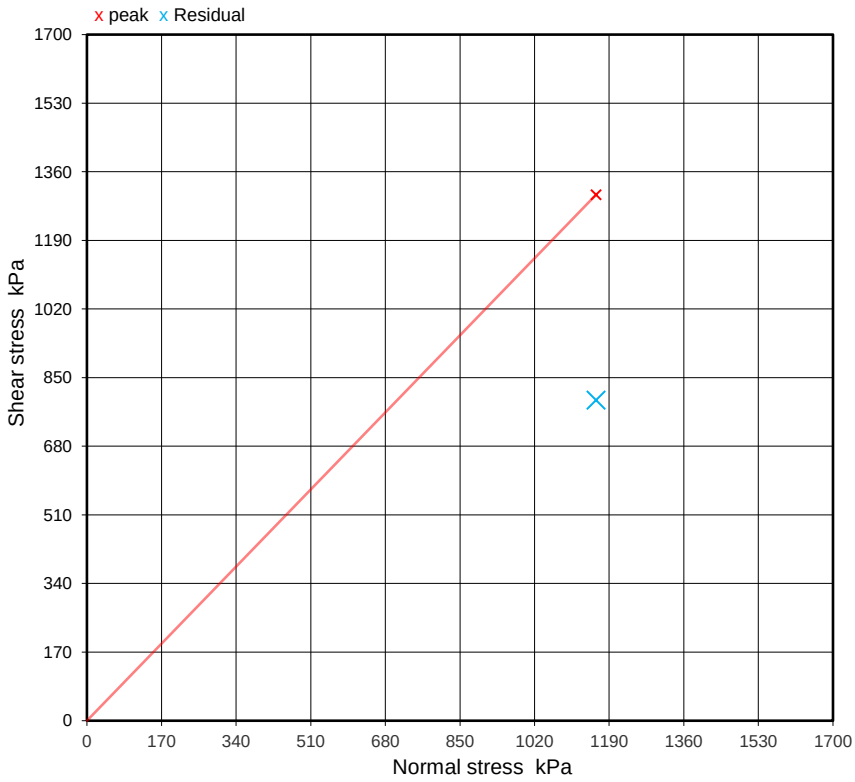
C40 Cement

Curing Time (hrs):

144.0

**Shearing stage(s)**

| | | | |
|---|---|---|---|
| Rate of displacement | Max Displacement | 10.03 | mm |
| | Calculated Shear Rate | 0.31 | mm/min |
| Peak values, (o) | Relative horizontal displacement | 0.63 | mm |
| | Shear stress | 1303.07 | KPa |
| | Vertical Movement at peak shear stress* | 0.13 | mm |
| Residual values | Shear stress | 794.33 | KPa |

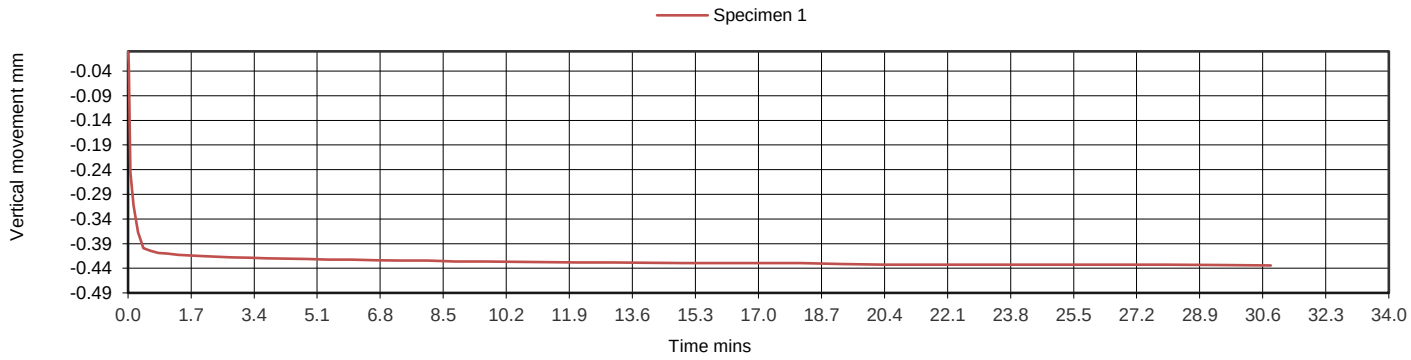



Remarks :

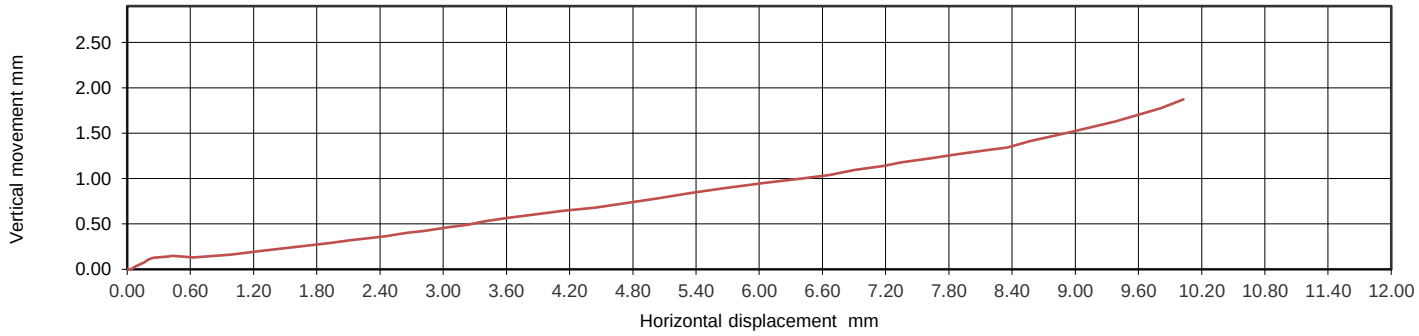
| Notes | Approved | Date printed | Test technician |
|---|---|---|---|
| | D.Smith | 12/05/2023 14:48 | S Ocio |

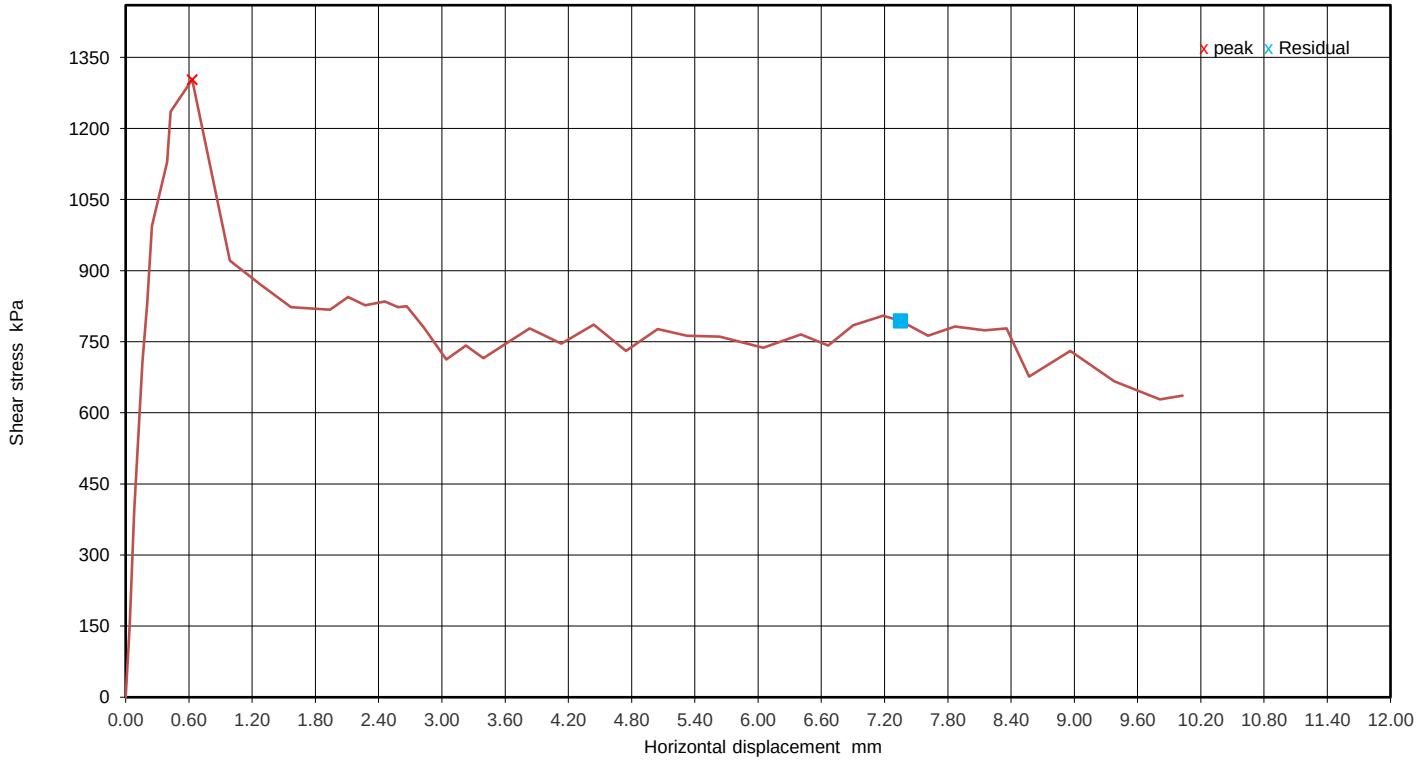
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR13 |
| Soil Description | (Weak) Grey (2.5Y 5/1) SANDSTONE | | | | Depth m | 14 |
| Specimen Reference | IS | Specimen Depth | 14 | m | Sample Type | IS |
| Specimen Description | (Weak) Grey (2.5Y 5/1) SANDSTONE | | | | KeyLAB ID | BH0120230227322 |

**Consolidation stage(s)**




**Shearing stage(s)**

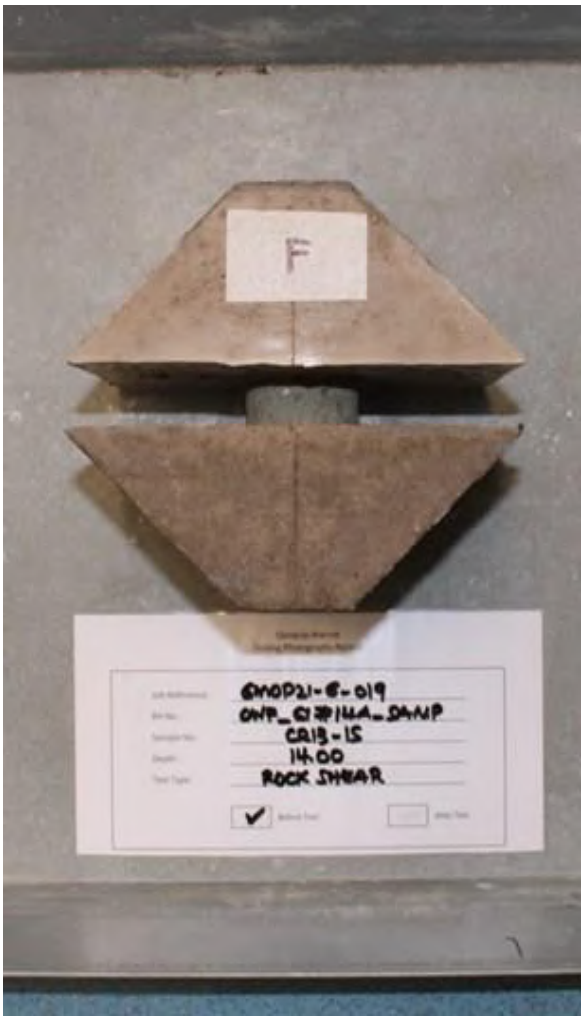



*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

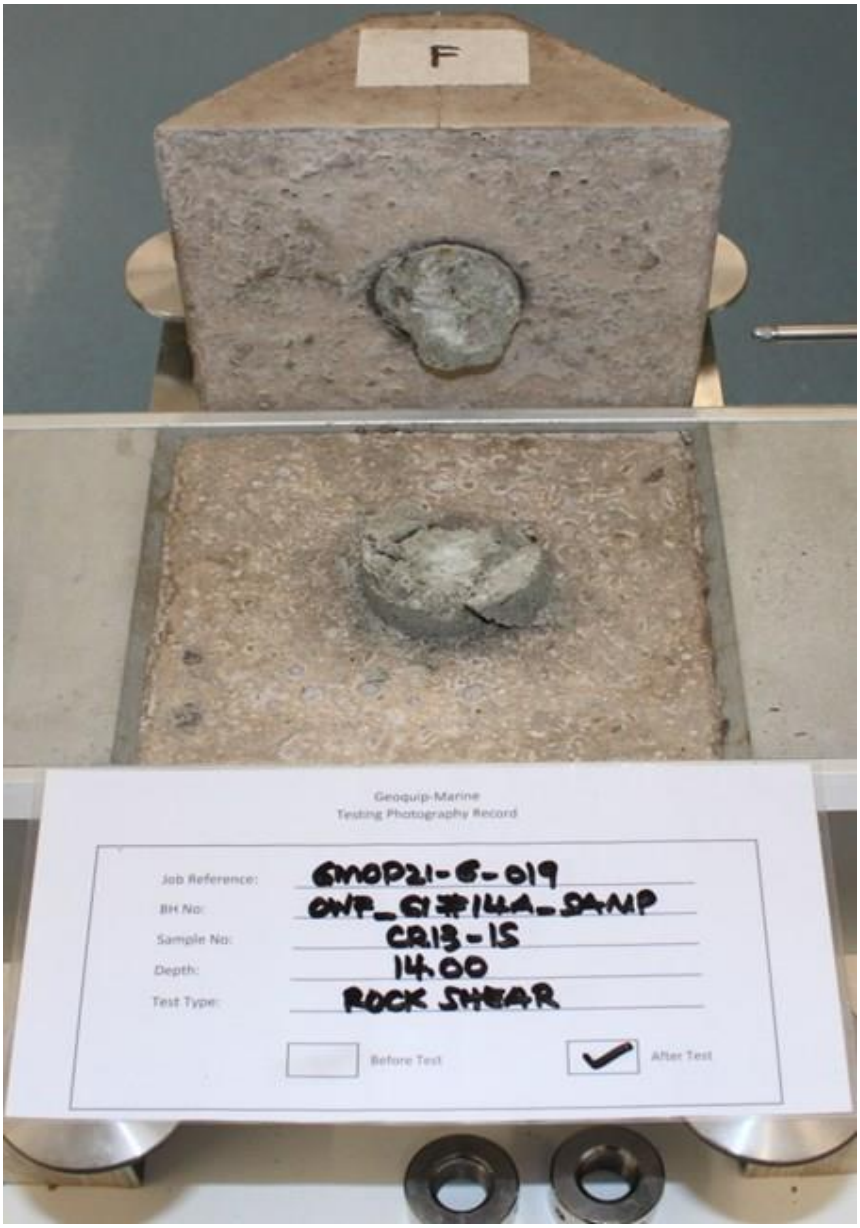
| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR13 |
| Soil Description | (Weak) Grey (2.5Y 5/1) SANDSTONE | | | | Depth m | 14 |
| Specimen Reference | IS | Specimen Depth | 14 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227322 |

**Sample before test**

| GEOQUIPMARINE | ISRM 2007 SM Determining Shear Strength - 1974 | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR13 |
| Soil Description | (Weak) Grey (2.5Y 5/1) SANDSTONE | | | | Depth m | 14 |
| Specimen Reference | IS | Specimen Depth | 14 | m | Sample Type | IS |
| Specimen Description | ISRM 2007 SM Determining Shear Strength - 1974 | | | | KeyLAB ID | BH0120230227322 |

**Sample after test**



| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR10 |
| Rock Description | Moderately weak SANDSTONE | | | | Depth m | 8.80 |
| Specimen Reference | IS | Specimen Depth | 8.80 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak pale brown (10YR 6/3) SANDSTONE. | | | | KeyLAB ID | BH012023022723 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 15/03/2023 |

| | |
|---|---|
| Orientation of loading to bedding planes | Random |
| Condition for test | as received |

| | | |
|---|---|---|
| Length, L | 210.07 | mm |
| Diameter, D | 77.76 | mm |
| L/D | 2.70 | |

| | | |
|---|---|---|
| Bulk density | 2.50 | $Mg/m^3$ |
| Dry density | 2.39 | $Mg/m^3$ |
| Moisture Content | 4.4 | % |

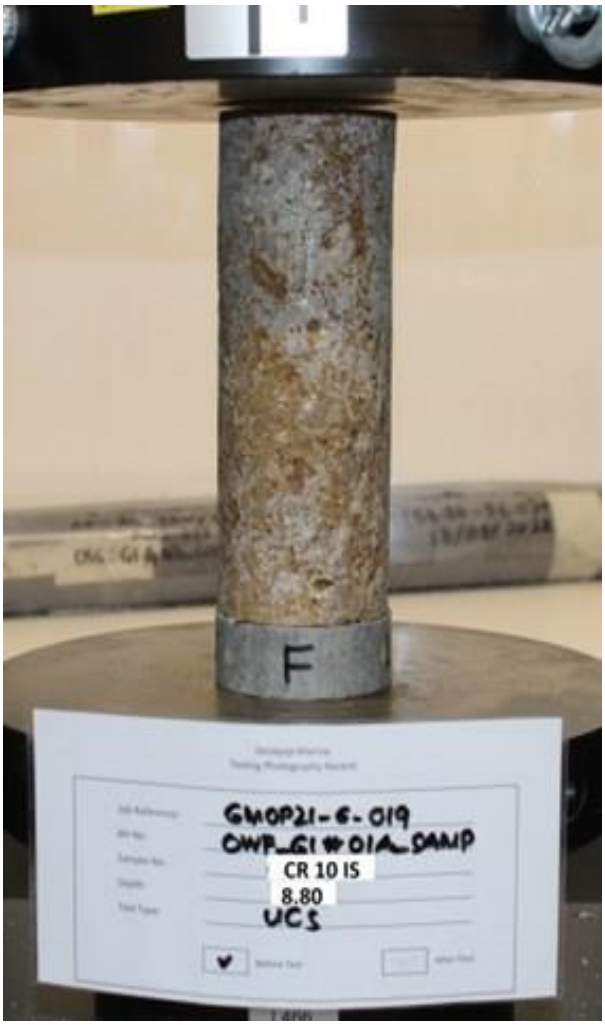
| | |
|---|---|
| Mode of failure | fragmented |
| Remarks : | |

| | | |
|---|---|---|
| Rate of loading | 21.0 | kN/min |
| Equivalent stress rate | 0.07369 | MPa/s |
| Duration of test | 338.7 | seconds |
| Maximum Axial Load | 115.4 | kN |
| Uniaxial Compressive Strength, UCS | 24.30 | MPa |

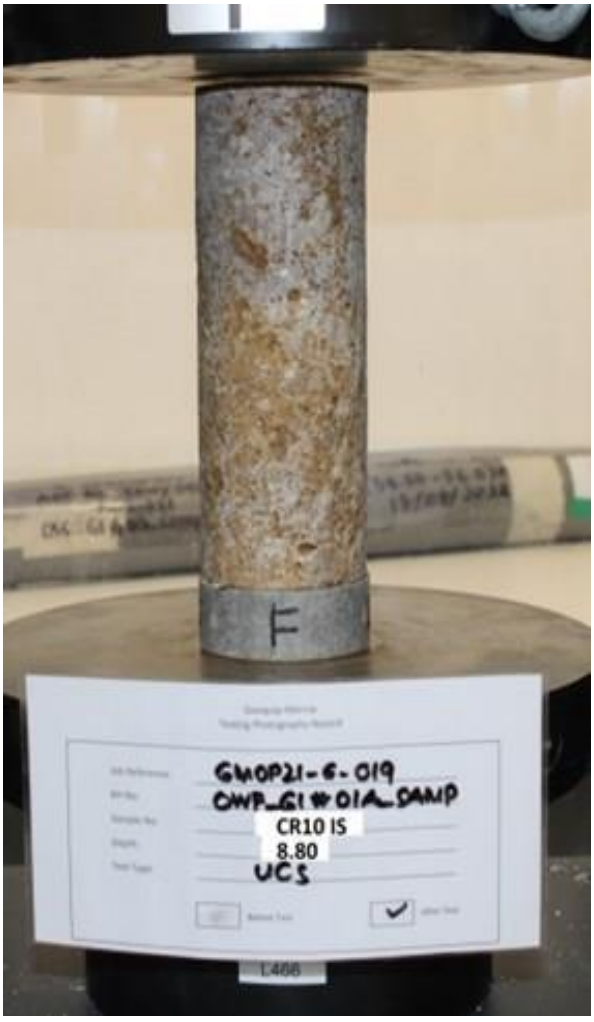
| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | U. Mazhar | 31/03/2023 11:45 |

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR10 |
| Rock Description | Moderately weak SANDSTONE | | | | Depth m | 8.80 |
| Specimen Reference | IS | Specimen Depth | 8.80 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak pale brown (10YR 6/3) SANDSTONE. | | | | KeyLAB ID | BH012023022723 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 15/03/2023 |

Before Test




After Test




Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#01A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR10 |
| Rock Description | Moderately weak SANDSTONE | | | | Depth m | 8.80 |
| Specimen Reference | IS | Specimen Depth | 8.80 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak pale brown (10YR 6/3) SANDSTONE. | | | | KeyLAB ID | BH012023022723 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 15/03/2023 |

Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Rock Description | Moderately weak MUDSTONE | | | | Depth m | 5.50 |
| Specimen Reference | IS | Specimen Depth | 5.50 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak greenish grey (5GY 5/1) MUDSTONE. | | | | KeyLAB ID | BH0120230227118 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 15/03/2023 |

| | |
|---|---|
| Orientation of loading to bedding planes | Random |
| Condition for test | as received |

| | | |
|---|---|---|
| Length, L | 169.83 | mm |
| Diameter, D | 77.55 | mm |
| L/D | 2.19 | * outside specification for ISRM |

| | | |
|---|---|---|
| Bulk density | 2.51 | $Mg/m^3$ |
| Dry density | 2.39 | $Mg/m^3$ |
| Moisture Content | 5.1 | % |

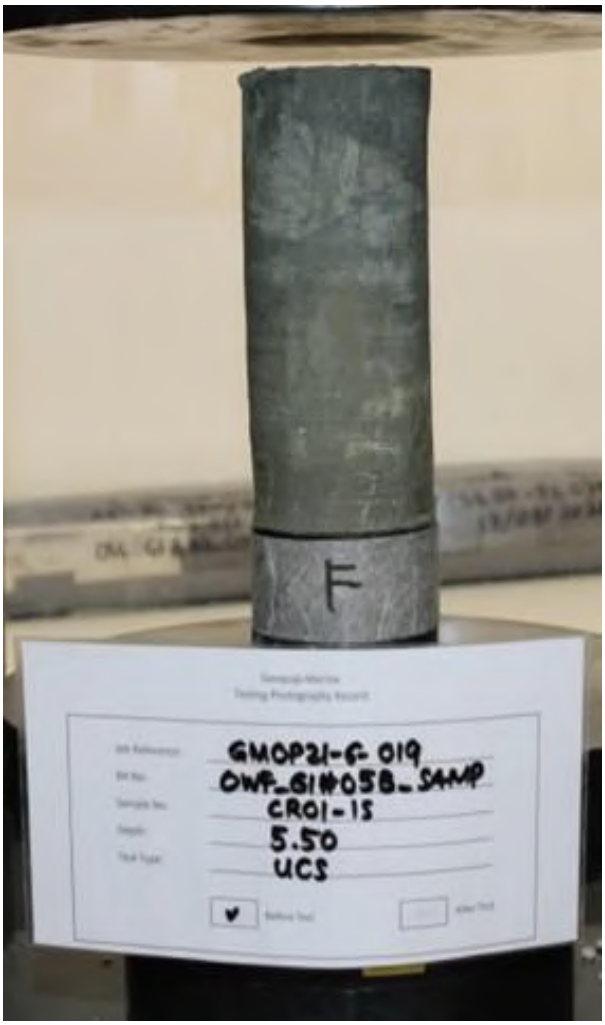
| | |
|---|---|
| Mode of failure | fragmented |
| Remarks : | |

| | | |
|---|---|---|
| Rate of loading | 8.5 | kN/min |
| Equivalent stress rate | 0.02999 | MPa/s |
| Duration of test | 514.3 | seconds |
| Maximum Axial Load | 75.6 | kN |
| Uniaxial Compressive Strength, UCS | 16.00 | MPa |

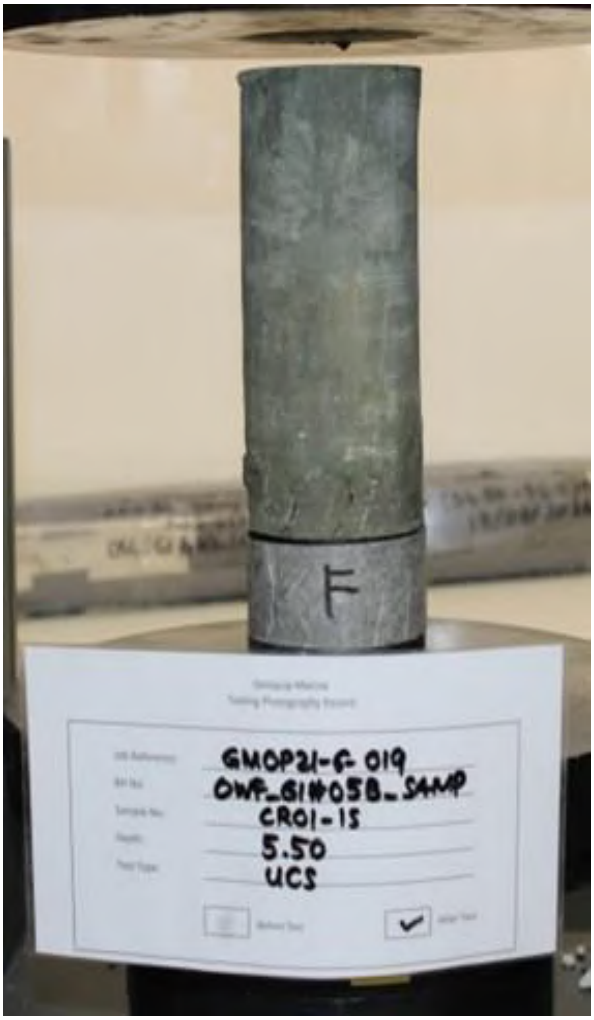
| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | U. Mazhar | 31/03/2023 11:48 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Rock Description | Moderately weak MUDSTONE | | | | Depth m | 5.50 |
| Specimen Reference | IS | Specimen Depth | 5.50 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak greenish grey (5GY 5/1) MUDSTONE. | | | | KeyLAB ID | BH0120230227118 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 15/03/2023 |

Before Test




After Test




Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#05B_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Rock Description | Moderately weak MUDSTONE | | | | Depth m | 5.50 |
| Specimen Reference | IS | Specimen Depth | 5.50 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak greenish grey (5GY 5/1) MUDSTONE. | | | | KeyLAB ID | BH0120230227118 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 15/03/2023 |

Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Rock Description | Medium strong brown(10yr 5/3) LIMESTONE | | | | Depth m | 0.20 |
| Specimen Reference | IS | Specimen Depth | 0.20 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown(10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227135 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 187.41 | mm |
| Diameter, D | 78.19 | mm |
| L/D | 2.40 | * outside specification for ISRM |
| Bulk density | 2.56 | $Mg/m^3$ |
| Dry density | 2.48 | $Mg/m^3$ |
| Moisture Content | 3.4 | % |
| Mode of failure | fragmented | |
| Remarks : | | |

| | | |
|---|---|---|
| Rate of loading | 23.1 | kN/min |
| Equivalent stress rate | 0.08017 | MPa/s |
| Duration of test | 304.4 | seconds |
| Maximum Axial Load | 129.9 | kN |
| Uniaxial Compressive Strength, UCS | 27.10 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | U. Mazhar | 31/03/2023 12:45 |

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Rock Description | Medium strong brown(10yr 5/3) LIMESTONE | | | | Depth m | 0.20 |
| Specimen Reference | IS | Specimen Depth | 0.20 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown(10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227135 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Before Test


After Test


Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR01 |
| Rock Description | Medium strong brown(10yr 5/3) LIMESTONE | | | | Depth m | 0.20 |
| Specimen Reference | IS | Specimen Depth | 0.20 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown(10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227135 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Rock Description | Medium strong brown (10yr 5/3) LIMESTONE | | | | Depth m | 1.20 |
| Specimen Reference | Q1 | Specimen Depth | 1.20 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227138 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 165.43 | mm |
| Diameter, D | 78.56 | mm |
| L/D | 2.11 | * outside specification for ISRM |
| Bulk density | 2.62 | $Mg/m^3$ |
| Dry density | 2.56 | $Mg/m^3$ |
| Moisture Content | 2.3 | % |
| Mode of failure | fragmented | |
| Remarks : | | |

| | | |
|---|---|---|
| Rate of loading | 23.4 | kN/min |
| Equivalent stress rate | 0.08046 | MPa/s |
| Duration of test | 555 | seconds |
| Maximum Axial Load | 223.7 | kN |
| Uniaxial Compressive Strength, UCS | 46.20 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | U. Mazhar | 31/03/2023 12:42 |

| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Rock Description | Medium strong brown (10yr 5/3) LIMESTONE | | | | Depth m | 1.20 |
| Specimen Reference | Q1 | Specimen Depth | 1.20 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227138 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Before Test


After Test


Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR02 |
| Rock Description | Medium strong brown (10yr 5/3) LIMESTONE | | | | Depth m | 1.20 |
| Specimen Reference | Q1 | Specimen Depth | 1.20 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227138 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR14 |
| Rock Description | Medium strong brown (10yr 5/3) LIMESTONE | | | | Depth m | 13.00 |
| Specimen Reference | Q1 | Specimen Depth | 13.00 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227157 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 181.18 | mm |
| Diameter, D | 79.71 | mm |
| L/D | 2.27 | * outside specification for ISRM |
| Bulk density | 2.48 | $Mg/m^3$ |
| Dry density | 2.35 | $Mg/m^3$ |
| Moisture Content | 5.3 | % |
| Mode of failure | Axial cleavage | |
| Remarks : | | |

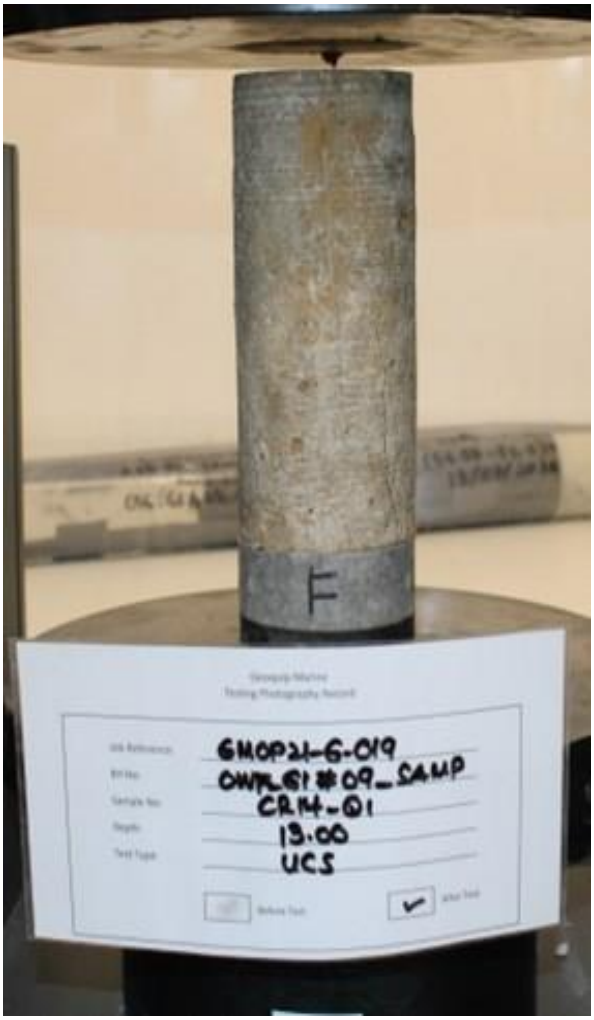
| | | |
|---|---|---|
| Rate of loading | 24.0 | kN/min |
| Equivalent stress rate | 0.08016 | MPa/s |
| Duration of test | 349.8 | seconds |
| Maximum Axial Load | 142.3 | kN |
| Uniaxial Compressive Strength, UCS | 28.50 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | U. Mazhar | 31/03/2023 12:34 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR14 |
| Rock Description | Medium strong brown (10yr 5/3) LIMESTONE | | | | Depth m | 13.00 |
| Specimen Reference | Q1 | Specimen Depth | 13.00 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227157 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Before Test


After Test




Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR14 |
| Rock Description | Medium strong brown (10yr 5/3) LIMESTONE | | | | Depth m | 13.00 |
| Specimen Reference | Q1 | Specimen Depth | 13.00 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227157 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Rock Description | Medium strong brown (10yr 5/3) LIMESTONE | | | | Depth m | 14.00 |
| Specimen Reference | Q1 | Specimen Depth | 14.00 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227159 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

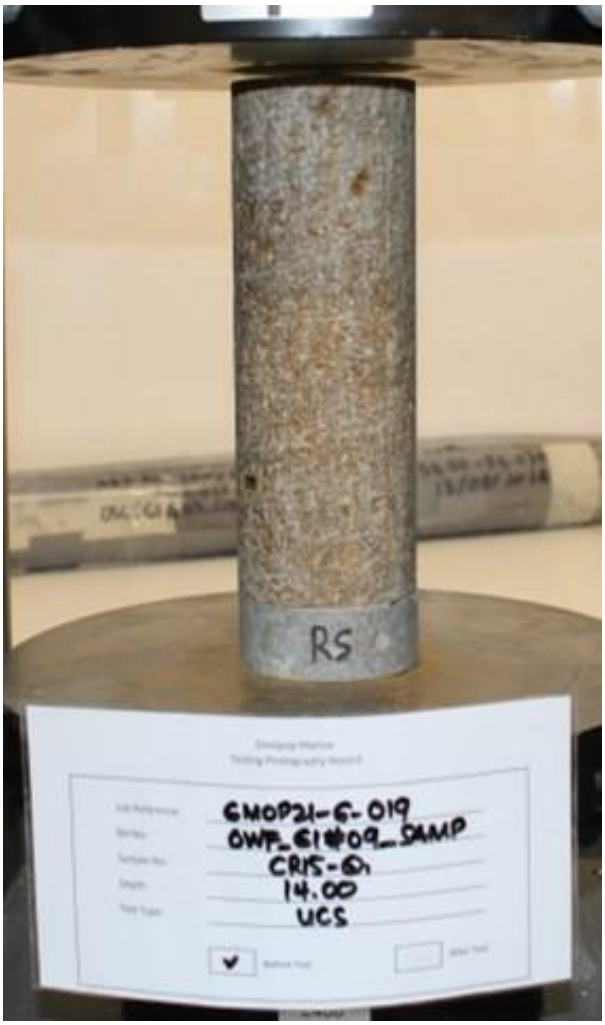
| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 208.91 | mm |
| Diameter, D | 79.84 | mm |
| L/D | 2.62 | |
| Bulk density | 2.63 | $Mg/m^3$ |
| Dry density | 2.56 | $Mg/m^3$ |
| Moisture Content | 2.5 | % |
| Mode of failure | Axial cleavage | |
| Remarks : | | |

| | | |
|---|---|---|
| Rate of loading | 24.0 | kN/min |
| Equivalent stress rate | 0.07990 | MPa/s |
| Duration of test | 397.1 | seconds |
| Maximum Axial Load | 161.9 | kN |
| Uniaxial Compressive Strength, UCS | 32.30 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | U. Mazhar | 31/03/2023 12:29 |

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Rock Description | Medium strong brown (10yr 5/3) LIMESTONE | | | | Depth m | 14.00 |
| Specimen Reference | Q1 | Specimen Depth | 14.00 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227159 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Before Test




After Test


Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Rock Description | Medium strong brown (10yr 5/3) LIMESTONE | | | | Depth m | 14.00 |
| Specimen Reference | Q1 | Specimen Depth | 14.00 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227159 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Rock Description | Medium strong brown (10yr, 5/3) LIMESTONE | | | | Depth m | 15.10 |
| Specimen Reference | Q1 | Specimen Depth | 15.10 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr, 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227162 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

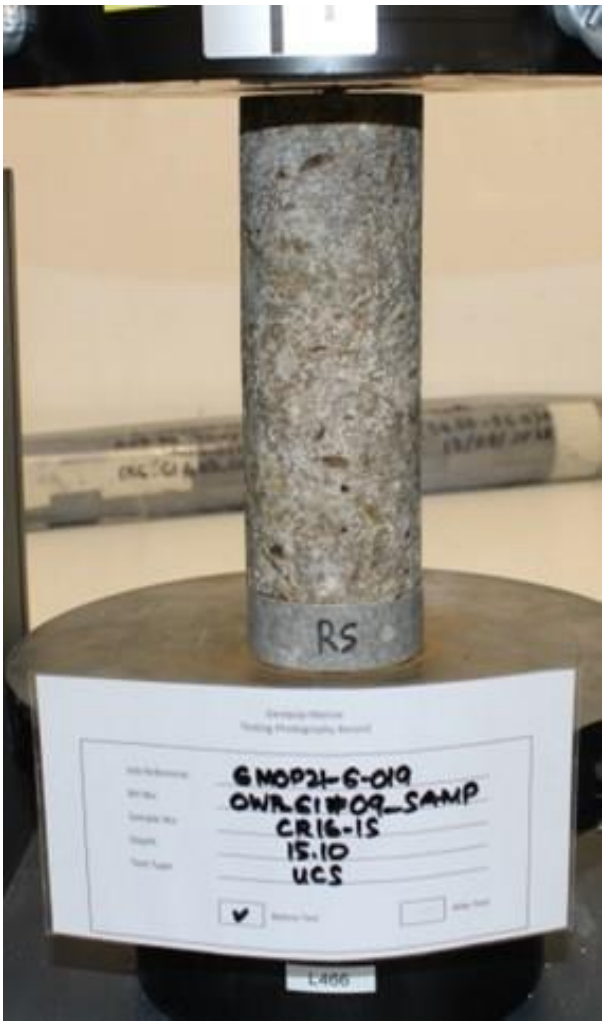
| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 210.74 | mm |
| Diameter, D | 79.88 | mm |
| L/D | 2.64 | |
| Bulk density | 2.64 | $Mg/m^3$ |
| Dry density | 2.59 | $Mg/m^3$ |
| Moisture Content | 1.9 | % |
| Mode of failure | Axial cleavage | |
| Remarks : | | |

| | | |
|---|---|---|
| Rate of loading | 24.1 | kN/min |
| Equivalent stress rate | 0.08016 | MPa/s |
| Duration of test | 421.2 | seconds |
| Maximum Axial Load | 173.8 | kN |
| Uniaxial Compressive Strength, UCS | 34.70 | MPa |

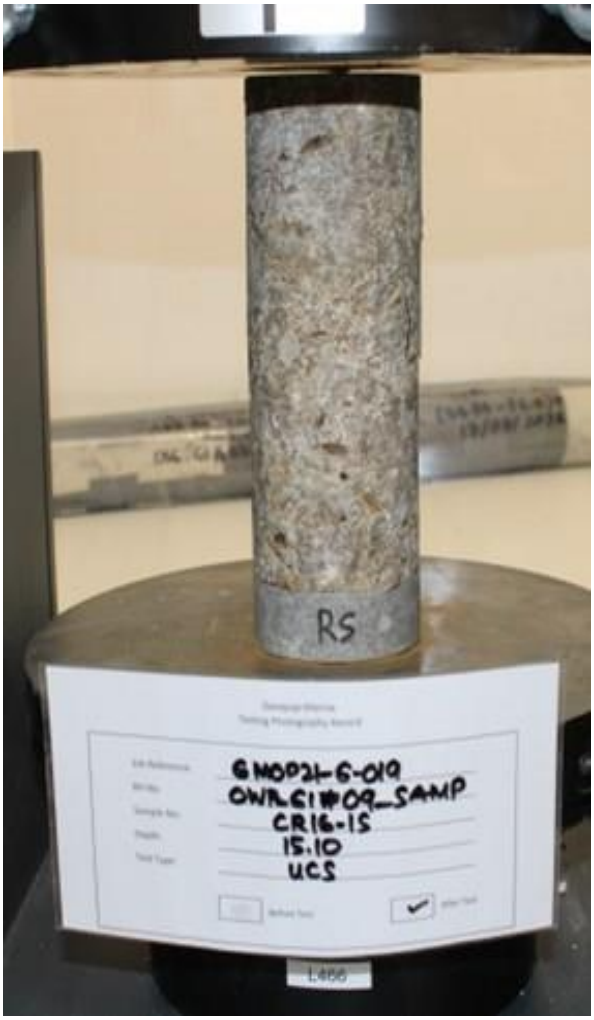
| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | U. Mazhar | 31/03/2023 12:20 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Rock Description | Medium strong brown (10yr, 5/3) LIMESTONE | | | | Depth m | 15.10 |
| Specimen Reference | Q1 | Specimen Depth | 15.10 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr, 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227162 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Before Test




After Test




Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#09_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Rock Description | Medium strong brown (10yr, 5/3) LIMESTONE | | | | Depth m | 15.10 |
| Specimen Reference | Q1 | Specimen Depth | 15.10 | m | Sample Type | Q1 |
| Specimen Rock Type | Medium strong brown (10yr, 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227162 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Rock Description | | | | | Depth m | 5.50 |
| Specimen Reference | IS | Specimen Depth | 5.50 | m | Sample Type | IS |
| Specimen Rock Type | | | | | KeyLAB ID | BH0120230227182 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 07/03/2023 |

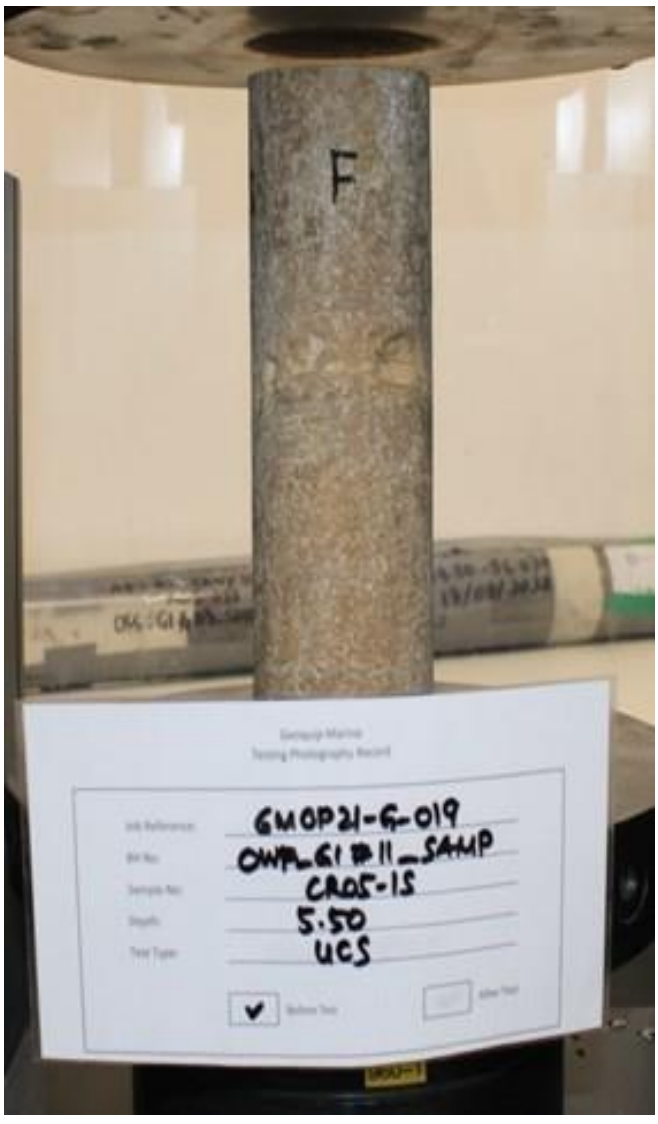
| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 210.81 | mm |
| Diameter, D | 79.12 | mm |
| L/D | 2.66 | |
| Bulk density | 2.53 | $Mg/m^3$ |
| Dry density | 2.44 | $Mg/m^3$ |
| Moisture Content | 3.7 | % |
| Mode of failure | fragmented | |
| Remarks : | CORE SAMPLE TOLERANCES NOT MEASURED | |

| | | |
|---|---|---|
| Rate of loading | 24.0 | kN/min |
| Equivalent stress rate | 0.08135 | MPa/s |
| Duration of test | 536.6 | seconds |
| Maximum Axial Load | 213.4 | kN |
| Uniaxial Compressive Strength, UCS | 43.40 | MPa |

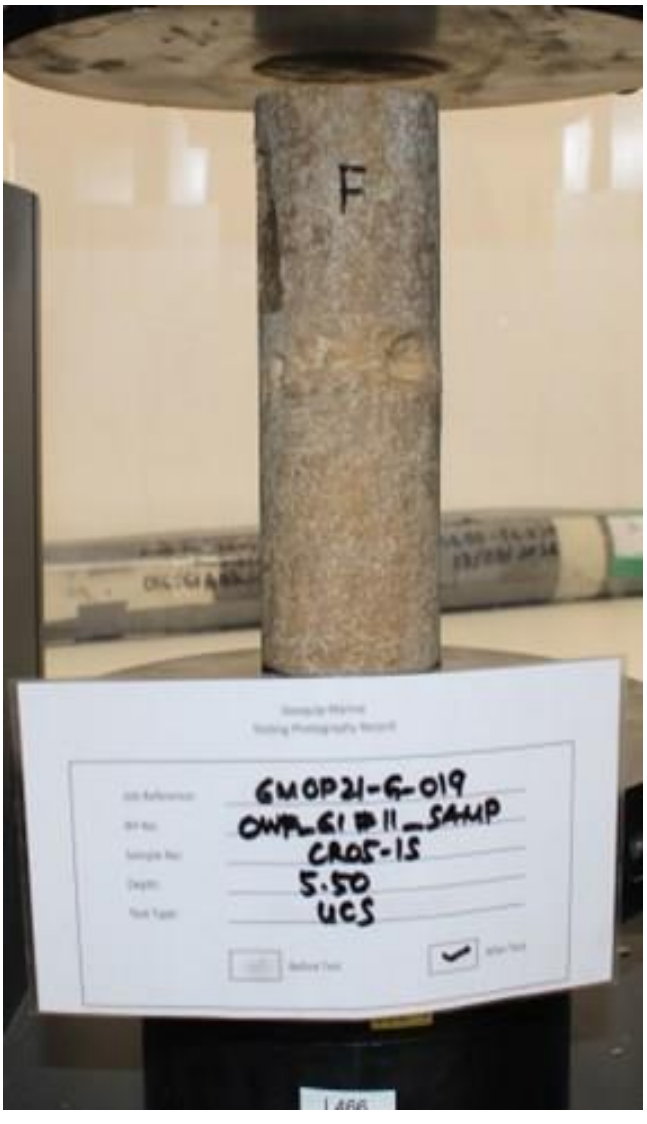
| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 09:13 |

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR05 |
| Rock Description | | | | Depth m | 5.50 |
| Specimen Reference | IS | Specimen Depth | 5.50 m | Sample Type | IS |
| Specimen Rock Type | | | | KeyLAB ID | BH0120230227182 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 07/03/2023 |

Before Test




After Test




Sample may have been rotated to highlight failures

| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR05 |
| Rock Description | | | | Depth m | 5.50 |
| Specimen Reference | IS | Specimen Depth | 5.50 m | Sample Type | IS |
| Specimen Rock Type | | | | KeyLAB ID | BH0120230227182 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 07/03/2023 |

## Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR14 |
| Rock Description | | | | | Depth m | 15.50 |
| Specimen Reference | IS | Specimen Depth | 15.50 | m | Sample Type | IS |
| Specimen Rock Type | | | | | KeyLAB ID | BH0120230227201 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 07/03/2023 |

| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 199.56 | mm |
| Diameter, D | 79.64 | mm |
| L/D | 2.51 | |
| Bulk density | 2.66 | $Mg/m^3$ |
| Dry density | 2.60 | $Mg/m^3$ |
| Moisture Content | 2.2 | % |
| Mode of failure | fragmented | |
| Remarks : | CORE SAMPLE TOLERANCES NOT MEASURED | |

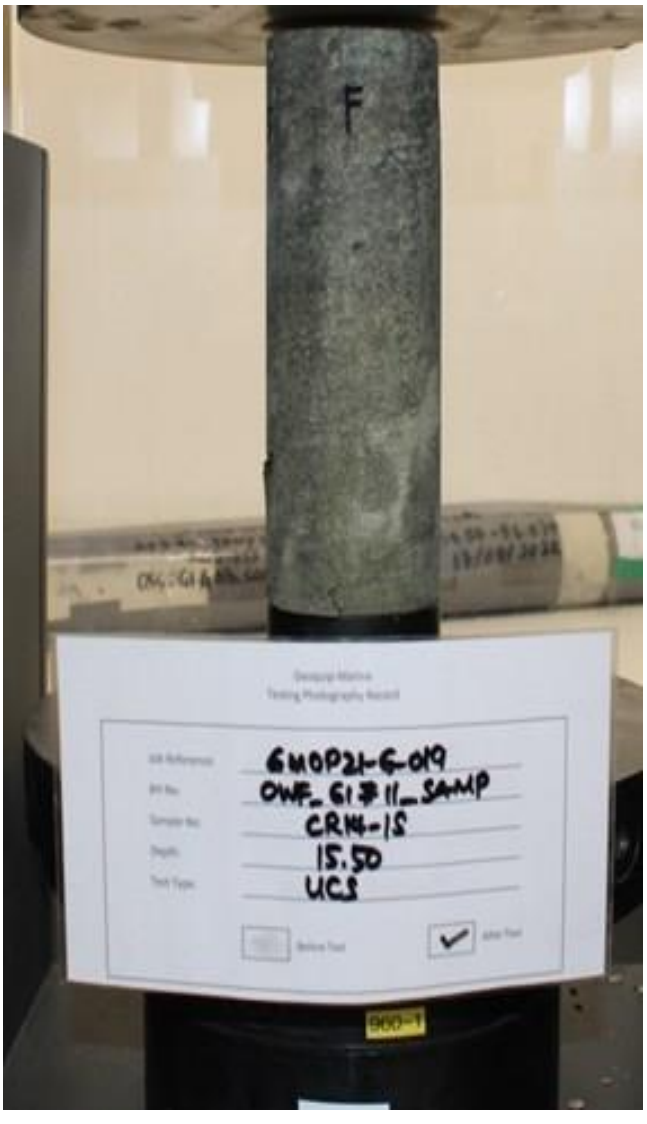
| | | |
|---|---|---|
| Rate of loading | 24.0 | kN/min |
| Equivalent stress rate | 0.08030 | MPa/s |
| Duration of test | 606 | seconds |
| Maximum Axial Load | 244.4 | kN |
| Uniaxial Compressive Strength, UCS | 49.10 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 09:13 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR14 |
| Rock Description | | | | | Depth m | 15.50 |
| Specimen Reference | IS | Specimen Depth | 15.50 | m | Sample Type | IS |
| Specimen Rock Type | | | | | KeyLAB ID | BH0120230227201 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 07/03/2023 |

Before Test


After Test




Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR14 |
| Rock Description | | | | Depth m | 15.50 |
| Specimen Reference | IS | Specimen Depth | 15.50 m | Sample Type | IS |
| Specimen Rock Type | | | | KeyLAB ID | BH0120230227201 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 07/03/2023 |

## Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Rock Description | | | | | Depth m | 17.50 |
| Specimen Reference | IS | Specimen Depth | 17.50 | m | Sample Type | IS |
| Specimen Rock Type | | | | | KeyLAB ID | BH0120230227206 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 07/03/2023 |

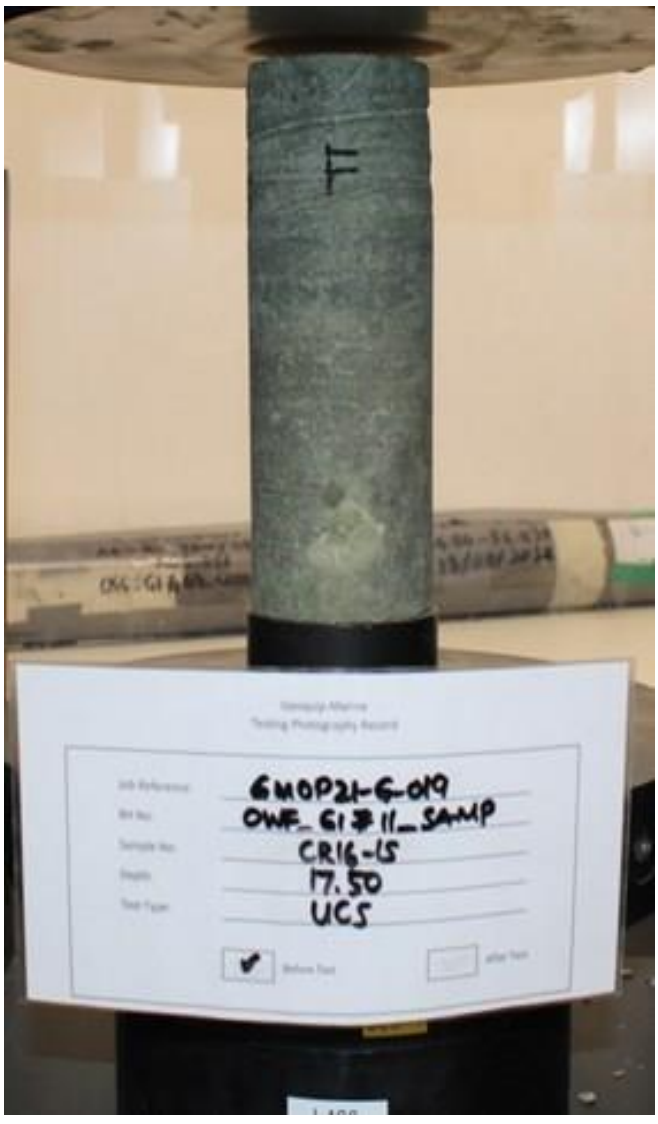
| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 196.62 | mm |
| Diameter, D | 76.18 | mm |
| L/D | 2.58 | |
| Bulk density | 2.52 | $Mg/m^3$ |
| Dry density | 2.43 | $Mg/m^3$ |
| Moisture Content | 3.7 | % |
| Mode of failure | fragmented | |
| Remarks : | CORE SAMPLE TOLERANCES NOT MEASURED | |

| | | |
|---|---|---|
| Rate of loading | 24.0 | kN/min |
| Equivalent stress rate | 0.08776 | MPa/s |
| Duration of test | 430.3 | seconds |
| Maximum Axial Load | 160.0 | kN |
| Uniaxial Compressive Strength, UCS | 35.10 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 09:13 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Rock Description | | | | | Depth m | 17.50 |
| Specimen Reference | IS | Specimen Depth | 17.50 | m | Sample Type | IS |
| Specimen Rock Type | | | | | KeyLAB ID | BH0120230227206 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 07/03/2023 |

Before Test




After Test


Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR16 |
| Rock Description | | | | Depth m | 17.50 |
| Specimen Reference | IS | Specimen Depth | 17.50 m | Sample Type | IS |
| Specimen Rock Type | | | | KeyLAB ID | BH0120230227206 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 07/03/2023 |

## Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR17 |
| Rock Description | Moderately weak dark greenish grey (5GY 4/1) MUDSTONE | | | | Depth m | 18.50 |
| Specimen Reference | Q1 | Specimen Depth | 18.50 | m | Sample Type | Q1 |
| Specimen Rock Type | Moderately weak dark greenish grey (5GY 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227209 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

| | |
|---|---|
| Orientation of loading to bedding planes | Random |
| Condition for test | as received |

| | | |
|---|---|---|
| Length, L | 187.92 | mm |
| Diameter, D | 76.86 | mm |
| L/D | 2.44 | * outside specification for ISRM |

| | | |
|---|---|---|
| Bulk density | 2.39 | $Mg/m^3$ |
| Dry density | 2.23 | $Mg/m^3$ |
| Moisture Content | 7.1 | % |

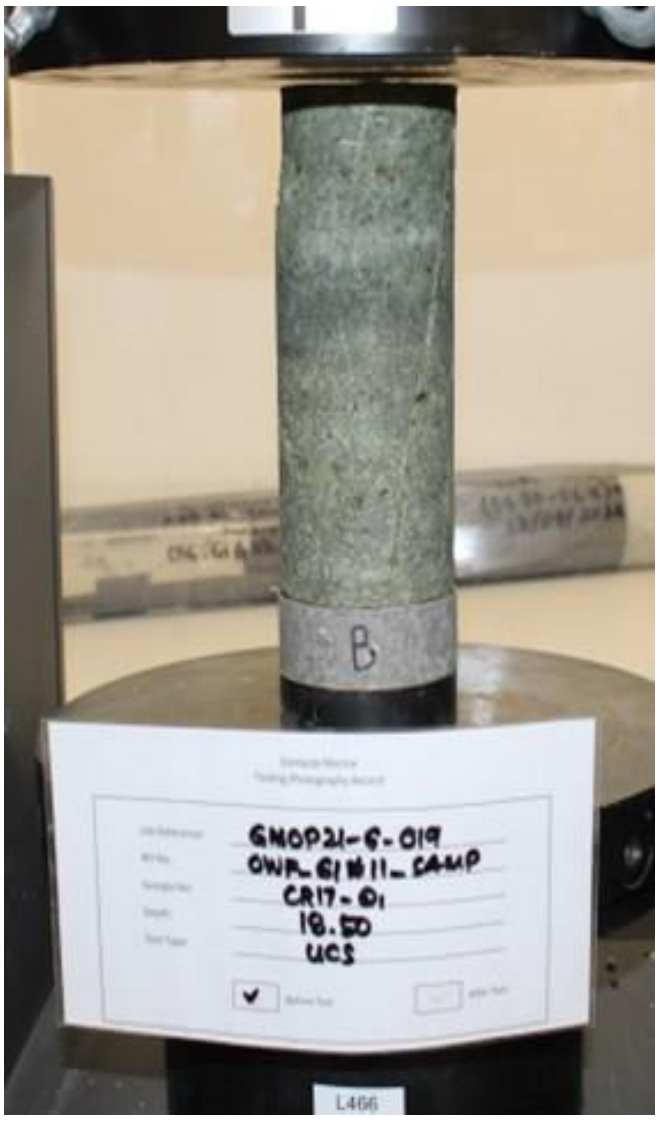
| | |
|---|---|
| Mode of failure | fragmented |
| Remarks : | |

| | | |
|---|---|---|
| Rate of loading | 16.7 | kN/min |
| Equivalent stress rate | 0.05998 | MPa/s |
| Duration of test | 237.1 | seconds |
| Maximum Axial Load | 67.8 | kN |
| Uniaxial Compressive Strength, UCS | 14.60 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 09:39 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR17 |
| Rock Description | Moderately weak dark greenish grey (5GY 4/1) MUDSTONE | | | | Depth m | 18.50 |
| Specimen Reference | Q1 | Specimen Depth | 18.50 | m | Sample Type | Q1 |
| Specimen Rock Type | Moderately weak dark greenish grey (5GY 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227209 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

Before Test




After Test


Sample may have been rotated to highlight failures

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR17 |
| Rock Description | Moderately weak dark greenish grey (5GY 4/1) MUDSTONE | | | Depth m | 18.50 |
| Specimen Reference | Q1 | Specimen Depth | 18.50 m | Sample Type | Q1 |
| Specimen Rock Type | Moderately weak dark greenish grey (5GY 4/1) MUDSTONE | | | KeyLAB ID | BH0120230227209 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 17/03/2023 |

## Split Sample

| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR18 |
| Rock Description | | | | | Depth m | 19.60 |
| Specimen Reference | Q1 | Specimen Depth | 19.60 | m | Sample Type | Q1 |
| Specimen Rock Type | | | | | KeyLAB ID | BH0120230227212 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 07/03/2023 |

| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 161.87 | mm |
| Diameter, D | 77.88 | mm |
| L/D | 2.08 | * outside specification for ISRM |
| Bulk density | 2.44 | $Mg/m^3$ |
| Dry density | 2.31 | $Mg/m^3$ |
| Moisture Content | 5.5 | % |
| Mode of failure | fragmented | |
| Remarks : | CORE SAMPLE TOLERANCES NOT MEASURED | |

| | | |
|---|---|---|
| Rate of loading | 30.0 | kN/min |
| Equivalent stress rate | 0.10497 | MPa/s |
| Duration of test | 213.4 | seconds |
| Maximum Axial Load | 103.2 | kN |
| Uniaxial Compressive Strength, UCS | 21.70 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 09:13 |

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR18 |
| Rock Description | | | | Depth m | 19.60 |
| Specimen Reference | Q1 | Specimen Depth | 19.60 m | Sample Type | Q1 |
| Specimen Rock Type | | | | KeyLAB ID | BH0120230227212 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 07/03/2023 |

Before Test


After Test


Sample may have been rotated to highlight failures

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR18 |
| Rock Description | | | | Depth m | 19.60 |
| Specimen Reference | Q1 | Specimen Depth | 19.60 m | Sample Type | Q1 |
| Specimen Rock Type | | | | KeyLAB ID | BH0120230227212 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 07/03/2023 |

Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Rock Description | Weak dark greenish grey (5gy, 4/1) MUDSTONE | | | | Depth m | 16.55 |
| Specimen Reference | Q1 | Specimen Depth | 16.55 | m | Sample Type | Q1 |
| Specimen Rock Type | Weak dark greenish grey (5gy, 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227204 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

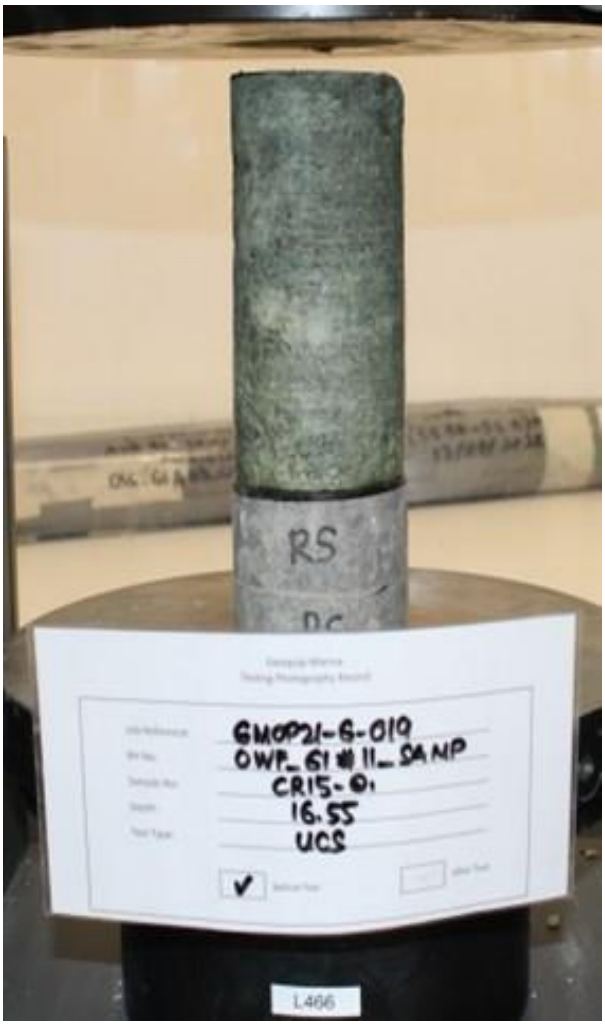
| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 160.54 | mm |
| Diameter, D | 77.33 | mm |
| L/D | 2.08 | * outside specification for ISRM |
| Bulk density | 2.40 | Mg/m3 |
| Dry density | 2.23 | Mg/m3 |
| Moisture Content | 7.6 | % |
| Mode of failure | fragmented | |
| Remarks : | | |

| | | |
|---|---|---|
| Rate of loading | 17.0 | kN/min |
| Equivalent stress rate | 0.06032 | MPa/s |
| Duration of test | 188.2 | seconds |
| Maximum Axial Load | 55.3 | kN |
| Uniaxial Compressive Strength, UCS | 11.80 | MPa |

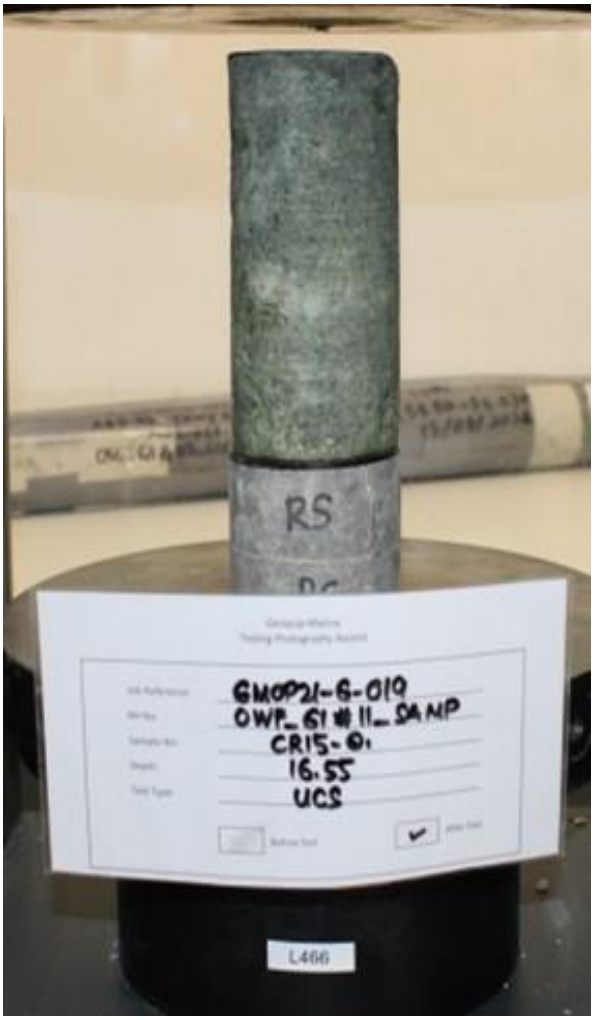
| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | U. Mazhar | 31/03/2023 12:15 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Rock Description | Weak dark greenish grey (5gy, 4/1) MUDSTONE | | | | Depth m | 16.55 |
| Specimen Reference | Q1 | Specimen Depth | 16.55 | m | Sample Type | Q1 |
| Specimen Rock Type | Weak dark greenish grey (5gy, 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227204 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Before Test




After Test




Sample may have been rotated to highlight failures

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#11_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR15 |
| Rock Description | Weak dark greenish grey (5gy, 4/1) MUDSTONE | | | | Depth m | 16.55 |
| Specimen Reference | Q1 | Specimen Depth | 16.55 | m | Sample Type | Q1 |
| Specimen Rock Type | Weak dark greenish grey (5gy, 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227204 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 16/03/2023 |

Split Sample

| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Rock Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 7.45 |
| Specimen Reference | Q1 | Specimen Depth | 7.45 | m | Sample Type | Q1 |
| Specimen Rock Type | Strong brown (10YR 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227233 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 01/03/2023 |

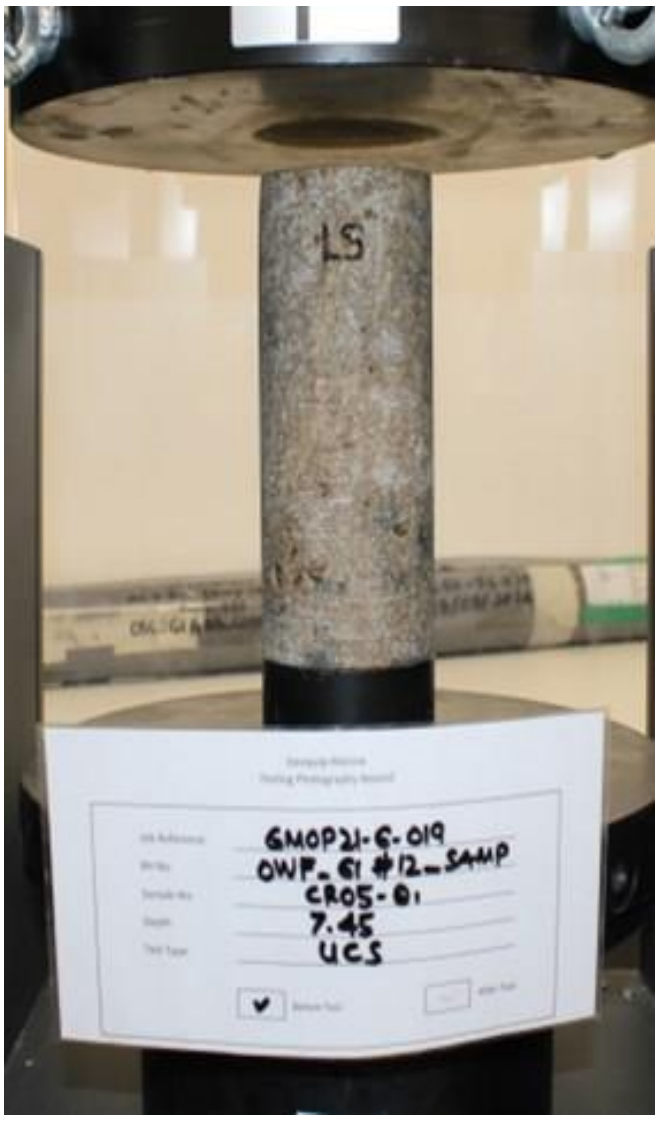
| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 187.10 | mm |
| Diameter, D | 79.54 | mm |
| L/D | 2.35 | * outside specification for ISRM |
| Bulk density | 2.66 | $Mg/m^3$ |
| Dry density | 2.59 | $Mg/m^3$ |
| Moisture Content | 2.7 | % |
| Mode of failure | Axial cleavage | |
| Remarks : | CORE SAMPLE TOLERANCES NOT MEASURED | |

| | | |
|---|---|---|
| Rate of loading | 24.0 | kN/min |
| Equivalent stress rate | 0.08051 | MPa/s |
| Duration of test | 738.5 | seconds |
| Maximum Axial Load | 296.0 | kN |
| Uniaxial Compressive Strength, UCS | 59.60 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 05/04/2023 10:00 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Rock Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 7.45 |
| Specimen Reference | Q1 | Specimen Depth | 7.45 | m | Sample Type | Q1 |
| Specimen Rock Type | Strong brown (10YR 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227233 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 01/03/2023 |

Before Test




After Test


Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Rock Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 7.45 |
| Specimen Reference | Q1 | Specimen Depth | 7.45 | m | Sample Type | Q1 |
| Specimen Rock Type | Strong brown (10YR 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227233 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 01/03/2023 |

## Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Rock Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 8.30 |
| Specimen Reference | IS | Specimen Depth | 8.30 | m | Sample Type | IS |
| Specimen Rock Type | Strong brown (10YR 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227234 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 28/02/2023 |

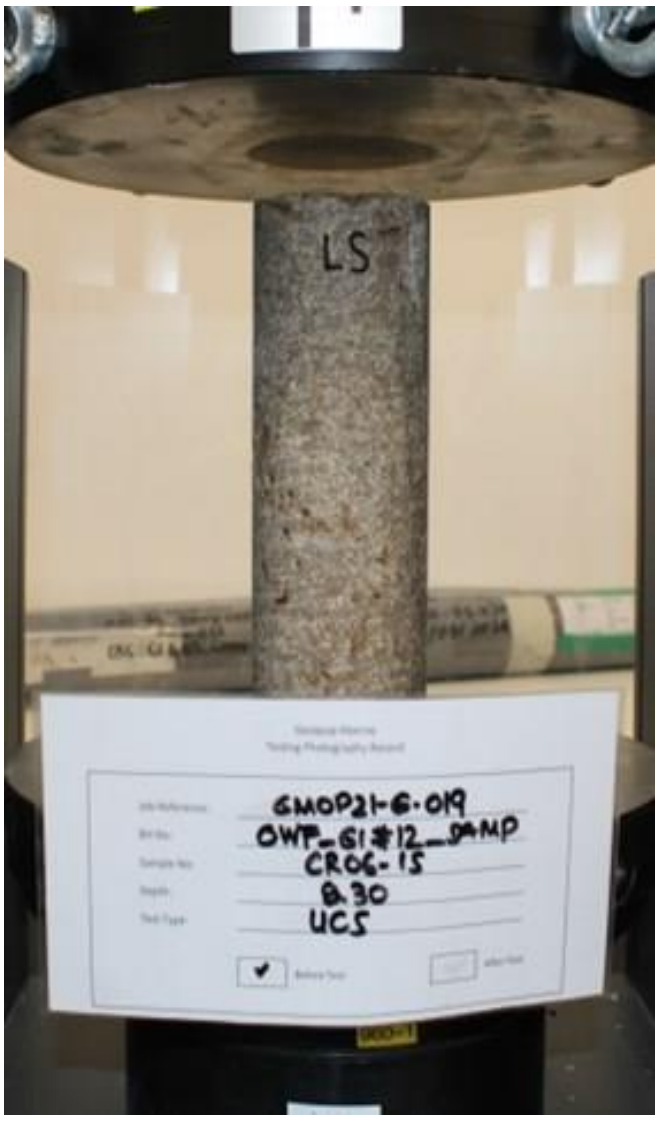
| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 223.05 | mm |
| Diameter, D | 79.47 | mm |
| L/D | 2.81 | |
| Bulk density | 2.63 | $Mg/m^3$ |
| Dry density | 2.55 | $Mg/m^3$ |
| Moisture Content | 3.1 | % |
| Mode of failure | fragmented | |
| Remarks : | CORE SAMPLE TOLERANCES NOT MEASURED | |

| | | |
|---|---|---|
| Rate of loading | 24.0 | kN/min |
| Equivalent stress rate | 0.08065 | MPa/s |
| Duration of test | 637.1 | seconds |
| Maximum Axial Load | 258.0 | kN |
| Uniaxial Compressive Strength, UCS | 52.00 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 05/04/2023 10:00 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Rock Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 8.30 |
| Specimen Reference | IS | Specimen Depth | 8.30 | m | Sample Type | IS |
| Specimen Rock Type | Strong brown (10YR 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227234 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 28/02/2023 |

Before Test




After Test


Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR06 |
| Rock Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 8.30 |
| Specimen Reference | IS | Specimen Depth | 8.30 | m | Sample Type | IS |
| Specimen Rock Type | Strong brown (10YR 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227234 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 28/02/2023 |

## Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Rock Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 19.10 |
| Specimen Reference | Q1 | Specimen Depth | 19.10 | m | Sample Type | Q1 |
| Specimen Rock Type | Strong brown (10YR 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227256 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 28/02/2023 |

| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 212.32 | mm |
| Diameter, D | 79.58 | mm |
| L/D | 2.67 | |
| Bulk density | 2.70 | $Mg/m^3$ |
| Dry density | 2.66 | $Mg/m^3$ |
| Moisture Content | 1.4 | % |
| Mode of failure | Axial cleavage | |
| Remarks : | CORE SAMPLE TOLERANCES NOT MEASURED | |

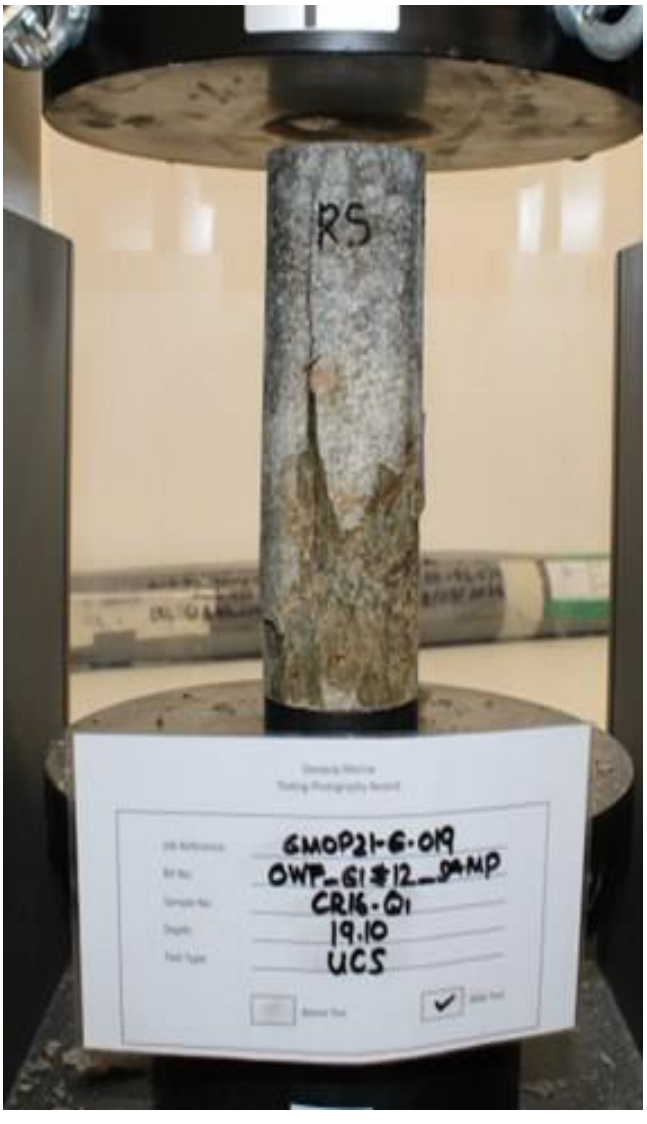
| | | |
|---|---|---|
| Rate of loading | 24.0 | kN/min |
| Equivalent stress rate | 0.08043 | MPa/s |
| Duration of test | 1102.3 | seconds |
| Maximum Axial Load | 442.0 | kN |
| Uniaxial Compressive Strength, UCS | 88.90 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 05/04/2023 10:00 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR16 |
| Rock Description | Strong brown (10YR 5/3) LIMESTONE | | | | Depth m | 19.10 |
| Specimen Reference | Q1 | Specimen Depth | 19.10 | m | Sample Type | Q1 |
| Specimen Rock Type | Strong brown (10YR 5/3) LIMESTONE | | | | KeyLAB ID | BH0120230227256 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 28/02/2023 |

Before Test


After Test




Sample may have been rotated to highlight failures

| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | OWF_GI#12_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR16 |
| Rock Description | Strong brown (10YR 5/3) LIMESTONE | | | Depth m | 19.10 |
| Specimen Reference | Q1 | Specimen Depth | 19.10 m | Sample Type | Q1 |
| Specimen Rock Type | Strong brown (10YR 5/3) LIMESTONE | | | KeyLAB ID | BH0120230227256 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 28/02/2023 |

Split Sample

| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR04 |
| Rock Description | Very weak dark greenish grey (5Gy 4/1) MUDSTONE | | | | Depth m | 3.30 |
| Specimen Reference | IS | Specimen Depth | 3.30 | m | Sample Type | IS |
| Specimen Rock Type | Very weak dark greenish grey (5Gy 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227270 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

| | |
|---|---|
| Orientation of loading to bedding planes | Random |
| Condition for test | as received |

| | | |
|---|---|---|
| Length, L | 200.05 | mm |
| Diameter, D | 78.09 | mm |
| L/D | 2.56 | |

| | | |
|---|---|---|
| Bulk density | 2.35 | $Mg/m^3$ |
| Dry density | 2.20 | $Mg/m^3$ |
| Moisture Content | 7.0 | % |

| | | |
|---|---|---|
| Rate of loading | 17.5 | kN/min |
| Equivalent stress rate | 0.06090 | MPa/s |
| Duration of test | 33.4 | seconds |
| Maximum Axial Load | 9.3 | kN |
| Uniaxial Compressive Strength, UCS | 1.94 | MPa |

Mode of failure: fragmented

Remarks :

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 09:54 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR04 |
| Rock Description | Very weak dark greenish grey (5Gy 4/1) MUDSTONE | | | | Depth m | 3.30 |
| Specimen Reference | IS | Specimen Depth | 3.30 | m | Sample Type | IS |
| Specimen Rock Type | Very weak dark greenish grey (5Gy 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227270 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

Before Test


After Test


Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR04 |
| Rock Description | Very weak dark greenish grey (5Gy 4/1) MUDSTONE | | | | Depth m | 3.30 |
| Specimen Reference | IS | Specimen Depth | 3.30 | m | Sample Type | IS |
| Specimen Rock Type | Very weak dark greenish grey (5Gy 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227270 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

## Split Sample

| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR03 |
| Rock Description | Weak dark greenish grey (5Gy, 1/4) MUDSTONE | | | | Depth m | 3.10 |
| Specimen Reference | Q1 | Specimen Depth | 3.10 | m | Sample Type | Q1 |
| Specimen Rock Type | Weak dark greenish grey (5Gy, 1/4) MUDSTONE | | | | KeyLAB ID | BH0120230227282 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 177.85 | mm |
| Diameter, D | 79.28 | mm |
| L/D | 2.24 | * outside specification for ISRM |
| Bulk density | 2.43 | $Mg/m^3$ |
| Dry density | 2.26 | $Mg/m^3$ |
| Moisture Content | 7.5 | % |
| Mode of failure | fragmented | |
| Remarks : | | |

| | | |
|---|---|---|
| Rate of loading | 17.8 | kN/min |
| Equivalent stress rate | 0.06010 | MPa/s |
| Duration of test | 188.1 | seconds |
| Maximum Axial Load | 57.1 | kN |
| Uniaxial Compressive Strength, UCS | 11.60 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 10:07 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR03 |
| Rock Description | Weak dark greenish grey (5Gy, 1/4) MUDSTONE | | | | Depth m | 3.10 |
| Specimen Reference | Q1 | Specimen Depth | 3.10 | m | Sample Type | Q1 |
| Specimen Rock Type | Weak dark greenish grey (5Gy, 1/4) MUDSTONE | | | | KeyLAB ID | BH0120230227282 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

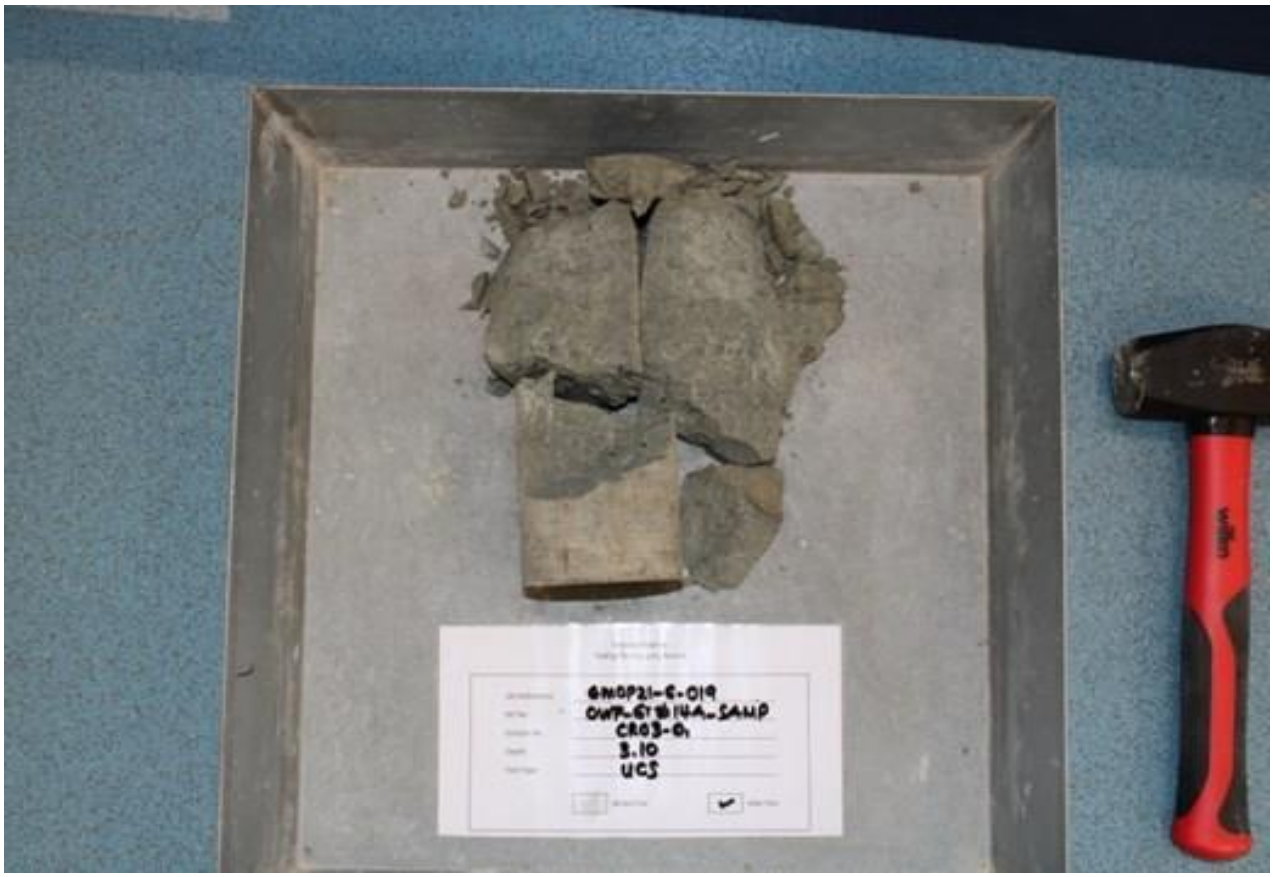
Before Test


After Test


Sample may have been rotated to highlight failures

| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR03 |
| Rock Description | Weak dark greenish grey (5Gy, 1/4) MUDSTONE | | | Depth m | 3.10 |
| Specimen Reference | Q1 | Specimen Depth | 3.10 m | Sample Type | Q1 |
| Specimen Rock Type | Weak dark greenish grey (5Gy, 1/4) MUDSTONE | | | KeyLAB ID | BH0120230227282 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 17/03/2023 |

## Split Sample



| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Rock Description | Moderately weak greenish grey (5GY 4/1) MUDSTONE | | | | Depth m | 5.70 |
| Specimen Reference | IS | Specimen Depth | 5.70 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak greenish grey (5GY 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227293 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

| | |
|---|---|
| Orientation of loading to bedding planes | Random |
| Condition for test | as received |

| | | |
|---|---|---|
| Length, L | 169.36 | mm |
| Diameter, D | 78.89 | mm |
| L/D | 2.15 | * outside specification for ISRM |

| | | |
|---|---|---|
| Bulk density | 2.50 | $Mg/m^3$ |
| Dry density | 2.38 | $Mg/m^3$ |
| Moisture Content | 4.9 | % |

| | |
|---|---|
| Mode of failure | Axial cleavage |
| Remarks : | |

| | | |
|---|---|---|
| Rate of loading | 17.8 | kN/min |
| Equivalent stress rate | 0.06069 | MPa/s |
| Duration of test | 271.3 | seconds |
| Maximum Axial Load | 83.2 | kN |
| Uniaxial Compressive Strength, UCS | 17.00 | MPa |

| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 10:08 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Rock Description | Moderately weak greenish grey (5GY 4/1) MUDSTONE | | | | Depth m | 5.70 |
| Specimen Reference | IS | Specimen Depth | 5.70 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak greenish grey (5GY 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227293 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

Before Test


After Test


Sample may have been rotated to highlight failures

| | | | | | | |
|---|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Rock Description | Moderately weak greenish grey (5GY 4/1) MUDSTONE | | | | Depth m | 5.70 |
| Specimen Reference | IS | Specimen Depth | 5.70 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak greenish grey (5GY 4/1) MUDSTONE | | | | KeyLAB ID | BH0120230227293 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

## Split Sample

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR13 |
| Rock Description | Moderately weak dark greenish grey (5Gy 4/1) SANDSTONE | | | | Depth m | 14.75 |
| Specimen Reference | Q1 | Specimen Depth | 14.75 | m | Sample Type | Q1 |
| Specimen Rock Type | Moderately weak dark greenish grey (5Gy 4/1) SANDSTONE | | | | KeyLAB ID | BH0120230227325 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

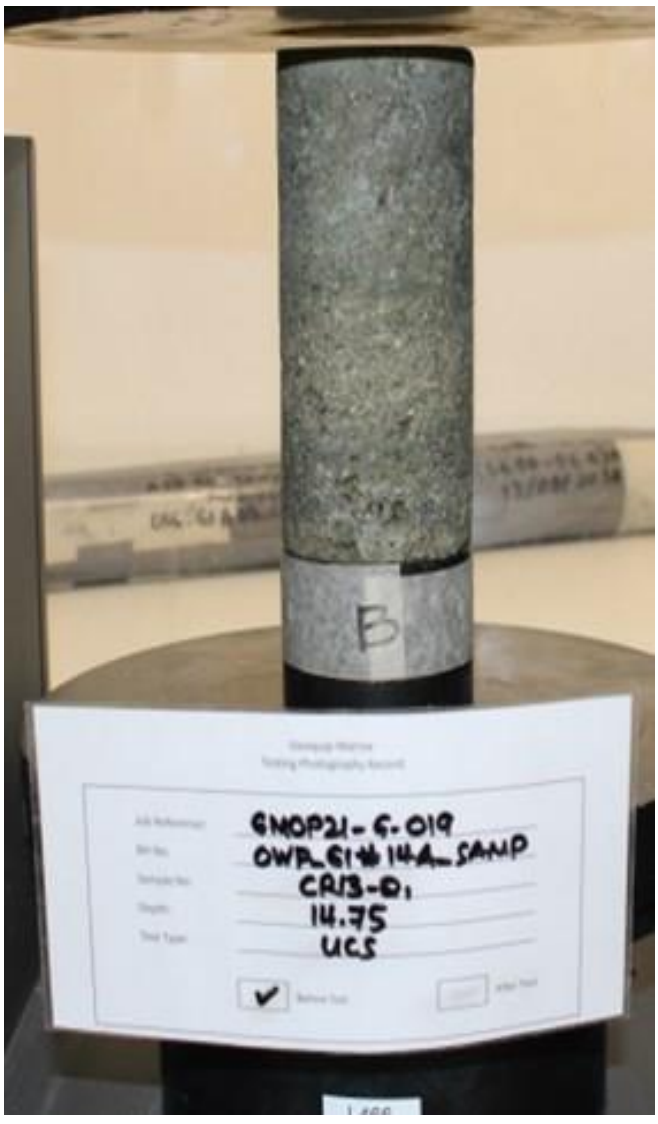
| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 174.65 | mm |
| Diameter, D | 78.87 | mm |
| L/D | 2.21 | * outside specification for ISRM |
| Bulk density | 2.31 | $Mg/m^3$ |
| Dry density | 2.17 | $Mg/m^3$ |
| Moisture Content | 6.3 | % |
| Mode of failure | Axial cleavage | |
| Remarks : | | |

| | | |
|---|---|---|
| Rate of loading | 17.6 | kN/min |
| Equivalent stress rate | 0.06004 | MPa/s |
| Duration of test | 294.8 | seconds |
| Maximum Axial Load | 88.7 | kN |
| Uniaxial Compressive Strength, UCS | 18.20 | MPa |

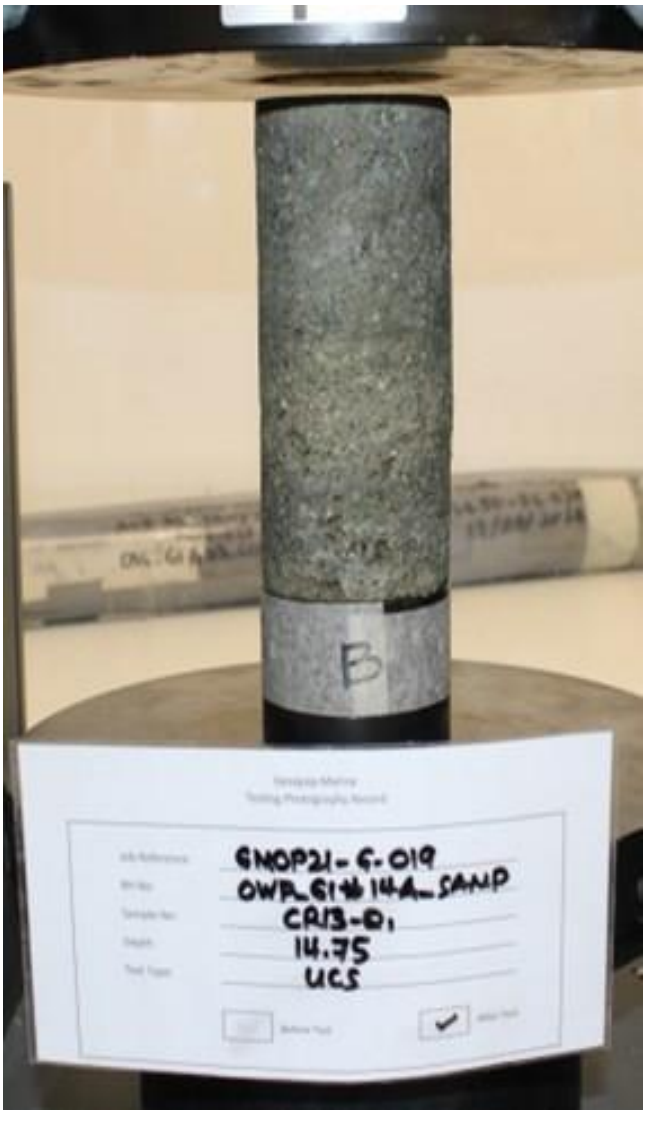
| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 10:08 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR13 |
| Rock Description | Moderately weak dark greenish grey (5Gy 4/1) SANDSTONE | | | | Depth m | 14.75 |
| Specimen Reference | Q1 | Specimen Depth | 14.75 | m | Sample Type | Q1 |
| Specimen Rock Type | Moderately weak dark greenish grey (5Gy 4/1) SANDSTONE | | | | KeyLAB ID | BH0120230227325 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

Before Test




After Test




Sample may have been rotated to highlight failures

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole/Pit No. | OWF_GI#14A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR13 |
| Rock Description | Moderately weak dark greenish grey (5Gy 4/1) SANDSTONE | | | Depth m | 14.75 |
| Specimen Reference | Q1 | Specimen Depth | 14.75 m | Sample Type | Q1 |
| Specimen Rock Type | Moderately weak dark greenish grey (5Gy 4/1) SANDSTONE | | | KeyLAB ID | BH0120230227325 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 17/03/2023 |

## Split Sample

| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Rock Description | Weak greenish grey (5Gy 5/1) MUDSTONE | | | | Depth m | 6.50 |
| Specimen Reference | IS | Specimen Depth | 6.50 | m | Sample Type | IS |
| Specimen Rock Type | Weak greenish grey (5Gy 5/1) MUDSTONE | | | | KeyLAB ID | BH012023030723 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

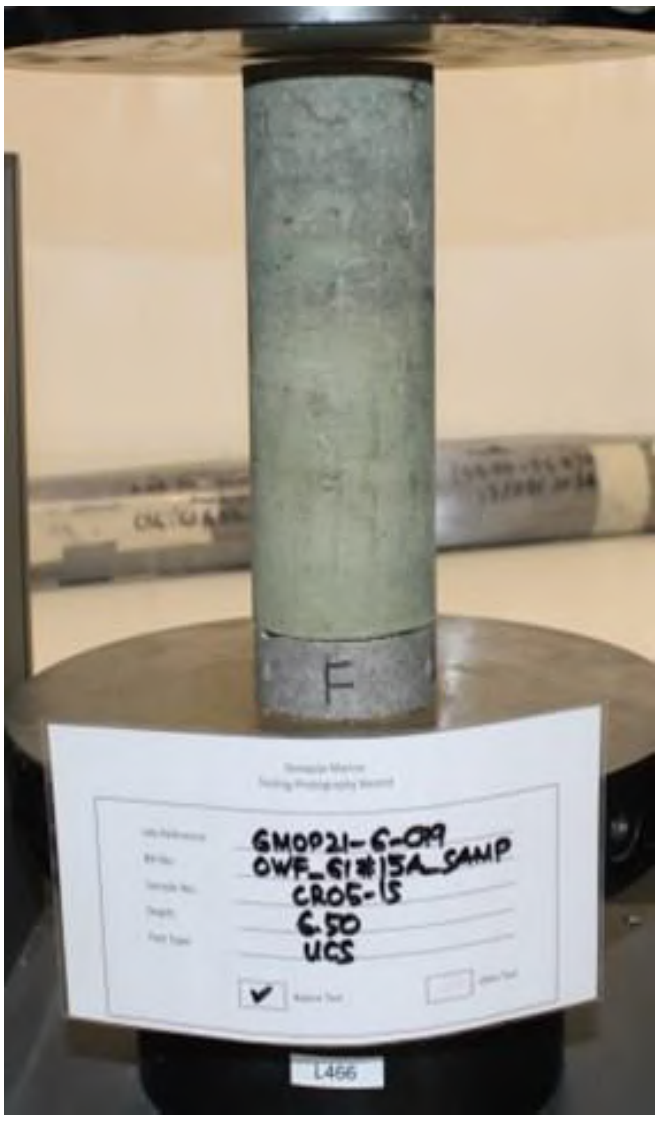
| | | |
|---|---|---|
| Orientation of loading to bedding planes | Random | |
| Condition for test | as received | |
| Length, L | 209.40 | mm |
| Diameter, D | 80.52 | mm |
| L/D | 2.60 | |
| Bulk density | 2.50 | $Mg/m^3$ |
| Dry density | 2.38 | $Mg/m^3$ |
| Moisture Content | 4.9 | % |
| Mode of failure | Axial cleavage | |
| Remarks : | | |

| | | |
|---|---|---|
| Rate of loading | 18.4 | kN/min |
| Equivalent stress rate | 0.06022 | MPa/s |
| Duration of test | 103 | seconds |
| Maximum Axial Load | 34.4 | kN |
| Uniaxial Compressive Strength, UCS | 6.76 | MPa |

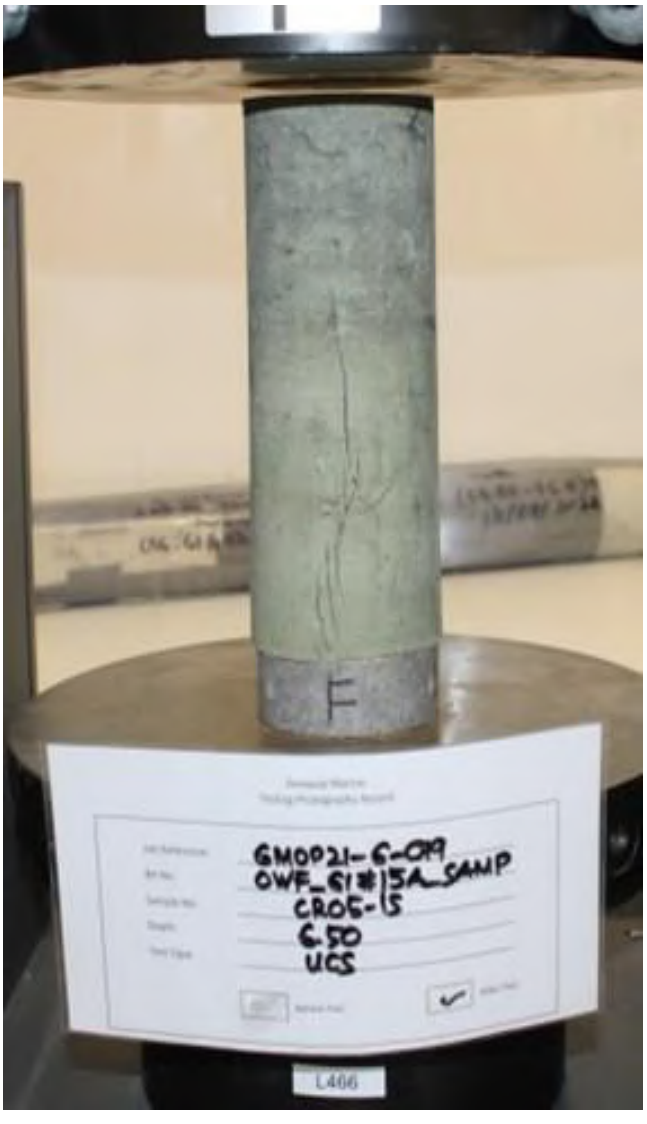
| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 10:14 |

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR05 |
| Rock Description | Weak greenish grey (5Gy 5/1) MUDSTONE | | | Depth m | 6.50 |
| Specimen Reference | IS | Specimen Depth | 6.50 m | Sample Type | IS |
| Specimen Rock Type | Weak greenish grey (5Gy 5/1) MUDSTONE | | | KeyLAB ID | BH012023030723 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 17/03/2023 |

Before Test



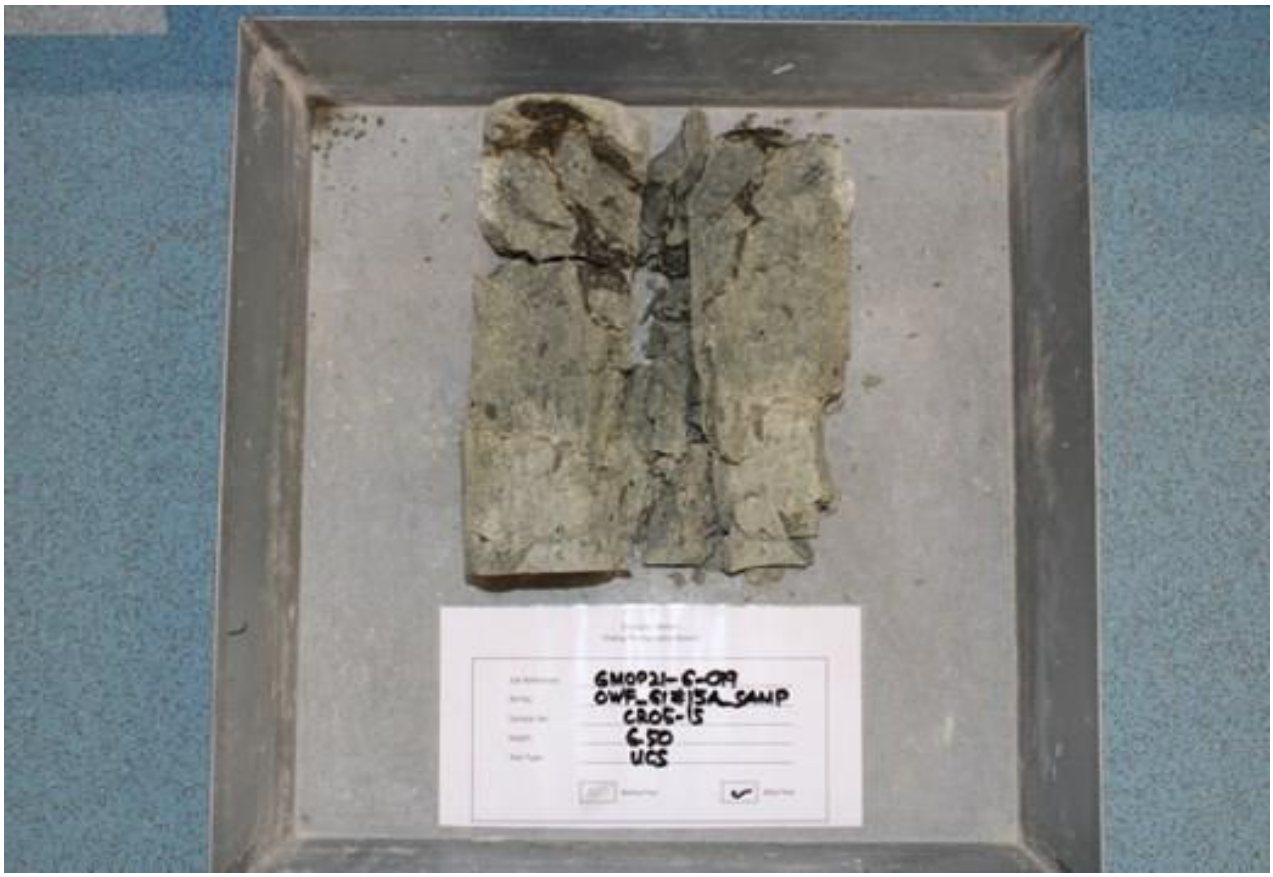

After Test




Sample may have been rotated to highlight failures

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#15A_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR05 |
| Rock Description | Weak greenish grey (5Gy 5/1) MUDSTONE | | | | Depth m | 6.50 |
| Specimen Reference | IS | Specimen Depth | 6.50 | m | Sample Type | IS |
| Specimen Rock Type | Weak greenish grey (5Gy 5/1) MUDSTONE | | | | KeyLAB ID | BH012023030723 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

## Split Sample



| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR09 |
| Rock Description | Moderately weak pale brown (2.5y 7/3) SANDSTONE | | | | Depth m | 12.70 |
| Specimen Reference | IS | Specimen Depth | 12.70 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak pale brown (2.5y 7/3) SANDSTONE | | | | KeyLAB ID | BH0120230227359 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

| | |
|---|---|
| Orientation of loading to bedding planes | Random |
| Condition for test | as received |

| | | |
|---|---|---|
| Length, L | 209.73 | mm |
| Diameter, D | 77.44 | mm |
| L/D | 2.71 | |

| | | |
|---|---|---|
| Bulk density | 2.44 | $Mg/m^3$ |
| Dry density | 2.36 | $Mg/m^3$ |
| Moisture Content | 3.6 | % |

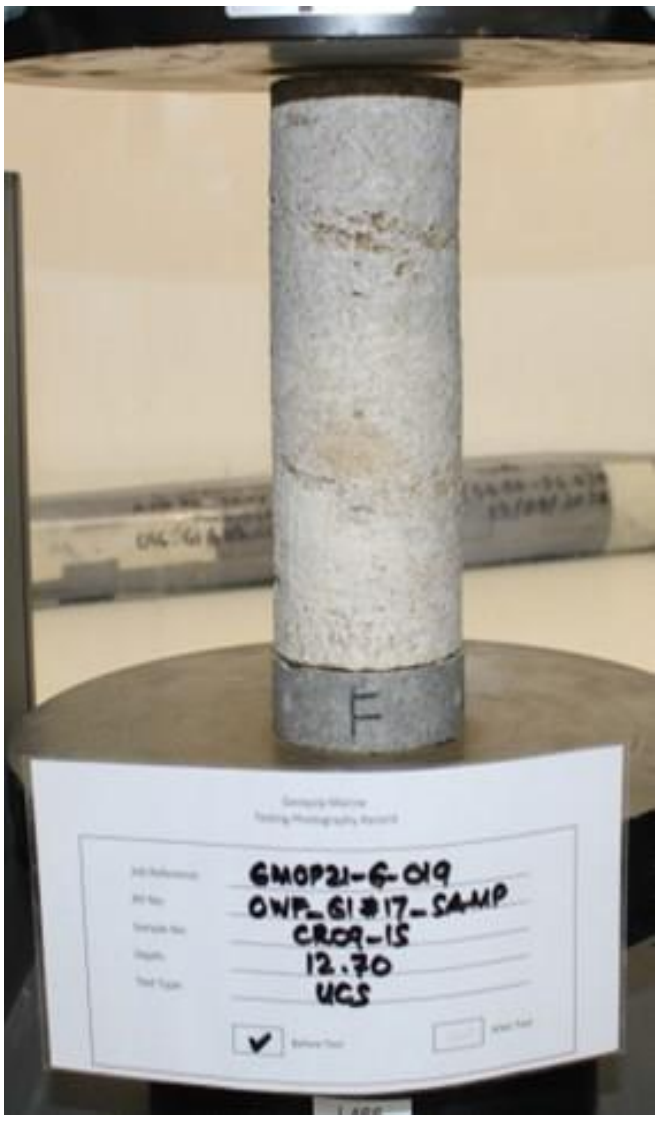
| | |
|---|---|
| Mode of failure | fragmented |
| Remarks : | |

| | | |
|---|---|---|
| Rate of loading | 11.3 | kN/min |
| Equivalent stress rate | 0.03999 | MPa/s |
| Duration of test | 372.4 | seconds |
| Maximum Axial Load | 72.0 | kN |
| Uniaxial Compressive Strength, UCS | 15.30 | MPa |

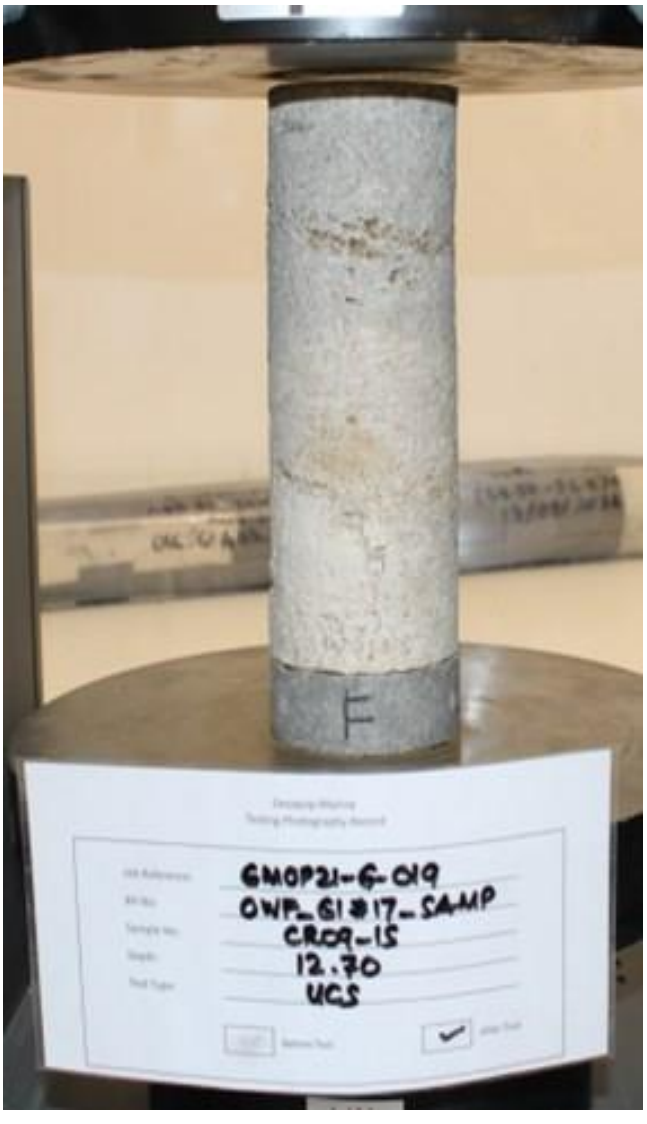
| Test technician | Approved by | Date printed |
|---|---|---|
| S Ocio | D.Smith | 04/04/2023 10:56 |

| GEOQUIPMARINE | Uniaxial Compressive Strength and Deformability of Rock | | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|---|
| | | | | | Borehole/Pit No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | | Sample No. | CR09 |
| Rock Description | Moderately weak pale brown (2.5y 7/3) SANDSTONE | | | | Depth m | 12.70 |
| Specimen Reference | IS | Specimen Depth | 12.70 | m | Sample Type | IS |
| Specimen Rock Type | Moderately weak pale brown (2.5y 7/3) SANDSTONE | | | | KeyLAB ID | BH0120230227359 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | | Date of test | 17/03/2023 |

Before Test



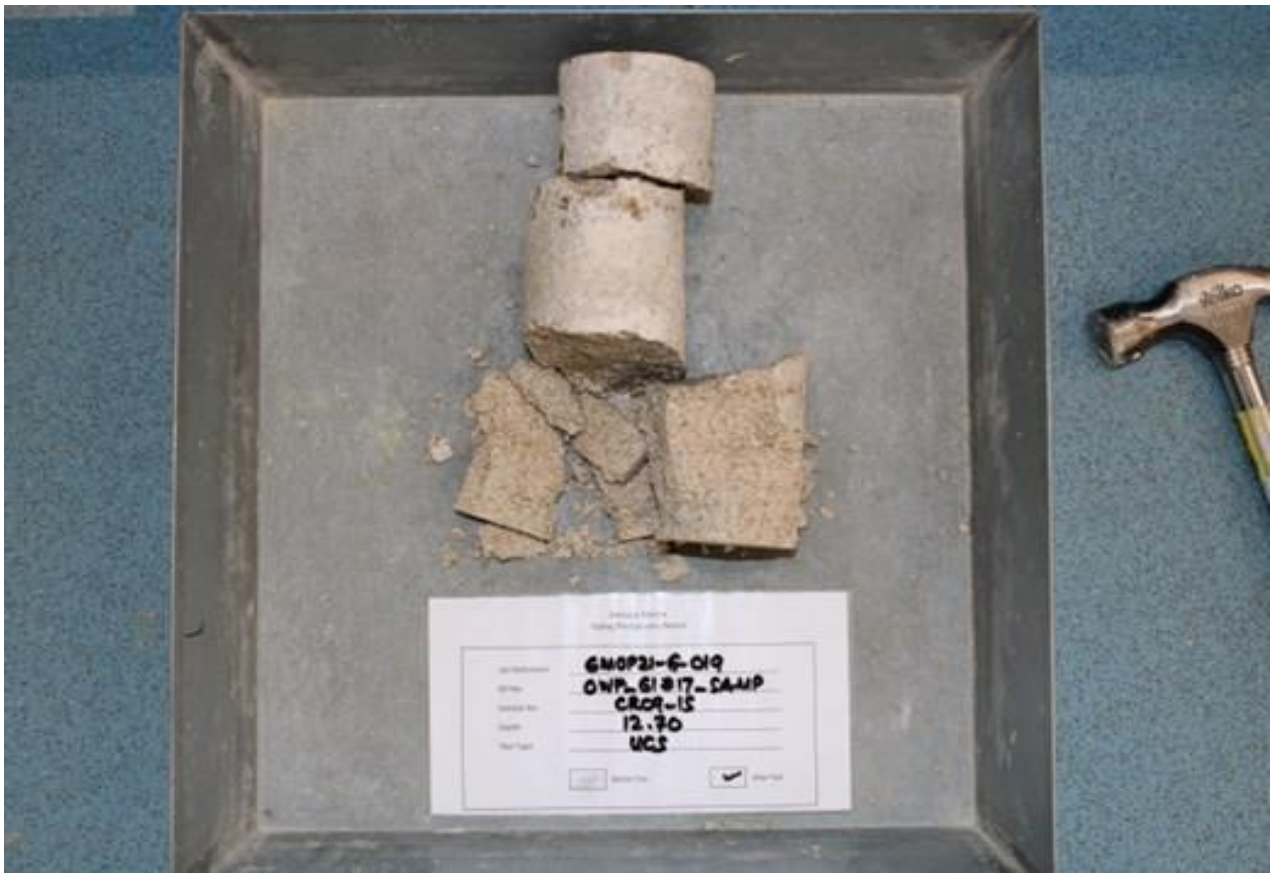

After Test




Sample may have been rotated to highlight failures

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | **Uniaxial Compressive Strength and Deformability of Rock** | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole/Pit No. | OWF_GI#17_SAMP |
| Site Name | A05 Bretagne Offshore GI | | | Sample No. | CR09 |
| Rock Description | Moderately weak pale brown (2.5y 7/3) SANDSTONE | | | Depth m | 12.70 |
| Specimen Reference | IS | Specimen Depth | 12.70 m | Sample Type | IS |
| Specimen Rock Type | Moderately weak pale brown (2.5y 7/3) SANDSTONE | | | KeyLAB ID | BH0120230227359 |
| Test Method | ISRM, Suggested Methods for Rock Characterization Testing and Monitoring, 2007 | | | Date of test | 17/03/2023 |

## Split Sample



# Unconsolidated Undrained Triaxial Test (ISO 17892-8:2018)

| | | | | | |
|---|---|---|---|---|---|
| GEOQUIPMARINE | | | | Job Ref | GMOP21-G-019 |
| | | | | Borehole No. | OWF_GI#05A_SAMP |
| Project Name | A05 Bretagne Offshore GI | | | Sample No. | CR05 |
| Soil Description | Dark grey sandy CLAY | | | Depth | 4.70 |
| Sample Reference | CR05 | Specimen Depth | 4.70 m | Sample Type | Q1 |
| Specimen Description | Very high strength 7.5YR (4/1) dark grey, sandy, CLAY | | | Unique ID | BH0120230227115 |
| Test Method | ISO 17982-8 | | | Date of test | 03/04/2023 |

**Initial Specimen Details**

| | | |
|---|---|---|
| Test Number | 1 | |
| Length | 140.1 | mm |
| Diameter | 69.7 | mm |
| Bulk Density | 1.90 | $Mg/m^3$ |
| Initial Moisture Content | 29.7 | % |
| Dry Density | 1.46 | $Mg/m^3$ |

**Test Details**

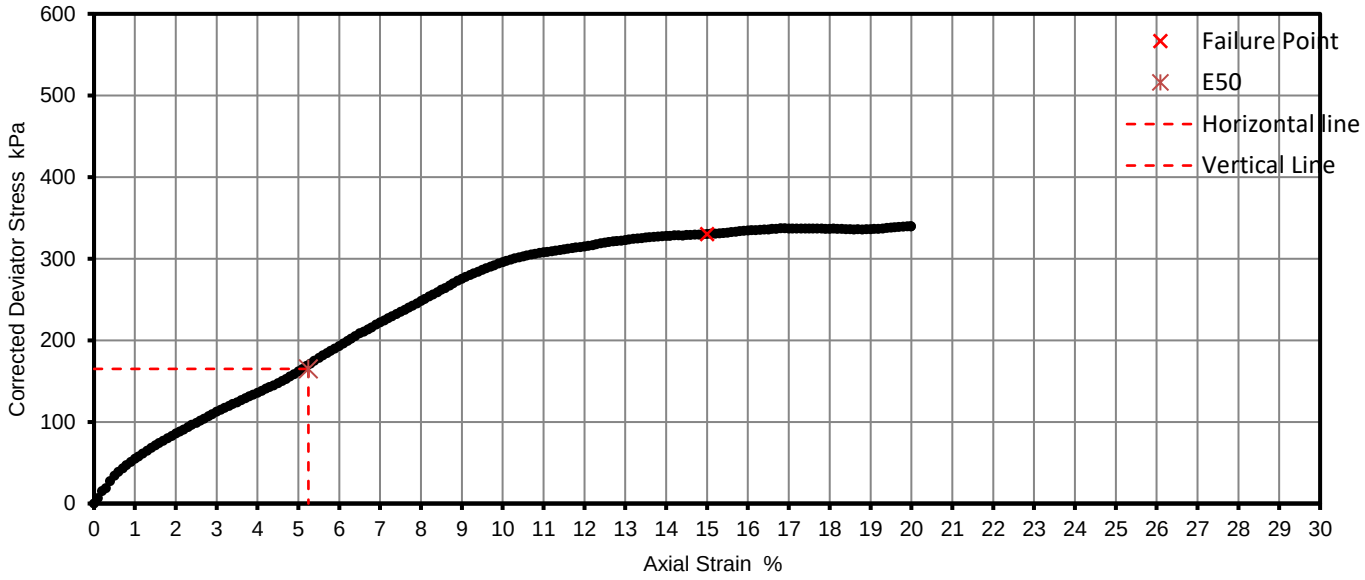
| | | |
|---|---|---|
| Rate of Strain | 0.7 | %/min |
| Cell Pressure | 1085 | kPa |
| Final Moisture Content | 29.9 | % |
| Sample condition | UNDISTURBED | |

**At Failure Details**

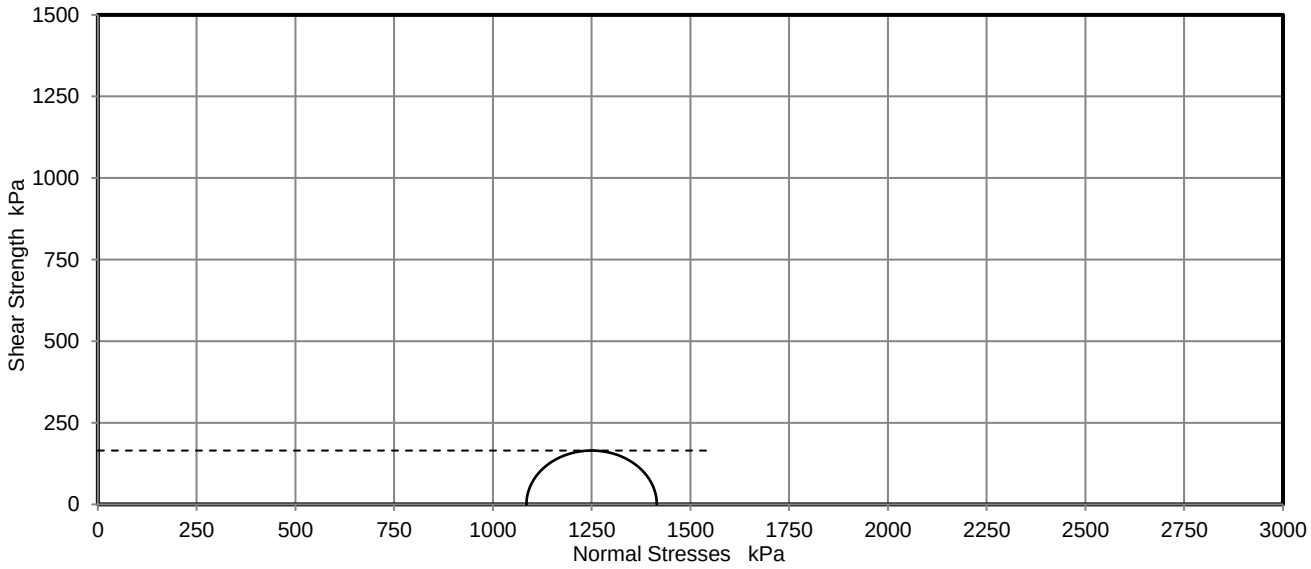
| | | |
|---|---|---|
| Axial Strain | 15.0 | % |
| Deviator Stress, $(\sigma_1 - \sigma_3)_f$ | 330 | kPa |

| | | |
|---|---|---|
| Epsilon 50 | 5.246 | % |
| Undrained Shear Strength, $c_u$ | 165 | kPa |
| Mode of Failure | Compound | |

**Deviator Stress v Axial Strain**




**Mohr Circles**




**Remarks**

| Approved | Printed | Test technician |
|---|---|---|
| D.Smith | 25/05/2023 13:10 | E Allan.Edward |

Lab Sheet Reference : GM-L-TS-35

| GEOQUIPMARINE | Unconsolidated Undrained Remoulded Triaxial Test (ISO 17892-8:2018) | | | Job Ref | GMOP21-G-019 |
|---|---|---|---|---|---|
| | | | | Borehole No. | OWF_GI#05A_SAMP |
| Project Name | A05 Bretagne Offshore GI | | | Sample No. | CR05 |
| Soil Description | Dark grey sandy CLAY | | | Depth | 4.70 |
| Sample Reference | CR05 | Specimen Depth | 4.70 m | Sample Type | Q1 |
| Specimen Description | High strength 7.5YR (4/1)dark grey low sensitivity sandy CLAY | | | Unique ID | BH0120230227115 |
| Test Method | ISO 17982-8 | | | Date of test | 03/04/2023 |

**Initial Specimen Details**

| | | |
|---|---|---|
| Test Number | 1 | |
| Length | 100.0 | mm |
| Diameter | 50.0 | mm |
| Bulk Density | 1.90 | $Mg/m^3$ |
| Initial Moisture Content | 30.2 | % |
| Dry Density | 1.46 | $Mg/m^3$ |

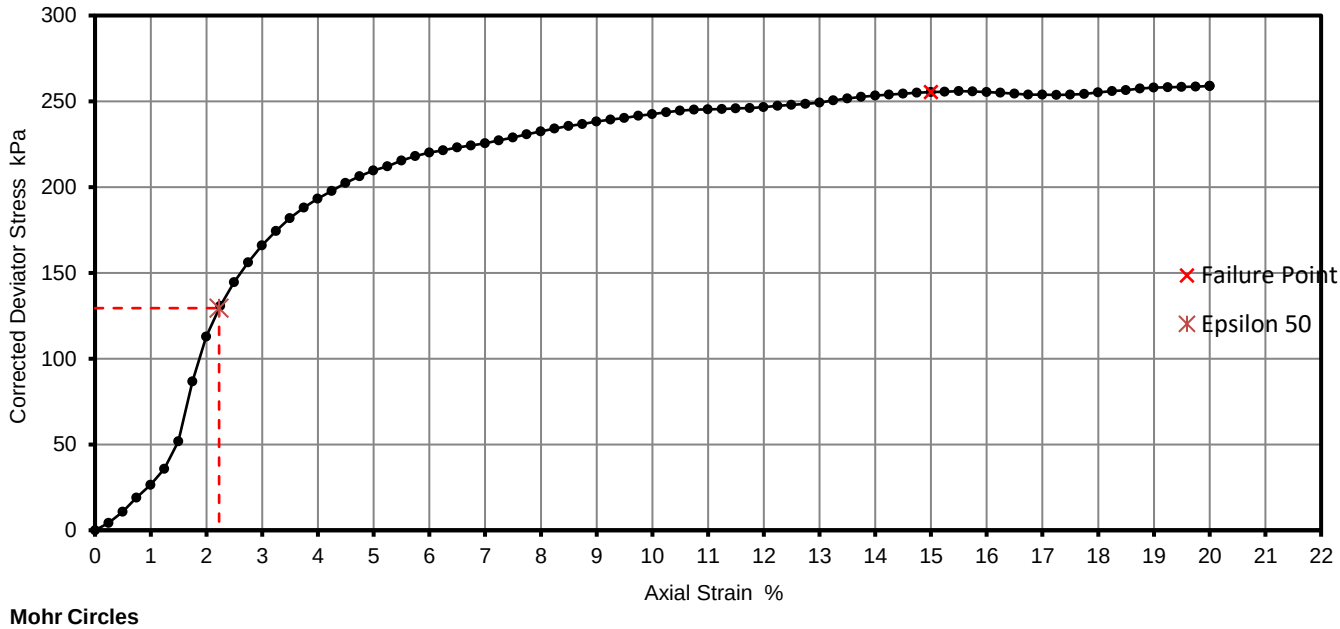
**At Failure Details**

| | | |
|---|---|---|
| Axial Strain | 15.0 | % |
| Deviator Stress, $(\sigma_1 - \sigma_3)_f$ | 255 | kPa |

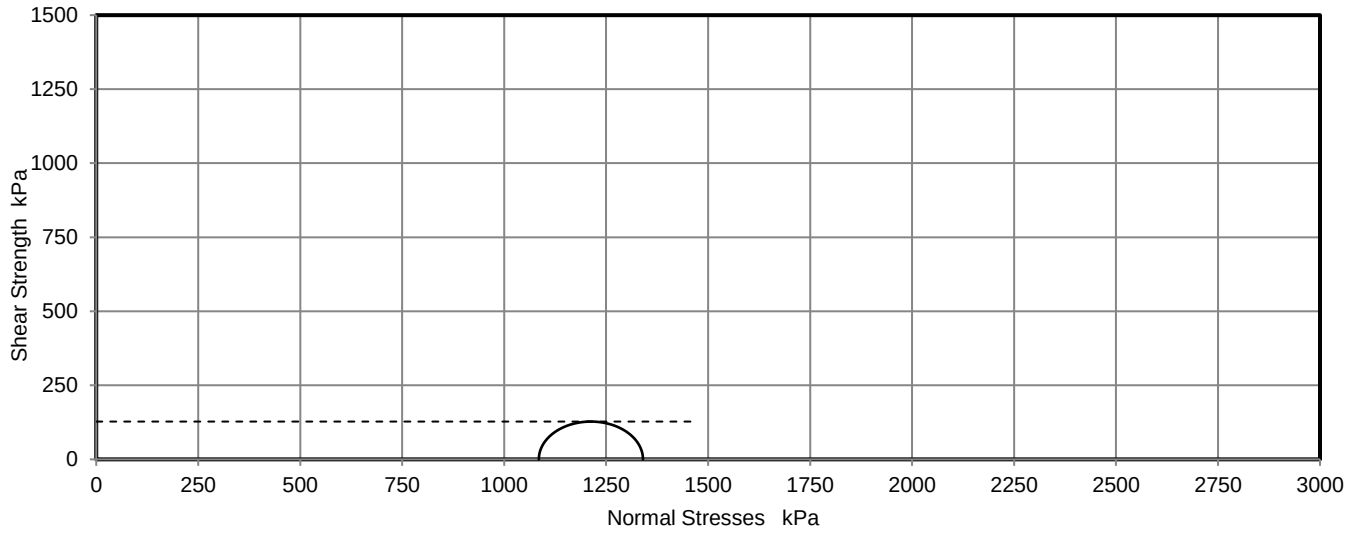
**Test Details**

| | | |
|---|---|---|
| Rate of Strain | 1.0 | %/min |
| Cell Pressure | 1085 | kPa |
| Final Moisture Content | 29.7 | % |
| Sample condition | REMOULDED | |
| Sensitivity | 1 | |
| Epsilon 50 | 2.23 | % |
| Undrained Shear Strength, $S_u$ | 129 | kPa |
| Mode of Failure | Plastic | |

**Deviator Stress v Axial Strain**




**Mohr Circles**




**Remarks**

| Approved | Printed | |
|---|---|---|
| D.Smith | 25/05/2023 13:11 | Test technician |
| | | E Allan.Edward |

Lab Sheet Reference : GM-L-TS-35

# APPENDIX C METHODOLOGIES AND PROCEDURES

## Appendix C.1 Soil Classification and Description Methodologies

**Overview**

In general, soil classifications and descriptions are based on the requirements as outlined by BS 5930, BS EN ISO 14688-1 and BS EN ISO 14688-2. Where classification or description terms are not covered by BS or ISO, they have been specified in the relevant sections below.

**Classification and Description**

Soil descriptions and classification are completed as per contractual requirements utilising the following standards:

- For primary, secondary and tertiary fractions:
    - BS 5930 – Code of practice for ground investigation
    - BS EN ISO 14688-1 – Identification and description
    - BS EN ISO 14688-2 – Principles for a classification

**Strength Descriptions**

Undrained Shear Strength descriptors are summarised in the following table (after ISO 14688-2):

| Term | Undrained shear strength $s_u$, kPa |
|---|---|
| Extremely Low | <10 |
| Very Low | 10-20 |
| Low | 20-40 |
| Medium | 40-75 |
| High | 75-150 |
| Very High | 150-300 |

Where undrained shear strengths of cohesive materials cannot be measured, a consistency based on hand manipulation can be applied (after BS EN ISO 14688-1):

| Term | Field Assessment |
|---|---|
| Very Soft | Finger can be easily pushed in up to 25 mm.<br>Soil exudes between the fingers when squeezed in the hand. |
| Soft | Finger can be pushed in up to 10 mm.<br>Soil can be moulded by light finger pressure. |
| Firm | Thumb makes an impression easily.<br>Soil cannot be moulded by fingers but rolls in the hand to 3 mm thick threads without breaking or crumbling. |
| Stiff | Soil can be indented slightly by thumb.<br>Soil crumbles and breaks when rolling to 3 mm thick threads but is still sufficiently moist to be moulded to a lump again. |
| Very stiff | Soil can be indented by thumb nail.<br>Soil cannot be moulded but crumbles under pressure.<br>Many desiccated soils fall in this class. |

Relative Density Descriptions are based on the following table (after Lunne and Christoffersen, 1983):

| Term | Relative Density (%) |
|---|---|
| Very loose | 0 to 15 |
| Loose | 15 to 35 |
| Medium dense | 35 to 65 |
| Dense | 65 to 85 |
| Very dense | 85 to 100 |

**Tertiary constituents fraction**

The following descriptions for tertiary fraction are used and were adopted for the terms from BS 5930.

| Term | Percentage |
|---|---|
| with rare | <5 |
| with occasional | 5 – 20 |
| with frequent | >20 |

**Bedding Thicknesses**

Bedding thicknesses are described on the following (after BS EN ISO 14688-1):

| Term | Thickness of bedding (mm) |
|---|---|
| Thinly laminated | <6 |
| Thickly laminated | 6 to 20 |
| Very thinly bedded | 20 to 60 |
| Thinly bedded | 60 to 200 |
| Medium bedded | 200 to 600 |
| Thickly bedded | 600 to 2000 |
| Very thickly bedded | >2000 |

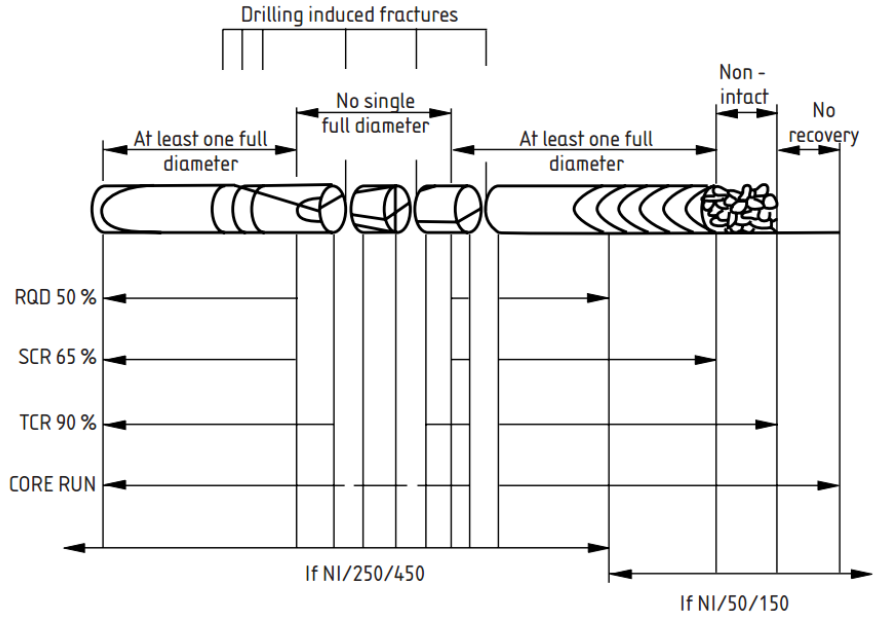
**Particle Size Distribution – Fractions**

The description of particle sizes is described (after ISO 14688-1) as follows:

| Soil Group | Particle Size Fractions | Range of Particle Sizes (mm) |
|---|---|---|
| Coarse Soil | Coarse Gravel | 20 – 63 |
| | Medium Gravel | 6.3 – 20 |
| | Fine Gravel | 2 – 6.3 |
| | Coarse Sand | 0.63 – 2 |
| | Medium Sand | 0.2 – 0.63 |
| | Fine Sand | 0.063 – 0.2 |
| Fine Soil | Silt | 0.002 – 0.063 |
| | Clay | < 0.002 |

**Fracture State**

Fracture state of the rock core is described as below based on BS EN ISO 22475-1:2006.




NOTE All features shown are natural discontinuities unless stated otherwise.

**Total Core Recovery (TCR)**

Total Core Recovery (TCR) is defined as the total length of the core recovered (solid and non-intact), expressed as a percentage of the length of the core run.

$$TCR = \left(\frac{Sum\ of\ core\ recovered}{Sum\ of\ the\ total\ core\ run}\right) \times 100\%$$

**Solid Core Recovery (SCR)**

Solid Core Recovery (SCR) is defined as the length of the core recovered as solid cylinders at full diameter, expresses as a percentage of the length of the core run.

$$SCR = \left(\frac{Sum\ of\ soild\ core\ pieces\ (of\ full\ diameter)}{Sum\ of\ the\ total\ core\ run}\right) \times 100\%$$

**Rock Quality Designation (RQD)**

Rock Quality Designation (RQD) is defined as the sum of length of core pieces of a full diameter greater than 100mm between natural fractures, measured along the centre line of the core, expressed as a percentage of the length of the core run.

$$RQD = \left(\frac{Sum\ of\ length\ of\ core\ pieces > 100mm}{Sum\ of\ the\ total\ core\ run}\right) \times 100\%$$

From the RQD the rock mass can then be classified as follows:

| RQD | Rock Mass Quality |
|---|---|
| <25% | Very Poor |
| 25-50% | Poor |
| 51-75% | Fair |
| 76-90% | Good |
| 91-100% | Excellent |

**Core Description to BS 5930 and BS EN ISO 14689**

Reference should be made to BS5930 and BS EN ISO 14689 for guidance on rock description.

- Strength of the rock (Based on Point load tests or Rock Hammer test)
- Structure and fabric of the rock (Bedding, Laminations, Foliations)
- Colour (Munsell Colour Charts - Rock)
- Weathering classification (use of terms weathered/unweathered)
- Grain size
- Rock classification (Rock Type – e.g. Sandstone, Shale, Marble)
- Minor constituents (Shells, Pyrite, Crystals, organics)
- Weathering of the whole rock
- Spacing (Bedding and discontinuities)
- Weathering description
- Dip/dip direction and spacing of discontinuities
- Roughness of discontinuities
- Discontinuity Infill

**Strength Classification**

The table below shows how the hammer test can be related to the unconfined compressive strength of the rock in accordance with BS 5930 and BS EN ISO 14689.

| Term | Field Identification | Unconfined compressive strength (MPa) |
|---|---|---|
| Extremely weak[a] | Indented by thumbnail | 0.6 to 1 |
| Very weak | Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife | 1 to 5 |
| Weak | Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer | 5 to 12.5 |
| Moderately Weak | Can be scratched with difficulty by pocket knife, specimen can be broken with single firm blow of geological hammer | 12.5 to 25 |
| Medium Strong | Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer | 25 to 50 |
| Strong | Specimen requires more than one blow of geological hammer to fracture it | 50 to 100 |
| Very Strong | Specimen requires many blows of geological hammer to fracture it | 100 to 250 |
| Extremely Strong | Specimen can only be chipped with geological hammer | Greater than 250 |
| a – Some extremely weak rocks will behave as soils and should be described as soils according to BS EN ISO 14688 and BS 5930 | | |

**Structure and Fabric**

| Sedimentary | Metamorphic | Igneous |
|---|---|---|
| Bedded<br>Interbedded<br>Laminated<br>Folded<br>Massive<br>Graded | Cleaved<br>Foliated<br>Schistose<br>Banded<br>Lineated<br>Gneissose<br>Folded | Massive<br>Flowbanded<br>Folded<br>Lineated |

Thickness of bedding units or other foliations shall be measured in millimetres and can be classified as below.

| Term | Thickness (mm) |
|---|---|
| Very Thickly | > 2000 |
| Thickly | 600 – 2000 |
| Medium | 200 – 600 |
| Thinly | 60 – 200 |
| Very Thinly | 20 – 60 |
| Thickly Laminated (Sedimentary) Narrowly (Metamorphic and Igneous) | 6 – 20 |
| Thinly Laminated (Sedimentary) Very narrowly (Metamorphic and Igneous) | < 6 |

**Weathering**

| Term | Description |
|---|---|
| Fresh | No visible sign of weathering/alteration of the rock |
| Discoloured | The colour of the original fresh rock is changed and is evidence of weathering/alteration. The degree of change from the original colour should be indicated. If the colour changes is confirmed to particular mineral constituents, this should be mentioned |
| Disintegrated | The rock is broken up by physical weathering, so that bonding between grains is lost and the rock is weathered/altered towards the condition of a soil in which the original material fabric is still intact. The rock material is friable but the mineral grains are not decomposed |
| Decomposed | The rock is weathered by the chemical alteration of the mineral grains to the condition of a soil in which the original material fabric is still intact; some or all of the mineral grains are decomposed |

**Grain Size**

| Term | Size (mm) |
|---|---|
| Very Coarse Grained | > 63 |
| Coarse Grained | 2 to 63 |
| Medium Grained | 0.063 to 2 |
| Fine Grained | 0.002 to 0.063 mm |
| Very Fine Grained/Crypto-crystalline | < 0.002 mm |

**Rock Classification**

| Sedimentary rock type | | | | | | |
|---|---|---|---|---|---|---|
| Grain size | Siliceous | Biogenic | | Volcanic | Carbonaceous | Evaporities |
| | | Low porosity | Porous | | | |
| >20mm | Conglomerate | Limestone | Calcirudite | Agglomerate | | Halite |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6.3mm to 20mm | Breccia | Or Dolomite | | Volcanic Breccia | | Anhydrite Gypsum Travertine |
| 2mm to 6.3mm | | | | | | |
| 0.63mm to 2mm | Sandstone Greywacke | | Calcarenite | Tuff | | |
| 0.2mm to 0.63mm | | | | | | |
| 63µm to 200µm | | | | | | |
| 2µm to 63µm | Siltstone | | Calcisiltite Chalk* | Fine Tuff | Coal Lignite | |
| <2µm | Claystone Mudstone | | Calcilutite | Very fine Tuff | | |
| Crypto-crystalline | Flint Chert | | | | | |

| **Igneous rock type** | | | | **Metamorphic rock type** | |
|---|---|---|---|---|---|
| Grain size | Light coloured (acidic) | Varying light to dark coloured | Dark coloured (basic) | Foliated | Other |
| Coarse >5mm | Granite | Diorite | Gabbro | Gneiss | Marble |
| Medium 1mm to 5mm | Micro-granite | Micro-diorite | Dolerite | Schist | Quartzite |
| Fine 0.5mm to 1mm | Rhyolite | Andesite | Basalt | Slate | Hornfels |
| Crypto-crystalline <0.5mm | | Volcanic glass/obsidian | | | |

**Discontinuities**

The following table briefly outlines on the indications of either natural or drilling induced discontinuities.

| Natural Discontinuities | Drilling/Mechanical induced Discontinuities |
|---|---|
| Joints are often not fresh | Fresh looking surface could indicate artificial break |
| Joints are often stained or have some type of coating or fill | Break perpendicular to the core axis could be an indication of an artificial break |
| Joints separate solid (intact) core pieces and exhibit no tensile strength | Rough surface could indicate artificial break |
| The edges of a joint usually do not match back together as seamlessly as a mechanical break | No coating or in fill could indicate artificial break |
| Low angle breaks are more likely to be joints than mechanical breaks | Spin marks from the drilling process |

Discontinuities are breaks, fractures or planes of weakness in the rock mass and include the following:

| Type of discontinuity | Description |
|---|---|
| Joint | A discontinuity in the body of rock along which there has been no visible displacement. |
| Fault | A fracture or fracture zone along which there has been recognisable displacement. |
| Bedding fracture | A fracture along the bedding. |
| Cleavage fracture | A fracture along cleavage. (cleavage is a set of parallel planes of weakness often associated with mineral realignment). |
| Induced fracture | A discontinuity of non-geological origin, e.g. brought about by coring, blasting, ripping etc. |

**Spacing & Thickness**

The spacing and thickness of discontinuities needs to be assessed. Tables below provides details regarding the spacing and thickness of discontinuities.

| Term | Thickness (mm) |
|---|---|
| Thinly laminated | Less than 6 |
| Thickly laminated | 6 to 20 |
| Very thin | 20 to 60 |
| Medium | 60 to 200 |
| Medium | 200 to 600 |
| Thick | 600 to 2000 |
| Very thick | Greater than 2000 |

| Term | Spacing (mm) |
|---|---|
| Extremely close | Less than 20 |
| Very close | 20 to 60 |
| Close | 60 to 200 |
| Medium | 200 to 600 |
| Wide | 600 to 2000 |
| Very wide | Greater than 2000 |

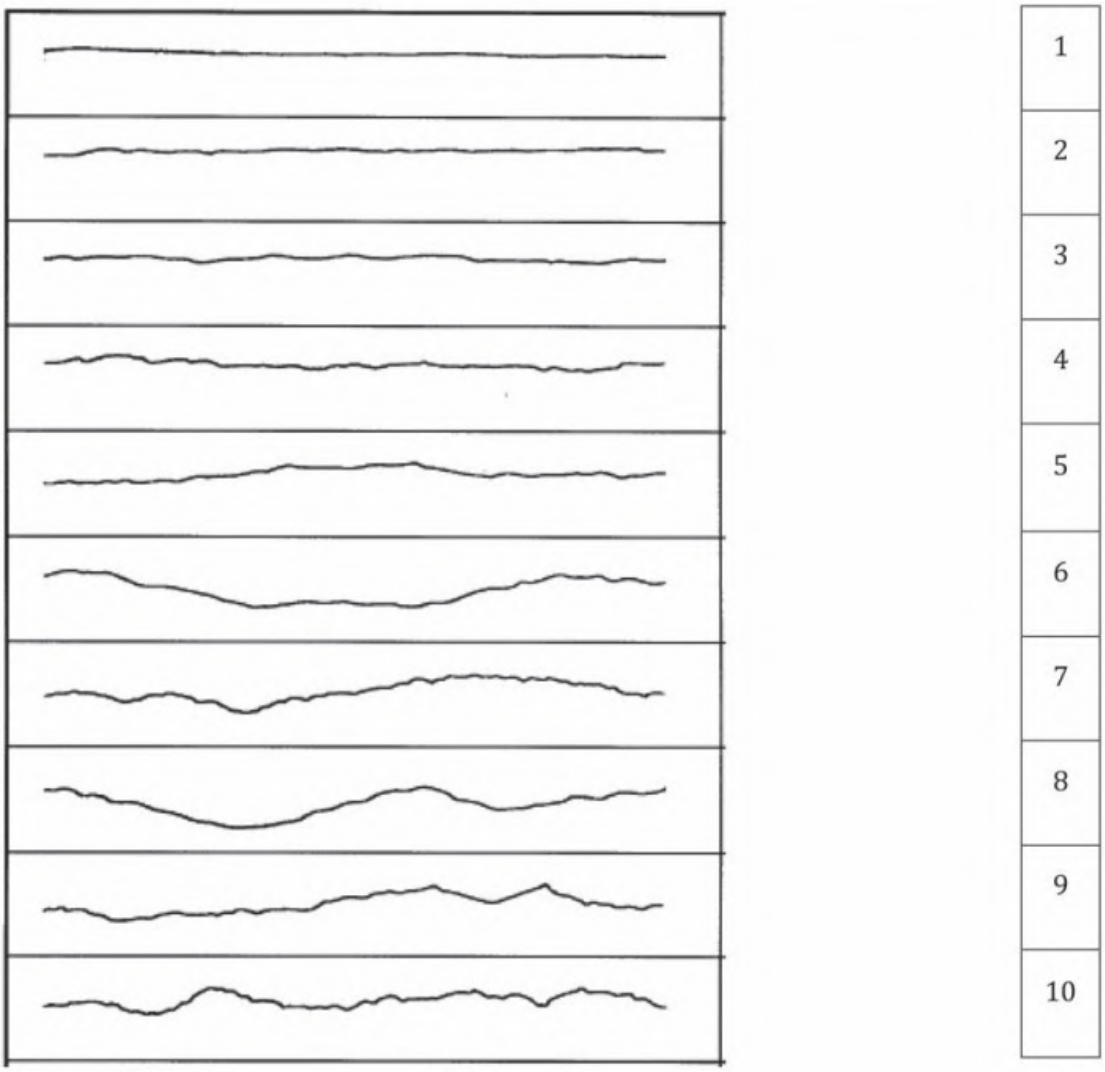
**Weathering along the Discontinuities**

If weathering is present along the discontinuities it needs to be describe as per the weathering section and included on the Log of Rock Core Sheet.

**Roughness**

The surface condition and the shape of discontinuities shall be described if possible on the basis of three scales of observation using the terms given in table below.

| Profiles number | Small scale of millimetres | Medium scale of centimetres | Large scale of meters |
|---|---|---|---|
| | Profile below = 10mm | Profile below = 100mm | Profile below = 1000mm |
| 1 to 3 | Striated (in direction of striae) | Planar | Straight |
| 4 to 7 | Smooth | Undulating | Curved |
| 8 to 10 | Rough | Stepped | Wavy |




Barton comb can be used, if available, in order to aid with the identification of the roughness of discontinuities.

**Wall Strength**

If possible, a strength test to directly identify the strength of the discontinuity should be undertaken. This needs to be undertaken in the event when discontinuity has a different strength than rock material. The hammer test may be conducted in order to determined different strength.

**Infilling**

If present the infilling material between discontinuity needs to be identified and described (e.g. soil, minerals such as calcite, quartz, epidote, chlorite). The shear strength of the infilling and the potential for infilling to swell or dissolve if applicable needs to determined.

## Appendix C.3 Offshore Laboratory Testing Methodologies

**Overview**

The following excerpts are from GEOQUIP procedure GM-MSP-OI-5-3-3 Offshore Sample Handling, Soil Description & Laboratory Testing.

**Water Content**

Moisture content tests were carried soon after recovery on samples recovered in the field.

The water content is the ratio between mass of water and mass of solids of soil.

$$w = \frac{M_w}{M_s}$$

where:

$w$ = Water content

$M_w$ = Mass of water

$M_s$ = Mass of solids

The water content tests were performed according with BS EN ISO 17892-1. This test consists of a measurement of the weight of the sample before and after drying in an oven. The sample is placed in an oven at a temperature of 105°c (± 5°c) for at least 16 hours. The measurements of weight should consider the weight of the tares.

**Density**

Bulk (or wet) and dry density test are determined on appropriate extruded samples in the field. Densities are calculated in accordance with BS EN ISO 17892-2.

The bulk (or wet) density is the ratio between the total mass and the total volume.

$$\rho_m = \frac{M_t}{V}$$

where:

$\rho_m$ = Bulk density of soil

$M_t$ = Total mass of soil sample (wet)

$V$ = Mass volume of soil sample

The dry density was then calculated, drying the sample following the procedure, or it was calculated following the next equation based on the total density and the water content.

$$\rho_d = \frac{\rho_m}{(1 + w/100)}$$

where:

$\rho_d$ = Dry density of soil

**Torvane**

This test is most accurately performed on cohesive soils up to 75kPa. Although the small vane adapter will allow you to exceed this and perform tests up to 225kPa, care and judgement must be used by the Geotechnical Engineer, and they must be confident that the test is representative of the soil. The results of shear strength measurements taken with a torvane should only be used as a guide to the soil's strength. The test can be susceptible to inaccuracy in cohesive soils with pockets of sand or shells. It is recommended to carry out several torvane tests in one undisturbed sample.

The following outlines the method for yielding undrained shear strength results from torvanes:

- Select an area of the undisturbed sample and cut a face parallel to the ends of the core

- Select the vane size based on soil characteristics. Small vane diameter for high strength soil and large vane diameter for low strength soil type
- Attach vane head to instrument body
- Ensure dial gauge reads zero
- Place vane on the 'undisturbed' flat soil surface and push into soil until vanes penetrate specimen. i.e. back of the vane head is flush with surface of soil
- Supporting the soil sample, rotate the instrument head at a smooth constant rate until shearing occurs. Remember to keep pressure applied to the torvane at all times and rotate the instrument in one movement (not too fast)
- Remove the torvane from the specimen and record dial gauge reading from the head of the torvane
- Record results on Soil Sample Data Sheets
- The shear strength of a specimen is determined from the conversion charts corresponding to the dial reading and vane size

**Pocket Penetrometer**

This test is most accurately performed on cohesive soils from 50 to 850kPa. The results of shear strength measurements taken with a pocket penetrometer should only be used as a guide to the soil's shear strength. This test is inaccurate in the shear strength range 0 to 50kPa and greater than 850kPa, at which point the soil can essentially be considered to have become rock. The test can be susceptible to inaccuracies in cohesive soils with pockets of sand or shells. It is recommended to carry out a number of pocket penetrometer tests in one undisturbed sample.

The following outlines the method for yielding undrained shear strength results from pocket penetrometers:

- Select an area of the undisturbed sample and cut a flat face parallel to the core specimen ends
- Select penetrometer head size based on soil characteristics. Small head for high strength soil and normal head for lower strength soil types
- Ensuring the penetrometer scale reads zero, push the instrument at a constant rate into the specimen until the head penetrates the soil up to marker on the style. Do not push to the end of the penetrating rod
- Observe reading on penetrometer scale and record. Note that the reading is taken from the underside of the indicator
- Record results on Soil Sample Data Sheets
- The shear strength of specimen is determined from conversion tables corresponding to penetrometer size and scale reading

**Miniature Laboratory Vane**

These tests are carried out on cohesive soils up to 75kPa. These were performed offshore on undisturbed samples in accordance with BS1377 Part 7.

The test is suitable for cohesive soils that are too soft or too sensitive for the preparation of good quality undisturbed specimens for use in UU triaxial shear strength tests. Always ensure that the spring set (4 in number) is in calibration period outlined in Geoquip Technical Procedure, "Field Laboratory Equipment Calibration", Ref GM-MSP-OI-5-3-13. Watch out for pockets and seams of silt or sand which should be looked for following extrusion and noted accordingly.

**Unconsolidated Undrained Triaxial Tests**

Undrained unconsolidated triaxial (UU) tests were conducted on cohesive soil samples above 20kPa to determine the undrained shear strength.

These were performed both offshore and onshore on undisturbed samples in accordance with BS EN ISO 17892-8. The selected specimens were trimmed so that the height to diameter ratio of 2 and then inserted into a latex membrane with a thickness of 0.38 mm. The samples were then placed into a triaxial cell and pressured with water back to near in situ conditions. An axial load is then applied to produce an axial strain rate of 2.0% per minute. The tests were run until the soil has failed or at least 20% axial strain.

## Appendix C.4 Sampling

Soil samples were obtained using conventional push tube sampling methodologies, based on GEOQUIP procedure GM-MSP-OI-5-2-9 Wireline Sampling & In Situ Testing and BS EN ISO 22475-1. Push sampling with or without using an internal piston arrangement was conducted in cohesive and non-cohesive formations.

The wireline push sampler is lowered into the drill string where it latches into the Bottom Hole Assembly (BHA). The attached sample tube was hydraulically pushed into the ground ahead of the drill bit to sample the soil. Before the push commences, the piston is located at the bottom of the sample tube preventing any ingress of drill cuttings and travels up the tube as it penetrates the ground minimising sample disturbance and maximising recovery. When the piston is not fitted the push sampler head has a hole which allows water to escape whilst penetrating the ground. After the test has completed the hole is then covered by a ball and held in place using a spring this is to prevent losing the sample when recovering the tool.

## Appendix C.5 Wireline Coring

Wireline coring can be used to recover samples where push and piston samplers and hammer sampling is deemed to be inappropriate, such as rock, highly over-consolidated clays and material with a high degree of cementation. Whilst coring sample is recovered whilst advancing the borehole. The operations were performed in accordance with Geoquip Procedure GM-MSP-OI-5-2-9 Wireline Sampling & In Situ Testing and ISO 22475-1.

The core barrel is either dropped or lowered with an overshot into the drill string where it latches into the Borehole Assembly (BHA). The borehole is then progressed with the core barrel in place with the driller reviewing rotation, torque, bit load and mud pressure, to safeguard sample to enter the core barrel rather than washing it away. It should be noted that whilst the driller will make every effort to recover sample due to ground conditions it may not always be successful.

On completion of a core run the barrel is recovered from the drill string using an overshot and returned to deck, where it is secured horizontally before the liner is removed.

## Appendix C.6 Cone Penetration Testing

**Overview**

In situ PCPT were performed in accordance with ISO 19901-8 (2014) using a WISON-APB wireline downhole tool with 1.5m and 3.0m stroke length tool configurations. This tool has a hydraulically controlled thrusting mechanism which pushes an instrumented cone on a rod into the soil. A data cable connects the cone to a surface acquisition computer.

To carry out a PCPT test, the hole is first drilled out to the required test depth, ensuring that all cuttings are flushed out of the hole by the drilling mud. The drill string is advanced to the required testing depth and clamped by the seabed frame to provide on bottom weight reaction for the test. At this point the first baseline reading is taken from the cone sensors at deck level. The WISON-APB tool is then lowered into the drill string on its combined hydraulic/data/lift cable until it latches into the bottom hole assembly (BHA) of the drill string. When the tool is correctly latched, the cone is just behind the drill bit at the bottom of the borehole.

At this point the second baseline reading is taken from the cone sensors, these are also known as the zero offsets before testing as the system zero's all the cone channels; cone resistance (qc), sleeve friction (fs) and pore water pressure (u2). The test is then started by activating the hydraulic flow from the topside power pack which pushes the cone into the soil at a constant (flow controlled) rate of 2cm/s. Data is continuously recorded and displayed in real time on the surface acquisition and control computer for all cone channels. At the end of the test the drill string is lifted to pull the cone rod free from the ground and so that the cone is at the same depth as the beginning of the test when the third baseline reading is taken. The tool is then recovered from the drill string and returned to the drill deck using the umbilical winch. Once safely back on deck the final baseline reading is taken. The baseline readings were checked after each test to ensure that the cone was stable and fell within the minimum allowable accuracies set in ISO 19901-8 (2014) for the testing soil type which is summarised in the following table.

| Application Class | |
|---|---|
| 1 | Intended for very soft to soft soil deposits. Class 1 penetration tests are normally not achievable for mixed bedded soil profiles with weak to strong layers (although predrilling through these layers can overcome the problem). Tests can only be performed as PCPT |
| 2 | Intended for precise evaluation for mixed bedded soil profiles with weak to strong layers, in terms of profiling and material identification. Interpretation in terms of soil parameters is also possible, with restriction to indicative use for the soft to weak layers. The test type should be PCPT |
| 3 | Intended for evaluation of mixed bedded soil profiles with soft to stiff clays and loose to dense sands, in terms of profiling and material identification. Interpretation in terms of soil parameters is appropriate for very stiff to hard clay and for dense to very dense sand layers. For stiff clays or silts and loose sands, only an indicative qualitative interpretation can be undertaken using data acquired under this application class. The test type should be PCPT but in some cases CPT may be acceptable |

| Application Class | Test Type | Measured parameter | Allowable min. accuracy [a] |
|---|---|---|---|
| 1 | PCPT | Cone resistance | 35 kPa or 5% |
| | | Sleeve friction | 5 kPa or 10% |
| | | Pore pressure | 10 kPa or 2% |
| 2 | CPT or PCPT | Cone resistance | 100 kPa or 5% |
| | | Sleeve friction | 15 kPa or 15% |
| | | Pore pressure [b] | 25 kPa or 3% |
| 3 | CPT or PCPT | Cone resistance | 200 kPa or 5% |
| | | Sleeve friction | 25 kPa or 15% |
| | | Pore pressure [b] | 50 kPa or 5% |

[a] Larger value of the two quoted. Percentage values apply to measured value and not measured range

[b] Pore pressure can only be measured if PCPT is used

**Derived Results – Net Cone Resistance**

The net cone resistance ($q_{net}$) is computed by correcting measured cone resistance ($q_c$) for pore water pressure effects on the net areas of the cone face and behind the shoulder of the cone (Lunne et al., 1997). Effects of overburden pressure are also removed to standardise the cone resistance as a function of depth.

The process for calculating $q_{net}$ from a test zeroed at the bottom of a borehole is:

$$q_t = q_c + (h \cdot \alpha \cdot \gamma_w) + (1 - \alpha) \cdot (u_2 + h \cdot \gamma_w)$$

which can be simplified to:

$$q_t = q_c + (1 - \alpha) \cdot u_2 + h \cdot \gamma_w$$

where:

$q_t$ = corrected cone resistance (for pore water pressure effects)

$q_c$ = measured cone resistance

$\alpha$ = net area ratio of cone

$u_2$ = measured pore pressure behind the cone tip

$h$ = depth (below seabed) at start of test

$\gamma_w$ = unit weight of water

then:

$$q_{net} = q_t - \sigma_{v0}$$

where:

$q_{net}$ = net cone resistance

$\sigma_{v0}$ = in situ vertical total stress (referenced to seabed)

**Derived Results – Friction Ratio**

The friction ratio ($R_f$) is the ratio of the sleeve friction divided by corrected cone resistance.

Therefore:

$$R_f = \frac{f_s}{q_t}$$

The ratio can be used for soil classification (Schmertmann, 1978). Sand typically gives a friction ratio of less than 2 percent, while the friction ratio of clays is normally between 2 to 5 percent, depending on cone resistance. Clays with a high silt content show a lower friction ratio.

**Derived Results – Pore Pressure Ratio**

The pore pressure ratio ($B_q$) is the ratio of the excess pore water pressure (i.e., the water pressure in excess of theoretical hydrostatic pressure) to the net cone resistance (Sennesset et al., 1982).

The process for calculating Bq is:

$$\Delta u = u_2 - z \cdot \gamma_w$$

then:

$$B_q = \frac{\Delta u}{q_{net}}$$

where:

$\gamma_w$ = unit weight of water

$\Delta u$ = excess pore pressure

$u_2$ = measured pore pressure

$z$ = test depth below bottom of the borehole

$q_{net}$ = net cone resistance

The pore pressure ratio is a good indicator for the soil type in layered soils. Clays show a positive pore pressure ratio (except stiff over-consolidated clays which may give small or negative values if dilatant during shear) and sands (except very loose or very silty sands) a negative pore pressure ratio. Sharp changes normally observed at layer changes accurately define the layer boundaries. The ratio can also be used to provide an indication of the over-consolidation ratio of clays (Lunne et al., 1985; Rad et al., 1985).

**Undrained Shear Strength Profile**

In addition to the direct measurements of undrained shear strength performed by laboratory testing, the undrained shear strength has also been derived from PCPT data in cohesive soil layers.

Undrained shear strength can be estimated from PCPT data using the following relationship (Lunne et al., 1997).

$$s_u = \frac{q_{net}}{N_{kt}}$$

where:

$q_{net}$ = net cone resistance

$N_{kt}$ = cone factor

Typically, a range 15< $N_{kt}$ < 20 is used however, this is can be modified depending on the as found conditions at the borehole or site.

**Relative Density Plot**

In situ relative density can be determined from the results of PCPTs based on the cone resistance as follows Jamiolkowski et al. (2003)

$$D_R = \frac{1}{3.10} \cdot ln\left(\frac{q_c}{17.68 \cdot {\sigma'_{v0}}^{0.50}}\right) \cdot 100$$

where:

$D_R$ = relative density (%)

$q_c$ = cone resistance (kPa)

$\sigma'_{v0}$ = in situ vertical effective stress (kPa)

**Internal Angle of Friction**

Internal angle of friction is derived based on the relative density as follows:

$$\varphi' = 0.226 \cdot D_r + 18.689$$

where:

$\varphi'$ = internal angle of friction (°)

## Appendix C.7 References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